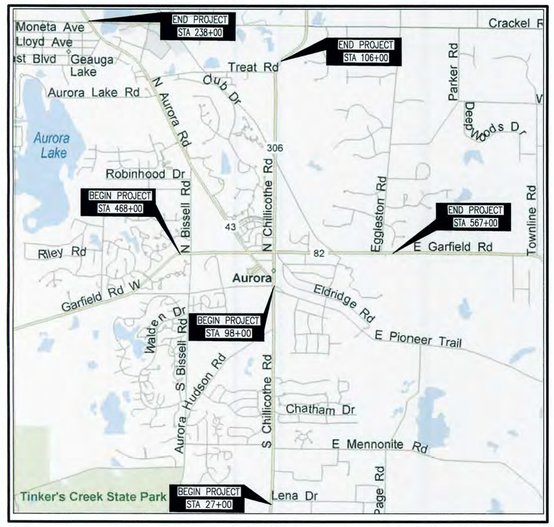
STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

POR-AURORA SIGNALS

CITY OF AURORA

PORTAGE COUNTY



LOCATION MAP

LATITUDE: 41°18′ 52″ N LONGITUDE: 81°50′ 07″ W

SCALE IN MILES

0 1 MILE

0 1000 2000 3000 4000 5000

PORTION TO BE IMPROVED _____

INTERSTATE & DIVIDED HIGHWAY _____

UNDIVIDED STATE & FEDERAL ROUTES _____

OTHER ROADS _____

DESIGN DESIGNATION

	AURORA ROAD (S.R. 43)	GARFIELD ROAD (S.R. 82)	S. CHILLICOTHE ROAD (S.R. 43)
OPENING A.D.T. (2022)	29,456	58,243	25,163
DESIGN YEAR A.D.T. (2042)	33,630	62,985	29,685
D.H.V. (2042)	3,363	6,299	2,968
DIRECTIONAL DISTRIBUTION	50%	50%	50%
TRUCKS (24 HOUR B&C)	2.5%	5%	2.5%
DESIGN SPEED	50/40 MPH	40 MPH	40/45 MPH
LEGAL SPEED	45/35 MPH	35 MPH	35/40 MPH

DESIGN FUNCTIONAL CLASSIFICATION: ARTERIALS (URBAN) ARTERIALS (URBAN) ARTERIALS (URBAN)

NHS PROJECT _____ NO

DESIGN EXCEPTIONS

NONE REQUIRED

ADA DESIGN WAIVERS

NONE REQUIRED

UNDERGROUND UTILITIES
Contact Two Working Days Before You Dig
OHIO811.org Before You Dig
OHIO811, 8-1-1, or 1-800-362-2764
(Non-members must be called directly)

PLAN PREPARED BY:

TMS Engineers, Inc.

2112 CASE PARKWAY SOUTH (UNIT #7)
TWINSBURG, OHIO 44087
(330) 686 - 6402 (330) 686 - 6417 FAX

ENGINEERS SEAL

STATE OF OHIO · MICHAEL WILLIAM SCHVEICKART · E-66882 · REGISTERED PROFESSIONAL ENGINEER

SIGNED: Michael W. Schveickart

DATE: 9-30-20

INDEX OF SHEETS:

STANDARD CONSTRUCTION DRAWINGS

BP-7.1	07/17/20		TC-21.20	07/20/18	TC-81.21	01/18/19	
			TC-22.20	01/17/14	TC-82.10	07/19/19	
HL-30.11	07/17/20		TC-41.20	10/18/13	TC-83.10	01/17/20	
HL-30.21	04/17/20		TC-42.20	10/18/13	TC-83.20	07/21/17	
HL-30.22	04/17/20		TC-52.10	10/18/13	TC-84.20	10/18/13	
			TC-52.20	07/20/18	TC-85.10	04/17/20	
			TC-71.10	01/19/18	TC-85.20	07/20/18	
MT-95.31	07/19/19						
MT-95.32	04/19/19						
MT-97.10	04/19/19						
MT-105.10	01/17/20						

SUPPLEMENTAL SPECIFICATIONS

800	10/16/20
804	07/17/20
809	07/17/20
816	10/18/19
824	01/18/19
825	01/17/20
832	10/19/18
904	07/17/20
907	10/18/19
916	01/19/18

SPECIAL PROVISIONS

NONE

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE UPGRADE OF EXISTING TRAFFIC SIGNALS THROUGHOUT THE CITY OF AURORA, OHIO 5 LOCATIONS ALONG AURORA ROAD, 7 LOCATIONS ALONG CHILICOTHE ROAD, 5 LOCATIONS ALONG GARFIELD ROAD, 1 LOCATION ON PIONEER TRAIL AND SCHOOL ZONE FLASHERS IN FOUR SCHOOL ZONES THROUGHOUT THE CITY. THE PROJECT WILL ALSO INCLUDE THE ADDITION OF FIBER OPTIC CABLE CONNECTION FOR 14 SIGNALIZED INTERSECTIONS AND HIGH SPEED ETHERNET RADIO AT 2 SIGNALIZED INTERSECTIONS WITHIN THE PROJECT LIMITS.

EARTH DISTURBED AREAS

PROJECT EARTH DISTURBED AREA:	N/A ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA:	N/A ACRES
NOTICE OF INTENT EARTH DISTURBED AREA:	N/A ACRES

2019 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

APPROVED _____
DATE 9-30-20 DIRECTOR OF PUBLIC SERVICES, CITY OF AURORA

APPROVED _____
DATE 9-30-20 ENGINEER, CITY OF AURORA

APPROVED _____
DATE _____ DISTRICT DEPUTY DIRECTOR

APPROVED _____
DATE _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO. E 180 (843)

PID NO. 107761

CONSTRUCTION PROJECT NO.

RAILROAD INVOLVEMENT NONE

POR-AURORA SIGNALS

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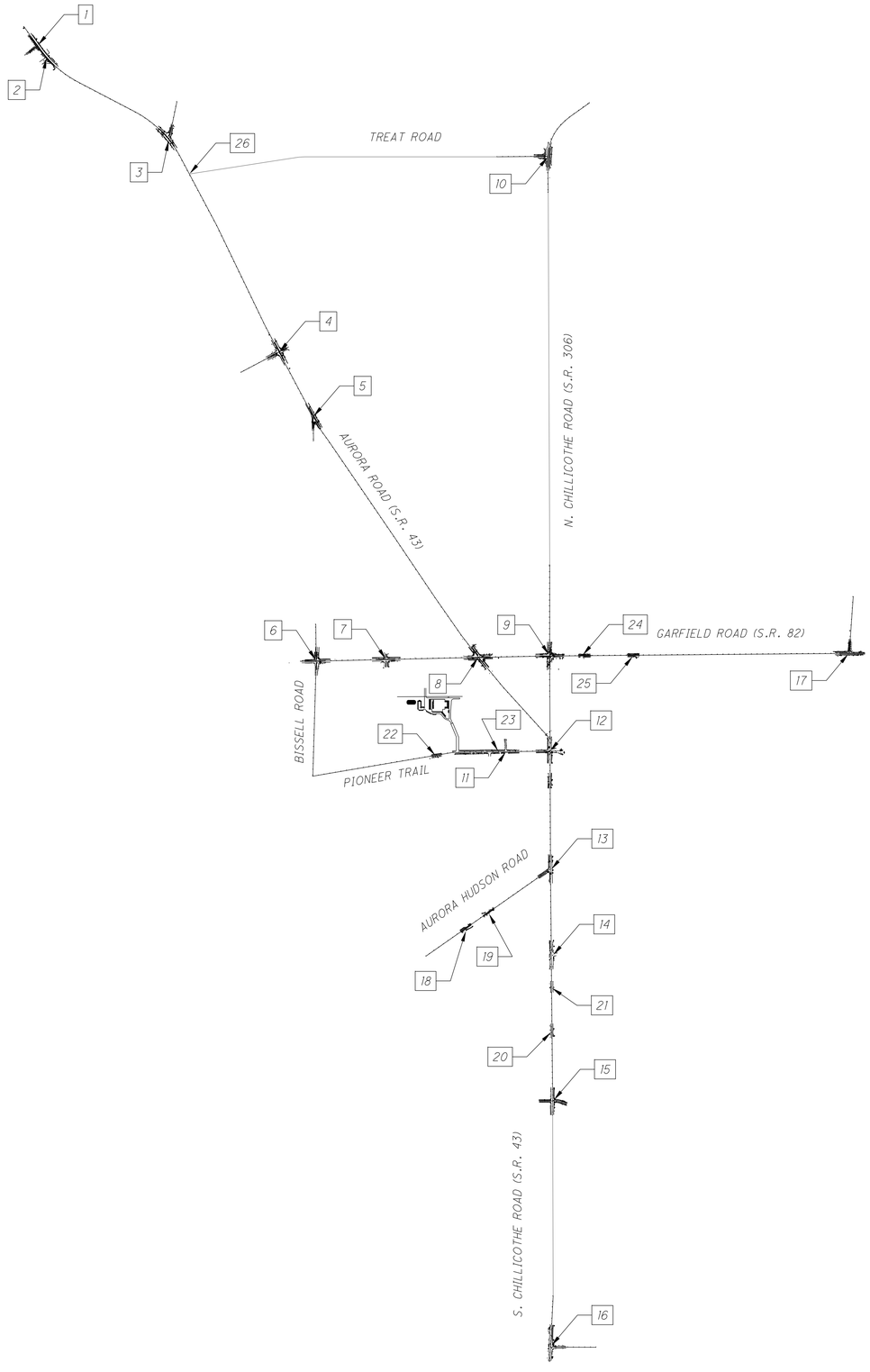


SCHEMATIC PLAN LEGEND

INTERSECTION NO.	DRAWING NAME	INTERSECTION	SHEET NO.
		TRAFFIC SIGNALS TO BE RECONSTRUCTED	
1		STATE ROUTE 43 & MONETA AVENUE	32-35
2		STATE ROUTE 43 & FIRE STATION NO. 2	36-39
6		GARFIELD ROAD, STATE ROUTE 82 & BISSELL ROAD	56-59
7		GARFIELD ROAD, STATE ROUTE 82 & AURORA COMMONS	60-63
8		STATE ROUTE 82 & STATE ROUTE 43	64-67
9		STATE ROUTE 82 & STATE ROUTE 306	68-71
10		STATE ROUTE 306 & TREAT ROAD	72-75
11		WEST PIONEER TRAIL & FIRE STATION NO. 1	76-79
13		STATE ROUTE 43 & AURORA-HUDSON ROAD	85-88
14		STATE ROUTE 43 & AURORA FARMS DRIVE	89-92
15		STATE ROUTE 43 & GREENBRIAR/CHATHAM DRIVE	93-96
16		STATE ROUTE 43 & LENA DRIVE	97-100
		TRAFFIC SIGNALS TO BE IMPROVED	
3		STATE ROUTE 43 & SQUIRES ROAD	40-43
26		STATE ROUTE 43 & TREAT ROAD	44-47
4		STATE ROUTE 43 & SYCAMORE DRIVE	48-51
5		STATE ROUTE 43 & BISSELL ROAD	52-55
12		STATE ROUTE 43/ STATE ROUTE 306/ PIONEER TRAIL	80-84
		TRAFFIC FLASHER TO BE RECONSTRUCTED	
17		STATE ROUTE 82 & EGGLESTON ROAD	101-103
		SCHOOL ZONE FLASHERS TO BE RECONSTRUCTED	
18		LEIGHTON E.S./ HARMON M.S. EASTBOUND	106
19		LEIGHTON E.S./ HARMON M.S. WESTBOUND	106
20		MILLER E.S. NORTHBOUND	107
21		MILLER E.S. SOUTHBOUND	107
24		CRADDOCK E.S. EASTBOUND	109
25		CRADDOCK E.S. WESTBOUND	109
		PROPOSED SCHOOL ZONE FLASHERS	
22		HIGH SCHOOL EASTBOUND	108
23		HIGH SCHOOL WESTBOUND	108

N

0 1500 3000 SCALE IN FEET

CALCULATED JAT
CHECKED MWS

SCHEMATIC PLAN

POR-AURORA SIGNALS

SCOPE

FURNISH LABOR, SUPPLIES, EQUIPMENT, AND MATERIALS AND PERFORM ALL OPERATIONS NECESSARY FOR THE ACCEPTABLE INSTALLATION OF THE TRAFFIC CONTROL DEVICES IN STRICT ACCORDANCE WITH THESE PLANS, NOTES AND SPECIFICATIONS. THESE NOTES, SCHEDULES AND DRAWINGS ARE INTENDED TO PROVIDE FOR ALL MATERIAL AND LABOR REQUIRED TO FURNISH AND INSTALL A COMPLETE TRAFFIC CONTROL SYSTEM.

UTILITIES

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

WATER, SANITARY & STORM
CITY OF AURORA
WATER & SEWER DEPARTMENT
ATTN: MIKE REKER
158 W. PIONEER TRAIL
AURORA, OHIO 44202
(330) 562-8662

ELECTRIC
OHIO EDISON-AKRON
ATTN: DAVID MILLER
1910 W. MARKET STREET
BLDG 1
AKRON, OHIO 44313
(330) 436-4055

GAS
DOMINION EAST OHIO GAS
ATTN: MATTHEW METZUNG
320 SPRINGSIDE DRIVE
SUITE 320
AKRON, OHIO 44333
(330) 664-4688
(330)-714-5577 CELL

COMMUNICATION
AT&T
THE OHIO BELL TELEPHONE COMPANY
ATTN: STEVEN HYLTON
50 W. BOWERY STREET
6TH FLOOR
AKRON, OHIO 44308
(330) 384-3055

CHARTER COMMUNICATIONS
(SPECTRUM)
ATTN: RON ICKES
5520 WHIPPLE AVE NW
N. CANTON OHIO 44720
(330) 494-9200

CALL OHIO UTILITIES PROTECTION SERVICE
TOLL FREE NO. 1-800-362-2764
TWO (2) WORKING DAYS BEFORE YOU DIG
THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

THE CITY OF AURORA SHALL BE CONSIDERED AS THE SULS CONSULTANT FOR THIS PROJECT IN- LIEU OF STANDARD SULS. THE CITY PERFORMED VARIOUS TEST HOLES AT CERTAIN SIGNAL FOUNDATION LOCATIONS PRIOR TO THIS PROJECT. FOR INFORMATION ON UNDERGROUND UTILITIES FOR THIS PROJECT THE CONTRACTOR MAY CONTACT THE CITY OF AURORA UTILITIES COORDINATOR, MR. MIKE REKER AT 330-562-8662 FOR FIELD ISSUES.

NOTIFICATION

NOTIFY, BY MAIL OR FAX, THE FOLLOWING AGENCIES AT LEAST ONE WEEK PRIOR TO THE START OF CONSTRUCTION, AND AT LEAST 72 HOURS BEFORE IMPLEMENTING ANY SUBSTANTIAL CHANGE IN TRAFFIC PATTERN OR DEACTIVATING ANY TRAFFIC SIGNAL CONTROLLERS:

THE AURORA BOARD OF EDUCATION:
102 E. GARFIELD RD., AURORA, OHIO 44202 330-562-6106

THE AURORA SERVICE DEPARTMENT:
158 W. PIONEER TRAIL, AURORA, OHIO 44202 330-995-9116

THE AURORA POLICE DEPARTMENT:
100 S. AURORA RD., AURORA, OHIO 44202 330-562-8181

THE AURORA FIRE DEPARTMENT:
65 W. PIONEER TRAIL, AURORA, OHIO 44202 330-562-7171

CONSTRUCTION NOISE

ACTIVITIES AND LAND USE ADJACENT TO THIS PROJECT MAY BE AFFECTED BY CONSTRUCTION NOISE. IN ORDER TO MINIMIZE ANY ADVERSE CONSTRUCTION NOISE IMPACTS, DO NOT OPERATE ANY POWER-OPERATED CONSTRUCTION-TYPE DEVICE BETWEEN THE HOURS OF 9:00 P.M. AND 7:00 A.M., MONDAY TO SATURDAY. NO WORK SHALL BE DONE ON SUNDAYS AND HOLIDAYS WITHOUT WRITTEN PERMISSION FROM THE MAYOR OF AURORA. IN ADDITION, DO NOT OPERATE ANY SUCH DEVICE AT ANY TIME IN SUCH A MANNER THAT THE NOISE CREATED SUBSTANTIALLY EXCEEDS THE NOISE CUSTOMARILY AND NECESSARILY ATTENDANT TO THE REASONABLE AND EFFICIENT PERFORMANCE OF SUCH EQUIPMENT.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 180 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS, AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY.

EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATION SHALL BE BORNE BY THE CONTRACTOR. THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: CONTROLLER, CABINET, UNINTERRUPTIBLE POWER SUPPLY, VEHICLE DETECTION EQUIPMENT, LED LAMP UNITS, NETWORK AND COMMUNICATIONS/INTERCONNECT EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO THE CITY OF AURORA FOLLOWING ACCEPTANCE OF THE EQUIPMENT. THE COST OF GUARANTEEING THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO AND INCLUDED IN THE CONTRACT UNIT PRICE OF THE VARIOUS ITEMS MAKING UP THE SYSTEM.

INSTALLATION LAYOUT

FURNISH AND PROVIDE AN OHIO LICENSED PROFESSIONAL SURVEYOR TO MARK AND LAYOUT THE TRAFFIC SIGNAL SUPPORTS AND ALL OTHER STATIONED SIGNAL ITEMS USING THE STATIONS AND OFFSETS PROVIDED IN THESE PLANS. HAVE THE SURVEYOR SET THE PROPER POLE AND CABINET FOUNDATION ELEVATIONS. HAVE THE ENGINEER APPROVE POLE FOUNDATION LOCATIONS AND ELEVATIONS PRIOR TO THE INSTALLATION OF ANY ITEM. INCUR COSTS FOR THIS SERVICE AND MAKE INCIDENTAL TO THE COST OF THE PROJECT OR PROVIDE UNDER THE "CONSTRUCTION LAYOUT STAKES" ITEM.

AURORA CENTER HISTORIC DISTRICT AVOIDANCE

THE FOLLOWING INTERSECTIONS ARE LOCATED WITHIN THE AURORA CENTER HISTORIC DISTRICT (NR# 74001601):

- STATE ROUTE 43 AND STATE ROUTE 306
- STATE ROUTE 43 AND PIONEER TRAIL
- STATE ROUTE 82 AND STATE ROUTE 306

ALL CONSTRUCTION OPERATIONS SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY AS INDICATED IN THE CONSTRUCTION PLAN. DISTURBANCE OF EXISTING STONE SIDEWALK AT THE ABOVE IDENTIFIED INTERSECTION LOCATIONS IS PROHIBITED. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR STORE EQUIPMENT AND/OR MATERIALS OUTSIDE OF THE CONSTRUCTION LIMITS WITHIN THE AURORA CENTER HISTORIC DISTRICT OR OTHERWISE IMPACT THE AURORA CENTER HISTORIC DISTRICT BEYOND THE PROJECT RIGHT-OF-WAY LIMITS AS INDICATED IN THE CONSTRUCTION PLAN.

FLAGSTONE STONE SIDEWALK AVOIDANCE

FLAGSTONE SIDEWALK IS PRESENT WITHIN THE RIGHT-OF-WAY AT THE SOUTHWEST CORNER OF STATE ROUTE 82 / STATE ROUTE 306 INTERSECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR DISTURB FLAGSTONE STONE SIDEWALK AT THE STATE ROUTE 82 / STATE ROUTE 306 INTERSECTION OR ANY OTHER INTERSECTION LOCATION.

MAINTENANCE OF TRAFFIC SIGNAL/FLASHER INSTALLATION

BEFORE ANY WORK IS STARTED REPRESENTATIVES OF THE STATE, THE MAINTAINING AGENCY, AND THE CONTRACTOR SHALL MAKE A VISUAL INSPECTION OF THE EXISTING SIGNAL/FLASHER INSTALLATIONS TO BE MAINTAINED. DURING THIS INSPECTION A WRITTEN RECORD OF THE CONDITION OF THE EXISTING SIGNAL/FLASHER SHALL BE MADE BY THE STATE'S REPRESENTATIVE. THIS WRITTEN REPORT SHALL NOTE INDIVIDUAL ITEMS WHICH ARE NOT IN WORKING ORDER. THE COMPLETED REPORT SHALL BE SIGNED BY THE REPRESENTATIVES OF THE STATE, THE MAINTAINING AGENCY, AND THE CONTRACTOR.

AFTER THE REPORT HAS BEEN SIGNED BY ALL PARTIES, THE SIGNAL INSTALLATION SHALL BE TURNED OVER TO THE CONTRACTOR, WHO SHALL THEN BE REQUIRED TO MAINTAIN THE TRAFFIC SIGNAL INSTALLATIONS WITHIN THE PROJECT UNDER THE FOLLOWING CONDITIONS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC SIGNAL INSTALLATIONS ONCE THE SIGNAL HAS BEEN AFFECTED, WITHIN THE PROJECT UNDER THE FOLLOWING CONDITIONS:

A) EXISTING SIGNAL/FLASHER INSTALLATIONS WHICH THE PLANS REQUIRE THE CONTRACTOR TO ADJUST, MODIFY, ADD ONTO OR REMOVE, OR WHICH THE CONTRACTOR ACTUALLY ADJUSTS, MODIFIES OR OTHERWISE DISTURBS INCLUDING DAMAGE DUE TO UTILITY RELOCATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENTIRE INSTALLATION AT AN INTERSECTION FROM THE TIME THE INSTALLATION IS FIRST DISTURBED, WHETHER FROM UTILITY WORK OR FROM THE CONTRACTOR UNTIL THE INSTALLATION HAS BEEN SUBSEQUENTLY REMOVED OR MODIFIED AND THE WORK IS ACCEPTED.

B) NEW OR REUSED SIGNAL/FLASHER INSTALLATIONS OR DEVICES, INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THESE FROM THE TIME OF INSTALLATION UNTIL THE THE WORK IS ACCEPTED.

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS. AT THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL PROVIDE THE MAINTAINING AGENCY AND THE PROJECT ENGINEER SUCH ADDRESSES AND PHONE NUMBERS WHERE HIS MAINTENANCE FORCES CAN BE CONTACTED. THE CONTRACTOR SHALL PROVIDE ONE OR MORE PERSONS TO RECEIVE ALL CALLS AND

DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MAY BE USED TO PERFORM OTHER DUTIES AS LONG AS PROMPT ATTENTION IS GIVEN TO THESE CALLS AND A PERSON IS READILY AVAILABLE CONTINUOUSLY 24 HOURS A DAY, 7 DAYS A WEEK. THE CONTRACTOR SHALL HAVE THE MALFUNCTION CORRECTED AND/ OR REPAIRED TO THE SATISFACTION OF THE ENGINEER WITHIN EIGHT HOURS OF THE NOTIFICATION OR LIQUIDATED DAMAGES OF $500 PER HOUR SHALL BE ASSESSED TO THE CONTRACTOR.

ALL LAMP OUTAGES, CABLE OUTAGES, ELECTRICAL FAILURES, EQUIPMENT MALFUNCTIONS AND MISALIGNED SIGNAL HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE PROJECT ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN FOUR HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF THE OUTAGES.

IN THE EVENT NEW SIGNALS ARE DAMAGED PRIOR TO ACCEPTANCE, ALL DAMAGED EQUIPMENT, EXCEPT POLES AND CONTROL EQUIPMENT, SHALL BE REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE PROJECT ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN EIGHT HOURS AFTER THE CONTRACTOR IS NOTIFIED OF THE OUTAGE. THE CONTRACTOR SHALL ARRANGE FOR FULL TRAFFIC CONTROL UNTIL THE SIGNAL IS BACK IN OPERATION.

IF POLES AND/OR CONTROL EQUIPMENT ARE DAMAGED AND MUST BE REPLACED, THE CONTRACTOR SHALL MAKE TEMPORARY REPAIRS AS NECESSARY TO BRING THE SIGNAL BACK INTO FULL OPERATION WITHIN THE ALLOWED EIGHT HOUR PERIOD, AND SHALL MAKE PERMANENT REPAIRS OR REPLACEMENT AS SOON AS POSSIBLE.

NONE OF THE ABOVE SHALL BE CONSTRUED AS COLLECTIVE OR CONSECUTIVE OUTAGE TIME PERIODS AT ANY ONE LOCATION. THAT IS, WHERE MORE THAN ONE OUTAGE OCCURS AT ANY ONE LOCATION, THEN THE ALLOTTED TIME LIMIT SHALL BE FOR THE WORST SINGLE OUTAGE.

WHERE OUTAGES ARE THE DIRECT RESULT OF A VEHICLE ACCIDENT THE RESPONSE OF THE CONTRACTOR SHALL BE AS OUTLINED ABOVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COLLECTION OF ANY COMPENSATION FOR THIS WORK FROM THOSE PARTIES RESPONSIBLE FOR THE DAMAGES AS PER 107.15.

CONTINUED ON SHEET 4

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

POR-AURORA SIGNALS

MAINTENANCE OF TRAFFIC SIGNAL/FLASHER INSTALLATION (CONT.)

WHERE THE CONTRACTOR HAS FAILED TO, OR CANNOT RESPOND TO, AN OUTAGE OR SIGNAL EQUIPMENT MALFUNCTION, AT THESE LOCATIONS WITHIN HIS RESPONSIBILITY, WITHIN PERIODS AS SPECIFIED ABOVE, THE PROJECT ENGINEER MAY INVOKE THE PROVISIONS OF SECTION 105.15 AND ANY SUBSEQUENT BILLINGS TO THE STATE OF THE CITY OF AURORA FOR POLICE AND MAINTENANCE SERVICES BY STATE OR CITY FORCES SHALL BE DEDUCTED FROM MONEYS DUE OR TO BECOME DUE TO THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15. IN ADDITION TO THESE BILLINGS, THE CONTRACTOR SHALL BE ASSESSED LIQUIDATED DAMAGES OF $500/HOUR FOR EACH HOUR BEYOND THE ALLOWED EIGHT HOUR PERIOD THAT THE SIGNAL IS INOPERATIVE.

THE CONTRACTOR SHALL PROVIDE THE MAINTENANCE SERVICES ENTIRELY WITH HIS FORCES OR HE MAY CHOOSE TO ENTER INTO A MUTUALLY ACCEPTABLE AGREEMENT WITH THE LOCAL MAINTAINING AGENCY TO PROVIDE THE MAINTENANCE.

THE CONTRACTOR SHALL INFORM THE PROJECT ENGINEER, IN WRITING, OF THE MAINTENANCE METHOD SELECTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY TRAFFIC SIGNAL COMPONENTS REQUIRED TO BE HANDLED DURING THE RELOCATION OF POLES AND REVISIONS TO THE SIGNAL SYSTEM.

WHEN A TRAFFIC SIGNAL MUST BE TAKEN OUT OF SERVICE BY THE CONTRACTOR, DUE TO CONSTRUCTION PROCEDURES, THIS OUTAGE SHALL NOT EXCEED FOUR HOURS AND SHALL NOT INCLUDE THE HOURS OF 9:00PM TO 7:00AM, MONDAY THRU SATURDAY, ALL DAY SUNDAY AND HOLIDAYS WITHOUT WRITTEN PERMISSION FROM THE MAYOR OF AURORA. ANY SIGNALIZED INTERSECTION, WHERE THE SIGNAL IS OUT OF SERVICE DUE TO CONSTRUCTION PROCEDURES, OR DUE TO AN OUTAGE OR MALFUNCTION OF EQUIPMENT AS DESCRIBED ABOVE, SHALL BE PROTECTED, BY THE CONTRACTOR, BY THE INSTALLATION OF TEMPORARY "STOP" SIGNS, EXCEPT FOR THE FOLLOWING INTERSECTIONS WHICH SHALL BE PROTECTED BY OFF-DUTY POLICE, HIRED BY THE CONTRACTOR:

1. S.R. 82 & S.R. 43
2. S.R. 83 & S.R. 306
3. PIONEER TRAIL & S.R.43/ S.R. 306

ANY VEHICULAR TRAFFIC SIGNAL HEAD, EITHER NEW OR EXISTING WHICH WILL BE OUT OF OPERATION SHALL BE COVERED, AS DESCRIBED IN 632.25.

THE CONTRACTOR SHALL MAINTAIN COMPLETE RECORDS OF MALFUNCTIONS INCLUDING: 1. TIME OF NOTIFICATION OF MALFUNCTION; 2. TIME OF WORK CREWS ARRIVAL TO CORRECT THE MALFUNCTION; 3. ACTIONS TAKEN TO CORRECT THE MALFUNCTION, INCLUDING A LIST OF PARTS REPAIRED OR REPLACED; 4. A DIAGNOSIS OF REASON FOR THE MALFUNCTION AND PROBABILITY OF REOCCURRENCE; AND 5. TIME OF COMPLETION OF REPAIR AND SYSTEM RESTORED TO FULL SERVICE. A COPY OF THESE RECORDS SHALL BE PROVIDED TO THE ENGINEER WITHIN THREE (3) WORKING DAYS FOLLOWING COMPLETION OF EACH REPAIR.

ALL COSTS RESULTING FROM THE ABOVE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 - MAINTAINING TRAFFIC.

GROUNDING AND BONDING

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (C&MS) AND THE HL AND TC SERIES OF STANDARD CONSTRUCTION DRAWINGS ARE MODIFIED AS FOLLOWS:

1. ALL METALLIC PARTS CONTAINING ELECTRICAL CONDUCTORS SHALL BE PERMANENTLY JOINED TO FORM AN EFFECTIVE GROUND FAULT CURRENT PATH BACK TO THE GROUNDED CONDUCTOR IN THE POWER SERVICE DISCONNECT SWITCH.

   a. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN METALLIC CONDUITS (725.04) IN ADDITION TO THE CONDUCTORS SPECIFIED AND BOND THE CONDUIT TO THIS GROUNDING CONDUCTOR.

   b. WHEN AN EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED IN PLASTIC CONDUIT (725.05). THE INSTALLATION SHALL INCLUDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN ADDITION TO THE CONDUCTORS SPECIFIED.

   c. METALLIC CONDUIT CARRYING THE LOOP WIRES FROM IN THE PAVEMENT TO THE PULL BOX SPLICE LOCATION WILL ONLY BE BONDED AT THE PULL BOX AND WILL NOT CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR.

   d. IF MULTIPLE CONDUIT RUNS BEGIN AND END AT THE SAME POINTS, ONLY ONE EQUIPMENT GROUNDING CONDUCTOR IS REQUIRED.

   e. IF AN EQUIPMENT GROUNDING CONDUCTOR IS NEEDED IN CONDUIT BETWEEN SIGNALIZED INTERSECTIONS FOR UNDERGROUND INTERCONNECT CABLE, THE GROUNDING SYSTEM FOR EACH SIGNALIZED INTERSECTION WILL BE SEPARATED ABOUT MIDWAY BETWEEN THE INTERSECTIONS.

   f. THE MESSENGER WIRE AT SIGNALIZED INTERSECTIONS WILL BE USED AS THE CONDUCTIVE PATH FROM CORNER TO CORNER IF CONDUIT IS NOT PROVIDED UNDER THE ROADWAY. WHEN CONDUIT CONNECTS THE CORNERS OF AN INTERSECTION, AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE USED IN THE CONDUIT.

2. CONDUITS

   a. THE 725.04 CONDUIT SHALL HAVE GROUNDING BUSHINGS INSTALLED AT ALL TERMINATION POINTS. THE BUSHING THE MATERIAL SHALL BE COMPATIBLE WITH GALVANIZED STEEL CONDUIT AND THE GROUNDING LUG MATERIAL SHALL BE COMPATIBLE FOR USE WITH COPPER WIRE. THREADED OR COMPRESSION TYPE BUSHINGS MAY BE USED.

   b. THE 725.05 CONDUIT SHALL HAVE THE INSIDE AND OUTSIDE DIAMETERS OF THE CONDUIT DEBURRED AT ALL TERMINATION POINTS.

   c. BOTH ENDS OF METALLIC CONDUIT SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.

   d. METALLIC CONDUIT MAY BE BONDED TO METALLIC BOXES THROUGH THE USE OF CONDUIT FITTINGS. UL APPROVED FOR THIS TYPE OF CONNECTION, WITH THE BOX BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.

3. WIRE FOR GROUNDING AND BONDING.

   a. USE INSULATED, COPPER WIRE FOR THE EQUIPMENT GROUNDING CONDUCTOR. BONDING JUMPERS IN BOXES AND ENCLOSURES MAY BE BARE OR INSULATED COPPER WIRE. WIRE SIZE SHALL BE AS FOLLOWS:

      - USE 4 AWG BETWEEN THE POWER SERVICE AND SUPPORTS, POLES, PEDESTALS, CONTROLLER OR FLASHER CABINETS.
      - USE A MINIMUM 8 AWG BETWEEN LOOP DETECTOR PULL BOXES AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE.
      - USE A MINIMUM 8 AWG BETWEEN THE "PREPARE TO STOP WHEN FLASHING" INSTALLATION (INCLUDING SUPPORT) AND THE FIRST CONDUIT THAT REQUIRES A LARGER SIZE AS SPECIFIED IN 3.A.I ABOVE
      - THE INSULATION SHALL BE GREEN OR GREEN WITH YELLOW STRIPE(S). FOR 4 AWG OR LARGER, INSULATION MAY ALSO BE BLACK WITH GREEN TAPE/LABELS INSTALLED AT ALL ACCESS POINTS

   b. IN A HIGHWAY LIGHTING SYSTEM, THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE THE SAME WIRE SIZE AS THE DUCT CABLE OR DISTRIBUTION CABLE CIRCUIT CONDUCTORS, WITH THE MINIMUM CONDUCTOR SIZE OF 4 AWG. BONDING JUMPERS WILL BE MINIMUM SIZE 4 AWG.

4. GROUND ROD.

   a. A ¾ INCH SCHEDULE 40 PVC CONDUIT WILL BE USED IN FOUNDATIONS AND CONCRETE WALLS FOR THE GROUNDING CONDUCTOR (GROUND WIRE) RACEWAY TO THE GROUND ROD. SHOULD METALLIC CONDUIT BE USED, BOTH ENDS OF THE CONDUIT SHALL BE BONDED TO THE GROUNDING CONDUCTOR.

   b. THE TYPICAL GROUNDING CONDUCTOR (GROUND WIRE) SHALL BE 4 AWG INSULATED COPPER.

5. THE GREEN CONDUCTOR IN SIGNAL CABLES (CONDUCTOR #4) SHALL NOT BE USED TO SUPPLY POWER TO A SIGNAL INDICATION. IT WILL BE CONNECTED TO THE SIGNAL BODY AS AN EQUIPMENT GROUND IN ALUMINUM HEADS AND IT WILL BE UNUSED IN PLASTIC HEADS. UNUSED CONDUCTORS SHALL BE GROUNDED IN THE CABINET. TYPICAL USE OF CONDUCTORS IS AS FOLLOWS:

COND. NO.	COLOR	VEHICLE SIGNAL	PEDESTRIAN SIGNAL
1	BLACK	GREEN BALL	#1 WALK
2	WHITE	AC NEUTRAL	AC NEUTRAL
3	RED	RED BALL	#1 DW/FDW
4	GREEN	EQUIP GND	EQUIP GND
5	ORANGE	YELLOW BALL	#2 DW/FDW
6	BLUE	GREEN ARROW	#2 WALK
7	WHITE/BLK ST	YELLOW ARROW	NOT USED

6. POWER SERVICE AND DISCONNECT SWITCH.

   a. AT THE POWER SERVICE LOCATION, THE GROUNDING CONDUCTOR (GROUND WIRE) FROM THE DISCONNECT SWITCH NEUTRAL (AC-) BAR TO THE GROUND ROD SHALL BE A CONTINUOUS, UNSPLICED CONDUCTOR. IF SPLICED, IT SHALL BE AN EXOTHERMIC WELD BUTT SPLICE.

   b. THE SERVICE NEUTRAL(AC-) SHALL ONLY BE CONNECTED TO GROUND AT THE PRIMARY POWER SERVICE DISCONNECT SWITCH.

      - NEMA CONTROLLER CABINETS: IF A POWER SERVICE DISCONNECT SWITCH IS LOCATED BEFORE THE CONTROLLER CABINET, THE NEUTRAL (AC-) AND THE GROUNDING BARS IN THE CONTROLLER CABINET SHALL NOT BE CONNECTED TOGETHER AS SHOWN IN NEMA TS-2, FIGURE 5-4.
      - IF SECONDARY DISCONNECT SWITCHES ARE CONNECTED AFTER THE PRIMARY DISCONNECT SWITCH, THE NEUTRAL (AC-) SHALL ONLY BE GROUNDED AT THE PRIMARY SWITCH. EQUIPMENT GROUNDING CONDUCTORS SHALL BE BROUGHT TO THE PRIMARY SWITCH, BUT SHALL BE GROUNDED AT BOTH SECONDARY AND PRIMARY SWITCHES.

7. PAYMENT.

   a. ALL MATERIALS AND WORK REQUIRED TO COMPLETE THE EFFECTIVE GROUND FAULT CURRENT PATH SYSTEM ARE INCIDENTAL TO THE CONDUCTORS INSTALLED BY CONTRACT.

TRENCHING UNDER EXISTING SIDEWALKS

WHERE CONDUIT FOR NEW TRAFFIC SIGNALS OR TRAFFIC SIGNAL INTERCONNECTION IS TO BE INSTALLED IN TRENCHES UNDER EXISTING SIDEWALK, DRIVE APRONS OR CURB RAMPS, REMOVE THE EXISTING SIDEWALK AND/OR CURB RAMPS UNDER ITEM 202 - WALK REMOVED, AS PER PLAN, AND INSTALL NEW SIDEWALK, DRIVE APRONS AND CURB RAMPS UNDER THE APPROPRIATE PAVING ITEMS. REMOVE AND INSTALL SIDEWALK IN WHOLE SLABS. THE TRENCHING NECESSARY TO INSTALL THE CONDUIT SHALL BE PAID UNDER ITEM 625 - TRENCH, INSTEAD OF UNDER ITEM 625 - TRENCH IN PAVED AREAS, TYPE A. THE REMOVAL AND RESTORATION OF THE PAVEMENT SHALL BE PAID UNDER THE RESPECTIVE REMOVAL AND PAVING ITEMS.

QUANTITIES: THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM	DESCRIPTION	QUANTITY
202	WALK REMOVED, AS PER PLAN	1200 SQ FT
410	TRAFFIC COMPACTED SURFACE, TYPE A	22 CU YD
608	4" CONCRETE WALK	1200 SQ FT
608	CURB RAMP	90 SQ FT
608	DETECTABLE WARNING	24 SQ FT
659	SEEDING AND MULCHING	200 SQ YDS

DETECTION MAINTENANCE

IF VEHICLE DETECTION BECOMES UNEXPECTEDLY DISABLED, REQUIRES MODIFICATION, OR IS SCHEDULED TO BE TEMPORARILY REMOVED DURING THE CONSTRUCTION PROJECT, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER.

IF THE LOSS OF VEHICLE DETECTION IS KNOWN PRIOR TO THE START OF CONSTRUCTION, IT SHALL BE DISCUSSED AT THE PRE-CONSTRUCTION MEETING. AT SUCH TIME, THE DISTRICT TRAFFIC ENGINEER SHALL ADVISE THE PROJECT ENGINEER AND CONTRACTOR ON THE APPROPRIATE ACTION TO RECTIFY ANY LOSS OF VEHICLE DETECTION. THIS MAY INCLUDE PLACING THE TRAFFIC SIGNAL ON MINIMUM OR MAXIMUM RECALL, MODIFYING THE MINIMUM GREEN TIMES, AND REMOVING THE MALFUNCTIONING DETECTION FROM SERVICE. WHERE NON-INTRUSIVE DETECTION (I.E. VIDEO, RADAR) ALREADY EXISTS, THE CONTRACTOR SHALL INSURE THAT DETECTION IS OPERATING AND MAINTAINED BY RECONFIGURING THE DETECTION UNITS ACCORDINGLY DURING ALL CONSTRUCTION PHASES. THIS IS TO AVOID THE SIGNAL FROM MAXING OUT THE EFFECTED SIGNAL PHASE AND CREATING UNNECESSARY DELAYS.

LOCATIONS WHERE NON-INTRUSIVE DETECTION IS PROPOSED AND THE EXISTING VEHICLE DETECTION IS TO BE ABANDON, THE NON-INTRUSIVE VEHICLE DETECTION SHALL BE INSTALLED, CONFIGURED AND MADE FULLY FUNCTIONAL PRIOR TO THE EXISTING DETECTION BEING DISABLED. THE CONTRACTOR SHALL CONTINUE TO MAINTAIN AND MODIFY THE DETECTION UNTIL FINAL ACCEPTANCE OF THE TRAFFIC SIGNAL. THIS IS TO ENSURE VEHICLE DETECTION REMAINS FULLY FUNCTIONAL THROUGHOUT CONSTRUCTION.

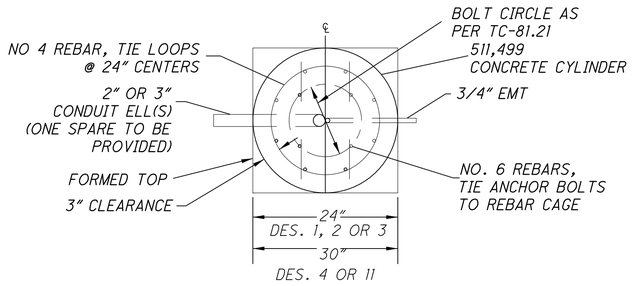
CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

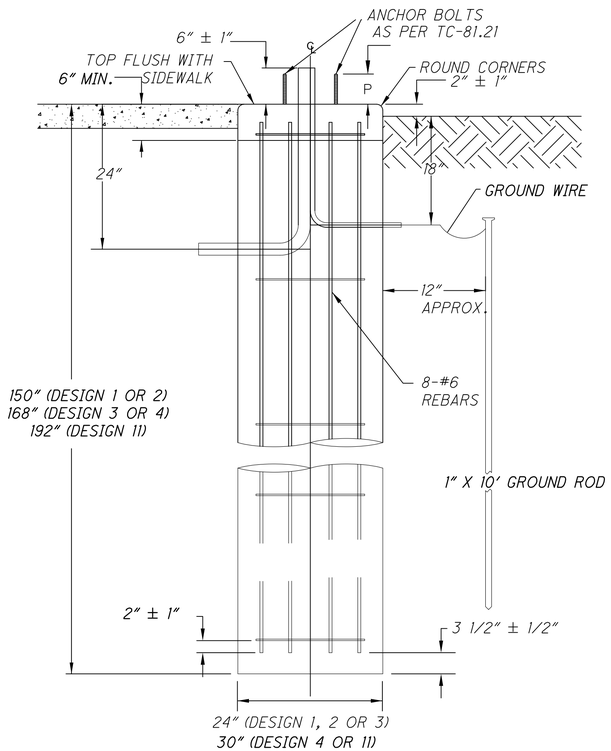
POR-AURORA SIGNALS

ALTERNATE FOUNDATIONS

IF UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED THAT PRECLUDE THE USE OF THE STANDARD FOUNDATION DESIGN, SUBSTITUTE THE ALTERNATIVE FOUNDATION SHOWN IN THE DETAIL ON THIS SHEET, FOR DESIGN 1, 2, 3, 4, OR 11 POLES, IF DIRECTED BY THE ENGINEER.



PLAN VIEW



ELEVATION VIEW

ALTERNATE FOUNDATION DETAIL

FOR DESIGN 1, 2, 3, 4 OR 11 POLES

SIGNAL SUPPORT POLE FOUNDATION ELEVATIONS

ELEVATIONS SHOWN IN THE PLANS FOR SIGNAL SUPPORT POLE FOUNDATIONS ARE FOR COMPUTATIONAL PURPOSES ONLY. THE ACTUAL ELEVATION OF THE FOUNDATION SHALL BE IN ACCORDANCE WITH SCD TC-21.20 PROVIDED THE EXISTING SLOPE IS LESS THAN 6:1.

AT LOCATIONS WHERE THE EXISTING SLOPE IS 6:1 OR GREATER, THE BURIED DEPTH OF FOUNDATION, AS SHOWN IN SCD TC-21.20 SHALL APPLY TO THE LOW SIDE OF THE SLOPE. THE TOP OF THE FOUNDATION SHALL BE SET 2 INCHES ABOVE THE EXISTING SURFACE ON THE HIGH SIDE OF THE SLOPE. THE ADDITIONAL DEPTH OF FOUNDATION NECESSARY TO MEET THESE REQUIREMENTS SHALL BE ADDED TO THE FORMED TOP.

ITEM 202 - WALK REMOVED, AS PER PLAN

WHERE SHOWN ON THE PLANS, REMOVE ALL WALKS OR CURB RAMPS CONSTRUCTED OF CONCRETED OR ASPHALT IN ACCORDANCE WITH ITEM 202.

PAYMENT FOR ACCEPTED QUANTITIES OF "ITEM 202 - WALK REMOVED, AS PER PLAN SHALL BE MADE AT THE CONTRACT UNIT PRICE BID PER SQUARE FOOT FOR ITEM 202 - WALK REMOVED, AS PER PLAN.

ITEM 203 - EMBANKMENT, AS PER PLAN

THIS ITEM SHALL PROVIDE FOR THE PLACEMENT OF A TEMPORARY EMBANKMENT AT THE LOCATION IN THE PLANS. THE PURPOSE IS TO PROVIDE ACCESS BY THE CONTRACTOR TO THE LOCATION WHERE A TRAFFIC SIGNAL SUPPORT IS TO BE CONSTRUCTED. THE EMBANKMENT WILL BE PLACED TEMPORARILY AND REMOVED AFTER THE TRAFFIC SIGNAL IS CONSTRUCTED. THE TEMPORARY EMBANKMENT SHALL BE REMOVED AND THE AREA AT WHICH IT WAS PLACED RESTORED TO ITS FORMER CONDITION OR BETTER.

PAYMENT FOR ITEM 203, "EMBANKMENT, AS PER PLAN" SHALL BE MADE FOR THE QUANTITY OF CUBIC YARDS OF EMBANKMENT PLACED, INCLUDING REMOVAL AND WILL INCLUDE ALL SEEDING AND RESTORATION OF THE AREA AFFECTED BY ITS REMOVAL.

ITEM 614 - MAINTAINING TRAFFIC

MAINTAIN A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION AT ALL TIMES.

MAINTAIN SAFE AND SATISFACTORY ACCESS TO ABUTTING PROPERTY. THE CONTRACTOR SHALL MAINTAIN ADEQUATE PEDESTRIAN WALKS AT ALL INTERSECTIONS.

DIVERT TRAFFIC FROM NORMAL CHANNELS WITH PLASTIC DRUMS, FLASHING ARROW PANELS COMPLYING WITH MT-95.30, MT-95.32 AND TRAFFIC SIGNS AND PAVEMENT MARKINGS.

FURNISH, ERECT, MAINTAIN, AND REMOVE CONSTRUCTION TRAFFIC CONTROL DEVICES USED FOR THIS PROJECT CONFORMING TO THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, EXCEPT AS NOTED BELOW.

FURNISH AND MAINTAIN ALL NECESSARY SAFEGUARDS, SUCH AS BARRICADES, LIGHTING FLAGGERS, AND SUCH OTHER TRAFFIC CONTROL DEVICES AS PROVIDED IN ITEM 614, MAINTAINING TRAFFIC, SO AS TO AVOID DAMAGE AND/OR INJURY TO VEHICLES AND PERSONS USING THE ROADWAY DURING CONSTRUCTION.

RELOCATE ANY EXISTING TRAFFIC CONTROL DEVICES (SIGNS AND/OR TRAFFIC SIGNALS), LOCATED WITHIN THE WORK AREA, WHICH ARE REQUIRED FOR INTERIM OR PERMANENT TRAFFIC CONTROL, TO POINTS APPROVED BY THE ENGINEER. MAINTAIN APPROPRIATE TRAFFIC CONTROL DEVICES IN COMPLIANCE WITH THE MANUAL AT ALL TIMES.

THE ENGINEER WILL APPROVE THE LENGTH AND DURATION OF LANE CLOSURES AND/OR TRAFFIC RESTRICTIONS, WITH THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. THE ENGINEER WILL NOT PERMIT LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME.

PERFORM ALL WORK AND USE TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH ITEM 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AND THE OHIO MANUAL OF UNIFORMED TRAFFIC CONTROL DEVICES.

WALK TIE-IN FOR NEW CURB RAMP CONSTRUCTION

WHERE NEW CURB RAMPS ARE BEING INSTALLED, IT IS POSSIBLE ADDITIONAL SIDEWALK REMOVAL OR NEW WALK INSTALLATION MAY BE NEEDED TO TIE INTO THE EXISTING LAYOUT TO MEET DESIGN CRITERIA FOR ADA COMPLIANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:

ITEM	DESCRIPTION	QUANTITY
202	WALK REMOVED, AS PER PLAN	1200 SQ FT
608	4" CONCRETE WALK	1200 SQ FT

614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

--DURING A TRAFFIC SIGNAL INSTALLATION WHEN IMPACTING THE NORMAL FUNCTION OF THE SIGNAL OR THE FLOW OF TRAFFIC, OR WHEN TRAFFIC NEEDS TO BE DIRECTED THROUGH AN ENERGIZED TRAFFIC SIGNAL CONTRARY TO THE SIGNAL DISPLAY (E.G., DIRECTING MOTORISTS THROUGH A RED LIGHT).

IN GENERAL, LEOS SHOULD BE POSITIONED IN ADVANCE OF AND ON THE SAME SIDE AS THE LANE RESTRICTION OR AT THE POINT OF ROAD CLOSURE, AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH SIGNALIZED INTERSECTIONS IN WORK ZONES.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORIST FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE.

THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES.

THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE WHICH SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT.

LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 240 HOURS

THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

POR-AURORA SIGNALS

ITEM 625 - PULL BOX, MISC.: PULL BOX, 24"X35"X26"

PULL BOXES SHALL HAVE NOMINAL OPENING DIMENSIONS OF 24 INCHES BY 35 INCHES. MATERIALS SHALL CONFORM TO 725.06. THE WORD "TRAFFIC" SHALL BE INTEGRALLY CAST AS A PART OF THE COVER OR SECURELY FASTENED WITH CORROSION RESISTANT HARDWARE. THE SUPPLIED PULL BOXES SHALL SUPPORT A 20,000 POUND MINIMUM VERTICAL LOADING WITHOUT PERMANENT DAMAGE OR DEFLECTION TO THE UNIT. DISPOSE OF SURPLUS MATERIAL AND RESTORE DISTURBED FACILITIES AND SURFACES.

CONTRACTOR WILL UTILIZE PULL BOXES WITH A BELL SHAPED BOTTOM TO ENSURE BEND RADII OF FIBER OPTIC CABLE IS SATISFACTORY. THE LARGEST BEND RADIUS POSSIBLE SHALL BE MAINTAINED FOR THE FIBER OPTIC CABLE.

ALL COSTS RESULTING FROM THE ABOVE REQUIREMENTS SHALL BE INCLUDED IN THE UNIT PRICE BID PER EACH FOR ITEM 625, "PULL BOX, MISC.: PULL BOX, 24"X35"X26"."

IITEM 625 - ARC FLASH CALCULATIONS AND LABEL

THIS ITEM SHALL BE IN ACCORDANCE WITH SS 825 - ARC FLASH HAZARD CALCULATIONS AND EQUIPMENT LABEL. THE ARC FLASH HAZARD LABEL SHALL BE LOCATED IN EACH CONTROLLER CABINET AT EACH INTERSECTION.

THE CALCULATIONS FOR DETERMINING THE ARC FLASH HAZARD LEVEL REQUIRE A QUALIFIED ENGINEER AND SHALL CONFORM TO IEEE 1584-2002 AND ODOT C&MS 625 ITEMS.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING THE LABEL MADE FROM WHAT IS COMMONLY KNOWN AS "ENGINEER GRADE" SIGN SHEETING.

THE ARC FLASH CALCULATIONS AND LABEL SHALL BE PERFORMED AND LOCATED AT EACH PROPOSED CONTROLLER WHERE A PROPOSED POWER SOURCE IS USED.

ITEM 625 - ARC FLASH CALCULATIONS AND LABEL 16 EACH

ITEM 631 - SCHOOL SPEED LIMIT SIGN ASSEMBLY, 24" X 36", AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF 631, PROVIDE SCHOOL SPEED LIMIT SIGN ASSEMBLIES WITH THE FOLLOWING FEATURES:

EACH SCHOOL SPEED LIMIT SIGN ASSEMBLY SHALL HAVE A BACKWARD FACING BEACON FOR USE BY LAW ENFORCEMENT OFFICERS DURING THE OPERATION OF THE FLASHING SPEED LIMIT SIGNS. THE BEACON SHALL HAVE AN 8" DIAMETER AND SHALL BE YELLOW.

PAYMENT FOR ITEM 631, "SCHOOL SPEED LIMIT SIGN ASSEMBLY, 24" X 36", AS PER PLAN" SHALL BE MADE FOR THE NUMBER OF COMPLETE SCHOOL SPEED LIMIT SIGN ASSEMBLIES FURNISHED AND INSTALLED AT THE LOCATIONS SHOWN IN THE PLAN INCLUDING LABOR, EQUIPMENT AND MATERIALS TO PROVIDE FOR THIS ITEM OF WORK IN ACCORDANCE WITH SPECIFICATION 631.

ITEM 631 - REMOVAL MISC.: REMOVE EXISTING SCHOOL SPEED LIMIT SIGN ASSEMBLY

EXISTING SCHOOL SPEED LIMIT SIGN ASSEMBLIES, INCLUDING PEDESTALS, POLES, WIRING, PULL BOXES, TIMERS WITH ENCLOSURE AND OTHER INCIDENTAL ITEMS REQUIRED BY THE ENGINEER, SHALL BE REMOVED AT THE LOCATIONS SHOWN IN THE PLANS.

STORE THE FOLLOWING ITEMS FOR SALVAGE BY THE CITY OF AURORA:

SPEED LIMIT SIGN
TIMER WITH ENCLOSURE

DISPOSE OF ALL OTHER ITEMS.

ITEM 632 - VEHICULAR SIGNAL HEAD LED, (BY TYPE), AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF C&MS 632 AND 732, THE FOLLOWING REQUIREMENTS SHALL APPLY:

1. SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF BLACK POLYCARBONATE PLASTIC WITH VISORS AS SPECIFIED AND MEET ITE SPECIFICATION.
2. PROPER EXTERIOR COLORS SHALL BE OBTAINED BY USE OF COLORED PLASTIC MATERIAL RATHER THAN PAINTING.
3. THE ENTRANCE FITTING SHALL BE OF THE TRI-STUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING.
4. ALL SIGNAL HEADS (EXCEPT SIGNAL HEADS ATTACHED TO MESSENGER CABLES) SHALL BE RIGIDLY MOUNTED TO THE MAST ARM WITH THE RED LENS LOCATED IN FRONT OF THE MAST ARM.
5. THE LIGHT EMITTING DIODE (LED) SIGNAL LAMP UNITS SHALL BE LONG LIFE AND MEET REQUIREMENTS OF C&MS 732.04-C. THE CONTRACTOR SHALL PROVIDE THE ENGINEER, IN WRITING, WITH THE LED MANUFACTURER NAME, SERIAL NUMBER, PART NUMBER, DESCRIPTION OF LAMP, AND DATE OF MANUFACTURE FOR ALL LED UNITS THAT ARE TO BE USED IN THE SIGNAL HEAD PRIOR TO INSTALLATION, FOR ACCEPTANCE AND WARRANTY PURPOSES. THE LED UNITS SHALL HAVE A MINIMUM 15 YEAR WARRANTY.
6. SIGNAL HEAD SHALL HAVE MINIMUM WALL THICKNESS OF 0.11 INCHES.
7. SIGNAL HEADS SHALL HAVE BLACK BACKPLATES WITH YELLOW REFLECTIVE BORDER.
8. SIGNAL HEADS SHALL INCLUDE TUNNEL TYPE VISORS UNLESS OTHERWISE SPECIFIED IN THE PLANS.
9. APPLY A BEAD OF SILICONE TO THE SIGNAL HEAD, WASHER, AND ENTRANCE ADAPTER SERRATIONS TO PREVENT WATER INTRUSION. ALSO, FILL THE SPACE BETWEEN CONCENTRIC SERRATION RINGS ON THE TOP OF THE SIGNAL HEAD TO COMPLETELY EXCLUDE WATER FROM THE SPACE BETWEEN THE CONCENTRIC RINGS.

PAYMENT FOR ITEM 632 VEHICULAR SIGNAL HEAD, LED, YELLOW, (BY TYPE), AS PER PLAN SHALL BE MADE FOR COMPLETE SIGNAL HEAD FURNISHED AND INSTALLED, INCLUDING ALL LABOR, EQUIPMENT, MATERIALS, AND NEW ATTACHMENT HARDWARE.

ITEM 632 - PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF C&MS SECTIONS 632 AND 732, THE FOLLOWING REQUIREMENTS SHALL APPLY:

1. SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF BLACK POLYCARBONATE PLASTIC AND MEET I.T.E. SPECIFICATIONS.
2. PROPER EXTERIOR COLORS SHALL BE OBTAINED BY THE USE OF COLORED PLASTIC MATERIAL RATHER THAN PAINTING.
3. ATTACH PEDESTRIAN SIGNALS TO NON-DECORATIVE SIGNAL SUPPORTS USING THE OPTIONAL 2-PIECE HINGED BRACKET WITH STAINLESS STEEL FASTENERS AS PER TC-85.10. DO NOT BAND PEDESTRIAN SIGNAL HOUSING TO STEEL POLES.
4. THE PEDESTRIAN SIGNAL HEAD SHALL BE OF THE LED COUNTDOWN TYPE.
5. NEW ATTACHMENT HARDWARE AND FITTINGS SHALL BE USED.
6. THE LIGHT EMITTING DIODE (LED) MODULES SHALL MEET THE REQUIREMENTS OF C&MS 732.04-C. THE CONTRACTOR SHALL PROVIDE THE MUNICIPALITY, IN WRITING, WITH THE LED MANUFACTURER NAME, SERIAL NUMBER, PART NUMBER, DESCRIPTION OF LAMP AND DATE OF MANUFACTURE FOR ALL LED UNITS THAT ARE TO BE USED IN THE SIGNAL HEAD PRIOR TO INSTALLATION, FOR ACCEPTANCE AND WARRANTY PURPOSES.

PAYMENT FOR ITEM 632 - PEDESTRIAN SIGNAL HEAD (LED), (COUNTDOWN), TYPE D2, AS PER PLAN SHALL BE MADE FOR THE NUMBER OF COMPLETE SIGNAL HEADS FURNISHED AND INSTALLED, INCLUDING LABOR, EQUIPMENT, MATERIALS AND NEW ATTACHMENT HARDWARE.

ITEM 632 - PEDESTRIAN PUSHBUTTON, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF 632 AND 732.06, PROVIDE PEDESTRIAN PUSHBUTTONS WITH THE FOLLOWING FEATURES:

FURNISH PUSHBUTTONS THAT ARE RATED AS WATERPROOF AND WHICH INCORPORATE A SOLID NEOPRENE RUBBER GASKET TO SEAL ITSELF AGAINST MOISTURE. FURNISH PUSHBUTTONS WITH PIEZO DRIVEN SOLID-STATE SWITCHES, INDICATOR LIGHTS AND AUDIBLE TONES.

SEAL THE PUSHBUTTON HOUSING TO THE SIGNAL SUPPORT, PEDESTAL OR POLE WITH SILICONE SEALANT.

PAYMENT FOR ITEM 632 - PEDESTRIAN PUSHBUTTON, AS PER PLAN SHALL BE MADE FOR THE NUMBER OF COMPLETE PEDESTRIAN PUSHBUTTON FURNISHED, INSTALLED AND TESTED, INCLUDING LABOR, EQUIPMENT, MATERIALS AND NEW ATTACHMENT HARDWARE AT LOCATIONS SHOWN IN THE PLAN.

ITEM 632 - POWER SERVICE, AS PER PLAN

POWER SERVICE SHALL BE AS PER CMS 632.24 AND STANDARD CONSTRUCTION DRAWING TC-83.10. POWER SERVICE SHALL ALSO INCLUDE THE FOLLOWING:

FURNISH DISCONNECT SWITCH ENCLOSURES IN ACCORDANCE WITH ITEM 632, POWER SERVICE, AS PER PLAN. INCLUDE A PADLOCK EQUAL TO WILSON BOHANNON 660, WITH LOCK BODY AND SHACKLE OF BRONZE OR BRASS AND KEYING TO THE STATE MASTER. FURNISH ALL CONDUIT AND FITTINGS IN GALVANIZED STEEL AS PER CMS 725.04. FURNISH CONDUIT RISERS AT 1-1/2" MINIMUM DIAMETER.

REQUEST AND SCHEDULE ANY INSPECTIONS THE POWER COMPANY MAY REQUIRE FOR THE POWER SERVICE HOOKUP. CONTACT THE POWER COMPANY FOR ELECTRICAL SERVICE CONNECTION. DO NOT SPLICE POWER CABLES INTO THE POWER COMPANY'S CIRCUITS. PROVIDE A NOMINAL 120 VOLT CURRENT, SINGLE PHASE, THREE WIRE POWER SERVICE. OBTAIN ANY NECESSARY PERMITS AND PAY ALL FEES RELATING TO THE POWER SERVICE CONNECTION. PAY ALL POWER CHARGES UNTIL THE SIGNAL IS ACCEPTED BY THE MAINTAINING AGENCY.

IN ADDITION TO THE REQUIREMENTS OF THIS NOTE, PAYMENT WILL INCLUDE ALL NECESSARY LABOR, MISCELLANEOUS HARDWARE AND EQUIPMENT REQUIRED TO PROVIDE FOR THIS ITEM OF WORK IN ACCORDANCE WITH SPECIFICATION 632. PAYMENT WILL BE AT THE CONTRACT UNIT PRICE PER EACH.

632 SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-81.21 MAST ARM (GREATER THAN 39' IN LENGTH), AS PER PLAN

THIS ITEM SHALL CONSIST OF THE CONTRACTOR INSTALLING A TUNED MASS-SPRING TYPE ON A TC-81.22 MAST ARM SIGNAL SUPPORT TO REDUCE THE POSSIBILITY OF HARMONIC VIBRATIONS CAUSED BY WIND LOADS. A MECHANICAL DAMPER SHALL BE APPLIED TO ALL MAST ARMS OVER 39 FEET IN LENGTH. THE INSTALLED DAMPER SHALL BE CAPABLE OF REDUCING THE LOADED MAXIMUM VERTICAL MOVEMENT AT THE TIP OF THE ARM TO 8 INCHES MEASURED FROM THE HIGHEST TO THE LOWEST POINT OF DEFLECTION AT WINDS SPEEDS OF 5-20 MPH. THE DAMPER SHALL INCREASE THE INHERENT DAMPING RATIO OF A TYPICAL UNLEADED MAST ARM SUPPORT (fn= 1-2 Hz) BY 0.01. THIS INCREASE SHALL BE DOCUMENTED BY LABORATORY TESTING AVAILABLE FROM THE MANUFACTURER

ALL ATTACHMENT HARDWARE CONNECTIONS SHALL BE STAINLESS STEEL. THE DAMPER SHALL BE ATTACHED TO THE ARM WITHIN 8 FEET OF MAST ARM TIP. INSTALLATION SHALL BE PER THE MANUFACTURER'S GUIDELINES. STATIC DAMPERS SUCH AS HORIZONTAL FLAT SIGN MOUNTINGS SHALL NOT BE USED. ACCEPTABLE DEVICES INCLUDE THE FOLLOWING OR APPROVED EQUAL:

1. VALMONT STRUCTURES MITIGATOR - MODELTRI

PAYMENT FOR ITEM 632 "SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-81.22 MAST ARM (GREATER THAN 39' IN LENGTH), AS PER PLAN" SHALL BE MADE AT THE CONTRACT UNIT PRICE PER EACH COMPLETE AND IN PLACE, AND SHALL INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE WORK.

ITEM 632 - SIGNAL SUPPORT, TYPE TC-81.21, AS PER PLAN
ITEM 632 - PEDESTAL, 8' TRANSFORMER BASE, AS PER PLAN

DUE TO THE POSSIBILITY OF CONFLICT WITH EXISTING OR PROPOSED UNDERGROUND OBSTRUCTIONS (INCLUDING THE POSSIBILITY OF UNRECORDED OBSTRUCTIONS) WHICH COULD AFFECT THE LOCATION OF THE FOUNDATIONS FOR THESE ITEMS, AND CONSEQUENTLY, THE DESIGN OF THE VARIOUS SUPPORTS, AND/OR ARMS. DO NOT PLACE FINAL ORDERS FOR THE SUPPORTS UNTIL THE FOUNDATIONS HAVE BEEN INSTALLED, AND WRITTEN NOTICE TO PROCEED WITH THE ORDERS FOR THESE ITEMS HAS BEEN RECEIVED FROM THE ENGINEER.

IF ANY FOUNDATION LOCATIONS MUST BE ADJUSTED, NOTIFY THE ENGINEER, WHO WILL DETERMINE THE REVISED LOCATIONS AND IF ANY SUPPORT DESIGN CHANGES ARE NECESSARY, IN CONSULTATION WITH THE MAINTAINING AGENCY. THE CONTRACTOR WILL NOT BE RESPONSIBLE FOR DETERMINING THE REVISED DESIGN. THE ENGINEER WILL SUBSEQUENTLY INFORM THE CONTRACTOR OF ANY CHANGES NECESSARY, AND AUTHORIZE HIM TO ORDER THE SUPPORTS.

WHEN DEVELOPING THE PROGRESS SCHEDULE, ENSURE THAT THE FOUNDATIONS ARE INSTALLED AT THE EARLIEST TIME AS IS FEASIBLE AND PRACTICAL, AND INCLUDE SUFFICIENT TIME IN THE PROGRESS SCHEDULE FOR THE ORDERING, MANUFACTURE, DELIVERY, AND INSTALLATION OF THESE ITEMS AFTER THE FOUNDATIONS ARE IN PLACE.

PAYMENTS FOR DELIVERED MATERIALS WILL NOT BE MADE FOR THESE ITEMS UNTIL THE FOUNDATIONS ARE IN PLACE, AND IF CHANGES IN THE DESIGN OF THESE ITEMS ARE REQUIRED, NO PAYMENTS WILL BE MADE FOR ITEMS MANUFACTURED TO THE ORIGINAL DESIGNS.

TEM 632 - REMOVAL OF TRAFFIC SIGNAL INSTALLATION

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS, CABLE, MESSENGER WIRE, STRAIN POLES, CABINET, CONTROLLER, DOWN GUYS, PULL BOXES AND OTHER INCIDENTAL ITEMS REQUIRED BY THE ENGINEER, SHALL BE REMOVED IN ACCORDANCE WITH C&MS 632.26 AND AS INDICATED ON THE PLANS. STORE REMOVED ITEMS ON THE PROJECT FOR SALVAGE BY THE CITY OF AURORA IN ACCORDANCE WITH THE LISTING GIVEN HEREIN. ANY ITEMS NOT DESIGNATED FOR SALVAGE AND /OR ITEMS NOT SALVAGED BY THE MUNICIPALITY BY THE COMPLETION DATE SHALL, WHEN DIRECTED BY THE ENGINEER IN WRITING, BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.

STORE THE FOLLOWING ITEMS FOR SALVAGE:

SIGNAL HEADS, PUSHBUTTONS, CONTROLLERS, AND CABINETS

DISPOSE OF ALL REMOVED ITEMS INCLUDING:

SIGNAL SUPPORTS, STRAIN POLES, WOOD POLES, PEDESTALS, PULL BOXES, CABLE, MESSENGER WIRE, DOWN GUYS, PREEMPTION ITEMS, AND RADIO INTERCONNECT ANTENNAS.

ITEM 632 - REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM, REMOVAL OF PREEMPTION CONFIRMATION LIGHT

THE REMOVAL OF PREEMPTION CONFIRMATION LIGHT SHALL ALSO INCLUDE THE REMOVAL OF THE WIRING TO THE CONTROLLER. THE WIRING CAN BE UTILIZED TO PULL IN THE WIRING FOR THE NEW CONFIRMATION LIGHTS.

DISPOSE OF ALL REMOVED ITEMS INCLUDING THE CONFIRMATION LIGHT AND WIRING.

ITEM 632 - REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM, REMOVAL OF PREEMPTION DETECTOR

THE REMOVAL OF PREEMPTION DETECTORS SHALL ALSO INCLUDE THE REMOVAL OF THE WIRING TO THE CONTROLLER. THE WIRING CAN BE UTILIZED TO PULL IN THE WIRING FOR THE NEW PREEMPTION DETECTOR.

DISPOSE OF ALL REMOVED ITEMS INCLUDING THE PREEMPTION DETECTOR AND WIRING.

ITEM 632 - SIGNALIZATION, MISC.: FOUNDATION TEST HOLE

IF UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED THAT PRECLUDE THE USE OF THE STANDARD OR ALTERNATE FOUNDATION DESIGNS, PROVIDE THE ENGINEER WITH COMPLETE INFORMATION REGARDING THE OBSTRUCTION, INCLUDING TYPE (I.E. UTILITY), SIZE, DEPTH, AND LATERAL CLEARANCES TO THE SIDES OF THE FOUNDATION EXCAVATION. COVER THE FOUNDATION HOLE WITH A STEEL PLATE UNTIL THE ENGINEER DETERMINES IF A NEW FOUNDATION LOCATION WILL BE REQUIRED. IF DIRECTED BY THE ENGINEER, BACKFILL AND COMPACT THE HOLE AND RESTORE THE SURFACE AS DESCRIBED IN " RESTORATION OF DISTURBED AREAS."

PAYMENT WILL BE MADE FOR EACH FOUNDATION HOLE THAT MUST BE ABANDONED. PAYMENT FOR ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND OTHER INCIDENTALS, INCLUDING BACKFILL, COMPACTING, AND SURFACE RESTORATION, WILL BE AT THE CONTRACT UNIT PRICE BID FOR "ITEM 632 - SIGNALIZATION, MISC.: FOUNDATION TEST HOLE" FOR THE NUMBER EXCAVATED AND BACKFILLED. AN ESTIMATED QUANTITY OF FOUR (4) HAS BEEN CARRIED TO THE GENERAL SUMMARY AS A CONTINGENCY QUANTITY FOR USE AS DESCRIBED HEREIN.

ITEM 633 - CABINET, TYPE TS2, AS PER PLAN

THE CABINET SHALL BE FURNISHED AND INSTALLED ACCORDING TO CMS 633 AND 733 AND BE LISTED ON THE OFFICE OF TRAFFIC OPERATIONS TRAFFIC AUTHORIZED PRODUCTS (TAP) LIST.

THE GROUND MOUNTED CABINET SHALL BE A NEMA TS-2 CABINET SIZE 7 AND SHALL HAVE A MINIMUM OF THREE SHELVES. A CABINET GENERATOR POWER PANEL AS SHOWN IN THE PLAN INSERT SHEET NO. 14 SHALL BE INCLUDED. IF THE PLANS REQUIRE A BATTERY BACKUP UPS SYSTEM, THE CABINET SHALL BE A DOUBLE DOOR SYSTEM WITH A SEPARATE AND ISOLATED COMPARTMENT FOR THE UPS EQUIPMENT. THE MINIMUM SIZE SHALL BE 72" H X 60" W X 24" D UNLESS OTHERWISE SPECIFIED.

THE CABINET SHALL BE EQUIPPED WITH TWO 16-CHANNEL CABINET DETECTOR RACKS (CDR) INCLUDING BUS INTERFACE UNITS (BIU). THE LOOP DETECTOR TERMINATION PANEL FOR THE SECOND DETECTOR RACK SHALL BE OMITTED.

FURNISH A NEMA TS-2 TYPE 16 MALFUNCTION MANAGEMENT UNIT AS ALLOWED ON THE TAP/APPROVED PRODUCTS LIST. PROVIDE THE MMU UNIT WITH A LIQUID CRYSTAL DISPLAY AND AN ETHERNET PORT. THE MMU SHALL PASS ALL TESTS PERFORMED BY AN AUTOMATIC MONITOR TESTER. TEST RESULTS SHALL BE PRINTED AND SUPPLIED WITH EACH CABINET.

PROVIDE A MANUAL PUSHBUTTON WITH 10' EXTENSION CORD.

PAYMENT WILL BE MADE FOR "ITEM 633, CABINET, TYPE TS2, AS PER PLAN, AT THE CONTRACT PRICE BID FOR EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS, TESTED AND ACCEPTED.

ITEM 633 - CABINET FOUNDATION, AS PER PLAN
ITEM 633 - CONTROLLER WORK PAD, AS PER PLAN

THE SIZE OF THE CABINET FOUNDATION AND THE CONTROLLER WORK PAD SHALL BE INCREASED TO ACCOMMODATE THE PROPOSED CONTROLLER WITH UNINTERRUPTIBLE POWER SUPPLY (UPS), FROM THOSE SHOWN ON TC-83.20. THE CABINET FOUNDATION SHALL BE 70" W X 36" D X 36" H AND THE CONTROLLER WORK PAD SHALL BE 70" X 30". ALL OTHER DETAILS SHALL BE AS SHOWN ON TC-83.20.

ITEM 633 - UNINTERRUPTIBLE POWER SUPPLY, 1000 WATT, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF CMS 633 AND 733, THE CONTRACTOR SHALL FURNISH, INSTALL AND TEST UNINTERRUPTIBLE POWER SUPPLY (UPS) STATUS INDICATOR LAMPS THAT ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. A 1-INCH (25mm) WATERPROOF NEMA 4X OR IP66 LAMP RATED FOR OUTDOOR USE AND BE TAMPER SHATTER RESISTANT. IT SHALL BE A DOMED RED/GREEN LENS WITH LED THAT IS VISIBLE FROM 100 FEET MINIMUM AND SHALL BE USED TO INDICATE THE CABINET IS OR IS NOT OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION). THIS LAMP SHALL BE WIRED USING A MINIMUM 20 AWG STRANDED, INSULATED HOOKUP WIRE TO THE STATUS RELAY OUTPUTS OF THE UPS. THE WIRES SHALL BE TERMINATED BY LUGS AT THE DISPLAY END AND PERMANENTLY LABELED "BACKUP POWER STATUS DISPLAY", WITH WIRE POLARITY INDICATED. THIS ITEM SHALL INCLUDE PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THE STATUS DISPLAY SHALL BE SOLID 100% DUTY CYCLE (NOT FLASHING). THE LAMP SHALL BE PLACED IN THE UPS CABINET WALL (NOT THE ROOF) IN SUCH A MANNER AS TO BE SEALED FROM WATER INTRUSION AND VISIBLE FROM A VEHICLE AT THE STOP LINE IN THE CLOSEST LANE OF AT LEAST ONE APPROACH TO THE SIGNALIZED INTERSECTION. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120 VAC.

THE UPS SHALL BE INSTALLED IN AN OVERSIZE, COMPARTMENTALIZED CONTROLLER CABINET WITH THE TRAFFIC CONTROL EQUIPMENT RATHER THAN A SEPARATE ENCLOSURE. IT SHALL INCLUDE A CABINET EXTENSION OR RISER AND SHALL BE COMPATIBLE WITH THE CONTROLLER CABINET. THERE SHALL BE NO CO-MINGLING OF FIELD WIRING AND BATTERIES. THERE SHALL BE PULL-OUT TYPE SHELVES FOR THE BATTERIES TO ALLOW EASY MAINTENANCE AND ACCESS.

PAYMENT FOR ITEM 633 "UNINTERRUPTIBLE POWER SUPPLY, 1000 WATT, AS PER PLAN" SHALL BE MADE AT THE CONTRACT UNIT PRICE BID FOR EACH AND SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND EXTRA CABINET SPACE.

ITEM 633 - CONTROLLER ITEM MISC.: REMOVE EXISTING CONTROLLER

EXISTING CONTROLLERS, INCLUDING CABINET, TIMER, LOAD SWITCHES, DETECTORS, CONFLICT MONITOR, PREEMPT PHASE SELECTOR, UPS, CABINET RISER AND OTHER INCIDENTALS REQUIRED BY THE ENGINEER, SHALL BE REMOVED AT THE LOCATIONS SHOWN IN THE PLANS.

STORE ALL ITEMS FOR SALVAGE BY THE CITY OF AURORA.

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

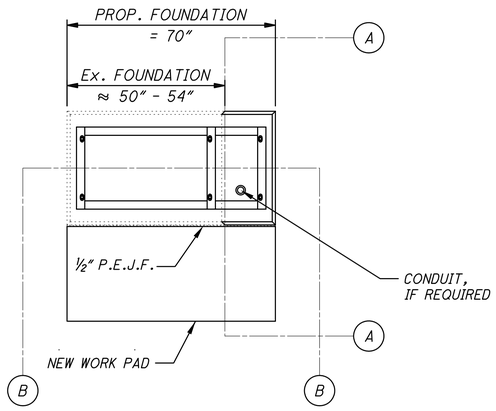
POR-AURORA SIGNALS

ITEM 633 - CONTROLLER ITEM, MISC.: MODIFY CABINET FOUNDATION

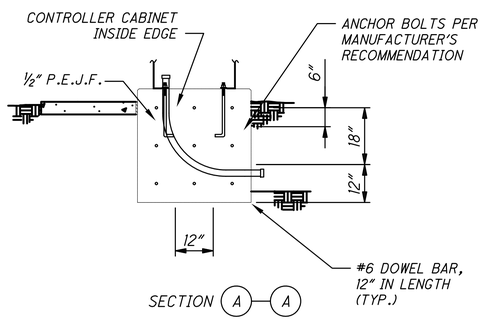
THE SIZE OF THE EXISTING CABINET FOUNDATION SHALL BE INCREASED TO ACCOMMODATE THE PROPOSED CONTROLLER WITH UNINTERRUPTIBLE POWER SUPPLY (UPS), FROM THOSE SHOWN ON TC-83.20. THE CABINET FOUNDATION SHALL BE MODIFIED AS SHOWN IN THE DETAILS ON THIS SHEET.

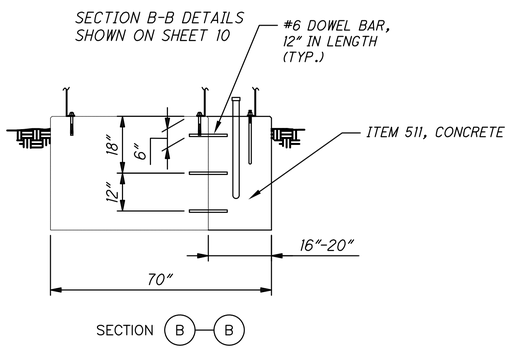
PAYMENT FOR ALL LABOR, MATERIALS, EQUIPMENT, TOOLS AND OTHER INCIDENTALS INCLUDING CONDUIT ELLS, ANCHOR BOLTS, BACKFILL, COMPACTING, SURFACE RESTORATION AND REMOVAL OF FORMS SHALL BE AT THE CONTRACT UNIT PRICE BID PER EACH FOR ITEM 633 - CONTROLLER ITEM, MISC.: MODIFY CABINET FOUNDATION.

TOP VIEW



CABINET FOUNDATION
MODIFICATION DETAILS





ITEM 633 - CONTROLLER ITEM, MISC. VIDEO MONITORING EQUIPMENT

THIS ITEM SPECIFIES EQUIPMENT TO BE INSTALLED AS DEFINED FOR CCTV CONTROL EQUIPMENT AND INSTALLATION ITEMS.

DIGITAL CONTROL SYSTEM:

PROVIDE A DIGITAL CONTROL SYSTEM CONSISTING OF A DESKTOP VIDEO MATRIX SWITCHER (LOCATED AT THE CITY OF AURORA SERVICE DEPT. OFFICE). THIS SWITCHER SHALL BE AN INTEGRAL PART OF THE REMOTE MONITORING SYSTEM VIDEO SERVER COMPUTER. THE FOLLOWING ITEMS SHALL APPLY TO THE DIGITAL CONTROL SYSTEM.

DESIGN:

THE DIGITAL CONTROL SYSTEM FOR NTSC SIGNAL AND CCTV APPLICATIONS. ENSURE THE CONTROL SYSTEM MINIMIZES THE NUMBER OF CABLE CONDUCTORS TO FACILITATE EASE OF SYSTEM INSTALLATION, AND WILL BE CAPABLE OF SWITCHING UP TO 32 VIDEO INPUTS ANY OF UP TO 4 VIDEO OUTPUTS. IN ADDITION TO MONITORING INDEPENDENT CAMERA SELECTION, SALVO SWITCHING SHALL ALSO BE AVAILABLE. THIS MODE SWITCHES VIDEO AS A SYNCHRONIZED GROUP FROM AS MANY AS 10 CAMERAS AT A TIME TO AS MANY AS 4 MONITORS. PROVIDE A DIGITAL CONTROL SYSTEM WITH THE CAPACITY TO STORE UP TO FOUR (4) SALVOS.

PROVIDE A SYSTEM WITH VIDEO BANDWIDTH OF 15 MHZ.

PROVIDE SWITCHERS WHICH WILL ALLOW FOR VIEWING OF UP TO 9 SIMULTANEOUS CAMERAS ON EACH MONITOR. THERE SHALL BE 1, 2, 4, 6, OR 9 VIDEO VIEWING OPTIONS. PROVIDE A SYSTEM CAPABLE OF DISPLAYING RECORDED OR LIVE VIDEO, AND A PICTURE-IN-PICTURE MODE.

PROVIDE ONE PRINTER PORT AVAILABLE FOR PRINTOUT OF SYSTEM STATUS CHANGES, SYSTEM CONFIGURATION TABLES, AND PROGRAMMED SEQUENCES. ENSURE THAT UP TO 16 PRE-POSITIONED (ZOOM, FOCUS, PAN & TILT) SCENES PER CAMERA ARE SELECTABLE. ENSURE THE DIGITAL CONTROL SYSTEM WILL CONTROL THE PAN AND TILT DEVICES VIA THE ADDRESSING (DIP SWITCH SETTING IN CAMERA) OR THE ON BOARD DIGITAL RECEIVER. STORE ALL PRESETS IN THE PZT CAMERA. STORE PROGRAM DATA IN BATTERY BACKED MEMORY.

ENSURE THE PZT CONTROLLER IS ALWAYS IN THE ON-LINE CONDITION WITH THE SYSTEM, AND PROVIDE THE USER WITH THE DISCRETION TO SELECT A MODE WHICH REQUIRES THE OPERATOR TO LOG-ON & LOG-OFF BY ENTERING A USER NAME AND USE REMOTE CAMERA/PZT CONTROL FOR CAMERA CALL-UP, PAN AND TILT CONTROL, LENS FUNCTIONS, AND PRESET ACTIVATION.

ENSURE THAT REMOTE CAMERA/PZT CONTROL WILL SUPPORT INDIVIDUAL CAMERA CALL-UP MONITOR OUTPUT SELECTION, ACTIVATION OF SPECIFIC PRESETS, ROUTINES, AND ALARM PROCESSING FOR INDIVIDUAL CAMERAS.

PROVIDE A DIGITAL CONTROL SYSTEM FULL FUNCTION PROGRAMMABLE CONTROLS EACH HAVING THE CAPABILITY TO SWITCH AND CONTROL ANY OF THE SYSTEM CAMERAS. THESE CAN BE ASSIGNED TO IMPORTANT PRESETS, TOURS, ETC. FOR QUICK AND EASY ACTIVATION.

ENSURE THAT ALL RECEIVER/DRIVER UNITS INITIATE A SELF-TEST FEATURE UPON POWER UP OF THE MONITORING EQUIPMENT. ENSURE THAT LOCAL TESTING OF RECEIVER/DRIVER FUNCTIONS IS ACCOMPLISHED WITHOUT THE NEED FOR EXTERNAL CONTROL CODE INPUT. PROVIDE A SWITCH WITHIN THE RECEIVER/DRIVER UNIT TO ALLOW SITE ADDRESS SELECTION.

DIGITAL VIDEO TIME LAPSE RECORDER:

PROVIDE A DIGITAL VIDEO RECORDER WHICH CAN RECORD AT SPEEDS FROM 1 FIELD EVERY 20 SECONDS TO REAL TIME RECORDING OF 60 FIELDS PER SECOND. RECORDING SHALL BE CAPABLE OF 4 SIMULTANEOUS CHANNELS.

PROVIDE A RECORDER WITH A MINIMUM 500 LINES OF RESOLUTION.

INCLUDE A TIME/DATE GENERATOR WITH 24-HOUR (A.M./P.M.) CAPABILITY AND WITH BATTERY BACK-UP. ENSURE THE DIGITAL RECORDER HAS A MINIMUM OF 3 TERABYTES OF HARD DISK SPACE.

FURNISH EQUIPMENT UTILIZING 120 VAC +/-10V, 50/60 HZ POWER.

DIGITAL VIDEO MONITOR:

FURNISH AND INSTALL A DIGITAL VIDEO MONITOR, SUITABLE FOR VIDEO CONFERENCE AND COMMERCIAL APPLICATIONS, IN THE CITY OF AURORA POLICE DISPATCH OFFICE. PROVIDE VIDEO MONITORS WITH A MINIMUM SCREEN SIZE OF 50 INCHES DIAGONALLY AND A THIN PROFILE OF NO GREATER THAN 5 INCHES.

ENSURE THE SCANNING FORMAT CAPACITY IS CAPABLE OF THE FOLLOWING DEFINITIONS:

A. 480/60I
B. 720/60P

C. 1080/60I
D. 1080/24P /24SF

PROVIDE VIDEO MONITORS WITH A CONTRAST RATIO OF AT LEAST 3000:1 AND A VIEWING ANGLE OF AT LEAST 160 DEGREES.

PROVIDE VIDEO MONITORS WITH VIDEO CONNECTIONS TO ALLOW TO THE CONNECTION TO THE DIGITAL CONTROL SYSTEM, DIGITAL VIDEO TIME LAPSE RECORDER AND THE REMOTE MONITORING SYSTEM COMPUTER SERVER.

INSTALL THE VIDEO MONITOR USING A STURDY ANGLED WALL HANGING BRACKET, CONSTRUCTED OF STEEL AND FINISHED IN BLACK FUSED EPOXY, WHICH SUPPORTS THE DIGITAL VIDEO MONITOR OF THE SIZE SHOWN IN THIS SPECIFICATION, AND WHICH FEATURES A WALL PLATE WITH 8 INCH HORIZONTAL ADJUSTMENT, A 0 TO 20 DEGREE ADJUSTABLE TILT, AND PROVIDES HORIZONTAL AND VERTICAL POSITIONING FOR THE MONITOR. ENSURE THE BRACKET IS UL LISTED AND CSA CERTIFIED. ASSEMBLE AND INSTALL THE BRACKET AND MONITOR ACCORDING TO THE INSTRUCTIONS PROVIDED BY THE MANUFACTURER.

INSTALL THE FOLLOWING EQUIPMENT NEAR THE REMOTE MONITORING SYSTEM, IN THE AURORA SERVICE DEPARTMENT, IN THE AREA DESIGNATED FOR MONITORING THE TRAFFIC CONTROL SYSTEM.

1- DIGITAL CONTROL SYSTEM (COMBINED WITH VIDEO SERVER)

1- REMOTE CAMERA/PZT CONTROL (CONTROLLABLE BY THE VIDEO SERVER)

1- DIGITAL VIDEO TIME LAPSE RECORDER

1- DIGITAL VIDEO MONITOR

PAYMENT WILL BE MADE FOR "ITEM 633 - CONTROLLER ITEM MISC.: VIDEO MONITORING EQUIPMENT AT THE CONTRACT LUMP SUM BID PRICE, INCLUDING INSTALLATION, TESTING, TRAINING, AND DOCUMENTATION.

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL
GENERAL NOTES

POR-AURORA SIGNALS

ITEM 804 - FIBER OPTIC CABLE MEDIA CONVERTER, ETHERNET, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF THE ODOT SUPPLEMENTAL SPECIFICATION 804, THE FIBER OPTIC MEDIA CONVERTER SHALL BE AN ENVIRONMENTALLY HARDENED, MANAGED ETHERNET SWITCH. IT SHALL HAVE SEVEN (7) 10/100 BASE-TX AND THREE (3) 100/1000 FX COMBO PORTS.
THE ETHERNET SWITCH SHALL BE USED TO CONNECT THE CONTROLLER, MMU, UPS AND OTHER PERIPHERALS TO A FIBER OPTIC INTERCONNECT SYSTEM. SUFFICIENT CAT5/6 CABLES SHALL BE FURNISHED AND INSTALLED TO MAKE THE CONNECTIONS.

PAYMENT FOR ITEM 804 "FIBER OPTIC CABLE MEDIA CONVERTER, ETHERNET, AS PER PLAN" SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED PROGRAMMING, MOUNTING BRACKETS, CABLES, CONNECTIONS TESTED AND ACCEPTED.

ITEM 809 - EMERGENCY VEHICLE PREEMPTION

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING PREEMPTION EQUIPMENT IN THE LOCATIONS AND LOCAL CONTROLLERS AS SHOWN IN THE PLANS. THE PREEMPTION SYSTEM SHALL CONFORM TO O.D.O.T. SPECIFICATION 809 THE COMMUNICATIONS MEDIUM SHALL EMPLOY LIGHT DETECTION TECHNIQUES TO DETERMINE AND LOG THE PRESENCE OF THE EMERGENCY VEHICLE. THE MODEL SUPPLIED SHALL BE OPTICOM MANUFACTURED BY GLOBAL TRAFFIC TECHNOLOGIES LLC, STROBECOM II MANUFACTURED BY TOMAR ELECTRONICS INC., OR APPROVED EQUAL.

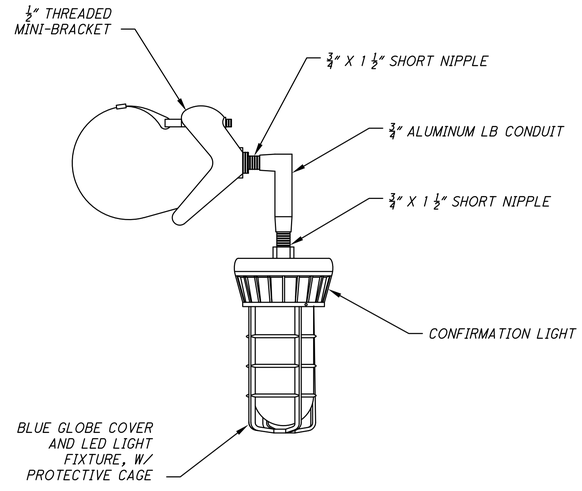
PAYMENT WILL BE MADE FOR ITEM 809 - EMERGENCY VEHICLE PREEMPTION AT THE CONTRACT UNIT PRICE FOR EACH PREEMPTION SYSTEM IN PLACE AND FULLY OPERATIONAL AS SHOWN IN THE PLANS, EXCEPT FOR THOSE ITEMS BID SEPARATELY.

ITEM 809 - PREEMPT CONFIRMATION LIGHT

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING PREEMPT CONFIRMATION LIGHTS IN CONFORMANCE WITH SPECIFICATION 809 INCLUDING MOUNTING HARDWARE AND ALL OTHER ACCESSORIES THAT ARE NECESSARY TO MAKE THE CONFIRMATION LIGHT COMPLETELY FUNCTIONAL AND OPERATIONAL AS SHOWN IN THE PLANS.

THE CONFIRMATION LIGHT SHALL BE A WEATHER TIGHT LIGHTING FIXTURE WITH BAKED EPOXY FINISH, BLUE LED CLUSTER LIGHT OUTPUT, STAINLESS STEEL MOUNTING HARDWARE TO ATTACH TO THE TRAFFIC SIGNAL MAST ARM. SEE DETAIL BELOW. THE CONFIRMATION LIGHT SHALL BE POWERED BY A LOAD SWITCH IN THE TRAFFIC SIGNAL CONTROLLER CABINET.

PAYMENT FOR ITEM 809 "PREEMPT CONFIRMATION LIGHT" SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH LIGHT IN PLACE, COMPLETELY INSTALLED IN THE LOCATIONS SHOWN IN THE PLANS, WIRED, TESTED AND ACCEPTED.



ITEM 809 - ATC V6.24 CONTROLLER, AS PER PLAN

THE CONTROLLER SHALL BE FURNISHED AND INSTALLED ACCORDING TO SS 809 AND BE LISTED ON THE OFFICE OF TRAFFIC OPERATIONS TRAFFIC AUTHORIZED PRODUCTS (TAP) LIST.

PAYMENT WILL BE MADE FOR "ITEM 809, ATC V6.24 CONTROLLER, AS PER PLAN, AT THE CONTRACT PRICE BID FOR EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS, TESTED AND ACCEPTED.

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

POR-AURORA SIGNALS

ITEM 809 - CCTV IP - CAMERA SYSTEM, DOME TYPE, AS PER PLAN

THE EQUIPMENT PROVIDED AS PART OF THIS CONTRACT SHALL BE ON THE OFFICE OF TRAFFIC OPERATIONS TRAFFIC AUTHORIZED PRODUCTS (TAP) LIST.

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING AN OUTDOOR, ETHERNET READY (LAN, VLAN), CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM CONSISTING OF A PAN-TILT-ZOOM (PTZ) CAMERA, FIELD EQUIPMENT, CABLES AND WIRING, AND OTHER ANCILLARY AND INCIDENTAL EQUIPMENT REQUIRED TO ASSEMBLE A FULLY FUNCTIONING INTEGRATED TRAFFIC SURVEILLANCE SYSTEM. THE CCTV SYSTEM SHALL HAVE FULL ETHERNET COMPATIBILITY AND FUNCTIONALITY INCLUDING BEING CAPABLE OF FULL MOTION VIDEO BROADCAST, REMOTE CONFIGURATION, AND REMOTE MANAGEMENT VIA THE ETHERNET CONNECTION. ALL PROVIDED COMPONENTS SHALL PROVIDE A MEAN TIME BETWEEN FAILURES (MTBF) OF 50,000 HOURS MINIMUM. COMPLIANCE WITH APPLICABLE ISO QUALITY ASSURANCE STANDARDS IS REQUIRED AND SHALL MEET OR EXCEED THE REQUIREMENTS SET FORTH IN THIS SPECIFICATION.

THE CCTV FIELD EQUIPMENT REQUIRED FOR THE CAMERA SITE SHALL INCLUDE INSTALLATION OF THE ITEMS DESCRIBED BELOW. PROCESS AND CONTROL EQUIPMENT FOR THE VIEWING WITH SURVEILLANCE CAMERAS AT THE REMOTE MONITORING STATION IS INCLUDED AS PART OF ITEM 633 CONTROLLER ITEM MISC.: VIDEO MONITORING EQUIPMENT.

CAMERA

THE CAMERA SHALL MEET OR EXCEED THE FOLLOWING MINIMUM REQUIREMENTS:

1. COLOR/MONOCHROME ADVANCED DIGITAL SIGNAL PROCESSING (DSP)
2. 18X OPTICAL (4.1 mm TO 73.8 mm) WITH 15X DIGITAL (200X)
3. UTILIZE 12 INCH CCD, USING THE MOST CURRENT TECHNOLOGY
4. PROVIDE A MINIMUM HORIZONTAL RESOLUTION OF 470 TVL (NTSC)
5. PROVIDE SHARP, DETAILED IMAGES DOWN TO 0.7 LUX COLOR
6. WHEN SWITCHING TO MONOCHROME MODE, THE CAMERA MUST AUTOMATICALLY REMOVE THE IR CUT FILTER WHEN NECESSARY, WHICH WILL INCREASE THE INFARED SENSITIVITY. WHEN ENOUGH AMBIENT LIGHT IS AVAILABLE TO PRODUCE AN ACCEPTABLE COLOR IMAGE, THE CAMERA MUST AUTOMATICALLY ENABLE THE IR CUT FILTER.
7. CONTINUOUS AUTO FOCUS. WHEN REQUIRED, OPERATOR OVERRIDE OF THE AUTO FOCUS SETTINGS MUST BE ALLOWED. AUTO IRIS WITH MANUAL OVERRIDE MUST ALSO BE ALLOWED.

DOME

THE CAMERA HOUSING/DOME SHALL MEET OR EXCEED THE FOLLOWING MINIMUM REQUIREMENTS:

1. BE COMPRISED OF A HIGH SPEED PAN/TILT ASSEMBLY USING PRECISION MOTORS AND HIGH STRENGTH BELT DRIVE, RESULTING IN QUIET AND ACCURATE OPERATION.

PATCH CORDS

ALL FACTORY ASSEMBLIES WIT CONNECTORS SHALL ADHERE TO THE APPLICABLE CABLE, CORDAGE, AND FIBER SPECIFICATIONS. ALL INSIDE PLANT (IP) AND OUTSIDE PLANT (OP) PATCH CORDS SHALL MEET NEC JACKETING REQUIREMENTS FOR THIS PROJECT'S APPLICATION. PIGTAIL CORDS ARE PERMITTED BUT SHALL BE RATED FOR ULTRA-VIOLET LIGHT, WEATHER AND WIND EXPOSURE IF IT IS NOT ENTIRELY CONTAINED WITHIN THE CONTROL CABINET. PIGTAILS CAN BE PRE-CONNECTORIZED AS LONG AS THE CONNECTORS CAN PASS THROUGH REQUIRED CONDUIT AND FITTINGS.

MOUNTING LOCATION

THE CONTRACTOR SHALL VIDEO TAPE THE LOCATION OF THE PROPOSED CAMERA AT THE HIGHEST PRACTICAL INSTALLATION HEIGHT (20 FEET MINIMUM) TWO WEEKS IN ADVANCE OF ACTUAL INSTALLATION. THE VIDEO SHALL SHOW THE 360 OF THE PROPOSED CAMERA OVER A 5 MINUTE DURATION. TWO (2) COPIES OF THE VIDEO TAPE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID PER EACH OF ITEM 632, SIGNALIZATION MISC.: PTZ CAMERA COMPLETE.

ITEM 809 - CENTRALLY CONTROLLED ARTERIAL TRAFFIC SIGNAL SYSTEM

1.0 INTRODUCTION

THIS ITEM SHALL CONSIST OF ALL EQUIPMENT, INSTALLATION, OR OTHER MATERIALS AND INSTALLATION REQUIRED TO INSTALL A NEW CENTRALLY CONTROLLED ARTERIAL TRAFFIC SIGNAL SYSTEM TO BE LOCATED AT THE CITY OF AURORA'S, SERVICE DEPARTMENT BUILDING.

2.0 PRIMARY COMPONENTS

2.1 SYSTEM ARCHITECTURE

THE SYSTEM SHALL INCLUDE ALL SOFTWARE AND HARDWARE TO PROVIDE FULL ACCESS TO AND CONTROL OF THE INSTALLED FIELD DEVICES. THE SYSTEM SHALL INCLUDE THE FOLLOWING BASIC COMPONENTS:

- FILE / APPLICATION (CORE) SERVER
- COMMUNICATIONS SERVER / TERMINAL SERVICES CENTER
- VIDEO SERVER
- COMPUTER RACK AND SERVER ACCESSORIES
- 2 WORKSTATIONS; ONE SHALL BE LOCATED AT THE SERVICE DEPARTMENT OFFICE AND THE OTHER SHALL BE LOCATED AT THE CITY OF AURORA ENGINEERS OFFICE.
- 1 LAPTOP COMPUTER(S): PROVIDE ONE (1) LAPTOPS FOR MOBILE SYSTEM MANAGEMENT
- 1 SIGNAL ANALYSIS & OPTIMIZATION SOFTWARE INSTALLATION (SYNCHRO) (LICENSES / SEATS)

2.2 SOFTWARE

2.2.1 OVERVIEW

-- THE SOFTWARE SHALL PROVIDE AN INTERSECTION CONTROL AND TRAFFIC MANAGEMENT SOFTWARE PLATFORM, FROM WHICH ADDITIONAL ITS APPLICATIONS CAN BE INTEGRATED. ALL ADDITIONAL ITS FEATURES AND FUNCTIONALITIES SHALL BE MODULAR AND INTEGRATED SEAMLESSLY INTO A SINGLE USER INTERFACE.

2.2.2 STANDARDS

-- NTCIP 1201 AND 1202 COMMUNICATIONS PROTOCOL STANDARD SHALL BE IMPLEMENTED SUCH THAT THE SYSTEM CAN ADAPT TO CHANGES IN TECHNOLOGY AND INCREASE FUNCTIONALITY OVER TIME WITH MINIMAL IMPACT ON INDIVIDUAL SYSTEM COMPONENTS. THE SYSTEM DEVELOPER AND THE CONTROLLER MANUFACTURER SHALL VERIFY THAT THE SYSTEM AND CONTROLLER FIRMWARE ARE NTCIP COMPLIANT AND COMPATIBLE.

-- THE PRIMARY COMMUNICATIONS STANDARDS SHALL BE NTCIP 1202 AND 1202 BASED FOR COMMUNICATING FROM CENTER-TO-FIELD (C2F) AND THE DEVELOPER SHALL DOCUMENT THE STANDARDS TO WHICH THE SYSTEMS LEVEL OF CONFORMITY OF EACH STANDARD IS DEVELOPED.

-- THE SERVER-WORKSTATION COMMUNICATIONS INTERFACE SHALL BE DESIGNED TO MINIMIZE ITS NETWORK BANDWIDTH.

2.2.3 ARCHITECTURE

-- THE SYSTEM SHALL BE MODULAR AND SCALABLE AT ALL LEVELS, USING A DISTRIBUTED PROCESSING CLIENT / SERVER ARCHITECTURE.

-- DATA PROCESSING SHALL BE DISTRIBUTED ACROSS MULTIPLE SERVERS AND APPLICATIONS TO MAINTAIN HIGH SYSTEM PERFORMANCE WHEN EXPANDED.

-- SOFTWARE ARCHITECTURE SHALL NOT REQUIRE A SINGLE CENTRAL PROCESSOR TO PERFORM ALL REAL-TIME FUNCTIONS, PROTECTING THE CITY'S SYSTEMS HARDWARE / SOFTWARE INVESTMENT AND ALLOWING FOR INCREMENTAL EXPANSION (MODULARITY) TO HANDLE ANY FUNCTIONS AND FEATURES THAT MAY NOT BE ANTICIPATED OR INCORPORATED AT THIS TIME.

-- ALL SYSTEM DEVICES SHALL COMMUNICATE THROUGH COMMUNICATIONS SERVERS UTILIZING DEVICE MANAGER SOFTWARE TO TRANSLATE DATA BEING TRANSMITTED BETWEEN THE CENTRAL SYSTEM AND FIELD DEVICES. EACH DEVICE SHALL BE CONFIGURED TO BE ON-LINE OR OFF-LINE TO REDUCE FAILURES AND ALERTS FOR DEVICES NOT CURRENTLY CONNECTED TO THE SYSTEM.

2.2.4 USER INTERFACE

THE CENTRAL SYSTEM SOFTWARE SHALL EMPLOY A GRAPHICAL USER INTERFACE. THE GRAPHICAL USER INTERFACE SHALL INTEGRATE WITH THE SYSTEM TO INCORPORATE GRAPHICAL ELEMENTS THAT FACILITATE, AT MINIMUM, THE FOLLOWING FUNCTIONALITIES:

-- ALLOW USER IMPORTED, MULTI-LAYERED MAPPING INTEGRATED AS THE MAJOR PORTION OF THE MAIN GRAPHICS DISPLAY, AND PROVIDE ANY UTILITIES NEEDED TO IMPORT OR GENERATE NEW MAPS FOR ON-DEMAND UPDATES FROM NEW SOURCE FILES. STANDARD GIS MAP FILES (ESRI, .SHP FILES, ETC.) SHALL BE SUPPORTED ALONG WITH A FULL ARRAY OF USER VIEW MANIPULATION TOOLS (PAN, ZOOM, WINDOW, ETC.)

-- MAPPING SHALL INTEGRATE SEAMLESSLY WITH THE SIMILARLY MULTI-LAYERED AND CONFIGURABLE USER SYSTEM INTERFACE TO DISPLAY DETAILED CATEGORIES OF DYNAMIC AND REAL-TIME SYSTEM OR DEVICE DATA, BASED UPON DEVICE SELECTION AND / OR ZOOM LEVEL.

-- PROVIDE A SCHEDULER FOR USER DEFINED AND SCHEDULED EVENTS AND FUNCTIONS TO BE IMPLEMENTED OR TERMINATED BY TIME OF DAY (TOD) / DAY OF WEEK (DOW) AND FREQUENCIES INCLUDING DAILY, WEEKLY, ANNUALLY, SEASONALLY, HOLIDAYS, SPECIAL, OR ONE-TIME EVENT. ANY SCHEDULED EVENT SHALL BE CONFIGURABLE BY ANY COMBINATION OF INDIVIDUAL FIELD DEVICES, GROUPS OF DEVICES, SECTIONS, OR SYSTEM-WIDE IMPLEMENTATION. ALL EVENTS AND SCHEDULING SHALL INTEGRATE WITH ALL REQUIRED ALERT AND REPORTING FUNCTIONS OF THE SYSTEM.

-- MANUAL COMMANDS SHALL BE AVAILABLE WITH THE SAME FUNCTIONALITY AS THE SCHEDULER AND OFFER FULL AUTONOMY FOR IMMEDIATE OR SCHEDULED OVERRIDES.

-- PROVIDE ADDITIONAL DISPLAY UTILITIES INCLUDING AT MINIMUM AN "ENTITY" OR DEVICE TREE, DEVICE STATUS, LIST OF CURRENT USERS, ALERTS, FAVORITES, AND INTERSECTION DISPLAY. EACH DISPLAY UTILITY SHALL BE EASILY ACCESSIBLE FROM THE MAIN MAP AND GRAPHICAL USER INTERFACE. CONTROL OF ALL DEVICES SHALL BE ACCESSIBLE FROM MULTIPLE USER INTERFACES.

-- PROVIDE USER CUSTOMIZABLE AND DYNAMIC INTERSECTION DISPLAY FEATURES WHERE, AT MINIMUM, INTERSECTION TIMINGS, PHASE DETAILS, DETECTION, COORDINATION, STATUS AND ALARMS CAN BE VIEWED OR ACCESSED FOR CONFIGURATION.

2.3 CENTRAL SYSTEM HARDWARE

THE ASSOCIATED HARDWARE SPECIFICATIONS SHALL, AT MINIMUM, INCLUDE ALL THE FOLLOWING (OR APPROVED EQUALS):

2.3.1 FILE / APPLICATIONS (CORE) SERVER:

PROCESSOR: INTEL DUAL XEON PROCESSOR E7, 40MB CACHE 2.1GHZ
MEMORY: 32GB
HARD DRIVE: 7 EACH - 750GB SAS, 2.5 INCH, 10K RPM HARD DRIVE WITH HOT PLUG USING RAID-5 WITH 1 AS HOT SPARE
HARD DRIVE CONTROLLER: INTEGRATED SAS RAID CONTROLLER
OPERATING SYSTEM: WINDOWS SERVER 2016
LAN: ONBOARD USING TWO GBe
CD-ROM OR DVD-ROM DRIVE: 24X IDE CD-RW / DVD ROM DRIVE
POWER: 2 X 750 WATT REDUNDANT POWER SUPPLIES

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POR-AURORA SIGNALS

ITEM 809 - CENTRALLY CONTROLLED ARTERIAL TRAFFIC SIGNAL SYSTEM - (CONT.)

2.3.2 COMMUNICATIONS SERVER / TERMINAL SERVICES AND VIDEO SERVER:

PROCESSOR: INTEL XEON E5 PROCESSOR, 8M CACHE 3.10GHZ
MEMORY: 8GB
HARD DRIVE: 3 EACH - 1TB 10K RPM HOT PLUG HARD DRIVE USING RAID 0
HARD DRIVE CONTROLLER: INTEGRATED SAS RAID CONTROLLER
OPERATING SYSTEM: WINDOWS SERVER 2016
NIC: ON BOARD USING TWO GIGABIT ETHERNET NIC
CD-ROM OR DVD-ROM DRIVE: 24X IDE CD-RW / DVD ROM DRIVE FOR ALL QS

2.3.3 COMPUTER RACK AND SERVER ACCESSORIES

84" ENCLOSED RACK (78" X 19" X 36") W/ 55CFM FAN, PLEXIGLAS FRONT DOOR, LOUVERED REAR DOOR, CASTORS
UPS: MS STANDARD - 3000 VA 120V
SWITCH: 24 PORT 10/100/1000 L3 MANAGED SWITCH WITH BACK PLANE CONNECTION TO EXISTING CITY SWITCHES
KEYBOARD / VIDEO SWITCH
TELEPHONE SURGE PROTECTOR: TELEPHONE SURGE PROT. 4-PORT
KEYBOARD / MONITOR CONSOLE: 15FP, 1U RACK CONSOLE 15" TFT LCD, 83 KEY MINI-KEYBOARD, U.S.

2.3.4 WORKSTATIONS

PROCESSOR: MINI TOWER, INTEL CORE I7
MEMORY: 32GB, DDR3 MEMORY
KEYBOARD: ENTRY LEVEL, USB, NO HOT KEYS KEYBOARDS
DUAL MONITORS: DUAL FLAT PANELS WITH HEIGHTS ADJUSTABLE STAND, 19.0 INCH
VIDEO CARD: DUAL NVIDIA, QUADRO 600 1GB, GRAPHICS CARD
HARD DRIVE: 750GB SATA, 7200 RPM HARD DRIVE
HARD DRIVE COLLECTOR: C1 ALL SATA HARD DRIVES NON-RAID FOR 1 HARD DRIVE
OPERATING SYSTEM: WINDOWS 10 PROFESSIONAL 64 BIT
MOUSE: USB 2 BUTTON OPTICAL MOUSE WITH SCROLL
NIC: 10/100/1000 GIGABIT ETHERNET CONTROLLER PCI EXPRESS
CD-ROM / DVD-ROM: 16XDVD AND 16XDVD+/-RW, DATA ONLY
MICROSOFT OFFICE PROFESSIONAL, ADOBE ACROBAT PRO WITH MEDIA

2.3.5 LAPTOP COMPUTER

PROCESSOR: INTEL CORE I7 - 2630QM, 2.0 GHZ, 6M CACHE
MEMORY: 8GB, DDR3-1600 SDRAM MEMORY
KEYBOARD: INTERNAL ENGLISH KEYBOARD, BACK-LIGHT
MONITOR: 14 INCH HIGH DEFINITION WITH LED BACK-LIGHT
VIDEO CARD: INTEL INTEGRATED GRAPHICS MEDIA ACCELERATOR
HARD DRIVE: 500GB SHOCK MOUNTED HARD DRIVE, 7200RPM
HARD DRIVE CONTROLLER: C1 ALL SATA HARD DRIVES NON-RAID FOR 1 HARD DRIVE
OPERATING SYSTEM: WINDOWS 10, 64 BIT
MOUSE: TOUCHPAD WITH FINGERPRINT READER
CD-ROM / DVD-ROM DRIVE: 8X DVD +/-RW

2.4 NETWORK HARDWARE SHALL BE CONFIGURABLE TO BE GATEWAY-INTERFACED IN THE FUTURE WITH AN EXISTING LAN

2.5 THE SYSTEM SHALL INCLUDE A CORE SERVER, VIDEO SERVER AND A COMMUNICATION SERVER. IT SHALL ACCOMMODATE UP TO SEVENTY-FIVE (75) DEVICES, ALL CORE SERVER APPLICATIONS AND COMMUNICATIONS SERVER APPLICATIONS SHALL BE INSTALLED SEPARATELY ON THEIR RESPECTIVE SERVERS

2.6 THE SYSTEM SHALL SUPPORT MULTIPLE COMMUNICATIONS SERVERS FOR INTER-JURISDICTIONAL SYSTEMS OR FOR SYSTEMS WITH A LARGE NUMBER OF DEVICES. EACH COMMUNICATIONS SERVER SHALL SUPPORT THE NUMBER OF DEVICES REQUIRED FOR THE SYSTEM PLUS 10% MORE FOR EXPANSION.

2.7 THE CENTRAL SOFTWARE SHALL INCORPORATE A MEANS FOR CLIENT WORKSTATIONS TO BE AUTOMATICALLY UPDATED WITH NEW VERSIONS THAT ARE INSTALLED ON THE SERVER. ALL UPDATES WILL BE INCLUDED DURING THE FIRST YEAR OF OPERATION AS PART OF THE STANDARD WARRANTY PERIOD. SUBSEQUENT UPDATES SHALL BE PROVIDED AUTOMATICALLY AS PART OF AN ANNUAL SOFTWARE MAINTENANCE AGREEMENT, THROUGH WHICH ANY AND ALL UPGRADES DURING THE MAINTENANCE AGREEMENT PERIOD WILL BE INCLUDED.

3.0 SYSTEM FUNCTION

3.1 CENTER-TO-FIELD COMMUNICATIONS:

COMMUNICATE TO THE FIELD DEVICES IN ACCORDANCE WITH NTCIP PROTOCOLS USING ETHERNET AND THE PROPOSED FIBER-OPTIC INTERCONNECT SYSTEM. THE SYSTEM SHALL BE CAPABLE OF CONTROLLING, RECEIVING STATUS AND DATA FROM, AND UPLOADING AND DOWNLOADING FIELD DATA, AND APPLICABLE CONTROL PARAMETERS TO AND FROM EACH DEVICE.

3.2 DATABASE:

THE SYSTEM SHALL MANAGE THE ATMS AND ALL DEVICE DATABASES AND MONITOR AND CONTROL ALL FIELD DEVICES FROM ONE CENTRAL LOCATION (MAIN SERVICE DEPT) AND OPTIONAL REMOTE FACILITIES.

- EACH SYSTEM WORKSTATION OR LAPTOP SHALL REQUIRE A USERNAME AND PASSWORD FOR ANY USER, TO BE ASSIGNED BY THE SYSTEM ADMINISTRATOR. THE SYSTEM SHALL ALLOW FOR USER AND GROUP PRIVILEGES TO BE DEFINED AND ASSIGNED BY THE ADMINISTRATOR.

- DATABASE MANAGEMENT SHALL ALLOW PROGRAMMING OF THE INTERSECTION CONTROLLER DATABASES. UPLOAD / DOWNLOAD SHALL TRANSFER THE PROGRAMMABLE DATABASE FROM / TO THE SELECTED DEVICE. EACH DEVICE SHALL HAVE SEPARATE DATABASE PROGRAMMING PAGES. THESE PAGES SHALL CONTAIN ALL THE PROGRAMMING OPTIONS UNIQUE TO EACH DEVICE.

- STANDARD INDUSTRY ACCEPTED TRAFFIC ENGINEERING TERMINOLOGY SHALL BE USED THROUGHOUT THE PROGRAMMING DISPLAYS. THE SYSTEM'S DEVICE DATABASE MANAGEMENT SHALL PROVIDE AN OPERATOR MENU SELECTION INTERFACE THAT IS SIMILAR TO THE CONTROLLER'S MENU SELECTIONS.

3.3 MAINTENANCE AND MALFUNCTION MANAGEMENT

THE SYSTEM SHALL BE CAPABLE OF THE FOLLOWING UPON DETECTING PROBLEMS WITH THE SYSTEM OR FROM ANY DEVICE:

- AUTOMATIC ALPHANUMERIC MESSAGES (SMS - TEXT MESSAGING) TO CELLULAR TELEPHONES AND EMAIL ADDRESSES

- POP-UP ALARM OR SIMILAR NOTIFICATIONS FOR ANY WORKSTATION OR LAPTOP LOGGED INTO THE SYSTEM

- USER ACKNOWLEDGEMENT CONFIRMATIONS AND PROGRAMMABLE ALERT RECURRENCE

- LOGGING OF ALL MALFUNCTION NOTIFICATIONS, RETRIES, AND / OR ACKNOWLEDGEMENTS WITH TIME AND DATE STAMPS.

3.4 INTERSECTION CONTROL

THE SYSTEM AND USER INTERFACE SHALL FACILITATE FULL ACCESS TO AUTHORIZED USERS FOR DYNAMIC, REAL-TIME STATUS AND OPERATIONAL CONTROL OF INTERCONNECTED NEMA, 2070, AND 170 INTERSECTION CONTROL STATUS AND OPERATIONAL DETAILS SHALL BE AVAILABLE FROM THE MAP AND OTHER USER INTERFACE DISPLAYS.

- CONTROLLER STATUS SHALL BE AVAILABLE DYNAMICALLY FROM ALL ZOOM LEVELS OF THE MAIN MAP INTERFACE AND STATUSES SHALL INCLUDE: FREE, COORDINATED, AND TRANSITIONAL OPERATIONS, FLASH, PREEMPTION, TRANSIT SIGNAL PRIORITY, AND / OR LOSS OF COMMUNICATIONS.

- ADDITIONAL DETAILED INFORMATION SHALL BE CUSTOMIZABLE WITH ZOOM LEVELS AND INCLUDE, BUT NOT LIMITED TO: SIGNAL COLORS OR OVERLAPS, ACTIVE COORDINATION PATTERN, ACTIVE PREEMPTION PLAN, AND GRAPHICAL INDICATION OF DEMANDS UPON VEHICULAR OR PEDESTRIAN PHASES.

- CUSTOMARY CONTROLLER PROGRAMMING AND OPERATION FEATURES SHALL BE ACCESSIBLE AT THE INTERSECTION LEVEL AND, AT MINIMUM, INCLUDE: INTERSECTION CONTROL MODE, COORDINATION STATUS, PROGRAMMED AND ACTUAL CYCLE LENGTH / OFFSET / PHASE TIMINGS, ALARM STATUS, OVERLAP TIMINGS AND STATUS, AND PHASE NEXT. INTERSECTION CONTROL MODES INCLUDE: TRAFFIC RESPONSIVE (TR), TIME-OF-DAY (TOD), MANUAL, FAILED, LOCAL, AND CENTRAL, TECHNICIAN, OR CONFLICT FLASH.

3.5 TIME SYNCHRONIZATION

CONTINUOUS MONITORING AND MANAGEMENT OF SYSTEM AND ALL CONTROLLERS SHALL BE PROVIDED TO MINIMIZE TIME DRIFT THROUGHOUT THE SYSTEM AND MAINTAIN ACCEPTABLE TIME SYNCHRONIZATION. THIS SHALL, AT MINIMUM, INCLUDE CAPABILITIES TO:

- RECEIVE CLOCK UPDATES FROM AN EXTERNAL TIME SYNCHRONIZATION SOURCE.

- BROADCAST, UNICAST, OR USE A COMBINATION OF BOTH TO SEND TIME UPDATES TO CONTROLLERS ON A USER-CONFIGURABLE SCHEDULE INCLUDING CONTROL OVER FREQUENCY, TIMING, AND REPETITION SETTINGS.

- AUTOMATICALLY CORRECT TIME DRIFT RELATIVE TO A PRE-CONFIGURED THRESHOLD.

- MANUALLY UPDATE OR OVERRIDE INDIVIDUAL AND SYSTEM-WIDE TIME CLOCKS.

3.6 SYSTEM ANALYSIS & ENGINEERING

PROVIDE A FULL ARRAY OF TOOLS TO MONITOR, ANALYZE, AND ENGINEER THE ONGOING TRAFFIC OPERATIONS UNDER CONTROL OF THE SYSTEM, INCLUDING:

- o INTERFACE TO THE MOST CURRENT RELEASE OF A COMPATIBLE SIGNAL ANALYSIS & OPTIMIZATION SOFTWARE. THIS SHALL INCLUDE THE ABILITY TO TRANSFER CONTROLLER PHASE TIMING, AND COORDINATION DATA AND DETECTOR DATA TO / FROM THE SOFTWARE FOR ANALYSIS AND MODIFICATION.

- o TIME / SPACE DIAGRAMS: PROVIDE FULL DISPLAY OF PROGRAMMED AND REAL-TIME COORDINATION TIMINGS, OFFSETS, PROGRESSION BANDS, AND PHASES / OVERLAPS, AND ALLOW FOR DYNAMIC ADJUSTMENT OF PROGRAMMED OFFSETS.

- o REAL-TIME MONITORING OF INTERSECTION PHASING / TIMING SPLITS AND TOOLS TO EVALUATE ACTUAL SPLIT CONDITIONS RELATIVE TO PROGRAMMED CONDITIONS OVER USER QUERIED TIME PERIODS.

3.7 REPORTING

THE SYSTEM SHALL PROVIDE REPORTING FUNCTIONS FOR INFORMATION COMPILED FROM SYSTEM RETRIEVED DATA AND ANY FIELD DEVICE CAPABLE OF LOGGING DATA. THESE REPORTS SHALL INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:

- o SYSTEM REPORTS SUCH AS: ALERTS LOG, DEVICE COMMUNICATIONS CONFIGURATION, SERVICE CONFIGURATION, ENTITY HIERARCHY, EVENTS LOG, SCHEDULER, SYSTEM ACTIVITY, UPLOAD, AND USER LOGIN REPORT.

- o DEVICE REPORTS SUCH AS: DETECTOR DATA, SIGNAL DETECTOR EVENTS, SIGNAL EVENTS, SPLIT MONITOR, AND TIME DRIFT REPORT

- o USER CUSTOMIZED REPORTS

4.0 BUILDING INTEGRATION & ADAPTATION

THE CENTRAL SIGNAL SYSTEM AND ONE (1) WORKSTATION SHALL BE INSTALLED IN THE CITY OF AURORA SERVICE DEPARTMENT. A SECOND WORKSTATION SHALL BE INSTALLED IN THE CITY OF AURORA ENGINEERS OFFICE. FULL CONNECTIVITY TO THE PRIMARY CENTRAL SYSTEM AND WORKSTATION IN THE SERVICE DEPARTMENT SHALL BE PROVIDED FOR THIS SECOND WORKSTATION USING CITY PROVIDED ETHERNET CONNECTIONS AT EACH LOCATION. DETAILS FOR THE ENTRANCE TO THE BUILDING ARE SHOWN ON SHEET 124.

SERVICE DEPARTMENT: 158 W. PIONEER TRAIL, AURORA, OHIO 44202
ENGINEERING DEPARTMENT: 158 W. PIONEER TRAIL, AURORA, OHIO 44202

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CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

POR-AURORA SIGNALS

ITEM 809 - CENTRALLY CONTROLLED ARTERIAL TRAFFIC SIGNAL SYSTEM - (CONT.)

ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO INSTALL THE CENTRAL SIGNAL SYSTEM IN EXISTING CITY OF AURORA FACILITIES AS INDICATED HEREIN SHALL BE INCLUDED. THIS MAY INCLUDE, BUT IS NOT LIMITED TO, ADAPTATIONS TO EXISTING ELECTRICAL AND COMMUNICATIONS ACHIEVED FOR THE SYSTEM AS SPECIFIED. THE CONTRACTOR SHALL OBTAIN EXISTING ARCHITECTURAL PLANS FROM THE CITY OF AURORA AND/OR CONDUCT ADVANCE FIELD VERIFICATION OF EXISTING FACILITIES AS NEEDED TO ASSURE SUCH ADDITIONAL ELEMENTS OF INSTALLATION ARE ADEQUATELY ADDRESSED.

5.0 ADMINISTRATION & SUPPORT

5.1 TRAINING

PROVIDE TRAINING FOR THE CENTRAL SYSTEM IN ACCORDANCE WITH CMS 633.16, AND TO INCLUDE THE FOLLOWING:

- o A MINIMUM OF TWO (2) DAYS (16 HOURS) FORMAL CLASSROOM TRAINING AND EIGHT (8) HOURS "HANDS-ON" OPERATIONS TRAINING SHALL BE PROVIDED FOR PERSONNEL DESIGNATED BY THE CITY OF AURORA. SYSTEM TRAINING SHALL BE PROVIDED BY EXPERIENCED INSTRUCTORS AND SHALL INCLUDE ALL TRAINING MATERIAL FOR FORMAL CLASSROOM AND HANDS-ON WORK. THE TRAINING SHALL COVER BOTH OPERATION AND MAINTENANCE OF THE SYSTEM SOFTWARE. COPIES OF COURSE MATERIALS SHALL BE SUPPLIED TO AND BE RETAINED BY THE CITY OF AURORA.

- o HANDS-ON TRAINING SHALL BE PROVIDED TO CITY OF AURORA PERSONNEL ASSIGNED TO THE PROJECT. THE TRAINING SHALL CONSIST OF, AT A MINIMUM: SYSTEM OPERATIONS, SYSTEM PERFORMANCE ANALYSIS, AND REVISION OF SYSTEM OPERATING PARAMETERS BASED ON THE ANALYSIS FAMILIARITY WITH CONSTRUCTION DETAILS OF CENTRAL OFFICE EQUIPMENT (DISCONNECT LOCATIONS, CABLE ROUTING, ETC.), OPERATION AND CONTROL OF ALL DEVICES, GENERATION AND EDITING OF DEVICE DATABASES, UPLOADING / DOWNLOADING OF DEVICE DATABASES, EXPLANATION OF THE COMMUNICATION SYSTEM, BASIC TROUBLESHOOTING PROCEDURES TO ISOLATE MALFUNCTIONS.

- o ALL CENTRAL SYSTEM TRAINING WILL BE PAID FOR UNDER ITEM 633, CENTRAL SIGNAL SYSTEM CONTROL STATION, AS PER PLAN FOR THE CONTRACT LUMP SUM PRICE BID.

5.2 LICENSING

PROVIDE FULL LICENSING DOCUMENTATION FOR ANY AND ALL SOFTWARE OR COMPONENTS REQUIRED HEREIN INCLUDING, AT MINIMUM, THE CENTRAL SYSTEM AND SIGNAL ANALYSIS AND OPTIMIZATION SOFTWARE. FULL LICENSURE SHALL BE INCLUDED FOR THE USE OF ALL SYSTEM COMPONENTS AND SOFTWARE REQUIRED BY THE CENTRAL TO INCLUDE ANY ASSOCIATED THIRD PARTY COMPONENTS OR SOFTWARE.

5.3 DOCUMENTATION

OPERATION AND MAINTENANCE MANUALS SHALL BE SUPPLIED FOR ALL EQUIPMENT AND COMPONENTS OF THE SYSTEM. PROVIDE IN BOTH ELECTRONIC AND HARD COPY FORMAT. A MINIMUM OF THREE (3) HARD COPIES SHALL BE SUPPLIED.

5.4 INSTALLATION & TESTING

UPON CONTRACT AWARD, ASSIGN A CENTRAL SYSTEM PROJECT MANAGER TO OVERSEE THE DEVELOPMENT OF THE SYSTEM IMPLEMENTATION SCHEDULE AND TO SERVE AS THE MAIN POINT OF CONTACT TO THE CITY OF AURORA, OHIO. THE PROJECT MANAGER SHALL HAVE PROVEN EXPERIENCE IN MANAGING TRAFFIC MANAGEMENT SYSTEM PROJECTS OF THE SIZE OUTLINED IN THIS SPECIFICATION. THE PROJECT MANAGER SHALL DEVELOP A MICROSOFT PROJECT (OR COMPATIBLE) SCHEDULE DETAILING THE TASKS REQUIRED TO FURNISH THE SPECIFIED SYSTEM. THIS SCHEDULE SHALL FORM THE BASIS OF ALL SYSTEM PROJECT MILESTONES.

IN ADDITION, ASSIGN A PROJECT ENGINEER TO OVERSEE THE DESIGN, ASSEMBLY, AND TESTING OF THE SYSTEM HARDWARE AND SOFTWARE. UPON COMPLETION OF THE SYSTEM DESIGN, THE PROJECT ENGINEER SHALL ASSEMBLE ALL CENTRAL SYSTEM HARDWARE AND SOFTWARE INTO A WORKING SYSTEM. THE PROJECT ENGINEER SHALL THEN COMPLETE A STANDARD FACTORY ACCEPTANCE TEST ON THE ASSEMBLED SYSTEM HARDWARE AND SOFTWARE. A COPY OF THE COMPLETED FACTORY ACCEPTANCE TEST SHALL BE PROVIDED TO THE PURCHASING AGENCY UPON REQUEST. AFTER COMPLETION OF THE FACTORY ACCEPTANCE TEST THE SYSTEM SHALL BE DISASSEMBLED, PACKED, AND SHIPPED TO THE PURCHASING AGENCY. THE PROJECT MANAGER SHALL OVERSEE, AND THE PROJECT ENGINEER SHALL BE ON-SITE TO UNPACK, ASSEMBLE, AND PERFORM INITIAL TESTS ON THE NEW SYSTEM. ON-SITE SYSTEM INTEGRATION SHALL INCLUDE, A TESTING AND VERIFICATION OF THE INSTALLED INTERCONNECT INFRASTRUCTURE BY ACTUALLY COMMUNICATING TO EACH CONTROLLER CONNECTED TO THE SYSTEM AND PERFORM A FULL ARRAY OF TESTS NECESSARY TO VALIDATE FULL SYSTEM FUNCTIONALITY AS REQUIRED HEREIN.

5.5 WARRANTY

ALL SYSTEM SOFTWARE AND COMPONENTS SHALL BE WARRANTED FOR A MINIMUM OF FIVE (5) YEARS FROM SYSTEM ACCEPTANCE. ANY CORRECTIONS OR REQUIRED MODIFICATIONS FOR PROPER SYSTEM OPERATION PER THESE SPECIFICATIONS SHALL BE FURNISHED TO THE CITY OF AURORA AT NO ADDITIONAL COST DURING THE WARRANTY PERIOD. PROVIDE BOTH PHONE AND EMAIL SUPPORT, AVAILABLE DURING NORMAL BUSINESS HOURS, FOR THE SYSTEM DURING THE WARRANTY PERIOD AT NO ADDITIONAL COST.

PROVIDE AN OPTIONAL ONE (1) YEAR SOFTWARE MAINTENANCE AGREEMENT TO EXTEND SUPPORT TO THE SYSTEM SOFTWARE AFTER THE WARRANTY PERIOD. THE MAINTENANCE AGREEMENT SHALL BE RENEWABLE AND OFFERED IN MULTIPLE OF 1 YEAR PERIODS. DURING THIS SOFTWARE MAINTENANCE PERIOD, PROVIDE CONTINUING REMOTE AND TELEPHONE SUPPORT FOR THE SYSTEM.

SYSTEM SOFTWARE UPDATES AND ON ANNUAL, ON-SITE VISIT FOR UP TO 32 HOURS SHALL BE PROVIDED. THIS VISIT SHALL BE CONDUCTED TO UPDATE SYSTEM SOFTWARE, CONDUCT SYSTEM CHECK-UP, AND CONDUCT SUPPLEMENTAL TRAINING IF NEEDED.

ANY THIRD PARTY HARDWARE AND SOFTWARE WARRANTIES SHALL BE PASSED TO THE CITY OF AURORA.

6.0 SYSTEM TESTING

INITIATE A 60-CALENDAR DAY PERFORMANCE TEST FOR THE TRAFFIC SIGNAL SYSTEM AFTER THE REMOTE MONITORING SYSTEM AND ALL SIGNALIZED INTERSECTIONS WITHIN THE PROJECT AREA ARE ON-LINE. THE PERFORMANCE TEST PERIOD WILL CONSIST OF THE OPERATION OF THE TRAFFIC CONTROL SYSTEM BY THE SYSTEM ADMINISTRATOR.

THE PERFORMANCE PERIOD WILL EXPIRE IN 60-CALENDAR DAYS UNLESS A SYSTEM MALFUNCTION OCCURS. THE PERFORMANCE PERIOD WILL BE STOPPED FOR THE LENGTH OF THE TIME THAT THE MALFUNCTION EXISTS. WHEN THE SYSTEM MALFUNCTION IS CORRECTED AND THE SYSTEM IS FUNCTIONING PROPERLY AGAIN, THE TEST WILL START AT THE POINT IT WAS SUSPENDED. CORRECT ANY AND ALL SYSTEM MALFUNCTIONS RELATED TO THE EQUIPMENT AND SOFTWARE SUPPLIED AS PART OF THE CONTRACT.

REPAIR OR REPLACE DURING THE 60-DAY PERFORMANCE PERIOD ANY EQUIPMENT THAT THAT FAILS TO FUNCTION PROPERLY BECAUSE OF DEFECTIVE MATERIALS OR WORKMANSHIP AT NO ADDITIONAL COST TO THE DEPARTMENT. REPLACE ANY PIECE OF EQUIPMENT THAT MALFUNCTIONS MORE THAN ONCE DURING THE TEST PERIOD. RESTORE NORMAL SYSTEM OPERATION WITHIN 24 HOURS BEING AFTER NOTIFIED OF A SYSTEM MALFUNCTION BY THE ENGINEER.

THE FINAL INSPECTION OF THE EQUIPMENT FURNISHED UNDER THIS CONTRACT WILL BE CONDUCTED FOLLOWING THE 60TH DAY OF THE PERFORMANCE PERIOD PROVIDING THAT NO MAJOR SYSTEM COMPONENTS HAVE FAILED IN THE FINAL 20 DAYS OF THE PERFORMANCE PERIOD. FINAL ACCEPTANCE WILL BE WITHHELD UNTIL THE SYSTEM HAS FUNCTIONED AGAIN FOR 20 CONSECUTIVE CALENDAR DAYS AFTER THE CORRECTIONS ARE MADE. A FAILURE OF THE FOLLOWING FEATURES WILL BE CONSIDERED AS A MAJOR SYSTEM FAILURE (DOWNTIME):

A. EVENT LOG AND LOCAL PRINTER

B. LOCAL CONTROLLERS AND PERIPHERALS

C. LOCAL AREA NETWORK AND ERROR FREE COMMUNICATION LINKS

D. REMOTE MONITORING SYSTEM AND SOFTWARE

ENSURE THE REMOTE MONITORING SYSTEM ACCUMULATES NO MORE THAN ONE (1) HOUR OF DOWNTIME DURING THE FINAL 20-DAY OBSERVATION PERIOD, AND THAT COMMUNICATIONS BETWEEN ALL THE LOCAL CONTROLLERS AND THE CENTRAL SIGNAL SYSTEM CONTROL STATION IS ON-LINE FOR AT LEAST 99.8 PERCENT OF THE 20 DAY PERIOD. REPEAT THE 20 DAY OBSERVATION PERIOD IF THE TESTING REQUIREMENTS ARE VIOLATED AS DEFINED ABOVE.

PAYMENT FOR ACCEPTED QUANTITIES FOR "ITEM 809 - CENTRALLY CONTROLLED ARTERIAL TRAFFIC SIGNAL SYSTEM". INCLUDING TESTING, TRAINING, AND DOCUMENTATION, WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR EACH.

ITEM 809 - ADVANCE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR RADAR DETECTION SYSTEM (MODEL SS-200E) FOR USE AS AN ADVANCE DETECTION SYSTEM. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUT CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATIONS MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD WIRED TO THE COMMUNICATIONS MODULES AS NECESSARY.

PAYMENT FOR ITEM 809 "ADVANCE RADAR DETECTION, AS PER PLAN" SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUITS, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTABLISH A FULLY FUNCTIONAL DETECTION SYSTEM.

CALCULATED JFS | CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

POR-AURORA SIGNALS

ITEM 809 - STOP LINE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR MATRIX RADAR DETECTION SYSTEM FOR USE AS A STOP BAR DETECTION SYSTEM. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUT CARDS SHALL BE INCLUDED IN THE TRAFFIC CABINET AND SHALL BE COMPATIBLE WITH CALTRANS, NEMA TS1 AND NEMA TS2 DETECTOR RACKS. THE CARDS SHALL PROVIDE TRUE PRESENCE DETECTOR CALLS OR CONTACT CLOSURE TO THE TRAFFIC CONTROLLER.
3. THE UNIT SHALL BE MOUNTED DIRECTLY TO A POLE OR MAST ARM, AS RECOMMENDED BY THE MANUFACTURER. CABLE(S) SHALL BE PROVIDED AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER.
4. SURGE PROTECTION DEVICES, AS RECOMMENDED BY THE MANUFACTURER SHALL BE INCLUDED BOTH AT THE POLE WHERE THE UNIT IS LOCATED TO PROTECT THE UNIT AND IN THE TRAFFIC CABINET TO PROTECT THE CABINET ELECTRONICS.
5. THE MANUFACTURER'S REPRESENTATIVE SHALL BE ON SITE DURING INSTALLATION AND TESTING AND SHALL PROVIDE ONSITE TRAINING ON THE SETUP, OPERATION AND MAINTENANCE OF THE UNIT.
6. A SERIAL TO ETHERNET COMMUNICATIONS MODULE AND ETHERNET CABLE (MINIMUM 7 FEET).
7. THE POWER SUPPLY AND COMMUNICATIONS MODULES SHALL BE SECURED TO A SINGLE PANEL THAT CAN BE MOUNTED INTERIOR TO THE TRAFFIC CABINET. THE PANEL SHALL INCLUDE MODULAR-PLUG STYLE CONNECTIONS FOR UP TO FOUR (4) SENSOR CABLES. ADDITIONAL SENSORS MAY BE HARD WIRED TO THE COMMUNICATIONS MODULES AS NECESSARY.

PAYMENT FOR ITEM 809 "STOP BAR RADAR DETECTION, AS PER PLAN" SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH UNIT, COMPLETE AND IN PLACE INCLUDING ALL REQUIRED CABINET HARDWARE, MOUNTING BRACKETS, CABLES, CONDUITS, CONNECTIONS TESTED AND ACCEPTED.

ITEM 824 - SYSTEM ANALYSIS, AS PER PLAN

A SYSTEM ANALYSIS SHALL BE PERFORMED PER SUPPLEMENTAL 824 FOR THE SIGNAL SYSTEM INSTALLED WITH THIS PROJECT. THE WORK SHALL BE PERFORMED BY AN ENGINEERING CONSULTANT FIRM THAT IS PRE-QUALIFIED BY ODOT IN BASIC TRAFFIC SIGNAL AND TRAFFIC SIGNAL SYSTEM DESIGN. THE SYSTEM ANALYSIS SHALL INCLUDE TIMING ADJUSTMENTS TO ANY EXISTING SYSTEMS THAT OVERLAP THE NEW SYSTEM INCLUDED WITH THIS PROJECT.

PAYMENT FOR THIS ITEM SHALL BE AT THE CONTRACT LUMP SUM PRICE BID.

ITEM 632 - SIGNAL SUPPORT, TYPE TC-81.21, AS PER PLAN (ALTERNATE BID)
ITEM 632 - PEDESTAL, 8' TRANSFORMER BASE, (ALTERNATE BID)

FURNISH SIGNAL POLES AND MAST ARMS WHICH COMPLY WITH 732.11, EXCEPT FURNISH POLES WHICH MEET THE FOLLOWING REQUIREMENTS:

OBTAIN THE SIGNAL SUPPORTS FROM THE UNION METAL COMPANY
1432 MAPLE AVENUE, NE, CANTON OHIO 44705 - 1700. PHONE NUMBER (330) 456-7653

OR OBTAIN THE SIGNAL SUPPORTS FROM THE VALMONT COMPANY
ONE VALMONT PLAZA, OMAHA NEBRASKA 68154 PHONE NUMBER (402) 963-1000

1. POLE SHAFT: 16 FLUTE
2. THE ARM SHALL BE STRAIGHT, ROUND
3. THE BASE SHALL BE THE UNION METAL, COLUMBIAN DECORATIVE BASE, OR VALMONT, HUNTINGTON BASE.
4. POLE TOP SHALL MATCH EXISTING CITY OF AURORA DECORATIVE SUPPORT POLE TOPS.

ATTACH ALL PEDESTRIAN SIGNAL HEADS TO THE POLES USING HALF-BLIND COUPLINGS WELDED TO THE POLE AND POLY-CARBONATE PIPES AND FITTINGS.

THE SIGNAL SUPPORTS SHALL BE PAINTED AS FOLLOWS:

PAINT PROCESS

ALL SIGNAL SUPPORTS AND PEDESTALS SHALL BE PAINTED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 916. THE PROCESS SHALL BE THE DRY PROCESS OR POWDER COATING SYSTEM OVER AN INITIAL COAT OF HOT DIP GALVANIZING.

THE FINISH COAT COLOR SHALL MATCH THE LATEST REVISION OF FEDERAL STANDARD 595B, COLOR NUMBER 27038 (BLACK). A PAINT CHIP SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE THE SUPPORTS ARE PAINTED.

PAYMENT FOR ACCEPTED QUANTITIES OF "ITEM - 632 SIGNAL SUPPORT, TYPE TC-81.21, AS PER PLAN, ALTERNATE BID" SHALL BE MADE AT THE CONTRACT UNIT PRICE BID FOR EACH SIGNAL SUPPORT COMPLETE AND IN PLACE. PAYMENT FOR ACCEPTED QUANTITIES OF "ITEM - 632 PEDESTAL, 8' TRANSFORMER BASE, ALTERNATE BID" SHALL BE MADE AT THE CONTRACT UNIT PRICE BID FOR EACH PEDESTAL COMPLETE AND IN PLACE.

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL GENERAL NOTES

POR-AURORA SIGNALS

MATERIAL SPECIFICATIONS FOR BBS GENERATOR POWER PANEL EQUIPMENT

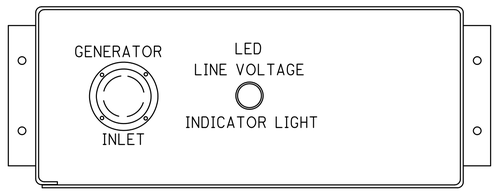
GENERATOR INLET - THE INLET SHALL BE 30 AMP, 125/250V, LOCKING, FOUR (4) WIRE GROUNDING AND MEET THE NEMA CONFIGURATION NUMBER L14-30-P 30A 125/250V SPECIFICATION. THE INLET SHALL BE A HUBBELL CATALOG #2715. LINE

VOLTAGE GENERATOR SWITCH - THE SWITCH SHALL BE 30 AMP, 125/250V AC, TWO (2) POLE, THREE (3) POSITION (ON, OFF, ON). THE SWITCH SHALL BE A HUBBELL CATALOG #1388.

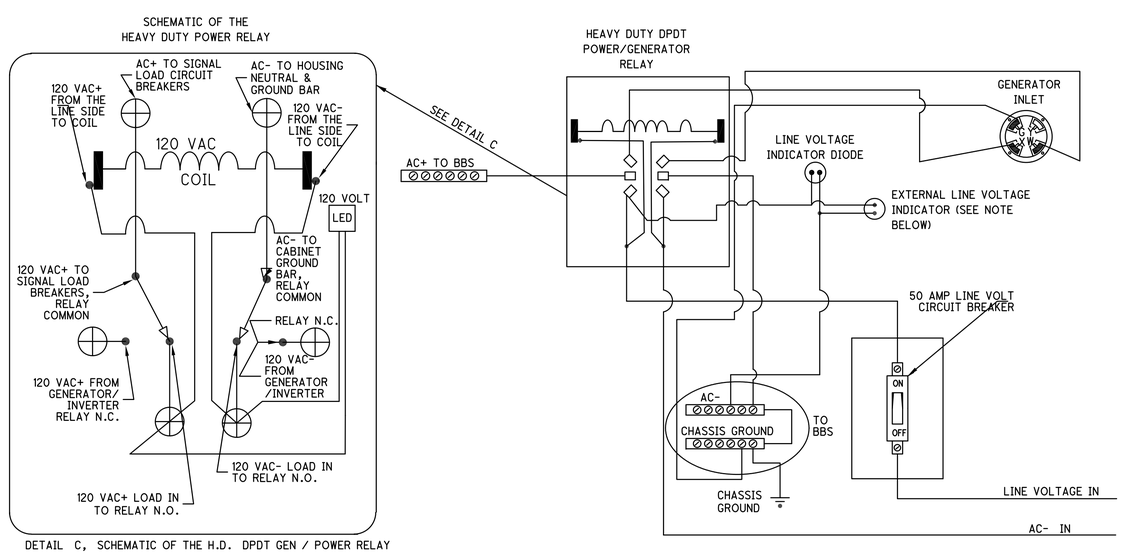
LINE VOLTAGE INDICATOR LIGHT - THE INDICATOR LIGHT SHALL BE A 125V AC LIGHT EMITTING DIODE WITH A RED LENS.

LINE VOLTAGE CIRCUIT BREAKER - THE CIRCUIT BREAKER SHALL BE SINGLE POLE SINGLE THROW AND A MINIMUM OF 30 AMPS. THE AMPERAGE SHALL BE INCREASED TO ACCOMODATE GREATER LOADS, IF NECESSARY. THE GAUGE OF THE POWER CABLE SHALL BE OF PROPER SIZE PER THE N.E.C.

EXTERNAL LINE VOLTAGE INDICATOR LIGHT - THE INDICATOR LIGHT SHALL BE A 1-INCH (25MM) WATERPROOF NEMA 4X OR IP66 LED LAMP WITH A GREEN LENS.



FRONT VIEW OF GENERATOR POWER PANEL

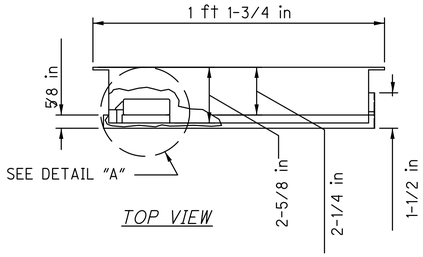


DETAIL C, SCHEMATIC OF THE H.D. DPDT GEN / POWER RELAY

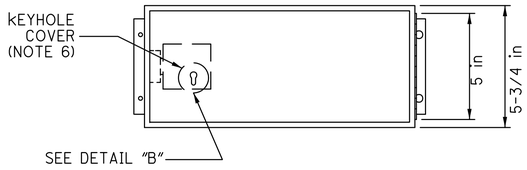
ELECTRICAL HOOKUP DETAIL FOR THE BBS GENERATOR POWER PANEL

NOTE : EXTERNAL LINE VOLTAGE INDICATOR LIGHT REQUIRED WHEN CALLED FOR IN THE PLANS. EXTERNAL LINE VOLTAGE INDICATOR LIGHT SHALL BE LOCATED ON THE ENCLOSURE EXTERIOR FOR VISIBILITY FROM THE ADJACENT ROADWAY WHEN ALL CABINET, AND GENERATOR PANEL DOORS ARE CLOSED.

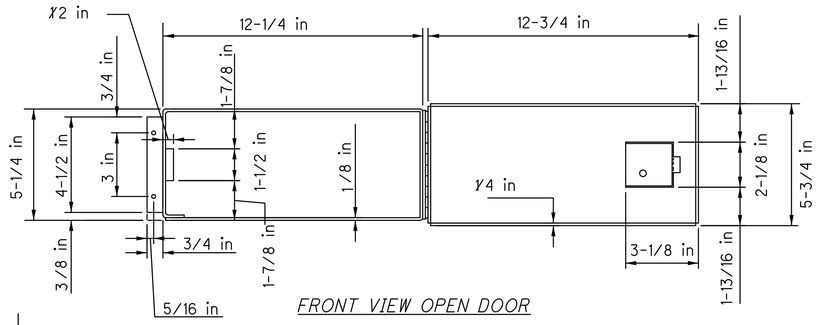
GENERATOR POWER PANEL ENCLOSURE



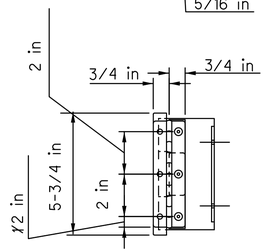
TOP VIEW



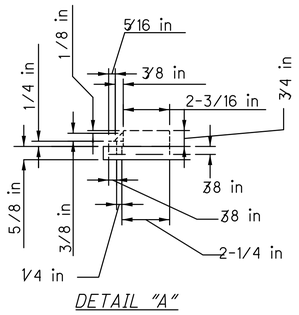
FRONT VIEW CLOSED DOOR



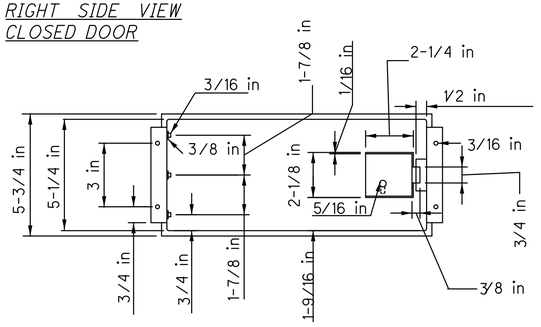
FRONT VIEW OPEN DOOR



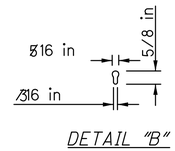
RIGHT SIDE VIEW CLOSED DOOR



DETAIL "A"



BACK VIEW CLOSED DOOR



DETAIL "B"

NOTES

1. THE ENCLOSURE SHALL BE CONSTRUCTED OF 1/8" THICK ALUMINUM.
2. THE LOCK SHALL BE THE STANDARD POLICE DOOR TYPE, KEYED WITH THE STANDARD FLASHER DOOR SKELETON KEY.
3. THE DOOR SHALL BE SEALED WITH A FOAM RUBBER GASKET TO PREVENT MOISTURE FROM ENTERING THE ENCLOSURE.
4. THE ENCLOSURE SHALL BE MOUNTED ONTO THE OUTSIDE OF THE CONTROLLER CABINET WITH NON-ACCESSIBLE BOLTS AND SEALED WITH A HIGH QUALITY SILICON CAULK AT ALL SURFACES TOUCHING THE CABINET.
5. THE HINGE SHALL BE OF STAINLESS STEEL OR EQUIVALENT CORROSIVE-RESISTANT MATERIAL.
6. KEYHOLE SHALL BE COVERED WITH A MOVABLE CIRCULAR ALUMINUM OR BRASS COVER WITH TOP PIVOT PIN.

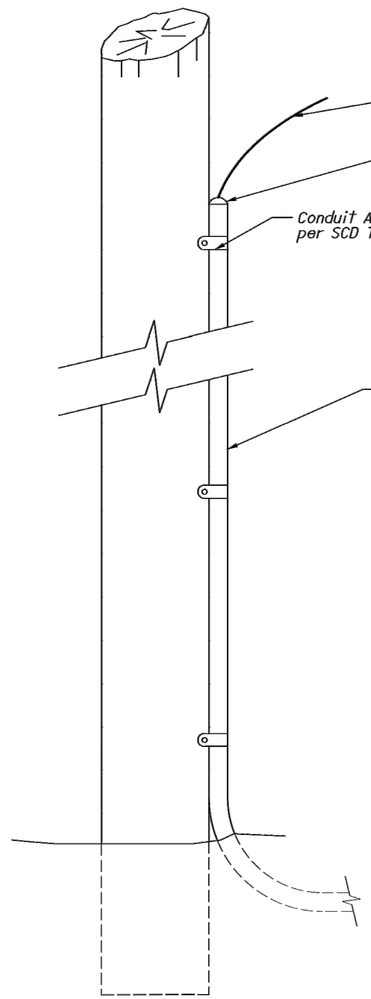
CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL MISCELLAINEOUS DETAILS

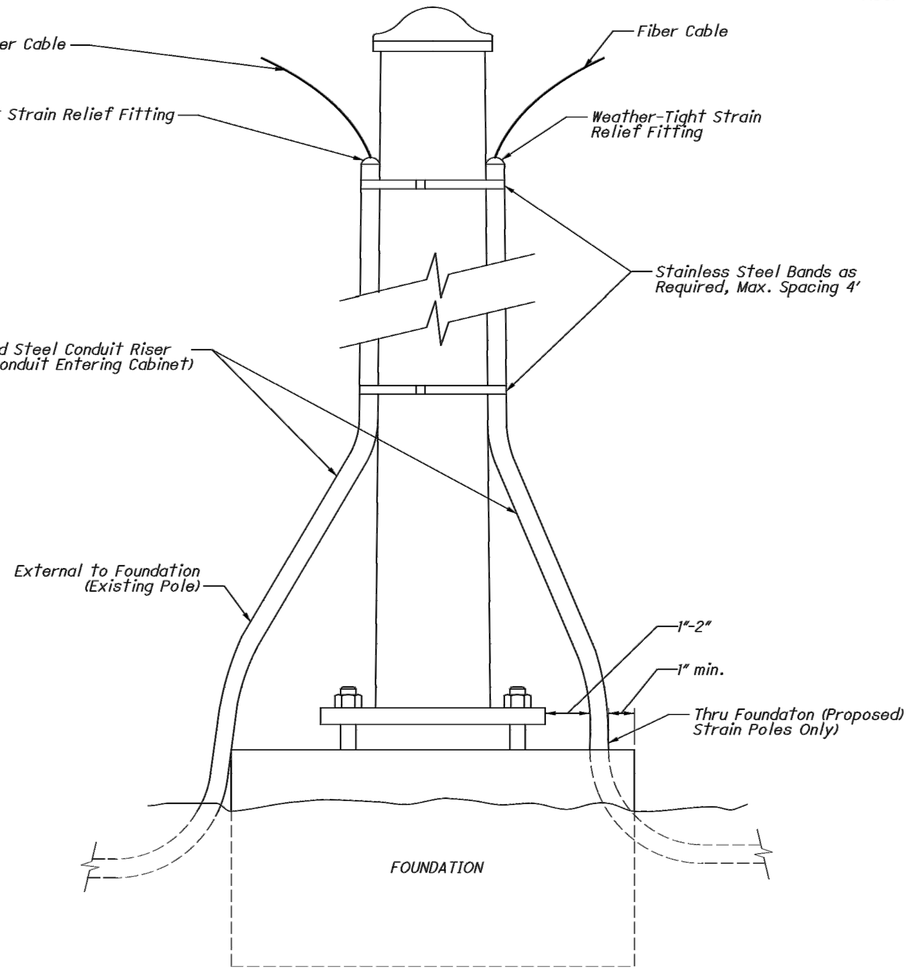
POR-AURORA SIGNALS

NOTES:

1. Conduit shall be placed at a minimum depth of 24". Direct buried cable shall be placed at a minimum depth of 30" below the frost line.
2. Conduit shall be sealed with duct sealer after cable is installed.
3. Saw cut sidewalk at existing joints and replace entire section to match existing material.
4. Conduit bends shall not exceed minimum bending for fiber optic cable.



TYPICAL WOOD POLE FIBER ROUTING



ALTERNATE STRAIN POLE FIBER ROUTING
(WHEN SPECIFIED IN PLAN)

THIS DRAWING REPLACES PIS 206014 DATED 04-15-2011.

OFFICE OF ROADWAY ENGINEERING

DESIGNED XXX | REVIEWED XXX

REVISION DATE 10-18-2013 | CHECKED CHECKED

PLAN INSERT SHEET

MISCELLANEOUS FIBER OPTIC DETAILS

PIS 206014

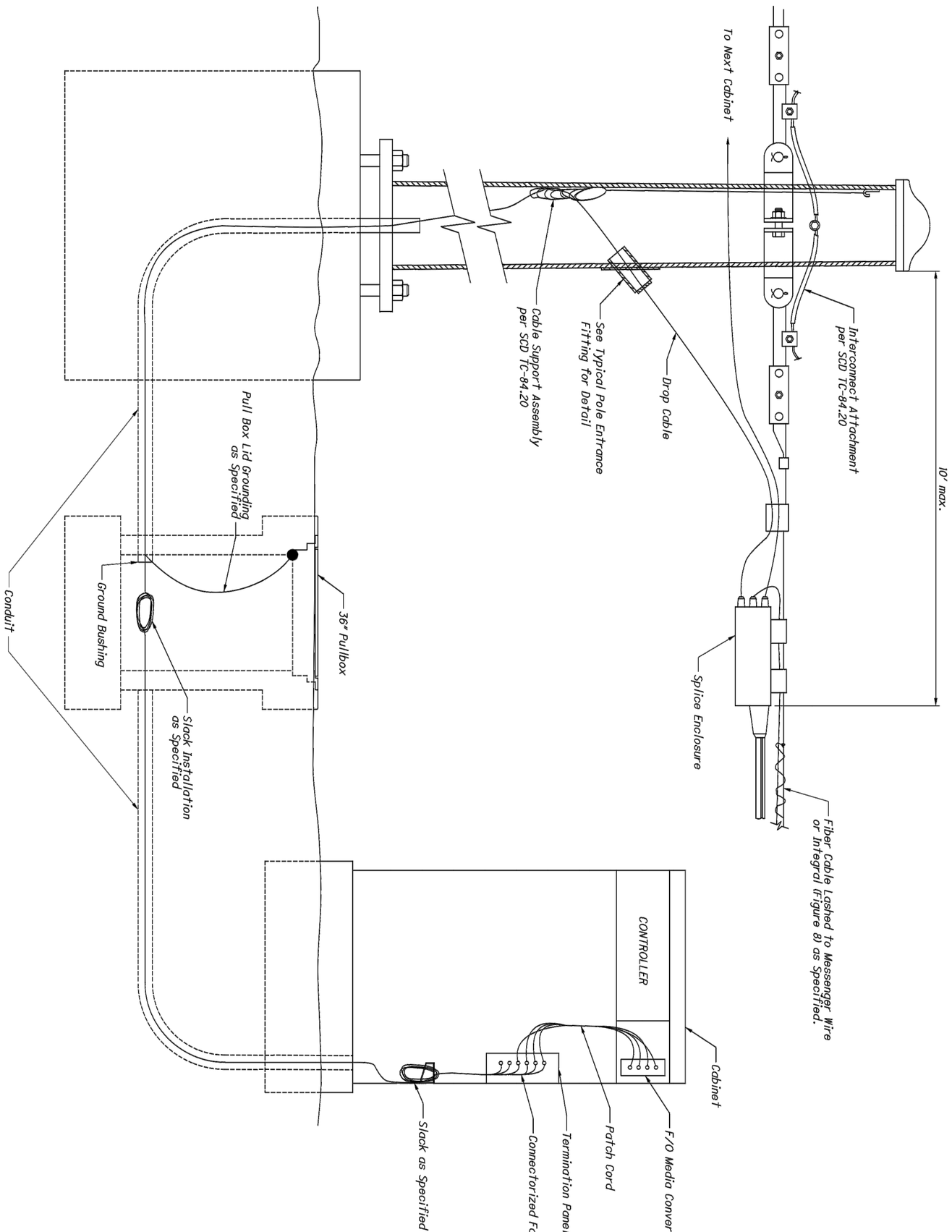
1 / 1

CALCULATED JAT | CHECKED MWS

TRAFFIC SIGNAL
MISCELLAINEOUS DETAILS

POR-AURORA SIGNALS

15
133



NOTES:

1. Conduit bends shall not exceed minimum bending radii of fiber optic cable.

THIS DRAWING REPLACES PIS 206015 DATED 04-20-2012.

1/1	PIS 206015	PLAN INSERT SHEET TYPICAL LOOSE TUBE CABLE INSTALLATION	REVISION DATE 10-18-2013 CHECKED CHECKED	DESIGNED XXX REVIEWED XXX	OFFICE OF ROADWAY ENGINEERING

SHEET NUM.																	PART.	ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
4	5	6	7	8	9	12	13	20	25	26	27	28	29	30	31	114	01/MPO/OT						
																						ROADWAY	
1,200	1,200							192									2,592	202	30001	2,592	SF	WALK REMOVED, AS PER PLAN	4,5
								113									113	202	32000	113	FT	CURB REMOVED	
								15									15	203	20001	15	CY	EMBANKMENT, AS PER PLAN	5
22																	22	410	10000	22	CY	TRAFFIC COMPACTED SURFACE, TYPE A	4
1,200	1,200							875									3,275	608	10000	3,275	SF	4" CONCRETE WALK	4,5
90								155									245	608	52000	245	SF	CURB RAMP	4
24								16									40	608	53020	40	SF	DETECTABLE WARNING	4
								113									113	609	26000	113	FT	CURB, TYPE 6	
								6.3									6.3	659	00300	6.3	CY	TOPSOIL	
200								56									256	659	10000	256	SY	SEEDING AND MULCHING	4
																						TRAFFIC CONTROL	
									182								182	630	03100	182	FT	GROUND MOUNTED SUPPORT, NO. 3 POST	
									46								46	630	79100	46	EACH	SIGN HANGER ASSEMBLY, MAST ARM	
									7								7	630	79500	7	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED	
									854								854	630	80100	854	SF	SIGN, FLAT SHEET	
									2								2	630	85000	2	EACH	REMOVAL OF GROUND MOUNTED SIGN AND STORAGE	
									2								2	630	86002	2	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND	
																						DISPOSAL	
									12								12	630	87000	12	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND STORAGE	
									8								8	631	84000	8	EACH	SIGN SERVICE	
									8								8	631	92991	8	EACH	SCHOOL SPEED LIMIT SIGN ASSEMBLY, 24" X 36",	6
																						AS PER PLAN	
									8								8	631	93300	8	EACH	TIMER WITH ENCLOSURE	
									6								6	631	94490	6	EACH	REMOVAL, MISC.:REMOVE EXISTING SCHOOL SPEED	6
																						LIMIT SIGN	
										75							75	642	00500	75	FT	STOP LINE, TYPE 1	
										668							668	642	00600	668	FT	CROSSWALK LINE, TYPE 1	
										296							296	642	30000	296	FT	REMOVAL OF PAVEMENT MARKING	
																						TRAFFIC SIGNALS	
											934					2,360	3,294	625	25400	3,294	FT	CONDUIT, 2", 725.04	
											1,323						1,323	625	25500	1,323	FT	CONDUIT, 3", 725.04	
											481						481	625	25600	481	FT	CONDUIT, 4", 725.04	
											876					225	1,101	625	25900	1,101	FT	CONDUIT, JACKED OR DRILLED, 3" DIA.	
											145						145	625	25900	145	FT	CONDUIT, JACKED OR DRILLED, 4" DIA.	
											1,766					2,360	4,126	625	29000	4,126	FT	TRENCH	
											944						944	625	29600	944	FT	TRENCH IN PAVED AREA, TYPE B	
											46					10	56	625	30700	56	EACH	PULL BOX, 725.08, 18"	
											14						14	625	30706	14	EACH	PULL BOX, 725.08, 24"	
																4	4	625	31600	4	EACH	PULL BOX, MISC.: 24" X 35" X 26"	6
											75						75	625	32000	75	EACH	GROUND ROD	
											2,642					2,360	5,002	625	36000	5,002	FT	PLASTIC CAUTION TAPE	
		16															16	625	76000	16	EACH	ARC FLASH CALCULATIONS AND LABEL	6
											12						12	632	04000	12	EACH	VEHICULAR SIGNAL HEAD, MISC.:3-SECTION, 12" - 12" - 8",	6
																						1-WAY POLYCARBONATE	
											6						6	632	04803	6	EACH	VEHICULAR SIGNAL HEAD, (LED), 1-SECTION, 12" LENS,	6
																						1-WAY, POLYCARBONATE, AS PER PLAN	
											69						69	632	05007	69	EACH	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS,	6
																						1-WAY, POLYCARBONATE, AS PER PLAN	
											38						38	632	05087	38	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS,	6
																						1-WAY, POLYCARBONATE, AS PER PLAN	
											46						46	632	20731	46	EACH	PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN,	6
																						AS PER PLAN	

CALCULATED J.A.T
CHECKED M.W.S

TRAFFIC SIGNAL
GENERAL SUMMARY

POR-AURORA SIGNALS

SHEET NUM.																	PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE
4	5	6	7	8	9	12	13	20	25	26	27	28	29	30	31	114	01/MPO/OT		EXT	TOTAL			SHEET NO.
																						TRAFFIC SIGNALS (CONT.)	
											88						88	632	25000	88	EACH	COVERING OF VEHICULAR SIGNAL HEAD	
												48					48	632	26001	48	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN	6
												34					34	632	26500	34	EACH	DETECTOR LOOP	
												19,979					19,979	632	40500	19,979	FT	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	
												7,423					7,423	632	40700	7,423	FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	
												8					8	632	64000	8	EACH	STRAIN POLE FOUNDATION	
												34					34	632	64010	34	EACH	SIGNAL SUPPORT FOUNDATION	
												24					24	632	64020	24	EACH	PEDESTAL FOUNDATION	
												10,460					10,460	632	65200	10,460	FT	LOOP DETECTOR LEAD-IN CABLE	
												595					595	632	68300	595	FT	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG	
												731					731	632	69800	731	FT	SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG	
												13					13	632	70001	13	EACH	POWER SERVICE, AS PER PLAN	6
												2				27	29	632	70400	29	EACH	CONDUIT RISER, 2" DIAMETER	
												1					1	632	75003	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21 DESIGN 3 POLE, WITH	7
																						MAST ARMS TC-81.21 DESIGN 1 AND DESIGN 1, AS PER PLAN	
												1					1	632	75013	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21 DESIGN 3 POLE, WITH	7
																						MAST ARMS TC-81.21 DESIGN 2 AND DESIGN 1, AS PER PLAN	
												1					1	632	75043	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21 DESIGN 4 POLE, WITH	7
																						MAST ARMS TC-81.21 DESIGN 3 AND DESIGN 2, AS PER PLAN	
												1					1	632	75053	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21 DESIGN 4 POLE, WITH	7
																						AMST ARMS TC-81.21 DESIGN 3 AND DESIGN 3, AS PER PLAN	
												1					1	632	75113	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21 DESIGN 12 POLE, WITH	7
																						MAST ARMS TC-81.21 DESIGN 11 AND DESIGN 3, AS PER PLAN	
												15					15	632	77233	15	EACH	SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-81.21	6
																						MAST ARM (GREATER THAN 39' IN LENGTH), AS PER PLAN	
													1				1	632	80103	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 1, AS PER PLAN	7
													4				4	632	80203	4	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 2, AS PER PLAN	7
													8				8	632	80303	8	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 3, AS PER PLAN	7
													1				1	632	80403	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 4, AS PER PLAN	7
													8				8	632	80503	8	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 11, AS PER PLAN	7
													5				5	632	80603	5	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 12, AS PER PLAN	7
													1				1	632	80621	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 13, AS PER PLAN	7
													1				1	632	80629	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 14, AS PER PLAN	7
													8				8	632	82100	8	EACH	STRAIN POLE, TYPE TC-81.10, DESIGN 1	
													18				18	632	89901	18	EACH	PEDESTAL, 8', TRANSFORMER BASE, AS PER PLAN	7
													1				1	632	89905	1	EACH	PEDESTAL, 10', TRANSFORMER BASE, AS PER PLAN	7
													36				36	632	90020	36	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM,	
																						REMOVE VEHICULAR SIGNAL HEAD	
													10				10	632	90020	10	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM,	
																						REMOVE PEDESTRIAN SIGNAL HEAD	
													10				10	632	90020	10	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM,	
																						REMOVE PEDESTRIAN PUSHBUTTON	
													19				19	632	90020	19	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM,	7
																						REMOVE PREEMPTION CONFIRMATION LIGHT	
													19				19	632	90020	19	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM,	7
																						REMOVE PREEMPTION DETECTOR	
													5				5	632	90020	5	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC SIGNAL ITEM,	
																						REMOVE RADIO INTERCONNECT	
													12				12	632	90100	12	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION	
			4											5			9	632	90400	9	EACH	SIGNALIZATION, MISC.: FOUNDATION TEST HOLE	7
														17			17	633	65511	17	EACH	CABINET, TYPE TS-2, AS PER PLAN	7
														12			12	633	67101	12	EACH	CABINET FOUNDATION, AS PER PLAN	7
														17			17	633	67201	17	EACH	CONTROLLER WORK PAD, AS PER PLAN	7
														1			1	633	71000	1	EACH	FLASHER CONTROLLER	
														17			17	633	75001	17	EACH	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT,	7
																						AS PER PLAN	
														5			5	633	99000	5	EACH	CONTROLLER ITEM, MISC.: REMOVE EXISTING CONTROLLER	7
														5			5	633	99000	5	EACH	CONTROLLER ITEM, MISC.: MODIFY CABINET FOUNDATION	8
				LS													LS	633	99300	LS		CONTROLLER ITEM, MISC.: VIDEO MONITORING EQUIPMENT	8

CALCULATED J.A.T
CHECKED M.W.S

TRAFFIC SIGNAL GENERAL SUMMARY

POR-AURORA SIGNALS

SHEET NUM.																	PART.	ALT	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE
4	5	6	7	8	9	12	13	20	25	26	27	28	29	30	31	114	01/MPO/OT	(X)		EXT	TOTAL			SHEET NO.
																							TRAFFIC SIGNALS (CONT.)	
																6,096	6,096		804	20034	6,096	FT	FIBER OPTIC CABLE, ARMORED, 24 FIBER	
																25,893	25,893		804	20240	25,893	FT	FIBER OPTIC CABLE, ARMORED, INTEGRAL	
																							MESSENGER, 24 FIBER	
																17	17		804	30010	17	EACH	FAN-OUT KIT, 12 FIBER	
																1,386	1,386		804	32040	1,386	FT	DROP CABLE, 12 FIBER	
																60	60		804	33990	60	EACH	FIBER OPTIC PATCH CORD, 1 FIBER	
																17	17		804	34012	17	EACH	FIBER TERMINATION PANEL, 12 FIBER	
																60	60		804	35000	60	EACH	FUSION SPLICE	
																15	15		804	36000	15	EACH	SLACK INSTALLATION	
																15	15		804	37000	15	EACH	SPLICE ENCLOSURE, BUTT STYLE	
														17			17		804	38101	17	EACH	FIBER OPTIC CABLE MEDIA CONVERTER,	9
																							ETHERNET, AS PER PLAN	
														6			6		809	60001	6	EACH	CCTV IP-CAMERA SYSTEM, DOME-TYPE,	10
																							AS PER PLAN	
														4			4		809	64500	4	EACH	HIGH-SPEED ETHERNET RADIO	
						1											1		809	66010	1	EACH	CENTRALLY CONTROLLED ARTERIAL TRAFFIC	10
																							SIGNAL SYSTEM	
														24			24		809	69001	24	EACH	ADVANCE RADAR DETECTION, AS PER PLAN	12
														6			6		809	69101	6	EACH	STOP LINE RADAR DETECTION, AS PER PLAN	13
														17			17		809	69123	17	EACH	ATC V6.24 CONTROLLER, AS PER PLAN	9
					1												1		809	69200	1	EACH	EMERGENCY VEHICLE PREEMPTION	9
														61			61		809	69210	61	EACH	PREEMPT RECEIVING UNIT	
															10,631		10,631		809	69220	10,631	FT	PREEMPT DETECTOR CABLE	
															18		18		809	69230	18	EACH	PREEMPT PHASE SELECTOR	
															61		61		809	69240	61	EACH	PREEMPT CONFIRMATION LIGHT	9
							LS										LS		824	00011	LS		SYSTEM ANALYSIS, AS PER PLAN	13
																							TRAFFIC SIGNALS ALTERNATES	
															2		2		632	80203	2	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 2,	13
																							AS PER PLAN	
															4		4		632	80303	4	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 3,	13
																							AS PER PLAN	
															1		1		632	80403	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 4,	13
																							AS PER PLAN	
															6		6		632	80503	6	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 11,	13
																							AS PER PLAN	
															3		3		632	80603	3	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 12	13
																							AS PER PLAN	
															1		1		632	80621	1	EACH	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 13,	13
																							AS PER PLAN	
															10		10		632	89901	10	EACH	PEDESTAL, 8', TRANSFORMER BASE,	13
																							AS PER PLAN	
																							MAINTENANCE OF TRAFFIC	
	240																240		614	11110	240	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL	5
																							CAR FOR ASSISTANCE	
																							INCIDENTALS	
	LS																LS		614	11000	LS		MAINTAINING TRAFFIC	5
																	15		619	16010	15	MNTH	FIELD OFFICE, TYPE B	
																	LS		623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING	
																	LS		624	10000	LS		MOBILIZATION	

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL
GENERAL SUMMARY

POR-AURORA SIGNALS

19
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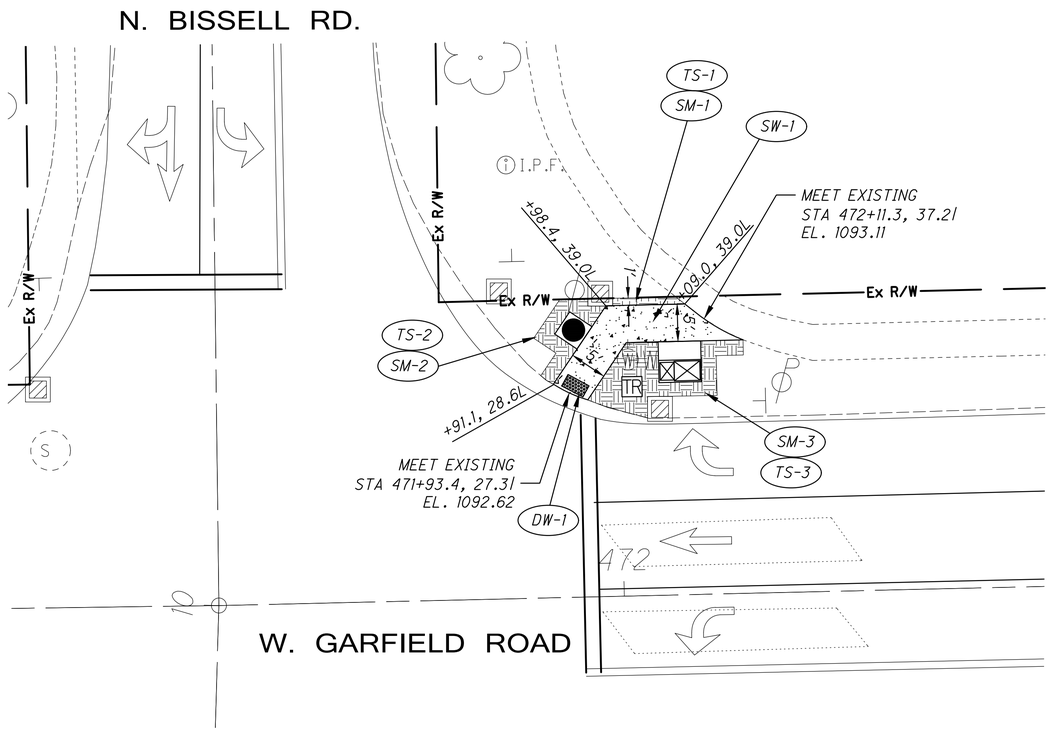
REF NO.	SHEET NO.	LOCATION	202			203		608			609	659									
			WALK REMOVED, AS PER PLAN	CURB REMOVED		EMBANKMENT, AS PER PLAN		4" CONCRETE WALK	CURB RAMP	DETECTABLE WARNING	CURB, TYPE 6	TOP SOIL	SEEDING AND MULCHING								
			SQ FT	FEET		CU YD		SQ FT	SQ FT	SQ FT	FEET	CU YD	SQ YD								
DW-1	21	82 / BISSELL - NEC								8											
SM-1	21	NEC											0.9								
SM-2	21	NEC											3.6								
SM-3	21	NEC											8.0								
SW-1	21	NEC						121.0													
TS-1	21	NEC										0.10									
TS-2	21	NEC										0.40									
TS-3	21	NEC										0.89									
C-1	22A	82 / AURORA COMMONS - SWC		27							27										
CR-1	22A	SWC							36.0												
SM-9	22A	SWC											2.5								
SM-10	22A	SWC											1.2								
SM-11	22A	SWC											6.4								
SW-3	22A	SWC						188.0													
TS-9	22A	SWC										0.28									
TS-10	22A	SWC										0.13									
TS-11	22A	SWC										0.71									
DW-2	22A	NWC								8											
SM-5	22A	NWC											3.0								
SM-6	22A	NWC											1.8								
SM-7	22A	NWC											0.6								
SM-8	22A	NWC											0.6								
SW-2	22A	NWC						72.0													
SWR-1	22A	NWC	27																		
TS-5	22A	NWC										0.33									
TS-6	22A	NWC										0.20									
TS-7	22A	NWC										0.06									
TS-8	22A	NWC										0.06									
C-2	22A	SEC		25							25										
CR-2	22A	SEC							47.0												
SM-12	22A	SEC											6.4								
SM-13	22A	SEC											2.5								
SM-14	22A	SEC											1.0								
SW-4	22A	SEC						197.0													
TS-12	22A	SEC										0.71									
TS-13	22A	SEC										0.28									
TS-14	22A	SEC										0.11									
C-3	23A	43 / GREENBRIAR / CHATHAM - SEC		61							61										
CR-3	23A	SEC							36.0												
CR-4	23A	SEC							36.0												
SM-15	23A	SEC											4.2								
SM-16	23A	SEC											1.9								
SM-17	23A	SEC											1.4								
SM-18	23A	SEC											3.9								
SM-19	23A	SEC											4.2								
SW-5	23A	SEC						279.0													
SWR-1	23A	SEC	165																		
TS-15	23A	SEC										0.46									
TS-16	23A	SEC										0.21									
TS-17	23A	SEC										0.15									
TS-18	23A	SEC										0.43									
TS-19	23A	SEC										0.46									
SW-6	23	SWC						18.0				0.33	2.0								
EM-1	72	SP-2				15.00															
TOTALS CARRIED TO GENERAL SUMMARY			192	113		15		875	155	16	113	6.3	56								

CALCULATED JAT
CHECKED MWS

ROADWAY SUB-SUMMARY

POR-AURORA SIGNALS



LEGEND

ITEM 202 WALK REMOVED, AS PER PLAN

ITEM 608 4" WALK

TYPE — CURB RAMP TYPE, PER ODOT SCD BP 7.1

ITEM 608 DETECTABLE WARNING

ITEM 659 SEEDING & MULCHING
ITEM 659 TOP SOIL

N

0 5 10 20
HORIZONTAL SCALE IN FEET

CALCULATED JAT
CHECKED MWS

INTERSECTION DETAIL
W. GARFIELD RD. (S.R. 82) & BISSELL RD.

POR-AURORA SIGNALS

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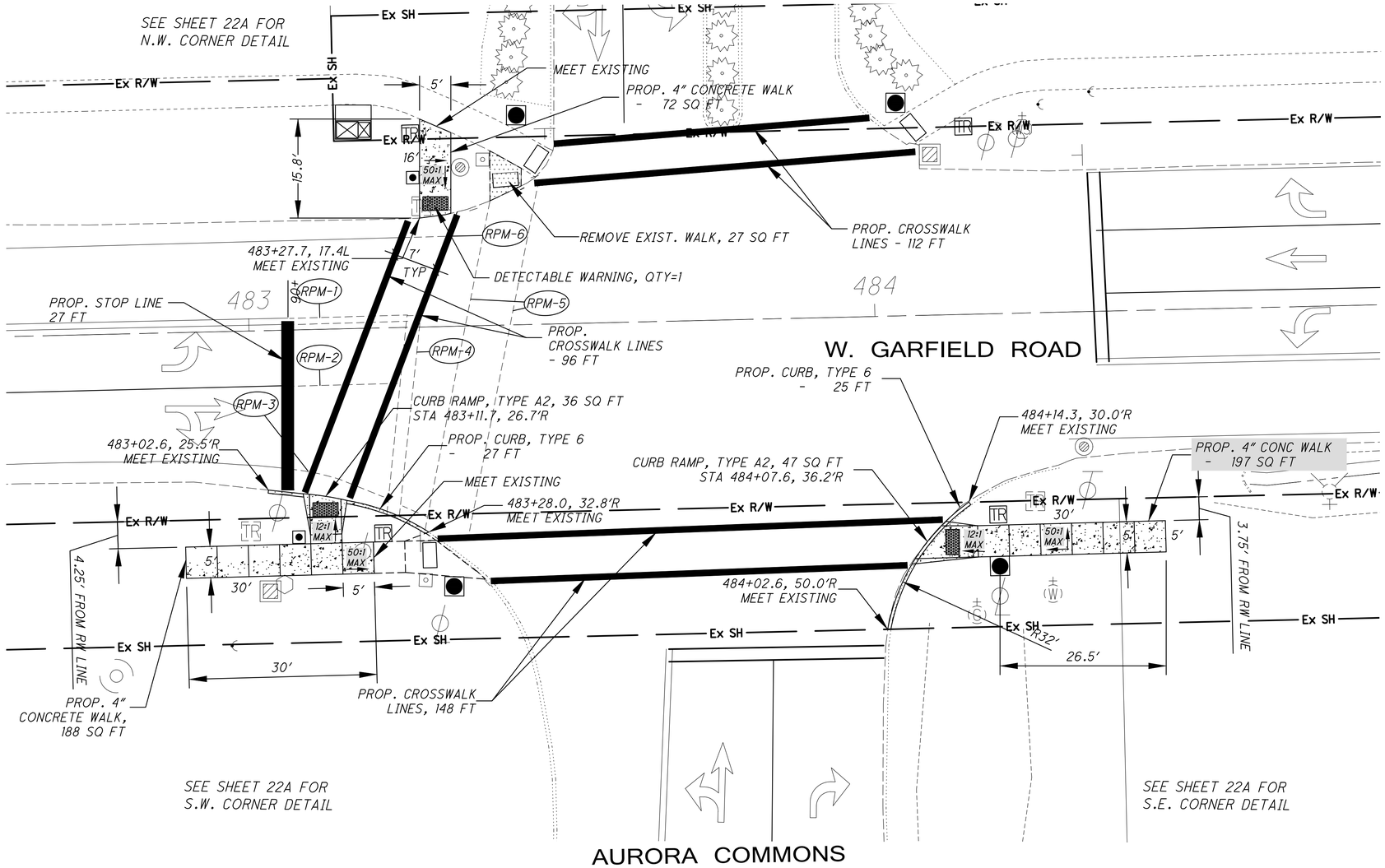
CURB RAMP CONSTRUCTION TO FOLLOW
LATEST VERSION OF SCD BP-7.1



RPM-1 EXIST. PAVEMENT MARKING REMOVAL

N

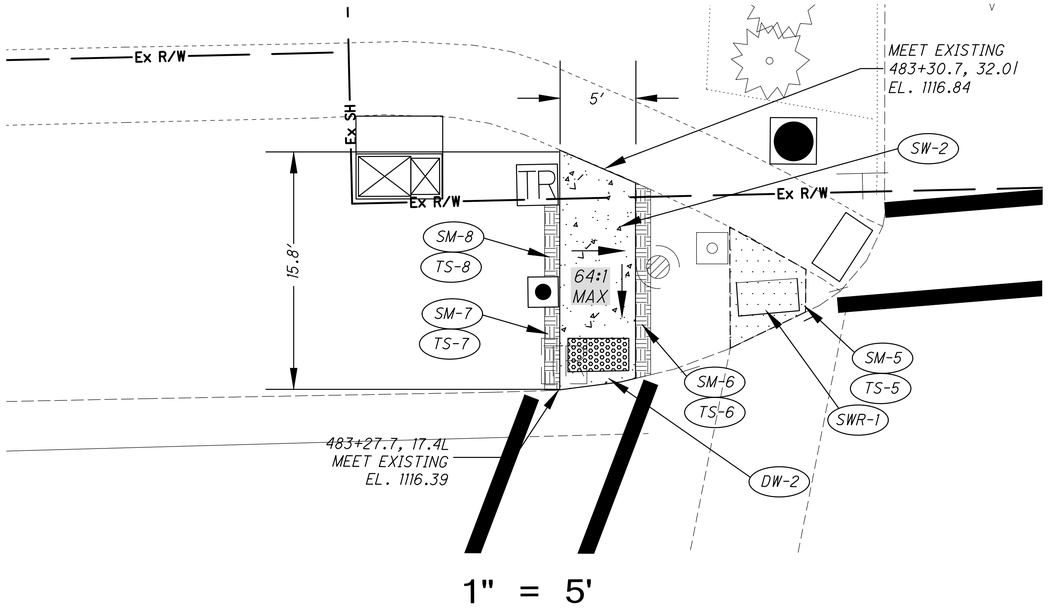
HORIZONTAL SCALE IN FEET
0 5 10 20

CALCULATED JAT
CHECKED MWS

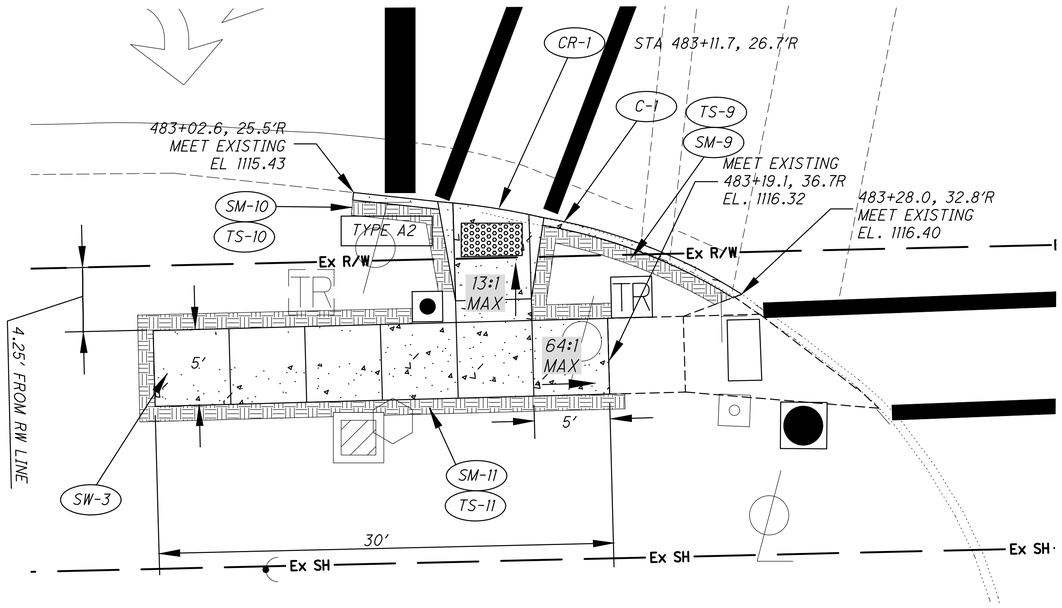
INTERSECTION DETAIL
GARFIELD RD. (S.R. 82) & AURORA COMMONS

POR-AURORA SIGNALS

22
133



1" = 5'



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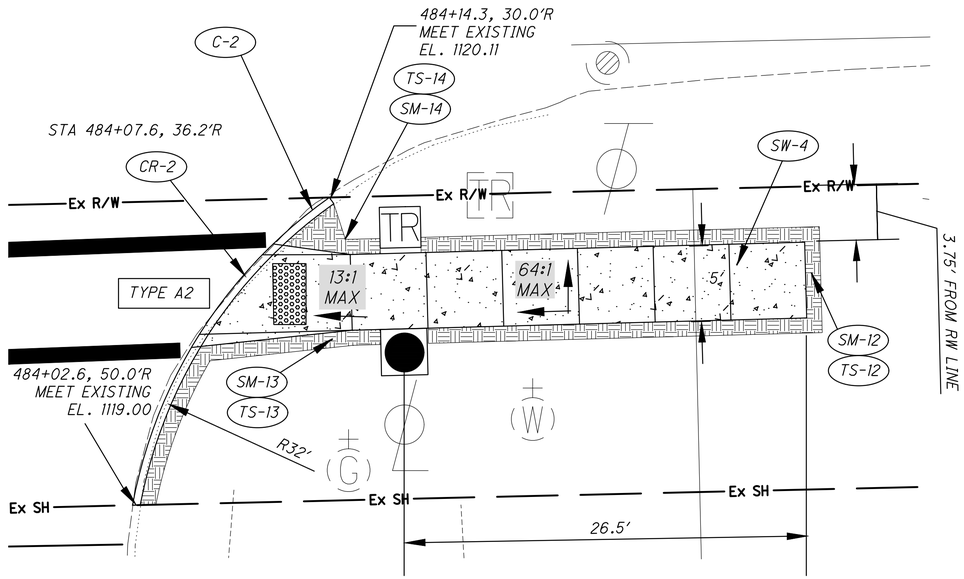


1" = 5'

LEGEND

ITEM 202 WALK REMOVED, AS PER PLAN
ITEM 659 SEEDING & MULCHING

ITEM 608 4" WALK

TYPE — CURB RAMP TYPE, PER ODOT SCD BP 7.1

ITEM 608 DETECTABLE WARNING

ITEM 659 SEEDING & MULCHING
ITEM 659 TOP SOIL

N

HORIZONTAL SCALE IN FEET
0 5 10 20

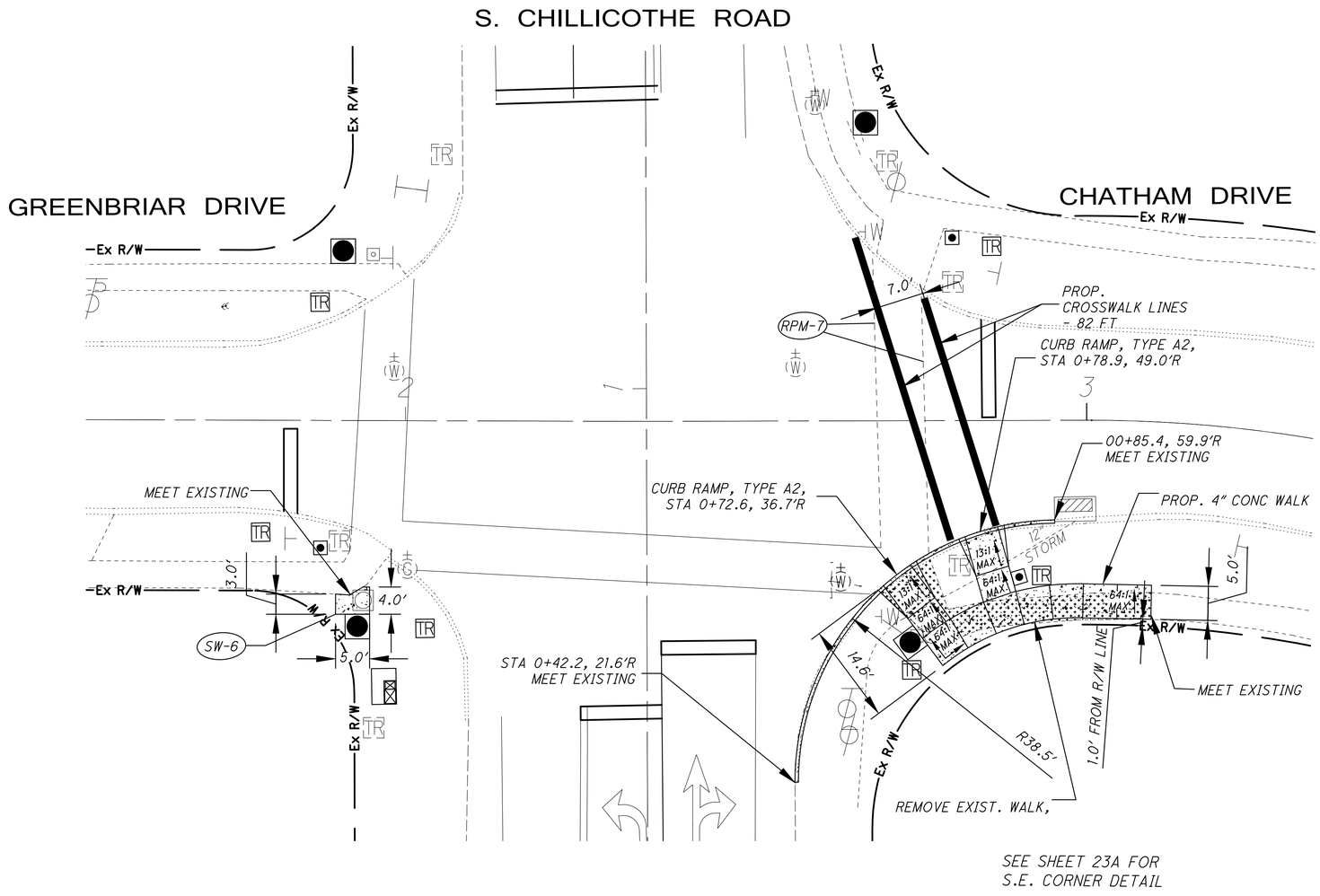
CALCULATED JAT
CHECKED MWS

INTERSECTION DETAIL
GARFIELD RD. (S.R. 82) & AURORA COMMONS
POR-AURORA SIGNALS

22A
133

CURB RAMP CONSTRUCTION TO FOLLOW
LATEST VERSION OF SCD BP-7.1

RPM-1 EXIST. PAVEMENT MARKING REMOVAL



N

HORIZONTAL SCALE IN FEET
0 5 10 20

CALCULATED JAT
CHECKED MWS

INTERSECTION DETAIL
S. CHILLICOTHE RD. (S.R. 43) & GREENBRIAR/ CHATHAM

POR-AURORA SIGNALS

23
133

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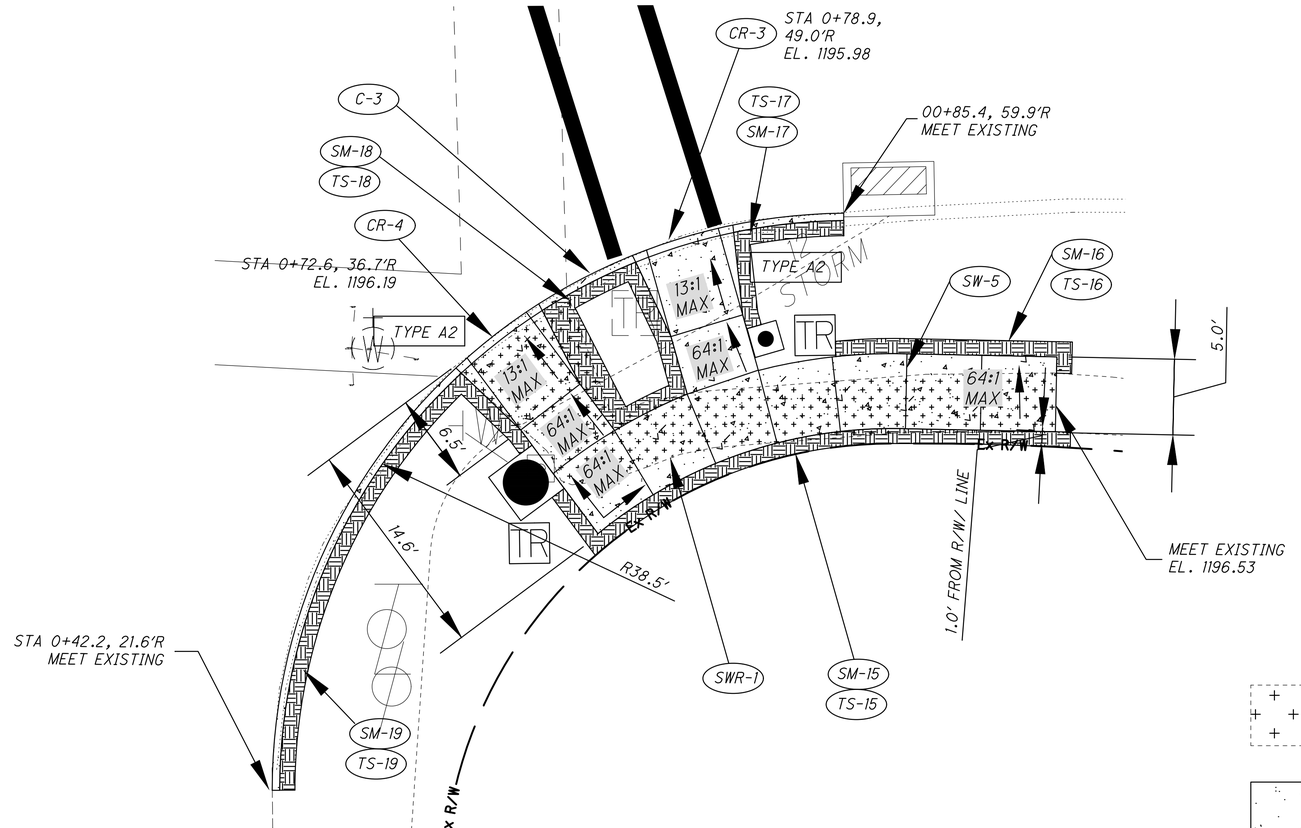

1" = 5'

LEGEND

- ITEM 202 WALK REMOVED, AS PER PLAN
- ITEM 608 4" WALK
- TYPE — CURB RAMP TYPE, PER ODOT SCD BP 7.1
- ITEM 608 DETECTABLE WARNING
- ITEM 659 SEEDING & MULCHING

N

HORIZONTAL SCALE IN FEET
0 5 10 20

CALCULATED JAT
CHECKED MWS

INTERSECTION DETAIL

S. CHILLICOTHE RD. (S.R. 43) & GREENBRIAR/ CHATHAM

POR-AURORA SIGNALS

23A
133

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SHEET NO.	LOCATION	630								631										
		GROUND MOUNTED SUPPORT, NO. 3 POST	SIGN HANGER ASSEMBLY, MAST ARM	SIGN SUPPORT ASSEMBLY, POLE MOUNTED	SIGN, FLAT SHEET	REMOVAL OF GROUND MOUNTED SIGN & STORAGE	REMOVAL OF GROUND MOUNTED POST & DISPOSAL	REMOVAL OF OVERHEAD SIGN & STORAGE		SIGN SERVICE	SCHOOL SPEED LIMIT SIGN ASSEMBLY, 24" X 48", AS PER PLAN	TIMER WITH ENCLOSURE	REMOVAL MISC.: REMOVE EXISTING SCHOOL SPEED LIMIT SIGN							
		FEET	EACH	EACH	SQ FT	EACH	EACH	EACH		EACH	EACH	EACH	EACH							
32	MONETA - ES	14			3.8															
	SP-1		2		36.0															
	SP-2		1		18.0															
	SWC	14			3.8															
36	FIRE STATION #2 - SEC - ES		1		8.8															
	SWC		1		8.8															
56	82 / BISSELL - SP-1			1	15.0															
	SP-2		1		21.0															
	SP-3		1		21.0															
	SP-4		1		15.0															
	NWC	14			3.8															
	SWC	14			3.8															
60	82 / AURORA COMMONS - SP-1		1		7.5															
	SP-2		1		21.0															
	SP-3		1		21.0															
	SP-4		1		7.5															
	NEC	14			3.8															
	SEC			1	3.8															
	EXISTNG SIGNAL							3												
64	82 / 43 - SP-1		2		25.5															
	SP-2		2		28.5															
	SP-3		2		28.5															
	SP-4		2		25.5															
	EXISTING SIGNAL							4												
68	82 / 306 - SP-1		3		37.5															
	SP-2		2		25.5															
	SP-3		3		34.5															
	SP-4		3	1	41.2															
	NEC	14			3.8															
	EXISTING SIGNAL							5												
72	306 / TREAT - SP-1		1		14.0															
	SP-2		2		38.0															
76	PIONEER / FIRE STATION #1 - SP-1		2		8.8															
80/81	43 / 306 / PIONEER -SEC	14			3.8															
	SWC	14			3.8															
85	43 / AURORA-HUDSON - SP-1			3	78.0															
	NEC	14			3.8															
	NWC	14			3.8															
89	43 / AURORA FARMS - SEC	14			3.8															
	SWC	14			3.8															
	SUBTOTALS CARRIED TO SHEET 25	168	36	6	635	0	0	12		0	0	0	0							

CALCULATED JAT
CHECKED MWS

SIGNING SUB-SUMMARY

POR-AURORA SIGNALS

SHEET NO.	LOCATION	630								631										
		GROUND MOUNTED SUPPORT, NO. 3 POST	SIGN HANGER ASSEMBLY, MAST ARM	SIGN SUPPORT ASSEMBLY, POLE MOUNTED	SIGN, FLAT SHEET	REMOVAL OF GROUND MOUNTED SIGN & STORAGE	REMOVAL OF GROUND MOUNTED POST & DISPOSAL	REMOVAL OF OVERHEAD SIGN & STORAGE		SIGN SERVICE	SCHOOL SPEED LIMIT SIGN ASSEMBLY, 24" X 48", AS PER PLAN	TIMER WITH ENCLOSURE	REMOVAL MISC.: REMOVE EXISTING SCHOOL SPEED LIMIT SIGN							
		FEET	EACH	EACH	SQ FT	EACH	EACH	EACH		EACH	EACH	EACH	EACH							
93	43 / GREENBRIAR / CHATHAM - SP-1		1		24.0															
	SP-2		1		25.5															
	SP-3		1	1	29.3															
	SP-4		1		24.0															
	NWC	14			3.8															
97	43 / LENA - SP-1		2		36.0															
	SP-2		1		12.0															
101	82 / EGGLESTON - SP-1		1		21.0															
	SP-2		2		41.0															
	NWC				3.1															
106	AURORA-HUDSON SF - EB									1	1	1	1							
	WB									1	1	1	1							
107	S CHILLICOTHE SF - NB									1	1	1	1							
	SB									1	1	1	1							
108	W PIONEER SF - EB					1	1			1	1	1								
	WB					1	1			1	1	1								
109	E GARFIELD SF - EB									1	1	1	1							
	WB									1	1	1	1							
SUBTOTALS FROM THIS SHEET		14	10	1	220	2	2	0		8	8	8	6							
SUBTOTALS FROM SHEET 24		168	36	6	635	0	0	12		0	0	0	0							
TOTALS CARRIED TO GENERAL SUMMARY		182	46	7	854	2	2	12		8	8	8	6							

CALCULATED JAT
CHECKED MWS

SIGNING
SUB-SUMMARY

POR-AURORA SIGNALS

SHEET NO.	LOCATION	642 STOP LINE	642 CROSSWALK LINE	642 REMOVAL OF PAVENMENT MARKING	
		FEET	FEET	FEET	
22	82 / AURORA COMMONS - RPM-1			19	
	RPM-2			17	
	RPM-3			19	
	RPM-4			34	
	RPM-5			112	
	RPM-6			14	
	WEST APPROACH	27	96		
	NORTH APPROACH		112		
	SOUTH APPROACH		148		
76	PIONEER / FIRE STATION #1 - EB	24			
	WB	24			
89	43 / AURORA FARMS - NORTH APPROACH		80		
	EAST APPROACH		150		
23	43 / GREENBRIAR / CHATHAM - RPM-7			81	
	EAST APPROACH		82		
	TOTALS CARRIED TO GENERAL SUMMARY	75	668	296	

CALCULATED JAT
CHECKED MWS

PAVEMENT MARKING
SUB-SUMMARY

POR-AURORA SIGNALS

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SHEET NO.	LOCATION	625												632					
		CONDUIT, 2", 725.04	CONDUIT, 3", 725.04	CONDUIT, 4", 725.04	CONDUIT, JACK OR DRILL, 725.04, 3"	CONDUIT, JACK OR DRILL, 725.04, 4"	TRENCH	TRENCH IN PAVED AREA, TYPE B	PULL BOX, 725.08, 18"	PULL BOX, 725.08, 24"	GROUND ROD	PLASTIC CAUTION TAPE		VEHICULAR SIGNAL HEAD MISC.: 3-SECTION, 12"-12"-8" 1-WAY POLYCARBONATE	VEHICULAR SIGNAL HEAD (LED), 1-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN	VEHICULAR SIGNAL HEAD (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN	VEHICULAR SIGNAL HEAD (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN	PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN,AS PER PLAN	COVERING OF VEHICULAR SIGNAL HEAD
		FEET	FEET	FEET	FEET	FEET	FEET	FEET	EACH	EACH	EACH	FEET		EACH	EACH	EACH	EACH	EACH	EACH
32	43 / MONETA	63	110	14	63		180	57	4	1	6	237				6		4	6
36	43 / FIRE STATION #2	19	38	18	58		66		2	1	3	66		6					6
40	43 / SQUIRES															4	3		
44	43 / TREAT																		
48	43 / SYCAMORE															6	2		
52	43 / N. BISSELL															6			
56	82 / BISSELL	75	62	82	95		83	128	3	1	6	211				3	5		8
60	82 / AURORA COMMONS	48	54	20	188	65	112		3	1	7	112				5	3	4	8
64	82 / 43	81	192	44		80	143	174	4	1	7	317				2	6	8	8
68	82 / 306	56	134	94	73		169	115	4	3	8	284				3	5	6	8
72	306 / TREAT	44	67	24	99		123		3	1	3	123				3	3		6
76	PIONEER / FIRE STATION #1	9	60	14			25	51	1	1	2	76		6					6
80 / 81	43 / 306 / PIONEER	114	135		98		249					249				13	3	10	
85	43 / AURORA-HUDSON	41	66	24			65	66	3	1	7	63				3	3	4	6
89	43 / AURORA FARMS	32	149	29			52	149	2	1	5	201				4	2	4	6
93	43 / GREENBRIAR / CHATHAM	70	149	96			145	158	5	1	8	303				8		6	8
97	43 / LENA	79	61	22	84		151		3	1	3	151				3	3		6
101	82 / EGGLESTON	43			51		43		2		2	43			6				6
106	AURORA-HUDSON SF	13			28		13		2		2	13							
107	S. CHILLICOTHE SF	103					103				2	103							
108	W. PIONEER SF	32	46				32	46	3		2	78							
109	E. GARFIELD SF	12			39		12		2		2	12							
	TOTALS CARRIED TO GENERAL SUMMARY	934	1323	481	876	145	1766	944	46	14	75	2642		12	6	69	38	46	88

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL
SUB-SUMMARY

POR-AURORA SIGNALS

632

SHEET NO.	LOCATION	PEDESTRIAN PUSHBUTTON, AS PER PLAN	DETECTOR LOOP	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	STRAIN POLE FOUNDATION	SIGNAL SUPPORT FOUNDATION	PEDESTAL FOUNDATION	LOOP DETECTOR LEAD-IN CABLE	POWE CABLE, 3 CONDUCTOR, NO. 6 AWG	SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG	POWER SERVICE, AS PER PLAN	CONDUIT RISER, 2" DIAMETER	SIGNAL SUPPORT, TYPE TC-81.21, DES 3 POLE W MAST ARMS DES 1 & DES 1, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DES 3 POLE W MAST ARMS DES 2 & DES 1, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DES 4 POLE W MAST ARMS DES 3 & DES 2, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DES 4 POLE W MAST ARMS DES 3 & DES 3, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DES 12 POLE W MAST ARMS DES 11 & DES 3, AS PER PLAN	SIGNAL SUPPORT, MECHANICAL DAMPER FOR TC-81.21 MAST ARM (GREATER THAN 39' IN LENGTH), AS PER PLAN
		EACH	EACH	FEET	FEET	EACH	EACH	EACH	FEET	FEET	FEET	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
32	43 / MONETA	4	1	1049	622		2	3	554	59	15	1				1			1
36	43 / FIRE STATION #2			424	493		2			42	10	1			1				
40	43 / SQUIRES			525															
44	43 / TREAT			772															
48	43 / SYCAMORE			726															
52	43 / N. BISSELL			425															
56	82 / BISSELL	2	6	822	877		4	1	1053	47	29	1							2
60	82 / AURORA COMMONS	4	2	1424	744		4	2	873	60	93	1							1
64	82 / 43	8	7	2162	777		4	2	1754	57	87	1							2
68	82 / 306	6	6	1710	792		4	3	1413	39	43	1							3
72	306 / TREAT		3	601	634		2		293	41	37	1						1	2
76	PiONEER / FIRE STATION #1			415	444		1			42		1	1						1
80 / 81	43 / 306 / PIONEER	10		5249				4	2495										
85	43 / AURORA-HUDSON	4	3	753	437		2	3	431	41	9	1							1
89	43 / AURORA FARMS	4	1	630	330		1	3	395	39	31	1							1
93	43 / GREENBRIAR / CHATHAM	6	2	1413	691		4	3	931	44	91	1							
97	43 / LENA		3	552	582		2		268	51	41	1						1	1
101	82 / EGGLESTON			327			2			33	44	1		1					
106	AURORA-HUDSON SF					2					30								
107	S. CHILLICOTHE SF					2					118								
108	W. PIONEER SF					2					33								
109	E. GARFIELD SF					2					20		1						
	TOTALS CARRIED TO GENERAL SUMMARY	48	34	19979	7423	8	34	24	10460	595	731	13	2	1	1	1	1	1	15

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL
SUB-SUMMARY

POR-AURORA SIGNALS

SHEET NO.	LOCATION	632																	
		SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 1, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 2, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 3, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 4, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 11, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 12, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 13, AS PER PLAN	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 14, AS PER PLAN	STRAIN POLE, TYPE TC-81.10, DES. 1	PEDESTAL, 8', TRANSFORMER BASE, AS PER PLAN	PEDESTAL, 10', TRANSFORMER BASE, AS PER PLAN	REMOVAL OF TRAFFIC SIGNAL ITEM, REMOVE VEHICULAR SIGNAL HEAD	REMOVAL OF TRAFFIC SIGNAL ITEM, REMOVE PEDESTRIAN SIGNAL HEAD	REMOVAL OF MISC. TRAFFIC SIGNAL ITEM, REMOVAL OF PEDESTRIAN PUSHBUTTON	REMOVAL OF MISC. TRAFFIC SIGNAL ITEM, REMOVAL OF PREEMPTION CONFIRMATION LIGHT	REMOVAL OF MISC. TRAFFIC SIGNAL ITEM, REMOVAL OF PREEMPTION DETECTOR	REMOVAL OF MISC. TRAFFIC SIGNAL ITEM, REMOVAL OF RADIO INTERCONNECT	REMOVAL OF TRAFFIC SIGNAL INSTALLATION
		EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
32	43 / MONETA					1													1
36	43 / FIRE STATION #2			1															1
40	43 / SQUIRES												6			3	3	1	
44	43 / TREAT															4	4	1	
48	43 / SYCAMORE												8			4	4	1	
52	43 / N. BISSELL												6			3	3	1	
56	82 / BISSELL			2		1	1				1								1
60	82 / AURORA COMMONS		1	1		2													1
64	82 / 43			1	1	1	1				2								1
68	82 / 306		1			1	2				3								1
72	306 / TREAT					1													1
76	PiONEER / FIRE STATION #1							1											
80 / 81	43 / 306 / PIONEER										4		16	10	10	5	5	1	
85	43 / AURORA-HUDSON		1			1					2	1							1
89	43 / AURORA FARMS								1		3								1
93	43 / GREENBRIAR / CHATHAM		1	3							3								1
97	43 / LENA						1												1
101	82 / EGGLESTON	1																	1
106	AURORA-HUDSON SF									2									
107	S. CHILLICOTHE SF									2									
108	W. PIONEER SF									2									
109	E. GARFIELD SF									2									
	TOTALS CARRIED TO GENERAL SUMMARY	1	4	8	1	8	5	1	1	8	18	1	36	10	10	19	19	5	12

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL SUB-SUMMARY

POR-AURORA SIGNALS

SHEET NO.	LOCATION	632		633								804		809					
		SIGNALIZATION MISC.: FOUNDATION TEST HOLE		CABINET, TYPE TS2, AS PER PLAN	CABINET FOUNDATION, AS PER PLAN	CONTROLLER WORK PAD, AS PER PLAN	FLASHER CONTROLLER	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN	CONTROLLER ITEM MISC: REMOVE EXISTING CONTROLLER	CONTROLLER ITEM MISC: MODIFY CABINET FOUNDATION		FIBER OPTIC MEDIA CONVERTER, ETHERNET, AS PER PLAN		CCTV IP-CAMERA SYSTEM, DOME-TYPE, AS PER PLAN	HIGH SPEED ETHERNET RADIO	ADVANCE RADAR DETECTION, AS PER PLAN	STOP LINE RADAR DETECTION, AS PER PLAN	ATC V6.24 CONTROLLER, AS PER PLAN	PREEMPT RECEIVING UNIT
		EACH		EACH	EACH	EACH	EACH	EACH	EACH	EACH		EACH		EACH	EACH	EACH	EACH	EACH	EACH
32	43 / MONETA	1		1	1	1		1				1		1		2		1	3
36	43 / FIRE STATION #2			1	1	1		1				1					1	1	3
40	43 / SQUIRES			1	0	1		1	1	1		1						1	3
44	43 / TREAT			1	0	1		1	1	1		1						1	4
48	43 / SYCAMORE			1	0	1		1	1	1		1					1	1	4
52	43 / N. BISSELL			1	0	1		1	1	1		1						1	3
56	82 / BISSELL			1	1	1		1				1		1		2		1	4
60	82 / AURORA COMMONS			1	1	1		1				1				2	2	1	4
64	82 / 43	1		1	1	1		1				1		1		4		1	4
68	82 / 306	2		1	1	1		1				1		1	1	4		1	4
72	306 / TREAT			1	1	1		1				1			1	2		1	3
76	PIONEER / FIRE STATION #1			1	1	1		1				1					1	1	3
80 / 81	43 / 306 / PIONEER			1	0	1		1	1	1		1		1				1	6
85	43 / AURORA-HUDSON			1	1	1		1				1				2		1	3
89	43 / AURORA FARMS			1	1	1		1				1				2	1	1	3
93	43 / GREENBRIAR / CHATHAM	1		1	1	1		1				1		1	1	2		1	4
97	43 / LENA			1	1	1		1				1			1	2		1	3
101	82 / EGGLESTON						1												
106	AURORA-HUDSON SF																		
107	S. CHILLICOTHE SF																		
108	W. PIONEER SF																		
109	E. GARFIELD SF																		
	TOTALS CARRIED TO GENERAL SUMMARY	5		17	12	17	1	17	5	5		17		6	4	24	6	17	61

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL SUB-SUMMARY

POR-AURORA SIGNALS

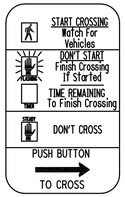
SHEET NO.	LOCATION	809											632						
		PREEMPT DETECTOR CABLE	PREEMPT PHASE SELECTOR	PREEMPT CONFIRMATION LIGHT									SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 2, AS PER PLAN - ALTERNATE BID	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 3, AS PER PLAN - ALTERNATE BID	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 4, AS PER PLAN - ALTERNATE BID	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 11, AS PER PLAN - ALTERNATE BID	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 12, AS PER PLAN - ALTERNATE BID	SIGNAL SUPPORT, TYPE TC-81.21, DESIGN 13, AS PER PLAN - ALTERNATE BID	PEDESTAL, 8', TRANSFORMER BASE, AS PER PLAN - ALTERNATE BID
		EACH	EACH	EACH									EACH	EACH	EACH	EACH	EACH	EACH	EACH
32	43 / MONETA	539	1	3															
36	43 / FIRE STATION #2	424	1	3															
40	43 / SQUIRES	525	1	3															
44	43 / TREAT	772	1	4															
48	43 / SYCAMORE	726	1	4															
52	43 / N. BISSELL	425	1	3															
56	82 / BISSELL	782	1	4										2		1	1		1
60	82 / AURORA COMMONS	656	1	4									1	1		2			
64	82 / 43	846	1	4										1	1	1	1		2
68	82 / 306	738	1	4									1			2	1		3
72	306 / TREAT	601	1	3															
76	PiONEER / FIRE STATION #1	415	1	3														1	
80 / 81	43 / 306 / PIONEER	1393	2	6															4
85	43 / AURORA-HUDSON	295	1	3															
89	43 / AURORA FARMS	294	1	3															
93	43 / GREENBRIAR / CHATHAM	648	1	4															
97	43 / LENA	552	1	3															
101	82 / EGGLESTON																		
106	AURORA-HUDSON SF																		
107	S. CHILLICOTHE SF																		
108	W. PIONEER SF																		
109	E. GARFIELD SF																		
	TOTALS CARRIED TO GENERAL SUMMARY	10631	18	61									2	4	1	6	3	1	10

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL SUB-SUMMARY

POR-AURORA SIGNALS

PEDESTRIAN SIGNS



R10-3E-9
2 - LEFT ARROWS
2 - RIGHT ARROWS

R9-3-18
2 EACH [5]

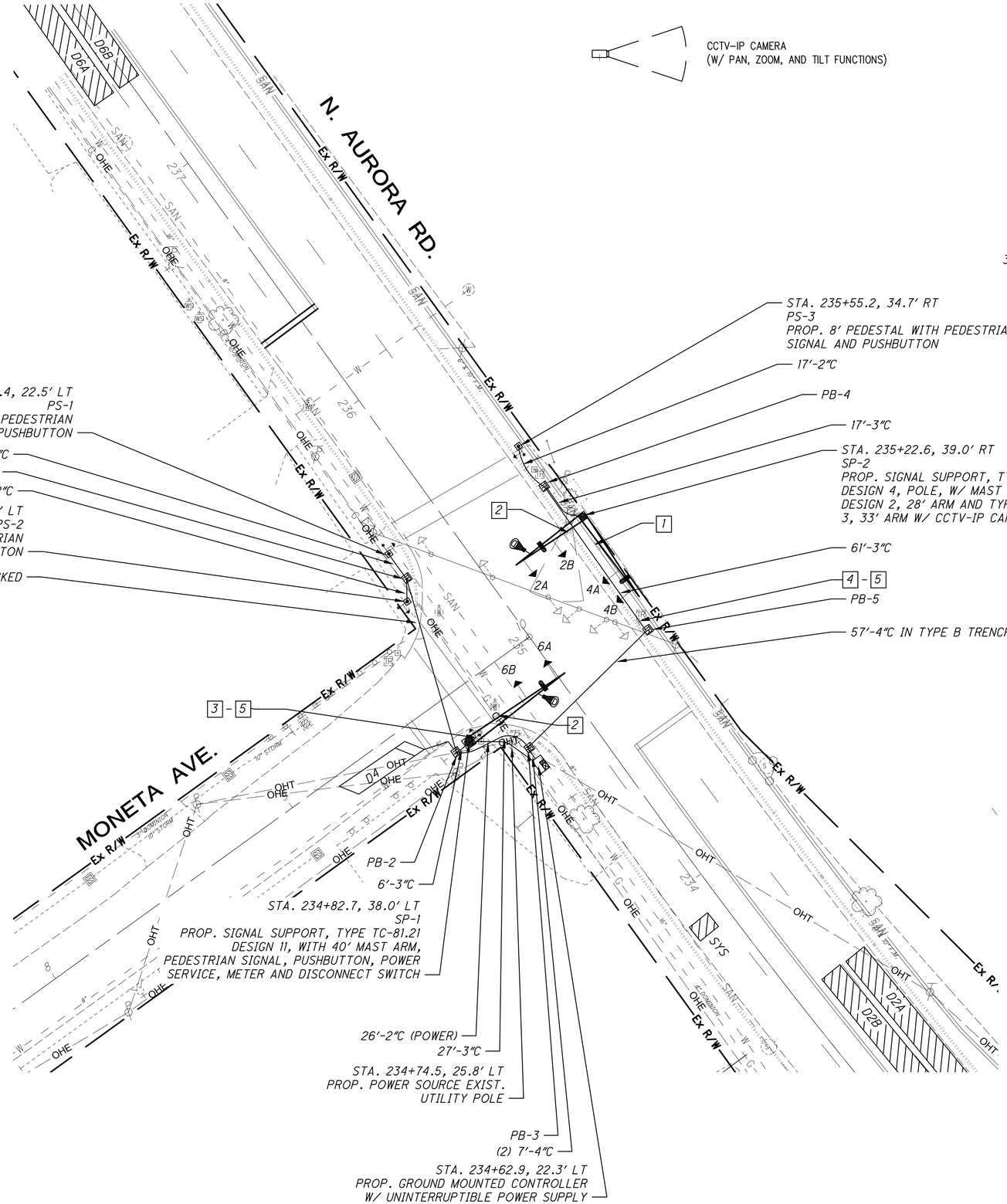
R9-3BP-18
1 - LEFT ARROWS [3]
1 - RIGHT ARROWS [4]

EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	235+21.3	LT	44.6′
PULLBOX	234+83.1	LT	34.6′
PULLBOX	235+44.4	RT	35.1′
PULLBOX	234+83.1	RT	35.8′
PEDESTAL	235+21.8	LT	39.6′
PEDESTAL	234+80.9	LT	34.4′
PEDESTAL	235+45.1	RT	34.7′
WOOD POLE	235+59.9	LT	22.5′
WOOD POLE	234+68.3	RT	39.1′
CONTROLLER	235+64.3	LT	22.5′

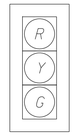
PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	235+40.9	LT	22.2′	18
PB-2	234+82.6	LT	43.6′	18
PB-3	234+69.1	LT	21.8′	24
PB-4	235+38.6	RT	34.4′	18
PB-5	234+78.2	RT	34.4′	18



SIGNAL HEADS

PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 4



2A, 2B, 6A, 6B, 4A & 4B

1. ALL SIGNAL HEADS SHALL HAVE 12″ LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

MAST ARM SIGNAGE

D3-1-108
QTY = 1
[1]

D3-1-108
QTY = 2
[2]

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12″	→	⇢
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12″	⇉	⇢
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	⌐	⌐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)		
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT		
CCTV-IP CAMERA		
RADIO ANTENNA		
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT		
DETECTOR LOOP		
DETECTION ZONE		
DETECTION COUNT		

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
N. AURORA RD. (S.R. 43) & MONETA AVE.
POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Aurora Rd (S.R. 43) & Moneta Ave						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:	2,4,6,8		
			REST IN RED:	RING 1	-		RING 2	-	
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH OR ALL RED:	9	6							
FIRST PHASE(S):	2	6							
COLOR DISPLAYED:	G		PHASES			-	-	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			-	2	-	4	-	6	-	-
DIRECTION			-	NB	-	EB	-	SB	-	-
MINIMUM GREEN (INITIAL)		(SEC.)	-	20	-	8	-	20	-	-
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	-	3.5	-	4.0	-	3.5	-	-
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	-	60	-	25	-	60	-	-
MAXIMUM GREEN II		(SEC.)	-	60	-	25	-	60	-	-
YELLOW CHANGE		(SEC.)	-	4.1	-	3.3	-	4.1	-	-
ALL RED CLEARANCE		(SEC.)	-	1.6	-	1.0	-	1.6	-	-
WALK		(SEC.)	-	-	-	8	-	7	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	11	-	8	-	-
RECALL	MAXIMUM	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-
	MINIMUM	(ON/OFF)	-	ON	-	OFF	-	ON	-	-
	PEDESTRIAN	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-
MEMORY		(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-

*VOLUME DENSITY CONTROLS

NOTES:

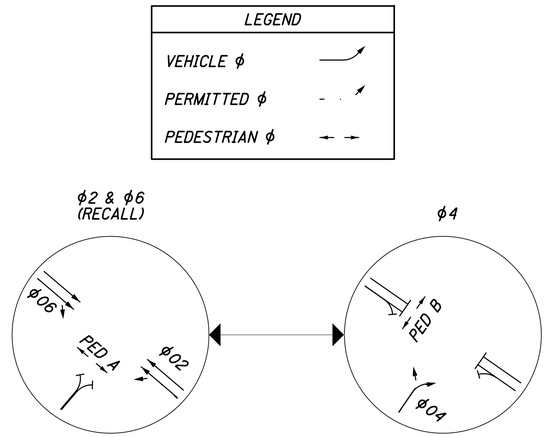
- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2A	NB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	150	100-250
D2B	NB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	150	100-250
D6A	SB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	150	100-250
D6B	SB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	150	100-250
SYS	SB THRU	PULSE	-	0	-	-	SYSTEM	8	250
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

PHASING DIAGRAM (TYPICAL)



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ\6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ\4) (EASTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D4	P	6' X 30'	PRESENSE	8	-	4-1	ϕ4
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

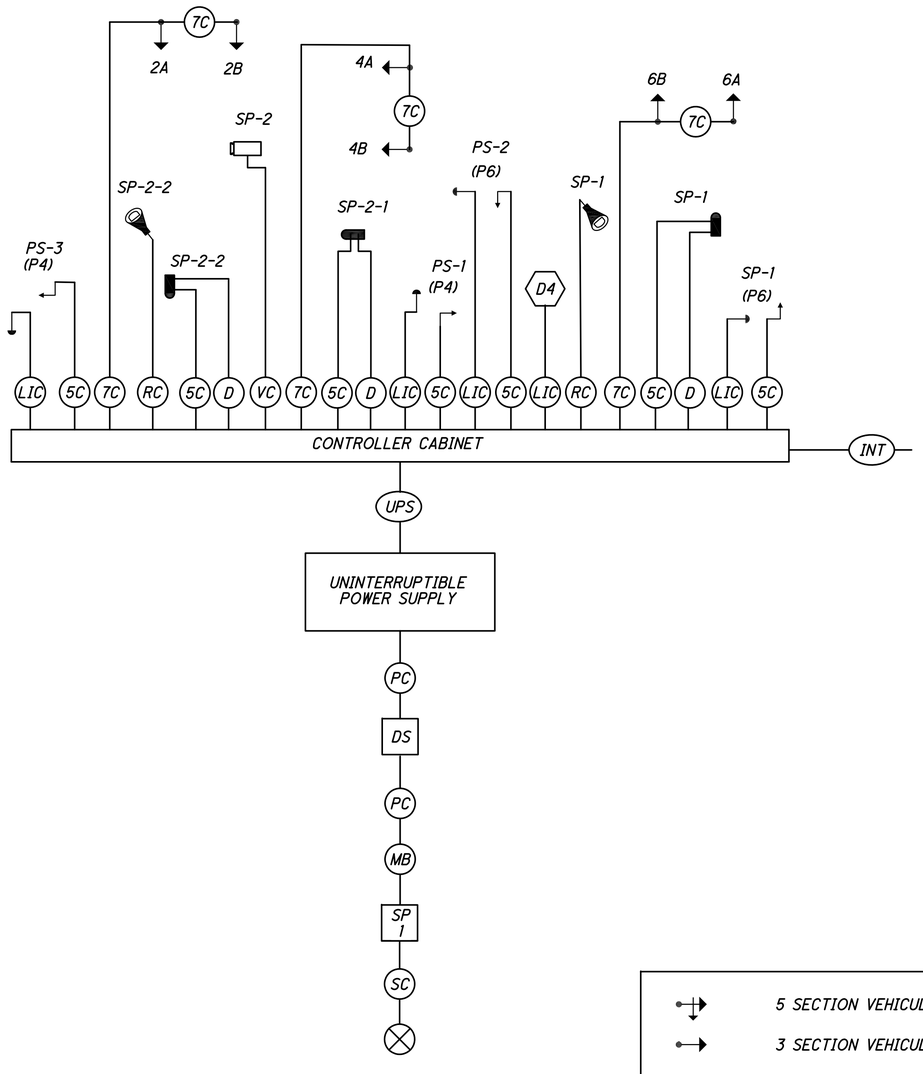
HORIZONTAL SCALE IN FEET (0, 10, 20, 40)

CALCULATED JAT | CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
N. AURORA RD. (S.R. 43) & MONETA AVE.

POR-AURORA SIGNALS

WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2A	R	Ø2 R	Y	6A	R	Ø6 R	Y
	Y	Ø2 Y			Y	Ø6 Y	
(NB)	G	Ø2 G		(SB)	G	Ø6 G	
2B	R	Ø2 R	Y	6B	R	Ø6 R	Y
	Y	Ø2 Y			Y	Ø6 Y	
(NB)	G	Ø2 G		(SB)	G	Ø6 G	
4A	R	Ø4 R	R	PEDESTRIAN MOVEMENTS			
	Y	Ø4 Y		PED A	W	Ø6 PED/LS15 G	OUT
(EB)	G	Ø4 G		WEST	DW	Ø6 PED/LS15 R	
4B	R	Ø4 R	R	PED B	W	Ø4 PED/LS14 G	OUT
	Y	Ø4 Y		NORTH	DW	Ø4 PED/LS14 R	
(EB)	G	Ø4 G					
LS = LOAD SWITCH							

VDC1

LEGEND

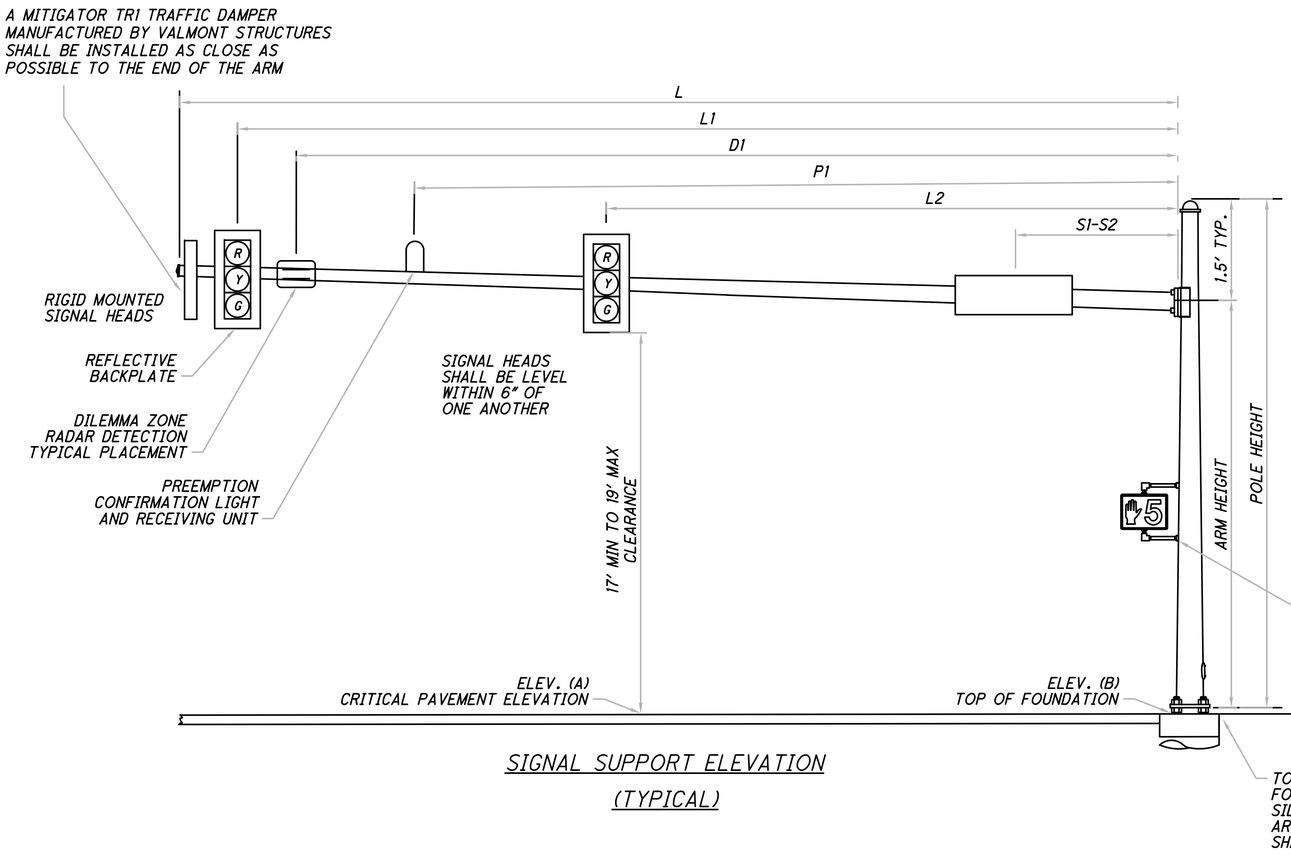
- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- RC — RADAR DETECTION CABLE
- VC — VIDEO CAMERA CABLE
- INT — INTERCONNECT CABLE
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. __
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE
- CCTV-IP CAMERA

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

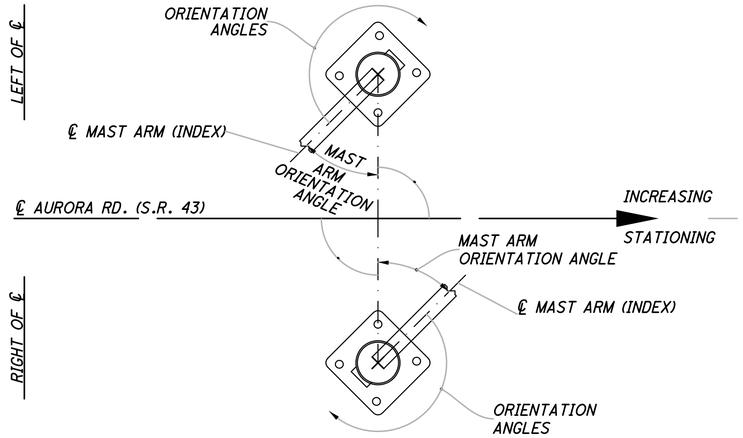
SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & MONETA AVE.

POR-AURORA SIGNALS



SIGNAL SUPPORT ELEVATION

(TYPICAL)



POLE ORIENTATION

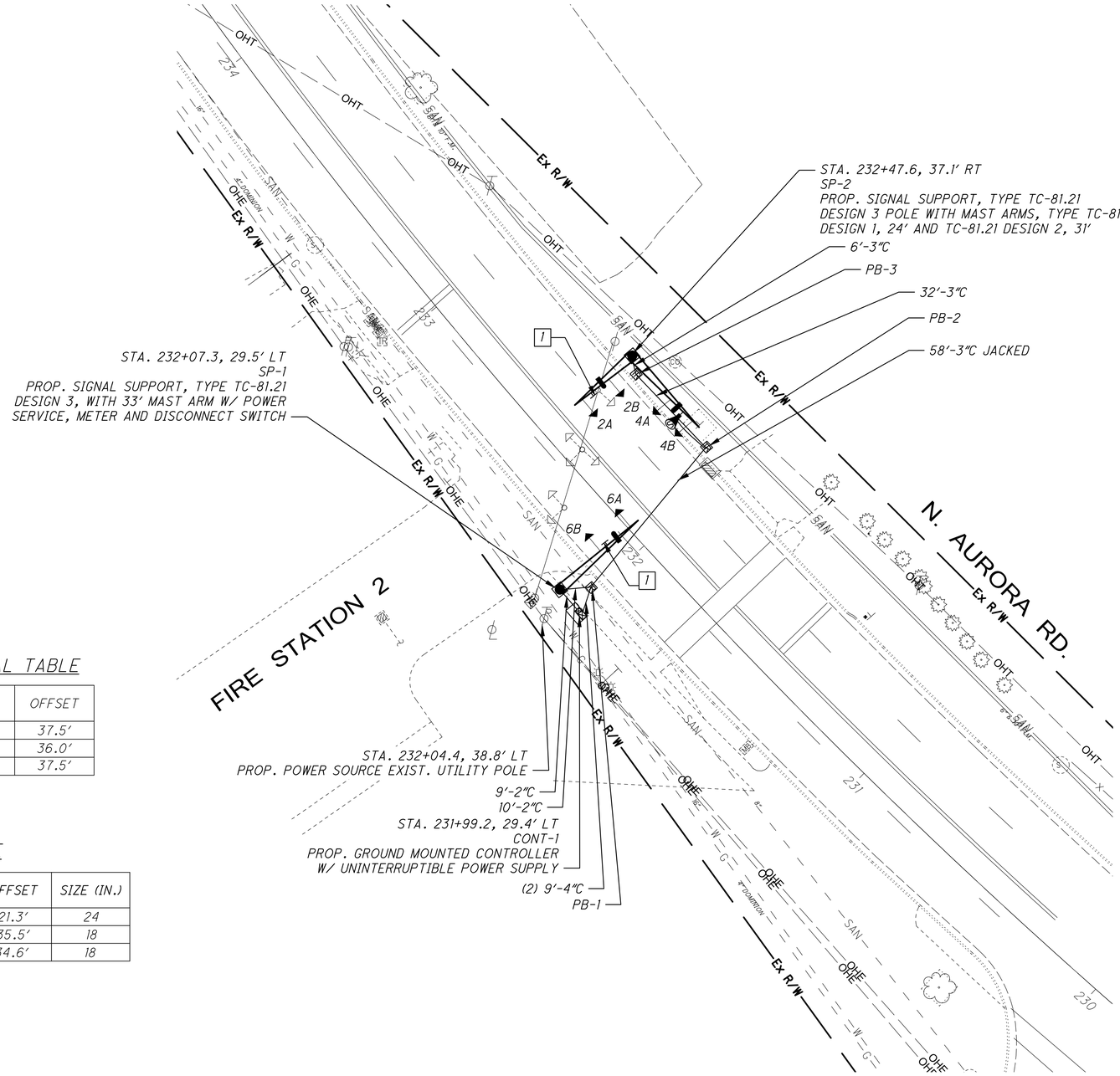
MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	S1	S2	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	234+82.7	38.0' LT	1028.15	1029.17	TC-81.21	11	21	19.5	40	37	25	-	34	-	19	31	0	-	0	0	180	180	90
SP-2	235+22.6	39.0' RT	1028.15	1027.99	TC-81.21	4	22	20.5	33	30	22	-	-	15	-	26	270	-	-	-	-	180	-
			-	-	-	-	22	20.5	28	25	13	-	22	-	6	19	-	90	-	-	-	-	-
PS-1	235+51.4	22.5' LT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	270	270	-	180	-
PS-2	235+33.9	26.6' LT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	180	180	-	180	-
PS-3	235+55.2	34.7' RT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	270	270	-	180	-

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & MONETA AVE.
POR-AURORA SIGNALS



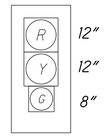
EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
WOOD POLE	232+11.0	LT	37.5'
WOOD POLE	232+55.0	RT	36.0'
CONTROLLER	232+11.0	LT	37.5'

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	232+02.2	LT	21.3'	24
PB-2	232+10.8	RT	35.5'	18
PB-3	232+42.2	RT	34.6'	18

SIGNAL HEADS



2A, 2B, 6A, 6B,
4A & 4B

1. SIGNAL HEADS SHALL BE 12", 12", and 8" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

MAST ARM SIGNAGE

EMERGENCY SIGNAL

R10-13
QTY = 2
1

EXISTING SIGNAGE TO BE REMOVED

FIRE SIGNAL

QTY = 2

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●	○
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●	○
SIGNAL SUPPORT POLE	◉	◎
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	◉	◎
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	D	D
RADIO ANTENNA	⊣	⊣
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
N. AURORA RD. (S.R. 43) & FIRE STATION 2

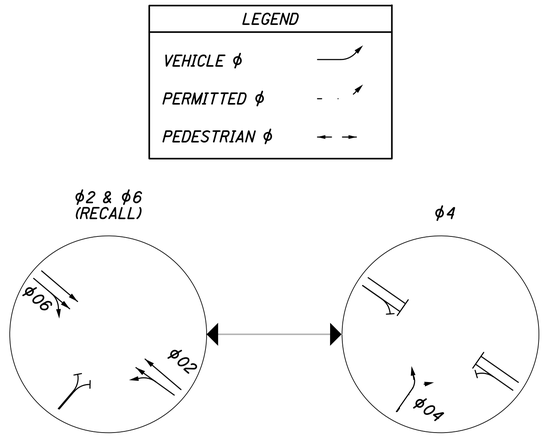
POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Aurora Rd (S.R. 43) & Fire Station No. 2						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:	2,4,6,8		
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH OR ALL RED:	9,	6							
FIRST PHASE(S):	2	6							
COLOR DISPLAYED:	G		PHASES			-	-	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			-	2	-	4	-	6	-	-
DIRECTION			-	SB	-	EB	-	NB	-	-
MINIMUM GREEN (INITIAL)		(SEC.)	-	20	-	8	-	20	-	-
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	-	2.0	-	4.0	-	2.0	-	-
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	-	60	-	25	-	60	-	-
MAXIMUM GREEN II		(SEC.)	-	60	-	25	-	60	-	-
YELLOW CHANGE		(SEC.)	-	4.1	-	3.3	-	4.1	-	-
ALL RED CLEARANCE		(SEC.)	-	1.5	-	1.0	-	1.5	-	-
WALK		(SEC.)	-	-	-	8	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	12	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-
	MINIMUM	(ON/OFF)	-	ON	-	OFF	-	ON	-	-
	PEDESTRIAN	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-
MEMORY		(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-

*VOLUME DENSITY CONTROLS

PHASING DIAGRAM (TYPICAL)



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(4) (EASTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
N. AURORA RD. (S.R. 43) & FIRE STATION 2

POR-AURORA SIGNALS

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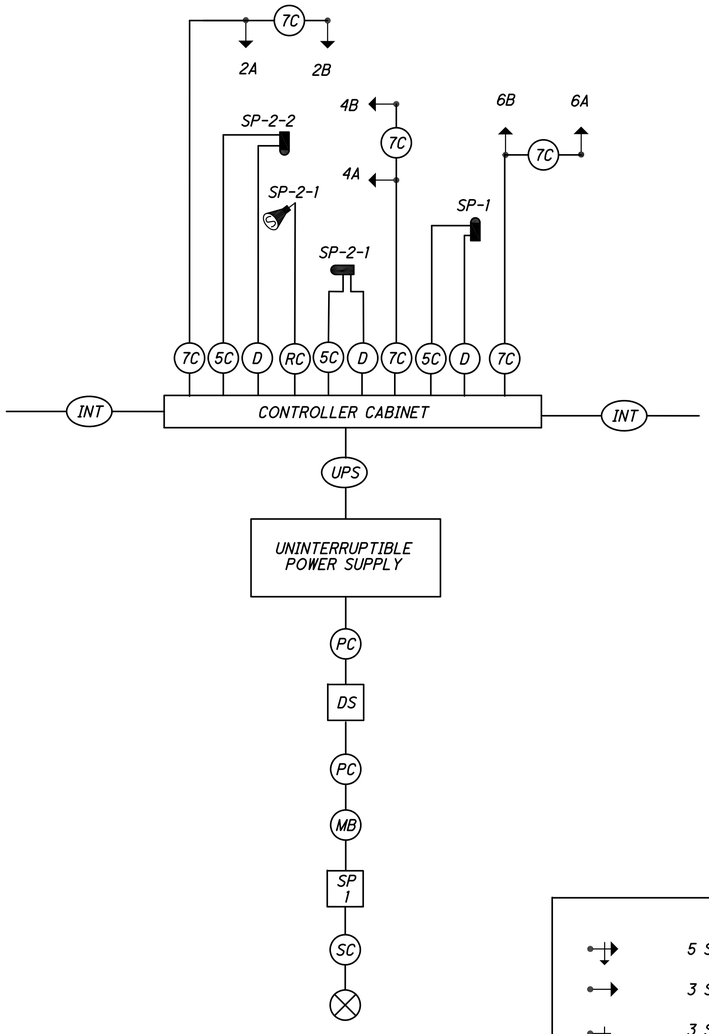
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2A	R	Ø2 R	Y	4B	R	Ø4 R	R
	Y	Ø2 Y			Y	Ø4 Y	
(NB)	G	Ø2 G		(EB)	G	Ø4 G	
2B	R	Ø2 R	Y	6A	R	Ø6 R	Y
	Y	Ø2 Y			Y	Ø6 Y	
(NB)	G	Ø2 G		(SB)	G	Ø6 G	
4A	R	Ø4 R	R	6B	R	Ø6 R	Y
	Y	Ø4 Y			Y	Ø6 Y	
(EB)	G	Ø4 G		(SB)	G	Ø6 G	
LS = LOAD SWITCH							

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- (L) VEHICLE LOOP DETECTOR
- (D) PREEMPTION DETECTOR CABLE
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (3C) SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- (5C) SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (RC) RADAR DETECTION CABLE
- (INT) INTERCONNECT CABLE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (PC) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 SIGNAL SUPPORT POLE NO. __
- (MB) METER BASE
- POWER SOURCE
- DS DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & FIRE STATION 2
POR-AURORA SIGNALS

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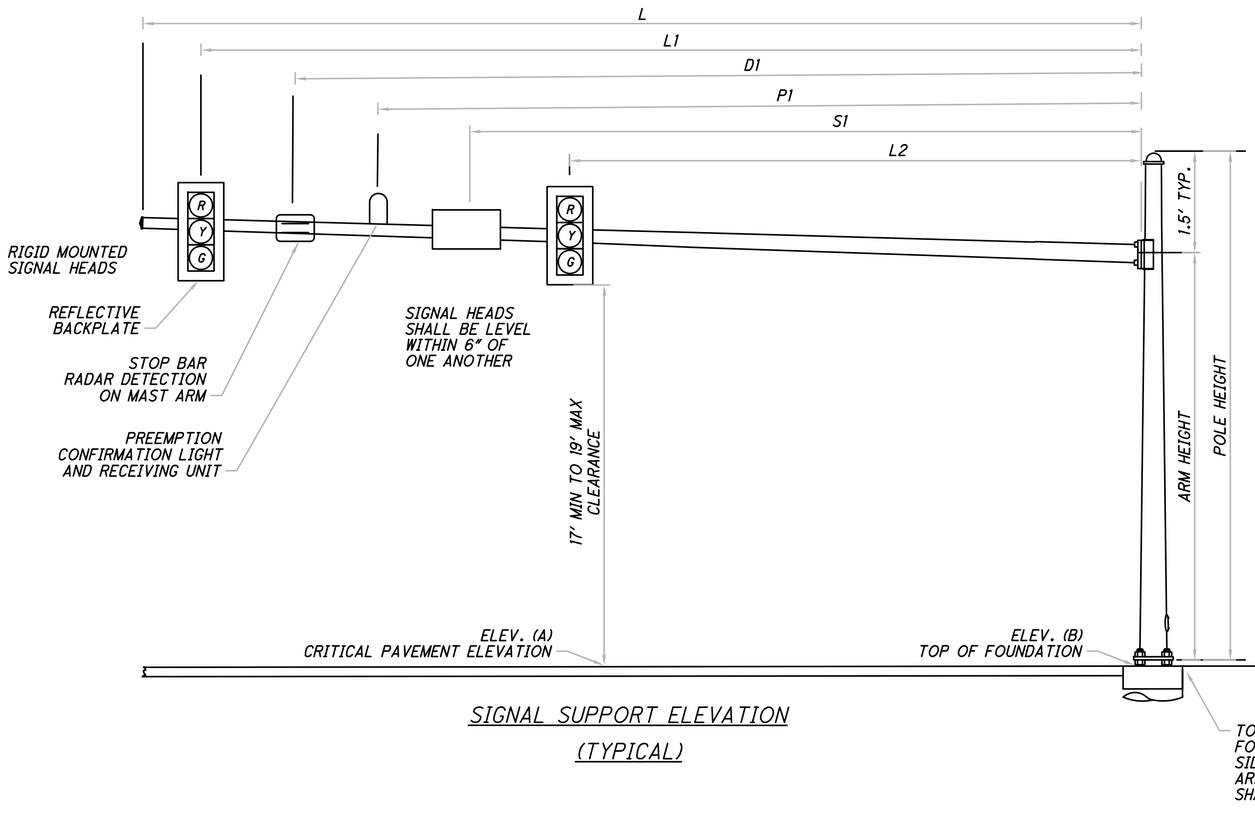
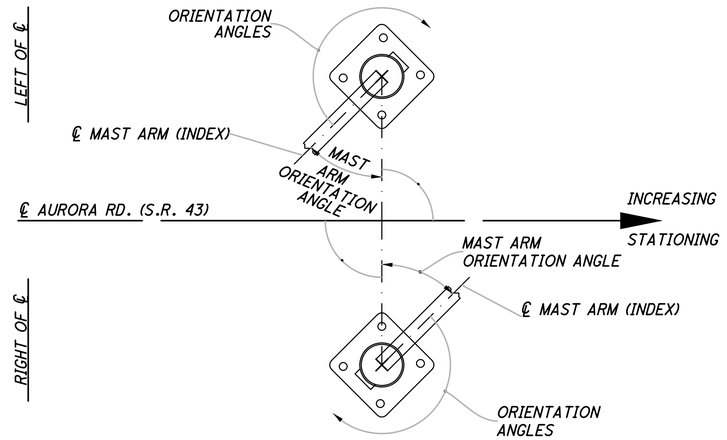


SIGNAL SUPPORT ELEVATION

(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	S1	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	232+07.3	29.5' LT	1026.04	1026.81	TC-81.21	3	21	19.5	33	30	18	-	-	24	21	0	-	-	-	180	180	180
SP-2	232+47.6	37.1' RT	1026.04	1025.46	TC-81.21	3	22.5	21	31	28	18	-	25	-	22	270	-	-	-	-	180	-
-	-	-	-	-	-	-	22.5	21	24	21	10	-	-	15.5	12	-	90	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HORIZONTAL SCALE IN FEET

CALCULATED JAT CHECKED MWS

SIGNAL DETAIL PLAN

N. AURORA RD. (S.R. 43) & FIRE STATION 2

POR-AURORA SIGNALS

EXIST. MAST ARM SIGNAGE

Aurora Rd — D3-1-108, QTY = 2

Squires Rd — D3-1-108, QTY = 2

ONLY — R3-RL-30, QTY = 1

SQUIRES RD.

N. AURORA RD.

EX.-2℄

PB-7

EX.-2℄

STA. 207+40.6, 56.5' RT
PS-1
EXIST. PEDESTAL W/
SIGNAL HEAD

PB-5

EX.-2℄

PB-6

EX.-3℄

STA. 206+32.7, 47.1' RT
SP-2
EXIST. SIGNAL SUPPORT, REMOVE EXIST.
PREEMPT DETECTORS & CONFIRMATION LIGHT.
REPLACE WITH NEW PREEMPT EQUIPMENT

EX.-2℄

PB-8

EX.-2℄

PB-9

EX.-2℄

EX-2℄

EXIST. PB-1

EX-3℄

EX-3℄

EXIST. PB-2

EX-(2)3℄

STA. 207+04.1, 38.7' LT
REMOVE EXIST. GROUND MOUNTED CONTROLLER, PROP.
GROUND MOUNTED CONTROLLER, W/ UNINTERRUPTABLE
POWER SUPPLY, MODIFIED FOUNDATION

EXIST. PB-3

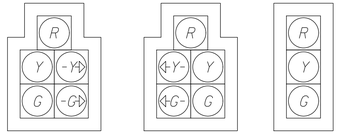
EX-2℄

STA. 206+73.7, 42.2' LT
SP-1
EXIST. SIGNAL SUPPORT, REMOVE EXIST.
RADIO ANTENNA, PREEMPT DETECTOR &
CONFIRMATION LIGHTS. REPLACE WITH
NEW PREEMPT EQUIPMENT

EX-2℄

EXIST. PB-4

PROP. SIGNAL HEADS



8B & 8C — 1A — 2A, 2B, 6A & 8A

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

NOTE:
ALL EXISTING SIGNAL HEADS TO BE REMOVED AND REPLACED WITH NEW IN SAME LOCATION.

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●→	○→
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●→	○→
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◖	◖
RADIO ANTENNA	⊣	⊣
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

N

HORIZONTAL SCALE IN FEET: 0, 10, 20, 40

CALCULATED: JAT
CHECKED: MWS

TRAFFIC SIGNAL PLAN
N. AURORA RD. (S.R. 43) & SQUIRES RD.

POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Aurora Rd (S.R. 43) & Squires Rd						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8	
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH OR ALL RED:	7								
FIRST PHASE(S):	2	6	PHASES			-	-	-	-
COLOR DISPLAYED:	G								
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	3	-	-	6	-	8
DIRECTION			SB L	NB	WB L	-	-	SB	-	WB
MINIMUM GREEN (INITIAL)		(SEC.)	7	20	10	-	-	20	-	10
ADDED INITIAL		*(SEC./ACTUATION)	-	1.8	-	-	-	1.8	-	-
MAXIMUM INITIAL		*(SEC.)	-	25	-	-	-	25	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	4.5	4.0	-	-	4.5	-	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	25	-	-	-	25	-	-
MINIMUM GAP		*(SEC.)	-	2.5	-	-	-	2.5	-	-
TIME TO REDUCE		*(SEC.)	-	25	-	-	-	40	-	-
MAXIMUM GREEN I		(SEC.)	15	50	25	-	-	65	-	25
MAXIMUM GREEN II		(SEC.)	15	50	25	-	-	65	-	25
YELLOW CHANGE		(SEC.)	3.9	4.8	3.3	-	-	4.8	-	3.3
ALL RED CLEARANCE		(SEC.)	2.3	1.7	1.7	-	-	1.7	-	1.7
WALK		(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	OFF	-	-	OFF	-	OFF
	MINIMUM	(ON/OFF)	OFF	ON	OFF	-	-	ON	-	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	OFF	-	-	OFF	-	OFF
MEMORY		(ON/OFF)	OFF	ON	OFF	-	-	ON	-	OFF

*VOLUME DENSITY CONTROLS

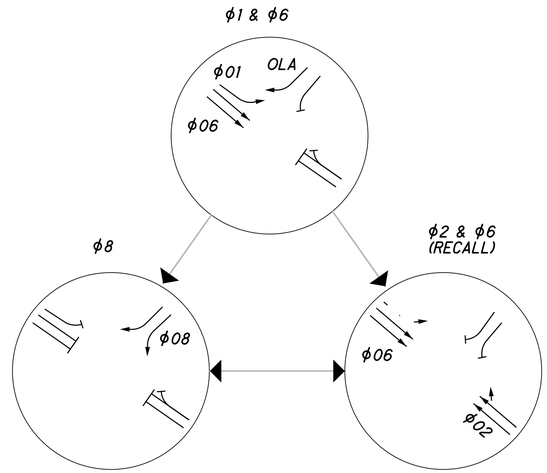
PHASING DIAGRAM (TYPICAL)

LEGEND

VEHICLE ϕ

PERMITTED ϕ

PEDESTRIAN ϕ



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(8) (WESTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

EXIST. TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D2A	EXIST	EXIST	PRESENCE	-	-	1	ϕ2
D2B	EXIST	EXIST	PRESENCE	10	-	2	ϕ2
D1	EXIST	EXIST	PRESENCE	15	-	3	ϕ5
D6A	EXIST	EXIST	PRESENCE	-	-	4	ϕ6
D6B	EXIST	EXIST	PRESENCE	-	-	5	ϕ6
D8B	EXIST	EXIST	PRESENCE	15	-	6	ϕ8
D8A	EXIST	EXIST	PRESENCE	-	-	7	ϕ3
D8C	EXIST	EXIST	PRESENCE	-	-	8	ϕ3
SYS	EXIST	EXIST	PULSE	-	-	9	SYS
SYS	EXIST	EXIST	PULSE	-	-	10	SYS
D2C	EXIST	EXIST	PRESENCE	-	-	11	-
D2D	EXIST	EXIST	PRESENCE	-	-	12	-
SYS	EXIST	EXIST	PULSE	-	-	13	SYS
SYS	EXIST	EXIST	PULSE	-	-	14	SYS
D6D	EXIST	EXIST	PRESENCE	-	-	15	-
D6C	EXIST	EXIST	PRESENCE	-	-	16	-

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

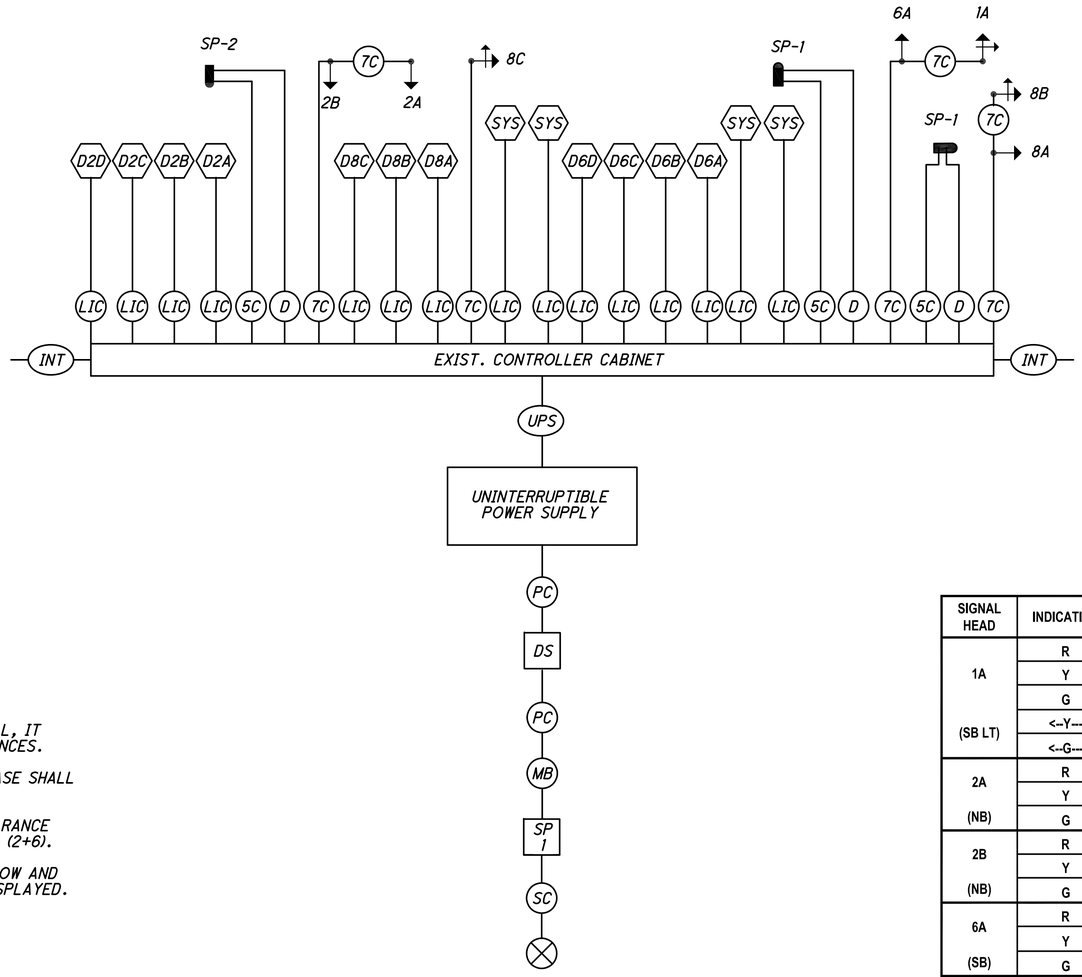
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
N. AURORA RD. (S.R. 43) & SQUIRES RD.

POR-AURORA SIGNALS

WIRING DIAGRAM



PREEMPT CHANNELS

CHANNEL 1 = φ(2) (NORTHBOUND ONLY)

CHANNEL 2 = φ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = φ(8) (WESTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE φ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE φ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A	R	Ø6 R	Y	8A (WB)	R	Ø8 R	R
	Y	Ø6 Y			Y	Ø8 Y	
	G	Ø6 G			G	Ø8 G	
(SB LT)	<--Y---	Ø1 Y		8B (WB)	R	Ø8 R	R
	<--G---	Ø1 G			Y	Ø8 Y	
2A (NB)	R	Ø2 R	Y		G	Ø8 G	
	Y	Ø2 Y			---Y-->	Ø1 Y/LS9 Y	
	G	Ø2 G			---G-->	Ø1 G/LS9 G	
2B (NB)	R	Ø2 R	Y	8C (WB)	R	Ø8 R	R
	Y	Ø2 Y			Y	Ø8 Y	
	G	Ø2 G			G	Ø8 G	
6A (SB)	R	Ø6 R	Y		---Y-->	Ø1 Y/LS9 Y	
	Y	Ø6 Y			---G-->	Ø1 G/LS9 G	
	G	Ø6 G		OVERLAPS			
LS = LOAD SWITCH				OLA	---Y-->	Ø1 Y/LS9 Y	-
					---G-->	Ø1 G/LS9 G	

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- INT — INTERCONNECT CABLE
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. __
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE

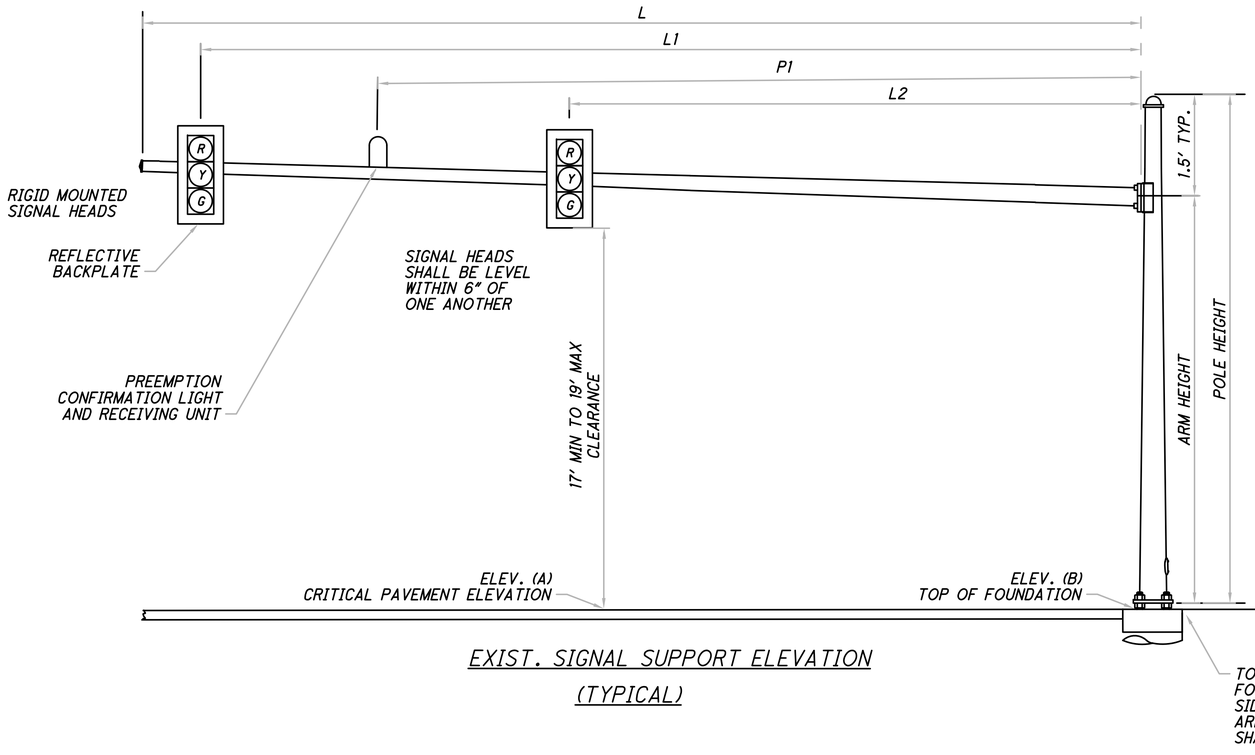
N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

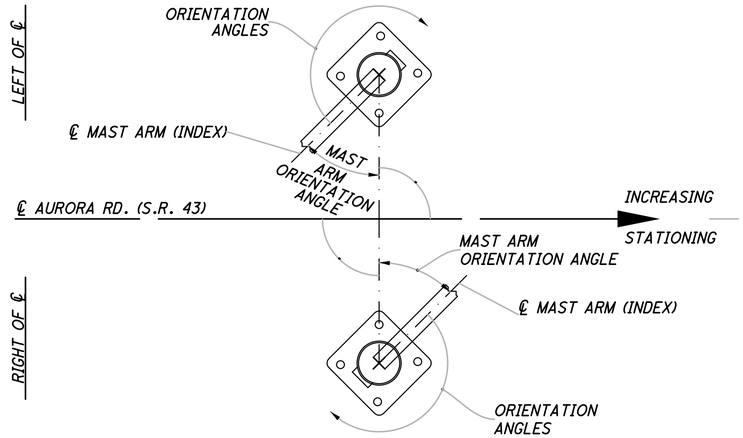
SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & SQUIRES RD.

POR-AURORA SIGNALS



EXIST. SIGNAL SUPPORT ELEVATION
(TYPICAL)

TOP OF SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS SHALL BE LEVEL WITH THE SIDEWALK ELEVATION WHERE ADA LANDINGS ARE ADJACENT; ELSEWHERE, FOUNDATIONS SHALL BE 2" (± 1") ABOVE GRADE PER TC-21.20



POLE ORIENTATION

MAST ARM TABLE

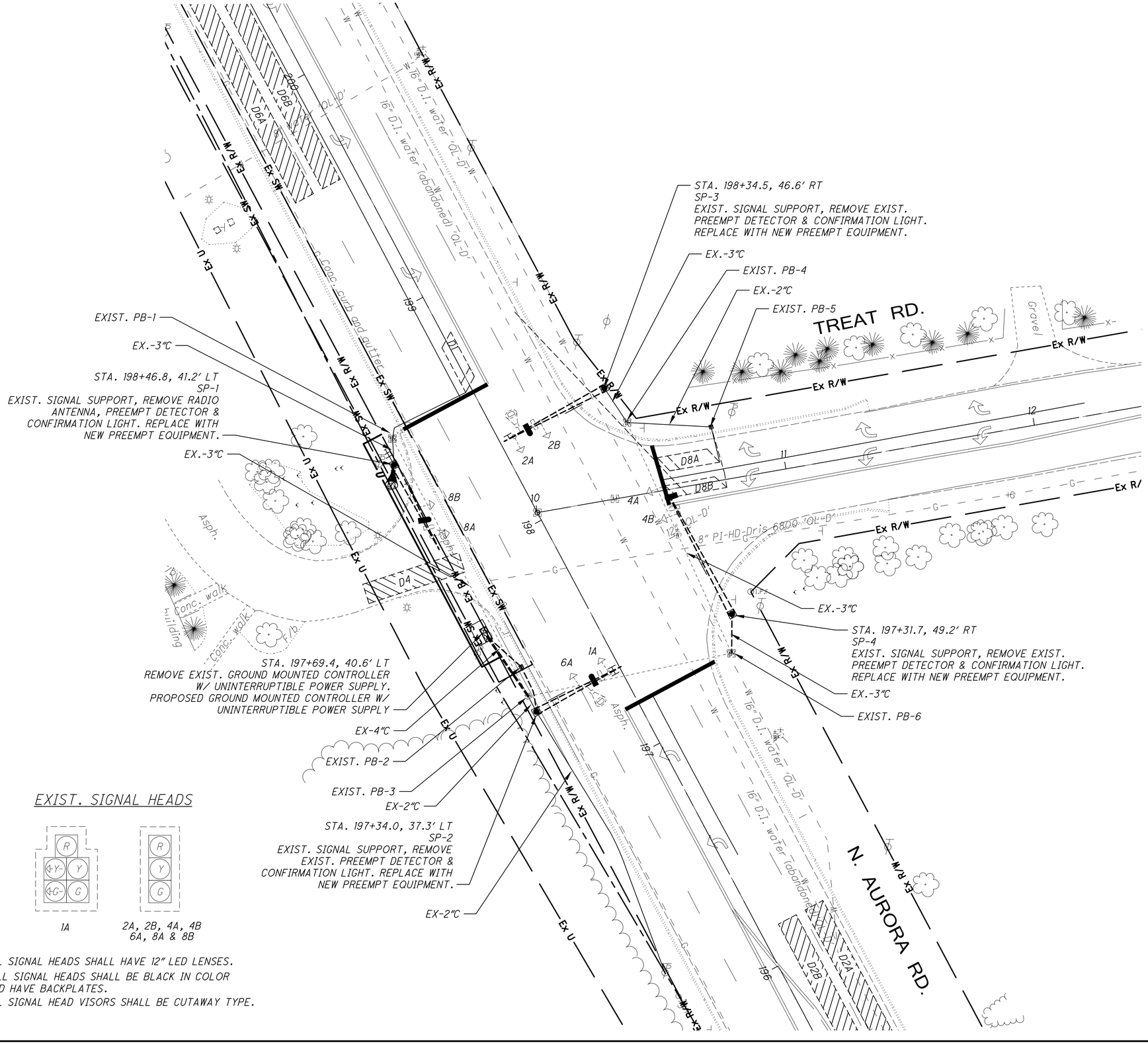
SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS												ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	S1	S2	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	206+73.7	42.2' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	31	17	-	-	EX	-	24	EX	-	-	-	EX	EX	EX
			-	-	-	-	EX	EX	EX	44	28	-	-	-	-	36	-	EX	-	-	-	-	-
SP-2	206+32.7	47.1' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	40	26	-	-	-	-	33	EX	-	-	-	-	EX	-

HORIZONTAL SCALE IN FEET
0 10 20 40

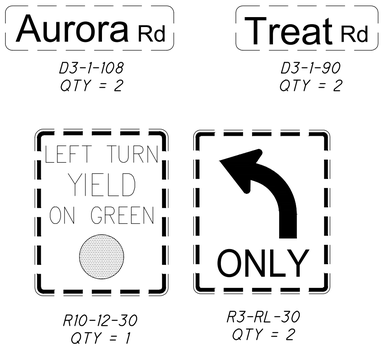
CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & SQUIRES RD.

POR-AURORA SIGNALS



EXIST. MASK ARM SIGNAGE



EXIST. SIGNAL HEADS

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●	○
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●	○
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	⌐	⌐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀D	◁D
STOP-LINE RADAR DETECTION UNIT	◀S	◁S
RADIO ANTENNA	⊣	⊣
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	

N

0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JJT CHECKED MWS

TRAFFIC SIGNAL PLAN
N. AURORA RD. (S.R. 43) & TREAT RD.

POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Aurora Rd (S.R. 43) & Treat Rd						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8	
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH OR ALL RED:	9,	6							
FIRST PHASE(S):	2	6	PHASES			-	-	-	-
COLOR DISPLAYED:	G								
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	-	4	-	6	-	8
DIRECTION			SB L	NB	-	EB	-	SB	-	WB
MINIMUM GREEN (INITIAL)		(SEC.)	7	20	-	8	-	20	-	10
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	1.0	-	4.0	-	1.0	-	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	15	50	-	25	-	65	-	25
MAXIMUM GREEN II		(SEC.)	15	50	-	25	-	65	-	25
YELLOW CHANGE		(SEC.)	3.6	4.4	-	4.1	-	4.4	-	4.1
ALL RED CLEARANCE		(SEC.)	2.0	1.0	-	1.0	-	1.0	-	1.0
WALK		(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	OFF
	MINIMUM	(ON/OFF)	OFF	ON	-	OFF	-	ON	-	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	OFF
MEMORY		(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	OFF

*VOLUME DENSITY CONTROLS

EXISTING RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2A	NB THRU	PULSE	ϕ2	EX	-	-	EXTEND ϕ2	EXIT	EXIST
D2B	NB THRU	PULSE	ϕ2	EX	-	-	EXTEND ϕ2	EXIT	EXIST
D4	EB THRU	PRESENCE	ϕ4	EX	-	ϕ4	STOP BAR	EXIT	EXIST
D6A	SB THRU	PULSE	ϕ6	EX	-	-	EXTEND ϕ6	EXIT	EXIST
D6B	SB THRU	PULSE	ϕ6	EX	-	-	EXTEND ϕ6	EXIT	EXIST

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

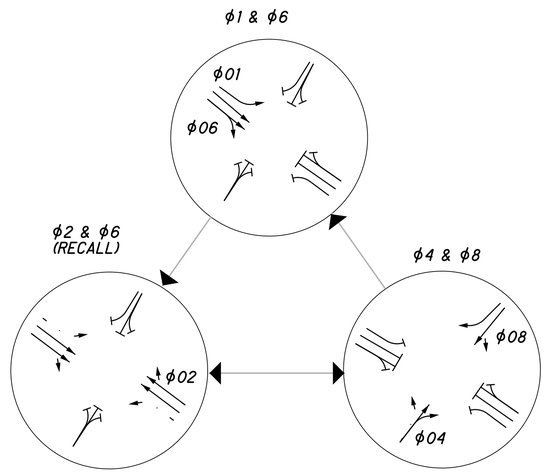
EXISTING TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	P	EXIST	PRESENCE	EX	-	1-1	ϕ1
D8A	P	EXIST	PRESENCE	EX	-	2-1	ϕ8
D8B	P	EXIST	PRESENCE	EX	-	2-2	ϕ8

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

PHASING DIAGRAM

LEGEND	
VEHICLE ϕ	———
PERMITTED ϕ	- - -
PEDESTRIAN ϕ	←- -→



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(4) (EASTBOUND ONLY)

CHANNEL 4 = ϕ(8) (WESTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

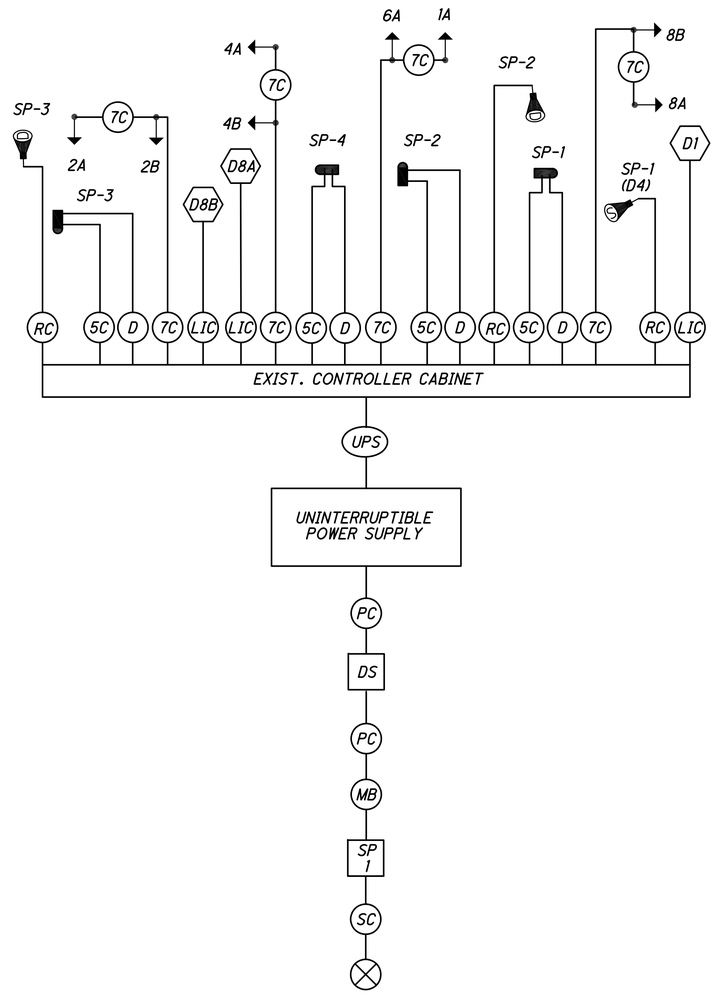
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
N. AURORA RD. (S.R. 43) & TREAT RD.

POR-AURORA SIGNALS

WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (SB LT)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
	<--Y---	Ø1 Y	
	<--G---	Ø1 G	
2A (NB)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
2B (NB)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
4A (EB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
4B (EB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
6A (SB)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
8A (WB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
8B (WB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	

LEGEND

	5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY	L	VEHICLE LOOP DETECTOR	SC	SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
	3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY	D	PREEMPTION DETECTOR CABLE	PC	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
	3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY	LIC	2/C NO. 14 AWG (LEAD-IN CABLE)	SP 1	SIGNAL SUPPORT POLE NO. --
	PEDESTRIAN SIGNAL HEAD	3C	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG	MB	METER BASE
	PEDESTRIAN PUSH BUTTON	5C	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG		POWER SOURCE
D	DILEMMA ZONE RADAR DETECTION UNIT	7C	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	DS	DISCONNECT SWITCH
S	STOP BAR RADAR DETECTION UNIT	RC	RADAR DETECTION CABLE	UPS	UNINTERRUPTIBLE POWER SUPPLY CABLE
	PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT	INT	INTERCONNECT CABLE		

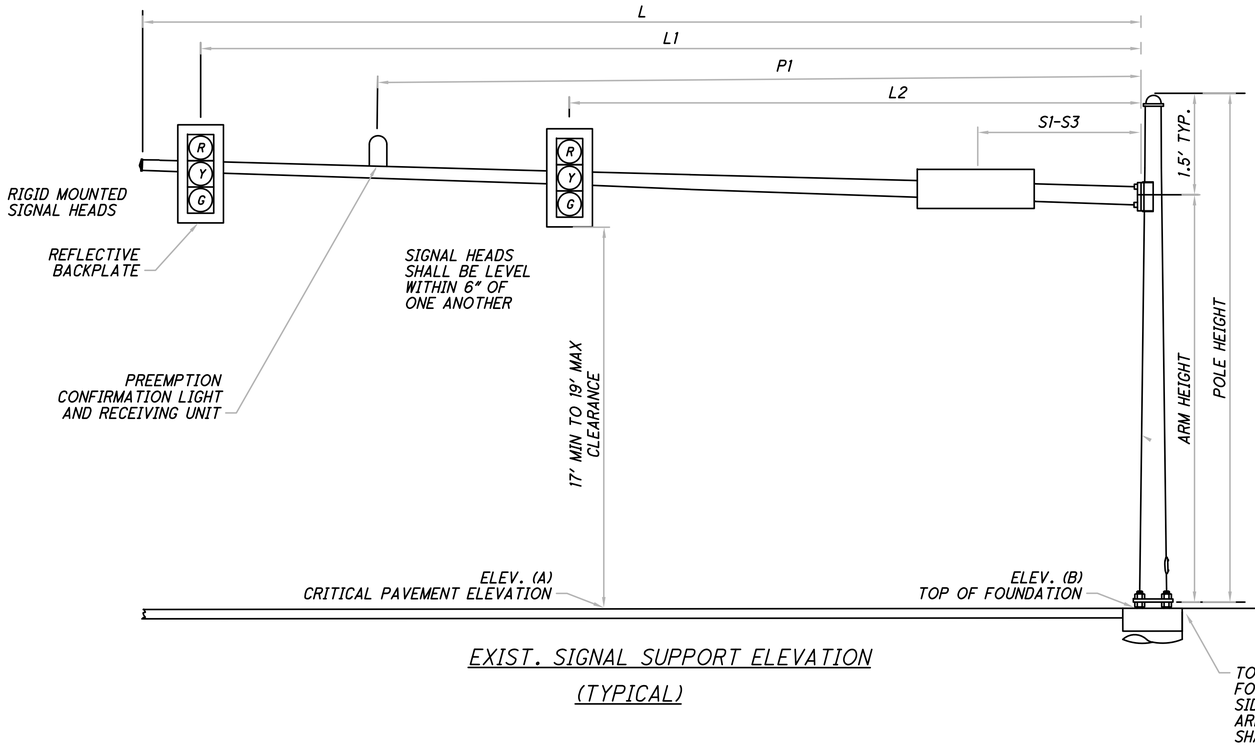
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

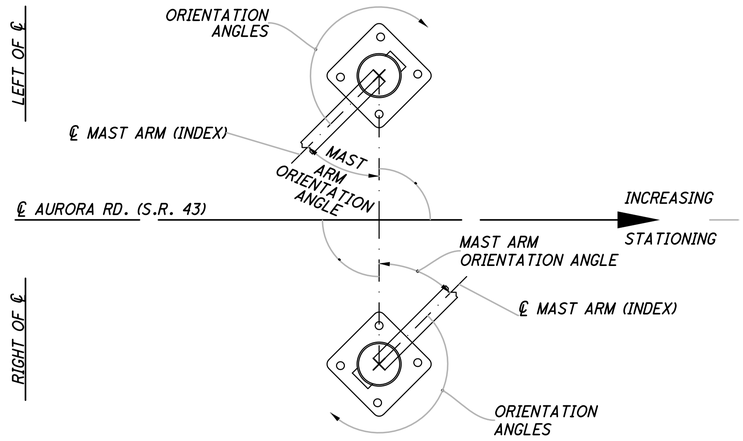
SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & TREAT RD.

POR-AURORA SIGNALS

46
133



EXIST. SIGNAL SUPPORT ELEVATION
(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	S1	S2	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	198+46.8	41.2' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	31	19	-	-	EX	-	25	EX	-	-	-	-	EX	-
SP-2	197+34.0	37.3' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	31.5	20	-	EX	EX	EX	26	EX	-	-	-	EX	EX	-
SP-3	198+34.5	46.6' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	40	28.5	-	EX	EX	EX	35	EX	-	-	-	-	EX	-
SP-4	197+31.7	49.2' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	57	48	-	-	EX	-	52.5	EX	-	-	-	-	EX	-

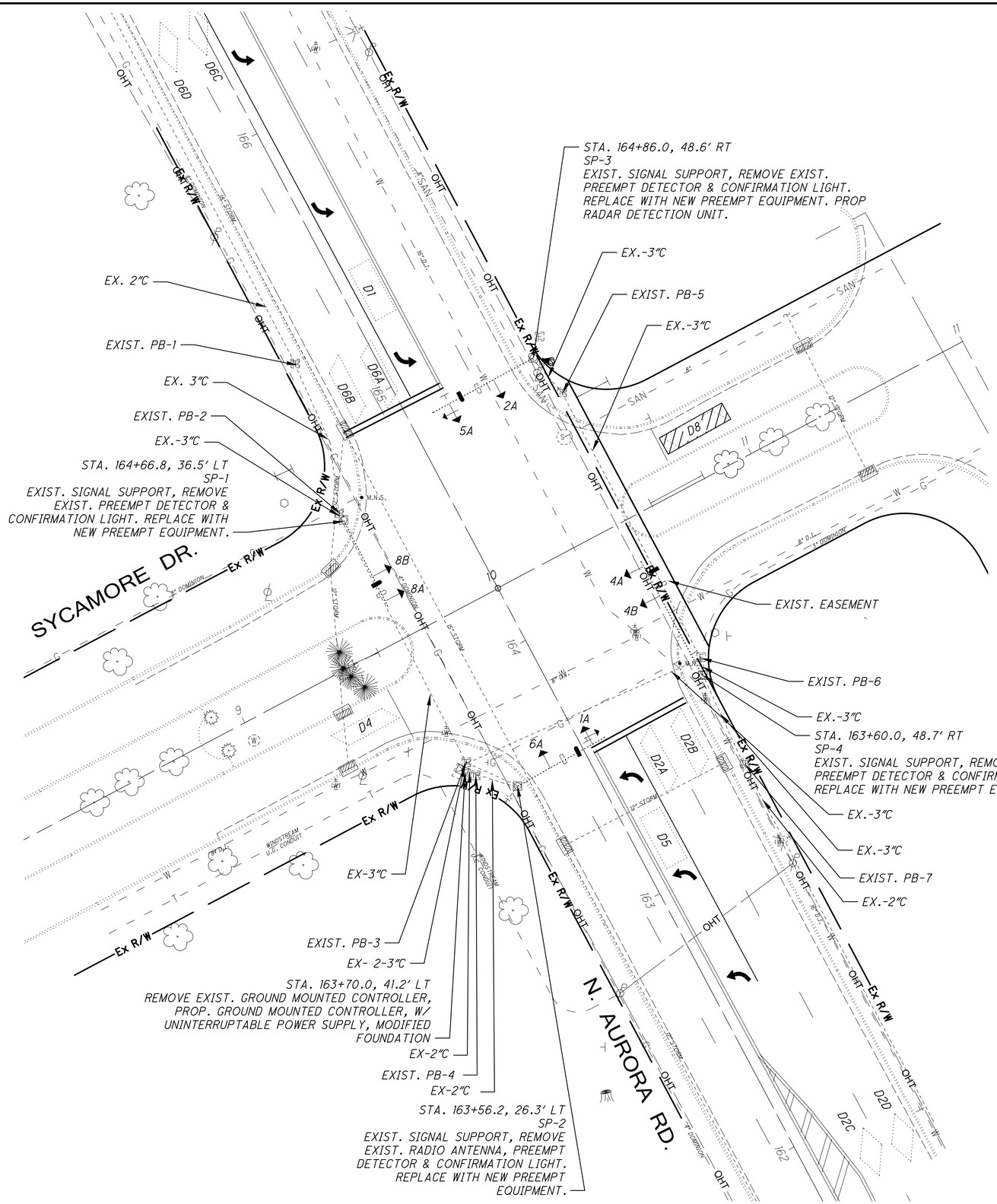
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & TREAT RD.

POR-AURORA SIGNALS

47
133



EXIST. MAST ARM SIGNAGE

Aurora Rd
D3-1-108
QTY = 2

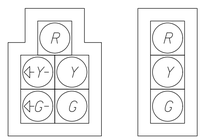
Sycamore Dr
D3-1-114
QTY = 2

ONLY
R3-RL-30
QTY = 2

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●→	○→
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●→	○→
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	⊠	⊠
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	D	D
STOP-LINE RADAR DETECTION UNIT	S	S
RADIO ANTENNA	⊣	⊣
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	

PROP. SIGNAL HEADS



1A & 5A 2A, 4A, 4B, 6A 8A & 8B

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

NOTE:
ALL EXISTING SIGNAL HEADS TO BE REMOVED AND REPLACED WITH NEW IN SAME LOCATION.

N

0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JJT CHECKED MWS

TRAFFIC SIGNAL PLAN
N. AURORA RD. (S.R. 43) & SYCAMORE DR.

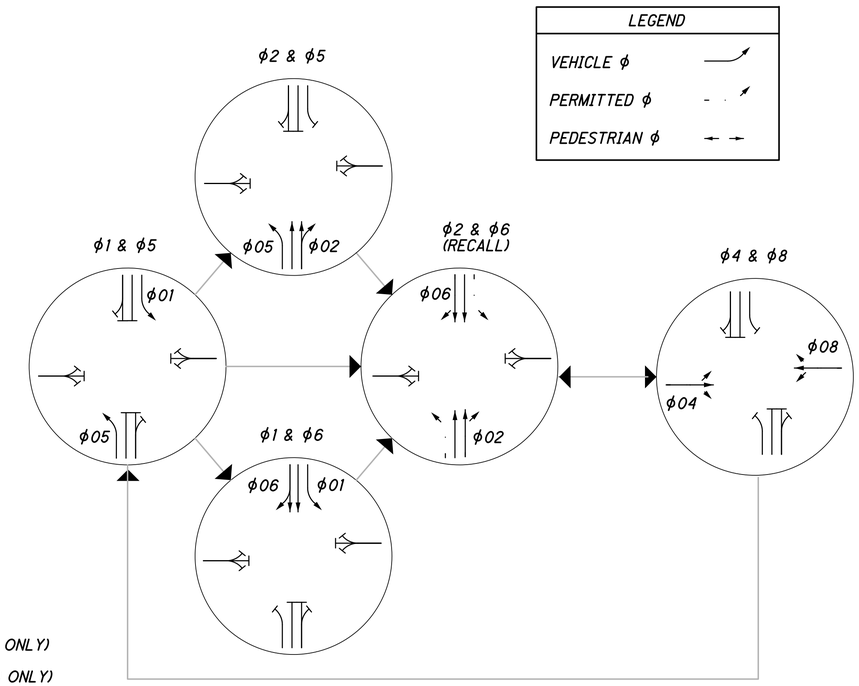
POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:				Aurora Rd (S.R. 43) & Sycamore Dr					
MAINTAINING AGENCY:				City of Aurora					
START UP				DUAL ENTRY:	Yes	PHASES:		2,4,6,8	
				REST IN RED:		RING 1	-	RING 2	-
START IN:	FLASH			OVERLAP		A	B	C	D
TIME FOR FLASH OR ALL RED:	9,	6							
FIRST PHASE(S):	2	6		PHASES		-	-	-	-
COLOR DISPLAYED:	G								
INTERVAL OR FEATURE				CONTROLLER MOVEMENT NO.					
INTERSECTION MOVEMENT (PHASE)				1	2	-	4	5	6	-	8
DIRECTION				SB L	NB	-	EB	NB L	SB	-	WB
MINIMUM GREEN (INITIAL)			(SEC.)	7	20	-	8	7	20	-	8
ADDED INITIAL			*(SEC./ACTUATION)	-	1.8	-	-	-	1.8	-	-
MAXIMUM INITIAL			*(SEC.)	-	25	-	-	-	25	-	-
PASSAGE TIME (PRESET GAP)			(SEC.)	2.5	4.5	-	4.0	2.5	4.5	-	4.0
TIME BEFORE REDUCTION			*(SEC.)	-	25	-	-	-	25	-	-
MINIMUM GAP			*(SEC.)	-	2.5	-	-	-	2.5	-	-
TIME TO REDUCE			*(SEC.)	-	30	-	-	-	30	-	-
MAXIMUM GREEN I			(SEC.)	15	55	-	20	15	55	-	20
MAXIMUM GREEN II			(SEC.)	15	55	-	20	15	55	-	20
YELLOW CHANGE			(SEC.)	3.9	4.8	-	3.3	3.9	4.8	-	3.3
ALL RED CLEARANCE			(SEC.)	2.3	1.0	-	1.6	2.3	1.0	-	1.6
WALK			(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE			(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM		(ON/OFF)	OFF	OFF	-	OFF	OFF	OFF	-	OFF
	MINIMUM		(ON/OFF)	OFF	ON	-	OFF	OFF	ON	-	OFF
	PEDESTRIAN		(ON/OFF)	OFF	OFF	-	OFF	OFF	OFF	-	OFF
MEMORY			(ON/OFF)	OFF	ON	-	OFF	OFF	ON	-	OFF

*VOLUME DENSITY CONTROLS

PHASING DIAGRAM (TYPICAL)



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(4) (EASTBOUND ONLY)

CHANNEL 4 = ϕ(8) (WESTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

EXISTING TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	EXIST	EXIST	PRESENCE	5	-	1	ϕ5
D6A	EXIST	EXIST	PRESENCE	-	-	2	ϕ2
D6B	EXIST	EXIST	PRESENCE	10	-	3	ϕ2
D5	EXIST	EXIST	PRESENCE	5	-	4	ϕ1
D2A	EXIST	EXIST	PRESENCE	10	-	5	ϕ6
D2B	EXIST	EXIST	PRESENCE	-	-	6	ϕ6
D4	EXIST	EXIST	PRESENCE	10	-	8	ϕ8
D6C	EXIST	EXIST	PRESENCE	-	-	9	ϕ2
D6D	EXIST	EXIST	PRESENCE	-	-	10	ϕ2
D2C	EXIST	EXIST	PRESENCE	-	-	11	ϕ6
D2D	EXIST	EXIST	PRESENCE	-	-	12	ϕ6

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D8	WB THRU	PRESENCE	ϕ8	8	-	-	STOP-BAR	25	0

N

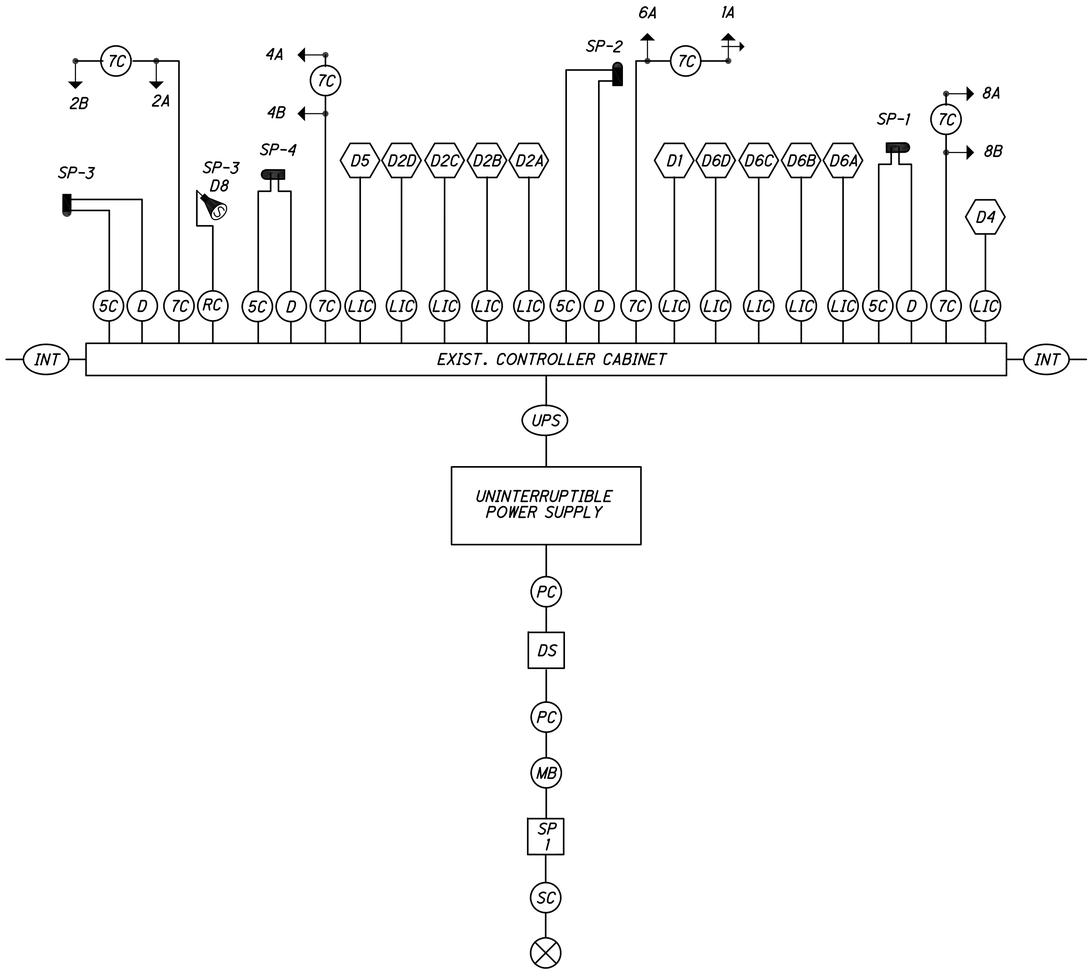
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
N. AURORA RD. (S.R. 43) & SYCAMORE DR.

POR-AURORA SIGNALS

WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A	R	Ø6 R	Y	5A	R	Ø2 R	Y
	Y	Ø6 Y			Y	Ø2 Y	
	G	Ø6 G			G	Ø2 G	
	<--Y---	Ø1 Y			<--Y---	Ø5 Y	
(SB LT)	<--G---	Ø1 G		(NB LT)	<--G---	Ø5 G	
2A	R	Ø2 R	Y	6A	R	Ø6 R	Y
	Y	Ø2 Y			Y	Ø6 Y	
(NB)	G	Ø2 G		(SB)	G	Ø6 G	
4A	R	Ø4 R	R	8A	R	Ø8 R	R
	Y	Ø4 Y			Y	Ø8 Y	
(EB)	G	Ø4 G		(WB)	G	Ø8 G	
4B	R	Ø4 R	R	8B	R	Ø8 R	R
	Y	Ø4 Y			Y	Ø8 Y	
(EB)	G	Ø4 G		(WB)	G	Ø8 G	

LS = LOAD SWITCH

LEGEND

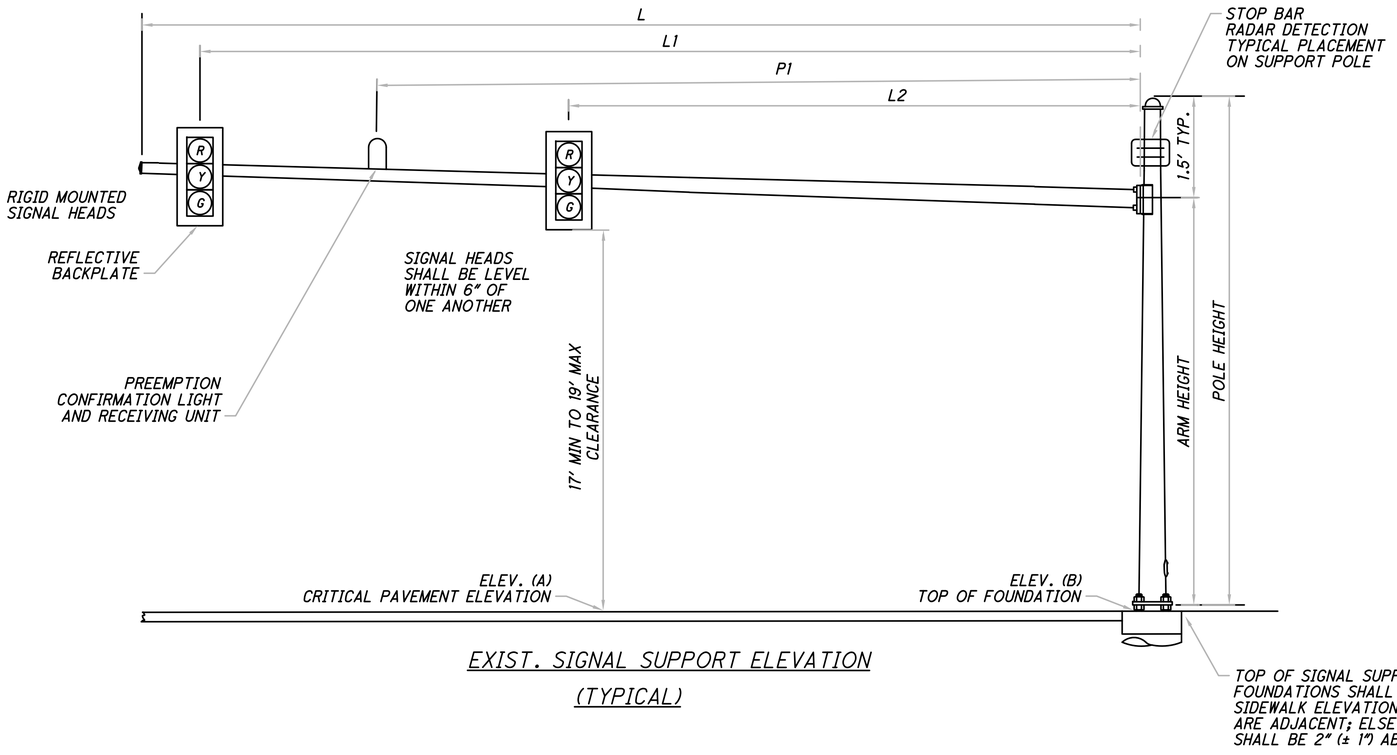
- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- INT — INTERCONNECT CABLE
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- RC — RADAR DETECTION CABLE
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. __
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & SYCAMORE DR.

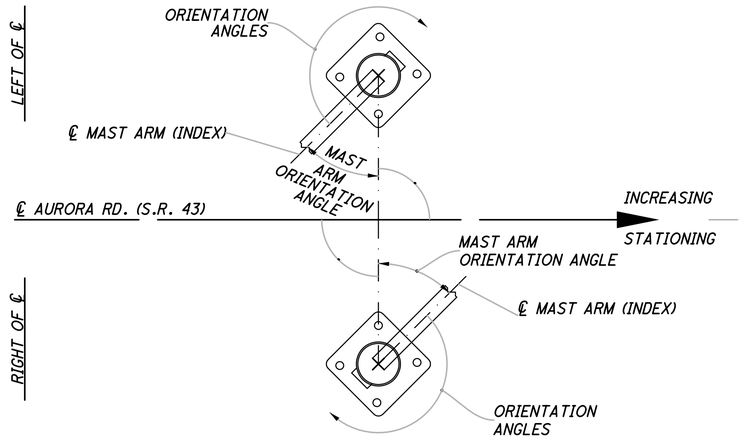
POR-AURORA SIGNALS



EXIST. SIGNAL SUPPORT ELEVATION

(TYPICAL)

TOP OF SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS SHALL BE LEVEL WITH THE SIDEWALK ELEVATION WHERE ADA LANDINGS ARE ADJACENT; ELSEWHERE, FOUNDATIONS SHALL BE 2" (± 1") ABOVE GRADE PER TC-21.20



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS												ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	S1	S2	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	164+66.8	36.5' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	34	20	-	-	-	-	27	EX	-	-	-	-	EX	-
SP-2	163+56.2	26.3' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	31	17	-	-	EX	-	24	EX	-	-	-	EX	EX	EX
SP-3	164+86.0	48.6' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	31	17	-	0	EX	-	24	EX	-	-	-	-	EX	-
SP-4	163+60.0	48.7' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	44	32	-	-	-	-	38	EX	-	-	-	-	EX	-

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & SYCAMORE DR.

POR-AURORA SIGNALS

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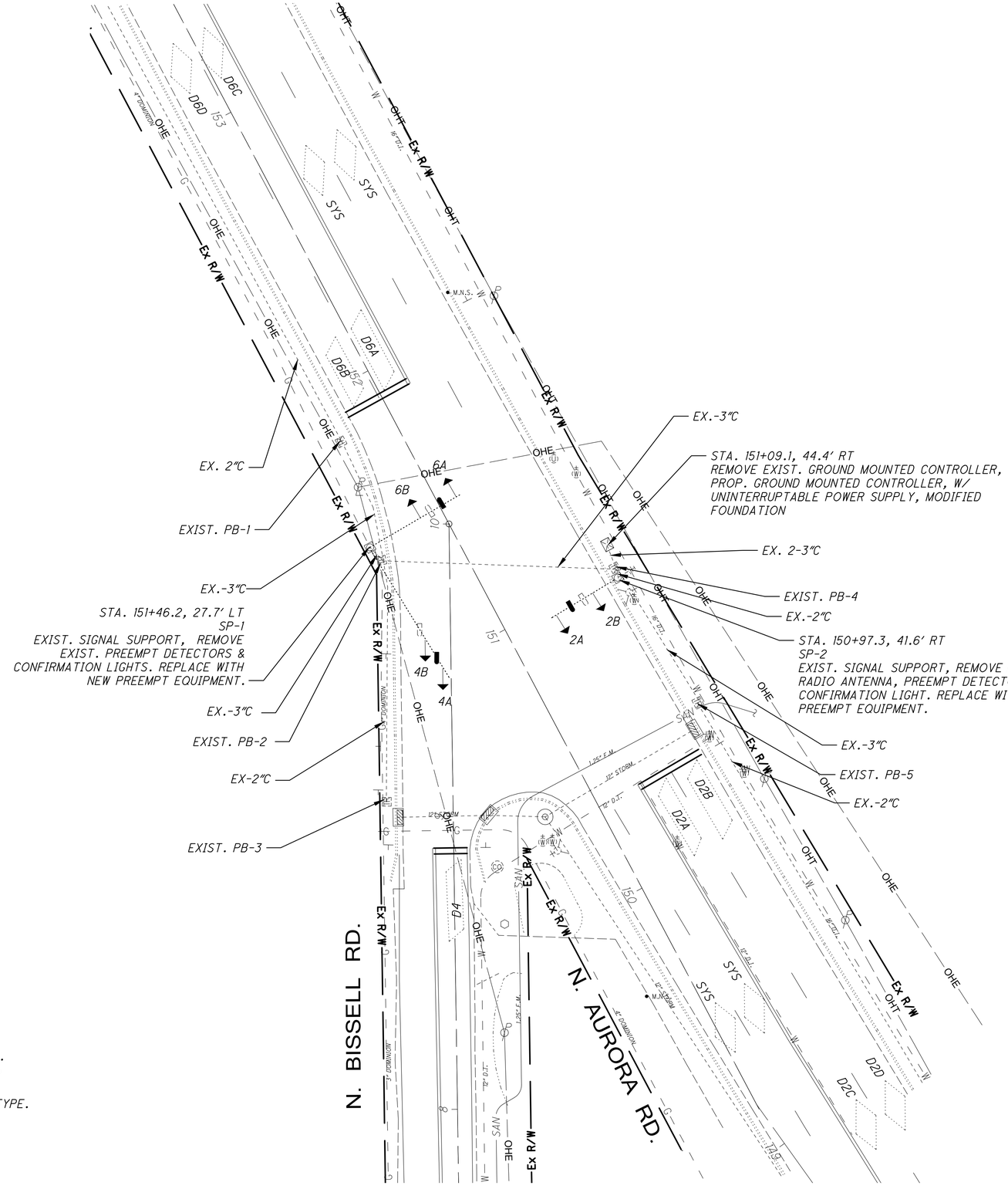


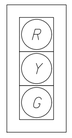
EXIST. MAST ARM SIGNAGE

Aurora Rd
D3-1-108
QTY = 2

N Bissell Rd
D3-1-108
QTY = 2

NO TURN ON RED
R10-11b
QTY = 1

PROP. SIGNAL HEADS



2A, 2B, 4A, 4B,
6A & 6B

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

NOTE:
ALL EXISTING SIGNAL HEADS TO BE REMOVED AND REPLACED WITH NEW IN SAME LOCATION.

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●→	○→
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●→	○→
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	D	D
STOP-LINE RADAR DETECTION UNIT	S	S
RADIO ANTENNA	⊢	⊢
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	

N

0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JAT | CHECKED MWS

TRAFFIC SIGNAL PLAN
N. AURORA RD. (S.R. 43) BISSELL RD.

POR-AURORA SIGNALS

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SIGNAL TIMING CHART

INTERSECTION:			Aurora Rd (S.R. 43) & Bissel Rd							
MAINTAINING AGENCY:			City of Aurora							
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8		
			REST IN RED:		RING 1	-		RING 2	-	
START IN:	FLASH		OVERLAP				A	B	C	D
TIME FOR FLASH OR ALL RED:	9,	6								
FIRST PHASE(S):	2	6	PHASES				-	-	-	-
COLOR DISPLAYED:	G									
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.							
INTERSECTION MOVEMENT (PHASE)			-	2	-	4	-	6	-	-
DIRECTION			-	NB	-	EB	-	SB	-	-
MINIMUM GREEN (INITIAL)		(SEC.)	-	20	-	10	-	20	-	-
ADDED INITIAL		*(SEC./ACTUATION)	-	1.8	-	-	-	1.8	-	-
MAXIMUM INITIAL		*(SEC.)	-	26	-	-	-	26	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	-	4.5	-	4.0	-	4.5	-	-
TIME BEFORE REDUCTION		*(SEC.)	-	26	-	-	-	26	-	-
MINIMUM GAP		*(SEC.)	-	2.5	-	-	-	2.5	-	-
TIME TO REDUCE		*(SEC.)	-	29	-	-	-	29	-	-
MAXIMUM GREEN I		(SEC.)	-	55	-	35	-	55	-	-
MAXIMUM GREEN II		(SEC.)	-	55	-	35	-	55	-	-
YELLOW CHANGE		(SEC.)	-	4.8	-	4.1	-	4.8	-	-
ALL RED CLEARANCE		(SEC.)	-	1.1	-	1.6	-	1.1	-	-
WALK		(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-
	MINIMUM	(ON/OFF)	-	ON	-	OFF	-	ON	-	-
	PEDESTRIAN	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-
MEMORY		(ON/OFF)	-	OFF	-	OFF	-	OFF	-	-

*VOLUME DENSITY CONTROLS

PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(4) (EASTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

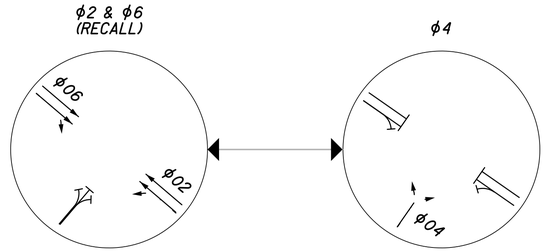
LEGEND

VEHICLE ϕ

PERMITTED ϕ

PEDESTRIAN ϕ

PHASING DIAGRAM



EXISTING TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D2A	EXIST	EXIST	PRESENCE	-	-	1	ϕ2
D2B	EXIST	EXIST	PRESENCE	-	-	2	ϕ2
D6A	EXIST	EXIST	PRESENCE	-	-	3	ϕ6
D6B	EXIST	EXIST	PRESENCE	10	-	4	ϕ6
D4	EXIST	EXIST	PRESENCE	10	-	5	ϕ4
D2C	EXIST	EXIST	PRESENCE	-	-	6	ϕ2
D2D	EXIST	EXIST	PRESENCE	-	-	7	ϕ2
D6C	EXIST	EXIST	PRESENCE	-	-	8	ϕ6
D6D	EXIST	EXIST	PRESENCE	-	-	9	ϕ6
SYS	EXIST	EXIST	PULSE	-	-	10	SYS
SYS	EXIST	EXIST	PULSE	-	-	11	SYS
SYS	EXIST	EXIST	PULSE	-	-	12	SYS
SYS	EXIST	EXIST	PULSE	-	-	13	SYS

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

HORIZONTAL SCALE IN FEET (0, 10, 20, 40)

CALCULATED JAT

CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS

N. AURORA RD. (S.R. 43) & BISSELL RD.

POR-AURORA SIGNALS

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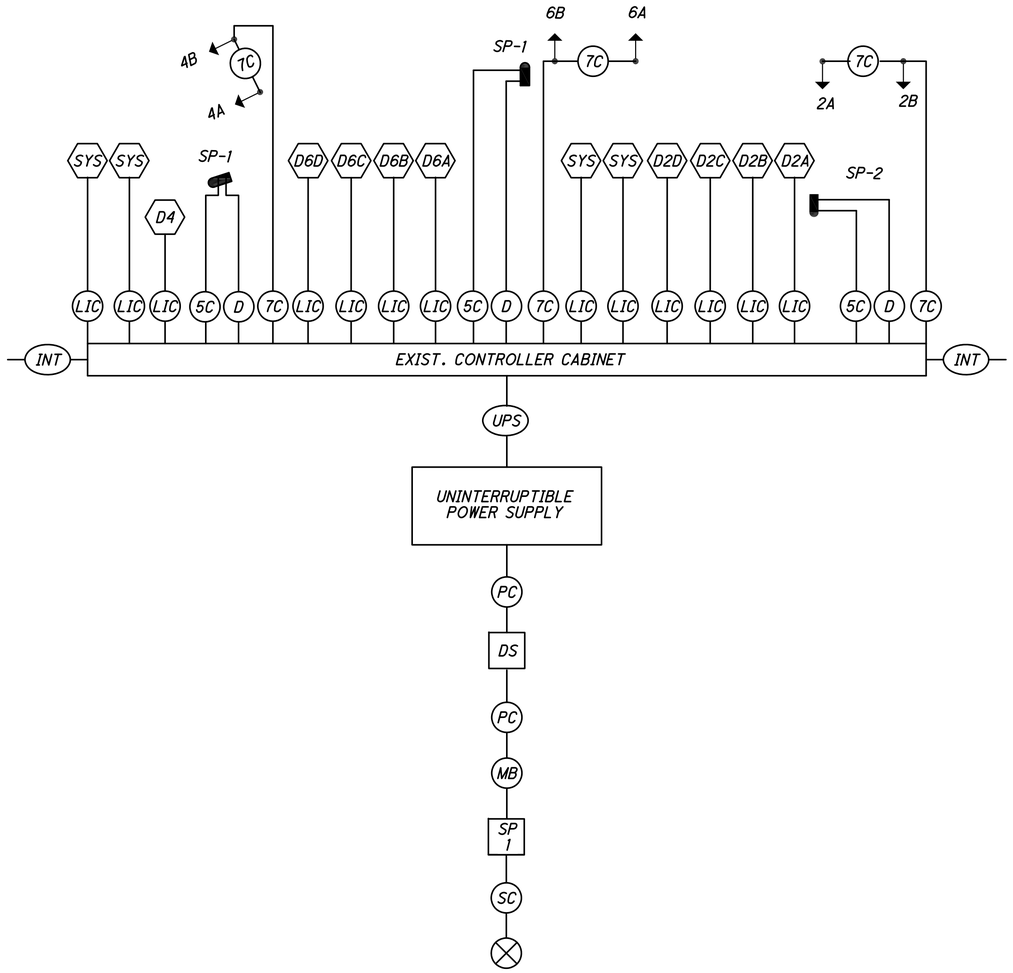
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2A	R	Ø2 R	Y	4B	R	Ø4 R	R
	Y	Ø2 Y			Y	Ø4 Y	
(NB)	G	Ø2 G		(EB)	G	Ø4 G	
2B	R	Ø2 R	Y	6A	R	Ø6 R	Y
	Y	Ø2 Y			Y	Ø6 Y	
(NB)	G	Ø2 G		(SB)	G	Ø6 G	
4A	R	Ø4 R	R	6B	R	Ø6 R	Y
	Y	Ø4 Y			Y	Ø6 Y	
(EB)	G	Ø4 G		(SB)	G	Ø6 G	
LS = LOAD SWITCH							

LEGEND

	3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY	D	PREEMPTION DETECTOR CABLE	SC	SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
	PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT	LIC	2/C NO. 14 AWG (LEAD-IN CABLE)	PC	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
INT	INTERCONNECT CABLE	3C	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG	SP 1	SIGNAL SUPPORT POLE NO. --
L	VEHICLE LOOP DETECTOR	5C	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	MB	METER BASE
UPS	UNINTERRUPTIBLE POWER SUPPLY CABLE	7C	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG		POWER SOURCE
		RC	RADAR DETECTION CABLE	DS	DISCONNECT SWITCH

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & BISSELL RD.

POR-AURORA SIGNALS

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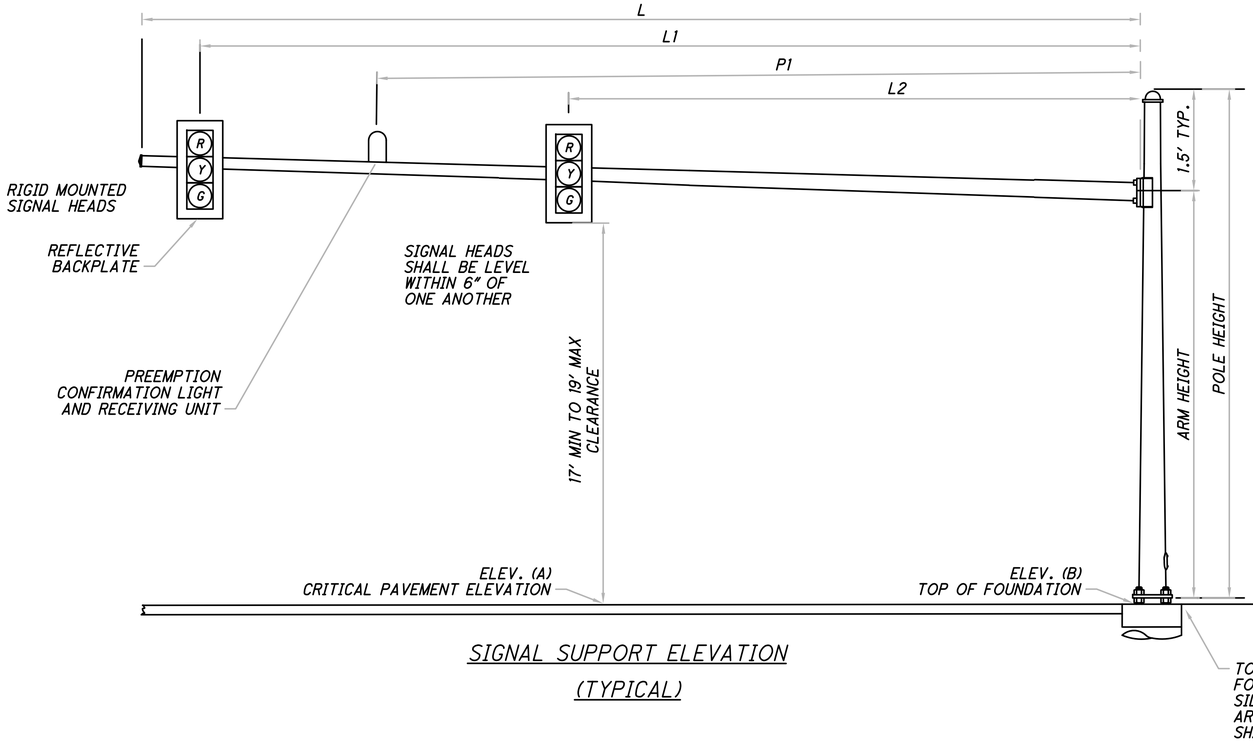
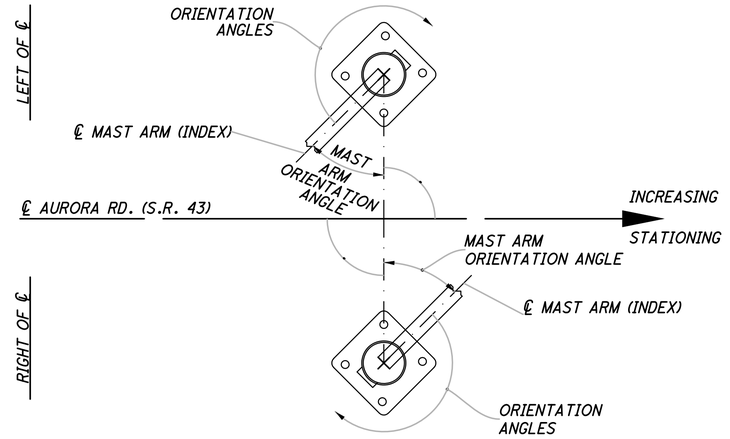


SIGNAL SUPPORT ELEVATION

(TYPICAL)

TOP OF SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS SHALL BE LEVEL WITH THE SIDEWALK ELEVATION WHERE ADA LANDINGS ARE ADJACENT; ELSEWHERE, FOUNDATIONS SHALL BE 2" (± 1") ABOVE GRADE PER TC-21.20



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	D1	S1	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	151+46.2	27.7' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	39	25	-	-	-	32	EX	-	-	-	-	EX	-
-	-	-	-	-	-	-	EX	EX	EX	34	24	-	-	EX	29	-	EX	-	-	-	-	-
SP-2	150+97.3	41.6' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	29	15	-	-	-	22	EX	-	-	-	EX	EX	EX
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. AURORA RD. (S.R. 43) & BISSELL RD.

POR-AURORA SIGNALS

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PEDESTRIAN SIGNS

R10-1
12" x 18"
QUANTITY = 2
6

R9-3-18
2 EACH 5

R9-3BP-18
1 - LEFT ARROWS 3
1 - RIGHT ARROWS 4

CCTV-IP CAMERA
(W/ PAN, ZOOM, AND TILT FUNCTIONS)

MAST ARM SIGNAGE

D3-1-126
QTY = 2
1

D3-1-90
QTY = 2
2

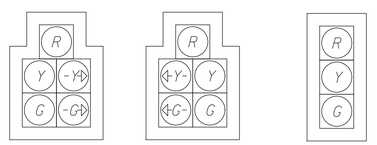
PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	471+00.0	LT	27.1'	18
PB-2	471+03.5	RT	34.1'	18
PB-3	472+01.7	LT	28.1'	24
PB-4	471+97.5	RT	37.7'	18

EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	471+10.2	RT	38.8'
WOOD POLE	471+06.1	LT	37.9'
WOOD POLE	471+94.2	RT	40.8'
WOOD POLE	471+59.9	LT	22.5'
WOOD POLE	471+92.4	RT	34.6'
CONTROLLER	471+08.4	RT	39.1'

SIGNAL HEADS



1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●→	○→
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●↓	○↓
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	▣	▣
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀D	◀D
CCTV-IP CAMERA	▭	
RADIO ANTENNA	⊣	⊣
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
W. GARFIELD RD. (S.R. 82) & BISSELL RD.
POR-AURORA SIGNALS

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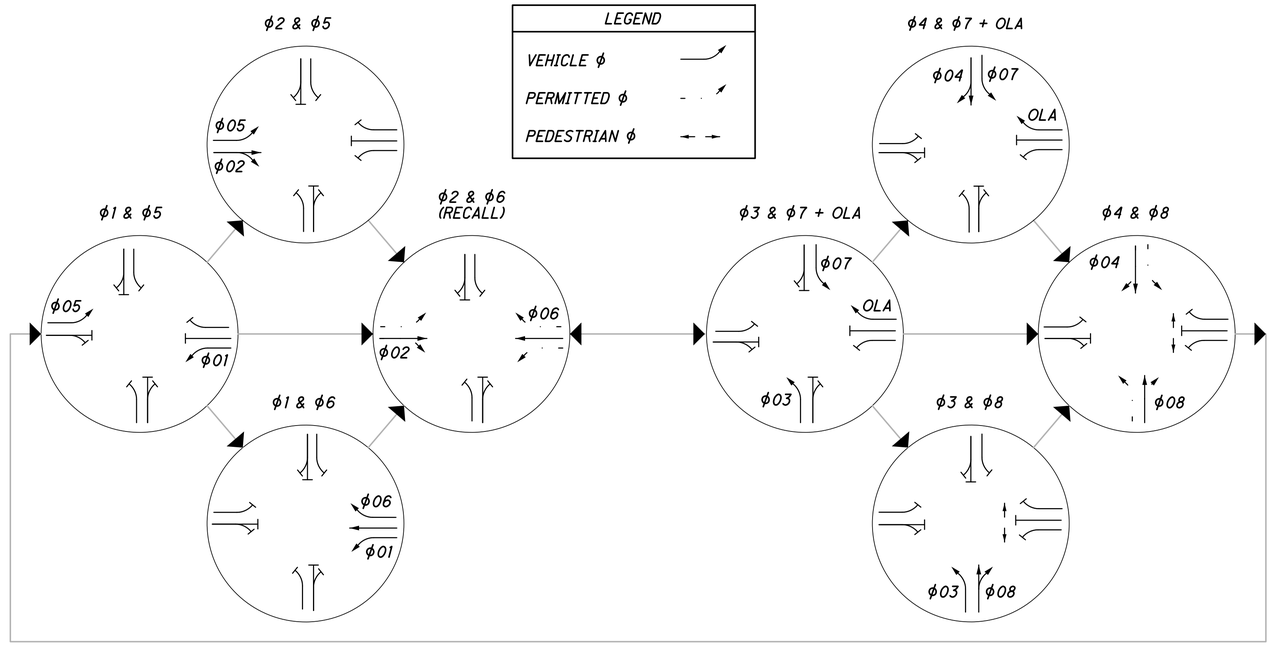
SIGNAL TIMING CHART

INTERSECTION:			Garfield Rd (S.R. 82) & Bissel Rd						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8	
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH OR ALL RED:	9,	6							
FIRST PHASE(S):	2	6	PHASES			7	-	-	-
COLOR DISPLAYED:	G								
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	3	4	5	6	7	8
DIRECTION			WB L	WB	NB L	SB	EB L	EB	SB L	NB
MINIMUM GREEN (INITIAL)		(SEC.)	7	15	7	10	7	15	7	10
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	3.5	2.5	4.0	2.5	3.5	2.5	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	15	45	15	40	15	45	15	40
MAXIMUM GREEN II		(SEC.)	15	45	15	40	15	45	15	40
YELLOW CHANGE		(SEC.)	3.2	4.1	3.2	4.1	3.2	4.1	3.2	4.1
ALL RED CLEARANCE		(SEC.)	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0
WALK		(SEC.)	-	-	-	-	-	-	-	8
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	-	-	-	-	13
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM	(ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY		(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

*VOLUME DENSITY CONTROLS

PHASING DIAGRAM



NOTES:

- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (WESTBOUND ONLY)

CHANNEL 2 = ϕ(6) (EASTBOUND ONLY)

CHANNEL 3 = ϕ(4) (SOUTHBOUND ONLY)

CHANNEL 4 = ϕ(8) (NORTHBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	EB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	150	100-250
D6	WB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	150	100-250
SYS	EB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	P	6' X 30'	PRESENCE	2	-	1-1	ϕ1
D5	P	6' X 30'	PRESENCE	2	-	5-1	ϕ5
D4	P	6' X 30'	PRESENCE	8	-	4-1	ϕ4
D7	P	6' X 30'	PRESENCE	2	-	7-1	ϕ7
D3	P	6' X 30'	PRESENCE	2	-	3-1	ϕ3
D8	P	6' X 30'	PRESENCE	2	-	8-1	ϕ8

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
W. GARFIELD RD. (S.R. 82) & BISSELL RD.

POR-AURORA SIGNALS

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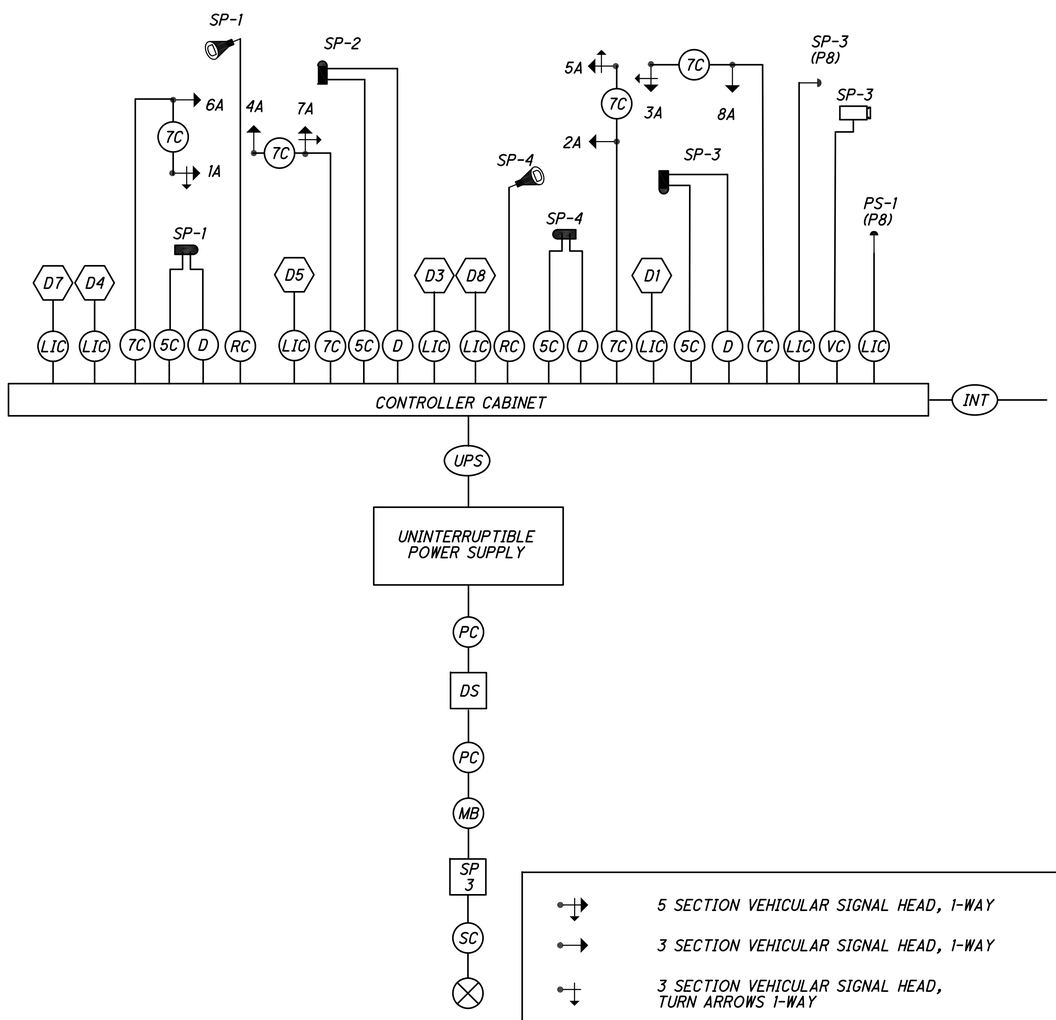
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (WB LT)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
	<--Y---	Ø1 Y	
	<--G---	Ø1 G	
2A (EB)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
3A (NB LT)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
	<--Y---	Ø3 Y	
	<--G---	Ø3 G	
4A (SB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
5A (EB LT)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
	<--Y---	Ø5 Y	
	<--G---	Ø5 G	

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
6A (WB)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
	---Y-->	Ø7 Y/LS12 Y	
	---G-->	Ø7 G/LS12 G	
7A (SB LT)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
	<--Y---	Ø7 Y	
	<--G---	Ø7 G	
8A (NB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
OVERLAPS			
OLA	---Y-->	Ø7 Y/LS12 Y	-
	---G-->	Ø7 G/LS12 G	
LS = LOAD SWITCH			

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- (L) VEHICLE LOOP DETECTOR
- (D) PREEMPTION DETECTOR CABLE
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (3C) SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- (5C) SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (RC) RADAR DETECTION CABLE
- (VC) VIDEO CAMERA CABLE
- (INT) INTERCONNECT CABLE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (PC) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- (SP 1) SIGNAL SUPPORT POLE NO. --
- (MB) METER BASE
- POWER SOURCE
- (DS) DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE
- CCTV-IP CAMERA

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
W. GARFIELD RD. (S.R. 82) & BISSELL RD.

POR-AURORA SIGNALS

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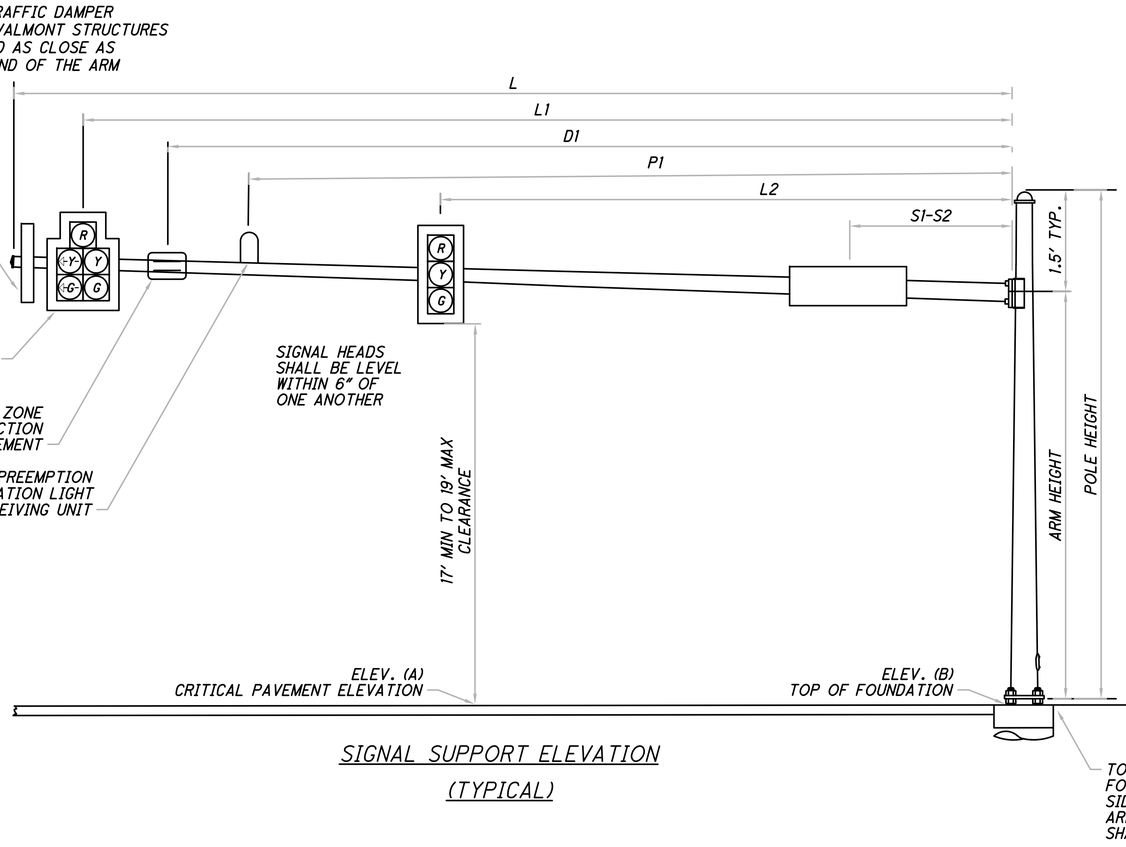
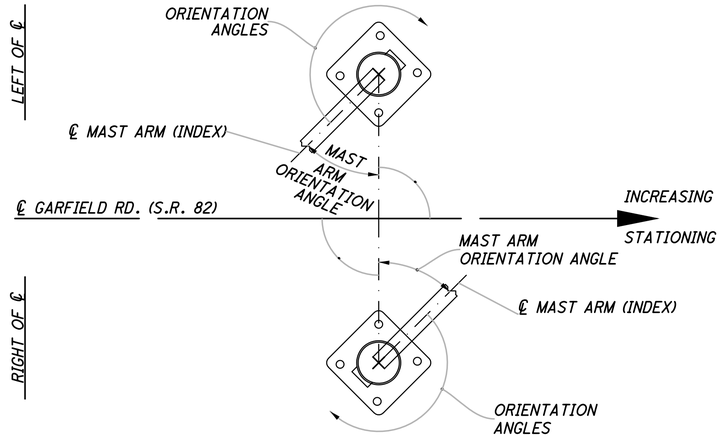


SIGNAL SUPPORT ELEVATION

(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	D1	S1	S2	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	470+80.0	26.5' LT	1092.80	1091.16	TC-81.21	3	23.5	22	37	34	14	31	-	0	28	315	-	-	-	-	180	-
SP-2	470+96.7	34.3' RT	1092.80	1090.00	TC-81.21	12	24.5	23	48	45	35	42	28	-	39	90	-	-	-	-	180	-
SP-3	471+94.0	35.8' LT	1092.80	1092.79	TC-81.21	11	21.5	20	40	37	27	34	20	-	31	90	-	-	180	90	180	270
SP-4	472+00.7	43.8' RT	1092.80	1091.97	TC-81.21	3	22.5	21	34	31	21	28	-	15	25	0	-	-	-	-	180	-
PS-1	472+05.7	25.6' RT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	270	-	180	-

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
GARFIELD RD. (S.R. 82) & BISSELL RD.

POR-AURORA SIGNALS

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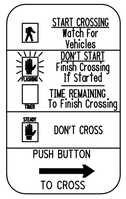
Z:\Projects (U)\2018\18-094 City of Aurora - Citywide Traffic Signal Improvement Project - Aurora\107761\signals\sheets\Detail Sheets\Stage 3 Revisions\107761CD006b_S3R_JFS.dwg - Jul 16, 2020 - 2:25:02pm Plotted By : gat

PEDESTRIAN SIGNS



R10-3E-9
3 - LEFT ARROWS
3 - RIGHT ARROWS

R9-3-18
2 EACH [5]

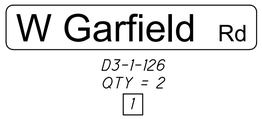
R9-3BP-18
1 - LEFT ARROWS [3]
1 - RIGHT ARROWS [4]

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	483+26.5	LT	31.1′	24
PB-2	483+20.6	RT	32.9′	18
PB-3	484+14.6	LT	30.0′	18
PB-4	484+19.0	RT	32.1′	18

MAST ARM SIGNAGE

R3-5L
30″ X 36″
QTY = 2
[2]



D3-1-126
QTY = 2
[1]

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12″		
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12″		
SIGNAL SUPPORT POLE		
PEDESTRIAN SIGNAL		
PEDESTRIAN PUSH BUTTON		
PEDESTAL SUPPORT		
CONTROLLER CABINET AND WORK PAD (TS-2)		
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT		
RADIO ANTENNA		
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT		
DETECTOR LOOP		
DETECTION ZONE		
DETECTION COUNT		

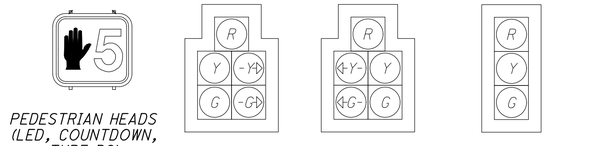
EXISTING SIGNAGE TO BE REMOVED

QTY = 3

EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	482+48.9	LT	23.2′
PULLBOX	483+27.7	LT	27.7′
PULLBOX	482+96.0	RT	33.3′
PULLBOX	484+24.7	RT	30.2′
PULLBOX	484+85.6	RT	30.4′
PULLBOX	486+06.1	RT	30.0′
PEDESTAL	483+37.2	LT	23.9′
PEDESTAL	483+27.8	RT	38.9′
WOOD POLE	484+23.0	LT	27.7′
WOOD POLE	483+17.3	RT	35.5′
CONTROLLER	484+40.0	RT	29.3′

SIGNAL HEADS



PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 4

8B

1A & 5A

2A, 4A, 4B, 6A & 8A

1. ALL SIGNAL HEADS SHALL HAVE 12″ LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
GARFIELD RD. (S.R. 82) & AURORA COMMONS

POR-AURORA SIGNALS

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SIGNAL TIMING CHART

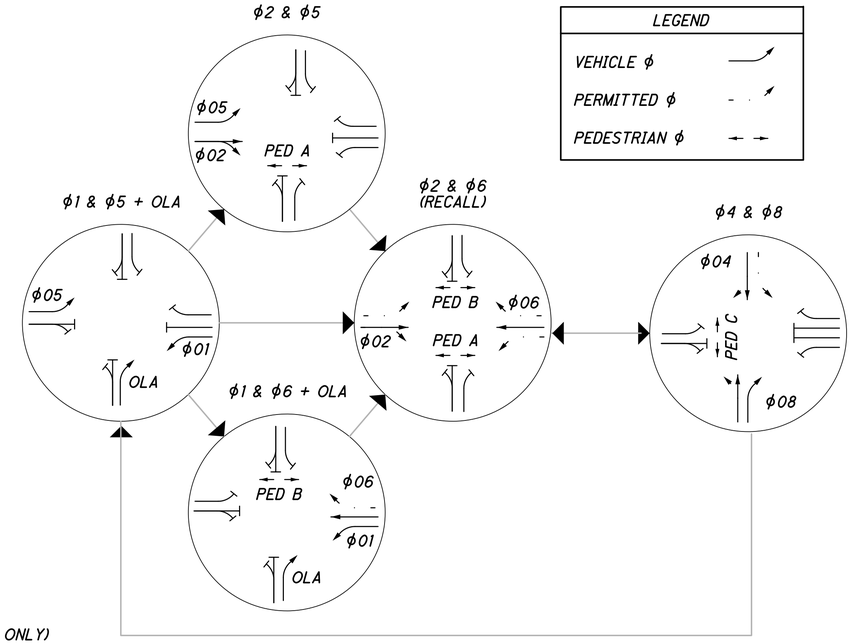
INTERSECTION:			Garfield Rd (S.R. 82) & Aurora Commons/Chase Bank						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8	
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH, ALL RED:	9,	6							
FIRST PHASE(S):	2	6	PHASES			1	-	-	-
COLOR DISPLAYED:	G								
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	-	4	5	6	-	8
DIRECTION			WB L	EB	-	SB	EB L	WB	-	NB
MINIMUM GREEN (INITIAL)		(SEC.)	7	15	-	10	7	15	-	10
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	3.0	-	4.0	2.5	3.0	-	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	20	70	-	35	15	75	-	35
MAXIMUM GREEN II		(SEC.)	20	70	-	35	15	75	-	35
YELLOW CHANGE		(SEC.)	3.2	4.1	-	3.3	3.2	4.1	-	3.3
ALL RED CLEARANCE		(SEC.)	1.6	1.0	-	1.0	1.6	1.0	-	1.0
WALK		(SEC.)	-	8	-	8	-	8	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	17	-	12	-	17	-	-
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM	(ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY		(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

*VOLUME DENSITY CONTROLS

NOTES:

- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM (TYPICAL)



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (EASTBOUND ONLY)

CHANNEL 2 = ϕ(6) (WESTBOUND ONLY)

CHANNEL 3 = ϕ(4) (SOUTHBOUND ONLY)

CHANNEL 4 = ϕ(8) (NORTHBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D4A	SB THRU	PRESENCE	ϕ4	8	ϕ4	STOP BAR	35	0
D4B	SB THRU	PRESENCE	ϕ4	2	ϕ4	STOP BAR	35	0
D8A	NB THRU	PRESENCE	ϕ8	8	ϕ8	STOP BAR	35	0
D8B	NB THRU	PRESENCE	ϕ8	2	ϕ8	STOP BAR	35	0
D2	EB THRU	PULSE	ϕ2	0	-	EXTEND ϕ2	150	100-250
D6	WB THRU	PULSE	ϕ6	0	-	EXTEND ϕ6	150	100-250
SYS	EB THRU	PULSE	SYS	0	-	SYSTEM	8	300
SYS	EB THRU	PULSE	SYS	0	-	SYSTEM	8	300

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	P	6' X 30'	PRESENCE	2	-	1-1	ϕ1
D5	P	6' X 30'	PRESENCE	2	-	1-1	ϕ5

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
W. GARFIELD RD. (S.R. 82) & AURORA COMMONS
POR-AURORA SIGNALS

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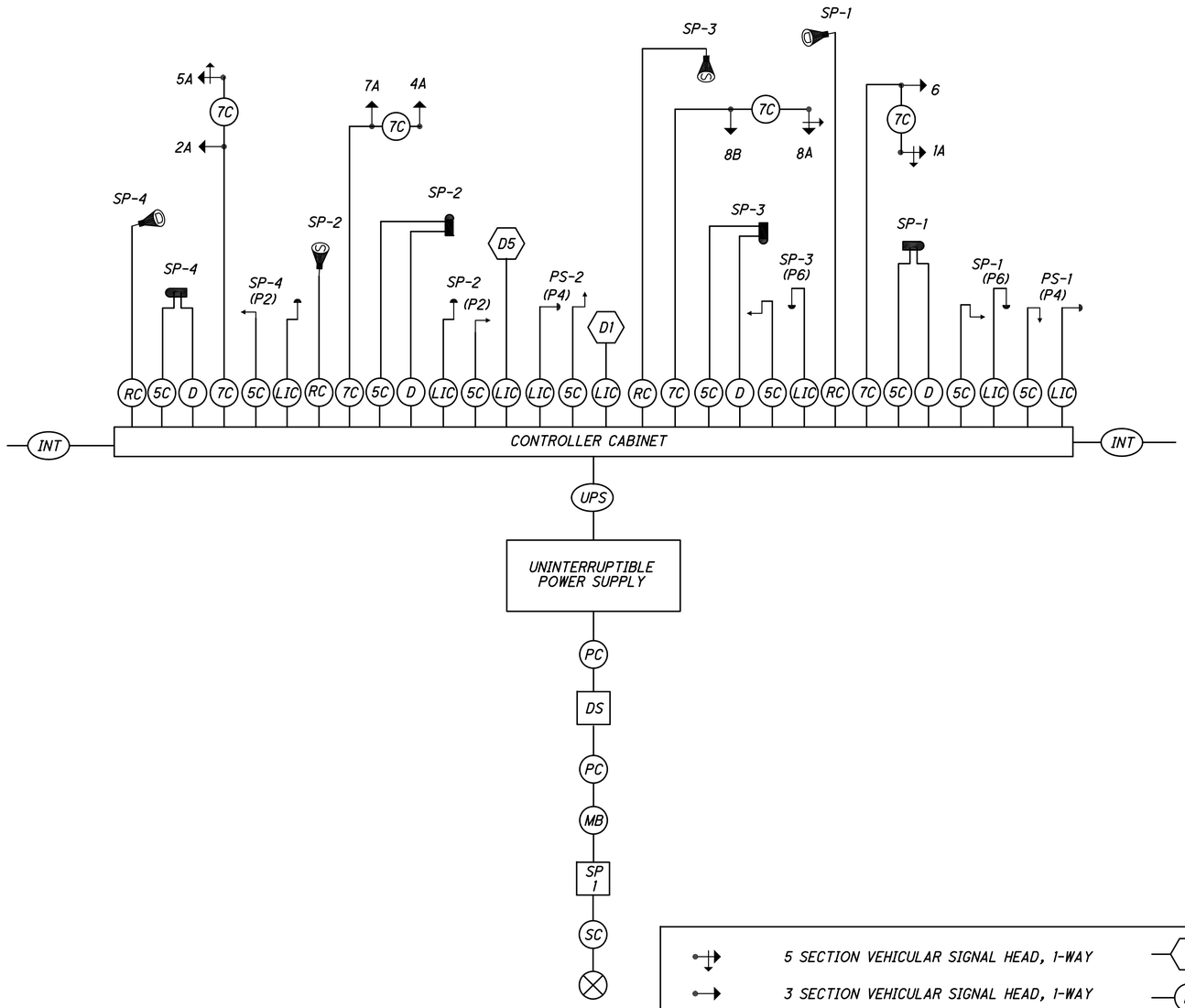
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (WB LT)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
	<--Y---	Ø1 Y	
	<--G---	Ø1 G	
2A (EB)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
4A (SB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
4B (SB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
5A (EB LT)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
	<--Y---	Ø5 Y	
	<--G---	Ø5 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
6A (WB)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
8A (NB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
8B (NB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
	---Y-->	Ø1 Y	
	---G-->	Ø1 G	
PEDESTRIAN MOVEMENTS			
PED A SOUTH	W	Ø2 PED/LS13 G	OUT
	DW	Ø2 PED/LS13 R	
PED B NORTH	W	Ø6 PED/LS15 G	OUT
	DW	Ø6 PED/LS15 R	
PED C WEST	W	Ø4 PED/LS14 G	OUT
	DW	Ø4 PED/LS14 R	
OVERLAPS			
OLA	---Y-->	Ø1 Y/LS9 Y	-
	---G-->	Ø1 G/LS9 G	
OLA = LS 9			

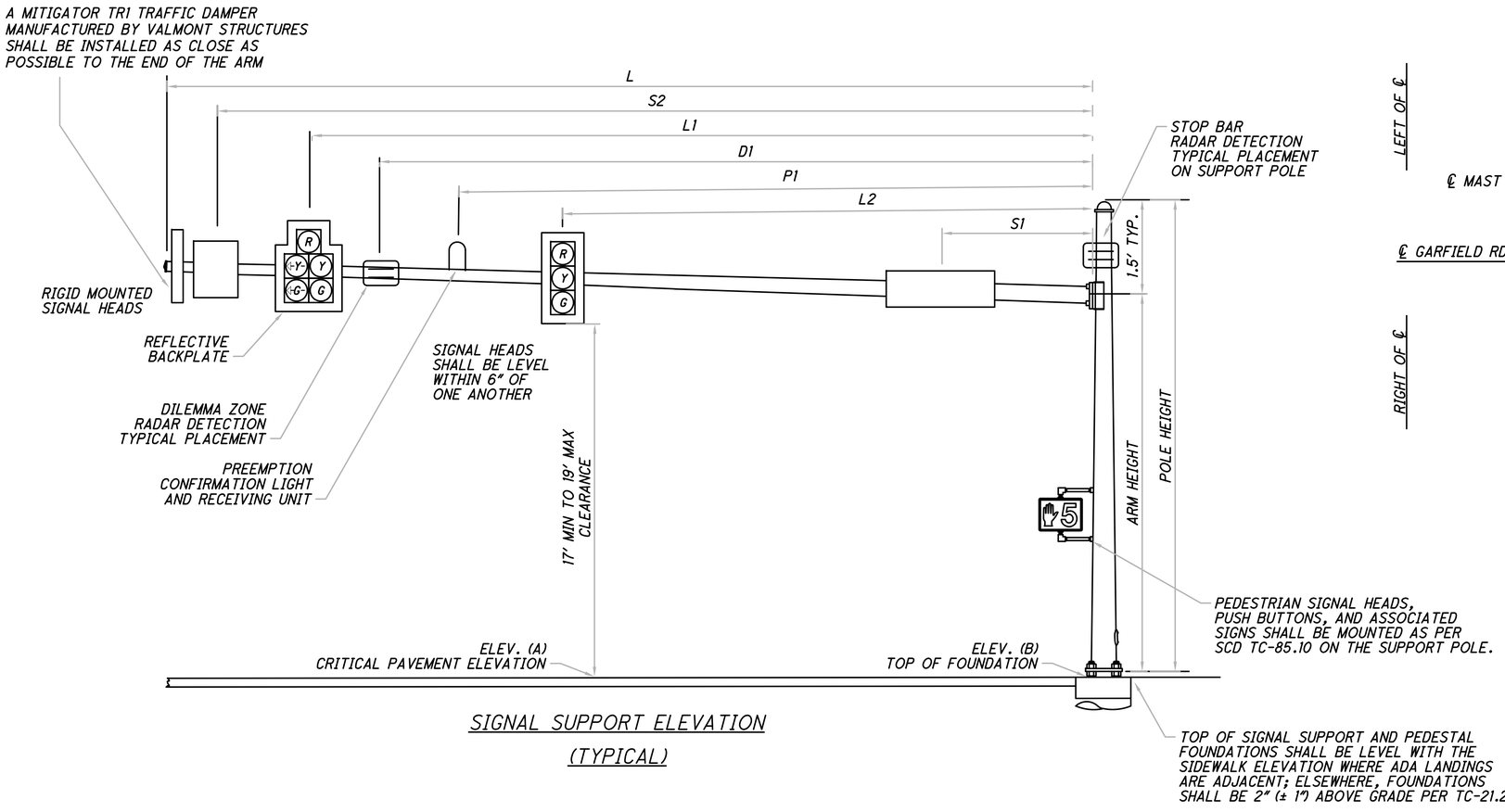
LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- RC — RADAR DETECTION CABLE
- VC — VIDEO CAMERA CABLE
- INT — INTERCONNECT CABLE
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. __
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE

HORIZONTAL SCALE IN FEET
0 10 20 40

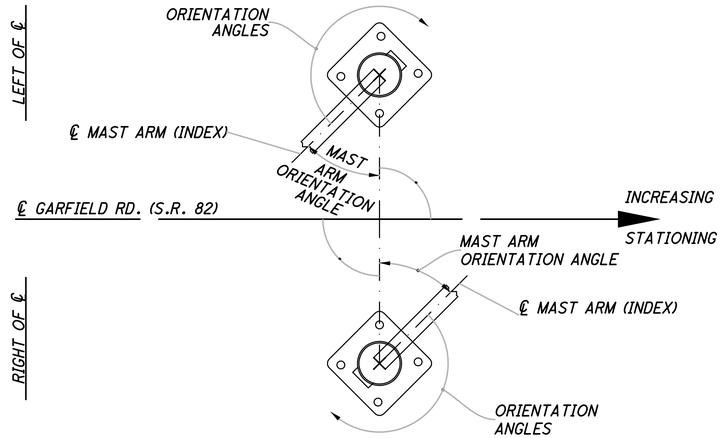
CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
W. GARFIELD RD. (S.R. 82) & AURORA COMMONS
POR-AURORA SIGNALS



SIGNAL SUPPORT ELEVATION

(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS										ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	D1	S1	S2	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	483+42.9	33.5' LT	1119.42	1117.81	TC-81.21	11	23.5	22	39	30	20	27	-	37	24	0	-	-	-	180	180	90
SP-2	483+32.9	43.5' RT	1119.42	1116.76	TC-81.21	3	24.5	23	36	33	20	30	12	-	27	90	-	-	-	-	180	-
SP-3	484+03.9	34.2' LT	1119.42	1120.45	TC-81.21	2	21	19.5	31	28	15	25	7	-	22	90	-	-	-	-	180	-
SP-4	484+19.3	41.7' RT	1119.42	1121.57	TC-81.21	11	20	18.5	41	33	22	30	-	39	27	0	-	-	-	-	180	-
PS-1	483+37.3	26.6' LT	-	-	-	-	8	8	-	-	-	-	-	-	-	-	-	270	270	-	180	-
PS-2	483+07.7	33.2' RT	-	-	-	-	8	8	-	-	-	-	-	-	-	-	-	90	90	-	180	-

HORIZONTAL SCALE IN FEET

CALCULATED JAT CHECKED MWS

SIGNAL DETAIL PLAN

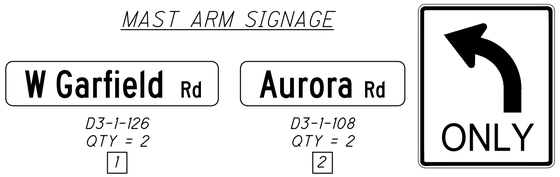
GARFIELD RD. (S.R. 82) & AURORA COMMONS

POR-AURORA SIGNALS

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●→	○→
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●→	○→
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐↓	┐↓
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	◉	◎
CONTROLLER CABINET AND WORK PAD (TS-2)	⊠	⊠
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀D	D
CCTV-IP CAMERA		
RADIO ANTENNA	⊣⊢	⊣⊢
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

MAST ARM SIGNAGE



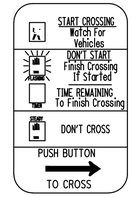
D3-1-126
QTY = 2
1

D3-1-108
QTY = 2
2

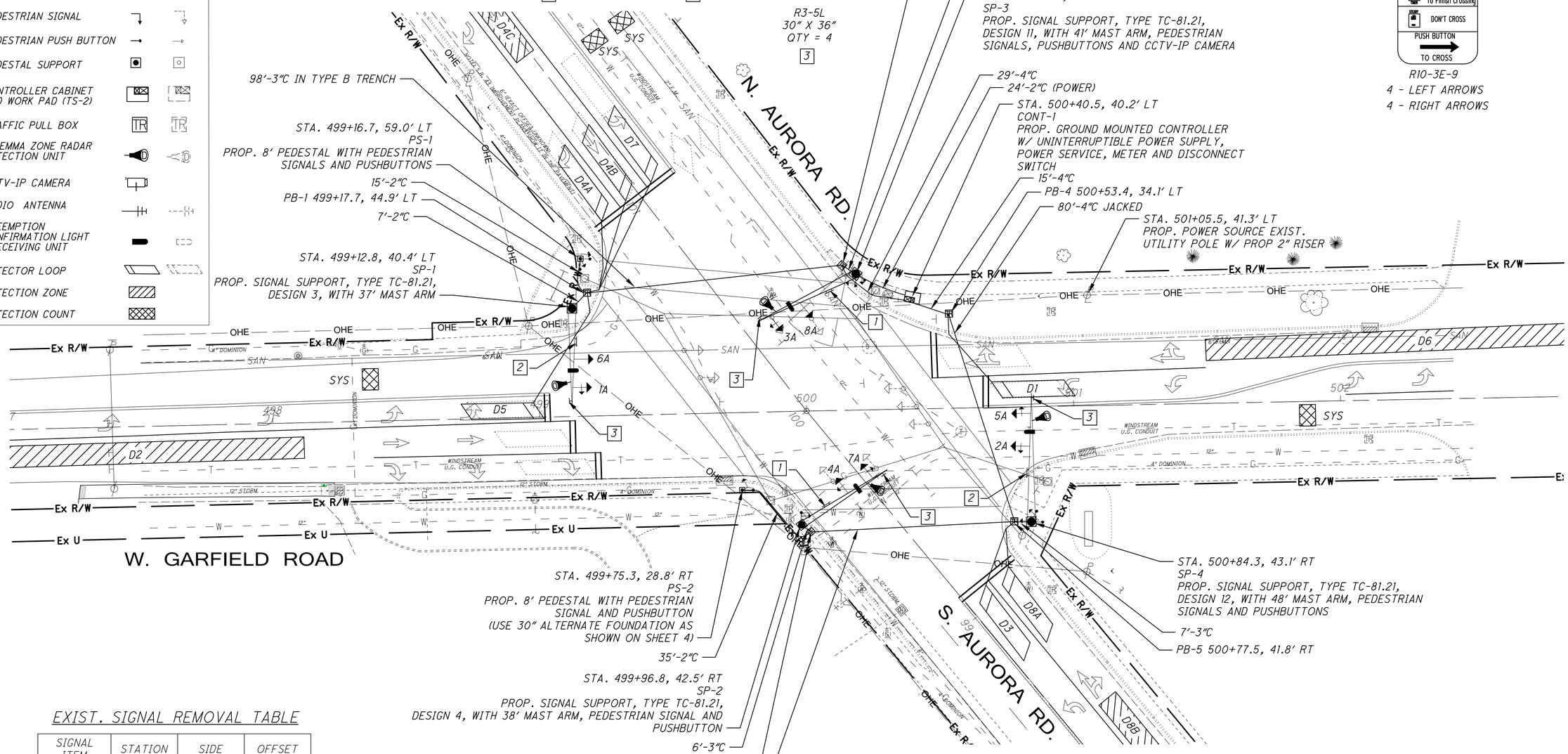
R3-5L
30" X 36"
QTY = 4
3

CCTV-IP CAMERA
(W/ PAN, ZOOM, AND TILT FUNCTIONS)

PEDESTRIAN SIGNS



R10-3E-9
4 - LEFT ARROWS
4 - RIGHT ARROWS



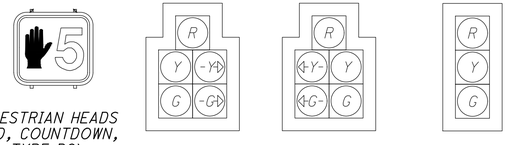
EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	499+09.1	LT	34.8'
PULLBOX	499+14.7	LT	66.5'
PULLBOX	499+92.3	RT	36.9'
PULLBOX	499+70.5	LT	118.7'
PULLBOX	500+29.8	LT	40.2'
PULLBOX	500+92.2	LT	35.4'
PULLBOX	500+90.4	RT	68.7'
PULLBOX	500+86.4	RT	27.9'
PULLBOX	502+10.2	RT	14.7'
STRAIN POLE	499+18.1	LT	51.4'
STRAIN POLE	499+85.5	RT	33.4'
STRAIN POLE	500+26.7	LT	44.5'
STRAIN POLE	500+89.7	RT	28.1'
CONTROLLER	500+31.3	LT	43.2'

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	499+17.7	LT	44.9'	18
PB-2	500+01.7	RT	45.0'	18
PB-3	500+15.0	LT	52.3'	18
PB-4	500+53.4	LT	34.1'	24
PB-5	500+77.5	RT	41.8'	18

SIGNAL HEADS



PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 8

2A & 4A

1A, 3A, 5A & 7A

6A & 8A

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

EXISTING SIGNAGE TO BE REMOVED

QTY = 4

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

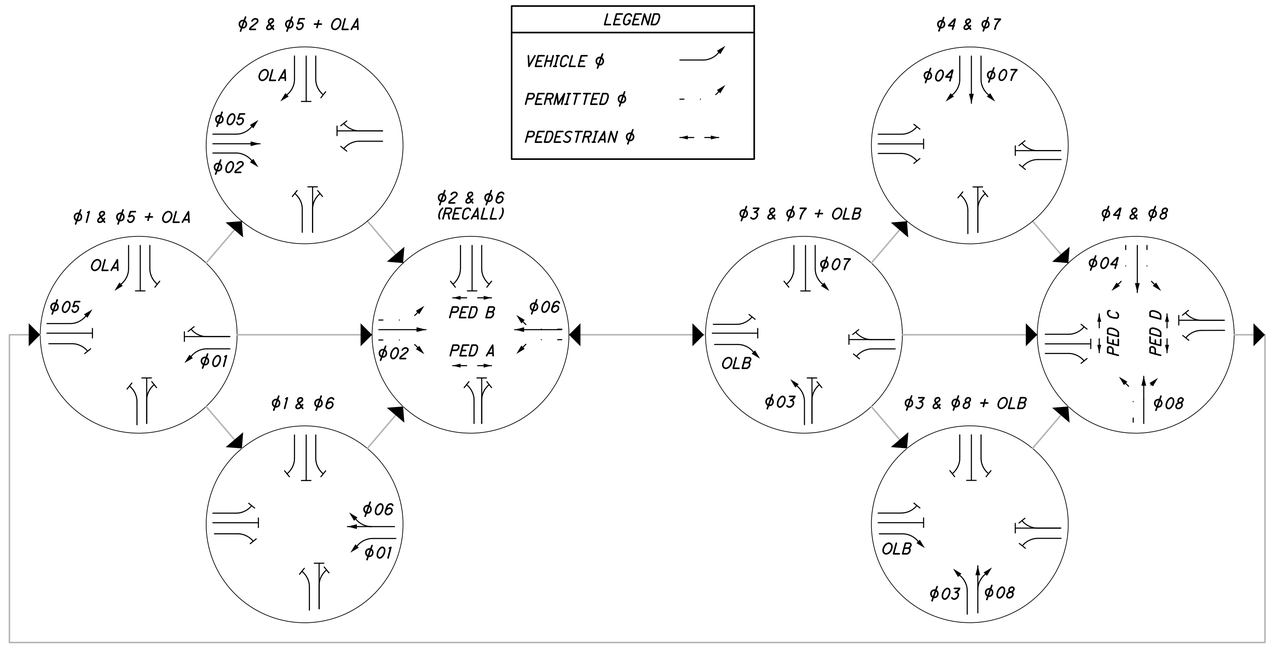
TRAFFIC SIGNAL PLAN
GARFIELD RD. (S.R. 82) & AURORA RD. (S.R. 43)
POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Aurora Rd (S.R. 43) & Garfield Rd (S.R. 82)						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:	2,4,6,8		
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH OR ALL RED:	9,	6							
FIRST PHASE(S):	4	8	PHASES			-	-	-	-
COLOR DISPLAYED:	G								
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	3	4	5	6	7	8
DIRECTION			WB L	EB	NB L	SB	EB L	WB	SB L	NB
MINIMUM GREEN (INITIAL)		(SEC.)	7	20	7	20	7	20	7	20
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	15	45	20	40	15	45	15	45
MAXIMUM GREEN II		(SEC.)	15	45	20	40	15	45	15	45
YELLOW CHANGE		(SEC.)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
ALL RED CLEARANCE		(SEC.)	3.1	3.1	2.8	3.1	3.1	3.1	2.8	3.1
WALK		(SEC.)	-	10	-	10	-	10	-	10
PEDESTRIAN CLEARANCE		(SEC.)	-	25	-	25	-	25	-	25
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM	(ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY		(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

*VOLUME DENSITY CONTROLS

PHASING DIAGRAM (TYPICAL)



RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	EB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	150	100-250
D6	WB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	150	100-250
D4C	SB THRU	PULSE	ϕ4	0	-	-	EXTEND ϕ4	150	100-250
D8B	NB THRU	PULSE	ϕ8	0	-	-	EXTEND ϕ8	150	100-250
SYS	EB THRU	PULSE	SYS	-	-	-	SYSTEM	8	250
SYS	WB THRU	PULSE	SYS	-	-	-	SYSTEM	8	250
SYS	NB THRU	PULSE	SYS	-	-	-	SYSTEM	8	250
SYS	NB THRU	PULSE	SYS	-	-	-	SYSTEM	8	250

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	P	6' X 30'	PRESENCE	2	-	1-1	ϕ1
D5	P	6' X 30'	PRESENCE	2	-	5-1	ϕ5
D3	P	6' X 30'	PRESENCE	2	-	3-1	ϕ3
D8A	P	6' X 30'	PRESENCE	8	-	8-1	ϕ8
D4A	P	6' X 30'	PRESENCE	8	-	4-1	ϕ4
D4B	P	6' X 30'	PRESENCE	-	-	4-2	ϕ4
D7	P	6' X 30'	PRESENCE	2	-	7-1	ϕ7

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

NOTES:

- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (EASTBOUND ONLY)

CHANNEL 2 = ϕ(6) (WESTBOUND ONLY)

CHANNEL 3 = ϕ(4) (SOUTHBOUND ONLY)

CHANNEL 4 = ϕ(8) (NORTHBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
W. GARFIELD RD. (S.R. 82) & AURORA RD. (S.R. 43)
POR-AURORA SIGNALS

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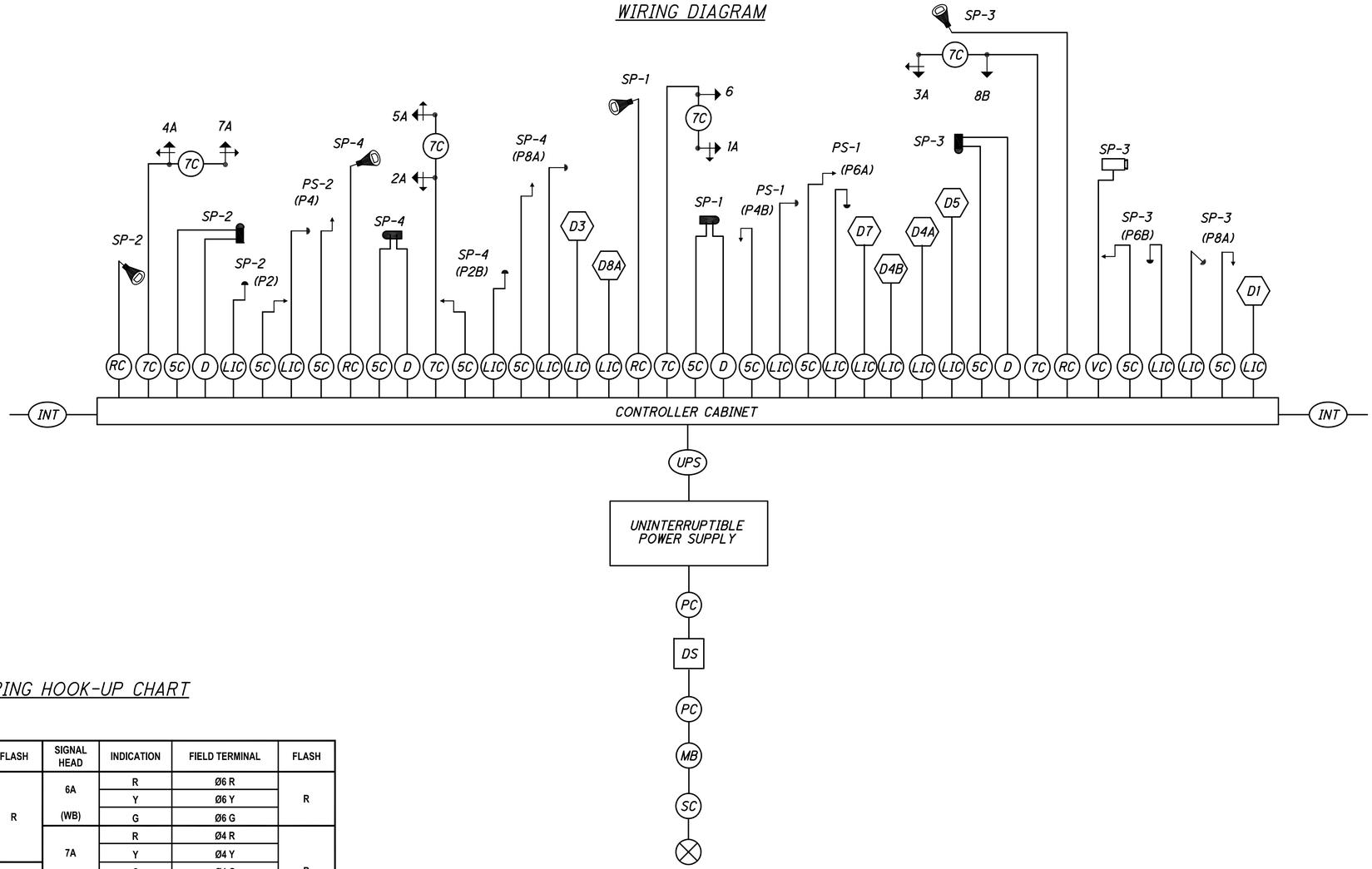
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (WB LT)	R	Ø6 R	R
	Y	Ø6 Y	
	G	Ø6 G	
	<--Y---	Ø1 Y	
	<--G---	Ø1 G	
2A (EB)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
	---Y-->	Ø3 Y	
	---G-->	Ø3 G	
3A (NB LT)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
	<--Y---	Ø3 Y	
	<--G---	Ø3 G	
4A (SB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
	---Y-->	Ø5 Y	
	---G-->	Ø5 G	
5A (EB LT)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
	<--Y---	Ø5 Y	
	<--G---	Ø5 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
6A (WB)	R	Ø6 R	R
	Y	Ø6 Y	
	G	Ø6 G	
7A (SB LT)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
	<--Y---	Ø7 Y	
	<--G---	Ø7 G	
8A (NB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
PEDESTRIAN MOVEMENTS			
PED A SOUTH	W	Ø2 PED/LS13 G	OUT
	DW	Ø2 PED/LS13 R	
PED B NORTH	W	Ø6 PED/LS15 G	OUT
	DW	Ø6 PED/LS15 R	
PED C WEST	W	Ø4 PED/LS14 G	OUT
	DW	Ø4 PED/LS14 R	
PED D EAST	W	Ø8 PED/LS16 G	OUT
	DW	Ø8 PED/LS16 R	
OVERLAPS			
OLA	---Y-->	Ø5 Y/LS11 Y	-
	---G-->	Ø5 G/LS11 G	
OLA = LS 11			
OLB	---Y-->	Ø3 Y/LS10 Y	-
	---G-->	Ø3 G/LS10 G	
OLA = LS 10			

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- RC — RADAR DETECTION CABLE
- VC — VIDEO CAMERA CABLE
- INT — INTERCONNECT CABLE
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. __
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE
- CCTV-IP CAMERA

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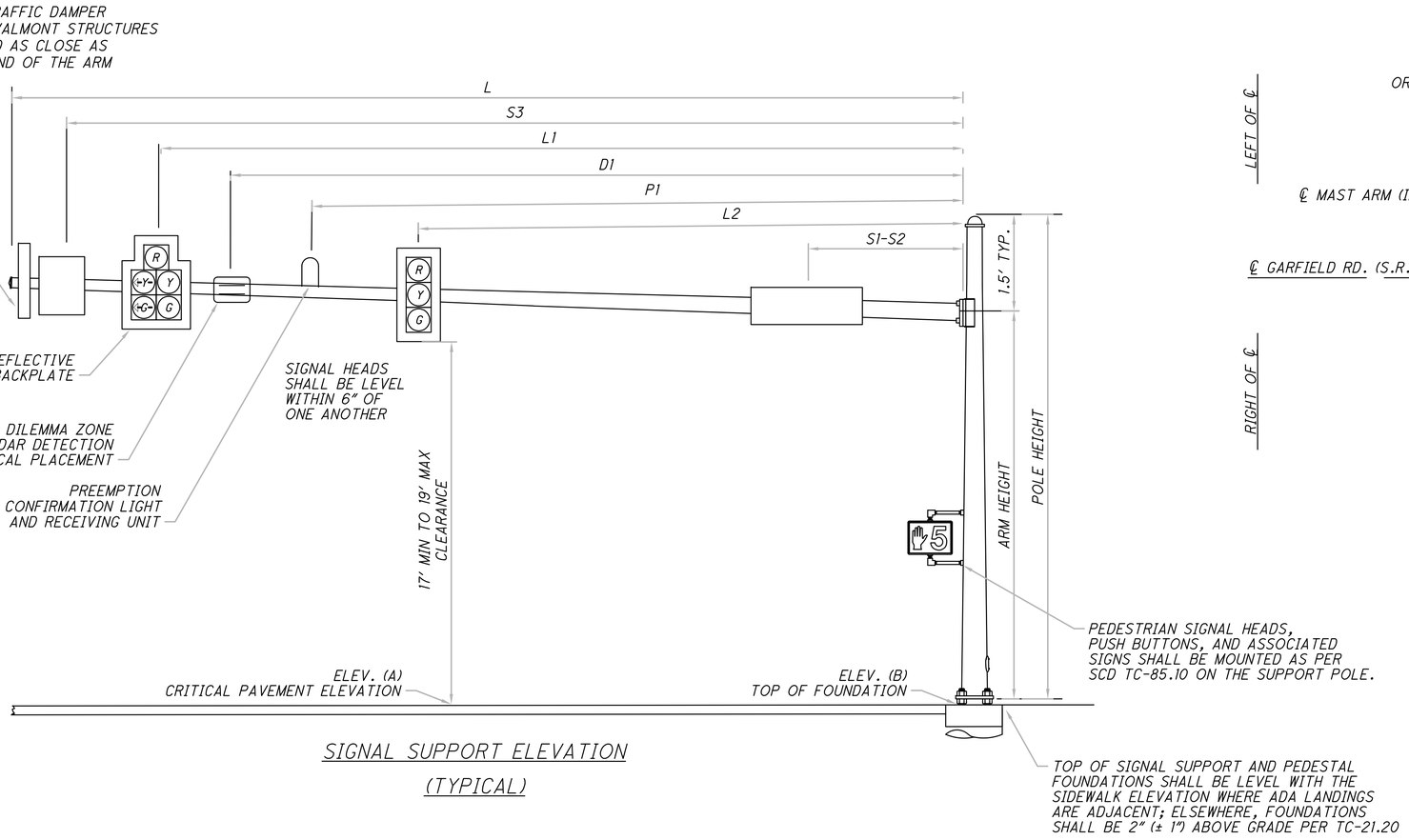
HORIZONTAL SCALE IN FEET
0 10 20 40

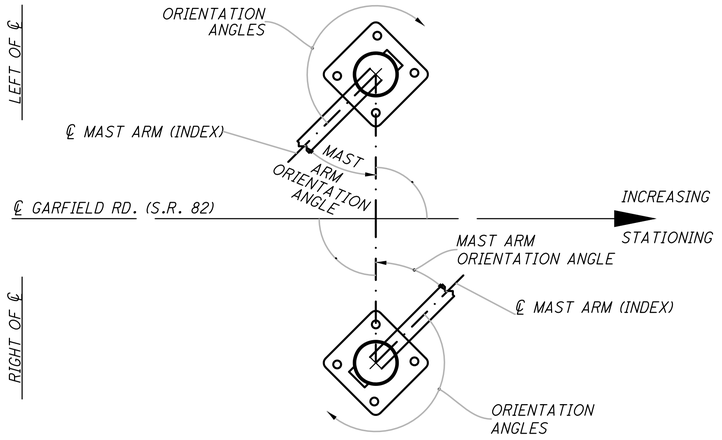
CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
W. GARFIELD RD. (S.R. 82) & AURORA RD. (S.R. 43)
POR-AURORA SIGNALS



SIGNAL SUPPORT ELEVATION

(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

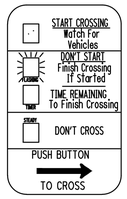
SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	D1	S1	S2	S3	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	499+12.8	40.4' LT	1160.65	1160.55	TC-81.21	3	22	20.5	37	30	18	27	-	9	35	24	0	-	-	-	-	180	-
SP-2	499+96.8	42.5' RT	1160.65	1161.10	TC-81.21	4	21.5	20	38	32	20	29	12	-	36	26	56	-	270	270	-	180	-
SP-3	500+19.2	50.8' LT	1160.65	1160.95	TC-81.21	11	21.5	20	41	36	24	33	16	-	39	30	63	-	180/270	180/270	90	180	270
SP-4	500+84.3	43.1' RT	1160.65	1160.65	TC-81.21	12	22	20.5	48	41	29	38	-	15	46	35	0	-	0/45	0/90	-	180	-
PS-1	499+16.7	59.0' LT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	0/270	0/270	-	180	-
PS-2	499+75.3	28.8' RT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	0	90	-	180	-

CALCULATED JAT
CHECKED MWS

HORIZONTAL SCALE IN FEET
0 10 20 40

SIGNAL DETAIL PLAN
GARFIELD RD. (S.R. 82) & AURORA RD. (S.R. 43)
POR-AURORA SIGNALS

PEDESTRIAN SIGNS



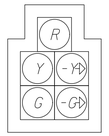
R10-3E-9
3 - LEFT ARROWS
3 - RIGHT ARROWS

R9-3-18
2 EACH [5]

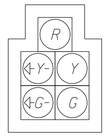
R9-3BP-18
1 - LEFT ARROWS [3]
1 - RIGHT ARROWS [4]

SIGNAL HEADS

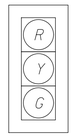
PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 6



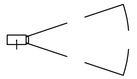
8A



1A, 3A, 5A & 7A



2A, 4A & 6A



CCTV-IP CAMERA
(W/ PAN, ZOOM, AND TILT FUNCTIONS)

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

MAST ARM SIGNAGE

Garfield Rd
D3-1-108
QTY = 2
[1]

Chillicothe Rd
D3-1-126
QTY = 2
[2]

R10-11b
36" X 36"
QTY = 3
[6]

R3-5L
30" X 36"
QTY = 4
[7]

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●→	○→
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●↓	○↓
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	▣	▣
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀▮	◀▮
CCTV-IP CAMERA	▭	
RADIO ANTENNA	⊣⊢	⊣⊢
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	511+89.5	LT	29.1''
PULLBOX	512+19.5	LT	39.5'
PULLBOX	512+29.9	LT	79.6'
PULLBOX	511+47.7	RT	19.0'
PULLBOX	511+98.3	RT	19.1'
PULLBOX	512+33.3	RT	53.6'
PULLBOX	512+26.0	RT	55.5'
WOOD POLE	512+14.6	LT	44.1'
PEDESTAL	511+99.4	LT	34.2'
PEDESTAL	512+18.3	LT	43.2'
PEDESTAL	512+02.1	RT	21.9'
PEDESTAL	512+80.7	LT	45.3'
CONTROLLER	512+79.0	LT	50.0'

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	512+25.3	LT	56.1'	18
PB-2	511+89.9	RT	17.2'	18
PB-3	512+23.9	RT	31.8'	24
EX. PB-4	512+76.3	LT	42.9'	18
EX. PB-5	513+17.9	LT	25.1'	18
PB-6	513+24.1	RT	36.1'	24
PB-7	512+95.2	RT	46.5'	24

EXISTING SIGNAGE TO BE REMOVED

QTY = 3

QTY = 2

N

0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JAT CHECKED MWS

TRAFFIC SIGNAL PLAN
GARFIELD RD. (S.R. 82) & CHILLICOTHIE RD. (S.R. 306)
POR-AURORA SIGNALS

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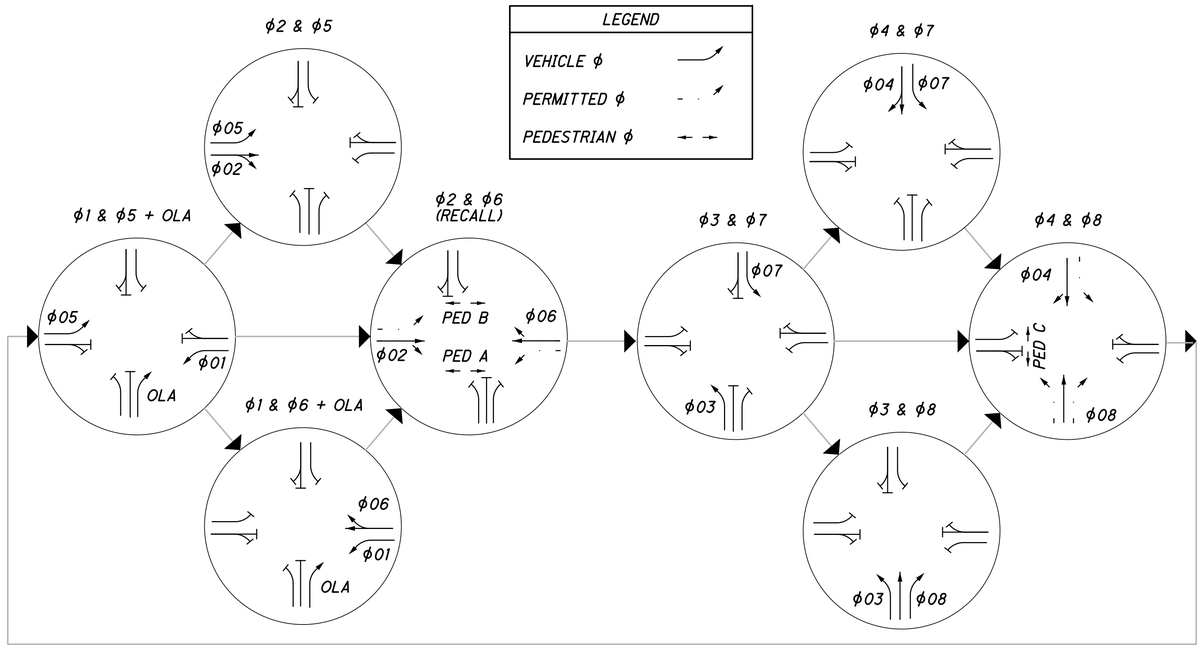
Z:\Projects (U)\2018\18-094 City of Aurora - Citywide Traffic Signal Improvement Project - Aurora\107761\roadway\sheets\Changes Due to Stage 3 Comments\107761CP009_S3R_JT.dwg 03-Aug-20 10:00

SIGNAL TIMING CHART

INTERSECTION:			Chillicothe Rd (S.R. 306) & Garfield Rd (S.R. 82)						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8	
			REST IN RED:		RING 1	-		RING 2	-
START IN:			OVERLAP			A	B	C	D
TIME FOR FLASH, ALL RED:	9,	6							
FIRST PHASE(S):	2	6							
COLOR DISPLAYED:	G		PHASES			1	-	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	3	4	5	6	7	8
DIRECTION			WB L	EB	NB L	SB	EB L	WB	SB L	NB
MINIMUM GREEN (INITIAL)		(SEC.)	7	15	7	15	7	15	7	15
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	3.5	2.5	2.5	2.5	3.5	2.5	3.5
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	15	50	15	60	15	50	15	45
MAXIMUM GREEN II		(SEC.)	15	50	15	60	15	50	15	45
YELLOW CHANGE		(SEC.)	3.2	4.1	3.2	3.2	3.2	4.1	3.2	4.1
ALL RED CLEARANCE		(SEC.)	1.0	1.0	1.2	1.2	1.0	1.0	1.2	1.0
WALK		(SEC.)	-	9	-	9	-	9	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	15	-	15	-	15	-	-
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM	(ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY		(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

*VOLUME DENSITY CONTROLS

PHASING DIAGRAM (TYPICAL)



RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	EB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	150	100-250
D6	WB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	150	100-250
D8C	NB THRU	PULSE	ϕ8	0	-	-	EXTEND ϕ8	150	100-250
D4B	SB THRU	PULSE	ϕ4	0	-	-	EXTEND ϕ4	150	100-250
SYS	WB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250
SYS	SB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250
SYS	NB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	P	6' X 30'	PRESENCE	2	-	1-1	ϕ1
D4A	P	6' X 30'	PRESENCE	2	-	4-1	ϕ4
D5	P	6' X 30'	PRESENCE	2	-	5-1	ϕ5
D7	P	6' X 30'	PRESENCE	8	-	7-1	ϕ7
D3	P	6' X 30'	PRESENCE	2	-	8-1	ϕ8
D8A	P	6' X 30'	PRESENCE	0	-	8-2	ϕ8
D8B	P	6' X 30'	PRESENCE	8	-	8-3	ϕ8

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

NOTES:

- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (EASTBOUND ONLY)

CHANNEL 2 = ϕ(6) (WESTBOUND ONLY)

CHANNEL 3 = ϕ(4) (SOUTHBOUND ONLY)

CHANNEL 4 = ϕ(8) (NORTHBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

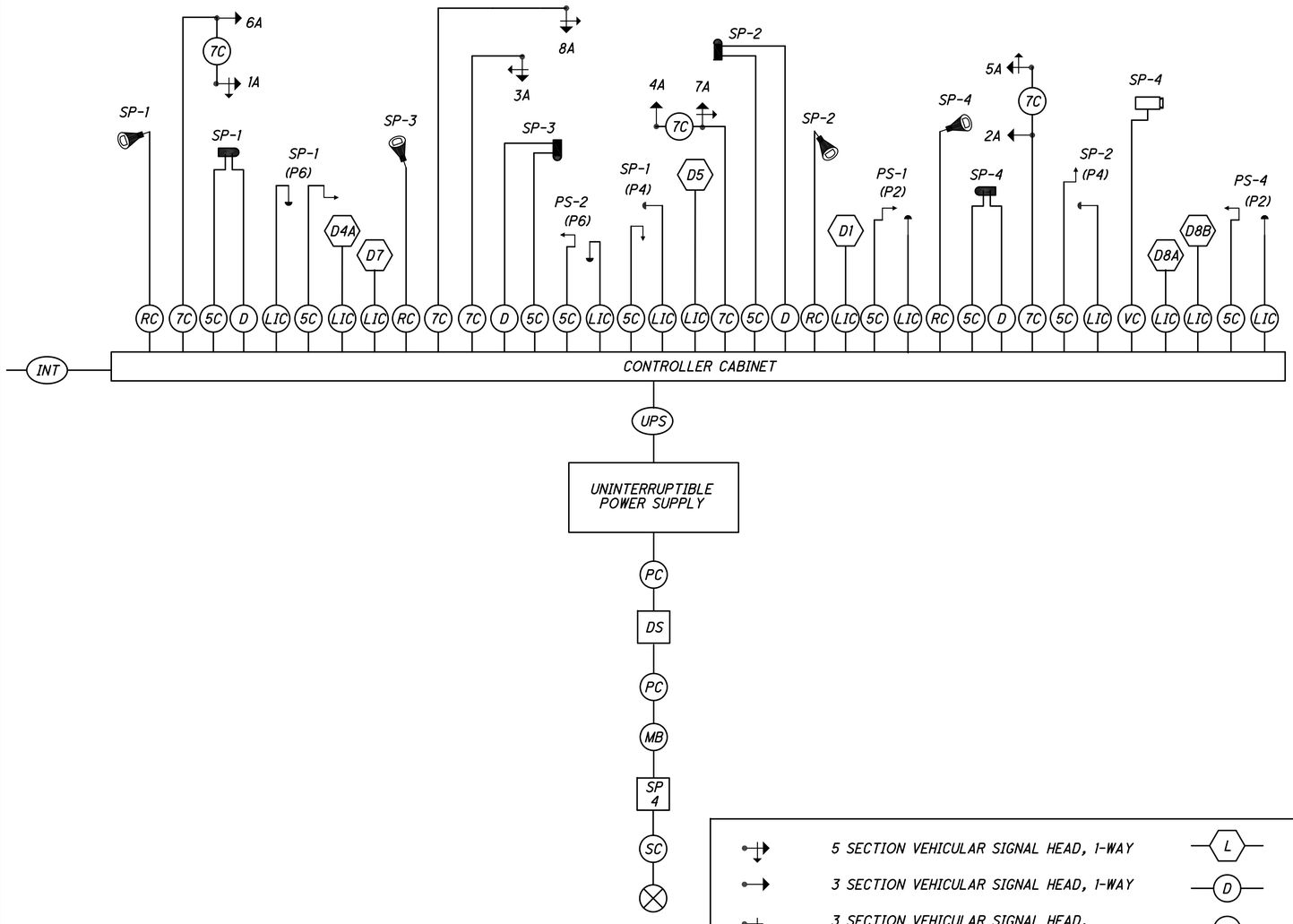
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
W. GARFIELD RD. (S.R. 82) & N. CHILLICOTHE RD. (S.R. 306)

POR-AURORA SIGNALS

WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (WB LT)	R	Ø6 R	R
	Y	Ø6 Y	
	G	Ø6 G	
	<--Y---	Ø1 Y	
	<--G---	Ø1 G	
2A (EB)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
4A (SB)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
5A (EB LT)	R	Ø2 R	R
	Y	Ø2 Y	
	G	Ø2 G	
	<--Y---	Ø5 Y	
	<--G---	Ø5 G	
6A (WB)	R	Ø6 R	R
	Y	Ø6 Y	
	G	Ø6 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
7A (SB LT)	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
	<--Y---	Ø7 Y	
	<--G---	Ø7 G	
3A (NB LT)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
	<--Y---	Ø3 Y	
	<--G---	Ø3 G	
8A (NB RT)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
	---Y-->	Ø1 Y	
	---G-->	Ø1 G	
PEDESTRIAN MOVEMENTS			
PED A SOUTH	W	Ø2 PED/LS13 G	OUT
	DW	Ø2 PED/LS13 R	
PED B NORTH	W	Ø6 PED/LS15 G	OUT
	DW	Ø6 PED/LS15 R	
PED C EAST	W	Ø8 PED/LS16 G	OUT
	DW	Ø8 PED/LS16 R	
OVERLAPS			
OLA	---Y-->	Ø1 Y/LS9 Y	-
	---G-->	Ø1 G/LS9 G	
OLA = LS 9			

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- ADVANCE RADAR DETECTION UNIT (D)
- STOP BAR RADAR DETECTION UNIT (S)
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- (L) VEHICLE LOOP DETECTOR
- (D) PREEMPTION DETECTOR CABLE
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (3C) SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- (5C) SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (RC) RADAR DETECTION CABLE
- (VC) VIDEO CAMERA CABLE
- (INT) INTERCONNECT CABLE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (PC) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- [SP 1] SIGNAL SUPPORT POLE NO. __
- (MB) METER BASE
- POWER SOURCE
- [DS] DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE
- CCTV-IP CAMERA

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
GARFIELD RD. (S.R. 82) & CHILLICOTHE RD. (S.R. 306)

POR-AURORA SIGNALS

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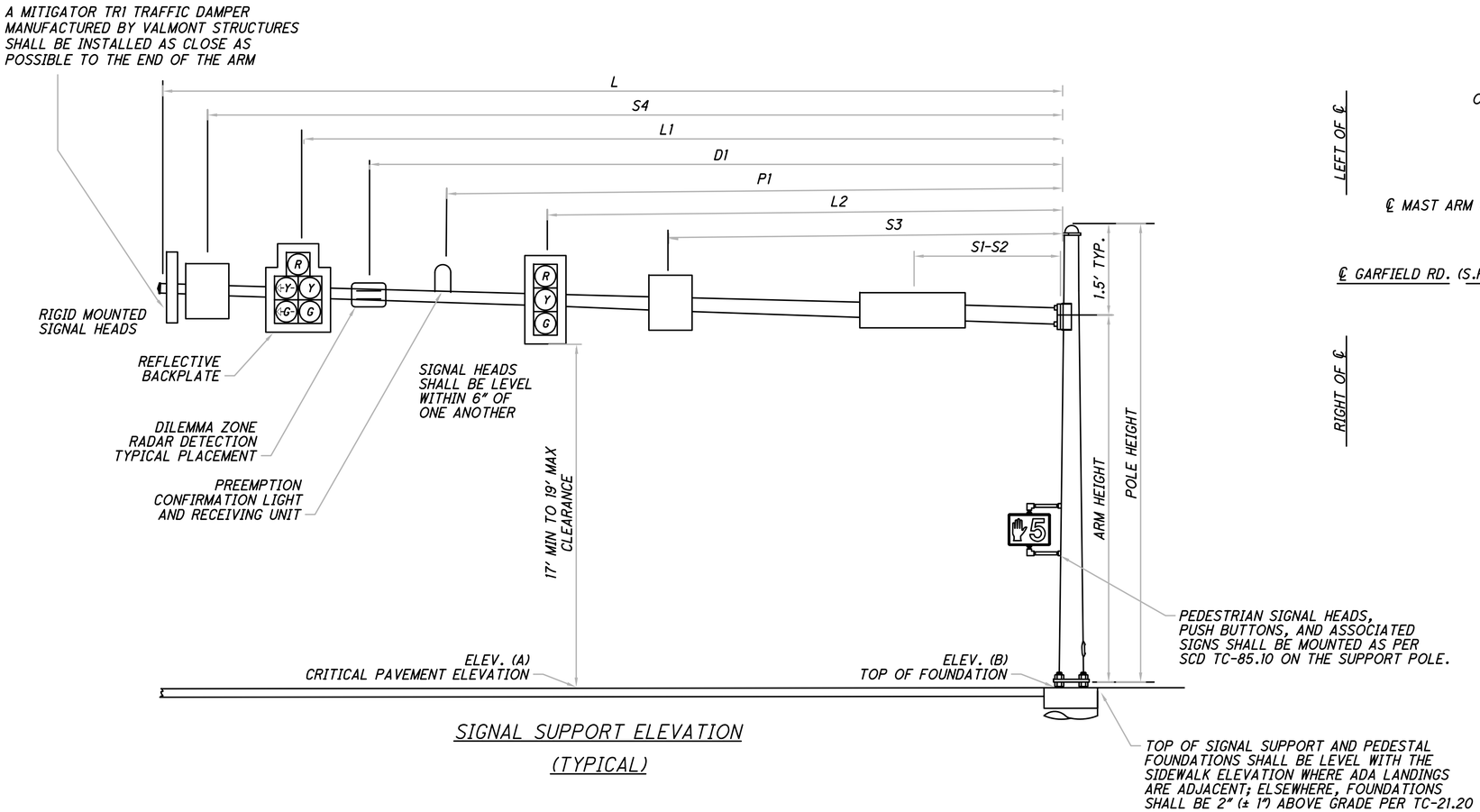
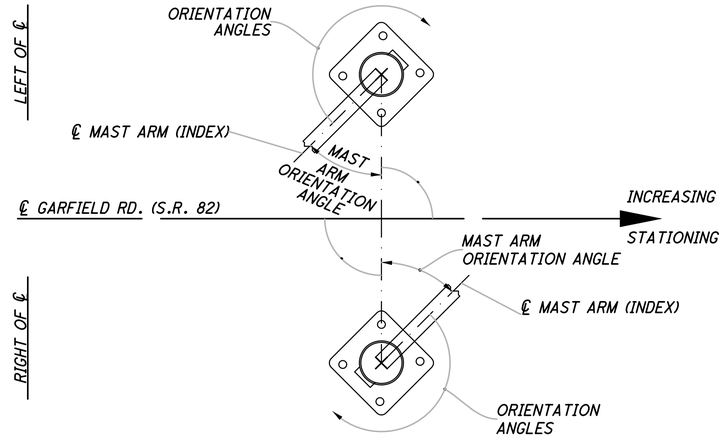


SIGNAL SUPPORT ELEVATION
(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS												ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	D1	S1	S2	S3	S4	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	512+23.0	52.4' LT	1130.41	1125.89	TC-81.21	12	26.5	25	46	39	31	36	-	20	28	44	33	0	-	0/90	0/90	-	180	-
SP-2	512+04.7	27.7' RT	1130.41	1133.32	TC-81.21	12	19	17.5	46	41	31	38	16	-	-	44	35	90	-	0	0	-	180	-
SP-3	512+75.8	54.1' LT	1130.41	1131.16	TC-81.21	1	21	19.5	25	20	8	15	0	-	5	23	13	90	-	-	-	-	180	-
SP-4	513+08.5	39.2' RT	1130.41	1127.85	TC-81.21	11	24.5	23	39	31	20	28	-	10	18	37	25	0	-	-	-	180	180	90
PS-1	512+26.0	52.0' RT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	180	-
PS-2	512+78.8	41.2' LT	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	180	-
PS-3	512+88.8	54.3' RT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	180	-
-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
GARFIELD RD. (S.R. 82) & CHILLICOTHE RD. (S.R. 306)

POR-AURORA SIGNALS

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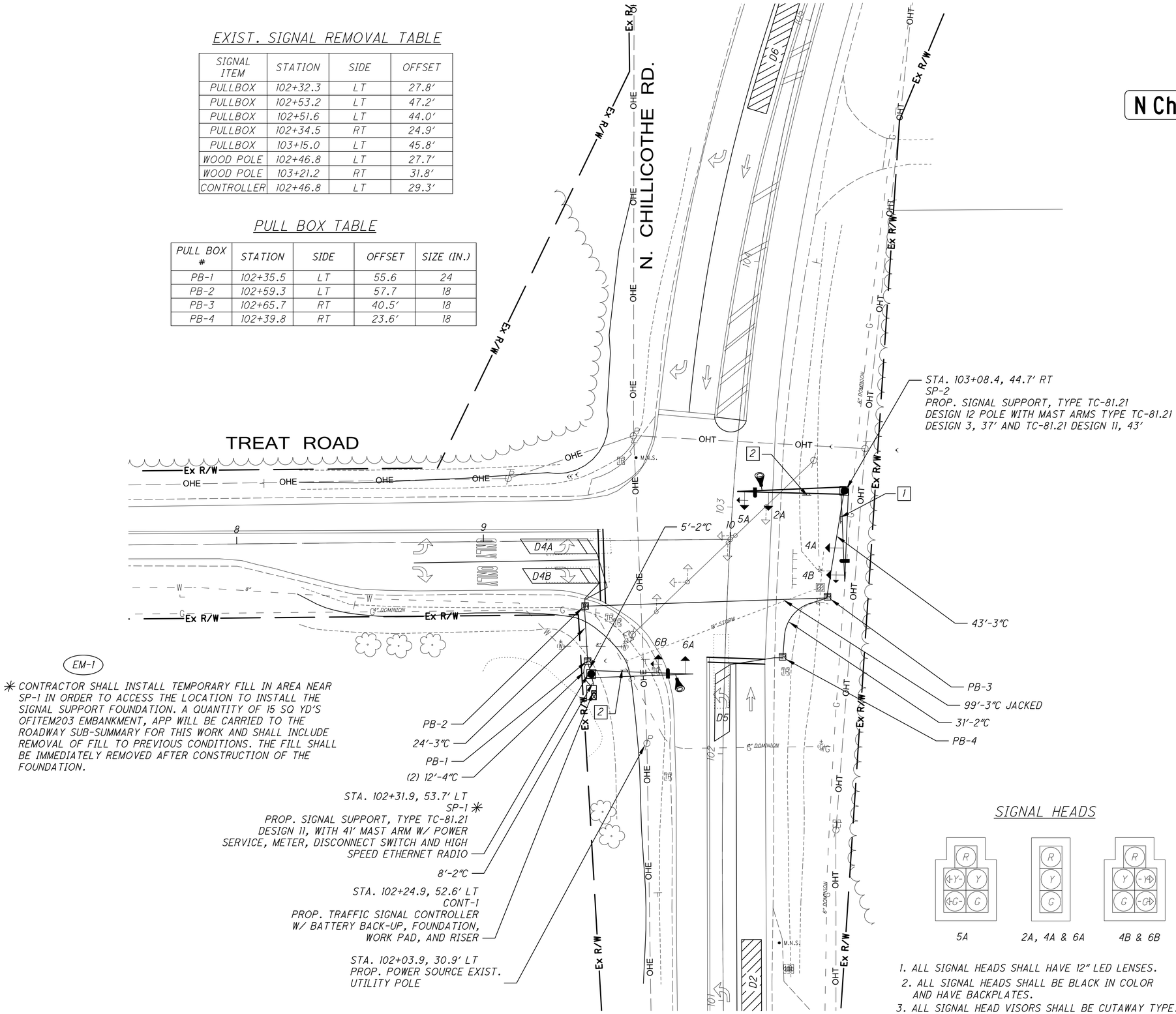
EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	102+32.3	LT	27.8'
PULLBOX	102+53.2	LT	47.2'
PULLBOX	102+51.6	LT	44.0'
PULLBOX	102+34.5	RT	24.9'
PULLBOX	103+15.0	LT	45.8'
WOOD POLE	102+46.8	LT	27.7'
WOOD POLE	103+21.2	RT	31.8'
CONTROLLER	102+46.8	LT	29.3'

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	102+35.5	LT	55.6	24
PB-2	102+59.3	LT	57.7	18
PB-3	102+65.7	RT	40.5'	18
PB-4	102+39.8	RT	23.6'	18



✳ CONTRACTOR SHALL INSTALL TEMPORARY FILL IN AREA NEAR SP-1 IN ORDER TO ACCESS THE LOCATION TO INSTALL THE SIGNAL SUPPORT FOUNDATION. A QUANTITY OF 15 SQ YD'S OFITEM203 EMBANKMENT, APP WILL BE CARRIED TO THE ROADWAY SUB-SUMMARY FOR THIS WORK AND SHALL INCLUDE REMOVAL OF FILL TO PREVIOUS CONDITIONS. THE FILL SHALL BE IMMEDIATELY REMOVED AFTER CONSTRUCTION OF THE FOUNDATION.

MAST ARM SIGNAGE

N Chillicothe Rd
D3-1-144
QTY = 1
1

Treat Rd
D3-1-84
QTY = 2
2

SIGNAL HEADS

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"		
SIGNAL SUPPORT POLE		
PEDESTRIAN SIGNAL		
PEDESTRIAN PUSH BUTTON		
PEDESTAL SUPPORT		
CONTROLLER CABINET AND WORK PAD (TS-2)		
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT		
RADIO ANTENNA		
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT		
DETECTOR LOOP		
DETECTION ZONE		
DETECTION COUNT		

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
N. CHILLICOTHE RD. (S.R. 306) & TREAT RD.
POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Chillicothe Rd (S.R. 306) & Treat Rd						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:	2,4,6,8		
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH, ALL RED:	9,	6							
FIRST PHASE(S):	2	6							
COLOR DISPLAYED:	G		PHASES			5	4	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			-	2	-	4	5	6	-	-
DIRECTION			-	NB	-	EB	NB L	SB	-	-
MINIMUM GREEN (INITIAL)		(SEC.)	-	20	-	10	7	20	-	-
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	-	2.5	-	4.0	2.5	2.5	-	-
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	-	60	-	20	15	45	-	-
MAXIMUM GREEN II		(SEC.)	-	60	-	20	15	45	-	-
YELLOW CHANGE		(SEC.)	-	5.2	-	4.1	4.3	5.2	-	-
ALL RED CLEARANCE		(SEC.)	-	1.0	-	1.0	1.2	1.0	-	-
WALK		(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	-	OFF	-	OFF	OFF	OFF	-	-
	MINIMUM	(ON/OFF)	-	ON	-	OFF	OFF	ON	-	-
	PEDESTRIAN	(ON/OFF)	-	OFF	-	OFF	OFF	OFF	-	-
MEMORY		(ON/OFF)	-	OFF	-	OFF	OFF	OFF	-	-

*VOLUME DENSITY CONTROLS

NOTES:

- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D4A	P	6' X 30'	PRESENCE	2	-	4-1	ϕ4
D4B	P	6' X 30'	PRESENCE	8	-	4-2	ϕ4
D5	P	6' X 30'	PRESENCE	2	-	5-1	ϕ5

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

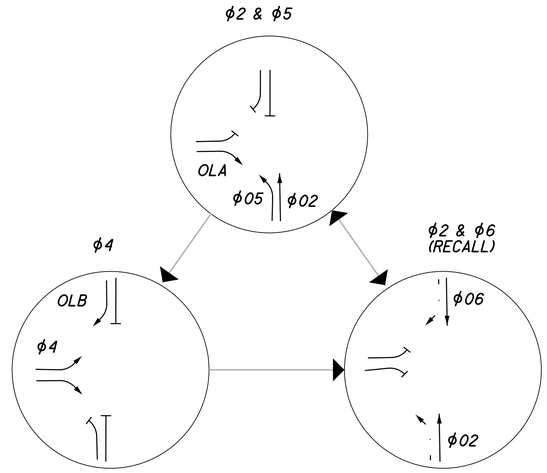
PHASING DIAGRAM

LEGEND

VEHICLE ϕ

PERMITTED ϕ

PEDESTRIAN ϕ



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(4) (EASTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	NB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	185	175-360
D6	SB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	185	175-360

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

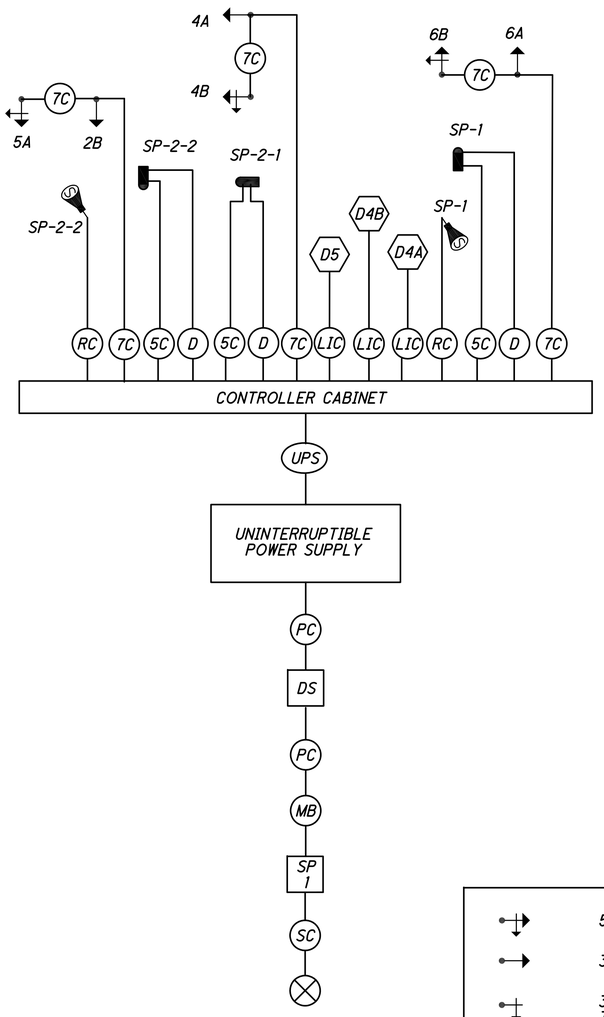
HORIZONTAL SCALE IN FEET (0, 10, 20, 40)

CALCULATED JAT | CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
N. CHILLICOTHE RD. (SR 306) & TREAT RD.

POR-AURORA SIGNALS

WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2A	R	Ø2 R	Y
	Y	Ø2 Y	
(NB)	G	Ø2 G	
4A	R	Ø4 R	R
	Y	Ø4 Y	
(EB)	G	Ø4 G	
4B	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
(EB)	---Y-->	Ø5 Y	
	---G-->	Ø5 G	
5A	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
(NB LT)	<--Y---	Ø5 Y	
	<--G---	Ø5 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
6A	R	Ø6 R	Y
	Y	Ø6 Y	
(SB)	G	Ø6 G	
6B	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
(SB RT)	---Y-->	Ø4 Y	
	---G-->	Ø4 G	
OVERLAPS			
OLA	---Y-->	Ø5 Y/LS11 Y	-
	---G-->	Ø5 G/LS11 G	
OLA = LS 11			
OLB	---Y-->	Ø4 Y/LS10 Y	-
	---G-->	Ø4 G/LS10 G	
OLA = LS 10			

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- (L) VEHICLE LOOP DETECTOR
- (D) PREEMPTION DETECTOR CABLE
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (3C) SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- (5C) SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (RC) RADAR DETECTION CABLE
- (VC) VIDEO CAMERA CABLE
- (INT) INTERCONNECT CABLE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (PC) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 SIGNAL SUPPORT POLE NO. __
- (MB) METER BASE
- POWER SOURCE
- DS DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
N. CHILLICOTHE RD. (S.R. 306) & TREAT RD.

POR-AURORA SIGNALS

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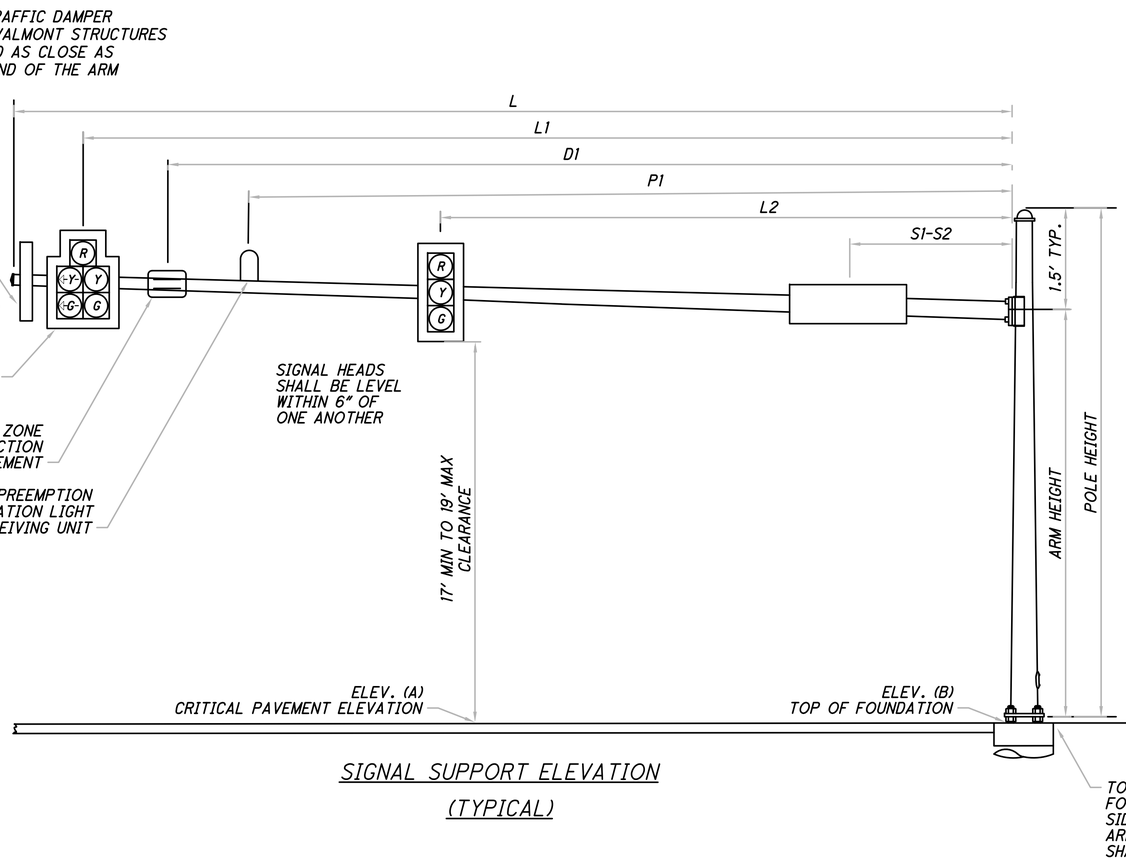
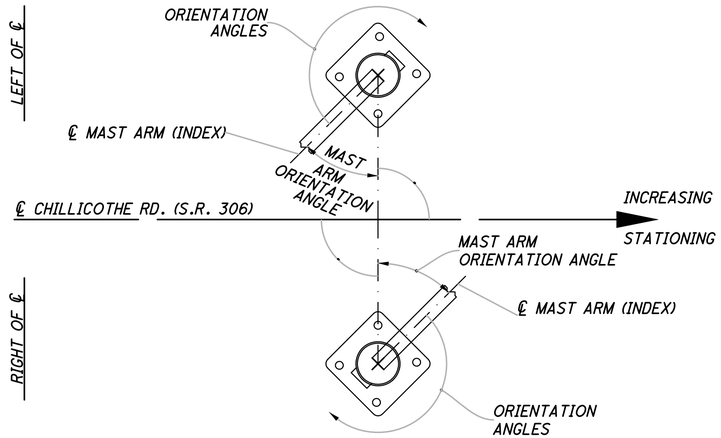


SIGNAL SUPPORT ELEVATION

(TYPICAL)

TOP OF SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS SHALL BE LEVEL WITH THE SIDEWALK ELEVATION WHERE ADA LANDINGS ARE ADJACENT; ELSEWHERE, FOUNDATIONS SHALL BE 2" (± 1") ABOVE GRADE PER TC-21.20



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS										ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	D1	S1	S2	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	102+31.9	53.7' LT	1061.02	1062.11	TC-81.21	11	21	19.5	41	38	26	35	-	20	32	0	-	-	-	180	180	90
SP-2	103+08.4	44.7' RT	1061.02	1060.08	TC-81.21	12	23	21.5	43	40	28	37	-	21	33	270	-	-	-	-	180	-
	-	-	-	-	-	-	23	21.5	37	34	22	31	14	-	27	-	90	-	-	-	-	-

HORIZONTAL SCALE IN FEET (0, 10, 20, 40)

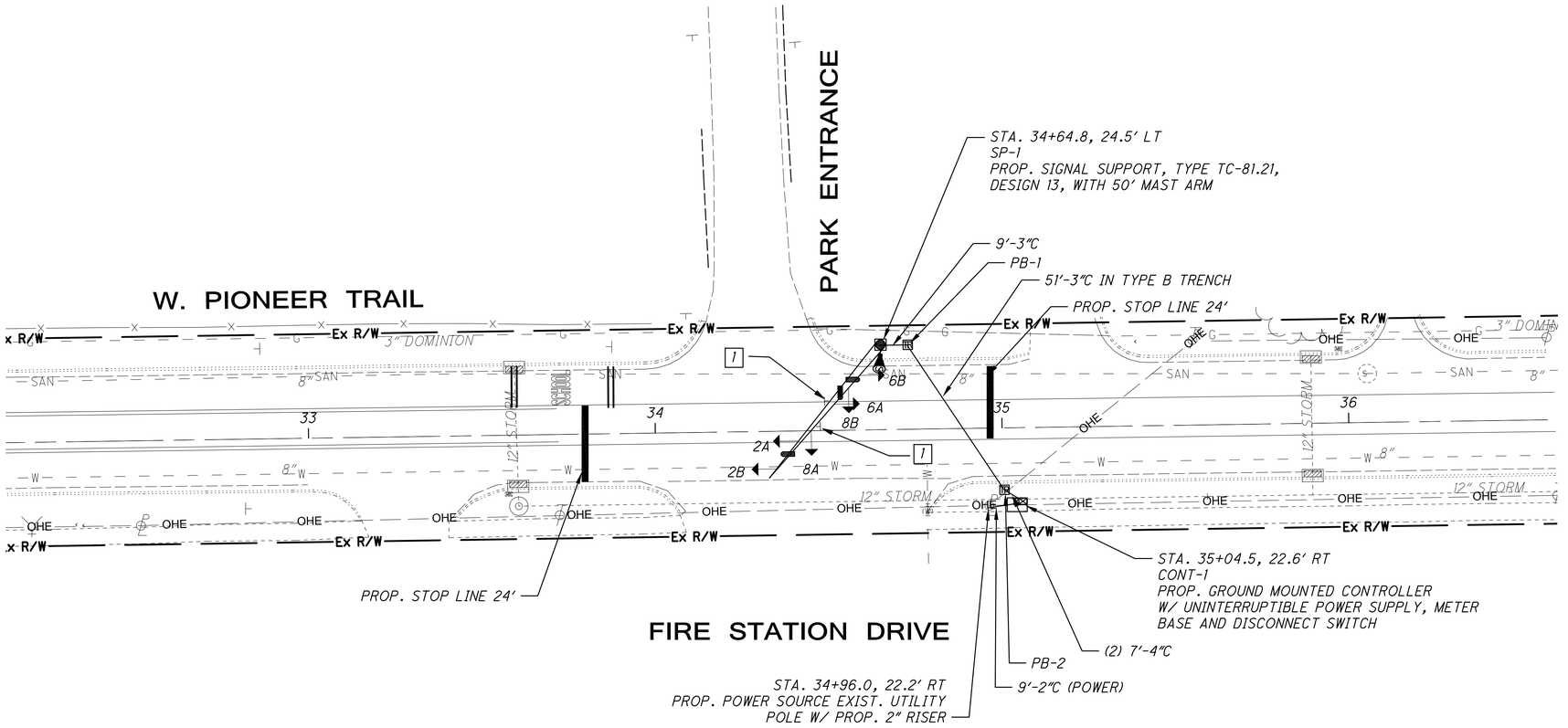
CALCULATED JAT | CHECKED MWS

SIGNAL DETAIL PLAN

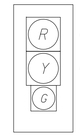
N. CHILLICOTHE RD. (S.R. 306) & TREAT RD.

POR-AURORA SIGNALS

75
133



SIGNAL HEADS



2A, 2B, 6A, 6B, 8A & 8B

1. ALL SIGNAL HEADS SHALL HAVE 12", 12" & 8" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

MAST ARM SIGNAGE

EMERGENCY SIGNAL

R10-13
42" x 30"
QTY = 2

1

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	34+73.0	LT	24.3'	18
PB-2	35+00.0	RT	17.9'	24

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●	○
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●	○
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	—	—
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	D	D
RADIO ANTENNA	⊢	⊢
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
W. PIONEER TRAIL & FIRE STATION DRIVE
POR-AURORA SIGNALS

SIGNAL TIMING CHART

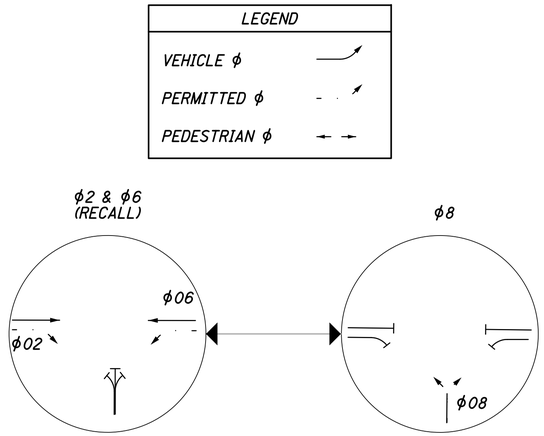
INTERSECTION:			Pioneer Trail & Fire Station No. 1						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:	2,4,6,8		
			REST IN RED:		RING 1	-		RING 2	-
START IN:		FLASH	OVERLAP			A	B	C	D
TIME FOR FLASH, ALL RED:		9, 6							
FIRST PHASE(S):		2 6							
COLOR DISPLAYED:		G	PHASES			-	-	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			-	2	-	-	-	6	-	8
DIRECTION			-	EB	-	-	-	WB	-	NB
MINIMUM GREEN (INITIAL)		(SEC.)	-	8	-	-	-	8	-	7
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	-	5.0	-	-	-	5.0	-	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	-	50	-	-	-	50	-	20
MAXIMUM GREEN II		(SEC.)	-	50	-	-	-	50	-	20
YELLOW CHANGE		(SEC.)	-	3.3	-	-	-	3.3	-	3.3
ALL RED CLEARANCE		(SEC.)	-	1.2	-	-	-	1.2	-	1.0
WALK		(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	-	OFF	-	-	-	OFF	-	OFF
	MINIMUM	(ON/OFF)	-	ON	-	-	-	ON	-	OFF
	PEDESTRIAN	(ON/OFF)	-	OFF	-	-	-	OFF	-	OFF
MEMORY		(ON/OFF)	-	OFF	-	-	-	OFF	-	OFF

*VOLUME DENSITY CONTROLS

NOTES:

- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM (TYPICAL)



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (EASTBOUND ONLY)

CHANNEL 2 = ϕ(6) (WESTBOUND ONLY)

CHANNEL 3 = ϕ(8) (NORTHBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
W. PIONEER TRAIL & FIRE STATION 1

POR-AURORA SIGNALS

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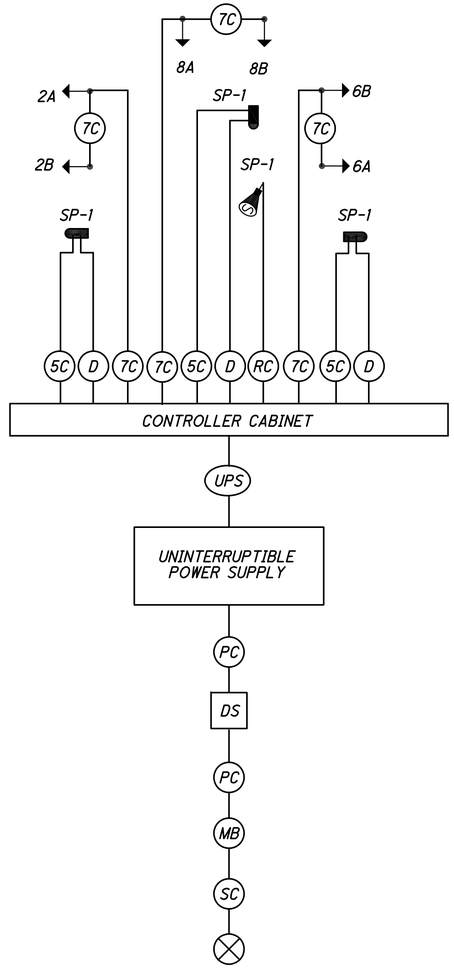
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2A (EB)	R	Ø2 R	Y	6B (WB)	R	Ø6 R	Y
	Y	Ø2 Y			Y	Ø6 Y	
	G	Ø2 G			G	Ø6 G	
2B (EB)	R	Ø2 R	Y	8A (NB)	R	Ø8 R	R
	Y	Ø2 Y			Y	Ø8 Y	
	G	Ø2 G			G	Ø8 G	
6A (WB)	R	Ø6 R	Y	8B (NB)	R	Ø8 R	R
	Y	Ø6 Y			Y	Ø8 Y	
	G	Ø6 G			G	Ø8 G	
LS = LOAD SWITCH							

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- (D) DILEMMA ZONE RADAR DETECTION UNIT
- (S) STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- (L) VEHICLE LOOP DETECTOR
- (D) PREEMPTION DETECTOR CABLE
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (3C) SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- (5C) SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (RC) RADAR DETECTION CABLE
- (VC) VIDEO CAMERA CABLE
- (INT) INTERCONNECT CABLE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (PC) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- (SP 1) SIGNAL SUPPORT POLE NO. __
- (MB) METER BASE
- POWER SOURCE
- (DS) DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE

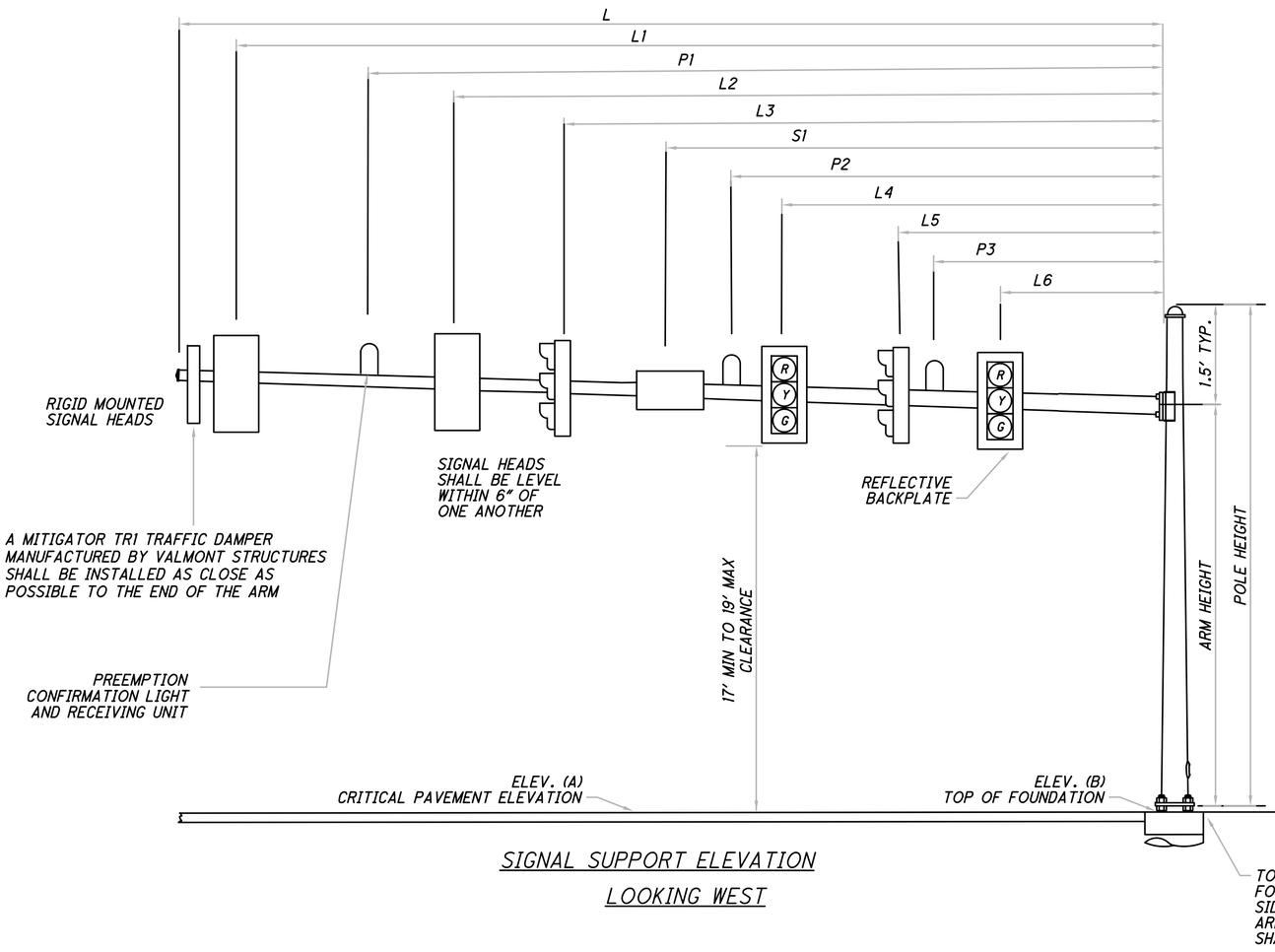
N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
W. PIONEER TRAIL & FIRE STATION 1

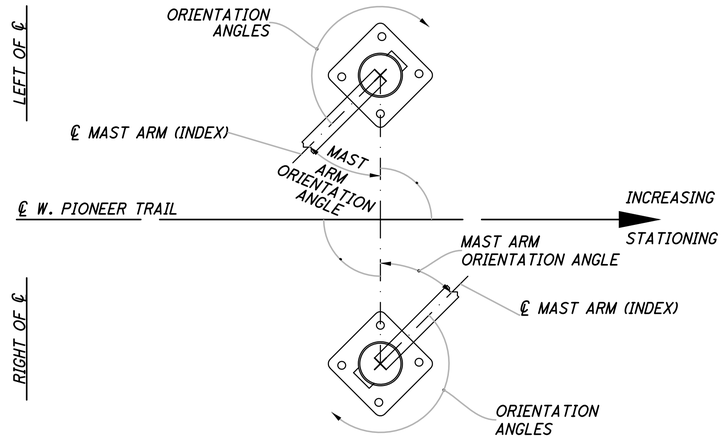
POR-AURORA SIGNALS



SIGNAL SUPPORT ELEVATION

LOOKING WEST

TOP OF SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS SHALL BE LEVEL WITH THE SIDEWALK ELEVATION WHERE ADA LANDINGS ARE ADJACENT; ELSEWHERE, FOUNDATIONS SHALL BE 2" (± 1") ABOVE GRADE PER TC-21.20



POLE ORIENTATION

MAST ARM TABLE

			ELEVATION		SIGNAL SUPPORT DETAILS														ORIENTATION ANGLES FROM MAST ARM						
SUPPORT NO.	STATION	OFFSET	A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	L4	L5	L6	D1	S1	P1	P2	P3	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	34+64.8	24.5' LT	1159.89	1159.44	TC-81.21	13	22.5	21	50	47	35	32	20	18	10	-	23	44	26	15	40	-	-	-	-	180	-
																	28		-	-							

SIGNAL DETAIL PLAN
W. PIONEER TRAIL & FIRE STATION 1

POR-AURORA SIGNALS

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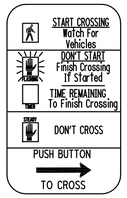
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

Z:\Projects (U)\2018\18-094 City of Aurora - Citywide Traffic Signal Improvement Project - Aurora\107761\signals\sheets\Detail Sheets\Stage 3 Revisions\107761CD011b_S3R_IFS.dwg - Jul 15, 2020 - 3:38:08pm Plotted By : gat

PROP. PEDESTRIAN SIGNS



R10-3E-9
4 - LEFT ARROWS
4 - RIGHT ARROWS

CCTV-IP CAMERA
(W/ PAN, ZOOM, AND TILT FUNCTIONS)

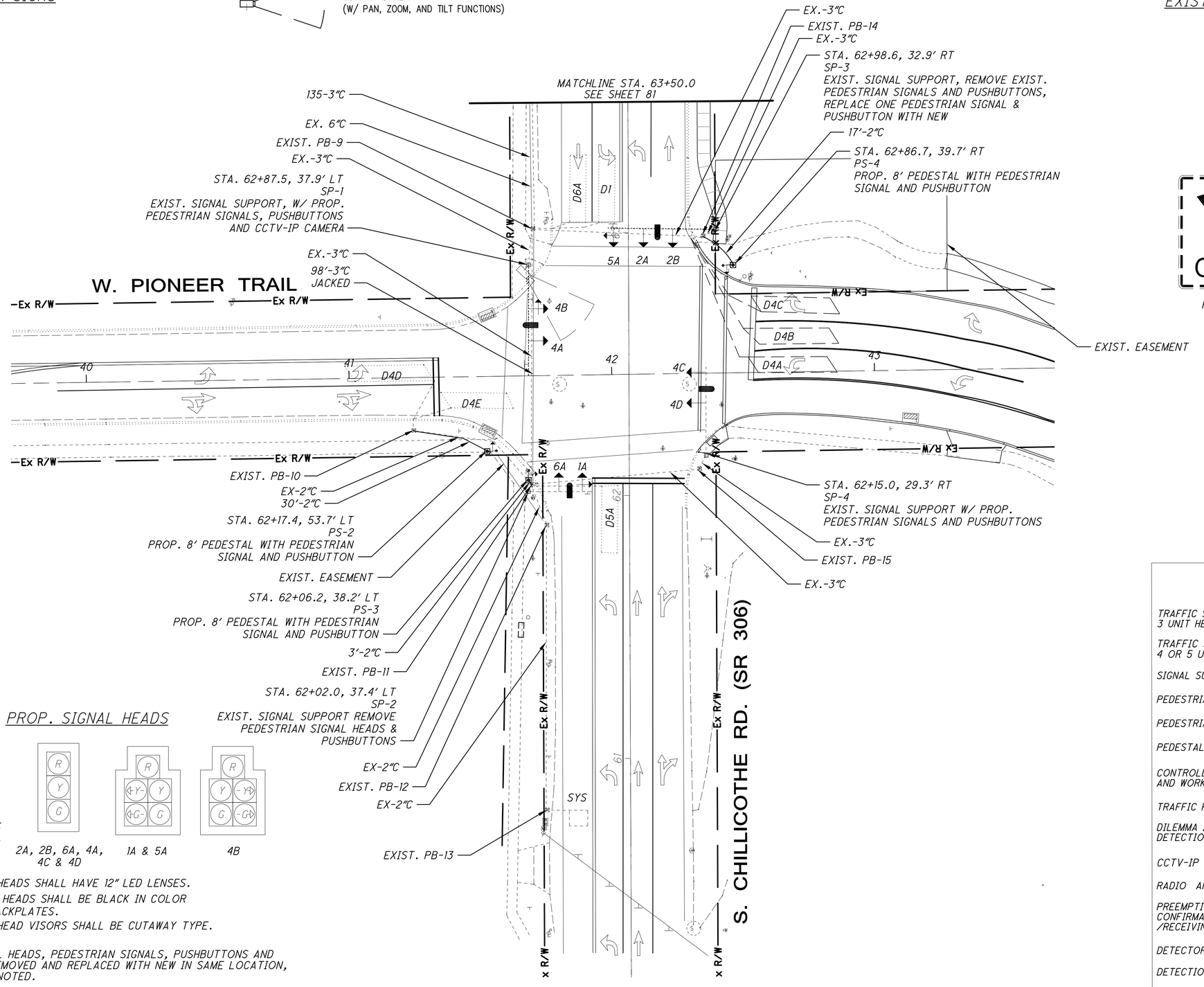
EXIST. MAST ARM SIGNAGE

Chillicothe Rd
D3-1-108
QTY = 2

Pioneer Tr
D3-1-96
QTY = 2

R3-5L-30
QTY = 3

R3-5R-30
QTY = 1



PROP. SIGNAL HEADS

PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 8

2A, 2B, 6A, 4A, 4C & 4D

1A & 5A

4B

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

NOTE:
ALL EXISTING SIGNAL HEADS, PEDESTRIAN SIGNALS, PUSHBUTTONS AND PED SIGNS TO BE REMOVED AND REPLACED WITH NEW IN SAME LOCATION, UNLESS OTHERWISE NOTED.

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	⟶	○⟶
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	⟶	○⟶
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	⟶	○⟶
PEDESTRIAN PUSH BUTTON	→	○→
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀D	◁D
CCTV-IP CAMERA	▭	
RADIO ANTENNA	⊢	⊢
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

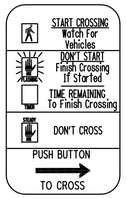
N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
S.R 43/ S.R. 306 & W. PIONEER TRAIL
POR-AURORA SIGNALS

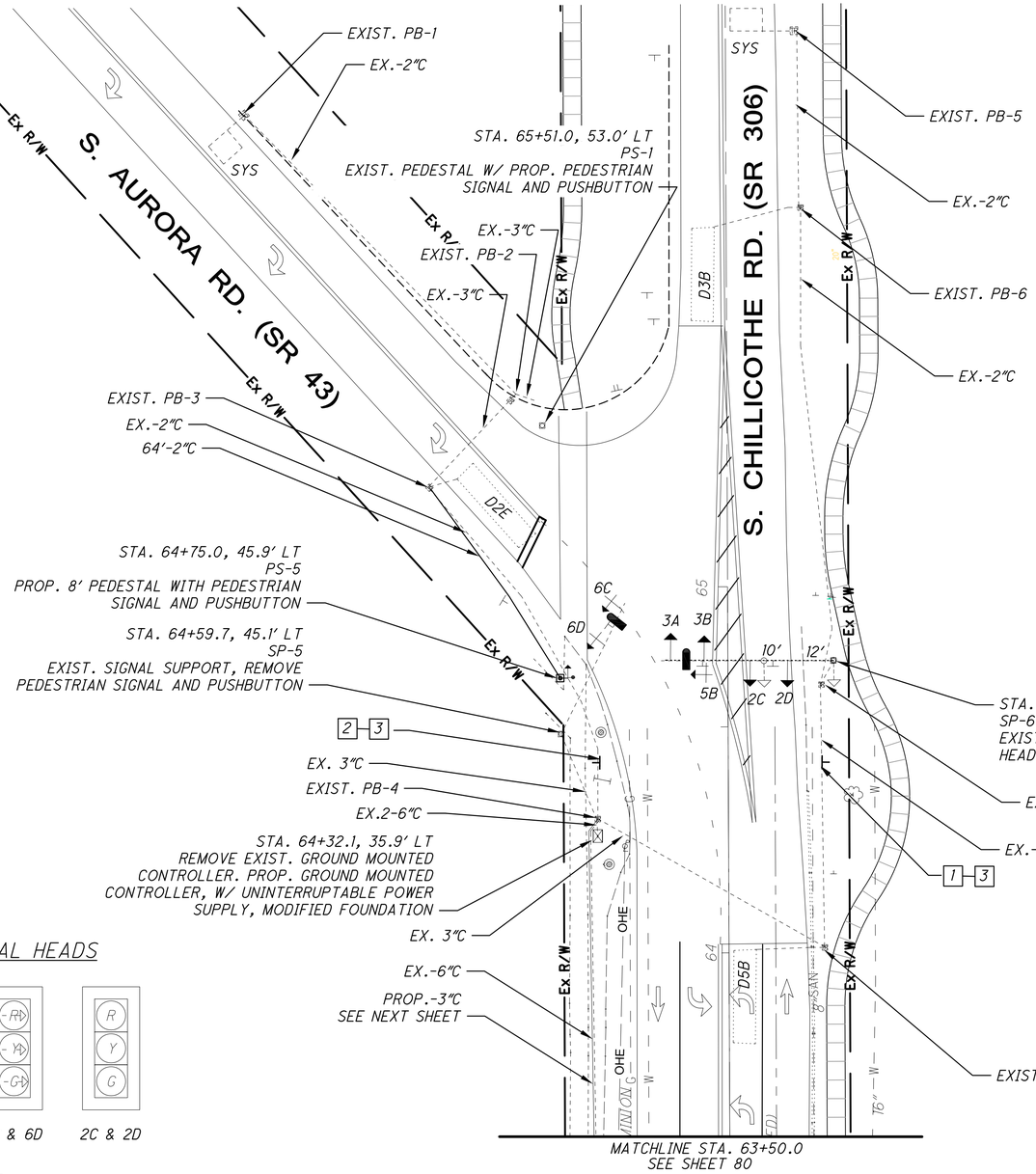
PROP. PEDESTRIAN SIGNS



R10-3E-9
1 - LEFT ARROWS
1 - RIGHT ARROWS

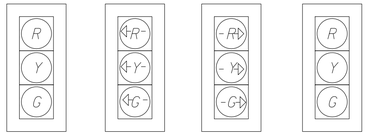
R9-3-18
2 EACH [3]

R9-3BP-18
1 - LEFT ARROWS [1]
1 - RIGHT ARROWS [2]



PROP. SIGNAL HEADS

PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 2



1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

NOTE:
ALL EXISTING SIGNAL HEADS, PEDESTRIAN SIGNALS, PUSHBUTTONS AND PED SIGNS TO BE REMOVED AND REPLACED WITH NEW IN SAME LOCATION. UNLESS OTHERWISE NOTED.

EXIST. MAST ARM SIGNAGE

D3-1-108
QTY = 2

D3-1-96
QTY = 2

R3-2-24
QTY = 1

M1-5-3
M6-3
QTY = 1

M1-5-2
M5-2L
QTY = 1

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●	○
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●	○
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	◉	◎
CONTROLLER CABINET AND WORK PAD (TS-2)	▣	▣
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀	◁
RADIO ANTENNA	⊥	⊥
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

N

0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JAT | CHECKED MWS

TRAFFIC SIGNAL PLAN
S.R 43/ S.R. 306 & W. PIONEER TRAIL
POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Chillicothe Rd (S.R. 43) & S Aurora Rd (S.R. 306)							
MAINTAINING AGENCY:			City of Aurora							
			DUAL ENTRY:	Yes		PHASES:		2,4,6,8		
START UP			REST IN RED:		RING 1	-		RING 2	-	
START IN:	FLASH		OVERLAP	A	B	C	D	E	F	G
TIME FOR FLASH OR ALL RED:	9	6								
FIRST PHASE(S):	2	6								
COLOR DISPLAYED:	G		PHASES	2 & 3	3 & 6	1,2,3,4	2 & 4	2 & 4	1 & 3	1
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.							
INTERSECTION MOVEMENT (PHASE)			1	2	3	4	5	6	-	-
DIRECTION			SB L	NB	NB/SB	EB/WB	NB L	SB	-	-
MINIMUM GREEN (INITIAL)		(SEC.)	7	20	15	15	7	20	-	-
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	6.5	4.0	4.0	2.5	6.5	-	-
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	20	30	35	25	20	30	-	-
MAXIMUM GREEN II		(SEC.)	20	30	35	25	20	30	-	-
YELLOW CHANGE		(SEC.)	3.0	3.3	3.3	3.3	3.0	3.3	-	-
ALL RED CLEARANCE		(SEC.)	1.2	1.1	1.1	1.1	1.2	1.1	-	-
WALK		(SEC.)	-	8	-	8	-	8	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	15	-	15	-	15	-	-
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	-	-
	MINIMUM	(ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	-	-
	PEDESTRIAN	(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	-	-
MEMORY		(ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	-	-

*VOLUME DENSITY CONTROLS

NOTES:

- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PREEMPT CHANNELS

CHANNEL 1 = Φ(2) (NORTHBOUND ONLY)

CHANNEL 2 = Φ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = Φ(4) (EASTBOUND ONLY)

CHANNEL 4 = Φ(4) (WESTBOUND ONLY)

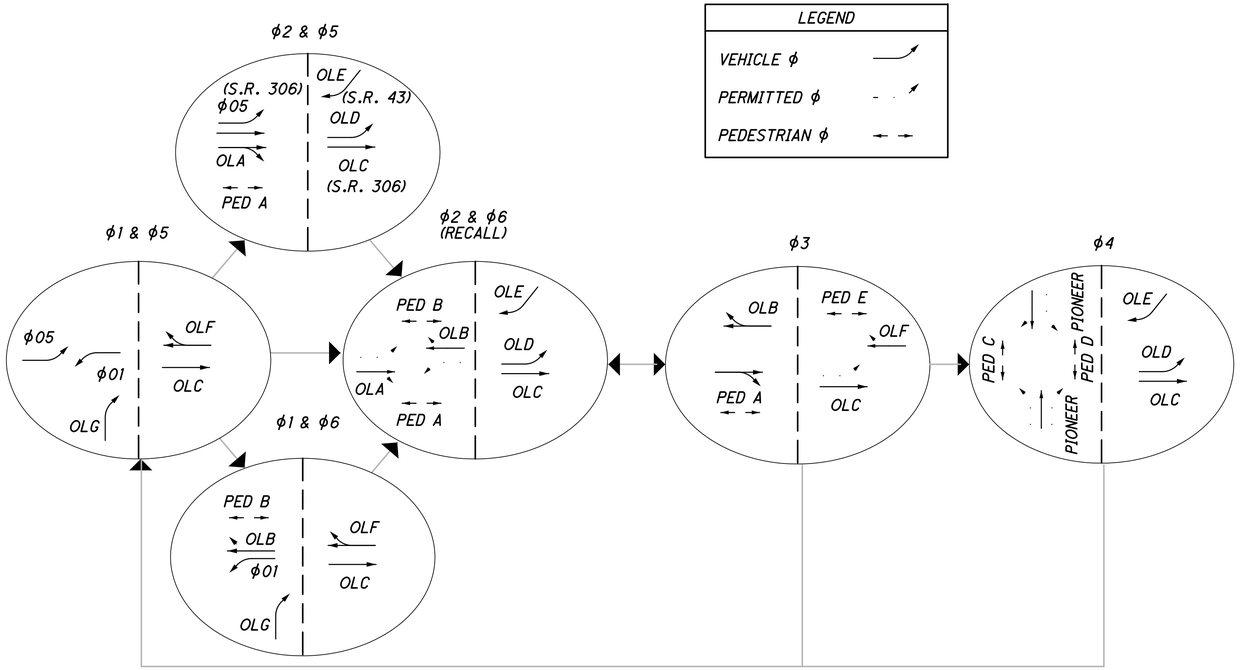
CHANNEL 5 = OLA + OLB (SOUTHBOUND ONLY)

CHANNEL 6 = OLF + OLB + Φ(1) (SOUTHBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE Φ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE Φ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

PHASING DIAGRAM



EXIST. TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
SYS	R	EXIST	PRESENCE	-	-	1	SYSTEM
D5A	R	EXIST	PRESENCE	-	-	2	Φ5
D4A	R	EXIST	PRESENCE	-	-	3	Φ4
D4B	R	EXIST	PRESENCE	-	-	4	Φ4
D4C	R	EXIST	PRESENCE	-	-	5	Φ4
D1	R	EXIST	PRESENCE	-	-	6	Φ1
D6A	R	EXIST	PRESENCE	-	-	7	Φ3 & Φ6
D4D	R	EXIST	PRESENCE	-	-	8	Φ4
D4E	R	EXIST	PRESENCE	-	-	9	Φ4
D5B	R	EXIST	PRESENCE	-	-	10	Φ5
SYS	R	EXIST	PRESENCE	-	-	11	SYSTEM
D3B	R	EXIST	PRESENCE	-	-	12	Φ3
SYS	R	EXIST	PRESENCE	-	-	13	SYSTEM
D2E	R	EXIST	PRESENCE	-	-	14	Φ2

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
CHILLICOTHE RD (S.R. 43) & AURORA RD. PIONEER TRAIL
POR-AURORA SIGNALS

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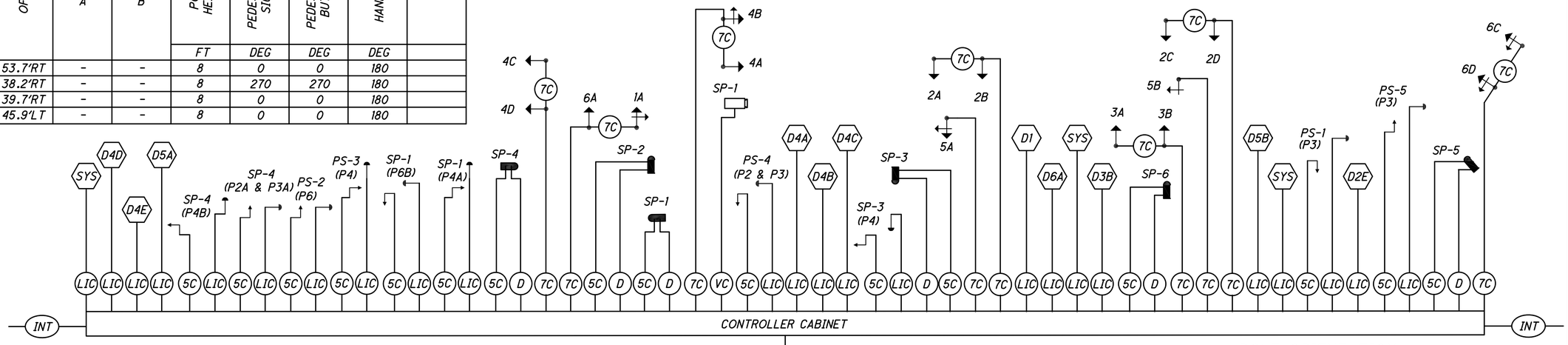
PEDESTAL TABLE

PEDESTAL NO.	STATION	OFFSET	ELEVATION A	ELEVATION B	POLE HEIGHT	ORIENTATION ANGLES: PEDESTRIAN SIGNAL	ORIENTATION ANGLES: PEDESTRIAN BUTTON	ORIENTATION ANGLES: HANDHOLE	
					FT	DEG	DEG	DEG	
PS-2	62+17.4	53.7'RT	-	-	8	0	0	180	
PS-3	62+06.2	38.2'RT	-	-	8	270	270	180	
PS-4	62+86.7	39.7'RT	-	-	8	0	0	180	
PS-5	64+75.0	45.9'LT	-	-	8	0	0	180	

WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

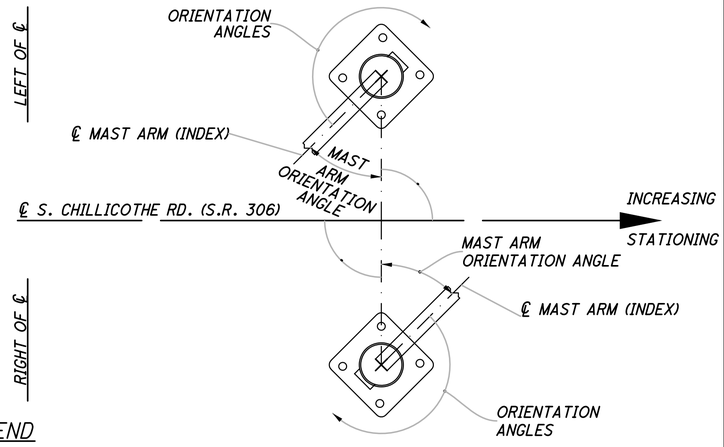
43 / 306 & Pioneer

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A	R	OLB R	R	4D	R	Ø4 R	R
	Y	OLB Y			Y	Ø4 Y	
	G	OLB G		(WB)	G	Ø4 G	
(SB)	<--Y---	Ø1 Y		5A	R	OLA R	R
	<--G---	Ø1 G			Y	OLA Y	
2A	R	OLA R	R		G	OLA G	
	Y	OLA Y		(NB)	<--Y---	Ø1 Y	
(NB)	G	OLA G			<--G---	Ø1 G	
2B	R	OLA R	R	6A	R	OLB R	R
	Y	OLA Y			Y	OLB Y	
(NB)	G	OLA G		(SB)	G	OLB G	
4A	R	Ø4 R	R	PEDESTRIAN MOVEMENTS			
	Y	Ø4 Y		PED A	W	Ø2 PED/LS13 G	OUT
(EB)	G	Ø4 G		EAST	DW	Ø2 PED/LS13 R	
4B	R	Ø4 R	R	PED B	W	Ø6 PED/LS14 G	OUT
	Y	Ø4 Y		WEST	DW	Ø6 PED/LS14 R	
(EB)	G	Ø4 G		PED C	W	Ø4 PED/LS15 G	OUT
4C	R	Ø4 R	R	SOUTH	DW	Ø4 PED/LS15 R	
	Y	Ø4 Y		PED D	W	Ø4 PED/LS14 G	OUT
(WB)	G	Ø4 G		NORTH	DW	Ø4 PED/LS14 R	

43 & 306

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2C	R	OLC R	R	5B	R	OLD R	R
	Y	OLC Y			Y	OLD Y	
(NB)	G	OLC G		(NB)	G	OLD G	
2D	R	OLC R	R	6C	---R-->	OLE R	R
	Y	OLC Y			---Y-->	OLE Y	
(NB)	G	OLC G		(EB)	---G-->	OLE G	
3A	R	OLF R	R	6D	---R-->	OLE R	R
	Y	OLF Y			---Y-->	OLE Y	
(SB)	G	OLF G		(EB)	---G-->	OLE G	
3B	R	OLF R	R	PEDESTRIAN MOVEMENTS			
	Y	OLF Y		PED E	W	Ø3 PED/LS16 G	OUT
(SB)	G	OLF G		WEST	DW	Ø3 PED/LS16 R	

POLE ORIENTATION



LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- RC — RADAR DETECTION CABLE
- VC — VIDEO CAMERA CABLE
- INT — INTERCONNECT CABLE
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. --
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE
- CCTV-IP CAMERA

HORIZONTAL SCALE IN FEET: 0, 10, 20, 40

CALCULATED JAT | CHECKED MWS

SIGNAL DETAIL PLAN
S.R. 43/S.R. 306 & W. PIONEER TRAIL
POR-AURORA SIGNALS

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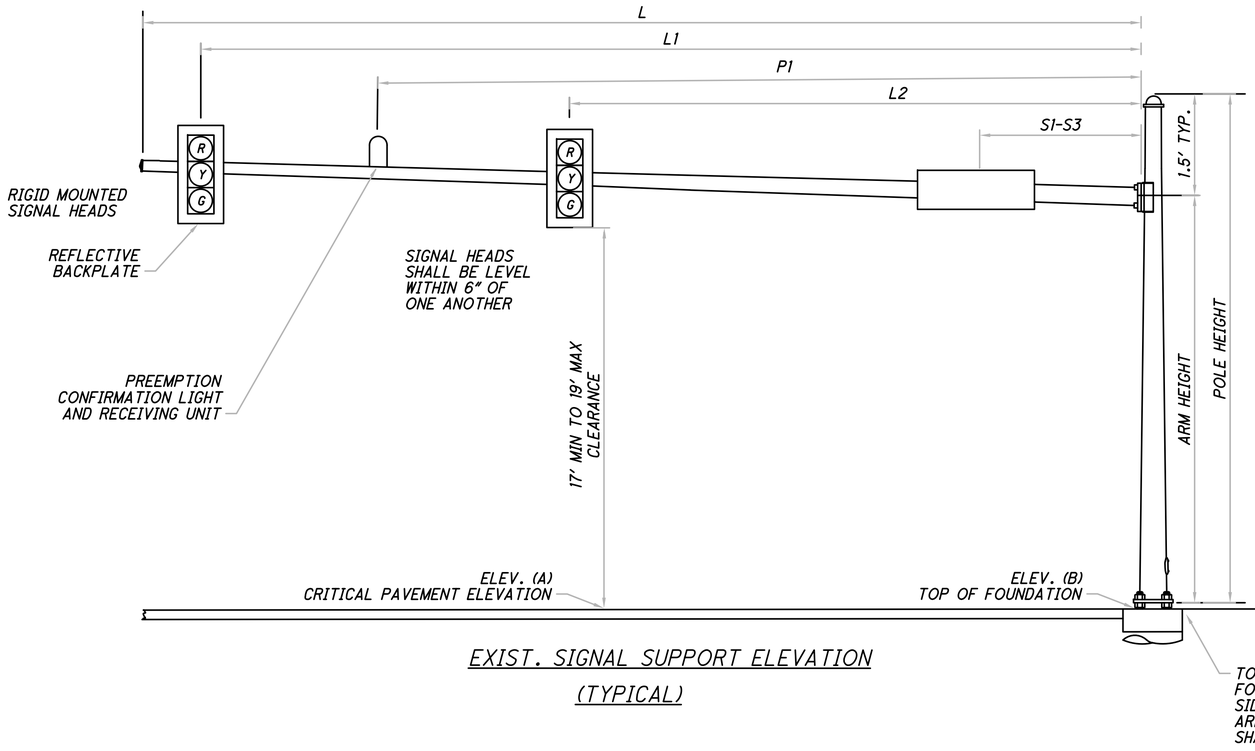
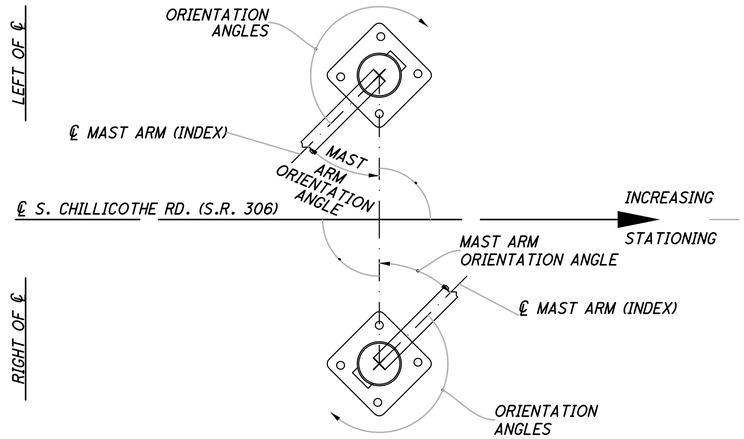


EXIST. SIGNAL SUPPORT ELEVATION

(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS														ORIENTATION ANGLES FROM MAST ARM						
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	L4	L5	S1	S2	S3	P1	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	62+87.5	37.9' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	23.5	10.5	-	-	-	EX	EX	EX	26	EX	-	90/180	90/180	-	EX	-
SP-2	62+02.0	37.4' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	20.5	9.5	-	-	-	EX	EX	-	16	EX	-	-	-	-	EX	-
SP-3	62+98.6	32.9' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	36.5	24.5	13	-	-	EX	EX	-	31	EX	-	270	270	-	EX	-
SP-4	62+15.0	29.3' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	28	18	-	-	-	EX	EX	-	23	EX	-	0/90	0/90	-	EX	-
SP-5	64+59.7	45.1' LT	EXIST	EXIST	EXIST	EX	EX	EX	EX	35	23	-	-	-	EX	EX	-	33	EX	-	-	-	-	EX	-
SP-6	64+79.5	28.5' RT	EXIST	EXIST	EXIST	EX	EX	EX	EX	45	35	33	22	12	EX	EX	EX	40	EX	-	-	-	-	EX	-

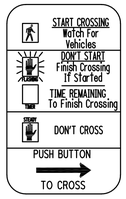
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
S.R. 43/ S.R. 306 & W. PIONEER TRAIL

POR-AURORA SIGNALS

PEDESTRIAN SIGNS



R10-3E-9
2 - LEFT ARROWS
2 - RIGHT ARROWS

R9-3-18
2 EACH [5]

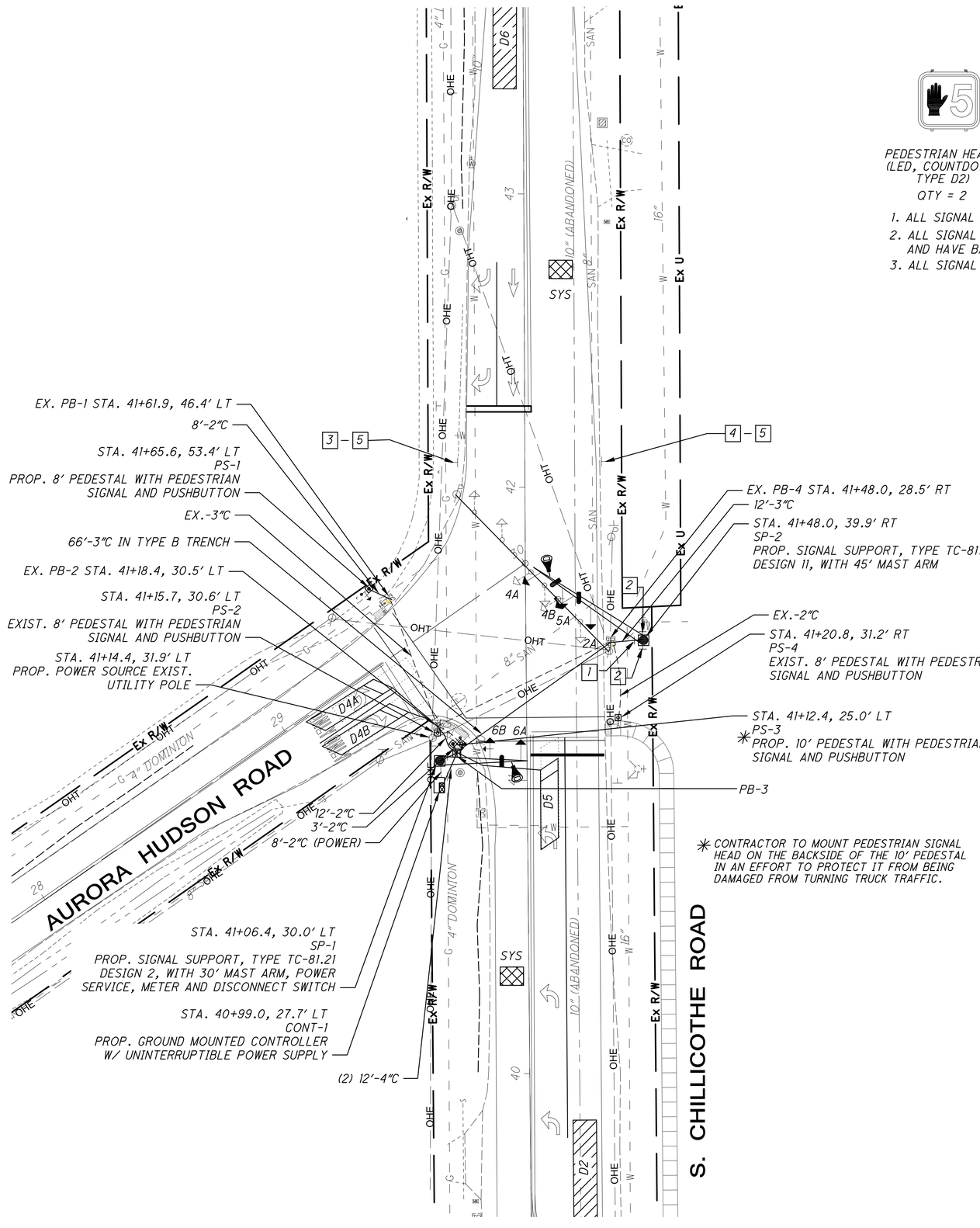
R9-3BP-18
1 - LEFT ARROWS [3]
1 - RIGHT ARROWS [4]

EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	39+50.6	LT	18.6'
PULLBOX	40+88.9	LT	16.2'
PEDESTAL	41+12.7	LT	22.4'
PEDESTAL	41+60.4	LT	48.2'
WOOD POLE	41+98.0	LT	23.4'
CONTROLLER	41+98.0	LT	23.4'

PULL BOX TABLE

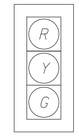
PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
EX. PB-1	41+61.9	LT	46.4'	18
EX. PB-2	41+18.4	LT	30.5'	18
PB-3	41+09.0	LT	24.0'	24
EX. PB-4	41+48.0	RT	28.5'	18



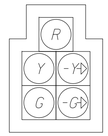
✳ CONTRACTOR TO MOUNT PEDESTRIAN SIGNAL HEAD ON THE BACKSIDE OF THE 10' PEDESTAL IN AN EFFORT TO PROTECT IT FROM BEING DAMAGED FROM TURNING TRUCK TRAFFIC.

SIGNAL HEADS

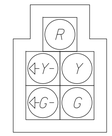
PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 2



2A, 4A, 6A



4B & 6B



5A

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEADS TO HAVE TUNNEL VISORS.

MAST ARM SIGNAGE

D3-1-144
QTY = 1
[1]

D3-1-162
QTY = 2
[2]

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"		
SIGNAL SUPPORT POLE		
PEDESTRIAN SIGNAL		
PEDESTRIAN PUSH BUTTON		
PEDESTAL SUPPORT		
CONTROLLER CABINET AND WORK PAD (TS-2)		
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT		
RADIO ANTENNA		
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT		
DETECTOR LOOP		
DETECTION ZONE		
DETECTION COUNT		

N

0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JAT CHECKED MWS

TRAFFIC SIGNAL PLAN
S. CHILLICOTHE RD. (S.R. 43) & AURORA HUDSON RD.
POR-AURORA SIGNALS

SIGNAL TIMING CHART

INTERSECTION:			Chillicothe Rd (S.R. 43) & Aurora-Hudson Rd						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8	
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH OR ALL RED:	9,	6							
FIRST PHASE(S):	2	6							
COLOR DISPLAYED:	G		PHASES			5	4	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			-	2	-	4	5	6	-	-
DIRECTION			-	NB	-	EB	NB L	SB	-	-
MINIMUM GREEN (INITIAL)		(SEC.)	-	20	-	10	7	20	-	-
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	-	2.5	-	4.0	2.5	2.5	-	-
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	-	90	-	30	15	75	-	-
MAXIMUM GREEN II		(SEC.)	-	90	-	30	15	75	-	-
YELLOW CHANGE		(SEC.)	-	4.4	-	4.1	3.6	4.4	-	-
ALL RED CLEARANCE		(SEC.)	-	1.0	-	1.0	1.2	1.0	-	-
WALK		(SEC.)	-	-	-	8	-	7	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	12	-	10	-	-
RECALL	MAXIMUM	(ON/OFF)	-	OFF	-	OFF	OFF	OFF	-	-
	MINIMUM	(ON/OFF)	-	ON	-	OFF	OFF	ON	-	-
	PEDESTRIAN	(ON/OFF)	-	OFF	-	OFF	OFF	OFF	-	-
MEMORY		(ON/OFF)	-	OFF	-	OFF	OFF	OFF	-	-

*VOLUME DENSITY CONTROLS

NOTES:

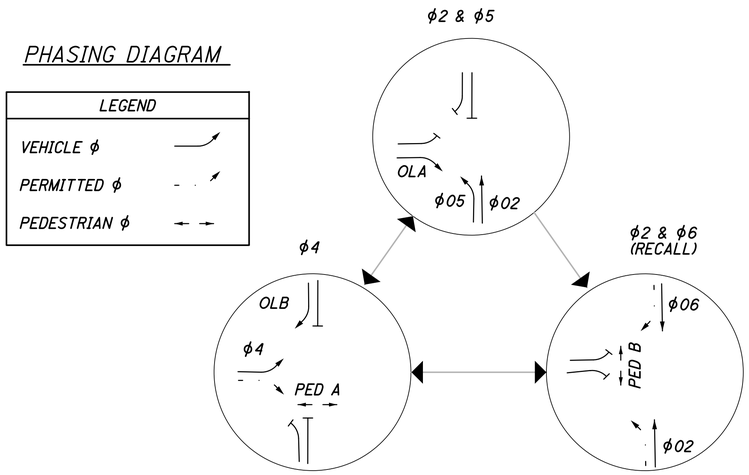
- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D4A	P	6' X 30'	PRESENCE	2	-	4-1	ϕ4
D4B	P	6' X 30'	PRESENCE	8	-	4-2	ϕ4
D5	P	6' X 30'	PRESENCE	2	-	5-1	ϕ5

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

PHASING DIAGRAM



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(4) (EASTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	NB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	175	125-300
D6	SB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	175	125-300
SYS	SB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250
SYS	NB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
N. CHILLICOTHE RD. (SR 43) & AURORA HUDSON

POR-AURORA SIGNALS

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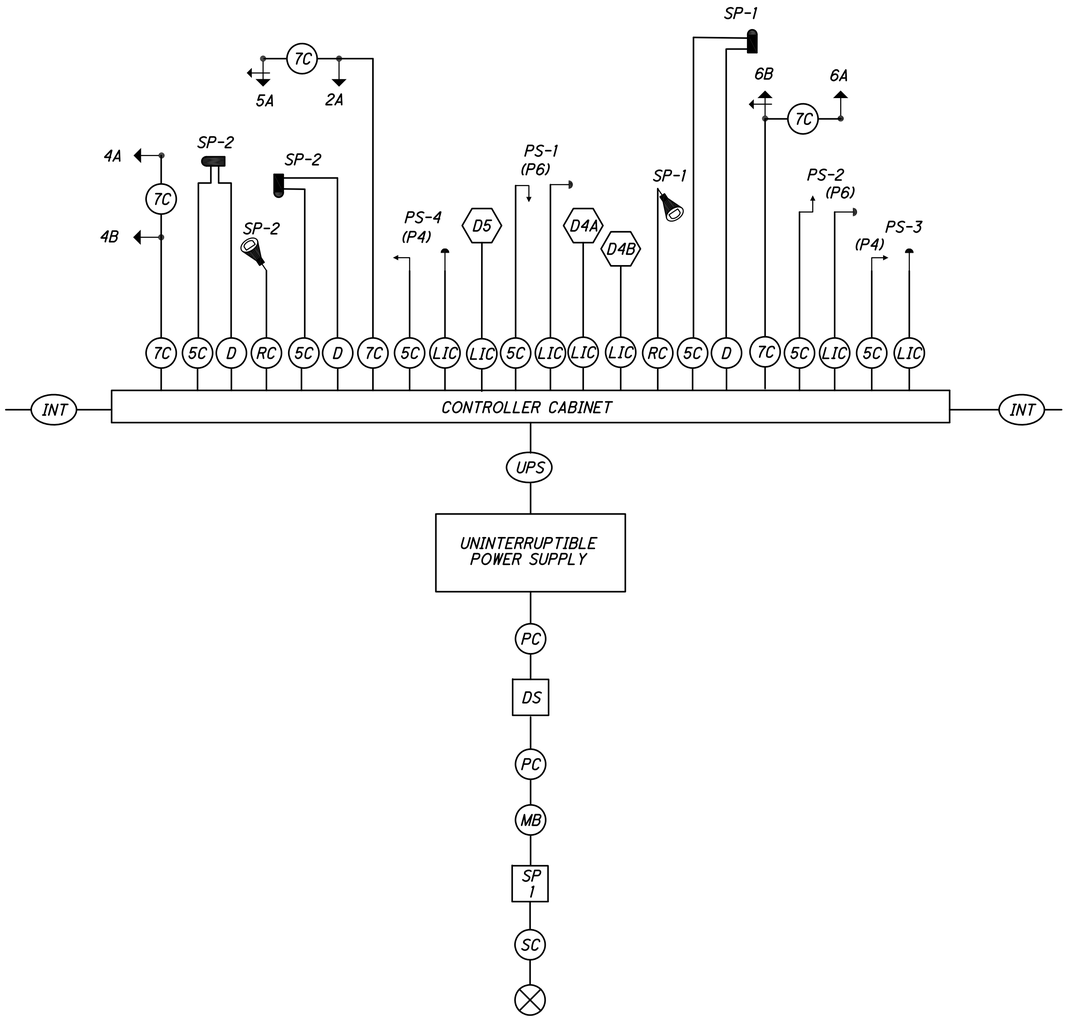
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2A	R	Ø2 R	Y
	Y	Ø2 Y	
(NB)	G	Ø2 G	
4A	R	Ø4 R	R
	Y	Ø4 Y	
(EB)	G	Ø4 G	
4B	R	Ø4 R	R
	Y	Ø4 Y	
	G	Ø4 G	
	---Y-->	Ø5 Y	
(EB)	---G-->	Ø5 G	
5A	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
	<--Y---	Ø5 Y	
(NB LT)	<--G---	Ø5 G	
6A	R	Ø6 R	Y
	Y	Ø6 Y	
(SB)	G	Ø6 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
6B	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
(SB RT)	---Y-->	Ø4 Y	
	---G-->	Ø4 G	
PEDESTRIAN MOVEMENTS			
PED A	W	Ø4 PED/LS14 G	OUT
SOUTH	DW	Ø4 PED/LS14 R	
PED B	W	Ø6 PED/LS15 G	OUT
WEST	DW	Ø6 PED/LS15 R	
OVERLAPS			
OLA	---Y-->	Ø5 Y/LS11 Y	-
	---G-->	Ø5 G/LS11 G	
OLA = LS 11			
OLB	---Y-->	Ø4 Y/LS10 Y	-
	---G-->	Ø4 G/LS10 G	
OLA = LS 10			

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- (D) DILEMMA ZONE RADAR DETECTION UNIT
- (S) STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- (L) VEHICLE LOOP DETECTOR
- (D) PREEMPTION DETECTOR CABLE
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (3C) SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- (5C) SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (RC) RADAR DETECTION CABLE
- (VC) VIDEO CAMERA CABLE
- (INT) INTERCONNECT CABLE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (PC) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- (SP 1) SIGNAL SUPPORT POLE NO. __
- (MB) METER BASE
- POWER SOURCE
- (DS) DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE

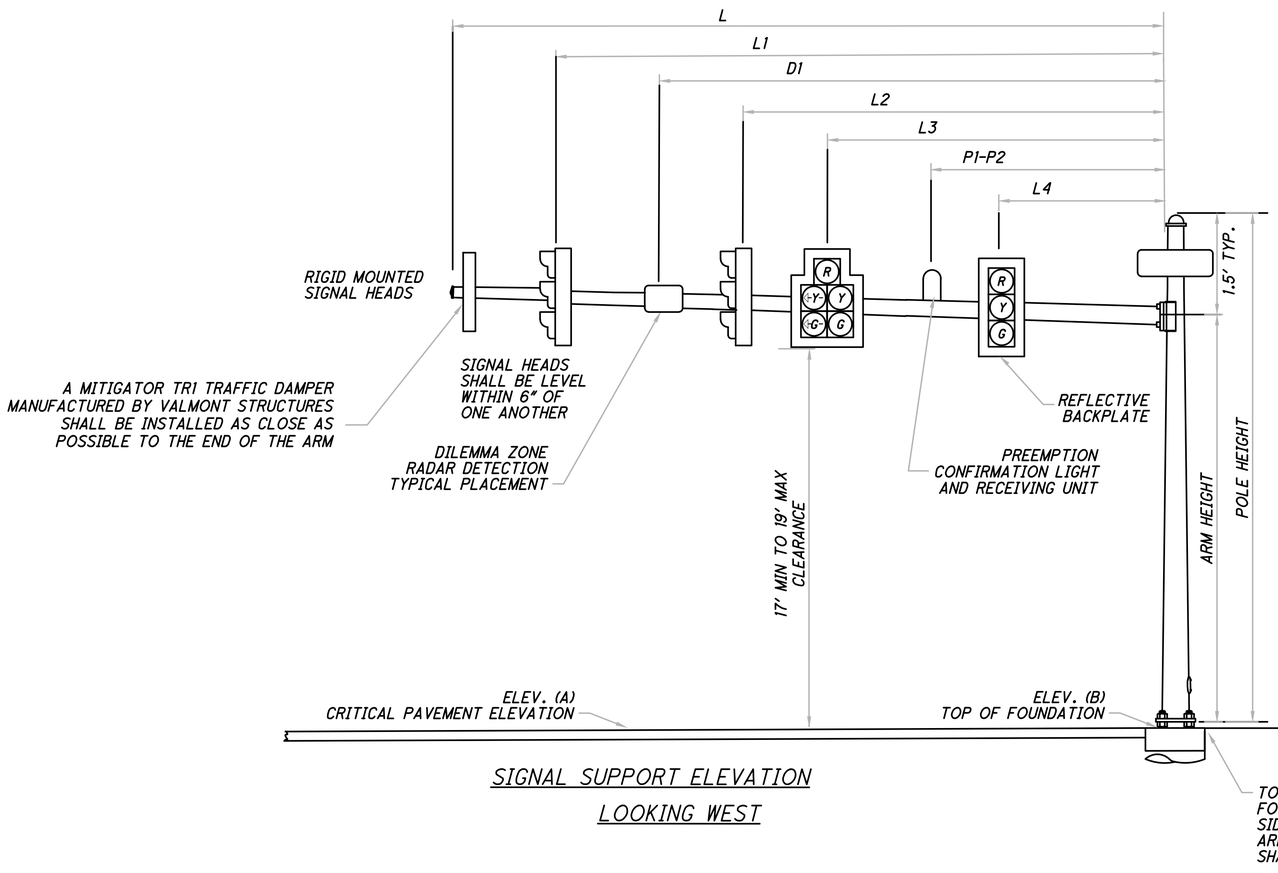
N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

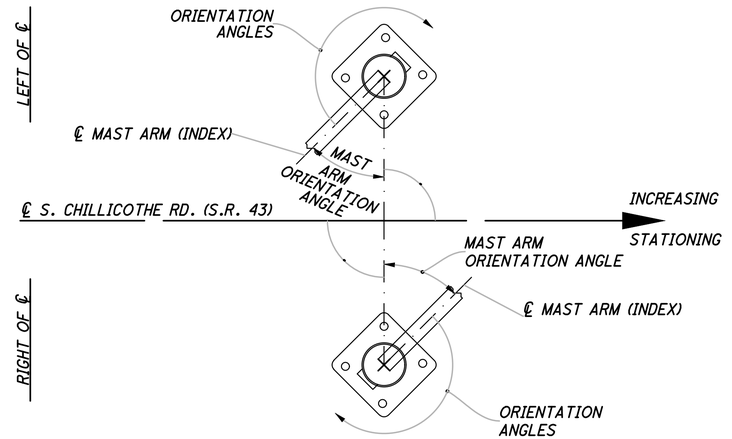
SIGNAL DETAIL PLAN
S. CHILLICOTHE RD. (S.R. 43) & AURORA-HUDSON RD.

POR-AURORA SIGNALS



SIGNAL SUPPORT ELEVATION

LOOKING WEST



POLE ORIENTATION

MAST ARM TABLE

			ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM						
SUPPORT NO.	STATION	OFFSET	A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	L4	D1	P1	P2	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	41+06.4	30.0' LT	1163.61	1162.47	TC-81.21	2	23.0	21.5	30	27	15	-	-	22	18	-	0	-	-	-	180	180	180
SP-2	41+48.0	39.9' RT	1163.61	1162.25	TC-81.21	11	23.5	22	45	42	36	30	24	40	23	38	35	-	-	-	-	180	
PS-1	41+65.6	53.4' LT					8.0												180	180		180	
EX PS-2	41+15.7	30.6' LT					EX												EX	EX		EX	
PS-3	41+12.4	25.0' LT					10.0												90	270		180	
EX PS-4	41+20.8	31.2' RT					EX												EX	EX		EX	

HORIZONTAL SCALE IN FEET 0 10 20 40

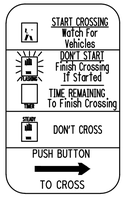
CALCULATED JAT CHECKED MWS

SIGNAL DETAIL PLAN

S. CHILLICOTHE RD. (SR 43) & AURORA HUDSON RD.

POR-AURORA SIGNALS

PEDESTRIAN SIGNS



R10-3E-9
2 - LEFT ARROWS

R9-3-18
2 EACH [5]

R9-3BP-18
1 - LEFT ARROWS [3]
1 - RIGHT ARROWS [4]

EXIST. SIGNAL REMOVAL TABLE

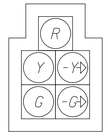
SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	27+32.9	LT	25.9′
PULLBOX	26+71.4	LT	26.1′
PULLBOX	28+80.4	RT	27.6′
PULLBOX	27+57.1	RT	27.3′
PULLBOX	27+27.6	RT	27.5′
PEDESTAL	27+34.9	LT	29.2′
WOOD POLE	26+70.6	LT	29.5′
WOOD POLE	27+19.5	RT	29.8′
WOOD POLE	26+24.0	RT	42.0′
CONTROLLER	27+19.5	RT	29.8′

PULL BOX TABLE

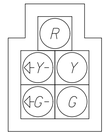
PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	27+31.5	LT	21.9′	18
PB-2	27+17.9	RT	24.5′	24
PB-3	26+19.4	RT	40.7′	18

SIGNAL HEADS

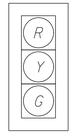
PEDESTRIAN HEADS (LED, COUNTDOWN, TYPE D2)
QTY = 4



2B



1A



2A, 6A, 8A & 8B

1. ALL SIGNAL HEADS SHALL HAVE 12″ LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE OPTICALLY PROGRAMMED

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12″	●→	○→
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12″	●→	○→
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	■	□
PEDESTRIAN PUSH BUTTON	→	→
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀D	◁D
RADIO ANTENNA	⊣	⊣
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	⊂⊃
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
S. CHILLICOTHE RD. (S.R. 43) & AURORA FARMS DRIVE
POR-AURORA SIGNALS

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INTERSECTION:			Chillicothe Rd (S.R. 43) & Aurora Farms Dr.						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes	PHASES:		2,4,6,8		
			REST IN RED:		RING 1	-	RING 2	-	
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH, ALL RED:	9	6							
FIRST PHASE(S):	2	6							
COLOR DISPLAYED:	G		PHASES			8	-	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	-	-	-	6	-	8
DIRECTION			SB L	NB	-	-	-	SB	-	WB
MINIMUM GREEN (INITIAL)		(SEC.)	7	20	-	-	-	20	-	10
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	3.0	-	-	-	3.0	-	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	20	70	-	-	-	90	-	30
MAXIMUM GREEN II		(SEC.)	20	70	-	-	-	90	-	30
YELLOW CHANGE		(SEC.)	3.6	4.4	-	-	-	4.4	-	3.3
ALL RED CLEARANCE		(SEC.)	1.5	1.0	-	-	-	1.0	-	1.0
WALK		(SEC.)	-	9	-	-	-	-	-	8
PEDESTRIAN CLEARANCE		(SEC.)	-	17	-	-	-	-	-	10
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	OFF
	MINIMUM	(ON/OFF)	OFF	ON	-	OFF	-	ON	-	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	OFF
MEMORY		(ON/OFF)	OFF	OFF	-	OFF	-	OFF	-	OFF

*VOLUME DENSITY CONTROLS

NOTES:

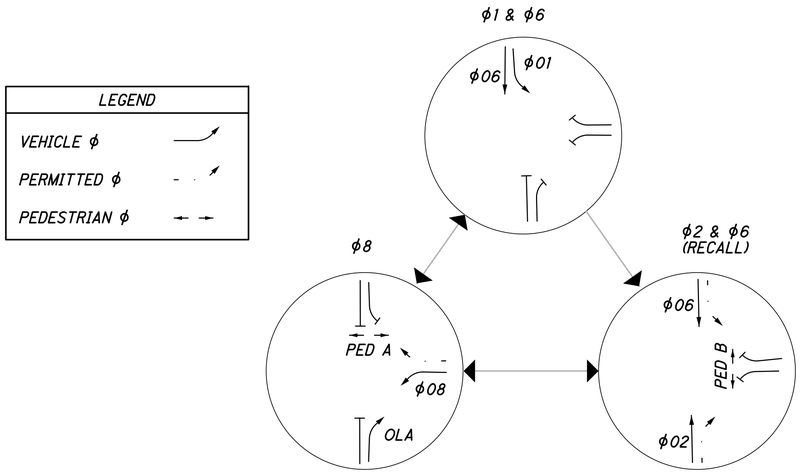
- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	P	6' X 30'	PRESENCE	2	-	1-1	ϕ1

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

PHASING DIAGRAM



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(8) (WESTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	NB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	175	125-300
D6	SB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	175	125-300
D8A	WB LEFT	PRESENCE	ϕ8	2	-	-	STOP BAR	30	0
D8B	WB RIGHT	PRESENCE	ϕ8	8	-	-	STOP BAR	30	0
SYS	SB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250
SYS	NB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

HORIZONTAL SCALE IN FEET (0, 10, 20, 40)

CALCULATED JAT | CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS

S. CHILLICOTHE RD. (S.R. 43) & AURORA FARMS

POR-AURORA SIGNALS

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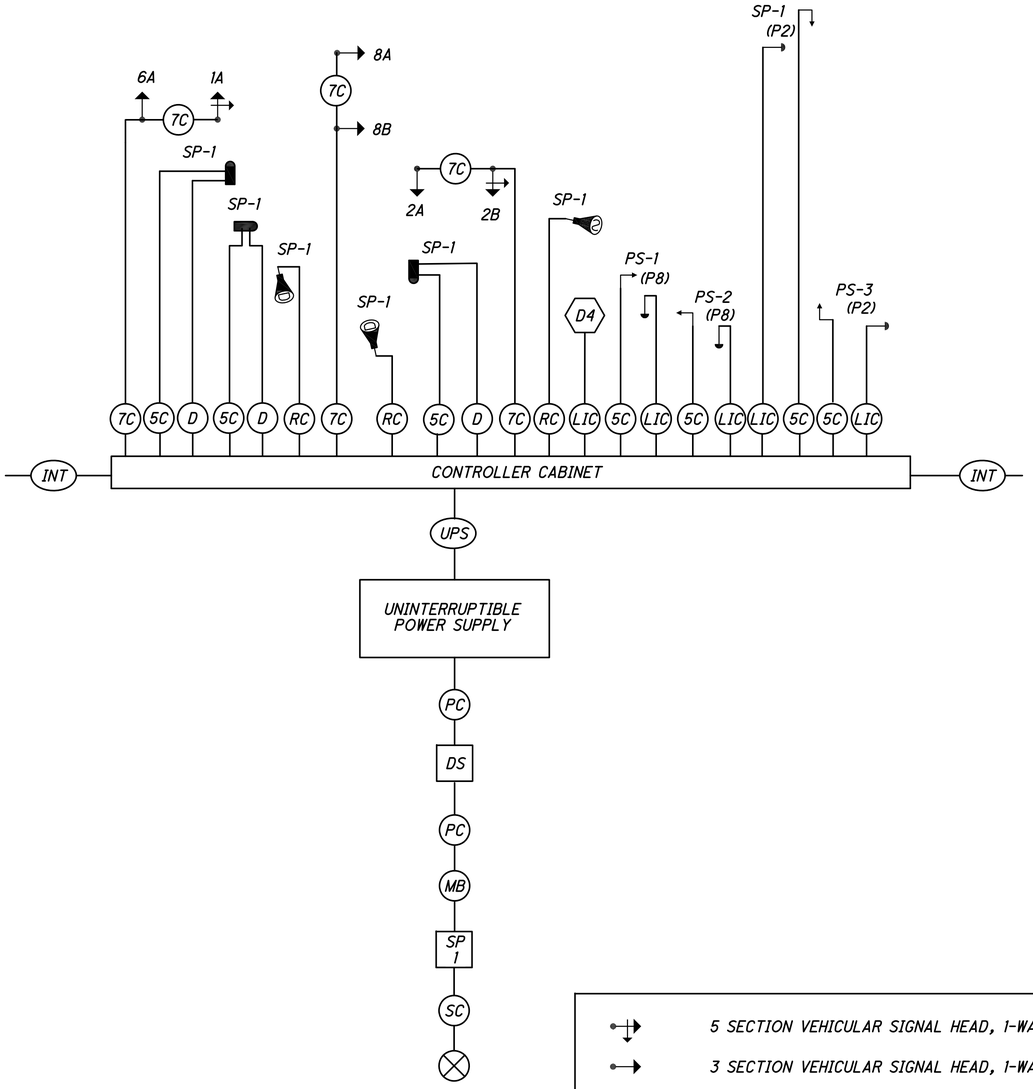
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (SB LT)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
	<--Y---	Ø1 Y	
	<--G---	Ø1 G	
2A (NB)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
2B (NB RT)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
	---Y-->	Ø8 Y	
	---G-->	Ø8 G	
6A (SB)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
8A (WB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
8B (WB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
	-	-	
	-	-	
PEDESTRIAN MOVEMENTS			
PED A NORTH	W	Ø8 PED/LS16 G	OUT
	DW	Ø8 PED/LS16 R	
PED B EAST	W	Ø2 PED/LS13 G	OUT
	DW	Ø2 PED/LS13 R	
OVERLAPS			
OLA	---Y-->	Ø8 Y/LS 10 Y	-
	---G-->	Ø8 G/LS 10 G	

LEGEND

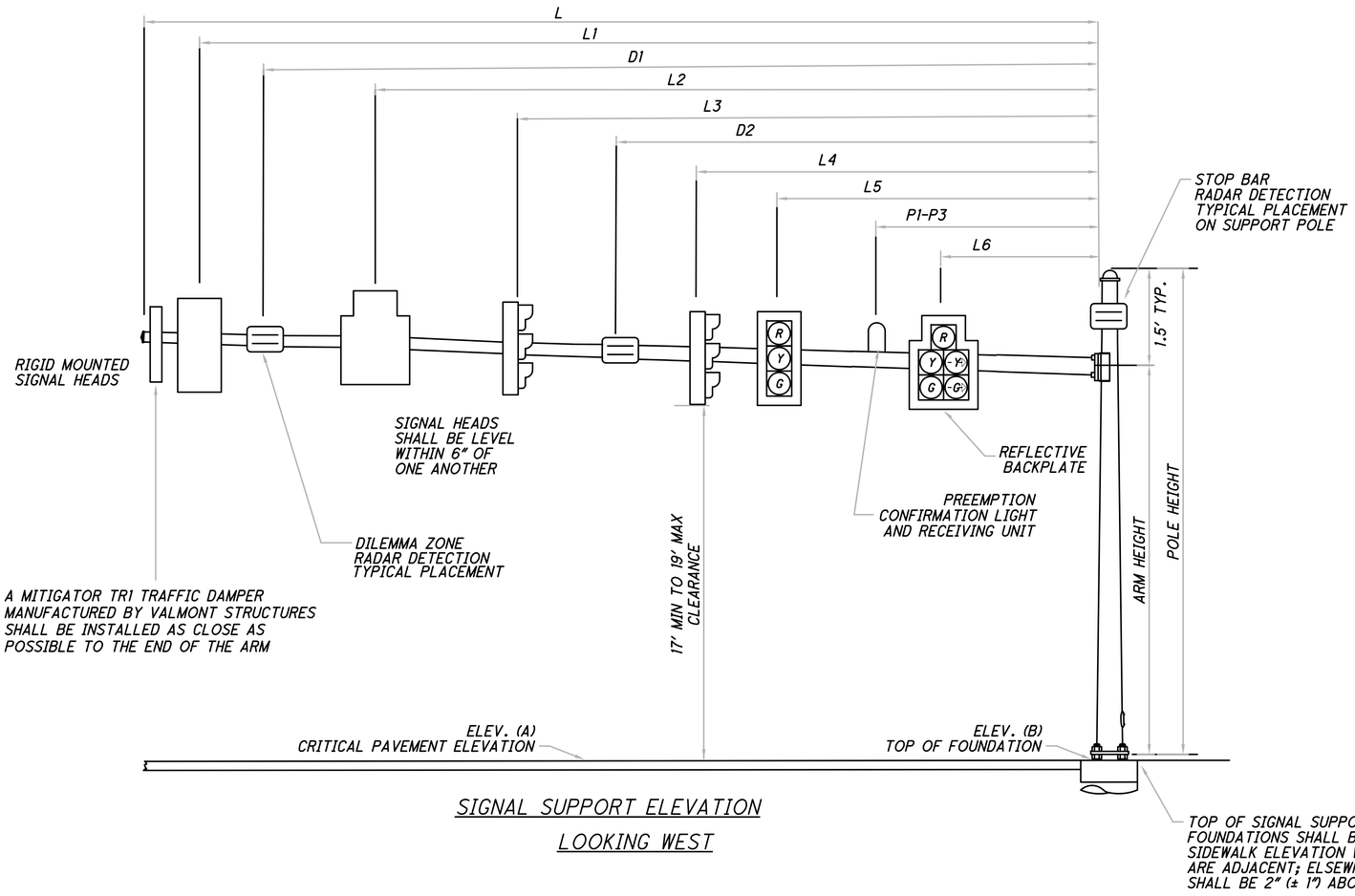
- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- RC — RADAR DETECTION CABLE
- VC — VIDEO CAMERA CABLE
- INT — INTERCONNECT CABLE
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. __
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

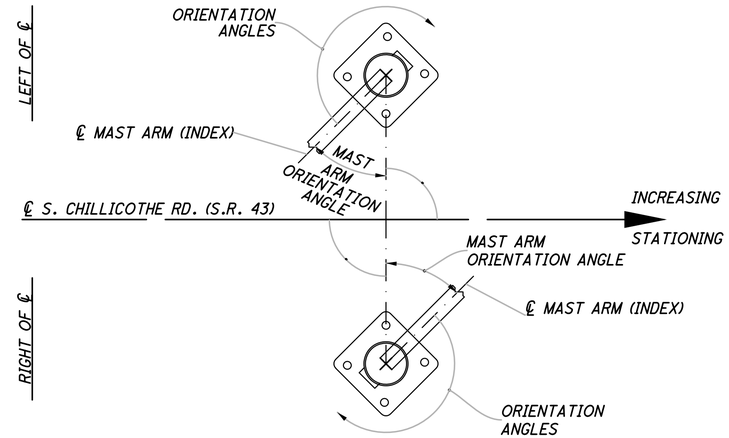
SIGNAL DETAIL PLAN
S. CHILLICOTHE RD. (S.R. 43) & AURORA FARMS DRIVE

POR-AURORA SIGNALS



SIGNAL SUPPORT ELEVATION

LOOKING WEST



POLE ORIENTATION

MAST ARM TABLE

			ELEVATION		SIGNAL SUPPORT DETAILS															ORIENTATION ANGLES FROM MAST ARM						
SUPPORT NO.	STATION	OFFSET	A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	L4	L5	L6	D1	D2	P1	P2	P3	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	27+11.6	33.2' RT	1175.64	1175.76	TC-81.21	14	21.5	20	66	63	51	47	35	31	15	20	48	60	43	17	295	-	0	0	205	180	180
PS-1	27+28.4	26.2' LT					8.0																90	90		180	
PS-2	27+27.4	25.0' RT					8.0																270	270		180	
PS-3	26+28.7	41.5' RT					8.0																0	0		180	

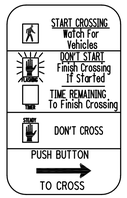
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
S. CHILLICOTHE RD. (S.R. 43) & AURORA FARMS DRIVE

POR-AURORA SIGNALS

PEDESTRIAN SIGNS



R10-3E-9
3 - LEFT ARROWS
3 - RIGHT ARROWS

R9-3-18
2 EACH [5]

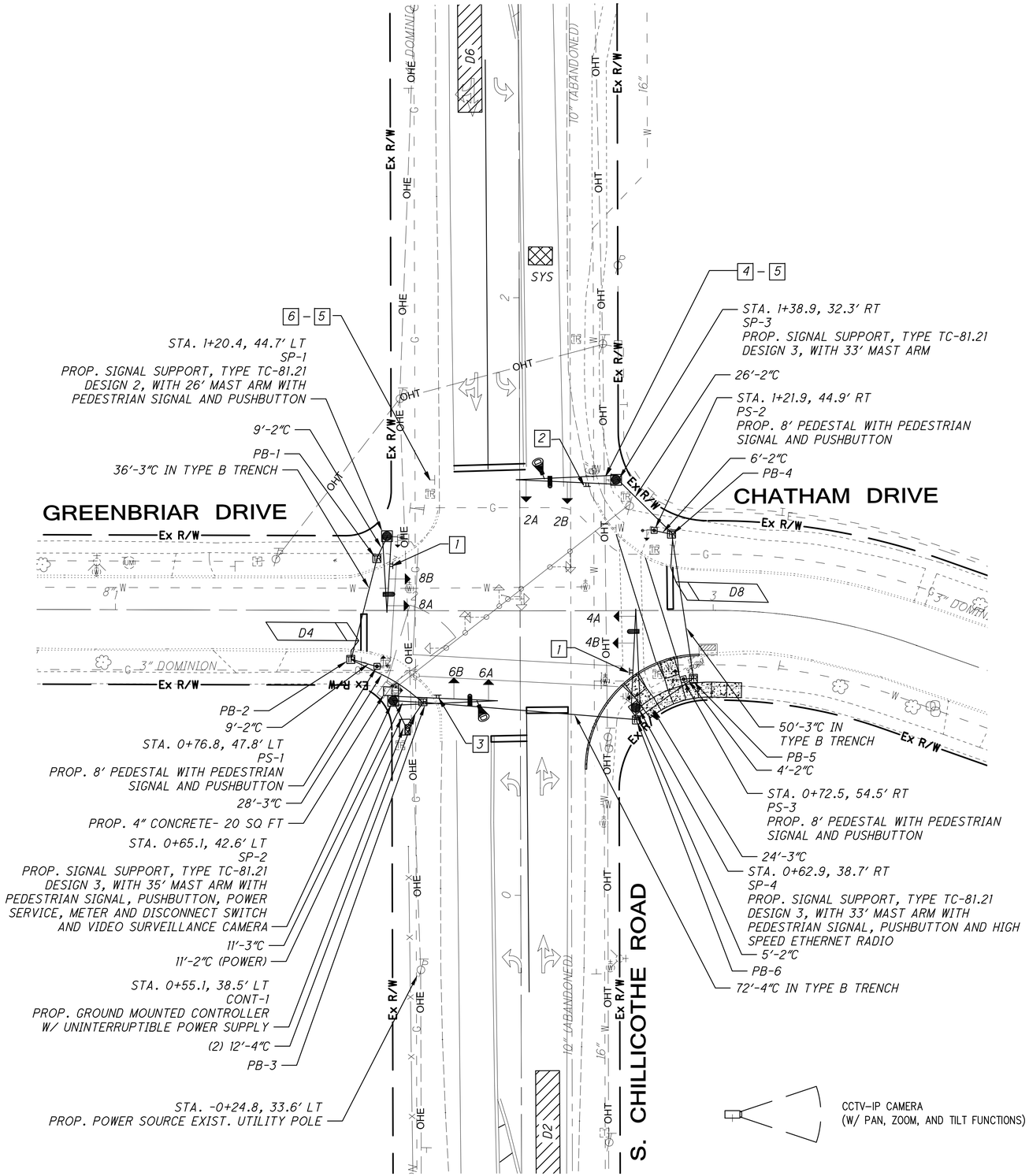
R9-3BP-18
1 - LEFT ARROWS [6]
1 - RIGHT ARROWS [4]

EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	1+34.5	LT	30.2'
PULLBOX	0+50.4	LT	40.3'
PULLBOX	0+77.6	LT	45.3'
PULLBOX	1+15.5	RT	44.9'
PULLBOX	1+33.2	RT	35.7'
PULLBOX	1+86.0	RT	18.7'
PULLBOX	0+73.8	RT	45.8'
PEDESTAL	1+20.0	LT	40.1'
PEDESTAL	0+63.4	RT	39.5'
STRAIN POLE	0+68.8	LT	41.6'
WOOD POLE	1+30.3	RT	36.5'
CONTROLLER	1+69.2	RT	30.0'

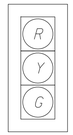
PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	1+12.8	LT	47.6'	18
PB-2	0+78.8	LT	56.5'	18
PB-3	0+65.1	LT	32.5'	24
PB-4	1+21.1	RT	50.8'	18
PB-5	0+72.5	RT	58.0'	18
PB-6	0+58.5	RT	38.9'	18



SIGNAL HEADS

PEDESTRIAN HEADS
(LED, COUNTDOWN,
TYPE D2)
QTY = 6



2A, 2B, 6A, 6B,
4A, 4B, 8A & 8B

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

MAST ARM SIGNAGE

D3-1-144
QTY = 2
[1]

D3-1-102
QTY = 1
[2]

D3-1-102
QTY = 1
[3]

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"	●	○
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"	●	○
SIGNAL SUPPORT POLE	■	□
PEDESTRIAN SIGNAL	┐	┐
PEDESTRIAN PUSH BUTTON	—	—
PEDESTAL SUPPORT	■	□
CONTROLLER CABINET AND WORK PAD (TS-2)	▭	▭
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT	◀	◁
CCTV-IP CAMERA	▭	
RADIO ANTENNA	┼	┼
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT	▬	▭
DETECTOR LOOP	▱	▱
DETECTION ZONE	▨	
DETECTION COUNT	▩	

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
S. CHILLICOTHE RD. (S.R. 43) & GREENBRIAR/ CHATHAM
POR-AURORA SIGNALS

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SIGNAL TIMING CHART

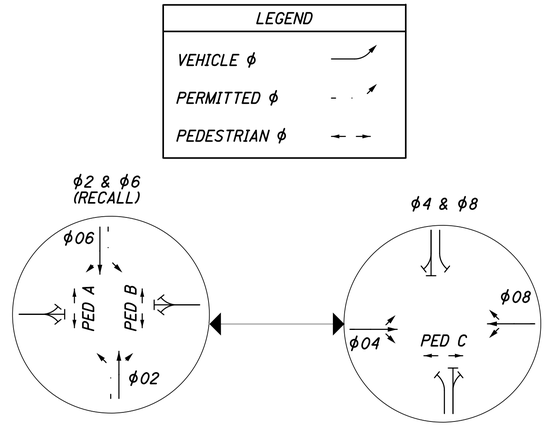
INTERSECTION:			Chillicothe Rd. & Greenbriar/Chathem Dr.						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:	2,4,6,8		
			REST IN RED:	RING 1	-		RING 2	-	
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH, ALL RED:	9	, 6							
FIRST PHASE(S):	2	6	PHASES			-	-	-	-
COLOR DISPLAYED:	G								
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			-	2	-	4	-	6	-	8
DIRECTION			-	NB	-	EB	-	SB	-	WB
MINIMUM GREEN (INITIAL)		(SEC.)	-	20	-	8	-	20	-	8
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	-	3.0	-	4.0	-	3.0	-	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	-	80	-	30	-	80	-	30
MAXIMUM GREEN II		(SEC.)	-	80	-	30	-	80	-	25
YELLOW CHANGE		(SEC.)	-	4.4	-	3.3	-	4.4	-	3.3
ALL RED CLEARANCE		(SEC.)	-	1.0	-	1.0	-	1.0	-	1.0
WALK		(SEC.)	-	8	-	9	-	8	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	10	-	15	-	10	-	-
RECALL	MAXIMUM	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF
	MINIMUM	(ON/OFF)	-	ON	-	OFF	-	ON	-	OFF
	PEDESTRIAN	(ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF
MEMORY		(ON/OFF)	-	OFF	-	OFF	-	OFF	-	OFF

*VOLUME DENSITY CONTROLS

NOTES:

- COUNTDOWN PEDESTRIAN SIGNALS SHALL GO TO ZERO ON YELLOW PER OMUTCD FIGURE 4E-2.
- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM



PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(4) (EASTBOUND ONLY)

CHANNEL 4 = ϕ(8) (WESTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D4	P	6' X 30'	PRESENCE	0	-	4-1	ϕ4
D8	P	6' X 30'	PRESENCE	0	-	8-2	ϕ8

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	NB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	175	125-300
D6	SB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	175	125-300
SYS	NB THRU	PULSE	SYS	0	-	-	SYSTEM	8	250

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

HORIZONTAL SCALE IN FEET (0, 10, 20, 40)

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
CHILLICOTHE RD (S.R. 43) & GREENBRIAR/ CHATHAM DR.

POR-AURORA SIGNALS

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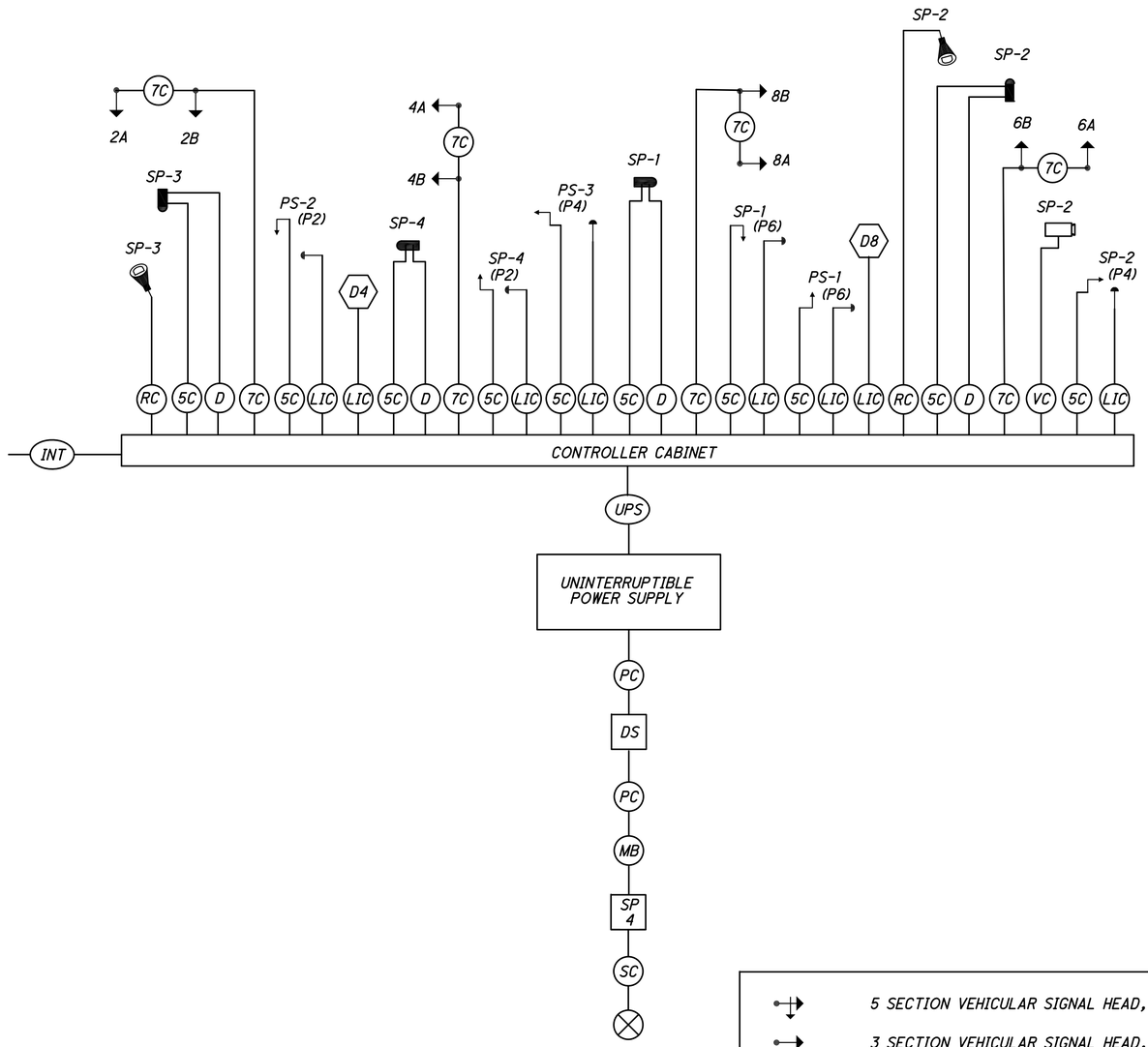
WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH	SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
2A	R	Ø2 R	Y	6B	R	Ø6 R	Y
	Y	Ø2 Y			Y	Ø6 Y	
(NB)	G	Ø2 G		(SB)	G	Ø6 G	
2B	R	Ø2 R	Y	8A	R	Ø8 R	R
	Y	Ø2 Y			Y	Ø8 Y	
(NB)	G	Ø2 G		(WB)	G	Ø8 G	
4A	R	Ø4 R	R	8B	R	Ø8 R	R
	Y	Ø4 Y			Y	Ø8 Y	
(EB)	G	Ø4 G		(WB)	G	Ø8 G	
4B	R	Ø4 R	R	PEDESTRIAN MOVEMENTS			
	Y	Ø4 Y		PED A	W	Ø6 PED/LS15 G	OUT
(EB)	G	Ø4 G		WEST	DW	Ø6 PED/LS15 R	
6A	R	Ø6 R	Y	PED B	W	Ø2 PED/LS13 G	OUT
	Y	Ø6 Y		EAST	DW	Ø2 PED/LS13 R	
(SB)	G	Ø6 G		PED B	W	Ø4 PED/LS14 G	OUT
LS = LOAD SWITCH				SOUTH	DW	Ø4 PED/LS14 R	

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- DILEMMA ZONE RADAR DETECTION UNIT
- STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- L — VEHICLE LOOP DETECTOR
- D — PREEMPTION DETECTOR CABLE
- LIC — 2/C NO. 14 AWG (LEAD-IN CABLE)
- 3C — SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- 5C — SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- 7C — SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- RC — RADAR DETECTION CABLE
- VC — VIDEO CAMERA CABLE
- INT — INTERCONNECT CABLE
- SC — SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- PC — POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 — SIGNAL SUPPORT POLE NO. __
- MB — METER BASE
- POWER SOURCE
- DS — DISCONNECT SWITCH
- UPS — UNINTERRUPTIBLE POWER SUPPLY CABLE
- CCTV-IP CAMERA

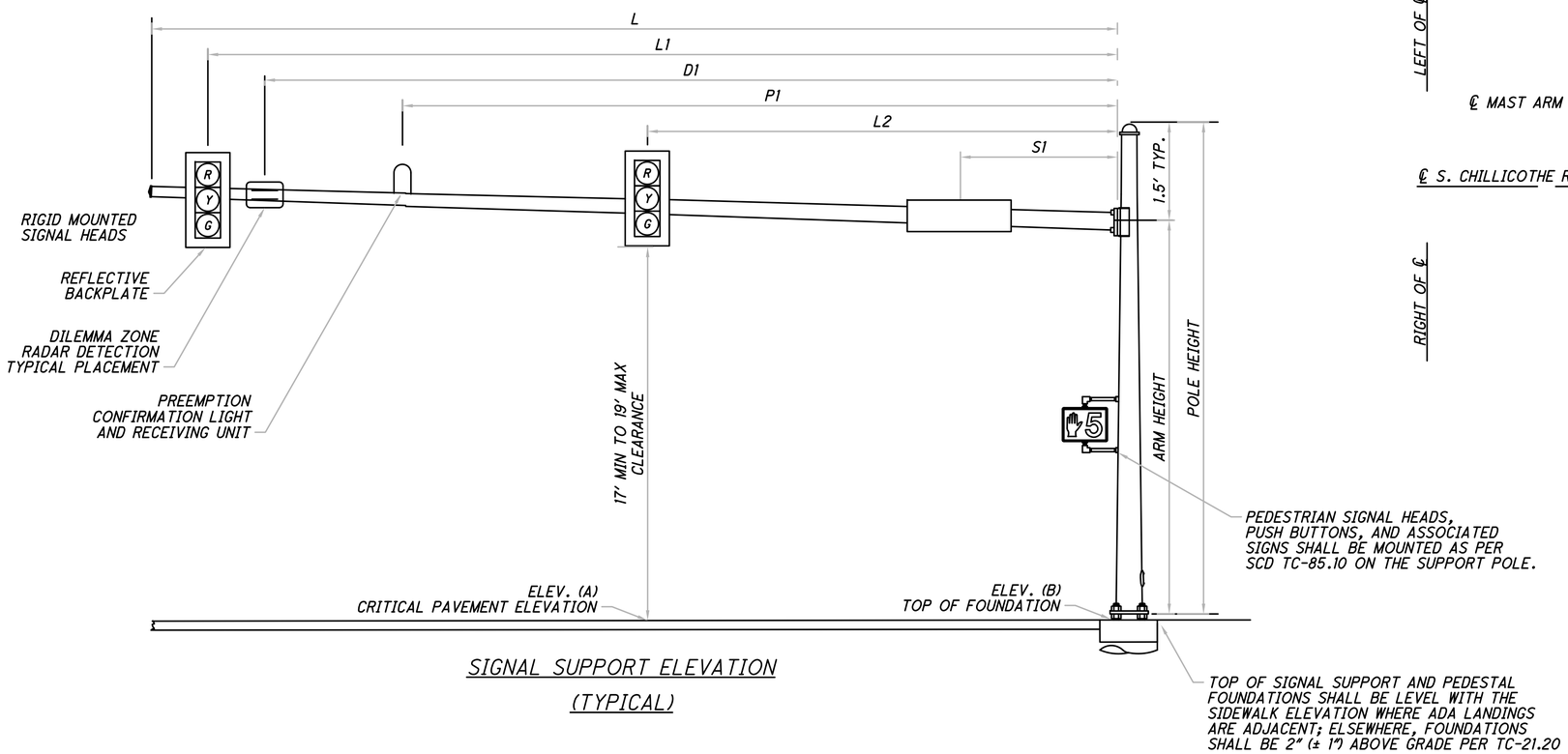
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

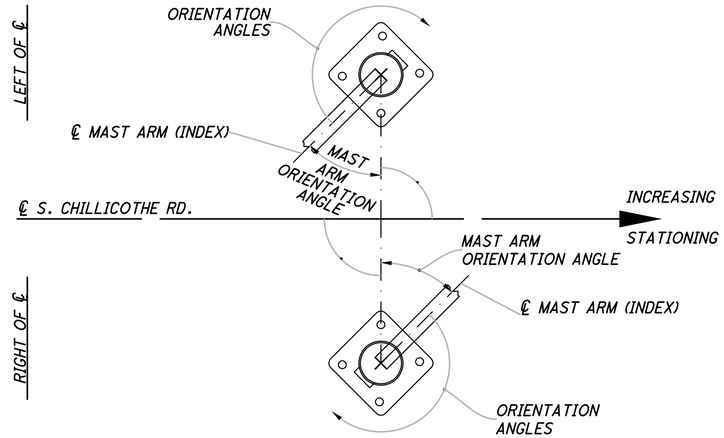
SIGNAL DETAIL PLAN
S. CHILLICOTHE RD. (S.R. 43) & GREENBRIAR/ CHATHAM

POR-AURORA SIGNALS

95
133



SIGNAL SUPPORT ELEVATION
(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM								
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	D1	P1	S1	S2	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	CONTROLLER	BRACKET ARM	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	1+20.4	44.7' L	1197.08	1195.67	TC-81.21	2	23.0	21.5	26	23	14	-	19	7	-	90	-	270	270	-	-	-	180	-
SP-2	0+65.1	42.6' L	1197.08	1196.73	TC-81.21	3	22.0	20.5	35	32	20	29	26	-	13	0	-	270	270	90	-	-	180	90
SP-3	1+38.9	32.3' R	1197.08	1196.54	TC-81.21	3	22.0	20.5	33	30	16	27	24	-	9	0	-	-	-	-	-	-	180	-
SP-4	0+69.9	38.7' R	1197.08	1196.57	TC-81.21	3	22.0	20.5	33	30	22	-	26	11	-	90	-	0	0	-	-	-	180	-
PS-1	0+76.8	47.8' L	-	-		-	8											0	0				180	
PS-2	1+21.9	44.9' R	-	-		-	8											0	0				180	
PS-3	0+72.5	54.5' R	-	-		-	8											0	0				180	

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
S. CHILLICOTHE RD. (SR 43) & GREENBRIER/ CHATHAM

POR-AURORA SIGNALS

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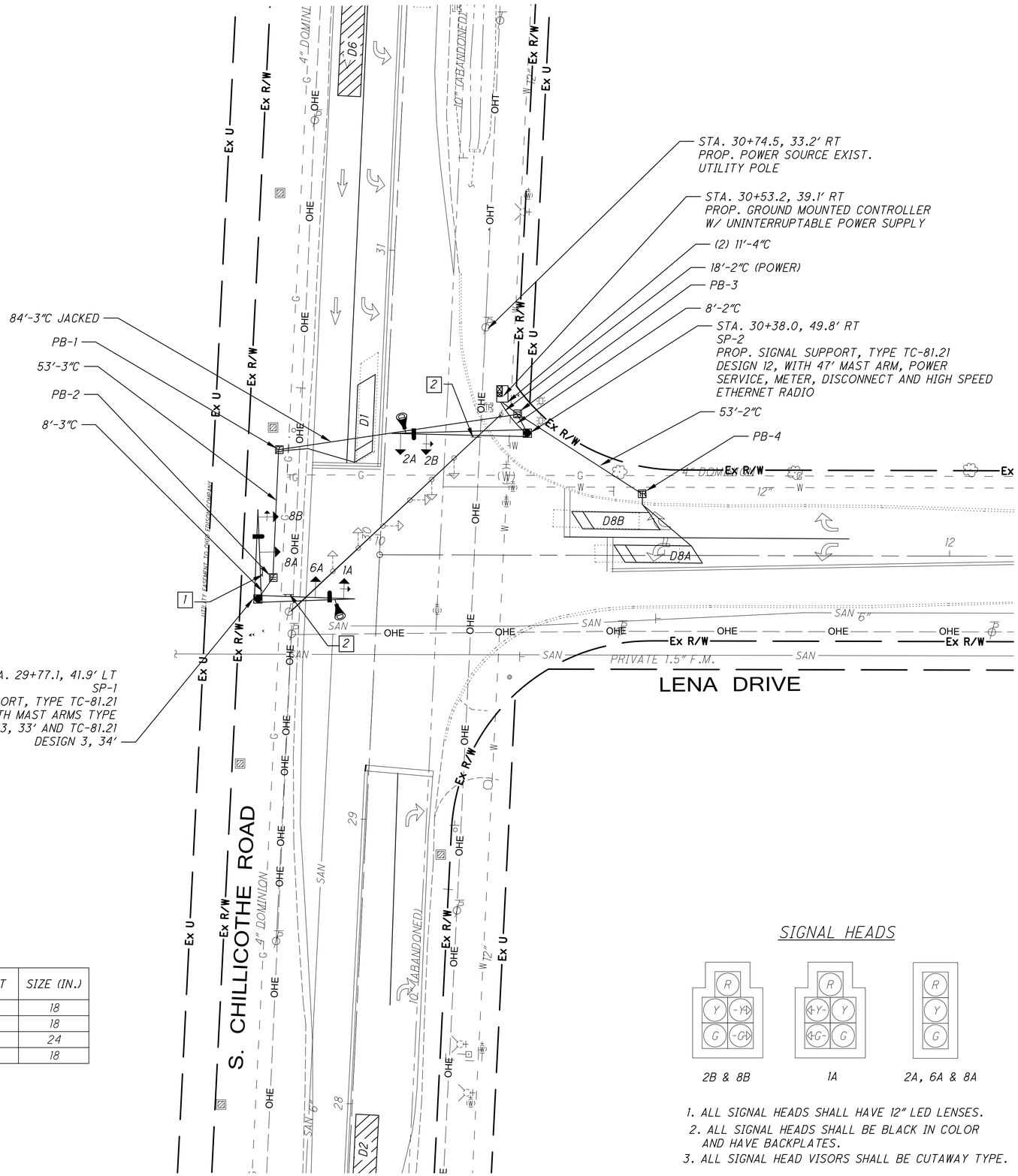
MAST ARM SIGNAGE

S Chillicothe Rd
D3-1-144
QTY = 1
1

Lena DR
D3-1-72
QTY = 2
2



EXIST. SIGNAL REMOVAL TABLE

SIGNAL ITEM	STATION	SIDE	OFFSET
PULLBOX	30+52.8	RT	35.6'
WOOD POLE	29+70.6	LT	31.5'
WOOD POLE	30+50.8	RT	40.0'
CONTROLLER	30+50.8	RT	40.0'

PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	30+34.9	LT	37.3'	18
PB-2	29+82.5	LT	36.3'	18
PB-3	30+44.7	RT	45.6'	24
PB-4	30+18.9	RT	91.1'	18

SIGNAL HEADS

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

LEGEND

	PROP	EXIST
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12"		
SIGNAL SUPPORT POLE		
PEDESTRIAN SIGNAL		
PEDESTRIAN PUSH BUTTON		
PEDESTAL SUPPORT		
CONTROLLER CABINET AND WORK PAD (TS-2)		
TRAFFIC PULL BOX	TR	TR
DILEMMA ZONE RADAR DETECTION UNIT		
RADIO ANTENNA		
PREEMPTION CONFIRMATION LIGHT /RECEIVING UNIT		
DETECTOR LOOP		
DETECTION ZONE		
DETECTION COUNT		

N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL PLAN
S. CHILLICOTHE RD. (S.R. 43) & LENA DRIVE
POR-AURORA SIGNALS

SIGNAL TIMING CHART

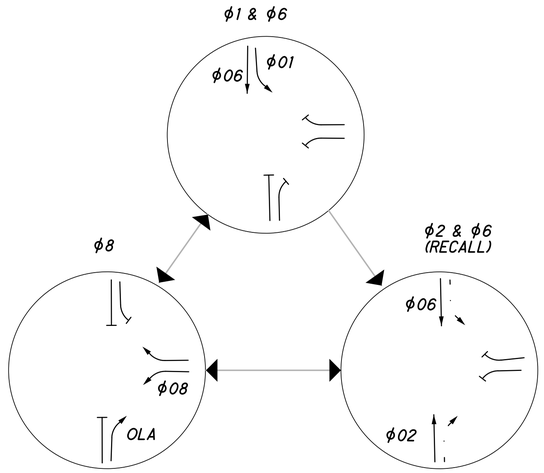
INTERSECTION:			SR 43 & Lena Drive						
MAINTAINING AGENCY:			City of Aurora						
START UP			DUAL ENTRY:	Yes		PHASES:		2,4,6,8	
			REST IN RED:		RING 1	-		RING 2	-
START IN:	FLASH		OVERLAP			A	B	C	D
TIME FOR FLASH, ALL RED:	9,	6							
FIRST PHASE(S):	2	6							
COLOR DISPLAYED:	G		PHASES			8	-	-	-
INTERVAL OR FEATURE			CONTROLLER MOVEMENT NO.						
INTERSECTION MOVEMENT (PHASE)			1	2	-	-	-	6	-	8
DIRECTION			SB L	NB	-	-	-	SB	-	WB
MINIMUM GREEN (INITIAL)		(SEC.)	7	20	-	-	-	20	-	10
ADDED INITIAL		*(SEC./ACTUATION)	-	-	-	-	-	-	-	-
MAXIMUM INITIAL		*(SEC.)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP)		(SEC.)	2.5	4.0	-	-	-	4.0	-	4.0
TIME BEFORE REDUCTION		*(SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP		*(SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE		*(SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I		(SEC.)	15	35	-	-	-	50	-	25
MAXIMUM GREEN II		(SEC.)	15	35	-	-	-	50	-	25
YELLOW CHANGE		(SEC.)	4.3	5.2	-	-	-	5.2	-	4.1
ALL RED CLEARANCE		(SEC.)	1.7	1.0	-	-	-	1.0	-	1.0
WALK		(SEC.)	-	-	-	-	-	-	-	-
PEDESTRIAN CLEARANCE		(SEC.)	-	-	-	-	-	-	-	-
RECALL	MAXIMUM	(ON/OFF)	OFF	OFF	-	-	-	OFF	-	OFF
	MINIMUM	(ON/OFF)	OFF	ON	-	-	-	ON	-	OFF
	PEDESTRIAN	(ON/OFF)	OFF	OFF	-	-	-	OFF	-	OFF
MEMORY		(ON/OFF)	OFF	OFF	-	-	-	OFF	-	OFF

*VOLUME DENSITY CONTROLS

NOTES:

- RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLES TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6 SECONDS. SPEED TRIGGER SHALL BE SET FOR VEHICLES TRAVELING 35 MPH AND GREATER.
- RADAR SHALL HAVE QUEUE DETECTION CONFIGURED AND A ZONE PLACED AT 100-200 FEET FROM STOP BAR FOR SLOW MOVING VEHICLE EXTENSIONS. SPEED TRIGGER SHALL BE SET AT 1-35 MPH.
- ALL DETECTOR DELAYS SHALL BE PLACED IN THE CONTROLLER.

PHASING DIAGRAM



LEGEND

VEHICLE ϕ

PERMITTED ϕ

PEDESTRIAN ϕ

PREEMPT CHANNELS

CHANNEL 1 = ϕ(2) (NORTHBOUND ONLY)

CHANNEL 2 = ϕ(6) (SOUTHBOUND ONLY)

CHANNEL 3 = ϕ(8) (WESTBOUND ONLY)

PREEMPT NOTES:

1. IF ACTIVE PHASE CONFLICTS WITH PREEMPT PHASE CALL, IT SHALL IMMEDIATELY TIME ITS YELLOW AND RED CLEARANCES.
2. IF ACTIVE PHASE = THE PREEMPT PHASE, THEN THE PHASE SHALL HOLD FOR THE DURATION OF THE PREEMPT SIGNAL.
3. AFTER RELEASE FROM PREEMPT, YELLOW AND RED CLEARANCE SHALL BE DISPLAYED AND RETURNED PHASE SHALL BE ϕ (2+6).
4. IF PREEMPT PHASE = RETURN PHASE ϕ (2+6) THEN YELLOW AND ALL RED CLEARANCE AFTER PREEMPT SHALL NOT BE DISPLAYED.

TRAFFIC SIGNAL DETECTOR CHART

LOOP DESIGNATION	LOOP CONFIGURATION**	SIZE (FT.)	PULSE OR PRESENCE	DELAY PROGRAMMED IN CONTROLLER (SEC.)	EXTENSION PROGRAMMED IN CONTROLLER (SEC.)	CONNECT TO DETECTOR UNIT (UNIT-CHANNEL)	ASSOCIATED CONTROLLER PHASE
D1	P	6' X 30'	PRESENCE	2	-	1-1	ϕ1
D8A	P	6' X 30'	PRESENCE	2	-	8-1	ϕ8
D8B	P	6' X 30'	PRESENCE	8	-	8-2	ϕ8

** CONFIGURATIONS: POWERHEAD (P), QUADRUPOLE (Q), ANGULAR DESIGN DETECTOR (ADD), OR RECTANGULAR (R); PER TC-82.10

RADAR DETECTION CHART

DETECTION ZONE	MOVEMENT	PULSE OR PRESENCE	ASSOCIATED PHASE	DELAY PROGRAMMED IN CONTROLLER (SEC)	EXTENSION PROGRAMMED IN CONTROLLER (SEC)	DELAY INHIBIT PHASE	PURPOSE	DETECTION ZONE LENGTH (FT)	LOCATION FROM STOP BAR (FT)
D2	NB THRU	PULSE	ϕ2	0	-	-	EXTEND ϕ2	185	175-360
D6	SB THRU	PULSE	ϕ6	0	-	-	EXTEND ϕ6	185	175-360

NOTE: DILEMMA ZONE SPEED THRESHOLD >35 MPH

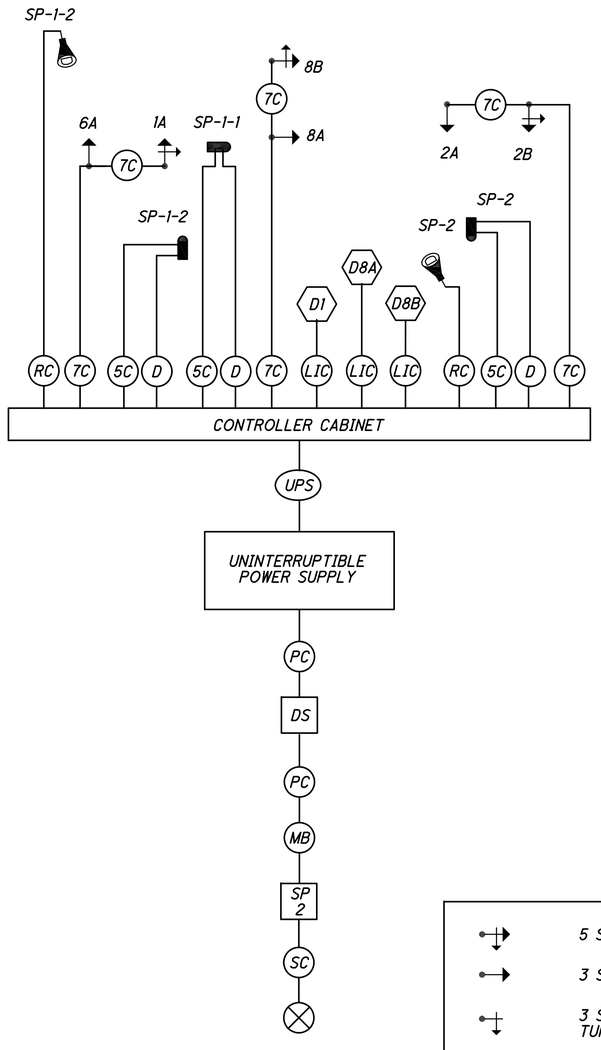
HORIZONTAL SCALE IN FEET (0, 10, 20, 40)

CALCULATED JAT | CHECKED MWS

TRAFFIC SIGNAL PLAN DETAILS
S. CHILLICOTHE RD. (S.R. 43) & LENA DR.

POR-AURORA SIGNALS

WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
1A (SB LT)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
	<--Y---	Ø1 Y	
	<--G---	Ø1 G	
2A (NB)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
2B (NB RT)	R	Ø2 R	Y
	Y	Ø2 Y	
	G	Ø2 G	
	---Y-->	Ø8 Y	
	---G-->	Ø8 G	
6A (SB)	R	Ø6 R	Y
	Y	Ø6 Y	
	G	Ø6 G	
LS = LOAD SWITCH			

SIGNAL HEAD	INDICATION	FIELD TERMINAL	FLASH
8A (WB)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
8B (WB RT)	R	Ø8 R	R
	Y	Ø8 Y	
	G	Ø8 G	
	---Y-->	Ø1 Y	
	---G-->	Ø1 G	
OVERLAPS			
OLA	---Y-->	Ø8 Y/LS10 Y	-
	---G-->	Ø8 G/LS10 G	
OLA = LS 10			
OLB	---Y-->	Ø1 Y/LS9 Y	-
	---G-->	Ø1 G/LS9 G	
OLA = LS 9			

LEGEND

- 5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY
- 3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- (D) DILEMMA ZONE RADAR DETECTION UNIT
- (S) STOP BAR RADAR DETECTION UNIT
- PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT
- (L) VEHICLE LOOP DETECTOR
- (D) PREEMPTION DETECTOR CABLE
- (LIC) 2/C NO. 14 AWG (LEAD-IN CABLE)
- (3C) SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
- (5C) SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
- (7C) SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
- (RC) RADAR DETECTION CABLE
- (VC) VIDEO CAMERA CABLE
- (INT) INTERCONNECT CABLE
- (SC) SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
- (PC) POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
- SP 1 SIGNAL SUPPORT POLE NO. __
- (MB) METER BASE
- (⊗) POWER SOURCE
- DS DISCONNECT SWITCH
- (UPS) UNINTERRUPTIBLE POWER SUPPLY CABLE

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
S. CHILLICOTHE RD. (S.R. 43) & LENA DRIVE

POR-AURORA SIGNALS

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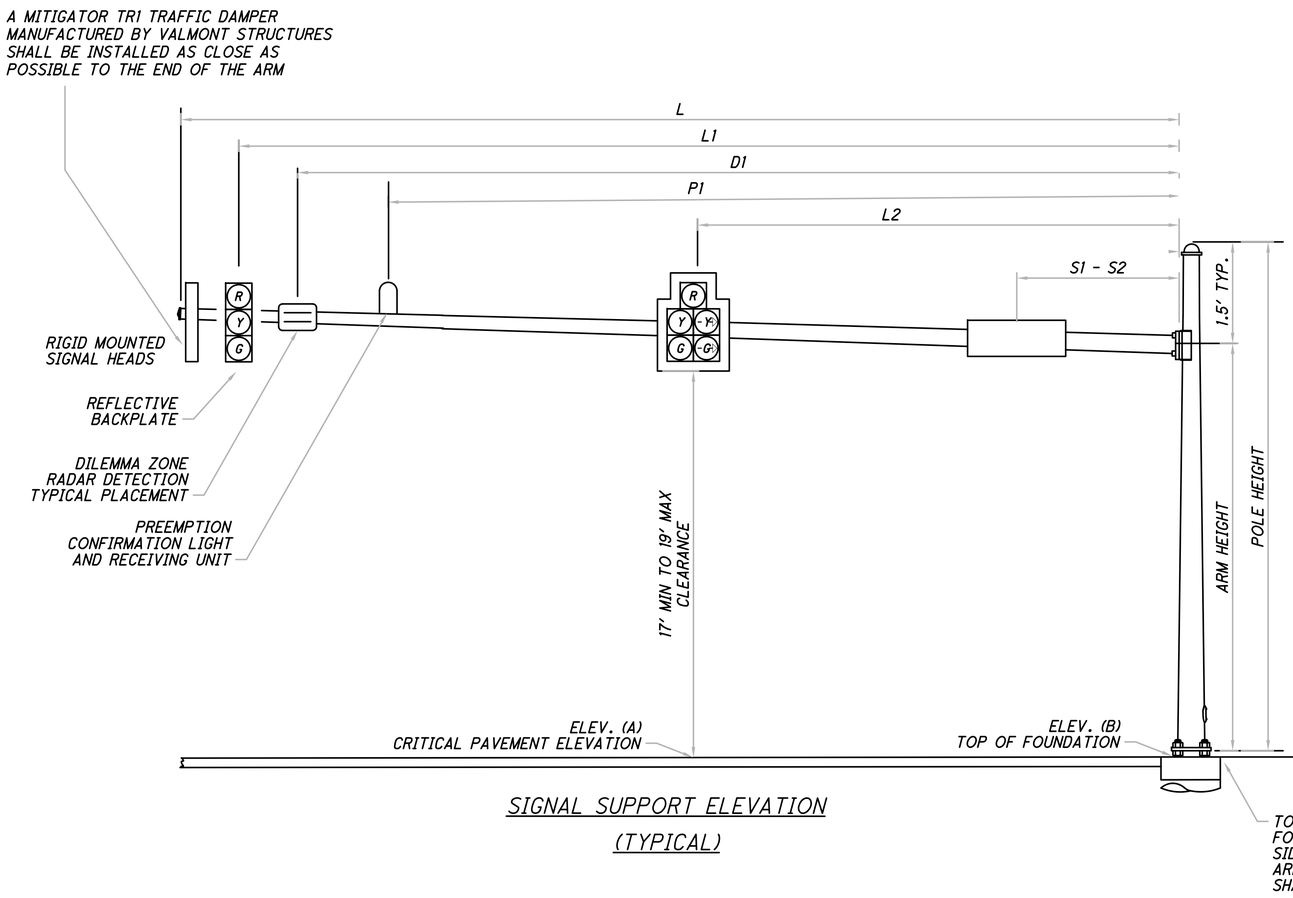
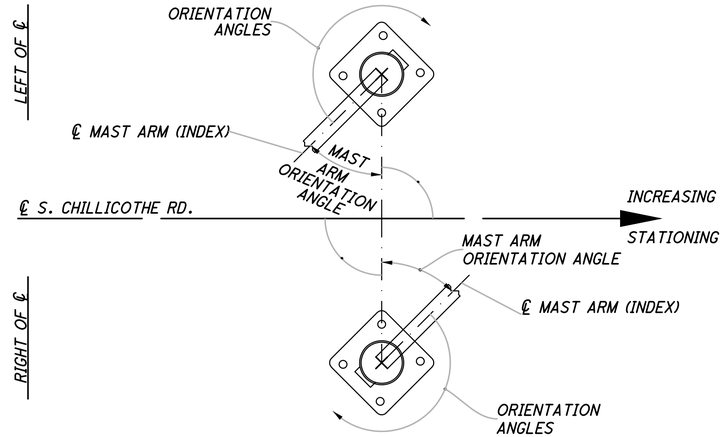


SIGNAL SUPPORT ELEVATION
(TYPICAL)



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM								
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	D1	P1	S1	S2	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	CONTROLLER	BRACKET ARM	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	29+77.1	41.9' L	1195.38	1195.46	TC-81.21	4	23.0	21.5	34	31	19	27	24	-	10	270	-	-	-	-	-	-	180	-
-	-	-	-	-	-	-	-	-	33	30	20	-	23	10	-	-	90	-	-	-	-	-	-	-
SP-2	30+38.0	49.8' R	1196.83	1196.45	TC-81.21	12	22.0	20.5	47	44	35	42	39	-	18	0	-	-	-	180	-	-	180	90
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
S. CHILLICOTHE RD. (SR 43) & LENA DR.

POR-AURORA SIGNALS

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PROPOSED SIGNS

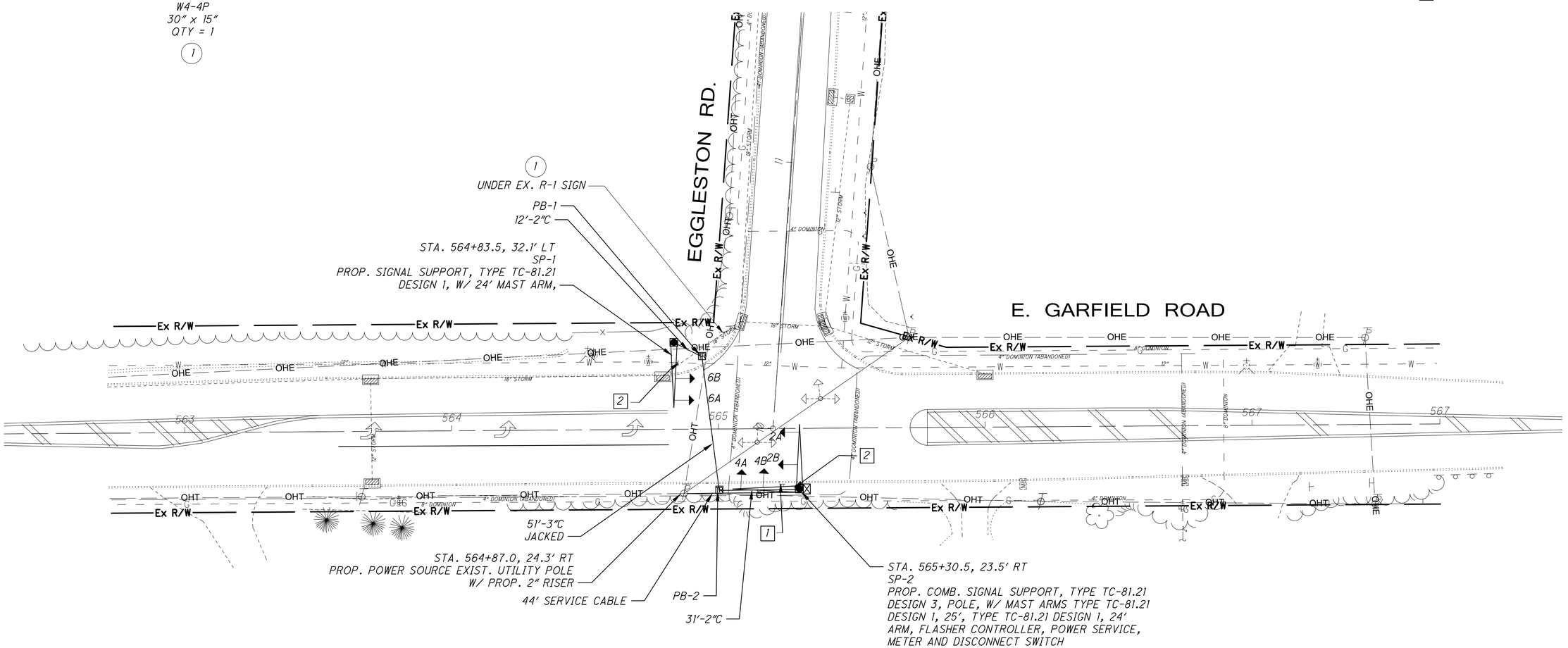
CROSS TRAFFIC DOES NOT STOP

W4-4P
30" x 15"
QTY = 1
(1)

MAST ARM SIGNAGE

E Garfield Rd
D3-1-126
QTY = 1
[1]

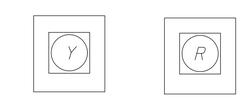
Eggleston Rd
D3-1-120
QTY = 2
[2]



PULL BOX TABLE

PULL BOX #	STATION	SIDE	OFFSET	SIZE (IN.)
PB-1	564+94.0	LT	27.2'	18
PB-2	565+00.0	RT	22.8'	18

SIGNAL HEADS



2A, 2B, 6A & 6B FLASH YELLOW
4A & 4B FLASH RED

1. ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
2. ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
3. ALL SIGNAL HEAD VISORS SHALL BE CUTAWAY TYPE.

LEGEND

	PROP
TRAFFIC SIGNAL, 1 UNIT HEAD, 12"	●→
SIGNAL SUPPORT POLE	◉
CONTROLLER CABINET AND WORK PAD (TS-2)	⊠
TRAFFIC PULL BOX	TR

N

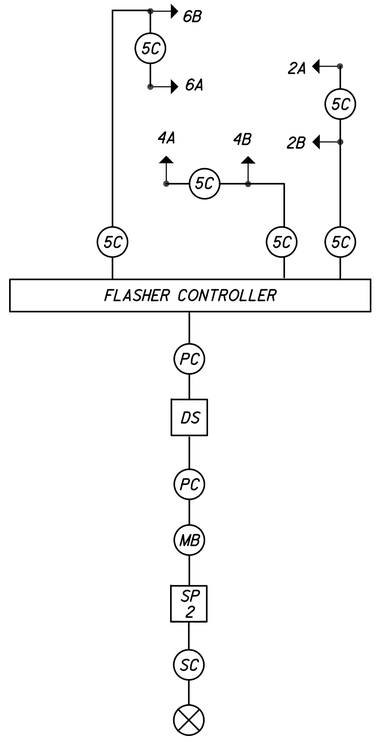
0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JAT
CHECKED MWS

TRAFFIC FLASHER PLAN
E. GARFIELD RD. (S.R. 82) & EGGLESTON RD.

POR-AURORA SIGNALS

WIRING DIAGRAM



LEGEND

	5 SECTION VEHICULAR SIGNAL HEAD, 1-WAY	L	VEHICLE LOOP DETECTOR	SC	SERVICE CABLE, 3 CONDUCTOR, NO. 6 AWG
	3 SECTION VEHICULAR SIGNAL HEAD, 1-WAY	D	PREEMPTION DETECTOR CABLE	PC	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG
	3 SECTION VEHICULAR SIGNAL HEAD, TURN ARROWS 1-WAY	LIC	2/C NO. 14 AWG (LEAD-IN CABLE)	SP 1	SIGNAL SUPPORT POLE NO. __
	PEDESTRIAN SIGNAL HEAD	3C	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG	MB	METER BASE
	PEDESTRIAN PUSH BUTTON	5C	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG		POWER SOURCE
D	DILEMMA ZONE RADAR DETECTION UNIT	7C	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	DS	DISCONNECT SWITCH
S	STOP BAR RADAR DETECTION UNIT	RC	RADAR DETECTION CABLE	UPS	UNINTERRUPTIBLE POWER SUPPLY CABLE
	PREEMPTION CONFIRMATION LIGHT AND RECEIVING UNIT	VC	VIDEO CAMERA CABLE	PTZ	PTZ CAMERA
		INT	INTERCONNECT CABLE		

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
E. GARFIELD RD. (S.R. 82) & EGGLESTON RD.

POR-AURORA SIGNALS

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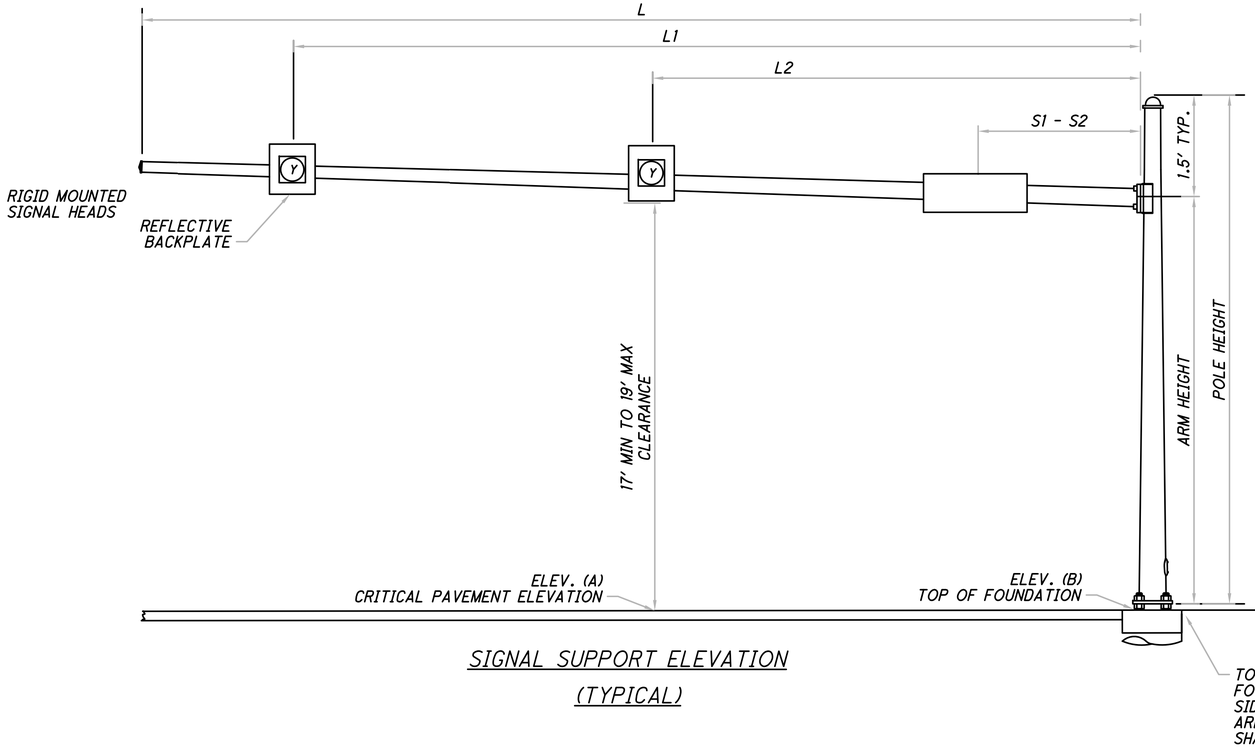
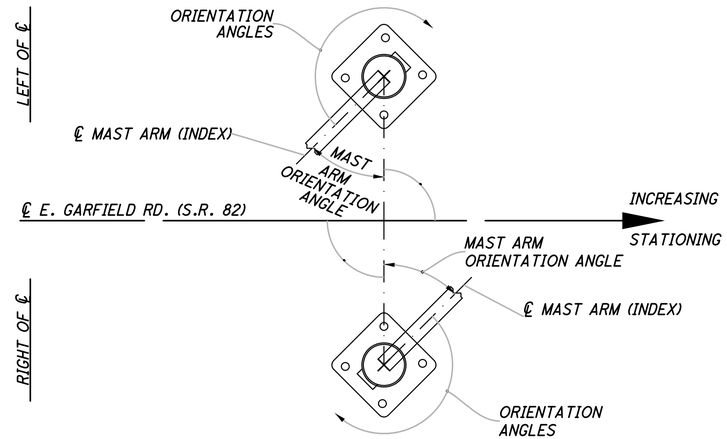


SIGNAL SUPPORT ELEVATION

(TYPICAL)

TOP OF SIGNAL SUPPORT AND PEDESTAL FOUNDATIONS SHALL BE LEVEL WITH THE SIDEWALK ELEVATION WHERE ADA LANDINGS ARE ADJACENT; ELSEWHERE, FOUNDATIONS SHALL BE 2" (± 1") ABOVE GRADE PER TC-21.20



POLE ORIENTATION

MAST ARM TABLE

SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS										ORIENTATION ANGLES FROM MAST ARM								
			A	B	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	S1	S2	MAST ARM A ANGLE	MAST ARM B ANGLE	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	POWER SERVICE	CONTROLLER	BRACKET ARM	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG
SP-1	564+83.5	32.1' L	1125.70	1124.78	TC-81.21	1	20.5	19.0	24	21	13	-	7	-	0	-	-	-	-	-	-	180	-
SP-2	565+30.5	23.5' R	1125.30	1126.28	TC-81.21	3	19.5	18.0	25	22	14	-	7	-	270	-	-	-	270	180	-	180	-
-	-	-	-	-	-	-	-	-	24	21	9	-	5	-	-	90	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SIGNAL DETAIL PLAN
E. GARFIELD RD. (SR 82) & EGGLESTON RD.

POR-AURORA SIGNALS

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INTERSECTION:	Aurora Rd (S.R. 43) & Moneta Ave									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	-	2	-	4	-	6	-	-		
PLAN NO. / DIRECTION	-	NB	-	EB	-	SB	-	-		
1		55		30		55			85	12
2		52		28		52			80	72
3		62		28		62			90	59
-										
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

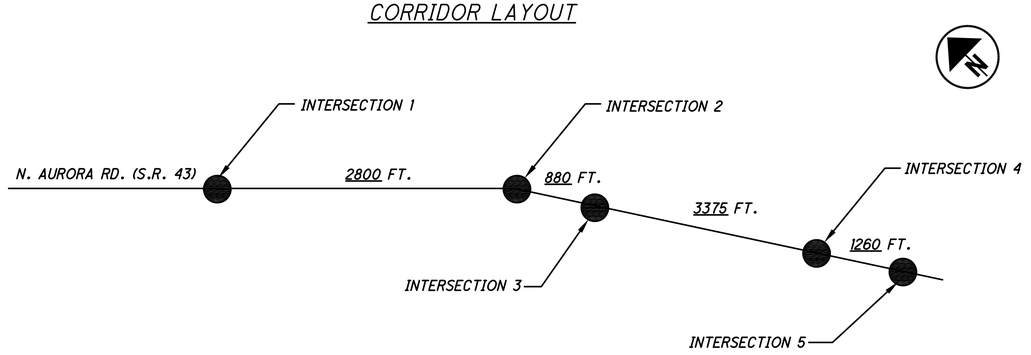
INTERSECTION:	Aurora Rd (S.R. 43) & Squires Rd									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	3	-	-	6	-	8		
PLAN NO. / DIRECTION	SB L	NB	WB L	-	-	SB	-	WB		
1	15	45	25			60		25	85	26
2	15	40	25			55		25	80	6
3	16	51	23			67		23	90	52
-										
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

INTERSECTION:	Aurora Rd (S.R. 43) & Treat Rd									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	-	4	-	6	-	8		
PLAN NO. / DIRECTION	SB L	NB	-	EB	-	SB	-	WB		
1	18	46		21		64		21	85	34
2	16	43		21		59		21	80	78
3	15	53		22		68		22	90	42
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

INTERSECTION:	Aurora Rd (S.R. 43) & Sycamore Dr									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	-	4	5	6	-	8		
PLAN NO. / DIRECTION	SB L	NB	-	EB	NB L	SB	-	WB		
1	17	45		23	17	45		23	85	72
2	18	43		19	18	43		19	80	34
3	17	56		17	16	57		17	90	88
-										
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

INTERSECTION:	Aurora Rd (S.R. 43) & Bissel Rd									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	-	2	-	4	-	6	-	-		
PLAN NO. / DIRECTION	-	NB	-	EB	-	SB	-	-		
1		45		40		45			85	31
2		44		36		44			80	46
3		54		36		54			90	88
-										
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

CORRIDOR LAYOUT



COORDINATION TIMING PLANS

Days	Time	Plan
MON - FRI	0:00 - 7:00 AM	FREE
MON - FRI	7:00 - 11:00 AM	1
MON - FRI	11:00 - 3:00 PM	2
MON - FRI	3:00 - 7:00 PM	3
MON - FRI	7:00 - 9:00 PM	1
MON - FRI	9:00 - 12:00 PM	FREE

Days	Time	Plan
SAT	0:00 - 9:00 AM	FREE
SAT	9:00 - 11:00 AM	1
SAT	11:00 - 1:00 PM	2
SAT	1:00 - 6:00 PM	3
SAT	6:00 - 8:00 PM	1
SAT	8:00 - 12:00 PM	FREE

Days	Time	Plan
SUN	0:00 - 9:00 AM	FREE
SUN	9:00 - 11:00 AM	1
SUN	11:00 - 1:00 PM	2
SUN	1:00 - 4:00 PM	3
SUN	4:00 - 7:00 PM	1
SUN	7:00 - 12:00 PM	FREE

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL COORDINATION PLAN

POR-AURORA SIGNALS

104
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COORDINATION TIMING CHARTING CHART

INTERSECTION:	Garfield Rd (S.R. 82) & Bissel Rd									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	3	4	5	6	7	8		
PLAN NO. / DIRECTION	WB L	WB	NB L	SB	EB L	EB	SB L	NB		
1	13	42	13	32	13	42	18	27	100	56
2	16	42	14	33	16	42	16	31	105	20
3	14	44	14	38	14	44	14	38	110	66
-										
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

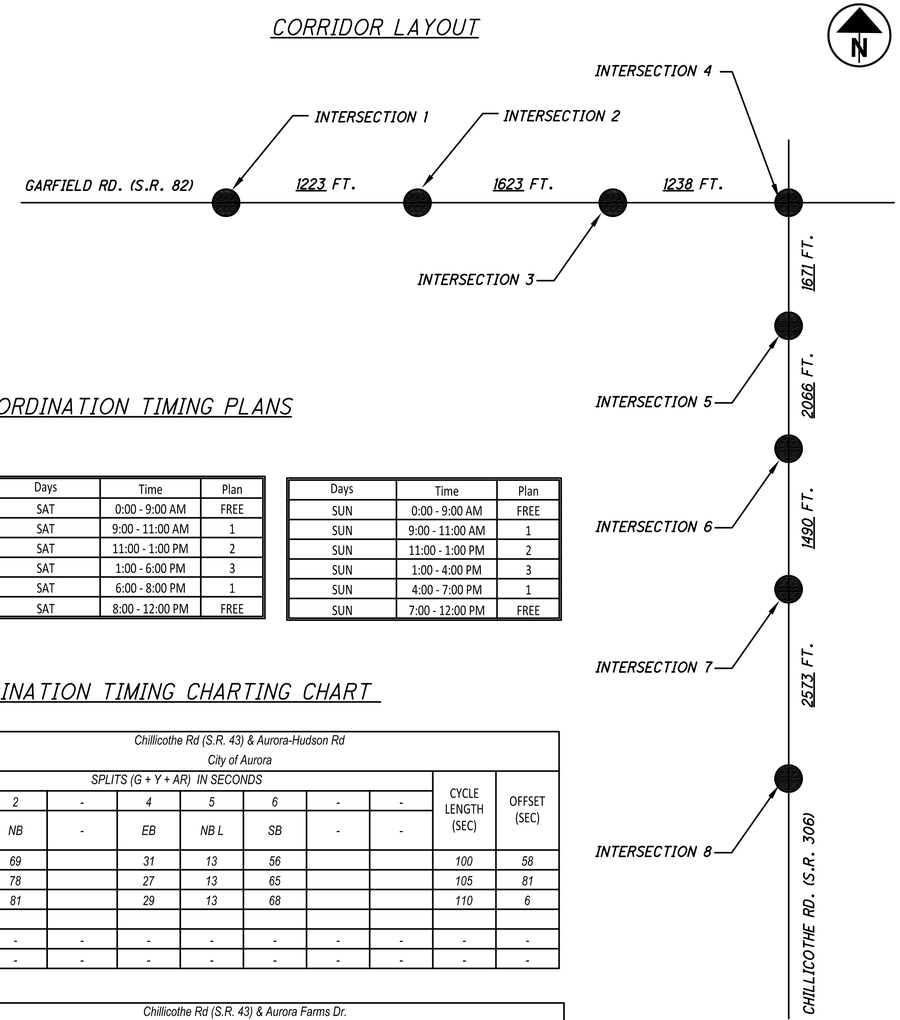
INTERSECTION:	Garfield Rd (S.R. 82) & Aurora Commons/Chase Bank									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	-	4	5	6	-	8		
PLAN NO. / DIRECTION	WB L	EB	-	SB	EB L	WB	-	NB		
1	17	52		31	13	56		31	100	49
2	20	52		33	15	57		33	105	42
3	16	63		31	13	66		31	110	108
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

INTERSECTION:	Aurora Rd (S.R. 43) & Garfield Rd (S.R. 82)									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	3	4	5	6	7	8		
PLAN NO. / DIRECTION	WB L	EB	NB L	SB	EB L	WB	SB L	NB		
1	15	41	14	30	15	41	14	30	100	0
2	15	43	16	31	15	43	16	31	105	51
3	15	43	17	35	15	43	14	38	110	0
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

INTERSECTION:	Chillicothe Rd (S.R. 306) & Garfield Rd (S.R. 82)									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	-	4	5	6	7	8		
PLAN NO. / DIRECTION	WB L	EB	-	SB	EB L	WB	SB L	NB		
1	12	41		47	12	41	12	34	100	50
2	12	37		56	12	37	12	44	105	50
3	12	44		54	13	43	13	41	110	105
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

INTERSECTION:	Chillicothe Rd (S.R. 43) & S Aurora Rd (S.R. 306)									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	3	4	5	6	-	-		
PLAN NO. / DIRECTION	SB L	NB	NB/SB	EB/WB	NB L	SB	-	-		
1	13	28	31	28	13	28			100	72
2	15	31	31	28	13	33			105	33
3	19	36	26	29	19	36			110	25
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

CORRIDOR LAYOUT



COORDINATION TIMING PLANS

Days	Time	Plan
MON - FRI	0:00 - 7:00 AM	FREE
MON - FRI	7:00 - 11:00 AM	1
MON - FRI	11:00 - 3:00 PM	2
MON - FRI	3:00 - 7:00 PM	3
MON - FRI	7:00 - 9:00 PM	1
MON - FRI	9:00 - 12:00 PM	FREE

Days	Time	Plan
SAT	0:00 - 9:00 AM	FREE
SAT	9:00 - 11:00 AM	1
SAT	11:00 - 1:00 PM	2
SAT	1:00 - 6:00 PM	3
SAT	6:00 - 8:00 PM	1
SAT	8:00 - 12:00 PM	FREE

Days	Time	Plan
SUN	0:00 - 9:00 AM	FREE
SUN	9:00 - 11:00 AM	1
SUN	11:00 - 1:00 PM	2
SUN	1:00 - 4:00 PM	3
SUN	4:00 - 7:00 PM	1
SUN	7:00 - 12:00 PM	FREE

COORDINATION TIMING CHARTING CHART

INTERSECTION:	Chillicothe Rd (S.R. 43) & Aurora-Hudson Rd									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	-	2	-	4	5	6	-	-		
PLAN NO. / DIRECTION	-	NB	-	EB	NB L	SB	-	-		
1		69		31	13	56			100	58
2		78		27	13	65			105	81
3		81		29	13	68			110	6
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

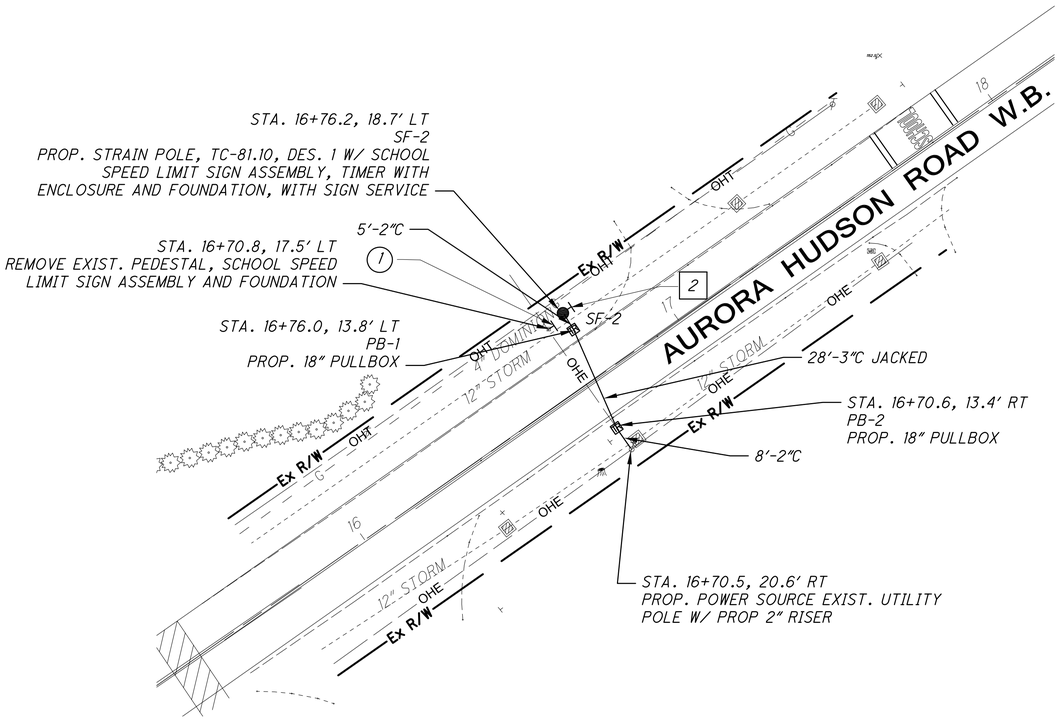
INTERSECTION:	Chillicothe Rd (S.R. 43) & Aurora Farms Dr.									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (SEC)
PHASE	1	2	-	-	-	6	-	8		
PLAN NO. / DIRECTION	SB L	NB	-	-	-	SB	-	WB		
1	14	60				74		26	100	31
2	16	63				79		26	105	26
3	15	69				84		26	110	84
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

INTERSECTION:	Chillicothe Rd. & Greenbriar/Chathem Dr.									
MAINTAINING AGENCY:	City of Aurora									
	SPLITS (G + Y + AR) IN SECONDS								CYCLE LENGTH (SEC)	OFFSET (%)
PHASE	-	2	-	4	-	6	-	8		
PLAN NO. / DIRECTION	-	NB	-	EB	-	SB	-	WB		
1		65		35		65		35	100	66
2		74		31		74		31	105	70
3		77		33		77		33	110	80
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

CALCULATED JAT
CHECKED MWS

TRAFFIC SIGNAL COORDINATION PLAN

POR-AURORA SIGNALS

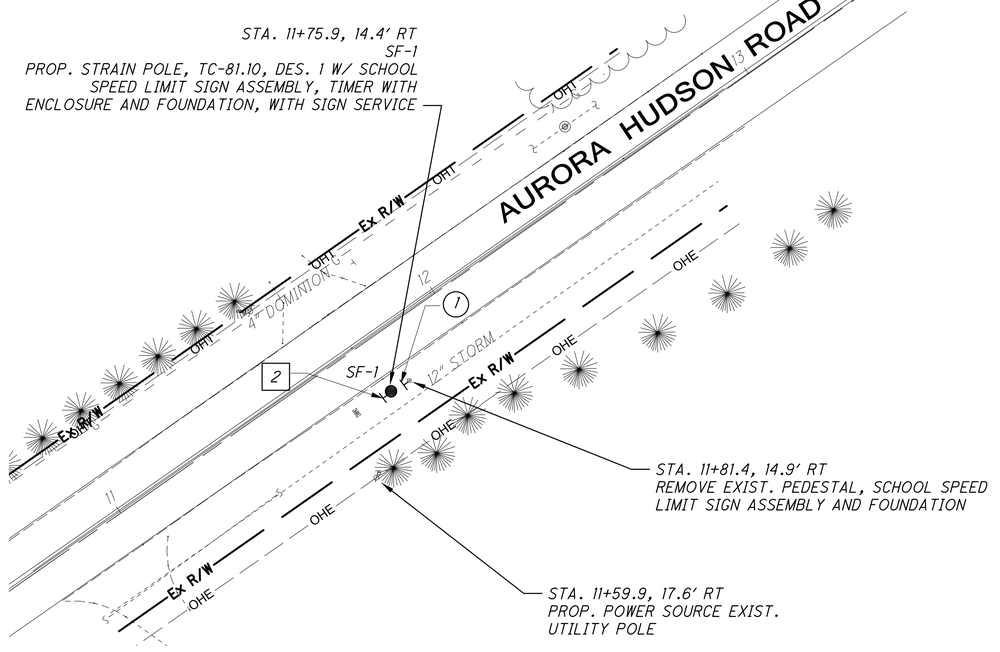


EXISTING FLASHER TO BE REMOVED

S5-H4-B
QTY = 2
(1)

PROPOSED SCHOOL SPEED LIMIT SIGN ASSEMBLY
WITH REAR FACING BEACON

S5-H3-B
24" X 48"
QTY = 2
[2]



N

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED JAT
CHECKED MWS

SCHOOL FLASHER PLAN

AURORA HUDSON RD & LEIGHTON\ MIDDLE SCHOOL DRIVE

POR-AURORA SIGNALS

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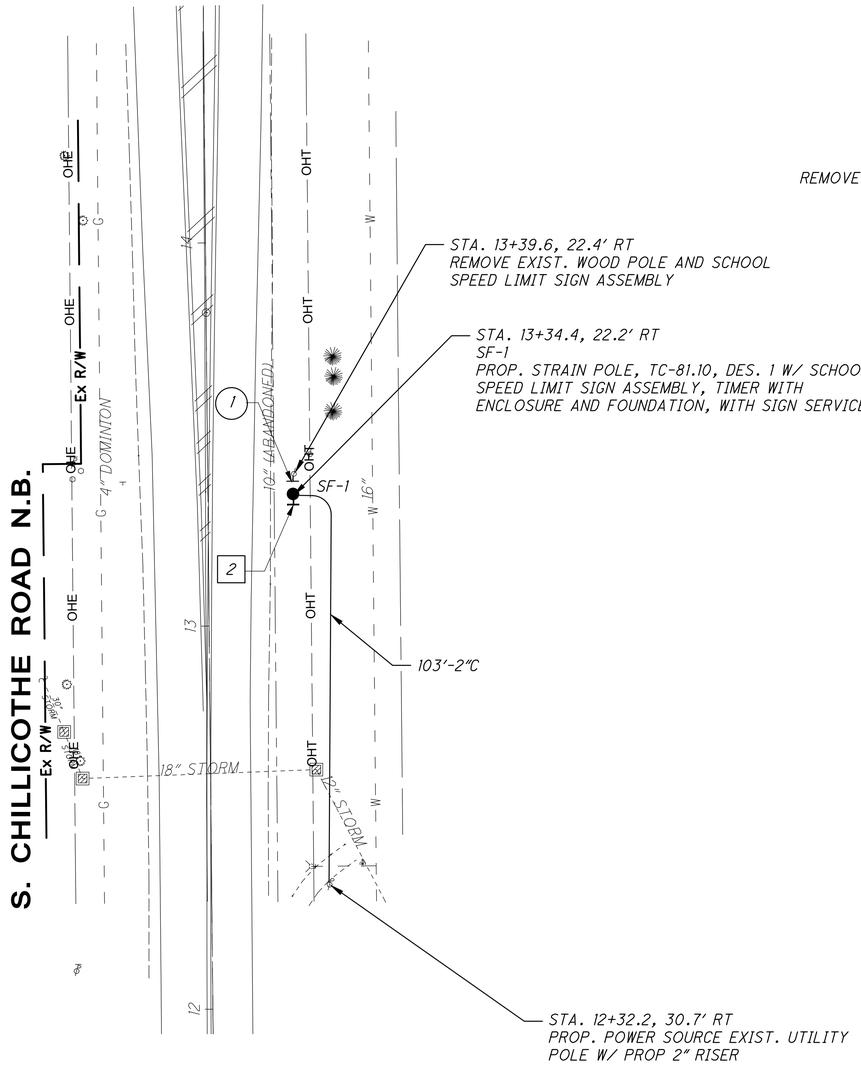
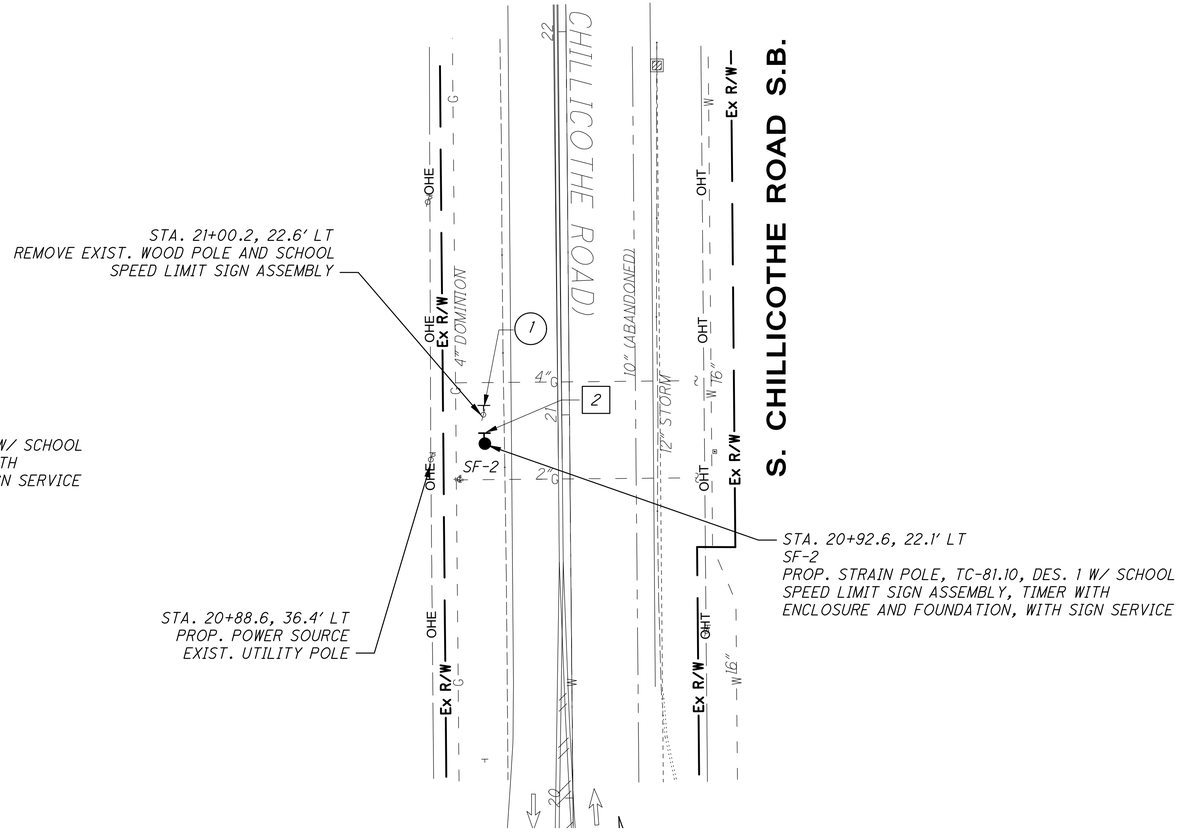




EXISTING FLASHER
TO BE REMOVED

S5-H4-B
QTY = 2

1

PROPOSED SCHOOL SPEED LIMIT
SIGN ASSEMBLY
WITH REAR FACING BEACON

S5-H3-B
24" X 48"
QTY = 2

2

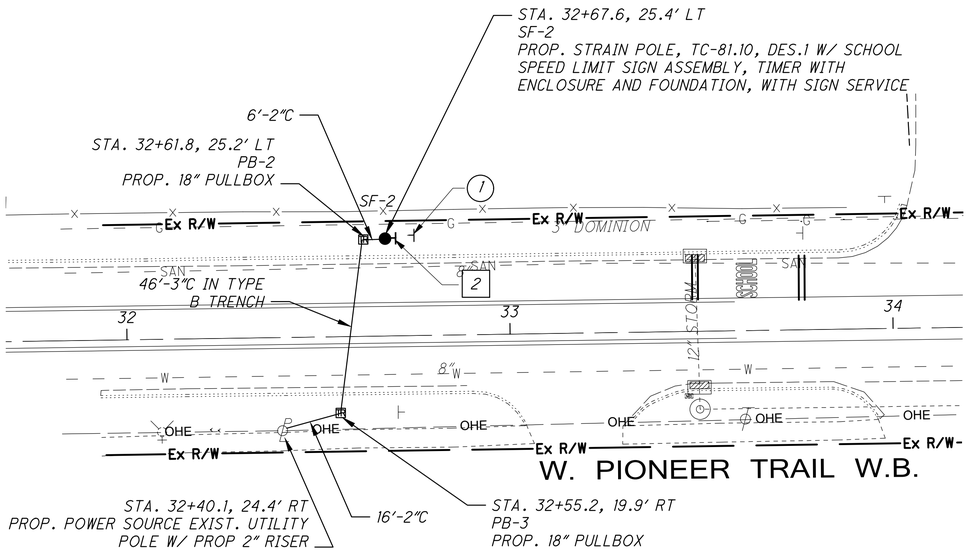
N

0 10 20 40
HORIZONTAL
SCALE IN FEET

CALCULATED JAT
CHECKED MWS

SCHOOL FLASHER PLAN
S. CHILLICOTHE RD. (S.R. 43) & MILLER\LEIGHTON SCHOOL
POR-AURORA SIGNALS

107
133



PROPOSED SCHOOL SPEED LIMIT SIGN ASSEMBLY

WITH REAR FACING BEACON

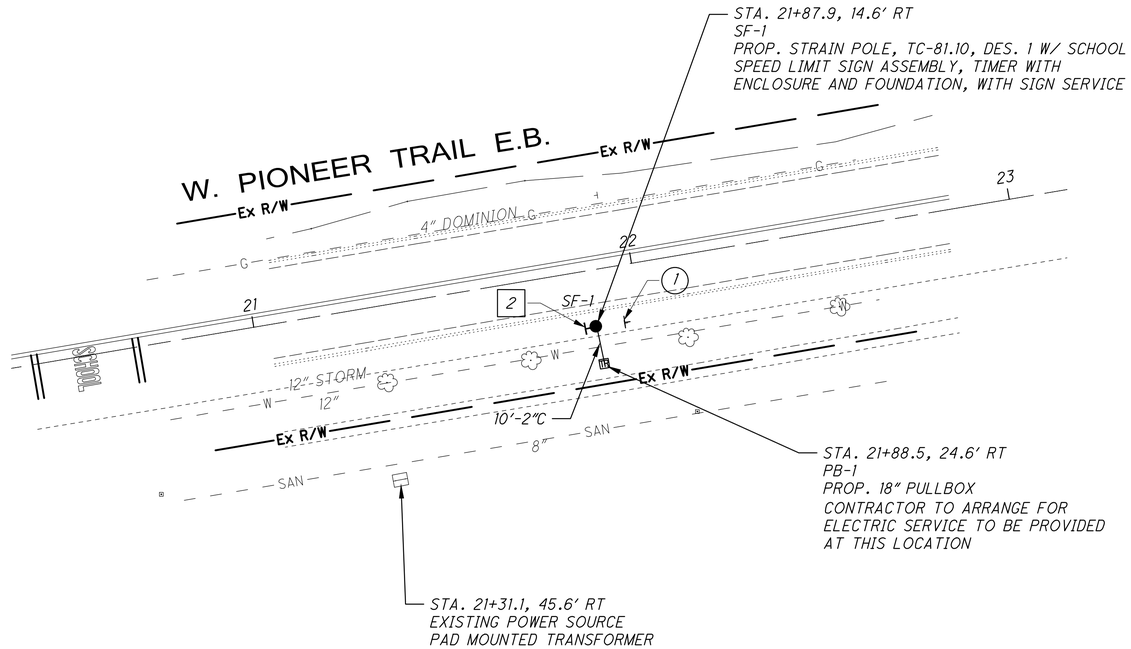
S5-H3-B
24" X 48"
QTY = 2

2

EXISTING SIGNS TO BE REMOVED

R2-1
QTY = 2

1



N

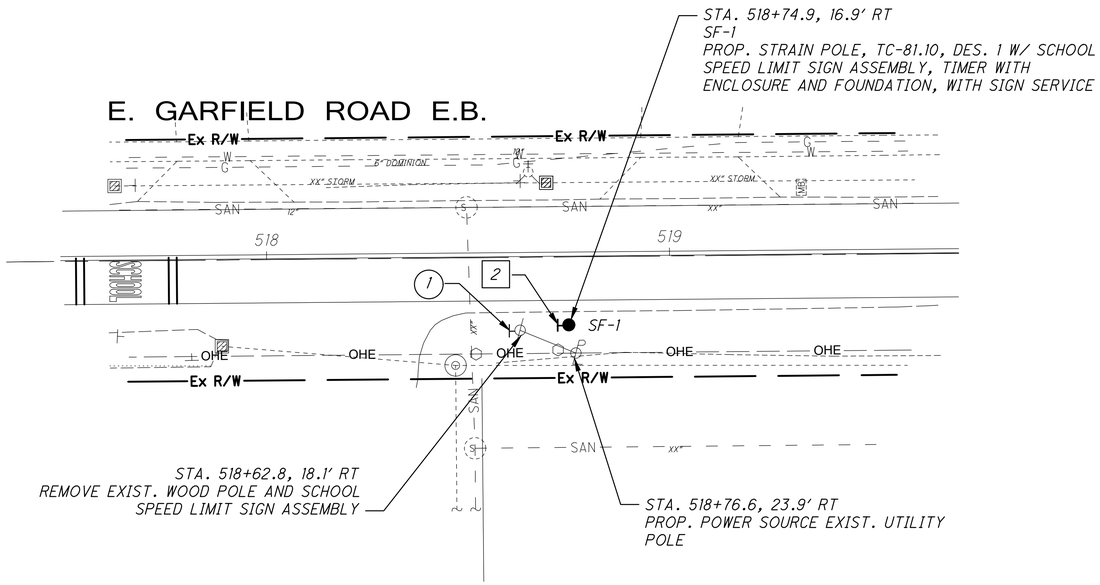
0 10 20 40 HORIZONTAL SCALE IN FEET

CALCULATED JAT CHECKED MWS

SCHOOL FLASHER PLAN

W. PIONEER TRAIL & HIGH SCHOOL DRIVE

POR-AURORA SIGNALS



EXISTING FLASHER TO BE REMOVED

S5-H4-B
QTY = 2

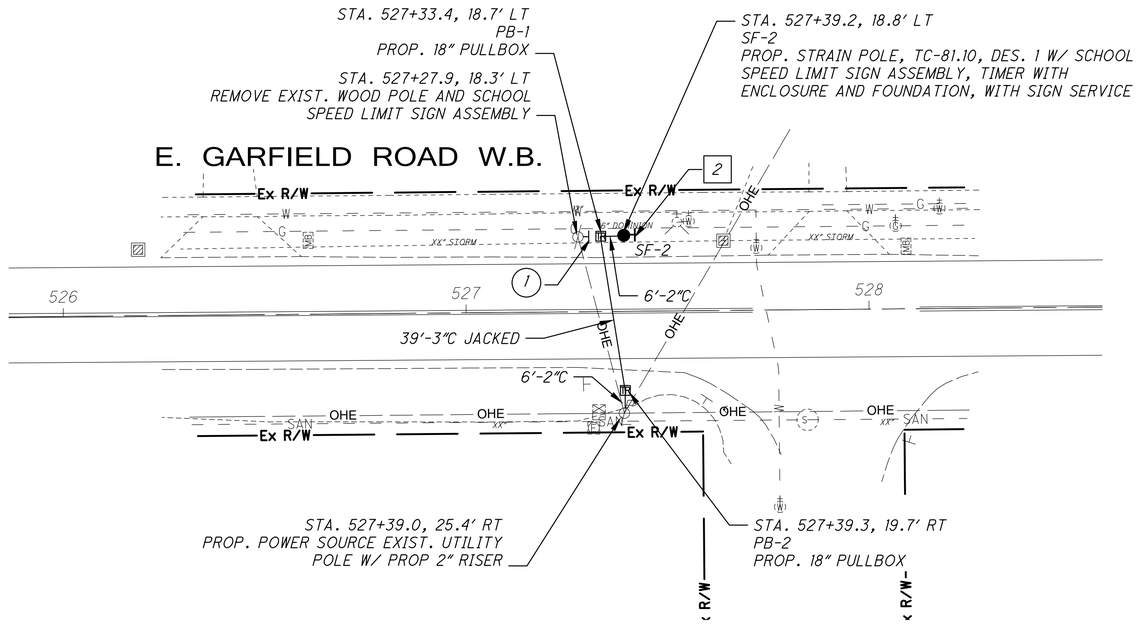
1

PROPOSED SCHOOL SPEED LIMIT SIGN ASSEMBLY

WITH REAR FACING BEACON

S5-H3-B
24" X 48"
QTY = 2

2



N

0 10 20 40
HORIZONTAL SCALE IN FEET

CALCULATED JAT
CHECKED MWS

SCHOOL FLASHER PLAN
E. GARFIELD RD. (S.R. 82) & CRADDOCK SCHOOL DRIVE
POR-AURORA SIGNALS

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REF. NO.	SHEET NO.	STATION		SIDE	625						632	804									
					CONDUIT, 2", 725.04	TRENCH	PLASTIC CAUTION TAPE	CONDUIT, JACKED OR DRILLED, 3"	PULL BOX, 725.08, 18"	PULL BOX, MISC.: 24"x35"x26"	CONDUIT RISER, 2" DIAMETER	FIBER OPTIC CABLE, 24 FIBER, ARMORED	FIBER OPTIC CABLE, ARMORED, INTEGRAL MESSENGER, 24 FIBER	FAN-OUT KIT, 12 FIBER	DROP CABLE, 12 FIBER	FIBER OPTIC PATCH CORD, 1 FIBER	FIBER TERMINATION PANEL, 12 FIBER	FUSION SPLICE	SPLICE ENCLOSURE, BUTT STYLE	SLACK INSTALLATION		
		FROM	TO		FOOT	FOOT	FOOT	EACH	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH		
F-1	120	-01+75.00	01+67.40	LT	87	87	87				1		190	1	131	4	1	2	1	1		
F-2	120	01+67.40	02+96.70	LT									129									
F-3	120	02+96.70	04+54.80	LT									158									
F-4	120	04+54.80	05+67.60	LT									113									
F-5	120	05+67.60	07+05.20	LT									138									
F-6	120	07+05.20	09+66.60	LT									261									
F-7	120	09+66.60	12+10.20	LT									244									
F-8	120	12+10.20	13+42.50	LT									132									
F-9	120	13+42.50	15+41.70	LT									199									
F-10	120	15+41.70	17+58.10	LT									216									
F-11	120	17+58.10	19+57.00	LT									199									
F-12	120	19+57.00	20+87.80	LT									131									
F-13	120	20+87.80	21+55.10	LT									67									
F-14	120/121	21+55.10	22+83.60	LT									129									
F-15	121																					
F-16	121	22+83.60	23+90.60	LT									107									
F-17	121	23+90.60	25+68.50	LT/RT									187									
F-18	121	25+68.50	27+42.40	RT	28	28	28				1		174	1	72	4	1	4	1	1		
F-19	121	27+42.40	29+18.20	RT									176									
F-20	121	29+18.20	31+00.00	RT									182									
F-21	121	31+00.00	32+95.40	RT									195									
F-22	121	32+95.40	34+95.20	RT									200									
F-23	121	34+95.20	36+14.80	RT									120									
F-24	121	36+14.80	37+00.00	RT									85									
F-25	121	37+00.00	38+95.40	RT									195									
F-26	121	38+95.40	39+55.60	RT/LT									90									
F-27	121	39+55.60	41+13.80	LT	3	3	3				1		158	1	63	4	1	4	1	1		
F-28	121	41+13.80	42+97.10	LT									183									
F-29	121/122	42+97.10	44+80.70	LT									184									
F-30	122	44+80.70	46+00.00	LT									119									
F-31	122	46+00.00	47+24.00	LT									124									
F-32	122	47+24.00	48+45.00	LT									121									
F-33	122	48+45.00	49+83.60	LT									139									
F-34	122	49+83.60	50+81.80	LT									98									
F-35	122	50+81.80	52+16.40	LT									135									
F-36	122	52+16.40	53+33.40	LT									117									
F-37	122	53+33.40	54+85.90	LT									153									
F-38	122	54+85.90	56+18.30	LT									132									
F-39	122	56+18.30	57+50.80	LT									133									
F-40	122	57+50.80	58+46.70	LT									96									
F-41	122	58+46.70	60+33.10	LT									186									
F-42	122	60+33.10	61+35.60	LT									103									
F-43	122	61+35.60	61+88.80	LT	53	53	53				1	91										
F-44	122	61+88.80	62+04.50	LT								26										
F-45	122	62+04.50	62+24.00	LT								126										
F-46	122	62+04.50	63+01.60	LT								107										
F-47	122	63+01.60	64+36.80	LT								145		1	18	4	1	4	1	1		
F-48	122	64+36.80	81+98.20	LT								114										
F-49	122	81+98.20	82+00.00	LT								42										
F-50	122	82+00.00	65+70.80	LT	34	34	34				1	72										
F-51	122/123	65+70.80	66+43.90	LT									73									
F-52	123	66+43.90	67+74.60	LT									131									
F-53	123	67+74.60	69+14.40	LT									140									
F-54	123	69+14.40	70+43.20	LT									129									
F-55	123	70+43.20	71+68.70	LT									126									
F-56	123	71+68.70	72+96.00	LT									127									
TOTALS CARRIED TO SHEET 114					205	205	205	0	0	0	5	723	6,922	4	284	16	4	14	4	4		

CALCULATED JAT
CHECKED MWS

FIBER INTERCONNECT
ESTIMATED QUANTITIES

POR-AURORA SIGNALS

REF. NO.	SHEET NO.	STATION FROM	STATION TO	SIDE	625 CONDUIT, 2", 725.04 FOOT	625 TRENCH FOOT	625 PLASTIC CAUTION TAPE FOOT	625 CONDUIT, JACKED OR DRILLED, 3" EACH	625 PULL BOX, 725.08, 18" EACH	625 PULL BOX, MISC.: 24"x35"x26" EACH	632 CONDUIT RISER, 2" DIAMETER EACH	804 FIBER OPTIC CABLE, 24 FIBER, ARMORED FOOT	804 FIBER OPTIC CABLE, ARMORED, INTEGRAL MESSENGER, 24 FIBER FOOT	804 FAN-OUT KIT, 12 FIBER EACH	804 DROP CABLE, 12 FIBER FOOT	804 FIBER OPTIC PATCH CORD, 1 FIBER EACH	804 FIBER TERMINATION PANEL, 12 FIBER EACH	804 FUSION SPLICE EACH	804 SPLICE ENCLOSURE, BUTT STYLE EACH	804 SLACK INSTALLATION EACH		
F-57	123	72+96.00	74+26.70	LT									131									
F-58	123	74+26.70	75+28.10	LT									101									
F-59	123	75+28.10	76+85.10	LT									157									
F-60	123	76+85.10	77+81.30	LT									96									
F-61	123	77+81.30	512+23.90	LT	100	100	100	15			1	138										
F-62	123	512+23.90	512+95.20	RT										1	103	4	1	4	1	1		
F-63	123	512+23.90	511+96.20	RT	4	4	4				1	94										
F-64	123/125	510+11.40	511+96.20	RT									185									
F-65	125	508+59.60	510+11.40	RT/LT	153	153	153	55	2		2	294										
F-66	125	507+33.60	508+59.60	LT									126									
F-67	125	505+81.70	507+33.60	LT									152									
F-68	125	504+60.50	505+81.70	LT									121									
F-69	125	502+91.70	504+60.50	LT									169									
F-70	125	501+05.80	502+91.70	LT									186									
F-71	125	500+53.40	501+05.80	LT	50	50	50				1	176		1	103	4	1	6	1	1		
F-72	125	500+15.00	500+53.40	LT	47	47	47					104										
F-73	125	499+17.70	500+15.00	LT								196										
F-74	125	101+72.80	499+17.70	LT	93	93	93				1	126										
F-75	125	497+39.90	499+17.70	LT	183	183	183				1	216										
F-76	125	495+80.70	497+39.90	LT									159									
F-77	125	494+13.50	495+80.70	LT									167									
F-78	125	492+40.10	494+13.50	LT									173									
F-79	125	492+16.10	492+40.10	LT/RT									62									
F-80	124/125	490+83.00	492+16.10	RT									133									
F-81	124	489+89.00	490+83.00	RT/LT	95	95	95	45	2		2	216										
F-82	124	488+94.30	489+89.00	LT									95									
F-83	124	487+30.20	488+94.30	LT									164									
F-84	124	486+14.30	487+30.20	LT									116									
F-85	124	484+17.00	486+14.30	LT									197									
F-86	124	483+16.70	484+17.00	LT	4	4	4				1			1	144	4	1	4	1	1		
F-87	124	482+49.30	484+17.00	LT									168									
F-88	124	480+78.00	482+49.30	LT									171									
F-89	124	479+04.50	480+78.00	LT									174									
F-90	124	477+33.00	479+04.50	LT									172									
F-91	124	475+59.60	477+33.00	LT									173									
F-92	124	474+34.50	475+59.60	LT									125									
F-93	124	473+16.90	474+34.50	LT									118									
F-94	124	472+21.00	473+16.90	LT									96									
F-95	124	472+04.80	472+21.00	LT	24	24	24				1			1	68	4	1	4	1	1		
F-96	125/126	101+72.80	103+40.80	LT									168									
F-97	126	102+98.00	103+40.80	LT/RT									99									
F-98	126	102+98.00	104+60.10	RT									162									
F-99	126	104+60.10	106+51.10	RT									191									
F-100	126	106+51.10	107+96.00	RT									145									
F-101	126	107+96.00	109+32.90	RT									137									
F-102	126	109+32.90	111+00.00	RT									167									
F-103	126	111+00.00	112+43.50	RT									144									
F-104	126	112+43.50	113+92.50	RT									149									
F-105	126	113+92.50	115+71.90	RT									179									
F-106	126	115+71.90	116+98.40	RT									127									
F-107	126	116+98.40	118+22.10	RT									124									
F-108	126	118+22.10	120+06.90	RT									185									
F-109	126	120+06.90	121+74.00	RT									167									
F-110	126	121+74.00	123+22.50	RT									149									
F-111	126	123+22.50	123+96.60	RT									74									
F-112	126/127	123+96.60	124+72.70	RT									76									
TOTALS CARRIED TO SHEET 114					753	753	753	115	4	0	11	1560	6,328	4	418	16	4	18	4	4		

CALCULATED JAT
CHECKED MWS

FIBER INTERCONNECT
ESTIMATED QUANTITIES

POR-AURORA SIGNALS

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REF. NO.	SHEET NO.	STATION FROM	STATION TO	SIDE	625 CONDUIT, 2", 725.04 FOOT	625 TRENCH FOOT	625 PLASTIC CAUTION TAPE FOOT	625 CONDUIT, JACKED OR DRILLED, 3" FOOT	625 PULL BOX, 725.08, 18" EACH	625 PULL BOX, MISC.: 24"x35"x26" EACH	632 CONDUIT RISER, 2" DIAMETER EACH	804 FIBER OPTIC CABLE, 24 FIBER, ARMORED FOOT	804 FIBER OPTIC CABLE, ARMORED, INTEGRAL MESSENGER, 24 FIBER FOOT	804 FAN-OUT KIT, 12 FIBER EACH	804 DROP CABLE, 12 FIBER FOOT	804 FIBER OPTIC PATCH CORD, 1 FIBER EACH	804 FIBER TERMINATION PANEL, 12 FIBER EACH	804 FUSION SPLICE EACH	804 SPLICE ENCLOSURE, BUTT STYLE EACH	804 SLACK INSTALLATION EACH		
F-113	127	124+72.70	126+55.90	RT									183									
F-114	127	126+55.90	128+40.80	RT									185									
F-115	127	128+40.80	129+76.50	RT									136									
F-116	127	129+76.50	131+41.70	RT									165									
F-117	127	131+41.70	133+35.90	RT									194									
F-118	127	133+35.90	134+62.40	RT									127									
F-119	127	134+62.40	136+29.30	RT									167									
F-120	127	136+29.30	137+84.80	RT									156									
F-121	127	137+84.80	139+43.60	RT									159									
F-122	127	139+43.60	140+95.70	RT									152									
F-123	127	140+95.70	142+73.50	RT									178									
F-124	127	142+73.50	144+24.30	RT									151									
F-125	127	144+24.30	145+35.40	RT									111									
F-126	127/128	145+35.40	147+39.20	RT									204									
F-127	128	147+39.20	148+84.60	RT									145									
F-128	128	148+84.60	149+50.70	RT									66									
F-129	128	149+50.70	150+08.90	RT									58									
F-130	128	150+08.90	151+10.10	RT	88	88	88			1	1	126		1	132	4	1	4	1	1		
F-131	128	151+05.20	151+67.10	RT/LT	28	28	28				1	151										
F-132	128	151+67.10	153+35.50	LT									168									
F-133	128	153+35.50	155+41.80	LT									206									
F-134	128	155+41.80	157+53.20	LT									211									
F-135	128	157+53.20	159+77.80	LT									225									
F-136	128	159+77.80	162+77.80	LT									300									
F-137	128	162+77.80	163+78.50	LT	97	97	97			1	1			1	137	4	1	4	1	1		
F-138	128	162+77.80	165+76.60	LT									299									
F-139	128	165+76.60	167+79.40	LT									203									
F-140	128/129	167+79.40	169+78.80	LT									199									
F-141	129	169+78.80	171+83.70	LT									205									
F-142	129	171+83.70	173+81.70	LT									198									
F-143	129	173+81.70	175+80.40	LT									199									
F-144	129	175+80.40	177+84.00	LT									204									
F-145	129	177+84.00	179+76.20	LT									192									
F-146	129	179+76.20	181+61.40	LT									185									
F-147	129	181+61.40	183+18.80	LT									157									
F-148	129	183+18.80	184+90.10	LT									171									
F-149	129	184+90.10	186+36.20	LT									146									
F-150	129	186+36.20	188+33.70	LT									198									
F-151	129/130	188+33.70	190+02.70	LT									169									
F-152	130	190+02.70	192+03.00	LT									200									
F-153	130	192+03.00	194+03.30	LT									200									
F-154	130	194+03.30	196+17.10	LT									214									
F-155	130	196+17.10	197+40.80	LT	121	121	121			1	1	159		1	188	4	1	4	1	1		
F-156	130	197+40.80	200+41.20	LT	182	182	182				1	343										
F-157	130	200+41.20	202+42.80	LT									202									
F-158	130	202+42.80	204+82.90	LT									240									
F-159	130																					
F-160	130	204+82.90	207+25.20	LT	20	20	20			1	1		242	1	56	4	1	4	1	1		
F-161	130	207+25.20	208+41.80	LT									117									
F-162	130	208+41.80	210+65.30	LT									224									
F-163	130/131	210+65.30	212+46.30	LT									181									
F-164	131	212+46.30	214+71.10	LT									225									
F-165	131	214+71.10	216+33.80	LT									163									
F-166	131	216+33.80	217+79.00	LT									145									
F-167	131	217+79.00	218+82.60	LT									104									
F-168	131	218+82.60	220+31.10	LT									149									
TOTALS CARRIED TO SHEET 114					536	536	536	0	0	4	6	779	8,976	4	513	16	4	16	4	4		

CALCULATED JAT
CHECKED MWS

FIBER INTERCONNECT
ESTIMATED QUANTITIES

POR-AURORA SIGNALS

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REF. NO.	SHEET NO.	STATION		SIDE	625						632	804									
					CONDUIT, 2", 725.04	TRENCH	PLASTIC CAUTION TAPE	CONDUIT, JACKED OR DRILLED, 3"	PULL BOX, 725.08, 18"	PULL BOX, MISC.: 24"x35"x26"	CONDUIT RISER, 2" DIAMETER	FIBER OPTIC CABLE, 24 FIBER, ARMORED	FIBER OPTIC CABLE, ARMORED, INTEGRAL MESSENGER, 24 FIBER	FAN-OUT KIT, 12 FIBER	DROP CABLE, 12 FIBER	FIBER OPTIC PATCH CORD, 1 FIBER	FIBER TERMINATION PANEL, 12 FIBER	FUSION SPLICE	SPLICE ENCLOSURE, BUTT STYLE	SLACK INSTALLATION		
		FROM	TO		FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH		
F-169	131	220+31.10	221+75.50	LT									144									
F-170	131	221+75.50	223+75.50	LT									200									
F-171	131	223+75.50	225+63.20	LT									122									
F-172	131	225+63.20	226+70.80	LT									108									
F-173	131	226+70.80	227+60.40	LT									90									
F-174	131	227+60.40	229+45.40	LT									185									
F-175	131	229+45.40	230+15.70	LT									70									
F-176	131/132	230+15.70	232+03.20	LT	32	32	32				1	92	188	1	77	4	1	4	1	1		
F-177	132	232+03.20	233+07.50	LT									109									
F-178	132	233+07.50	234+75.40	LT	6	6	6				1		168	1	46	4	1	4	1	1		
F-179	132	62+24.00	38+69.50	RT	221	221	221	48	2		1	634										
F-180	132	36+60.30	38+69.50	RT									418									
F-181	132	34+96.00	36+60.30	RT	6	6	6				1		329	1	48	4	1	4	1	1		
F-182	132	33+72.10	34+96.00	RT									248									
F-183	132	32+51.90	33+72.10	RT									240									
F-184	132	30+59.30	32+51.90	RT									385									
F-185	132/133	28+59.20	30+59.30	RT									400									
F-186	133	27+28.00	28+59.20	RT									262									
F-187	133	27+21.20	27+28.00	RT/LT	5	5	5	62	2		1	220										
F-188	133	26+03.50	27+21.20	LT	115	115	115		1			250										
F-189	133	26+04.40	26+03.50	LT	239	239	239		1			498										
F-190	133	25+09.00	26+04.40	LT	242	242	242					504										
F-191	133	23+15.40	25+09.00	LT								596										
F-192	133	22+08.40	23+15.40	LT								240		2			2					
TOTALS CARRIED TO SHEET 114					866	866	866	110	6	0	5	3034	3,666	5	171	12	5	12	3	3		

CALCULATED JAT
CHECKED MWS

FIBER INTERCONNECT
ESTIMATED QUANTITIES

POR-AURORA SIGNALS

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	625						632	804								
	CONDUIT, 2", 725.04	TRENCH	PLASTIC CAUTION TAPE	CONDUIT, JACKED OR DRILLED, 3"	PULL BOX, 725.08, 18"	PULL BOX, MISC.: 24"x35"x26"	CONDUIT RISER, 2" DIAMETER	FIBER OPTIC CABLE, 24 FIBER, ARMORED	FIBER OPTIC CABLE, ARMORED, INTEGRAL MESSENGER, 24 FIBER	FAN-OUT KIT, 12 FIBER	DROP CABLE, 12 FIBER	FIBER OPTIC PATCH CORD, 1 FIBER	FIBER TERMINATION PANEL, 12 FIBER	FUSION SPLICE	SPLICE ENCLOSURE, BUTT STYLE	SLACK INSTALLATION
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET 110	205	205	205	0	0	0	5	723	6922	4	284	16	4	14	4	4
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET 111	753	753	753	115	4	0	11	1560	6328	4	418	16	4	18	4	4
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET 112	536	536	536	0	0	4	6	779	8976	4	513	16	4	16	4	4
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET 113	866	866	866	110	6	0	5	3034	3666	5	171	12	5	12	3	3
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED FROM SHEET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	FOOT	FOOT	FOOT	FOOT	EACH	EACH	EACH	FOOT	FOOT	EACH	FOOT	EACH	EACH	EACH	EACH	EACH
TOTALS CARRIED TO GENERAL SUMMARY	2360	2360	2360	225	10	4	27	6096	25,893	17	1386	60	17	60	15	15

CALCULATED JAT
CHECKED MWS

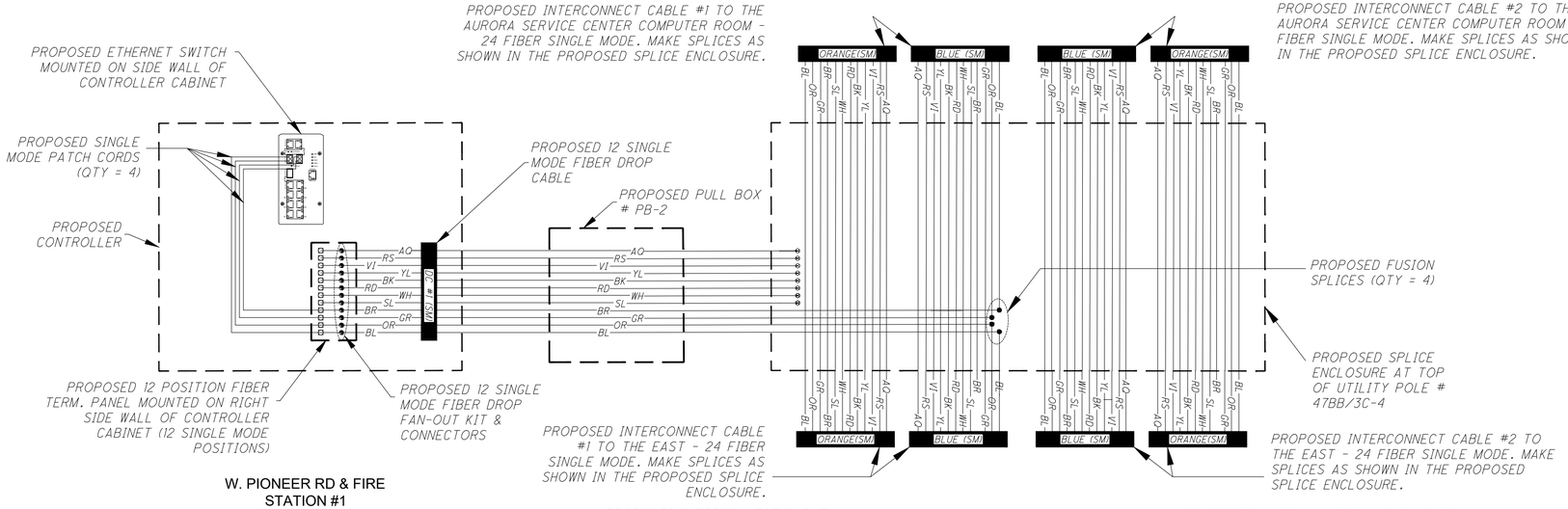
FIBER INTERCONNECT ESTIMATED QUANTITIES

POR-AURORA SIGNALS

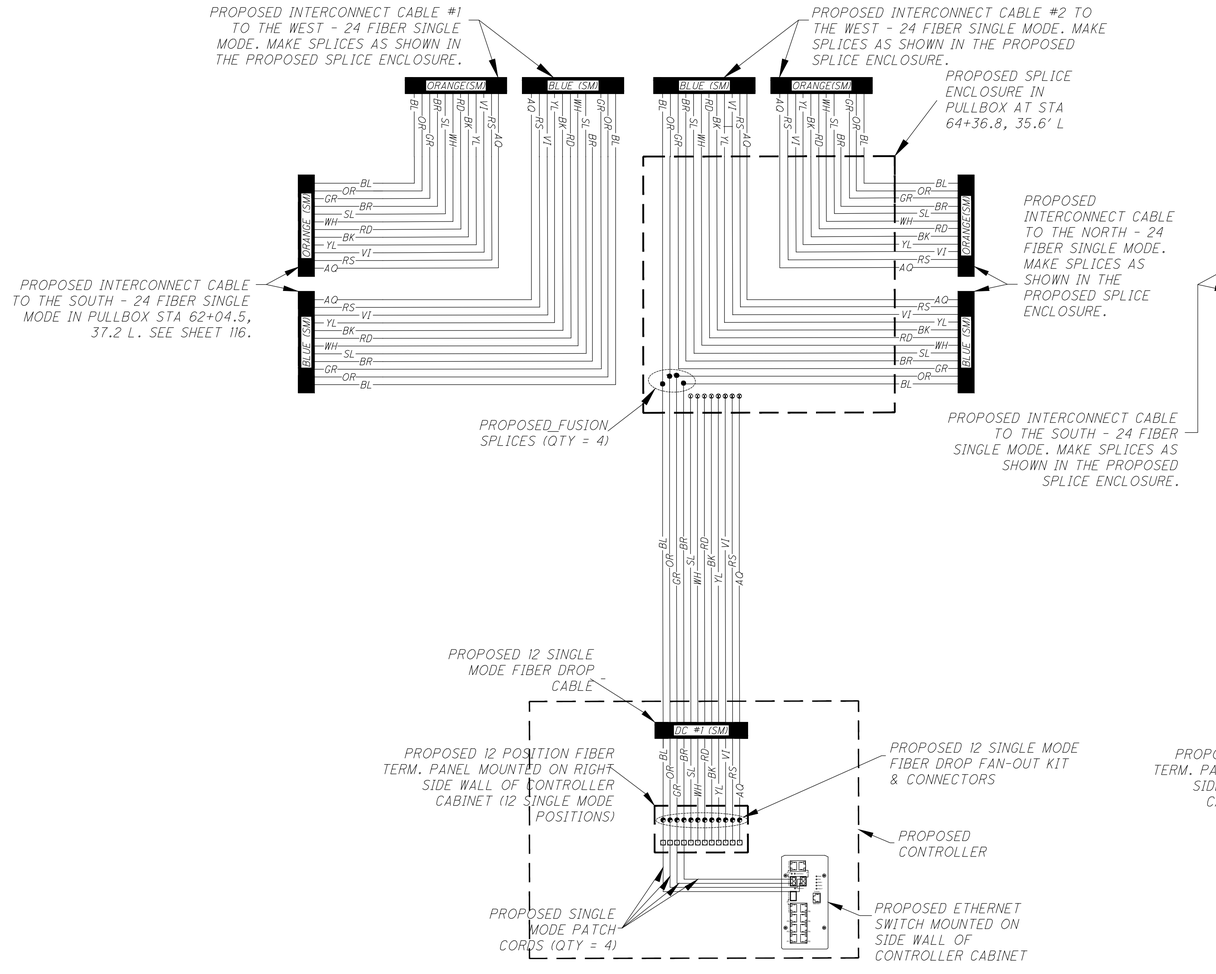
FIGURE 1
SPLICE DIAGRAM

LEGEND

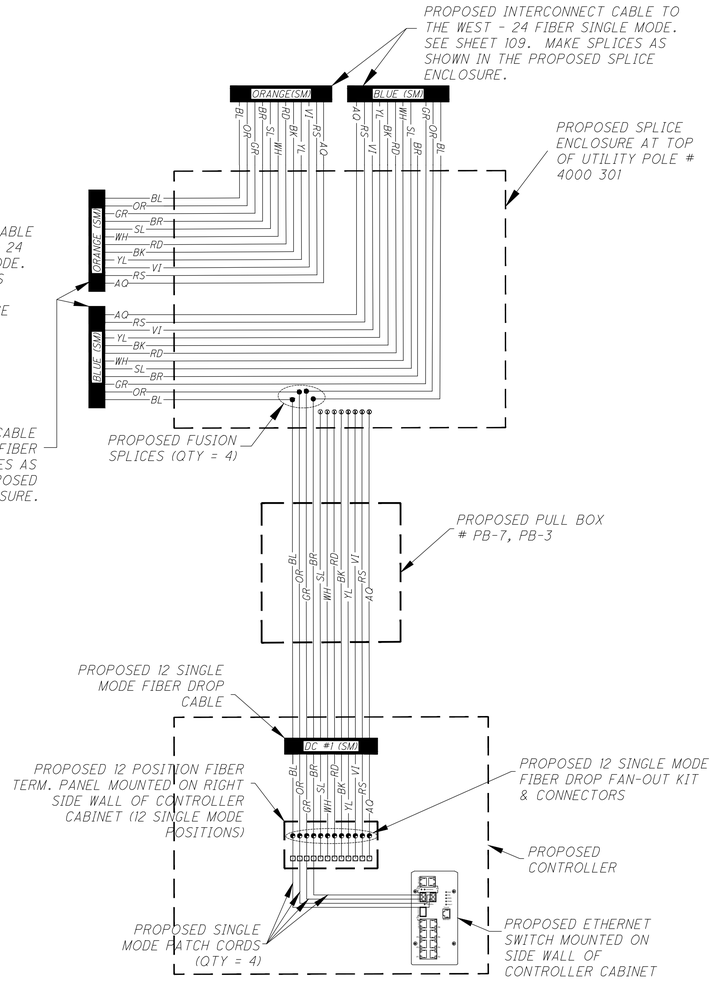
- ● FUSION SPLICE
- ⊗ NOT SPLICED
- DC DROP CABLE



W. PIONEER RD & FIRE STATION #1



S. CHILLICOTHE RD (SR 43 / SR 306) & W. PIONEER TRAIL



N. CHILLICOTHE RD (SR 306) & GARFIELD RD (SR 82)

CALCULATED JAT
CHECKED MWS

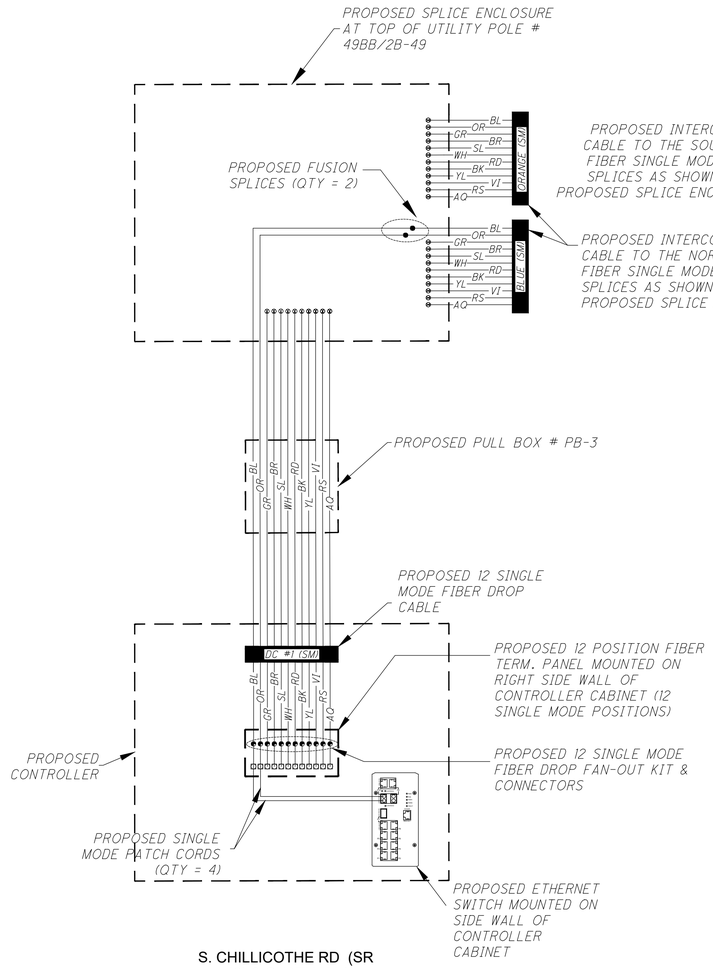
FIBER CONECTION DETAILS

POR-AURORA SIGNALS

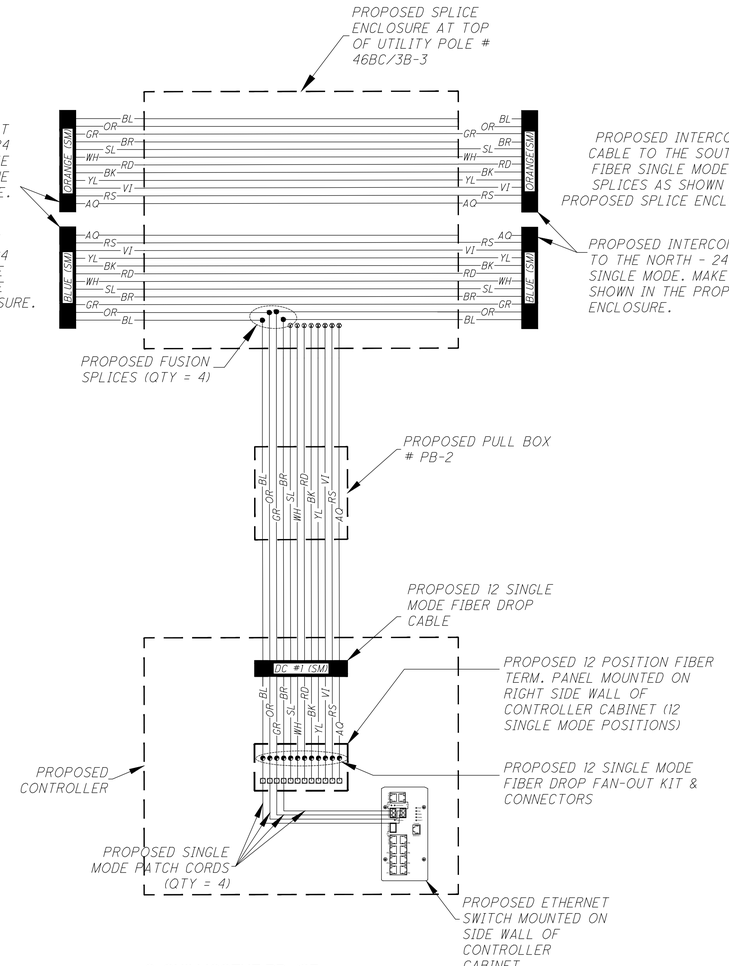
FIGURE 2
SPLICE DIAGRAM

LEGEND

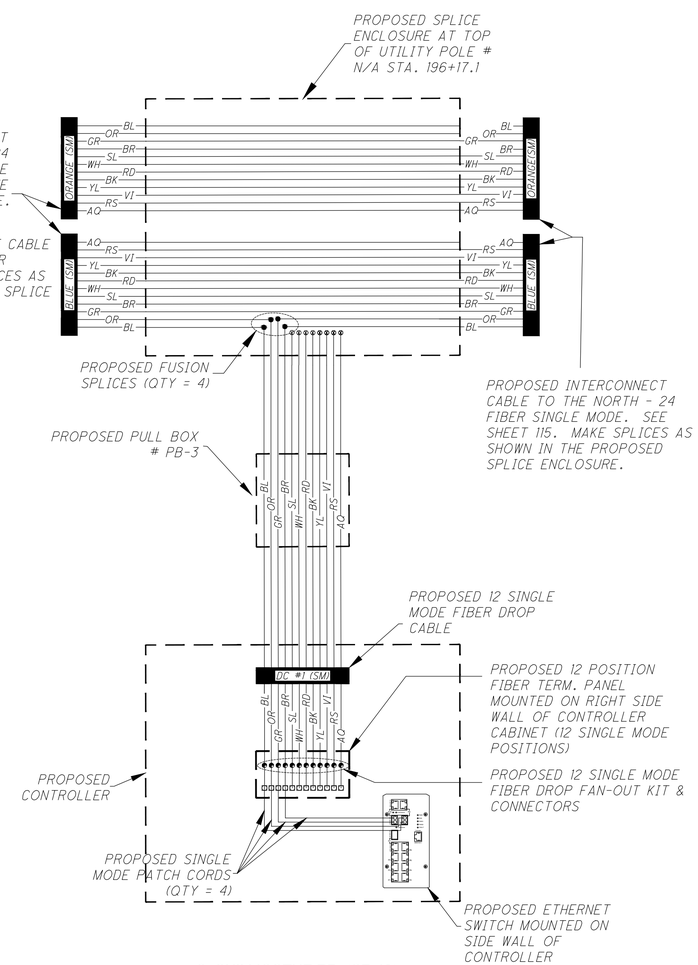
- ● FUSION SPLICE
- ⊗ NOT SPLICED
- DC DROP CABLE



S. CHILLICOTHE RD (SR 43) & CHATHAM / GREEBRIAR



S. CHILLICOTHE RD (SR 43) & AURORA FARMS DR



S. CHILLICOTHE RD (SR 43) & AURORA HUDSON RD

CALCULATED JAT
CHECKED MWS

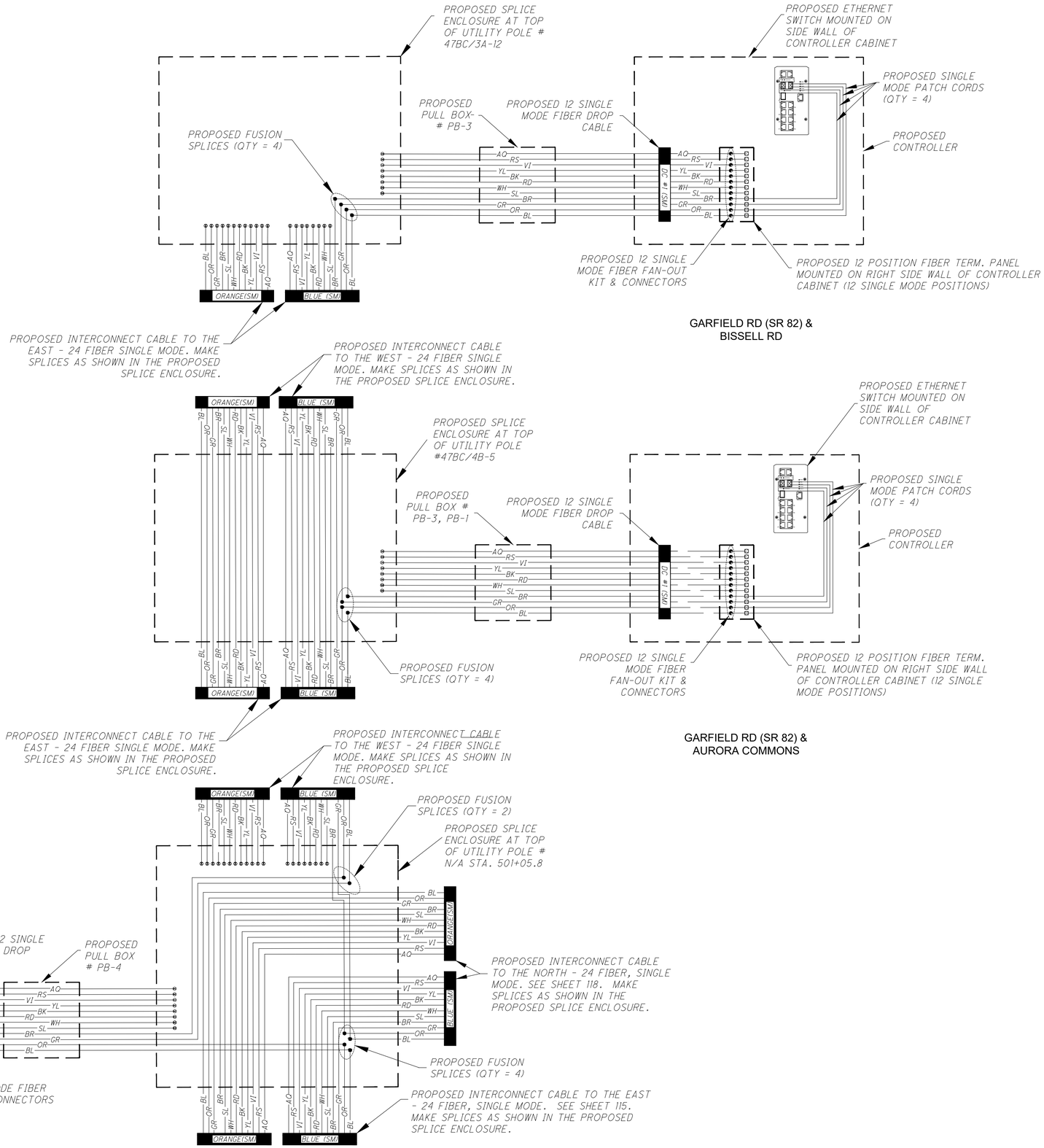
FIBER CONECTION DETAILS

POR-AURORA SIGNALS

FIGURE 3
SPLICE DIAGRAM

LEGEND

- ● FUSION SPLICE
- ⊗ NOT SPLICED
- DC DROP CABLE



CALCULATED JAT
CHECKED MWS

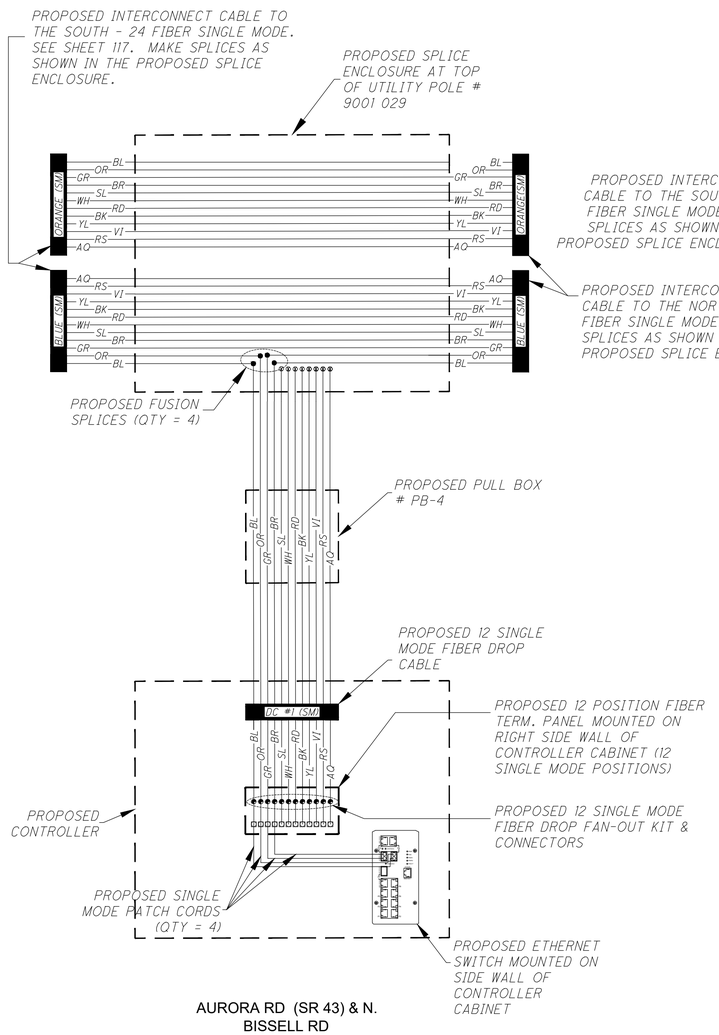
FIBER CONECTION DETAILS

POR-AURORA SIGNALS

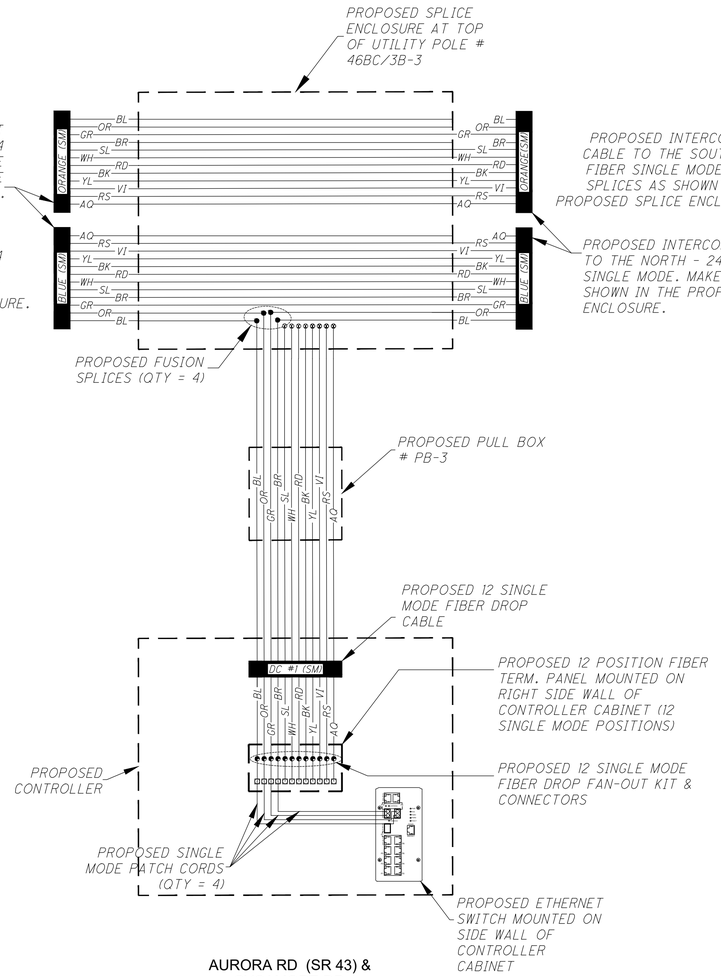
FIGURE 4
SPLICE DIAGRAM

LEGEND

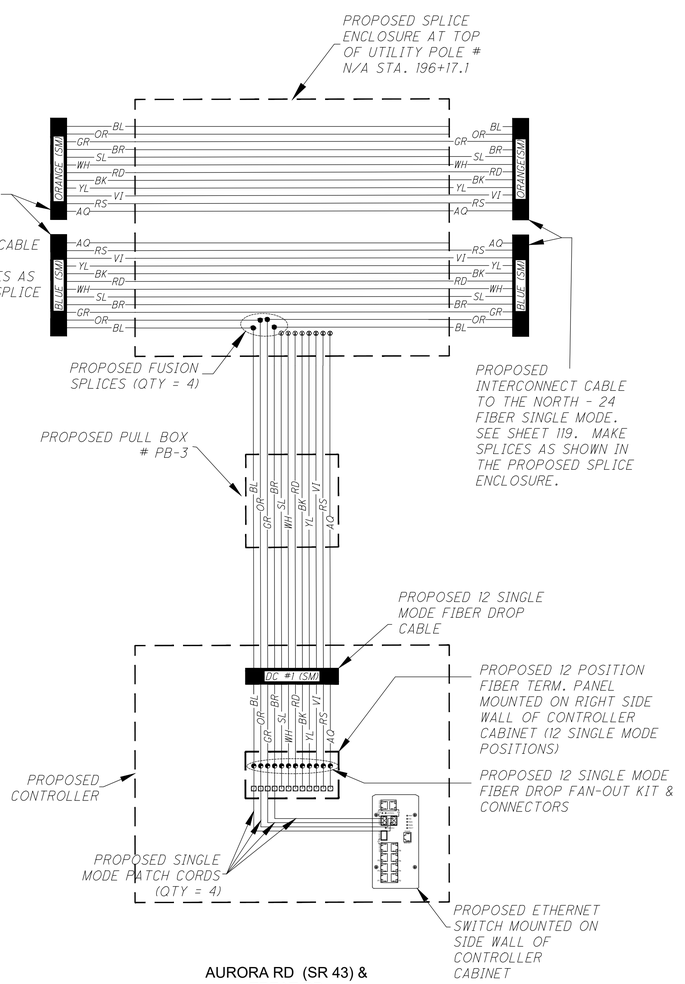
- ● FUSION SPLICE
- ⊗ NOT SPLICED
- DC DROP CABLE



AURORA RD (SR 43) & N. BISSELL RD



AURORA RD (SR 43) & SYCAMORE DR



AURORA RD (SR 43) & TREAT RD

CALCULATED JAT
CHECKED MWS

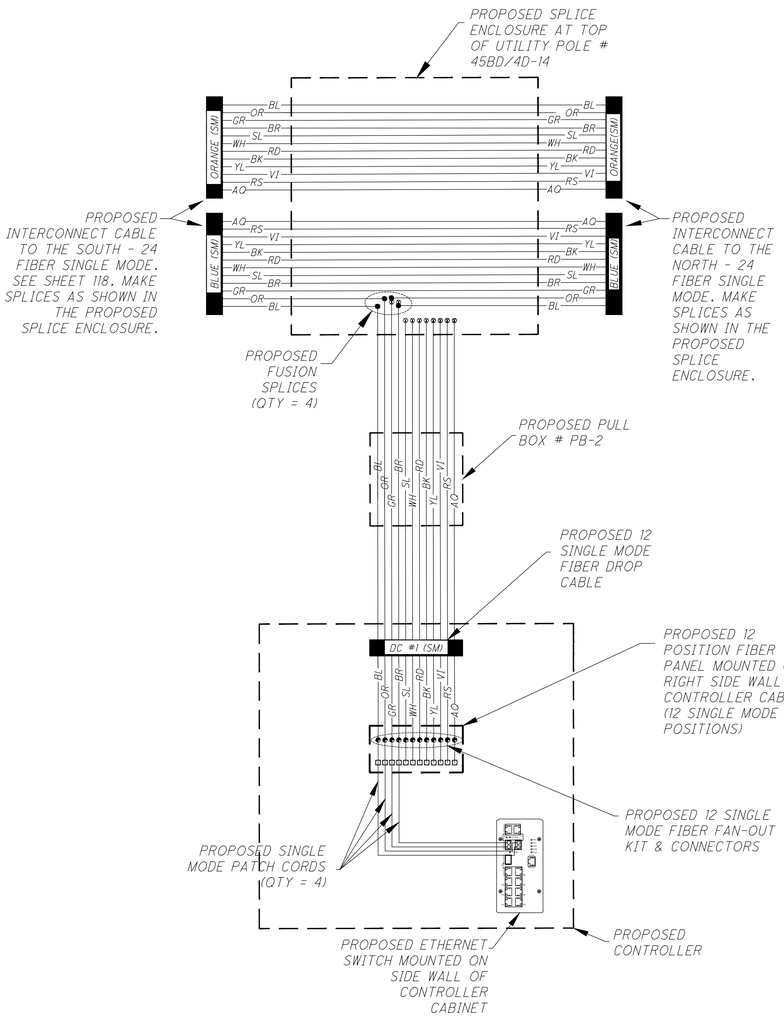
FIBER CONECTION DETAILS

POR-AURORA SIGNALS

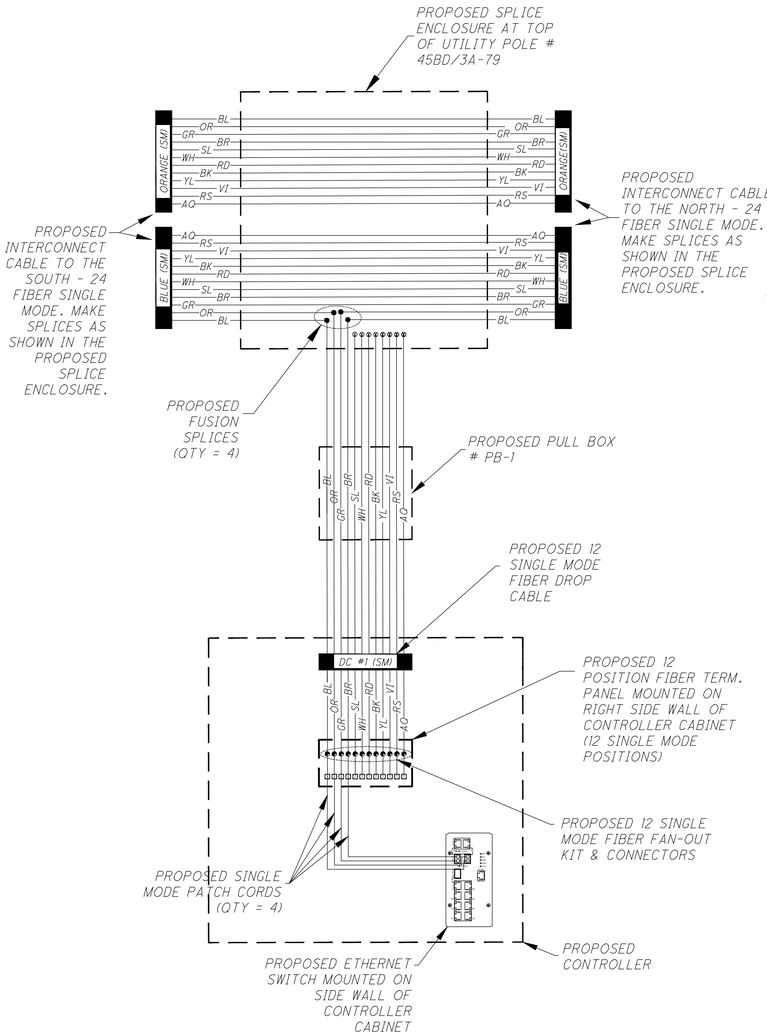
FIGURE 5
SPLICE DIAGRAM

LEGEND

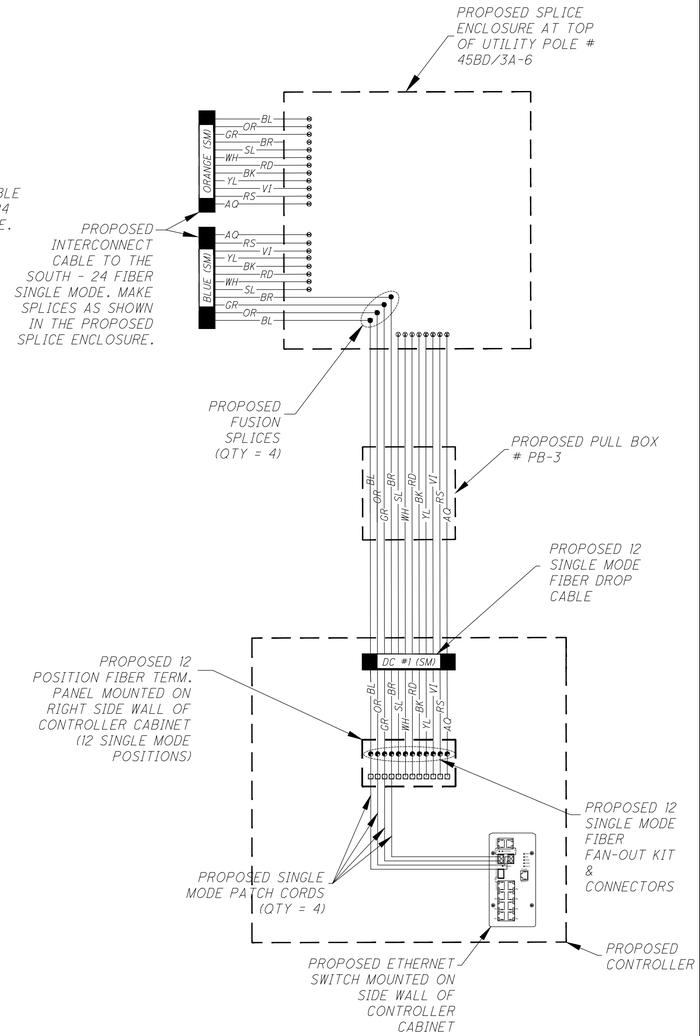
- ● FUSION SPLICE
- ⊗ NOT SPLICED
- DC DROP CABLE



AURORA RD (SR 43) &
SQUIRES RD



AURORA RD (SR 43) &
FIRE STATION #2

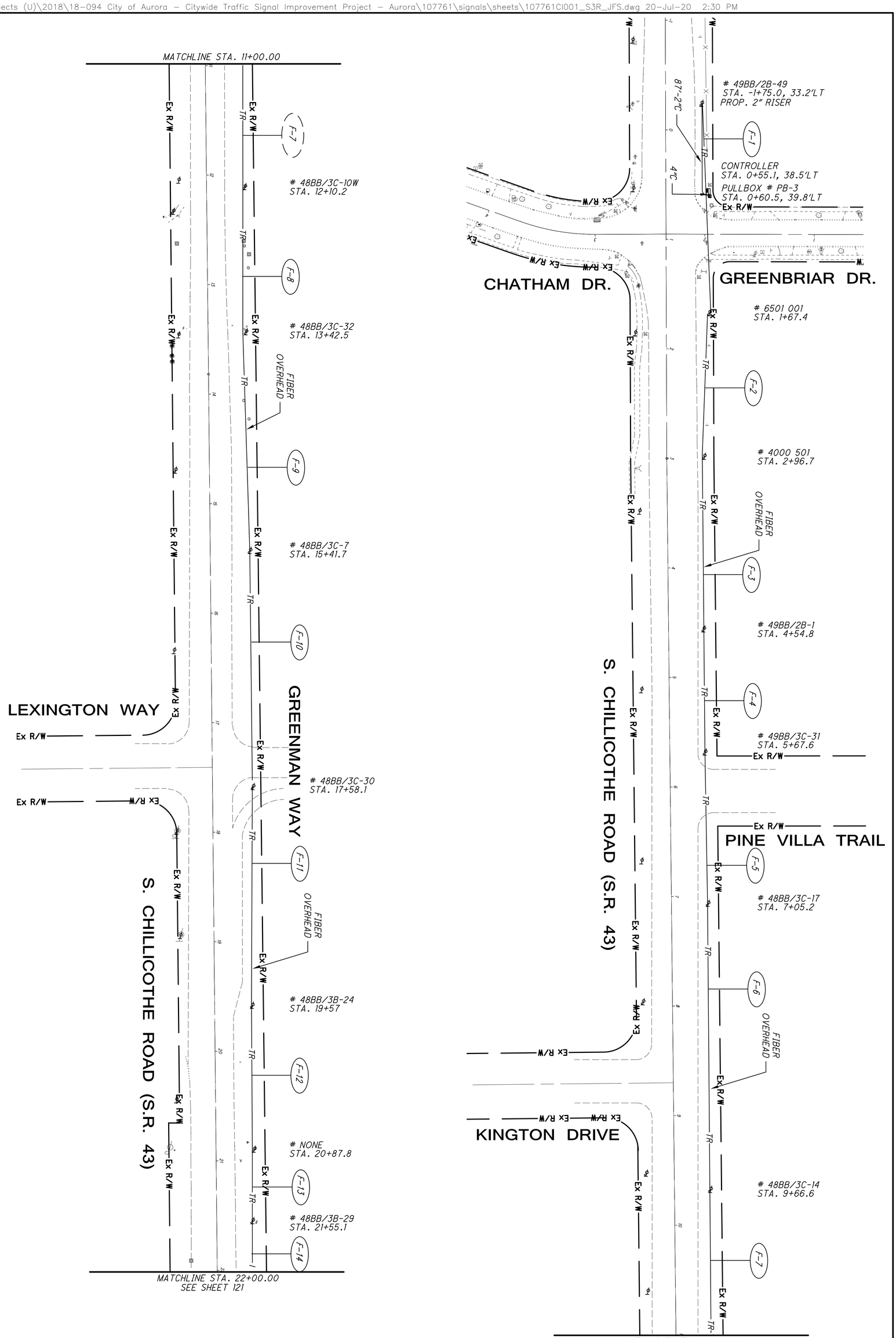


AURORA RD (SR 43) &
MONETA AVE

CALCULATED JAT
CHECKED MWS

FIBER CONECTION DETAILS

POR-AURORA SIGNALS



POR-AURORA SIGNALS

TRAFFIC SIGNAL INTERCONNECT PLAN
S. CHILLICOTHE ROAD (S.R. 43)

CALCULATED JFS
CHECKED MWS

0 20 40 80
HORIZONTAL SCALE IN FEET

N

N

0 20 40 80
HORIZONTAL
SCALE IN FEET

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL INTERCONNECT PLAN
S. CHILLICOTHE ROAD (S.R. 43)

POR-AURORA SIGNALS

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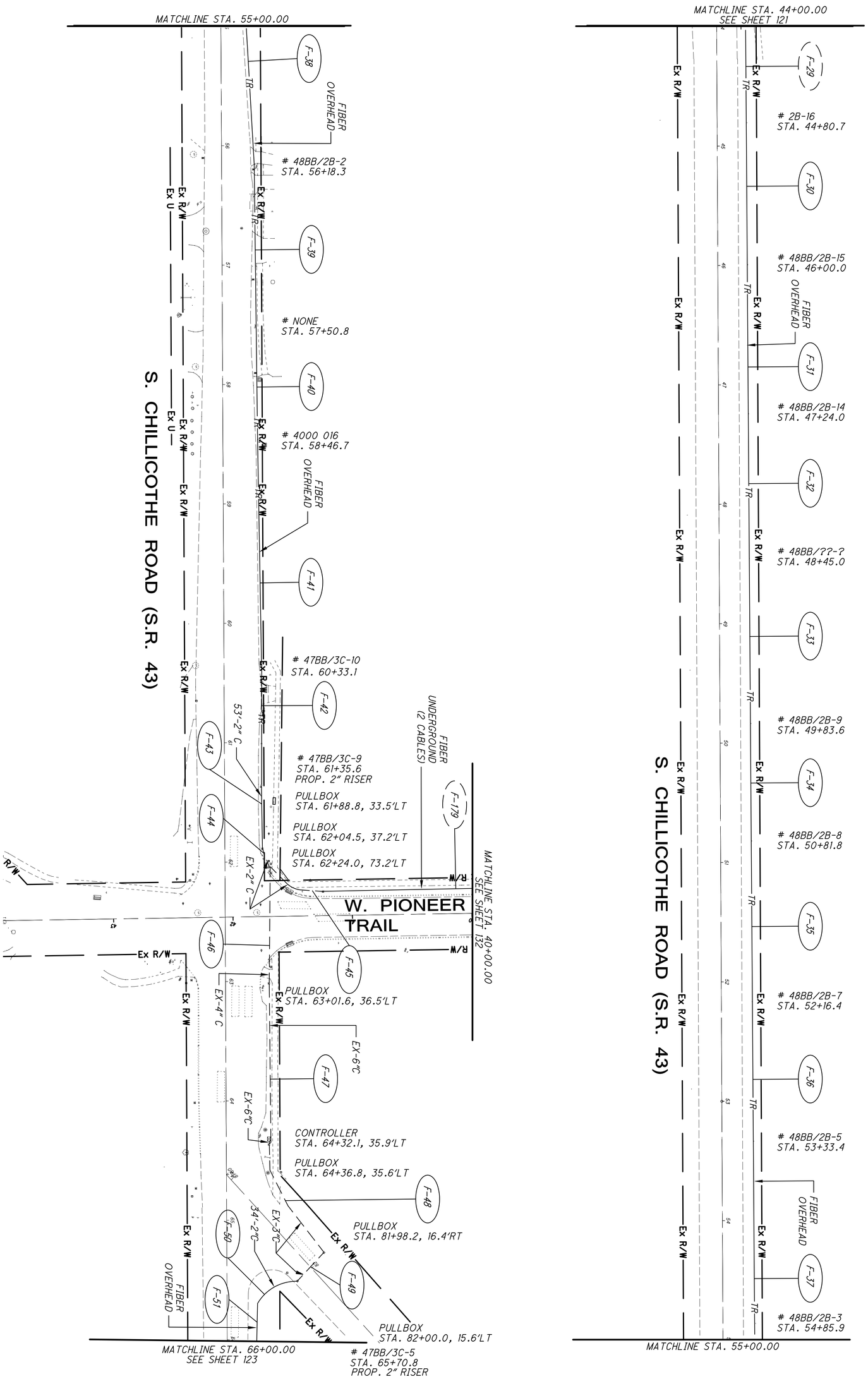
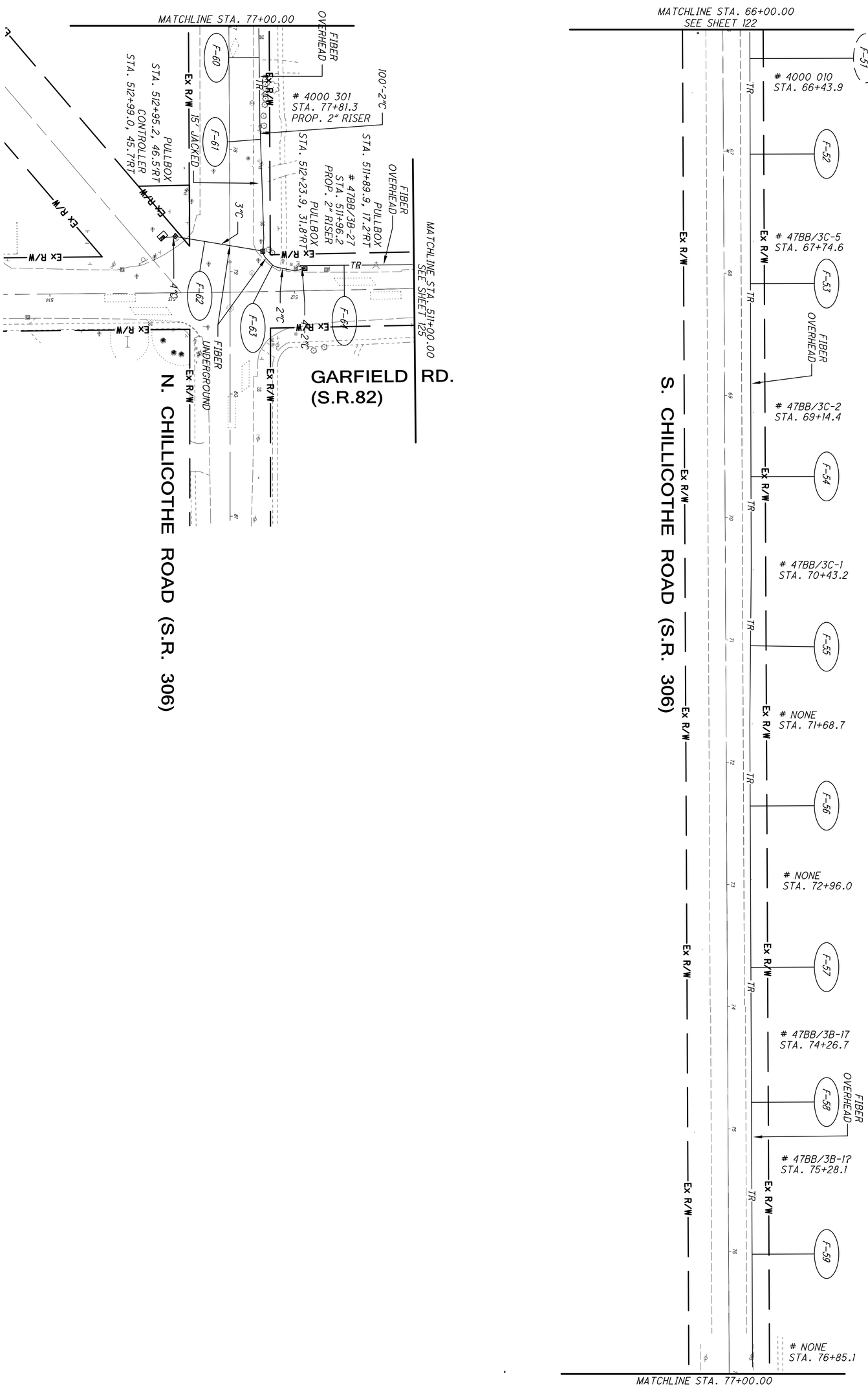
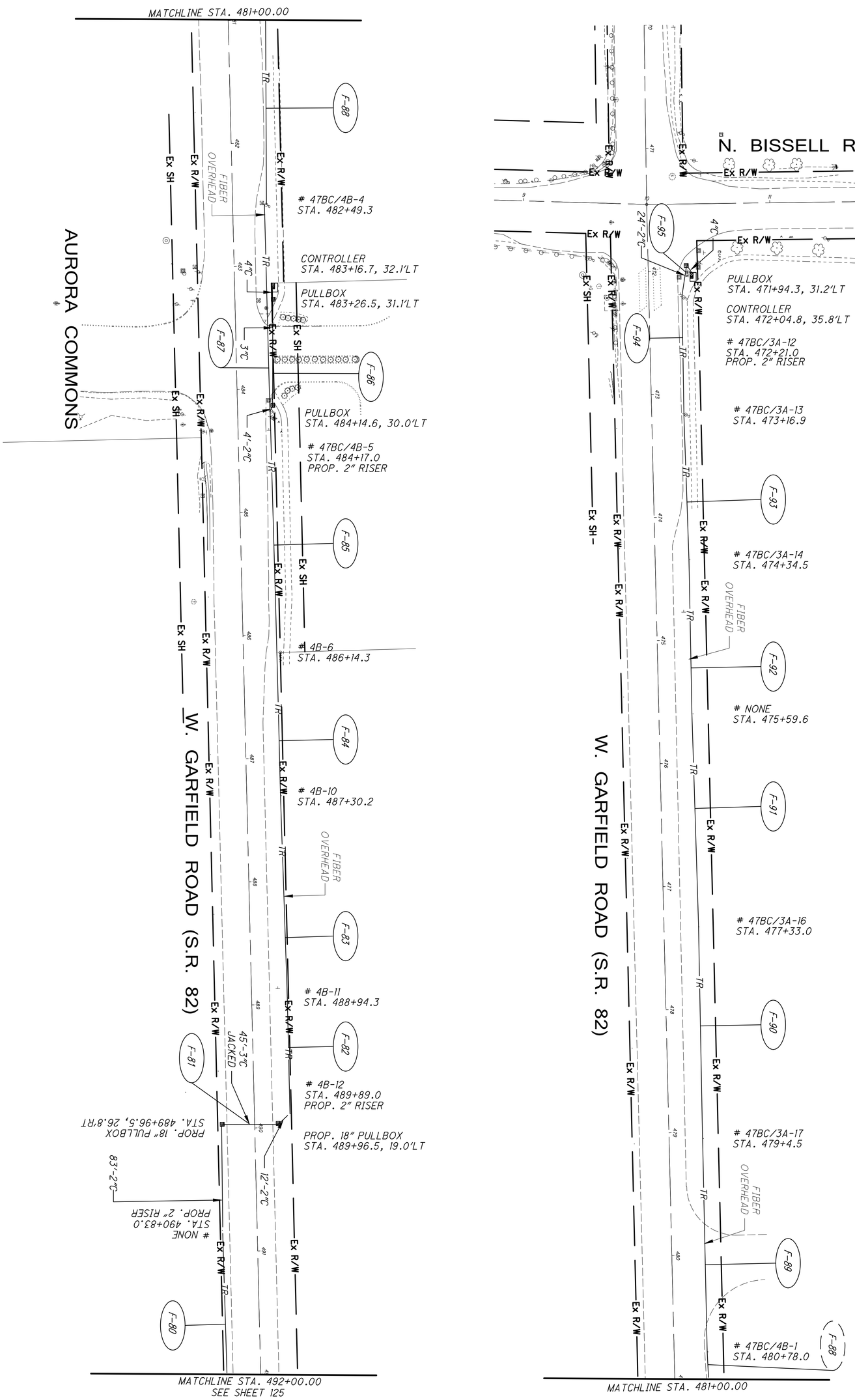


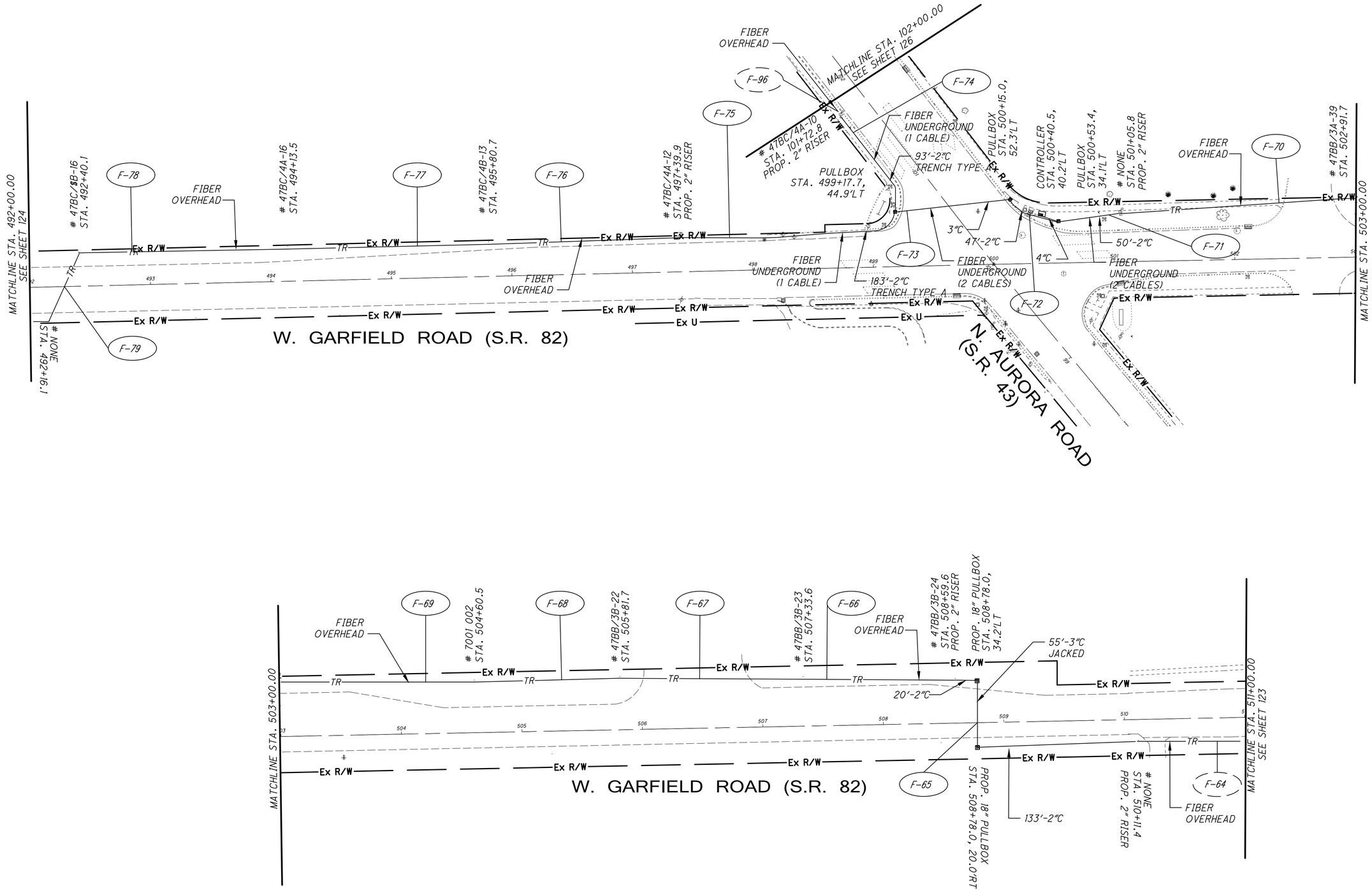
122 / 133	POR-AURORA SIGNALS	TRAFFIC SIGNAL INTERCONNECT PLAN S. CHILLICOTHE ROAD (S.R. 43)	CALCULATED JFS CHECKED MWS	0 40 20 80 HORIZONTAL SCALE IN FEET



123 133	POR-AURORA SIGNALS	TRAFFIC SIGNAL INTERCONNECT PLAN S. CHILLICOTHE ROAD (S.R. 306)	CALCULATED JFS CHECKED MWS	0 40 20 80 HORIZONTAL SCALE IN FEET



124 / 133	POR-AURORA SIGNALS	TRAFFIC SIGNAL INTERCONNECT PLAN W. GARFIELD ROAD (S.R. 82)	CALCULATED JFS CHECKED MWS	0 40 20 80 HORIZONTAL SCALE IN FEET



N

0 20 40 80
HORIZONTAL
SCALE IN FEET

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL INTERCONNECT PLAN
W. GARFIELD ROAD (S.R. 82)

POR-AURORA SIGNALS

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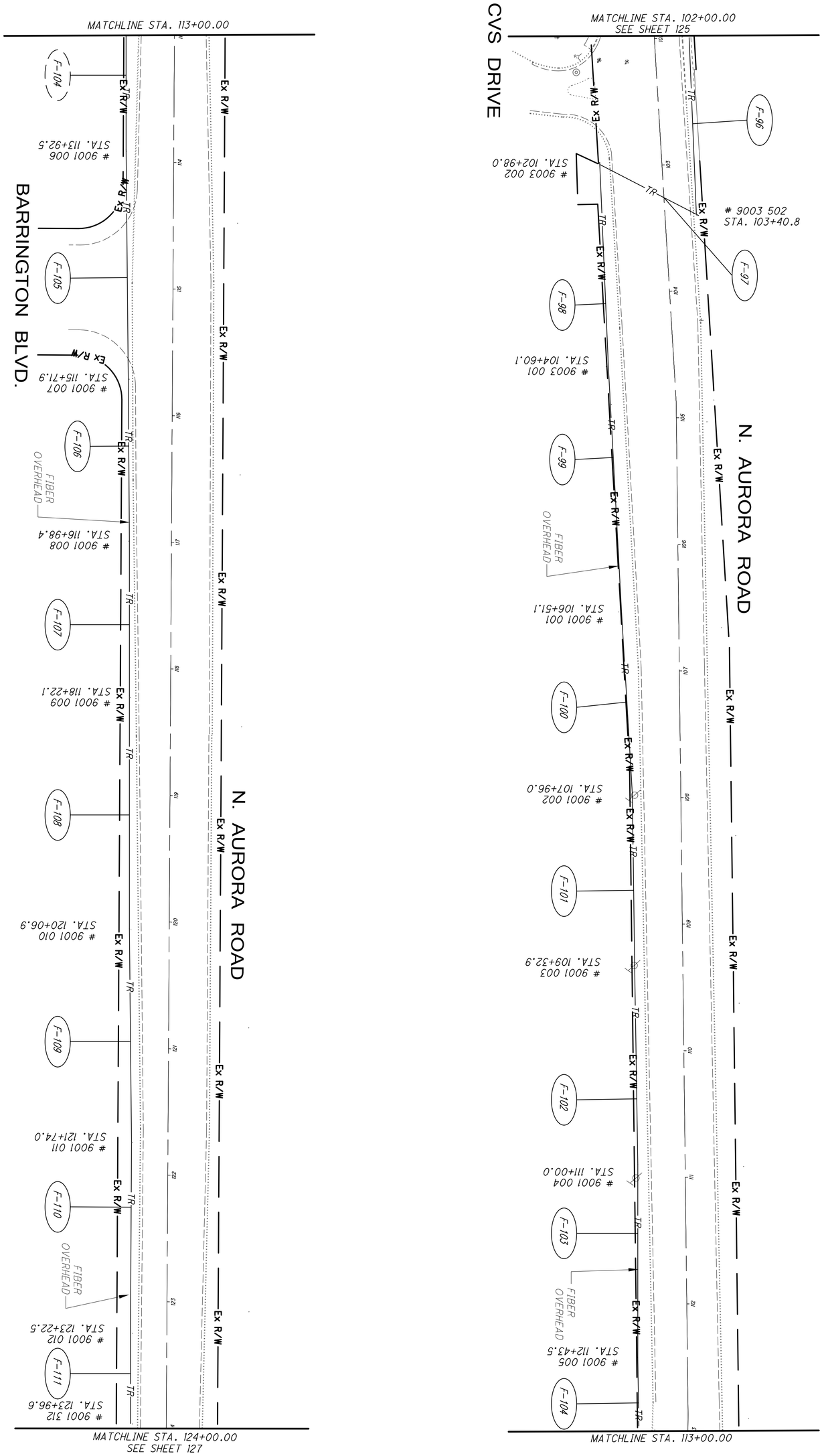


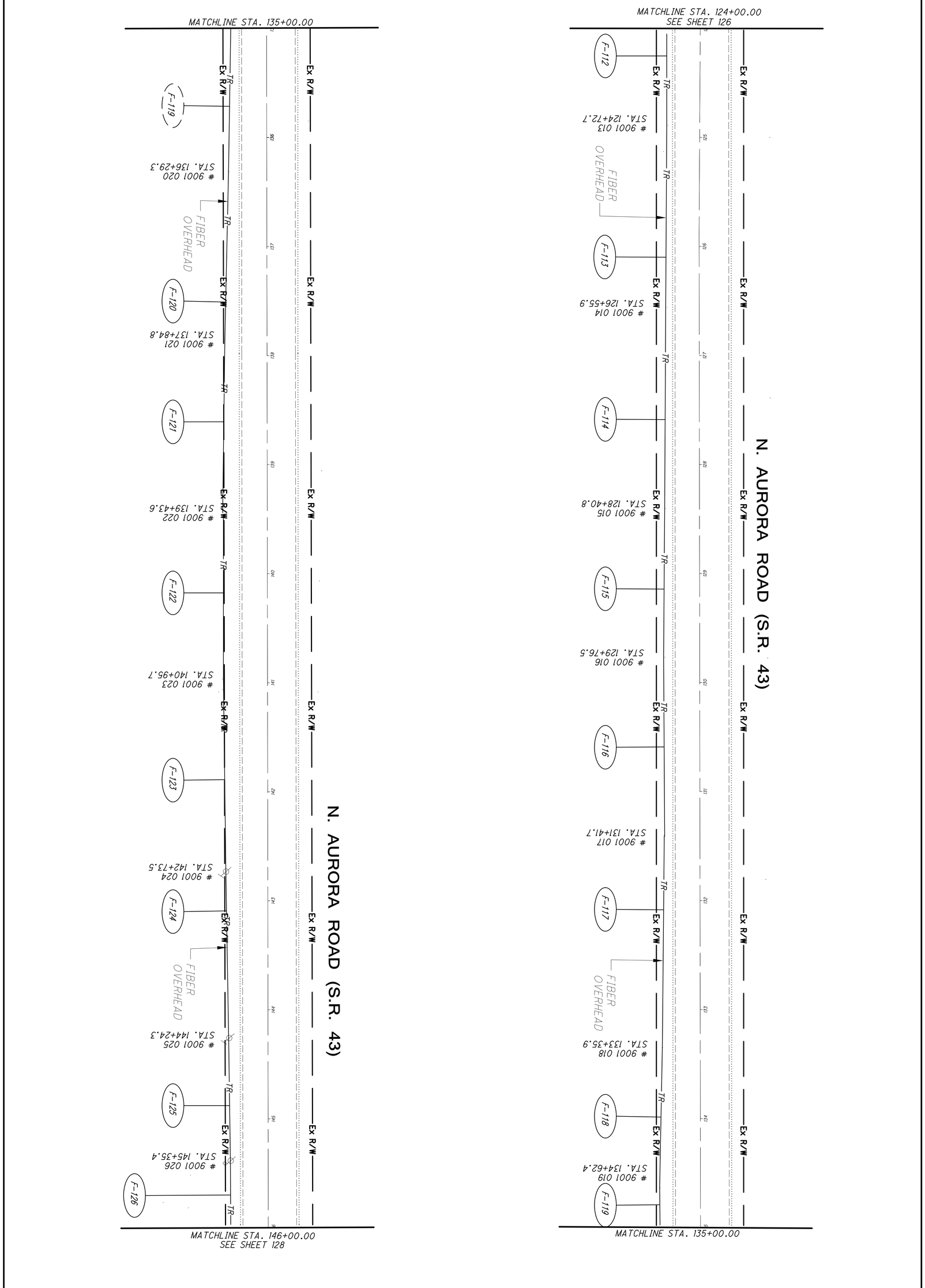
POR-AURORA SIGNALS

TRAFFIC SIGNAL INTERCONNECT PLAN
N. AURORA ROAD (S.R. 43)

CALCULATED JFS
CHECKED MWS

0 20 40 80
HORIZONTAL SCALE IN FEET

N

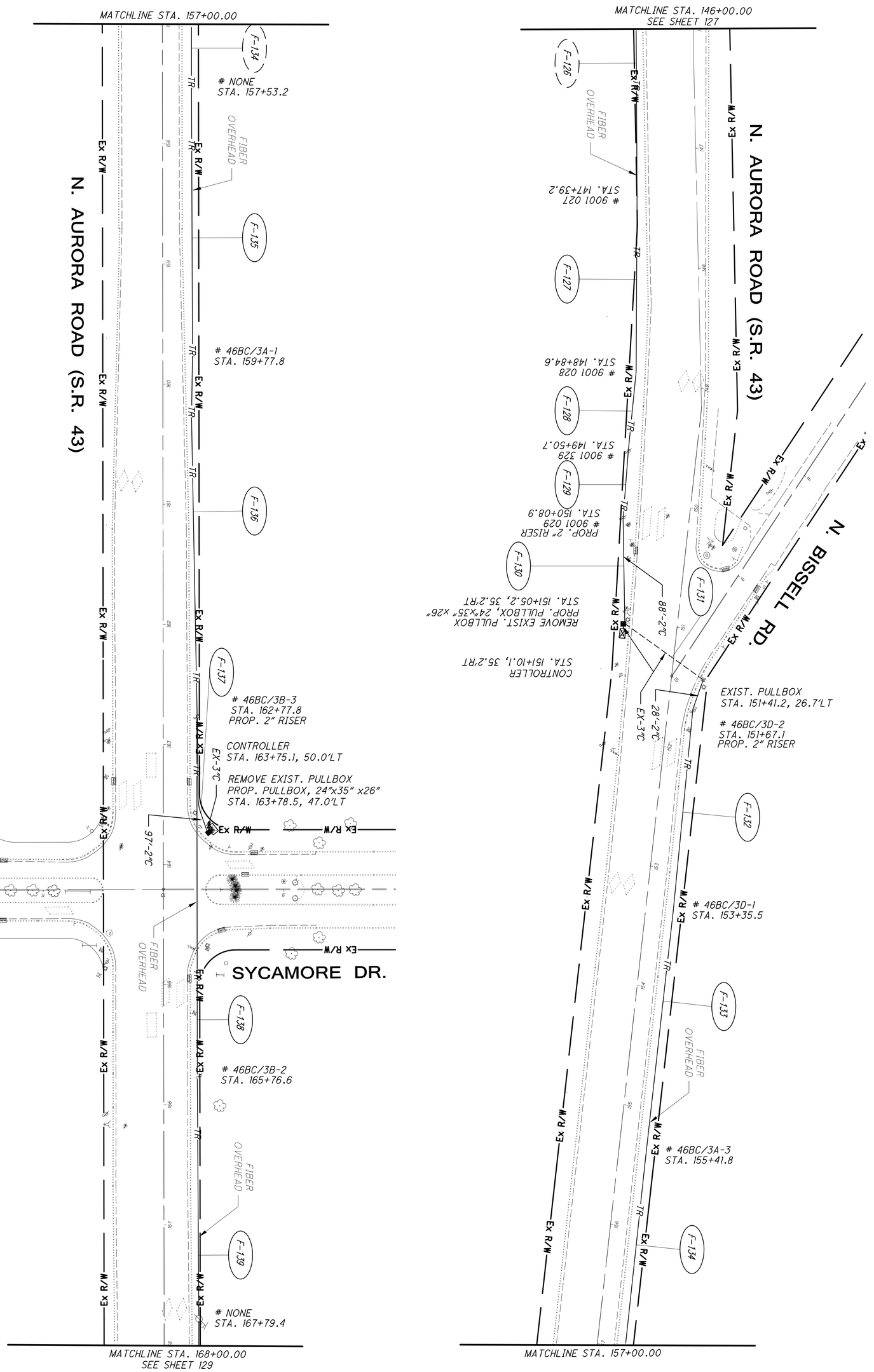


POR-AURORA SIGNALS

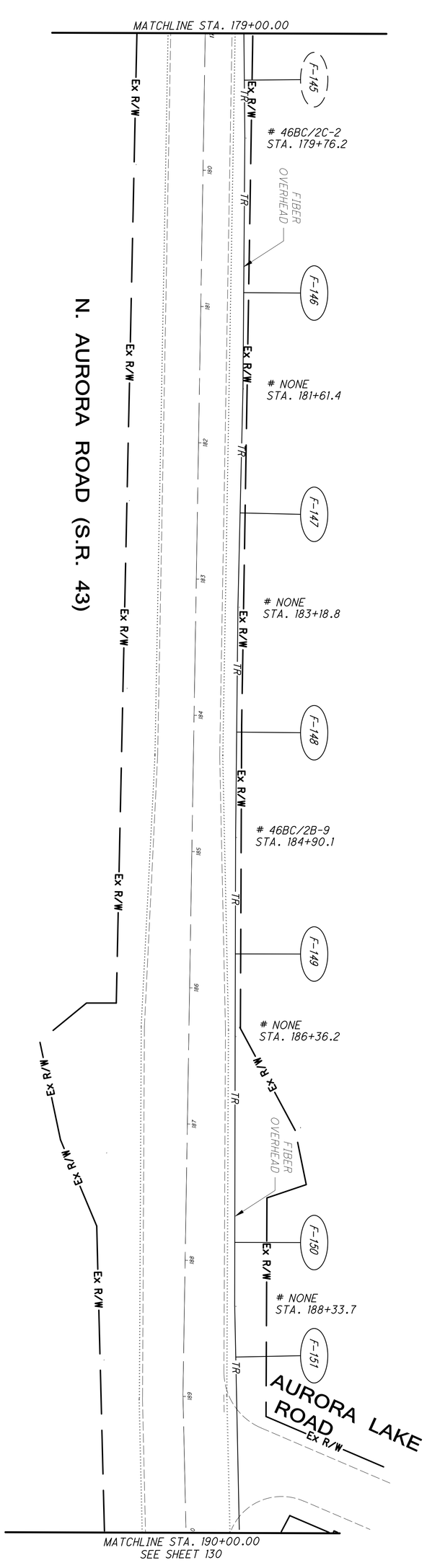
TRAFFIC SIGNAL INTERCONNECT PLAN
N. AURORA ROAD (S.R. 43)

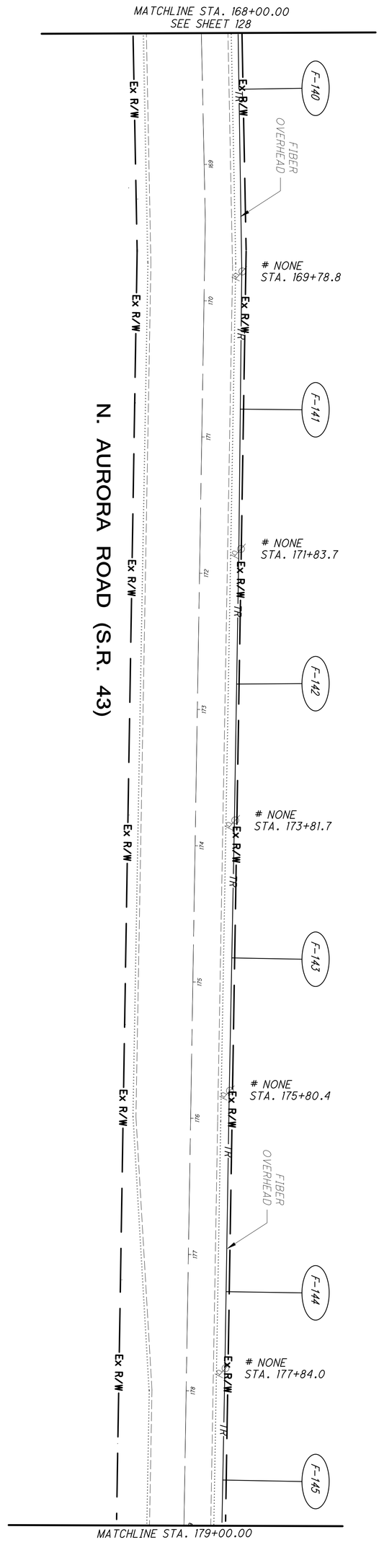
CALCULATED JFS
CHECKED MWS

0 40
20 80
HORIZONTAL SCALE IN FEET



128 / 133	POR-AURORA SIGNALS	TRAFFIC SIGNAL INTERCONNECT PLAN N. AURORA ROAD (S.R. 43)	CALCULATED JFS CHECKED MWS	0 40 20 80 HORIZONTAL SCALE IN FEET



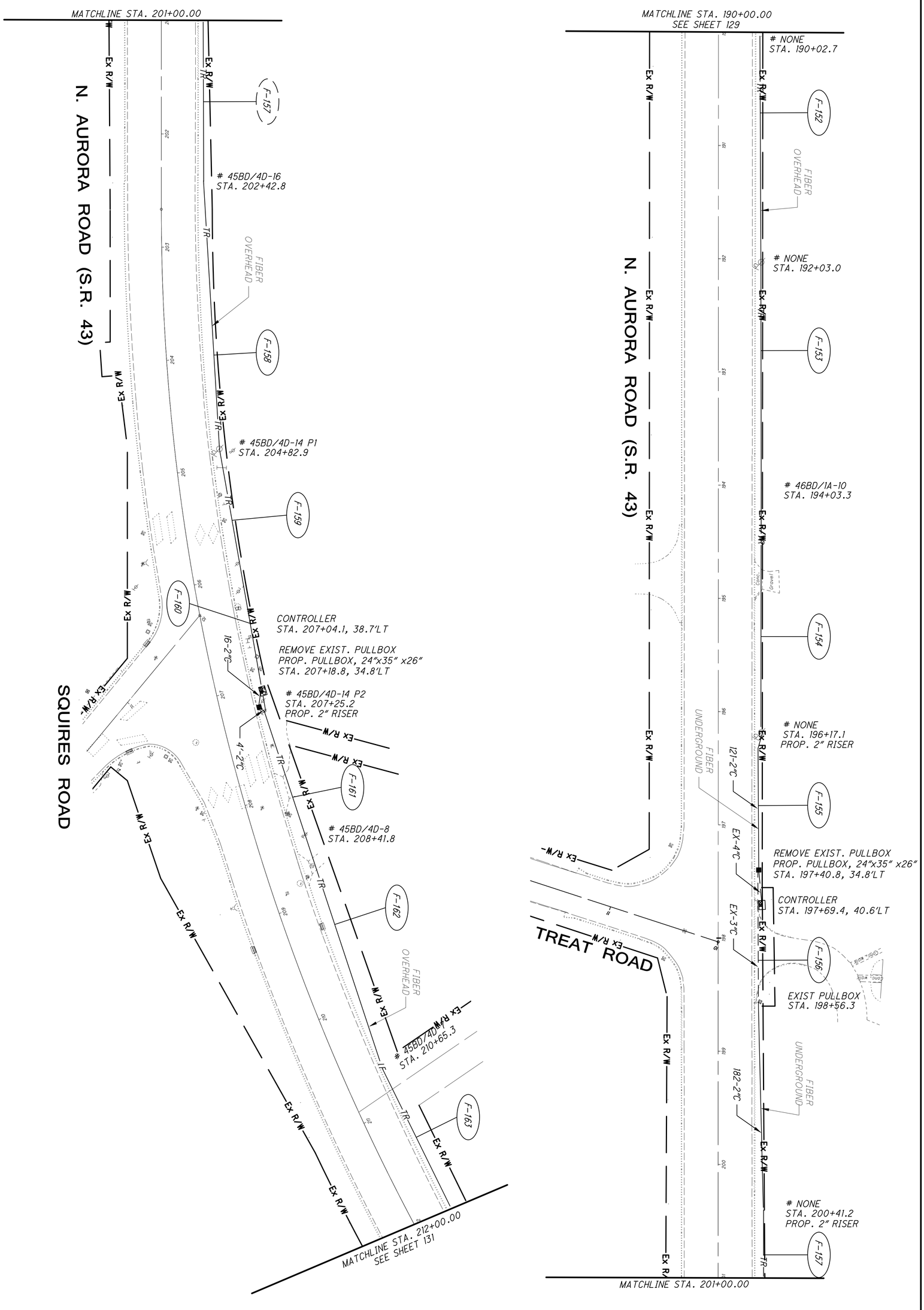


POR-AURORA SIGNALS

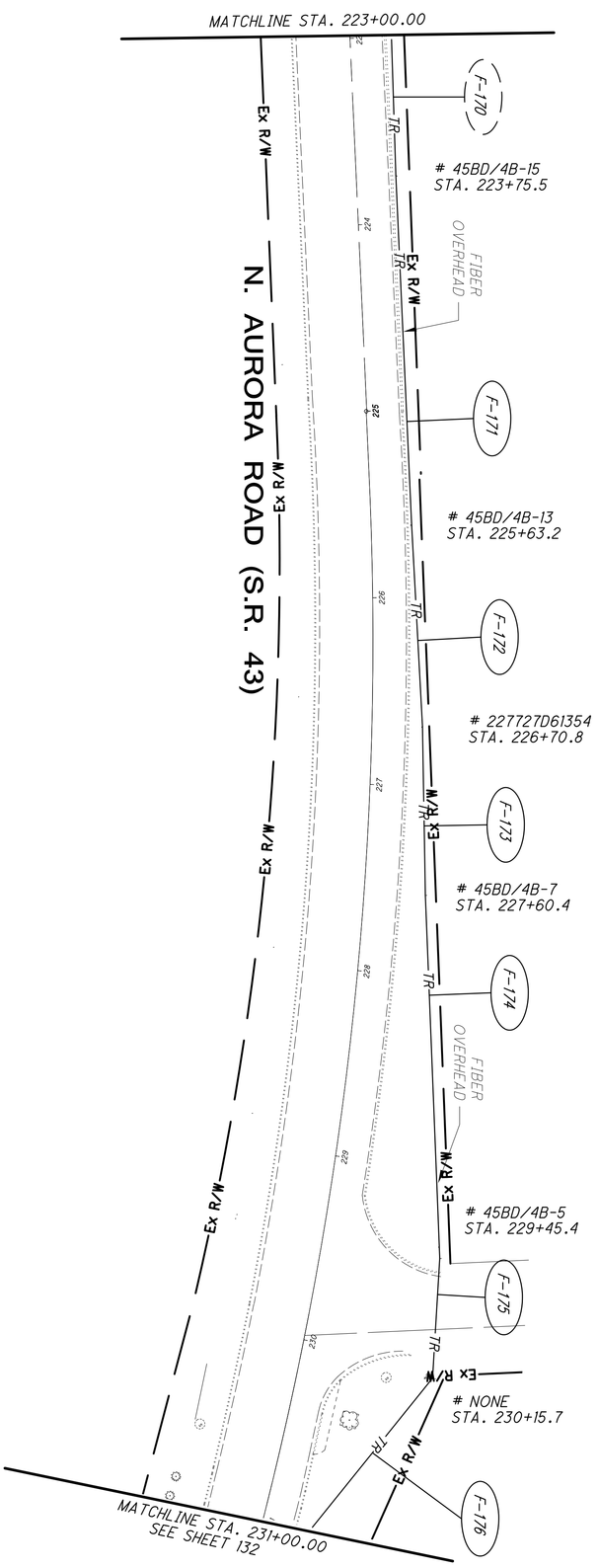
TRAFFIC SIGNAL INTERCONNECT PLAN
N. AURORA ROAD (S.R. 43)

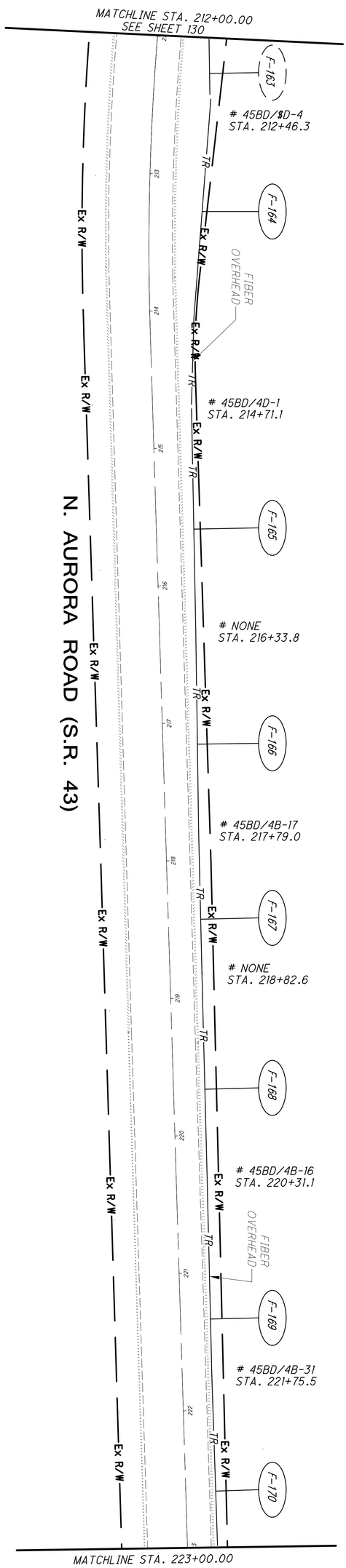
CALCULATED JFS
CHECKED MWS

0 40
20 80
HORIZONTAL SCALE IN FEET

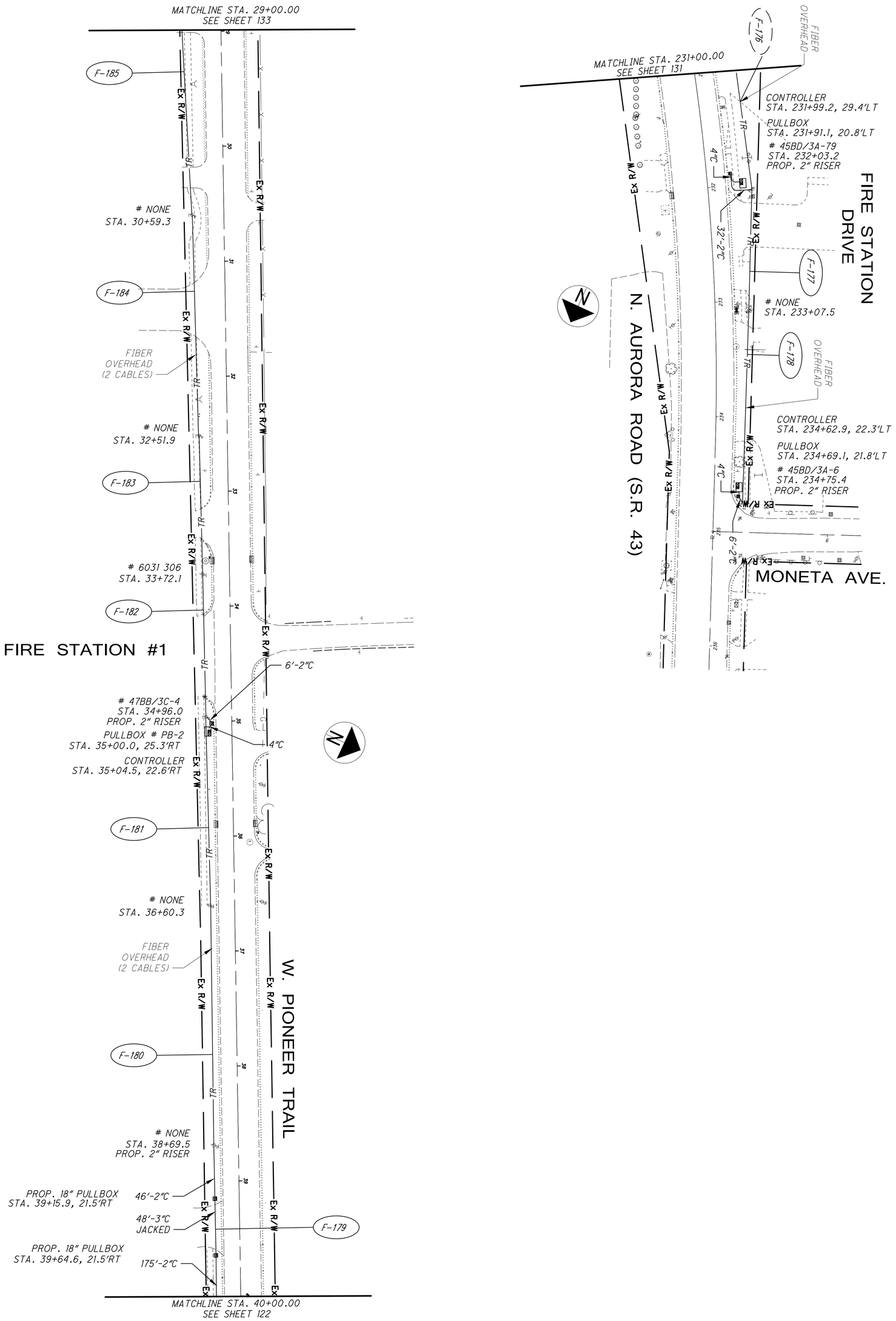


130 / 133	POR-AURORA SIGNALS	TRAFFIC SIGNAL INTERCONNECT PLAN N. AURORA ROAD (S.R. 43)	CALCULATED JFS CHECKED MWS	0 20 40 80 HORIZONTAL SCALE IN FEET

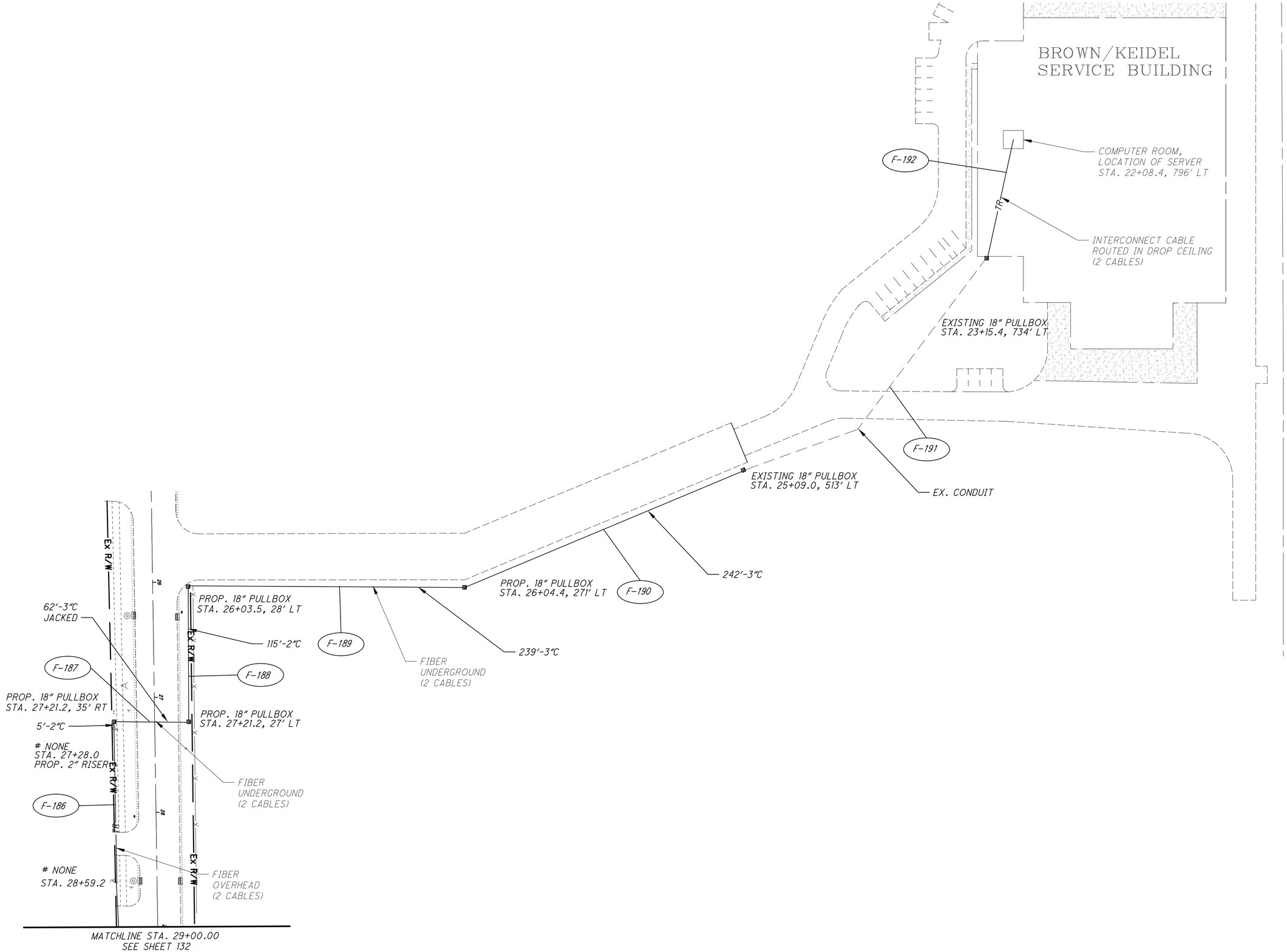




131 / 133	POR-AURORA SIGNALS	TRAFFIC SIGNAL INTERCONNECT PLAN N. AURORA ROAD (S.R. 43)	CALCULATED JFS CHECKED MWS	0 20 40 80 HORIZONTAL SCALE IN FEET



132 133	POR-AURORA SIGNALS	TRAFFIC SIGNAL INTERCONNECT PLAN N. AURORA ROAD (S.R. 43)/ W. PIONEER TRAIL	CALCULATED JFS CHECKED MWS	0 40 20 80 HORIZONTAL SCALE IN FEET



0 20 40 80
HORIZONTAL
SCALE IN FEET

CALCULATED JFS
CHECKED MWS

TRAFFIC SIGNAL INTERCONNECT PLAN
W. PIONEER TRAIL/ CITY SERVICE BUILDING

POR-AURORA SIGNALS

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