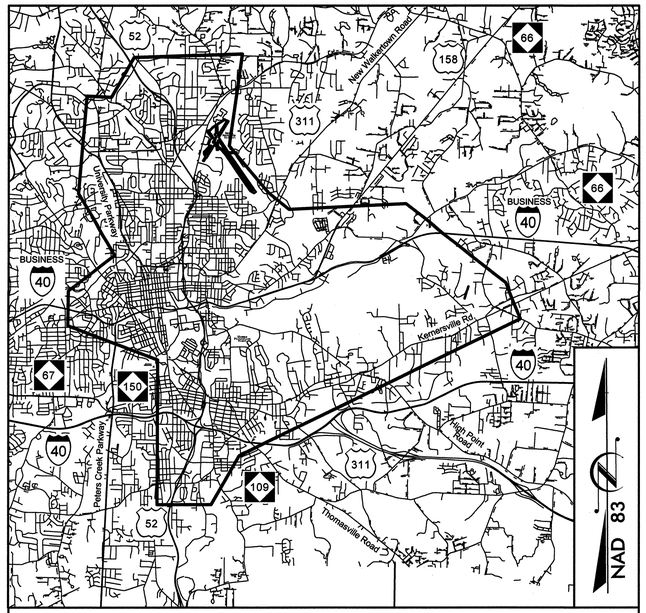
TIP PROJECT: C-5224A

CONTRACT: C203153

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	C-5224A	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45437.1.1		PE
45437.3.1	CMS-0918(89)	CONST



VICINITY MAP

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

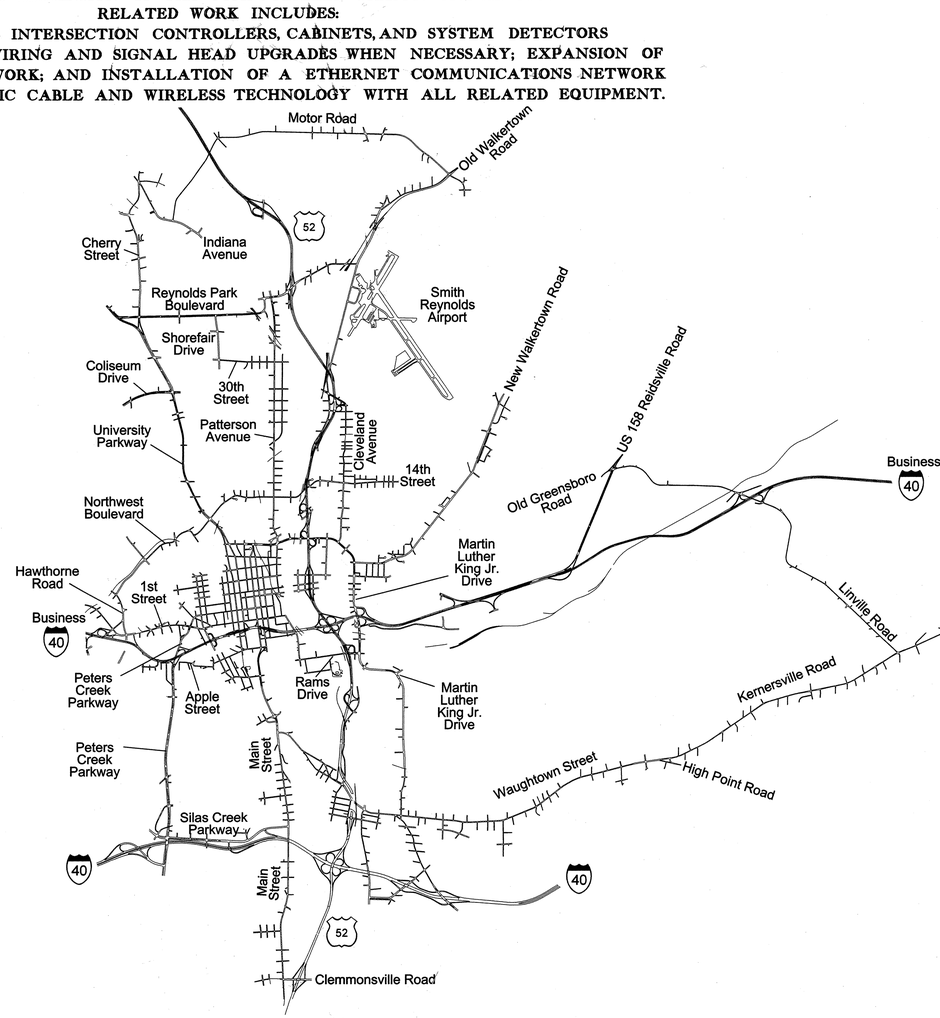
PLANS FOR PROPOSED IMPROVEMENTS

CITY OF WINSTON-SALEM

COMPUTERIZED TRAFFIC SIGNAL SYSTEM

PHASE A: EASTERN SECTION & DOWNTOWN

REPLACEMENT & EXPANSION OF THE COMPUTERIZED TRAFFIC SIGNAL SYSTEM.
RELATED WORK INCLUDES:
UPGRADING LOCAL INTERSECTION CONTROLLERS, CABINETS, AND SYSTEM DETECTORS WITH LIMITED SIGNAL WIRING AND SIGNAL HEAD UPGRADES WHEN NECESSARY; EXPANSION OF CCTV MONITORING NETWORK; AND INSTALLATION OF A ETHERNET COMMUNICATIONS NETWORK COMPRISED OF FIBER-OPTIC CABLE AND WIRELESS TECHNOLOGY WITH ALL RELATED EQUIPMENT.



Phase A

Volume III of III
Traffic Signal Designs

2012 STANDARD SPECIFICATIONS

LETTING DATE: MAY 21, 2013

PROJECT LENGTH = 45 MILES

750 Greenfield Parkway, Garner, NC 27529

NCDOT CONTACTS:
TRANSPORTATION MOBILITY & SAFETY DIVISION
INTELLIGENT TRANSPORTATION SYSTEMS SECTION
GREG A. FULLER, PE - STATE ITS & SIGNALS ENGINEER

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

J. TODD BROOKS, PE - ATKINS PROJECT MANAGER
LISA M. MOON, PE - ATKINS SENIOR PROJECT ENGINEER
H. ALFRED BADGETT, PE - ATKINS SENIOR PROJECT ENGINEER

Winston-Salem

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

SIGNATURE 1-11-13 DATE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	C-5224A	1	

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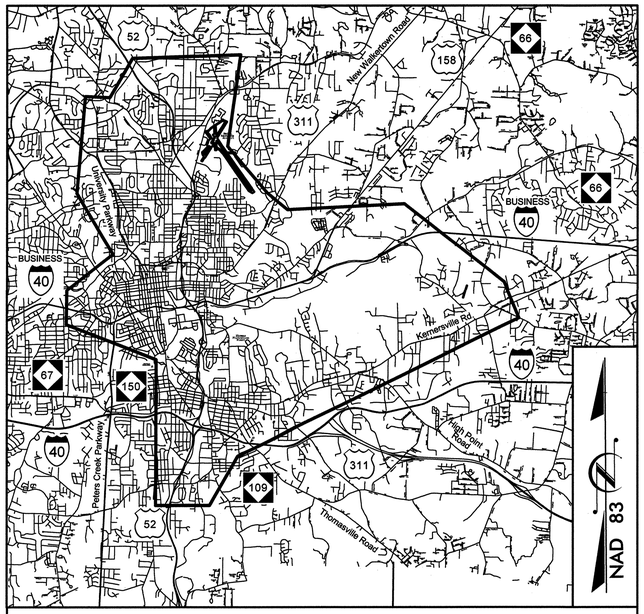
45437.1.1		PE
45437.3.1	CMS-0918(89)	CONST

TIP PROJECT: C-5224A

CONTRACT: C203153



VICINITY MAP

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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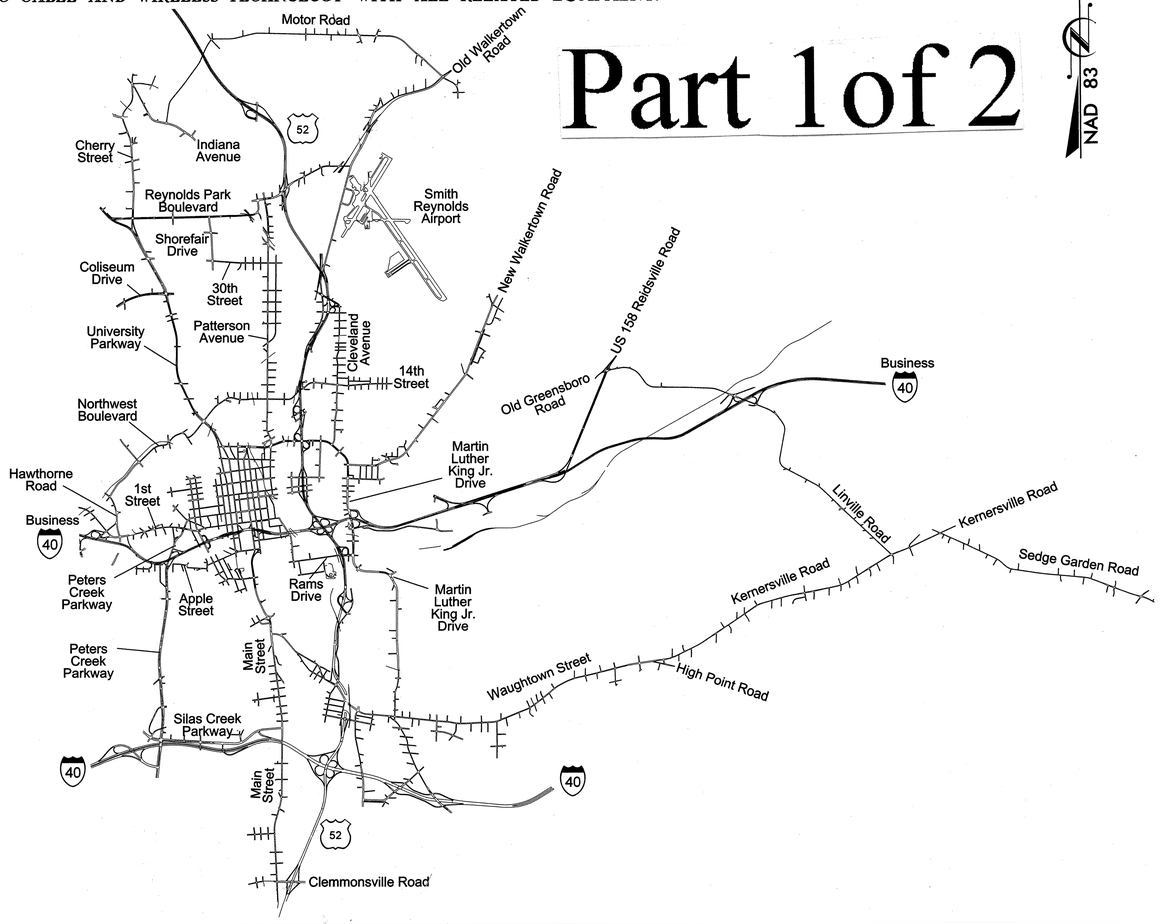

Part 1 of 2

Phase A

Volume III of III
Traffic Signal Designs

2012 STANDARD SPECIFICATIONS

LETTING DATE: MAY 21, 2013

PROJECT LENGTH = 45 MILES

750 Greenfield Parkway, Garner, NC 27529

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Winston-Salem

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NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

Lisa M Moon 1-11-13
SIGNATURE *DATE*

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	2

INDEX OF SHEETS

Volume I

1	TITLE SHEET (COMMUNICATIONS & CCTV FIELD INFRASTRUCTURE, BUILDING MODIFICATIONS AND SPECIAL DETAILS)
2	INDEX OF SHEETS AND ROADWAY STANDARD DRAWINGS
3	SUMMARY OF QUANTITIES
4	OVERVIEW OF PHASES A & B
5 THRU 6	CENTRAL BLOCK DIAGRAM
7	WIRELESS FIELD EQUIPMENT BLOCK DIAGRAM
8 THRU 10	CBD WIRELESS CORRIDOR DESIGN
11 THRU 12	SYSTEM DETECTORS AND CONTROL ZONE SCHEMATIC
13 THRU 30	SUMMARY OF WORK BY CABLE LAYOUT PLANS
31	CCTV INSTALLATION SUMMARY
CL A–1A THRU CL A–1D	CABLE LAYOUT PLANS KEY SHEET
CL A–1E	LEGEND/ GENERAL NOTES/ ABBREVIATIONS
CL A–1F	CONSTRUCTION NOTES
CL A–001 THRU CL A–223	CABLE LAYOUT PLANS
SD–1	CCTV CAMERA INSTALLATION, WOOD POLES U/G ELEC. SERVICE
SD–2	CCTV RISER AND CONDUIT DETAILS, POLE–MOUNTED CABINET
SD–3	CCTV CABINET ASSEMBLY LAYOUT
SD–4	SIGNAL CABINET DETAIL, POLE–MOUNTED
SD–5	RECONFIGURED POLE–MOUNTED 336 AND 336S CABINETS
SD–6	TERMINAL SPLICE CABINET DETAIL
SD–7	RISER DETAIL
SD–8	FOUNDATION MODIFICATION DETAIL
SD–9	BASE ADAPTER DETAIL
SD–10 THRU SD–11	CBD ANTENNA MOUNTING DETAIL
SD–12 THRU SD–13	CBD WIRELESS CABINET DETAIL
SD–14	AERIAL FIBER–OPTIC CABLE STORAGE & SPLICE ENCLOSURES
SD–15	GROUND MOUNTED ELECTRICAL SERVICE DETAIL
SD–16	BRYCE STUART BUILDING MODIFICATIONS
SD–17	TMC MODIFICATIONS
SD–18	TMC MONITOR WALL MODIFICATIONS
SD–19	TMC RACK LAYOUTS
SD–20	SIGNAL SHOP MODIFICATIONS
SD–21	HUB CABINET DETAIL
SD–22	JUNCTION BOX PLACEMENT DETAIL
SD–23	VERTICAL ADJUSTMENT OF SMFO CABLE
SD–24	DOWNTOWN ELECTRICAL SERVICE AND SPLICE BOX DETAILS
SD–25	BASE–MOUNTED CABINET FOUNDATION DETAILS
SD–26	GRANITE CURB INSTALLATION
TMP–1 THRU TMP–14	TRANSPORTATION MANAGEMENT PLAN

Volume II

1	TITLE SHEET (FIBER–OPTIC SPLICING)
2	INDEX OF SHEETS AND ROADWAY STANDARD DRAWINGS
3	COMMS. CABLE SCHEMATICS SHEET LAYOUT
4 THRU 8	COMMS. CABLE SCHEMATICS
9 THRU 12	IS COMMS. CABLE SCHEMATICS
13 THRU 17	FIBER–OPTIC CABLE USAGE SUMMARY
18	FIBER–OPTIC SPLICING DETAILS KEY SHEET
FS–01 THRU FS–64	FIBER–OPTIC SPLICING DETAILS
FS–65 THRU FS–66	IS FIBER–OPTIC SPLICING DETAILS

Volume III

1	TITLE SHEET (TRAFFIC SIGNAL DESIGNS)
2	INDEX OF SHEETS AND ROADWAY STANDARD DRAWINGS
3	SIGNAL PLANS INDEX SHEET
4 THRU 27	SUMMARY OF WORK BY INTERSECTION
SIG. 1 THRU SIG. 418	TRAFFIC SIGNAL PLANS

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" PROJECT SERVICES UNIT – N.C. DEPARTMENT OF TRANSPORTATION – RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE ARE HEREBY CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
848.01	CONCRETE SIDEWALK
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES – TYPE III
1150.01	FLAGGING DEVICES
1165.01	TRUCK MOUNTED ATTENUATOR – DELINEATION
1180.01	SKINNY DRUM
1205.01	PAVEMENT MARKINGS – LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS – DIVIDED AND UNDIVIDED ROADWAYS
1205.04	PAVEMENT MARKINGS – INTERSECTIONS
1205.05	PAVEMENT MARKINGS – TURN LANES
1205.07	PAVEMENT MARKINGS – PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS – SYMBOLS AND WORD MESSAGES
1700.01	ELECTRICAL SERVICE OPTIONS
1700.02	ELECTRICAL SERVICE GROUNDING
1705.01	SIGNAL HEADS – VEHICULAR SIGNAL HEADS
1705.02	SIGNAL HEADS – PEDESTRIAN ASSEMBLIES
1705.03	SIGNAL HEADS – WIRE COLOR CONVENTIONS
1715.01	UNDERGROUND CONDUIT – TRENCHING
1716.01	JUNCTION BOXES
1720.01	WOOD POLES
1721.01	GUY ASSEMBLIES
1725.01	INDUCTIVE DETECTION LOOPS
1730.01	FIBER–OPTIC CABLE – SPARE CABLE STORAGE
1736.01	SPREAD SPECTRUM RADIO
1743.01	PEDESTAL
1751.01	CONTROLLERS AND CABINETS – CABINET COMPONENT LAYOUT
1751.02	CONTROLLERS AND CABINETS – POWER, GROUND AND AUXILIARY

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems, NCDEPARTMENT OF TRANSPORTATION

750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Index of Sheets and
Roadway Standard Drawings
Phase A

Division 09 Forsyth County Winston-Salem

PLAN DATE:	January 2013	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE	REVISIONS	INIT.	DATE
NTS			

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

SIGNATURE DATE 1-11-13

CADD Filename: Phase A 2_IndexSheet.dgn

22-MAR-2013 15:44
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13833

SIGNAL PLANS INDEX BY SIGNAL ID NUMBER

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	3

NCDOT OR CITY SIGNAL INVENTORY NUMBER	INTERSECTION	SIGNAL SHEET NUMBER	CABLE LAYOUT SHEET NUMBER
09-0009	Cherry Street at Polo Road	Sig. 1	CL A-057
09-0010	Cherry Street at Reynolds Boulevard	Sig. 3	CL A-059
09-0011	University Parkway at Coliseum Drive / 27th Street	Sig. 5	CL A-062
09-0012	University Parkway at 25th Street	Sig. 7	CL A-063
09-0016	Glenn Ave at Akron Drive	Sig. 9	CL A-102
09-0018	Liberty Street at 25th Street	Sig. 11	CL A-108
09-0023	Silas Creek Parkway at Buchanan Street	Sig. 13	CL A-156
09-0029	Thomasville Road at Sprague Street	Sig. 15	CL A-195
09-0032	Waughtown Street at Peachtree Street	Sig. 17	CL A-171
09-0033	Waughtown Street at Martin Luther King Jr Drive	Sig. 19	CL A-170
09-0034	Thomasville Road at E Clemmonsville Road	Sig. 21	CL A-196
09-0037	E Clemmonsville Road at Old Lexington Road	Sig. 23	CL A-192
09-0040	Clemmonsville Road at Main Street	Sig. 25	CL A-141
09-0041	W Clemmonsville Road at Konnoak Drive	Sig. 27	CL A-141
09-0044	Waughtown Street at Main Street	Sig. 29	CL A-151
09-0045	Old Salem Road at Academy Street	Sig. 31	CL A-153
09-0046	NC 150 (Peters Creek Parkway) at Business 40 WB Ramp	Sig. 33	CL A-017
09-0053	Business 40 WB Ramp at First Street	Sig. 35	CL A-014
09-0056	Martin Luther King Jr Drive at Third Street	Sig. 37	CL A-028
09-0057	Martin Luther King Jr Drive at First Street/ Business 40 Ramp	Sig. 39	CL A-028
09-0058	Martin Luther King Jr Drive at Business 40 EB Ramps	Sig. 41	CL A-027
09-0059	Martin Luther King Jr Drive at Rams Drive	Sig. 43	CL A-026
09-0062	Patterson Avenue at Liberty Street	Sig. 45	CL A-009
09-0065	Liberty Street at 14th Street / Northwest Boulevard	Sig. 47	CL A-121
09-0081	Marshall Street at First Street	Sig. 49	CL A-031
09-0082	Cherry Street at First Street	Sig. 51	CL A-215
09-0087	Cherry Street at Second Street	Sig. 53	CL A-215
09-0088	Marshall Street at Second Street	Sig. 55	CL A-215
09-0089	Marshall Street at High Street	Sig. 57	CL A-032
09-0096	Marshall Street at Fifth Street	Sig. 60	CL A-219
09-0097	Cherry Street at Fifth Street	Sig. 62	CL A-219
09-0106	Martin Luther King Jr Drive at Fifth Street	Sig. 64	CL A-029
09-0110	Marshall Street at Fourth Street	Sig. 66	CL A-217
09-0111	Cherry Street at Fourth Street	Sig. 68	CL A-217
09-0121	Marshall Street at Sixth Street	Sig. 70	CL A-219
09-0122	Cherry Street at Sixth Street	Sig. 72	CL A-219
09-0127	Cherry Street at Seventh Street	Sig. 74	CL A-039
09-0128	Marshall Street at Seventh Street	Sig. 76	CL A-039
09-0129	University Parkway at 14th Street	Sig. 78	CL A-066
09-0132	University Parkway / Cherry Street / Marshall Street at Northwest Boulevard	Sig. 80	CL A-005
09-0133	Cherry Street at Third Street	Sig. 82	CL A-217
09-0136	Main Street at Business 40	Sig. 84	CL A-045
09-0137	Liberty Street at Cemetery Street	Sig. 86	CL A-022
09-0138	Main Street at Cemetery Street	Sig. 88	CL A-022
09-0139	Liberty Street / Old Salem Road at Brookstown Avenue	Sig. 90	CL A-021
09-0150	Indiana Avenue at Cherry Street	Sig. 92	CL A-054
09-0157	Rams Drive at US 52 Ramp	N/A	CL A-026
09-0161	University Parkway at Deacon Boulevard / Bonhurst Drive	Sig. 94	CL A-061
09-0162	Polo Road at Indiana Avenue	Sig. 96	CL A-070
09-0167	US 311 (New Walkertown Road) at Dellabrook Road	Sig. 98	CL A-128
09-0175	Akron Drive at US 52 Ramp	Sig. 100	CL A-100
09-0176	Akron Drive at Leo Street	Sig. 102	CL A-100
09-0179	Liberty Street at 28th Street	Sig. 107	CL A-108
09-0186	Liberty Street at Glenn Avenue	Sig. 109	CL A-115
09-0187	Liberty Street / Old Rural Hall Road at Old Walkertown Road / Newport Street	Sig. 111	CL A-116
09-0195	US 158 (Reidsville Road) at Old Greensboro Road	Sig. 113	CL A-222
09-0199	Liberty Street at Fairchild Road	Sig. 115	CL A-110
09-0267	Liberty Street at Akron Drive	Sig. 117	CL A-113
09-0271	Waughtown Street at Reynolds Park Road / Sprague Street	Sig. 119	CL A-179
09-0327	E Clemmonsville Road at I-40 EB Ramp	Sig. 121	CL A-194
09-0328	E Clemmonsville Road at I-40 WB Ramp	Sig. 123	CL A-194
09-0395	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue	Sig. 125	CL A-012
09-0398	Old Walkertown Road at Carver School Road	Sig. 127	CL A-118
09-0475	Linville Road / Old Greensboro Road at Business 40 WB Ramp / W. Mountain Road	Sig. 130	CL A-210
09-0479	US 311 (New Walkertown Road) at US 311 (Martin Luther King Jr Drive)	Sig. 132	CL A-029
09-0566	Akron Drive at Ogburn Avenue	Sig. 134	CL A-101
09-0577	Kernersville Road at High Point Road	Sig. 136	CL A-180
09-0578	US 311 (New Walkertown Road) at Water Works Raod	Sig. 138	CL A-129
09-0597	Reynolds Boulevard at Indiana Avenue	Sig. 140	CL A-098
09-0598	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue / File Street	Sig. 142	CL A-012
09-0599	NC 109 (Thomasville Road) at North Frontage Road / I-40 WB Ramp	Sig. 144	CL A-197
09-0600	NC 109 (Thomasville Road) at South Frontage Road / I-40 EB Ramp	Sig. 146	CL A-198
09-0605	Waughtown Street at Pleasant Street	Sig. 148	CL A-173
09-0647	Cherry Street at North Point Boulevard	Sig. 150	CL A-055
09-0660	Kernersville Road at Linville Road / Motsinger Road	Sig. 152	CL A-188
09-0665	Reynolds Boulevard / B Street at Akron Drive	Sig. 154	CL A-099
09-0675	Martin Luther King Jr Drive at Highland Avenue	Sig. 156	CL A-011
09-0676	Sheraton Street at Akron Drive	Sig. 158	CL A-099
09-0689	Waughtown Street at Vargrave Street	Sig. 160	CL A-166
09-0690	Waughtown Street at Dacian Street	Sig. 162	CL A-169
09-0691	Waughtown Street at Old Lexington Road	Sig. 164	CL A-191
09-0705	Cherry Street at University Parkway	Sig. 166	CL A-059
09-0726	Kernersville Road at Sedge Garden Road	Sig. 168	CL A-190
09-0819	Silas Creek Parkway at I-40 WB Ramp	Sig. 170	CL A-158
09-0820	Silas Creek Parkway at Main Street	Sig. 172	CL A-148
09-0931	US 311 (New Walkertown Road) at 14th Street	Sig. 174	CL A-128
09-1022	Martin Luther King Jr Drive at US 52 SB Ramp	Sig. 176	CL A-010
09-1090	Broad Street at Business 40 WB Ramp	Sig. 178	CL A-033
09-1091	Broad Street at Business 40 EB Ramp	Sig. 184	CL A-033
09-1121	Liberty Street at Lansing Drive	Sig. 189	CL A-115
09-1266	US 311 (New Walkertown Road) at Jackson Avenue	Sig. 191	CL A-124
09-1269	Old Rural Hall Road at Motor Road	Sig. 193	CL A-079
09-1270	E. Clemmonsville Road at US 52 Southbound Ramp	Sig. 195	CL A-142
09-1271	Indiana Avenue at Alspaugh Drive	Sig. 197	CL A-070
09-1283	Martin Luther King Jr Drive at Reynolds Park Road	Sig. 199	CL A-135
09-1288	Martin Luther King Jr Drive at Cromartie Street	Sig. 201	CL A-027
09-1289	Reynolds Boulevard at Whitaker Park	Sig. 203	CL A-084
09-1302	New Greensboro Road / Business 40 EB Ramp at Old Greensboro Road / Linville Road	Sig. 205	CL A-210
09-1311	Martin Luther King Jr Drive at Main Street / Liberty Street	Sig. 207	CL A-042
09-1312	Martin Luther King Jr Drive at Patterson Avenue	Sig. 209	CL A-010
09-1313	Martin Luther King Jr Drive / Eighth Street at Trade Street	Sig. 211	CL A-042
09-1329	Clemmonsville Road at US 52 Northbound Ramp	Sig. 213	CL A-142
09-1331	Cherry Street / Marshall Street at Eighth Street	Sig. 215	CL A-039
09-1334	28th Street / Cleveland Avenue at US 52 NB Ramp	Sig. 217	CL A-107
09-1336	US 311 (New Walkertown Road) at Overlook Drive / Bowen Boulevard	Sig. 220	CL A-131
09-1338	Martin Luther King Jr Drive at US 52 NB Ramp	Sig. 222	CL A-011
09-1354	US 311 (New Walkertown Road) at Ferrell Avenue / Ferrell Court	N/A	CL A-126
09-xxxxx	Motor Road at Baux Mountain Road	N/A	CL A-079
09-xxxxx	Rams Drive at Salem Creek Connector / Research Parkway	N/A	CL A-025
FUTURE STATE	Carver School Road / Winston Lake Road at US 311 (New Walkertown Road)	N/A	CL A-132
C-013	Patterson Avenue at North Side Shopping Center	Sig. 224	CL A-097
C-014	Patterson Avenue at Indiana Avenue	Sig. 226	CL A-096
C-016	Patterson Avenue at 30th Street	Sig. 228	CL A-095
C-017	30th Street at Glenn Avenue	Sig. 230	CL A-095
C-018	Patterson Avenue at 28th Street	Sig. 232	CL A-094
C-019	28th Street at Glenn Avenue	Sig. 234	CL A-094
C-023	Patterson Avenue at 27th Street	Sig. 236	CL A-094
C-024	27th Street at Glenn Ave	Sig. 238	CL A-094
C-026	Patterson Avenue at 25th Street	Sig. 240	CL A-094
C-027	25th Street at Glenn Avenue	Sig. 242	CL A-094
C-029	25th Street at Cleveland Avenue	Sig. 244	CL-A107
C-037	Patterson Avenue at Glenn Avenue	Sig. 246	CL A-093
C-038	Cleveland Avenue at 21st Street	Sig. 248	CL A-106
C-040	Northwest Boulevard at Reynolda Road	Sig. 250	CL A-002
C-041	Northwest Boulevard at Thurmond Street / Broad Street	Sig. 252	CL A-004
C-044	Northwest Boulevard at Trade Street	Sig. 254	CL A-007
C-045	Northwest Boulevard at Patterson Avenue	Sig. 256	CL A-008
C-046	Northwest Boulevard at Ivy Avenue	Sig. 258	CL A-119
C-049	14th Street at Cleveland Avenue	Sig. 260	CL A-104
C-050	14th Street at Cameron Avenue	Sig. 262	CL A-123
C-057	Fifth Street at Cameron Avenue	Sig. 264	CL A-133
C-066	Northwest Boulevard at Hawthorne Road	Sig. 266	CL A-001
C-068	Hawthorne Road at Glade Street	Sig. 268	CL A-013
C-072	Hawthorne Road at First Street	Sig. 270	CL A-014
C-074	First Street at Fourth Street / Burke Street	Sig. 272	CL A-015
C-080	Salem Avenue at Rams Drive	Sig. 274	CL A-024
C-083	Martin Luther King Jr Drive at WSSU	Sig. 276	CL A-134
C-087	Fifth Street at Poplar Street	Sig. 278	CL A-219
C-088	Broad Street at Academy Street	Sig. 280	CL A-161
C-089	Academy Street at Marshall Street	Sig. 282	CL A-162
C-095	Salem Avenue at Marshall Street	Sig. 284	CL A-160
C-109	Broad Street at Acadia Avenue	Sig. 286	CL A-159
C-110	Main Street at Acadia Avenue	Sig. 288	CL A-149
C-114	Main Street at Sprague Street	Sig. 290	CL A-148
C-115	Sprague Street at Vargrave Street	Sig. 292	CL A-167
C-120	Sprague Street at Old Lexington Road	Sig. 294	CL A-168
C-123	Sprague Street at Peachtree Street	Sig. 296	CL A-199
C-127	Fifth Street at Highland Avenue	Sig. 298	CL A-051
C-129	Sprague Street at Marble Street	Sig. 300	CL A-200
C-135	Sprague Street at Clemmonsville Road	Sig. 302	CL A-199
C-140	Seventh Street at Trade Street	Sig. 304	CL A-040
C-141	Liberty Street at Seventh Street	Sig. 306	CL A-040
C-142	Main Street at Seventh Street	Sig. 308	CL A-040
C-143	Patterson Avenue at Seventh Street	Sig. 310	CL A-048
C-144	Broad Street at Sixth Street	Sig. 312	CL A-035
C-146	Spruce Street / West End Boulevard at Sixth Street	Sig. 314	CL A-219
C-149	Trade Street at Sixth Street	Sig. 316	CL A-043
C-150	Liberty Street at Sixth Street	Sig. 318	CL A-219
C-151	Main Street at Sixth Street	Sig. 320	CL A-046
C-154	Broad Street at Fifth Street	Sig. 322	CL A-035
C-155	Fifth Street at Spring Street	Sig. 324	CL A-035
C-156	Fifth Street at Spruce Street	Sig. 326	CL A-219
C-159	Fifth Street at Trade Street	Sig. 328	CL A-043
C-160	Liberty Street at Fifth Street	Sig. 330	CL A-043
C-161	Fifth Street at Main Street	Sig. 332	CL A-219
C-162	Fifth Street at Church Street	Sig. 334	CL A-219
C-163	Fifth Street at Patterson Avenue	Sig. 336	CL A-047
C-164	Broad Street at Fourth Street	Sig. 338	CL A-035
C-165	Fourth Street at Spring Street	Sig. 340	CL A-035
C-166	Fourth Street at Poplar Street	Sig. 342	CL A-217
C-167	Fourth Street at Spruce Street	Sig. 344	CL A-217
C-170	Fourth Street at Trade Street	Sig. 346	CL A-217
C-171	Liberty Street at Fourth Street	Sig. 348	CL A-044
C-172	Main Street at Fourth Street	Sig. 350	CL A-217
C-173	Fourth Street at Church Street	Sig. 352	CL A-217
C-174	Patterson Avenue at Fourth Street	Sig. 354	CL A-047
C-175	Brookstown Avenue at Burke Street	Sig. 356	CL A-036
C-178	Liberty Street at Third Street	Sig. 358	CL A-044
C-179	Main Street at Third Street	Sig. 360	CL A-218
C-180	Third Street at Church Street	Sig. 362	CL A-218
C-181	Third Street at Chestnut Street	Sig. 364	CL A-218
C-182	Third Street at Patterson Avenue	Sig. 366	CL A-047
C-183	Broad Street at Second Street	Sig. 368	CL A-034
C-185	Second Street at Spruce Street	Sig. 370	CL A-215
C-189	Second Street at Liberty Street	Sig. 372	CL A-044
C-190	Second Street at Main Street	Sig. 374	CL A-044
C-191	Second Street Church Street	Sig. 376	CL A-216
C-193	First Street at Second Street / Peters Creek Parkway	Sig. 378	CL A-016
C-194	First Street at Broad Street	Sig. 380	CL A-030
C-197	First Street at Liberty Street	Sig. 385	CL A-216
C-198	First Street at Main Street	Sig. 387	CL A-045
C-199	First Street at Church Street	Sig. 389	CL A-045
C-209	Highland Avenue at Carl Russell Avenue	Sig. 391	CL A-051
C-213	Martin Luther King Jr Drive at WSSU Crosswalk	Sig. 393	CL A-134
C-223	Broad Street at Wachovia Street	Sig. 395	CL A-019
C-237	Patterson Avenue at Motor Road	Sig. 397	CL A-074
C-268	Deacon Boulevard / 30th Street at Shorefair Drive	Sig. 399	CL A-087
C-275	Coliseum Drive at Pilgrim Court	Sig. 401	CL A-089
C-283	Fifth Street at Summit Street	Sig. 403	CL A-037
C-288	Konnoak Drive at Haverhill Street	Sig. 405	CL A-155
C-298	Kernersville Road at Oak Grove Church Road	Sig. 407	CL A-189
C-323	Fifth Street at Linden Street	Sig. 409	CL A-049
C-324	Fourth Street at Linden Street	Sig. 411	CL A-049
C-326	Carver School Road at Lansing Drive	Sig. 413	CL A-221
C-332	Sprague Street at Cole Road	Sig. 415	CL A-201
C-335	Cleveland Avenue at 12th Street	Sig. 417	CL A-103

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: North Carolina Department of Transportation, Mobility and Safety Division, Intelligent Transportation Systems Section
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Signal Plans Index Sheet
Phase A

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
Lisa M Moon 1-11-13
SIGNATURE DATE

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	4

Reference Information				Controller,Cabinet & Foundation Work																																			
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																																	
														Base		Install New Foundation																								
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux File in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)		Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees)	Rotate Cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	Pole (336S)	Pole (336)	Ex. Height - Ground to Bottom (inches)	Lower Cabinet		Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)						
09-0009	Cherry Street at Polo Road	CL A-057	Sig. 1	1		1		1			2	1		1					other side of pole	1		1	315		1					42									
09-0010	Cherry Street at Reynolds Boulevard	CL A-059	Sig. 3	1		1		1			7	1									1		90		1													
09-0011	University Parkway at Coliseum Drive / 27th Street	CL A-062	Sig. 5	1		1					13	1									1		270		1													
09-0012	University Parkway at 25th Street	CL A-063	Sig. 7	1		1		1			6	1									1		0		1													
09-0016	Glenn Ave at Akron Drive	CL A-102	Sig. 9	1		1					2	1		1					left -btwn ex & pole			1	0		1				42									
09-0018	Liberty Street at 25th Street	CL A-108	Sig. 11	1		1		1			2	1				1	SE		by signal pole	1		1	180		1				42									
09-0023	Silas Creek Parkway at Buchanan Street	CL A-156	Sig. 13	1		1		1			10	1									1		90		1													
09-0029	Thomasville Road at Sprague Street	CL A-195	Sig. 15	1		1		1				1		1					opposite side of pole	1		1	270		1				42									
09-0032	Waughtown Street at Peachtree Street	CL A-171	Sig. 17	1		1					2	1			1				left of ex. DI				90		1				42				25					
09-0033	Waughtown Street at Martin Luther King Jr Drive	CL A-170	Sig. 19	1		1		1				1			1				remove adjacent JB			1	90		1				42				110					
09-0034	Thomasville Road at E Clemmonsville Road	CL A-196	Sig. 21	1		1		1			4	1			1				avoid ex JB			1	270		1				42				100					
09-0037	E Clemmonsville Road at Old Lexington Road	CL A-192	Sig. 23	1		1		1			5	1									1		270		1													
09-0040	Clemmonsville Road at Main Street	CL A-141	Sig. 25	1		1		1			6	1							to be modified under -2923		1		90		1													
09-0041	W Clemmonsville Road at Konnoak Drive	CL A-141	Sig. 27	1		1		1			4	1							to be modified under -2923		1		90		1													
09-0044	Waughtown Street at Main Street	CL A-151	Sig. 29	1		1		1			4	1									1		270		1													
09-0045	Old Salem Road at Academy Street	CL A-153	Sig. 31	1		1		1			8	1				1	SW	*	flush against sidewalk for tech pad, between sidewalk and trail	1		1	270		1									80	**			
09-0046	NC 150 (Peters Creek Parkway) at Business 40 WB Ramp	CL A-017	Sig. 33	1		1					3	1			1				left of existing	1		1	75		1				42									
09-0053	Business 40 WB Ramp at First Street	CL A-014	Sig. 35	1		1					1								# square cabinet with sidewalk				270	#				1	39			1		**			
09-0056	Martin Luther King Jr Drive at Third Street	CL A-028	Sig. 37	1		1					6												270					1	25									
09-0057	Martin Luther King Jr Drive at First Street/ Business 40 Ramp	CL A-028	Sig. 39	1		1		1			7	1									1		90		1													
09-0058	Martin Luther King Jr Drive at Business 40 EB Ramps	CL A-027	Sig. 41	1		1		1			7	1											0		1													
09-0059	Martin Luther King Jr Drive at Rams Drive	CL A-026	Sig. 43	1		1					5	1							hand dig around this cabinet, lots of utilities		1		270		1													
09-0062	Patterson Avenue at Liberty Street	CL A-009	Sig. 45	1		1					4	1											270		1													
09-0065	Liberty Street at 14th Street / Northwest Boulevard	CL A-121	Sig. 47	1		1		1			4	1									1		270		1													
09-0081	Marshall Street at First Street	CL A-031	Sig. 49	1		1							1		1				replace existing terminal splice box	1		1	255		1				42				36					
09-0082	Cherry Street at First Street	CL A-215	Sig. 51	1		1																	90					1	39			1						

See Boxed Note at Bottom of Sheet

* Foundation shall utilize a concrete mix that has been tinted a light earth-tone palette to soften the visual impact.

** Sidewalk shall utilize a concrete mix that has been tinted to match adjacent sidewalk to soften the visual impact.

- Work shown on this sheet is for the upgrade of the traffic signals, including installation of new controllers and cabinets, new or modified foundations, electrical service and miscellaneous signal related items. Additional information can be found in the signal plans in this Volume. Work to be done for fiber-optic cable routing and interconnection is shown on the cable layout plans and on the sheets entitled "Summary of Work by Cable Layout Plans" in Volume I of III.
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ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: North Carolina Department of Transportation — Transportation Mobility and Safety Division — Intelligent Transportation Systems

750 Greensfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 1 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY: MB Toth

PREPARED BY: JAW/BKS REVIEWED BY: LW Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 LISA M. MOON

SIGNATURE DATE 1-11-13

CADD Filename: Phase A Int Summary v3.dgn

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	5

SUMMARY OF WORK BY INTERSECTION

Reference Information				*Conduit and Riser Work																Power Service				
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Riser for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnec	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service	
09-0009	Cherry Street at Polo Road	CL A-057	Sig. 1							1					1	2						3	1	
09-0010	Cherry Street at Reynolds Boulevard	CL A-059	Sig. 3							1					1							3	1	
09-0011	University Parkway at Coliseum Drive / 27th Street	CL A-062	Sig. 5	1						1										1				#
09-0012	University Parkway at 25th Street	CL A-063	Sig. 7		1					1					1							3	1	
09-0016	Glenn Ave at Akron Drive	CL A-102	Sig. 9							1					1	3						3	1	
09-0018	Liberty Street at 25th Street	CL A-108	Sig. 11							1					1	3						3	1	
09-0023	Silas Creek Parkway at Buchanan Street	CL A-156	Sig. 13	1	1					1					1							3	1	
09-0029	Thomasville Road at Sprague Street	CL A-195	Sig. 15							1					1	2						3	1	
09-0032	Waughtown Street at Peachtree Street	CL A-171	Sig. 17			1									1							3	1	
09-0033	Waughtown Street at Martin Luther King Jr Drive	CL A-170	Sig. 19			1				1					1							3	1	
09-0034	Thomasville Road at E Clemmonsville Road	CL A-196	Sig. 21							1					1							3	1	
09-0037	E Clemmonsville Road at Old Lexington Road	CL A-192	Sig. 23	1						1					1							3	1	
09-0040	Clemmonsville Road at Main Street	CL A-141	Sig. 25		1					1														
09-0041	W Clemmonsville Road at Konnoak Drive	CL A-141	Sig. 27			1																		
09-0044	Waughtown Street at Main Street	CL A-151	Sig. 29							1										1				
09-0045	Old Salem Road at Academy Street	CL A-153	Sig. 31							1					1	3						3	1	
09-0046	NC 150 (Peters Creek Parkway) at Business 40 WB Ramp	CL A-017	Sig. 33							1					1	1						3	1	
09-0053	Business 40 WB Ramp at First Street	CL A-014	Sig. 35								1				1							3	1	
09-0056	Martin Luther King Jr Drive at Third Street	CL A-028	Sig. 37			1																		
09-0057	Martin Luther King Jr Drive at First Street/ Business 40 Ramp	CL A-028	Sig. 39			1														1				
09-0058	Martin Luther King Jr Drive at Business 40 EB Ramps	CL A-027	Sig. 41			1																		
09-0059	Martin Luther King Jr Drive at Rams Drive	CL A-026	Sig. 43	1	1					1			1		1							3	1	#
09-0062	Patterson Avenue at Liberty Street	CL A-009	Sig. 45		1					1														
09-0065	Liberty Street at 14th Street / Northwest Boulevard	CL A-121	Sig. 47		1							1												
09-0081	Marshall Street at First Street	CL A-031	Sig. 49							1					1	2						3	1	
09-0082	Cherry Street at First Street	CL A-215	Sig. 51																			3	1	

See Boxed Note at Bottom of Sheet

Install new shared electrical service for signal controller and CCTV or hub cabinet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

- Work shown on this sheet is for the upgrade of the traffic signals, including installation of new controllers and cabinets, new or modified foundations, electrical service and miscellaneous signal related items. Additional information can be found in the signal plans in this Volume. Work to be done for fiber-optic cable routing and interconnection is shown on the cable layout plans and on the sheets entitled "Summary of Work by Cable Layout Plans" in Volume I of III.
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ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: NC Department of Transportation, Transportation Mobility and Safety Division, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY: MB Toth
PREPARED BY: JAW/BKS REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE DATE 1-11-13

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	6

SUMMARY OF WORK BY INTERSECTION

Reference Information				Signal Items															
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
09-0009	Cherry Street at Polo Road	CL A-057	Sig. 1				80				70						15		
09-0010	Cherry Street at Reynolds Boulevard	CL A-059	Sig. 3																
09-0011	University Parkway at Coliseum Drive / 27th Street	CL A-062	Sig. 5						1										
09-0012	University Parkway at 25th Street	CL A-063	Sig. 7																
09-0016	Glenn Ave at Akron Drive	CL A-102	Sig. 9																
09-0018	Liberty Street at 25th Street	CL A-108	Sig. 11				540				390						15		
09-0023	Silas Creek Parkway at Buchanan Street	CL A-156	Sig. 13																
09-0029	Thomasville Road at Sprague Street	CL A-195	Sig. 15				90									15			
09-0032	Waughtown Street at Peachtree Street	CL A-171	Sig. 17																
09-0033	Waughtown Street at Martin Luther King Jr Drive	CL A-170	Sig. 19																
09-0034	Thomasville Road at E Clemmonsville Road	CL A-196	Sig. 21																
09-0037	E Clemmonsville Road at Old Lexington Road	CL A-192	Sig. 23																
09-0040	Clemmonsville Road at Main Street	CL A-141	Sig. 25																
09-0041	W Clemmonsville Road at Konnoak Drive	CL A-141	Sig. 27																
09-0044	Waughtown Street at Main Street	CL A-151	Sig. 29																
09-0045	Old Salem Road at Academy Street	CL A-153	Sig. 31				740				1100						15		
09-0046	NC 150 (Peters Creek Parkway) at Business 40 WB Ramp	CL A-017	Sig. 33				60		2		120	1		2			20		
09-0053	Business 40 WB Ramp at First Street	CL A-014	Sig. 35																
09-0056	Martin Luther King Jr Drive at Third Street	CL A-028	Sig. 37																
09-0057	Martin Luther King Jr Drive at First Street/ Business 40 Ramp	CL A-028	Sig. 39																
09-0058	Martin Luther King Jr Drive at Business 40 EB Ramps	CL A-027	Sig. 41																
09-0059	Martin Luther King Jr Drive at Rams Drive	CL A-026	Sig. 43						1										
09-0062	Patterson Avenue at Liberty Street	CL A-009	Sig. 45																
09-0065	Liberty Street at 14th Street / Northwest Boulevard	CL A-121	Sig. 47																
09-0081	Marshall Street at First Street	CL A-031	Sig. 49				30									15			
09-0082	Cherry Street at First Street	CL A-215	Sig. 51																

See Boxed Note at Bottom of Sheet

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Prepared for the Offices of: North Carolina Department of Transportation — Transportation Mobility and Safety Division — Integrated Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LW Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE Lisa M. Moon 1-11-13 DATE

CADD Filename: Phase A Int Summary v3.dgn

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	7

Reference Information				Controller,Cabinet & Foundation Work																																	
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																															
														Base		Install New Foundation																					
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux File in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)	Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees)	Rotate Cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	Pole (336S)	Pole (336)	EX. Height - Ground to Bottom (inches)	Lower Cabinet		Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)			
09-0087	Cherry Street at Second Street	CL A-215	Sig. 53	1		1																270						1	43								
09-0088	Marshall Street at Second Street	CL A-215	Sig. 55	1		1																270					1		38			1					
09-0089	Marshall Street at High Street	CL A-032	Sig. 57	1		1																270					1		46			1					
09-0096	Marshall Street at Fifth Street	CL A-219	Sig. 60	1		1																270						1	46			1					
09-0097	Cherry Street at Fifth Street	CL A-219	Sig. 62	1		1																270						1	39			1					
09-0106	Martin Luther King Jr Drive at Fifth Street	CL A-029	Sig. 64	1		1		1			6	1										0		1													
09-0110	Marshall Street at Fourth Street	CL A-217	Sig. 66	1		1				1												90						1	45			1					
09-0111	Cherry Street at Fourth Street	CL A-217	Sig. 68	1		1				1												270						1	44			1					
09-0121	Marshall Street at Sixth Street	CL A-219	Sig. 70	1		1						1										90		1													
09-0122	Cherry Street at Sixth Street	CL A-219	Sig. 72	1		1																90					1		38			1					
09-0127	Cherry Street at Seventh Street	CL A-039	Sig. 74	1		1																90					1		45			1					
09-0128	Marshall Street at Seventh Street	CL A-039	Sig. 76	1		1						1		1				behind sidewalk along Marshall	1			270		1					47				30				
09-0129	University Parkway at 14th Street	CL A-066	Sig. 78	1		1		1			6	1								1				1													
09-0132	University Parkway / Cherry Street / Marshall Street at Northwest Boulevard	CL A-005	Sig. 80	1		1		1			8	1		1				right of ex, closer to pole			1	0		1													
09-0133	Cherry Street at Third Street	CL A-217	Sig. 82	1		1																270						1	42			1					
09-0136	Main Street at Business 40	CL A-045	Sig. 84	1		1																0	90				1		37			1					
09-0137	Liberty Street at Cemetery Street	CL A-022	Sig. 86	1		1							1		1			remove JB			1	270		1									40				
09-0138	Main Street at Cemetery Street	CL A-022	Sig. 88	1		1												# rotate cabinet to align parellel to Cemetery Street				90	#				1		46			1		**			
09-0139	Liberty Street / Old Salem Road at Brookstown Avenue	CL A-021	Sig. 90	1		1						1		1			*	behind ex & pole	1		1	90		1					42					**			
09-0150	Indiana Avenue at Cherry Street	CL A-054	Sig. 92	1		1					8	1								1		270		1													
09-0157	Rams Drive at US 52 Ramp	CL A-026	N/A															removed under U-2925																			
09-0161	University Parkway at Deacon Boulevard / Bonhurst Drive	CL A-061	Sig. 94	1		1					9	1								1		270		1													
09-0162	Polo Road at Indiana Avenue	CL A-070	Sig. 96	1		1		1			4	1								1		90		1													
09-0167	US 311 (New Walkertown Road) at Dellabrook Road	CL A-128	Sig. 98	1		1		1			4	1		1				behind sidewalk	1			90		1					36				36				
09-0175	Akron Drive at US 52 Ramp	CL A-100	Sig. 100	1		1		1			4	1		1				back side of ex & pole, closer to pole			1	270		1					42								
09-0176	Akron Drive at Leo Street	CL A-100	Sig. 102	1		1		1			5	1				1	NE					270		1					42								

See Boxed Note at Bottom of Sheet

* Foundation shall utilize a concrete mix that has been tinted a light earth-tone palette to soften the visual impact.

** Sidewalk shall utilize a concrete mix that has been tinted to match adjacent sidewalk to soften the visual impact.

- Work shown on this sheet is for the upgrade of the traffic signals, including installation of new controllers and cabinets, new or modified foundations, electrical service and miscellaneous signal related items. Additional information can be found in the signal plans in this Volume. Work to be done for fiber-optic cable routing and interconnection is shown on the cable layout plans and on the sheets entitled "Summary of Work by Cable Layout Plans" in Volume I of III.
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ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Integrated Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 1 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY: MB Toth

PREPARED BY: JAW/BKS REVIEWED BY: LW Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

SIGNATURE 1-11-13 DATE

CADD Filename: Phase A Int Summary v3.dgn

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	8

SUMMARY OF WORK BY INTERSECTION

Reference Information				*Conduit and Riser Work																	Power Service			
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Riser for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnect	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service
09-0087	Cherry Street at Second Street	CL A-215	Sig. 53																				3	1
09-0088	Marshall Street at Second Street	CL A-215	Sig. 55																				3	1
09-0089	Marshall Street at High Street	CL A-032	Sig. 57								1				1				1				3	1
09-0096	Marshall Street at Fifth Street	CL A-219	Sig. 60																				3	1
09-0097	Cherry Street at Fifth Street	CL A-219	Sig. 62																				3	1
09-0106	Martin Luther King Jr Drive at Fifth Street	CL A-029	Sig. 64						1															
09-0110	Marshall Street at Fourth Street	CL A-217	Sig. 66																				3	1
09-0111	Cherry Street at Fourth Street	CL A-217	Sig. 68																				3	1
09-0121	Marshall Street at Sixth Street	CL A-219	Sig. 70				1																	
09-0122	Cherry Street at Sixth Street	CL A-219	Sig. 72																				3	1
09-0127	Cherry Street at Seventh Street	CL A-039	Sig. 74			1									1								3	1
09-0128	Marshall Street at Seventh Street	CL A-039	Sig. 76							1					1				2				3	1
09-0129	University Parkway at 14th Street	CL A-066	Sig. 78	1	1					1					1								3	1
09-0132	University Parkway / Cherry Street / Marshall Street at Northwest Boulevard	CL A-005	Sig. 80							1					1	3							3	1
09-0133	Cherry Street at Third Street	CL A-217	Sig. 82																				3	1
09-0136	Main Street at Business 40	CL A-045	Sig. 84																				3	1
09-0137	Liberty Street at Cemetery Street	CL A-022	Sig. 86							1					1	2							3	1
09-0138	Main Street at Cemetery Street	CL A-022	Sig. 88								1				1								3	1
09-0139	Liberty Street / Old Salem Road at Brookstown Avenue	CL A-021	Sig. 90							1					1	3							3	1
09-0150	Indiana Avenue at Cherry Street	CL A-054	Sig. 92				1																	
09-0157	Rams Drive at US 52 Ramp	CL A-026	N/A																					
09-0161	University Parkway at Deacon Boulevard / Bonhurst Drive	CL A-061	Sig. 94		1					1					1								3	1
09-0162	Polo Road at Indiana Avenue	CL A-070	Sig. 96	1		1									1								3	1
09-0167	US 311 (New Walkertown Road) at Dellabrook Road	CL A-128	Sig. 98							1					1				2				3	1
09-0175	Akron Drive at US 52 Ramp	CL A-100	Sig. 100							1					1	3							3	1
09-0176	Akron Drive at Leo Street	CL A-100	Sig. 102							1					1	3							3	1

See Boxed Note at Bottom of Sheet

Install new shared electrical service for signal controller and CCTV or hub cabinet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

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Prepared for the Offices of: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Transportation Mobility and Safety Division Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE	REVISIONS	INIT.	DATE
NTS			

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

SIGNATURE 1-11-23 DATE

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	9

SUMMARY OF WORK BY INTERSECTION

Reference Information				Signal Items																
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
09-0087	Cherry Street at Second Street	CL A-215	Sig. 53																
09-0088	Marshall Street at Second Street	CL A-215	Sig. 55																
09-0089	Marshall Street at High Street	CL A-032	Sig. 57																
09-0096	Marshall Street at Fifth Street	CL A-219	Sig. 60																
09-0097	Cherry Street at Fifth Street	CL A-219	Sig. 62																
09-0106	Martin Luther King Jr Drive at Fifth Street	CL A-029	Sig. 64																
09-0110	Marshall Street at Fourth Street	CL A-217	Sig. 66																
09-0111	Cherry Street at Fourth Street	CL A-217	Sig. 68																
09-0121	Marshall Street at Sixth Street	CL A-219	Sig. 70	2			200								2			75	1
09-0122	Cherry Street at Sixth Street	CL A-219	Sig. 72	2			200								2			75	1
09-0127	Cherry Street at Seventh Street	CL A-039	Sig. 74																
09-0128	Marshall Street at Seventh Street	CL A-039	Sig. 76				60									15			
09-0129	University Parkway at 14th Street	CL A-066	Sig. 78																
09-0132	University Parkway / Cherry Street / Marshall Street at Northwest Boulevard	CL A-005	Sig. 80						2	30	500								
09-0133	Cherry Street at Third Street	CL A-217	Sig. 82																
09-0136	Main Street at Business 40	CL A-045	Sig. 84						1										
09-0137	Liberty Street at Cemetery Street	CL A-022	Sig. 86																
09-0138	Main Street at Cemetery Street	CL A-022	Sig. 88																
09-0139	Liberty Street / Old Salem Road at Brookstown Avenue	CL A-021	Sig. 90				60									15			
09-0150	Indiana Avenue at Cherry Street	CL A-054	Sig. 92																
09-0157	Rams Drive at US 52 Ramp	CL A-026	N/A																
09-0161	University Parkway at Deacon Boulevard / Bonhurst Drive	CL A-061	Sig. 94																
09-0162	Polo Road at Indiana Avenue	CL A-070	Sig. 96			1	130												
09-0167	US 311 (New Walkertown Road) at Dellabrook Road	CL A-128	Sig. 98				80				120						15		
09-0175	Akron Drive at US 52 Ramp	CL A-100	Sig. 100						2										
09-0176	Akron Drive at Leo Street	CL A-100	Sig. 102		1		1250				1700	1		4			30		

See Boxed Note at Bottom of Sheet

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ATKINS 1616 EAST WILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY: MB Toth
PREPARED BY: JAW/BKS REVIEWED BY: LW Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

SIGNATURE DATE: 1-11-13

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	10

Reference Information				Controller,Cabinet & Foundation Work																															
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																											
												Base		Install New Foundation																					
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux File in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)		Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees)	Rotate Cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	Pole (336S)	Pole (336)	Ex. Height - Ground to Bottom (inches)	Lower Cabinet	Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)
09-0179	Liberty Street at 28th Street	CL A-108	Sig. 107	1		1		1			6	1									1		90		1										
09-0186	Liberty Street at Glenn Avenue	CL A-115	Sig. 109	1		1					3	1									1		270		1										
09-0187	Liberty Street / Old Rural Hall Road at Old Walkertown Road / Newport Street	CL A-116	Sig. 111	1		1					4	1									1		0		1										
09-0195	US 158 (Reidsville Road) at Old Greensboro Road	CL A-222	Sig. 113	1		1		1			6	1									1		90		1										
09-0199	Liberty Street at Fairchild Road	CL A-110	Sig. 115	1		1					1												270					1		35		1			
09-0267	Liberty Street at Akron Drive	CL A-113	Sig. 117	1		1		1			5	1									1		90		1										
09-0271	Waughtown Street at Reynolds Park Road / Sprague Street	CL A-179	Sig. 119	1		1		1			8	1											270		1										
09-0327	E Clemmonsville Road at I-40 EB Ramp	CL A-194	Sig. 121	1		1					3	1									1		270			1									
09-0328	E Clemmonsville Road at I-40 WB Ramp	CL A-194	Sig. 123	1		1		1			4	1									1		270			1									
09-0395	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue	CL A-012	Sig. 125	1		1					3												270					1		29					
09-0398	Old Walkertown Road at Carver School Road	CL A-118	Sig. 127	1		1		1			10	1									1		270		1										
09-0475	Linville Road / Old Greensboro Road at Business 40 WB Ramp / W. Mountain Road	CL A-210	Sig. 130	1		1		1			8	1									1		90		1										
09-0479	US 311 (New Walkertown Road) at US 311 (Martin Luther King Jr Drive)	CL A-029	Sig. 132	1		1					8	1									1		90		1										
09-0566	Akron Drive at Ogburn Avenue	CL A-101	Sig. 134	1		1		1			4	1									1		270		1										
09-0577	Kernersville Road at High Point Road	CL A-180	Sig. 136	1		1					3	1				1	SW		beside signal pole	1			180		1					39					
09-0578	US 311 (New Walkertown Road) at Water Works Raod	CL A-129	Sig. 138	1		1		1			4	1									1		270		1										
09-0597	Reynolds Boulevard at Indiana Avenue	CL A-098	Sig. 140	1		1		1			5	1									1		90		1										
09-0598	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue / File Street	CL A-012	Sig. 142	1		1		1			6	1									1		90		1										
09-0599	NC 109 (Thomasville Road) at North Frontage Road / I-40 WB Ramp	CL A-197	Sig. 144	1		1		1			5	1									1		0		1										
09-0600	NC 109 (Thomasville Road) at South Frontage Road / I-40 EB Ramp	CL A-198	Sig. 146	1		1		1			4	1									1		90		1										
09-0605	Waughtown Street at Pleasant Street	CL A-173	Sig. 148	1		1		1			5	1									1		270		1										
09-0647	Cherry Street at North Point Boulevard	CL A-055	Sig. 150	1		1		1			8	1									1		270		1										
09-0660	Kernersville Road at Linville Road / Motsinger Road	CL A-188	Sig. 152	1		1					4												270					1		25					
09-0665	Reynolds Boulevard / B Street at Akron Drive	CL A-099	Sig. 154	1		1		1			5	1		1						1			270		1					32					
09-0675	Martin Luther King Jr Drive at Highland Avenue	CL A-011	Sig. 156	1		1		1			4	1									1		270		1										
09-0676	Sheraton Street at Akron Drive	CL A-099	Sig. 158	1		1					3												270					1		23					

See Boxed Note at Bottom of Sheet

* Foundation shall utilize a concrete mix that has been tinted a light earth-tone palette to soften the visual impact.

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Prepared for the Offices of: Transportation Mobility and Safety Division, State of North Carolina Department of Transportation, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A (sheet 1 of 3)

Division 09 | Forsyth County | Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL: North Carolina Professional Engineer Seal 022516 Lisa M. Moon

Lisa M. Moon 1-11-13
SIGNATURE DATE

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	11

Reference Information				*Conduit and Riser Work																	Power Service				
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Riser for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnect	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service	
09-0179	Liberty Street at 28th Street	CL A-108	Sig. 107			1																			
09-0186	Liberty Street at Glenn Avenue	CL A-115	Sig. 109	1	1					1					1								3	1	
09-0187	Liberty Street / Old Rural Hall Road at Old Walkertown Road / Newport Street	CL A-116	Sig. 111	1	1					1					1								3	1	
09-0195	US 158 (Reidsville Road) at Old Greensboro Road	CL A-222	Sig. 113	1											1								3	1	
09-0199	Liberty Street at Fairchild Road	CL A-110	Sig. 115								1				1								3	1	
09-0267	Liberty Street at Akron Drive	CL A-113	Sig. 117	1	2							1			1								3	1	
09-0271	Waughtown Street at Reynolds Park Road / Sprague Street	CL A-179	Sig. 119			1																			#
09-0327	E Clemmonsville Road at I-40 EB Ramp	CL A-194	Sig. 121							1					1								3	1	
09-0328	E Clemmonsville Road at I-40 WB Ramp	CL A-194	Sig. 123	1	1					1					1								3	1	
09-0395	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue	CL A-012	Sig. 125												1				1				3	1	
09-0398	Old Walkertown Road at Carver School Road	CL A-118	Sig. 127						1																
09-0475	Linville Road / Old Greensboro Road at Business 40 WB Ramp / W. Mountain Road	CL A-210	Sig. 130		1					1															
09-0479	US 311 (New Walkertown Road) at US 311 (Martin Luther King Jr Drive)	CL A-029	Sig. 132		1							1			1								3	1	
09-0566	Akron Drive at Ogburn Avenue	CL A-101	Sig. 134	1		1									1								3	1	
09-0577	Kernersville Road at High Point Road	CL A-180	Sig. 136							1					1				2				3	1	
09-0578	US 311 (New Walkertown Road) at Water Works Raod	CL A-129	Sig. 138							1										1					
09-0597	Reynolds Boulevard at Indiana Avenue	CL A-098	Sig. 140		1							1											3	1	
09-0598	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue / File Street	CL A-012	Sig. 142			1																			
09-0599	NC 109 (Thomasville Road) at North Frontage Road / I-40 WB Ramp	CL A-197	Sig. 144		1					1										1					
09-0600	NC 109 (Thomasville Road) at South Frontage Road / I-40 EB Ramp	CL A-198	Sig. 146	1	1					1					1								3	1	
09-0605	Waughtown Street at Pleasant Street	CL A-173	Sig. 148	1	1					1					1								3	1	
09-0647	Cherry Street at North Point Boulevard	CL A-055	Sig. 150	1				1							1								3	1	
09-0660	Kernersville Road at Linville Road / Motsinger Road	CL A-188	Sig. 152								1				1								3	1	
09-0665	Reynolds Boulevard / B Street at Akron Drive	CL A-099	Sig. 154							1									3						
09-0675	Martin Luther King Jr Drive at Highland Avenue	CL A-011	Sig. 156	1						1					1								3	1	
09-0676	Sheraton Street at Akron Drive	CL A-099	Sig. 158								1				1								3	1	

See Boxed Note at Bottom of Sheet

Install new shared electrical service for signal controller and CCTV or hub cabinet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

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Prepared for the Offices of: North Carolina Department of Transportation, Transportation Mobility and Safety Division, Traffic Engineering Branch

750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY: MB Toth

PREPARED BY: JAW/BKS REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

SIGNATURE DATE: 1-11-13

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	12

Reference Information				Signal Items																
NCDOT / CITY SIGNAL INV. NO.	INTERSECTION NAME	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
09-0179	Liberty Street at 28th Street	CL A-108	Sig. 107																
09-0186	Liberty Street at Glenn Avenue	CL A-115	Sig. 109																
09-0187	Liberty Street / Old Rural Hall Road at Old Walkertown Road / Newport Street	CL A-116	Sig. 111																
09-0195	US 158 (Reidsville Road) at Old Greensboro Road	CL A-222	Sig. 113																
09-0199	Liberty Street at Fairchild Road	CL A-110	Sig. 115																
09-0267	Liberty Street at Akron Drive	CL A-113	Sig. 117																
09-0271	Waughtown Street at Reynolds Park Road / Sprague Street	CL A-179	Sig. 119																
09-0327	E Clemmonsville Road at I-40 EB Ramp	CL A-194	Sig. 121						1										
09-0328	E Clemmonsville Road at I-40 WB Ramp	CL A-194	Sig. 123																
09-0395	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue	CL A-012	Sig. 125																
09-0398	Old Walkertown Road at Carver School Road	CL A-118	Sig. 127																
09-0475	Linville Road / Old Greensboro Road at Business 40 WB Ramp / W. Mountain Road	CL A-210	Sig. 130																
09-0479	US 311 (New Walkertown Road) at US 311 (Martin Luther King Jr Drive)	CL A-029	Sig. 132																
09-0566	Akron Drive at Ogburn Avenue	CL A-101	Sig. 134																
09-0577	Kernersville Road at High Point Road	CL A-180	Sig. 136				600				700						20		
09-0578	US 311 (New Walkertown Road) at Water Works Raod	CL A-129	Sig. 138			2	450												
09-0597	Reynolds Boulevard at Indiana Avenue	CL A-098	Sig. 140																
09-0598	US 311 (Martin Luther King Jr Drive) at Cleveland Avenue / File Street	CL A-012	Sig. 142																
09-0599	NC 109 (Thomasville Road) at North Frontage Road / I-40 WB Ramp	CL A-197	Sig. 144						3										
09-0600	NC 109 (Thomasville Road) at South Frontage Road / I-40 EB Ramp	CL A-198	Sig. 146						2	100	540				1	20			
09-0605	Waughtown Street at Pleasant Street	CL A-173	Sig. 148																
09-0647	Cherry Street at North Point Boulevard	CL A-055	Sig. 150																
09-0660	Kernersville Road at Linville Road / Motsinger Road	CL A-188	Sig. 152																
09-0665	Reynolds Boulevard / B Street at Akron Drive	CL A-099	Sig. 154				140				140						15		
09-0675	Martin Luther King Jr Drive at Highland Avenue	CL A-011	Sig. 156																
09-0676	Sheraton Street at Akron Drive	CL A-099	Sig. 158																

See Boxed Note at Bottom of Sheet

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ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: North Carolina Department of Transportation — Transportation Mobility and Safety Division — Traffic Engineering Branch — Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE Lisa M. Moon DATE 1-11-13

CADD Filename: Phase A Int Summary v3.dgn

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	13

See Boxed Note at Bottom of Sheet

Reference Information				Controller,Cabinet & Foundation Work																																
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																														
													Base		Install New Foundation																						
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux Flie in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)	Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees	Rotate Cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	Pole (336S)	Pole (336)	Ex. Height - Ground to Bottom (inches)	Lower Cabinet	Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)
09-0689	Waughtown Street at Vargrave Street	CL A-166	Sig. 160	1		1		1			4	1								1		90		1										
09-0690	Waughtown Street at Dacian Street	CL A-169	Sig. 162	1		1					2	1			1			move JB to west			1	270		1				42					
09-0691	Waughtown Street at Old Lexington Road	CL A-191	Sig. 164	1		1		1			6	1								1		0		1									
09-0705	Cherry Street at University Parkway	CL A-059	Sig. 166	1		1					4	1								1		0		1									
09-0726	Kernersville Road at Sedge Garden Road	CL A-190	Sig. 168	1		1					4											270				1		29					
09-0819	Silas Creek Parkway at I-40 WB Ramp	CL A-158	Sig. 170	1		1					2	1								1		90		1									
09-0820	Silas Creek Parkway at Main Street	CL A-148	Sig. 172	1		1		1			4	1								1		90		1									
09-0931	US 311 (New Walkertown Road) at 14th Street	CL A-128	Sig. 174	1		1		1			5	1								1		270		1									
09-1022	Martin Luther King Jr Drive at US 52 SB Ramp	CL A-010	Sig. 176	1		1			1		5	1						installed under U-2826B		1		270		1		1								
09-1090	Broad Street at Business 40 WB Ramp	CL A-033	Sig. 178	1		1		1			9	1										0		1							20		
09-1091	Broad Street at Business 40 EB Ramp	CL A-033	Sig. 184	1		1		1			6	1										0		1									
09-1121	Liberty Street at Lansing Drive	CL A-115	Sig. 189	1		1					1	1								1		0		1									
09-1266	US 311 (New Walkertown Road) at Jackson Avenue	CL A-124	Sig. 191	1		1		1			3	1								1		270		1									
09-1269	Old Rural Hall Road at Motor Road	CL A-079	Sig. 193	1		1		1			6	1								1		270											
09-1270	E. Clemmonsville Road at US 52 Southbound Ramp	CL A-142	Sig. 195	1		1		1			4	1								1		0		1									
09-1271	Indiana Avenue at Alspaugh Drive	CL A-070	Sig. 197	1		1		1			5	1								1		0		1									
09-1283	Martin Luther King Jr Drive at Reynolds Park Road	CL A-135	Sig. 199	1		1		1			7	1								1		90		1									
09-1288	Martin Luther King Jr Drive at Cromartie Street	CL A-027	Sig. 201	1		1		1			6	1										0		1									
09-1289	Reynolds Boulevard at Whitaker Park	CL A-084	Sig. 203	1		1		1			5	1								1		270		1									
09-1302	New Greensboro Road / Business 40 EB Ramp at Old Greensboro Road / Linville Road	CL A-210	Sig. 205	1		1					4	1								1		270		1									
09-1311	Martin Luther King Jr Drive at Main Street / Liberty Street	CL A-042	Sig. 207	1		1					4	1								1		90		1									
09-1312	Martin Luther King Jr Drive at Patterson Avenue	CL A-010	Sig. 209	1		1		1	1		7	1								1		90		1		1							
09-1313	Martin Luther King Jr Drive / Eighth Street at Trade Street	CL A-042	Sig. 211	1		1		1			4	1								1		90		1									
09-1329	Clemmonsville Road at US 52 Northbound Ramp	CL A-142	Sig. 213	1		1		1			4	1			1				1			270		1				29					
09-1331	Cherry Street / Marshall Street at Eighth Street	CL A-039	Sig. 215	1		1		1			5	1								1		0		1									

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Prepared for the Offices of: NCDOT Transportation Mobility and Safety Division, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 1 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
Lisa M. Moon 1-11-13
SIGNATURE DATE

CADD Filename: Phase A Int Summary v3.dgn

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	14

Reference Information				*Conduit and Riser Work																Power Service			
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Riser for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnect	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service
09-0689	Waughtown Street at Vargrave Street	CL A-166	Sig. 160							1					1							3	1
09-0690	Waughtown Street at Dacian Street	CL A-169	Sig. 162							1					1							3	1
09-0691	Waughtown Street at Old Lexington Road	CL A-191	Sig. 164		1					1										1			
09-0705	Cherry Street at University Parkway	CL A-059	Sig. 166						1													3	1
09-0726	Kernersville Road at Sedge Garden Road	CL A-190	Sig. 168								1				1							3	1
09-0819	Silas Creek Parkway at I-40 WB Ramp	CL A-158	Sig. 170			1									1							3	1
09-0820	Silas Creek Parkway at Main Street	CL A-148	Sig. 172							1													
09-0931	US 311 (New Walkertown Road) at 14th Street	CL A-128	Sig. 174	1	1					1					1							3	1
09-1022	Martin Luther King Jr Drive at US 52 SB Ramp	CL A-010	Sig. 176				1																
09-1090	Broad Street at Business 40 WB Ramp	CL A-033	Sig. 178							1			1										
09-1091	Broad Street at Business 40 EB Ramp	CL A-033	Sig. 184							1			1										
09-1121	Liberty Street at Lansing Drive	CL A-115	Sig. 189	1				1							1							3	1
09-1266	US 311 (New Walkertown Road) at Jackson Avenue	CL A-124	Sig. 191			1														1			
09-1269	Old Rural Hall Road at Motor Road	CL A-079	Sig. 193																				
09-1270	E. Clemmonsville Road at US 52 Southbound Ramp	CL A-142	Sig. 195	1		1									1							3	1
09-1271	Indiana Avenue at Alspaugh Drive	CL A-070	Sig. 197	1	1					1					1							3	1
09-1283	Martin Luther King Jr Drive at Reynolds Park Road	CL A-135	Sig. 199		1					1										1			
09-1288	Martin Luther King Jr Drive at Cromartie Street	CL A-027	Sig. 201			1																	
09-1289	Reynolds Boulevard at Whitaker Park	CL A-084	Sig. 203	1				1													1		
09-1302	New Greensboro Road / Business 40 EB Ramp at Old Greensboro Road / Linville Road	CL A-210	Sig. 205		1					1													
09-1311	Martin Luther King Jr Drive at Main Street / Liberty Street	CL A-042	Sig. 207		1					1													
09-1312	Martin Luther King Jr Drive at Patterson Avenue	CL A-010	Sig. 209			1																	
09-1313	Martin Luther King Jr Drive / Eighth Street at Trade Street	CL A-042	Sig. 211		1					1													
09-1329	Clemmonsville Road at US 52 Northbound Ramp	CL A-142	Sig. 213							1									3				
09-1331	Cherry Street / Marshall Street at Eighth Street	CL A-039	Sig. 215		1					1													

See Boxed Note at Bottom of Sheet

Install new shared electrical service for signal controller and CCTV or hub cabinet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

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Prepared for the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE 1-11-13 DATE

CADD Filename: Phase A Int Summary v3.dgn

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	15

SUMMARY OF WORK BY INTERSECTION

Reference Information				Signal Items															
NCDOT / CITY SIGNAL INV. NO.	INTERSECTION NAME	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
09-0689	Waughtown Street at Vargrave Street	CL A-166	Sig. 160																
09-0690	Waughtown Street at Dacian Street	CL A-169	Sig. 162																
09-0691	Waughtown Street at Old Lexington Road	CL A-191	Sig. 164																
09-0705	Cherry Street at University Parkway	CL A-059	Sig. 166						2										
09-0726	Kernersville Road at Sedge Garden Road	CL A-190	Sig. 168																
09-0819	Silas Creek Parkway at I-40 WB Ramp	CL A-158	Sig. 170																
09-0820	Silas Creek Parkway at Main Street	CL A-148	Sig. 172																
09-0931	US 311 (New Walkertown Road) at 14th Street	CL A-128	Sig. 174																
09-1022	Martin Luther King Jr Drive at US 52 SB Ramp	CL A-010	Sig. 176																
09-1090	Broad Street at Business 40 WB Ramp	CL A-033	Sig. 178																
09-1091	Broad Street at Business 40 EB Ramp	CL A-033	Sig. 184																
09-1121	Liberty Street at Lansing Drive	CL A-115	Sig. 189																
09-1266	US 311 (New Walkertown Road) at Jackson Avenue	CL A-124	Sig. 191						1										
09-1269	Old Rural Hall Road at Motor Road	CL A-079	Sig. 193																
09-1270	E. Clemmonsville Road at US 52 Southbound Ramp	CL A-142	Sig. 195						1										
09-1271	Indiana Avenue at Alspaugh Drive	CL A-070	Sig. 197			1	160												
09-1283	Martin Luther King Jr Drive at Reynolds Park Road	CL A-135	Sig. 199																
09-1288	Martin Luther King Jr Drive at Cromartie Street	CL A-027	Sig. 201																
09-1289	Reynolds Boulevard at Whitaker Park	CL A-084	Sig. 203																
09-1302	New Greensboro Road / Business 40 EB Ramp at Old Greensboro Road / Linville Road	CL A-210	Sig. 205																
09-1311	Martin Luther King Jr Drive at Main Street / Liberty Street	CL A-042	Sig. 207						1										
09-1312	Martin Luther King Jr Drive at Patterson Avenue	CL A-010	Sig. 209																
09-1313	Martin Luther King Jr Drive / Eighth Street at Trade Street	CL A-042	Sig. 211																
09-1329	Clemmonsville Road at US 52 Northbound Ramp	CL A-142	Sig. 213				80		2		100						15		
09-1331	Cherry Street / Marshall Street at Eighth Street	CL A-039	Sig. 215																

See Boxed Note at Bottom of Sheet

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Integrated Mobility Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LW Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 022516
ENGINEER
LISA M. MOON

SIGNATURE DATE 1/11/13

CADD Filename: Phase A Int Summary v3.dgn

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	16

Reference Information				Controller,Cabinet & Foundation Work																																			
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																																	
														Base		Install New Foundation																								
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux File in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)	Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees	Rotate Cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	**Pole (336S)**	**Pole (336)**	Ex. Height - Ground to Bottom (inches)	Lower Cabinet	Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)
09-1334	28th Street / Cleveland Avenue at US 52 NB Ramp	CL A-107	Sig. 217	1		1					6	1						installed under U-2826A		1		0		1													
09-1336	US 311 (New Walkertown Road) at Overlook Drive / Bowen Boulevard	CL A-131	Sig. 220	1		1		1			7	1								1		270		1													
09-1338	Martin Luther King Jr Drive at US 52 NB Ramp	CL A-011	Sig. 222	1		1			1		4	1						installed under U-2826B		1				1		1											
09-1354	US 311 (New Walkertown Road) at Ferrell Avenue / Ferrell Court	CL A-126	N/A	1		1						1								1				1												
09-xxxxx	Motor Road at Baux Mountain Road	CL A-079	N/A																																	
09-xxxxx	Rams Drive at Salem Creek Connector / Research Parkway	CL A-025	N/A																																	
FUTURE STATE	Carver School Road / Winston Lake Road at US 311 (New Walkertown Road)	CL A-132	N/A																																	
C-013	Patterson Avenue at North Side Shopping Center	CL A-097	Sig. 224	1		1		1			5	1								1		270		1												
C-014	Patterson Avenue at Indiana Avenue	CL A-096	Sig. 226	1		1					9	1								1		0		1												
C-016	Patterson Avenue at 30th Street	CL A-095	Sig. 228	1		1					2											270					1		39	1	14"					
C-017	30th Street at Glenn Avenue	CL A-095	Sig. 230	1		1					2											90					1		39			1				
C-018	Patterson Avenue at 28th Street	CL A-094	Sig. 232	1		1					1	1		1				left in grass strip		1		90		1					42				100			
C-019	28th Street at Glenn Avenue	CL A-094	Sig. 234	1		1					1	1		1				right in grass strip		1		270		1					42							
C-023	Patterson Avenue at 27th Street	CL A-094	Sig. 236	1		1					1	1		1				on other side of JB to east	1	1		90		1					42							
C-024	27th Street at Glenn Ave	CL A-094	Sig. 238	1		1					1	1				1	NW	adj to front of sidewalk (use as tech pad) near pole along Glenn		1		0		1					42							
C-026	Patterson Avenue at 25th Street	CL A-094	Sig. 240	1		1					2	1		1				remove JB & locate over LI stubouts	1	1		270		1					42							
C-027	25th Street at Glenn Avenue	CL A-094	Sig. 242	1		1					2	1		1				move ex JB to fit in new foundation btwn pole and JB		1		0		1					42							
C-029	25th Street at Cleveland Avenue	CL-A107	Sig. 244	1		1						1		1				directly behind sidewalk along Cleveland	1	1		270		1					42				75			
C-037	Patterson Avenue at Glenn Avenue	CL A-093	Sig. 246	1		1					2	1		1				directly behind sidewalk, sidewalk as tech pad	1			270							37							
C-038	Cleveland Avenue at 21st Street	CL A-106	Sig. 248	1		1					2											0	90				1		33			1				
C-040	Northwest Boulevard at Reynolda Road	CL A-002	Sig. 250	1		1		1			7	1				1	NW		1	1		90		1												
C-041	Northwest Boulevard at Thurmond Street / Broad Street	CL A-004	Sig. 252	1		1						1			1					1		0		1					42				25			
C-044	Northwest Boulevard at Trade Street	CL A-007	Sig. 254	1		1					2	1			1					1		180		1					42				25			
C-045	Northwest Boulevard at Patterson Avenue	CL A-008	Sig. 256	1		1		1				1			1					1		90		1					42				180			
C-046	Northwest Boulevard at Ivy Avenue	CL A-119	Sig. 258	1		1					2											270					1		40			1				
C-049	14th Street at Cleveland Avenue	CL A-104	Sig. 260	1		1		1			4	1				1	SE	directly at back of sidewalk in center of radius	1			45		1					20							

See Boxed Note at Bottom of Sheet

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ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
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Prepared for the Offices of: NCDOT Transportation Mobility and Safety Division, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 1 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE: November 2012	REVIEWED BY: MB Toth
PREPARED BY: JAW/BKS	REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE
DATE 1-11-13

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	17

Reference Information				*Conduit and Riser Work																		Power Service				
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Rise for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnect	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service	
09-1334	28th Street / Cleveland Avenue at US 52 NB Ramp	CL A-107	Sig. 217			1																			
09-1336	US 311 (New Walkertown Road) at Overlook Drive / Bowen Boulevard	CL A-131	Sig. 220					1																	
09-1338	Martin Luther King Jr Drive at US 52 NB Ramp	CL A-011	Sig. 222				1																		
09-1354	US 311 (New Walkertown Road) at Ferrell Avenue / Ferrell Court	CL A-126	N/A					1																	
09-xxxxx	Motor Road at Baux Mountain Road	CL A-079	N/A																						
09-xxxxx	Rams Drive at Salem Creek Connector / Research Parkway	CL A-025	N/A																						
FUTURE STATE	Carver School Road / Winston Lake Road at US 311 (New Walkertown Road)	CL A-132	N/A																						
C-013	Patterson Avenue at North Side Shopping Center	CL A-097	Sig. 224	1	1					1					1								3	1	
C-014	Patterson Avenue at Indiana Avenue	CL A-096	Sig. 226	1	1					1					1								3	1	
C-016	Patterson Avenue at 30th Street	CL A-095	Sig. 228								1				1	3							3	1	
C-017	30th Street at Glenn Avenue	CL A-095	Sig. 230								1				1								3	1	
C-018	Patterson Avenue at 28th Street	CL A-094	Sig. 232							1					1	3							3	1	
C-019	28th Street at Glenn Avenue	CL A-094	Sig. 234							1					1	3							3	1	
C-023	Patterson Avenue at 27th Street	CL A-094	Sig. 236							1					1	3							3	1	
C-024	27th Street at Glenn Ave	CL A-094	Sig. 238							1					1	3							3	1	
C-026	Patterson Avenue at 25th Street	CL A-094	Sig. 240							1					1	3							3	1	
C-027	25th Street at Glenn Avenue	CL A-094	Sig. 242							1					1	3							3	1	
C-029	25th Street at Cleveland Avenue	CL-A107	Sig. 244							1					1	2							3	1	
C-037	Patterson Avenue at Glenn Avenue	CL A-093	Sig. 246							1					1				2				3	1	
C-038	Cleveland Avenue at 21st Street	CL A-106	Sig. 248			1														1					
C-040	Northwest Boulevard at Reynolda Road	CL A-002	Sig. 250					1							1	4		1					3	1	#
C-041	Northwest Boulevard at Thurmond Street / Broad Street	CL A-004	Sig. 252							1					1								3	1	
C-044	Northwest Boulevard at Trade Street	CL A-007	Sig. 254							1					1								3	1	#
C-045	Northwest Boulevard at Patterson Avenue	CL A-008	Sig. 256				1								1								3	1	
C-046	Northwest Boulevard at Ivy Avenue	CL A-119	Sig. 258								1				1								3	1	
C-049	14th Street at Cleveland Avenue	CL A-104	Sig. 260							1					1	4							3	1	

See Boxed Note at Bottom of Sheet

Install new shared electrical service for signal controller and CCTV or hub cabinet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

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Prepared for the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

Lisa M Moon 1/11/13
SIGNATURE DATE

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	18

SUMMARY OF WORK BY INTERSECTION

Reference Information				Signal Items																
NCDOT / CITY SIGNAL INV. NO.	INTERSECTION NAME	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
09-1334	28th Street / Cleveland Avenue at US 52 NB Ramp	CL A-107	Sig. 217																
09-1336	US 311 (New Walkertown Road) at Overlook Drive / Bowen Boulevard	CL A-131	Sig. 220																
09-1338	Martin Luther King Jr Drive at US 52 NB Ramp	CL A-011	Sig. 222																
09-1354	US 311 (New Walkertown Road) at Ferrell Avenue / Ferrell Court	CL A-126	N/A																
09-xxxxx	Motor Road at Baux Mountain Road	CL A-079	N/A																
09-xxxxx	Rams Drive at Salem Creek Connector / Research Parkway	CL A-025	N/A																
FUTURE STATE	Carver School Road / Winston Lake Road at US 311 (New Walkertown Road)	CL A-132	N/A																
C-013	Patterson Avenue at North Side Shopping Center	CL A-097	Sig. 224																
C-014	Patterson Avenue at Indiana Avenue	CL A-096	Sig. 226										1	1					
C-016	Patterson Avenue at 30th Street	CL A-095	Sig. 228				420				30		3	2					
C-017	30th Street at Glenn Avenue	CL A-095	Sig. 230											2					
C-018	Patterson Avenue at 28th Street	CL A-094	Sig. 232				330	70		330	60		1		1	30			
C-019	28th Street at Glenn Avenue	CL A-094	Sig. 234										1	3					
C-023	Patterson Avenue at 27th Street	CL A-094	Sig. 236										2	3					
C-024	27th Street at Glenn Ave	CL A-094	Sig. 238				390	70			80								
C-026	Patterson Avenue at 25th Street	CL A-094	Sig. 240				100				50					10			
C-027	25th Street at Glenn Avenue	CL A-094	Sig. 242																
C-029	25th Street at Cleveland Avenue	CL-A107	Sig. 244				100									10			
C-037	Patterson Avenue at Glenn Avenue	CL A-093	Sig. 246				560				50					10			
C-038	Cleveland Avenue at 21st Street	CL A-106	Sig. 248																
C-040	Northwest Boulevard at Reynolda Road	CL A-002	Sig. 250																
C-041	Northwest Boulevard at Thurmond Street / Broad Street	CL A-004	Sig. 252																
C-044	Northwest Boulevard at Trade Street	CL A-007	Sig. 254																
C-045	Northwest Boulevard at Patterson Avenue	CL A-008	Sig. 256																
C-046	Northwest Boulevard at Ivy Avenue	CL A-119	Sig. 258				350				330								
C-049	14th Street at Cleveland Avenue	CL A-104	Sig. 260				840				840					15			

See Boxed Note at Bottom of Sheet

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750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE 1-11-13 DATE

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	19

See Boxed Note at Bottom of Sheet

Reference Information				Controller,Cabinet & Foundation Work																															
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																													
														Base		Install New Foundation																				
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux File in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)		Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees	Rotate cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	Pole (336S)	Pole (336)	Ex. Height - Ground to Bottom (inches)	Lower Cabinet		Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)
C-050	14th Street at Cameron Avenue	CL A-123	Sig. 262	1		1					4	1		1					on front side of existing cabinet			1	270		1								32		
C-057	Fifth Street at Cameron Avenue	CL A-133	Sig. 264	1		1					1								to other side of adjacent pole	1		1	0	180				1		42				25		
C-066	Northwest Boulevard at Hawthorne Road	CL A-001	Sig. 266	1		1					5		1						remove front edge of existing foundation to allow for 48" min sidewalk CLR distance		1		90		1								25		
C-068	Hawthorne Road at Glade Street	CL A-013	Sig. 268	1		1					3												270					1	34	1	9"				
C-072	Hawthorne Road at First Street	CL A-014	Sig. 270	1		1					6	1											270		1								90		
C-074	First Street at Fourth Street / Burke Street	CL A-015	Sig. 272	1		1					3												0	270			1		33	1	8"			**	
C-080	Salem Avenue at Rams Drive	CL A-024	Sig. 274	1		1				1	6												90				1		38			1			
C-083	Martin Luther King Jr Drive at WSSU	CL A-134	Sig. 276	1		1					6	1											0		1										
C-087	Fifth Street at Poplar Street	CL A-219	Sig. 278	1		1							1										180		1										
C-088	Broad Street at Academy Street	CL A-161	Sig. 280	1		1					4	1				1	NW		adj to pole along Broad, right behind sidewalk, 10' to north	1		1	180		1				42				25		
C-089	Academy Street at Marshall Street	CL A-162	Sig. 282	1		1					4		1			1	NE		directly behind and parallel to SW	1					1				39						
C-095	Salem Avenue at Marshall Street	CL A-160	Sig. 284	1		1					4												270				1		31	1	6"				
C-109	Broad Street at Acadia Avenue	CL A-159	Sig. 286	1		1					4												270				1		40	1	15"				
C-110	Main Street at Acadia Avenue	CL A-149	Sig. 288	1		1		1			2	1				1	NE		along Acadia in NE quadrant 10' east of sidewalk	1			180		1				42						
C-114	Main Street at Sprague Street	CL A-148	Sig. 290	1		1		1			2	1				1	NW		in grass strip along Spargue, about 20' from Main Street	1			90		1				36				100		
C-115	Sprague Street at Vargrave Street	CL A-167	Sig. 292	1		1					2												90				1		51			1			
C-120	Sprague Street at Old Lexington Road	CL A-168	Sig. 294	1		1					8	1											0		1										
C-123	Sprague Street at Peachtree Street	CL A-199	Sig. 296	1		1					2			1					pole mt oppsite side of pole			1	0	180			1		42						
C-127	Fifth Street at Highland Avenue	CL A-051	Sig. 298	1		1					2												90				1		36			1			
C-129	Sprague Street at Marble Street	CL A-200	Sig. 300	1		1					4	1		1					adjacent to and right of ex	1		1	270		1								50		
C-135	Sprague Street at Clemmonsville Road	CL A-199	Sig. 302	1		1					6	1		1					install new cabinet as close to existing as possible so that the ex DGUY will not affect opening doors at new location	1		1	90		1										
C-140	Seventh Street at Trade Street	CL A-040	Sig. 304	1		1																	270				1		37	1	17"				
C-141	Liberty Street at Seventh Street	CL A-040	Sig. 306	1		1																	90				1		47	1	22"				
C-142	Main Street at Seventh Street	CL A-040	Sig. 308	1		1																	270				1		38	1	13"				
C-143	Patterson Avenue at Seventh Street	CL A-048	Sig. 310	1		1																	90		1		1		39				25		
C-144	Broad Street at Sixth Street	CL A-035	Sig. 312	1		1					2		1	1				**	right of existing pedestal in grass strip, flush with sidewalk.	1		1	270		1				42				25	**	

* Foundation shall be utililize a concrete mix that has been tinted to blend with the adjacent sidewalk.

** Sidewalk shall utilize a concrete mix that has been tinted to match adjacent sidewalk to soften the visual impact.

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750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 1 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LW Moon

REVISIONS	INIT.	DATE

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	20

SUMMARY OF WORK BY INTERSECTION

Reference Information				*Conduit and Riser Work																		Power Service			
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Riser for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnect	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service	
C-050	14th Street at Cameron Avenue	CL A-123	Sig. 262							1		1			1	3						3	1	
C-057	Fifth Street at Cameron Avenue	CL A-133	Sig. 264								1				1				2			3	1	
C-066	Northwest Boulevard at Hawthorne Road	CL A-001	Sig. 266	1	1					1					1							3	1	
C-068	Hawthorne Road at Glade Street	CL A-013	Sig. 268								1				1		3					3	1	
C-072	Hawthorne Road at First Street	CL A-014	Sig. 270	1	2					1					1		1					3	1	
C-074	First Street at Fourth Street / Burke Street	CL A-015	Sig. 272								1			1	1		3					3	1	
C-080	Salem Avenue at Rams Drive	CL A-024	Sig. 274								1				1							3	1	
C-083	Martin Luther King Jr Drive at WSSU	CL A-134	Sig. 276	1	1							1			1							3	1	
C-087	Fifth Street at Poplar Street	CL A-219	Sig. 278																	1				
C-088	Broad Street at Academy Street	CL A-161	Sig. 280							1					1	3						3	1	
C-089	Academy Street at Marshall Street	CL A-162	Sig. 282							1					1	3			2			3	1	
C-095	Salem Avenue at Marshall Street	CL A-160	Sig. 284									1			1		3					3	1	
C-109	Broad Street at Acadia Avenue	CL A-159	Sig. 286								1			1	1		3					3	1	
C-110	Main Street at Acadia Avenue	CL A-149	Sig. 288							1					1	3						3	1	
C-114	Main Street at Sprague Street	CL A-148	Sig. 290							1					1	3						3	1	
C-115	Sprague Street at Vargrave Street	CL A-167	Sig. 292								1			1	1							3	1	
C-120	Sprague Street at Old Lexington Road	CL A-168	Sig. 294		1					1														
C-123	Sprague Street at Peachtree Street	CL A-199	Sig. 296								1				1	3						3	1	
C-127	Fifth Street at Highland Avenue	CL A-051	Sig. 298			1																		
C-129	Sprague Street at Marble Street	CL A-200	Sig. 300							1					1	3						3	1	
C-135	Sprague Street at Clemmonsville Road	CL A-199	Sig. 302							1					1	3						3	1	
C-140	Seventh Street at Trade Street	CL A-040	Sig. 304								1				1		3					3	1	
C-141	Liberty Street at Seventh Street	CL A-040	Sig. 306								1				1		3					3	1	
C-142	Main Street at Seventh Street	CL A-040	Sig. 308								1				1		3					3	1	
C-143	Patterson Avenue at Seventh Street	CL A-048	Sig. 310							1					1	2						3	1	
C-144	Broad Street at Sixth Street	CL A-035	Sig. 312							1					1	3						3	1	

See Boxed Note at Bottom of Sheet

Install new shared electrical service for signal controller and CCTV or hub cabinet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

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750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE: NTS

REVISIONS | INIT. | DATE

SEAL
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Lisa M. Moon 1-11-13
SIGNATURE DATE

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	21

SUMMARY OF WORK BY INTERSECTION

Reference Information				Signal Items																
NCDOT / CITY SIGNAL INV. NO.	INTERSECTION NAME	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
C-050	14th Street at Cameron Avenue	CL A-123	Sig. 262																
C-057	Fifth Street at Cameron Avenue	CL A-133	Sig. 264																
C-066	Northwest Boulevard at Hawthorne Road	CL A-001	Sig. 266																
C-068	Hawthorne Road at Glade Street	CL A-013	Sig. 268				150												
C-072	Hawthorne Road at First Street	CL A-014	Sig. 270										3						
C-074	First Street at Fourth Street / Burke Street	CL A-015	Sig. 272																
C-080	Salem Avenue at Rams Drive	CL A-024	Sig. 274																
C-083	Martin Luther King Jr Drive at WSSU	CL A-134	Sig. 276																
C-087	Fifth Street at Poplar Street	CL A-219	Sig. 278																
C-088	Broad Street at Academy Street	CL A-161	Sig. 280				780				780					25			
C-089	Academy Street at Marshall Street	CL A-162	Sig. 282				400				400					10			
C-095	Salem Avenue at Marshall Street	CL A-160	Sig. 284				400												
C-109	Broad Street at Acadia Avenue	CL A-159	Sig. 286				370				510								
C-110	Main Street at Acadia Avenue	CL A-149	Sig. 288				500				250					30			
C-114	Main Street at Sprague Street	CL A-148	Sig. 290				880				270								
C-115	Sprague Street at Vargrave Street	CL A-167	Sig. 292																
C-120	Sprague Street at Old Lexington Road	CL A-168	Sig. 294																
C-123	Sprague Street at Peachtree Street	CL A-199	Sig. 296																
C-127	Fifth Street at Highland Avenue	CL A-051	Sig. 298																
C-129	Sprague Street at Marble Street	CL A-200	Sig. 300				50				50					10			
C-135	Sprague Street at Clemmonsville Road	CL A-199	Sig. 302				70				100					10			
C-140	Seventh Street at Trade Street	CL A-040	Sig. 304				850												
C-141	Liberty Street at Seventh Street	CL A-040	Sig. 306				540												
C-142	Main Street at Seventh Street	CL A-040	Sig. 308				390												
C-143	Patterson Avenue at Seventh Street	CL A-048	Sig. 310																
C-144	Broad Street at Sixth Street	CL A-035	Sig. 312				60		2		50								

See Boxed Note at Bottom of Sheet

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ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: North Carolina Department of Transportation, Mobility and Safety Division, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LW Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

Lisa M. Moon 1-11-13
SIGNATURE DATE

CADD Filename: Phase A Int Summary v3.dgn

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	22

See Boxed Note at Bottom of Sheet

Reference Information				Controller,Cabinet & Foundation Work																														
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																												
														Base		Install New Foundation																		
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux File in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)		Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees)	Rotate Cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	Pole (336S)	Pole (336)	Ex. Height - Ground to Bottom (inches)	Lower Cabinet	Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)
C-146	Spruce Street / West End Boulevard at Sixth Street	CL A-219	Sig. 314	1		1					2	1		1					directly back of sidewalk, 15' north of pole	1			270		1							36			50		
C-149	Trade Street at Sixth Street	CL A-043	Sig. 316	1		1						1		1					along 6th Street about 10' behind pole	1			270		1							46			80		
C-150	Liberty Street at Sixth Street	CL A-219	Sig. 318	1		1																	270					1				42		1			
C-151	Main Street at Sixth Street	CL A-046	Sig. 320	1		1						1				1	NW		along Main Street between signal pole and DGUY	1			90									46			80		
C-154	Broad Street at Fifth Street	CL A-035	Sig. 322	1		1																	270					1		49		1		**	
C-155	Fifth Street at Spring Street	CL A-035	Sig. 324	1		1							1										0		1							25		
C-156	Fifth Street at Spruce Street	CL A-219	Sig. 326	1		1						1											0		1									
C-159	Fifth Street at Trade Street	CL A-043	Sig. 328	1		1																	90					1	39		1			
C-160	Liberty Street at Fifth Street	CL A-043	Sig. 330	1		1																	270					1	42		1			
C-161	Fifth Street at Main Street	CL A-219	Sig. 332	1		1																	90					1	38		1			
C-162	Fifth Street at Church Street	CL A-219	Sig. 334	1		1																	270					1	42		1			
C-163	Fifth Street at Patterson Avenue	CL A-047	Sig. 336	1		1						1											0		1									
C-164	Broad Street at Fourth Street	CL A-035	Sig. 338	1		1		1			1	1											270		1									
C-165	Fourth Street at Spring Street	CL A-035	Sig. 340	1		1																	270					1	49		1			
C-166	Fourth Street at Poplar Street	CL A-217	Sig. 342	1		1				1													270					1	45		1			
C-167	Fourth Street at Spruce Street	CL A-217	Sig. 344	1		1				1													270					1	48		1			
C-170	Fourth Street at Trade Street	CL A-217	Sig. 346	1		1				1													270					1	44		1			
C-171	Liberty Street at Fourth Street	CL A-044	Sig. 348	1		1				1													270					1	42		1			
C-172	Main Street at Fourth Street	CL A-217	Sig. 350	1		1				1													90					1	44		1			
C-173	Fourth Street at Church Street	CL A-217	Sig. 352	1		1				1													90					1	48		1			
C-174	Patterson Avenue at Fourth Street	CL A-047	Sig. 354	1		1						1											0		1									
C-175	Brookstown Avenue at Burke Street	CL A-036	Sig. 356	1		1																	90				1		44		1		**	
C-178	Liberty Street at Third Street	CL A-044	Sig. 358	1		1																	270					1	47		1			
C-179	Main Street at Third Street	CL A-218	Sig. 360	1		1																	90					1	42		1			
C-180	Third Street at Church Street	CL A-218	Sig. 362	1		1																	270					1	43		1			
C-181	Third Street at Chestnut Street	CL A-218	Sig. 364	1		1																	270				1		40		1			

** Sidewalk shall utilize a concrete mix that has been tinted to match adjacent sidewalk to soften the visual impact.

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ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: North Carolina Department of Transportation, Mobility and Safety Division, Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 1 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

REVISIONS	INIT.	DATE

SEAL: North Carolina Professional Engineer Seal 022516 Lisa M. Moon

SIGNATURE DATE: 1-11-13

CADD Filename: Phase A Int Summary v3.dgn

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	23

See Boxed Note at Bottom of Sheet

Reference Information				*Conduit and Riser Work																	Power Service			
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Riser for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnect	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service
C-146	Spruce Street / West End Boulevard at Sixth Street	CL A-219	Sig. 314							1					1	3			2			3	1
C-149	Trade Street at Sixth Street	CL A-043	Sig. 316							1					1	3			3			3	1
C-150	Liberty Street at Sixth Street	CL A-219	Sig. 318																			3	1
C-151	Main Street at Sixth Street	CL A-046	Sig. 320							1					1	4						3	1
C-154	Broad Street at Fifth Street	CL A-035	Sig. 322								1				1		3					3	1
C-155	Fifth Street at Spring Street	CL A-035	Sig. 324	1																		3	1
C-156	Fifth Street at Spruce Street	CL A-219	Sig. 326																	1			
C-159	Fifth Street at Trade Street	CL A-043	Sig. 328																			3	1
C-160	Liberty Street at Fifth Street	CL A-043	Sig. 330																			3	1
C-161	Fifth Street at Main Street	CL A-219	Sig. 332																			3	1
C-162	Fifth Street at Church Street	CL A-219	Sig. 334																			3	1
C-163	Fifth Street at Patterson Avenue	CL A-047	Sig. 336																				
C-164	Broad Street at Fourth Street	CL A-035	Sig. 338				1																
C-165	Fourth Street at Spring Street	CL A-035	Sig. 340																			3	1
C-166	Fourth Street at Poplar Street	CL A-217	Sig. 342																	1			
C-167	Fourth Street at Spruce Street	CL A-217	Sig. 344																	1			
C-170	Fourth Street at Trade Street	CL A-217	Sig. 346																			3	1
C-171	Liberty Street at Fourth Street	CL A-044	Sig. 348																			3	1
C-172	Main Street at Fourth Street	CL A-217	Sig. 350																			3	1
C-173	Fourth Street at Church Street	CL A-217	Sig. 352																			3	1
C-174	Patterson Avenue at Fourth Street	CL A-047	Sig. 354																				
C-175	Brookstown Avenue at Burke Street	CL A-036	Sig. 356								1				1							3	1
C-178	Liberty Street at Third Street	CL A-044	Sig. 358																			3	1
C-179	Main Street at Third Street	CL A-218	Sig. 360																			3	1
C-180	Third Street at Church Street	CL A-218	Sig. 362																			3	1
C-181	Third Street at Chestnut Street	CL A-218	Sig. 364																			3	1

Install new shared electrical service for signal controller and CCTV or hub cabinet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

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Prepared for the Offices of: Transportation Mobility and Safety Division, State of North Carolina Department of Transportation, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem
PLAN DATE: November 2012 REVIEWED BY: MB Toth
PREPARED BY: JAW/BKS REVIEWED BY: LW Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 LISA M. MOON
SIGNATURE DATE 1-11-13
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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	24

Reference Information				Signal Items																
NCDOT / CITY SIGNAL INV. NO.	INTERSECTION NAME	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
C-146	Spruce Street / West End Boulevard at Sixth Street	CL A-219	Sig. 314										1	1					
C-149	Trade Street at Sixth Street	CL A-043	Sig. 316				100												
C-150	Liberty Street at Sixth Street	CL A-219	Sig. 318																
C-151	Main Street at Sixth Street	CL A-046	Sig. 320				600												
C-154	Broad Street at Fifth Street	CL A-035	Sig. 322										1	2					
C-155	Fifth Street at Spring Street	CL A-035	Sig. 324																
C-156	Fifth Street at Spruce Street	CL A-219	Sig. 326																
C-159	Fifth Street at Trade Street	CL A-043	Sig. 328																
C-160	Liberty Street at Fifth Street	CL A-043	Sig. 330																
C-161	Fifth Street at Main Street	CL A-219	Sig. 332																
C-162	Fifth Street at Church Street	CL A-219	Sig. 334																
C-163	Fifth Street at Patterson Avenue	CL A-047	Sig. 336																
C-164	Broad Street at Fourth Street	CL A-035	Sig. 338																
C-165	Fourth Street at Spring Street	CL A-035	Sig. 340																
C-166	Fourth Street at Poplar Street	CL A-217	Sig. 342																
C-167	Fourth Street at Spruce Street	CL A-217	Sig. 344																
C-170	Fourth Street at Trade Street	CL A-217	Sig. 346																
C-171	Liberty Street at Fourth Street	CL A-044	Sig. 348																
C-172	Main Street at Fourth Street	CL A-217	Sig. 350																
C-173	Fourth Street at Church Street	CL A-217	Sig. 352																
C-174	Patterson Avenue at Fourth Street	CL A-047	Sig. 354																
C-175	Brookstown Avenue at Burke Street	CL A-036	Sig. 356																
C-178	Liberty Street at Third Street	CL A-044	Sig. 358																
C-179	Main Street at Third Street	CL A-218	Sig. 360																
C-180	Third Street at Church Street	CL A-218	Sig. 362																
C-181	Third Street at Chestnut Street	CL A-218	Sig. 364																

See Boxed Note at Bottom of Sheet

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ATKINS 1616 EAST WILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: NCDOT Transportation Mobility and Safety Division, North Carolina Department of Transportation, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY: MB Toth
PREPARED BY: JAW/BKS REVIEWED BY: LW Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 LISA M. MOON

SIGNATURE DATE: 1-11-13

CADD Filename: Phase A Int Summary v3.dgn

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SUMMARY OF WORK BY INTERSECTION

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	25

See Boxed Note at Bottom of Sheet

Reference Information				Controller,Cabinet & Foundation Work																																			
				2070 Controller		Type 170 Cabinet		Install New Controller & Cabinet																																	
														Base		Install New Foundation																								
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	New	Existing	New	Existing	Aux File in Cabinet	Special Coating (332)	Special Coating (336)	No. of New Detector Cards	332	336S	Adjacent to Existing	In Same Place as Existing	Relocated to (quadrant)	Special Tint for Foundation	Comment	Terminal Splice Box	Modify Foundation	Remove Existing Foundation	Rotate Front of Cabinet clockwise (degrees)	Rotate Cabinet around pole clockwise (degrees)	Base Extender	Base Adapter	Special Coating (extender/adapter)	**Pole (336S)**	**Pole (336)**	Ex. Height - Ground to Bottom (inches)	Lower Cabinet	Reconfigure Cabinet	Replace concrete (SF)	Special Tint for Sidewalk	Replace Brick (SF)
C-182	Third Street at Patterson Avenue	CL A-047	Sig. 366	1		1																270					1		41	1	16"						
C-183	Broad Street at Second Street	CL A-034	Sig. 368	1		1						1		1				right of ex cabinet	1		1	270		1									160			
C-185	Second Street at Spruce Street	CL A-215	Sig. 370	1		1																270					1		37			1				
C-189	Second Street at Liberty Street	CL A-044	Sig. 372	1		1																90						1	40			1				
C-190	Second Street at Main Street	CL A-044	Sig. 374	1		1																270						1	41			1				
C-191	Second Street Church Street	CL A-216	Sig. 376	1		1																0	90					1	43			1				
C-193	First Street at Second Street / Peters Creek Parkway	CL A-016	Sig. 378	1		1		1				1		1				back side of ex, closer to street			1	0		1					42							
C-194	First Street at Broad Street	CL A-030	Sig. 380	1		1					2																1		36			1				
C-197	First Street at Liberty Street	CL A-216	Sig. 385	1		1																180	270				1	1	40			1				
C-198	First Street at Main Street	CL A-045	Sig. 387	1		1																270						1	36			1				
C-199	First Street at Church Street	CL A-045	Sig. 389	1		1												# rotate parallel to road				270	#				1		23							
C-209	Highland Avenue at Carl Russell Avenue	CL A-051	Sig. 391	1		1					4	1			1			directly behind SW between existing cabinet and bus shelter, parallel to SW to avoid down guy,	1		1	270		1												
C-213	Martin Luther King Jr Drive at WSSU Crosswalk	CL A-134	Sig. 393	1		1						1								1		90		1												
C-223	Broad Street at Wachovia Street	CL A-019	Sig. 395	1		1					2	1				1	NE	in grasss strip along Broad on far side of pole & SW guy - install foundation flush with sidewalk - maintain 48" clr SW and keep away from travel lane as much as	1			180		1					41						
C-237	Patterson Avenue at Motor Road	CL A-074	Sig. 397	1		1					2											270					1		29							
C-268	Deacon Boulevard / 30th Street at Shorefair Drive	CL A-087	Sig. 399	1		1					4	1								1		270		1												
C-275	Coliseum Drive at Pilgrim Court	CL A-089	Sig. 401	1		1					6	1								1		270		1												
C-283	Fifth Street at Summit Street	CL A-037	Sig. 403	1		1					3											270					1		35	1	10"			**		
C-288	Konnoak Drive at Haverhill Street	CL A-155	Sig. 405	1		1					4											270					1		39			1				
C-298	Kernersville Road at Oak Grove Church Road	CL A-189	Sig. 407	1		1					4											270					1		36			1				
C-323	Fifth Street at Linden Street	CL A-049	Sig. 409	1		1			1		2	1								1		0		1		1										
C-324	Fourth Street at Linden Street	CL A-049	Sig. 411	1		1			1		2	1								1		0		1		1										
C-326	Carver School Road at Lansing Drive	CL A-221	Sig. 413	1		1					4	1								1		0		1												
C-332	Sprague Street at Cole Road	CL A-201	Sig. 415	1		1					4											270					1		26							
C-335	Cleveland Avenue at 12th Street	CL A-103	Sig. 417	1		1					4	1								1		270		1												
	Total			202	0	202	0	66	5	9	603	126	7	28	9	13			32	67	35			129	2	5	44	25		10		47	1674		*50

* Contingency Item

** Sidewalk shall utilize a concrete mix that has been tinted to match adjacent sidewalk to soften the visual impact.

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1616 EAST MILLBROOK ROAD, SUITE 310
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Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Transportation Mobility and Safety Division
Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 1 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LW Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE
DATE 1-11-13
CADD Filename: Phase A Int Summary v3.dgn

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13833

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	26

SUMMARY OF WORK BY INTERSECTION

Reference Information				*Conduit and Riser Work																	Power Service			
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Core Drill for 1" for New Power Service or CCTV	Core Drill for 2"	Reuse Ex. 1" (pole) or 2" (base) ST Dedicated Riser for Comm (Retrofit Kit)	Reuse Ex. 2" Dedicated Conduit Entrance for UG Comm	Use 2" Spare Riser for Comm (Retrofit Kit)	Use 2" Spare Conduit for UG Comm	New 2" Riser (HST) for Comm	New 1" Riser (HST) for Comm	New UG Comm Entrance	Re-route Ex. Cables in Ex. Risers to create Dedicated Comm Riser	Replace short PVC conduit to pole mt cabinet	New 1" Risers (WH) for Sig- New Electrical Service	New 2" Risers (WH) for Sig- New Foundation Location	New 2" Risers (WH) for Sig (replace existing)	New ug conduit to new foundation location	New 2" short Risers for Sig (from terminal splice box or from ug)	Modify Breaker/Ground Wire in Existing Disconnect	Install Service Disconnect by Signal Cabinet	Install 5/8" x 10' Grounding Electrode	Install New Electrical Service
C-182	Third Street at Patterson Avenue	CL A-047	Sig. 366							1					1		1		1			3	1
C-183	Broad Street at Second Street	CL A-034	Sig. 368							1					1	3						3	1
C-185	Second Street at Spruce Street	CL A-215	Sig. 370																			3	1
C-189	Second Street at Liberty Street	CL A-044	Sig. 372																			3	1
C-190	Second Street at Main Street	CL A-044	Sig. 374																			3	1
C-191	Second Street Church Street	CL A-216	Sig. 376																			3	1
C-193	First Street at Second Street / Peters Creek Parkway	CL A-016	Sig. 378						1													3	1
C-194	First Street at Broad Street	CL A-030	Sig. 380								1				1		1					3	1
C-197	First Street at Liberty Street	CL A-216	Sig. 385																			3	1
C-198	First Street at Main Street	CL A-045	Sig. 387																			3	1
C-199	First Street at Church Street	CL A-045	Sig. 389												1							3	1
C-209	Highland Avenue at Carl Russell Avenue	CL A-051	Sig. 391							1					1	3						3	1
C-213	Martin Luther King Jr Drive at WSSU Crosswalk	CL A-134	Sig. 393																			3	1
C-223	Broad Street at Wachovia Street	CL A-019	Sig. 395							1					1	4						3	1
C-237	Patterson Avenue at Motor Road	CL A-074	Sig. 397								1				1							3	1
C-268	Deacon Boulevard / 30th Street at Shorefair Drive	CL A-087	Sig. 399	1		1									1							3	1
C-275	Coliseum Drive at Pilgrim Court	CL A-089	Sig. 401		1						1									1			
C-283	Fifth Street at Summit Street	CL A-037	Sig. 403							1					1		3					3	1
C-288	Konnoak Drive at Haverhill Street	CL A-155	Sig. 405								1				1							3	1
C-298	Kernersville Road at Oak Grove Church Road	CL A-189	Sig. 407					1												1			
C-323	Fifth Street at Linden Street	CL A-049	Sig. 409		1					1													
C-324	Fourth Street at Linden Street	CL A-049	Sig. 411			1																	
C-326	Carver School Road at Lansing Drive	CL A-221	Sig. 413		1					1					1							3	1
C-332	Sprague Street at Cole Road	CL A-201	Sig. 415								1												
C-335	Cleveland Avenue at 12th Street	CL A-103	Sig. 417	1				1							1							3	1
	Total			29	37	22	6	6	6	85	26	10	3	3	112	110	30	1	26	15	1	441	147

See Boxed Note at Bottom of Sheet

*Coordinate installation of risers and underground conduits for communications network shown on the cable layout plans (i.e. "CL" sheets) with the installation of risers for signal and lead-in cables on pole(s) adjacent to the signal controller cabinet and with the provisions for conduit entrances (stubouts) in the cabinet foundation. Refer also to sheets entitled "Summary of Work by Cable Layout Plans."

- Work shown on this sheet is for the upgrade of the traffic signals, including installation of new controllers and cabinets, new or modified foundations, electrical service and miscellaneous signal related items. Additional information can be found in the signal plans in this Volume. Work to be done for fiber-optic cable routing and interconnection is shown on the cable layout plans and on the sheets entitled "Summary of Work by Cable Layout Plans" in Volume I of III.
- The items listed above are for informational purposes only and represent work that is necessary to complete the contract and are not necessarily pay items. See Summary of Quantites and the Project Special Provisions for defined Pay Items for this contract.

This area has been determined to contain properties with documented historic significance. If it is necessary to deviate from these plans in this area, alert the Engineer to contact Project Development and Environmental Analysis Branch – Historic Architecture Group of the North Carolina Department of Transportation for an effects determination before proceeding.

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Statewide Traffic Engineering Systems, 750 Greenfield Parkway, Garner, NC 27529

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 2 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LM Moon

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

Lisa M Moon 1-11-13
SIGNATURE DATE

CADD Filename: Phase A Int Summary v3.dgn

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13833

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	27

SUMMARY OF WORK BY INTERSECTION

Reference Information				Signal Items																
NCDOT / City Signal Inv. No.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	Install 16-inch Countdown Pedestrian Signal Head	Install 12-inch 4-Section Signal Head	Install 12-inch 5-Section Signal Head	Signal Cable	Messenger Cable 3/8"	Signs	Inductive Loop Sawcut	Loop Lead-In Cable	New Pole	Sidewalk Guy Assembly	Standard Down Guy Assembly	Junction Box	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill (1, 2")	Type II Pedestal with Foundation
C-182	Third Street at Patterson Avenue	CL A-047	Sig. 366				470												
C-183	Broad Street at Second Street	CL A-034	Sig. 368				40												
C-185	Second Street at Spruce Street	CL A-215	Sig. 370																
C-189	Second Street at Liberty Street	CL A-044	Sig. 372																
C-190	Second Street at Main Street	CL A-044	Sig. 374																
C-191	Second Street Church Street	CL A-216	Sig. 376																
C-193	First Street at Second Street / Peters Creek Parkway	CL A-016	Sig. 378																
C-194	First Street at Broad Street	CL A-030	Sig. 380																
C-197	First Street at Liberty Street	CL A-216	Sig. 385																
C-198	First Street at Main Street	CL A-045	Sig. 387																
C-199	First Street at Church Street	CL A-045	Sig. 389																
C-209	Highland Avenue at Carl Russell Avenue	CL A-051	Sig. 391				60				50					10			
C-213	Martin Luther King Jr Drive at WSSU Crosswalk	CL A-134	Sig. 393																
C-223	Broad Street at Wachovia Street	CL A-019	Sig. 395				440				220					15			
C-237	Patterson Avenue at Motor Road	CL A-074	Sig. 397																
C-268	Deacon Boulevard / 30th Street at Shorefair Drive	CL A-087	Sig. 399																
C-275	Coliseum Drive at Pilgrim Court	CL A-089	Sig. 401																
C-283	Fifth Street at Summit Street	CL A-037	Sig. 403				300				45								
C-288	Konnoak Drive at Haverhill Street	CL A-155	Sig. 405																
C-298	Kernersville Road at Oak Grove Church Road	CL A-189	Sig. 407																
C-323	Fifth Street at Linden Street	CL A-049	Sig. 409				250												
C-324	Fourth Street at Linden Street	CL A-049	Sig. 411																
C-326	Carver School Road at Lansing Drive	CL A-221	Sig. 413																
C-332	Sprague Street at Cole Road	CL A-201	Sig. 415																
C-335	Cleveland Avenue at 12th Street	CL A-103	Sig. 417																
	Total			4	1	4	15740	140	24	460	9645	2	13	20	6	265	160	150	2

See Boxed Note at Bottom of Sheet

- Work shown on this sheet is for the upgrade of the traffic signals, including installation of new controllers and cabinets, new or modified foundations, electrical service and miscellaneous signal related items. Additional information can be found in the signal plans in this Volume. Work to be done for fiber-optic cable routing and interconnection is shown on the cable layout plans and on the sheets entitled "Summary of Work by Cable Layout Plans" in Volume I of III.
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This area has been determined to contain properties with documented historic significance. If it is necessary to deviate from these plans in this area, alert the Engineer to contact Project Development and Environmental Analysis Branch – Historic Architecture Group of the North Carolina Department of Transportation for an effects determination before proceeding.

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: NCDOT Transportation Mobility and Safety Division, Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE: NTS

Winston-Salem Signal System
Summary of Work by Intersection - Phase A
(sheet 3 of 3)

Division 09 Forsyth County Winston-Salem

PLAN DATE:	November 2012	REVIEWED BY:	MB Toth
PREPARED BY:	JAW/BKS	REVIEWED BY:	LW Moon

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON
SIGNATURE DATE 1-11-13

CADD Filename: Phase A Int Summary v3.dgn

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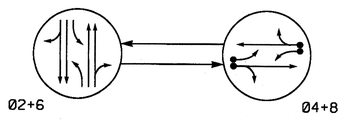
13833

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 1

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22, 23	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22, 23
41, 42
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

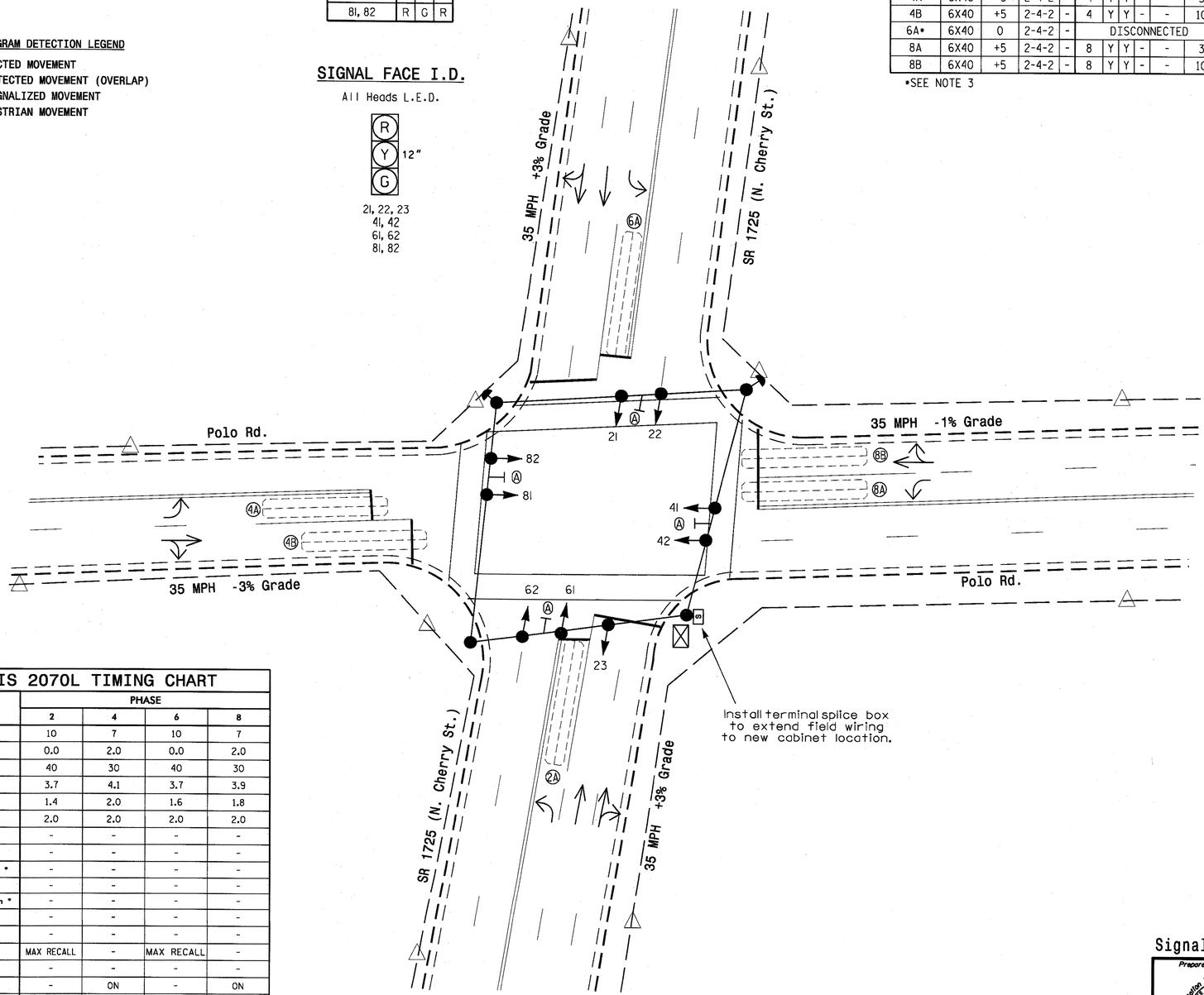
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A•	6X40	0	2-4-2	-	DISCONNECTED						-	-
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	+5	2-4-2	-	4	Y	Y	-	-	10	-	Y
6A•	6X40	0	2-4-2	-	DISCONNECTED						-	-
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-	Y

•SEE NOTE 3

2 Phase
Semi-Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Loops 2A and 6A are cut in the field but are not connected.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	0.0	2.0	0.0	2.0
Max Green 1 *	40	30	40	30
Yellow Clearance	3.7	4.1	3.7	3.9
Red Clearance	1.4	2.0	1.6	1.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	-	MAX RECALL	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	Street Name Sign (D3-1)	A

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725 (N. Cherry Street)
at
Polo Road

Division 9 Forsyth County Winston-Salem
PLAN DATE: December 2012 REVIEWED BY: Hough
PREPARED BY: Sterling REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 1/3/13 DATE
SIG. INVENTORY NO. 09-0009

03-JAN-2013 11:41
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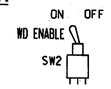
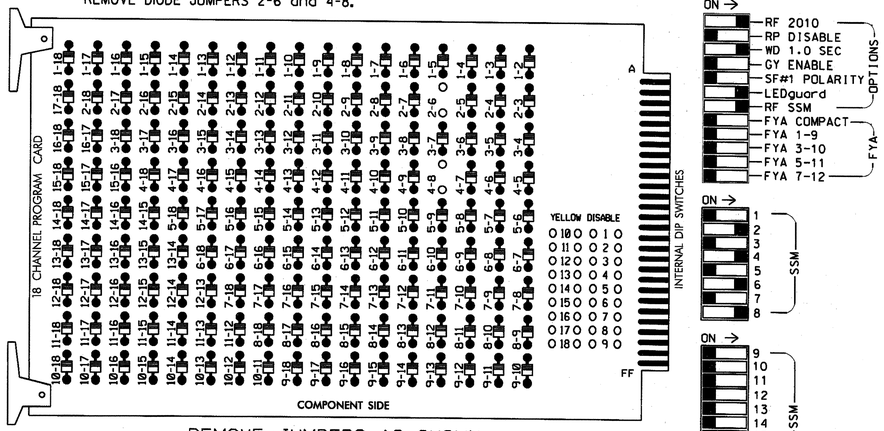
ziembo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.2

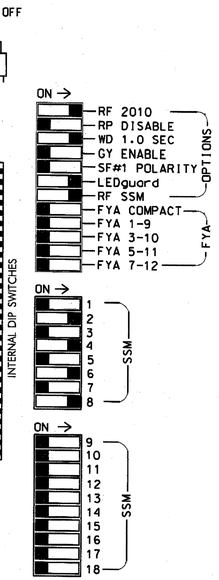
EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Cord is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22 23	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L						Ø4 4B								ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L						Ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0009
DESIGNED: December 2012
SEALED: 1-3-13
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1725 (N. Cherry Street) at Polo Road

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 01-03-13 | REVIEWED BY: T. Igo

PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE | 1/7/13 DATE

SIG. INVENTORY NO. 09-0009

03-JAN-2013 13:57
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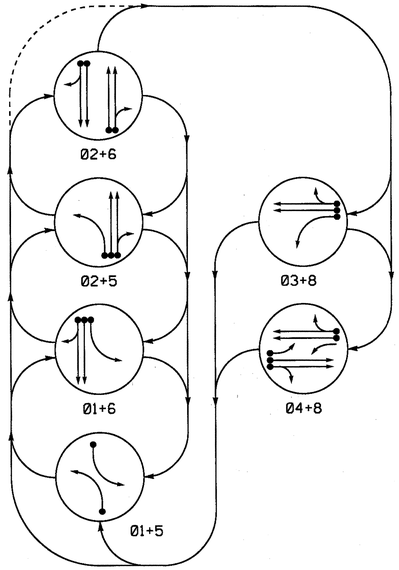
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 3

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+8	04+8	FLASH
11	←	←	~~↱~~	~~↱~~	~~↱~~	~~↱~~	~~↱~~
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	↑G	G	R
41, 42	R	R	R	R	R	G	R
51	←	~~↱~~	←	~~↱~~	~~↱~~	~~↱~~	~~↱~~
61, 62	R	G	R	G	R	R	Y
81, 82	R	R	R	R	G	G	R

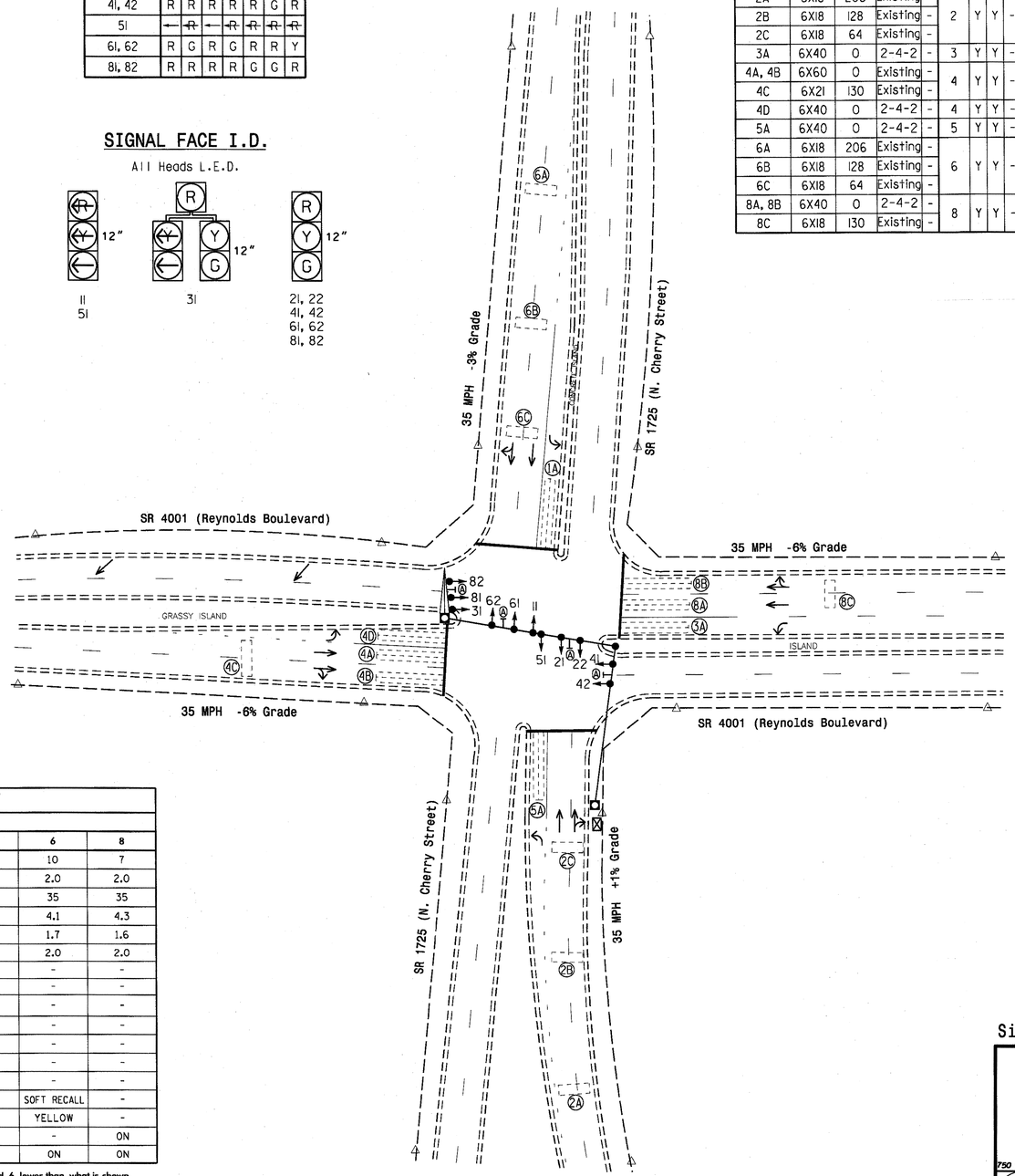
SIGNAL FACE I.D.

All Heads L.E.D.

11
51

31

21, 22
41, 42
61, 62
81, 82



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	8
Min Green 1 *	7	10	7	7	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	35	25	35	20	35	35
Yellow Clearance	3.0	3.8	3.1	4.3	3.0	4.1	4.3
Red Clearance	2.6	1.9	2.6	1.8	2.8	1.7	1.6
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A	6X18	206	Existing	-	2	Y	Y	-	-	-	-	Y
2B	6X18	128	Existing	-								
2C	6X18	64	Existing	-								
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	Y
4A, 4B	6X60	0	Existing	-	4	Y	Y	-	-	-	-	Y
4C	6X21	130	Existing	-								
4D	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A	6X18	206	Existing	-	6	Y	Y	-	-	-	-	Y
6B	6X18	128	Existing	-								
6C	6X18	64	Existing	-								
8A, 8B	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y
8C	6X18	130	Existing	-								

6 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Omit phase 3 during phase 4 on.
4. Phase 1 and/or phase 5 may be lagged.
5. Set all detector units to presence mode.
6. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. The cabinet should be designed to include an Auxiliary Output file for future use.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	Street Name Sign (D3-1)	(A)

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (N. Cherry Street) at SR 4001 (Reynolds Boulevard)

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2011 REVIEWED BY:
PREPARED BY: Sterling REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

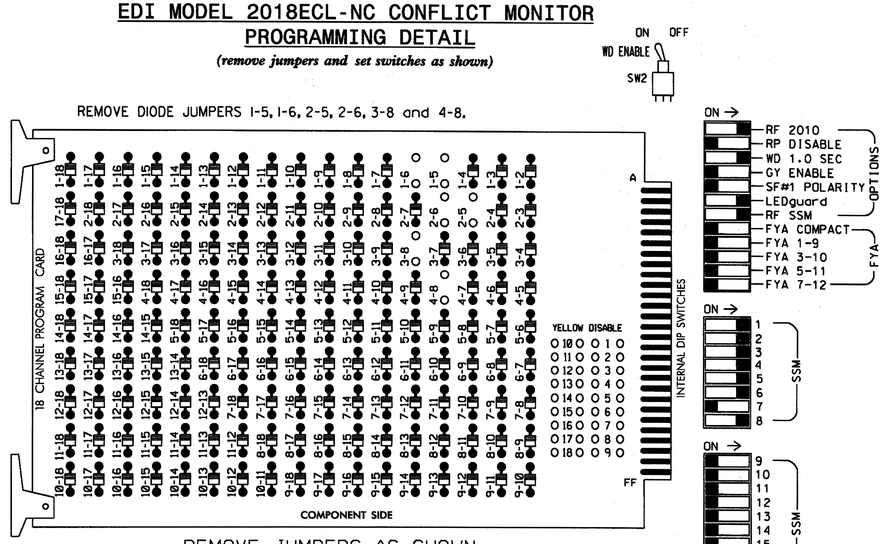
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 8/9/12 DATE
SIG. INVENTORY NO. 09-0010

02-JAN-2013 12:41
S:\TIS\SSA\TIS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0010\090010_sig_dsn_20120809.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 4

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S11
PHASES USED.....1,2,3,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	41,42	NU	51	61,62	NU	NU	81,82 31	NU	NU	NU	NU	NU	NU	NU
RED		128		*	101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126			117			132											
GREEN ARROW	127			118			133											

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR        PHASES:¦12345678910111213141516
IF PHASES ARE ON¦   X
OMIT PHASES     ¦   X
CALL PHASES     ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	ø1 1A	ø2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	ø3 3A	ø4 4A,4B,4C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L	NOT USED	NOT USED			NOT USED	ø4 4D								ST DC ISOLATOR
FILE "J" U	ø5 5A	ø6 6A,6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A,8B,8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
L	NOT USED	NOT USED				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

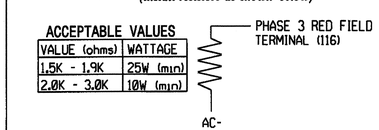
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A,4B,4C	TB4-9,10	I6U	41	3	4	4	Y	Y			
4D	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A,8B,8C	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0010
DESIGNED: September 2011
SEALED: 8-09-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1725 (N. Cherry Street)
at
SR 4001 (Reynolds Boulevard)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: August 2012 | REVIEWED BY: JTK

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

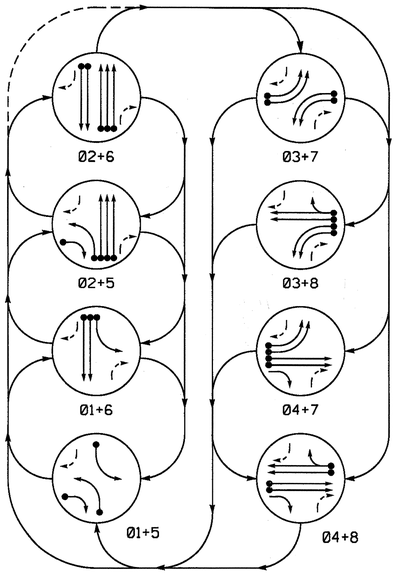
SIGNATURE 8-13-12 DATE

SIG. INVENTORY NO. 09-0010

10-AUG-2012 09:52
S:\NITSSAS\ITS Signals\Workgroups\Sig Mgmt\Peterson\09010_SmLeIe_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 5

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

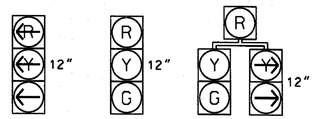
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←	←	↛	↛	↛	↛	↛	↛	↛
21, 22, 23	R	R	G	G	R	R	R	R	Y
31, 32	↛	↛	↛	↛	←	←	↛	↛	↛
41	R	R	R	R	R	R	G	G	R
42	R/	R	R/	R	R	R	G	G	R
51	←	↛	←	↛	↛	↛	↛	↛	↛
61, 62	R	G	R	G	R	R	R	R	Y
71, 72	↛	↛	↛	↛	←	←	↛	↛	↛
81, 82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

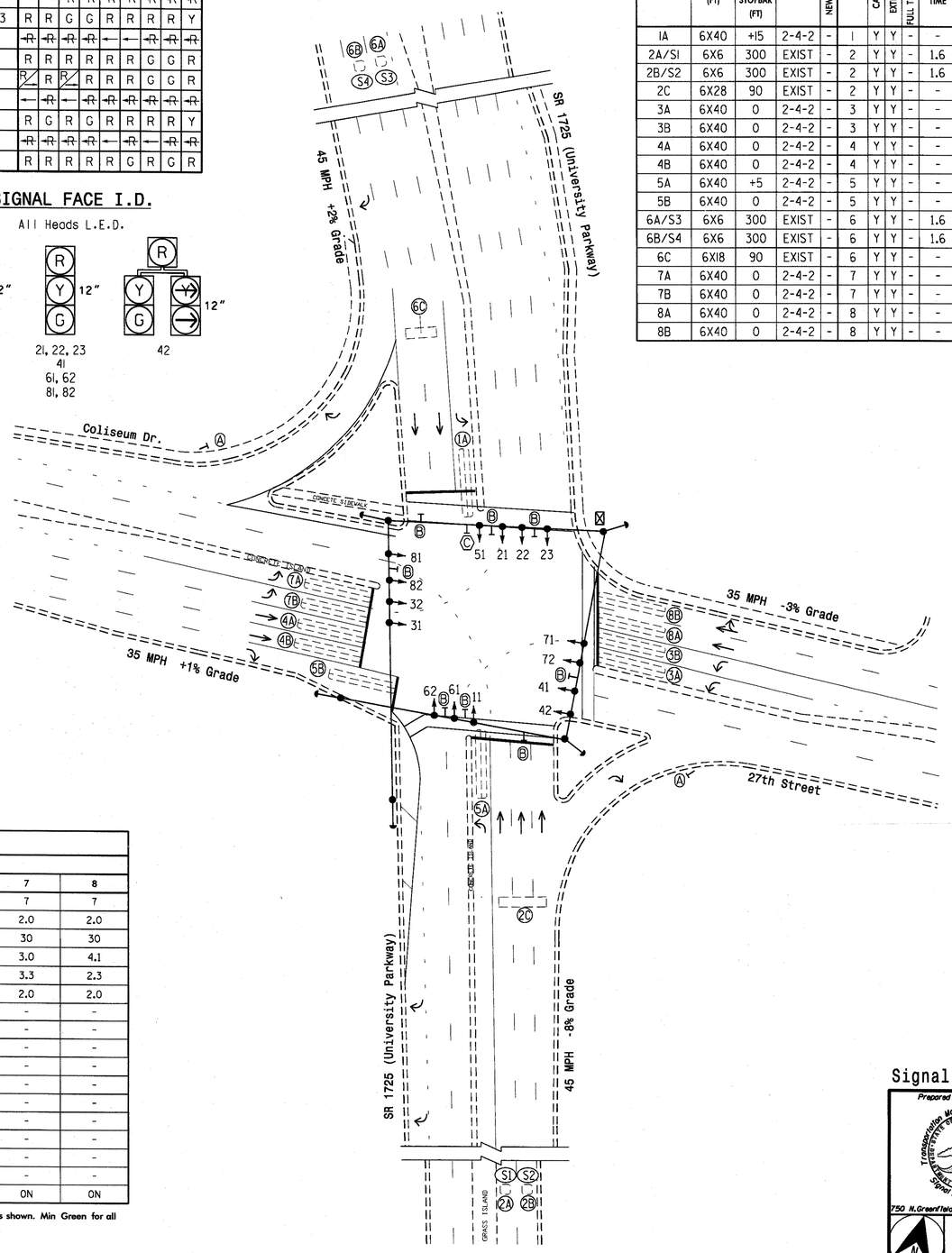
All Heads L.E.D.



11
31, 32
51
71, 72

21, 22, 23
41
61, 62
81, 82

42



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+15	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A/S1	6X6	300	EXIST	-	2	Y	Y	-	1.6	-	Y	Y
2B/S2	6X6	300	EXIST	-	2	Y	Y	-	1.6	-	Y	Y
2C	6X28	90	EXIST	-	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	Y
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	-	-	Y
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
6A/S3	6X6	300	EXIST	-	6	Y	Y	-	1.6	-	Y	Y
6B/S4	6X6	300	EXIST	-	6	Y	Y	-	1.6	-	Y	Y
6C	6X18	90	EXIST	-	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	Y
7B	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

8 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and Submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	30	50	30	30	30	50	30	30
Yellow Clearance	3.0	5.4	3.0	3.8	3.3	4.3	3.0	4.1
Red Clearance	3.8	1.9	3.3	2.6	3.3	2.1	3.3	2.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	----
→	Directional Arrow	→
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725 (University Parkway) at Coliseum Drive/27th Street

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: September 2012 | PREPARED BY: L. Blount
PREPARED BY: Sterling | REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

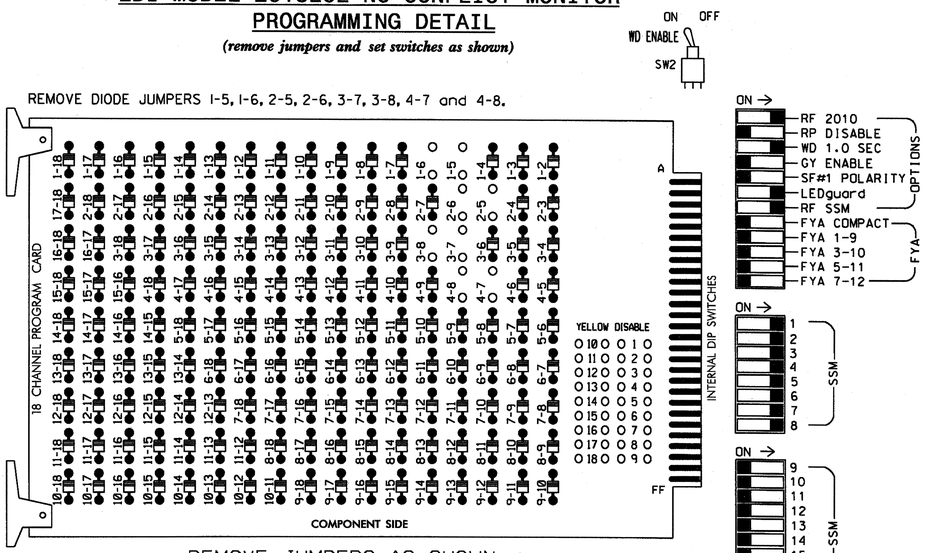
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 10/12/12 DATE
SIG. INVENTORY NO. 09-0011

28-NOV-2012 17:29
S:#ITSSS#ITS Signals#Signal Design Section#Control Regions#Div 9#C-5224 Winston Salem#Signals#09-0011#090011_sig_dsn_20121022.dgn
rziembo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 6

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21, 22,23	NU	31,32	41,42	NU	42	51	61,62	NU	71,72	81,82	NU
RED		128			101				134			107	
YELLOW		129			102				135			108	
GREEN		130			103				136			109	
RED ARROW	125			116				131			122		
YELLOW ARROW	126			117			132	132			123		
GREEN ARROW	127			118			133	133			124		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1	Ø 2/SYS	Ø 2	SLOT EMPTY	Ø 3	Ø 3	Ø 4	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
		1A	2A/S1	2C		3A	3B	4A							
	L	NOT USED	Ø 2/SYS 2B/S2	NOT USED		NOT USED	NOT USED	Ø 4 4B							ST DC ISOLATOR
FILE "J"	U	Ø 5	Ø 5	Ø 6/SYS	Ø 6	Ø 7	Ø 7	Ø 8	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
		5A	5B	6A/S3	6C	7A	7B	8A							
	L	NOT USED	NOT USED	Ø 6/SYS 6B/S4	NOT USED	NOT USED	NOT USED	Ø 8 8B							

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A/S1	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y		1.6	
2B/S2	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y		1.6	
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A/S3	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y		1.6	
6B/S4	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y		1.6	
6C	TB5-1,2	J4U	48	10	26	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-9,10	J6U	42	4	8	7	Y	Y			
8A	TB7-1,2	J7U	66	28	38	8	Y	Y			
8B	TB7-3,4	J7L	79	41	48	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0011
DESIGNED: September 2012
SEALED: 10/22/12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (University Parkway) at Coliseum Drive/27th Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY:

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE

10/25/12
DATE

SIG. INVENTORY NO. 09-0011

23-OCT-2012 09:25
$1=$ USER: $2=$ $3=$ $4=$ $5=$ $6=$ $7=$ $8=$ $9=$ $10=$ $11=$ $12=$ $13=$ $14=$ $15=$ $16=$ $17=$ $18=$ $19=$ $20=$
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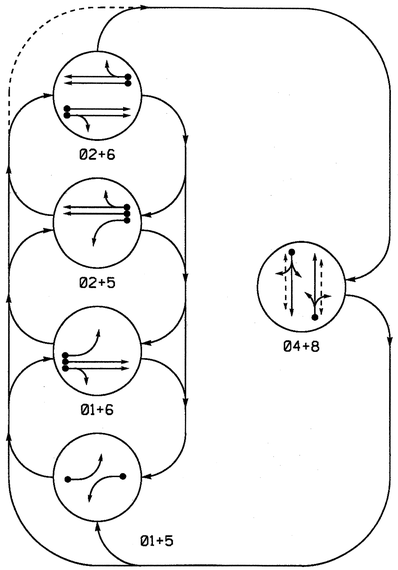
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 7

5 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	04+08	FLASH
11	←	←	↛	↛	↛	↛
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	↛	←	↛	↛	↛
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P41, P42	DW	DW	DW	DW	W	DRK
P81, P82	DW	DW	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

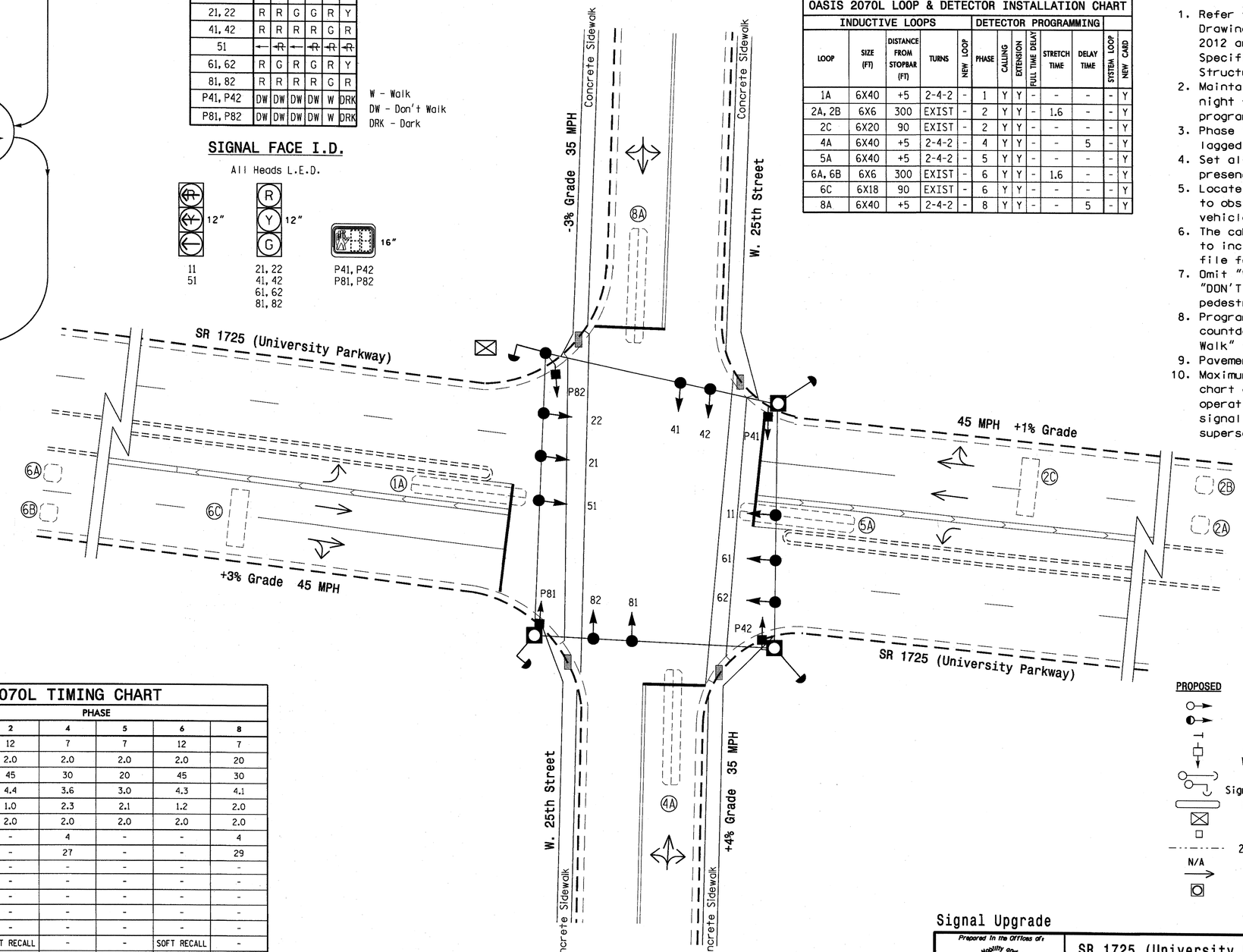
11, 51 — 21, 22, 41, 42, 61, 62, 81, 82 — P41, P42, P81, P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A, 2B	6X6	300	EXIST	-	2	Y	Y	-	1.6	-	-	Y
2C	6X20	90	EXIST	-	2	Y	Y	-	-	-	-	Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	5	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A, 6B	6X6	300	EXIST	-	6	Y	Y	-	1.6	-	-	Y
6C	6X18	90	EXIST	-	6	Y	Y	-	-	-	-	Y
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	5	-	Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊥	Sign	⊥
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○→	Signal Pole with Sidewalk Guy	●→
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - - -
→	Directional Arrow	→
◎	Metal Strain Pole	◘

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	20
Max Green 1 *	20	45	30	20	45	30
Yellow Clearance	3.0	4.4	3.6	3.0	4.3	4.1
Red Clearance	2.4	1.0	2.3	2.1	1.2	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	4	-	-	4
Don't Walk 1	-	-	27	-	-	29
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (University Parkway) at W. 25th Street

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: September 2011 | PREPARED BY: L. Blount
PREPARED BY: W.Bazzarie | REVIEWED BY:

SCALE 0 20 1'=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 5/21/12 DATE

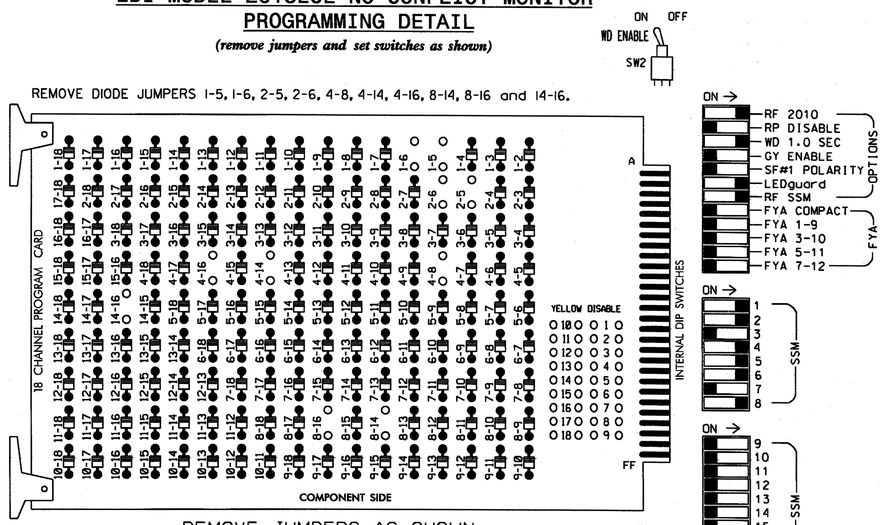
SIG. INVENTORY NO. 09-0012

24-MAY-2012 12:14
S:#MISC#MTS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0012#090012_sig_dsn_20120521.dgn
rziemba

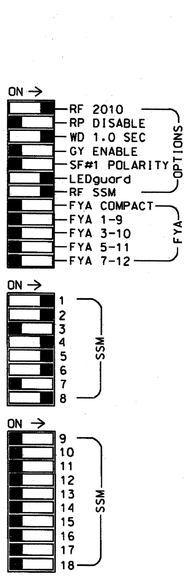
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 8

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 4 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S6,S7,S8,S11,S12
PHASES USED.....1,2,4,4 PED,5,6,8,8 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	P41, P42	51	61,62	NU	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
GREEN ARROW	127						133											
✋						104						110						
🚶						106						112						

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	NOT USED	FS DC ISOLATOR
	L	NOT USED	Ø2 2C				NOT USED						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6C				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y		1.6	
2C	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y		1.6	
6C	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0012
DESIGNED: September 2011
SEALED: 05/21/12
REVISED: N/A

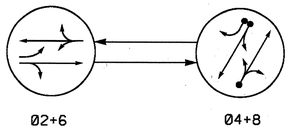
Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 1725 (University Parkway) at W. 25th Street	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, Signal Management Section	Division 9 · Forsyth County · Winston-Salem	NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
750 N.Greenfield Pkwy.,Garner,NC 27529	PLAN DATE: May 2012 · REVIEWED BY: T. Vogel	
	PREPARED BY: C. Strickland · REVIEWED BY:	
	REVISIONS · INIT. · DATE	SIGNATURE · DATE: 5/22/12
		SIG. INVENTORY NO. 09-0012

21-MAY-2012 13:50
S:\#TTSS\Dm\TS Signals\Workgroups\Sig Mgmt\Strickland\M09012_sample_xxx.dgn
Cesar Fabiano

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 9

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

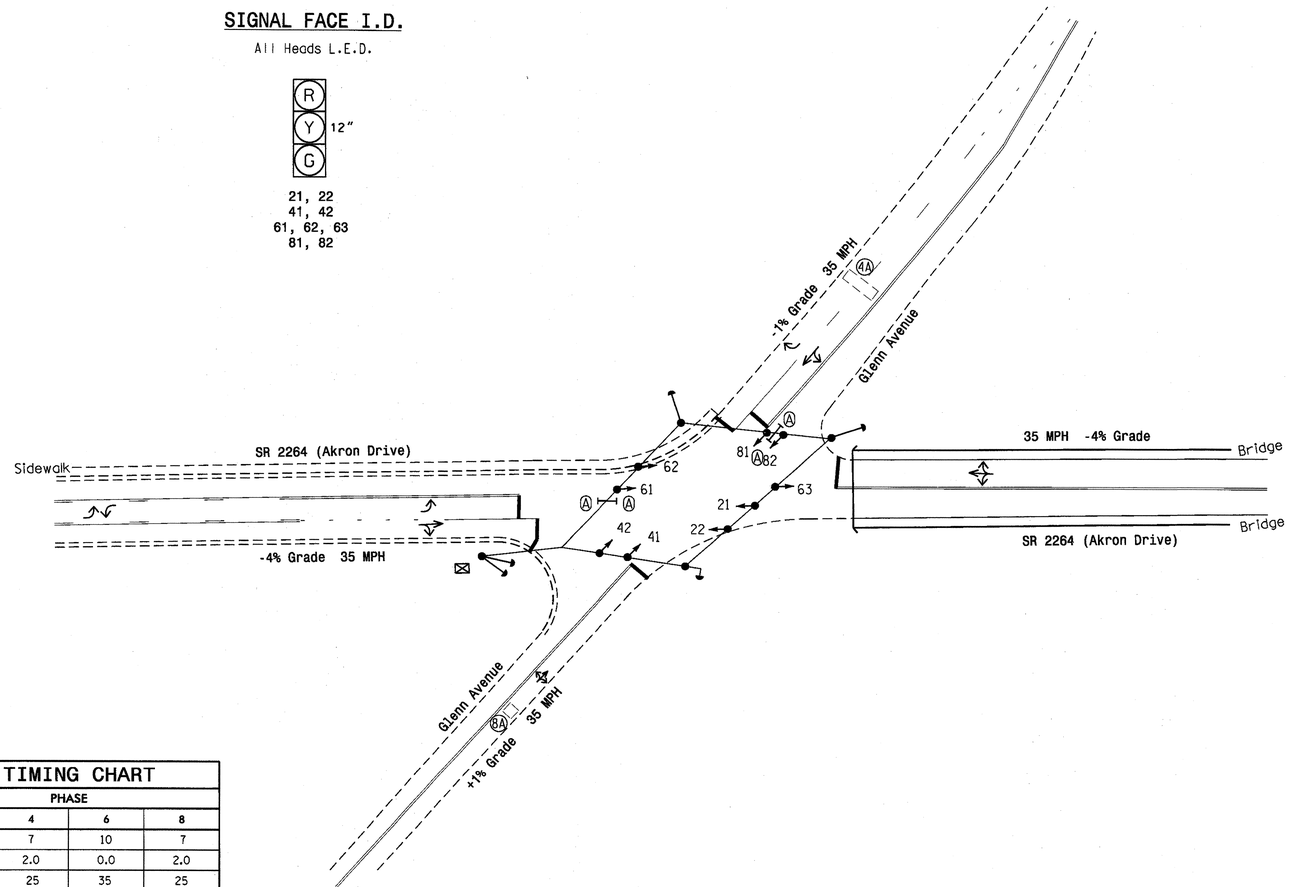
TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62, 63	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62, 63
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X20	100	EXIST	-	4	Y	Y	-	-	-	-	Y
8A	6X6	38	EXIST	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	0.0	2.0	0.0	2.0
Max Green 1 *	35	25	35	25
Yellow Clearance	4.1	3.9	4.1	3.8
Red Clearance	2.5	2.1	2.3	1.7
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	-	MAX RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Semi-Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	Street Name Sign (D3-1)	(A)

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 2264 (Akron Drive)
at
Glenn Avenue

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2011 REVIEWED BY:
PREPARED BY: W. Bazzarie REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

N

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 3/1/12 DATE

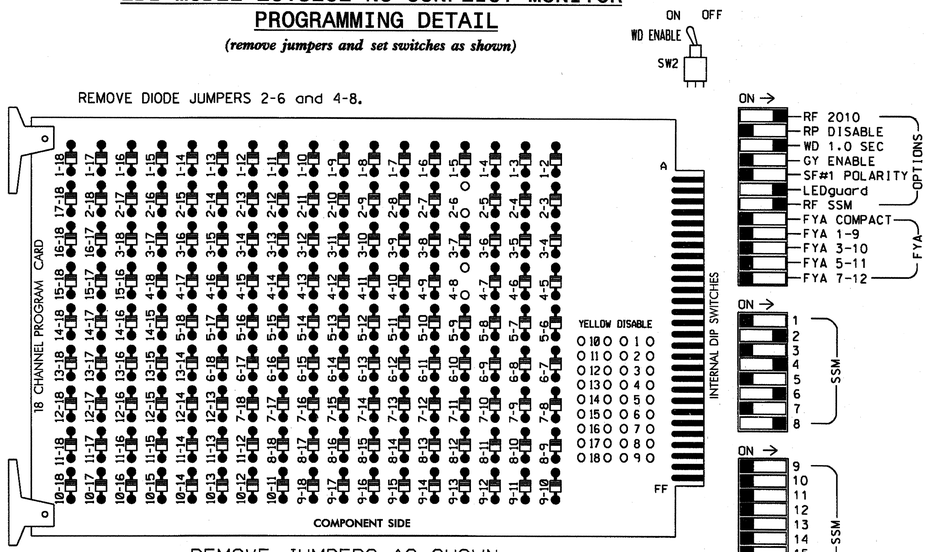
SIG. INVENTORY NO. 09-0016

02-JAN-2013 12:29
S:\Traffic\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0016\090016_sig_dsn_20120307.dgn

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 10

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62 63	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L						NOT USED								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L						NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0016
DESIGNED: September 2011
SEALED: 3/7/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Traffic Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 2264 (Akron Drive)
at
Glenn Avenue

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: February 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

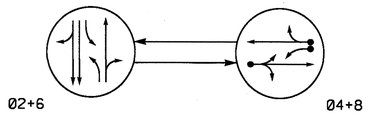
John T Rowe 3-8-12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0016

08-MAR-2012 06:59
S:\#TSSCUMITS Signals\Workgroups\Sig Mgmt\Armstrong\409016_sht_elec_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 11

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

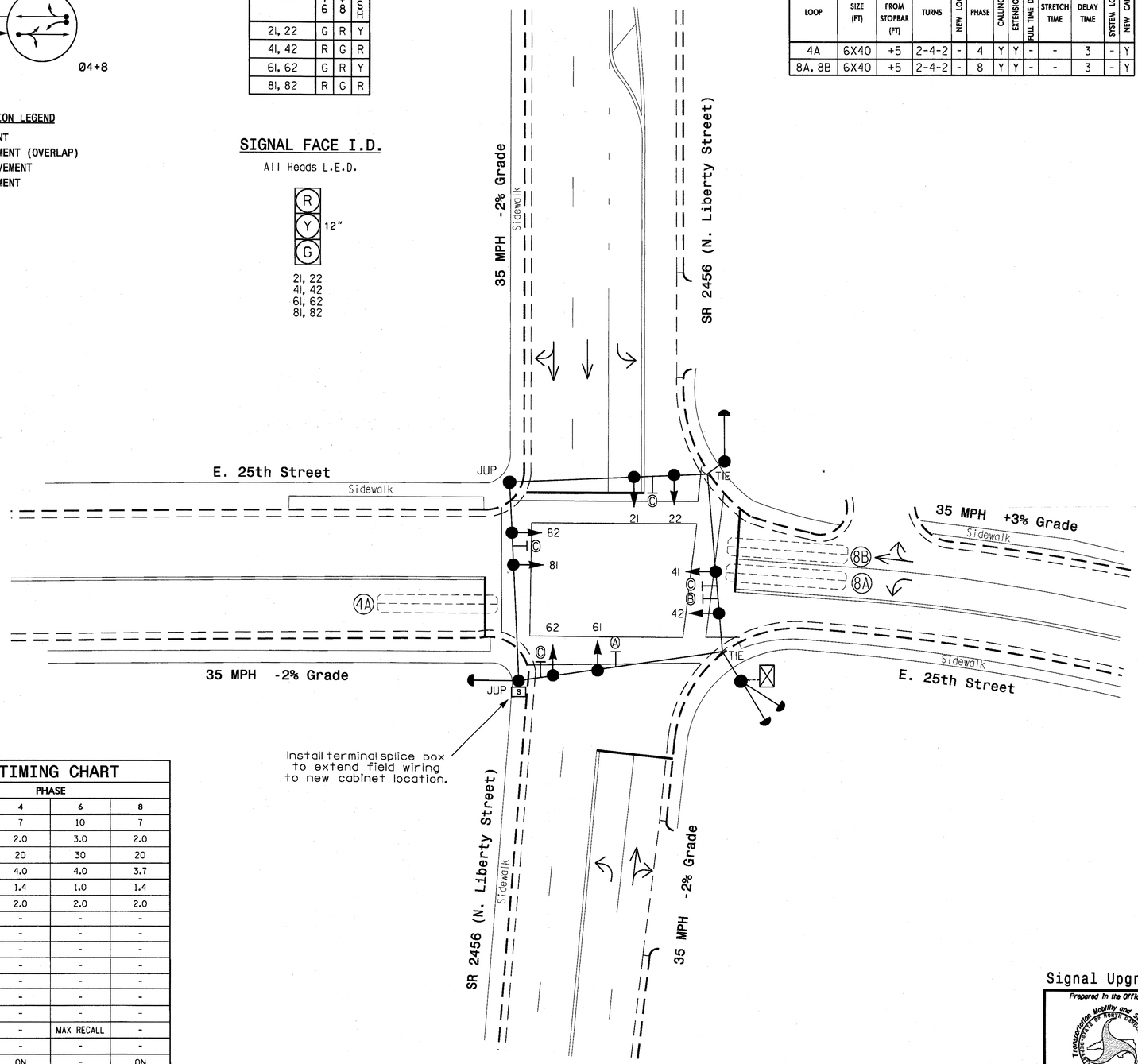
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	3	-	Y
8A, 8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	3	-	Y

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	30	20	30	20
Yellow Clearance	4.0	4.0	4.0	3.7
Red Clearance	1.6	1.4	1.0	1.4
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	-	MAX RECALL	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Semi-Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Existing Left Arrow "ONLY" sign (R3-5l) may be removed at the direction of the Engineer.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	"NO TURN ON RED" Sign (R10-11)	B
C	Street Name Sign (D3-1)	C

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2456 (N. Liberty Street) at E. 25th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: August 2011 REVIEWED BY:

PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMEIER

SIGNATURE 2/16/12 DATE

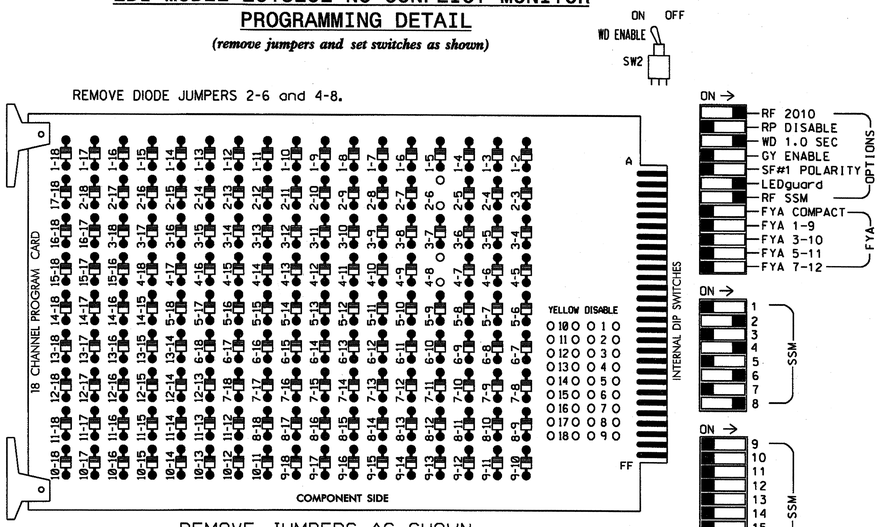
SIG. INVENTORY NO. 09-0018

05-DEC-2012 17:26
S:#TTSSASM#TS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0018#090018_sig_dsn_20120416.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 12

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L						NOT USED								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 8 8A,8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L						NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
8A,8B	TB5-9,10	J6U	42	4	8	8	Y	Y			3

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0018
DESIGNED: August 2011
SEALED: 4-16-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering Branch
Traffic Management Unit
Traffic Management Section
NCDOT
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Mobility and Safety Division
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2456 (N. Liberty Street) at E. 25th Street

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: April 2012 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

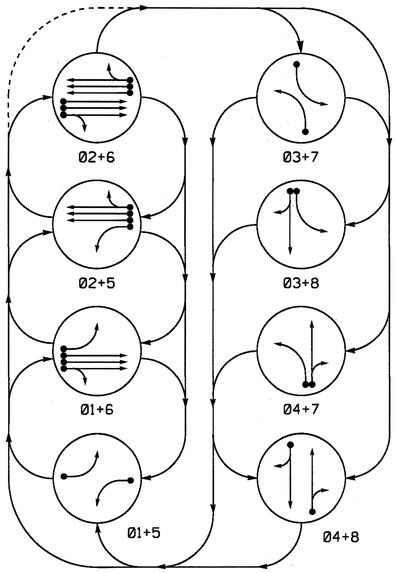
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 4-18-12 DATE
SIG. INVENTORY NO. 09-0018

18-APR-2012 07:40
S:\Traffic\Signals\Workgroups\Sig Mgmt\Peterson\#09018_smus_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 13

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

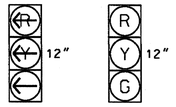
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←	←	↛	↛	↛	↛	↛	↛	↛
21, 22, 23	R	R	G	G	R	R	R	R	Y
31	↛	↛	↛	↛	←	←	↛	↛	↛
41, 42	R	R	R	R	R	R	G	G	R
51	←	↛	←	↛	↛	↛	↛	↛	↛
61, 62, 63	R	G	R	G	R	R	R	R	Y
71	↛	↛	↛	↛	←	↛	←	↛	↛
81, 82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



11
31
51
71

21, 22, 23
41, 42
61, 62, 63
81, 82

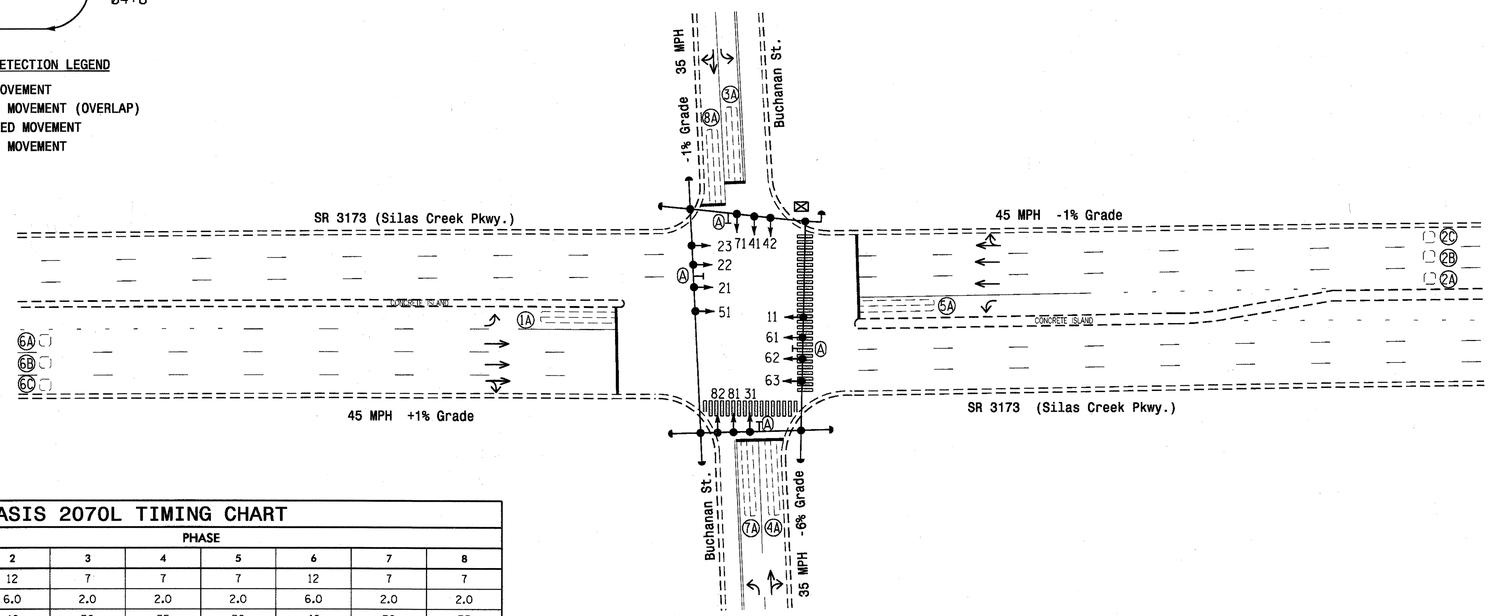
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2C	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	3	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
6C	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	3	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

8 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	30	40	30	35	30	40	30	35
Yellow Clearance	3.0	4.6	3.0	4.3	3.0	4.4	3.1	3.9
Red Clearance	3.1	1.3	3.1	2.3	3.1	1.6	2.8	2.1
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	▩
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - -
→	Directional Arrow	→
Ⓐ	Street Name Sign (D3-1)	Ⓐ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 3173 (Silas Creek Pkwy.) at Buchanan Street

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: September 2012 | PREPARED BY: L. Blount
PREPARED BY: Sterling | REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/13/12 DATE

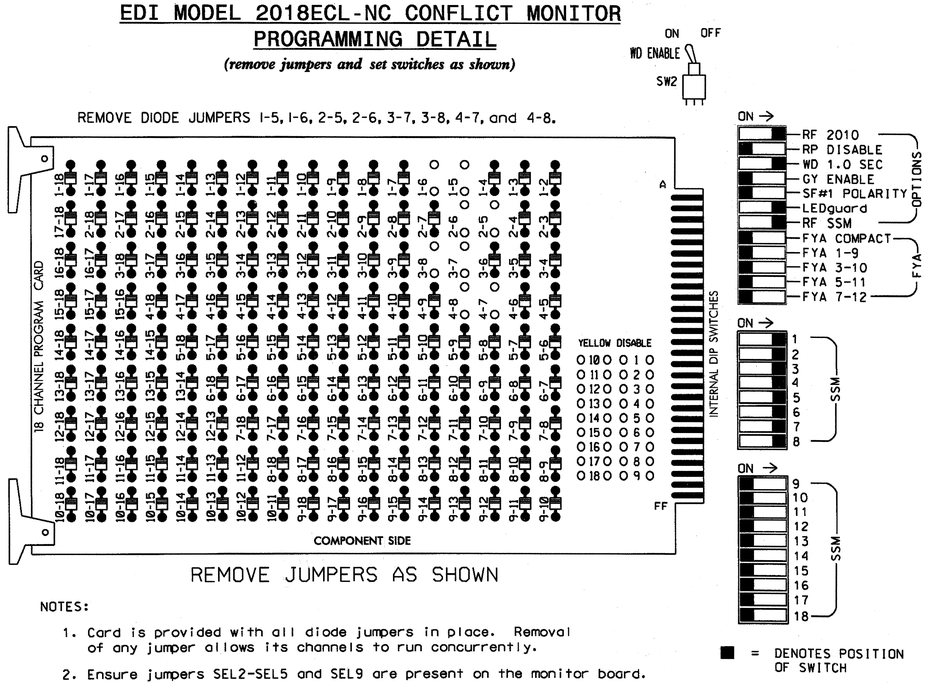
SIG. INVENTORY NO. 09-0023

13-NOV-2012 09:25
S:\TISA\SAM\TS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\09-0023\090023_sig_dsn_20121113.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 14

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22 23	NU	31	41,42	NU	51	61,62 63	NU	71	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123								
GREEN ARROW	127			118			133			124								

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	ø2 2C	SLOT EMPTY	ø3 3A	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	ø2 2B	NOT USED		NOT USED	NOT USED								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	ø6 6C	SLOT EMPTY	ø7 7A	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B	NOT USED		NOT USED	NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0023
DESIGNED: September 2012
SEALED: 11/13/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 3173 (Silas Creek Pkwy.)
at
Buchanan Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

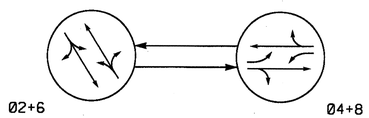
John T Rowe Jr 11-13-12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0023

13-NOV-2012 11:02
S:#ITS&SIG#ITS Signals#Workgroups#Sig Mon#armstrong#090023_smple.xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 15

PHASING DIAGRAM



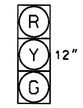
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE		
	Ø2+6	Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

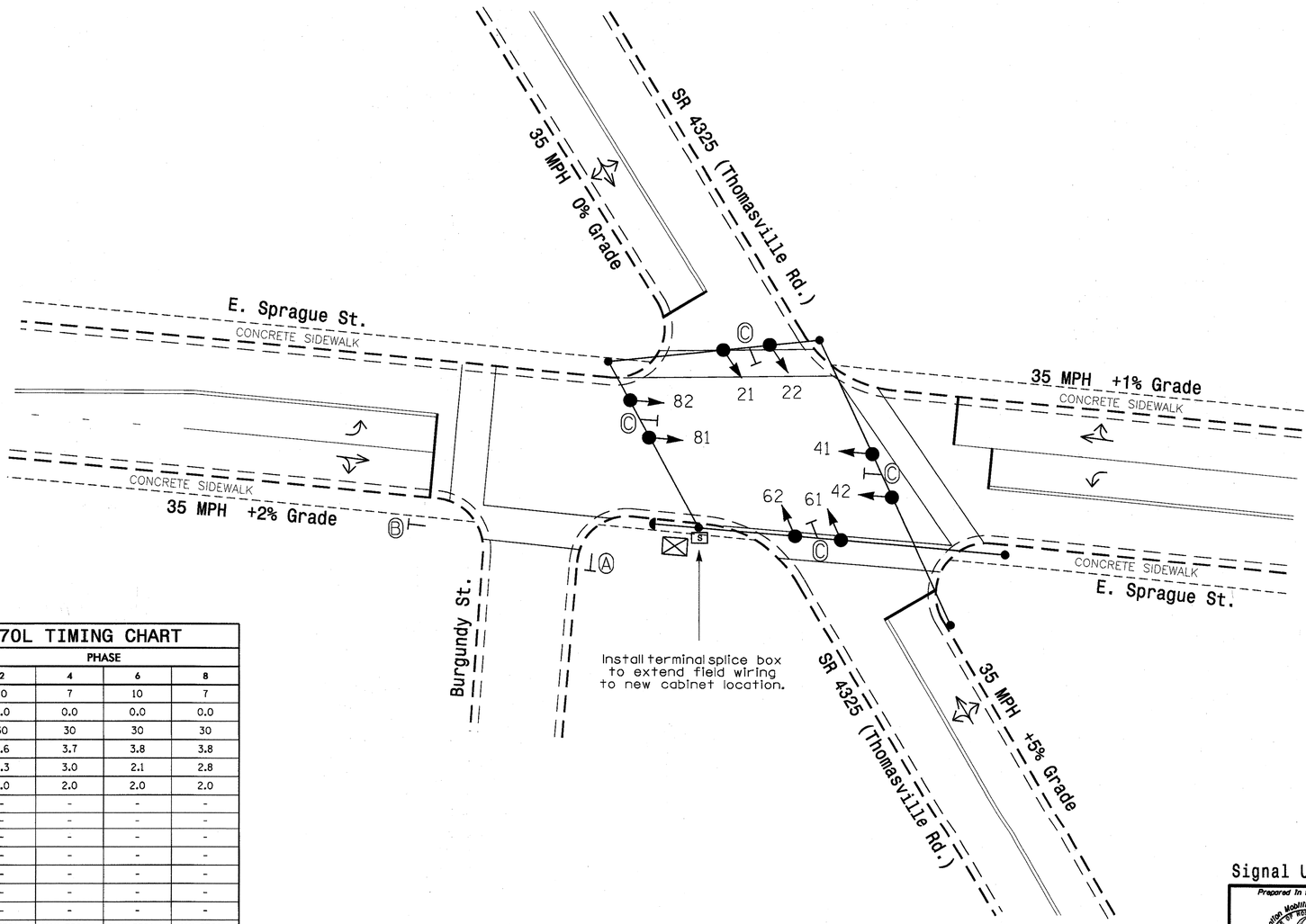


21, 22
41, 42
61, 62
81, 82

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. The cabinet should be designed to include an Auxiliary Output file for future use.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
Ⓐ	"STOP" Sign (R1-1)	Ⓐ
Ⓑ	"STOP HERE ON RED" Sign (R10-16)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	0.0	0.0	0.0	0.0
Max Green 1 *	30	30	30	30
Yellow Clearance	3.6	3.7	3.8	3.8
Red Clearance	3.3	3.0	2.1	2.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	MAX RECALL	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
State of North Carolina
Department of Transportation
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 20 1"=20'

SR 4325 (Thomasville Road)
at
E. Sprague Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2011	REVIEWED BY:
PREPARED BY: Sterling	REVIEWED BY:

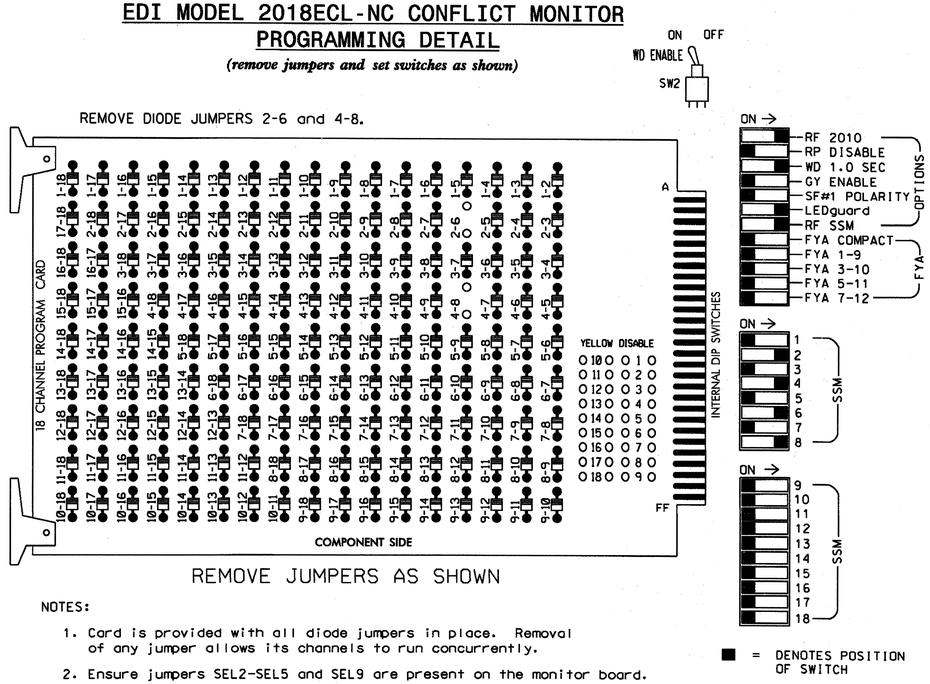
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 3/7/12 DATE
SIG. INVENTORY NO. 09-0029

05-DEC-2012 17:30
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0029\090029_sig_dsn_20120307.dgn
rziemba

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 16

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX. OUTPUT FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0029
DESIGNED: September 2011
SEALED: 3/7/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

SR 4325 (Thomasville Road)
at
E. Sprague Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: February 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 008453
ENGINEER
JOHN T. ROWE, JR.

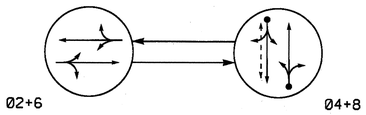
SIGNATURE 3-8-12 DATE

SIG. INVENTORY NO. 09-0029

08-MAR-2012 06:48
S:\eITS&SDM\ITS Signals\Workgroups\Sig Mon\Armstrong\M090029_sm_ele_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 17

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P41, P42	DW	W	DRK

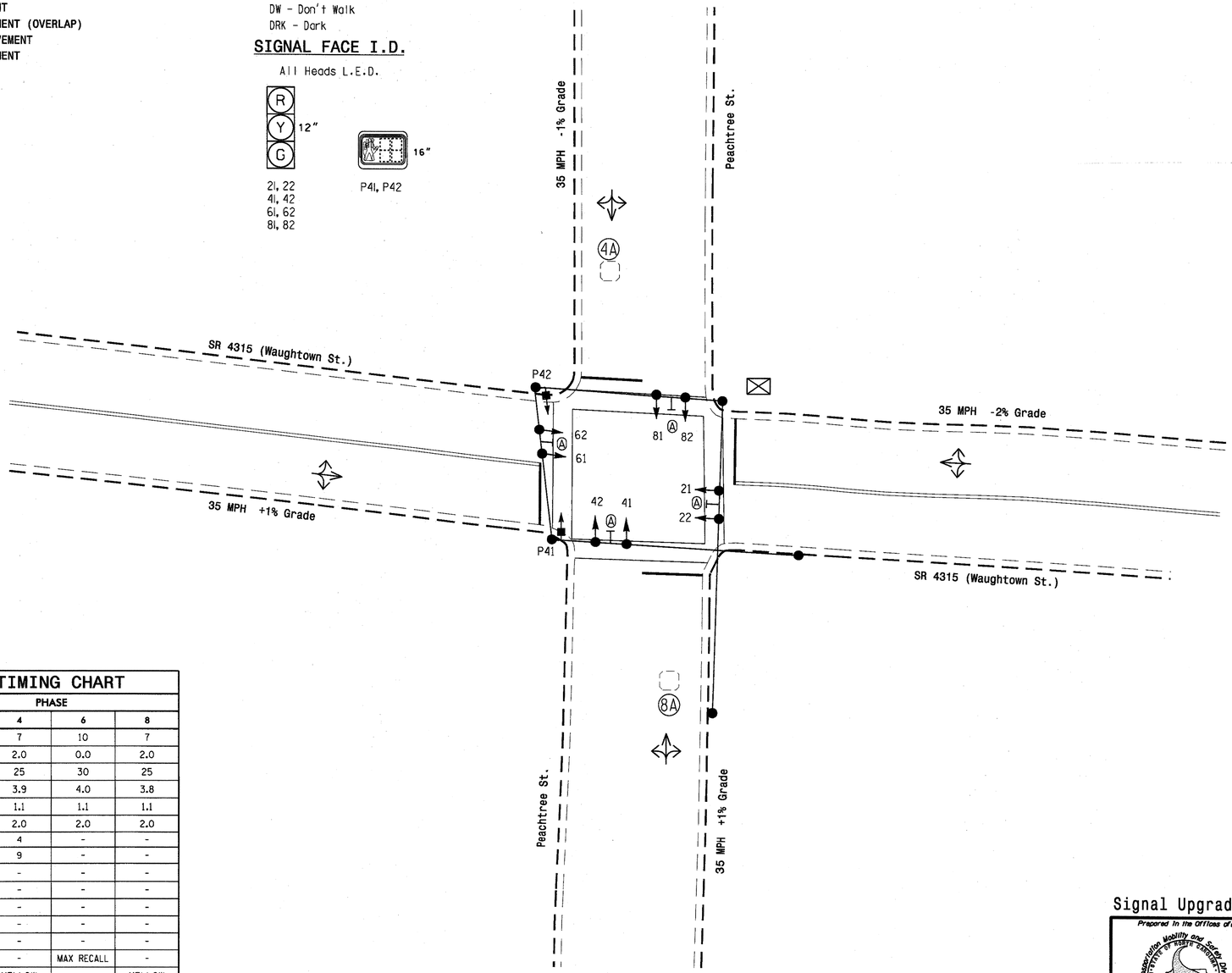
W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82

P41, P42



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X6	30	EXIST	-	4	Y	Y	-	-	-	-	Y
8A	6X6	30	EXIST	-	8	Y	Y	-	-	-	-	Y

2 Phase
Semi-Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Street Name Sign (D3-1)	

OASIS 2070L TIMING CHART				
FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	0.0	2.0	0.0	2.0
Max Green 1 *	30	25	30	25
Yellow Clearance	3.8	3.9	4.0	3.8
Red Clearance	1.1	1.1	1.1	1.1
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	4	-	-
Don't Walk 1	-	9	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	-	MAX RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Waughtown St.) at Peachtree Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2011 PREPARED BY: L. Blount

PREPARED BY: Sterling REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIMMONS

SIGNATURE 9/12/12 DATE

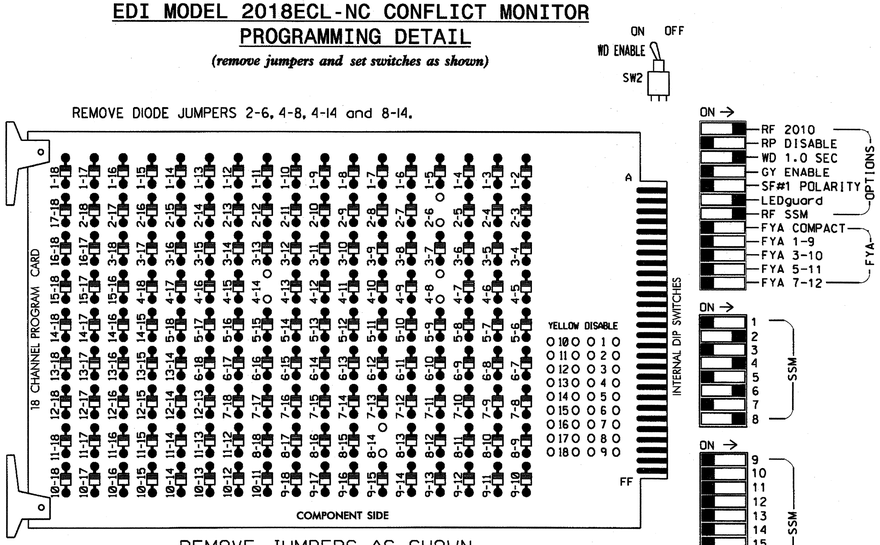
SIG. INVENTORY NO. 09-0032

29-NOV-2012 13:55
S:\#TSASUBMITS\Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0032\#090032_sig_dsn_20120502.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 18

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phase 4 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S6,S8,S11
PHASES USED.....2,4,4PED,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	P41, P42	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋						104						
🚶						106						

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED ø4 PED	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L						NOT USED						DC ISOLATOR		ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L						NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0032
DESIGNED: September 2011
SEALED: 5-2-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4315 (Waughtown St.)
at
Peachtree Street

Division 09 | Forsyth County | Winston-Salem
PLAN DATE: 05-01-12 | REVIEWED BY: T. Jga
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
George C Brown 5/7/12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0032

04-MAY-2012 15:00
S:\#TISSUE\TS Signals\Workgroups\Sig Mon\Spaulding\In-progress\09032_sm_ele_2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 19

PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	PHASE FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. The cabinet should be designed to include an Auxiliary Output file for future use.
5. Pavement markings are existing.
6. Existing lane control signs may be removed at the direction of the Engineer.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

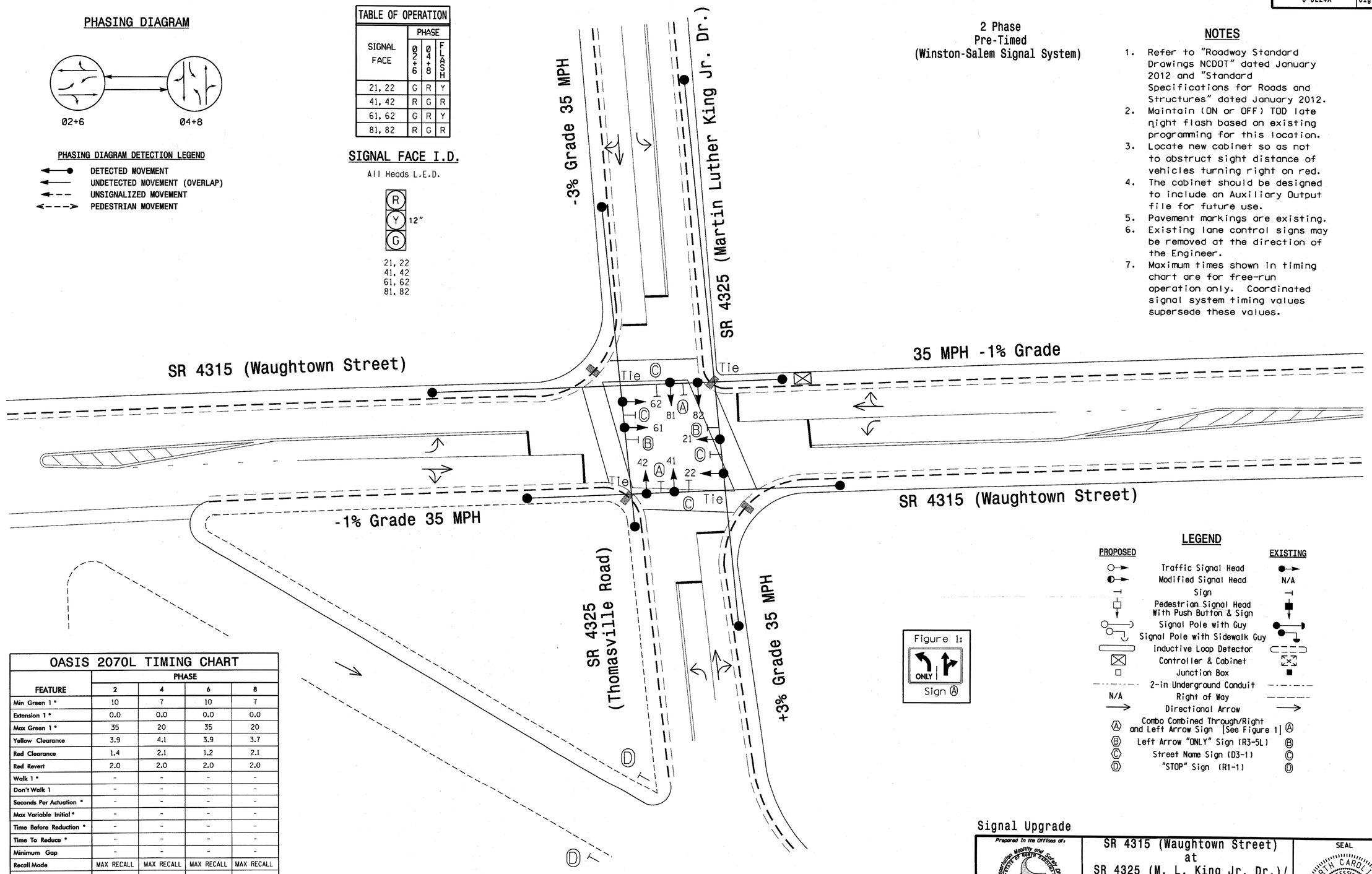


Figure 1:

Sign Ⓐ

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Combo Combined Through/Right and Left Arrow Sign [See Figure 1]	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ
Ⓓ	"STOP" Sign (R1-1)	Ⓓ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	0.0	0.0	0.0	0.0
Max Green 1 *	35	20	35	20
Yellow Clearance	3.9	4.1	3.9	3.7
Red Clearance	1.4	2.1	1.2	2.1
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	MAX RECALL	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 4315 (Waughtown Street)
at
SR 4325 (M. L. King Jr. Dr.)/
SR 4325 (Thomasville Road)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: September 2011 | REVIEWED BY:
PREPARED BY: W.Bazzarie | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

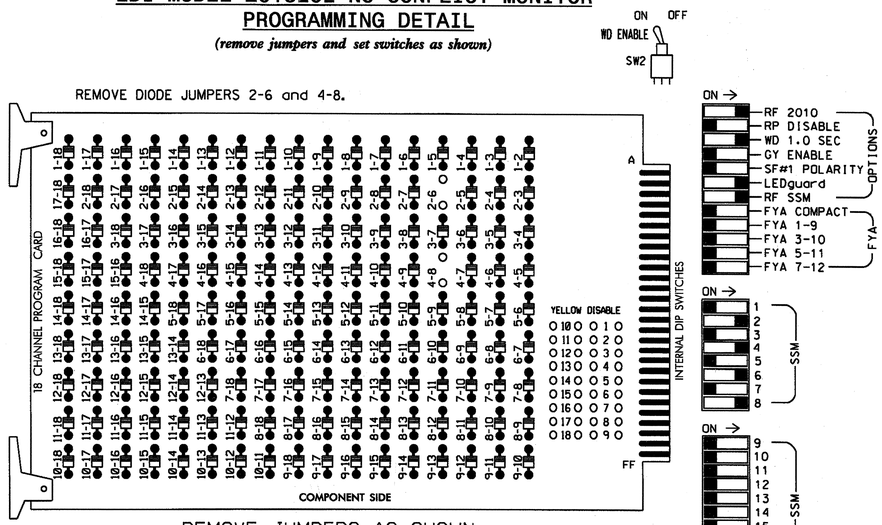
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE
DATE 2/24/12
SIG. INVENTORY NO. 09-0033

12-JUN-2012 09:32
S:\Traffic\Projects\09-0033\Signals\Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0033#090033_sig_dsn_20120224.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A$_{AB}$	Sig.20

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0033
DESIGNED: September 2011
SEALED: 02/24/2012
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4315 (Waughtown Street) at SR 4325 (M. L. King Jr. Dr.)/ SR 4325 (Thomasville Road)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: February 2012 | REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

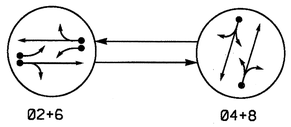
Prepared in the Offices of:
North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
George C. Brown 2/24/12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0033

24-FEB-2012 12:16
S:\TSSD\SIGNALS\ATMS\Signals\Workgroups\Sig Mon\Strickland\09033_sm_ele_xxx.dgn
cstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 2

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

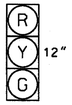
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42
61, 62
81, 82

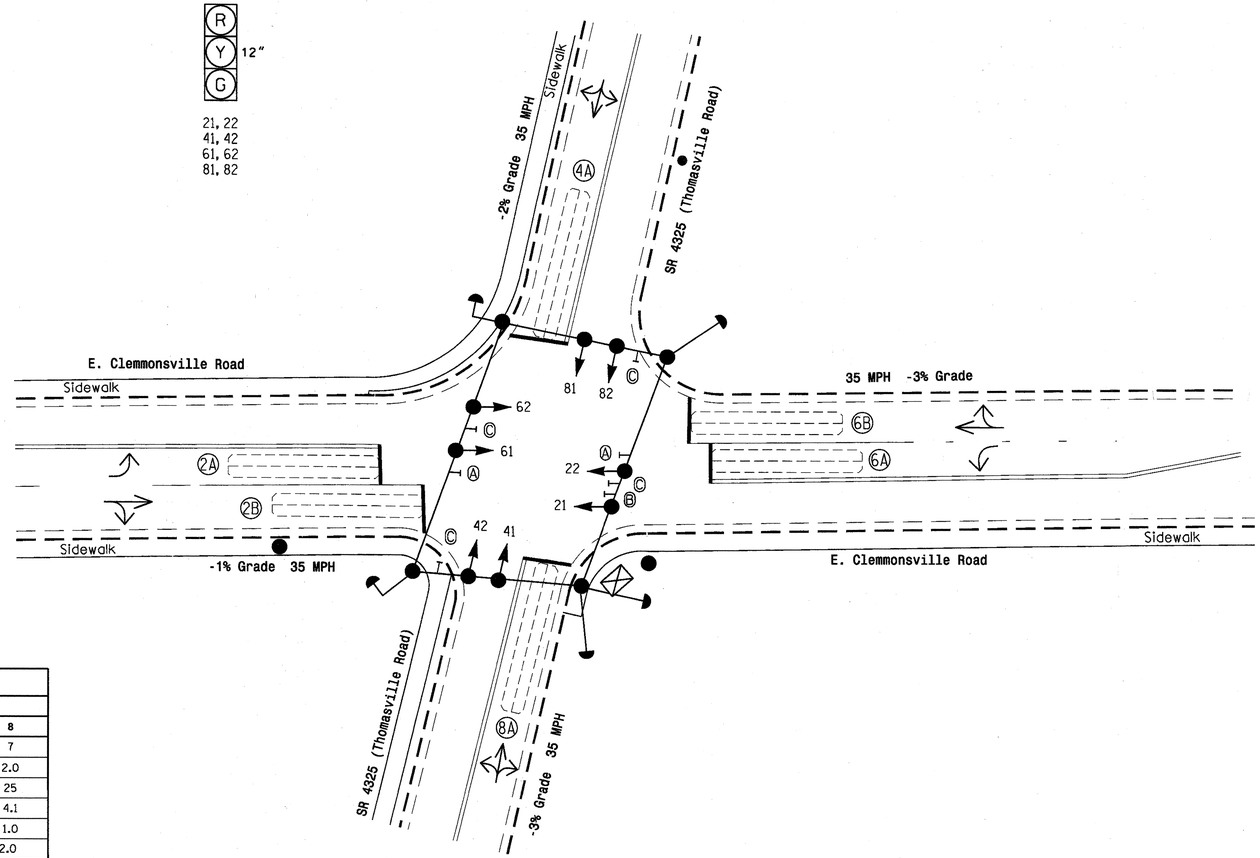
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
2B	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	5	-	Y
6A	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
6B	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	5	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The cabinet should be designed to include an Auxiliary Output file for future use.
6. Existing lane control signs may be removed at the direction of the Engineer.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	45	25	45	25
Yellow Clearance	3.9	4.0	4.1	4.1
Red Clearance	1.0	1.1	1.1	1.0
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)
(B)	Combined Through and Right Arrow Sign (R3-6R)	(B)
(C)	Street Name Sign (D3-1)	(C)

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

E. Clemmonsville Road at SR 4325 (Thomasville Road)

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2011 REVIEWED BY:

PREPARED BY: W.Bazzarie REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMEY
SIGNATURE 4/23/12 DATE

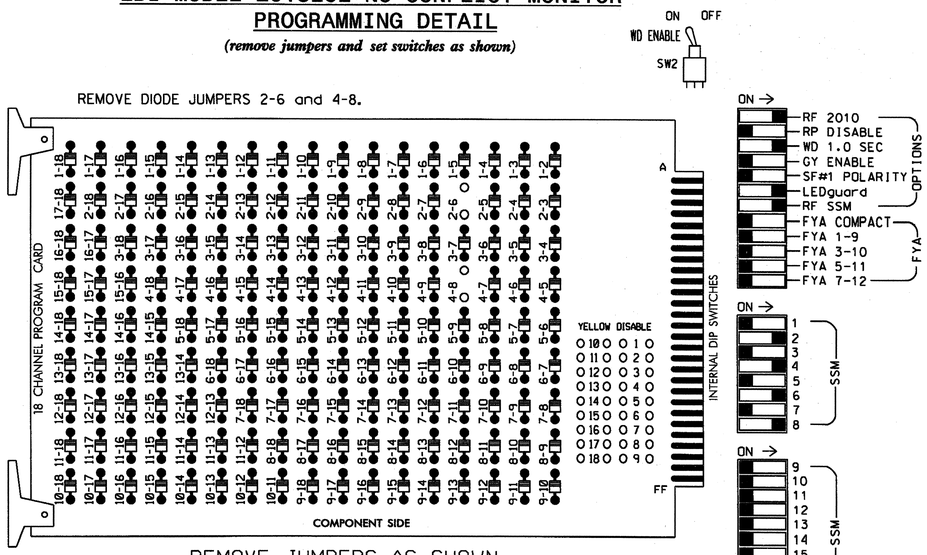
SIG. INVENTORY NO. 09-0034

12-JUN-2012 09:34
S:#ITS&SM#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0034#090034_sig_dsn_20120423.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 22

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX OUTPUT FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				NOT USED								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0034
DESIGNED: September 2011
SEALED: 4/23/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

E. Clemmonsville Road
at
SR 4325 (Thomasville Road)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: April 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

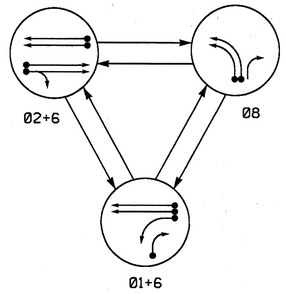
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE
4-23-12
DATE

SIG. INVENTORY NO. 09-0034

23-APR-2012 15:24
S:\ATTS\SIGNALS\Workgroups\Sig Mon\Armstrong\#09034_smelle_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 23

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

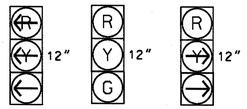
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	PHASE FLASH
11	←	Ⓡ	Ⓡ	Ⓡ
12	→	R	→	R
21, 22	R	G	R	Y
61, 62	G	G	R	Y
81, 82	Ⓡ	Ⓡ	←	Ⓡ

SIGNAL FACE I.D.

All Heads L.E.D.



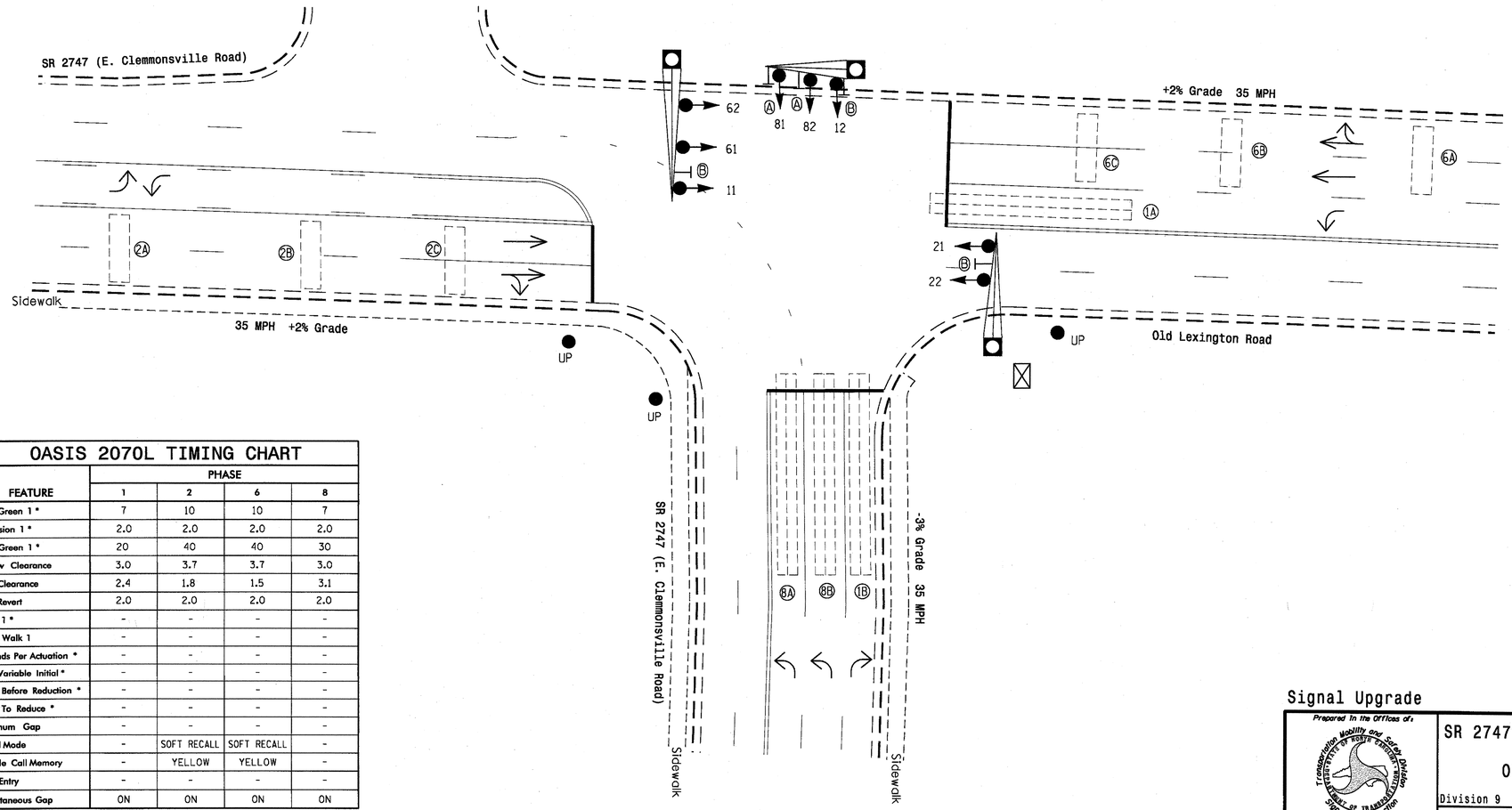
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Y	Y	-	-	-	-	Y
1B	6X60	+5	2-4-2	-	1	Y	Y	-	-	15	-	Y
2A	6X20	138	EXIST	-								
2B	6X20	81	EXIST	-	2	Y	Y	-	-	-	-	Y
2C	6X20	38	EXIST	-								
6A	6X20	138	EXIST	-								
6B	6X20	81	EXIST	-	6	Y	Y	-	-	-	-	Y
6C	6X20	38	EXIST	-								
8A	6X60	+5	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X60	+5	2-4-2	-	8	Y	Y	-	-	-	-	Y

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Existing Left Arrow "ONLY" (R3-5L) signs may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	10	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	20	40	40	30
Yellow Clearance	3.0	3.7	3.7	3.0
Red Clearance	2.4	1.8	1.5	3.1
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2747 (E. Clemmonsville Rd.)
at
Old Lexington Road

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: October 2012 | PREPARED BY: L. Blount
PREPARED BY: W. Bazzarie | REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

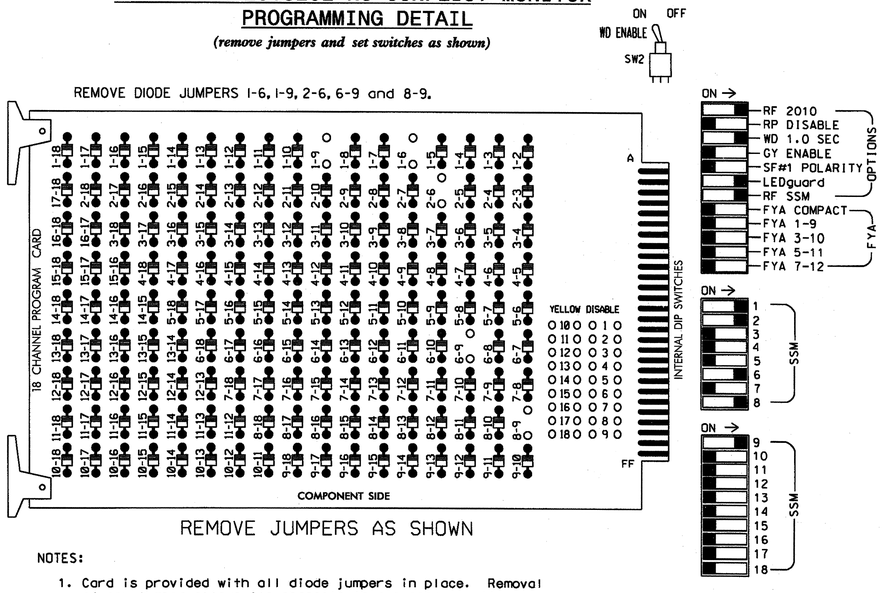
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/5/12 DATE
SIG. INVENTORY NO. 09-0037

13-NOV-2012 11:32
S:*ITS&SIGNALS\Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0037\09037_sig_dsn_20121105.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.24

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
5. The cabinet and controller are part of the Winston-Salem Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	12	NU	NU	NU	NU	NU
RED		128						134					A121					
YELLOW		129						135										
GREEN		130						136										
RED ARROW	125										107							
YELLOW ARROW	126										108		A122					
GREEN ARROW	127										109		A123					

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S1
PHASES USED.....1,2,6,8
OVERLAP A:.....1+8
OVERLAP B:.....NOT USED
OVERLAP C:.....NOT USED
OVERLAP D:.....NOT USED

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |123456789101112131415 16
VEH OVL PARENTS: |X       X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø1 1B	ø2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED	NOT USED											ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A,6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	SLOT EMPTY	NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A,2B,2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0037
DESIGNED: October 2012
SEALED: 11-05-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 2747 (E. Clemmonsville Rd.) at Old Lexington Road	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Management Section	Division 9 · Forsyth County · Winston-Salem	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: October 2012 · REVIEWED BY: JTR	
	PREPARED BY: James Peterson · REVIEWED BY:	
	REVISIONS · INIT. · DATE	SIGNATURE · DATE 11-6-12
		SIG. INVENTORY NO. 09-0037

06-NOV-2012 07:46
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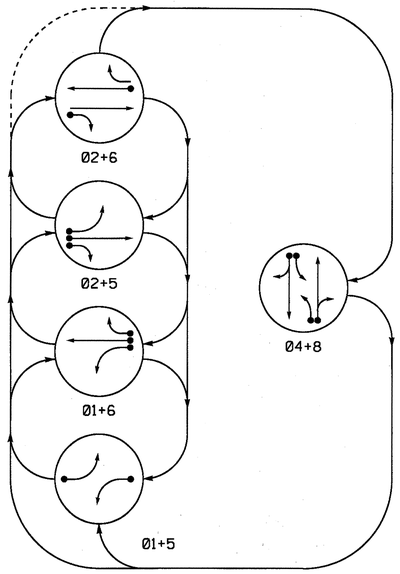
ITS Version 5.00

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 25

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

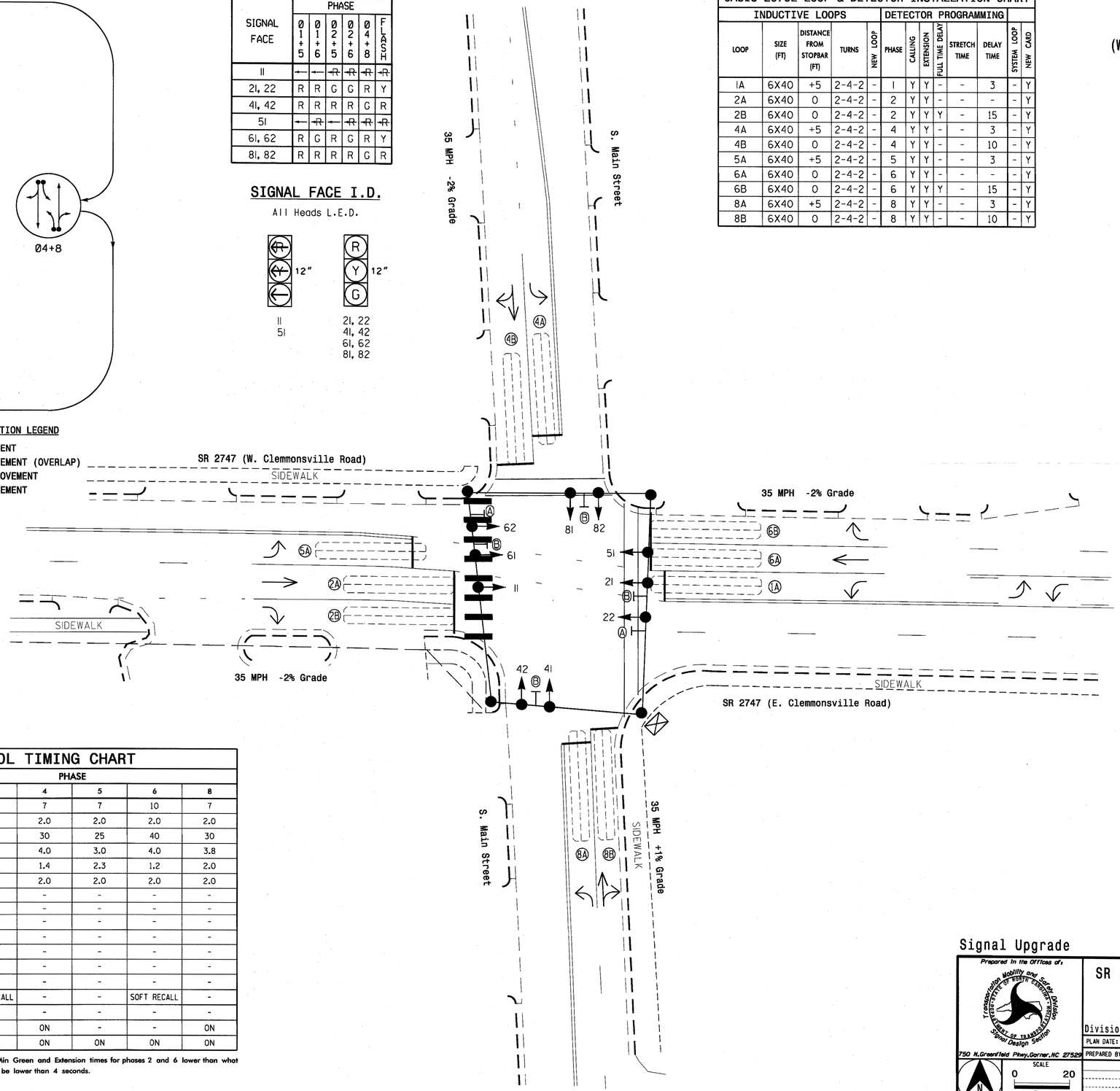
TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	↱	↱	↱	↱
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	↱	←	↱	↱	↱
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

11
51

21, 22
41, 42
61, 62
81, 82



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	3	-	Y
2A	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
2B	6X40	0	2-4-2	-	2	Y	Y	Y	-	15	-	Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	3	-	Y
6A	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
6B	6X40	0	2-4-2	-	6	Y	Y	Y	-	15	-	Y
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

OASIS 2070L TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	25	40	30	25	40	30
Yellow Clearance	3.0	4.0	4.0	3.0	4.0	3.8
Red Clearance	1.8	1.3	1.4	2.3	1.2	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	-	-	-	-	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

5 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Existing Right Arrow "ONLY" signs (R3-5R) may be removed at the direction of the Engineer.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2747 (Clemmonsville Road) at S. Main Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2012 PREPARED BY:

PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/27/12 DATE

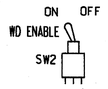
SIG. INVENTORY NO. 09-0040

27-NOV-2012 14:53
S:\TIS&S\ITS Signal\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signal\s#09-0040\090040_sig_dsn_20121127.dgn
rziemba

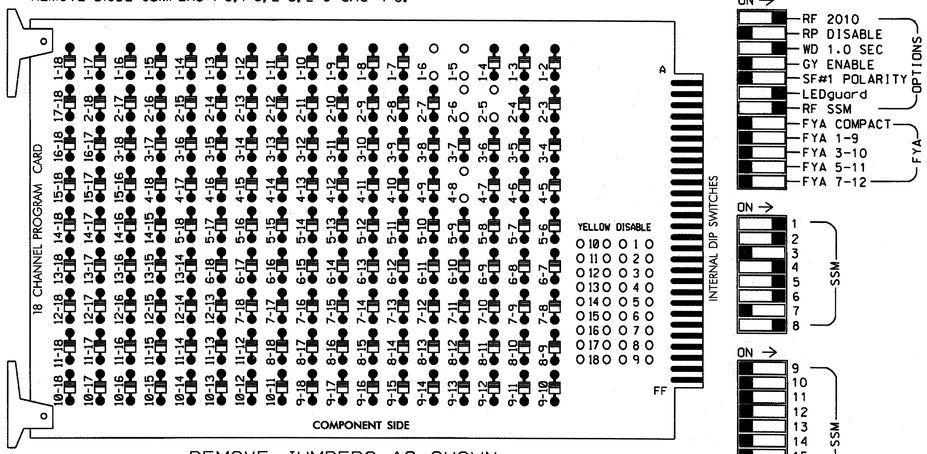
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.26

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6 and 4-8.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	ø2 2B				ø4 4B								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B				ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	Y		15
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y	Y		15
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0040
DESIGNED: November 2012
SEALED: 11/27/12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2747 (Clemmonsville Road)
at
S. Main Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: T. Vigh
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 11/29/12 DATE
SIG. INVENTORY NO. 09-0040

28-NOV-2012 11:28
S:\TSS&S\TS Signals\Workgroups\Sig Mgmt\Strickland\090040_amele_xxx.dgn
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 27

PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

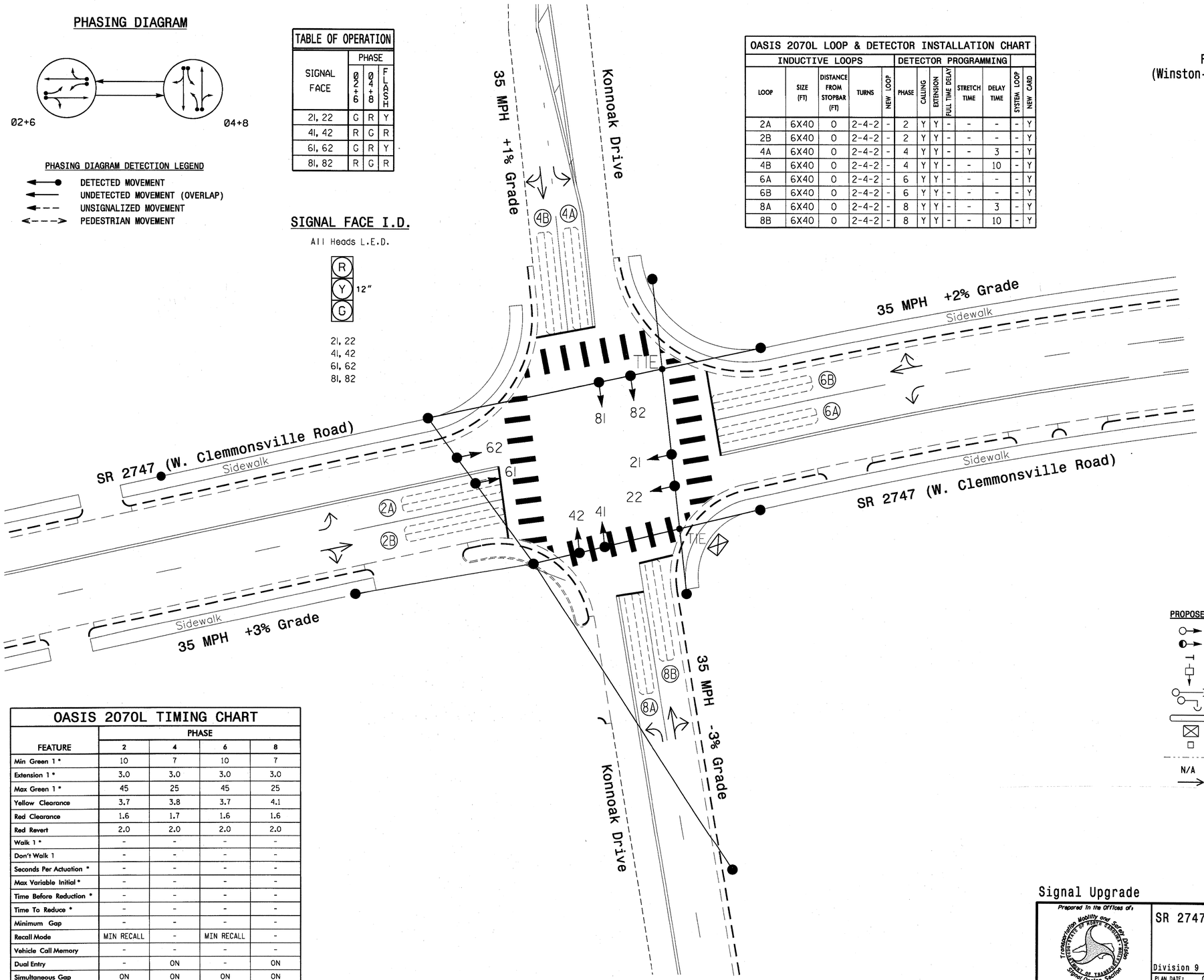
21, 22
41, 42
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
2B	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
6A	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
6B	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The cabinet should be designed to include an Auxiliary Output file for future use.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	3.0	3.0	3.0
Max Green 1 *	45	25	45	25
Yellow Clearance	3.7	3.8	3.7	4.1
Red Clearance	1.6	1.7	1.6	1.6
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 2747 (W. Clemmonsville Rd.)
at
Konnoak Drive

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: October 2012 | REVIEWED BY:
PREPARED BY: C.E. Carter | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/29/12 DATE
SIG. INVENTORY NO. 09-0041

29-NOV-2012 13:52
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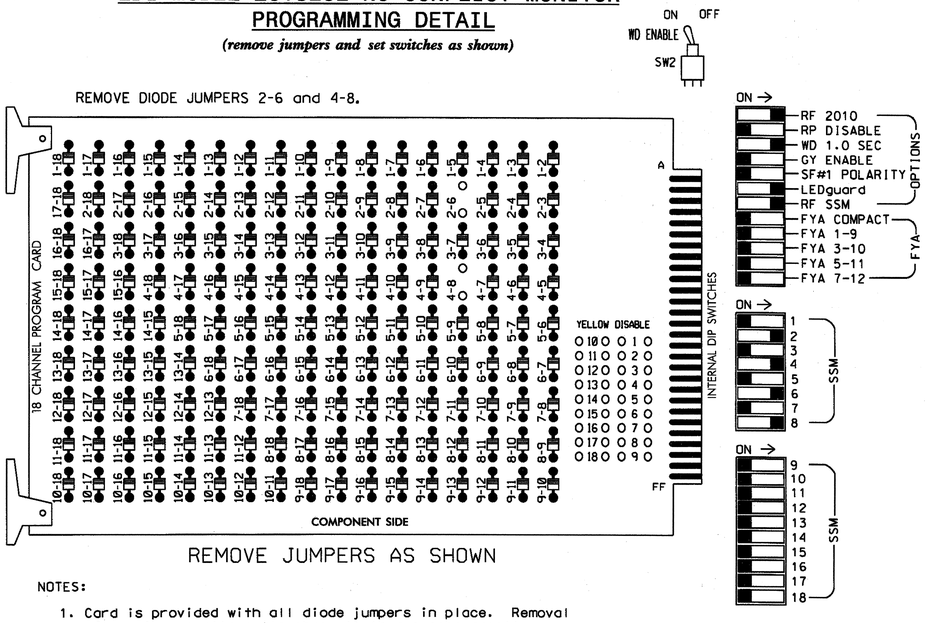
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 28

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				ø4 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B				ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0041
DESIGNED: October 2012
SEALED: 11/29/2012
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2747 (W. Clemmonsville Road) at Konnoak Drive

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2012 | REVIEWED BY: T. Jyn

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

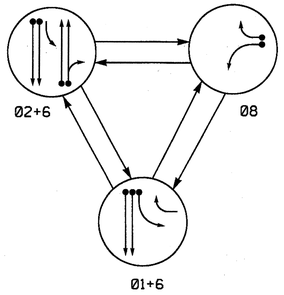
SIGNATURE | DATE 12/4/12

SIG. INVENTORY NO. 09-0041

03-DEC-2012 08:12
S:\TSA$U#ITS Signals\Workgroups\Sig Mgmt\Strickland\09041_smale_xxx.dgn
cstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 29

PHASING DIAGRAM



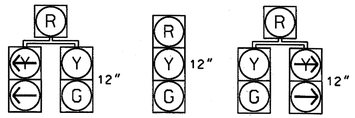
PHASING DIAGRAM DETECTION LEGEND

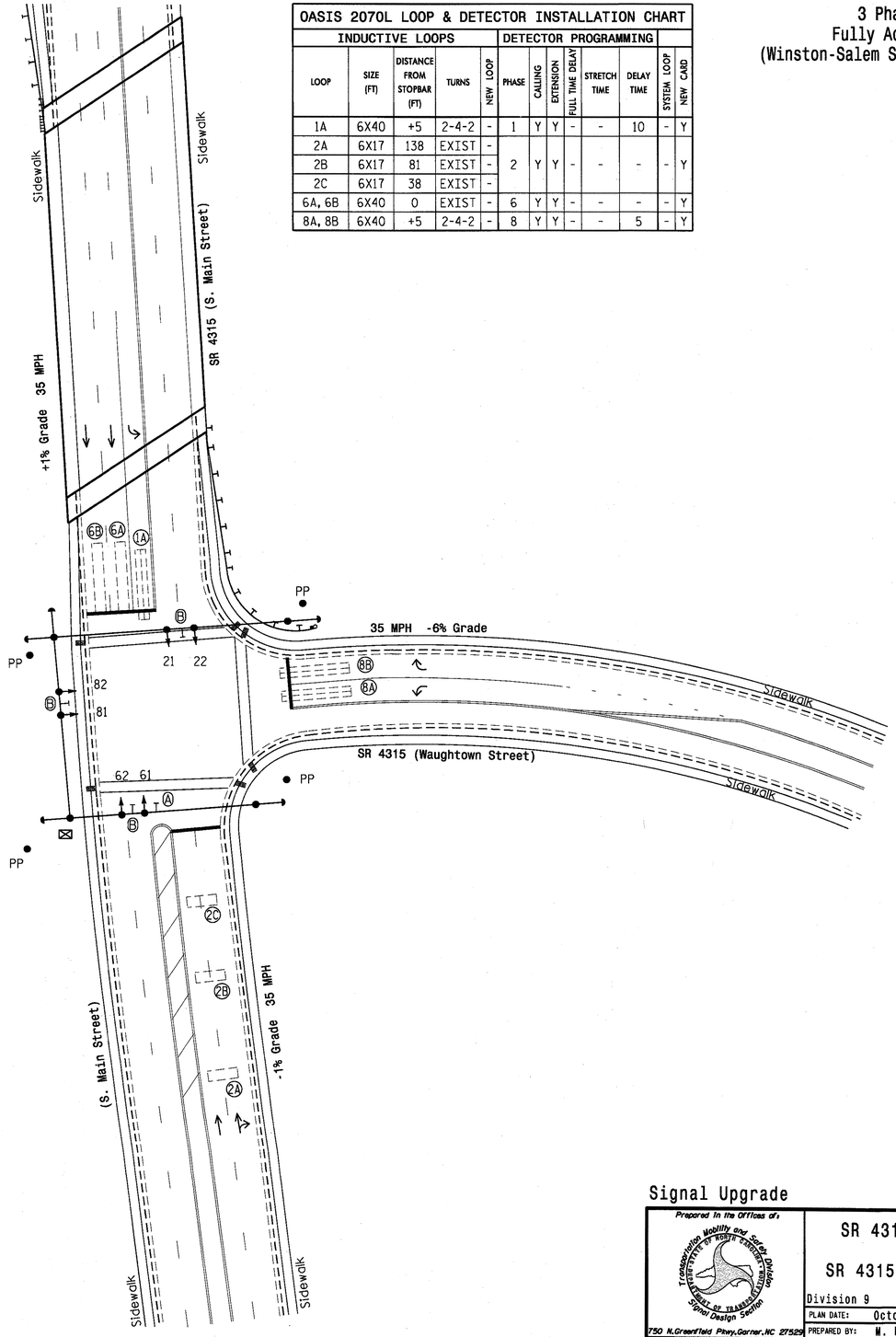
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	FLASH
21, 22	R	G	R	Y
61	G	G	R	R
62	G	G	R	Y
81	R	R	G	R
82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	10	-	Y
2A	6X17	138	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X17	81	EXIST	-								
2C	6X17	38	EXIST	-								
6A, 6B	6X40	0	EXIST	-	6	Y	Y	-	-	-	-	Y
8A, 8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	5	-	Y

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Existing Left Arrow "ONLY" sign (R3-5L) may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	Street Name Sign (D3-1)	B

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	10	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	15	35	35	20
Yellow Clearance	3.0	3.9	3.8	3.1
Red Clearance	3.1	2.2	2.3	3.3
Red Clearance	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signal Design Section
1590 Mail Service Center, Raleigh, NC 27699-1590
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (S. Main Street)
at
SR 4315 (Waughtown Street)

Division 9 Forsyth County Winston-Salem

PLAN DATE: October 2011 REVIEWED BY:
PREPARED BY: W. Bazzarie REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TEMPA
4/16/12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0044

02-JAN-2013 14:19
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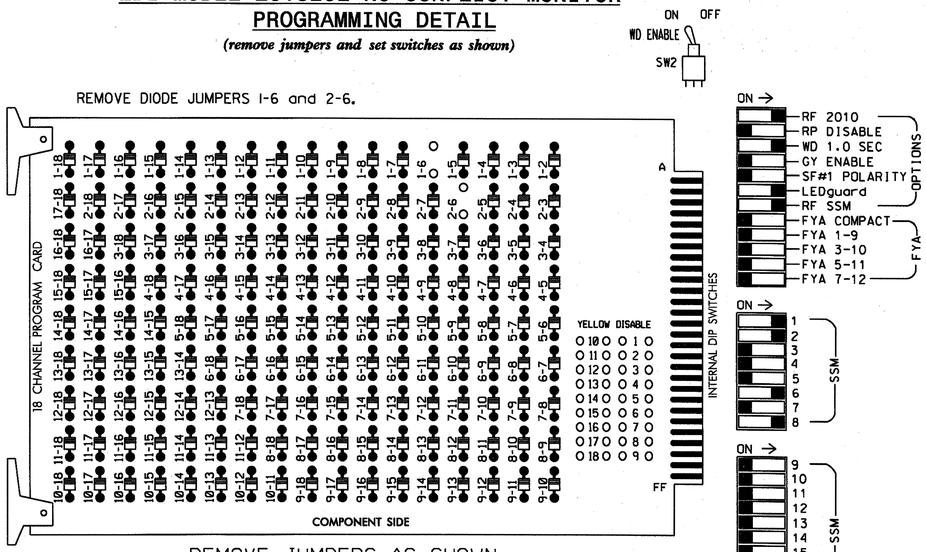
cz:cmoo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 30

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX OUTPUT FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S8,S11
PHASES USED.....1,2,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61,82	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED	*	128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW																		
YELLOW ARROW	126																	
GREEN ARROW	127																	

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS OC ISOLATOR
	L	NOT USED	NOT USED												ST OC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A,8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

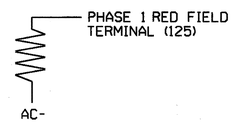
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			10
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A,8B	TB5-9,10	J6U	42	4	8	8	Y	Y			5

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0044
DESIGNED: October 2011
SEALED: 4/16/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4315 (S. Main Street)
at
SR 4315 (Waughtown Street)

Division 9 | Forsyth County | Winston Salem

PLAN DATE: March 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

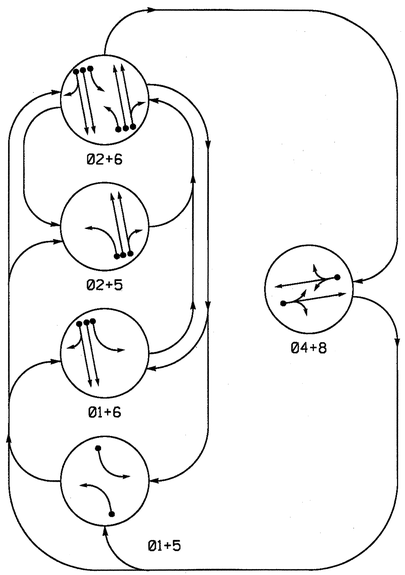
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE
DATE 4-16-12
SIG. INVENTORY NO. 09-0044

16-APR-2012 14:00
S:\ATE\Signals\Workgroups\Sig Mgmt\Armstrong\409044_sm_ele_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 31

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

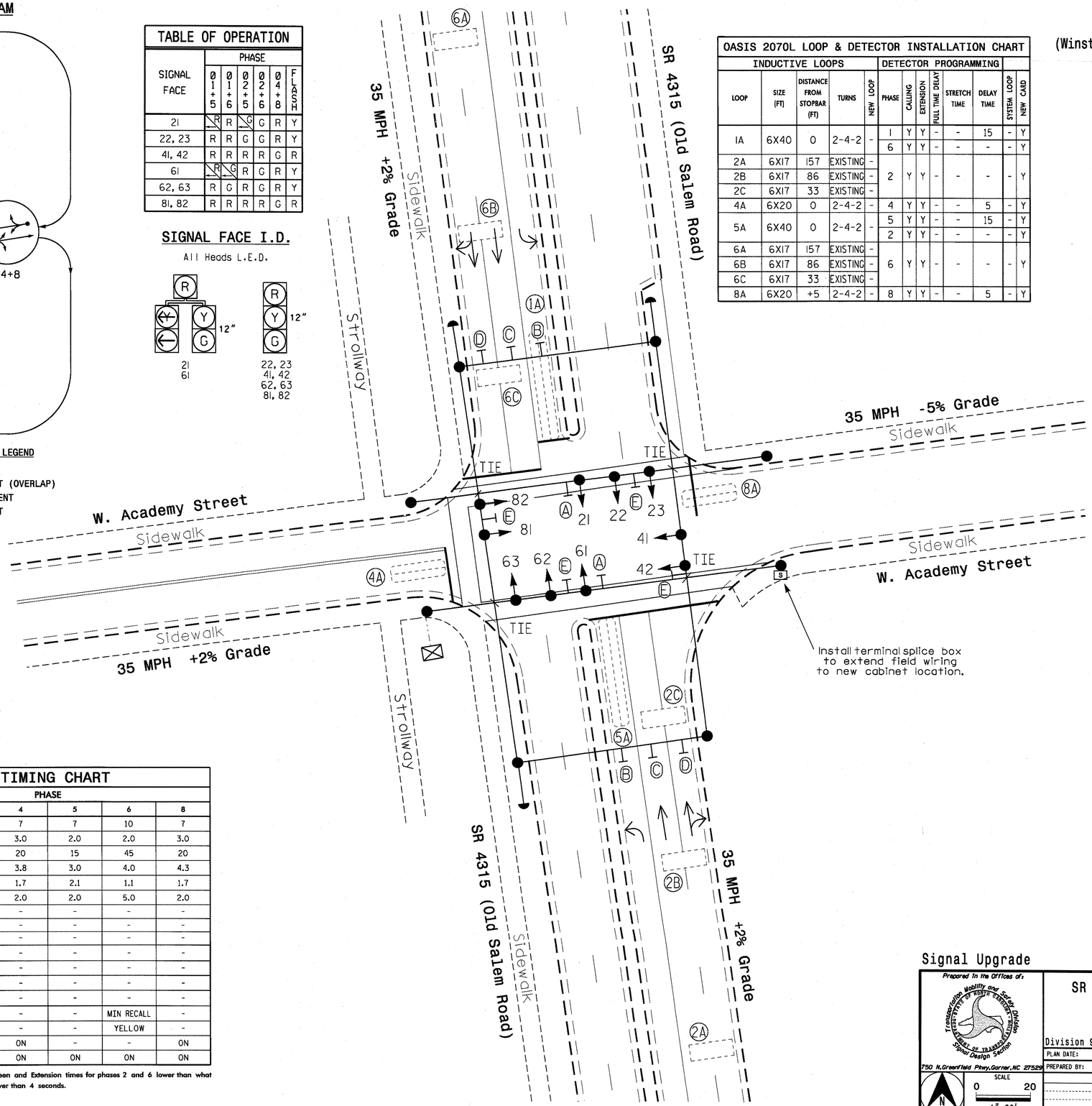
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
21	R	R	G	G	R	Y
22, 23	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
61	R	G	R	G	R	Y
62, 63	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
2A	6X17	157	EXISTING	-								
2B	6X17	86	EXISTING	-	2	Y	Y	-	-	-	-	Y
2C	6X17	33	EXISTING	-								
4A	6X20	0	2-4-2	-	4	Y	Y	-	-	5	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
6A	6X17	157	EXISTING	-								
6B	6X17	86	EXISTING	-	6	Y	Y	-	-	-	-	Y
6C	6X17	33	EXISTING	-								
8A	6X20	+5	2-4-2	-	8	Y	Y	-	-	5	-	Y

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	2.0	3.0	2.0	2.0	3.0
Max Green 1 *	15	45	20	15	45	20
Yellow Clearance	3.0	3.7	3.8	3.0	4.0	4.3
Red Clearance	2.1	1.4	1.7	2.1	1.1	1.7
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

5 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Existing "Left Turn Yield on Green" ball (R10-12) and/or lane control signs may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	A
B	Left Arrow "ONLY" Sign (R3-5L)	B
C	Through Arrow "ONLY" Sign (R3-5A)	C
D	Combined Through and Right Arrow Sign (R3-6R)	D
E	Street Name Sign (D3-1)	E

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 4315 (Old Salem Road) at W. Academy Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2011 REVIEWED BY:

PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMBA
5/21/12
SIGNATURE DATE

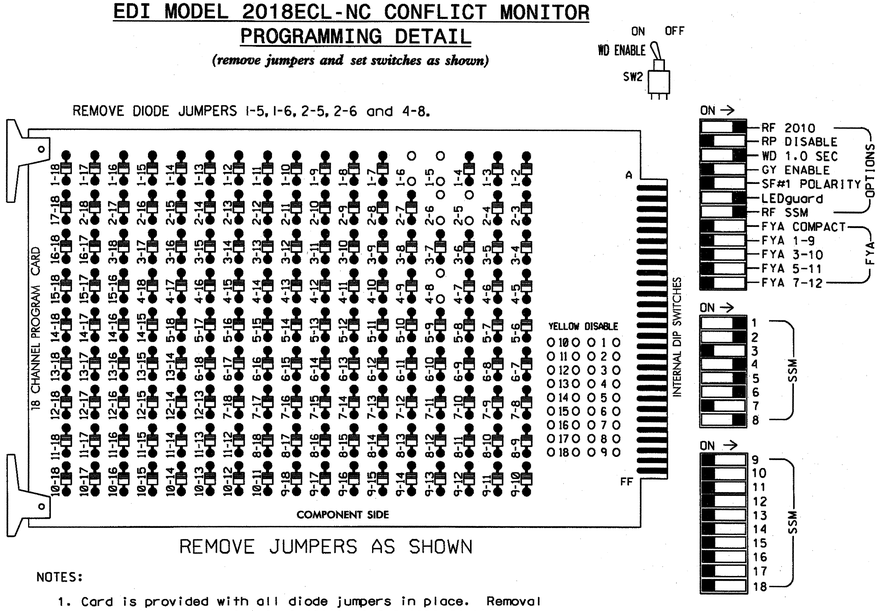
SIG. INVENTORY NO. 09-0045

20-NOV-2012 13:37
S:\TS&S\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0045\090045_sig_dsn_20120521.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 32

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61	21, 22,23	NU	NU	41,42	NU	21	61, 62,63	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A, 2B,2C	NOT USED	WADD INPUT ⊗	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED	NOT USED			NOT USED									ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A, 6B,6C	NOT USED	WADD INPUT ⊗	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED	NOT USED			NOT USED									

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5

[1] Add jumper from I1-W to J4-W. on rear of input file.

[2] Add jumper from J1-W to I4-W. on rear of input file.

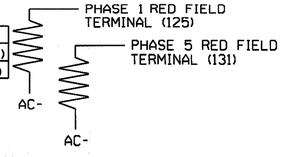
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0045
DESIGNED: September 2011
SEALED: 05/21/12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4315 (Old Salem Road)
at
W. Academy Street

Division 9	Forsyth County	Winston-Salem
PLAN DATE: May 2012	REVIEWED BY:	
PREPARED BY: C. Strickland	REVIEWED BY:	

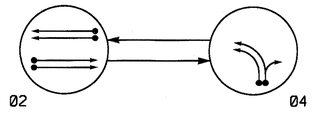
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 5/22/12 DATE
SIG. INVENTORY NO. 09-0045

P:\MKT\2012\1408
S:\TSS\Traffic Signals\Workgroups\Sig Mgmt\Strickland\09045_smallex.xxx.dgn
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 33

PHASING DIAGRAM



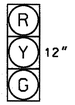
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2	PHASE Ø4	FLASH
21, 22	G	R	Y
23, 24	G	R	Y
41, 42	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



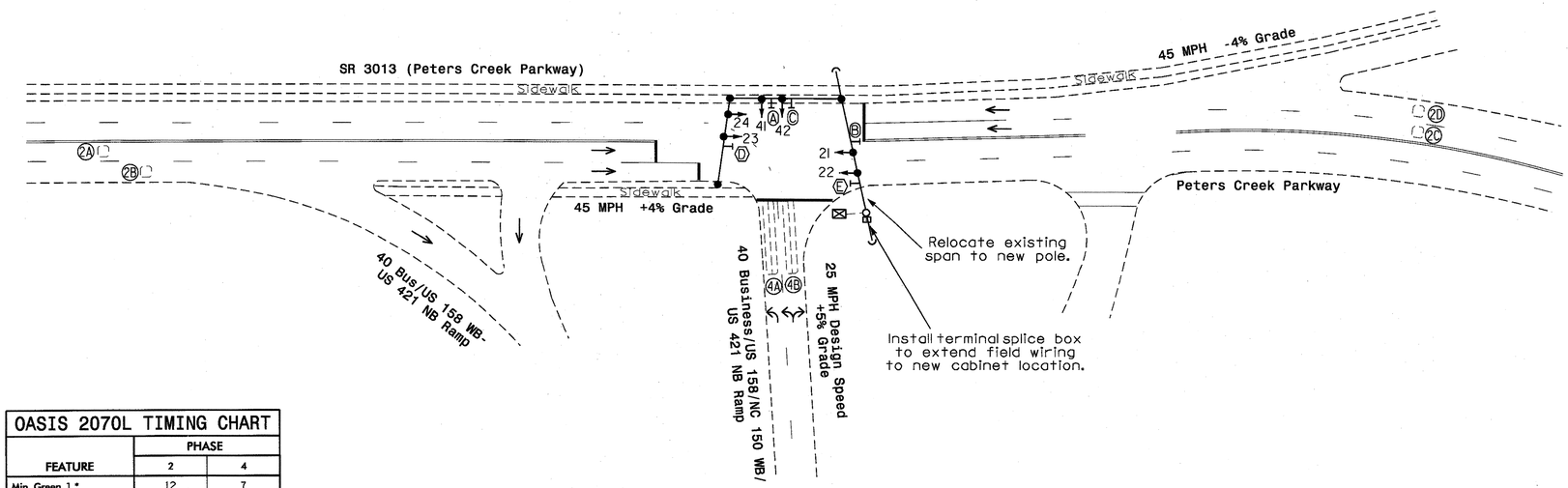
21, 22
23, 24
41, 42

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2C	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2D	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	5	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Relocate existing span to the new pole.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART		
FEATURE	PHASE 2	PHASE 4
Min Green 1 *	12	7
Extension 1 *	6.0	2.0
Max Green 1 *	60	30
Yellow Clearance	4.9	3.0
Red Clearance	1.0	1.8
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	1.5	-
Max Variable Initial *	34	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.0	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	Dual Left Turn and Right Arrows Sign	A
B	No U-Turn Sign (R3-4)	B
C	Street Name Sign (D3-1)	C
D	No Left Turn Sign (R3-2)	D
E	No Right Turn Sign (R3-1)	E

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 3013 (Peters Creek Parkway)
at
40 Bus/US 158 WB-US 421 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: January 2013 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

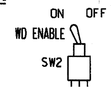
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 1/9/13 DATE
SIG. INVENTORY NO. 09-0046

09-JAN-2013 14:59
S:\#ITSGS\#ITS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\#09-0046\#90046_sig_dsn_20130109.dgn
rziemba

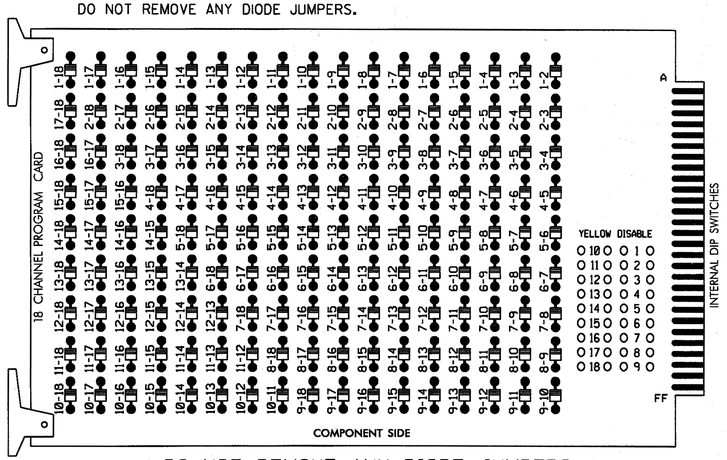
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 34

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

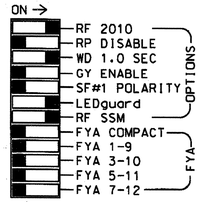
(set switches as shown)



DO NOT REMOVE ANY DIODE JUMPERS.



DO NOT REMOVE ANY DIODE JUMPERS



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Variable Initial and Gap Reduction.
4. Program phases 2 for Start Up In Green.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5
PHASES USED.....2,4
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22 23,24	NU	NU	41,42	NU	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A	Ø2 2C	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø2 2B	Ø2 2D			Ø4 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
2D	TB2-11,12	I3L	76	38	42	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			5

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0046
DESIGNED: January 2013
SEALED: 1/9/13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 3013 (Peters Creek Parkway)
at
40 Bus/US 158 WB-US 421 NB Ramps

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: January 2013 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

John T Rowe 1-10-13
SIGNATURE DATE

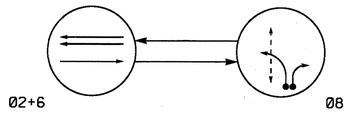
SIG. INVENTORY NO. 09-0046

10-JAN-2013 07:51
S:\TTSS\Units Signals\WorkGroups\Sig Mgmt\Armstrong\09046_sm_ele_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 35

2 Phase
Semi-Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	FLASH
21, 22	G	R	Y
61, 62, 63	G	R	Y
81, 82	R	G	R
P81, P82	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

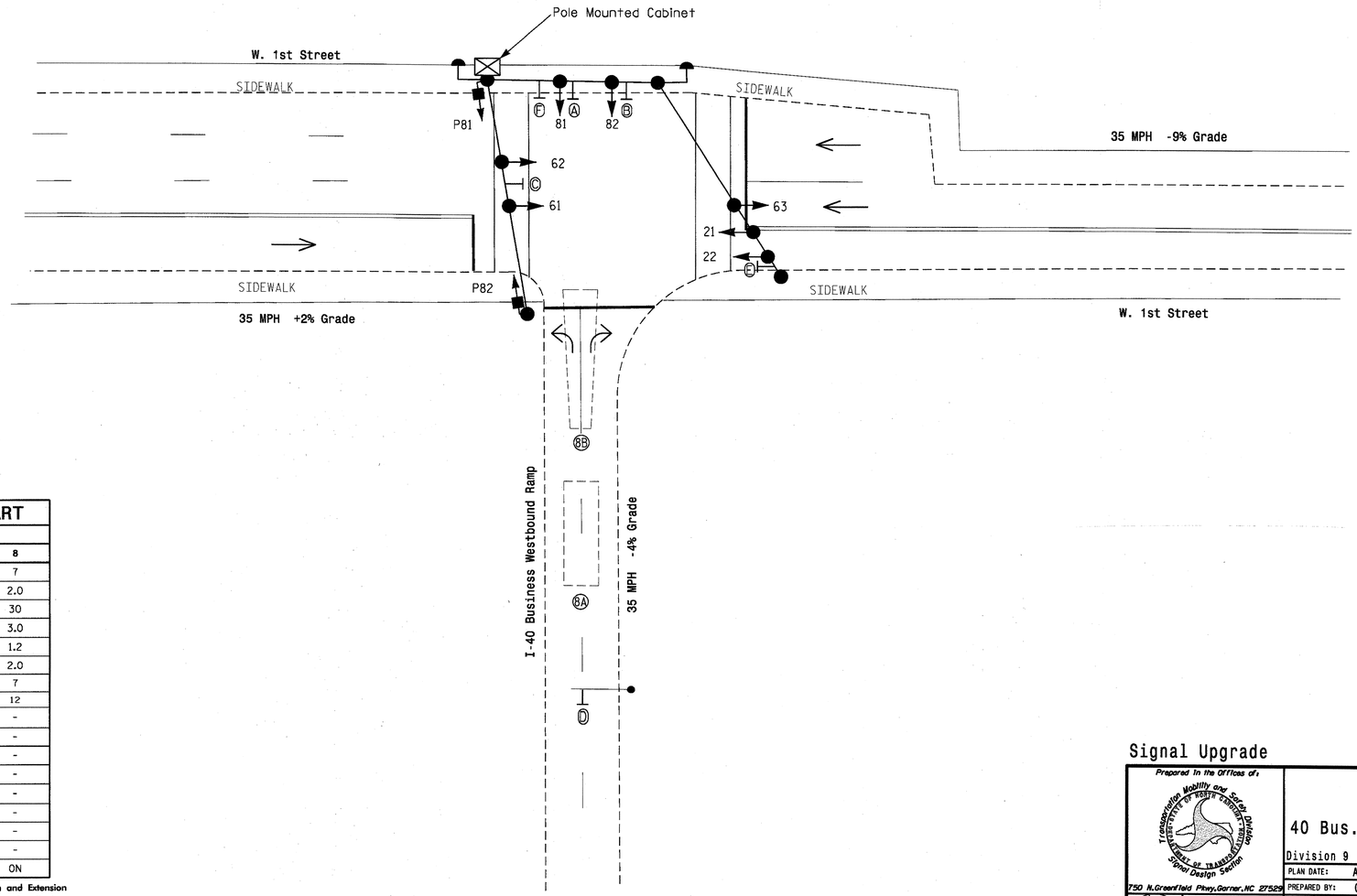
SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
61, 62, 63
81, 82

P81, P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
8A	6X30	50	EXISTING	-	8	Y	Y	-	-	5	-	Y
8B	8X40	+5	EXISTING	-								



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Existing lane control signs may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2)	Ⓒ
Ⓓ	Left Arrow "ONLY" and Right Arrow "ONLY" Sign	Ⓓ
Ⓔ	No Right Turn Sign (R3-1)	Ⓔ
Ⓕ	Street Name Sign (D3-1)	Ⓕ

OASIS 2070L TIMING CHART			
FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	10	10	7
Extension 1 *	0.0	0.0	2.0
Max Green 1 *	40	40	30
Yellow Clearance	3.7	4.6	3.0
Red Clearance	1.3	1.3	1.2
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	7
Don't Walk 1	-	-	12
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MAX RECALL	MAX RECALL	-
Vehicle Call Memory	-	-	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

W. 1st Street at 40 Bus. WB/US 421 NB Exit Ramp

Division 9 Forsyth County Winston-Salem

PLAN DATE: August 2012 REVIEWED BY: L. Blount
PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

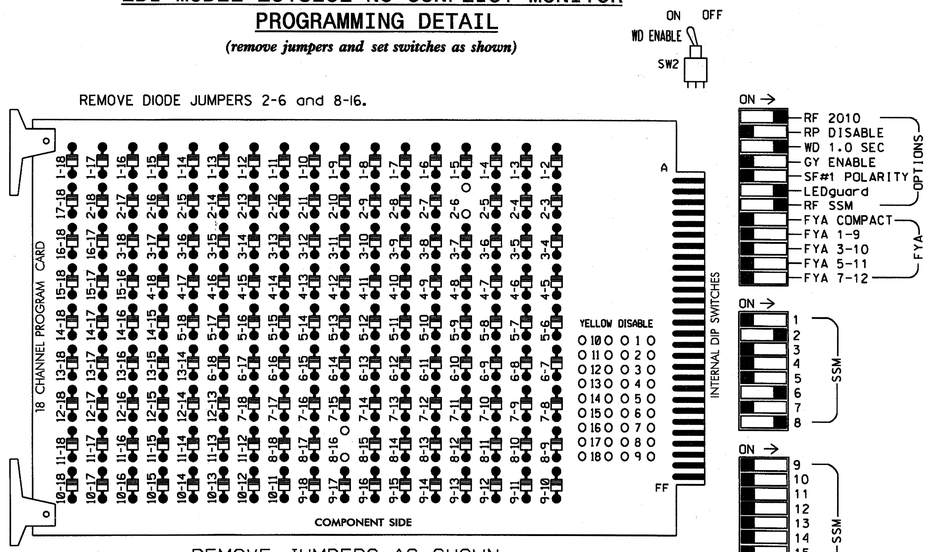
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TEMPA
SIGNATURE 9/18/12 DATE
SIG. INVENTORY NO. 09-0053

29-NOV-2012 15:05
S:\#ITSSIG\#ITS Signals\Signal Design Section\Central Region\Wolv 9\#C-5224 \#Winston Salem\Signals\#09-0053\#090053_sig_dsn_20120918.dgn
rzlamb

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 36

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phase 8 for 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S8,S11,S12
PHASES USED.....2,6,8,8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62 63	NU	NU	81,82	P81, P82
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												110
🚶												112

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A,8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	FS DC ISOLATOR
L								NOT USED					ø8 PED DC ISOLATOR	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
8A,8B	TB22-1,2	I8U	42	4	8	8	Y	Y			5
PED PUSH BUTTONS											
P81,P82	TB24-11,12	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATOR
IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0053
DESIGNED: August 2012
SEALED: 9/18/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

W. 1st Street
at
40 Bus. WB/US 421 NB Exit Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: September 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

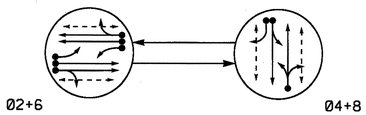
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE
9-19-12
DATE
SIG. INVENTORY NO. 09-0053

19-SEP-2012 06:55
S:#ITSASSUM\TS Signals#Workgroups#Sig Mgmt#rmstrong#090053_sm_ele_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 37

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	EXISTING	-	2	Y	Y	-	-	-	-	Y
2B	6X6	70	EXISTING	-	2	Y	Y	-	-	-	-	Y
2C	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	Y	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	Y	-	15	-	Y
6A	6X6	70	EXISTING	-	6	Y	Y	-	-	-	-	Y
6B	6X6	70	EXISTING	-	6	Y	Y	-	-	-	-	Y
6C	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	Y	-	3	-	Y

SIGNAL FACE I.D.

All Heads L.E.D.

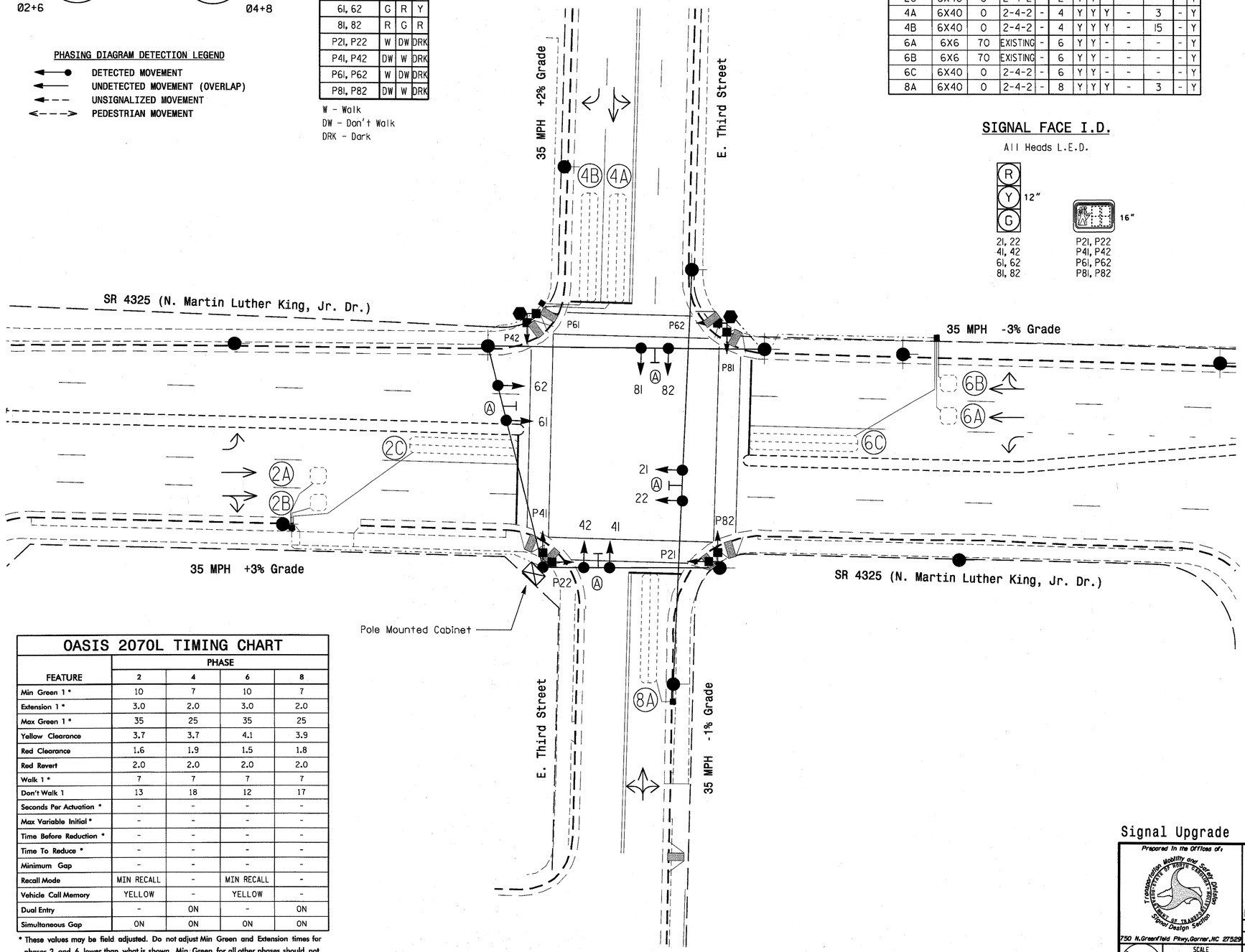
21, 22
41, 42
61, 62
81, 82

P21, P22
P41, P42
P61, P62
P81, P82

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	35	25	35	25
Yellow Clearance	3.7	3.7	4.1	3.9
Red Clearance	1.6	1.9	1.5	1.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	7	7	7	7
Don't Walk 1	13	18	12	17
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	-----------
N/A	Right of Way	----------
→	Directional Arrow	→
N/A	Wheelchair Ramp	
Ⓐ	Street Name Sign (D3-1)	Ⓐ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NCDOT
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4325
(N. Martin Luther King, Jr. Dr.)
at
East Third Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: May 2011 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

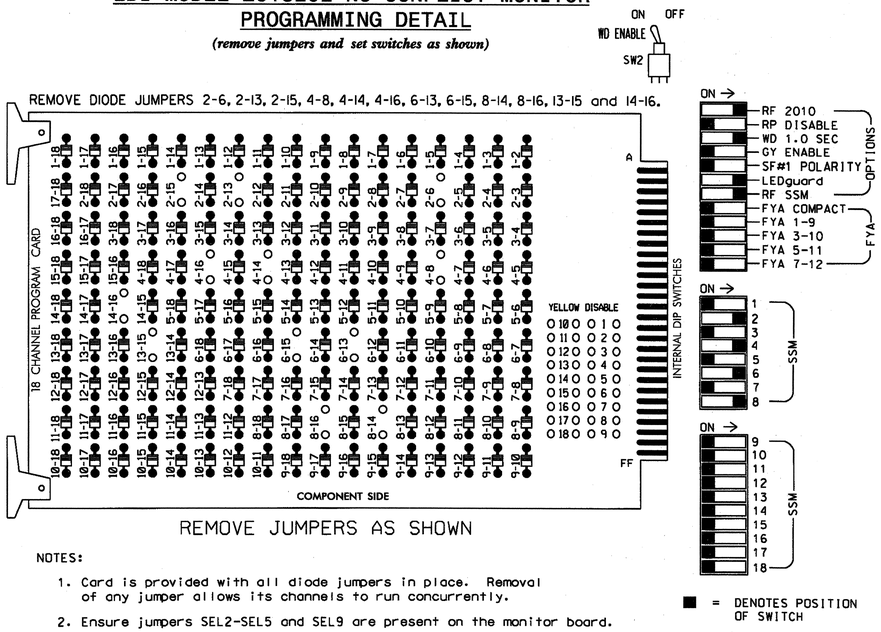
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/13/12 DATE
SIG. INVENTORY NO. 09-0056

02-JAN-2013 15:46
S:\eITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\09-0056\090056_sig_dsn_20121113.dgn
zziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 38

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12
PHASES USED.....2,4,6,8,2 PED,4 PED,6 PED,8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113			104			119			110
🚶			115			106			121			112

NU = Not Used

✱ Denotes install load resistor. See load resistor installation detail this sheet.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	NOT USED	ø2 2A	SLOT EMPTY	ø4 4A	NOT USED	ø6 6A	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø2 PED DC ISOLATOR	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	ø2 2C	ø2 2B		ø4 4B	ø6 6C	ø6 6B		NOT USED				ø4 PED DC ISOLATOR	ø8 PED DC ISOLATOR	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2C	TB23-1,2	I1L	47	9	22	2	Y	Y			
2A	TB21-3,4	I2U	39	1	2	2	Y	Y			
2B	TB23-3,4	I2L	43	5	12	2	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y	Y		3
4B	TB23-7,8	I4L	45	7	14	4	Y	Y	Y		15
6C	TB23-9,10	I5L	48	10	26	6	Y	Y			
6A	TB21-11,12	I6U	40	2	6	6	Y	Y			
6B	TB23-11,12	I6L	44	6	16	6	Y	Y			
8A	TB22-1,2	I8U	42	4	8	8	Y	Y	Y		3
PED PUSH BUTTONS											
P21,P22	TB22-9,10	I12U	67	29	PED 2	2 PED					
P41,P42	TB24-9,10	I12L	69	31	PED 4	4 PED					
P61,P62	TB22-11,12	I13U	68	30	PED 6	6 PED					
P81,P82	TB24-11,12	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0056
DESIGNED: May 2011
SEALED: 11-13-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4325
(N. Martin Luther King, Jr. Dr.)
at
East Third Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 008453 ENGINEER
JOHN T. ROWE, JR.

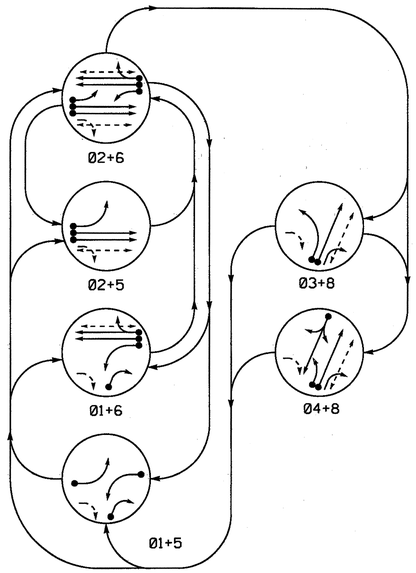
SIGNATURE | 11-20-12 DATE

SIG. INVENTORY NO. 09-0056

20-NOV-2012 08:20
\\ssa-ssm-fs1\TS Signals\Workgroups\Sig Mgmt\Peterson\M090056_sm.ela.20120427.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 39

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

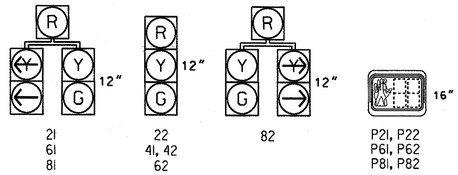
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+8	04+8	FLASH
21	R/G	R	R/G	G	R	R	Y
22	R	R	G	G	R	R	Y
41, 42	R	R	R	R	R	G	R
61	R/G	R/G	R	G	R	R	Y
62	R	G	R	G	R	R	Y
81	R	R	R	R	R/G	G	R
82	R/G	R/G	R	R	G	G	R
P21, P22	DW	DW	W	W	DW	DW	DRK
P61, P62	DW	W	DW	W	DW	DW	DRK
P81, P82	DW	DW	DW	DW	W	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

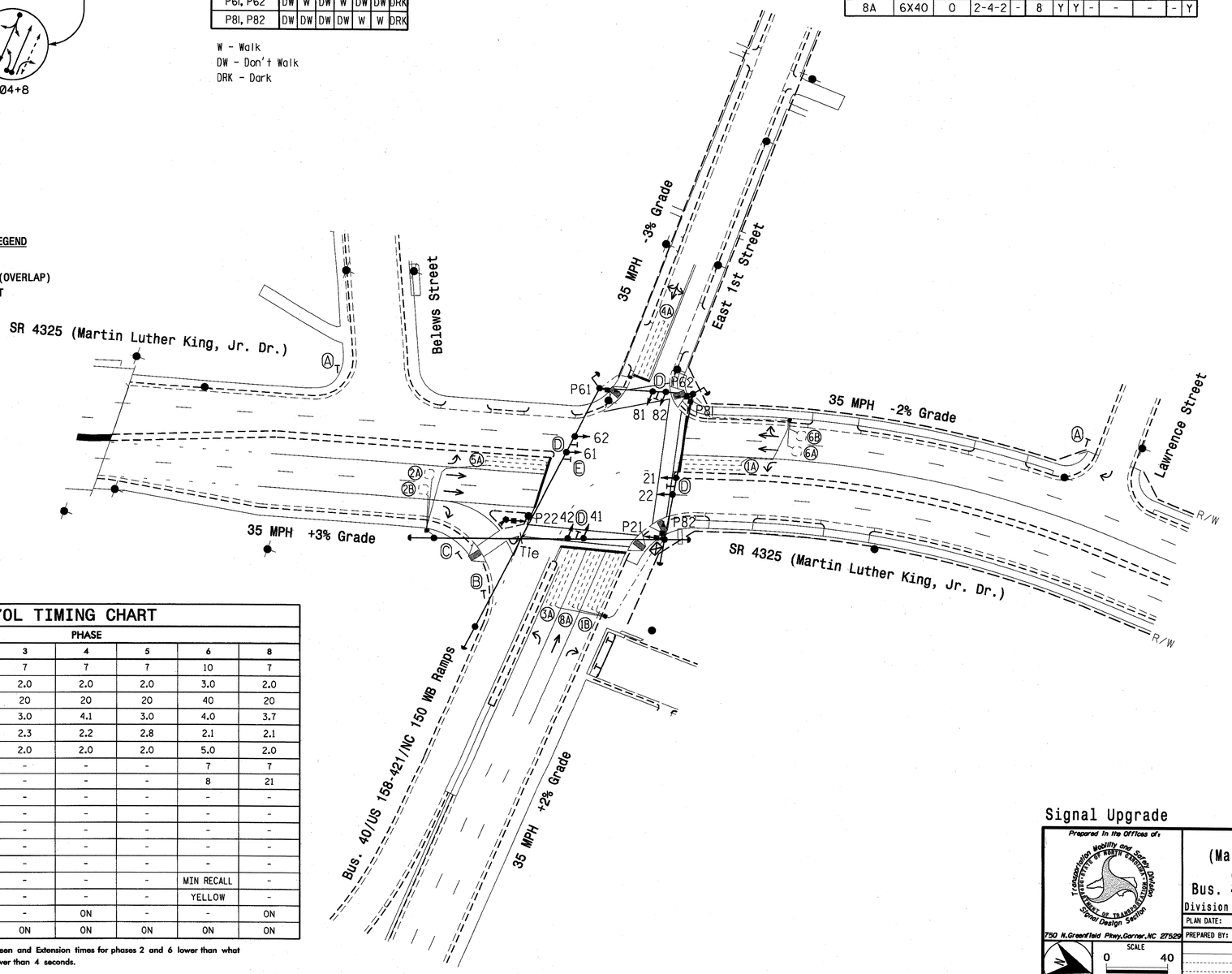
All Heads L.E.D.



21, 61, 81 — 22, 41, 42, 62 — 82 — P21, P22, P61, P62, P81, P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
2A, 2B	6X6	70	EXISTING	-	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	15	-	Y
					8	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	5	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
6A, 6B	6X6	70	EXISTING	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	8
Min Green 1 *	7	10	7	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	2.0	3.0	2.0
Max Green 1 *	20	40	20	20	20	40	20
Yellow Clearance	3.0	3.7	3.0	4.1	3.0	4.0	3.7
Red Clearance	3.1	2.1	2.3	2.2	2.8	2.1	2.1
Red Revert	2.0	5.0	2.0	2.0	2.0	5.0	2.0
Walk 1 *	-	7	-	-	-	7	7
Don't Walk 1	-	27	-	-	-	8	21
Seconds Per Actuation *	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

6 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Omit phase 3 during phase 4 on.
4. Enable Backup Protect for phase 2 and 6 to allow the controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through an all red display.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊤	Sign	⊤
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○~	Signal Pole with Guy	●~
○~	Signal Pole with Sidewalk Guy	●~
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
------	2-in Underground Conduit	------
N/A	Right of Way	------
→	Directional Arrow	→
N/A	Guardrail	⊤⊤⊤
N/A	Wheelchair Ramp	
Ⓐ	"STOP" Sign (R1-1)	Ⓐ
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ
Ⓒ	Pedestrian Crossing Sign (W11-2)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4325 (Martin Luther King, Jr. Dr.) at East 1st Street and Bus. 40/US 158-421/NC 150 WB Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: June 2011 | REVIEWED BY:
PREPARED BY: C.E. Carter | REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 5/17/12 DATE

SIG. INVENTORY NO. 09-0057

17-MAY-2012 14:34
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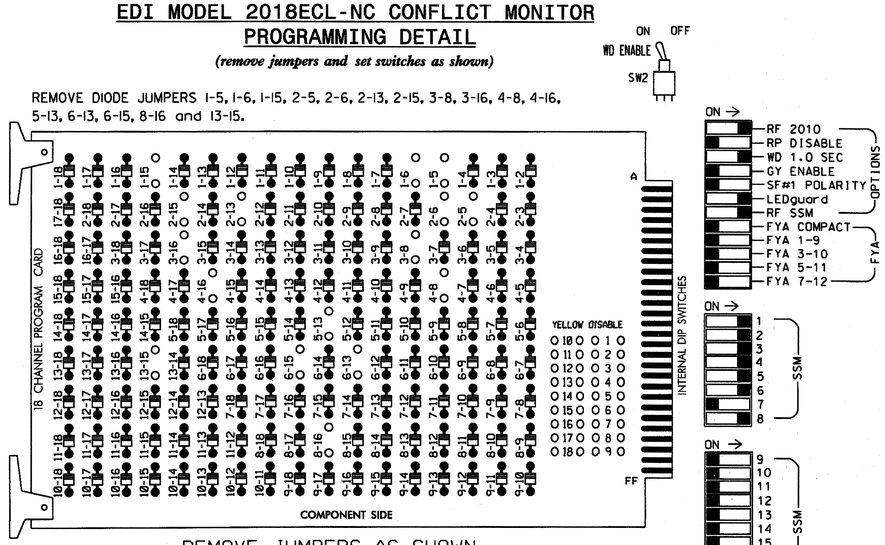
rziembo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 4D

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S7,S8,S9,S11,S12
PHASES USED.....1,2,2 PED,3,4,5,6,6 PED,8,8 PED
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61,62	21,22	P21, P22	81	41,42	NU	21	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED	*	128		*	101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126			117			132											
GREEN ARROW	127			118			133											
✋			113						119			110						
🚶			115						121			112						

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                OVERLAPS:|ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE |
OR        PHASES:|12345678910111213141516
IF PHASES ARE ON|   X
OMIT PHASES     |   X
CALL PHASES     |
```

BACKUP PROTECTION PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø1 1B	SLOT EMPTY	WIRED INPUT ⊗	ø3 3A	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø2 PED DC ISOLATOR	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	ø2 2A,2B			NOT USED	NOT USED						NOT USED	ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A,6B	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	ø8 8A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A,2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A[2]	TB4-5,6	I5U	58	20	3	3	Y	Y			15
	-	J8U	50	12	28	8	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A[3]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W. on rear of input file.
[2] Add jumper from I5-W to J8-W. on rear of input file.
[3] Add jumper from J1-W to I4-W. on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

BACKUP PROTECTION NOTE

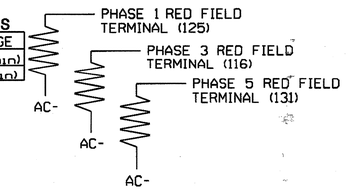
(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0057
DESIGNED: June 2011
SEALED: 05/17/12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4325
(Martin Luther King, Jr. Dr.)
at East 1st Street and
Bus. 40/US 158-421/NC 150 WB Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	May 2012	REVIEWED BY:	T. Vann
PREPARED BY:	C. Strickland	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

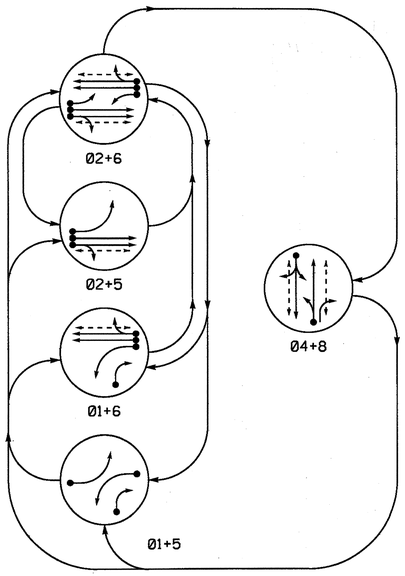
George C. Brown 5/18/12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0057

18-MAY-2012 10:37
S:\TISS\Sig\TS Signals\Working\groups\Sig Man\Strickland\090057_sm_ele_xxx.dgn
cstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 41

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

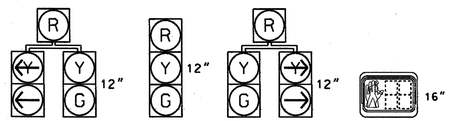
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
21	R/G	R	G/R	G	R	Y
22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
61	R/G	R	G/R	R	G	R
62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/G	R/G	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

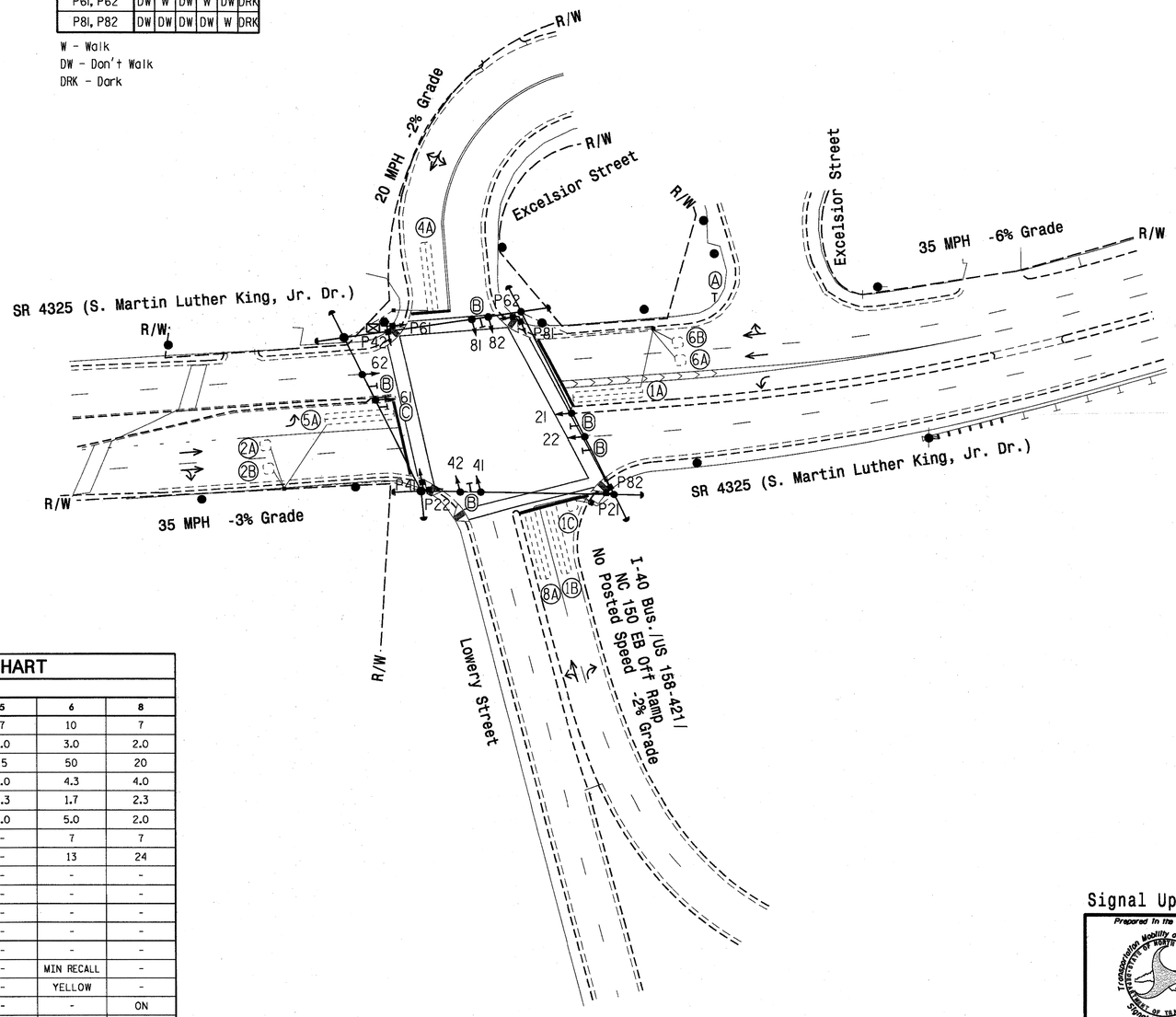
All Heads L.E.D.



21, 61 | 22, 41, 42, 62, 81 | 82 | P21, P22, P41, P42, P61, P62, P81, P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
1C	6X6	0	EXIST	-	1	Y	Y	-	-	15	-	Y
2A, 2B	6X6	70	EXIST	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	5	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
6A, 6B	6X6	70	EXIST	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0
Max Green 1 *	15	50	20	15	50	20
Yellow Clearance	3.1	4.1	3.0	3.0	4.3	4.0
Red Clearance	2.6	1.9	3.5	2.3	1.7	2.3
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	19	22	-	13	24
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

5 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 2 and 6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
Ⓐ	"STOP" Sign (R1-1)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ

Signal Upgrade

Prepared in the Offices of: Transportation Mobility and Safety Division, NCDEPARTMENT OF TRANSPORTATION, Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4325 (S. Martin Luther King, Jr. Dr.) at Excelsior Street and I-40 Bus./US 158-421/NC 150 EB Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: June 2011 | REVIEWED BY:
PREPARED BY: C.E. Carter | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE | DATE 4/10/12
SIG. INVENTORY NO. 09-0058

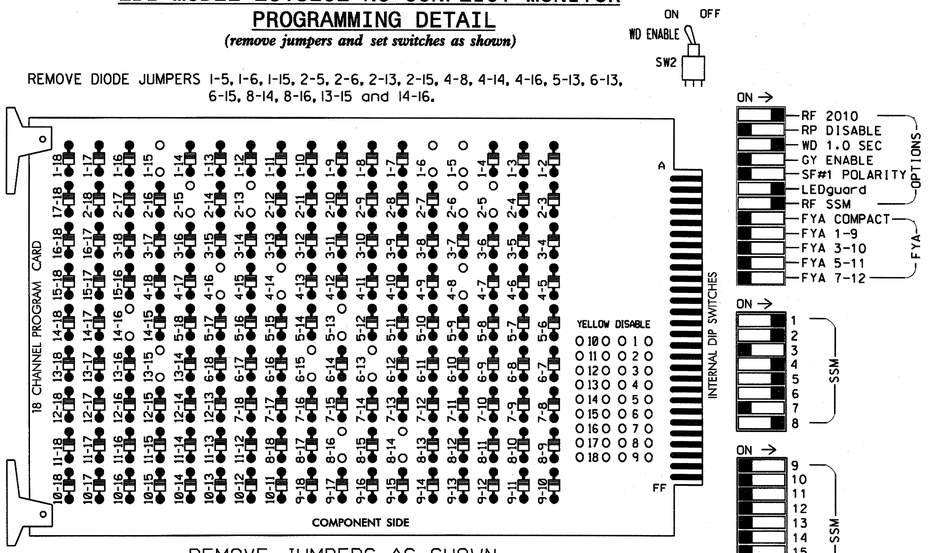
10-APR-2012 16:51
S:\#TIS&SW\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signal\#09-0058#090058_sig_dsn_20120410.dgn

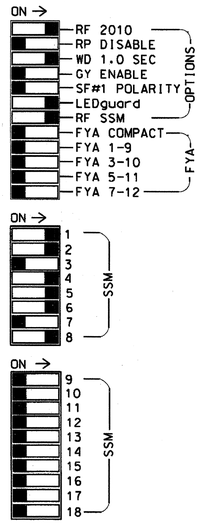
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 42

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 8-14, 8-16, 13-15 and 14-16.





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,S12
PHASES USED.....1,2,4,5,6,8,2PED,4PED,6PED,8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61,62	21,22	P21, P22	NU	41,42	P41, P42	21	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126						132											
GREEN ARROW	127						133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø1 1B	Ø2 2A,2B	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø1 1C	NOT USED			NOT USED						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A,6B	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				NOT USED								

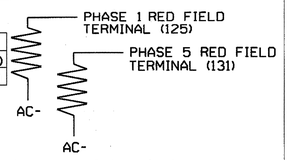
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A,2B	TB2-9,10	I3U	63	25	32	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W. on rear of input file.

[2] Add jumper from J1-W to I4-W. on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0058
DESIGNED: June 2011
SEALED: 4-10-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4325 (S. Martin Luther King, Jr. Dr.)
at
Excelsior Street and
I-40 Bus./US 158-421/NC 150 EB Ramp

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 04-4-12 | REVIEWED BY: T.Jgn
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 022013
ENGINEER
GEORGE C. BROWN

SIGNATURE 4/13/12 DATE

SIG. INVENTORY NO. 09-0058

13-APR-2012 11:20
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dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 43

PHASING DIAGRAM

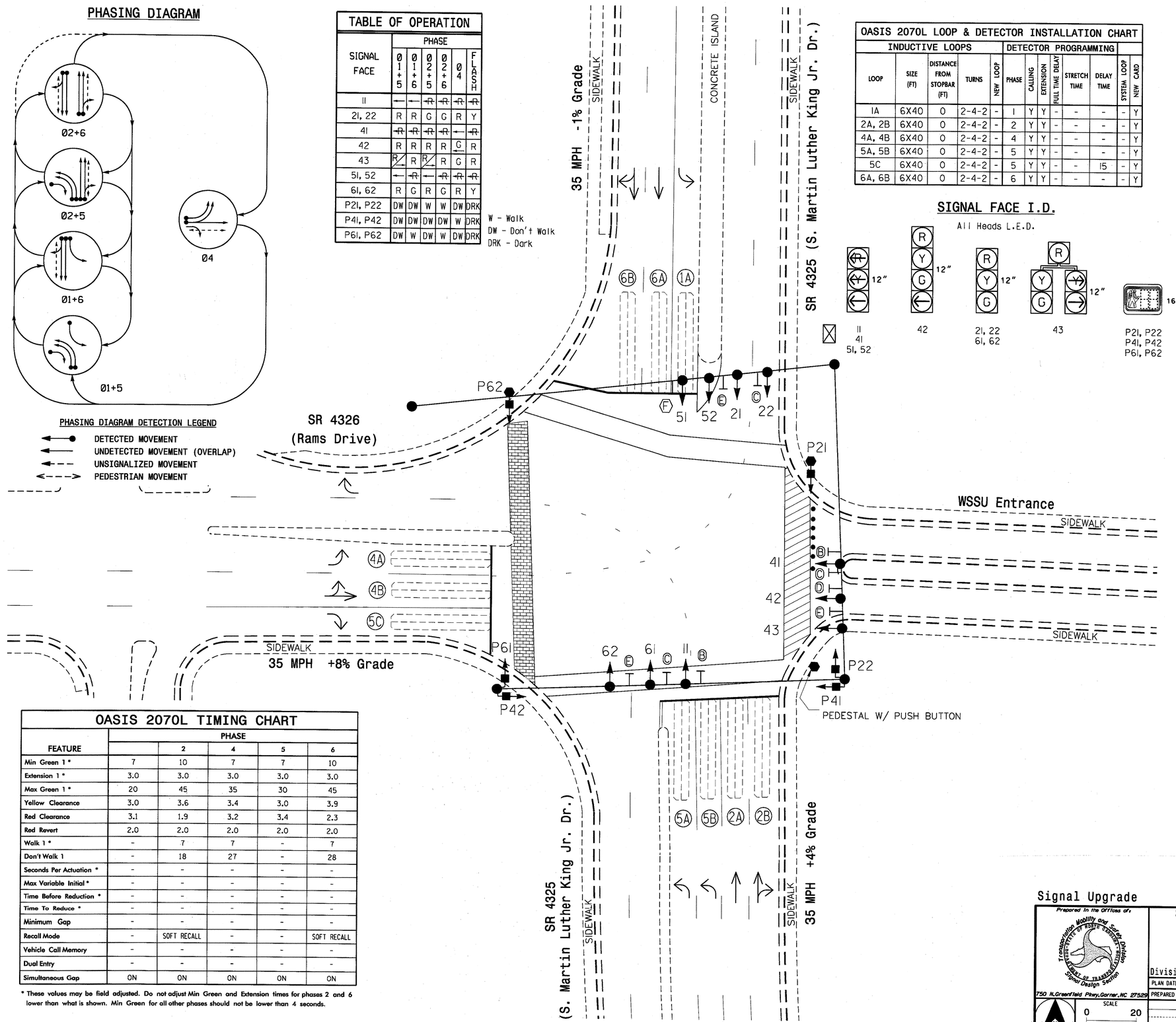
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04	FLASH
11	←	←	↛	↛	↛	↛
21, 22	R	R	G	G	R	Y
41	↛	↛	↛	↛	←	↛
42	R	R	R	R	G (←)	R
43	R (↗)	R	R (↗)	R	G	R
51, 52	←	↛	←	↛	↛	↛
61, 62	R	G	R	G	R	Y
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK

W - Walk
DW - Don't Walk
DRK - Dark



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A, 2B	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A, 4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
5A, 5B	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
6A, 6B	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y

SIGNAL FACE I.D.

All Heads L.E.D.

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	5	6
Min Green 1 *	7	10	7	7	10
Extension 1 *	3.0	3.0	3.0	3.0	3.0
Max Green 1 *	20	45	35	30	45
Yellow Clearance	3.0	3.6	3.4	3.0	3.9
Red Clearance	3.1	1.9	3.2	3.4	2.3
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7
Don't Walk 1	-	18	27	-	28
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL
Vehicle Call Memory	-	-	-	-	-
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

5 Phase
Fully Actuated
((Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Remove existing "RIGHT TURN SIGNAL" sign (R10-10R).
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
⬡	Signal Pedestal	●
○~	Signal Pole with Guy	●~
○~	Signal Pole with Sidewalk Guy	●~
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	----
→	Directional Arrow	→
(B)	Left Arrow "ONLY" Sign (R3-5L)	(B)
(C)	"YIELD TO PEDESTRIANS" Sign	(C)
(D)	Combined Through and Left Arrow Sign (R3-6L)	(D)
(E)	Street Name Sign (D3-1)	(E)
(F)	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	(F)

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SCALE 0 20 1"=20'

SR 4325 (S. MLK Jr. Dr.) at SR 4326 (Rams Drive) and WSSU Entrance

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: September 2011 | REVIEWED BY:
PREPARED BY: Sterling | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

SIGNATURE | DATE 4/20/12

SIG. INVENTORY NO. 09-0059

02-JAN-2013 16:50
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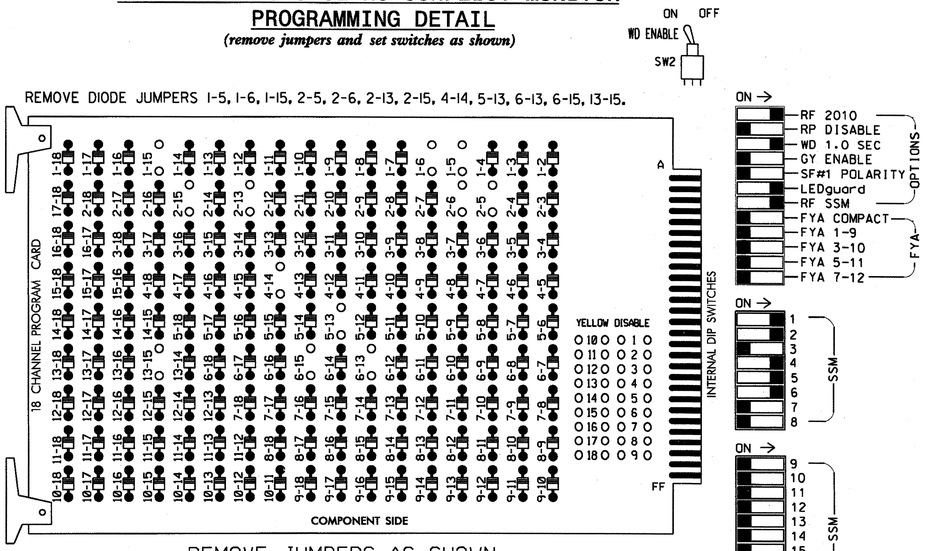
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 44

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2, 4 and 6 for 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9
PHASES USED.....1,2,4,5,6,2PED,4PED,6PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5			S6	S7		S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4			14	5		6	15	7	8	16
PHASE	1	2	2 PED	3	4			4 PED	5		6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	41	42	43	P41, P42	51,52	43	61,62	P61, P62	NU	NU	NU
RED		128				101	101				134				
YELLOW		129				102	102				135				
GREEN		130				103	103				136				
RED ARROW	125				101				131						
YELLOW ARROW	126				102				132	132					
GREEN ARROW	127				103	103			133	133					
✋			113					104				119			
🚶			115					106				121			

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A,4B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø2 PED DC ISOLATOR	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	NOT USED				NOT USED						ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø5 5A,5B	ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø5 5C	NOT USED											

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A,4B	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A,5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
5C	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A,6B	TB3-9,10	J3U	64	26	36	6	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0059
DESIGNED: September 2011
SEALED: 4-26-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4325 (S. MLK Jr. Dr.) at SR 4326 (Rams Drive) and WSSU Entrance

Division 09 | Forsyth County | Winston-Salem
PLAN DATE: 04-24-12 | REVIEWED BY: T. Vigil
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 4/30/12 DATE
SIG. INVENTORY NO. 09-0059

27-APR-2012 07:34
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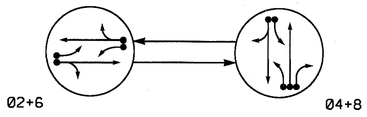
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 45

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

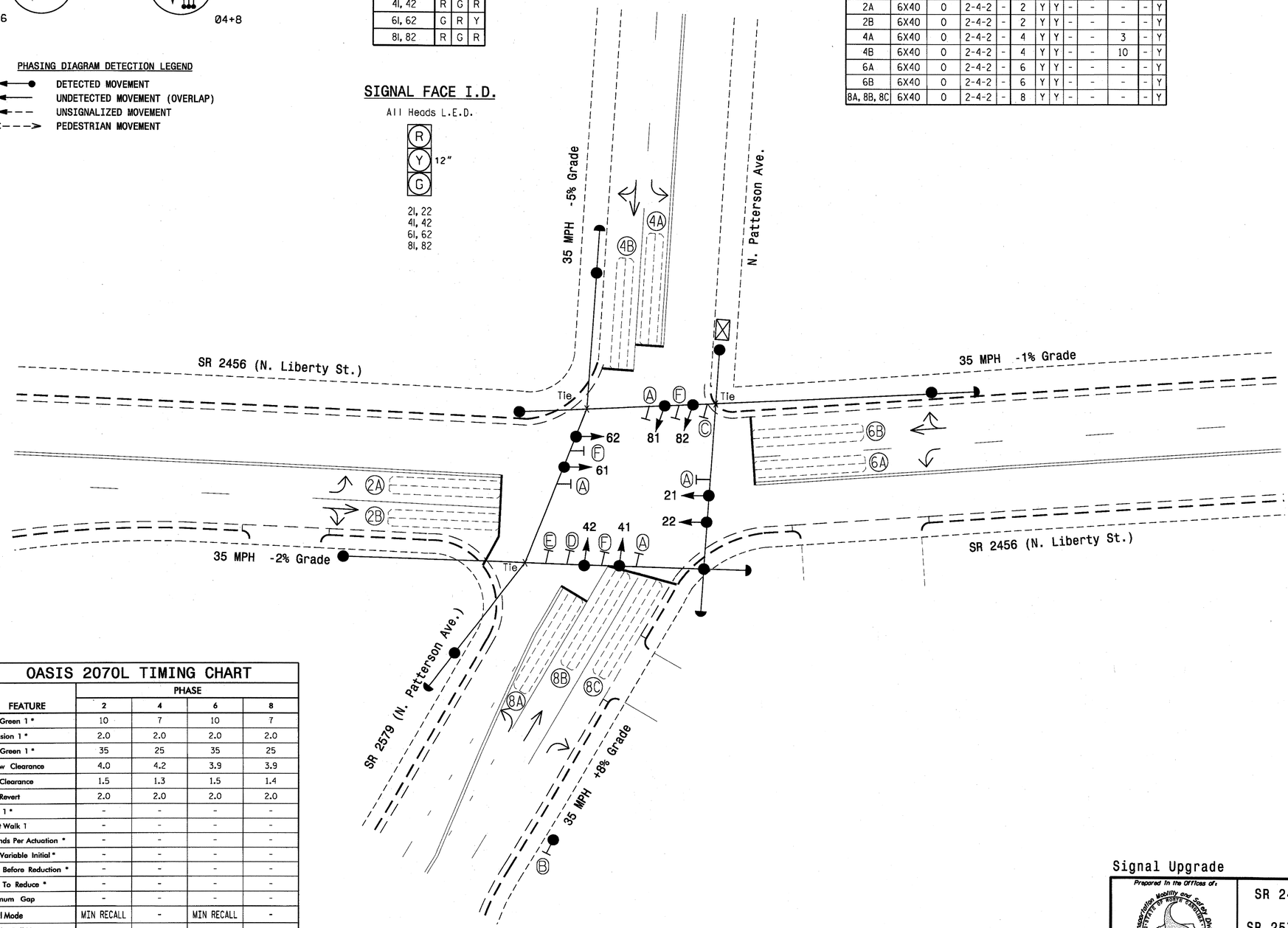
TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
2B	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
6A	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
6B	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A, 8B, 8C	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	35	25	35	25
Yellow Clearance	4.0	4.2	3.9	3.9
Red Clearance	1.5	1.3	1.5	1.4
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Existing lane control signs may be removed at the direction of the Engineer.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	"RIGHT LANE MUST TURN RIGHT" Sign (R3-7R)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
Ⓓ	Combined Through and Right Arrow Sign (R3-6R)	Ⓓ
Ⓔ	"NO TURN ON RED" Sign (R10-11)	Ⓔ
Ⓕ	Street Name Sign (D3-1)	Ⓕ

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 2456 (N. Liberty Street)
at
SR 2579 (N. Patterson Avenue)

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: September 2011 | REVIEWED BY: L. Blount
PREPARED BY: Sterling | REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

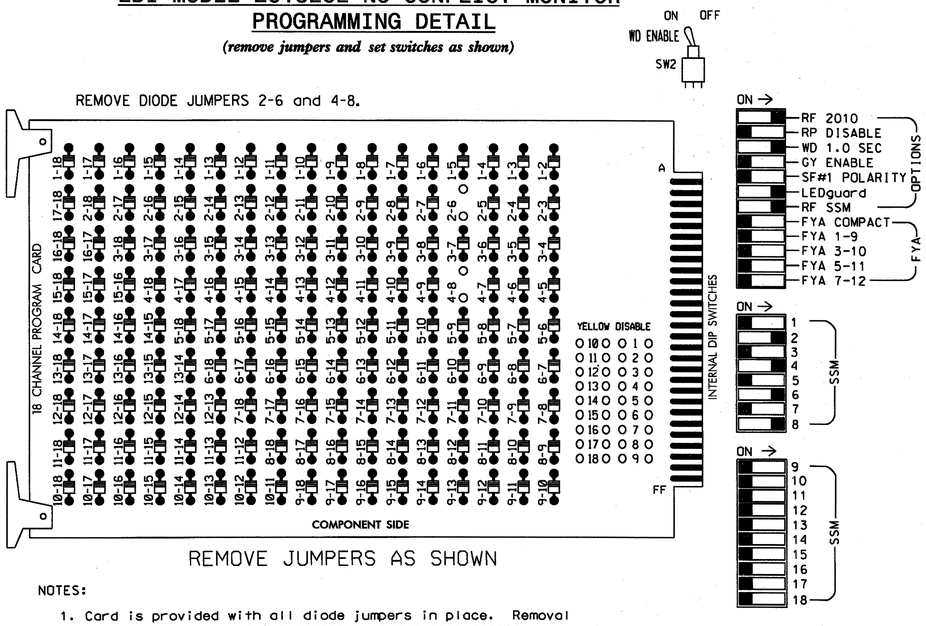
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 4/12/12 DATE
SIG. INVENTORY NO. 09-0062

29-NOV-2012 15:35
S:#TS&S#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0062#090062_sig_dsn_20120412.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 46

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø 2 2B				Ø 4 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A,8B,8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø 6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A,8B,8C	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0062
DESIGNED: September 2011
SEALED: 4/12/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2456 (N. Liberty Street)
at
SR 2579 (N. Patterson Avenue)

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: April 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
John T Rowe 9-12-12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0062

12-APR-2012 15:22
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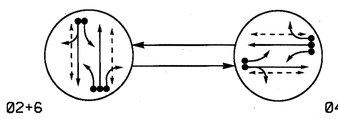
scrmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 47

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
2I, 22	G	R	Y
4I, 42	R	G	R
6I, 62	G	R	Y
8I, 82	R	G	R
P2I, P22	W	DW	DRK
P23, P24	W	DW	DRK
P4I, P42	DW	W	DRK
P43, P44	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

2I, 22
4I, 42
6I, 62
8I, 82

P2I, P22
P23, P24
P4I, P42
P43, P44

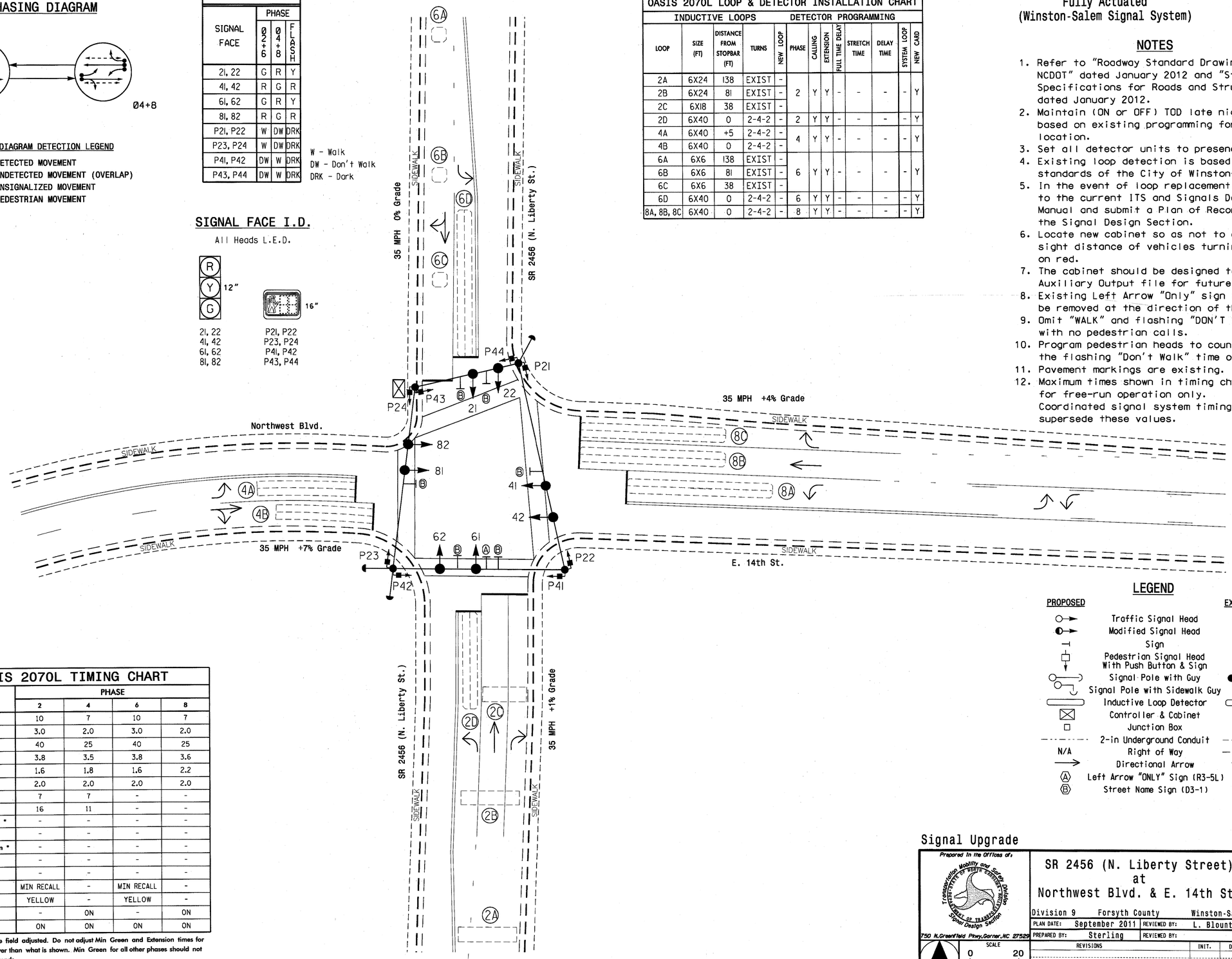
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X24	138	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X24	81	EXIST	-								
2C	6X18	38	EXIST	-								
2D	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-								
6A	6X6	138	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X6	81	EXIST	-								
6C	6X6	38	EXIST	-								
6D	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A, 8B, 8C	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Existing Left Arrow "Only" sign (R3-5L) may be removed at the direction of the Engineer.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	40	25	40	25
Yellow Clearance	3.8	3.5	3.8	3.6
Red Clearance	1.6	1.8	1.6	2.2
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	7	7	-	-
Don't Walk 1	16	11	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SCALE 0 20 1"=20'

SR 2456 (N. Liberty Street) at Northwest Blvd. & E. 14th St.

Division 9 Forsyth County Winston-Salem
PLAN DATE: September 2011 REVIEWED BY: L. Blount
PREPARED BY: Sterling REVIEWED BY:

REVISIONS	INIT.	DATE

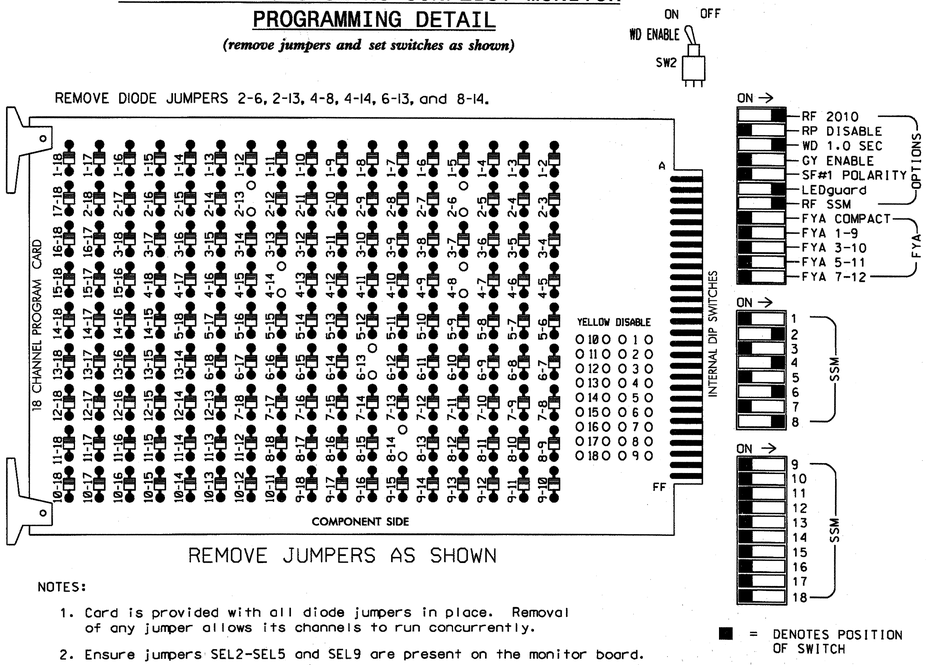
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 4/9/13 DATE
SIG. INVENTORY NO. 09-0065

09-JAN-2013 15:04
S:\TSSD\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0065\4090065_sig_dsn_20130109.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 48

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 4 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX OUTPUT FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD. 6-AUX)
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S11
PHASES USED.....2,2PED,4,4PED,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21,P22 P23,P24	NU	41,42	P41,P42 P43,P44	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		
✋			113			104												
🚶			115			106												

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	Ø2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A,4B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		Ø2 2D				NOT USED						Ø4 PED DC ISOLATOR		ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	Ø6 6A,6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A,8B,8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L		Ø6 6D				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
2D	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A,4B	TB4-9,10	I6U	41	3	4	4	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
6D	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A,8B,8C	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
P21,P22 P23,P24	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42 P43,P44	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0065
DESIGNED: September 2011
SEALED: 1/9/13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 2456 (N. Liberty Street) at Northwest Blvd. & E. 14th St.	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Traffic Engineering Branch, Signal Management Section	Division 9 Forsyth County Winston-Salem	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy,Garner,NC 27529	PLAN DATE: January 2013 REVIEWED BY: JTR	SIGNATURE 1-10-13 DATE
	PREPARED BY: S. Armstrong REVIEWED BY:	SIG. INVENTORY NO. 09-0065
	REVISIONS INIT. DATE	

10-JAN-2013 09:06
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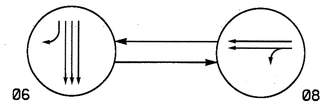
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 49

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

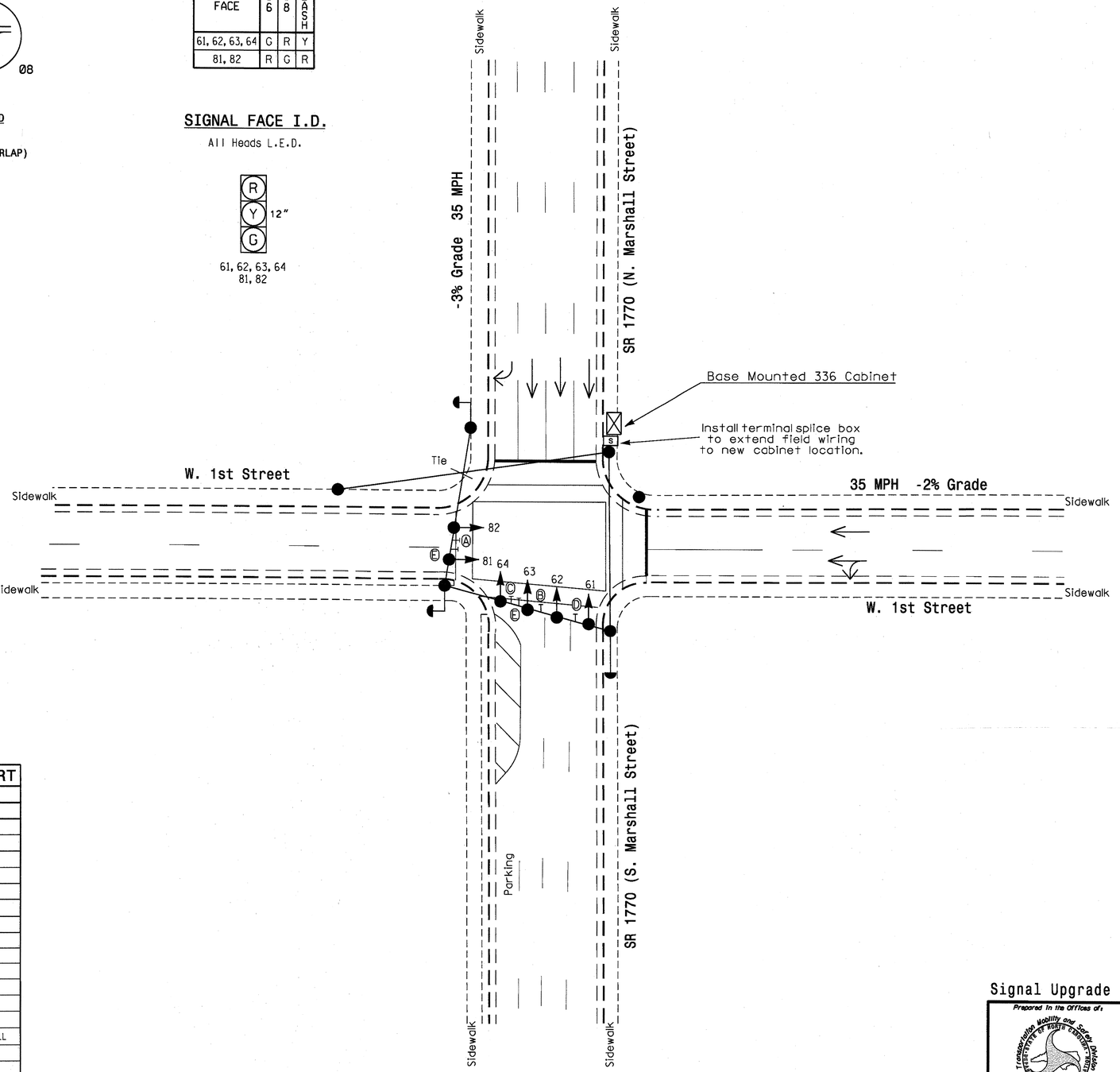
TABLE OF OPERATION			
SIGNAL FACE	PHASE 06	PHASE 08	PHASE FLASH
61, 62, 63, 64	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

61, 62, 63, 64
81, 82

2 Phase
Pre-Timed
(Winston-Salem Signal System)



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Pavement markings are existing.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	One Way Left Sign (R3-1L)	A
B	One Way Right Sign (R3-1R)	B
C	Right Arrow "ONLY" Sign (R3-5R)	C
D	Through Arrow "ONLY" Sign (R3-5A)	D
E	Street Name Sign (D3-1)	E

OASIS 2070L TIMING CHART

FEATURE	PHASE 6	PHASE 8
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	45	25
Yellow Clearance	4.0	4.1
Red Clearance	2.0	2.0
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1770 (Marshall Street)
at
W. 1st Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	November 2011	REVIEWED BY:	R. Hough
PREPARED BY:	M.Bazzarie	REVIEWED BY:	

REVISIONS | INIT. | DATE

SCALE 0 20 1'=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE DATE 1/18/12
SIG. INVENTORY NO. 09-0081

03-JAN-2013 11:02
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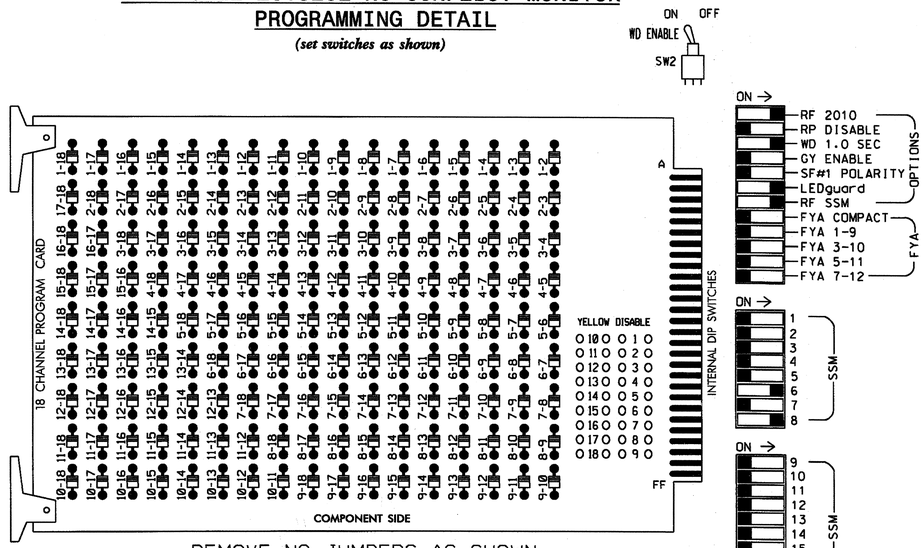
cecarter

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.5D

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



REMOVE NO JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phase 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S6,S8
PHASES USED.....6,8
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	NU	NU	NU	61,62 63,64	NU	NU	81,82	NU
RED								134			107	
YELLOW								135			108	
GREEN								136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0081
DESIGNED: November 2011
SEALED: 1-18-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1770 (Marshall Street) at W. 1st Street

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 11-23-11 | REVIEWED BY: T. Jones

PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

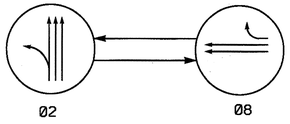
George C Brown 1/19/12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0081

18-JAN-2012 14:39
S:\#TSSDUM~1\TS Signals\Workgroups\Sig Mgmt\Spaulding\work-in-progress\090081_sm_ele_2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 5

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2	PHASE Ø8	PHASE FLASH
21, 22	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

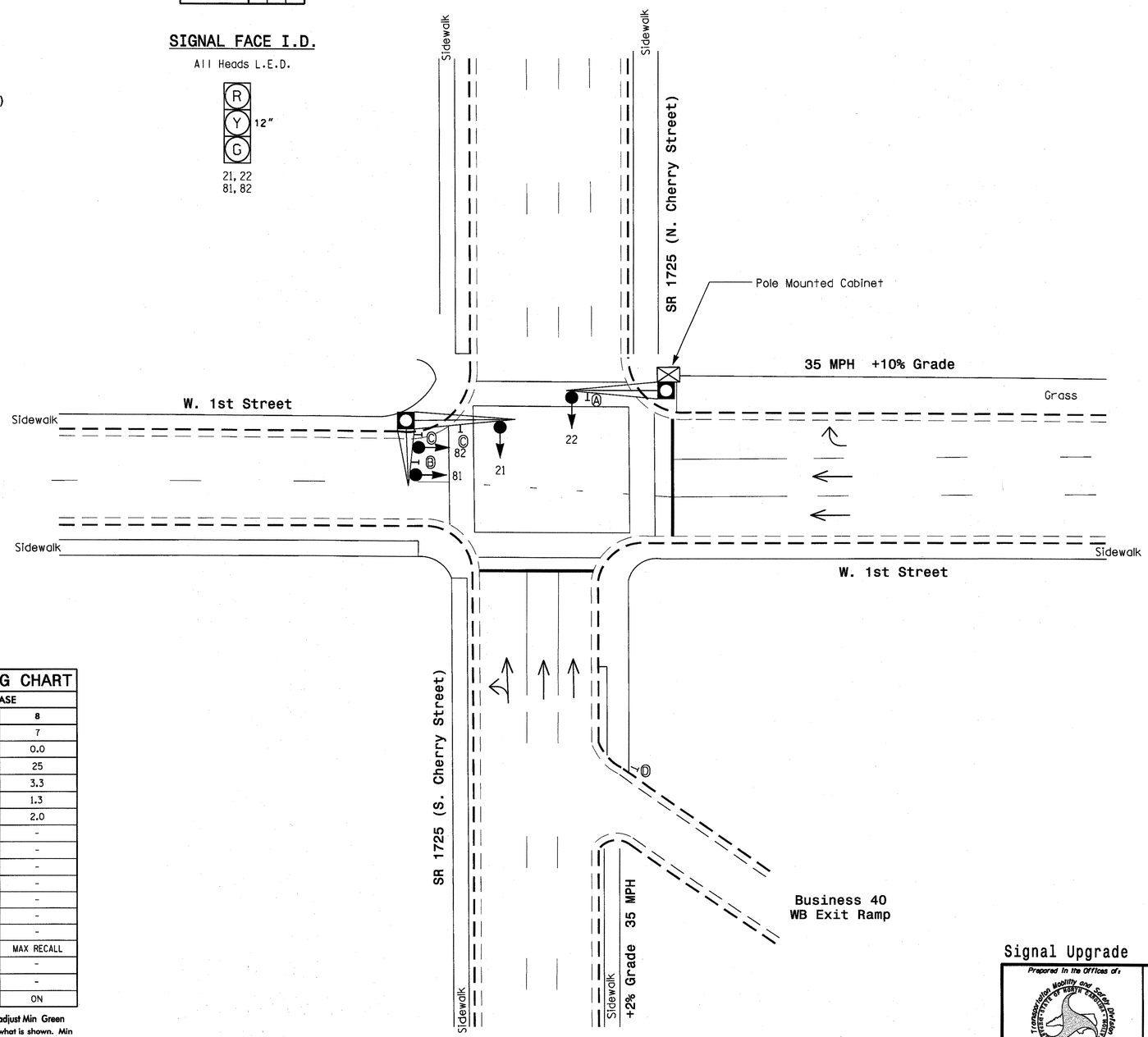
All Heads L.E.D.

21, 22
81, 82

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Pavement markings are existing.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 8
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	45	25
Yellow Clearance	3.7	3.3
Red Clearance	1.1	1.3
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
Ⓐ	Left One Way Sign (R6-1L)	Ⓐ
Ⓑ	Right One Way Sign (R6-1R)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ
Ⓓ	"STOP" Sign (R1-1)	Ⓓ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (Cherry Street)
at
W. 1st Street

Division 9 Forsyth County Winston-Salem
PLAN DATE: July 2011 REVIEWED BY: R. Hough
PREPARED BY: M.Bazzarie REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMEN
SIGNATURE 12/29/11 DATE
SIG. INVENTORY NO. 09-0082

11-JUN-2012 12:24
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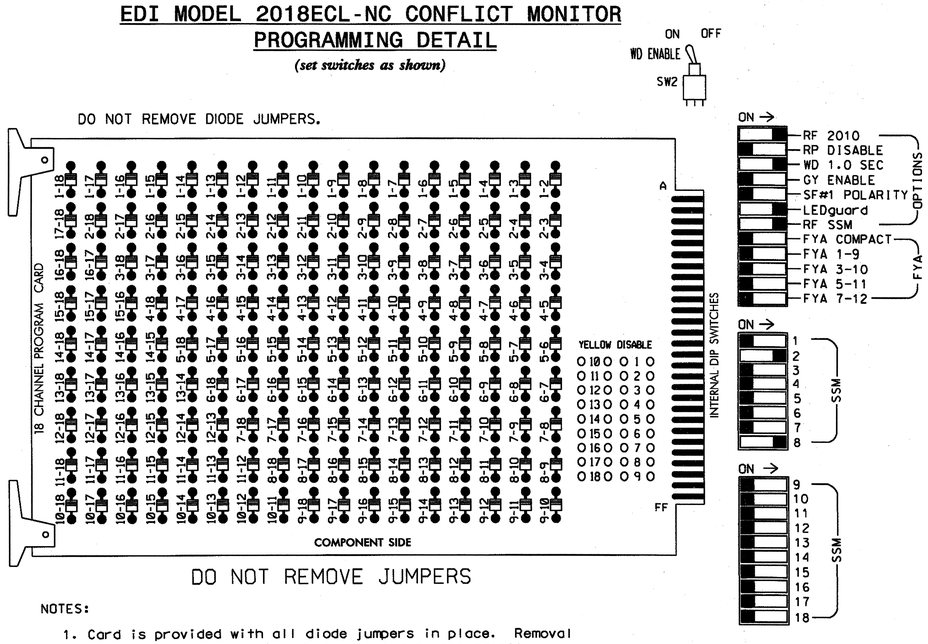
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 52

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



DO NOT REMOVE JUMPERS

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phase 2 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S11
PHASES USED.....2,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	NU	81,82	NU
RED		128									107	
YELLOW		129									108	
GREEN		130									109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
L	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0082
DESIGNED: July 2011
SEALED: 12/20/2011
REVISED:

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (Cherry Street) at W. 1st Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY: T. Vgel
PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

George C. Brown 12/23/11
SIGNATURE DATE

SIG. INVENTORY NO. 09-0082

22-DEC-2011 09:52
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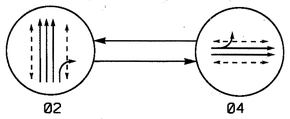
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 53

2 Phase
Pre-Timed
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

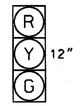
TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2	PHASE Ø4	FLASH
21, 22, 23	G	R	Y
41, 42	R	G	R
P21, P22	W	DW	DRK
P23, P24	W	DW	DRK
P41, P42	DW	W	DRK
P43, P44	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

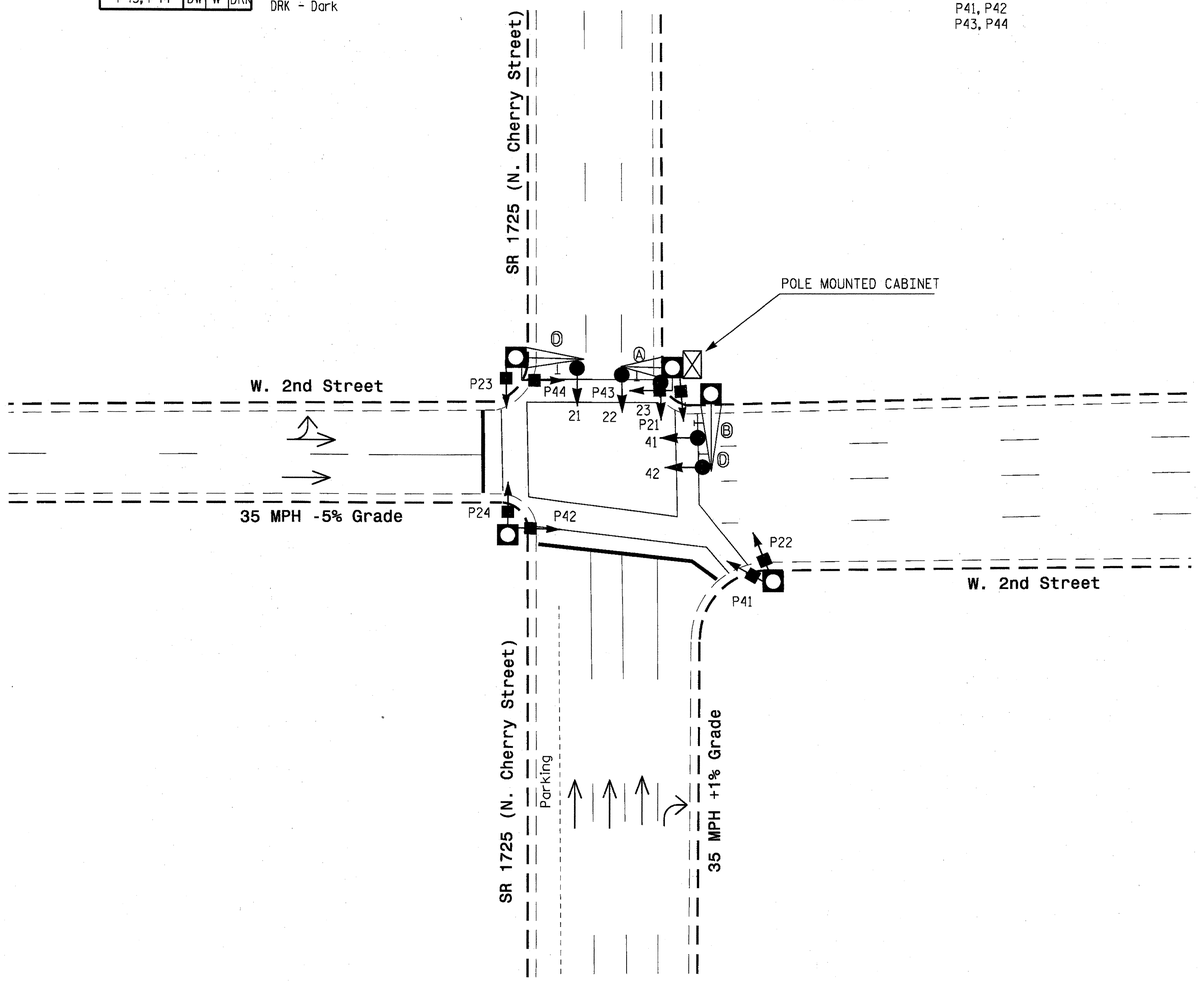
SIGNAL FACE I.D.

All Heads L.E.D.



21, 22, 23
41, 42

P21, P22
P23, P24
P41, P42
P43, P44



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○⤵	Signal Pole with Sidewalk Guy	●⤵
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
▱	Metal Pole with Mastarm	▱
◎	Light Pole	◎
Ⓐ	Right "ONE WAY" Sign (R6-1R)	Ⓐ
Ⓑ	Left "ONE WAY" Sign (R6-1L)	Ⓑ
Ⓒ	Pedestrian Warning Sign (W11-2)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	35	25
Yellow Clearance	3.8	4.2
Red Clearance	1.0	1.1
Red Revert	2.0	2.0
Walk 1 *	7	7
Don't Walk 1	10	13
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED. RECALL	MAX/PED. RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725 (N. Cherry Street)
at
W. 2nd Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: July 2011 | REVIEWED BY: R. Hough
PREPARED BY: W.Bazzarie | REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZILMBA
SIGNATURE 12/8/11 DATE
SIG. INVENTORY NO. 09-0087

03-JAN-2013 09:54
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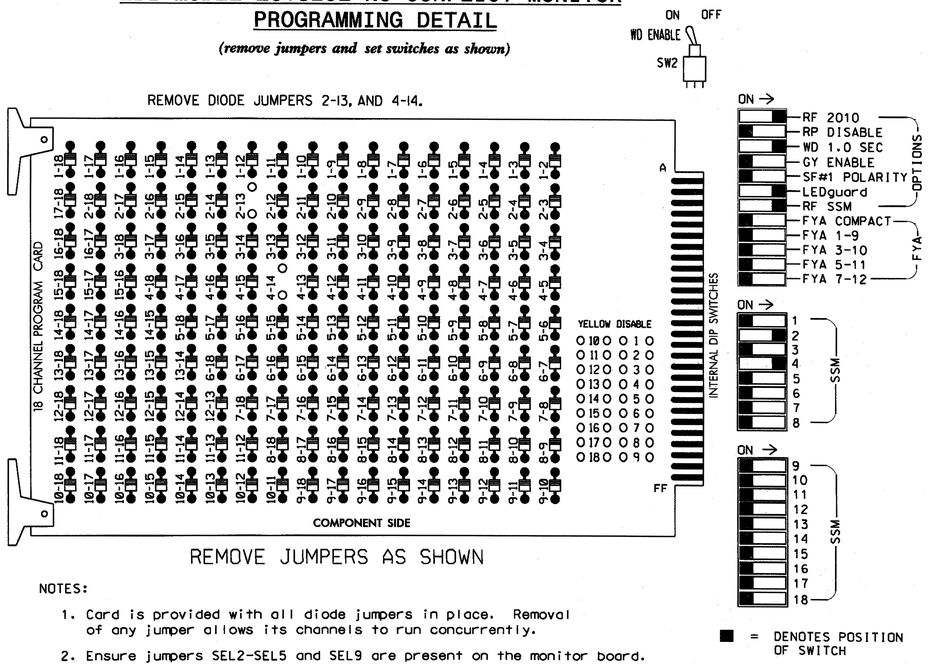
Zilmbo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 54

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phases 2 and 4 for 'STARTUP PED CALL'.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

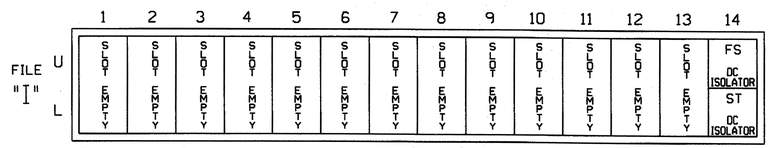
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6
PHASES USED.....2,4,2PED,4PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22 23	P21, P22, P23, P24	NU	41,42	P41, P42, P43, P44	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
			113			104						
			115			106						

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: I2L

FILE I
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0087
DESIGNED: July 2011
SEALED: 12-8-11
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (N. Cherry Street) at W. 2nd Street

Division 09 Forsyth County Winston-Salem

PLAN DATE: 12-02-11 REVIEWED BY: T. Jager

PREPARED BY: D.H. Spaulding REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

George C. Brown 12/9/11
SIGNATURE DATE

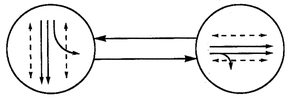
SIG. INVENTORY NO. 09-0087

09-DEC-2011 10:31
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Spaulding*in-progress*090087_sm.ele_2011xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 55

2 Phase
Pre-Timed
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø4	PHASE Ø6	FLASH
41, 42	G	R	R
61, 62	R	G	Y
P41, P42	W	DW	DRK
P43, P44	W	DW	DRK
P61, P62	DW	W	DRK
P63, P64	DW	W	DRK

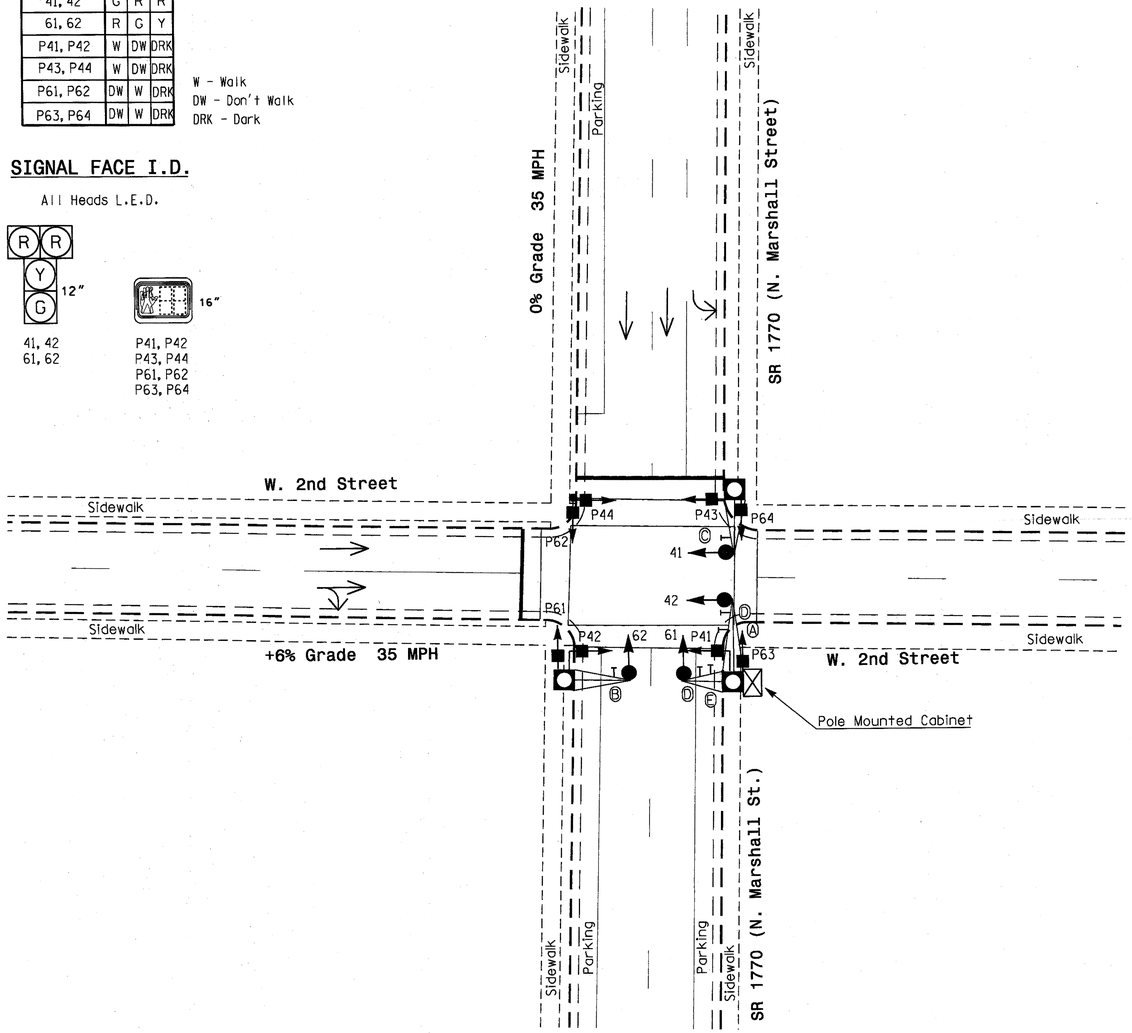
W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

41, 42
61, 62

P41, P42
P43, P44
P61, P62
P63, P64



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Signal Pedestal	
Ⓐ	"NO TURN ON RED" Sign (R10-11)	Ⓐ
Ⓑ	Left "ONE WAY" Sign (R6-1L)	Ⓑ
Ⓒ	Right "ONE WAY" Sign (R6-1R)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ
Ⓔ	Left Arrow "ONLY" Sign (R3-5L)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE 4	PHASE 6
Min Green 1 *	7	10
Extension 1 *	0.0	0.0
Max Green 1 *	35	50
Yellow Clearance	3.5	3.8
Red Clearance	1.2	1.0
Red Revert	2.0	2.0
Walk 1 *	7	7
Don't Walk 1	9	4
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED RECALL	MAX/PED RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 1770 (N. Marshall Street)
at
W. 2nd Street

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: July 2011 | REVIEWED BY: R. Hough
PREPARED BY: W. Bazzarie | REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

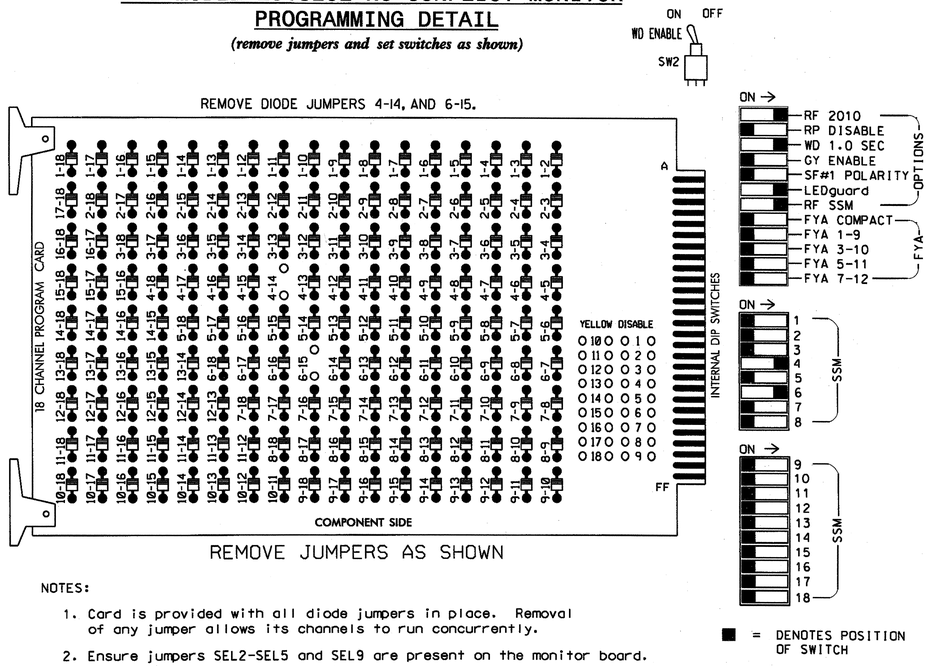
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J ZUMBA
SIGNATURE | DATE 12/12/14
SIG. INVENTORY NO. 09-0088

03-JAN-2013 10:01
S:#ITS&SI#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0088#M93088_sig_dsn_20111212.dgn
rzumba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 56

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phases 4 and 6 for 'STARTUP PED CALL'.
5. Program phase 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S6,S8,S9
PHASES USED.....4,6,4PED,6PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	P41, P42, P43, P44	NU	61,62	P61, P62, P63, P64	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
						104			119			
						106			121			

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
L	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0088
DESIGNED: July 2011
SEALED: 12-12-11
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1770 (N. Marshall Street) at W. 2nd Street

Division 09 Forsyth County Winston-Salem

PLAN DATE:	12-08-11	REVIEWED BY:	T. Tyle
PREPARED BY:	D.H. Spaulding	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

George C. Brown 12/13/11
SIGNATURE DATE

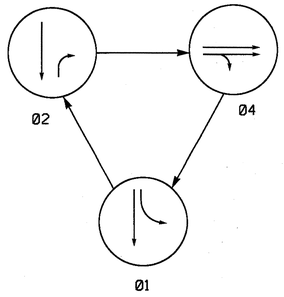
SIG. INVENTORY NO. 09-0088

13-DEC-2011 07:26
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Spaulding*in-progress*090088_smlele_2011xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 57

3 Phase
Pre-Timed
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

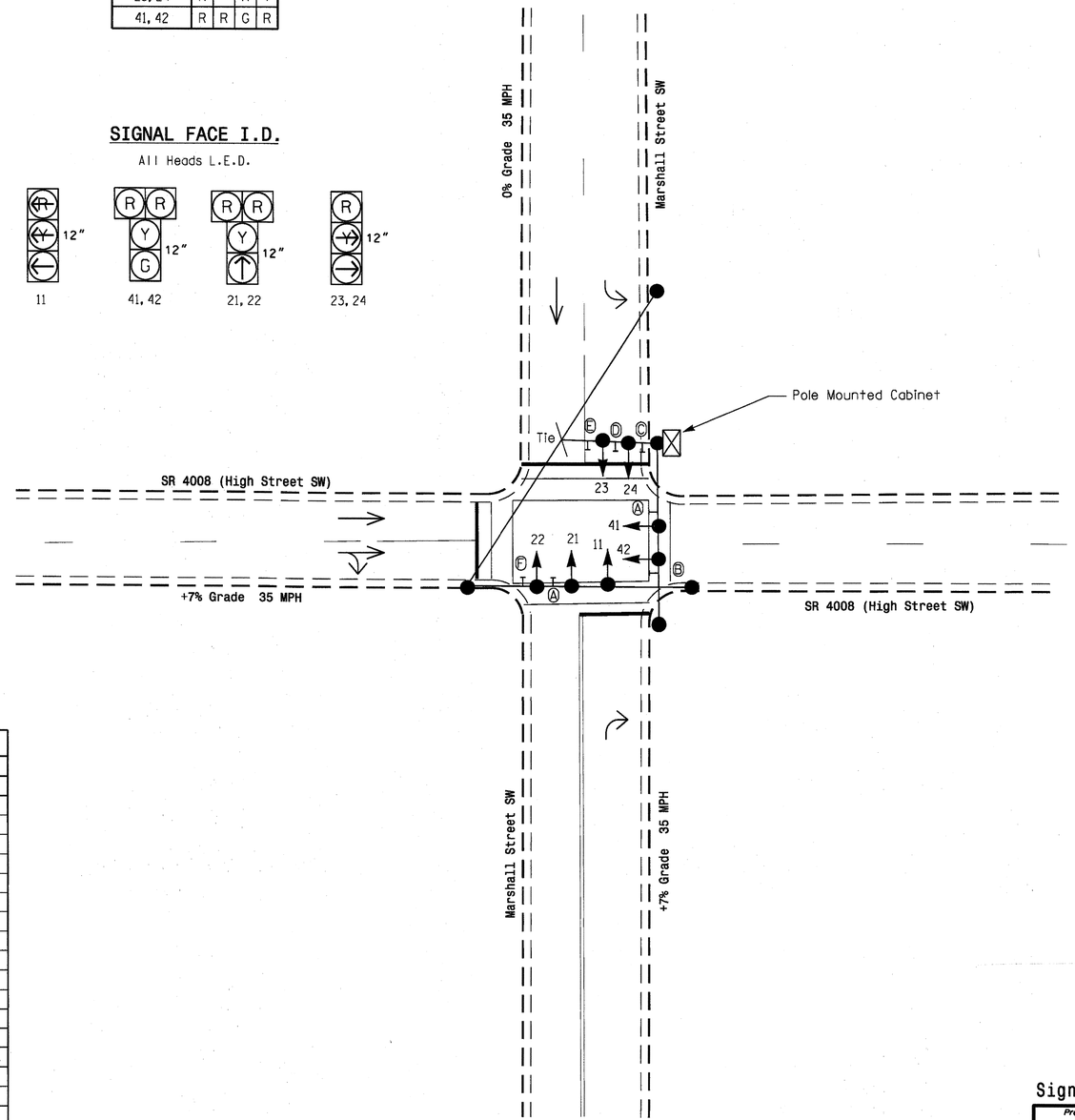
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01	PHASE 02	PHASE 04	FLASH
11	←	~~R~~	~~R~~	~~R~~
21, 22	↑	↑	R	Y
23, 24	R	→	R	~~→~~
41, 42	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Remove existing "LEFT TURN SIGNAL" sign (R10-10L).
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	Through Arrow "ONLY" Sign (R3-5A)	Ⓐ
Ⓑ	Combined Through and Right Arrow Sign (R3-6R)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
Ⓓ	"NO TURN ON RED" Sign (R10-11)	Ⓓ
Ⓔ	"DO NOT ENTER" Sign (R5-1)	Ⓔ
Ⓕ	"ONE WAY" Street Sign (R6-1L)	Ⓕ

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4
Min Green 1 *	7	10	7
Extension 1 *	0.0	0.0	0.0
Max Green 1 *	15	45	25
Yellow Clearance	3.0	3.8	3.5
Red Clearance	1.1	1.0	1.0
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MAX RECALL	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

Marshall Street SW at SR 4008 (High Street SW)

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: August 2012 | REVIEWED BY: R. Hough
PREPARED BY: W.Bazzarie | REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
10/2/12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0089

15-NOV-2012 14:12
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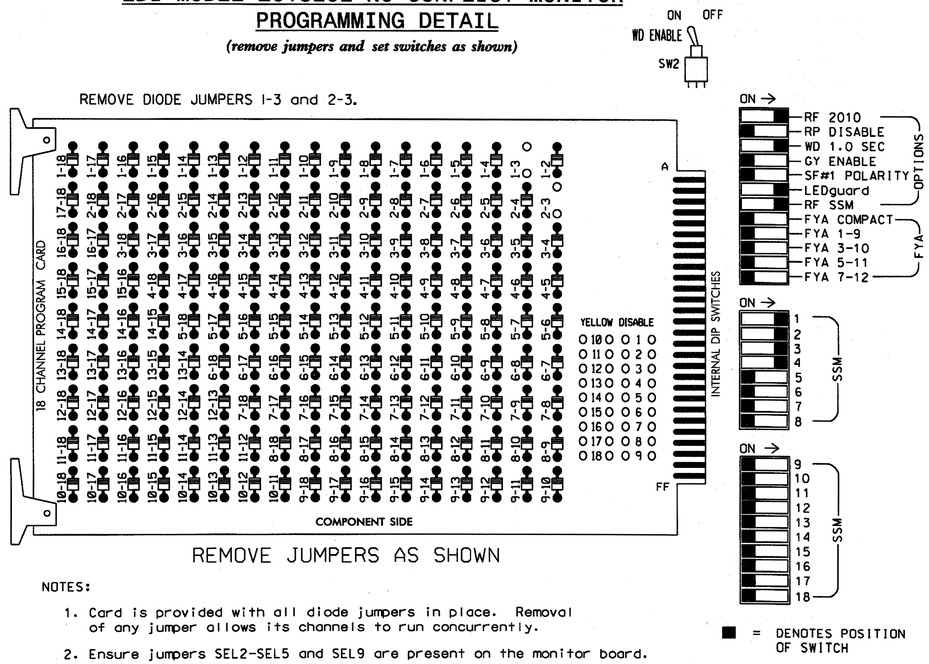
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 58

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag overlaps.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S4,S5
PHASES USED.....1,2,4
OVERLAP A.....1+2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	OLA	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	23,24	NU	21,22	41,42	NU	NU	NU	NU	NU	NU	NU
RED		128		116	101							
YELLOW				117	102							
GREEN					103							
RED ARROW	125											
YELLOW ARROW	126	129										
GREEN ARROW	127	130		118								
✋												
🚶												

NU = Not Used

NOTE: Loadswitch S4 is remapped as Vehicle Overlap 'A'. See sheet 2 for programming details.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	SDET EMPTY	FS DC ISOLATOR
L														ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0089
DESIGNED: August 2012
SEALED: 10/2/12
REVISED: N/A

Signal Upgrade - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	Marshall Street SW at SR 4008 (High Street SW)	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Traffic Engineering Branch, Signal Management Section	Division 9 Forsyth County Winston-Salem	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: September 2012 REVIEWED BY: JTR	SIGNATURE DATE: 10-2-12
	PREPARED BY: S. Armstrong REVIEWED BY:	SIG. INVENTORY NO. 09-0089
	REVISIONS / INIT. / DATE	

02-OCT-2012 15:43
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scarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 59

OUTPUT REMAPPING PROGRAMMING DETAIL
TO ASSIGN OVERLAP 'A' TO LOADSWITCH S4

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "6"

```
PAGE:1  C1 PIN:7   VEHICLE PHASE
OUTPUT ASSIGNMENT #.................6
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 RED

THE OUPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:7   VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA,
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:7   VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................6
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 7

```
PAGE:1  C1 PIN:8   VEHICLE PHASE
OUTPUT ASSIGNMENT #.................7
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 YELLOW

THE OUPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:8   VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA,
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:8   VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................7
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 8

```
PAGE:1  C1 PIN:9   VEHICLE PHASE
OUTPUT ASSIGNMENT #.................8
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 GREEN

THE OUPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:9   VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA,
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:9   VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................8
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0089
DESIGNED: August 2012
SEALED: 10/2/12
REVISED: N/A

Signal Upgrade - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	Marshall Street SW at SR 4008 (High Street SW)		
Prepared in the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Traffic Engineering Branch, Signal Management Section	Division 9	Forsyth County	Winston-Salem
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: September 2012	REVIEWED BY: JTR	
	PREPARED BY: S. Armstrong	REVIEWED BY:	

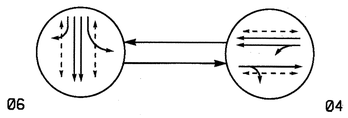
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
John T Rowe 10-2-12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0089

02-OCT-2012 15:43
S:\TISSIG\WITS Signals\Workgroup\Sig Mgmt\Armstrong\090089_sm_ele_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 60

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

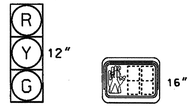
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 04	PHASE 06	FLASH
41, 42	G	R	R
43, 44	G	R	R
61, 62	R	G	Y
P41, P42	W	DW	DRK
P43, P44	W	DW	DRK
P61, P62	DW	W	DRK
P63, P64	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

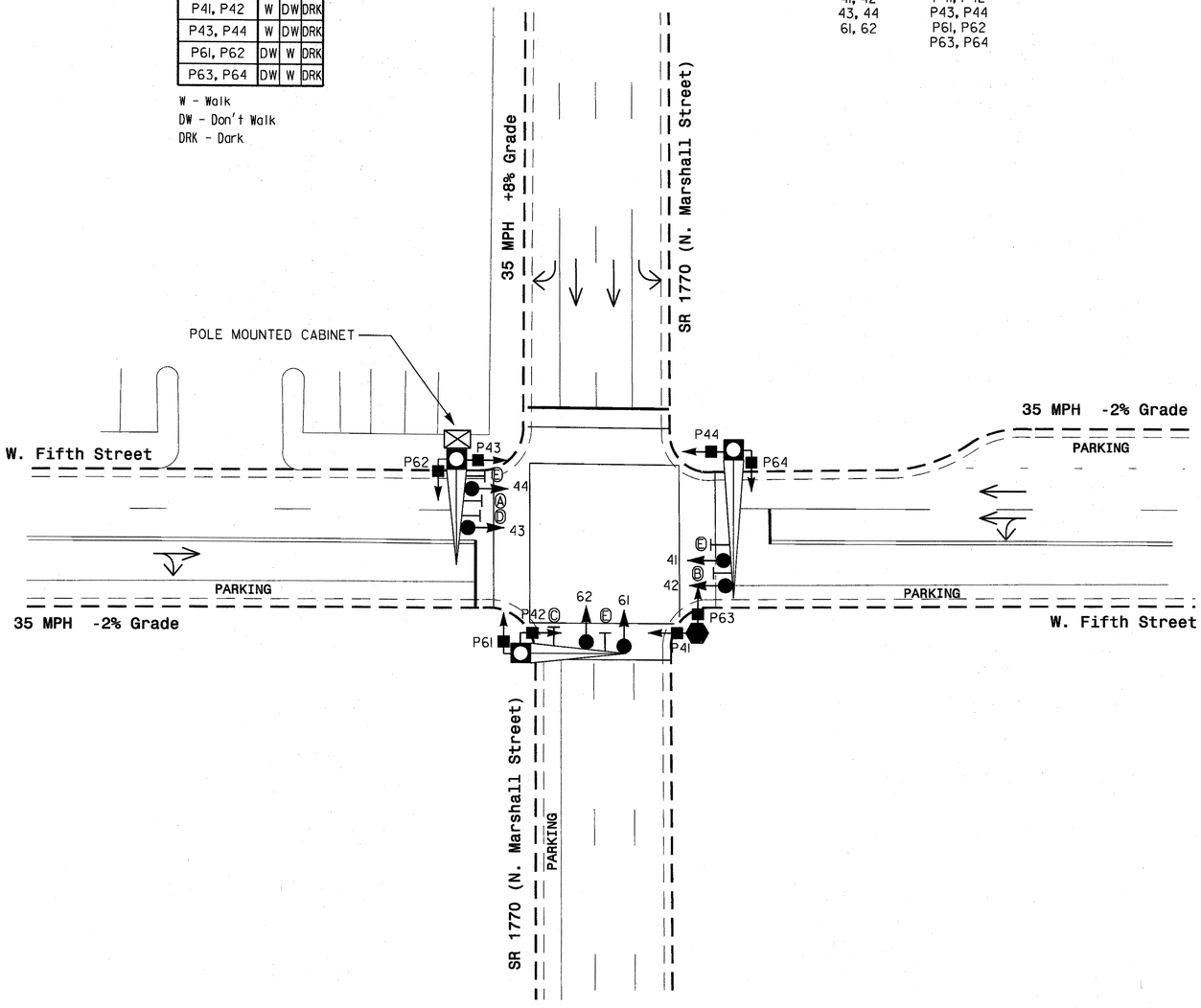
SIGNAL FACE I.D.

All Heads L.E.D.



41, 42
43, 44
61, 62

P41, P42
P43, P44
P61, P62
P63, P64



2 Phase Pre-Timed (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

OASIS 2070L TIMING CHART		
FEATURE	PHASE 4	PHASE 6
Min Green 1 *	7	10
Extension 1 *	0.0	0.0
Max Green 1 *	25	30
Yellow Clearance	4.0	3.4
Red Clearance	1.6	1.2
Red Revert	2.0	2.0
Walk 1 *	7	7
Don't Walk 1	8	9
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED RECALL	MAX/PED RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
Ⓐ	Left "ONE WAY" Sign (R6-1L)	Ⓐ
Ⓑ	Right "ONE WAY" Sign (R6-1R)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
Ⓓ	Combined Through and Left Arrow Sign (R3-6L)	Ⓓ
Ⓔ	Street Name Sign (D3-1)	Ⓔ

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 20 1"=20'

SR 1770 (N. Marshall Street) at W. Fifth Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: October 2011 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

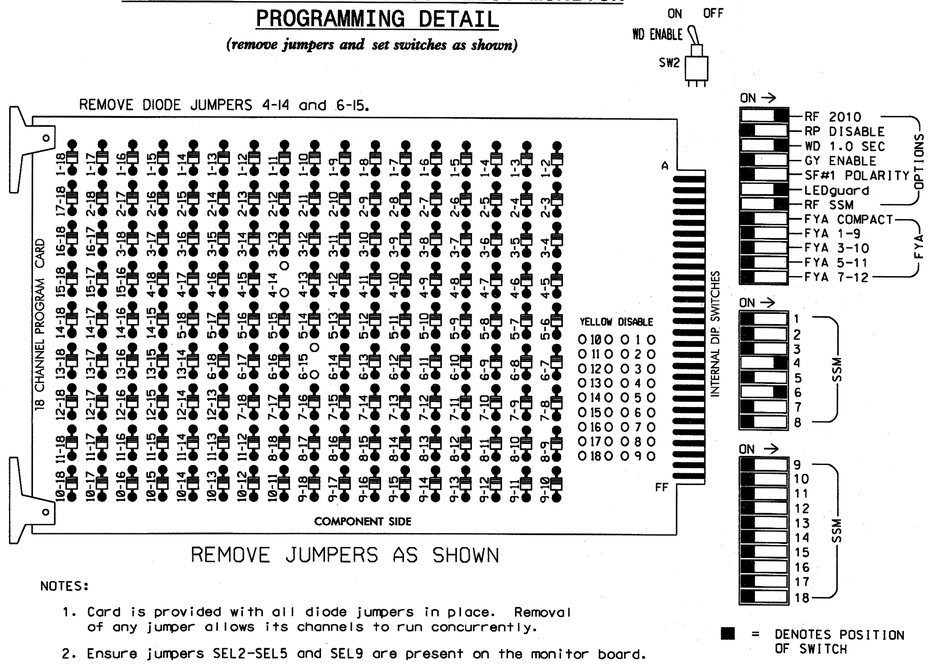
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 12/14/11 DATE
SIG. INVENTORY NO. 09-0096

24-APR-2012 17:49
S:#TISAS1#TIS Signals#Signal Design Section#Central Region#Oly 9#C-5224 Winston Salem#Signals#09-0096#090096_sig_dsn_20111214.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 61

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up in Green.
4. Program phases 4 and 6 for 'STARTUP PED CALL'.
5. Program phase 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S6,S8,S9
PHASES USED.....4,6,4 PED,6 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42 43,44	P41,P42 P43,P44	NU	61,62	P61,P62 P63,P64	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋						104			119			
🚶						106			121			

NU = Not Used

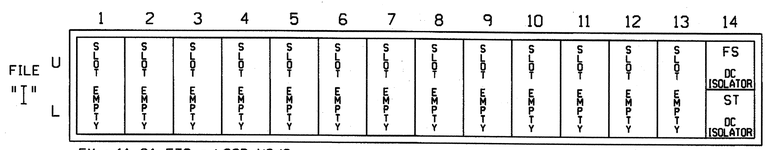
✱ Denotes install load resistor. See load resistor installation detail this sheet.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0096
DESIGNED: October 2011
SEALED: 12-14-11
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1770 (N. Marshall Street)
at
W. Fifth Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2011 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

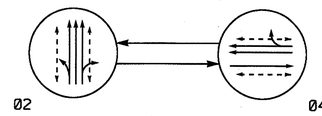
John T Rowe 12-15-11
SIGNATURE DATE

SIG. INVENTORY NO. 09-0096

15-DEC-2011 07:59
S:\MTS&SUM\TS Signals\workgroups\Sig Mgmt\Peterson\090096_sm_ele_xxx.dgn
jmpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.G2

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

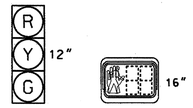
TABLE OF OPERATION

SIGNAL FACE	PHASE 02	PHASE 04	FLASH
21, 22	G	R	Y
41, 42	R	G	R
43, 44	R	G	R
P21, P22	W	DW	DRK
P23, P24	W	DW	DRK
P41, P42	DW	W	DRK
P43, P44	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



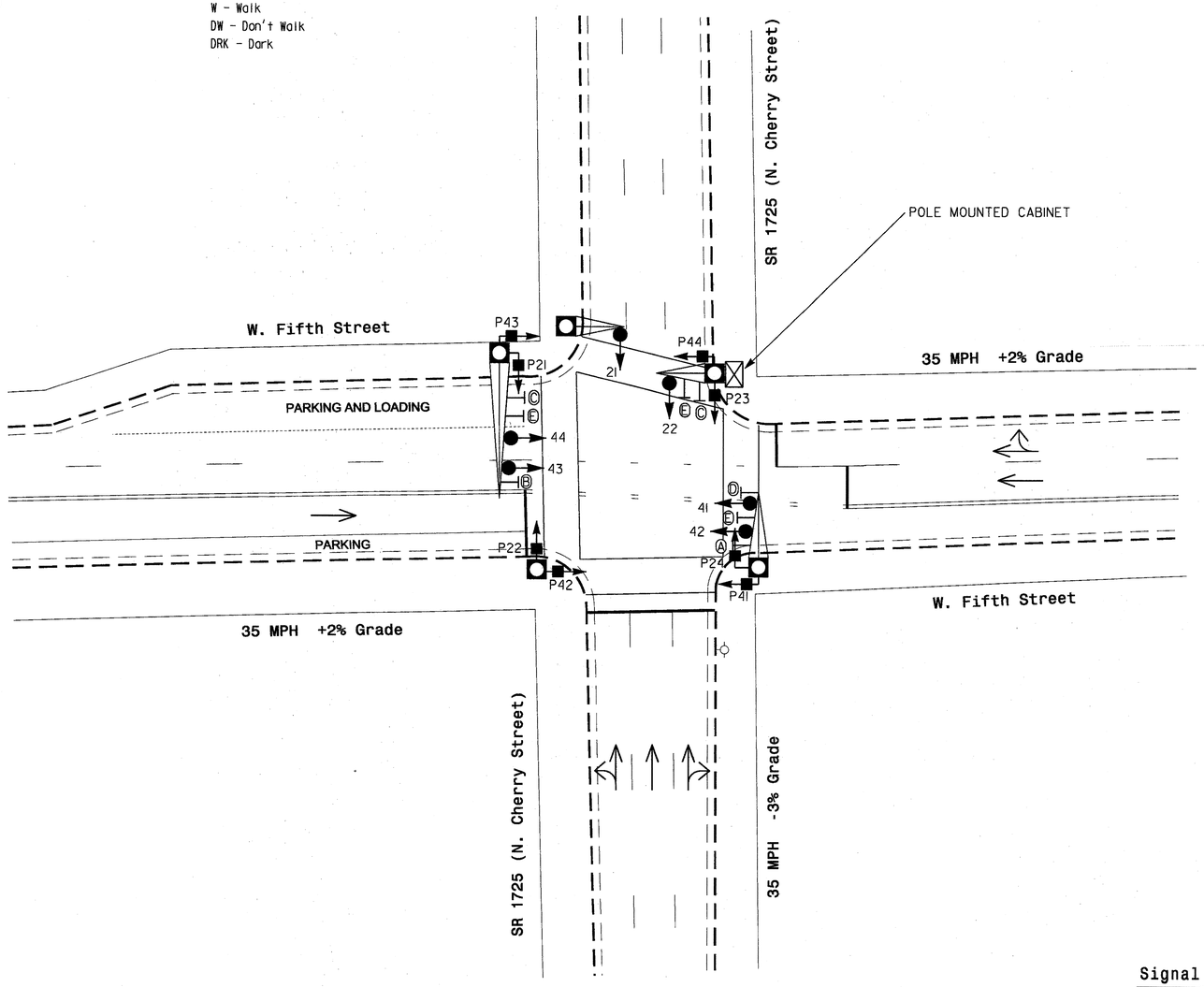
21, 22
41, 42
43, 44

P21, P22
P23, P24
P41, P42
P43, P44

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Metal Pole	
Ⓐ	Left "ONE WAY" Sign (R6-1L)	Ⓐ
Ⓑ	Right "ONE WAY" Sign (R6-1R)	Ⓑ
Ⓒ	Combined Through and Right Arrow Sign (R3-6R)	Ⓒ
Ⓓ	No Left Turn Sign (R3-2)	Ⓓ
Ⓔ	Street Name Sign (D3-1)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	30	25
Yellow Clearance	4.1	3.7
Red Clearance	1.4	1.6
Red Revert	2.0	2.0
Walk 1 *	7	7
Don't Walk 1	12	9
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED RECALL	MAX/PED RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (N. Cherry Street)
at
W. Fifth Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	October 2011	REVIEWED BY:	
PREPARED BY:	C.E. Carter	REVIEWED BY:	

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

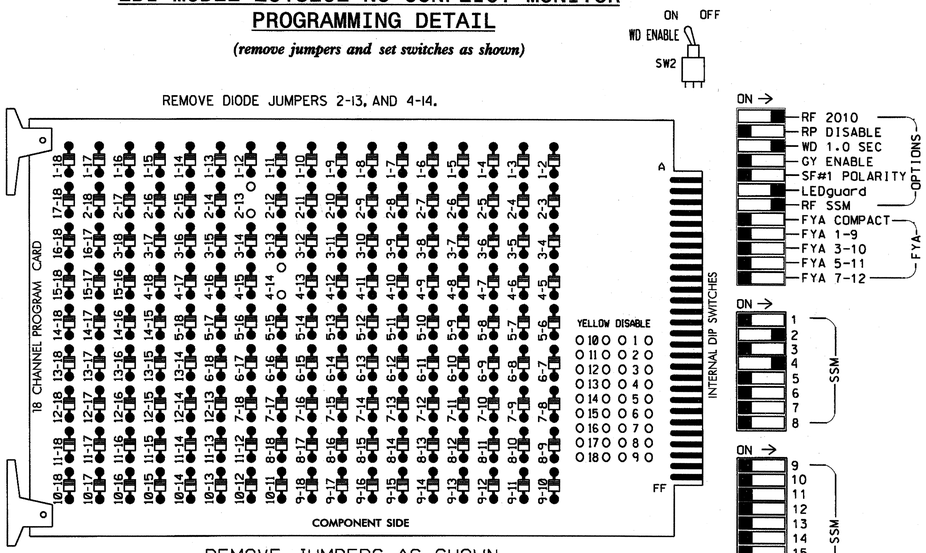
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER
ROBERT J. ZIEMBA
SIGNATURE 12/12/11 DATE
SIG. INVENTORY NO. 09-0097

24-APR-2012 17:51
S:\#ITS&SU#ITS Signals\#Signal Design Section\#Central Region\Div 9\#C-5224 Winston Salem\#Signals\#09-0097\#090097.sig_dsn_20111212.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 63

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phases 2 and 4 for 'STARTUP PED CALL'.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6
PHASES USED.....2,4,2PED,4PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22, P23, P24	NU	41,42 43,44	P41, P42, P43, P44	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113			104						
🚶			115			106						

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L														ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0097
DESIGNED: October 2011
SEALED: 12-12-11
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 1725 (N. Cherry Street) at W. Fifth Street

Division 09 | Forsyth County | Winston-Salem
PLAN DATE: 12-08-11 | REVIEWED BY: T. Ugh
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE | DATE 12/14/11
SIG. INVENTORY NO. 09-0097

13-DEC-2011 13:46
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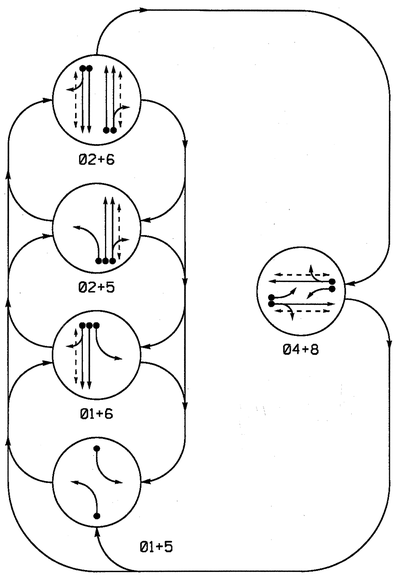
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 64

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

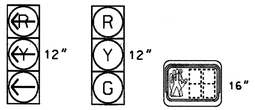
TABLE OF OPERATION

SIGNAL FACE	PHASE 0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 4 + 8	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

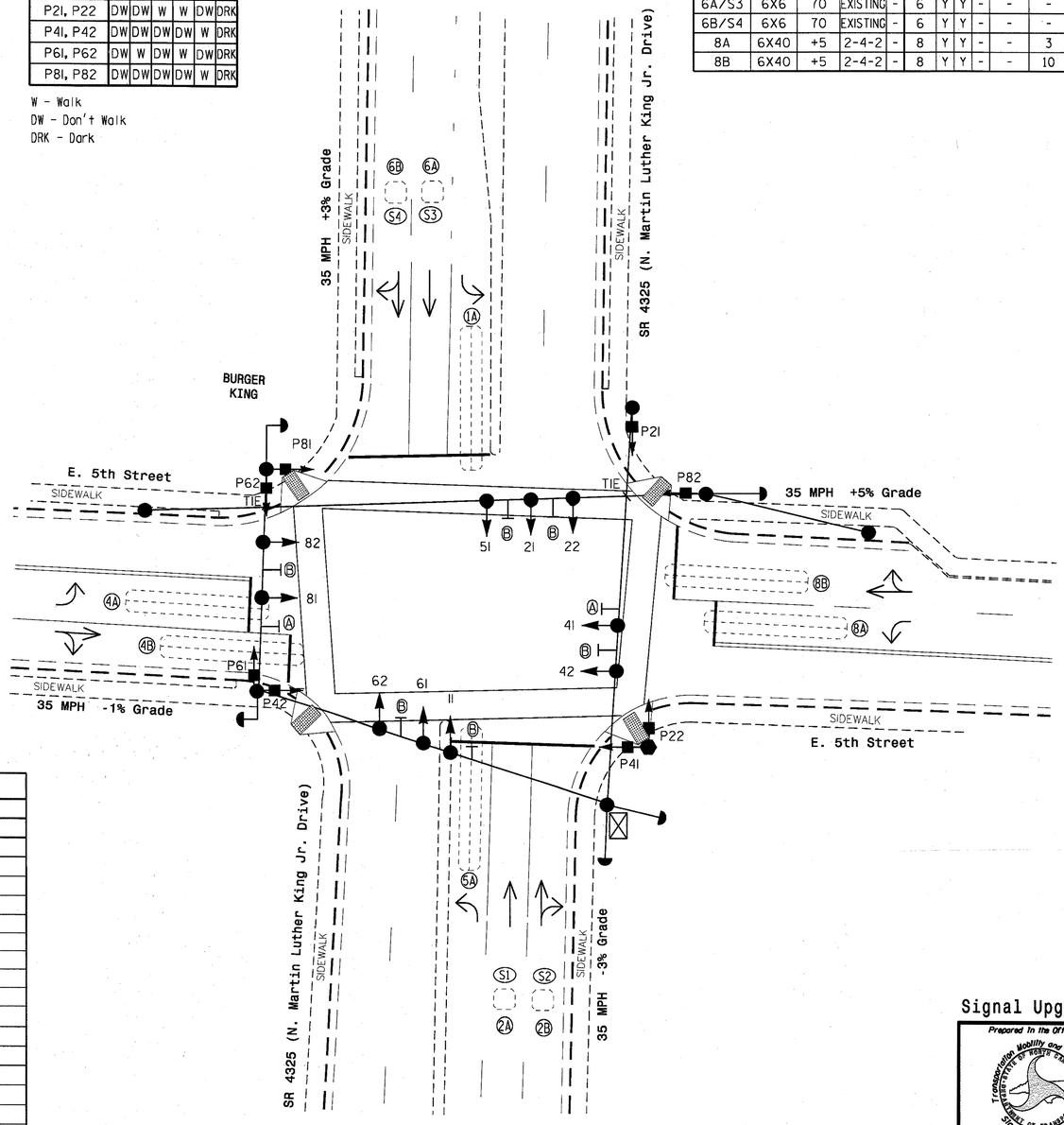
All Heads L.E.D.



11
51

21, 22
41, 42
61, 62
81, 82

P21, P22
P41, P42
P61, P62
P81, P82



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A/S1	6X6	70	EXISTING	-	2	Y	Y	-	-	-	Y	Y
2B/S2	6X6	70	EXISTING	-	2	Y	Y	-	-	-	Y	Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	+5	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A/S3	6X6	70	EXISTING	-	6	Y	Y	-	-	-	Y	Y
6B/S4	6X6	70	EXISTING	-	6	Y	Y	-	-	-	Y	Y
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-	Y

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0
Max Green 1 *	25	40	30	15	40	30
Yellow Clearance	3.0	4.1	3.9	3.0	3.7	3.5
Red Clearance	2.4	1.3	1.9	2.3	1.4	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	13	21	-	13	24
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN/PED RECALL	-	-	MIN/PED RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

5 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls for phase 4 or phase 8.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Existing Left Arrow "ONLY" (R3-5L) signs may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
------	2-in Underground Conduit	------
N/A	Right of Way	------
→	Directional Arrow	→
⬡	Signal Pedestal	⬢
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4325
(N. Martin Luther King Jr. Dr.)
at
E. 5th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: January 2013 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

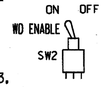
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER
ROBERT J. ZIEMBA
SIGNATURE 1/3/13 DATE
SIG. INVENTORY NO. 09-0106

03-JAN-2013 14:10
S:\#TISSUE#\TS Signals\Signal Design Section\Central Region\Oly 9\C-5224 Winston Salem\Signals\#09-0106#090106_sig_dsn_20130jxx.dgn

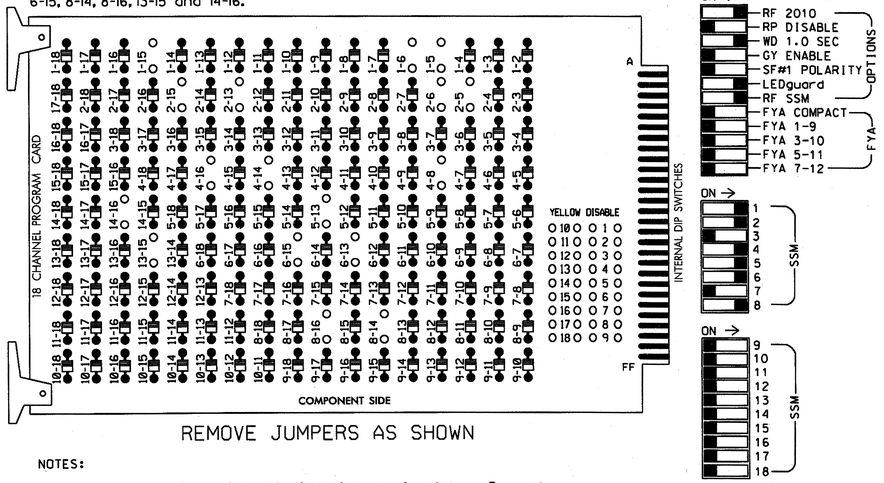
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 65

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 8-14, 8-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	41,42	P41, P42	51	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
GREEN ARROW	127						133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,S12
PHASES USED.....1,2,2 PED,4,4 PED,5,6,6 PED,8,8 PED
OVERLAPS.....NONE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1	Ø2/SYS	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	NOT USED	FS
		1A	2A/S1				4A								DC ISOLATOR
	L	NOT USED	Ø2/SYS				Ø 4						Ø4 PED	Ø8 PED	ST
			2B/S2				4B						DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
FILE "J"	U	Ø 5	Ø6/SYS	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
		5A	6A/S3				8A								
	L	NOT USED	Ø6/SYS				Ø 8								
			6B/S4				8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A/S1	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S2	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A/S3	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B/S4	TB3-7,8	J2L	44	6	16	6/SYS	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0106
DESIGNED: January 2013
SEALED: 1/3/13
REVISED: N/A

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4325
(N. Martin Luther King Jr. Dr.)
at
E. 5th Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	January 2013	REVIEWED BY:	T. Joyce
PREPARED BY:	C. Strickland	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

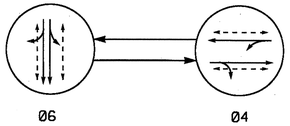
SIGNATURE | DATE 1/8/13

SIG. INVENTORY NO. 09-0106

04-JAN-2013 07:53
S:\Traffic\Signals\Workgroups\Sig Mgmt\Strickland\m09010...
Carl Strickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 66

PHASING DIAGRAM



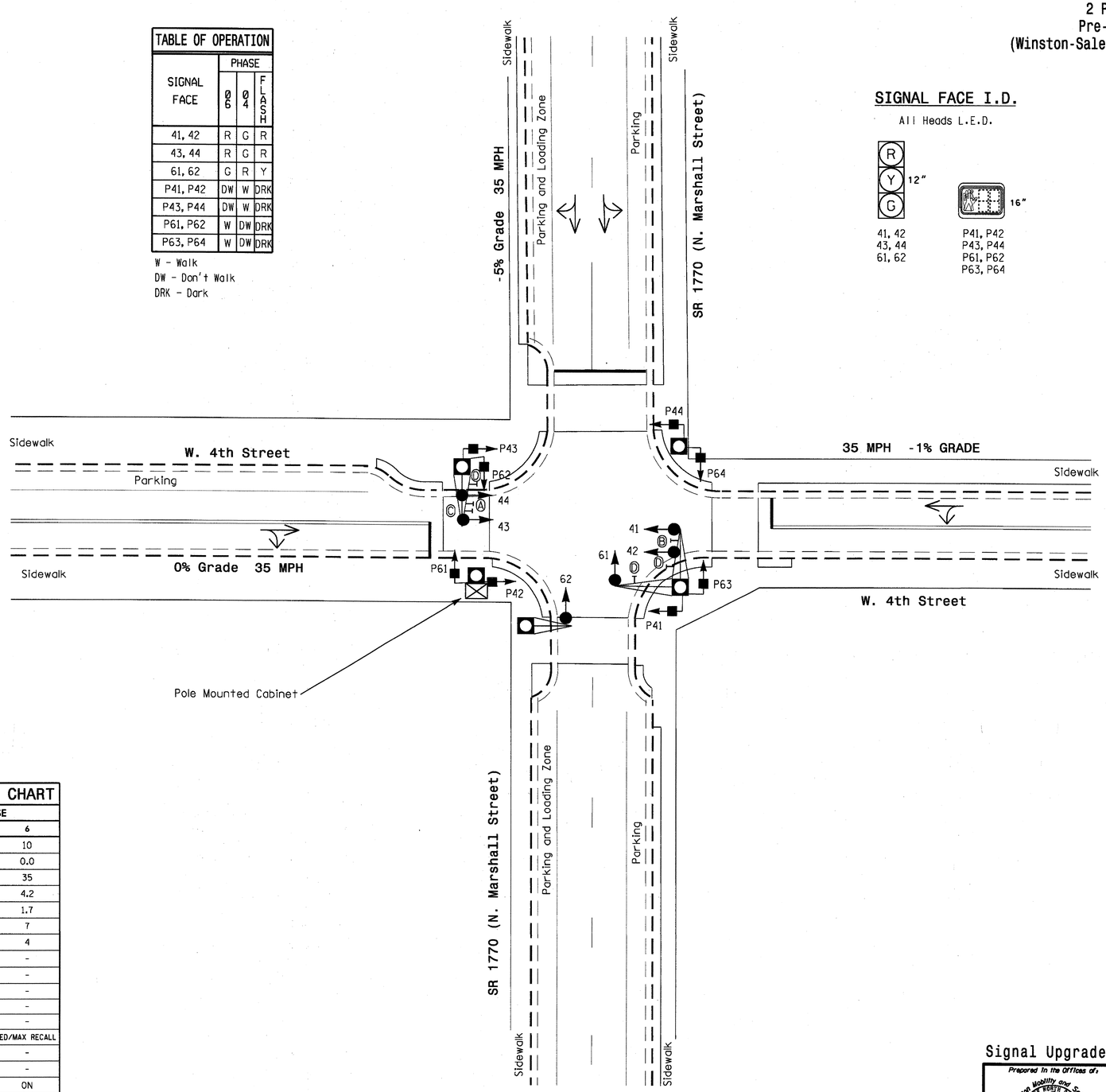
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø6	PHASE Ø4	PHASE FLASH
41, 42	R	G	R
43, 44	R	G	R
61, 62	G	R	Y
P41, P42	DW	W	DRK
P43, P44	DW	W	DRK
P61, P62	W	DW	DRK
P63, P64	W	DW	DRK

W - Walk
DW - Don't Walk
DRK - Dark

2 Phase
Pre-Timed
(Winston-Salem Signal System)



SIGNAL FACE I.D.

All Heads L.E.D.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
Ⓐ	Left "ONE WAY" Sign (R6-1L)	Ⓐ
Ⓑ	Right "ONE WAY" Sign (R6-1R)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2) w/ Times	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

OASIS 2070L TIMING CHART		
FEATURE	PHASE 4	PHASE 6
Min Green 1 *	7	10
Extension 1 *	0.0	0.0
Max Green 1 *	20	35
Yellow Clearance	3.9	4.2
Red Clearance	1.9	1.7
Walk 1 *	7	7
Don't Walk 1	7	4
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	PED/MAX RECALL	PED/MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1770 (N. Marshall Street)
at
W. 4th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	August 2011	REVIEWED BY:	R. Hough
PREPARED BY:	M.Bazzarie	REVIEWED BY:	

REVISIONS | INIT. | DATE

SCALE 0 20 1'=20'

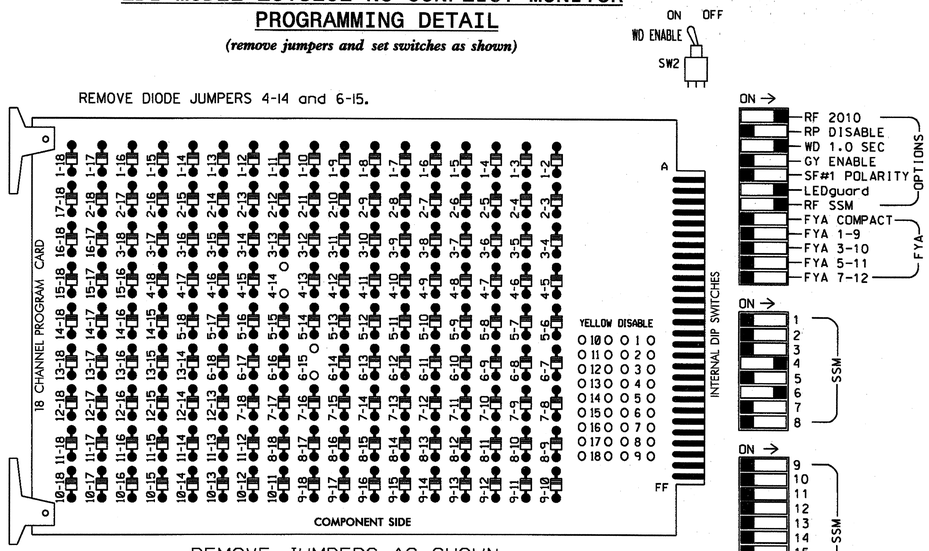
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
12/19/11
SIGNATURE DATE
SIG. INVENTORY NO. 09-0110

03-JAN-2013 11:23
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0110\090110_sig_dsn_20111219.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 67

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phases 4 and 6 for 'STARTUP PED CALL'.
5. Program phase 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S6,S8,S9
PHASES USED.....4,6,4 PED,6 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42 43,44	P41,P42 P43,P44	NU	61,62	P61,P62 P63,P64	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋						104			119			
🚶						106			121			

NU = Not Used

✱ Denotes install load resistor. See load resistor installation detail this sheet.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
"I" L														ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0110
DESIGNED: August 2011
SEALED: 12-19-11
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 1770 (N. Marshall Street)
at
W. 4th Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2011 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

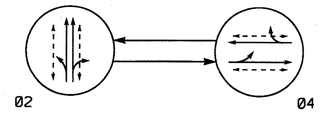
John Rowe 12-19-11
SIGNATURE DATE

SIG. INVENTORY NO. 09-0110

19-DEC-2011 14:07
S:\#TSS\SI#ITS Signals\Workgroups\Sig Mon\Peterson\#09010_smle1e_xxx.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 68

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2	PHASE Ø4	FLASH
21, 22	G	R	Y
41, 42	R	G	R
43, 44	R	G	R
P21, P22	W	DW	DRK
P23, P24	W	DW	DRK
P41, P42	DW	W	DRK
P43, P44	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

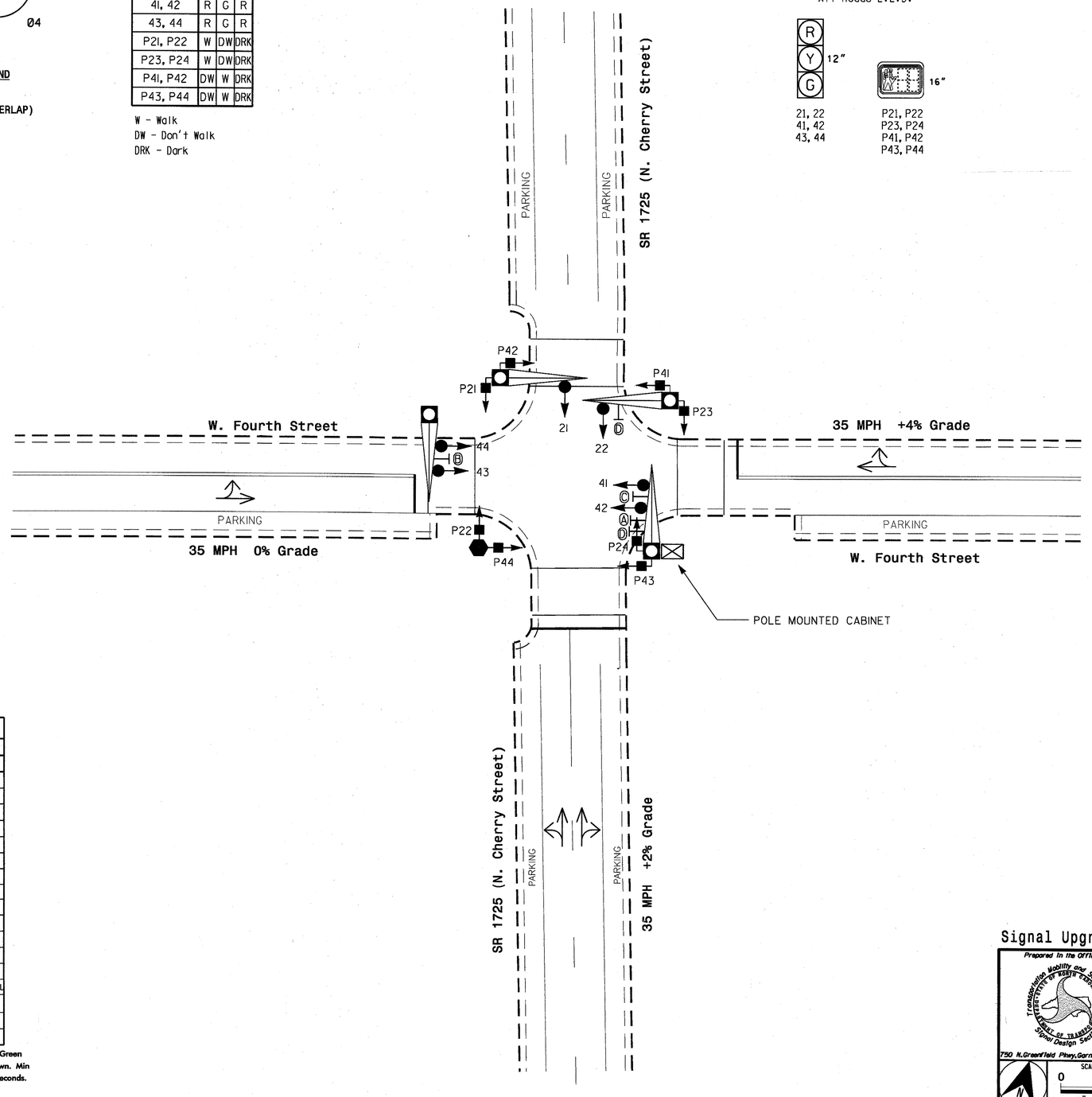
21, 22
41, 42
43, 44

P21, P22
P23, P24
P41, P42
P43, P44

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
	Pedestrian Signal Head With Push Button & Sign	
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
○	Metal Pole with Mastarm	○
⬡	Signal Pedestal	⬢
Ⓐ	Left "ONE WAY" Sign (R6-1L)	Ⓐ
Ⓑ	Right "ONE WAY" Sign (R6-1R)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2) w/ Times	Ⓒ

Ⓓ Street Name Sign (D3-1) Ⓓ

OASIS 2070L TIMING CHART		
FEATURE	PHASE 2	PHASE 4
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	35	25
Yellow Clearance	3.7	3.8
Red Clearance	1.6	1.8
Red Revert	2.0	2.0
Walk 1 *	7	7
Don't Walk 1	4	5
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED RECALL	MAX/PED RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725 (N. Cherry Street)
at
W. Fourth Street

Division 9 Forsyth County Winston-Salem
PLAN DATE: July 2011 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

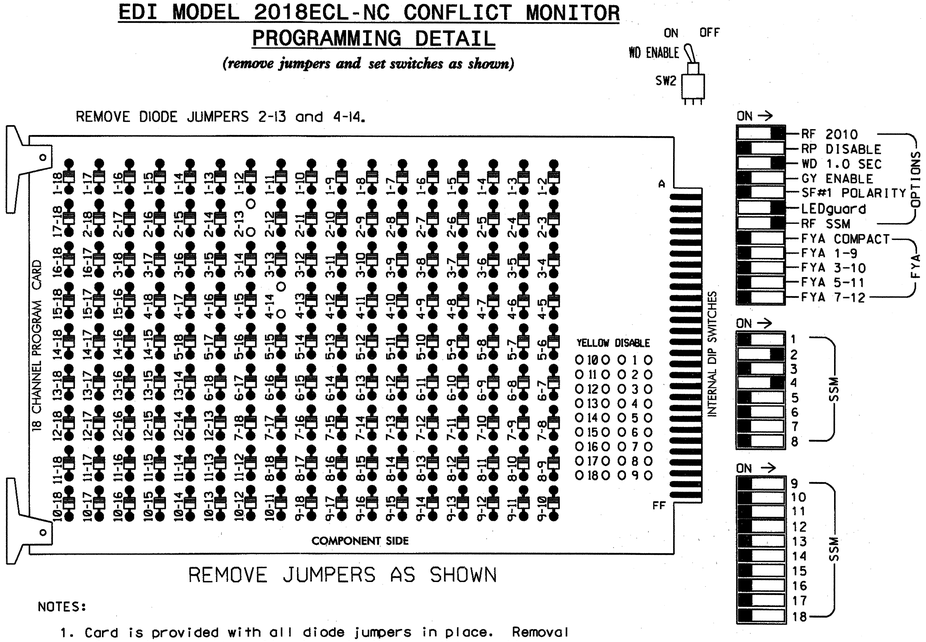
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER
ROBERT J. ZIEMBA
SIGNATURE 12/19/11 DATE
SIG. INVENTORY NO. 09-0111

25-APR-2012 14:33
S:#ITSASU#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0111#090111_sig_dsn_20111219.dgn

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 69

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phases 2 and 4 for 'STARTUP PED CALL'.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6
PHASES USED.....2,4,2 PED,4 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21,P22 P23,P24	NU	41,42 43,44	P41,P42 P43'P44	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
			113			104						
			115			106						

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
L	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0111
DESIGNED: July 2011
SEALED: 12-19-11
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (N. Cherry Street) at W. Fourth Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY: JTR
PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

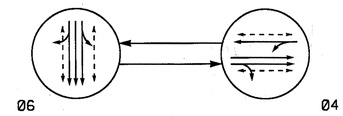
John T. Rowe Jr. 12-19-11
SIGNATURE DATE

SIG. INVENTORY NO. 09-0111

19-DEC-2011 14:09
S:\ITS&SU\ITS Signals\Workgroups\Sig Man\Peterson\090111_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 70

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

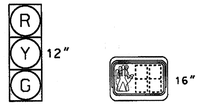
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø6	PHASE Ø4	PHASE FLASH
41, 42	R	G	R
43, 44	R	G	R
61, 62	G	R	Y
P41, P42	DW	W	DRK
P43, P44	DW	W	DRK
P61, P62	W	DW	DRK
P63, P64	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



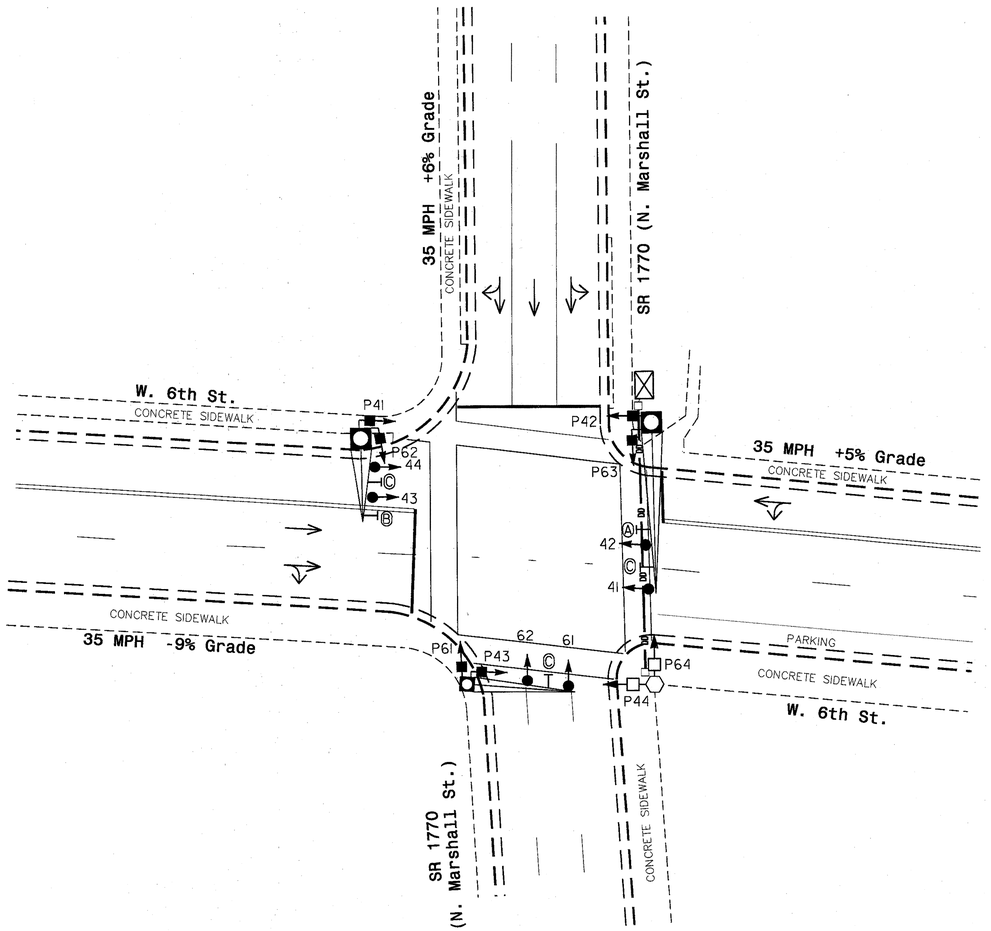
41, 42
43, 44
61, 62

P41, P42
P43, P44
P61, P62
P63, P64

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. New pedestrian signal heads P44 and P64 shall be black in color with black visors.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Signal Pedestal	
DD	Directional Drill	N/A
Ⓐ	Right "ONE WAY" Sign (R6-1R)	Ⓐ
Ⓑ	Left "ONE WAY" Sign (R6-1L)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ

OASIS 2070L TIMING CHART

FEATURE	PHASE 4	PHASE 6
Min Green 1 *	7	10
Extension 1 *	0.0	0.0
Max Green 1 *	20	35
Yellow Clearance	4.6	3.5
Red Clearance	1.2	1.3
Red Revert	2.0	2.0
Walk 1 *	4	4
Don't Walk 1	11	13
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED RECALL	MAX/PED RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1770 (N. Marshall Street)
at
W. 6th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	January 2013	PREPARED BY:	Hough
PREPARED BY:	Sterling	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

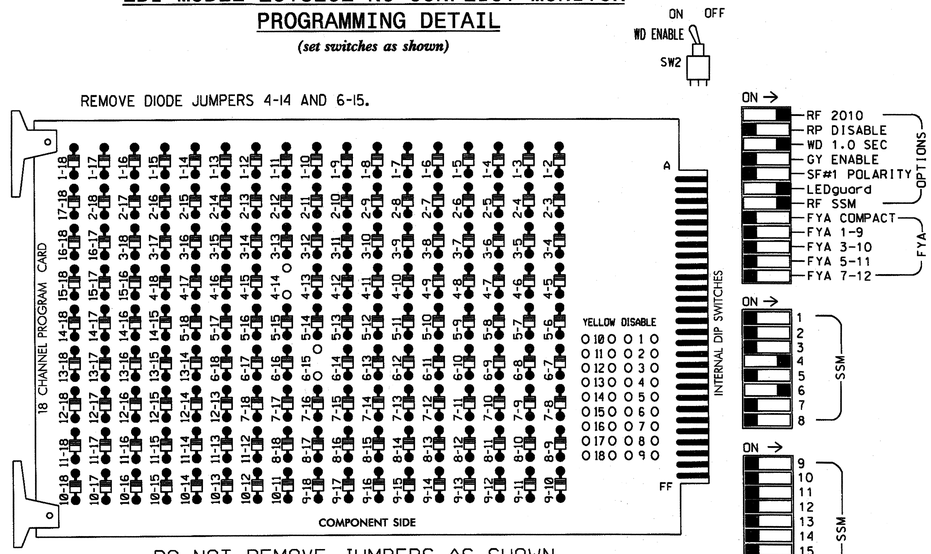
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 1/10/13 DATE
SIG. INVENTORY NO. 09-0121

11-JAN-2013 11:19
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0121\090121_sig_dsn_20130110.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 7I

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phases 4 and 6 for 'STARTUP PED CALL'.
5. Program phase 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S6,S8,S9
PHASES USED.....4,6,4 PED,6 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42 43,44	P41,P42 P43,P44	NU	61,62	P61,P62 P63,P64	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋						104			119			
🚶						106			121			

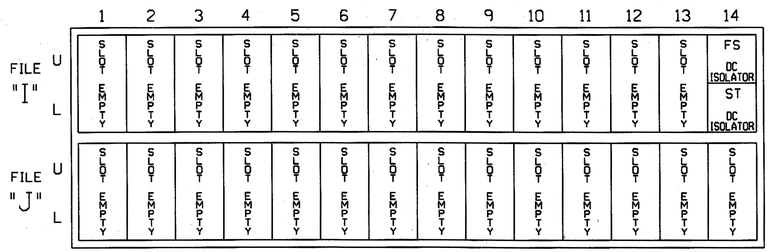
NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0121
DESIGNED: January 2013
SEALED: 1-10-13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1770 (N. Marshall Street) at W. 6th Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: January 2013 | REVIEWED BY: JTK

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

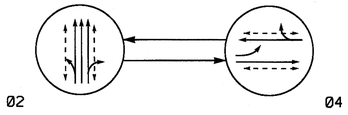
John T. Rowe 1-10-13
SIGNATURE DATE

SIG. INVENTORY NO. 09-0121

10-JAN-2013 13:23
S:#ITSSGNLS\Signals\Workgroups\Sig Mgmt\Peterson\#09121_smple_20111215.dgn
Peterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 72

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

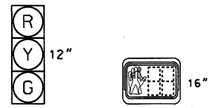
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02	PHASE 04	FLASH
21, 22	G	R	Y
41, 42, 43, 44	R	G	R
P21, P22	W	DW	DRK
P23, P24	W	DW	DRK
P41, P42	DW	W	DRK
P43, P44	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



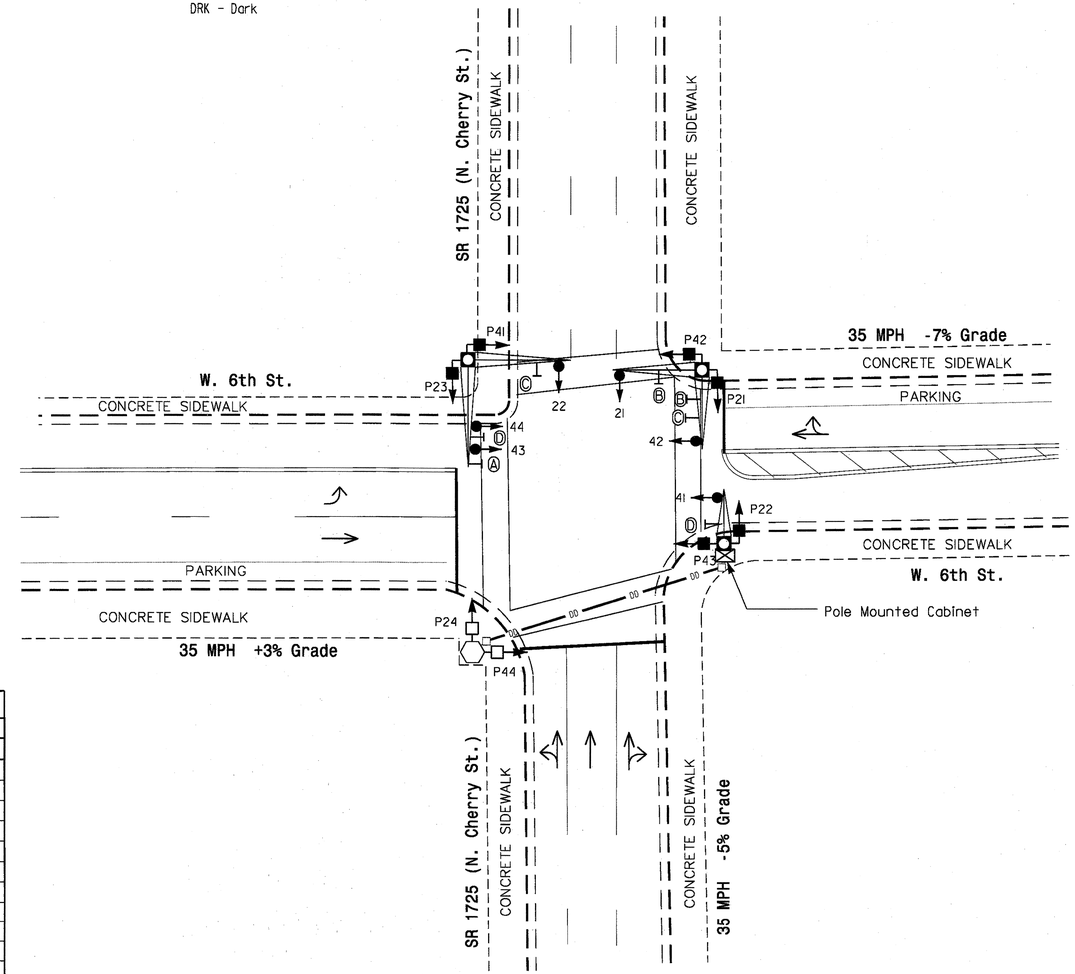
21, 22
41, 42, 43, 44

P21, P22
P23, P24
P41, P42
P43, P44

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. New pedestrian signal heads P24 and P44 shall be black in color with black visors.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Signal Pedestal	
	Directional Drill	N/A
Ⓐ	Right "ONE WAY" Sign (R6-1R)	Ⓐ
Ⓑ	Left "ONE WAY" Sign (R6-1L)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

OASIS 2070L TIMING CHART		
FEATURE	PHASE 2	PHASE 4
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	30	25
Yellow Clearance	4.1	4.4
Red Clearance	1.4	1.2
Red Revert	2.0	2.0
Walk 1 *	7	7
Don't Walk 1	12	9
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED RECALL	MAX/PED RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (N. Cherry Street)
at
W. 6th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	January 2013	PREPARED BY:	Hough
PREPARED BY:	Sterling	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

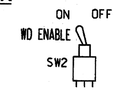
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE DATE 1/10/13
SIG. INVENTORY NO. 09-0122

11-JAN-2013 11:18
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0122\090122_sig_dsn_20130110.dgn
rziemba

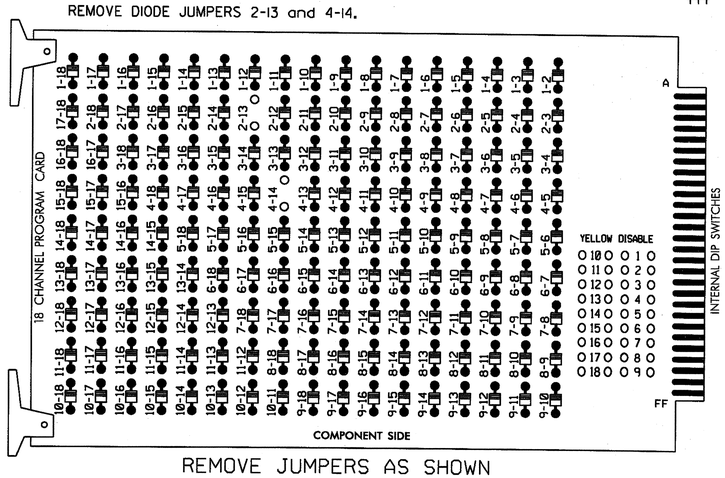
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 73

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

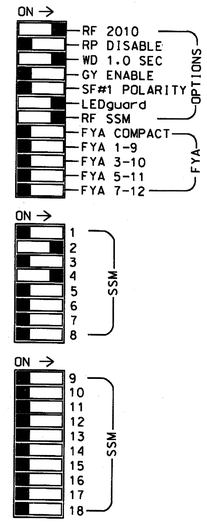
(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-13 and 4-14.



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phases 2 and 4 for 'STARTUP PED CALL'.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6
PHASES USED.....2,2PED,4,4PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21,P22 P23,P24	NU	41,42 43,44	P41,P42 P43,P44	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
			113			104						
			115			106						

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
L	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0122
DESIGNED: January 2013
SEALED: 1/10/13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (N. Cherry Street) at W. 6th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	January 2013	REVIEWED BY:	JTR
PREPARED BY:	S. Armstrong	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

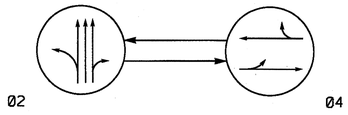
John T. Rowe 1-10-13
SIGNATURE DATE

SIG. INVENTORY NO. 09-0122

10-JAN-2013 14:02
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Armstrong*090122_sm_ele_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 74

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

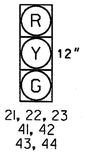
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02	PHASE 04	PHASE FLASH
21, 22, 23	G	R	Y
41, 42	R	G	R
43, 44	R	G	R

SIGNAL FACE I.D.

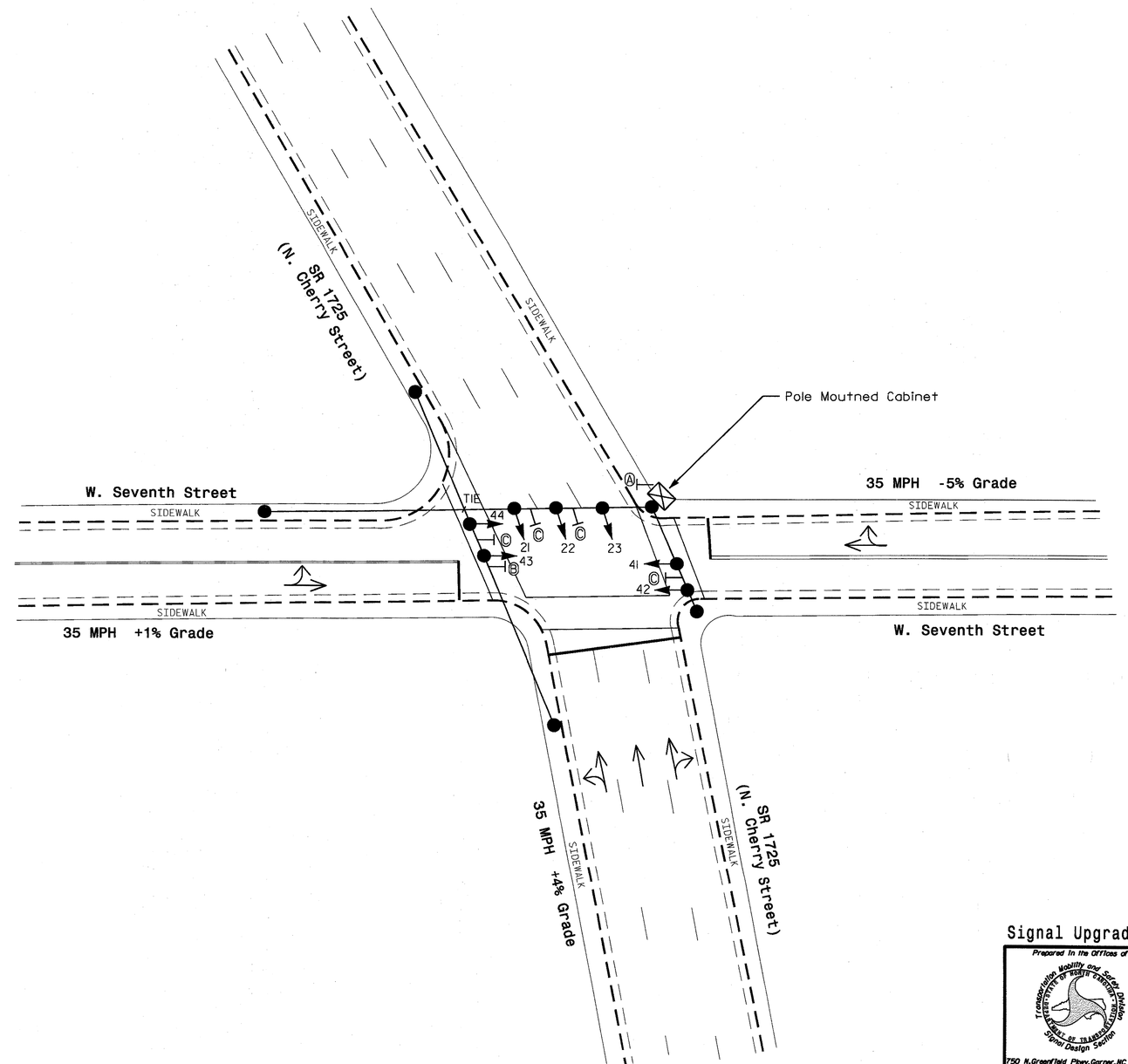
All Heads L.E.D.



2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left "ONE WAY" Sign (R6-1L)	Ⓐ
Ⓑ	Right "ONE WAY" Sign (R6-1R)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	40	15
Yellow Clearance	3.6	4.2
Red Clearance	1.0	1.3
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 20
1"=20'

SR 1725 (N. Cherry Street)
at
W. Seventh Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	July 2011	REVIEWED BY:	
PREPARED BY:	C.E. Carter	REVIEWED BY:	

REVISIONS	INIT.	DATE

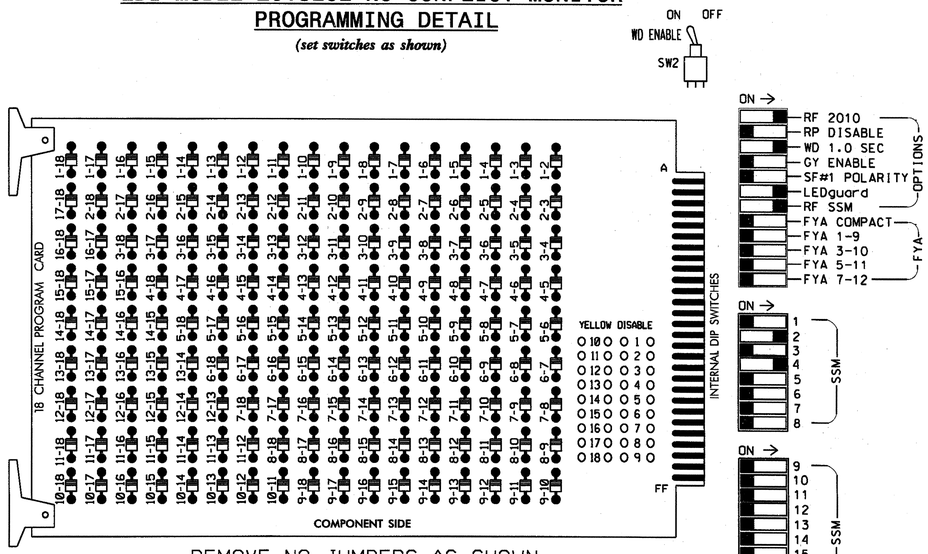
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
12/8/11
SIGNATURE DATE
SIG. INVENTORY NO. 09-0127

11-JUN-2012 13:08
S:*ITS&SU*ITS Signals*Signal Design Section*Central Region*Div 9*C-5224 Winston Salem*Signals*09-0127*090127_sig_dsn_20111208.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 7S

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



REMOVE NO JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phase 2 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

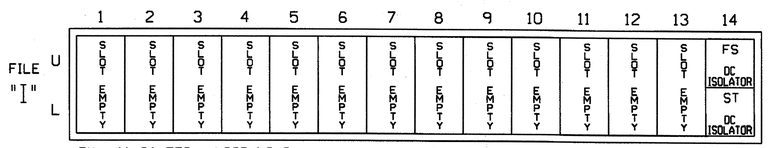
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5
PHASES USED.....2,4
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22 23	NU	NU	41,42 43,44	NU	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: I2L

FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0127
DESIGNED: July 2011
SEALED: 12-8-11
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1725 (N. Cherry Street)
at
W. Seventh Street

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 12-07-11 | REVIEWED BY: T. Jay

PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

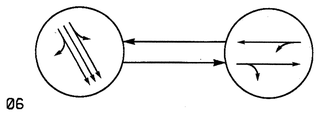
SIGNATURE | DATE 12/9/11

SIG. INVENTORY NO. 09-0127

09-DEC-2011 09:09
S:\#ITS&S\#ITS Signals\#Workgroups\#Sig Mans\#spaulding\#in-progress\#090127_sm_ele_2011xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 76

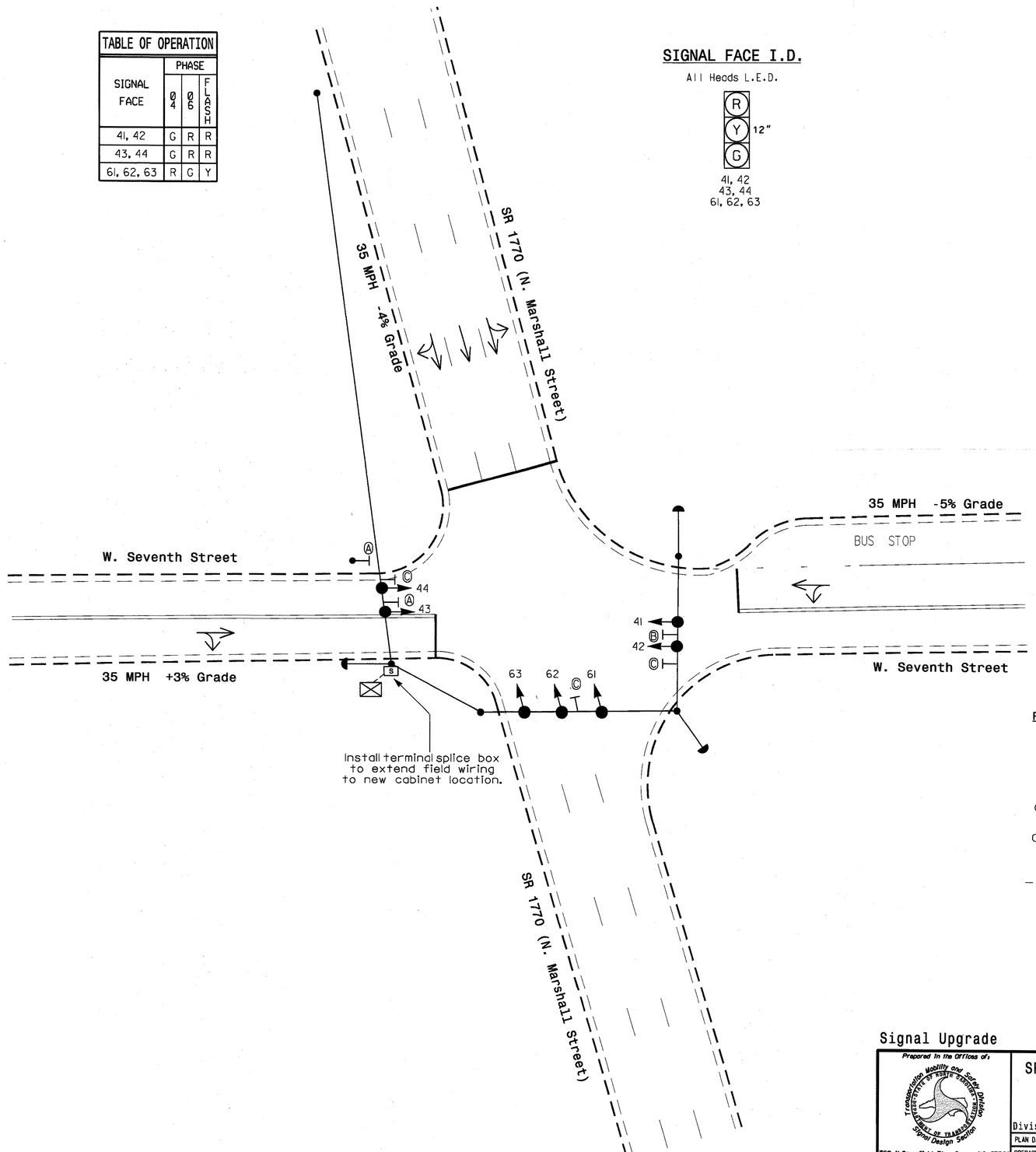
PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 04	PHASE 06	FLASH
41, 42	G	R	R
43, 44	G	R	R
61, 62, 63	R	G	Y



SIGNAL FACE I.D.

All Heads L.E.D.

41, 42
43, 44
61, 62, 63

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	Left "ONE WAY" Sign (R6-1L)	A
B	Right "ONE WAY" Sign (R6-1R)	B
C	Street Name Sign (D3-1)	C

OASIS 2070L TIMING CHART

FEATURE	PHASE 4	PHASE 6
Min Green 1 *	7	10
Extension 1 *	0.0	0.0
Max Green 1 *	15	40
Yellow Clearance	4.2	4.1
Red Clearance	1.9	1.3
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1770 (N. Marshall Street)
at
W. Seventh Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: July 2011 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 12/5/12 DATE

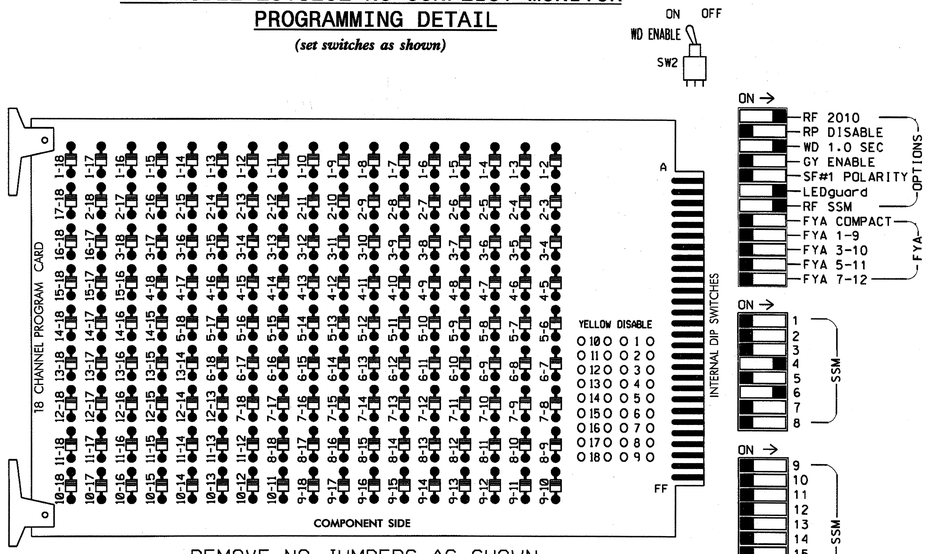
SIG. INVENTORY NO. 09-0128

05-DEC-2012 17:36
S:\Traffic\Signals\Signal Design Section\Control Regions\Div 9\C-5224 Winston Salem\Signals\09-0128\090128_sig_dsn_20111208.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.77

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



REMOVE NO JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phase 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

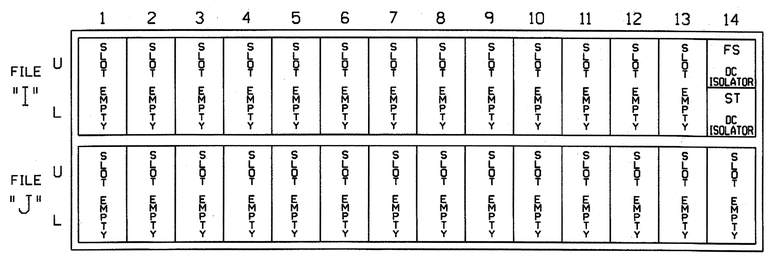
CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5.S8.
PHASES USED.....4,6.
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42 43,44	NU	NU	61,62 63	NU	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

INPUT FILE POSITION LAYOUT

(front view)



INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0128
DESIGNED: July 2011
SEALED: 12-5-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1770 (N. Marshall Street)
at
W. Seventh Street

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 12-07-11 | REVIEWED BY: T. Joyner
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

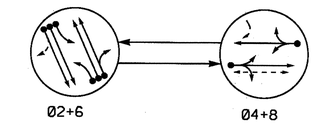
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 12/12/12 DATE

SIG. INVENTORY NO. 09-0128

12-DEC-2012 09:09
S:\TS&S\TS Signals\Workgroups\Sig Mon\Spaulding\In-progress\090128_sm_ele_2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 78

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

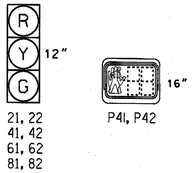
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

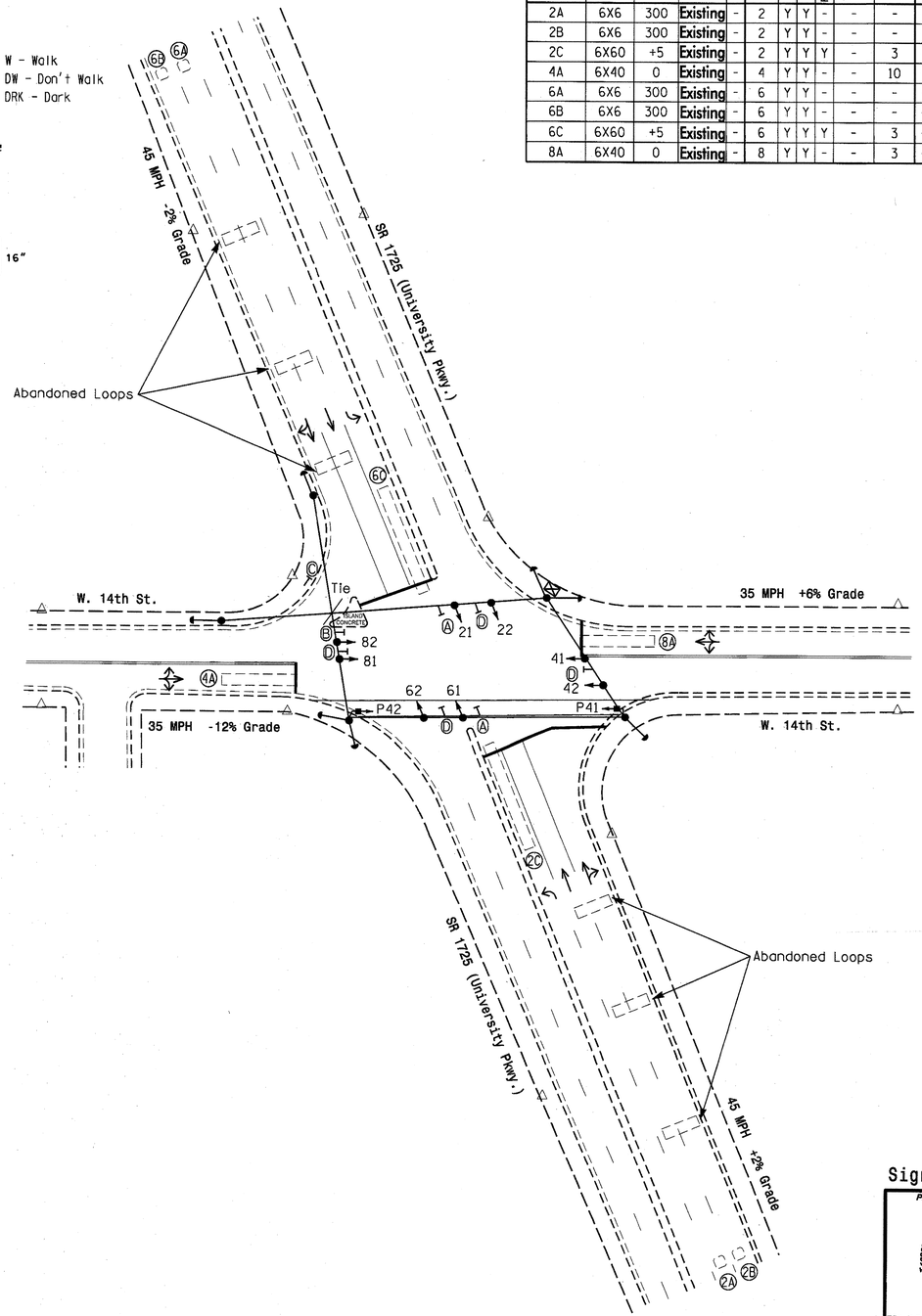
TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	PHASE FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P41, P42	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	Existing	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	Existing	-	2	Y	Y	-	-	-	-	Y
2C	6X60	+5	Existing	-	2	Y	Y	Y	-	3	-	Y
4A	6X40	0	Existing	-	4	Y	Y	-	-	10	-	Y
6A	6X6	300	Existing	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	Existing	-	6	Y	Y	-	-	-	-	Y
6C	6X60	+5	Existing	-	6	Y	Y	Y	-	3	-	Y
8A	6X40	0	Existing	-	8	Y	Y	-	-	3	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Existing "Left Arrow Only" signs (R3-5L) may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)
(B)	"NO TURN ON RED" Sign (R10-11)	(B)
(C)	"YIELD" Sign (R1-2)	(C)
(D)	Street Name Sign (D3-1)	(D)

OASIS 2070L TIMING CHART				
	PHASE			
FEATURE	2	4	6	8
Min Green 1 *	12	7	12	7
Extension 1 *	6.0	2.0	6.0	2.0
Max Green 1 *	90	25	90	25
Yellow Clearance	4.3	5.0	4.7	3.5
Red Clearance	1.5	2.9	1.2	2.3
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	4	-	-
Don't Walk 1	-	39	-	-
Seconds Per Actuation *	1.5	-	1.5	-
Max Variable Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 1725 (University Pkwy.)
at
W. 14th Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2011 | PREPARED BY: Monif
PREPARED BY: Sterling | REVIEWED BY:

REVISIONS	INIT.	DATE

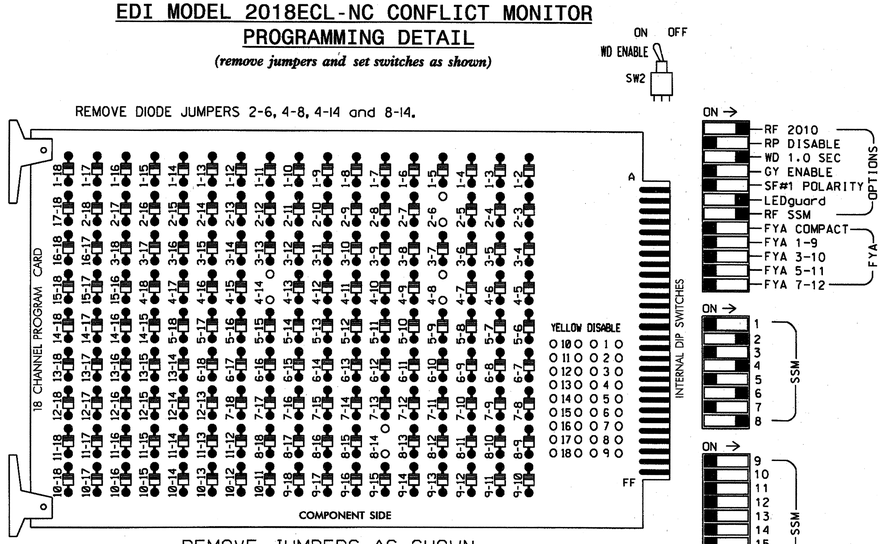
SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. STERLING
12/21/12
SIGNATURE | DATE
SIG. INVENTORY NO. 09-0129

21-DEC-2012 14:18
S:\#ITS&SU#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0129#09O129_sig_den_20121221.dgn
rzelenko

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.79

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL
(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phase 4 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash.
8. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S6,S8,S11
PHASES USED.....2,4,4 PED,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	P41, P42	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		
✋						104												
🚶						106												

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT
(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A	Ø2 2C	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	SLOT EMPTY	FS DC ISOLATOR
	L		Ø2 2B	NOT USED			NOT USED						Ø4 PED DC ISOLATOR		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	Ø6 6C	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B	NOT USED			NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y	Y		3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0129
DESIGNED: October 2011
SEALED: 12/21/12
REVISED: N/A

Electrical Design

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725 (University Pkwy.)
at
W. 14th Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: January 2013 | REVIEWED BY: T. Jay
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 022013
ENGINEER
GEORGE C. BROWN

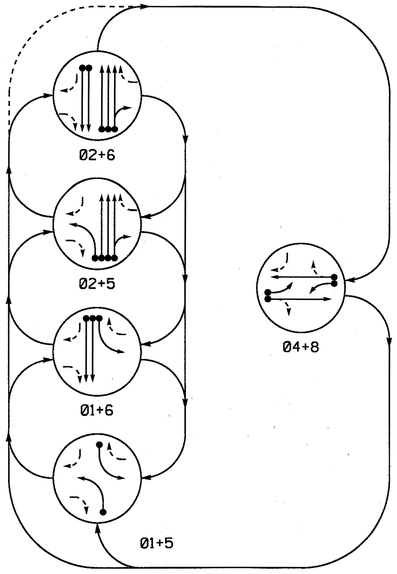
SIGNATURE 1/8/13 DATE

SIG. INVENTORY NO. 09-0129

03-JAN-2013 07:40
S:\#TSASIGWITS Signals\Workgroups\Sig Mgmt\Strickland\SIG09129_smlete_20120613.dgn
user=cstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 80

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

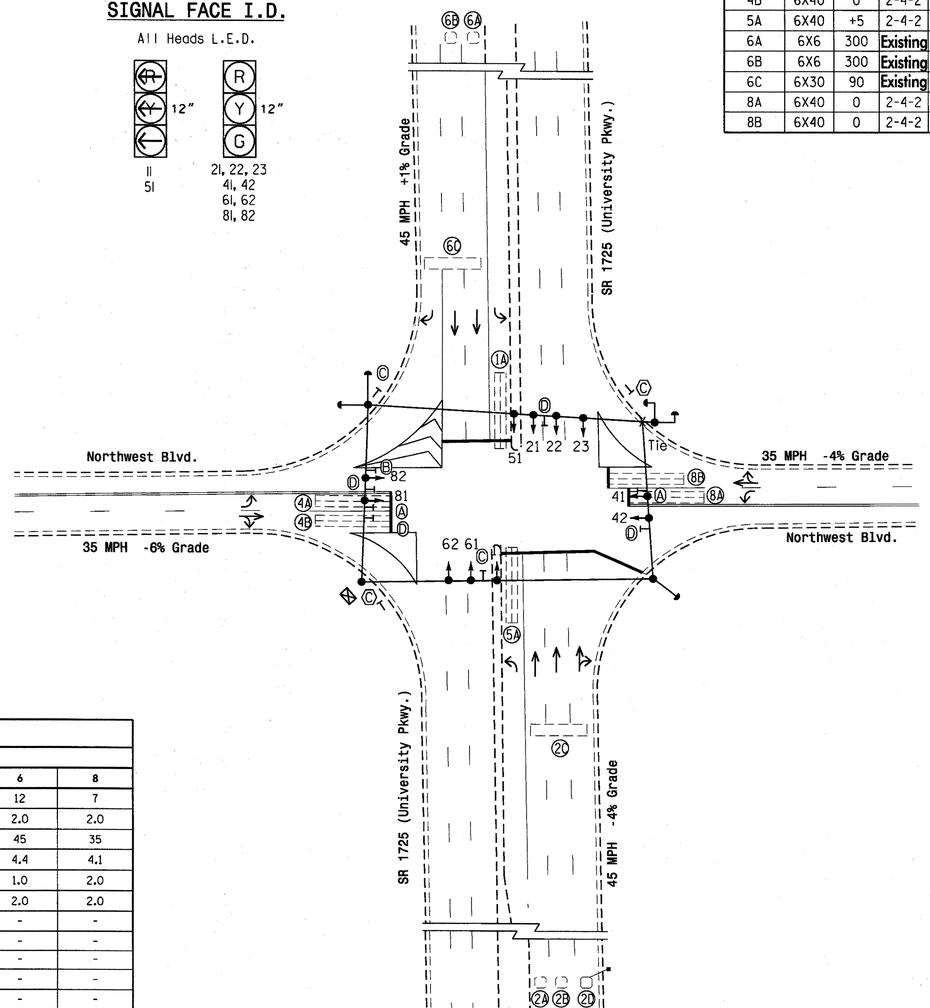
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~
21, 22, 23	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	25	45	35	25	45	35
Yellow Clearance	3.0	4.9	4.3	3.0	4.4	4.1
Red Clearance	2.4	1.0	2.2	2.3	1.0	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A	6X6	300	Existing	-	2	Y	Y	-	1.6	-	-	Y
2B	6X6	300	Existing	-	2	Y	Y	-	1.6	-	-	Y
2C	6X30	90	Existing	-	2	Y	Y	-	-	-	-	Y
2D	6X6	300	5	Y	2	Y	Y	-	1.6	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-		-	-	Y
6A	6X6	300	Existing	-	6	Y	Y	-	1.6	-	-	Y
6B	6X6	300	Existing	-	6	Y	Y	-	1.6	-	-	Y
6C	6X30	90	Existing	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	3	-	Y

5 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Existing lane conrol signs may be removed at the direction of the Engineer.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○↴	Signal Pole with Sidewalk Guy	●↴
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Right Arrow Sign (R3-6R)	Ⓑ
Ⓒ	"YIELD" Sign (R1-2)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 1725 (University Pkwy.)
at
Northwest Blvd.

Division 9 Forsyth County Winston-Salem
PLAN DATE: October 2011 PREPARED BY: Monif
PREPARED BY: Sterling REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

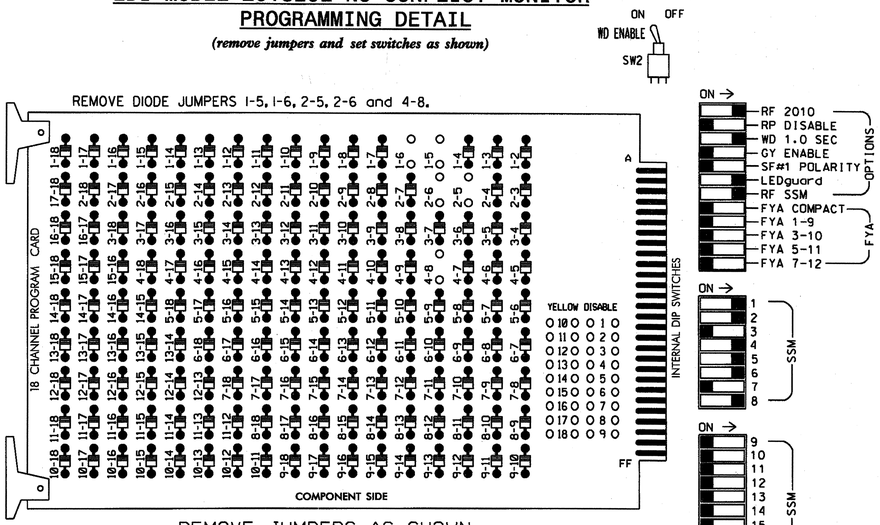
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 8/9/12 DATE
SIG. INVENTORY NO. 09-0132

09-AUG-2012 14:34
S:*ITS&SU*ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0132\090132_sig_dsn_20120809.dgn
Z:\emb3

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 81

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22 23	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	ø2 2C	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	ø2 2B	ø2 2D			ø4 4B								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	ø6 6C	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B	NOT USED			ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y		1.6	
2B	TB2-7,8	I2L	43	5	12	2	Y	Y		1.6	
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
2D	TB2-11,12	I3L	76	38	42	2	Y	Y		1.6	
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y		1.6	
6B	TB3-7,8	J2L	44	6	16	6	Y	Y		1.6	
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			3

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0132
DESIGNED: October 2011
SEALED: 08-09-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725 (University Pkwy.) at Northwest Blvd.

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: August 2012 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

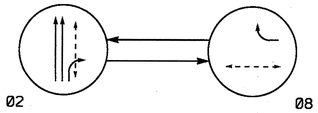
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE
8-13-12 DATE
SIG. INVENTORY NO. 09-0132

10-AUG-2012 09:33
S:\Traffic\Signals\Workgroups\Sig Mon\Peterson\090132_sm_ela_xxx.dgn
Microstation V8
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 82

PHASING DIAGRAM



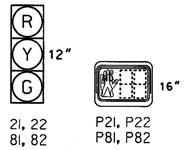
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02	PHASE 08	PHASE FLASH
21, 22	G	R	Y
81, 82	R	G	R
P21, P22	W	DW	DRK
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

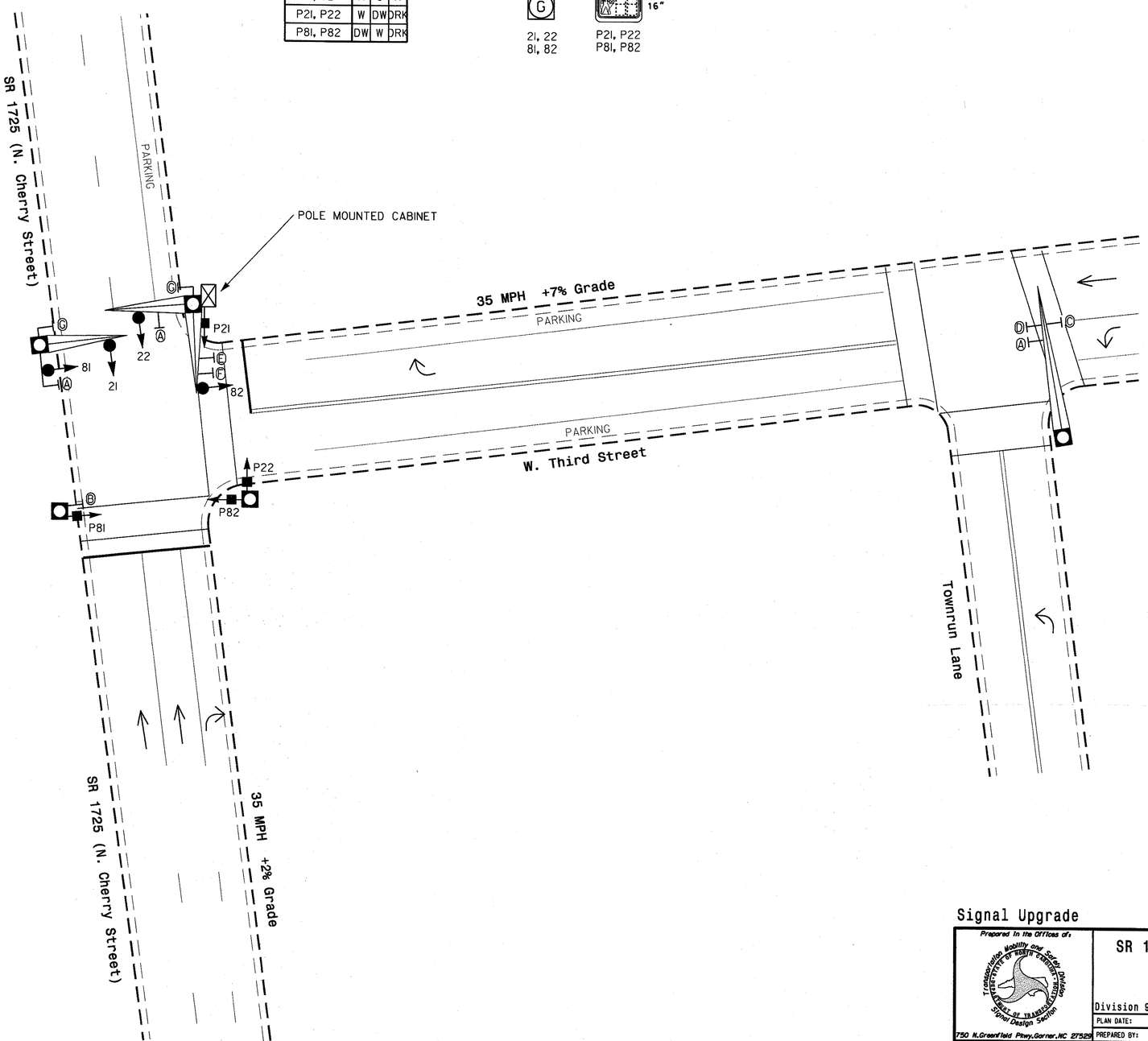
All Heads L.E.D.



2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Metal Light Pole	
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ
Ⓑ	Right "ONE WAY" Arrow Sign (R6-2R)	Ⓑ
Ⓒ	Left Arrow "ONLY" and Through Arrow Sign (R3-8F)	Ⓒ
Ⓓ	"DO NOT ENTER" Sign (R5-1)	Ⓓ
Ⓔ	Right "ONE WAY" Sign (R6-1R)	Ⓔ
Ⓕ	Street Name Sign (D3-1)	Ⓕ
Ⓖ	No Pedestrian Crossing Sign (R9-3)	Ⓖ

OASIS 2070L TIMING CHART		
FEATURE	PHASE 2	PHASE 8
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	35	20
Yellow Clearance	3.7	3.0
Red Clearance	1.3	1.8
Red Revert	2.0	2.0
Walk 1 *	7	7
Don't Walk 1	11	10
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX/PED RECALL	MAX/PED RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 20
1"=20'

SR 1725 (N. Cherry Street)
at
N. Third Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: July 2011	REVIEWED BY:
PREPARED BY: C.E. Carter	REVIEWED BY:

REVISIONS	INIT.	DATE

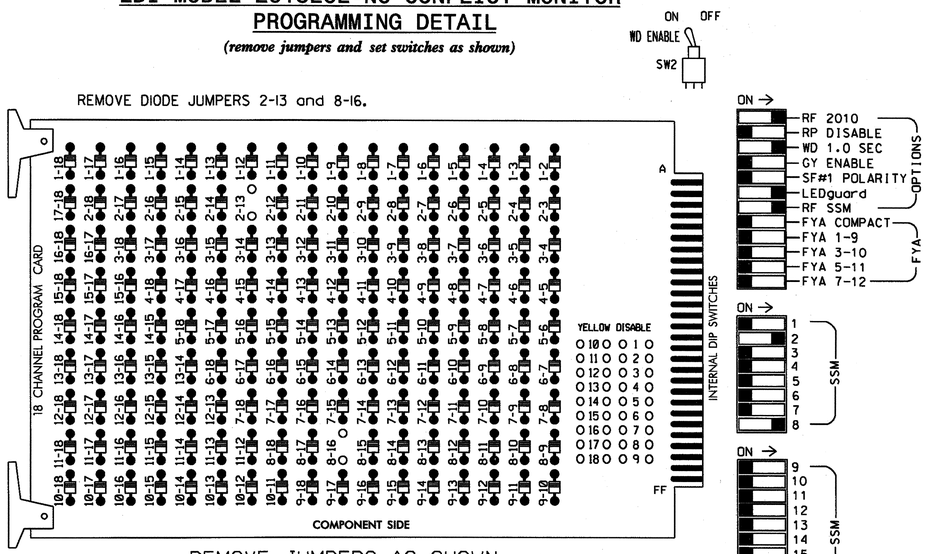
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
12/20/11
SIGNATURE DATE
SIG. INVENTORY NO. 09-0133

25-APR-2012 15:01
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0133\090133_sig_dsn_20111220.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 83

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phases 2 and 8 for 'STARTUP PED CALL'.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S11,S12
PHASES USED.....2,2 PED,8,8 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	NU	NU	NU	NU	NU	NU	81,82	P81, P82
RED		128									107	
YELLOW		129									108	
GREEN		130									109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113									110
🚶			115									112

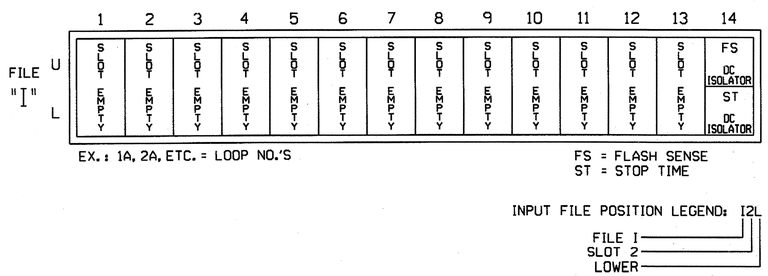
NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0133
DESIGNED: July 2011
SEALED: 12/20/2011
REVISED:

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1725 (N. Cherry Street)
at
N. Third Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2011 | REVIEWED BY: T. Vyas
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

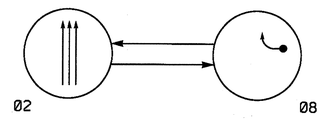
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE DATE 12/23/11
SIG. INVENTORY NO. 09-0133

22-DEC-2011 09:43
S:\TSASU\TS Signals\Workgroups\Sig Mgmt\Strickland\09133_smle_le_xxx.dgn
cstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 84

PHASING DIAGRAM



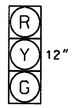
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02	PHASE 08	FLASH
21, 22	G	R	Y
81, 82, 83	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



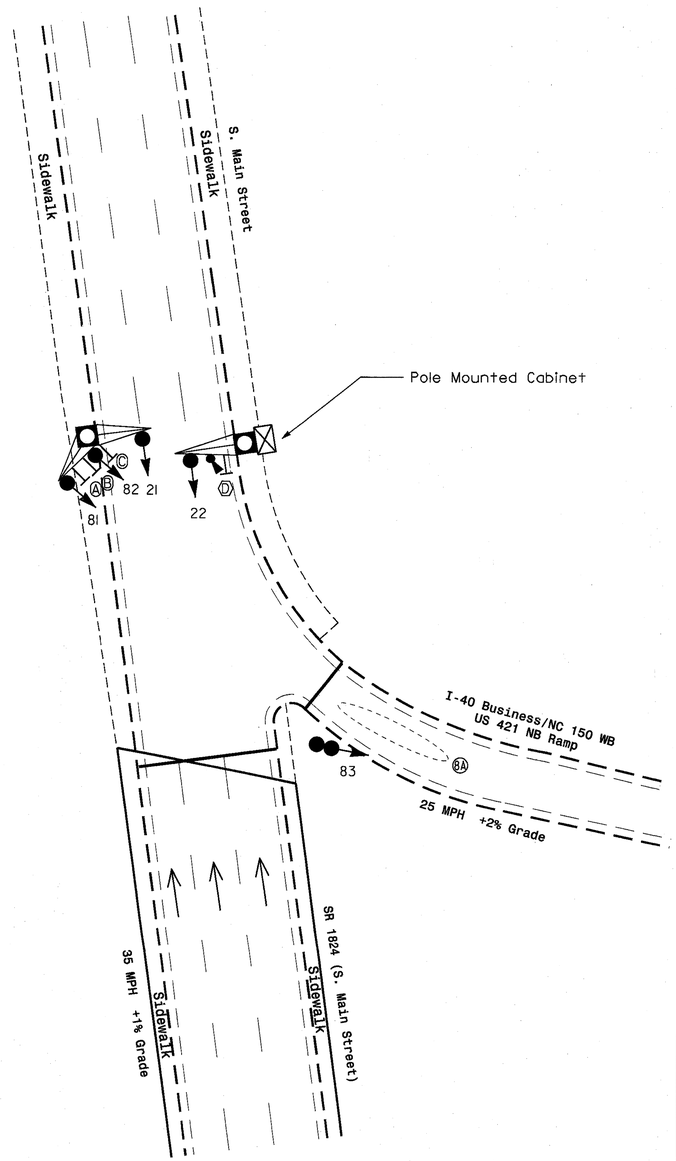
21, 22
81, 82, 83

OASIS 2070L DETECTION ZONE INSTALLATION CHART										
DETECTION ZONES			DETECTOR PROGRAMMING							
ZONE NO.	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
8A	-	+5	8	Y	Y	-	-	15	-	Y

2 Phase Semi-Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Signal Pedestal	
	Out of Pavement Detector	
	Out of Pavement Detection Zone	
A	No Left Turn Sign (R3-2)	A
B	Street Name Sign (D3-1)	B
C	Right "ONE WAY" Sign (R6-2R)	C
D	No Right Turn Sign (R3-1)	D

OASIS 2070L TIMING CHART		
FEATURE	PHASE 2	PHASE 8
Min Green 1 *	4	4
Extension 1 *	2.0	2.0
Max Green 1 *	32	23
Yellow Clearance	3.8	3.0
Red Clearance	1.5	2.4
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	-
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Mobility and Safety Division
Transportation
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1824 (S. Main Street)
at
I-40 Business/NC 150 WB
US 421 NB Exit Ramp

Division 9 Forsyth County Winston-Salem

PLAN DATE: January 2013 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 1/3/13 DATE

SIG. INVENTORY NO. 09-0136

03-JAN-2013 14:49
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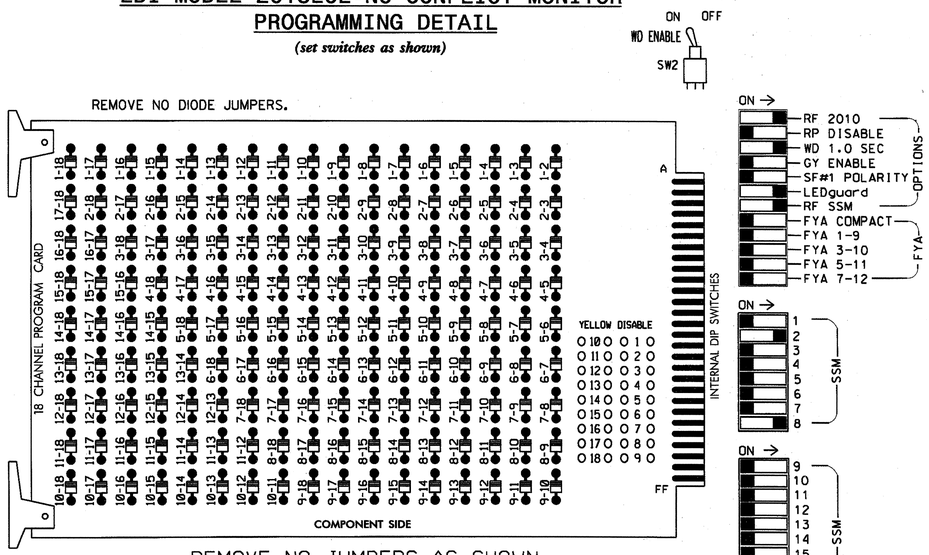
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 85

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL
(set switches as shown)



REMOVE NO JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phase 2 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S11.
PHASES USED.....2,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	NU	81,82 83	NU
RED		128									107	
YELLOW		129									108	
GREEN		130									109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT
(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0136
DESIGNED: January 2013
SEALED: 1-3-13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 1824 (S. Main Street)
at
I-40 Business/ NC 150 WB
US 421 NB Exit Ramp

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 1-4-13 | REVIEWED BY: T. Vann
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
George C Brown 1/7/13
SIGNATURE DATE
SIG. INVENTORY NO. 09-0136

04-JAN-2013 08:49
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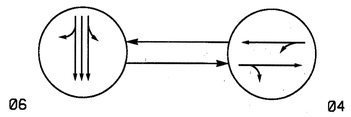
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 86

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

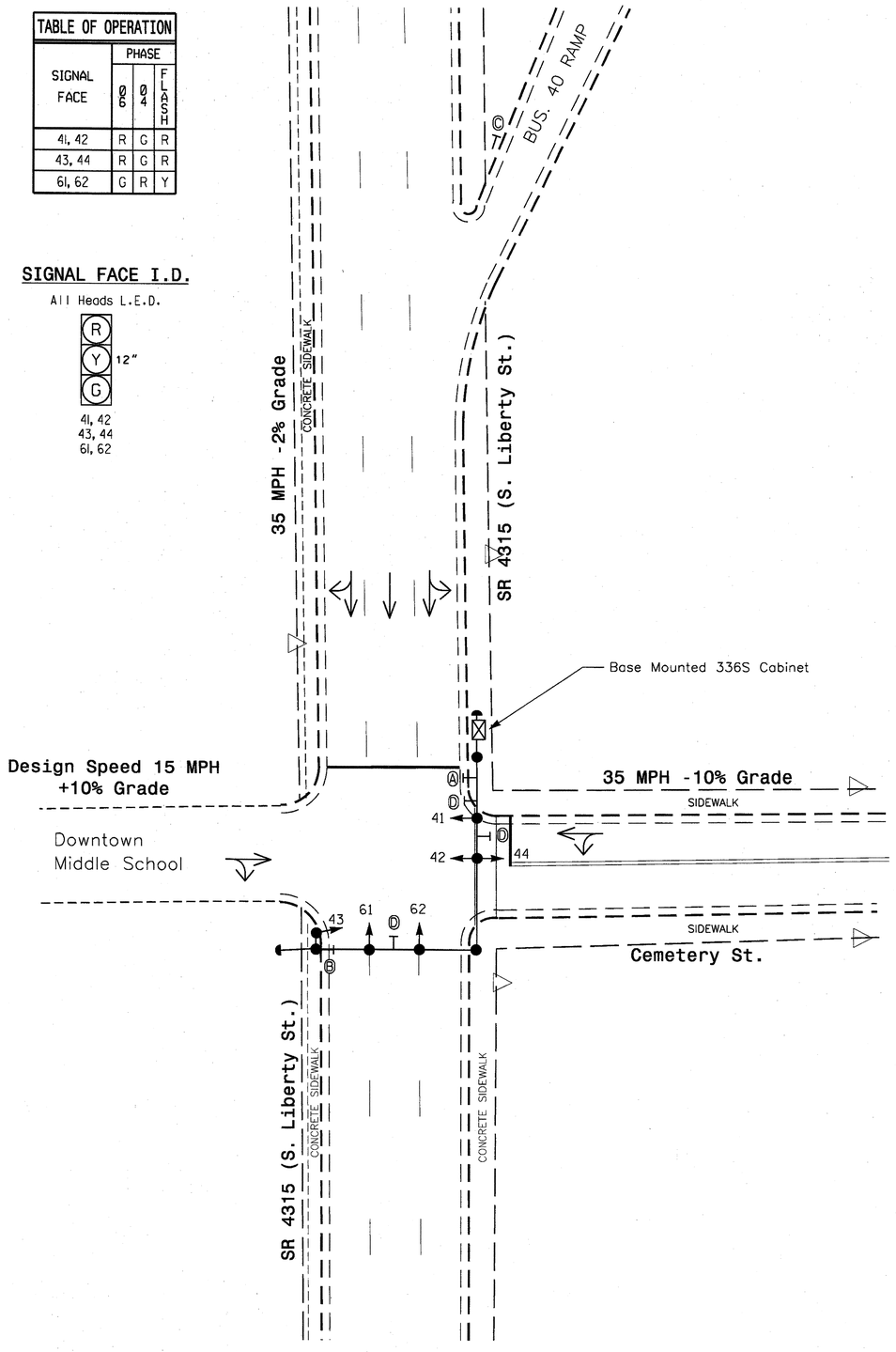
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE		
	06	04	FLASH
41, 42	R	G	R
43, 44	R	G	R
61, 62	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.

41, 42
43, 44
61, 62



2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. In the event of loop placement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	Right "ONE WAY" Sign (R6-1R)	A
B	Left "ONE WAY" Sign (R6-1L)	B
C	"YIELD" Sign (R1-2)	D
D	Street Name Sign (D3-1)	D

OASIS 2070L TIMING CHART

FEATURE	PHASE 4	PHASE 6
Min Green 1 *	7	10
Extension 1 *	0.0	0.0
Max Green 1 *	20	30
Yellow Clearance	4.8	4.0
Red Clearance	1.1	1.0
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 4315 (S. Liberty Street)
at
Cemetery Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: January 2013	REVIEWED BY: Hough
PREPARED BY: Sterling	REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20
1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 1/3/13 DATE
SIG. INVENTORY NO. 09-0137

03-JAN-2013 15:03
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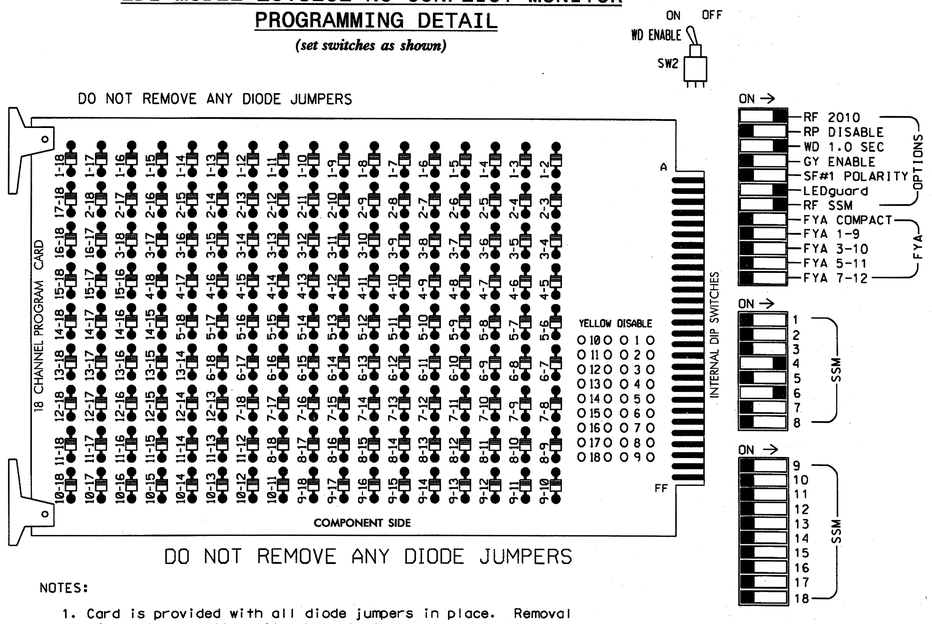
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 87

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



DO NOT REMOVE ANY DIODE JUMPERS

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phase 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S8
PHASES USED.....4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42 43,44	NU	NU	61,62	NU	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
L	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0137
DESIGNED: January 2013
SEALED: 1/3/13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4135 (S. Liberty Street) at Cemetery Street

Division 9 Forsyth County Winston-Salem

PLAN DATE:	January 2013	REVIEWED BY:	JTR
PREPARED BY:	S. Armstrong	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

John T. Rowe Jr. 1-4-13
SIGNATURE DATE

SIG. INVENTORY NO. 09-0137

04-JAN-2013 07:58
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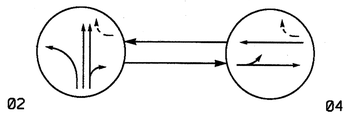
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 88

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

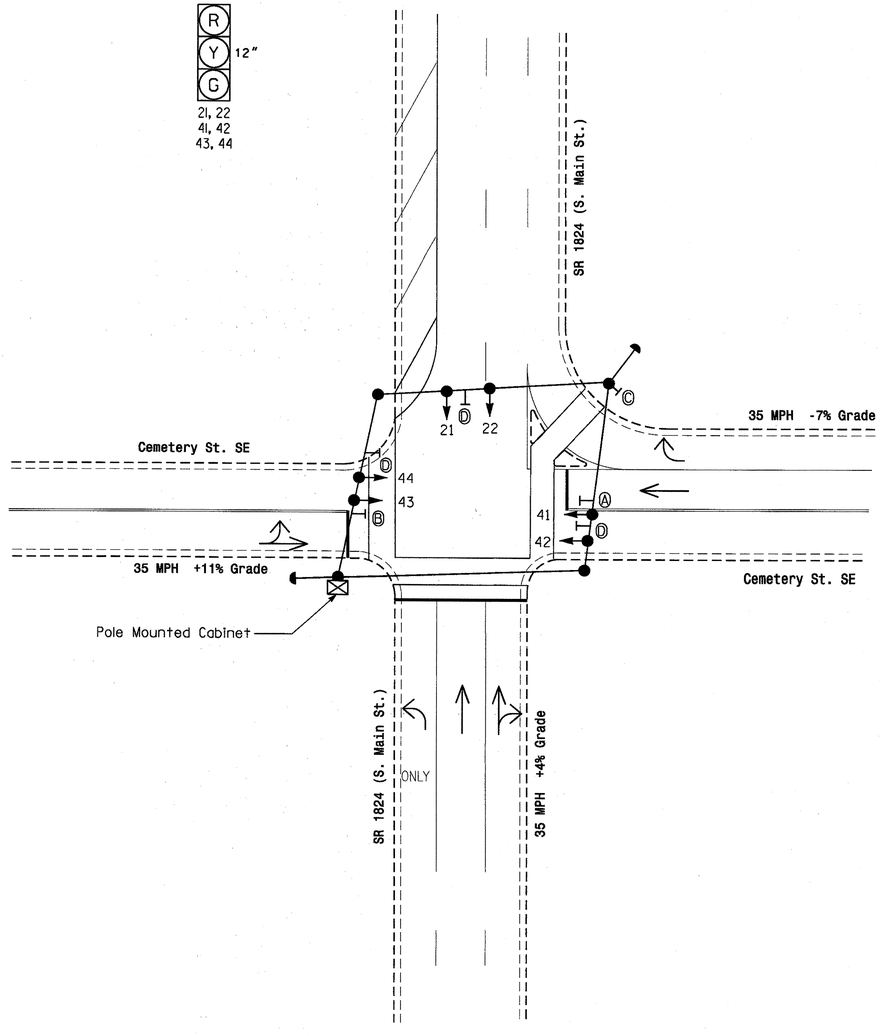
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02	PHASE 04	FLASH
21, 22	G	R	Y
41, 42	R	G	R
43, 44	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
43, 44



OASIS 2070L TIMING CHART		
FEATURE	PHASE 2	PHASE 4
Min Green 1 *	10	7
Extension 1 *	0.0	0.0
Max Green 1 *	30	20
Yellow Clearance	3.6	4.4
Red Clearance	1.0	1.0
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Pavement markings are existing.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	"ONE WAY" Left Sign (R6-1L)	Ⓐ
Ⓑ	"ONE WAY" Right Sign (R6-1R)	Ⓑ
Ⓒ	"YIELD" Sign (R1-2)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1824 (S. Main Street) at Cemetery Street SE

Divisio 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2011 | REVIEWED BY:

PREPARED BY: Sterling | REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT W. ZIEMBA

SIGNATURE | DATE 5/1/12

SIG. INVENTORY NO. 09-0138

17-APR-2012 18:58
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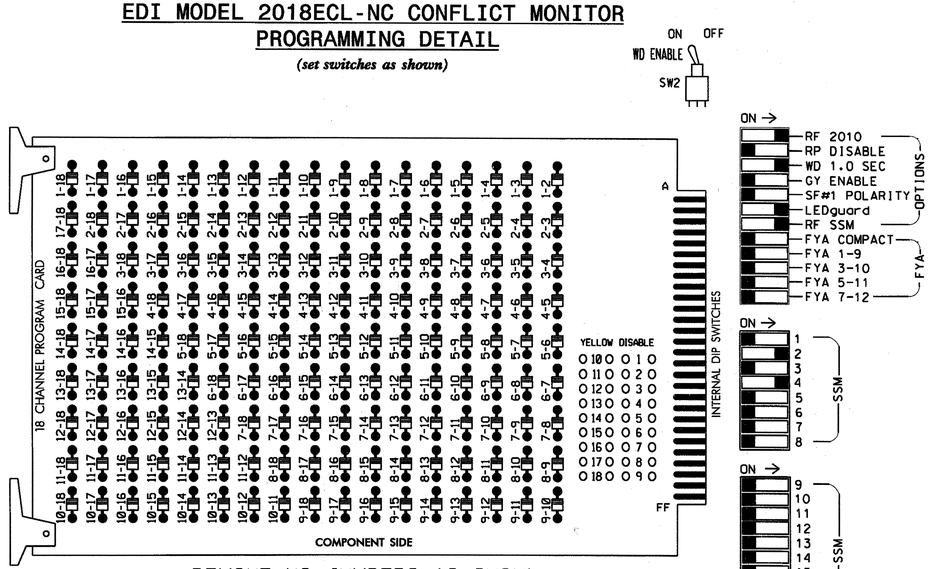
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 89

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



REMOVE NO JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phase 2 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5
PHASES USED.....2,4
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42 43,44	NU	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L														ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0138
DESIGNED: October 2011
SEALED: 1-5-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1824 (S. Main Street)
at
Cemetery Street SE

Division 09 Forsyth County Winston-Salem

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

PLAN DATE: 01-04-12	REVIEWED BY: T. Upchurch
PREPARED BY: D.H. Spaulding	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

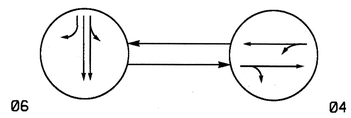
SIGNATURE DATE 1/6/12

SIG. INVENTORY NO. 09-0138

06-JAN-2012 09:38
S:#ITSS&S#ITS Signals#Workgroups#Sig Mgmt#Spaulding#in-progress#090138_sm_ele_2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 9D

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

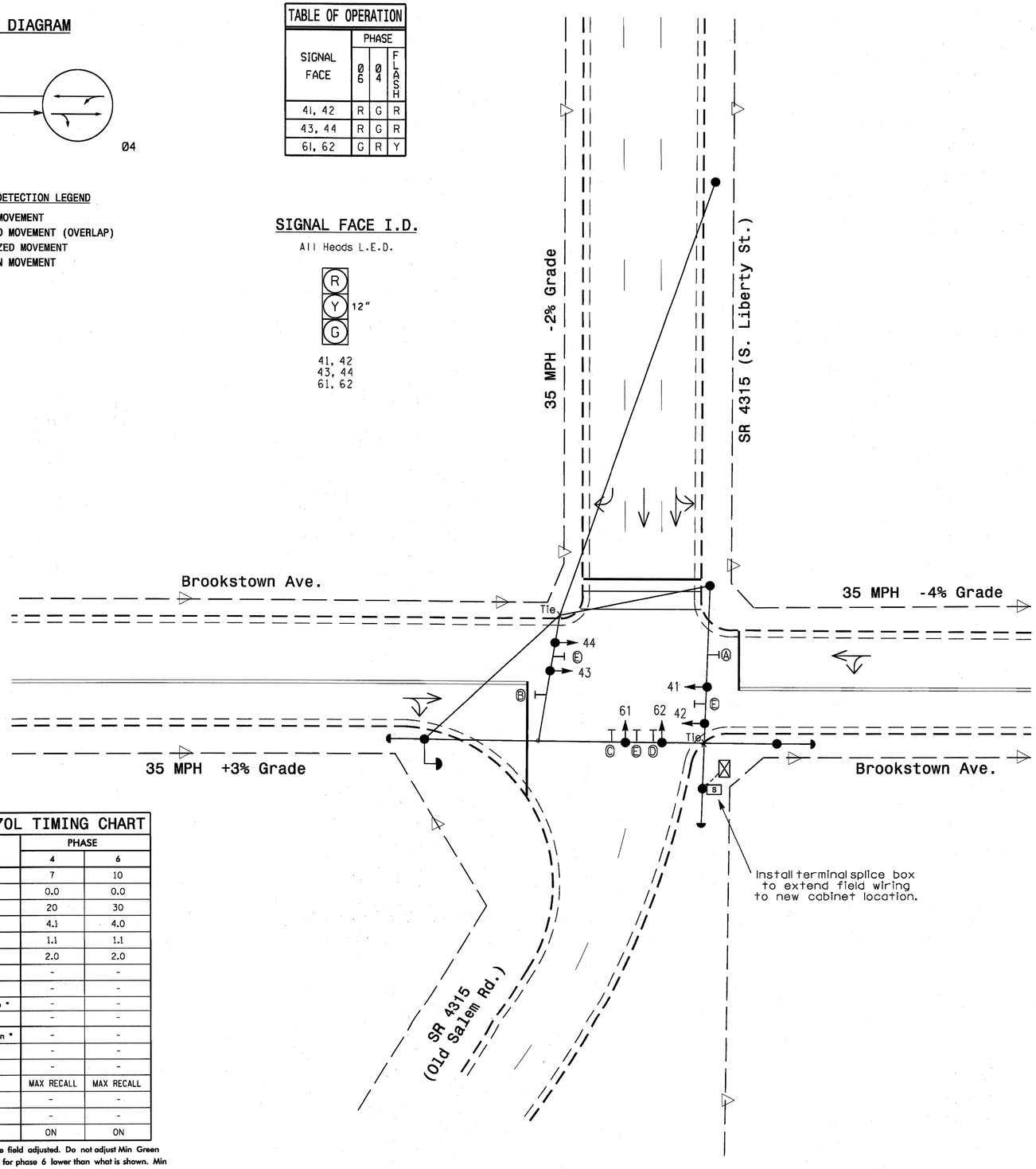
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 06	PHASE 04	FLASH
41, 42	R	G	R
43, 44	R	G	R
61, 62	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.

41, 42
43, 44
61, 62



2 Phase
Pre-Timed
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. In the event of loop placement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	No Right Turn Sign (R3-1)	A
B	No Left Turn Sign (R3-2)	B
C	Right Arrow "ONLY" Sign (R3-5R)	C
D	Through Arrow "ONLY" Sign (R3-5A)	D
E	Street Name Sign (D3-1)	E

OASIS 2070L TIMING CHART		
FEATURE	PHASE 4	PHASE 6
Min Green 1 *	7	10
Extension 1 *	0.0	0.0
Max Green 1 *	20	30
Yellow Clearance	4.1	4.0
Red Clearance	1.1	1.1
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MAX RECALL	MAX RECALL
Vehicle Call Memory	-	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4315
(S. Liberty St./Old Salem Rd.)
at
Brookstown Avenue

Division 9 Forsyth County Winston-Salem

PLAN DATE:	October 2011	REVIEWED BY:
PREPARED BY:	Sterling	REVIEWED BY:

REVISIONS	INIT.	DATE

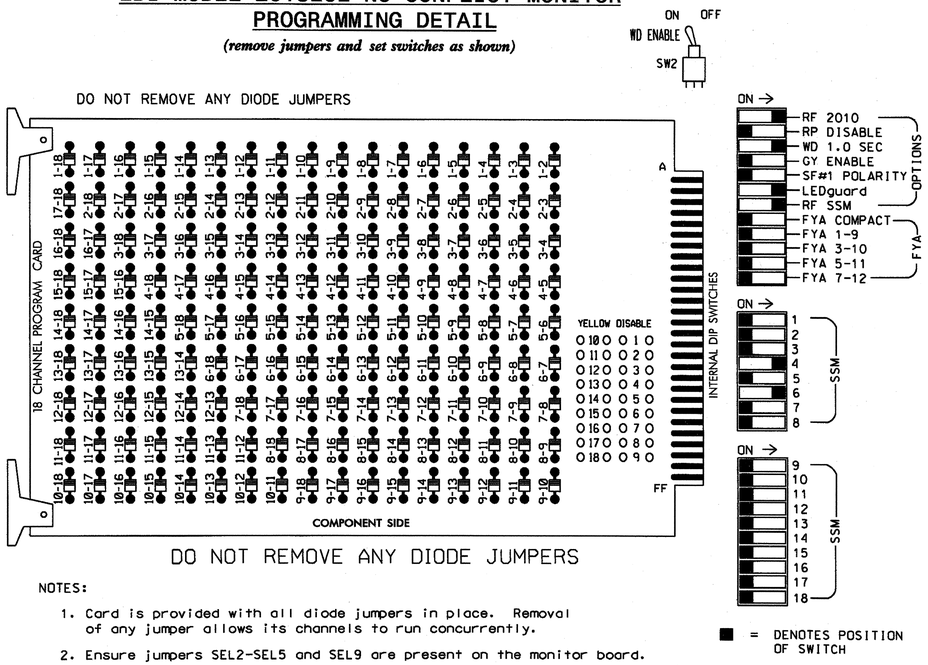
SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE DATE 2/9/12
SIG. INVENTORY NO. 09-0139

05-DEC-2012 17:33
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0139\090139_sig_dsn_20120209.dgn
rziemba

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phase 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S8
PHASES USED.....4,6
OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 9\

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42 43,44	NU	NU	61,62	NU	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS OC ISOLATOR
	L														ST OC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0139
DESIGNED: October 2011
SEALED: 2/9/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4315
(S. Liberty St./Old Salem Rd.)
at
Brookstown Avenue

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: February 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

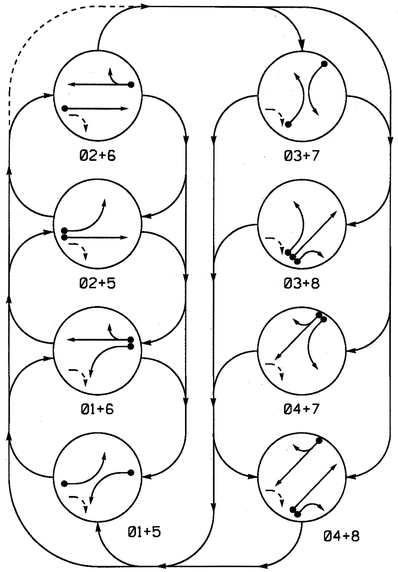
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 2-13-12 DATE

SIG. INVENTORY NO. 09-0139

10-FEB-2012 07:01
S:\ESS\Signals\Projects\Sig Mon\Armstrong\090139_sm_ele_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 92

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

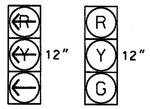
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	R	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←	←	~~R~~	~~R~~	~~R~~
41, 42	R	R	R	R	R	R	G	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	R	R	R	Y
71	~~R~~	~~R~~	~~R~~	~~R~~	←	~~R~~	←	~~R~~	~~R~~
81, 82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



11 — 21, 22
31 — 41, 42
51 — 61, 62
71 — 81, 82

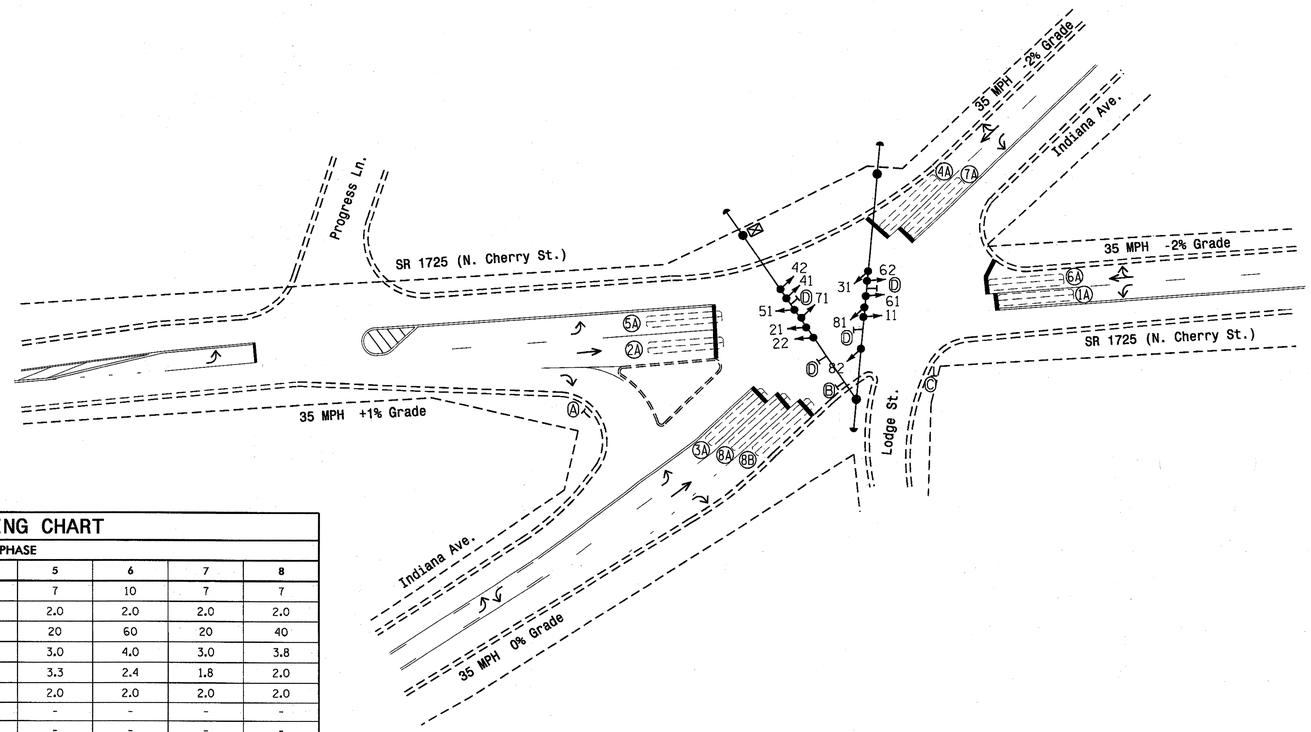
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	3	-	Y
2A	6X40	+5	2-4-2	-	2	Y	Y	-	-	-	-	Y
3A	6X40	+3	2-4-2	-	3	Y	Y	-	-	3	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	3	-	Y
6A	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	3	-	Y
8A	6X40	+3	2-4-2	-	8	Y	Y	-	-	-	-	Y
8B	6X40	+3	2-4-2	-	8	Y	Y	-	-	10	-	Y

8 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Existing Right Arrow "ONLY" (R3-5R) sign may be removed at the direction of the Engineer.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
⊣□↓	Pedestrian Signal Head With Push Button & Sign	⊣■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	"STOP" Sign (R1-1)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	10	7	7	7	10	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	60	20	40	20	60	20	40
Yellow Clearance	3.0	3.8	3.0	4.0	3.0	4.0	3.0	3.8
Red Clearance	3.5	2.2	1.9	1.9	3.3	2.4	1.8	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	-	-	-	-	-	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1725 (N. Cherry Street)
at
Indiana Avenue

Division 9 Forsyth County Winston-Salem
PLAN DATE: October 2011 PREPARED BY: L. Blount
PREPARED BY: Sterling REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

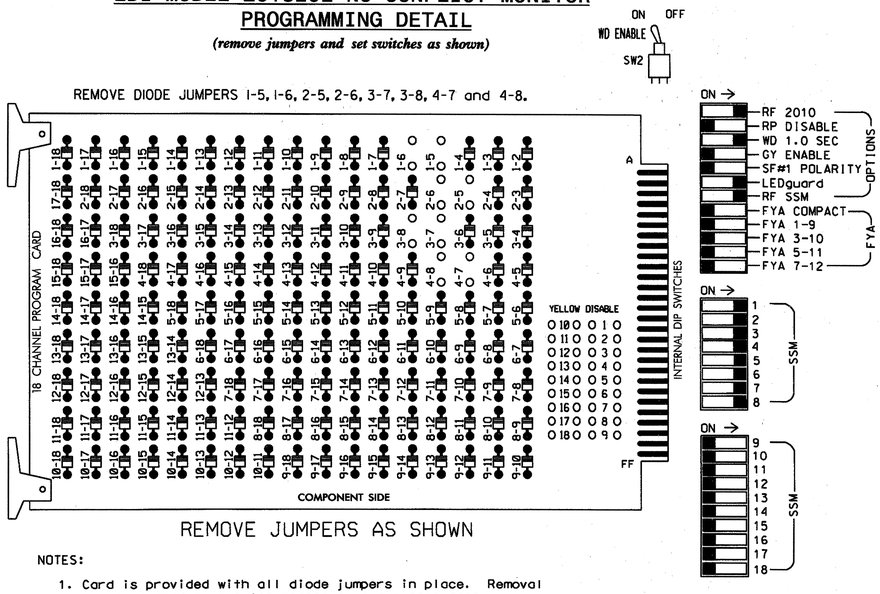
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMEIER
SIGNATURE 9/18/12 DATE
SIG. INVENTORY NO. 09-0150

03-JAN-2013 12:18
S:\NITSIGS\Hits Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0150\09150_sig_dsn_20120918.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 93

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	NU	31	41,42	NU	51	61,62	NU	71	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW	125			116			131			122		
YELLOW ARROW	126			117			132			123		
GREEN ARROW	127			118			133			124		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	SLOT EMPTY	SLOT EMPTY	ø3 3A	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED			NOT USED	NOT USED								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	ø7 7A	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED			NOT USED	ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0150
DESIGNED: October 2011
SEALED: 9-18-12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1725 (N. Cherry Street)
at
Indiana Avenue

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 9-12-12 | REVIEWED BY: T. Udy

PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

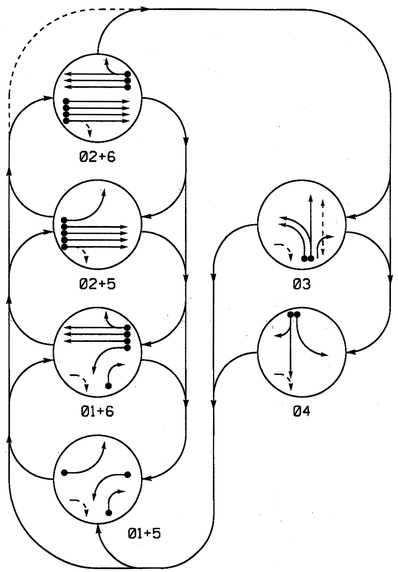
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 9/21/12 DATE

SIG. INVENTORY NO. 09-0150

19-SEP-2012 10:41
S:\TSG\UNITS\Signals\Workgroups\Sig Mgmt\Spaulding\In-progress\090150_sm_ele_2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 9\4

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

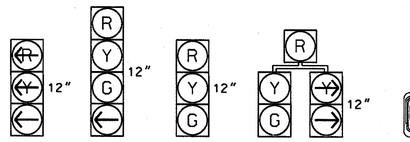
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03	04	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21, 22, 23, 24	R	R	G	G	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←	~~R~~	~~R~~
32	R	R	R	R	G	R	R
33	R/←	R/←	R	R	G	R	R
41	R	R	R	R	R	G	R
42, 43	R	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~
61, 62, 63	R	G	R	G	R	R	Y
P31, P32	DW	DW	DW	DW	W	DW	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



11, 31, 51 | 32, 41 | 21, 22, 23, 24, 42, 43, 61, 62, 63 | 33 | P31, P32

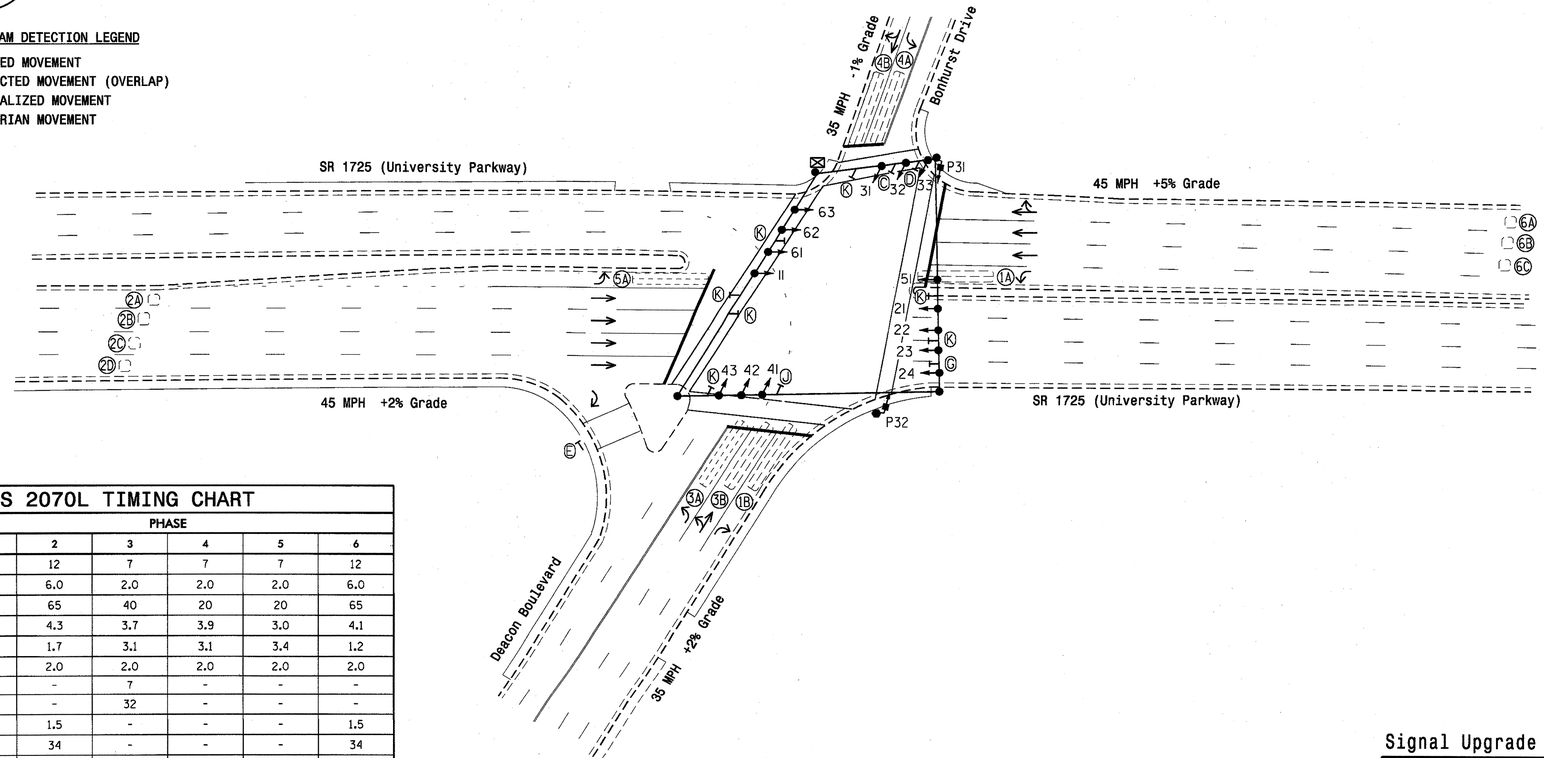
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	-	-	Y
1B	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	Y
2A	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
2C	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
2D	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
3A, 3B	6X40	+5	2-4-2	-	3	Y	Y	-	-	-	-	Y
4A, 4B	6X40	0	2-4-2	-	4	Y	Y	-	-	5	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	Y
6C	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	Y

6 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. Existing lane control signs may be removed at the direction of the Engineer.
12. Pavement markings are existing.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pedestal	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓒ	Combined Through and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	Right Arrow "ONLY" Sign (R3-5R)	Ⓓ
Ⓔ	"YIELD" Sign (R1-2)	Ⓔ
Ⓖ	Through Arrow "ONLY" Sign (R3-5A)	Ⓖ
Ⓙ	Left Arrow "ONLY" Sign (R3-5L)	Ⓙ
Ⓚ	Street Name Sign (D3-1)	Ⓚ

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	2.0	2.0	6.0
Max Green 1 *	30	65	40	20	20	65
Yellow Clearance	3.0	4.3	3.7	3.9	3.0	4.1
Red Clearance	3.8	1.7	3.1	3.1	3.4	1.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	7	-	-	-
Don't Walk 1	-	-	32	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5
Max Variable Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NC DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725 (University Parkway)
at
Deacon Boulevard/
Bonhurst Drive

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: October 2012 | PREPARED BY: CE Carter
PREPARED BY: Sterling | REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

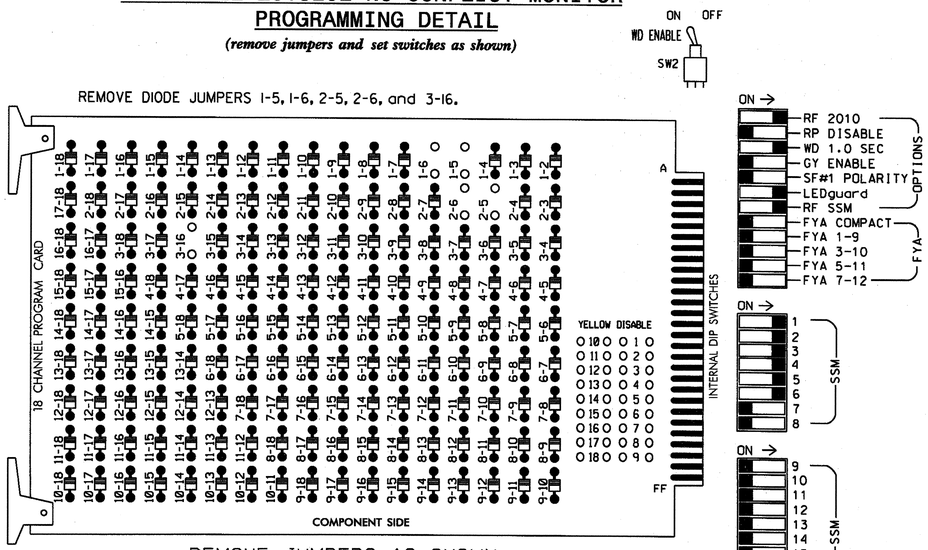
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/6/12 DATE
SIG. INVENTORY NO. 09-0161

06-NOV-2012 09:50
S:\MTS&SU\TS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0161\090161_sig_dsn_20121106.dgn
Z:\dms

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 95

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phase 3 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S12
PHASES USED.....1,2,3,3PED,4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4			S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1		2	13	3			4		14	5	6	15	7	8	16
PHASE	1		2	2 PED	3			4		4 PED	5	6	6 PED	7	8	3 PED
SIGNAL HEAD NO.	11	33	21,22 23,24	NU	31	32	33	41	42,43	NU	51	61,62 63	NU	NU	NU	P31, P32
RED			128			116	116	101	101			134				
YELLOW			129			117	117	102	102			135				
GREEN			130			118	118	103	103			136				
RED ARROW	125				116						131					
YELLOW ARROW	126	126			117						132					
GREEN ARROW	127	127			118	118		103			133					
✋																110
🚶																112

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø1 1B	ø2 2B	ø2 2D	ø3 3A,3B	ø4 4A,4B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED ø3 PED	FS OC ISOLATOR
	L	NOT USED	ø2 2A	ø2 2C	NOT USED	NOT USED	NOT USED							OC ISOLATOR	ST OC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	ø6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B	NOT USED											

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-7,8	I2L	43	5	12	2	Y	Y			
2B	TB2-9,10	I3U	63	25	32	2	Y	Y			
2C	TB2-11,12	I3L	76	38	42	2	Y	Y			
2D	TB4-1,2	I4U	47	9	22	2	Y	Y			
3A,3B	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A,4B	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			
PED PUSH BUTTONS											
P31,P32	TB8-8,9	I13L	70	32	PED 8	3 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

PED 3 PROGRAMMING DETAIL

(program controller as shown below)

CHANGING OUTPUT ASSIGNMENTS

1. FROM MAIN MENU SELECT '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS)
2. ENTER 17 (PHASE 8 DW) FOR OUTPUT ASSIGNMENT #.
3. SCROLL DOWN TO 'PEDESTRIAN PHASE' AND ENTER 'Y' REGARDLESS OF DEFAULT PROGRAMMING!
4. ENTER '3' FOR 'SELECT PEDESTRIAN PHASE'. NO CHANGE NEEDED FOR 'SELECT COLOR'
5. BACKUP TO 'OUTPUT ASSIGNMENTS AND SETTINGS MENU:' BY PRESSING THE 'ESC' BUTTON ON KEYBOARD.
6. SELECT '1' (OUTPUT ASSIGNMENTS)
7. ENTER 18 (PHASE 8 W) FOR OUTPUT ASSIGNMENT #.
8. REPEAT STEPS # 3 AND # 4.

CHANGING INPUT ASSIGNMENTS

1. FROM MAIN MENU SELECT '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS)
2. CYCLE TO PED DETECTOR #8 BY REPEATEDLY DEPRESSING '+' KEY
3. MODIFY PHASE ASSIGNED TO PED DETECTOR # 8 FROM PHASE 8 TO PHASE 3

PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0161
DESIGNED: October 2012
SEALED: 11/6/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1725 (University Pkwy.) at Deacon Boulevard/ Bonhurst Drive

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

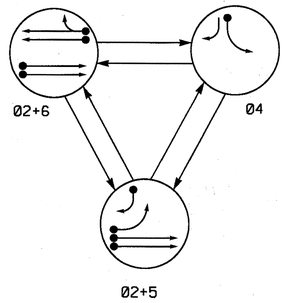
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE
11-7-12 DATE
SIG. INVENTORY NO. 09-0161

07-NOV-2012 06:41
S:\TRANSDWG\TS Signals\Workgroups\Sig Mgmt\Armstrong\09016I_smele_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 9

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

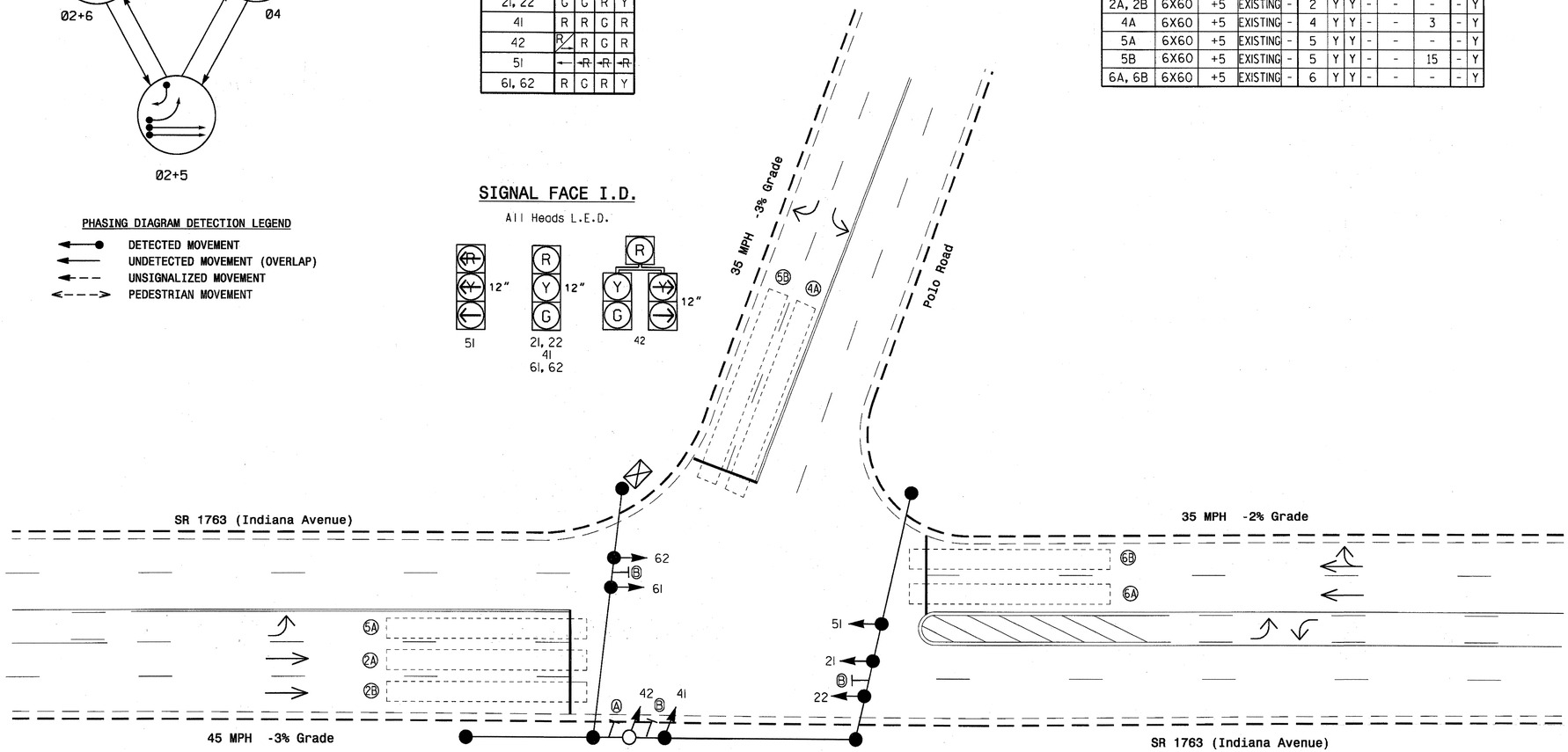
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04	PHASE FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	~~-~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A, 2B	6X60	+5	EXISTING	-	2	Y	Y	-	-	-	-	Y
4A	6X60	+5	EXISTING	-	4	Y	Y	-	-	3	-	Y
5A	6X60	+5	EXISTING	-	5	Y	Y	-	-	-	-	Y
5B	6X60	+5	EXISTING	-	5	Y	Y	-	-	15	-	Y
6A, 6B	6X60	+5	EXISTING	-	6	Y	Y	-	-	-	-	Y

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	50	40	30	50
Yellow Clearance	4.8	3.0	3.0	4.0
Red Clearance	1.0	1.9	2.1	1.7
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Existing Right Arrow "ONLY" sign (R3-1) may be removed at the direction of the Engineer.
12. New signal head 42 shall be yellow in color with black visors.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	Right Arrow "ONLY" Sign (R3-5R)	A
B	Street Name Sign (D3-1)	B

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1763 (Indiana Avenue) at Polo Road

Division 9 Forsyth County Winston-Salem

PLAN DATE:	July 2011	PREPARED BY:	Monif
PREPARED BY:	C.E. Carter	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

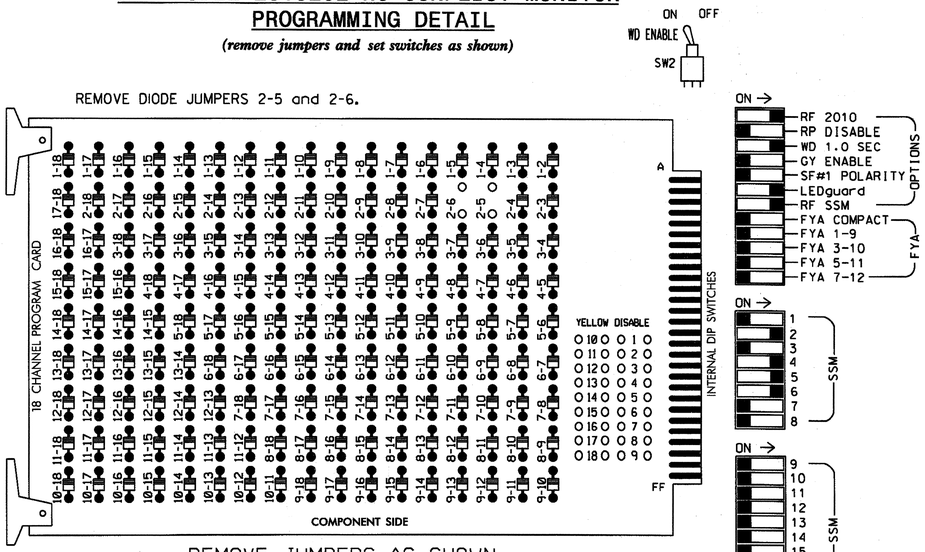
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 9/17/12 DATE
SIG. INVENTORY NO. 09-0162

04-DEC-2012 12:43
S:\#TS&CM\ITS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\#09-0162\#090162_sig_dsn_20120917.dgn
rziembo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 97

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. FILE
LOAD SWITCHES USED.....S2,S5,S7,S8
PHASES USED.....2,4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	51	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101				134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW								131											
YELLOW ARROW							132	132											
GREEN ARROW							133	133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L		NOT USED				NOT USED								ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	ø5 5A	ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
L		ø5 5B	NOT USED											

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A	TB3-5,6	J2U	40	2	6	5	Y	Y			
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A,6B	TB3-9,10	J3U	64	26	36	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0162
DESIGNED: July 2011
SEALED: 9/17/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1763 (Indiana Avenue)
at
Polo Road

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: September 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

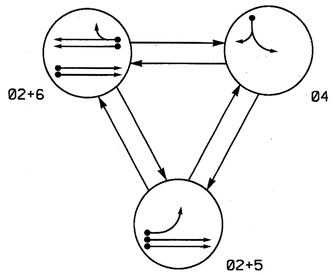
John T Rowe 9-17-12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0162

17-SEP-2012,14:05
T:\TEC\Projects\Signals\Workgroups\Sig Mgmt\Armstrong\09162_sm.ele.xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 98

PHASING DIAGRAM



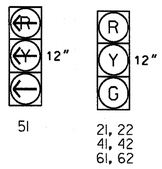
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
51	~~R~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.

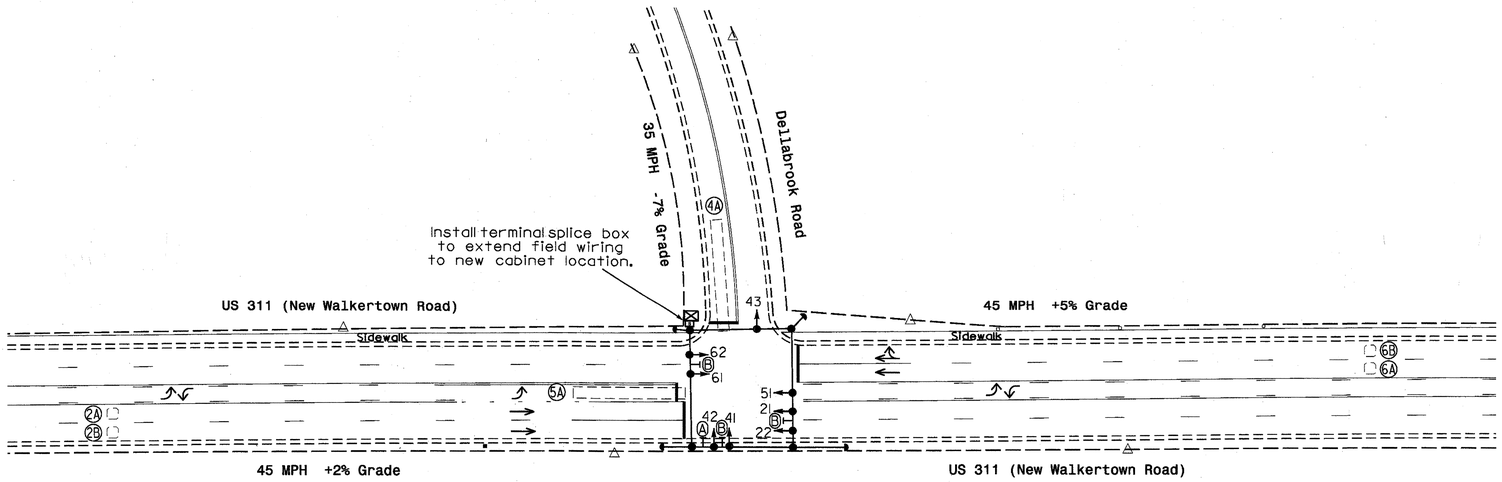


OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
4A	6X60	+5	EXISTING	-	4	Y	Y	-	-	5	-	Y
5A	6X60	+5	EXISTING	-	5	Y	Y	-	-	-	-	Y
6A	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	Y

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	"NO TURN ON RED" Sign (R10-11)	A
B	Street Name Sign (D3-1)	B

OASIS 2070L TIMING CHART				
FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	1.0	1.0	6.0
Max Green 1 *	40	30	20	40
Yellow Clearance	4.3	3.2	3.0	4.1
Red Clearance	1.0	1.9	1.8	1.0
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	SOFT RECALL	-	-	SOFT RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

US 311 (New Walkertown Road) at Dellabrook Road

Division 9 Forsyth County Winston-Salem

PLAN DATE:	October 2012	REVIEWED BY:	
PREPARED BY:	C.E. Carter	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 10/23/12 DATE

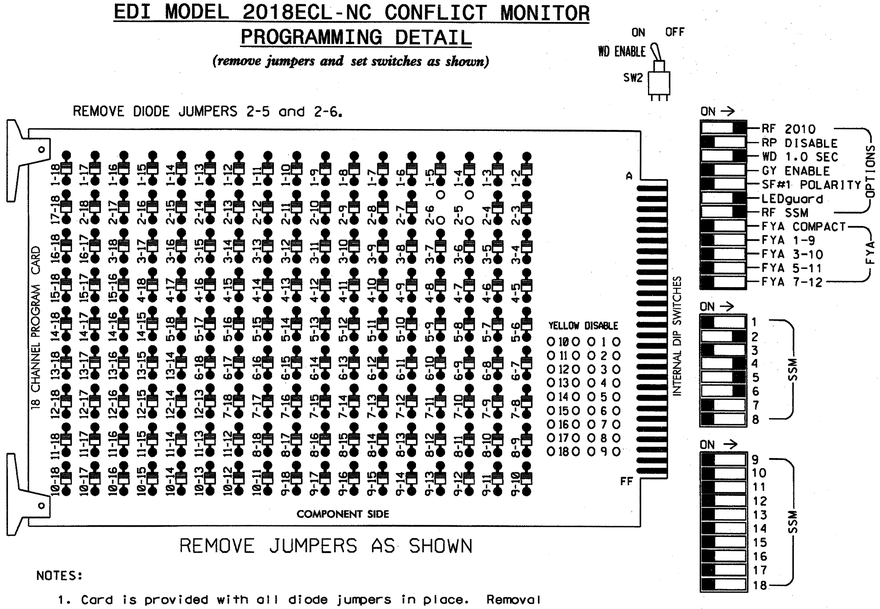
SIG. INVENTORY NO. 09-0167

23-OCT-2012 13:13
S:\#ITS&SU#ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\#09-0167#090167_sig_dsn_2012xxxx.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 99

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S7,S8
PHASES USED.....2,4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW							131											
YELLOW ARROW							132											
GREEN ARROW							133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				NOT USED								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0167
DESIGNED: October 2012
SEALED: 10-23-12
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 04-05-12.

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 311 (New Walkertown Road) at Dellabrook Road

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | DATE 10-30-12

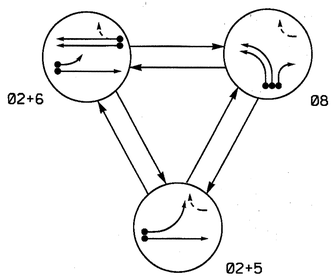
SIG. INVENTORY NO. 09-0167

30-OCT-2012 14:11
S:#ITSSIG#ITS Signals#Workgroups#Sig Mgmt#Peterson#090167_smple_20120405.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 100

3 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21, 22	G	G	R	Y
51	G	G	R	Y
61, 62	R	G	R	Y
81, 82	~~R~~	~~R~~	←	~~R~~
83, 84	R	R	→	R

SIGNAL FACE I.D.

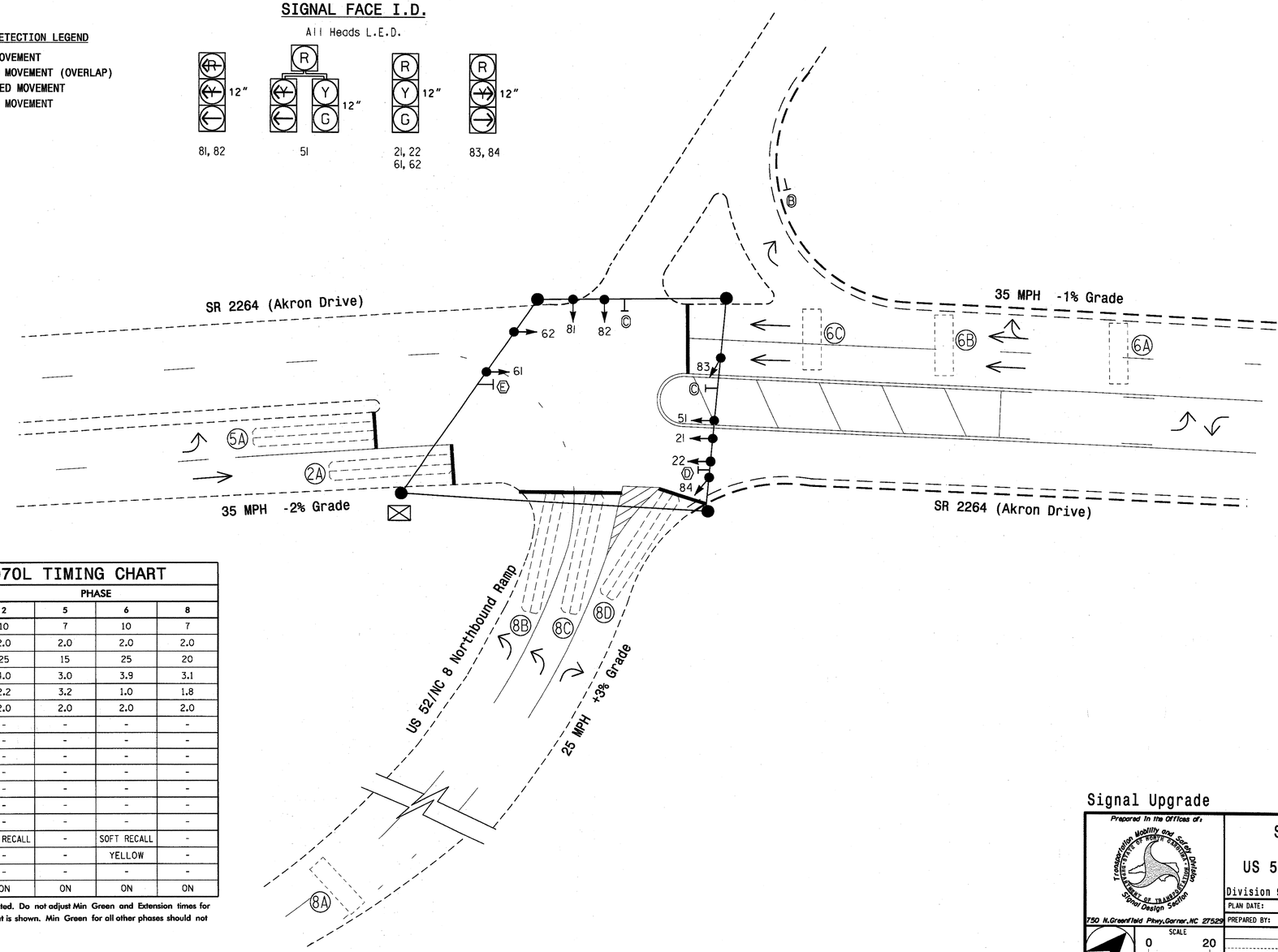
All Heads L.E.D.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
6A	6X20	138	Existing	-	6	Y	Y	-	-	-	-	Y
6B	6X20	81	Existing	-								
6C	6X20	38	Existing	-								
8A	6X20	300	Existing	-	8	Y	Y	-	-	-	-	Y
8B	6X20	0	2-4-2	-								
8C	6X20	0	2-4-2	-								
8D	6X20	0	2-4-2	-								

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Remove existing "LEFT TURN SIGNAL" sign (R10-10L).
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	------
→	Directional Arrow	→
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	No Left Turn Sign (R3-2)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	25	15	25	20
Yellow Clearance	4.0	3.0	3.9	3.1
Red Clearance	2.2	3.2	1.0	1.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	SOFT RECALL	-
Vehicle Call Memory	-	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2264 (Akron Drive)
at
US 52/NC 8 Northbound Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: October 2011 REVIEWED BY:
PREPARED BY: Sterling REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 4/13/12 DATE

SIG. INVENTORY NO. 09-0175

04-DEC-2012 12:50
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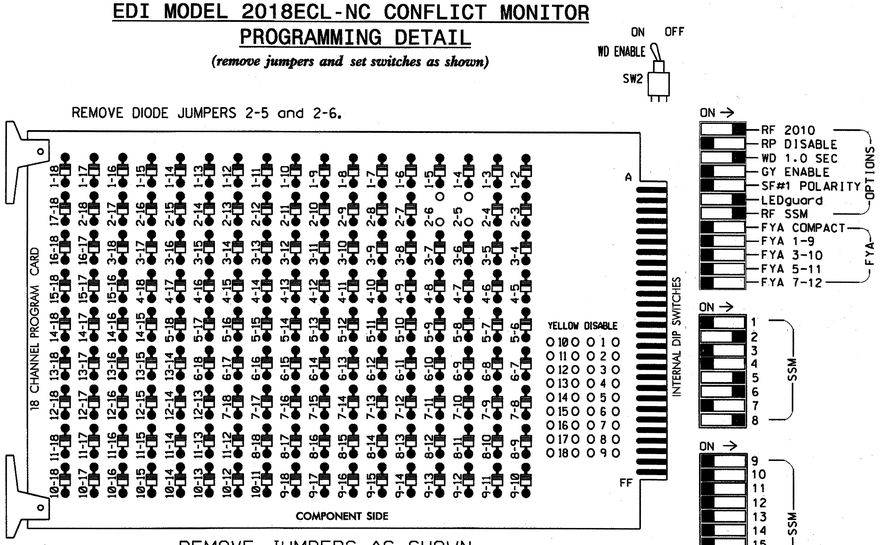
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 101

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S7,S8,S11
PHASES USED.....2,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51	61,62	NU	NU	81,82	83,84	NU	NU	NU	NU	NU	NU	NU
RED		128					*	134				107							
YELLOW		129						135											
GREEN		130						136											
RED ARROW											107								
YELLOW ARROW							132				108	108							
GREEN ARROW							133				109	109							

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED												ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A,6B, 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A,8B, 8C,8D	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A,8B,8C,8D	TB5-9,10	J6U	42	4	8	8	Y	Y			

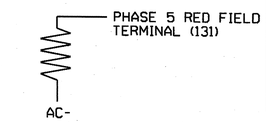
[1] Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



NOTE: The purpose of this resistor is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0175
DESIGNED: October 2011
SEALED: 4-13-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2264 (Akron Drive)
at
US 52/NC 8 Northbound Ramps

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

Division 09	Forsyth County	Winston-Salem
PLAN DATE: 04-12-12	REVIEWED BY:	
PREPARED BY: D.H. Spaulding	REVIEWED BY:	

REVISIONS	INIT.	DATE

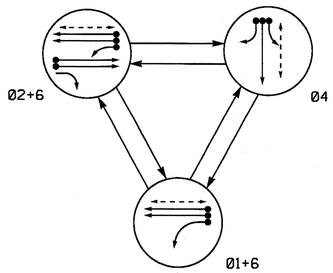
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE DATE 4/18/12

SIG. INVENTORY NO. 09-0175

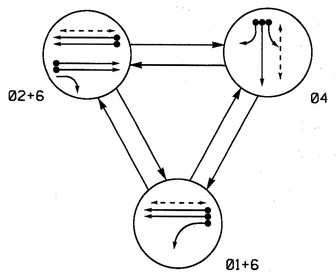
13-APR-2012 16:45
S:\ITS&SUM\ITS Signals\Workgroups\Sig Mgmt\Spaulding\In-progress\#09175_sm_ele.2012xx.dgn
dgnsetting

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 102

NORMAL PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



NORMAL PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 04	FLASH
11	←	~~F/Y~~	~~R~~	~~Y~~
21, 22	R	G	R	Y
41, 42, 43	R	R	G	R
61, 62	G	G	R	Y
P41, P42	DW	DW	W	DRK
P61, P62	W	W	DW	DRK

~~F/Y~~ = Flashing Yellow Arrow

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 04	FLASH
11	←	~~R~~	~~R~~	~~Y~~
21, 22	R	G	R	Y
41, 42, 43	R	R	G	R
61, 62	G	G	R	Y
P41, P42	DW	DW	W	DRK
P61, P62	W	W	DW	DRK

W - Walk
DW - Don't Walk
DRK - Dark

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	*15	-	Y
					** 6	Y	Y	-	-	3	-	Y
2A/S1	6X6	70	EXIST	-	2	Y	Y	-	-	-	Y	Y
2B/S2	6X6	70	EXIST	-	2	Y	Y	-	-	-	Y	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4C	6X40	0	2-4-2	-	4	Y	Y	-	-	15	-	Y
6A/S3	6X6	70	EXIST	-	6	Y	Y	-	-	-	Y	Y
6B/S4	6X6	70	EXIST	-	6	Y	Y	-	-	-	Y	Y

* Disable Delay During Alternate Phasing Operation.
** Disable Phase 6 Call For Loop 1A During Alternate Phasing.

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

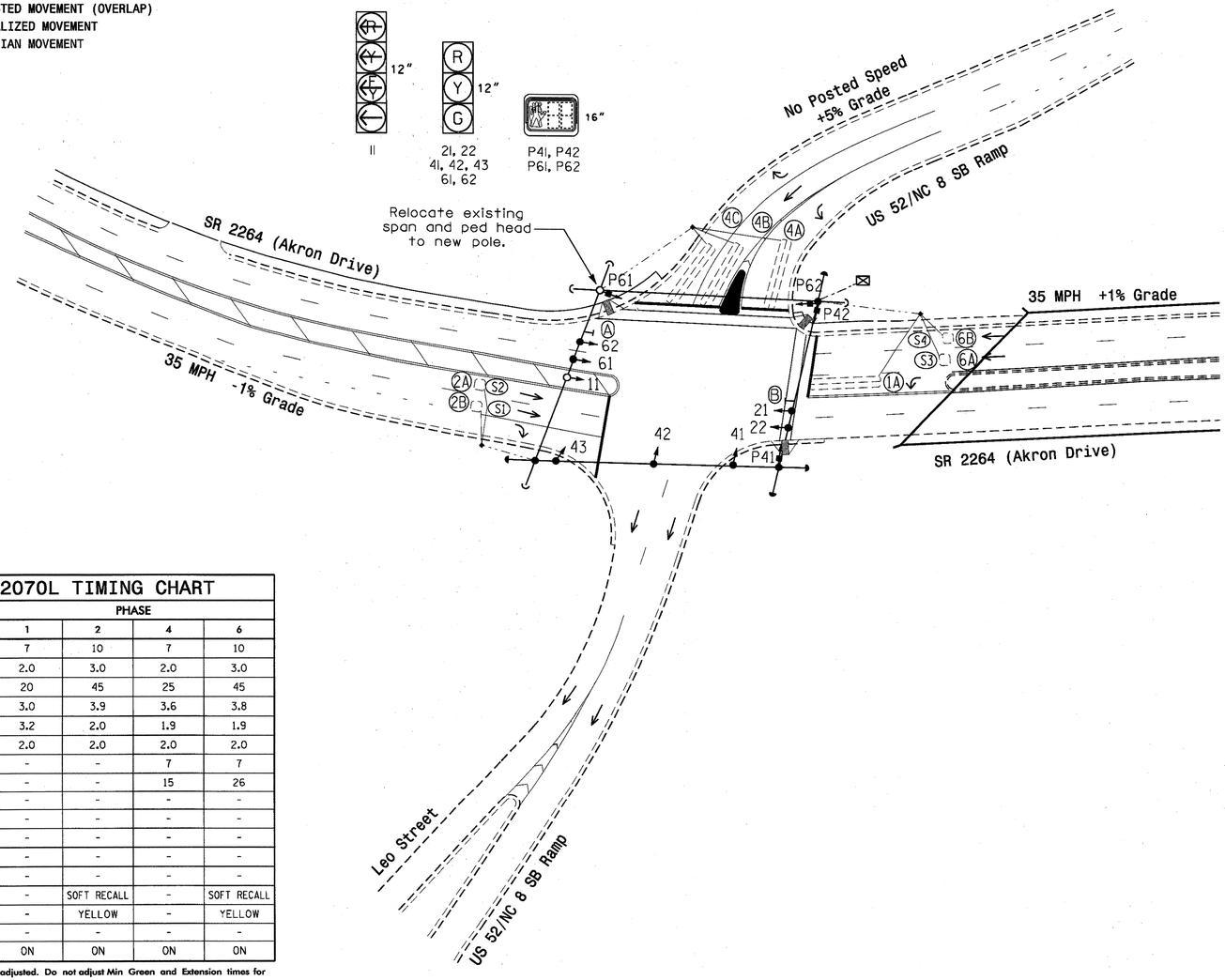
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pavement markings are existing.
9. The Division Traffic Engineer will determine the hours of use for each phasing plan.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	7	10	7	10
Extension 1 *	2.0	3.0	2.0	3.0
Max Green 1 *	20	45	25	45
Yellow Clearance	3.0	3.9	3.6	3.8
Red Clearance	3.2	2.0	1.9	1.9
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	7	7
Don't Walk 1	-	-	15	26
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	No Right Turn Sign (R3-1)	(A)
(B)	No Left Turn Sign (R3-2)	(B)

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2264 (Akron Drive)
at
Leo Street/US 52-NC 8 SB Ramp

Division 9 Forsyth County Winston-Salem
PLAN DATE: December 2012 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

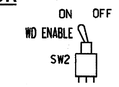
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 12/11/12 DATE
SIG. INVENTORY NO. 09-0176

11-DEC-2012 13:10
S:\Traffic\Shared\TS Signal\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0176\090176_sig_dsn_20121211.dgn
rziemba

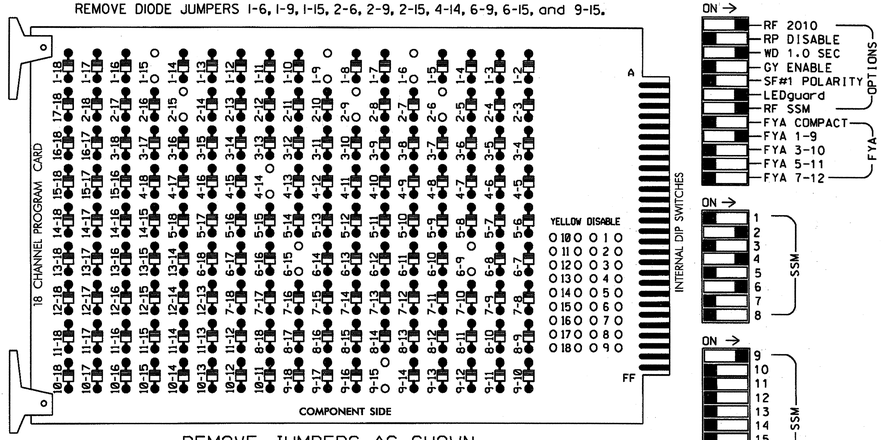
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.103

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

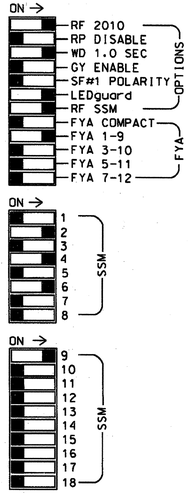
(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-6, 1-9, 1-15, 2-6, 2-9, 2-15, 4-14, 6-9, 6-15, and 9-15.



REMOVE JUMPERS AS SHOWN



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 4 and 6 for 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S6,S8,S9,AUX S1
PHASES USED.....1,2,4,4PED,6,6PED
OVERLAP "A".....1+2*
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

* ALTERNATE PHASING OVERLAP PROGRAMMING DETAILS SHOWN ON SHEET 2

SIGNAL HEAD HOOK-UP CHART

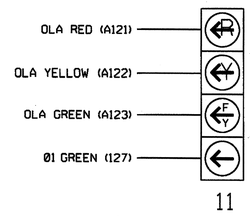
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42 43	P41, P42	NU	61,62	P61, P62	NU	NU	NU	11★	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN		130			103			136										
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	
✋						104			119									
🚶						106			121									

NU = Not Used

★ See pictorial of head wiring in detail below.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



11

NOTE

The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø2/SYS 2A/S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	Ø 4 4C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø2/SYS 2B/S2				Ø 4 4B	NOT USED					Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6/SYS 6A/S3	SLOT EMPTY	WAG INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6/SYS 6B/S4												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			3
	-	I1U	56	18★	51	1	Y	Y			
2A/S1	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S2	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			15
6A/S3	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B/S4	TB3-7,8	J2L	44	6	16	6/SYS	Y	Y			
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W. on rear of input file.

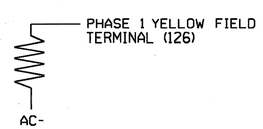
★ See Input Page Assignment programming details on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0176
DESIGNED: December 2012
SEALED: 12/11/12
REVISED: N/A

Signal Upgrade - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2264 (Akron Drive) at Leo Street/US 52-NC 8 SB Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-12-12 DATE
SIG. INVENTORY NO. 09-0176

11-DEC-2012 15:26
S:\MTSSD\all IS Signals\mcarr\groups\Sig Mon\mstr\ong\0090176_sm_e1a_xxx.dgn
smcarr.cfg

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 04

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
  LOGICAL I/O COMMAND #1   (+/-COMMAND#)
IF  ACTIVE PHASE       #1   IS ON
AND RED CLEAR ON PHASE #1   IS ON

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

```
  LOGICAL I/O COMMAND #2   (+/-COMMAND#)
IF  ACTIVE PHASE       #1   IS ON

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

```
  LOGICAL I/O COMMAND #3   (+/-COMMAND#)
IF  YELLOW ON PHASE    #1   IS ON

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0176
DESIGNED: December 2012
SEALED: 12/11/12
REVISED: N/A

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          ¦12345678910111213141516
VEH OVL PARENTS: ¦XX
VEH OVL NOT VEH: ¦
VEH OVL NOT PED: ¦
VEH OVL GRN EXT: ¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL
FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          ¦12345678910111213141516
VEH OVL PARENTS: ¦X
VEH OVL NOT VEH: ¦
VEH OVL NOT PED: ¦
VEH OVL GRN EXT: ¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

Signal Upgrade - Sheet 2 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 2264 (Akron Drive) at Leo Street/US 52-NC 8 SB Ramp	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, Signals Management Section	Division 9 · Forsyth County · Winston-Salem PLAN DATE: December 2012 · REVIEWED BY: JTR PREPARED BY: S. Armstrong · REVIEWED BY:	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR
750 N.Greenfield Pkwy.,Garner,NC 27529	REVISIONS · INIT. · DATE	SIGNATURE · DATE 12-12-12
		SIG. INVENTORY NO. 09-0176

11-DEC-2012 15:27
S:#ITSSOUTS S:\Signals\Workgroups\Sig Mgmt\mrstrong\#09017G_smlate_xxx.dgn
mrstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.105

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.

```
PAGE: 2 C1 PIN:48  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................10
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................Y
VEHICLE DETECTOR (1-64).............26
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)......................_
FLASH SENSE (Y/N)...................._
DOOR OPEN (Y/N)......................_
MANUAL CONTROL ENABLE (Y/N).........._
MANUAL CONTROL ADVANCE (Y/N)........._
SPECIAL FUNCTION ALARM (1-8)........._
TOD HOUR SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._ OFFSET#..._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

ENTER A 'Y' FOR NOT ENABLED

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 1A - PHASE 6)

```
PAGE: 2 C1 PIN:48  NOT ENABLED
INPUT ASSIGNMENT #.................10
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................Y
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)......................_
FLASH SENSE (Y/N)...................._
DOOR OPEN (Y/N)......................_
MANUAL CONTROL ENABLE (Y/N).........._
MANUAL CONTROL ADVANCE (Y/N)........._
SPECIAL FUNCTION ALARM (1-8)........._
TOD HOUR SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._ OFFSET#..._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PRESS '+' TO ADVANCE TO INPUT 18

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................18
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64).............1
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)......................_
FLASH SENSE (Y/N)...................._
DOOR OPEN (Y/N)......................_
MANUAL CONTROL ENABLE (Y/N).........._
MANUAL CONTROL ADVANCE (Y/N)........._
SPECIAL FUNCTION ALARM (1-8)........._
TOD HOUR SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._ OFFSET#..._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

ENTER '51' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 1A - PHASE 1)

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................18
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64).............51
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)......................_
FLASH SENSE (Y/N)...................._
DOOR OPEN (Y/N)......................_
MANUAL CONTROL ENABLE (Y/N).........._
MANUAL CONTROL ADVANCE (Y/N)........._
SPECIAL FUNCTION ALARM (1-8)........._
TOD HOUR SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._ OFFSET#..._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

```
VEHICLE DETECTOR #51  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................N
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#           ¦1234567891011121314151 6
PHASES ASSIGNED  ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

ENTER 'Y' FOR ENABLE DETECTOR

ENTER '1' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```
VEHICLE DETECTOR #51  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#           ¦1234567891011121314151 6
PHASES ASSIGNED ¦X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: Ø9-Ø176
DESIGNED: December 2012
SEALED: 12/11/12
REVISED: N/A

Signal Upgrade - Sheet 3 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2264 (Akron Drive)
at
Leo Street/US 52-NC 8 SB Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | 12-12-12 DATE

SIG. INVENTORY NO. 09-0176

11-DEC-2012 15:29
S:\TISSUe\IS Signals\Workgroups\Sig Mgt\Armstrong\M090176_smle1e_xxx.dgn
samarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 106

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN NORMAL PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for head 11 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and modifies delay time.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0176
DESIGNED: December 2012
SEALED: 12/11/12
REVISED: N/A

Signal Upgrade - Sheet 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 2264 (Akron Drive)
at
Leo Street/US 52-NC 8 SB Ramp

Division 9 Forsyth County Winston-Salem

PLAN DATE:	December 2012	REVIEWED BY:	JTR
PREPARED BY:	S. Armstrong	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR

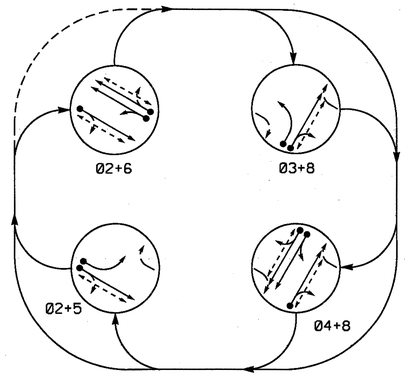
John T. Rowe Jr 12-12-12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0176

11-DEC-2012 15:30
S:\ITSASU\ITS Signals\Workgroups\Sig Man\Armstrong\090176_sm_ele_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 107

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

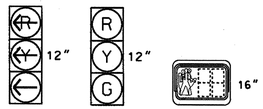
TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	02+6	03+8	04+8	FLASH
2I, 22	G	G	R	R	Y
3I	~~R~~	~~R~~	–	~~R~~	~~R~~
4I, 42	R	R	R	G	R
5I	–	~~R~~	~~R~~	~~R~~	~~R~~
6I, 62	R	G	R	R	Y
8I, 82	R	R	G	G	R
P2I, P22	W	W	DW	DW	DRK
P4I, P42	DW	DW	DW	W	DRK
P6I, P62	DW	W	DW	DW	DRK
P8I, P82	DW	DW	W	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



3I
5I

2I, 22
4I, 42
6I, 62
8I, 82

P2I, P22
P4I, P42
P6I, P62
P8I, P82

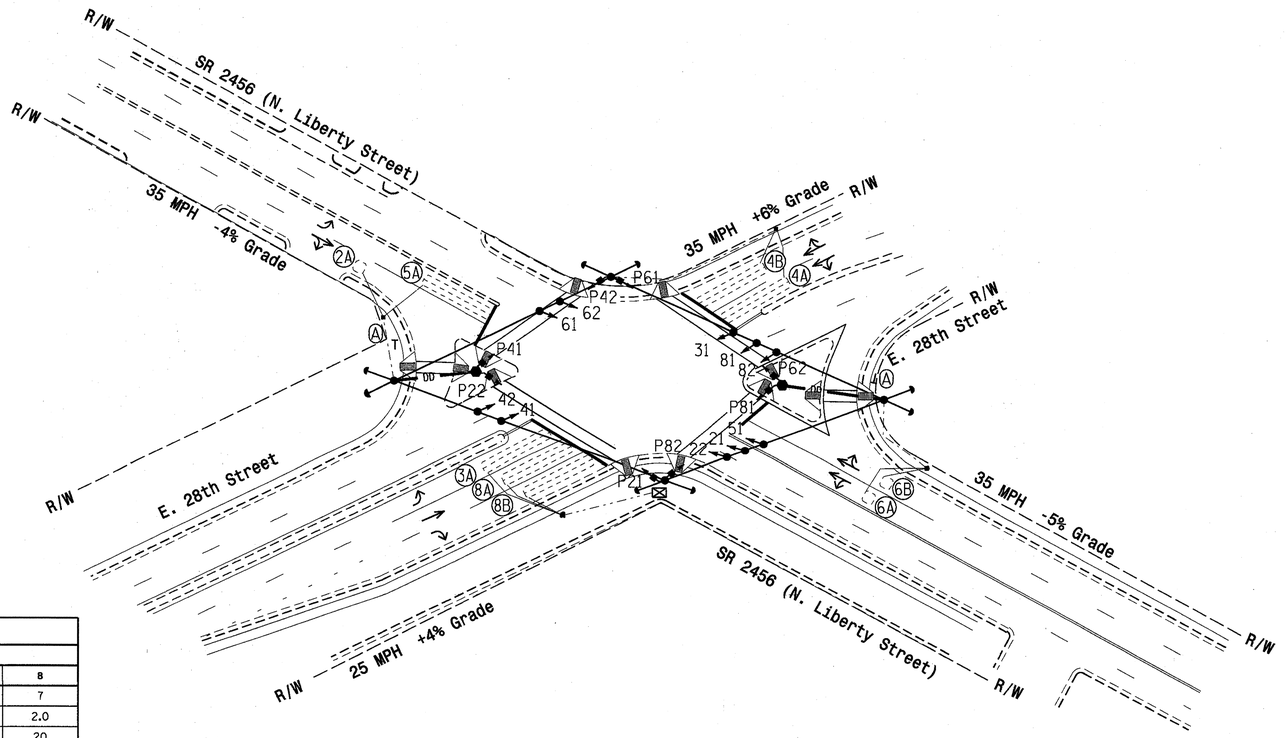
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	EXISTING	-	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A, 6B	6X6	70	EXISTING	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	15	-	Y

4 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Omit phase 3 during phase 4 on.
4. Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Curb Ramp	N/A
	Signal Pedestal	
N/A	Directional Drill	DD
A	"YIELD" Sign (R1-2)	A

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	3	4	5	6	8
Min Green 1 *	10	7	7	7	10	7
Extension 1 *	3.0	2.0	2.0	2.0	3.0	2.0
Max Green 1 *	45	20	20	20	45	20
Yellow Clearance	4.1	3.0	3.5	3.0	4.2	3.6
Red Clearance	2.5	2.3	2.1	3.7	2.3	2.0
Red Revert	5.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	7	-	7	-	7	7
Don't Walk 1	18	-	13	-	14	11
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	SOFT RECALL	-	-	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	-	-	YELLOW	-
Dual Entry	-	-	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 2456 (N. Liberty Street) at E. 28th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: February 2012 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 3/13/12 DATE
SIG. INVENTORY NO. 09-0179

17-APR-2012 09:35
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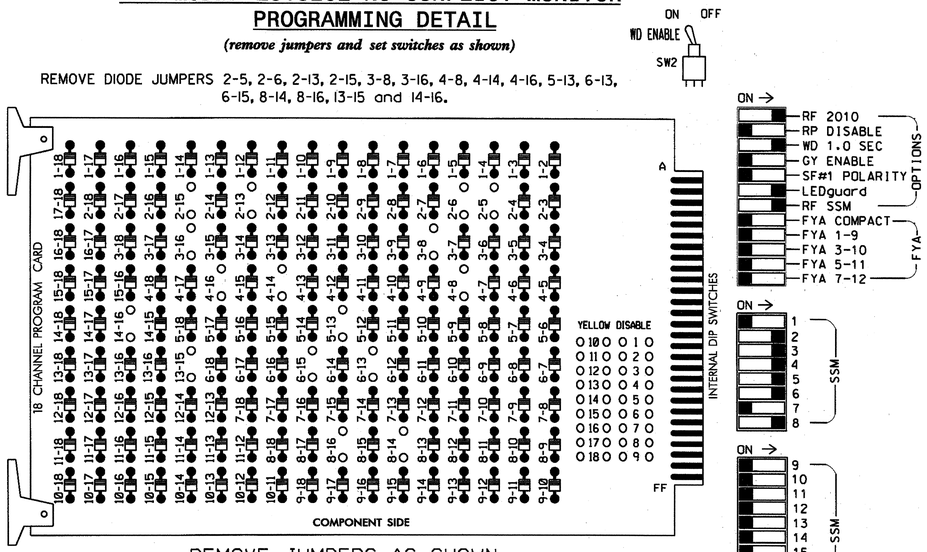
$USER

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 108

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-13, 2-15, 3-8, 3-16, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 8-14, 8-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phase 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S3,S4,S5,S6,S7,S8,S9,S11,S12
PHASES USED.....2,3,4,5,6,8,2PED,4PED,6PED,8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	31	41,42	P41, P42	51	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW				116			131											
YELLOW ARROW				117			132											
GREEN ARROW				118			133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                OVERLAPS:¦ABCDEFGH¦JKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR       PHASES:¦12345678910111213141516
IF PHASES ARE ON¦   X
OMIT PHASES     ¦   X
CALL PHASES     ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	Ø2 2A	SLOT EMPTY	SLOT EMPTY	Ø3 3A	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L		NOT USED			NOT USED	Ø4 4B							Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	NOT USED				Ø8 8B									

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			15
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0179
DESIGNED: February 2012
SEALED: 3-13-12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2456 (N. Liberty Street) at E. 28th Street

Prepared in the Offices of:
Traffic Engineering Branch, Congestion Mobility and Safety Division, North Carolina Department of Transportation, Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

Division 09 | Forsyth County | Winston-Salem
PLAN DATE: 2-28-12 | REVIEWED BY: T. Jay
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE | DATE 3/15/12
SIG. INVENTORY NO. 09-0179

15-MAR-2012 08:57
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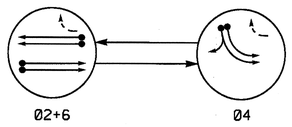
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 10

PHASING DIAGRAM



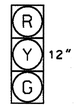
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	FLASH
21, 22	G	R	Y
41, 42, 43	R	G	R
61, 62	G	R	Y

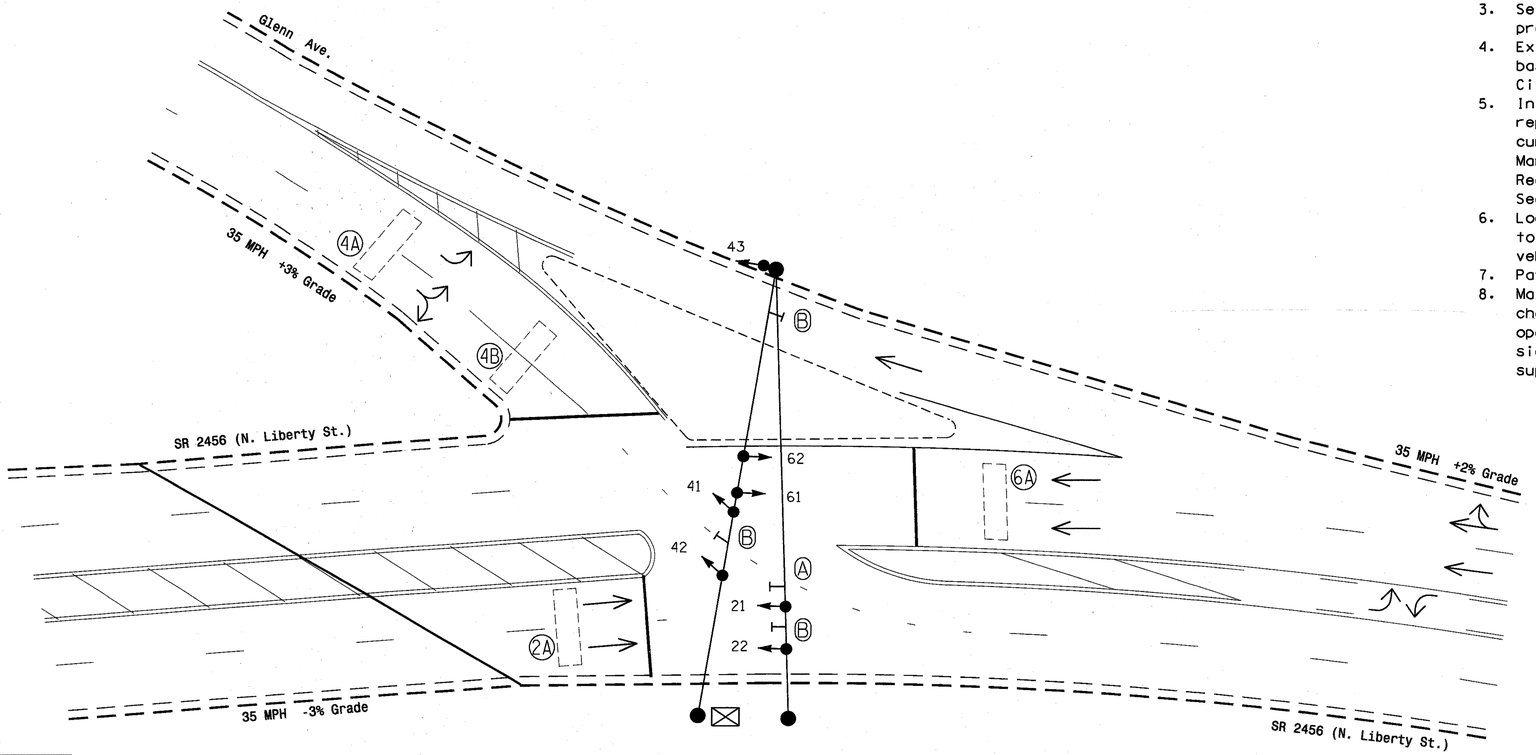
SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42, 43
61, 62

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X20	18	Existing	-	2	Y	Y	-	-	-	-	Y
4A	6X20	64	Existing	-	4	Y	Y	-	-	-	-	Y
4B	6X20	18	Existing	-	4	Y	Y	-	-	-	-	Y
6A	6X20	18	Existing	-	6	Y	Y	-	-	-	-	Y



2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	No Left Turn Sign (R3-2)	(A)
(B)	Street Name Sign (D3-1)	(B)

OASIS 2070L TIMING CHART			
	PHASE		
FEATURE	2	4	6
Min Green 1 *	10	7	10
Extension 1 *	3.0	2.0	3.0
Max Green 1 *	45	25	45
Yellow Clearance	4.1	3.3	3.7
Red Clearance	1.0	3.0	1.8
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	YELLOW	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2456 (N. Liberty Street) at Glenn Avenue

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: October 2011 | PREPARED BY: M.Bazzarie
PREPARED BY: Sterling | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

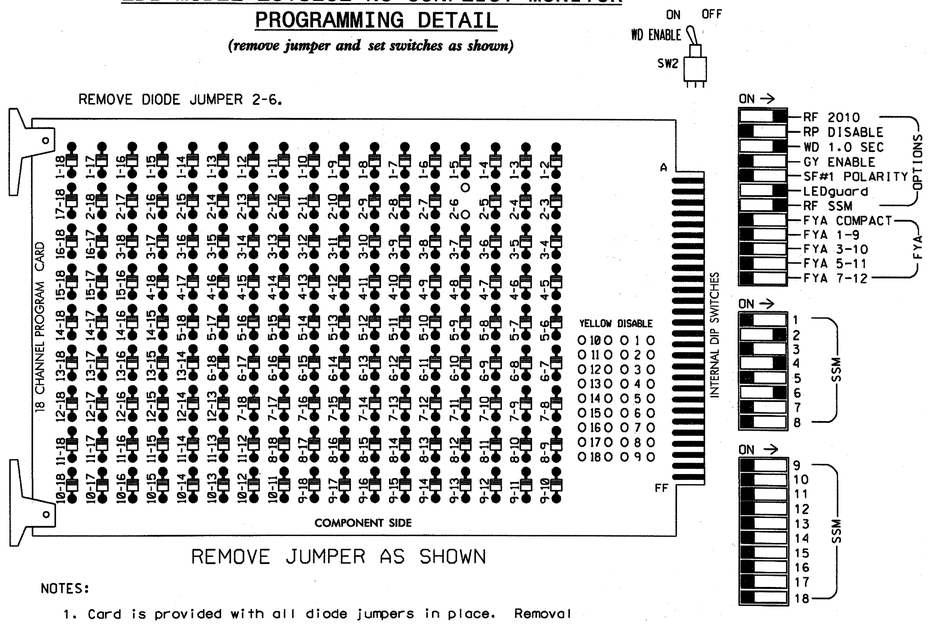
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TEMBY
SIGNATURE 10/2/12 DATE
SIG. INVENTORY NO. 09-0186

08-OCT-2012 18:31
S:\#ITS&SIG\#ITS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\09-0186\090186_sig_dsn_20121002.dgn
rzeiher

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.110

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41, 42,43	NU	NU	61,62	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A,4B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS OC ISOLATOR
	L		NOT USED				NOT USED								ST OC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A,4B	TB4-9,10	I6U	41	3	4	4	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0186
DESIGNED: October 2011
SEALED: 10/02/2012
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2456 (N. Liberty Street) at Glenn Avenue

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: T. Sapp

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 10/8/12 DATE

SIG. INVENTORY NO. 09-0186

03-OCT-2012 09:01
S:\TSS\Units Signals\Workgroups\Sig Mgmt\Strickland\090186_smale_xxx.dgn
cstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 111

PHASING DIAGRAM

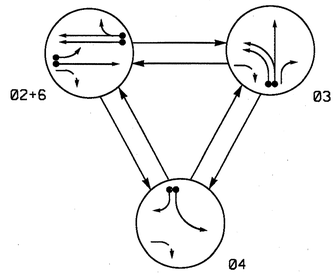


TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+6	PHASE Ø3	PHASE Ø4	FLASH
21, 22	G	R	R	Y
31	~~R~~	←	~~R~~	~~R~~
32	R	G	R	R
33	R	G	R	R
41, 42	~~R~~	~~R~~	←	~~R~~
43	R	R	→	R
61, 62	G	R	R	Y

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A, 2B	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
3A, 3B	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	Y
4A	6X40	+8	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	+5	2-4-2	-	4	Y	Y	-	-	-	-	Y
6A, 6B	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y

3 Phase
Fully Actuated
(Winston-Salem Signal System)

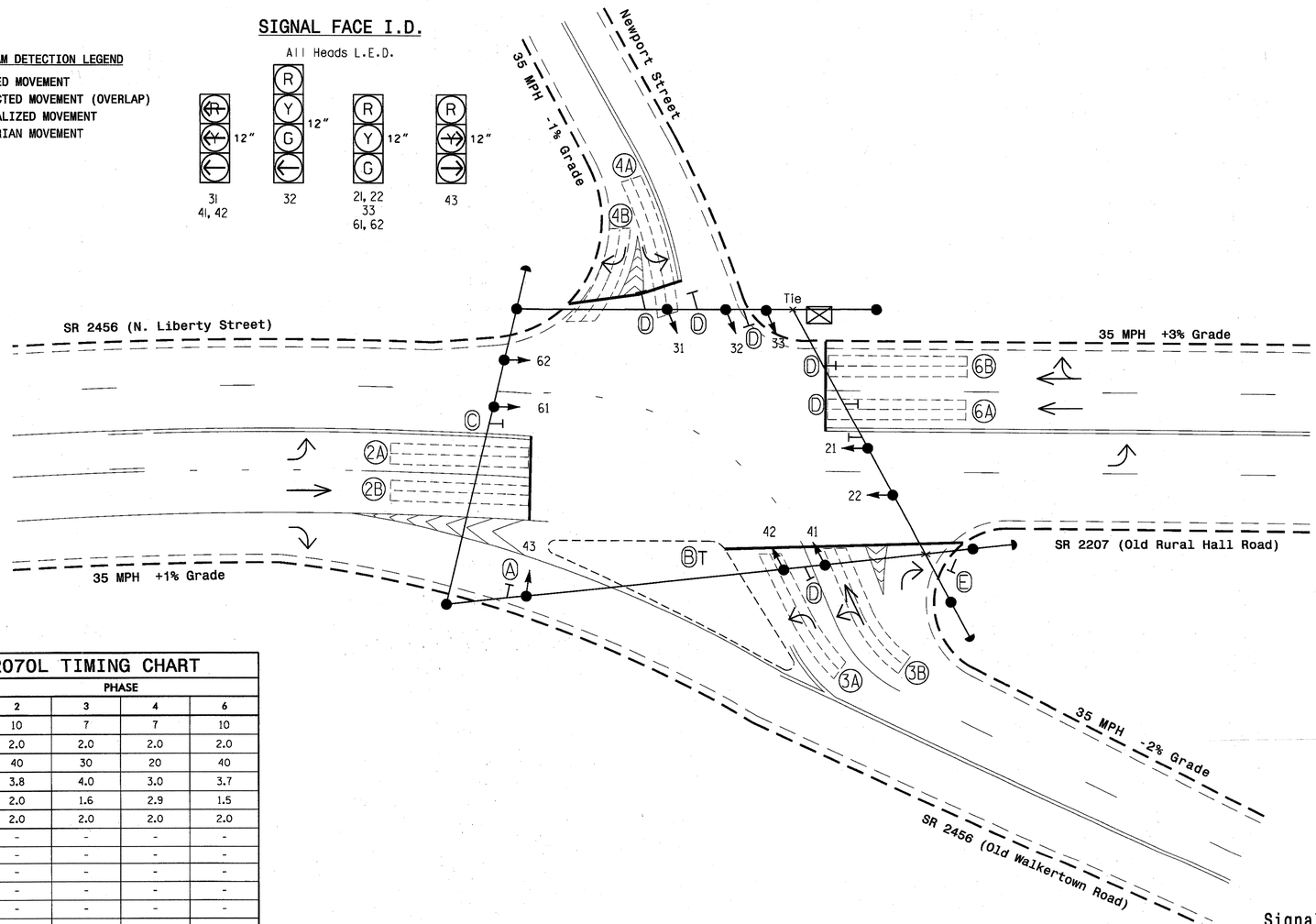
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. The order of phase 3 and phase 4 may be reversed.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○⌇	Signal Pole with Sidewalk Guy	●⌇
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	"NO TURN ON RED" Sign (R10-11)	Ⓐ
Ⓑ	"DO NOT ENTER" Sign (R5-1)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2)	Ⓒ
Ⓓ	Street Sign (D3-1)	Ⓓ
Ⓔ	"YIELD" Sign (R1-2)	Ⓔ

OASIS 2070L TIMING CHART				
FEATURE	PHASE 2	PHASE 3	PHASE 4	PHASE 6
Min Green 1 *	10	7	7	10
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	40	30	20	40
Yellow Clearance	3.8	4.0	3.0	3.7
Red Clearance	2.0	1.6	2.9	1.5
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2456 (N. Liberty St.)/ SR 2207 (Old Rural Hall Rd.) at SR 2456 (Old Walkertown Rd.)/ Newport St.

Division 9 Forsyth County Winston-Salem

PLAN DATE:	October 2011	PREPARED BY:	L. Blount
PREPARED BY:	Sterling	REVIEWED BY:	

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

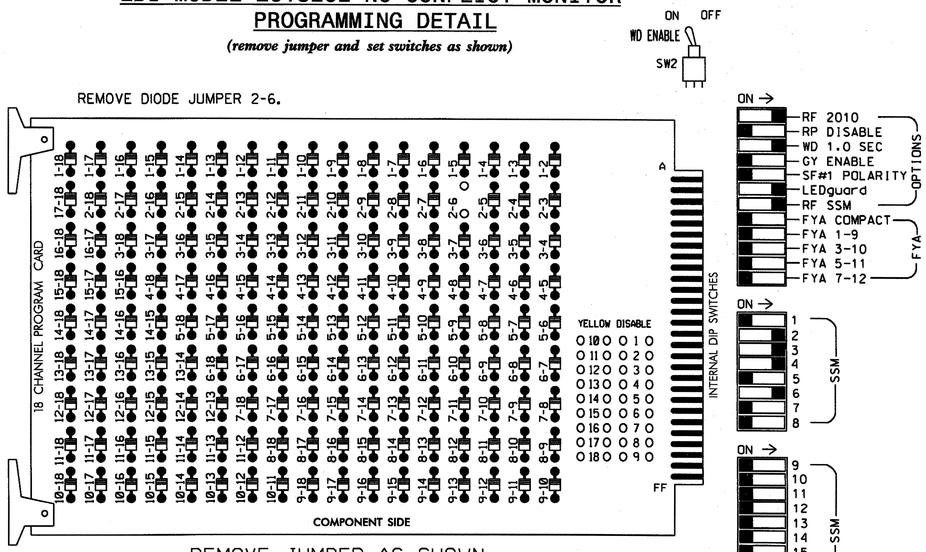
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZEMBA
SIGNATURE 9/18/12 DATE
SIG. INVENTORY NO. 09-0187

04-DEC-2012 13:06
S:\#ITS&SU#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0187#090187_sig_den_20120918.dgn
rzemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 112

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



REMOVE JUMPER AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems. insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S4,S5,S8
PHASES USED.....2,3,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4			S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3			4		14	5	6	15	7	8	16
PHASE	1	2	2 PED	3			4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	31	32	33	41,42	43	NU	NU	61,62	NU	NU	NU	NU
RED		128			116	116		101			134				
YELLOW		129			117	117					135				
GREEN		130			118	118					136				
RED ARROW				116			101								
YELLOW ARROW				117			102	102							
GREEN ARROW				118	118		103	103							
✋															
🚶															

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	ø3 3A,3B	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED			NOT USED	ø4 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A,3B	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0187
DESIGNED: October 2011
SEALED: 9/18/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2456 (N. Liberty St.)/ SR 2207 (Old Rural Hall Rd.) at SR 2456 (Old Walkertown Rd.)/ Newport St.

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: September 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | DATE 9-19-12

SIG. INVENTORY NO. 09-0187

19-SEP-2012 06:35
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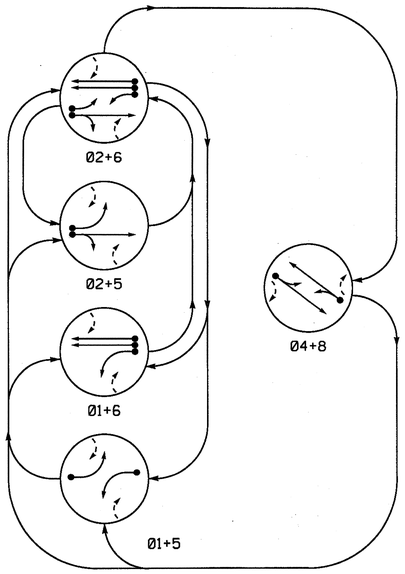
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.13

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

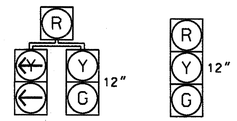
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
21	←R	R	←G	G	R	Y
22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
61	←R	G←	R	G	R	Y
62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

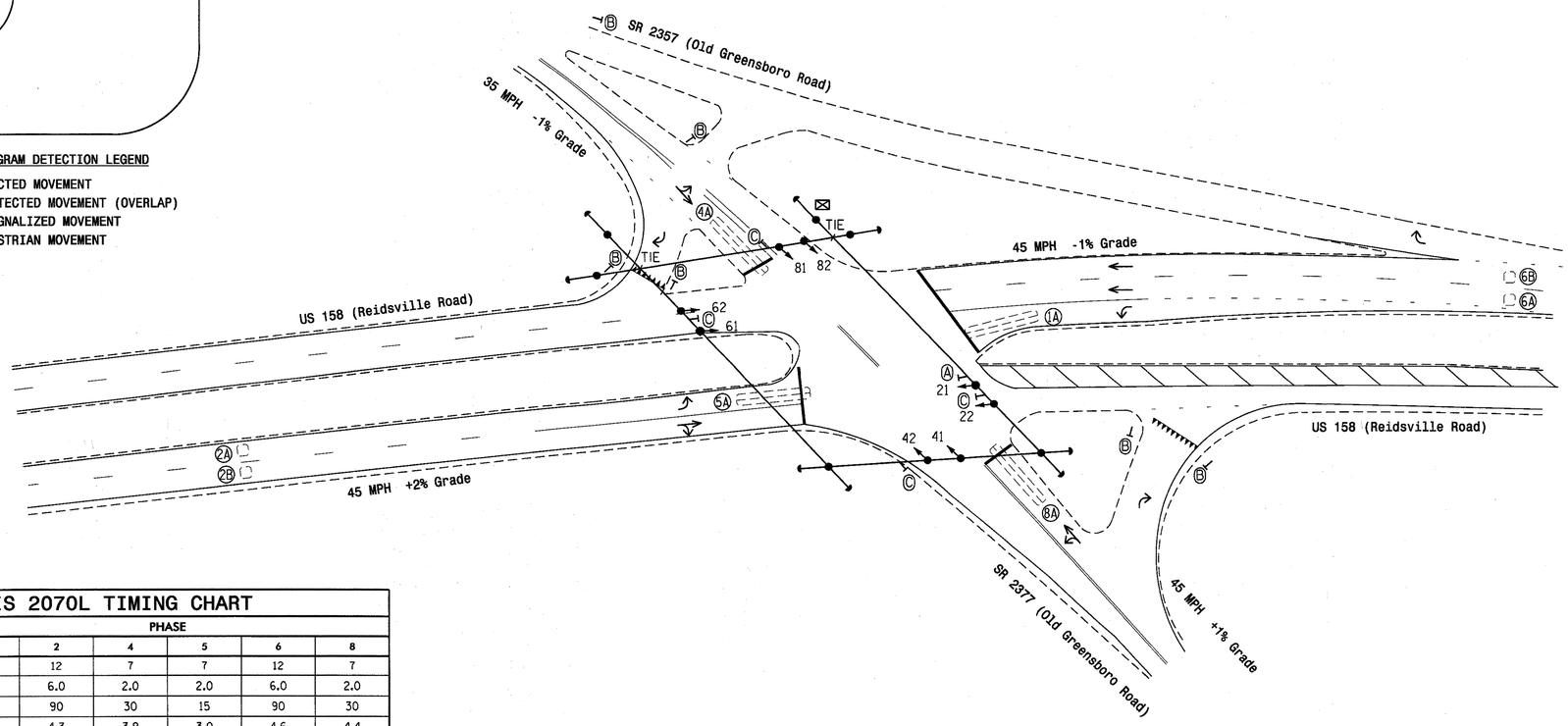
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	Y
					6	Y	Y	Y	-	3	-	Y
2A	6X6	300	5	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	5	-	2	Y	Y	-	-	-	-	Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	-	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
6A	6X6	300	5	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	5	-	6	Y	Y	-	-	-	-	Y
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	15	90	30	15	90	30
Yellow Clearance	3.0	4.3	3.9	3.0	4.6	4.4
Red Clearance	2.1	1.6	3.1	2.4	1.4	2.5
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

5 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 2 and 6 to allow the controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○~	Signal Pole with Sidewalk Guy	●~
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
▲▲▲▲▲▲▲	Yield Bar Pavement Marking	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

US 158 (Reidsville Road) at SR 2357/SR 2377 (Old Greensboro Rd.)

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2012 REVIEWED BY:

PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIENKA
SIGNATURE 10/4/12 DATE

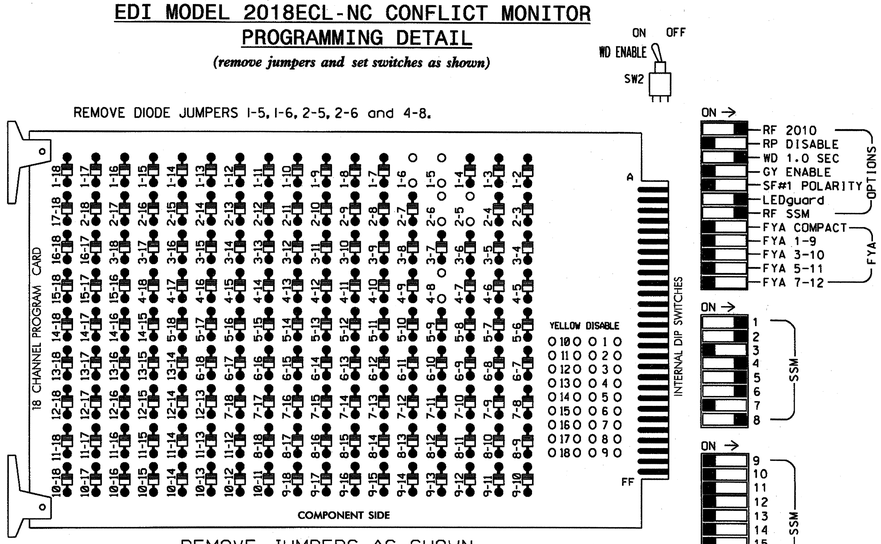
SIG. INVENTORY NO. 09-0195

04-OCT-2012 11:00
S:*ITS&SI*ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0195\090195_sig_dsn_20121004.dgn
rzienka

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 114

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	SLOT EMPTY	WIRED ⊗ INPUT	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	ø2 2B				NOT USED								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	WIRED ⊗ INPUT	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

[1] Add jumper from I1-W to J4-W, on rear of input file.

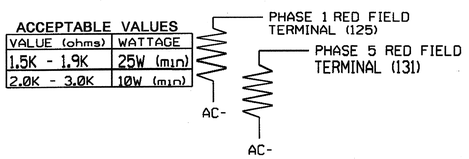
[2] Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0195
DESIGNED: September 2012
SEALED: 10/04/2012
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 158 (Reidsville Road)
at
SR 2357/SR 2377 (Old Greensboro Rd.)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: T. Jay
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

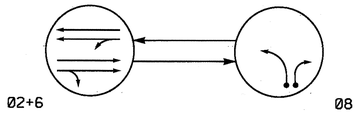
SIGNATURE
10/8/12
DATE

SIG. INVENTORY NO. 09-0195

04-OCT-2012 14:17
S:\mITSSIGUNITS Signals\Workgroups\Sig Mgmt\Strickland\090195_sample_xxx.dgn
cstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 115

PHASING DIAGRAM



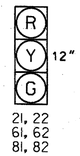
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 08	PHASE FLASH
21, 22	G	R	Y
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

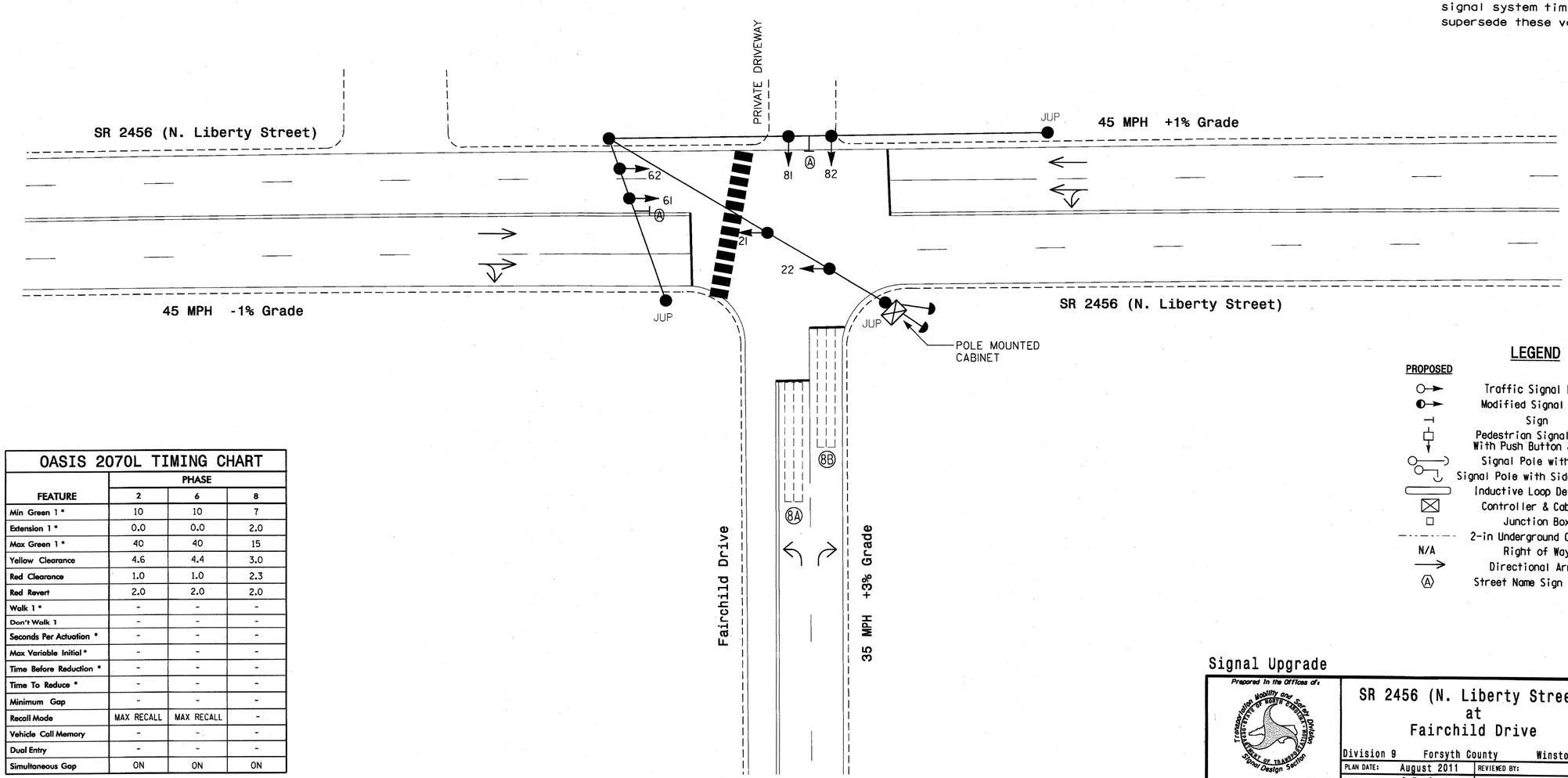


OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	15	-	Y

2 Phase
Semi-Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Street Name Sign (D3-1)	Ⓐ

OASIS 2070L TIMING CHART			
FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	10	10	7
Extension 1 *	0.0	0.0	2.0
Max Green 1 *	40	40	15
Yellow Clearance	4.6	4.4	3.0
Red Clearance	1.0	1.0	2.3
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MAX RECALL	MAX RECALL	-
Vehicle Call Memory	-	-	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 20
1"=20'

SR 2456 (N. Liberty Street)
at
Fairchild Drive

Division 9 Forsyth County Winston-Salem

PLAN DATE:	August 2011	REVIEWED BY:	
PREPARED BY:	C.E. Carter	REVIEWED BY:	

REVISIONS	INIT.	DATE

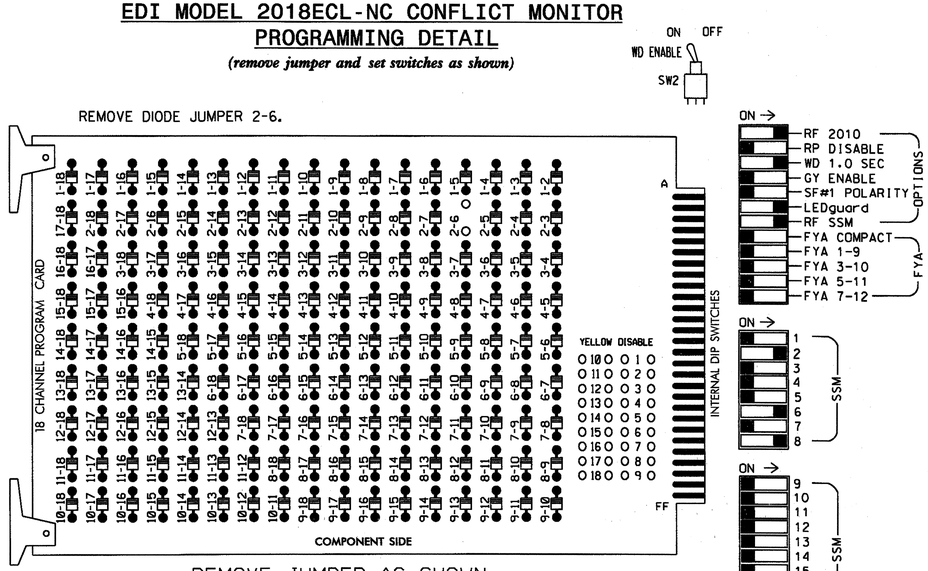
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
3/21/12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0199

17-APR-2012 09:46
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0199\090199_sig_dsn_20120321.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 116

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



REMOVE JUMPER AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S8,S11
PHASES USED.....2,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L								Ø 8 8B						ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
8A	TB22-1,2	I8U	42	4	8	8	Y	Y			3
8B	TB24-1,2	I8L	46	8	18	8	Y	Y			15

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0199
DESIGNED: August 2011
SEALED: 3/21/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2456 (N. Liberty Street)
at
Fairchild Drive

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: March 2012	REVIEWED BY: JTR
PREPARED BY: S. Armstrong	REVIEWED BY:

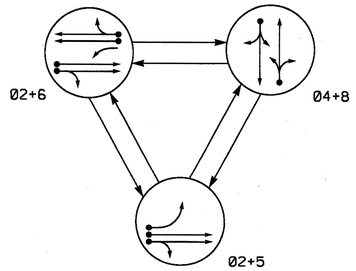
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE
3-22-12
DATE
SIG. INVENTORY NO. 09-0199

22-MAR-2012 06:56
S:\TSS\SW\ITS Signals\Workgroups\Sig Mon\Armstrong\09199_sm_ele_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 117

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
51	~~←~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	Y
81, 82	R	R	G	R

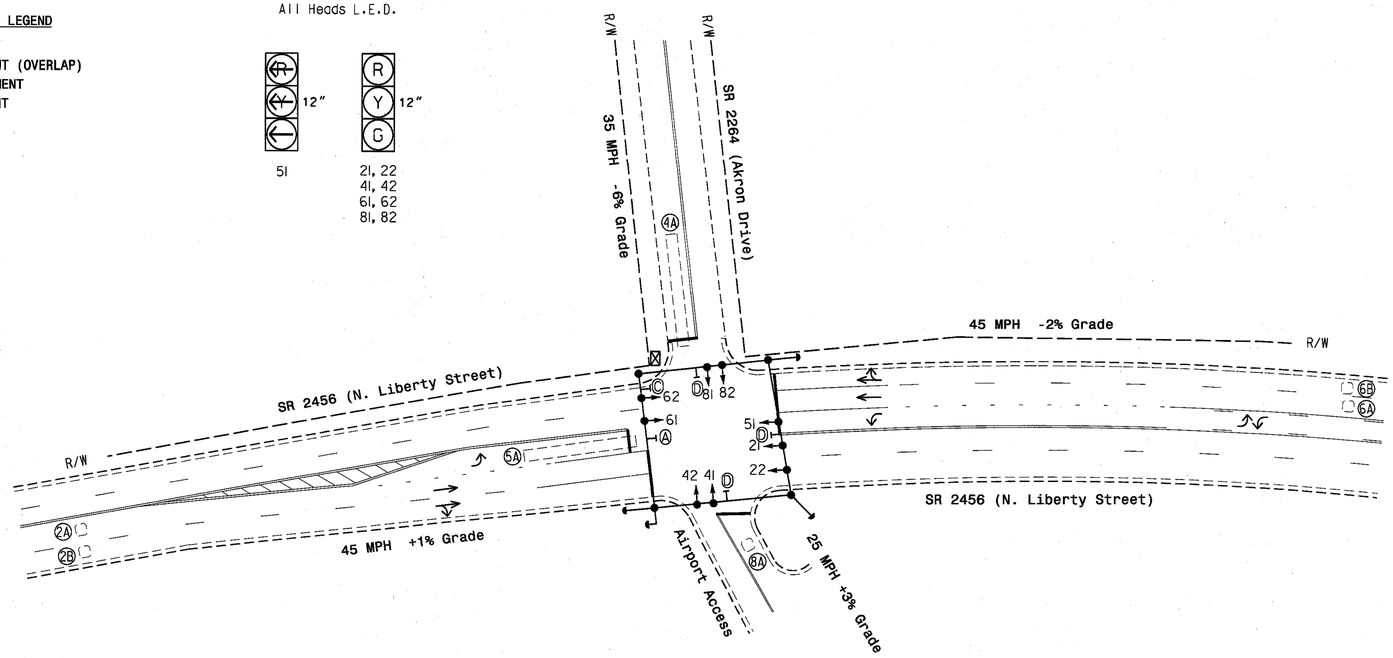
SIGNAL FACE I.D.

All Heads L.E.D.

51

21, 22
41, 42
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	Y
4A	6X60	+5	EXISTING	-	4	Y	Y	-	-	10	-	Y
5A	6X60	+5	EXISTING	-	5	Y	Y	-	-	3	-	Y
6A	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	Y
8A	6X6	15	EXISTING	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	5	6	8
Min Green 1 *	12	7	7	12	7
Extension 1 *	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	45	45	25	45	45
Yellow Clearance	4.5	3.2	3.0	4.5	3.2
Red Clearance	1.0	2.4	1.9	1.0	2.1
Red Revert	5.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5	-
Max Variable Initial *	34	-	-	34	-
Time Before Reduction *	15	-	-	15	-
Time To Reduce *	30	-	-	30	-
Minimum Gap	3.0	-	-	3.0	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	YELLOW
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
4. Phase 5 may be lagged.
5. Set all detector units to presence mode.
6. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. The cabinet should be designed to include an Auxiliary Output file for future use.
10. Existing Left Arrow "ONLY" sign (R3-5L) may be removed at the direction of the Engineer.
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	Left Arrow "ONLY" Sign (R3-5L)	A
C	"NO TURN ON RED" Sign (R10-11)	C
D	Street Name Sign	D

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2456 (N. Liberty Street) at SR 2264 (Akron Drive)

Division 9 Forsyth County Winston-Salem

PLAN DATE: July 2012 REVIEWED BY:

PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/6/12 DATE

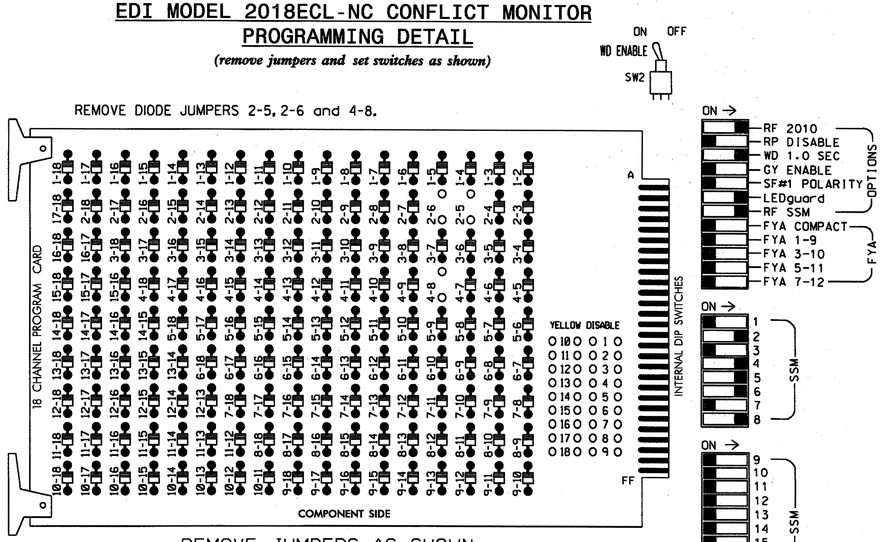
SIG. INVENTORY NO. 09-0267

06-NOV-2012 14:53
S:\#TSS\SW\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0267\#090267_sig_dsn_20121106.dgn
ZIEMBA

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 118

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S7,S8,S11
PHASES USED.....2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW							131											
YELLOW ARROW							132											
GREEN ARROW							133											

NU = Not Used

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				NOT USED									ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0267
DESIGNED: July 2012
SEALED: 11/06/12
REVISED: N/A

Electrical Design

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2456 (N. Liberty Street)
at
SR 2264 (Akron Drive)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: T. Lyga
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE | DATE 11/7/12

SIG. INVENTORY NO. 09-0267

07-NOV-2012 07:35
S:\eli\SIGSHEETS Signals\Workgroups\Sig Mgmt\Strickland\09026?_sht_eld_xxx.dgn
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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 119

8 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM

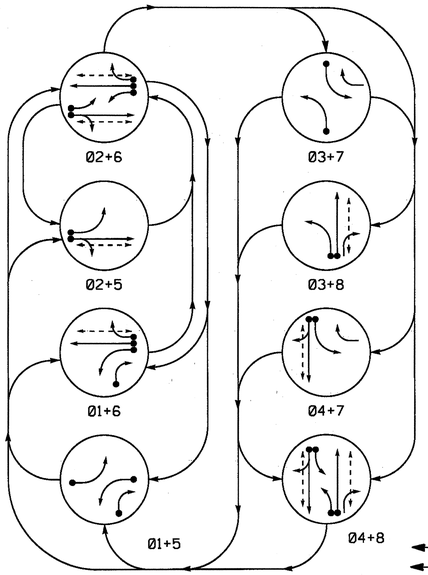


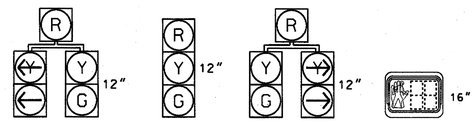
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R	R	R	R	Y
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	G	R
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



21, 41, 61, 81 — 22, 42 — 62, 82 — P21, P22, P41, P42, P61, P62, P81, P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

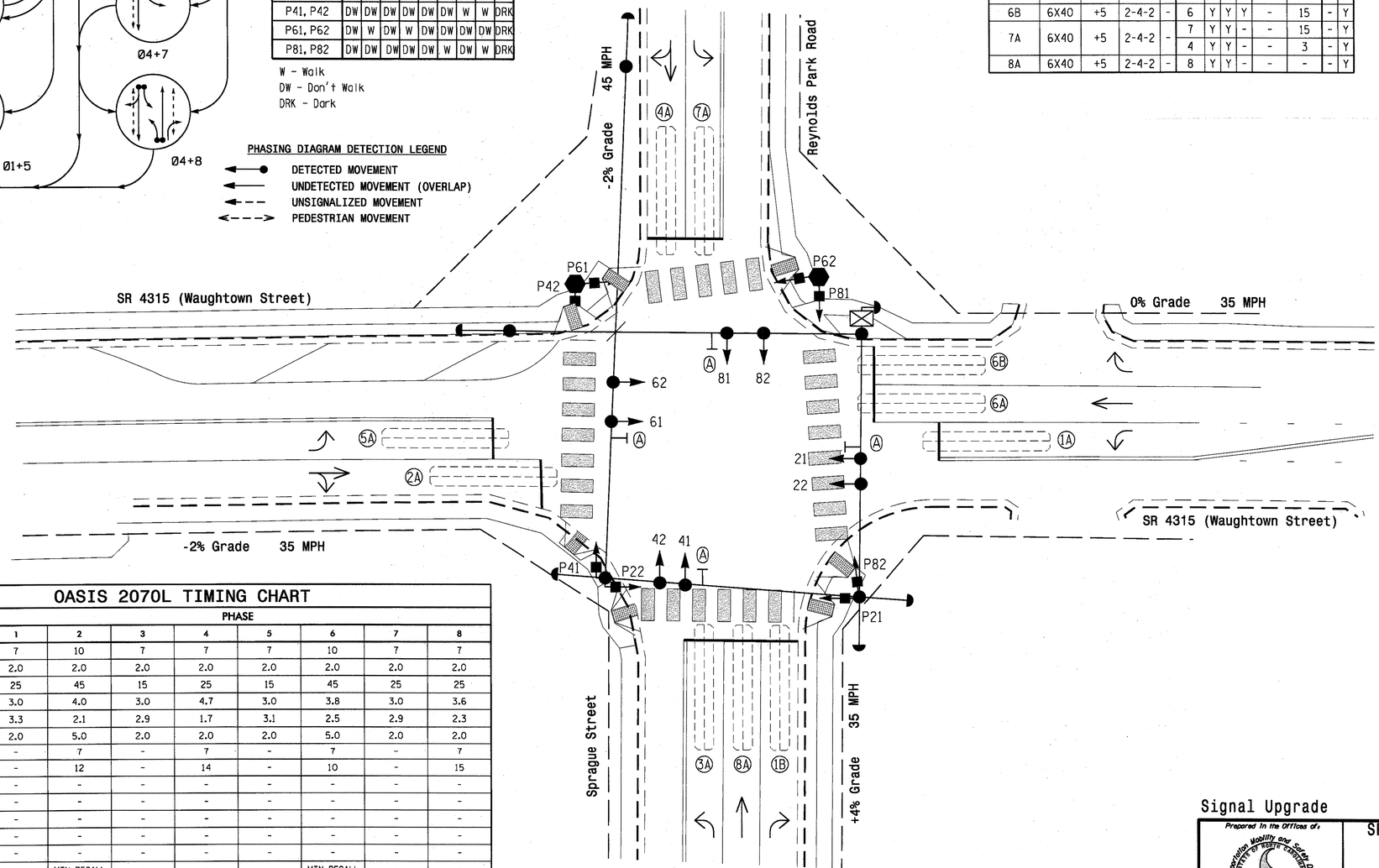
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP / NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	- / Y
					6	Y	Y	-	-	-	- / Y
1B	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	- / Y
2A	6X40	+5	2-4-2	-	2	Y	Y	-	-	-	- / Y
3A	6X40	+5	2-4-2	-	3	Y	Y	-	-	15	- / Y
					8	Y	Y	-	-	3	- / Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	10	- / Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	15	- / Y
					2	Y	Y	-	-	-	- / Y
6A	6X40	+5	2-4-2	-	6	Y	Y	-	-	-	- / Y
6B	6X40	+5	2-4-2	-	6	Y	Y	Y	-	15	- / Y
7A	6X40	+5	2-4-2	-	7	Y	Y	-	-	15	- / Y
					4	Y	Y	-	-	3	- / Y
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	-	- / Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Omit phase 3 during phase 4 on.
5. Omit phase 7 during phase 8 on.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. Existing "Left Turn Yield On Green" signs (R-10-12) may be removed at the direction of the Engineer.
12. Pavement markings are existing.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	10	7	7	7	10	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	25	45	15	25	15	45	25	25
Yellow Clearance	3.0	4.0	3.0	4.7	3.0	3.8	3.0	3.6
Red Clearance	3.3	2.1	2.9	1.7	3.1	2.5	2.9	2.3
Red Revert	2.0	5.0	2.0	2.0	2.0	5.0	2.0	2.0
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	12	-	14	-	10	-	15
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	-	-	-	-	-	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Signal Pedestal	
(A)	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	(A)

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4315 (Waughtown Street) at Reynolds Park Road and Sprague Street

Division 9 Forsyth County Winston-Salem
PLAN DATE: December 2012 REVIEWED BY:
PREPARED BY: L. Blount REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 1/3/13 DATE
SIG. INVENTORY NO. 09-0271

03-JAN-2013 14:06
K:\TSD\ATS\Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0271\09271_sig_dsn_20130103.dgn
rzlotnicki

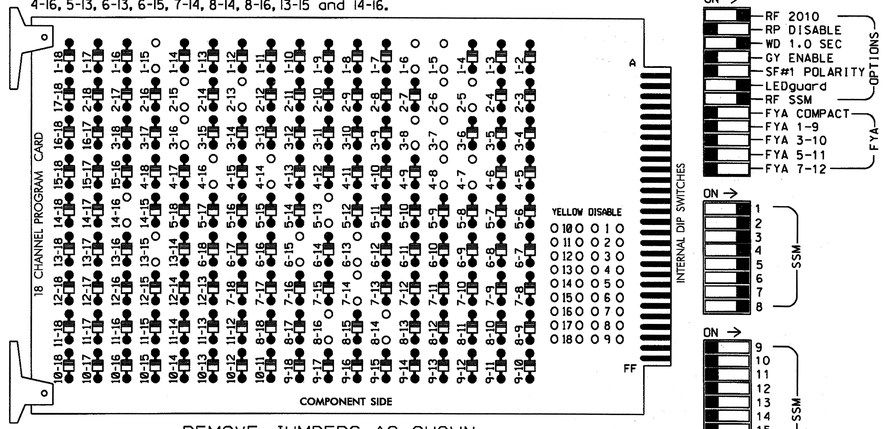
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 120

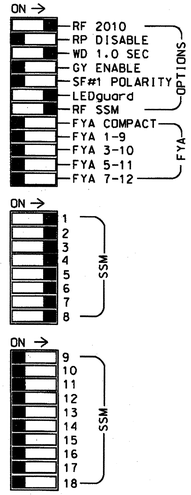
EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2

REMOVE DIODE JUMPERS I-5, I-6, I-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-16, 4-7, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 7-14, 8-14, 8-16, I3-15 and I4-16.





■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8, S9,S10,S11,S12
PHASES USED.....1,2,2 PED,3,4,4 PED,5,6, 6 PED,7,8,8 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61,82	21,22	P21, P22	81	41,42	P41, P42	21	61,62	P61, P62	41,62	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED	*	128		*	101		*	134		*	107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126			117			132			123								
GREEN ARROW	127			118			133			124								
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Functions 1 and 2.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
              OVERLAPS:|ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE |
OR       PHASES:|1234567891011121314 1516
IF PHASES ARE ON|   X
OMIT PHASES     |  X
CALL PHASES     |
```

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #02
              OVERLAPS:|ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE |
OR       PHASES:|1234567891011121314 1516
IF PHASES ARE ON|     X
OMIT PHASES     |    X
CALL PHASES     |
```

BACKUP PROTECTION PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø1 1B	SLOT EMPTY	WIRED INPUT ⊗	ø3 3A	ø4 4A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø2 PED DC ISOLATOR	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	ø2 2A			NOT USED	NOT USED						ø4 PED DC ISOLATOR	ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	ø7 7A	ø8 8A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B			NOT USED	NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

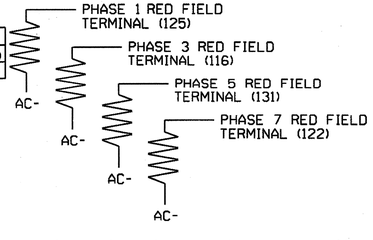
FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A[2]	TB4-5,6	I5U	58	20	3	3	Y	Y			15
	-	J8U	50	12	28	8	Y	Y			3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
5A[3]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y	Y		15
7A[4]	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from I5-W to J8-W, on rear of input file.
[3] Add jumper from J1-W to I4-W, on rear of input file.
[4] Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Electrical Detail

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0271
DESIGNED: December 2012
SEALED: 1/3/13
REVISED: N/A

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4315 (Waughtown Street) at Reynolds Park Road and Sprague Street

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: January 2013 | REVIEWED BY: T.Lyn
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 1/3/13 DATE
SIG. INVENTORY NO. 09-0271

04-JAN-2013 07:15
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Osstrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 121

PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

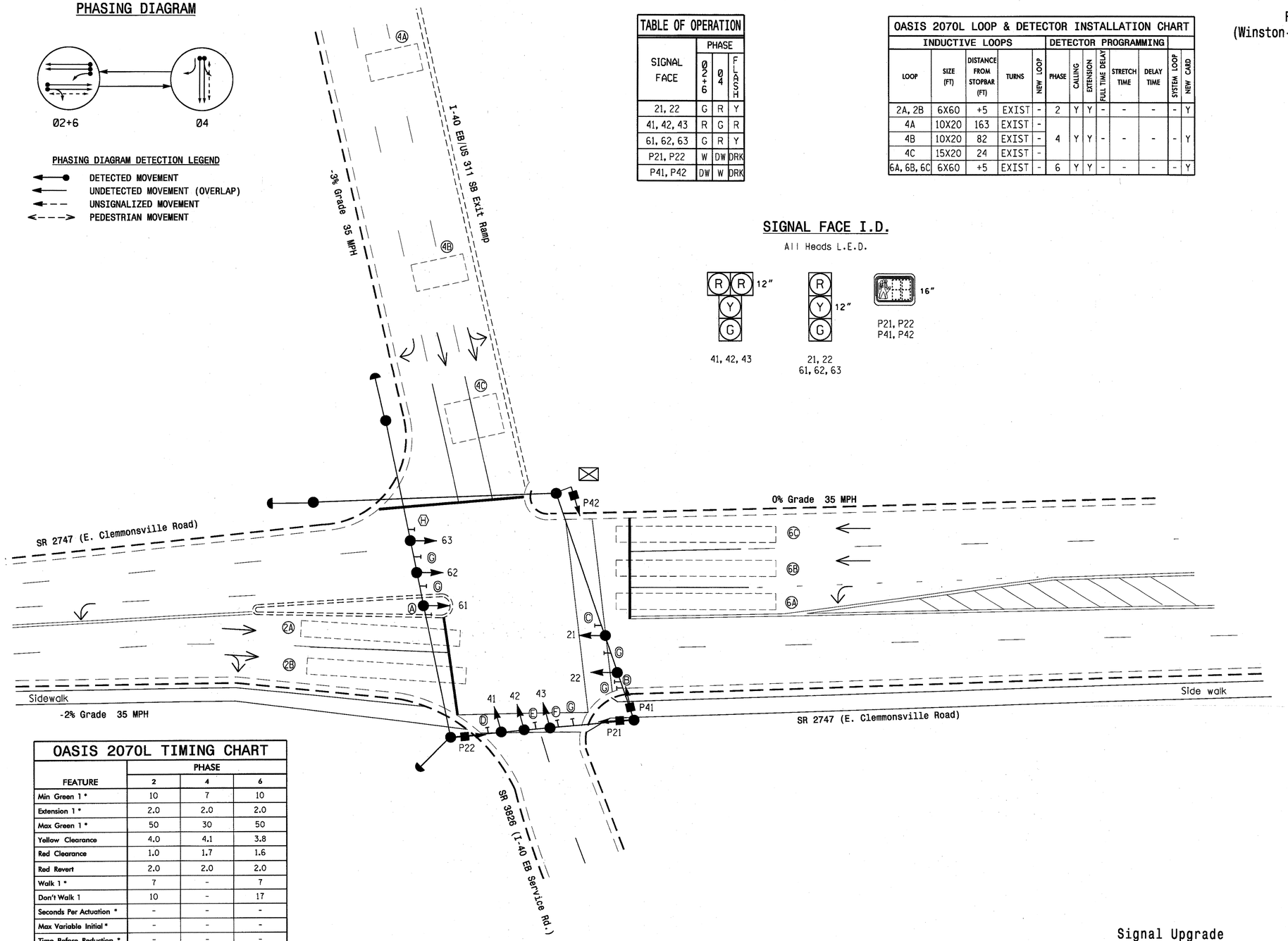


TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	FLASH
21, 22	G	R	Y
41, 42, 43	R	G	R
61, 62, 63	G	R	Y
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A, 2B	6X60	+5	EXIST	-	2	Y	Y	-	-	-	-	Y
4A	10X20	163	EXIST	-	4	Y	Y	-	-	-	-	Y
4B	10X20	82	EXIST	-								
4C	15X20	24	EXIST	-								
6A, 6B, 6C	6X60	+5	EXIST	-	6	Y	Y	-	-	-	-	Y

SIGNAL FACE I.D.

All Heads L.E.D.

OASIS 2070L TIMING CHART			
FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	10	7	10
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	50	30	50
Yellow Clearance	4.0	4.1	3.8
Red Clearance	1.0	1.7	1.6
Red Revert	2.0	2.0	2.0
Walk 1 *	7	-	7
Don't Walk 1	10	-	17
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. Existing lane control signs may be removed at the direction of the Engineer.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Right Arrow Sign (R3-6R)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2)	Ⓒ
Ⓓ	Right Arrow "ONLY" Sign (R3-5R)	Ⓓ
Ⓔ	Through Arrow "ONLY" Sign (R3-5A)	Ⓔ
Ⓕ	Combined Through and Left Arrow Sign (R3-6L)	Ⓕ
Ⓖ	Street Name Sign (D3-1)	Ⓖ
Ⓗ	No Right Turn Sign (R3-1)	Ⓗ

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2747 (E. Clemmonsville Rd.)
at
I-40 EB/US 311 SB Exit Ramp

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY:
PREPARED BY: W. Bazzarie REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZUNIGA
SIGNATURE 5/21/12 DATE

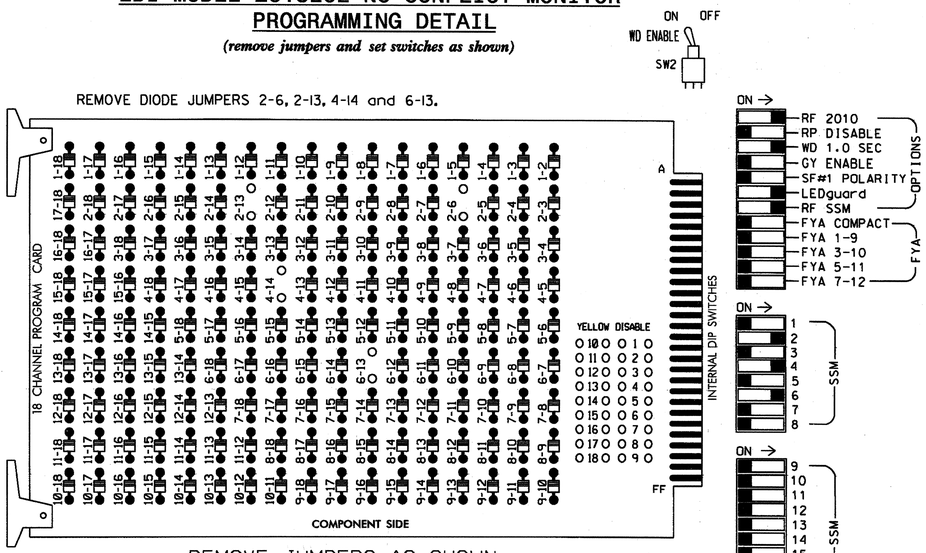
SIG. INVENTORY NO. 09-0327

04-DEC-2012 13:23
S:\ITS&S\Sig\TS Signal\Signal Design Section\Control Regions\Div 9\C-5224 Winston Salem\Signals\09-0327\09032?_sig_dsn_20120521.dgn

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 122

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 4 for 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S8
PHASES USED.....2,2 PED,4,4 PED,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41, 42,43	P41, P42	NU	61, 62,63	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113			104						
🚶			115			106						

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A, 4B,4C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED				NOT USED						Ø4 PED DC ISOLATOR		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A, 6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A,4B,4C	TB4-9,10	I6U	41	3	4	4	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0327
DESIGNED: November 2011
SEALED: 05/21/12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2747 (E. Clemmonsville Road)
at
I-40 EB/US 311 SB Exit Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: May 2012 | REVIEWED BY: T. Igel
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

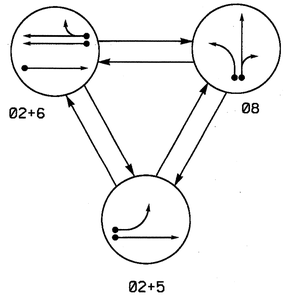
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE
5/22/12
DATE
SIG. INVENTORY NO. 09-0327

21-MAY-2012 13:36
$1:\MSSGM\TS Signals\Workgroups\Sig Mon\Strickland\09327_sm_ele_xxx.dgn
castrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 123

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

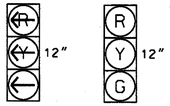
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21, 22	G	G	R	Y
51	~~←~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	Y
81, 82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



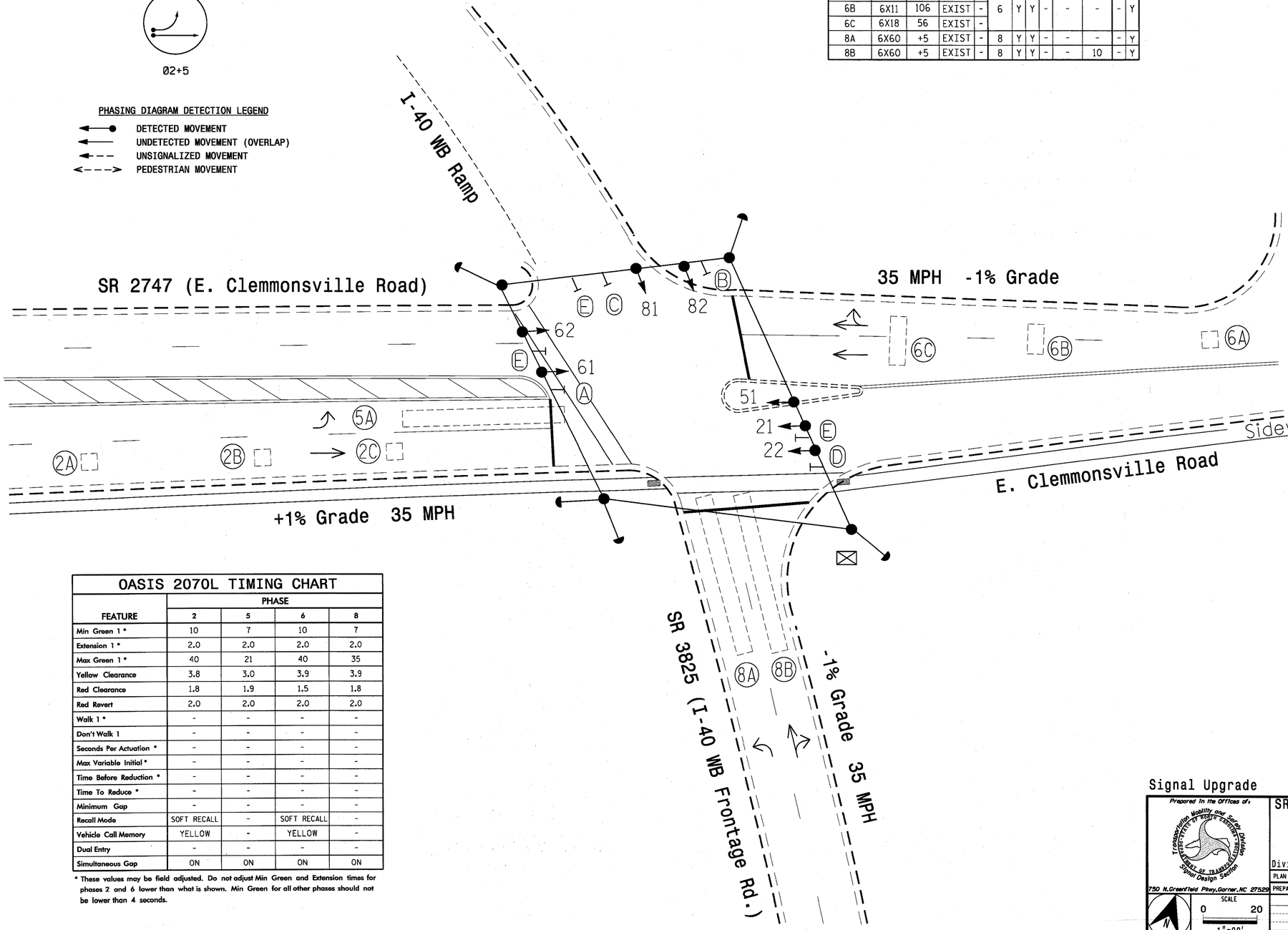
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	171	EXIST	-								
2B	6X6	106	EXIST	-	2	Y	Y	-	-	-	-	Y
2C	6X6	56	EXIST	-								
5A	6X60	+5	EXIST	-	5	Y	Y	-	-	-	-	Y
6A	6X6	171	EXIST	-								
6B	6X11	106	EXIST	-	6	Y	Y	-	-	-	-	Y
6C	6X18	56	EXIST	-								
8A	6X60	+5	EXIST	-	8	Y	Y	-	-	-	-	Y
8B	6X60	+5	EXIST	-	8	Y	Y	-	-	10	-	Y

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Combined Through and Right Arrow Sign (R3-6R)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	Street Name Sign (D3-1)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	40	21	40	35
Yellow Clearance	3.8	3.0	3.9	3.9
Red Clearance	1.8	1.9	1.5	1.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2747 (E. Clemmonsville Rd.)
at
I-40 WB Ramp/ SR 3825
(I-40 WB Frontage Road)

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY:
PREPARED BY: W. Bazzarie REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
5/15/12
SIGNATURE DATE

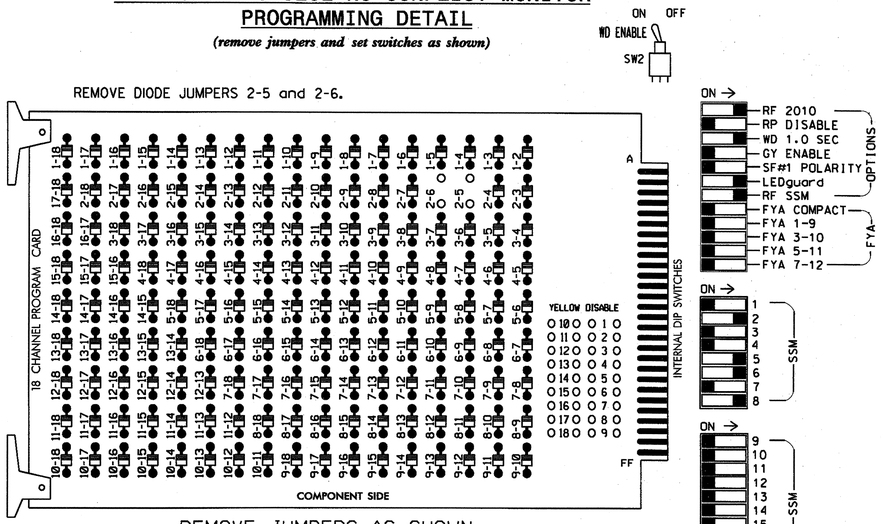
SIG. INVENTORY NO. 09-0328

04-DEC-2012 13:17
S:\MITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0328\090328_sig_dsn_20120515.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.124

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S7,S8,S11
PHASES USED.....2,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW							131											
YELLOW ARROW							132											
GREEN ARROW							133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A,2B, 2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED												ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A,6B, 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	12U	39	1	2	2	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0328
DESIGNED: November 2011
SEALED: 5-15-12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2747 (E. Clemmonsville Rd.)
at
I-40 WB Ramp/ SR 3825
(I-40 WB Frontage Road)

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 05-10-12 | REVIEWED BY: T.Vgs

PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

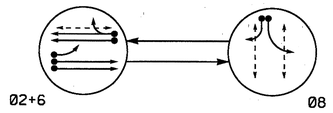
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE George C Brown 5/16/12 DATE

SIG. INVENTORY NO. 09-0328

15-MAY-2012 16:46
S:\TSS&S\ITS Signals\Workgroups\Sig Mans\Spaulding\In-progress\090328_sht_ele_2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 125

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21, 22	G	R	Y
61, 62	G	R	Y
81, 82	R	G	R
P21, P22	W	DW	DRK
P81, P82	DW	W	DRK
P83, P84	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

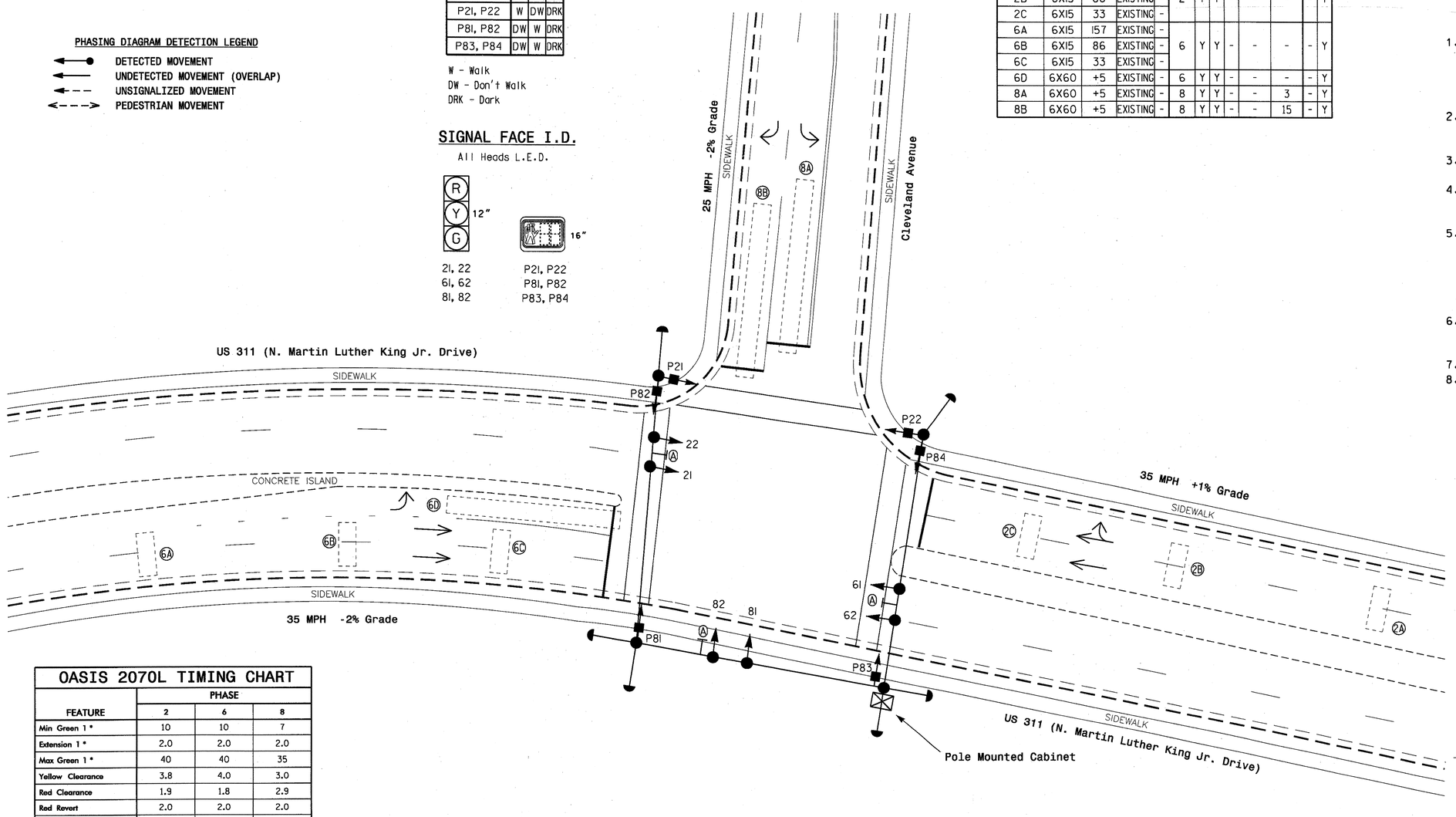
All Heads L.E.D.

21, 22
61, 62
81, 82

P21, P22
P81, P82
P83, P84

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X15	157	EXISTING	-								
2B	6X15	86	EXISTING	-	2	Y	Y	-	-	-	-	Y
2C	6X15	33	EXISTING	-								
6A	6X15	157	EXISTING	-								
6B	6X15	86	EXISTING	-	6	Y	Y	-	-	-	-	Y
6C	6X15	33	EXISTING	-								
6D	6X60	+5	EXISTING	-	6	Y	Y	-	-	-	-	Y
8A	6X60	+5	EXISTING	-	8	Y	Y	-	-	3	-	Y
8B	6X60	+5	EXISTING	-	8	Y	Y	-	-	15	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	10	10	7
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	40	40	35
Yellow Clearance	3.8	4.0	3.0
Red Clearance	1.9	1.8	2.9
Red Revert	2.0	2.0	2.0
Walk 1 *	7	-	7
Don't Walk 1	15	-	17
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	YELLOW	YELLOW	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	Street Name Sign (D3-1)	(A)

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 20 1"=20'

US 311
(N. Martin Luther King, Jr. Dr.)
at
Cleveland Avenue

Division 9 Forsyth County Winston-Salem

PLAN DATE: August 2011 REVIEWED BY:
PREPARED BY: CE Carter REVIEWED BY:

REVISIONS	INIT.	DATE

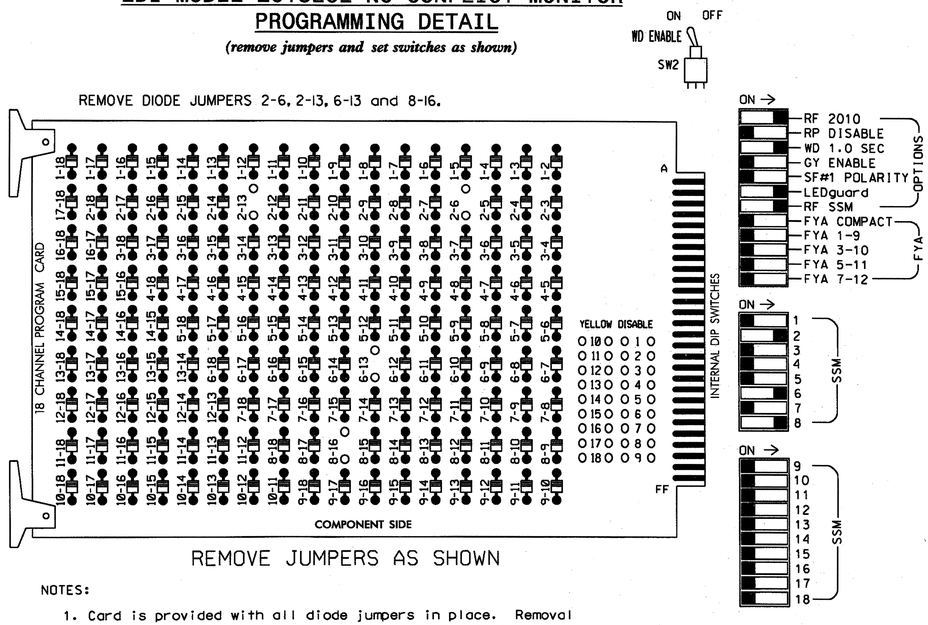
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 10/8/12 DATE
SIG. INVENTORY NO. 09-0395

08-OCT-2012 17:47
S:\NITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\09-0395\#090395_sig.dsn_20121008.dgn
rziembo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 126

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 8 for 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S8,S11,S12
PHASES USED.....2,2 PED,6,8,8 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	NU	NU	NU	61,62	NU	NU	81,82	P81,P82, P83,P84
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113									110
🚶			115									112

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 6A, 6B,6C	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	NOT USED	FS DC ISOLATOR
FILE "I" L		Ø2 2A, 2B,2C				Ø6 6D		Ø8 8B				NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB23-3,4	I2L	43	5	12	2	Y	Y			
6A,6B,6C	TB21-11,12	I6U	40	2	6	6	Y	Y			
6D	TB23-11,12	I6L	44	6	16	6	Y	Y			
8A	TB22-1,2	I8U	42	4	8	8	Y	Y			3
8B	TB24-1,2	I8L	46	8	18	8	Y	Y			15
PED PUSH BUTTONS											
P21,P22	TB22-9,10	I12U	67	29	PED 2	2 PED					
P81,P82,P83,P84	TB24-11,12	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0395
DESIGNED: August 2011
SEALED: 10/08/2012
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 311
(N. Martin Luther King, Jr. Dr.)
at
Cleveland Avenue

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: T. Vann
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
George C. Brown 10/9/12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0395

09-OCT-2012 09:28
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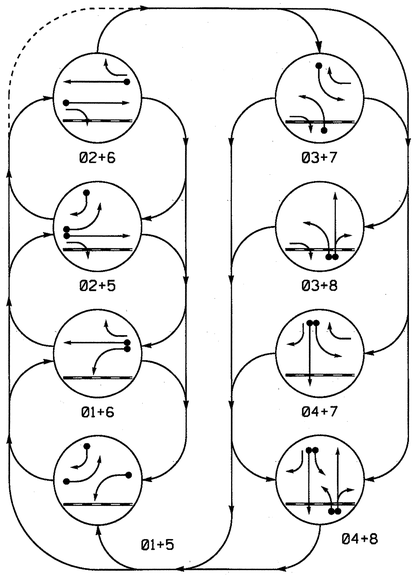
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 127

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

RAIL PREEMPT PHASES

(High Priority)

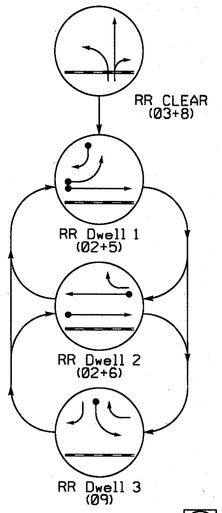


TABLE OF OPERATION

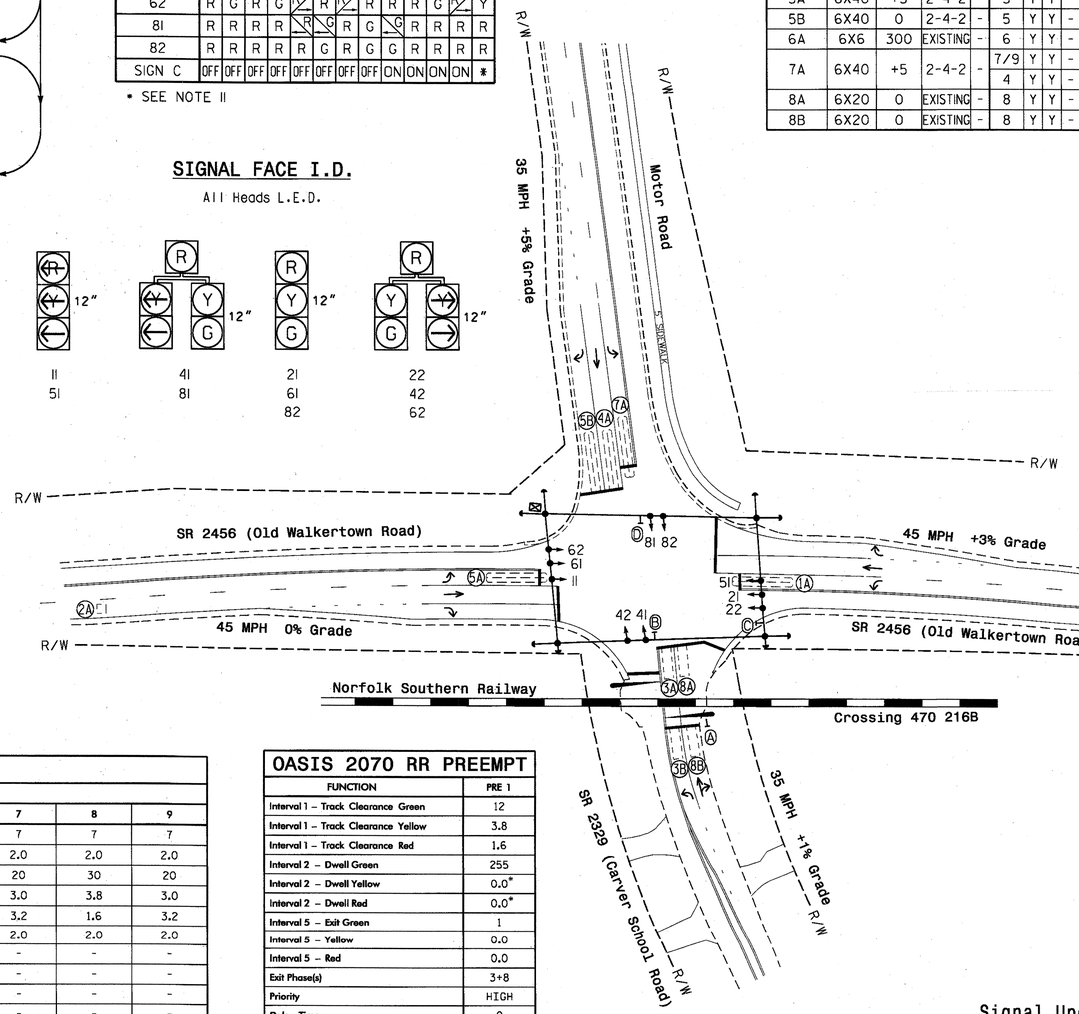
SIGNAL FACE	PHASE													
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	CLR RR	DWL RR 1	DWL RR 2	DWL RR 3	FLASH
11	↚	↚	↛	↛	↛	↛	↛	↛	↛	↛	↛	↛	↛
21	R	R	G	G	R	R	R	R	R	G	G	R	Y
22	R	R	G	G	R/↛	R/→	R	R	R	G	G	R	Y
41	R	R	R	R	↛/R	R	R/←	G	G	R	R	R/←	R
42	R/↛	R	R/↛	R	R	R	G	G	R	R/↛	R	R/↛	R
51	↚	↛	↚	↛	↛	↛	↛	↛	↛	↚	↛	↛	↛
61	R	G	R	G	R	R	R	R	R	R	G	R	Y
62	R	G	R	G	R/↛	R	R/←	R	R	R	G	R/↛	Y
81	R	R	R	R	↛/R	R/←	G	G	←/G	R	R	R	R
82	R	R	R	R	R	G	R	G	G	R	R	R	R
SIGN C	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	*

• SEE NOTE 11

SIGNAL FACE I.D.

All Heads L.E.D.

11 51 | 41 81 | 21 61 82 | 22 42 62



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP		PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-		1	Y	Y	-	-	3	-	Y
2A	6X6	300	EXISTING	-		2	Y	Y	-	-	-	-	Y
3A	6X20	0	EXISTING	-		3	Y	Y	-	-	15	-	Y
						8	Y	Y	-	-	3	-	Y
3B	6X20	0	EXISTING	-		3	Y	Y	-	-	10	-	Y
						8	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-		4	Y	Y	-	-	-	-	Y
5A	6X40	+5	2-4-2	-		5	Y	Y	-	-	3	-	Y
5B	6X40	0	2-4-2	-		5	Y	Y	-	-	15	-	Y
6A	6X6	300	EXISTING	-		6	Y	Y	-	-	-	-	Y
7A	6X40	+5	2-4-2	-		7/9	Y	Y	-	-	15	-	Y
						4	Y	Y	-	-	3	-	Y
8A	6X20	0	EXISTING	-		8	Y	Y	-	-	10	-	Y
8B	6X20	0	EXISTING	-		8	Y	Y	-	-	5	-	Y

8 Phase w/Railroad Preemption Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Omit phase 3 during phase 4 on.
5. Omit phase 7 during phase 8 on.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Existing "Left Turn Yield on Green" ball sign (R10-12) may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Ensure flashing operation does not alter operation of blankout signs.
12. Program parent phases for Overlap "P" for all phases used in normal operation.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○⤵	Signal Pole With Sidewalk Guy	●⤵
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⛶
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓐ
Ⓑ	"ONCOMING TRAFFIC MAY HAVE EXTENDED GREEN" Sign (W25-2)	Ⓑ
Ⓒ	"NO RIGHT TURN - TRAIN" Fiber Optic Blankout Sign	Ⓒ
Ⓓ	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	Ⓓ

OASIS 2070L TIMING CHART

FEATURE	PHASE								
	1	2	3	4	5	6	7	8	9
Min Green 1 *	7	12	7	7	7	12	7	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0	2.0
Max Green 1 *	25	90	20	30	20	90	20	30	20
Yellow Clearance	3.0	4.5	3.0	3.6	3.0	4.3	3.0	3.8	3.0
Red Clearance	2.3	1.5	2.4	2.6	2.8	1.3	3.2	1.6	3.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	-	2.5	-	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-	-
Time To Reduce *	-	30	-	-	-	30	-	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-	-
Dual Entry	-	-	-	ON	-	-	-	ON	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

OASIS 2070 RR PREEMPT

FUNCTION	PRE 1
Interval 1 – Track Clearance Green	12
Interval 1 – Track Clearance Yellow	3.8
Interval 1 – Track Clearance Red	1.6
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Exit Phase(s)	3+8
Priority	HIGH
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	4.5
Red Clear Before Pre	1.7
Dwell Min Time	10
Enable Backup Protection	N
Ped Clear Through Yellow	N
Omit Overlaps	C, P

* Time defaults to time used for phase during normal operation

This signal was designed for simultaneous preemption.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2456 (Old Walkertown Road) at SR 2329 (Carver School Road)/ Motor Road

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY:

PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZEMBA

SIGNATURE 9/13 DATE

SIG. INVENTORY NO. 09-0398

09-JAN-2013 09:27
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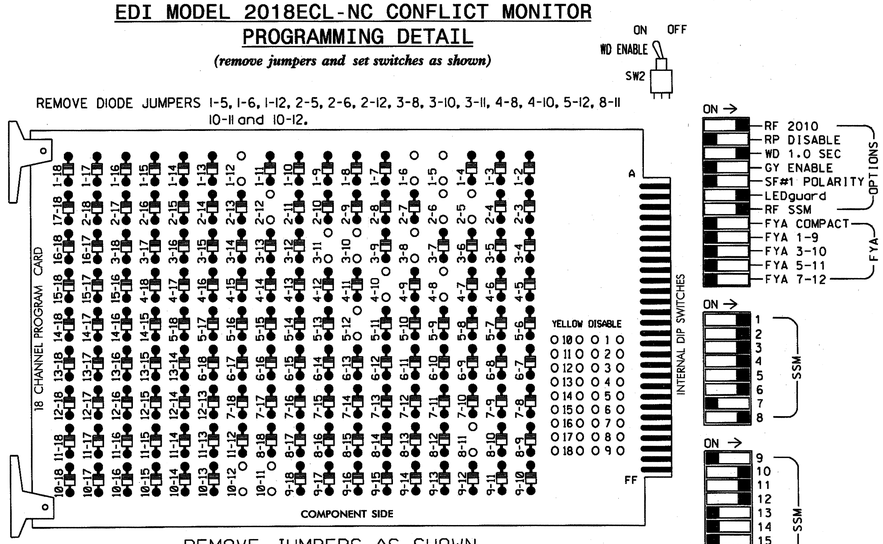
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.12B

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash, and overlap 2 as Wag Overlaps.
7. The cabinet and controller are part of the Winston-Salem Signal.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS VERSION 3.03.26E
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S11,AUX S2, AUX S4,AUX S5
PHASES USED.....1,2,3,4,5,6,7,8,9
OVERLAP A:.....NOT USED
OVERLAP B:.....7+9
OVERLAP C:.....3
OVERLAP D:.....5+9
OVERLAP P:.....1+2+3+4+5+6+7+8

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	81	41,42	NU	51	61,62	NU	NU	81,82	NU	NU	41,62	NU	22	42	NU
RED		128		*	101			134			107			*		*	*	
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126			117			132							A125		A115	A102	
GREEN ARROW	127			118			133							A126		A116	A103	

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Functions 1 and 2.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                    OVERLAPS:|ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE |
OR        PHASES:|123456789101112131415 16
IF PHASES ARE ON|   X
OMIT PHASES     |  X
CALL PHASES     |
```

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #02
                    OVERLAPS:|ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE |
OR        PHASES:|123456789101112131415 16
IF PHASES ARE ON|      X
OMIT PHASES     |     X
CALL PHASES     |
```

BACKUP PROTECTION PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	Ø3 3A	Ø3 3B	Ø4 4A	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED			NOT USED	NOT USED	NOT USED							ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø5 5B	Ø6 6A	SLOT EMPTY	Ø7/Ø9 7A	Ø8 8A	WIRED INPUT ⊗	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	PRE1 AC ISOLATOR
	L	NOT USED	NOT USED	NOT USED		NOT USED	Ø8 8B								NOT USED

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

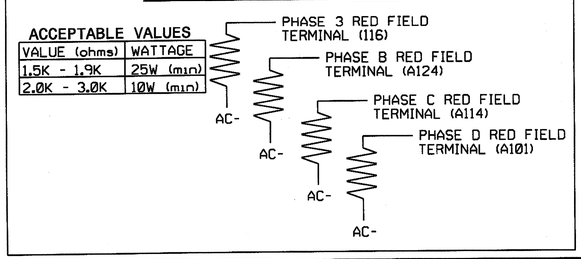
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A[1]	TB4-5,6	I5U	58	20	3	3	Y	Y			15
	-	J8U	50	12	28	8	Y	Y			3
3B[2]	TB4-9,10	I6U	41	3	4	3	Y	Y			10
	-	J7U	66	28	38	8	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
7A[3]	TB5-5,6	J5U	57	19	7	7/9	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			5

[1] Add jumper from I5-W to J8-W. on rear of input file.
[2] Add jumper from I6-F to J7-F. on rear of input file.
[3] Add jumper from J5-W to I8-W. on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

```
PHASE SEQUENCE: PAGE 1  NEXT: PAGES)
RNG|LEAD  BARRIER 1  X-LAG|LEAD  BARRIER 2  X-LAG|LEAD  BARRIER 3  X-LAG
 1 | 1    2         0     0 | 3    4         0     0 | 9    0         0     0
 2 | 5    6         0     0 | 7    8         0     0 | 0    0         0     0
 3 | 0    0         0     0 | 0    0         0     0 | 0    0         0     0
 4 | 0    0         0     0 | 0    0         0     0 | 0    0         0     0
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0398
DESIGNED: November 2012
SEALED: 1-09-13
REVISED: N/A

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 2456 (Old Walkertown Road) at SR 2329 (Carver School Road)/ Motor Road	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, NCDEPARTMENT OF TRANSPORTATION, Signal Management Section	Division 9 · Forsyth County · Winston-Salem	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy.,Garner,NC 27529	PLAN DATE: January 2013 · REVIEWED BY: JTR	SIGNATURE · DATE 1-9-17
	PREPARED BY: James Peterson · REVIEWED BY:	SIG. INVENTORY NO. 09-0398
	REVISIONS · INIT. · DATE	

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Peterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.129

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |1234567891011213141516
VEH OVL PARENTS: |      X X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011213141516
VEH OVL PARENTS: |  X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          |1234567891011213141516
VEH OVL PARENTS: |    X   X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+' 12 TIMES

```
 PAGE 1: VEHICLE OVERLAP 'P' SETTINGS
 PHASE:          |1234567891011213141516
VEH OVL PARENTS: |XXXXXXXX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 9 for 'Omit Phase' and Phases 1, 2, 3, 4, 5, 6, 7 and 8 for 'Startup Calls'. This is to prevent Phase 9 from being served when not in Preempt.

VEHICLE DETECTOR #~~7~~ 2 SETTINGS

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN '1' (VEHICLE DETECTOR ASSIGNMENTS). PRESS '+' UNTIL DETECTOR #7 IS REACHED.

```
VEHICLE DETECTOR #7   SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................Y
ENABLE DIAGNOSTICS..................Y
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........Y
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          |1234567891011213141516
PHASES ASSIGNED |      X X
SWITCH/DUPLICATE|
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0398
DESIGNED: November 2012
SEALED: 1-09-13
REVISED: N/A

Electrical Detail - Sheet 2 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2456 (Old Walkertown Road)
at
SR 2329 (Carver School Road)/
Motor Road

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: January 2013	REVIEWED BY: JTR
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR

SIGNATURE | DATE 1-9-13

SIG. INVENTORY NO. 09-0398

09-JAN-2013 11:20
S:#ITS&SM#ITS Signals#Workgroups#Sig Mon#Peterson#2070NC332eol.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.129A

RAILROAD PREEMPTION PROGRAMMING DETAIL

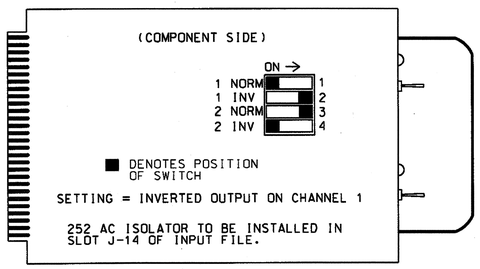
(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

```
   PREEMPTION  #1  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1  12  3.8  1.6  |  X     X
2 255  0.0  0.0  | X  XX  X
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   1  0.0  0.0  |  X     X
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).4.5
RED CLEAR BEFORE PRE (0= DEFAULT)....1.7
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |   X             X
```

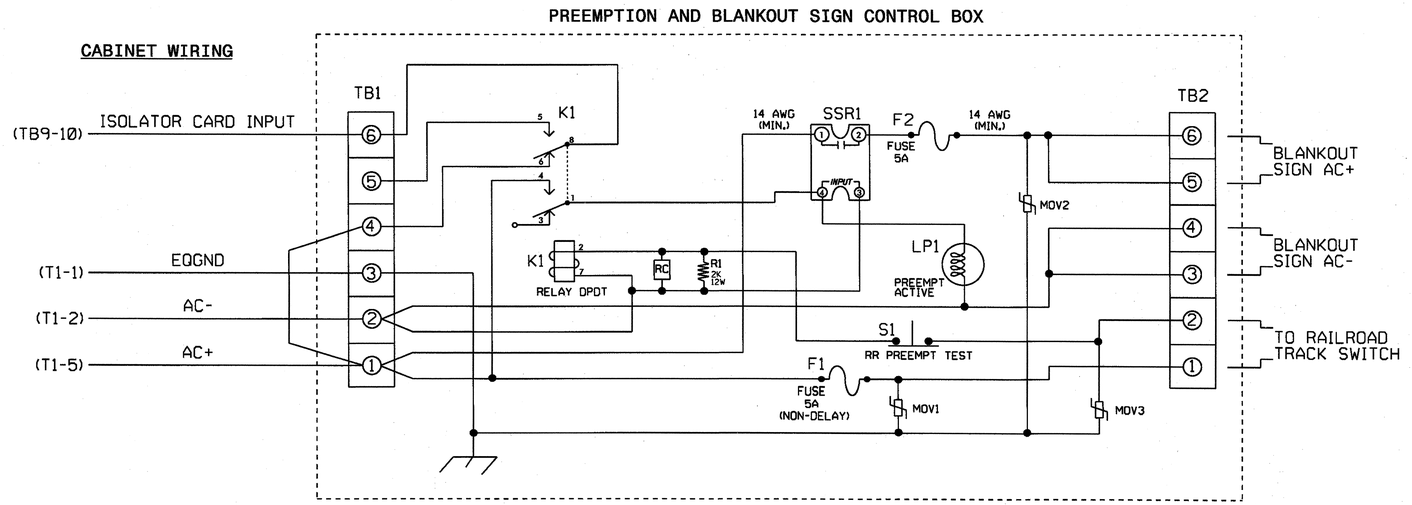
TYPICAL PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



RAILROAD PREEMPTION WIRING DETAIL

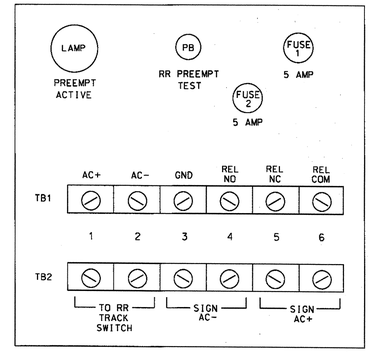
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0398
DESIGNED: November 2012
SEALED: 1-09-13
REVISED: N/A

Electrical Detail - Sheet 3 of 3

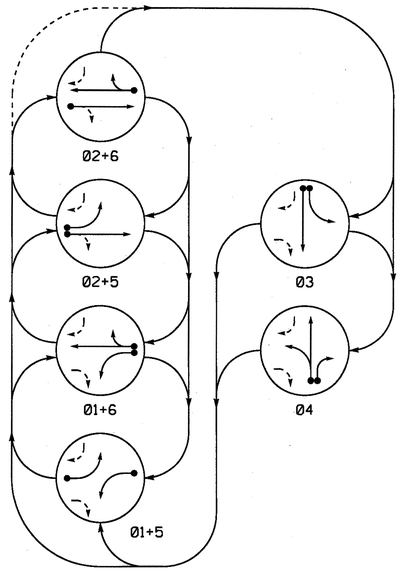
ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 2456 (Old Walkertown Road) at SR 2329 (Carver School Road)/ Motor Road		
Prepared In the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Traffic Engineering Branch, Signals Management Section	Division 9	Forsyth County	Winston-Salem
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: January 2013	REVIEWED BY: JTR	
	PREPARED BY: James Peterson	REVIEWED BY:	
	REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 1-9-13 DATE
SIG. INVENTORY NO. 09-0398

09-JAN-2013 11:20
S:\#TSAS\#TS Signals\#Workgroups\#Sig Mark\Peterson\2070NC332wo1.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 130

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

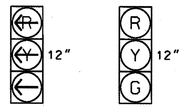
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE						
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←	←	R	R	R	R	R
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	←	R	R
32, 33	R	R	R	R	G	R	R
41	R	R	R	R	R	←	R
42, 43	R	R	R	R	R	G	R
51	←	R	←	R	R	R	R
61, 62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



11
31
41
51

21, 22
32, 33
42, 43
61, 62

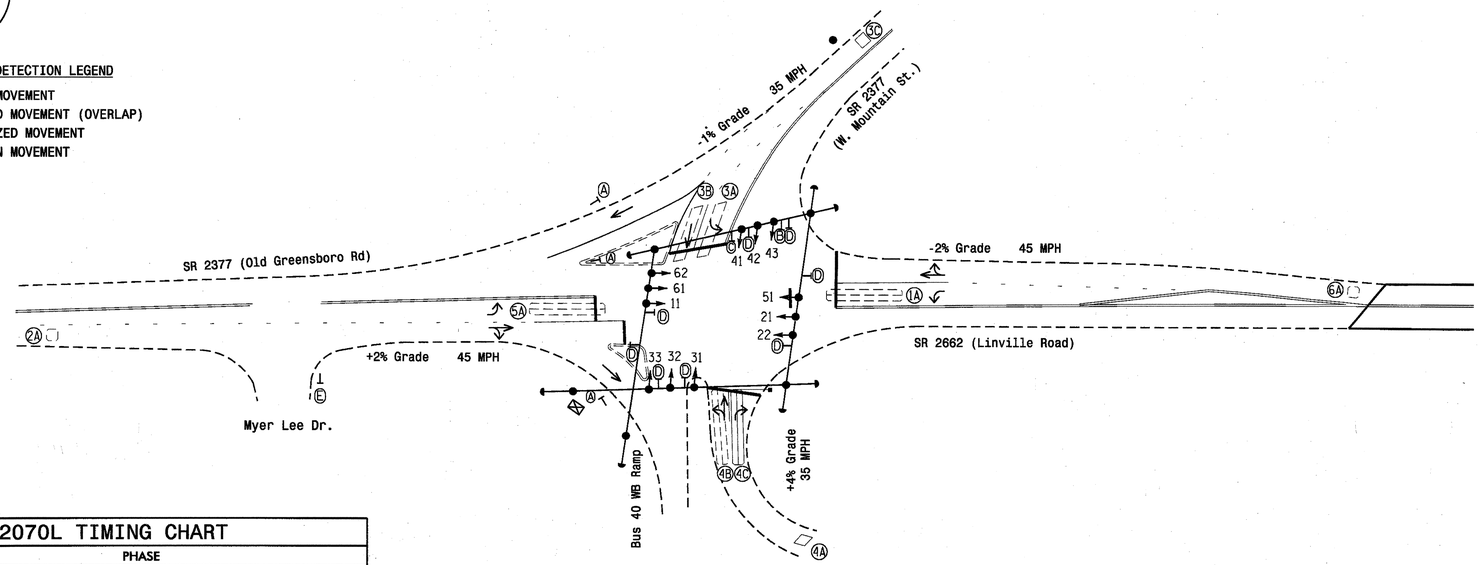
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
3A	6X30	0	2-4-2	-	3	Y	Y	-	-	-	-	Y
3B	6X30	0	2-4-2	-	3	Y	Y	-	-	5	-	Y
3C	6X6	126	EXIST	-	3	Y	Y	-	-	-	-	Y
4A	6X6	95	EXIST	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A	6X6	270	EXIST		6	Y	Y	-	-	-	-	Y

6 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. The Cabinet should be designed to include an Auxiliary Output file for future use.
10. Existing lane control signs may be removed at the direction of the Engineer.
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	Combined Through and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	2.0	2.0	6.0
Max Green 1 *	25	30	20	30	25	30
Yellow Clearance	3.0	4.3	3.9	3.6	3.0	4.7
Red Clearance	3.2	1.2	1.1	2.0	2.6	1.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	-	2.5
Max Variable Initial *	-	34	-	-	-	31
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 2377 (Old Greensboro Rd.)/ SR 2662 (Linville Rd.) at Bus. 40 WB Ramp and SR 2377 (W. Mountain St.)

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2012 REVIEWED BY:

PREPARED BY: L. Blount REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
11/28/12
SIGNATURE DATE

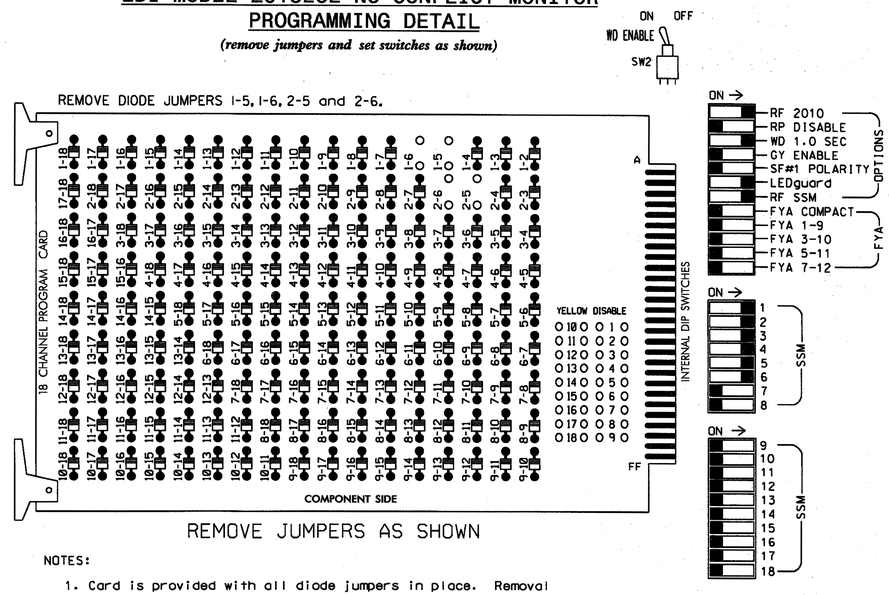
SIG. INVENTORY NO. 09-0475

28-NOV-2012 11:18
S:#TS&SUM#TS Signals#Signal Design Section#Control Regions#Div 9#C-5224 Winston Salem#Signals#09-0475#090475_sig_dsn_20121128.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.13

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,
PHASES USED.....1,2,3,4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5		S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4		14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	32,33	41	42,43	NU	51	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			116		101			134										
YELLOW		129			117		102			135										
GREEN		130			116		103			136										
RED ARROW	125			116		101			131											
YELLOW ARROW	126			117		102			132											
GREEN ARROW	127			118		103			133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	SLOT EMPTY	SLOT EMPTY	ø3 3A	ø3 3B	ø4 4A	ø4 4C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED			NOT USED	ø3 3C	ø4 4B	NOT USED						ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			5
3C	TB4-11,12	I6L	45	7	14	3	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			
4C	TB6-5,6	I8U	49	11	24	4	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0475
DESIGNED: November 2012
SEALED: 11-28-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2377 (Old Greensboro Rd.)/
SR 2662 (Linville Rd.)
at Bus. 40 WB Ramp and
SR 2377 (W. Mountain St.)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

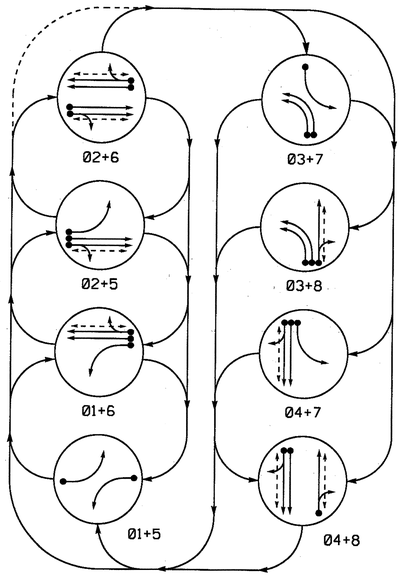
SIGNATURE | DATE 11-29-12

SIG. INVENTORY NO. 09-0475

29-NOV-2012 08:12
S:\#ITS&SIG\#ITS Signals\Workgroups\Sig Mgmt\Peterson\#09045_sm.ele.xxx.dgn
Peterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 132

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

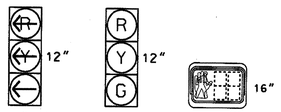
TABLE OF OPERATION

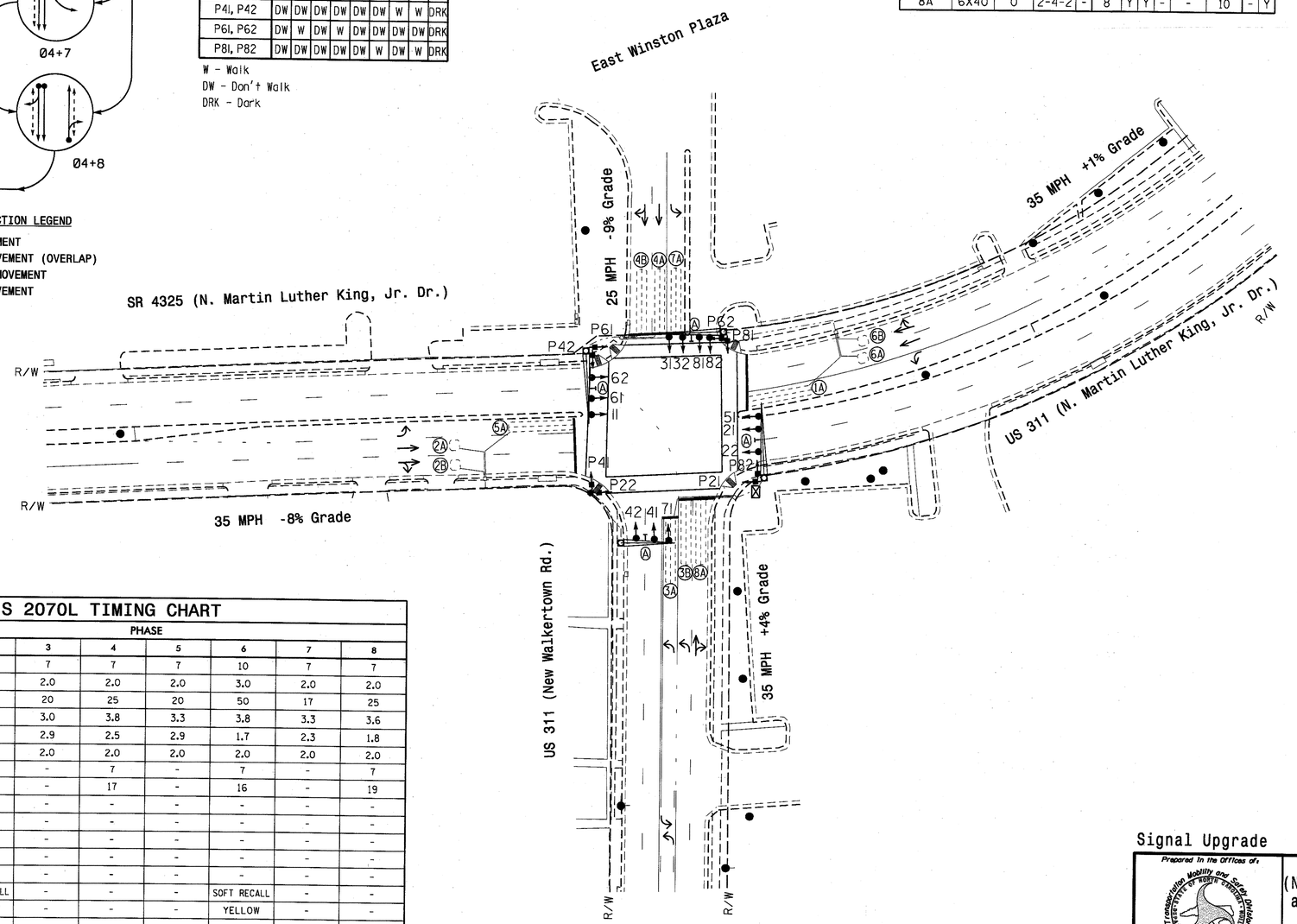
SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←	←	↛	↛	↛	↛	↛	↛	↛
21, 22	R	R	G	G	R	R	R	R	Y
31, 32	↛	↛	↛	↛	←	←	↛	↛	↛
41, 42	R	R	R	R	R	R	G	G	R
51	←	↛	←	↛	↛	↛	↛	↛	↛
61, 62	R	G	R	G	R	R	R	R	Y
71	↛	↛	↛	↛	←	↛	←	↛	↛
81, 82	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	10	7	7	7	10	7	7
Extension 1 *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max Green 1 *	20	50	20	25	20	50	17	25
Yellow Clearance	3.0	4.5	3.0	3.8	3.3	3.8	3.3	3.6
Red Clearance	2.6	1.8	2.9	2.5	2.9	1.7	2.3	1.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	18	-	17	-	16	-	19
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	EXISTING	-	1	Y	Y	-	-	-	-	Y
2A, 2B	6X6	70	2-4-2	-	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	3	-	Y
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	15	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A, 6B	6X6	70	EXISTING	-	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

8 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
A	Street Name Sign (D3-1)	A

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NC DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 311/SR 4325 (N. Martin Luther King, Jr. Dr.) at US 311 (New Walkertown Rd.) and East Winston Plaza

Division 9 Forsyth County Winston-Salem

PLAN DATE: June 2011 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMEIER
SIGNATURE 1/8/13 DATE

SIG. INVENTORY NO. 09-0479

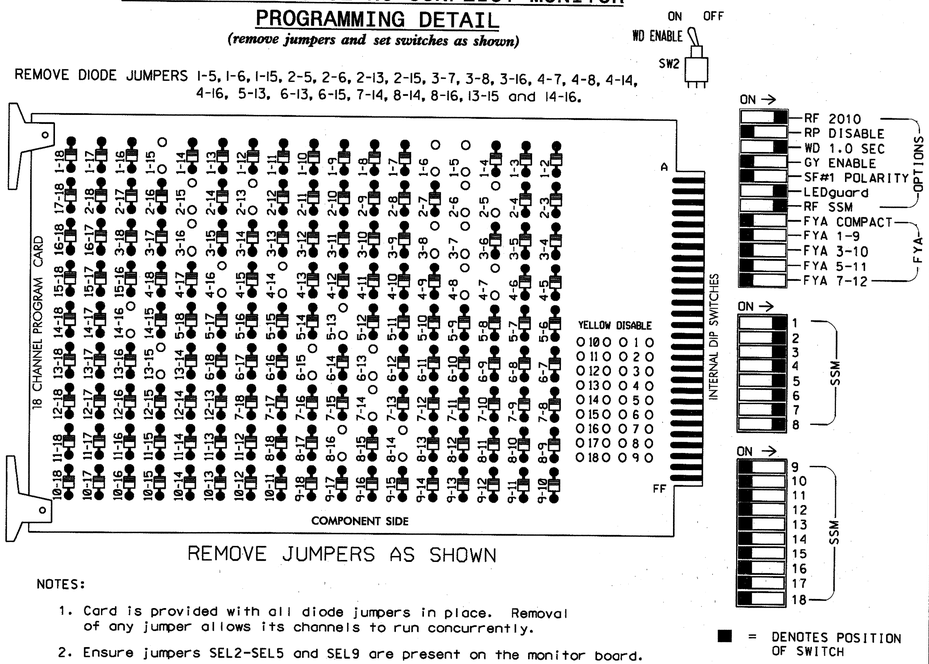
08-JAN-2013 17:31
S:\ITS&SWM\TS Signals\Signal Design Section\Control Regions\Div 9\WC-5224 Winston Salem\Signals\09-0479\090479_sig_dsn_20130108.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.133

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-16, 4-7, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 7-14, 8-14, 8-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12
PHASES USED.....1,2,3,4,5,6,7,8,2PED,4PED,6PED,8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	P21, P22	31,32	41,42	P41, P42	51	61,62	P61, P62	71	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW	125			116			131			122		
YELLOW ARROW	126			117			132			123		
GREEN ARROW	127			118			133			124		
✋			113			104			119			110
🚶			115			106			121			112

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A,2B	ø3 3A	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø2 PED DC ISOLATOR	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	NOT USED	ø3 3B			ø4 4B						ø4 PED DC ISOLATOR	ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	ø7 7A	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED			NOT USED	NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB2-9,10	I3U	63	25	32	3	Y	Y			3
3B	TB2-11,12	I3L	76	38	42	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0479
DESIGNED: June 2011
SEALED: 1-8-13
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 311/SR 4325
(N. Martin Luther King, Jr. Dr.) at US 311 (New Walkertown Rd.) and East Winston Plaza

Division 09 | Forsyth County | Winston-Salem
PLAN DATE: 01-09-13 | REVIEWED BY: T. Vaja
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

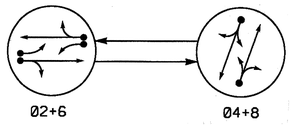
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 1/9/13 DATE
SIG. INVENTORY NO. 09-0479

09-JAN-2013 11:24
S:\ITS\SIGNALS\Workgroups\Sig Mgmt\Spaulding\In-progress\09079.sm.ele.2013xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.134

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

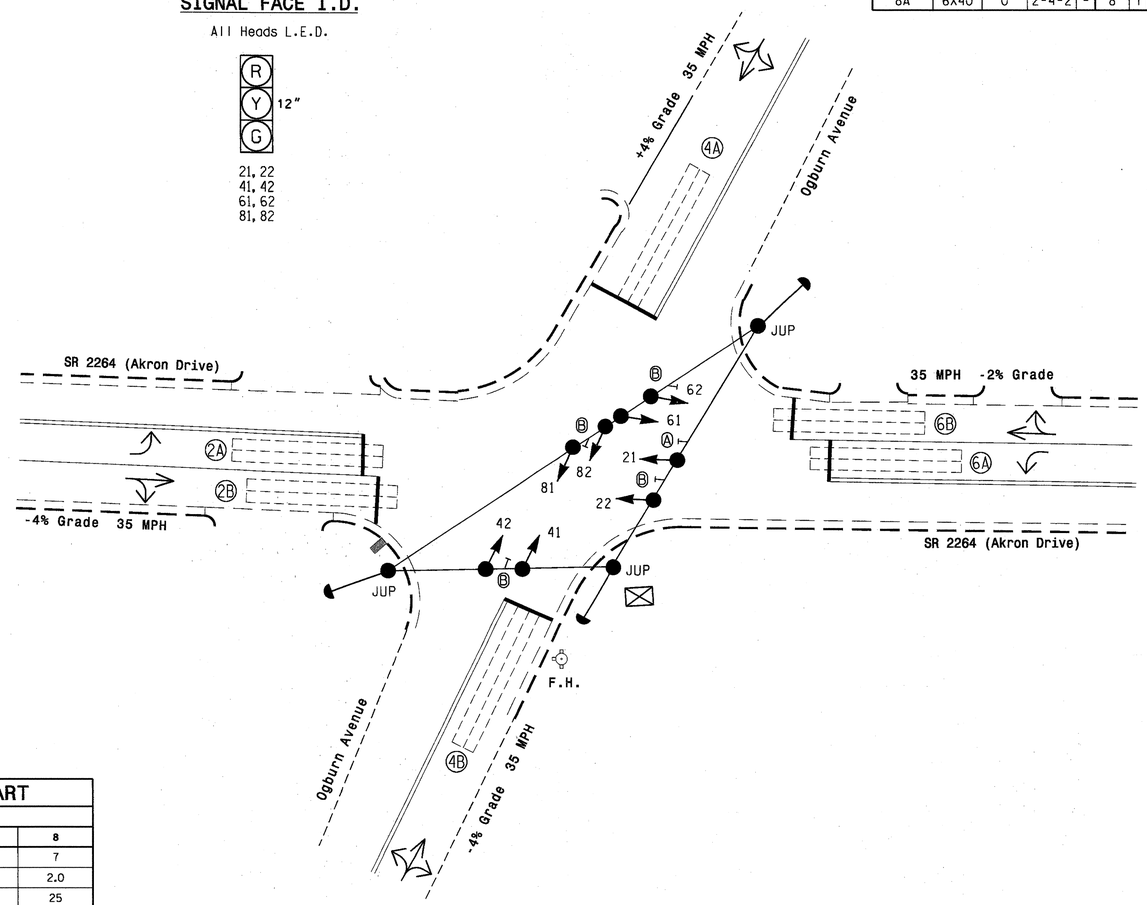
TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	+5	2-4-2	-	2	Y	Y	-	-	-	-	Y
2B	6X40	+5	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	5	-	Y
6A	6X40	+5	2-4-2	-	6	Y	Y	-	-	-	-	Y
6B	6X40	+5	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	5	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	45	25	45	25
Yellow Clearance	4.1	3.6	4.0	4.1
Red Clearance	1.4	1.4	1.8	1.4
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	SOFT RECALL	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The cabinet should be designed to include an Auxiliary Output file for future use.
6. Pavement markings are existing.
7. Existing Left Arrow "ONLY" sign (R3-5L) may be removed at the direction of the Engineer.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)
(B)	Street Name Sign (D3-1)	(B)

Signal Upgrade

Prepared in the Offices of:
Traffic Engineering Branch, Mobility and Safety Division, NC DEPARTMENT OF TRANSPORTATION, Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2264 (Akron Drive) at Ogburn Avenue

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY:

PREPARED BY: W. Bazzarie REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

SIGNATURE 6/11/12 DATE

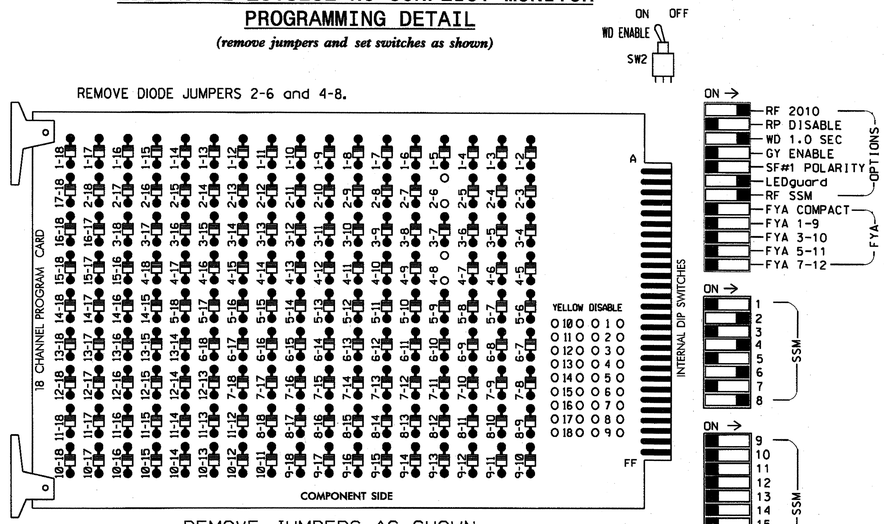
SIG. INVENTORY NO. 09-0566

11-JUN-2012 15:55
S:\#TSASU#TS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\#09-0566#090566_sig_dsn_20120611.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 13S

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems. insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2.S5.S8.S11
PHASES USED.....2.4.6.8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				NOT USED								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0566
DESIGNED: November 2011
SEALED: 6-11-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2264 (Akron Drive)
at
Ogburn Avenue

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 04-18-12 | REVIEWED BY: T. Vipp
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 6/12/12 DATE

SIG. INVENTORY NO. 09-0566

12-JUN-2012 07:24
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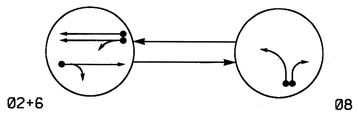
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 136

PHASING DIAGRAM



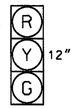
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	FLASH
21, 22	G	R	Y
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



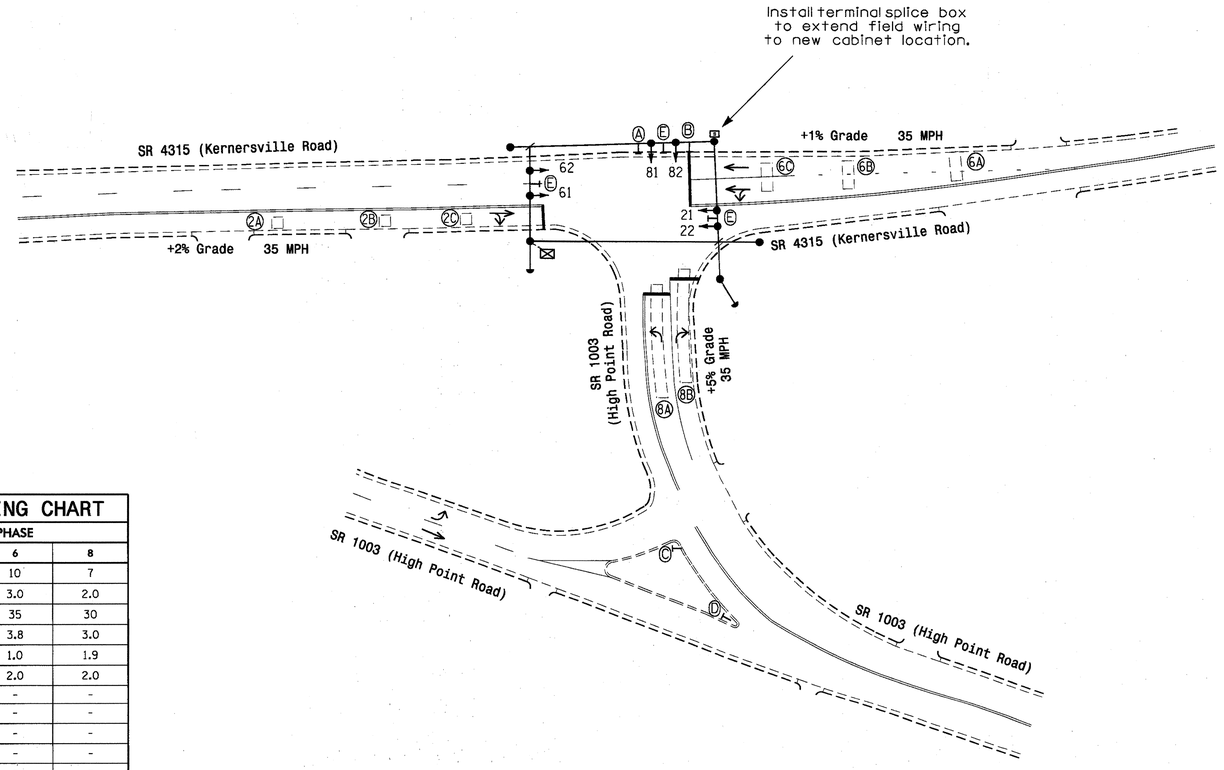
21, 22
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	138	EXIST	-								
2B	6X6	81	EXIST	-	2	Y	Y	-	-	-	-	Y
2C	6X6	38	EXIST	-								
6A	6X15	138	EXIST	-								
6B	6X15	81	EXIST	-	6	Y	Y	-	-	-	-	Y
6C	6X15	38	EXIST	-								
8A	6X60	+5	EXIST	-	8	Y	Y	-	-	3	-	Y
8B	6X60	+5	EXIST	-	8	Y	Y	-	-	15	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Existing lane control signs may be removed at the direction of the Engineer.
8. Pavement markings are exisitng.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
S	Terminal Splice Box	S
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	Right Arrow "ONLY" Sign (R3-5R)	B
C	"STOP" Sign (R1-1)	C
D	"YIELD" Sign (R1-2)	D
E	Street Name Sign (D3-1)	E

OASIS 2070L TIMING CHART			
	PHASE		
FEATURE	2	6	8
Min Green 1 *	10	10	7
Extension 1 *	3.0	3.0	2.0
Max Green 1 *	35	35	30
Yellow Clearance	3.7	3.8	3.0
Red Clearance	1.7	1.0	1.9
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	YELLOW	YELLOW	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Kernersville Road) at SR 1003 (High Point Road)

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY:

PREPARED BY: L. Blount REVIEWED BY:

SCALE 0 40 1" = 40'

REVISIONS	INIT.	DATE

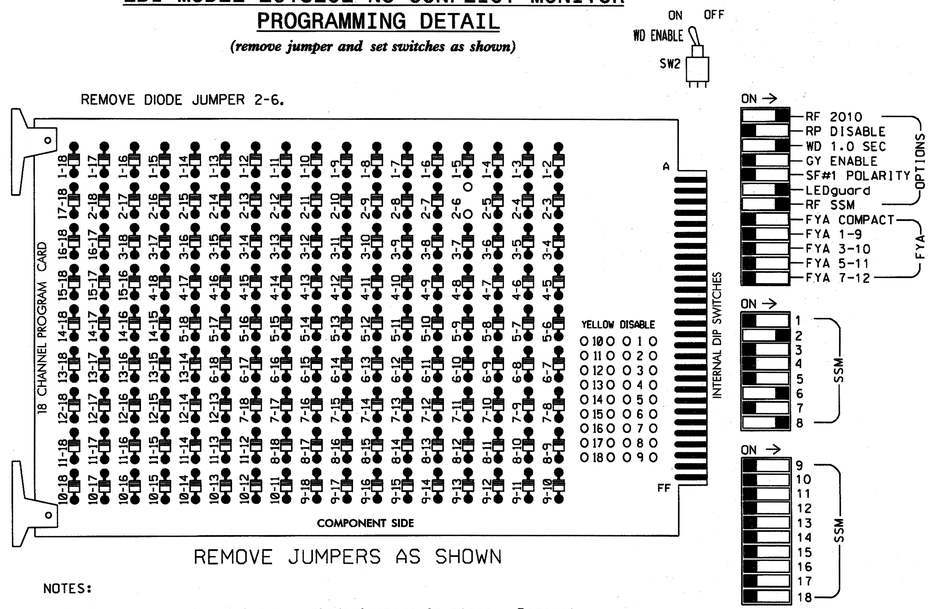
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 8/17/12 DATE
SIG. INVENTORY NO. 09-0577

06-DEC-2012 10:02
S:\#ITS&SU#\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0577\090577_sig.dgn_20120817.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 137

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S8,S11
PHASES USED.....2,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED												ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A,6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED				ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			15

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0577
DESIGNED: November 2011
SEALED: 8-17-12
REVISED: N/A

New Installation

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4315 (Kernersville Road)
at
SR 1003 (High Point Road)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: August 2012 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

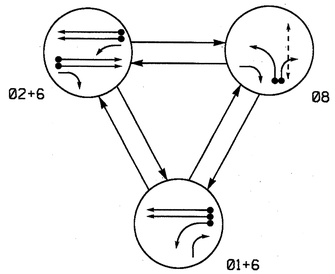
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 8-21-12 DATE
SIG. INVENTORY NO. 09-0577

20-AUG-2012 09:57
S:\#IT&S&Util\ITS Signals\Workgroups\Sig Mgmt\Peterson\090577_sm.ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 138

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

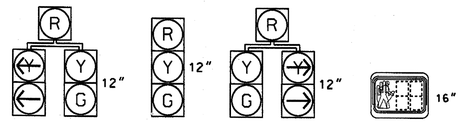
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
11, 12	G→	G	R	Y
21, 22	R	G	R	Y
23	R	G	R→	Y
61, 62	G	G	R	Y
81	R	R	G	R
82	R→	R	G	R
P81, P82	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

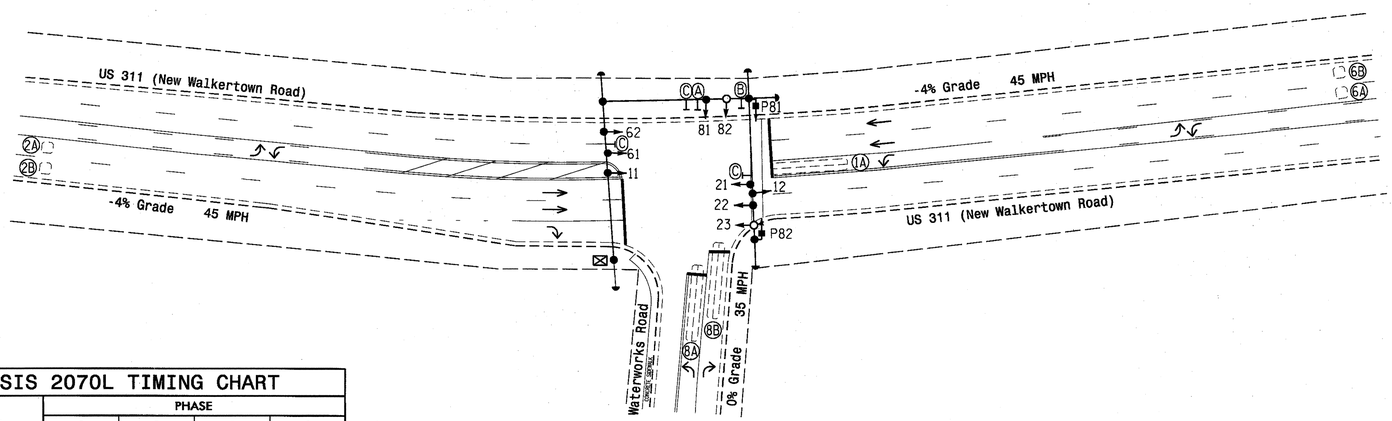


3 Phase
Fully Actuated
(Winston-Salem Signal System)

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
2A	6x6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6x6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
6A	6x6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6x6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
8A, 8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	5	-	Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. Existing lane control signs may be removed at direction of the Engineer.
12. Pavement markings are existing.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
14. New signal heads 23 and 82 shall be yellow in color with black visors.



OASIS 2070L TIMING CHART				
FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	6.0	6.0	2.0
Max Green 1 *	25	90	90	30
Yellow Clearance	3.0	4.9	4.9	3.0
Red Clearance	2.3	1.1	1.0	2.4
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	4
Don't Walk 1	-	-	-	13
Seconds Per Actuation *	-	1.5	1.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.0	3.0	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊤	Sign	⊤
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	2'x2' ■
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	Street Sign (D3-1)	Ⓒ

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 311 (New Walkertown Road) at Waterworks Road

Division 9 Forsyth County Winston-Salem
PLAN DATE: November 2011 REVIEWED BY:
PREPARED BY: L. Blount REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

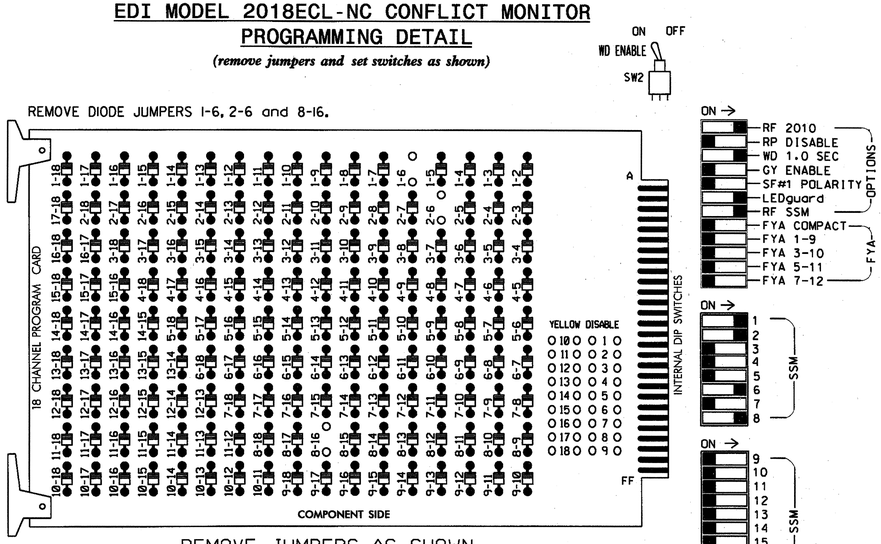
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZEMBA
SIGNATURE 11/6/12 DATE
SIG. INVENTORY NO. 09-0578

07-JAN-2013 12:16
S:\TRANSDWG\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0578\09057B.sig.dgn.20121106.dgn

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.137

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems. insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phase 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S8,S11,S12
PHASES USED.....1,2,6,8,8 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12, 82	21, 22,23	NU	NU	NU	NU	NU	11,12, 61,62	NU	NU	23	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED	*	128						134				107							
YELLOW		129						135				108							
GREEN		130						136				109							
RED ARROW																			
YELLOW ARROW	126										108								
GREEN ARROW	127										109								
✋													110						
🚶													112						

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	FS DC ISOLATOR
	L	NOT USED	ø2 2B											ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A,8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			15
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A,8B	TB5-9,10	J6U	42	4	8	8	Y	Y			5
PED PUSH BUTTONS											
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

PHASE 1 RED FIELD TERMINAL (125)

AC-

NOTE: The purpose of this resistor is to load the channel red monitor input in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0578
DESIGNED: November 2011
SEALED: 11/06/12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 311 (New Walkertown Road)
at
Waterworks Road

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: T. Jap

PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE | DATE 11/7/12

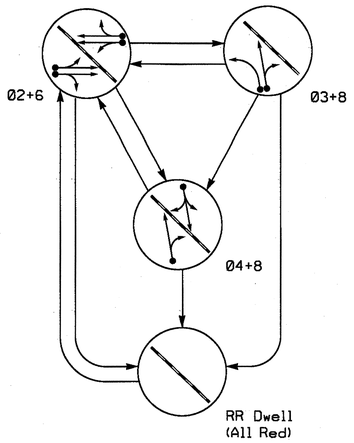
SIG. INVENTORY NO. 09-0578

07-NOV-2012 07:28
S:\#TSSGIM\TS Signals\Workgroups\Sig Mgmt\Strickland\090578_sm_ele_xxx.dgn
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 140

3 Phase w/Railroad Preemption Fully Actuated (Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

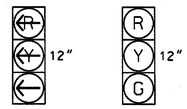
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+6	PHASE 03+8	PHASE 04+8	PHASE RR DWELL	PHASE FLASH
21, 22	G	R	R	R	Y
31	~~R~~	~~-~~	~~R~~	~~R~~	~~R~~
41, 42, 43	R	R	G	R	R
61, 62, 63	G	R	R	R	Y
81, 82	R	G	G	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



31

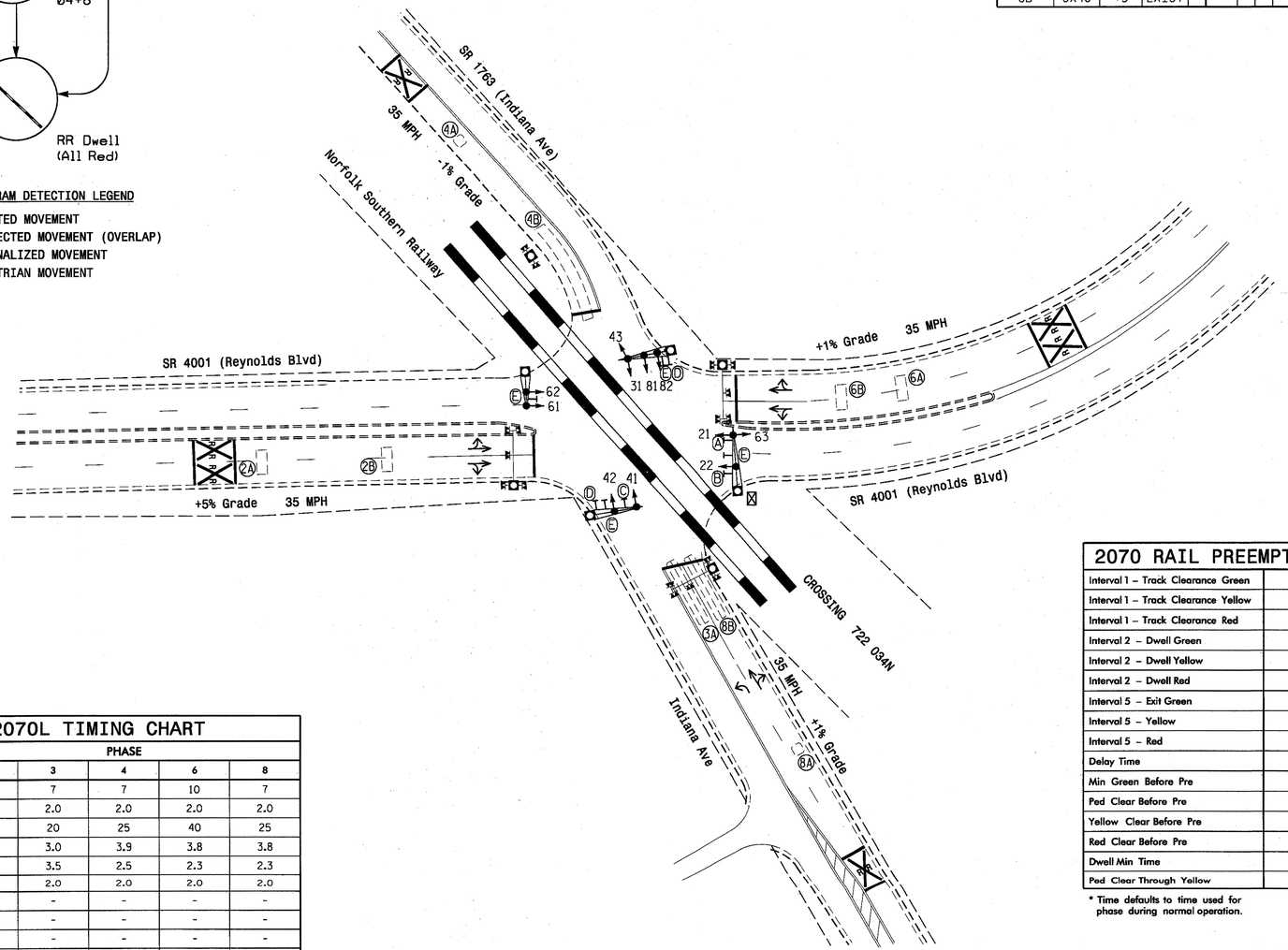
21, 22
41, 42, 43
61, 62, 63
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X14	157	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X14	86	EXIST	-								
3A	6X40	+5	EXIST	-	3	Y	Y	-	-	-	-	Y
4A	6X6	118	EXIST	-	4	Y	Y	-	-	-	-	Y
4B	6X60	+5	EXIST	-								
6A	6X14	98	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X14	64	EXIST	-								
8A	6X6	118	EXIST	-	8	Y	Y	-	-	-	-	Y
8B	6X40	+5	EXIST	-								

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Omit phase 3 during phase 4 on.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Existing lane control signs may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
N/A	Railroad Tracks	
N/A	Railroad Cantilever	
Ⓐ	Combined Through and Left Arrow Sign (R3-6L)	Ⓐ
Ⓑ	Combined Through and Right Arrow Sign (R3-6R)	Ⓑ
Ⓒ	"NO TURN ON RED" Sign (R10-11)	Ⓒ
Ⓓ	"NO RIGHT TURN - TRAIN" Fiber Optic Blankout Sign	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 3	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	40	20	25	40	25
Yellow Clearance	3.6	3.0	3.9	3.8	3.8
Red Clearance	2.2	3.5	2.5	2.3	2.3
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2070 RAIL PREEMPTION

Interval 1 – Track Clearance Green	0.0
Interval 1 – Track Clearance Yellow	0.0
Interval 1 – Track Clearance Red	0.0
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	5
Ped Clear Through Yellow	N

* Time defaults to time used for phase during normal operation.

This signal is designed for simultaneous preemption.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
1750 N.Greenfield Pkwy.Garner,NC 27529

SR 4001 (Reynolds Blvd.) at SR 1763 (Indiana Ave.)

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY:

PREPARED BY: L. Blount REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

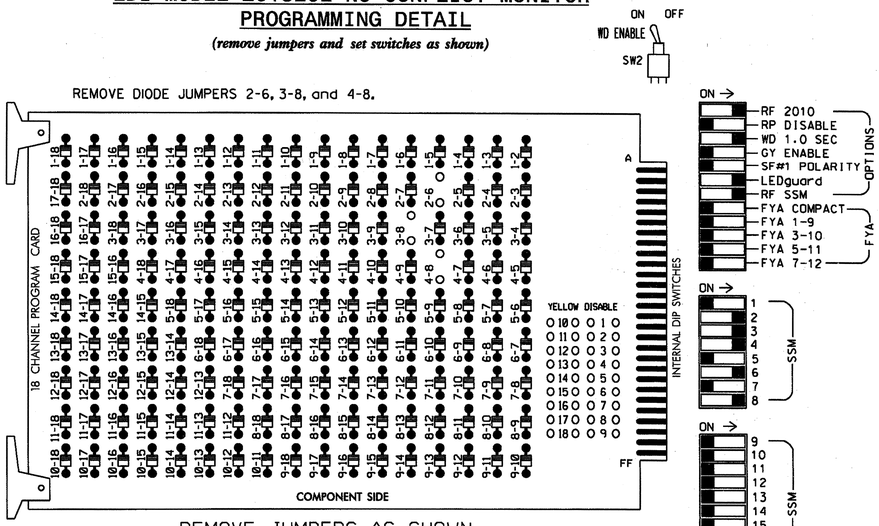
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 9/28/12 DATE

SIG. INVENTORY NO. 09-0597

07-JAN-2013 12:30
S:\#ITS&SU#\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0597\M090597_sig_dsn_20120928.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.14

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL
(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

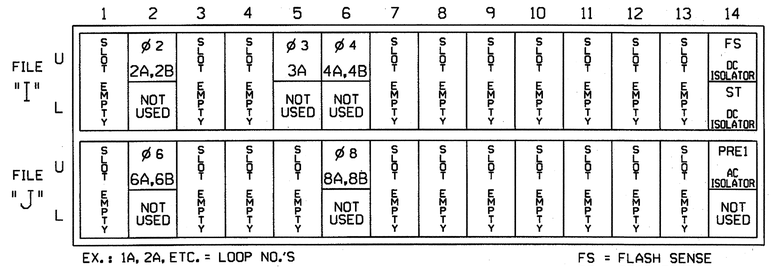
CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS 3.03.26E OR LATEST APROVED VERSION
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. FILE
LOAD SWITCHES USED.....S2,S4,S5,S8,S11
PHASES USED.....2,3,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	31	41,42 43	NU	NU	61,62 63	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW				116														
YELLOW ARROW				117														
GREEN ARROW				118														

NU = Not Used

INPUT FILE POSITION LAYOUT
(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME
PRE = PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A,4B	TB4-9,10	I6U	41	3	4	4	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A,8B	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0597
DESIGNED: November 2011
SEALED: 9/28/12
REVISED: N/A

DYNAMIC BACK-UP CONTROL PROGRAMMING
(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR        PHASES:¦12345678910111213141516
IF PHASES ARE ON ¦   X
OMIT PHASES      ¦   X
CALL PHASES      ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

Signal Upgrade - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4001 (Reynolds Blvd)
at
SR 1763 (Indiana Ave)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: September 2011	REVIEWED BY: JTR
PREPARED BY: S. Armstrong	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

John T Rowe 10-3-12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0597

02-OCT-2012 07:46
S:\#TSS&SM\TS Signals\workgroups\Sig Mgmt\armstrong\#090597_sm_ole_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.14A

RAILROAD PREEMPTION PROGRAMMING DETAIL

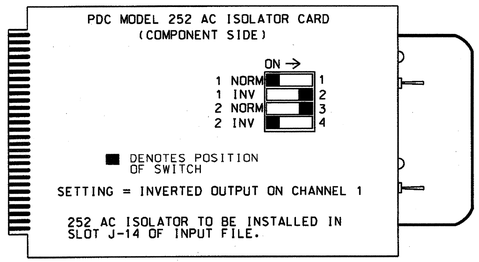
(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

```
   PREEMPTION  #1   SETTINGS (NEXT:1-10)
 INTERVAL/TIMING  |  CLEAR/DWELL PHASES
   GRN YEL  RED   |1234567891011121314151 6
 1 255  0.0  0.0  |
 2   0  0.0  0.0  |
 3   0  0.0  0.0  |
 4   0  0.0  0.0  |
 5   1  0.0  0.0  | X   X
EXIT CALLS        |
            OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........5
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..Y   <-
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                 | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW    |
OMIT OVERLAPS:            |
```

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

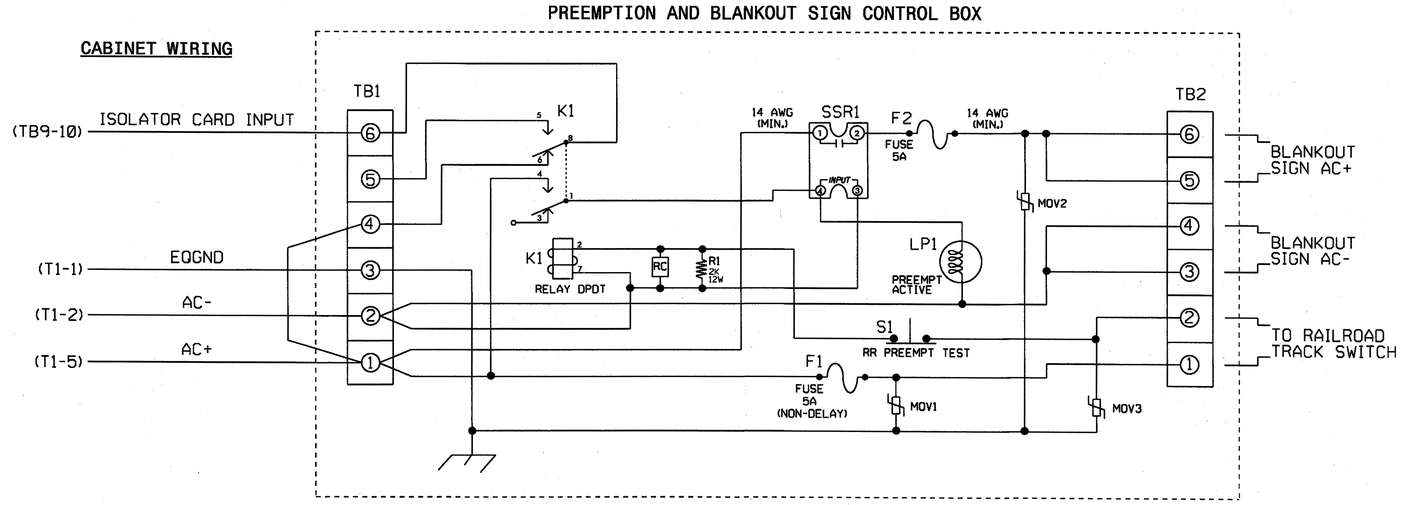
(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

RAILROAD PREEMPTION WIRING DETAIL

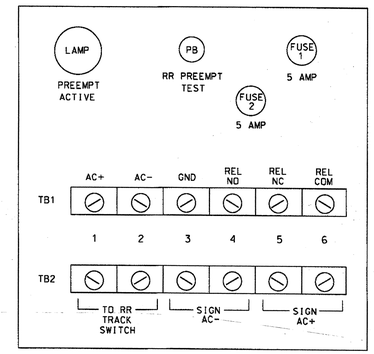
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0597
DESIGNED: November 2011
SEALED: 9/28/12
REVISED: N/A

Signal Upgrade - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4001 (Reynolds Blvd)
at
SR 1763 (Indiana Ave)

Division 9	Forsyth County	Winston-Salem
PLAN DATE: September 2011	REVIEWED BY:	JTR
PREPARED BY: S. Armstrong	REVIEWED BY:	

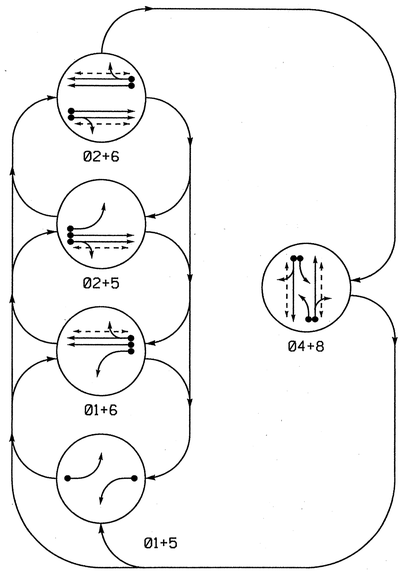
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 10-2-12 DATE
SIG. INVENTORY NO. 09-0597

02-OCT-2012 07:46
S:#ITS&SU#ITS Signals#Workgroups#Sig Mgt#Armstrong#090597_sample_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 142

PHASING DIAGRAM



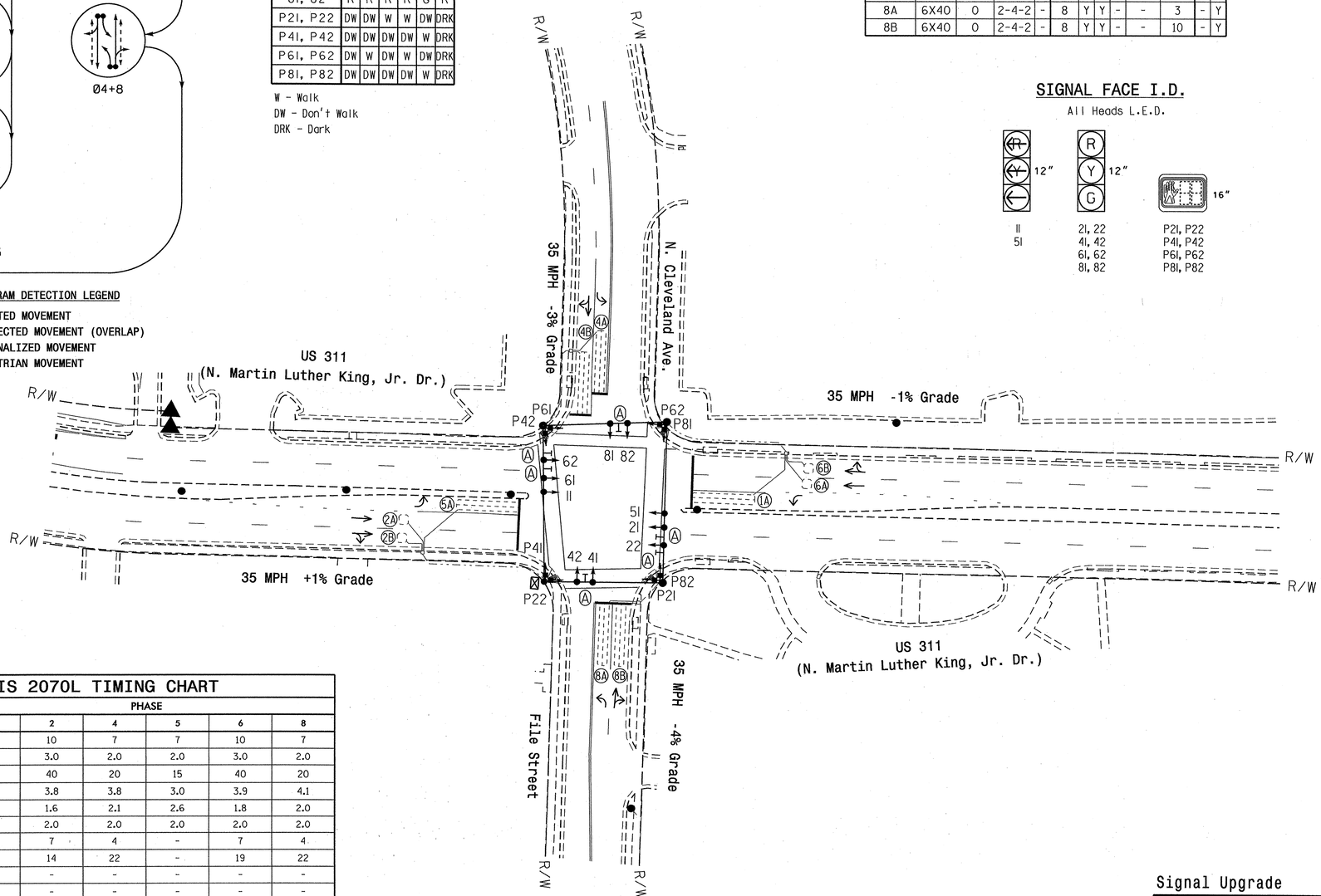
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	04+08	FLASH
11	~~←~~	~~←~~	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	~~←~~	~~R~~	~~←~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	Y
2A, 2B	6X6	70	EXISTING	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A, 6B	6X6	70	EXISTING	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

SIGNAL FACE I.D.

All Heads L.E.D.

11
51

21, 22
41, 42
61, 62
81, 82

P21, P22
P41, P42
P61, P62
P81, P82

5 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	Street Name Sign (D3-1)	(A)

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0
Max Green 1 *	15	40	20	15	40	20
Yellow Clearance	3.0	3.8	3.8	3.0	3.9	4.1
Red Clearance	2.4	1.6	2.1	2.6	1.8	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	4	-	7	4
Don't Walk 1	-	14	22	-	19	22
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 311
(N. Martin Luther King, Jr. Dr.)
at
File St./N. Cleveland Ave.

Division 9 Forsyth County Winston-Salem

PLAN DATE: May 2011 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 5/8/12 DATE
SIG. INVENTORY NO. 09-0598

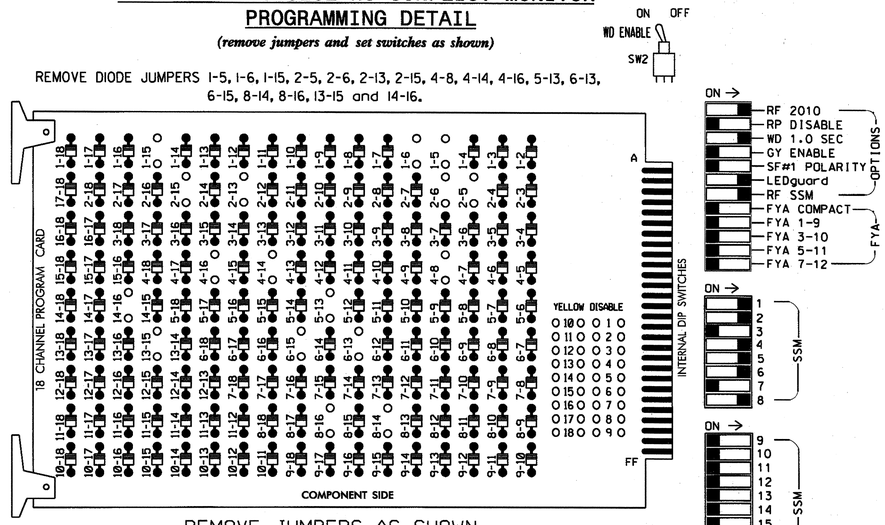
18-JAN-2013 13:22
S:\ITS&SSM\ITS Signals\Signal Design Section\Central Region\Div 9\c-5224 Winston Salem\Signals\09-0598\09598_sig_dsn_20120508.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 143

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 8-14, 8-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,S12
PHASES USED.....1,2,4,5,6,8,2PED,4PED,6PED,8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	41,42	P41, P42	51	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
GREEN ARROW	127						133											
✋			113		104				119			110						
🚶			115			106			121			112						

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	NOT USED				Ø4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				Ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0598
DESIGNED: May 2011
SEALED: 5-8-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 311
(N. Martin Luther King, Jr. Dr.)
at
File St./N. Cleveland Ave.

Division 09 | Forsyth County | Winston-Salem
PLAN DATE: 05-01-12 | REVIEWED BY: T. Joyce
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
George C. Brown 5/10/12
SIGNATURE DATE

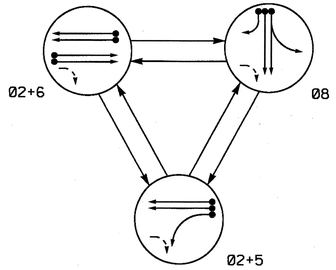
SIG. INVENTORY NO. 09-0598

09-MAY-2012 13:03
S:\#TSS\SW\TS Signals\Workgroups\Sig Mons\Spaulding\in-progress\#090598_sm.ele.2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 144

3 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

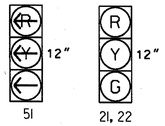
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 08	FLASH
21, 22	G	G	R	Y
51	←	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	Y
81, 82	R	R	G	R

SIGNAL FACE I.D.

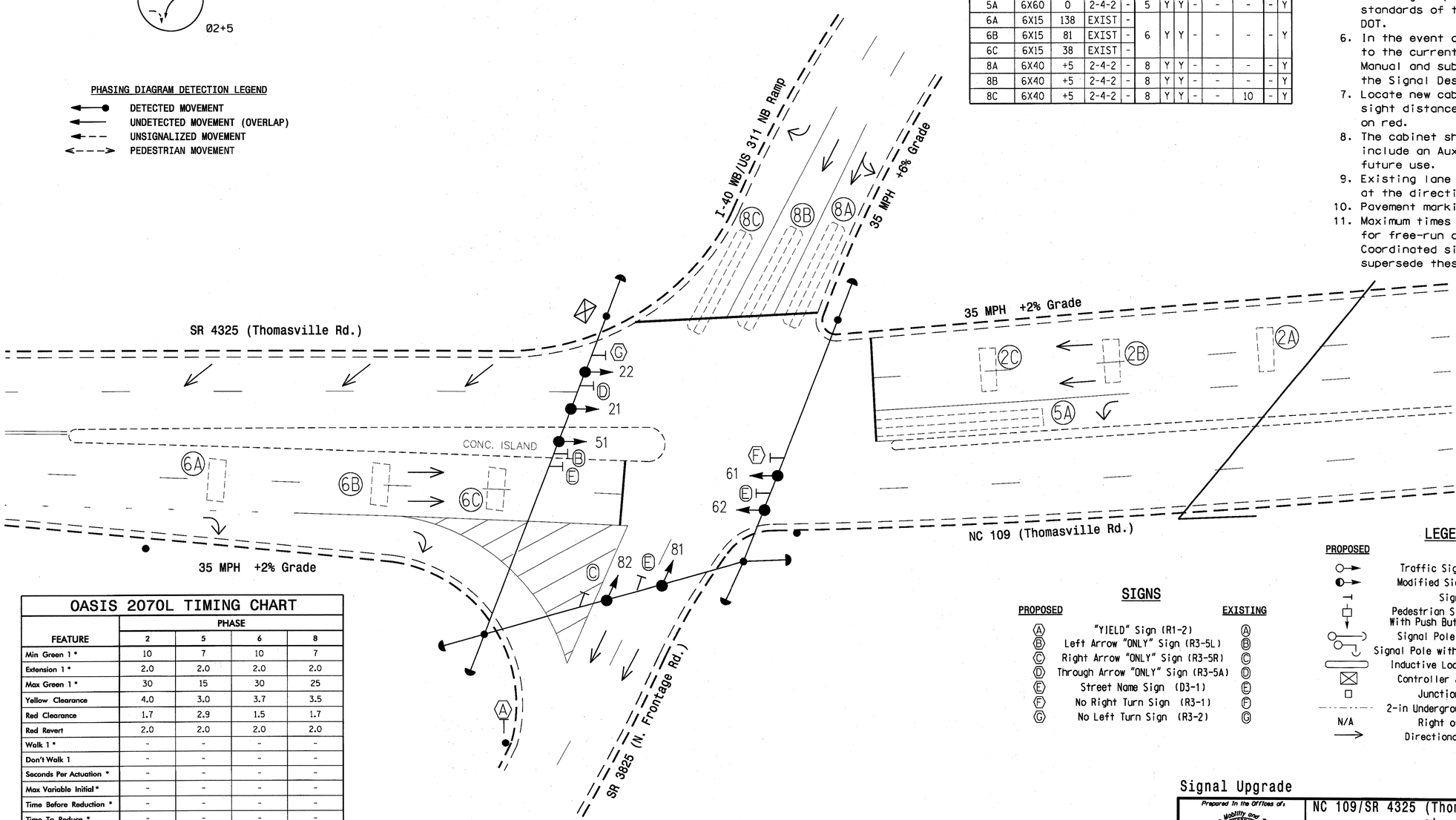
All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X15	138	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X15	81	EXIST	-								
2C	6X15	38	EXIST	-								
5A	6X60	0	2-4-2	-	5	Y	Y	-	-	-	-	Y
6A	6X15	138	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X15	81	EXIST	-								
6C	6X15	38	EXIST	-								
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	-	-	Y
8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	-	-	Y
8C	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-	Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Existing lane control signs may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	30	15	30	25
Yellow Clearance	4.0	3.0	3.7	3.5
Red Clearance	1.7	2.9	1.5	1.7
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

SIGNS

PROPOSED		EXISTING
A	"YIELD" Sign (R1-2)	A
B	Left Arrow "ONLY" Sign (R3-5L)	B
C	Right Arrow "ONLY" Sign (R3-5R)	C
D	Through Arrow "ONLY" Sign (R3-5A)	D
E	Street Name Sign (D3-1)	E
F	No Right Turn Sign (R3-1)	F
G	No Left Turn Sign (R3-2)	G

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

NC 109/SR 4325 (Thomasville Rd.)
at
I-40 WB/US 311 NB Ramp/
SR 3825 (N. Frontage Road)

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY: L. Blount
PREPARED BY: Sterling REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

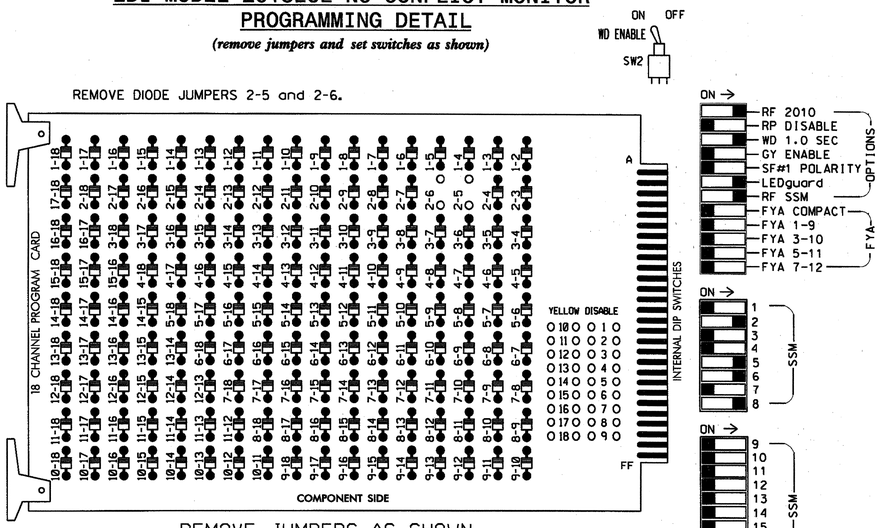
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 2/13/12 DATE
SIG. INVENTORY NO. 09-0599

04-DEC-2012 14:17
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0599\090599_sig.dsn.20120413.dgn
rziembo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 145

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S7,S8,S11
PHASES USED.....2,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW							131											
YELLOW ARROW							132											
GREEN ARROW							133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	ø2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		NOT USED												ST DC ISOLATOR
FILE "J" U	ø5 5A	ø6 6A,6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	ø8 8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	NOT USED				ø8 8B	NOT USED							

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A,2B,2C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0599
DESIGNED: November 2011
SEALED: 4-13-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 109/SR 4325 (Thomasville Rd.)
at
I-40 WB/US 311 NB Ramp/
SR 3825 (N. Frontage Road)

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 04-10-12 | REVIEWED BY: T. Light
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

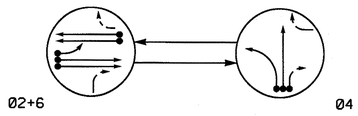
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 4/10/12 DATE

SIG. INVENTORY NO. 09-0599

18-APR-2012 11:07
S:\#TS&SU#TS Signals#Workgroups#Sig Mgmt#Spaulding#in-progress#090599_sm.e1e_2012_0413.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 146

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	PHASE FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.

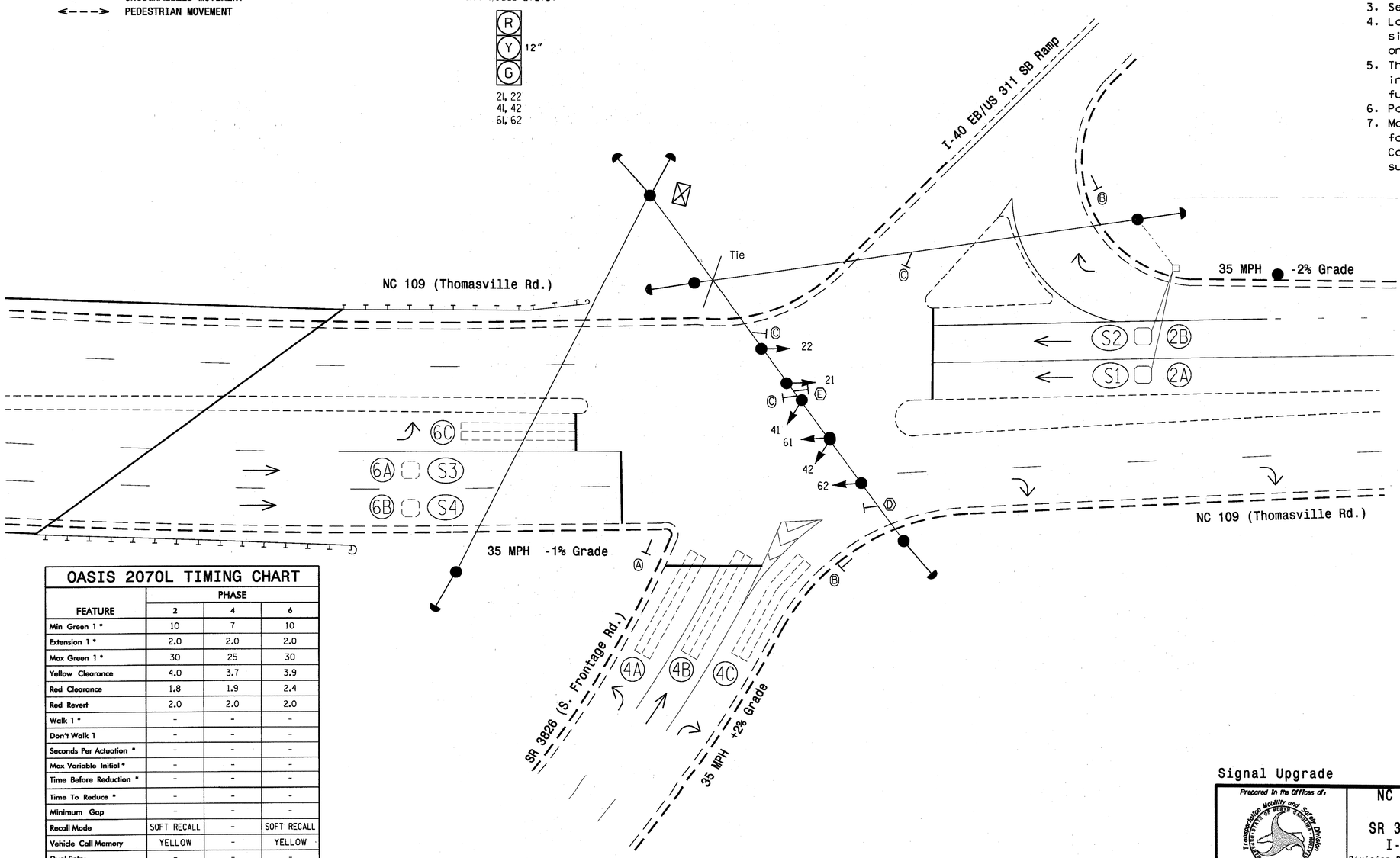
21, 22
41, 42
61, 62

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S1	6X6	70	4	Y	2	Y	Y	-	-	-	Y	Y
2B/S2	6X6	70	4	Y	2	Y	Y	-	-	-	Y	Y
4A, 4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4C	6X40	-	2-4-2	-	4	Y	Y	-	-	20	-	Y
6A/S3	6X6	70	EXIST	-	6	Y	Y	-	-	-	Y	Y
6B/S4	6X6	70	EXIST	-	6	Y	Y	-	-	-	Y	Y
6C	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The cabinet should be designed to include an Auxiliary Output file for future use.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
Ⓐ	"LEFT LANE MUST TURN LEFT" Sign (R3-7R)	Ⓐ
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	No U-Turn/No Left Turn Sign (R3-18)	Ⓔ

OASIS 2070L TIMING CHART			
FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	10	7	10
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	30	25	30
Yellow Clearance	4.0	3.7	3.9
Red Clearance	1.8	1.9	2.4
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	SOFT RECALL	-	SOFT RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

NC 109 (Thomasville Road)
at
SR 3826 (S. Frontage Road)/
I-40 EB/US 311 SB Ramp

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: September 2012 | PREPARED BY: L. Blount
PREPARED BY: Monif | REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

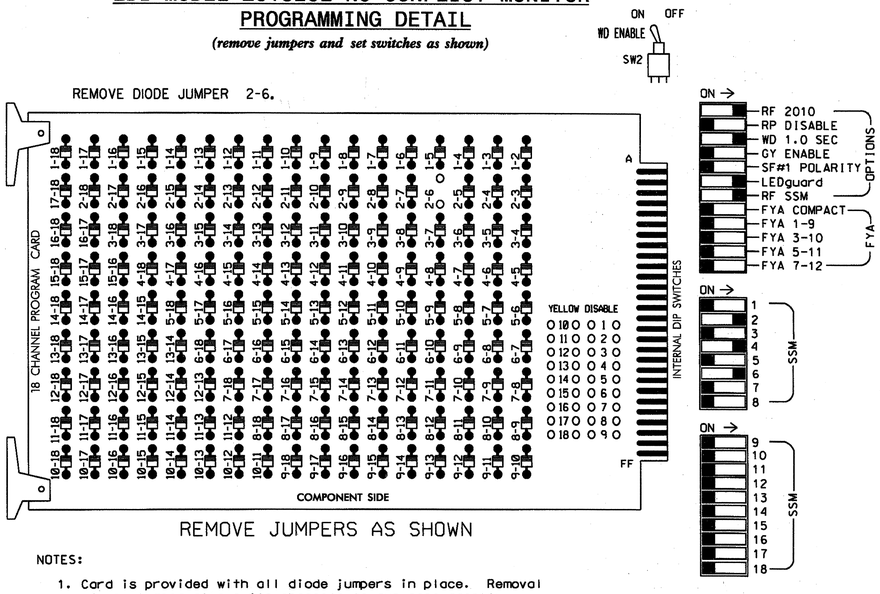
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE
DATE 10/1/12
SIG. INVENTORY NO. 09-0600

01-OCT-2012 14:03
S:\#ITS&S\#ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0600\090600_sig_dsn_201208xx.dgn
rzienba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.147

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT	ø2/SYS	SLOT	SLOT	SLOT	ø 4	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS
		EMPTY	2A/S1	EMPTY	EMPTY	EMPTY	4A,4B	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	DC ISOLATOR
	L		ø2/SYS				ø 4								ST
			2B/S2				4C								DC ISOLATOR
FILE "J"	U	SLOT	ø6/SYS	ø 6	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT
		EMPTY	6A/S3	6C	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
	L		ø6/SYS	NOT USED											
			6B/S4												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S1	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S2	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A,4B	TB4-9,10	I6U	41	3	4	4	Y	Y			
4C	TB4-11,12	I6L	45	7	14	4	Y	Y			20
6A/S3	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B/S4	TB3-7,8	J2L	44	6	16	6/SYS	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0600
DESIGNED: September 2012
SEALED: 10-01-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy.Garner,NC 27529

NC 109 (Thomsville Road)
at
SR 3826 (S. Frontage Road)/
I-40 EB/US 311 SB Ramp

Division 9 | Forsyth Couty | Winston-Salem
PLAN DATE: October 2012 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

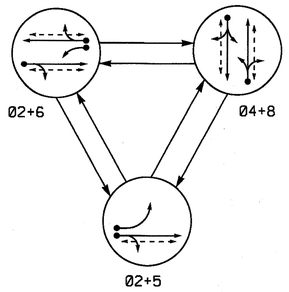
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 10-5-12 DATE
SIG. INVENTORY NO. 09-0600

05-OCT-2012 08:33
S:#ITS&SU#ITS Signals#Workgroups#Sig Mgt#Peterson#090600_smu_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 148

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4+8	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
51	~~R~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	Y
81, 82	R	R	G	R
P21, P22	W	W	DW	DRK
P41, P42	DW	DW	W	DRK
P61, P62	DW	W	DW	DRK
P81, P82	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

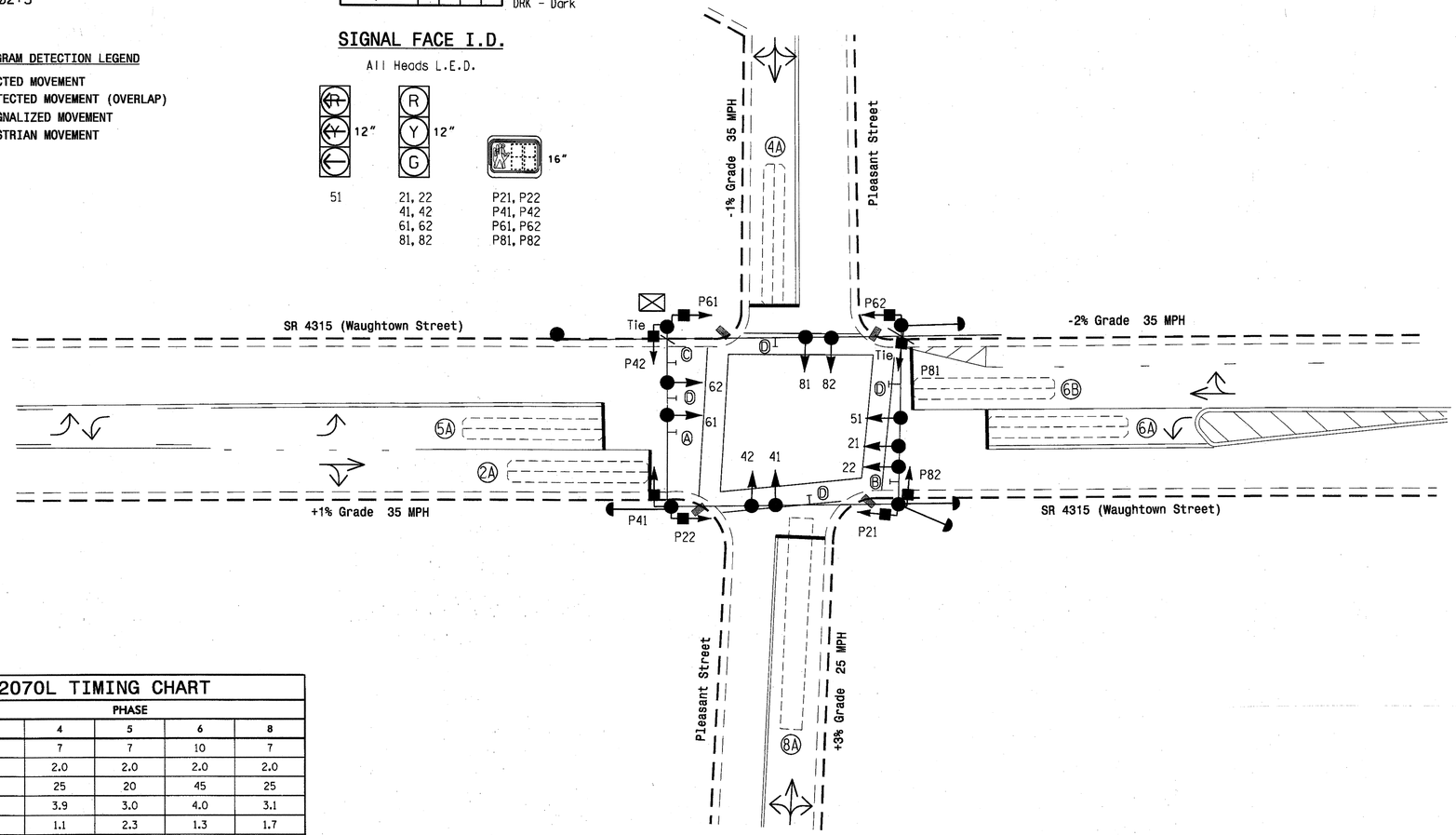
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	0	EXIST	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	EXIST	-	4	Y	Y	-	-	5	-	Y
5A	6X40	0	EXIST	-	5	Y	Y	-	-	3	-	Y
6A	6X40	0	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X40	0	EXIST	-	6	Y	Y	-	-	-	-	Y
8A	6X60	+5	EXIST	-	8	Y	Y	-	-	5	-	Y

SIGNAL FACE I.D.

All Heads L.E.D.

51 | 21, 22, 41, 42, 61, 62, 81, 82 | P21, P22, P41, P42, P61, P62, P81, P82



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	5	6	8
Min Green 1 *	10	7	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	45	25	20	45	25
Yellow Clearance	3.8	3.9	3.0	4.0	3.1
Red Clearance	1.3	1.1	2.3	1.3	1.7
Red Revert	5.0	2.0	2.0	2.0	2.0
Walk 1 *	7	7	-	7	7
Don't Walk 1	9	9	-	8	9
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	-	-	-	-
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Existing lane control signs may be removed at the direction of the Engineer.
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Right Arrow Sign (R3-6R)	Ⓑ
Ⓒ	"NO TURN ON RED" Sign (R10-11)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4315 (Waughtown Street)
at
Pleasant Street

Division 9 Forsyth County Winston-Salem
PLAN DATE: November 2011 REVIEWED BY:
PREPARED BY: W. Bazzarie REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 8/6/12 DATE
SIG. INVENTORY NO. 09-0605

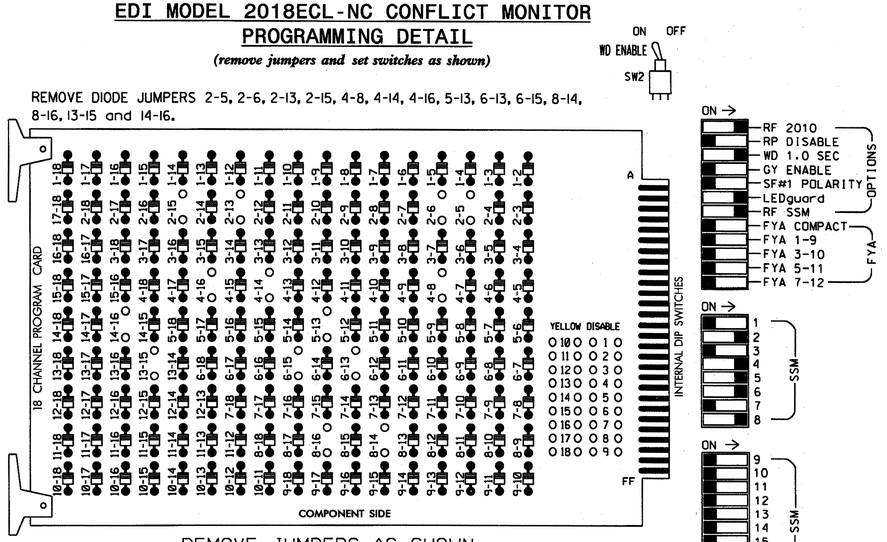
06-AUG-2012 14:36
S:\ITS&S\ATIS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\09-0605\090605_sig_dsn_20120806.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 14

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 8-14, 8-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	51	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW							131											
YELLOW ARROW							132											
GREEN ARROW							133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S3,S5,S6,S7,S8,S9,S11,S12
PHASES USED.....2,2 PED,4,4 PED,5,6,6 PED,8,8 PED
OVERLAPS.....NONE

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø2 PED DC ISOLATOR	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		NOT USED				NOT USED						ø4 PED DC ISOLATOR	ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0605
DESIGNED: November 2011
SEALED: 08/06/2012
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Safety Unit, Traffic Engineering Branch, Mobility and Safety Division, NCDOT, Statewide Traffic Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Waughtown Street) at Pleasant Street

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: August 2012 | REVIEWED BY: T. Vaughn
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022013 GEORGE C. BROWN

SIGNATURE | DATE 8/9/12

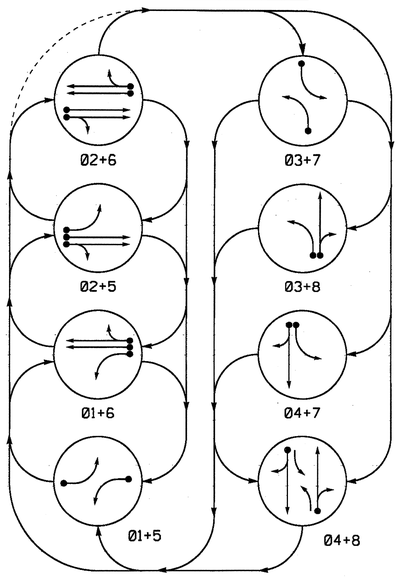
SIG. INVENTORY NO. 09-0605

08-AUG-2012 12:07
User Name: Signals#workgroups#Sig Mgmt#Strickland#0906O5_sm.ele.xxx.dgn
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 150

8 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←	←	↛	↛	↛	↛	↛	↛	↛
21, 22	R	R	G	G	R	R	R	R	Y
31	R	R	R	R	R/←	G/←	R	G	R
41, 42	R	R	R	R	R	R	G	G	R
51	←	↛	←	↛	↛	↛	↛	↛	↛
61, 62	R	G	R	G	R	R	R	R	Y
71	R	R	R	R	R/←	R	G/←	G	R
81, 82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

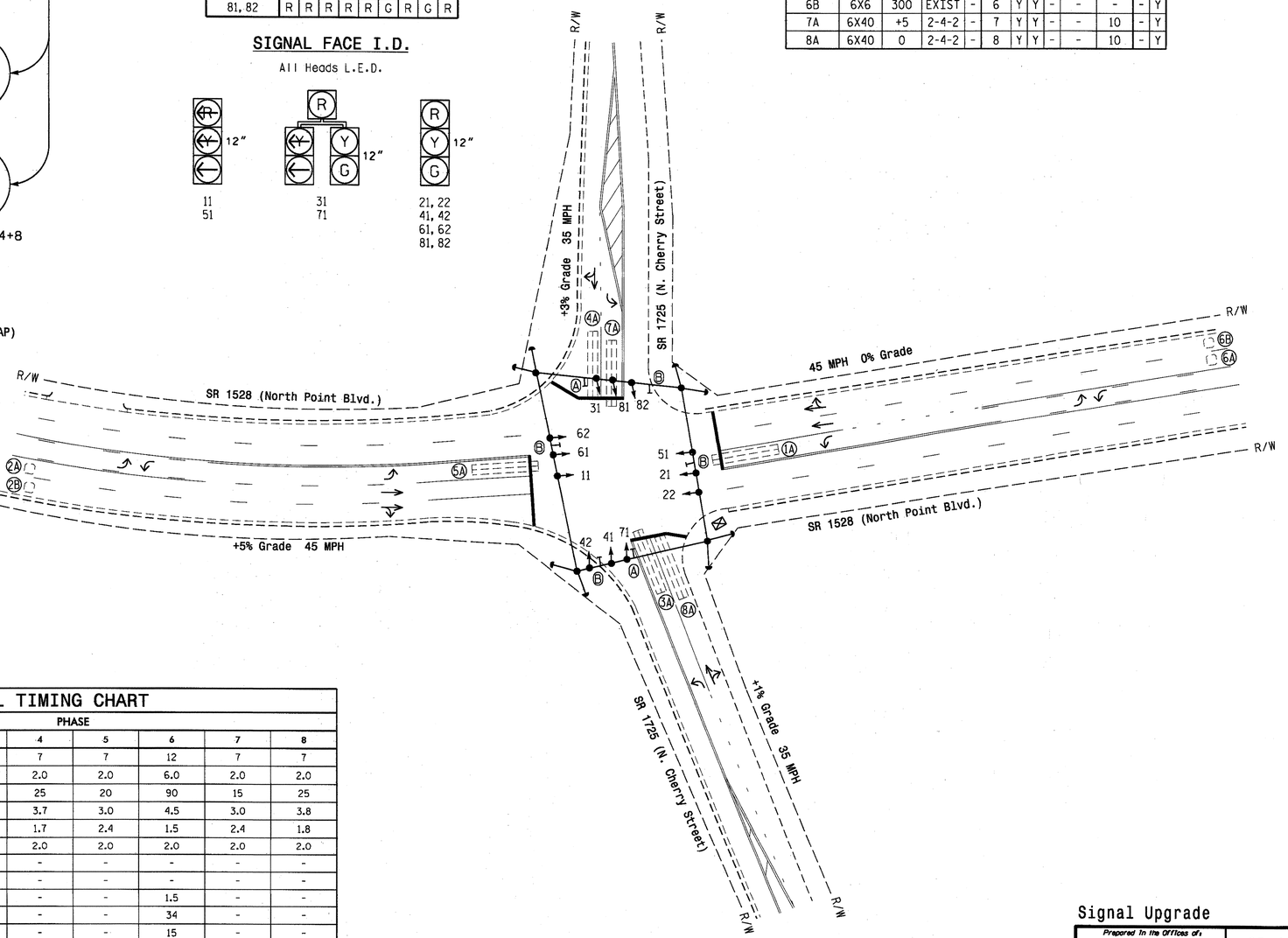
All Heads L.E.D.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	3	-	Y
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
3A	6X40	+5	2-4-2	-	3	Y	Y	-	-	10	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	3	-	Y
6A	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
7A	6X40	+5	2-4-2	-	7	Y	Y	-	-	10	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Omit pahse 3 during phase 4 on.
4. Omit phase 7 during phase 8 on.
5. Phase 1 and/or phase 5 may be lagged.
6. Set all detector units to presence mode.
7. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. The cabinet should be designed to include an Auxiliary Output file for future use.
10. Existing Left Arrow "ONLY" signs (R3-5L) may be removed at the direction of the Engineer.
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
T	Sign	T
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○~	Signal Pole with Sidewalk Guy	●~
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-------	2-in Underground Conduit	-------
N/A	Right of Way	-----
→	Directional Arrow	→
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	20	90	15	25	20	90	15	25
Yellow Clearance	3.0	4.1	3.0	3.7	3.0	4.5	3.0	3.8
Red Clearance	2.6	1.4	2.6	1.7	2.4	1.5	2.4	1.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1528 (North Point Blvd.) at SR 1725 (N. Cherry Street)

Division 9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY:

PREPARED BY: M.Bazzarie REVIEWED BY:

REVISIONS | INIT. | DATE

SCALE 0 40 1"=40'

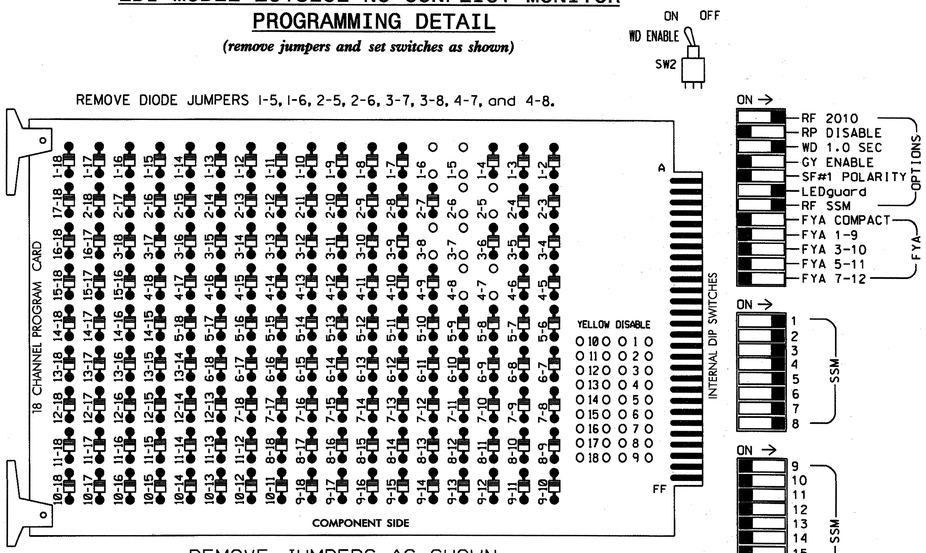
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMEN
SIGNATURE 11/6/12 DATE
SIG. INVENTORY NO. 09-0647

06-NOV-2012 09:31
S:\#TSSS\#ITS Signals\#Signal Design Section\Central Region\Div 9\mc-5224 Winston Salem\Signals\#09-0647\#09647_sig_dsn_20121106.dgn
cz.comb

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 151

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	41,42 71	NU	51	61,62	NU	71	81,82 31	NU	NU	NU	NU	NU	NU	NU
RED		128		*	101			134		*	107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126			117			132			123								
GREEN ARROW	127			118			133			124								

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	SLOT EMPTY	SLOT EMPTY	ø3 3A	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	ø2 2B			NOT USED	NOT USED								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	ø7 7A	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B			NOT USED	NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

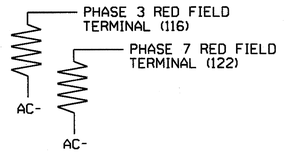
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			10
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			10
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0647
DESIGNED: December 2011
SEALED: 11/6/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1528 (North Point Blvd.) at SR 1725 (N. Cherry Street)

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

Division 9	Forsyth County	Winston-Salem
PLAN DATE: October 2012	REVIEWED BY: JTR	
PREPARED BY: S. Armstrong	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

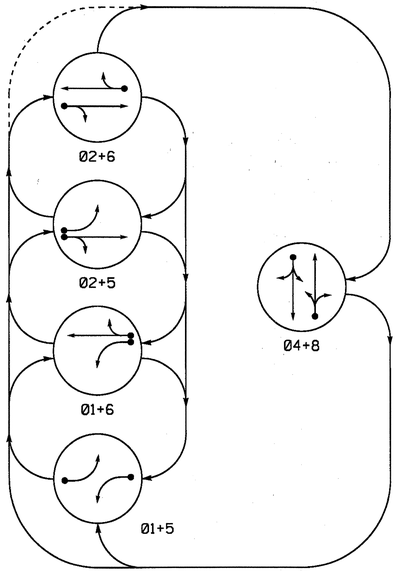
SIGNATURE 11-7-12 DATE

SIG. INVENTORY NO. 09-0647

06-NOV-2012 15:26
S:\#ITS&SIM\ITS\Signals\Workgroups\Sig Mgmt\armstrong\209647_smi_e1a_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 152

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

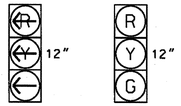
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	↱	↱	↱	↱
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	↱	←	↱	↱	↱
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

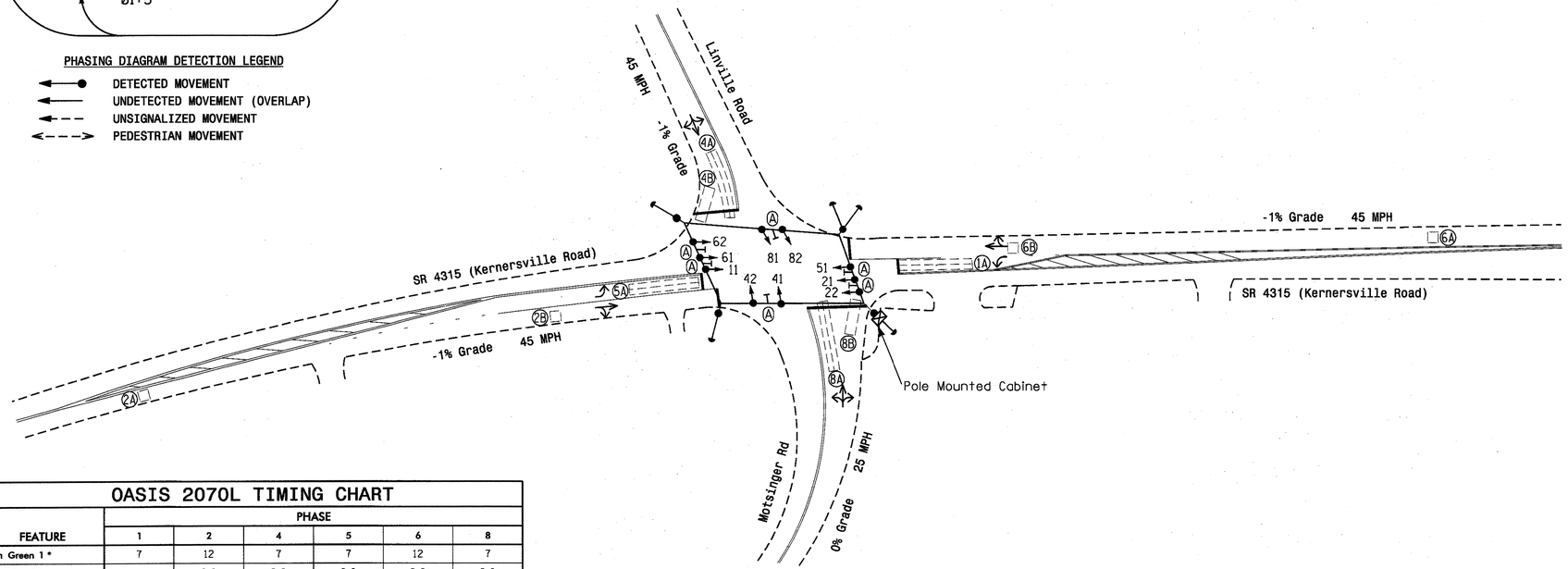
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	3	-	Y
2A	6X6	330	EXIST	-	2	Y	Y	-	2.0	-	-	Y
2B	6X6	90	EXIST	-								
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	5	-	Y
4B	6X20	+5	EXIST	-	4	Y	Y	-	-	15	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	3	-	Y
6A	6X6	330	EXIST	-	6	Y	Y	-	2.0	-	-	Y
6B	6X6	90	EXIST	-								
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	5	-	Y
8B	6X20	+5	EXIST	-	8	Y	Y	-	-	15	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	45	20	20	45	20
Yellow Clearance	3.0	4.6	4.6	3.0	4.6	4.2
Red Clearance	2.1	1.4	1.6	1.4	1.4	1.9
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

5 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-------	2-in Underground Conduit	-------
N/A	Right of Way	-------
→	Directional Arrow	→
Ⓐ	Street Name Sign (D3-1)	Ⓐ

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Kernersville Road) at Linville Rd./Motsinger Rd.

Division 9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY:
PREPARED BY: L. Blount REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

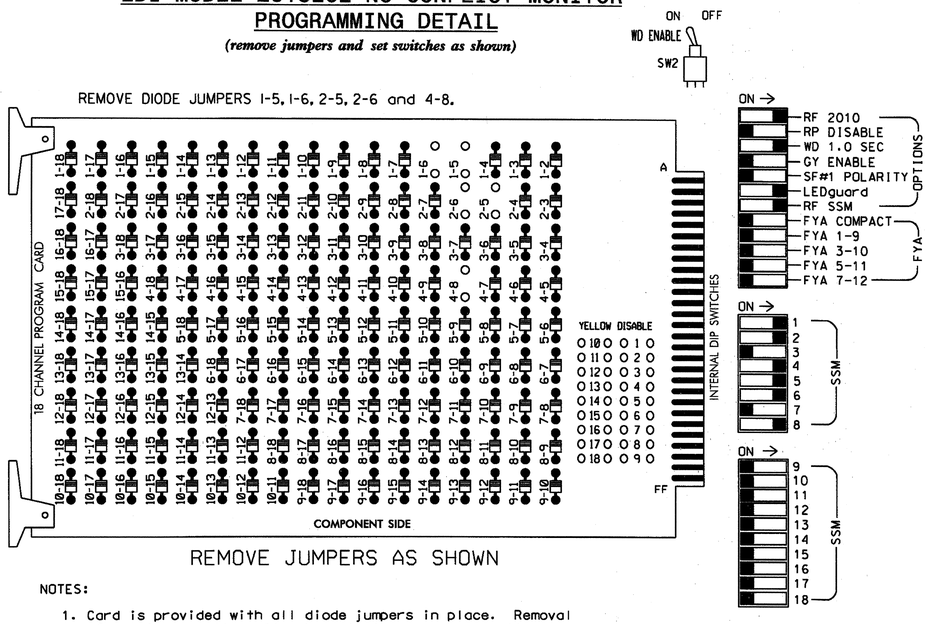
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 8/22/12 DATE
SIG. INVENTORY NO. 09-0660

04-DEC-2012 14:34
S:\TSS\Unit5 Signals\Signal Design Section\Central Region\Qtly 9\C-5224 Winston Salem\Signals\09-0660\090660_sig_dsn_20120822.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.153

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW	125						131					
YELLOW ARROW	126						132					
GREEN ARROW	127						133					

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	SLOT EMPTY	SLOT EMPTY	ø4 4A	ø5 5A	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	ø4 4B	ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	ø8 8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB21-1,2	I1U	56	18	1	1	Y	Y			3
2A,2B	TB23-1,2	I1L	47	9	22	2	Y	Y		2.0	
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			5
4B	TB23-7,8	I4L	45	7	14	4	Y	Y			15
5A	TB21-9,10	I5U	55	17	5	5	Y	Y			3
6A,6B	TB23-9,10	I5L	48	10	26	6	Y	Y		2.0	
8A	TB22-1,2	I8U	42	4	8	8	Y	Y			5
8B	TB24-1,2	I8L	46	8	18	8	Y	Y			15

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0660
DESIGNED: December 2011
SEALED: 08/22/12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Kernersville Road)
at
Linville Rd/Motsinger Rd

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: August 2012 | REVIEWED BY: T. Jgp
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

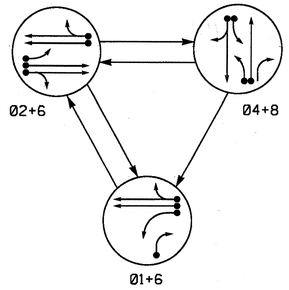
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 8/29/12 DATE
SIG. INVENTORY NO. 09-0660

27-AUG-2012 12:14
S:#TTSSIG#415 Signals#Workgroups#Sig Mgmt#Strickland#090660_sm_ele_xxx.dgn
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 154

3 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

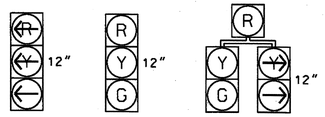
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 04+8	FLASH
11	~~R~~	~~R~~	~~R~~	~~R~~
21, 22, 23	R	G	R	Y
41, 42	R	R	G	R
61, 62	G	G	R	Y
81, 82	R	R	G	R
83	R/	R	G	R

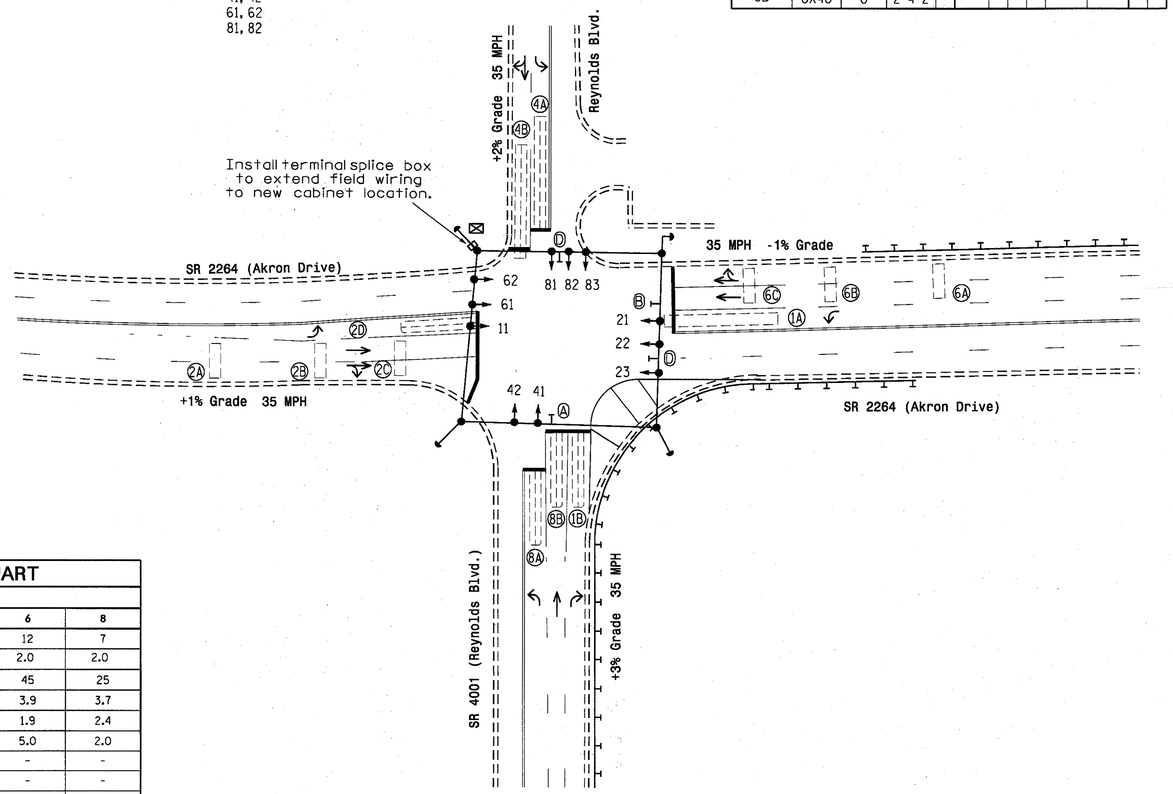
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	+5	EXIST	-	1	Y	Y	-	-	-	-	Y
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
2A	6X18	138	EXIST	-								
2B	6X18	81	EXIST	-	2	Y	Y	-	-	-	-	Y
2C	6X18	38	EXIST	-								
2D	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X60	+5	2-4-2	-	4	Y	Y	-	-	10	-	Y
6A	6X18	138	EXIST	-								
6B	6X18	81	EXIST	-	6	Y	Y	-	-	-	-	Y
6C	6X18	38	EXIST	-								
8A	6X40	0	2-4-2	-								
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	6	8
Min Green 1 *	7	12	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	45	25	45	25
Yellow Clearance	3.0	3.8	3.7	3.9	3.7
Red Clearance	3.1	1.2	1.6	1.9	2.4
Red Revert	2.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
4. Phase 1 may be lagged.
5. Set all detector units to presence mode.
6. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. The cabinet should be designed to include an Auxiliary Output file for future use.
10. Existing "Left Turn Yield on Green" (R10-12) ball and Left Arrow "ONLY" (R3-5L) signs may be removed at the direction of the Engineer.
11. Remove existing "RIGHT TURN SIGNAL" sign (R10-10R).
12. Pavement markings are existing.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
S	Terminal Splice Box	S
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	B
D	Street Name Sign (D3-1)	D

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
North Carolina Department of Transportation
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2264 (Akron Drive)
at
SR 4001 (Reynolds Blvd.)

Division 9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY:
PREPARED BY: M. Bazzarie REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

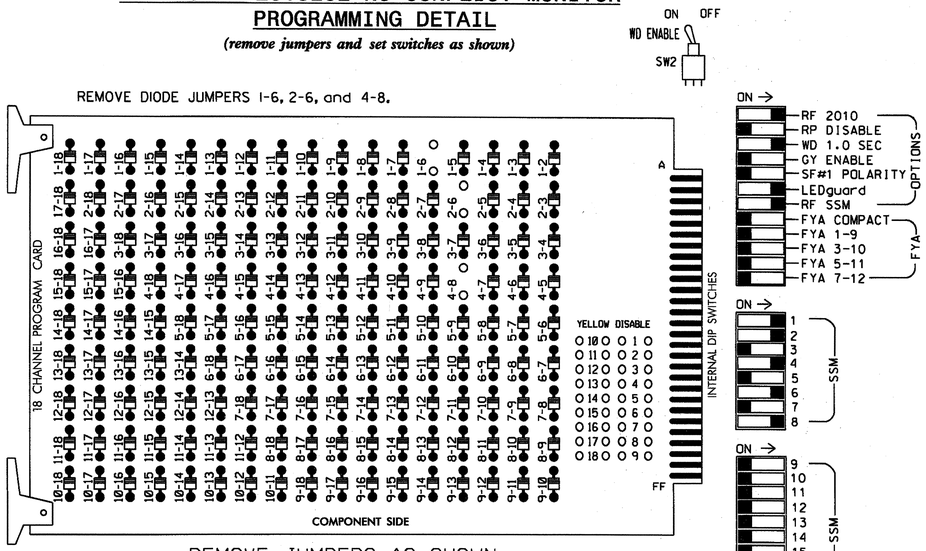
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. TEMBO
SIGNATURE 8/6/12 DATE
SIG. INVENTORY NO. 09-0665

07-JAN-2013 13:09
S:\ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\09-0665\90665_sig_dsn_20120806.dgn
rzimbo

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 155

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. FILE
LOAD SWITCHES USED.....S1,S2,S5,S8,S11
PHASES USED.....1,2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	83	21,22 23	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82 83	NU	NU	NU	NU	NU	NU	NU
RED			128			101			134			107							
YELLOW			129			102			135			108							
GREEN			130			103			136			109							
RED ARROW	125																		
YELLOW ARROW	126	126																	
GREEN ARROW	127	127																	

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 1 1A	Ø 2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø 1 1B	Ø 2 2D			Ø 4 4B									ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 6 6A,6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A,8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	
	L		NOT USED				NOT USED									

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-5,6	I2U	39	1	2	1	Y	Y			
1B	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A,2B,2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
2D	TB2-11,12	I3L	76	38	42	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A,8B	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0665
DESIGNED: December 2011
SEALED: 8/6/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

SR 2264 (Akron Drive)
at
SR 4001 (Reynolds Blvd.)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: August 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | DATE 8-13-12

SIG. INVENTORY NO. 09-0665

10-AUG-2012 07:13
S:*ITSAS3\#ITS Signals\#Workgroups\#Sig Man\#Armstrong\#09065_sht_e1a_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 156

PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

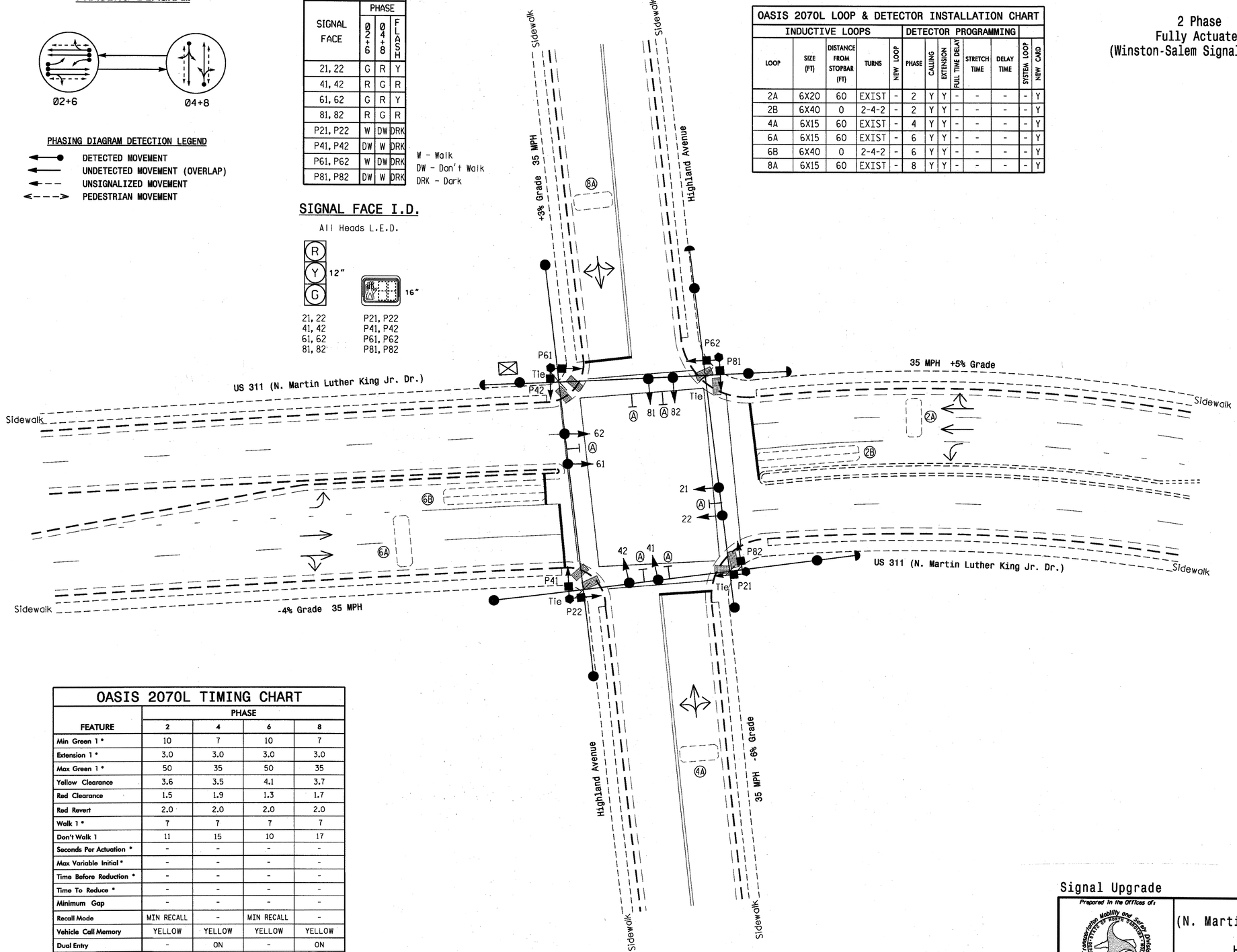
All Heads L.E.D.

21, 22	P21, P22
41, 42	P41, P42
61, 62	P61, P62
81, 82	P81, P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X20	60	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X15	60	EXIST	-	4	Y	Y	-	-	-	-	Y
6A	6X15	60	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A	6X15	60	EXIST	-	8	Y	Y	-	-	-	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	3.0	3.0	3.0
Max Green 1 *	50	35	50	35
Yellow Clearance	3.6	3.5	4.1	3.7
Red Clearance	1.5	1.9	1.3	1.7
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	7	7	7	7
Don't Walk 1	11	15	10	17
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	YELLOW	YELLOW	YELLOW
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
------	2-in Underground Conduit	------
N/A →	Right of Way	------
→	Directional Arrow	→
⬡	Signal Pedestal	●
Ⓐ	Street Name Sign (D3-1)	Ⓐ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 311
(N. Martin Luther King Jr. Dr.)
at
Highland Avenue

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2012 PREPARED BY: L. Blount

PREPARED BY: W. Bazzarie REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZELNICK

SIGNATURE 10/8/12 DATE

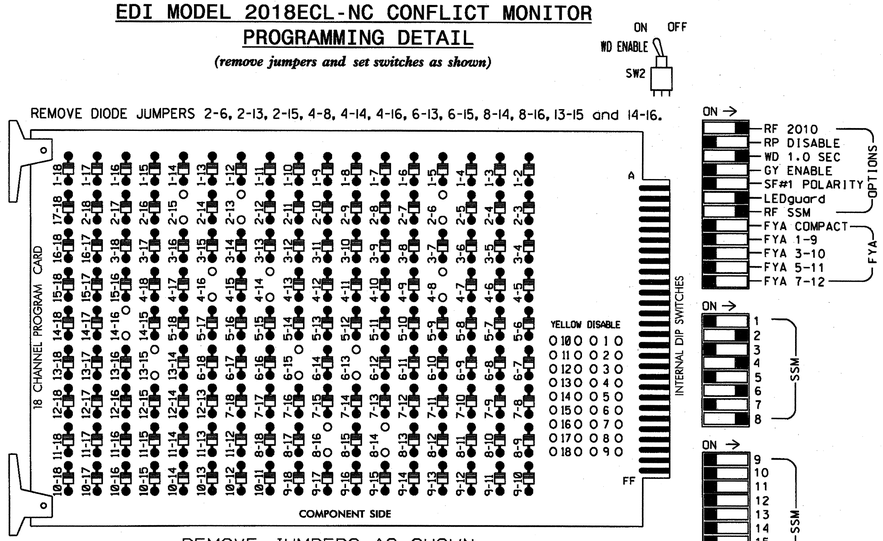
SIG. INVENTORY NO. 09-0675

08-OCT-2012 17:42
S:#ITS&S\#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0675#09067S_sig_dsn_20121008.dgn
ZELNICK

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 157

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12
PHASES USED.....2,2 PED,4,4 PED,6,6 PED,8,8 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		ø2 2B				NOT USED						ø4 PED DC ISOLATOR	ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0675
DESIGNED: September 2012
SEALED: 10/08/2012
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering, Mobility and Safety Division
City of Winston-Salem
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

US 311
(N. Martin Luther King Jr Dr.)
at
Highland Avenue

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: T. Jaja
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 022013
ENGINEER
GEORGE C. BROWN

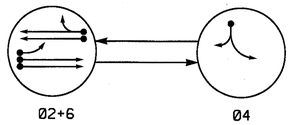
SIGNATURE | DATE 10/9/12

SIG. INVENTORY NO. 09-0675

09-OCT-2012 09:47
S:\#TSSIG\#TS Signals\Workgroups\Sig Man\Strickland\#09675_sm_ele_xxx.dgn
cestrickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 15B

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04	PHASE FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.

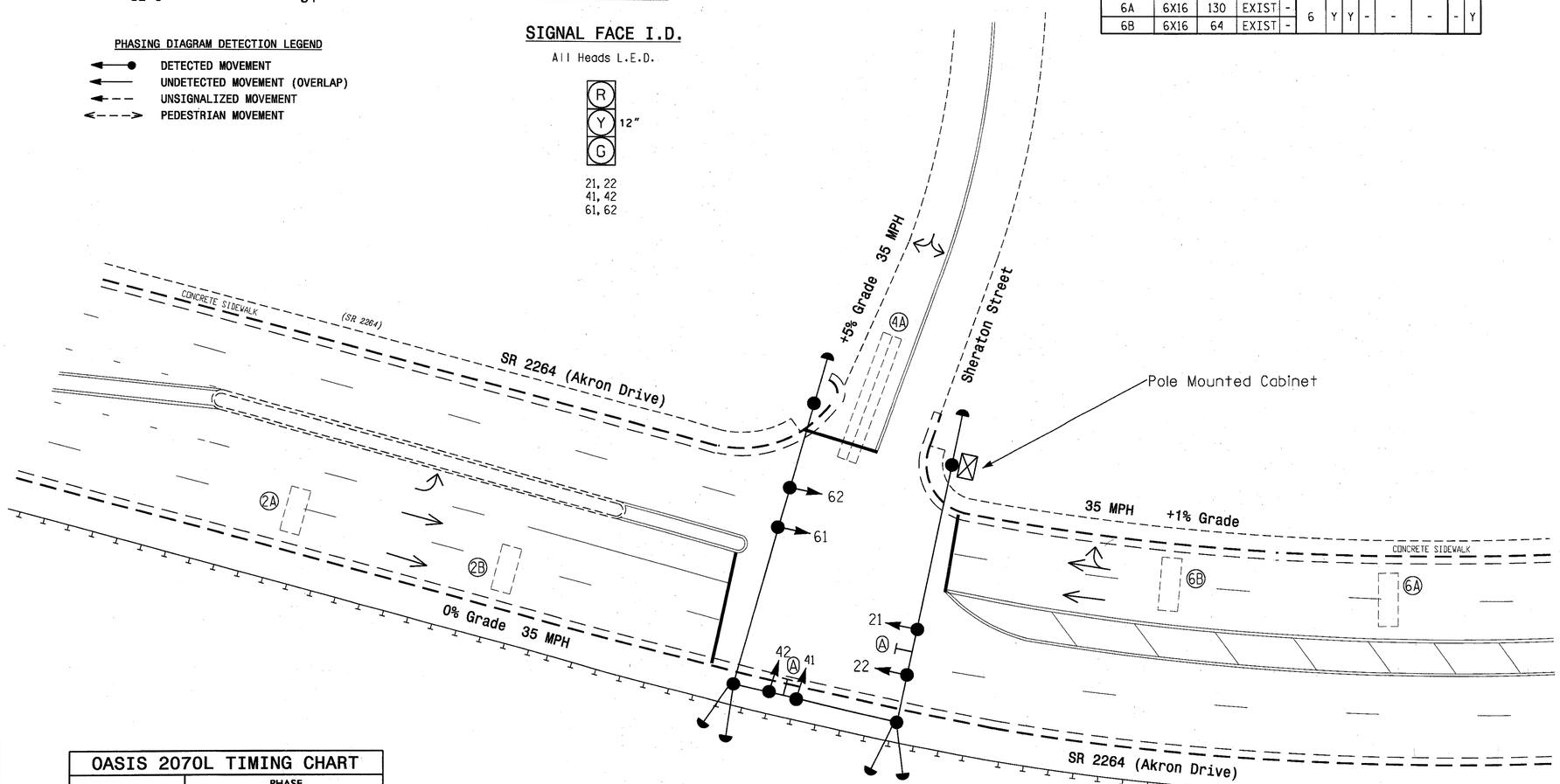
21, 22
41, 42
61, 62

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X14	130	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X14	64	EXIST	-								
4A	6X40	+5	EXIST	-	4	Y	Y	-	-	5	-	Y
6A	6X16	130	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X16	64	EXIST	-								

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART			
FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	10	7	10
Extension 1 *	3.0	2.0	3.0
Max Green 1 *	35	25	35
Yellow Clearance	3.8	3.0	3.8
Red Clearance	1.0	1.8	1.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW		YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
A	Street Name Sign (D3-1)	A

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2264 (Akron Drive)
at
Sheraton Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: September 2011 REVIEWED BY:
PREPARED BY: W. Bazzarie REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 4/13/12 DATE
SIG. INVENTORY NO. 09-0676

04-DEC-2012 14:41
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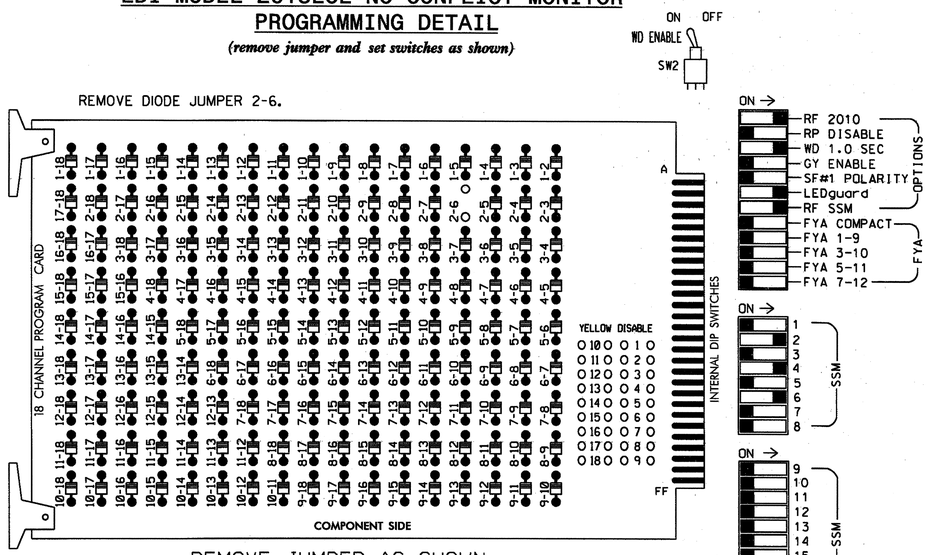
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 159

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



REMOVE JUMPER AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2.S5.S8
PHASES USED.....2.4.6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	ø2 2A,2B	SLOT EMPTY	ø4 4A	SLOT EMPTY	ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L		NOT USED		NOT USED		NOT USED								ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB21-3,4	12U	39	1	2	2	Y	Y			
4A	TB21-7,8	14U	41	3	4	4	Y	Y			5
6A,6B	TB21-11,12	16U	40	2	6	6	Y	Y			

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0676
DESIGNED: September 2011
SEALED: 4/13/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2264 (Akron Drive)
at
Sheraton Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	April 2012	REVIEWED BY:	JTR
PREPARED BY:	S. Armstrong	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 008453
ENGINEER
JOHN T. ROWE, JR.

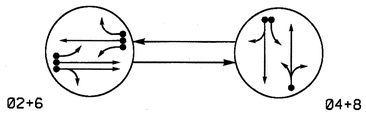
SIGNATURE
DATE 4-16-12

SIG. INVENTORY NO. 09-0676

16-APR-2012 11:18
S:\TSS\SU\TS Signals\Workgroups\Sig Mgmt\Armstrong\09676_sm.ele.xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 160

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

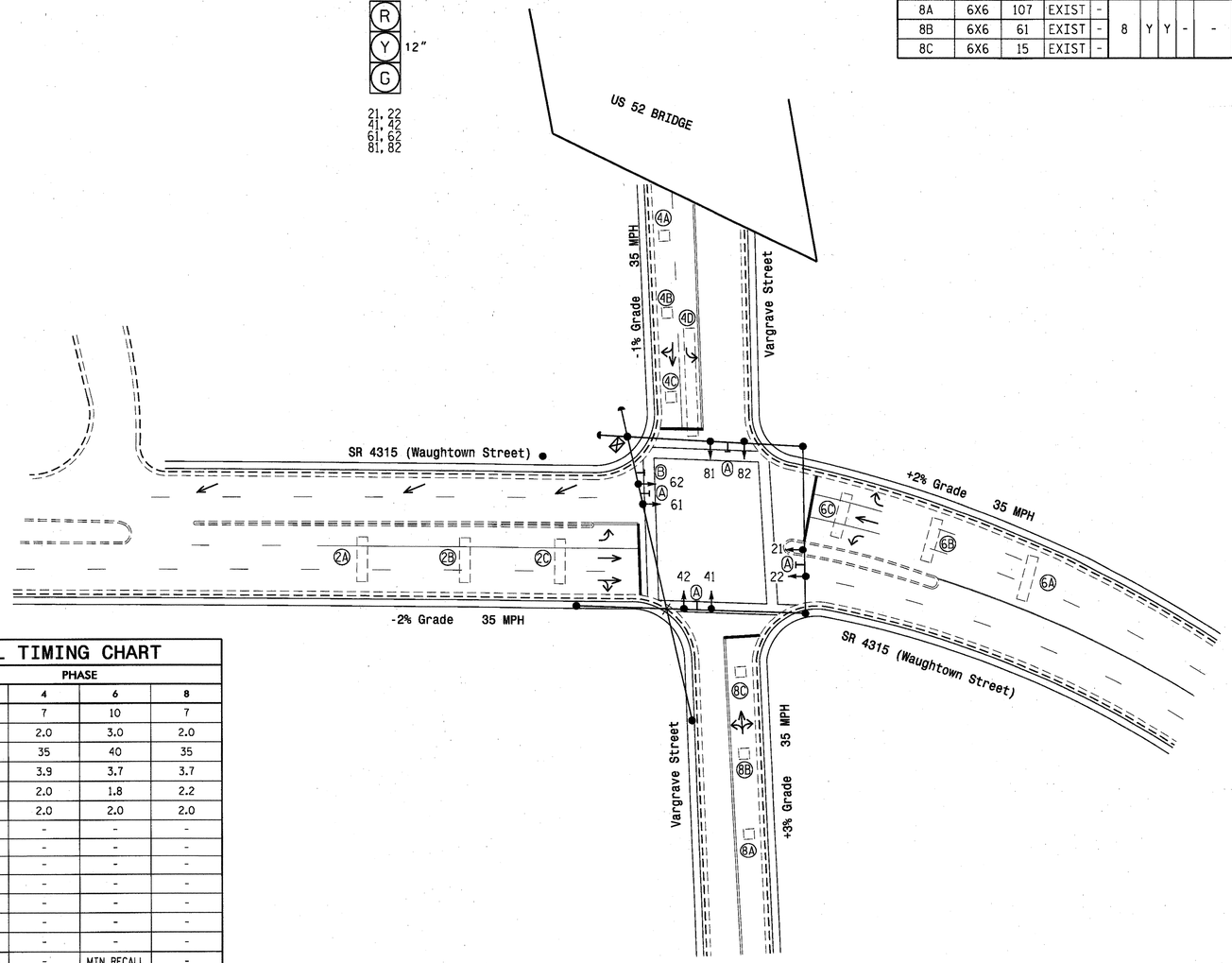
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X24	122	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X24	66	EXIST	-								
2C	6X24	12	EXIST	-								
4A	6X6	107	EXIST	-	4	Y	Y	-	-	-	-	Y
4B	6X6	61	EXIST	-								
4C	6X6	15	EXIST	-								
4D	6X60	+5	EXIST	-	4	Y	Y	-	-	3	-	Y
6A	6X24	122	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X24	66	EXIST	-								
6C	6X24	12	EXIST	-							-	-
8A	6X6	107	EXIST	-	8	Y	Y	-	-	-	-	Y
8B	6X6	61	EXIST	-								
8C	6X6	15	EXIST	-								

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	40	35	40	35
Yellow Clearance	4.0	3.9	3.7	3.7
Red Clearance	1.4	2.0	1.8	2.2
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	YELLOW	YELLOW	YELLOW
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	Street Name Sign (D3-1)	A
B	Right Arrow "ONLY" Sign (R3-5R)	B

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
North Carolina Department of Transportation
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Waughtown Street) at Vargrave Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: January 2012 REVIEWED BY:

PREPARED BY: L. Blount REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

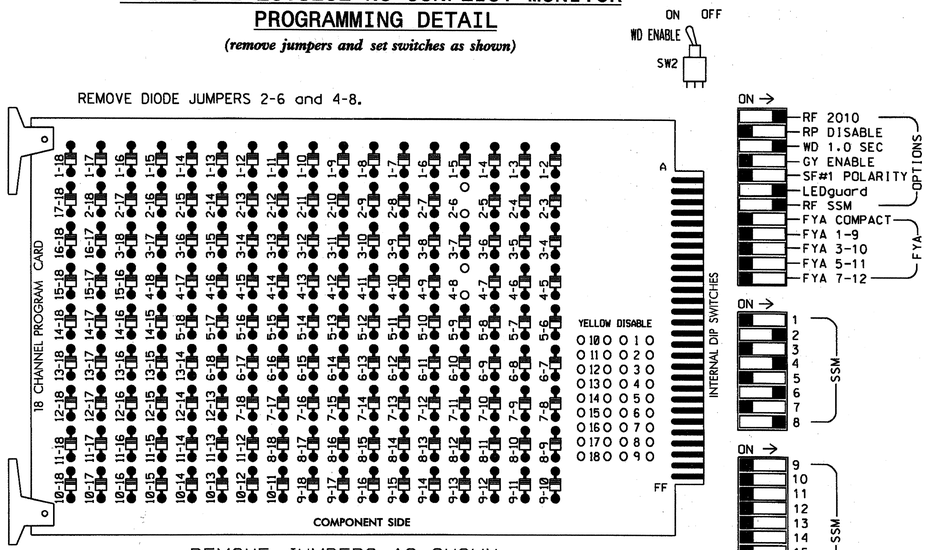
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE DATE 12/12
SIG. INVENTORY NO. 09-0689

04-DEC-2012 14:43
S:\MTS&SW\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0689\0906890_sig_dsn_20120502.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.16

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX OUTPUT FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT	ø2 2A,2B,2C	SLOT	SLOT	SLOT	ø4 4A,4B,4C	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
	L	EMPTY	NOT USED	EMPTY	EMPTY	EMPTY	ø4 4D	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR
FILE "J"	U	SLOT	ø6 6A,6B,6C	SLOT	SLOT	SLOT	ø8 8A,8B,8C	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT
	L	EMPTY	NOT USED	EMPTY	EMPTY	EMPTY	NOT USED	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A,4B,4C	TB4-9,10	I6U	41	3	4	4	Y	Y			
4D	TB4-11,12	I6L	45	7	14	4	Y	Y			3
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A,8B,8C	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0689
DESIGNED: January 2012
SEALED: 5/2/12
REVISED: N/A

Sigal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4315 (Waughtown Street)
at
Vargrave Street

Prepared in the Offices of:
Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: May 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

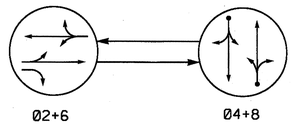
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 5-3-12 DATE
SIG. INVENTORY NO. 09-0689

03-MAY-2012 07:03
S:\ITS&SUM\ITS Signals\Workgroups\Sig Mark\Armstrong\M090689_sm_e1a_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 162

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

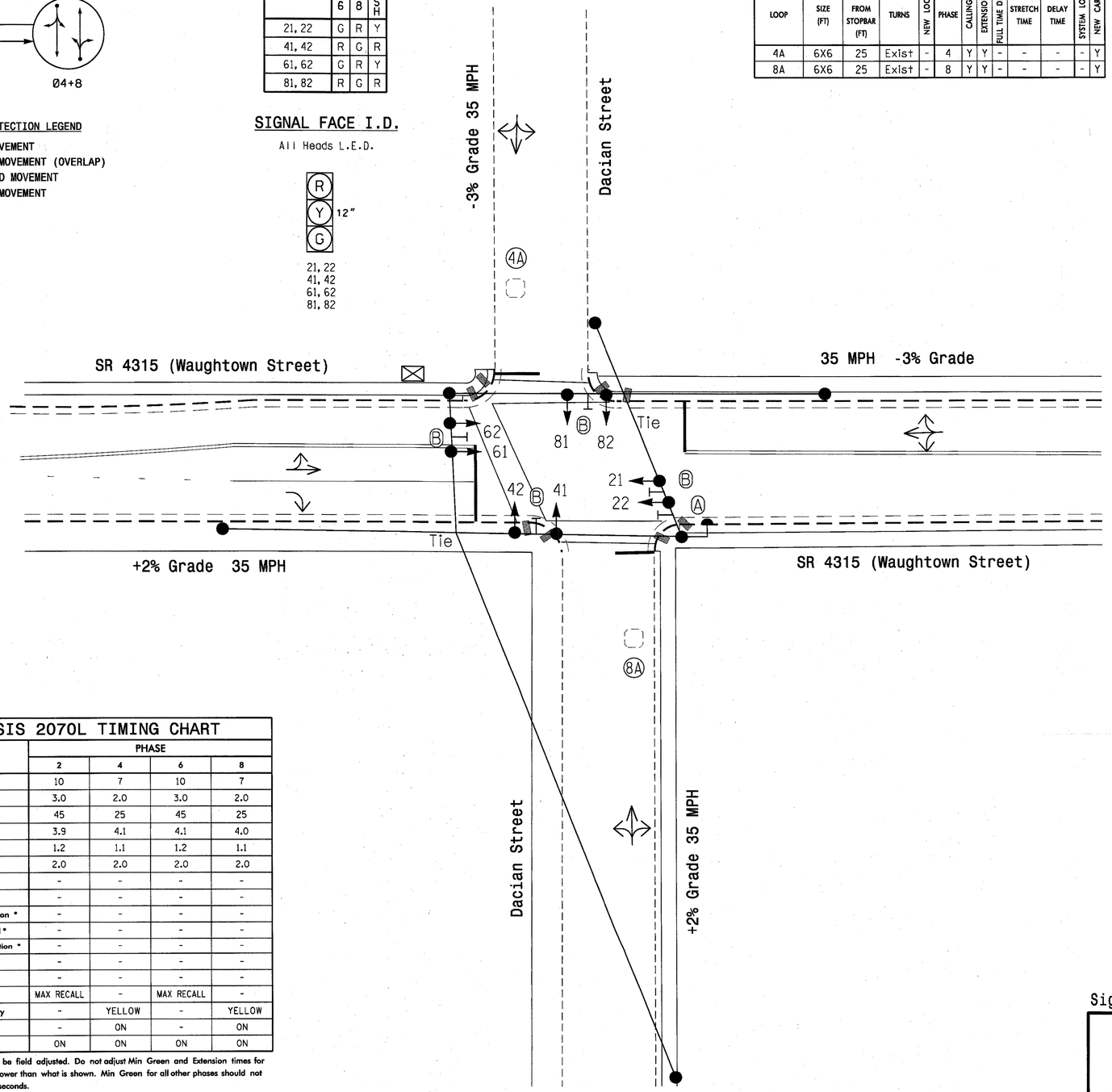
TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X6	25	Exist	-	4	Y	Y	-	-	-	-	Y
8A	6X6	25	Exist	-	8	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	45	25	45	25
Yellow Clearance	3.9	4.1	4.1	4.0
Red Clearance	1.2	1.1	1.2	1.1
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MAX RECALL	-	MAX RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Semi Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2012 and "Standard Specifications for Roads and Structures" dated July 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Existing Right Arrow "ONLY" (R3-5R) sign may be removed at the direction of the Engineer.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4315 (Waughtown Street) at Dacian Street

Division 9 Forsyth County Winston Salem

PLAN DATE: September 2011 REVIEWED BY:

PREPARED BY: W.Bazzarie REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1'=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 2/28/12 DATE

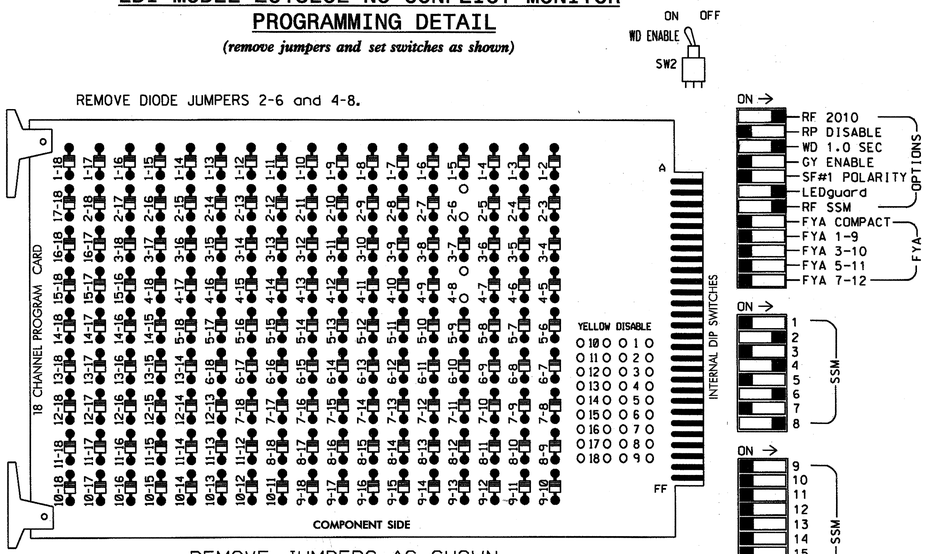
SIG. INVENTORY NO. 09-0690

04-DEC-2012 14:47
S:\TISAS\ITS Signals\Signal Design Section\Central Region\Div 9\c-5224 Winston Salem\Signals\09-0690\090690_sig_dsn_20120228.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 163

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

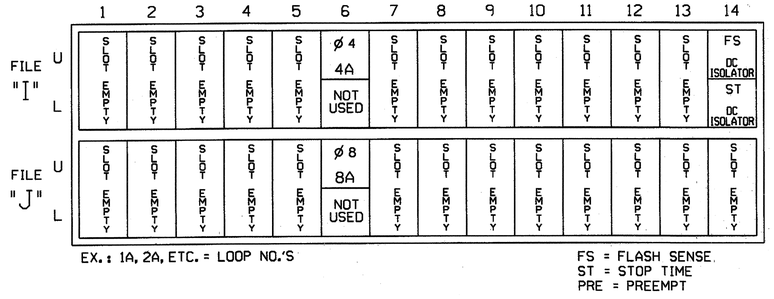
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME
PRE = PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0690
DESIGNED: September 2011
SEALED: 2-28-12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4315 (Waughtown Street)
at
Dacian Street

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

Division 09	Forsyth County	Winston-Salem
PLAN DATE: 2-22-12	REVIEWED BY: T. Joyce	
PREPARED BY: D.H. Spaulding	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 022013
ENGINEER
GEORGE C. BROWN

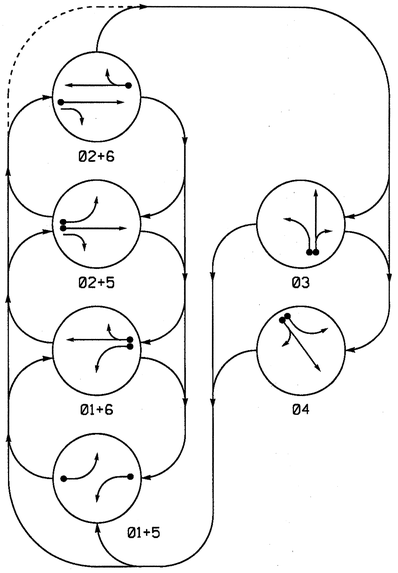
SIGNATURE _____ DATE 3/1/12

SIG. INVENTORY NO. 09-0690

28-FEB-2012 14:43
S:\#TIS&SUM\TIS Signals\Workgroups\Sig Mgmt\Spaulding\In-progress\09-0690_smele_2012xx.dgn
dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 164

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

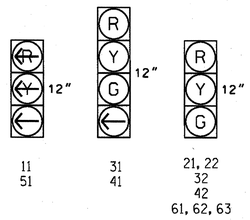
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03	04	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~
61, 62, 63	R	G	R	G	R	R	Y

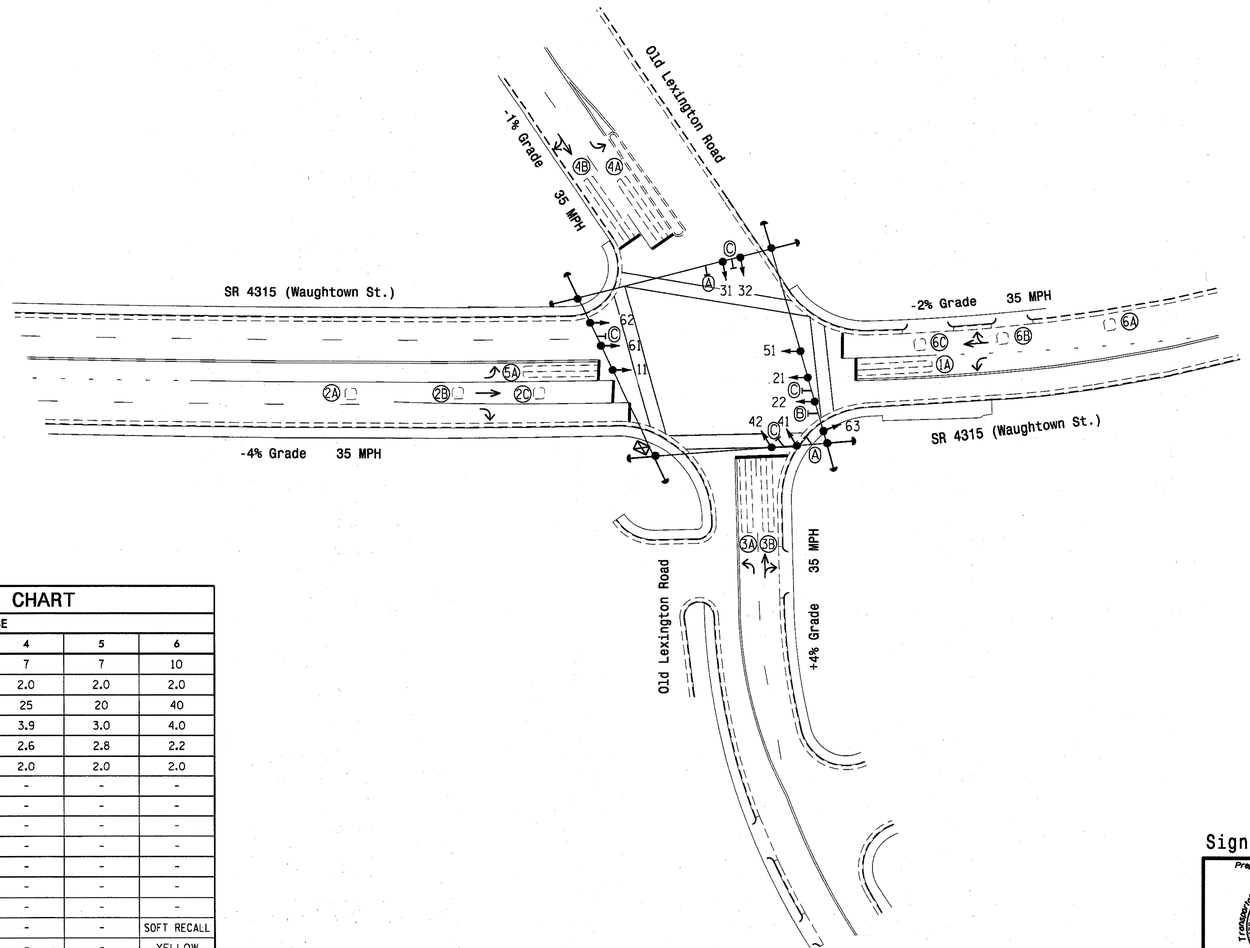
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	3	-	Y
2A	6X6	138	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X6	81	EXIST	-								
2C	6X6	38	EXIST	-								
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	3	-	Y
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	10	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	3	-	Y
6A	6X6	138	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X6	81	EXIST	-								
6C	6X6	38	EXIST	-								



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green 1 *	7	10	7	7	7	10
Extension 1	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	40	30	25	20	40
Yellow Clearance	3.0	4.1	3.6	3.9	3.0	4.0
Red Clearance	2.8	2.2	2.2	2.6	2.8	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

6 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. The cabinet should be designed to include an Auxiliary Output file for future use.
10. Existing Left Arrow "ONLY" signs (R3-5L) may be removed at the direction of the Engineer.
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	Right Arrow "ONLY" Sign (R3-5R)	B
C	Street Name Sign (D3-1)	C

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Waughtown St.) at Old Lexington Rd.

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY:

PREPARED BY: L. Blount REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1" = 40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT ZIEMBA

SIGNATURE DATE 7/10/12

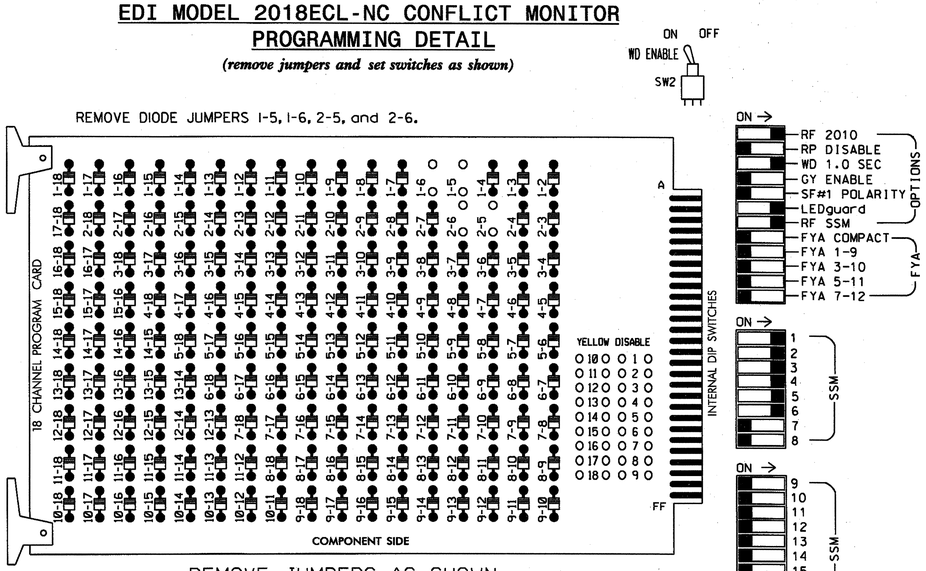
SIG. INVENTORY NO. 09-0691

04-DEC-2012 14:49
S:#ITSSGS#ITS Signals#Signal Design Section#Central Region#Div 9#C-5224 Winston Salem#Signals#09-0691#090691_sig_dsn_20120718.dgn
ZIEMBA

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 165

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5		S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4		14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	NU	51	61,62 63	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128		116	116	101	101			134										
YELLOW		129		117	117	102	102			135										
GREEN		130		118	118	103	103			136										
RED ARROW	125								131											
YELLOW ARROW	126								132											
GREEN ARROW	127			118		103			133											

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX OUTPUT FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
PHASES USED.....1,2,3,4,5,6
OVERLAPS.....NONE

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A,2B,2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø3 3A	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED				Ø3 3B	Ø4 4B							ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A,6B,6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			3
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-9,10	I6U	41	3	4	3	Y	Y			3
3B	TB4-11,12	I6L	45	7	14	3	Y	Y			10
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0691
DESIGNED: November 2011
SEALED: 7/18/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Statewide Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

SR 4315 (Waughtown St.)
at
Old Lexington Rd.

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: July 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
008453
ENGINEER
JOHN T. ROWE, JR

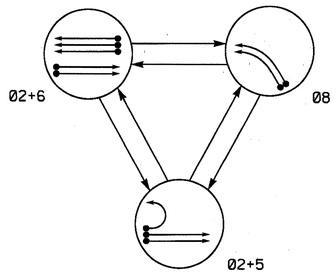
SIGNATURE 7-19-12 DATE

SIG. INVENTORY NO. 09-0691

19-JUL-2012 09:11
S:\TSS\CAD\ITS Signals\Workgroups\Sig Mon\Armstrong\09691_sm.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 166

PHASING DIAGRAM



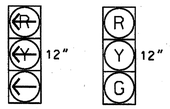
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø8	FLASH
21, 22	G	G	R	Y
51	←	~~R~~	~~R~~	~~R~~
61, 62, 63, 64	R	G	R	Y
81, 82	~~R~~	~~R~~	←	~~R~~

SIGNAL FACE I.D.

All Heads L.E.D.



51
81, 82

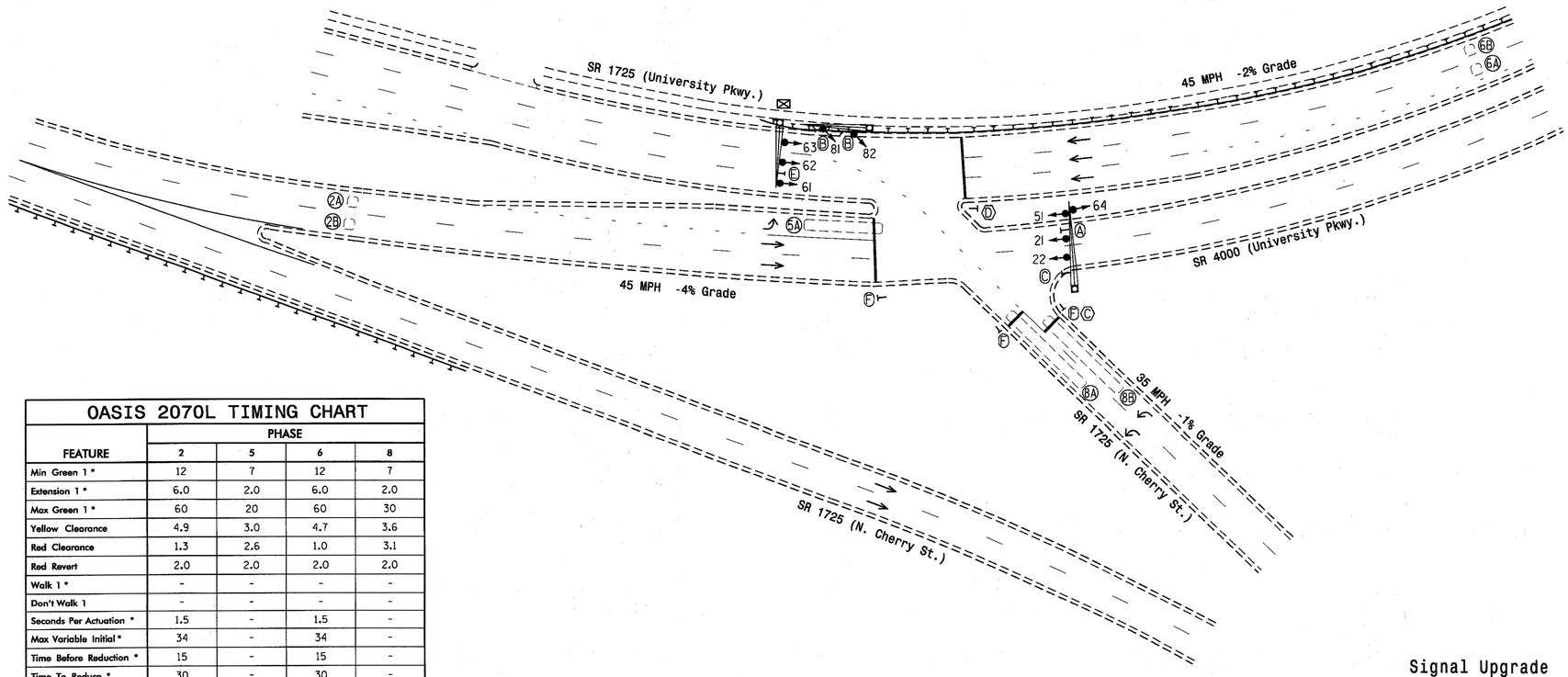
21, 22
61, 62, 63, 64

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
5A	6X45	+5	EXIST	-	5	Y	Y	-	-	-	-	Y
6A	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
8A, 8B	6X60	+5	EXIST	-	8	Y	Y	-	-	-	-	Y

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Existing lane control signs may be removed at the direction of the Engineer.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	12	7	12	7
Extension 1 *	6.0	2.0	6.0	2.0
Max Green 1 *	60	20	60	30
Yellow Clearance	4.9	3.0	4.7	3.6
Red Clearance	1.3	2.6	1.0	3.1
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	1.5	-
Max Variable Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.4	-	3.4	-
Recall Mode	SOFT RECALL	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Metal Pole with Mastarm	▭
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
N/A	Guardrail	⊥⊥⊥
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	No Right Turn Sign (R3-1)	Ⓒ
Ⓓ	No Left Turn Sign (R3-2)	Ⓓ
Ⓔ	Through Arrow "ONLY" Sign (R3-5A)	Ⓔ
Ⓕ	"STOP HERE ON RED" Sign (R10-6)	Ⓕ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

SR 1725/4000 (University Pkwy.) at SR 1725 (N. Cherry Street)

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: November 2012 | PREPARED BY: L. Blount
PREPARED BY: Sterling | REVIEWED BY:

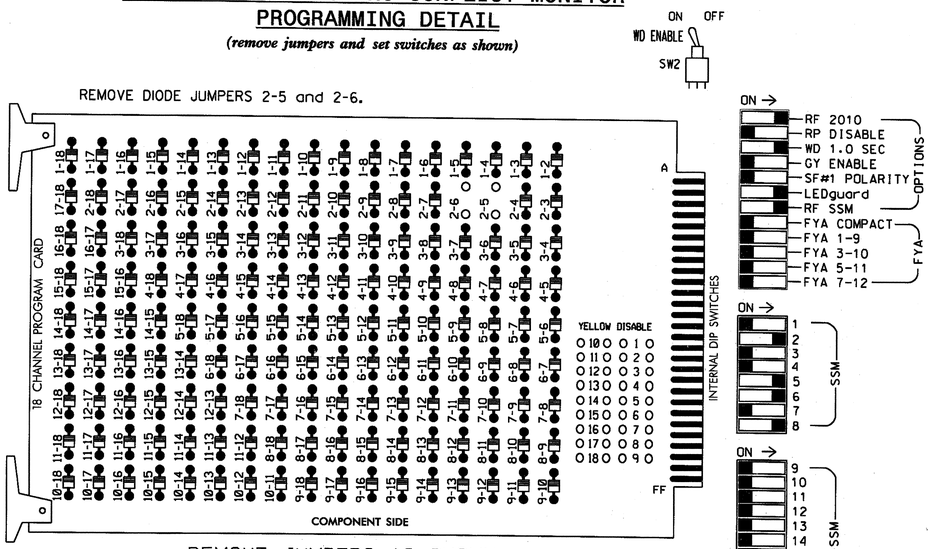
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 1/9/13 DATE
SIG. INVENTORY NO. 09-0705

09-JAN-2013 12:23
S:\TSS\Units\Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0705\090705_sig_dsn_20130109.dgn
rziemba

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S7,S8,S11
PHASES USED.....2,5,6,8
OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.167

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51	61,62 63,64	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW							131					
YELLOW ARROW							132					
GREEN ARROW							133					

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		ø2 2B												ST DC ISOLATOR
FILE "J" U	ø5 5A	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A,8B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	ø6 6B				NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A,8B	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0705
DESIGNED: November 2012
SEALED: 1/9/13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

SR 1725/4000 (University Pkwy.)
at
SR 1725 (N. Cherry Street)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

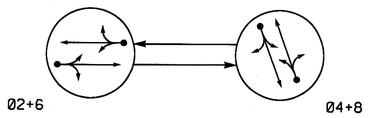
John T. Rowe, Jr. 1-9-13
SIGNATURE DATE

SIG. INVENTORY NO. 09-0705

09-JAN-2013 14:28
s:\#TSASig#ITS Signals#WorkGroups#Sig Mon#Armstrong#090705_sample_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 168

PHASING DIAGRAM



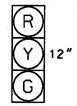
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

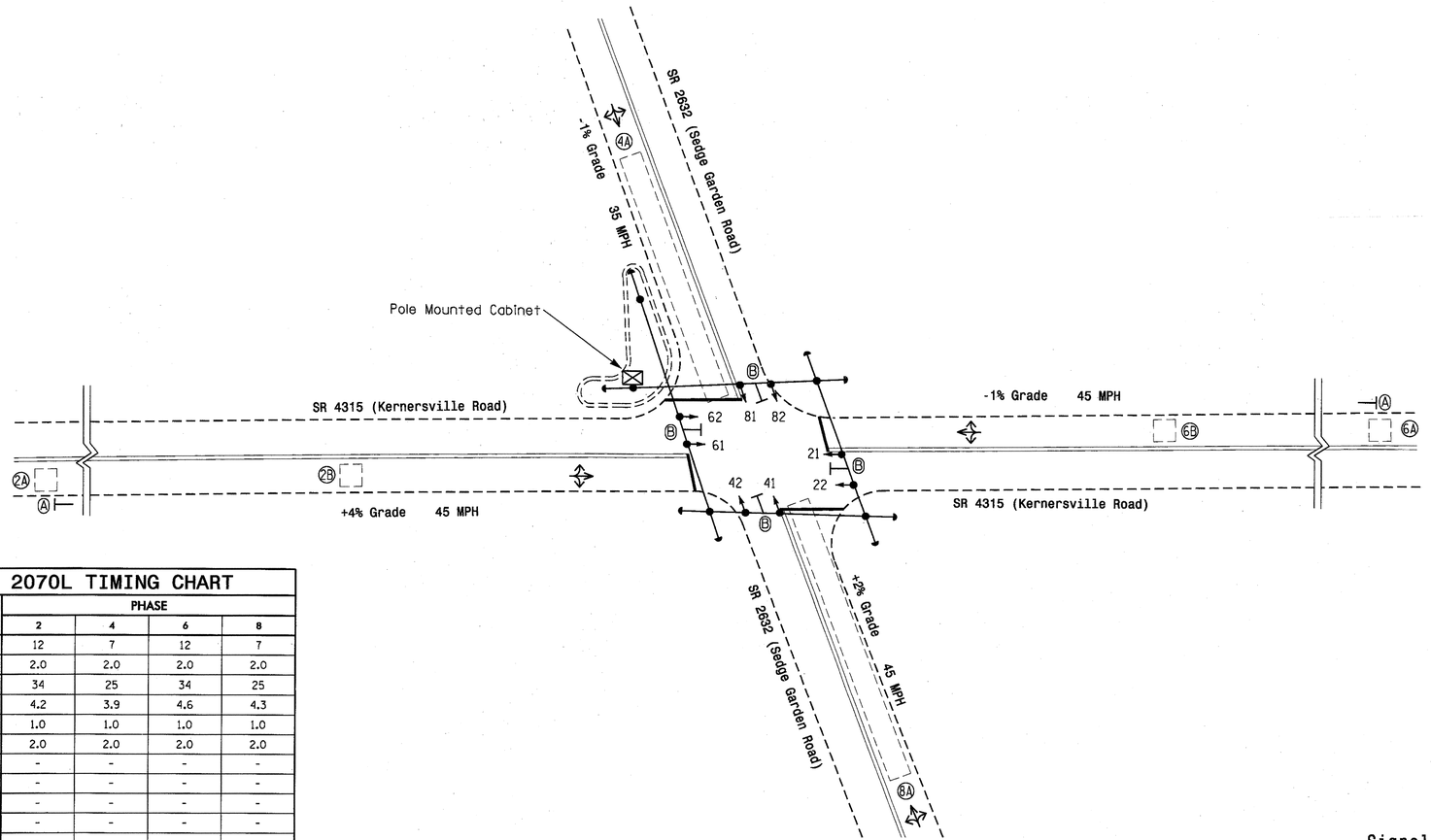
SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42
61, 62
81, 82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	330	EXIST	-	2	Y	Y	-	2.0	-	-	Y
2B	6X6	90	EXIST	-	2	Y	Y	-	-	-	-	Y
4A	6X70	0	EXIST	-	4	Y	Y	-	-	5	-	Y
6A	6X6	330	EXIST	-	6	Y	Y	-	2.0	-	-	Y
6B	6X6	90	EXIST	-	6	Y	Y	-	-	-	-	Y
8A	6X80	0	EXIST	-	8	Y	Y	-	-	5	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	12	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	34	25	34	25
Yellow Clearance	4.2	3.9	4.6	4.3
Red Clearance	1.0	1.0	1.0	1.0
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	Signal Ahead Sign (W3-3)	A
B	Street Name Sign (D3-1)	B

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4315 (Kernersville Road)
at
SR 2632 (Sedge Garden Road)

Division 9 Forsyth County Winston-Salem

PLAN DATE: January 2013 REVIEWED BY:
PREPARED BY: L. Blount REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. TIEMEIER
SIGNATURE 1/14/13 DATE

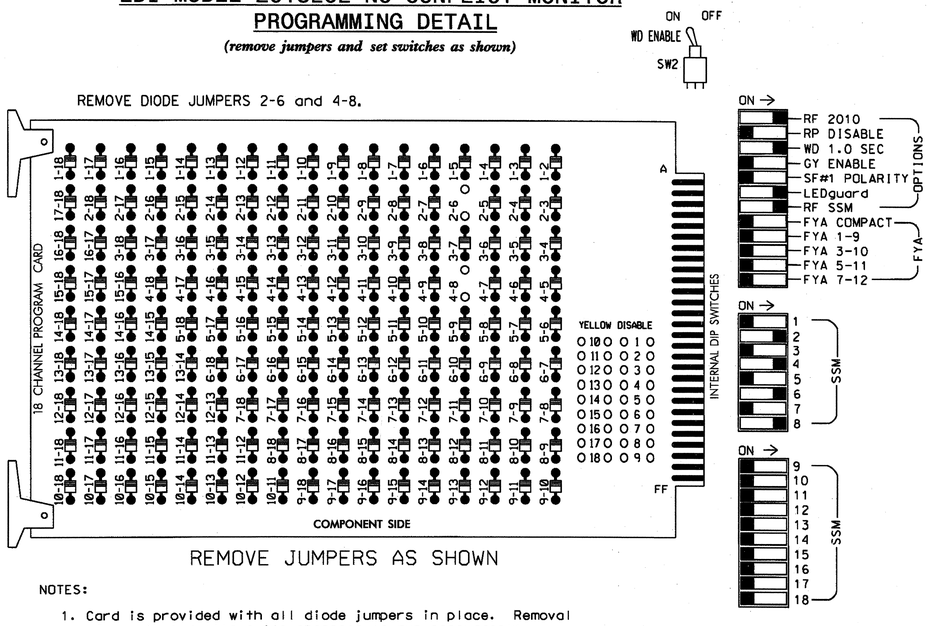
SIG. INVENTORY NO. 09-0726

14-JAN-2013 16:51
S:\TISAS\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-0726\090726_sig_dsn_20120726.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 19

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT	ø2 2A	SLOT	ø4 4A	SLOT	ø6 6A	SLOT	ø8 8A	SLOT	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
	L	EMPTY	ø2 2B	EMPTY	NOT USED	EMPTY	ø6 6B	EMPTY	NOT USED	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB21-3,4	I2U	39	1	2	2	Y	Y		2.0	
2B	TB23-3,4	I2L	43	5	12	2	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			5
6A	TB21-11,12	I6U	40	2	6	6	Y	Y		2.0	
6B	TB23-11,12	I6L	44	6	16	6	Y	Y			
8A	TB22-1,2	I8U	42	4	8	8	Y	Y			5

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0726
DESIGNED: January 2013
SEALED: 1/14/13
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4315 (Kernersville Road) at SR 2632 (Sedge Garden Road)

Prepared in the offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: January 2013 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

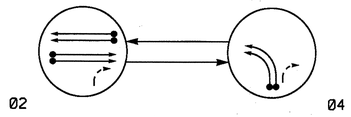
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
John T Rowe 1-15-13
SIGNATURE DATE
SIG. INVENTORY NO. 09-0726

15-JAN-2013 08:56
S:\TTSASU\TS Signals\Workgroups\Sig Mgn\Armstrong\090726_sm_sig_xxx.dgn
Armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 17O

PHASING DIAGRAM



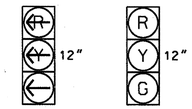
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2	PHASE Ø4	FLASH
21, 22	G	R	Y
23, 24	G	R	Y
41, 42	R	←	R

SIGNAL FACE I.D.

All Heads L.E.D.

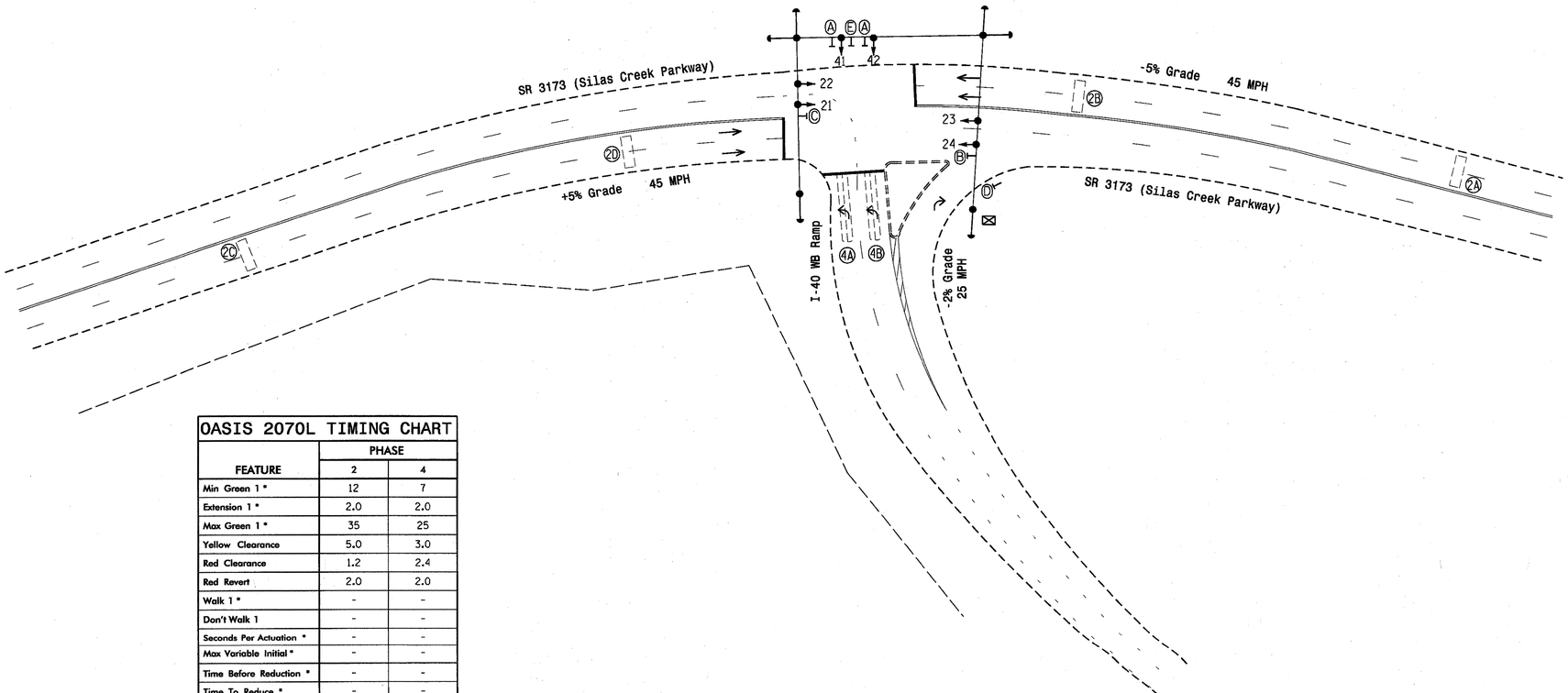


OASIS 2070L LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS				DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X18	330	EXIST	-	2	Y	Y	-	2.0	-	-	Y
2B	6X18	90	EXIST	-								
2C	6X18	330	EXIST	-	2	Y	Y	-	2.0	-	-	Y
2D	6X18	+5	EXIST	-				-	-			
4A	6X40	0	EXIST	-	4	Y	Y	-	-	-	-	Y
4B	6X40	0	EXIST	-	4	Y	Y	-	-	-	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Existing Left Arrow "ONLY" (R3-5L) signs may be removed at the direction of the Engineer.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART		
FEATURE	PHASE 2	PHASE 4
Min Green 1 *	12	7
Extension 1 *	2.0	2.0
Max Green 1 *	35	25
Yellow Clearance	5.0	3.0
Red Clearance	1.2	2.4
Red Revert	2.0	2.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	-
Max Variable Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	No Right Turn Sign (R3-1)	Ⓑ
Ⓒ	No Left Turn Sign (R3-2)	Ⓒ
Ⓓ	"YIELD" Sign (R1-2)	Ⓓ
Ⓔ	Street Name Sign (D3-1)	Ⓔ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 3173 (Silas Creek Parkway) at I-40 WB Ramp

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: December 2011 | REVIEWED BY:

PREPARED BY: L. Blount | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1" = 40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER
ROBERT J. ZIEMBA
SIGNATURE
10/15/12
DATE

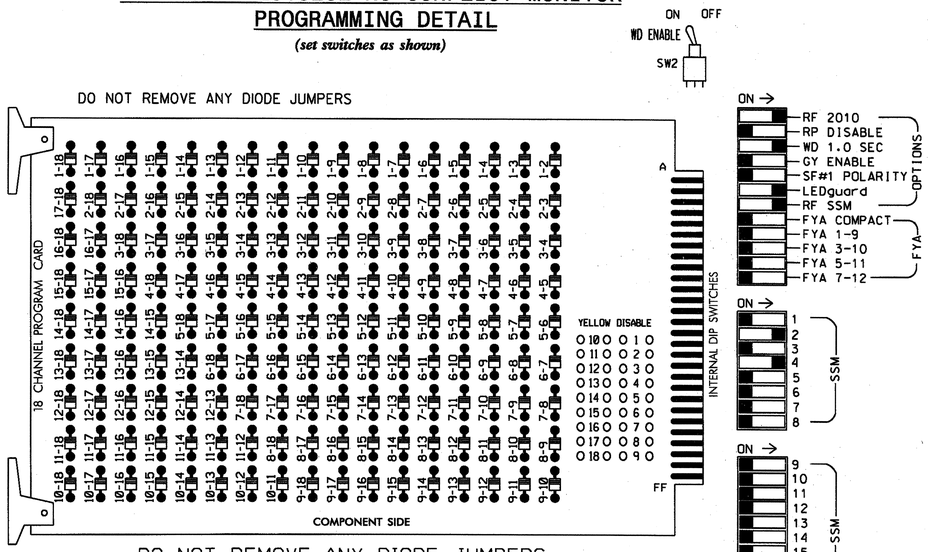
SIG. INVENTORY NO. 09-0819

15-OCT-2012 12:06
S:\ITS&SIG\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\03-0819\09D819_sig_dsn_20121015.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.171

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



DO NOT REMOVE ANY DIODE JUMPERS

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Start Up In Green.
4. Program phase 2 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2.S5
PHASES USED.....2.4
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22 23,24	NU	NU	41,42	NU	NU	NU	NU	NU	NU	NU
RED		128										
YELLOW		129										
GREEN		130										
RED ARROW					101							
YELLOW ARROW					102							
GREEN ARROW					103							
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2C,2D				ø4 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y		2.0	
2C,2D	TB2-7,8	I2L	43	5	12	2	Y	Y		2.0	
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0819
DESIGNED: December 2011
SEALED: 10/15/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 3173 (Silas Creek Parkway)
at
I-40 WB Ramp

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: September 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

John Thowe 10-16-12
SIGNATURE DATE

SIG. INVENTORY NO. 09-0819

15-OCT-2012 14:48
S:#TSG#TS Signals#Workgroups#Sig Mgmt#Armstrong#090819_sheet_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. \12

PHASING DIAGRAM

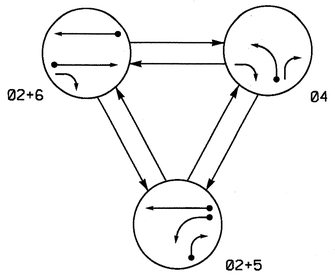
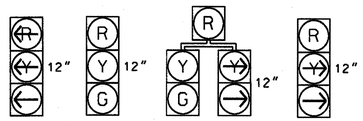


TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
43	→	R	→	R
51	←	~~R~~	~~R~~	~~R~~
61, 63	R	G	R	Y
62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART													
INDUCTIVE LOOPS					DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	EXISTING	-	2	Y	Y	-	-	-	-	Y
4A	6X60	+5	EXISTING	-	4	Y	Y	-	-	-	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	-	-	Y
5B	6X60	+5	EXISTING	-	5	Y	Y	-	-	15	-	Y
6A	6X6	70	EXISTING	-	6	Y	Y	-	-	-	-	Y

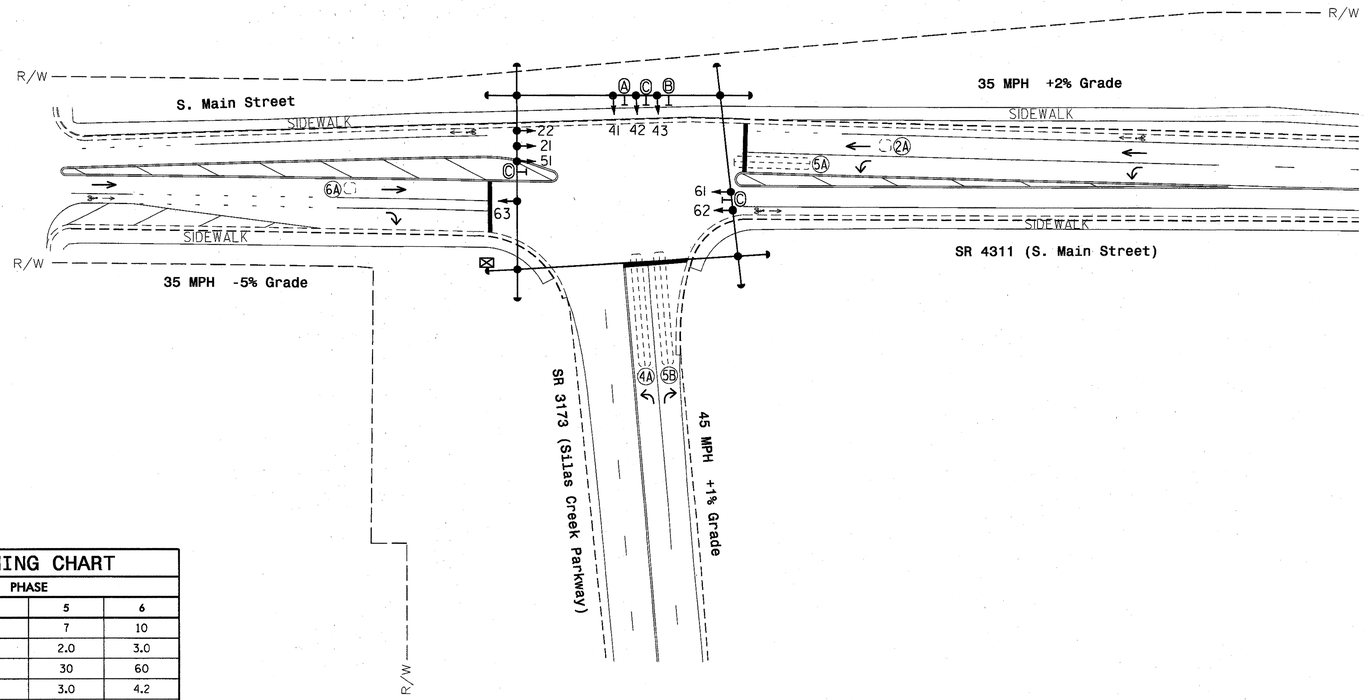
3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	"RIGHT TURN ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	Street Name Sign (D3-1)	Ⓒ

OASIS 2070L TIMING CHART				
FEATURE	PHASE 2	4	5	6
Min Green 1 *	10	7	7	10
Extension 1 *	3.0	2.0	2.0	3.0
Max Green 1 *	60	40	30	60
Yellow Clearance	3.7	3.0	3.0	4.2
Red Clearance	2.1	2.6	2.8	1.9
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4311 (S. Main Street)
at
SR 3173 (Silas Creek Parkway)

Division 9 Forsyth County Winston-Salem
PLAN DATE: September 2012 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

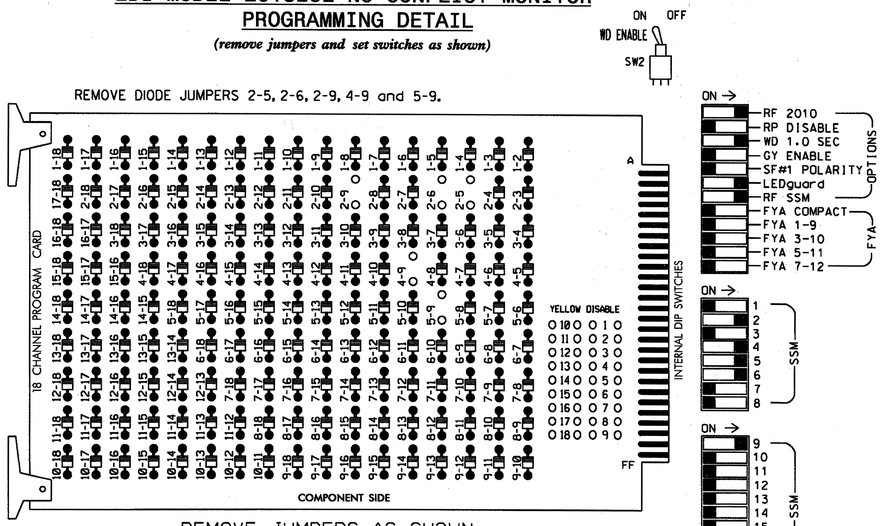
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE DATE 10/8/12
SIG. INVENTORY NO. 09-0820

08-OCT-2012 17:51
S:\TS&L\ITS Signals\Signal Design Section\Central Region\Div 9\WC-5224 Winston Salem\Signals\09-0820\090820L_sig_dsn_20121008.dgn
rzlemos

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.173

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
5. The cabinet and controller are part of the Winston-Salem Signal System

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S1
PHASES USED.....2,4,5,6
OVERLAP A.....4+5
OVERLAP B.....NONE
OVERLAP C.....NONE
OVERLAP D.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5		S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4		14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED	* OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	51	61, 62,63	NU	NU	NU	NU	43	NU	NU	NU	NU	NU
RED		128			101				134					A121					
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW								131											
YELLOW ARROW						102		132						A122					
GREEN ARROW						103		133						A123					

NU = Not Used

* Flash Note: Wire Overlap "A" to flash on Flasher unit #2, Circuit #2.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          |1234567891011121314 1516
VEH OVL PARENTS:|   XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:    (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED				NOT USED								ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6A												

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-7,8	J2L	44	6	16	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0820
DESIGNED: September 2012
SEALED: 10/08/2012
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 4311 (S. Main Street)
at
SR 3173 (Silas Creek Parkway)

Prepared in the Offices of:
Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: T.V.
PREPARED BY: C. Strickland | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE | DATE 10/9/12
SIG. INVENTORY NO. 09-0820

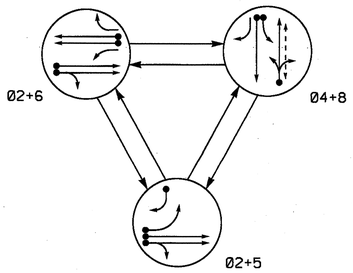
09-OCT-2012 09:08
S:\ITS&SIM\ITS Signals\Workgroups\Sig Maint\Strickland\m090820_sm_ele_xxx.dgn

user:rickland

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 17A

3 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

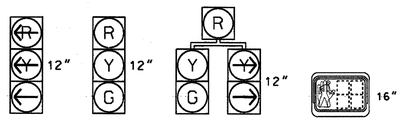
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
43	R/	R	G	R
51	←	~~R~~	~~R~~	~~R~~
61, 62, 63	R	G	R	Y
81, 82	R	R	G	R
P81, P82	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

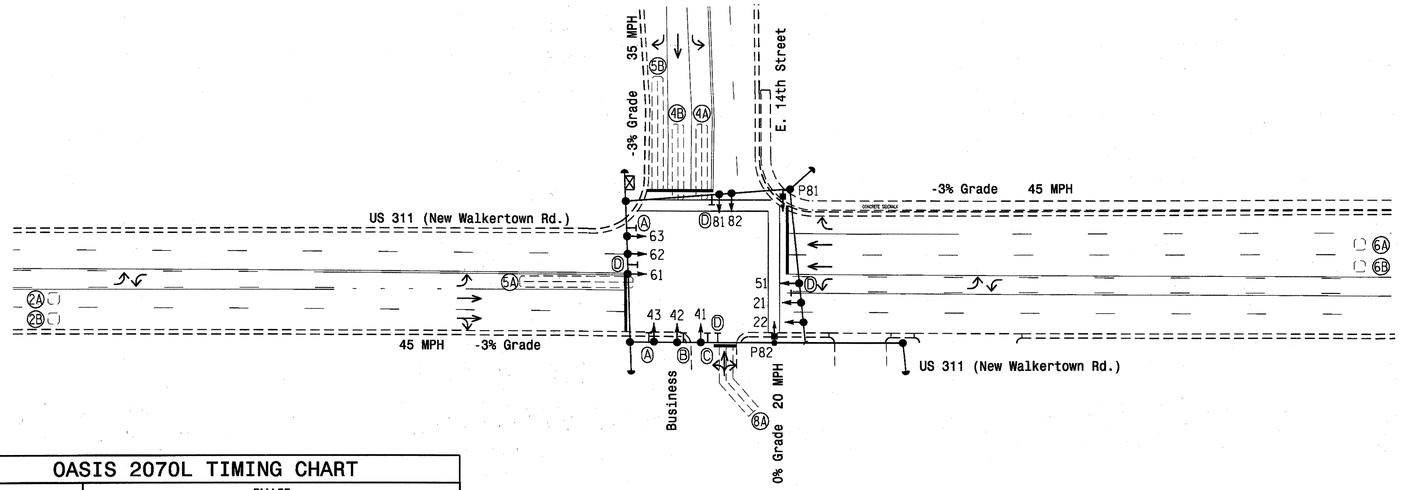
All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	+5	2-4-2	-	4	Y	Y	-	-	-	-	Y
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	3	-	Y
5B	6X60	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
6A	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Existing lane control signs may be removed at direction of the Engineer.
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Signal Pedestal	
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ
Ⓑ	Through Arrow "ONLY" Sign (R3-5A)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	Street Sign (D3-1)	Ⓓ

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	5	6	8
Min Green 1 *	12	7	7	12	7
Extension 1 *	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	90	30	20	90	30
Yellow Clearance	4.8	4.1	3.0	4.8	3.2
Red Clearance	1.3	1.6	2.3	1.3	2.1
Red Revert	5.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	4
Don't Walk 1	-	-	-	-	18
Seconds Per Actuation *	1.5	-	-	1.5	-
Max Variable Initial *	34	-	-	34	-
Time Before Reduction *	15	-	-	15	-
Time To Reduce *	30	-	-	30	-
Minimum Gap	3.0	-	-	3.0	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

US 311 (New Walkertown Rd.) at E. 14th Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY:

PREPARED BY: L. Blount REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

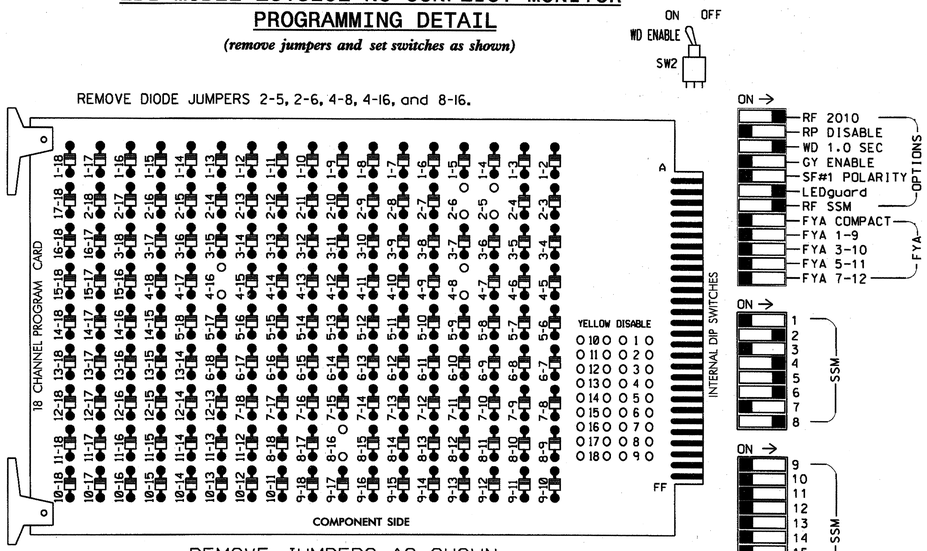
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 11/6/12 DATE
SIG. INVENTORY NO. 09-0931

06-NOV-2012 09:35
S:\ITS&SU\ITS Signals\Signal Design Section\Control Regions\Div 9\C-5224 Winston Salem\Signals\09-0931\090931_sig_dsn_20121106.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.175

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phase 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash.
8. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX FILE
LOAD SWITCHES USED.....S2,S5,S7,S8,S11,S12
PHASES USED.....2,4,5,6,8,8PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42 43	NU	43	51	61,62 63	NU	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101				134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW								131											
YELLOW ARROW							132	132											
GREEN ARROW							133	133											
✋													110						
🚶													112						

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	FS DC ISOLATOR
	L		Ø2 2B				Ø4 4B							Ø8PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø5 5A	Ø6 6A	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø5 5B	Ø6 6B			NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A	TB3-5,6	J2U	40	2	6	5	Y	Y			3
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0931
DESIGNED: December 2011
SEALED: 11/6/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 311 (New Walkertown Rd.)
at
E. 14th Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

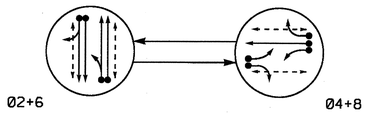
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
John T. Rowe 11-6-12
SIGNATURE DATE
SIG. INVENTORY NO. 09-0931

06-NOV-2012 15:45
S:\TISSIG\TS Signals\Workgroups\Sig Man\armstrong\090931_sm_ele_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 176

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

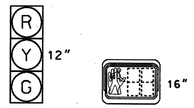
TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	PHASE FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42
61, 62
81, 82

P21, P22
P41, P42
P61, P62
P81, P82

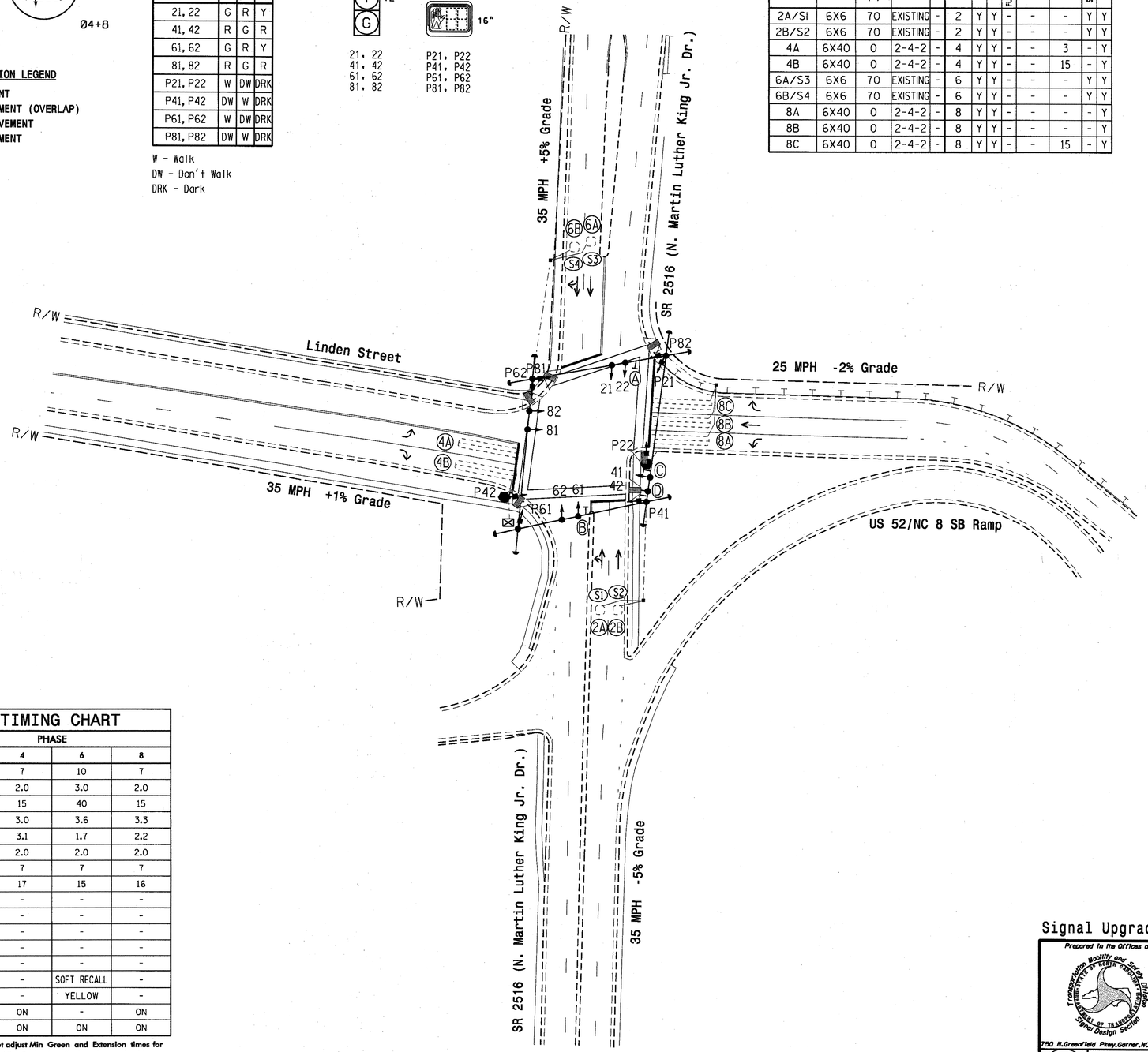
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S1	6X6	70	EXISTING	-	2	Y	Y	-	-	-	Y	Y
2B/S2	6X6	70	EXISTING	-	2	Y	Y	-	-	-	Y	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	15	-	Y
6A/S3	6X6	70	EXISTING	-	6	Y	Y	-	-	-	Y	Y
6B/S4	6X6	70	EXISTING	-	6	Y	Y	-	-	-	Y	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	Y
8C	6X40	0	2-4-2	-	8	Y	Y	-	-	15	-	Y

2 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pavement markings are existing.
8. Existing lane control signs may be removed at the direction of the Engineer.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	40	15	40	15
Yellow Clearance	4.2	3.0	3.6	3.3
Red Clearance	1.9	3.1	1.7	2.2
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	7	7	7	7
Don't Walk 1	16	17	15	16
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	SOFT RECALL	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Signal Pedestal	
N/A	Guardrail	
(A)	No Right Turn Sign (R3-1)	(A)
(B)	No Left Turn Sign (R3-2)	(B)
(C)	Left Arrow "ONLY" Sign (R3-5L)	(C)
(D)	Right Arrow "ONLY" Sign (R3-5R)	(D)

Signal Upgrade

Prepared in the Offices of:
Traffic Engineering Branch, Mobility and Safety Division, NCDOT, Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2516 (N. Martin Luther King Jr. Dr.) at US 52/NC 8 SB Ramp and Linden Street

Division 9 Forsyth County Winston-Salem

PLAN DATE: May 2011 REVIEWED BY:
PREPARED BY: C.E. Carter REVIEWED BY:

REVISIONS	INIT.	DATE

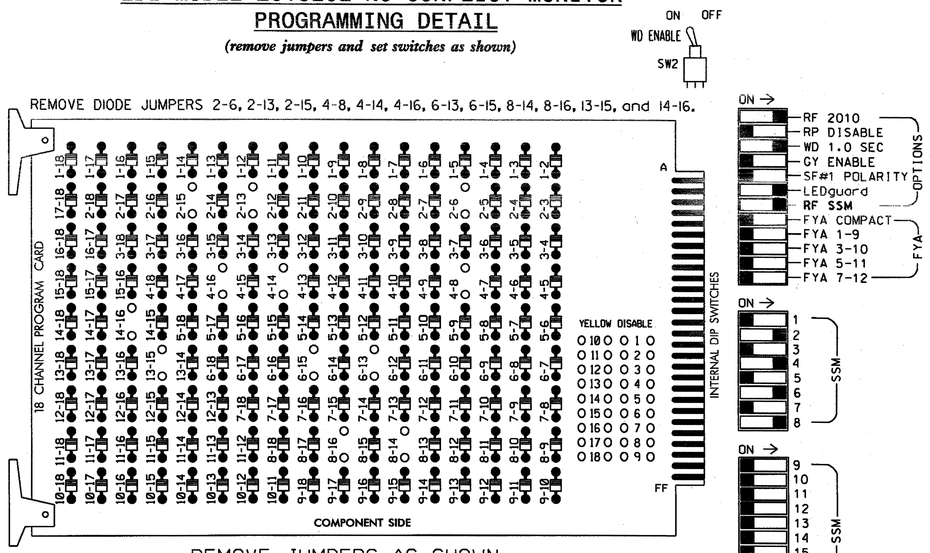
SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE DATE 6/11/12
SIG. INVENTORY NO. 09-1022

11-JUN-2012 18:22
S:\#ITS&SU\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-1022\091022_sig_dsn_20120611.dgn
rziemba

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX OUTPUT FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12
PHASES USED.....2,2PED,4,4PED,6,6PED,8,8PED
OVERLAPS.....NONE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 177

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2/SYS 2A/S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø2/SYS 2B/S2				Ø 4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6/SYS 6A/S3	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	Ø 8 8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6/SYS 6B/S4				Ø 8 8B	NOT USED							

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S1	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S2	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
6A/S3	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B/S4	TB3-7,8	J2L	44	6	16	6/SYS	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			15
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1022
DESIGNED: May 2011
SEALED: 6/11/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2516
(N. Martin Luther King Jr. Dr.) at US 52/NC 8 SB Ramp and Linden Street

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: April 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE DATE 6-12-12

SIG. INVENTORY NO. 09-1022

12-JUN-2012 09:43
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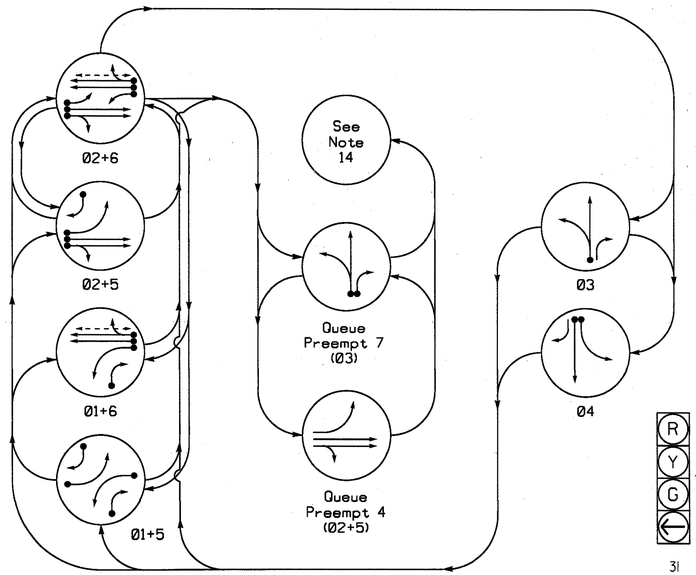
armstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 178

6 Phase
Fully Actuated
With Queue Preemption
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

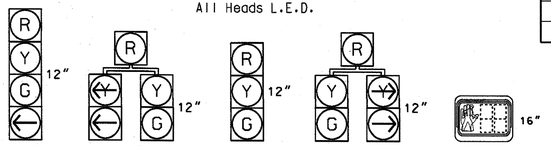
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03	04	OVERLAP E7	OVERLAP E4	FLASH
21	R	R	G	G	R	R	R	G	Y
22	R	R	G	G	R	R	R	G	Y
31	R	R	R	R	G	R	G	R	R
32	R	R	R	R	G	R	G	R	R
41	R	R	R	R	G	R	R	R	R
42	R	R	R	R	R	G	R	R	R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	2-4-2	0	-	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
1B	6X40	2-4-2	0	-	1	Y	Y	-	-	15	-	Y
1C	6X6	EXIST	0	-	1	Y	Y	-	-	15	-	Y
2A	6X6	EXIST	70	-	2	Y	Y	-	-	-	-	Y
2B	6X6	EXIST	70	-	2	Y	Y	-	-	-	-	Y
3A	6X40	2-4-2	+5	-	3	Y	Y	-	-	-	-	Y
4A	6X40	2-4-2	0	-	4	Y	Y	-	-	3	-	Y
4B	6X40	2-4-2	0	-	4	Y	Y	-	-	-	-	Y
5A	6X40	2-4-2	0	-	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
5B	6X40	2-4-2	0	-	5	Y	Y	-	-	15	-	Y
6A	6X6	EXIST	70	-	6	Y	Y	-	-	-	-	Y
6B	6X6	EXIST	70	-	6	Y	Y	-	-	-	-	Y
Q1	6X15	EXIST	300	-	PRE 7	Y	Y	-	-	-	-	Y
Q2	6X15	EXIST	300	-	PRE 7	Y	Y	-	-	-	-	Y

2070 QUEUE PREEMPTION

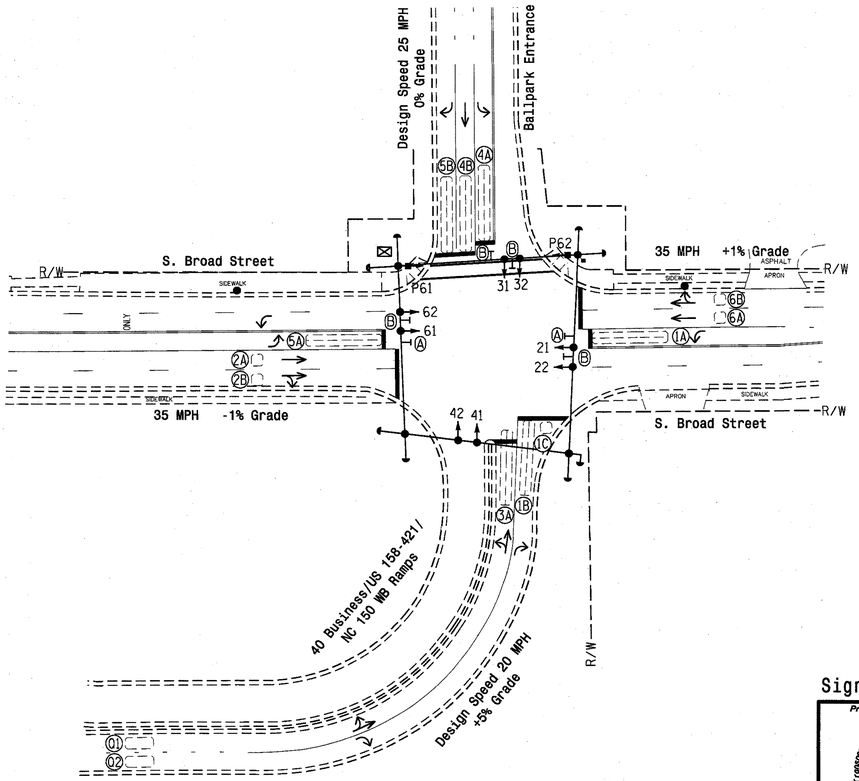
FUNCTION	PRE 4	PRE 7
Interval 1 – Dwell Green	255	255
Interval 1 – Dwell Yellow	0.0*	0.0*
Interval 1 – Dwell Red	0.0*	0.0*
Interval 5 – Exit Green	0	0
Interval 5 – Yellow	0.0	0.0
Interval 5 – Red	0.0	0.0
Priority	LOW	MED
Delay Time	0	0
Min Green Before Pre	4	4
Ped Clear Before Pre	8	8
Yellow Clear Before Pre	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*
Dwell Min Time	10	34
Enable Backup Protection	N	Y
Ped Clear Through Yellow	Y	Y

* Time defaults to time used for phase during normal operation

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green 1 *	7	10	7	7	7	10
Extension 1 *	2.0	3.0	2.0	2.0	2.0	3.0
Max Green 1 *	30	60	30	15	15	60
Yellow Clearance	3.0	3.9	3.0	3.2	3.0	3.8
Red Clearance	2.3	1.7	3.1	2.4	2.6	1.5
Red Revert	2.0	5.0	2.0	2.0	2.0	5.0
Walk 1 *	-	-	-	-	-	7
Don't Walk 1	-	-	-	-	-	17
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programing for this location.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output file for future use.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Existing "Left Turn Yield on Green" ball signs (R10-12) may be removed at the direction of the Engineer.
11. Pavement markings are existing.
12. Loops Q1 and Q2 serve as queue backup detectors. After 10 seconds of constant actuation, the detector unit places a call to the controller to force off anyphase in the cycle and go to phase 3 to clearout the storage lanes.
13. Set the Preempt Dwell Max Timer for 4 minutes (see Electrical Details). This is to be done for both preempts.
14. Upon completion of queue preemption, controller returns to normal operation based on vehicle demand.
15. An interconnection must be provided to relay queue preemption calls from this signal to the adjacent signals at the I-40 Business EB Ramps [09-1091] to the south and at First Street [C-194] to the north. See Electrical Details.
16. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
(A)	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	(A)
(B)	Street Name Sign (D3-1)	(B)

Signal Upgrade

Prepared In the Offices of:
North Carolina Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

S. Broad Street
at
40 Bus./US 158-421/NC 150 WB Ramps
and Ballpark Entrance

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 PREPARED BY: L. Blount
PREPARED BY: Sterling REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIELINSKA
SIGNATURE 10/4/12 DATE
SIG. INVENTORY NO. 09-1090

07-NOV-2012 16:29
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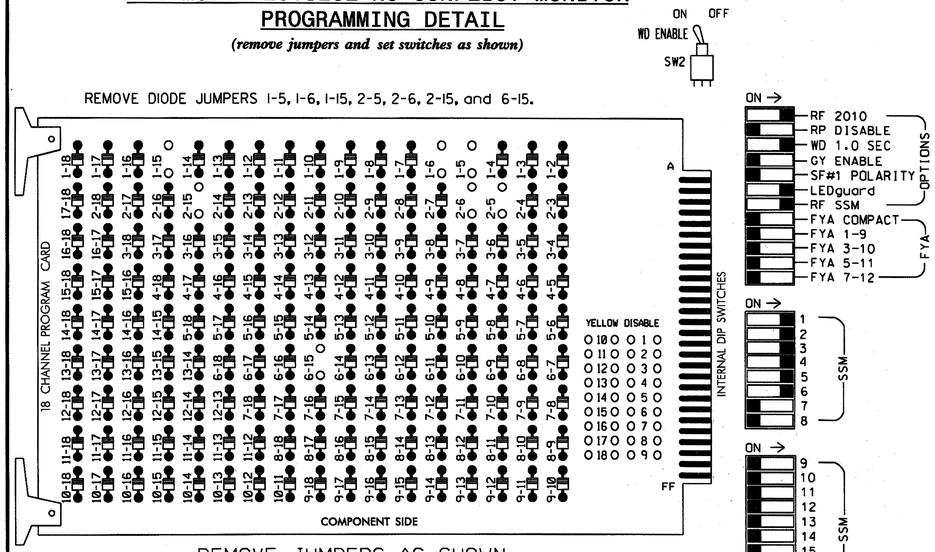
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 19

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phase 6 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. FILE
LOAD SWITCHES USED.....S1,S2,S3*,S4,S5, S6,S7,S8,S9**
PHASES USED.....1,2,3,4,5,6,6PED
OVERLAPS.....NONE

* USED FOR QUEUE PREEMPT 7
** USED FOR QUEUE PREEMPT 4

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5		S6	S7	S8	S9		S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4		14	5	6	15		7	8	16	9	10	17	11	12	18
PHASE	1	2	PRE7	3		4		PRE4 OR PRE7	5	6	6 PED	PRE4	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	32,61	21,22	RELAY 'K1'	31	32	41	42	RELAY 'K3'	21,42	61,62	P61, P62	RELAY 'K2'	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED	*	128		116	116	101	101		*	134											
YELLOW		129		117	117	102	102			135											
GREEN		130		118	118	103	103			136											
RED ARROW																					
YELLOW ARROW	126								132												
GREEN ARROW	127			118		103			133												
✋											119										
PED YELLOW			114					105				120									
🚶			*					*			121										

NU = Not Used

Note: Load switches S3 and S6 are used for Queue Preempts. See sheet 2 for special logic programming, and sheet 3 for special wiring details.

* Denotes install load resistor. See load resistor installation detail this sheet.

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø1 1B	ø2 2A	WDT INPUT ⊗	ø3 3A	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	ø1 1C	ø2 2B		NOT USED	ø4 4B							NOT USED	ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø5 5B	ø6 6A	WDT INPUT ⊗	SLOT EMPTY	SLOT EMPTY	PRE 7 Q1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	PRE4 DC ISOLATOR	SLOT EMPTY
	L	NOT USED	NOT USED	ø6 6B				PRE 7 Q2						NOT USED	

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
* Q1	TB7-1,2	J7U	66	28		PRE7					
* Q2	TB7-3,4	J7L	79	41		PRE7					
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

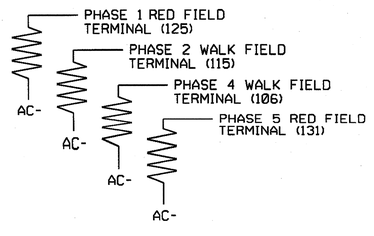
[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.

* See Input Assignment Programming Detail on sheet 2 for Q1 and Q2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1090
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

Signal Upgrade - Sheet 1 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

S. Broad Street
at
40 Bus./US 158-421/NC 150 WB Ramps and Ballpark Entrance

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE 1-7-13 DATE

SIG. INVENTORY NO. 09-1090

07-JAN-2013 09:09
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sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.180

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR QUEUE PREEMPT 7 (Q1)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 66 (INPUT 28) IS REACHED.

```
PAGE: 1 C1 PIN:66  PREEMPT
INPUT ASSIGNMENT #.................28
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............10.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64)............._
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10).....................7
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N)....................._
FLASH SENSE (Y/N)..................._
DOOR OPEN (Y/N)....................._
MANUAL CONTROL ENABLE (Y/N)........._
MANUAL CONTROL ADVANCE (Y/N)......._
SPECIAL FUNCTION ALARM (1-8)......._
TOD HOUR SYCHRONIZATION (0-23)....._
FORCE OFF RING (1-4)..............._
HOLD PHASES (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#..._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

← NOTICE PREEMPT INPUT DELAY TIME

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR QUEUE PREEMPT 7 (Q2)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 79 (INPUT 41) IS REACHED.

```
PAGE: 1 C1 PIN:79  PREEMPT
INPUT ASSIGNMENT #.................41
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............10.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64)............._
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10).....................7
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N)....................._
FLASH SENSE (Y/N)..................._
DOOR OPEN (Y/N)....................._
MANUAL CONTROL ENABLE (Y/N)........._
MANUAL CONTROL ADVANCE (Y/N)......._
SPECIAL FUNCTION ALARM (1-8)......._
TOD HOUR SYCHRONIZATION (0-23)....._
FORCE OFF RING (1-4)..............._
HOLD PHASES (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#..._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

← NOTICE PREEMPT INPUT DELAY TIME

QUEUE PREEMPTION PROGRAMMING DETAIL FOR PREEMPT 7

(program controller as shown below)

THIS PREEMPT ORIGINATES "LOCALLY" FROM THE Q1 AND Q2 LOOPS LOCATED AT THE I-40 BUSINESS WESTBOUND RAMPS (CABINET 10-1090).

FROM MAIN MENU PRESS 'A' (PREEMPTION), THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #7 IS REACHED.

```
   PREEMPTION  #7   SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1 255  0.0  0.0  |  X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....4
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........34
DWELL MAX TIMER (0=OFF,1-255MIN) ....4
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ..........................N
LINK TO NEXT PREEMPT? ................N
ENABLE BACKUP PROTECTION? ............Y
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? .......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? .....N
SERVICE DURING SOFTWARE FLASH? .......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ................N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? ..............N
OVERLAPS:            | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW |
OMIT OVERLAPS:       |
```

QUEUE PREEMPTION PROGRAMMING DETAIL FOR PREEMPT 4

(program controller as shown below)

THIS PREEMPT ORIGINATES "REMOTELY" FROM 10-1091 LOCATED AT THE I-40 BUSINESS EASTBOUND RAMPS.

FROM MAIN MENU PRESS 'A' (PREEMPTION), THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #4 IS REACHED.

```
   PREEMPTION  #4   SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1 255  0.0  0.0  |  X  X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) .............LOW
DELAY TIMER (0-255 SEC) ..............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....4
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....4
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ..........................N
LINK TO NEXT PREEMPT? ................N
ENABLE BACKUP PROTECTION? ............N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? .......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? .......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ................N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? ..............N
OVERLAPS:            | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW |
OMIT OVERLAPS:       |
```

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL FOR PREEMPT RELAY CONTROL

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1    (+/-COMMAND#)
IF  ACTIVE PREEMPTION  #7  IS ON
                ↓
          SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #33 ON
```

TURNS ON LOADSWITCH S3 SO RELAY K1 CAN SEND A PREEMPT CALL TO 09-1091 VIA OPTICAL TX #1.

PRESS '+'

```
LOGICAL I/O COMMAND #2    (+/-COMMAND#)
IF  ACTIVE PREEMPTION  #4  IS ON
                ↓
          SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #34 ON
```

TURNS ON LOADSWITCH S9 SO RELAY K2 CAN SEND AN ACKNOWLEDGEMENT VIA OPTICAL TX #1 TO 09-1091 THAT IT RECEIVED A REMOTE PREEMPT CALL.

PRESS '+'

```
LOGICAL I/O COMMAND #3    (+/-COMMAND#)
IF  ACTIVE PREEMPTION  #4  IS ON
OR  ACTIVE PREEMPTION  #7  IS ON
                ↓
          SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #35 ON
```

TURNS ON LOADSWITCH S6 SO RELAY K3 CAN SEND A PREEMPT CALL TO 09-0090 VIA OPTICAL TX #3.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 33 = Phase 2 PED Yellow
OUTPUT 34 = Phase 6 PED Yellow
OUTPUT 35 = Phase 4 PED Yellow

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1090
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

Signal Upgrade - Sheet 2 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

S. Broad Street
at
40 Bus./US 158-421/NC 150 WB Ramps and Ballpark Entrance

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

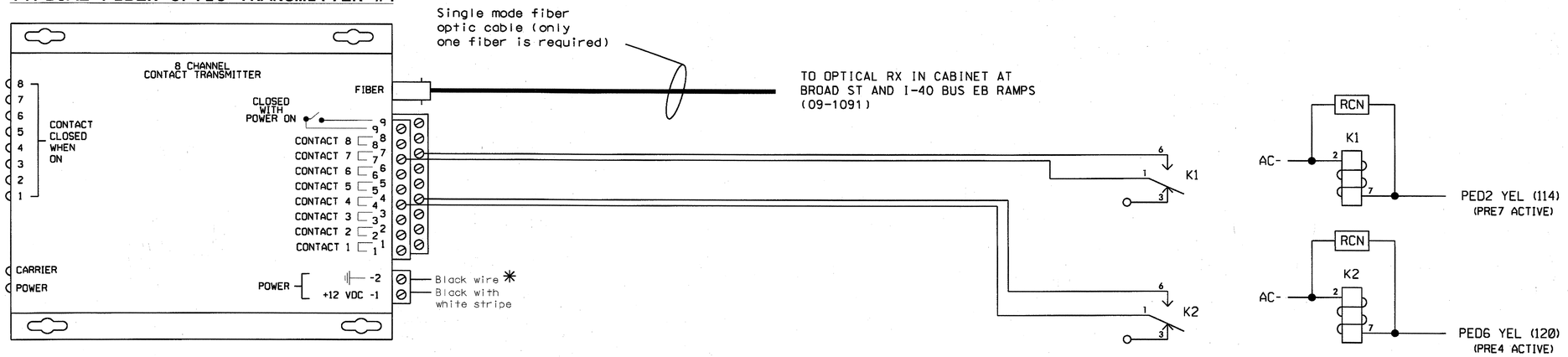
Prepared in the Offices of:
North Carolina Department of Transportation, Traffic Engineering Branch, Signal Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, JR.
SIGNATURE 1-7-13 DATE
SIG. INVENTORY NO. 09-1090

07-JAN-2013 09:08
C:\Users\sarmstrong\Documents\stuar1\091090_sm_sig_20121107.dgn
sarmstrong

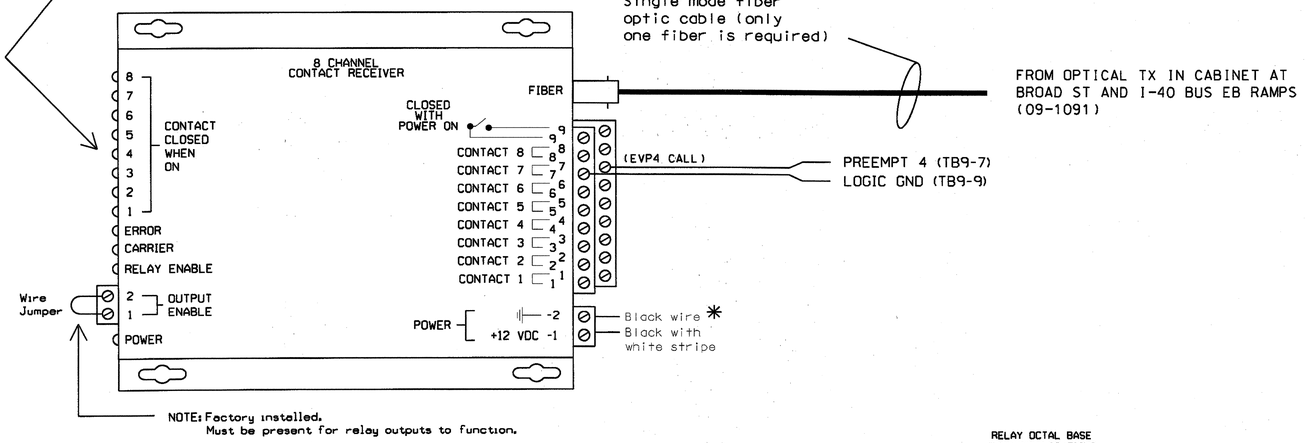
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 181

TYPICAL FIBER OPTIC TRANSMITTER #1



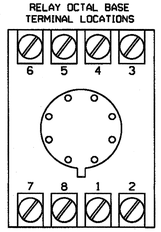
Indicator 4 is used to confirm the cabinet for 09-1091 has received the queue preempt call from this cabinet.

TYPICAL FIBER OPTIC RECEIVER #2



NOTE: Factory installed.
Must be present for relay outputs to function.

RELAY OCTAL BASE
TERMINAL LOCATIONS



NOTES

1. This wiring is needed to relay the preemption calls between this signal and the signal at the I-40 Business EB ramps (09-1091).
2. The fiber optic transmitter is an 8-channel contact mapping transmitter capable of sending contact closures to a receiver up to 2.5 miles away over fiber optic cable.
3. The fiber optic receiver is an 8-channel contact mapping receiver capable of sensing contact closures from a transmitter up to 2.5 miles away over fiber optic cable.
4. ✳ Power connections are with the supplied 12 Volt DC Plug-in Power Supply.
5. Relays K1 and K2 are SPDT with 120VAC coil, and are shown in the normally de-energized state.
6. RC network is valued at 0.1 microfarads, 100 ohms.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1090
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

Signal Upgrade - Sheet 3 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

S. Broad Street
at
40 Bus./US 158-421/NC 150 WB Ramps
and Ballpark Entrance

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 008453
ENGINEER
JOHN T. ROWE, JR.

SIGNATURE 1-7-13 DATE

SIG. INVENTORY NO. 09-1090

07-JAN-2013 09:08
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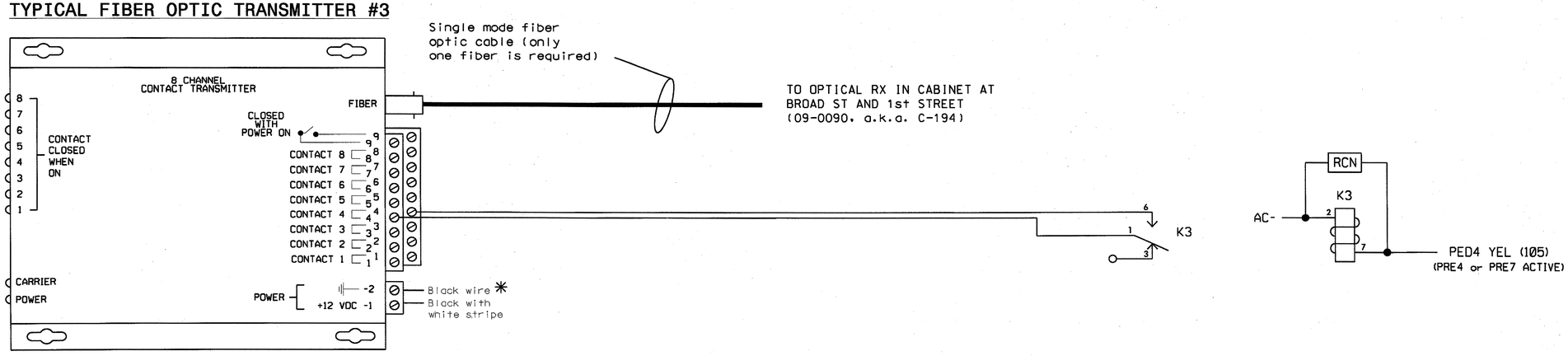
scarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 182

TYPICAL FIBER OPTIC TRANSMITTER #3



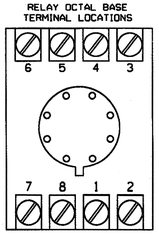
NOTES

1. This wiring is needed to relay the preemption calls between this signal and the signal at 1st Street and Broad Street (09-0090, a.k.a. C-194).
2. The fiber optic transmitter is an 8-channel contact mapping transmitter capable of sending contact closures to a receiver up to 2.5 miles away over fiber optic cable.

* 3. Power connections are with the supplied 12 Volt DC Plug-in Power Supply.

4. Relay K3 is a SPDT with 120VAC coil, and is shown in the normally de-energized state.
5. RC network is valued at 0.1 microfarads, 100 ohms.

RELAY OCTAL BASE TERMINAL LOCATIONS



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1090
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

Signal Upgrade - Sheet 4 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

S. Broad Street
at
40 Bus./US 158-421/NC 150 WB Ramps
and Ballpark Entrance

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE 1-7-13 DATE

SIG. INVENTORY NO. 09-1090

07-JAN-2013 09:08
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smarmstrong

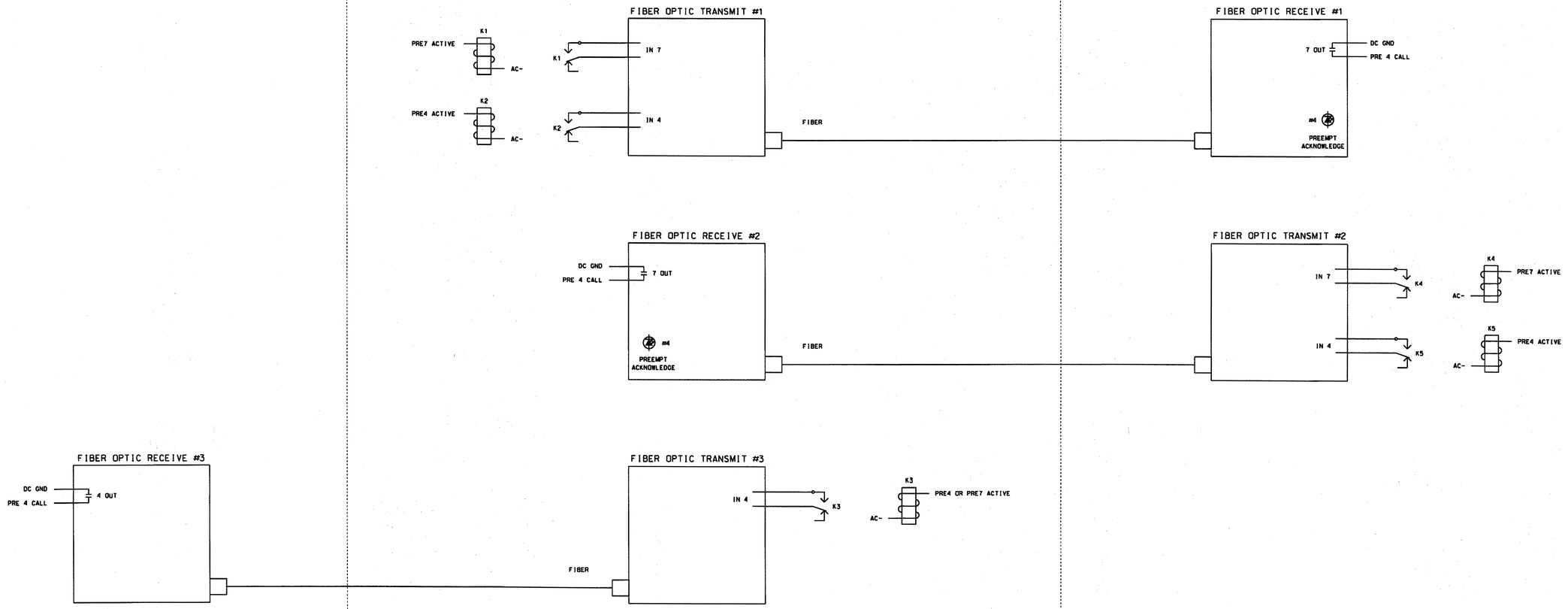
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 183

FIBER OPTIC CONTACT CLOSURE SCHEMATIC FOR BROAD ST. AND I-40 BUS. RAMPS AT BALLPARK IN WINSTON SALEM

09-0090 (C-194)
(S. Broad Street at 1st Street)

09-1090
(S. Broad Street at 40 Bus. WB Ramps and Ballpark Entrance)

09-1091
(S. Broad Street at 40 Bus. EB Ramps)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1090
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

NOTES

1. The fiber optic transmitter is an 8-channel contact mapping transmitter capable of sending contact closures to a receiver up to 2.5 miles away over fiber optic cable.
2. The fiber optic receiver is an 8-channel contact mapping receiver capable of sensing contact closures from a transmitter up to 2.5 miles away over fiber optic cable.
3. Power connections are with the supplied 12 Volt DC Plug-in Power Supply.

OPERATION

With respect to 09-1090 and 09-1091 only...
preemption is always initiated by one of the loops located on the EB or WB I-40 ramps, and is designated as preempt 7 at both 09-1090 and 09-1091. When preemption is active, the originating cabinet sends contact closure information to the adjacent cabinet which activates preempt 4 at that location. An acknowledgement is sent back to the originating cabinet to confirm the signal was received and preemption was initiated.

Regardless of which ramp initiates preemption, cabinet 09-1090 will always send contact closure information to city signal C-194 (09-0090) so that preemption can be initiated at that location. No acknowledgement is required in return from C-194.

Signal Upgrade - Sheet 5 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

S. Broad Street at 40 Bus./US 158-421/NC 150 WB Ramps and Ballpark Entrance

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | 1-7-13 DATE

SIG. INVENTORY NO. 09-1090

07-JAN-2013 09:07
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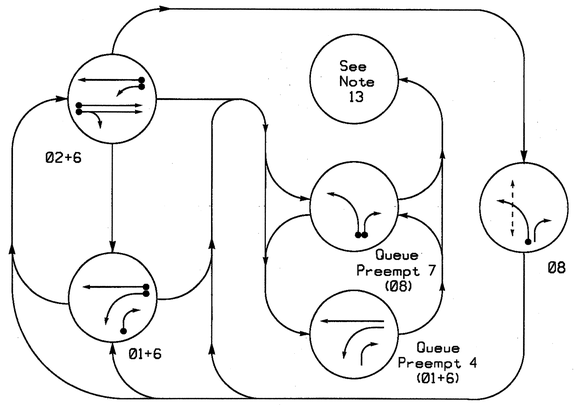
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 184

3 Phase Fully Actuated With Queue Preemption (Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

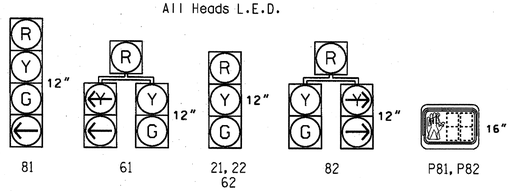
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	02+6	08	OPTIONAL QUEUE PE 7	OPTIONAL QUEUE PE 4	FLASH
21, 22	R	G	R	R	R	Y
61	G	G	R	R	G	Y
62	G	G	R	R	G	Y
81	R	R	G	G	R	R
82	R	R	G	G	R	R
P81, P82	DW	DW	W	DW	DW	DRK

W - Walk
DW - Don't Walk
DRK - Dark

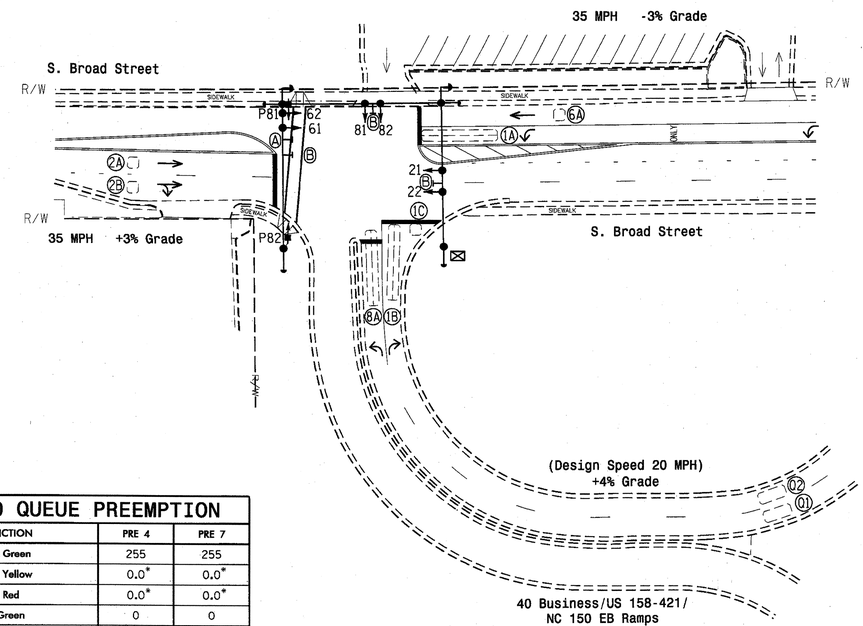
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
IA	6X40	2-4-2	0	-	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
IB	6X40	2-4-2	+5	-	1	Y	Y	-	-	15	-	Y
IC	6X6	2-4-2	0	-	1	Y	Y	-	-	15	-	Y
2A	6X6	EXIST	70	-	2	Y	Y	-	-	-	-	Y
2B	6X6	EXIST	70	-	2	Y	Y	-	-	-	-	Y
6A	6X6	EXIST	70	-	6	Y	Y	-	-	-	-	Y
8A	6X40	2-4-2	0	-	8	Y	Y	-	-	-	-	Y
Q1	6X15	EXIST	300	-	PRE 7	Y	Y	-	-	-	-	Y
Q2	6X15	EXIST	300	-	PRE 7	Y	Y	-	-	-	-	Y



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	6	8
Min Green 1 *	7	10	10	7
Extension 1 *	2.0	3.0	3.0	2.0
Max Green 1 *	25	60	60	35
Yellow Clearance	3.0	3.7	4.1	3.0
Red Clearance	1.9	1.6	1.2	2.6
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	7
Don't Walk 1	-	-	-	15
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2070 QUEUE PREEMPTION

FUNCTION	PRE 4	PRE 7
Interval 1 - Dwell Green	255	255
Interval 1 - Dwell Yellow	0.0*	0.0*
Interval 1 - Dwell Red	0.0*	0.0*
Interval 5 - Exit Green	0	0
Interval 5 - Yellow	0.0	0.0
Interval 5 - Red	0.0	0.0
Priority	LOW	MED
Delay Time	0	0
Min Green Before Pre	4	4
Ped Clear Before Pre	8	8
Yellow Clear Before Pre	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*
Dwell Min Time	10	34
Enable Backup Protection	N	N
Ped Clear Through Yellow	Y	Y

* Time defaults to time used for phase during normal operation

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Existing "Left Turn Yield on Green" ball sign (R10-12) may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Loops Q1 and Q2 serve as queue backup detectors. After 10 seconds of constant actuation, the detector unit places a call to the controller to force off any phase in the cycle and go to phase 8 to clear out the storage lanes.
12. Set the Preempt Dwell Max Timer for 4 minutes (see Electrical Details). This is to be done for both preempts.
13. Upon completion of queue preemption, controller returns to normal operation based on vehicle demand.
14. An interconnection must be provided to relay queue preemption calls from this signal to the signals at the 40 Bus. WB Ramps/Ballpark Entrance (09-1090) and at First Street (C-194). See Electrical Details.
15. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

S. Broad Street at 40 Bus./US 158-421/NC 150 EB Ramps

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2011 | PREPARED BY: L. Blount

PREPARED BY: Sterling | REVIEWED BY:

SCALE 0 40 1" = 40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIELINSKA
SIGNATURE | DATE 10/11/12
SIG. INVENTORY NO. 09-1091

07-NOV-2012 16:30
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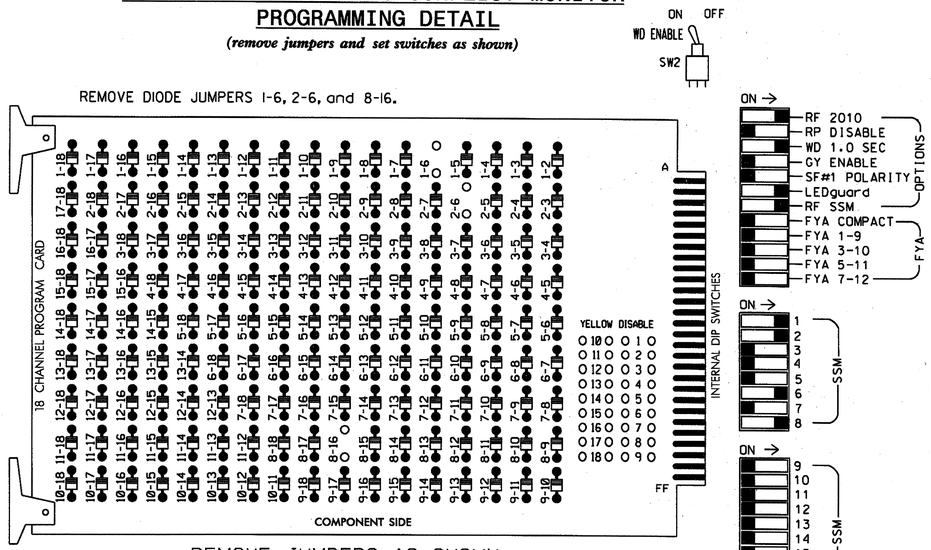
rzielinska

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig.1&5

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phase 8 for 'STARTUP PED CALL'.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. FILE
LOAD SWITCHES USED.....S1,S2,S3*,S8,S9**,S11,S12
PHASES USED.....1,2,6,8,8PED
OVERLAPS.....NONE

* USED FOR QUEUE PREEMPT 7
** USED FOR QUEUE PREEMPT 4

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16	9	10	17	11	12	18
PHASE	1	2	PRE7	3	4	4 PED	5	6	PRE4	7	8		8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61,82	21,22	RELAY 'K4'	NU	NU	NU	NU	61,62	RELAY 'K5'	NU	81	82	P81, P82	NU	NU	NU	NU	NU	NU
RED	*	128						134			107	107							
YELLOW		129						135			108	108							
GREEN		130						136			109	109							
RED ARROW																			
YELLOW ARROW	126																		
GREEN ARROW	127										109								
✋													110						
PED YELLOW			114						120										
🚶			*						*				112						

NU = Not Used

Note: Load switches S3 and S9 are used for Queue Preempts. See sheet 2 for special logic programming, and sheet 3 for special wiring details.

* Denotes install load resistor. See load resistor installation detail this sheet.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø1 1B	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	FS DC ISOLATOR
	L	NOT USED	Ø1 1C	Ø2 2B										Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	PRE 7 Q1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	PRE4 DC ISOLATOR	SLOT EMPTY
	L		NOT USED				NOT USED	PRE 7 Q2						NOT USED	

EX.: 1A, 2A, ETC. = LOOP NO.'S

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME
PRE4 = REMOTE CALL PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
*01	TB7-1,2	J7U	66	28		PRE7					
*02	TB7-3,4	J7L	79	41		PRE7					
PED PUSH BUTTONS											
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

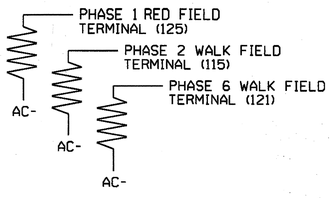
[1] Add jumper from I1-W to J4-W, on rear of input file.

* See Input Assignment Programming Detail on sheet 2 for 01 & 02.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1091
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

Signal Upgrade - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

S. Broad Street
at
40 Bus./US 158-421/NC 150 EB Ramps

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 1-7-12 DATE
SIG. INVENTORY NO. 09-1091

07-JAN-2013 09:02
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Default

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PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 186

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR QUEUE PREEMPT 7 (Q1)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 66 (INPUT 28) IS REACHED.

```
PAGE: 1 C1 PIN:66  PREEMPT
INPUT ASSIGNMENT #.................28
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............10.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64)............._
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10).....................7
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N)....................._
FLASH SENSE (Y/N)..................._
DOOR OPEN (Y/N)....................._
MANUAL CONTROL ENABLE (Y/N)........._
MANUAL CONTROL ADVANCE (Y/N)......._
SPECIAL FUNCTION ALARM (1-8)......._
TOD HOUR SYCHRONIZATION (0-23)....._
FORCE OFF RING (1-4)..............._
HOLD PHASES (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)..._
CHANGE PHASE TIMING PAGE (1-4)......_
CHANGE PHASE CONTROL PAGE (1-4)....._
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

← NOTICE PREEMPT INPUT DELAY TIME

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR QUEUE PREEMPT 7 (Q2)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 79 (INPUT 41) IS REACHED.

```
PAGE: 1 C1 PIN:79  PREEMPT
INPUT ASSIGNMENT #.................41
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............10.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................._
VEHICLE DETECTOR (1-64)............._
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10).....................7
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N)....................._
FLASH SENSE (Y/N)..................._
DOOR OPEN (Y/N)....................._
MANUAL CONTROL ENABLE (Y/N)........._
MANUAL CONTROL ADVANCE (Y/N)......._
SPECIAL FUNCTION ALARM (1-8)......._
TOD HOUR SYCHRONIZATION (0-23)....._
FORCE OFF RING (1-4)..............._
HOLD PHASES (1-16).................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)..._
CHANGE PHASE TIMING PAGE (1-4)......_
CHANGE PHASE CONTROL PAGE (1-4)....._
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

← NOTICE PREEMPT INPUT DELAY TIME

QUEUE PREEMPTION PROGRAMMING DETAIL FOR PREEMPT 7

(program controller as shown below)

THIS PREEMPT ORIGINATES "LOCALLY" FROM THE Q1 AND Q2 LOOPS LOCATED AT THE I-40 BUSINESS EASTBOUND RAMPS (CABINET 10-1091).

FROM MAIN MENU PRESS 'A' (PREEMPTION), THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #7 IS REACHED.

```
   PREEMPTION  #7   SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1 255  0.0  0.0  |       X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ............MED
DELAY TIMER (0-255 SEC) .............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....4
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........34
DWELL MAX TIMER (0=OFF,1-255MIN) ....4
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:        | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW
OMIT OVERLAPS:
```

QUEUE PREEMPTION PROGRAMMING DETAIL FOR PREEMPT 4

(program controller as shown below)

THIS PREEMPT ORIGINATES "REMOTELY" FROM 10-1090 LOCATED AT THE I-40 BUSINESS WESTBOUND RAMPS.

FROM MAIN MENU PRESS 'A' (PREEMPTION), THEN '1' (STANDARD PREEMPTIONS). PRESS 'NEXT' UNTIL PREEMPTION #4 IS REACHED.

```
   PREEMPTION  #4   SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1 255  0.0  0.0  |X      X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ............LOW
DELAY TIMER (0-255 SEC) .............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....4
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....4
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:        | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW
OMIT OVERLAPS:
```

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL FOR PREEMPT RELAY CONTROL

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1 AND 2.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1    (+/-COMMAND#)
IF  ACTIVE PREEMPTION  #7  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #33 ON
```

TURNS ON LOADSWITCH S3 SO RELAY K4 CAN SEND A PREEMPT CALL TO 09-1090 VIA OPTICAL TX #2.

PRESS '+'

```
LOGICAL I/O COMMAND #2    (+/-COMMAND#)
IF  ACTIVE PREEMPTION  #4  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #34 ON
```

TURNS ON LOADSWITCH S9 SO RELAY K5 CAN SEND AN ACKNOWLEDGEMENT VIA OPTICAL TX #2 TO 09-1090 THAT IT RECEIVED A REMOTE PREEMPT CALL.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 33 = Phase 2 PED Yellow
OUTPUT 34 = Phase 6 PED Yellow

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1091
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

Signal Upgrade - Sheet 2 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division — North Carolina Department of Transportation — Traffic Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

S. Broad Street
at
40 Bus./US 158-421/NC 150 EB Ramps

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: November 2012 | REVIEWED BY: JTR

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR

John T. Rowe, Jr. 1-7-13
SIGNATURE DATE

SIG. INVENTORY NO. 09-1091

07-JAN-2013 09:02
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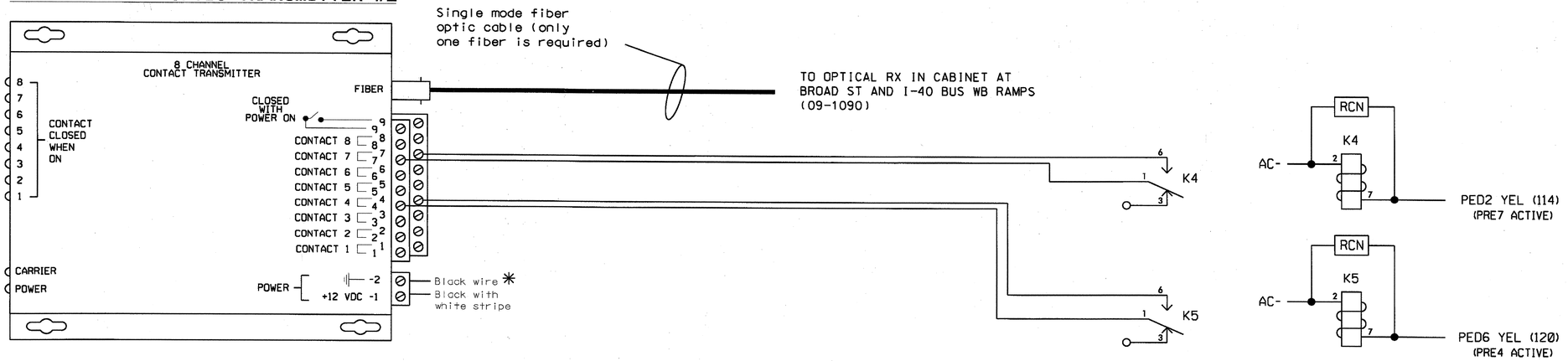
sarmstrong

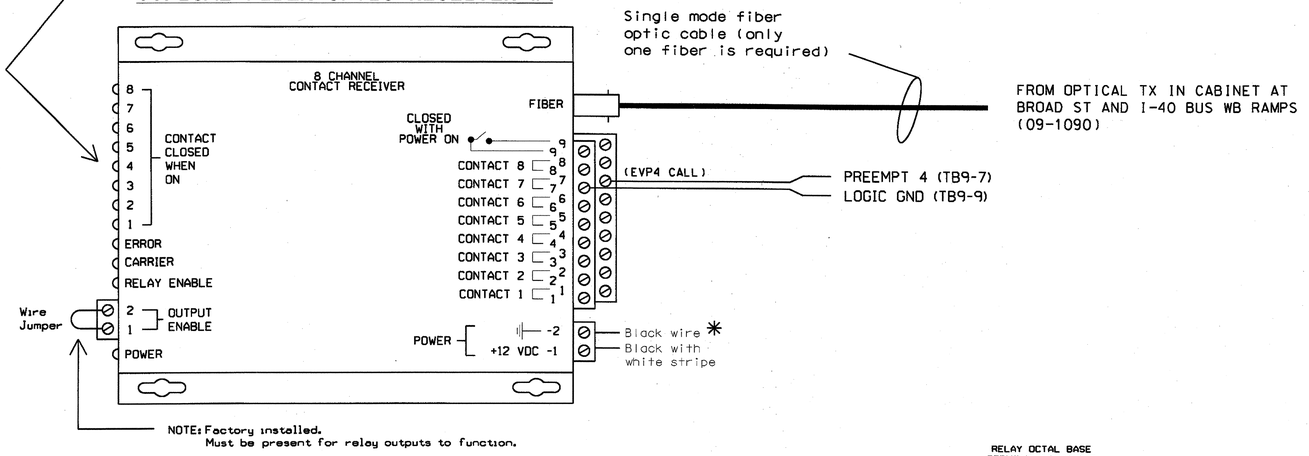
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 187

TYPICAL FIBER OPTIC TRANSMITTER #2



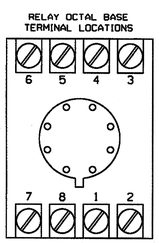
Indicator 4 is used to confirm the cabinet for 09-1090 has received the queue preempt call from this cabinet.

TYPICAL FIBER OPTIC RECEIVER #1



NOTE: Factory installed.
Must be present for relay outputs to function.

RELAY OCTAL BASE TERMINAL LOCATIONS



NOTES

1. This wiring is needed to relay the preemption calls between this signal and the signal at the I-40 Business WB ramps (09-1090).
2. The fiber optic transmitter is an 8-channel contact mapping transmitter capable of sending contact closures to a receiver up to 2.5 miles away over a fiber optic cable.
3. The fiber optic receiver is an 8-channel contact mapping receiver capable of sensing contact closures from a transmitter up to 2.5 miles away over fiber optic cable.
4. * Power connections are with the supplied 12 Volt DC Plug-in Power Supply.
5. Relays K4 and K5 are SPDT with 120VAC coil, and are shown in the normally de-energized state.
6. RC network is valued at 0.1 microfarads, 100 ohms.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1091
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

Signal Upgrade - Sheet 3 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

S. Broad Street
at
40 Bus./US 158-421/NC 150 EB Ramps

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: November 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 1-7-13 DATE
SIG. INVENTORY NO. 09-1091

07-JAN-2013 09:02
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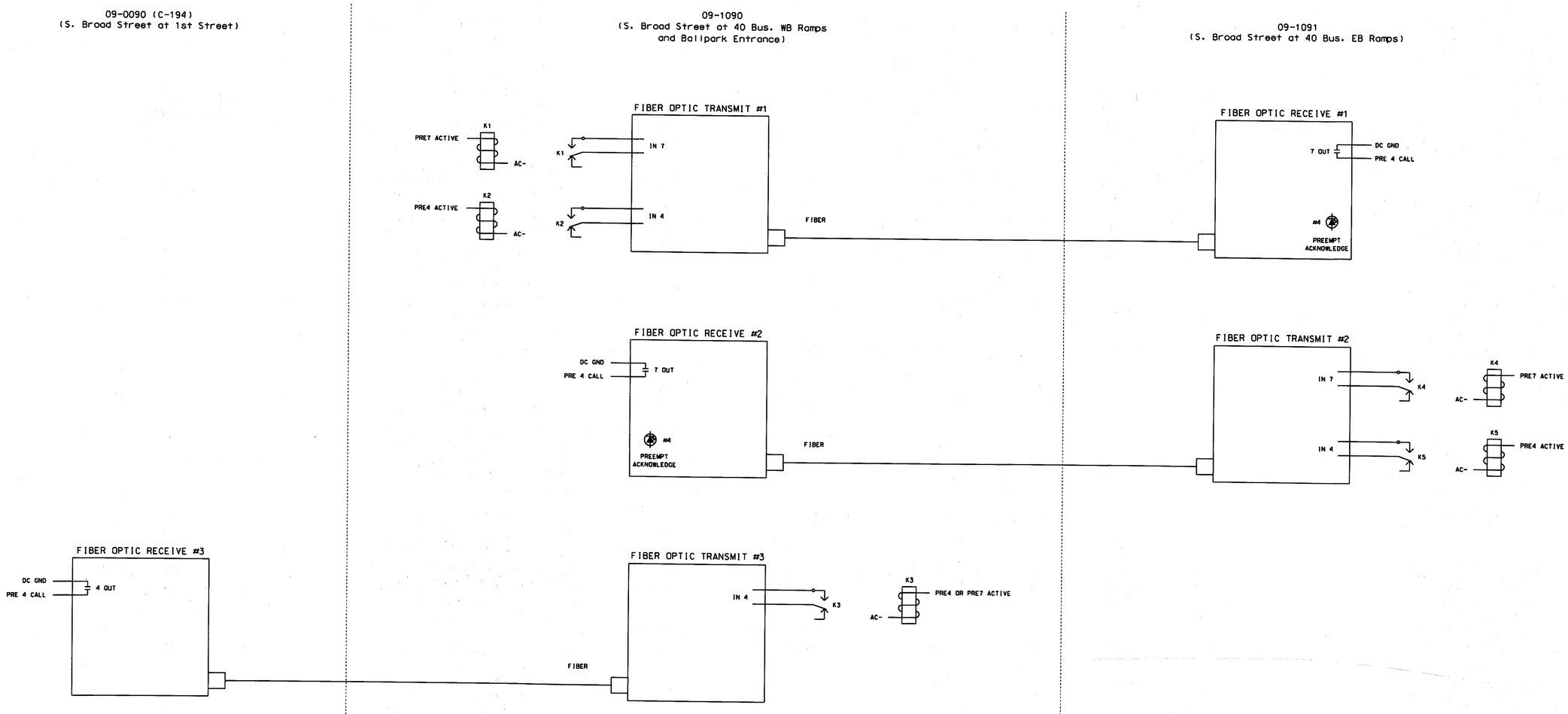
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 188

FIBER OPTIC CONTACT CLOSURE SCHEMATIC FOR BROAD ST. AND I-40 BUS. RAMPS AT BALLPARK IN WINSTON SALEM



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1091
DESIGNED: November 2011
SEALED: 10/11/12
REVISED: N/A

NOTES

1. The fiber optic transmitter is an 8-channel contact mapping transmitter capable of sending contact closures to a receiver up to 2.5 miles away over fiber optic cable.
2. The fiber optic receiver is an 8-channel contact mapping receiver capable of sensing contact closures from a transmitter up to 2.5 miles away over fiber optic cable.
3. Power connections are with the supplied 12 Volt DC Plug-in Power Supply.

OPERATION

With respect to 09-1090 and 09-1091 only...
preemption is always initiated by one of the loops located on the EB or WB I-40 ramps, and is designated as preempt 7 at both 09-1090 and 09-1091. When preemption is active, the originating cabinet sends contact closure information to the adjacent cabinet which activates preempt 4 at that location. An acknowledgement is sent back to the originating cabinet to confirm the signal was received and preemption was initiated.

Regardless of which ramp initiates preemption, cabinet 09-1090 will always send contact closure information to city signal C-194 (09-0090) so that preemption can be initiated at that location. No acknowledgement is required in return from C-194.

Signal Upgrade - Sheet 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

S. Broad Street
at
40 Bus./US 158-421/NC 150 EB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2012	REVIEWED BY: JTR		
PREPARED BY: S. Armstrong	REVIEWED BY:		
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

John T. Rowe 1-7-13
SIGNATURE DATE

SIG. INVENTORY NO. 09-1091

07-JAN-2013 09:01
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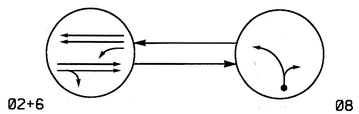
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 18?

PHASING DIAGRAM



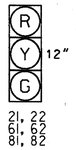
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 08	PHASE FLASH
21, 22	G	R	Y
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

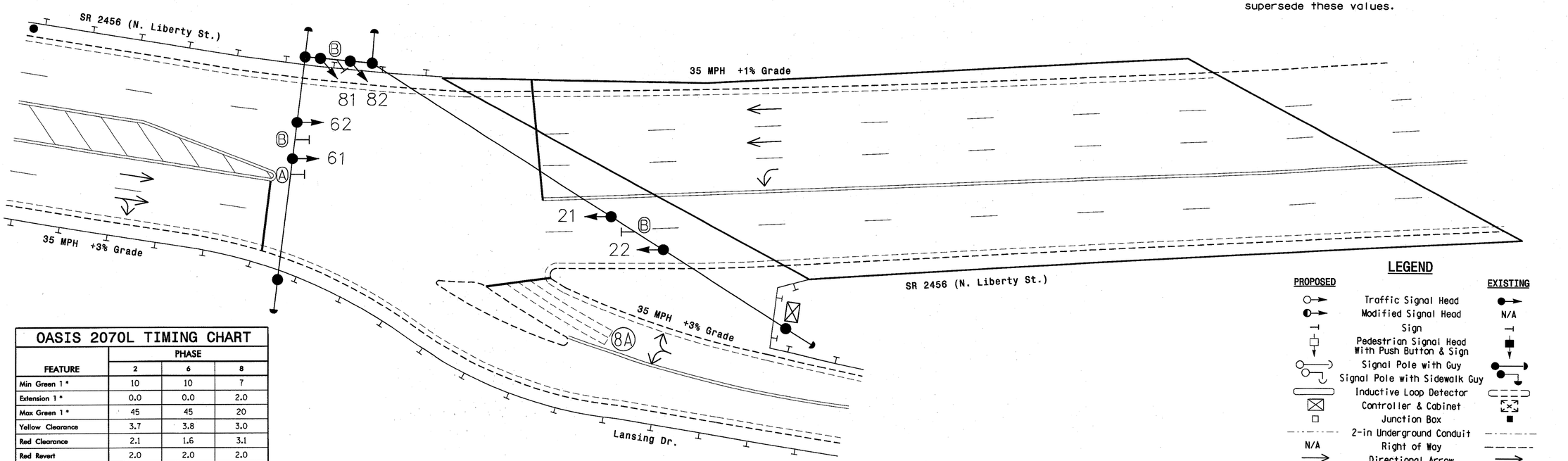


OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	5	-	Y

2 Phase
Semi-Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Existing Left Arrow "ONLY" (R3-5L) sign may be removed at the direction of the Engineer.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART			
FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	10	10	7
Extension 1 *	0.0	0.0	2.0
Max Green 1 *	45	45	20
Yellow Clearance	3.7	3.8	3.0
Red Clearance	2.1	1.6	3.1
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MAX RECALL	MAX RECALL	-
Vehicle Call Memory	-	-	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	Street Name Sign (D3-1)	B

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2456 (N. Liberty Street) at Lansing Drive

Division9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY:

PREPARED BY: Sterling REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

SIGNATURE 7/11/12 DATE

SIG. INVENTORY NO. 09-1121

11-JUL-2012 18:04
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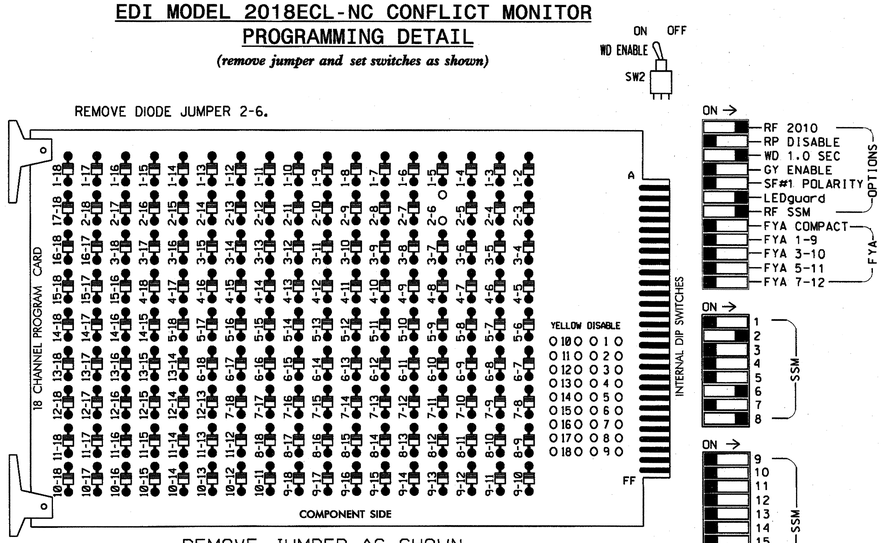
PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 19D

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S8,S11
PHASES USED.....2,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1121
DESIGNED: December 2011
SEALED: 7-11-12
REVISED: N.A.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2456 (N. Liberty Street)
at
Lansing Drive

Division 09 | Forsyth County | Winston-Salem

PLAN DATE: 7-5-12 | REVIEWED BY: T. Vgn
PREPARED BY: D.H. Spaulding | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE | DATE 7/20/12

SIG. INVENTORY NO. 09-1121

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dspaulding

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 19

PHASING DIAGRAM

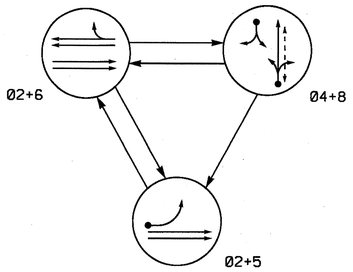


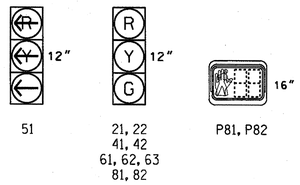
TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
51	←	~~R~~	~~R~~	~~R~~
61, 62, 63	R	G	R	Y
81, 82	R	R	G	R
P81, P82	DW	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.

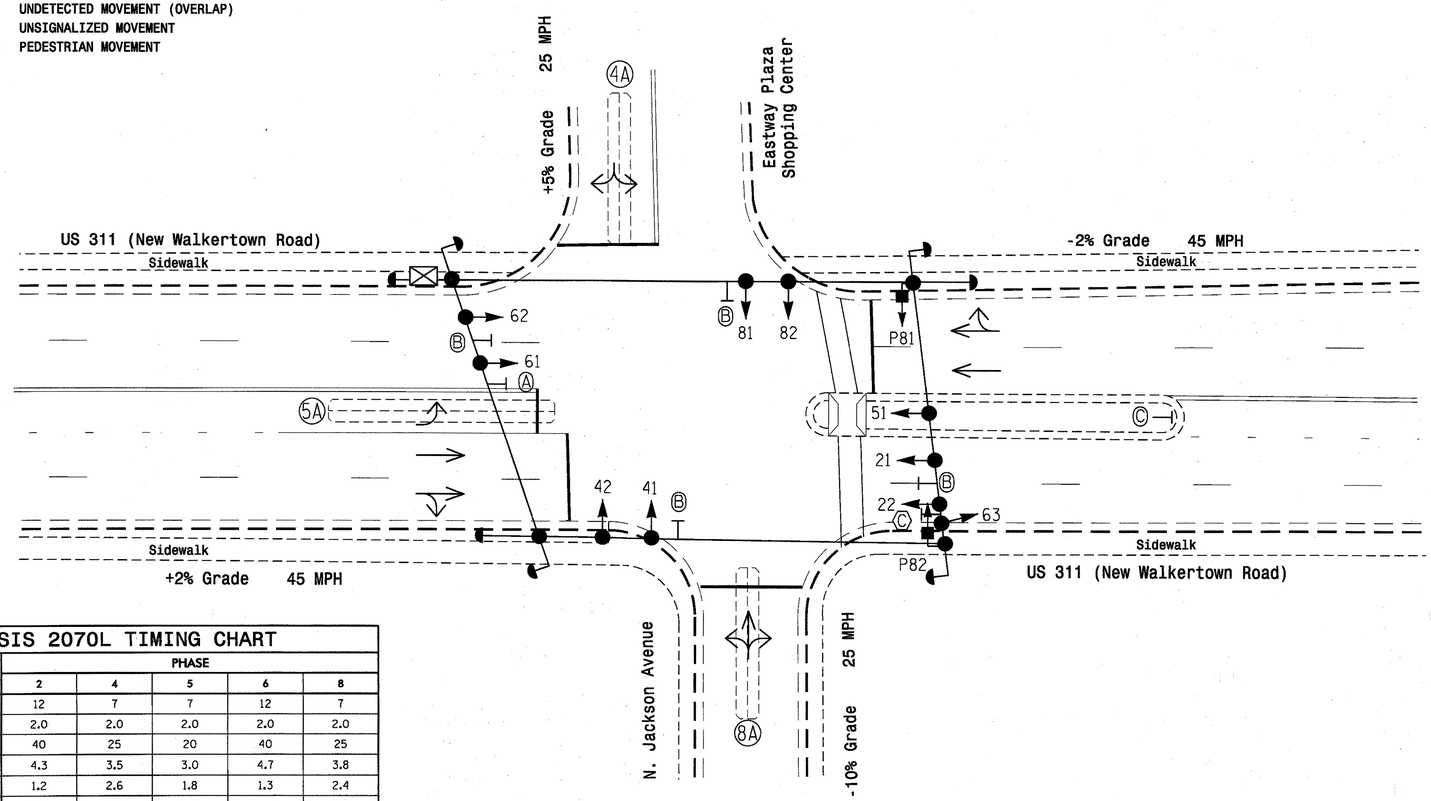


OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	5	-	Y
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	3	-	Y
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	5	-	Y

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	40	25	20	40	25
Yellow Clearance	4.3	3.5	3.0	4.7	3.8
Red Clearance	1.2	2.6	1.8	1.3	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	4
Don't Walk 1	-	-	-	-	15
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	MAX RECALL	-	-	MAX RECALL	-
Vehicle Call Memory	-	-	-	-	-
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

3 Phase
Semi-Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
------	2-in Underground Conduit	------
N/A	Right of Way	------
→	Directional Arrow	→
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ
Ⓒ	No Right Turn Sign (R3-1)	Ⓒ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 311 (New Walkertown Road)
at
N. Jackson Avenue and
Eastway Plaza Shopping Center
Division 9 Forsyth County Winston-Salem

PLAN DATE: December 2011 REVIEWED BY:
PREPARED BY: L. Blount REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 20 1" = 20'

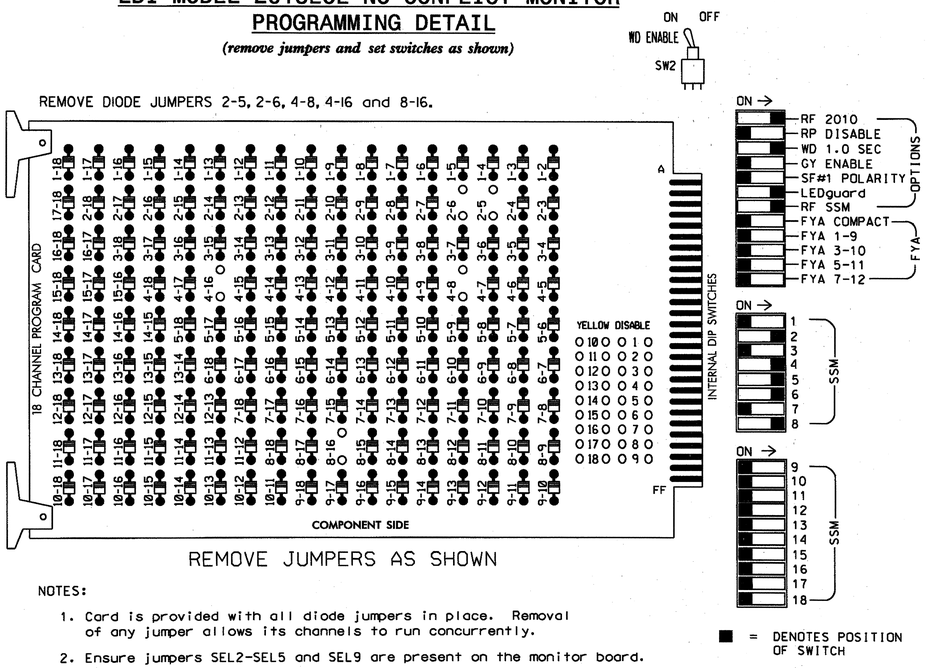
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 4/4/12 DATE
SIG. INVENTORY NO. 09-1266

11-JUN-2012 14:36
S:\ITS&SS\ITS Signals\Signal Design Section\Central Region\Div 9\C-5224 Winston Salem\Signals\09-1266\091266_sig_dsn_20120404.dgn
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 192

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phase 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S7,S8,S11,S12
PHASES USED.....2,4,5,6,8,8 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62 63	NU	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW							131					
YELLOW ARROW							132					
GREEN ARROW							133					
✋												110
🚶												112

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	FS DC ISOLATOR
	L						NOT USED							Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED					NOT USED								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			5
PED PUSH BUTTONS											
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1266
DESIGNED: December 2011
SEALED: 4-04-12
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

US 311 (New Walkertown Road)
at
N. Jackson Avenue and
Eastway Plaza Shopping Center

Division 9 | Forsyth County | Winston-Salem
PLAN DATE: April 2012 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

John T Rowe IV 4-5-12
SIGNATURE DATE

SIG. INVENTORY NO. 09-1266

05-APR-2012 08:14
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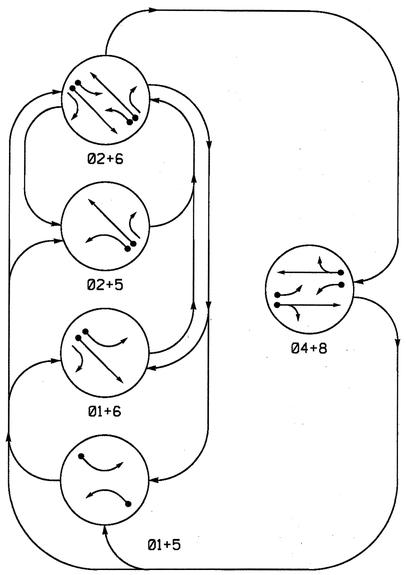
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 193

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

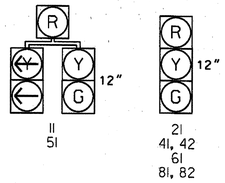
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	R→	G→	R	G	R	Y
21	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	R→	R	G→	G	R	Y
61	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

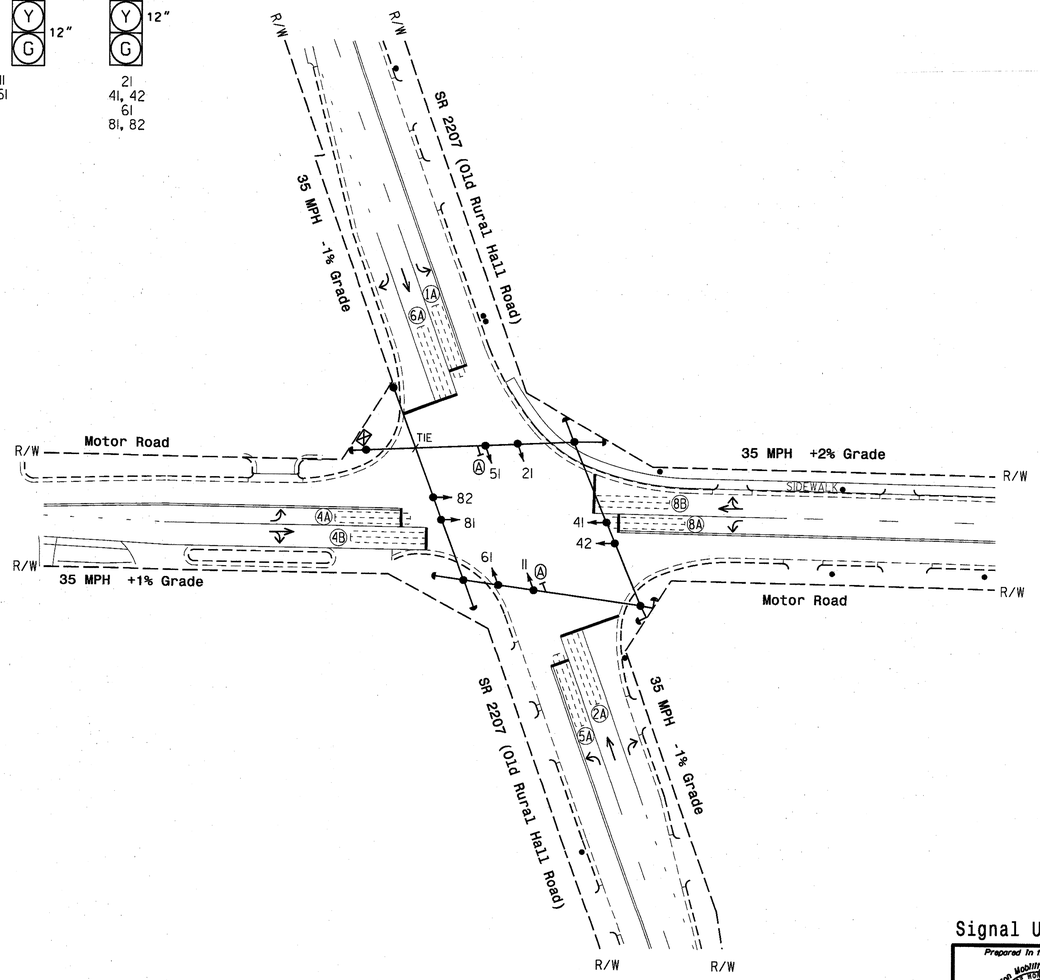
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
2A	6X40	0	2-4-2	-	2	Y	Y	-	-	-	-	Y
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	10	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	15	-	Y
					2	Y	Y	-	-	-	-	Y
6A	6X40	0	2-4-2	-	6	Y	Y	-	-	-	-	Y
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	3	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	Y



5 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The cabinet should be designed to include an Auxiliary Output file for future use.
7. Existing "Left Turn Yield on Green" ball (R10-12) signs may be removed at the direction of the Engineer.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	Ⓐ

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	25	45	30	15	45	30
Yellow Clearance	3.0	3.9	3.8	3.0	3.9	3.7
Red Clearance	3.3	2.4	1.5	3.3	2.4	1.6
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	-	-	-	-	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SR 2207 (Old Rural Hall Road) at Motor Road

Division 9 Forsyth County Winston-Salem

PLAN DATE: October 2012 REVIEWED BY:

PREPARED BY: C.E. Carter REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

SIGNATURE 11/13/12 DATE

SIG. INVENTORY NO. 09-1269

13-NOV-2012 08:29
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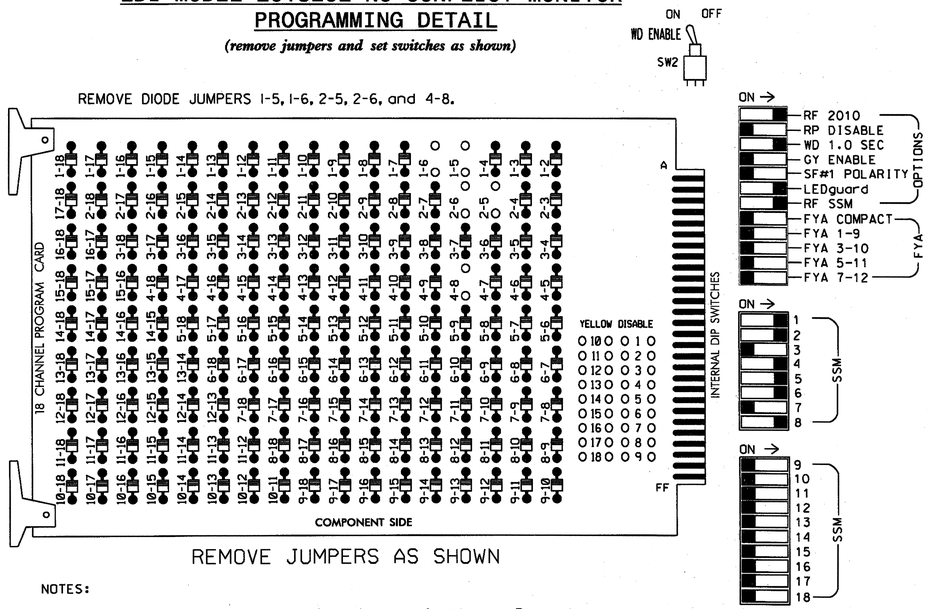
rziemba

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. \94

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL
(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Winston-Salem Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,51	NU	NU	41,42	NU	51	11,61	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT
(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED				ø4 4B								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED				ø8 8B								

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10

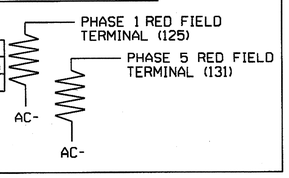
[1] Add jumper from I1-W to J4-W, on rear of input file.

[2] Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



BACKUP PROTECTION NOTE
(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1269
DESIGNED: October 2012
SEALED: 11/13/12
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2207 (Old Rural Hall Road)
at
Motor Road

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: October 2012 | REVIEWED BY: JTR
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE
11-13-12
DATE
SIG. INVENTORY NO. 09-1269

13-NOV-2012 15:00
S:\mITS&SU\mITS Signals\mWorkgroups\mSig Mgmt\mArmstrong\m091269_sm_ele_xxx.dgn
sarmstrong

PROJECT REFERENCE NO.	SHEET NO.
C-5224A	Sig. 195

PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø4	FLASH
21, 22	R	G	R	Y
41, 42, 43, 44	R	R	G	R
61	G	G	R	Y
62, 63, 64	G	G	R	Y

SIGNAL FACE I.D.

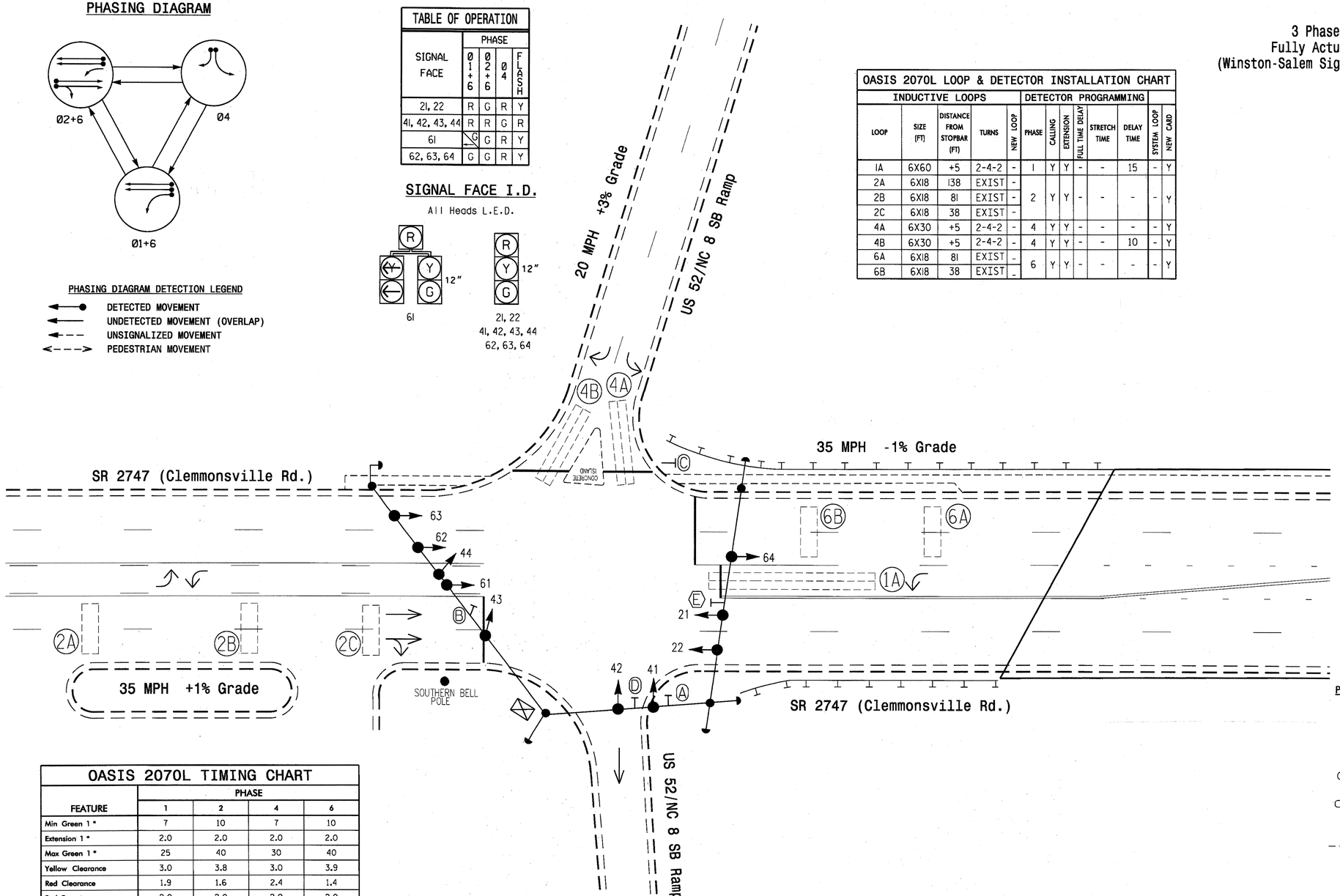
All Heads L.E.D.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Y	Y	-	-	15	-	Y
2A	6X18	138	EXIST	-	2	Y	Y	-	-	-	-	Y
2B	6X18	81	EXIST	-								
2C	6X18	38	EXIST	-								
4A	6X30	+5	2-4-2	-	4	Y	Y	-	-	-	-	Y
4B	6X30	+5	2-4-2	-	4	Y	Y	-	-	10	-	Y
6A	6X18	81	EXIST	-	6	Y	Y	-	-	-	-	Y
6B	6X18	38	EXIST	-								

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maintain (ON or OFF) TOD late night flash based on existing programming for this location.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Existing loop detection is based on the standards of the City of Winston-Salem DOT.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output file for future use.
9. Existing lane control signs may be removed at the direction of the Engineer.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	No Right Turn Sign (R3-1)	Ⓒ
Ⓓ	Street Name Sign (D3-1)	Ⓓ
Ⓔ	No Left Turn Sign (R3-2)	Ⓔ

OASIS 2070L TIMING CHART				
FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	7	10	7	10
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	25	40	30	40
Yellow Clearance	3.0	3.8	3.0	3.9
Red Clearance	1.9	1.6	2.4	1.4
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 2747 (Clemmonsville Road)
at
US 52/NC 8 SB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: November 2011 REVIEWED BY:
PREPARED BY: Sterling REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 5/11/12 DATE
SIG. INVENTORY NO. 09-1270

07-JAN-2013 15:12
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