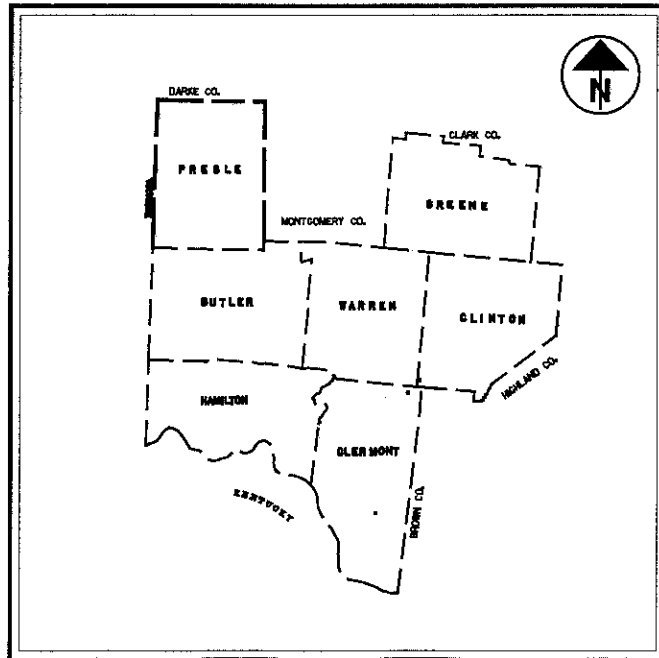


STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION

PROJECT DESCRIPTION

INSTALL UP TO A MAXIMUM OF EIGHTEEN (18) TRAFFIC SIGNALS AT VARIOUS LOCATIONS IN THE FOLLOWING COUNTIES: BUTLER, CLERMONT, CLINTON, GREENE, HAMILTON, PREBLE, AND WARREN.



LOCATION MAP

**BUT-27-1.01**

**2001 SIGNAL  
INSTALLATION CONTRACT**

1997 SPECIFICATIONS

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

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING OF THE HIGHWAYS TO TRAFFIC. PROVISIONS FOR THE SAFETY AND MAINTENANCE OF TRAFFIC WILL BE AS INDICATED IN THE PROPOSAL.

INDEX OF SHEETS:

TITLE SHEET \_\_\_\_\_ 1  
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BUT - USR 27-1.01/Variou  
 010066 PID - 21585  
 Dist 8 2/14/01

Engineers Seal

Signed: *Tammy K. Campbell*  
 Date: 11-17-2000

**UNDERGROUND UTILITIES**  
 TWO WORKING DAYS  
**BEFORE YOU DIG**  
 CALL 1-800-362-2764 (TOLL FREE)  
 OHIO UTILITIES PROTECTION SERVICE  
 NON-MEMBERS  
 MUST BE CALLED DIRECTLY

PLAN PREPARED BY:  
 DISTRICT 8 TRAFFIC  
 MAINTENANCE

STANDARD CONSTRUCTION DRAWINGS						SUPPLEMENTAL SPECIFICATIONS	
HL-20.11M	3-31-95	TC-81.10	5-01-00	MT-35.10M	1-30-95	806	9-09-97
HL-30.11M	3-31-95	TC-82.10	1-19-99	MT-35.11M	1-30-95	1063	4-16-96
HL-30.21M	5-01-95	TC-82.11	1-19-99	MT-95.30M	4-25-94		
HL-60.11M	5-01-95	TC-83.10	5-01-00	MT-95.31M	4-25-94		
HL-30.22M	3-31-95	TC-83.20	5-01-00	MT-95.32M	4-25-94		
TC-17.10M	2-01-94	TC-84.20	5-01-00	MT-95.60M	4-01-97		
TC-21.20M	12-10-96	TC-84.21	3-06-00	MT-95.61M	4-01-97		
TC-41.20M	7-01-94	TC-85.10	5-01-00	MT-97.10M	4-25-94		
TC-41.40M	3-31-94	TC-85.20	5-01-00	MT-105.10M	4-25-94		
TC-41.41M	3-31-94			MT-105.11M	4-25-94		
TC-42.20M	3-31-94			MT-110.10M	3-01-96		
TC-52.10M	7-29-94			MT-110.20M	3-01-96		
TC-52.20M	7-29-94			MT-110.30M	3-01-96		
TC-71.10M	9-01-93			MT-120.00	3-01-00		

APPROVED *[Signature]*  
 DATE 11/21/00 DISTRICT DEPUTY DIRECTOR

APPROVED *[Signature]*  
 DATE 12-5-00 DIRECTOR, DEPARTMENT OF  
 TRANSPORTATION

FEDERAL PROJECT NO.

PID NO. 21585

CONSTRUCTION PROJECT NO.

RAILROAD INVOLVEMENT NO

BUT-27-1.01

1/12

SCOPE

THE PURPOSE OF THIS CONTRACT IS TO INSTALL UP TO EIGHTEEN (18) TRAFFIC SIGNALS AT VARIOUS INTERSECTIONS WITHIN THE OHIO DEPARTMENT OF TRANSPORTATION DISTRICT 8. THE CONTRACTOR WILL BE FURNISHED AN OPERATIONAL PLAN THAT WILL INCLUDE THE ESTIMATED QUANTITIES FOR EACH SIGNAL. (NOTE: THERE COULD BE WORK TO PERFORM THAT DOES NOT APPEAR ON ANY PARTICULAR OPERATION PLAN, BUT IS LISTED IN THE GENERAL SUMMARY. THAT WORK SHALL BE PERFORMED AT THE DISCRETION OF THE ENGINEER.) UPON RECEIPT OF A SET OF PLANS THE CONTRACTOR SHALL HAVE A PERIOD OF EIGHT (8) WEEKS TO INSTALL AND PUT THE SIGNAL IN "STOP-AND-GO" OPERATION. STOP-AND-GO OPERATION, OR A 10-DAY BURN TEST, DOES NOT ABSOLVE THE CONTRACTOR FROM LIQUIDATED DAMAGES IF THE PROJECT WORK HAS NOT BEEN COMPLETED TO THE SATISFACTION OF THE ENGINEER, AS SPECIFIED IN THE CONSTRUCTION AND MATERIAL SPECIFICATIONS 105.04, 105.09, 105.10, 108.06, 108.07. THE ENGINEER SHALL RECORD THE DATE THAT THE PLANS WERE RECEIVED BY THE CONTRACTOR. THIS DATE WILL THEN BE USED TO ESTABLISH AN INTERIM COMPLETION DATE SUBJECT TO LIQUIDATED DAMAGES OF \$750.00 /DAY. NO MORE THAN THREE SIGNAL PLANS WILL BE GIVEN TO THE CONTRACTOR IN ANY GIVEN THREE (3) MONTH PERIOD.

TERM OF THE CONTRACT

THE TERM OF THE CONTRACT SHALL BE FROM THE DATE OF AWARD FOR A PERIOD OF TWENTY-FOUR (24) MONTHS, OR UNTIL EIGHTEEN (18) SIGNALS HAVE BEEN INSTALLED, WHICHEVER COMES FIRST.

SUBMITTALS

THE FOLLOWING SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL AT THE PRE-CONSTRUCTION MEETING:

A COMPLETE INVENTORY LIST OF THE MATERIALS THE CONTRACTOR INTENDS TO KEEP ON HAND AT ALL TIMES FOR THE DURATION OF THE CONTRACT. THIS SHALL INCLUDE REQUIRED CATALOG CUTS FOR APPROVAL.

CONVERSION OF METRIC STANDARD DRAWINGS

THE METRIC STANDARD DRAWINGS REFERENCED IN THIS PLAN SHALL BE CONVERTED TO ENGLISH UNITS USING THE SI (METRIC) TO ENGLISH CONVERSION FACTORS PROVIDED IN SECTION 109.011 OF THE 1997 CONSTRUCTION AND MATERIALS SPECIFICATIONS. THE APPENDIX OF ASTM E 380 SHALL BE UTILIZED FOR ANY ADDITIONAL CONVERSION FACTORS REQUIRED. CONVERSIONS SHALL BE APPROPRIATELY PRECISE AND SHALL REFLECT STANDARD INDUSTRY ENGLISH VALUES WHERE SUITABLE.

MATERIALS

ALL MATERIALS FURNISHED FOR THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIALS SPECIFICATIONS DATED JANUARY 1, 1997. NO USED MATERIAL WILL BE PERMITTED.

THE CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO INSTALL A MINIMUM OF NINE (9) TRAFFIC SIGNALS UP TO A MAXIMUM OF EIGHTEEN (18) TRAFFIC SIGNALS, EXCEPT FOR THE 16 STRAIN POLES WITH ANCHOR BOLTS WHICH WILL BE FURNISHED BY THE STATE. THE ABOVE ITEMS SHALL BE PICKED-UP BY THE CONTRACTOR AT DISTRICT 8 HEADQUARTERS.

THE CONTRACTOR WILL BE REQUIRED TO FURNISH CERTAIN DESIGN 10 STRAIN POLES AND ANCHOR BOLTS.

THE CONTRACTOR SHALL MAINTAIN AN INVENTORY OF SUFFICIENT QUANTITY TO INSTALL A MINIMUM OF THREE (3) SIGNALS UP TO THE LAST NINETY (90) DAYS OF THE CONTRACT, AT WHICH TIME HE SHALL MAINTAIN ENOUGH STOCK TO FINISH THE CONTRACT. INVENTORY IS SUBJECT TO INSPECTION BY THE ENGINEER. MATERIALS ARE TO INCLUDE, BUT ARE NOT LIMITED TO SIGNAL HEADS, SIGNAL CABLE, LOOP DETECTOR WIRE, MESSENGER WIRE, HARDWARE, AND ALL MATERIAL NECESSARY FOR LOOP DETECTOR INSTALLATION.

ALL MATERIAL IN CONTRACTOR'S STOCK AT THE END OF THE CONTRACT WILL REMAIN THE PROPERTY OF THE CONTRACTOR AND WILL NOT BE PURCHASED BY THE STATE, UNLESS OTHERWISE SPECIFIED IN THE PLAN.

644 REMOVAL OF PAVEMENT MARKING

THE ESTIMATED QUANTITY OF LIN. FT. FOR REMOVAL OF PAVEMENT MARKING SHALL INCLUDE, BUT NOT BE LIMITED TO, CENTER LINE, EDGE LINE, LANE LINE, CHANNELIZING LINE, TRANSVERSE LINE, CROSSWALK LINE, AND STOP LINE.

THE ESTIMATED QUANTITY OF EACH FOR REMOVAL OF PAVEMENT MARKING SHALL INCLUDE, BUT NOT BE LIMITED TO, LANE ARROWS, WORD ON PAVEMENT, SYMBOL MARKINGS, AND ISLAND MARKINGS.

BASIS OF PAYMENT

PAYMENT FOR TRAFFIC SIGNAL INSTALLATION WORK ANYWHERE WITHIN THE SEVEN COUNTIES OF DISTRICT 8 INCLUDING; BUTLER, CLERMONT, CLINTON, GREENE, HAMILTON, PREBLE AND WARREN COUNTIES WILL BE MADE AT THE CONTRACT UNIT PRICE BID. THIS INCLUDES FURNISHING ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY FOR INSTALLING EACH TRAFFIC SIGNAL AS REQUIRED.

RESTORATION AND CLEAN-UP IN WORK AREAS

THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO THAT WHICH EXISTED BEFORE THE WORK WAS STARTED, AS PER ITEM 104.

ALL BROKEN CONCRETE AND DIRT SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR OFF THE RIGHT-OF-WAY. PAYMENT FOR RESTORATION WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR THE VARIOUS ITEMS.

ALL RESTORATION AND CLEAN-UP WORK SHALL BE COMPLETED AT EACH SIGNAL LOCATION BEFORE ANY OTHER SIGNAL INSTALLATION CAN BEGIN. IF DRAWINGS HAVE BEEN RECEIVED BY THE CONTRACTOR FOR ANOTHER INSTALLATION(S), AND RESTORATION HAS NOT BEEN COMPLETED FOR THE PREVIOUS INSTALLATION(S), THE EIGHT (8) WEEK TIME CLOCK WILL BE IN FORCE FOR THE NEW LOCATION(S), BUT NO WORK SHALL BE PERFORMED ON ANY NEW LOCATION(S) UNTIL RESTORATION IS COMPLETED.

DOCUMENTATION

THE CONTRACTOR SHALL PROVIDE AN "AS BUILT" DRAWING INDICATING ANY REVISIONS TO THE ORIGINAL OPERATIONAL PLAN OR QUANTITIES. THIS DRAWING SHALL BE SUBMITTED TO THE ENGINEER WITHIN TWO (2) WEEKS FOLLOWING ENERGIZING THE TRAFFIC SIGNAL.

GENERAL SUMMARY ESTIMATED QUANTITIES

QUANTITIES SHOWN IN THE GENERAL SUMMARY WERE ESTIMATED QUANTITIES BASED ON THE INSTALLATION OF EIGHTEEN (18) TRAFFIC SIGNALS OF VARIOUS TYPES. THEY ARE NOT TO BE CONSTRUED AS EXACT AND VARIANCE CAN BE EXPECTED IN THE ACTUAL QUANTITIES USED DURING THE LIFE OF THE CONTRACT.

THE ENGINEER HAS THE DISCRETION TO USE ANY GENERAL SUMMARY ITEM IN LIEU OF ITEMS LISTED OR OMITTED FROM THE INDIVIDUAL PLAN DRAWING.

632 PEDESTRIAN PUSHBUTTON, AS PER PLAN

IN ORDER TO CONFORM TO THE AMERICAN WITH DISABILITIES ACT (ADA), THE REQUIREMENTS OF 632.08 AND 732.06 ARE MODIFIED AS FOLLOWS:

- A) THE MAXIMUM FORCE REQUIRED TO OPERATE THE PUSHBUTTON SHALL BE 5 POUNDS PER FOOT (22.2N).
- B) THE PUSHBUTTON SHALL BE RAISED OR FLUSH AND SHALL BE A MINIMUM OF 2 INCHES (50 mm) AT ITS SMALLEST DIMENSION.

632 PEDESTRIAN SIGNAL HEAD, TYPE A2, AS PER PLAN

IN ADDITION TO 632.07 AND 732.05, THE INTERNATIONAL SYMBOLS (MAN/HAND) SHALL BE USED.

INSPECTION

FOLLOWING COMPLETION OF THE SIGNAL INSTALLATION, THE CONTRACTOR SHALL PLACE THE SIGNAL IN FLASH OPERATION FOR A PERIOD OF THREE (3) DAYS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. AT THIS TIME, THE ENGINEER WILL CONDUCT AN OPERATIONAL AND ELECTRICAL INSPECTION OF THE TRAFFIC SIGNAL. ANY DEFICIENCIES SHALL BE CORRECTED BY THE CONTRACTOR PRIOR TO PLACING THE SIGNAL IN "STOP-AND-GO" OPERATION.

AFTER THE THREE (3) DAY FLASH OPERATION, AND WITH APPROVAL FROM THE ENGINEER, THE CONTRACTOR SHALL PLACE THE TRAFFIC SIGNAL IN "STOP-AND-GO" OPERATION. THE SIGNAL SHALL THEN BE SUBJECT TO A TEN (10) DAY BURN TEST PER 633.05. SEE "SCOPE" PLAN SHEET 2 FOR LIQUIDATED DAMAGES.

640 PAVEMENT MARKINGS

ALL PAVEMENT MARKINGS SHALL BE IN PLACE PRIOR TO PLACING A SIGNAL IN "STOP-AND-GO" OPERATION.

PAYMENT FOR THIS ITEM WILL BE MADE AT THE CONTRACT UNIT PRICE OF THE APPROPRIATE ITEM.

630 SIGNING

THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL GROUND AND SPAN WIRE MOUNTED SIGNS AS INDICATED ON THE SIGNAL PLAN. ALL SIGNS SHALL BE INSTALLED PRIOR TO PLACING A SIGNAL IN "STOP-AND-GO" OPERATION.

PAYMENT FOR THIS ITEM WILL BE MADE AT THE CONTRACT UNIT PRICE PER SQUARE FEET.

632 WOOD POLE, AS PER PLAN

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING WOOD POLES, BY TYPE/CLASS, THIRTY-FIVE (35) FEET AS PER 632.16. ALL ITEMS REQUIRED TO ATTACH POWER SERVICE TO THESE POLES SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALTERNATE HEIGHT AND CLASS POLES MAY BE USED WITH APPROVAL FROM THE ENGINEER.

PAYMENT FOR THIS ITEM WILL BE MADE AT THE CONTRACT UNIT PRICE PER EACH.

632 VEHICULAR SIGNAL HEAD, BY TYPE, AS PER PLAN

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

1. ALL UPPER SIGNAL SUPPORT HARDWARE AND PIPING UP TO AND INCLUDING THE WIRE INLET FITTING SHALL BE FERROUS METAL FOR SIGNAL DISPLAYS OF TWO OR MORE SECTIONS.
2. WHEN SIGNAL HEADS ARE SUSPENDED FROM SPAN WIRE OR MAST ARMS AND NOT RIGIDLY MOUNTED, THEY SHALL BE PROVIDED WITH A PIVOT AND LOCK BALANCE ADJUSTER.
3. ALL BALANCE ADJUSTERS SHALL HAVE A MINIMUM 3/4" EYE BOLT AND 3/4" WIDE SLOT. EYE BOLTS ARE CAST FROM 316 STAINLESS STEEL AND PROVIDED WITH A SATIN FINISH. 3/4" BODY HALVES ARE CAST FROM A MINIMUM 65-45-12 DUCTILE IRON AND PROVIDED WITH A BRIGHT ZINC FINISH (ZNI). BALANCE ADJUSTERS SHALL ONLY BE USED WHERE NECESSARY. BALANCE ADJUSTERS SHALL BE USED ON ONE-WAY HEADS.
4. GLASS LENSES SHALL BE USED.
5. THE ENTRANCE FITTING SHALL BE OF THE TRI-STUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING.

632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN

THIS ITEM SHALL CONSIST OF THE REMOVAL AND DISPOSAL OR STORAGE OF AN EXISTING TRAFFIC SIGNAL AS DETERMINED BY THE ENGINEER AND ACCORDING TO 632.25 OF THE CONSTRUCTION AND MATERIALS SPECIFICATION HANDBOOK. ALL ITEMS IDENTIFIED FOR STORAGE ON THE PLANS, INCLUDING, BUT NOT LIMITED TO, SIGNAL HEADS, HOUSINGS AND CONTROLLERS, SHALL BE DELIVERED BY THE CONTRACTOR TO THE DISTRICT 8 TRAFFIC YARD IN LEBANON WITH TWO WORKING DAYS NOTICE.

PAYMENT FOR THIS ITEM WILL BE MADE AT THE CONTRACT UNIT PRICE PER EACH.

632 STRAIN POLE, TYPE TC-81.10, INSTALLATION ONLY, AS PER PLAN

THIS ITEM SHALL CONSIST OF ERECTING SIGNAL STRAIN POLES FURNISHED BY THE STATE. THE POLES WITH ANCHOR BOLTS WILL BE AVAILABLE FOR PICK-UP BY THE CONTRACTOR AT THE INDICATED DEPARTMENT STORAGE YARD DURING NORMAL DEPARTMENT WORKING HOURS, MONDAY THROUGH FRIDAY, 7:00 A.M. TO 3:30 P.M., EXCEPT STATE HOLIDAYS.

ODOT, DISTRICT 8  
505 SOUTH S.R. 741  
LEBANON, OHIO 45036  
(513) 932-3030 OR 1-800-831-2142, EXT. 454  
CONTACT: JAN KETRON

THE CONTRACTOR SHALL CALL OR INFORM THE CONTACT PERSON AT LEAST 3 WORKING DAYS PRIOR TO THE INTENDED PICKUP DATE. HE SHALL INDICATE THE PROJECT, MATERIALS TO BE PICKED UP (QUANTITIES, SIZES OF POLES AND/OR ANCHOR BOLTS), AND THE TIME HE DESIRES TO ARRIVE AT THE STORAGE YARD. REASONABLE ADJUSTMENTS IN DESIRED PICK-UP TIMES OR DATES TO SUIT BOTH PARTIES MAY BE EXPECTED.

THE CONTRACTOR SHALL, WITH HIS FORCES AND EQUIPMENT, LOAD THE POLES AND ANCHOR BOLTS AND TRANSPORT.

THE CONTRACTOR AND ODOT REPRESENTATIVE SHALL INSPECT THE POLES PRIOR TO REMOVAL FROM THE STORAGE YARD TO DETERMINE CONDITION AND BOTH PARTIES WILL SIGN AN INSPECTION REPORT.

UPON DELIVERY TO THE PROJECT, THE POLES SHALL BE INSPECTED. ANY DAMAGE DISCOVERED, BEYOND THAT DESCRIBED ON THE INSPECTION REPORT PREPARED AT THE STORAGE YARD, WILL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO COST TO THE PROJECT.

A POLE THAT IS BENT, DENTED, OR OTHERWISE EXTENSIVELY DAMAGED SHALL BE REJECTED BY THE ENGINEER AND THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER, EITHER FURNISH OR ERECT A REPLACEMENT POLE AS PART OF THIS PAY ITEM, OR ERECT A REPLACEMENT POLE FURNISHED BY ODOT AND PAY THE COST OF THE ADDITIONAL POLE PLUS HANDLING CHARGE.

GENERAL NOTES

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632 STRAIN POLE (con't)

EACH POLE PROVIDED WILL BE ACCORDING TO THE SPECIAL STRAIN POLE DETAIL DRAWING INCLUDED WITH THE SIGNAL PLAN SHEETS, OR IF NONE IS PROVIDED, THEN TO STANDARD DRAWING TC 81.10 MODIFIED TO INCLUDE THE FOLLOWING:

1. A HANDHOLE ALIGNED BETWEEN TWO ADJACENT ANCHOR BOLTS.
2. A 2-INCH THREADED BLIND HALF COUPLING FOR WIRING CENTERED 12 INCHES FROM THE TOP AND OPPOSITE THE HANDHOLE WITH GALVANIZED PLUG.
3. ONE SPAN WIRE CLAMP
4. A SET OF FOUR ANCHOR BOLTS, WITH TWO NUTS, ONE PLAIN WASHER, AND ONE LOCK WASHER FOR EACH BOLT.

THE CONTRACTOR SHALL PROVIDE NECESSARY ATTACHMENTS OR CONNECTIONS TO THE POLES. ADDITIONAL WIRING HOLES IN THE POLE SHALL BE DRILLED, REAMED, OR HOLE SAWED. FLAME CUTTING (OXYACETYLENE OR ELECTRICAL ARC) WILL NOT BE PERMITTED. ALL CUT EDGES OR DEFECTS IN THE ZINC COATING SHALL BE CLEANED AND COVERED WITH TWO COATS OF ZINC-RICH REPAIR PAINT. BRACKETS AND APPURTENANCES SHALL BE SECURELY ATTACHED WITH STAINLESS STEEL BANDS OR STAINLESS STEEL SCREWS OF SUFFICIENT SIZE FOR THE INTENDED LOADING. THE CONTRACTOR SHALL FURNISH AND INSTALL, UNDER THIS ITEM, ALL CONDUIT ELLS (WIRING AND GROUNDING) FOR FOUNDATIONS.

THE REQUIREMENTS OF 630.06 FOR THREADED FASTENERS, ANCHOR BOLTS, ANCHOR BOLT NUTS, AND ANAEROBIC ADHESIVE SHALL APPLY.

THIS ITEM OF WORK SHALL BE MEASURED AS EACH COMPLETE SIGNAL POLE IN PLACED IN ESSENTIALLY A VERTICAL POSITION UNDER FULL PLAN LOADING. ALL LABOR, EQUIPMENT, AND MATERIALS NECESSARY TO PICK UP, TRANSPORT, STORE, ERECT, ADJUST AND REPAIR THE SIGNAL SUPPORT AND ANCHOR BOLTS SHALL BE INCLUDED FOR PAYMENT IN THE BID ITEM.

PAYMENT FOR THIS ITEM WILL BE MADE AT THE CONTRACT UNIT PRICE PER EACH.

632 STRAIN POLES TYPE TC-81.10, DESIGN #10, BY LENGTH, AS PER PLAN

CONTRACTOR WILL BE REQUIRED TO PURCHASE DESIGN #10, BY LENGTH, SIGNAL STRAIN POLES FOR THIS PROJECT. IN ADDITION TO ITEM 732.12, ALL POLES WILL NEED POLE CLAMPS, CAPS, HAND-HOLE, 2" BLIND COUPLING 1' FROM THE TOP OF THE POLE 180" FROM HANDHOLE, AND 3" BLIND COUPLING 1' FROM THE BOTTOM OF THE POLE 90" FROM THE HANDHOLE. ANY POLE REMAINING IN THE CONTRACTOR'S STOCK AT THE END OF THE PROJECT WILL BE PURCHASED FROM THE CONTRACTOR BY THE STATE AT BID PRICE MINUS INSTALLATION COST AND UNITS WILL BE DELIVERED TO THE STATE BY THE CONTRACTOR AT THE END OF THE PROJECT TO THE DISTRICT OFFICE LOCATED ON SR-741. DELIVERED MATERIAL PRICE WILL BE PAID AT END OF PROJECT FOR UNUSED STRAIN POLES AND ACCESSORIES.

632 DOWN GUY, AS PER PLAN

IN ADDITION TO ITEMS REQUIRED FOR DOWN GUY ASSEMBLY, THE CONTRACT WILL BE REQUIRED TO INSTALL A STAND-OFF ASSEMBLY.

633 CONTROLLER, MODEL 170E, BY TYPE, AS PER PLAN

IN ADDITION TO ITEM 633, MODEL 170E CONTROLLER WITH MODEL 332 AND 336 CABINET AND ACCESSORIES, THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN ONE COMPLETE 332 CABINET AND ONE COMPLETE 336 CABINET AS PER O.D.O.T PLAN UNTIL THE FIRST TEN LOCATIONS ARE INSTALLED. ALL UNITS WILL HAVE 12 LOAD SWITCHES, 2 FLASHERS, 4 FLASH TRANSFER RELAYS, 8 2-CHANNEL DETECTORS, CONFLICT MONITOR (210 PLUS), AND ALL OTHER REQUIRED EQUIPMENT AS PER MODEL 170E CONTROLLER WITH MODEL 332 AND 336 CABINET AND ACCESSORIES AND ITEM 633. ALL UNUSED ITEMS SUPPLIED BY THE CONTRACTOR SHALL BE TURNED OVER TO THE DISTRICT 8 SIGNAL SUPERVISOR AT THE COMPLETION OF EACH INSTALLATION. ANY REMAINING CONTROL BOXES AT THE END OF THE PROJECT WILL BE PURCHASED BY O.D.O.T COMPLETE WITH ALL REQUIRED EQUIPMENT AND DELIVERED TO O.D.O.T DISTRICT 8 OFFICE ON SR-741 BY THE CONTRACTOR. DELIVERED MATERIAL PRICE WILL BE PAID AT THE END OF PROJECT FOR UNUSED CONTROLLERS. PAYMENT FOR ALL OF THE ABOVE SHALL BE MADE UNDER THE APPROPRIATE 633 ITEM.

SET UP & TESTING

ALL CONTROLLER'S WILL BE TYPE 170E. THEY WILL BE SET UP AND TESTED IN ACCORDANCE TO PLANS SUBMITTED BY O.D.O.T. BY CONTRACTOR PERSONNEL WITH A MINIMUM OF AN IMSA LEVEL TWO CERTIFICATION IN THE CONTRACTOR'S SHOP LOCATED WITHIN THE DISTRICT 8 AREA. THE PROPER OPERATION SHALL BE DEMONSTRATED TO THE PROJECT ENGINEER BEFORE THE UNIT IS INSTALLED IN THE FIELD. PAYMENT FOR THIS ITEM WILL BE INCLUDE UNDER 633 CONTROLLER, 170E, BY TYPE, AS PER PLAN.

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 THE SUCCESSFUL 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: CONTROLLERS AND ASSOCIATED EQUIPMENT, DETECTOR UNITS, AND TIME-BASED ITEMS.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO THE STATE OR THE MAINTAINING AGENCY 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.

624 MOBILIZATION, AS PER PLAN

MOBILIZATION FUNDS FOR THIS PROJECT SHALL BE DIVIDED EVENLY BETWEEN THE 18 LOCATIONS POSSIBLE IN THIS PLAN. IF SOME LOCATIONS ARE NON-PERFORMED, THE FUNDS SHALL BE PRO-RATED ACCORDINGLY. A MINIMUM OF 50% WILL BE PAID REGARDLESS OF THE AMOUNT OF WORK PERFORMED.

GENERAL NOTES

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623 CONSTRUCTION LAYOUT STAKES, AS PER PLAN

CONSTRUCTION LAYOUT STAKES FUNDS FOR THIS PROJECT SHALL BE DIVIDED EVENLY BETWEEN THE 18 LOCATIONS POSSIBLE IN THIS PLAN. IF SOME LOCATIONS ARE NON-PERFORMED THE FUNDS SHALL BE PRO-RATED ACCORDINGLY. A MINIMUM OF 50% WILL BE PAID REGARDLESS OF THE AMOUNT OF WORK PERFORMED.

614 MAINTAINING TRAFFIC, MISC.: MAINTAINING TRAFFIC PER LOCATION

IN ADDITION TO THE REQUIREMENTS OF ITEM 614 MAINTAINING TRAFFIC, THE FOLLOWING SHALL APPLY:

NO LANE CLOSURE SHALL BE IMPLEMENTED DURING THE HOURS, OF 6:00 A.M. TO 9:00 A.M. OR 3:00 P.M. TO 6:00 P.M. WEEKDAYS. WHEN IT IS NECESSARY TO CLOSE ONE LANE OF TRAFFIC ADJACENT TO THE WORK, THE CLOSURE SHALL BE ACCOMPLISHED BY THE APPLICATION OF TRAFFIC CONTROL DEVICES AS SHOWN ON ODOT STANDARD DRAWING MT-97.10M. ALL ADVANCE WARNING SIGNS FOR ANY CONDITION WHICH RESTRICTS TRAFFIC SHALL BE ERECTED BEFORE ANY SUCH RESTRICTION IS PUT INTO EFFECT. ALL SUCH SIGNS SHALL BE COVERED OR REMOVED FROM THE VIEW OF TRAFFIC WHEN THEY ARE NOT APPLICABLE, AS DETERMINED BY THE ENGINEER. FOR WORK WHICH IS CONFINED TO THE SHOULDER, TRAFFIC CONTROL SHALL CONFORM TO FIGURE C-12 OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD).

IF THE CONTRACTOR FAILS TO COMPLY WITH THE PROVISIONS FOR TRAFFIC CONTROL AS SET FORTH IN THESE PLANS AND PROVISIONS OF THE OMUTCD AND THE FAILURE RESULTS IN A CONDITION AT THE WORK SITE WHICH IS UNSAFE FOR TRAFFIC, THE ENGINEER SHALL SUSPEND WORK UNTIL THE CONTRACTOR COMPLIES WITH THE NECESSARY REQUIREMENTS.

PRIOR TO ACTIVATION OF A NEW SIGNAL, THE REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING MT-120.00 SHALL BE FOLLOWED.

TWO-WAY TRAFFIC ON A MINIMUM OF TWO 12-FOOT LANES SHALL BE MAINTAINED BY USE OF THE EXISTING PAVEMENT. ONE-WAY TRAFFIC MAY BE PERMITTED DURING PLACEMENT OF LOOPS, SIGNAL SUPPORTS, OVERHEAD SIGNS, AND TRAFFIC SIGNAL HEADS, SUBJECT TO THE APPROVAL OF THE ENGINEER. SHORT DURATION CLOSURE (15 MINUTES) MAY BE PERMITTED UNDER THE DIRECTION OF FLAGGER(S) OR LAW ENFORCEMENT OFFICER(S) TO ERECT SPAN WIRE. PAYMENTS FOR ALL OF THE ABOVE SHALL BE INCLUDED IN THE CONTRACT UNIT BID PRICE PER EACH FOR ITEM 614 MAINTAINING TRAFFIC, MISC.: MAINTAINING TRAFFIC PER LOCATION.

614 TEMPORARY PAVEMENT MARKINGS, STOP LINE AND CROSSWALKS

TEMPORARY PAVEMENT MARKING ITEM 642 MAY BE REQUIRED DUE TO WEATHER CONDITIONS AND SHALL BE REPLACED WITH PERMANENT PAVEMENT MARKING ITEM 644 AS SOON AS WEATHER CONDITIONS PERMIT.

UNDERDRAINS FOR PULLBOXES

REFERENCE IS MADE TO STANDARD CONSTRUCTION DRAWINGS FOR DETAILS OF 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 APPROXIMATELY 20 FEET. AN ESTIMATED QUANTITY OF 500 LIN. FT. OF ITEM 603 4" CONDUIT IS INCLUDED IN THE GENERAL SUMMARY FOR THIS PURPOSE.

632 POWER SERVICE, AS PER PLAN

IN ADDITION TO 632.23, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANY FOR A POWER DROP TO THE NEW SIGNAL AND SERVICE INSPECTION.

CONTRACTOR'S COMMITMENT

IF AT ANY TIME THE CONTRACTOR IS UNABLE TO MEET HIS COMMITMENT UNDER THE TERMS OF THIS CONTRACT, AS DETERMINED SOLELY BY THE DISTRICT TRAFFIC ENGINEER, THE STATE WILL PROCEED BY ANY MEANS NECESSARY TO COMPLETE THE SIGNAL INSTALLATION. ANY EXPENSE INCURRED BY O.D.O.T. IN CONNECTION WITH THE COMPLETION OF THE SIGNAL INSTALLATION WHICH EXCEEDS THE ORIGINAL CONTRACT BID SHALL BE CHARGED AGAINST ANY AMOUNTS DUE THE CONTRACTOR.

UTILITIES NOTIFICATION

AT LEAST TWO (2) WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA WHICH MAY INVOLVE UNDERGROUND UTILITIES, THE CONTRACTOR SHALL NOTIFY THE ENGINEER, THE REGISTERED UTILITY PROTECTION SERVICE AND THE OWNERS OF EACH UNDERGROUND UTILITY AFFECTED.

THE OWNER OF THE UNDERGROUND UTILITY SHALL, WITHIN FORTY-EIGHT (48) HOURS, EXCLUDING SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS, AFTER NOTICE IS RECEIVED, STAKE, MARK OR OTHERWISE DESIGNATE THE LOCATION OF THE UNDERGROUND UTILITY IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE TOGETHER WITH THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED. THE MARKING OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY TWO DAYS AHEAD OF THE PLANNED CONSTRUCTION. SEE SHEET NO. 10 FOR ADDITIONAL INFORMATION.

GENERAL NOTES

BUT - 27 - 1.01

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ITEM 614 MAINTENANCE OF TRAFFIC SIGNAL INSTALLATIONS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC SIGNAL INSTALLATIONS UNDER THE FOLLOWING CONDITIONS:

A) EXISTING SIGNAL INSTALLATIONS WHICH THE PLANS REQUIRE THE CONTRACTOR TO ADJUST, MODIFY, ADD ONTO OR REMOVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENTIRE INSTALLATION FROM THE TIME HIS OPERATION FIRST STARTS CONSTRUCTION UNTIL THE INSTALLATION HAS BEEN SUBSEQUENTLY REMOVED OR MODIFIED AND THE WORK IS ACCEPTED.

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

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS. HE SHALL PROVIDE TO THE ENGINEER ADDRESSES AND PHONE NUMBERS WHERE HIS MAINTENANCE FORCES CAN BE CONTACTED. THE CONTRACTOR SHALL PROVIDE ONE OR MORE PERSONS TO RECEIVE CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MAY BE USED TO PERFORM OTHER DUTIES AS LONG AS PROMPT ATTENTION IS GIVEN TO THESE CALLS AND A PERSON IS READILY AVAILABLE CONTINUOUSLY 24 HOURS A DAY, 7 DAYS A WEEK. ALL LAMP OUTAGES, ELECTRICAL FAILURES, EQUIPMENT MALFUNCTIONS, CABLE OUTAGES AND MISALIGNED HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK TO SERVICE WITHIN TWO HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF THE OUTAGE.

COMMUNICATION ARRANGEMENT MUST BE ESTABLISHED WITH THE DEPARTMENT'S LEBANON HEADQUARTERS AND WITH THE ENGINEER FOR EMERGENCY CALL-OUT. THIS CAN BE BY TELEPHONE BETWEEN THE CONTRACTOR'S OFFICE AND THE DEPARTMENT'S OFFICE. THE CONTRACTOR SHALL PROVIDE NAMES AND TELEPHONE NUMBERS OF PERSONS WHICH CAN BE CONTACTED TWENTY-FOUR (24) HOURS A DAY IN CASE OF EMERGENCIES.

THE CONTRACTOR SHALL HAVE A STORAGE YARD LOCATED WITHIN THE DISTRICT 8 AREA. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN EITHER TWO-WAY COMMERCIAL GRADE RADIO COMMUNICATION OR PORTABLE CELLULAR PHONE COMMUNICATION WITH THE SIGNAL CREWS. THE CONTRACTOR SHALL SUPPLY THE ENGINEER WITH EITHER A PORTABLE TWO-WAY COMMERCIAL GRADE RADIO OR PORTABLE CELLULAR PHONE FOR COMMUNICATION WITH THE CONTRACTOR'S FIELD CREWS. THE ABOVE SHALL BE PAID FOR PER EACH UNDER ITEM 614 MAINTAINING TRAFFIC, MISC.: MAINTAINING TRAFFIC PER LOCATION.

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 PERIODS AT ANY ONE LOCATION. THAT IS WHERE MORE THAN ONE OUTAGE OCCURS AT ANY ON 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 STATE FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15.

WHEN A TRAFFIC SIGNAL MUST BE TAKEN OUT OF SERVICE BY THE CONTRACTOR, DUE TO CONSTRUCTION PROCEDURES, THIS OUTAGE SHALL NOT EXCEED 4 HOURS AND SHALL NOT INCLUDE THE HOURS OF 6:00 A.M. TO 9:00 A.M. AND 3:00 P.M. TO 6:00 P.M. ANY SIGNALIZED INTERSECTION, WHERE THE SIGNAL IS OUT OF SERVICE DURE TO CONSTRUCTION PROCEDURES, OR DUE TO AN OUTAGE OR MALFUNCTION OF EQUIPMENT AS DESCRIBED ABOVE, SHALL BE PROTECTED BY AN LAW ENFORCEMENT OFFICER, HIRED BY THE CONTRACTOR. ANY VEHICULAR TRAFFIC SIGNAL HEAD, EITHER NEW OR EXISTING WHICH WILL BE OUT OF OPERATION SHALL BE COVERED IN THE MANNER DESCRIBED IN 632.24.

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 UNIT PRICE BID FOR ITEM 614 MAINTAINING TRAFFIC, MISC.: MAINTAINING TRAFFIC PER LOCATION.

GENERAL NOTES

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7/12

**633 CONTROLLER, MODEL 170E, WITH MODEL 332 CABINET AND ACCESSORIES, AS PER PLAN**

THE CONTROLLER SUPPLIED SHALL BE COMPLETE WITH THE SPECIFIED CABINET INCLUDING ALL NECESSARY COMPONENTS AND CABLES NOT SPECIFICALLY MENTIONED BELOW. ALL EQUIPMENT AND CABINETS SHALL CONFORM TO ODOT SPECIFICATIONS 633.733 AND THE FOLLOWING:

**MODEL 170E CONTROLLERS:**

SPECIFICATIONS FOR THESE CONTROLLERS SHALL BE 'TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATIONS', CALIFORNIA DEPARTMENT OF TRANSPORTATION, NOVEMBER 19, 1998, INCLUDING ALL ADDENDA. THE CONTROLLER UNITS SHALL CURRENTLY BE LISTED ON THE CALTRANS 'QUALIFIED PRODUCTS LIST'.

**IN ADDITION:**

1. THE CONTROLLER UNIT SHALL NOT BE SUPPLIED WITH THE M170E BOARD.
  2. FOR CABINETS THAT ARE TO BE INCLUDED IN A HARDWARE (TWISTED PAIR) INTERCONNECTED SIGNAL SYSTEM, THE CONTROLLER UNIT SHALL INCLUDE A MODEL 400 MODEM AND COMMUNICATION SYSTEM INTERFACE AS SPECIFIED IN THE CALTRANS SPECIFICATIONS. IN ADDITION TO THE CALTRANS SPECIFICATION, MODEMS SHALL BE DESIGNED SUCH THAT IF ONE MODEM LOSES COMMUNICATION WITH THE MASTER, SUBSEQUENT MODEMS SHALL STILL BE ABLE TO COMMUNICATE.
  3. A 412C PROM MODULE SHALL BE SUPPLIED FOR MEMORY SELECT #4 CONFIGURATION WITHOUT CONTROLLER SOFTWARE TO THE ODOT DISTRICT OFFICE 14 DAYS IN ADVANCE OF WHEN SOFTWARE IS NEEDED. THE DISTRICT WILL PROVIDE THE LOCAL PROGRAM OR MASTER PROGRAM AS REQUIRED TO THE CONTRACTOR FOR HIS USE ON THE 412C PROM MODULE. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO USE THE RETURNED 412C MODULE WITH THE CONTROLLER SOFTWARE TO PROGRAM THE SIGNAL PER THE PLANS.
  4. AS PER CALTRANS REQUIREMENTS, ALL MEMORY, MICROPROCESSOR AND A/D DEVICES SHALL BE SOCKET MOUNTED. SOCKETS SHALL HAVE MACHINED BERYLLIUM COPPER CONTACTS WITH GOLD PLATING.
  5. A CABLE HARNESS, APPROXIMATELY 4 FT. LONG, SHALL BE SUPPLIED TO CONNECT A LAPTOP COMPUTER WITH THE CONTROLLER FOR THE TRANSFER OF DATA. THE CABLE SHALL HAVE A DB-9 CONNECTOR ON ONE END, AND A CONNECTOR ON THE OTHER END TO MATE WITH THE C2 ON THE BACK OF THE CONTROLLER.
  6. ALL CIRCUIT BOARDS SHALL BE VERTICALLY MOUNTED.
  7. THE POWER SUPPLY SHALL BE MODULAR AND EASILY REMOVABLE FROM THE CHASSIS.
  8. THE UNIT SHALL CONTAIN SEPARATE INPUT AND OUTPUT MODULES.
  9. IF A TELEPHONE DROP IS SHOWN IN THE PLANS, ALL NECESSARY COMMUNICATION MODULES, MODEM, LIGHTNING PROTECTION AND CABLES FOR AUTO DIAL/ANSWER TELEPHONE CONNECTION SHALL BE PROVIDED.
  10. IF THE CONTROLLER IS PART OF AN INTERCONNECTED SIGNAL SYSTEM, THE CONTROLLER SHALL INCLUDE MODEMS, PORTS AND CABLES FOR SYSTEM COMMUNICATION.
- 2 SETS OF CONTROLLER SCHEMATICS AND SERVICE MANUALS SHALL BE SUPPLIED WITH EACH CONTROLLER.

**CONFLICT MONITORS, TYPE 2010:**

CONFLICT MONITORS SHALL BE ON THE ODOT PRE-APPROVED LIST (S.S. 962). TWO SETS OF OPERATIONS INSTRUCTIONS AND MONITOR SCHEMATICS SHALL BE SUPPLIED WITH EACH MONITOR. PERMISSIVE CHANNELS SHALL BE PROGRAMMED WITH THE USE OF A DIODE CARD (CALTRANS STANDARD) WHICH SHALL BE INCLUDED WITH THE MONITOR.

**CABINET, MODEL 332:**

MODEL 332 CABINETS SHALL MEET THE SPECIFICATIONS 'TRAFFIC SIGNAL CONTROL EQUIPMENT SPECIFICATIONS', CALIFORNIA DEPARTMENT OF TRANSPORTATION, JANUARY 1989, OR LATEST EDITION, AND SHALL CURRENTLY BE ON THE CALTRANS 'QUALIFIED PRODUCTS LIST' (OPL) FOR 332 CABINETS.

CABINETS SHALL BE CONSTRUCTED OF ALUMINUM AND SHALL BE SUPPLIED UNPAINTED. ANODIC COATING IS NOT REQUIRED. CABINETS SHALL BE FULLY EQUIPPED WITH CONFLICT MONITOR, FLASHERS, AC ISOLATORS, DC ISOLATORS, AND FLASH TRANSFER RELAYS. THE APPROPRIATE NUMBER OF SWITCH PACKS AND MODEL 222 LOOP DETECTOR SENSOR UNITS SHALL BE SUPPLIED TO OPERATE THE INTERSECTION AS SHOWN IN THE PLANS. ALL COMPONENTS SHALL MEET CALTRANS SPECIFICATIONS AND SHALL BE ON THE OPL AS APPLICABLE.

CABINETS SHALL BE FITTED WITH A POA-2 POWER DISTRIBUTION ASSEMBLY. CABINETS SHALL BE EQUIPPED WITH AN EDCO SHA12-10 OR APPROVED EQUAL SURGE PROTECTOR IN LIEU OF THE CALTRANS SPECIFIED SURGE PROTECTOR. THE SHA12-10 UNIT SHALL BE INSTALLED IN AN ENCLOSURE WITHIN THE CABINET.

THE FRONT OF THE INPUT AND OUTPUT FILES SHALL BE LABELED USING A WRITABLE TAPE. IN THE CASE OF THE OUTPUT FILE, THE TAPE SHALL CLEARLY DESIGNATE THE PURPOSE OF THE CORRESPONDING SWITCH PACK. AN EXAMPLE OF SWITCH PACK LABELING IS 'PHASE 2' OR 'PHASE 2 PED'. IN THE CASE OF THE INPUT FILE, THE TAPE SHALL CLEARLY DESIGNATE THE PURPOSE OF THE CORRESPONDING DETECTOR UNIT. EVERY USED CHANNEL OF THE 222 DETECTOR SHALL BE LABELED. AN EXAMPLE OF DETECTOR UNIT LABELING IS 'PHASE 2 C' OR 'PHASE 2 EC' OR 'PHASE 2 EXT' WHERE:  
 C - IS A CALL INPUT ONLY DURING RED  
 EC - IS EXTEND AND CALL DURING RED, YELLOW AND GREEN  
 EXT - IS AN EXTENSION ONLY DURING GREEN

**CABINET WIRING SHALL COMPLY WITH THE FOLLOWING:**

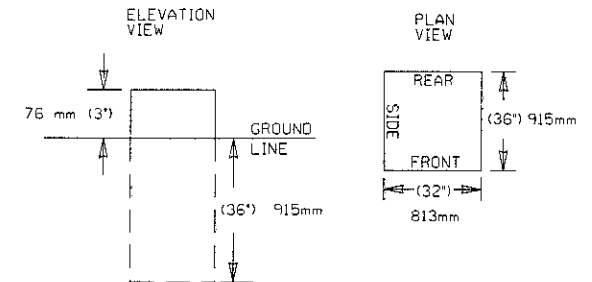
1. OUTPUT FILES SHALL BE 'HARDWIRED'. NO PRINTED CIRCUIT WIRING SHALL BE USED IN THE OUTPUT FILE EXCEPT FOR THE RED MONITOR BOARD.
2. CABINETS SHALL HAVE RED MONITOR CABLING INSTALLED. A PROGRAM BOARD SHALL BE INSTALLED TO ENABLE/DISABLE RED MONITORING. CABINETS SHALL BE SHIPPED WITH THE RED MONITOR JUMPERS SET IN THE 'ENABLE' POSITION.
3. PEDESTRIAN YELLOW LOADSWITCH OUTPUTS SHALL NOT BE CONNECTED TO THE CONFLICT MONITOR CARD-EDGE CONNECTOR.
4. FIELD WIRING FOR LOOP DETECTOR LEAD-IN CABLES AND PEDESTRIAN DETECTORS SHALL BE TERMINATED ON A LOWER LOOP INPUT PANEL. EDCO MODEL SRA-6LCA, SRA-6LCB OR SRA-6LC SURRESTORS SHALL BE PROVIDED ON THE LOWER INPUT PANEL FOR PROTECTION AGAINST INCOMING ELECTRICAL SURGES AND LIGHTNING. FIELD WIRING TERMINALS ON THE LOWER INPUT PANEL SHALL BE LABELED BY A PERMANENT SCREENING PROCESS TO IDENTIFY THE INPUT FILE (I OR J), THE INPUT FILE SLOT NUMBER (1-14) AND THE CHANNEL TERMINAL (D, E, J OR K). AN EXAMPLE IS 'I4-K' STANDING FOR INPUT FILE 'I'; SLOT 4; CHANNEL TERMINAL 'K'. ALL TERMINALS ON THESE DETECTOR PANELS SHALL BE EASILY ACCESSIBLE WITHOUT REMOVING EQUIPMENT FROM THE MOUNTING RACK. TAGGING OF WIRES SHALL NOT BE CONSIDERED ACCEPTABLE TO SATISFYING TERMINAL LABELING.
5. FOR CABINETS THAT ARE TO BE INCLUDED IN A HARDWARE (TWISTED PAIR) INTERCONNECTED SIGNAL SYSTEM, INCOMING INTERCONNECT CABLE SHALL BE TERMINATED ON AN APPROPRIATE TERMINAL BASE THAT IS MOUNTED ON THE SIDE OF THE CABINET. PROTECTION FROM INCOMING ELECTRICAL SURGES/LIGHTNING ON INTERCONNECT PAIRS SHALL BE PROVIDED BY INSTALLATION OF EDCO PC642 SURGE ARRESTORS ON THE TERMINAL BASE. THE PROTECTED OUTPUTS FROM THE TERMINAL BASE SHALL THEN BE ROUTED THROUGH TO THE CONTROLLER.
6. ON THE OUTPUT FILE, PIN NUMBER 11 OF EACH SWITCHPACK SHALL BE WIRED TO AC-, SO THAT THE OUTPUT INDICATORS ON DUAL INDICATOR SWITCHPACKS WILL DISPLAY PROPERLY. SWITCHPACKS SHALL HAVE BOTH INPUT AND OUTPUT INDICATORS FOR EACH SWITCH.

**THE FOLLOWING AUXILIARY ITEMS SHALL BE SUPPLIED:**

1. CABINETS SHALL HAVE TWO FLUORESCENT LIGHTS (FRONT AND REAR) WITH DOOR SWITCHES.
2. A RACK MOUNTED DETECTOR TEST PANEL SHALL BE FURNISHED WITH SEPARATE TEST SWITCHES FOR ALL POSSIBLE VEHICLE AND PEDESTRIAN PHASES. THE SWITCHES SHALL BE THREE (3) POSITION 'ON/OFF/MOMENTARY ON' SWITCHES.
3. EACH CABINET SHALL BE PROVIDED WITH A POLICE PANEL WHICH WILL INCLUDE A PUSHBUTTON WITH CORD AND THREE SWITCHES LABELED AUTO/FLASH, SIGNALS ON/OFF, AND AUTO/MANUAL. THE PUSHBUTTON CORD SHALL NOT BE WIRED THROUGH AN AC ISOLATOR, BUT SHALL BE CONNECTED TO THE CONTROLLER HARNESS WIRING BY A MOLEX PLUG CONNECTION. WHEN PLACED IN THE MANUAL POSITION, MANUAL CONTROL ENABLE SHALL BE APPLIED TO THE CONTROLLER AND 'RECALL' SHALL BE APPLIED TO ALL PHASES. ACTIVATION OF THE PUSHBUTTON SHALL 'ADVANCE' THE CONTROLLER EXCEPT THAT MANUAL ADVANCEMENT WILL BE PROHIBITED IN THE MINIMUM GREEN, YELLOW AND RED INTERVALS.
4. AN ALUMINUM SHELF WITH INTEGRAL STORAGE COMPARTMENT SHALL BE PROVIDED IN THE RACK BELOW THE CONTROLLER. THE STORAGE COMPARTMENT WILL HAVE TELESCOPING DRAWER GUIDES FOR FULL EXTENSION. THE COMPARTMENT TOP SHALL HAVE A NON-SLIP PLASTIC LAMINATE ATTACHED.
5. CABINETS SHALL BE SUPPLIED WITH GALVANIZED ANCHOR BOLTS WITH NUTS AND WASHERS. ANCHOR BOLTS SHALL BE 3/4" (19mm) DIAM. BY 16" (406mm) MINIMUM LENGTH WITH AN 'L' BEND ON THE UNTHREADED END.

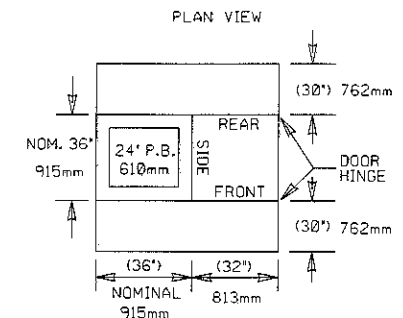
TWO SETS OF CABINET WIRING DIAGRAMS, SERVICE MANUALS, PROGRAMING AND MAINTENANCE INSTRUCTIONS SHALL BE FURNISHED FOR EACH CABINET AND EQUIPMENT ITEM. THE CABINET WIRING DIAGRAMS SHALL BE SUPPLIED IN A CLEAR PLASTIC POUCH FASTENED TO THE INSIDE OF THE CONTROLLER CABINET.

**332 CABINET FOUNDATION**



633 CONCRETE FOR CABINET FOUNDATION, AS PER PLAN. IN ADDITION TO THE REQUIREMENTS OF 633.09, THE TOP OF THE FOUNDATION SHALL BE LOWERED TO A 3' (76 mm) CLEARANCE ABOVE THE SURROUNDING GROUND LINE.

**332 CONTROLLER WORK PAD**



**CABINET RISER:**  
 AN ALUMINUM RISER SHALL BE PROVIDED WITH EACH BASE MOUNTED CABINET WHICH WILL RAISE THE CABINET APPROXIMATELY 8" (203mm) ABOVE THE CONCRETE FOUNDATION. THE BOTTOM OF THE RISER SHALL BOLT TO THE STANDARD CABINET FOUNDATION ANCHOR BOLTS AND THE TOP OF THE RISER SHALL BOLT TO THE BOTTOM OF THE CABINET. ALL NECESSARY BOLTS, WASHERS AND NUTS SHALL BE SUPPLIED.

**PAYMENT:**  
 COST FOR ALL OF THE ABOVE INCLUDING LABOR, MATERIAL, TOOLS AND EQUIPMENT TO PROVIDE AND INSTALL A COMPLETELY OPERATIONAL CABINET AND CONTROLLER SHALL BE INCLUDED IN THE BID ITEM PRICE FOR ITEM 633 CONTROLLER, MODEL 170E, WITH MODEL 332 CABINET AND ACCESSORIES, AS PER PLAN.

NOTE: PULLBOX SHALL BE PLACED ON OPPOSITE SIDE OF DOOR HINGE

**INPUT FILE ASSIGNMENT FOR 332 CABINET**

	SLOT 1	SLOT 2	SLOT 3	SLOT 4	SLOT 5	SLOT 6	SLOT 7	SLOT 8	SLOT 9	SLOT 10	SLOT 11	SLOT 12	SLOT 13	SLOT 14
Channel #1	1 EC	2 EC	2 EC	2 C	3 EC	4 EC	4 EC	4 C	1 EC	SPARE	MAN. CTRL. ADV.	2 PPB	6 PPB	FLSH
Field Term.	I 1-D,E	I 2-D,E	I 3-D,E	I 4-D,E	I 5-D,E	I 6-D,E	I 7-D,E	I 8-D,E	I 9-D,E	I 10-D,E	I 11-D,E	I 12-D,E	I 13-D,E	I 14-D,E
Channel #2	1 EC	2 EC	2 EXT	2 C	3 EC	4 EC	4 EXT	4 C	3 EC	SPARE	ADV. ENAB.	4 PPB	8 PPB	STOP TIME
Field Term.	I 1-J,K	I 2-J,K	I 3-J,K	I 4-J,K	I 5-J,K	I 6-J,K	I 7-J,K	I 8-J,K	I 9-J,K	I 10-J,K	I 11-J,K	I 12-J,K	I 13-J,K	I 14-J,K

SEPARATE BID ITEMS:  
 625 PULLBOX, 713.08, 24"  
 633 CONTROLLER WORK PAD  
 633 CONC. FOR CAB. FOUNDATION

**FRONT VIEW OF TOP INPUT FILE I**

	SLOT 1	SLOT 2	SLOT 3	SLOT 4	SLOT 5	SLOT 6	SLOT 7	SLOT 8	SLOT 9	SLOT 10	SLOT 11	SLOT 12	SLOT 13	SLOT 14
Channel #1	5 EC	6 EC	6 EC	6 C	7 EC	8 EC	8 EC	8 C	5 EC	SPARE	SPARE	EV-A	EV-B	RR-1
Field Term.	J 1-D,E	J 2-D,E	J 3-D,E	J 4-D,E	J 5-D,E	J 6-D,E	J 7-D,E	J 8-D,E	J 9-D,E	J 10-D,E	J 11-D,E	J 12-D,E	J 13-D,E	J 14-D,E
Channel #2	5 EC	6 EC	6 EXT	6 C	7 EC	8 EC	8 EXT	8 C	7 EC	SPARE	SPARE	EV-C	EV-D	RR-2
Field Term.	J 1-J,K	J 2-J,K	J 3-J,K	J 4-J,K	J 5-J,K	J 6-J,K	J 7-J,K	J 8-J,K	J 9-J,K	J 10-J,K	J 11-J,K	J 12-J,K	J 13-J,K	J 14-J,K

**FRONT VIEW OF BOTTOM INPUT FILE J**

**INPUT FILE TERMINAL ASSIGNMENT**

TERM.	PIN	FUNCTION
1	SP	SPARE
2	F	CHANNEL 1 OUTPUT
3	W	CHANNEL 2 OUTPUT
4	D	CHANNEL 1 INPUT
5	E	CHANNEL 1 INPUT
6	J	CHANNEL 2 INPUT
7	K	CHANNEL 2 INPUT
8	L	EQUIPMENT GROUND

( ) - JUMPED TO UPPER CHANNEL  
 C - INPUT ONLY DURING RED  
 EC - EXTEND AND CALL (RED, YELLOW, GREEN)  
 EXT - INPUT ONLY DURING GREEN

TERMINATION OF FIELD WIRING SHALL CONFORM TO THE ABOVE CHART. THE CONTRACTOR SHALL DUPLICATE THE INPUT ASSIGNMENT CHART AND INCLUDE IT IN THE CABINET DOCUMENTATION. THE CHART SHALL CLEARLY INDICATE WHICH INPUT FILE SLOTS AND CHANNEL TERMINALS ARE USED IN THE CABINET. A RED PEN SHALL BE USED TO CIRCLE SLOT NUMBERS AND CHANNEL TERMINALS THAT ARE USED.

REVISED BY:	DATE:
ODOT MAINTAINED MODEL 170E CONTROLLER WITH MODEL 332 CABINET AND ACCESSORIES	
DATE 08/12/98 11/24/99	
PLAN INSERT SHEET	

CALCULATED  
 CHECKED  
**MODEL 170 CONTROLLER WITH 332 CABINET**  
**BUT-27-1.01**  
 8  
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**633 CONTROLLER, MODEL 170E, WITH MODEL 336 CABINET AND ACCESSORIES (POLE OR BASE MOUNTED), AS PER PLAN**

THE CONTROLLER SUPPLIED SHALL BE COMPLETE WITH THE SPECIFIED CABINET INCLUDING ALL NECESSARY COMPONENTS AND CABLES NOT SPECIFICALLY MENTIONED BELOW. ALL EQUIPMENT AND CABINETS SHALL CONFORM TO ODOT SPECIFICATIONS 633, 733 AND THE FOLLOWING:

**MODEL 170E CONTROLLERS:**

SPECIFICATIONS FOR THESE CONTROLLERS SHALL BE "TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATIONS", CALIFORNIA DEPARTMENT OF TRANSPORTATION, NOVEMBER 19, 1998, INCLUDING ALL ADDENDA. THE CONTROLLER UNITS SHALL CURRENTLY BE LISTED ON THE CALTRANS "QUALIFIED PRODUCTS LIST".

**IN ADDITION:**

1. THE CONTROLLER UNIT SHALL NOT BE SUPPLIED WITH THE M170E BOARD.
2. FOR CABINETS THAT ARE TO BE INCLUDED IN A HARDWIRE (TWISTED PAIR) INTERCONNECTED SIGNAL SYSTEM, THE CONTROLLER UNIT SHALL INCLUDE A MODEL 400 MODEM AND COMMUNICATION SYSTEM INTERFACE AS SPECIFIED IN THE CALTRANS SPECIFICATIONS. IN ADDITION TO THE CALTRANS SPECIFICATION, MODEMS SHALL BE DESIGNED SUCH THAT IF ONE MODEM LOSES COMMUNICATION WITH THE MASTER, SUBSEQUENT MODEMS SHALL STILL BE ABLE TO COMMUNICATE.
3. A 412C PROM MODULE SHALL BE SUPPLIED FOR MEMORY SELECT \*4 CONFIGURATION WITHOUT CONTROLLER SOFTWARE TO THE ODOT DISTRICT OFFICE 14 DAYS IN ADVANCE OF WHEN SOFTWARE IS NEEDED. THE DISTRICT WILL PROVIDE THE LOCAL PROGRAM OR MASTER PROGRAM AS REQUIRED TO THE CONTRACTOR FOR HIS USE ON THE 412C PROM MODULE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO USE THE RETURNED 412C MODULE WITH THE CONTROLLER SOFTWARE TO PROGRAM THE SIGNAL PER THE PLANS.
4. AS PER CALTRANS REQUIREMENTS, ALL MEMORY, MICROPROCESSOR AND ACIA DEVICES SHALL BE SOCKET MOUNTED. SOCKETS SHALL HAVE MACHINED BERYLLIUM COPPER CONTACTS WITH GOLD PLATING.
5. A CABLE HARNESS, APPROXIMATELY 4 FT. LONG, SHALL BE SUPPLIED TO CONNECT A LAPTOP COMPUTER WITH THE CONTROLLER FOR THE TRANSFER OF DATA. THE CABLE SHALL HAVE A DB-9 CONNECTOR ON ONE END, AND A CONNECTOR ON THE OTHER END TO MATE WITH THE C2 ON THE BACK OF THE CONTROLLER.
6. ALL CIRCUIT BOARDS SHALL BE VERTICALLY MOUNTED.
7. THE POWER SUPPLY SHALL BE MODULAR AND EASILY REMOVABLE FROM THE CHASSIS.
8. THE UNIT SHALL CONTAIN SEPARATE INPUT AND OUTPUT MODULES.
9. IF A TELEPHONE DROP IS SHOWN IN THE PLANS, ALL NECESSARY COMMUNICATION MODULES, MODEM, LIGHTNING PROTECTION AND CABLES FOR AUTO DIAL/ANSWER TELEPHONE CONNECTION SHALL BE PROVIDED.
10. IF THE CONTROLLER IS PART OF AN INTERCONNECTED SIGNAL SYSTEM, THE CONTROLLER SHALL INCLUDE MODEMS, PORTS AND CABLES FOR SYSTEM COMMUNICATION.

2 SETS OF CONTROLLER SCHEMATICS AND SERVICE MANUALS SHALL BE SUPPLIED WITH EACH CONTROLLER.

**CONFLICT MONITORS, TYPE 2010:**

CONFLICT MONITORS SHALL BE ON THE ODOT PRE-APPROVED LIST (S.S. 962). TWO SETS OF OPERATIONS INSTRUCTIONS AND MONITOR SCHEMATICS SHALL BE SUPPLIED WITH EACH MONITOR. PERMISSIVE CHANNELS SHALL BE PROGRAMMED WITH THE USE OF A DIODE CARD (CALTRANS STANDARD) WHICH SHALL BE INCLUDED WITH THE MONITOR.

**CABINET, MODEL 336:**

MODEL 336 CABINETS SHALL MEET THE SPECIFICATIONS "TRAFFIC SIGNAL CONTROL EQUIPMENT SPECIFICATIONS", CALIFORNIA DEPARTMENT OF TRANSPORTATION, JANUARY 1989, OR LATEST EDITION. THE MANUFACTURER OF 336 CABINETS SHALL CURRENTLY BE ON THE CALTRANS "QUALIFIED PRODUCTS LIST" (OPL) FOR 332 CABINETS.

THE CALTRANS SPECIFICATION FOR MODEL 336 CABINETS SHALL BE MODIFIED SO THAT THE CABINETS PROVIDED FOR THIS ITEM ARE THE STRETCH TYPE THAT PROVIDES AN ADDITIONAL 10 INCHES (250mm) CABINET HEIGHT.

CABINETS SHALL BE CONSTRUCTED OF ALUMINUM AND SHALL BE SUPPLIED UNPAINTED. ANODIC COATING IS NOT REQUIRED. CABINETS SHALL BE FULLY EQUIPPED WITH CONFLICT MONITOR, FLASHERS, AC ISOLATORS, DC ISOLATORS, AND FLASH TRANSFER RELAYS. THE APPROPRIATE NUMBER OF SWITCH PACKS AND MODEL 222 LOOP DETECTOR SENSOR UNITS SHALL BE SUPPLIED TO OPERATE THE INTERSECTION AS SHOWN IN THE PLANS. ALL COMPONENTS SHALL MEET CALTRANS SPECIFICATIONS AND SHALL BE ON THE OPL AS APPLICABLE.

FOR POLE MOUNTED CABINETS, MOUNTING BRACKETS AND BOTTOM PLATES SHALL BE SUPPLIED AND INSTALLED. UNLESS OTHERWISE SHOWN IN THE PLANS, THE MOUNTING BRACKET AND DOOR HINGE SHALL BE ON THE SAME SIDE. FOR BASE MOUNTED CABINETS, GALVANIZED ANCHOR BOLTS WITH NUTS AND WASHERS SHALL BE SUPPLIED. ANCHOR BOLTS SHALL BE 3/4" (19mm) DIAM, BY 16" (406mm) MINIMUM LENGTH WITH AN 'L' BEND ON THE UNTHREADED END.

CABINETS SHALL BE FITTED WITH A PDA-2 POWER DISTRIBUTION ASSEMBLY. CABINETS SHALL BE EQUIPPED WITH AN EDCO SHAI2-10 OR APPROVED EQUAL SURGE PROTECTOR IN LIEU OF THE CALTRANS SPECIFIED SURGE PROTECTION. THE SHAI2-10 UNIT SHALL BE INSTALLED IN AN ENCLOSURE WITHIN THE CABINET.

THE FRONT OF THE INPUT AND OUTPUT FILES SHALL BE LABELED USING A WRITABLE TAPE. IN THE CASE OF THE OUTPUT FILE, THE TAPE SHALL CLEARLY DESIGNATE THE PURPOSE OF THE CORRESPONDING SWITCH PACK. AN EXAMPLE OF SWITCH PACK LABELING IS 'PHASE 2' OR 'PHASE 2 PED'. IN THE CASE OF THE INPUT FILE, THE TAPE SHALL CLEARLY DESIGNATE THE PURPOSE OF THE CORRESPONDING DETECTOR UNIT. EVERY USED CHANNEL OF THE 222 DETECTOR SHALL BE LABELED. AN EXAMPLE OF DETECTOR UNIT LABELING IS 'PHASE 2 C' OR 'PHASE 2 EC' OR 'PHASE 2 EXT' WHERE:  
 C - IS A CALL INPUT ONLY DURING RED  
 EC - IS EXTEND AND CALL DURING RED, YELLOW AND GREEN  
 EXT - IS AN EXTENSION ONLY DURING GREEN

**CABINET WIRING SHALL COMPLY WITH THE FOLLOWING:**

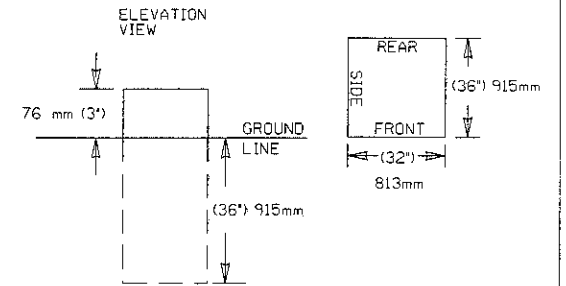
1. OUTPUT FILES SHALL BE 'HARDWIRED'. NO PRINTED CIRCUIT WIRING SHALL BE USED IN THE OUTPUT FILE EXCEPT FOR THE RED MONITOR BOARD.
2. CABINETS SHALL HAVE RED MONITOR CABLING INSTALLED. A PROGRAM BOARD SHALL BE INSTALLED TO ENABLE/DISABLE RED MONITORING. CABINETS SHALL BE SHIPPED WITH THE RED MONITOR JUMPERS SET IN THE 'ENABLE' POSITION.
3. PEDESTRIAN YELLOW LOADSWITCH OUTPUTS SHALL NOT BE CONNECTED TO THE CONFLICT MONITOR CARD-EDGE CONNECTOR.
4. FIELD WIRING FOR LOOP DETECTOR LEAD-IN CABLES AND PEDESTRIAN DETECTORS SHALL BE TERMINATED ON A LOWER LOOP INPUT PANEL. EDCO MODEL SRA-6LCA, SRA-6LCB OR SRA-6LC SURRESTORS SHALL BE PROVIDED ON THE LOWER INPUT PANEL FOR PROTECTION AGAINST INCOMING ELECTRICAL SURGES AND LIGHTNING. FIELD WIRING TERMINALS ON THE LOWER INPUT PANEL SHALL BE LABELED BY A PERMANENT SCREENING PROCESS TO IDENTIFY THE INPUT FILE (I OR J). THE INPUT FILE SLOT NUMBER (1-14) AND THE CHANNEL TERMINAL (D, E, J OR K). AN EXAMPLE IS '14-K' STANDING FOR INPUT FILE 'I'; SLOT 4; CHANNEL TERMINAL 'K'. ALL TERMINALS ON THESE DETECTOR PANELS SHALL BE EASILY ACCESSIBLE WITHOUT REMOVING EQUIPMENT FROM THE MOUNTING RACK. TAGGING OF WIRES SHALL NOT BE CONSIDERED ACCEPTABLE TO SATISFYING TERMINAL LABELING.
5. FOR CABINETS THAT ARE TO BE INCLUDED IN A HARDWIRE (TWISTED PAIR) INTERCONNECTED SIGNAL SYSTEM, INCOMING INTERCONNECT CABLE SHALL BE TERMINATED ON AN APPROPRIATE TERMINAL BASE THAT IS MOUNTED ON THE SIDE OF THE CABINET. PROTECTION FROM INCOMING ELECTRICAL SURGES/LIGHTNING ON INTERCONNECT PAIRS SHALL BE PROVIDED BY INSTALLATION OF EDCO PC642 SURGE ARRESTORS ON THE TERMINAL BASE. THE PROTECTED OUTPUTS FROM THE TERMINAL BASE SHALL THEN BE ROUTED THROUGH TO THE CONTROLLER.
6. ON THE OUTPUT FILE, PIN NUMBER 11 OF EACH SWITCHPACK SHALL BE WIRED TO AC-. SO THAT THE OUTPUT INDICATORS ON DUAL INDICATOR SWITCHPACKS WILL DISPLAY PROPERLY. SWITCHPACKS SHALL HAVE BOTH INPUT AND OUTPUT INDICATORS FOR EACH SWITCH.

**THE FOLLOWING AUXILIARY ITEMS SHALL BE SUPPLIED:**

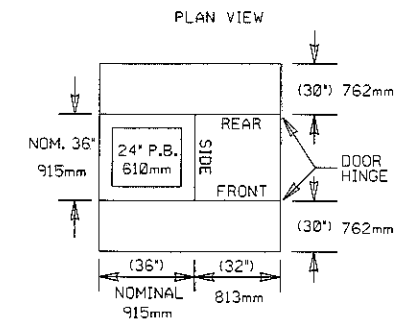
1. CABINETS SHALL HAVE TWO FLUORESCENT LIGHTS (FRONT AND REAR) WITH DOOR SWITCHES.
2. A RACK MOUNTED DETECTOR TEST PANEL SHALL BE FURNISHED WITH SEPARATE TEST SWITCHES FOR ALL POSSIBLE VEHICLE AND PEDESTRIAN PHASES. THE SWITCHES SHALL BE THREE (3) POSITION 'ON/OFF/MOMENTARY ON' SWITCHES.
3. EACH CABINET SHALL BE PROVIDED WITH A POLICE PANEL WHICH WILL INCLUDE A PUSHBUTTON WITH CORD AND THREE SWITCHES LABELED AUTO/FLASH, SIGNALS ON/OFF, AND AUTO/MANUAL. THE PUSHBUTTON CORD SHALL NOT BE WIRED THROUGH AN AC ISOLATOR, BUT SHALL BE CONNECTED TO THE CONTROLLER HARNESS WIRING BY A MOLEX PLUG CONNECTION. WHEN PLACED IN THE MANUAL POSITION, MANUAL CONTROL ENABLE SHALL BE APPLIED TO THE CONTROLLER AND 'RECALL' SHALL BE APPLIED TO ALL PHASES. ACTIVATION OF THE PUSHBUTTON SHALL 'ADVANCE' THE CONTROLLER EXCEPT THAT MANUAL ADVANCEMENT WILL BE PROHIBITED IN THE MINIMUM GREEN, YELLOW AND RED INTERVALS.
4. AN ALUMINUM SHELF WITH INTEGRAL STORAGE COMPARTMENT SHALL BE PROVIDED IN THE RACK BELOW THE CONTROLLER. THE STORAGE COMPARTMENT WILL HAVE TELESCOPING DRAWER GUIDES FOR FULL EXTENSION. THE COMPARTMENT TOP SHALL HAVE A NON-SLIP PLASTIC LAMINATE ATTACHED.

TWO SETS OF CABINET WIRING DIAGRAMS, SERVICE MANUALS, PROGRAMING AND MAINTENANCE INSTRUCTIONS SHALL BE FURNISHED FOR EACH CABINET AND EQUIPMENT ITEM. THE CABINET WIRING DIAGRAMS SHALL BE SUPPLIED IN A CLEAR PLASTIC POUCH FASTENED TO THE INSIDE OF THE CONTROLLER CABINET.

**(WHEN GROUND MOUNTING SPECIFIED)  
336 CABINET FOUNDATION**



**336 CONTROLLER WORK PAD**



NOTE: PULLBOX SHALL BE PLACED ON OPPOSITE SIDE OF DOOR HINGE

- SEPARATE BID ITEMS:**  
 625 PULLBOX, 713.08, 24"  
 633 CONTROLLER WORK PAD  
 633 CONC. FOR CAB. FOUNDATION

**INPUT FILE TERMINAL ASSIGNMENT**

TERM.	PIN	FUNCTION
1	SP	SPARE
2	F	CHANNEL 1 OUTPUT
3	W	CHANNEL 2 OUTPUT
4	D	CHANNEL 1 INPUT
5	E	CHANNEL 1 INPUT
6	J	CHANNEL 2 INPUT
7	K	CHANNEL 2 INPUT
8	L	EQUIPMENT GROUND

**FRONT VIEW OF TOP INPUT FILE I**

	SLOT 1	SLOT 2	SLOT 3	SLOT 4	SLOT 5	SLOT 6	SLOT 7	SLOT 8	SLOT 9	SLOT 10	SLOT 11	SLOT 12	SLOT 13	SLOT 14
Channel #1	1 EC	2 EC	3 EC	4 EC	5 EC	6 EC	7 EC	8 EC	PED. INHIB	EV-A	EV-B	2 PPB	6 PPB	FLSH
Field Term.	11-D,E	12-D,E	13-D,E	14-D,E	15-D,E	16-D,E	17-D,E	18-D,E	19-D,E	110-D,E	111-D,E	112-D,E	113-D,E	114-D,E
Channel #2	2 C	2 EC	4 C	4 EC	6 C	6 EC	8 C	8 EC	RR	EV-C	EV-D	4 PPB	8 PPB	STOP TIME
Field Term.	11-J,K	12-J,K	13-J,K	14-J,K	15-J,K	16-J,K	17-J,K	18-J,K	19-J,K	110-J,K	111-J,K	112-J,K	113-J,K	114-J,K

**FRONT VIEW OF BOTTOM INPUT FILE J**

- C - INPUT ONLY DURING RED
- EC - EXTEND AND CALL (RED, YELLOW, GREEN)
- EXT - INPUT ONLY DURING GREEN

REVISED BY:	DATE:
ODOT MAINTAINED MODEL 170E CONTROLLER WITH MODEL 336 CABINET AND ACCESSORIES	
PLAN INSERT SHEET	
DATE	08/12/98 11/24/99

TERMINATION OF FIELD WIRING SHALL CONFORM TO THE ABOVE CHART. THE CONTRACTOR SHALL DUPLICATE THE INPUT ASSIGNMENT CHART AND INCLUDE IT IN THE CABINET DOCUMENTATION. THE CHART SHALL CLEARLY INDICATE WHICH INPUT FILE SLOTS AND CHANNEL TERMINALS ARE USED IN THE CABINET. A RED PEN SHALL BE USED TO CIRCLE SLOT NUMBERS AND CHANNEL TERMINALS THAT ARE USED.

UTILITIES

BELOW IS A LIST OF UTILITY COMPANIES WHICH MAY HAVE UNDERGROUND INSTALLATIONS ALONG THE VARIOUS ROUTES AFFECTED BY THIS PROJECT. THIS IS NOT TO BE CONSIDERED AS A COMPLETE LIST, BUT RATHER AS A DIRECTORY OF THE MOST FREQUENTLY ENCOUNTERED COMPANIES.

ADELPHIA COMMUNICATIONS  
3416 STATE ROUTE 132  
AMELIA, OH 45102  
PHONE 513-218-9964

BUTLER COUNTY ENVIRONMENTAL  
130 HIGH STREET  
HAMILTON, OHIO 45011  
PHONE 513-867-3061

CABLE MANAGEMENT  
109 SOUTH UNION ST.  
BETHEL, OHIO 45016

COLUMBIA GAS  
P.O. BOX 1273  
1700 MC CORKLE AVE.  
CHARLESTON, WEST VIRGINIA 25325  
304-357-2537

CINCINNATI BELL TELEPHONE CO.  
201 E. FOURTH ST.  
CINCINNATI, OHIO 45202  
PHONE 513-565-7043

CITY OF CINCINNATI WATER  
4747 SPRING GROBVE AVE.  
CINCINNATI, OHIO 45232  
PHONE 513-591-7891

CLERMONT CO. SEWER AND WATER  
4000 FILAGER ROAD  
BATAVIA, OHIO 45103  
513-732-8857

COLUMBIA GAS TRANSMISSION CORP.  
P.O. BOX 1565  
SPRINGFIELD, OHIO 45501  
PHONE 937-322-7111

TATE MONROE WATER  
112 N UNION ST  
BETHEL, OH 45106  
PHONE 513-734-2236

BP OIL COMPANY  
12011 HAMILTON AVE  
CINCINNATI, OH 45231  
PHONE 513-825-5250

COAXIAL COMMUNICATIONS FOR  
SOUTHERN OHIO  
3416 S.R. 132  
AMELIA, OHIO 45102  
513-797-4400

CONTENTAL CABLE VISION  
78 E. MAIN ST.  
XENIA, OHIO, 45385  
937-376-3138

GTE  
P.O. BOX 511  
824 SEVENTH ST.  
PORTSMITH, OHIO 45662  
PHONE 614-354-0511

GREEN CO. SANITARY  
667 DAYTON-XENIA RD.  
XENIA, OHIO 45385  
PHONE 937-376-7450

WESTERN WATER COMPANY  
1775 STATE ROUTE 28  
GOSHEN, OH 45122  
PHONE 513-722-1682

AMERITECH  
3233 WOODMAN DR.  
DAYTON, OHIO 45420  
PHONE 937-296-3645

OHIO DEPARTMENT OF TRANSPORTATION  
505 SOUTH S.R. 741  
LEBANON, OHIO 45036  
PHONE 513-932-3030  
PHONE 800-831-2142

AT&T  
229 W SEVENTH ST  
CINCINNATI, OH 45202  
PHONE 513-784-3238

GTE  
100 IAWA ST  
GEORGETOWN, OH 45121  
PHONE 937-378-6369

CINCINNATI TRAFFIC CONTROL  
705 CENTRAL AVE  
CINCINNATI, OH 45202  
PHONE 513-352-6200

CINCINNATI GAS & (ELECTRIC)  
PO BOX 960 ROOM 467A  
CINCINNATI, OHIO 45201  
513-659-2891

OHIO EDISON CO.  
111 E. HIGH ST.  
SPRING FIELD, OHIO 45502  
PHONE 937-322-4911

DAYTON POWER AND LIGHT CO.  
P.O. BOX 1247  
COURTHOUSE PLAZA SW  
DAYTON, OHIO 45401  
PHONE 937-224-6239

UNITED TELEPHONE CO  
200 SOUTH BROADWAY  
GREENVILLE, OHIO 45331  
PHONE 937-547-8258

SPRINT  
2223 LAGONDA AVE  
SPRINGFIELD, OH 45503  
PHONE 937-323-6665

UNITED VIDEO CABLE VISION  
1272 EBENEZER RD.  
CINCINNATI, OHIO 45238  
PHONE 513-941-7000

VIACOM CABLEVISION OF DAYTON  
275 LEO ST.  
P.O. BOX 213  
DAYTON, OH 45404  
PHONE 937-223-8472

MCI WORLDCOM  
9073 LYTLE FERRY RD  
WAYNESVILLE, OH 45068  
PHONE 513-721-4711

METROPOLITAN SEWER DISTRICT  
1600 GEST ST  
CINCINNATI, OH 45204  
PHONE 513-244-1355

CINCINNATI GAS & ELECTRIC (GAS)  
PO BOX 960 ROOM 460A  
CINCINNATI, OHIO 45201  
513-287-2730

TIME WARNER CABLE  
11252 CORNELL PARK DRIVE  
BLUE ASH, OHIO, 45242  
PHONE 513-469-5483

WARREN CO. WATER AND SANITARY  
P.O. BOX 96  
LEBANON, OHIO 45036  
PHONE 513-932-1894

WESTERN UNION TELEGRAPH CO.  
4220 DANE STREET  
CINCINNATI, OHIO 45223  
PHONE 513-681-5334

SOUTHWEST REGIONAL WATER DIST.  
3640 OLD OXFORD HIGHWAY  
HAMILTON, OHIO 45013  
PHONE 513-863-0828

XENIA WATER  
CITY OF XENIA  
101 N. DETROIT  
XENIA, OHIO 45385  
PHONE 937-376-7232

AMERICAN TELEPHONE AND TELEGRAPH  
2716 E. SPRINGVALLEY-PAINTERSVILLE  
XENIA, OHIO 45385  
PHONE 937-376-3311

BUTLER RURAL ELECTRIC CO..  
1382 HAMILTON-RICHMOND RD.  
HAMILTON, OHIO 45013  
PHONE 937-876-4400

GENERAL NOTES

BUT-27-1.01

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SHEET NUMBER										SHEET NO.	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
											603	00400	500	LIN. FT.	4' CONDUIT, TYPE E
											625	25100	600	LIN. FT.	CONDUIT, 1", 713.04
											625	25400	5000	LIN. FT.	CONDUIT, 2", 713.04
											625	25500	200	LIN. FT.	CONDUIT, 3", 713.04
											625	25600	200	LIN. FT.	CONDUIT, 4", 713.04
											625	25900	300	LIN. FT.	CONDUIT, JACKED OR DRILLED UNDER PAVEMENT, 2"
											625	25900	300	LIN. FT.	CONDUIT, JACKED OR DRILLED UNDER PAVEMENT, 3"
											625	29002	6000	LIN. FT.	TRENCH, 24" DEEP
											625	29500	400	LIN. FT.	TRENCH IN PAVED AREAS, TYPE A
											625	29600	400	LIN. FT.	TRENCH IN PAVED AREAS, TYPE B
											625	30700	100	EACH	PULLBOX, 713.08, 18"
											625	30706	18	EACH	PULLBOX, 713.08, 24"
											625	32000	100	EACH	GROUND ROD
											630	03100	550	LIN. FT.	GROUND MOUNTED SUPPORT, NO. 3 POST
											630	79000	72	EACH	SIGN HANGER ASSEMBLY, SPAN WIRE
											630	80102	650	SQ. FT.	SIGN, FLAT SHEET, TYPE G
											630	84900	20	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL
											630	86002	20	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL
											631	92000	6	EACH	SIGN FLASHER ASSEMBLY
									4		632	00301	144	EACH	VEHICULAR SIGNAL HEAD, 3-SECTION, 12" LENS, 1-WAY, AS PER PLAN
									4		632	00501	30	EACH	VEHICULAR SIGNAL HEAD, 5-SECTION, 12" LENS, 1-WAY, AS PER PLAN
									4		632	01101	6	EACH	VEHICULAR SIGNAL HEAD, 3-SECTION, 12" LENS, 2-WAY, AS PER PLAN
									4		632	02201	4	EACH	VEHICULAR SIGNAL HEAD, 3-SECTION, 12" LENS, 3-WAY, AS PER PLAN
									4		632	02901	2	EACH	VEHICULAR SIGNAL HEAD, 3-SECTION, 12" LENS, 4-WAY, AS PER PLAN
									3		632	20101	20	EACH	PEDESTRIAN SIGNAL HEAD, TYPE A2, AS PER PLAN
											632	25000	150	EACH	COVERING OF VEHICULAR SIGNAL HEAD
											632	25010	20	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
									3		632	26001	20	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
											632	26500	150	EACH	DETECTOR LOOP
											632	27200	10	EACH	LOOP DETECTOR TIE IN
											632	30200	6000	LIN. FT.	MESSENGER WIRE, 7 STRAND, 3/8" DIAMETER WITH ACCESSORIES
											632	40500	4000	LIN. FT.	SIGNAL CABLE, 5 CONDUCTOR, #14 AWG
											632	40700	10000	LIN. FT.	SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
											632	40900	1000	LIN. FT.	SIGNAL CABLE, 9 CONDUCTOR, #14 AWG
											632	64000	72	EACH	STRAIN POLE FOUNDATION
											632	64020	8	EACH	PEDESTAL FOUNDATION
											632	65200	20000	LIN. FT.	LOOP DETECTOR LEAD-IN CABLE
											632	65202	4000	LIN. FT.	LOOP DETECTOR LEAD-IN CABLE, INTEGRAL MESSENGER TYPE, NO. 14 AWG
											632	68200	1000	LIN. FT.	POWER CABLE, 2 CONDUCTOR, #6 AWG
									6		632	70001	18	EACH	POWER SERVICE, AS PER PLAN
											632	70400	35	EACH	CONDUIT RISER, 2" DIAMETER
											632	83001	6	EACH	STRAIN POLE, TYPE TC-8110, DESIGN #10 - 30', AS PER PLAN
									5		632	83001	50	EACH	STRAIN POLE, TYPE TC-8110, DESIGN #10 - 32', AS PER PLAN
									4,5		632	83503	4	EACH	STRAIN POLE, TYPE TC-8110, DESIGN 6, INSTALLATION ONLY, AS PER PLAN
									4,5		632	83505	8	EACH	STRAIN POLE, TYPE TC-8110, DESIGN 7, INSTALLATION ONLY, AS PER PLAN
									4,5		632	83507	4	EACH	STRAIN POLE, TYPE TC-8110, DESIGN 10, INSTALLATION ONLY, AS PER PLAN
									4		632	89301	5	EACH	WOOD POLE, AS PER PLAN

CALCULATED  
CHECKED

GENERAL SUMMARY

BUT - 27 - 1.01

SHEET NUMBER										SHEET NO.	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	
										5	632	89400	5	EACH	DOWN GUY	
											632	89401	3	EACH	DOWN GUY, AS PER PLAN	
											632	89904	8	EACH	PEDESTAL, 10', TRANSFORMER BASE	
										4	632	90101	6	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN	
										5,8	633	39101	17	EACH	CONTROLLER, TYPE 170E, WITH MODEL 332 CABINET AND ACCESSORIES, AS PER PLAN	
										5,9	633	39201	1	EACH	CONTROLLER, TYPE 170E, WITH MODEL 336 CABINET AND ACCESSORIES, AS PER PLAN	
										8	633	70001	22	CU. YD.	CONCRETE FOR CABINET FOUNDATION, AS PER PLAN	
											633	70500	792	SQ. FT.	CONTROLLER WORK PAD	
											642	00290	0.1	MILE	CENTER LINE	
											644	00400	600	LIN. FT.	CHANNELIZING LINE	
											644	00500	1200	LIN. FT.	STOP LINE	
											644	00600	500	LIN. FT.	CROSSWALK	
											644	01300	6	EACH	LANE ARROW	
											644	01410	3	EACH	WORD ON PAVEMENT, 96"	
											644	30020	6	EACH	REMOVAL OF PAVMENT MARKING	
											644	30000	600	LIN. FT.	REMOVAL OF PAVMENT MARKING	
											614	26200	500	LIN. FT.	TEMPORARY STOP LINE, CLASS 1, 642 <i>PAINT</i>	
											614	27200	250	LIN. FT.	TEMPORARY CROSSWALK LINE, CLASS 1, 642 <i>PAINT</i>	
										6	614	18000	18	EACH	MAINTAINING TRAFFIC, MISC.: MAINTAINING TRAFFIC PER LOCATION	
										6	623	10001	LUMP	LUMP	CONSTRUCTION LAYOUT STAKES, AS PER PLAN	
										5	624	10001	LUMP	LUMP	MOBILIZATION, AS PER PLAN	

CALCULATED  
CHECKED

**GENERAL SUMMARY**

**BUT -27 -1.01**

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