Traffic Engineering, Operations & Safety Manual

Chapter 4 Signals
Section 5 Signal Plan Format

4-5-1 Permanent Signal Plan Format — April 2025

GENERAL

Preparation of signal plans involves preparing a set of detailed drawings showing location, geometric configuration, quantities, and details of work to be performed on a project. The objective of this section is to present standards that will meet the requirements of the Department.

Preparation of traffic signal plan sheets **shall** follow base sheets that have been developed in the FDM Chapter 15, Plan Preparation. The signal plan sheet set **shall** be in one design file. The number and type of sheets are dependent on the type of traffic signal installation. As a minimum, the signal plan set **shall** include:

1. Plan Sheet(s)
2. Sequence of Operations Sheet
3. Cable routing sheet

And if applicable:

1. Temporary signal plan
2. Temporary Sequence of Operations Sheet
3. Miscellaneous quantities for electrical items
4. Engineering estimate for electrical items
5. Special provisions pertaining to electrical items
6. Signal Removal plans
7. Details of non-standard items
8. List of SDDs, general construction notes, and construction details pertaining to electrical items

To obtain a signal number (e.g., S 18-1006), the Regional Traffic Signal Unit will assign the signal number once the DT1199 form has been approved by the Bureau of Traffic Operations. In rare cases, a T-number *may* be assigned instead of an S-number due to the temporary nature of the signal.

The Sequence of Operations Sheet comes in three variations: 1) TS1; 2) Econolite TS2; and 3) Eagle TS2.

Consultants' logos **shall not** be included on the signal plans. These two sheets, along with the plan sheet and cell libraries, are available from the Department for CADD usage.

Consultant prepared plans **shall** be signed and sealed by a Professional Engineer registered in Wisconsin and submitted to the Regional Traffic Signal Engineer for approval. Electronic CADD files **shall** be submitted in accordance with the FDM.

An original, 11”X17” signal plan signed by the Regional Traffic Signal Engineer Professional Engineer (refer to Wis. State Statute 443) or delegate, needs to be submitted by the Regions to Central Office, Bureau of Traffic Operations for all new signal plans and for signal plan revisions.

All signal plan sets, including those in a PS&E submittal or permit application, must be submitted to the Regional Traffic Unit for approval. If the signal plan is part of a PS&E, the signal plan must be submitted to the Region at least one month prior to the draft PS&E date. Upon approval by the Regional Traffic Signal Engineer, it is the responsibility of the Region to submit the signal plan to the Bureau of Traffic Operations for approval. If a signal plan is to be included in a permit application, the permit coordinator will submit the signal plan to the Regional Traffic Signal Engineer for approval. Upon approval by the Region, it is the responsibility of the Region to submit the signal plan to the Bureau of Traffic Operations for approval.

PLAN SHEET

1. Signal plans **shall** have a signature block in the lower right hand corner showing approvals and revision history. Use the appropriate signature block on the signal plan to distinguish between connecting highways and state-owned signals.
    a. Page 1 Signature block for state owned signals (see Figure 1.1a)
    b. Page 1 Title block for connecting highways and locally owned streets (see Figure 1.1b)
    c. Signal plan page 2 identification block, if required (see Figure 1.1c)
    d. Page 1 Revision block, if required (see Figure 1.1d)
    e. Sequence of operations block (see Figure 1.1e)

Figure 1.1a. Traffic Control Signal Plan Page 1 Signature Block for State-owned Signals

PAGE 1 NEW PLAN OR
SIGNAL RECONSTRUCT
(3 LINES TEXT)

TRAFFIC CONTROL SIGNAL
INTERSECTION
MUNICIPALITY
COUNTY

SIGNAL NO. NUMBER
CABINET TYPE: TYPE
CONTROLLER TYPE: TYPE

WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVAL RECOMMENDED
DATE DATE _____ TRAFFIC ENGINEER
REGION TRAFFIC ENGINEER

APPROVED
DATE DATE _____ STATE ENGINEER
STATE TRAFFIC ENGINEER

REGION CONTACT: REGION CONTACT
DESIGNED BY: DESIGNED BY
REVISED BY: REVISED BY
PAGE XX OF XX

PAGE 1 NEW PLAN OR
SIGNAL RECONSTRUCT
(4 LINES TEXT)

TRAFFIC CONTROL SIGNAL
INTERSECTION
INTERSECTION/MUNICIPALITY
MUNICIPALITY
COUNTY

SIGNAL NO. NUMBER
CABINET TYPE: TYPE
CONTROLLER TYPE: TYPE

WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVAL RECOMMENDED
DATE DATE _____ TRAFFIC ENGINEER
REGION TRAFFIC ENGINEER

APPROVED
DATE DATE _____ STATE ENGINEER
STATE TRAFFIC ENGINEER

REGION CONTACT: REGION CONTACT
DESIGNED BY: DESIGNED BY
REVISED BY: REVISED BY
PAGE XX OF XX

Figure 1.1b. Traffic Control Signal Plan Page 1 Title Block for Connecting Highway and Local Signals

TRAFFIC CONTROL SIGNAL
INTERSECTION
MUNICIPALITY
COUNTY

MUNICIPAL CONTACT:
DESIGNED BY:
REVISED BY:
PAGE OF

Figure 1.1c. Traffic Control Signal Plan Page 2, 3, 4, etc. Block for state-owned signals

PAGE 2, 3, 4, ETC
(THERE ARE BLOCKS FOR 4 & 5
LINES OF TEXT

TRAFFIC CONTROL SIGNAL
INTERSECTION
MUNICIPALITY
COUNTY

SIGNAL NO. NUMBER

REGION CONTACT: REGION CONTACT
DESIGNED BY: DESIGNED BY
REVISED BY: REVISED BY
PAGE XX OF XX

Figure 1.1d. Traffic Control Signal Plan Page 1 Revision Block for state-owned signals

PAGE 1 SIGNAL PLAN REVISION
W/REVISION BLOCK

REVISION

REV. NO.	INSTALL EMERGENCY VEHICLE PREEMPTION & RADAR ADVANCED DETECTION			
	APPROVAL RECOMMENDED		APPROVED	
XX	REGION		CENTRAL OFFICE	
	DATE	BY	DATE	BY
	DATE	NAME	DATE	NAME

TRAFFIC CONTROL SIGNAL
INTERSECTION
MUNICIPALITY
COUNTY

SIGNAL NO. NUMBER
CABINET TYPE: TYPE
CONTROLLER TYPE: TYPE

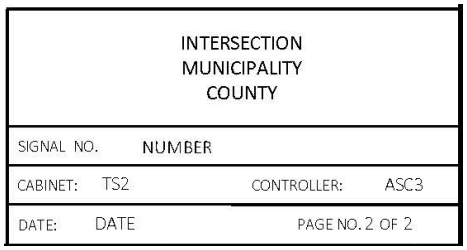
WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVAL RECOMMENDED
DATE DATE _____ TRAFFIC ENGINEER
REGION TRAFFIC ENGINEER

APPROVED
DATE DATE _____ STATE ENGINEER
STATE TRAFFIC ENGINEER

REGION CONTACT: REGION CONTACT
DESIGNED BY: DESIGNED BY
REVISED BY: REVISED BY
PAGE XX OF XX

Figure 1.1e. Traffic Control Signal Plan Sequence of Operations Block



According to state statute 443.08(4)(b), final signal plans **shall** bear the signature of a professional engineer. In addition, PS&E plans not developed by WisDOT staff **shall** bear the stamp of the consultant designer.

1. Show North arrow on all sheets.
2. The mainline roadway *should* be oriented horizontally on the plan sheet. Typically, the STH *should* be designated as the mainline.
3. Matchlines **shall** be used instead of breaklines. Matchlines are helpful for indicating utility locates, approach geometries, intermediate access points, and signal infrastructure placement.
4. NEMA phasing convention **shall** be used. Typically, NEMA phase 6 is in the Cardinal direction (Northbound/Eastbound).
5. Show curb cuts, ramps, sidewalks, crosswalks and stop bars due to their influence on signal base and detection placement.
6. Pavement markings **shall** be shown on the signal plan. Lane lines need to be shown due to their effect on detector placement past the far loops. Informational lane designation arrows *may* be shown on complicated designs. If the pavement marking plan is not incorporated into the plan sheet, and arrows are shown for lane designation purposes, supply the symbols and a note in the legend saying, “Arrows shown are for lane designation and are for information only”.
7. Show posted speed limits on each approach.
8. Show right-turn control. STOP or YIELD if separated by an island and not controlled by the signal.
9. The Department has created a CADD cell library specifically to aid in the creation of signal and lighting plans. The State signal cell library **shall** be used for signal design. Each signal and pedestrian head **shall** have a number.
10. Show and label asphalt-to-concrete-pavement joints. Loop detectors *should not* cross these joints; therefore, they are important for detector placement.
11. Show municipal lighting, if any, and state lighting. It is the policy of the Department to light signalized intersections.
12. All signal plans **shall** show utilities, including overhead lines.
13. Show mast arm lengths for mast arm installations. Show monotube arm lengths for monotube arm installations.
14. Each detector **shall** be a two-digit number, the first digit of the number being the phase number with which it is associated.
15. Signal plans **shall** be drawn and printed at 1”=40’ scale on an 11”x17” (D-size) number 2 tab plan sheet. For signal plans to be included in a PS&E submittal, refer to FDM Chapter 15, Plan Preparation.
16. Show Right-of-way gray shaded.
17. Show reference line.
18. Show access points.
19. Existing geometrics on fully reconstructed intersections **shall not** be shown.

The Regional Traffic Signal Unit will assign an intersection signal number (“S”, “M”, “T” or “U” number) as required for proper identification & future reference.

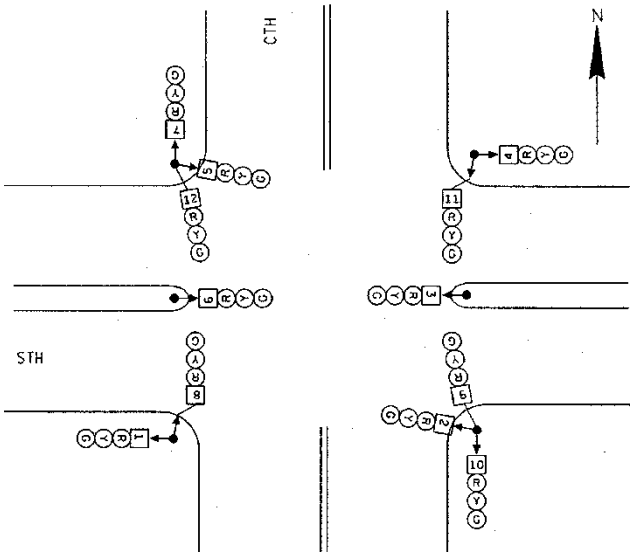
Signal equipment to be installed in the field are identified on the plan and quantity sheets by the schemes described below, these schemes *should* be applied on a per signalized intersection basis. In the case where multiple signal plans exist along a corridor within the same plan set, these numbering schemes **shall** apply to individual signal locations.

Signal Head Numbering

Individual signal heads **shall** be uniquely numbered. Head numbering is arbitrary, but typical practice is to number signal heads by approaches.

Pedestrian head numbers **shall** also be numbered. When using the same numbering scheme for both signal and pedestrian heads, first number all vehicular signal indications, then label pedestrian heads starting with the next consecutive number.

Figure 1.2. Signal Head Numbering



Detection Numbering

Loops **shall** be designated by two numbers (NEMA phase + consecutive numbering systems as described below). Detection associated with an overlap **shall** be designated with the NEMA phases that it accompanies. Dimensions and number of turns **shall** be included on the traffic signal plan sheet or in the case of a TS1 cabinet, the sequence of operation sheet.

Number loops starting at advanced detection to near stop bar detection, then right lane to left lane. If left turns phases are added, left turn loops do not influence renumbering of other detection.

Signal Base Numbering

Signal base numbers **shall** be prefixed with an “SB” and numbered consecutively in the clockwise direction starting at the signal cabinet.

Light Base Numbering

Lighting bases that only have lighting equipment on them **shall** be prefixed with an “LB”.

Cabinet Numbering

The main cabinet base **shall** be called “CB1”, a splice cabinet **shall** be called “CB2” and temporary cabinets **shall** be called “TCB1”.

Pull Box Numbering

Pull box numbers **shall** be prefixed with a “PB” and numbered consecutively in the clockwise direction starting at the signal cabinet.

SEQUENCE OF OPERATIONS SHEET

The standardized Sequence of Operations Sheet is in the State standard cell library.

The guidelines listed below **shall** be followed when preparing the Sequence of Operations Sheet.

1. Show North arrow. It **shall** be oriented the same as the plan sheet. The arrows in the boxes on the sequence of operations **shall not** be rotated and **shall** remain oriented up and down or left and right. The north arrow *may* be rotated up to 45 degrees in either direction to accomplish this.
2. NEMA phasing **shall** be used for uniform phase numbering. Use phases 2 & 6 for the mainline and phases 4 & 8 for the cross street. Phase 6 **shall** be for the northbound or eastbound phase and phase 8 **shall** be counterclockwise from phase 6 (the phasing and directions can be changed only in special phasing situations, such as interchanges, T-intersections, or split-phase operations).
3. The pedestrian movements are shown with half arrow heads.

4. If the word "phase" is listed in a column, the symbol "Ø" does not need to be shown. Using just the number is sufficient.
5. In the controller logic box, the phase-recall column *should* be listed as "MIN", "MAX", "PED", and/or "SOFT". The remaining columns *should* have either a number or an "X."
6. Overlaps can be shown in one of two ways:
    a. A movement is active or allowed to be on with 2 or more phases.
    b. A Flashing Yellow Arrow.

SIGNAL CABLING

For all new or reconstructed state-owned signals installed under contract, a Cable Routing Schedule **shall** be included, and reviewed by the Regional Electrical staff and the Regional Traffic Signal Engineer as part of the signal plan review process.

The Cable Schedule assures the maintaining electrical staff that the standard WisDOT wiring scheme is followed. Electrical staff *should* be contacted prior to preparing the Cable Routing Schedule to discuss proper wiring practices. Additionally, it is important that this plan sheet correctly identifies the wiring scheme as installed at the intersection. A sample of the chart is provided.

The cable routing sheet is also used by the electrical contractor as a blueprint for the routing of the signal feeder cables and field connections. This sheet will also aid the signal designer when determining miscellaneous quantities.

This section presents information, some of which has been previously printed in such documents as the State of Wisconsin Standard Specifications for Highway and Structure Construction (Specification 655), Standard Detail Drawings, and the Wisconsin Electrical Code.

COMPLETION OF THE CABLE ROUTING SCHEDULE

At the top left of the cable routing sheet, insert the project identification number followed by the intersection name and signal number.

The color-coding chart provides identification of each conductor within the signal feeder cables. The conductor colors and sequence for cables can be found in the International Municipal Signal Association, Inc. (IMSA) specification No. 20-1. Base colors **shall** consist of colored insulation. Tracers **shall** be colored stripes or bands along the surface of the insulation. The color-coding chart utilizes the use of a three-letter abbreviation for each conductor color. Examples: RED=red, ORG=orange, GRN=green and for the tracer colors: WHT/BLK=white/black, RED/WHT=red/white, etc.

There are six tables placed in the cable routing sheet, which are:

- SIGNAL FEEDER CABLES
- EQUIPMENT GROUNDING CONDUCTOR
- CONDUCTIVE PULL BOX BONDING JUMPERS
- LIGHTING CABLES
- EMERGENCY VEHICLE PREEMPTION CABLES
- NON-INTRUSIVE DETECTION

To fill in the cable routing sheet from the example Second Revision Plan, the signal feeder cable goes from the cabinet base (i.e. CB1) to each signal base (i.e. SB1). For SB1, the minimum number of conductors needed is 7 and a maximum will typically be 15 conductors. The following concepts apply to the example chart provided: head no. 18 requires 3 conductors, head no. 23 requires 2 conductors, 1 conductor is needed for the pedestrian push button (in some cases loop lead-in cable *may* be used instead), and 1 conductor is used for the grounded conductor. This example used a 12 conductor as a feeder cable. A 15 conductor could also be used, in either case this will provide some additional spare conductors to meet future needs.

Signal Cable, IMSA-20-1, Ungrounded Conductors

During emergency situations, it is imperative that the maintenance staff knows the wiring at the intersection. For this reason, the Signal Cable, IMSA-20-1, Ungrounded Conductors (wiring table) is very important. The wiring table identifies the signal cable path and wiring scheme for all signal and pedestrian indications at the intersection it is important that a copy of this be located inside the controller cabinet for use during maintenance. Wiring color schemes vary among Regions and local jurisdictions. Prior to beginning the wiring table, the maintaining electrician *should* be contacted to determine the proper routing procedure.

Signal Feeder Cables Table

The preferred method for installing signal feeder cable is to run a separate home run cable from the control cabinet base to each individual signal base. When selecting the number of conductors needed in each signal feeder cable, future signal expansion *should* be considered such as adding pedestrian heads, pedestrian push buttons, turn arrows, etc. Consideration *should* also be given to minimize the number of different sized cables to be used as feeder cables. For intersection wiring, it is easier to provide a few standard size cables like a 12-conductor cable instead of providing 7, 9, or 10 conductor cables.

The next entry on the chart is the signal head number and the phase the head is associated with as shown on the signal plan. In the example, Head 18 is a phase 4 head, head 23 is a phase 6 pedestrian head, and the push button is for the phase 6 ped.

To complete the entries for SB 1, the signal indication wire color section needs to be entered. Across the top of the chart are the signal indications. We start with the circular indications of red, yellow, and green followed by the arrow indications, the pedestrian signal indications, the pedestrian push buttons, and other. For each indication used, a signal feeder conductor is assigned to the signal indication. These colors are entered as shown in the signal wire color-coding section. Head # 18, RED = red, ORG = yellow, and GRN = green. Head #23 the DON'T WALK = BLK and the WALK = BLU. The push button needs 2 conductors. One conductor will be the WHT/BLK and the other side of the button will be connected to the grounded conductor (neutral) in the signal feeder cable. If loop lead-in cable is to be used for the pedestrian push buttons refer to the pedestrian push button chart.

Cable Routing Schedule Example

PROJECT ID:	
INTERSECTION:	

			SIGNAL INDICATION WIRE COLOR									
SC1 TO	CABLE (AWG 14)	HEAD NO.	RED	YELLOW	GREEN	FLASHING YELLOW	<RED>	<YELLOW>	<GREEN>	<FLASHING YELLOW>	DON'T WALK	WALK
SB1	12/C	81	RED	ORG	GRN	-	-	-	-	-	-	-
		72	-	-	-	-	RED/BLK	ORG/BLK	GRN/BLK	BLUE/BLK	-	-
SB2	12/C	42,43	RED	ORG	GRN	-	-	-	-	-	-	-
		71	-	-	-	-	RED/BLK	ORG/BLK	GRN/BLK	BLUE/BLK		
SB3	12/C	21	RED	ORG	GRN	-	-	-	-	-	-	-
		12	-	-	-	-	RED/BLK	ORG/BLK	GRN/BLK	BLUE/BLK	-	-
SB4	12/C	62,63	RED	ORG	GRN	-	-	-	-	-	-	-
		11	-	-	-	-	RED/BLK	ORG/BLK	GRN/BLK	BLUE/BLK	-	-
ESB307	12/C	41	RED	ORG	GRN	-	-	-	-	-	-	-
		32	-	-	-	-	RED/BLK	ORG/BLK	GRN/BLK	BLUE/BLK	-	-
		P62	-	-	-	-	-	-	-	-	BLK	BLUE
ESB308	12/C	31	RED	ORG	GRN	BLUE	-	-	-	-	-	-
		73	-	-	-	-	RED/BLK	ORG/BLK	GRN/BLK	BLUE/BLK	-	-
SB8	12/C	82,83	RED	ORG	GRN	-	-	-	-	-	-	-
		P82	-	-	-	-	-	-	-	-	BLK	BLUE
			-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-

To complete the wiring chart, an entry is added for each signal base and associated signal heads and pedestrian push buttons. The OTHER column is used for any shadow box signs, time of day signs, etc., fed out of the signal feeder cable.

Equipment Grounding Conductor

The equipment grounding conductors provide grounding for the physical elements at the intersection (i.e. controller cabinet, signal poles, pull boxes, light poles powered from signal cabinet). As with signal cable, the maintaining electrician *should* be contacted to determine the correct routing for the equipment grounding conductors.

Equipment Grounding Conductor Table

The equipment-grounding conductor is a stranded 10 AWG XLP insulated conductor used for grounding purposes. This wire **shall** have an insulation that is green. The conductor starts at the cabinet base and is jumpered in and out of each signal base and returning to the cabinet base. This creates a loop around the intersection. A stranded 10 AWG conductor is used due to the mechanical strength of the conductor. The use of a spare conductor from the signal feeder cable to be used as permitted. In the example, the equipment-grounding conductor starts at CB1 runs to SB20, to SB1, in and out of the signal bases to SB 19 and from SB 20 terminating back at CB1.

EQUIPMENT GROUNDING CONDUCTOR 10 AWG GRN XLP	
FROM	TO
CB 1	SB 1
SB 1	SB 2
SB 2	SB 3
SB 3	SB 4

SB 4	SB 5
SB 5	SB 6
SB 6	SB 7
SB 7	SB 8
SB 8	SB 9
SB 9	SB 10
SB 10	SB 11
SB 11	SB 12
SB12	SB 13
SB 13	SB 14
SB 14	SB 15
SB 15	SB 18
SB 19	SB 16
SB 16	SB 17
SB 17	SB 19
SB 19	SB 20
SB 20	CB 1

Conductive Pull Box Bonding Jumper Table

The pull box bonding jumper **shall** be in accordance with Specification 655.2.5. The purpose of this conductor is to bond all metal pull boxes and metal pull box covers that are used as a raceway for cables that carry voltages of 50 volts or more to ground. The pull box bonding jumper extends from the pull box to the nearest signal base or cabinet.

PULL BOX BONDING JUMPER 10 AWG GRN XLP	
FROM	TO
CB 1	PB 1
SB 2	PB 4
SB 3	PB 2
SB 4	PB 5
SB 6	PB 6
SB 6	PB 7
SB 8	PB 10
SB 10	PB 11
SB 11	PB 12
SB 11	PB 13
SB 13	PB 16
SB 14	PB 17
SB 16	PB 22
SB 18	PB 18
SB 18	PB 19
SB 19	PB 24
SB 20	PB 23
CB 1	PB 25

Lighting

The Lighting Chart identifies the routing for the lighting wire/cable. Since some Regions provide separate conduit for lighting systems, the cable routing *may* have been previously discussed with the maintaining engineer or electrician during the design; nevertheless, the wire/cable routing **shall** be included in the plans. Refer to Specification 655.3.4.

Lighting Table

Lighting fed from a signal cabinet is line to neutral (120V) or line to line (240V) Individual lighting feeder cables could be run to each light pole. Typically, a 12 AWG 2 conductor UF cable with ground feeds the intersection. For higher lighting loads and to maintain minimal voltage drops a larger conductor *may* be required. A maximum 5% voltage drop for a branch circuit is recommended according to the NEC. It is preferred to design up to a 3.5% maximum voltage drop, which would allow for some limited expansion of the lighting system in the future.

LIGHTING UF 12 AWG W/GROUND	
FROM	TO
CB 1	SB 21
SB 21	SB 5
SB 5	SB 6
SB 6	SB 9
CB 1	SB 20
SB 20	SB 18
SB 18	SB 15
SB 15	SB 11

When the load of the luminaires exceeds 16 amps, a separate lighting cabinet is required.

When separate traffic signal and street lighting systems are used, the systems **shall** be electrically isolated from each other. Each system would have a separate cabinet and underground conduit system. Examples would include signals and street lighting fed from two different power sources, lighting branch circuit loads exceeding 16 amperes, and/or lighting systems maintained by different governmental agencies.

Emergency Vehicle Preemption Table

The EVP cable and confirmation light cable (if applicable) **shall** be installed as shown on the plan and in accordance with the manufacturer's specifications. The cable(s) **shall** be installed from the control cabinet to the EVP detector head and to the confirmation light (if applicable) in one continuous non-spliced length. The EVP detector cable **shall** be terminated at the detector head and control cabinet. The confirmation light cable **shall** be terminated at the confirmation light and control cabinet. The cable(s) **shall** be routed through the underground conduit system using the shortest route.

EVP CABLE	
FROM	TO
CB1	HEAD 'C'
CB1	HEAD 'A'
CB1	HEAD 'D'
CB1	HEAD 'B'

Loop Detector Lead-in Cable & Loop Wire Table

Although loop detector lead-in cables are not shown on the chart, a separate loop detector lead-in cable **shall** be provided for each individual loop. This cable **shall** run from the cabinet base (CB) to the loop pull box used as the splice point. The detector lead-in cable **shall** be pulled thru each pull box without any additional loops or coils in each pull box. Excessive coils of detector lead in cables *may* affect the loop detector amplifier or detector card operation. At the splice point pull box, the detector cable **shall** extend 3 feet above the pull box cover for splicing purposes. At the control cabinet, the detector cable **shall** extend 3 feet above the top of the control cabinet to allow for future landing of the detector cables on the associated loop panel. Splices are made between the loop detector wire and the lead-in cable at the pull box at the side of the road.

Non-Intrusive Detection Cable Table

Non-Intrusive Detection cable **shall** be installed as shown on the plan and in accordance with the manufacturer's specifications. The cable **shall** be installed from the control cabinet to the device. The cable **shall** be routed through the underground conduit system using the shortest route. The type of cable along with the use of splices, signal repeaters/extenders, etc. **shall** be used according to manufacturer's specifications.

PROJECT ID:	0000-00-00
INTERSECTION:	STH XX and CTH XX

Signal Wire Color Coding	BLK - black	RED - red	GRN - green
	WHT - white	BLU - blue	ORG - orange

CB1 TO	AWG14 # OF CONDUCTORS	HEAD NO.	SIGNAL INDICATION WIRE COLOR									PED BUTTON	OTHER
			RED	YELLOW	GREEN	<RED>	<YELLOW>	<GREEN>	<FLASHING YELLOW>	D/WALK	WALK		
SB1	12	1	RED	ORG	GRN								

Equipment grounding conductor 10 AWG Green XLP	
From	TO

Pull Box Bonding Jumper 10 AWG Green XLP	
From	To

Lighting UF #12 w/ground	
From	To

EVP CABLE	
From	To

VIDEO DETECTION CABLE	
From	To

*Use the white conductor in the cable assembly as the grounded conductor for all traffic signal indications
*Ensure the grounded conductor in the feeder cable and the pole cables are both 18" longer than the ungrounded conductors.
*At the signal bases, connect one terminal from the pedestrian push buttons to the color indicated in the chart. Connect the other terminal to the grounded conductor.
*Reconnect the grounding conductors wherever the circuit has been interrupted to ensure the grounding circuit is complete.
*Reserve the Blue/Black conductor in the cable assembly as the APS conductor for all push buttons

UNDERGROUND PLAN FOR FUTURE SIGNALS

If during the design of an improvement project, especially on reconstruction projects, an intersection is deemed to be close to meeting warrants in the next several years, then the underground conduit system and pull boxes *may* be installed under the improvement project. The signal designer *should* obtain a U number (e.g., U-XX-1004) from the regional traffic unit for identification purposes, i.e., diggers hotline locates, etc.

If breaker run is used in the construction of the roadway, it is recommended that conduit be installed for future signal installations due to the inability to bore through breaker run. In addition, consideration *should* be given to installation of signal bases and pull boxes in medians and islands when breaker run is used.

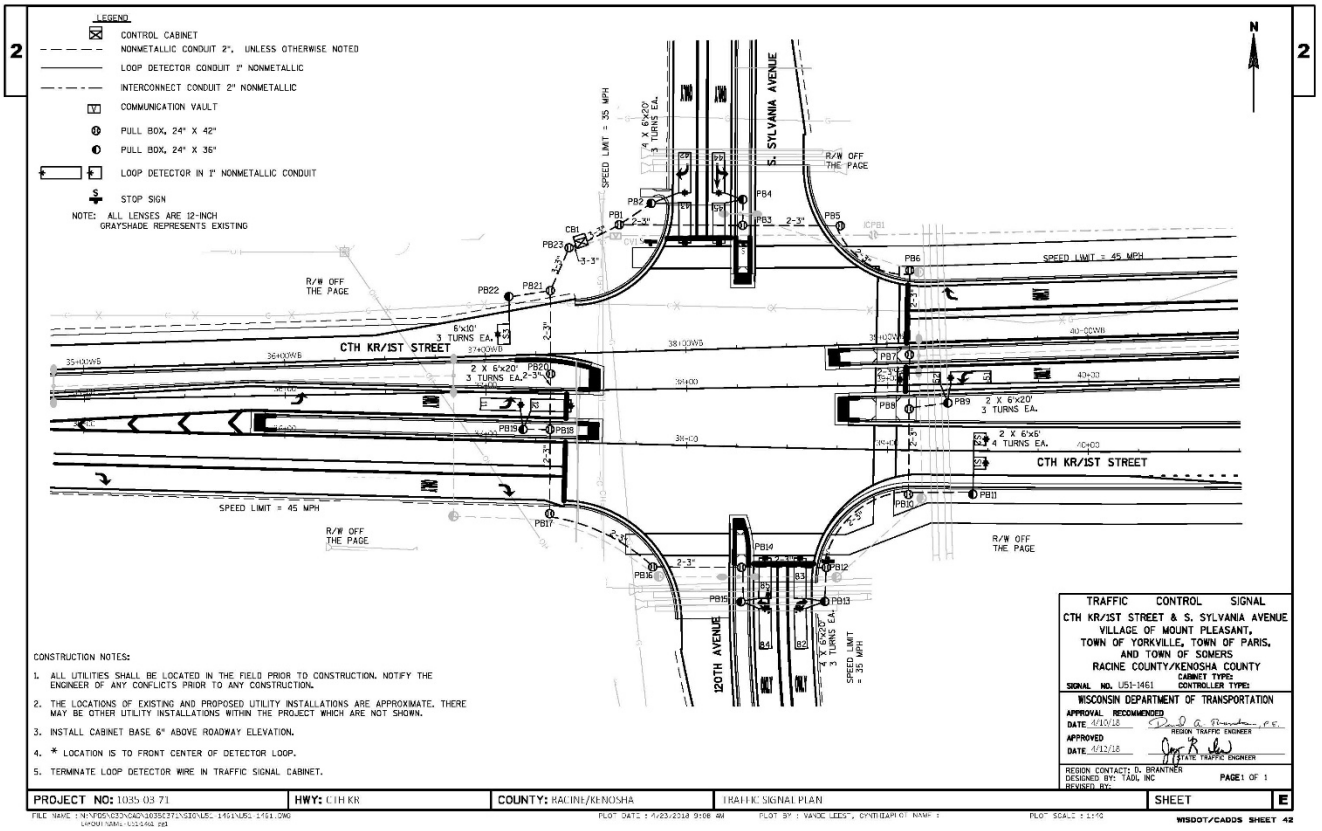
The conduit *should* be installed in an underground system around the complete intersection, not just under the roadway. The 24” diameter pull boxes *should* be installed at all angle points, medians and islands. Loop detector conduit *may* be installed at this time under the new concrete. If several adjacent intersections are being constructed, conduit for the interconnection of the future signals *may* also be installed. Additionally, according to standard specifications, a continuous pull wire **shall** be installed in all underground conduits for locate purposes. Loop detector wire *should* be installed in the loop detector conduit during construction with the number of turns indicated in the construction plans. Locate wire in loop conduit **shall** be accessible off the roadway.

The underground conduit system *should* be installed at a sufficient distance along the intersection approach to accommodate for future expansion of the intersection and installation of the future signals. Contact the Regional Traffic Signal Engineer for other considerations, such as possible future geometrics, i.e., turn lanes, radii, etc.

In concrete-capped medians and islands, box-outs *may* be added for future signal base placement. Box-outs *should* be sized so they will accommodate a standard concrete base. Conduits from the adjacent pull box *should* be stubbed and capped to the box-out.

Shown below is an example of an underground plan for a future signal.

Figure 1.3. Underground plan for a future signal



MISCELLANEOUS QUANTITIES

Plans **shall** be developed including the miscellaneous quantities according to the FDM 15-1-1, General Plan Preparation. The Regional and Central Office Traffic Signal staff will determine which specific plan type is required for each signal installation. Revisions to a plan that are not part of a let or permit project that will be performed by WisDOT forces, such as adding a left turn phase or right turn overlap, etc., do not require a miscellaneous quantities sheet, but will require a plan revision.

Let projects require a significant amount of information regarding the quantities. Discussions of these types of plans can be found in the FDM Chapter 19, PS&E.

MISCELLANEOUS QUANTITIES SHEET

The purpose of these sheets is to indicate specific types, sizes, and locations for the signal equipment at the intersection. The following are common items found in the electrical miscellaneous quantities sheet:

- SIGNAL HEADS
- SIGNAL POLES, LUMINARE POLES, MAST ARMS, BASES
- PULL BOXES
- CONDUIT, SPECIAL
- CONDUIT
- CONCRETE BASES
- MAJOR ITEMS REQUIRED FOR TRAFFIC DETECTORS
- CONCRETE CONTROL CABINET BASE
- CABLE, WIRE

Like items *should* be combined into one table to avoid several small tables. The item reference (i.e. signal base number, head number, pull box number, etc.) **shall** be included for all items labeled on the plan sheet of the signal installation. Station and offset reference *should* be linked only to items installed into the ground (i.e. pull boxes, concrete bases, detector loops, and control cabinet bases). Although not required, a solid line *may* be placed around each table to avoid confusion.

QUANTITY TAKE-OFF PROCEDURES

Methods used to estimate plan quantities follow standard engineering practices, which, for the most part, are self-explanatory. The following points *should* be reviewed prior to computing the final quantities.

Items must use same terminology as stated in the Standard Specifications, Supplemental Specifications, and Special Provisions.

Items appearing in the Miscellaneous Quantities Sheets (as part of the lump sum) **shall** be so noted.

All plan sheet item references (i.e. signal base number, head number, pull box number, etc.) **shall** be tied to the appropriate quantity.

All pay items must be shown in the Miscellaneous Quantities Sheet.

Station and offset references **shall** be used to locate pull boxes, concrete bases, detector loops, and control cabinet bases.

DETERMINING ELECTRICAL CABLE QUANTITIES

Tables 1.1, 1.2, and 1.3 show suggested cable measurements for poles, light poles, and monotubes that can be used to determine electrical cable quantities.

Table 1.1. Suggested cable measurements for poles

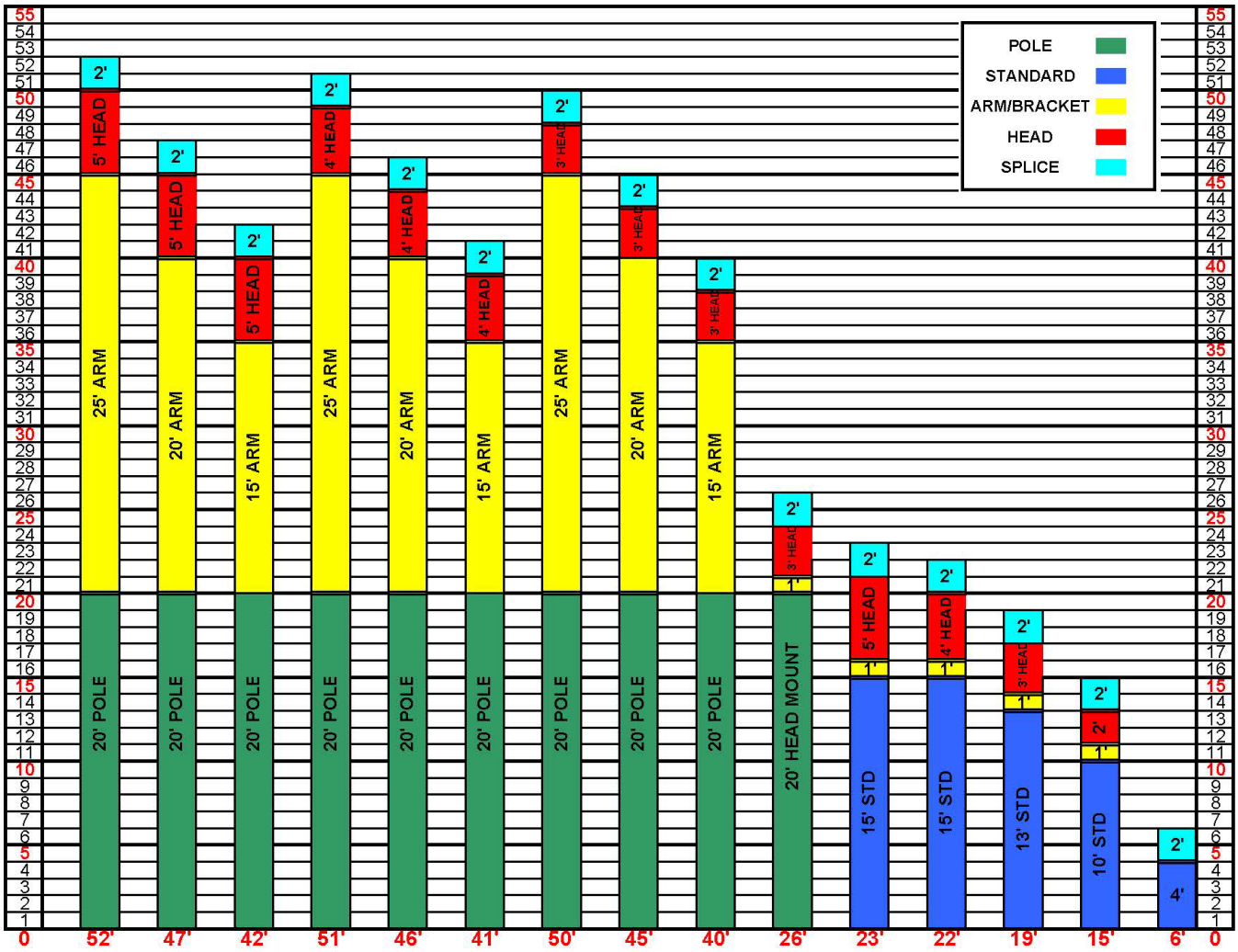


Table 1.2. Suggested cable measurements for light poles

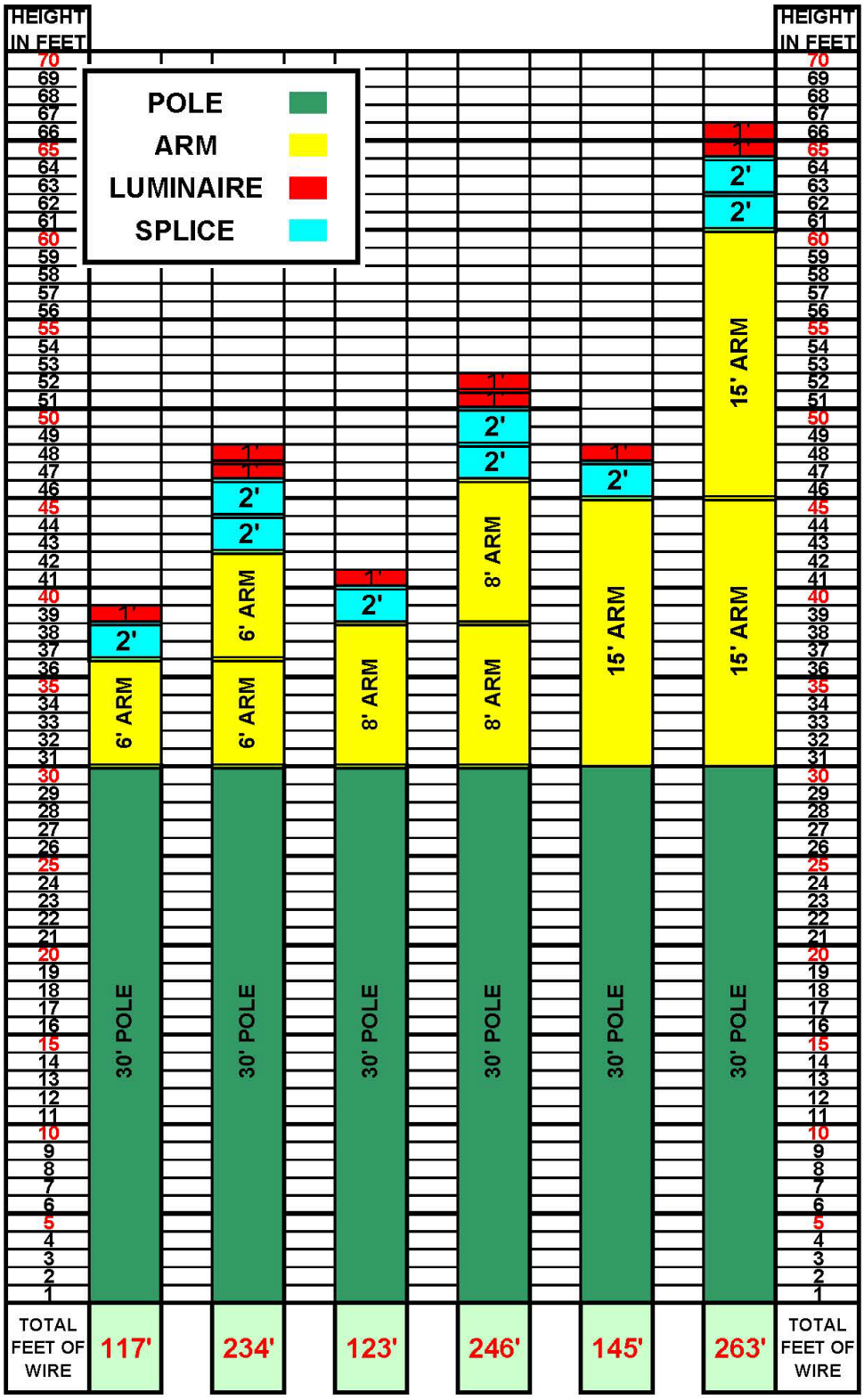
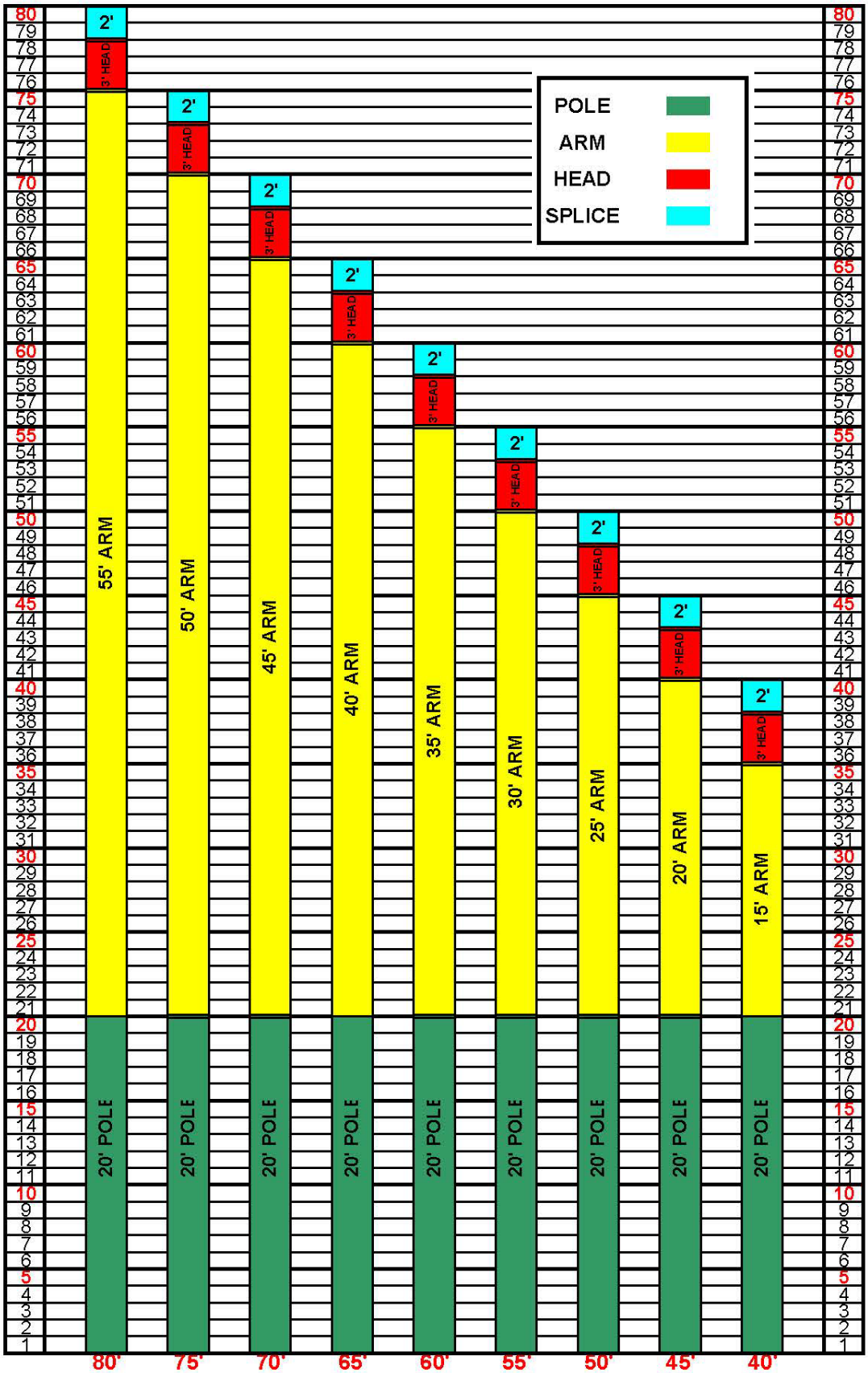


Table 1.3. Suggested cable measurements for monotubes



4-5-2 Signal Plan Revisions April 2025

Wherever an existing signal is modified, the change **shall** be reflected on the signal plan. Any change **shall** be documented in a revision block located in the bottom right of the signal plan sheet. Revisions **shall** be approved by Bureau of Traffic Operations Statewide Traffic Signal Engineer or a designated representative. Examples of these changes would include:

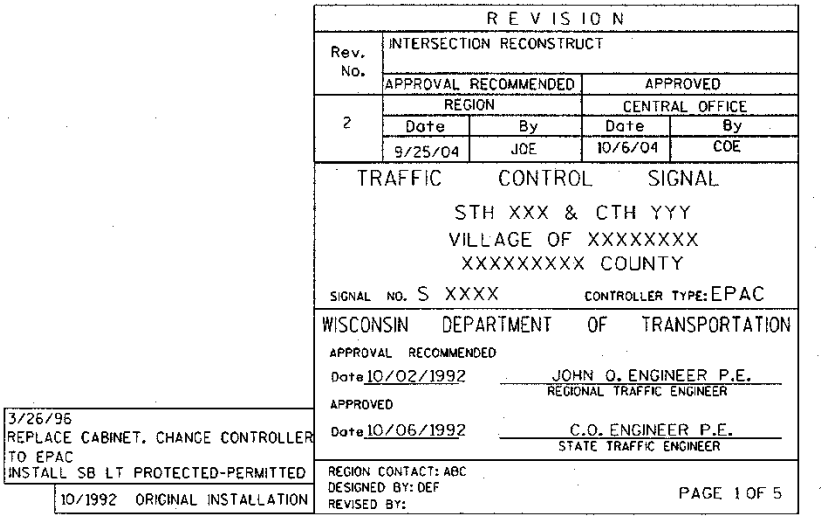
- adding pedestrian phasing and pushbuttons,
- modifying phasing, including reassigning to NEMA phasing,
- adding preemption,
- modifying detection design,
- modifying signal/lighting equipment,
- as-built plans, or
- other changes that would require a cabinet wire change.

An addition or deletion of a pull box, signal base, signal head, or detection to an existing installation does not require renumbering the existing PB, SB, etc. on the signal plan; the next consecutive number *should* be used.

Only one revision block will appear on the signal plan. Any previous revisions will be noted along with the date approved in history blocks, as shown in the example in Figure 2.1. The original signature block and signature *should* remain on the plan. With a CADD-prepared plan, the name of the original signers and dates *should* be inserted in place of the original signatures (see example).

Revised signal plans **shall** bear the initials of a Regional Traffic Signal Unit Professional Engineer. In addition, plans not developed by WisDOT staff **shall** include the stamp and signature of the Professional Engineer.

Figure 2.1. Sample History, Signature and Revision Blocks



4-5-3 Signal Plan Development Process April 2025

The PS&E review process is covered in FDM Chapter 3 and Chapter 19. Signal Plans that will require right-of-way acquisition, utility relocation, or railroad coordination *may* require greater coordination efforts. Approval of the traffic signal plan set at the Regional level is required to occur prior to the final submittal. The level of coordination between individuals developing the plan set and the regional traffic section is dependent on the project complexity.

Bureau of Project Development has set specific schedules for PS&E submittal. Chapter 19 of the FDM presents a detailed description of the review process, schedule/timing, and plan composition. The signal plan set within the PS&E *should* include the following sheets:

1. Plan Sheet(s)
2. Sequence of Operations Sheet
3. Cable routing sheet

And if applicable:

1. Temporary signal plan and timings

2. Temporary Sequence of Operations Sheet
3. Miscellaneous quantities for electrical items
4. Engineering estimate for electrical items
5. Special provisions pertaining to electrical items
6. Signal Removal plans
7. Details of non-standard items
8. List of SDDs, general construction notes, and construction details pertaining to electrical items

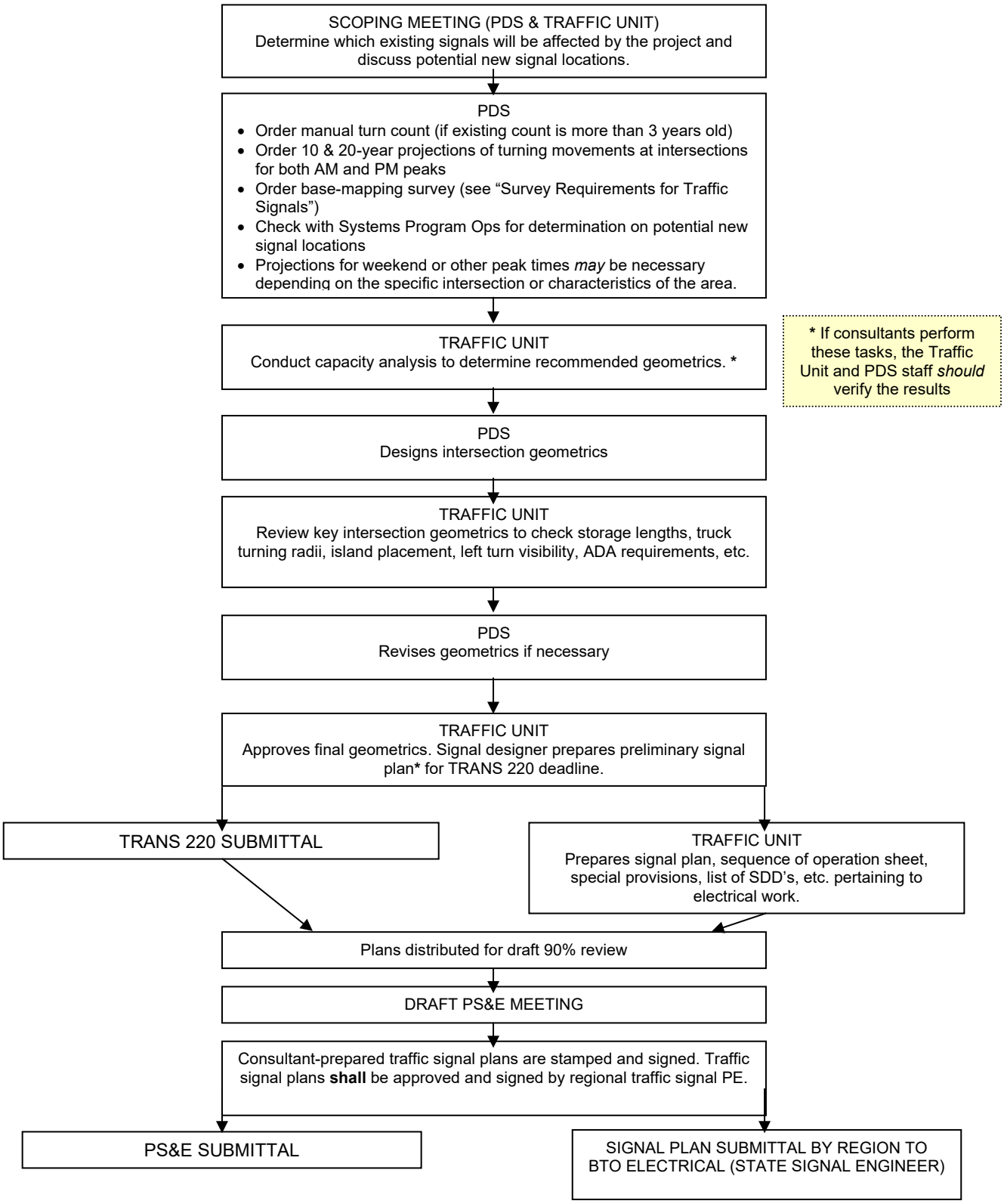
In cases where the maintaining authority is not the State (i.e. municipality, county, connecting highway), yet is installed through a state administered project on the local system, Regional Traffic Signal Engineers *may* provide a cursory plan review, however the ultimate maintaining authority will be responsible for the final design and approval.

Any questions regarding the approval process *should* be directed to the Bureau of Project Development.

Other necessary items that are part of the PS&E are the engineers' estimate plan letter and special provisions, and contract time for completion, etc., are the responsibility of the project manager.

SIGNAL PLAN DEVELOPMENT IN THE PS&E PROCESS

(Applies to state-owned signals only)



PERMIT PROJECTS

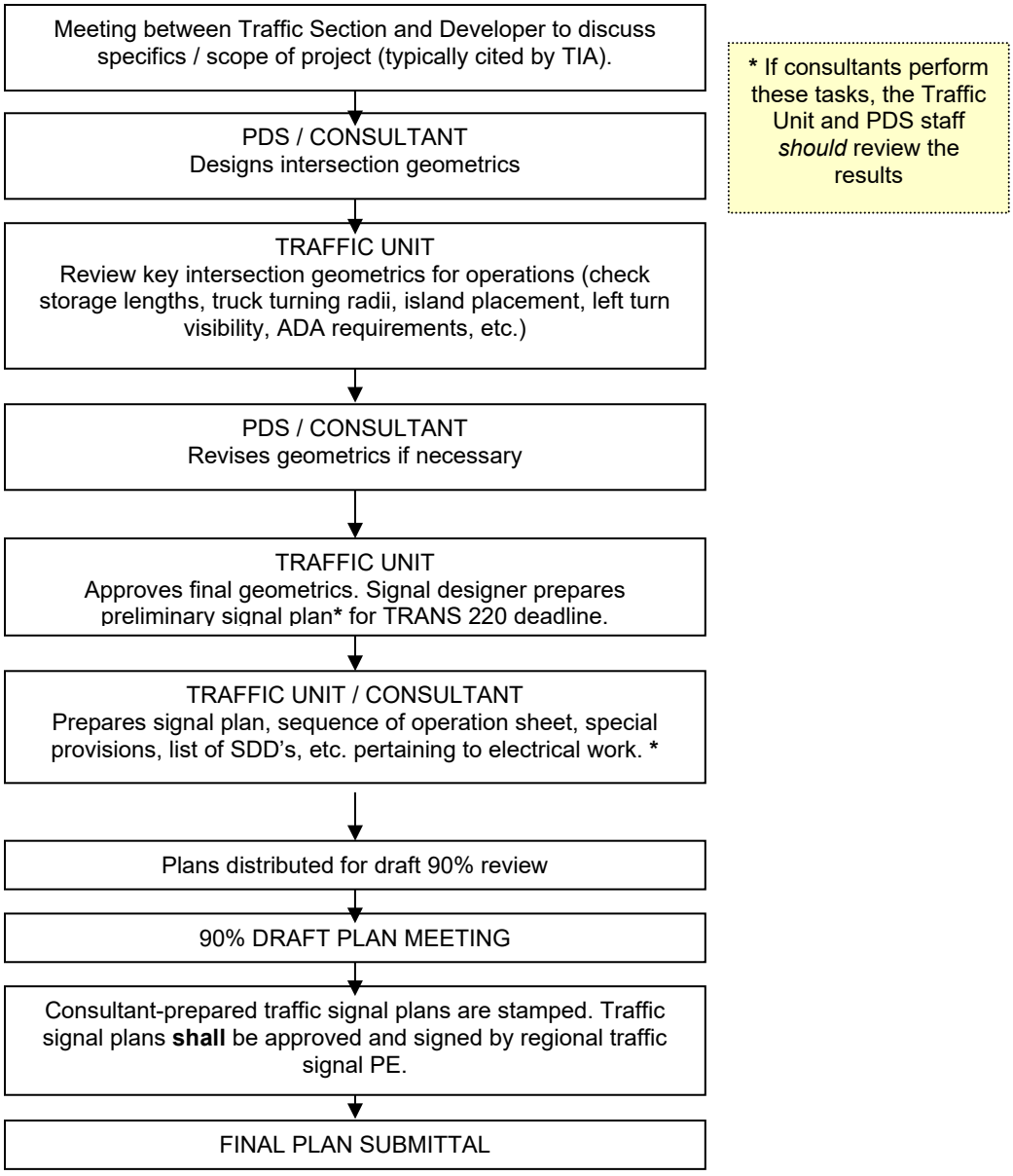
At times, signals or other roadway improvements are needed to mitigate adverse traffic impacts caused by land development. Signals that are designed and installed as a condition of an Access Permit (DT1646) or a Work on Highway Right-of-Way (DT1812) are referred to more generally as Permit Projects. Depending on the improvement program schedule, separate improvements that are required because of a development can be implemented through a let or non-let process, with cost-share provisions. Non-let projects can be performed by contract or State Forces. Signals that are warranted due to these situations are done so as part of a Traffic Impact Analysis (TIA).

Permit Project plan set will include:

1. Title Sheet
2. Signal Plan Set
3. Sequence of Operations Sheet
4. Miscellaneous Quantities
5. Special Provisions
6. Special Details
7. Standard Detail Drawings

Costs for State furnished materials and labor that are expended while overseeing Permit Projects *should* be assigned to the local municipality or developer responsible for the project.

SIGNAL PLAN DEVELOPMENT IN THE PERMIT PROCESS
(Applies to permit projects only)



4-5-4 Sample Plan Sheets April 2025

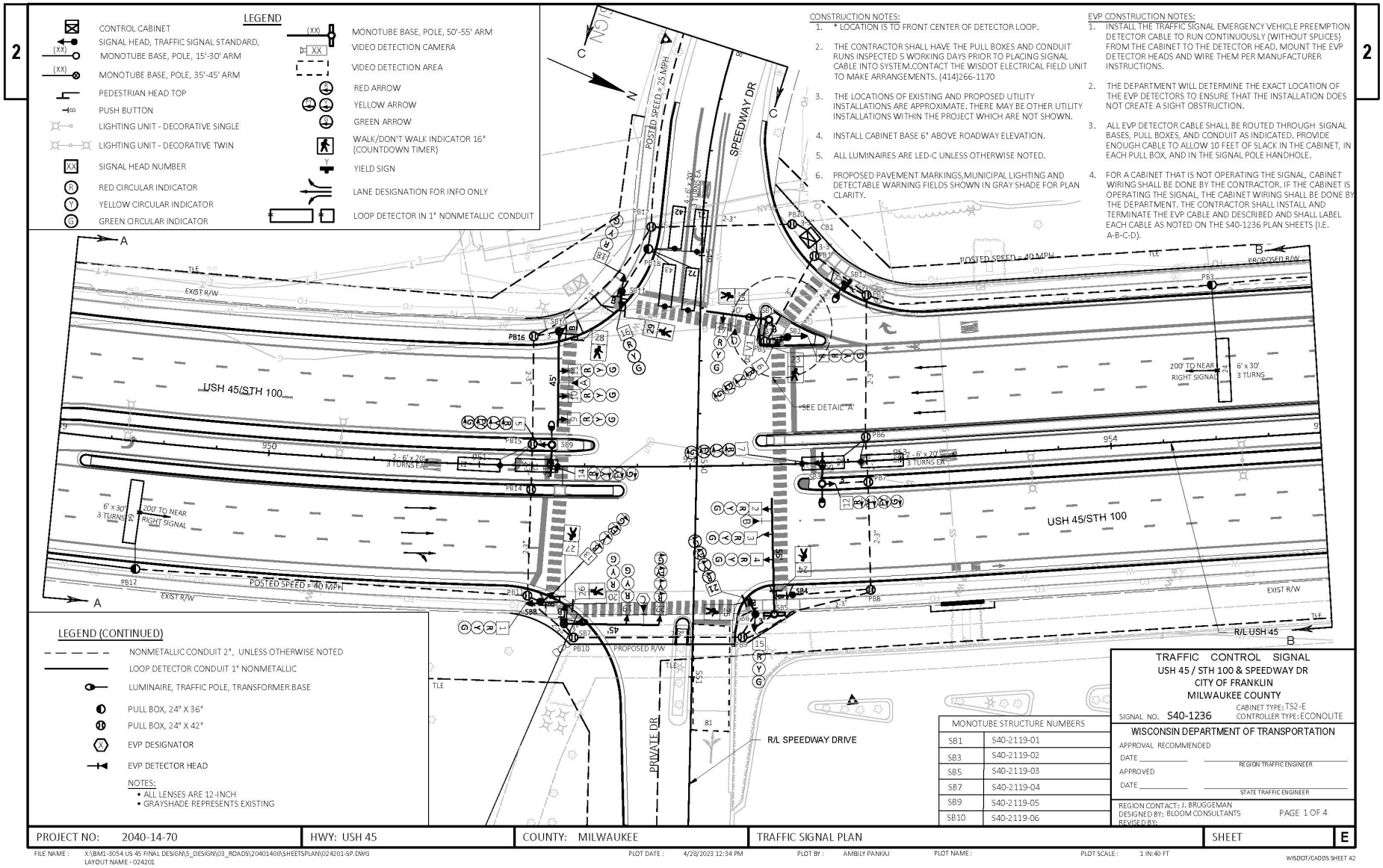
The following plan sets illustrate the possible stages a typical signalized intersection *may* go through when creating/revising traffic signal control plans of an example intersection. FDM 15-1-5 covers sample plans for all types of improvement projects.

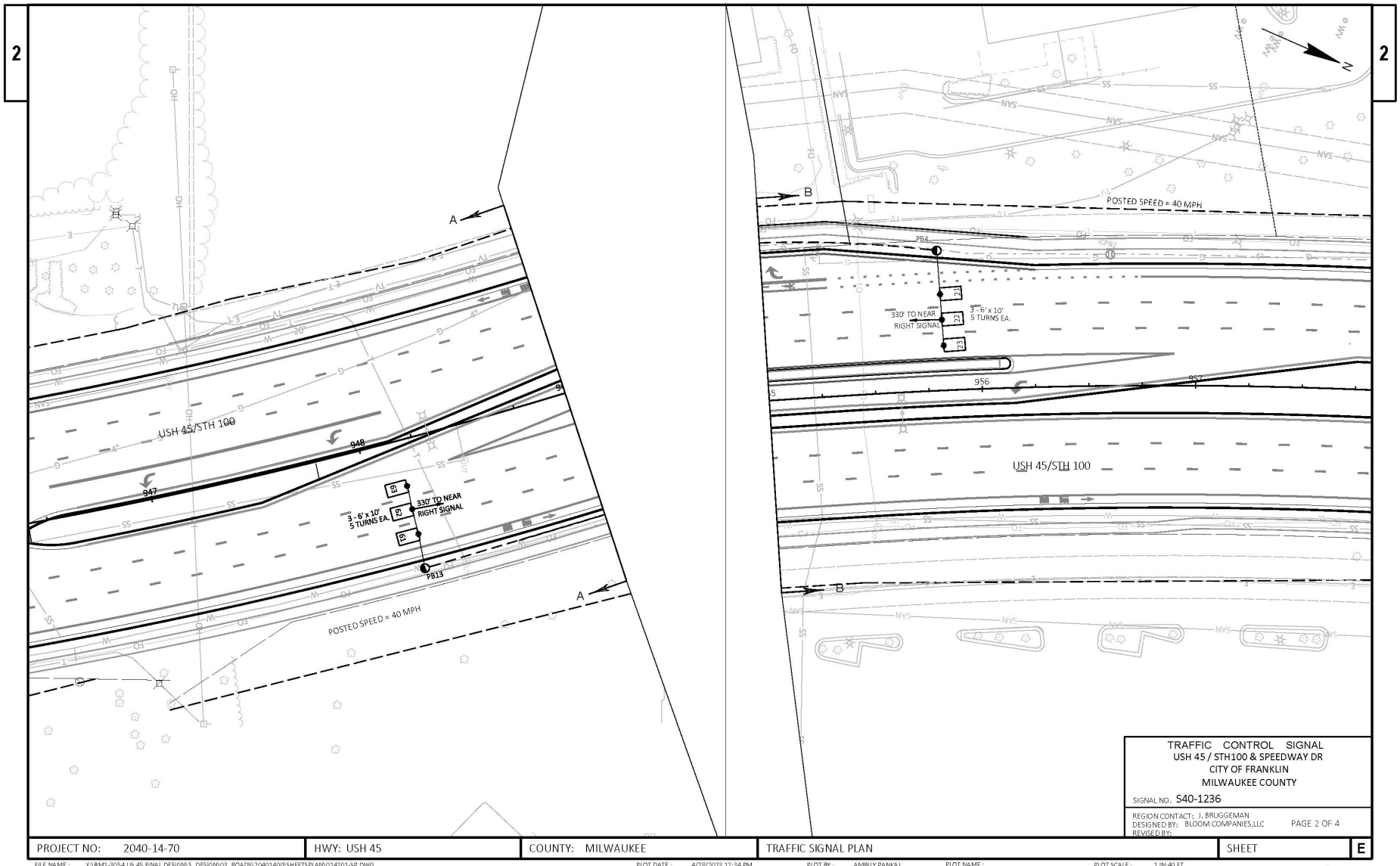
Example Plan Sets

1. Original plan with existing geometrics
2. Removal plan
3. Temporary plan
4. Revision plan (add monotubes)
5. Signalized intersection plan with railroad preemption
6. Single controller plan at an interchange (dual ring with overlaps)
7. TTI Phasing plan at an interchange

These sample traffic signal plans are strictly for reference. These plans attempt to demonstrate various signal operations and applications of special features (EVP, railroad, interchanges, overlaps). The Regional Traffic Signal Engineering staff *should* be involved during the development of traffic signal plans or special applications.

Example 1. Original plan with existing geometrics (4 sheets)




2
2
A
A
B
B
USH 45/STH 100
948
947
956
957
3 - 6' x 10'
5 TURNS EA.
330' TO NEAR
RIGHT SIGNAL
PB13
PB4
POSTED SPEED = 40 MPH
N
TRAFFIC CONTROL SIGNAL
USH 45 / STH100 & SPEEDWAY DR
CITY OF FRANKLIN
MILWAUKEE COUNTY
SIGNAL NO. S40-1236
REGION CONTACT: J. BRUGGEMAN
DESIGNED BY: BLOOM COMPANIES,LLC
REVISED BY:
PAGE 2 OF 4
PROJECT NO: 2040-14-70
HWY: USH 45
COUNTY: MILWAUKEE
TRAFFIC SIGNAL PLAN
SHEET
E
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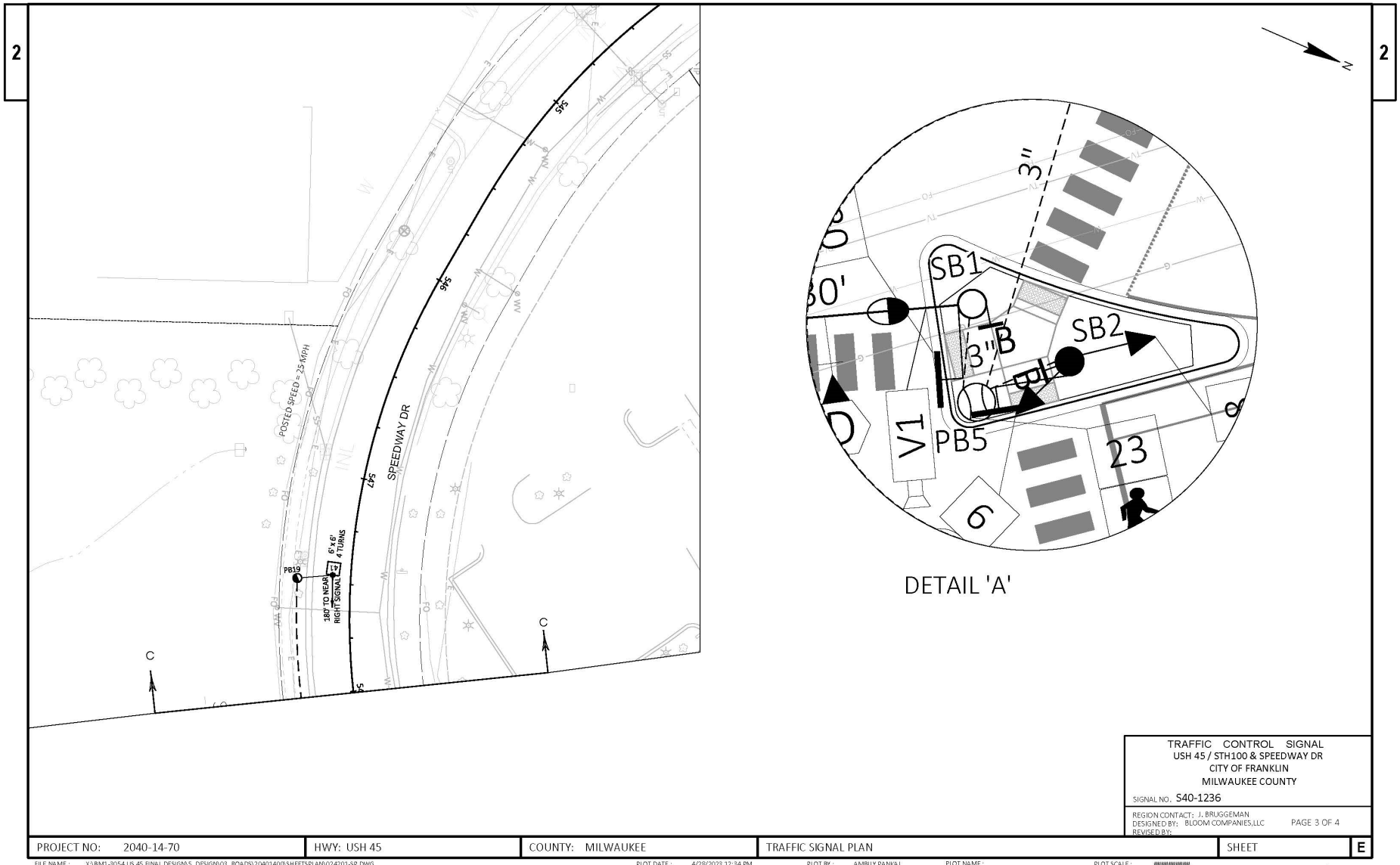
LAYOUT NAME - 024202
PLOT DATE : 4/28/2023 12:34 PM
PLOT BY : AMBILY PANKAJ
PLOT NAME :
PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42


2
2
N
SPEEDWAY DR
POSTED SPEED = 25 MPH
PB19
180' TO NEAR RIGHT SIGNAL
6' x 6' 4 TURNS
C
C
3"
SB1
SB2
3"
B
V1
PB5
23
6
DETAIL 'A'
TRAFFIC CONTROL SIGNAL
USH 45 / STH100 & SPEEDWAY DR
CITY OF FRANKLIN
MILWAUKEE COUNTY
SIGNAL NO. S40-1236
REGION CONTACT: J. BRUGGEMAN
DESIGNED BY: BLOOM COMPANIES,LLC
REVISED BY:
PAGE 3 OF 4
PROJECT NO: 2040-14-70
HWY: USH 45
COUNTY: MILWAUKEE
TRAFFIC SIGNAL PLAN
SHEET
E
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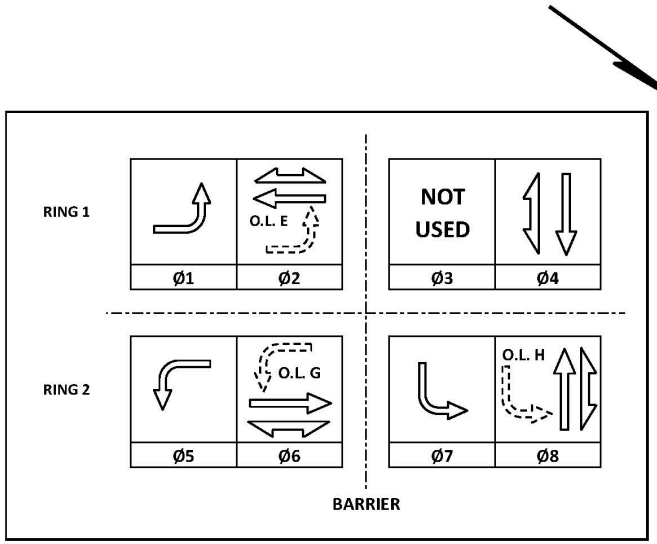
LAYOUT NAME - 024203
PLOT DATE : 4/28/2023 12:34 PM
PLOT BY : AMBILY PANKAJ
PLOT NAME :
PLOT SCALE : ##########
WISDOT/CADDS SHEET 42

2

	HEAD NUMBERS	FLASH
Ø1	5,6,7	R ←
Ø2	8,9,10,11	R
Ø3		
Ø4	18,19,20	R
Ø5	12,13,14	R ←
Ø6	1,2,3,4	R
Ø7	21,22	R ←
Ø8	15,16,17	R
Ø2P	29,30	
Ø4P	27,28	
Ø6P	25,26	
Ø8P	23,24	
OLE	5,6,7	-
OLF		
OLG	12,13,14	-
OLH	18,19	-



CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / Ø	PHASE RECALL	PHASE ACTIVE
1		6		X
2	X	6	MIN	X
3				
4		8		X
5		2		X
6	X	2	MIN	X
7		4		X
8		4		X

EMERGENCY VEHICLE PREEMPTION SEQUENCE

EMERGENCY VEHICLE PREEMPTOR	A	B	C	D
MOVEMENT				
PHASE	2+5	1+6	4+7	8

AFTER PREEMPTION SEQUENCE 2+5 OR 1+6, CONTROLLER SHALL RETURN TO PHASES 2+6.
AFTER PREEMPTION SEQUENCE 4+7 OR 8, CONTROLLER SHALL RETURN TO PHASES 4+8.

TYPE OF INTERCONNECT/COMMUNICATION	
NONE	
CLOSED LOOP	
TWISTED PAIR	
FIBER OPTIC*	
FIBER OPTIC (ETHERNET)	X
RADIO	
CELL MODEM	

TYPE OF COORDINATION	
NONE	
TBC	X
TRAFFIC RESPONSIVE	
ADAPTIVE	
*LOCATION OF MASTER CONTROLLER NO: S-	
SIGNAL SYSTEM NO: SS-	

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC CABINET	X
IN SEPARATE DOT LIGHTING CABINET	

TYPE OF PRE-EMPT	
NONE	
RAILROAD	
EMERGENCY VEHICLE	X
GTT	
TOMAR	X
HARDWIRE	
OTHER	
CONFIRMATION LIGHTS	
LIFT BRIDGE	
QUEUE DETECTION	

DETECTOR LOGIC

DETECTOR INPUT	3	1	7	5	11	9	15	13	19	17	23	21	27	33	37	29	DETECTOR INPUT
PLAN LOOP DETECTOR*(S)	11	21	23	41	43	51	61	63	71		81						PLAN LOOP DETECTOR*(S)
CALLED PHASE	1	2	2	4	4	5	6	6	7		8						CALLED PHASE
CALL OPTION	X	X	X		X	X	X	X	X		X						CALL OPTION
DELAY TIME					X												DELAY TIME
EXTENTION OPTION	X	X	X	X	X	X	X	X	X		X						EXTENTION OPTION
EXTEND TIME				X													EXTEND TIME
USE ADDED INITIAL		X	X				X	X									USE ADDED INITIAL
CROSS SWITCH PHASE	2					6			8								CROSS SWITCH PHASE

DETECTOR INPUT	4	2	8	6	12	10	16	14	20	18	24	22	28	34	38	30	DETECTOR INPUT
PLAN LOOP DETECTOR*(S)	12	22	24	42		52	62	64	72								PLAN LOOP DETECTOR*(S)
CALLED PHASE	1	2	2	4		5	6	6	7								CALLED PHASE
CALL OPTION	X	X	X	X		X	X	X	X								CALL OPTION
DELAY TIME				X													DELAY TIME
EXTENTION OPTION	X	X	X	X		X	X	X	X								EXTENTION OPTION
EXTEND TIME																	EXTEND TIME
USE ADDED INITIAL		X	X				X	X									USE ADDED INITIAL
CROSS SWITCH PHASE	2					6			8								CROSS SWITCH PHASE

GENERAL NOTES:

1.

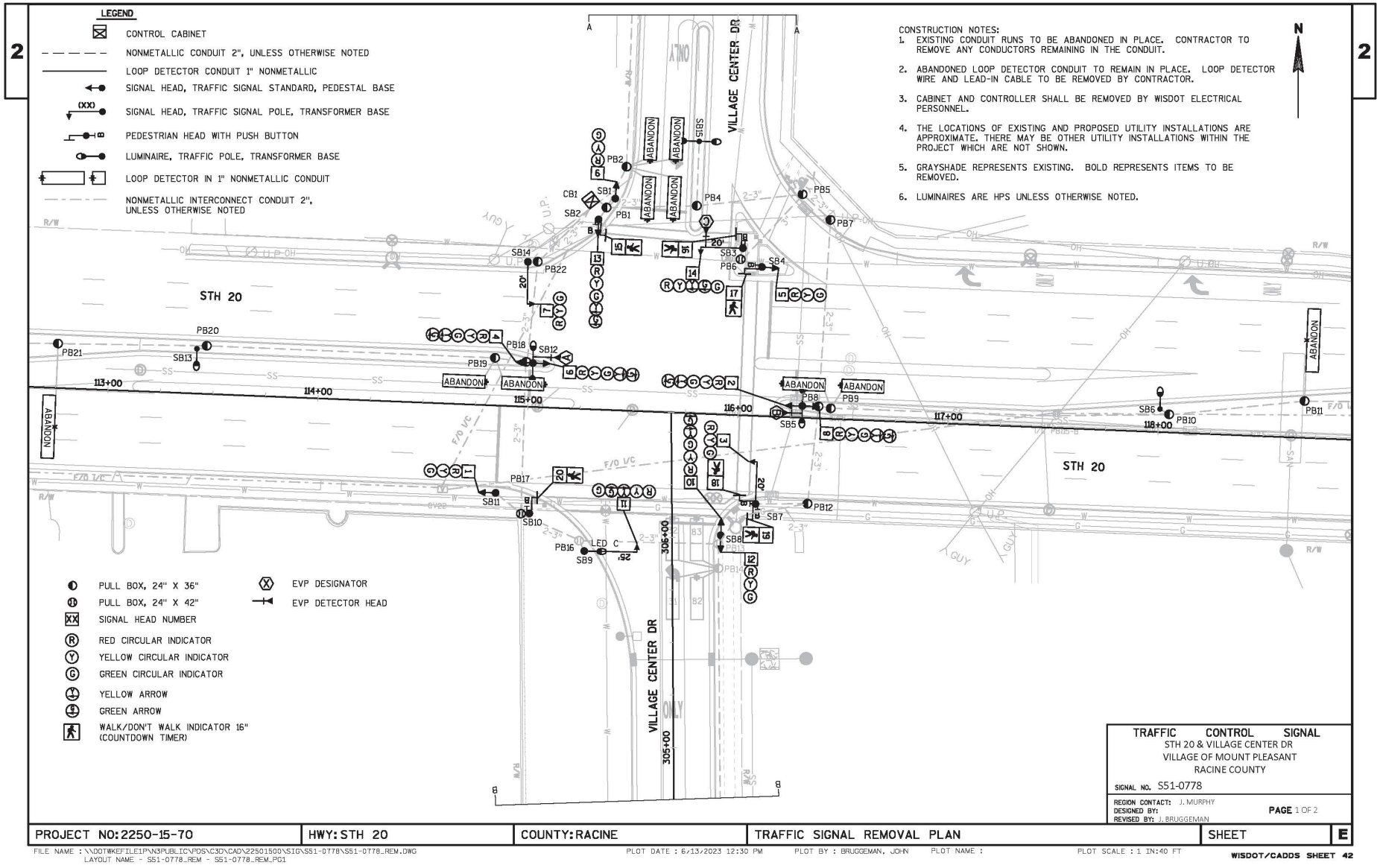
USH 45 / STH 100 & SPEEDWAY DR
CITY OF FRANKLIN
MILWAUKEE COUNTY

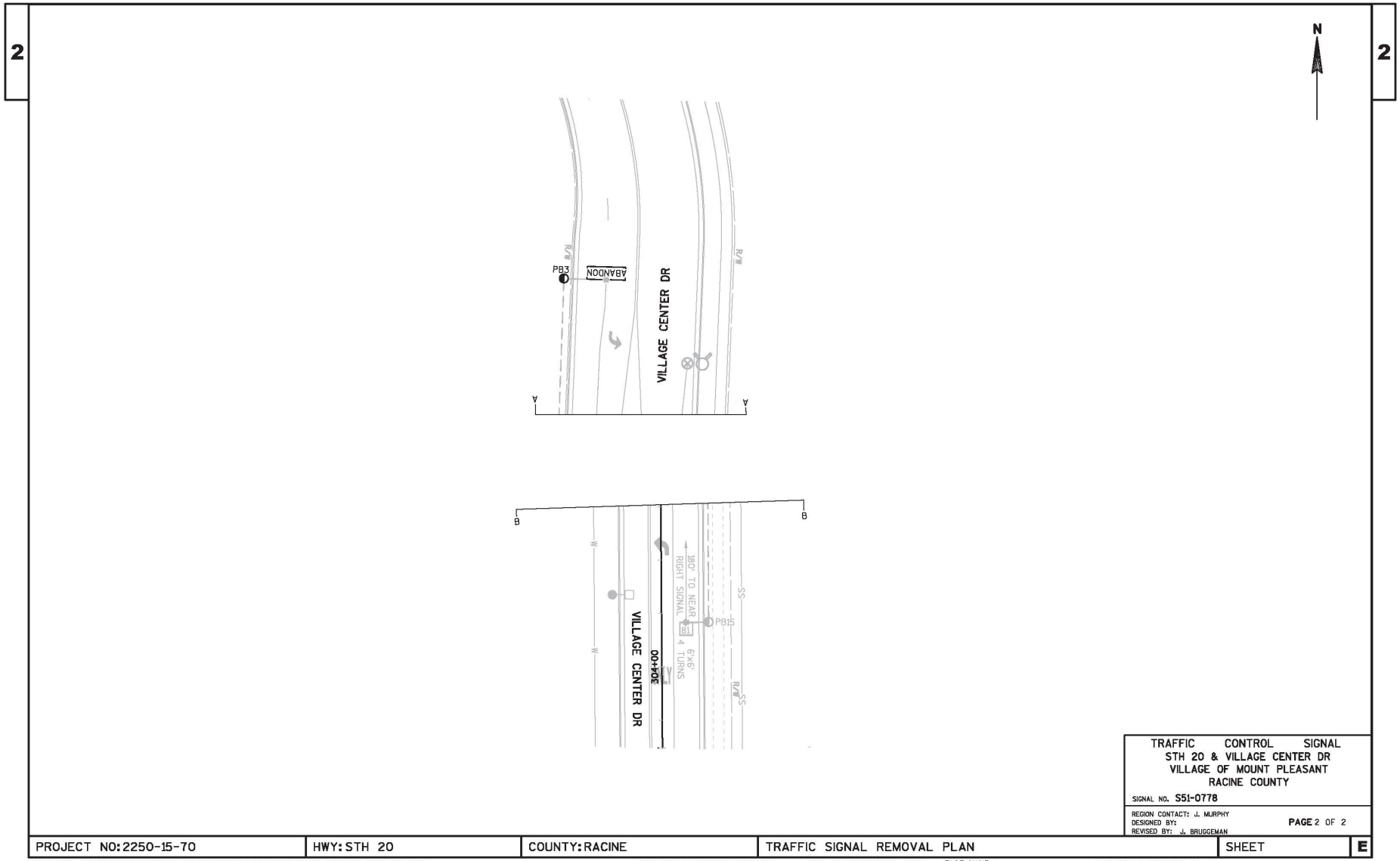
SIGNAL NO: S40-1236 CABINET TYPE: TS2-E
CONTROLLER TYPE: ECONOLITE
DATE: 05/2023 PAGE NUMBER: 4 OF 4

PROJECT NO: 2040-14-70	HWY: USH 45	COUNTY: MILWAUKEE	SEQUENCE OF OPERATIONS	SHEET NO:	E

FILE NAME: X:\BM1-3054 US 45 Final Design\6 Design\03 Roads\2040140\Sheets\Plan\Speedway\TS2-S_E_FYA_EFGH_Econolite_SEQ.xlsx PLOT DATE: 4/28/2023 PLOT NAME: TS2-S_E_FYA_EFGH_Econolite_SEQ.xlsx PLOT BY: _____ PLOT SCALE: 1:1

Example 2. Removal Plan (2 sheets)





TRAFFIC CONTROL SIGNAL
STH 20 & VILLAGE CENTER DR
VILLAGE OF MOUNT PLEASANT
RACINE COUNTY

SIGNAL NO. S51-0778

REGION CONTACT: J. MURPHY
DESIGNED BY:
REVISED BY: J. BRUGGEMAN

PAGE 2 OF 2

PROJECT NO: 2250-15-70	HWY: STH 20	COUNTY: RACINE	TRAFFIC SIGNAL REMOVAL PLAN	SHEET	E

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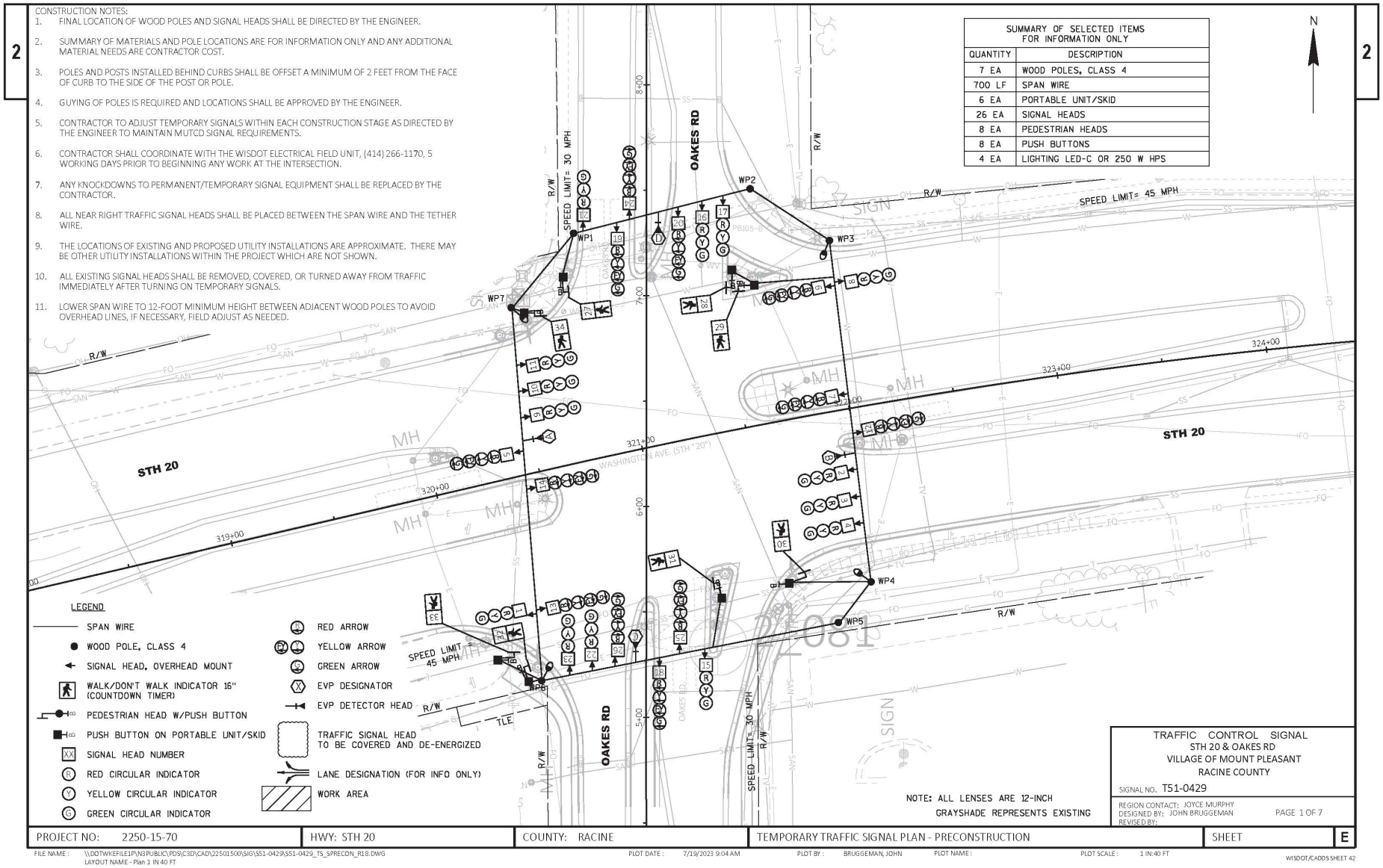
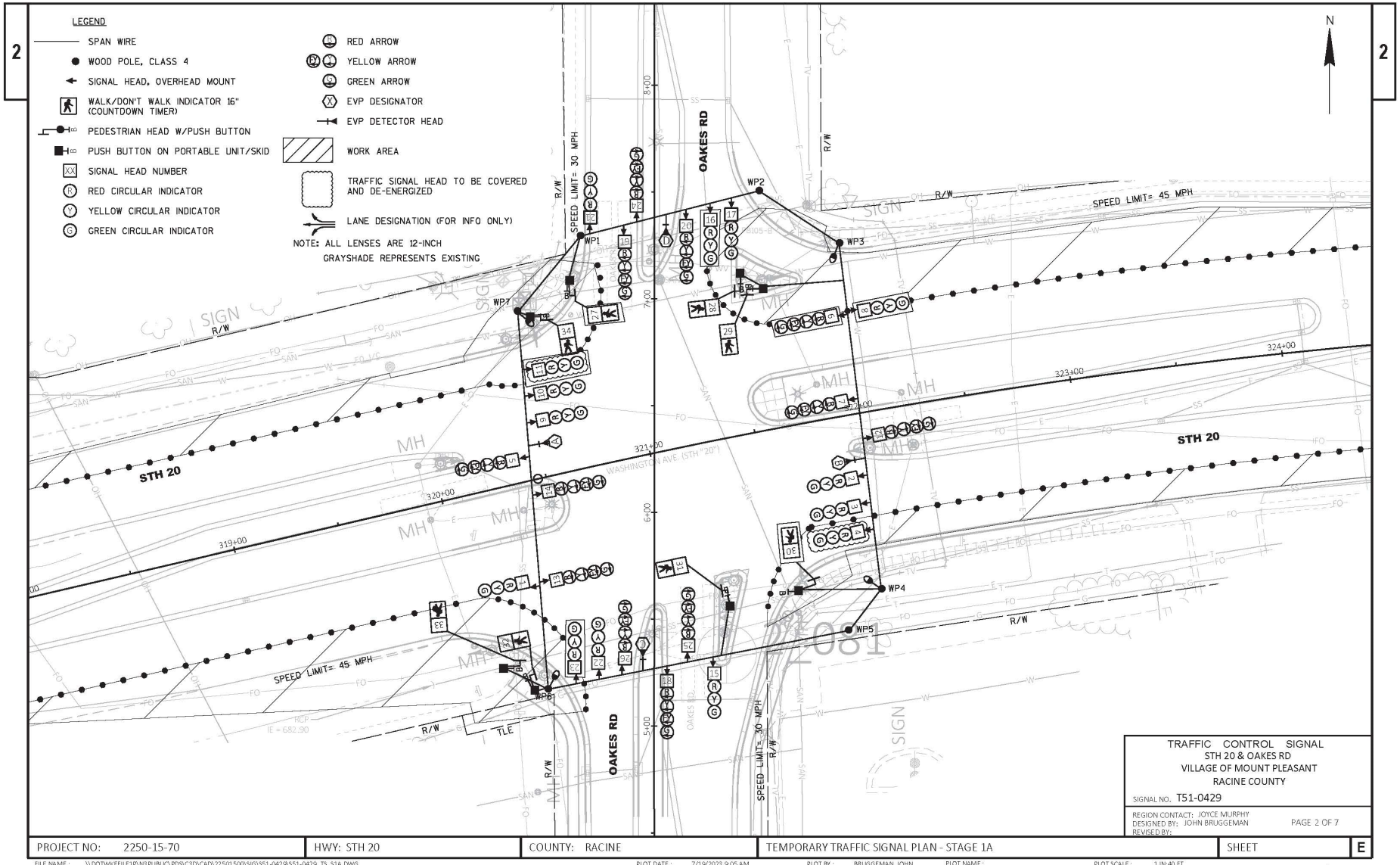
PLOT DATE : 6/13/2023 12:30 PM PLOT BY : BRUGGEMAN, JOHN PLOT NAME : PLOT SCALE : 1 IN:40 FT

WISDOT/CADDS SHEET 42

Example 3. Temporary Signal Plan (7 sheets)




LEGEND
SPAN WIRE
WOOD POLE, CLASS 4
SIGNAL HEAD, OVERHEAD MOUNT
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
PEDESTRIAN HEAD W/PUSH BUTTON
PUSH BUTTON ON PORTABLE UNIT/SKID
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
WORK AREA
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
LANE DESIGNATION (FOR INFO ONLY)
NOTE: ALL LENSES ARE 12-INCH
GRAYSHADE REPRESENTS EXISTING
N
OAKES RD
STH 20
SPEED LIMIT= 45 MPH
SPEED LIMIT= 30 MPH
WP1
WP2
WP3
WP4
WP5
WP6
WP7
R/W
TLE
TRAFFIC CONTROL SIGNAL
STH 20 & OAKES RD
VILLAGE OF MOUNT PLEASANT
RACINE COUNTY
SIGNAL NO. T51-0429
REGION CONTACT: JOYCE MURPHY
DESIGNED BY: JOHN BRUGGEMAN
REVISED BY:
PAGE 2 OF 7
PROJECT NO: 2250-15-70
HWY: STH 20
COUNTY: RACINE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 1A
SHEET
E
FILE NAME : \\DOTWKEFILE1P\N3 PUBLIC\PDS\C3D\CAD\22501500\SIG\S51-0429\S51-0429_TS_S1A.DWG
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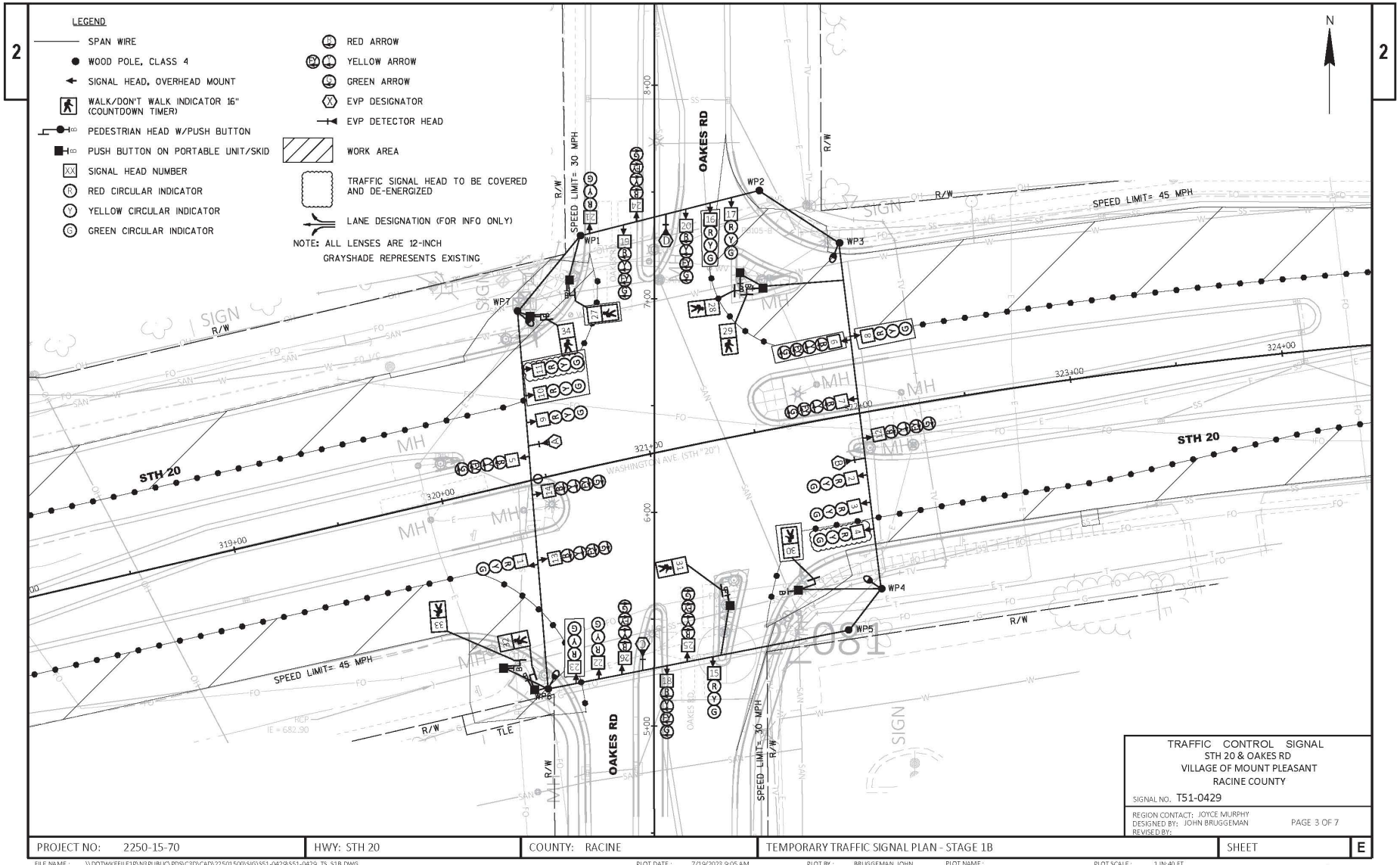
PLOT DATE : 7/19/2023 9:05 AM
PLOT BY : BRUGGEMAN, JOHN
PLOT NAME :
PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42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SPAN WIRE
WOOD POLE, CLASS 4
SIGNAL HEAD, OVERHEAD MOUNT
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
PEDESTRIAN HEAD W/PUSH BUTTON
PUSH BUTTON ON PORTABLE UNIT/SKID
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
WORK AREA
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
LANE DESIGNATION (FOR INFO ONLY)
NOTE: ALL LENSES ARE 12-INCH
GRAYSHADE REPRESENTS EXISTING
N
STH 20
OAKES RD
SPEED LIMIT= 30 MPH
SPEED LIMIT= 45 MPH
WP1
WP2
WP3
WP4
WP5
WP6
WP7
R/W
TLE
MH
SIGN
TRAFFIC CONTROL SIGNAL
STH 20 & OAKES RD
VILLAGE OF MOUNT PLEASANT
RACINE COUNTY
SIGNAL NO. T51-0429
REGION CONTACT: JOYCE MURPHY
DESIGNED BY: JOHN BRUGGEMAN
REVISED BY:
PAGE 3 OF 7
PROJECT NO: 2250-15-70
HWY: STH 20
COUNTY: RACINE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 1B
SHEET
E
FILE NAME : \\DOTWKEFILE1P\N3 PUBLIC\PDS\C3D\CAD\225015OO\SIG\S51-0429\S51-0429_TS_S1B.DWG
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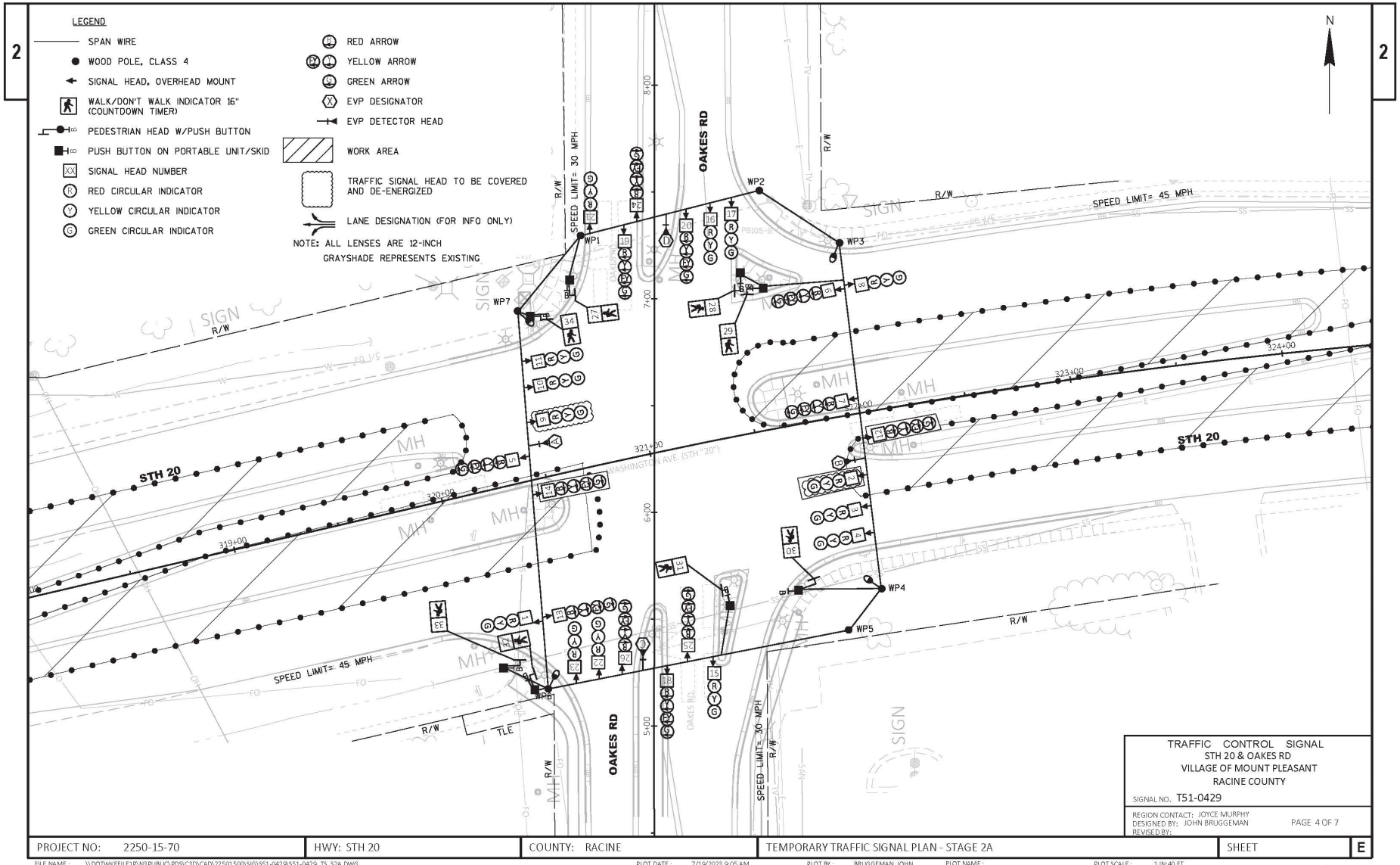
PLOT DATE : 7/19/2023 9:05 AM
PLOT BY : BRUGGEMAN, JOHN
PLOT NAME :
PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42


LEGEND
SPAN WIRE
WOOD POLE, CLASS 4
SIGNAL HEAD, OVERHEAD MOUNT
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
PEDESTRIAN HEAD W/PUSH BUTTON
PUSH BUTTON ON PORTABLE UNIT/SKID
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
WORK AREA
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
LANE DESIGNATION (FOR INFO ONLY)
NOTE: ALL LENSES ARE 12-INCH
GRAYSHADE REPRESENTS EXISTING
N
OAKES RD
STH 20
SPEED LIMIT= 30 MPH
SPEED LIMIT= 45 MPH
R/W
WP1
WP2
WP3
WP4
WP5
WP7
TLE
TRAFFIC CONTROL SIGNAL
STH 20 & OAKES RD
VILLAGE OF MOUNT PLEASANT
RACINE COUNTY
SIGNAL NO. T51-0429
REGION CONTACT: JOYCE MURPHY
DESIGNED BY: JOHN BRUGGEMAN
REVISED BY:
PAGE 4 OF 7
PROJECT NO: 2250-15-70
HWY: STH 20
COUNTY: RACINE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 2A
SHEET
E
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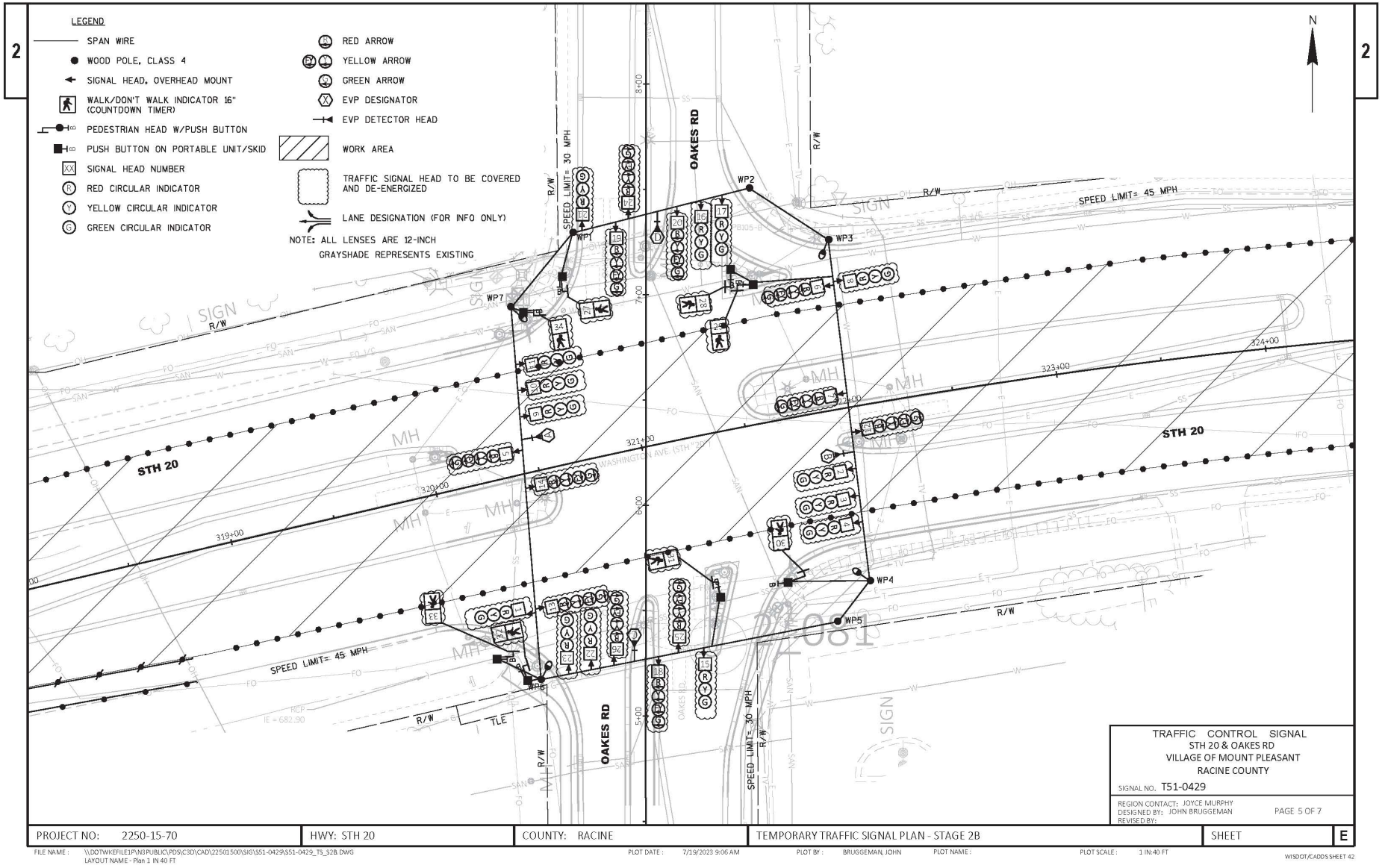
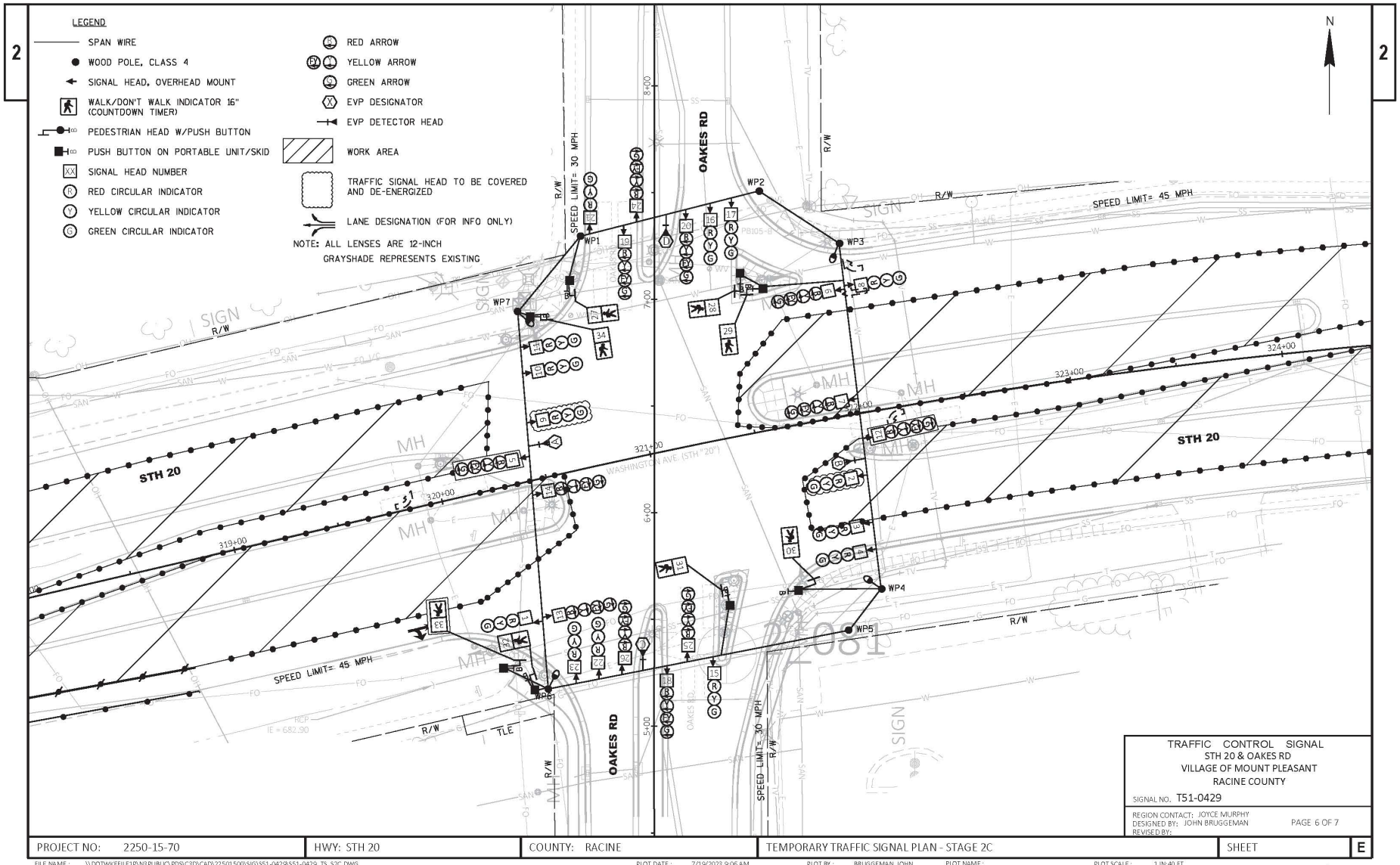
PLOT NAME :
PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42


LEGEND
SPAN WIRE
WOOD POLE, CLASS 4
SIGNAL HEAD, OVERHEAD MOUNT
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
PEDESTRIAN HEAD W/PUSH BUTTON
PUSH BUTTON ON PORTABLE UNIT/SKID
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
WORK AREA
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
LANE DESIGNATION (FOR INFO ONLY)
NOTE: ALL LENSES ARE 12-INCH
GRAYSHADE REPRESENTS EXISTING
N
STH 20
OAKES RD
SPEED LIMIT= 45 MPH
SPEED LIMIT= 30 MPH
R/W
WP1
WP2
WP3
WP4
WP5
WP6
WP7
319+00
320+00
321+00
323+00
324+00
5+00
6+00
7+00
8+00
TLE
TRAFFIC CONTROL SIGNAL
STH 20 & OAKES RD
VILLAGE OF MOUNT PLEASANT
RACINE COUNTY
SIGNAL NO. T51-0429
REGION CONTACT: JOYCE MURPHY
DESIGNED BY: JOHN BRUGGEMAN
REVISED BY:
PAGE 5 OF 7
PROJECT NO: 2250-15-70
HWY: STH 20
COUNTY: RACINE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 2B
SHEET
E
FILE NAME : \\DOTWKEFILE1P\N3 PUBLIC\PDS\C3D\CAD\22501500\SIG\S51-0429\S51-0429_TS_S2B.DWG
LAYOUT NAME - Plan 1 IN 40 FT
PLOT DATE : 7/19/2023 9:06 AM
PLOT BY : BRUGGEMAN, JOHN
PLOT NAME :
PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42


LEGEND
SPAN WIRE
WOOD POLE, CLASS 4
SIGNAL HEAD, OVERHEAD MOUNT
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
PEDESTRIAN HEAD W/PUSH BUTTON
PUSH BUTTON ON PORTABLE UNIT/SKID
SIGNAL HEAD NUMBER
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
RED ARROW
YELLOW ARROW
GREEN ARROW
EVP DESIGNATOR
EVP DETECTOR HEAD
WORK AREA
TRAFFIC SIGNAL HEAD TO BE COVERED AND DE-ENERGIZED
LANE DESIGNATION (FOR INFO ONLY)
NOTE: ALL LENSES ARE 12-INCH
GRAYSHADE REPRESENTS EXISTING
N
OAKES RD
STH 20
WASHINGTON AVE (STH "20")
SPEED LIMIT= 30 MPH
SPEED LIMIT= 45 MPH
WP1
WP2
WP3
WP4
WP5
WP6
WP7
R/W
TLE
SIGN
MH
2081
TRAFFIC CONTROL SIGNAL
STH 20 & OAKES RD
VILLAGE OF MOUNT PLEASANT
RACINE COUNTY
SIGNAL NO. T51-0429
REGION CONTACT: JOYCE MURPHY
DESIGNED BY: JOHN BRUGGEMAN
REVISED BY:
PAGE 6 OF 7
PROJECT NO: 2250-15-70
HWY: STH 20
COUNTY: RACINE
TEMPORARY TRAFFIC SIGNAL PLAN - STAGE 2C
SHEET E
FILE NAME : \\DOTWKEFILE1P\N3 PUBLIC\PDS\C3D\CAD\22501500\SIG\S51-0429\S51-0429_TS_S2C.DWG
LAYOUT NAME - Plan 1 IN 40 FT
PLOT DATE : 7/19/2023 9:06 AM
PLOT BY : BRUGGEMAN, JOHN
PLOT NAME :
PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42

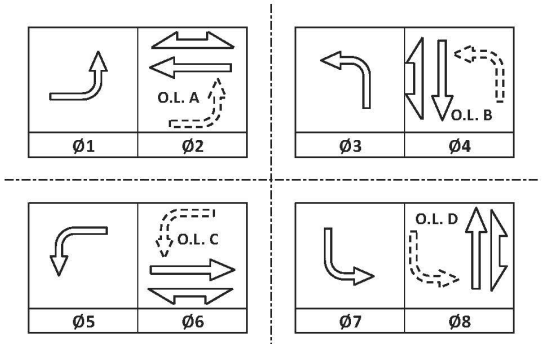
2

2

	HEAD NUMBERS	FLASH
Ø1	5,6,7	-
Ø2	8,9,10,11	R
Ø3	18,19,20	-
Ø4	21,22,23	R
Ø5	12,13,14	-
Ø6	1,2,3,4	R
Ø7	24,25,26	-
Ø8	15,16,17	R
Ø2P	27,28	
Ø4P	33,34	
Ø6P	31,32	
Ø8P	29,30	
OLA	5,6,7	R ←
OLB	18,19,20	R ←
OLC	12,13,14	R ←
OLD	24,25,26	R ←

RING 1

RING 2



CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / Ø	PHASE RECALL	PHASE ACTIVE
1		6	MAX	X
2	X	6	MAX	X
3		8	MAX	X
4		8	MAX	X
5		2	MAX	X
6	X	2	MAX	X
7		4	MAX	X
8		4	MAX	X

TYPE OF INTERCONNECT/COMMUNICATION	
NONE	X
CLOSED LOOP	
TWISTED PAIR	
FIBER OPTIC*	
FIBER OPTIC (ETHERNET)	
RADIO	
CELL MODEM	

TYPE OF COORDINATION	
NONE	
TBC	X
TRAFFIC RESPONSIVE	
ADAPTIVE	
*LOCATION OF MASTER CONTROLLER NO:	S-
SIGNAL SYSTEM NO:	SS-

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC CABINET	X
IN SEPARATE DOT LIGHTING CABINET	

TYPE OF PRE-EMPT	
NONE	
RAILROAD	
EMERGENCY VEHICLE	X
GTT	X
TOMAR	
HARDWIRE	
OTHER	
CONFIRMATION LIGHTS	
LIFT BRIDGE	
QUEUE DETECTION	

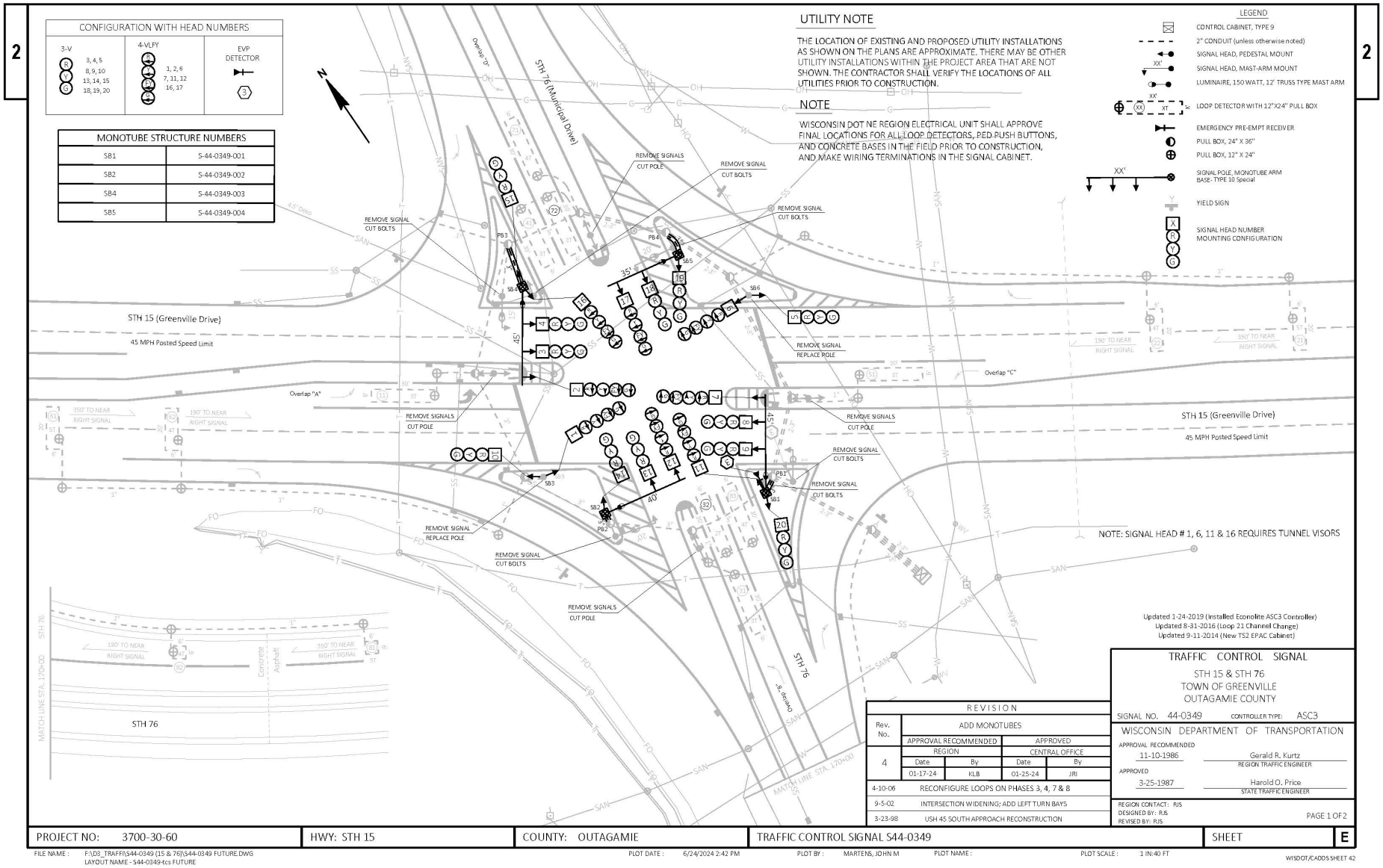
STH 20 & OAKES RD
VILLAGE OF MOUNT PLEASANT
RACINE COUNTY

SIGNAL NO: T51-0429 CABINET TYPE: TEMP
CONTROLLER TYPE: ECONOLITE
DATE: AUGUST 2023 PAGE NUMBER: 7 OF 7

PROJECT NO: 2250-15-70	HWY: STH 20	COUNTY: RACINE	TEMPORARY SEQUENCE OF OPERATIONS	SHEET NO:	E

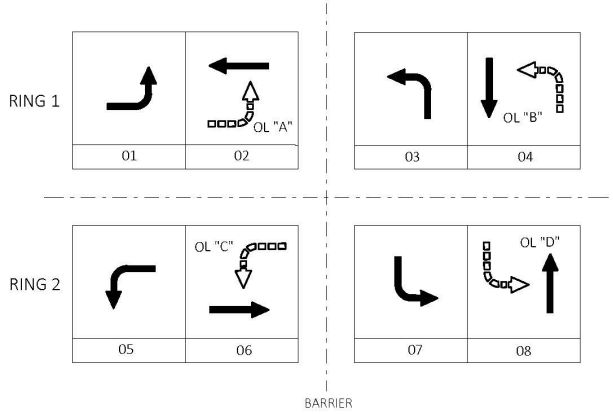
FILE NAME: \\WKERTOVFILP101\n3public\SPO\Operations\Signals\Databases\Signal Intersection Files\S40-1144\PLANS\TS1.xlsx PLOT DATE: 3/2/2020 PLOT NAME: TS1.xlsx PLOT BY: _____ PLOT SCALE: 1:1

Example 4. Revision Plan to Add Monotubes (2 sheets)



2

	HEAD NUMBERS	FLASH
01	6, 7	-
02	3, 4, 5	R
03	16, 17	-
04	13, 14, 15	R
05	1, 2	-
06	8, 9, 10	R
07	11, 12	-
08	18, 19, 20	R
02P		
04P		
06P		
08P		
OLA	6, 7	R
OLB	16, 17	R
OLC	1, 2	R
OLD	11, 12	R



CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / β	PHASE RECALL	PHASE ACTIVE
1				YES
2			MIN	YES
3				YES
4	YES	8		YES
5				YES
6			MIN	YES
7				YES
8		4		YES

EMERGENCY VEHICLE PREEMPTION

EMERGENCY VEHICLE DETECTOR	3
MOVEMENT	
PHASE	4+7

TYPE OF INTERCONNECT/COMMUNICATION	
CELL MODEM	X
CLOSED LOOP	
TWISTED PAIR*	
FIBER OPTIC*	
FIBER OPTIC (ETHERNET)	
RADIO	

TYPE OF COORDINATION	
NONE	X
TBC	
TRAFFIC RESPONSIVE	
ADAPTIVE	
*LOCATION OF MASTER CONTROLLER NO:	S00-0000
SIGNAL SYSTEM #:	SS-0000

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC SIGNAL CABINET	X
IN SEPARATE DOT LIGHTING CABINET	

TYPE OF PRE-EMPT	
NONE	
RAILROAD	
EMERGENCY VEHICLE	
GTT/3M	X
TOMAR	
HARDWIRE	
OTHER (GPS)	
LIFT BRIDGE	
QUEUE DETECTOR	

DETECTOR LOGIC

RACK # 1

DETECTOR CHANNEL	3	1	7	5	11	9	15	13
PLAN LOOP DETECTOR #(S)	11		31	41				
ASSIGNED PHASE	1		3	4				
OPERATION MODE	Veh	BAD	Veh	Veh				
SWITCH TO PHASE								
EXTEND								
DELAY								
DETECTOR CHANNEL	4	2	8	6	12	10	16	14
PLAN LOOP DETECTOR #(S)	21	22	32					
ASSIGNED PHASE	2	2	3					
OPERATION MODE	Veh	Veh	Veh					
SWITCH TO PHASE								
EXTEND	Yes							
DELAY								

RACK # 2

DETECTOR CHANNEL	19	17	23	21	27	25	31	29
PLAN LOOP DETECTOR #(S)	51	61	71	81	83			
ASSIGNED PHASE	5	6	7	8	8			
OPERATION MODE	Veh	Veh	Veh	Veh	Veh			
SWITCH TO PHASE								
EXTEND		Yes						
DELAY				Yes				
DETECTOR CHANNEL	20	18	24	22	28	26	32	30
PLAN LOOP DETECTOR #(S)		62	72	82				
ASSIGNED PHASE		6	7	8				
OPERATION MODE		Veh	Veh	Veh				
SWITCH TO PHASE								
EXTEND								
DELAY				Yes				

GENERAL NOTES:

1. PROVIDE FOR HAND CONTROL
2. MMU SET UP FOR MODE B

Revision 4 - Add Monotubes
Updated 1-24-2019 (Installed Econolite ASC3 Controller)
Updated 8-31-2016 (Loop 21 Channel Change)
Updated 9-11-2014 (New TS2 EPAC Cabinet)

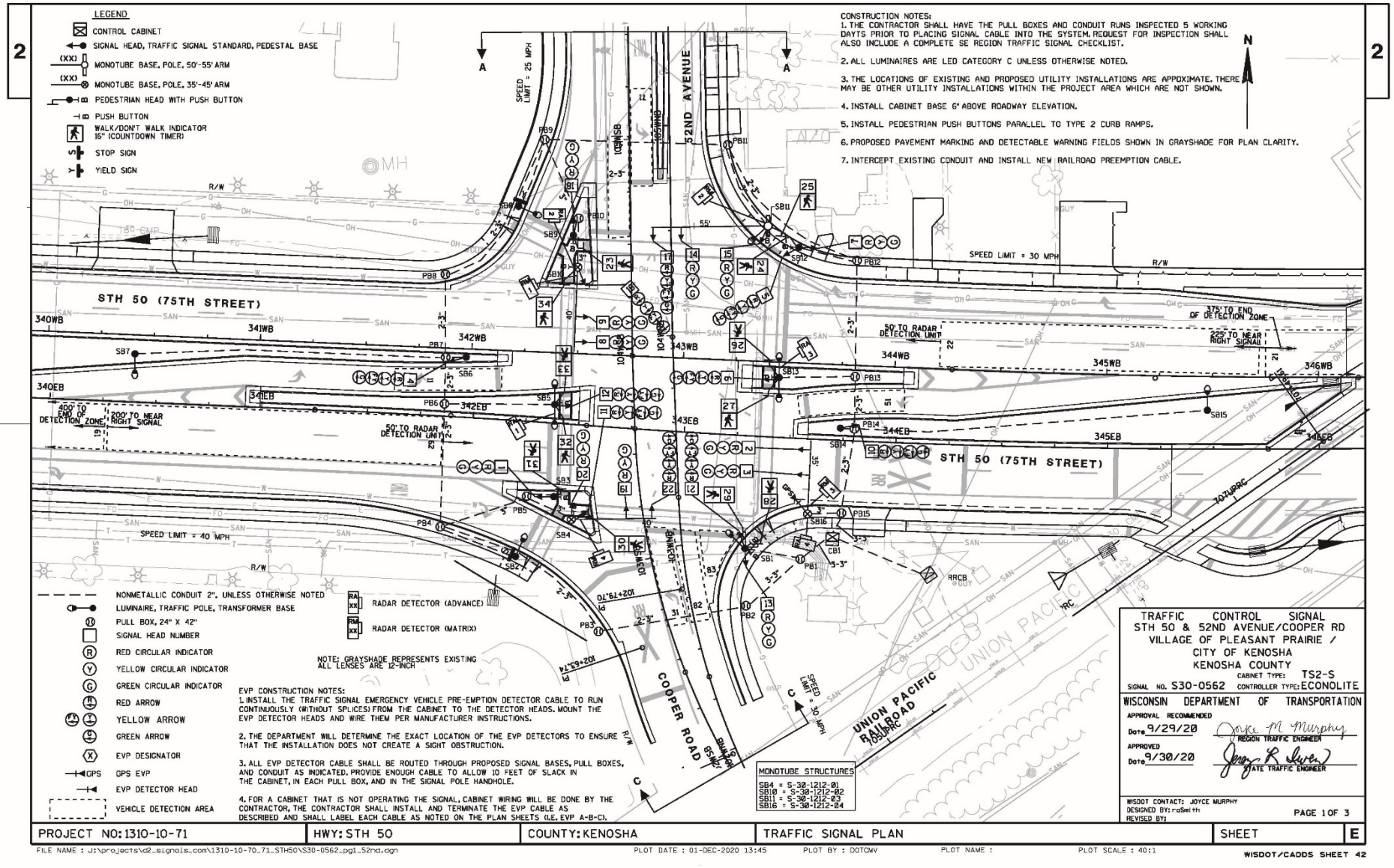
STH 15 & STH 76
TOWN OF GREENVILLE
OUTAGAMIE COUNTY

SIGNAL NO. 44-0349
CABINET: TS2 CONTROLLER: ASC3
DATE: 01-17-24 PAGE NO. 2 OF 2

PROJECT NO: 3700-30-60	HWY: STH 15	COUNTY: OUTAGAMIE	SEQUENCE OF OPERATIONS - S44-0349	SHEET	E

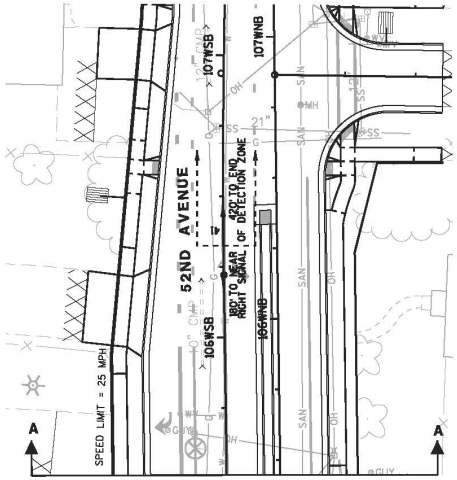
FILE NAME : F:\DS_TRAFFI\S44-0349 (15 & 76)\S44-0349 FUTURE.DWG
LAYOUT NAME - S44-0349-seq FUTURE
PLOT DATE : 6/24/2024 2:42 PM PLOT BY : MARTENS, JOHN M PLOT NAME : PLOT SCALE : 1 IN:40 FT
WISDOT/CADDS SHEET 42

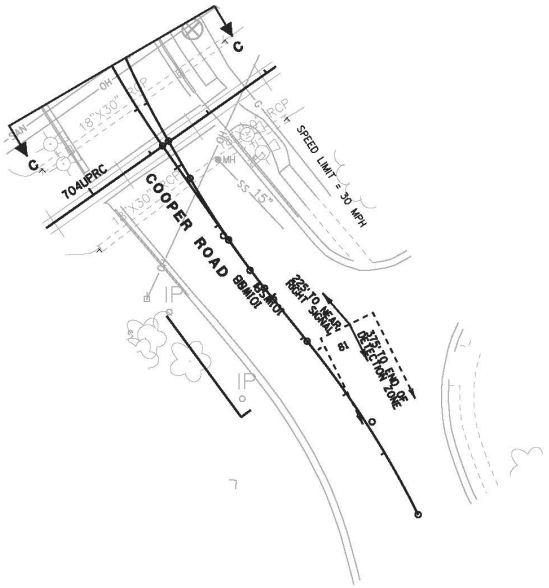
Example 5. Signalized Intersection Plan with Railroad Preemption (3 sheets)



2

2





TRAFFIC CONTROL SIGNAL
STH 50 & 52ND AVENUE/COOPER RD
VILLAGE OF PLEASANT PRAIRIE /
CITY OF KENOSHA
KENOSHA COUNTY

SIGNAL NO. S30-0562

WISDOT CONTACT: JOYCE MURPHY
DESIGNED BY: raSmith
REVISED BY:

PAGE 2 OF 3

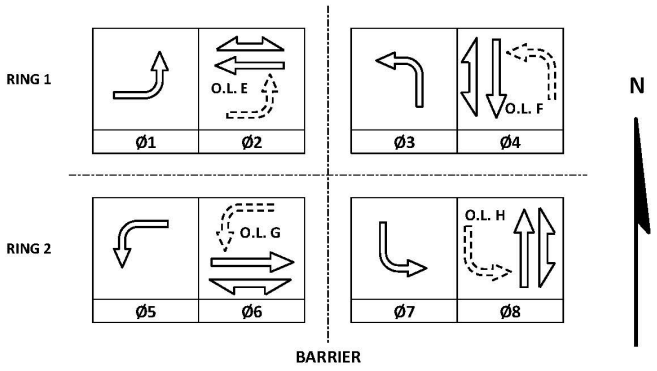
PROJECT NO: 1310-10-71	HWY: STH 50	COUNTY: KENOSHA	TRAFFIC SIGNAL PLAN	SHEET	E

FILE NAME : J:\projects\d2_signals_com\1310-10-70_71_STH50\S30-0562_pg2_52nd.dgn PLOT DATE : 01-DEC-2020 13:46 PLOT BY : DOTCMV PLOT NAME : PLOT SCALE : 40:1

WISDOT/CADDS SHEET 42

2

	HEAD NUMBERS	FLASH
Ø1	4,5,6	R ←
Ø2	7,8,9	R
Ø3	16,17	R ←
Ø4	18,19,20	R
Ø5	10,11,12	R ←
Ø6	1,2,3	R
Ø7	21,22	R ←
Ø8	13,14,15	R
Ø2P	23,24	
Ø4P	31,32,33,34	
Ø6P	29,30	
Ø8P	25,26,27,28	
OLE	4,5,6	-
OLF	16,17	-
OLG	10,11,12	-
OLH	21,22	-



CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / Ø	PHASE RECALL	PHASE ACTIVE
1		6		X
2	X	6	MIN	X
3		8		X
4		8		X
5		2		X
6	X	2	MIN	X
7		4		X
8		4		X

EMERGENCY VEHICLE PREEMPTION SEQUENCE

EMERGENCY VEHICLE PREEMPTOR	A	B	C	D
MOVEMENT				
PHASE	2+5	6+1	4+7	8+3

AFTER PREEMPTION SEQUENCE 2+5 OR 6+1, CONTROLLER SHALL RETURN TO PHASES 2+6.

AFTER PREEMPTION SEQUENCE 4+7 OR 8+3, CONTROLLER SHALL RETURN TO PHASES 4+8.

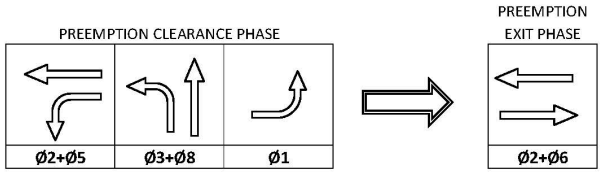
TYPE OF INTERCONNECT/COMMUNICATION	
NONE	
CLOSED LOOP	
TWISTED PAIR	
FIBER OPTIC*	
FIBER OPTIC (ETHERNET)	X
RADIO	
CELL MODEM	

TYPE OF COORDINATION	
NONE	
TBC	X
TRAFFIC RESPONSIVE	
ADAPTIVE	
*LOCATION OF MASTER CONTROLLER NO:	S-
SIGNAL SYSTEM NO:	SS-30-0116

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC CABINET	X
IN SEPARATE DOT LIGHTING CABINET	

TYPE OF PRE-EMPT	
NONE	
RAILROAD	X
EMERGENCY VEHICLE	X
GTT	X
TOMAR	
HARDWIRE	
OTHER - GPS	X
CONFIRMATION LIGHTS	
LIFT BRIDGE	
QUEUE DETECTION	

RAILROAD PREEMPTION PHASING



DETECTOR LOGIC

DETECTOR INPUT	3	1	7	5	11	9	15	13
PLAN LOOP DETECTOR*(S)	11	42	71	83				
CALLED PHASE	1	4	7	8				
CALL OPTION	X	X	X	X				
DELAY TIME				X				
EXTENTION OPTION	X	X	X	X				
EXTEND TIME								
USE ADDED INITIAL								
CROSS SWITCH PHASE								

DETECTOR INPUT	19	17	23	21	27	25	31	29
PLAN LOOP DETECTOR*(S)	21	41	62					
CALLED PHASE	2	4	6					
CALL OPTION	X		X					
DELAY TIME								
EXTENTION OPTION	X	X	X					
EXTEND TIME		X						
USE ADDED INITIAL								
CROSS SWITCH PHASE								

DETECTOR INPUT	4	2	8	6	12	10	16	14
PLAN LOOP DETECTOR*(S)	31	51	82					
CALLED PHASE	3	5	8					
CALL OPTION	X	X	X					
DELAY TIME								
EXTENTION OPTION	X	X	X					
EXTEND TIME								
USE ADDED INITIAL								
CROSS SWITCH PHASE								

DETECTOR INPUT	20	18	24	22	28	26	32	30
PLAN LOOP DETECTOR*(S)	22	61	81					
CALLED PHASE	2	6	8					
CALL OPTION	X	X						
DELAY TIME								
EXTENTION OPTION	X	X	X					
EXTEND TIME			X					
USE ADDED INITIAL								
CROSS SWITCH PHASE								

GENERAL NOTES:

1. TRAFFIC SIGNAL CABINET SHALL OPERATE WITH BATTERY BACKUP TO ACCOMMODATE RAILROAD PREEMPTION.
2. IN THE EVENT OF RAILROAD PRE-EMPTION, PHASES 2 + 5 SHALL RECEIVE A GREEN INDICATION FOLLOWED BY A CLEARANCE PERIOD TO CLEAR PHASES 3+8. THE INTERSECTION WILL DWELL IN PHASE 1 UNTIL THE CONCLUSION OF THE PRE-EMPTION EVENT. AT THE CONCLUSION OF PRE-EMPTION, THE INTERSECTION WILL RETURN TO PHASE 2 + 6 GREEN.

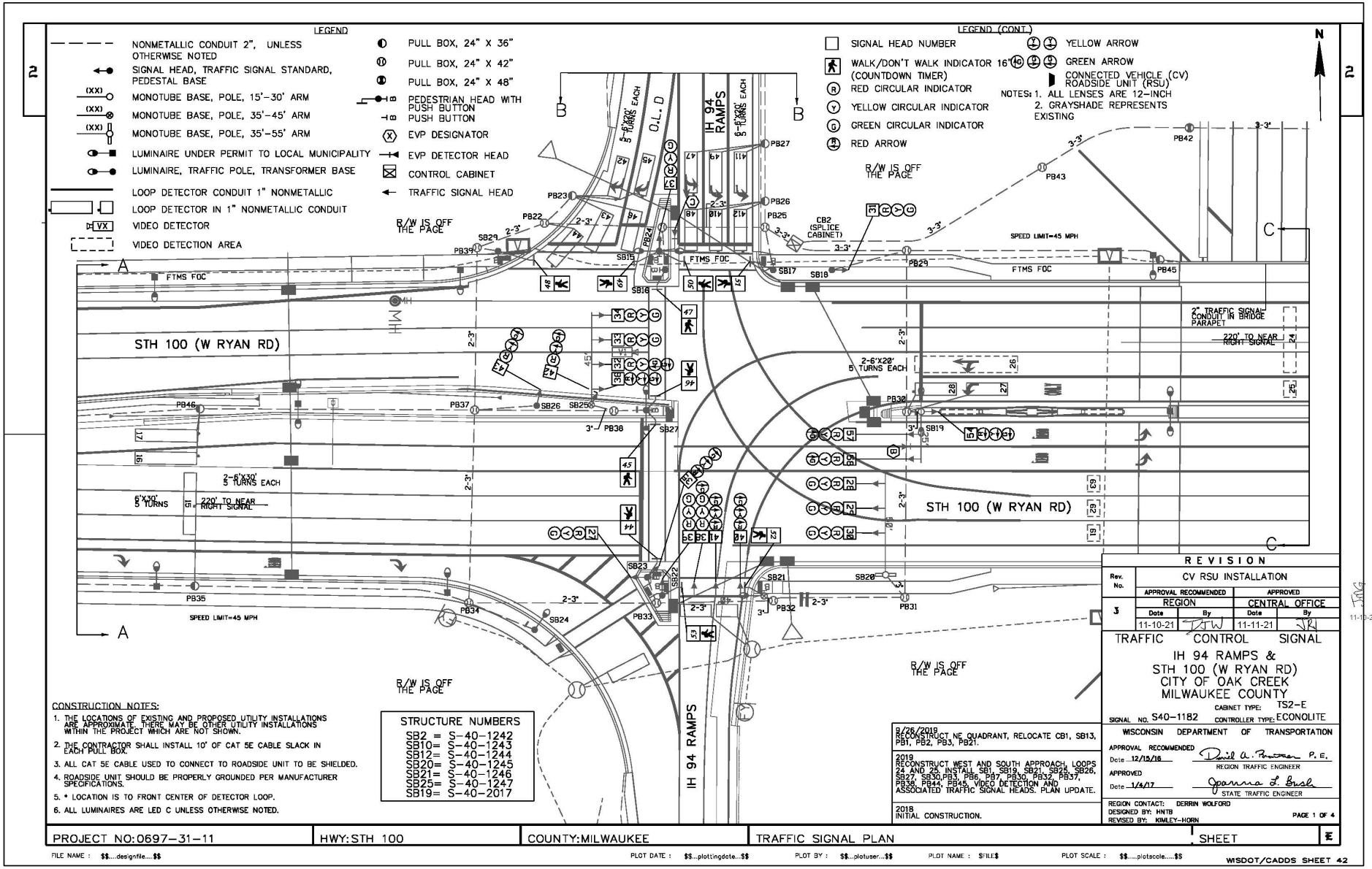
STH 50 & 52ND AVENUE/COOPER RD
VILLAGE OF PLEASANT PRAIRIE/CITY OF KENOSHA
KENOSHA COUNTY

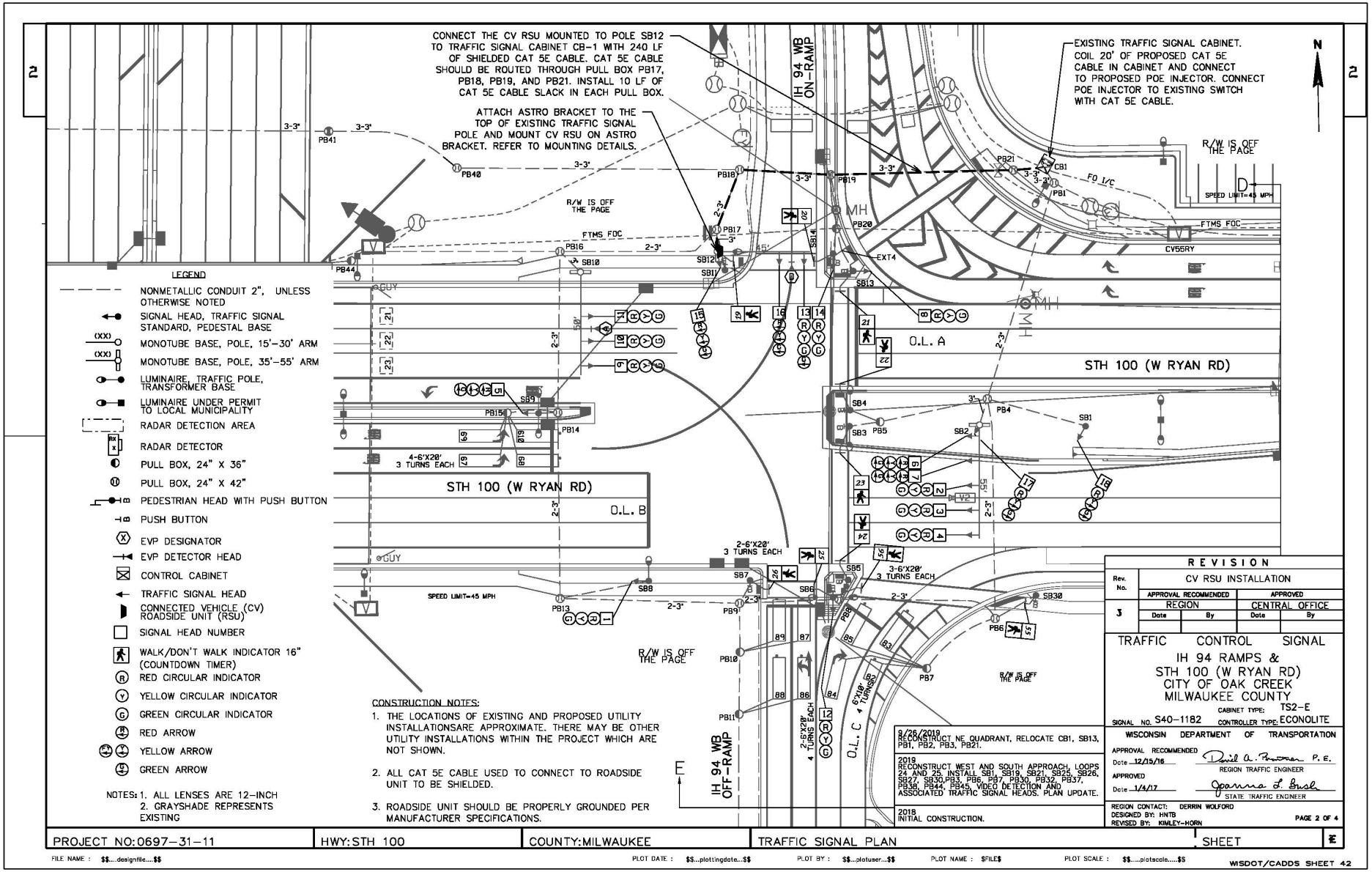
SIGNAL NO:	S30-0562	CABINET TYPE: TS2-5
		CONTROLLER TYPE: ECONOLITE
DATE:	10/2020	PAGE NUMBER: 3 OF 3

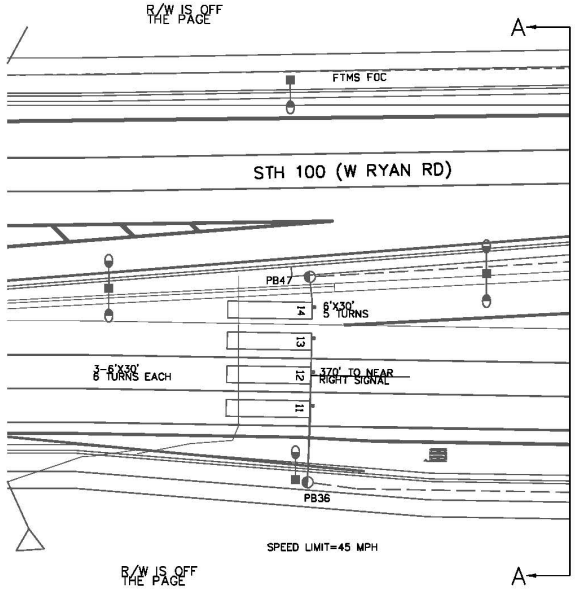
PROJECT NO: 1310-10-71	HWY: STH 50	COUNTY: KENOSHA	SEQUENCE OF OPERATIONS	SHEET NO:	E

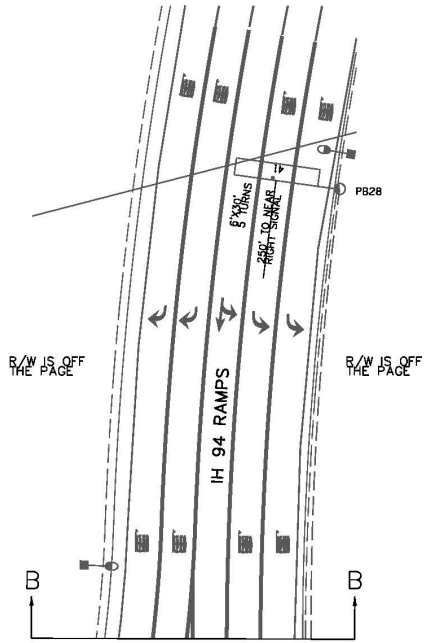
FILE NAME: \\rasmith.com\Brookfield\Transportation\1112711\Traffic\Signal Design\Sequence Sheets\WIS 50 & 52nd\TS2-S_E_FYA_EFGH_Econolite_SEQ.xlsx PLOT DATE: 9/29/2020 PLOT NAME: TS2-S_E_FYA_EFGH_Econ PLOT BY: _____ PLOT SCALE: 1:1

Example 6. Signal Controller Plan at an Interchange - Dual Ring with Overlaps (5 sheets)




CONNECT THE CV RSU MOUNTED TO POLE SB12 TO TRAFFIC SIGNAL CABINET CB-1 WITH 240 LF OF SHIELDED CAT 5E CABLE. CAT 5E CABLE SHOULD BE ROUTED THROUGH PULL BOX PB17, PB18, PB19, AND PB21. INSTALL 10 LF OF CAT 5E CABLE SLACK IN EACH PULL BOX.
ATTACH ASTRO BRACKET TO THE TOP OF EXISTING TRAFFIC SIGNAL POLE AND MOUNT CV RSU ON ASTRO BRACKET. REFER TO MOUNTING DETAILS.
EXISTING TRAFFIC SIGNAL CABINET. COIL 20' OF PROPOSED CAT 5E CABLE IN CABINET AND CONNECT TO PROPOSED POE INJECTOR. CONNECT POE INJECTOR TO EXISTING SWITCH WITH CAT 5E CABLE.
IH 94 WB ON-RAMP
IH 94 WB OFF-RAMP
STH 100 (W RYAN RD)
O.L. A
O.L. B
O.L. C
R/W IS OFF THE PAGE
FTMS FOC
FO I/C
CV55RY
EXT4
4-6'X20' 3 TURNS EACH
2-6'X20' 3 TURNS EACH
3-6'X20' 3 TURNS EACH
6'X10' 4 TURNS EACH
SPEED LIMIT=45 MPH
LEGEND
NONMETALLIC CONDUIT 2", UNLESS OTHERWISE NOTED
SIGNAL HEAD, TRAFFIC SIGNAL STANDARD, PEDESTAL BASE
MONOTUBE BASE, POLE, 15'-30' ARM
MONOTUBE BASE, POLE, 35'-55' ARM
LUMINAIRE, TRAFFIC POLE, TRANSFORMER BASE
LUMINAIRE UNDER PERMIT TO LOCAL MUNICIPALITY
RADAR DETECTION AREA
RADAR DETECTOR
PULL BOX, 24" X 36"
PULL BOX, 24" X 42"
PEDESTRIAN HEAD WITH PUSH BUTTON
PUSH BUTTON
EVP DESIGNATOR
EVP DETECTOR HEAD
CONTROL CABINET
TRAFFIC SIGNAL HEAD
CONNECTED VEHICLE (CV) ROADSIDE UNIT (RSU)
SIGNAL HEAD NUMBER
WALK/DON'T WALK INDICATOR 16" (COUNTDOWN TIMER)
RED CIRCULAR INDICATOR
YELLOW CIRCULAR INDICATOR
GREEN CIRCULAR INDICATOR
RED ARROW
YELLOW ARROW
GREEN ARROW
NOTES: 1. ALL LENSES ARE 12-INCH
2. GRAYSHADE REPRESENTS EXISTING
CONSTRUCTION NOTES:
1. THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONSARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT WHICH ARE NOT SHOWN.
2. ALL CAT 5E CABLE USED TO CONNECT TO ROADSIDE UNIT TO BE SHIELDED.
3. ROADSIDE UNIT SHOULD BE PROPERLY GROUNDED PER MANUFACTURER SPECIFICATIONS.
REVISION
Rev. No. 3
CV RSU INSTALLATION
APPROVAL RECOMMENDED REGION Date By
APPROVED CENTRAL OFFICE Date By
9/26/2019 RECONSTRUCT NE QUADRANT, RELOCATE CB1, SB13, PB1, PB2, PB3, PB21.
2019 RECONSTRUCT WEST AND SOUTH APPROACH, LOOPS 24 AND 25. INSTALL SB1, SB19, SB21, SB25, SB26, SB27, SB30,PB3, PB6, PB7, PB30, PB32, PB37, PB38, PB44, PB45, VIDEO DETECTION AND ASSOCIATED TRAFFIC SIGNAL HEADS. PLAN UPDATE.
2018 INITIAL CONSTRUCTION.
TRAFFIC CONTROL SIGNAL
IH 94 RAMPS & STH 100 (W RYAN RD)
CITY OF OAK CREEK
MILWAUKEE COUNTY
CABINET TYPE: TS2-E
SIGNAL NO. S40-1182 CONTROLLER TYPE: ECONOLITE
WISCONSIN DEPARTMENT OF TRANSPORTATION
APPROVAL RECOMMENDED Date 12/15/16 David A. Pustaver P.E. REGION TRAFFIC ENGINEER
APPROVED Date 1/4/17 Joanna L. Brusk STATE TRAFFIC ENGINEER
REGION CONTACT: DERRIN WOLFORD
DESIGNED BY: HNTB
REVISED BY: KIMLEY-HORN
PAGE 2 OF 4
PROJECT NO:0697-31-11
HWY:STH 100
COUNTY:MILWAUKEE
TRAFFIC SIGNAL PLAN
SHEET
FILE NAME : $$....designfile....$$
PLOT DATE : $$...plottingdate...$$
PLOT BY : $$...plotuser...$$
PLOT NAME : $FILE$
PLOT SCALE : $$.....plotscale.....$$
WISDOT/CADDS SHEET 42





REVISION				
Rev. No.	CV RSU INSTALLATION			
	APPROVAL RECOMMENDED		APPROVED	
	REGION		CENTRAL OFFICE	
	Date	By	Date	By
3				

TRAFFIC CONTROL SIGNAL

IH 94 RAMPS &
STH 100 (W RYAN RD)
CITY OF OAK CREEK
MILWAUKEE COUNTY

CABINET TYPE: TS2-E
SIGNAL NO. S40-1182 CONTROLLER TYPE: ECONOLITE

WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVAL RECOMMENDED
Date 12/15/16 David A. Pastman P. E.
REGION TRAFFIC ENGINEER

APPROVED
Date 1/4/17 Joanna L. Bush
STATE TRAFFIC ENGINEER

REGION CONTACT: DERRIN WOLFORD
DESIGNED BY: HNTB
REVISED BY: KIMLEY-HORN

PAGE 3 OF 4

8/26/2019
RECONSTRUCT NE QUADRANT, RELOCATE CB1, SB13, PB1, PB2, PB3, PB21.

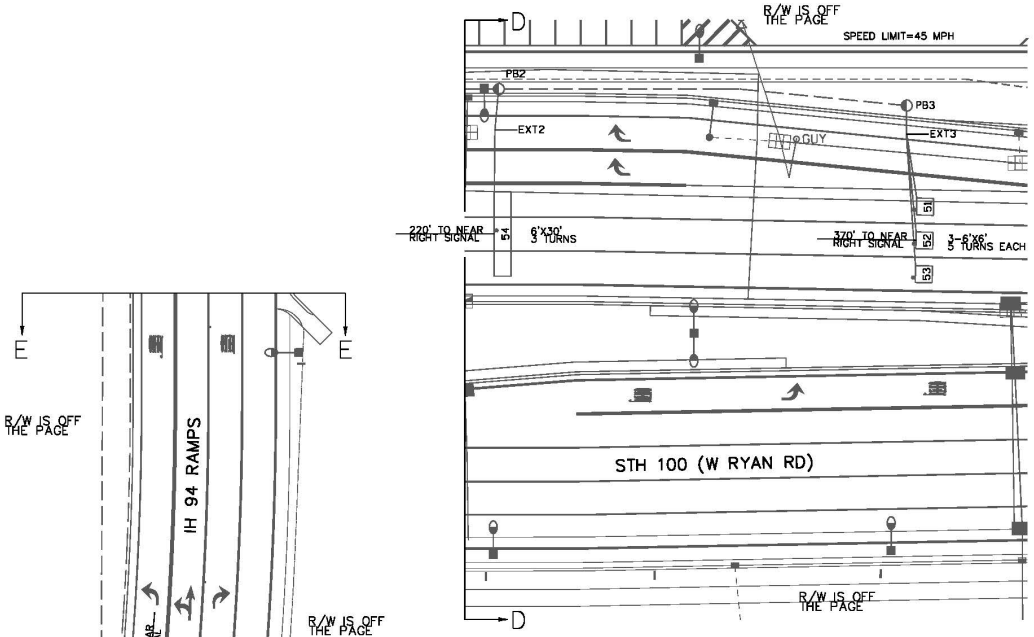
2019
RECONSTRUCT WEST AND SOUTH APPROACH, LOOPS 24 AND 25. INSTALL SB1, SB19, SB21, SB25, SB26, SB27, SB30,PB3, PB6, PB7, PB30, PB32, PB37, PB38, PB44, PB45, VIDEO DETECTION AND ASSOCIATED TRAFFIC SIGNAL HEADS. PLAN UPDATE.

2018
INITIAL CONSTRUCTION.

PROJECT NO:0697-31-11	HWY:STH 100	COUNTY:MILWAUKEE	TRAFFIC SIGNAL PLAN	SHEET

FILE NAME : $$....designfile....$$ PLOT DATE : $$...plottingdate...$$ PLOT BY : $$...plotuser...$$ PLOT NAME : $FILE$ PLOT SCALE : $$.....plotscale.....$$

WISDOT/CADDS SHEET 42



N

REVISION				
Rev. No.	CV RSU INSTALLATION			
	APPROVAL RECOMMENDED		APPROVED	
	REGION		CENTRAL OFFICE	
3	Date	By	Date	By

TRAFFIC CONTROL SIGNAL

IH 94 RAMPS &
STH 100 (W RYAN RD)
CITY OF OAK CREEK
MILWAUKEE COUNTY

CABINET TYPE: TS2-E
SIGNAL NO. S40-1182 CONTROLLER TYPE: ECONOLITE

WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVAL RECOMMENDED
Date 12/15/16 David A. Pastrnak P. E.
REGION TRAFFIC ENGINEER

APPROVED
Date 1/4/17 Joanna L. Bush
STATE TRAFFIC ENGINEER

REGION CONTACT: DERRIN WOLFORD
DESIGNED BY: HNTB
REVISED BY: KIMLEY-HORN

PAGE 4 OF 4

9/26/2019
RECONSTRUCT NE QUADRANT, RELOCATE CB1, SB13, PB1, PB2, PB3, PB21.

2019
RECONSTRUCT WEST AND SOUTH APPROACH, LOOPS 24 AND 25. INSTALL SB1, SB19, SB21, SB25, SB26, SB27, SB30,PB3, PB6, PB7, PB30, PB32, PB37, PB38, PB44, PB45, VIDEO DETECTION AND ASSOCIATED TRAFFIC SIGNAL HEADS. PLAN UPDATE.

2018
INITIAL CONSTRUCTION.

PROJECT NO:0697-31-11	HWY:STH 100	COUNTY:MILWAUKEE	TRAFFIC SIGNAL PLAN	SHEET

FILE NAME : $$....designfile....$$ PLOT DATE : $$...plottingdate...$$ PLOT BY : $$...plotuser...$$ PLOT NAME : $FILE$ PLOT SCALE : $$.....plotscale.....$$

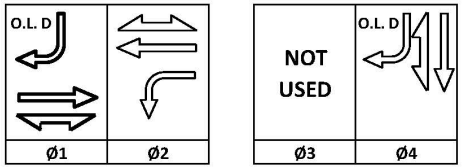
WISDOT/CADDS SHEET 42

2

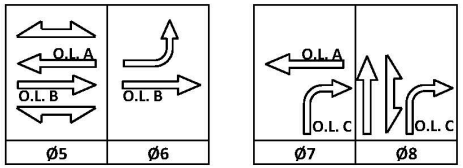
	HEAD NUMBERS	FLASH
Ø1	27,28,29,30,57,58	R
Ø2	21,32,33,34,35,36,54	R,R ←
Ø3		
Ø4	37,38,39,40,41	R,R ←
Ø5		
Ø6	5,6,7	R ←
Ø7		
Ø8	12,13,14,15,16	R,R ←
Ø1P	52,53	
Ø2P	48,49,50,10	
Ø4P	44,45,46,47	
Ø5P	19,20,25,26,55,56	
Ø8P	21,22,23,24	
OLA	8,9,10,11	R
OLB	1,2,3,4	R
OLC	17,18	R
OLD	42,43	R

** RING 1 SHALL CONTROL THE WEST RAMP

RING 1



RING 2



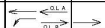
** RING 2 SHALL CONTROL THE EAST RAMP

N

CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / Ø	PHASE RECALL	PHASE ACTIVE
1	X		MIN	X
2	X		MIN	X
3				
4				X
5				X
6	X		MIN	X
7				X
8				X

EMERGENCY VEHICLE PREEMPTION SEQUENCE

EMERGENCY VEHICLE PREEMPTOR	A	B	C	D
MOVEMENT				
PHASE	5+2	1+6	4+6	8+2

AFTER PREEMPTION SEQUENCE 5+2, CONTROLLER SHALL RETURN TO PHASES 5+2.
AFTER PREEMPTION SEQUENCE 1+6, CONTROLLER SHALL RETURN TO PHASES 1+6.
AFTER PREEMPTION SEQUENCE 4+6, CONTROLLER SHALL RETURN TO PHASES 4+6.
AFTER PREEMPTION SEQUENCE 8+2, CONTROLLER SHALL RETURN TO PHASES 8+2.

TYPE OF INTERCONNECT/COMMUNICATION	
NONE	
CLOSED LOOP	
TWISTED PAIR	
FIBER OPTIC*	
FIBER OPTIC (ETHERNET)	X
RADIO	
CELL MODEM	

TYPE OF COORDINATION	
NONE	
TBC	X
TRAFFIC RESPONSIVE	
ADAPTIVE	
*LOCATION OF MASTER CONTROLLER NO:	S-
SIGNAL SYSTEM NO:	SS- 40-0012

TYPE OF LIGHTING	
BY OTHER AGENCY	X
IN TRAFFIC CABINET	X
IN SEPARATE DOT LIGHTING CABINET	

TYPE OF PRE-EMPT	
NONE	
RAILROAD	
EMERGENCY VEHICLE	X
GTT	X
TOMAR	
HARDWIRE	
OTHER	
CONFIRMATION LIGHTS	
LIFT BRIDGE	
QUEUE DETECTION	

DETECTOR LOGIC

DETECTOR INPUT	3	1	7	5	11	9	15	13	19	17	23	21	27	25	31	29	DETECTOR INPUT
PLAN LOOP DETECTOR*(S)	11	13	15	17	28	42	44	46	48	410	412	52	54	68	610	82	PLAN LOOP DETECTOR*(S)
CALLED PHASE	1	1	1	1	2	4	4	4	4	4	4	5	5	6	6	8	CALLED PHASE
CALL OPTION	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	CALL OPTION
DELAY TIME						X	X	X								X	DELAY TIME
EXTENTION OPTION	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	EXTENTION OPTION
EXTEND TIME																	EXTEND TIME
USE ADDED INITIAL	X	X	X	X								X	X				USE ADDED INITIAL
CROSS SWITCH PHASE																	CROSS SWITCH PHASE

DETECTOR INPUT	4	2	8	6	12	10	16	14	20	18	24	22	28	26	32	30	DETECTOR INPUT
PLAN LOOP DETECTOR*(S)	12	14	16	27	41	43	45	47	49	411	51	53	67	69	81	83	PLAN LOOP DETECTOR*(S)
CALLED PHASE	1	1	1	2	4	4	4	4	4	4	5	5	6	6	8	8	CALLED PHASE
CALL OPTION	X	X	X	X		X	X	X	X	X	X	X	X	X		X	CALL OPTION
DELAY TIME						X	X									X	DELAY TIME
EXTENTION OPTION	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	EXTENTION OPTION
EXTEND TIME					X										X		EXTEND TIME
USE ADDED INITIAL	X	X	X								X	X					USE ADDED INITIAL
CROSS SWITCH PHASE																	CROSS SWITCH PHASE

DETECTOR INPUT	35	33	39	37	43	41	47	45	49	51	53	55	57	59	61	63	DETECTOR INPUT
PLAN LOOP DETECTOR*(S)	84	86	88						21	23	25	61	63	65			PLAN LOOP DETECTOR*(S)
CALLED PHASE	8	8	8						2	2	2	6	6	6			CALLED PHASE
CALL OPTION	X	X	X						X	X	X	X	X				CALL OPTION
DELAY TIME	X																DELAY TIME
EXTENTION OPTION	X	X	X						X	X	X	X	X	X			EXTENTION OPTION
EXTEND TIME									X	X	X			X			EXTEND TIME
USE ADDED INITIAL																	USE ADDED INITIAL
CROSS SWITCH PHASE												5	5				CROSS SWITCH PHASE

DETECTOR INPUT	36	34	40	38	44	42	48	46	50	52	54	56	58	60	62	64	DETECTOR INPUT
PLAN LOOP DETECTOR*(S)	85	87	89						22	24	26	62	64	66			PLAN LOOP DETECTOR*(S)
CALLED PHASE	8	8	8						2	2	2	6	6	6			CALLED PHASE
CALL OPTION	X	X	X						X	X	X	X	X				CALL OPTION
DELAY TIME	X																DELAY TIME
EXTENTION OPTION	X	X	X						X	X	X	X	X	X			EXTENTION OPTION
EXTEND TIME									X	X				X			EXTEND TIME
USE ADDED INITIAL																	USE ADDED INITIAL
CROSS SWITCH PHASE												5	5				CROSS SWITCH PHASE

GENERAL NOTES:

1. CABINET IS EQUIPPED WITH BATTERY BACK-UP.

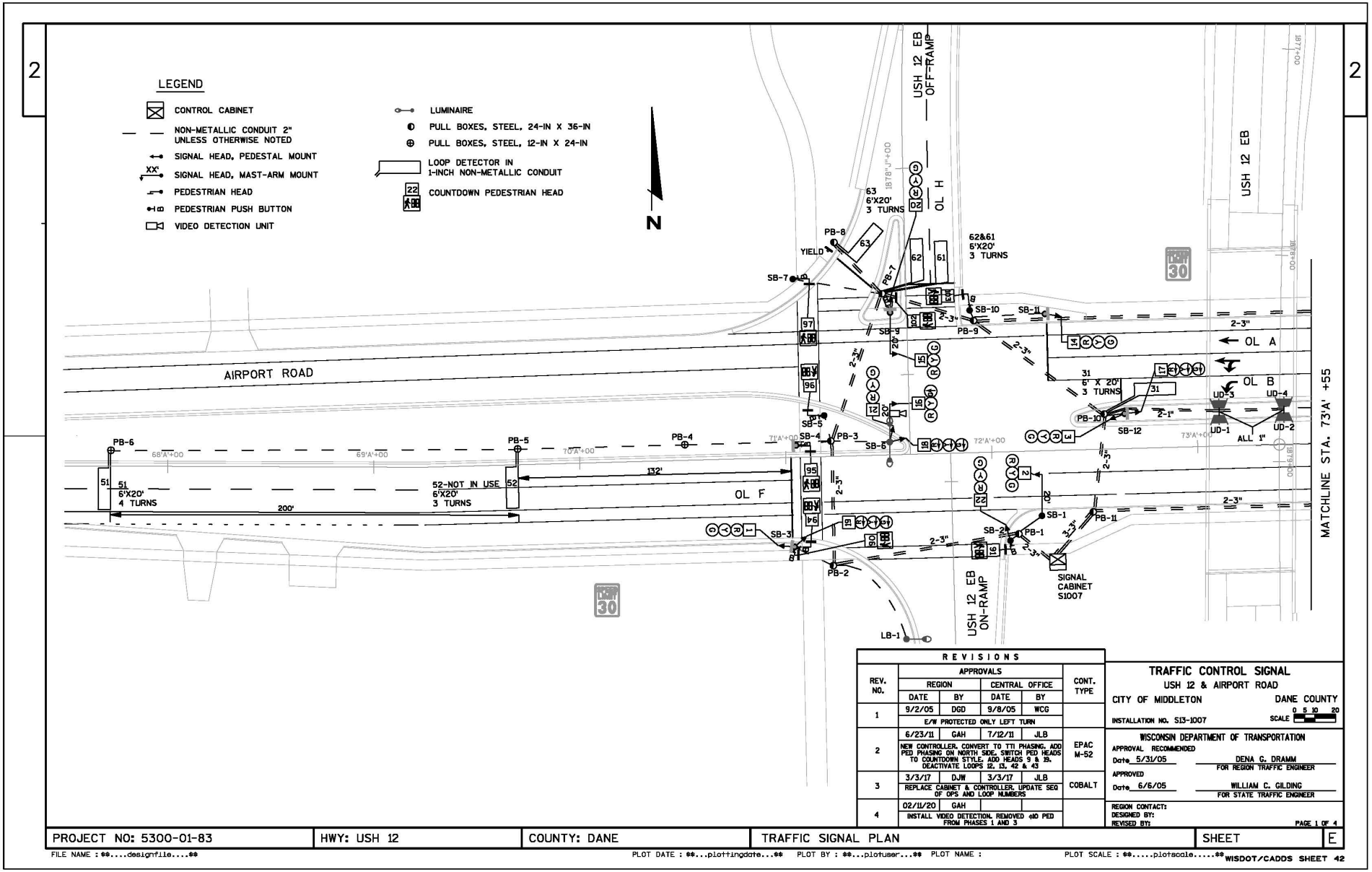
IH 94 RAMPS & STH 100 (W RYAN RD)
CITY OF OAK CREEK
MILWAUKEE COUNTY

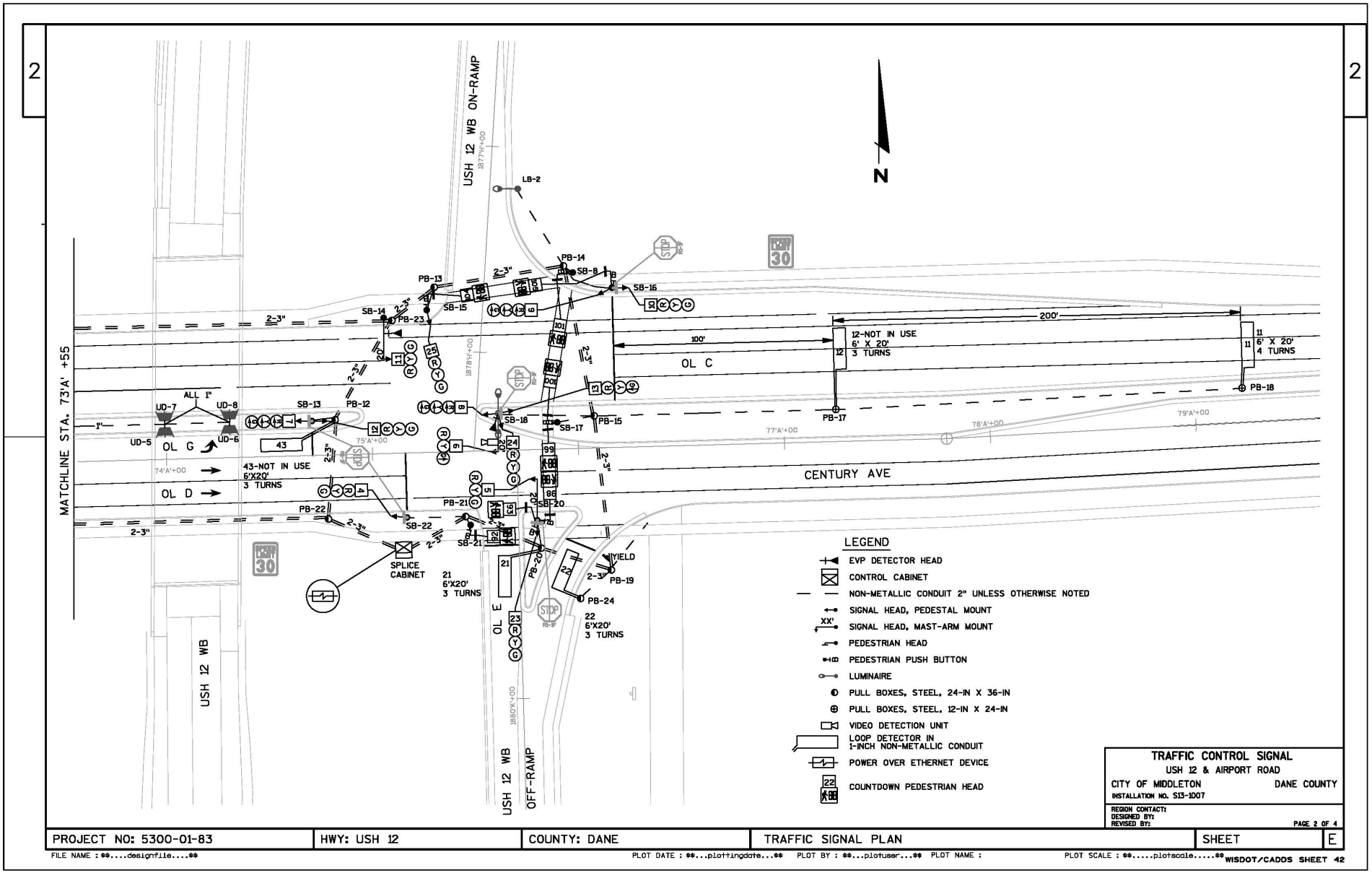
SIGNAL NO: S40-1182 CABINET TYPE: TS2-E
CONTROLLER TYPE: ECONOLITE
DATE: 7/21 PAGE NUMBER: 5 OF 5

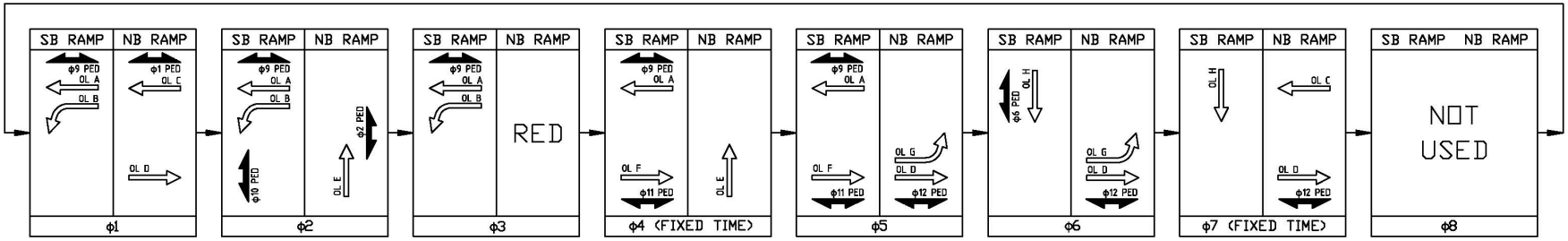
PROJECT NO: 0697-31-11	HWY: IH 94	COUNTY: MILWAUKEE	SEQUENCE OF OPERATIONS	SHEET NO:	E

FILE NAME: \\WKERTCVFILP01\v3\public\SPC\Operations\Signals\Databases\Signal Intersection Files\S40-1182\PLANS\TS2-S_FYA_ABCD_Econolite_SEQ.dgn PLOT DATE: 7/16/2021 PLOT NAME: TS2-S_FYA_ABCD_Econol PLOT BY: _____ PLOT SCALE: 1:1

Example 7. TTI Phasing Plan at an Interchange (4 sheets)




USH 12 WB ON-RAMP
USH 12 WB
USH 12 WB OFF-RAMP
MATCHLINE STA. 73'A' +55
CENTURY AVE
OL C
OL D
OL E
OL G
N
LB-2
PB-13
PB-14
PB-15
PB-17
PB-18
PB-19
PB-21
PB-22
PB-23
PB-24
SB-8
SB-13
SB-14
SB-15
SB-16
SB-17
SB-18
SB-20
SB-21
SB-22
UD-5
UD-6
UD-7
UD-8
SPLICE CABINET
12-NOT IN USE
6' X 20'
3 TURNS
43-NOT IN USE
6'X20'
3 TURNS
21
6'X20'
3 TURNS
22
6'X20'
3 TURNS
6' X 20'
4 TURNS
200'
100'
YIELD
STOP
LEGEND
EVP DETECTOR HEAD
CONTROL CABINET
NON-METALLIC CONDUIT 2" UNLESS OTHERWISE NOTED
SIGNAL HEAD, PEDESTAL MOUNT
SIGNAL HEAD, MAST-ARM MOUNT
PEDESTRIAN HEAD
PEDESTRIAN PUSH BUTTON
LUMINAIRE
PULL BOXES, STEEL, 24-IN X 36-IN
PULL BOXES, STEEL, 12-IN X 24-IN
VIDEO DETECTION UNIT
LOOP DETECTOR IN 1-INCH NON-METALLIC CONDUIT
POWER OVER ETHERNET DEVICE
COUNTDOWN PEDESTRIAN HEAD
TRAFFIC CONTROL SIGNAL
USH 12 & AIRPORT ROAD
CITY OF MIDDLETON
DANE COUNTY
INSTALLATION NO. S13-1007
REGION CONTACT:
DESIGNED BY:
REVISED BY:
PAGE 2 OF 4
PROJECT NO: 5300-01-83
HWY: USH 12
COUNTY: DANE
TRAFFIC SIGNAL PLAN
SHEET
E
FILE NAME : ##....designfile....##
PLOT DATE : ##...plottingdate...##
PLOT BY : ##...plotuser...##
PLOT NAME :
PLOT SCALE : ##.....plotscale.....##
WISDOT/CADDS SHEET 42



PREEMPTION ASSIGNMENTS				
PREEMPTION DESIGNATION	PREEMPTION TYPE	EVP CHANNEL	PHASE(S) CALLED	PREEMPTED APPROACH
1	RESERVED			
2	RESERVED			
3	EVP	A	φ1	WB
4	NOT USED			
5	EVP	C	φ2	NB
6	NOT USED			
7	NOT USED			
8	NOT USED			
9	NOT USED			
10	NOT USED			

TYPE OF INTERCONNECT COMMUNICATION	
NONE	
TBC	
CLOSED LOOP TWISTED PAIR	
CLOSED LOOP FIBER OPTIC	
RADIO	
CELL MODEM	X
LOCATION OF MASTER CONTROLLER NO. S	
SIGNAL SYSTEM. SS	

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC SIGNAL CABINET	X
IN SEPERATE DOT LIGHTING CABINET	

N

TYPE OF COORDINATION	
NONE	
TBC	X
TRAFFIC RESPONSIVE	
ADAPTIVE	

TYPE OF PRE-EMPT	
NONE	
RAILROAD	
EMERGENCY VEHICLE	X
3M	X
TOMAR	
HARDWARE	
OTHER	
LIFT BRIDGE	
QUEUE DETECTOR	

	INTERSECTION	MOVEMENT	HEAD NUMBERS	FLASH	OL PARENT PHASES / PED PHASE COMPATIBILITY	CHANNEL	PED DETECTOR INPUT
OL A	W RAMP	WB THRU	14-16	R	φ1,φ2,φ3,φ4,φ5	1	
OL B	W RAMP	WB LEFT	17-19	R	φ1,φ2,φ3	2	
OL C	E RAMP	WB THRU	10-13	R	φ1,φ7	3	
OL D	E RAMP	EB THRU	4-6	R	φ1,φ5,φ6,φ7	4	
OL E	E RAMP	NB THRU	23-25	R	φ2,φ4	5	
OL F	W RAMP	EB THRU	1-3	R	φ4,φ5	6	
OL G	E RAMP	EB LEFT	7-9	R	φ5,φ6	7	
OL H	W RAMP	SB THRU	20-22	R	φ6,φ7	8	
OL I							
OL J							
φ1 PED	E RAMP	N PED	104,105		φ1	9	1
φ2 PED	E RAMP	E PED	98-101		φ2	10	3
φ6 PED	W RAMP	NW PED	96,97		φ6	11	2
φ9 PED	W RAMP	N PED	102,103		φ1,φ2,φ3,φ4,φ5	12	4
φ10 PED	W RAMP	SW PED	94,95		φ1,φ2,φ3	13	6
φ11 PED	W RAMP	S PED	90,91		φ4,φ5	14	8
φ12 PED	E RAMP	S PED	92,93		φ5,φ6,φ7	15	5

DETECTOR LOGIC

DETECTOR INPUT	3	1	7	5	11	9	15	13
DETECTOR(S)	11	21	31	43	51	63		
PHASE CALLED	1	2	3		5	6		
PHASE EXTENDED	1	2	3		5	6		
DISCONNECT PHASE								
CALLING DELAY						15		
EXTENSION STRETCH								
LOOP FUNCTION				NIU				

DETECTOR INPUT	19	17	23	21	27	25	31	29	DETECTOR INPUT
DETECTOR(S)									DETECTOR(S)
PHASE CALLED									PHASE CALLED
PHASE EXTENDED									PHASE EXTENDED
DISCONNECT PHASE									DISCONNECT PHASE
CALLING DELAY									CALLING DELAY
EXTENSION STRETCH									EXTENSION STRETCH
LOOP FUNCTION									LOOP FUNCTION

DETECTOR INPUT	4	2	8	6	12	10	16	14
DETECTOR(S)	12	22			52	61	62	
PHASE CALLED		2				6	6	
PHASE EXTENDED		2				6	6	
DISCONNECT PHASE								
CALLING DELAY		15						
EXTENSION STRETCH								
LOOP FUNCTION	NIU				NIU			

NIU = NOT IN USE

DETECTOR INPUT	20	18	24	22	28	26	32	30	DETECTOR INPUT
DETECTOR(S)									DETECTOR(S)
PHASE CALLED									PHASE CALLED
PHASE EXTENDED									PHASE EXTENDED
DISCONNECT PHASE									DISCONNECT PHASE
CALLING DELAY									CALLING DELAY
EXTENSION STRETCH									EXTENSION STRETCH
LOOP FUNCTION									LOOP FUNCTION

GENERAL NOTES

1. φ3 SHALL ONLY BE SERVED FOLLOWING THE TERMINATION OF φ2 AND AN ACTUATION ON DETECTOR 31.
2. φ4 SHALL ONLY BE CALLED FOLLOWING AN ACTUATION ON φ2 AND NO ACTUATION ON DETECTOR 31.
3. φ7 SHALL ONLY BE CALLED FOLLOWING AN ACTUATION ON φ6.
4. φ9 PED SHALL HAVE THE ABILITY TO BEGIN TIMING WITH φ1 AND FINISH TIMING WITH φ5.
5. φ10 PED SHALL HAVE THE ABILITY TO BEGIN TIMING WITH φ1 AND FINISH TIMING WITH φ3.
6. φ11 PED SHALL HAVE THE ABILITY TO BEGIN TIMING WITH φ4 AND FINISH TIMING WITH φ5.
7. φ12 PED SHALL HAVE THE ABILITY TO BEGIN TIMING WITH φ5 AND FINISH TIMING WITH φ7.
8. φ9 PED IS ASSIGNED IN RING 2 (NOT SHOWN).
9. φ10 AND φ11 PED ARE ASSIGNED IN RING 3 (NOT SHOWN).
10. φ12 PED IS ASSIGNED IN RING 4 (NOT SHOWN).

CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / φ	PHASE RECALL	PHASE ACTIVE
1	X		MIN	X
2			MIN	X
3				X
4				X
5	X		MIN	X
6				X
7				X
8				

TRAFFIC CONTROL SIGNAL
USH 12 & AIRPORT ROAD
CITY OF MIDDLETON DANE COUNTY
SIGNAL NO. SIS-1007
REGION CONTACT:
DESIGNED BY:
REVISED BY:
PAGE 3 OF 4

PROJECT NO: 5300-01-83	HWY: USH 12	COUNTY: DANE	TRAFFIC SIGNAL SEQUENCE OF OPERATIONS	SHEET	E

FILE NAME : ##....designfile....## PLOT DATE : ##...plottingdate...## PLOT BY : ##...plotuser...## PLOT NAME : S-400,seq,rev2 PLOT SCALE : ##.....plotscale.....## WISDOT/CADDS SHEET 42

2

USH 12 & AIRPORT ROAD (WEST INTERSECTION) TRAFFIC SIGNAL CABLING CHART NO. 14 CABLE

CABLE RUN	CABLE	HEAD NUMBER	MOVEMENT	LENS	CONDUCTOR COLOR	REMARKS
CABINET TO SB-1	5C	2	EB	R	R	OL F
				Y	O	
				G	G	
CABINET TO SB-2	12C	22	SB	R	R	OL H
				Y	O	
				G	G	
		91	S LEG	W	BLU	ϕ11 PED
				DW	BLK	
				PB	W	
CABINET TO SB-3	19C	1	EB	R	R	OL F
				Y	O	
				G	G	
		19	WB LT	←R	R/BLK	OL B
				←Y	O/BLK	
				←G	G/BLK	
		90	S LEG	W	BLU	ϕ11 PED
				DW	BLK	
				PB	W	
		94	W LEG	W	BLU/BLK	ϕ10 PED
				DW	BLK/W	
				PB	W/BLK	
CABINET TO SB-4	5C	95	W LEG	W	G	ϕ10 PED
				DW	R	
				PB	W	
CABINET TO SB-5	5C	96	W LEG	W	G	ϕ6 PED
				DW	R	
				PB	W	
CABINET TO SB-6	12C	21	SB	R	R	OL H
				Y	O	
				G	G	
		16	WB	R	R/BLK	OL A
				Y	O/BLK	
				G ↑	G/BLK	
		18	WB LT	←R	BLK	OL B
				←Y	W/BLK	
				←G	BLU	

USH 12 & AIRPORT ROAD (WEST INTERSECTION) TRAFFIC SIGNAL CABLING CHART NO. 14 CABLE

CABLE RUN	CABLE	HEAD NUMBER	MOVEMENT	LENS	CONDUCTOR COLOR	REMARKS
CABINET TO SB-9	15C	20	SB	R	R	OL H
				Y	O	
				G	G	
		15	WB	R	R/BLK	OL A
				Y	O/BLK	
				G	G/BLK	
		97	W LEG	W	G/W	ϕ6 PED
				DW	R/W	
				PB	BLK/W	
		102	N LEG	W	BLU	ϕ9 PED
				DW	BLK	
				PB	W/BLK	
SB-9 TO SB-7	5C	97	W LEG	W	G	ϕ6 PED
				DW	R	
				PB	W	
CABINET TO SB-10	5C	103	N LEG	W	G	ϕ9 PED
				DW	R	
				PB	W	
CABINET TO SB-11	5C	14	WB	R	R	OL A
				Y	O	
				G	G	
CABINET TO SB-12	12C	17	WB LT	←R	R/BLK	OL B
				←Y	O/BLK	
				←G	G/BLK	
		3	EB	R	R	OL F
				Y	O	
				G	G	

USH 12 & AIRPORT ROAD TRAFFIC SIGNAL CHART

WIRE SIZE	LUMINAIRE WIRE RUN
2-12C	CABINET TO SPLICE CABINET

USH 12 & AIRPORT ROAD (EAST INTERSECTION) TRAFFIC SIGNAL CABLING CHART NO. 14 CABLE

CABLE RUN	CABLE	HEAD NUMBER	MOVEMENT	LENS	CONDUCTOR COLOR	REMARKS
SPLICE CABINET TO SB-13	12C	7	EB LT	←R	R	OL G
				←Y	O	
				←G	G	
		12	WB	R	R/BLK	OL C
				Y	O/BLK	
				G	G/BLK	
SPLICE CABINET TO SB-14	5C	11	WB	R	R	OL C
				Y	O	
				G	G	
SPLICE CABINET TO SB-15	12C	25	NB	R	R	OL E
				Y	O	
				G	G	
		104	N LEG	W	BLU	ϕ1 PED
				DW	BLK	
				PB	W/BLK	
SPLICE CABINET TO SB-8	5C	101	E LEG	W	G/BLK	ϕ2 PED
				DW	R/BLK	
				PB	W/BLK	
SPLICE CABINET TO SB-16	12C	10	WB	R	R	OL C
				Y	O	
				G	G	
		9	EB LT	←R	R/BLK	OL G
				←Y	O/BLK	
				←G	G/BLK	
		105	N LEG	W	BLU	ϕ1 PED
				DW	BLK	
				PB	W/BLK	
SPLICE CABINET TO SB-17	12C	99	E LEG	W	G	ϕ2 PED
				DW	R	
				PB	W	
		100	E LEG	W	G	ϕ2 PED
				DW	R	
SPLICE CABINET TO SB-18	15C	6	EB	R	R/BLK	OL D
				Y	O/BLK	
				G ↑	G/BLK	
		8	EB LT	←R	BLK	OL G
				←Y	W/BLK	
				←G	BLU	
		24	NB	R	R	OL E
				Y	O	
				G	G	
		13	WB	R	R/W	OL C
				Y	BLK/W	
				G	G/W	

USH 12 & AIRPORT ROAD (EAST INTERSECTION) TRAFFIC SIGNAL CABLING CHART NO. 14 CABLE

CABLE RUN	CABLE	HEAD NUMBER	MOVEMENT	LENS	CONDUCTOR COLOR	REMARKS
SPLICE CABINET TO SB-20	12C	23	NB	R	R	OL E
				Y	O	
				G	G	
		5	EB	R	R/BLK	OL D
				Y	O/BLK	
				G	G/BLK	
		98	E LEG	W	BLU/BLK	ϕ2 PED
				DW	BLK/W	
				PB	W/BLK	
		93	S LEG	W	BLU	ϕ12 PED
				DW	BLK	
				PB	W	
SPLICE CABINET TO SB-21	5C	92	S LEG	W	G	ϕ12 PED
				DW	R	
				PB	W	
SPLICE CABINET TO SB-22	5C	4	EB	R	R	OL D
				Y	O	
				G	G	

USH 12 & AIRPORT ROAD LIGHTING CABLING CHART NO. 12 UF W/GROUND

CABLE	CABLE RUN	LUMINAIRE LOCATION
2C W/ GROUND	CABINET TO LB-1	W INT, SW QUAD
	CABINET TO SB-6	W INT, W MEDIAN
	CABINET TO SPLICE CABINET	
	SPLICE CABINET TO SB-17	E INT, E MEDIAN
	SB-17 TO LB-2	E INT, NE QUAD
	CABINET TO UD-1	BENEATH USH 12 EB
	UD-1 TO UD-2	BENEATH USH 12 EB
	UD-1 TO UD-3	BENEATH USH 12 EB
	UD-3 TO UD-4	BENEATH USH 12 EB
	CABINET TO UD-5	BENEATH USH 12 WB
	UD-5 TO UD-6	BENEATH USH 12 WB
	UD-5 TO UD-7	BENEATH USH 12 WB
	UD-7 TO UD-8	BENEATH USH 12 WB

CABLE ROUTING PLAN
USH 12 & AIRPORT ROAD
CITY OF MIDDLETON — DANE COUNTY
SIGNAL NO. SIS-1007
REGION CONTACT:
DESIGNED BY:
REVISED BY:
PAGE 4 OF 4

PROJECT NO: 5300-01-83	HWY: USH 12	COUNTY: DANE	CABLE ROUTING PLAN	SHEET	E

FILE NAME : ##....designfile....## PLOT DATE : ##...plottingdate...## PLOT BY : ##...plotuser...## PLOT NAME : S-400,seq,rev2 PLOT SCALE : ##.....plotscale.....## WISDOT/CADDS SHEET 42