

# CITY OF BLOOMINGTON, ILLINOIS

## HERSHEY ROAD & COLLEGE AVENUE

FAU 6416 & FAU 6352  
**TRAFFIC SIGNAL INSTALLATION**  
 PROJECT NO. ARA-5227 (050)  
 SECTION NO. 05-00331-00-TL  
 JOB NO. C-95-320-09  
 CITY PROJECT NO. 50-02-33046-97-00

CITY OF BLOOMINGTON  
 ENGINEERING DEPARTMENT

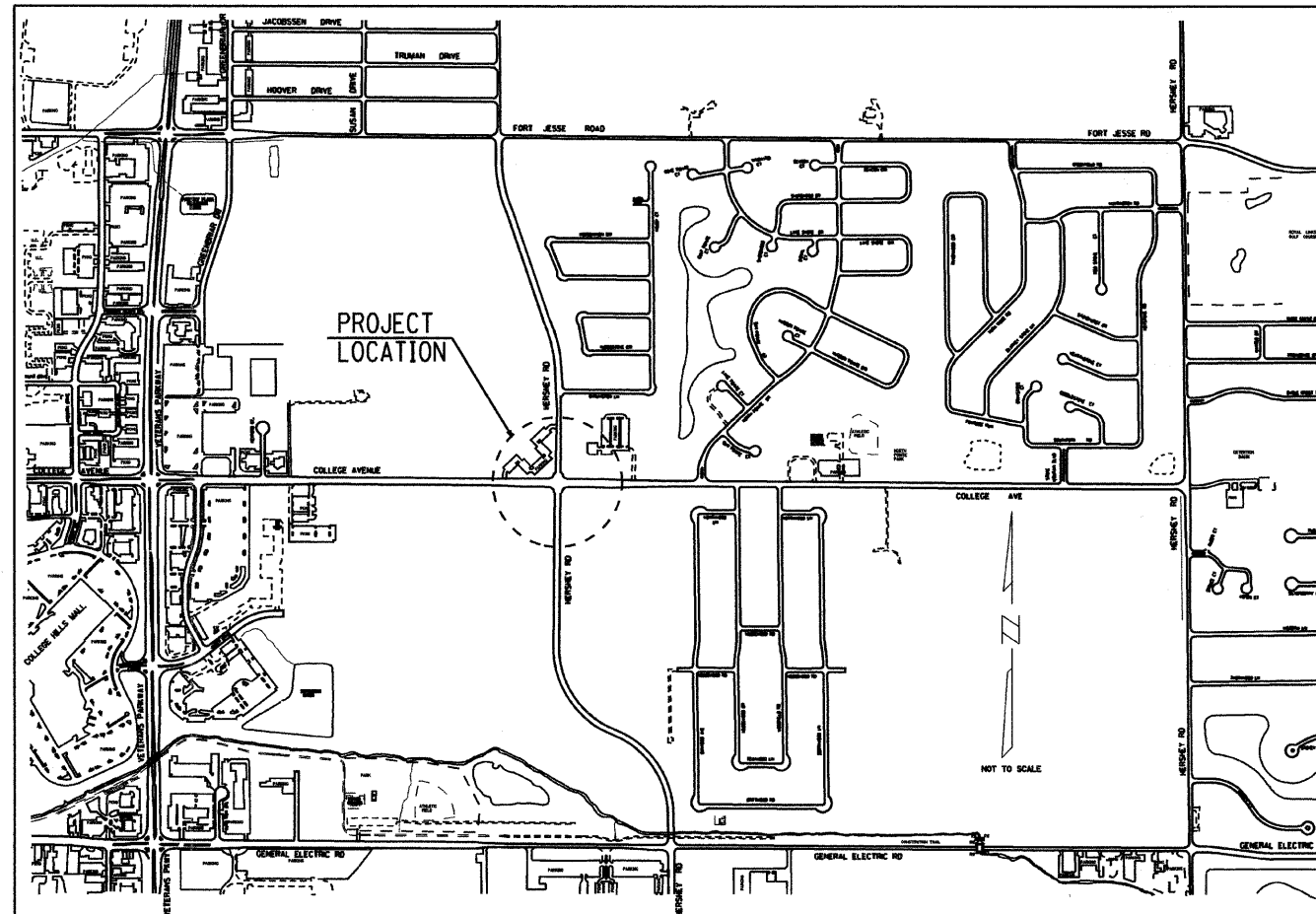


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- 6 WIRING PLAN
- 7 MAST ARM LOADING
- 8 DIST. 5 MAST ARM DAMPENING DEVICE MOUNTING DETAIL

**STATE STANDARDS**

STANDARD	TITLE
424001-05	CURB RAMPS FOR SIDEWALKS (SHTS 1 - 2)
701606-06	URBAN LANE CLOSURE, MULTILANE, 2-WAY WITH MOUNTABLE MEDIAN (SHTS 1 - 2)
701701-06	URBAN LANE CLOSURE, MULTILANE, INTERSECTION
701801-04	LANE CLOSURE, MULTILANE, 1-WAY OR 2-WAY CROSSWALK OR SIDEWALK CLOSURE
701901-01	TRAFFIC CONTROL DEVICES (SHEET 1)
720001-01	SIGN PANEL MOUNTING DETAILS
720016-02	MAST ARM MOUNTED STREET NAME SIGNS
805001-01	ELECTRICAL SERVICE INSTALLATION DETAILS
814001-02	CONCRETE HANDHOLES
814006-02	DOUBLE HANDHOLES
857001-01	STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES (SHTS 1 - 2)
862001-01	UNINTERRUPTIBLE POWER SUPPLY (UPS)
873001-02	TRAFFIC SIGNAL GROUNDING & BONDING
877001-04	STEEL MAST ARM ASSEMBLY AND POLE
878001-07	CONCRETE FOUNDATION DETAILS (SHEET 1)
880006-01	TRAFFIC SIGNAL MOUNTING DETAILS
886001-01	DETECTOR LOOP INSTALLATIONS
886006-01	TYPICAL LAYOUTS FOR DETECTOR LOOPS



LOCATION MAP  
 NOT TO SCALE

**FUNCTIONAL CLASSIFICATION**  
 HERSHEY ROAD - MINOR ARTERIAL  
 COLLEGE AVENUE - MINOR ARTERIAL

**TRAFFIC VOLUMES ADT - YEAR**

ROAD LEG	ADT - YEAR
HERSHEY ROAD NORTH LEG	7,100 - 2004
HERSHEY ROAD SOUTH LEG	10,200 - 2008
COLLEGE AVENUE EAST LEG	8,100 - 2004
COLLEGE AVENUE WEST LEG	13,100 - 2004

Approved	<i>July 23, 2009</i> <i>Jim Ford</i> City of Bloomington Director of Public Works
Passed	<i>8/6/09</i> <i>Dan A. Sal</i> District 1 Engineer of Local Roads & Streets
Releasing for Bid Based on Limited Review	<i>8-6-09</i> Deputy Director of Highway, Road & Bridge



*Kevin A. Kothe 7-23-09*  
 KEVIN A. KOTHE  
 ILL. P.E. #062-048373  
 EXPIRES 11/30/2009

SCALE N/A  
 APPROVED BY: KAK DATE: 7-20-2009  
 REVISED BY: JCK DATE: 7-20-2009  
 DESIGN BY: AES  
 COVER SHEET  
 HERSHEY ROAD & COLLEGE AVE. TRAFFIC SIGNALS SECTION NO. 05-00331-00-TL

**GENERAL NOTES:**

1. The Contractor is responsible for the cost of uncovering or hand digging around utilities as necessary, incidental to the respective contract pay item.
2. Exact signal location may be modified in the field to avoid existing utilities, as directed by the City Engineer.
3. All signal bases shall be located a minimum of 6 feet from the face of the curb unless approved otherwise by the City Engineer.
4. All mast arm pole bases shall be protected by a stainless steel mesh screening around the base bolts to prevent rodent entry. The mesh shall be secured to the base by stainless steel banding as incidental to the individual mast arm assembly pay item.
5. No additional compensation will be allowed for placing conduit at greater than 2 feet minimum depth to avoid obstacles such as underground utilities.
6. A 10 gauge stranded THHN wire shall be furnished and left in place in all conduits that are empty or contain fiber optic cable with six (6) feet of slack at each hand hole as incidental to the conduit pay item.
7. Drilling holes through existing curb and gutter, inserting conduit and filling with approved sealer for detector loops is incidental to the detector loop pay item.
8. All mast arm mounted signal heads on each individual mast arm shall be mounted so that the red indications are level with each other.
9. All bracket mounted heads shall be mounted on side of pole as directed by the City Engineer in order to minimize vehicle damage.
10. All LED signal lenses shall be of the same type, design and appearance and be from the same manufacturer for any given intersection.
11. The electrical conductors for all traffic signal heads shall be 14 gauge solid, soft copper.
12. The proposed traffic signal control cabinet shall be furnished with a door switch, conflict flash and manual flash inputs wired to the appropriate controller 'D' connector inputs. The cabinet shall also be furnished with a manual control switch and manual cord within the police compartment door as incidental to the controller pay item.
13. An Innovative Technologies model HS-P-SP-120A-30A-RJ suppressor or approved equal with a 3 position terminal block shall be mounted on an aluminum plate below the cabinet power distribution panel. Incoming power shall connect to the terminal block which shall feed the IT suppressor through 10 gauge solid copper wire (AC+, AC-, Gnd.) with approximately ten 1.5 to 2 inch coils in the AC+ and AC- lines.
14. All detector loop amplifiers shall be rack mounted and shall be labeled on the edge of the shelf below the amplifier with their respective directions, phases, loop terminals and controller inputs.
15. Contractor shall submit shop drawings for all signal components to the City of Bloomington for approval prior to ordering.
16. The Contractor shall be responsible for obtaining electrical service for the traffic signals and street lighting. The Contractor shall contact the power supplier prior to beginning work in order to meet the power supplier's requirements. Contractor shall notify the Engineer a minimum of 72 hours before the circuit is energized.
17. Mast arm luminaire service shall be energized from the opposite transformer phase of the traffic signal service.
18. The Engineer shall be notified at least 72 hours prior to signal turn on.
19. The Contractor shall arrange for a factory or supplier representative to be present at the intersection when the signals are turned on as incidental to the controller pay item.
20. The City reserves the right to cancel any turn on if the City deems the situation unsafe for reasons such as bad weather, peak hour traffic conditions or road conditions.
21. The Contractor shall be responsible for having the cabinet energized and fully functional with field displays turned off a minimum of 24 hours prior to scheduled signal turn on.
22. Signal turn on shall be scheduled between 9 and 10 am.
23. The City Electricians shall assist with the programming of the traffic signal controller. The Contractor shall notify the City Electricians by contacting (309)434-2225 a minimum of 72 hours prior to controller being ready for programming. The Contractor shall be responsible for the programming of all video detection parameters.
24. The Contractor shall provide the Engineer with the controller, conflict monitor and one set of the cabinet prints a minimum of 72 hours prior to energizing the cabinet

**SUMMARY OF QUANTITIES**

Y031-1F

ITEM NO.	ITEM	UNITS	PLAN QTY
42400100	PORTLAND CEMENT CONCRETE SIDEWALK 4 INCH	SF	215
42400800	DETECTABLE WARNINGS	SF	24
44000600	SIDEWALK REMOVAL	SF	100
67100100	MOBILIZATION	LS	1
70102625	TRAFFIC CONTROL AND PROTECTION - 701606	LS	1
70102635	TRAFFIC CONTROL AND PROTECTION - 701701	LS	1
70102640	TRAFFIC CONTROL AND PROTECTION - 701801	LS	1
72000200	SIGN PANEL - TYPE 2	SF	70
80500100	SERVICE INSTALLATION, TYPE A	EA	1
81012400	CONDUIT IN TRENCH, 1/4" DIA., PVC	LF	500
81012600	CONDUIT IN TRENCH, 2" DIA., PVC	LF	1100
81012700	CONDUIT IN TRENCH, 2 1/2" DIA., PVC	LF	65
81013100	CONDUIT IN TRENCH, 5" DIA., PVC	LF	10
81021330	CONDUIT PUSHED, 2" DIA., PVC	LF	35
81021340	CONDUIT PUSHED, 2 1/2" DIA., PVC	LF	15
81021370	CONDUIT PUSHED, 4" DIA., PVC	LF	195
81021380	CONDUIT PUSHED, 5" DIA., PVC	LF	105
81400700	HANDHOLE, PORTLAND CEMENT CONCRETE	EA	12
81400720	DOUBLE HANDHOLE, PORTLAND CEMENT CONCRETE	EA	1
81900200	TRENCH & BACKFILL FOR ELECTRICAL WORK	LF	1805
85700205	FULL ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL	EA	1
86200300	UNINTERRUPTABLE POWER SUPPLY, EXTENDED	EA	1
86400100	TRANCEIVER - FIBER OPTIC	EA	1
87301215	ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 14 2/C	LF	1300
87301225	ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 14 3/C	LF	1400
87301245	ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 14 5/C	LF	1700
87301255	ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 14 7/C	LF	1600
87301305	ELECTRIC CABLE IN CONDUIT, LEAD IN, NO. 14 1 PAIR	LF	8900
87301805	ELECTRIC CABLE IN CONDUIT, SERVICE, NO. 6 2C	LF	50
87502500	TRAFFIC SIGNAL POST, GALVANIZED STEEL, 16 FT	EA	1
87700220	STEEL MAST ARM ASSEMBLY AND POLE, 36 FT	EA	1
87700250	STEEL MAST ARM ASSEMBLY AND POLE, 42 FT	EA	2
87700260	STEEL MAST ARM ASSEMBLY AND POLE, 44 FT	EA	1
87800100	CONCRETE FOUNDATION, TYPE A	LF	3
87800200	CONCRETE FOUNDATION, TYPE D	LF	3
87800415	CONCRETE FOUNDATION, TYPE E 36 - INCH DIAMETER	LF	50
87900200	DRILL EXISTING HANDHOLE	EA	1
88040090	SIGNAL HEAD, POLYCARBONATE, LED, 1 FACE, 3 SEC, MAM	EA	8
88040130	SIGNAL HEAD, POLYCARBONATE, LED, 1 FACE, 5 SEC, W 1 DUAL IND SEC, MAM	EA	4
88040140	SIGNAL HEAD, POLYCARBONATE, LED, 1 FACE, 5 SEC, W 1 DUAL IND SEC, BM	EA	4
88102717	PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, LED, 1 FACE, BM W/CNT DWN TIMER	EA	8
88200410	TRAFFIC SIGNAL BACKPLATE, LOUVERED, FORMED PLASTIC	EA	12
88500500	INDUCTION LOOP DETECTOR AMPLIFIER	EA	28
88500525	INDUCTION LOOP DETECTOR AMPLIFIER W/ SYSTEM OUTPUT	EA	12
88600100	DETECTOR LOOP, TYPE I	LF	1700
88700200	LIGHT DETECTOR	EA	4
88700300	LIGHT DETECTOR AMPLIFIER	EA	4
88800100	PEDESTRIAN PUSH-BUTTON	EA	8
X8730027	ELECTRIC CABLE IN CONDUIT, GROUNDING, NO. 6 1 C	LF	550

CITY OF BLOOMINGTON  
ENGINEERING DEPARTMENT



SCALE 1:250

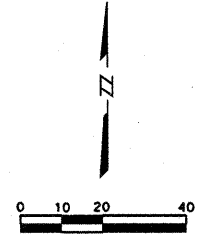
APPROVED BY: KAK  
DATE: 9-4-2009

REVISED: 9-4-2009

DRAWN BY: JCK

DESIGN BY: AES  
SUMMARY OF QUANTITIES & GENERAL NOTES

HERSHEY ROAD & COLLEGE AVE. TRAFFIC SIGNALS SECTION NO. 05-00331-00-TL



PEDESTRIAN SIGN  
STANDARD R10-40



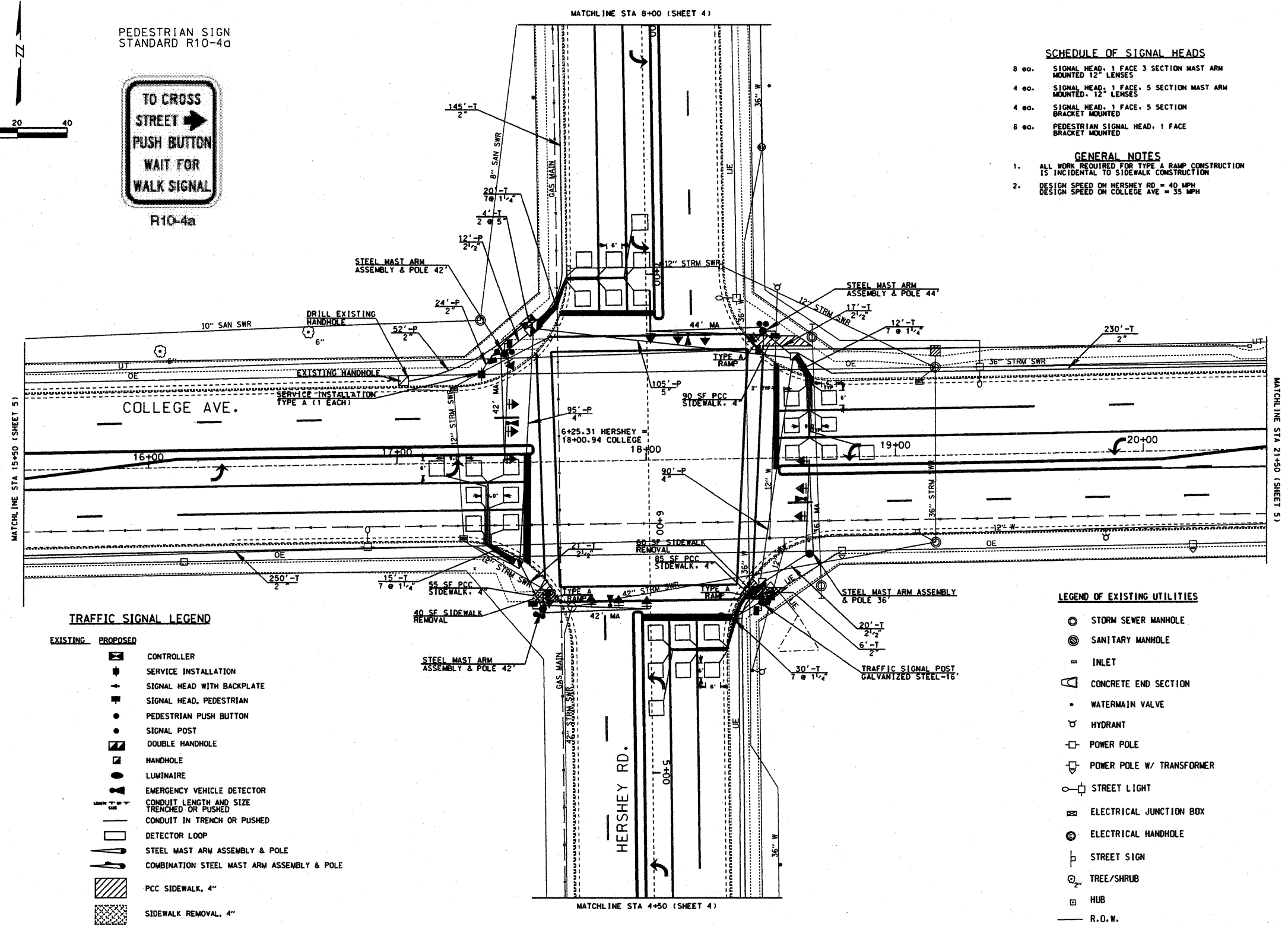
R10-4a

**SCHEDULE OF SIGNAL HEADS**

- 8 ea. SIGNAL HEAD, 1 FACE 3 SECTION MAST ARM MOUNTED 12" LENSES
- 4 ea. SIGNAL HEAD, 1 FACE, 5 SECTION MAST ARM MOUNTED, 12" LENSES
- 4 ea. SIGNAL HEAD, 1 FACE, 5 SECTION BRACKET MOUNTED
- 8 ea. PEDESTRIAN SIGNAL HEAD, 1 FACE BRACKET MOUNTED

**GENERAL NOTES**

1. ALL WORK REQUIRED FOR TYPE A RAMP CONSTRUCTION IS INCIDENTAL TO SIDEWALK CONSTRUCTION
2. DESIGN SPEED ON HERSHEY RD = 40 MPH  
DESIGN SPEED ON COLLEGE AVE = 35 MPH



**TRAFFIC SIGNAL LEGEND**

- | EXISTING | PROPOSED | DESCRIPTION                                |
|----------|----------|--|
| □        | ■        | CONTROLLER                                 |
| □        | ■        | SERVICE INSTALLATION                       |
| □        | ■        | SIGNAL HEAD WITH BACKPLATE                 |
| □        | ■        | SIGNAL HEAD, PEDESTRIAN                    |
| □        | ■        | PEDESTRIAN PUSH BUTTON                     |
| □        | ■        | SIGNAL POST                                |
| □        | ■        | DOUBLE HANDHOLE                            |
| □        | ■        | HANDHOLE                                   |
| □        | ■        | LUMINAIRE                                  |
| □        | ■        | EMERGENCY VEHICLE DETECTOR                 |
| □        | ■        | CONDUIT LENGTH AND SIZE TRENCHED OR PUSHED |
| □        | ■        | DETECTOR LOOP                              |
| □        | ■        | STEEL MAST ARM ASSEMBLY & POLE             |
| □        | ■        | COMBINATION STEEL MAST ARM ASSEMBLY & POLE |
| □        | ■        | PCC SIDEWALK, 4"                           |
| □        | ■        | SIDEWALK REMOVAL, 4"                       |

**LEGEND OF EXISTING UTILITIES**

- STORM SEWER MANHOLE
- ⊙ SANITARY MANHOLE
- INLET
- △ CONCRETE END SECTION
- WATERMAIN VALVE
- ⊕ HYDRANT
- POWER POLE
- POWER POLE W/ TRANSFORMER
- STREET LIGHT
- ELECTRICAL JUNCTION BOX
- ⊙ ELECTRICAL HANDHOLE
- STREET SIGN
- TREE/SHRUB
- HUB
- R.O.W.

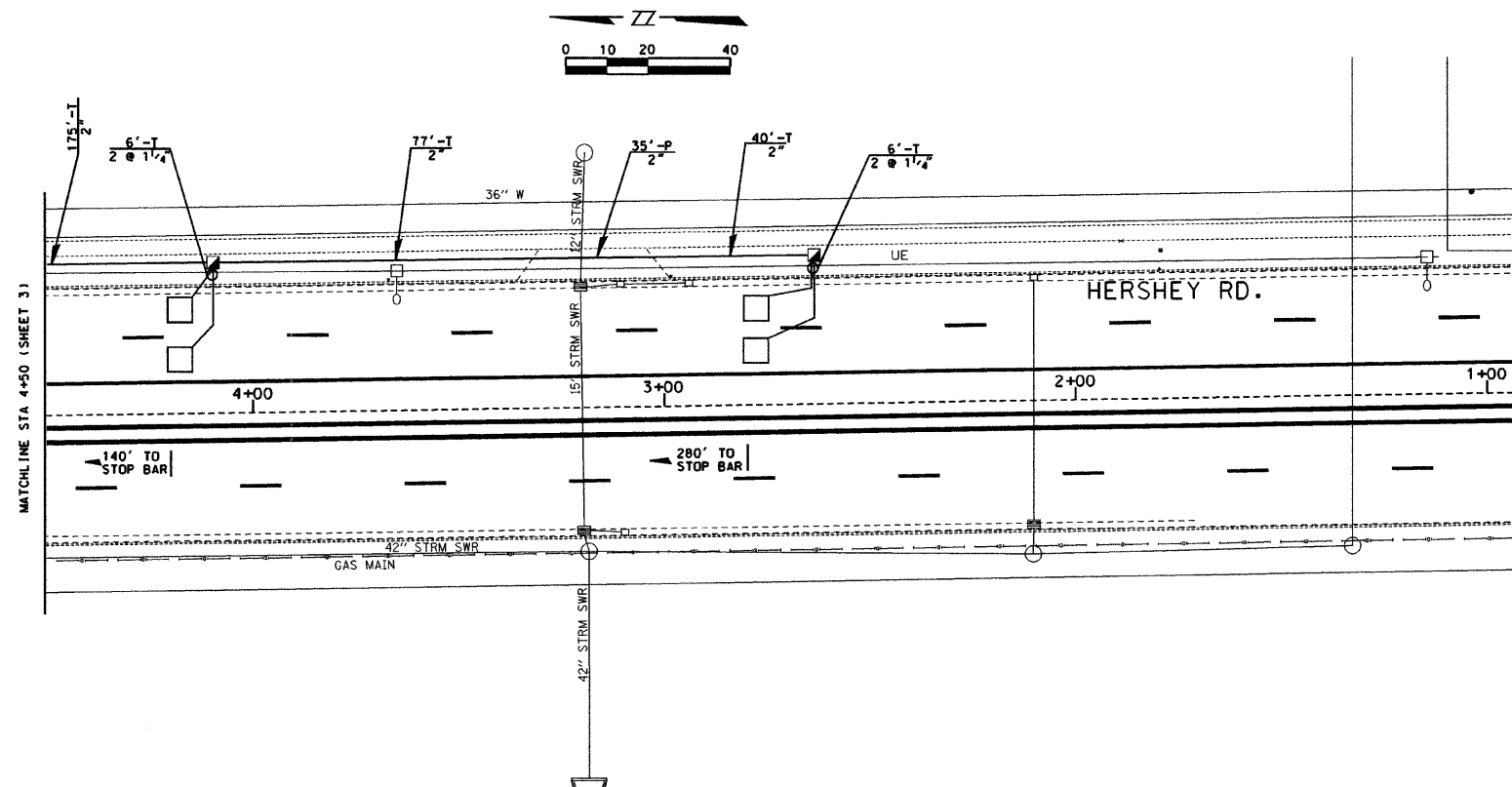
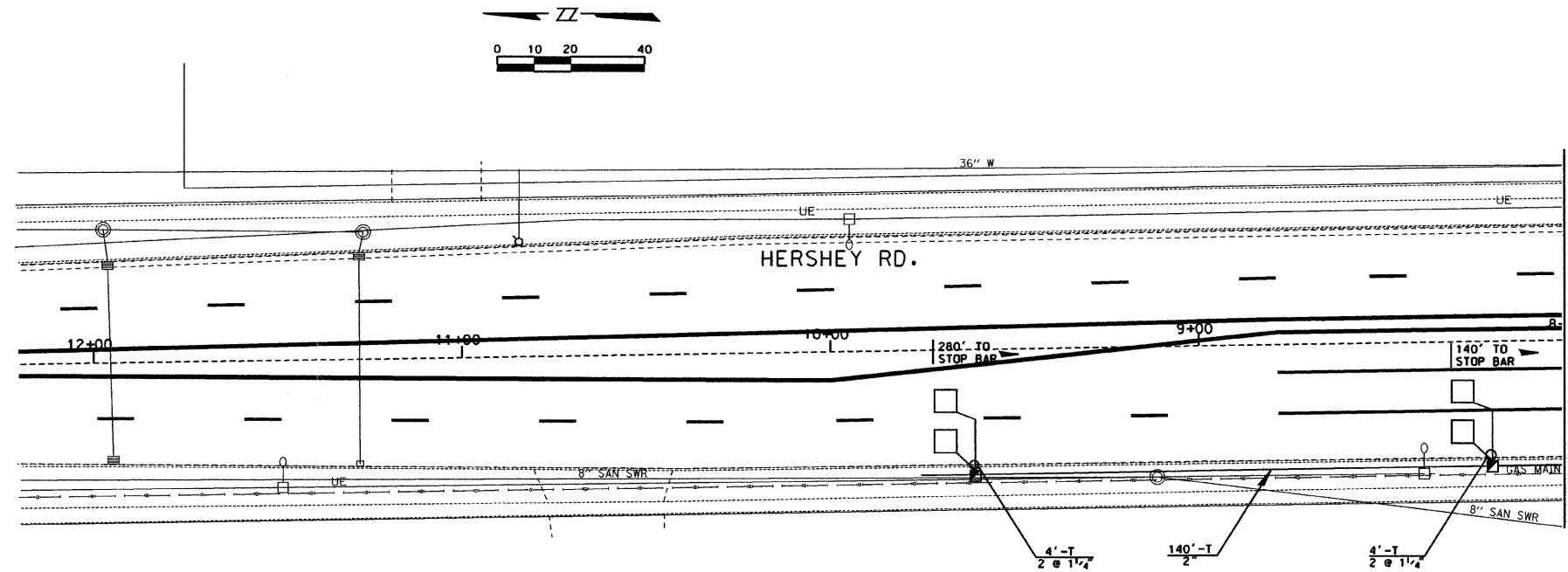
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ENGINEERING DEPARTMENT



BY: KAK  
APPROVED: 9-4-2009  
SCALE: 1" = 20'

DESIGN BY: AES  
REVISOR: 9-4-2009 KAK  
TRAFFIC SIGNAL PLAN  
HERSHEY ROAD & COLLEGE AVE. TRAFFIC SIGNALS

SHEET  
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CITY OF BLOOMINGTON  
ENGINEERING DEPARTMENT



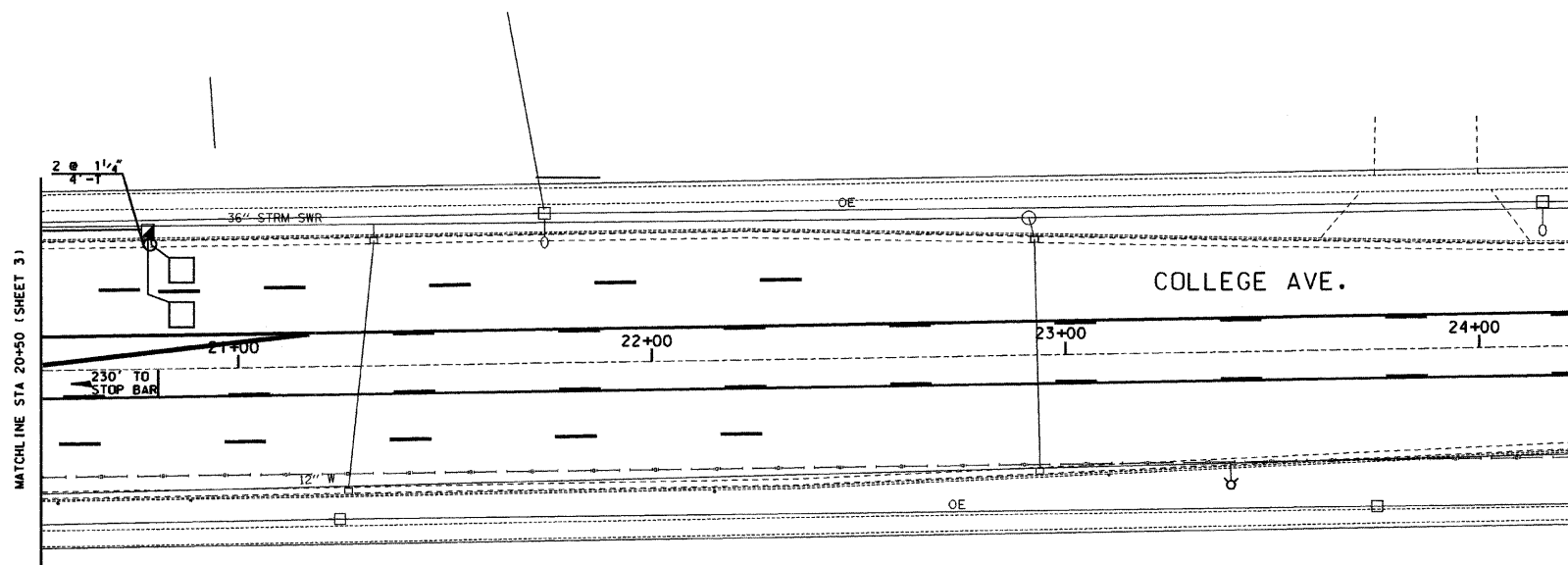
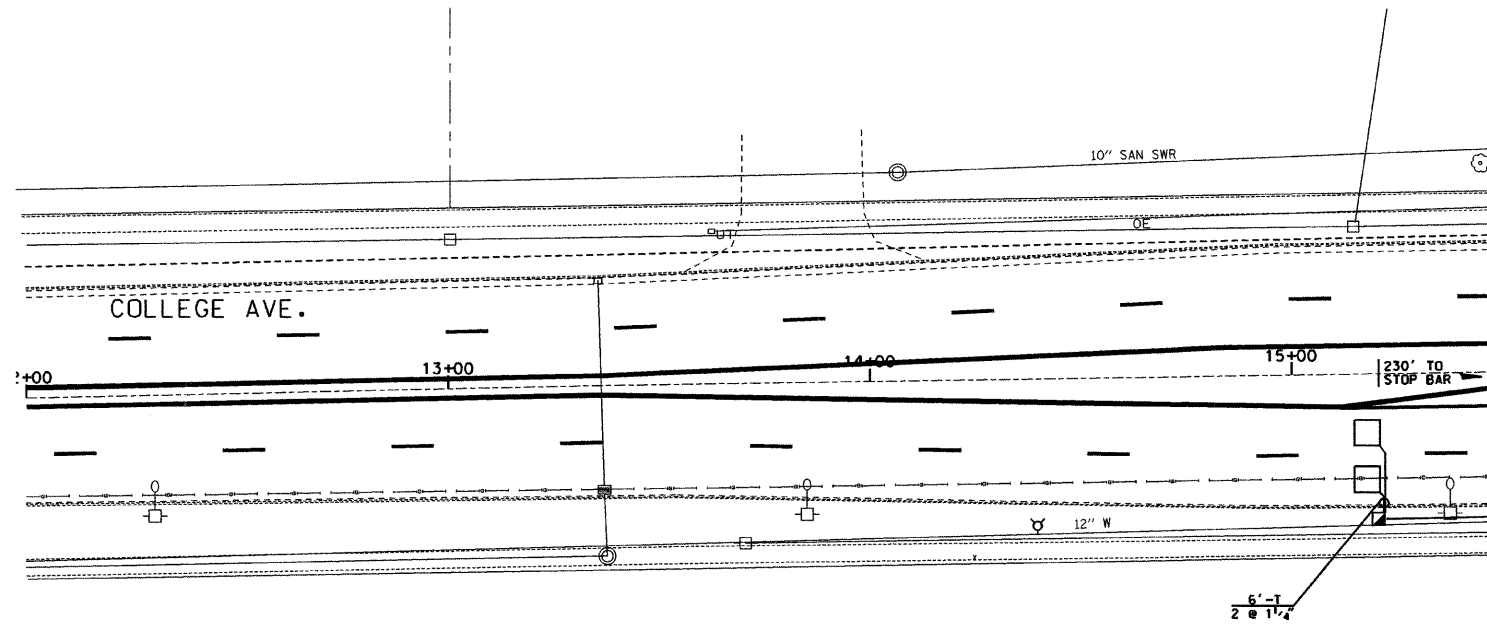
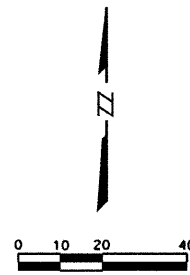
DESIGN BY: AES  
TRAFFIC SIGNAL PLAN

REVISOR: 7-20-2009 KAK

DESIGN BY: KAK  
APPROVED DATE: 7-20-2009

SHEET  
4 OF 8

SECTION NO. 05-00331-00-TL  
HERSHEY ROAD & COLLEGE AVE. TRAFFIC SIGNALS



CITY OF BLOOMINGTON  
ENGINEERING DEPARTMENT



DESIGN BY: AES  
TRAFFIC SIGNAL PLAN

REVISOR: 7/20/2009 KAK  
APPROVED BY: KAK  
DATE: 7-20-2009  
SECTION NO. 05-00331-00-TL

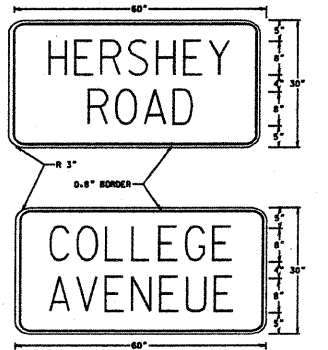
SHEET  
5 OF 8

Loop Amplifier	Detector	Loops	Controller	JPN Status	System Output
A	SLYTOR	1 SLYFR	VD1		
B	SLYCOUNT	1 SLYFR	SD1		4
C	SB STOR LL	6 SB STOR FR LL	VD6	0#	
D	SB STOR RL	6 SB STOR FR RL	VD6	0#	
E	SB MID LL	6 SB STOR BK LL	SD6		3
F	SB MID RL	6 SB STOR BK RL	SD6		14
G	SB FAR	6 SB FAR LL	VD6		
H	NB FAR	6 SB FAR RL	VD2		
I	NB MID LL	2 NB FAR LL	SD2		1
J	NB MID RL	2 NB FAR RL	PD1		13
K	NB STOR LL	2 NB STOR FR LL	VD2	0#	
L	NB STOR RL	2 NB STOR FR RL	VD2	0#	
M	NLT STOR	5 NLTFR	VD5		
N	NLT COUNT	5 NLTFR	SD5		2
M	WLT STOR	3 WLTFR	VD3		
O	WLT COUNT	3 WLTFR	SD3		8
P	WB STOR LL	8 WB STOR FR LL	VD8	0#	
Q	WB STOR RL	8 WB STOR FR RL	VD8	0#	
R	WB FAR LL	8 WB FAR RL	SD8		7
S	WB FAR RL	8 WB FAR RL	PD7		16
U	ELT STOR	7 ELTFR	VD7		
V	ELT COUNT	7 ELTFR	SD7		6
W	EB STOR LL	4 EB STOR FR LL	VD4	0#	
X	EB STOR RL	4 EB STOR FR RL	VD4	0#	
Y	EB FAR LL	4 EB FAR RL	SD4		5
Z	EB FAR RL	4 EB FAR RL	VD4		15

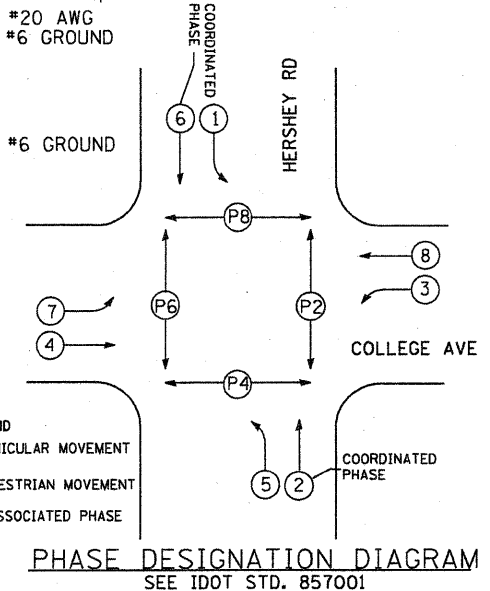
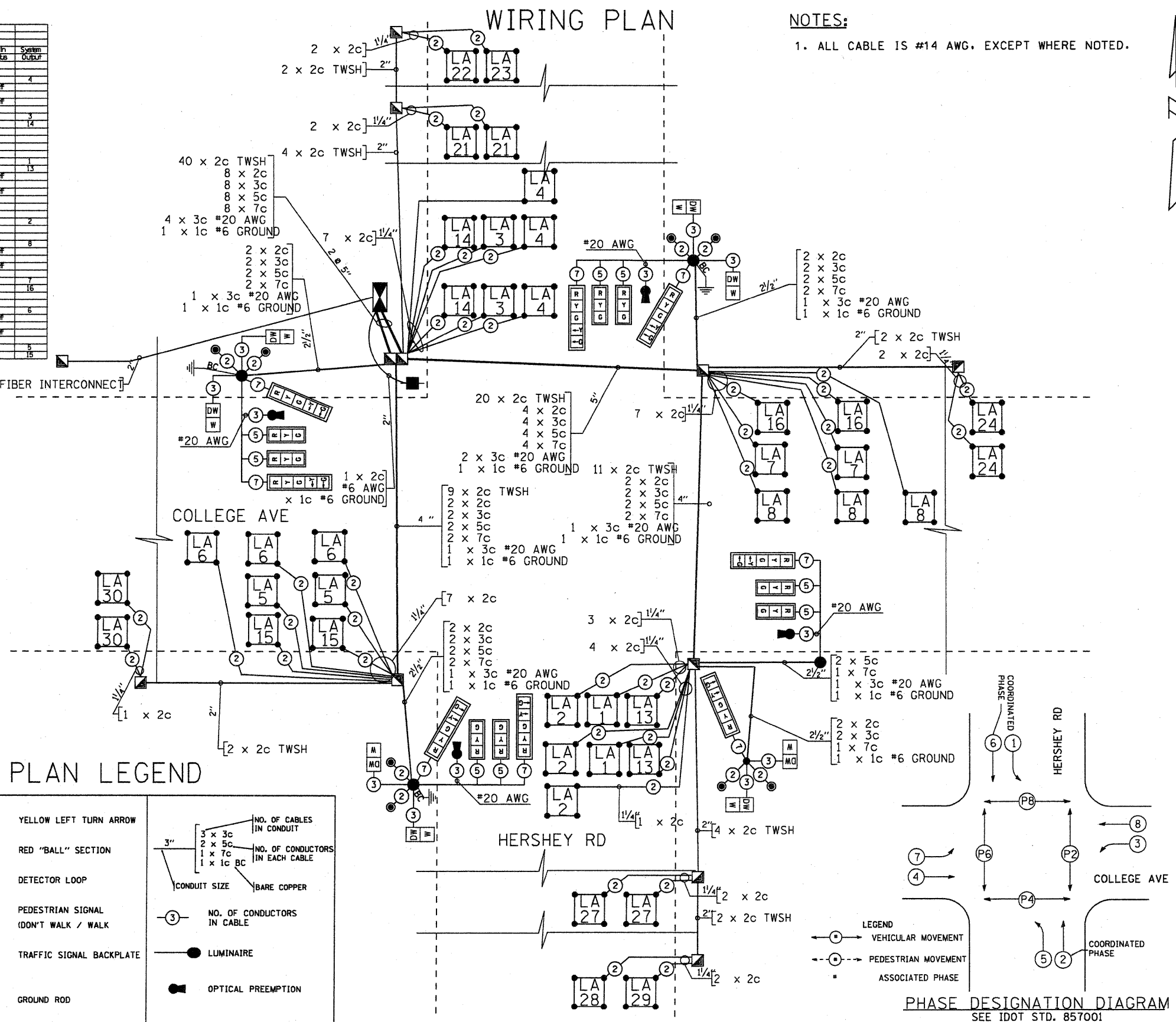
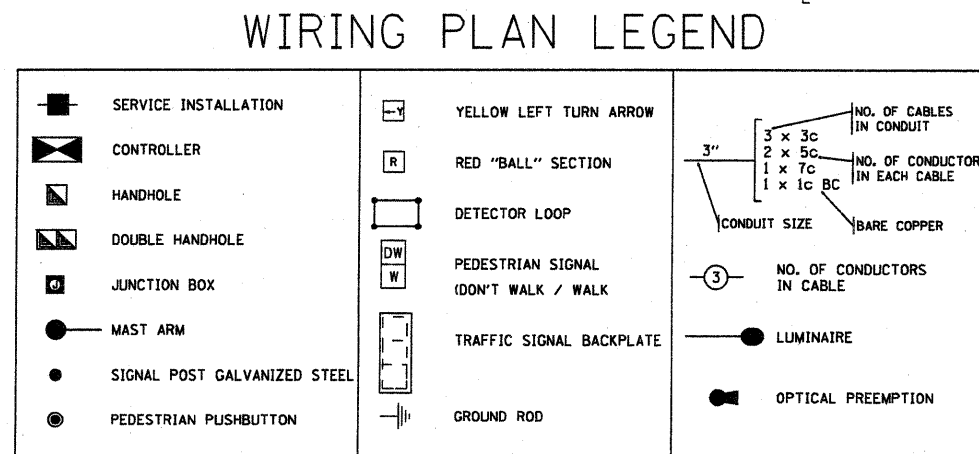
# WIRING PLAN

## NOTES:

1. ALL CABLE IS #14 AWG, EXCEPT WHERE NOTED.



SIGN PANEL TYPE 2 - SIGN STYLE F



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ENGINEERING DEPARTMENT



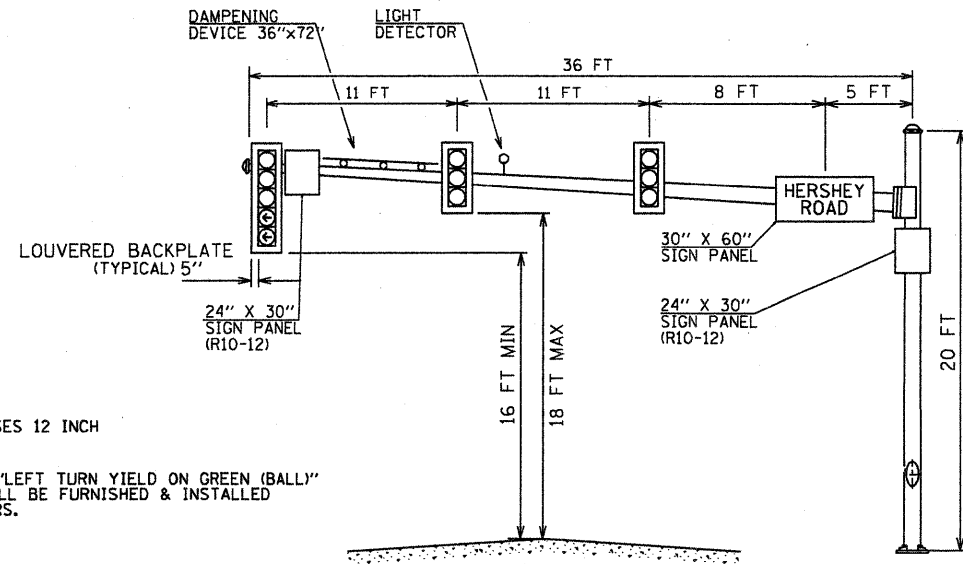
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APPROVED BY: KAK  
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DESIGN BY: AES  
DRAWN BY: JCK  
REVISED: 9-4-2009

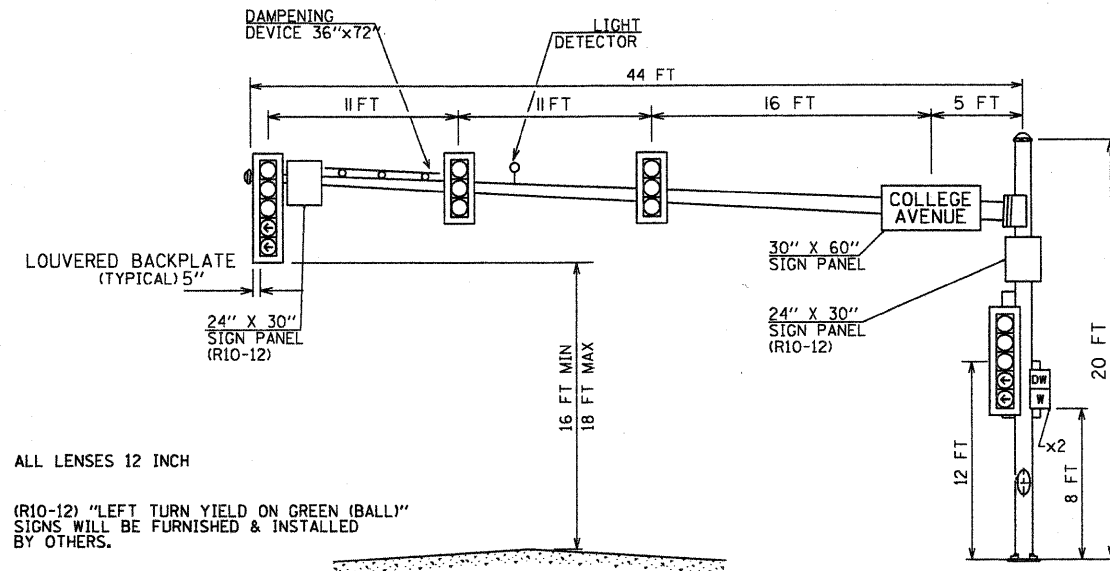
WIRING PLAN  
HERSHEY ROAD & COLLEGE AVE. TRAFFIC SIGNALS SECTION NO. 05-00331-00-TL

SHEET 6 OF 8



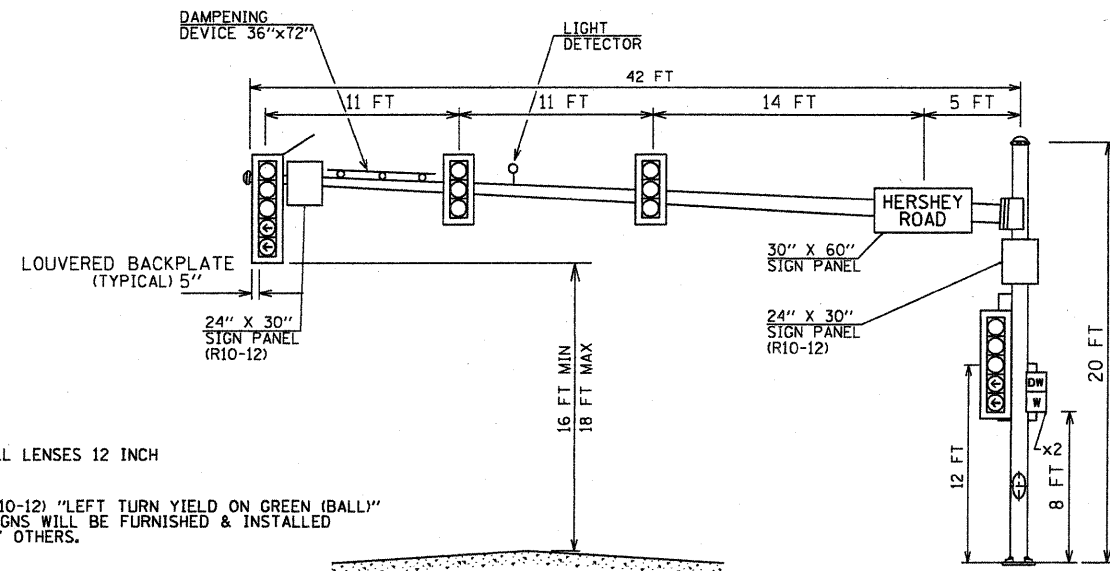
SOUTHEAST MAST ARM  
EAST BOUND COLLEGE AVE

ALL LENSES 12 INCH  
(R10-12) "LEFT TURN YIELD ON GREEN (BALL)"  
SIGNS WILL BE FURNISHED & INSTALLED  
BY OTHERS.



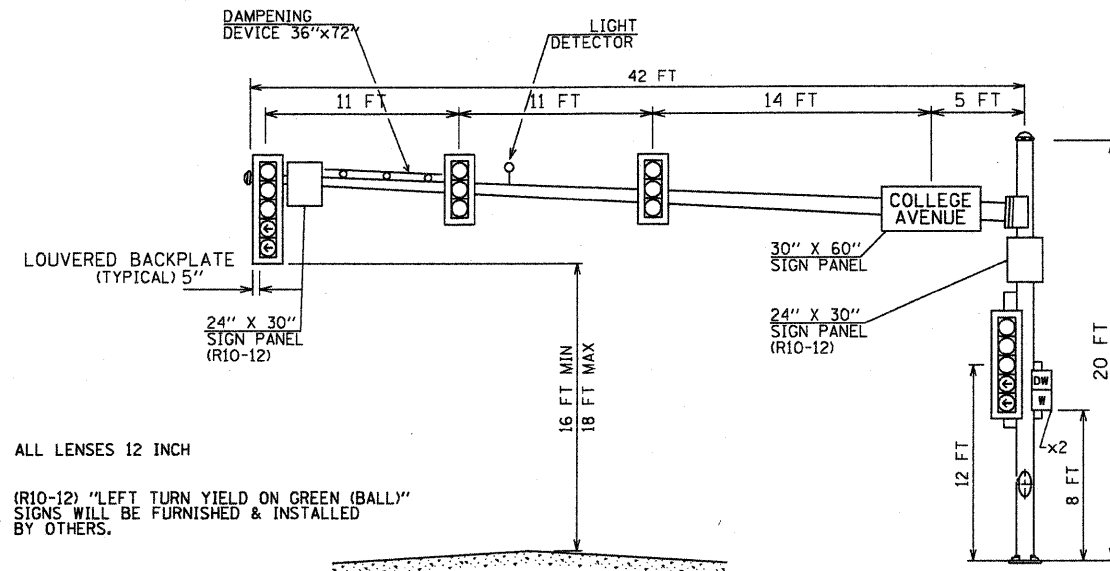
NORTHEAST MAST ARM  
NORTH BOUND HERSHEY RD

ALL LENSES 12 INCH  
(R10-12) "LEFT TURN YIELD ON GREEN (BALL)"  
SIGNS WILL BE FURNISHED & INSTALLED  
BY OTHERS.



NORTHWEST MAST ARM  
WEST BOUND COLLEGE AVE

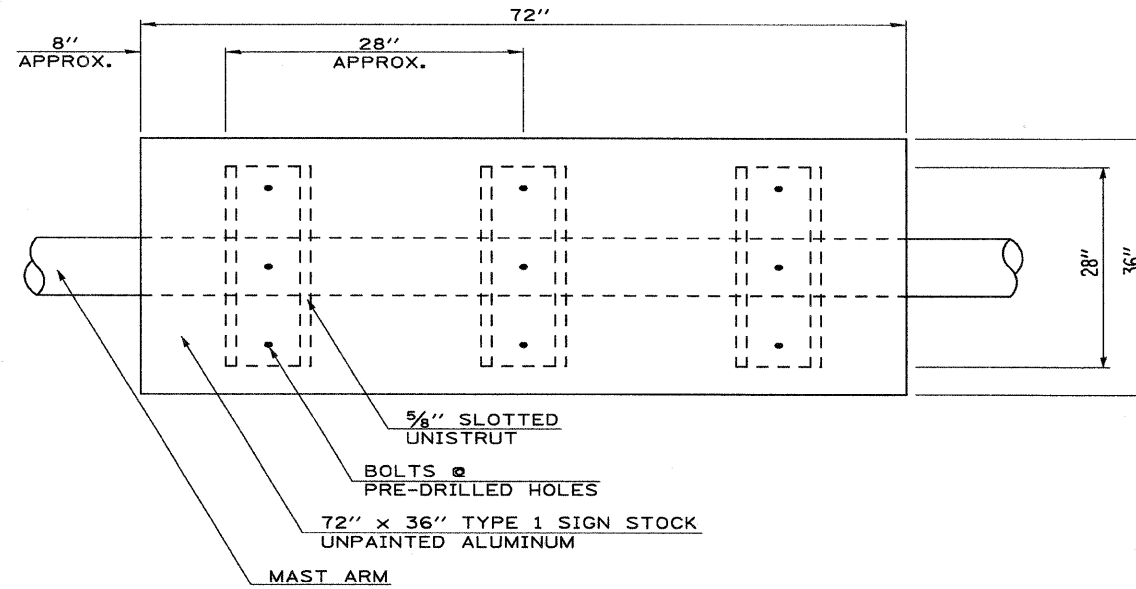
ALL LENSES 12 INCH  
(R10-12) "LEFT TURN YIELD ON GREEN (BALL)"  
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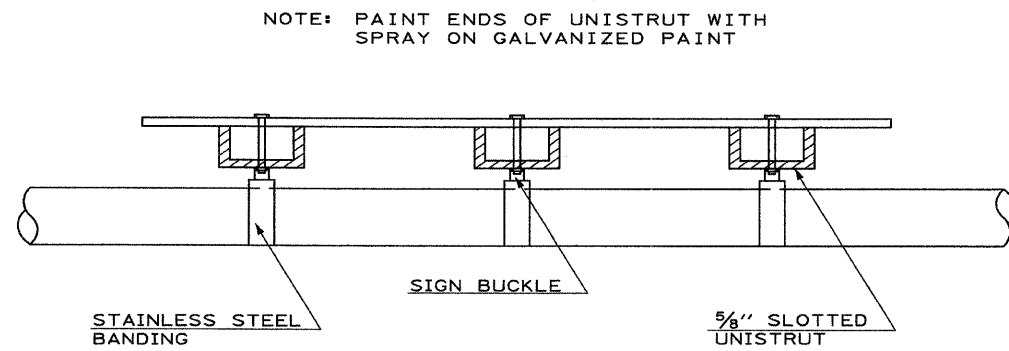
SOUTHWEST MAST ARM  
SOUTH BOUND HERSHEY RD

ALL LENSES 12 INCH  
(R10-12) "LEFT TURN YIELD ON GREEN (BALL)"  
SIGNS WILL BE FURNISHED & INSTALLED  
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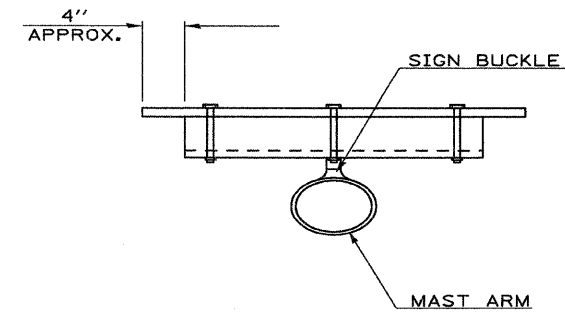
**MAST ARM DAMPENING DEVICE MOUNTING DETAIL**



**PLAN VIEW**



**ELEVATION**



**CROSS SECTION**

CITY OF BLOOMINGTON  
ENGINEERING DEPARTMENT



SCALE N/A

BY: KAK  
APPROVED  
DATE: 7-20-2009

DESIGN BY: AES  
DRAWN BY: JCK  
REVISED: 7-20-2009  
STANDARDS & MAST ARM LOADING DETAILS  
HERSHEY ROAD & COLLEGE AVE. TRAFFIC SIGNALS SECTION NO. 05-00331-00-TL

SHEET  
8 OF 8