

| FHWA<br>REGION<br>NO. | STATE  | PROJECT<br>NO. | FISCAL<br>YEAR | SHEET<br>NO. | TOTAL<br>SHEETS |
|-----------------------|--------|----------------|----------------|--------------|-----------------|
| 7                     | KANSAS | 87-N-0225-01   | 2002           | 23           | 47              |

## BILL OF MATERIALS

| ITEM                                                       | UNIT   | QTY      |
|------------------------------------------------------------|--------|----------|
| PAD MOUNTED CONTROLLER & CABINET                           | EACH   | 1        |
| TRAFFIC SIGNAL HEAD (SEE CHART A) W/ MOUNTING HARDWARE     | EACH   | 24       |
| TRAFFIC SIGNAL POLE (SEE CHART B) STEEL                    | EACH   | 4        |
| CONCRETE CONTROLLER PAD                                    | EACH   | 1        |
| CONCRETE FOOTING - POLE                                    | EACH   | 4        |
| CONDUIT ELBOW 90°                                          | EACH   | As Req'd |
| CONDUIT ELBOW 90° 3"                                       | EACH   | As Req'd |
| BACK PLATE 5" - 3 SECTION                                  | EACH   | 12       |
| BACK PLATE 5" - 5 SECTION                                  | EACH   | 4        |
| SERVICE BOX                                                | EACH   | 4        |
| GROUND ROD & CLAMP                                         | EACH   | 6        |
| CONDUIT CLAMP                                              | EACH   | As Req'd |
| TRAFFIC SIGNAL LAMP RED LED KIT                            | EACH   | 16       |
| TRAFFIC SIGNAL LAMP YELLOW LED KIT                         | EACH   | 16       |
| TRAFFIC SIGNAL LAMP GREEN LED KIT                          | EACH   | 16       |
| TRAFFIC SIGNAL LAMP GREEN ARROW LED KIT                    | EACH   | 4        |
| TRAFFIC SIGNAL LAMP YELLOW ARROW LED KIT                   | EACH   | 4        |
| TRAFFIC SIGNAL LAMP WALK LED KIT                           | EACH   | 8        |
| TRAFFIC SIGNAL LAMP DON'T WALK LED KIT                     | EACH   | 8        |
| CLASS 4 - WOOD POLE                                        | EACH   | 1        |
| ENTRANCE HEAD                                              | EACH   | 1        |
| CIRCUIT BREAKER & BOX                                      | EACH   | 1        |
| GUY WIRE GUARD                                             | EACH   | As Req'd |
| GUY WIRE CLAMP                                             | EACH   | As Req'd |
| THIMBLE EYE ANCHOR ROD                                     | EACH   | As Req'd |
| PEDESTRIAN PUSHBUTTON W/SIGN                               | EACH   | 8        |
| LEAD-IN WIRE No. 4 A.W.G. 1/C (TYPE THNN)                  | LIN. m | 9.6m     |
| STANDARD 1C #8 (GROUND)                                    | LIN. m | 143.6m   |
| MULTI-CONDUCTOR CABLE No. 16 A.W.G. 3/C (V3)               | LIN. m | 146.8m   |
| MULTI-CONDUCTOR CABLE No. 14 A.W.G. 7/C                    | LIN. m | 277.6m   |
| VIDEO CABLE 75 OHM COAXIAL (BELDON 8281) (CX)              | LIN. m | 146.8m   |
| CONDUIT 50mm PVC - WESTAR                                  | LIN. m | 162.3m   |
| CONDUIT 35mm RGC                                           | LIN. m | 4.8m     |
| CONDUIT 50mm RGC                                           | LIN. m | 13.1m    |
| CONDUIT 75mm RGC                                           | LIN. m | 123.5m   |
| CAMERA HOUSING                                             | EACH   | 4        |
| VIDEO DETECTION CAMERA & MOUNTING HARDWARE (RISER BRACKET) | EACH   | 4        |
| VIDEO DETECTION PROCESSOR UNIT                             | EACH   | 4        |
| VIDEO MONITOR                                              | EACH   | 1        |
| CAMERA CHARGED COUPLING DEVICE                             | EACH   | 4        |
| TETHER WIRE 1/4" ASTM A475 SIEMENS-MARTIN                  | LIN. m | As Req'd |
| GRADE MIN.                                                 | L.S.   | -        |
| REMOVAL OF EXISTING TRAFFIC SIGNAL EQUIPMENT **            | EACH   | 4        |
| STREET NAME SIGNS W/MOUNTING HARDWARE (D-3)                | EACH   | 4        |
| LEFT TURN YIELD ON GREEN W/MOUNTING HARDWARE (R10-12)      | EACH   | 4        |
| SPLICE KIT (TRAFFIC INTERCONNECT)                          | EACH   | X        |

## CHART 'A' - SIGNAL INVENTORY

| NO. WAYS | NO. SECTIONS (Per Face) | SIGNAL FACE ARRANGEMENT | MOUNTING TYPE | QTY |
|----------|-------------------------|-------------------------|---------------|-----|
| 1        | 3                       | A                       | TYPE I        | 8   |
| 1        | 5                       | I                       | TYPE I        | 4   |
| 1        | 3                       | A                       | TYPE III      | 4   |
| 2        | 2                       | K (SYMB)                | TYPE II       | 4   |

## CHART 'B' - TRAFFIC SIGNAL POLES

| STATION      | DIST. | SIDE | ARM LENGTH (Meters) | NO. OF SIGNALS ON ARM | SIGNAL SPACING (Meters) | TYPE |
|--------------|-------|------|---------------------|-----------------------|-------------------------|------|
| Sta. 0+199.0 | 12.3m | Lt.  | 12.0m               | 3                     | 5.2-3.4-3.4             | STD  |
| Sta. 0+206.5 | 15.9m | Rt.  | 15.0m               | 3                     | 8.2-3.4-3.4             | STD  |
| Sta. 0+230.6 | 15.8m | Lt.  | 12.0m               | 3                     | 5.8-3.4-2.8             | STD  |
| Sta. 0+238.8 | 11.1m | Rt.  | 11.0m               | 3                     | 4.2-3.4-3.4             | STD  |

## CHART C

| CONDUIT SIZE (Millimeters) | TRENCHED (Meters) | PUSHED (Meters) |
|----------------------------|-------------------|-----------------|
| 50mm PVC                   | 162.3m            | -               |
| 35mm RGC                   | 4.8m              | -               |
| 50mm RGC                   | 13.1m             | -               |
| 75mm RGC                   | 123.5m            | -               |

## TYPE 170 CONTROLLER SETTINGS

| WAPITI PROGRAM |       |     |      |     |      |     |      |     | Nominal Display |           |              |   |   |   |   |   |   |   |   |
|----------------|-------|-----|------|-----|------|-----|------|-----|-----------------|-----------|--------------|---|---|---|---|---|---|---|---|
| Interval       | Phase |     |      |     |      |     |      |     | Time Clock      | Features  |              |   |   |   |   |   |   |   |   |
|                | 1     | 2   | 3    | 4   | 5    | 6   | 7    | 8   |                 | Phase     |              |   |   |   |   |   |   |   |   |
|                | WBLT  | EB  | SBLT | NB  | EBLT | WB  | NBLT | SB  |                 | 1         | 2            | 3 | 4 | 5 | 6 | 7 | 8 |   |   |
| Max.           | 0     | 30  | 80   | 30  | 80   | 30  | 80   | 30  | 0               | Year      | Veh Recall   |   |   |   |   |   |   |   |   |
| Max. 2         | 1     | 30  | 80   | 30  | 80   | 30  | 80   | 30  | 1               | Month     | Ped Recall   |   |   |   |   |   |   |   |   |
| Walk           | 2     | 0   | 8    | 0   | 8    | 0   | 8    | 0   | 2               | Day/Month | Red Lock     |   |   |   |   |   |   |   |   |
| Fl. Dw.        | 3     | 0   | 15   | 0   | 15   | 0   | 15   | 0   | 3               | Day/Week  | Yel Lock     |   |   |   |   |   |   |   |   |
| Max. Init.     | 4     | 6   | 10   | 6   | 10   | 6   | 10   | 6   | 4               | Hour      | 0 Permit     | X | X | X | X | X | X | X | X |
| Min. Green     | 5     | 5   | 8    | 5   | 8    | 5   | 8    | 5   | 5               | Minute    | Ped Phases   | X | X | X |   |   |   |   |   |
| TBR            | 6     | 1   | 15   | 1   | 15   | 1   | 15   | 1   | 6               | Second    | Lead Phases  | X | X | X | X | X |   |   |   |
| TTR            | 7     | 1   | 25   | 1   | 25   | 1   | 25   | 1   | 7               |           | Dbl Entry    |   |   |   |   |   |   |   |   |
|                | 8     |     |      |     |      |     |      |     | 8               |           | Sequential   |   |   |   |   |   |   |   |   |
| Passage        | 9     | 1.0 | 3.0  | 1.0 | 3.0  | 1.0 | 3.0  | 1.0 | 9               |           | Start Up Yel | X |   |   |   | X |   |   |   |
| Min. Gap       | a     | 1.0 | 1.5  | 1.0 | 1.5  | 1.0 | 1.5  | 1.0 | a               |           | Overlap A    |   |   |   |   |   |   |   |   |
| Add Act        | b     | 1.0 | 1.3  | 1.0 | 1.3  | 1.0 | 1.3  | 1.0 | b               |           | Overlap B    |   |   |   |   |   |   |   |   |
| Yellow         | c     | 3.0 | 3.0  | 3.0 | 4.0  | 3.0 | 3.0  | 4.0 | c               |           | Overlap C    |   |   |   |   |   |   |   |   |
| Red Cir        | d     | 1.0 | 1.5  | 1.0 | 1.5  | 1.0 | 1.5  | 1.0 | d               |           | Overlap D    |   |   |   |   |   |   |   |   |
| Red Rev        | e     | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | e               |           | Exclusive    |   |   |   |   |   |   |   |   |
| Walk II        | f     | 0   | 0    | 0   | 0    | 0   | 0    | 0   | f               |           | Sim Gap      |   |   |   |   |   |   |   |   |

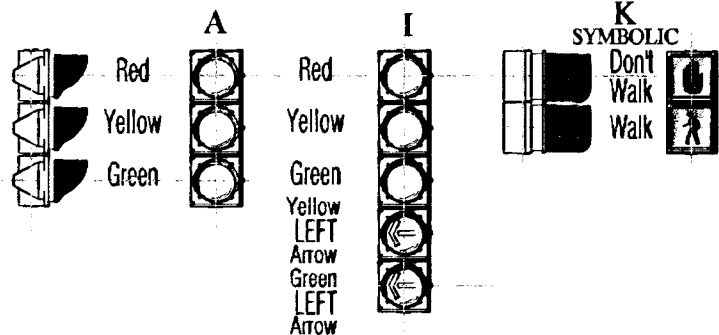
## TRAFFIC MANHOLE SUMMARY

| STATION      | DIST. - SIDE |
|--------------|--------------|
| Sta. 0+201.7 | 15.8m Lt.    |
| Sta. 0+205.6 | 14.0m Rt.    |
| Sta. 0+233.4 | 13.7m Lt.    |
| Sta. 0+234.5 | 10.9m Rt.    |

## CHART 'D' - STREET NAME SIGN SUMMARY

| LEGEND       | TYPE | QTY | UNITS | SIZE (Millimeters) |
|--------------|------|-----|-------|--------------------|
| Lincoln      | D-3  | 2   | EA    | 750 x 1500         |
| McLean Blvd. | D-3  | 2   | EA    | 750 x 1500         |

## TYPICAL TRAFFIC SIGNAL HEADS



## GENERAL NOTES

- SIGNAL TIMING BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING THE CONTROLLER, CABINET, CONCRETE BASE, AND FOR ALL EQUIPMENT NECESSARY FOR THE COMPLETE AND SATISFACTORY OPERATION OF THE TRAFFIC SIGNAL, WHETHER SAID EQUIPMENT IS SPECIFICALLY MENTIONED OR NOT.
- LENGTHS GIVEN ARE TO CENTERLINE OF POLE/BOX AND DO NOT INCLUDE LENGTHS FOR ELBOWS AND RISERS.
- SIGNAL HEADS, PEDESTRIAN SIGNALS, TRAFFIC SIGNS & ETC. INCLUDE ALL BRACKETS, HARDWARE & OTHER INCIDENTALS NECESSARY FOR INSTALLATION.
- SEE CITY OF WICHITA STANDARD SPECIFICATIONS FOR ADDITIONAL WIRING NOTES.

## SPECIAL FINISH FOR TRAFFIC SIGNAL EQUIPMENT:

The traffic signal controller cabinet, brackets, sign blank backs, signal backs and other exposed surfaces shall be shop painted with an aerosol lacquer cellulose ester to match the traffic signal pole color. The contractor shall submit two copies of the proposed coating system to the City for approval to application.

## TRAFFIC SIGNAL POLE & PEDESTAL EXTERIOR COATING:

In addition to being galvanized, all exterior surfaces shall be coated with a zinc rich epoxy powder to a minimum dry film thickness of 2.0 mils. The coating shall be electrostatically applied and partially cured in a gas fired convection oven by heating the steel substrate to a minimum of 250 degrees Fahrenheit.

The powder primed surface shall be coated with an intermediate coat of polyester powder to a minimum dry film thickness of 2.0 mils. The coating shall be electrostatically applied and cured by heating the steel substrate in a convection oven to minimum of 350 degrees and a maximum of 400 degrees Fahrenheit.

The intermediate coat shall be top coated with one coat of high-build acrylic polyurethane enamel to a minimum dry film thickness of 2.0 mils. The coating shall be electrostatically applied and cured by heating the substrate in a convection oven to a minimum of 225 degrees Fahrenheit. The final top coating color shall be BLACK.

## NOTE

ALL SIGNAL CABLE SPLICES SHALL BE MADE ABOVE GROUND IN POLE OR PEDESTAL BASES.

2m OF SLACK OR EXCESS CABLE, AS APPLICABLE, SHALL BE LEFT IN EACH TRAFFIC MANHOLE.

ONE SEVEN CONDUCTOR CABLE SHALL BE RUN FROM THE CONTROLLER TO EACH SIGNAL POLE FOR APPLICABLE FIVE-SECTION SIGNAL HEAD (LEFT TURN SIGNAL). THE FOLLOWING COLOR CODES SHALL BE USED:

|               |                          |
|---------------|--------------------------|
| WHITE         | COMMON                   |
| RED           | RED BALL                 |
| GREEN         | GREEN BALL               |
| ORANGE        | YELLOW BALL              |
| BLUE          | GREEN ARROW              |
| BLACK         | YELLOW ARROW             |
| WHITE W/BLACK | STREET NAME SIGN (WHERE) |

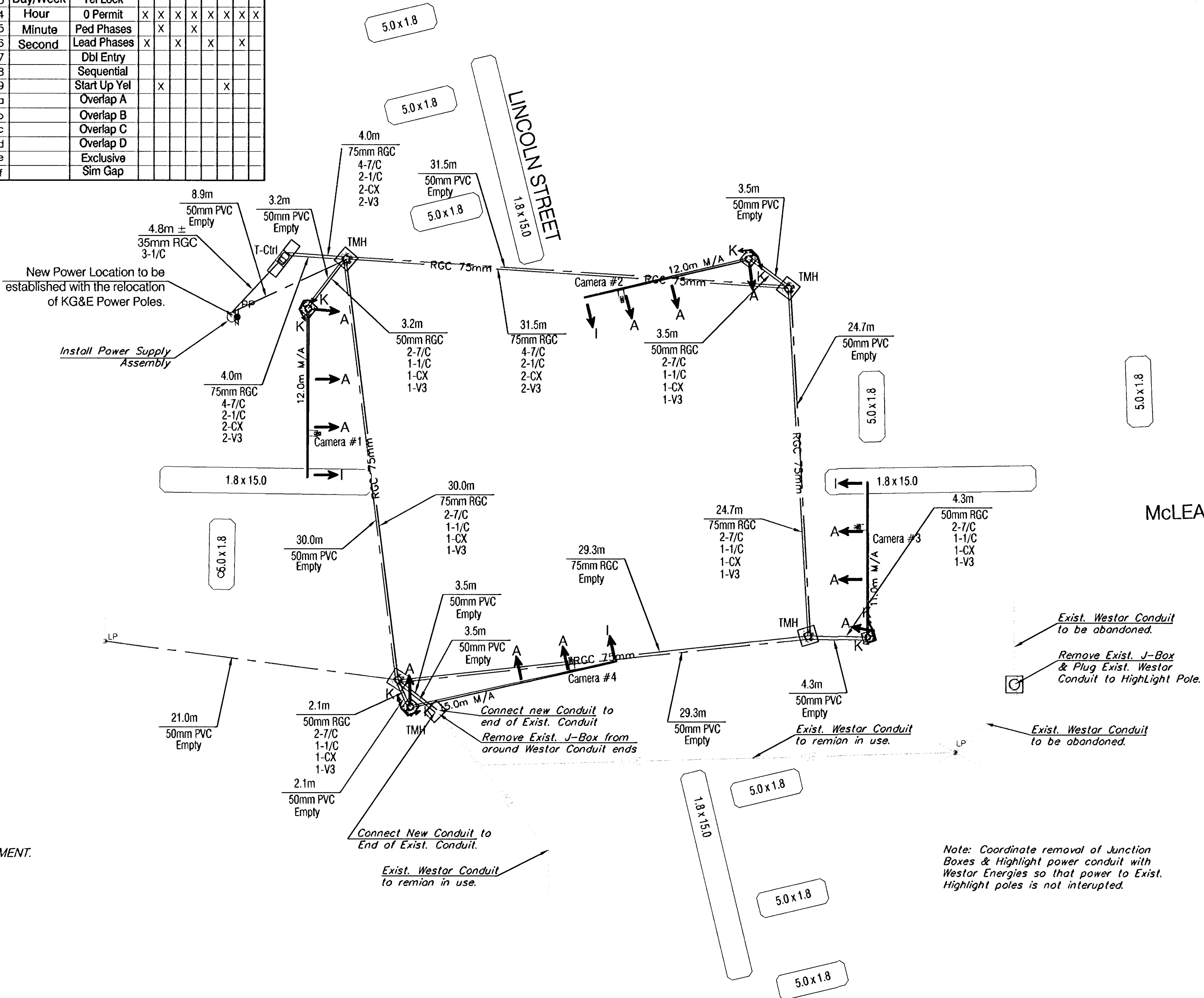
ONE SEVEN CONDUCTOR CABLE SHALL BE RUN FROM THE CONTROLLER TO EACH SIGNAL POLE FOR PEDESTRIAN MOVEMENT. THE FOLLOWING COLOR CODES SHALL BE USED:

|               |                            |
|---------------|----------------------------|
| RED           | DON'T WALK (PHASE 2 OR 6)  |
| GREEN         | WALK (PHASE 2 OR 6)        |
| ORANGE        | PUSH BUTTON (PHASE 2 OR 6) |
| WHITE W/BLACK | DON'T WALK (PHASE 4 OR 8)  |
| BLUE          | WALK (PHASE 4 OR 8)        |
| BLACK         | PUSH BUTTON (PHASE 4 OR 8) |
| WHITE         | COMMON                     |

A SINGLE CONDUCTOR STRANDED NO. 8 GREEN WIRE SHALL CARRY THE EQUIPMENT GROUND FROM THE GROUNDING LUG OF ALL SIGNAL POLES TO THE CONTROLLER CABINET AND THE POWER DISCONNECT BOX.

ONE 75 OHM COAXIAL CABLE (BELDON 8281) SHALL BE RUN FROM THE CONTROLLER TO EACH SIGNAL POLE FOR VIDEO TRANSMISSION (CX).

ONE THREE CONDUCTOR CABLE SHALL BE RUN FROM THE CONTROLLER TO EACH SIGNAL POLE FOR CAMERA POWER (V3).



## McLEAN BLVD

## Type 170 Controller System to include:

- Model 170E controller unit complete with W4IKS (53A or Latest Revisions) traffic program on 412B system memory module with a 400 modem
- One (1) Model 332 Cabinet complete with all accessories & shall include:
  - One (1) Model 210ECL or 210MS Conflict Monitor with software.
  - Four (4) Model 430 Transfer Relays.
  - Two (2) Model 204 Flashing Units.
  - Twelve (12) Model 200 Switch Packs.
  - Three (3) Model 242 DC Isolators.
  - One (1) Surge Arrester.

Note: Coordinate removal of Junction Boxes & Highlight power conduit with Westar Energies so that power to Exist. Highlight poles is not interrupted.



|                             |              |                      |                   |                                           |                           |
|-----------------------------|--------------|----------------------|-------------------|-------------------------------------------|---------------------------|
| PROJECT NUMBER<br>472-83799 |              | SHEET NAME<br>Wiring |                   | ENGINEERING DIRECTORY<br>F:\LinMcLn\Traff |                           |
| DESIGN<br>JFB               | DRAWN<br>KWR | APPROVED<br>JFB      | DATE<br>July 2003 | SCALE<br>Noted                            | BAUGHMAN NO<br>01-03-E944 |

CAPITAL IMPROVEMENT PROJECT  
**WIRING DETAIL**  
AT LINCOLN AND MCLEAN  
LINCOLN & MCLEAN INTERSECTION IMPROVEMENTS

**BAUGHMAN COMPANY, P.A.**  
ENGINEERING, SURVEYING, & PLANNING  
316-262-7271 • 315 ELLIS • WICHITA, KANSAS 67211

SHEET  
23  
OF  
47