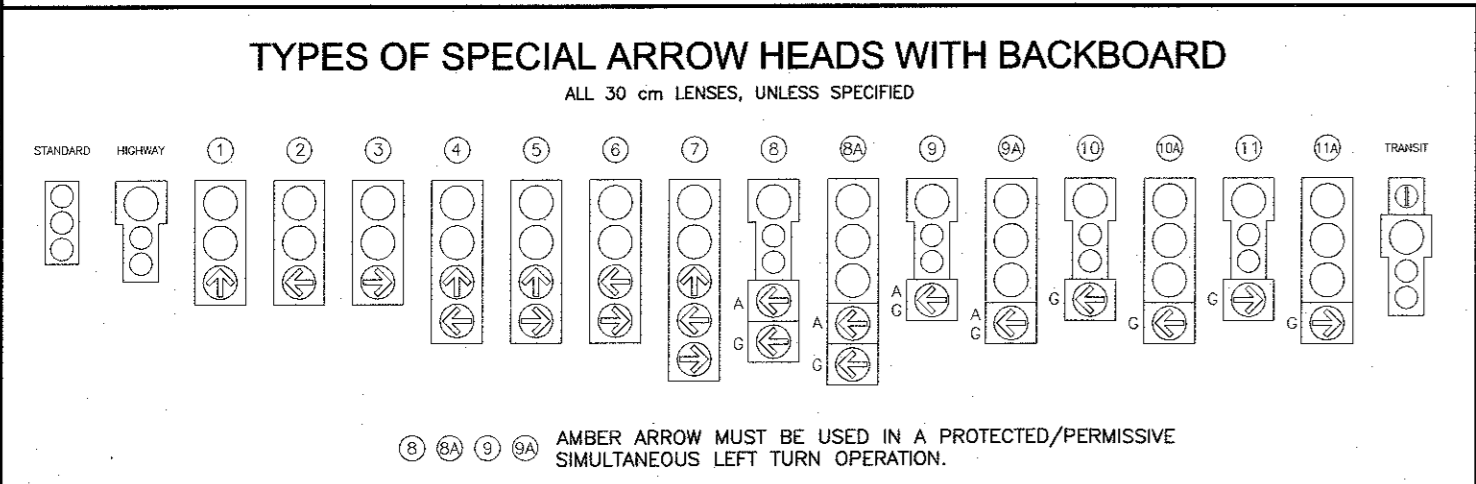
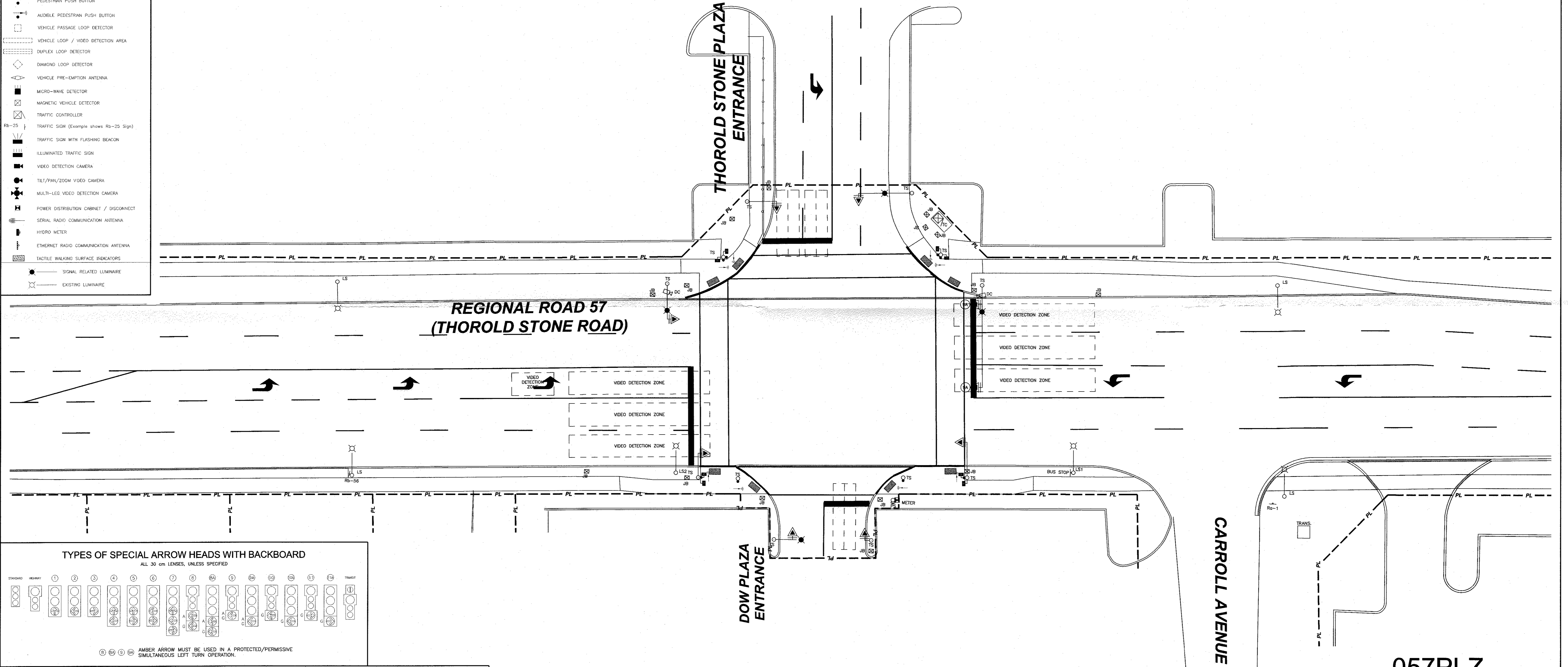
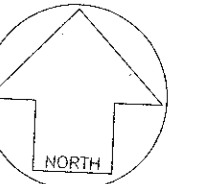


LEGEND

TRAFFIC SIGNAL BLOCKS

- HIGHWAY SIGNAL HEAD (30 cm. Red) WITH BACKBOARD AND MAST ARM
- HIGHWAY SIGNAL HEAD (30 cm. Red) WITH BACKBOARD AND OVERHEAD CABLE
- HIGHWAY SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 30 cm. LENSES)
- SPECIAL HEAD WITH ARROW INDICATION AND BACKBOARD (Example shows Type 2 Head)
- HIGHWAY SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 30 cm. LENSES) (Example shows Type 2 Head)
- SPECIAL HEAD WITH BACKBOARD AND ONE OR MORE PROGRAMMABLE LENSES (Example shows Type 2 Head)
- STANDARD SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 20 cm. LENSES)
- STANDARD SIGNAL HEAD WITH MAST ARM, WITHOUT BACKBOARD
- PEDESTRIAN SIGNAL HEAD
- COUNTDOWN PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- AUDIBLE PEDESTRIAN PUSH BUTTON
- VEHICLE PASSAGE LOOP DETECTOR
- VEHICLE LOOP / VIDEO DETECTION AREA
- DUPLEX LOOP DETECTOR
- DIAMOND LOOP DETECTOR
- VEHICLE PRE-EMPTION ANTENNA
- MICRO-WAVE DETECTOR
- MAGNETIC VEHICLE DETECTOR
- TRAFFIC CONTROLLER
- TRAFFIC SIGN (Example shows Rb-25 Sign)
- TRAFFIC SIGN WITH FLASHING BEACON
- ILLUMINATED TRAFFIC SIGN
- VIDEO DETECTION CAMERA
- TILT/PAN/ZOOM VIDEO CAMERA
- MULTI-LEG VIDEO DETECTION CAMERA
- POWER DISTRIBUTION CABINET / DISCONNECT
- SERIAL RADIO COMMUNICATION ANTENNA
- HYDRO METER
- ETHERNET RADIO COMMUNICATION ANTENNA
- TACTILE WALKING SURFACE INDICATORS
- SIGNAL RELATED LUMINAIRE
- EXISTING LUMINAIRE

REVISIONS	DATE	ANALYST	DESCRIPTION OF REVISIONS	RECOMMENDED BY
	AUG 2014	TC	NEW TRAFFIC SIGNAL	HDM



CLASSIFICATION OF ROADWAY	TRAFFIC SIGNAL HEADS			LOCATION	
	TYPE	SIZE	BACKBOARD	MOUNTING HT.	OFFSET FROM POLE
ROADWAY REGIONAL ROAD 57 (THOROLD STONE ROAD)	PRIMARY	HWY, HWY	YES	5.00m	EB - 3.65m WB - 4.57m
	SECONDARY	9A, HWY	YES	5.00m	EB - 10.70m WB - 2.44m
	AUXILIARY	9A	YES	5.00m	EB - 2.8m
ROADWAY THOROLD STONE / DOW PLAZA ENTRANCE	PRIMARY	HWY	YES	5.00m	NB - 5.50m SB - 3.00m
	SECONDARY	HWY	YES	5.00m	NB - 3.65m SB - 0.50m
ROADWAY CARROLL AVENUE	PRIMARY	HWY	YES	5.00m	NB - 5.50m SB - 3.00m
	SECONDARY	HWY	YES	5.00m	NB - 3.65m SB - 0.50m

057PLZ

MUNICIPALITY CITY OF NIAGARA FALLS
 INTERSECTION REGIONAL ROAD 57 (THOROLD STONE ROAD)
 AT THOROLD STONE / DOW PLAZA ENTRANCE
 DATE: AUGUST 2014 SCALE: 1:200

SIGNAL DESIGN RECOMMENDED FOR APPROVAL: *H. [Signature]*
 SIGNAL INSTALLATION APPROVED AS PER SECTION 144 (31) H.T.A.: *[Signature]*
 APPROVAL DATE: Aug 2014

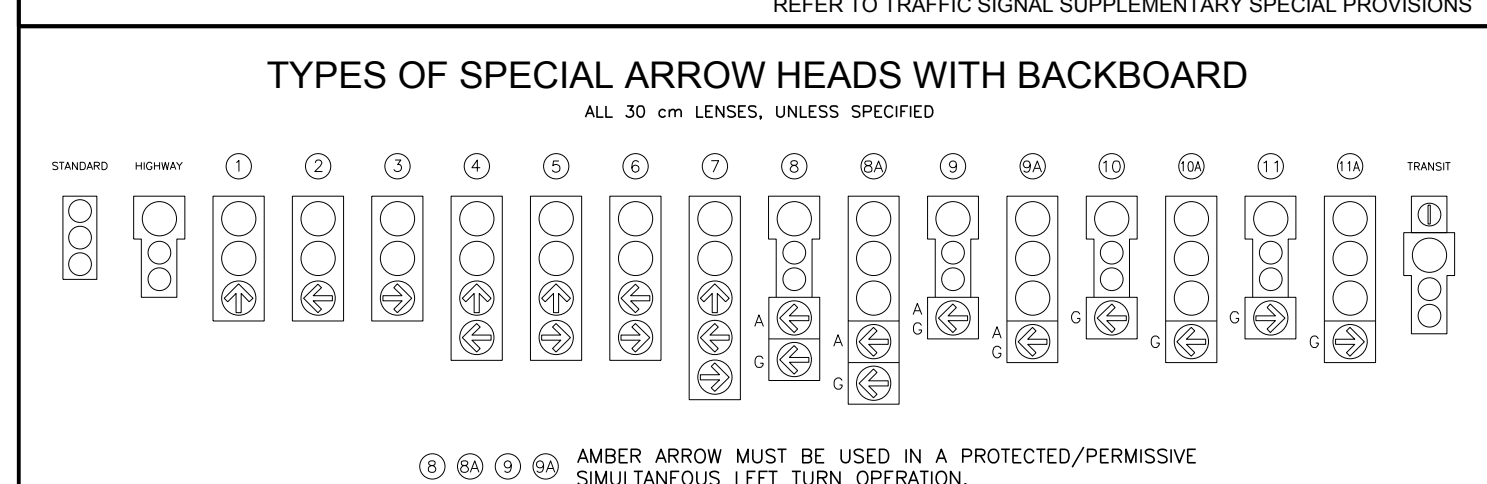
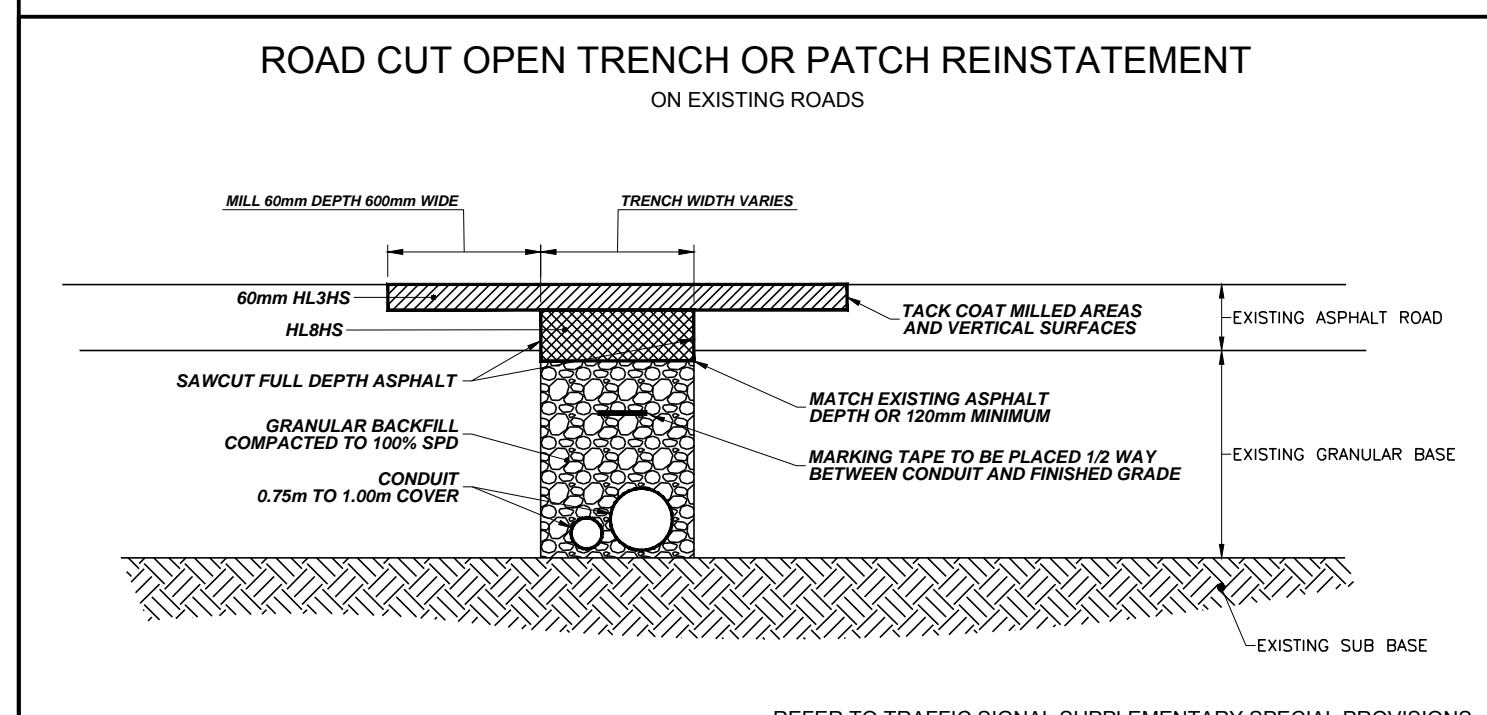
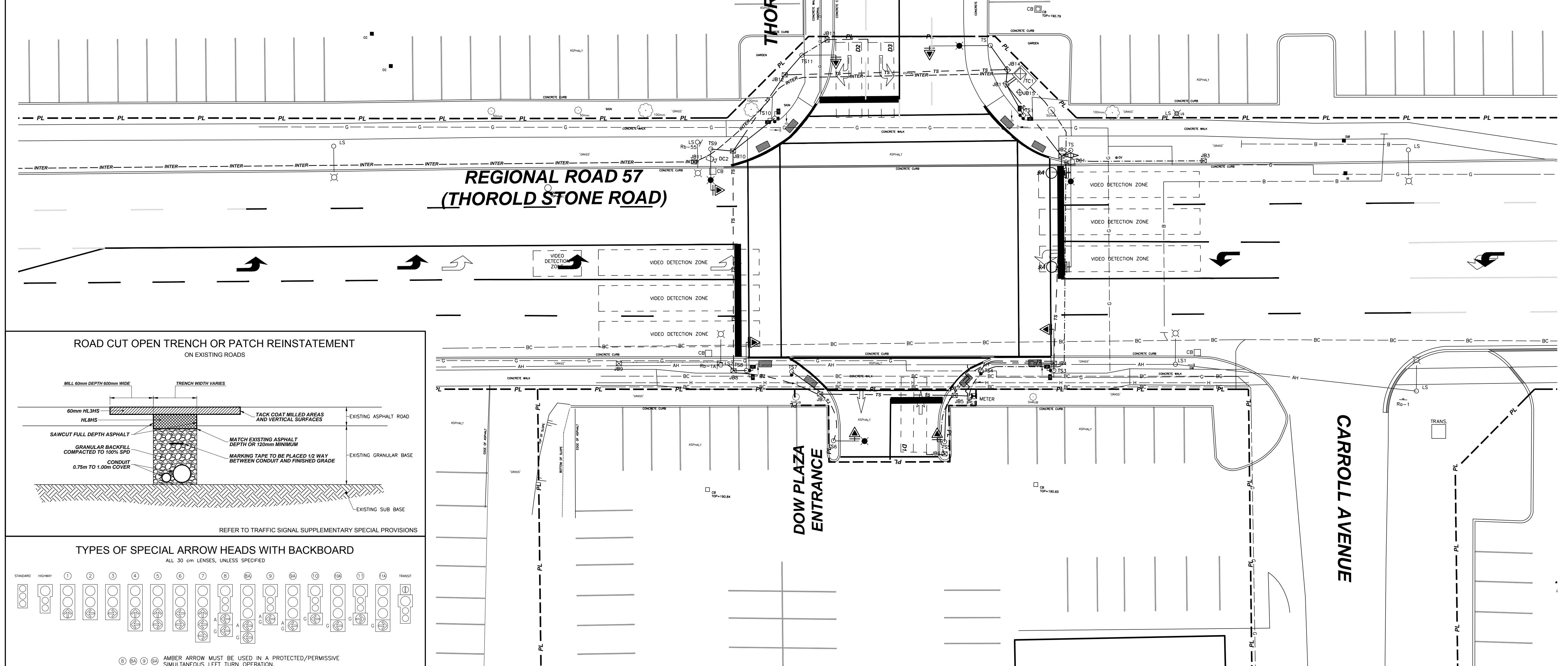


POLE & ELECTRICAL STRUCTURES				
LOCATION (QUADRANT)	POLE OR STRUCT. No.	POLE HEIGHT	POLE BASE TYPE	COMMENTS
NE	TS1	3.80m	3	PED HEADS / BUTTONS
NE	TS2	10.40m	8	SIGNAL HEADS, CAMERA, PRE-EMPTION AND LUMINAIRE
SE	TS3	6.30m	5	SIGNAL HEAD, PED HEADS AND BUTTON
SE	TS4	1.50m	1	PED BUTTON
SE	TS5	6.30m	5	SIGNAL HEAD
SW	TS6	8.90m	5	SIGNAL HEAD AND LUMINAIRE
SW	TS7	1.50m	1	PED BUTTON
SW	TS8	6.30m	5	SIGNAL HEAD, PED HEADS / BUTTON
NW	TS9	10.50m	6	SIGNAL HEAD, LUMINAIRE, CAMERA
NW	TS10	3.80m	3	PED HEADS / BUTTONS
NW	TS11	6.30m	6	SIGNAL HEAD
NE	TS12	10.50m	6	SIGNAL HEAD, LUMINAIRE
SE	PS1	7.00m	DIRECT BURIED	DISCONNECT AND METER

TYPE AND LOCATION OF TRAFFIC SIGNAL HEADS				
LOCATION	TYPE	BACKBOARD	SIGNAL MOUNTING HEIGHT	COMMENTS
EB PRIMARY	HWY	YES	5.00m	
EB SECONDARY	9A	YES	5.00m	
EB AUXILIARY	9A	YES	5.00m	
WB PRIMARY	HWY	YES	5.00m	
WB SECONDARY	HWY	YES	5.00m	
NB PRIMARY	HWY	YES	5.00m	
NB SECONDARY	HWY	YES	5.00m	
SB PRIMARY	HWY	YES	5.00m	
SB SECONDARY	HWY	YES	5.00m	

TYPE AND LOCATION OF DETECTION				
LOCATION	No.	TYPE	COMMENTS	
DOW PLAZA	-	LOOP DETECTION		
THOROLD STONE ROAD	-	VIDEO DETECTION		
THOROLD STONE PLAZA ENTRANCE	-	LOOP DETECTION		

ELECTRICAL MAINTENANCE HOLES & MANHOLES				
LOCATION (QUADRANT)	POLE OR STRUCT. No.	SIZE (mm)	COMMENTS	
NE	JB1	330 x 600	CONCRETE POLYMER	
NE	JB2	330 x 600	CONCRETE POLYMER	
NE	JB3	330 x 600	CONCRETE POLYMER	
SE	JB4	330 x 600	CONCRETE POLYMER	
SE	JB5	330 x 600	CONCRETE POLYMER	
SE	JB6	330 x 600	CONCRETE POLYMER	
SW	JB7	330 x 600	CONCRETE POLYMER	
SW	JB8	330 x 600	CONCRETE POLYMER	
SW	JB9	330 x 600	CONCRETE POLYMER	
NW	JB10	330 x 600	CONCRETE POLYMER	
NW	JB11	330 x 600	CONCRETE POLYMER	
NW	JB12	330 x 600	CONCRETE POLYMER	
NW	JB13	330 x 600	CONCRETE POLYMER	
NE	JB14	330 x 600	CONCRETE POLYMER	
NE	JB15	330 x 600	CONCRETE POLYMER	



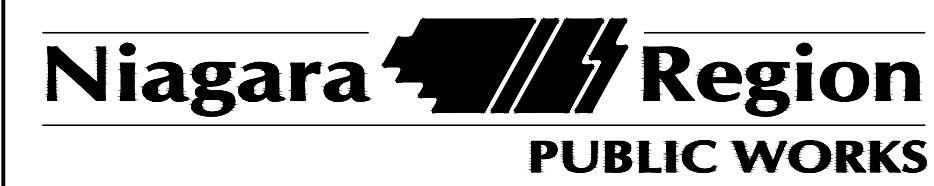
LEGEND	
	HIGHWAY SIGNAL HEAD (30 cm. Red) WITH BACKBOARD AND MAST ARM
	HIGHWAY SIGNAL HEAD (30 cm. Red) WITH BACKBOARD AND OVERHEAD CABLE
	HIGHWAY SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 30 cm. LENSES)
	SPECIAL HEAD WITH ARROW INDICATION AND BACKBOARD (Example shows Type 2 Head)
	HIGHWAY SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 30 cm. LENSES) (Example shows Type 2 Head)
	SPECIAL HEAD WITH BACKBOARD AND ONE OR MORE PROGRAMMABLE LENSES (Example shows Type 2 Head)
	STANDARD SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 20 cm. LENSES)
	STANDARD SIGNAL HEAD WITH MAST ARM, WITHOUT BACKBOARD
	PEDESTRIAN SIGNAL HEAD
	COUNTDOWN PEDESTRIAN SIGNAL HEAD
	PEDESTRIAN PUSH BUTTON
	AUDIBLE PEDESTRIAN PUSH BUTTON
	VEHICLE PASSAGE LOOP DETECTOR
	VEHICLE LOOP / VIDEO DETECTION AREA
	DUPLEX LOOP DETECTOR
	DIAMOND LOOP DETECTOR
	VEHICLE PRE-EMPTION ANTENNA
	MICRO-WAVE DETECTOR
	MAGNETIC VEHICLE DETECTOR
	TRAFFIC CONTROLLER
	TRAFFIC SIGN (Example shows Rb-25 Sign)
	TRAFFIC SIGN WITH FLASHING BEACON
	ILLUMINATED TRAFFIC SIGN
	VIDEO DETECTION CAMERA
	TILT/PAN/ZOOM VIDEO CAMERA
	MULTI-LEG VIDEO DETECTION CAMERA
	POWER DISTRIBUTION CABINET / DISCONNECT
	SERIAL RADIO COMMUNICATION ANTENNA
	HYDRO METER
	ETHERNET RADIO COMMUNICATION ANTENNA
	TACTILE WALKING SURFACE INDICATORS
	SIGNAL RELATED LUMINAIRE
	EXISTING LUMINAIRE

NO.	REVISION	DATE	INIT.
8	RECORD OF CONSTRUCTION	2014-08-19	TC
7	LAYOUT REVISIONS	2014-07-10	TC
6	SIDEWALK AND POLE ADJUSTMENTS - SOUTH SIDE	2014-07-02	TC
5	REQUEST FOR QUOTATION	2014-04-22	TC
4	GENERAL REVISIONS	2013-10-29	TC
3	90% DESIGN REVIEW	2013-10-17	TC
2	60% DESIGN REVIEW	2013-09-23	TC
1	REQUEST FOR LOCATES	2013-09-17	TC

NOTES:

- THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWER AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
- PROPERTY LINES WERE PLOTTED USING REGISTERED PLANS AND BARS LOCATED IN THE FIELD TO VERIFY THE ACCURACY OF THESE PROPERTY LINES. A LEGAL SURVEY SHOULD BE PERFORMED PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL CONTACT THE REGION'S TRAFFIC OPERATIONS MANAGER FOLLOWING THE TRAFFIC SIGNAL PLANT LAYOUT. PROPERTY AND UTILITY LOCATIONS MUST ALSO BE IDENTIFIED. THE FINAL LOCATIONS FOR ALL TRAFFIC SIGNAL PLANT INCLUDING BUT NOT LIMITED TO: SIGNS, POLE BASES, JUNCTION BOXES, CONTROLLER BASES AND LOOPS WILL BE VERIFIED IN THE FIELD BY THE NIAGARA REGION TRAFFIC SIGNAL SUPERVISOR OR DESIGNATE PRIOR TO INSTALLATION. A TRAFFIC SIGNAL INSPECTOR FROM THE REGION MUST BE ON SITE AT ALL TIMES (OR WHERE DETERMINED BY THE REGION'S TRAFFIC OPERATIONS MANAGER AS NECESSARY) WHEN TRAFFIC SIGNAL WORK IS BEING UNDERTAKEN.
- ALL MATERIALS SHALL BE AS PER NIAGARA REGION TRAFFIC SIGNAL STANDARDS MANUAL. CONTRACTORS SHALL VERIFY ALL MATERIALS WITH REGION'S SIGNAL SUPERVISOR PRIOR TO COMMENCING CONSTRUCTION.
- ALL CONDUIT FROM JUNCTION BOXES TO JUNCTION BOXES AND FROM JUNCTION BOXES TO TRAFFIC SIGNAL POLES SHALL INCLUDE 1-100mm DUCT AND 1-50mm DUCT UNLESS OTHERWISE SPECIFIED.
- WHERE APPROVED FINAL POLE BASE LOCATION DIFFER FROM THIS PLAN, INSTALL SIGNAL MAST ARM OF APPROPRIATE LENGTH TO MAINTAIN POSITION OF SIGNAL HEAD AT DESIGNED LOCATION.
- ALL TRAFFIC SIGNAL ELECTRICAL CONNECTIONS, BOTH TEMPORARY AND FINAL ARE TO BE COORDINATED WITH AND PERFORMED BY NIAGARA REGION FORCES.

DRAFTING	TC
DESIGN	TC
CHECKED BY	HM, AS
APPROVED BY	HM



2013 SIGNAL REPLACEMENT PROGRAM
 REGIONAL ROAD 57 (Thorold Stone Road)
 at Thorold Stone Plaza Entrance
 CITY OF NIAGARA FALLS
 TRAFFIC SIGNAL DESIGN

CONSULTANT FILE No.	
DATE	SEPTEMBER 2013
SCALE	1:200
REF. No.	RN -
DWG No.	RR57_TS01
REV.	8

LEGEND

- ① TRAFFIC SIGNAL CABLE - 25c #14 AWG.
- ② TRAFFIC SIGNAL CABLE - 7c #14 AWG.
- ③ TRAFFIC SIGNAL CABLE - 4c #14 AWG.
- ④ LOOP CABLE - (BLACK/WHITE) GENERAL CABLE OR EQUIVALENT, SHIELDED COMMUNICATION AND CONTROL CABLE, 1 TWISTED PAIR, BELDFOIL(R) SHIELD, 600w RATING
- ⑤ PUSH BUTTON CABLE - (BLACK/RED) GENERAL CABLE OR EQUIVALENT, SHIELDED COMMUNICATION AND CONTROL CABLE, 1 TWISTED PAIR, BELDFOIL(R) SHIELD, 600w RATING
- ⑥ INSULATED GROUND CABLE - #6 AWG. GREEN CU RWU-90
- ⑦ ILLUMINATION CABLE - #6 AWG. (BLACK/WHITE)
- ⑧ ILLUMINATION CABLE - #6 AWG. (RED/WHITE)
- ⑨ ILLUMINATION CABLE - 12/2 NMWU (BLACK & WHITE)
- ⑩ TRAFFIC CONTROLLER POWER - 2 #8 AWG. CU RWU-90 and 1 #6 AWG. CU RWU-90
- ⑪ COMMUNICATIONS (INTERCONNECT) - FIBRE OPTIC
- ⑫ VEHICLE PRE-EMPTION DETECTOR - COAXIAL

- ⊕ SUPPLY A - 120/240v
- ⊕ GROUND ROD
- CONNECTION POINT
- ⊕ LUMINAIRE
- ⊕ TRAFFIC SIGNAL HEAD
- ⊕ PEDESTRIAN PUSH BUTTON
- ⊕ PEDESTRIAN SIGNAL HEAD
- ⊕ VEHICLE DETECTION LOOP
- ⊕ HYDRO METER
- ⊕ VEHICLE PRE-EMPTION DETECTOR

GENERAL NOTES

A. ALL CABLES TO BE PLACED IN 1-100mm RIGID PVC UNLESS OTHERWISE SPECIFIED.

B. ALL TRAFFIC SIGNAL HEAD RISER CABLE SHALL BE AS PER THE FOLLOWING:
 - 3 SECTION HEADS - 4 CONDUCTOR #14 AWG. TRAFFIC SIGNAL CABLE (SUPPLIED BY REGION)
 - 4 SECTION HEADS - 7 CONDUCTOR #14 AWG. TRAFFIC SIGNAL CABLE (SUPPLIED BY REGION)

C. ALL LUMINAIRE RISER CABLE SHALL BE 12/2 NMW-U

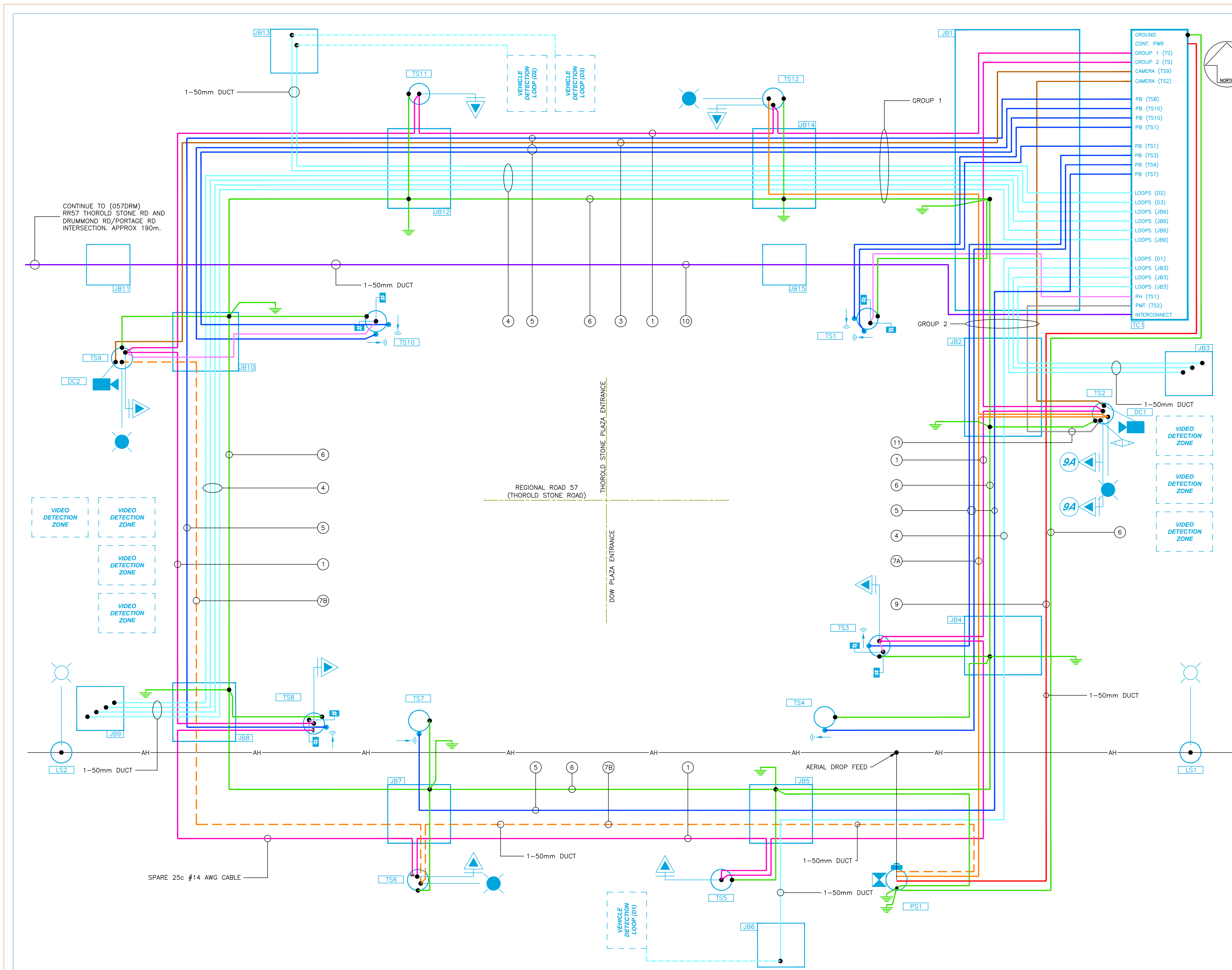
D. ALL PEDESTRIAN SIGNAL RISER CABLE TO BE 4-CONDUCTOR (SUPPLIED BY REGION)

E. ALL 'END OF RUN' CONDUCTORS TO BE TERMINATED WITH INSULATING MARRETT CONNECTORS, TAPED, AND BEND UPWARDS.

F. A SUFFICIENT AMOUNT OF CABLE IS TO BE SPOOLED AT CONNECTION POINTS TO MAKE ALL CONNECTIONS AND PROVIDE DRIP LOOPS

G. THE ENDS OF EACH CABLE SHALL BE UNIQUELY IDENTIFIED WITH COLORED ELECTRICAL TAPE. REFER TO NRS 2710 FOR CABLE COLOR ID CHART.

SUPPLY CONTROL CABINET ASSEMBLY						NRS	2441
120/240v, 1 PHASE, 3 WIRE						TYPE	3s 60A
CIRCUIT NO.	DESCRIPTION	LOCATION	BREAKER AMPS	WATTAGE	QUANT.	CIRCUIT LOAD (w)	
1	TRAFFIC SIGNALS	24hr LOAD	40	520w	1ea	520	
2	LED LUMINAIRES	GROUP 1	15	169w	2ea	338	
3	LED LUMINAIRES	GROUP 2	15	169w	2ea	338	
						TOTAL WATTS	1,196



NO.	REVISION	DATE	INIT.
6	RECORD OF CONSTRUCTION	2014-08-19	TC
5	LAYOUT REVISIONS	2014-07-10	TC
4	REVISIONS - ILLUMINATION CIRCUITS	2014-07-03	TC
3	REQUEST FOR QUOTATION	2014-04-22	TC
2	GENERAL REVISIONS	2013-10-29	TC
1	90% DESIGN REVIEW	2013-10-17	TC

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DRAFTING
TC

DESIGN
TC

CHECKED BY
HM, AS

APPROVED BY
HM



2013 SIGNAL REPLACEMENT PROGRAM
 REGIONAL ROAD 57 (THOROLD STONE ROAD) AT
 THOROLD STONE PLAZA ENTRANCE
 CITY OF NIAGARA FALLS
 WIRING SCHEMATIC

CONSULTANT FILE No. -	
DATE	OCTOBER 2013
SCALE	NTS
REF. No.	RN -
DWG No.	RR57_WS01
REV.	6

057PLZ