Illinois Department of Transportation

District One

Traffic Signal Design Guidelines

October 2009

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APPENDICES

Documents Available from the District One Office Upon Written Request

- District 1 Traffic Signal Specifications
- Community Special Request Listing
- Latest Signal Equipment Pay Item Descriptions
- IDOT "Standard Specifications for Traffic Control Items"
- District 1 Mast Arm Mounted Street Name Sign Standard Base Sheet
- District 1 Standard Traffic Signal Design Details
- Existing Traffic Signal Plans

Note:

Send a letter requesting a copy of specific documents and why they are needed to Traffic Design Engineer, Illinois Department of Transportation, Bureau of Traffic Operations, 201 West Center Court, Schaumburg, Illinois 60196-1096.

Other IDOT Documents

For information on traffic control device material specifications, design and application criteria, review the applicable publications listed in **Chapter 57 – Section 1.02 References**, of the IDOT Bureau of Design and Environment Manual.

Additional information, including standard specifications, highway standards and various IDOT forms may be downloaded from IDOT's website at www.dot.state.il.us.

Other Documents

Institute of Transportation Engineers publication "Preemption of Traffic Signals at or Near Railroad Grade Crossings with Active Warning Devices."

FHWA publication "Railroad-Highway Grade Crossing Handbook."

ARTICLE 1 PLAN PREPARATION PROCEDURES

1.1 Designer Prequalification

The firm supplying plans to IDOT District 1 (District) must be prequalified with the Illinois Department of Transportation (Department) in Traffic Signal Design and its signal design staff shall be familiar with the latest traffic signal design procedures used for the District.

On projects involving complex designs, the firm's signal designer should schedule a preliminary meeting with the Traffic Design Engineer to discuss project specific issues. If requested by the District, the signal designer shall provide copies of their most recent traffic signal installation design and/or modification projects completed for projects in the District.

Interaction between a traffic signal design firm and the District must be on a shared benefit basis. If, in the opinion of the District, the firm is attempting to design plans beyond the level of competence of its staff, the District shall refuse further review until qualified assistance is acquired and approved. The District does not intend to be a teaching agency.

The designer is expected to provide interpretive assistance and corrections to his work up to and through the construction phase of the project. Article 2.26 of the IDOT "Standard Agreement Provisions for Consultants Services" shall be strictly adhered to.

1.2 Metric System of Measurement

This design guide is written using the English system, but parentheses are included next to all English units with Metric conversions shown in the parentheses.

1.3 Project Presentation and Reviews

Signal design work shall be performed in a comprehensive manner. Traffic signal design plans shall be developed in sufficient detail to allow for a comprehensive review by the District. If in the opinion of the District, the plans do not include sufficient information to allow for a comprehensive and meaningful review, they shall be returned to the designer without comments. No further plan reviews shall be conducted by the District until the designer demonstrates that the traffic signal design plans have been developed to a sufficient level of detail.

The review process shall be established at the preliminary meeting with the Traffic Design Engineer and in general shall be as follows:

- Project Presentation and Considerations
- Plan Review
- Final Review

A written disposition of comments and the return of all marked plans/specifications/estimates from **ALL** previous District review comments supplied to the designer shall accompany each subsequent submittal. Specific dates may be established for the plan submittals. The Department will not be responsible for changes resulting from the failure to follow the process as noted above.

1.3.1 Project Presentation and Considerations

To assist the designer in evaluating the various design elements, the District has developed a check sheet (see Section 1.3.4) that shall be utilized by the designer for each project. The check sheet shall be completed by the designer and submitted with the plans/specifications as part of the overall review process. Failure by the designer to complete the form in its entirety and/or to submit it with the plans will result in the District rejecting the plans and returning them to the designer.

The items listed in the check sheet will aid the designer in developing a written scope of work for the project. Additional information, including field data, traffic counts, survey information, right-of-way limits, and cost participation information by municipal and/or private participants may be requested. The above items shall be investigated and addressed by the designer.

1.3.2 Plan Review

A full-size set of plans shall be submitted together with the Specifications, Cost Estimate and Traffic Signal Design Check Sheet. A written disposition of comments and the return of all marked up plans from **ALL** previous District review comments supplied to the designer shall accompany each submittal. The plans shall be developed in sufficient detail to allow for a comprehensive review by the District. Incomplete or partial plans (80% complete plans) will not be accepted by the District for review. The intent of this provision is to minimize the number of reviews in the design process and to expedite the overall approval process.

1.3.3 Final Review

The complete signal project shall be submitted to the District 1 Bureau of Traffic Operations, which shall have incorporated all previous review comments and be checked in depth by the designer prior to submittal. A written disposition of comments and the return of all marked up plans from **ALL** previous District reviews shall accompany the final submittal. The final submittal shall also include:

- One full-size reproducible plan set
- One full-size blueline plan set (6 sets for Permit Projects)

- Electronic files in Microstation format of traffic signal design plans.
- One final set of Specifications
- Cost Estimate with pay code item numbers, unit, item, quantity, unit price and total cost estimate (except for Permit and Roadway Projects)
- Signal Project File which includes:
  - Project scope of work
  - Review comments and disposition of comments
  - Correspondence with the Electric Utility
  - Copy of the Electric Utility service response or agreement
  - Correspondence with the Telephone Utility
  - Correspondence from Communities regarding a commitment for cost participation
  - Correspondence with railroads
  - Correspondence with ICC
  - Correspondence with any other Highway Agencies or IDOT Bureau
  - Commitments for cost participation
  - Correspondence from Communities
  - Correspondence from local fire departments/protection districts
  - Copies of temporary/permanent easement agreements
  - Copies of right-of-way dedication
  - Correspondence with utility companies regarding utility reviews and/or conflicts

1.3.4 Final Plan Submittal

Upon final plan approval by the District 1 Bureau of Traffic Operations, the following shall be submitted:

- One full-size blueline plan set (22” x 34”)
- Six reduced plan sets (11” x 17” format)
- Additional reduced plan sets may be requested by District
- Two sets of specifications
- Electronic files in Microstation format of the signal design plans (Note: The Microstation electronic files must be accepted by the District 1 CADD Unit).
- Electronic files in PDF format
- Specifications in PDF format

1.3.5 Check Sheet

The Traffic Plan Check Sheets are included in Appendix B.

1.4 Plan Format

1.4.1 General

The following applies to **each sheet** in the plans:

- Include Designer's full name, firm name and date
- Include District 1 sheet number block
- Include District 1 title block (expect title sheet)
- Sheet size shall be 34 inches (864 mm) wide by 22 inches (559 mm) high
- Orientation of north arrows should be up or to the right on the plan sheets and shall be consistent throughout the plans.
- Minimum lettering size may be as small as 0.10 inches (3mm) if capital letters are used. Titles and Phase Designation Diagrams must have 0.15 inches (4mm) or larger lettering
- Include General Notes for important project specific considerations

The designer shall have a clear understanding of Part VII – Plans and Contracts of the IDOT "Bureau of Design and Environment Manual".

It is understood that each project is unique, but in order to provide the maximum benefits from the design work the designer is expected to adhere to the following format requirements and shall submit plan sets with sheets in the order as listed below. An example of each of these sheets is included in Appendix A.

1.4.2 Title Sheet

Follow guidelines set forth in Part VII – Plan and Contracts of the IDOT "Bureau of Design and Environment Manual".

- Designer name and phone number shall be provided in the left side margin
- Communities and Townships shall be listed on title sheet location map
- District 1 sheet number block
- See example in Appendix A

1.4.3 Summary of Quantities Sheet(s)

On Roadway Projects, or projects with more than one schedule of traffic signal quantities, a summary of quantities sheet shall follow the Title Sheet.

- The Summary sheet shall list items in pay item code number sequence priority, with the full pay code item description. Each item shall be broken into sub-quantities per location and function. The amount of sub-quantity to be paid for by each participating Agency shall be listed. The total quantity shall match the balance of the sub-quantities.

- The body of the quantities should be in capital letters and include: CODE NUMBER, UNIT, ITEM, AND QUANTITY. Items shall be in exactly the same Code Number order as on the Estimate of Cost pages or schedule.
- The function code for IDOT contract signal plans is Y031-1F for both new installations and modernizations. The function code for emergency vehicle preemption equipment is Y031-3D.

1.4.4 District 1 Standard Traffic Signal Design Details

- These sheets are required for all designs.
- See Appendix A

1.4.5 Temporary Signal Design Sheet(s)

- North arrow up or to the right. Should be the same orientation as the Signal Layout Sheet.
- Geometric layout scale: 1" = 20' (1:250)
- District 1 Notes for Temporary Traffic Signals (see Appendix B)
- Temporary cable plan, temporary controller sequence
- Existing and proposed geometrics
- Dimensioned pole locations
- Pole guy wire locations
- If the sequence will not fit on the temporary cable plan, a separate sheet may be used
- Locations of existing equipment
- Schedule of existing equipment to be removed, salvaged or returned
- Notes concerning any controller specifications
- Temporary interconnect plan
- See example in Appendix A

1.4.6 Geometric Plan and Signal Layout Sheet

- North arrow up or to the right
- Geometric layout scale: 1" = 20' (1:250)
- Break Lines are not allowed. All pavement, driveways and cross streets between the intersection and perimeter loops must be shown. Match lines will be allowed, with the geometric/signal information shown on additional sheets.
- Proposed geometrics only should be shown
- Label and dimension from centerline R.O.W.
- Dimension pavement marking and lane widths
- Label roadway names
- Dimension equipment locations
- Dimension loops and their locations
- Dimension and size conduit runs
- Special detail sheet(s) should be referenced from this sheet

- Locate curb, sidewalk, driveways, buildings, and other features adjacent to R.O.W., etc.
- Locate drainage structure(s) which may affect signal appurtenances
- Construction notes related to signals
- See example in Appendix A

1.4.7 Cable Plan, Sequence of Operation and Schedule of Quantities Sheet(s)

- North arrow up or to the right. Same orientation as the Signal Layout Sheet
- Cable plan including signal heads
- Schedule of Quantities.
- Phase Designation Diagram or Chart Sequence of Operation. If these Diagrams or Chart Sequences do not fit on this sheet, a separate sheet may be used. Also include diagram or chart sequence for emergency vehicle preemption and chart sequence for railroad preemption if appropriate
- IDOT Table for "Traffic Signal Installation Electrical Service Requirements"
- See example in Appendix A

1.4.8 System Interconnect Sheets

1.4.8.1 System Interconnect Plan Sheet

- North arrow up or to the right
- Geometric layout scale: 1" = 50' (1:500)
- Label and dimension from centerline R.O.W.
- Dimension and size conduit runs
- Denote limits of system and intersection plans
- Denote locations of intersection and sampling (system) detectors
- See example in Appendix A

1.4.8.2 System Interconnect Schematic

- System Schedule of Quantities
- The body of the quantities should be in capital letters and include: UNIT, ITEM, AND QUANTITY. Items shall be in exactly the same Code Number order as on the Estimate of Cost pages or schedule.
- Show system detectors and what intersection they are assigned to, the number of conductors to each system detector, the cable between controllers, the type of conductor (either copper or fiber optic) between controllers, tracer cable, and the location of the master controller and telephone service.
- See example in Appendix A

1.4.9 Special Detail Sheet(s)

- Each detail shall be labeled per pay code item designation (if applicable)
- If multiple details are supplied on one sheet, they shall be labeled separately in the title block and on the title sheet
- Reference all special details sheet numbers on layout sheet

1.4.10 Pavement Marking Sheet(s)

- All markings shall be clearly labeled according to pay item description
- All markings shall be clearly dimensioned
- Minor reconstruction quantities may be provided on this sheet, such as: Curb and Gutter Removal and Replacement, Sidewalk and Median work
- Signing quantities and locations may be provided on this sheet
- See example in Appendix A

1.4.11 Mast Arm Mounted Sign Design Sheet(s)

- Use the District design sheet
- Multiple intersection designs may be used on one sheet
- See example in Appendix A

1.4.12 Standard Detail Sheet(s)

- The Standards are updated frequently. The Designer shall check for the latest revisions.
- Do not in any circumstances revise any IDOT Standard Detail Sheet
- For permit projects, these sheets must be included in the plans or specifications
- Generally, Signal Plans may include any combination of the following IDOT Standards. Copies of these details, with the exception of the District 1 Standard Traffic Signal Design Details, may be found in the IDOT Highway Standards Manual

Typical Traffic Signal Standards:

424001	Curb Ramps for Sidewalks
701006	Off-Road Operations, 2L, 2W, 15' (4.5 m) to 24" (600 mm) From Pavement Edge
701011	Off-Road Moving Operations 2L, 2W Day Only
701101	Off-Road Operations Multilane, 15 (4.5 m) to 24" (600 mm) From Pavement Edge
701201	Lane Closure, 2L, 2W, Day Only for Speeds ≥ 45 MPH
701301	Lane Closure 2L, 2W, Short Time Operations
701501	Urban Lane Closure 2L, 2W Undivided
701502	Urban Lane Closure, 2L 2W, with Bidirectional Left Turn Lane
701601	Urban Lane Closure, Multilane, 1W or 2W with Nontraversable Median
701602	Urban Lane Closure, Multilane, 2W with Bidirectional Left Turn Lane
701606	Urban Lane Closure, Multilane, 2W with Mountable Median
701701	Urban Lane Closure Multilane Intersection

701801	Lane Closure, Multilane 1W or 2W Crosswalk or Sidewalk Closure
701901	Traffic Control Devices
720001	Sign Panel Mounting Detail
814001	Handholes
814006	Double Handholes
857001	Standard Phase Designation Diagrams and Phase Sequences
857006	Supervised Railroad Interconnect Circuit
862001	Uninterruptable Power Supply (UPS)
873001	Traffic Signal Grounding & Bonding
876001	Pedestrian Push Button Post
877001	Steel Mast Arm Assembly and Pole 16' Through 55'
877002	Steel Mast Arm Assembly and Pole 56' Through 75'
877006	Steel Mast Arm Assembly and Pole with Dual Mast Arms
877011	Steel Combination Mast Arm Assembly and Pole 16' Through 55'
877012	Steel Combination Mast Arm Assembly and Pole 56' Through 75'
878001	Concrete Foundation Details
880001	Span Wire Mounted Signals and Flashing Beacon Installation
880006	Traffic Signal Mounting Details
886001	Detector Loop Installations
000001	Standard Symbols, Abbreviations and Patterns
001006	Decimal of an Inch and of a Foot

1.4.13 District 1 Traffic Signal Specifications

- The latest District 1 Traffic Signal Specifications shall be used for <u>all</u> designs
- Any additions, modifications, or subtractions to the District 1 Traffic Signal Specifications must be approved by the Traffic Design Engineer prior to approval of the plans and specifications.

1.4.14 Estimate of Cost

- Shall be on 8-1/2" x 11" sheets of paper
- Top right hand corner shall have the FA Number, Section Number, and County on each sheet of the Cost Estimate
- Use the following for a heading: State of Illinois, Department of Transportation, and Estimate of Cost and center the text on three lines.
- Information paragraph should read "The proposed improvement consists of the traffic signal (*system, modernization, or installation*) at the intersection(s) of (*name*) in (*name*) County.
- Number the pages as "Sheet 1 of _____" etc.
- The body of the estimate should be in capital letters and include: CODE NUMBER, UNIT, ITEM, QUANTITY, UNIT PRICE AND TOTAL PRICE. Items shall be in exactly the same Code Number order as on the Summary of Quantities sheet or schedule.
- Total should be on the last page
- Non-standard prices should include explanations
- Date
- See example in Appendix A

ARTICLE 2 DESIGN GUIDELINES

2.1 Electrical Service

The designer shall provide written notification to the electric utility or appropriate governmental controlled power source via their marketing representative, defining the future project and requesting notification of service installation requirements and/or charges. The electric utility must be notified at the initial stage of the project. If service charges are necessary, the designer will have the funding agency approve and sign the electric utility contract. Copies of all correspondence with the electric/utility company shall be sent to the Bureau of Traffic Operations. The designer will then return the signed contract to the electric utility, documenting the date returned. Copies of all correspondence and contracts shall be included with final plan review.

The designer shall secure an agreement with the utility company whenever a utility easement is needed for service.

The electrical service shall be brought into the cabinet foundation using a separate 2" conduit from a location which has public access.

The two types of service installations included in the District 1 Traffic Signal Specifications are:

Service Installation Pole Mounted
Service Installation Ground Mounted

The designer will be responsible for investigating special types of service installations requested by the municipality or county. All special requests shall be documented by the designer and submitted to the Traffic Design Engineer for review and approval prior to completion of the final plans.

2.2 Railroad Coordination/Preemption

The designer should always contact IDOT District 1 and request a meeting prior to beginning a design involving a railroad crossing within 200 feet of a traffic signal and/or when the existing or projected vehicular queue will extend beyond the crossing. Consideration must first be given to whether railroad preemption is required. This determination shall be made based on current IDOT District 1 traffic signal design criteria, guidelines contained in the Institute of Transportation Engineers publication "Preemption of Traffic Signals at or Near Railroad Grade Crossings with Active Warning Devises" and Illinois Commerce Commission (ICC) recommendations.

Prior to beginning design work for an intersection that is interconnected to a railroad crossing, a Traffic Signal/Railroad Report must be approved by the District and the ICC. If a Traffic Signal/Railroad Report has not been completed, it shall be the responsibility of the designer to coordinate with the District to prepare the report prior to beginning design work.

Based on the distance between the railroad tracks and the cross street, pre-signals may be required. This will be determined in the **Traffic Signal/Railroad Report**. The preferred mounting location for the pre-signals is the railroad cantilever if one is present. The structural adequacy of the cantilever must be evaluated to determine if the cantilever is capable of accommodating the pre-signal. The final decision on placement of the pre-signals will be based on ICC order. Details concerning mounting of signal heads on the cantilever are shown in Appendix B.

The design shall incorporate internally illuminated (LED) left-turn and right-turn restriction ("blank out") signs based on the recommendations contained in the Traffic Signal Railroad Report. Two signs that display the international turn restriction shall be included for each turning movement to be restricted. When post mounted, the signs must be installed on posts at least 18 feet (5.45 m) tall. These signs are not required for protected only left turn movements.

Details of the requirements for the railroad controller/traffic signal controller interconnect will be determined by IDOT District 1 and the ICC based on current design standards. A phone drop must be included to the traffic signal controller cabinet unless the signal installation is part of a signal system.

When a project involves work adjacent to a railroad, a lump sum pay item for "Railroad Protective Liability Insurance" shall be included in the pay items. The District 1 form for "Railroad Protective Liability Insurance" shall be included in the specifications.

In addition, the designer shall determine and document if the railroad will require construction, right-of-entry or similar permits for work within the railroad right-of-way. When required, these permits should be included in the pay items.

The designer should be familiar with the following publications:

- "Preemption of Traffic Signals at or Near Railroad Grade Crossings with Active Warning Devices" by ITE, 2006 or later
- "Railroad-Highway Grade Crossing Handbook" by FHWA, 2007 or later

Additional specific guidance can be found in the IDOT BDE Procedure Memoranda Numbers 45-05 and 53-06

2.2.1 Design and Operation of Signalized Intersections in Close Proximity to Railroad Grade Crossings

When a project is located in close proximity to a railroad grade crossing, regardless of whether it is interconnected to the crossing, the designer should be aware of construction-related conditions that may cause traffic to back up onto the railroad tracks. When such queueing is likely, the designer should consider additional Maintenance of Traffic measures or other procedures to satisfy the requirements of the current edition of the MUTCD for work zone conditions and railroad-highway grade crossings.

Interconnection System Design

A. Traffic Signals

Design – Locations where traffic signals and railroad warning devices are interconnected should be designed differently than the typical intersection. The two signal systems must be designed to operate together to provide a safe system for both the highway users and the railroads. Communication between the traffic signal designers and the railroad signal designers is critical so that everyone understands the design times and actual operations of the system.

- Four or five section signal heads should be installed to allow for a protected left turn phase on the track approach leg of the intersection during the preemption sequence.

- Pre-Signal (Near Side): Traffic signal heads should be placed on the near side of the rails to stop vehicular traffic before the railroad crossing at all signalized intersections where the clear storage distance (measured from the stop line to a point 6 ft. from the rail nearest the intersection) is 50 ft (15 m) or less. At all approaches where the crossing is on a State highway or where high percentages of multi-unit vehicles are evident, the distance should be increased to 75 ft (22.9 m).

- Traffic signal heads located on the near side of the tracks should be mounted on the railroad structure, if available, or as close to the crossing as possible without restricting visibility of the railroad signals.

- When pre-signals are used, signal phase sequencing should be designed to avoid left turn vehicles from being trapped at the intersection. The designer shall be responsible for coordinating the signal phasing, sequence, timing, and design details with the District and the ICC.

- Equipment – The Department has committed to standardizing the type of traffic signal controllers used at interconnected traffic/railroads signals. IDOT has worked with two manufacturers to develop software that will allow a second preemption call to be recognized sooner and then to re-service the track approach. The software will be installed in all new controllers that are interconnected to railroad signals. The designer shall coordinate with the District to ensure that an approved controller model and software version is specified for the project.

- Pedestrian signal heads with countdown timers are NOT allowed at intersections interconnected with railroad grade crossings. Refer to Section 2.4.2 of this guide.

- Uninterruptible Power Supply (UPS) systems shall be installed at intersections interconnected with railroad grade crossings. Refer to Section 2.11 of this guide.

B. Signing — Refer to attached diagrams for supplemental signing:

- Provide **"DO NOT STOP ON TRACKS"** at all interconnected crossing locations.

- Where pre-signals are not present, the **"CAUTION ___FT BETWEEN TRACKS AND HIGHWAY"** sign should be provided in advance of all tracks where the rail nearest the highway is located within 81 ft (24.7 m) of the point where a vehicle would normally stop. This sign should also be used as an interim measure until pre-signals are installed.

- Provide **"STOP HERE ON RED"** and **"NO TURN ON RED"** signage at crossings with pre-signals.

- Provide "**WALK TIME SHORTENED WHEN TRAIN APPROACHES**" signage at crossings with pedestrian signals.

- Blank out signs: When recommended in the Traffic Signal/Railroad report, or when a need is determined based on engineering judgement, blank out signs shall be installed to prohibit turning movements from the cross street into the tracks during the preemption sequence. Signs should be consistent with the MUTCD recommendations.

2.3 Sequence of Operations

2.3.1 General

In order to provide maximum efficiency of traffic flow along State highways in District 1, on all state highways traffic signal installations require the use of fully actuated signal and system equipment.

- On state highways, actuated left turn arrow phases shall be installed in most cases where separate left turn channelization exists. On non-state highways the use of actuated left turn phases shall be determined based on engineering evaluation of left turn volumes and conflicting through/right turn movements.

- Right turn overlap phases may be installed where separate right-turn channelization exists with complimentary left-turn movements regardless of the number of receptor lanes.

- Protected only left-turn phasing should be utilized in (but not limited to) the following circumstances:

- Left-turn movement from a dual left-turn lane.
- Left-turn movement opposing a protected only left-turn movement (i.e. single left-turn lane opposite a dual left-turn lane; leading left-turn phase opposite a lagging left-turn phase).
- Wide intersections and/or skewed intersections where left turning traffic is exposed to conflicting traffic longer than the normal driver expectation. [Requires approval from Traffic design Engineer.]
- Intersections with a left turning crash history higher than normal.

Phase movements shall conform to those designated in the Phase Designation Diagrams that are shown in the design examples. Phases 2 and 6 shall be the major route (arterial) phase movements at all intersections with Phase 2 designated as the northbound or eastbound movement.

When the improvement involves modifications to the sequence/controller at an existing signalized intersection, both the existing and proposed phase designation diagrams and sequences of operation must be included in the plan sheets.

The designer shall have a clear understanding of all NEMA publications relating to traffic control items. The Sequence of Operation should be developed in the initial portion of the project. Complex Sequences of Operation can very easily become the most time consuming portion of the project to develop. The District will not lead each designer through the development of a complicated sequence. If the District decides that the designer is incapable of developing the necessary Sequence of Operation, no further review will be made until a qualified individual for the project is retained.

2.3.2 Normal Sequencing

The Phase Designation Diagrams shall be utilized by the designer in developing the Sequence of Operation. Most intersections contain geometric conditions in which these Phase Designation Diagrams can be utilized. Appropriate notes and symbols should be used to designate each vehicle and pedestrian phase, and right turn overlaps. Phase Designation Diagrams cannot be used at an intersection where railroad preemption is required (see Section 2.2) or at an intersection with emergency vehicle preemption with a hardwire preemptive device (see Section 2.3.3). A chart sequence must be developed in these two cases. Examples of the basic Phase Designation Diagrams are included with the design examples in Appendix C.

Intersections that require split-phasing (i.e. one leg of an intersection must be serviced alone on its own phase and the opposite leg must be serviced alone on its own phase) can be designed using a Phase Designation Diagram. Only one phase per movement on the same ring (on the same side of the barrier) should be utilized for this type of operation (i.e. one direction or movement should be assigned Phase 3 and the opposite direction or

movement should be assigned Phase 4). Phase 3 will be the first phase serviced on the side of the barrier operating the split phase and should be assigned to the minor side street approach. Split phasing shall be avoided whenever possible, even when doing so requires modifications to the intersection geometry.

Intersections with a continuous right turn arrow (hot right) may utilize a Phase Designation Diagram for the sequence of operation. Appropriate notes must be added to the plans indicating the specific continuous right-turn overlap movement.

When geometric conditions exist where the Phase Designation Diagrams cannot be utilized, the designer must prepare a chart Sequence of Operation. An example of the chart Sequence of Operation is included in Appendix C.

2.3.3 Emergency Vehicle Preemption Sequencing

The District will not participate in the cost of emergency preemption equipment or its installation. Whenever emergency preemption sequencing or equipment is called for in the plans, the designer shall provide documentation of a request from the Municipality or Fire Protection District involved.

The designer when developing preemption sequences shall utilize the Emergency Vehicle Preemption Sequence Diagram shown in the design examples in Appendix C. Emergency Vehicle Preemptor channels shall begin with channel 3. Preemptor channels 1 and 2 are reserved for Railroad Preemption. These Diagrams shall be used for the following standard emergency vehicle preemption situations in District 1.

Transmitter/Receiver Preemptive Devices

- Intersections with protected/permitted left turn phasing (dual entry – all approaches) in the normal Sequence of Operation shall preempt to the bi-directional street green for the call being serviced. Preempting to the bi-directional street green eliminates left turn traps at an intersection during preemption.

- Intersections with protected only left turn phasing (single entry – all approaches) in the normal Sequence of Operation shall preempt to only the intersection approach for the call being serviced. Right turn overlaps shall be terminated during preemption.

- Intersections that combine protected/permitted left turn phasing (dual entry) and protected only left turn phasing (single entry) shall preempt to the bi-directional street green for the call being serviced on the dual entry side of the barrier and preempt to only the intersection approach for the

call being serviced on the single entry side of the barrier. Right turn overlaps shall be terminated during preemption.

When geometric conditions exist where the Emergency Vehicle Preemption Sequence Diagrams cannot be utilized, the designer must prepare a chart Emergency Vehicle Preemption Sequence of Operation.

Hardwire Preemptive Devices (Fire Station Actuation)

- If the leg of the intersection where the fire station entrance is located on includes protected/permitted left turn phasing or no left turn phasing (dual entry), the preemption sequence shall be designed to stop all movements at the intersection followed by a preemption phase to service only the intersection approach containing the fire station entrance.

- If the leg of the intersection where the fire station entrance is located includes protected only left turn phasing (single entry), the preemption sequence shall be designed to stop only the movements at the intersection that conflict with the preemption phase movement that services the leg of the intersection containing the fire station entrance. The preemption phase shall follow the clearances required to stop the conflicting movements.

- If the leg of the intersection where the fire station entrance is located includes permitted left turn phasing only, the signal indications for that leg must be modified to include green left turn arrow sections. This may consist of providing either 4 section or 5 section heads for the fire station entrance leg of the intersection. The preemption sequence shall be designed to stop all movements at the intersection, then service the intersection approach containing the fire station entrance. The preemption phase shall include both CIRCULAR GREEN and green left arrow indications for that leg.

This type of preemption is not included in this Design Guideline and must be developed by the designer in chart form when required.

When a municipal fire department or a fire protection district requests different preemption phasing than that described above (for either transmitter/receiver preemption or hardwire preemption), the designer must obtain this request in writing and provide the District a copy of this request for review and approval/disapproval.

Preemption that is not included in this Design Guideline must be developed by the designer in chart form when required.

2.3.4 Railroad Preemption Sequencing

The Railroad Preemption Sequence shall provide sufficient time for the stopped queue of traffic over a track at a signalized intersection to safely clear the tracks when the signal is preempted by any train movement. The designer shall contact the District 1 Bureau of Traffic Operations prior to beginning any design involving railroad preemption.

Normal railroad preemption in District 1 shall clear the railroad crossing approach while holding all other approaches. The preempt shall then hold the parallel street green. If trains frequently cause long delays, the preempt may be allowed to cycle between all non-conflicting movements.

The preemption sequence must be developed by the designer in chart form. Provisions for preemption shall be in accordance with current IDOT District 1 design criteria, the ITE report "Preemption of Traffic Signals at or Near Railroad Grade Crossings with Active Warning Devices" and ICC recommendations. The railroad preemption phase(s) shall always be assigned to preemptor channel 2.

2.4 Signal Heads

2.4.1 General

All new or modernized traffic signal installations shall utilize Light Emitting Diode (LED) signals. All traffic signal heads used in permanent signal installations shall be either bracket mounted or mast arm mounted and the material type shall not be specified.

All traffic signal sections shall have 12-inch (300 mm) lenses. Intersections in which 8-inch (200 mm) lenses exist will include quantities to replace the applicable signal heads containing these lenses. This will be a requirement even if the intersection is only being partially modified.

All mast arm mounted signal heads require louvered backplates.

Near right signals shall not be used, except when one or more of the following conditions are present on the approach that is under consideration:

- A right turn lane with a right turn overlap present in the Sequence of Operation.
- Left turn on left arrow only (protected only left turn) type operation.
- Where the nearest signal face is located 150 feet (45 m) or farther from the stop bar.
- Where a railroad crossing exists, check with District 1 Bureau of Traffic Operations for latest design requirements.
- At certain "T" intersections.

- Special geometric conditions exist. (Vertical curves, horizontal curves, obstructions, etc).
- Consistency throughout the intersection. (Example: 3 out of 4 legs have near right signal heads).
- Where there are no mast arms facing a leg of an intersection.
- Three through lanes of traffic.

When left-turn or right-turn arrows are used in the Sequence of Operation, there shall be a minimum of two green and two yellow turn arrow sections per approach except for the following conditions:

- When a left-turn GREEN ARROW clears concurrently with a CIRCULAR GREEN (for all phase changes), then the left-turn YELLOW ARROW shall be omitted. (Example: a split phase type of operation).
- When green right arrows clear concurrently with green through arrows, then yellow right turn arrows shall be omitted. (Example: At diamond interchange intersections where there is no right turn overlap or no pedestrian conflicts).
- When right turn movement is continuous and the green right turn arrows that control this movement do not clear, then yellow right turn arrows shall be omitted.

A minimum of three signal faces displaying through indications shall be provided on the far side of the intersection.

At least one and preferably two of the signal faces required in the above shall be located between two lines intersecting with the center of the approach lanes at the stop line, one making an angle of approximately 20 degrees to the right of the center of the approach extended and the other making an angle of approximately 20 degrees to the left of center of the approach extended. One signal head shall be provided for each traffic lane. Sample signal head placements are included in Appendix C.

Dual indication signal sections shall not be used in a new or modernized traffic signal installation.

For a Protected Only Mode the left-turn signal face shall be capable of displaying one of the following sets of signal indications:

1. Left-turn RED ARROW, YELLOW ARROW, and GREEN ARROW signal indications only. Only one of the three colors shall be illuminated at any given time. A signal instruction sign (R10-5) with the message LEFT ON GREEN ARROW ONLY shall be required with this set of signal indications; or

2. CIRCULAR RED, left-turn YELLOW ARROW, and left-turn GREEN ARROW signal indications. Only one of the three colors shall be

illuminated at any given time. Unless the CIRCULAR RED signal indication is shielded, hooded, louvered, positioned, or designed such that it cannot be seen by drivers in the through lane(s), either a LEFT TURN SIGNAL sign (R10-10) or visibility-limited CIRCULAR RED signal indication shall be used; or

3. CIRCULAR RED, CIRCULAR YELLOW, CIRCULAR GREEN, and left-turn GREEN ARROW signal indications. This four-section signal face shall be used only when the CIRCULAR GREEN and left-turn GREEN ARROW signal indications begin and terminate together. During each interval, the circular signal indication shall be the same color as the signal indication on the signal face(s) for the adjacent through traffic.

2.4.2 Pedestrian Signal Heads

All new pedestrian signals are to be LED. type signals. All new signals shall include countdown timers, except at intersections interconnected with railroad warning devices. At the railroad intersections, countdown timers are NOT to be used.

Pedestrian signal heads with countdown timers shall consist of a section displaying two numerals and a section displaying a double overlay message combining symbols of an upraised hand and a walking person. Signals without countdown timers shall consist of two sections designed to display the international symbol for walk (walking person) on the bottom and the international symbol for don't walk (raised palm) on the top.

All pedestrian signals at an intersection must be the same type and have the same display. Newly installed pedestrian signal heads shall not utilize text (Don't Walk/Walk) or outlined hand/walking person symbols. At intersections that are being modified, existing pedestrian signal heads displaying text or outlined hand/walking person symbols should be replaced.

All pedestrian signal heads shall be bracket mounted.

2.4.3 Traffic Signal Placement

Examples shown in Appendix C represent the common geometric configurations for which traffic signals are designed. The designer should make any adjustments necessary for particular intersections to conform to the Manual On Uniform Traffic Devises (MUTCD) requirements.

Normal signal displays are also shown near the corresponding signal heads in the examples. Signal head placement on the mast arms should be dimensioned in the signal layout. The current District 1 design standards call for one signal head per lane as shown in the examples in Appendix C. However, the head placement shall conform to the requirements of the latest version of the MUTCD adopted by the State of Illinois.

Each design shall include the District 1 Standard Traffic Signal Design Details included in Appendix A.

2.4.4 LED Traffic Signal Head Retrofit

At locations where incandescent signal lamps are in use, the designer should provide for replacing the lamps with LED technologies. When required, the entire signal head should be replaced with an LED signal head. A new traffic signal backplate louvered, aluminum should be installed when the signal head is being replaced. If the existing signal head housing is polycarbonate in good condition, and uniform throughout the intersection, the individual incandescent signal section can be removed and an LED retrofit section can be installed in its place. Retrofits can be made for both vehicular and pedestrian signal heads.

All vehicular signal sections must contain 12" (300 mm) lenses for retrofits to be considered.

2.5 Detection

2.5.1 Pedestrian Push Buttons

Pedestrian push button detectors are to be placed next to sidewalks or at locations convenient to crosswalks. The placement and type shall be in accordance with current ADA standards and MUTCD policy.

2.5.1.1 Latching Pedestrian Push Buttons

All new traffic signal installations shall utilize separate push buttons for each pedestrian phase to meet the District One specification for latching LED push buttons. On traffic signal modification projects that involve relocating or replacing traffic signal posts and/or mast arms, separate push buttons should be added as well. For modification projects with limited changes to posts or mast arms, the designer should contact the Traffic Design Engineer to confirm whether separate push buttons will be required.

2.5.1.2 "Dual Call" Pedestrian Push Buttons

On projects with existing pedestrian signals not being improved or with only minor traffic signal modifications, when one push button is used to place a call in two phases, these "dual call" push buttons can remain in use subject to approval of the Traffic Design Engineer. In such cases, one or more of the following notes must be shown next to the cable plan:

NOTES:

- PUSH BUTTON “A” SHALL PLACE A CALL IN PHASES 2 AND 4
- PUSH BUTTON “B” SHALL PLACE A CALL IN PHASES 4 AND 6
- PUSH BUTTON “C” SHALL PLACE A CALL IN PHASES 6 AND 8
- PUSH BUTTON “D” SHALL PLACE A CALL IN PHASES 2 AND 8

The designer shall only show the required notes and shall always assign the push button letters listed above to the corresponding push buttons for phases shown. The push button letters shall be shown adjacent to each push button on the cable plan.

If a push button is used to place a call in only one phase, notes and corresponding push button letter assignments are not required.

2.5.2 Vehicle Loop Detectors

All lead in cable shall be “ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 14 1 PAIR”.

Each detector loop shall have its own saw cut (homerun for preformed loops) from the loop to the edge of pavement or to a handhole in the pavement.

For Detector Loop Type I, each detector loop shall have its own 1-inch (25 mm) unit duct between the edge of pavement and the first handhole. Each unit duct run shall be shown on the plans by the designer, but shall not be paid for separately. This item is incidental to the pay item for detector loops.

Preformed detector loops do not require a unit duct run between the edge of pavement and the adjacent handhole.

Detector Loop Type I should be utilized when the detector loop is to be placed (saw cut) in an existing pavement or new bituminous binder course.

Preformed detector loops should be utilized in projects involving new pavement consisting of Portland concrete cement. The preformed loops shall be placed in the substrate.

One dimension of all detector loops shall be 6 feet (1.8 m). The width of an individual detector loop shall not exceed 25 feet (7.6 m). At intersections with wide corner radii, this may necessitate adding a second, smaller detector loop to provide full coverage for the turning lane.

Loop detector quantities are not measured based on the actual length of the wire. Instead, Type I loop detector quantities are measured along the sawed slot in the pavement containing the loop and lead-in. Preformed detector loops are measured along the detector loop and lead-in embedded in the pavement.

Each lane of presence detection and each lane of a protected only left turn lane require a separate inductive loop detector and lead in cable. When non-locking, presence detection is used, two loops per lane are required behind the stop bar.

When system loops are required on an approach of an intersection, the loops used for volume density and intersection timing shall also be used as system detectors. Each one of these type of loops requires a separate "Electric Cable in Conduit, Lead-in, No. 14 1 Pair" and a separate inductive loop detector when new controllers are utilized. The designer shall label these types of loops as "INTERSECTION AND SAMPLING (SYSTEM) DETECTORS" on the signal layout, the cable plan, the interconnect plan, and the system schematic plan. In addition, **ALL** preformed loops shall be labeled on the signal layout and cable plan to distinguish them from Type I detector loops.

Typically system loops are installed on the main street at either end of a signal system and at critical intersections (i.e. two arterials) within a system. The placement and number of sampling detectors shall be reviewed by the designer with the District so that the system loops provide adequate coverage to allow for effective traffic responsive signal system operation. In addition, the number of system loops shall not exceed the capacity that the controller equipment is capable of accommodating.

2.5.3 Placement of Detectors

The figures in Appendix D represent the most common detector loop locations and sizes. Adjustments will be necessary for specific geometric considerations.

Locations and dimensions of all detector loops are required on all signal layout plan sheets.

"Far out" detection refers to locking, presence type detection located in through lanes, right turn lanes, and right turn lane taper areas (if applicable), usually 250' (75 m) in advance of stop bars. "Uptight" detection refers to non-locking presence type detection located in all lanes and 10-15 feet (3.0 m – 4.57 m) behind the crossing street's edge of pavement extended.

2.5.3.1 Emergency Vehicle Transmitter/Receiver Preemption Detectors or Devices

The critical design element for the placement of emergency vehicle light detectors is providing adequate line-of-sight between the emergency vehicle approaching the intersection and the detector. This is necessary to provide adequate time for the controller to cycle through the necessary clearance intervals (vehicular and pedestrian) so the requested emergency vehicle preemption interval is displayed as the vehicle arrives at the intersection.

Under most conditions, a bi-directional light detector assembly will be adequate. Where mast arms are present, the detector shall be placed on the mast arm 2 feet to the right of the far left mast arm mounted signal. On intersection approaches which do not have mast arms, the designer should field check the line-of-sight to determine the best location. Emergency vehicle light detectors must be mounted on 18-foot posts where mast arm mounting is not possible. At larger intersections with dual left turn lanes, wide medians and/or three through lanes, the detectors should be split. In such cases, a separate single-channel light detector will be required on the mast arm for each approach.

Confirmation beacons must be provided for each direction of emergency vehicle detection. The designer shall ensure that appropriate pay items are included in the plans (i.e., "LIGHT DETECTOR". "LIGHT DETECTOR AMPLIFIER"). The pay item "LIGHT DETECTOR AMPLIFIER" shall be paid for on a basis of one (1) each per intersection controller and shall provide operation for all movements required in the preemption phase sequence.

2.6 Control Equipment

Actuated solid state digital controllers meeting the latest NEMA standards housed in a Type IV cabinet shall be specified. The pay item "FULL-ACTUATED CONTROLLER AND TYPE IV CABINET" shall be specified for all intersections, except as noted below.

The pay item "FULL-ACTUATED CONTROLLER AND TYPE V CABINET" shall be specified for all intersections that include a local controller and master controller.

The pay item "RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE V CABINET" shall be specified for all intersections that are interconnected with a railroad grade crossing.

The designer will be responsible for ensuring controller and master controller compatibility with existing equipment in the vicinity of the proposed design. When the proposed controller or master controller is to be installed within an existing signal system, the pay item should include the "SPECIAL" designation and a note should be added to the plans indicating the compatible controller brand that is to be installed.

In addition, the designer will be responsible for keeping abreast of the District's approved signal system manufacturers and their limitations (i.e., maximum number of system loops per master, maximum number of system loops per local, maximum number of controllers per master, maximum number of system loops per local, maximum number of controllers pre master, special telemetry requirements for large systems, etc.)

2.7 Signal Hardware

2.7.1 Signal Posts

Traffic signal posts shall be galvanized steel in composition.

All traffic signal posts should be placed a minimum of 4 feet (1.2 m) behind the back of a barrier curb. If barrier curb does not exist, the post should be placed a minimum of 10 feet (3.0 m) behind the edge of pavement or 2 feet (0.6 m) behind the edge of shoulder, whichever is greater.

The minimum mounting height for signal heads not mounted over a roadway, from the pavement to the bottom section of traffic signal heads, is 10 feet (3.0 m), unless otherwise approved by the Traffic Design Engineer.

The following post lengths should be used with bracket mounted traffic signal heads and other post mounted equipment.

Signal Equipment	Post Length
3-section head	14 foot (3.00 m) post
4-section head	15 foot (4.25 m) post
5-section head	16 foot (4.85 m) post
Internally illuminated sign (fiber-optic, LED, or other)	18 foot (5.45 m) post
Emergency vehicle preemption light detectors	18 foot (5.45 m) post
Optically programmed signal heads	Add 2 feet (0.60 m) to the above post lengths [18 ft (5.45 m) maximum]
Pedestrian signal head posts	10 foot (3.00 m) post

2.7.2 Mast Arm Assembly and Poles

Mast arm assemblies and poles shall be made of galvanized steel. Other mast arm assemblies and poles may be used with prior written approval form the District.

All mast arm poles shall be located at a minimum of six feet (1.80 m) behind the back of barrier curb. If a barrier curb does not exist, the mast arm poles shall be located at a minimum of ten feet (3.00 m) behind the edge of pavement or two feet (0.60 m) behind the edge of shoulder, whichever distance is greater.

The mast arm lengths shall be in two foot (0.60 m), even increments between 16 and 74 feet (4.87 to 22.56 m) [i.e., 16 ft. (4.87 m), ...72 ft. (21.95 m), 74 ft. (22.56 m)]. Mast arms are also allowed in 55 foot (16.76 m) and 75 foot (22.86 m) lengths

The designer should be familiar with the IDOT Standards for Steel Mast Arm Assembly and Pole, and Steel Combination Mast Arm Assembly and Pole. The preferred design provides mast arm locations that utilize a 16 to 55 foot (4.87 to 16.80 m) mast arm. Mast arm lengths up to 75 feet (22.9 m) are allowed, if necessary.

The outer traffic signal head on a steel mast arm assembly is to be placed two feet (0.60 m) in from end of the mast arm.

2.8 Underground Facilities

2.8.1 Concrete Handholes

All handholes shall be cast in place utilizing IDOT Standards 814001 and 814006.

A double handhole shall be specified when eighteen or more cables enter a handhole and next to each controller cabinet.

A handhole is required when there is a change in direction of any conduit run that is 90° or less. Conduit runs with a change in direction of 90° or less, but that occur over a long distance (i.e., large radii) may not require a handhole.

Heavy-duty handholes shall be specified at all locations where vehicles could drive over them, such as adjacent to shoulders.

Heavy-duty handholes shall be specified in the pavement only when it becomes necessary to service inside lane loops. Up to three lanes of detection can be serviced from a handhole outside the pavement area. The heavy duty handholes are to be centered in the left-turn lane.

Heavy-duty double handholes are not allowed. If eighteen or more cables need to cross a leg of an intersection where a heavy-duty handhole is servicing the left turn lane loops, two separate runs of 4" (100 mm) diameter conduit each will be required. One conduit run will service only the left turn lane loops and other conduit run will service the eighteen or more cables.

Interconnect handholes should be located as close to the right-of-way line as possible. Cross sections must be analyzed to ensure proper placement of interconnect handholes (i.e., outside drainage ditches and where a Contractor can build handholes). Interconnect handhole placement at or near the right-of-way line is extremely important when designing signal systems located on S.R.A. routes.

The maximum spacing for interconnect handholes is 300 feet (90 m) for copper conductor cable and 600 feet (180 m) for fiber optic cable.

2.8.2 Conduit

All conduit shall be ridged galvanized steel with the exception of the low voltage detector raceway for loop detector cable located between the pavement and adjacent handholes, which should utilize plastic unit duct.

All conduit shall be pushed under driveways and pavement (even if driveways are to be replaced or the pavement is to be reconstructed).

All conduit must be placed a minimum of 30 inches (750 mm) below the finished grade.

Telephone service conduits shall enter the controller foundation directly for new and modified foundations. The telephone service conduit may enter the double handhole adjacent to the controller foundation only if this foundation is being re-used. If the telephone service will be routed through the double handhole adjacent to the controller foundation it shall be installed in a 1 inch (25mm) unit duct through double handhole to reduce electrical interference from the electrical cables in the handhole.

The electric service conduit shall enter the controller cabinet foundation for all permanent traffic signal installations.

All main conduit runs and road crossings shall consist of 4" (100 mm) size conduit. At large intersections that have a substantial number of signal cables, a single 4" (100 mm) conduit may not be adequate to accommodate the number of cables. In these instances the designer shall use two 4" (100 mm) conduits for the main conduit crossings.

Four conduits shall be installed connecting the controller cabinet to the double handhole. Each of the conduits shall be 4" (100 mm) diameter.

2.8.3 Conduit Size Estimation Procedure

The designer must calculate the size of conduit required for each raceway segment at the intersection. The following procedure is to be used to determine the required diameter based on the number of cables in each segment. When the calculated size falls below the minimum size shown in step 5 for a particular application, the minimum size shall be used.

CONDUIT SIZE ESTIMATION PROCEDURE

1. Find cable factor for each cable in conduit for which size is to be determined:

CABLE	FACTOR
#12 or 14, 2/C	1.00
#12 or 14, 3/C	1.08
#12 or 14, 5/C	1.64
#12 or 14, 7/C	1.80
#12 or 14, 9/C	2.37
#12 or 14, 11/C	2.63
#12 or 14, 13/C	3.17
#2, 2/C	4.00
#4, 2/C	3.00
#6, 2/C	2.00
Fiber Optic Cable	1.80
3 Pair No. 18	1.64
6 Pair No. 18	2.37
#20, 3/C Emergency Vehicle Light Detector	0.50
#14, 1/C	0.60
#10, 1/C Tracer Cable	0.50
#6, 1/C System Ground	1.00

2. Add together the factors for all cable in the conduit.
3. Add 1.00 to the sum of the factors from Step 2.
4. Using the sum found in Step 3, find the conduit size.

SUM (Step 3)			
New Signal or Modify	Add Pedestrian or Pre-emption	CONDUIT SIZE	
40% Full	50% Full	English	Metric
1.0 to 3.0	<3.750	1 ¼ inches	30 mm
3.1 to 4.1	<5.125	1 ½ inches	40 mm
4.2 to 6.8	<8.500	2 inches	50 mm
6.9 to 9.7	<12.125	2 ½ inches	65 mm
9.8 to 15.0	<18.750	3 inches	75 mm
15.1 to 20.1	<25.125	3 ½ inches	90 mm
20.2 to 25.9	<32.375	4 inches	100 mm
26.0 to 40.7	<50.875	5 inches	125 mm

5. Check conduit size found in Step 4 with the minimum sizes to be used for particular conditions and change to minimum size if size found in Step 4 is smaller.

	MINIMUM CONDUIT SIZE	
CONDUIT SEGMENT	English	Metric
Signal Post Foundation	2 ½ inches	65 mm
Mast Arm Foundation	3 inches	75 mm
Service	2 inches	50 mm
Double Handhole to controller	4 inches (4 @ 5 ft.)	100 mm (4 @ 1.5m)
Controller to railroad cabinet	2 inches	50 mm
To perimeter handholes	2 inches	50 mm
Pedestrian Signal Post	2 inches	50 mm
Interconnect system	2 inches	50 mm
Push under driveway	2 inches	50 mm
Push under roadway	2 inches	50 mm
Detector raceway (unit duct)	1 inch	25 mm
Telephone service installation	2 inches	50 mm
Main conduit crossings	4 inches	100 mm

2.8.4 Service Cable – Voltage Drop Calculation

The designer must calculate the size of cable for connection from the controller cabinet to the service location. Most intersections require a 2/C, No. 6 cable but larger intersections with service located further from the intersection may require a larger cable. Following is the procedure for calculating voltage drop to determine wire size for service:

- Commonwealth Edison voltage is normally 120 volts but they are allowed to drop 10% to 108 volts.
- The lowest voltage that a NEMA controller can operate at is 95 volts.
- If a 5% voltage drop (from 108 volts) is allowed, there will still be 102.7 volts which allows a 7.7-volt safety margin.

In order to determine the voltage drop, the following must be determined:

VOLTAGE DROP CALCULATIONS

1. Total wattage (load) of the signal installation.

   To determine the signal load, count the maximum number of signal lenses (including pedestrian) to be displayed at the same time. This can be determined by checking the sequence and counting the lenses.

2. After determining the maximum number of lenses to be disciplined, proceed as follows:

   Controller is 100 watts (nominal)
   Each 12" LED lens is:
   Red is 17 watts (nominal)
   Yellow is 25 watts (nominal)
   Green is 15 watts (nominal)
   Arrows are 12 watts (nominal)
   Pedestrian is 25 watts (nominal)
   Illuminated LED Blankout Sign is 25 watts (nominal)
   Video detection system is 150 watts (nominal)

3. Multiply the number of each type of signal lens by its respective wattage, then add the controller wattage to determine the maximum load.

$$\frac{\text{Total Wattage}}{102.7\ (103\pm)\ \text{volts}} = \text{Total Amps Required}$$

Utilizing the following chart, allowing 5% voltage drop, determine the size of wire required for the maximum one way distance from the controller to the service drop location.

AMPERES	NO. 6	NO. 4	NO. 2
30	225 ft. (68 m)	375 ft. (114 m)	588 ft. (179 m)
35	200 ft. (60 m)	318 ft. (97 m)	500 ft. (152 m)
40	175 ft. (53 m)	275 ft. (84 m)	438 ft. (134 m)
45	150 ft. (46 m)	250 ft. (76 m)	388 ft. (118 m)
50	138 ft. (42 m)	225 ft. (68 m)	350 ft. (107 m)

2.8.5 Cable Slack

The cable slack and vertical length requirements to be used in calculating cable length quantities are provided on the IDOT District 1 detail sheet.

2.8.6 Foundations

The concrete foundation depths shall be based on the IDOT District 1 detail sheet.

2.9 Temporary Traffic Signals

The installation of temporary traffic signals at locations with existing traffic signals is required in most cases where the existing signal equipment is being disrupted by construction or where the staging of traffic reduces visibility of the existing signals. These are not the only two cases where temporary signals may be required. When existing traffic signal equipment is being disrupted and the designer feels that modifications to these signals can be accomplished without the use of temporary signals, the designer must first obtain approval from the Traffic Design Engineer on a case-by-case basis to proceed with a design that does not utilize temporary traffic signals.

The placement of temporary poles shall take into consideration existing and proposed geometrics, R.O.W. limits, construction staging, ground contours, drainage, etc. A minimum of three LED signal heads with 12- inch (300 mm) lenses shall face traffic on each approach. One of these heads shall be a near right signal head (required for all designs) for each approach. For particularly large intersections, where additional signal heads may be needed, the designer should contact the Traffic Design Engineer early in the design process to coordinate head placement and signal layout. When protected only left-turn phasing is required, a minimum of five signal heads with 12-inch (300 mm) lenses is required for that approach (two signal heads for the left turn movement displaying red, yellow, and green left-turn arrows plus a R10-5 “LEFT ON GREEN ARROW ONLY” sign placed between these heads).

The designer must utilize the District 1 Specifications and Notes for Temporary Traffic Signals. The Specifications and Notes require the use of controllers that are fully actuated, NEMA microprocessor based and include internal time base coordination capabilities plus an eight phase back panel. When temporary signals are being installed where there is an existing signal system (closed-loop, time base, yellow offset, etc.), the designer shall ensure that this system is maintained. Closed-loops systems require the use of the same manufacturer, model number, and

software revision for the temporary controller as what is present in the existing control cabinet. In addition, a transceiver must be specified and the existing interconnect cable must be utilized to maintain the integrity of the closed-loop system. If the existing cable cannot be reused, the designer shall provide for temporary interconnect hardware in the plans. The designer shall use Notes and applicable Specifications when designing temporary signals within closed-loop system. If the master controller is located at the intersection, a temporary master controller and phone drop to the master shall be provided. Time base systems only require the use of the same manufacturer for the temporary controller as what is present in the existing control cabinet. Yellow offset systems only require that the existing interconnect cable and coordinating unit be maintained with the temporary signals.

The designer shall develop a Sequence of Operation for the temporary signals as described in Section 2.3 of this guideline. When emergency vehicle or railroad preemption is active in the exiting signals, this preemption must be incorporated into the temporary design. Any existing emergency vehicle preemption equipment (light detectors, light detector amplifiers, etc.) may not be relocated to the temporary traffic signals. The equipment may be stored and installed on the new signal installation. However, the designer should contact the Municipality or Fire Protection District to determine if they would like the equipment to be upgraded.

Construction staging and associated traffic staging may require two or more temporary traffic signal designs. An example would be when, during one stage of construction, protected/permitted left turn phasing is required but another stage of construction requires the use of protected only left turn phasing. In this case, two separate temporary signal designs (on two separate sheets) would be required since different phasing, signal displays, and number of signal heads are required for each stage of construction. It is imperative that the designer obtain final, approved construction and traffic staging plans before the temporary traffic signal design is started. Only those signal heads that are required for the initial stage of construction shall be installed. Any signal heads that are required for subsequent stages of construction shall not be installed until required by a particular stage(s). This also applies to signs (i.e. “Left on Green Arrow Only”) that may be required for a particular stage(s).

On projects that involve significant roadway improvements that may require substantial offset of the left turn movements under certain stages of construction the designer shall review the turning radii of opposing left turn movements to determine if the turning movements will be in conflict. In cases where the turning paths of opposing left turn movements will be in conflict, protected-only lead/lag left turn phasing should be utilized for that particular stage(s) of construction.

If temporary pedestrian signals are installed, a push button shall be required for pedestrian actuation. Countdown pedestrian signals shall be indicated except when a temporary signal is installed at an intersection interconnected with a railroad grade crossing.

Temporary vehicle detection shall be evaluated by the designer to minimize impacts to the major route. Temporary vehicle detection should be included for all approaches of the intersection unless geometric conditions do not allow for placement of effective temporary vehicle detection. Types of temporary detection that should be considered include microwave detection, video detection, wireless detectors, and standard inductive loops.

When temporary traffic signals are being installed where permanent signals will not be erected for a period of time in non-construction zones, vehicle loop detectors should be incorporated in the design. Normally, uptight detection is used on the side streets and detection on the mainline is 250 feet (75 m) from the mainline stop bars. Left turn lanes should also be actuated with a normal left turn lane loop lay out. All detector loops should be saw cut to the closest edge of pavement with unit duct running between this point and ten feet (3.0 m) up the closest wood pole (with splices made on the wood pole). Handholes are normally not included in this type of design. The designer shall use appropriate notes on the plans to specify the above requirements. Designs of temporary signals in use in non-construction zones must first be approved by the Traffic Design Engineer on a case-by-case basis before the designer begins.

When Temporary Bridge Traffic Signals of any type are to be installed, roadway lighting will be included in the project. The designer should contact the Electrical Design Section prior to beginning the design to determine the extent of the lighting required. When possible, the Temporary Bridge Traffic Signal installation and the roadway lighting should be designed to utilize the same electrical service and the same wood poles to minimize construction cost.

When temporary traffic signals are specified for a project, the designer should include the pay item "TEMPORARY TRAFFIC SIGNAL TIMING" for each intersection to provide for modified signal timings during construction. The item is paid for on a per intersection basis, so every intersection with a temporary traffic signal installation should include a quantity of 1 EACH.

2.10 Uninterruptible Power Supply (UPS) Systems

All new permanent traffic signal installations shall include Uninterruptible Power Supply (UPS) systems. UPS may also be required on traffic signal upgrades and modifications, as well as "permanent temporary" traffic signals.

The following traffic signal installations will also require UPS Systems:

- All bridge temporary traffic signal installations.
- All temporary traffic signal installations at railroad intersections
- All temporary traffic signal installations at intersections involving fire station actuated emergency vehicle preemption
- All traffic signal modernizations or modifications at railroad intersections
- All traffic signal modernizations or modifications at intersections involving fire station actuated emergency vehicle preemption

- All temporary signal installations where UPS is installed at the existing traffic signal
- All traffic signal modernizations or modifications where UPS is installed at the existing traffic signal.

Contact the Traffic Design Engineer for requirements at other traffic signal installations being modernized or modified before beginning the design.

2.11 Traffic Signal Timing & Optimization

When a traffic signal improvement project impacts a signal that is or will be part of a coordinated signal system, one of the District One optimization or re-optimization items should be included in the pay items. The designer should give careful consideration to the type of optimization that is necessary for the scope of the traffic signal project. It is also important that the quantities be applied correctly to the project based on the number of intersections being impacted and the specific item selected by the designer. The designer should coordinate with the Traffic Design Engineer to determine the scope of timing changes, and which pay item, will be required by the District.

2.11.1 Re-Optimize Traffic Signal System – Level 1

Re-optimize Traffic Signal System – Level 1 applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system. This type of work would be commonly associated with the addition of signal phases or pedestrian phases or improvements that do not affect the capacity at an intersection. The purpose of this item is to integrate the subject intersection into the signal system with minimal impacts to the existing system operation.

With the Level 1 reoptimization, the SCAT consultant will provide the District with revised signal timings implemented at the subject intersection, a cover letter, and an updated intersection graphic display for the subject intersection.

Plan quantities for Level 1 reoptimization are on the basis of EACH intersection, meaning that if multiple intersections are being modified, a quantity of one (1) should be provided for each intersection being modified. Reoptimize Level 1 shall NOT be used for new intersections or for intersections where lanes are being added.

2.11.2 Re-Optimize Traffic Signal System – Level 2

Re-optimize Traffic Signal System – Level 2 applies when improvements are made to an existing signalized intersection in an existing closed loop traffic signal system or when a new signalized or existing signalized intersection is being added to an existing system, but when full optimization of the entire system is not required. The purpose of this work is to optimize the subject

intersection, while integrating it into the existing signal system with limited impact to the system operations. This item also includes an evaluation of the overall system operation, including the traffic responsive program.

With the Level 2 reoptimization, the SCAT consultant will provide the District with new or revised signal timings implemented at the subject intersection, peak hour traffic counts conducted after the signal improvements have been accepted by the District, system re-addressing and system detector assignments (as necessary), and evaluation of the traffic responsive program operation. A detailed summary of this information will be provided in a technical memorandum and CD, including the project datafiles and an updated intersection graphic display for the subject intersection.

Plan quantities for Level 2 reoptimization are on the basis of EACH intersection, meaning that if multiple intersections are being added or modified, a quantity of one (1) should be provided for each intersection being modified.

2.11.3 Optimize Traffic Signal System

Optimize Traffic Signal System applies when a new or existing closed loop traffic signal system is to be optimized and a formal Signal Coordination and Timing (SCAT) Report is to be prepared. The purpose of this work is to improve system performance by optimizing traffic signal timings, developing a time of day program and a traffic responsive program.

With the Optimize Traffic Signal System item, the SCAT consultant will prepare a formal SCAT report, which will include the following items for each intersection in the coordinated signal system:

- New/revised signal timings and offsets
- Development of Traffic Responsive Program
- Peak hour traffic counts
- Printed SCAT Report in District One format
- Intersection re-addressing
- Before and after speed and delay studies
- On-site implementation of timings
- System detector assignments
- CD's containing project datafiles
- Updated intersection and system graphic display files

The plan quantity for Optimize Traffic Signal System is on the basis of EACH system. In most projects requiring optimization, the designer should include a quantity of one (1) each, since generally only one signal system is affected. However, the designer should coordinate with the Traffic Design Engineer to determine the appropriate quantity that should be included.

2.11.4 Temporary Traffic Signal Timing

The Temporary Traffic Signal Timing item should be included on any project that includes a temporary traffic signal installation, which provides for the signal timings to be evaluated and adjusted during the construction activities. This is particularly important for projects involving stage changes or unique construction activities.

When a project includes a detour route, the designer should consider including the Temporary Traffic Signal Timing item to allow signal timing adjustments at signals along the detour route. It is recommended that the designer contact the Traffic Design Engineer to determine whether the item should be included and in what quantity it should be included in the contract.

Plan quantities for Temporary Traffic Signal Timing are on the basis of EACH intersection, meaning that if multiple intersections include temporary traffic signal installations, or if the item is being used for a detour route, a quantity of one (1) should be provided for each intersection being impacted.

2.12 Emergency Vehicle Preemption

The District will not participate in the cost of emergency vehicle preemption (EVP) equipment or its installation. Whenever new EVP equipment is called for in the plans, the designer shall provide documentation of a request from the Municipality or Fire Protection District involved.

When a traffic signal modification project includes existing EVP, the designer should contact the Municipality or Fire Protection District to determine if they prefer to have the equipment relocated or upgraded to a new model. All the construction costs associated with EVP is the responsibility of the local municipality.

2.13 Automatic Enforcement Cameras

Several vendors have installed automatic enforcement cameras in municipalities within the District to enforce red light running and railroad grade crossing violations. The District allows the equipment to be installed at the intersections, with approval, but does not participate in the cost of installing or maintaining the systems. When automatic enforcement camera systems are encountered on a traffic signal modification project, the designer shall NOT include any pay items or provisions for maintaining or modifying the enforcement equipment.

The designer must contact the enforcement camera vendor and the local municipality to advise them of the proposed improvements. The vendor and/or municipality will be responsible to restore enforcement system operations after the improvement project is complete. A note shall be added to the plan listing the

municipality and the enforcement camera vendor, along with a contact name and phone number for BOTH.

District One design requirements and guides are not included in this document. More information regarding these systems is available from the Traffic Design Engineer.

2.14 Street Name Sign Design

2.14.1 Aluminum Mast Arm Mounted Sign Design

Signs for street names should be provided on all mast arm poles. All street name sign designs shall be shown on the District 1 Mast Arm Mounted Street Name Sign Standard Base Sheet. An example is included on page A-11 in Appendix A.

- 8-inch (200 mm) upper case and 6-inch (150 mm) lower case letters shall be used as described in the District 1 Mast Arm Mounted Street Name Standard Base Sheet.
- Only the first letter of each word shall be upper case, unless the abbreviations for United States (US) and/or Illinois (ILL) are used, in which case all letters are upper case (Examples: US Rte 45 or ILL Rte 72).
- The spacing between the words should be 6 inches (150 mm), if possible, but may be reduced to 5 inches (125 mm) when the spacing is critical.
- A minimum of 2 ½ inches (65 mm) shall be included between the word and the right and left edges of the sign.
- Sign lengths are in 6-inch (150 mm) increments.
- The preferred method for the sign design is to use a Series “D” letter on a one-line sign 18 inches (450 mm) in height and a maximum of 8 feet-0 inches (2400 mm) in width.
- If Series “D” lettering does not fit on a 8-foot (2400 mm) sign, then Series “C” should be tried.
- If Series “C” does not fit on a 8-foot (2400 mm) sign, a 30-inch (750 mm) high two-line sign can be used. The crossroad designation as to Street, Avenue, etc. should be spelled out on the second line, if there is space available.
- Clearview font of comparable dimensions may be used in place of the FHWA Standard Alphabet.
- If a street has different names on each side of the intersection, two street name signs for each street name shall be provided in the quantities.
- Each pair of signs, with the same name, shall be mounted back to back on the mast arm on the same side as the respective street names.
- Mast Arm mounted street name signs shall not be installed at private benefit driveways. Only dedicated streets will have signs.

The following abbreviations for street names should be used.

Name – Abbreviation	Dimension "D" Series	Dimension "C" Series
Avenue – Av	12-4/8 (318 mm)	10-0/8 (254 mm)
Boulevard – Blvd	19-3/8 (492 mm)	18-0/8 (457 mm)
Court – Ct	10-1/8 (257 mm)	8-4/8 (216 mm)
Circle – Cir	14-3/8 (365 mm)	12-4/8 (317 mm)
Drive – Dr	10-6/8 (273 mm)	9-1/8 (232 mm)
Highway – Hwy	20-5/8 (524 mm)	17-1/8 (435 mm)
Lane – Ln	11-0/8 (279 mm)	9-3/8 (238 mm)
Parkway – Pkwy	26-7/8 (683 mm)	21-0/8 (533 mm)
Place – Pl	8-1/8 (206 mm)	7-0/8 (178 mm)
Road – Rd	11-2/8 (286 mm)	9-4/8 (241 mm)
Street – St	10-1/8 (257 mm)	8-4/8 (216 mm)
Terrace – Ter	15-4/8 (394 mm)	13-2/8 (336 mm)
Trail – Tr	10-0/8 (254 mm)	8-4/8 (216 mm)
United States – US	12-2/8 (311 mm)	10-1/8 (257 mm)
Illinois – ILL	14-2/8 (362 mm)	12-1/8 (308 mm)

Standard 720001 and the District One Mast Arm Mounted Street Name Sign Detail TS-02 shall be included in plan sets when mast arm mounted street names signs are required.

2.14.2 LED Internally Illuminated Street Name Sign

The District allows LED Internally Illuminated Street Name Signs to be used when requested by a municipality. However, the District will not participate in the cost of internally illuminated street name signs or the installation. The designer shall provide the District with copies of the written request for the signs from the municipality.

Internally illuminated street name signs shall be designed and installed in accordance with the District One standard detail. The standard detail must be included in the plans, including a clear depiction of the street name and any special wording and municipal symbology. The wording and symbology shown on the signs must be approved by the District.

The sign can be mounted on most steel mast arm poles. The designer should be aware that mounting on aluminum mast arm pole requires further structural review. Some older or special designed steel mast arm poles may also require structural evaluation. In these cases, the designer should coordinate with the municipality and the District to determine what measures will be required to install the signs.

The sign shall be located on a steel traffic signal mast arm no further than 8 feet (2.4 m) from the center of the pole to the center of the sign at a height of between 16 feet (4.9 m) to 18 feet (5.5 m) above traveled pavement.

The internally illuminated street name signs are generally available in 4 foot (1.2 m), 6 foot (1.8 m), and 8 foot (2.4 m) increments. The preferred method for the sign design is to use a Series "D" letter on a one-line sign. If Series "D" lettering does not fit on a standard width sign, then Series "C" should be used. Clearview font of comparable dimensions may be used in place of the FHWA Standard Alphabet. A second line for the street name cannot be used with internally illuminated street name signs. The same abbreviations should be used as those for the aluminum street name signs.

Signs are double sided and shall have the same message and symbols on both sides of the sign.

2.15 Geometrics

Intersection geometrics shall meet, as a minimum, all requirements outlined in the latest edition of the "Location and Environment Manual of Policies and Procedures. If an intersection design study (IDS) was prepared, the traffic signal designer must include a copy of it with the first review submittal, along with verification that the IDS was approved by the Department. If the IDS geometry is not conducive to proper traffic signal layout and operation, as covered in these guidelines, the Traffic Signal Designer should notify the IDOT Traffic Design Engineer of conflicts and discrepancies. The decision as to whether an IDS requires revisions lies solely with the Traffic Design Engineer.

The use of barrier islands shall be avoided wherever possible. If islands are used for the installation of above ground traffic signal equipment the islands shall have a minimum dimension of 30 foot (9.10 m) on two of the three sides (i.e. a minimum of 450 square feet (18.6 sq. m) of surface area). These islands should include 6-inch (150 mm) barrier curb.

Intersections where traffic signal modifications or modernizations are proposed with no roadway work included should be studied for possible removal of small sections of barrier medians and islands. If they exist, small lengths of barrier medians should be removed and replaced with pavement marking or a mountable median that is compatible with the remainder of the channelization. Small islands should be removed when not useful for signal standard placement. The designer shall identify the hazards of each barrier island or median and weigh them against the benefits as a channelization device to determine removal needs.

The geometry and pavement markings shall be reviewed by the designer with respect to future pedestrian crossings such that they would not require removal of the stop bar(s) or medians if installed in the future.

2.16 Pavement Marking and Sidewalks

All designers shall adhere to the District 1 Pavement Marking Details included in Appendix F. Thermoplastic pavement marking meeting State specifications shall be specified for all bituminous pavement. Polyurea pavement marking meeting state specifications shall be specified for all concrete pavement. Pavement marking shall be included for a minimum of 100 feet (30.0 m) beyond the detection loops from the intersection.

All sidewalks removed for construction purposes shall be replaced. Additions of small lengths of sidewalk to enhance the existing system will be expected. Sidewalks should match the dimensions of the existing system. Curb ramps should be designed in accordance with current IDOT standards and Standard 424001 should be included in contracts that have sidewalk quantities.

2.17 Roadway Lighting

Warrants for roadway lighting installations shall be reviewed and approved by the District 1 Bureau of Traffic Operations, Electrical Design Section. The designer shall contact the Bureau at (847) 705-4371.

If roadway lighting will be installed in conjunction with a traffic signal installation(s), te designer should contact the Electrical Design Section prior to beginning design to discuss the use of combination mast arms or other lighting treatments.

A 3½-inch (90 mm) PVC Raceway shall be provided in each foundation for lighting unit duct.

2.18 Traffic Control & Protection Guidelines

Contract pay items for Traffic Control and Protection shall be included in every design contract. The designer shall be responsible for reviewing the traffic control and protection standards developed by IDOT for typical applications. Only those standards that are applicable to a particular project should be utilized. On roadway design projects the traffic signal designer shall coordinate with the roadway designer with respect to the traffic control and protection pay items and standards that are specified for the project. The District may also provide guidance to the designer on an as needed basis.

2.19 System Grounding of Traffic Signal Equipment

All traffic signal systems shall be grounded. A continuous equipment grounding conductor (NO. 6 1C) shall be included in all new or modernized traffic signal installations. The grounding conductor shall be installed in all metallic or non-metallic conduits that contain traffic signal circuit runs, except conduits that contain

only detector loop lead-in circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment grounding conductor.

The equipment grounding conductor and associated ground rods shall be illustrated in the cable plan. (See Appendix A for Sample Cable Plan). Ground rods are required for all post and service (Concrete Foundation Type A), controller (Concrete Foundation Type C or D) and mast arm (Concrete Foundation Type E, any size) foundations. In a typical signal installation there will be two ground rods per quadrant in addition to the ground rod in the controller foundation. The ground rods are included in the cost of the foundation. The equipment grounding conductor is paid for separately as Electric Cable in Conduit, Grounding NO. 6 1C.

2.20 Traffic Signal Systems

All new or modernized closed loop traffic signal systems shall utilize 24 fiber optic cable, 12 fibers shall be multimode and 12 fibers single mode. The District typically uses only the multimode fibers for system communication. The single mode fibers are for future use. The single mode fibers may be used in unique situations involving long transmission lengths or transmission of video detection/monitoring data.

A separate “Transceiver – Fiber Optic” is required for each new controller that is being installed in a system that utilizes fiber optic cable. For existing systems that are being expanded or modernized the designer shall also consult with the equipment manufacturer to determine if the existing master controller is capable of accommodating the additional intersection(s). Depending on the size and configuration of the existing signal system it may be necessary to provide an additional telemetry channel(s) in the master controller.

A separate No. 14 1C tracer cable shall be installed in conjunction with the fiber optic interconnect cable to enable the fiber optic cable to be located in the field.

For existing systems which utilize twisted pair cable that require modification, either 3 pair or 6 pair NO. 18, communication cable shall be utilized for the interconnect. This type of interconnect is often referred to as a “copper” interconnect. A separate “Transceiver” is required for each new controller that is being installed in a system that utilizes twisted pair cable.

In certain situations the use of a hardwire interconnect may be appropriate to provide some level of coordinated signal system operation. This type of interconnect is most appropriate when interconnecting a minor cross street intersection to a major isolated intersection. Hardwire interconnect typically consists of a 5 or 7 conductor cable. A coordinating unit is typically required with this type of interconnect which provides for variable offset timings to be implemented.

The District advocates the use of fiber optic cable for signal system communication. The physical properties of fiber optic interconnect systems provide superior protection against electrical interference associated with lightning strikes and ground

faults. This significantly reduces maintenance costs when compared to twisted pair or hardwire interconnect systems. This applies to both permanent and temporary signal system interconnects

2.21 Project Coordination with Outside Agencies

2.21.1 Equipment Owned by Other Agencies

The designer shall coordinate with municipalities, county, PACE, or other agencies as necessary to determine what equipment is owned by each agency and how it should be stored, returned, or salvaged. The designer is responsible for indicating these requirements through the use of Removal Notes or Construction Notes on the plan sheets.

2.21.2 System Communications Requirements

When a traffic signal or peripheral equipment is, or will be, connected to a county or municipal area-wide signal system, the designer is responsible for making initial contact and coordinating with the responsible agency. Plan submittals will need to be made to both IDOT and the agency. The designer shall coordinate design and equipment requirements, as well as operational needs for the communication system. It may also be necessary to incorporate specific design considerations to maintain system operations during construction. Contact information for agencies with area-wide signal systems can be obtained from the Traffic Design Engineer.

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APPENDIX A-1

Sample Plan Set 1
IL Route 83 (147th St.) from Homan Ave. to East of I-57 Ramps

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
FED. ROAD DIST. NO.	ILLINOIS	CONTRACT NO. 60F06		

FOR INDEX OF SHEETS, SEE SHEET NO. 2

IDOT STANDARDS

STD. No.	DESCRIPTION
000001-05	STANDARD SYMBOLS, ABBREVIATION AND PATTERNS
001006	DECIMAL OF AN INCH AND A FOOT
424001-05	CURB RAMPS FOR SIDEWALKS
606001-04	CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER
606301-04	P.C. CONCRETE ISLANDS AND MEDIANS
606306-03	CORRUGATED P.C. CONCRETE MEDIAN
701006-03	OFF-RD OPERATIONS, 2L, 2W, 4.5 m (15') TO 600 mm (24") FROM PAVEMENT EDGE
701011-02	OFF-RD MOVING OPERATIONS, 2L, 2W, DAY ONLY
701101-02	OFF-RD OPERATIONS, MULTILANE, 4.5 m (15') TO 600 mm (24") FROM PAVEMENT EDGE
701301-03	LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS
701501-05	URBAN LANE CLOSURE, 2L, 2W, UNDIVIDED
701601-06	URBAN LANE CLOSURE, MULTILANE 1W OR 2W NON-TRAVERSABLE MEDIAN
701606-06	URBAN LANE CLOSURE, MULTILANE 1W OR 2W MOUNTABLE MEDIAN
701701-06	URBAN LANE CLOSURE, MULTILANE INTERSECTION
701801-04	LANE CLOSURE, MULTILANE, 1W OR 2W CROSSWALK OR SIDEWALK CLOSURE
701901-01	TRAFFIC CONTROL DEVICES
720001-01	SIGN PANEL MOUNTING DETAILS
814001-02	HANDHOLES
814006-02	DOUBLE HANDHOLES
857001-01	STANDARDS PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES
862001-01	UNINTERRUPTABLE POWER SUPPLY (UPS)
873001-02	TRAFFIC SIGNAL GROUNDING & BONDING
877001-04	STEEL MAST ARM ASSEMBLY AND POLE
878001-07	CONCRETE FOUNDATION DETAILS
880001-01	SPAN WIRE MOUNTED SIGNALS AND BEACON INSTALLATION
880006-01	TRAFFIC SIGNAL MOUNTING DETAILS
886001-01	DETECTOR LOOP INSTALLATION

PREPARED BY: _____
TRAFFIC ENGINEER **DATE**

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1-800-892-0123
OR 811

CONTRACT NO. 60F06

DISTRICT 1 - BUREAU OF TRAFFIC: STEVE TRAVIA / DARYLE DREW (847) 705-4420

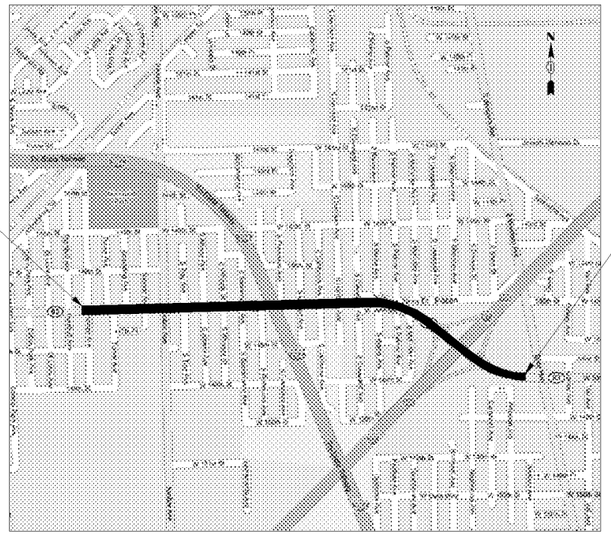
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

DISTRICT 1
CONGESTION MITIGATION AIR QUALITY
FIBER OPTIC COMMUNICATIONS NETWORK

IL. ROUTE 83 (147th STREET) FROM HOMAN AVENUE TO EAST OF I-57 RAMPS

F.A.U. ROUTE 1602 /IL 83 (147th ST.)
SECTION 2008-054 TS
PROJECT NO. C-91-575-08
COOK COUNTY



LOCATION OF SECTION INDICATED THUS: - ▬

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED _____ **20** _____

_____
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER

_____ **20** _____

_____
ENGINEER OF DESIGN AND ENVIRONMENT

_____ **20** _____

_____
DIRECTOR OF HIGHWAYS, CHIEF ENGINEER

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

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INDEX OF SHEETS

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	**INDEX OF SHEETS IL. ROUTE 83 (147th ST.) FROM HOMAN AVENUE TO EAST OF I-57 RAMPS MIDLOTHIAN / POSEN, ILLINOIS**
		DRAWN - FPB	REVISED -		
	PLOT SCALE =	CHECKED - MJT	REVISED -		SCALE: N.T.S. SHEET NO. OF SHEETS STA. TO STA.
	PLOT DATE =	DATE -	REVISED -		

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

SUMMARY OF QUANTITIES

				CONSTRUCTION TYPE CODE												
				ILL Rte 83 (147th Street) @ Homan Avenue		ILL Rte 83 (147th Street) @ Keczie Avenue		ILL Rte 83 (147th Street) @ Sacramento Avenue		ILL Rte 83 (147th Street) @ Harrison Avenue		ILL Rte 83 (147th Street) @ Cleveland Avenue		ILL Rte 83 (147th Street) @ I-57 Ramps C & D	ILL Rte 83 (147th Street) @ I-57 Ramps A & B	Interconnect
CODE NO.	ITEM	UNIT	TOTAL	Y031 1F	Y031 3D *	Y031 1F	Y031 3D *	Y031 1F	Y031 3D **	Y031 1F	Y031 3D **	Y031 1F	Y031 3D **	Y031 1F	Y031 1F	
42400200	PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	3842	636		1500				687		969		25	25	
42400800	DETECTABLE WARNINGS	SQ FT	431	86		117				110		118				
44000600	SIDEWALK REMOVAL	SQ FT	3796	636		1500				641		969		25	25	
44001700	COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	472	144		76				112		140				
44003500	MEDIAN REMOVAL AND REPLACEMENT, SPECIAL	SQ FT	256			218						38				
67000400	ENGINEER'S FIELD OFFICE, TYPE A	CAL MO	7	1		1				1		1		1	1	1
67100100	MOBILIZATION	LSUM	1	0.125		0.125		0.125		0.125		0.125		0.125	0.125	0.125
70102620	TRAFFIC CONTROL AND PROTECTION, STANDARD 701501	LSUM	1	0.125		0.125		0.125		0.125		0.125		0.125	0.125	0.125
70102635	TRAFFIC CONTROL AND PROTECTION, STANDARD 701701	LSUM	1	0.125		0.125		0.125		0.125		0.125		0.125	0.125	0.125
72000100	SIGN PANEL - TYPE 1	SQ FT	86	15		15				18		18		10	10	
72000200	SIGN PANEL - TYPE 2	SQ FT	100	25		25				25		25				
78000400	THERMOPLASTIC PAVEMENT MARKING - LINE 6"	FOOT	390			163		227								
78000600	THERMOPLASTIC PAVEMENT MARKING - LINE 12"	FOOT	102									102				
78300400	THERMOPLASTIC PAVEMENT MARKING REMOVAL	SQ FT	212			80						132				
81000600	CONDUIT IN TRENCH, 2" DIA., GALVANIZED STEEL	FOOT	5929	283		711				433		478		497	822	2705
81000700	CONDUIT IN TRENCH, 2 1/2" DIA., GALVANIZED STEEL	FOOT	322	34		43				20				154	71	
81000800	CONDUIT IN TRENCH, 3" DIA., GALVANIZED STEEL	FOOT	136	25		27				43		32			9	
81001000	CONDUIT IN TRENCH, 4" DIA., GALVANIZED STEEL	FOOT	263	10		32								128	93	
81001100	CONDUIT IN TRENCH, 5" DIA., GALVANIZED STEEL	FOOT	30			10				10		10				
81018500	CONDUIT PUSHED, 2" DIA., GALVANIZED STEEL	FOOT	2502	435		637				242		304		50	80	854
81018900	CONDUIT PUSHED, 4" DIA., GALVANIZED STEEL	FOOT	1517	234		378				230		244		236	195	
81400100	HANDHOLE	EACH	39	5		7				7		5		5	6	4
81400200	HEAVY-DUTY HANDHOLE	EACH	10			4				2		2		1	1	
81400300	DOUBLE HANDHOLE	EACH	8	2		2				1		1		1	1	
81900200	TRENCH AND BACKFILL FOR ELECTRICAL WORK	FOOT	7164	438		872				638		663		801	1047	2705
85000200	MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION	EACH	5	1				1		1		1				1
85700205	FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL	EACH	6	1		1				1		1		1	1	
85700505	FULL-ACTUATED CONTROLLER IN EXISTING CABINET, SPECIAL	EACH	1					1								
86400100	TRANSCEIVER - FIBER OPTIC	EACH	7	1		1				1		1		1	1	1
87301215	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 2C	FOOT	2109	419		653				519		518				
87301225	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 3C	FOOT	5572	886	356	1330	346			1094	228	1092	240			
87301245	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 5C	FOOT	12036	1603		1528				1579		1513		2918	2895	
87301255	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 7C	FOOT	2749			1501				623		625				
87301305	ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 14, 1 PR	FOOT	12469	899		4212				1089		1446		2554	2269	
87301805	ELECTRIC CABLE IN CONDUIT, SERVICE, NO. 6 2C	FOOT	1527	202		278				180		139		200	528	
87502440	TRAFFIC SIGNAL POST, GALVANIZED STEEL, 10 FT.	EACH	1							1						
87502480	TRAFFIC SIGNAL POST, GALVANIZED STEEL, 14 FT	EACH	8	1				3						2	2	
87502500	TRAFFIC SIGNAL POST, GALVANIZED STEEL, 16 FT	EACH	2			2										
87700160	STEEL MAST ARM ASSEMBLY AND POLE, 24 FT.	EACH	1	1												
87700170	STEEL MAST ARM ASSEMBLY AND POLE, 26 FT.	EACH	4	2						1					1	
87700180	STEEL MAST ARM ASSEMBLY AND POLE, 28 FT.	EACH	1											1		
87700190	STEEL MAST ARM ASSEMBLY AND POLE, 30 FT.	EACH	1	1												
87700210	STEEL MAST ARM ASSEMBLY AND POLE, 34 FT.	EACH	4							1		2			1	
87700220	STEEL MAST ARM ASSEMBLY AND POLE, 36 FT.	EACH	4							1		2		1		
87700230	STEEL MAST ARM ASSEMBLY AND POLE, 38 FT.	EACH	1			1										
87700250	STEEL MAST ARM ASSEMBLY AND POLE, 42 FT.	EACH	1			1										
87700280	STEEL MAST ARM ASSEMBLY AND POLE, 48 FT.	EACH	4			2								1	1	
87700290	STEEL MAST ARM ASSEMBLY AND POLE, 50 FT.	EACH	1							1						
87800100	CONCRETE FOUNDATION, TYPE A	FOOT	32	4		8				4				8	8	
87800150	CONCRETE FOUNDATION, TYPE C	FOOT	24	4		4				4		4		4	4	
87800400	CONCRETE FOUNDATION, TYPE E 30-INCH DIAMETER	FOOT	90	45						15				15	15	
87800415	CONCRETE FOUNDATION, TYPE E 36-INCH DIAMETER	FOOT	240	15		60				45		60		30	30	
87900200	DRILL EXISTING HANDHOLE	EACH	1													1
88030020	SIGNAL HEAD, LED, 1-FACE, 3-SECTION, MAST ARM MOUNTED	EACH	53	8		8		2		8		8		9	10	
88030050	SIGNAL HEAD, LED, 1-FACE, 3-SECTION, BRACKET MOUNTED	EACH	14	4				2		2		2		2	2	
88030100	SIGNAL HEAD, LED, 1-FACE, 5-SECTION, BRACKET MOUNTED	EACH	8			4				2		2				
88030110	SIGNAL HEAD, LED, 1-FACE, 5-SECTION, MAST ARM MOUNTED	EACH	8			4				2		2				
88030210	SIGNAL HEAD, LED, 2-FACE, 3-SECTION, BRACKET MOUNTED	EACH	8					4						2	2	
88102717	PEDESTRIAN SIGNAL HEAD, LED, 1-FACE, BRACKET MOUNTED WITH COUNTDOWN TIMER	EACH	6					6								
88102747	PEDESTRIAN SIGNAL HEAD, LED, 2-FACE, BRACKET MOUNTED WITH COUNTDOWN TIMER	EACH	16	4		4				4		4				
88200210	TRAFFIC SIGNAL BACKPLATE, LOUVERED, ALUMINUM	EACH	61	8		12		2		10		10		9	10	
88500100	INDUCTIVE LOOP DETECTOR	EACH	51	4		16				6		7		9	9	
88600100	DETECTOR LOOP, TYPE I	FOOT	3435	337		889				549		574		549	537	
88800100	PEDESTRIAN PUSH-BUTTON	EACH	22	4		4		6		4		4				
89000100	TEMPORARY TRAFFIC SIGNAL INSTALLATION	EACH	3			1								1	1	
89501400	RELOCATE EMERGENCY VEHICLE PRIORITY SYSTEM, DETECTOR UNIT	EACH	8		2		2				2		2			
89501410	RELOCATE EMERGENCY VEHICLE PRIORITY SYSTEM, PHASING UNIT	EACH	4		1		1				1		1			
89502375	REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT	EACH	7	1		1		1		1		1		1	1	
89502380	REMOVE EXISTING HANDHOLE	EACH	51	4		12				6		9		13	7	
89502385	REMOVE EXISTING CONCRETE FOUNDATION	EACH	49	9		9				9		9		7	6	
X0322256	TEMPORARY INFORMATION SIGNING	SQ FT	102.8													102.8
X0322925	ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C	FOOT	6536													6536
X0325134	WIRELESS INTERCONNECT (COMPLETE)	EACH	1													1
X0325705	RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM LEVEL II	EACH	7													7
X0325737	TEMPORARY TRAFFIC SIGNAL TIMING	EACH	7	1		1		1		1		1		1	1	
X8050015	SERVICE INSTALLATION - POLE MOUNTED	EACH	6	1		1				1		1		1	1	
X8620020	UNINTERRUPTIBLE POWER SUPPLY	EACH	6	1		1				1		1		1	1	
X8710020	FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, MM12F SM12F	FOOT	6666													6666
X8730027	ELECTRIC CABLE IN CONDUIT, GROUNDING, NO. 6 1C	FOOT	4319	552		820				514		642		798	993	
X8730250	ELECTRIC CABLE IN CONDUIT, NO. 20 3C, TWISTED, SHIELDED	FOOT	1170		356		346				228		240			
XX000406	BRICK PAVER REMOVAL AND REPLACEMENT	SQ FT	276							276						

* 100% OF THE COST SHALL BE PAID FOR BY THE VILLAGE OF MIDLOTHIAN
** 100% OF THE COST SHALL BE PAID FOR BY THE VILLAGE OF POSEN

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES
IL. ROUTE 83 (147th ST.) FROM HOMAN AVE. TO EAST OF I-57 RAMPS
MIDLOTHIAN / POSEN, ILLINOIS

SCALE: N.T.S. | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

TRAFFIC SIGNAL LEGEND

ITEM	REMOVAL	EXISTING	PROPOSED
CONTROLLER CABINET	R		
RAILROAD CONTROL CABINET		B.C.	B.C.
COMMUNICATIONS CABINET	R CC	ECC	CC
MASTER CONTROLLER		EMC	MC
MASTER MASTER CONTROLLER		EMMC	MMC
UNINTERRUPTIBLE POWER SUPPLY	R UPS	EUPS	UPS
SERVICE INSTALLATION, (P) POLE OR (G) GROUND MOUNT	R	P	P
TELEPHONE CONNECTION (P) POLE OR (G) GROUND MOUNT	R T	P T	P T
STEEL MAST ARM ASSEMBLY AND POLE	R		
ALUMINUM MAST ARM ASSEMBLY AND POLE	R		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH LUMINAIRE	R		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH PTZ CAMERA	R PTZ	PTZ	PTZ
SIGNAL POST	R		
TEMPORARY WOOD POLE (CLASS 5 OR BETTER) 45 FOOT (13.7m) MINIMUM	R		
GUY WIRE	R		
SIGNAL HEAD	R		
SIGNAL HEAD CONSTRUCTION STAGES (NUMBERS INDICATE THE CONSTRUCTION STAGE)			2
SIGNAL HEAD WITH BACKPLATE	R		
SIGNAL HEAD OPTICALLY PROGRAMMED	R "P"	"P"	"P"
FLASHER INSTALLATION (S DENOTES SOLAR POWER)	R "F"	"F"	"F"
PEDESTRIAN SIGNAL HEAD	R		
PEDESTRIAN PUSHBUTTON DETECTOR	R		
ACCESSIBLE PEDESTRIAN PUSHBUTTON DETECTOR	R APS	APS	APS
ILLUMINATED SIGN "NO LEFT TURN"	R		
ILLUMINATED SIGN "NO RIGHT TURN"	R		
DETECTOR LOOP, TYPE I			
PREFORMED DETECTOR LOOP		P	P
MICROWAVE VEHICLE SENSOR	R M	M	M
VIDEO DETECTION CAMERA	R V	V	V
VIDEO DETECTION ZONE			
PAN, TILT, ZOOM CAMERA	R PTZ	PTZ	PTZ
WIRELESS DETECTOR SENSOR	R W	W	W
WIRELESS ACCESS POINT	R		

ITEM	REMOVAL	EXISTING	PROPOSED
EMERGENCY VEHICLE LIGHT DETECTOR	R		
CONFIRMATION BEACON	R		
HANDHOLE	R		
HEAVY DUTY HANDHOLE	R H	H	H
DOUBLE HANDHOLE	R		
JUNCTION BOX	R		
GALVANIZED STEEL CONDUIT IN TRENCH (T) OR PUSHED (P)			
TEMPORARY SPAN WIRE, TETHER WIRE, AND CABLE	R		
COMMON TRENCH			CT
COILABLE NONMETALLIC CONDUIT (EMPTY)			CNC
SYSTEM ITEM		S	S
INTERSECTION ITEM		I	IP
REMOVE ITEM	R		
RELOCATE ITEM	RL		
ABANDON ITEM	A		
12" (300mm) TRAFFIC SIGNAL SECTION		R	R
12" (300mm) RED WITH 8" (200mm) YELLOW AND GREEN TRAFFIC SIGNAL FACE		R Y G	
SIGNAL FACE		R Y G ◀Y ◀G	R Y G ◀Y ◀G
SIGNAL FACE WITH BACKPLATE. "P" INDICATES PROGRAMMED HEAD		R Y G ◀Y ◀G "P"	R Y G ◀Y ◀G "P"
12" (300mm) PEDESTRIAN SIGNAL HEAD WALK/DON'T WALK SYMBOL		DW W	
12" (300mm) PEDESTRIAN SIGNAL HEAD INTERNATIONAL SYMBOL, OUTLINED			
12" (300mm) PEDESTRIAN SIGNAL HEAD INTERNATIONAL SYMBOL, SOLID			
PEDESTRIAN SIGNAL HEAD, INTERNATIONAL SYMBOL, WITH COUNTDOWN TIMER		C D	C D
RADIO INTERCONNECT	R		
RADIO REPEATER	R ERR	ERR	RR
DENOTES NUMBER OF CONDUCTORS, ELECTRIC CABLE NO. 14, UNLESS NOTED OTHERWISE, ALL DETECTOR LOOP CABLE TO BE SHIELDED		5	5
GROUND CABLE IN CONDUIT NO. 6 SOLID COPPER (GREEN)		I	I

ITEM	REMOVAL	EXISTING	PROPOSED
ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1/C, UNLESS NOTED OTHERWISE		I	I
COAXIAL CABLE		C	C
VENDOR CABLE FOR CAMERA		V	V
COPPER INTERCONNECT CABLE, NO. 18 3 PAIR TWISTED, SHIELDED		6	6
FIBER OPTIC CABLE NO. 62.5/125, MM12F		12F	
FIBER OPTIC CABLE NO. 62.5/125, MM12F SM12F		24F	24F
FIBER OPTIC CABLE NO. 62.5/125, (NUMBER OF FIBERS & TYPE TO BE NOTED ON PLANS)			
GROUND ROD AT (C) CONTROLLER, (H) HANDHOLE, (P) POST, (M) MAST ARM, OR (S) SERVICE		C	C
CONTROLLER CABINET AND FOUNDATION TO BE REMOVED	RCF		
STEEL MAST ARM POLE AND FOUNDATION TO BE REMOVED	RMF		
ALUMINUM MAST ARM POLE AND FOUNDATION TO BE REMOVED	RMF		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH LUMINAIRE AND FOUNDATION TO BE REMOVED	RMF		
SIGNAL POST AND FOUNDATION TO BE REMOVED	RMF		
INTERSECTION & SAMPLING (SYSTEM) DETECTOR		IS	IS
SAMPLING (SYSTEM) DETECTOR		S	S
EXISTING INTERSECTION LOOP DETECTOR PROPOSED INTERSECTION AND SAMPLING (SYSTEM) DETECTOR		P	
EXISTING PREFORMED INTERSECTION LOOP DETECTOR PROPOSED INTERSECTION AND SAMPLING (SYSTEM) DETECTOR		PP	
PREFORMED INTERSECTION AND SAMPLING (SYSTEM) DETECTOR		PIS	PIS
PREFORMED SAMPLING (SYSTEM) DETECTOR		PS	PS

RAILROAD SYMBOLS

	EXISTING	PROPOSED
RAILROAD CONTROL CABINET		
RAILROAD CANTILEVER MAST ARM		
FLASHING SIGNAL		
CROSSING GATE		
CROSSBUCK		

FILE NAME = c:\pw_work\PWIDOT\KANTHAPHIXAYBC\d0112644\traffic_legend_v7.dgn	USER NAME = kanthaphixaybc	DESIGNED - DAG/BCK	REVISED -
		DRAWN - BCK	REVISED -
	PLOT SCALE = 20.0000 ' / IN.	CHECKED - DAD	REVISED -
	PLOT DATE = 10/6/2009	DATE - 10/28/09	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISTRICT 1
STANDARD TRAFFIC SIGNAL DESIGN DETAILS

SCALE: NONE | SHEET NO. 6 OF 6 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

NOTES FOR TEMPORARY TRAFFIC SIGNALS

1. ALL CONTROL EQUIPMENT INCLUDING EMERGENCY PRE-EMPTION AND COMMUNICATION DEVICES FOR THE TEMPORARY TRAFFIC SIGNAL(S) SHALL BE FURNISHED BY THE CONTRACTOR.

2. ONLY CONTROLLERS SUPPLIED BY ONE OF THE DISTRICT APPROVED CLOSED LOOP EQUIPMENT MANUFACTURERS WILL BE APPROVED FOR USE AT TEMPORARY SIGNAL LOCATIONS. ALL CONTROLLERS USED FOR TEMPORARY TRAFFIC SIGNALS SHALL BE FULLY ACTUATED NEMA MICROPROCESSOR BASED WITH RS232 DATA ENTRY PORTS COMPATIBLE WITH EXISTING MONITORING SOFTWARE APPROVED BY IDOT DISTRICT 1, INSTALLED IN A NEMA TS2 CABINET. ONLY ONE BRAND OF CONTROLLER WILL BE ACCEPTED FOR ANY ONE CONTRACT.

3. ALL TRAFFIC SIGNAL SECTIONS AND PEDESTRIAN SIGNAL SECTIONS SHALL BE LED AND 12" (300mm) DIAMETER. HEADS SHALL BE PLACED AS INDICATED ON THE TEMPORARY TRAFFIC SIGNAL PLAN OR AS DIRECTED BY THE ENGINEER. PEDESTRIAN SIGNALS SHALL INCLUDE SOLID INTERNATIONAL SYMBOLS. PEDESTRIAN SIGNALS WITH COUNTDOWN TIMERS SHALL BE USED WHEN THE EXISTING INSTALLATION UTILIZES COUNTDOWN TYPE OR AS DIRECTED BY THE ENGINEER. COUNTDOWN TYPE PEDESTRIAN SIGNALS ARE NOT TO BE INSTALLED AT A RAILROAD INTERSECTION. THE CONTRACTOR SHALL FURNISH ENOUGH CABLE SLACK TO RELOCATE HEADS TO ANY POSITION ON THE SPAN WIRE OR AT LOCATIONS ILLUSTRATED ON THE PLANS FOR CONSTRUCTION STAGING. THE TEMPORARY TRAFFIC SIGNAL SHALL REMAIN IN OPERATION DURING ALL SIGNAL HEAD RELOCATIONS. EACH TEMPORARY TRAFFIC SIGNAL HEAD SHALL HAVE ITS OWN CABLE FROM THE CONTROLLER CABINET TO THE SIGNAL HEAD.

4. ALL EXISTING STREET NAME AND INTERSECTION REGULATORY SIGNS SHALL BE REMOVED FROM EXISTING POLES, RELOCATED AND SECURELY FASTENED TO THE SPAN WIRE OR WOOD POLE AS DIRECTED BY THE ENGINEER.

5. ANY TEMPORARY SIGNAL WITHIN AN EXISTING CLOSED LOOP TRAFFIC SIGNAL SYSTEM SHALL BE INTERCONNECTED TO THAT SYSTEM USING SIMILAR BRAND CONTROL EQUIPMENT.

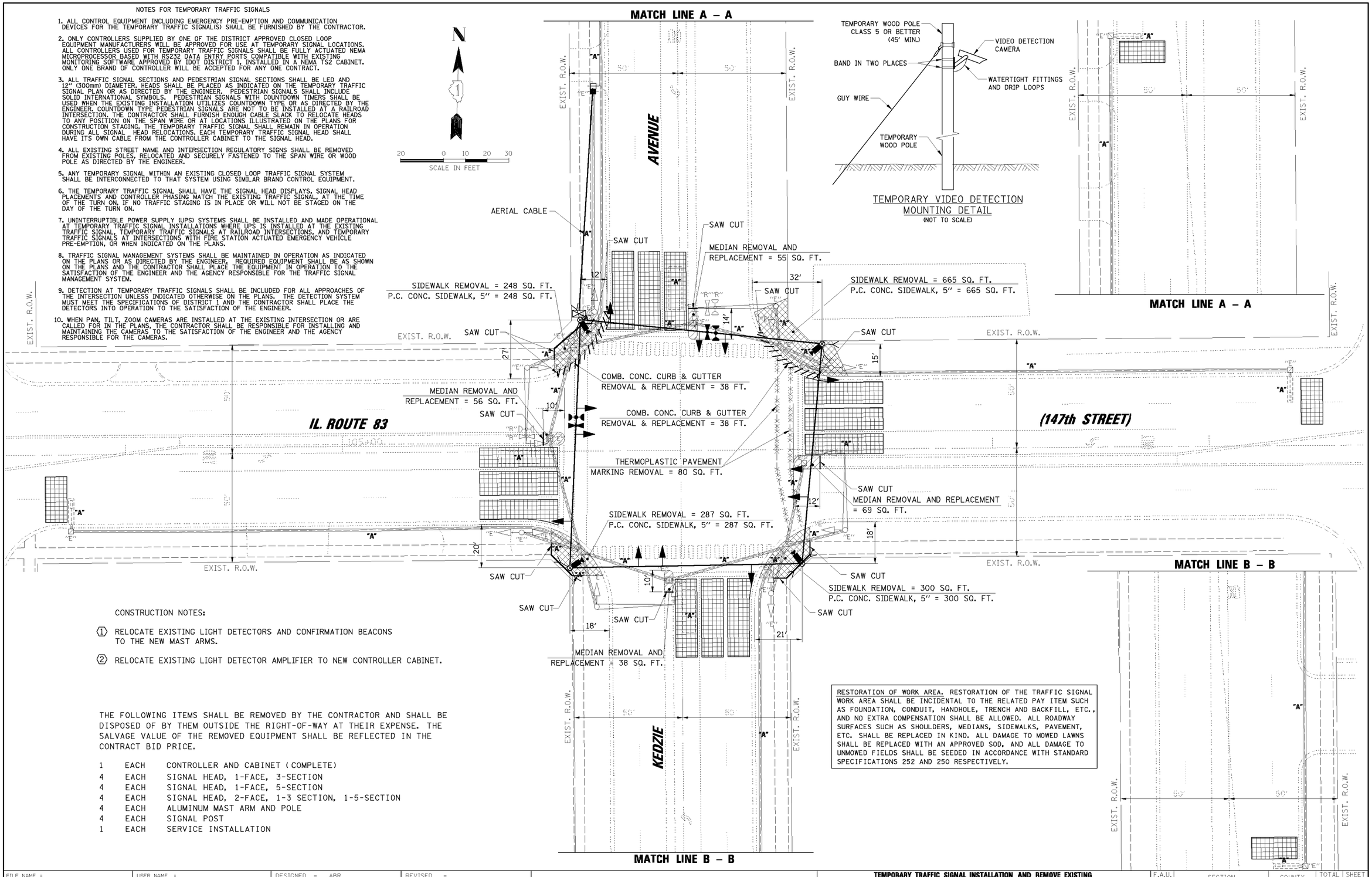
6. THE TEMPORARY TRAFFIC SIGNAL SHALL HAVE THE SIGNAL HEAD DISPLAYS, SIGNAL HEAD PLACEMENTS AND CONTROLLER PHASING MATCH THE EXISTING TRAFFIC SIGNAL, AT THE TIME OF THE TURN ON, IF NO TRAFFIC STAGING IS IN PLACE OR WILL NOT BE STAGED ON THE DAY OF THE TURN ON.

7. UNINTERRUPTIBLE POWER SUPPLY (UPS) SYSTEMS SHALL BE INSTALLED AND MADE OPERATIONAL AT TEMPORARY TRAFFIC SIGNAL INSTALLATIONS WHERE UPS IS INSTALLED AT THE EXISTING TRAFFIC SIGNAL. TEMPORARY TRAFFIC SIGNALS AT RAILROAD INTERSECTIONS, AND TEMPORARY TRAFFIC SIGNALS AT INTERSECTIONS WITH FIRE STATION ACTUATED EMERGENCY VEHICLE PRE-EMPTION, OR WHEN INDICATED ON THE PLANS.

8. TRAFFIC SIGNAL MANAGEMENT SYSTEMS SHALL BE MAINTAINED IN OPERATION AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. REQUIRED EQUIPMENT SHALL BE AS SHOWN ON THE PLANS AND THE CONTRACTOR SHALL PLACE THE EQUIPMENT IN OPERATION TO THE SATISFACTION OF THE ENGINEER AND THE AGENCY RESPONSIBLE FOR THE TRAFFIC SIGNAL MANAGEMENT SYSTEM.

9. DETECTION AT TEMPORARY TRAFFIC SIGNALS SHALL BE INCLUDED FOR ALL APPROACHES OF THE INTERSECTION UNLESS INDICATED OTHERWISE ON THE PLANS. THE DETECTION SYSTEM MUST MEET THE SPECIFICATIONS OF DISTRICT 1 AND THE CONTRACTOR SHALL PLACE THE DETECTORS INTO OPERATION TO THE SATISFACTION OF THE ENGINEER.

10. WHEN PAN, TILT, ZOOM CAMERAS ARE INSTALLED AT THE EXISTING INTERSECTION OR ARE CALLED FOR IN THE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING THE CAMERAS TO THE SATISFACTION OF THE ENGINEER AND THE AGENCY RESPONSIBLE FOR THE CAMERAS.



TEMPORARY VIDEO DETECTION MOUNTING DETAIL
(NOT TO SCALE)

CONSTRUCTION NOTES:

① RELOCATE EXISTING LIGHT DETECTORS AND CONFIRMATION BEACONS TO THE NEW MAST ARMS.

② RELOCATE EXISTING LIGHT DETECTOR AMPLIFIER TO NEW CONTROLLER CABINET.

THE FOLLOWING ITEMS SHALL BE REMOVED BY THE CONTRACTOR AND SHALL BE DISPOSED OF BY THEM OUTSIDE THE RIGHT-OF-WAY AT THEIR EXPENSE. THE SALVAGE VALUE OF THE REMOVED EQUIPMENT SHALL BE REFLECTED IN THE CONTRACT BID PRICE.

1	EACH	CONTROLLER AND CABINET (COMPLETE)
4	EACH	SIGNAL HEAD, 1-FACE, 3-SECTION
4	EACH	SIGNAL HEAD, 1-FACE, 5-SECTION
4	EACH	SIGNAL HEAD, 2-FACE, 1-3 SECTION, 1-5-SECTION
4	EACH	ALUMINUM MAST ARM AND POLE
4	EACH	SIGNAL POST
1	EACH	SERVICE INSTALLATION

RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

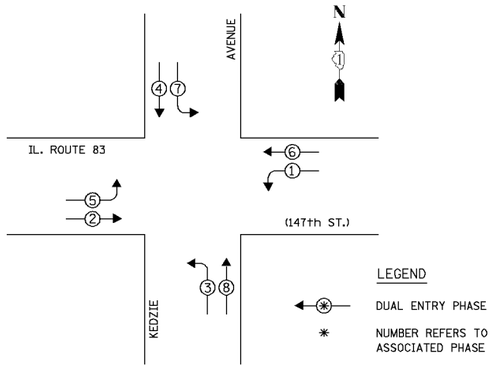
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY TRAFFIC SIGNAL INSTALLATION AND REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT PLAN
IL ROUTE 83 (147th STREET) AND KEDZIE AVENUE
MIDLOTHIAN, ILLINOIS

SCALE: 1" = 20' | SHEET NO. OF SHEETS | STA. | TO STA.

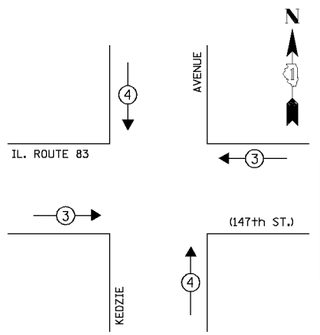
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

TEMPORARY CONTROLLER SEQUENCE



TEMPORARY PHASE DESIGNATION DIAGRAM

TEMPORARY EMERGENCY VEHICLE PREEMPTION SEQUENCE



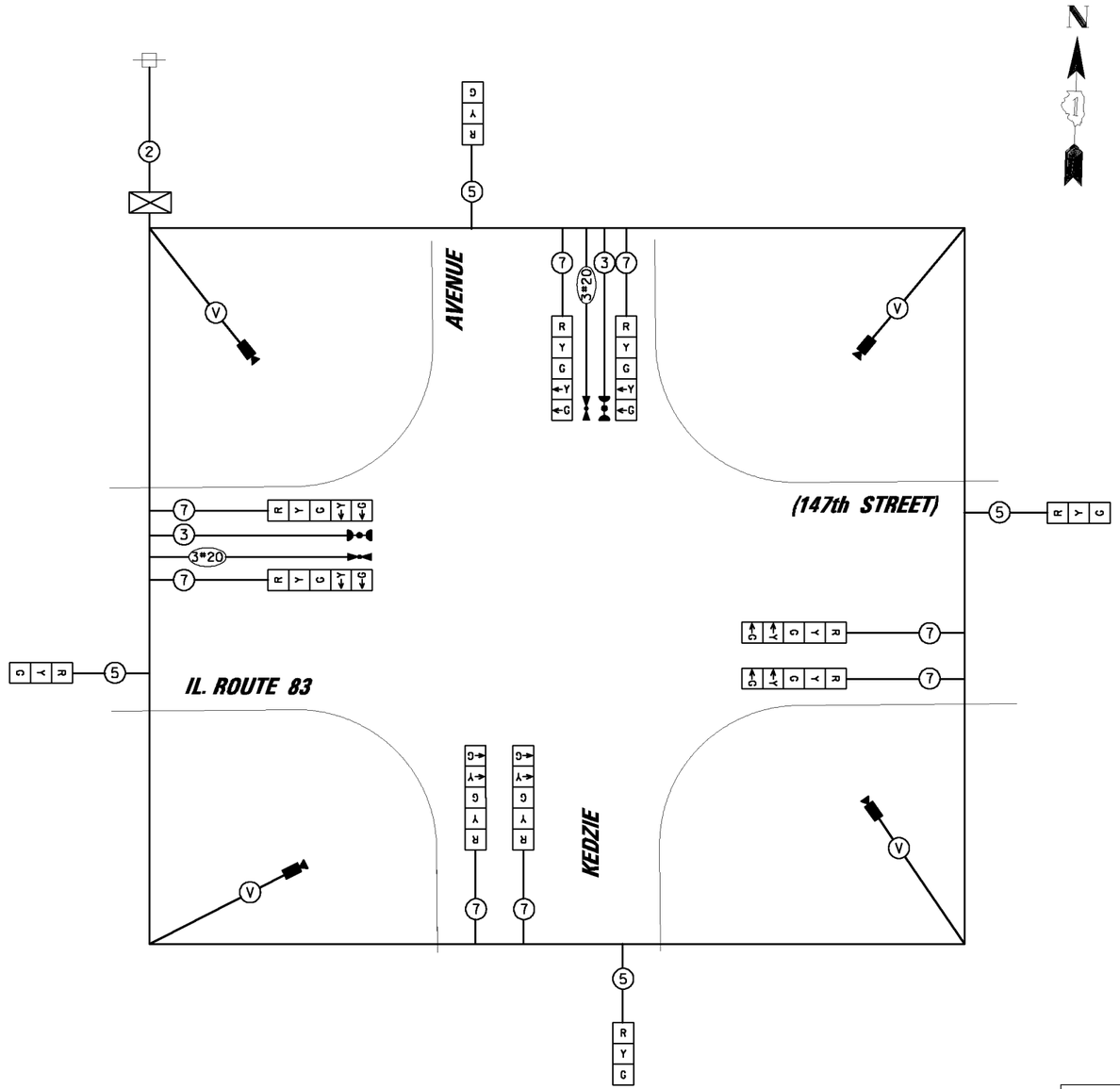
TEMPORARY EMERGENCY VEHICLE PREEMPTORS		
EMERGENCY VEHICLE PREEMPTOR	3	4
MOVEMENT	← →	↓ ↑

I.D.O.T. TRAFFIC SIGNAL INSTALLATION ELECTRICAL SERVICE REQUIREMENTS					TOTAL WATTAGE
TYPE	NO. OF LAMPS	WATTAGE x INCAND.	WATTAGE LED	x % OPERATION	
SIGNAL (RED)	12		17	0.50	102.00
(YELLOW)	12		25	0.25	75.00
(GREEN)	12		15	0.25	45.00
ARROW	16		12	0.10	19.20
PED. SIGNAL	-		25	1.00	-
CONTROLLER	1		100	1.00	100.00
ILLUM. SIGN	-		25	0.05	-
VIDEO SYSTEM	1	150	-	1.00	150.00
FLASHER				0.50	
ENERGY COSTS TO:				TOTAL =	491.20

ILLINOIS DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAY/DISTRICT 1
201 WEST CENTER COURT/SCHAUMBURG, ILLINOIS 60196-1096

ENERGY SUPPLY: CONTACT: STEVE FITZGERALD
PHONE: (708) 235-2327
COMPANY: COMED



TEMPORARAY CABLE PLAN

RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

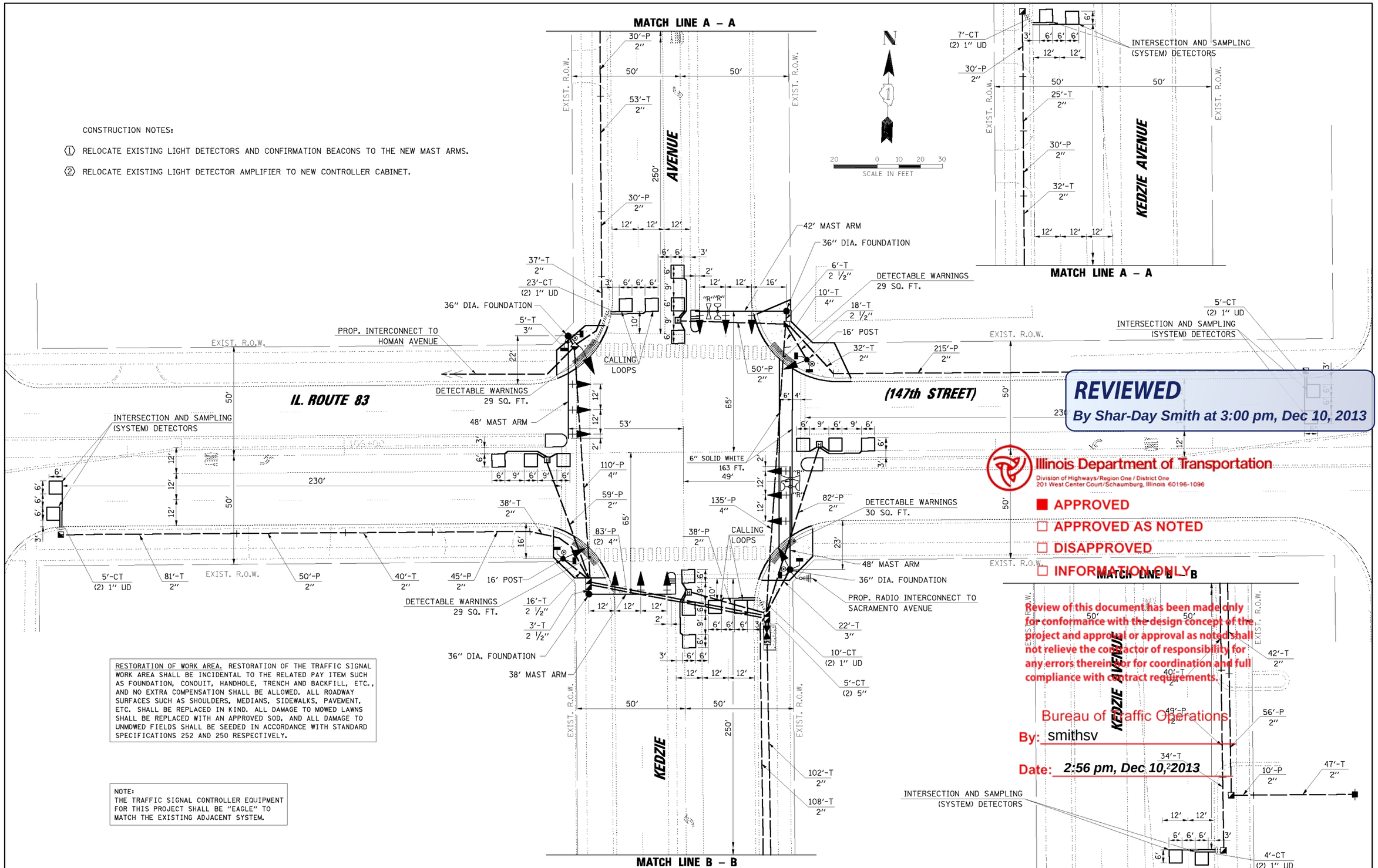
TEMPORARY CABLE PLAN, TEMPORARY PHASE DESIGNATION DIAGRAM AND TEMPORARY EMERGENCY VEHICLE PREEMPTION SEQUENCE
IL ROUTE 83 (147th STREET) AND KEDZIE AVENUE
MIDLOTHIAN, ILLINOIS

SCALE: N.T.S. | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

CONSTRUCTION NOTES:

1. RELOCATE EXISTING LIGHT DETECTORS AND CONFIRMATION BEACONS TO THE NEW MAST ARMS.
2. RELOCATE EXISTING LIGHT DETECTOR AMPLIFIER TO NEW CONTROLLER CABINET.



RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.

REVIEWED
By Shar-Day Smith at 3:00 pm, Dec 10, 2013

Illinois Department of Transportation
Division of Highways/Region One / District One
201 West Center Court/Schaumburg, Illinois 60196-1096

■ APPROVED
☐ APPROVED AS NOTED
☐ DISAPPROVED
☐ INFORMATION ONLY

Review of this document has been made only for conformance with the design concept of the project and approval or approval as noted shall not relieve the contractor of responsibility for any errors therein or for coordination and full compliance with contract requirements.

Bureau of Traffic Operations
By: smithsv
Date: 2:56 pm, Dec 10, 2013

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

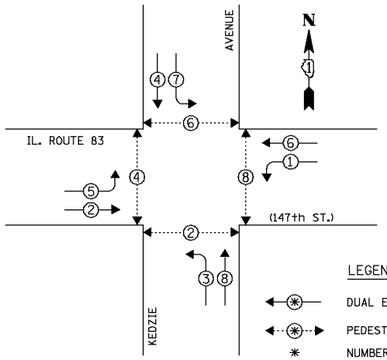
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL MODERNIZATION PLAN
IL. RTE. 83 (147th STREET) AND KEDZIE AVENUE
MIDLOTHIAN, ILLINOIS

SCALE: 1" = 20' | SHEET NO. OF SHEETS | STA. | TO STA.

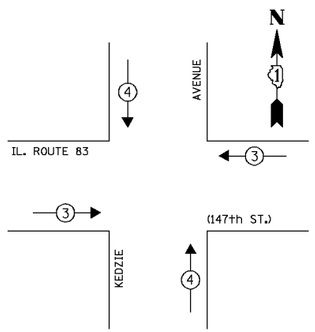
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

CONTROLLER SEQUENCE



PHASE DESIGNATION DIAGRAM

EMERGENCY VEHICLE PREEMPTION SEQUENCE



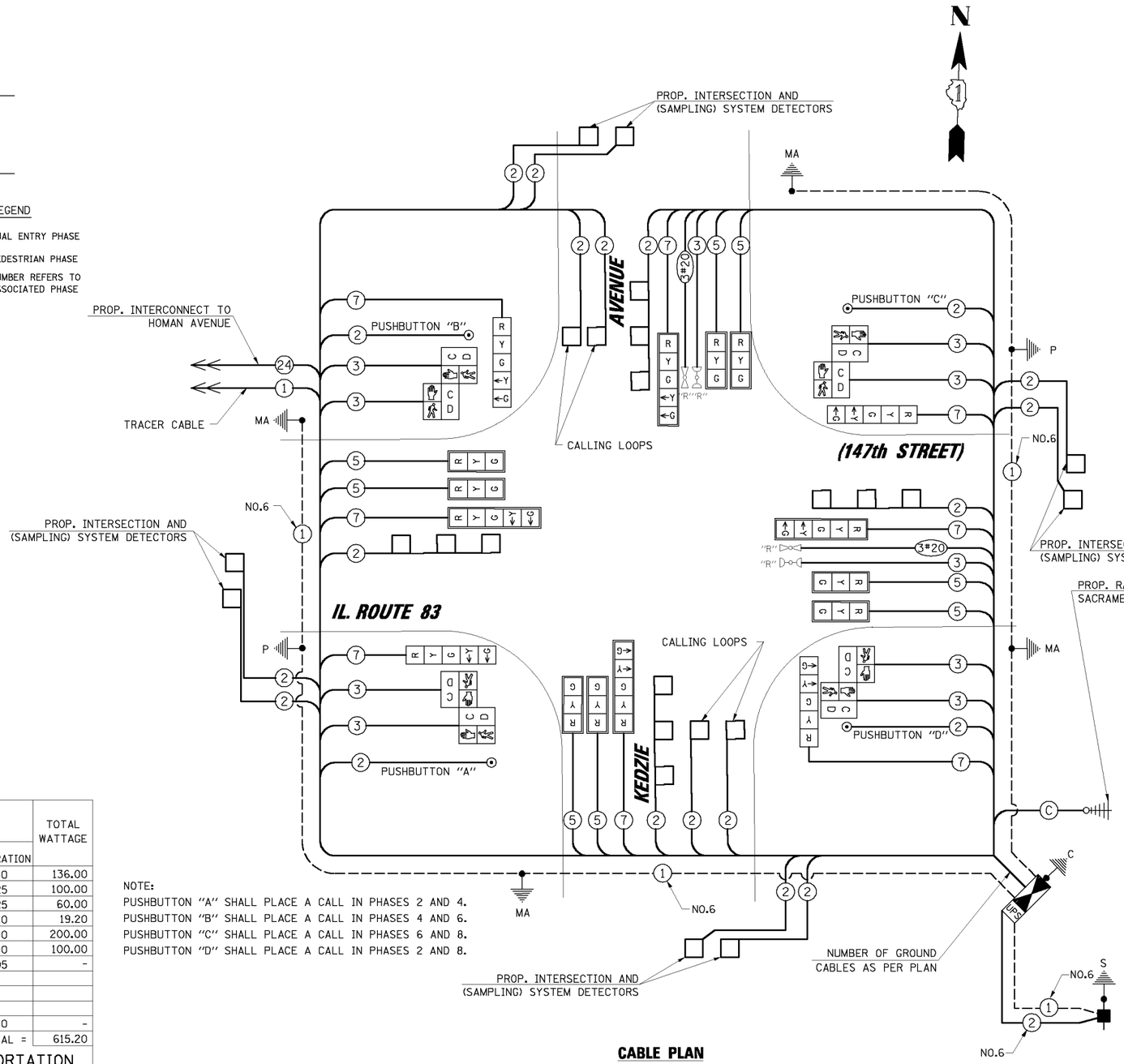
PROPOSED EMERGENCY VEHICLE PREEMPTORS		
EMERGENCY VEHICLE PREEMPTOR	3	4
MOVEMENT	← →	↓ ↑

I.D.O.T. TRAFFIC SIGNAL INSTALLATION ELECTRICAL SERVICE REQUIREMENTS					TOTAL WATTAGE
TYPE	NO. OF LAMPS	WATTAGE X INCAND.	WATTAGE LED	X % OPERATION	
SIGNAL (RED)	16		17	0.50	136.00
(YELLOW)	16		25	0.25	100.00
(GREEN)	16		15	0.25	60.00
ARROW	16		12	0.10	19.20
PED. SIGNAL	8		25	1.00	200.00
CONTROLLER	1		100	1.00	100.00
ILLUM. SIGN	-		25	0.05	-
FLASHER				0.50	-
ENERGY COSTS TO:				TOTAL =	615.20

ILLINOIS DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAY/DISTRICT 1
201 WEST CENTER COURT/SCHAUMBURG, ILLINOIS 60196-1096

ENERGY SUPPLY: CONTACT: STEVE FITZGERALD
PHONE: (708) 235-2327
COMPANY: COMED



NOTE:
PUSHBUTTON "A" SHALL PLACE A CALL IN PHASES 2 AND 4.
PUSHBUTTON "B" SHALL PLACE A CALL IN PHASES 4 AND 6.
PUSHBUTTON "C" SHALL PLACE A CALL IN PHASES 6 AND 8.
PUSHBUTTON "D" SHALL PLACE A CALL IN PHASES 2 AND 8.

CABLE PLAN

RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.

THE END OF THE TRACER CABLE SHALL BE CONTINUOUS AND EXTEND INTO THE CONTROLLER CABINET.

SCHEDULE OF QUANTITIES

ITEM	UNIT	TOTAL
PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	1500
DETECTABLE WARNINGS	SQ FT	117
SIDEWALK REMOVAL	SQ FT	1500
COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	76
MEDIAN REMOVAL AND REPLACEMENT, SPECIAL	SQ FT	218
SIGN PANEL - TYPE 1	SQ FT	15
SIGN PANEL - TYPE 2	SQ FT	25
THERMOPLASTIC PAVEMENT MARKING - LINE 6"	FOOT	163
THERMOPLASTIC PAVEMENT MARKING REMOVAL	SQ FT	80
CONDUIT IN TRENCH, 2" DIA., GALVANIZED STEEL	FOOT	711
CONDUIT IN TRENCH, 2 1/2" DIA., GALVANIZED STEEL	FOOT	43
CONDUIT IN TRENCH, 3" DIA., GALVANIZED STEEL	FOOT	27
CONDUIT IN TRENCH, 4" DIA., GALVANIZED STEEL	FOOT	32
CONDUIT IN TRENCH, 5" DIA., GALVANIZED STEEL	FOOT	10
CONDUIT PUSHED, 2" DIA., GALVANIZED STEEL	FOOT	637
CONDUIT PUSHED, 4" DIA., GALVANIZED STEEL	FOOT	378
HANDHOLE	EACH	7
HEAVY-DUTY HANDHOLE	EACH	4
DOUBLE HANDHOLE	EACH	2
TRENCH AND BACKFILL FOR ELECTRICAL WORK	FOOT	872
FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL	EACH	1
TRANSCEIVER - FIBER OPTIC	EACH	1
ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 2C	FOOT	653
ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 3C	FOOT	1676
ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 5C	FOOT	1528
ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 7C	FOOT	1501
ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 14, 1 PR	FOOT	4212
ELECTRIC CABLE IN CONDUIT, SERVICE, NO. 6 2C	FOOT	278
TRAFFIC SIGNAL POST, GALVANIZED STEEL, 16 FT	EACH	2
STEEL MAST ARM ASSEMBLY AND POLE, 38 FT.	EACH	1
STEEL MAST ARM ASSEMBLY AND POLE, 42 FT.	EACH	1
STEEL MAST ARM ASSEMBLY AND POLE, 48 FT.	EACH	2
CONCRETE FOUNDATION, TYPE A	FOOT	8
CONCRETE FOUNDATION, TYPE C	FOOT	4
CONCRETE FOUNDATION, TYPE E 36-INCH DIAMETER	FOOT	60
SIGNAL HEAD, LED, 1-FACE, 3-SECTION, MAST ARM MOUNTED	EACH	8
SIGNAL HEAD, LED, 1-FACE, 5-SECTION, BRACKET MOUNTED	EACH	4
SIGNAL HEAD, LED, 1-FACE, 5-SECTION, MAST ARM MOUNTED	EACH	4
PEDESTRIAN SIGNAL HEAD, LED, 2-FACE, BRACKET MOUNTED WITH COUNTDOWN TIMER	EACH	4
TRAFFIC SIGNAL BACKPLATE, LOUVERED, ALUMINUM	EACH	12
INDUCTIVE LOOP DETECTOR	EACH	16
DETECTOR LOOP, TYPE I	FOOT	589
PEDESTRIAN PUSH-BUTTON	EACH	4
TEMPORARY TRAFFIC SIGNAL INSTALLATION	EACH	1
RELOCATE EMERGENCY VEHICLE PRIORITY SYSTEM, DETECTOR UNIT	EACH	2
RELOCATE EMERGENCY VEHICLE PRIORITY SYSTEM, PHASING UNIT	EACH	1
REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT	EACH	1
REMOVE EXISTING HANDHOLE	EACH	12
REMOVE EXISTING CONCRETE FOUNDATION	EACH	9
TEMPORARY TRAFFIC SIGNAL TIMING	EACH	1
SERVICE INSTALLATION - POLE MOUNTED	EACH	1
UNINTERRUPTIBLE POWER SUPPLY	EACH	1
ELECTRIC CABLE IN CONDUIT, GROUNDING, NO. 6 1C	FOOT	820
ELECTRIC CABLE IN CONDUIT, NO. 20 3C, TWISTED, SHIELDED	FOOT	346

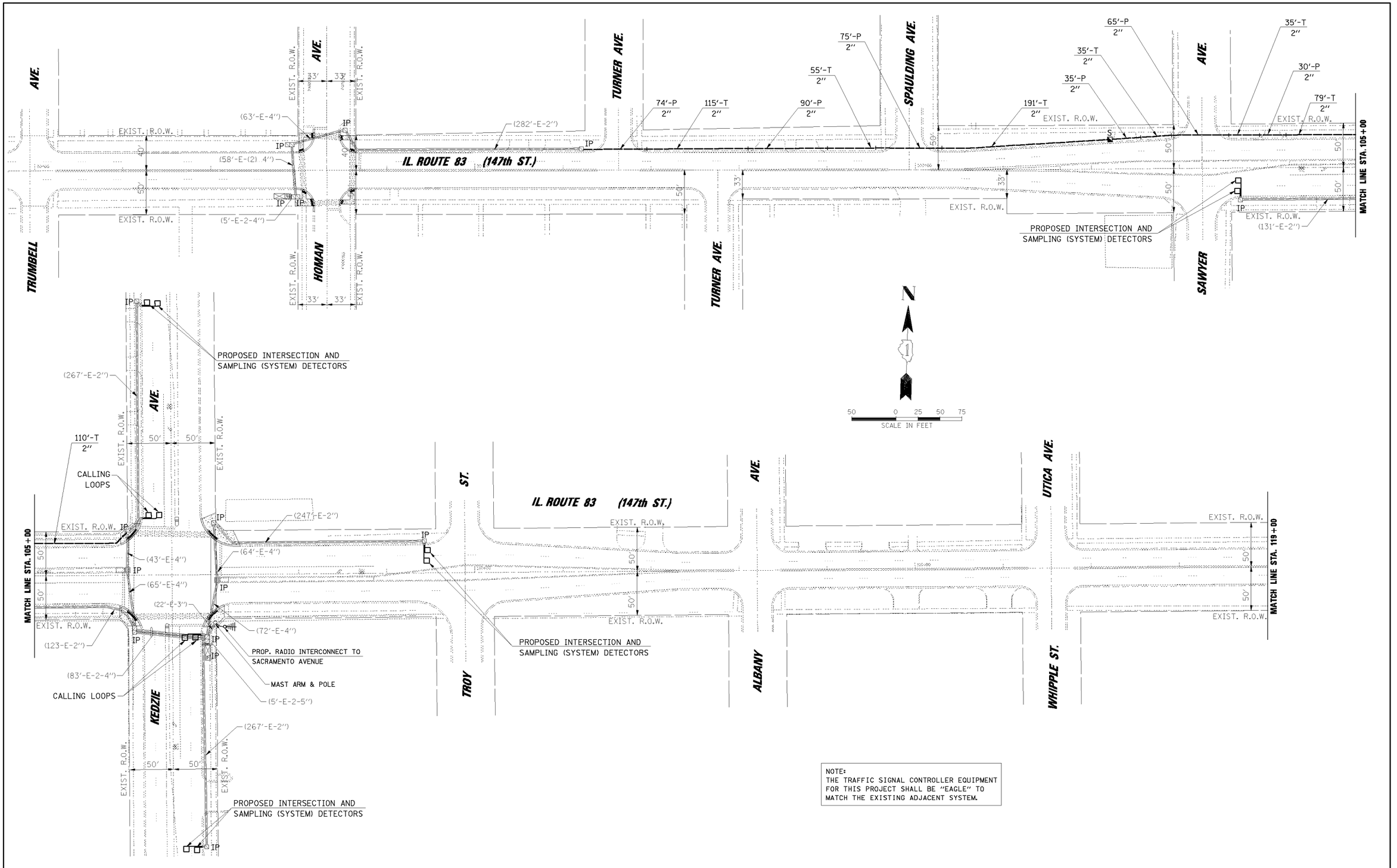
FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCHEDULE OF QUANTITIES, CABLE PLAN, PHASE DESIGNATION DIAGRAM AND EMERGENCY VEHICLE PREEMPTIN SEQUENCE
IL. ROUTE 83 (147th STREET) AND KEDZIE AVENUE
MIDLOTHIAN, ILLINOIS

SCALE: N.T.S. | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.

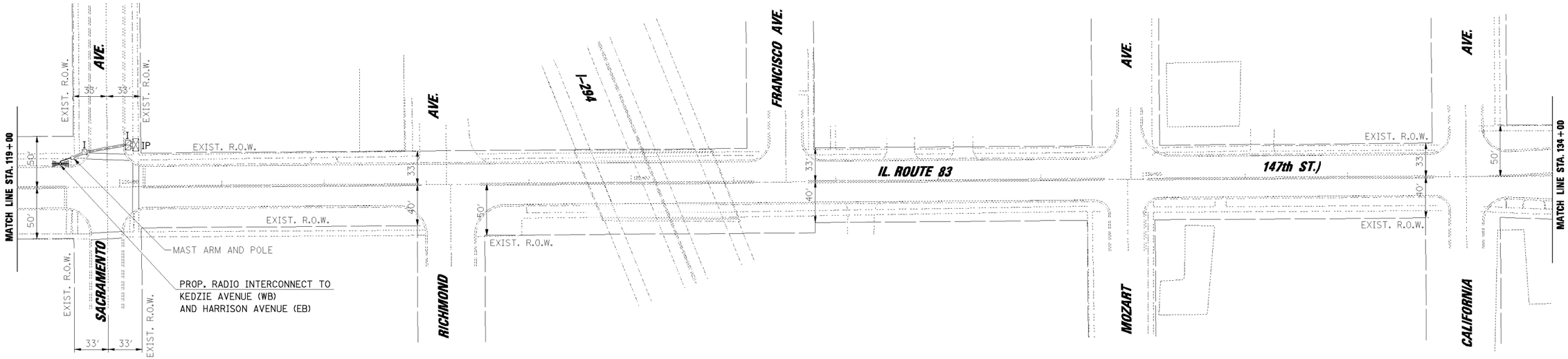
FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

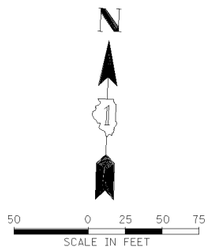
INTERCONNECT PLAN
IL. ROUTE 83 (147th STREET)
FROM HOMAN AVENUE TO EAST OF I-57 RAMPS

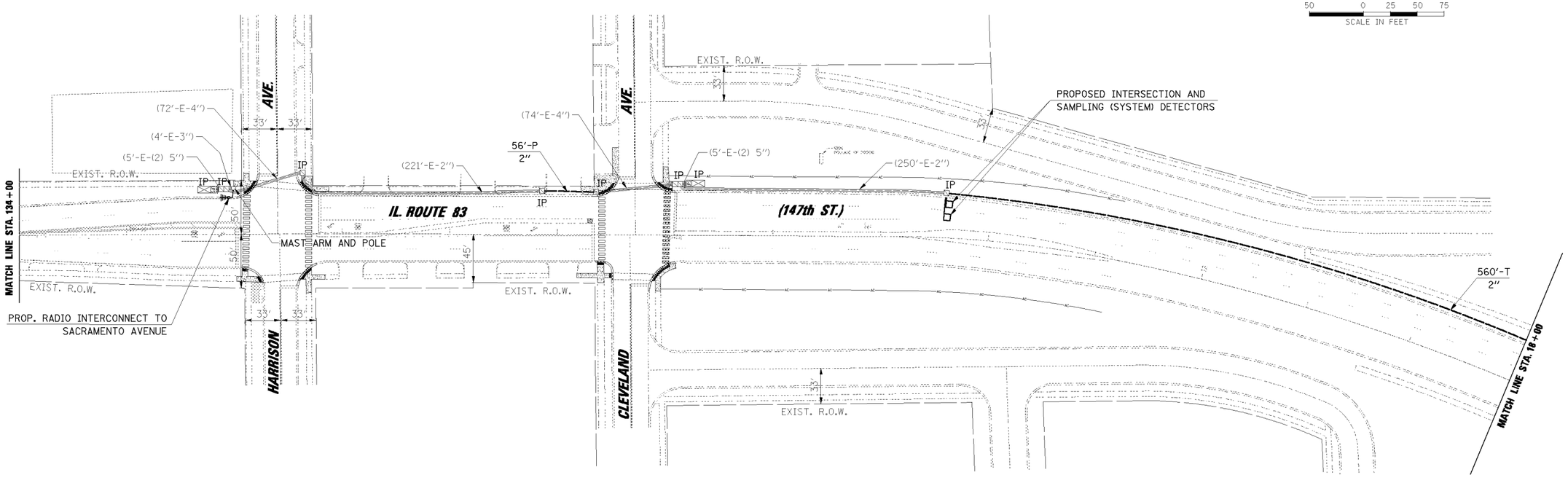
SCALE: 1" = 50' | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.





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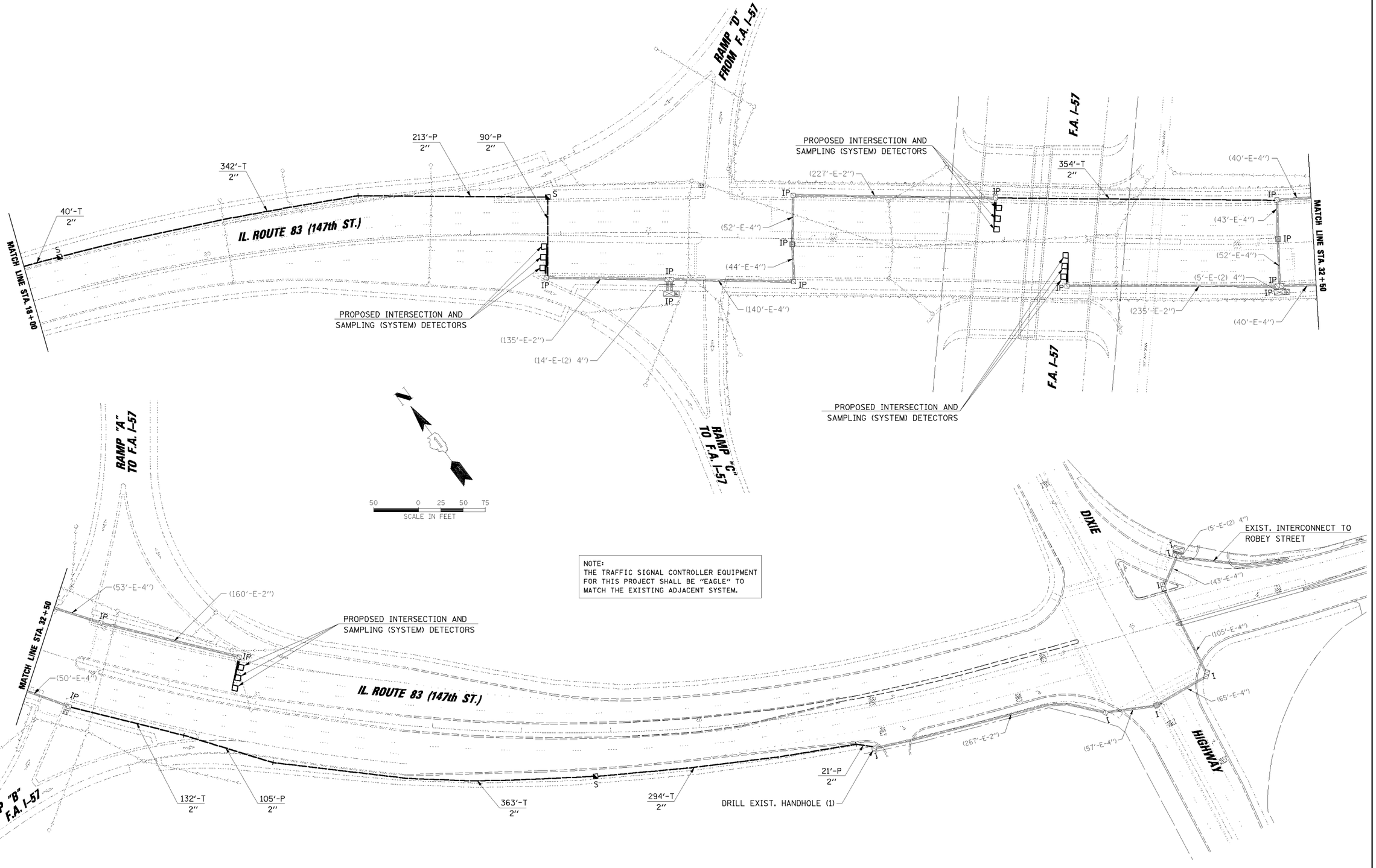
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERCONNECT PLAN
IL. ROUTE 83 (147th STREET)
FROM HOMAN AVENUE TO EAST OF I-57 RAMPS

SCALE: 1" = 50' | SHEET NO. OF SHEETS | STA. TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



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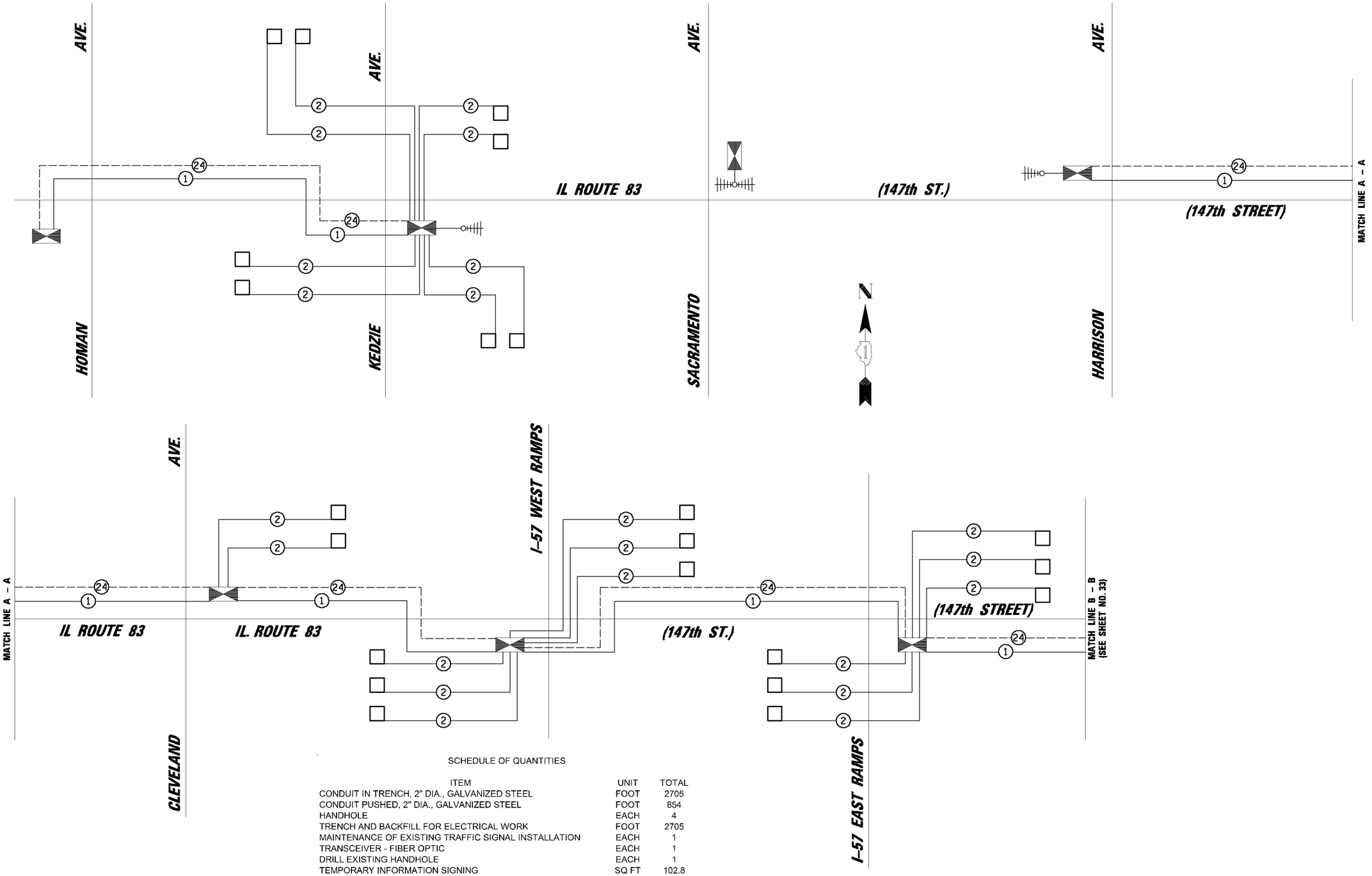
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERCONNECT PLAN
IL. ROUTE 83 (147th STREET)
FROM HOMAN AVENUE TO EAST OF I-57 RAMPS

SCALE: 1" = 50' | SHEET NO. OF SHEETS | STA. TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



SCHEDULE OF QUANTITIES

ITEM	UNIT	TOTAL
CONDUIT IN TRENCH, 2" DIA., GALVANIZED STEEL	FOOT	2705
CONDUIT PUSHED, 2" DIA., GALVANIZED STEEL	FOOT	854
HANDHOLE	EACH	4
TRENCH AND BACKFILL FOR ELECTRICAL WORK	FOOT	2705
MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION	EACH	1
TRANSCEIVER - FIBER OPTIC	EACH	1
DRILL EXISTING HANDHOLE	EACH	1
TEMPORARY INFORMATION SIGNING	SQ FT	102.8
ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C	FOOT	6536
WIRELESS INTERCONNECT (COMPLETE)	EACH	1
RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM LEVEL II	EACH	7
FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, MM12F SM12F	FOOT	6666

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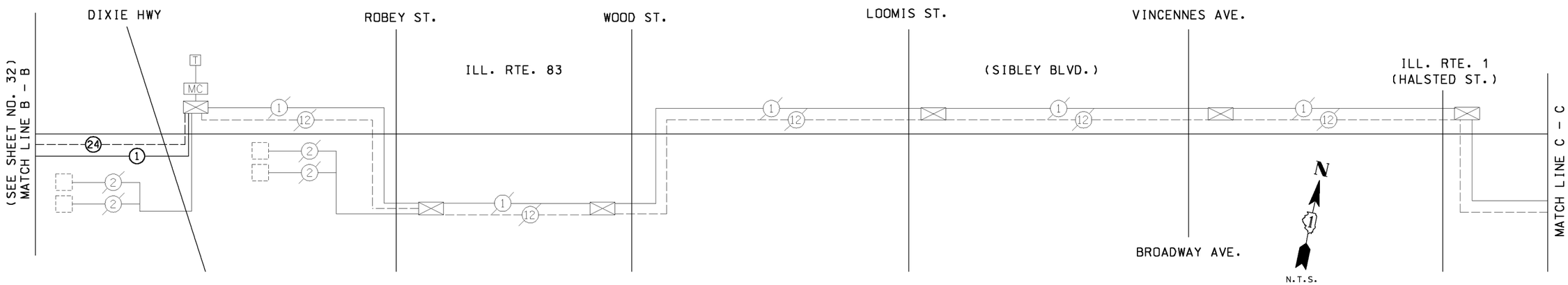
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

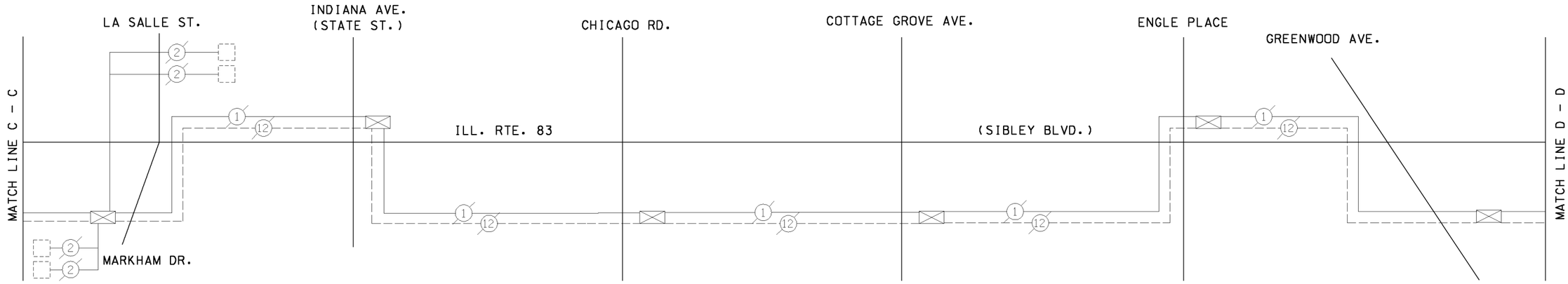
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

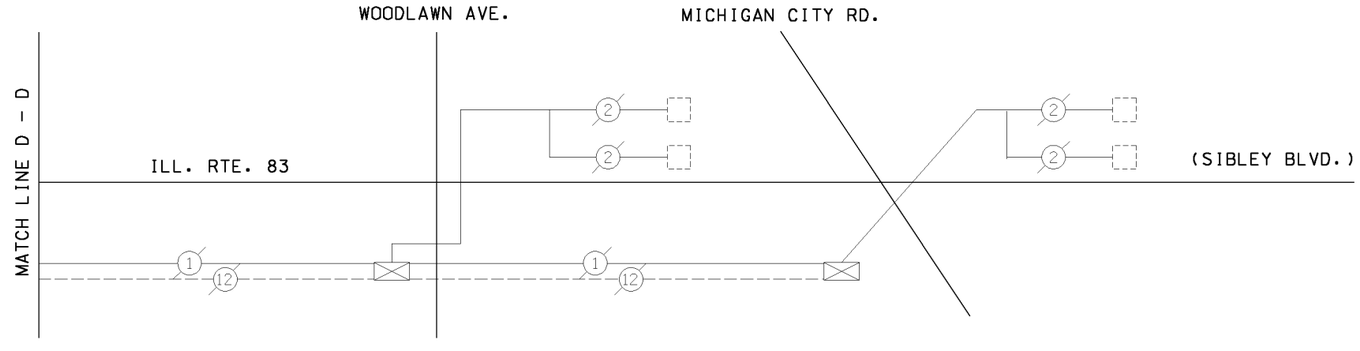
INTERCONNECT SCHEMATIC
IL ROUTE 83 (147th STREET) FROM HOMAN AVENUE TO EAST OF I–57 RAMPS
MIDLOTHIAN-POSEN, ILLINOIS

SCALE: N.T.S. | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		







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		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - MJT	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERCONNECT SCHEMATIC
IL. ROUTE 83 (SIBLEY BLVD.) FROM DIXIE HIGHWAY TO MICHIGAN CITY ROAD
POSEN, ILLINOIS

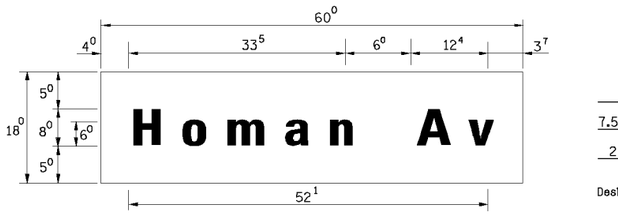
SCALE: N.T.S. | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
		CONTRACT NO. 60F06		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

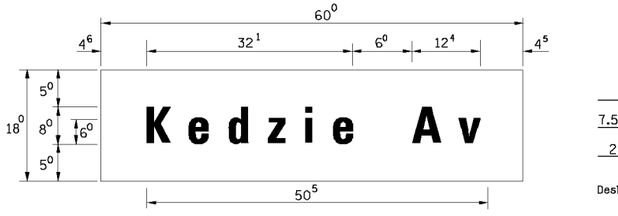
CONTRACT NO. 60F06

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1602	2008-054 TS	COOK		
STA.		TO STA.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

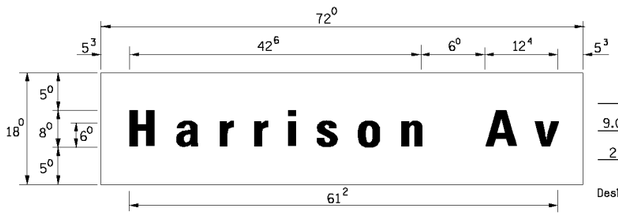
PANEL DESIGN TYPE 1



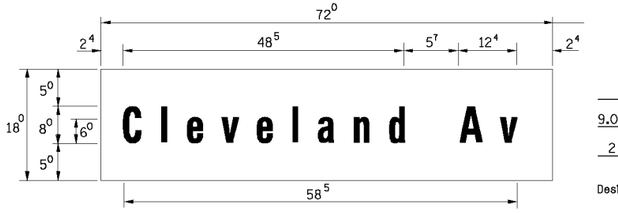
____ Sq. M. each
7.50 Sq. Ft. each
2 Required
Design Series D



____ Sq. M. each
7.50 Sq. Ft. each
2 Required
Design Series D

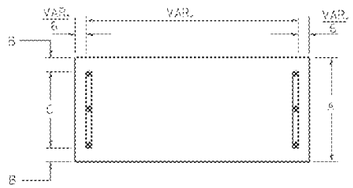


____ Sq. M. each
9.0 Sq. Ft. each
2 Required
Design Series D

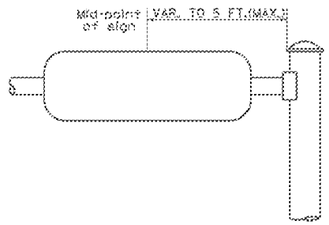


____ Sq. M. each
9.00 Sq. Ft. each
2 Required
Design Series D

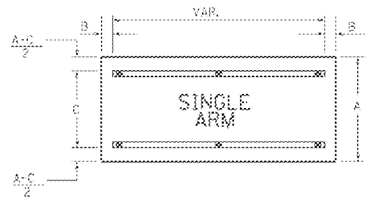
SUPPORTING CHANNELS



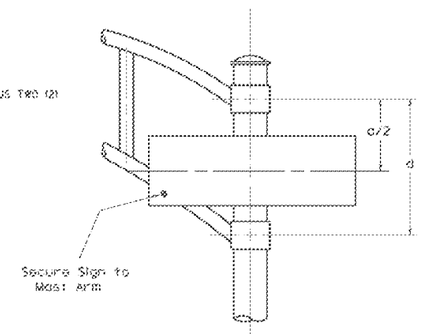
A	B	C
18"	2"	14"



SUPPORTING CHANNELS



A	B	C
18"	2"	12"
30"	2"	22"



GENERAL NOTES

1. WHERE MAST ARM MOUNTED STREET NAME SIGNS ARE SPECIFIED, THE MAST ARM ASSEMBLY AND POLES SHALL BE DESIGNED TO SUPPORT THE LOADINGS CALLED FOR ON STANDARDS 834001, 834006 AND 834011, AS APPLICABLE, PLUS TWO (2) SIGN PANELS 2'-6" x 6'-0" MOUNTED AS SHOWN. THE DESIGN SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" AS PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS FOR 80 M.P.H. WIND VELOCITY.
2. ALL SIGNS SHALL HAVE A WHITE REFLECTORIZED LEGEND AND BORDER ON A GREEN REFLECTORIZED BACKGROUND, TYPE A SHEETING.
3. THE SIGN LENGTH SHOULD BE INCREASED IN 6-INCH INCREMENTS, BUT THE OVERALL LENGTH SHOULD NOT EXCEED 6'-0".
4. ALL BORDERS SHALL BE ¾" WIDE AND CORNER RADIUS SHALL BE 2-¼".
5. SIGNFIX ALUMINUM CHANNEL FRAMING SYSTEM SHALL BE USED FOR ALL SIGNS ATTACHED TO SIGNAL POLES AND POSTS. LOCAL SUPPLIERS OF THE SIGNFIX ALUMINUM CHANNEL FRAMING SYSTEM ARE:
   - * A.K.T. CORPORATION, SCHAUMBURG, IL
   - * AMERICAN FABRICATION CO., CHICAGO HEIGHTS, IL
   - * THICKER COMPANY, INC., WAUKEGAN, WI
   - * WESTERN TRAFFIC CONTROL INC., CICERO, IL

PARTS LISTING

SIGN CHANNEL	PART #MP6053 (MED. CHANNEL)
SIGN SCREWS	¼" x 14 x 1" H.W.H. #3 SELF TAPPING WITH NEOPRENE WASHER
BRACKETS	PART #MP6034 (UNIVERSAL) CHANNEL CLAMPS WITH STAINLESS STEEL STRAPPING

OTHER BRANDS OF MOUNTING HARDWARE ARE ACCEPTABLE, BASED UPON THE DEPARTMENT'S APPROVAL AND COMPATIBILITY WITH THE CHANNEL/BRACKET OF THE ABOVE PRODUCT.

SIGNFIX ALUMINUM CHANNEL FRAMING SYSTEM

Shall be used. See Note #5.

EXAMPLE, 2 ③ DENOTES 3⅜"

Upper Case to Lower Case
Spacing Chart 8-6 Inch Series "C & D"

First Letter	SECOND LETTER: a c d e g o q		b h i k l m n p r u		f w		j		s t		v y		x		z	
SERIES	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
A W X	1²	1⁴	1⁴	1⁵	1²	1⁴	0⁹	1⁰	1¹	1⁴	0⁹	1⁰	1¹	1²	1²	1⁴
B	1⁴	1⁵	2⁰	2¹	1⁴	1⁵	1¹	1²	1⁴	1⁵	1²	1⁴	1²	1⁴	1⁶	1⁷
C E G	1⁴	1⁵	2⁰	2¹	1²	1⁴	0⁹	1⁰	1²	1⁴	1²	1⁴	1⁴	1⁵	1⁴	1⁵
D O Q R	1⁴	1⁵	2⁰	2¹	1⁴	1⁵	0⁹	1⁰	1²	1⁴	1²	1⁴	1⁴	1⁵	1⁴	1⁵
F	0⁵	0⁶	1⁴	1⁵	0⁹	1⁰	0⁵	0⁶	0⁶	1⁰	0⁵	1⁰	0⁶	1⁰	1¹	1²
H I M N	2⁰	2¹	2²	2⁴	2⁰	2¹	1⁴	1⁵	1⁵	1⁷	1⁶	1⁷	2⁰	2¹	2⁰	2¹
J U	2⁰	2¹	2⁰	2¹	1⁶	1⁷	1⁴	1⁵	1⁶	1⁷	1⁶	1⁷	1⁶	1⁷	2⁰	2¹
K L	1¹	1²	1⁶	1⁷	1¹	1²	0⁵	0⁶	1¹	1²	1¹	1²	1²	1²	1²	1⁴
P	1²	1⁴	1⁴	1⁵	1²	1⁴	0⁹	0⁶	1¹	1²	1¹	1²	1⁴	1⁵	1⁴	1⁴
S	1²	1⁴	1⁶	1⁷	1²	1⁴	0⁶	1⁰	1²	1⁴	1²	1⁴	1⁴	1⁵	1²	1⁴
T	1¹	1²	1⁶	1⁷	0⁶	1⁰	0⁶	1⁰	1¹	1²	1¹	1²	1²	1²	1²	1⁴
V	0⁶	1⁰	1⁴	1⁵	1¹	1²	0⁶	1⁰	1²	1⁴	1²	1⁴	1²	1⁴	1²	1⁴
Y	0⁵	0⁶	1⁴	1⁵	0⁶	1⁰	0⁵	0⁶	0⁵	0⁷	0⁵	0⁶	0⁶	1⁰	1¹	1²
Z	1⁶	1⁷	2²	2⁴	1⁶	1⁷	1²	1⁴	1⁵	1⁷	1⁶	1⁷	1⁶	1⁷	2⁰	2¹

Lower Case to Lower Case
Spacing Chart 6 Inch Series "C & D"

First Letter	SECOND LETTER: a c d e g o q		b h i k l m n p r u		f w		j		s t		v y		x		z	
SERIES	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
a d n g i j l m n q u	1⁶	1⁷	2²	2⁴	1⁶	1⁷	1²	1⁴	1⁶	1⁵	1⁴	1⁵	1⁶	1⁷	1⁶	1⁷
b f k o p s	1²	1⁴	1⁶	1⁷	1¹	1²	0⁹	0⁶	1¹	1²	1¹	1²	1²	1⁴	1²	1⁴
c e	1²	1⁴	1⁶	1⁷	1²	1⁴	0⁶	1⁰	1²	1⁴	1²	1⁴	1²	1⁴	1²	1⁴
r	0⁶	1⁰	1²	1⁴	0⁶	1⁰	0³	0³	0⁵	0⁶	0⁵	0⁶	0⁶	1⁰	0⁶	1⁰
t z	1²	1⁴	1⁶	1⁷	1²	1⁴	0⁶	1⁰	1¹	1²	1¹	1²	1²	1⁴	1²	1⁴
v y	1¹	1²	1⁴	1⁵	1¹	1²	0⁵	0⁶	1¹	1²	1¹	1²	1¹	1²	1²	1²
w	1¹	1²	1⁴	1⁵	1¹	1²	0⁵	0⁶	1¹	1²	1¹	1²	1¹	1²	1²	1⁴
x	1²	1⁴	1⁶	1⁷	1¹	1²	0⁵	0⁶	1¹	1²	1¹	1²	1¹	1²	1²	1⁴

Number to Number
Spacing Chart 8 Inch Series "C & D"

First Number	SECOND NUMBER: 0		1		2		3		4		5		6		7		8		9	
SERIES	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
0 9	1⁶	1⁷	1⁶	1⁷	1⁴	1⁵	1²	1⁴	1⁴	1⁵	1⁴	1⁵	1⁶	1⁷	1²	1⁴	1⁶	1⁷	1⁶	1⁷
1	2⁰	2¹	2⁰	2¹	2⁰	2¹	1⁶	1⁷	1⁴	1⁶	2⁰	2¹	2⁰	2¹	1⁴	1⁵	2⁰	2¹	2⁰	2¹
2 3 4	1⁴	1⁵	1⁴	1⁵	1⁴	1⁵	1²	1⁴	1²	1⁴	1⁴	1⁵	1⁴	1⁵	1¹	1²	1⁶	1⁷	1⁴	1⁵
5	1⁴	1⁵	1⁴	1⁵	1⁴	1⁵	1¹	1²	1¹	1²	1⁶	1⁷	1⁴	1⁵	1¹	1²	1⁶	1⁷	1⁴	1⁵
6	1⁶	1⁷	1⁶	1⁷	1⁴	1⁵	1²	1⁴	1²	1⁴	1⁶	1⁷	1⁴	1⁵	1¹	1²	1⁶	1⁷	1⁴	1⁵
7	1²	1⁴	1²	1⁴	1⁴	1⁵	1²	1⁴	0⁹	0⁶	1²	1⁴	1⁴	1⁵	1¹	1²	1⁴	1⁵	1²	1⁴
8	1⁶	1⁷	1⁶	1⁷	1⁴	1⁵	1²	1⁴	1²	1⁴	1⁶	1⁷	1⁶	1⁷	1²	1⁴	1⁶	1⁷	1⁴	1⁵

UPPER AND LOWER CASE LETTER WIDTHS

LETTERS	6 INCH UPPER CASE LETTERS SERIES C	6 INCH UPPER CASE LETTERS SERIES D	8 INCH UPPER CASE LETTERS SERIES C	8 INCH UPPER CASE LETTERS SERIES D	LETTERS	6 INCH LOWER CASE LETTERS SERIES C	6 INCH LOWER CASE LETTERS SERIES D
A	3⁶	5⁰	5⁰	6⁸	a	3⁵	4²
B	3²	4⁰	4³	5³	b	3⁵	4²
C	3²	4⁰	4³	5³	c	3⁵	4¹
D	3²	4⁰	4³	5³	d	3⁵	4²
E	3⁰	3⁸	4⁰	4⁷	e	3⁵	4²
F	3⁰	3⁸	4⁰	4⁷	f	2³	2⁸
G	3²	4⁰	4³	5³	g	3²	4²
H	3²	4⁰	4³	5³	h	3²	4²
I	0⁷	0⁷	1¹	1²	i	1¹	1¹
J	3⁰	3⁸	4⁰	5⁰	j	2⁰	2²
K	3²	4¹	4³	5⁴	k	3⁵	4²
L	3⁰	3⁸	4⁰	4⁷	l	1³	1³
M	3⁷	4⁸	5¹	6¹	m	6⁰	7⁰
N	3²	4⁰	4³	5³	n	3⁵	4²
O	3⁴	4²	4⁵	5⁵	o	3⁶	4³
P	3²	4⁰	4³	5³	p	3⁵	4²
Q	3⁴	4²	4⁵	5⁵	q	3⁵	4²
R	3²	4⁰	4³	5³	r	2⁶	3²
S	3²	4⁰	4³	5³	s	3⁶	4²
T	3⁰	3⁸	4⁰	4⁷	t	2⁷	3²
U	3²	4⁰	4³	5³	u	3⁵	4²
V	3⁶	4⁶	4⁷	6⁰	v	4⁰	4²
W	4⁴	5²	6⁰	7⁶	w	5⁶	5⁴
X	3⁴	4⁰	4⁵	5³	x	4⁴	5¹
Y	3⁶	5⁰	5⁰	6⁸	y	4⁶	5³
Z	3²	4⁰	4³	5³	z	3⁶	4³

NUMBERS	6 INCH SERIES C	6 INCH SERIES D	8 INCH SERIES C	8 INCH SERIES D
1	1²	1⁴	1⁵	2⁰
2	3²	4⁰	4³	5³
3	3²	4⁰	4⁵	5³
4	3⁵	4⁵	4⁷	5⁷
5	3²	4⁰	4³	5³
6	3²	4⁰	4³	5³
7	3²	4⁰	4³	5³
8	3²	4⁰	4³	5³
9	3²	4⁰	4³	5³
0	3⁴	4²	4⁵	5⁵

REVISIONS	
NAME	DATE
CREATED	2/14
D.A.Z./ D.A.C.	11/96
	5/98
CADD	10/01/00

ILLINOIS DEPARTMENT OF TRANSPORTATION

DISTRICT 1
MAST ARM MOUNTED
STREET NAME SIGNS

SCALE: NONE

DRAWN BY TJH
CHECKED BY RFK

TS 2

State of Illinois
Deparment of Transportation
Estimate of Cost

FA Number: 1602
Section: 2008-054 TS
County: COOK

The proposed improvement consists of the traffic signal system modernization at the intersection of IL Route 83 and 147th Street in Cook County.

CODE NUMBER	UNIT	ITEM	QUANTITY	UNIT PRICE	TOTAL PRICE
42400200	SQ FT	PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	3842	$8.00	$30,736.00
42400800	SQ FT	DETECTABLE WARNINGS	431	$30.00	$12,930.00
44000600	SQ FT	SIDEWALK REMOVAL	3796	$6.00	$22,776.00
44001700	FOOT	COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	472	$35.00	$16,520.00
44003500	SQ FT	MEDIAN REMOVAL AND REPLACEMENT, SPECIAL	256	$15.00	$3,840.00
67000400	CAL MO	ENGINEER'S FIELD OFFICE, TYPE A	7	$1,000.00	$7,000.00
67100100	LSUM	MOBILIZATION	1	$20,000.00	$20,000.00
70102620	LSUM	TRAFFIC CONTROL AND PROTECTION, STANDARD 701501	1	$12,500.00	$12,500.00
70102635	LSUM	TRAFFIC CONTROL AND PROTECTION, STANDARD 701701	1	$12,500.00	$12,500.00
72000100	SQ FT	SIGN PANEL - TYPE 1	86	$30.00	$2,580.00
72000200	SQ FT	SIGN PANEL - TYPE 2	100	$40.00	$4,000.00
78000400	FOOT	THERMOPLASTIC PAVEMENT MARKING - LINE 6"	390	$6.00	$2,340.00
78000600	FOOT	THERMOPLASTIC PAVEMENT MARKING - LINE 12"	102	$12.00	$1,224.00
78300400	SQ FT	THERMOPLASTIC PAVEMENT MARKING REMOVAL	212	$5.00	$1,060.00
81000600	FOOT	CONDUIT IN TRENCH, 2" DIA., GALVANIZED STEEL	5929	$25.00	$148,225.00
81000700	FOOT	CONDUIT IN TRENCH, 2 1/2" DIA., GALVANIZED STEEL	322	$30.00	$9,660.00
81000800	FOOT	CONDUIT IN TRENCH, 3" DIA., GALVANIZED STEEL	136	$35.00	$4,760.00
81001000	FOOT	CONDUIT IN TRENCH, 4" DIA., GALVANIZED STEEL	263	$38.00	$9,994.00
81001100	FOOT	CONDUIT IN TRENCH, 5" DIA., GALVANIZED STEEL	30	$45.00	$1,350.00
81018500	FOOT	CONDUIT PUSHED, 2" DIA., GALVANIZED STEEL	2602	$30.00	$78,060.00
81018900	FOOT	CONDUIT PUSHED, 4" DIA., GALVANIZED STEEL	1517	$42.00	$63,714.00
81400100	EACH	HANDHOLE	39	$2,000.00	$78,000.00
81400200	EACH	HEAVY-DUTY HANDHOLE	10	$2,500.00	$25,000.00
81400300	EACH	DOUBLE HANDHOLE	8	$3,300.00	$26,400.00
81900200	FOOT	TRENCH AND BACKFILL FOR ELECTRICAL WORK	7164	$4.00	$28,656.00
85000200	EACH	MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION	5	$5,000.00	$25,000.00
85700205	EACH	FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL	6	$22,000.00	$132,000.00
85700505	EACH	FULL-ACTUATED CONTROLLER IN EXISTING CABINET, SPECIAL	1	$4,500.00	$4,500.00
86400100	EACH	TRANSCEIVER - FIBER OPTIC	7	$4,000.00	$28,000.00
87301215	FOOT	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 2C	2109	$2.00	$4,218.00
87301225	FOOT	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 3C	5572	$2.75	$15,323.00
87301245	FOOT	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 5C	12036	$3.50	$42,126.00
87301255	FOOT	ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 7C	2749	$4.25	$11,683.25
87301305	FOOT	ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 14. 1 PR	12469	$2.50	$31,172.50
87301805	FOOT	ELECTRIC CABLE IN CONDUIT, SERVICE, NO. 6 2C	1527	$4.00	$6,108.00
87502440	EACH	TRAFFIC SIGNAL POST, GALVANIZED STEEL, 10 FT.	1	$900.00	$900.00
87502480	EACH	TRAFFIC SIGNAL POST, GALVANIZED STEEL, 14 FT	8	$1,000.00	$8,000.00
87502500	EACH	TRAFFIC SIGNAL POST, GALVANIZED STEEL, 16 FT	2	$1,100.00	$2,200.00
87700160	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 24 FT.	1	$6,500.00	$6,500.00
87700170	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 26 FT.	4	$6,700.00	$26,800.00
87700180	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 28 FT.	1	$6,900.00	$6,900.00
87700190	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 30 FT.	1	$7,100.00	$7,100.00
87700210	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 34 FT.	4	$7,500.00	$30,000.00
87700220	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 36 FT.	4	$7,700.00	$30,800.00
87700230	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 38 FT.	1	$7,900.00	$7,900.00
87700250	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 42 FT.	1	$8,500.00	$8,500.00
87700280	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 48 FT.	4	$8,900.00	$35,600.00
87700290	EACH	STEEL MAST ARM ASSEMBLY AND POLE, 50 FT.	1	$9,500.00	$9,500.00
87800100	FOOT	CONCRETE FOUNDATION, TYPE A	32	$250.00	$8,000.00
87800150	FOOT	CONCRETE FOUNDATION, TYPE C	24	$500.00	$12,000.00
87800400	FOOT	CONCRETE FOUNDATION, TYPE E 30-INCH DIAMETER	90	$300.00	$27,000.00
87800415	FOOT	CONCRETE FOUNDATION, TYPE E 36-INCH DIAMETER	240	$350.00	$84,000.00
87900200	EACH	DRILL EXISTING HANDHOLE	1	$300.00	$300.00
88030020	EACH	SIGNAL HEAD, LED, 1-FACE, 3-SECTION, MAST ARM MOUNTED	53	$1,100.00	$58,300.00
88030050	EACH	SIGNAL HEAD, LED, 1-FACE, 3-SECTION, BRACKET MOUNTED	14	$1,200.00	$16,800.00
88030100	EACH	SIGNAL HEAD, LED, 1-FACE, 5-SECTION, BRACKET MOUNTED	8	$1,800.00	$14,400.00
88030110	EACH	SIGNAL HEAD, LED, 1-FACE, 5-SECTION, MAST ARM MOUNTED	8	$1,900.00	$15,200.00
88030210	EACH	SIGNAL HEAD, LED, 2-FACE, 3-SECTION, BRACKET MOUNTED	8	$2,000.00	$16,000.00
88102717	EACH	PEDESTRIAN SIGNAL HEAD, LED, 1-FACE, BRACKET MOUNTED WITH COUNTDOWN TIM	6	$1,200.00	$7,200.00
88102747	EACH	PEDESTRIAN SIGNAL HEAD, LED, 2-FACE, BRACKET MOUNTED WITH COUNTDOWN TIM	16	$1,800.00	$28,800.00
88200210	EACH	TRAFFIC SIGNAL BACKPLATE, LOUVERED, ALUMINUM	61	$175.00	$10,675.00
88500100	EACH	INDUCTIVE LOOP DETECTOR	51	$250.00	$12,750.00
88600100	FOOT	DETECTOR LOOP, TYPE I	3435	$18.00	$61,830.00
88800100	EACH	PEDESTRIAN PUSH-BUTTON	22	$350.00	$7,700.00
89000100	EACH	TEMPORARY TRAFFIC SIGNAL INSTALLATION	3	$50,000.00	$150,000.00
89501400	EACH	RELOCATE EMERGENCY VEHICLE PRIORITY SYSTEM, DETECTOR UNIT	8	$400.00	$3,200.00
89501410	EACH	RELOCATE EMERGENCY VEHICLE PRIORITY SYSTEM, PHASING UNIT	4	$250.00	$1,000.00
89502375	EACH	REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT	7	$5,000.00	$35,000.00
89502380	EACH	REMOVE EXISTING HANDHOLE	51	$450.00	$22,950.00
89502385	EACH	REMOVE EXISTING CONCRETE FOUNDATION	49	$300.00	$14,700.00

State of Illinois
Deparment of Transportation
Estimate of Cost

FA Number: 1602
Section: 2008-054 TS
County: COOK

The proposed improvement consists of the traffic signal system modernization at the intersection of IL Route 83 and 147th Street in Cook County.

CODE NUMBER	UNIT	ITEM	QUANTITY	UNIT PRICE	TOTAL PRICE
X0322256	SQ FT	TEMPORARY INFORMATION SIGNING	102.8	$30.00	$3,084.00
X0322925	FOOT	ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C	6536	$1.50	$9,804.00
X0325134	EACH	WIRELESS INTERCONNECT (COMPLETE)	1	$15,000.00	$15,000.00
X0325705	EACH	RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM LEVEL II	7	$2,000.00	$14,000.00
X0325737	EACH	TEMPORARY TRAFFIC SIGNAL TIMING	7	$5,000.00	$35,000.00
X8050015	EACH	SERVICE INSTALLATION - POLE MOUNTED	6	$1,800.00	$10,800.00
X8620020	EACH	UNINTERRUPTIBLE POWER SUPPLY	6	$10,000.00	$60,000.00
X8710020	FOOT	FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, MM12F SM12F	6666	$4.00	$26,664.00
X8730027	FOOT	ELECTRIC CABLE IN CONDUIT, GROUNDING, NO. 6 1C	4319	$2.00	$8,638.00
X8730250	FOOT	ELECTRIC CABLE IN CONDUIT, NO. 20 3C, TWISTED, SHIELDED	1170	$2.00	$2,340.00
XX000406	SQ FT	BRICK PAVER REMOVAL AND REPLACEMENT	276	$60.00	$16,560.00

TOTAL ESTIMATED COST OF WORK
INCLUDING ALL LABOR, MATERIAL & PROFITS **TOTAL** **$1,914,350.75**

Date: 9/1/2009

By: (Name)
Consultant

Examined: _____
District Engineer

APPENDIX A-2

Sample Plan Set 2
Temporary Traffic Signal Installation IL Route 58 (Golf Rd.) at New Wilke Rd.

NOTES FOR TEMPORARY TRAFFIC SIGNALS

1. ALL CONTROL EQUIPMENT INCLUDING EMERGENCY PRE-EMPTION AND COMMUNICATION DEVICES FOR THE TEMPORARY TRAFFIC SIGNAL(S) SHALL BE FURNISHED BY THE CONTRACTOR.

2. ONLY CONTROLLERS SUPPLIED BY ONE OF THE DISTRICT APPROVED CLOSED LOOP EQUIPMENT MANUFACTURERS WILL BE APPROVED FOR USE AT TEMPORARY SIGNAL LOCATIONS. ALL CONTROLLERS USED FOR TEMPORARY TRAFFIC SIGNALS SHALL BE FULLY ACTUATED NEMA MICROPROCESSOR BASED WITH RS232 DATA ENTRY PORTS COMPATIBLE WITH EXISTING MONITORING SOFTWARE APPROVED BY IDOT DISTRICT 1. INSTALLED IN A NEMA TS2 CABINET. ONLY ONE BRAND OF CONTROLLER WILL BE ACCEPTED FOR ANY ONE CONTRACT.

3. ALL TRAFFIC SIGNAL SECTIONS AND PEDESTRIAN SIGNAL SECTIONS SHALL BE LED AND 12" (300mm) DIAMETER. HEADS SHALL BE PLACED AS INDICATED ON THE TEMPORARY TRAFFIC SIGNAL PLAN OR AS DIRECTED BY THE ENGINEER. PEDESTRIAN SIGNALS SHALL INCLUDE SOLID INTERNATIONAL SYMBOLS. PEDESTRIAN SIGNALS WITH COUNTDOWN TIMERS SHALL BE USED WHEN THE EXISTING INSTALLATION UTILIZES COUNTDOWN TYPE OR AS DIRECTED BY THE ENGINEER. COUNTDOWN TYPE PEDESTRIAN SIGNALS ARE NOT TO BE INSTALLED AT A RAILROAD INTERSECTION. THE CONTRACTOR SHALL FURNISH ENOUGH CABLE SLACK TO RELOCATE HEADS TO ANY POSITION ON THE SPAN WIRE OR AT LOCATIONS ILLUSTRATED ON THE PLANS FOR CONSTRUCTION STAGING. THE TEMPORARY TRAFFIC SIGNAL SHALL REMAIN IN OPERATION DURING ALL SIGNAL HEAD RELOCATIONS. EACH TEMPORARY TRAFFIC SIGNAL HEAD SHALL HAVE ITS OWN CABLE FROM THE CONTROLLER CABINET TO THE SIGNAL HEAD.

4. ALL EXISTING STREET NAME AND INTERSECTION REGULATORY SIGNS SHALL BE REMOVED FROM EXISTING POLES, RELOCATED AND SECURELY FASTENED TO THE SPAN WIRE OR WOOD POLE AS DIRECTED BY THE ENGINEER.

5. ANY TEMPORARY SIGNAL WITHIN AN EXISTING CLOSED LOOP TRAFFIC SIGNAL SYSTEM SHALL BE INTERCONNECTED TO THAT SYSTEM USING SIMILAR BRAND CONTROL EQUIPMENT.

6. THE TEMPORARY TRAFFIC SIGNAL SHALL HAVE THE SIGNAL HEAD DISPLAYS, SIGNAL HEAD PLACEMENTS AND CONTROLLER PHASING MATCH THE EXISTING TRAFFIC SIGNAL, AT THE TIME OF THE TURN ON, IF NO TRAFFIC STAGING IS IN PLACE OR WILL NOT BE STAGED ON THE DAY OF THE TURN ON.

7. UNINTERRUPTIBLE POWER SUPPLY (UPS) SYSTEMS SHALL BE INSTALLED AND MADE OPERATIONAL AT TEMPORARY TRAFFIC SIGNAL INSTALLATIONS WHERE UPS IS INSTALLED AT THE EXISTING TRAFFIC SIGNAL, TEMPORARY TRAFFIC SIGNALS AT RAILROAD INTERSECTIONS, AND TEMPORARY TRAFFIC SIGNALS AT INTERSECTIONS WITH FIRE STATION ACTUATED EMERGENCY VEHICLE PRE-EMPTION, OR WHEN INDICATED ON THE PLANS.

8. TRAFFIC SIGNAL MANAGEMENT SYSTEMS SHALL BE MAINTAINED IN OPERATION AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. REQUIRED EQUIPMENT SHALL BE AS SHOWN ON THE PLANS AND THE CONTRACTOR SHALL PLACE THE EQUIPMENT IN OPERATION TO THE SATISFACTION OF THE ENGINEER AND THE AGENCY RESPONSIBLE FOR THE TRAFFIC SIGNAL MANAGEMENT SYSTEM.

9. DETECTION AT TEMPORARY TRAFFIC SIGNALS SHALL BE INCLUDED FOR ALL APPROACHES OF THE INTERSECTION UNLESS INDICATED OTHERWISE ON THE PLANS. THE DETECTION SYSTEM MUST MEET THE SPECIFICATIONS OF DISTRICT 1 AND THE CONTRACTOR SHALL PLACE THE DETECTORS INTO OPERATION TO THE SATISFACTION OF THE ENGINEER.

10. WHEN PAN, TILT, ZOOM CAMERAS ARE INSTALLED AT THE EXISTING INTERSECTION OR ARE CALLED FOR IN THE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING THE CAMERAS TO THE SATISFACTION OF THE ENGINEER AND THE AGENCY RESPONSIBLE FOR THE CAMERAS.

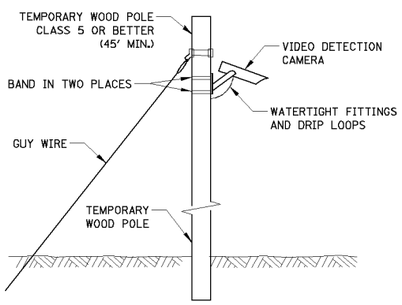
THE FOLLOWING EXISTING TRAFFIC SIGNAL EQUIPMENT SHALL BE REMOVED BY THE CONTRACTOR AND SHALL REMAIN THE PROPERTY OF THE AGENCY LISTED BELOW. THE CONTRACTOR SHALL SAFELY STORE AND ARRANGE FOR PICK UP OF ALL EQUIPMENT TO BE RETURNED TO THE LISTED AGENCY AS PER THE TRAFFIC SIGNAL SPECIFICATIONS.

AGENCY: CITY OF ROLLING MEADOWS

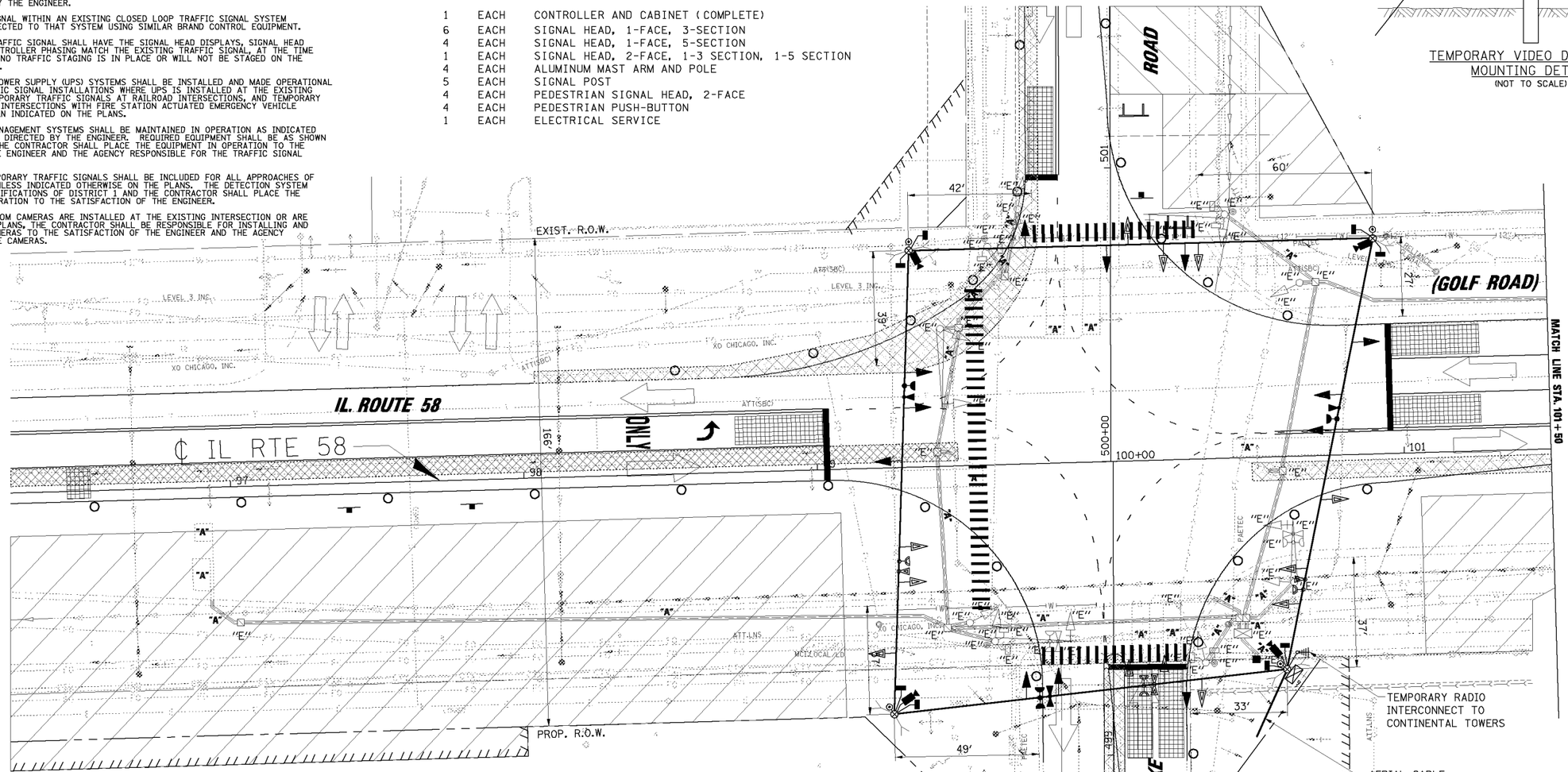
2	EACH	LIGHT DETECTOR
1	EACH	LIGHT DETECTOR AMPLIFIER

THE FOLLOWING ITEMS SHALL BE REMOVED BY THE CONTRACTOR AND SHALL BE DISPOSED OF BY THEM OUTSIDE THE RIGHT-OF-WAY AT THEIR EXPENSE. THE SALVAGE VALUE OF THE REMOVED EQUIPMENT SHALL BE REFLECTED IN THE CONTRACT BID PRICE.

1	EACH	CONTROLLER AND CABINET (COMPLETE)
6	EACH	SIGNAL HEAD, 1-FACE, 3-SECTION
4	EACH	SIGNAL HEAD, 1-FACE, 5-SECTION
1	EACH	SIGNAL HEAD, 2-FACE, 1-3 SECTION, 1-5 SECTION
4	EACH	ALUMINUM MAST ARM AND POLE
5	EACH	SIGNAL POST
4	EACH	PEDESTRIAN SIGNAL HEAD, 2-FACE
4	EACH	PEDESTRIAN PUSH-BUTTON
1	EACH	ELECTRICAL SERVICE



TEMPORARY VIDEO DETECTION MOUNTING DETAIL
(NOT TO SCALE)



CONSTRUCTION NOTES:

1. ALL PEDESTRIAN SIGNAL HEADS SHALL BE BAGGED AND DISCONNECT WHEN EXISTING PAVEMENT IS REMOVED.

2. ALL PEDESTRIAN SIGNAL HEADS SHALL REMAIN BAGGED UNTIL THE PAVEMENT IS RESTORED TO PROVIDE A SAFE CROSSING AREA.

3. PEDESTRIAN SIGNAL HEADS AT THIS LOCATION SHALL BE DETERMINED BY THE RESIDENT ENGINEER ON LOCATION.

4. TEMPORARY RADIO INTERCONNECT SHALL NOT BE REMOVED UNTIL FIBER INTERCONNECT TO IL. ROUTE 62 (ALGONQUIN RD.) IS INSTALLED AND OPERATIONAL.

RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - GMZ	REVISED -
	PLOT DATE =	DATE - 10/21/08	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY TRAFFIC SIGNAL INSTALLATION AND REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT PLAN – STAGE I & II
IL RTE 58 (GOLF RD.) AT NEW WILKE ROAD

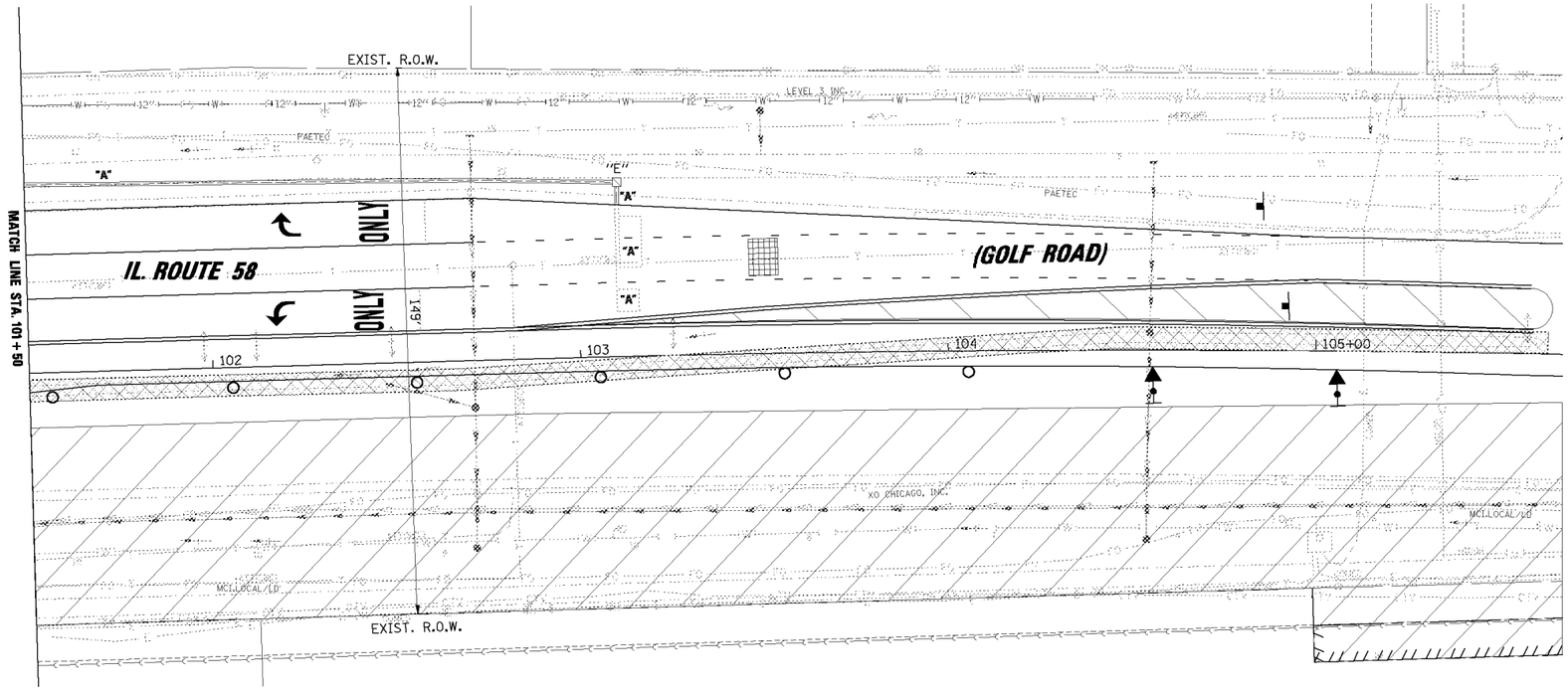
SCALE: 1" = 20' | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
0559	00-00078-00-CH	COOK		
		CONTRACT NO. 83735		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

N

20 0 10 20 30

SCALE IN FEET



FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - GMZ	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

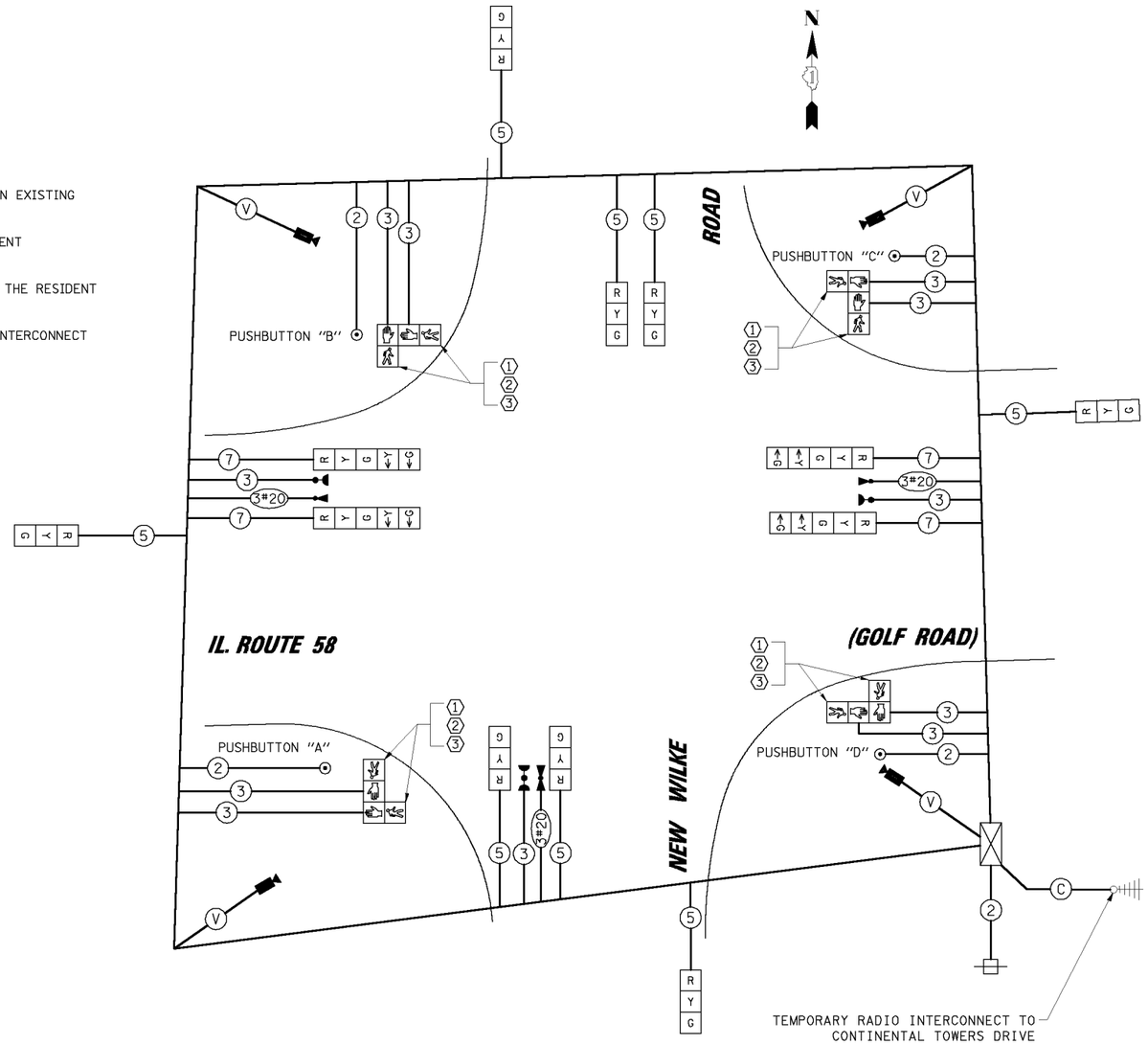
TEMPORARY TRAFFIC SIGNAL INSTALLATION AND REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT PLAN – STAGE I & II
IL RTE 58 (GOLF RD.) AT NEW WILKE ROAD

SCALE: 1" = 20' | SHEET NO. OF SHEETS | STA. | TO STA.

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
0559	00-00078-00-CH	COOK		
		CONTRACT NO. 83735		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

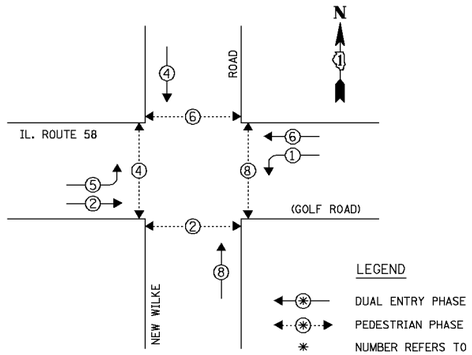
CONSTRUCTION NOTES:

1. ALL PEDESTRISAN SIGNAL HEADS SHALL BE BAGGED AND DISCONNECT WHEN EXISTING PAVEMENT IS REMOVED.
2. ALL PEDESTRIAN SIGNAL HEADS SHALL REMAIN BAGGED UNTIL THE PAVEMENT IS RESTORED TO PROVIDE A SAFE CROSSING AREA.
3. PEDESTRIAN SIGNAL HEADS AT THIS LOCATION SHALL BE DETERMINED BY THE RESIDENT ENGINEER ON LOCATION.
4. TEMPORARY RADIO INTERCONNECT SHALL NOT BE REMOVED UNTIL FIBER INTERCONNECT TO IL. ROUTE 62 (ALGONQUIN RD.) IS INSTALLED AND OPERATIONAL.



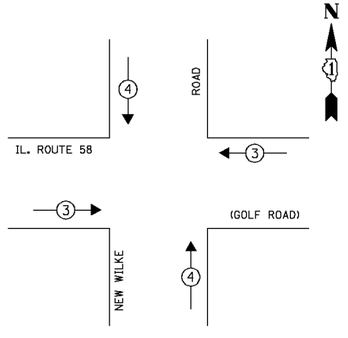
TEMPORARY CABLE PLAN
STAGE I AND II

TEMPORARY CONTROLLER SEQUENCE



TEMPORARY PHASE DESIGNATION DIAGRAM
STAGE I AND II

TEMPORARY EMERGENCY VEHICLE PREEMPTION SEQUENCE
STAGE I AND II



TEMPORARY EMERGENCY VEHICLE PREEMPTORS		
EMERGENCY VEHICLE PREEMPTOR	3	4
MOVEMENT	← →	↓ ↑

NOTE:
PUSHBUTTON "A" SHALL PLACE A CALL IN PHASES 2 AND 4.
PUSHBUTTON "B" SHALL PLACE A CALL IN PHASES 4 AND 6.
PUSHBUTTON "C" SHALL PLACE A CALL IN PHASES 6 AND 8.
PUSHBUTTON "D" SHALL PLACE A CALL IN PHASES 2 AND 8.

RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.

I.D.O.T. TRAFFIC SIGNAL INSTALLATION ELECTRICAL SERVICE REQUIREMENTS					TOTAL WATTAGE
TYPE	NO. OF LAMPS	WATTAGE x INCAND.	WATTAGE LED	x % OPERATION	
SIGNAL (RED)	12		17	0.50	102.00
(YELLOW)	12		25	0.25	75.00
(GREEN)	12		15	0.25	45.00
ARROW	8		12	0.10	9.60
PED. SIGNAL	6		25	1.00	150.00
CONTROLLER	1		100	1.00	100.00
ILLUM. SIGN	-		25	0.05	
VIDEO SYSTEM	1	150		1.00	150.00
FLASHER				0.50	-
ENERGY COSTS TO:				TOTAL =	631.60

ILLINOIS DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY/DISTRICT 1
201 WEST CENTER COURT/SCHAUMBURG, ILLINOIS 60196-1096
ENERGY SUPPLY: CONTACT: DEAN MARTINEZ
PHONE: (630) 691-4869
COMPANY: COMED

STAGE I & II

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - GMZ	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY CABLE PLAN, TEMPORARY PHASE DESIGNATION DIAGRAM AND TEMPORARY EMERGENCY VEHICLE PREEMPTION SEQUENCE
IL RTE 58 (GOLF RD.) AT NEW WILKE ROAD
SCALE: N.T.S. | SHEET NO. OF SHEETS | STA. TO STA.

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
0559	00-00078-00-CH	COOK		
		CONTRACT NO. 83735		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.

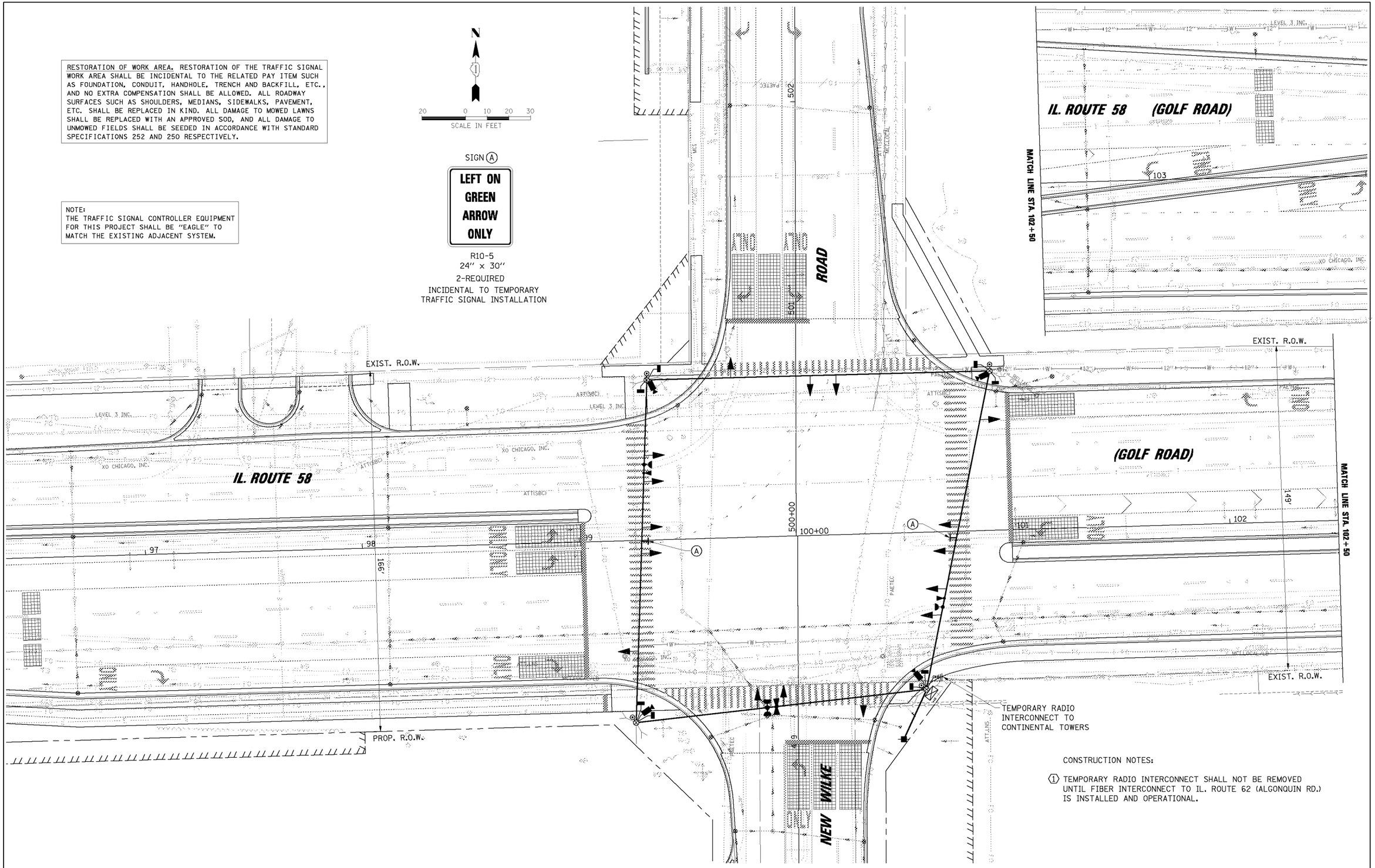
N

20 0 10 20 30
SCALE IN FEET

SIGN (A)

LEFT ON GREEN ARROW ONLY

R10-5
24" x 30"
2-REQUIRED
INCIDENTAL TO TEMPORARY
TRAFFIC SIGNAL INSTALLATION



CONSTRUCTION NOTES:

(1) TEMPORARY RADIO INTERCONNECT SHALL NOT BE REMOVED UNTIL FIBER INTERCONNECT TO IL. ROUTE 62 (ALGONQUIN RD.) IS INSTALLED AND OPERATIONAL.

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - GMZ	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY TRAFFIC SIGNAL INSTALLATION PLAN
STAGE 3 / INTERIM
IL RTE 58 (GOLF RD.) AT NEW WILKE ROAD

SCALE: 1" = 20' | SHEET NO. OF SHEETS | STA. TO STA.

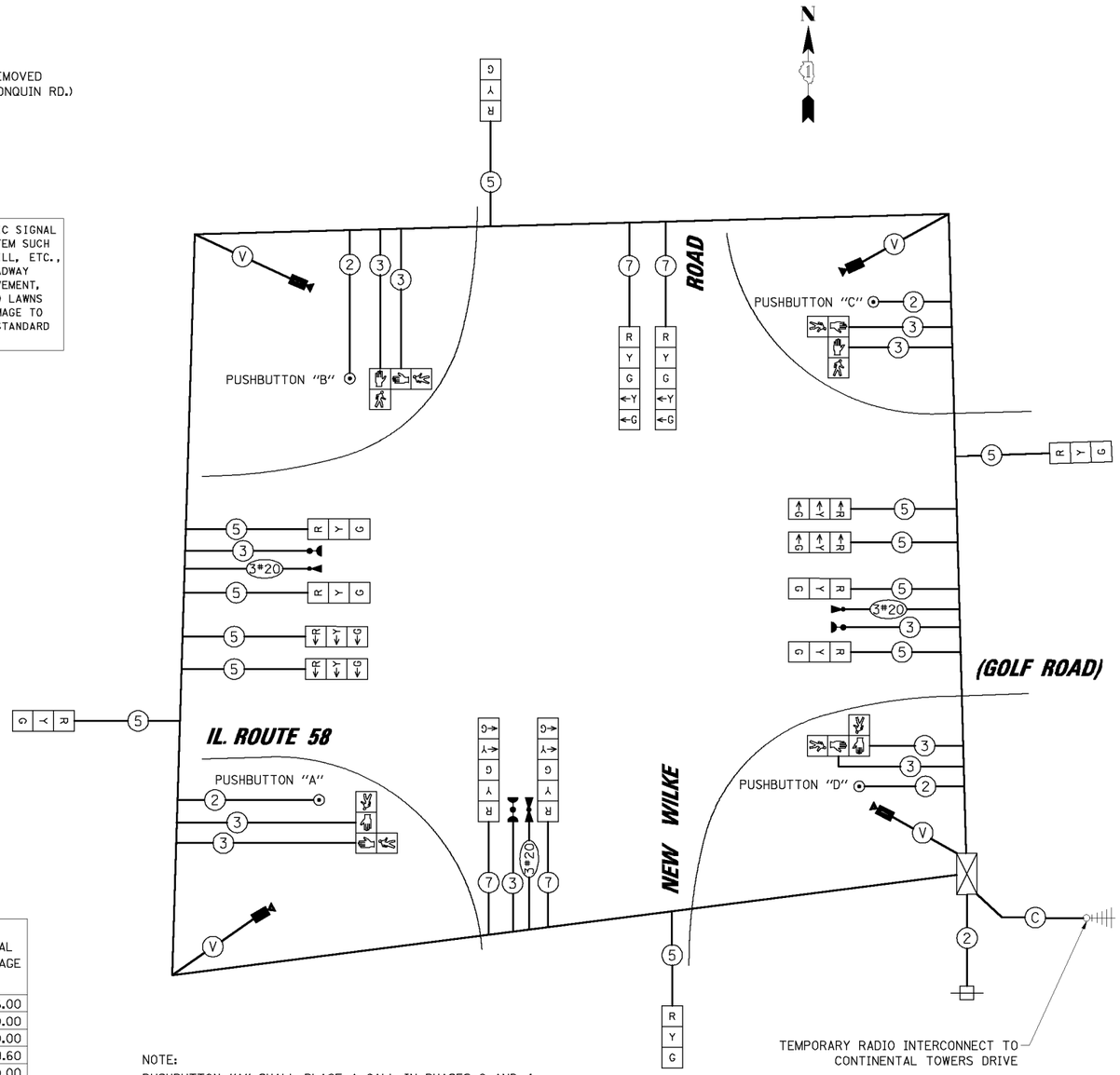
F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
0559	00-00078-00-CH	COOK		
		CONTRACT NO. 83735		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

CONSTRUCTION NOTES:

(1) TEMPORARY RADIO INTERCONNECT SHALL NOT BE REMOVED UNTIL FIBER INTERCONNECT TO IL. ROUTE 62 (ALGONQUIN RD.) IS INSTALLED AND OPERATIONAL.

RESTORATION OF WORK AREA. RESTORATION OF THE TRAFFIC SIGNAL WORK AREA SHALL BE INCIDENTAL TO THE RELATED PAY ITEM SUCH AS FOUNDATION, CONDUIT, HANDHOLE, TRENCH AND BACKFILL, ETC., AND NO EXTRA COMPENSATION SHALL BE ALLOWED. ALL ROADWAY SURFACES SUCH AS SHOULDERS, MEDIANS, SIDEWALKS, PAVEMENT, ETC. SHALL BE REPLACED IN KIND. ALL DAMAGE TO MOWED LAWNS SHALL BE REPLACED WITH AN APPROVED SOD, AND ALL DAMAGE TO UNMOWED FIELDS SHALL BE SEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 252 AND 250 RESPECTIVELY.

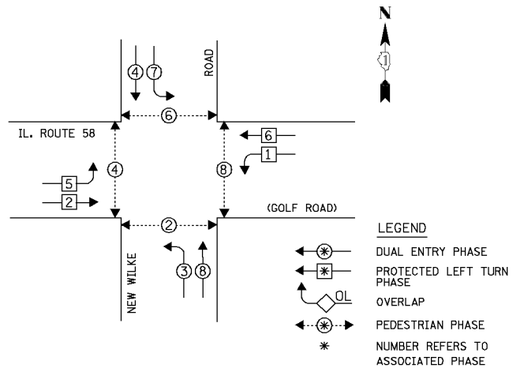
NOTE:
THE TRAFFIC SIGNAL CONTROLLER EQUIPMENT FOR THIS PROJECT SHALL BE "EAGLE" TO MATCH THE EXISTING ADJACENT SYSTEM.



NOTE:
PUSHBUTTON "A" SHALL PLACE A CALL IN PHASES 2 AND 4.
PUSHBUTTON "B" SHALL PLACE A CALL IN PHASES 4 AND 6.
PUSHBUTTON "C" SHALL PLACE A CALL IN PHASES 6 AND 8.
PUSHBUTTON "D" SHALL PLACE A CALL IN PHASES 2 AND 8.

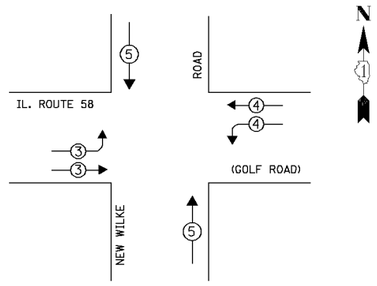
TEMPORARY CABLE PLAN
STAGE 3 / INTERIM

TEMPORARY CONTROLLER SEQUENCE



TEMPORARY PHASE DESIGNATION DIAGRAM
STAGE 3 / INTERIM

TEMPORARY EMERGENCY VEHICLE PREEMPTION SEQUENCE
STAGE 3 / INTERIM



TEMPORARY EMERGENCY VEHICLE PREEMPTORS			
EMERGENCY VEHICLE PREEMPTOR	3	4	5
MOVEMENT			

I.D.O.T. TRAFFIC SIGNAL INSTALLATION ELECTRICAL SERVICE REQUIREMENTS					TOTAL WATTAGE
TYPE	NO. OF LAMPS	WATTAGE x INCAND.	WATTAGE LED	x % OPERATION	
SIGNAL (RED)	16		17	0.50	136.00
(YELLOW)	16		25	0.25	100.00
(GREEN)	16		15	0.25	60.00
ARROW	8		12	0.10	9.60
PED. SIGNAL	8		25	1.00	200.00
CONTROLLER	1		100	1.00	100.00
ILLUM. SIGN	-		25	0.05	-
VIDEO SYSTEM	1	150		1.00	150.00
FLASHER				0.50	-
ENERGY COSTS TO:				TOTAL =	755.60

ILLINOIS DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY/DISTRICT 1
201 WEST CENTER COURT/SCHAUMBURG, ILLINOIS 60196-1096

ENERGY SUPPLY: CONTACT: DEAN MARTINEZ
PHONE: (630) 691-4869
COMPANY: COMED

STAGE 3 / INTERIM

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -
		DRAWN - FPB	REVISED -
	PLOT SCALE =	CHECKED - GMZ	REVISED -
	PLOT DATE =	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY CABLE PLAN, TEMPORARY PHASE DESIGNATION DIAGRAM AND TEMPORARY EMERGENCY VEHICLE PREEMPTION SEQUENCE
IL RTE 58 (GOLF RD.) AT NEW WILKE ROAD
SCALE: N.T.S. | SHEET NO. OF SHEETS | STA. TO STA.

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
0559	00-00078-00-CH	COOK		
		CONTRACT NO. 83735		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

APPENDIX B

LOOP DETECTOR NOTES

1. EACH PAIR OF LOOP WIRES SHALL BE PLACED IN A SEPARATE EMPTY COILABLE NONMETALLIC CONDUIT FROM THE EDGE OF PAVEMENT TO THE HANDHOLE. SPACING BETWEEN THE HOLES DRILLED IN THE PAVEMENT SHALL NOT BE LESS THAN 6'' (150 mm). EMPTY COILABLE NONMETALLIC CONDUIT SHALL BE INCLUDED IN THE COST OF THE LOOP WIRE.

2. THE NUMBER OF LOOP TURNS SHALL BE AS RECOMMENDED BY THE AMPLIFIER MANUFACTURER. ALL ADJACENT SIDES OF THE LOOPS SHALL BE INSTALLED IN SUCH A WAY THAT THE CURRENT FLOW IS IN THE SAME DIRECTION TO REINFORCE ITS MAGNETIC FIELDS FOR SMALL VEHICLE DETECTION.

3. EACH LOOP LEAD-IN SHALL BE IDENTIFIED AND PERMANENTLY TAGGED IN THE HANDHOLE. EACH LEAD-IN CABLE TAG SHALL INDICATE THE LOCATION OF THE LOOP, LOOP ROTATION (CLOCKWISE/COUNTERCLOCKWISE), LOOP LEAD-IN DIRECTION (IN OR OUT), LOOP CABLE NUMBER AND LOCATION IN CABINET, AND NUMBER OF TURNS IN THE DETECTOR LOOPS IN WATER PROOF INK AS INDICATED ON THE DISTRICT 1 STANDARD TRAFFIC SIGNAL DESIGN DETAIL. THE CONTRACTOR SHALL MARK LOOP LOCATIONS ON RECORD DRAWINGS AND PRESENT TO THE ENGINEER AFTER FINAL INSPECTION. LOOPS SHALL BE MARKED BY LANE AND LOOP NUMBER. SEE DETAIL BELOW.

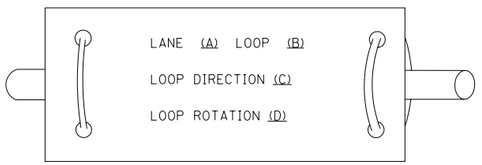
4. ALL LOOP CABLE SHALL BE FASTENED WITH PLASTIC TIE WRAP TO THE HANDHOLE HOOKS.

5. IN ASPHALT PAVEMENT, LOOPS SHOULD BE PLACED IN THE BINDER AND DIVEHOLES MARKED AT THE CURB WITH A SAW-CUT. THE SAW-CUT SHALL BE CUT IN ACCORDANCE WITH LOCAL AND E.P.A. DUST CONTROL REQUIREMENTS. DETECTOR LOOP(S) SHALL NOT BE INSTALLED IN WET CONDITIONS AND THE SAW-CUTS MUST BE FREE OF DEBRIS AND RESIDUE SUCH AS DUST AND WATER WHICH IS TO BE ACHIEVED BY THE USE OF COMPRESSED AIR, WIRE BRUSHING AND HEAT DRYING ACCORDING TO SEALANT MANUFACTURER REQUIREMENTS. THE DETECTOR WIRE SHALL BE HELD IN PLACE BY THE USE OF FORM WEDGES. WEDGES SHALL BE SPACED NO MORE THAN 18'' (450 mm) APART.

6. LOOP SPLICES SHALL BE SOLDERED USING A SOLDERING IRON. BLOW TORCHES OR OTHER DEVICES WHICH OXIDIZE COPPER CABLE SHALL NOT BE ALLOWED FOR SOLDERING OPERATIONS. SEE DETAIL BELOW RIGHT.

7. PREFORMED DETECTOR LOOPS SHALL BE USED, AS SHOWN ON THE PLANS, WHERE NEW CONCRETE PAVEMENT IS PROPOSED. THE INSTALLATION OF PREFORMED LOOPS SHALL BE IN ACCORDANCE WITH THE DISTRICT 1 SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.

LOOP LEAD-IN CABLE TAG

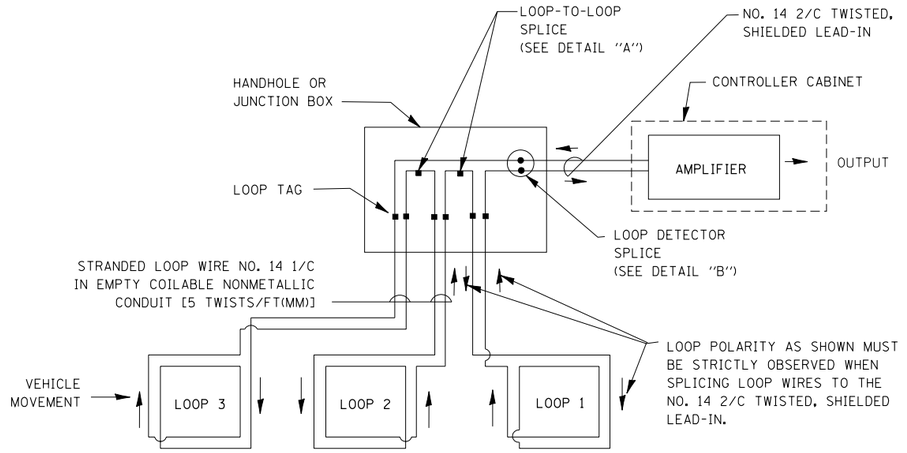


A. LANE 1 IS THE LANE CLOSEST TO THE CENTERLINE OF THE ROADWAY

B. LOOP #1 IS THE LOOP IN THE LANE CLOSEST TO THE INTERSECTION.

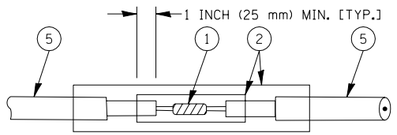
C. LABEL LOOP CABLE ''IN'' OR LOOP CABLE ''OUT''.

D. LABEL LOOP CABLE CLOCKWISE OR LOOP CABLE COUNTERCLOCKWISE.

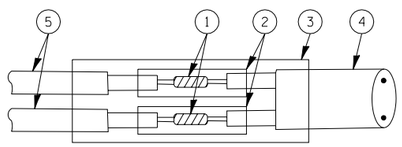


DETECTOR LOOP WIRING SCHEMATIC

- LOOPS SHALL BE SPLICED IN SERIES.
- SAW-CUTS SHALL BE A MINIMUM WIDTH OF 5/16'' (8 mm).
- SAW-CUT DEPTHS SHALL BE 3'' (75 mm). IF IN CONCRETE, THE SAW-CUT DEPTH SHALL BE TO THE TOP OF THE REINFORCEMENT.
- LOOP CORNERS SHALL BE DRILLED WITH A 2'' (50 mm) DIAMETER CORE.

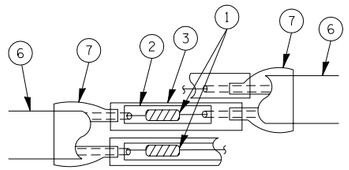


DETAIL ''A''
LOOP-TO-LOOP SPLICE



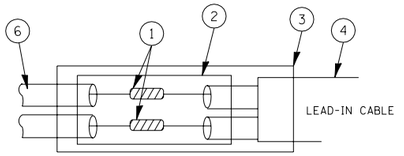
DETAIL ''B''
LOOP-TO-CONTROLLER SPLICE

TYPE I LOOP



DETAIL ''A''
LOOP-TO-LOOP SPLICE

PRE-FORMED LOOP



DETAIL ''B''
LOOP-TO-CONTROLLER SPLICE

LOOP DETECTOR SPLICE

(1) WESTERN UNION SPLICE SOLDERED WITH ROSIN CORE FLUX. ALL EXPOSED SURFACES OF THE SOLDER SHALL BE SMOOTH.

(2) WCSMW 30/100 HEAT SHRINK TUBE, MINIMUM LENGTH 3'' (75 mm), UNDERWATER GRADE.

(3) WCS 200/750 HEAT SHRINK TUBE, MINIMUM LENGHT 6'' (150 mm), UNDERWATER GRADE.

(4) NO. 14 2/C TWISTED, SHIELDED CABLE.

(5) LOOP CONDUCTOR WITH FLEXIBLE PLASTIC TUBE.

(6) PRE-FORMED LOOP

(7) XL POLYOLEFIN 2 CONDUCTOR BREAKOUT SEALS. TYCO CBR-2 OR APPROVED EQUAL

FILE NAME = c:\pw_work\PWIDOT\KANTHAPHIXAYBC\d0112614\traffic_legend_v7.dgn	USER NAME = kanthaphixaybc	DESIGNED - DAD	REVISED -
		DRAWN - BCK	REVISED -
	PLOT SCALE = 20.0000 ' / IN.	CHECKED - DAD	REVISED -
	PLOT DATE = 10/6/2009	DATE - 10/28/09	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

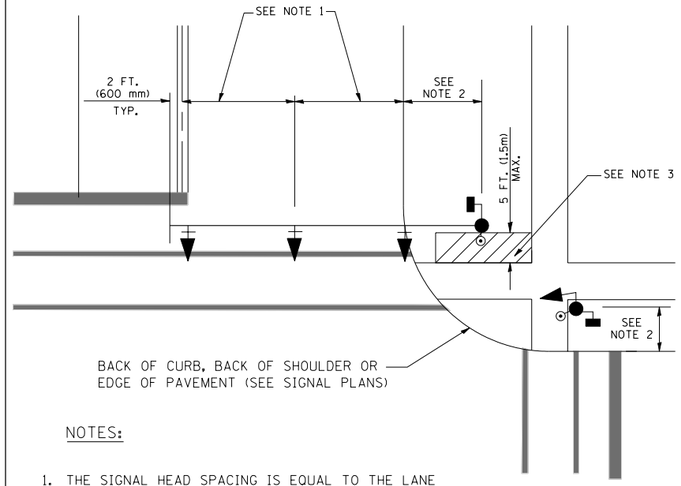
DISTRICT ONE
STANDARD TRAFFIC SIGNAL DESIGN DETAILS

SCALE: | SHEET NO. 1 OF 6 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

TRAFFIC SIGNAL MAST ARM AND SIGNAL POST

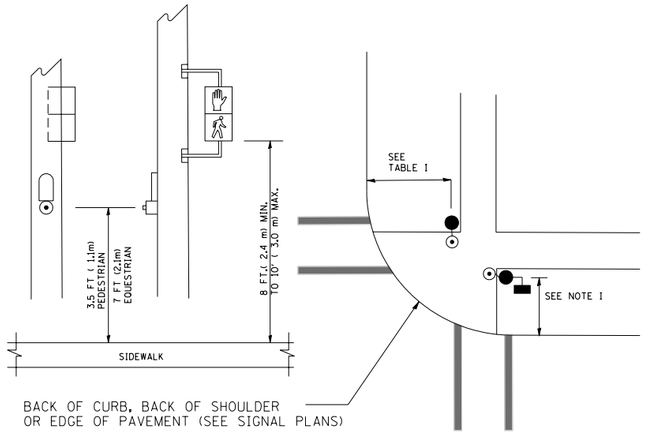
MAST ARM MOUNTED SIGNALS IN EXISTING, PROPOSED OR FUTURE SIDEWALK/BICYCLE PATH AREA. INTERSECTION SHOWN WITH PEDESTRIAN SIGNALS AND PEDESTRIAN PUSHBUTTON DETECTORS.



NOTES:

1. THE SIGNAL HEAD SPACING IS EQUAL TO THE LANE WIDTH OR AS SHOWN ON THE TRAFFIC SIGNAL PLAN.
2. REFER TO THE TRAFFIC SIGNAL EQUIPMENT OFFSET TABLE.
3. PROVIDE A LEVEL ALL-WEATHER SURFACE (CONCRETE SIDEWALK, ASPHALT BICYCLE PATH SURFACE OR MATCHING MATERIAL TO THE ADJACENT SURFACE) UP TO THE MAST ARM SHAFT OR THE SIGNAL POST.
4. THE FACE OF THE PEDESTRIAN PUSHBUTTON SHALL BE PARALLEL TO THE CROSSWALK TO BE USED.
5. THE LOCATIONS AND INSTALLATION OF PEDESTRIAN SIGNAL HEADS AND PEDESTRIAN PUSHBUTTONS SHALL MEET THE REQUIREMENTS OF THE MUTCD AND INFORMATION FOUND IN THE "AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES."

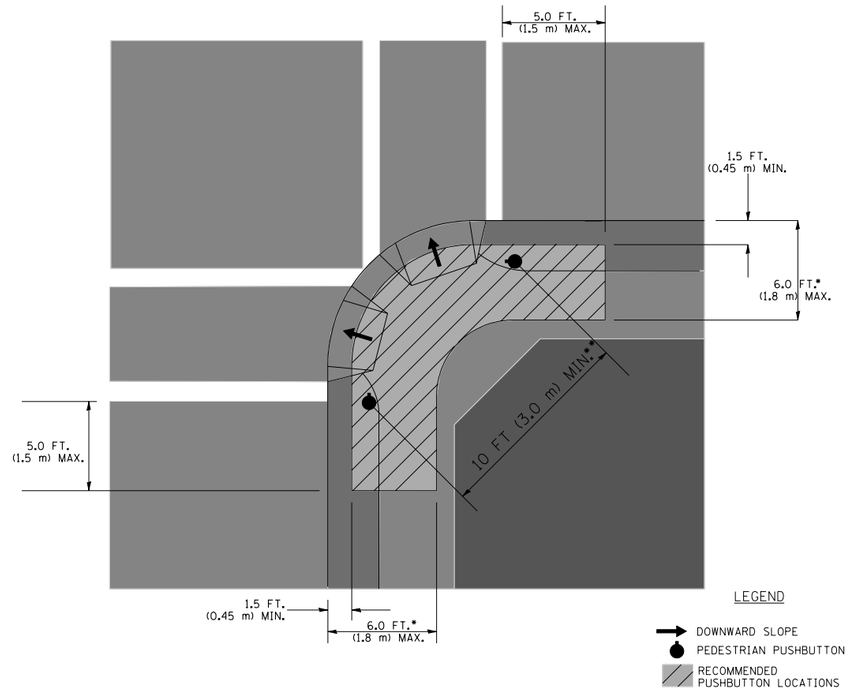
PEDESTRIAN SIGNAL POST AND PEDESTRIAN PUSH BUTTON POST



NOTES:

1. REFER TO THE TRAFFIC SIGNAL EQUIPMENT OFFSET TABLE.
2. PROVIDE A LEVEL ALL-WEATHER SURFACE (CONCRETE SIDEWALK, ASPHALT BICYCLE PATH SURFACE OR MATCHING MATERIAL TO THE ADJACENT SURFACE) UP TO THE PEDESTRIAN SIGNAL POST OR THE PEDESTRIAN PUSH BUTTON POST.
3. THE FACE OF THE PEDESTRIAN PUSHBUTTON SHALL BE PARALLEL TO THE CROSSWALK TO BE USED.
4. THE LOCATIONS AND INSTALLATION OF PEDESTRIAN SIGNAL HEADS AND PEDESTRIAN PUSHBUTTONS SHALL MEET THE REQUIREMENTS OF THE MUTCD AND INFORMATION FOUND IN THE "AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES."

RECOMMENDED PUSHBUTTON LOCATIONS



- WHERE THERE ARE CONSTRAINTS THAT MAKE IT IMPRACTICAL TO PLACE THE PEDESTRIAN PUSHBUTTON BETWEEN 1.5 FT (0.45 m) AND 6 FT (1.8 m) FROM THE EDGE OF THE CURB, SHOULDER, OR PAVEMENT, IT SHOULD NOT BE FURTHER THAN 10 FT (3 m) FROM THE EDGE OF CURB, SHOULDER, OR PAVEMENT.
- •• WHERE THERE ARE CONSTRAINTS ON A PARTICULAR CORNER THAT MAKE IT IMPRACTICAL TO PROVIDE THE 10 FT (3 m) SEPERATION BETWEEN THE TWO PEDESTRIAN PUSHBUTTONS, THE PUSHBUTTONS MAY BE PLACED CLOSER TOGETHER OR ON THE SAME POLE.

NOTES:

1. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH THE BOTTOM OF THE SIGNAL HOUSING INCLUDING BRACKETS NOT LESS THAN 8 FT (2.4 m) OR MORE THAN 10 FT (3 m) ABOVE SIDEWALK LEVEL, AND SHALL BE POSITIONED AND ADJUSTED TO PROVIDE MAXIMUM VISIBILITY AT THE BEGINNING OF THE CONTROLLED CROSSWALK.
2. THE BOTTOM OF THE SIGNAL HOUSING (INCLUDING BRACKETS) OF A VEHICULAR SIGNAL FACE THAT IS NOT LOCATED OVER A HIGHWAY SHALL BE AT LEAST 8 FT (2.4 m) BUT NOT MORE THAN 19 FT (5.8 m) ABOVE THE SIDEWALK OR, IF THERE IS NO SIDEWALK, ABOVE THE PAVEMENT GRADE AT THE CENTER OF THE ROADWAY.
3. THE BOTTOM OF THE SIGNAL HOUSING AND ANY RELATED ATTACHMENTS TO A SIGNAL FACE LOCATED OVER ANY PORTION OF A HIGHWAY SHALL BE ACCORDING TO CURRENT STATE STANDARDS 877001, 877002, 877006, 877011 AND 877012 WITH A MINIMUM OF 16 FT (5.0 m) AND A MAXIMUM OF 18 FT. (5.5 m) FROM THE HIGHEST POINT OF PAVEMENT.
4. THE BOTTOM OF THE TEMPORARY SPAN WIRE MOUNTED SIGNAL HOUSING AND ANY RELATED ATTACHMENTS TO A SIGNAL FACE LOCATED OVER ANY PORTION OF A HIGHWAY SHALL BE ACCORDING TO CURRENT STATE STANDARD 880001 WITH A MINIMUM OF 17 FT (5.18 m) FROM THE HIGHEST POINT OF PAVEMENT.
5. THE TOP OF THE SIGNAL HOUSING OF A SIGNAL FACE LOCATED OVER ANY PORTION OF A HIGHWAY SHALL NOT BE MORE THAN 25.6 FT (7.8 m) ABOVE THE PAVEMENT.

TRAFFIC SIGNAL EQUIPMENT OFFSET

TRAFFIC SIGNAL EQUIPMENT	COMBINATION CONCRETE CURB AND GUTTER (MINIMUM DISTANCE FROM BACK OF CURB TO CENTERLINE OF FOUNDATION)	SHOULDER/NON-CURBED AREA (MINIMUM DISTANCE FROM EDGE OF PAVEMENT TO CENTERLINE OF FOUNDATION)
TRAFFIC SIGNAL MAST ARM POLE	6 FT (1.8m)	SHOULDER WIDTH + 2 FT (0.6m), MINIMUM 10 FT (3.0m)
TRAFFIC SIGNAL POST	4 FT (1.2m)	SHOULDER WIDTH + 2 FT (0.6m), MINIMUM 10 FT (3.0m)
PEDESTRIAN SIGNAL POST	4 FT (1.2m)	SHOULDER WIDTH + 2 FT (0.6m), MINIMUM 10 FT (3.0m)
PEDESTRIAN PUSHBUTTON POST	4 FT (1.2m)	SHOULDER WIDTH + 2 FT (0.6m), MINIMUM 10 FT (3.0m)
TEMPORARY WOOD POLE	6 FT (1.8m)	SHOULDER WIDTH + 2 FT (0.6m), MINIMUM 10 FT (3.0m)
CONTROLLER CABINET	6 FT (1.8m) MINIMUM DISTANCE SEE NOTE 2	SHOULDER WIDTH + 6 FT (1.8m), MINIMUM 16 FT (4.9m) SEE NOTE 3.
SERVICE INSTALLATION, GROUND MOUNT	6 FT (1.8m) MINIMUM DISTANCE SEE NOTE 2	SHOULDER WIDTH + 6 FT (1.8m), MINIMUM 16 FT (4.9m) SEE NOTE 3.

NOTES:

1. CONTACT THE "AREA TRAFFIC SIGNAL MAINTENANCE AND OPERATIONS ENGINEER" FOR ASSISTANCE IN LOCATING THE TRAFFIC SIGNAL EQUIPMENT WHEN THERE ARE CONFLICTS WITH DITCHES OR THE MINIMUM OFFSET DISTANCES CANNOT BE MET.
2. MINIMUM DISTANCE FROM THE BACK OF CURB TO THE ROADWAY SIDE OF THE FOUNDATION.
3. MINIMUM DISTANCE FROM THE EDGE OF PAVEMENT TO THE ROADWAY SIDE OF THE FOUNDATION.
4. ANY CHANGES TO THE OFFSETS OF THE FOUNDATIONS, FROM THE MINIMUM DISTANCES LISTED IN THE "TRAFFIC SIGNAL EQUIPMENT OFFSET" CHART AND THE TRAFFIC SIGNAL INSTALLATION PLAN, COULD EFFECT THE PLACEMENT OF THE SIGNAL HEADS, PEDESTRIAN SIGNAL HEADS AND THE PEDESTRIAN PUSHBUTTONS. THE SIGNAL HEAD PLACEMENT ON THE MAST ARMS SHALL REMAIN AS PER THE TRAFFIC SIGNAL INSTALLATION PLAN AND THE "TRAFFIC SIGNAL MAST ARM AND SIGNAL POST" DETAIL ABOVE. THE PROPOSED MAST ARM LENGTHS MAY NEED TO BE REVISED TO MEET THE ABOVE REQUIREMENTS. THE PEDESTRIAN SIGNAL HEADS AND PEDESTRIAN PUSHBUTTONS MUST MEET THE REQUIREMENTS UNDER THE DETAILS ON THIS SHEET.

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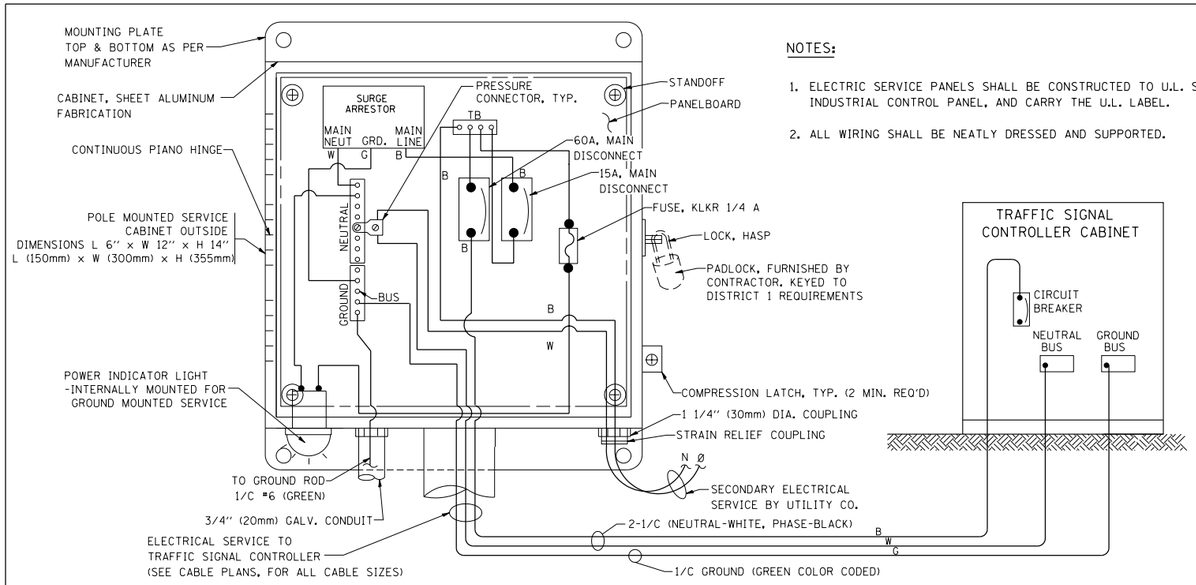
	PLOT DATE = 10/6/2009	DATE - 10/28/09	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISTRICT 1
STANDARD TRAFFIC SIGNAL DESIGN DETAILS

SCALE: | SHEET NO. 2 OF 6 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



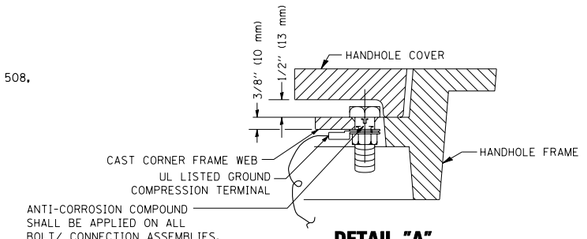
NOTES:

1. ELECTRIC SERVICE PANELS SHALL BE CONSTRUCTED TO U.L. STD 508, INDUSTRIAL CONTROL PANEL, AND CARRY THE U.L. LABEL.
2. ALL WIRING SHALL BE NEATLY DRESSED AND SUPPORTED.

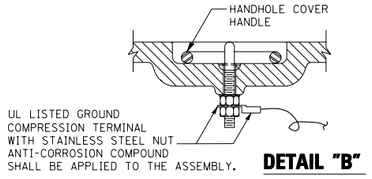
ELECTRICAL SERVICE – PANEL DIAGRAM (TYPICAL FOR POLE AND GROUND MOUNTED SERVICE)

SERVICE INSTALLATION POLE MOUNT (SHOWN)

(NOT TO SCALE)



DETAIL "A"

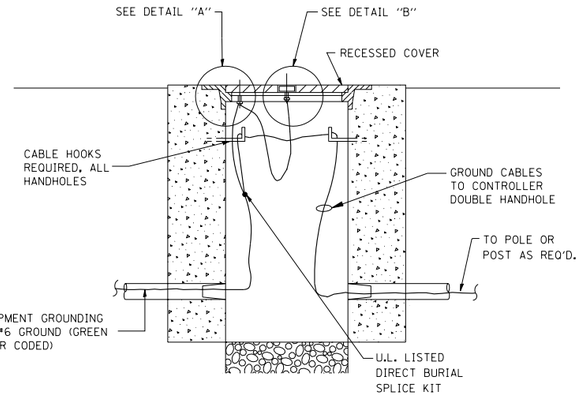


DETAIL "B"

NOTES:

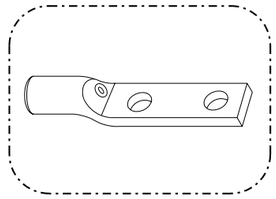
GROUNDING SYSTEM

1. THE GROUNDING SYSTEM SHALL CONSIST OF AN INSULATED CONDUCTOR TYPE XLP, NO. 6 A.W.G., STRANDED COPPER TO BE INSTALLED IN RACEWAYS. THE GROUNDING CABLE SHALL BE INSTALLED IN A CONTINUOUS MANNER AS SHOWN ON THE CABLE PLAN PROVIDED. ALL GROUNDING CONDUCTORS SHALL BE BONDED TO METAL ENCLOSURE (HANDHOLE, POST, MAST ARM, CONTROLLER, ETC.). GROUND ROD SHALL BE 3/4" DIA. x 10'-0" (20mm x 3.0m) LONG, COPPER CLAD. ONE GROUND ROD SHALL BE INSTALLED AT ALL POST FOUNDATIONS, POLE FOUNDATIONS, CONTROLLER CABINET FOUNDATION AND ELECTRICAL SERVICE INSTALLATION AS INDICATED ON THE CABLE PLAN. IF THERE ARE ANY SPECIAL CONDITIONS SUCH AS SUB-SURFACE CONDITIONS OR INSTALLATION PROBLEMS, THE RESIDENT ENGINEER SHALL BE NOTIFIED OR CONTACT THE BUREAU OF TRAFFIC, ILLINOIS DEPARTMENT OF TRANSPORTATION DISTRICT ONE AT (847) 705-4139.
2. THE NEUTRAL CONDUCTOR AND THE GROUND CONDUCTOR SHALL BE CONNECTED IN THE SERVICE INSTALLATION. AT NO OTHER POINT IN THE TRAFFIC SIGNAL SYSTEM SHALL THE NEUTRAL AND GROUND CONDUCTORS BE CONNECTED.
3. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL TERMINATE AT THE GROUND BUS IN THE CONTROLLER CABINET.
4. THE CONTRACTOR SHALL PROVIDE A GROUND CABLE WITH CONNECTORS BETWEEN THE HANDHOLE COVER AND HANDHOLE FRAME.

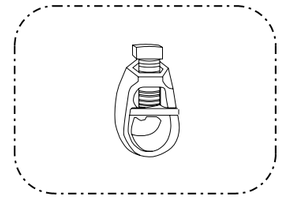


HANDHOLE COVER & FRAME – GROUNDING DETAIL

(NOT TO SCALE)



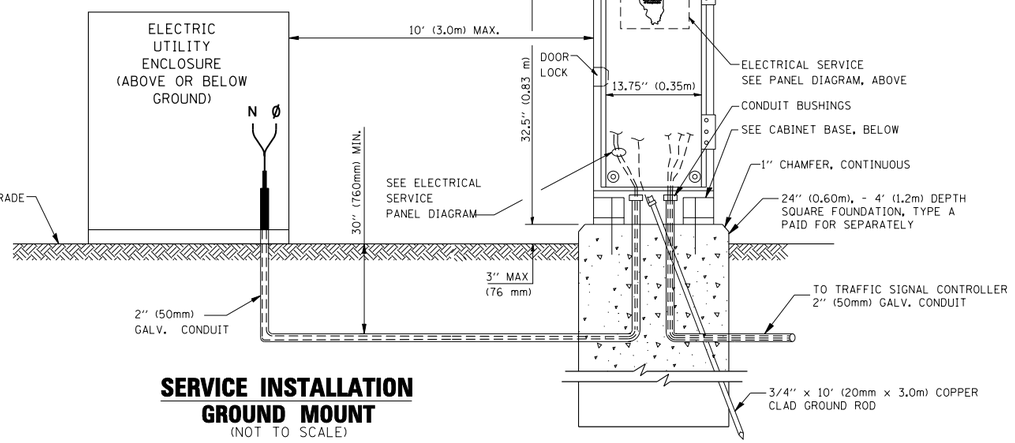
HEAVY-DUTY COMPRESSION TERMINAL (BURNDY TYPE YGHA OR APPROVED EQUAL)



¾" (20mm) HEAVY-DUTY GROUND ROD CLAMP (BURNDY TYPE GRC OR APPROVED EQUAL)

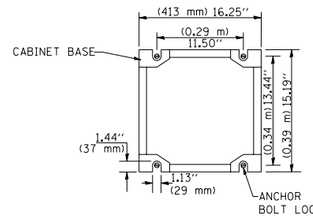
NOTES:

- ALL CLAMPS SHALL BE BRONZE OR COPPER, UL APPROVED.
- GROUND CABLE SHALL BE LOOPED OVER HOOKS IN THE HANDHOLES 6.5' (2.0m) SLACK SHALL BE PROVIDED IN SINGLE HANDHOLES 13' (4.0m) OF SLACK SHALL BE PROVIDED IN DOUBLE HANDHOLES. 5' (1.4m) OF SLACK SHALL BE PROVIDED BETWEEN FRAME AND COVER.



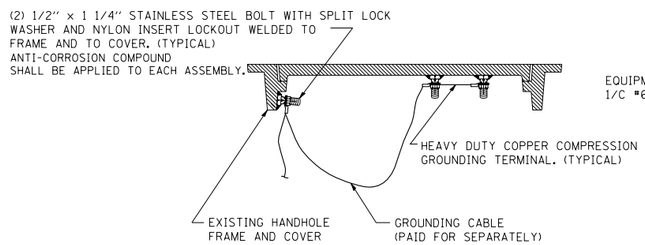
SERVICE INSTALLATION GROUND MOUNT

(NOT TO SCALE)



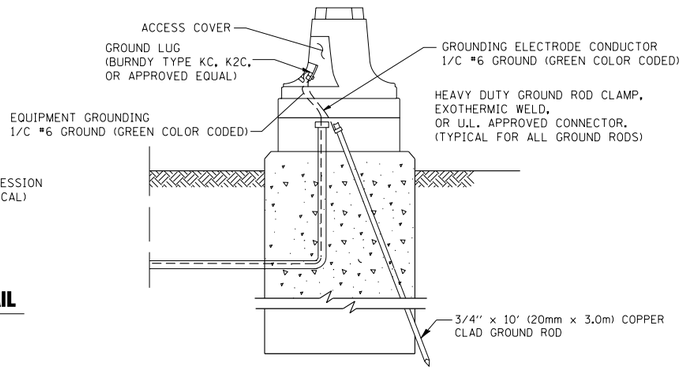
CABINET – BASE BOLT PATTERN

(NOT TO SCALE)



EXISTING HANDHOLE COVER & FRAME – GROUNDING DETAIL

(NOT TO SCALE)



MAST ARM POLE / POST–GROUNDING DETAIL

(NOT TO SCALE)

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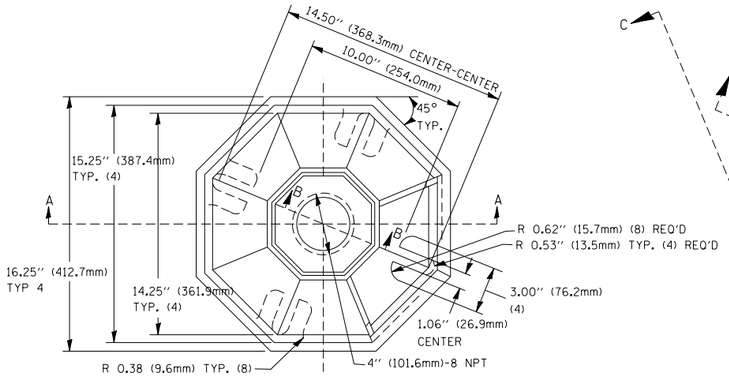
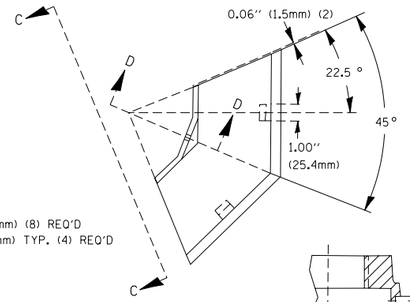
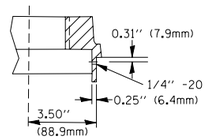
	PLOT SCALE = 20.0000 ' / IN.	DRAWN - BCK	REVISED -							
	PLOT DATE = 10/6/2009	CHECKED - DAD	REVISED -					CONTRACT NO.		
		DATE - 10/28/09	REVISED -		SCALE: SHEET NO. 3 OF 6 SHEETS STA. TO STA.	FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

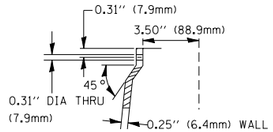


TOP VIEW

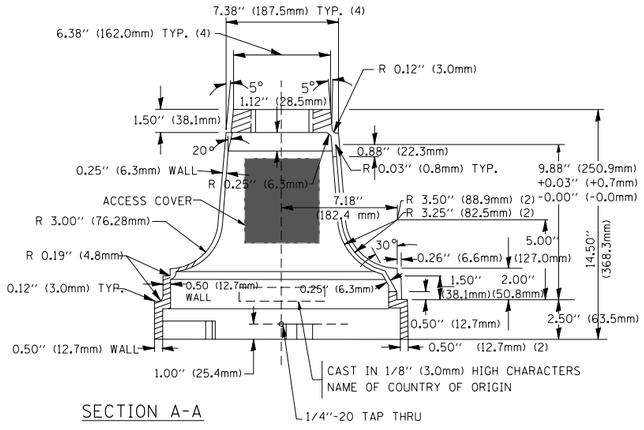




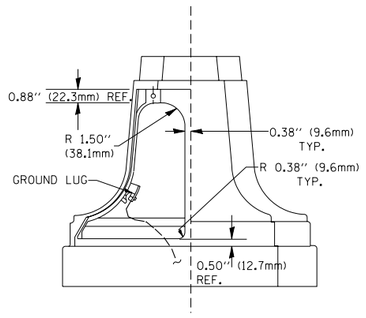
SECTION B-B



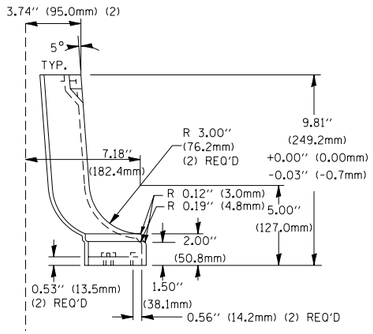
SECTION D-D



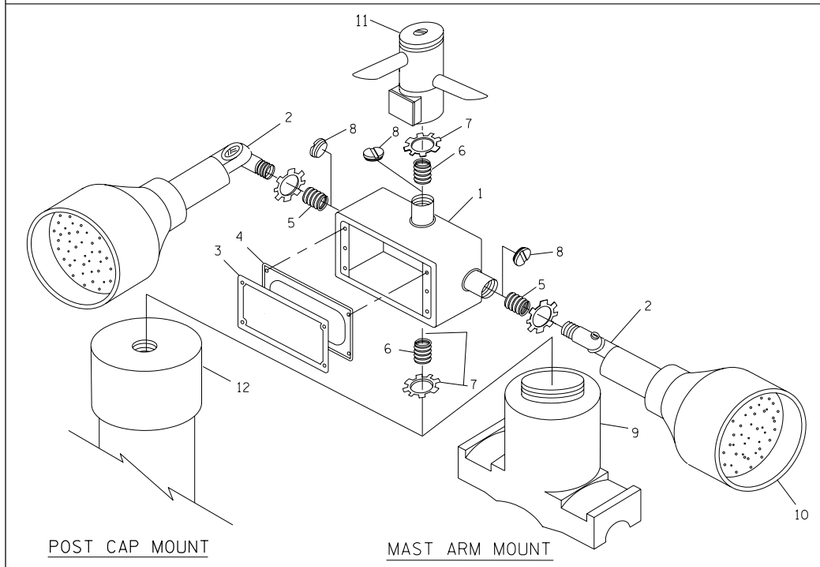
SECTION A-A



VIEW C-C



TRAFFIC SIGNAL POST - MOUNTING BASE - TYPE A



POST CAP MOUNT

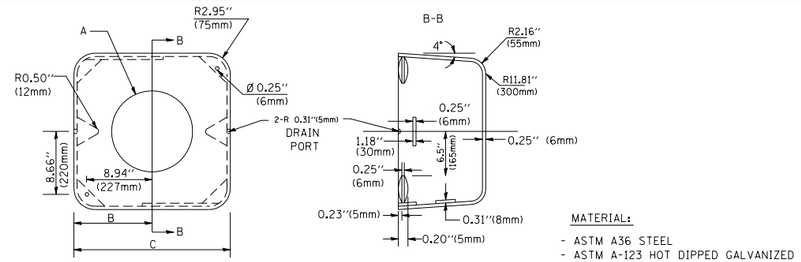
MAST ARM MOUNT

ITEM NO.	IDENTIFICATION
1	OUTLET BOX- GALV. 21 CU.IN. (0.000344 CU-M)
2	LAMP HOLDER AND COVER
3	OUTLET BOX COVER
4	RUBBER COVER GASKET
5	REDUCING BUSHING
6	¾''(19 mm) CLOSE NIPPLE
7	¾''(19 mm) LOCKNUT
8	¾''(19 mm) HOLE PLUG
9	SADDLE BRACKET - GALV.
10	6 WATT PAR 38 LED FLOOD LAMP
11	DETECTOR UNIT
12	POST CAP [18 FT. (5.4 m) POST MIN.]

NOTES:

1. ALL ELECTRICAL ITEMS, EXCEPT ITEMS #2 AND #11 SHALL BE ALUMINUM OR GALVANIZED
2. ITEM #1- OZ/GEDNEY FSX-1-50 OR EQUIVALENT
   ITEM #2- MULBERRY CON-O-SHADE LAMP SHIELD OR EQUIVALENT
   ITEM #9- ''BAND-IT'' SADDLE BRACKET OR EQUIVALENT
3. WHEN POST MOUNTING IS SPECIFIED, ITEM #9 SHALL NOT BE REQUIRED. THE DETECTION UNIT SHALL BE MOUNTED DIRECTLY ON TOP OF THE CAP BY DRILLING AND TAPPING A ¾''(19 mm) HOLE WITH PIPE THREADS. THE POST CAP SHALL EITHER BE SCREWED TO THE TOP OF THE POST OR A MINIMUM OF 3 TIGHTENING SCREWS SHALL BE REQUIRED ON EACH CAP.

EMERGENCY VEHICLE DETECTOR WITH CONFIRMATION BEACON MOUNTING DETAIL



MATERIAL:
- ASTM A36 STEEL
- ASTM A-123 HOT DIPPED GALVANIZED

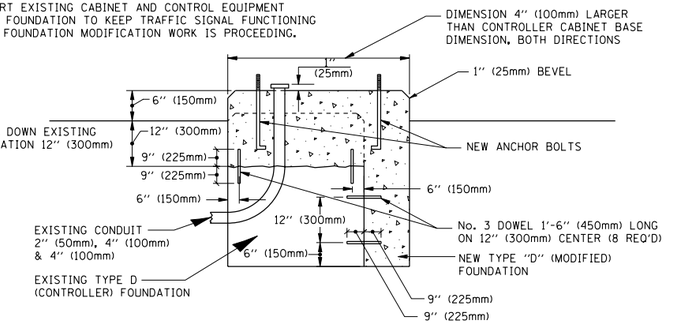
A	B	C	HEIGHT	WEIGHT
VARIES	9.5''(241mm)	19''(483mm)	7'' (178mm) - 12'' (300mm)	53 lbs (24kg)
VARIES	10.75''(273mm)	21.5''(546mm)	7'' (178mm) - 12'' (300mm)	68 lbs (31 kg)
VARIES	13.0''(330mm)	26''(660mm)	7'' (178mm) - 12'' (300mm)	81 lbs (37 kg)
VARIES	18.5''(470mm)	37''(940mm)	7'' (178mm) - 12'' (300mm)	126 lbs (57 kg)

SHROUD

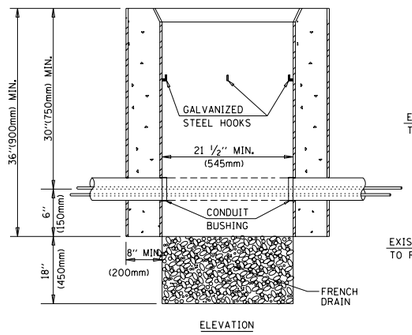
NOTES:

1. DIMENSION ''A'' IS EQUAL TO THE DIAMETER OF THE MAST ARM POLE AT THE TOP OF THE SHROUD. THE SHROUD SHALL BE TIGHT TO THE MAST ARM POLE.
2. THE SUPPLIER SHALL VERIFIED THE ABOVE DIMENSIONS BASED ON MAST ARM REQUIREMENTS.
3. THE HEIGHT OF THE SHROUD SHALL COVER THE ANCHOR BOLTS, NUTS AND MAST ARM POLE BASE.

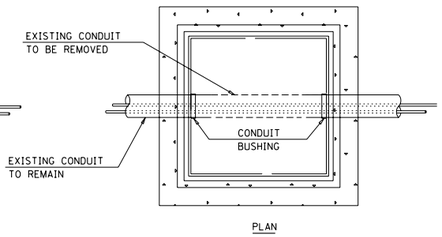
NOTE:
SUPPORT EXISTING CABINET AND CONTROL EQUIPMENT ABOVE FOUNDATION TO KEEP TRAFFIC SIGNAL FUNCTIONING WHILE FOUNDATION MODIFICATION WORK IS PROCEEDING.



MODIFY EXISTING TYPE ''D'' FOUNDATION



ELEVATION



PLAN

NOTES:

1. HANDHOLE CONSTRUCTED PER STATE STANDARD 814001.
2. REMOVAL OF THE EXISTING CONDUIT FROM THE HANDHOLE AND THE INSTALLATION OF THE CONDUIT BUSHINGS SHALL BE INCIDENTAL TO THE HANDHOLE.

HANDHOLE TO INTERCEPT EXISTING CONDUIT

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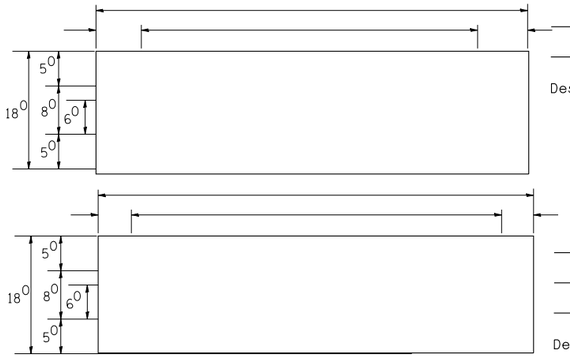
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISTRICT 1
STANDARD TRAFFIC SIGNAL DESIGN DETAILS

SCALE: | SHEET NO. 4 OF 6 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

PANEL SIGN DESIGN TYPE 1

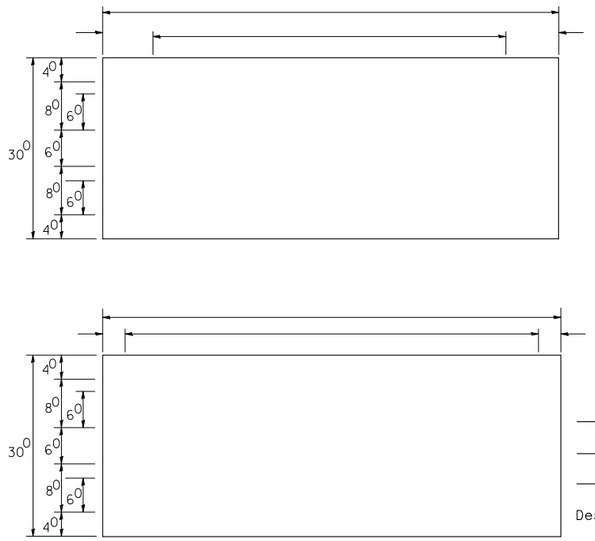


___ Sq. M. each
___ Sq. Ft. each
___ Required
Design Series ___

___ Sq. M. each
___ Sq. Ft. each
___ Required
Design Series ___

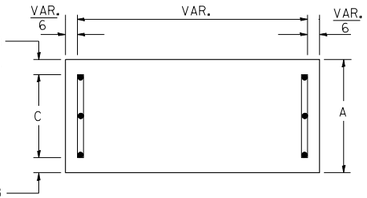
NOTE: SIGN DIMENSIONS ARE IN ENGLISH UNITS

PANEL SIGN DESIGN TYPE 2

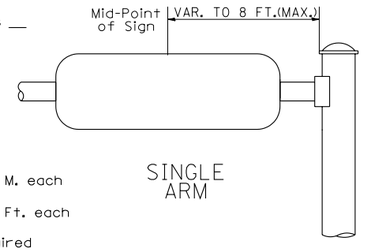


___ Sq. M. each
___ Sq. Ft. each
___ Required
Design Series ___

SUPPORTING CHANNELS



A	B	C
18"	2"	14"



SINGLE ARM

___ Sq. M. each
___ Sq. Ft. each
___ Required
Design Series ___

SUPPORTING CHANNELS

SINGLE ARM

A	B	C
18"	2"	12"
30"	2"	22"

___ Sq. M. each
___ Sq. Ft. each
___ Required
Design Series ___

GENERAL NOTES

1. WHERE MAST ARM MOUNTED STREET NAME SIGNS ARE SPECIFIED, THE MAST ARM ASSEMBLY AND POLES SHALL BE DESIGNED TO SUPPORT THE LOADINGS CALLED FOR ON STANDARDS 877001, 877002, 877006, 877011 AND 877012, AS APPLICABLE, PLUS TWO (2) SIGN PANELS 2'-6" x 8'-0" MOUNTED AS SHOWN. THE DESIGN SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" AS PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS FOR 80 M.P.H. WIND VELOCITY.
2. ALL SIGNS SHALL HAVE A WHITE REFLECTORIZED LEGEND AND BORDER ON A GREEN REFLECTORIZED BACKGROUND, TYPE A SHEETING.
3. THE SIGN LENGTH SHOULD BE INCREASED IN 6-INCH INCREMENTS, BUT THE OVERALL LENGTH SHOULD NOT EXCEED 8'-0".
4. ALL BORDERS SHALL BE ¾" WIDE AND CORNER RADIUS SHALL BE 2-1/4 ".
5. SIGNFIX ALUMINUM CHANNEL FRAMING SYSTEM SHALL BE USED FOR ALL SIGNS ATTACHED TO SIGNAL POLES AND POSTS. LOCAL SUPPLIERS OF THE SIGNFIX ALUMINUM CHANNEL FRAMING SYSTEM ARE:

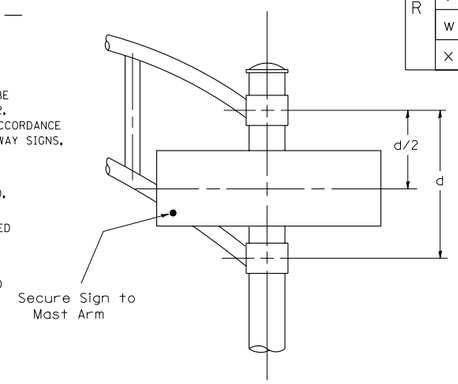
* J.O. HERBERT CO.
MIDLOTHIAN, VA.

* WESTERN REMAC INC.
WOODRIDGE, IL.

PARTS LISTING:

SIGN CHANNEL	PART #HPN053 (MED. CHANNEL)
SIGN SCREWS	¼" x 14 x 1" H.W.H. #3 SELF TAPPING WITH NEOPRENE WASHER
BRACKETS	PART #HPN034 (UNIVERSAL) CHANNEL CLAMPS WITH STAINLESS STEEL STRAPPING

OTHER BRANDS OF MOUNTING HARDWARE ARE ACCEPTABLE, BASED UPON THE DEPARTMENT'S APPROVAL AND COMPATIBILITY WITH THE CHANNEL/BRACKET OF THE ABOVE PRODUCT.



DUAL ARM

SIGNFIX ALUMINUM CHANNEL FRAMING SYSTEM shall be used. See Note #5.

Upper Case To Lower Case
Spacing Chart 8-6 Inch Series "C & D"

FIRST LETTER	SECOND LETTER: a c d e g o q		b h i k l m n p r u		f w		j		s t		v y		x		z	
SERIES	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
A W X	1^{2}	1^{4}	1^{4}	1^{5}	1^{2}	1^{4}	0^{6}	1^{0}	1^{1}	1^{4}	0^{6}	1^{0}	1^{1}	1^{2}	1^{2}	1^{4}
B	1^{4}	1^{5}	2^{0}	2^{1}	1^{4}	1^{5}	1^{1}	1^{2}	1^{4}	1^{5}	1^{2}	1^{4}	1^{2}	1^{4}	1^{6}	1^{7}
C E G	1^{4}	1^{5}	2^{0}	2^{1}	1^{2}	1^{4}	0^{6}	1^{0}	1^{2}	1^{4}	1^{2}	1^{4}	1^{4}	1^{5}	1^{4}	1^{5}
D O Q R	1^{4}	1^{5}	2^{0}	2^{1}	1^{4}	1^{5}	0^{6}	1^{0}	1^{2}	1^{4}	1^{2}	1^{4}	1^{4}	1^{5}	1^{4}	1^{5}
F	0^{5}	0^{6}	1^{4}	1^{5}	0^{6}	1^{0}	0^{5}	0^{6}	0^{6}	1^{0}	0^{6}	1^{0}	0^{6}	1^{0}	1^{1}	1^{2}
H I M N	2^{0}	2^{1}	2^{2}	2^{4}	2^{0}	2^{1}	1^{4}	1^{5}	1^{6}	1^{7}	1^{6}	1^{7}	2^{0}	2^{1}	2^{0}	2^{1}
J U	2^{0}	2^{1}	2^{0}	2^{1}	1^{6}	1^{7}	1^{4}	1^{5}	1^{6}	1^{7}	1^{6}	1^{7}	1^{6}	1^{7}	2^{0}	2^{1}
K L	1^{1}	1^{2}	1^{6}	1^{7}	1^{1}	1^{2}	0^{5}	0^{6}	1^{1}	1^{2}	1^{1}	1^{2}	1^{1}	1^{2}	1^{2}	1^{4}
P	1^{2}	1^{4}	1^{4}	1^{5}	1^{2}	1^{4}	0^{5}	0^{6}	1^{1}	1^{2}	1^{1}	1^{2}	1^{2}	1^{4}	1^{2}	1^{4}
S	1^{2}	1^{4}	1^{6}	1^{7}	1^{2}	1^{4}	0^{6}	1^{0}	1^{2}	1^{4}	1^{2}	1^{4}	1^{2}	1^{4}	1^{2}	1^{4}
T	1^{1}	1^{2}	1^{6}	1^{7}	0^{6}	1^{0}	0^{6}	1^{0}	1^{1}	1^{2}	1^{1}	1^{2}	1^{1}	1^{2}	1^{2}	1^{4}
V	0^{6}	1^{0}	1^{4}	1^{5}	1^{1}	1^{2}	0^{6}	1^{0}	1^{2}	1^{4}	1^{2}	1^{4}	1^{2}	1^{4}	1^{2}	1^{4}
Y	0^{5}	0^{6}	1^{4}	1^{5}	0^{6}	1^{0}	0^{5}	0^{6}	0^{5}	0^{7}	0^{5}	0^{6}	0^{6}	1^{0}	1^{1}	1^{2}
Z	1^{6}	1^{7}	2^{2}	2^{4}	1^{6}	1^{7}	1^{2}	1^{4}	1^{6}	1^{7}	1^{6}	1^{7}	1^{6}	1^{7}	2^{0}	2^{1}

Lower Case To Lower Case
Spacing Chart 6 Inch Series "C & D"

FIRST LETTER	SECOND LETTER: a c d e g o q		b h i k l m n p r u		f w		j		s t		v y		x		z	
SERIES	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
a d h g i j l m n q u	1^{6}	1^{7}	2^{2}	2^{4}	1^{6}	1^{7}	1^{2}	1^{4}	1^{4}	1^{5}	1^{4}	1^{5}	1^{6}	1^{7}	1^{6}	1^{7}
b f k o p s	1^{2}	1^{4}	1^{6}	1^{7}	1^{1}	1^{2}	0^{5}	0^{6}	1^{1}	1^{2}	1^{1}	1^{2}	1^{2}	1^{4}	1^{2}	1^{4}
c e	1^{2}	1^{4}	1^{6}	1^{7}	1^{2}	1^{4}	0^{6}	1^{0}	1^{2}	1^{4}	1^{2}	1^{4}	1^{2}	1^{4}	1^{2}	1^{4}
r	0^{6}	1^{0}	1^{2}	1^{4}	0^{6}	1^{0}	0^{3}	0^{3}	0^{5}	0^{6}	0^{5}	0^{6}	0^{6}	1^{0}	0^{6}	1^{0}
t z	1^{2}	1^{4}	1^{6}	1^{7}	1^{2}	1^{4}	0^{6}	1^{0}	1^{1}	1^{2}	1^{1}	1^{2}	1^{2}	1^{4}	1^{2}	1^{4}
v y	1^{1}	1^{2}	1^{4}	1^{5}	1^{1}	1^{2}	0^{5}	0^{6}	0^{6}	1^{0}	0^{6}	1^{0}	1^{1}	1^{2}	1^{1}	1^{2}
w	1^{1}	1^{2}	1^{4}	1^{5}	1^{1}	1^{2}	0^{5}	0^{6}	1^{1}	1^{2}	1^{1}	1^{2}	1^{1}	1^{2}	1^{2}	1^{4}
x	1^{2}	1^{4}	1^{6}	1^{7}	1^{1}	1^{2}	0^{5}	0^{6}	1^{1}	1^{2}	1^{1}	1^{2}	1^{1}	1^{2}	1^{2}	1^{4}

Number To Number
Spacing Chart 8 Inch Series "C & D"

FIRST NUMBER	SECOND NUMBER: 0		1		2		3		4		5		6		7		8		9	
SERIES	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
0 9	1^{6}	1^{7}	1^{6}	1^{7}	1^{4}	1^{5}	1^{2}	1^{4}	1^{4}	1^{5}	1^{4}	1^{5}	1^{6}	1^{7}	1^{2}	1^{4}	1^{6}	1^{7}	1^{6}	1^{7}
1	2^{0}	2^{1}	2^{0}	2^{1}	2^{0}	2^{1}	1^{6}	1^{7}	1^{4}	1^{5}	2^{0}	2^{1}	2^{0}	2^{1}	1^{4}	1^{5}	2^{0}	2^{1}	2^{0}	2^{1}
2 3 4	1^{4}	1^{5}	1^{4}	1^{5}	1^{4}	1^{5}	1^{2}	1^{4}	1^{2}	1^{4}	1^{4}	1^{5}	1^{4}	1^{5}	1^{1}	1^{2}	1^{6}	1^{7}	1^{4}	1^{5}
5	1^{4}	1^{5}	1^{4}	1^{5}	1^{4}	1^{5}	1^{1}	1^{2}	1^{1}	1^{2}	1^{4}	1^{5}	1^{4}	1^{5}	1^{1}	1^{2}	1^{4}	1^{5}	1^{4}	1^{5}
6	1^{6}	1^{7}	1^{4}	1^{5}	1^{4}	1^{5}	1^{2}	1^{5}	1^{2}	1^{4}	1^{4}	1^{5}	1^{4}	1^{5}	1^{1}	1^{2}	1^{4}	1^{5}	1^{4}	1^{5}
7	1^{2}	1^{4}	1^{2}	1^{4}	1^{4}	1^{5}	1^{2}	1^{5}	0^{5}	0^{6}	1^{2}	1^{4}	1^{4}	1^{5}	1^{1}	1^{2}	1^{4}	1^{5}	1^{2}	1^{4}
8	1^{6}	1^{7}	1^{6}	1^{7}	1^{4}	1^{5}	1^{2}	1^{5}	1^{2}	1^{4}	1^{4}	1^{5}	1^{6}	1^{7}	1^{2}	1^{4}	1^{6}	1^{7}	1^{4}	1^{5}

EXAMPLE, $2^{\textcircled{3}}$ DENOTES $\frac{3''}{8}$

UPPER AND LOWER CASE LETTER WIDTHS

LETTERS	6 INCH UPPER CASE LETTERS, SERIES C	6 INCH UPPER CASE LETTERS, SERIES D	8 INCH UPPER CASE LETTERS, SERIES C	8 INCH UPPER CASE LETTERS, SERIES D	LETTERS	6 INCH LOWER CASE LETTERS, SERIES C	6 INCH LOWER CASE LETTERS, SERIES D
A	3^{6}	5^{0}	5^{0}	6^{5}	a	3^{5}	4^{2}
B	3^{2}	4^{0}	4^{3}	5^{3}	b	3^{5}	4^{2}
C	3^{2}	4^{0}	4^{3}	5^{3}	c	3^{5}	4^{1}
D	3^{2}	4^{0}	4^{3}	5^{3}	d	3^{5}	4^{2}
E	3^{0}	3^{5}	4^{0}	4^{7}	e	3^{5}	4^{2}
F	3^{0}	3^{5}	4^{0}	4^{7}	f	2^{3}	2^{6}
G	3^{2}	4^{0}	4^{3}	5^{3}	g	3^{5}	4^{2}
H	3^{2}	4^{0}	4^{3}	5^{3}	h	3^{5}	4^{2}
I	0^{7}	0^{7}	1^{1}	1^{2}	i	1^{1}	1^{1}
J	3^{0}	3^{6}	4^{0}	5^{0}	j	2^{0}	2^{2}
K	3^{2}	4^{1}	4^{3}	5^{4}	k	3^{5}	4^{2}
L	3^{0}	3^{5}	4^{0}	4^{7}	l	1^{1}	1^{1}
M	3^{7}	4^{5}	5^{1}	6^{1}	m	6^{0}	7^{0}
N	3^{2}	4^{0}	4^{3}	5^{3}	n	3^{5}	4^{2}
O	3^{4}	4^{2}	4^{5}	5^{5}	o	3^{6}	4^{3}
P	3^{2}	4^{0}	4^{3}	5^{3}	p	3^{5}	4^{2}
Q	3^{4}	4^{2}	4^{5}	5^{5}	q	3^{5}	4^{2}
R	3^{2}	4^{0}	4^{3}	5^{3}	r	2^{6}	3^{2}
S	3^{2}	4^{0}	4^{3}	5^{3}	s	3^{6}	4^{2}
T	3^{0}	3^{5}	4^{0}	4^{7}	t	2^{7}	3^{2}
U	3^{2}	4^{0}	4^{3}	5^{3}	u	3^{5}	4^{2}
V	3^{5}	4^{4}	4^{7}	6^{0}	v	4^{2}	4^{7}
W	4^{4}	5^{2}	6^{0}	7^{0}	w	5^{5}	6^{4}
X	3^{4}	4^{0}	4^{5}	5^{3}	x	4^{4}	5^{1}
Y	3^{6}	5^{0}	5^{0}	6^{6}	y	4^{6}	5^{3}
Z	3^{2}	4^{0}	4^{3}	5^{3}	z	3^{6}	4^{3}

NUMBER	6 INCH SERIES, C	6 INCH SERIES, D	8 INCH SERIES, C	8 INCH SERIES, D
1	1^{2}	1^{4}	1^{5}	2^{0}
2	3^{2}	4^{0}	4^{3}	5^{3}
3	3^{2}	4^{0}	4^{3}	5^{3}
4	3^{5}	4^{3}	4^{7}	5^{7}
5	3^{2}	4^{0}	4^{3}	5^{3}
6	3^{2}	4^{0}	4^{3}	5^{3}
7	3^{2}	4^{0}	4^{3}	5^{3}
8	3^{2}	4^{0}	4^{3}	5^{3}
9	3^{2}	4^{0}	4^{3}	5^{3}
0	3^{4}	4^{2}	4^{5}	5^{5}

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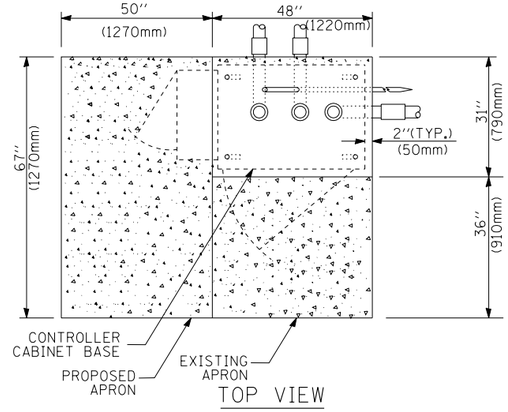
		DRAWN - BCK.	REVISED -
	PLOT SCALE = 20.0000 ' / IN.	CHECKED - DAG/DAD	REVISED -
	PLOT DATE = 10/6/2009	DATE - 03/15/09	REVISED -

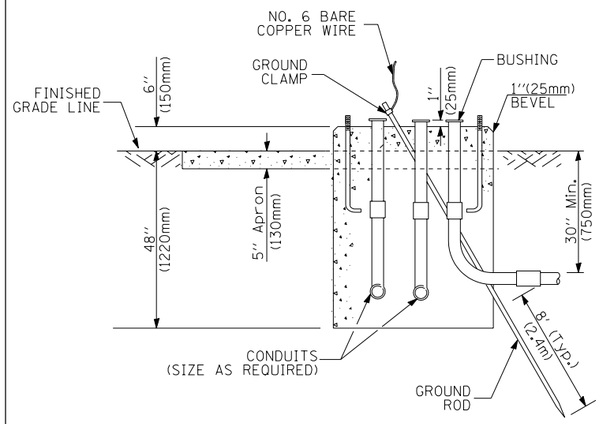
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISTRICT 1
MAST ARM MOUNTED STREET NAME SIGNS

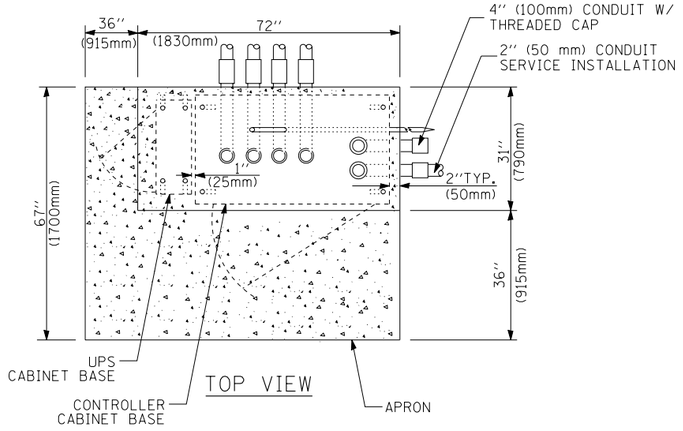
SCALE: | SHEET NO. OF SHEETS | STA. TO STA.

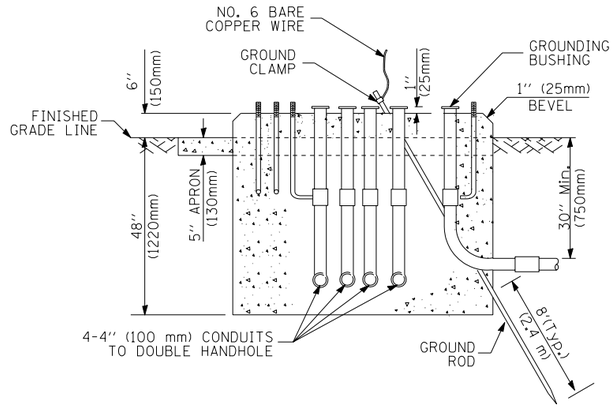
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



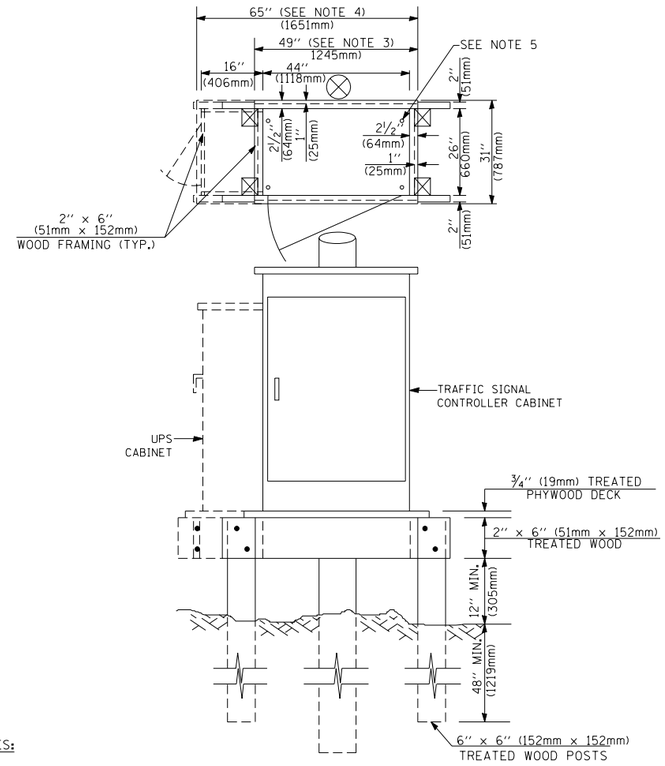


TYPE D
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET





TYPE C
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET



NOTES:

1. BASED ON CONTROLLER CABINET TYPE IV WITH BASE DIMENSIONS OF 26'' x 44'' (660mm x 1118mm). ADJUST PLATFORM SIZE TO FIT CABINET BASE DIMENSIONS BEING SUPPLIED.
2. BASED ON UNINTERRUPTIBLE POWER SUPPLY CABINET WITH BASE DIMENSIONS OF 16'' x 25'' (406mm x 635mm). ADJUST PLATFORM SIZE TO FIT CABINET BASE DIMENSIONS BEING SUPPLIED.
3. PLATFORM SIZE FOR CONTROLLER CABINET TYPE IV.
4. PLATFORM SIZE FOR CONTROLLER CABINET TYPE IV AND UNINTERRUPTIBLE POWER SUPPLY CABINET.
5. DRILLED HOLES THROUGH THE PLATFORM BASE TO MATCH THE CONTROLLER CABINET BOLT TEMPLATE. FASTEN THE CONTROLLER CABINET TO THE PLATFORM WITH CARRIAGE BOLTS, WASHERS AND NUTS.
6. FASTEN ALL SUPPORT WOOD FRAMING TO THE WOOD POSTS WITH 2 LAG SCREWS FOR EACH CONNECTION.

TEMPORARY SIGNAL CONTROLLER
WOOD SUPPORT PLATFORM

CABLE SLACK LENGTH	FEET	METER
HANDHOLE	6.5	2.0
DOUBLE HANDHOLE	13.0	4.0
SIGNAL POST	2.0	0.6
MAST ARM	2.0	0.6
CONTROLLER CABINET	1.5	0.5
FIBER OPTIC AT CABINET	13.0	4.0
ELECTRIC SERVICE AT (CABINET OR SERVICE LOCATION)	1.5	0.5
GROUND CABLE (SIGNAL POST, MAST ARM, CABINET)	1.5	0.5
GROUND CABLE (BETWEEN FRAME AND COVER)	5.0	1.6

CABLE SLACK

VERTICAL CABLE LENGTH	FEET	METER
MAST ARM POLE (MAST ARM MOUNTED SIGNAL HEAD) (L = MAST ARM LENGTH - DISTANCE TO SIGNAL HEAD FROM END OF ARM)	20.0+L	6.0+L
BRACKET MOUNTED (MAST ARM POLE OR SIGNAL POLE)	13.0	4.0
PEDESTRIAN PUSH BUTTON	6.0	2.0
SERVICE INSTALLATION POLE MOUNT TO SERVICE DROP	13.5	4.1
SERVICE INSTALLATION POLE MOUNT TO GROUND	13.5	4.1
SERVICE INSTALLATION GROUND MOUNT	6.0	2.0
FOUNDATION (SIGNAL POST, MAST ARM POLE, CONTROLLER CABINET, SERVICE-GROUND MOUNT)	3.0	1.0

VERTICAL CABLE LENGTH

FOUNDATION	DEPTH
TYPE A - Signal Post	4'-0'' (1.2m)
TYPE C - CONTROLLER W/ UPS	4'-0'' (1.2m)
TYPE D - CONTROLLER	4'-0'' (1.2m)
SERVICE INSTALLATION, GROUND MOUNT, TYPE A - SQUARE	4'-0'' (1.2m)

DEPTH OF FOUNDATION

Mast Arm Length	① Foundation Depth	Foundation Diameter	Spiral Diameter	Quantity of Rebars	Size of Rebars
Less than 30' (9.1 m)	10'-0'' (3.0 m)	30'' (750mm)	24'' (600mm)	8	6(19)
Greater than or equal to 30' (9.1 m) and less than 40' (12.2 m)	13'-6'' (4.1 m)	30'' (750mm)	24'' (600mm)	8	6(19)
	11'-0'' (3.4 m)	36'' (900mm)	30'' (750mm)	12	7(22)
Greater than or equal to 40' (12.2 m) and less than 50' (15.2 m)	13'-0'' (4.0 m)	36'' (900mm)	30'' (750mm)	12	7(22)
Greater than or equal to 50' (15.2 m) and up to 55' (16.8 m)	15'-0'' (4.6 m)	36'' (900mm)	30'' (750mm)	12	7(22)
Greater than or equal to 56' (16.8 m) and less than 65' (19.8 m)	21'-0'' (6.4 m)	42'' (1060mm)	36'' (900mm)	16	8(25)
Greater than or equal to 65' (19.8 m) and up to 75' (22.9 m)	25'-0'' (7.6 m)	42'' (1060mm)	36'' (900mm)	16	8(25)

NOTES:

1. These foundation depths are for sites which have cohesive soils (clayey silt, sandy clay, etc.) along the length of the shaft, with an average Unconfined Compressive Strength (Qu) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & structures should be contacted for a revised design if other conditions are encountered.
2. Combination mast arm assemblies under 55 feet (16.8 m) shall use 36'' (900 mm) diameter foundations.
3. Combination mast arm assemblies under 56 feet (16.8 m) through 75 feet (22.9 m) shall use 42'' (1060 mm) diameter foundations.
4. For mast arm assemblies with dual arms refer to state standard 878001.

DEPTH OF MAST ARM FOUNDATIONS, TYPE E

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	PLOT SCALE = 20.0000 ' / IN.	CHECKED - DAD	REVISED -
	PLOT DATE = 10/6/2009	DATE - 10/28/09	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISTRICT 1
STANDARD TRAFFIC SIGNAL DESIGN DETAILS

SCALE: | SHEET NO. 5 OF 6 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

TRAFFIC SIGNAL LEGEND

ITEM	REMOVAL	EXISTING	PROPOSED
CONTROLLER CABINET	R		
RAILROAD CONTROL CABINET		RC	RC
COMMUNICATIONS CABINET	R CC	ECC	CC
MASTER CONTROLLER		EMC	MC
MASTER MASTER CONTROLLER		EMMC	MMC
UNINTERRUPTIBLE POWER SUPPLY	R UPS	EUPS	UPS
SERVICE INSTALLATION, (P) POLE OR (G) GROUND MOUNT	R	P	P
TELEPHONE CONNECTION (P) POLE OR (G) GROUND MOUNT	R T	P T	P T
STEEL MAST ARM ASSEMBLY AND POLE	R		
ALUMINUM MAST ARM ASSEMBLY AND POLE	R		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH LUMINAIRE	R		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH PTZ CAMERA	R PTZ	PTZ	PTZ
SIGNAL POST	R		
TEMPORARY WOOD POLE (CLASS 5 OR BETTER) 45 FOOT (13.7m) MINIMUM	R		
GUY WIRE	R		
SIGNAL HEAD	R		
SIGNAL HEAD CONSTRUCTION STAGES (NUMBERS INDICATE THE CONSTRUCTION STAGE)			2
SIGNAL HEAD WITH BACKPLATE	R		
SIGNAL HEAD OPTICALLY PROGRAMMED	R "P"	"P"	"P"
FLASHER INSTALLATION (S DENOTES SOLAR POWER)	R "F"	"F"	"F"
PEDESTRIAN SIGNAL HEAD	R		
PEDESTRIAN PUSHBUTTON DETECTOR	R		
ACCESSIBLE PEDESTRIAN PUSHBUTTON DETECTOR	R APS	APS	APS
ILLUMINATED SIGN "NO LEFT TURN"	R		
ILLUMINATED SIGN "NO RIGHT TURN"	R		
DETECTOR LOOP, TYPE I			
PREFORMED DETECTOR LOOP		P	P
MICROWAVE VEHICLE SENSOR	R M	M	M
VIDEO DETECTION CAMERA	R V	V	V
VIDEO DETECTION ZONE			
PAN, TILT, ZOOM CAMERA	R PTZ	PTZ	PTZ
WIRELESS DETECTOR SENSOR	R W	W	W
WIRELESS ACCESS POINT	R		

ITEM	REMOVAL	EXISTING	PROPOSED
EMERGENCY VEHICLE LIGHT DETECTOR	R		
CONFIRMATION BEACON	R		
HANDHOLE	R		
HEAVY DUTY HANDHOLE	R H	H	H
DOUBLE HANDHOLE	R		
JUNCTION BOX	R		
GALVANIZED STEEL CONDUIT IN TRENCH (T) OR PUSHED (P)			
TEMPORARY SPAN WIRE, TETHER WIRE, AND CABLE	R		
COMMON TRENCH			CT
COILABLE NONMETALLIC CONDUIT (EMPTY)			CNC
SYSTEM ITEM		S	S
INTERSECTION ITEM		I	IP
REMOVE ITEM	R		
RELOCATE ITEM	RL		
ABANDON ITEM	A		
12" (300mm) TRAFFIC SIGNAL SECTION		R	R
12" (300mm) RED WITH 8" (200mm) YELLOW AND GREEN TRAFFIC SIGNAL FACE		R Y G	
SIGNAL FACE		R Y G Y G	R Y G Y G
SIGNAL FACE WITH BACKPLATE. "P" INDICATES PROGRAMMED HEAD		R Y G Y G "P"	R Y G Y G "P"
12" (300mm) PEDESTRIAN SIGNAL HEAD WALK/DON'T WALK SYMBOL		DW W	
12" (300mm) PEDESTRIAN SIGNAL HEAD INTERNATIONAL SYMBOL, OUTLINED			
12" (300mm) PEDESTRIAN SIGNAL HEAD INTERNATIONAL SYMBOL, SOLID			
PEDESTRIAN SIGNAL HEAD, INTERNATIONAL SYMBOL, WITH COUNTDOWN TIMER		C D	C D
RADIO INTERCONNECT	R		
RADIO REPEATER	R ERR	ERR	RR
DENOTES NUMBER OF CONDUCTORS, ELECTRIC CABLE NO. 14, UNLESS NOTED OTHERWISE, ALL DETECTOR LOOP CABLE TO BE SHIELDED		5	5
GROUND CABLE IN CONDUIT NO. 6 SOLID COPPER (GREEN)		I	I

ITEM	REMOVAL	EXISTING	PROPOSED
ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1/C, UNLESS NOTED OTHERWISE		I	I
COAXIAL CABLE		C	C
VENDOR CABLE FOR CAMERA		V	V
COPPER INTERCONNECT CABLE, NO. 18 3 PAIR TWISTED, SHIELDED		6	6
FIBER OPTIC CABLE NO. 62.5/125, MM12F		12F	
FIBER OPTIC CABLE NO. 62.5/125, MM12F SM12F		24F	24F
FIBER OPTIC CABLE NO. 62.5/125, (NUMBER OF FIBERS & TYPE TO BE NOTED ON PLANS)			
GROUND ROD AT (C) CONTROLLER, (H) HANDHOLE, (P) POST, (M) MAST ARM, OR (S) SERVICE		C	C
CONTROLLER CABINET AND FOUNDATION TO BE REMOVED	RCF		
STEEL MAST ARM POLE AND FOUNDATION TO BE REMOVED	RMF		
ALUMINUM MAST ARM POLE AND FOUNDATION TO BE REMOVED	RMF		
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE WITH LUMINAIRE AND FOUNDATION TO BE REMOVED	RMF		
SIGNAL POST AND FOUNDATION TO BE REMOVED	RMF		
INTERSECTION & SAMPLING (SYSTEM) DETECTOR		IS	IS
SAMPLING (SYSTEM) DETECTOR		S	S
EXISTING INTERSECTION LOOP DETECTOR PROPOSED INTERSECTION AND SAMPLING (SYSTEM) DETECTOR		P	
EXISTING PREFORMED INTERSECTION LOOP DETECTOR PROPOSED INTERSECTION AND SAMPLING (SYSTEM) DETECTOR		PP	
PREFORMED INTERSECTION AND SAMPLING (SYSTEM) DETECTOR		PIS	PIS
PREFORMED SAMPLING (SYSTEM) DETECTOR		PS	PS

RAILROAD SYMBOLS

	EXISTING	PROPOSED
RAILROAD CONTROL CABINET	RC	RC
RAILROAD CANTILEVER MAST ARM		
FLASHING SIGNAL		
CROSSING GATE		
CROSSBUCK		

FILE NAME = c:\pw_work\PWIDOT\KANTHAPHIXAYBC\d0112644\traffic_legend_v7.dgn	USER NAME = kanthaphixaybc	DESIGNED - DAG/BCK	REVISED -
		DRAWN - BCK	REVISED -
	PLOT SCALE = 20.0000 ' / IN.	CHECKED - DAD	REVISED -
	PLOT DATE = 10/6/2009	DATE - 10/28/09	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

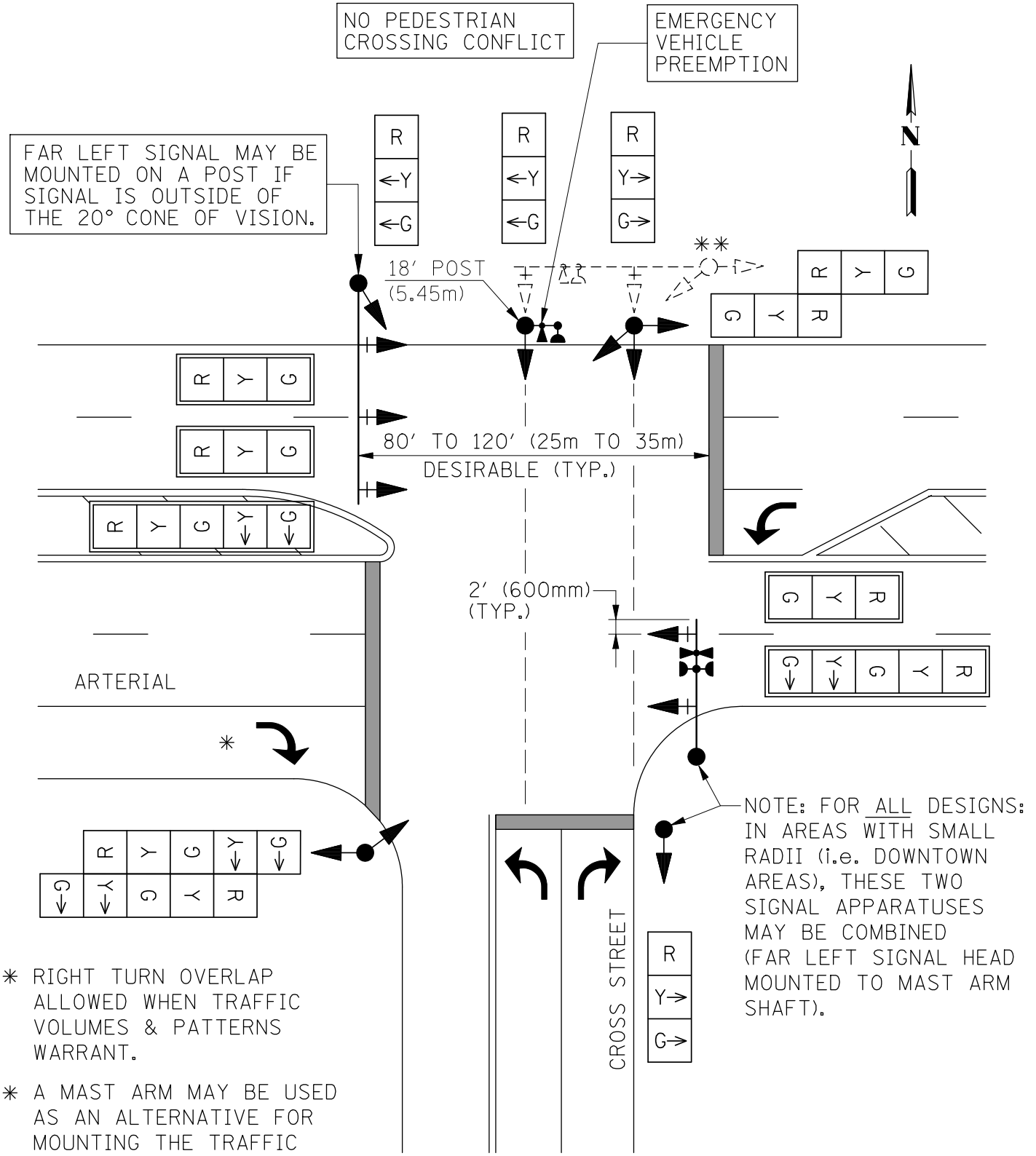
DISTRICT 1
STANDARD TRAFFIC SIGNAL DESIGN DETAILS

SCALE: NONE | SHEET NO. 6 OF 6 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CONTRACT NO.		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

APPENDIX C

EXAMPLE C-1
"T" INTERSECTION
(WITHOUT PEDESTRIANS)
DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING



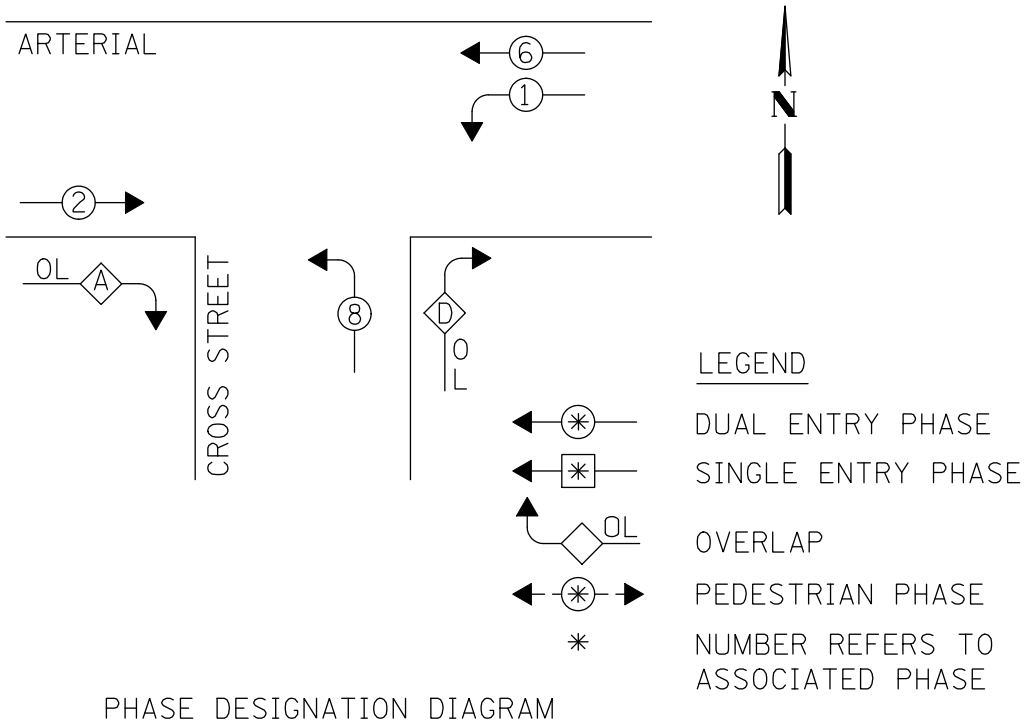
* RIGHT TURN OVERLAP ALLOWED WHEN TRAFFIC VOLUMES & PATTERNS WARRANT.

** A MAST ARM MAY BE USED AS AN ALTERNATIVE FOR MOUNTING THE TRAFFIC SIGNALS IF CONDITIONS WARRANT.

N.T.S.

EXAMPLE C-1
"T" INTERSECTION
(WITHOUT PEDESTRIANS)
DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING

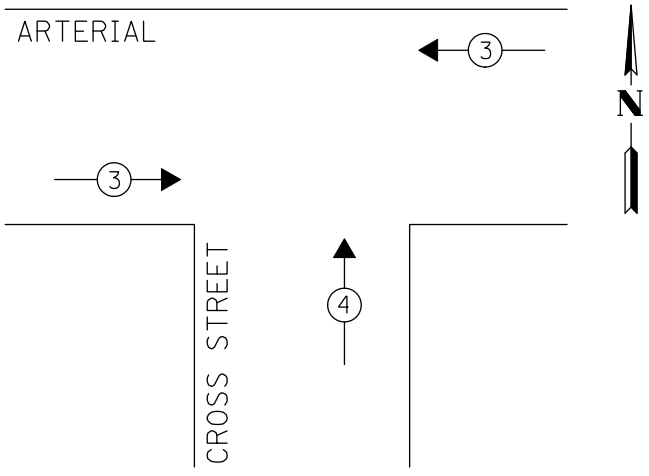
CONTROLLER SEQUENCE



PHASE DESIGNATION DIAGRAM

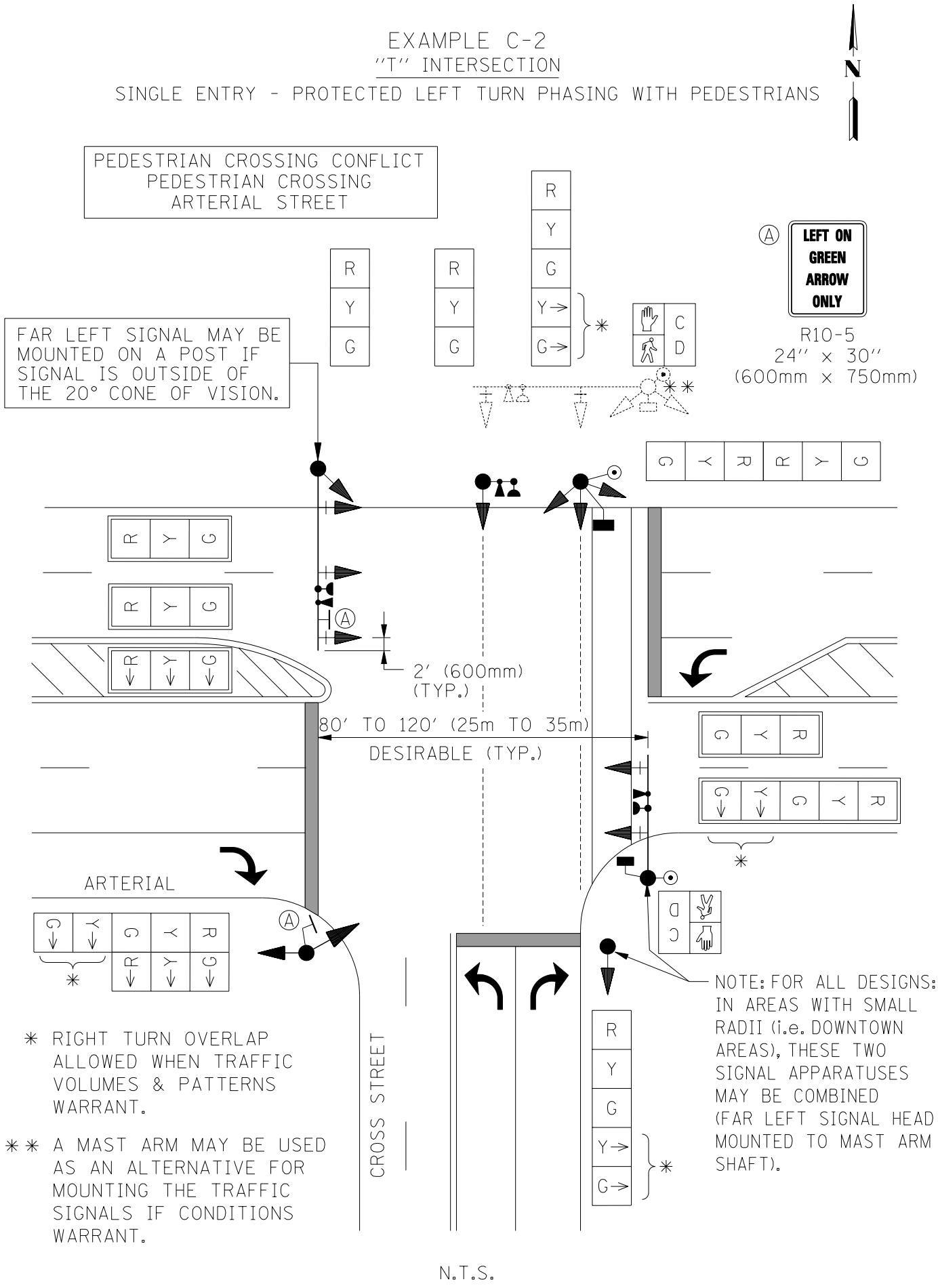
OVERLAP LETTER		PERMISSIVE PHASE		PROTECTED PHASE
A	=	2	+	8
D	=	8	+	1

EMERGENCY VEHICLE PREEMPTION SEQUENCE



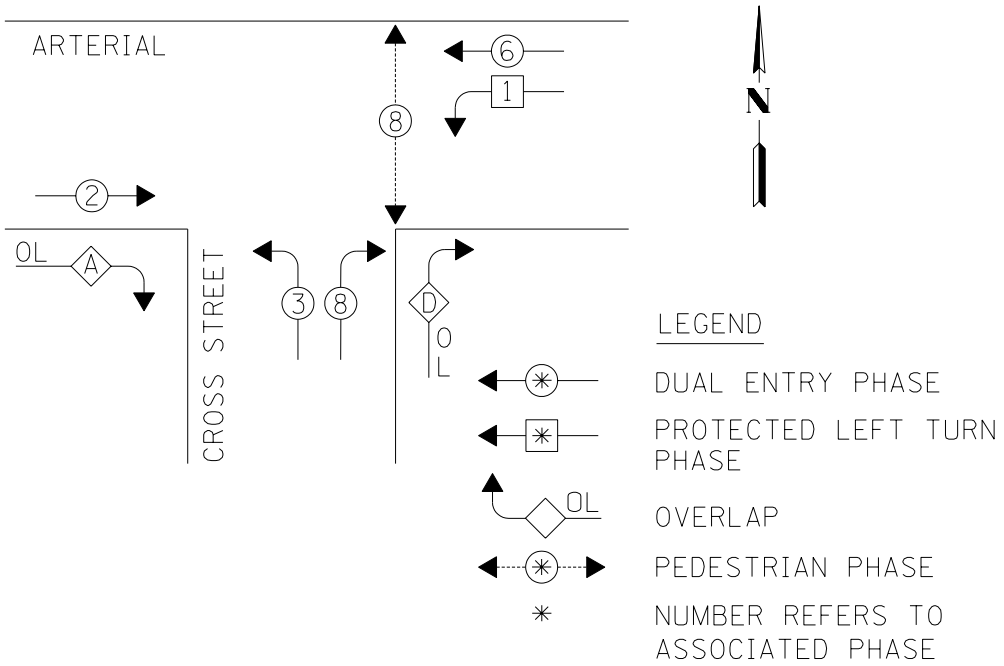
PROPOSED EMERGENCY VEHICLE PREEMPTORS		
EMERGENCY VEHICLE PREEMPTOR	3	4
MOVEMENT	← →	↑

EXAMPLE C-2
"T" INTERSECTION
SINGLE ENTRY - PROTECTED LEFT TURN PHASING WITH PEDESTRIANS



EXAMPLE C-2
"T" INTERSECTION
SINGLE ENTRY - PROTECTED LEFT TURN PHASING WITH PEDESTRIANS

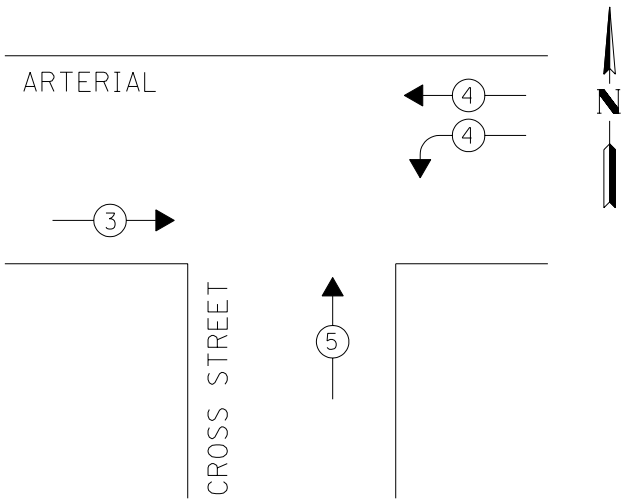
CONTROLLER SEQUENCE



PHASE DESIGNATION DIAGRAM

OVERLAP LETTER		PERMISSIVE PHASE		PROTECTED PHASE
A	=	2	+	3
D	=	8	+	1

EMERGENCY VEHICLE PREEMPTION SEQUENCE

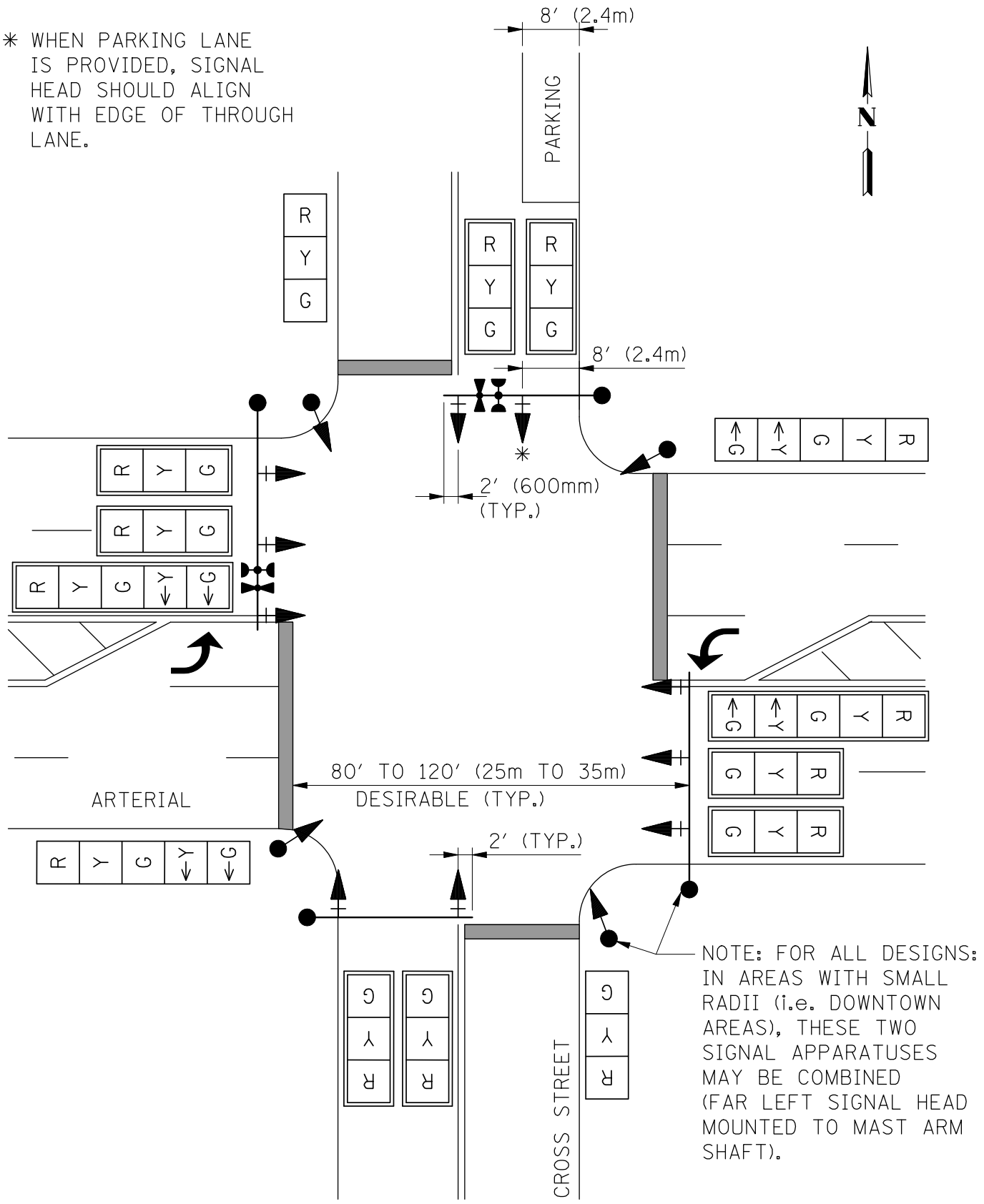


PROPOSED EMERGENCY VEHICLE PREEMPTORS			
EMERGENCY VEHICLE PREEMPTOR	3	4	5
MOVEMENT	→	← ↓	↑

EXAMPLE C-3

TWO AND FIVE LANE CROSS SECTIONS

DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING ON THE ARTERIAL



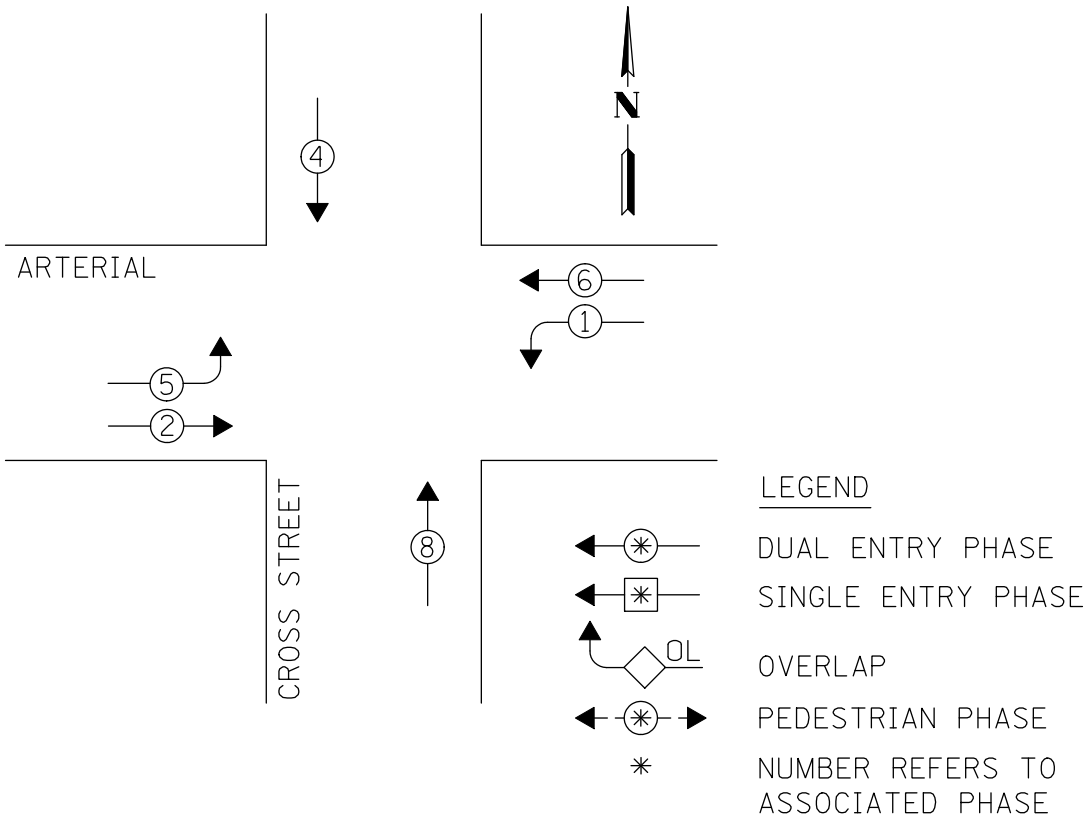
N.T.S.

EXAMPLE C-3

TWO AND FIVE LANE CROSS SECTIONS

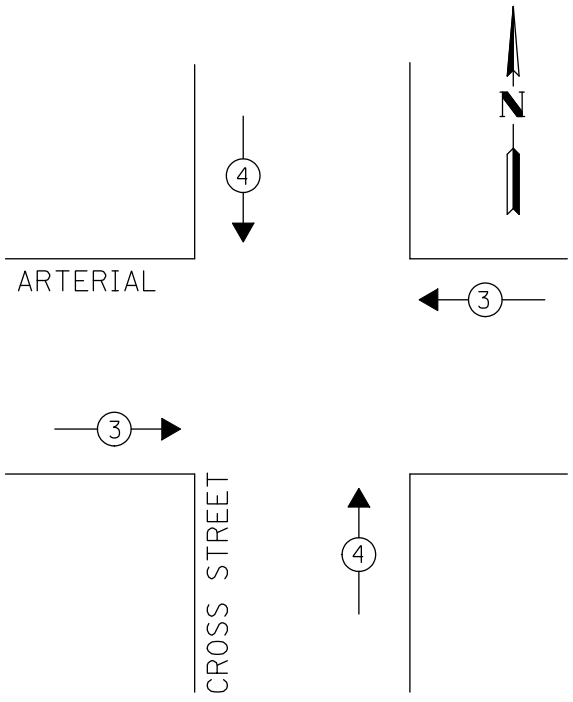
DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING ON THE ARTERIAL

CONTROLLER SEQUENCE



PHASE DESIGNATION DIAGRAM

EMERGENCY VEHICLE PREEMPTION SEQUENCE

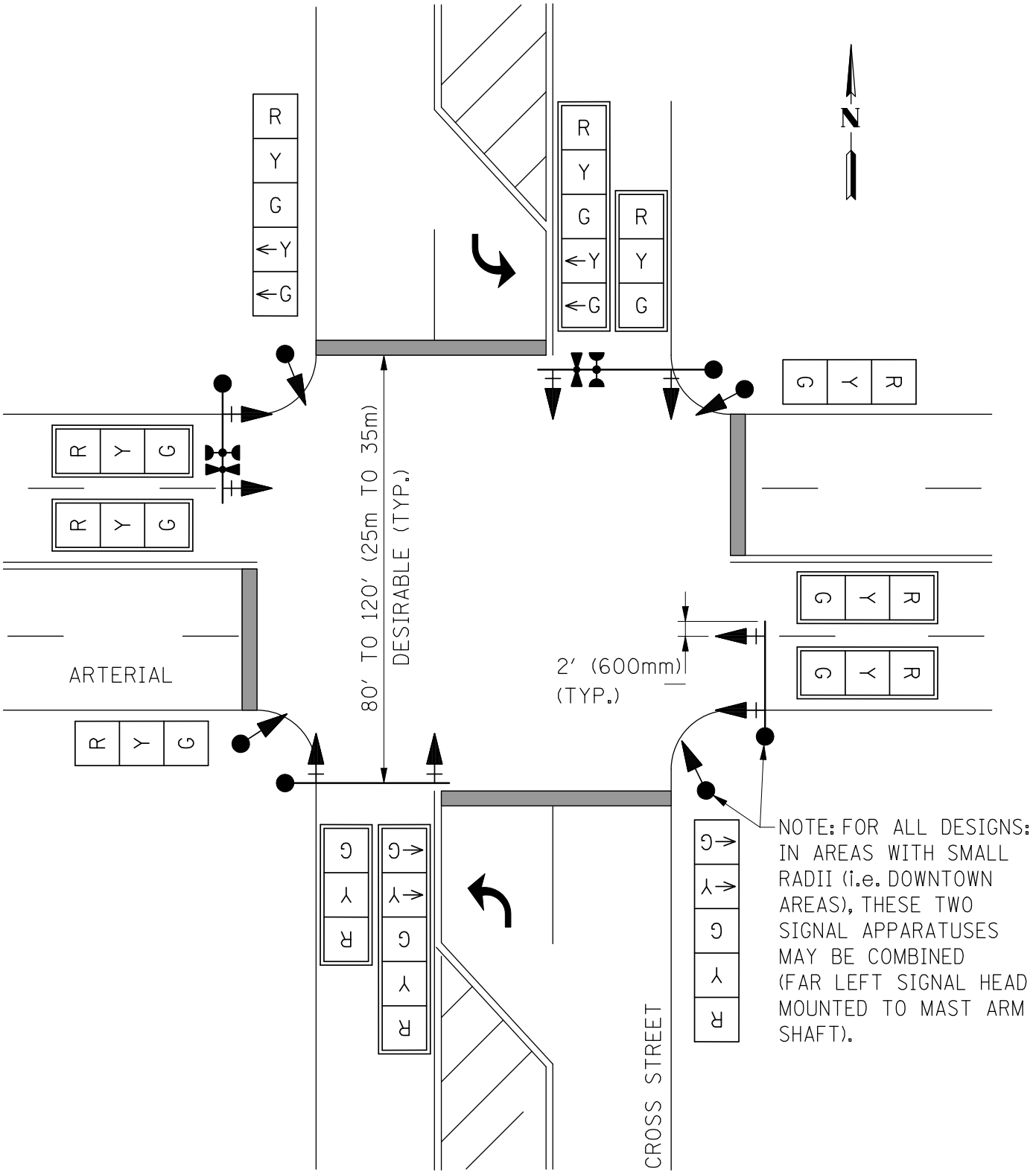


PROPOSED EMERGENCY VEHICLE PREEMPTORS		
EMERGENCY VEHICLE PREEMPTOR	3	4
MOVEMENT	← →	↓ ↑

EXAMPLE C-4

THREE AND FOUR LANE CROSS SECTIONS

DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING - ON THE CROSS STREET



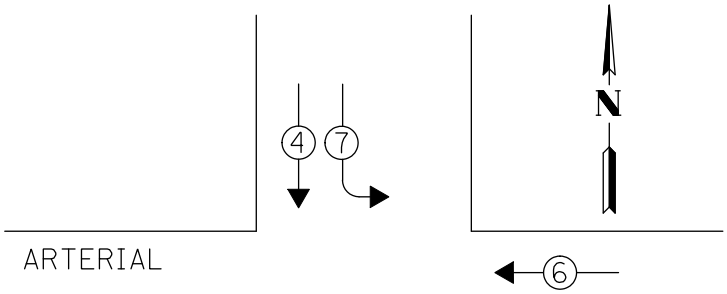
N.T.S.

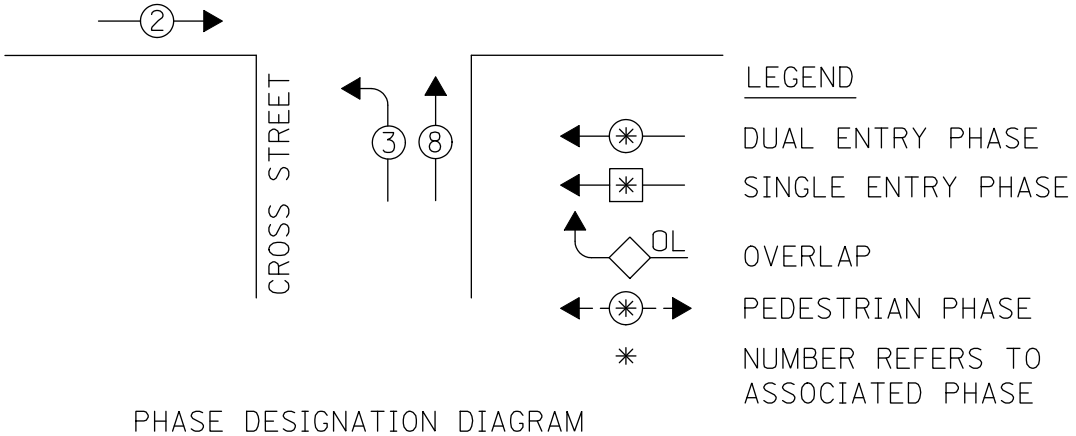
EXAMPLE C-4

THREE AND FOUR LANE CROSS SECTIONS

DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING - ON THE CROSS STREET

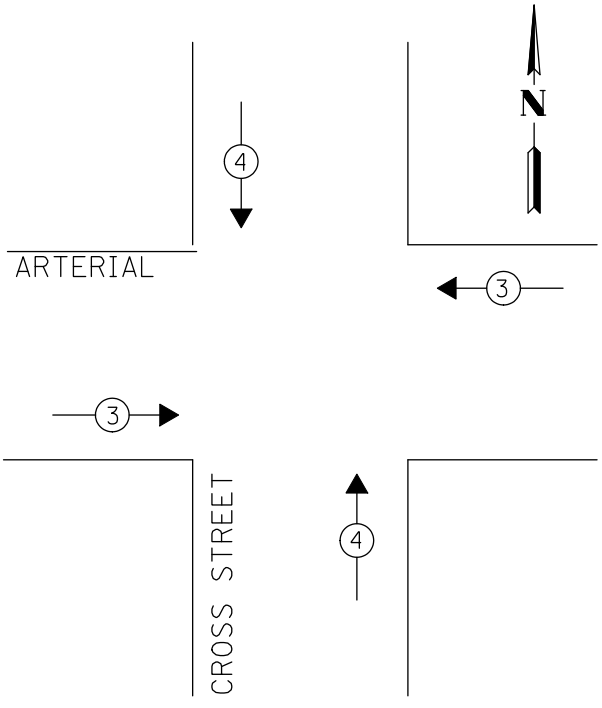
CONTROLLER SEQUENCE





PHASE DESIGNATION DIAGRAM

EMERGENCY VEHICLE PREEMPTION SEQUENCE

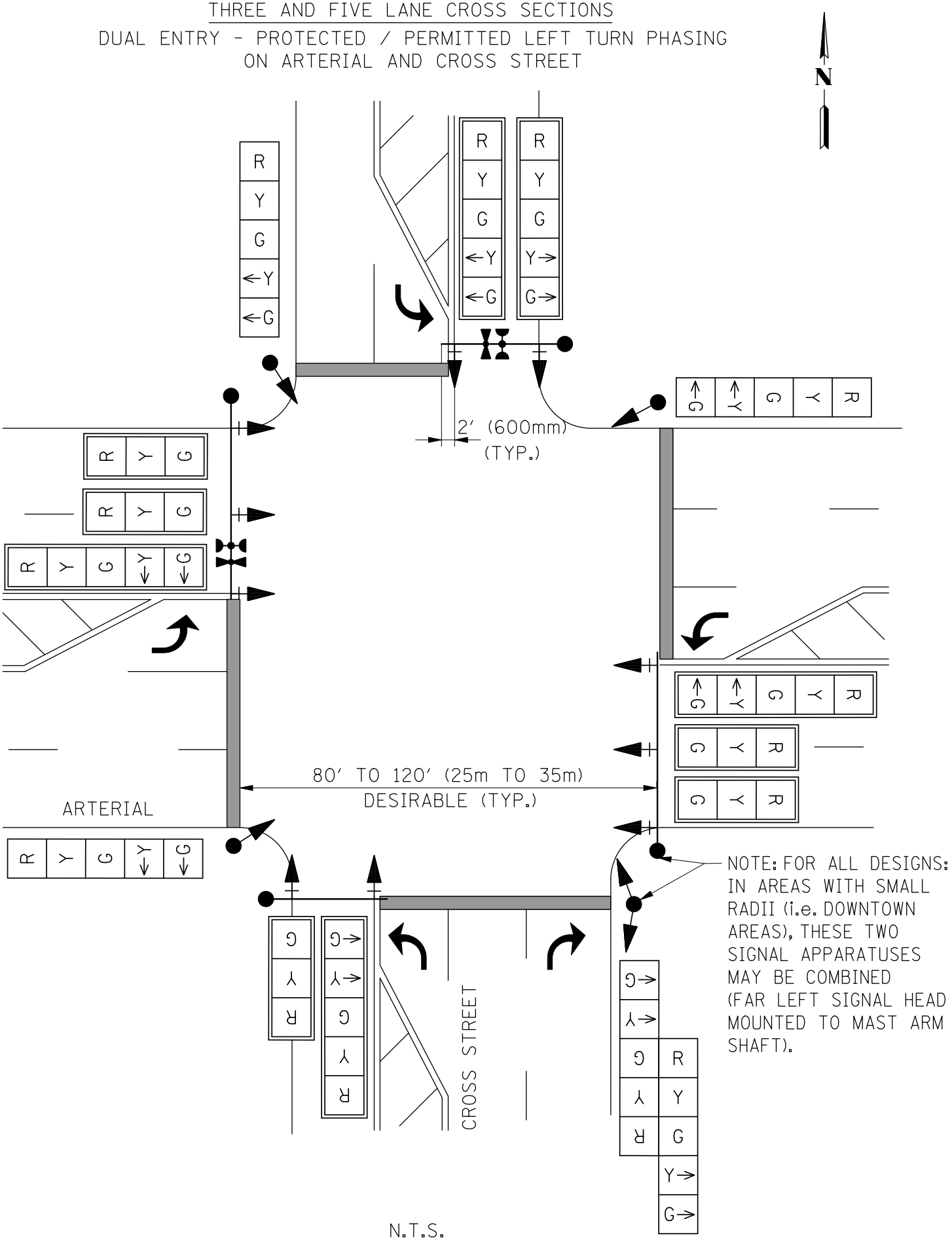


PROPOSED EMERGENCY VEHICLE PREEMPTORS		
EMERGENCY VEHICLE PREEMPTOR	3	4
MOVEMENT	← →	↓ ↑

EXAMPLE C-5

THREE AND FIVE LANE CROSS SECTIONS

DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING ON ARTERIAL AND CROSS STREET

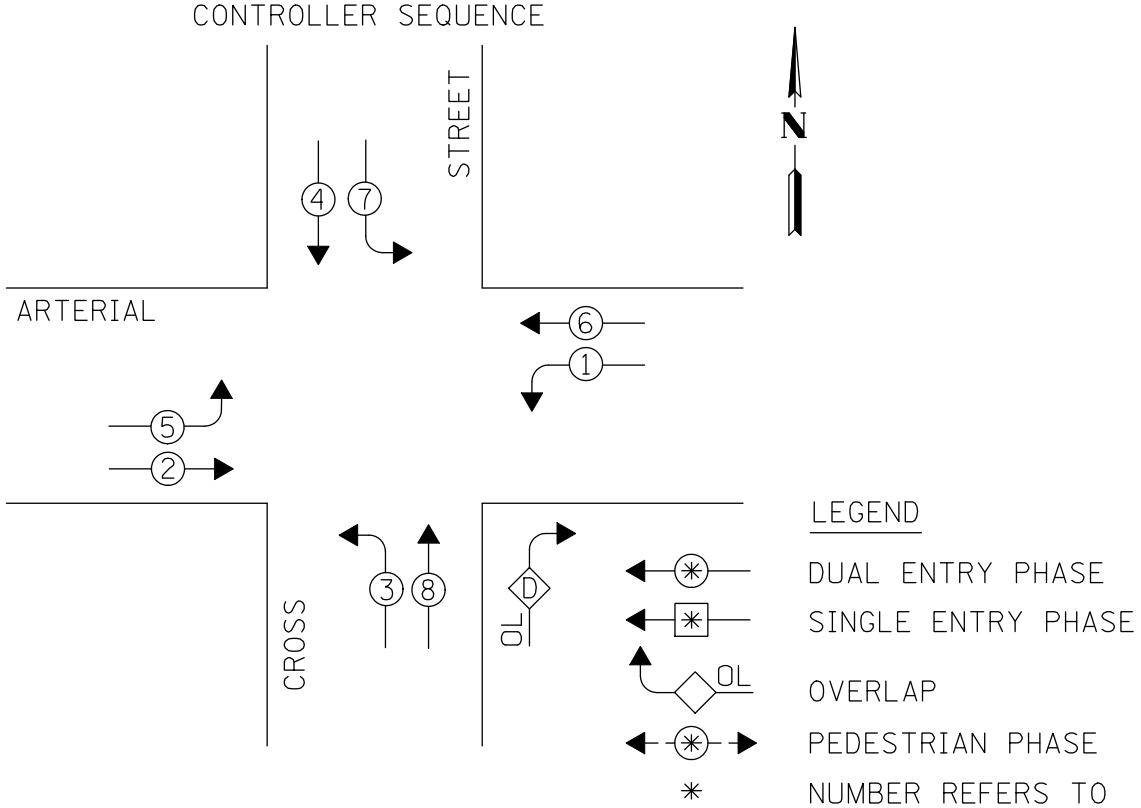


N.T.S.

EXAMPLE C-5

THREE AND FIVE LANE CROSS SECTIONS
DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING
ON ARTERIAL AND CROSS STREET

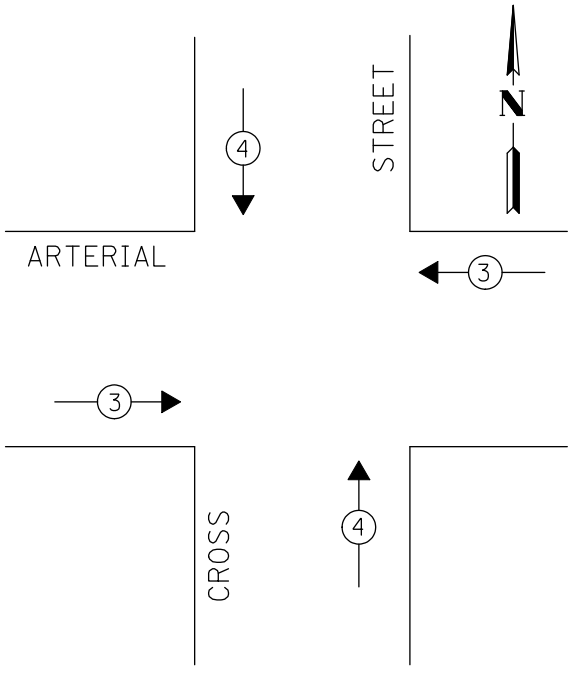
CONTROLLER SEQUENCE



PHASE DESIGNATION DIAGRAM

OVERLAP LETTER		PERMISSIVE PHASE		PROTECTED PHASE
D	=	8	+	1

EMERGENCY VEHICLE PREEMPTION SEQUENCE

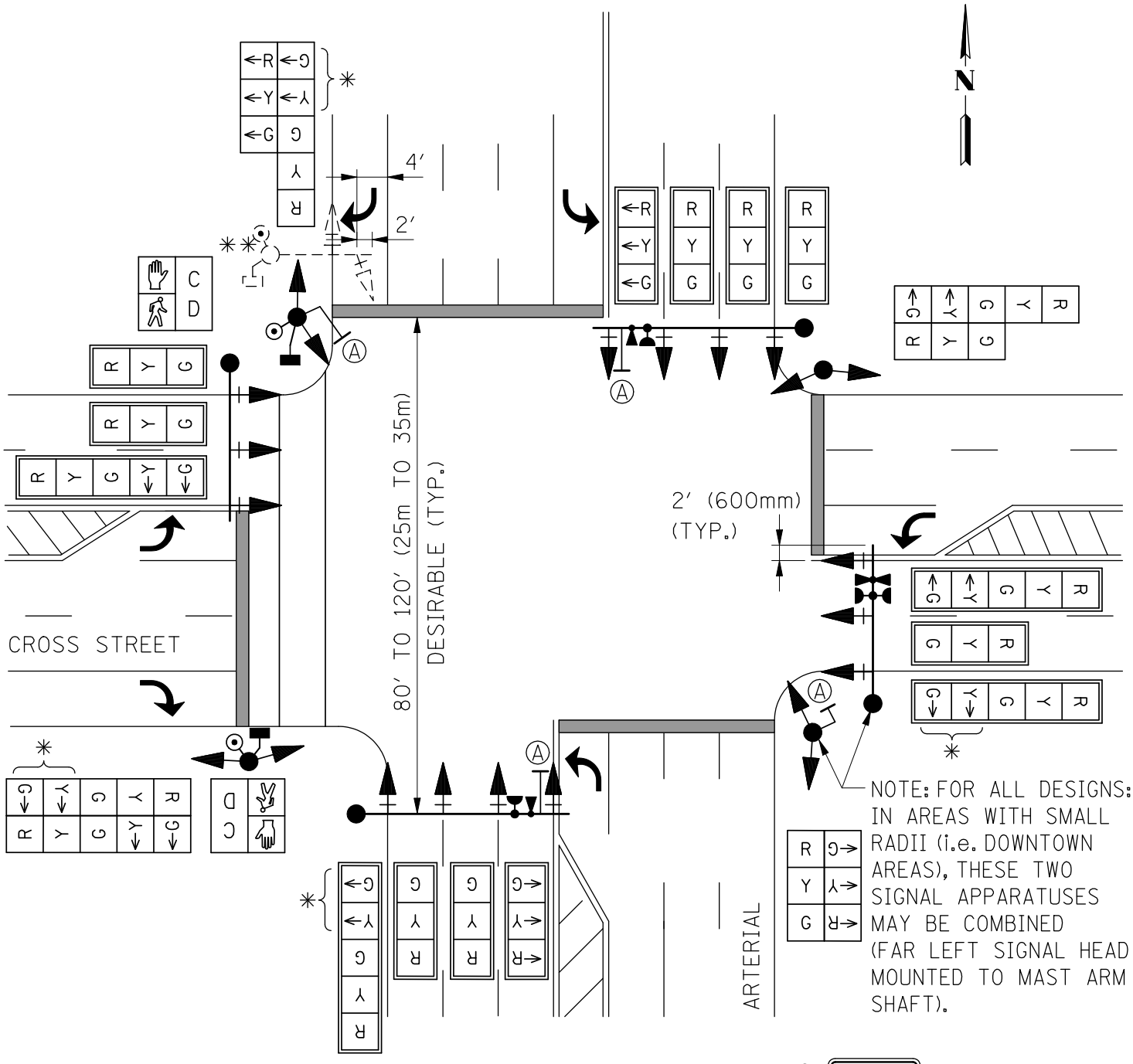


PROPOSED EMERGENCY VEHICLE PREEMPTORS		
EMERGENCY VEHICLE PREEMPTOR	3	4
MOVEMENT	← →	↓ ↑

EXAMPLE C-6

FIVE OR MORE LANE CROSS SECTIONS

SINGLE ENTRY - PROTECTED ONLY LEFT TURN PHASING - ARTERIAL
DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING - CROSS STREET



Ⓐ **LEFT ON GREEN ARROW ONLY**

R10-5

24″ x 30″ (600mm x 750mm) (TYPICAL) SIGN PANEL TYPE 1

* RIGHT TURN OVERLAP ALLOWED WHEN TRAFFIC VOLUMES & PATTERNS WARRANT.

** A MAST ARM MAY BE USED AS AN ALTERNATIVE FOR MOUNTING THE TRAFFIC SIGNALS IF CONDITIONS WARRANT.

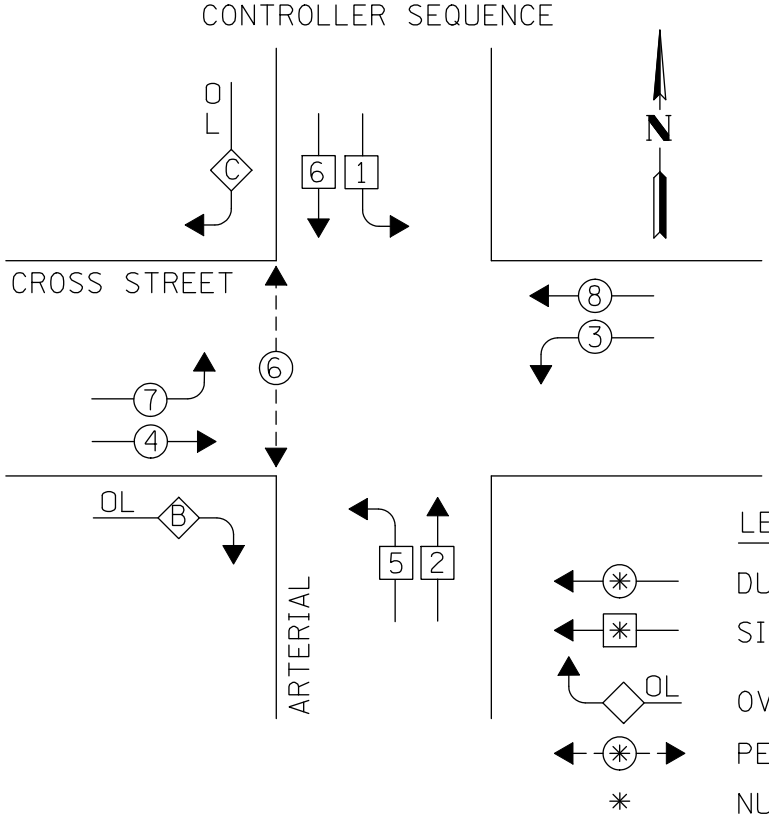
N.T.S.

EXAMPLE C-6

FIVE OR MORE LANE CROSS SECTIONS

SINGLE ENTRY - PROTECTED ONLY LEFT TURN PHASING - ARTERIAL
DUAL ENTRY - PROTECTED / PERMITTED LEFT TURN PHASING - CROSS STREET

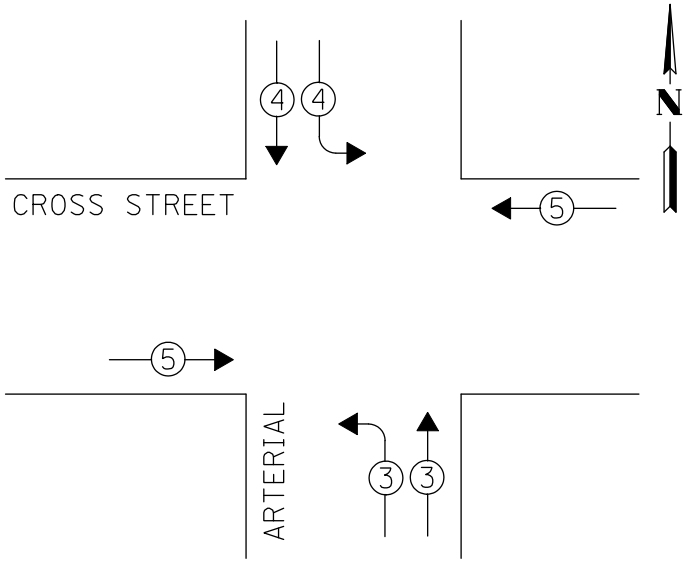
CONTROLLER SEQUENCE



PHASE DESIGNATION DIAGRAM

OVERLAP LETTER		PERMISSIVE PHASE		PROTECTED PHASE
B	=	4	+	5
C	=	6	+	7

EMERGENCY VEHICLE PREEMPTION SEQUENCE

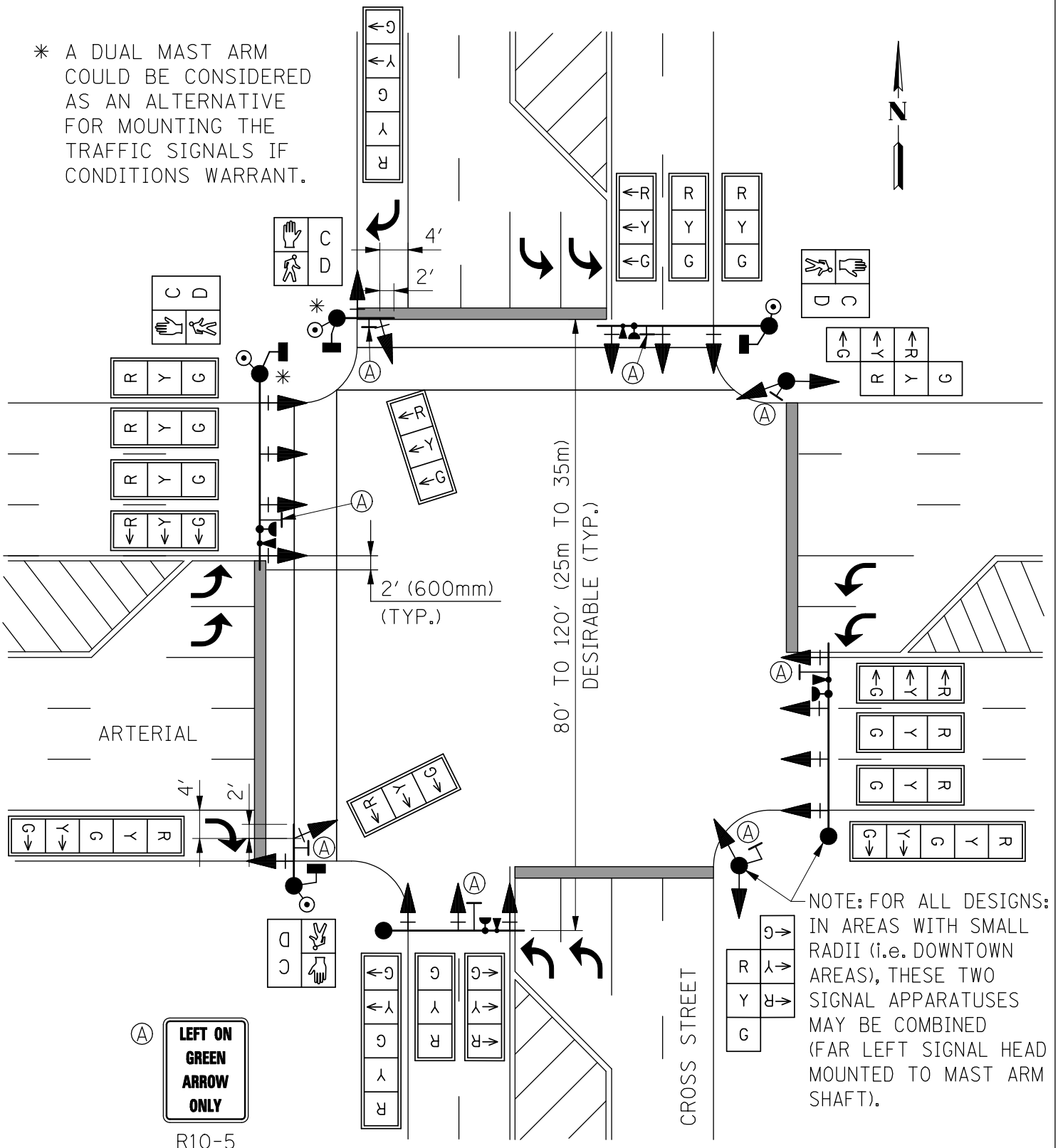


PROPOSED EMERGENCY VEHICLE PREEMPTORS			
EMERGENCY VEHICLE PREEMPTOR	3	4	5
MOVEMENT	↰ ↑	↓ ↱	← →

EXAMPLE C-7

FIVE OR MORE LANE CROSS SECTIONS

LEFT TURN ON ARROW ONLY - ALL APPROACHES
SINGLE ENTRY - PROTECTED ONLY LEFT TURN PHASING



N.T.S.

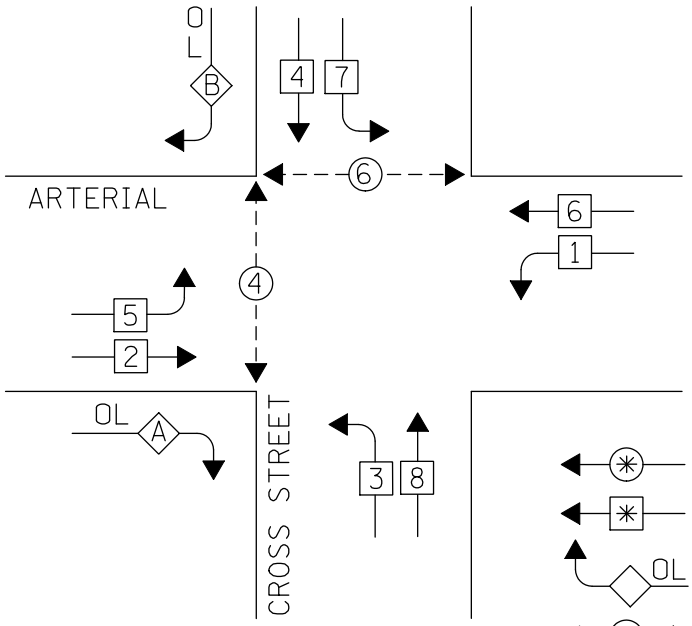
N:\ACEC\IDOT DESIGN GUIDELINES 2009\Exhibit Rev 9-14-09\example_C-7.dgn

EXAMPLE C-7

FIVE OR MORE LANE CROSS SECTIONS

LEFT TURN ON ARROW ONLY - ALL APPROACHES
SINGLE ENTRY - PROTECTED ONLY LEFT TURN PHASING

CONTROLLER SEQUENCE



LEGEND

DUAL ENTRY PHASE

SINGLE ENTRY PHASE

OVERLAP

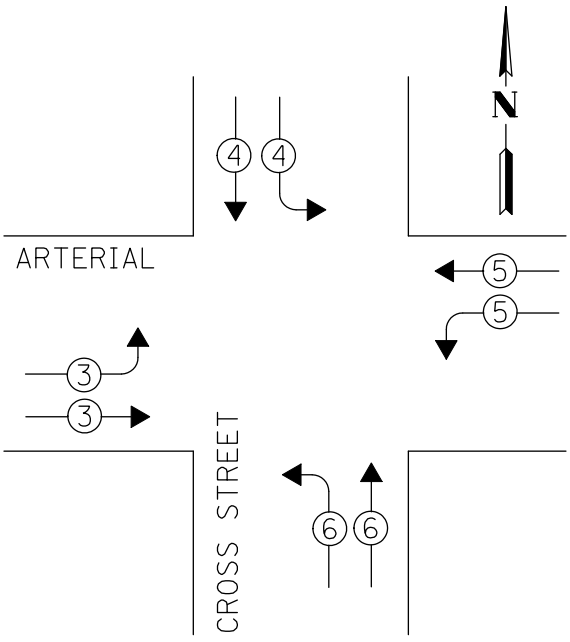
PEDESTRIAN PHASE

* NUMBER REFERS TO ASSOCIATED PHASE

PHASE DESIGNATION DIAGRAM

OVERLAP LETTER		PERMISSIVE PHASE		PROTECTED PHASE
A	=	2	+	3
B	=	4	+	5

EMERGENCY VEHICLE PREEMPTION SEQUENCE

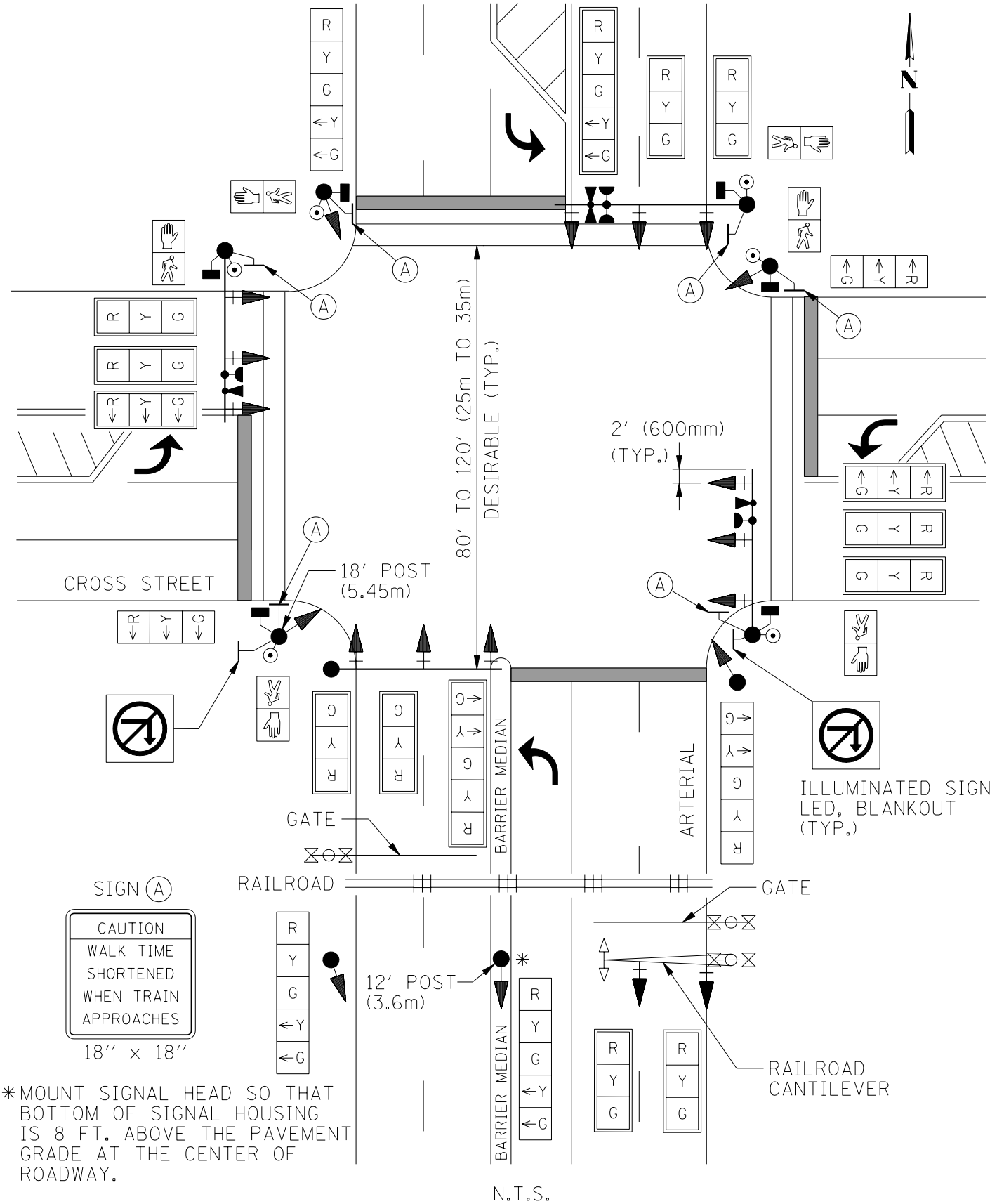


PROPOSED EMERGENCY VEHICLE PREEMPTORS				
EMERGENCY VEHICLE PREEMPTOR	3	4	5	6
MOVEMENT				

EXAMPLE C-8

FIVE LANE CROSS SECTIONS

DUAL ENTRY - PROTECTED/PERMITTED LEFT TURN PHASING - ARTERIAL
SINGLE ENTRY - PROTECTED ONLY LEFT TURN PHASING - CROSS STREET
RAILROAD PREEMPTION WITH PRE-SIGNALS



*MOUNT SIGNAL HEAD SO THAT BOTTOM OF SIGNAL HOUSING IS 8 FT. ABOVE THE PAVEMENT GRADE AT THE CENTER OF ROADWAY.

N.T.S.

EXAMPLE C-8

FIVE LANE CROSS SECTIONS

DUAL ENTRY - PROTECTED/PERMITTED LEFT TURN PHASING - ARTERIAL
SINGLE ENTRY - PROTECTED ONLY LEFT TURN PHASING - CROSS STREET
RAILROAD PREEMPTION WITH PRE-SIGNALS

SEQUENCE OF OPERATION

MOVEMENT N	1 5 5								6 1			5 2 5 2					6 2 2					
PHASE	1 + 5								1 + 6			2 + 5					2 + 6					
INTERVAL	1	2A	2B	2C	3	4A	4B	4C	5	6	7	8	9	10A	10B	10C	11	12	13A	13B	13C	13D
CHANGE TO		1+6			2+5	2+6			θ	θ	2+6	θ	θ	2+6						3+7 3+8	4+7 4+8	
ARTERIAL (NORTH OF TRACKS) END MAST ARM AND FAR LEFT SIGNALS N/B	R ←G	R ←G	R ←G	R ←Y	R ←G	R ←G	R ←G	R ←Y	R	R	R	G ←G	G ←G	G ←G	G ←G	G ←Y	G	G	G	G	Y	R
ARTERIAL (NORTH OF TRACKS) MID AND RIGHT MAST ARM SIGNALS N/B	R	R	R	R	R	R	R	R	R	R	R	G	G	G	G	G	G	G	G	G	Y	R
ARTERIAL (SOUTH OF TRACKS) FAR LEFT AND MEDIAN SIGNALS N/B	R ←G	R ←Y	R	R	R ←G	R ←Y	R	R	R	R	R	G ←G	G ←G	G ←Y	G	G	G	G	Y	R	R	R
ARTERIAL (SOUTH OF TRACKS) CANTILEVER SIGNALS N/B	R	R	R	R	R	R	R	R	R	R	R	G	G	G	G	G	G	G	Y	R	R	R
ARTERIAL END MAST ARM AND FAR LEFT SIGNALS S/B	R ←G	R ←G	R ←G	R ←G	R ←Y	R ←Y	R	R	G ←G	G ←G	G ←Y	R	R	R	R	R	G	G	Y	R	R	R
ARTERIAL MID AND RIGHT MAST ARM SIGNALS S/B	R	R	R	R	R	R	R	R	G	G	G	R	R	R	R	R	G	G	Y	R	R	R
CROSS STREET END MAST ARM AND FAR LEFT SIGNALS E/B	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R
CROSS STREET MID AND RIGHT MAST ARM SIGNALS E/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CROSS STREET END MAST ARM AND FAR LEFT SIGNALS W/B	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R
CROSS STREET MID AND RIGHT MAST ARM SIGNALS W/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PEDESTRIAN SIGNALS CROSSING ARTERIAL ON NORTH SIDE OF CROSS STREET	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON EAST SIDE OF ARTERIAL	H	H	H	H	H	H	H	H	H	H	H	* P	** FH	H	H	H	* P	** FH	H	H	H	H
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON WEST SIDE OF ARTERIAL	H	H	H	H	H	H	H	H	* P	** FH	H	H	H	H	H	H	* P	** FH	H	H	H	H

MOVEMENT	7 3							8 3						7 4					4 8				
PHASE	3 + 7							3 + 8						4 + 7					4 + 8				FLASH
INTERVAL	14	15A	15B	16A	16B	17A	17B	18	19	20A	20B	21A	21B	22	23A	23B	24A	24B	25	26	27A	27B	
CHANGE TO		1+5 1+6 2+5 2+6 4+8		3+8		4+7		θ	θ	1+5 2+5	1+6 2+6	4+8			1+5 2+5	1+6 2+6	4+8				1+5 2+5	1+6 2+6	
ARTERIAL (NORTH OF TRACKS) END MAST ARM AND FAR LEFT SIGNALS N/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL (NORTH OF TRACKS) MID AND RIGHT MAST ARM SIGNALS N/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL (SOUTH OF TRACKS) FAR LEFT AND MEDIAN SIGNALS N/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL (SOUTH OF TRACKS) CANTILEVER SIGNALS N/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL END MAST ARM AND FAR LEFT SIGNALS S/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL MID AND RIGHT MAST ARM SIGNALS S/B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CROSS STREET END MAST ARM AND FAR LEFT SIGNALS E/B	←G	←Y	←R	←Y	←R	←G	←G	←R	←R	←R	←R	←R	←R	←G	←Y	←R	←Y	←R	←R	←R	←R	←R	←R
CROSS STREET MID AND RIGHT MAST ARM SIGNALS E/B	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	G	G	G	G	Y	R	R
CROSS STREET END MAST ARM AND FAR LEFT SIGNALS W/B	←G	←Y	←R	←G	←G	←Y	←R	←G	←G	←Y	←R	←Y	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R
CROSS STREET MID AND RIGHT MAST ARM SIGNALS W/B	R	R	R	R	R	R	R	G	G	Y	R	G	G	R	R	R	R	R	G	G	Y	R	R
PEDESTRIAN SIGNALS CROSSING ARTERIAL ON NORTH SIDE OF CROSS STREET	H	H	H	H	H	H	H	* P	** FH	H	H	H	H	H	H	H	H	H	* P	** FH	H	H	DARK
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON EAST SIDE OF ARTERIAL	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON WEST SIDE OF ARTERIAL	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	

PHASE 2+6 SHALL BE PLACED ON RECALL

* TO APPEAR ONLY UPON PUSHBUTTON ACTUATION

** FLASHING "[hand]" IS TO TERMINATE AT THE COMPLETION OF THE PEDESTRIAN INTERVAL CLEARANCE.

θ THIS "[person]" OR FLASHING "[hand]" INTERVAL MAY FINISH TIMING IN THE BIDIRECTIONAL STRAIGHT THROUGH MOVEMENT IF THE LEFT ARROW TIME IS NOT SUFFICIENT TO COMPLETE "[person]" OR FLASHING "[hand]" INTERVALS.

P = ILLUMINATED PERSON = WALK
FH = ILLUMINATED FLASHING HAND = FLASHING DON'T WALK
H = ILLUMINATED SOLID HAND = DON'T WALK

RAILROAD PREEMPTION SEQUENCE OF OPERATION

																PREEMPTOR NUMBER 3		PREEMPTOR NUMBER 4		PREEMPTOR NUMBER 5		PREEMPTOR NUMBER 2				
CHANGE FROM NORMAL SEQUENCE OF OPERATION INTERVAL NUMBER	1	5		8		11		14		18		22		25												
CHANGE FROM EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER																2		3		4						
RAILROAD PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	1A	1B	1C	1D	1E	1F	1G	1H	1J	1K	1L	1M	1N	1P	1Q	1R	1S	1T	1U	1V	1W	2	3	4	5	CLEAR TO NORMAL SEQUENCE
CHANGE TO RAILROAD PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	2	1C	2	1E	2	1G	2	1J	2	1L	2	1N	2	1Q	2	1S	2	1U	2	1W	2	3	4	5		
ARTERIAL (NORTH OF TRACKS) END MAST ARM AND FAR LEFT SIGNALS N/B	R ←G	R	R	G ←G	G ←G	G	G	R	R	R	R	R	R	R	R	G	G	R	R	R	R	G ←G	Y	R	R	Δ
ARTERIAL (NORTH OF TRACKS) MID AND RIGHT MAST ARM SIGNALS N/B	R	R	R	G	G	G	G	R	R	R	R	R	R	R	R	G	G	R	R	R	R	G	Y	R	R	Δ
ARTERIAL (SOUTH OF TRACKS) FAR LEFT AND MEDIAN SIGNALS N/B	R ←Y	R	R	Y	R	Y	R	R	R	R	R	R	R	R	R	Y	R	R	R	R	R	R	R	R	R	Δ
ARTERIAL (SOUTH OF TRACKS) CANTILEVER SIGNALS N/B	R	R	R	Y	R	Y	R	R	R	R	R	R	R	R	R	Y	R	R	R	R	R	R	R	R	R	Δ
ARTERIAL END MAST ARM AND FAR LEFT SIGNALS S/B	R ←Y	Y	R	R	R	Y	R	R	R	R	R	R	R	R	R	Y	R	R	R	R	R	R	R	R	R	Δ
ARTERIAL MID AND RIGHT MAST ARM SIGNALS S/B	R	Y	R	R	R	Y	R	R	R	R	R	R	R	R	R	Y	R	R	R	R	R	R	R	R	R	Δ
CROSS STREET END MAST ARM AND FAR LEFT SIGNALS E/B	←R	←R	←R	←R	←R	←R	←R	←Y	←R	←R	←R	←Y	←R	←R	←R	←R	←R	←Y	←R	←R	←R	←R	←R	←R	←R	Δ
CROSS STREET MID AND RIGHT MAST ARM SIGNALS E/B	R	R	R	R	R	R	R	R	R	R	R	Y	R	Y	R	R	R	Y	R	R	R	R	R	R	G	Δ
CROSS STREET END MAST ARM AND FAR LEFT SIGNALS W/B	←R	←R	←R	←R	←R	←R	←R	←Y	←R	←Y	←R	←R	←R	←R	←R	←R	←R	←R	←R	←Y	←R	←R	←R	←R	←R	Δ
CROSS STREET MID AND RIGHT MAST ARM SIGNALS W/B	R	R	R	R	R	R	R	R	R	Y	R	R	R	Y	R	R	R	R	R	Y	R	R	R	R	G	Δ
PEDESTRIAN SIGNALS CROSSING ARTERIAL ON NORTH SIDE OF CROSS STREET	H	H	H	H	H	H	H	H	H	FH	H	H	H	FH	H	H	H	H	H	H	H	H	H	H	H	Δ
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON EAST SIDE OF ARTERIAL	H	H	H	FH	H	FH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	Δ
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON WEST SIDE OF ARTERIAL	H	FH	H	H	H	FH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	Δ
INTERNALLY ILLUMINATED NO RIGHT TURN SIGNS	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT	NRT HOLD	Δ

Δ RAILROAD PREEMPTION SEQUENCE SHALL PROVIDE THE PROPER CLEARANCE INTERVAL TO RESUME THE NORMAL SEQUENCE OF OPERATION OR PROPER CLEARANCE INTERVAL TO DISPLAY AN EMERGENCY VEHICLE INTERVAL (IF APPLICABLE) AFTER RAILROAD PREEMPTION INTERVAL 5 IS TERMINATED.

NRT = "NO RIGHT TURN" OR [symbol]

FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	SEQUENCE OF OPERATION AND RAILROAD PREEMPTION SEQUENCE OF OPERATION ARTERIAL AND CROSS STREET	F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN - FPB	REVISED -							
	PLOT SCALE =	CHECKED - MJT	REVISED -					CONTRACT NO.		
	PLOT DATE =	DATE -	REVISED -		SCALE: N.T.S. SHEET NO. OF SHEETS STA. TO STA.	FED. ROAD DIST. NO.	ILLINOIS FED. AID PROJECT			

EXAMPLE C-8

FIVE LANE CROSS SECTIONS

DUAL ENTRY - PROTECTED/PERMITTED LEFT TURN PHASING - ARTERIAL

SINGLE ENTRY - PROTECTED ONLY LEFT TURN PHASING - CROSS STREET

RAILROAD PREEMPTION WITH PRE-SIGNALS

EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION

CHANGE FROM NORMAL SEQUENCE OF OPERATION INTERVAL NUMBER	1			5		5			8				8					11
EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	1A	1B	1C	1D	1E	1F	1G	1H	1J	1K	1L	1M	1N	1P	1Q	1R	1S	1T
CHANGE TO EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	1B	1C	2,3 OR 4	1E	2	1G	1H	3 OR 4	1K	1L	1M	2	1P	1Q	1R	1S	3 OR 4	2
ARTERIAL (NORTH OF TRACKS) N/B END MAST ARM AND FAR LEFT SIGNALS	R ←G	R ←G	R ← Y	R	R	R	R	R	G ←G	G ←G	G ←G	G ← Y	G ←G	G ←G	G ←G	Y	R	G
ARTERIAL (NORTH OF TRACKS) N/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	R	R	R	R	R	G	G	G	G	G	G	G	Y	R	G
ARTERIAL (SOUTH OF TRACKS) N/B FAR LEFT AND MEDIAN SIGNALS	R ← Y	R	R	R	R	R	R	R	G ←G	G ← Y	G	G	G ←G	Y	R	R	R	G
ARTERIAL (SOUTH OF TRACKS) N/B CANTILEVER SIGNALS	R	R	R	R	R	R	R	R	G	G	G	G	G	Y	R	R	R	G
ARTERIAL S/B END MAST ARM AND FAR LEFT SIGNALS	R ← Y	R	R	G ←G	G ←Y	G ←G	Y	R	R	R	R	R	R	R	R	R	R	G
ARTERIAL S/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	G	G	G	Y	R	R	R	R	R	R	R	R	R	R	G
CROSS STREET E/B END MAST ARM AND FAR LEFT SIGNALS	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R
CROSS STREET E/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CROSS STREET W/B END MAST ARM AND FAR LEFT SIGNALS	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R	←R
CROSS STREET W/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PEDESTRIAN SIGNALS CROSSING ARTERIAL ON NORTH SIDE OF CROSS STREET	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON EAST SIDE OF ARTERIAL	H	H	H	H	H	H	H	H	FH	H	H	H	FH	H	H	H	H	FH
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON WEST SIDE OF ARTERIAL	H	H	H	FH	H	FH	H	H	H	H	H	H	H	H	H	H	H	FH

CHANGE FROM NORMAL SEQUENCE OF OPERATION INTERVAL NUMBER	11					14		14		14		18			18	22		22
EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	1U	1V	1W	1X	1Y	1Z	1AA	1BB	1CC	1DD	1EE	1FF	1GG	1HH	1JJ	1KK	1LL	1MM
CHANGE TO EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	1V	1W	1X	1Y	3 OR 4	1AA	2	1CC	3	1EE	4	1GG	1HH	2 OR 3	4	1LL	2 OR 4	3
ARTERIAL (NORTH OF TRACKS) N/B END MAST ARM AND FAR LEFT SIGNALS	G	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL (NORTH OF TRACKS) N/B MID AND RIGHT MAST ARM SIGNALS	G	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL (SOUTH OF TRACKS) N/B FAR LEFT AND MEDIAN SIGNALS	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL (SOUTH OF TRACKS) N/B CANTILEVER SIGNALS	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL S/B END MAST ARM AND FAR LEFT SIGNALS	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ARTERIAL S/B MID AND RIGHT MAST ARM SIGNALS	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
CROSS STREET E/B END MAST ARM AND FAR LEFT SIGNALS	←R	←R	←R	←R	←R	←Y	←R	←G	←G	←Y	←R	←R	←R	←R	←R	←Y	←R	←G
CROSS STREET E/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y	R	G
CROSS STREET W/B END MAST ARM AND FAR LEFT SIGNALS	←R	←R	←R	←R	←R	←Y	←R	←Y	←R	←G	←G	←G	←Y	←R	←G	←R	←R	←R
CROSS STREET W/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	G	R	R	R
PEDESTRIAN SIGNALS CROSSING ARTERIAL ON NORTH SIDE OF CROSS STREET	H	H	H	H	H	H	H	H	H	H	H	FH	H	H	FH	H	H	H
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON EAST SIDE OF ARTERIAL	FH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON WEST SIDE OF ARTERIAL	FH	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

										PREEMPTOR NUMBER 3	PREEMPTOR NUMBER 4	PREEMPTOR NUMBER 5	
CHANGE FROM NORMAL SEQUENCE OF OPERATION INTERVAL NUMBER	25			25			25						
EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	1NN	1PP	1QQ	1RR	1SS	1TT	1UU	1VV	1WW	2	3	4	CLEAR TO NORMAL SEQUENCE
CHANGE TO EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION INTERVAL NUMBER	1PP	1QQ	2	1SS	1TT	3	1VV	1WW	4				
ARTERIAL (NORTH OF TRACKS) N/B END MAST ARM AND FAR LEFT SIGNALS	R	R	R	R	R	R	R	R	R	G	R	R	◊
ARTERIAL (NORTH OF TRACKS) N/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	R	R	R	R	R	R	G	R	R	◊
ARTERIAL (SOUTH OF TRACKS) N/B FAR LEFT AND MEDIAN SIGNALS	R	R	R	R	R	R	R	R	R	G	R	R	◊
ARTERIAL (SOUTH OF TRACKS) N/B CANTILEVER SIGNALS	R	R	R	R	R	R	R	R	R	G	R	R	◊
ARTERIAL S/B END MAST ARM AND FAR LEFT SIGNALS	R	R	R	R	R	R	R	R	R	G	R	R	◊
ARTERIAL S/B MID AND RIGHT MAST ARM SIGNALS	R	R	R	R	R	R	R	R	R	G	R	R	◊
CROSS STREET E/B END MAST ARM AND FAR LEFT SIGNALS	←R	←R	←R	←R	←R	←R	←R	←R	←R	← R	← G	← R	◊
CROSS STREET E/B MID AND RIGHT MAST ARM SIGNALS	G	Y	R	G	G	G	G	Y	R	R	G	R	◊
CROSS STREET W/B END MAST ARM AND FAR LEFT SIGNALS	←R	←R	←R	←R	←R	←R	←R	←R	←R	← R	← R	← G	◊
CROSS STREET W/B MID AND RIGHT MAST ARM SIGNALS	G	Y	R	G	Y	R	G	G	G	R	R	G	◊
PEDESTRIAN SIGNALS CROSSING ARTERIAL ON NORTH SIDE OF CROSS STREET	FH	H	H	FH	H	H	FH	H	H	H	H	H	◊
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON EAST SIDE OF ARTERIAL	H	H	H	H	H	H	H	H	H	H	H	H	◊
PEDESTRIAN SIGNALS CROSSING CROSS STREET ON WEST SIDE OF ARTERIAL	H	H	H	H	H	H	H	H	H	H	H	H	◊

◊ **EMERGENCY VEHICLE SEQUENCE SHALL PROVIDE THE PROPER CLEARANCE INTERVAL TO RESUME THE NORMAL SEQUENCE OF OPERATION OR PROPER CLEARANCE INTERVAL TO DISPLAY A DIFFERENT EMERGENCY VEHICLE INTERVAL AFTER EMERGENCY VEHICLE INTERVAL 2, 3, or 4 IS TERMINATED.**

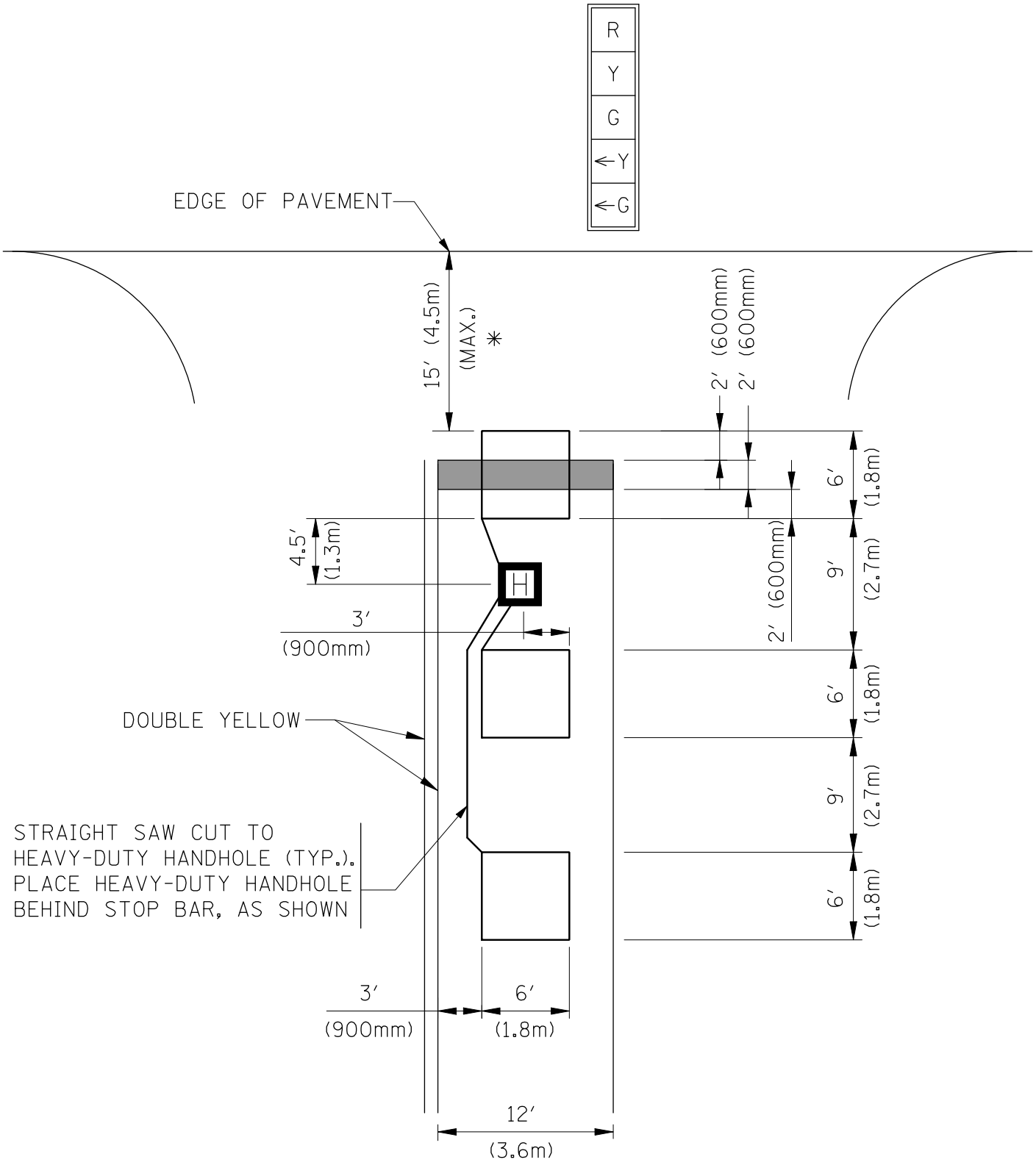
FILE NAME =	USER NAME =	DESIGNED - ABR	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	EMERGENCY VEHICLE PREEMPTION SEQUENCE OF OPERATION ARTERIAL AND CROSS STREET	F.A.P RTE. / SECTION / COUNTY / TOTAL SHEETS / SHEET NO.
		DRAWN - FPB	REVISED -			
	PLOT SCALE =	CHECKED - MJT	REVISED -			CONTRACT NO.
	PLOT DATE =	DATE -	REVISED -		SCALE: N.T.S. / SHEET NO. OF SHEETS / STA. TO STA.	FED. ROAD DIST. NO. / ILLINOIS / FED. AID PROJECT

APPENDIX D

EXAMPLE D-1

LEFT TURN LANE WITHOUT MEDIAN

(PROTECTED / PERMITTED LEFT TURN PHASING)

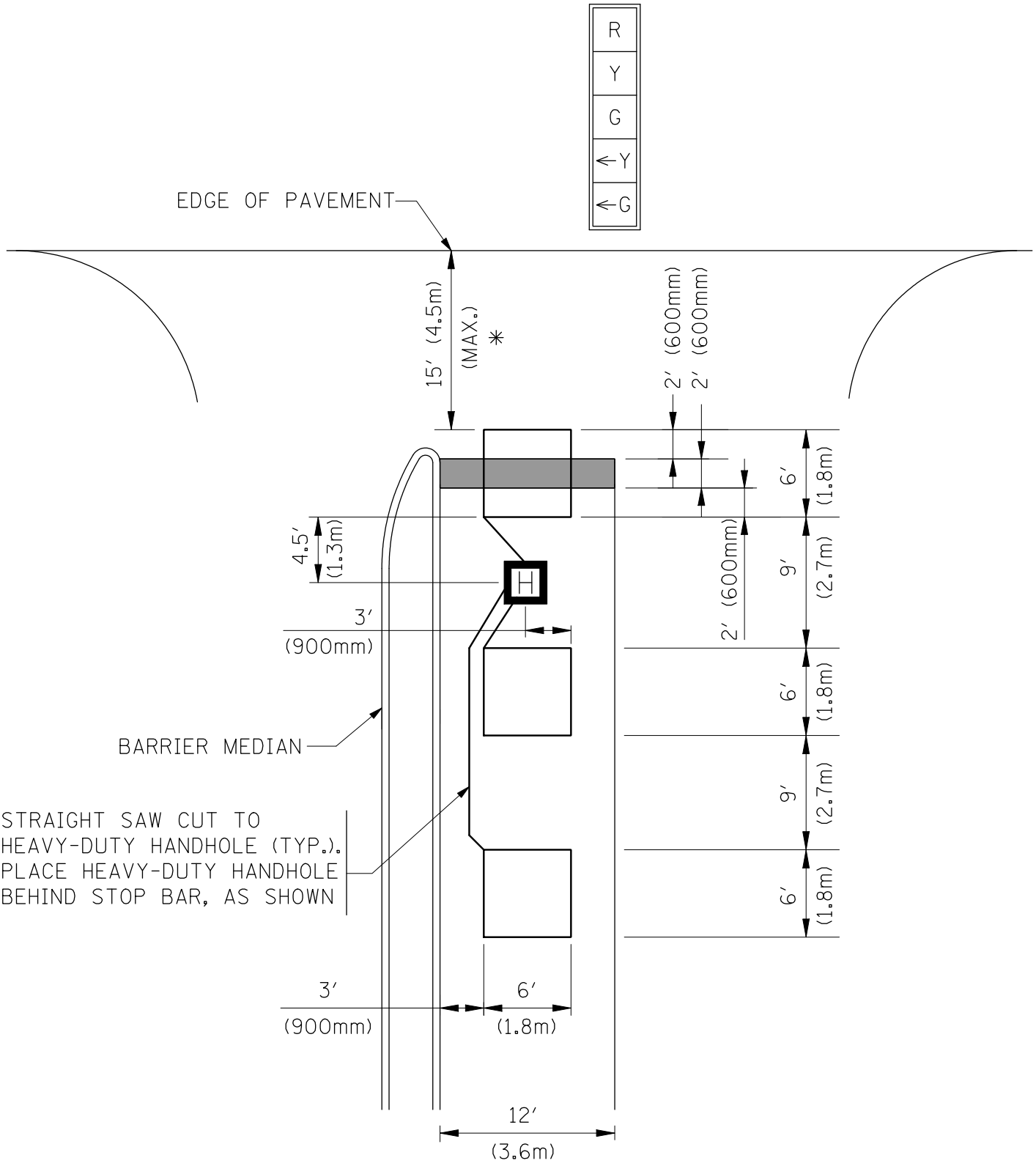


* NOTE:
FOR INTERSECTIONS WHERE STOP BAR IS SET BACK FARTHER, PLACE THE LOOP 15 FEET (MAX.) FROM THE EDGE OF PAVEMENT. HEAVY-DUTY HANDHOLE SHOULD BE PLACED BEHIND STOP BAR REGARDLESS OF LOOP CONFIGURATION.

EXAMPLE D-2

LEFT TURN LANE WITH MEDIAN

(PROTECTED / PERMITTED LEFT TURN PHASING)

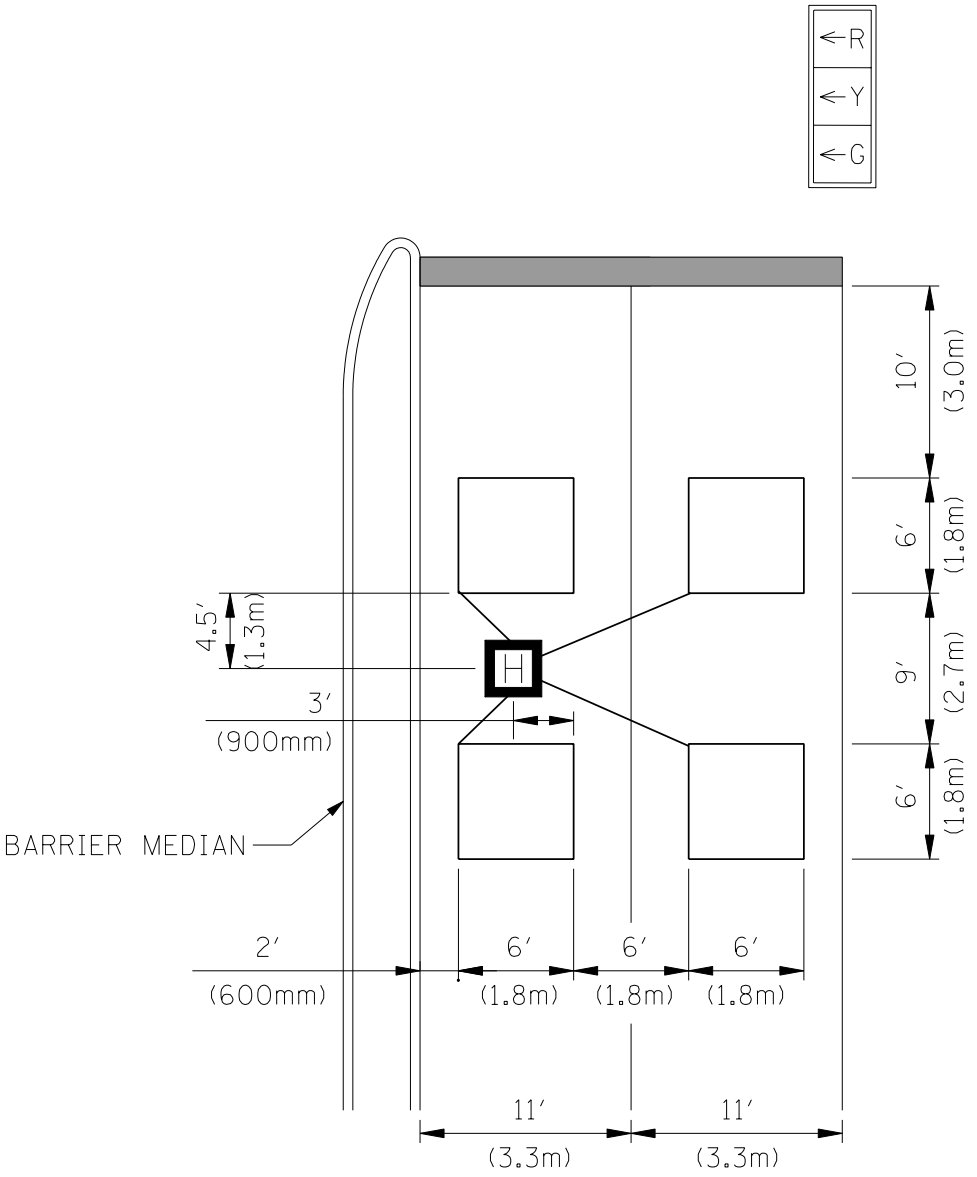


* NOTE:
FOR INTERSECTIONS WHERE STOP BAR IS SET BACK FARTHER, PLACE THE LOOP 15 FEET (MAX.) FROM THE EDGE OF PAVEMENT. HEAVY-DUTY HANDHOLE SHOULD BE PLACED BEHIND STOP BAR REGARDLESS OF LOOP CONFIGURATION.

EXAMPLE D-3

DUAL LEFT TURN LANES WITH MEDIAN

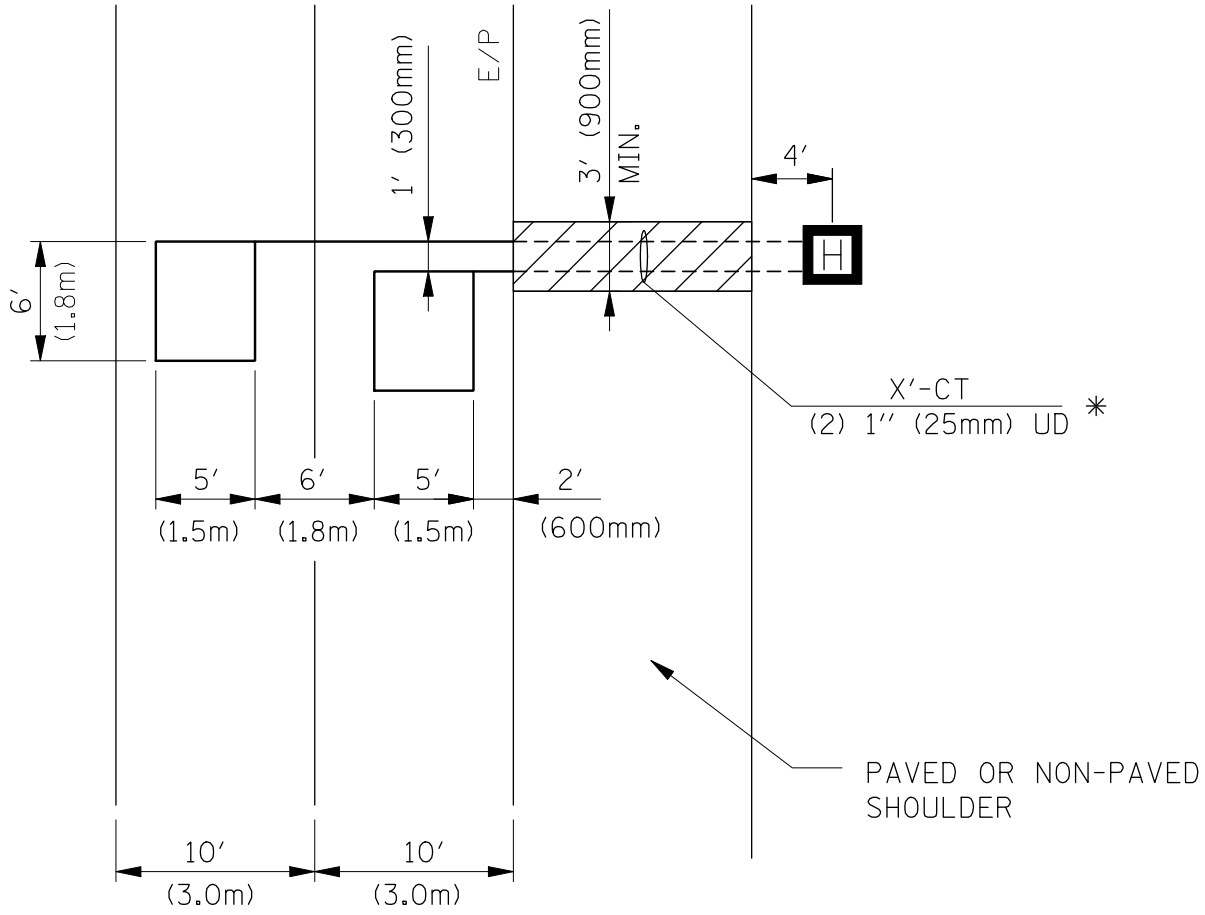
(PROTECTED ONLY LEFT TURN PHASING)



EXAMPLE D-4

LOOPS NEXT TO SHOULDER

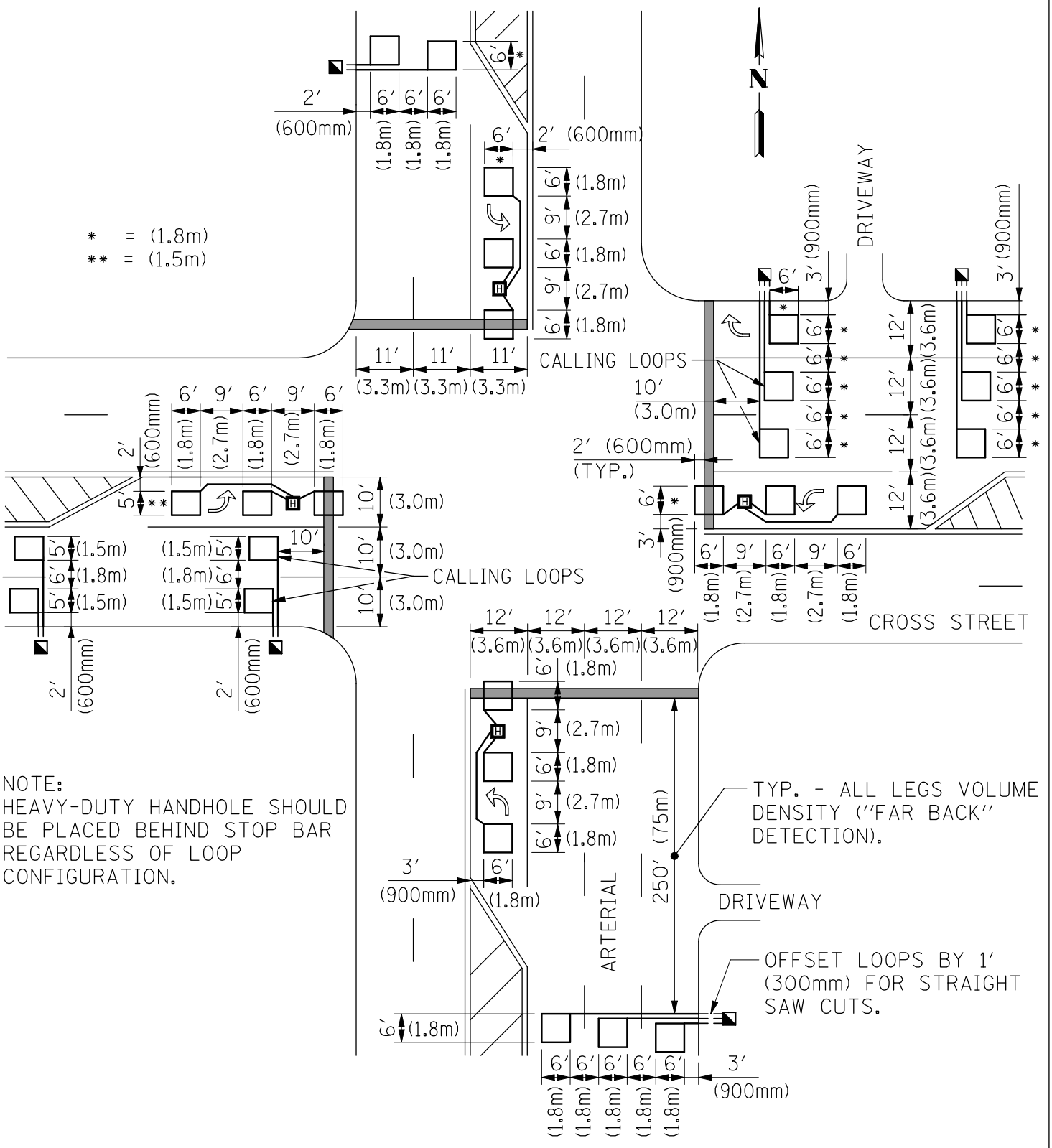
FOR PAVED SHOULDERS, PROVIDE A QUANTITY FOR "PAVEMENT REPLACEMENT" THE QUANTITY SHOULD EQUAL 3' (900mm) x WIDTH OF PAVED SHOULDER.



* UNIT DUCT IS TO BE SHOWN ON PLAN SHEETS BUT NOT INCLUDED IN THE PAY ITEMS.

EXAMPLE D-5

ARTERIAL-VOLUME DENSITY (''FAR BACK'' DETECTION)
CROSS STREET-VOLUME DENSITY (''FAR BACK DETECTION)



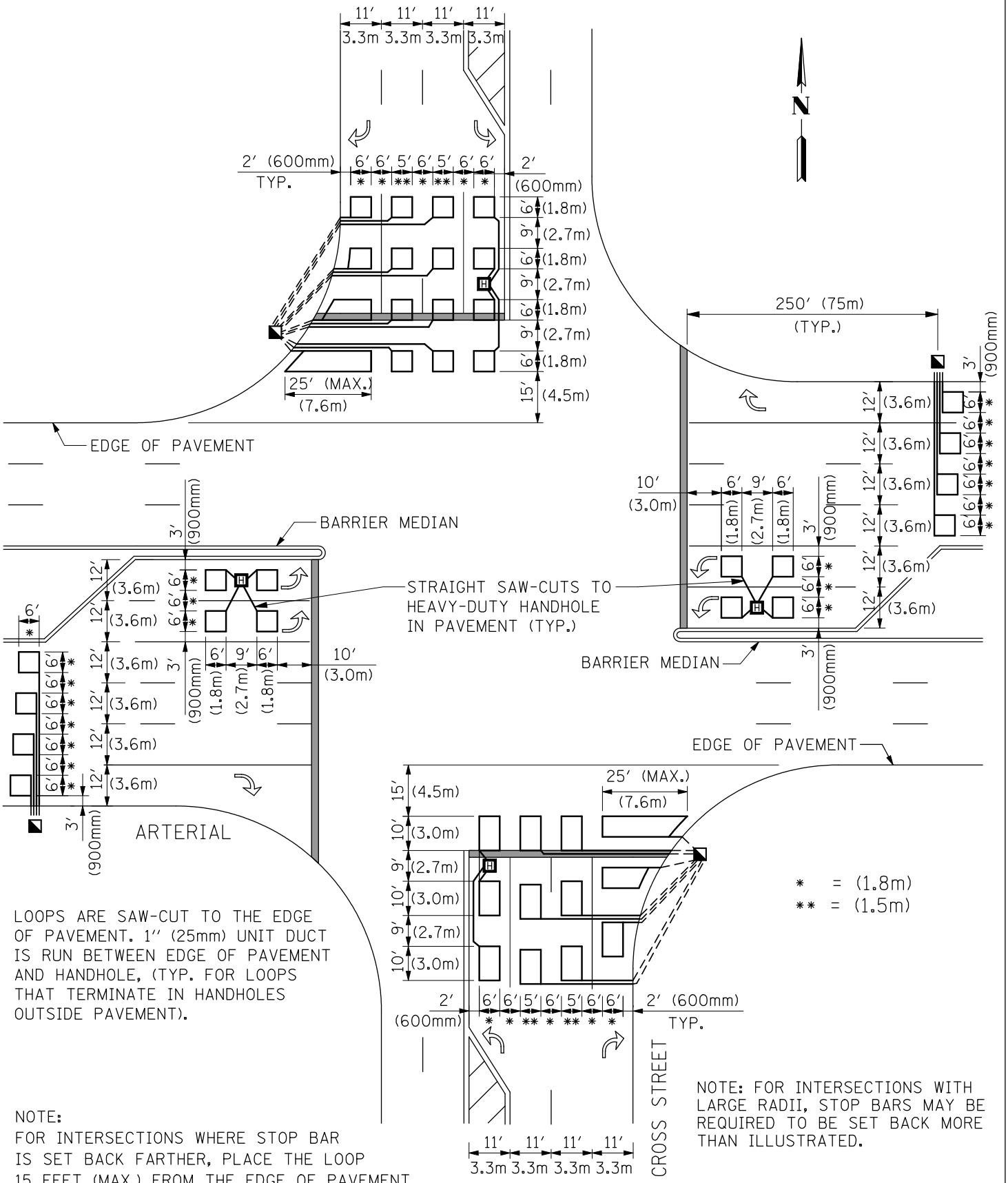
NOTE:
HEAVY-DUTY HANDHOLE SHOULD BE PLACED BEHIND STOP BAR REGARDLESS OF LOOP CONFIGURATION.

LOOPS ARE SAW-CUT TO THE EDGE OF PAVEMENT. 1'' (25mm) UNIT DUCT IS RUN BETWEEN EDGE OF PAVEMENT AND HANDHOLE, (TYP. FOR LOOPS THAT TERMINATE IN HANDHOLES OUTSIDE PAVEMENT).

N.T.S.

EXAMPLE D-6

ARTERIAL-VOLUME DENSITY (''FAR BACK'' DETECTION)
CROSS STREET-PRESENCE (''UPTIGHT'' DETECTION)



* = (1.8m)
** = (1.5m)

LOOPS ARE SAW-CUT TO THE EDGE OF PAVEMENT. 1'' (25mm) UNIT DUCT IS RUN BETWEEN EDGE OF PAVEMENT AND HANDHOLE, (TYP. FOR LOOPS THAT TERMINATE IN HANDHOLES OUTSIDE PAVEMENT).

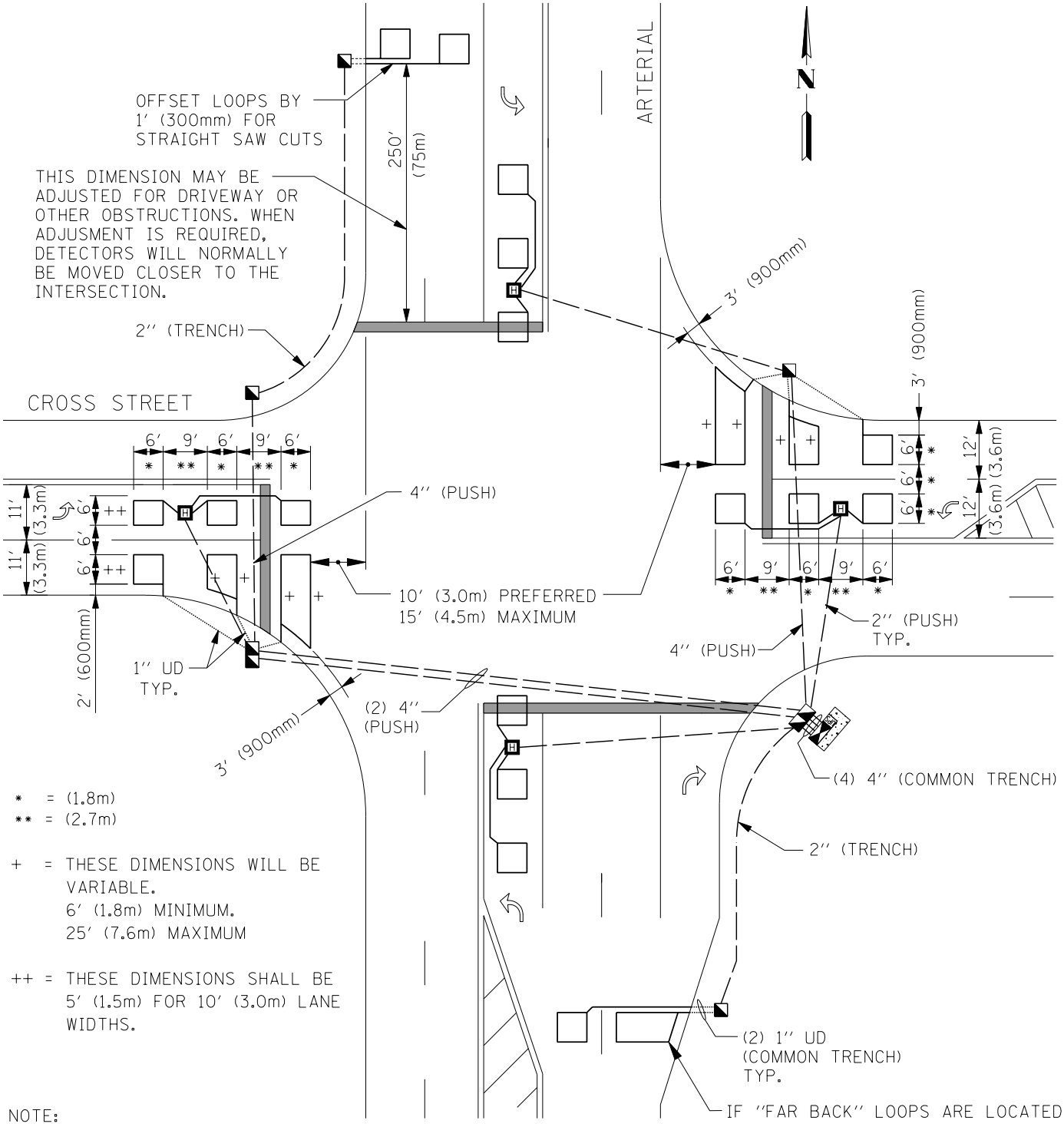
NOTE:
FOR INTERSECTIONS WHERE STOP BAR IS SET BACK FARTHER, PLACE THE LOOP 15 FEET (MAX.) FROM THE EDGE OF PAVEMENT. HEAVY-DUTY HANDHOLE SHOULD BE PLACED BEHIND STOP BAR REGARDLESS OF LOOP CONFIGURATION.

NOTE: FOR INTERSECTIONS WITH LARGE RADII, STOP BARS MAY BE REQUIRED TO BE SET BACK MORE THAN ILLUSTRATED.

N.T.S.

EXAMPLE D-7

ARTERIAL-VOLUME DENSITY (''FAR BACK'' DETECTION)
CROSS STREET-PRESENCE (''UPTIGHT'' DETECTION)
(WITH EXAMPLE CONDUIT ROUTING)



* = (1.8m)
** = (2.7m)

\+ = THESE DIMENSIONS WILL BE VARIABLE.
6' (1.8m) MINIMUM.
25' (7.6m) MAXIMUM

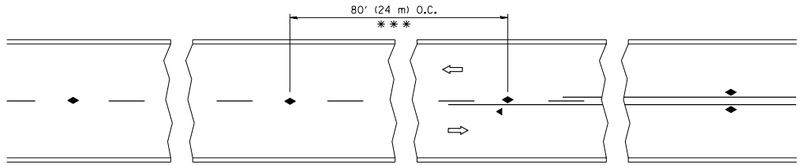
++ = THESE DIMENSIONS SHALL BE 5' (1.5m) FOR 10' (3.0m) LANE WIDTHS.

NOTE:
FOR INTERSECTIONS WHERE STOP BAR IS SET BACK FARTHER, PLACE THE LOOP 15 FEET (MAX.) FROM THE EDGE OF PAVEMENT. HEAVY-DUTY HANDHOLE SHOULD BE PLACED BEHIND STOP BAR REGARDLESS OF LOOP CONFIGURATION.

IF ''FAR BACK'' LOOPS ARE LOCATED IN TAPER OF A RIGHT TURN LANE, DIMENSION THIS LOOP TO COVER TAPER AREA. DO NOT COVER THE LEFT TURN LANE OR LEFT TURN LANE TAPER.

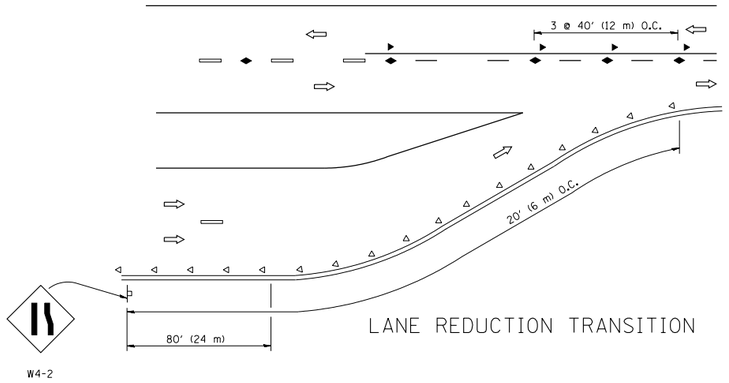
N.T.S.

APPENDIX E

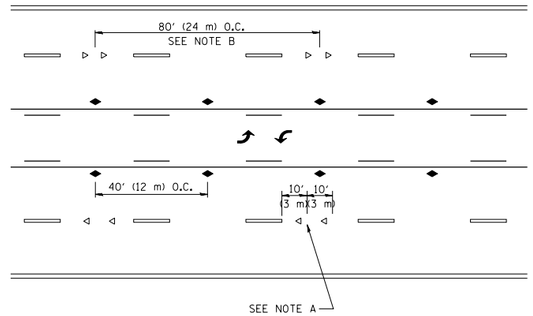


* * * REDUCE TO 40' (12 m) O.C. ON CURVES WITH POSTED OR ADVISORY SPEED 45 M.P.H. (70 km/h) OR LESS.

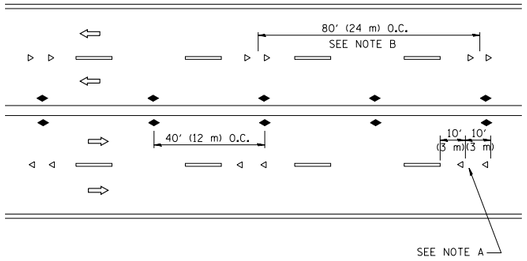
TWO-LANE/TWO-WAY



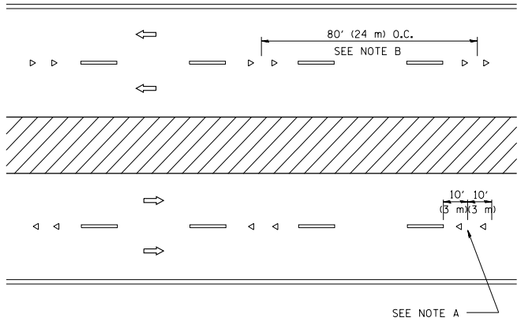
LANE REDUCTION TRANSITION



TWO-WAY LEFT TURN



MULTI-LANE/UNDIVIDED



MULTI-LANE/DIVIDED

GENERAL NOTES

1. MARKERS USED WITH DASHED LINES SHALL BE CENTERED IN THE GAP BETWEEN SEGMENTS.
2. MARKERS USED ADJACENT TO SOLID LINES SHALL BE OFFSET 2 TO 3 (50 TO 75) TOWARD TRAFFIC AS SHOWN.
3. MARKERS THROUGH TANGENTS LESS THAN 500' (150 m) IN LENGTH BETWEEN CURVES SHALL BE INSTALLED AT THE LESSER OF THE TWO CURVE SPACINGS.

SYMBOLS

- YELLOW STRIPE
- WHITE STRIPE
- ONE-WAY AMBER MARKER
- ONE-WAY CRYSTAL MARKER (W/O)
- TWO-WAY AMBER MARKER

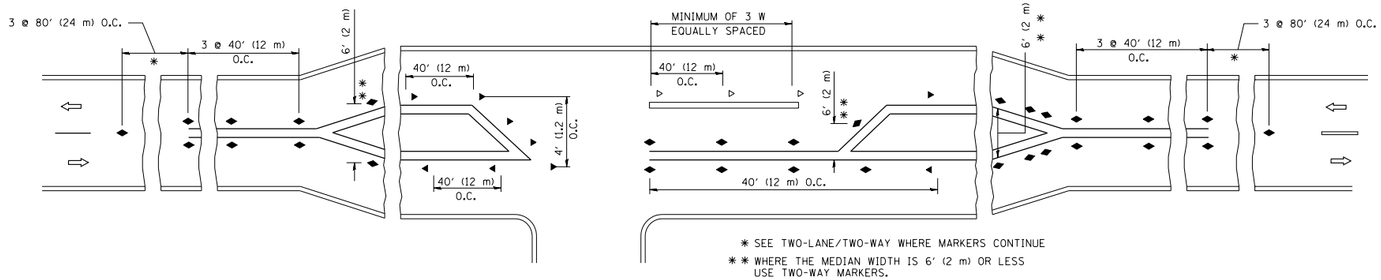
LANE MARKER NOTES

A. USE DOUBLE LANE LINE MARKERS SPACED AS SHOWN.

B. REDUCE TO 40' (12 m) O.C. ON CURVES WHERE ADVISORY SPEEDS ARE 10 M.P.H (20 km/h) LOWER THAN POSTED SPEEDS.

DESIGN NOTES

1. DOUBLE LANE LINE MARKERS SHALL BE USED UNLESS SPECIFIED OTHERWISE.
2. EXCEPT AS SHOWN ON THE LANE REDUCTION TRANSITION AND FREEWAY EXIT RAMP DETAIL, MARKERS ARE NOT TO BE SPECIFIED ON RIGHT EDGE LINES.
3. THE EXACT MARKER LIMITS, SPACING, AND COLOR SHOULD BE INCLUDED IN THE PLANS.
4. MARKERS SHOULD NOT BE USED ALONGSIDE CURBS EXCEPT FOR EXTREMELY SHORT SECTIONS OF CURBS WHERE NOT MORE THAN TWO MARKERS WOULD BE INVOLVED.



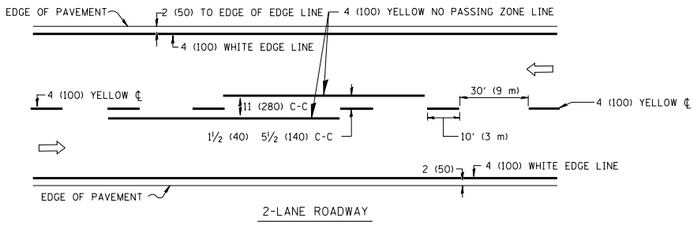
* SEE TWO-LANE/TWO-WAY WHERE MARKERS CONTINUE

** WHERE THE MEDIAN WIDTH IS 6' (2 m) OR LESS USE TWO-WAY MARKERS.

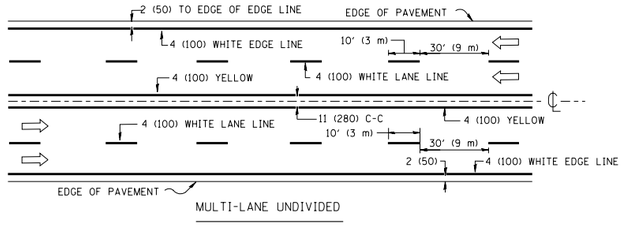
LEFT TURN

All dimensions are in inches (millimeters) unless otherwise shown.

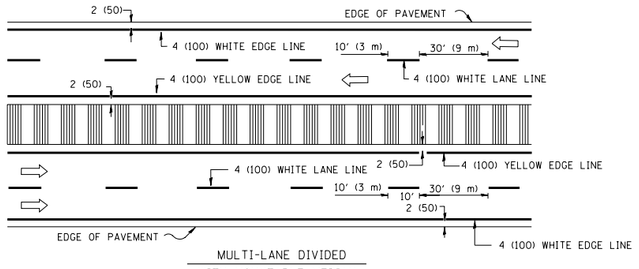
FILE NAME = c:\pw_work\pwidot\drivakosgn\d0108315\tc11.dgn	USER NAME = drivakosgn	DESIGNED -	REVISED - T. RAMMACHER 09-19-94	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	**TYPICAL APPLICATIONS RAISED REFLECTIVE PAVEMENT MARKERS (SNOW-PLOW RESISTANT)**		F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN -	REVISED - T. RAMMACHER 03-12-99								
	PLOT SCALE = 50.000 ' / IN.	CHECKED -	REVISED - T. RAMMACHER 01-06-00					TC-11	CONTRACT NO.		
	PLOT DATE = 9/9/2009	DATE -	REVISED - C. JUCIUS 09-09-09		SCALE: NONE	SHEET NO. 1 OF 1 SHEETS STA. TO STA.	FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



2-LANE ROADWAY



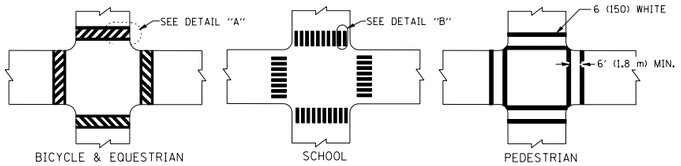
MULTI-LANE UNDIVIDED

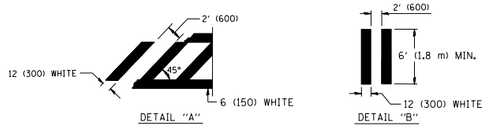


MULTI-LANE DIVIDED
WITH MOUNTABLE MEDIAN

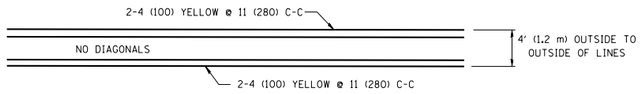
NOTE: MEDIANS WITH BARRIER CURB DO NOT REQUIRE AN EDGE LINE

TYPICAL LANE AND EDGE LINE MARKING

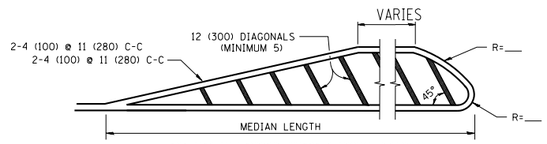




TYPICAL CROSSWALK MARKING



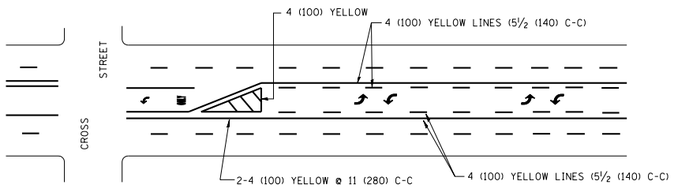
4' (1.2 m) WIDE MEDIANS ONLY



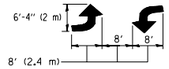
FOR MEDIAN LENGTHS WHERE DIAGONAL SPACING CANNOT BE ATTAINED, USE 5 (FIVE) EQUALLY SPACED DIAGONAL LINES.

DIAGONAL LINE SPACING: 50' (15 m) C-C (LESS THAN 30MPH (50 km/h))
75' (25 m) C-C 30MPH (50 km/h) TO 45MPH (70 km/h))
150' (45 m) C-C (MORE THAN 45MPH (70 km/h))

MEDIANS OVER 4' (1.2 m) WIDE

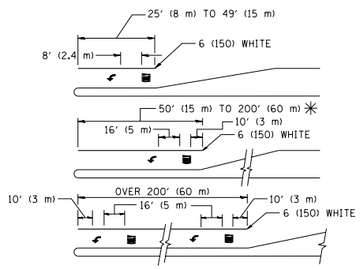


A MINIMUM OF TWO PAIRS OF TURN ARROWS SHALL BE USED, WHITE IN COLOR. ADDITIONAL PAIRS SHALL BE PLACED AT 200' (60 m) TO 300' (90 m) INTERVALS.



MEDIAN WITH TWO-WAY LEFT TURN LANE

TYPICAL PAINTED MEDIAN MARKING

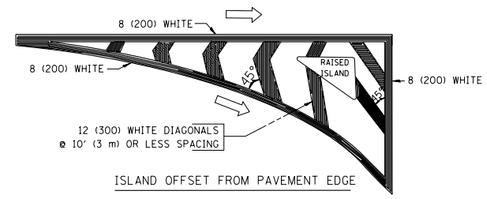


FULL SIZE LETTERS 8' (2.4 m) AND ARROWS SHALL BE USED.
AREA = 15.6 SQ. FT. (1.5 m^2) **ONLY** AREA = 20.8 SQ. FT. (1.9 m^2)

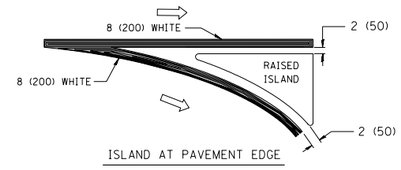
✳ TURN LANES IN EXCESS OF 400' (120 m) IN LENGTH MAY HAVE AN ADDITIONAL SET OF ARROW - "ONLY" INSTALLED MIDWAY BETWEEN THE OTHER TWO SETS OF ARROW - "ONLY".

TYPICAL LEFT (OR RIGHT) TURN LANE

TYPICAL TURN LANE MARKING



ISLAND OFFSET FROM PAVEMENT EDGE



ISLAND AT PAVEMENT EDGE

TYPICAL ISLAND MARKING

TYPE OF MARKING	WIDTH OF LINE	PATTERN	COLOR	SPACING / REMARKS
CENTERLINE ON 2 LANE PAVEMENT	4 (100)	SKIP-DASH	YELLOW	10' (3 m) LINE WITH 30' (9 m) SPACE
CENTERLINE ON MULTI-LANE UNDIVIDED PAVEMENT	2 ø 4 (100)	SOLID	YELLOW	11 (280) C-C
NO PASSING ZONE LINES: FOR ONE DIRECTION FOR BOTH DIRECTIONS	4 (100) 2 ø 4 (100)	SOLID SOLID	YELLOW YELLOW	5½ (140) C-C FROM SKIP-DASH CENTERLINE 11 (280) C-C OMIT SKIP-DASH CENTERLINE BETWEEN
LANE LINES	4 (100) 5 (125) ON FREEWAYS	SKIP-DASH SKIP-DASH	WHITE WHITE	10' (3 m) LINE WITH 30' (9 m) SPACE
DOTTED LINES (EXTENSIONS OF CENTER, LANE OR TURN LANE MARKINGS)	SAME AS LINE BEING EXTENDED	SKIP-DASH	SAME AS LINE BEING EXTENDED	2' (600) LINE WITH 6' (1.8 m) SPACE
EDGE LINES	4 (100)	SOLID	YELLOW-LEFT WHITE-RIGHT	OUTLINE MOUNTABLE MEDIANS IN YELLOW; EDGE LINES ARE NOT USED NEXT TO BARRIER CURB
TURN LANE MARKINGS	6 (150) LINE; FULL SIZE LETTERS & SYMBOLS (8' (2.4m))	SOLID	WHITE	SEE TYPICAL TURN LANE MARKING DETAIL
TWO WAY LEFT TURN MARKING	2 ø 4 (100) EACH DIRECTION 8' (2.4m) LEFT ARROW	SKIP-DASH AND SOLID IN PAIRS	YELLOW WHITE	10' (3 m) LINE WITH 30' (9 m) SPACE FOR SKIP-DASH; 5½ (140) C-C BETWEEN SOLID LINE AND SKIP-DASH LINE SEE TYPICAL TWO-WAY LEFT TURN MARKING DETAIL
CROSSWALK LINES (PEDESTRIAN) A. DIAGONALS (BIKE & EQUESTRIAN) B. LONGITUDINAL BARS (SCHOOL)	2 ø 6 (150) 12 (300) ø 45° 12 (300) ø 90°	SOLID SOLID SOLID	WHITE WHITE WHITE	NOT LESS THAN 6' (1.8 m) APART 2' (600) APART 2' (600) APART SEE TYPICAL CROSSWALK MARKING DETAILS.
STOP LINES	24 (600)	SOLID	WHITE	PLACE 4' (1.2 m) IN ADVANCE OF AND PARALLEL TO CROSSWALK, IF PRESENT. OTHERWISE, PLACE AT DESIRED STOPPING POINT, PARALLEL TO CROSSROAD CENTERLINE, WHERE POSSIBLE
PAINTED MEDIANS	2 ø 4 (100) WITH 12 (300) DIAGONALS ø 45° NO DIAGONALS USED FOR 4' (1.2 m) WIDE MEDIANS	SOLID	YELLOW: TWO WAY TRAFFIC WHITE: ONE WAY TRAFFIC	11 (280) C-C FOR THE DOUBLE LINE SEE TYPICAL PAINTED MEDIAN MARKING.
GORE MARKING AND CHANNELIZING LINES	8 (200) WITH 12 (300) DIAGONALS ø 45°	SOLID	WHITE	DIAGONALS: 15' (4.5 m) C-C (LESS THAN 30MPH (50 km/h)) 20' (6 m) C-C 30MPH (50 km/h) TO 45MPH (70 km/h)) 30' (9 m) C-C (OVER 45MPH (70 km/h))
RAILROAD CROSSING	24 (600) TRANSVERSE LINES; "RR" IS 6' (1.8 m) LETTERS; 16 (400) LINE FOR "X"	SOLID	WHITE	SEE STATE STANDARD 780001 AREA OF: "R"=3.6 SQ. FT. (0.33 m^2) EACH "X"=54.0 SQ. FT. (5.0 m^2)
SHOULDER DIAGONALS	12 (300) ø 45°	SOLID	WHITE - RIGHT YELLOW - LEFT	50' (15 m) C-C (LESS THAN 30MPH (50 km/h)) 75' (25 m) C-C (30 MPH (50 km/h) TO 45MPH (70 km/h)) 150' (45 m) C-C (OVER 45MPH (70 km/h))

FOR FURTHER DETAILS ON PAVEMENT MARKING REFER TO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND STATE STANDARD 780001.

All dimensions are in inches (millimeters) unless otherwise shown.

FILE NAME = c:\pw_work\pwidot\drivakosgn\d0108315\tc13.dgn	USER NAME = drivakosgn	DESIGNED - EVERS	REVISED -T. RAMMACHER 10-27-94
		DRAWN -	REVISED -C. JUCIUS 09-09-09
	PLOT SCALE = 50.000 ' / IN.	CHECKED -	REVISED -
	PLOT DATE = 9/9/2009	DATE - 03-19-90	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DISTRICT ONE
TYPICAL PAVEMENT MARKINGS

SCALE: NONE | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	TC-13	CONTRACT NO.		
FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		