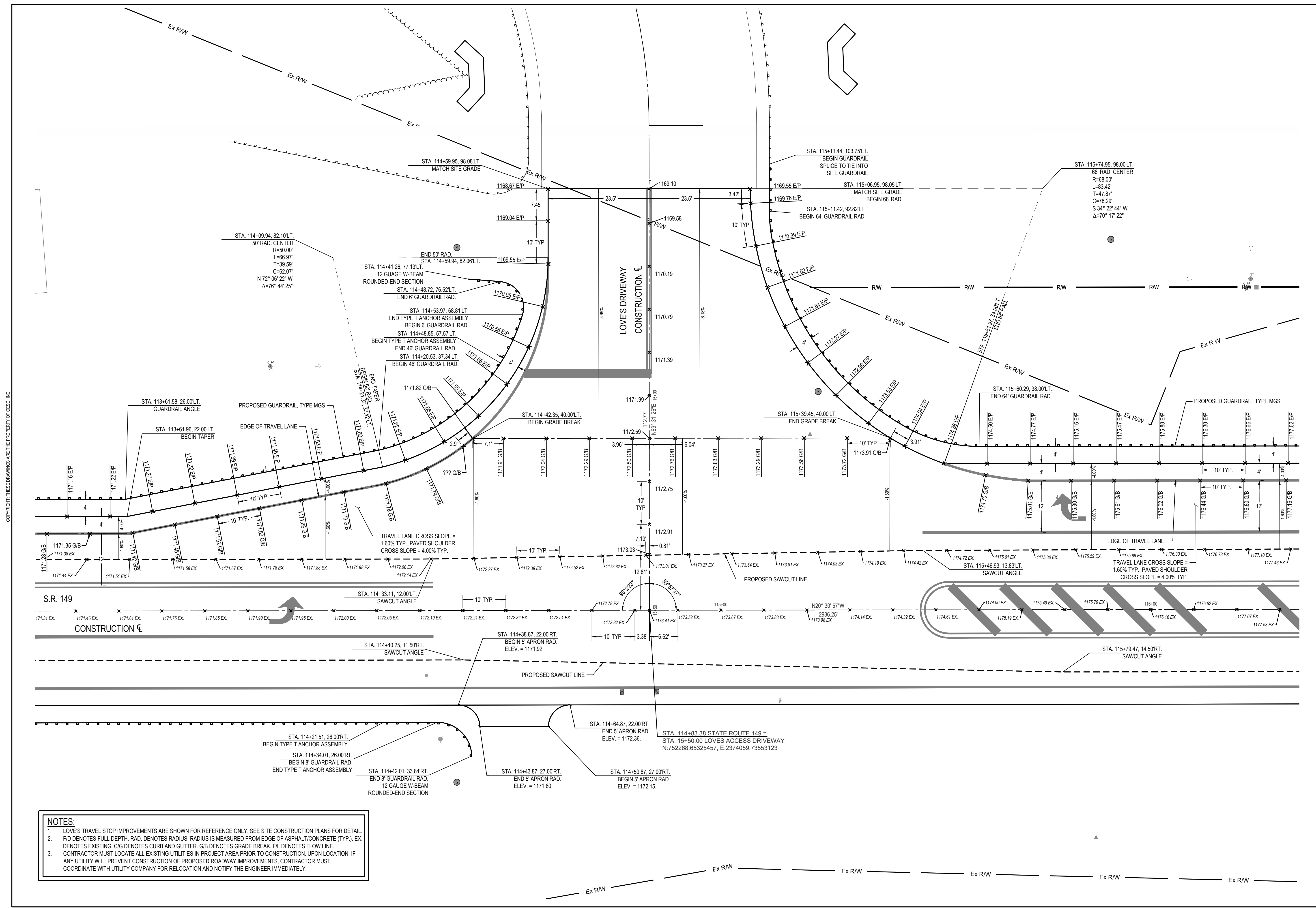


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INTERSECTION DETAIL
S.R. 149

BEL-149-23.44

R26
R31

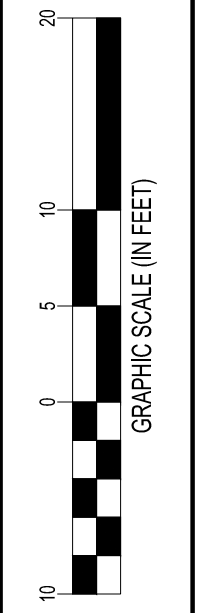
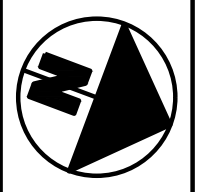


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- NOTES:**
1. LOVE'S TRAVEL STOP IMPROVEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE SITE CONSTRUCTION PLANS FOR DETAIL.
 2. F/D DENOTES FULL DEPTH, RAD. DENOTES RADIUS. RADIUS IS MEASURED FROM EDGE OF ASPHALT/CONCRETE (TYP.). EX. DENOTES EXISTING. C/G DENOTES CURB AND GUTTER. G/B DENOTES GRADE BREAK. F/L DENOTES FLOW LINE.
 3. CONTRACTOR MUST LOCATE ALL EXISTING UTILITIES IN PROJECT AREA PRIOR TO CONSTRUCTION. UPON LOCATION, IF ANY UTILITY WILL PREVENT CONSTRUCTION OF PROPOSED ROADWAY IMPROVEMENTS, CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY FOR RELOCATION AND NOTIFY THE ENGINEER IMMEDIATELY.

NOTES:

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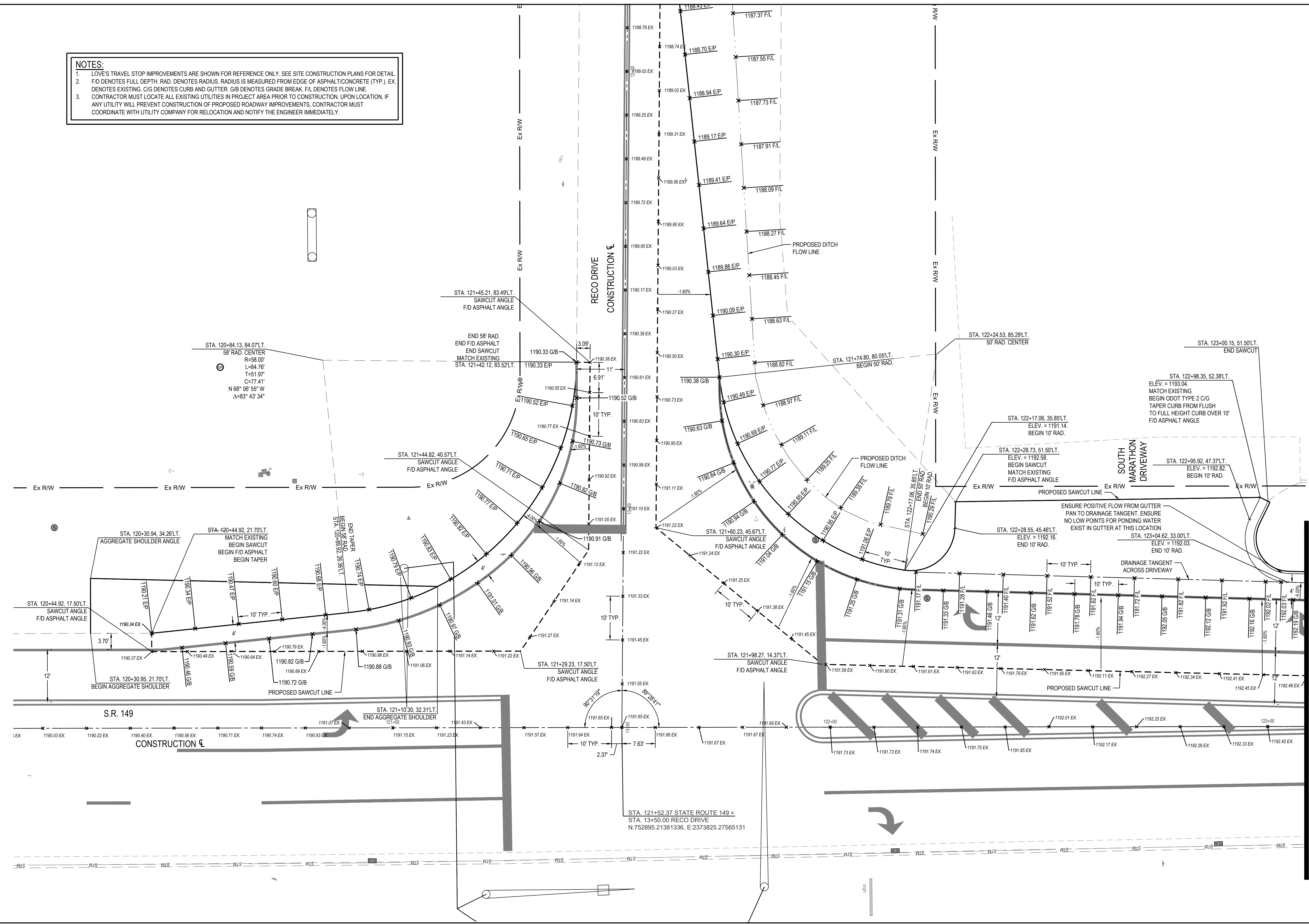
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INTERSECTION DETAIL
S.R. 149

BEL-149-23.44

R27
R31

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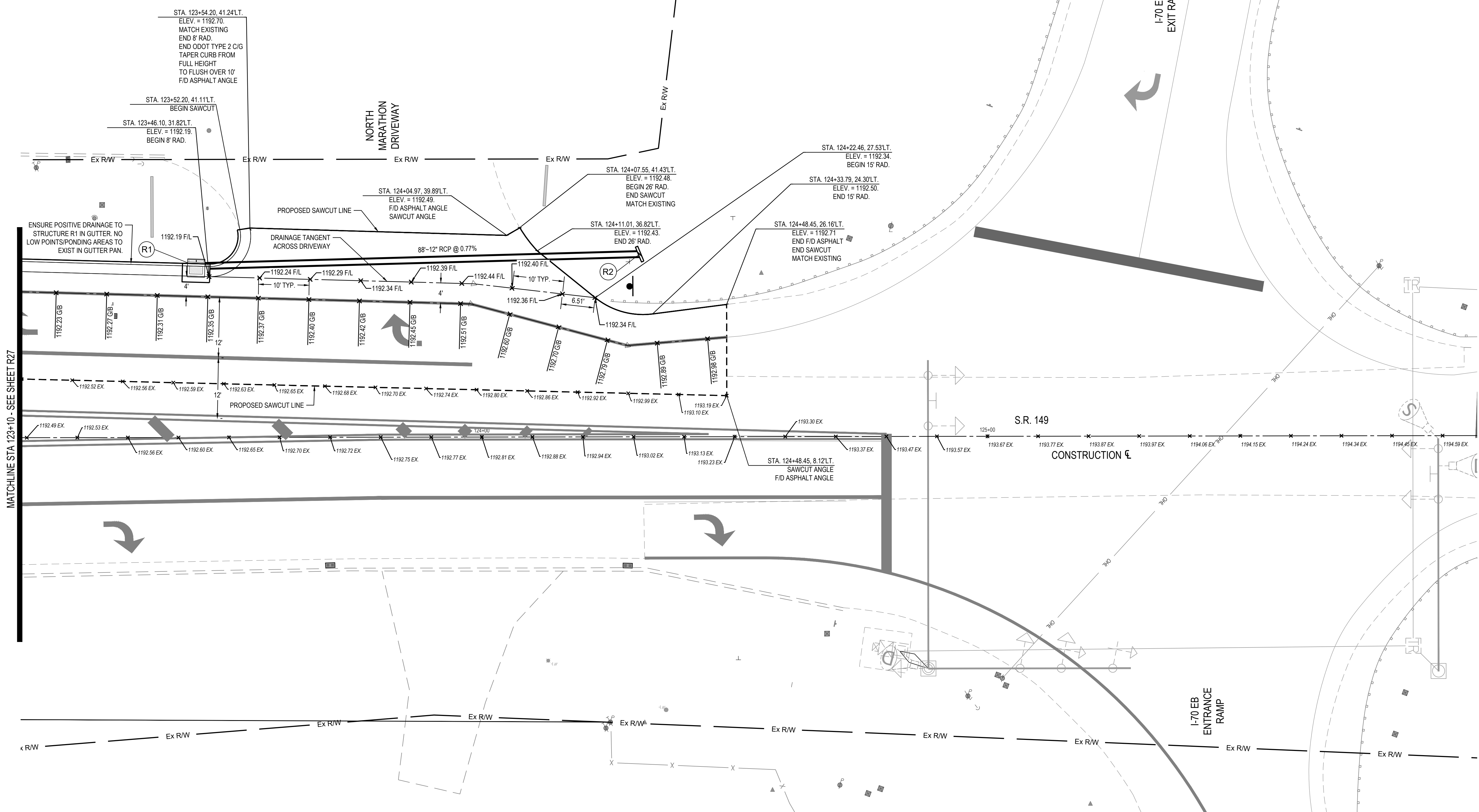


MATCHLINE STA 123+10 - SEE SHEET R28

NOTES:

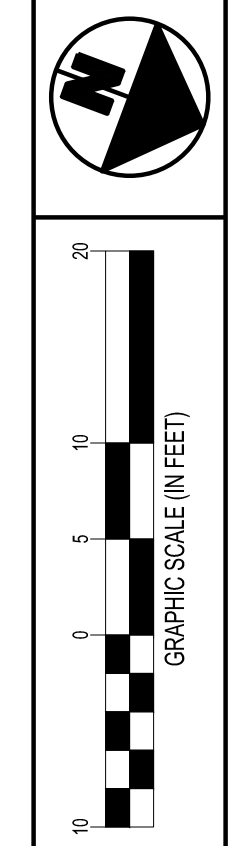
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STORM SEWER STRUCTURE SCHEDULE				
NO.	STRUCTURE	GRATE	INVERT	STATION/OFFSET
R1	CATCH BASIN NO.3A PER ODOT SCD CB-3A	1192.01	1189.28 (12") N	STA. 123+43.57, 33.89'LT.
R2	HALF-HEIGHT HEADWALL PER ODOT SCD HW-2.2		1188.60 (12") S	STA. 124+31.25, 36.15'LT.



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MATCHLINE STA 123+10 - SEE SHEET R27



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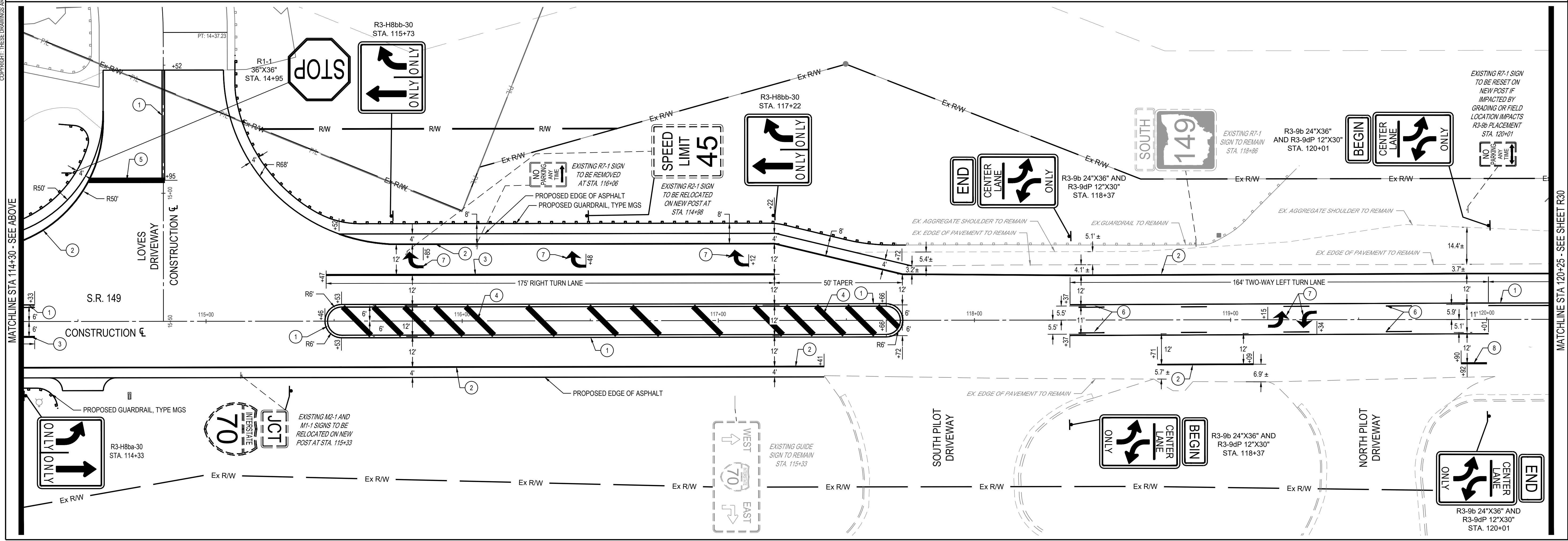
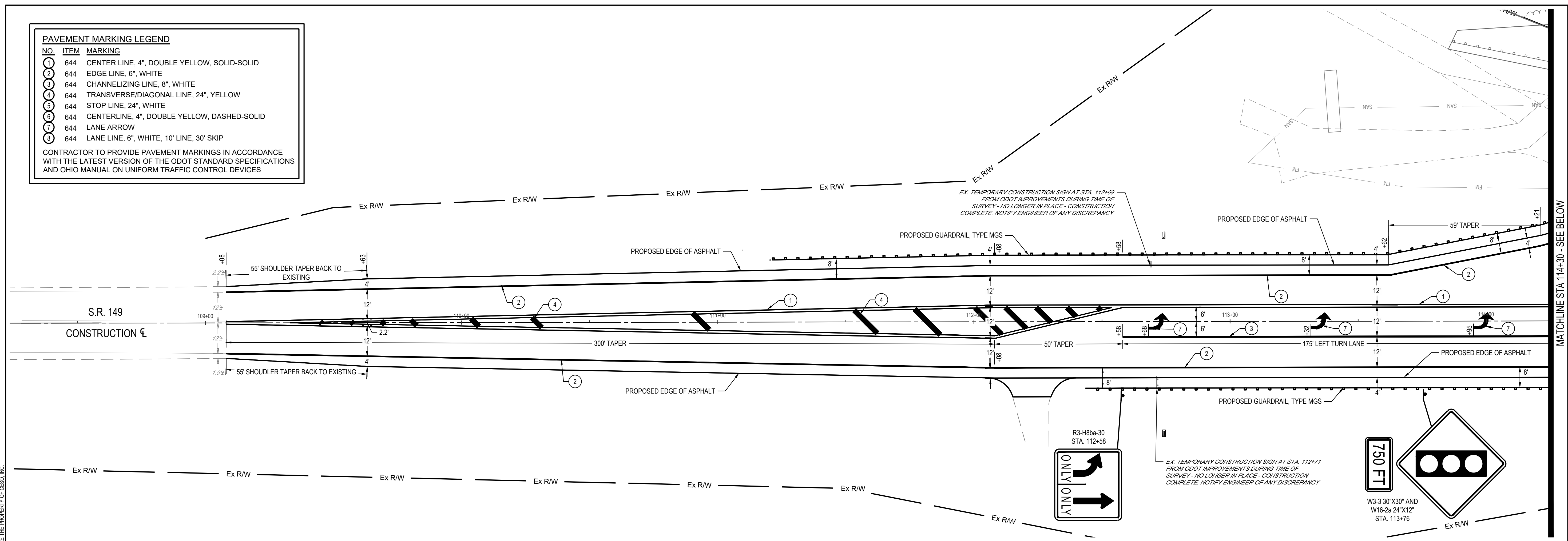
INTERSECTION DETAIL
S.R. 149

BEL-149-23.44

R28
R31

NO.	ITEM	MARKING
1	644	CENTER LINE, 4", DOUBLE YELLOW, SOLID-SOLID
2	644	EDGE LINE, 6", WHITE
3	644	CHANNELIZING LINE, 8", WHITE
4	644	TRANSVERSE/DIAGONAL LINE, 24", YELLOW
5	644	STOP LINE, 24", WHITE
6	644	CENTERLINE, 4", DOUBLE YELLOW, DASHED-SOLID
7	644	LANE ARROW
8	644	LANE LINE, 6", WHITE, 10' LINE, 30' SKIP

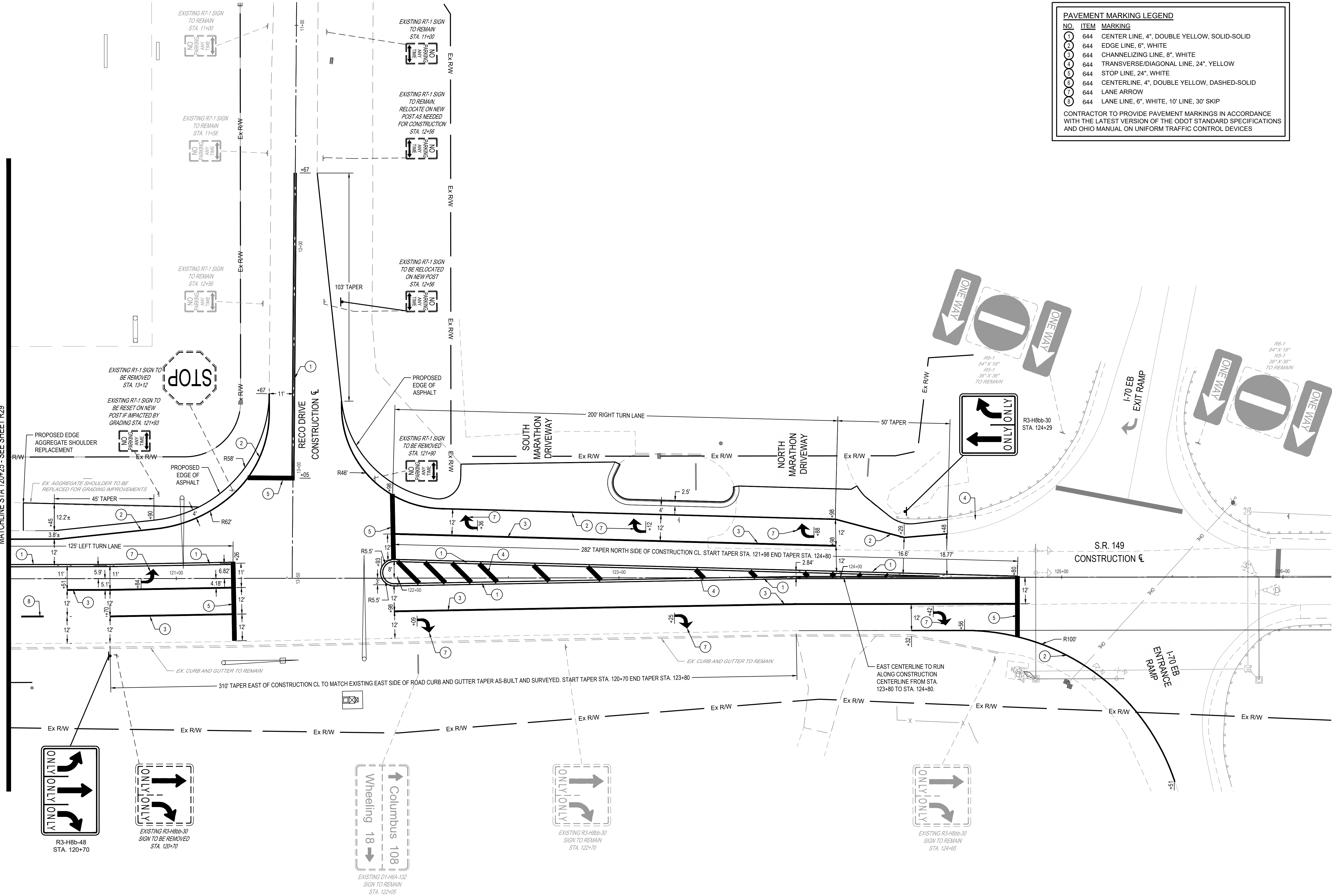
CONTRACTOR TO PROVIDE PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST VERSION OF THE ODOT STANDARD SPECIFICATIONS AND OHIO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES



MATCHLINE STA 114+30 - SEE ABOVE
 MATCHLINE STA 114+30 - SEE BELOW
 BEL-149-23.44
 PAVEMENT MARKING & SIGNAGE - STA. 108+50 TO STA. 120+25
 S.R. 149
 R29
 R31

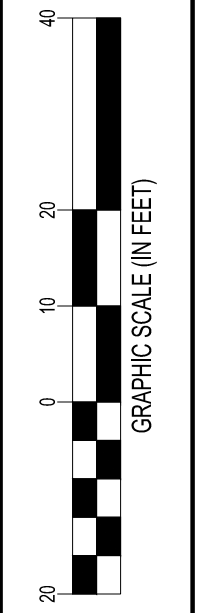
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MATCHLINE STA 120+25 - SEE SHEET R29



PAVEMENT MARKING LEGEND		
NO.	ITEM	MARKING
1	644	CENTER LINE, 4", DOUBLE YELLOW, SOLID-SOLID
2	644	EDGE LINE, 6", WHITE
3	644	CHANNELIZING LINE, 8", WHITE
4	644	TRANSVERSE/DIAGONAL LINE, 24", YELLOW
5	644	STOP LINE, 24", WHITE
6	644	CENTERLINE, 4", DOUBLE YELLOW, DASHED-SOLID
7	644	LANE ARROW
8	644	LANE LINE, 6", WHITE, 10' LINE, 30' SKIP

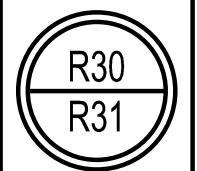
CONTRACTOR TO PROVIDE PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST VERSION OF THE ODOT STANDARD SPECIFICATIONS AND OHIO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES



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PAVEMENT MARKING & SIGNAGE - STA. 120+25 TO 126+00
S.R. 149

BEL-149-23.44




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GENERAL CONSTRUCTION REQUIREMENTS

1. DETAIL PLANS OF PLANNED WATER LINE CONSTRUCTION WILL BE SUBMITTED TO THE BELMONT COUNTY WATER AND SEWER DISTRICT FOR APPROVAL BY THE ENGINEER ASSOCIATE, PRIOR TO CONSTRUCTION. A PRECONSTRUCTION MEETING WILL BE REQUIRED BEFORE START OF CONST.
2. SIGNED WATER APPLICATIONS & APPLICABLE FEES MUST BE RECEIVED PRIOR TO CONSTRUCTION.
3. ALL WATERLINES SHALL BE C900 (DR-14) IN HIGH PRESSURE AREAS DUCTILE IRON CLASS 50 OR 52 WILL BE REQUIRED BY THE DISTRICT. (ALL DUCTILE IRON PIPE TO BE POLYETHYLENE WRAPPED AS PER AWWA C105/A21.5) PIPE SIZES TO BE 3/4"CTS, 1"CTS, 2" P.P., 4", 6", 8", 10", 12" C-900 DR 14-18 (3/4" OR 1" TO BE TYPE-K SOFT COPPER IF LINE PRESSURE IS GREATER THAN 200 PSI)
4. RESIDENTIAL PVC SEWER LINE WILL BE A MINIMUM OF 4 INCH SDR-35.
5. SEWER FORCE MAIN WILL BE A MINIMUM OF 1 1/2", OR 2" POLYETHYLENE CLASS 200, OR 2", 4", 6", 8" SDR-21 CL-200 PVC PIPE, AND GREEN IN COLOR. GRAVITY SEWER LINES SHALL BE AIR AND DEFLECTION TESTED IN ACCORDANCE WITH TABLE 1 PAGE 29 OF THIS BOOKLET.
6. ALL PIPE THAT IS INSTALLED SHALL BE BEDDED WITH A MINIMUM OF 6" ABOVE AND BELOW THE PIPE WITH GOOD TOP SOIL FREE OF STONE AND OTHER FOREIGN OBJECTS, OR CRUSH AND RUN STONE.
7. WATERLINE SHALL BE INSTALLED WITH 4 FOOT MINIMUM COVER UNLESS OTHERWISE APPROVED.
8. A MINIMUM VERTICAL CLEARANCE OF 18 INCHES SHALL BE PROVIDED BETWEEN THE PROPOSED WATER MAIN AND OTHER UTILITIES OR STRUCTURES, UNLESS OTHERWISE NOTED.
9. A MINIMUM HORIZONTAL CLEARANCE OF 4 FEET SHALL BE PROVIDED BETWEEN THE PROPOSED WATER LINE AND OTHER UTILITIES OR STRUCTURES UNLESS OTHERWISE APPROVED.
10. THE WATERLINE SHALL BE PLACED WITH A MINIMUM OF 10 FOOT HORIZONTAL SEPARATION FROM ANY SANITARY SEWERS OR WHEN THE WATER LINE CROSSES A SANITARY SEWER, THE WATER LINE SHALL BE A MINIMUM OF 18 INCHES ABOVE THE SEWER.
11. SEWER LINES MUST CROSS UNDER ALL WATERLINES WITH A MINIMUM OF 18" OF CLEARANCE. IF NOT POSSIBLE THE BCSD WILL PERMIT CROSSING OVER WITH STEEL CASING OR PLASTIC CASING AND CONCRETE. MINIMUM CASING LENGTH IS 10FT. AS PER NOTE ON SHT. #16
12. ALL FITTINGS SHALL BE MECHANICAL JOINT (M.J), FUSION EPOXY COATED, DUCTILE IRON, RESTRAINED BY THE USE OF RESTRAINERS AND/OR MEGALUGS AND THRUST BLOCKED WITH CONCRETE AS REQUIRED. SEE SHT# 25 FOR THRUST BLOCKING DETAIL.
13. A 16FT. MIN. LENGTH OF WATERLINE SHALL BE PROVIDED ON EACH SIDE OF ANY MAINLINE FITTING, OR THE JOINT SHALL BE RESTRAINED WITH BELL RESTRAINT FITTINGS.
14. ALL SERVICE CONNECTIONS MADE TO EXISTING LINES WILL BE MADE BY THE DISTRICT. THE CONNECTION SHALL BE MADE WET USING A TAPPING TEE AND VALVE. IF A LINE TO BE CONNECTED IS THE SAME AS THE EXISTING LINE, 2" CONNECTED TO 2" OR 6" CONNECTED TO 6". THE CONNECTION WILL BE MADE DRY. EXCEPTIONS MAY BE MADE DUE TO UNFORESEEN FIELD CIRCUMSTANCES.

CONTINUES ON NEXT PAGE

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO



12/14/17


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GENERAL CONSTRUCTION REQUIREMENTS

15. MAGNETIC DETECTABLE TRACER TAPE SHALL BE INSTALLED AT 18 INCHES DEEP WITH ALL PVC PIPE.
16. TRACE WIRE TO BE INSTALLED ON ALL WATER & SEWER LINES.
 - A.) OPEN-TRENCH INSTALLATION: DIRECT BURIAL #12 AWG SOLID (0.0808" DIA.), STEEL CORE SOFT DRAWN TRACER WIRE, 250# AVERAGE TENSILE BREAK LOAD, 30 MIL HIGH MOLECULAR-HIGH DENSITY POLYETHYLENE JACKET COMPLYING WITH ASTM-D-1248.30 VOLT RATING, 45 MIL JACKET WHEN DIRECTIONAL BORED.
 - B.) CONNECTORS
SPICES ALONG THE CONTINUOUS RUN OF TRACE WIRE FOR REPAIR OF A WIRE BREAK OR REPLACEMENT OF FAILED SEGMENT OF WIRE SHALL USE 3M BRAND DBR DIRECT BURY SPLICE KIT OR APPROVED EQUAL.
 - C.) INSTALLATION
TRACE WIRE ACCESS POINT SHALL BE ACCESSIBLE AT ALL NEW WATER VALVE BOXES, WATER METER BOXES, BLOWOFFS, ARVs, FIRE HYDRANTS AND MANHOLES.
 - D.) TESTING REQUIREMENTS
CONTRACTOR SHALL PERFORM A CONTINUITY TEST ON ALL TRACE WIRE IN THE PRESENCE OF BCSD. IF THE TRACE WIRE IS FOUND TO BE NOT CONTINUOUS AFTER TESTING, CONTRACTOR SHALL REPAIR OR REPLACE THE FAILED SEGMENT OF WIRE.
17. THE CONTRACTOR WILL SCHEDULE WITH THE DISTRICT APPROXIMATE TIMES FOR THE INSPECTION OF LINES, FITTINGS & ETC., PRIOR TO BACKFILLING. THE COUNTY SHALL BE GIVEN A MINIMUM 48 HOURS OF NOTICE WHEN AN INSPECTION IS REQUIRED.
18. EXISTING MAINLINE VALVES WILL ONLY BE OPERATED BY DISTRICT PERSONNEL.
19. A MINIMUM OF 24 HOURS NOTICE FOR ANY INSTALLATIONS BY CONTRACTORS THAT MAY DISRUPT WATER SERVICE TO EXISTING WATER CUSTOMERS. THE NOTICE SHALL BE MADE THROUGH THE DISTRICTS OFFICE.
20. ALL SERVICE CONNECTIONS INSTALLED WILL BE STAKED AT THE TIME OF CONSTRUCTION WITH IRON "TEE BAR STAKES" PER DISTRICT REQUIREMENTS.
21. CHANGES IN GRADE AND ALIGNMENT TO BE OBTAINED BY DEFLECTIONS AT PIPE JOINTS SHALL BE NO GREATER THAN RECOMMENDED BY THE MANUFACTURER OF THE WATER LINE.
22. PRESSURE TESTING OF WATER LINES AND SEWER FORCE MAINS SHALL BE IN ACCORDANCE WITH AWWA C600-87. TESTING AT 1-1/2 TIMES EXISTING PRESSURE AND/OR WORKING PRESSURE OR MINIMUM OF 100psi/MAX. OF 200 psi. PRESSURE TESTING MUST BE DONE WITHIN 2 WORKING WEEKS ONCE LINE IS IN PLACE.
23. THE CONTRACTOR WILL CHLORINATE THE INSTALLED WATER LINE AT RECOMMENDED AWWA 651 STANDARDS, FOR A MINIMUM OF 24 HOURS, AT 50 P.P.M.
24. THE DISTRICT WILL TAKE REPRESENTATIVE SAMPLES OF THE WATER IN THE LINES, AND HAVE AN APPROVED LABORATORY MAKE THE BACTERIOLOGICAL EXAMINATIONS OF THE SAMPLE TO ESTABLISH THE ACCEPTABILITY OF THAT PORTION OF THE SYSTEM PRIOR TO ANY TURN ON OF SERVICE TO ANY FACILITY. THERE WILL BE NO EXCEPTION TO THIS STANDARD.

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BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO



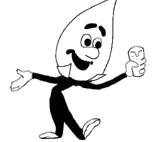
10/31/17

3

GENERAL CONSTRUCTION REQUIREMENTS

25. ALL MAIN LINE VALVES & FLUSH-OUT ASSEMBLIES SHALL BE MARKED BY A WHITE FIBERGLASS MARKER AS PER THE WATER DISTRICTS REQUIREMENTS.
26. LOCATION OF THE PROPOSED SERVICE TAPS SHALL BE FIELD LOCATED BY THE OWNER PRIOR TO CONSTRUCTION OR AT TIME OF CONSTRUCTION.
27. ALL MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BELMONT COUNTY SPECIFICATIONS AS OUTLINED IN STANDARD DETAILS MANUAL.
28. ALL PARTS, LABOR, EQUIPMENT, AND MISC. EXPENSES BY THE BELMONT COUNTY SANITARY SEWER DISTRICT WILL BE INVOICED TO THE DEVELOPER.
29. CONTRACTOR IS RESPONSIBLE FOR ALL WORK PERFORMED FOR THE FIRST YEAR OF CUSTOMER SERVICE.
30. ALL PRESSURE TESTING STARTS BEFORE NOON.
31. AS-BUILTS DRAWINGS (MAPS) MUST BE PROVIDED TO BCSD WITHIN 3 MONTHS OF THE BACTERIA TEST, WHICH MARKS THE WATER LINE COMPLETION DATE. FOR 6" AND LARGER LINES; AND WITHIN ONE MONTH FOR 2" & 4" LINES.
32. AS-BUILTS FOR 6" & LARGER LINES ARE REQUIRED TO HAVE GPS POINT WHEN SUBMITTED FOR APPROVAL THEY ARE TO POINT OUT THE FOLLOWING: HYDRANTS, FITTINGS, CURB BOXES, METER WELLS, MAN HOLES, CLEAN OUTS, VALVES, AND WATER OR SEWER LINES IN 100FT. INCREMENTS.

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO

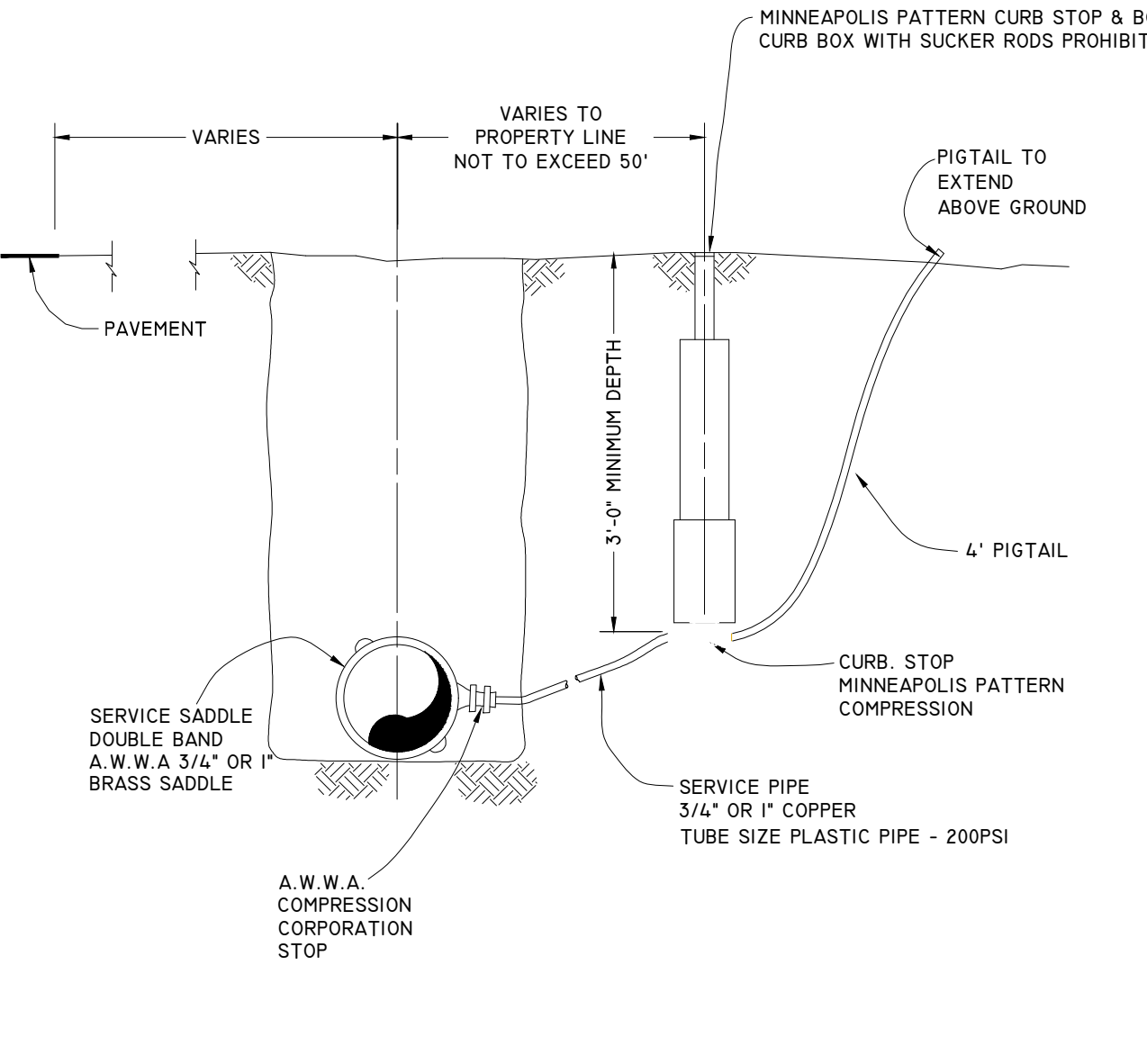


10/31/17

3A

NOT TO SCALE

NOTE: TEE BAR STAKES TO MARK CURB BOX ON ALL VACANT AND OR UNDEVELOPED PROPERTY.



MINNEAPOLIS PATTERN CURB STOP & BOX CURB BOX WITH SUCKER RODS PROHIBITED

VARIES

VARIES TO PROPERTY LINE NOT TO EXCEED 50'

PIGTAIL TO EXTEND ABOVE GROUND

PAVEMENT

5'-0" MINIMUM DEPTH

4" PIGTAIL


CURB STOP MINNEAPOLIS PATTERN COMPRESSION

SERVICE SADDLE DOUBLE BAND A.W.W.A. 3/4" OR 1" BRASS SADDLE

SERVICE PIPE 3/4" OR 1" COPPER TUBE SIZE PLASTIC PIPE - 200PSI

A.W.W.A. COMPRESSION CORPORATION STOP

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO



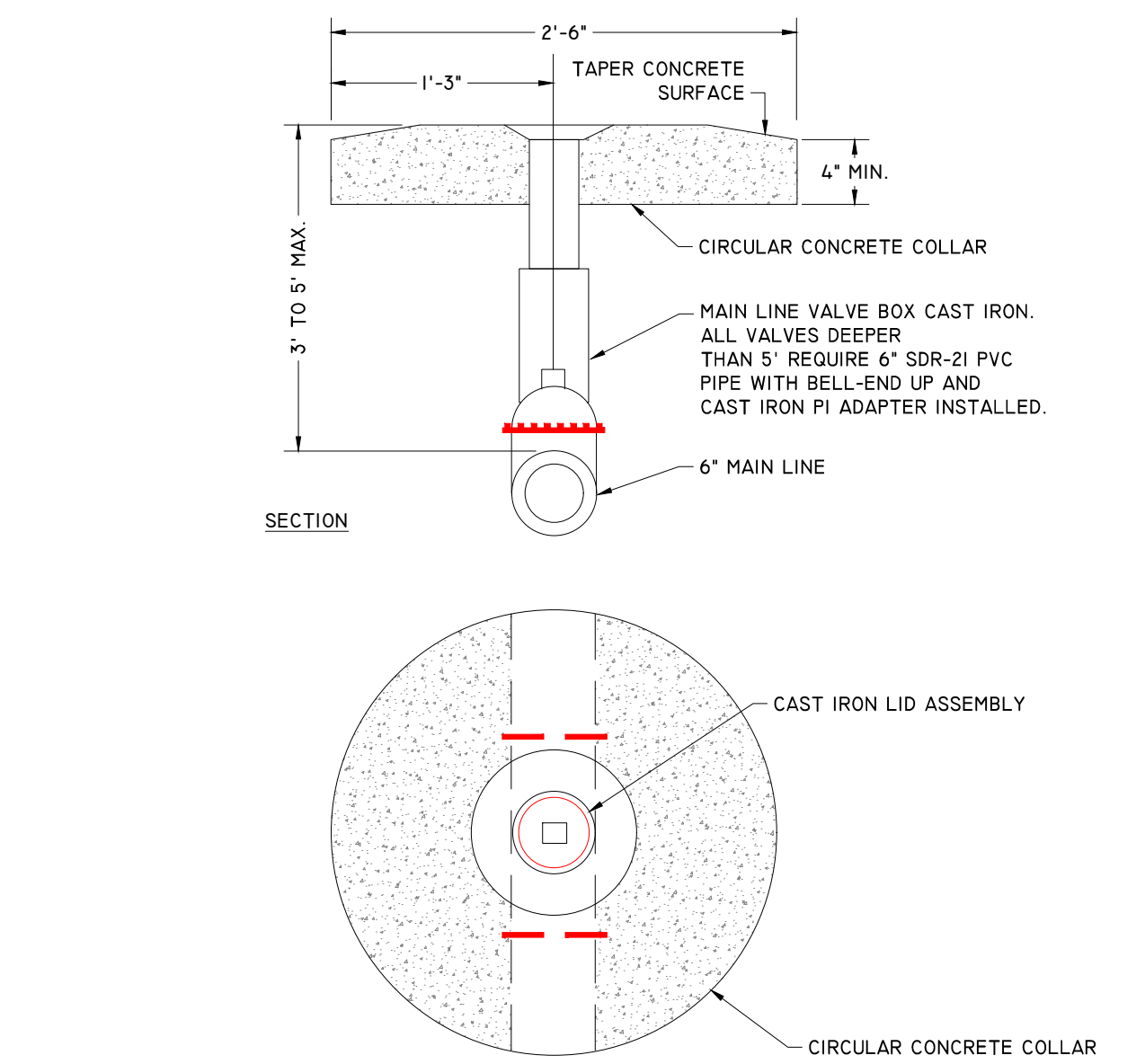
STANDARD DETAILS
INSIDE SERVICE SETTING

DWG. NO.
2

9/25/17

5

NOT TO SCALE



2'-6"

1'-3"

TAPER CONCRETE SURFACE

4" MIN.

3" TO 5" MAX.

SECTION

CIRCULAR CONCRETE COLLAR

MAIN LINE VALVE BOX CAST IRON. ALL VALVES DEEPER THAN 5' REQUIRE 6" SDR-21 PVC PIPE WITH BELL-END UP AND CAST IRON PI ADAPTER INSTALLED.


6" MAIN LINE

PLAN

CAST IRON LID ASSEMBLY

CIRCULAR CONCRETE COLLAR

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO



STANDARD DETAILS
VALVE BOX SETTING

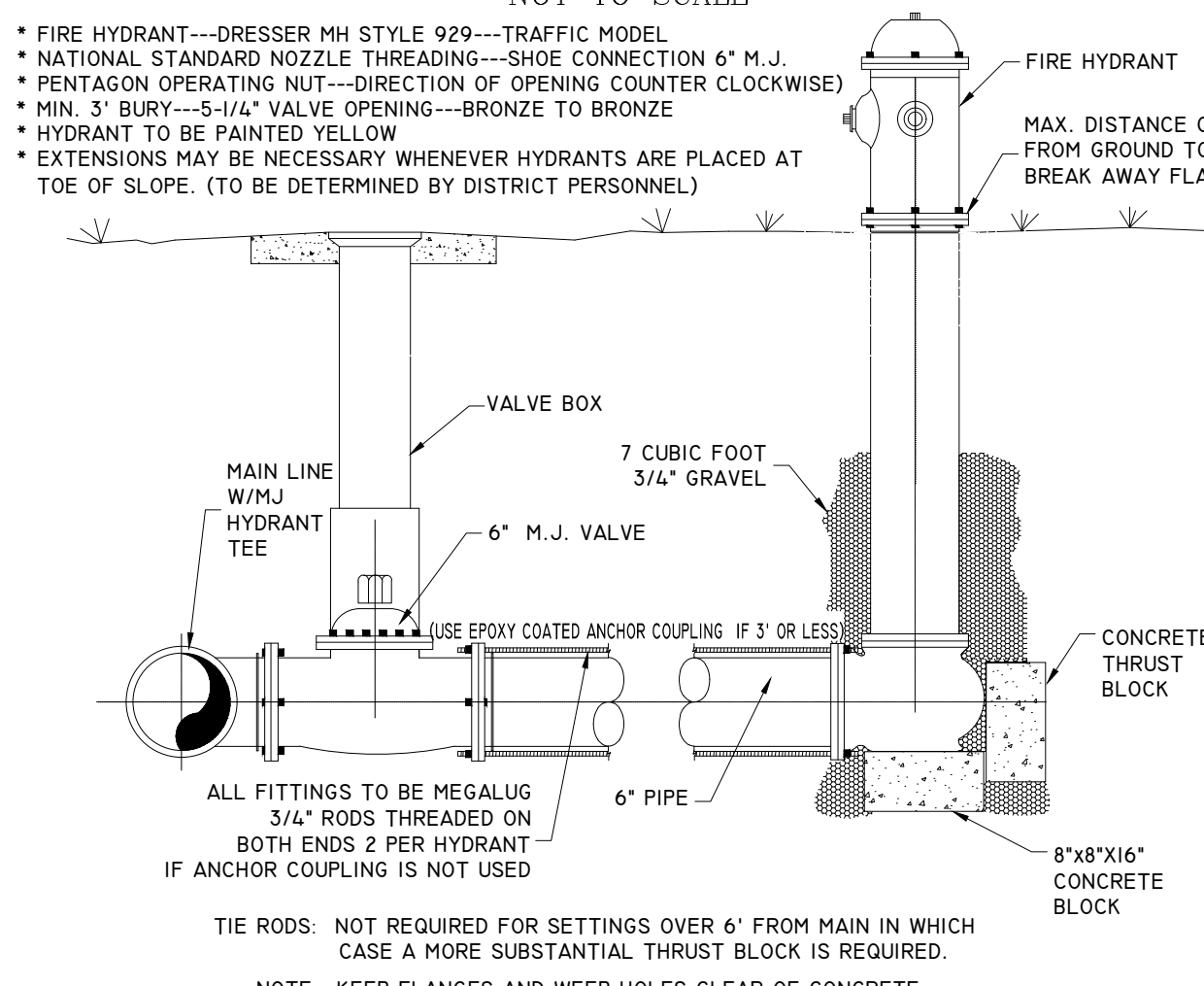
DWG. NO.
5

10/31/17

10

NOT TO SCALE

- FIRE HYDRANT---DRESSER MH STYLE 929---TRAFFIC MODEL
- NATIONAL STANDARD NOZZLE THREADING---SHOE CONNECTION 6" M.J.
- PENTAGON OPERATING NUT---DIRECTION OF OPENING COUNTER CLOCKWISE
- MIN. 3' BURY---5-1/4" VALVE OPENING---BRONZE TO BRONZE
- HYDRANT TO BE PAINTED YELLOW
- EXTENSIONS MAY BE NECESSARY WHENEVER HYDRANTS ARE PLACED AT TOE OF SLOPE. (TO BE DETERMINED BY DISTRICT PERSONNEL)



FIRE HYDRANT

MAX. DISTANCE OF 6' FROM GROUND TO BREAK AWAY FLANGE

VALVE BOX

7 CUBIC FOOT 3/4" GRAVEL

6" M.J. VALVE

6" PIPE

CONCRETE THRUST BLOCK

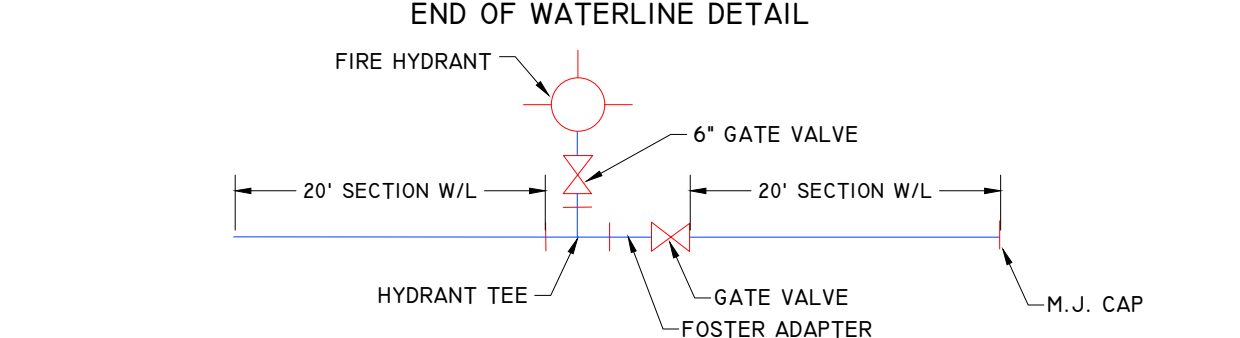
8"x8"x16" CONCRETE BLOCK

ALL FITTINGS TO BE MEGALUG 3/4" RODS THREADED ON BOTH ENDS 2 PER HYDRANT IF ANCHOR COUPLING IS NOT USED

TIE RODS: NOT REQUIRED FOR SETTINGS OVER 6' FROM MAIN IN WHICH CASE A MORE SUBSTANTIAL THRUST BLOCK IS REQUIRED.

NOTE: KEEP FLANGES AND WEEP HOLES CLEAR OF CONCRETE.

END OF WATERLINE DETAIL



FIRE HYDRANT

6" GATE VALVE

20' SECTION W/L

20' SECTION W/L


HYDRANT TEE

GATE VALVE

FOSTER ADAPTER

M.J. CAP

BELMONT COUNTY WATER AND SEWER DISTRICT
BELMONT COUNTY, OHIO



STANDARD DETAILS
FIRE HYDRANT ASSEMBLY
ARRANGEMENT AT END OF WATERLINE EXTENSION

DWG. NO.
7

10/31/17

14

CONSTRUCTION DETAILS
S.R. 149

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R31
R31

ITEM 632 - POWER SERVICE, AS PER PLAN

ELECTRIC POWER SHALL BE OBTAINED FROM THE AEP AT THE LOCATION INDICATED ON THE PLANS. POWER SUPPLIED SHALL BE 120 VOLTS.

POWER SERVICE SHALL BE AS PER CMS ITEM 632 AND SCD TC- 83.10 WITH THE FOLLOWING EXCEPTIONS:

1. THE CONTRACTOR SHALL MEET WITH A REPRESENTATIVE FROM THE POWER SUPPLY AGENCY TO CONFIRM HOW THE PROPOSED POWER SERVICE IS TO BE WIRED, HOOKED UP, AND ITS LOCATION

2. ALL POWER SERVICES SHALL BE METERED. THE METER SHALL HAVE A LEVER OPERATED BYPASS.

DISCONNECT SWITCH ENCLOSURES FURNISHED IN ACCORDANCE WITH CMS ITEM 632, POWER SERVICE, AS PER PLAN, SHALL INCLUDE A PADLOCK EQUAL TO MASTER NO. 4BKA OR WILSON BOHANNON 660, WITH LOCK BODY OF BRONZE OR BRASS AND KEYING SHALL BE TO THE STATE MASTER. THE CONTRACTOR SHALL CONTACT THE METER SECTION OF THE POWER COMPANY FOR INFORMATION REGARDING THE METER BASE INSTALLATION PRIOR TO ORDERING POLES. CONTRACTOR WILL BE RESPONSIBLE FOR REQUESTING AND SCHEDULING ANY INSPECTIONS THE POWER COMPANY MAY REQUIRE FOR THE POWER SERVICE HOOK UP. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE POWER COMPANY FOR THE ELECTRICAL SERVICE CONNECTION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR SPLICE POWER CABLE INTO THE POWER COMPANY'S CIRCUITS. THE VOLTAGE SUPPLIED SHALL BE NOMINALLY 120 VOLTS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS AND THE PAYING OF ALL FEES. THE CONTRACTOR SHALL PAY ALL POWER CHARGES UNTIL THE SIGNAL IS ACCEPTED BY MAINTAINING AGENCY.

SIGNAL ACTIVATION

PRIOR TO ACTIVATION 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 OF 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.

ITEM 632 - SIGNAL SUPPORT FOUNDATION

PRIOR TO ORDERING THE SIGNAL SUPPORTS, THE CONTRACTOR SHALL CONTACT OUPS TO HAVE ALL THE UTILITIES LOCATED IN THE FIELD. THEN, THE CONTRACTOR SHALL MEET WITH THE PROJECT ENGINEER TO LOCATE THE PROPOSED SUPPORT LOCATIONS TO INSURE THERE ARE NO CONFLICTS WITH UTILITIES. IF THERE ARE ISSUES, THE PROJECT ENGINEER SHALL PROVIDE GUIDANCE AS TO THE RELOCATION OF THE SUPPORT POLES.

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.

UNDERDRAINS FOR PULL BOXES

REFERENCE TRAFFIC SCD HL-30.11 FOR DETAILS ABOUT DRAINING PULL BOXES. UNDERDRAINS FOR PULL BOXES 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. THE FOLLOWING ESTIMATED QUANTITY IS CARRIED TO THE GENERAL SUMMARY FOR THIS PURPOSE:

ITEM 611 - 4" CONDUIT, TYPE E FOR UNDERDRAIN OUTLET 10 FT

WORK INSPECTION

THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER AND THE DISTRICT TRAFFIC ENGINEER WITH 72 HOUR NOTICE OF ANY SIGNAL WORK TO BE PERFORMED AT THE INTERSECTION SITE(S) SO THAT INSPECTION SERVICES CAN BE SUPPLIED.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 90 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 COMMUNICATION/INTERCONNECT EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO ODOT DISTRICT 11 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.

ITEM 625 - ARC FLASH CALCULATIONS AND LABEL

THIS ITEM SHALL INCLUDE PROVIDING ARC FLASH HAZARD CALCULATIONS AND LABELS PER SUPPLEMENTAL SPECIFICATION 825. LABELS SHALL BE APPLIED TO THE OUTSIDE OF EACH CONTROLLER CABINET. LABELS SHALL BE PROVIDED BY THE ODOT SIGN SHOP.

1606 WEST BROAD STREET
COLUMBUS, OHIO 43223

LOCATIONS OF ARC FLASH HAZARD LABELS ARE:

SIGNAL CONTROLLER (STA. 120+90.62, 36.58' LT.)

PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR EACH ITEM 625 "ARC FLASH CALCULATION LABEL" FOR EACH SET OF CALCULATIONS ACCEPTED AND LABEL INSTALLED, INCLUDING ALL LABOR, MATERIALS, AND INCIDENTALS NECESSARY.

ITEM 633 - CABINET, TYPE 332L, 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 CABINET SHALL BE FURNISHED WITH AN EDI MONITOR AS ALLOWED ON THE TAP/APPROVED PRODUCTS LIST. THE CABINET SHALL INCLUDE A CABINET RISER (12 INCH MINIMUM).

THE CONTRACTOR SHALL NOT REASSIGN THE CABINET DETECTOR INPUTS IN ORDER TO REDUCE THE NUMBER OF 2-CHANNEL DETECTOR UNITS SUPPLIED AND SHALL USE THE STANDARD CALTRANS INPUT FILE DESIGNATIONS FOLLOWING SHEET T6.

PAYMENT FOR ITEM 633 CABINET, TYPE 332L, AS PER PLAN WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 809 - ATC CONTROLLER, AS PER PLAN (PROGRAM AND INSTALL ONLY)

ALL REQUIREMENTS OF SS 809 SHALL BE FOLLOWED, ALONG WITH THE ADDITIONAL DESCRIPTION AS STATED BELOW. THE ATC CONTROLLER WILL BE PROVIDED BY THE DISTRICT WITHOUT PROGRAMMING.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROGRAMMING THE CONTROLLER TO THE PROPOSED CONDITIONS ACCORDING TO THE PLANS. ODOT WILL NOT BE RESPONSIBLE FOR THE PROGRAMMING.

PAYMENT SHALL BE MADE ONCE THE CONTROLLER IS PROGRAMMED, INSTALLED, TESTED, FUNCTIONING ACCORDING TO THE PLANS, AND SHALL INCLUDE INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS TO COMPLETE WORK.

CONTROLLER ITEM, MISC.: TIMING AND COORDINATION

THIS ITEM SHALL INCLUDE THE WORK NECESSARY TO CHANGE THE SIGNAL TIMING AND NETWORK COORDINATION IN THE LOCAL CONTROLLER LOCATED AT THE IR 70 WB RAMPS AS INDICATED ON SHEET T11.

COORDINATION TIMING WILL BE IMPLEMENTED AT THE FOLLOWING FOUR (4) INTERSECTIONS: S.R. 149 & RECO DRIVE, I-70 EASTBOUND RAMPS & S.R. 149, I-70 WESTBOUND RAMPS & S.R. 149, AND S.R. 149 & BOND DRIVE/SCHOOL STREET.

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TRAFFIC SIGNAL GENERAL NOTES

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

IN ADDITION TO THE REQUIREMENTS OF C&MS 633 AND 733, POLE ATTACHMENT HARDWARE WILL BE INCLUDED FOR POLE-MOUNTED CABINETS, AND A CABINET RISER (8-INCH MINIMUM) AND ANCHOR BOLTS WILL BE PROVIDED FOR BASE-MOUNTED CABINETS. BEFORE PERFORMING THE WORK, THE CONTRACTOR, THE DISTRICT TRAFFIC ENGINEER, AND THE PROJECT ENGINEER WILL PERFORM A SITE INSPECTION TO ESTABLISH THE LOCATION OF THE UPS CABINET AND FOUNDATION.

THE UPS 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 CABINET SHALL HAVE A DOOR STOP MECHANISM AND THERMOSTATICALLY CONTROLLED FAN.

THE CABINET SHALL INCLUDE A BATTERY BALANCING DEVICE THAT REGULATES THE BATTERIES AND OPTIMIZES PERFORMANCE.

AFTER FOUR (4) HOURS OF BATTERY RUNTIME, 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.

ITEM 809 - ADVANCE RADAR DETECTION, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING A WAVETRONIX SMARTSENSOR ADVANCE DETECTION UNTIL (MODEL SS-200E). 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 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, CONDUIT, CONNECTIONS TESTED AND ACCEPTED, AND ANY OTHER NECESSARY HARDWARE TO ESTABLISH A FULLY FUNCTIONAL DETECTION SYSTEM.

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 PRECONSTRUCTION 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.

ITEM 633 - COMMUNICATIONS, AS PER PLAN

FURNISH A CELLULAR MODEM, ONE 3-ANTENNA ASSEMBLY (PART #6001136), AND A 10' ETHERNET CABLE FOR REMOTE WIRELESS CELLULAR COMMUNICATION.

FOR NETWORK CONSISTENCY CELLULAR MODEMS SHALL BE THE SIERRA WIRELESS:

MODEM, AIRLINK MP70 ETHERNET WITH AC TO DC POWER CABLE - MODEL 1102709KIT

THIS ITEM SHALL INCLUDE THE FURNISHING A MOUNTING BRACKET FOR THE ANTENNA WITH ALL NECESSARY HARDWARE INCLUDING BUT NOT LIMITED TO SPRING NUTS, WASHERS, AND BOLTS THAT INSTALLS TO THE MOUNTING CHANNEL ON THE SIDE OF THE SIGNAL CABINET.

THE CELLULAR MODEM EQUIPMENT SHALL BE DELIVERED TO ODOT DISTRICT 11 TRAFFIC FOR PROGRAMMING AND INSTALLATION.

JOSEPH PARISI, P.E.
(330) 308-7813
2201 REISER AVENUE SE
NEW PHILADELPHIA, OHIO 44663

THE CONTRACTOR SHALL PROVIDE THE MODEM SERIAL NUMBERS AND NECESSARY ESN NUMBERS FOR ODOT TO ESTABLISH WIRELESS SERVICE.

THE DEPARTMENT WILL MEASURE "COMMUNICATIONS, AS PER PLAN" BY THE NUMBER OF COMPLETE UNITS FURNISHED, RECEIVED, AND ACCEPTED BY ODOT DISTRICT 11 TRAFFIC.

ITEM 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.

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GROUNDING AND BONDING

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (C&MS) AND THE 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 END, 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 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.

GROUNDING AND BONDING (CONT.)

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:
 - I. USE 4 AWG BETWEEN THE POWER SERVICE AND SUPPORTS, POLES, PEDESTALS, CONTROLLER OR FLASHER CABINETS.
 - II. 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.
 - III. 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.
 - IV. 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 3/4 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	EQUIPMENT GROUND	EQUIPMENT GROUND
5	ORANGE	YELLOW BALL	#2 DW/FDW
6	BLUE	GREEN ARROW	#2 WALK
7	WHITE/BLACK STRIPE	YELLOW ARROW	NOT USED

GROUNDING AND BONDING (CONT.)

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

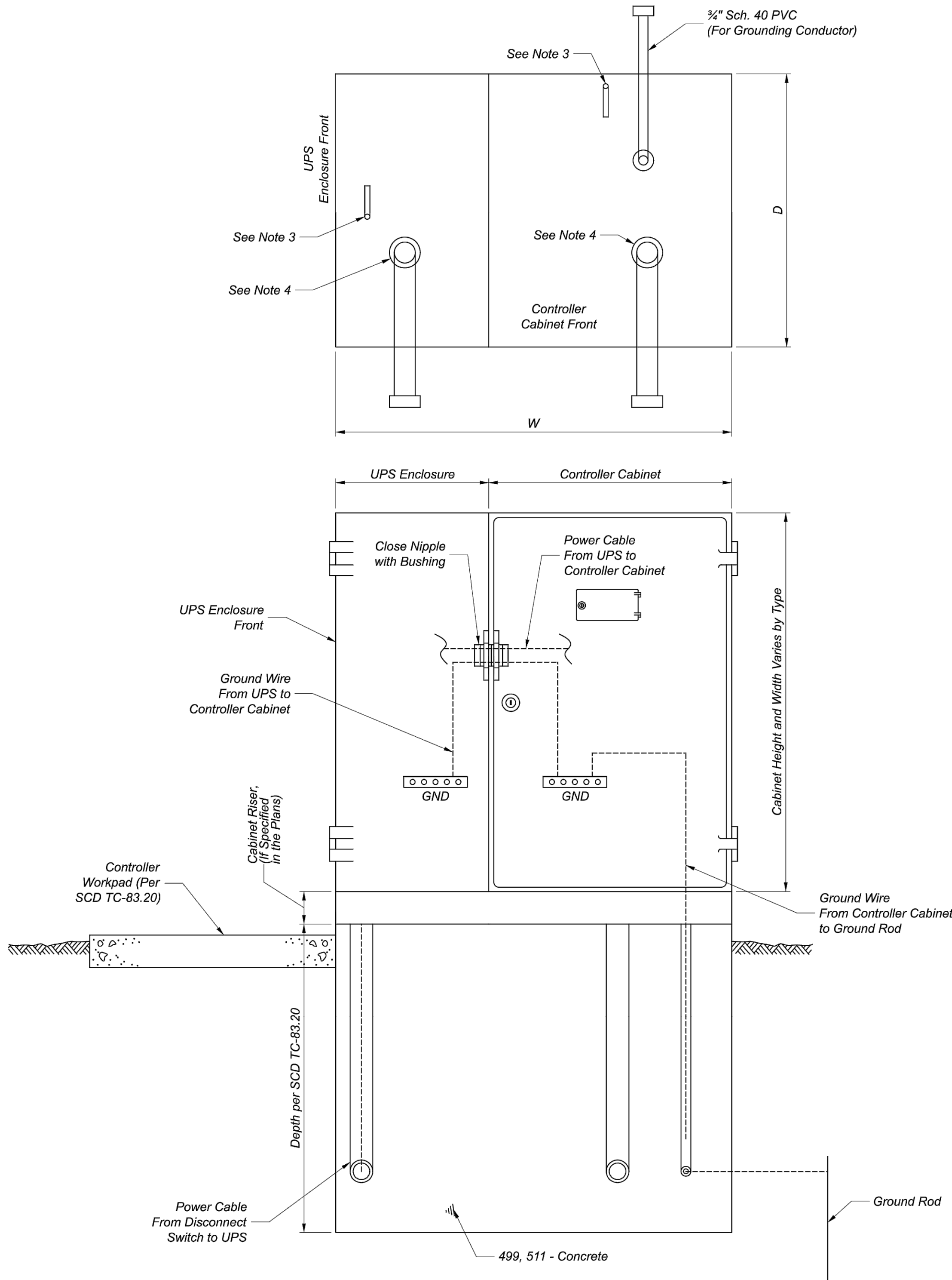
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NOTES:

1. THE UNINTERRUPTIBLE POWER SUPPLY (UPS) ENCLOSURE SHALL BE MOUNTED FLUSH UP AGAINST THE TRAFFIC SIGNAL CABINET AND SEALED WITH SILICONE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE NECESSARY POWER CABLE BETWEEN THE UPS UNIT AND SIGNAL CABINET.
2. THE UPS SHOULD BE PLACED ON THE OPPOSITE SIDE OF THE PULL BOX ON A 332/336 CABINET (PER STANDARD CONSTRUCTION DRAWING (SCD) TC-83.20). THE UPS PLACEMENT FOR A NEMA CABINET VARIES, PLACEMENT SHOULD PROVIDE ADEQUATE ACCESS WITH RESPECT TO SLOPE, GUARDRAIL SPACING, ETC.
3. THE SIZE, NUMBER, AND LOCATION OF ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. THE SIZE, NUMBER, AND ORIENTATION OF CONDUIT ELLS SHALL BE AS SHOWN IN THE PLAN, EXCEPT THAT A 3/4" SCHEDULE 40 PVC SHALL BE INSTALLED IN EACH FOUNDATION.
5. 1/2" PREFORMED JOINT FILLER AS PER CMS 705.03 SHALL BE USED BETWEEN FOUNDATIONS AND ADJACENT PAVED AREAS.
6. SEE SCD TC-83.20 FOR FURTHER DETAILS.

TYPE	W (IN.)	D (IN.)	FOUNDATION CONCRETE (CU. YD.)
TS-1	60	24	1.23
TS-2	70	36	2.16
2070/170	50	36	1.54

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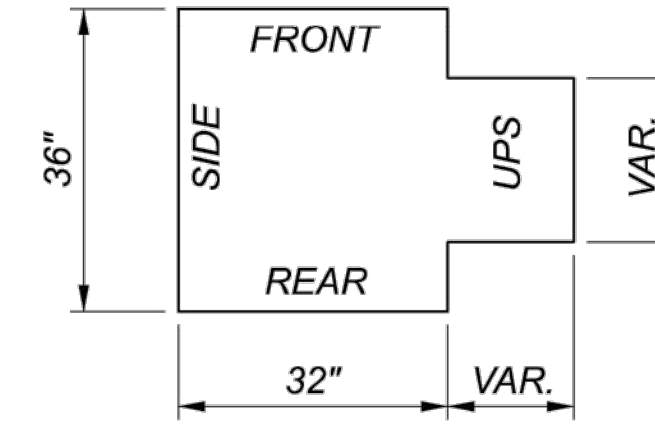
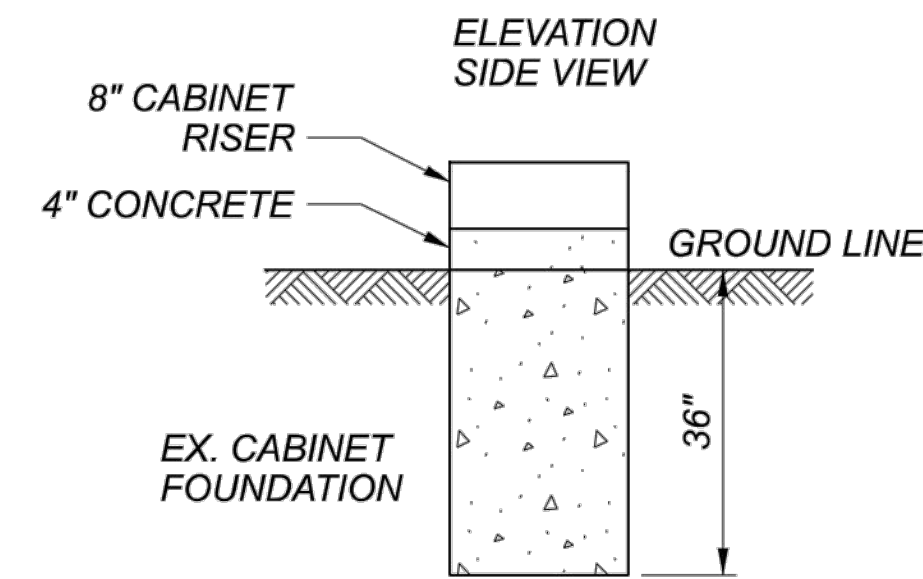
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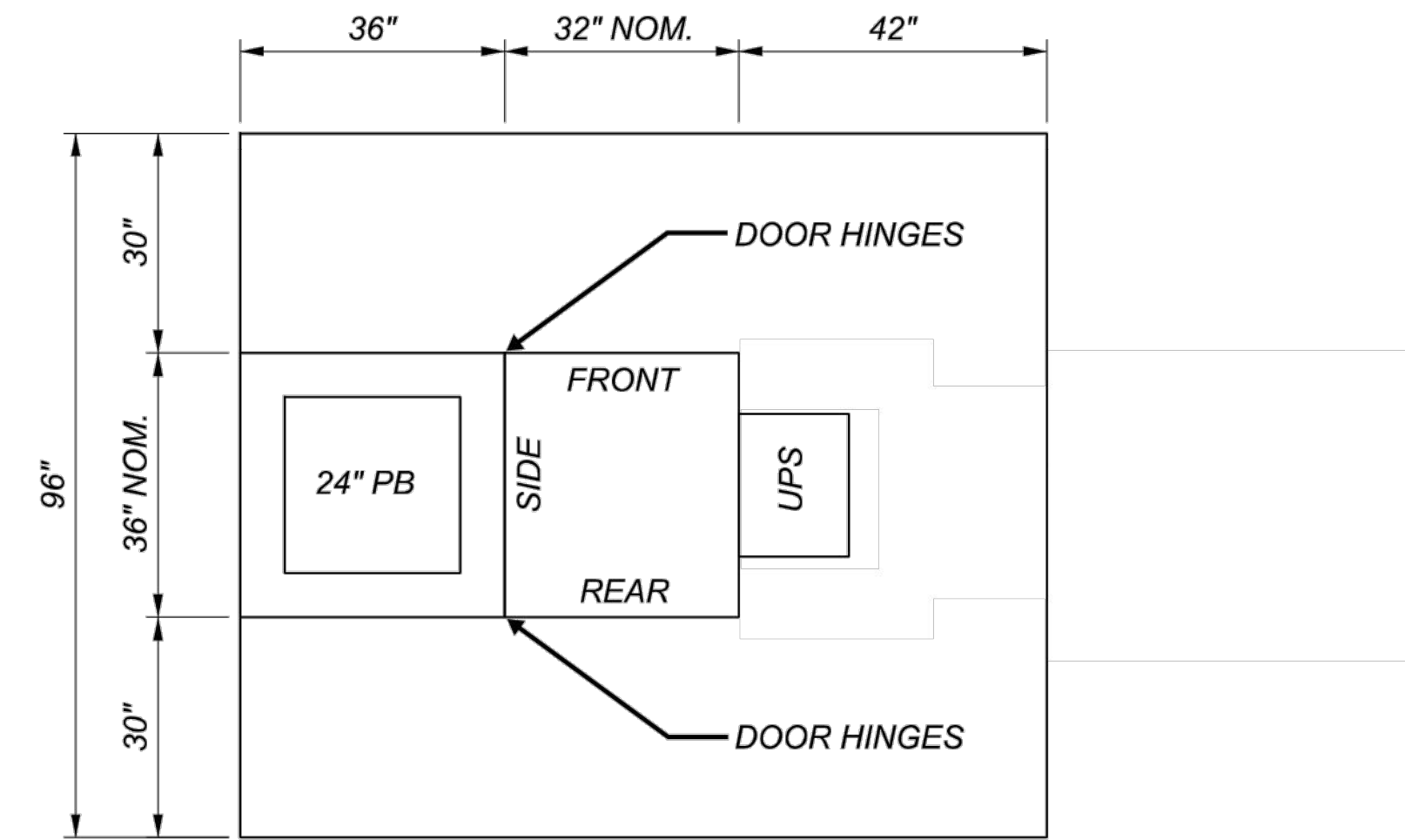
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MODEL 332 CABINET DETAIL (TYP.)

UPS FOUNDATION DETAIL



UPS WORK PAD DETAIL



PLAN VIEW

NOTES:

- 1) THE SIZE OF THE UPS FOUNDATION MAY VARY BASED ON THE CABINET SIZE PROVIDED.
- 2) UPS FOUNDATION ELEVATION SHOULD MATCH CABINET FOUNDATION ELEVATION.
- 3) THE UPS CABINET SHALL BE MOUNTED FLUSH UP AGAINST THE SIGNAL CABINET AND SEALED.
- 4) CONDUIT AND WIRING FROM THE SIGNAL CABINET TO THE UPS SHALL BE INSTALLED THROUGH THE CABINET RISER.

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SEPAC AND ASC/3 INPUT FILE INFORMATION FOR THE 332 CABINET

UPPER INPUT FILE (FILE=I)

C U H P A P N E N R E L	PHASE	1	2	2	2	3	4	4	4	1	MANUAL CONTROL ADV.	2	6	FLASH	
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	PED	PED	SENSE	
	SEPAC DETECTOR NO.	VEH 1	VEH 3	VEH 5	VEH 7	VEH 9	VEH 11	VEH 13	VEH 15	VEH 17		PED 2	PED 6		
	ASC/3 DETECTOR NO.	VEH 1	VEH 2	VEH 3	VEH 4	VEH 5	VEH 6	VEH 7	VEH 8	VEH 9		PED 2	PED 6		
	C1 PIN NUMBER	56	39	63	47	58	41	65	49	60	80	67	68	81	
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
C L H O A W N E N R E L	PHASE	1	2	2	2	3	4	4	4	3	ADV.	4	8	STOP	
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	ENABLE	PED	PED	TIME
	SEPAC DETECTOR NO.	VEH 1	VEH 4	VEH 6	VEH 7	VEH 9	VEH 12	VEH 14	VEH 15	VEH 18		PED 4	PED 8		
	ASC/3 DETECTOR NO.	VEH 1	VEH 10	VEH 11	VEH 4	VEH 5	VEH 14	VEH 15	VEH 8	VEH 13		PED 4	PED 8		
	C1 PIN NUMBER	56	43	76	47	58	45	78	49	62	53	69	70	82	
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

LOWER INPUT FILE (FILE=J)

C U H P A P N E N R E L	PHASE	5	6	6	6	7	8	8	8	5	SPARE	SPARE	EV - A	EV - B	RR - 1
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	SPARE			
	SEPAC DETECTOR NO.	VEH 19	VEH 21	VEH 23	VEH 25	VEH 29	VEH 31	VEH 33	VEH 35	VEH 37					
	ASC/3 DETECTOR NO.	VEH 17	VEH 18	VEH 19	VEH 20	VEH 21	VEH 22	VEH 23	VEH 24	VEH 25					
	C1 PIN NUMBER	55	40	64	48	57	42	66	50	59	54	71	72	51	
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
C L H O A W N E N R E L	PHASE	5	6	6	6	7	8	8	8	7	SPARE	SPARE	EV - C	EV - D	RR - 2
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	SPARE	SPARE			
	SEPAC DETECTOR NO.	VEH 19	VEH 22	VEH 24	VEH 25	VEH 29	VEH 32	VEH 34	VEH 35	VEH 38					
	ASC/3 DETECTOR NO.	VEH 17	VEH 26	VEH 27	VEH 20	VEH 21	VEH 30	VEH 31	VEH 24	VEH 29					
	C1 PIN NUMBER	55	44	77	48	57	46	79	50	61	75	73	74	52	
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

SEPAC AND ASC/3 INPUT FILE INFORMATION FOR THE 336 CABINET

C U H P A P N E N R E L	PHASE	1	2	3	4	5	6	7	8	RR - 1	EV - A	EV - B	2	6	FLASH
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	RR - 1	EV - A	EV - B	PED	PED	SENSE
	SEPAC DETECTOR NO.	VEH 1	VEH 3	VEH 9	VEH 11	VEH 19	VEH 21	VEH 29	VEH 31				PED 2	PED 6	
	ASC/3 DETECTOR NO.	VEH 1	VEH 2	VEH 5	VEH 6	VEH 17	VEH 18	VEH 21	VEH 22				PED 2	PED 6	
	C1 PIN NUMBER	56	39	58	41	55	40	57	42	51	71	72	67	68	81
	FIELD TERMINALS	1-D,E	2-D,E	3-D,E	4-D,E	5-D,E	6-D,E	7-D,E	8-D,E	9-D,E	10-D,E	11-D,E	12-D,E	13-D,E	14-D,E
SLOT NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14
C L H O A W N E N R E L	PHASE	2	2	4	4	6	6	8	8	RR - 2	EV - C	EV - D	4	8	STOP
	DEFAULT FUNCTION	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	EXT-CALL	RR - 2	EV - C	EV - D	PED	PED	TIME
	SEPAC DETECTOR NO.	VEH 7	VEH 4	VEH 15	VEH 12	VEH 25	VEH 22	VEH 35	VEH 32				PED 4	PED 8	
	ASC/3 DETECTOR NO.	VEH 4	VEH 10	VEH 8	VEH 14	VEH 20	VEH 26	VEH 24	VEH 30				PED 4	PED 8	
	C1 PIN NUMBER	47	43	49	45	48	44	50	46	52	73	74	69	70	82
	FIELD TERMINALS	1-J,K	2-J,K	3-J,K	4-J,K	5-J,K	6-J,K	7-J,K	8-J,K	9-J,K	10-J,K	11-J,K	12-J,K	13-J,K	14-J,K

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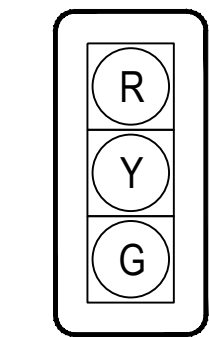
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TRAFFIC SIGNAL GENERAL NOTES
S.R. 149

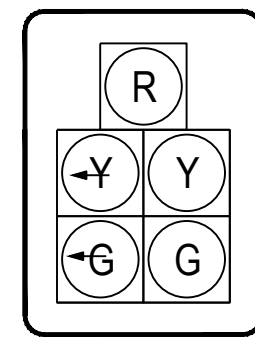
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PROPOSED VEHICULAR SIGNAL HEADS



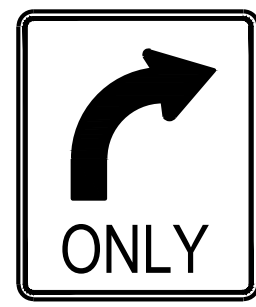
SIGNALS
2A 2B 4A
4B 6A 6B



SIGNALS
5A



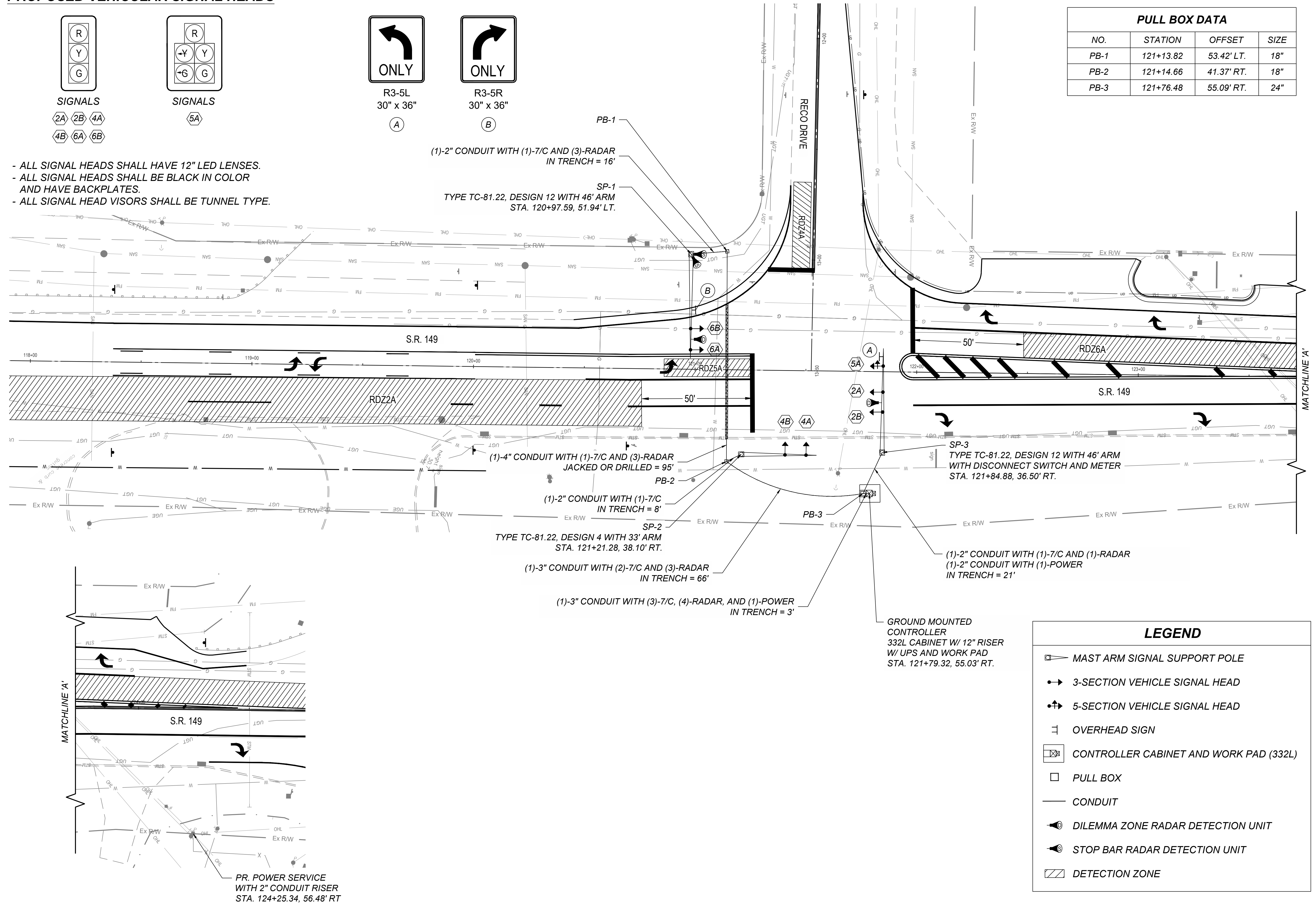
R3-5L
30" x 36"
A



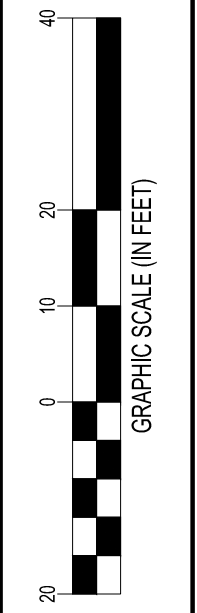
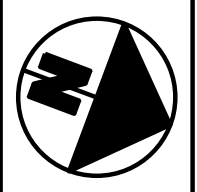
R3-5R
30" x 36"
B

- ALL SIGNAL HEADS SHALL HAVE 12" LED LENSES.
- ALL SIGNAL HEADS SHALL BE BLACK IN COLOR AND HAVE BACKPLATES.
- ALL SIGNAL HEAD VISORS SHALL BE TUNNEL TYPE.

PULL BOX DATA			
NO.	STATION	OFFSET	SIZE
PB-1	121+13.82	53.42' LT.	18"
PB-2	121+14.66	41.37' RT.	18"
PB-3	121+76.48	55.09' RT.	24"



LEGEND	
	MAST ARM SIGNAL SUPPORT POLE
	3-SECTION VEHICLE SIGNAL HEAD
	5-SECTION VEHICLE SIGNAL HEAD
	OVERHEAD SIGN
	CONTROLLER CABINET AND WORK PAD (332L)
	PULL BOX
	CONDUIT
	DILEMMA ZONE RADAR DETECTION UNIT
	STOP BAR RADAR DETECTION UNIT
	DETECTION ZONE



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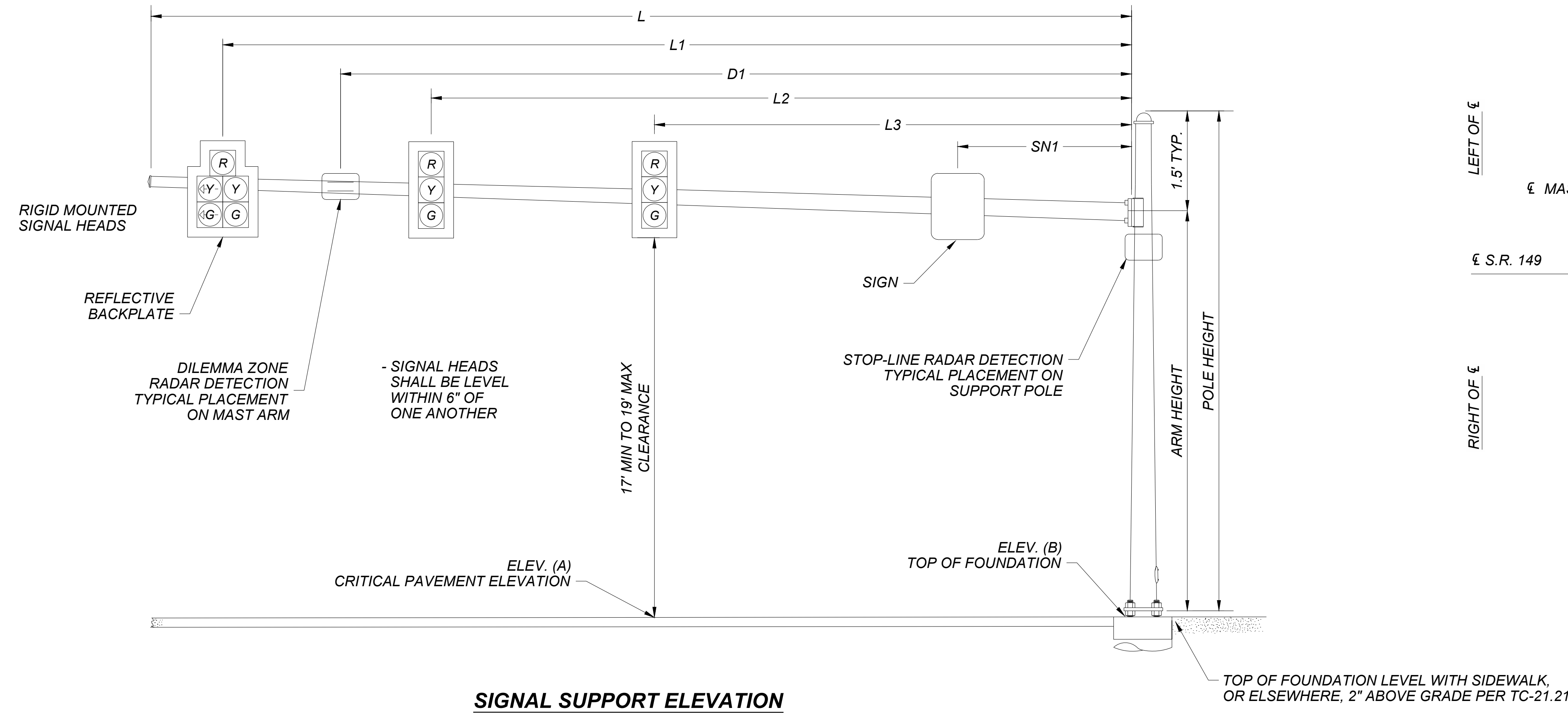
TRAFFIC SIGNAL PLAN
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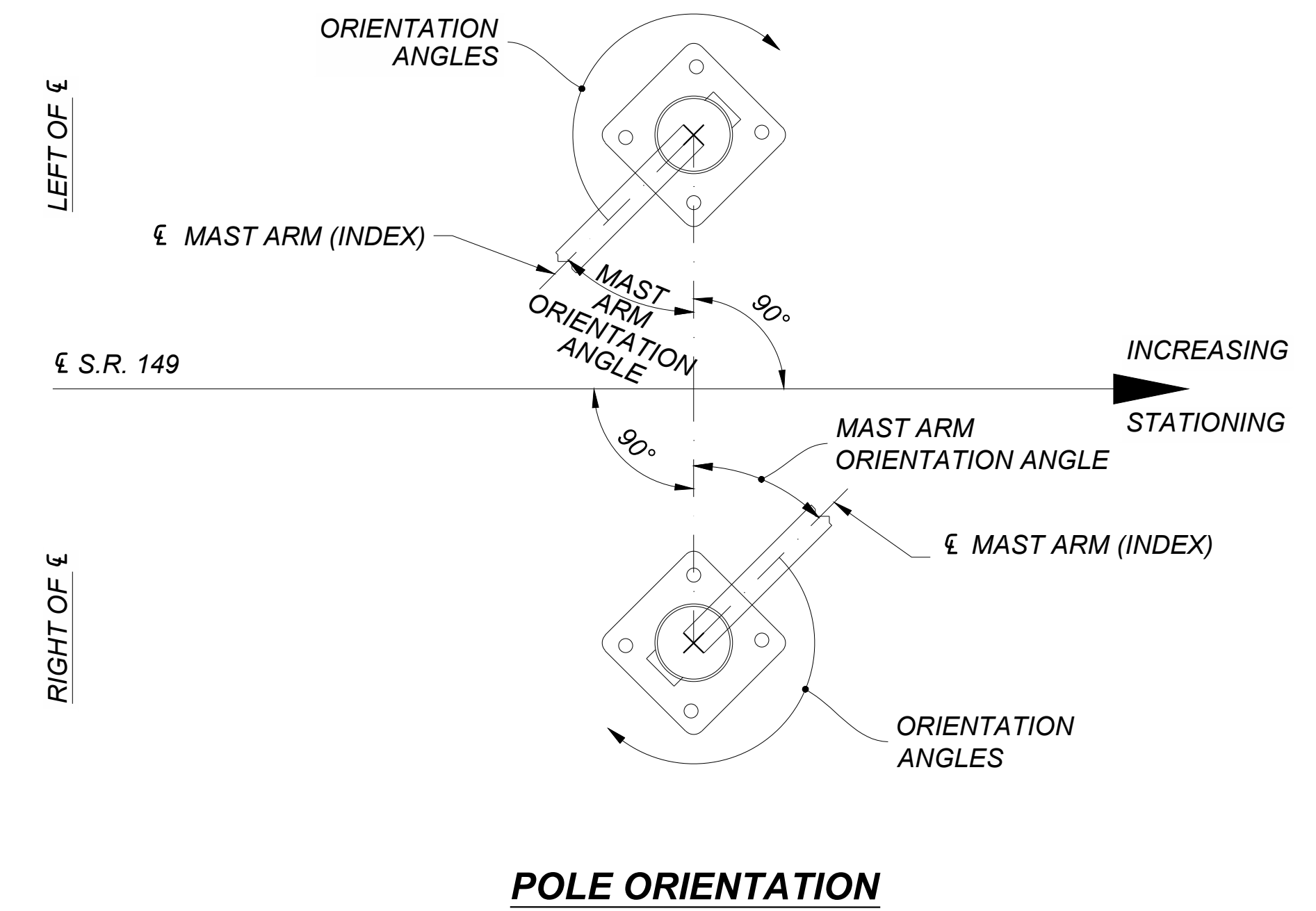
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SIGNAL SUPPORT ELEVATION



POLE ORIENTATION

MAST ARM TABLE

TEM Fig. 498-37: Plan Details for Signal Supports - Arm Lengths																TEM Fig. 498-38: Plan Details for Signal Supports - Mast Arm Orientation				
SUPPORT NO.	STATION	OFFSET	ELEVATION		SIGNAL SUPPORT DETAILS											ORIENTATION ANGLES FROM MAST ARM				
			A (Pavt. Elev.)	B (Top of Found.)	DESIGN TYPE	DESIGN NO.	POLE HEIGHT	ARM HEIGHT	L	L1	L2	L3	R1	R2	R3	SN1	MAST ARM ANGLE	POWER SERVICE	HANDHOLE	CABLE ENTRANCE 12" FROM TOP
							FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	DEG	DEG	DEG	DEG
SP-1	120+97.59	51.94' LT	1191.07	1191.92	TC-81.22	12	21	19.5	46	42	33	-	0	0	37.5	24	0	-	180	-
SP-2	121+21.28	38.10' RT	1192.35	1192.26	TC-81.22	4	21	19.5	33	19	28.5	-	-	-	-	-	90	-	180	-
SP-3	121+84.88	36.50' RT	1191.88	1192.72	TC-81.22	12	21	19.5	46	17.5	26.5	38	21.5	-	-	42.5	0	180	180	180
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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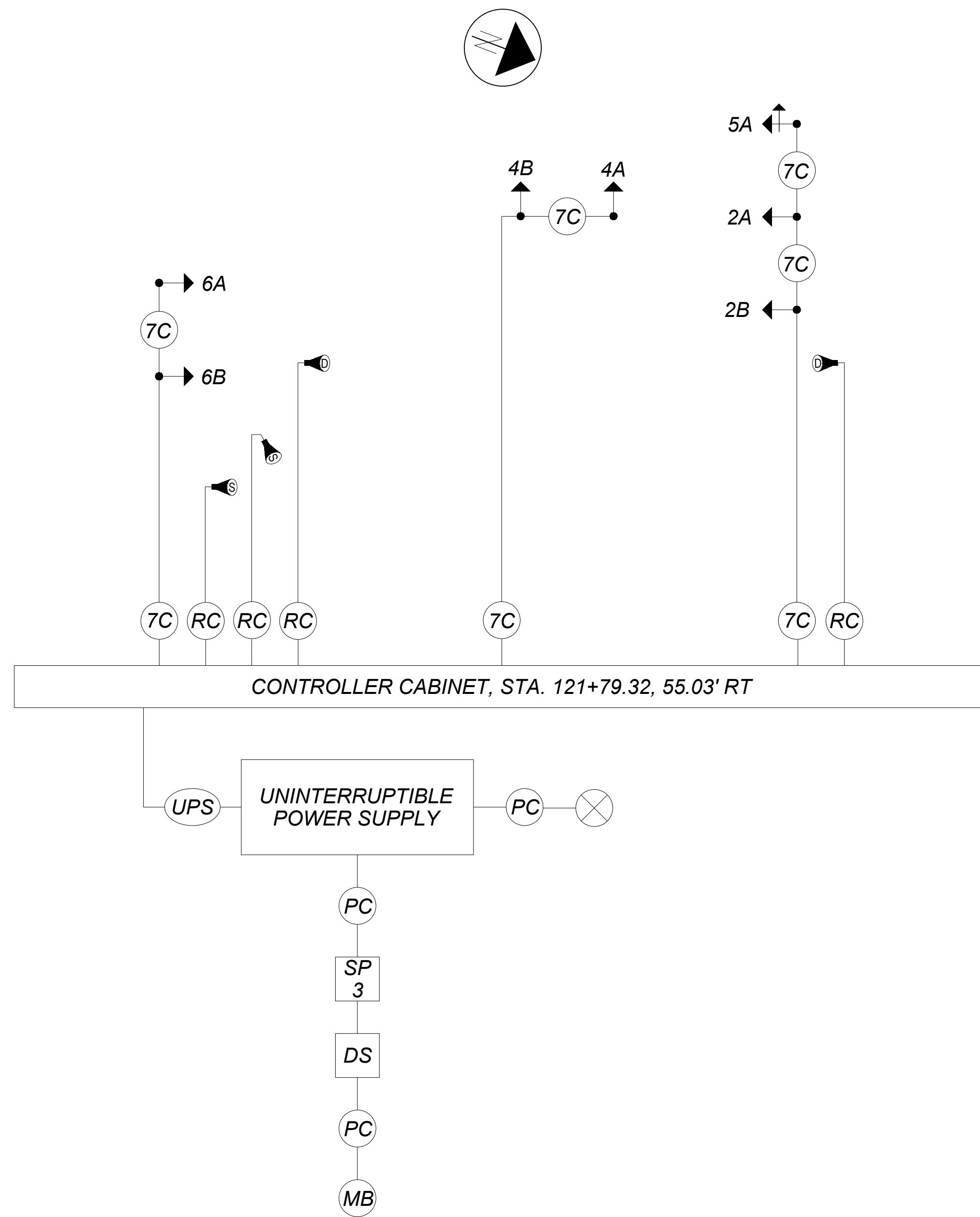
TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

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WIRING DIAGRAM



FIELD WIRING HOOK-UP CHART

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

WIRING DIAGRAM LEGEND

	5-SECTION VEHICULAR SIGNAL HEAD, 1-WAY
	3-SECTION VEHICULAR SIGNAL HEAD, 1-WAY
	STOP BAR RADAR DETECTION UNIT
	DILEMMA ZONE RADAR DETECTION UNIT
	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
	RADAR DETECTION CABLE
	POWER SOURCE
	POWER CABLE, 2 CONDUCTOR, NO. 6 AWG
	METER BASE
	SIGNAL DISCONNECT SWITCH
	UNINTERRUPTIBLE POWER SUPPLY CABLE

TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

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SIGNAL TIMING CHART

INTERSECTION: S.R. 149 & RECO DRIVE MAINTAINING AGENCY: ODOT DISTRICT 11									
START UP		DUAL ENTRY:	YES	PHASES:		2 + 6			
START IN:	ALL RED	REST IN RED:		RING 1	-	RING 2	-		
TIME FOR FLASH, ALL RED:	5 SEC.	OVERLAP		A	B	C	D		
FIRST PHASE(S):	Ø2 + Ø6	PHASES		-	-	-	-		
COLOR DISPLAYED:	GREEN								
INTERVAL OR FEATURE	CONTROLLER MOVEMENT NO.								
INTERSECTION MOVEMENT (PHASE)	1	2	3	4	5	6	7	8	
DIRECTION	-	NB	-	EB	NBLT	SB	-	-	
MINIMUM GREEN (INITIAL) (SEC.)	-	20	-	10	7	20	-	-	
ADDED INITIAL *(SEC./ACTUATION)	-	-	-	-	-	-	-	-	
MAXIMUM INITIAL *(SEC.)	-	-	-	-	-	-	-	-	
PASSAGE TIME (PRESET GAP) (SEC.)	-	2.0	-	2.0	2.0	2.0	-	-	
TIME BEFORE REDUCTION *(SEC.)	-	-	-	-	-	-	-	-	
MINIMUM GAP *(SEC.)	-	-	-	-	-	-	-	-	
TIME TO REDUCE *(SEC.)	-	-	-	-	-	-	-	-	
MAXIMUM GREEN I (SEC.)	-	34	-	14	8	21	-	-	
MAXIMUM GREEN II (SEC.)	-	-	-	-	-	-	-	-	
YELLOW CHANGE (SEC.)	-	4.5	-	4.5	4.0	5.0	-	-	
ALL RED CLEARANCE (SEC.)	-	1.0	-	1.0	1.5	1.0	-	-	
DELAYED GREEN (LPI) # (SEC.)	-	-	-	-	-	-	-	-	
WALK (SEC.)	-	-	-	-	-	-	-	-	
PEDESTRIAN CLEARANCE (SEC.)	-	-	-	-	-	-	-	-	
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:

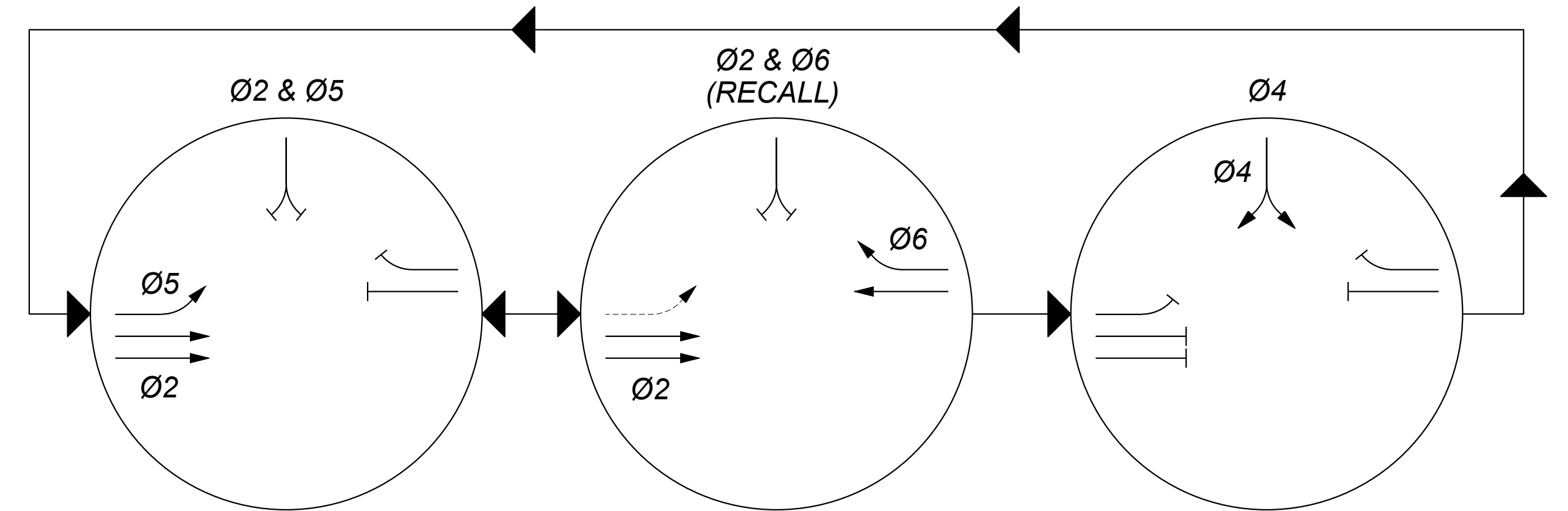
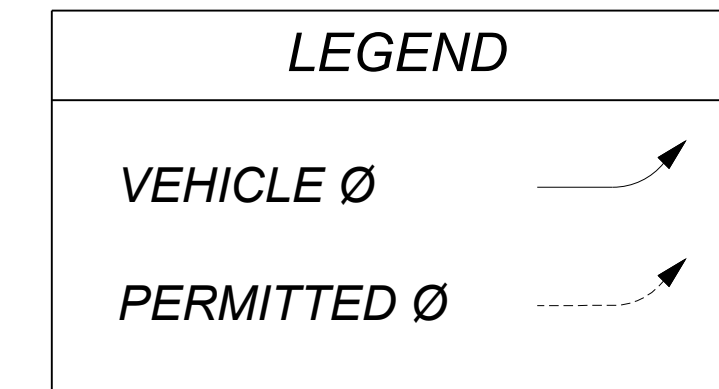
- ALL MOVEMENTS SHALL BE ACTUATED. THE PRIMARY THRU MOVEMENT SHOULD HAVE MIN RECALL ACTIVE TO REST IN GREEN.

-RADAR DETECTION UNITS FOR DILEMMA ZONE DETECTION SHALL PLACE A CONSTANT CALL TO THE CONTROLLER WHEN VEHICLE TRAVEL TIMES TO THE STOP BAR ARE BETWEEN 2.5 AND 6.0 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 THE 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



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)
RDZ5A	NB LT	PRESENCE	Ø5	5.0	2.0	D2A	STOP BAR	40
RDZ2A	NB	PULSE	Ø2	0.0	2.0	D2B	DILEMMA ZONE	850
RDZ4A	EB LR	PRESENCE	Ø4	10.0	2.0	D4A	STOP BAR	40
RDZ6A	SB	PULSE	Ø6	0.0	2.0	D6A	DILEMMA ZONE	850

NOTE: ALL DETECTION ZONES SHALL BE CENTERED IN THEIR RESPECTIVE LANES UNLESS OTHERWISE SHOWN.

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TRAFFIC SIGNAL PLAN DETAILS
S.R. 149

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COORDINATION TIME CHART

"INTERSECTION 1" - S.R. 149 & RECO DRIVE										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	NBLT	SB	-	-		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	40	-	20	13.4	26.6	-	-	55	-
2	-	52.6	-	17.4	13.4	39.2	-	-	64	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

"INTERSECTION 3" - I-70 WESTBOUND RAMPS & S.R. 149 (MASTER)										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	WB	-	SB	-	WB		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	37.5	-	22.5	-	37.5	-	-	0	-
2	-	43	-	27	-	43	-	-	0	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

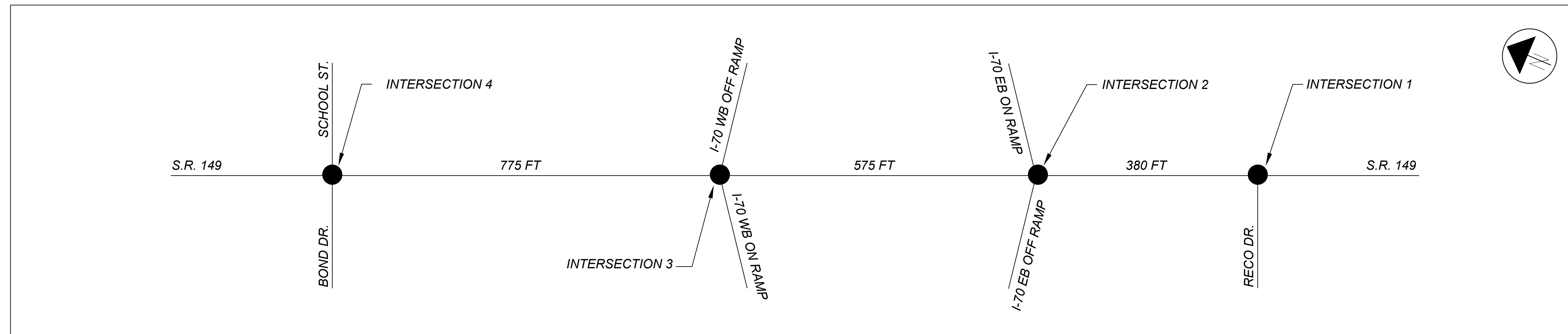
"INTERSECTION 2" - I-70 EASTBOUND RAMPS & S.R. 149										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	-	SB	-	-		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	42	-	18	-	42	-	-	52	-
2	-	47.5	-	22.5	-	47.5	-	-	62	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

"INTERSECTION 4" - S.R. 149 & BOND DRIVE/SCHOOL STREET										
PHASE	1	2	3	4	5	6	7	8	OFFSET 1 (SEC)	OFFSET 2 (SEC)
DIRECTION	-	NB	-	EB	-	SB	-	WB		
PLAN NO. OR C/S/O	SPLITS (G+Y+AR) IN SECONDS									
-	-	-	-	-	-	-	-	-	-	-
1	-	37	-	23	-	37	-	23	12	-
2	-	42	-	28	-	42	-	28	5	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

COORDINATION TIMING PLANS

DAY(S) OF WEEK	PLAN NAME	HOURS	PLAN NO. OR CYCLE/SPLIT/OFFSET	CYCLE LENGTH (SEC)
-	-	-	-	-
SAT-SUN	FREE	0000 - 2400	FREE	FREE
-	-	-	-	-
MON-FRI	FREE	0000 - 0700	FREE	FREE
MON-FRI	AM PEAK	0700 - 0930	1	60
MON-FRI	FREE	0930 - 1430	FREE	FREE
MON-FRI	PM PEAK	1430 - 1800	2	70
MON-FRI	FREE	1800 - 2400	FREE	FREE
-	-	-	-	-

COORDINATION LAYOUT



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TRAFFIC SIGNAL COORDINATION PLAN
S.R. 149

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SHEET NO.	REFERENCE	STATION TO STATION	625	625	625	625	625	625	625	625	625	632	632	632	632	632	632	632	632	632	633	633	633	633	633	633	809	809	809
			CONDUIT, 2", 725.04'	CONDUIT, 3", 725.04'	TRENCH	CONDUIT, JACKED OR DRILLED, 725.04, 4"	PULL BOX, 725.08, 18"	PULL BOX, 725.08, 24"	GROUND ROD	UNDERGROUND WARNING/MARKING TAPE	ARC FLASH CALCULATIONS AND LABEL	VEHICULAR SIGNAL HEAD, (LED), 3-SECTION, 12" LENS, 1-WAY, POLYCARBONATE	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE	COVERING OF VEHICULAR SIGNAL HEAD	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	SIGNAL SUPPORT FOUNDATION	POWER CABLE, 2 CONDUCTOR, NO. 6 AWG	POWER SERVICE, AS PER PLAN	CONDUIT RISER, 2" DIAMETER	SIGNAL SUPPORT, TYPE TC-81.22, DESIGN 4	SIGNAL SUPPORT, TYPE TC-81.22, DESIGN 12	CABINET, TYPE 332L, AS PER PLAN	CABINET FOUNDATION	CONTROLLER WORK PAD	UNINTERRUPTIBLE POWER SUPPLY (UPS), 1000 WATT, AS PER PLAN	CONTROLLER ITEM, MISC.: TIMING AND COORDINATION	COMMUNICATIONS, AS PER PLAN	ADVANCED RADAR DETECTION, AS PER PLAN	STOP LINE RADAR DETECTION, AS PER PLAN
			FT	FT	FT	FT	EACH	EACH	EACH	FT	EACH	EACH	EACH	FT	EACH	FT	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
		SR 149																											
T7	CONTR.	121+79.32 RT TO 121+76.48 RT		3	3			1	3	1				24		8				1	1	1	1	1	1			1	
	PB-3	121+76.48 RT TO 121+84.88 RT	42		21			1	21							31													
	SP-3	121+84.88 RT TO 121+14.66 RT		66	66				66		2	1	3	82.5	1		1										1		
	PB-2	121+14.66 RT TO 121+21.28 RT	8		8		1		8																				
	SP-2	121+21.28 RT TO 121+13.82 LT				95			1			2		68	1			1											
	PB-1	121+13.82 LT TO 120+97.59 LT	16		16		1		16					21													1	2	
	SP-1	120+97.59 LT TO 124+25.34 RT																											
	POWER	124+25.34 RT TO 121+79.32 RT															1	1											
	CONTR.	121+79.32 RT																											
TOTALS CARRIED TO GENERAL SUMMARY			66	69	114	95	2	1	4	114	1	6	1	7	543	3	39	1	2	1	2	1	1	1	1	2	2	1	

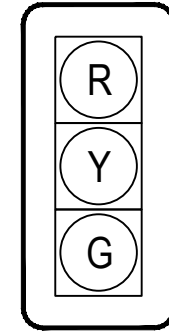
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TRAFFIC SIGNAL SUBSUMMARY
S.R. 149

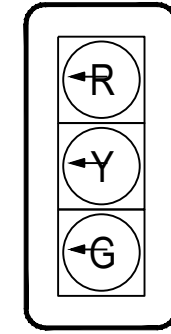
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T12
T14

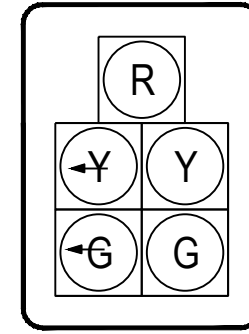
**SIGNAL HEADS, 12", LED
WITH BACK PLATES**



SIGNALS
2A, 2B, 2C,
4C, 6A, 6C

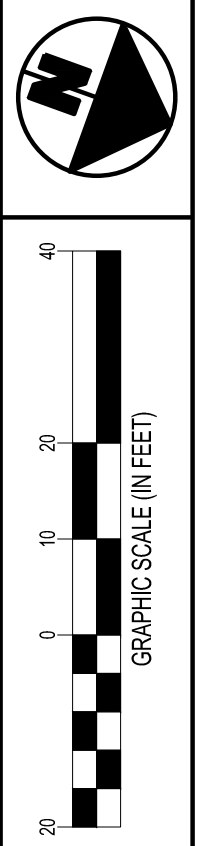


SIGNALS
4A



SIGNALS
4B, 6B

TRAFFIC SIGNAL SUBSUMMARY			
ITEM	QUANTITY	UNIT	
614	1	LS	MAINTAINING TRAFFIC
632	1	EACH	VEHICULAR SIGNAL HEAD, (LED), 5-SECTION, 12" LENS, 1-WAY, POLYCARBONATE
809	1	EACH	STOP LINE RADAR DETECTION, AS PER PLAN



CALCULATED
TMC
CHECKED
REM

EXISTING 3-SECTION SIGNAL HEAD
TO BE REPLACED WITH 5-SECTION
SIGNAL HEAD.

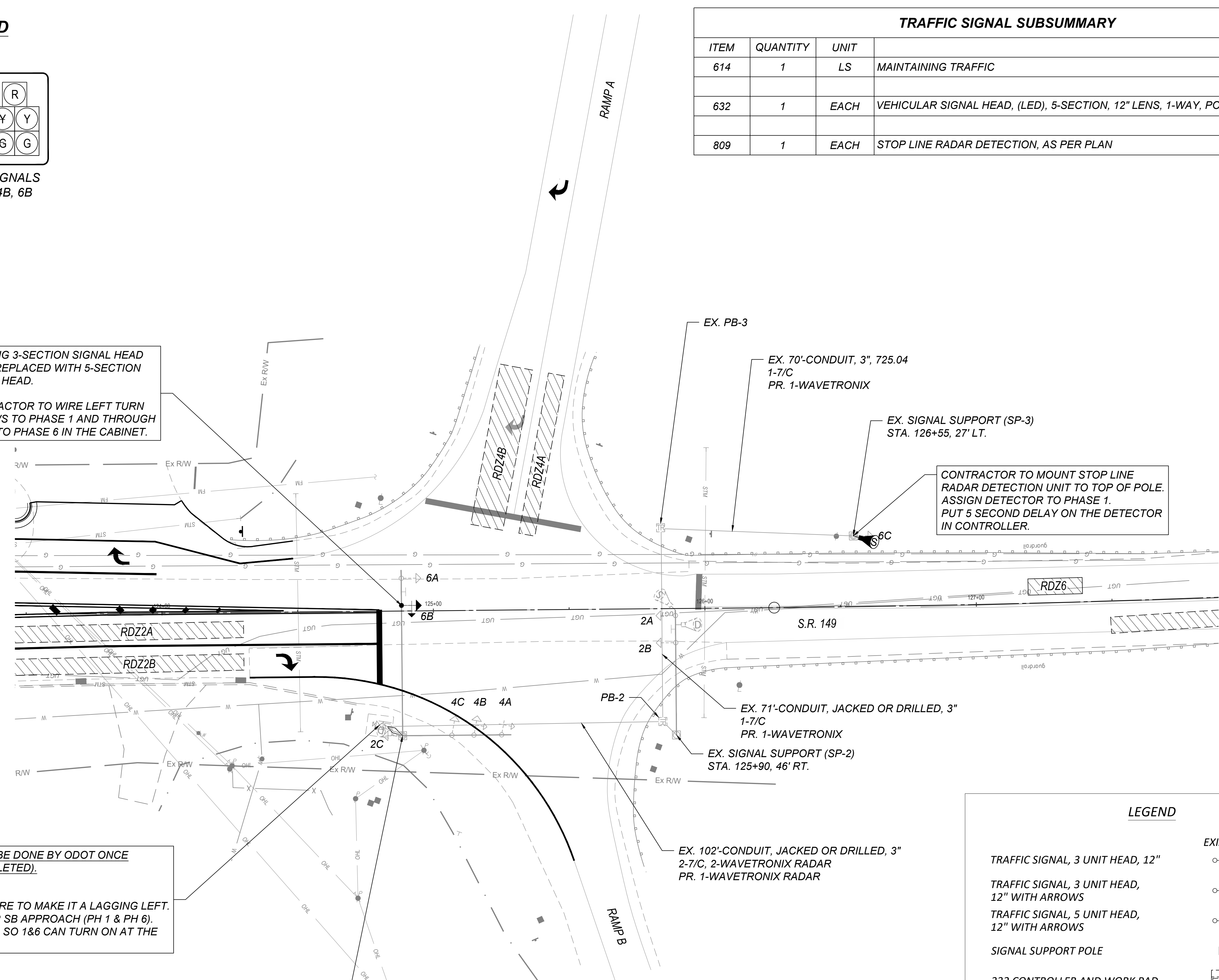
CONTRACTOR TO WIRE LEFT TURN
ARROWS TO PHASE 1 AND THROUGH
BALLS TO PHASE 6 IN THE CABINET.

CONTRACTOR TO MOUNT STOP LINE
RADAR DETECTION UNIT TO TOP OF POLE.
ASSIGN DETECTOR TO PHASE 1.
PUT 5 SECOND DELAY ON THE DETECTOR
IN CONTROLLER.

CONTROLLER WORK (TO BE DONE BY ODOT ONCE
CONSTRUCTION IS COMPLETED).

- ACTIVATE PHASE 1.
- CHANGE RING STRUCTURE TO MAKE IT A LAGGING LEFT.
- ENABLE PREEMPT 3 FOR SB APPROACH (PH 1 & PH 6).
- SOLDER MONITOR CARD SO 1&6 CAN TURN ON AT THE SAME TIME.

PULL BOX DATA			
NO.	STATION	OFFSET	SIZE
PB-1	124+82.8	42' RT.	24"
PB-2	125+85	41' RT.	18"
PB-3	125+85	30' LT.	18"

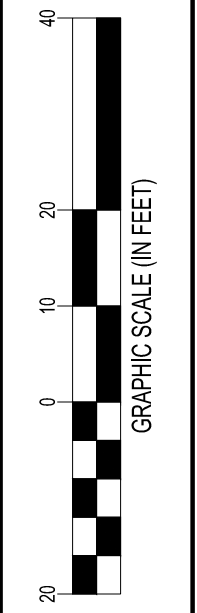
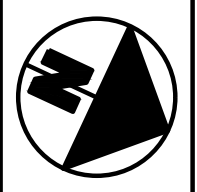


	EXISTING	PROPOSED
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
TRAFFIC SIGNAL, 3 UNIT HEAD, 12" WITH ARROWS		
TRAFFIC SIGNAL, 5 UNIT HEAD, 12" WITH ARROWS		
SIGNAL SUPPORT POLE		
332 CONTROLLER AND WORK PAD		
TRAFFIC PULL BOX		
DILEMMA ZONE RADAR DETECTION UNIT		
STOP LINE RADAR DETECTION UNIT		
DETECTION ZONE		

TRAFFIC SIGNAL PLAN
S.R. 149 & EASTBOUND I.R. 70 RAMPS

BEL-149-23.44

T13
T14



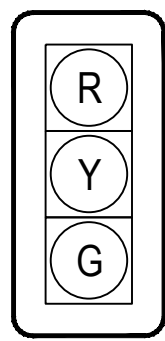
CALCULATED
TMC
CHECKED
REM

TRAFFIC SIGNAL PLAN
S.R. 149 & WESTBOUND I.R. 70 RAMPS

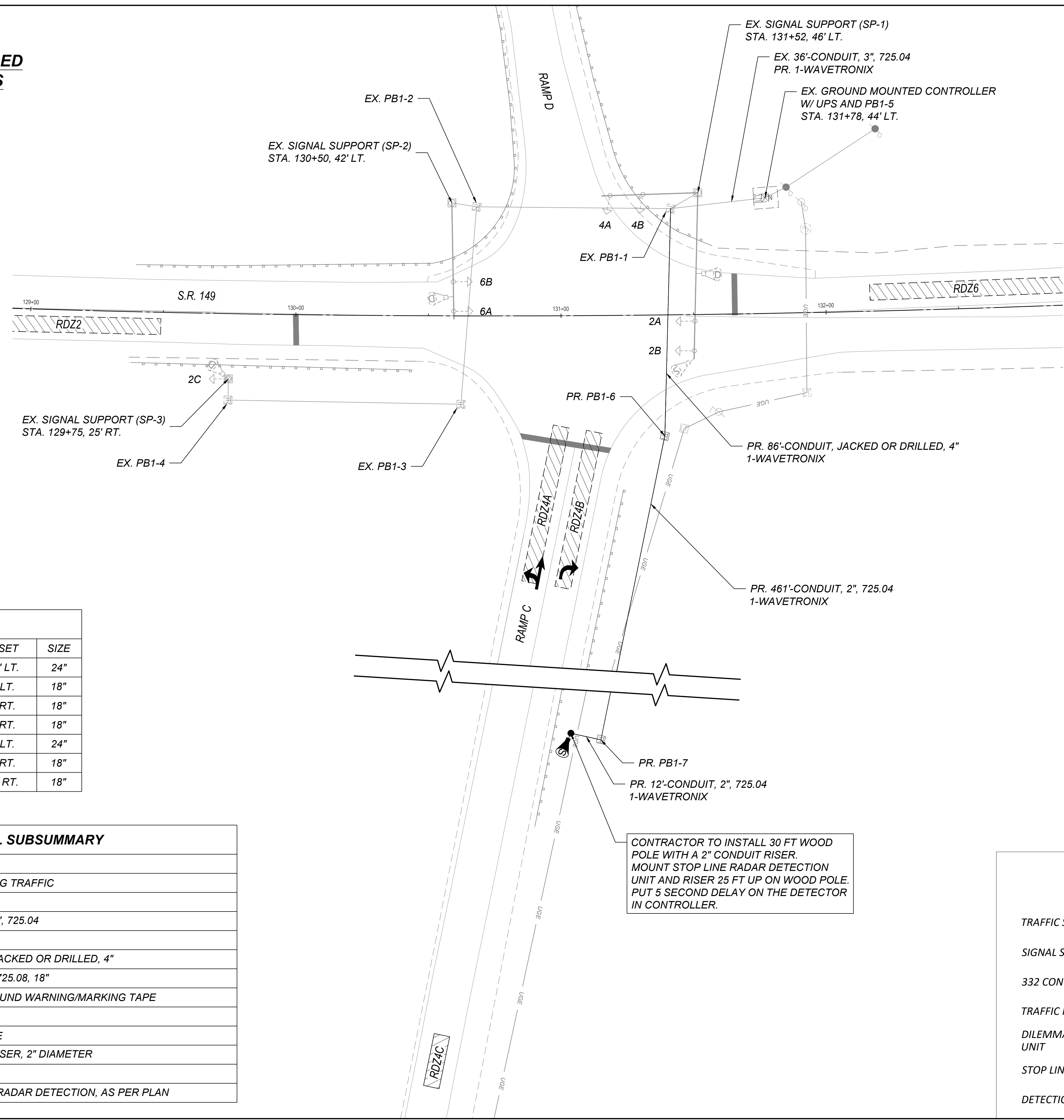
BEL-149-23.44

T14
T14

**SIGNAL HEADS, 12", LED
WITH BACK PLATES**



SIGNALS
2A, 2B, 2C,
4A, 4B, 6A, 6B



PULL BOX DATA				
	NO.	STATION	OFFSET	SIZE
EX.	PB1-1	131+42	40.5' LT.	24"
EX.	PB1-2	130+68	41' LT.	18"
EX.	PB1-3	130+68	31' RT.	18"
EX.	PB1-4	129+75	30' RT.	18"
EX.	PB1-5	131+78	44' LT.	24"
PR.	PB1-6	131+39	46' RT.	18"
PR.	PB1-7	130+49	497' RT.	18"

TRAFFIC SIGNAL SUBSUMMARY			
ITEM	QUANTITY	UNIT	
614	1	LS	MAINTAINING TRAFFIC
625	473	FT	CONDUIT, 2", 725.04
625	473	FT	TRENCH
625	86	FT	CONDUIT, JACKED OR DRILLED, 4"
625	2	EACH	PULL BOX, 725.08, 18"
625	473	FT	UNDERGROUND WARNING/MARKING TAPE
632	1	EACH	WOOD POLE
632	1	EACH	CONDUIT RISER, 2" DIAMETER
809	1	EACH	STOP LINE RADAR DETECTION, AS PER PLAN

CONTRACTOR TO INSTALL 30 FT WOOD POLE WITH A 2" CONDUIT RISER. MOUNT STOP LINE RADAR DETECTION UNIT AND RISER 25 FT UP ON WOOD POLE. PUT 5 SECOND DELAY ON THE DETECTOR IN CONTROLLER.

LEGEND		
	EXISTING	PROPOSED
TRAFFIC SIGNAL, 3 UNIT HEAD, 12"		
SIGNAL SUPPORT POLE		
332 CONTROLLER AND WORK PAD		
TRAFFIC PULL BOX		
DILEMMA ZONE RADAR DETECTION UNIT		
STOP LINE RADAR DETECTION UNIT		
DETECTION ZONE		

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