

UTILITIES

LUC-2-9.35

COLUMBIA GAS OF OHIO
2901 MANHATTAN BLVD.
TOLEDO, OH 43611
419-539-6066

ODOT DISTRICT 2 TRAFFIC
317 E. POE RD.
BOWLING, GREEN 43402
419-353-8131

OHIO GAS COMPANY
P.O. BOX 528
BRYAN, OHIO 43506
800-331-7396

TOLEDO EDISON
6099 ANGOLA RD.
HOLLAND, OHIO 43528
419-249-5218

BUCKEYE CABLEVISION
2700 OREGON RD.
NORTHWOOD, OHIO 43519
419-724-3713

LUCAS COUNTY SANITARY
1111 S MCCORD RD
HOLLAND, OH 43528
419-213-2926

WIL-20A-4.77

CHARTER TELECOMMUNICATIONS
3760 INTERCHANGE DR.
COLUMBUS, OHIO 43204
614-255-6340

ODOT DISTRICT 2 TRAFFIC
317 E. POE RD.
BOWLING, GREEN 43402
419-353-8131

COLUMBIA GAS TRANSMISSION
301 MAPLE STREET
SUGAR GROVE, OHIO 43155
740-746-2297

COLUMBIA GAS OF OHIO
2901 E. MANHATTAN BLVD.
TOLEDO, OHIO 43611
419-539-6066

TOLEDO EDISON
6099 ANGOLA ROAD
HOLLAND, OHIO 43528
419-249-5218

FRONTIER COMMUNICATIONS
3126 N MCCORD RD
TOLEDO, OHIO 43617
419-841-7281

BUCKEYE CABLEVISION
2700 OREGON RD.
NORTHWOOD, OHIO 43519
419-724-3713

SIGNAL ACTIVATION

PRIOR TO ACTIVATING THE NEW TRAFFIC SIGNAL TO STOP AND GO MODE AND/OR REMOVING THE EXISTING TRAFFIC SIGNAL FROM SERVICE, ALL ITEMS IN THE PROPOSED SIGNAL PLAN SHALL BE FULLY COMPLETED, (I.E., VEHICLE DETECTION, PEDESTRIAN SIGNAL HEADS, ETC.). IF THERE ARE CONSTRUCTABILITY ISSUES (I.E., ROADWAY WIDENING, ETC.) THAT PREVENT THE SIGNAL FROM BEING COMPLETED PRIOR TO ACTIVATION, IT SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER. THE DISTRICT TRAFFIC ENGINEER WILL THEN REVIEW, APPROVE OR REJECT PROPOSALS TO ACTIVATE THE TRAFFIC SIGNAL PRIOR TO COMPLETION.

THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND DISTRICT TRAFFIC ENGINEER AT LEAST 10 WORKING DAYS PRIOR TO SCHEDULING THE FINAL INSPECTION OF THE SIGNAL INSTALLATION. FINAL INSPECTION IS NOT CONSIDERED COMPLETE UNTIL DESIGNATED DISTRICT TRAFFIC PERSONNEL INSPECT THE TRAFFIC SIGNAL AND ISSUE WRITTEN APPROVAL. IF ISSUES ARE FOUND DURING THE FINAL INSPECTION THAT EFFECT THE SAFETY OF THE TRAVELING PUBLIC AND/OR THE EFFICIENCY OF THE INTERSECTION, THE SIGNAL SHALL NOT BE ACTIVATED ON THE PROPOSED DATE. ANY PUNCH LIST ITEMS THAT ARE FOUND SHALL BE CORRECTED AND REINSPECTED BY

DISTRICT TRAFFIC PERSONNEL PRIOR TO FINAL ACCEPTANCE. ODOT FORCES SHALL ONLY ASSUME DAY TO DAY MAINTENANCE OF THE TRAFFIC SIGNAL AFTER FINAL WRITTEN ACCEPTANCE HAS BEEN ISSUED.

632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS, CABLE, MESSENGER WIRE, STRAIN POLES, CABINET, CONTROLLER, ETC., SHALL BE REMOVED IN ACCORDANCE WITH CMS 632.26 AND AS INDICATED ON THE PLANS. REMOVED ITEMS SHALL BE REUSED AS PART OF A NEW INSTALLATION ON THE PROJECT OR STORED ON THE PROJECT FOR SALVAGE BY (ODOT DISTRICT 2) IN ACCORDANCE WITH THE LISTING GIVEN HEREIN

(ITEMS TO BE REUSED)

LUC-2-9.35

-COMMUNICATION/NETWORK EQUIPMENT AND RELATED COMPONENTS
-RADAR DETECTION AND EQUIPMENT

(ITEMS TO BE STORED)

LUC-2-9.35 & WIL-20A-4.77

-CONTROLLER
-UPS

IN THE EVENT THE ITEMS STORED ON THE PROJECT FOR SALVAGE BY THE LOCAL AGENCY ARE NOT REMOVED, THE CONTRACTOR SHALL, WHEN DIRECTED BY THE ENGINEER IN WRITING, REMOVE AND DISPOSE OF THE ITEMS AT NO ADDITIONAL COST TO THE PROJECT.

UNDERDRAINS FOR PULLBOXES

REFERENCE TRAFFIC SCD HL-30.11 FOR DETAILS ABOUT DRAINING PULLBOXES. UNDERDRAINS FOR PULLBOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED 20 FEET.

633 CABINET, TYPE TS-2, AS PER PLAN

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

THE GROUND-MOUNTED CABINET SHALL BE A NEMA TS-2, TYPE 1, CABINET SIZE 7 SUPER R WITH 16 LOAD SWITCH BAYS, LED UNDER-SHELF LIGHTING, POWER HARNESSSES FOR BOTH TS2 TYPE 1 AND TYPE 2 CONTROLLERS AND SHALL HAVE A MINIMUM OF THREE SHELVES.

THIS CABINET WILL HAVE TWO SEPARATE FULL-SIZED ENCLOSURES. ONE SIDE WILL BE FOR THE SIGNAL CONTROLLER AND THE OTHER FOR THE UPS.

EACH CABINET SHALL COME 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.

THE CABINET SHALL BE FURNISHED WITH AN EDI MMU AS ALLOWED ON THE TAP/APPROVED PRODUCTS LIST.

PAYMENT FOR ITEM 633 CABINET, TYPE TS-2, AS PER PLAN WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS TESTED AND ACCEPTED.

633 UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN

THE UPS SIDE OF THE CABINET SHALL INCLUDE A GENERATOR POWER PANEL WITH A HEAVY-DUTY POWER RELAY VERSUS THE LINE VOLTAGE GENERATOR SWITCH. THE GENERATOR INLET SHALL BE A RECESSED PANEL WITH A DOOR THAT IS FLUSH WITH THE EXTERNAL SIDE OF THE UPS CABINET. IT SHALL INCLUDE A RECESSED PLUG, AUTOMATIC TRANSFER SWITCH AND A DOOR THAT SECURELY CLOSES OVER THE POWER CORD.

THE UPS SIDE OF THE CABINET SHALL HAVE A DOOR STOP MECHANISM AND THERMOSTATICALLY CONTROLLED FAN. THE UPS SIDE OF THE CABINET SHALL INCLUDE A BATTERY BALANCING DEVICE THAT REGULATES THE BATTERIES AND OPTIMIZES PERFORMANCE.

AFTER FOUR (4) HOURS OF BATTERY RUN TIME, THE SYSTEM SHALL BE PROGRAMMED TO SWITCH THE INTERSECTION FROM FULL OPERATION TO CONTROLLER AUTOMATIC FLASH OPERATION THROUGH THE MONITOR. THE CONTROLLER SHALL BE PROGRAMMED SO THAT FLASH OPERATION SHALL BEGIN ONCE THE INTERSECTION RUNS MINOR STREET GREEN (TYP. PH. 4 & 8), ALL-RED CLEARANCE, AND THEN FLASH OPERATION.

THE UPS OUTPUT NOTIFICATIONS FOR ON BATTERY, BATTERY 2-HOUR TIMER, AND LOW BATTERY SHALL BE WIRED INTO THE TRAFFIC SIGNAL CABINET BACK PANEL OR THROUGH THE CONTROLLER WITH A C11 TO PROVIDE SPECIAL STATUS ALARMS FOR EACH OUTPUT INTO THE SIGNAL CONTROLLER.

THIS ITEM SHALL INCLUDE A RED LED STATUS INDICATOR LAMP TO ALLOW MAINTENANCE PERSONNEL AND LAW ENFORCEMENT TO QUICKLY ASSESS WHETHER A TRAFFIC SIGNAL CABINET IS BEING POWERED BY A UPS. THE LED HOUSING SHALL BE NEMA 4X, IP65 OR IP66, RATED FOR OUTDOOR USE AND BE TAMPER/SHATTER RESISTANT. IT SHALL BE A DOMED ENCLOSURE CONTAINING A RED LENS WITH LED THAT IS VISIBLE FROM 100 FOOT MINIMUM. THE ENCLOSURE AND LED MODULE SHOULD BE PLACED ON THE SIDE OF THE UPS CABINET FACING TOWARDS THE MAINLINE ROADWAY AND SEALED FROM WATER INTRUSION. IT SHOULD BE WIRED USING MINIMUM 20GA 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. THE RED LED SHALL ONLY ILLUMINATE TO INDICATE THE CABINET IS OPERATING UNDER UPS BACKUP POWER (THE "BACKUP" OPERATING CONDITION). THIS ITEM INCLUDES PROGRAMMING THE UPS STATUS RELAY OUTPUTS TO PRODUCE THE LAMP STATUS DISPLAYS. THESE STATUS DISPLAYS WILL BE SOLID 100% DUTY CYCLE (NOT FLASHING) DISPLAYS. THE OPERATING VOLTAGE OF THE LED LAMP SHALL BE 120V AC UNLESS OTHERWISE INDICATED.

SEEDING AND MULCHING

THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS:

659, TOPSOIL 10 CU. YD.

659, SEEDING AND MULCHING 100 SQ. YD.

659, COMMERCIAL FERTILIZER 0.1 TON

659, WATER 1 M. GAL.

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

809 STOP-LINE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR MATRIX DETECTION UNIT. THE DETECTION UNIT SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE PROVIDED FROM THE TRAFFIC CABINET.
2. ALL REQUIRED INPUTS 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 COMMUNICATION 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 COMMUNICATION MODULES, AS NECESSARY.
8. THE CONTRACTOR SHALL INSTALL THE RADAR DETECTION PRIOR TO MILLING/DISABLING EXISTING LOOPS.
9. THE INSTALLATION SHALL INCLUDE ALL CONTROLLER PROGRAMMING FOR COMPLETE INSTALLATION, WHICH INCLUDES MODIFICATIONS FOR REMOVAL OF EXISTING DETECTION.

PAYMENT FOR ITEM 809 STOP-LINE 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, CONDUIT AND CONNECTIONS TESTED AND ACCEPTED.

DESIGN AGENCY



DESIGNER

DEK

REVIEWER

JJM

PROJECT ID

107947

SHEET

P.4

TOTAL

19

DUE TO THE FURTHER POSSIBILITY OF CONFLICT WITH EXISTING OR PROPOSED UNDERGROUND OBSTRUCTIONS (INCLUDING THE POSSIBILITY OF UNRECORDED OBSTRUCTIONS) WHICH COULD AFFECT THE LOCATION OF THE FOUNDATION FOR THIS ITEM, AND CONSEQUENTLY, THE DESIGN OF THE SUPPORT AND/OR ARMS, THE CONTRACTOR SHALL NOT PLACE FINAL ORDERS FOR THE ITEM UNTIL THE FOUNDATIONS HAVE BEEN INSTALLED, AT FINAL GRADE, AND THE CONTRACTOR HAS RECEIVED, FROM ENGINEER, WRITTEN NOTICE TO PROCEED WITH THE ORDERS FOR THE ITEM.

IF ANY FOUNDATION LOCATIONS MUST BE ADJUSTED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND MAINTAINING AGENCY, WHO WILL DETERMINE THE REVISED LOCATION AND IF NEEDED, THE SUPPORT DESIGN. THE CONTRACTOR WILL NOT BE RESPONSIBLE FOR DETERMINING THE REVISED DESIGN. THE ENGINEER WILL INFORM THE CONTRACTOR OF ANY CHANGES NECESSARY AND AUTHORIZE THE CONTRACTOR TO ORDER THE SUPPORT.

THE CONTRACTOR SHALL, WHEN DEVELOPING THE PROGRESS SCHEDULE, AND THOSE OF SUBCONTRACTORS, ENSURE THAT THE FOUNDATIONS ARE INSTALLED AT THE EARLIEST TIME AS IS FEASIBLE AND PRACTICAL, AND SHALL INCLUDE SUFFICIENT TIME IN THE PROGRESS SCHEDULE FOR ORDERING, MANUFACTURING, DELIVERY AND INSTALLATION OF THE SUPPORT ITEMS AFTER THE FOUNDATIONS ARE IN PLACE.

NO PAYMENTS FOR DELIVERED MATERIALS FOR THE FOUNDATION OR SUPPORT ITEMS SHALL BE MADE UNTIL THE FOUNDATIONS ARE IN PLACE, AND IF CHANGES IN THE DESIGN OF THIS ITEM ARE REQUIRED, NO PAYMENT SHALL BE MADE FOR THE ITEMS MANUFACTURED TO THE ORIGINAL DESIGN.

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE AND WILL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND OTHER INCIDENTALS NECESSARY FOR EACH SUPPORT FURNISHED, IN PLACE, COMPLETE AND ACCEPTED.

625 ARC-FLASH HAZARD CALCULATIONS AND EQUIPMENT LABEL

THIS ITEM CONSISTS OF CALCULATING THE ARC FLASH HAZARD FOR INSTALLED NEW OR EXISTING ELECTRICAL ENCLOSURES, PROVIDING DOCUMENTATION OF THE CALCULATIONS, AND APPLYING THE APPROPRIATE EXTERNAL ARC FLASH HAZARD EQUIPMENT LABEL TO ESTABLISHED INDUSTRY STANDARDS.

ELECTRICAL EQUIPMENT REQUIRING LABELS: 1 CABINET

ENSURE THAT MATERIAL FOR THE ARC FLASH HAZARD EQUIPMENT LABEL CONFORMS TO ODOT C&MS 730.18, REFLECTIVE SHEETING TYPE F. THE SHEETING COLOR SHALL BE SAFETY ORANGE, 4 INCHES HIGH AND SIX INCHES WIDE.

CALCULATIONS ARE TO BE DONE IN ACCORDANCE TO IEEE 1584-2002.

LABELS ARE TO BE PERMANENTLY MARKED USING STANDARD SIGN SHEETING SILK SCREEN PROCESS, SUCH THAT EACH ENCLOSURE LABEL IS UNIQUE, WITH INTEGRAL TEXT AND CHECK BOX MARKS.

REFER TO SUPPLEMENTAL SPECIFICATION 825 FOR ADDITIONAL INFORMATION.

625 - DISCONNECT CIRCUIT, AS PER PLAN

LUC-2-9.35

DISCONNECT THE PORTION OF THE LIGHTING CIRCUIT TO BE REMOVED OR ABANDONED FROM THE PORTION OF THE CIRCUIT TO REMAIN IN SERVICE AT THE DESIGNATED NODE POINT. REMOVE THE CABLE FROM THE LINK NO LONGER TO REMAIN IN SERVICE FROM THE NODE POINT ENCLOSURE. REMOVE THE CONDUIT OR DUCT FOR THE LINK NO LONGER IN SERVICE FROM THE NODE POINT ENCLOSURE AND PROPERLY CLOSE THE RESULTANT OPENINGS IN THE ENCLOSURE UNLESS THE CONDUIT OR DUCT IS TO BE LEFT IN PLACE TO ALLOW ANOTHER CIRCUIT LINK TO ENTER THE NODE ENCLOSURE. CONNECTION OF THE REMAINING CIRCUIT SHALL BE IN ACCORDANCE WITH 625.18.

ITEM 632 – SIGNALIZATION, MISC.: UNLASH AND RELASH MESSENGER WIRE

THE CONTRACTOR SHALL REMOVE EXISTING MESSENGER WIRE LASHING RODS AND REINSTALL THEM AS NECESSARY FOR THE INSTALLATION OF ANY NEW CABLES ON THE EXISTING INTERSECTION SPAN LABELED ON SHEET 16. IF NECESSARY, NEW LASHING RODS SHALL BE INSTALLED. THE CABLES SHALL ENTER THE EXISTING STRAIN POLE THROUGH THE POLE CABLE ENTRANCE FITTING AND USE THE EXISTING CONDUIT SYSTEM TO GET TO THE CONTROLLER CABINET. THE NEW CABLES SHALL BE SUPPORTED BY A NEW CABLE SUPPORT ASSEMBLY AT THE TOP OF THE STRAIN POLE. THE NEW SIGNAL CABLES SHALL BE BID BY SEPARATE BID ITEMS.

PAYMENT FOR ITEM 632 SIGNALIZATION MISC.: UNLASH AND RELASH MESSENGER WIRE WILL BE PER FOOT AND INCLUDE ALL LABOR, MATERIALS, CABLE SUPPORT ASSEMBLIES, AND EQUIPMENT TO INSTALL NEW CABLES ON EXISTING SPAN WIRE INSTALLATIONS.

ITEM 809 - ITS DEVICE, MISC.: REMOVAL AND REINSTALLATION OF ETHERNET RADIO

INCIDENTAL WORK TO THIS ITEM INCLUDES RUNNING ONE ETHERNET CABLE (CAT 5E OR CAT 6 OUTDOOR RATED SHIELDED/ARMORED, UV RESISTANT, GEL FILLED) WITH RJ-45 TERMINATIONS TO THE RADIO FROM THE CABINET WHERE ONE CABLE WILL BE POWER OVER ETHERNET AND COMMUNICATIONS THE MANAGED SWITCH, AND ALL MOUNTING EQUIPMENT.

ITEM 828 - LED BLANKOUT SIGN, (MMU/CMU COMPATIBLE), TYPE R3-2, SIZE 24" X 24"

THE CONTRACTOR SHALL PROVIDE AND INSTALL A SOLID FILLED RED SYMBOL, SOLID FILLED WHITE ARROW NO RIGHT TURN SYMBOL SIGN ON THE TRAFFIC SIGNAL MAST ARM AT THE LOCATION INDICATED ON THE PLANS, IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATIONS 828 AND 928. THE SYMBOL SIGN SHALL BE A WEATHER TIGHT NEMA ENCLOSURE. THE FOLLOWING ADDITIONAL SPECIFICATIONS SHALL APPLY:

VOLTAGE: 120V
ILLUMINATION: LED
CHARACTER HEIGHT: 20.0"
CABINET SIZE: 24" H X 24" W X 5.5" D
FINISH: BLACK
WARRANTY: 5 YEAR



THE SIGN SHALL BE WIRED TO ACTIVATE DURING ASSOCIATED LEFT TURN PHASE. THE MAST ARM MOUNTING BRACKET SHALL BE SUPPLIED BY THE SIGN MANUFACTURER AND INSTALLED BY THE CONTRACTOR.

DESIGN AGENCY



DESIGNER

DEK

REVIEWER

JJM

PROJECT ID

107947

SHEET TOTAL

P.6 | 19

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 ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN 8 HOURS AFTER THE CONTRACTOR'S NOTIFICATION 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 8-HOUR PERIOD, AND SHALL MAKE PERMANENT REPAIRS OR REPLACEMENT AS SOON THEREAFTER 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 DAMAGE.

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 ENGINEER MAY INVOKE THE PROVISIONS OF SECTION 105.15 AND ANY SUBSEQUENT BILLINGS TO THE STATE FOR POLICE SERVICES AND MAINTENANCE SERVICES BY CITY FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15.

THE CONTRACTOR SHALL PROVIDE THE MAINTENANCE SERVICE ENTIRELY WITH HIS FORCES OR HE MAY CHOOSE TO ENTER INTO A COOPERATIVE UNDERSTANDING WITH THE LOCAL MAINTAINING AGENCY TO PROVIDE THE MAINTENANCE. THE CONTRACTOR SHALL INFORM THE 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 8 HOURS AND SHALL NOT INCLUDE THE HOURS OF 7AM TO 7PM. 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.

ANY VEHICULAR TRAFFIC SIGNAL HEAD, EITHER NEW OR EXISTING WHICH WILL BE OUT OF OPERATION SHALL BE COVERED IN THE MANNER 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;

5. TIME OF COMPLETION OF THE 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.

NOTIFICATION OF TRAFFIC RESTRICTIONS

THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW TO INFORM THE SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS.

INFORMATION SHOULD INCLUDE, BUT IS NOT LIMITED TO, ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTIFICATION OF TRAFFIC RESTRICTIONS TIME TABLE
ITEM DURATION OF NOTICE DUE TO
CLOSURE PERMITS & PIO

RAMP & >= 2 WEEKS 21 CALENDAR DAYS
ROAD CLOSURES PRIOR TO CLOSURE

> 12 HOURS 14 CALENDAR DAYS
& < 2 WEEKS PRIOR TO CLOSURE

<= 12 HOURS 4 CALENDAR DAYS
PRIOR TO CLOSURE

LANE >= 2 WEEKS 14 CALENDAR DAYS
CLOSURES & PRIOR TO CLOSURE
RESTRICTIONS
< 2 WEEKS 5 BUSINESS DAYS
PRIOR TO CLOSURE

START OF N/A 14 CALENDAR DAYS
CONSTRUCTION & PRIOR TO
TRAFFIC PATTERN IMPLEMENTATION
CHANGES

ANY UNFORESEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME TABLE.

DESIGN AGENCY



DESIGNER
DEK
REVIEWER
JJM


PROJECT ID
107947

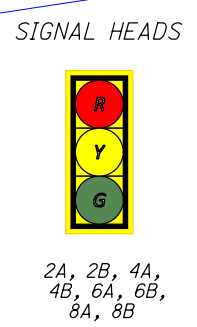
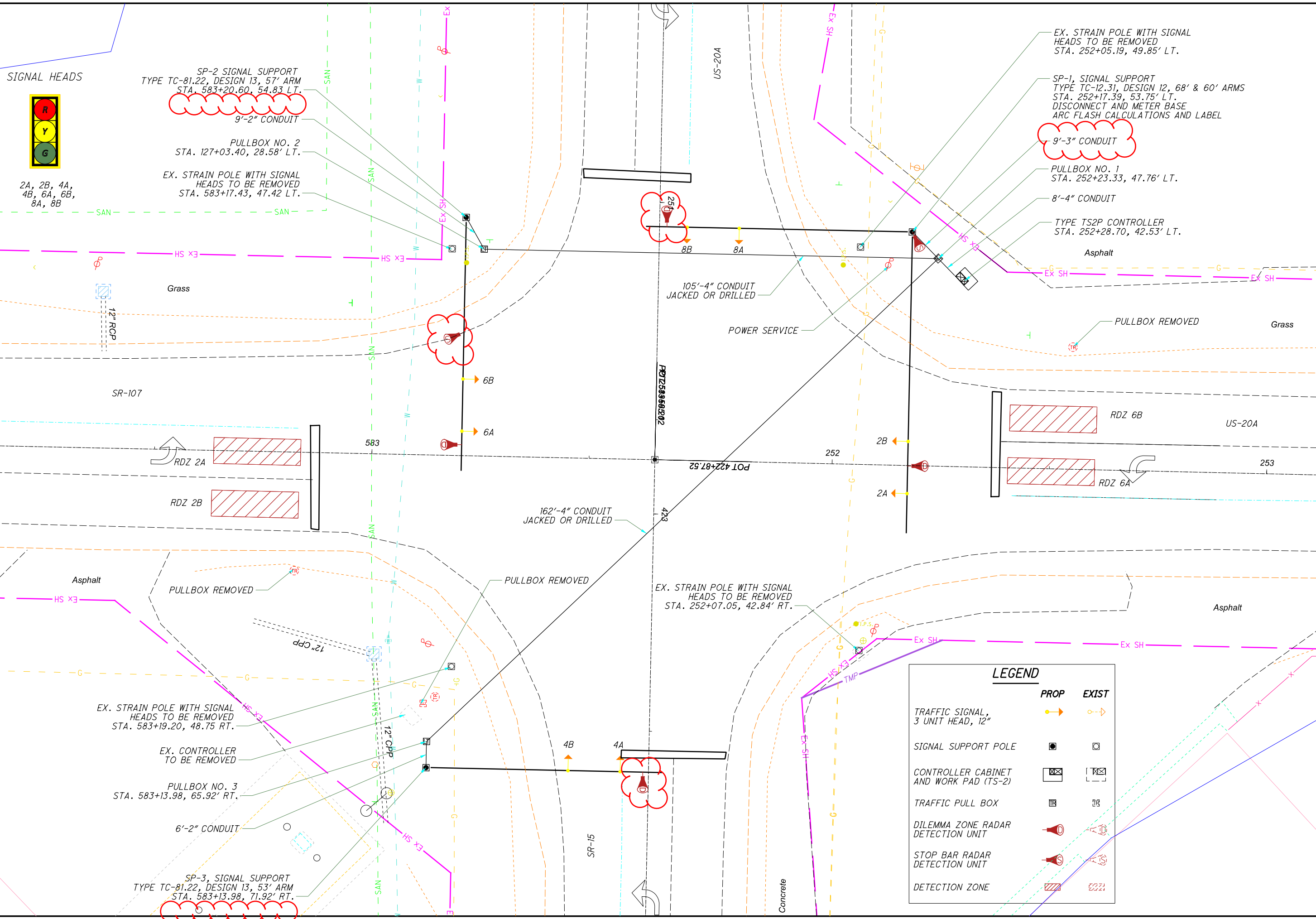
SHEET TOTAL
P.8 19

| SHEET NO. | LOCATIONS | 625 | 625 | 625 | 625 | 625 | 625 | 625 | 625 | 625 | 625 | 632 | 632 | 632 | 632 | 632 | 632 | 632 | 632 | 632 | 632 | |
|--|--|----------------------------|----------------------------|----------------------------|--|--------------|-------------------------------|--------------------------|--------------------|---|---|---|---|---|---|--|---|--|--|--|-----------------------------------|--|
| | | CONDUIT, 2", 725.051 FT | CONDUIT, 3", 725.051 FT | CONDUIT, 4", 725.051 FT | CONDUIT, JACKED OR DRILLED, 725.0514" FT | TRENCH FT | PULL BOX, 725.08, 24" EACH | PULL BOX REMOVED EACH | GROUND ROD EACH | UNDERGROUND WARNING/MARKING TAPE FT | ARC FLASH CALCULATIONS AND LABEL EACH | VEHICULAR SIGNAL HEAD, (LED), 3- SECTION, 12" LENS, 1-WAY, POLYCARBONATE, BLACK EACH | VEHICULAR SIGNAL HEAD, (LED), 5- SECTION, 12" LENS, 1-WAY, POLYCARBONATE, BLACK EACH | PEDESTRIAN SIGNAL HEAD (LED), TYPE D2, COUNTDOWN EACH | ACCESSIBLE PEDESTRIAN PUSHBUTTON EACH | COVERING OF VEHICULAR SIGNAL HEAD EACH | COVERING OF PEDESTRIAN SIGNAL HEAD EACH | SIGNAL CABLE, 2 CONDUCTOR, NO. 14 AWG FT | SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG FT | SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG FT | SIGNAL SUPPORT FOUNDATION EACH | POWER CABLE, 3 CONDUCTOR, NO. 6 AWG FT |
| LUC-2-9.35 (SPRING MEADOWS WEST) | | | | | | | | | | | | | | | | | | | | | | |
| 12 | EX. STRAIN POLE 4 TO EX. PULLBOX 1 | | | | | | | | | | 1 | 5 | 2 | 1 | 5 | 1 | | | 295 | 495 | | |
| 12 | EX. STRAIN POLE 3 TO EX. PULLBOX 1 | | | | | | | | | | | | 1 | | 1 | | | | 300 | | | |
| 12 | PUSHBUTTON PEDESTAL 1 TO PULLBOX 2 | | | | | | | | | 1 | 1 | | | | 1 | | | 20 | | | | |
| 12 | PULLBOX 2 TO EX. STRAIN POLE 2 | | | | | | | | | | 1 | | | | 2 | | | 8 | | | | |
| 12 | EX. STRAIN POLE 2 TO EX. STRAIN POLE 1 | | | | | | | | | | | 4 | 3 | | 4 | | | 255 | 235 | 375 | | |
| 12 | EX. STRAIN POLE 1 TO EX. PULLBOX 1 | | | 5 | | 5 | | | | | 5 | | | | 2 | 1 | | 30 | 20 | 590 | | |
| 12 | EX. PULLBOX 1 TO CONTROLLER | | | 7 | | 7 | | | | 1 | 7 | | | | | | | 24 | 24 | 84 | 50 | |
| WIL-20A-4.77 | | | | | | | | | | | | | | | | | | | | | | |
| 16 | SIGNAL SUPPORT 3 TO PULLBOX 3 | 6 | | | | | | 6 | | 1 | 3 | 1 | 6 | | | | | | | | 92 | 1 |
| 16 | PULLBOX 3 TO PULLBOX 1 | | | | 162 | | | | | | | | | | | | | | | | 162 | |
| 16 | SIGNAL SUPPORT 2 TO PULLBOX 2 | 9 | | | | | | 9 | | 1 | | 1 | 9 | | | | | | | | 100 | 1 |
| 16 | PULLBOX 2 TO PULLBOX 1 | | | | 105 | | | | | | | | | | | | | | | | 105 | |
| 16 | SIGNAL SUPPORT 1 TO PULLBOX 1 | | 9 | | | | | 9 | | 1 | 2 | 1 | 9 | | | | | | | | 214 | 1 |
| 16 | PULLBOX 1 TO CONTROLLER | | | 8 | | | | 8 | | | | | 1 | | | | | | | | 52 | 50 |
| TOTALS CARRIED TO GENERAL SUMMARY | | 15 | 9 | 20 | 267 | 44 | 4 | 7 | 4 | 303 | 2 | 17 | 5 | 6 | 2 | 17 | 6 | 337 | 874 | 2269 | 3 | 100 |

| SHEET NO. | LOCATIONS | 632 | 632 | 632 | 632 | 632 | 632 | 633 | 633 | 633 | 633 | 809 | 809 | 809 | 809 | 828 |
|--|--|--|-----------------------|--|---|--|--|---|--|---|--|--|---|---|-------------------------------------|--|
| | | SERVICE CABLE, 3 CONDUCTOR, NO. 4 AWG FT | POWER SERVICE EACH | SIGNAL SUPPORT, TYPE TC-12.31 DESIGN 12 POLE, WITH MAST ARMS TC-81.22 DESIGN 14 AND DESIGN 13 EACH | SIGNAL SUPPORT, TYPE TC-81.22, DESIGN 13 EACH | REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN EACH | SIGNALIZATION, MISC.:UNLASH AND RELASH MESSENGER WIRE FT | CABINET, TYPE TS-2, AS PER PLAN EACH | CABINET FOUNDATION, AS PER PLAN EACH | CONTROLLER WORK PAD, AS PER PLAN EACH | UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN EACH | ITS DEVICE, MISC.:REMOVAL AND REINSTALLATION OF ETHERNET RADIO EACH | ADVANCE RADAR DETECTION, AS PER PLAN EACH | STOP LINE RADAR DETECTION, AS PER PLAN EACH | ATC CONTROLLER, AS PER PLAN EACH | LED BLANKOUT SIGN, (MMU/CMU COMPATIBLE) EACH |
| LUC-2-9.35 (SPRING MEADOWS WEST) | | | | | | | | | | | | | | | | |
| 12 | EX. STRAIN POLE 4 TO EX. PULLBOX 1 | | | | | | | | | | | | | | | |
| 12 | EX. STRAIN POLE 3 TO EX. PULLBOX 1 | | | | | | | | | | | | | | | |
| 12 | PUSHBUTTON PEDESTAL 1 TO PULLBOX 2 | | | | | | | | | | | | | | | |
| 12 | PULLBOX 2 TO EX. STRAIN POLE 2 | | | | | | | | | | | | | | | |
| 12 | EX. STRAIN POLE 2 TO EX. STRAIN POLE 1 | | | | | | | | | | | | | | | |
| 12 | EX. STRAIN POLE 1 TO EX. PULLBOX 1 | | | | | | | | | | | | | | | |
| 12 | EX. PULLBOX 1 TO CONTROLLER | 50 | 1 | | | 1 | 405 | 1 | 1 | 1 | 1 | 2 | | 1 | 1 | |
| WIL-20A-4.77 | | | | | | | | | | | | | | | | |
| 16 | SIGNAL SUPPORT 3 TO PULLBOX 3 | | | | | 1 | | | | | | | | | | |
| 16 | PULLBOX 3 TO PULLBOX 1 | | | | | | | | | | | | | | | |
| 16 | SIGNAL SUPPORT 2 TO PULLBOX 2 | | | | | 1 | | | | | | | | | | |
| 16 | PULLBOX 2 TO PULLBOX 1 | | | | | | | | | | | | | | | |
| 16 | SIGNAL SUPPORT 1 TO PULLBOX 1 | | | | | 1 | | | | | | | | | | |
| 16 | PULLBOX 1 TO CONTROLLER | 50 | 1 | | | 1 | | 1 | 1 | 1 | 1 | 2 | | 1 | 2 | |
| TOTALS CARRIED TO GENERAL SUMMARY | | 100 | 2 | 1 | 2 | 2 | 405 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 |

TRAFFIC SIGNAL SUBSUMMARY

DESIGN AGENCY

 DESIGNER
 DEK
 REVIEWER
 JJM
 PROJECT ID
 107947
 SHEET TOTAL
 P.11 | 19



SP-2 SIGNAL SUPPORT
TYPE TC-81.22, DESIGN 13, 57' ARM
STA. 583+20.60, 54.83' LT.

9'-2" CONDUIT

PULLBOX NO. 2
STA. 127+03.40, 28.58' LT.

EX. STRAIN POLE WITH SIGNAL HEADS TO BE REMOVED
STA. 583+17.43, 47.42' LT.

EX. STRAIN POLE WITH SIGNAL HEADS TO BE REMOVED
STA. 252+05.19, 49.85' LT.

SP-1, SIGNAL SUPPORT
TYPE TC-12.31, DESIGN 12, 68' & 60' ARMS
STA. 252+17.39, 53.75' LT.
DISCONNECT AND METER BASE
ARC FLASH CALCULATIONS AND LABEL

9'-3" CONDUIT

PULLBOX NO. 1
STA. 252+23.33, 47.76' LT.

8'-4" CONDUIT

TYPE TS2P CONTROLLER
STA. 252+28.70, 42.53' LT.

EX. STRAIN POLE WITH SIGNAL HEADS TO BE REMOVED
STA. 583+19.20, 48.75' RT.

EX. CONTROLLER TO BE REMOVED

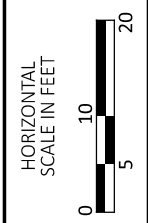
PULLBOX NO. 3
STA. 583+13.98, 65.92' RT.

6'-2" CONDUIT

SP-3, SIGNAL SUPPORT
TYPE TC-81.22, DESIGN 13, 53' ARM
STA. 583+13.98, 71.92' RT.

LEGEND

| | PROP | EXIST |
|--|------|-------|
| TRAFFIC SIGNAL, 3 UNIT HEAD, 12" | | |
| SIGNAL SUPPORT POLE | | |
| CONTROLLER CABINET AND WORK PAD (TS-2) | | |
| TRAFFIC PULL BOX | | |
| DILEMMA ZONE RADAR DETECTION UNIT | | |
| STOP BAR RADAR DETECTION UNIT | | |
| DETECTION ZONE | | |



TRAFFIC SIGNAL PLAN
WIL-20A-4.77

| | |
|---------------|--------|
| DESIGN AGENCY | |
| DESIGNER | DEK |
| REVIEWER | JJM |
| PROJECT ID | 107947 |
| SHEET | P.12 |
| TOTAL | 19 |

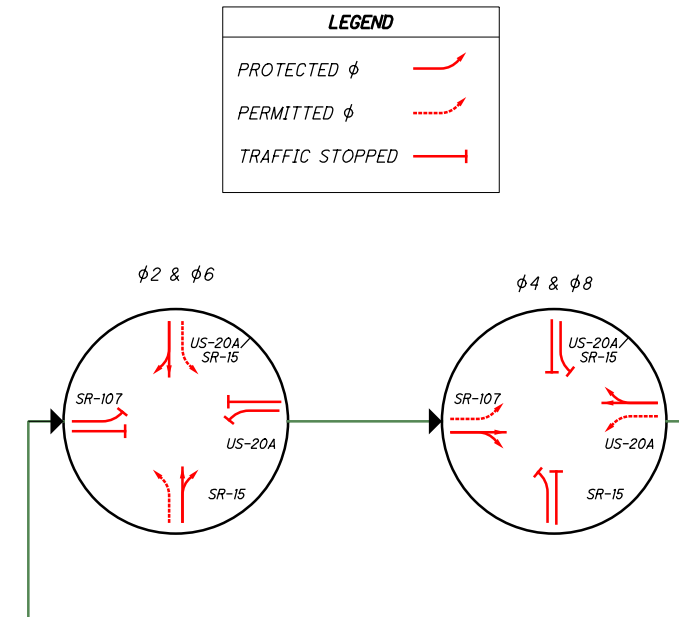
SIGNAL TIMING CHART (TEM FORM 496-3)

| INTERSECTION: WIL-20A & SR-15 | | | | | | | | |
|-------------------------------------|-------------------------|----------------------|----|----------|---|--------|---|-----|
| MAINTAINING AGENCY: ODOT District 2 | | | | | | | | |
| START UP | DUAL ENTRY: | PHASES: 2 & 6, 4 & 8 | | | | | | |
| | REST IN RED: | RING 1 - | | RING 2 - | | | | |
| START IN: | ALL-RED FLASH | OVERLAP | | | | | | |
| TIME FOR: FLASH, ALL RED (SEC.): | 9, 6 | A | B | C | D | PHASES | | |
| FIRST PHASE(S): | 2 & 6 | - | - | - | - | | | |
| COLOR DISPLAYED: | GREEN | - | - | - | - | | | |
| INTERVAL OR FEATURE | CONTROLLER MOVEMENT NO. | | | | | | | |
| INTERSECTION MOVEMENT (PHASE) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DIRECTION | - | 30 | - | 10 | - | 30 | - | 10 |
| MINIMUM GREEN (INITIAL) (SEC.) | - | - | - | - | - | - | - | - |
| ADDED INITIAL *(SEC./ACTUATION) | - | - | - | - | - | - | - | - |
| MAXIMUM INITIAL *(SEC.) | - | - | - | - | - | - | - | - |
| PASSAGE TIME (PRESET GAP) (SEC.) | - | 3 | - | 3 | - | 3 | - | 3 |
| TIME BEFORE REDUCTION *(SEC.) | - | - | - | - | - | - | - | - |
| MINIMUM GAP *(SEC.) | - | - | - | - | - | - | - | - |
| TIME TO REDUCE *(SEC.) | - | - | - | - | - | - | - | - |
| MAXIMUM GREEN I (SEC.) | - | 60 | - | 40 | - | 60 | - | 40 |
| MAXIMUM GREEN II (SEC.) | - | 60 | - | 40 | - | 60 | - | 40 |
| YELLOW CHANGE (SEC.) | - | 5.5 | - | 5.6 | - | 5.5 | - | 5.6 |
| ALL RED CLEARANCE (SEC.) | - | 1 | - | 1 | - | 1 | - | 1 |
| DELAYED GREEN (LPI) (SEC.) | - | - | - | - | - | - | - | - |
| FLASHING YELLOW ARROW DELAY (SEC.) | - | - | - | - | - | - | - | - |
| WALK (SEC.) | - | - | - | - | - | - | - | - |
| PEDESTRIAN CLEARANCE (SEC.) | - | - | - | - | - | - | - | - |
| RECALL | MAXIMUM (ON/OFF) | - | - | - | - | - | - | - |
| | MINIMUM (ON/OFF) | - | ON | - | - | ON | - | - |
| | PEDESTRIAN (ON/OFF) | - | - | - | - | - | - | - |
| MEMORY (ON/OFF) | - | - | - | - | - | - | - | - |

NOTES:

- ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.
- 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)

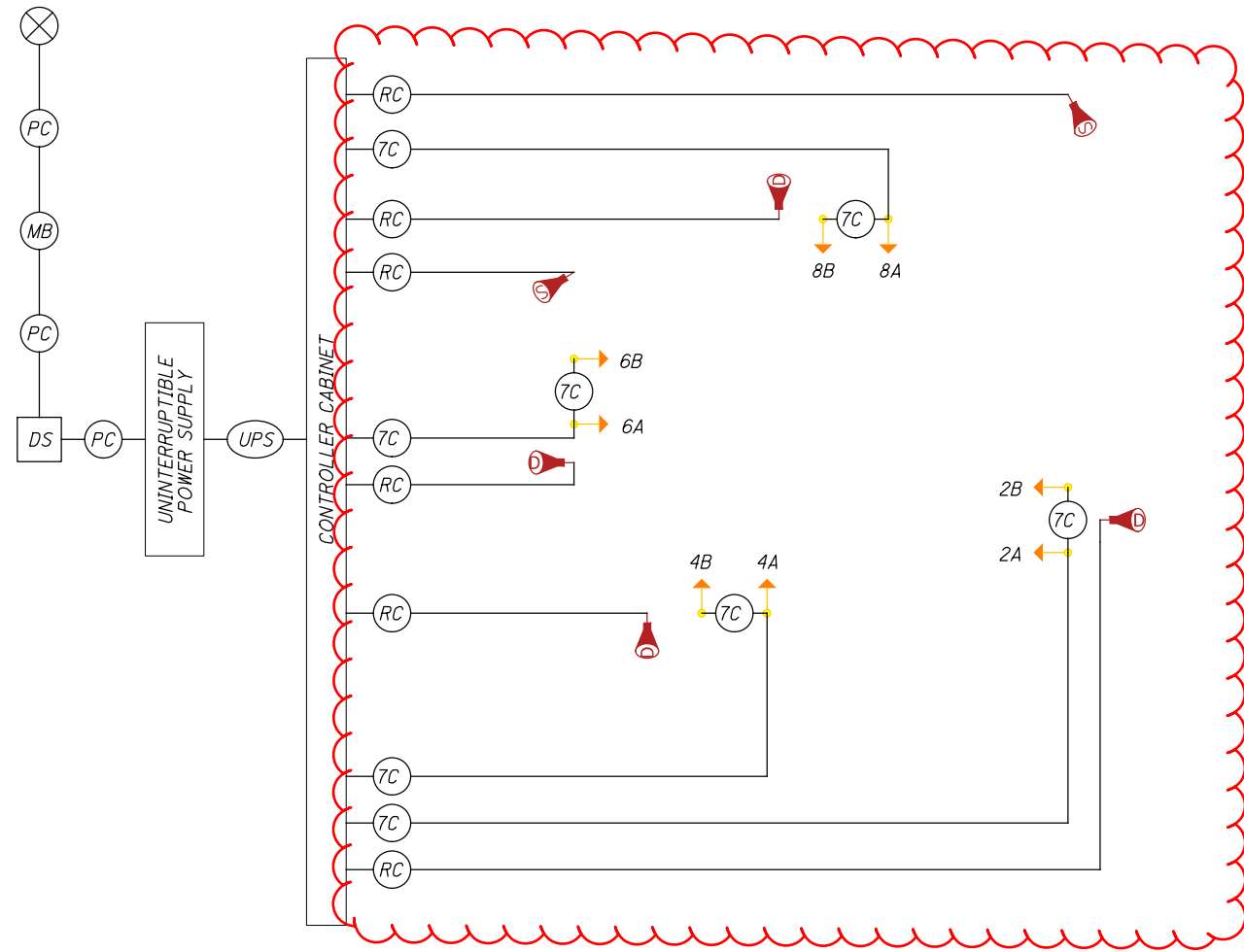


RADAR DETECTION CHART

| DETECTION ZONE | MOVEMENT | PULSE OR PRESENCE | ASSOCIATED PHASE | DELAY PROGRAMMED IN CONTROLLER (SEC.) | EXTENSION PROGRAMMED IN CONTROLLER (SEC.) | DETECTOR NO. | PURPOSE | DETECTION ZONE LENGTH (FT) |
|----------------|----------|-------------------|------------------|---------------------------------------|---|--------------|----------------|----------------------------|
| 2A | EB THRU | PRESENCE | 2 | 0 | 0 | 0 | EXTEND PHASE 2 | 50 |
| 2B | EB THRU | PRESENCE | 2 | 0 | 0 | 0 | EXTEND PHASE 2 | 50 |
| 2C | EB THRU | PULSE | 2 | 0 | 0 | 0 | EXTEND PHASE 2 | 700 |
| 4A | SB THRU | PULSE | 4 | 0 | 0 | 0 | EXTEND PHASE 4 | 700 |
| 6A | WB THRU | PRESENCE | 6 | 0 | 0 | 0 | EXTEND PHASE 6 | 50 |
| 6B | WB THRU | PRESENCE | 6 | 0 | 0 | 0 | EXTEND PHASE 6 | 50 |
| 6C | WB THRU | PULSE | 6 | 0 | 0 | 0 | EXTEND PHASE 6 | 700 |
| 8A | NB THRU | PULSE | 8 | 0 | 0 | 0 | EXTEND PHASE 8 | 700 |



WIRING DIAGRAM (TYPICAL)



FIELD WIRING HOOK-UP CHART (TEM FORM 496-16)

| SIGNAL HEAD | INDICATION | FIELD TERMINAL | FLASH | SIGNAL HEAD | INDICATION | FIELD TERMINAL | FLASH |
|-----------------------------|------------|----------------|-------|-------------|------------|----------------|-------|
| 2A, B (EB) | R | 2R | R | - | - | - | - |
| | Y | 2Y | | | | | |
| | G | 2G | | | | | |
| | - | - | | | | | |
| 4A, B (SB) | R | 4R | R | - | - | - | |
| | Y | 4Y | | | | | |
| | G | 4G | | | | | |
| | - | - | | | | | |
| 6A, B (WB) | R | 6R | R | - | - | - | |
| | Y | 6Y | | | | | |
| | G | 6G | | | | | |
| | - | - | | | | | |
| 8A, B (NB) | R | 8R | R | - | - | - | |
| | Y | 8Y | | | | | |
| | G | 8G | | | | | |
| | - | - | | | | | |
| - | - | - | - | - | - | - | |
| - | - | - | - | - | - | - | |
| PEDESTRIAN MOVEMENTS | | | | | | | |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| OVERLAPS | | | | | | | |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| LS = LOAD SWITCH | | | | | | | |

LEGEND

| | | | | | |
|--|---|--|---------------------------------------|--|--|
| | TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12" | | LUMINAIRE, CONVENTIONAL | | SERVICE CABLE, 3 CONDUCTOR, NO. X AWG |
| | TRAFFIC SIGNAL, 2 UNIT, 3 UNIT, OR PHB HEAD 12" | | 2/C NO. XX AWG (LEAD-IN CABLE) | | POWER CABLE, 2 CONDUCTOR, NO. X AWG |
| | TRAFFIC SIGNAL, 3 UNIT HEAD, 12" WITH ARROWS | | VEHICLE LOOP DETECTOR | | SIGNAL SUPPORT POLE NO. __ |
| | PEDESTRIAN SIGNAL | | SIGNAL CABLE, 5 CONDUCTOR, NO. XX AWG | | METER BASE |
| | PEDESTRIAN PUSH BUTTON | | SIGNAL CABLE, 7 CONDUCTOR, NO. XX AWG | | NO. X AWG DISTRIBUTION CABLE |
| | DILEMMA ZONE RADAR DETECTION UNIT | | RADAR DETECTION CABLE | | SIGNAL CABLE, 4 CONDUCTOR, NO. XX AWG |
| | STOP LINE RADAR DETECTION UNIT | | VIDEO CAMERA CABLE | | DUAL LIGHTING/SIGNAL DISCONNECT SWITCH |
| | VIDEO DETECTION CAMERA | | INTERCONNECT CABLE | | FLASHER CABINET |
| | PTZ CAMERA | | PHOTOELECTRIC CELL | | UNINTERRUPTIBLE POWER SUPPLY CABLE |
| | ETHERNET RADIO | | POWER SOURCE | | HAND/ OFF/ AUTO SWITCH |



EX. STRAIN POLE NO. 2 TO REMAIN
EX. PEDESTRIAN SIGNAL HEADS NO. 3 & 4 TO BE REPLACED
EX. PEDESTRIAN PUSHBUTTONS TO BE REMOVED
STA. 493+94.36, 82.01' LT.

EX. STRAIN POLE NO. 3 TO REMAIN
EX. PEDESTRIAN SIGNAL HEAD NO. 5 TO BE REPLACED
EX. PEDESTRIAN PUSHBUTTON TO BE REMOVED
STA. 494+64.24, 84.85' LT.

PULLBOX NO. 2
STA. 493+61.88, 74.94' RT.

PUSHBUTTON PEDESTAL SUPPORT NO. 1
STA. 494+87.46, 75.53' LT.

STA. 492+95.00
APPROX LOCATION OF BARRIER
JUNCTION BOX FOR CIRCUIT DISCONNECT

STA. 494+20.80 ? R/W S.R.2 (9.36 SLM)
S.M.W. DR. STA. 32+80.84 (PLANS LUC-2-8.82-9.38)

STA. 495+45.00
APPROX LOCATION OF BARRIER
JUNCTION BOX FOR CIRCUIT DISCONNECT

EX. PULLBOX NO. 1 TO BE REUSED
STA. 493+61.88, 74.94' RT.

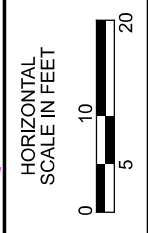
TYPE TS2P CONTROLLER
STA. 493+60.79, 80.13' RT.

EX. PULLBOX NO. 3
STA. 494+87.66, 66.09' RT.
TO BE REMOVED

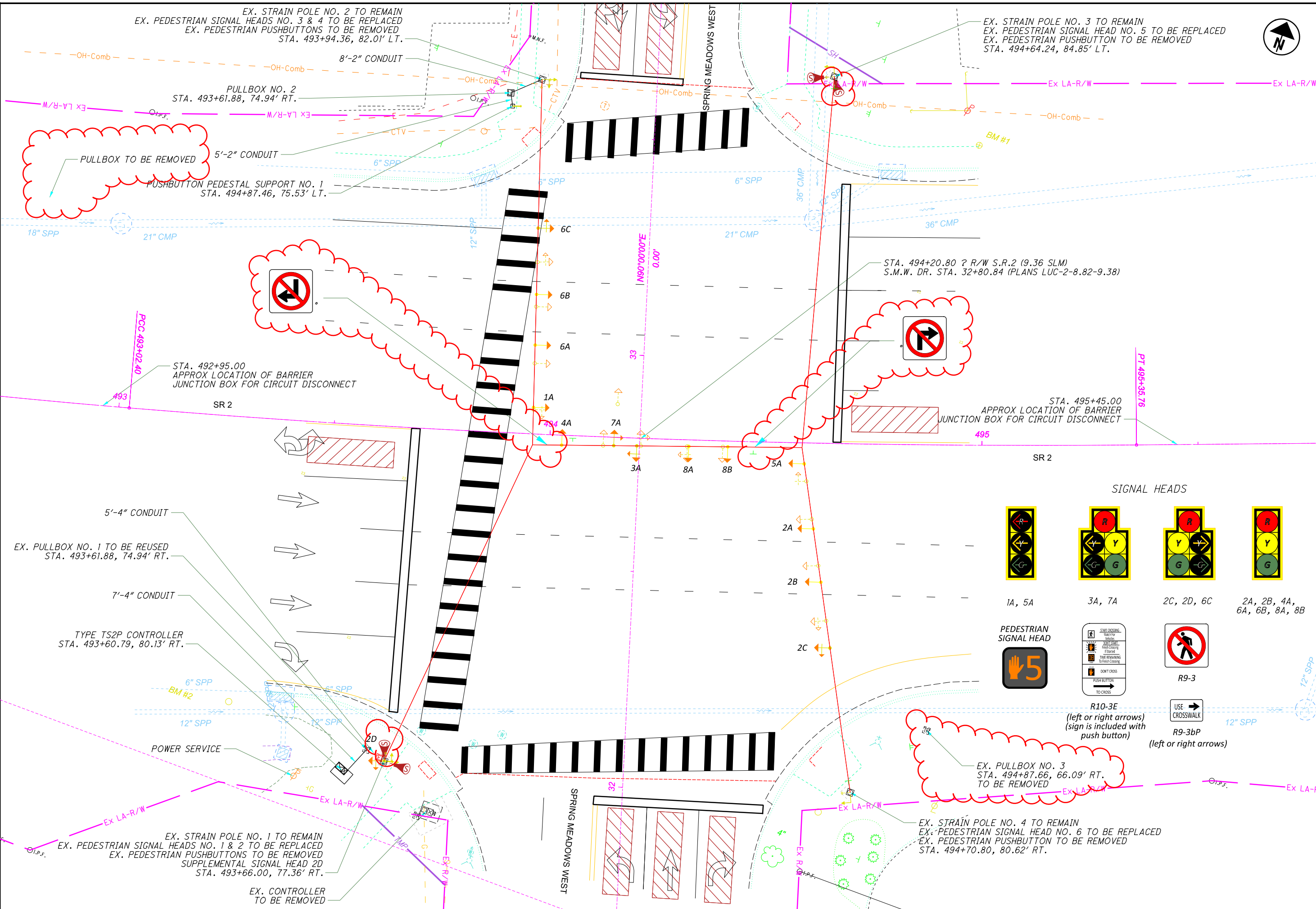
EX. STRAIN POLE NO. 1 TO REMAIN
EX. PEDESTRIAN SIGNAL HEADS NO. 1 & 2 TO BE REPLACED
EX. PEDESTRIAN PUSHBUTTONS TO BE REMOVED
SUPPLEMENTAL SIGNAL HEAD 2D
STA. 493+66.00, 77.36' RT.

EX. STRAIN POLE NO. 4 TO REMAIN
EX. PEDESTRIAN SIGNAL HEAD NO. 6 TO BE REPLACED
EX. PEDESTRIAN PUSHBUTTON TO BE REMOVED
STA. 494+70.80, 80.62' RT.

EX. CONTROLLER
TO BE REMOVED



TRAFFIC SIGNAL PLAN
LUC-2-9.35 (SPRING MEADOWS WEST)



SIGNAL HEADS



1A, 5A



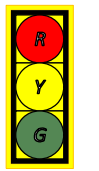
PEDESTRIAN SIGNAL HEAD



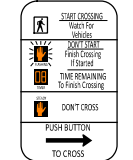
3A, 7A



2C, 2D, 6C



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



R10-3E
(left or right arrows)
(sign is included with push button)



R9-3



R9-3bP
(left or right arrows)



USE CROSSWALK

DESIGN AGENCY



| | |
|------------|--------|
| DESIGNER | DEK |
| REVIEWER | JJM |
| PROJECT ID | 107947 |
| SHEET | TOTAL |
| 16 | 19 |

SIGNAL TIMING CHART (TEM FORM 496-3)

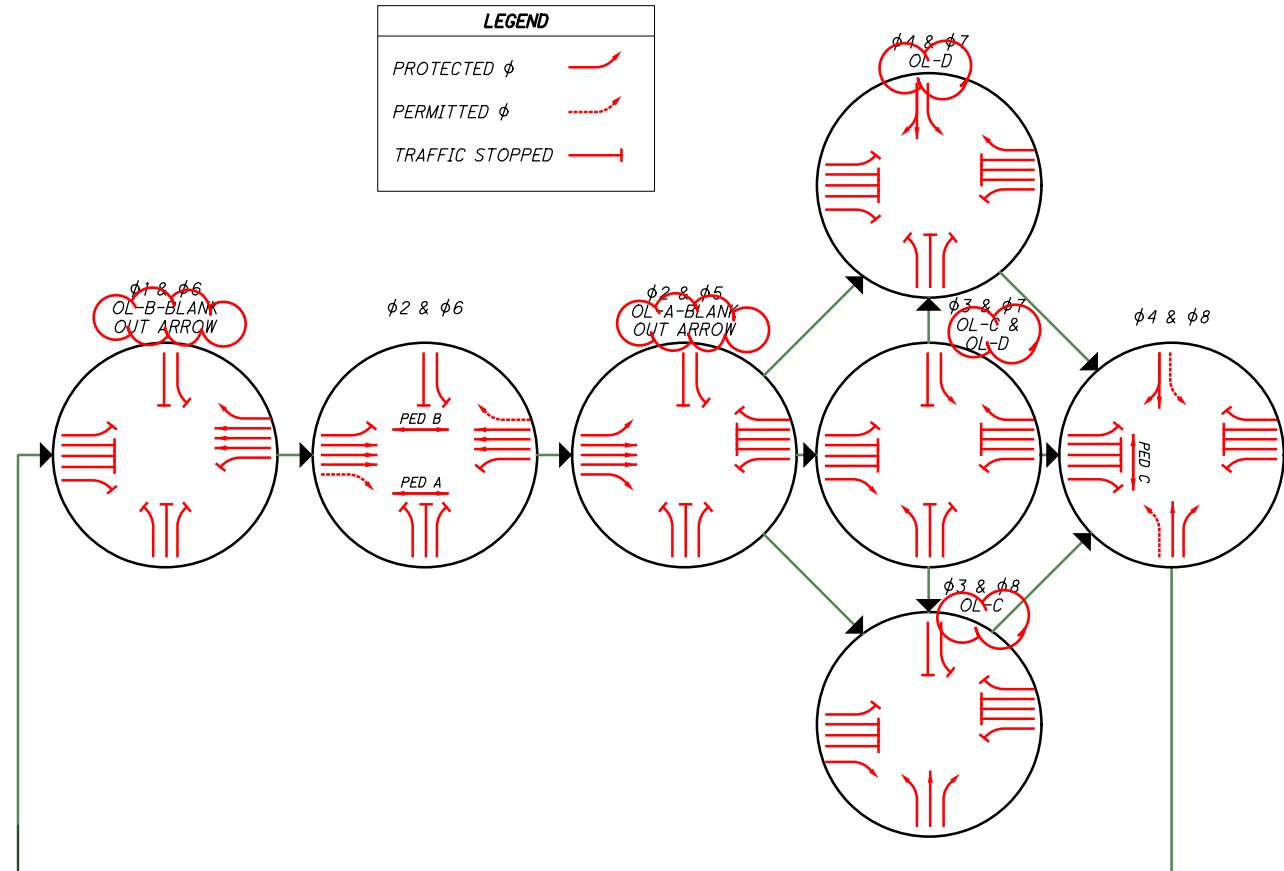
| | | | | | | | | | |
|--|----------------------------|--------------------------------|-----|----------------------|-----|----------|-----|------|-----|
| INTERSECTION: LUC-2-9.35 (Spring Meadows West) | | | | | | | | | |
| MAINTAINING AGENCY: | | | | | | | | | |
| START UP | | DUAL ENTRY: ON | | PHASES: 2 & 6, 4 & 8 | | | | | |
| START IN: ALL-RED FLASH | | REST IN RED: | | RING 1 - | | RING 2 - | | | |
| TIME FOR: FLASH, ALL RED (SEC.): 9, 6 | | OVERLAP | | A | B | C | D | | |
| FIRST PHASE(S): 2 & 6 | | PHASES | | - | - | - | - | | |
| COLOR DISPLAYED: GREEN | | | | | | | | | |
| INTERVAL OR FEATURE | | CONTROLLER MOVEMENT NO. | | | | | | | |
| INTERSECTION MOVEMENT (PHASE) | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DIRECTION | | WBLT | EB | NBLT | SB | EBLT | WB | SBLT | NB |
| MINIMUM GREEN (INITIAL) (SEC.) | | 7 | 20 | 7 | 10 | 7 | 20 | 7 | 10 |
| ADDED INITIAL *(SEC./ACTUATION) | | - | - | - | - | - | - | - | - |
| MAXIMUM INITIAL *(SEC.) | | - | - | - | - | - | - | - | - |
| PASSAGE TIME (PRESET GAP) (SEC.) | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| TIME BEFORE REDUCTION *(SEC.) | | - | - | - | - | - | - | - | - |
| MINIMUM GAP *(SEC.) | | - | - | - | - | - | - | - | - |
| TIME TO REDUCE *(SEC.) | | - | - | - | - | - | - | - | - |
| MAXIMUM GREEN I (SEC.) | | 20 | 60 | 20 | 40 | 20 | 60 | 20 | 40 |
| MAXIMUM GREEN II (SEC.) | | 20 | 60 | 20 | 40 | 20 | 60 | 20 | 40 |
| YELLOW CHANGE (SEC.) | | 3.8 | 5 | 3 | 3.4 | 5 | 4.7 | 3 | 3.4 |
| ALL RED CLEARANCE (SEC.) | | 2.4 | 2.5 | 2 | 2.6 | 2.5 | 1 | 2.5 | 2.6 |
| DELAYED GREEN (LPI) (SEC.) | | - | - | - | - | - | - | - | - |
| FLASHING YELLOW ARROW DELAY (SEC.) | | - | - | - | - | - | - | - | - |
| WALK (SEC.) | | - | 11 | - | 15 | - | 10 | - | - |
| PEDESTRIAN CLEARANCE (SEC.) | | - | 21 | - | 39 | - | 13 | - | - |
| RECALL | MAXIMUM (ON/OFF) | - | - | - | - | - | - | - | - |
| | MINIMUM (ON/OFF) | - | ON | - | - | - | ON | - | - |
| | PEDESTRIAN (ON/OFF) | - | - | - | - | - | - | - | - |
| MEMORY (ON/OFF) | ON | - | - | - | ON | - | - | - | - |

NOTES:

- ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.
- 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.

| ECONOLITE COORD SETTINGS | |
|--------------------------|---------|
| MANUAL PATTERN | AUTO |
| SYSTEM SOURCE | SYS |
| SPLITS IN | SECONDS |
| TRANSITION | SMOOTH |
| DWELL/ADD TIME | 0 |
| OFFSET REFERENCE | YELLOW |
| PED RECALL | - |
| LOCAL ZERO OVERRIDE | - |
| RE-SYNC COUNT | - |
| ECPI COORD | YES |
| SYSTEM FORMAT | PTN |
| OFFSET IN | SECONDS |
| MAX SELECT | MAXINH |
| FORCE OFF | FLOAT |
| USE PED TIME | YES |
| PED RESERVICE | - |
| FO ADD INI GRN | - |
| MULTISYNC | - |

PHASING DIAGRAM (TYPICAL)



RADAR DETECTION CHART

| DETECTION ZONE | MOVEMENT | PULSE OR PRESENCE | ASSOCIATED PHASE | DELAY PROGRAMMED IN CONTROLLER (SEC.) | EXTENSION PROGRAMMED IN CONTROLLER (SEC.) | DETECTOR NO. | PURPOSE | DETECTION ZONE LENGTH (FT) |
|----------------|----------|-------------------|------------------|---------------------------------------|---|--------------|---------------------|----------------------------|
| 1A | WB LEFT | PRESENCE | 1 | 0 | 0 | 0 | CALL/EXTEND PHASE 1 | 50 |
| 3A | NB LEFT | PRESENCE | 3 | 0 | 0 | 0 | CALL/EXTEND PHASE 3 | 50 |
| 4A | SB THRU | PRESENCE | 4 | 0 | 0 | 0 | EXTEND PHASE 4 | 50 |
| 5A | EB LEFT | PRESENCE | 5 | 0 | 0 | 0 | CALL/EXTEND PHASE 5 | 50 |
| 7A | SB LEFT | PRESENCE | 7 | 0 | 0 | 0 | CALL/EXTEND PHASE 7 | 50 |
| 8A | NB THRU | PRESENCE | 8 | 0 | 0 | 0 | EXTEND PHASE 8 | 50 |
| 8B | NB THRU | PRESENCE | 8 | 0 | 0 | 0 | EXTEND PHASE 8 | 50 |

Note: Advance/Dilemma Zone Speed Threshold: 30 MPH
 Purpose: Stop-Line or Advance Detection



STRAIN POLE TABLE (TEM FIGURE 498-36)

| REFERENCE SHEET NO.* | STATION & OFFSET* | POLE NO. | DESIGN NO. | POLE HEIGHT (FT.) | FOUNDATION ELEV.* | SPAN WIRE ATTACHED HEIGHT* | CABLE ENTRANCE DISTANCE FROM TOP (IN.) | INDEX LINE ANGLE (DEG.) | ANGLES (DEG.) FROM INDEX LINE | | | | | | | |
|----------------------|-----------------------|----------|------------|-------------------|-------------------|----------------------------|--|-------------------------|-------------------------------|-------------------------|----------------|---------------|----------------|-------------|------------------------------|-----------|
| | | | | | | | | | PEDESTRIAN SIGNALS | PEDESTRIAN PUSH BUTTONS | SIGNAL CABINET | POWER SERVICE | CABLE ENTRANCE | BRACKET ARM | INTERCONNECT POLE SPLICE BOX | 2" CAPPED |
| 16 | 493+66.00, 77.36' RT. | SP-1 | 10 | 32 | 628.84 | 31 | 6 | 204 | - | - | - | 90 | 180 | - | - | - |
| 16 | 493+94.36, 82.01' LT. | SP-2 | 10 | 32 | 626.36 | 31 | 6 | 168 | - | - | - | - | 180 | - | - | - |
| 16 | 494+64.24, 84.85' LT. | SP-3 | 10 | 32 | 626.68 | 31 | 6 | 176 | - | - | - | - | 180 | - | - | - |
| 16 | 494+70.80, 80.62' RT. | SP-4 | 10 | 32 | 627.24 | 31 | 6 | 169 | - | - | - | - | 180 | - | - | - |

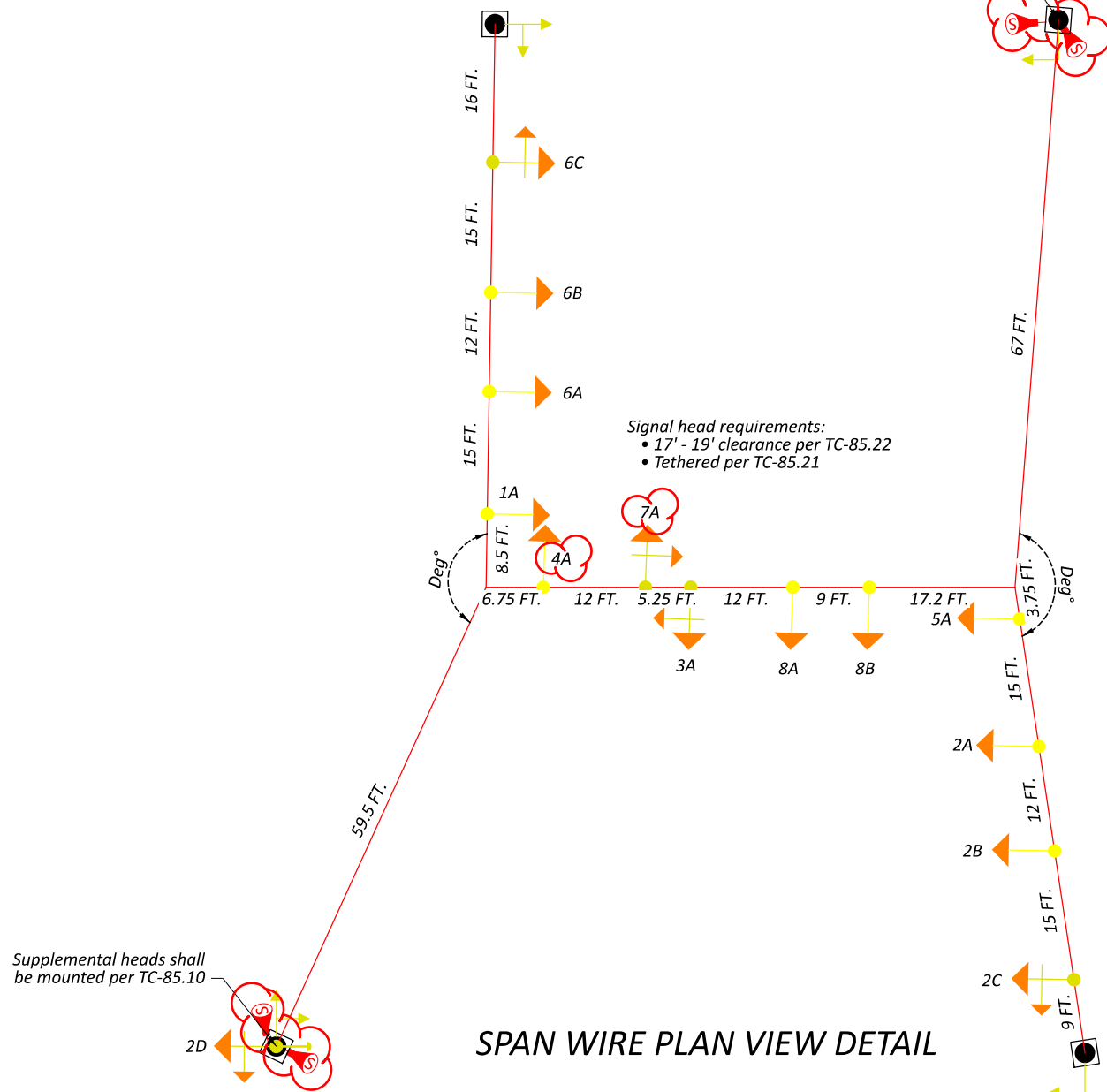
| COORDINATION TIMING PLANS | | | | |
|---------------------------|-----------|-----------|--------------------------------|--------------------|
| DAY(S) OF WEEK | PLAN NAME | HOURS | PLAN NO. OR CYCLE/SPLIT/OFFSET | CYCLE LENGTH (SEC) |
| M-F | OFF | 0001-0600 | 40* | 115 |
| M-F | AM | 0600-0830 | 10 | 115 |
| M-F | OFF | 0830-1030 | 40* | 115 |
| M-F | NOON | 1030-1400 | 20 | 125 |
| M-F | SCHOOL | 1400-1500 | 31 | 120 |
| M-F | PM | 1500-1830 | 30 | 120 |
| M-F | OFF | 1830-0000 | 40* | 115 |
| S-S | OFF | 0001-0800 | 51* | 115 |
| S-S | AM | 0800-1030 | 50 | 115 |
| S-S | WKND | 1030-1700 | 60 | 115 |
| S-S | AM | 1700-2000 | 50 | 115 |
| S-S | OFF | 2000-0000 | 51* | 115 |

| LUC-2 & Spring Meadows West | | | | | | | | | | | | |
|-----------------------------|----------------------------|------|----|------|----|------|----|------|----|---|----------------|----------------|
| PHASE | 1 | | 2 | | 3 | | 4 | | 5 | | OFFSET 1 (SEC) | OFFSET 2 (SEC) |
| | DIRECTION | WBLT | EB | NBLT | SB | EBLT | WB | SBLT | NB | | | |
| PLAN NO. OR C/S/O | SPLITS (G+Y+AR) IN SECONDS | | | | | | | | | | | |
| 10 - AM | 30 | 52 | 13 | 20 | 16 | 66 | 15 | 18 | 63 | - | | |
| 20 - NOON | 43 | 42 | 13 | 27 | 15 | 70 | 13 | 27 | 74 | - | | |
| 30 - PM | 39 | 44 | 13 | 24 | 15 | 68 | 13 | 24 | 69 | - | | |
| 31 - SCHOOL | 40 | 43 | 13 | 24 | 15 | 68 | 13 | 24 | 69 | - | | |
| 40 - OFF | 32 | 47 | 13 | 23 | 16 | 63 | 13 | 23 | 63 | - | | |
| 50 - WKND AM/PM | 30 | 52 | 13 | 20 | 16 | 66 | 15 | 18 | 63 | - | | |
| 51 - WKND OFF | 32 | 47 | 13 | 23 | 16 | 63 | 13 | 23 | 63 | - | | |
| 60 - WKND | 39 | 40 | 13 | 23 | 15 | 64 | 13 | 23 | 60 | - | | |
| 70 - HV BAL (O1) | 42 | 50 | 15 | 20 | 15 | 77 | 13 | 18 | 95 | - | | |
| 71 - HV EB (O2) | 42 | 50 | 15 | 20 | 15 | 77 | 13 | 18 | 80 | - | | |
| 72 - HV WB (O3) | 15 | 77 | 13 | 20 | 42 | 50 | 15 | 18 | 72 | - | | |

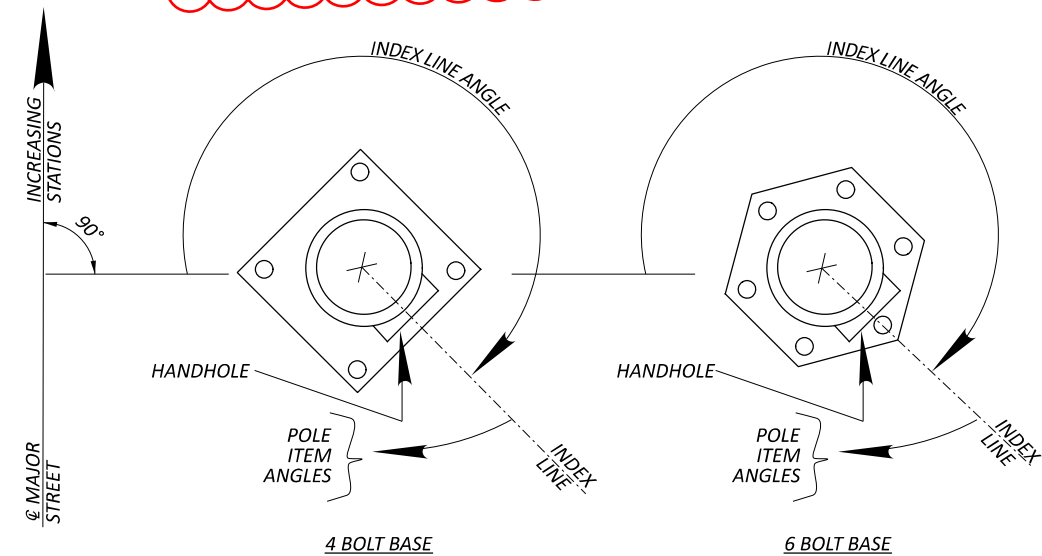
* See TEM Section 441-8

Pedestrian signal heads, push buttons and associated signs shall be mounted per TC-85.10

Signal head requirements:
 • 17' - 19' clearance per TC-85.22
 • Tethered per TC-85.21

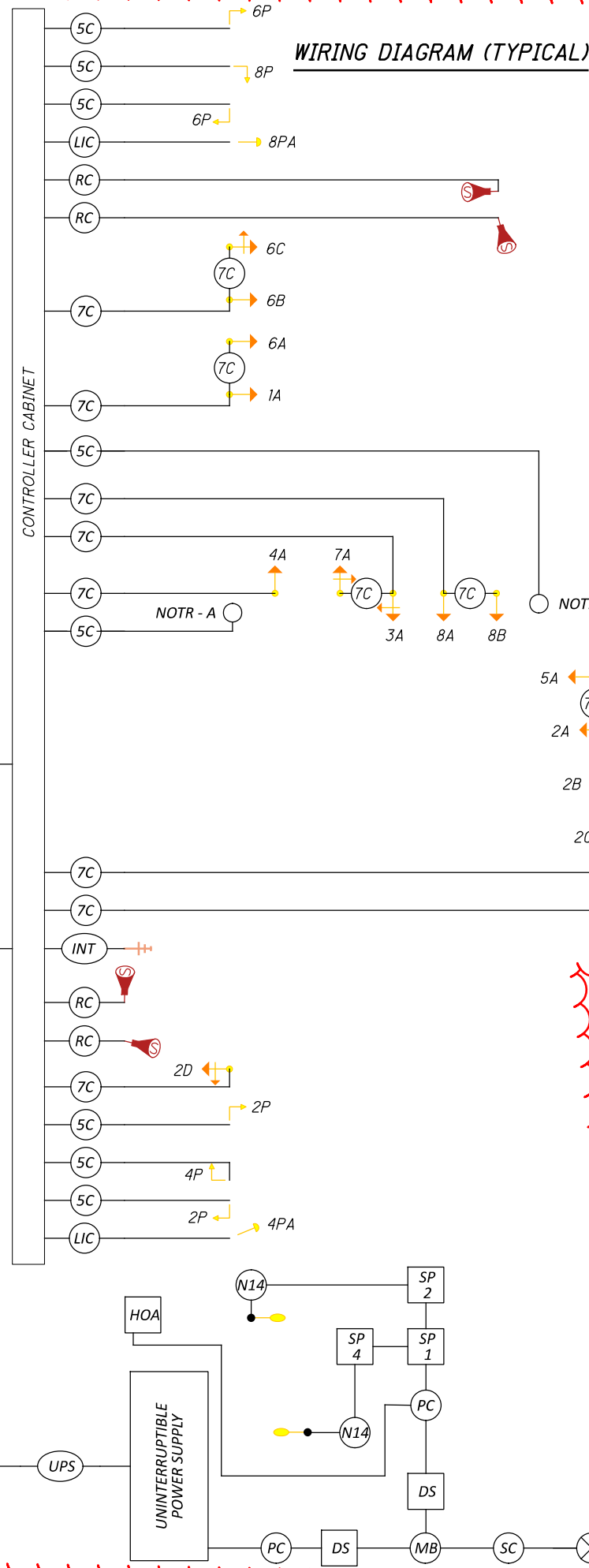


SPAN WIRE PLAN VIEW DETAIL



POLE ORIENTATION

LUC-2-9.35
SPAN WIRE & TIMING DETAILS



FIELD WIRING HOOK-UP CHART (TEM FORM 496-16)

| SIGNAL HEAD | INDICATION | FIELD TERMINAL | FLASH | SIGNAL HEAD | INDICATION | FIELD TERMINAL | FLASH | PEDESTRIAN MOVEMENTS | | | | |
|---------------|--|----------------|-------|---------------|--|----------------|-------|------------------------------|--|---------------------------|-----|--------------|
| | | | | | | | | PED A | W | Φ2 PED/LS 9 | OUT | |
| 1A (WB LT) | <--R--- | 1R | R | 5A (EB LT) | <--R--- | 5R | R | - | DW | Φ2 PED/LS 9 | OUT | |
| | <--Y--- | 1Y | | | <--Y--- | 5Y | | | PED B | W | | Φ4 PED/LS 10 |
| | <--G--- | 1G | | | <--G--- | 5G | | | | DW | | Φ4 PED/LS 10 |
| 2A (EB) | R | 2R | R | 6A (WB) | R | 6R | R | - | W | Φ6 PED/LS 11 | OUT | |
| | Y | 2Y | | | Y | 6Y | | | DW | Φ6 PED/LS 11 | | |
| | G | 2G | | | G | 6G | | | | | | |
| 2B (EB) | R | 2R | R | 6B (WB) | R | 6R | R | OVERLAPS/ LED NO TURN ON RED | | | | |
| | Y | 2Y | | | Y | 6Y | | OLA A | NOTR | LS 13 Y/G | OUT | |
| | G | 2G | | | G | 6G | | | | | | |
| 2C (EB RT) | R | 2R | R | 6C (WB RT) | R | 6R | R | - | W | LS 14 Y/G | OUT | |
| | Y | 2Y | | | Y | 6Y | | | OLA B | NOTR | | EB RT/LS 15Y |
| | G | 2G | | | G | 6G | | | OLA C | --- <td>EB RT/LS 15G</td> | | EB RT/LS 15G |
| 2D (EB RT) | --- <td>OLA C/LS 15Y</td> <td rowspan="3">R</td> <td rowspan="3">7A (SB LT)</td> <td>--- <td>OLA D/LS 16Y</td> <td rowspan="3">R</td> <td rowspan="3">-</td> <td>--- <td>WB RT/LS 16Y</td> <td rowspan="3">OUT</td> </td></td> | OLA C/LS 15Y | R | 7A (SB LT) | --- <td>OLA D/LS 16Y</td> <td rowspan="3">R</td> <td rowspan="3">-</td> <td>--- <td>WB RT/LS 16Y</td> <td rowspan="3">OUT</td> </td> | OLA D/LS 16Y | R | - | --- <td>WB RT/LS 16Y</td> <td rowspan="3">OUT</td> | WB RT/LS 16Y | OUT | |
| | --- <td>OLA C/LS 15G</td> <td>--- <td>OLA D/LS 16G</td> <td>--- <td>WB RT/LS 16G</td> </td></td> | OLA C/LS 15G | | | --- <td>OLA D/LS 16G</td> <td>--- <td>WB RT/LS 16G</td> </td> | OLA D/LS 16G | | | --- <td>WB RT/LS 16G</td> | WB RT/LS 16G | | |
| | R | 2R | | | R | 7R | | | | | | |
| 3A (NB LT) | Y | 2Y | R | 8A (NB) | Y | 7Y | R | - | --- <td></td> <td rowspan="3">OUT</td> | | OUT | |
| | G | 2G | | | G | 7G | | | --- <td></td> | | | |
| | <--Y--- | 3Y | | | <--Y--- | 4Y | | | | | | |
| 4A (SB) | <--G--- | 3G | R | 8B (NB) | <--G--- | 4G | R | - | | | OUT | |
| | R | 4R | | | R | 8R | | | | | | |
| | Y | 4Y | | | Y | 8Y | | | | | | |
| | G | 4G | | G | 8G | | | | | | | |

LS = LOAD SWITCH

LEGEND

| | | | | | |
|--|---|--|---------------------------------------|--|--|
| | TRAFFIC SIGNAL, 4 OR 5 UNIT HEAD, 12" | | LUMINAIRE, CONVENTIONAL | | SERVICE CABLE, 3 CONDUCTOR, NO. X AWG |
| | TRAFFIC SIGNAL, 2 UNIT, 3 UNIT, OR PHB HEAD 12" | | 2/C NO. XX AWG (LEAD-IN CABLE) | | POWER CABLE, 2 CONDUCTOR, NO. X AWG |
| | TRAFFIC SIGNAL, 3 UNIT HEAD, 12" WITH ARROWS | | VEHICLE LOOP DETECTOR | | SIGNAL SUPPORT POLE NO. __ |
| | PEDESTRIAN SIGNAL | | SIGNAL CABLE, 5 CONDUCTOR, NO. XX AWG | | METER BASE |
| | PEDESTRIAN PUSH BUTTON | | SIGNAL CABLE, 7 CONDUCTOR, NO. XX AWG | | NO. X AWG DISTRIBUTION CABLE |
| | DILEMMA ZONE RADAR DETECTION UNIT | | RADAR DETECTION CABLE | | SIGNAL CABLE, 4 CONDUCTOR, NO. XX AWG |
| | STOP LINE RADAR DETECTION UNIT | | VIDEO CAMERA CABLE | | DUAL LIGHTING/SIGNAL DISCONNECT SWITCH |
| | VIDEO DETECTION CAMERA | | INTERCONNECT CABLE | | FLASHER CABINET |
| | PTZ CAMERA | | PHOTOELECTRIC CELL | | UNINTERRUPTIBLE POWER SUPPLY CABLE |
| | ETHERNET RADIO | | POWER SOURCE | | HAND/ OFF/ AUTO SWITCH |