



GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 180 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. THE CONTRACTOR AND/OR SUPPLIER SHALL BE RESPONSIBLE FOR NEW EQUIPMENT WARRANTY FOR A ONE (1) YEAR PERIOD. IN THE EVENT OF UNSATISFACTORY OPERATION, THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OR 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, INTERCONNECTION ITEMS, AND MASTER CONTROL EQUIPMENT. CUSTOMARY MANUFACTURER'S GUARANTEES SHALL BE TURNED OVER TO THE MAINTAINING AGENCY FOLLOWING ACCEPTANCE OF ALL 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 CLOSED LOOP SYSTEM.

MAINTENANCE OF TRAFFIC

THIS ITEM SHALL CONSIST OF MAINTENANCE OF TRAFFIC ON EXISTING ROADWAYS AND RAMPS IN ACCORDANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD) FOR STREETS AND HIGHWAYS, CURRENT EDITION, LATEST REVISION, THE SPECIFICATIONS AND THE FOLLOWING:

- A. A MINIMUM OF ONE (1) ELEVEN FOOT LANE IN EACH DIRECTION SHALL BE MAINTAINED ON THE EXISTING PAVEMENT.
- B. THE CONTRACTOR SHALL INFORM THE DISTRICT OFFICE (330) 297-0801 EXT 209, EIGHTEEN (18) DAYS PRIOR TO THE BEGINNING OF WORK.
- C. CONES SHALL NOT BE ACCEPTABLE TRAFFIC CONTROL DEVICES FOR LANE RESTRICTIONS OR LANE REDUCTIONS THAT ARE IN OPERATION ONE-HALF HOUR AFTER SUNSET OR ONE HALF-HOUR BEFORE SUNRISE. ALL NIGHTTIME LANE RESTRICTIONS SHALL REQUIRE DRUMS OR BARRICADES AT A MAXIMUM SPACING OF FIFTY (50) FEET.
- D. LANE RESTRICTIONS OR LANE REDUCTIONS SHALL NOT BE PERMITTED AFTER NORMAL WORKING HOURS, NORMAL WORKING HOURS SHALL BE THOSE HOURS DURING WHICH THE CONTRACTOR HAS A FULL COMPLEMENT OF EMPLOYEES AND EQUIPMENT ACTIVELY REMOVING AND/OR PLACING PAVEMENT MATERIALS.
- E. THE CONTRACTOR SHALL FURNISH, ERECT, MAINTAIN AND SUBSEQUENTLY REMOVE ALL FLAGS, BARRICADES, SIGNS, SIGN SUPPORTS, AND FURNISH AND MAINTAIN ALL FLAGGERS, WATCHERS AND INCIDENTALS RELATED THERETO.

THE CONTRACTOR SHALL ALSO FOLLOW THE INTERSECTION PRIORITY LIST SEQUENCING WHICH WILL BE PROVIDED AT THE INITIAL ON-SITE MEETING (SEE NOTE REGARDING FOUNDATIONS FOR MORE INFORMATION). THE COST FOR THE ABOVE MAINTENANCE OF TRAFFIC REQUIREMENTS SHALL BE INCIDENTAL TO AND INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 - MAINTAINING TRAFFIC.

MAINTENANCE OF TRAFFIC SIGNAL INSTALLATION

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

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

- A. EXISTING SIGNAL INSTALLATIONS WHICH THE PLANS REQUIRE THE CONTRACTOR TO ADJUST, MODIFY, ADD ONTO OR REMOVE, OR WHICH THE CONTRACTOR ACTUALLY ADJUSTS, MODIFIES OR OTHERWISE DISTURBS INCLUDING DAMAGE DUE TO UTILITY RELOCATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENTIRE INSTALLATION AT AN INTERSECTION FROM THE TIME THE INSTALLATION IS FIRST DISTURBED, WHETHER FROM UTILITY WORK OR FROM THE CONTRACTOR.
- B. NEW OR REUSED SIGNAL INSTALLATIONS OR DEVICES, INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR 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. AT THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL PROVIDE THE MAINTAINING AGENCY AND THE PROJECT ENGINEER SUCH ADDRESSES AND PHONE NUMBERS WHERE HIS MAINTENANCE FORCES CAN BE CONTACTED. THE CONTRACTOR SHALL PROVIDE ONE (1) OR MORE PERSONS TO RECEIVE ALL CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MAY BE USED TO PERFORM OTHER DUTIES AS LONG AS PROMPT ATTENTION IS GIVEN TO THESE CALLS AND A PERSON IS READILY AVAILABLE CONTINUOUSLY 24 HOURS A DAY, SEVEN (7) DAYS A WEEK.

THE CONTRACTOR SHALL HAVE THE MALFUNCTION CORRECTED AND/OR REPAIRED TO THE SATISFACTION OF THE ENGINEER WITHIN EIGHT HOURS OF THE NOTIFICATION OR LIQUIDATED DAMAGES OF \$500 PER HOUR SHALL BE ASSESSED THE CONTRACTOR.

ALL LAMP OUTAGES, ELECTRICAL FAILURES, EQUIPMENT MALFUNCTIONS AND MISALIGNED SIGNAL HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE PROJECT ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN EIGHT (8) HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF THE OUTAGES.

IN THE EVENT NEW SIGNALS ARE DAMAGED PRIOR TO ACCEPTANCE ALL DAMAGED EQUIPMENT EXCEPT POLES AND CONTROL EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE PROJECT ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN EIGHT (8) HOURS AFTER THE CONTRACTOR IS NOTIFIED OF THE OUTAGE.

IF POLES AND/OR CONTROL EQUIPMENT ARE DAMAGED AND MUST BE REPLACED, THE CONTRACTOR SHALL MAKE TEMPORARY REPAIRS AS NECESSARY TO BRING THE SIGNAL BACK INTO FULL OPERATION WITHIN THE ALLOWED EIGHT (8) HOUR PERIOD, AND SHALL MAKE PERMANENT REPAIRS OR REPLACEMENT AS SOON AS POSSIBLE.

NONE OF THE ABOVE SHALL BE CONSTRUED AS COLLECTIVE OR CONSECUTIVE OUTAGE TIME PERIODS AT ANY ONE (1) LOCATION. WHERE MORE THAN ONE (1) OUTAGE OCCURS AT ANY ONE (1) 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 DAMAGES FOR THIS WORK FROM THOSE PARTIES RESPONSIBLE FOR THE DAMAGES AS PER 107.15.

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

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

THE CONTRACTOR SHALL INFORM THE PROJECT ENGINEER, IN WRITING, OF THE MAINTENANCE METHOD SELECTED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DUE TO ANY TRAFFIC SIGNAL COMPONENTS REQUIRED TO BE HANDLED DURING THE RELOCATION OF POLES AND REVISIONS TO THE SIGNAL SYSTEM.

WHEN A TRAFFIC SIGNAL MUST BE TAKEN OUT OF SERVICE BY THE CONTRACTOR DUE TO CONSTRUCTION PROCEDURES, THIS OUTAGE SHALL NOT EXCEED FOUR (4) HOURS FOR INSTALLATIONS UTILIZING NEW FOUNDATIONS AND EIGHT (8) HOURS FOR INSTALLATIONS UTILIZING EXISTING FOUNDATIONS AND NO OUTAGE TIME PERIOD SHALL INCLUDE THE HOURS OF 6:00 AM TO 8:00 AM AND 4:00 PM TO 6:00 PM. ANY VEHICULAR TRAFFIC SIGNAL HEAD, EITHER NEW OR EXISTING WHICH WILL BE OUT OF OPERATION SHALL BE COVERED, AS DESCRIBED IN 632.25.

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

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

DRAWN BY: EGM  
CHECKED BY: NAL

GENERAL NOTES

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

**UTILITY CONTACT INFORMATION**

THE FOLLOWING UTILITIES ARE LOCATED WITHIN THE PROJECT AREA:

- |   |   |
|---|---|
| AMERICAN ELECTRIC POWER<br>301 CLEVELAND AVENUE SW<br>P.O. BOX 24400<br>CANTON, OH 44701<br>PHONE: 330-438-7718<br>ATTN: MR. RAY ZITNEY | SBC<br>50 WEST BOWERY STREET<br>4TH FLOOR<br>AKRON, OH 44308<br>PHONE: 330-384-8057<br>ATTN: MS. SABRENA LAMPLEY                                |
| DOMINION EAST OHIO<br>(DISTRIBUTION)<br>4725 SOUTHWAY STREET SW<br>CANTON, OH 44706<br>PHONE: 330-478-3140<br>ATTN: MS. KATE QUILLIN    | DOMINION EAST OHIO<br>(TRANSMISSION)<br>7015 FREEDOM AVENUE NW<br>NORTH CANTON, OH 44720<br>PHONE: 330-266-2120<br>ATTN: MR. FRANK MARTIN, P.E. |
| TIME-WARNER CABLE<br>5520 WHIPPLE ROAD NW<br>NORTH CANTON, OH 44720<br>PHONE: 330-494-9200(EXT. 3087)<br>ATTN: MR. TIM KNIGHT           | CITY OF CANTON (SANITARY)<br>2436 30TH STREET NE<br>CANTON, OH 44705<br>PHONE: 330-489-3381<br>ATTN: MR. DANIEL MOEGLIN, P.E., S.I.             |
| CITY OF CANTON (WATER)<br>2664 HARRISBURG ROAD NE<br>CANTON, OH 44705<br>PHONE: 330-489-3310<br>ATTN: MR. LEWI MILLER                   | CITY OF CANTON (SIGNAL)<br>2436 30TH STREET NE<br>CANTON, OH 44705<br>PHONE: 330-489-3370<br>ATTN: MR. NICHOLAS LOUKAS, P.E.                    |

**ITEM 202 - CURB REMOVED, AS PER PLAN**

THE CITY MAY REQUEST TO TAKE POSSESSION OF ANY GRANITE CURB REMOVED UNDER ITEM 202 - CURB REMOVED. IF SO, THE CANTON CITY PARK DEPARTMENT WILL COORDINATE WITH THE CONTRACTOR.

**ITEM 202 - REMOVAL MISC.; SIGN FOUNDATION REMOVED**

THIS ITEM SHALL CONSIST OF THE REMOVAL OF THE EXISTING SIGN FOUNDATION ON N.W. CORNER OF NAVARRE RD. AND CLEVELAND AVE. THE FOUNDATION SHALL BE REMOVED COMPLETELY OR TO A DEPTH OF 9 FEET, WHICHEVER IS LESS. THE VOID LEFT BY THE REMOVAL OF THE FOUNDATION SHALL BE BACKFILLED WITH TYPE I BACKFILL.

**ITEM 608 - CURB RAMP, AS PER PLAN**

INSTALL NEW CURB RAMPS AT LOCATIONS SHOWN ON THE PLANS AS PER ODOT'S STANDARD CONSTRUCTION DRAWING BP-7.1. IN ADDITION TO BP-7.1 THE FOLLOWING SHALL APPLY: WHEN IN CLOSE PROXIMITY, SOME LOCATIONS WILL REQUIRE MODIFICATION OF THESE STANDARDS TO ALLOW A LARGER RAMP WIDTH.

DETECTABLE WARNING PANELS ARE PREFERRED ON THIS PROJECT, IF DETECTABLE WARNING PAVERS ARE USED, PAVERS WILL MEET ASTM C 902 CLASS SX, TYPE 1, OR C 936, OR C 1272 TYPE R. AN ALTERNATIVE TO ODOTS STANDARD MORTAR JOINTS IS TO SWEEP IN A SAND AND CEMENT MIXTURE (3:1) INTO JOINTS TO REFUSAL. CONCRETE STAMPING SHALL NOT PERMITTED FOR NEW CURB RAMPS. THE SURFACE OF ANY TWO ADJACENT UNITS SHOULD NOT DIFFER BY MORE THAN 1/8" IN HEIGHT. BRICKS SHALL BE PLACED IN A RUNNING BOND PATTERN. FACE OF ALL BRICK SHALL BE CLEAN OF CEMENT AND PROTECTED SO AS TO AVOID CHIPPING DURING CONSTRUCTION.

ACCEPTABLE MANUFACTURES AND PRODUCTS ARE:

- 1) WHITACRE-GREER FIREPROOFING COMPANY 800- WG PAVER  
1400 S. MAHONING AVE., ALLIANCE, OHIO 44601  
ADA PAVER, 4"x8"x2 1/4", CLEAR RED (RUSTIC) #30.
- 2) THE BELDEN BRICK COMPANY 330-456-0031  
P.O. BOX 20910, CANTON, OH. 44701  
CITY LINE ADA PAVER, 2 1/4"x4"x8", REGIMENTAL RED
- 3) ARMORCAST PRODUCTS COMPANY 818-982-3800  
NORTH HOLLYWOOD, CA.  
ARMORCAST DETECTABLE WARNING PANELS (WET SET PANELS)  
24"x48" POLYMER CONCRETE, RED BRICK COLOR
- 4) ADA SOLUTIONS, INC.  
P.O. BOX 3 N. BILLERICA, MA. 01962  
REPLACABLE COMPOSITE (WET SET) TACTILE  
2'X4', 24"x33 1/4" RADIUS PANEL, RED CLAY COLOR

**PAVEMENT MARKINGS**

THE CITY WILL PERFORM ANY AND ALL NECESSARY PAVEMENT MARKING OPERATIONS. THE ENGINEER SHALL COORDINATE THE WORK WITH THE CANTON CITY TRAFFIC ENGINEERING OFFICE.

**SIGNS**

ALL SIGNS SHOWN IN THE PLAN SHEETS ARE EXISTING SIGNS MOUNTED TO MAST ARMS. THESE SIGNS SHALL BE REMOVED AND REERECTED ON THE NEW MAST ARMS BY THE CONTRACTOR. THE CITY MAY ELECT TO REPLACE EXISTING SIGNS. IF SO, THE CITY WILL PROVIDE THE CONTRACTOR WITH REPLACEMENT SIGNS. PAYMENT FOR THE REMOVAL AND REERECTION OF SIGNS SHALL BE MADE UNDER ITEM 630 - REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION.

**GROUNDING AND BONDING**

THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (CMS) 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 SEPARATE 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 725.04 CONDUIT SHALL HAVE THE INSIDE AND OUTSIDE DIAMETERS OF THE CONDUIT DEBYRRED AT ALL TERMINATION POINTS.
  - C. BOTH ENDS OF METALLIC CONDUIT SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.
  - D. METALLIC CONDUIT MAY BE BONDED TO METALLIC BOXES THROUGH THE USE OF CONDUIT FITTINGS UL APPROVED FOR THIS TYPE OF CONNECTION, WITH THE BOX BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR.
3. WIRE FOR GROUNDING AND BONDING.
  - A. USE INSULATED, COPPER WIRE FOR THE EQUIPMENT GROUNDING CONDUCTOR. BONDING JUMPERS IN BOXES AND ENCLOSURES MAY BE BARE OR INSULATED COPPER WIRE. WIRE SIZE SHALL BE AS FOLLOWS:
    - 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 TAPES/LABELS INSTALLED AT ALL ACCESS POINTS.

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- 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.
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
  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 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.

**ITEM 625 - CONDUIT, (BY SIZE), 725.05, AS PER PLAN**

ALL CONDUITS AND FITTINGS SHALL BE TYPE EB, SCHEDULE 40 PVC ENCASED IN CONCRETE. ALL CONDUITS SHALL HAVE PULL WIRE. ALL CONDUITS ENTERING A PULL BOX, POLE, ETC. SHALL NOT EXTEND MORE THAN 1" BEYOND ENTERING THE PULL BOX, POLE, ETC.

**ITEM 625 - TRENCH IN PAVED AREA, BY TYPE, AS PER PLAN**

IN ADDITION TO THE REQUIREMENTS OF 625.11, THIS ITEM SHALL INCLUDE FULL SLAB REPLACEMENT WHEN TRENCHING IN SIDEWALK. BORING OR JACKING THE CONDUIT UNDER THE PAVEMENT CAN BE PERFORMED IN LIEU OF TRENCHING. IF BORING OR JACKING IS PERFORMED IN LIEU OF TRENCHING, THE CONDUIT PLACED SHALL BE 725.04. ANY EXTRA COST FOR THE 725.04 CONDUIT SHALL BE INCLUDED IN THIS ITEM.

DRAWN BY: EGM  
CHECKED BY: NUL

GENERAL NOTES

NAVARRE ROAD S.W. SIGNAL SYSTEM

ITEM 625 - PULL BOX, MISC.: 725.06, (BY SIZE)

PULL BOXES SHALL BE MANUFACTURED BY CARSON BROOKS (MODEL #1324 AND #1730), QUAZITE (MODEL #PG1324BA18/PG1324HA44 AND #PG1730BA18/PG1730HA44), OR SYNERTECH (MODEL #S1324 HBBOA18 AND #S1730 HBBOA18), OR APPROVED EQUAL. ALL PULL BOXES SHALL INCLUDE A POLYMER CONCRETE RING AND COVER TYPE, OR EQUAL, AND SHALL BE MARKED "TRAFFIC". THE PULL BOX SHALL BE FIBERGLASS REINFORCED POLYESTER, OR EQUAL, WITH INSERTS AND SHALL BE 18" IN DEPTH. EACH PULL BOX SHALL INCLUDE TWO (2) STAINLESS STEEL HEX BOLTS. EACH PULL BOX AND COVER SHALL HAVE A MINIMUM LOAD RATING OF 20,000 POUNDS CAPACITY IN ACCORDANCE WITH THE WESTERN UNDERGROUND COMMITTEE GUIDE 3.6. UNDERDRAINS SHALL NOT BE INSTALLED IN PULL BOXES.

ITEM 632 - POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN

POWER CABLE SHALL BE 1 CONDUCTOR, NO. 10 AWG STRANDED, COPPER, TYPE UF, 600 VOLT.

ITEM 632 - POWER SERVICE, AS PER PLAN

POWER SERVICE SHALL BE AS PER ODOT SPECIFICATION 632 AND ODOT STANDARD CONSTRUCTION DRAWING TC-83.10. ELECTRIC POWER SHALL BE SUPPLIED BY AMERICAN ELECTRIC POWER (AEP). POWER SERVICE IS TO BE UNMETERED. THE 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, EXCEPT WHERE DECORATIVE SIGNAL SUPPORTS WITH ORNAMENTAL LUMINAIRE WHICH REQUIRES 240V OR 208V. 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 THE CITY OF CANTON.

ITEM 632 - CONDUIT RISER, 2" DIAMETER, AS PER PLAN

CONTRACTOR SHALL CONTACT AND ARRANGE FOR INSTALLATION BY LOCAL POWER UTILITY COMPANY, (AEP) AMERICAN ELECTRIC POWER. COST OF INSTALLATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND PAYMENT MADE DIRECTLY TO POWER COMPANY.

ITEM 632 - REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN

THE REMOVAL SHALL CONSIST OF VEHICULAR SIGNAL HEADS, PEDESTRIAN SIGNAL HEADS, CONTROLLER WITH CABINET, TRAFFIC POLES AND PEDESTALS, FOUNDATIONS, PULL BOXES, MESSENGER WIRE, SIGNAL CABLE, CONDUIT RISER, MISCELLANEOUS ATTACHMENTS, POLE AND MAST ARM MOUNTED SIGNS, AND ALL OTHER PORTIONS OF A TRAFFIC SIGNAL INSTALLATION PER SECTION 632.26 UNLESS OTHERWISE STATED ON THE INTERSECTION PLAN SHEET. UNLESS OTHERWISE DESIGNATED, ALL TRAFFIC POLES AND ARMS REMOVED SHALL BE DELIVERED TO THE CITY OF CANTON TRAFFIC SIGN AND PAINT DEPARTMENT AT 2506 CLEVELAND AVENUE S.W., CANTON, OHIO. IN ADDITION, UNLESS OTHERWISE DESIGNATED, ALL OTHER ITEMS REMOVED EXCEPT MESSENGER WIRE AND SIGNAL CABLES SHALL BE DELIVERED TO THE CITY OF CANTON TRAFFIC SIGNAL DEPARTMENT AT 2436-30TH STREET N.E., CANTON, OHIO. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MESSENGER WIRE, SIGNAL CABLES, AND ANY OTHER TRAFFIC SIGNAL ITEMS DESIGNATED BY THE ENGINEER.

ITEM 632 - REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD

VEHICULAR SIGNAL HEADS REMOVED UNDER THIS ITEM SHALL BE DELIVERED TO THE CITY OF CANTON TRAFFIC SIGNAL DEPARTMENT AT 2436 30TH STREET N.E., CANTON, OHIO.

ITEM 632 - REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD

PEDESTRIAN SIGNAL HEADS REMOVED UNDER THIS ITEM SHALL BE DELIVERED TO THE CITY OF CANTON TRAFFIC SIGNAL DEPARTMENT AT 2436 30TH STREET N.E., CANTON, OHIO.

ITEM 632 - REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON

PEDESTRIAN PUSHBUTTON REMOVED UNDER THIS ITEM SHALL BE DELIVERED TO THE CITY OF CANTON TRAFFIC SIGNAL DEPARTMENT AT 2436 30TH STREET N.E., CANTON, OHIO.

ITEM 632 - VEHICULAR SIGNAL HEAD (LED), BY TYPE, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN

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

- A. VEHICULAR SIGNAL HEADS SHALL BE FREE SWINGING.
- B. 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.
- C. THE ENTRANCE FITTING SHALL BE OF THE TRI-STUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING.
- D. VEHICULAR SIGNAL HEADS SHALL BE PROVIDED WITH A PIVOT AND LOCK BALANCE ADJUSTER. ALL BALANCE ADJUSTERS SHALL HAVE A MINIMUM THREE-QUARTER INCH (19 MILLIMETER) EYE BOLT AND THREE-QUARTER INCH (19 MILLIMETER) WIDE SLOT. EYE BOLTS ARE CAST FROM 316 STAINLESS STEEL AND PROVIDED WITH A SATIN FINISH. THREE-QUARTER INCH (19 MILLIMETER) BODY HALVES ARE CAST FROM AN MINIMUM 65-45-12 DUCTILE IRON AND PROVIDED WITH A BRIGHT ZINC FINISH (Zn1).
- E. ALL LAMP UNITS SHALL BE THE 12 INCH (300 MILLIMETER) SIZE AND BE EQUIPPED WITH 12"x11" CUTAWAY VISORS, UNLESS OTHERWISE NOTED IN PLANS.
- F. SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF POLYCARBONATE PLASTIC AND MEET ITS SPECIFICATIONS.
- G. PIPE, SPACERS AND FITTINGS CONSTRUCTED OF ALUMINUM.
- H. PROPER EXTERIOR COLORS SHALL BE OBTAINED BY USE OF COLORED PLASTIC MATERIAL RATHER THAN PAINTING. ALL EXTERIOR COLOR SHALL BE FEDERAL HIGHWAY YELLOW OR BLACK AT INTERSECTIONS THAT CONTAIN NOSTALGIA SIGNAL SIGNAL SUPPORTS AND PEDESTALS. THE FOLLOWING IS A SUMMARY OF THE SIGNAL HEADS NEEDED.

YELLOW COLORED HEADS; THIRTY (31) 3-SECTION, AND NINE (9) 5-SECTION HEADS, BLACK COLORED HEADS; FORTY SIX (46) 3-SECTION, AND TWO (2) 5-SECTION HEADS, ALL (1-WAY).

THE CONTRACTOR SHALL PROVIDE THE CITY, IN WRITING, THE LED MANUFACTURER NAME, SERIAL NUMBER, PART NUMBER, DESCRIPTION OF LAMP, AND DATE OF MANUFACTURER FOR ALL LED UNITS TO BE USED IN THE TRAFFIC SIGNAL HEADS PRIOR TO INSTALLATION, FOR ACCEPTANCE AND WARRANTY PURPOSES. THE INFORMATION SHALL BE SENT TO THE FOLLOWING LOCATION:

TRAFFIC ENGINEERING DEPARTMENT  
2436 30TH STREET N.E.  
CANTON, OHIO 44705  
ATTN: NICHOLAS LOUKAS, P.E.

ODOT WILL MEASURE VEHICULAR SIGNAL HEAD WITH LED LAMP UNITS, BY TYPE, AS PER PLAN" BY THE NUMBER OF COMPLETE UNITS FURNISHED AND INSTALLED, AND WILL INCLUDE ALL SUPPORT AND MOUNTING HARDWARE, DISCONNECT HANGERS, CLOSURE CAPS, DIMMERS, AND LAMPS AS SPECIFIED.

THE FOLLOWING QUANTITIES HAVE BEEN PROVIDED AS SPARES AND NUMBER OF UNITS WILL BE CARRIED TO GENERAL SUMMARY:

ITEM 632 - VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN 6 EACH, (3 YELLOW, 3 BLACK COLORED)

ITEM 632 - VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN 2 EACH, (1 YELLOW, 1 BLACK COLORED)

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

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

- A. LED, LIGHT EMITTING DIODE, SIGNAL LAMP UNITS SHALL MEET THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION B72. ALL LAMP UNITS SHALL BE THE 16 INCH SIZE AND A SINGLE UNIT.
- B. SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED OF POLYCARBONATE PLASTIC AND MEET ITS SPECIFICATIONS.
- C. ALL LAMP UNITS SHALL BE PROVIDED WITH QUICK COUPLERS FOR SIDE OF POLE MOUNTING OR WITH TOP OF PEDESTAL MOUNTING HARDWARE, AS SPECIFIED IN THE PLANS.
- D. PROPER EXTERIOR COLORS SHALL BE OBTAINED BY USE OF COLORED PLASTIC MATERIAL (BLACK) RATHER THAN PAINTING.

THE CONTRACTOR SHALL PROVIDE THE CITY, IN WRITING, THE LED MANUFACTURER NAME, SERIAL NUMBER, PART NUMBER, DESCRIPTION OF LAMP, AND DATE OF MANUFACTURER FOR ALL LED UNITS TO BE USED IN THE TRAFFIC PEDESTRIAN HEADS PRIOR TO INSTALLATION, FOR ACCEPTANCE AND WARRANTY PURPOSES. THE INFORMATION SHALL BE SENT TO THE FOLLOWING LOCATION:

TRAFFIC ENGINEERING DEPARTMENT  
2436-30TH STREET N.E.  
CANTON, OHIO 44705  
ATTN: NICHOLAS LOUKAS, P.E.

ODOT WILL MEASURE "PEDESTRIAN SIGNAL HEAD WITH LED LAMPS, COUNTDOWN, TYPE D2, UNITS, AS PER PLAN" BY THE NUMBER OF COMPLETE UNITS FURNISHED AND INSTALLED, AND WILL INCLUDE ALL SUPPORT AND MOUNTING HARDWARE, CLOSURE CAPS, AND LAMPS AS SPECIFIED.

ALL PROPOSED CONNECTIONS SHALL BE FIELD DRILLED. BANDING OR STRAPPING ON THE NOSTALGIA SIGNAL POLES SHALL NOT BE PERMITTED.

THE FOLLOWING QUANTITIES HAVE BEEN PROVIDED AS SPARES AND NUMBER OF UNITS WILL BE CARRIED TO GENERAL SUMMARY:

ITEM 632 - PEDESTRIAN SIGNAL HEAD WITH (LED), TYPE D2, AS PER PLAN 8 EACH

ITEM 632 - PEDESTRIAN PUSHBUTTON, AS PER PLAN

PEDESTRIAN PUSHBUTTON SHALL BE AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANT AND FREEZE PROOF. IN ORDER TO CONFORM TO ADA, THE REQUIREMENTS OF 632.09 AND 732.06 ARE MODIFIED AS FOLLOWS:

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

ITEM 632 - SIGNALIZATION ITEM, MISC.: PRE-EMPTION DETECTOR

THE PRE-EMPTION SYSTEM EQUIPMENT BID ON THIS PROJECT SHALL EMPLOY SOUND DETECTION COMMUNICATIONS. OTHER TYPES OF PRE-EMPTION SYSTEMS SHALL NOT BE PERMITTED. PRE-EMPTION DETECTORS SHALL BE BLACK IN COLOR AND CONSIST OF A LIGHT WEIGHT, WEATHERPROOF AND DIRECTIONAL ASSEMBLY. EACH DETECTOR SHALL BE 360 DEGREE ADJUSTABLE. PRE-EMPTION DETECTORS SHALL HAVE INTERNAL CIRCUITRY TO SEND THE PROPER ELECTRICAL SIGNAL TO THE PRE-EMPTION PHASE SELECTOR ASSEMBLY VIA THE PRE-EMPTION DETECTOR CABLE. PRE-EMPTION DETECTORS SHALL BE SUPPLIED WITH MAST ARM MOUNTING HARDWARE WHICH INCLUDE STAINLESS STEEL BANDING, BOLTS, WASHERS AND BRACKETS AS APPROVED BY ODOT.

THE FOLLOWING QUANTITIES HAVE BEEN PROVIDED AS SPARES AND NUMBER OF UNITS WILL BE CARRIED TO GENERAL SUMMARY:

ITEM 632 - SIGNALIZATION ITEM, MISC.: PRE-EMPTION DETECTOR. 4 EACH

ITEM 632 - SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE

PRE-EMPTION DETECTOR CABLE SHALL BE NO. 20 AWG SHIELDED, 300 VOLT, TYPE PLTC, 2 CONDUCTOR CABLE IN ACCORDANCE WITH IMSA 50-2. PRE-EMPTION DETECTOR CABLE SHALL BE APPROVED FOR BOTH OVERHEAD AND UNDERGROUND USE. THE JACKET SHALL WITHSTAND EXPOSURE TO SUNLIGHT AND ATMOSPHERIC TEMPERATURES AND STRESSES EXPECTED IN NORMAL INSTALLATIONS.

DRAWN BY: ECM  
CHECKED BY: NAL

GENERAL NOTES

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

ITEM 632 - SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE

ALL INTERCONNECT CABLE SHALL BE CONTINUOUS BETWEEN CONTROLLERS. WHERE SPLICING IS NECESSARY A WEATHER TIGHT AERIAL SPLICE ENCLOSURE IS REQUIRED. THE CONTRACTOR SHALL SPLICE THE EXISTING INTERCONNECT CABLE TO THE NEW INTERCONNECT CABLE IN ACCORDANCE WITH AND APPROVED BY ODOT. SPLICING OF INTERCONNECT CABLE IN UNDERGROUND INSTALLATIONS SUCH AS, PULL BOXES OR POLES ARE NOT PERMITTED.

AN AERIAL ENCLOSURE FOR SPLICING INTERCONNECT CABLE SHALL BE MANUFACTURED BY 3M (MODEL SLIC 2"x 19" SES), OR GATM SERIES 2000, GATM 92000-22 OR APPROVED EQUAL. ALL SPLICE ENCLOSURES SHALL BE A SINGLE-PIECE AERIAL CLOSURE, FREE BREATHING AND SUITABLE FOR STRAIGHT, BUTT AND BRANCH SPLICES OF NON-PRESSURIZED COMMUNICATIONS CABLES. DOUBLE-WALL MOLDED POLYETHYLENE CONSTRUCTION, BOTTOM HINGED, INTERLOCKING ENDS TO EXPAND TO MEET ANY SIZE SHEATH OPENING WITHOUT SPECIAL KITS. NO TAPING, BRICKING, SPECIAL LABOR OR SEALING COLLARS REQUIRED. ALL COMPONENTS ARE ATTACHED TO THE ENCLOSURE. THE COST FOR THE SPLICES SHALL BE INCIDENTAL TO THIS ITEM.

ITEM 632 - SIGNAL SUPPORT FOUNDATION, AS PER PLAN

THIS PROJECT REQUIRES CONSTRUCTION OF SIGNAL SUPPORT FOUNDATIONS IN LOCATIONS WHICH CONTAIN NUMEROUS EXISTING UNDERGROUND UTILITIES. ORDERS FOR SIGNAL POLES AND MAST ARMS SHALL BE PLACED SYSTEMATICALLY AFTER THEIR RESPECTIVE FOUNDATIONS HAVE BEEN CONSTRUCTED. FOUNDATIONS THAT HAVE BEEN CONSTRUCTED SHALL BE PROTECTED AS PER SECTION 107.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS. WITHIN TWO (2) WEEKS OF RECEIVING A SIGNED CONTRACT, THE CONTRACTOR SHALL LAYOUT THE PERIMETER OF EACH FOUNDATION THEN CONTACT OUPS AND ODOT (330-297-0801, EXT 298). A MEETING BETWEEN THE CONTRACTOR, ENGINEER AND A REPRESENTATIVE FROM THE CITY OF CANTON WILL BE HELD ON SITE NO LATER THEN TWO (2) WEEKS AFTER THE OUPS NOTIFICATION. BASED UPON THE PRIORITIES DETERMINED AT THIS MEETING, THE CONTRACTOR WILL CONSTRUCT FOUNDATIONS BEGINNING WITH THE HIGHEST PRIORITY FIRST. IF A UTILITY OR OTHER CONFLICT EXISTS WHICH REQUIRES THAT A SIGNAL SUPPORT BE CONSTRUCTED AT A LOCATION OTHER THAN WHAT IS INDICATED IN THE PLAN, THE ENGINEER SHALL DETERMINE WHETHER THE SPECIFIED MAST ARM LENGTH IS APPROPRIATE. IF A LONGER ARM IS REQUIRED, WITHIN TEN (10) WORKING DAYS, THE CONTRACTOR WILL BE PROVIDED WITH REVISED POLE AND ARM DATA. THE CONTRACTOR SHALL NOT ORDER THE POLES PRIOR TO RECEIVING THIS DATA. SUPPORT FOUNDATION LOCATIONS SHALL BE ADJUSTED ONLY WHEN APPROVED BY THE ENGINEER. THE CONTRACTOR IS ADVISED TO LOCATE AND CONSTRUCT THE SIGNAL SUPPORT FOUNDATIONS AS SOON AS POSSIBLE IN ORDER TO PROVIDE AMPLE LEAD TIME TO ORDER THE SIGNAL SUPPORTS AND THEIR ASSOCIATED MAST ARMS. ALL FOUNDATIONS SHALL BE HAND EXCAVATED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. NO TIME EXTENSIONS SHALL BE GRANTED FOR DELAYS WHICH ARE CAUSED BY THE CONTRACTOR'S FAILURE TO PLAN FOUNDATION WORK AS SOON AS POSSIBLE IN THE CONTRACTORS PROGRESS SCHEDULE.

PAYMENT FOR ITEM 632 - SIGNAL SUPPORT FOUNDATION, AS PER PLAN SHALL BE MADE AT THE UNIT CONTRACT PRICE BID PER EACH. PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND OTHER INCIDENTALS NECESSARY TO EXCAVATE AND BUILD THE FOUNDATION SYSTEM, COMPLETE IN PLACE AND ACCEPTED.

BECAUSE OF THE RECOGNIZED TIME DELAY BETWEEN THE CONSTRUCTION OF THE FOUNDATIONS AND THE DELIVERY OF THE SIGNAL SUPPORTS AND/OR PEDESTALS FROM THE MANUFACTURER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE NEW CONSTRUCTED FOUNDATIONS BY A DEVICE SUCH AS A WOODEN BOX IN ACCORDANCE WITH ODOT SECTION 107.07. THE TYPE OF PROTECTIVE DEVICE SHALL BE APPROVED BY ODOT PRIOR TO ITS APPLICATION IN THE FIELD. TRAFFIC CONES SHALL NOT BE ACCEPTABLE. PROTECTIVE DEVICES CAN BE REUSED IF THEY ARE NO LONGER NEEDED AT A PREVIOUS INTERSECTION AND THEY MEET ODOT SECTION 107.07.

FOUNDATIONS FOR NOSTALGIA SIGNAL SUPPORTS SHALL BE CONSTRUCTED AS PER DETAILS ON SHEETS 45-49.

ITEM 632 - PEDESTAL FOUNDATION, AS PER PLAN

FOUNDATIONS FOR NOSTALGIA PEDESTALS SHALL BE CONSTRUCTED AS PER DETAILS ON SHEETS 45-49.

ITEM 625 - LIGHT POLE FOUNDATION, AS PER PLAN

LIGHT POLE FOUNDATIONS FOR SHALL BE CONSTRUCTED AS PER DETAILS ON SHEETS 45-49.

ITEM 632 - SIGNAL SUPPORT, MISC.: NOSTALGIA SIGNAL SUPPORT. (BY TYPE)

NOSTALGIA SIGNAL SUPPORTS (MAST ARM POLES AND ARMS) SHALL BE PACIFIC FAMILY 50312GF SERIES (SEE DETAILS ON SHEETS 45-49) AND MANUFACTURED BY:

UNION METAL CORPORATION  
1432 MAPLE AVENUE N.E.  
P.O. BOX 9920  
CANTON, OH. 44711  
PHONE: 330-456-7653

THE CONTRACTOR SHALL FURNISH AND INSTALL NOSTALGIA SIGNAL SUPPORTS AS PER PLANS. ALL HARDWARE INCLUDING LUMINARIES AND RELATED EQUIPMENT SHALL BE INCLUDED WITH THIS ITEM.

THE MANUFACTURER SHALL PROVIDE WRITTEN CERTIFICATION TO THE CITY THAT THE ACCEPTED POLE, ARM, LUMINAIRE, AND DECORATIVE SHROUD, IS OR WILL BECOME A STOCK ITEM, READILY AVAILABLE WITH REPLACEMENT PARTS FOR MINIMUM TEN (10) YEAR PERIOD. ALL MATERIAL SUPPLIES SHALL BE WARRANTED BY THE MANUFACTURER FOR ONE (1) YEAR AFTER DELIVERY AGAINST FAULTY MATERIALS AND WORKMANSHIP. THE POLE TOP SHALL BE MECHANICALLY ATTACHED TO THE TOP OF THE POLE SHAFT TO PROVIDE ACCESS FOR WIRING SIGNALS SECURED BY A J-HOOK WIRE SUPPORT. AN OPTIONAL OUTLET FRAME SHALL BE INTEGRALLY WELDED INTO THE POLE SHAFT TO ACCOMMODATE A 20A - 125V GFCI DUPLEX RECEPTACLE WHICH IS ALSO INCLUDED. THE RECEPTACLE COVER SHALL BE WEATHERPROOF WHILE IN USE AND PAINTED TO MATCH POLE. THE MAST ARM SHALL BE DRILLED IN THE FIELD 1' FROM REQUIRED SIGNAL LOCATIONS. TWO (2) RUBBER GROMMETS SHALL BE FURNISHED WITH EACH MAST ARM. SIGNAL HANGER CLAMPS SHALL BE SUPPLIED BY THE SIGNAL SUPPLIER OR MANUFACTURER, AS REQUIRED. A PERMANENT LEGIBLE MARKING INDICATION SHALL BE INCLUDED ON EACH SIGNAL SUPPORT AND ARM. THE FOLLOWING INDICATIONS SHALL BE REQUIRED AS A MINIMUM:

- A. POLE INDICATIONS: MONTH/DATE OF FABRICATION; POLE GAUGE; BOTTOM DIAMETER; POLE HEIGHT; BOLT CIRCLE; ANCHOR BOLT DIAMETER; FLANGE BOLT DIAMETER; AND INTERSECTION LOCATION INCLUDING CORNER QUADRANT.
- B. ARM INDICATIONS: MONTH/DATE OF FABRICATION; ARM GAUGE; ARM DIAMETER; ARM LENGTH; CONNECTING FLANGE BOLT DIAMETER; AND INTERSECTION LOCATION INCLUDING CORNER QUADRANT.

THE ORNAMENTAL BASE SHALL BE UNION METAL BASE NO. 731. THE FOUNDATION SURFACE SHALL BE LEVEL IN ORDER TO ACCEPT THE BASE ASSEMBLY. ALL PROPOSED EXTERIOR CONNECTIONS (PEDESTRIAN SIGNAL HEADS, SCHOOL SPEED LIMIT SIGNS, ETC.) TO NOSTALGIA SIGNAL POLES SHALL BE FIELD DRILLED. BANDING OR STRAPPING ON THE NOSTALGIA SIGNAL POLES SHALL NOT BE PERMITTED.

ITEM 632 - PEDESTAL, MISC.: NOSTALGIA PEDESTAL, B'

NOSTALGIA PEDESTALS SHALL BE PACIFIC FAMILY P2000G SERIES (SEE DETAILS ON SHEETS 45-49) AND MANUFACTURED BY:

UNION METAL CORPORATION  
1432 MAPLE AVENUE N.E.  
P.O. BOX 9920  
CANTON, OH 44711  
PHONE: 330-456-7653

THE CONTRACTOR SHALL FURNISH AND INSTALL NOSTALGIA PEDESTALS AS PER PLANS. PEDESTAL SHALL INCLUDE HANDHOLE, CHAIN, AND COVER. ALL HARDWARE SHALL BE INCLUDED WITH THIS ITEM. THE ENTIRE ASSEMBLY SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF AASHTO. A STEEL FABRICATION TENON SHALL BE WELDED TO THE TOP OF THE SHAFT AND SIZED TO ACCEPT PEDESTRIAN SIGNALS AS REQUIRED. THE ORNAMENTAL BASE SHALL BE UNION METAL CORPORATION BASE NO. 74 AND SHALL BE LEVEL IN ORDER TO ACCEPT THE BASE ASSEMBLY AND SHALL BE AT LEAST AS LARGE AS THE BOTTOM DIMENSION OF THE ORNAMENTAL BASE CASTING. ALL PROPOSED EXTERIOR CONNECTIONS (PEDESTRIAN PUSHBUTTONS, ETC.) TO NOSTALGIA PEDESTALS SHALL BE FIELD DRILLED. BANDING OR STRAPPING ON THE NOSTALGIA PEDESTALS SHALL NOT BE PERMITTED.

ITEM 625 - LIGHT POLE, DECORATIVE, AS PER PLAN

NOSTALGIA PEDESTALS SHALL BE PACIFIC FAMILY P2000G SERIES (SEE DETAILS ON SHEETS 45-49) AND MANUFACTURED BY:

UNION METAL CORPORATION  
1432 MAPLE AVENUE N.E.  
P.O. BOX 9920  
CANTON, OH 44711  
PHONE: 330-456-7653

THE CONTRACTOR SHALL FURNISH AND INSTALL DECORATIVE LIGHT POLES AS PER PLANS. POLES SHALL INCLUDE HANDHOLE, CHAIN, AND COVER. ALL HARDWARE INCLUDING LUMINARIES AND RELATED EQUIPMENT SHALL BE INCLUDED WITH THIS ITEM. THE ENTIRE ASSEMBLY SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF AASHTO. THE ORNAMENTAL BASE SHALL BE UNION METAL CORPORATION BASE NO. 74 AND SHALL BE LEVEL IN ORDER TO ACCEPT THE BASE ASSEMBLY AND SHALL BE AT LEAST AS LARGE AS THE BOTTOM DIMENSION OF THE ORNAMENTAL BASE CASTING. ALL PROPOSED EXTERIOR CONNECTIONS (PEDESTRIAN SIGNAL HEADS, SCHOOL SPEED LIMIT SIGNS, ETC.) TO DECORATIVE LIGHT POLES SHALL BE FIELD DRILLED. BANDING OR STRAPPING ON THE DECORATIVE LIGHT POLES SHALL NOT BE PERMITTED. A PERMANENT LEGIBLE MARKING INDICATION SHALL BE INCLUDED ON EACH DECORATIVE LUMINAIRE SUPPORT. THE FOLLOWING INDICATION SHALL BE REQUIRED AS A MINIMUM:

- A. POLE INDICATIONS: MONTH/DATE OF FABRICATION; POLE GAUGE; BOTTOM DIAMETER; POLE HEIGHT; BOLT CIRCLE; ANCHOR BOLT DIAMETER; FLANGE BOLT DIAMETER; AND INTERSECTION LOCATION INCLUDING CORNER QUADRANT.

NOSTALGIA SIGNAL SUPPORT AND PEDESTAL AND DECORATIVE LIGHT POLE PAINTING

NOSTALGIA SIGNAL SUPPORT, ARMS, AND LUMINAIRE BRACKETS SHALL BE POWDER COATED. THE FOLLOWING SHALL APPLY:

- A. BLASTING:  
ALL THREADS SHALL BE PROTECTED FROM DAMAGE DURING BLASTING PROCESS.  
PREPARATION-STEEL, BLAST TO SSPC-SP6.  
PREPARATION-ALUMINUM AND GALVANIZED, BLAST TO SSPC-SP7.
- B. POWDER COATING:  
POWDER FINISH 3-5 MIL BOTH INSIDE AND OUTSIDE OF POLES AND ALL SURFACES OF PARTS WITH TIGER DRYLAC SUPER DURABLE SERIES 38.
- C. POWDER BAKING:  
BAKE PART PER POWDER MANUFACTURER'S RECOMMENDATIONS. GALVANIZED PARTS SHALL BE PRE-BAKED TO ENSURE ALL GASSES ARE RELEASED FROM THE GALVANIZED SURFACE BEFORE POWDER COATING AFTER WHICH THE TOP COAT SHALL BE APPLIED.
- D. COLOR:  
THE COLOR OF THE POLES SHALL BE CBD GREEN (COLOR AND FORMULA IS ON FILE AT THE MIDWEST TANK SERVICES CO., INC., CANTON, OH).
- E. FINAL INSPECTION:  
ALL PRODUCTS SHALL RECEIVE A FINAL INSPECTION BEFORE PACKAGING. A MIL THICKNESS OF 3-5 SHALL BE VERIFIED AND DOCUMENTED.
- F. WARRANTY:  
MANUFACTURER SHALL PROVIDE A FIVE (5) YEAR MATERIALS PERFORMANCE GUARANTEE FROM PEELING AND/OR 8 DELTA E MAXIMUM COLOR CHANGE WHEN MEASURED IN ACCORDANCE WITH ASTM E 1349, CHALKING <8, AND GLOSS RETENTION >30%.

THE COST FOR NOSTALGIA SIGNAL SUPPORT AND PEDESTAL AND DECORATIVE LIGHT POLE PAINTING SHALL BE INCLUDED IN AND INCIDENTAL TO THE NOSTALGIA SIGNAL SUPPORT AND PEDESTAL BID ITEMS (BID ITEMS 632) AND LIGHT POLE DECORATIVE BID ITEM (BID ITEM 625).

DRAWN BY:  
EGM  
CHECKED BY:  
NLL

GENERAL NOTES

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

ITEM 633 - CONTROLLER ITEM, MISC.; PRE-EMPTION

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING PRE-EMPTION EQUIPMENT IN THE LOCATIONS AND LOCAL CONTROLLERS AS SHOWN ON THE PLANS. THE PRE-EMPTION SHALL CONFORM TO O.D.O.T. SPECIFICATION 633 AND SHALL UTILIZE COMMUNICATIONS TO IDENTIFY THE PRESENCE OF AN EMERGENCY PRIORITY VEHICLE. IT SHALL CAUSE THE TRAFFIC SIGNAL CONTROLLER TO SELECT A PRE-PROGRAMMED, PRE-EMPTION PLAN THAT WILL DISPLAY AND HOLD THE DESIRED SIGNAL PHASE FOR THE DIRECTION OF THE EMERGENCY VEHICLE.

THE COMMUNICATIONS MEDIUM SHALL EMPLOY SOUND DETECTION TECHNIQUES TO DETERMINE AND LOG THE PRESENCE OF THE EMERGENCY VEHICLE. THE SYSTEM SHALL DETECT THE PRESENCE OF THE VEHICLE THROUGH AN EMITTING DEVICE LOCATED ON THE EMERGENCY VEHICLE. THE SYSTEM SHALL ACTIVATE THE PRE-EMPTION SEQUENCE BY APPLYING A SIGNAL TO ONE OF THE CONTROLLER'S PRE-EMPT DISCRETE INPUTS. THE SYSTEM SHALL BE COMPLETELY COMPATIBLE WITH THE NEMA CONTROLLER.

THE EQUIPMENT SHALL BE SHELF OR RACK MOUNTED AND EASILY REMOVABLE AND REPLACEABLE WITHIN THE CABINET. THE EQUIPMENT SHALL BE SUPPLIED COMPLETELY WIRED IN THE CONTROLLER CABINET AND TESTED. THE SYSTEM SHALL BE CAPABLE OF PRE-EMPTING AND RECEIVING PRIORITY FOR EACH APPROACH TO THE INTERSECTION. IT SHALL BE POSSIBLE TO DETECT THE EMERGENCY VEHICLE UP TO 1200 FEET FROM THE INTERSECTION.

EACH INTERSECTION SHOWN IN THE PLANS AND THE ADDITIONAL SPARES SHALL BE SUPPLIED WITH THE FOLLOWING COMPONENTS:

- A. PRE-EMPT RECEIVING UNIT
- B. PRE-EMPT PHASE SELECTOR ASSEMBLY
- C. PRE-EMPT INTERFACE PANEL

AN ADDITIONAL ONE (1) PRE-EMPTION SPARES SUBJECT TO ALL THE REQUIREMENTS AND COMPONENTS LISTED IN THIS SECTION SHALL BE SUPPLIED AS SPARES AND SHALL BE INCIDENTAL TO BID ITEM 633 - CONTROLLER ITEM, MISC.; PRE-EMPTION.

THE CONTRACTOR SHALL INVENTORY THE CITY'S EMERGENCY VEHICLES TO DETERMINE COMPATIBILITY OF THE SIRENS WITH THE PROPOSED SYSTEM. EACH VEHICLE THAT IS DETERMINED TO BE NOT COMPATIBLE SHALL BE SUPPLIED WITH NEW SIRENS FOR THE FOLLOWING EMERGENCY VEHICLES AT COST INCIDENTAL TO THE SYSTEM. THE CITY SHALL BE RESPONSIBLE FOR INSTALLING VEHICLE EQUIPMENT:

- A. FIRE: 40 VEHICLES
- B. POLICE: 105 VEHICLES

THE CITY SHALL BE SUPPLIED WITH SOFTWARE REQUIRED TO CALIBRATE, LOG, AND OPERATE THE SYSTEM. THE SOFTWARE SHALL BE CAPABLE OF OPERATING ON AN IBM OR IBM COMPATIBLE PERSONAL COMPUTER. TWO (2) OPERATING AND INSTRUCTION MANUALS SHALL BE SUPPLIED WITH THE SOFTWARE.

THE CONTRACTOR SHALL THOROUGHLY TEST THE INSTALLED SYSTEM. AS A MINIMUM, THE CONTRACTOR SHALL VERIFY THAT ALL CONNECTIONS ARE PROPERLY MADE TO THE CONTROLLER CABINETS. THE CONTRACTOR SHALL CHECK THAT THE RANGE SETTING IS PROPER FOR EACH INTERSECTION. THE CONTRACTOR SHALL DETERMINE THAT ALL PHASE SELECTORS ARE SELECTING THE PROPER PHASE AND TIMING ACCURATELY. THE CONTRACTOR SHALL VERIFY THAT ALL VEHICLE EMITTERS ARE BEING PROPERLY DETECTED.

IF THE PROPOSED PRE-EMPT SYSTEM IS NOT COMPATIBLE WITH THE EXISTING SYSTEM, THE CONTRACTOR SHALL PROVIDE TRAINING FOR UP TO FIFTEEN (15) PERSONS IN THE OPERATION OF THE SYSTEM. IT SHALL BE PROVIDED WITHIN 48 HOURS OF THE INSTALLATION OF THE SYSTEM. IT SHALL CONSIST OF HANDS-ON INSTRUCTION FOR A MINIMUM OF SIXTEEN (16) HOURS. THE CONTRACTOR SHALL PROVIDE TRAINING FOR UP TO FOUR (4) PERSONS IN THE INSTALLATION AND MAINTENANCE OF THE SYSTEM. IT SHALL CONSIST OF A MINIMUM OF EIGHT (8) HOURS OF INSTRUCTION. TRAINING SHALL BE SUPPLIED WITHIN SEVEN (7) DAYS OF THE INSTALLATION OF THE SYSTEM. ALL TRAINING SHALL BE HELD IN A CITY SUPPLIED LOCATION. TRAINING SHALL BE CONDUCTED BY SOMEONE WHO HAS PERFORMED THIS WITHIN THE LAST YEAR AND DOES IT ON A REGULAR BASIS. THE COST OF TRAINING, INCLUDING COURSE MATERIAL, TRAVEL SUBSISTENCE AND RELATED COSTS, SHALL BE ENTIRELY BORNE BY THE CONTRACTOR AND SHALL BE INCIDENTAL TO THE PRE-EMPTION EQUIPMENT.

PAYMENT FOR ITEM 633 - CONTROLLER ITEM, MISC.; PRE-EMPTION SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR EACH PRE-EMPTION IN PLACE AND FULLY OPERATIONAL AS SHOWN IN THE PLANS, EXCEPT FOR THOSE ITEMS BID SEPARATELY.

ITEM 816 - VIDEO DETECTION SYSTEM, AS PER PLAN

THIS ITEM OF WORK SHALL MEET STATE OF OHIO DEPARTMENT OF TRANSPORTATION (ODOT) SUPPLEMENTAL SPECIFICATION 816, VIDEO DETECTION SYSTEM. IN ADDITION TO THE REQUIREMENTS OF ODOT'S SUPPLEMENTAL SPECIFICATION 907 THE FOLLOWING REQUIREMENTS SHALL ALSO APPLY:

THE NECESSARY VIDEO DETECTION CAMERAS MUST PROVIDE A COMMUNICATIONS INTERFACE THAT FULLY SUPPORTS AN ETHERNET IEEE 802.3 COMPLIANT 10/100BASE T AUTO SENSING PORT FOR ADVANCED SYSTEMS COMMUNICATIONS. THE ETHERNET PORT SHALL PROVIDE AN UPSTREAM CONNECTION TO OTHER ETHERNET DEVICES IN THE CABINET. AN INDUSTRY STANDARD RJ-45 TYPE CONNECTOR SHALL BE INCLUDED THAT SUPPORTS A SIMPLE CAT5E PATCH CABLE INTERFACE.

PERFORMANCE TESTING AND SYSTEM ACCEPTANCE

THE SUPPLIER OF THE CLOSED LOOP SYSTEM EQUIPMENT SHALL SUPPLY ADEQUATE PERSONNEL AND EQUIPMENT, INCLUDING ANY TESTING DEVICES ON SITE TO COMPLETE ALL TESTING PROCEDURES IN A TIMELY MANNER. BENCH MARK TESTING SHALL BE ACCOMPLISHED AT THE CLOSED LOOP SYSTEM SUPPLIER'S FACILITIES. THE PURPOSE OF THE BENCH MARK TESTING IS TO DEMONSTRATE THE CAPABILITIES OF THE CLOSED LOOP SYSTEM WHICH THE SUPPLIER INTENDS TO FURNISH. CLOSED LOOP SYSTEM SHALL BE REQUIRED TO EXHIBIT SATISFACTORY RELIABILITY DURING A TEN (10) CONSECUTIVE DAY, ESSENTIALLY TROUBLE-FREE PERIOD OF OPERATION BEFORE SYSTEM ACCEPTANCE WHICH SHALL BEGIN AFTER THE INSTALLATION OF THE ON-STREET MASTER, LOCAL INTERSECTION CONTROLLERS, DETECTORS, AND OTHER REQUIRED EQUIPMENT TO MAKE THE CLOSED LOOP SYSTEM FUNCTION. THE INTENT OF PERFORMANCE TESTING IS TO DEMONSTRATE THAT THE TOTAL CLOSED LOOP SYSTEM IS PROPERLY INSTALLED, IS FREE FROM IDENTIFIED PROBLEMS, COMPLIES WITH THE SPECIFICATIONS, AND HAS EXHIBITED A STABLE, RELIABLE PERFORMANCE LEVEL REQUIRED FOR THE CONTROL OF TRAFFIC. DURING THE 10-DAY TEST PERIOD, THE CLOSED LOOP SYSTEM SHALL OPERATE ALL SYSTEM-CONTROLLED INTERSECTIONS WITH PROGRAM SELECTIONS BY THE ON-STREET MASTER CONTROLLER. IT SHALL BE BASED ON BOTH THE TIME-OF-DAY AND TRAFFIC RESPONSIVE MODES. FAILURE OF ANY HARDWARE ITEM DURING THE 10-DAY TEST PERIOD, WITH THE EXCEPTION OF EXPENDABLE ITEMS SUCH AS SIGNAL LAMPS AND FUSES, SHALL NECESSITATE RESTARTING THE 10-DAY TEST PERIOD FOR ITS FULL 10-DAY DURATION FOR THAT ITEM, AFTER ITS REPAIR.

NO INTERMITTENT HARDWARE, SOFTWARE, COMMUNICATION OR CONTROL OPERATION SHALL BE PERMITTED TO PERSIST DURING THE 10-DAY TEST PERIOD. IF SUCH PROBLEMS ARE ENCOUNTERED, THE 10-DAY TEST PERIOD SHALL HALT UNTIL THE PROBLEM IS CORRECTED. SYSTEM ACCEPTANCE SHALL BE GRANTED WHEN THE LEVEL OF PERFORMANCE DEFINED IN THIS SECTION AND IN ALL OTHER SECTIONS OF THE SPECIFICATIONS HAS BEEN REACHED AND ALL OTHER CONTRACTUAL ELEMENTS HAVE BEEN MET. THE COST FOR PERFORMANCE TESTING AND SYSTEM ACCEPTANCE SHALL BE INCIDENTAL TO THE CONTROLLER BID ITEMS (BID ITEMS 633).

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR

IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD). A UNIFORMED LAW ENFORCEMENT OFFICER AND OFFICIAL PATROL CAR WITH WORKING TOP MOUNTED EMERGENCY FLASHING LIGHTS SHALL BE PROVIDED FOR CONTROLLING TRAFFIC FOR THE FOLLOWING TASKS:

FOR LANE CLOSURES: DURING INITIAL SET UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED.

DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.

DURING PHASE CHANGES.

DURING MODIFICATION, CLOSING OR MAINTAINING A SIGNALIZED INTERSECTION DURING REMOVAL OR INSTALLATION.

LAW ENFORCEMENT OFFICERS (LEOS) SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED. THE LEOS ARE CONSIDERED TO BE EMPLOYED BY THE CONTRACTOR AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR ACTIONS. ALTHOUGH THEY ARE EMPLOYED BY THE CONTRACTOR, THE ENGINEER SHALL HAVE CONTROL OVER THEIR PLACEMENT. THE OFFICIAL PATROL CAR SHALL BE A PUBLIC SAFETY VEHICLE AS REQUIRED BY THE OHIO REVISED CODE. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THESE SERVICES WITH:

CITY OF CANTON  
CHIEF DEAN McKIMM  
221 THIRD STREET SW.  
CANTON, OHIO 330-489-3111

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

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR 100 HOURS

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

IF CONTRACTOR WISHES TO UTILIZE LEOS FOR FLAGGING AND TRAFFIC CONTROL, OTHER THAN FOR THAT REQUIRED IN THESE PLANS, THEY MAY DO SO AT THEIR OWN EXPENSE, PAYMENT FOR THE EXCESS ABOVE THE CONTRACT REQUIREMENTS WILL BE INCLUDED UNDER ITEM 614, MAINTAINING TRAFFIC.

DRAWN BY: EGM  
CHECKED BY: NUL

GENERAL NOTES

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

ITEM 633 - CONTROLLER, MASTER TRAFFIC RESPONSIVE, AS PER PLAN

THE CONTROLLER MASTER UNITS PROVIDED IN THIS PROJECT SHALL BE NEMA TYPE MANUFACTURED BY:  
ECONOLITE CONTROL PRODUCTS  
3360 EAST LA PALMA  
ANAHEIM, CA 92806  
PHONE: 800-225-6480

THE CONTROLLER MASTERS SHALL BE MODEL ASC/2M-1000. THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A SOLID STATE DIGITAL MICROPROCESSOR TYPE TRAFFIC RESPONSIVE MASTER CONTROLLER. FSK OR RS232 (AS REQUIRED) COMMUNICATION TELEMETRY CAPABILITIES AND ALL OTHER ACCESSORIES THAT ARE REQUIRED TO MAKE THE CONTROLLER COMPLETELY FUNCTIONAL AND OPERATIONAL AS SHOWN IN THE PLANS. MANUFACTURER GUARANTEES OR WARRANTIES ON ALL INSTALLED TRAFFIC SIGNAL CONTROL EQUIPMENT SHALL BE TRANSFERRED TO THE CITY OF CANTON TRAFFIC SIGNAL DEPARTMENT UPON ACCEPTANCE OF THE EQUIPMENT. PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TESTING, CERTIFICATIONS AND OTHER INCIDENTALS NECESSARY TO FURNISH THE CONTROLLER COMPLETE, INCLUDING ALL CONNECTIONS MADE AND WIRING COMPLETE, TESTED AND ACCEPTED. THE MASTER CONTROLLER SHALL BE INSTALLED IN THE SAME CABINET AS THE LOCAL CONTROLLER AT THE INTERSECTION SHOWN IN THE PLANS. THE CABINET SPECIFIED FOR THE LOCAL CONTROLLER SHALL BE REPLACED WITH A CABINET, AS REQUIRED TO MATCH THE EXISTING FOUNDATION IN ORDER TO HOUSE THE MASTER CONTROLLER. THE COST OF THE LARGER CABINET ABOVE AND BEYOND THE STANDARD CABINET SHALL BE INCLUDED IN THE COST OF THE MASTER CONTROLLER BID PRICE. THE MASTER CONTROLLER SHALL CONFORM TO ODOT SPECIFICATION 633. MEANS SHALL BE PROVIDED TO ALLOW INTER-MASTER LINKING IN ORDER TO ALLOW COORDINATION BETWEEN CONTIGUOUS SYSTEM CONTROL AREAS. THIS SHALL INCLUDE THE SYNCHRONIZATION OF THE MASTER REFERENCE CLOCKS. PROVISIONS SHALL BE MADE FOR CROSSING ARTERIAL SYNCHRONIZATION IN TWO INDEPENDENT SYSTEM MASTERS SYNCHRONIZATION SHALL BE ESTABLISHED THROUGH A COMMON INTERSECTION OF BOTH SYSTEMS IN ORDER TO MAINTAIN SIMULTANEOUS COORDINATED TRAFFIC FLOW ALONG EACH OF THE ARTERIALS. CROSSING ARTERIAL SYNCHRONIZATION SHALL BE ENABLED BY THE TIME-OF-DAY SCHEDULER AND SHALL OCCUR WHEN THE TRAFFIC PATTERN COMMANDED BY THE MASTERS HAS THE SAME CYCLE INFORMATION. CROSSING ARTERIAL SYNCHRONIZATION SHALL BE ENABLED AS LONG AS BOTH MASTER CYCLE COMMANDS ARE THE SAME AND SHALL REMAIN IN EFFECT FOR AS LONG AS TRAFFIC DEMAND WARRANTS THE MODE. TO PREVENT OSCILLATION, IT SHALL BE POSSIBLE TO "LOCK IN" THIS MODE FOR A USER-PROGRAMMABLE PERIOD. AN ADDITIONAL ONE (1) MASTER CONTROLLER UNIT ASSEMBLY, SUBJECT TO ALL OF THESE SPECIFICATIONS, SHALL BE SUPPLIED AS A SPARE UNDER BID ITEM 633 - CONTROLLER ITEM, MISC.: ECONOLITE CONTROLLER, MASTER TRAFFIC RESPONSIVE.

ITEM 633 - CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN

THE CONTROLLER UNITS PROVIDED IN THIS PROJECT SHALL BE NEMA TYPE MANUFACTURED BY:  
ECONOLITE CONTROL PRODUCTS  
3360 EAST LA PALMA  
ANAHEIM, CA 92806  
PHONE: 800-225-6480

THE CONTROLLER SHALL BE MODEL ASC/2S-2100. THIS ITEM SHALL CONSIST OF FURNISHING AN ACTUATED, SOLID STATE DIGITAL MICROPROCESSOR TYPE CONTROLLER WITH MENU DRIVEN PROMPTS, INTERNAL TBC, FSK TELEMETRY MODULE FOR CLOSED LOOP COMMUNICATIONS AND ALL OTHER ACCESSORIES THAT ARE REQUIRED TO MAKE THE CONTROLLER COMPLETELY FUNCTIONAL AND OPERATIONAL AS SHOWN IN THE PLANS. MANUFACTURER GUARANTEES OR WARRANTIES ON ALL INSTALLED TRAFFIC SIGNAL CONTROL EQUIPMENT SHALL BE TRANSFERRED TO THE CITY OF CANTON TRAFFIC SIGNAL DEPARTMENT UPON ACCEPTANCE OF THE EQUIPMENT. PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TESTING, CERTIFICATIONS, AND OTHER INCIDENTALS NECESSARY TO FURNISH THE CONTROLLER COMPLETE, INCLUDING ALL CONNECTIONS MADE AND WIRING COMPLETE, TESTED, AND ACCEPTED. THE CONTROLLER ASSEMBLY AND CABINET SHALL INCLUDE A NEMA TS2 TYPE 2 CONTROLLER AND A NEMA TS2 TYPE 16 MALFUNCTION MANAGEMENT UNIT (MMU) COMPLETE IN A NEMA TS1 CABINET ASSEMBLY. IN ADDITION, THE CONTROLLER ASSEMBLY AND CABINET SHALL CONFORM TO ODOT SPECIFICATION 633. THE CONTROLLER SHALL BE CAPABLE OF AN ADDITIONAL 12 STANDARD OVERLAPS BY ASSIGNING EACH PHASE OUTPUT TO AN OVERLAP.

CON'T

THE CONTROLLER SHALL INCLUDE TIME-OF-DAY AND COORDINATION CAPABILITIES. IN ADDITION, THE CONTROLLER SHALL INCLUDE PREEMPTION CAPABILITIES INCLUDING SIX (6) RAILROAD, FIRE, AND EMERGENCY VEHICLE HIGH-PRIORITY PREEMPTORS AND FOUR (4) LOW-PRIORITY BUS-PREEMPTORS. CONTROLLER SHALL BE PROGRAMMABLE TO ALLOW FOR FLASHING "DON'T WALK" THROUGH THE YELLOW SIGNAL PHASE. THE CABINET SHALL BE EQUIPPED WITH A COMMUNICATIONS INTERFACE THAT FULLY SUPPORTS AN ETHERNET IEEE 802.3 COMPLIANT 10/100 BASE T AUTO SENSING PORT AND CAPABLE OF HANDLING BOTH COPPER AND FIBER OPTIC CABLES FOR SYSTEM COMMUNICATIONS. THE CABINET SHALL BE WIRED FOR MONITORING EACH APPROACH SEPARATELY. ALL VEHICLE SIGNAL CIRCUITS SHALL BE ISOLATED (SPLITTING THE HEADS FOR PRE-EMPTION PURPOSES). THE MMU SHALL PASS ALL TESTS AS PERFORMED BY AN AUTOMATIC MONITOR TESTER. TEST RESULTS SHALL BE PRINTED AND SUPPLIED WITH EACH CABINET. THE POLICE PANEL SHALL HAVE SWITCH ACCESS FOR SIGNAL ON/OFF, FLASH CONTROL, AUTOMATIC/MANUAL TRANSFER, AND MANUAL PUSHBUTTON WITH TEN (10) FEET COILED HAND CORD. TECHNICIAN SWITCH PANEL SHALL BE MOUNTED ON THE INSIDE OF THE MAIN CABINET DOOR AND SHALL HAVE SWITCH ACCESS FOR STOP TIME ON/OFF, FLASH CONTROL, TIMER POWER ON/OFF, DETECTOR TEST, MONETARY PUSHBUTTON. THE CABINET SHALL BE ALUMINUM, WITH A NATURAL SATIN FINISH OUTSIDE WITH A PAINTED SEMI-GLOSS WHITE ENAMEL FINISH INSIDE. THE CABINETS SHALL COMPLY WITH THE REQUIREMENTS OF 733.03 (SECTION A). IN ADDITION TO CABINET REQUIREMENTS, CONTRACTOR SHALL FURNISH AT INTERSECTION WITH NOSTALGIA POLE TYPE/STYLE AND STREET LIGHTING CONTROL; THE STREET LIGHTING IS TO BE CONTROLLED BY SINGLE PHOTO CELL ON CLOSEST SIGNAL POLE OR LUMINAIRE WITH CONTACTOR (TORK 5401 OR EQUAL) INSTALLED IN CABINET INCLUDING A THREE POSITION MAINTENANCE SWITCH HAND, OFF, AUTO (TELEMECANIQUE #XB4BD33 OR EQUAL). THE FAIL CONTACTS OF THE SURGE PROTECTOR SHALL BE WIRED TO AN ALARM INPUT FOR REPORTING A FAILED DEVICE TO A CENTRAL COMPUTER, WIRE CONNECTIONS TO THE BACKPANEL SHALL BE MADE WITH CRIMP TERMINALS AND THREADED FASTENERS. SOLDIER CONNECTIONS MAY BE USED ON THE BACKSIDE OF A PANEL THAT UTILIZES FEED-THRU STYLE TERMINAL BLOCKS. PRINTED CIRCUIT BOARDS SHALL NOT BE USED ON ANY PART OF THE TERMINALS AND FACILITIES PROVIDED WITHIN THE CABINET. ALL WIRES FASTENED TO THE LOAD SWITCH, FLASHER AND FLASH TRANSFER RELAY SOCKETS SHALL BE SOLDERED IN PLACE. A GOOD MECHANICAL CONNECTION MUST BE MADE PRIOR TO SOLDERING. ALL WIRING OF HARNESSES AND INTERPANEL WIRING, INCLUDING WIRING TO THE POLICE PANEL SHALL BE PROTECTED WITH A NYLON MESH OR "SNAKE SKIN". ANY EXPOSED WIRES, OR THE USE OF CABLE TIES TO HOLD THE WIRE BUNDLES TOGETHER SHALL NOT BE ALLOWED. FOR EASE OF MAINTENANCE, ALL HARNESSES SHALL BE OF SUFFICIENT LENGTH TO PLACE THE EQUIPMENT ON TOP OF THE CABINET AND BE OPERATIONAL.

A COLOR-CODED WIRING SYSTEM SHALL BE USED THROUGHOUT THE WIRING OF THE CABINET. ALL SYSTEMS FUNCTIONS OF THE CONTROLLER SHALL BE TERMINATED ON A SINGLE PANEL. WIRING COLOR-CODE SHALL BE AS FOLLOWS:

- A. BLUE CONTROLLER UNIT
- B. VIOLET MMU
- C. RED RED LOAD SWITCH OUTPUT
- D. YELLOW YELLOW LOAD SWITCH OUTPUT
- E. BROWN GREEN LOAD SWITCH OUTPUT
- F. BLACK AC LINE POWER
- G. WHITE AC NEUTRAL
- H. GREEN EARTH GROUND
- I. GRAY LOGIC GROUND
- J. ORANGE FLASH PROGRAMMING

TWO (2) SETS OF CABINET WIRING DIAGRAMS, SERVICE MANUALS, PROGRAMMING 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. AN ADDITIONAL ONE (1) CONTROLLER UNIT ASSEMBLIES WITH CABINETS, SUBJECT TO ALL OF THESE SPECIFICATIONS, SHALL BE SUPPLIED AS SPARES UNDER BID ITEM 633 - CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN.

NOTE:  
ALL PROPOSED CABINETS SHALL BE TYPE SM/SM2 (SIZE: 30"x17"x58") UNLESS MODIFICATION IS OTHERWISE NEEDED AS NOTED BELOW:

THE SUPPLIER FOR BOTH THE LOCAL AND MASTER CONTROLLER UNITS (ECONOLITE CONTROL PRODUCTS) SHALL VERIFY THAT THE PROPOSED CABINET WILL FIT ON AND CONFORM TO THE EXISTING GROUND MOUNTED FOUNDATION AT THE FOLLOWING LOCATION:

- A. 15TH STREET AND DUEBER AVENUE S.W.

ITEM 690 - ITEM SPECIAL - WORK INVOLVING SOLID WASTE

ENVIRONMENTAL STUDIES HAVE SHOWN THAT THERE IS A POTENTIAL OF ENCOUNTERING PETROLEUM CONTAMINATED MATERIALS AND/ OR OTHER REGULATED SUBSTANCES DURING THE EXCAVATION IN THE VICINITY OF:

- A. NORTHWEST CORNER OF 9TH STREET AND MCKINLEY AVENUE S.W.
- B. SOUTHWEST CORNER OF NAVARRE ROAD AND MARKET AVENUE S.
- C. NORTHWEST CORNER OF NAVARRE ROAD AND CLEVELAND AVENUE S.W.
- D. NORTHEAST CORNER OF NAVARRE ROAD AND CLEVELAND AVENUE S.W.
- E. NORTHWEST CORNER OF NAVARRE ROAD AND DUEBER AVENUE S.W.
- F. NORTHEAST CORNER OF NAVARRE ROAD AND DUEBER AVENUE S.W.
- G. SOUTHEAST CORNER OF NAVARRE ROAD AND HARRISON AVENUE S.W.
- H. NORTHWEST CORNER OF 15TH STREET AND CLEVELAND AVENUE S.W.
- I. SOUTHEAST CORNER OF CLEVELAND AVENUE AND MARKET AVENUE S.

THE CONTRACTOR SHALL MANAGE MATERIAL EXCAVATED FROM THE VICINITY OF THE ABOVE REFERENCE INTERSECTION LOCATIONS ACCORDING TO THE FOLLOWING NOTES. THE ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THIS WORK. ALL EXCAVATIONS WITHIN THE AFOREMENTIONED LIMITS SHALL BE PAID FOR UNDER THE ORIGINAL PLAN BID ITEMS. ALL MATERIAL EXCAVATED BY THE CONTRACTOR WITHIN THESE LIMITS SHALL BE SUBJECT TO TESTING BY AN INSPECTOR PROVIDED BY THE CONTRACTOR.

ALL MATERIAL EXCAVATED BY THE CONTRACTOR AT THIS LOCATION MAY BE STOCKPILED IN AN AREA PROVIDED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THE ENGINEER MAY PERMIT TEMPORARY STORAGE OF THE EXCAVATED MATERIAL IN A LINED AND COVERED ROLL-OFF BOX. THE ENGINEER MAY PERMIT TEMPORARY STORAGE OF THE EXCAVATED MATERIAL ON AN IMPERMEABLE MEMBRANE. THE MEMBRANE SHALL BE SURROUNDED BY BALES OF STRAW TO PREVENT THE SUSPECTED SOILS FROM COMING IN CONTACT WITH THE ORIGINAL SOILS. THE ENGINEER MAY PERMIT THE CONTRACTOR TO DIRECT LOAD THE EXCAVATED CONTAMINATED MATERIAL INTO TRUCKS.

THIS MATERIAL SHALL BE PROPERLY TESTED, TRANSPORTED, AND DISPOSED OF IN A LICENSED (BY THE LOCAL HEALTH DEPARTMENT) AND PERMITTED (BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY) SOLID WASTE FACILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS AND TO TRANSPORT THE MATERIAL TO A LICENSED AND PERMITTED SOLID WASTE DISPOSAL FACILITY. THE CONTRACTOR SHALL CONTACT THE FACILITY TO DETERMINE IF ANY ADDITIONAL TESTING IS REQUIRED FOR DISPOSAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUCTING ANY ADDITIONAL SAMPLING AND ANALYSIS OF THIS MATERIAL.

THE CONTRACTOR SHALL FURNISH ALL THE LABOR, EQUIPMENT, AND MATERIALS NECESSARY TO PROPERLY HANDLE, STORE, TEST (FOR DISPOSAL), TRANSPORT, AND DISPOSE OF REGULATED MATERIALS, INCLUDING ANY REQUIRED PERMITS, APPROVALS, OR FEES WITHIN THE LIMITS IDENTIFIED ABOVE. PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT PRICE BID PER TON. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE: 55 TONS

DRAWN BY: ECM  
CHECKED BY: NAL

GENERAL NOTES

NAVARRE ROAD S.W.  
SIGNAL SYSTEM



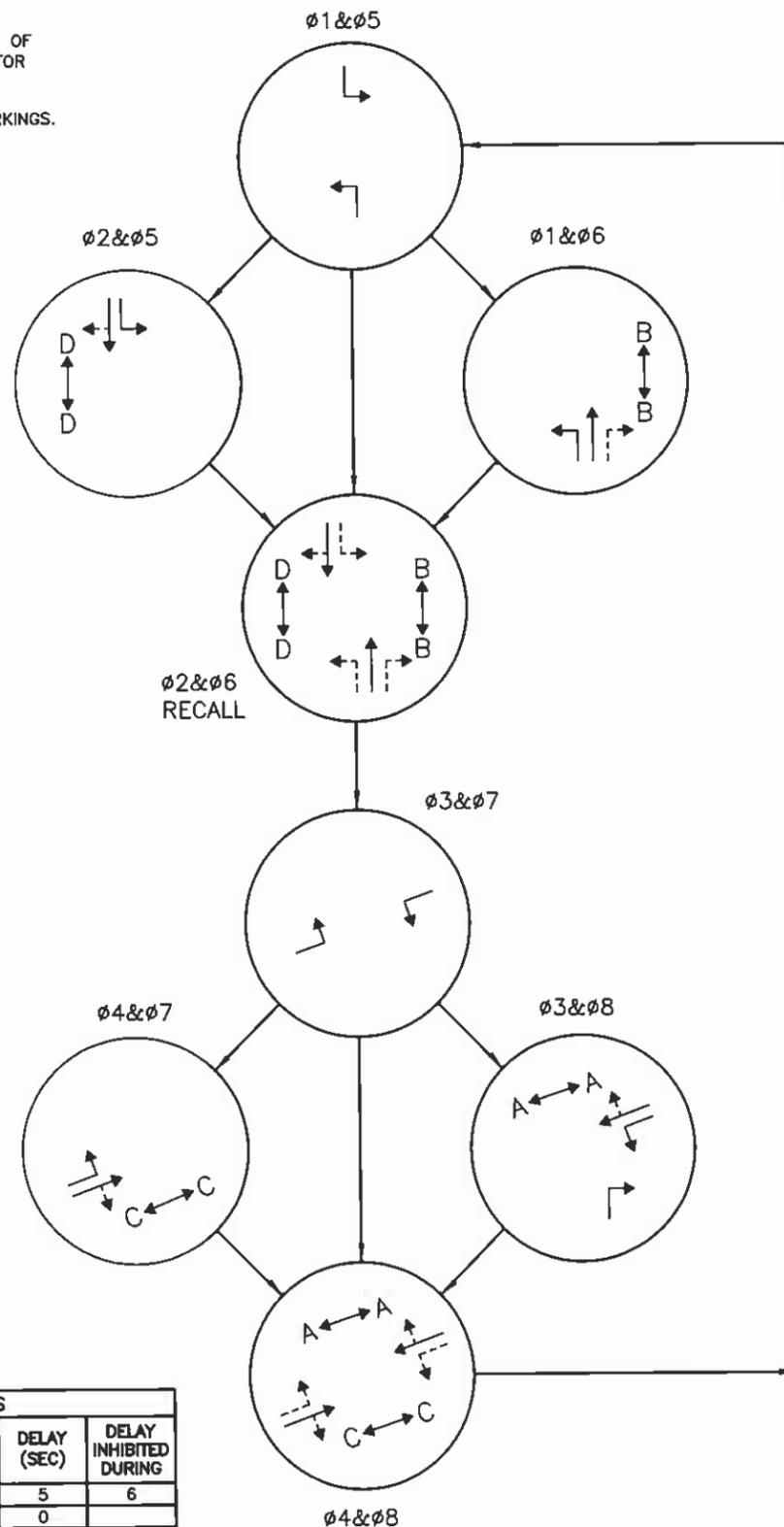
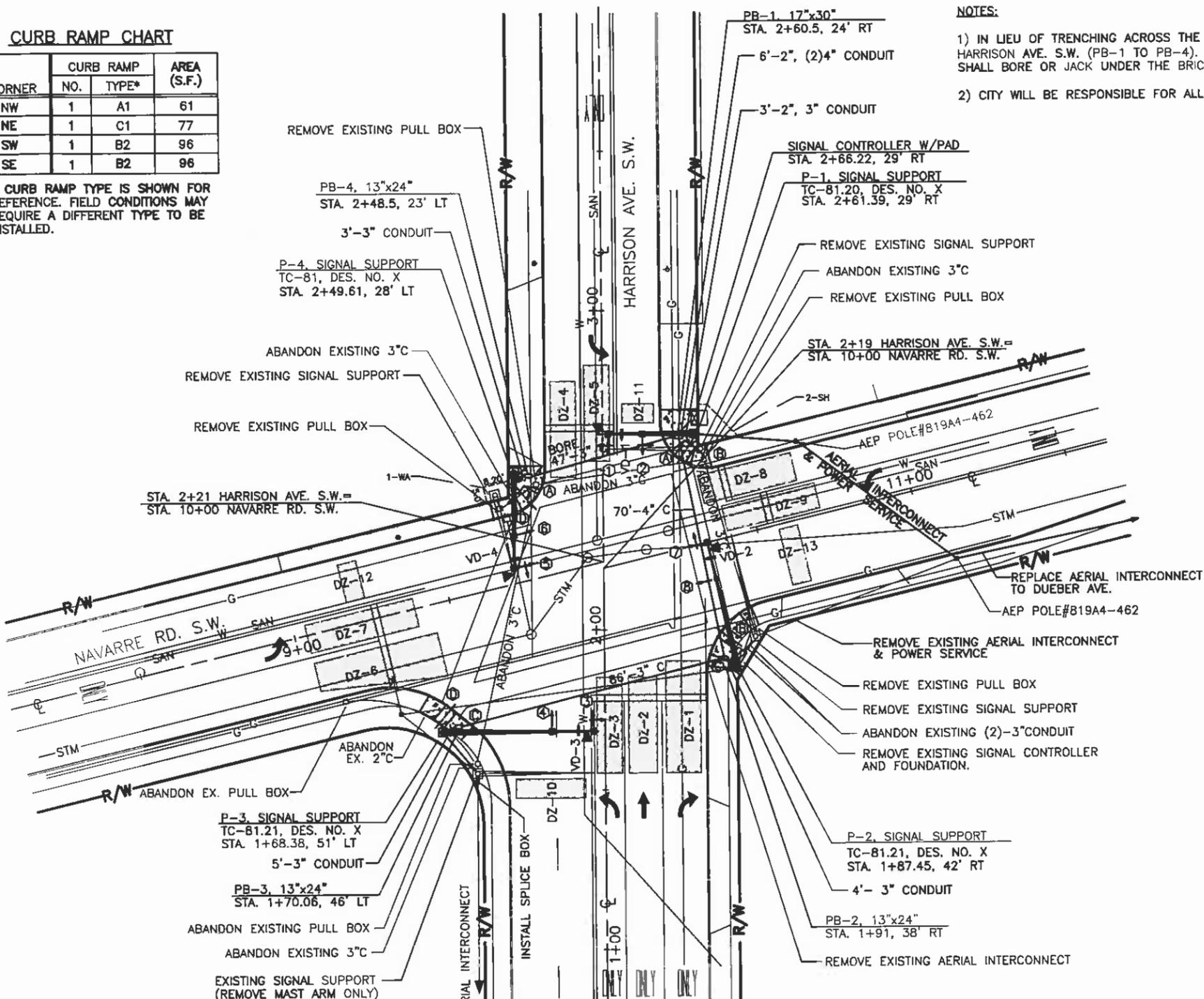
**CURB RAMP CHART**

CORNER	CURB RAMP NO.	TYPE*	AREA (S.F.)
NW	1	A1	61
NE	1	C1	77
SW	1	B2	96
SE	1	B2	96

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

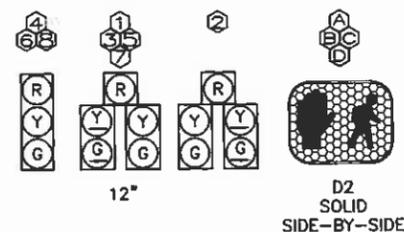
**NOTES:**

- 1) IN LIEU OF TRENCHING ACROSS THE BRICK PORTION OF HARRISON AVE. S.W. (PB-1 TO PB-4). THE CONTRACTOR SHALL BORE OR JACK UNDER THE BRICK PAVEMENT.
- 2) CITY WILL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS.



**LEGEND**

- 3-SECTION HEAD
- 5-SECTION HEAD
- VIDEO DETECTOR
- PREEMPTION DETECTOR
- CONTROLLER CABINET
- PULL BOX
- NOSTALGIA POLE
- PEDESTRIAN SIGNAL
- STREET NAME SIGN
- CONCRETE SIDEWALK REMOVAL AND REPLACEMENT
- DECORATIVE LIGHT
- UTILITY POLE
- CATCH BASIN
- MANHOLE
- HYDRANT
- WATER
- GAS
- SAN- SANITARY
- STM- STORM
- TEL- TELEPHONE



**SIGNAL INDICATIONS**

TRAFFIC SIGNAL DETECTOR ZONES					
DETECTION ZONE DESIGNATION	ASSOCIATED VIDEO DETECTOR	LOCATION-MOVEMENT	ASSOCIATED CONTROLLER PHASE	DELAY (SEC)	DELAY INHIBITED DURING
DZ-1	VD-1	HARRISON AVE.-NB RT	6	5	6
DZ-2	VD-1	HARRISON AVE.-NB TH	6	0	
DZ-3	VD-1	HARRISON AVE.-NB LT	1	0	
DZ-4	VD-3	HARRISON AVE.-SB TH/RT	2	5	2
DZ-5	VD-3	HARRISON AVE.-SB LT	5	0	
DZ-6	VD-2	NAVARRE RD.-EB TH/RT	4	5	4
DZ-7	VD-2	NAVARRE RD.-EB LT	7	0	
DZ-8	VD-4	NAVARRE RD.-WB TH/RT	8	5	8
DZ-9	VD-4	NAVARRE RD.-WB LT	3	0	
DZ-10	VD-1	HARRISON AVE.-SB	SYSTEM	0	
DZ-11	VD-3	HARRISON AVE.-NB	SYSTEM	0	
DZ-12	VD-2	NAVARRE RD.-WB	SYSTEM	0	
DZ-13	VD-4	NAVARRE RD.-EB	SYSTEM	0	

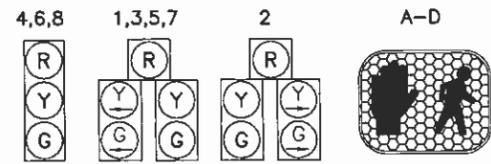
TRAFFIC SIGNAL PLAN  
NAVARRE ROAD AND HARRISON AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

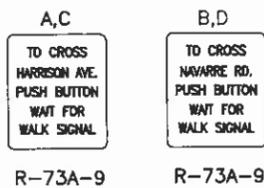
**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⓑ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- Ⓐ INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓤ INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓟ POWER CABLE, (BY CONDUCTOR), #10 AWG
- Ⓢ PRE-EMPTION CABLE
- Ⓥ VIDEO DETECTOR CABLE

- Ⓧ PEDESTRIAN SIGNAL HEAD
- SPLICE LOCATION
- X VEHICULAR SIGNAL HEAD
- Ⓟ PEDESTRIAN PUSHBUTTON
- ▶ VIDEO DETECTOR CAMERA
- ▶ PRE-EMPTION DETECTOR
- ☀ LUMINAIRE



**SIGNAL INDICATIONS**

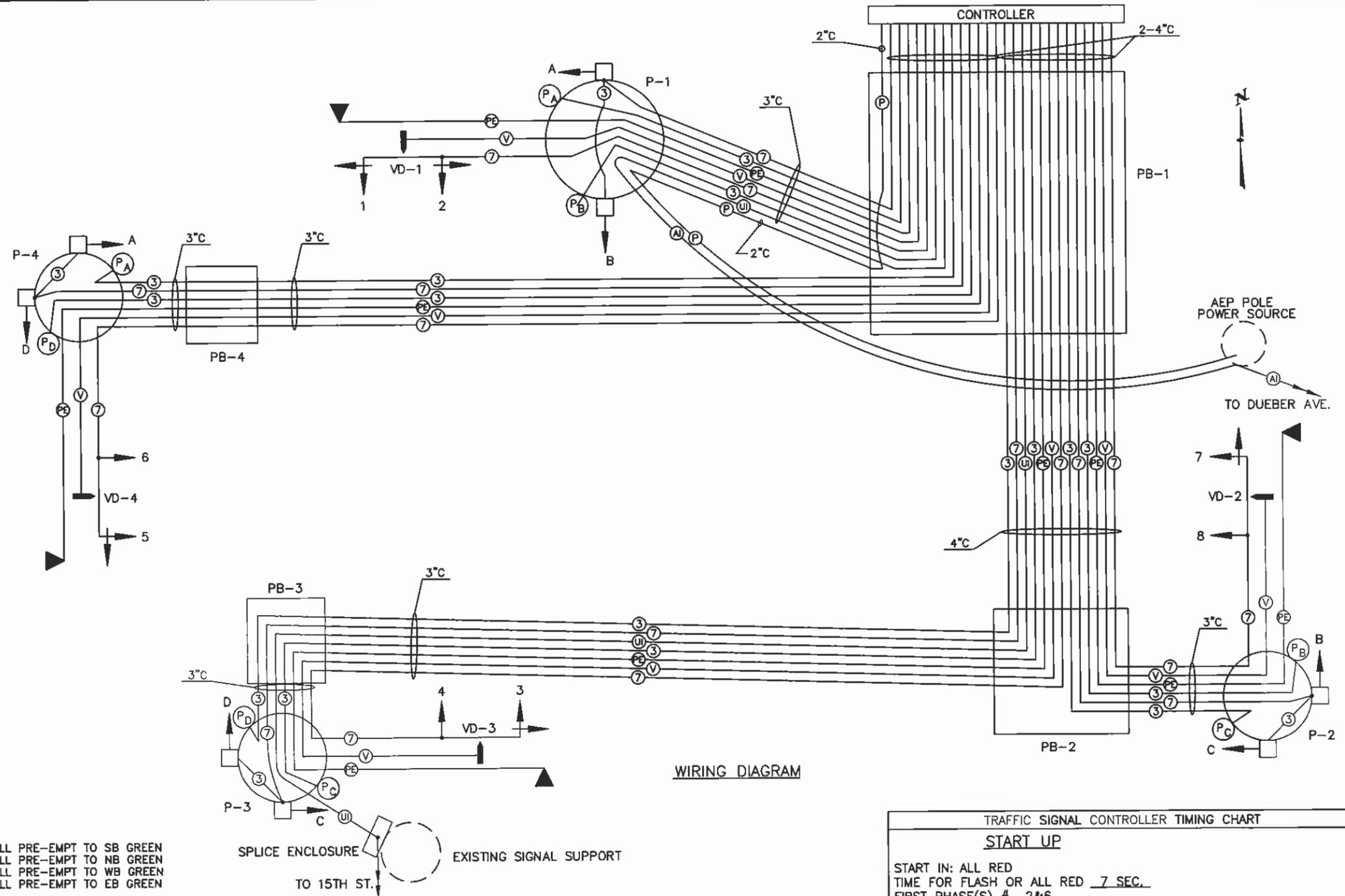


**PRE-EMPTION NOTES:** CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

**SIGNAL DISPLAY CHART**

DIRECTION	SIGNAL HEAD	PHASE 1&5 *		PHASE 1&6		PHASE 2&5		PHASE 2&6		PHASE 3&7 **		PHASE 3&8		PHASE 4&7		PHASE 4&8		FLASH	
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR		
HARRISON AVE. NORTHBOUND	1	G/R	G/R	Y/R	R	G/G	G/G	Y/G	Y/G	R	R	R	R	R	R	R	R	R	R
	2	R	R	R	R	G	G	G	G	R	R	R	R	R	R	R	R	R	R
HARRISON AVE. SOUTHBOUND	3	G/R	G/R	Y/R	R	R	R	R	R	G/G	G/G	Y/G	Y/G	G	G	Y	R	R	R
	4	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
NAVARRE RD. WESTBOUND	5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
NAVARRE RD. EASTBOUND	7	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	8	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CROSSING HARRISON AVE.	A-A	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
	C-C	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
CROSSING NAVARRE RD.	B-B	DW	DW	DW	DW	W	W	W	W	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW
	D-D	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	W	FDW	DW	DW	DW	DW

\* IF PHASE 1&6 OCCURS NEXT, THEN LEFT ARROW ON HEAD 1 REMAINS GREEN  
 IF PHASE 2&5 OCCURS NEXT, THEN LEFT ARROW ON HEAD 3 REMAINS GREEN  
 \*\* IF PHASE 4&7 OCCURS NEXT, THEN LEFT ARROW ON HEAD 7 REMAINS GREEN  
 IF PHASE 3&8 OCCURS NEXT, THEN LEFT ARROW ON HEAD 5 REMAINS GREEN



**WIRING DIAGRAM**

**TRAFFIC SIGNAL CONTROLLER TIMING CHART**

**START UP**

START IN: ALL RED  
 TIME FOR FLASH OR ALL RED 7 SEC.  
 FIRST PHASE(S) # 2&6  
 COLOR DISPLAYED: GREEN

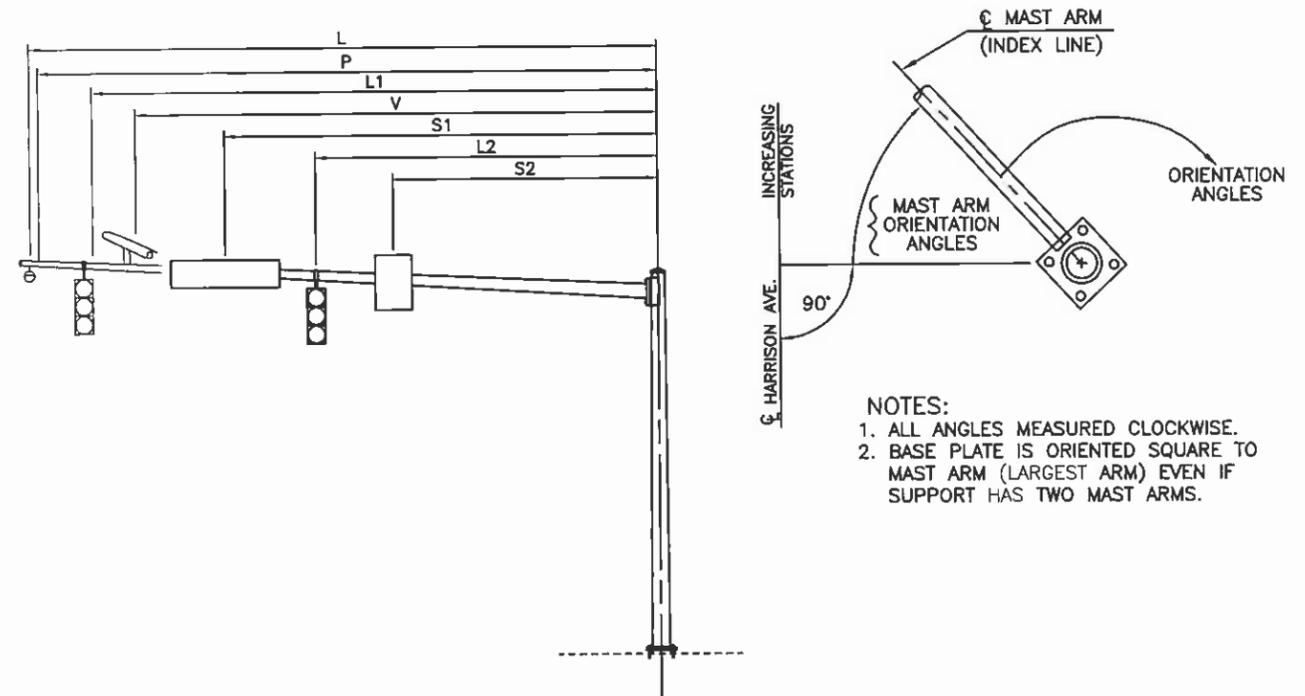
INTERVAL	CONTROLLER PHASE							
	1	2	3	4	5	6	7	8
	NBLT	SB	EBLT	WB	SBLT	NB	WBLT	EB
MINIMUM GREEN (INITIAL) (SEC.)	7	5	7	10	7	5	7	10
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	4	5	4	5	4	5	4	5
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	11	25	11	25	11	25	11	25
MAXIMUM GREEN II (SEC.)	15	30	15	30	15	30	15	30
YELLOW CHANGE (SEC.)	3	3.6	3	3.6	3	3.6	3	3.6
ALL RED CLEARANCE (SEC.)	0	1.7	0	1.4	0	1.7	0	1.4
WALK (SEC.)	-	7	-	7	-	7	-	7
PEDESTRIAN CLEARANCE (SEC.)	-	15	-	16	-	15	-	16
RECALL	MAXIMUM (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF
	PEDESTRIAN (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY (ON/OFF)	-	-	-	-	-	-	-	-
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-
	NO. 2	-	-	-	-	-	-	-

TRAFFIC SIGNAL DETAIL  
 NAVARRE ROAD AND HARRISON AVENUE S.W.

NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

ITEM	EXT.	QUANT	UNIT	DESCRIPTION
202	32001	98	EACH	CURB REMOVED, AS PER PLAN
202	30000	571	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	241	S.F.	4" CONCRETE WALK
608	49001	330	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	30	FEET	CURB, TYPE 6
625	14501	0	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	0	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	3	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	9	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	148	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	82	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	47	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	21	FEET	TRENCH
625	29601	156	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	0	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	0	EACH	CONNECTOR KIT, TYPE II
625	00600	0	EACH	CONNECTOR KIT, TYPE III
625	31510	4	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	177	EACH	PLASTIC CAUTION TAPE
630	87101	0	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	3	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	5	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	4	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	4	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	0	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	972	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	1231	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	0	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	170	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	8	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	8	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	4	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	688	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	1	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	1	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	1	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT TC-81.21										ANGLES(DEG.) FROM INDEX LINE					
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	V (FT.)	S1 (FT.)	S2 (FT.)	MAST ARM	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	2	31	27	16	30	23	-	-	0	A 250	A 250	B 345	B 345	180
P-2	21.0	11	42	41	29	39	36	-	-	77	B 270	B 270	C 0	C 0	0
P-3	21.0	12	48	47	34	45	42	-	-	0	C 255	C 310	D 25	D 0	0
P-4	21.0	3	33	30	20	32	27	-	-	77	A 0	A 0	D 270	D 270	270



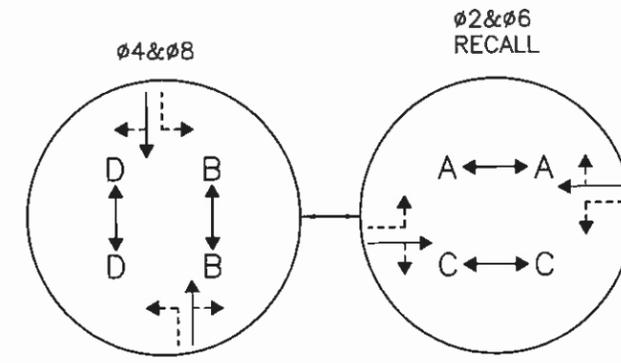
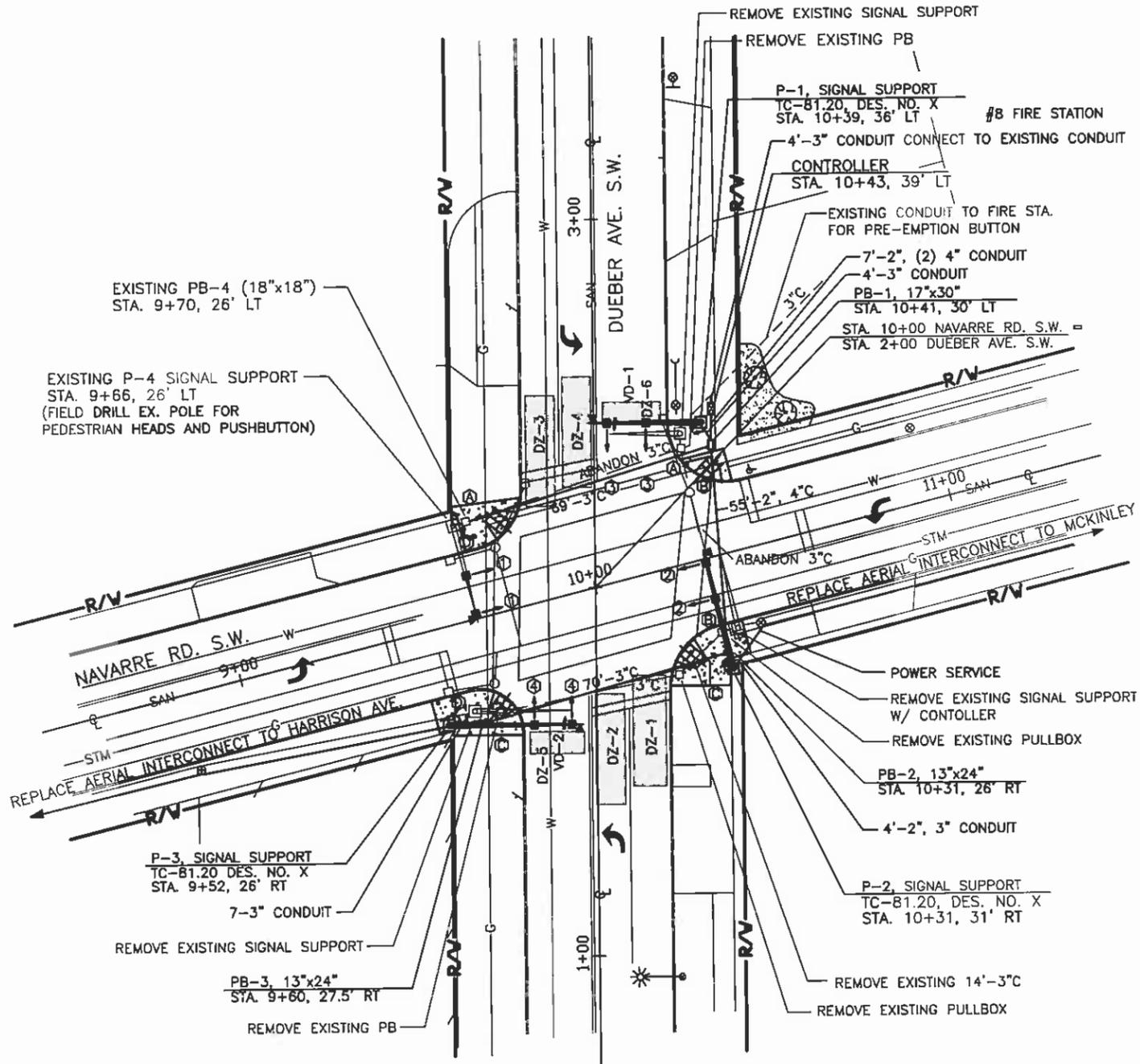
- NOTES:
1. ALL ANGLES MEASURED CLOCKWISE.
  2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.

CALCULATED: NJL  
 CHECKED: EGM  
 TRAFFIC SIGNAL DETAIL  
 NAVARRE ROAD AND HARRISON AVENUE S.W.

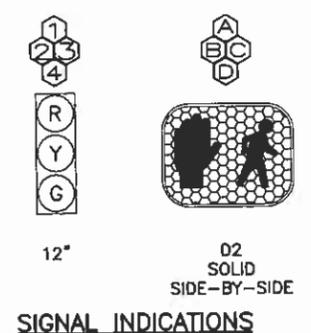
NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

**NOTE:**

CITY WILL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS



TRAFFIC SIGNAL DETECTOR ZONES					
DETECTION ZONE DESIGNATION	ASSOCIATED VIDEO DETECTOR	LOCATION-MOVEMENT	ASSOCIATED CONTROLLER PHASE	DELAY (SEC)	DELAY INHIBITED DURING
DZ-1	VD-1	DUEBER AVE.-NB TH/RT	4	5	4
DZ-2	VD-1	DUEBER AVE.-NB LT	4	0	
DZ-3	VD-2	DUEBER AVE.-SB TH/RT	8	5	8
DZ-4	VD-2	DUEBER AVE.-SB LT	8	0	
DZ-5	VD-1	DUEBER AVE.-SB	SYSTEM	0	4
DZ-6	VD-2	DUEBER AVE.-NB	SYSTEM	0	



**CURB RAMP CHART**

CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	1	A1	61
NE	1	A1	61
SW	1	A1	61
SE	1	A1	61

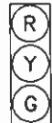
\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

- LEGEND**
- 3-SECTION HEAD
  - 5-SECTION HEAD
  - VIDEO DETECTOR
  - PREEMPTION DETECTOR
  - CONTROLLER CABINET
  - PULL BOX
  - NOSTALGIA POLE
  - PEDESTRIAN SIGNAL
  - STREET NAME SIGN
  - CONCRETE SIDEWALK REMOVAL AND REPLACEMENT
  - DECORATIVE LIGHT
  - UTILITY POLE
  - CATCH BASIN
  - MANHOLE
  - HYDRANT
  - WATER
  - GAS
  - SANITARY
  - STORM
  - TELEPHONE

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- AI INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- UI INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- P POWER CABLE, (BY CONDUCTOR), #10 AWG
- PE PRE-EMPTION CABLE
- V VIDEO DETECTOR CABLE
- X PEDESTRIAN SIGNAL HEAD
- SPLICE LOCATION
- X VEHICULAR SIGNAL HEAD
- (P<sub>x</sub>) PEDESTRIAN PUSHBUTTON
- ▶ VIDEO DETECTOR CAMERA
- ▶ PRE-EMPTION DETECTOR
- ☀ LUMINAIRE

1,2,3,4

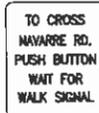


A-D

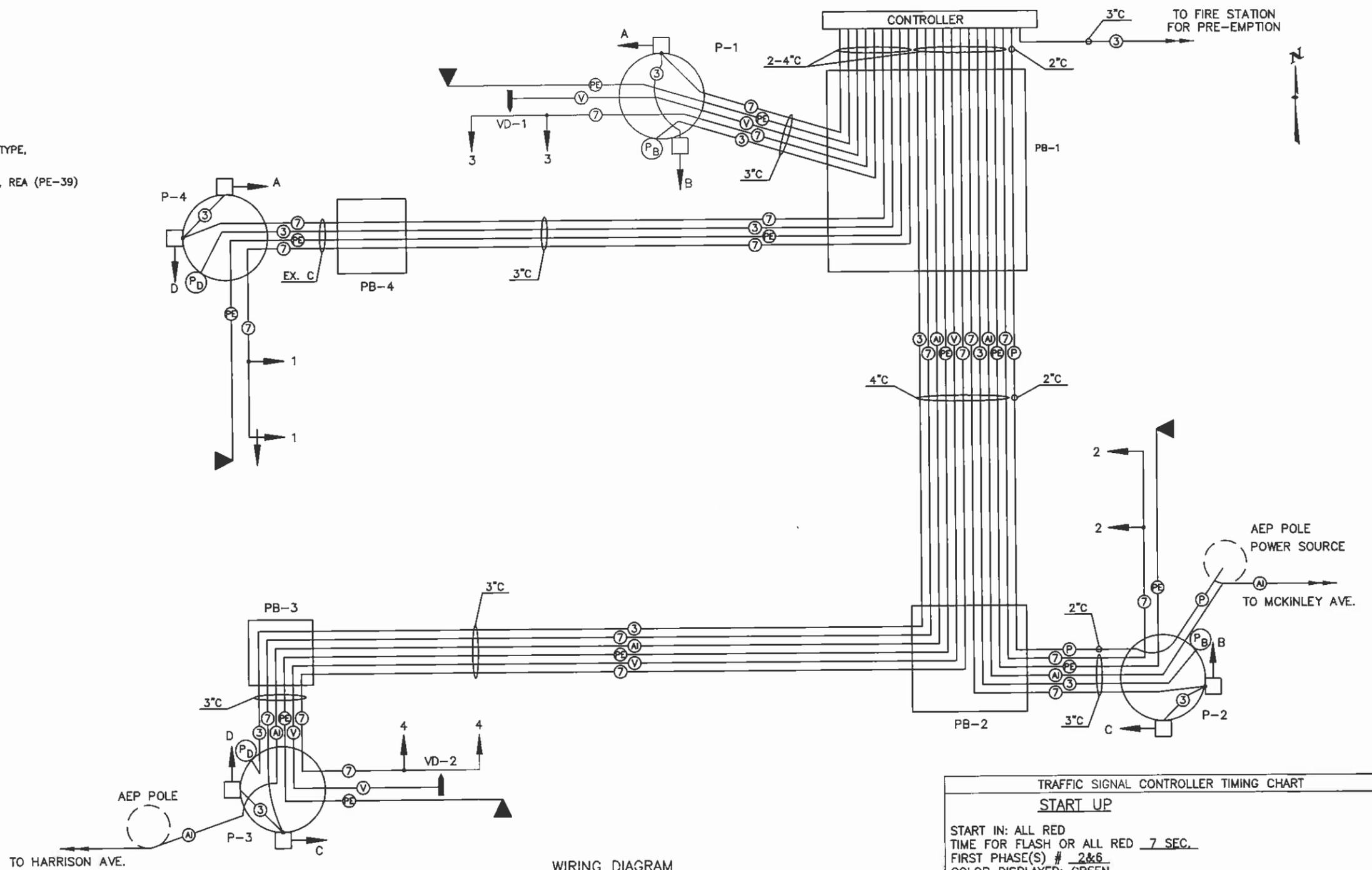


**SIGNAL INDICATIONS**

B,D



R-73A-9



**WIRING DIAGRAM**

**PRE-EMPTION NOTES:** CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

**SIGNAL DISPLAY CHART**

DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4&8				FLASH
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
NAVARRE RD. WESTBOUND	1	G	G	Y	R	R	R	R	R	Y
	1	G	G	Y	R	R	R	R	R	Y
NAVARRE RD. EASTBOUND	2	G	G	Y	R	R	R	R	R	Y
	2	G	G	Y	R	R	R	R	R	Y
DUEBER AVE. NORTHBOUND	3	R	R	R	R	G	G	Y	R	R
	3	R	R	R	R	G	G	Y	R	R
DUEBER AVE. SOUTHBOUND	4	R	R	R	R	G	G	Y	R	R
	4	R	R	R	R	G	G	Y	R	R
CROSSING DUEBER AVE.	A-A	W	FDW	DW	DW	DW	DW	DW	DW	DARK
	C-C	W	FDW	DW	DW	DW	DW	DW	DW	DARK
CROSSING NAVARRE RD.	B-B	DW	DW	DW	DW	W	FDW	DW	DW	DARK
	D-D	DW	DW	DW	DW	W	FDW	DW	DW	DARK

**TRAFFIC SIGNAL CONTROLLER TIMING CHART**

**START UP**

START IN: ALL RED  
 TIME FOR FLASH OR ALL RED 7 SEC.  
 FIRST PHASE(S) # 2&6  
 COLOR DISPLAYED: GREEN

INTERVAL	CONTROLLER PHASE							
	1	2	3	4	5	6	7	8
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	-	5	-	10
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	5
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	40	-	25	-	40	-	25
MAXIMUM GREEN II (SEC.)	-	45	-	30	-	45	-	30
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	-	3.6	-	3.6
ALL RED CLEARANCE (SEC.)	-	1.6	-	1.1	-	1.6	-	1.1
WALK (SEC.)	-	7	-	7	-	7	-	7
PEDESTRIAN CLEARANCE (SEC.)	-	25	-	25	-	25	-	25
RECALL	MAXIMUM (ON/OFF)	OFF						
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN (ON/OFF)	OFF						
MEMORY (ON/OFF)	-	-	-	-	-	-	-	-
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-
	NO. 2	-	-	-	-	-	-	-

TRAFFIC SIGNAL DETAIL  
 NAVARRE ROAD AND DUEBER AVENUE S.W.

NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

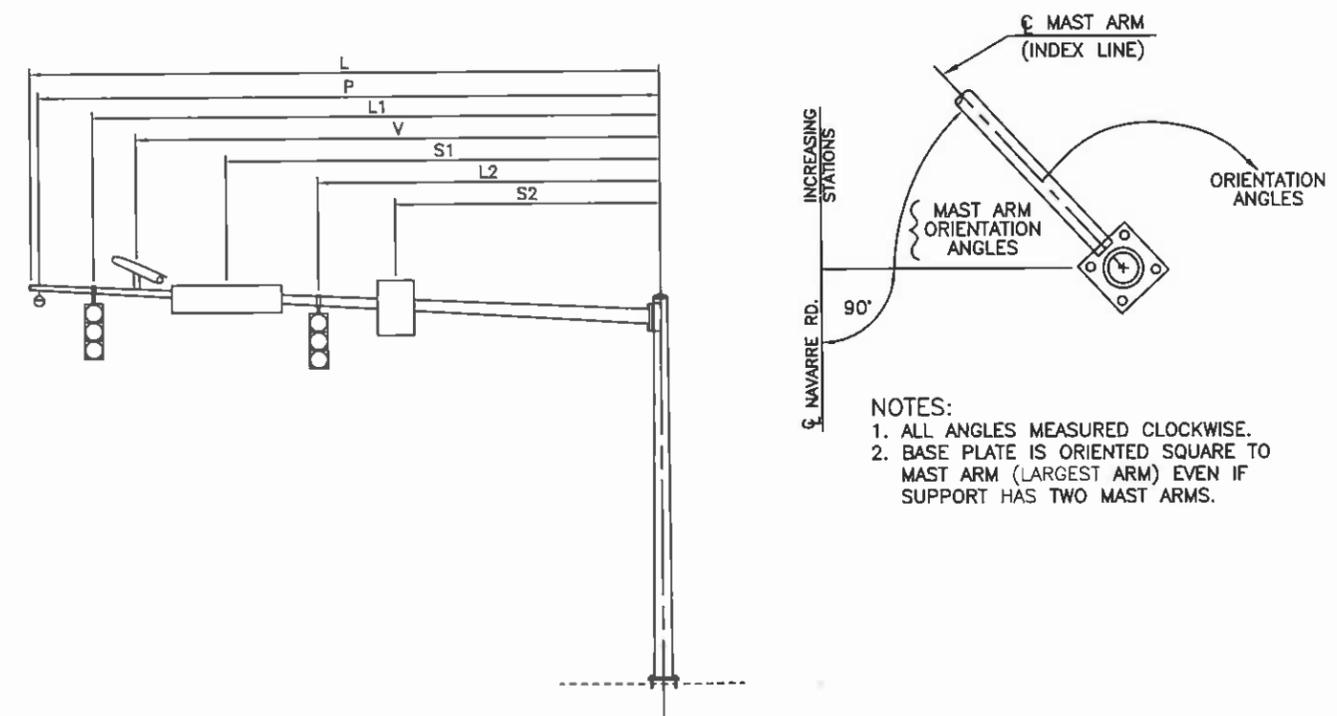
ITEM	EXT.	QUANT.	UNIT	DESCRIPTION
202	32001	100	EACH	CURB REMOVED, AS PER PLAN
202	30000	729	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	485	S.F.	4" CONCRETE WALK
608	49001	244	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	36	FEET	CURB, TYPE 6
625	14501	0	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	0	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	2	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	63	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	158	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	69	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	26	FEET	TRENCH
625	29601	194	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	4	EACH	GROUND ROD
625	23304	0	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	0	EACH	CONNECTOR KIT, TYPE II
625	00600	0	EACH	CONNECTOR KIT, TYPE III
625	31510	3	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	220	EACH	PLASTIC CAUTION TAPE
630	87101	0	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	8	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE AS PER PLAN
632	05085	0	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	4	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	3	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	2	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	0	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	571	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	1150	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	0	EACH	SIGNALIZATION MISC.: INTERCONNECT SPL. K. E. ENCLOSURE
632	66101	280	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	6	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	6	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	2	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	4	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	635	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	0	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	1	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT  
TC-81.21

ANGLES(DEG.)  
FROM  
INDEX LINE

POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	V (FT.)	S1 (FT.)	S2 (FT.)	MAST ARM	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	2	31	26	15	30	24	-	-	105	A 255	-	B 0	B 180	180
P-2	21.0	2	32	29.5	19.5	31	-	-	-	0	B 280	B 285	C 0	-	270
P-3	21.0	3	37	34	23	36	32	-	-	255	C 255	-	D 15	D 0	180
P-4 *	21.0	*	26	24	13	25	-	-	-	0	A 180	-	D 270	D 315	-

\* EXISTING SIGNAL SUPPORT AND ARM



- NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.

TRAFFIC SIGNAL DETAIL  
NAVARRE ROAD AND DUEBER AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

CALCULATED:  
N/JL  
CHECKED:  
EGM

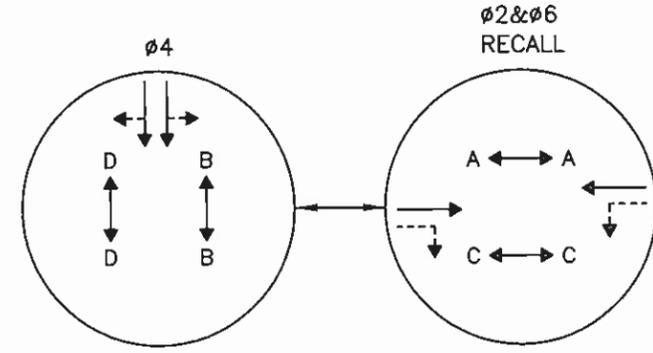
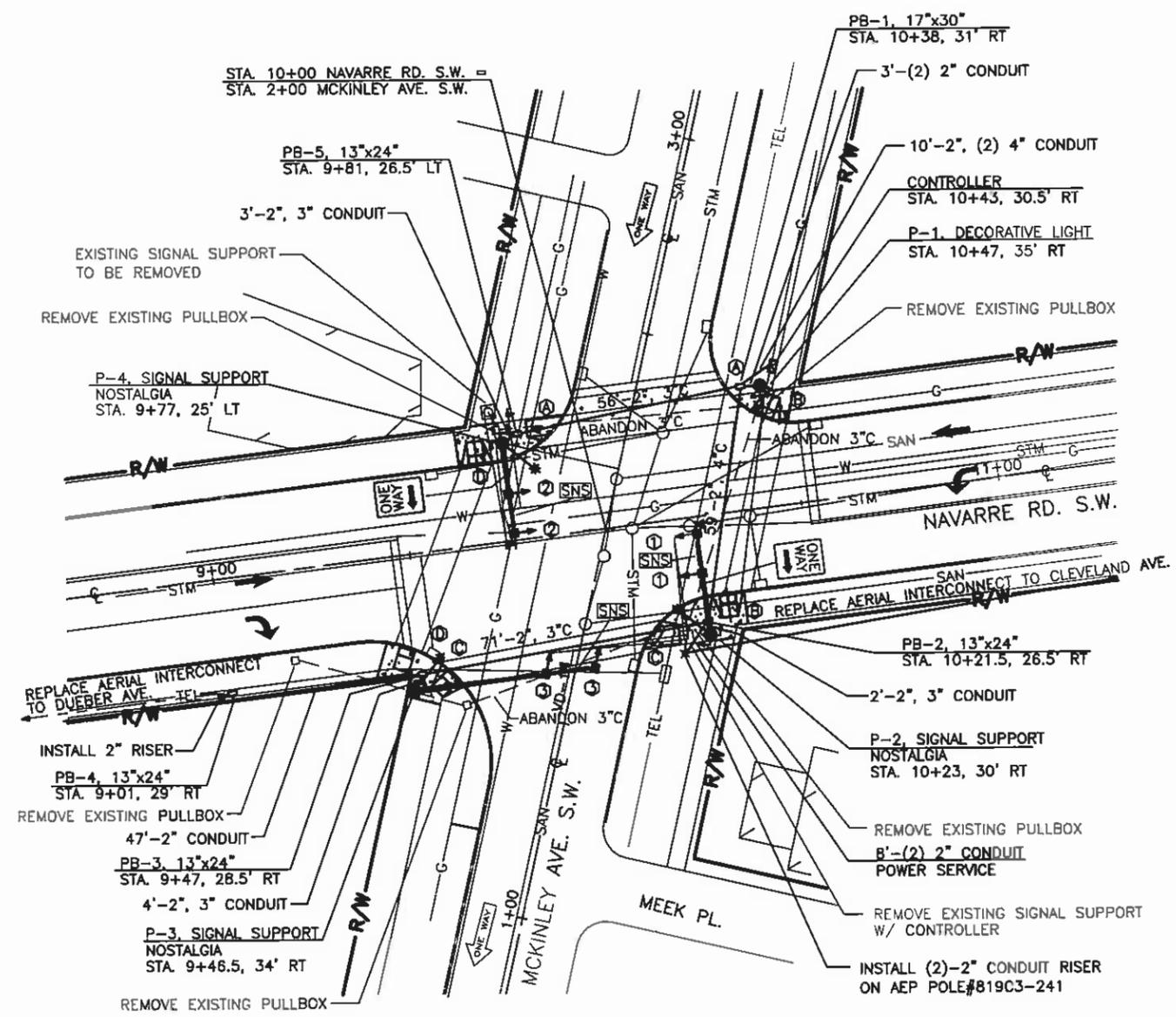


HORIZONTAL SCALE  
1" = 20 FEET

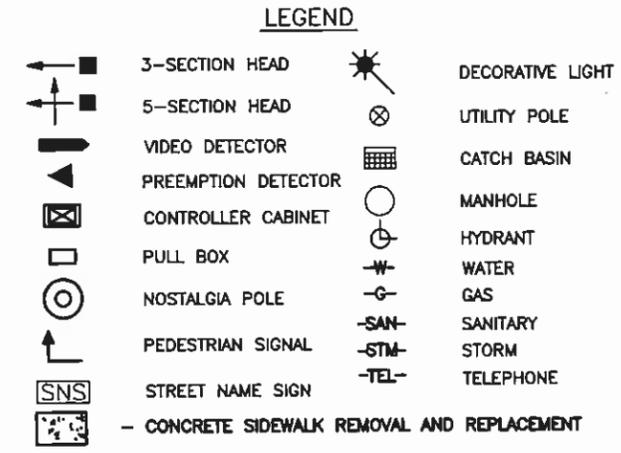
TRAFFIC SIGNAL PLAN  
NAVARRE ROAD AND MCKINLEY AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

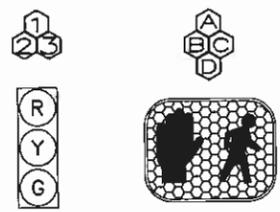
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PHASING DIAGRAM



**NOTE:**  
CITY WILL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS.



SIGNAL INDICATIONS

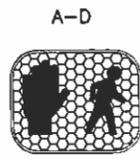
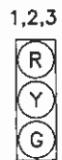
CURB RAMP CHART

CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	2	A1, B3	103
NE	1	A1	61
SW	2	A1, B3	103
SE	2	B2, B3	138

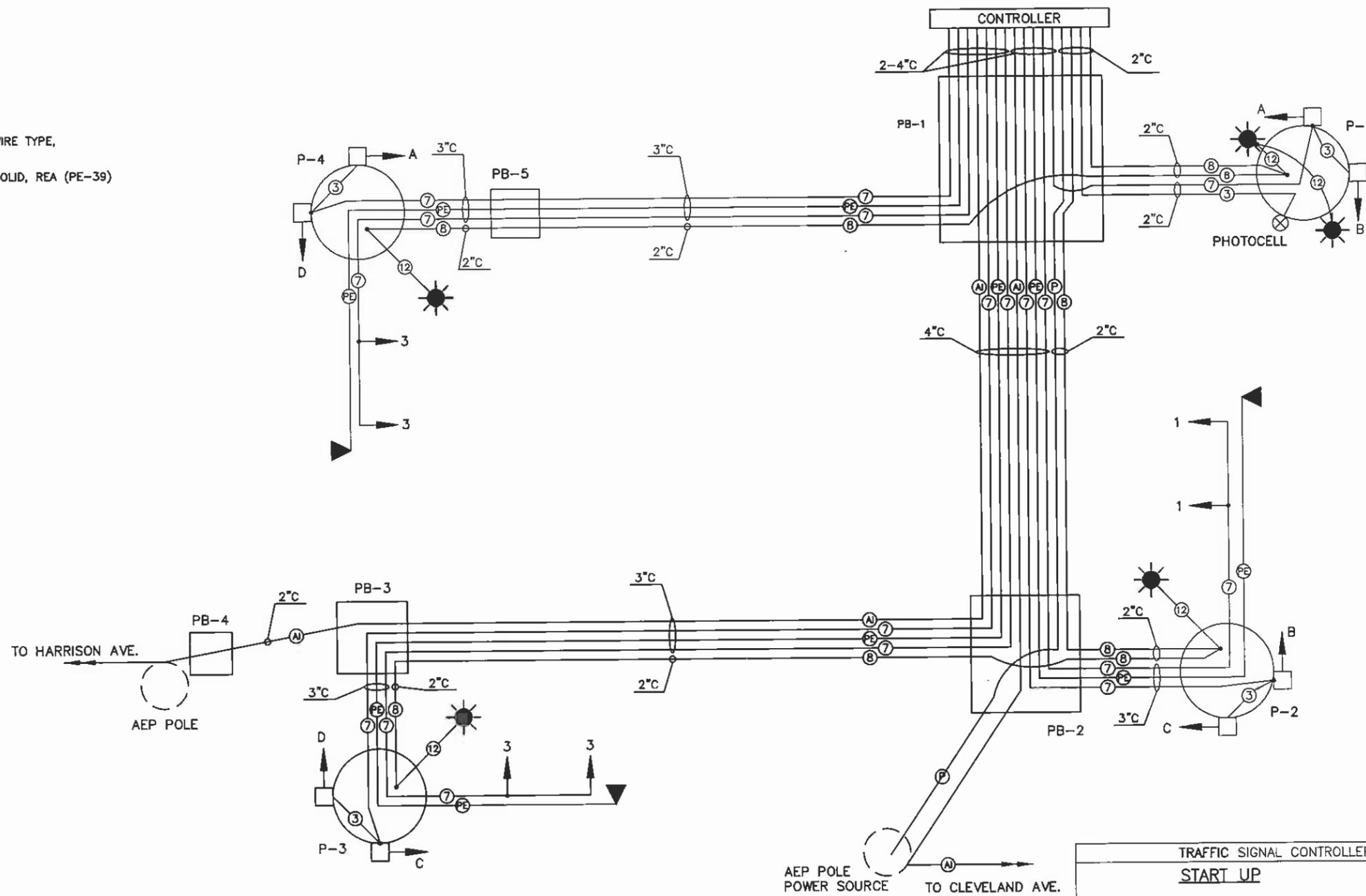
\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- (AI) INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (UI) INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (P) POWER CABLE, (BY CONDUCTOR), #10 AWG
- (PE) PRE-EMPTION CABLE
- (V) VIDEO DETECTOR CABLE
- X PEDESTRIAN SIGNAL HEAD
- SPLICE LOCATION
- X VEHICULAR SIGNAL HEAD
- (P<sub>x</sub>) PEDESTRIAN PUSHBUTTON
- ▶ VIDEO DETECTOR CAMERA
- ▶ PRE-EMPTION DETECTOR
- ☀ LUMINAIRE



**SIGNAL INDICATIONS**



**WIRING DIAGRAM**

**PRE-EMPTION NOTES:** CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

**SIGNAL DISPLAY CHART**

DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4				FLASH
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
NAVARRE RD. EASTBOUND	1	G	G	Y	R	R	R	R	R	Y
	1	G	G	Y	R	R	R	R	R	Y
NAVARRE RD. WESTBOUND	2	G	G	Y	R	R	R	R	R	Y
	2	G	G	Y	R	R	R	R	R	Y
McKINLEY AVE. SOUTHBOUND	3	R	R	R	R	G	G	Y	R	R
	3	R	R	R	R	G	G	Y	R	R
CROSSING McKINLEY AVE.	A-A	W	FDW	DW	DW	DW	DW	DW	DW	DARK
	C-C	W	FDW	DW	DW	DW	DW	DW	DW	DARK
CROSSING NAVARRE RD.	B-B	DW	DW	DW	DW	W	FDW	DW	DW	DARK
	D-D	DW	DW	DW	DW	W	FDW	DW	DW	DARK

**TRAFFIC SIGNAL CONTROLLER TIMING CHART**

START UP									
START IN: ALL RED									
TIME FOR FLASH OR ALL RED <u>7</u> SEC.									
FIRST PHASE(S) # <u>2&amp;6</u>									
COLOR DISPLAYED: GREEN									
INTERVAL	CONTROLLER PHASE								
	1	2	3	4	5	6	7	8	
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	6	-	5	-	-	
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-	
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	-	
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-	
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-	
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-	
MAXIMUM GREEN I (SEC.)	-	40	-	25	-	40	-	-	
MAXIMUM GREEN II (SEC.)	-	40	-	25	-	40	-	-	
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	-	3.6	-	-	
ALL RED CLEARANCE (SEC.)	-	1.4	-	1.4	-	1.4	-	-	
WALK (SEC.)	-	7	-	7	-	7	-	-	
PEDESTRIAN CLEARANCE (SEC.)	-	25	-	25	-	25	-	-	
RECALL	MAXIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	MINIMUM (ON/OFF)	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
	PEDESTRIAN (ON/OFF)	OFF							
MEMORY (ON/OFF)	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-	-
	NO. 2	-	-	-	-	-	-	-	-

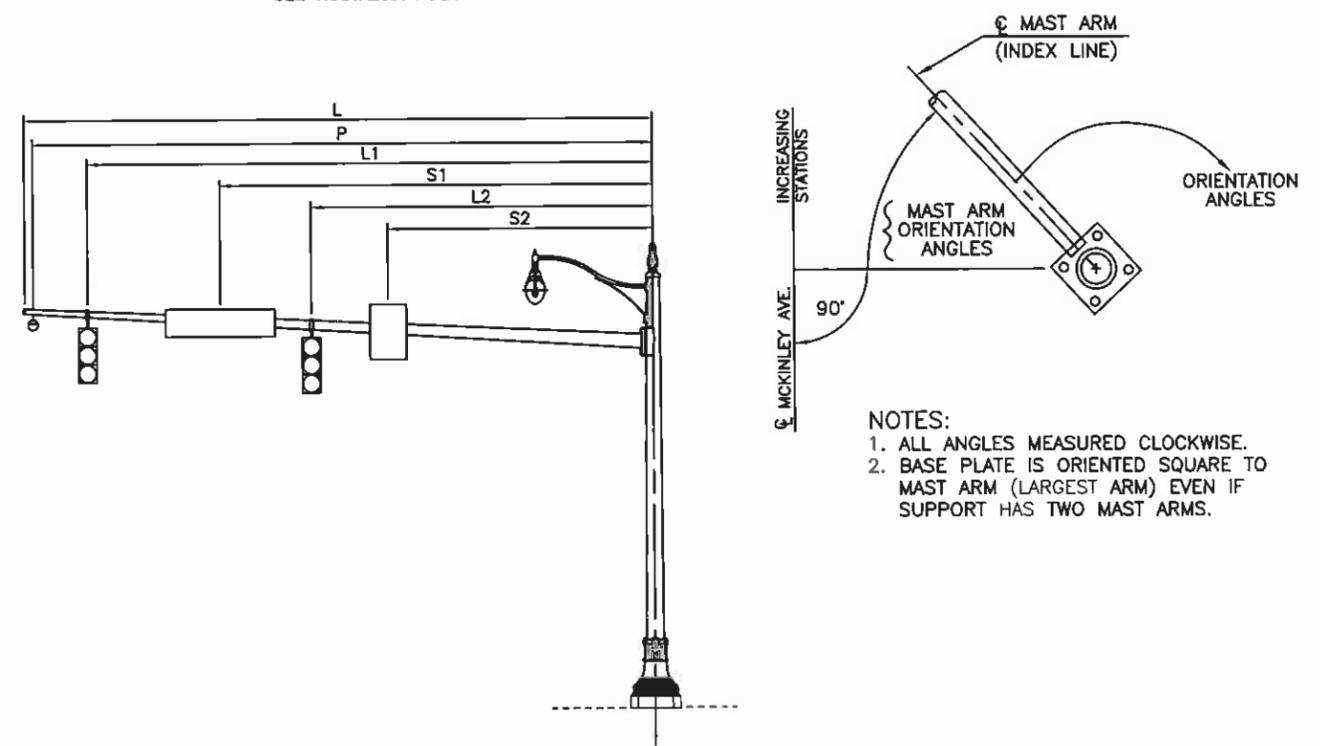
TRAFFIC SIGNAL DETAIL  
 NAVARRE ROAD AND MCKINLEY AVENUE S.W.

NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

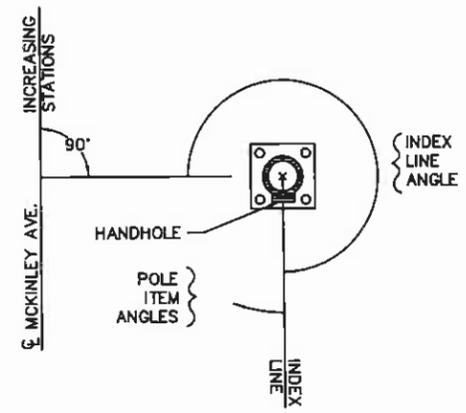
ITEM	EXT.	QUANT	UNIT	DESCRIPTION
202	32001	104	EACH	CURB REMOVED, AS PER PLAN
202	30000	718	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	313	S.F.	4" CONCRETE WALK
608	49001	405	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	30	FEET	CURB, TYPE 6
625	14501	1	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	1	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	3	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	255	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	139	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	79	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	77	FEET	TRENCH
625	29601	186	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	1380	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	12	EACH	CONNECTOR KIT, TYPE II
625	00600	4	EACH	CONNECTOR KIT, TYPE III
625	31510	4	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	263	EACH	PLASTIC CAUTION TAPE
630	87101	5	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	6	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	0	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	0	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	3	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	3	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	2	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	76	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	1040	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	0	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	390	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	6	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	8	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	4	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	550	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	0	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	0	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT NOSTALGIA										ANGLES(DEG.) FROM INDEX LINE						
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	S1 (FT.)	S2 (FT.)	LUMINAIRE (FT.)	MAST ARM	LUMINAIRE BRACKET	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-2	21.0	*	29	25.5	15.5	28	20.5	13	*	70	315	B 110	-	C 180	-	180
P-3	21.0	*	47	46	34	36	40	-	*	340	315	C 270	-	D 20	-	90
P-4	21.0	*	26	23	13	25	18	8	*	70	315	A 180	-	D 115	-	180

\* SEE NOSTALGIA POLE DETAILS



- NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.



- NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE.  
3. DOUBLE LUMINAIRE SHALL BE MOUNTED PARALLEL TO MAIN STREET

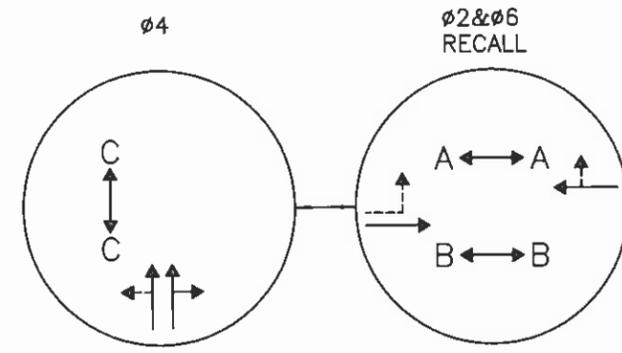
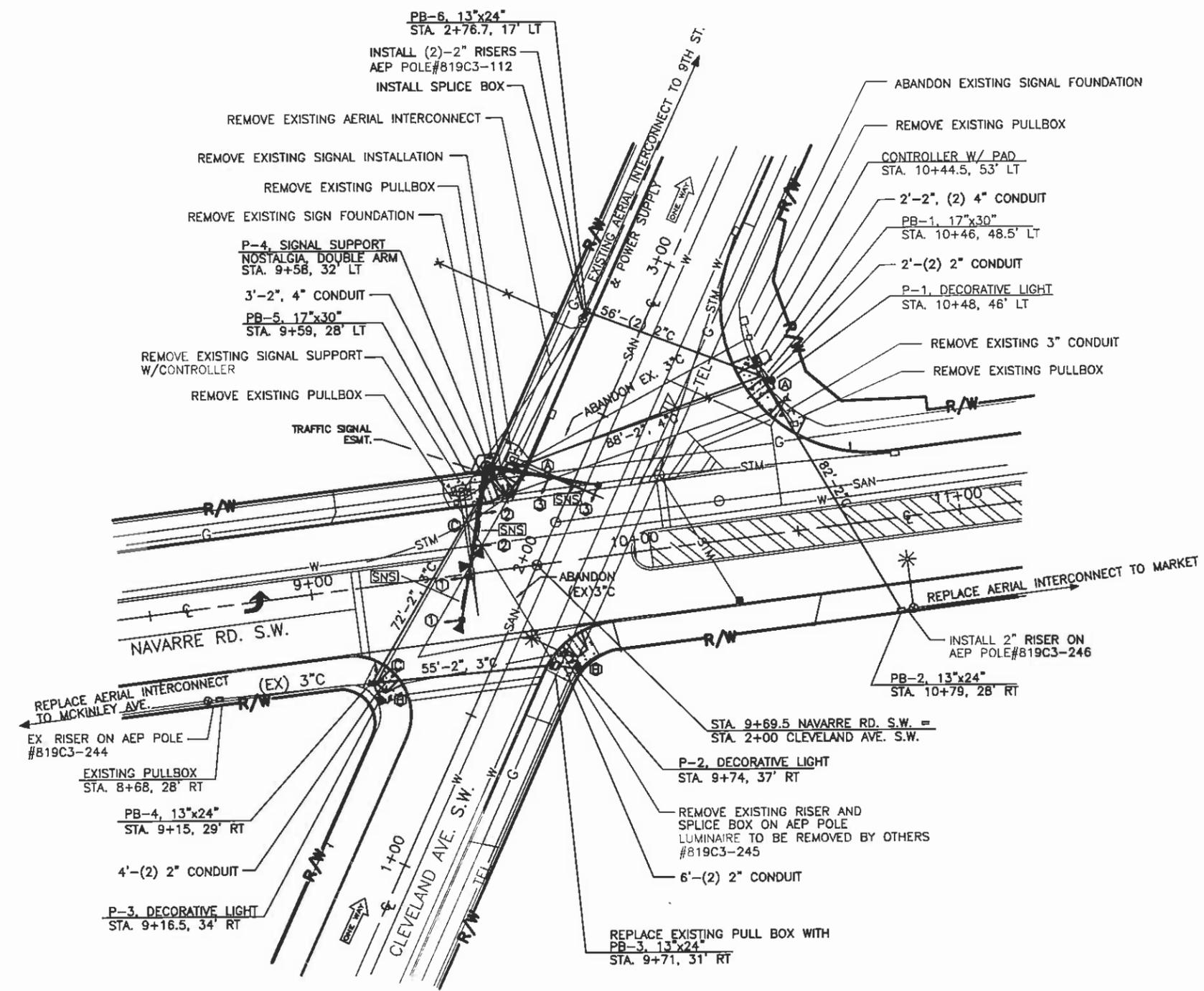
PEDESTAL CHART					
POLE NO.	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	A 108	-	B 180	-	180

CALCULATED: NJL  
CHECKED: EGM  
TRAFFIC SIGNAL DETAIL  
NAVARRE ROAD AND MCKINLEY AVENUE S.W.  
NAVARRE ROAD S.W. SIGNAL SYSTEM  
17  
54

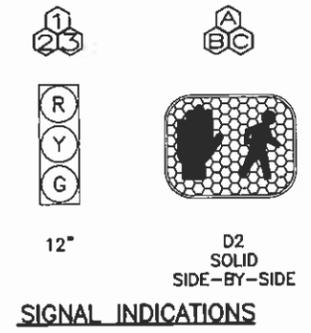
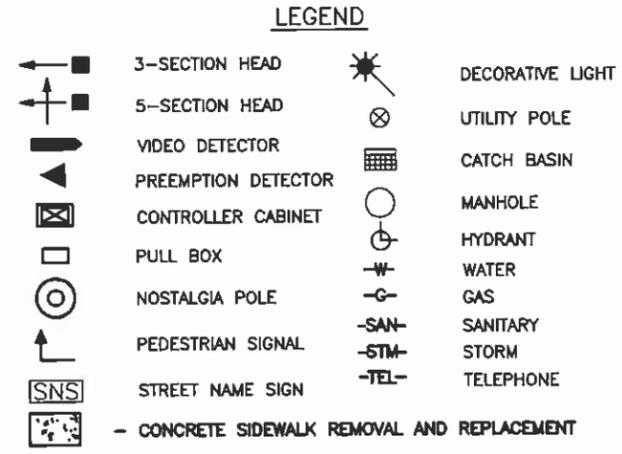


TRAFFIC SIGNAL PLAN  
NAVARRE ROAD AND CLEVELAND AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM



PHASING DIAGRAM



NOTE:  
CITY WILL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS.

CURB RAMP CHART

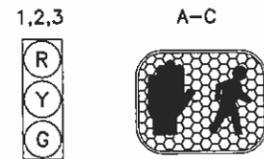
CORNER	CURB RAMP NO.	TYPE*	AREA (S.F.)
NW	1	A1	61
NE	1	B2	96
SW	1	A1	61
SE	1	A1	61

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

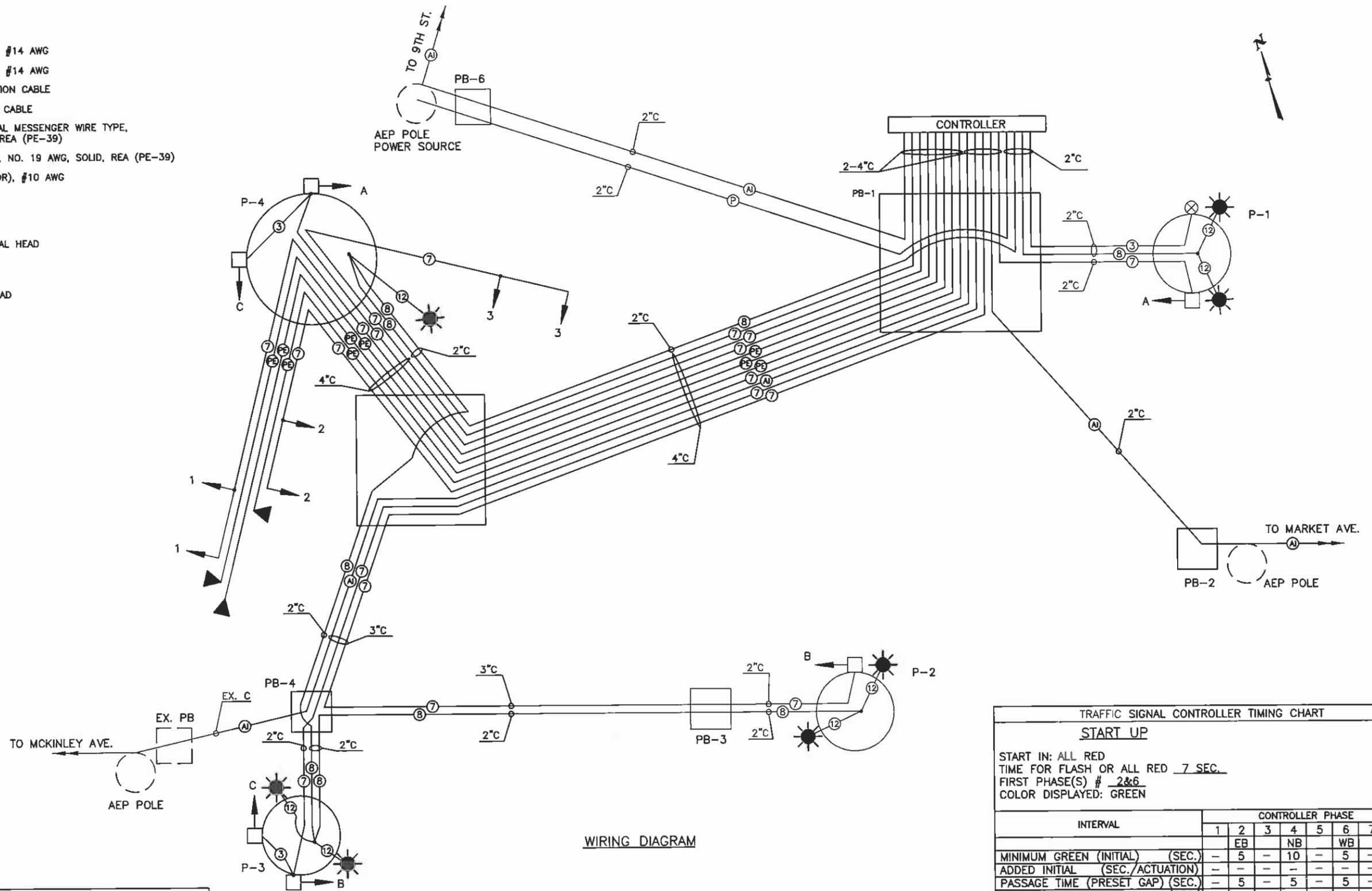
**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⓑ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- Ⓐ INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓤ INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓟ POWER CABLE, (BY CONDUCTOR), #10 AWG
- Ⓟ PRE-EMPTION CABLE
- Ⓥ VIDEO DETECTOR CABLE

- ☐ X PEDESTRIAN SIGNAL HEAD
- SPLICE LOCATION
- ➔ X VEHICULAR SIGNAL HEAD
- Ⓟ PEDESTRIAN PUSHBUTTON
- ➔ VIDEO DETECTOR CAMERA
- ▶ PRE-EMPTION DETECTOR
- ☀ LUMINAIRE



**SIGNAL INDICATIONS**



**WIRING DIAGRAM**

**PRE-EMPTION NOTES:** CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

**SIGNAL DISPLAY CHART**

DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4				FLASH
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
NAVARRE RD. EASTBOUND	1	G	G	Y	R	R	R	R	R	Y
	1	G	G	Y	R	R	R	R	R	Y
NAVARRE RD. WESTBOUND	2	G	G	Y	R	R	R	R	R	Y
	2	G	G	Y	R	R	R	R	R	Y
CLEVELAND AVE. NORTHBOUND	3	R	R	R	R	G	G	Y	R	R
	3	R	R	R	R	G	G	Y	R	R
CROSSING CLEVELAND AVE.	A-A	W	FDW	DW	DW	DW	DW	DW	DW	DARK
CROSSING NAVARRE RD.	B-B	W	FDW	DW	DW	DW	DW	DW	DW	DARK
CROSSING NAVARRE RD.	C-C	DW	DW	DW	DW	W	FDW	DW	DW	DARK

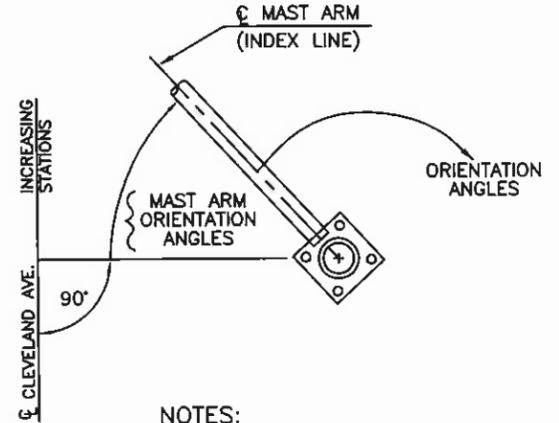
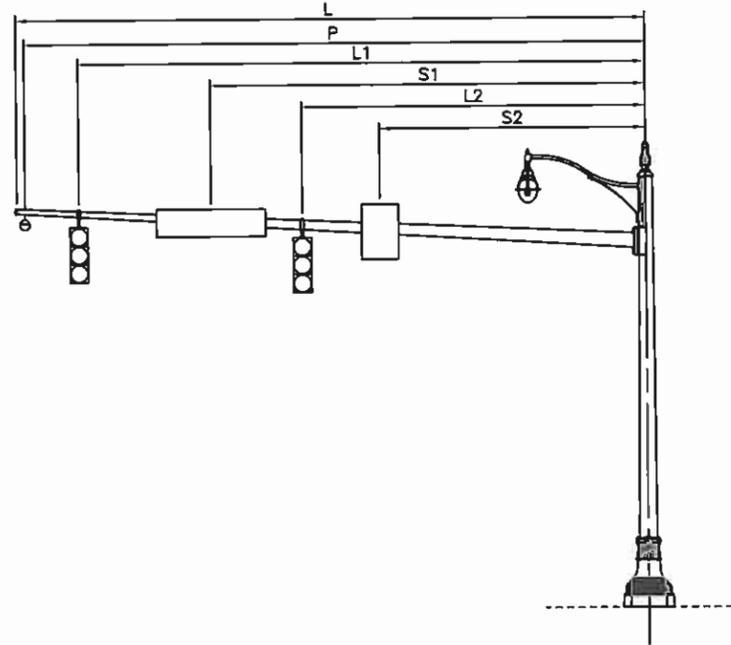
TRAFFIC SIGNAL CONTROLLER TIMING CHART									
START UP									
START IN: ALL RED									
TIME FOR FLASH OR ALL RED 7 SEC.									
FIRST PHASE(S) # 2&6									
COLOR DISPLAYED: GREEN									
INTERVAL	CONTROLLER PHASE								B
	1	2	3	4	5	6	7	8	
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	-	5	-	-	-
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	-	-
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	40	-	25	-	40	-	-	-
MAXIMUM GREEN II (SEC.)	-	40	-	25	-	40	-	-	-
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	-	3.6	-	-	-
ALL RED CLEARANCE (SEC.)	-	1.4	-	1.4	-	1.4	-	-	-
WALK (SEC.)	-	7	-	7	-	7	-	-	-
PEDESTRIAN CLEARANCE (SEC.)	-	25	-	25	-	25	-	-	-
RECALL	MAXIMUM (ON/OFF)	OFF							
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN (ON/OFF)	OFF							
MEMORY	(ON/OFF)	-	-	-	-	-	-	-	-
	NO. 1	-	YES	-	-	-	YES	-	-
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-	-
	NO. 2	-	-	-	-	-	-	-	-

TRAFFIC SIGNAL DETAIL  
 NAVARRE ROAD AND CLEVELAND AVENUE S.W.  
 NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

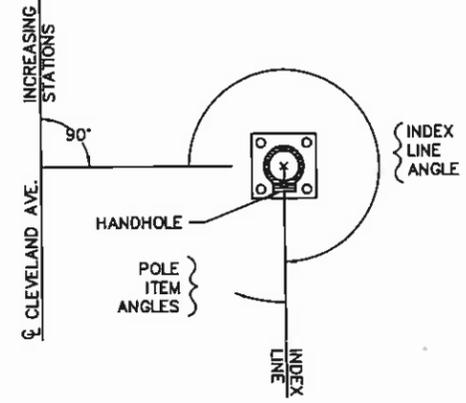
ITEM	EXT.	QUANT	UNIT	DESCRIPTION
202	32001	99	EACH	CURB REMOVED, AS PER PLAN
202	30000	614	S.F.	WALK REMOVED
202	98100	1	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	274	S.F.	4" CONCRETE WALK
608	49001	340	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	19	FEET	CURB, TYPE 6
625	14501	3	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	3	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	4	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	438	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	127	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	95	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	17	FEET	TRENCH
625	29601	353	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	1420	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	12	EACH	CONNECTOR KIT, TYPE II
625	00600	4	EACH	CONNECTOR KIT, TYPE III
625	31510	5	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	370	EACH	PLASTIC CAUTION TAPE
630	87101	3	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	6	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	0	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	6	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	0	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	1	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	1	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	3	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	48	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	1240	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	1	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	330	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	6	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	6	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	3	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	565	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	1	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC. PRE-EMPTION
816	30001	0	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT NOSTALGIA														ANGLES(DEG.) FROM INDEX LINE						
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	L3 (FT.)	L4 (FT.)	P1 (FT.)	P2 (FT.)	P3 (FT.)	S1 (FT.)	S2 (FT.)	LUMINAIRE (FT.)	MAST ARM	LUMINAIRE BRACKET	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-4		*											*	**	315	A 165	-	C 290	-	290
NB ARM	21.0		36	35	20	-	-	-	-	-	27.5	-		345						
EB/WB ARM	21.0		49	47	34	25	15	48	31	27	40.5	20		75						

\* SEE NOSTALGIA POLE DETAILS  
 \*\* EB/WB ARM IS REFERENCE ARM (INDEX LINE)



NOTES:  
 1. ALL ANGLES MEASURED CLOCKWISE.  
 2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.



NOTES:  
 1. ALL ANGLES MEASURED CLOCKWISE.  
 2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE.  
 3. DOUBLE LUMINAIRES SHALL BE MOUNTED PARALLEL TO MAIN STREET

PEDESTAL CHART					
POLE NO.	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	A 225	-	-	-	225
P-2	B 60	-	-	-	90
P-3	B 230	-	C 0	-	45

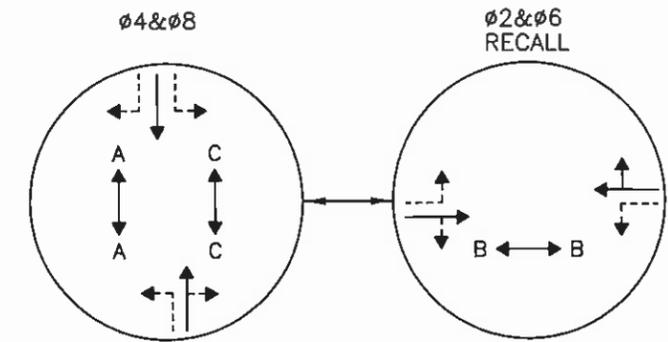
CALCULATED: NJL  
 CHECKED: EGM  
 NAVARRE ROAD S.W. SIGNAL SYSTEM  
 NAVARRE ROAD AND CLEVELAND AVENUE S.W.  
 20  
 54



HORIZONTAL SCALE  
1" = 20 FEET

TRAFFIC SIGNAL PLAN  
NAVARRE ROAD S.W. AND MARKET AVENUE S.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM



PHASING DIAGRAM

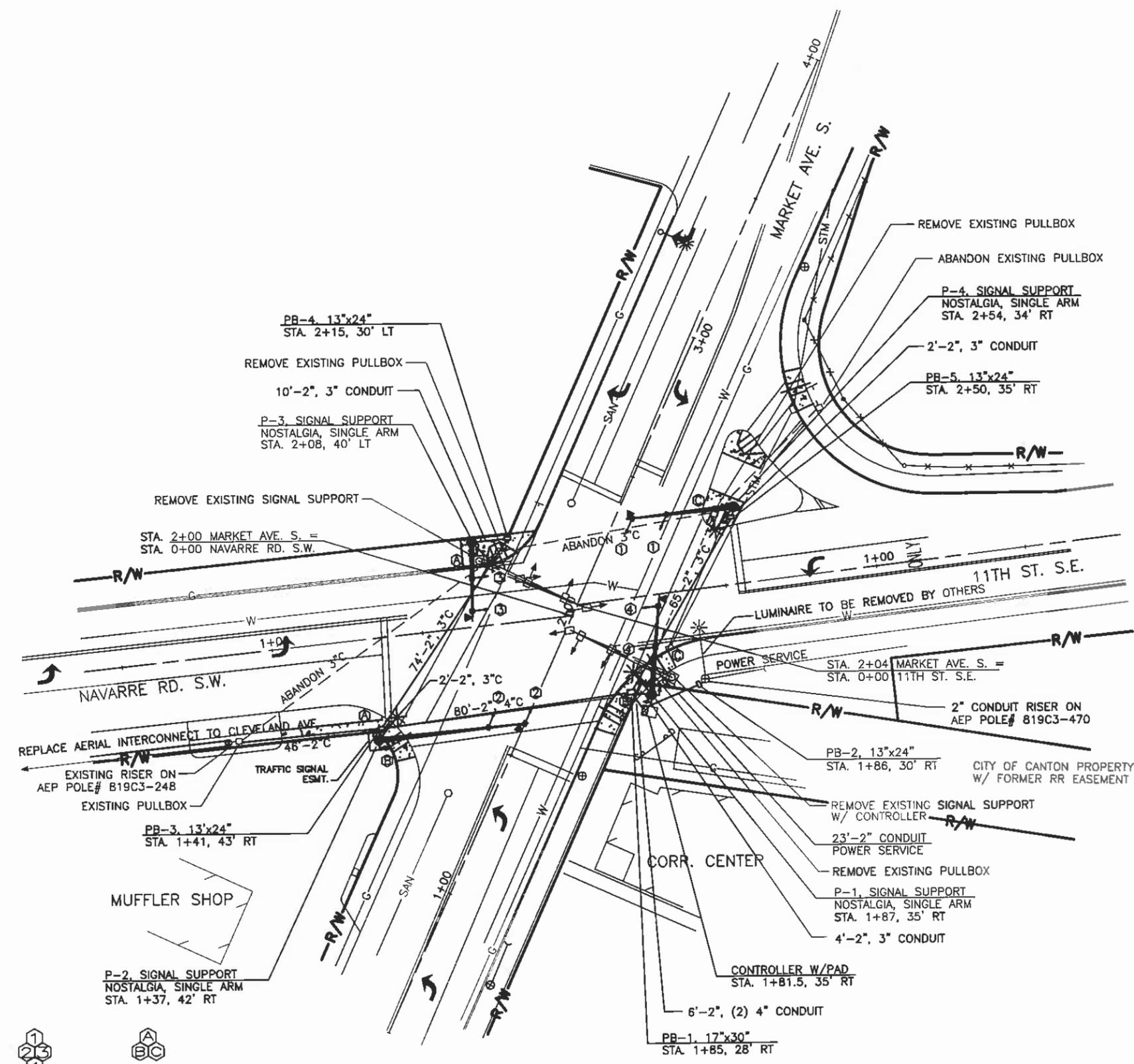
LEGEND

- 3-SECTION HEAD
- 5-SECTION HEAD
- VIDEO DETECTOR
- PREEMPTION DETECTOR
- CONTROLLER CABINET
- PULL BOX
- NOSTALGIA POLE
- PEDESTRIAN SIGNAL
- STREET NAME SIGN
- CONCRETE SIDEWALK REMOVAL AND REPLACEMENT
- DECORATIVE LIGHT
- UTILITY POLE
- CATCH BASIN
- MANHOLE
- HYDRANT
- WATER
- GAS
- SANITARY
- TELEPHONE

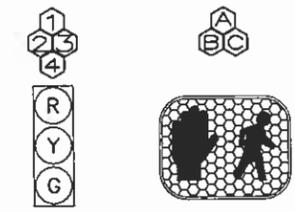
CURB RAMP CHART

CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	1	A1	61
NE	3	A1,A1,B2	218
SW	1	B2	96
SE	2	B2, B2	192

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.



NOTE:  
CITY WILL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS.



12" D2 SOLID SIDE-BY-SIDE  
SIGNAL INDICATIONS

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- Ⓐ INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓤ INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓟ POWER CABLE, (BY CONDUCTOR), #10 AWG
- Ⓟ PRE-EMPTION CABLE
- Ⓥ VIDEO DETECTOR CABLE

☐ X PEDESTRIAN SIGNAL HEAD

• SPLICE LOCATION

→ X VEHICULAR SIGNAL HEAD

Ⓟ PEDESTRIAN PUSHBUTTON

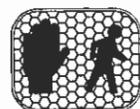
▶ VIDEO DETECTOR CAMERA

▶ PRE-EMPTION DETECTOR

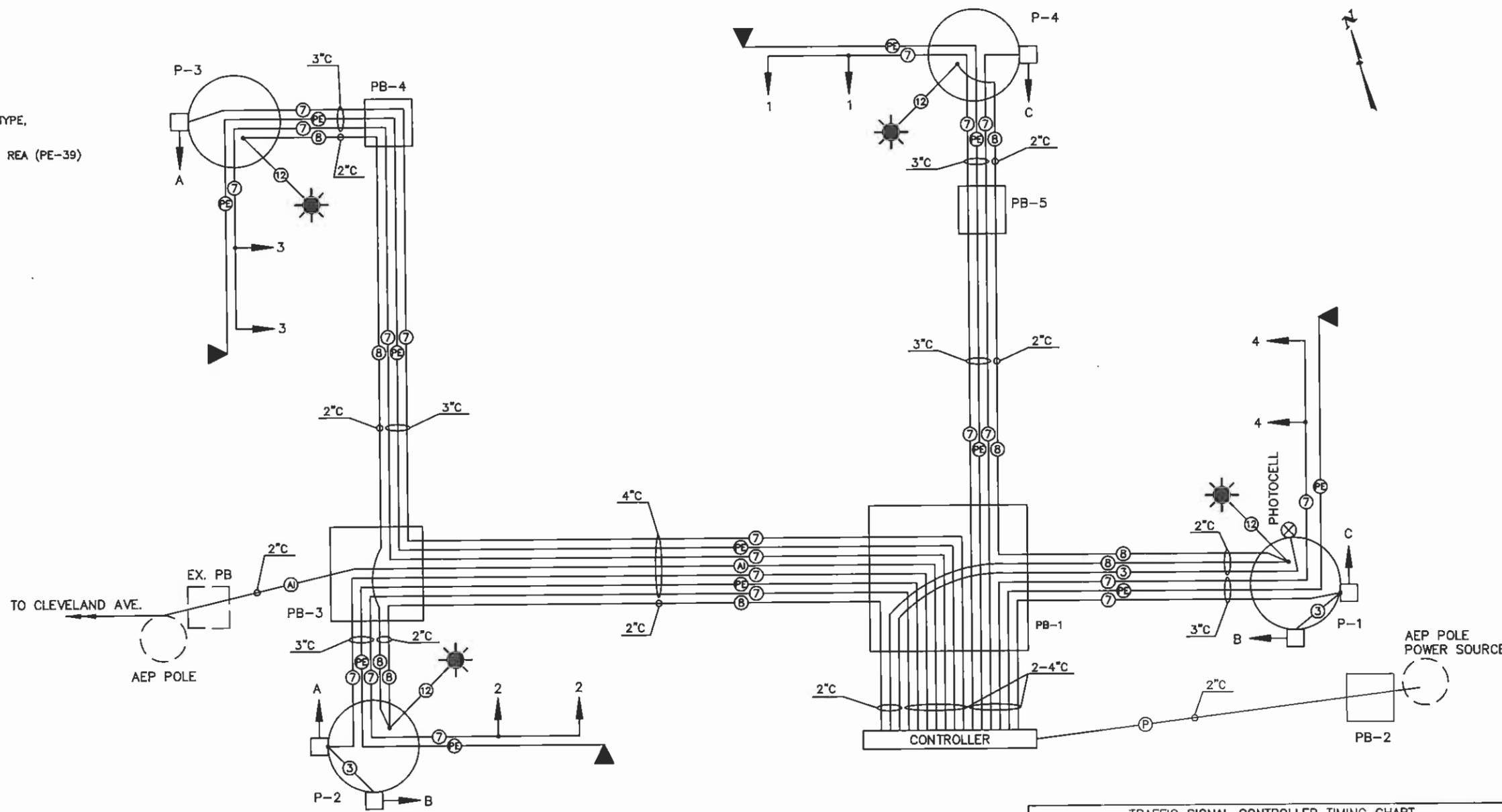
☀ LUMINAIRE

1,2,3,4

A-C



**SIGNAL INDICATIONS**



**WIRING DIAGRAM**

PRE-EMPTION NOTES: CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4&8				FLASH
		R/W	R	R	CLEAR	R/W	R	R	CLEAR	
MARKET AVE. NORTHBOUND	1	R	R	R	R	G	G	Y	R	R
	1	R	R	R	R	G	G	Y	R	R
MARKET AVE. SOUTHBOUND	2	R	R	R	R	G	G	Y	R	R
	2	R	R	R	R	G	G	Y	R	R
NAVARRE RD. WESTBOUND	3	G	G	Y	R	R	R	R	R	Y
	3	G	G	Y	R	R	R	R	R	Y
NAVARRE RD. EASTBOUND	4	G	G	Y	R	R	R	R	R	Y
	4	G	G	Y	R	R	R	R	R	Y
CROSSING NAVARRE RD.	A-A	DW	DW	DW	DW	W	FDW	DW	DW	DARK
	C-C	DW	DW	DW	DW	W	FDW	DW	DW	DARK
CROSSING MARKET AVE.	B-B	W	FDW	DW	DW	DW	DW	DW	DW	DARK

START UP									
START IN: ALL RED									
TIME FOR FLASH OR ALL RED 7 SEC.									
FIRST PHASE(S) # 2&6									
COLOR DISPLAYED: GREEN									
INTERVAL	CONTROLLER PHASE								
	1	2	3	4	5	6	7	8	
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	-	5	-	10	-
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	5	-
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	40	-	25	-	40	-	25	-
MAXIMUM GREEN II (SEC.)	-	40	-	25	-	40	-	25	-
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	-	3.6	-	3.6	-
ALL RED CLEARANCE (SEC.)	-	1.4	-	1.4	-	1.4	-	1.4	-
WALK (SEC.)	-	7	-	7	-	7	-	7	-
PEDESTRIAN CLEARANCE (SEC.)	-	25	-	25	-	25	-	25	-
RECALL	MAXIMUM (ON/OFF)	OFF							
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN (ON/OFF)	OFF							
MEMORY	(ON/OFF)	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-	-
	NO. 2	-	-	-	-	-	-	-	-

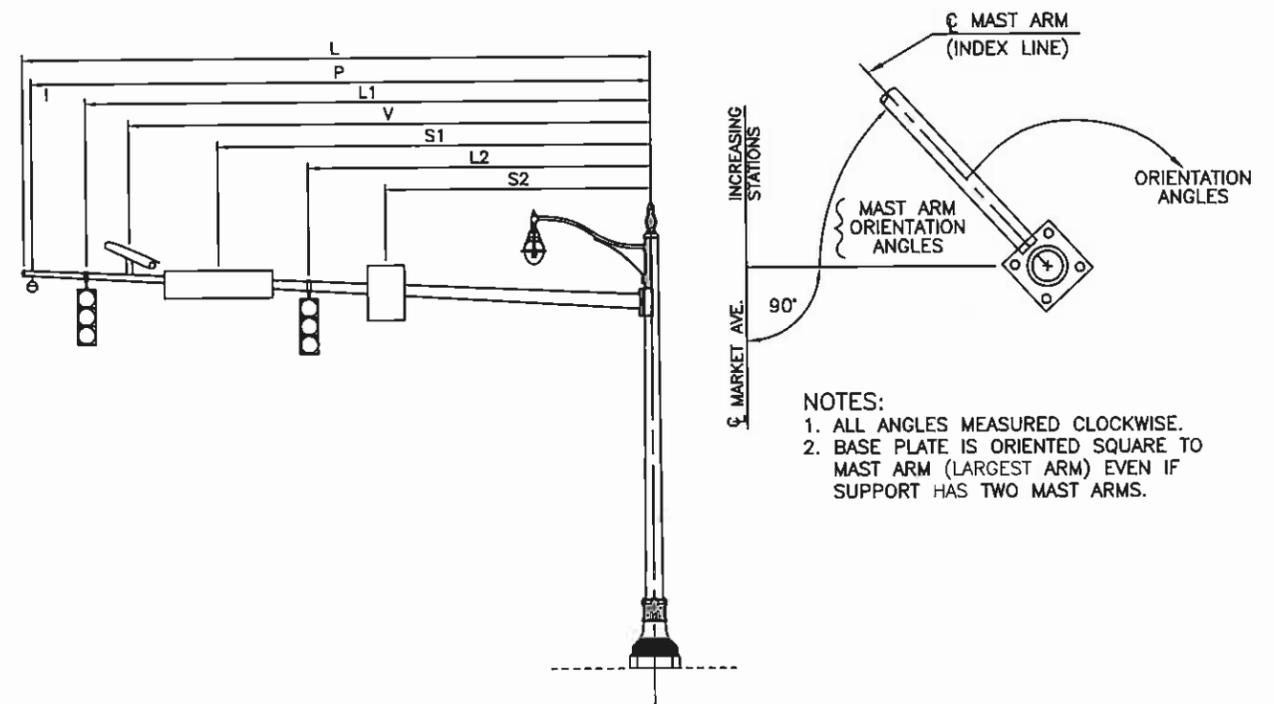
TRAFFIC SIGNAL DETAIL  
 NAVARRE ROAD AND MARKET AVENUE S.W.

NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

ITEM	EXT.	QUANT.	UNIT	DESCRIPTION
202	32001	142	EACH	CURB REMOVED, AS PER PLAN
202	30000	961	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	394	S.F.	4" CONCRETE WALK
608	49001	567	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	30	FEET	CURB, TYPE 6
625	14501	0	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	0	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	3	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	312	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	157	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	92	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	93	FEET	TRENCH
625	29601	219	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	1400	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	12	EACH	CONNECTOR KIT, TYPE II
625	00600	4	EACH	CONNECTOR KIT, TYPE III
625	31510	3	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	312	EACH	PLASTIC CAUTION TAPE
630	87101	0	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	8	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE AS PER PLAN
632	05085	0	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2 AS PER PLAN
632	26001	0	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	4	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	4	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT. SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT. DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	1	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	63	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	1235	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	0	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	210	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	8	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	8	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	4	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	690	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1 AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	1	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	0	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT NOSTALGIA											ANGLES(DEC.) FROM INDEX LINE						
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	V (FT.)	S1 (FT.)	S2 (FT.)	LUMINAIRE (FT.)	MAST ARM	LUMINAIRE BRACKET	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	*	32	29	16	31	-	-	-	*	70	315	B 170	-	C 105	-	0
P-2	21.0	*	49	48	36	46	-	-	-	*	330	315	A 225	-	B 85	-	315
P-3	21.0	*	26	22	12	25	-	-	-	*	65	315	A 290	-	-	-	0
P-4	21.0	*	36	34	22	35	-	-	-	*	330	315	C 35	-	-	-	120

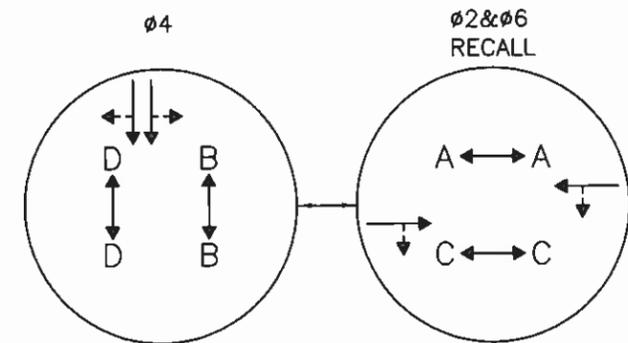
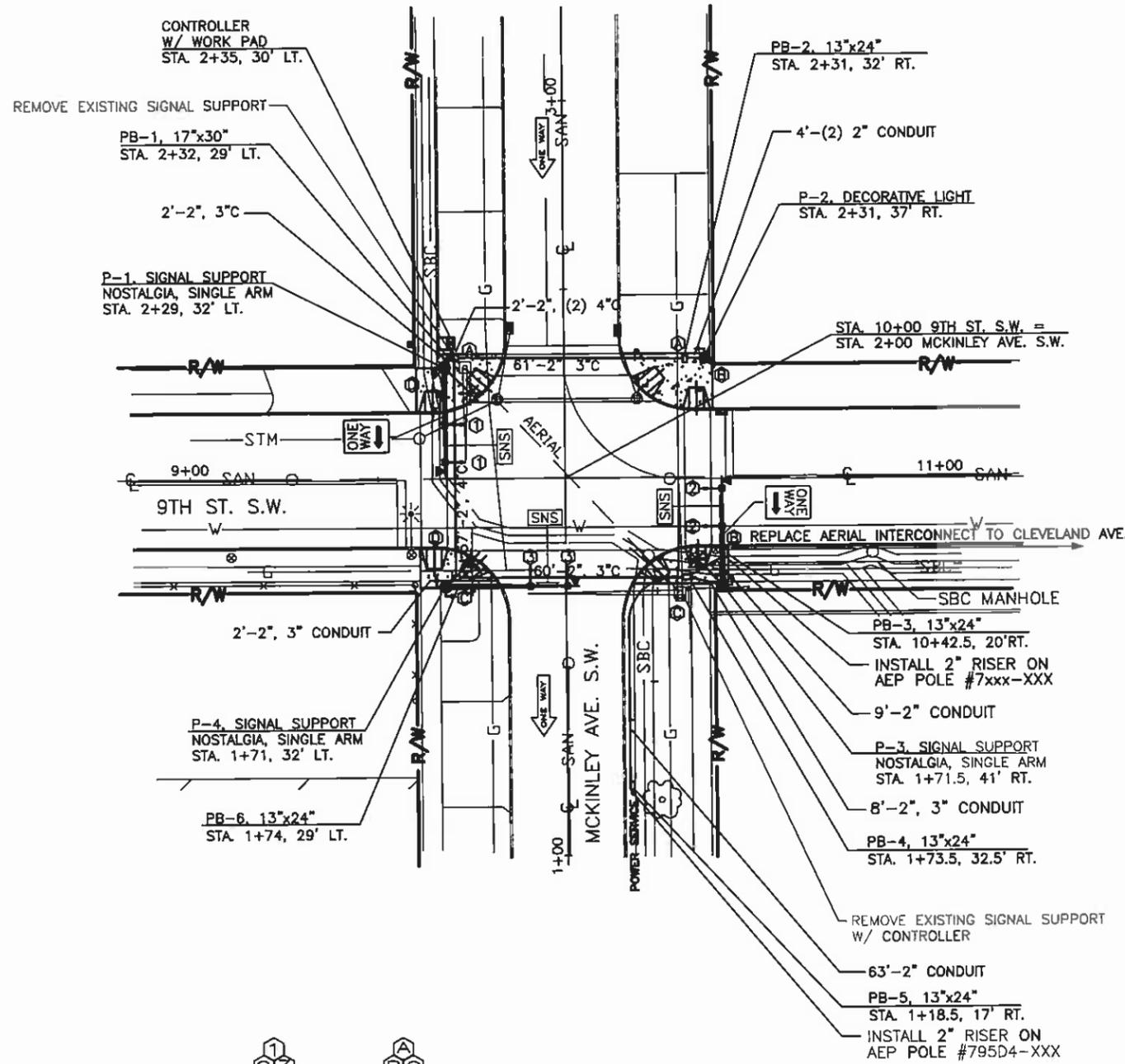
\* SEE NOSTALGIA POLE DETAILS



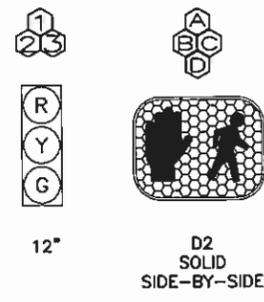
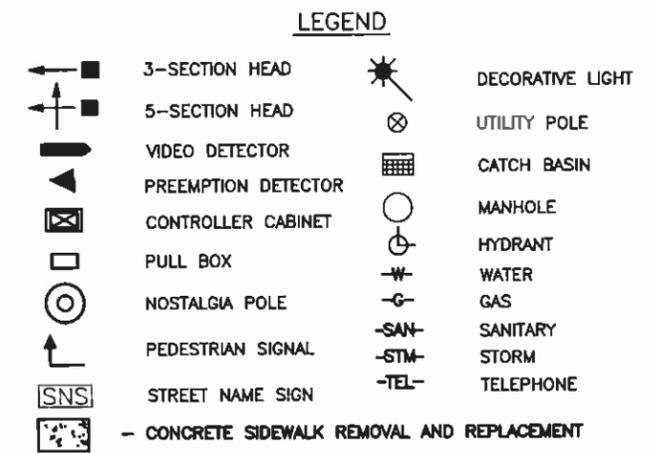
- NOTES:
1. ALL ANGLES MEASURED CLOCKWISE.
  2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.

CALCULATED: NJL  
 CHECKED: EGM  
 TRAFFIC SIGNAL DETAIL  
 NAVARRE ROAD AND MARKET AVENUE S.W.  
 NAVARRE ROAD S.W. SIGNAL SYSTEM

NOTE:  
CITY WILL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS.



PHASING DIAGRAM

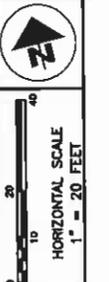


SIGNAL INDICATIONS

CURB RAMP CHART

CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	2	A1, A1	122
NE	2	A1, A1	122
SW	2	A1, A1	122
SE	2	A1, A1	122

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.



TRAFFIC SIGNAL PLAN  
9TH STREET AND MCKINLEY AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- (AI) INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (U) INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (P) POWER CABLE, (BY CONDUCTOR), #10 AWG
- (PE) PRE-EMPTION CABLE
- (V) VIDEO DETECTOR CABLE

☐ X PEDESTRIAN SIGNAL HEAD

• SPLICE LOCATION

→ X VEHICULAR SIGNAL HEAD

(P<sub>x</sub>) PEDESTRIAN PUSHBUTTON

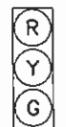
▶ VIDEO DETECTOR CAMERA

▶ PRE-EMPTION DETECTOR

☀ LUMINAIRE

1,2,3

A-D

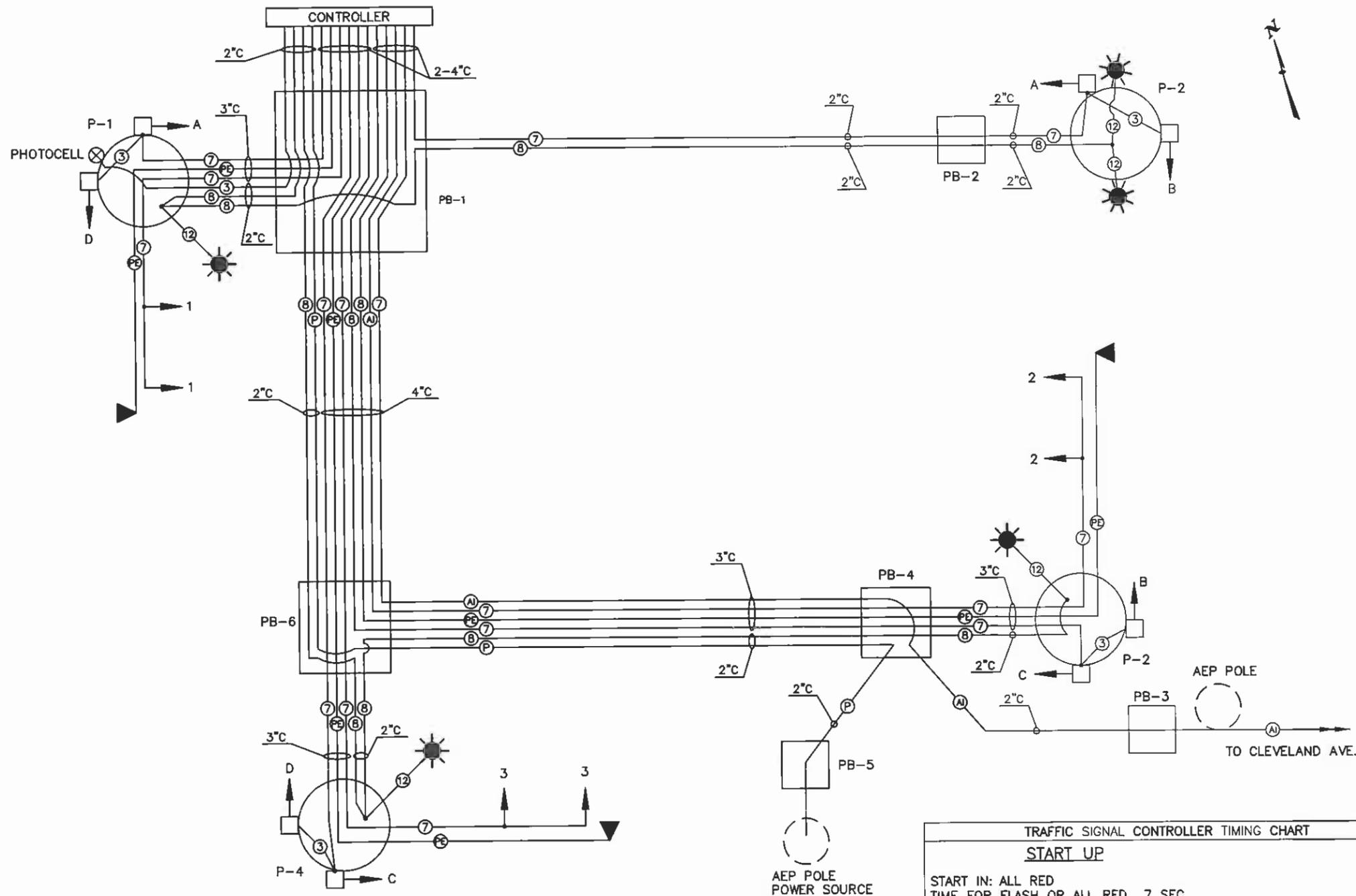


**SIGNAL INDICATIONS**

**PRE-EMPTION NOTES:** CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

**SIGNAL DISPLAY CHART**

DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4				FLASH
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
9TH ST. WESTBOUND	1	G	G	Y	R	R	R	R	R	Y
	1	G	G	Y	R	R	R	R	R	Y
9TH ST. EASTBOUND	2	G	G	Y	R	R	R	R	R	Y
	2	G	G	Y	R	R	R	R	R	Y
MCKINLEY AVE. SOUTHBOUND	3	R	R	R	R	G	G	Y	R	R
	3	R	R	R	R	G	G	Y	R	R
CROSSING MCKINLEY AVE.	A-A	W	FDW	DW	DW	DW	DW	DW	DW	DARK
	C-C	W	FDW	DW	DW	DW	DW	DW	DW	DARK
CROSSING 9TH ST.	B-B	DW	DW	DW	DW	W	FDW	DW	DW	DARK
	D-D	DW	DW	DW	DW	W	FDW	DW	DW	DARK



**WIRING DIAGRAM**

TRAFFIC SIGNAL CONTROLLER TIMING CHART								
START UP								
START IN: ALL RED								
TIME FOR FLASH OR ALL RED <u>7 SEC.</u>								
FIRST PHASE(S) # <u>2&amp;6</u>								
COLOR DISPLAYED: GREEN								
INTERVAL	CONTROLLER PHASE							
	1	2	3	4	5	6	7	8
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	-	5	-	-
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	-
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	40	-	20	-	40	-	-
MAXIMUM GREEN II (SEC.)	-	50	-	30	-	50	-	-
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	-	3.6	-	-
ALL RED CLEARANCE (SEC.)	-	2	-	2	-	2	-	-
WALK (SEC.)	-	7	-	7	-	7	-	-
PEDESTRIAN CLEARANCE (SEC.)	-	32	-	17	-	32	-	-
RECALL	MAXIMUM (ON/OFF)	OFF						
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF
	PEDESTRIAN (ON/OFF)	OFF						
MEMORY (ON/OFF)	-	-	-	-	-	-	-	-
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-
	NO. 2	-	-	-	-	-	-	-

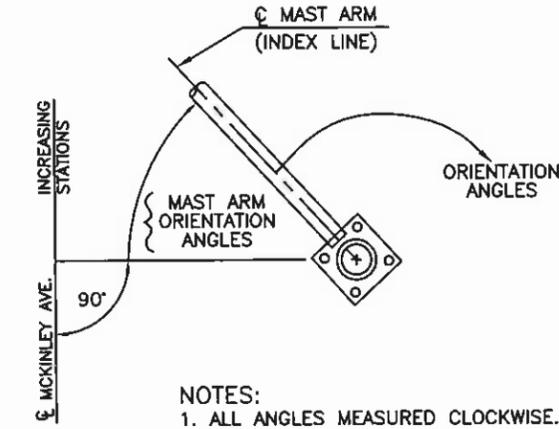
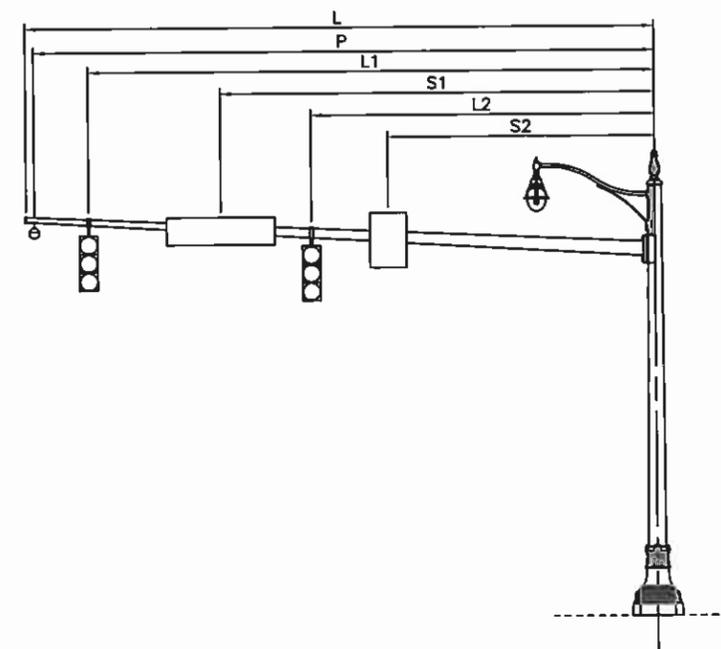
TRAFFIC SIGNAL DETAIL  
9TH STREET AND MCKINLEY AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

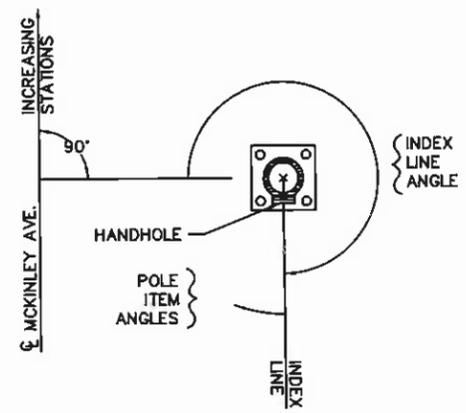
ITEM	EXT.	QUANT.	UNIT	DESCRIPTION
202	32001	193	EACH	CURB REMOVED, AS PER PLAN
202	30000	878	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	390	S.F.	4" CONCRETE WALK
608	49001	488	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	65	FEET	CURB, TYPE 6
625	14501	1	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	1	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	3	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	333	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	72	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	61	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	90	FEET	TRENCH
625	29601	178	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	1300	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	12	EACH	CONNECTOR KIT, TYPE II
625	00600	4	EACH	CONNECTOR KIT, TYPE III
625	31510	0	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	268	EACH	PLASTIC CAUTION TAPE
630	87101	5	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	6	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	0	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	0	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	3	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	3	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	1	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	66	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	885	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	0	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	750	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	6	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	8	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	3	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	450	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	1	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	0	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT NOSTALGIA										ANGLES(DEG.) FROM INDEX LINE						
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	S1 (FT.)	S2 (FT.)	LUMINAIRE (FT.)	MAST ARM	LUMINAIRE BRACKET	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	*	28	25	15	27	20	12	*	90	315	A 180	-	D 90	-	90
P-3	21.0	*	29	25.5	15.5	28	20.5	12.5	*	90	315	B 90	-	C 90	-	0
P-4	21.0	*	36	32.5	22.5	35	27.5	-	*	0	315	C 270	-	D 180	-	180

\* SEE NOSTALGIA POLE DETAILS



NOTES:  
 1. ALL ANGLES MEASURED CLOCKWISE.  
 2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.



NOTES:  
 1. ALL ANGLES MEASURED CLOCKWISE.  
 2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE.  
 3. DOUBLE LUMINAIRES SHALL BE MOUNTED PARALLEL TO MAIN STREET

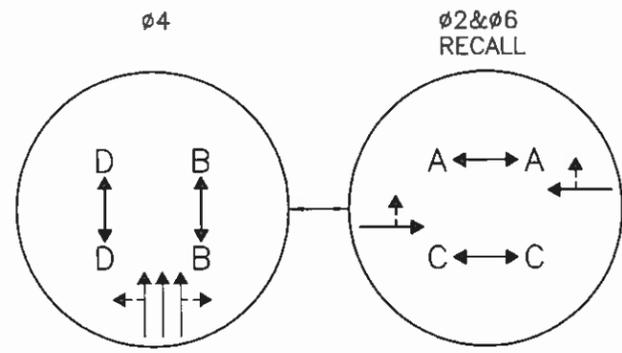
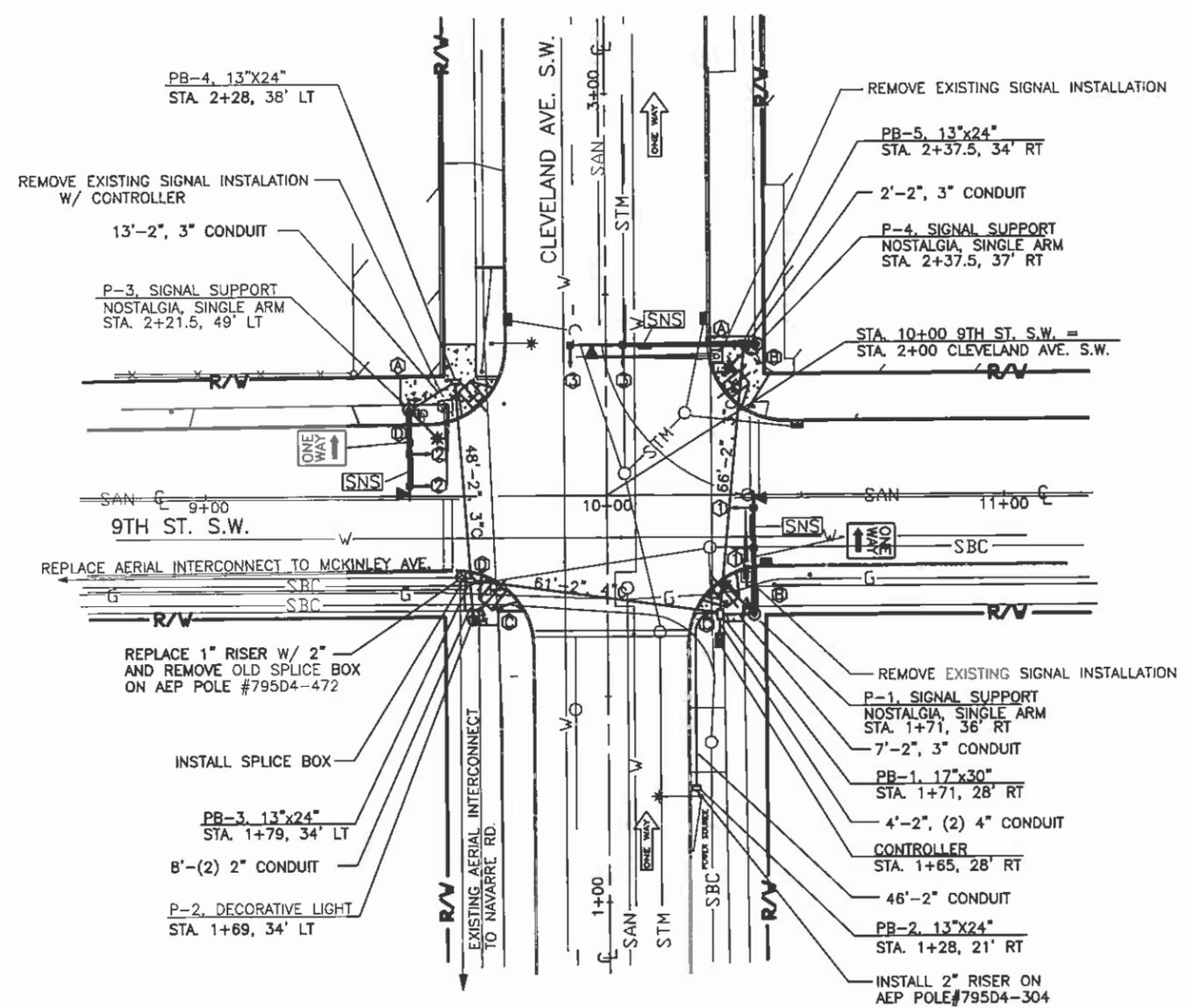
PEDESTAL CHART					
POLE NO.	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-2	A 90	-	B 180	-	270

CALCULATED: NJL  
 CHECKED: EGM  
 TRAFFIC SIGNAL DETAIL  
 9TH STREET AND MCKINLEY AVENUE S.W.  
 NAVARRE ROAD S.W.  
 SIGNAL SYSTEM  
 26  
 54



TRAFFIC SIGNAL PLAN  
9TH STREET AND CLEVELAND AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

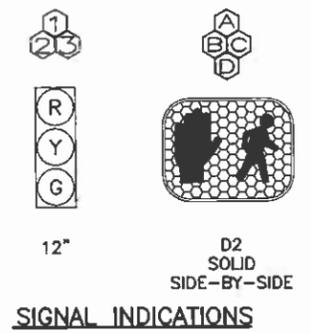


PHASING DIAGRAM

LEGEND

- 3-SECTION HEAD
- 5-SECTION HEAD
- VIDEO DETECTOR
- PREEMPTION DETECTOR
- CONTROLLER CABINET
- PULL BOX
- NOSTALGIA POLE
- PEDESTRIAN SIGNAL
- STREET NAME SIGN
- CONCRETE SIDEWALK REMOVAL AND REPLACEMENT
- DECORATIVE LIGHT
- UTILITY POLE
- CATCH BASIN
- MANHOLE
- HYDRANT
- WATER
- GAS
- SANITARY
- STORM
- TELEPHONE

NOTE:  
CITY WILL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS.



CURB RAMP CHART

CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	1	A1	61
NE	1	A1	61
SW	1	A1	61
SE	1	A1	61

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- (AI) INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (UI) INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (P) POWER CABLE, (BY CONDUCTOR), #10 AWG
- (PE) PRE-EMPTION CABLE
- (V) VIDEO DETECTOR CABLE

□ X PEDESTRIAN SIGNAL HEAD

• SPLICE LOCATION

→ X VEHICULAR SIGNAL HEAD

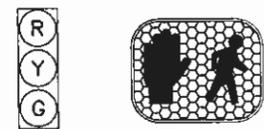
(P<sub>x</sub>) PEDESTRIAN PUSHBUTTON

▶ VIDEO DETECTOR CAMERA

▶ PRE-EMPTION DETECTOR

☀ LUMINAIRE

1,2,3      A-D

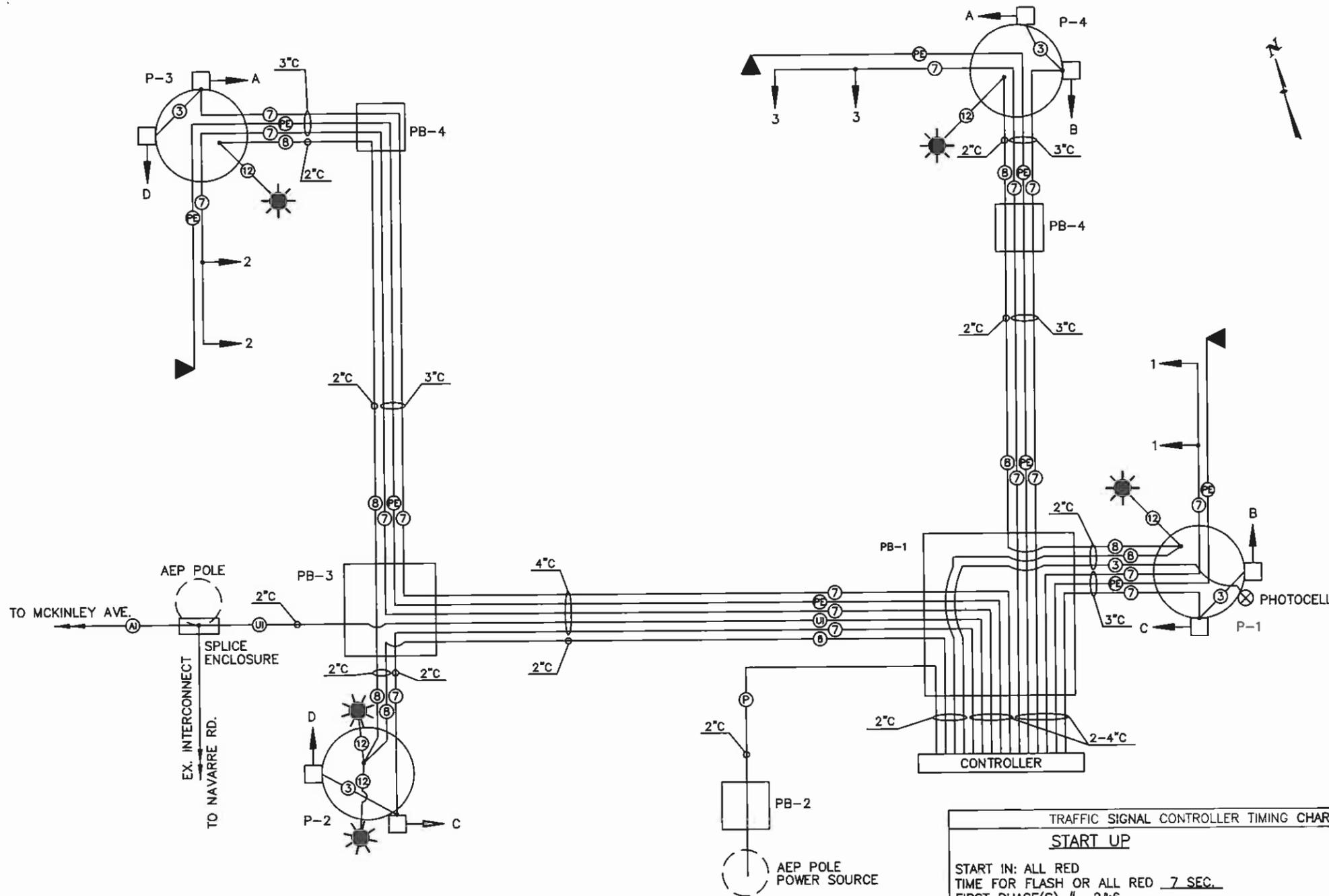


**SIGNAL INDICATIONS**

**PRE-EMPTION NOTES:** CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

**SIGNAL DISPLAY CHART**

DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4				FLASH
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
9TH ST. EASTBOUND	1	G	G	Y	R	R	R	R	R	Y
	1	G	G	Y	R	R	R	R	R	Y
9TH ST. WESTBOUND	2	G	G	Y	R	R	R	R	R	Y
	2	G	G	Y	R	R	R	R	R	Y
CLEVELAND AVE. NORTHBOUND	3	R	R	R	R	G	G	Y	R	R
	3	R	R	R	R	G	G	Y	R	R
CROSSING CLEVELAND AVE.	A-A	W	FDW	DW	DW	DW	DW	DW	DW	DARK
	C-C	W	FDW	DW	DW	DW	DW	DW	DW	DARK
CROSSING 9TH ST.	B-B	DW	DW	DW	DW	W	FDW	DW	DW	DARK
	D-D	DW	DW	DW	DW	W	FDW	DW	DW	DARK



**WIRING DIAGRAM**

**TRAFFIC SIGNAL CONTROLLER TIMING CHART**

**START UP**

START IN: ALL RED  
 TIME FOR FLASH OR ALL RED 7 SEC.  
 FIRST PHASE(S) # 2&6  
 COLOR DISPLAYED: GREEN

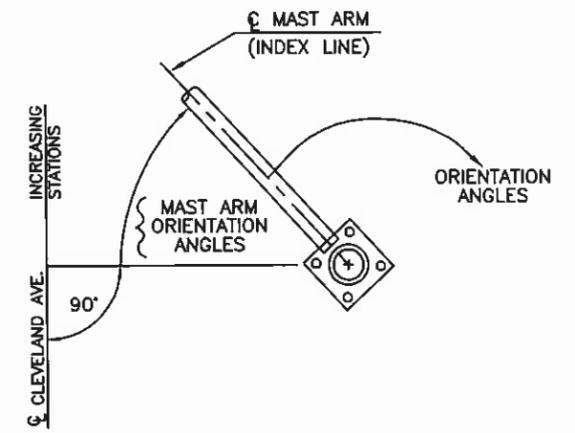
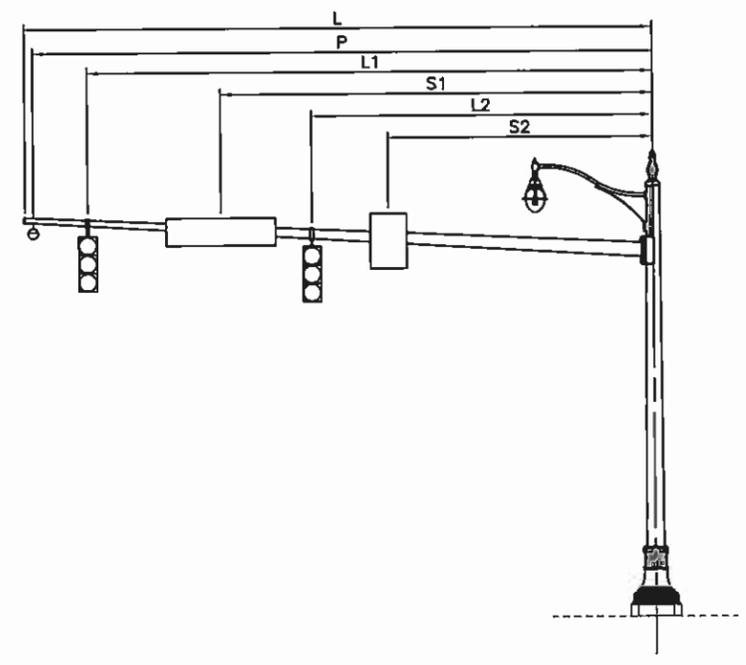
INTERVAL	CONTROLLER PHASE							
	1	2	3	4	5	6	7	8
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	-	5	-	-
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	-
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	30	-	30	-	30	-	-
MAXIMUM GREEN II (SEC.)	-	35	-	35	-	35	-	-
YELLOW CHANGE (SEC.)	-	4	-	4	-	4	-	-
ALL RED CLEARANCE (SEC.)	-	1	-	1	-	1	-	-
WALK (SEC.)	-	7	-	7	-	7	-	-
PEDESTRIAN CLEARANCE (SEC.)	-	33	-	18	-	33	-	-
RECALL	MAXIMUM (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF
	PEDESTRIAN (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY	(ON/OFF)	-	-	-	-	-	-	-
	CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	YES	-
	NO. 2	-	-	-	-	-	-	-

TRAFFIC SIGNAL DETAIL  
 9TH STREET AND CLEVELAND AVENUE S.W.  
 NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

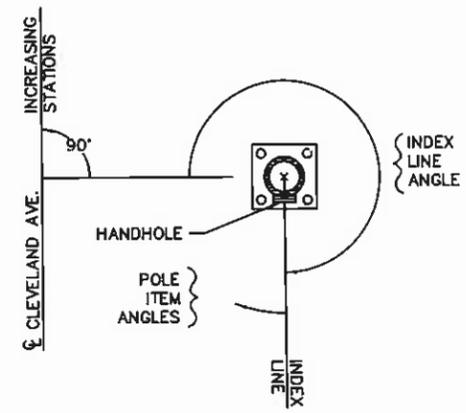
ITEM	EXT	QUANT.	UNIT	DESCRIPTION
202	32001	80	EACH	CURB REMOVED, AS PER PLAN
202	30000	610	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	366	S.F.	4" CONCRETE WALK
608	49001	244	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	16	FEET	CURB, TYPE 6
625	14501	1	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	1	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	3	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	263	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	136	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	69	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	90	FEET	TRENCH
625	29601	175	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	1300	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	12	EACH	CONNECTOR KIT, TYPE II
625	00600	4	EACH	CONNECTOR KIT, TYPE III
625	31510	0	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	285	EACH	PLASTIC CAUTION TAPE
630	87101	5	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	8	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	0	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	0	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	3	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	3	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8'
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8'
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	2	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	56	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	875	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	1	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	300	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	6	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	8	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM. VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM. PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM. PEDESTRIAN PUSHBUTTON
632	90400	3	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	455	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	0	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	0	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT NOSTALGIA											ANGLES(DEC.) FROM INDEX LINE					
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	S1 (FT.)	S2 (FT.)	LUMINAIRE (FT.)	MAST ARM	LUMINAIRE BRACKET	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	*	30	26.5	16.5	39	21.5	14	*	90	315	B O	-	C 270	-	0
P-3	21.0	*	22	19	11	21	15	8	*	90	315	A 180	-	D 270	-	180
P-4	21.0	*	47	46	33	41	26	-	*	0	315	A 0	-	B 270	-	0

\* SEE NOSTALGIA POLE DETAILS



NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.



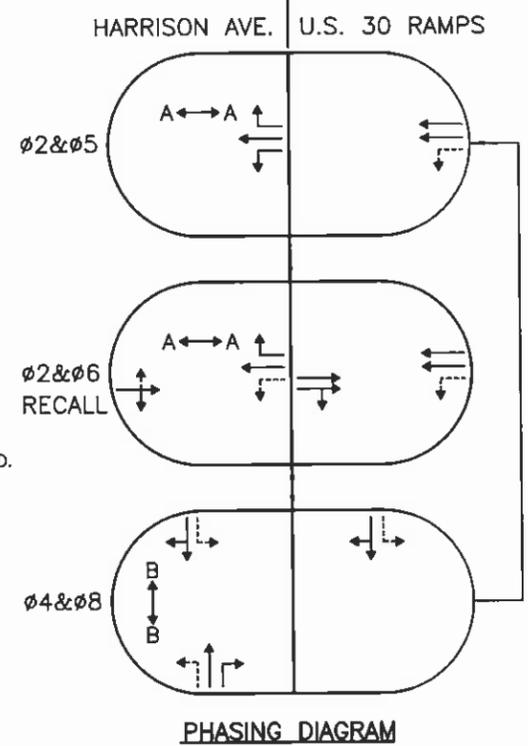
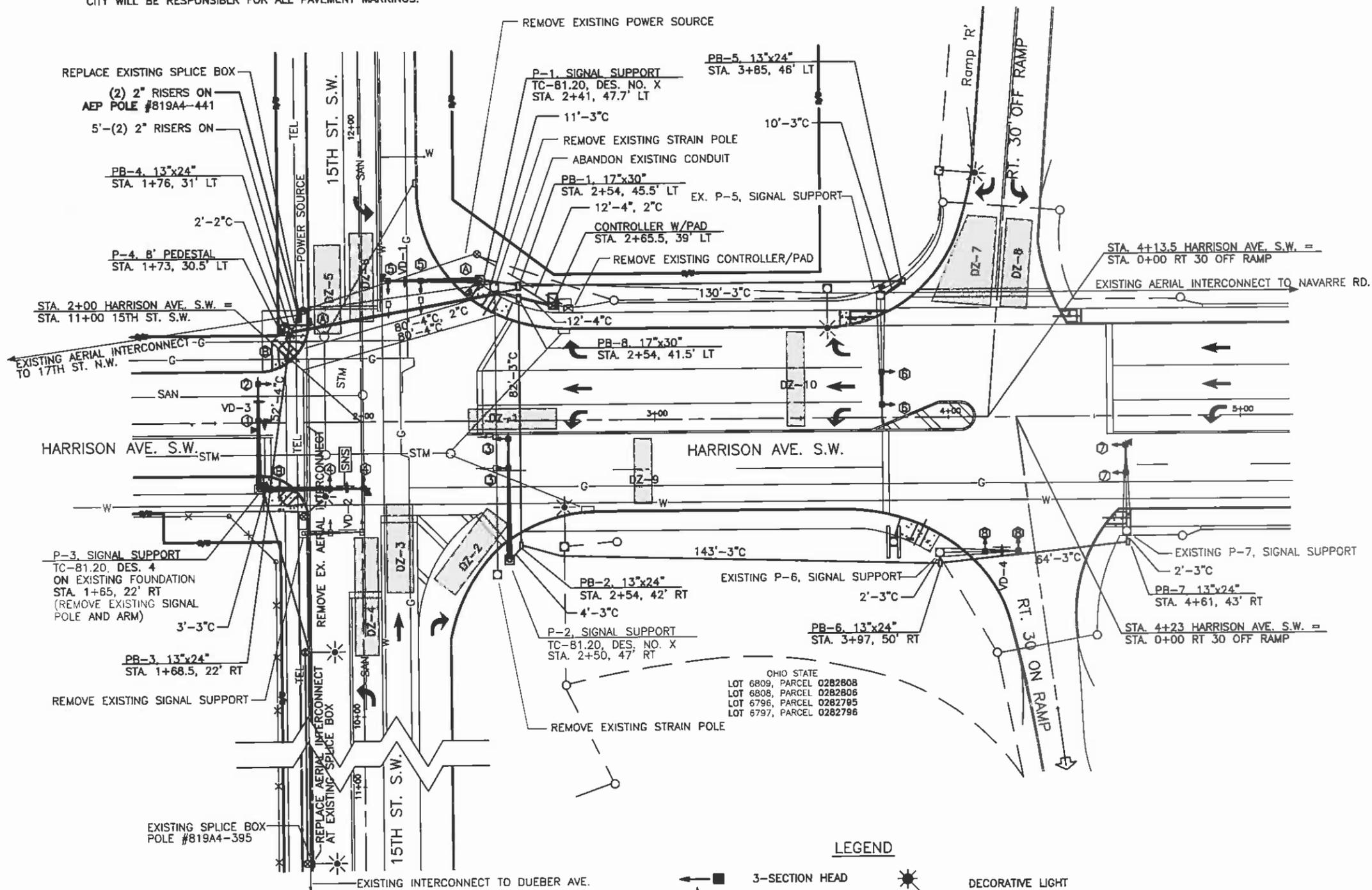
NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE.  
3. DOUBLE LUMINAIRES SHALL BE MOUNTED PARALLEL TO MAIN STREET

PEDESTAL CHART					
POLE NO.	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-2	C 0	-	D 270	-	90

CALCULATED: NJL  
CHECKED: EGM  
TRAFFIC SIGNAL DETAIL  
9TH STREET AND CLEVELAND AVENUE S.W.  
NAVARRE ROAD S.W.  
SIGNAL SYSTEM  
29  
54

**NOTE:**

CITY WILL BE RESPONSIBLR FOR ALL PAVEMENT MARKINGS.



**CURB RAMP CHART**

HARRISON/ 15TH ST. CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	1	B2	96
NE	0	-	0
SW	1	A1	61
SE	1	A1	61

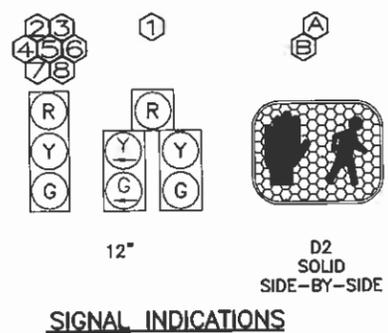
  

HARRISON/ RT. 30 OFF RAMP	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	1	B3	42
NE	1	B3	42
SW	1	B3	54
SE	1	B2	96

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

**LEGEND**

- 3-SECTION HEAD
- 5-SECTION HEAD
- VIDEO DETECTOR
- PREEMPTION DETECTOR
- CONTROLLER CABINET
- PULL BOX
- NOSTALGIA POLE
- PEDESTRIAN SIGNAL
- STREET NAME SIGN
- CONCRETE SIDEWALK REMOVAL AND REPLACEMENT
- DECORATIVE LIGHT
- UTILITY POLE
- CATCH BASIN
- MANHOLE
- HYDRANT
- WATER
- GAS
- SAN- SANITARY
- STM- STORM
- TEL- TELEPHONE



TRAFFIC SIGNAL DETECTOR ZONES					
DETECTION ZONE DESIGNATION	ASSOCIATED VIDEO DETECTOR	LOCATION-MOVEMENT	ASSOCIATED CONTROLLER PHASE	DELAY (SEC)	DELAY INHIBITED DURING
DZ-1	VD-3	HARRISON AVE.-SB LT	7	0	
DZ-2	VD-1	15TH ST-WB RT	8	5	8
DZ-3	VD-1	15TH ST-WB TH	8	0	
DZ-4	VD-1	15TH ST-WB LT	8	0	
DZ-5	VD-2	15TH ST-EB TH/RT	4	5	4
DZ-6	VD-2	15TH ST-EB LT	4	0	
DZ-7	VD-4	US 30 OFF RAMP.-EB RT	8	5	8
DZ-8	VD-4	US 30 OFF RAMP.-EB LT	8	0	
DZ-9	VD-3	HARRISON AVE.-NB	SYSTEM	0	
DZ-10	VD-3	HARRISON AVE.-SB	SYSTEM	0	

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- (A) INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (U) INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (P) POWER CABLE, (BY CONDUCTOR), #10 AWG
- (PE) PRE-EMPTION CABLE
- (V) VIDEO DETECTOR CABLE

□ X PEDESTRIAN SIGNAL HEAD

• SPLICE LOCATION

→ X VEHICULAR SIGNAL HEAD

(P<sub>x</sub>) PEDESTRIAN PUSHBUTTON

▶ VIDEO DETECTOR CAMERA

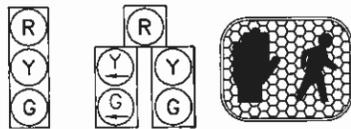
▶ PRE-EMPTION DETECTOR

☀ LUMINAIRE

1,2,3,4,  
5,6,7,8

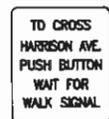
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A-B



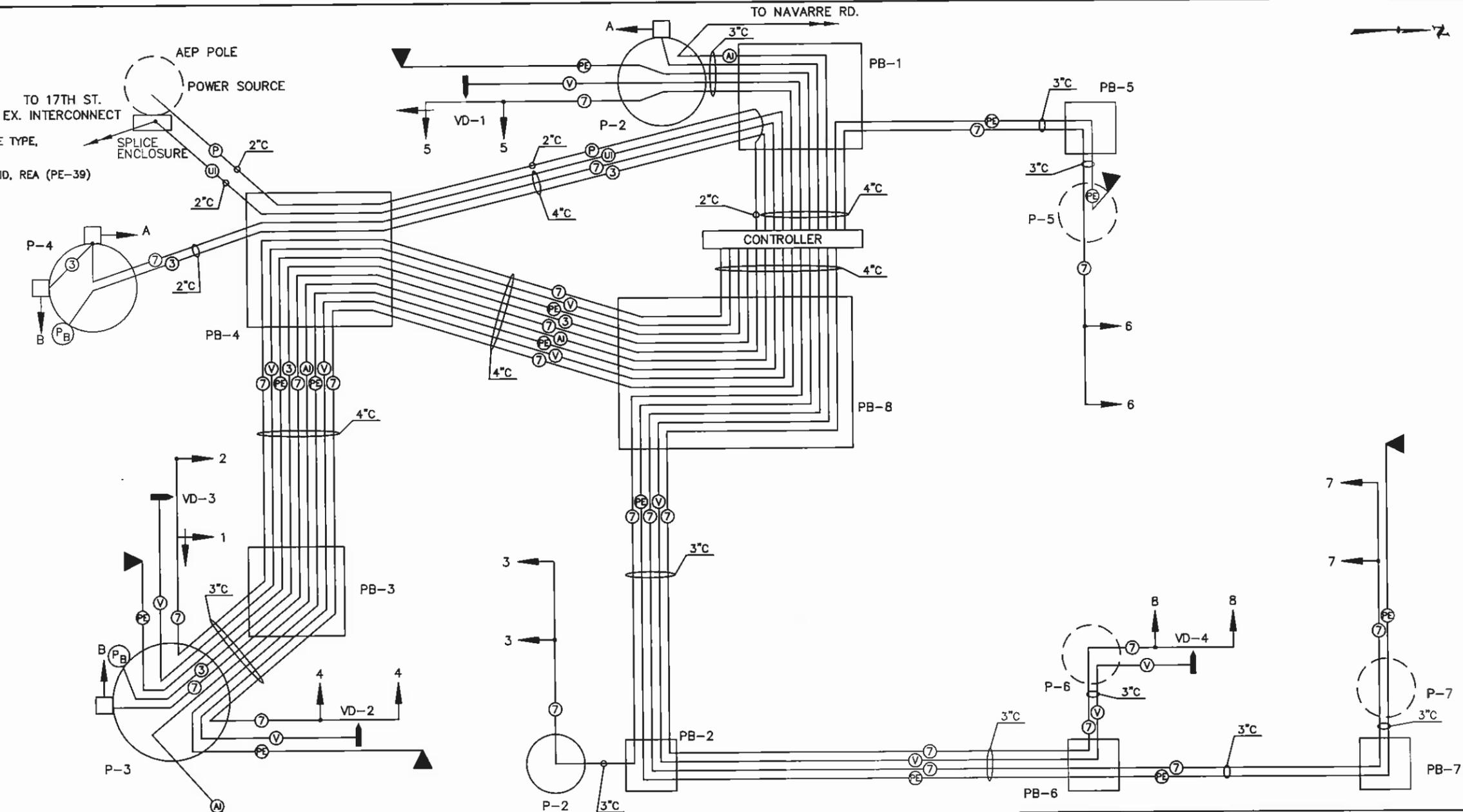
**SIGNAL INDICATIONS**

B



R-73A-9

SIGNAL DISPLAY CHART														
DIRECTION	SIGNAL HEAD	PHASE 2&5				PHASE 2&6				PHASE 4&8				FLASH
		R/W	G/G	Y/G	Y/G	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
HARRISON AVE. SOUTHBOUND @ 15TH ST.	1	G/G	G/G	Y/G	Y/G	G	G	Y	R	R	R	R	R	Y
	2	G	G	Y	R	G	G	Y	R	R	R	R	R	Y
HARRISON AVE. NORTHBOUND @ 15TH ST.	3	R	R	R	R	G	G	Y	R	R	R	R	R	Y
	3	R	R	R	R	G	G	Y	R	R	R	R	R	Y
15TH ST. EASTBOUND	4	R	R	R	R	R	R	R	R	G	G	Y	R	R
	4	R	R	R	R	R	R	R	R	G	G	Y	R	R
15TH ST. WESTBOUND	5	R	R	R	R	R	R	R	R	G	G	Y	R	R
	5	R	R	R	R	R	R	R	R	G	G	Y	R	R
HARRISON AVE. SOUTHBOUND @ U.S. 30 RAMP	6	G	G	Y	R	G	G	Y	R	R	R	R	R	Y
	6	G	G	Y	R	G	G	Y	R	R	R	R	R	Y
HARRISON AVE. NORTHBOUND @ U.S. 30 RAMP	7	R	R	R	R	G	G	Y	R	R	R	R	R	Y
	7	R	R	R	R	G	G	Y	R	R	R	R	R	Y
U.S. 30 RAMP SOUTHBOUND	8	R	R	R	R	R	R	R	R	G	G	Y	R	R
	8	R	R	R	R	R	R	R	R	G	G	Y	R	R
CROSSING 15TH ST.	A-A	W	W	W	W	W	W	W	W	DW	DW	DW	DW	DARK
CROSSING HARRISON AVE.	B-B	DW	DW	DW	DW	W	W	W	W	DW	DW	DW	DW	DARK



**WIRING DIAGRAM**

**PRE-EMPTION NOTES:** CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN  
 CHANNEL 5 SHALL PRE-EMPT TO EB RAMP GREEN

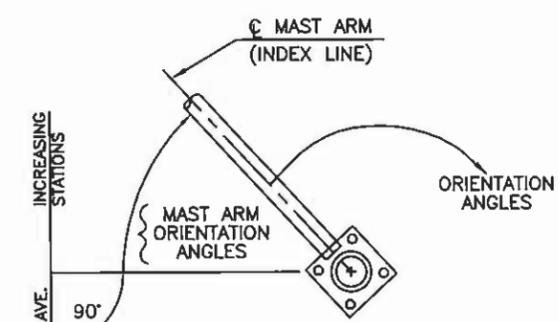
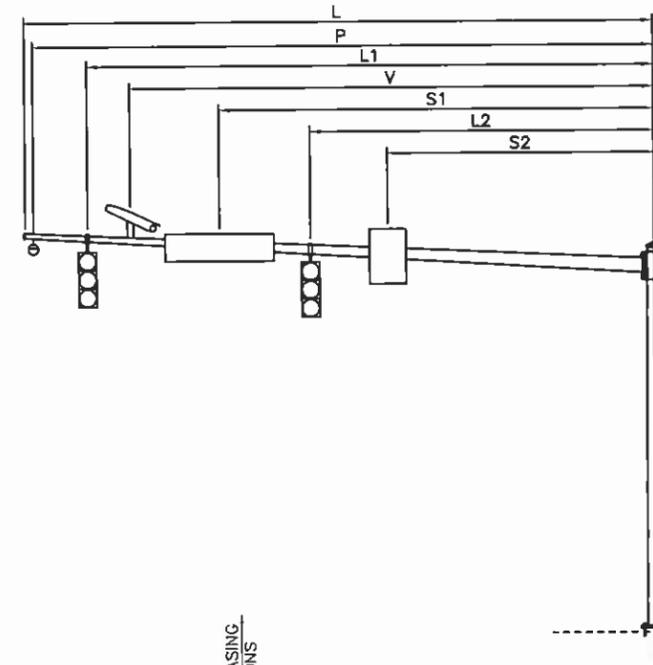
TRAFFIC SIGNAL CONTROLLER TIMING CHART									
START UP									
START IN: ALL RED									
TIME FOR FLASH OR ALL RED 7 SEC.									
FIRST PHASE(S) # 2&6									
COLOR DISPLAYED: GREEN									
INTERVAL	CONTROLLER PHASE								8
	1	2	3	4	5	6	7	8	
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	7	5	-	-	10
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	4	5	-	-	5
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	25	-	20	11	25	-	-	25
MAXIMUM GREEN II (SEC.)	-	30	-	25	15	30	-	-	25
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	3	3.6	-	-	3.6
ALL RED CLEARANCE (SEC.)	-	1.4	-	1.4	-	1.4	-	-	1.4
WALK (SEC.)	-	7	-	7	-	7	-	-	7
PEDESTRIAN CLEARANCE (SEC.)	-	32	-	15	-	32	-	-	15
RECALL	MAXIMUM (ON/OFF)	OFF							
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	PEDESTRIAN (ON/OFF)	OFF							
MEMORY (ON/OFF)	NO. 1	-	YES	-	-	-	YES	-	-
	NO. 2	-	-	-	-	-	-	-	-
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-	-
	NO. 2	-	-	-	-	-	-	-	-

TRAFFIC SIGNAL DETAIL  
 15TH STREET AND HARRISON AVENUE S.W.  
 NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

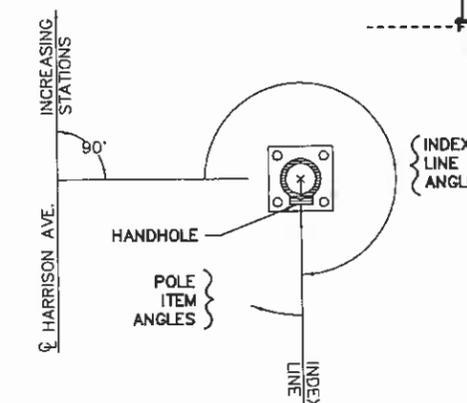
ITEM	EXT.	QUANT.	UNIT	DESCRIPTION
202	32001	105	EACH	CURB REMOVED, AS PER PLAN
202	30000	586	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC : SIGN FOUNDATION REMOVED
608	10000	134	S.F.	4" CONCRETE WALK
608	49001	452	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	14	FEET	CURB, TYPE 6
625	14501	0	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	0	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	6	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	2	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	104	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	451	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	236	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	331	FEET	TRENCH
625	29601	278	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	4	EACH	GROUND ROD
625	23304	0	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	0	EACH	CONNECTOR KIT, TYPE II
625	00600	0	EACH	CONNECTOR KIT, TYPE III
625	31510	0	EACH	PULL BOX REMOVED
625	75510	0	EACH	POWER SERVICE REMOVED
625	36000	609	EACH	PLASTIC CAUTION TAPE
630	87101	1	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	13	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	1	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	4	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	2	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	2	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	1	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	1	EACH	PEDESTAL, 8'
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8'
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	2	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	354	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	2350	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	1	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	340	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	6	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	4	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	8	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	5	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	1240	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	1	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	1	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT TC-81.21										ANGLES(DEG.) FROM INDEX LINE					
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	V (FT.)	S1 (FT.)	S2 (FT.)	MAST ARM	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	3	34	31	22	33	27	-	-	90	A 250	-	-	-	180
P-2	21.0	11	42	41	31	-	-	-	-	0	-	-	-	-	180
P-3		4								**	B 90	B 90	-	-	180
SB ARM	21.0	3	38	37	23	20	30	-	-	0	-	-	-	-	-
EB ARM	21.0	3	38	35.5	24	37	30	-	-	90	-	-	-	-	-
P-6 *							21								
P-7 *						30									

\* EXISTING SIGNAL SUPPORT  
\*\* SB ARM IS REFERENCE ARM (INDEX LINE)



NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.



NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE.

PEDESTAL CHART					
POLE NO.	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-4	A 165	-	B 270	B 270	270

CALCULATED: NJL  
 CHECKED: EGM  
 TRAFFIC SIGNAL DETAIL  
 15TH STREET AND HARRISON AVENUE S.W.  
 NAVARRE ROAD S.W.  
 SIGNAL SYSTEM  
 32  
 54



HORIZONTAL SCALE  
1" = 20 FEET

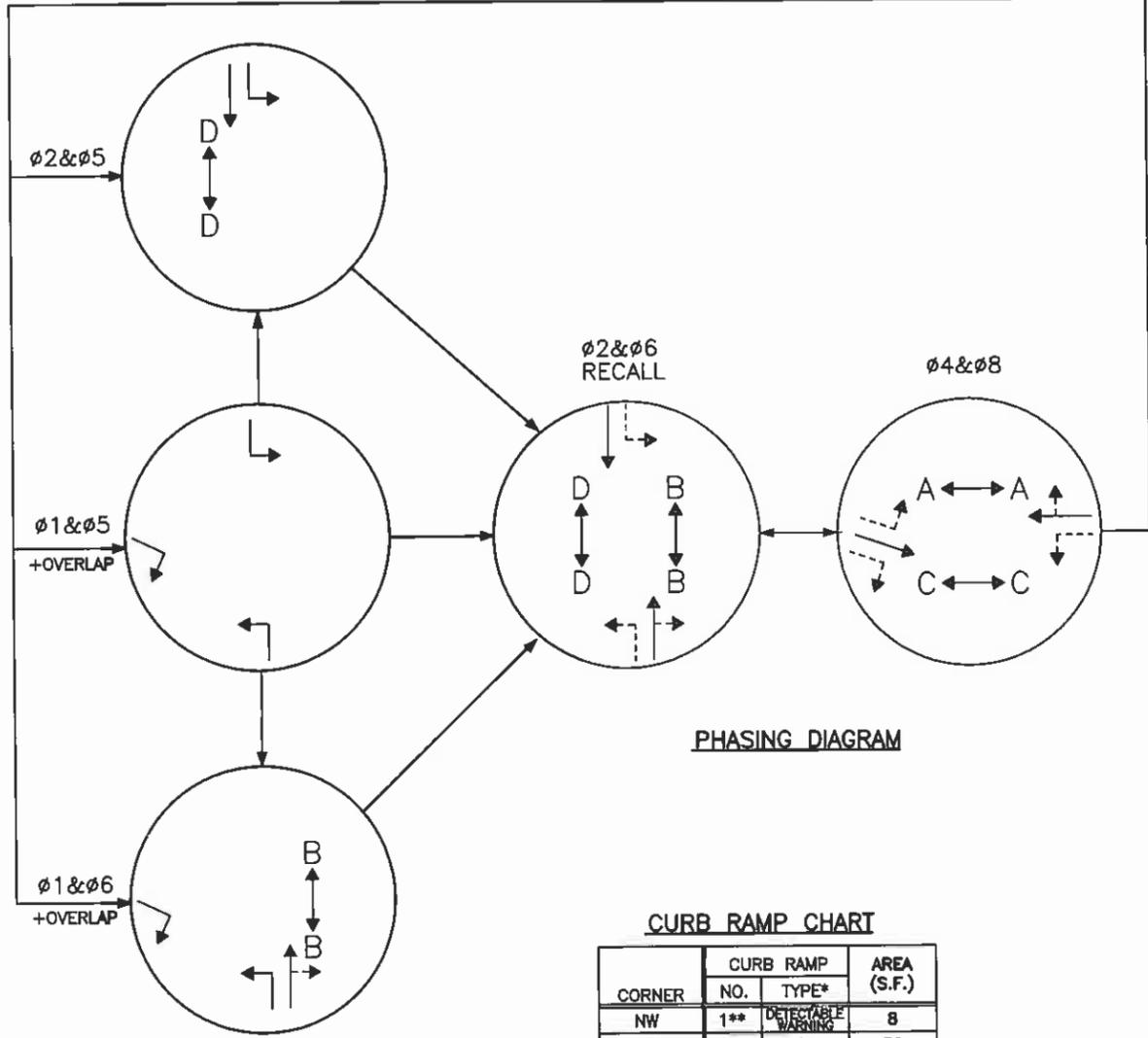
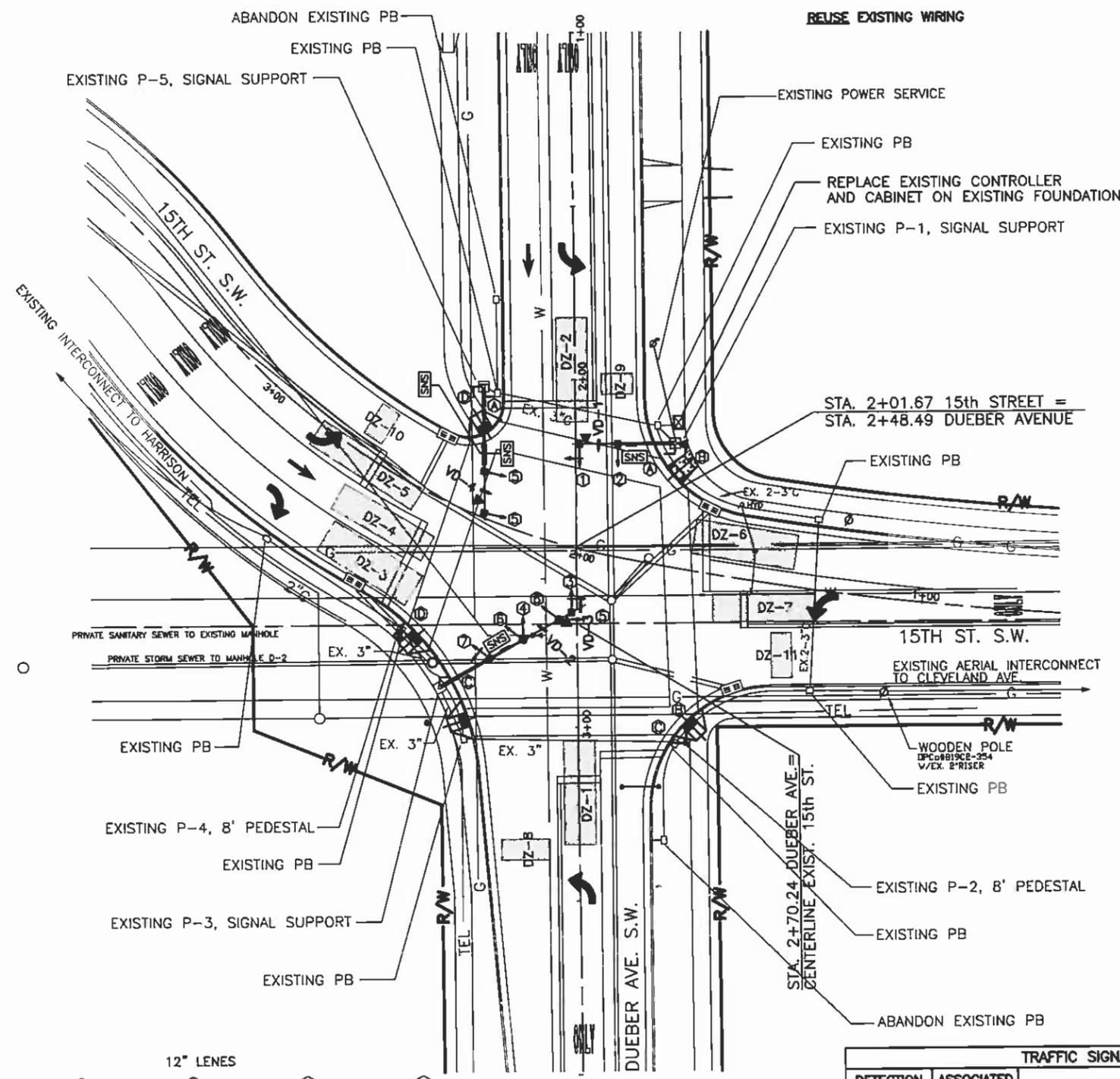
TRAFFIC SIGNAL PLAN  
15TH STREET AND DUEBER AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

33  
54

**REPLACE:**  
VEHICULAR SIGNAL HEADS  
PEDESTRIAN SIGNAL HEADS  
PEDESTRIAN PUSHBUTTONS  
PRE-EMPTION DETECTORS

**REUSE EXISTING WIRING**



PHASING DIAGRAM

CURB RAMP CHART

CORNER	CURB RAMP NO.	CURB RAMP TYPE*	AREA (S.F.)
NW	1**	DETECTABLE WARNING	8
NE	1	A2	39
SW	2**	DETECTABLE WARNING	8, 8
SE	1**	DETECTABLE WARNING	8

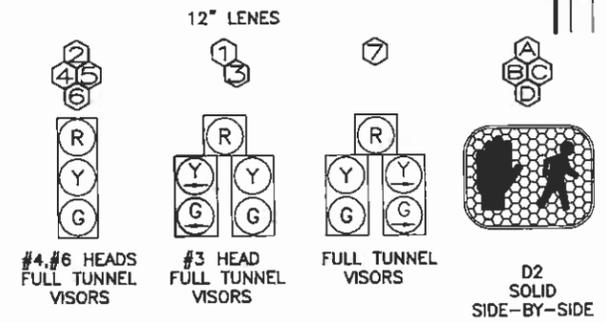
\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.  
\*\* INSTALL DETECTABLE WARNING IN EXISTING CURB RAMP.

LEGEND

- 3-SECTION HEAD
- 5-SECTION HEAD
- VIDEO DETECTOR
- PREEMPTION DETECTOR
- CONTROLLER CABINET
- PULL BOX
- NOSTALGIA POLE
- PEDESTRIAN SIGNAL
- STREET NAME SIGN
- CONCRETE SIDEWALK REMOVAL AND REPLACEMENT
- DECORATIVE LIGHT
- UTILITY POLE
- CATCH BASIN
- MANHOLE
- HYDRANT
- WATER
- GAS
- SANITARY
- STORM
- TELEPHONE

TRAFFIC SIGNAL DETECTOR ZONES

DETECTION ZONE DESIGNATION	ASSOCIATED VIDEO DETECTOR	LOCATION-MOVEMENT	ASSOCIATED CONTROLLER PHASE	DELAY (SEC)	DELAY INHIBITED DURING
DZ-1	VD-1	DUEBER AVE.-NB LT	5	0	2
DZ-2	VD-3	DUEBER AVE.-SB LT	1	0	
DZ-3	VD-2	15TH ST.-EB RT	4	5	4
DZ-4	VD-2	15TH ST.-EB TH	4	0	
DZ-5	VD-2	15TH ST.-EB LT	4	0	
DZ-6	VD-4	15TH ST.-WB TH/RT	8	5	8
DZ-7	VD-4	15TH ST.-WB LT	8	0	
DZ-8	VD-1	DUEBER AVE.-SB	SYSTEM	0	
DZ-9	VD-3	DUEBER AVE.-NB	SYSTEM	0	
DZ-10	VD-2	15TH ST.-WB	SYSTEM	0	
DZ-11	VD-4	15TH ST.-EB	SYSTEM	0	

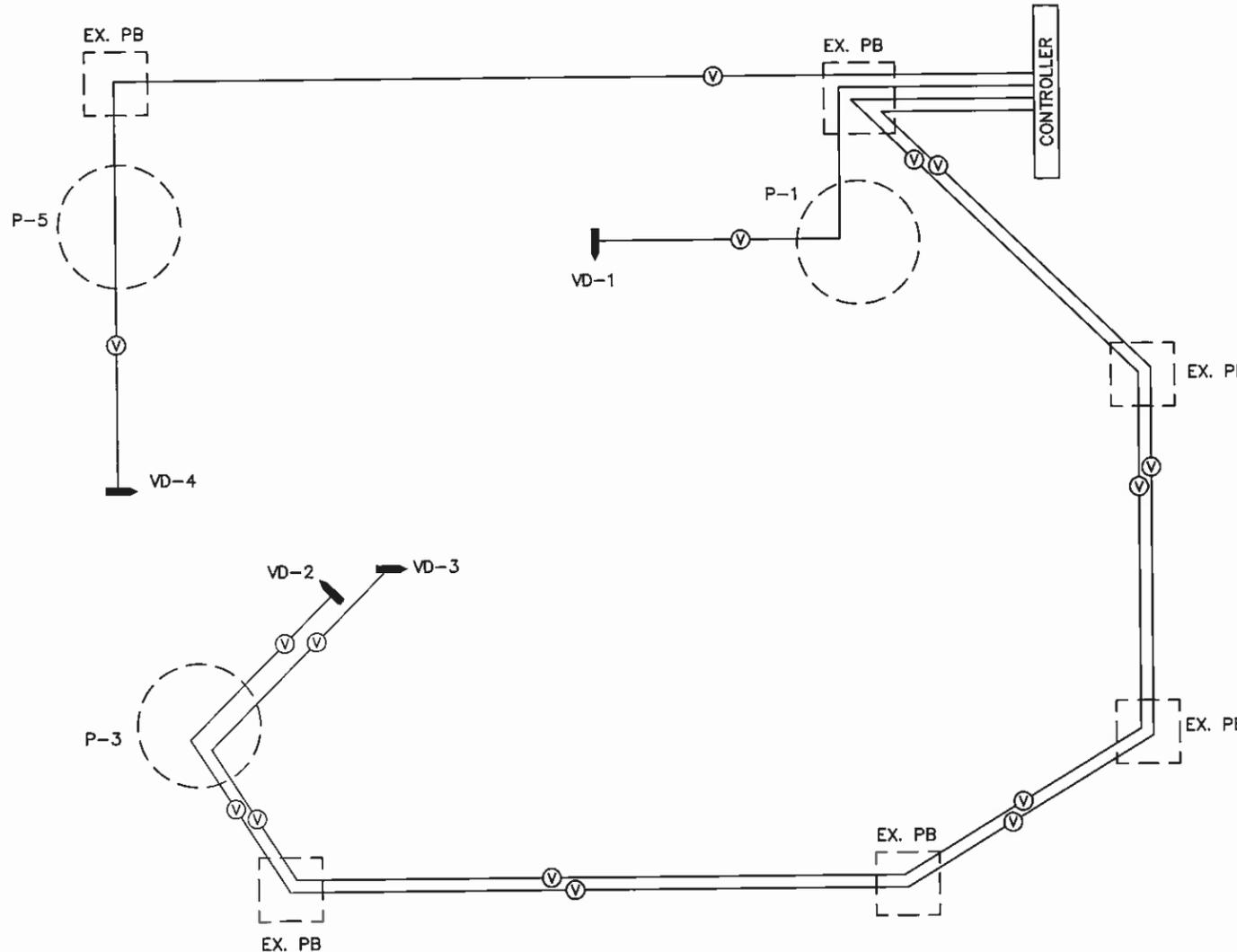


SIGNAL INDICATIONS

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- AI INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- UI INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- P POWER CABLE, (BY CONDUCTOR), #10 AWG
- PE PRE-EMPTION CABLE
- V VIDEO DETECTOR CABLE

- X PEDESTRIAN SIGNAL HEAD
- SPLICE LOCATION
- X VEHICULAR SIGNAL HEAD
- Px PEDESTRIAN PUSHBUTTON
- VIDEO DETECTOR CAMERA
- PRE-EMPTION DETECTOR
- LUMINAIRE



NOTE: EXISTING WIRING TO BE REUSED.

WIRING DIAGRAM

SIGNAL DISPLAY CHART

DIRECTION	SIGNAL HEAD	PHASE 1&6		PHASE 1&5 *				PHASE 2&5				PHASE 2&6				PHASE 4&8				FLASH		
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR					
DUEBER AVE. NORTHBOUND	1	R	R	R	R	G/R	G/R	Y/R	R	G/G	G/G	Y/G	Y/G	G	G	Y	R	R	R	R	R	Y
	2	R	R	R	R	R	R	R	R	G	G	G	G	G	G	Y	R	R	R	R	R	Y
DUEBER AVE. SOUTHBOUND	3	G/G	G/G	Y/G	Y/G	G/R	G/R	Y/R	R	R	R	R	R	G	G	Y	R	R	R	R	R	Y
	4	G	G	G	G	R	R	R	R	R	R	R	R	G	G	Y	R	R	R	R	R	Y
15TH ST. WESTBOUND	5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
	5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
15TH ST. EASTBOUND	6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
	6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y
CROSSING DUEBER AVE.	A-A	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DARK
	C-C	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DARK
CROSSING 15TH ST.	B-B	DW	DW	DW	DW	DW	DW	DW	DW	W	W	W	W	W	FDW	DW	DW	DW	DW	DW	DW	DARK
	D-D	W	W	W	W	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DARK

\* IF PHASE 1&6 OCCURS NEXT, THEN LEFT ARROW ON HEAD 3 REMAINS GREEN  
 IF PHASE 2&5 OCCURS NEXT, THEN LEFT ARROW ON HEAD 1 AND RIGHT ARROW ON HEAD 7 REMAIN GREEN

PRE-EMPTION NOTES: CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

TRAFFIC SIGNAL CONTROLLER TIMING CHART

START UP

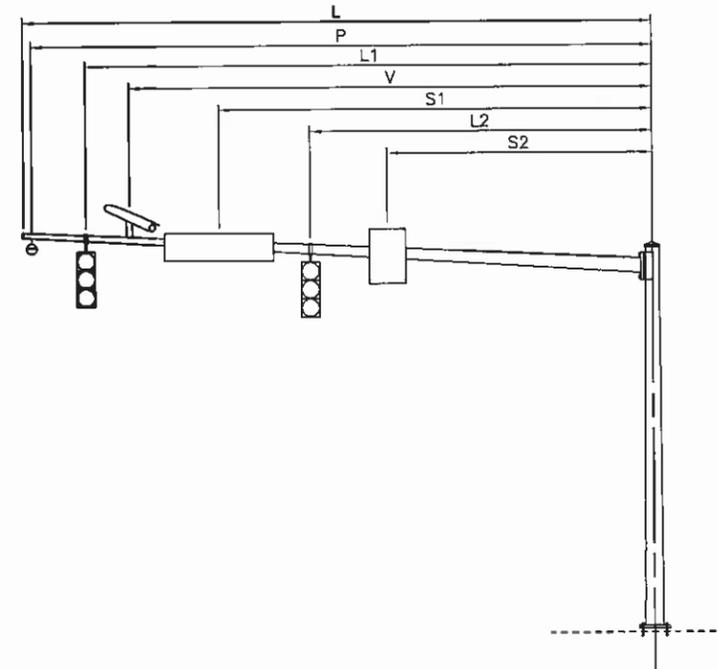
START IN: ALL RED  
 TIME FOR FLASH OR ALL RED 7 SEC.  
 FIRST PHASE(S) # 2&6  
 COLOR DISPLAYED: GREEN

INTERVAL	CONTROLLER PHASE							
	1	2	3	4	5	6	7	8
	NBLT	SB		WB	SBLT	NB		EB
MINIMUM GREEN (INITIAL) (SEC.)	7	5	-	10	7	5	-	10
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	4	5	-	5	4	5	-	5
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	15	25	-	20	15	25	-	20
MAXIMUM GREEN II (SEC.)	15	25	-	20	15	25	-	20
YELLOW CHANGE (SEC.)	3	3	-	3	3	3	-	3
ALL RED CLEARANCE (SEC.)	-	2	-	2	-	2	-	2
WALK (SEC.)	-	7	-	7	-	7	-	7
PEDESTRIAN CLEARANCE (SEC.)	-	19	-	16	-	19	-	16
RECALL	MAXIMUM (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF
	PEDESTRIAN (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY (ON/OFF)	NO. 1	-	-	-	-	-	-	-
	NO. 2	-	YES	-	-	-	YES	-
CALL TO NON-ACTUATED	NO. 1	-	-	-	-	-	-	-
	NO. 2	-	-	-	-	-	-	-

TRAFFIC SIGNAL DETAIL  
 15TH STREET AND DUEBER AVENUE S.W.

NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

ITEM	EXT.	QUANT.	UNIT	DESCRIPTION
202	32001	8	EACH	CURB REMOVED, AS PER PLAN
202	30000	103	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	0	S.F.	4" CONCRETE WALK
608	49001	39	S.F.	CURB RAMP, AS PER PLAN
608	53020	32	S.F.	DETECTABLE WARNING
609	26001	0	FEET	CURB, TYPE 6
625	14501	0	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	0	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	0	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	0	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	0	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	0	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	0	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	0	FEET	TRENCH
625	29601	0	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	0	EACH	GROUND ROD
625	23304	0	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	0	EACH	CONNECTOR KIT, TYPE II
625	00600	0	EACH	CONNECTOR KIT, TYPE III
625	31510	0	EACH	PULL BOX REMOVED
625	75510	0	EACH	POWER SERVICE REMOVED
625	36000	0	EACH	PLASTIC CAUTION TAPE
630	87101	0	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	7	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	3	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	4	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	0	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC. NOSTALGIA PEDESTAL, 8"
632	70001	0	EACH	POWER SERVICE, AS PER PLAN
632	70401	0	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	0	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	0	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	0	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	0	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	0	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	0	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	0	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	10	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	8	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	4	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	4	EACH	SIGNALIZATION, MISC. PRE-EMPTION DETECTOR
632	90400	0	FEET	SIGNALIZATION, MISC. PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	0	EACH	CABINET RISER
633	67100	0	EACH	CABINET FOUNDATION
633	67200	0	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC. PRE-EMPTION
816	30001	1	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN



SIGNAL SUPPORT

POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	V(FT.)
P-1 *	-	-	30
P-3 *	-	-	22
P-5 *	-	-	34,46

\* EXISTING SIGNAL SUPPORT

CALCULATED:  
N/JL  
CHECKED:  
EGM

TRAFFIC SIGNAL DETAIL  
15TH STREET AND DUEBER AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

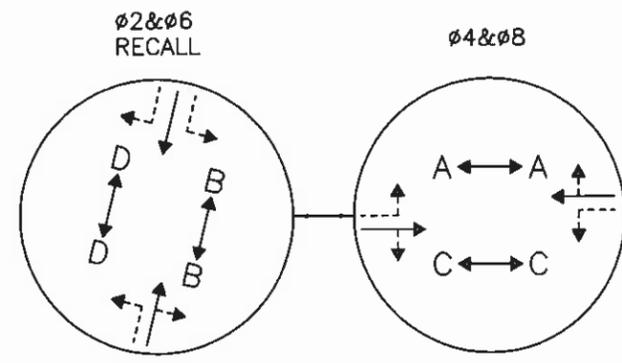
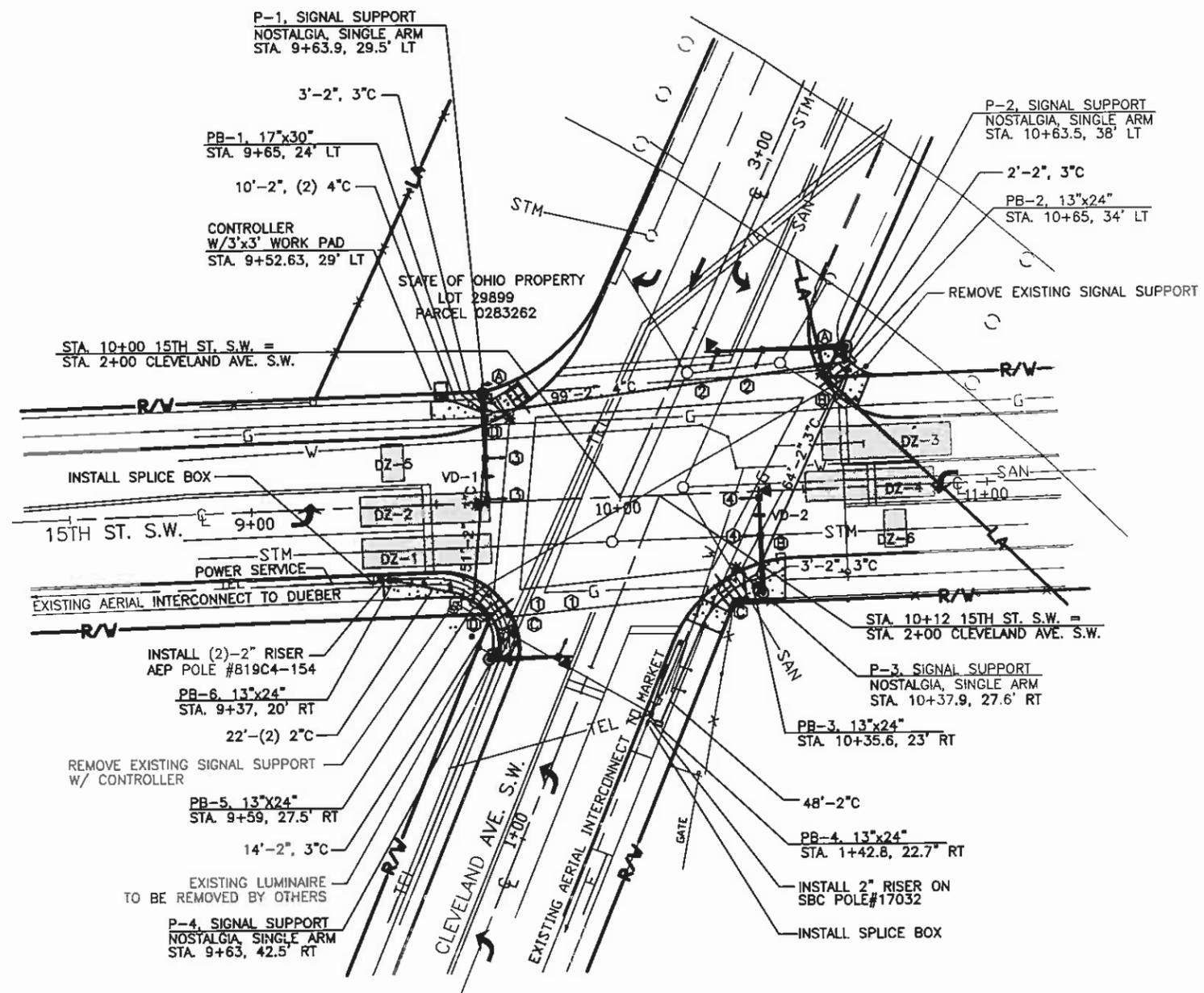


HORIZONTAL SCALE  
1" = 20 FEET

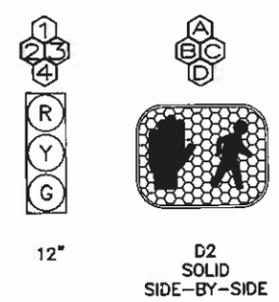
TRAFFIC SIGNAL PLAN  
15TH STREET AND CLEVELAND AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

36  
54



TRAFFIC SIGNAL DETECTOR ZONES					
DETECTION ZONE DESIGNATION	ASSOCIATED VIDEO DETECTOR	LOCATION-MOVEMENT	ASSOCIATED CONTROLLER PHASE	DELAY (SEC)	DELAY INHIBITED DURING
DZ-1	VD-2	15TH ST.-EB TH/RT	4	5	4
DZ-2	VD-2	15TH ST.-EB LT	4	0	
DZ-3	VD-1	15TH ST.-WB TH/RT	8	5	8
DZ-4	VD-1	15TH ST.-WB LT	8	0	
DZ-5	VD-2	15TH ST.-WB	SYSTEM	0	
DZ-6	VD-1	15TH ST.-EB	SYSTEM	0	



**CURB RAMP CHART**

CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	1	B1	54
NE	1	A1	61
SW	1	B2	96
SE	1	B2	96

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

- LEGEND**
- 3-SECTION HEAD
  - 5-SECTION HEAD
  - VIDEO DETECTOR
  - PREEMPTION DETECTOR
  - CONTROLLER CABINET
  - PULL BOX
  - NOSTALGIA POLE
  - PEDESTRIAN SIGNAL
  - STREET NAME SIGN
  - CONCRETE SIDEWALK REMOVAL AND REPLACEMENT
  - DECORATIVE LIGHT
  - UTILITY POLE
  - CATCH BASIN
  - MANHOLE
  - HYDRANT
  - WATER
  - GAS
  - SANITARY
  - STORM
  - TELEPHONE

**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⑧ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- (AI) INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (U) INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- (P) POWER CABLE, (BY CONDUCTOR), #10 AWG
- (PE) PRE-EMPTION CABLE
- (V) VIDEO DETECTOR CABLE

- X PEDESTRIAN SIGNAL HEAD
- SPLICE LOCATION
- X VEHICULAR SIGNAL HEAD
- (P<sub>x</sub>) PEDESTRIAN PUSHBUTTON
- ▶ VIDEO DETECTOR CAMERA
- ▶ PRE-EMPTION DETECTOR
- ☀ LUMINAIRE

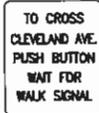
1,2,3,4

A-D

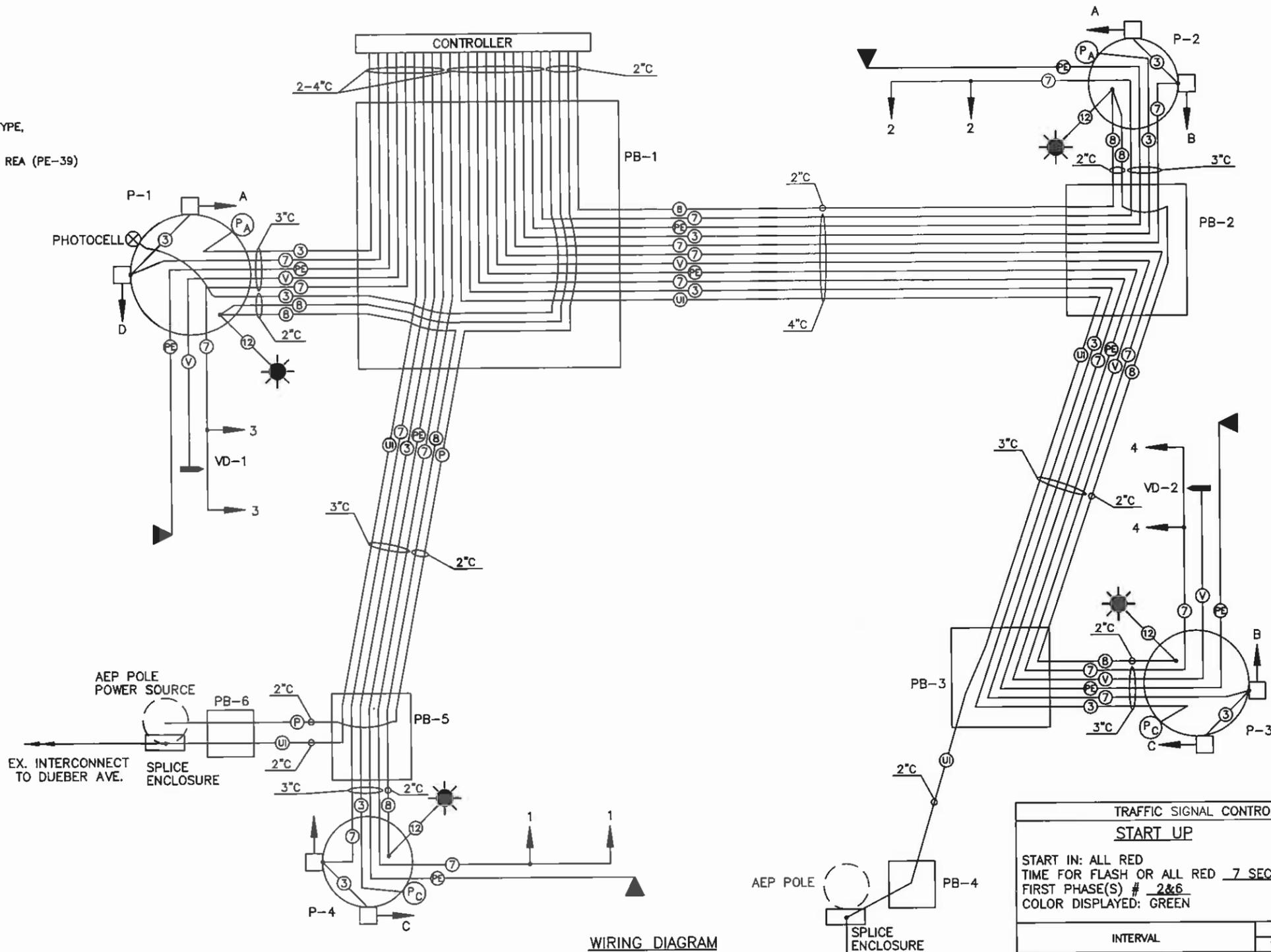


**SIGNAL INDICATIONS**

A,C



R-73A-9



**WIRING DIAGRAM**

PRE-EMPTION NOTES: CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
 CHANNEL 4 SHALL PRE-EMPT TO EB GREEN

**SIGNAL DISPLAY CHART**

DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4&8				FLASH
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
CLEVELAND AVE. SOUTHBOUND	1	G	G	Y	R	R	R	R	R	Y
	1	G	G	Y	R	R	R	R	R	Y
CLEVELAND AVE. NORTHBOUND	2	G	G	Y	R	R	R	R	R	Y
	2	G	G	Y	R	R	R	R	R	Y
15TH ST. EASTBOUND	3	R	R	R	R	G	G	Y	R	R
	3	R	R	R	R	G	G	Y	R	R
15TH ST. WESTBOUND	4	R	R	R	R	G	G	Y	R	R
	4	R	R	R	R	G	G	Y	R	R
CROSSING CLEVELAND AVE.	A-A	DW	DW	DW	DW	W	FDW	DW	DW	DARK
	C-C	DW	DW	DW	DW	W	FDW	DW	DW	DARK
CROSSING 15TH ST.	B-B	W	FDW	DW	DW	DW	DW	DW	DW	DARK
	D-D	W	FDW	DW	DW	DW	DW	DW	DW	DARK

TRAFFIC SIGNAL CONTROLLER TIMING CHART								
START UP								
START IN: ALL RED								
TIME FOR FLASH OR ALL RED <u>7 SEC.</u>								
FIRST PHASE(S) # <u>2&amp;6</u>								
COLOR DISPLAYED: GREEN								
INTERVAL	CONTROLLER PHASE							
	1	2	3	4	5	6	7	8
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	-	5	-	10
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	5
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-
MAXIMUM GREEN I (SEC.)	-	40	-	25	-	40	-	25
MAXIMUM GREEN II (SEC.)	-	40	-	30	-	40	-	30
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	-	3.6	-	3.6
ALL RED CLEARANCE (SEC.)	-	1.9	-	1.4	-	1.9	-	1.4
WALK (SEC.)	-	7	-	7	-	7	-	7
PEDESTRIAN CLEARANCE (SEC.)	-	25	-	25	-	25	-	25
RECALL	MAXIMUM (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF
	PEDESTRIAN (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY	(ON/OFF)	-	-	-	-	-	-	-
	CALL TO NON-ACTUATED	NO. 1	YES	-	-	-	YES	-
	NO. 2	-	-	-	-	-	-	-

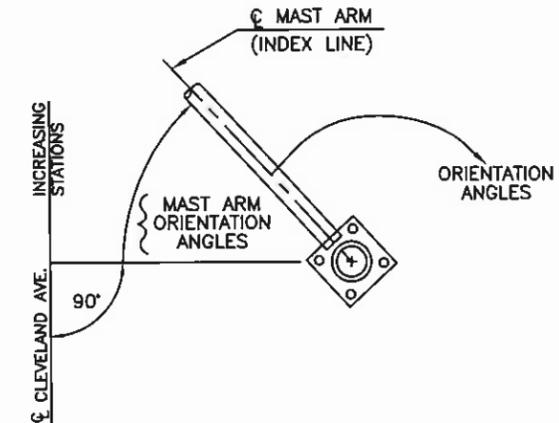
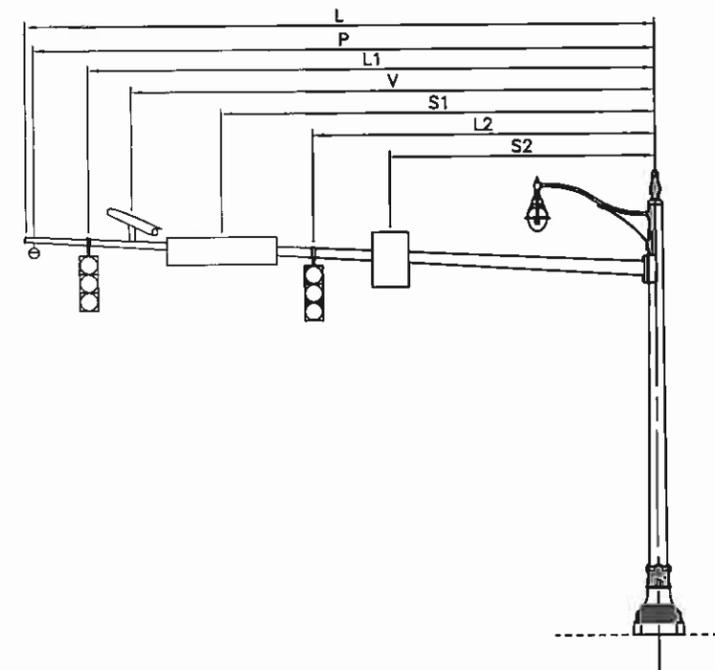
TRAFFIC SIGNAL DETAIL  
 15TH STREET AND CLEVELAND AVENUE S.W.

NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

ITEM	EXT	QUANT.	UNIT	DESCRIPTION
202	32001	120	EACH	CURB REMOVED, AS PER PLAN
202	30000	799	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	492	S.F.	4" CONCRETE WALK
608	49001	307	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	62	FEET	CURB, TYPE 6
625	14501	0	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	0	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	4	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	338	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	137	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	119	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	102	FEET	TRENCH
625	29601	214	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	1600	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	12	EACH	CONNECTOR KIT, TYPE II
625	00600	4	EACH	CONNECTOR KIT, TYPE III
625	31510	0	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	316	EACH	PLASTIC CAUTION TAPE
630	87101	0	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	8	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	0	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	8	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	4	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	4	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	0	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	4	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	0	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	2	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	651	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	1415	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	2	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	540	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	8	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	8	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	4	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	765	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	1	EACH	CONTROLLER WORK PAD
633	99000	1	EACH	CONTROLLER ITEM, MISC.: PRE-EMPTION
816	30001	1	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT NOSTALGIA											ANGLES(DEG.) FROM INDEX LINE						
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	P (FT.)	V (FT.)	S1 (FT.)	S2 (FT.)	LUMINAIRE (FT.)	MAST ARM	LUMINAIRE BRACKET	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	*	31	29	17	30	23	-	-	*	63	315	A 0	A 0	D 275	-	0
P-2	21.0	*	39	35	23	38	-	-	-	*	333	315	A 180	A 315	B 27	-	0
P-3	21.0	*	28	26	15	27	21	-	-	*	66	315	B 180	-	C 180	D 270	90
P-4	21.0	*	23	19	5	22	-	-	-	*	336	315	C 0	C 345	D 10	-	0

\* SEE NOSTALGIA POLE DETAILS



- NOTES:  
1. ALL ANGLES MEASURED CLOCKWISE.  
2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.

CALCULATED: NJL  
CHECKED: EEM  
TRAFFIC SIGNAL DETAIL  
15TH STREET AND CLEVELAND AVENUE S.W.  
NAVARRE ROAD S.W.  
SIGNAL SYSTEM  
38  
54

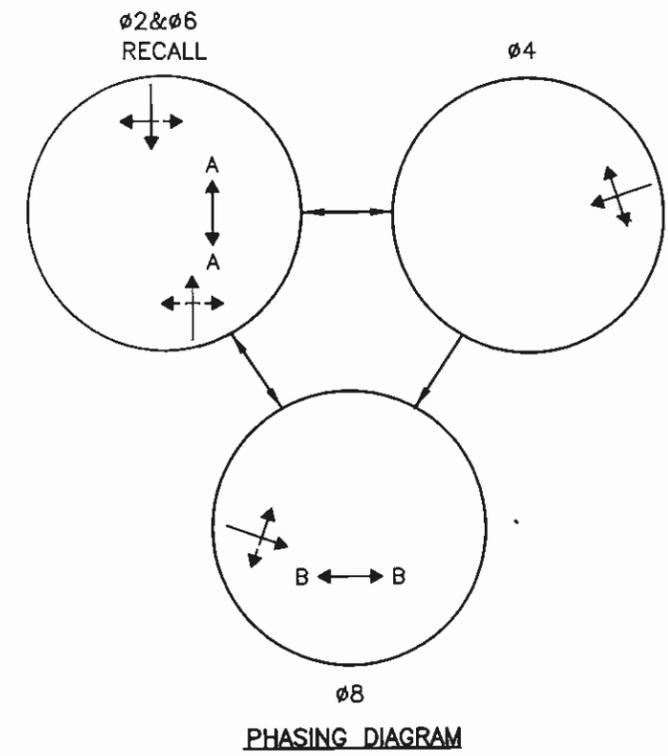


HORIZONTAL SCALE  
1" = 20 FEET

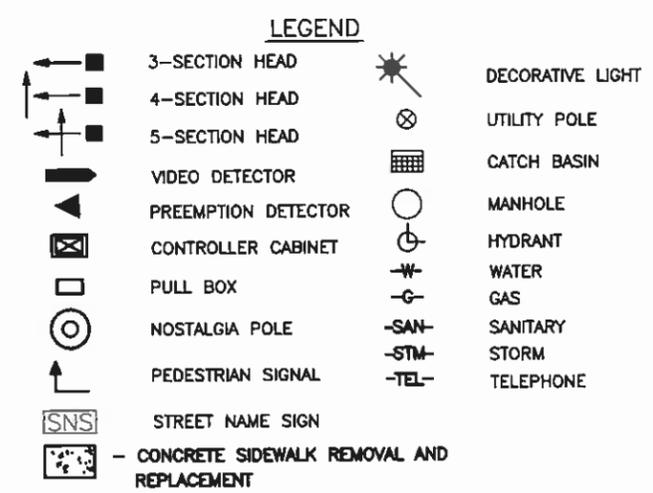
TRAFFIC SIGNAL PLAN  
CLEVELAND AVENUE AND MARKET AVENUE S.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

39  
54



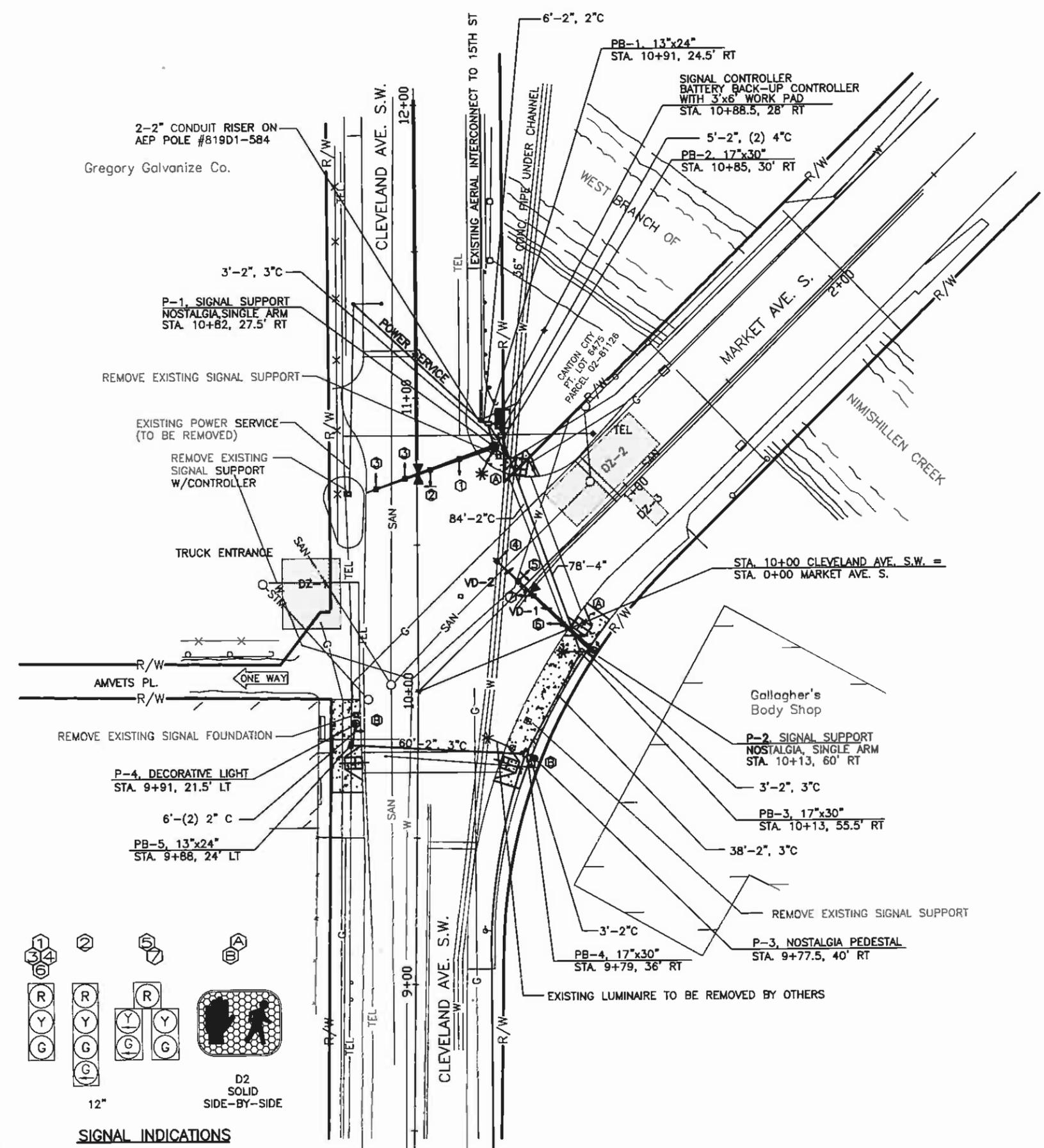
TRAFFIC SIGNAL DETECTOR ZONES					
DETECTION ZONE DESIGNATION	ASSOCIATED VIDEO DETECTOR	LOCATION-MOVEMENT	ASSOCIATED CONTROLLER PHASE	DELAY (SEC)	DELAY INHIBITED DURING
DZ-1	VD-1	DRIVEWAY-EB	8	0	
DZ-2	VD-2	MARKET AVE.-SB	4	0	
DZ-3	VD-2	MARKET AVE.-NB	SYSTEM	0	



CURB RAMP CHART

CORNER	CURB RAMP		AREA (S.F.)
	NO.	TYPE*	
NW	0	-	0
NE	1	A1	61
SW	1	A1	61
SE	2	A1, A1	122

\* CURB RAMP TYPE IS SHOWN FOR REFERENCE. FIELD CONDITIONS MAY REQUIRE A DIFFERENT TYPE TO BE INSTALLED.

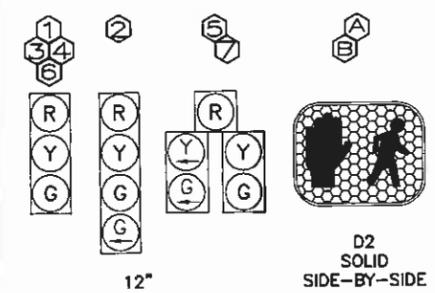


SIGNAL INDICATIONS

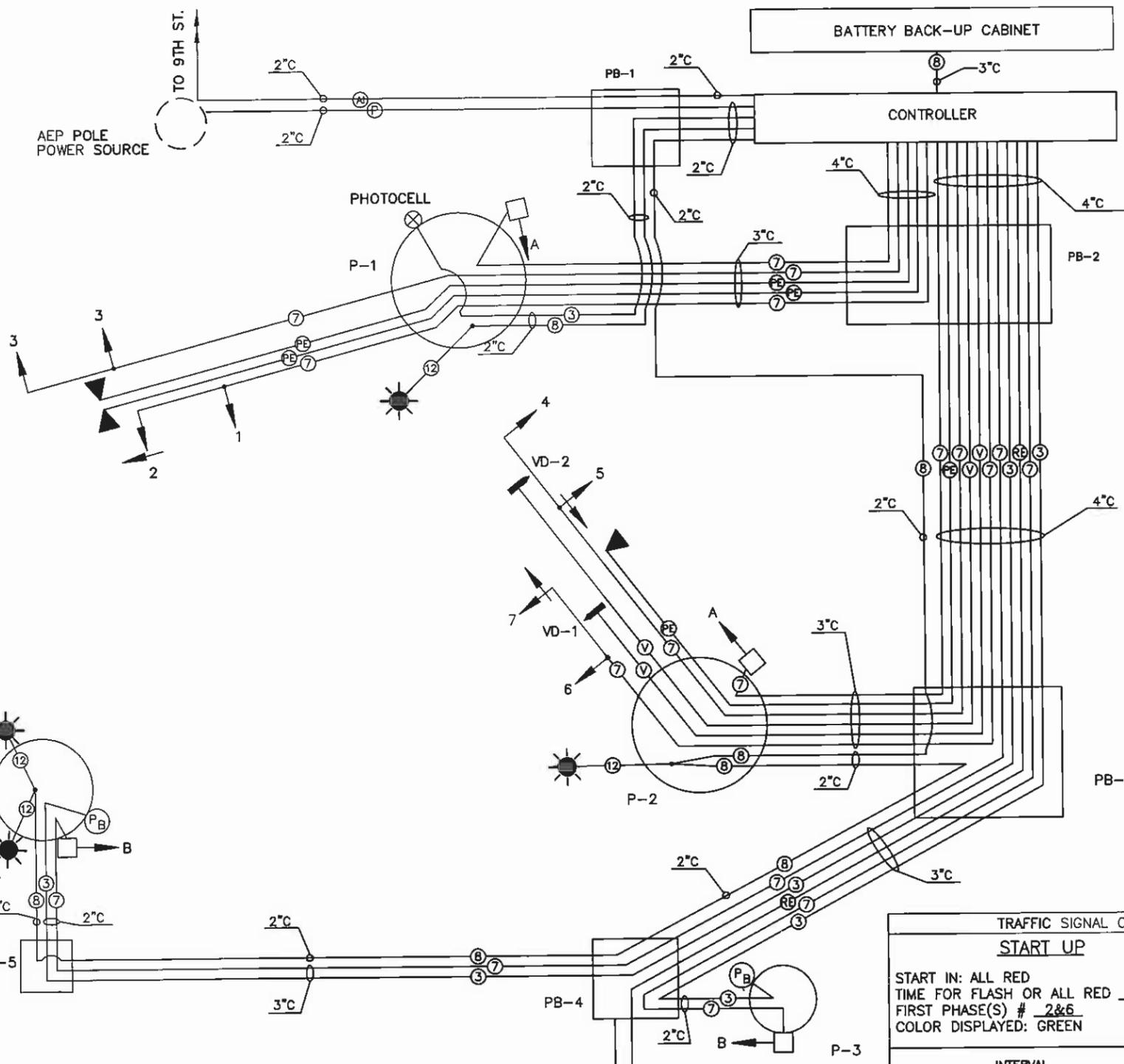
**LEGEND**

- ③ SIGNAL CABLE, 3 CONDUCTOR, #14 AWG
- ⑦ SIGNAL CABLE, 7 CONDUCTOR, #14 AWG
- ⓑ #8 AWG, 600 VOLT, DISTRIBUTION CABLE
- ⑫ #12 AWG POLE AND BRACKET CABLE
- Ⓐ INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓤ INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
- Ⓟ POWER CABLE, (BY CONDUCTOR), #10 AWG
- Ⓟ PRE-EMPTION CABLE
- Ⓡ RAILROAD PRE-EMPTION CABLE
- Ⓢ VIDEO DETECTOR CABLE

- Ⓧ PEDESTRIAN SIGNAL HEAD
- SPLICE LOCATION
- ➔ VEHICULAR SIGNAL HEAD
- Ⓟ PEDESTRIAN PUSHBUTTON
- ➔ VIDEO DETECTOR CAMERA
- ➔ PRE-EMPTION DETECTOR
- ☀ LUMINAIRE



**SIGNAL INDICATIONS**



**WIRING DIAGRAM**

**PRE-EMPTION NOTES:**  
**EMERGENCY PRE-EMPTION**  
 CHANNEL 1 SHALL PRE-EMPT TO SB GREEN  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN  
 CHANNEL 3 SHALL PRE-EMPT TO WB GREEN  
**RAILROAD PRE-EMPTION**  
 CHANNEL 2 SHALL PRE-EMPT TO NB GREEN

SIGNAL DISPLAY CHART														
DIRECTION	SIGNAL HEAD	PHASE 2&6				PHASE 4				PHASE B				FLASH
		R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	R/W	CLEAR	
CLEVELAND AVE. NORTHBOUND	1	G	G	Y	R	R	R	R	R	R	R	R	R	R
	2	G	G	Y	R	R	R	R	R	R	R	R	R	R
CLEVELAND AVE. SOUTHBOUND	3	G	G	Y	R	R	R	R	R	R	R	R	R	R
	3	G	G	Y	R	R	R	R	R	R	R	R	R	R
MARKET AVE. WESTBOUND	4	R	R	R	R	G	G	Y	R	R	R	R	R	R
	5	R	R	R	R	G	G	Y	R	R	R	R	R	R
DRIVEWAY EASTBOUND	6	R	R	R	R	G	G	Y	R	G	G	Y	R	R
	7	R	R	R	R	G	G	Y	R	G	G	Y	R	R
CROSSING MARKET AVE.	A-A	W	FWD	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DARK
CROSSING CLEVELAND AVE.	B-B	DW	DW	DW	DW	DW	DW	DW	DW	W	FWD	DW	DW	DARK

TRAFFIC SIGNAL CONTROLLER TIMING CHART									
START UP									
START IN: ALL RED									
TIME FOR FLASH OR ALL RED 7 SEC.									
FIRST PHASE(S) # 2&6									
COLOR DISPLAYED: GREEN									
INTERVAL	CONTROLLER PHASE								
	1	2	3	4	5	6	7	8	
	SB	WB	NB	EB					
MINIMUM GREEN (INITIAL) (SEC.)	-	5	-	10	-	5	-	10	
ADDED INITIAL (SEC./ACTUATION)	-	-	-	-	-	-	-	-	
PASSAGE TIME (PRESET GAP) (SEC.)	-	5	-	5	-	5	-	5	
TIME BEFORE REDUCTION (SEC.)	-	-	-	-	-	-	-	-	
MINIMUM GAP (SEC.)	-	-	-	-	-	-	-	-	
TIME TO REDUCE (SEC.)	-	-	-	-	-	-	-	-	
MAXIMUM GREEN I (SEC.)	-	40	-	25	-	40	-	25	
MAXIMUM GREEN II (SEC.)	-	50	-	30	-	50	-	30	
YELLOW CHANGE (SEC.)	-	3.6	-	3.6	-	3.6	-	3.6	
ALL RED CLEARANCE (SEC.)	-	2	-	2	-	2	-	2	
WALK (SEC.)	-	7	-	7	-	7	-	7	
PEDESTRIAN CLEARANCE (SEC.)	-	24	-	24	-	24	-	13	
RECALL	MAXIMUM (ON/OFF)	OFF							
	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	
MEMORY	PEDESTRIAN (ON/OFF)	OFF							
	(ON/OFF)	-	-	-	-	-	-	-	
CALL TO NON-ACTUATED	NO. 1	-	YES	-	-	-	YES	-	
	NO. 2	-	-	-	-	-	-	-	

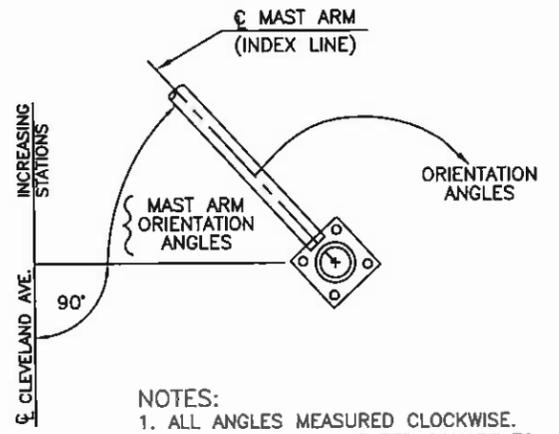
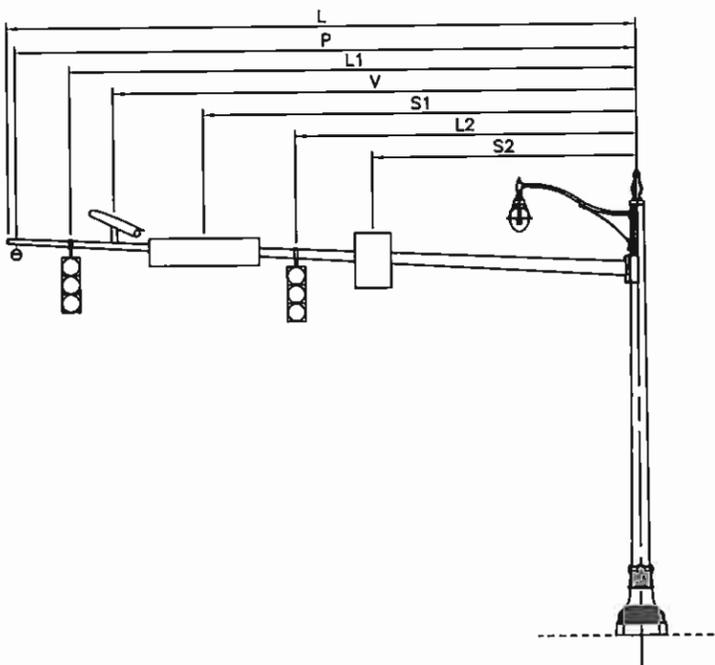
TRAFFIC SIGNAL DETAIL  
 CLEVELAND AVENUE AND MARKET AVENUE S.  
 NAVARRE ROAD S.W.  
 SIGNAL SYSTEM

40  
54

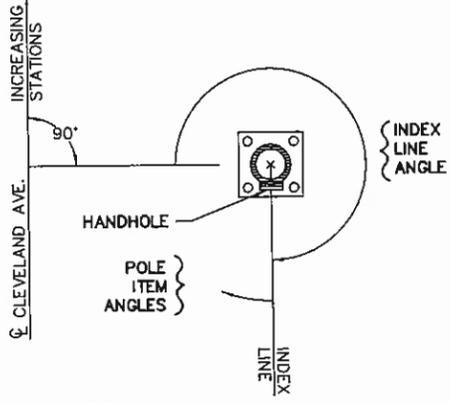
ITEM	EXT	QUANT	UNIT	DESCRIPTION
202	32001	120	EACH	CURB REMOVED, AS PER PLAN
202	30000	1069	S.F.	WALK REMOVED
202	98100	0	EACH	REMOVAL MISC.: SIGN FOUNDATION REMOVED
608	10000	825	S.F.	4" CONCRETE WALK
608	49001	244	S.F.	CURB RAMP, AS PER PLAN
608	53020	0	S.F.	DETECTABLE WARNING
609	26001	56	FEET	CURB, TYPE 6
625	14501	1	EACH	LIGHT POLE FOUNDATION, AS PER PLAN
625	10481	1	EACH	LIGHT POLE, DECORATIVE, AS PER PLAN
625	31600	3	EACH	PULL BOX, MISC.: 725.06, 13"x24"
625	31600	1	EACH	PULL BOX, MISC.: 725.06, 17"x30"
625	25400	218	FEET	CONDUIT, 2", 725.05, AS PER PLAN
625	25500	103	FEET	CONDUIT, 3", 725.05, AS PER PLAN
625	25600	85	FEET	CONDUIT, 4", 725.05, AS PER PLAN
625	25900	0	FEET	CONDUIT, JACKED OR DRILLED, 3"
625	29000	67	FEET	TRENCH
625	29601	135	FEET	TRENCH IN PAVED AREA, TYPE B, AS PER PLAN
625	32000	5	EACH	GROUND ROD
625	23304	1220	FEET	NO. 8 AWG 600 VOLT DISTRIBUTION CABLE
625	00500	9	EACH	CONNECTOR KIT, TYPE II
625	00600	3	EACH	CONNECTOR KIT, TYPE III
625	31510	0	EACH	PULL BOX REMOVED
625	75510	1	EACH	POWER SERVICE REMOVED
625	36000	202	EACH	PLASTIC CAUTION TAPE
630	87101	0	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION
632	05005	6	EACH	VEHICULAR SIGNAL HEAD, (LED), 3 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	05085	2	EACH	VEHICULAR SIGNAL HEAD, (LED), 5 SECTION, 12" LENS, 1-WAY, POLYCARBONATE, AS PER PLAN
632	20731	4	EACH	PEDESTRIAN SIGNAL HEAD, (LED), (COUNTDOWN), TYPE D2, AS PER PLAN
632	26001	2	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	64001	2	EACH	SIGNAL SUPPORT FOUNDATION, AS PER PLAN
632	64021	1	EACH	PEDESTAL FOUNDATION, AS PER PLAN
632	80200	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 2
632	80300	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 3
632	80500	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11
632	80600	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12
632	75050	0	EACH	SIGNAL SUPPORT, TYPE TC-81.20 DESIGN 4 POLE, WITH MAST ARMS TC-81.20 DESIGN 3 AND DESIGN 3
632	80700	2	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, SINGLE ARM
632	80700	0	EACH	SIGNAL SUPPORT MISC.: NOSTALGIA SIGNAL SUPPORT, DOUBLE ARM
632	89600	0	EACH	PEDESTAL, 8"
632	90010	1	EACH	PEDESTAL, MISC.: NOSTALGIA PEDESTAL, 8"
632	70001	1	EACH	POWER SERVICE, AS PER PLAN
632	70401	2	EACH	CONDUIT RISER, 2" DIAMETER, AS PER PLAN
632	40300	485	FEET	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG
632	40700	1095	FEET	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	90400	0	EACH	SIGNALIZATION MISC.: INTERCONNECT SPLICE ENCLOSURE
632	66101	195	FEET	POWER CABLE, 1 CONDUCTOR, NO. 10 AWG, AS PER PLAN
632	25000	10	EACH	COVERING OF VEHICULAR SIGNAL HEAD
632	25010	4	EACH	COVERING OF PEDESTRIAN SIGNAL HEAD
632	90101	1	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: VEHICULAR SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN SIGNAL HEAD
632	90020	0	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: PEDESTRIAN PUSHBUTTON
632	90400	3	EACH	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR
632	90400	355	FEET	SIGNALIZATION, MISC.: PRE-EMPTION DETECTOR CABLE
633	01561	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, WITH CABINET, TYPE TS1, AS PER PLAN
633	39001	0	EACH	CONTROLLER, MASTER, TRAFFIC RESPONSIVE, AS PER PLAN
633	67000	1	EACH	CABINET RISER
633	67100	1	EACH	CABINET FOUNDATION
633	67200	1	EACH	CONTROLLER WORK PAD
633	99500	1	EACH	CONTROLLER ITEM, MISC. PRE-EMPTION
816	30001	1	EACH	VIDEO DETECTION SYSTEM, AS PER PLAN

SIGNAL SUPPORT NOSTALGIA												ANGLES(DEC.) FROM INDEX LINE							
POLE NO.	ARM HEIGHT-H (FT.)	DESIGN NO.	L (FT.)	L1 (FT.)	L2 (FT.)	L3 (FT.)	L4 (FT.)	P1 (FT.)	P2 (FT.)	V1 (FT.)	V2 (FT.)	LUMINAIRE (FT.)	MAST ARM	LUMINAIRE BRACKET	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-1	21.0	*	44	43	32	23	13	28	27	-	-	*	340	315	A 180	-	-	-	270
P-2	21.0	*	46	45	35	28	14	30	-	40	22	*	45	315	A 115	-	-	-	0

\* SEE NOSTALGIA POLE DETAILS



NOTES:  
 1. ALL ANGLES MEASURED CLOCKWISE.  
 2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.

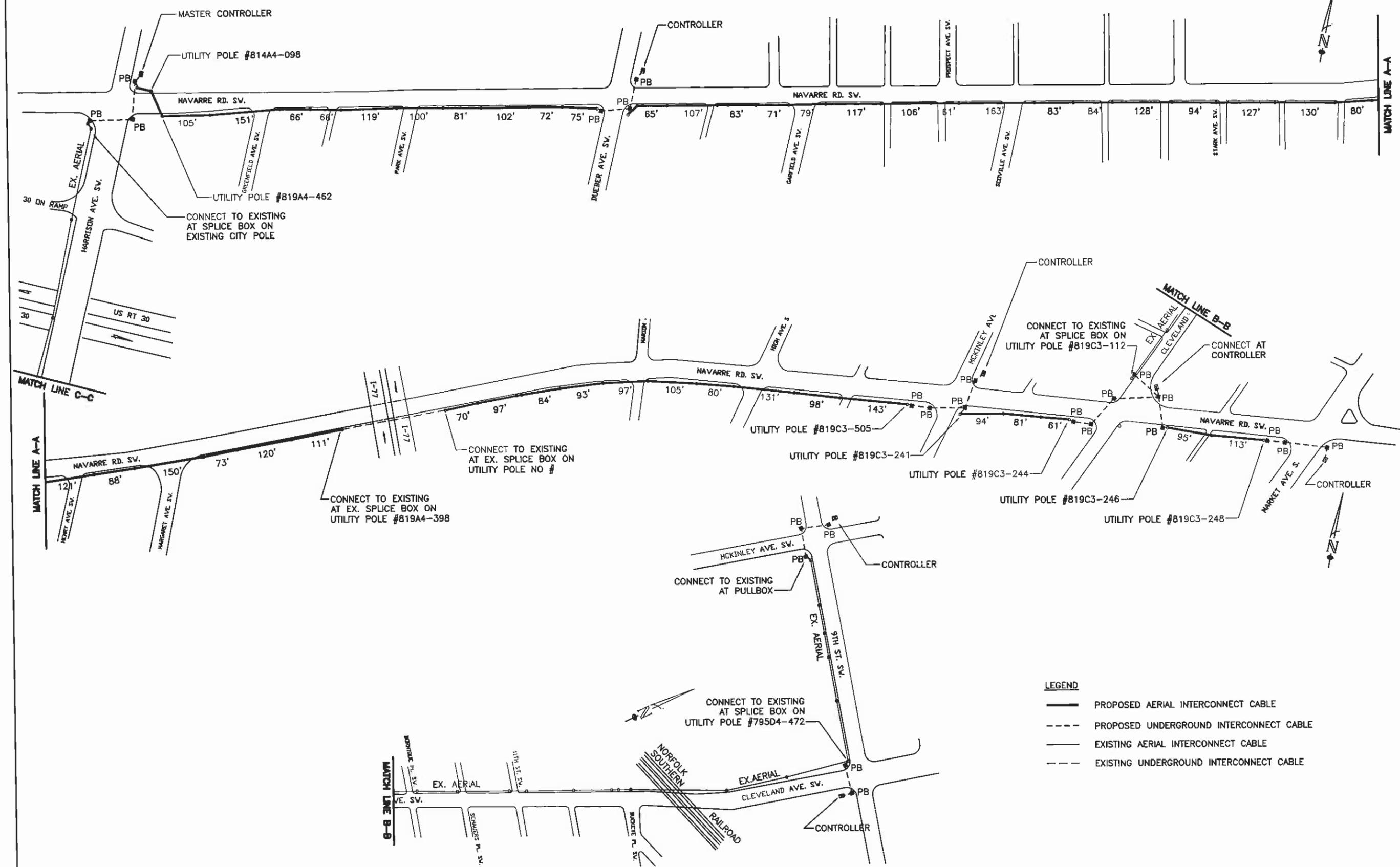
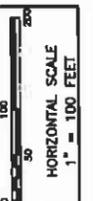


NOTES:  
 1. ALL ANGLES MEASURED CLOCKWISE.  
 2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE.  
 3. DOUBLE LUMINAIRES SHALL BE MOUNTED PARALLEL TO MAIN STREET

PEDESTAL CHART					
POLE NO.	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	PEDESTRIAN SIGNALS	PEDESTRIAN PUSHBUTTONS	HANDHOLE
P-3	B 270	B 0	-	-	0
P-4	B 90	B 90	-	-	180

CALCULATED: EGM  
 CHECKED: NJL  
 NAVARRE ROAD S.W. SIGNAL SYSTEM  
 CLEVELAND AVENUE AND MARKET AVENUE S.  
 41  
 54

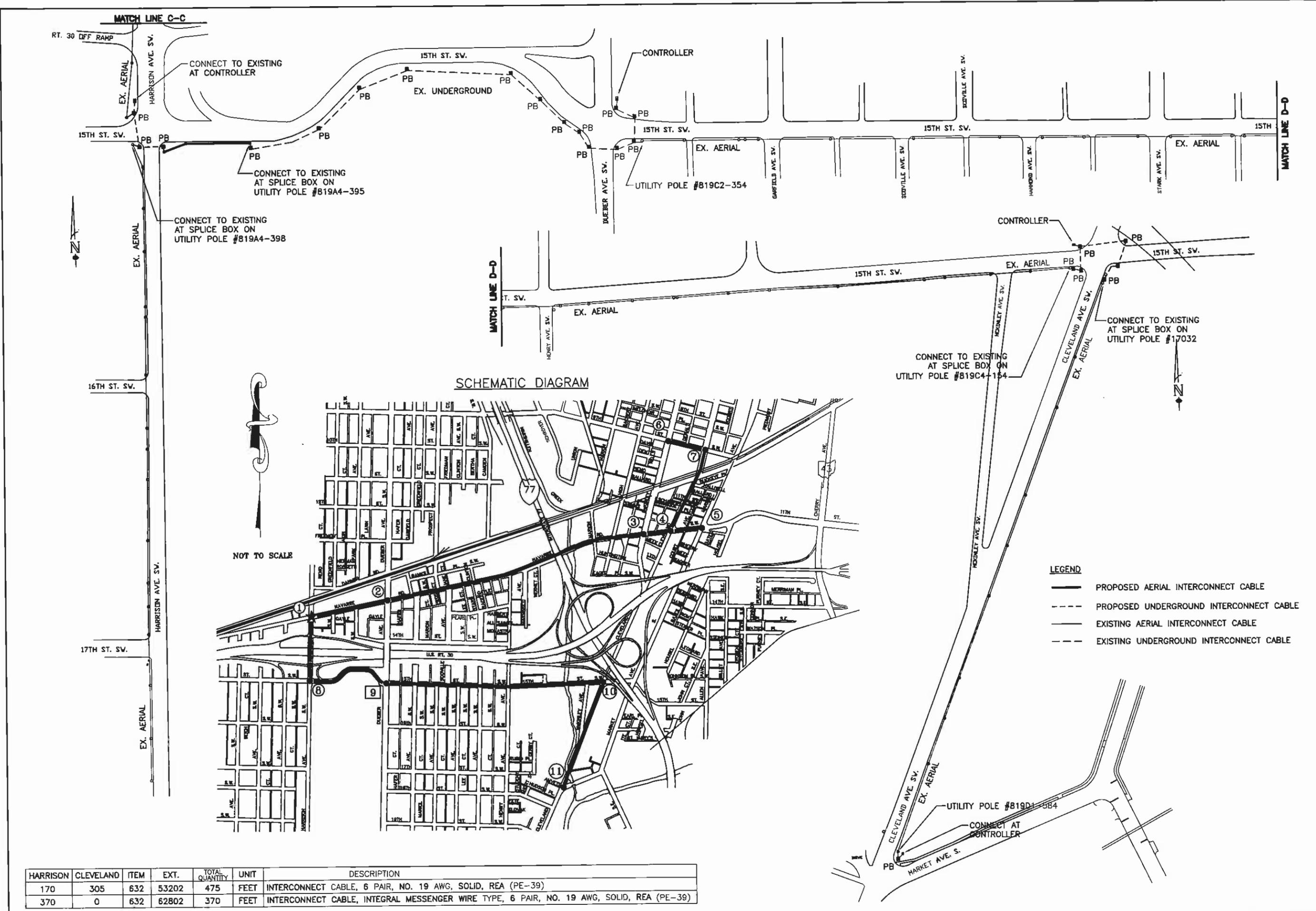
NAVARRE	9TH ST.	ITEM	EXT.	TOTAL QUANTITY	UNIT	DESCRIPTION
373	310	632	53202	683	FEET	INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
6,120	0	632	62802	6,120	FEET	INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)



- LEGEND**
- PROPOSED AERIAL INTERCONNECT CABLE
  - - - PROPOSED UNDERGROUND INTERCONNECT CABLE
  - EXISTING AERIAL INTERCONNECT CABLE
  - - - EXISTING UNDERGROUND INTERCONNECT CABLE

INTERCONNECT PLAN

NAVARRE ROAD S.W. SIGNAL SYSTEM



HARRISON	CLEVELAND	ITEM	EXT.	TOTAL QUANTITY	UNIT	DESCRIPTION
170	305	632	53202	475	FEET	INTERCONNECT CABLE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)
370	0	632	62802	370	FEET	INTERCONNECT CABLE, INTEGRAL MESSENGER WIRE TYPE, 6 PAIR, NO. 19 AWG, SOLID, REA (PE-39)

NAVARRE RD. & HARRISON AVE. S.W. ID NO.: 1			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	0		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	13	
	PHASE 2	36	
	PHASE 3	13	
	PHASE 4	38	
	PHASE 5	13	
	PHASE 6	36	
	PHASE 7	13	
	PHASE 8	38	

MASTER ID: ZONE 11

NAVARRE RD. & DUEBER AVE. S.W. ID NO.: 2			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	20		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	50	
	PHASE 3	0	
	PHASE 4	50	
	PHASE 5	0	
	PHASE 6	50	
	PHASE 7	0	
	PHASE 8	50	

NAVARRE RD. & MCKINLEY AVE. S.W. ID NO.: 3			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	25		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	50	
	PHASE 3	0	
	PHASE 4	50	
	PHASE 5	0	
	PHASE 6	50	
	PHASE 7	0	
	PHASE 8	0	

NAVARRE RD. & CLEVELAND AVE. S.W. ID NO.: 4			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	25		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	50	
	PHASE 3	0	
	PHASE 4	50	
	PHASE 5	0	
	PHASE 6	50	
	PHASE 7	0	
	PHASE 8	0	

NAVARRE RD. & MARKET AVE. S. ID NO.: 5			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	25		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	50	
	PHASE 3	0	
	PHASE 4	50	
	PHASE 5	0	
	PHASE 6	50	
	PHASE 7	0	
	PHASE 8	50	

9TH ST. & CLEVELAND AVE. S.W. ID NO.: 6			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	0		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	60	
	PHASE 3	0	
	PHASE 4	40	
	PHASE 5	0	
	PHASE 6	60	
	PHASE 7	0	
	PHASE 8	0	

9TH ST. & MCKINLEY AVE. S.W. ID NO.: 7			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	0		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	60	
	PHASE 3	0	
	PHASE 4	40	
	PHASE 5	0	
	PHASE 6	60	
	PHASE 7	0	
	PHASE 8	0	

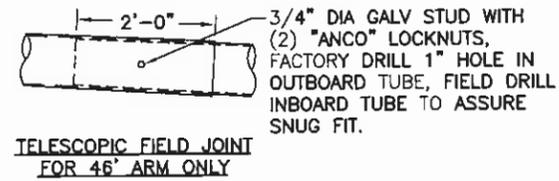
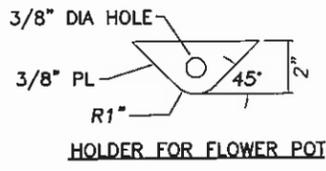
15TH ST./HARRISON AVE./U.S. 30 RAMPS ID NO.: 8			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	0		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	63	
	PHASE 3	0	
	PHASE 4	37	
	PHASE 5	21	
	PHASE 6	42	
	PHASE 7	0	
	PHASE 8	37	

15TH ST. & DUEBER AVE. S.W. ID NO.: 9			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	0		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	21	
	PHASE 2	42	
	PHASE 3	0	
	PHASE 4	37	
	PHASE 5	21	
	PHASE 6	42	
	PHASE 7	0	
	PHASE 8	37	

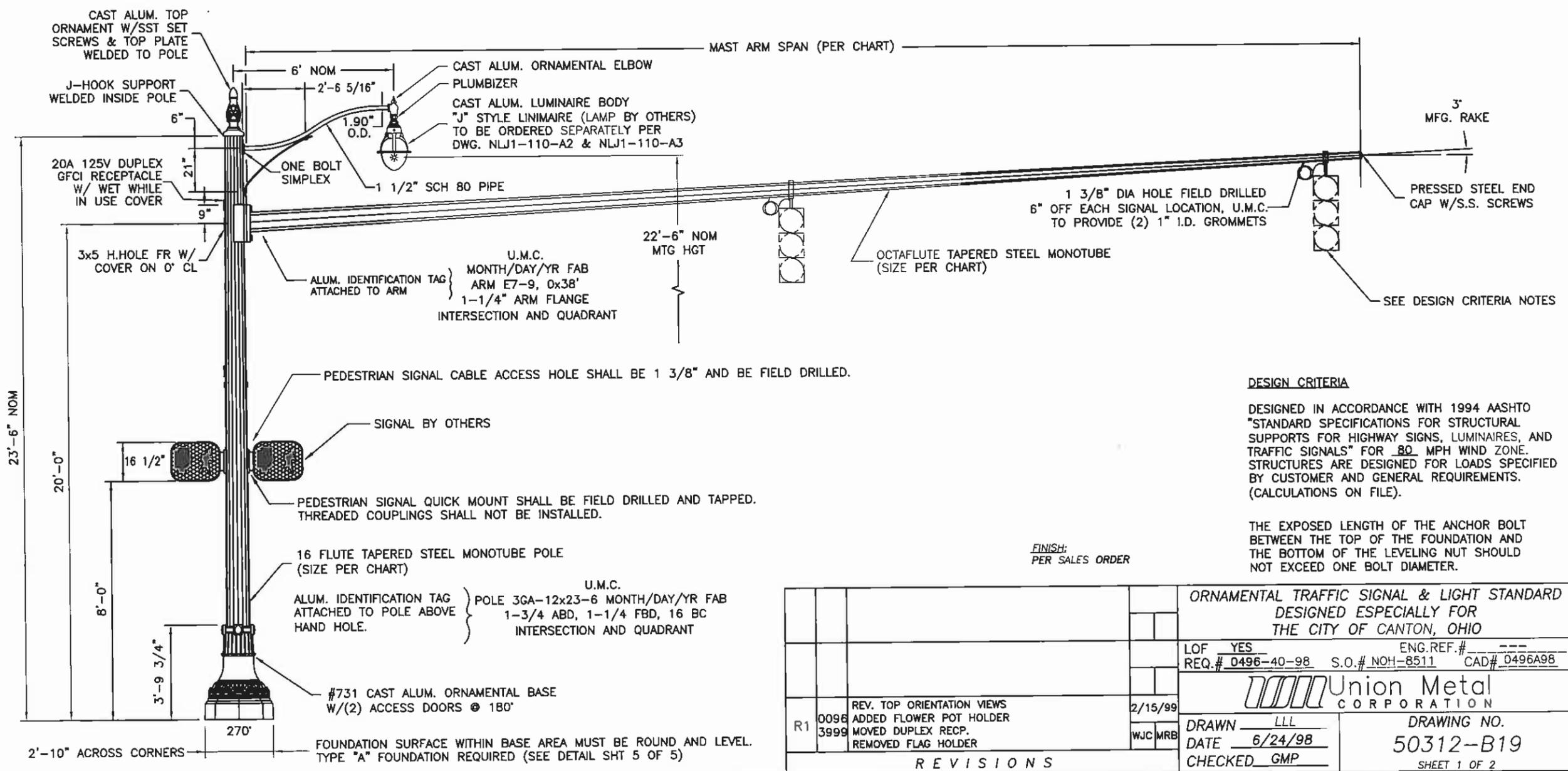
15TH ST. & CLEVELAND AVE. S.W. ID NO.: 10			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	48		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	50	
	PHASE 3	0	
	PHASE 4	50	
	PHASE 5	0	
	PHASE 6	50	
	PHASE 7	0	
	PHASE 8	50	

MARKET AVE. & CLEVELAND AVE. S.W. ID NO.: 11			
	PATTERN		
	1	2	3
DESCRIPTION	ALL DAY		
TIME PERIOD	ALL DAY		
CYCLE LENGTH (SEC)	75		
OFFSET (%)	98		
PERMISSIVE (%)	0		
SPLITS (%)	PHASE 1	0	
	PHASE 2	50	
	PHASE 3	0	
	PHASE 4	25	
	PHASE 5	0	
	PHASE 6	50	
	PHASE 7	0	
	PHASE 8	25	

NOTE:  
 SEE 50312-B19 - SHT. 2 OF 5  
 FOR TOP ORIENTATION VIEW

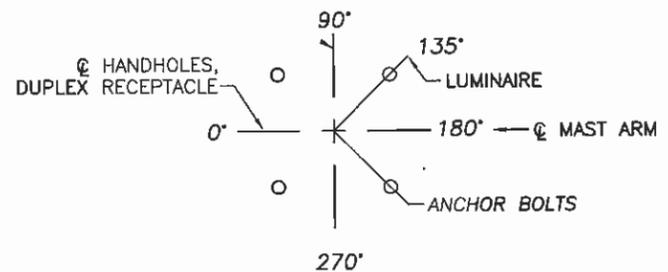


MATERIAL SPECIFICATIONS
TUBES: CHEM. & PHYSICAL PROP. OF ASTM A595 GR A PLATE, BAR: ASTM A709 GR 36 ANCHOR BOLTS: ASTM F1554 GR55 TOP END GALV TO A153 ANCHOR BOLT NUTS: ASTM A563 GR A GALV TO A153 MISC. HDWE: (STN STL) AISI 300 SERIES (18-8) POLE TOP: CAST ALUMINUM-AA319F TRAFFIC ARM CONN. BOLTS: ASTM-A325 H.H. FRAME: ASTM-A576 H.H. COVER: C1010 STEEL PEDESTAL BASE: CAST ALUMINUM SPLIT BASE:A319F STEEL PIPE: ASTM-A53 GR B OR A501 GALV & FINISH PAINT PER SALES ORDER.

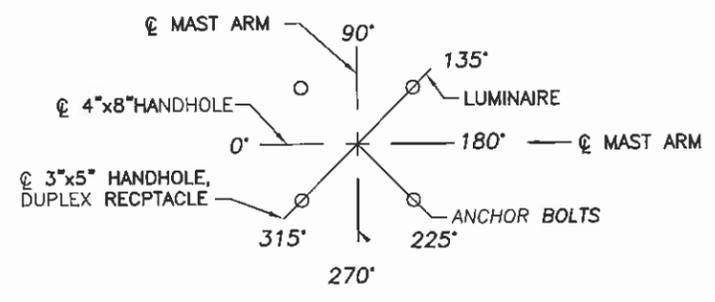


**DESIGN CRITERIA**  
 DESIGNED IN ACCORDANCE WITH 1994 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" FOR 80 MPH WIND ZONE. STRUCTURES ARE DESIGNED FOR LOADS SPECIFIED BY CUSTOMER AND GENERAL REQUIREMENTS. (CALCULATIONS ON FILE).  
 THE EXPOSED LENGTH OF THE ANCHOR BOLT BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE BOLT DIAMETER.

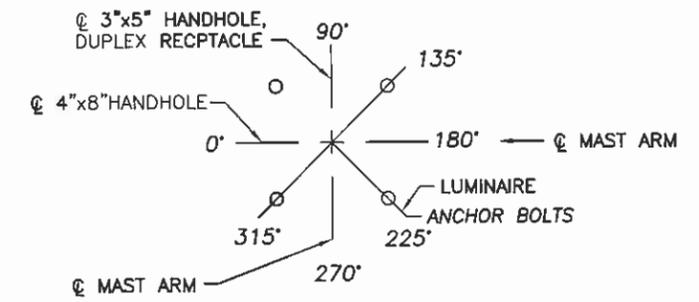
ORNAMENTAL TRAFFIC SIGNAL & LIGHT STANDARD DESIGNED ESPECIALLY FOR THE CITY OF CANTON, OHIO	
LOF YES REQ.# 0496-40-98	ENG. REF.# S.O.# NOH-8511 CAD# 0496A98
REV. TOP ORIENTATION VIEWS ADDED FLOWER POT HOLDER MOVED DUPLEX RECP. REMOVED FLAG HOLDER 0098 3999 R1	DRAWN LLL DATE 6/24/98 CHECKED GMP 2/15/99 WJC MRB DRAWING NO. 50312-B19 SHEET 1 OF 2
REVISIONS	



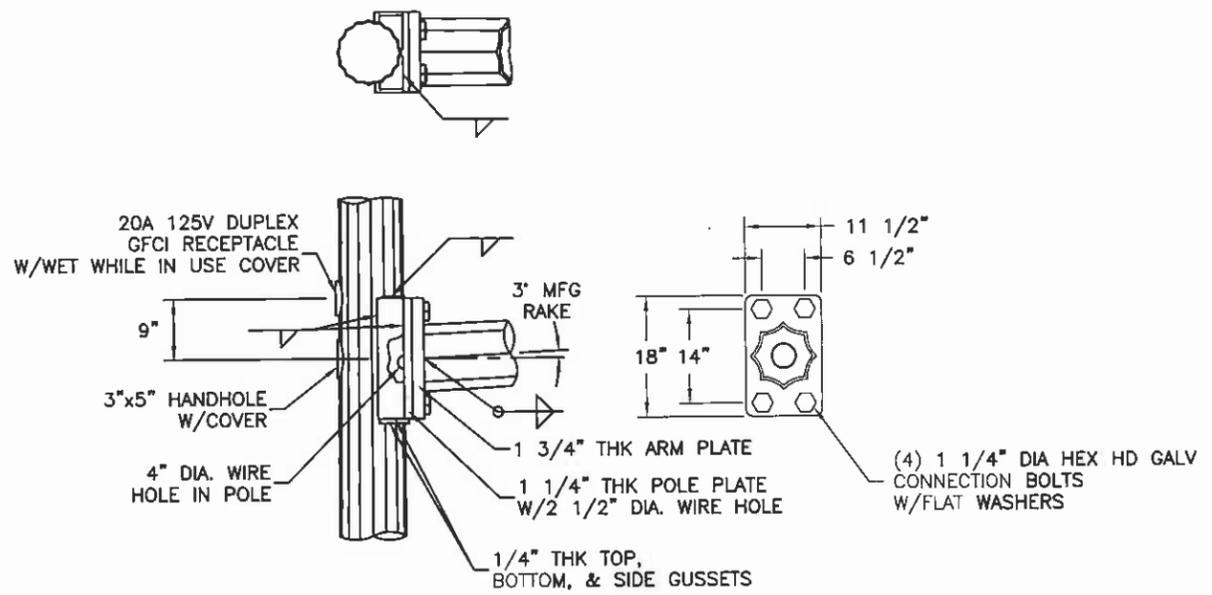
TOP VIEW ORIENTATION  
SINGLE MAST ARMPoles



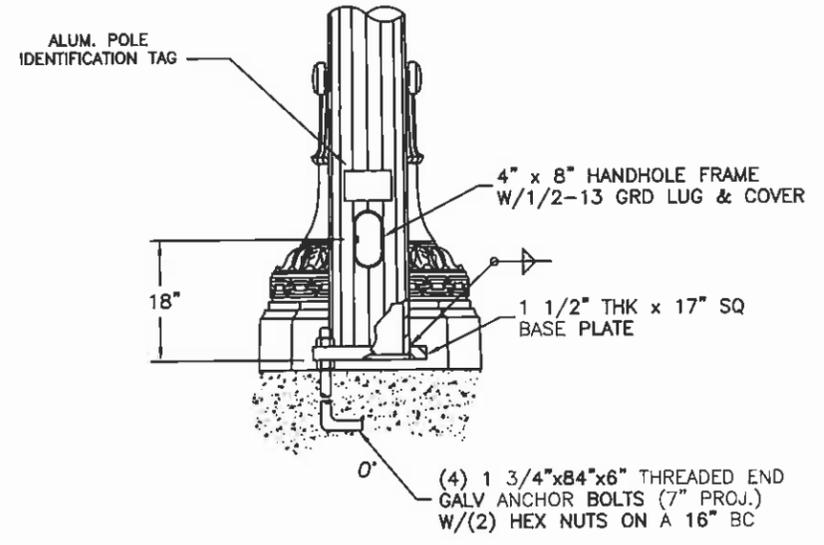
TOP VIEW ORIENTATION  
TWIN MAST ARM DESIGNS  
50312-Y99 THRU -Y102



TOP VIEW ORIENTATION  
TWIN MAST ARM DESIGN  
50312-Y103



ARM CONNECTION DETAIL  
SINGLE ARM CONNECTION SHOWN

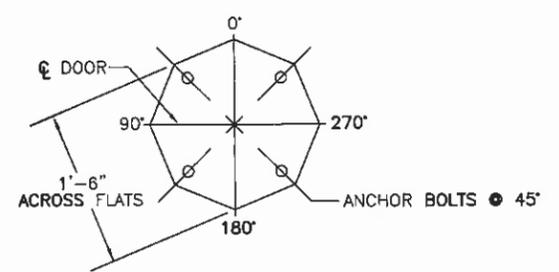
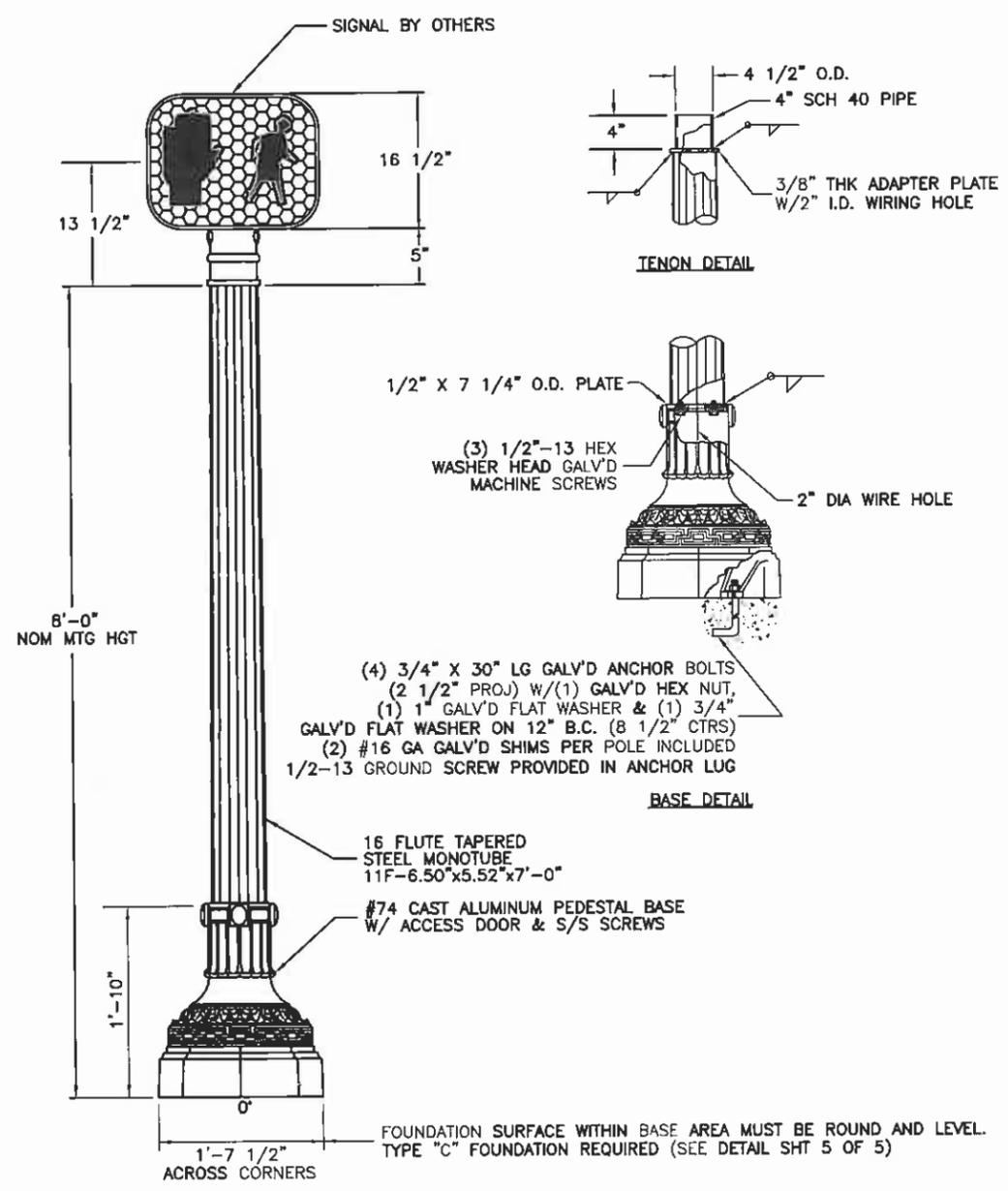


BASE DETAIL

FINISH:  
PER SALES ORDER

		ORNAMENTAL TRAFFIC SIGNAL & LIGHT STANDARD DESIGNED ESPECIALLY FOR THE CITY OF CANTON, OHIO	
		LOF _____	ENG. REF. # _____
		REQ. # 0496-40-98	S.O. # NOH-8511 CAD# 0496B98
		<b>Union Metal</b> CORPORATION	
		DRAWN LLL	DRAWING NO.
		DATE 6/24/98	50312-B19
		CHECKED GMP	SHEET 2 OF 5

REVISIONS



FINISH:  
 PER SALES ORDER

ORNAMENTAL PEDESTRIAN POLE  
 DESIGNED FOR CANTON, OHIO  
 U.M.C. DESIGN NO. P2000-74-B9-Y1

LOF --- ENG. REF. # ---  
 REQ.# 0329-40-98 S.O.# --- CAD# 0329C98A

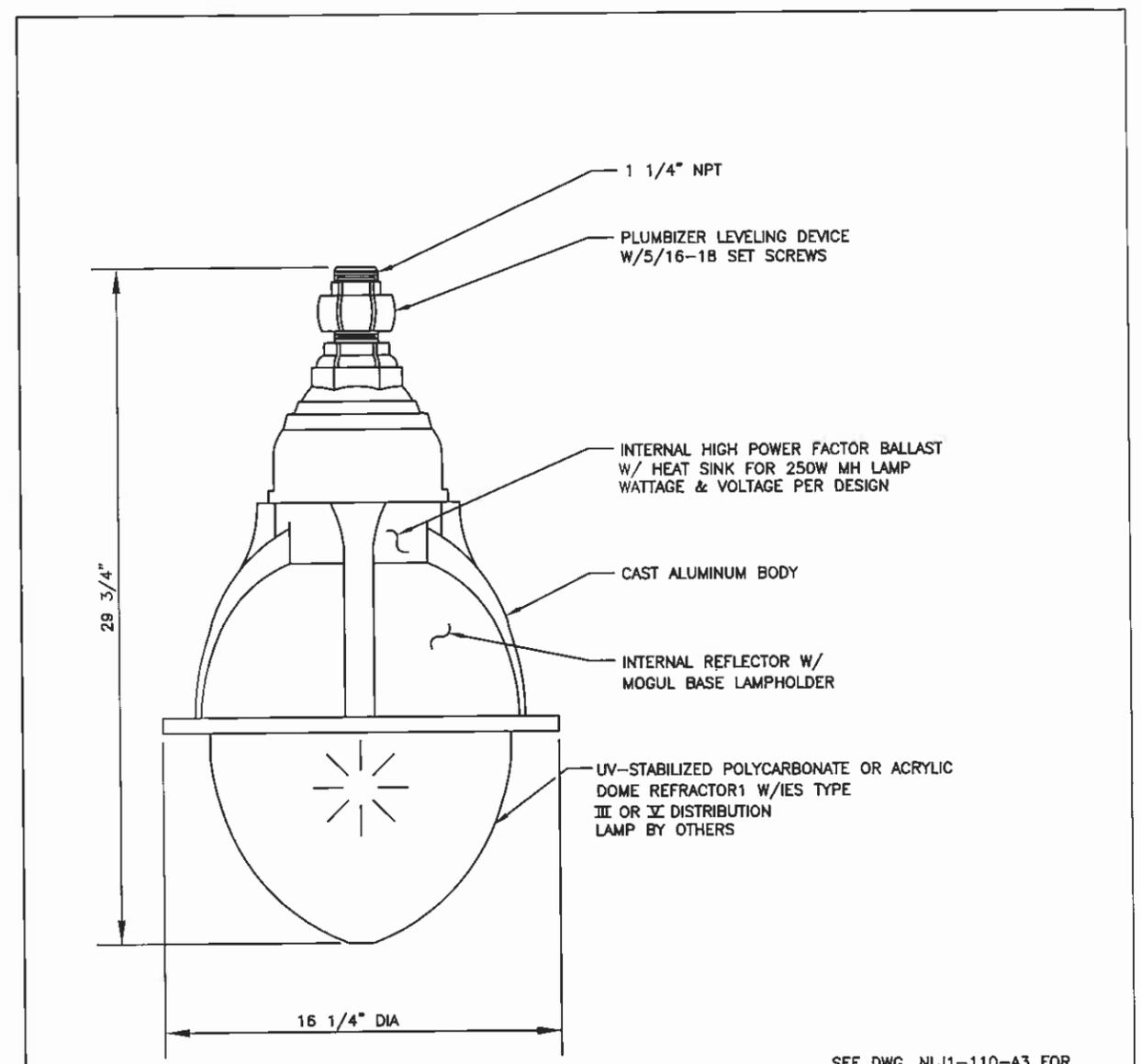
REV	DESCRIPTION	DATE
R1	0098 REV NOM MTG HGT. WAS TO BE SPECIFIED	2/15/99
	3999 ADDED SIGNAL DIM'S	

REVISIONS

Union Metal CORPORATION

DRAWN WJC  
 DATE 4/24/98  
 CHECKED GMP

DRAWING NO.  
 N2000-74-B9



WEIGHT 40 LBS MAX EPA 1.2 SQ FT

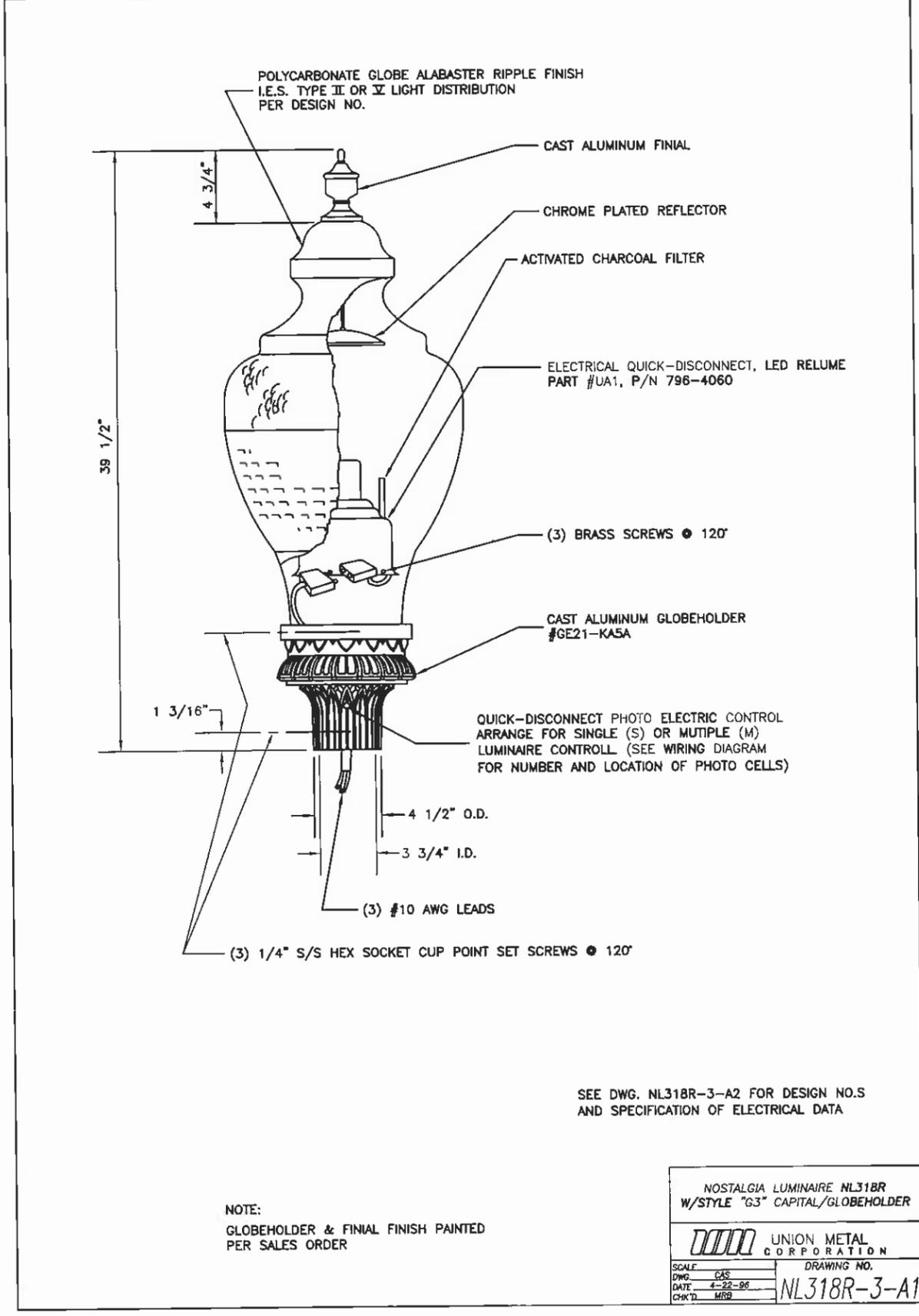
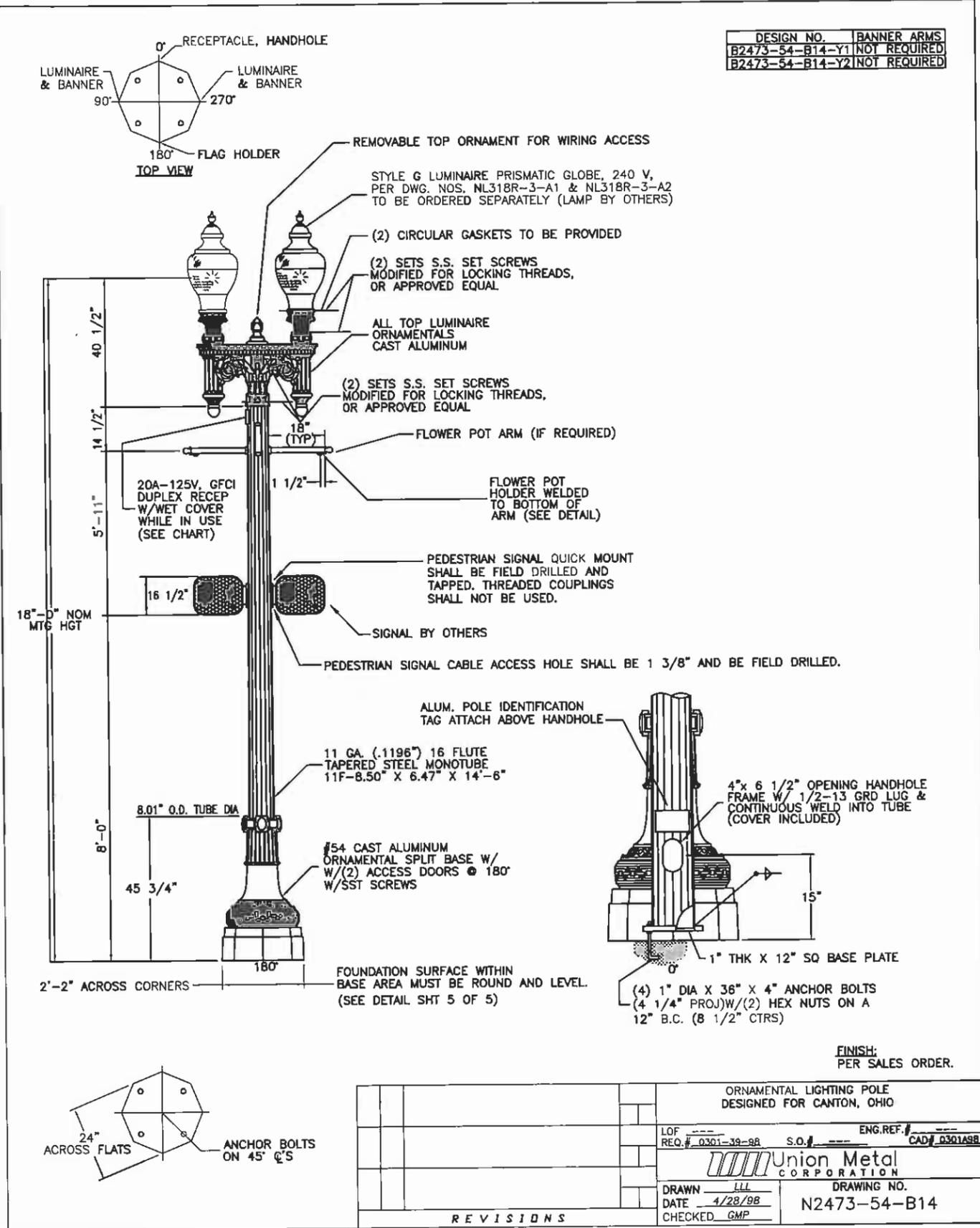
SEE DWG. NLJ1-110-A3 FOR DESIGN NO'S. AND SPECIFICATION OF ELECTRICAL DATA

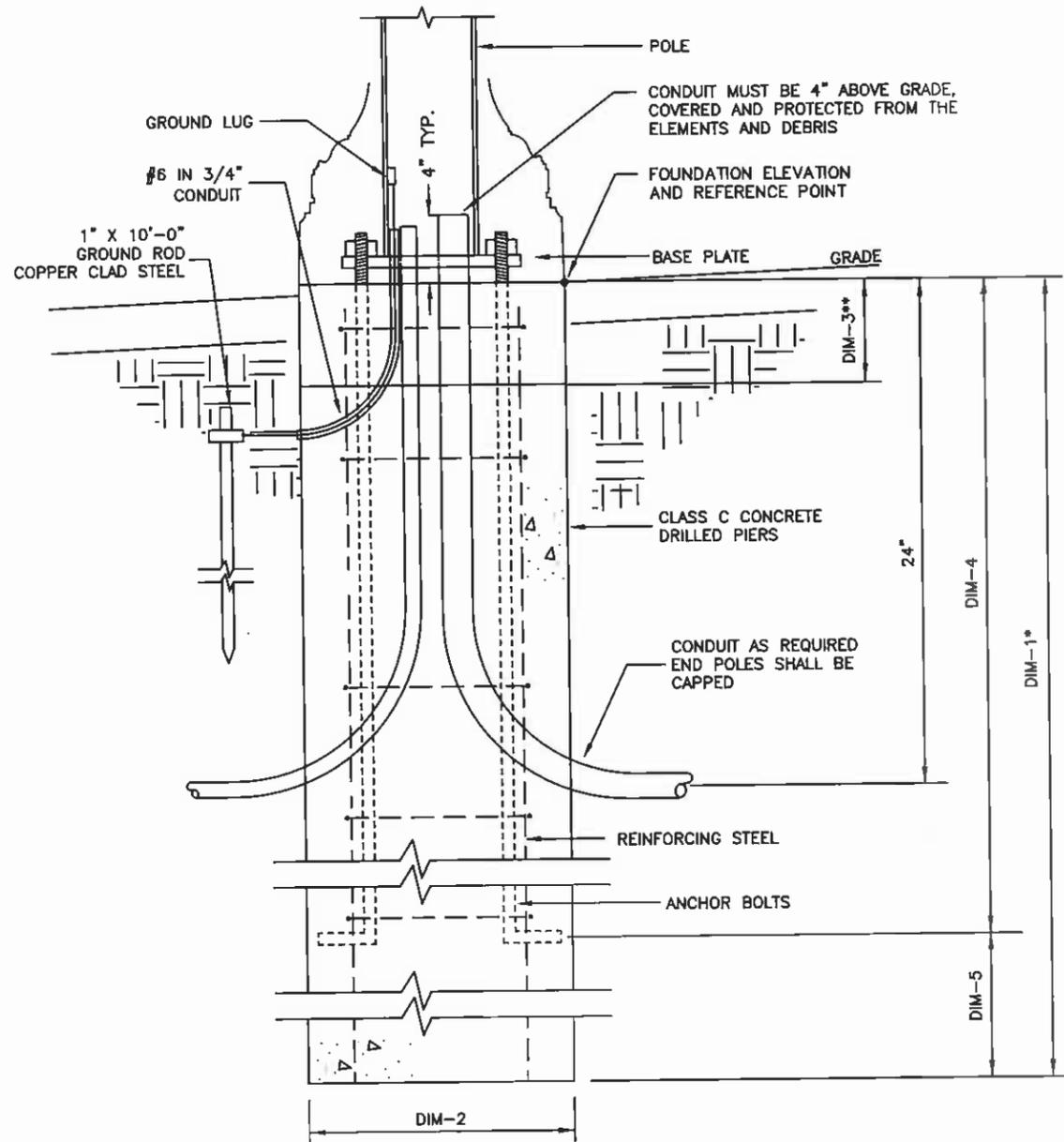
"J" STYLE LUMINAIRE W/PLUMBIZER

UNION METAL CORPORATION

SCALE: CAS  
 DWG: CAS  
 DATE: 10-28-94  
 CHK'D: MRB

DRAWING NO.  
 NLJ1-110-A2





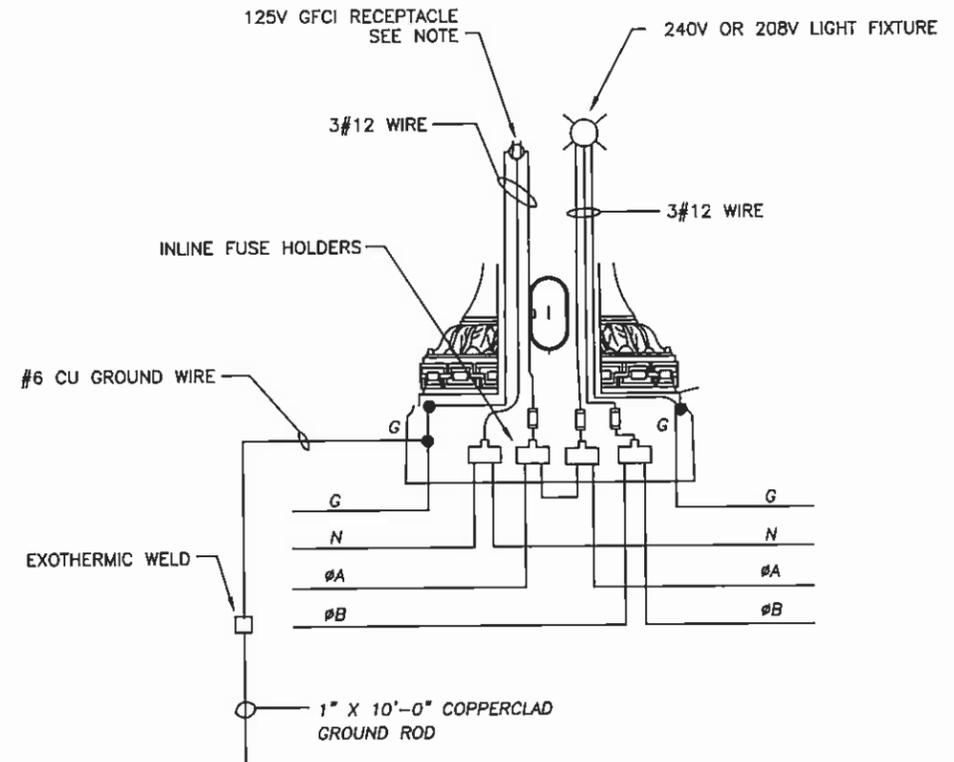
NOSTALGIC FOUNDATION DETAIL

NO SCALE

**NOTES:**

1. ALL FOUNDATIONS SHALL BE DRILLED PIERS TO AVOID DISTURBING SURROUNDING SOIL. A TEMPORARY STEEL CASING MAY BE REQUIRED. IF UTILITIES OR ANOTHER CONFLICT IS IN CLOSE PROXIMITY TO THE FOUNDATION, THEN THOSE FOUNDATIONS MAY HAVE TO BE EXCAVATED BY HAND.
  2. ANCHOR BOLT PATTERN SHALL BE PROVIDED BY POLE MANUFACTURER (U.M.C.).
  3. REINFORCING STEEL SHALL BE ASSEMBLED IN CAGES USING #4 TIES.
  4. FOUNDATION TOP SHALL BE ROUND AND LEVEL FOR DECORATIVE HOUSING.
- \* MINIMUM DEPTH MAY VARY BASED ON SOIL CONDITION.  
 \*\* ONLY APPLICABLE IN SIDEWALK AREAS.
- A. TUBE TO BE PLACED W/TOP AT LEAST 1" ABOVE PROJECTED FINISHED SIDEWALK GRADE.
  - B. FOUNDATION TO BE POURED TO A MIN. 8" BELOW PROJECT FINISHED SIDEWALK GRADE.
  - C. ONCE SIDEWALK IS PROVIDED AND/OR FINAL FINISHED GRADE ESTABLISHED, TUBE SHALL BE CUT TO PROPER ELEVATION AND FOUNDATION CAP POURED AND LEVELED WITHIN THE TUBE.
    1. CUT AND REMOVE EXPOSED TUBE TO FINISHED GRADE AFTER CONCRETE IS CURED.

FOUNDATION	DIM-1*	DIM-2	DIM-3**	DIM-4	DIM-5
SIGNAL	9'-0"	36"	N/A	84"	24"
LUMINARIES	6'-0"	30"	8"	32"	40"
PEDESTRIAN	4'-0"	24"	8"	30"	18"



POLE WIRING DIAGRAM

NO SCALE

**NOTE:**

1. THE COST FOR WIRING TO ALL NOSTALGIA LUMINARIES AND RECEPTACLES SHALL BE INCIDENTAL TO THE NOSTALGIA BID ITEMS. ALL WIRING IN POLES AND CONDUITS TO LIGHTS AND RECEPTACLES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. ALL WIRING INTO EACH NOSTALGIA POLE BASE SHALL BE NO. 6 AWG WIRE AND CONNECTED TO IN-LINE FUSE HOLDERS. THE COST FOR THIS WIRE SHALL BE INCIDENTAL TO THE NOSTALGIA BID ITEMS.
3. IN-LINE FUSE HOLDERS SHALL BE BUSSMAN (HEB-AW-RYC). INSTALL FUSES IN PHASE LINES AND SOLID LINK IN NEUTRAL (HET-AW-RYC) FOR GROUND USE SPLIT BOLT CONNECTOR. COPPER GROUND CABLE SHALL BE EXOTHERMICALLY WELDED TO THE GROUND ROD. RUN CABLE FREE END THROUGH 3/4" EMT AND CONNECTED AS SHOWN IN THE POLE WIRING DIAGRAM. THE COST FOR THE IN-LINE FUSE HOLDERS AND ALL RELATED ITEMS SHALL BE INCIDENTAL TO THE NOSTALGIA BID ITEMS.
4. THE POLE RECEPTACLE SHALL BE ALTERNATELY WIRED TO PHASE A AND PHASE B AS SHOWN IN THE POLE WIRING DIAGRAM.
5. FOR LIGHTS, USE 5 AMP FUSES. FOR RECEPTACLES, USE 10 AMP FUSES. AMP RATINGS SHALL BE BASED UPON 75 DEGREE C RATINGS.
6. UNLESS OTHERWISE NOTED IN THESE PLANS, ALL WIRING SHALL BE MINIMUM NO. 12 AWG, COPPER, 600 VOLT RATED WITH THE EXCEPTION OF NO. 14 AWG, COPPER SHALL BE PERMISSIBLE FOR CONTROL CIRCUITRY. THE FOLLOWING SHALL APPLY TO ALL WIRING:
  - A. ALL WIRING SHALL BE STRANDED "THHN/THWN".
  - B. UNDERGROUND BRANCH CIRCUIT WIRING SHALL BE "XHHW".

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION

# STA-CANTON NAVARRE ROAD SIGNAL SYSTEM

## CITY OF CANTON STARK COUNTY

INDEX OF SHEETS:

R/W SUMMARY ..... 1  
R/W PLANS ..... 2-5

**PROJECT DESCRIPTION**

REPLACING AND/OR UPGRADING TRAFFIC SIGNAL EQUIPMENT AT 11 LOCATIONS WITHIN THE NAVARRE ROAD TRAFFIC SIGNAL SYSTEM. THE INSTALLATIONS OF NEW TRAFFIC SIGNAL CONTROLLERS, VEHICLE AND PEDESTRIAN SIGNAL HEADS, TRAFFIC SIGNAL POLES AND ARMS, FOUNDATIONS, PULL BOXES, CONDUIT, CABLE AND WIRE, AND EMERGENCY PRE-EMPTION EQUIPMENT ARE ALSO INCLUDED AMONG THE SAFETY IMPROVEMENTS.

**CONVENTIONAL SYMBOL**

- RIGHT-OF-WAY
- CENTERLINE
- PROPOSED EASEMENT LINE
- GUADRAIL
- SIGN
- SIGNAL POLE W/MAST ARM
- UTILITY POLE W/STREET LIGHT
- UTILITY POLE W/ANCHOR
- WHEELCHAIR RAMP
- SIGNAL CONTROLLER ON CONC. PAD
- PULL BOX
- FENCE

**PROJECT CONTROL**

COORDINATES AND BEARINGS ARE BASED UPON THE STATE PLANE COORDINATE SYSTEM NAD 1983(86), OHIO, NORTH ZONE.

**CERTIFICATION**

I DO HEREBY CERTIFY THAT THE ESTABLISHMENT OF THE PROPERTY LINES AND EXISTING RIGHT-OF-WAY LINES SHOWN ON THE PLANS HEREIN WERE DERIVED FROM RECORD FROM THE STARK COUNTY G.I.S., AUDITOR, AND RECORDER OFFICES.

RICHARD M. BODENSCHATZ, P.S. 8213 DATE

NOTES: ALL PROPERTY TO BE ACQUIRED IN THE NAME OF THE CITY OF CANTON (UNLESS OTHERWISE NOTED)

UNDER NO CIRCUMSTANCES ARE TEMPORARY EASEMENTS TO BE USED FOR STORAGE OF MATERIAL OR EQUIPMENT BY THE CONTRACTOR UNLESS OTHERWISE NOTED.

TEMPORARY PARCEL DURATION = 18 MONTHS

**UTILITIES NOTES**

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 O.R.C.

**UTILITY CONTACT INFORMATION**

THE FOLLOWING UTILITIES ARE LOCATED WITHIN THE PROJECT AREA:

- AMERICAN ELECTRIC POWER  
301 CLEVELAND AVENUE SW  
P.O. BOX 24400  
CANTON, OH 44701  
PHONE: 330-438-7718  
ATTN: MR. RAY ZITNEY
- DOMINION EAST OHIO  
(DISTRIBUTION)  
320 SPRINGSIDE DR., SUITE 320  
AKRON, OH 44333  
PHONE: 330-478-3140  
ATTN: MS. MARY LONG
- TIME-WARNER CABLE  
5520 WHIPPLE ROAD NW  
NORTH CANTON, OH 44720  
PHONE: 330-494-9200(EXT. 3087)  
ATTN: MR. TIM KNIGHT
- CITY OF CANTON (WATER)  
2864 HARRISBURG ROAD NE  
CANTON, OH 44705  
PHONE: 330-489-3310  
ATTN: MR. LEWIS MILLER
- AT&T  
50 WEST BOWERY STREET  
4TH FLOOR  
AKRON, OH 44308  
PHONE: 330-384-3561  
ATTN: CINDY ZUCHEGNO
- DOMINION EAST OHIO  
(TRANSMISSION)  
7015 FREEDOM AVENUE NW  
NORTH CANTON, OH 44720  
PHONE: 330-266-2120  
ATTN: MR. FRANK MARTIN, P.E.
- CITY OF CANTON (SANITARY)  
2436 30TH STREET NE  
CANTON, OH 44705  
PHONE: 330-489-3381  
ATTN: MR. DANIEL MOEGLIN, P.E., S.I.
- CITY OF CANTON (SIGNAL)  
2436 30TH STREET NE  
CANTON, OH 44705  
PHONE: 330-489-3370  
ATTN: MR. NICHOLAS LOUKAS, P.E.



PLANS PREPARED BY:  
CITY OF CANTON  
DIVISION OF TRAFFIC ENGINEERING  
2436- 30TH STREET N.E.  
CANTON, OHIO 44705

PLANS PREPARED BY:  
FIRM NAME: CANTON CITY ENGINEERING DEPT.  
PLANS PREPARED BY: RMB  
FIELD REVIEW BY: RMB  
DATE COMPLETED: 4/15/2011  
OWNERSHIP VERIFIED BY: RMB  
DATE COMPLETED: 4/15/2011  
DATE COMPLETED: 4/15/2011

STRUCTURE KEY  
 RESIDENTIAL  
 COMMERCIAL  
 OUTBUILDING

LEGEND  
SH = STANDARD HIGHWAY EASEMENT  
T = TEMPORARY EASEMENT

TOTAL NUMBER OF :

6 OWNERSHIPS      0 OWNERSHIPS WITH STRUCTURES INVOLVED  
6 PARCELS          0 OWNERSHIPS WITH "P" ITEMS  
0 TOTAL TAKES

NET RESIDUE = RECORD AREA - TOTAL P.R.O. - NET TAKE

ALL AREAS IN ACRES

PARCEL No.	OWNER(S)	SHEET NO.	OWNER'S RECORD BOOK/PAGE -OR- IMAGE #	AUDITOR'S PARCEL	RECORD AREA (AC.)	TOTAL PRO	GROSS TAKE (AC.)	P.R.O. IN TAKE	NET TAKE (AC.)	STRUC-TURE	NET RESIDUE		TYPE FUND	REMARKS & PERSONALITY	AS ACQUIRED IMAGE #
											LEFT	RIGHT			
1-T	FREEWAY MOTORCARS	2	INST. 200507010043140	0225652	0.397	0	0.003	0	0.003	N				REMOVE EXISTING SIGNAL POLE, RESTORE SURFACE. LOTS 18073 & 18074, 2203 NAVARRE RD SW	
2-SH	HEINEMANN SAW COMPANY	2	INST. 200311130109048	0203773	0.174	0	0.003	0	0.003	N	0.171		CITY	INSTALL CONCRETE PAD AND UNDERGROUND CONDUIT. PART OF LOT 4348, 2017 NAVARRE RD SW	
3-SH	ROBERT D. COEN	3	D.V. 3782, PG. 736	0244195	0.238	0	0.001	0	0.001	N	0.237		CITY	INSTALL SIGNAL POLE AND FOUNDATION. PART OF LOT 571, 301 NAVARRE RD SW	
4-SH	SIPASAK PROPERTIES LLC	4	INST. 201008190031741	0244191	0.160	0	0.002	0	0.002	N		0.158	CITY	INSTALL SIGNAL POLE AND FOUNDATION. PART OF LOT 579, 104 NAVARRE RD SW	
5-SH	H & H AUTO PARTS INC.	5	D.V. 3796, PG. 313	0236250	0.690	0	0.002	0	0.002	N		0.688	CITY	INSTALL SIGNAL POLE, FOUNDATION AND UNDERGROUND CONDUIT. PT OUTLOT 68, 300 15TH ST. SW	
6-SH	WHEELING & LAKE ERIE R.R.	4	O.R. 998, PG. 464	0299096	0.072	0	0.003	0	0.003	N		0.069	CITY	INSTALL SIGNAL POLE, FOUNDATION AND UNDERGROUND CONDUIT. SE COR. 11TH ST. SE/MARKET AVE. S	

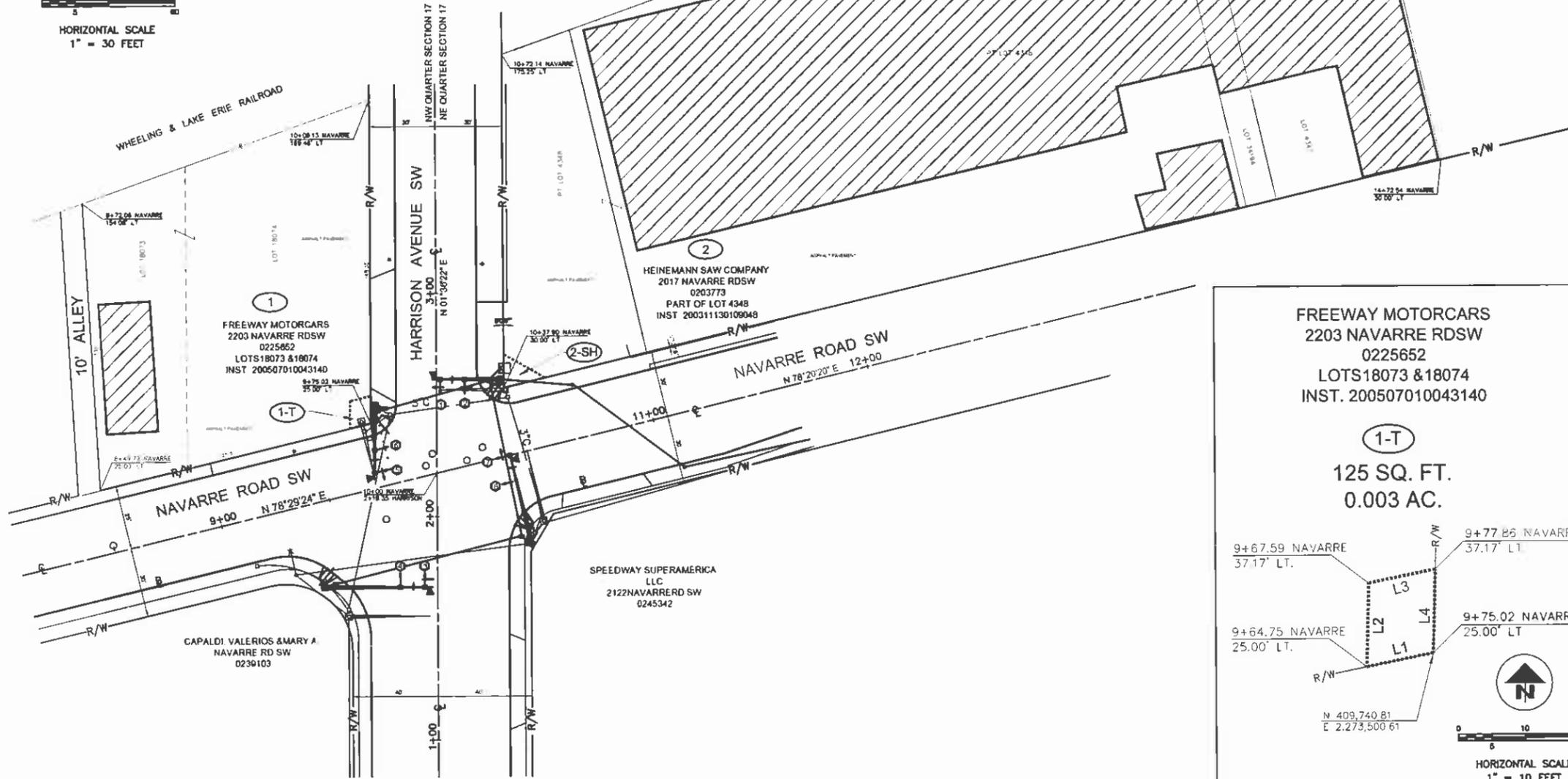
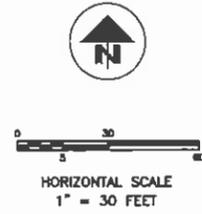
NO.	REVISION DESCRIPTION	DATE	BY
1	PARCEL 6-SH, SIZE AND DIM.	9/7/11	RMB

FEDERAL PROJECT NO.	TE21-C0101571
PID NO.	76007
R/W PLAN DESIGNER	RMB
P/W PLAN REVIEWER	NIL

RIGHT-OF-WAY SUMMARY

NAVARRE ROAD S.W. SIGNAL SYSTEM

NW & NE QUARTER SECTION 17  
T-10, R-8  
CITY OF CANTON  
STARK COUNTY, OHIO



**FREEWAY MOTORCARS**  
2203 NAVARRE RDSW  
0225652  
LOTS 18073 & 18074  
INST. 200507010043140

**(1-T)**  
125 SQ. FT.  
0.003 AC.

**HEINEMANN SAW COMPANY**  
2017 NAVARRE RDSW  
0203773  
PART OF LOT 4348  
INST. 200311130109048

**(2-SH)**  
131 SQ. FT.  
0.003 AC.

LINE TABLE		
LINE	LENGTH	BEARING
L1	10.27	S78°29'24"W
L2	12.50	N01°36'22"E
L3	10.27	N78°29'24"E
L4	12.50	S01°36'22"W
L5	15.00	N01°36'22"E
L6	20.62	S56°34'43"E
L7	18.00	S78°20'20"W

NO.	REVISION DESCRIPTION	BY	DATE

FEDERAL PROJECT NO. TE21-G01R157

PID NO. 76007

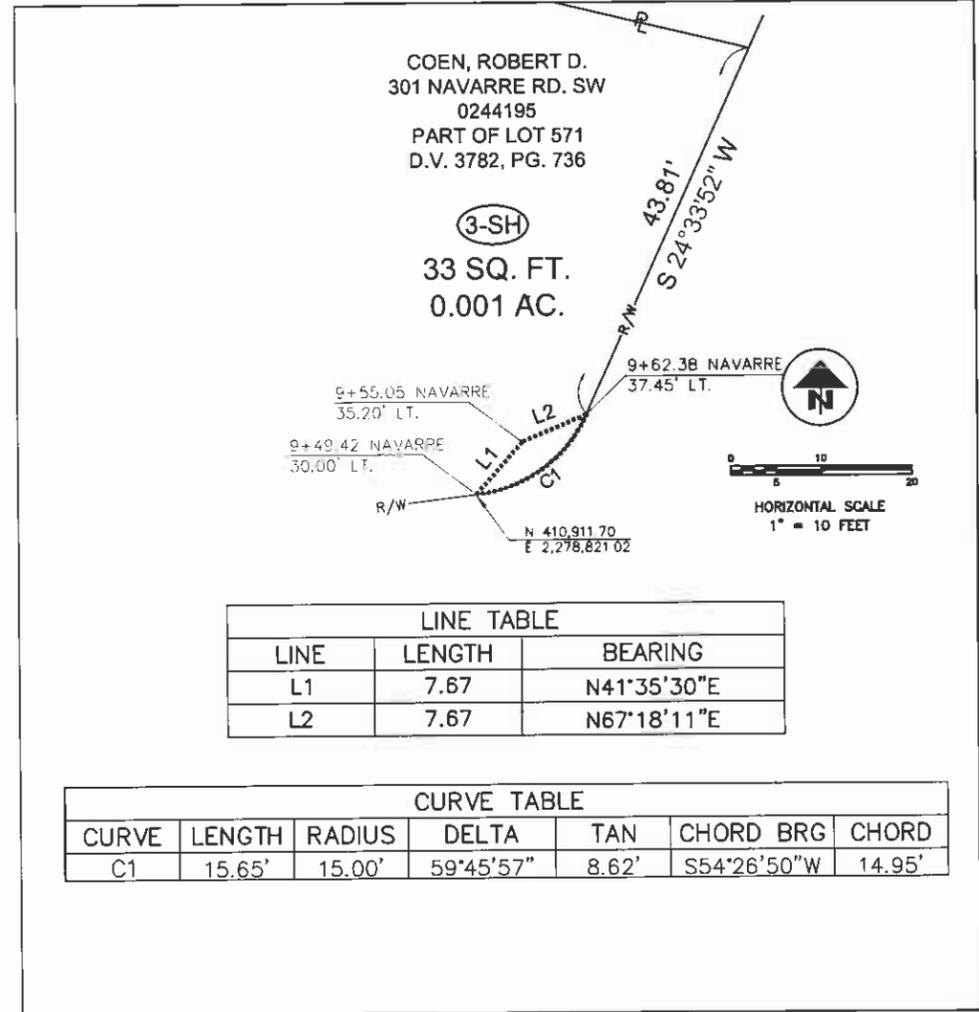
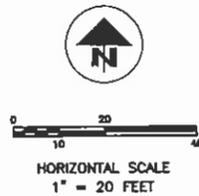
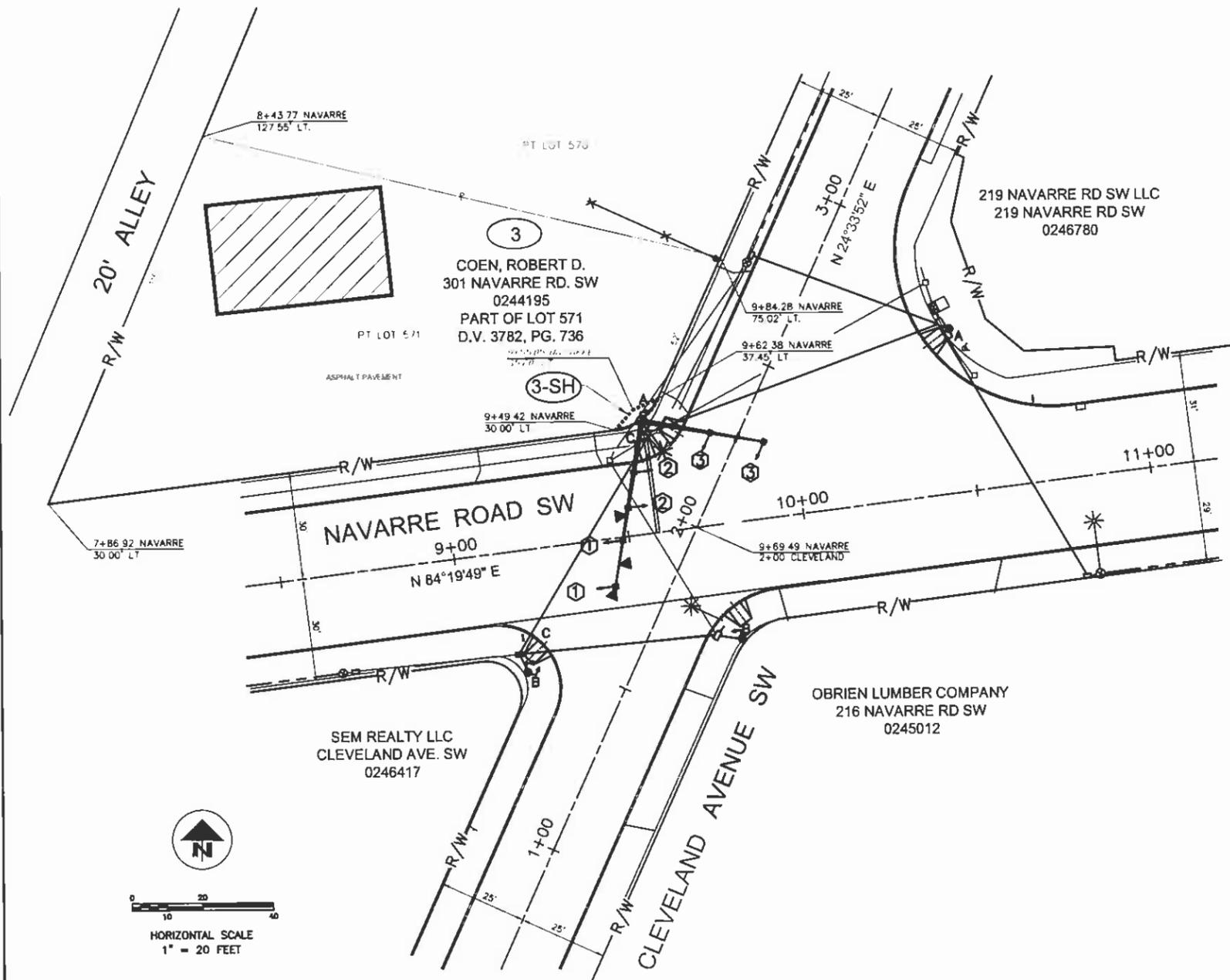
R/W PLAN DESIGNER: RMB

R/W PLAN REVIEWER: N/L

RIGHT-OF-WAY PLAN  
NAVARRE ROAD AND HARRISON AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

SW QUARTER SECTION 9  
T-10, R-8  
CITY OF CANTON  
STARK COUNTY, OHIO



LINE TABLE		
LINE	LENGTH	BEARING
L1	7.67	N41°35'30"E
L2	7.67	N67°18'11"E

CURVE TABLE						
CURVE	LENGTH	RADIUS	DELTA	TAN	CHORD BRG	CHORD
C1	15.65'	15.00'	59°45'57"	8.62'	S54°26'50"W	14.95'

NO.	REVISION DESCRIPTION	BY	DATE

R/W PLAN DESIGNER: PWB	FEDERAL PROJECT NO: TE21-0010157
P/W PLAN REVIEWER: NJL	PID NO: 76007

RIGHT-OF-WAY PLAN  
NAVARRE ROAD AND CLEVELAND AVENUE S.W.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

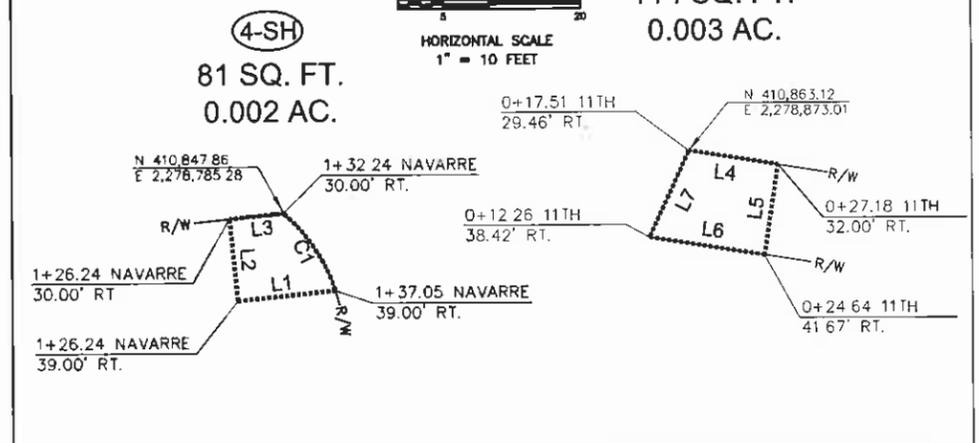
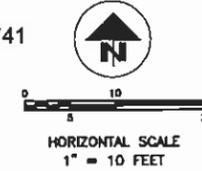
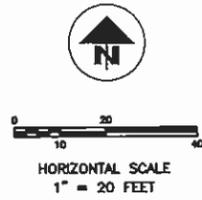
3  
5

52  
54

SW QUARTER SECTION 9  
T-10, R-8  
CITY OF CANTON  
STARK COUNTY, OHIO

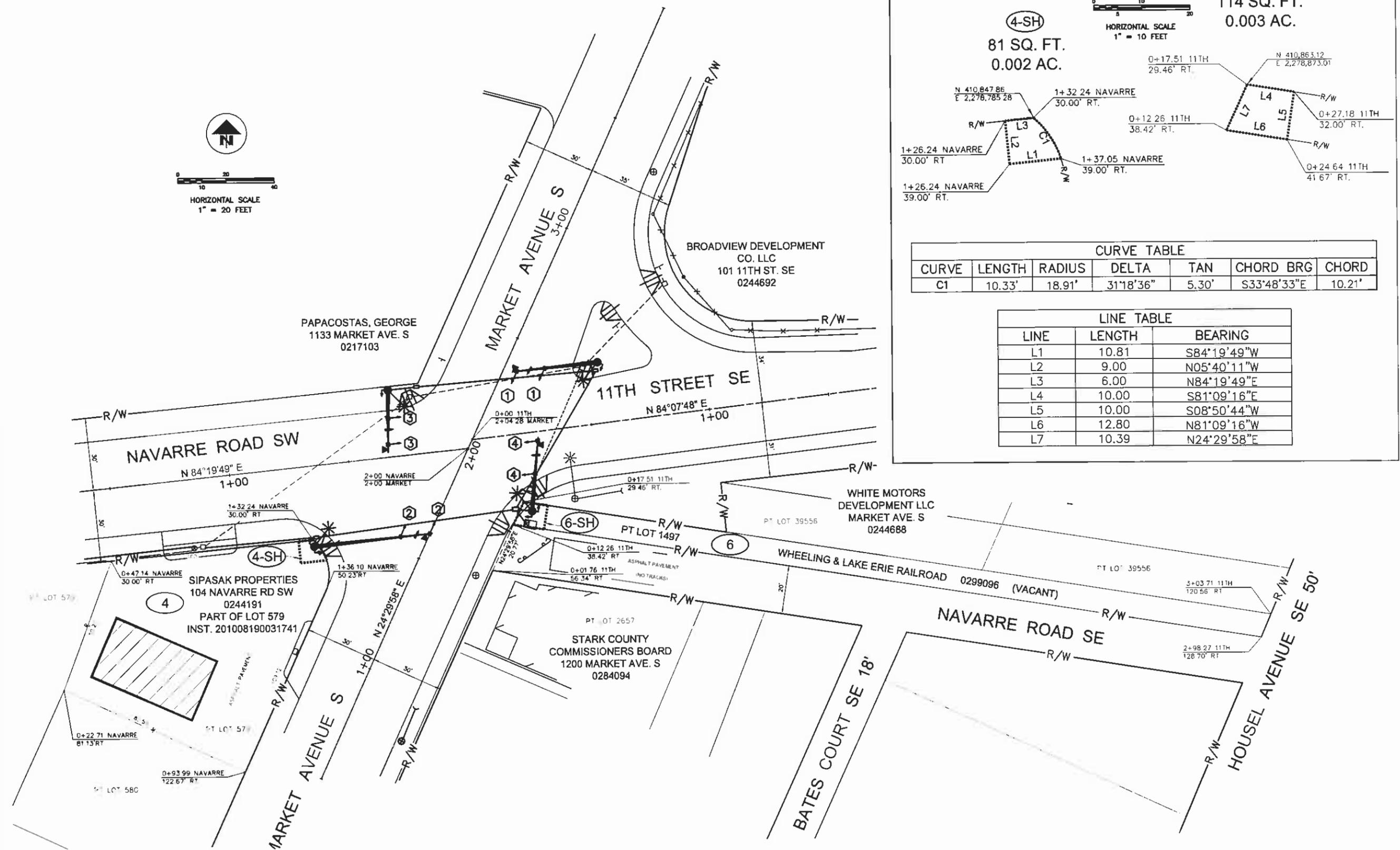
SIPASAK PROPERTIES LLC  
104 NAVARRE RD SW  
0244191  
PART OF LOT 579  
INST. 201008190031741

WHEELING & LAKE ERIE RAILROAD  
0299096  
PART OF LOT 1497  
O.R. 998, PG. 464



CURVE TABLE						
CURVE	LENGTH	RADIUS	DELTA	TAN	CHORD BRG	CHORD
C1	10.33'	18.91'	31°18'36"	5.30'	S33°48'33"E	10.21'

LINE TABLE		
LINE	LENGTH	BEARING
L1	10.81	S84°19'49"W
L2	9.00	N05°40'11"W
L3	6.00	N84°19'49"E
L4	10.00	S81°09'16"E
L5	10.00	S08°50'44"W
L6	12.80	N81°09'16"W
L7	10.39	N24°29'58"E



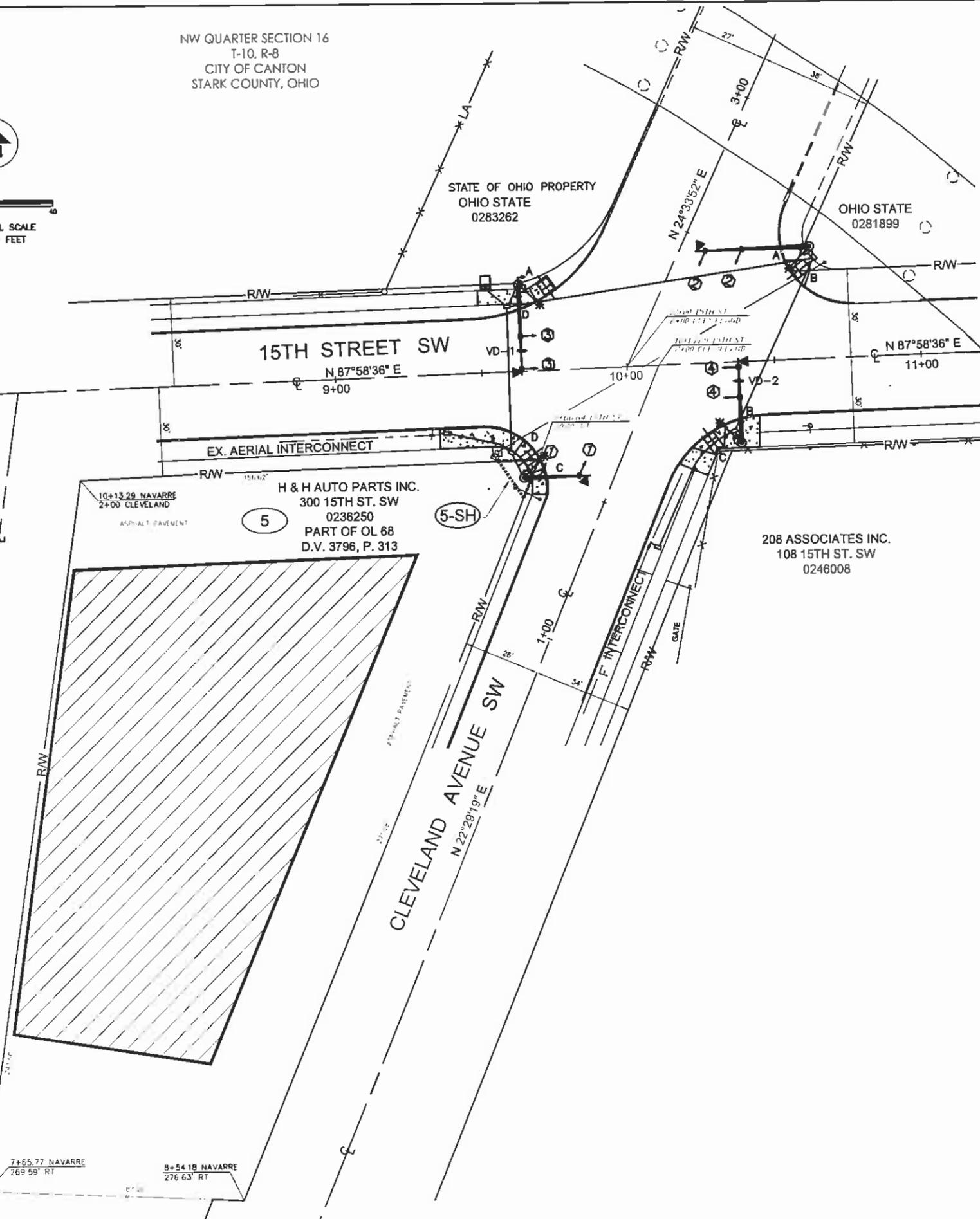
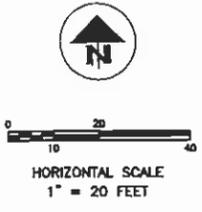
NO.	REVISION DESCRIPTION	BY	DATE
1	PARCEL 6-SH, SIZE AND DIM.	RMB	8/7/11

FEDERAL PROJECT NO.	PIC NO.	R/W PLAN DESIGNER - RMB	R/W PLAN REVIEWER - NJL
TE21-G0101(B7)	76007		

RIGHT-OF-WAY PLAN  
NAVARRE ROAD AND MARKET AVENUE S.

NAVARRE ROAD S.W.  
SIGNAL SYSTEM

NW QUARTER SECTION 16  
T-10, R-8  
CITY OF CANTON  
STARK COUNTY, OHIO



H & H AUTO PARTS INC.  
300 15TH ST. SW  
0236250  
PART OF OL 68

5-SH

89 SQ. FT.  
0.002 AC.

HORIZONTAL SCALE  
1" = 10 FEET

N 408,783.96  
E 2,277,456.12

9+52.64 NAVARRE  
30.00' RT.

9+66.64 NAVARRE  
30.00' RT.

9+60.83 NAVARRE  
42.74' RT.

L1

L2

L3

LINE TABLE		
LINE	LENGTH	BEARING
L1	14.00	S22°29'19"W
L2	15.14	N34°46'03"W
L3	14.00	N87°58'36"E

NO.	REVISION DESCRIPTION	BY	DATE

FEDERAL PROJECTING	
PID NO.	76007
R/W PLAN DESIGNER	RMB
R/W PLAN REVIEWER	NJL

RIGHT-OF-WAY PLAN  
15TH STREET AND CLEVELAND AVENUE SW

NAVARRE ROAD S.W.  
SIGNAL SYSTEM