PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	ITS 1

34601.3.6

PROJECT:

INDEX OF SHEETS

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SHEET ITS 2 ..... CONDUIT AND RISER ASSEMBLY ROUTING DETAIL
SHEET ITS 3 ..... CONSTRUCTION PHASING
SHEET ITS 4 – 6 ..... SIGN GANTRY REVISIONS
SHEET SIG. 1 – 2 ..... TRAFFIC PATTERN PHASING DIAGRAMS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

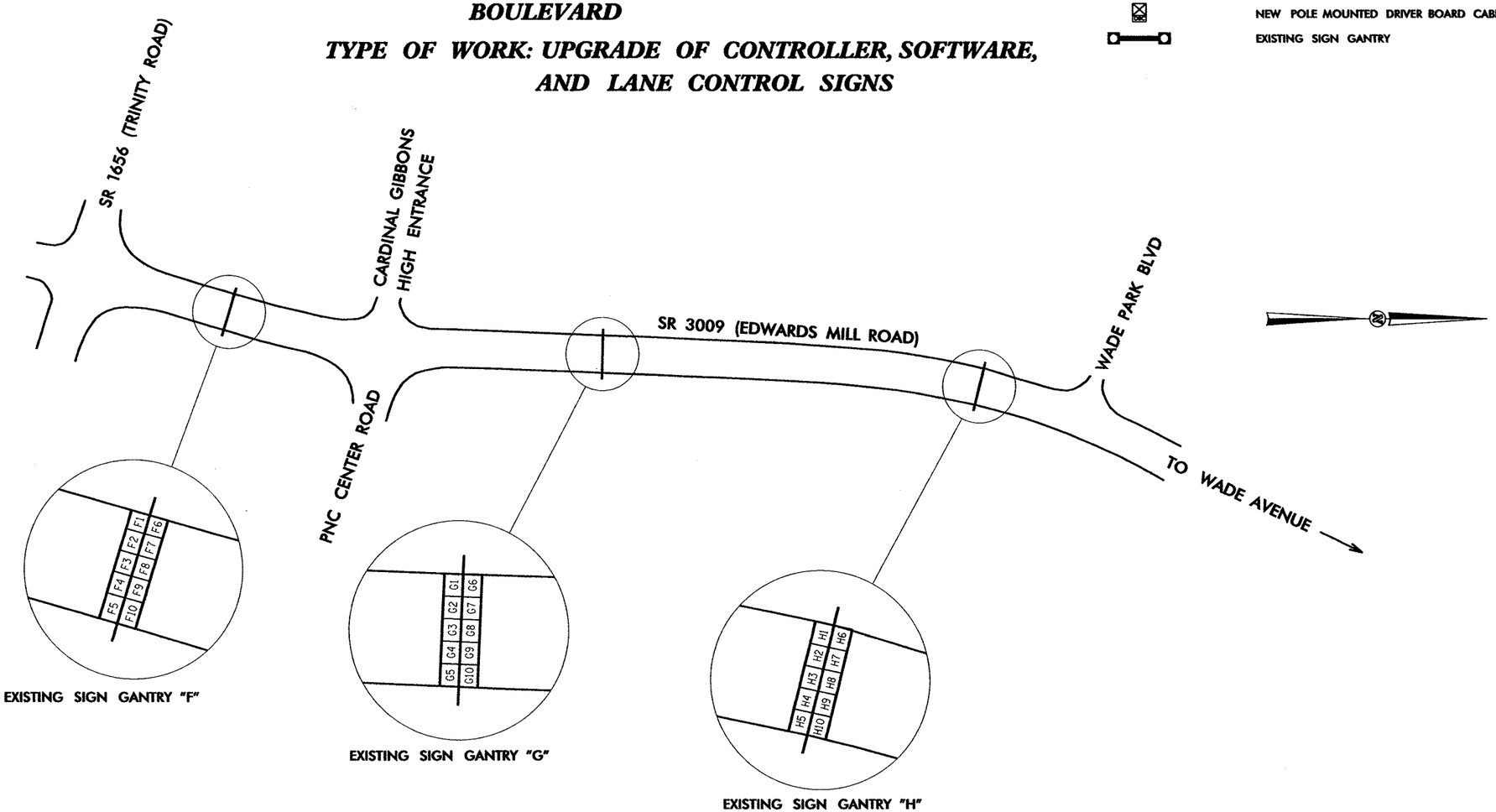
WAKE COUNTY

LOCATION: SR 3009 (EDWARDS MILL ROAD) BETWEEN SR 1656 (TRINITY ROAD) AND WADE PARK BOULEVARD

TYPE OF WORK: UPGRADE OF CONTROLLER, SOFTWARE, AND LANE CONTROL SIGNS

LEGEND

- NEW CONDUIT
- EXISTING CONDUIT
- EXISTING COMMUNICATIONS CABLE
- NEW TYPE 170E CONTROLLER CABINET
- EXISTING TYPE 170E CONTROLLER CABINET
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- EXISTING AERIAL SPLICE ENCLOSURE WITH SNOW SHOE
- EXISTING WOOD POLE
- NEW POLE MOUNTED DRIVER BOARD CABINET
- EXISTING SIGN GANTRY



Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.

NCDOT CONTACT:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
G.A. FULLER, PE – STATE ITS AND SIGNALS ENGINEER

Prepared in the Offices of:
Transportation Mobility and Safety Division
Intelligent Transportation Systems
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

REVISIONS TO EXISTING LANE CONTROL SIGNS

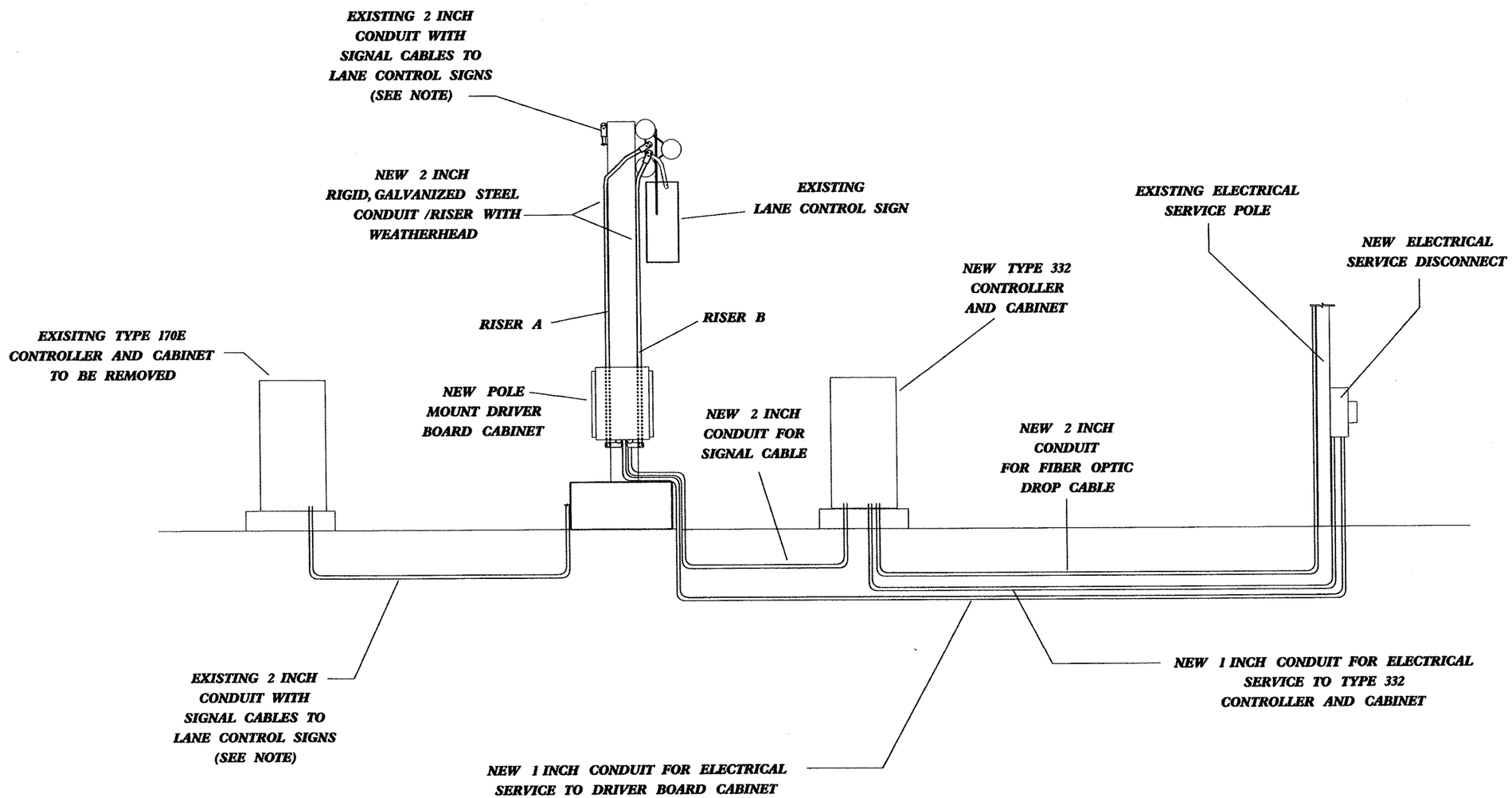
DIVISION 05	WAKE COUNTY	RALEIGH
PLAN DATE: APRIL 2012	REVIEWED BY: I.N. AVERY	
PREPARED BY: S.C. WARDLE	REVIEWED BY: G.A. FULLER	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 4/18/12
SIGNATURE DATE
CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	ITS 2



NOTE:

REMOVE ABOVE GRADE CONDUIT SYSTEM CONTAINING SIGNAL CABLES FOR EXISTING LANE CONTROL SIGNS. ABANDON UNDERGROUND PORTION OF CONDUIT SYSTEM IN PLACE.

Prepared in the Offices of:
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

CONDUIT AND RISER ASSEMBLY ROUTING DETAIL

DIVISION 05 | WAKE COUNTY | RALEIGH

PLAN DATE:	APRIL 2012	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE Gregory A. Fuller DATE 4/16/12

CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	ITS 3

CONSTRUCTION PHASING

PERFORM THE FOLLOWING FIELD WORK PRIOR TO SWITCHING OVER FROM EXISTING TYPE 170E CONTROLLER CABINET TO NEW TYPE 332 CONTROLLER CABINET:

1) INSTALL FOUNDATION AND TYPE 332, BASE MOUNTED CONTROLLER CABINET AND NEW "ATC CONTROLLER" (INSTALL NEW CABINET CLOSER TO FIBER OPTIC CABLE).
2) INSTALL POLE MOUNTED DRIVER BOARD CABINET.
3) INSTALL CONDUITS BETWEEN NEW TYPE 332 CONTROLLER CABINET AND BOTTOM OF DRIVER BOARD CABINET.
4) INSTALL 2" RISERS WITH WEATHERHEADS FROM BOTTOM OF DRIVER BOARD CABINET TO TOP OF STRUCTURE.
5) INSTALL SIGNAL CABLE BETWEEN TYPE 332 CONTROLLER CABINET AND DRIVER BOARD CABINET. INSTALL MULTIPLE SECTIONS OF SIGNAL CABLE (16AWG – 12 CONDUCTOR /6 PAIR) BETWEEN DRIVER BOARD CABINET AND LEAVE HANGING ADJACENT TO THE LANE CONTROL SIGNS. INSTALL 2 CABLES PER SIGN.
6) INSTALL FEEDER TO NEW TYPE 332 CONTROLLER CABINET (MAINTAIN EXISTING ELECTRICAL SERVICE TO EXISTING TYPE 170E CONTROLLER CABINET UNTIL LATER).
7) INSTALL FEEDER TO NEW DRIVER BOARD CABINET.
8) MODIFY ELECTRICAL SERVICE AND UPDATE GROUNDING SYSTEM.
9) NEATLY LASH SIGNAL CABLES TO HORIZONTAL SUPPORTS OF THE GANTRY. APPLY LASHING METHOD EVERY 12–16 INCHES.

SWITCH OVER FROM EXISTING TYPE 170E CABINET AND CONTROLLER TO NEW TYPE 332 CABINET AND "ATC CONTROLLER":

1) REMOVE THE EXISTING CONDUIT AND SIGNAL CABLE ENTERING THE LANE CONTROL SIGNS.
2) REMOVE SECTION OF CONDUIT FEEDING LANE CONTROL SIGNS THAT IS NOT BEING REUSED.
3) INSTALL NEW SIGNAL CABLES (16AWG – 12 CONDUCTOR /6 PAIR) INTO LANE CONTROL SIGNS THROUGH NEW WEATHERHEAD ENTRANCE.
4) REMOVE INTERNAL DRIVER BOARD RACK FROM LANE CONTROL SIGN AND INSTALL NEW PRINTED CIRCUIT BOARD WITH TERMINAL STRIPS.
5) REPLACE SIGN FACES WITH NEW SIGN FACES IN EACH LANE CONTROL SIGN AS SHOWN ON THE PLANS.
6) TERMINATE SIGNAL CABLE (16AWG – 12 CONDUCTOR /6 PAIR) TO APPROPRIATE TERMINAL STRIPS FOR EACH DISPLAY. LABEL EACH CONDUCTOR PAIR AS TO ITS FUNCTION IN THE LANE CONTROL SIGN ENCLOSURE AND DRIVER BOARD CABINET.
7) FIELD TEST GANTRY FOR PROPER OPERATION.
8) REMOVE POWER SERVICE FROM OLD TYPE 170E CABINET AND REMOVE CABINET AND CONTROLLER.
9) REMOVE UNUSED SIGNAL CABLE AND RISERS.
10) INSTALL INTERCONNECT CENTER AND ETHERNET SWITCH IN NEW TYPE 332 CONTROLLER CABINET AND REROUTE EXISTING FIBER OPTIC CABLE TO THE NEW CABINET AND "ATC CONTROLLER."
11) PERFORM SYSTEM TEST BY ISSUING COMMANDS FOR THE CENTRAL CONTROL CENTER.

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

CONSTRUCTION PHASING NOTES

DIVISION 05	WAKE COUNTY	RALEIGH
PLAN DATE: APRIL 2012	REVIEWED BY: I.N. AVERY	
PREPARED BY: S.C. WARDLE	REVIEWED BY: G.A. FULLER	

REVISIONS	INIT.	DATE

SCALE 0

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE Gregory A. Fuller DATE 4/18/12

CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	ITS 4

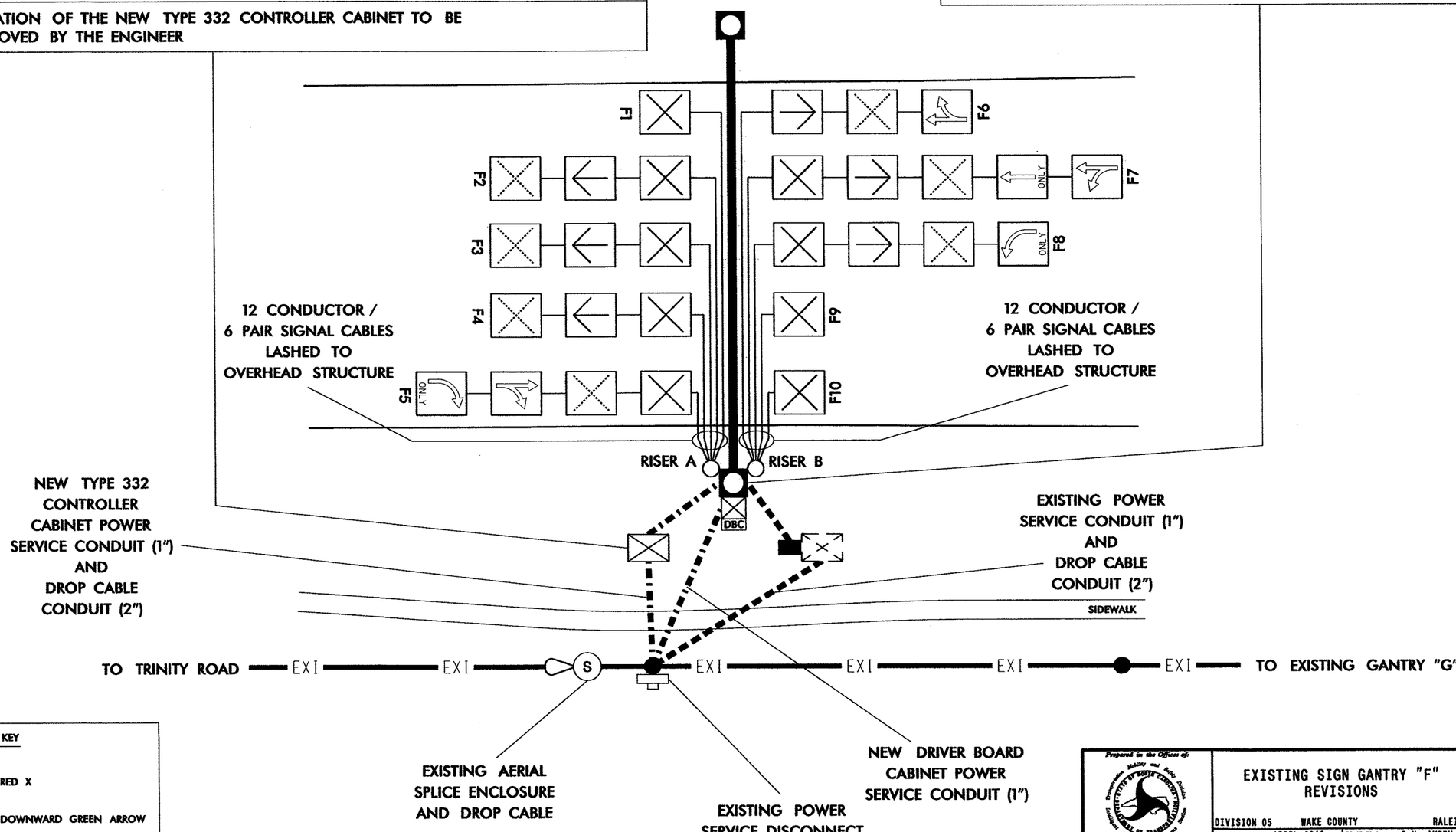
INSTALL THE FOLLOWING

QUANTITY	DESCRIPTION
1	CABINET FOUNDATION*
160'	UNPAVED TRENCHING (1) (1")
95'	UNPAVED TRENCHING (1) (2")
100'	SIGNAL CABLE
1	INTERCONNECT CENTER
1	ETHERNET SWITCH
1	ATC CONTROLLER
1	TYPE 332 CONTROLLER CABINET*
1	MODIFY ELECTRICAL SERVICE
65'	FEEDER CONDUCTOR (2-WIRE #8 AWG /1-WIRE #4 AWG THWN COPPER)

*NOTE: LOCATION OF THE NEW TYPE 332 CONTROLLER CABINET TO BE APPROVED BY THE ENGINEER

INSTALL THE FOLLOWING

QUANTITY	DESCRIPTION
2	2" RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
700'	SIGNAL CABLE (16 AWG – 12 CONDUCTOR)
1	DRIVER BOARD CABINET
31	DRIVER BOARD
3	LED MESSAGE DISPLAY BOARD (1 MESSAGE)
4	LED MESSAGE DISPLAY BOARD (3 MESSAGE)
2	LED MESSAGE DISPLAY BOARD (5 MESSAGE)
1	LED MESSAGE DISPLAY BOARD (6 MESSAGE)
95'	FEEDER CONDUCTOR (3-WIRE #10 AWG THWN COPPER)



DISPLAY KEY

- RED X
- DOWNWARD GREEN ARROW
- YELLOW X

Prepared in the Offices of:
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

EXISTING SIGN GANTRY "F" REVISIONS

DIVISION 05 WAKE COUNTY RALEIGH

PLAN DATE:	APRIL 2012	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE DATE 4/18/12

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	ITS 5

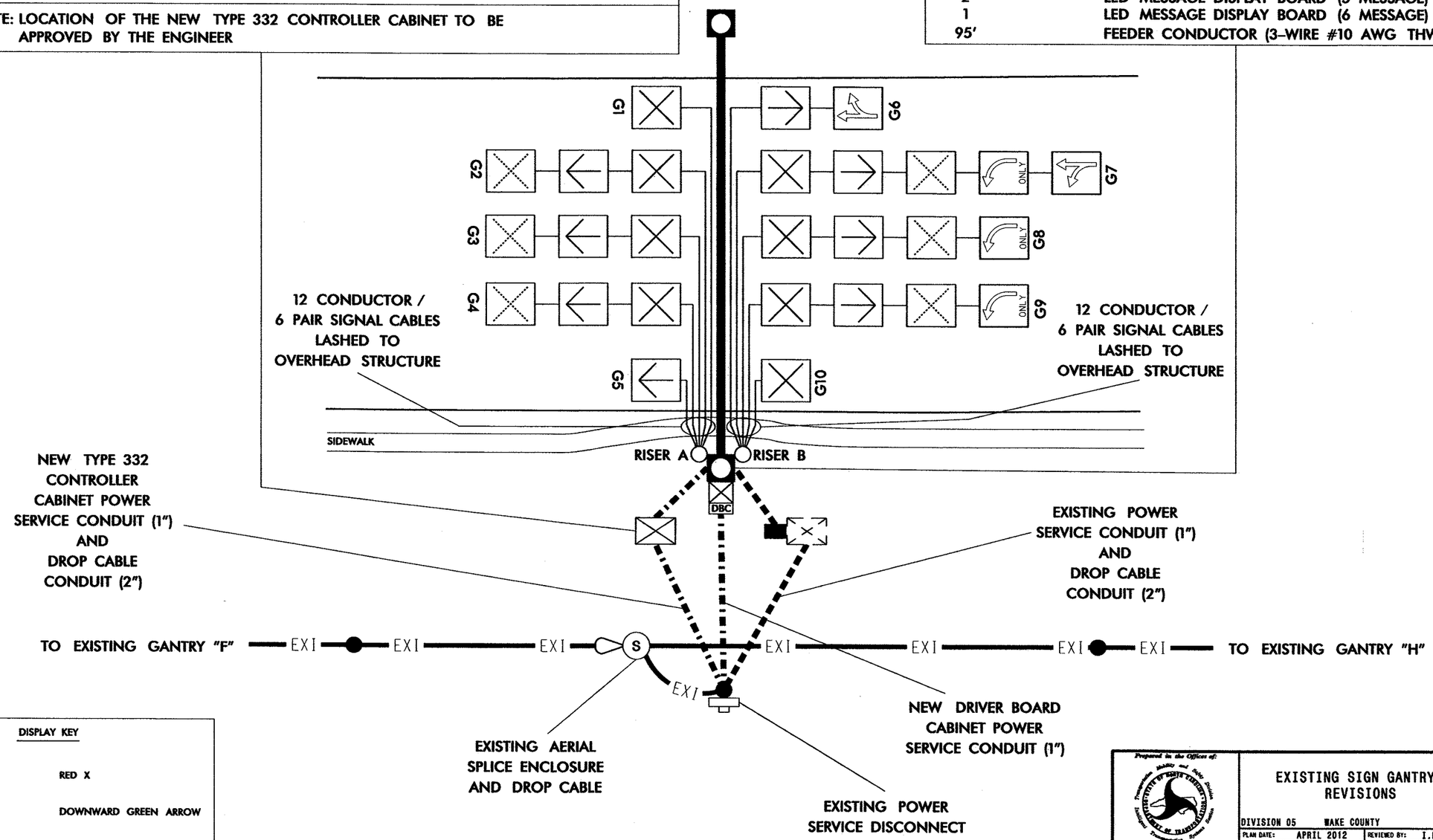
INSTALL THE FOLLOWING

QUANTITY	DESCRIPTION
1	CABINET FOUNDATION*
160'	UNPAVED TRENCHING (1) (1")
95'	UNPAVED TRENCHING (1) (2")
100'	SIGNAL CABLE
1	INTERCONNECT CENTER
1	ETHERNET SWITCH
1	ATC CONTROLLER
1	TYPE 332 CONTROLLER CABINET*
1	MODIFY ELECTRICAL SERVICE
65'	FEEDER CONDUCTOR (2-WIRE #8 AWG /1-WIRE #4 AWG THWN COPPER)

*NOTE: LOCATION OF THE NEW TYPE 332 CONTROLLER CABINET TO BE APPROVED BY THE ENGINEER

INSTALL THE FOLLOWING

QUANTITY	DESCRIPTION
2	2" RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
700'	SIGNAL CABLE (16 AWG – 12 CONDUCTOR)
1	DRIVER BOARD CABINET
30	DRIVER BOARD
3	LED MESSAGE DISPLAY BOARD (1 MESSAGE)
1	LED MESSAGE DISPLAY BOARD (2 MESSAGE)
3	LED MESSAGE DISPLAY BOARD (3 MESSAGE)
2	LED MESSAGE DISPLAY BOARD (5 MESSAGE)
1	LED MESSAGE DISPLAY BOARD (6 MESSAGE)
95'	FEEDER CONDUCTOR (3-WIRE #10 AWG THWN COPPER)



DISPLAY KEY

- RED X
- DOWNWARD GREEN ARROW
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Prepared in the Offices of: Transportation Mobility and Safety Division, State of North Carolina, Department of Transportation, Intelligent Transportation Systems Section, 750 N. Greenfield Pkwy., Garner, NC 27529

EXISTING SIGN GANTRY "G" REVISIONS

DIVISION 05 WAKE COUNTY RALEIGH

PLAN DATE:	APRIL 2012	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

SCALE 0

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE 4/18/12 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	ITS 6

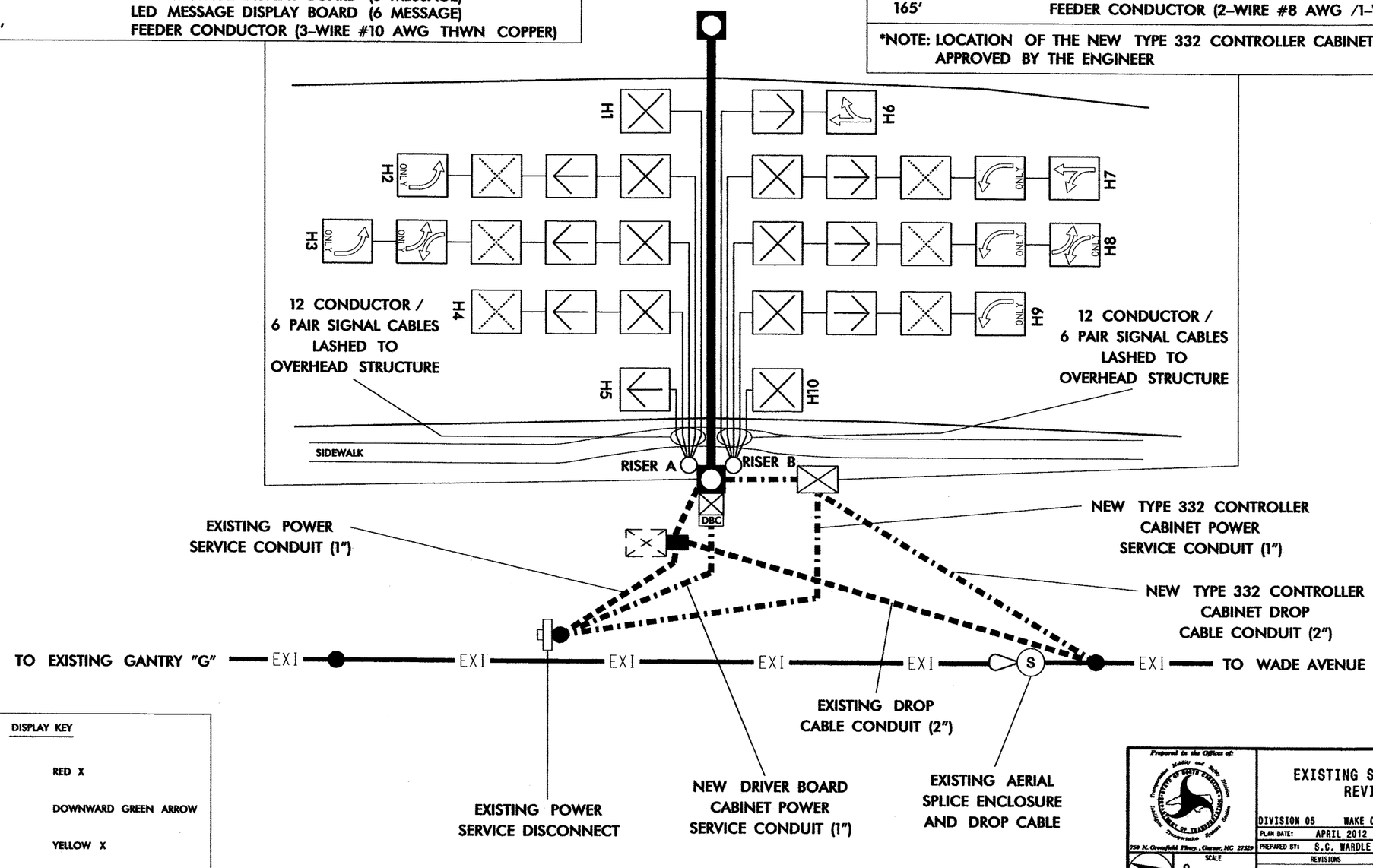
INSTALL THE FOLLOWING

QUANTITY	DESCRIPTION
2	2" RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
700'	SIGNAL CABLE (16 AWG – 12 CONDUCTOR)
1	DRIVER BOARD CABINET
36	DRIVER BOARD
3	LED MESSAGE DISPLAY BOARD (1 MESSAGE)
1	LED MESSAGE DISPLAY BOARD (2 MESSAGE)
1	LED MESSAGE DISPLAY BOARD (3 MESSAGE)
2	LED MESSAGE DISPLAY BOARD (5 MESSAGE)
3	LED MESSAGE DISPLAY BOARD (6 MESSAGE)
135'	FEEDER CONDUCTOR (3-WIRE #10 AWG THWN COPPER)

INSTALL THE FOLLOWING

QUANTITY	DESCRIPTION
1	CABINET FOUNDATION*
300'	UNPAVED TRENCHING (1) (1")
185'	UNPAVED TRENCHING (1) (2")
100'	SIGNAL CABLE
1	INTERCONNECT CENTER
1	ETHERNET SWITCH
1	ATC CONTROLLER
1	TYPE 332 CONTROLLER CABINET*
1	MODIFY ELECTRICAL SERVICE
165'	FEEDER CONDUCTOR (2-WIRE #8 AWG /1-WIRE #4 AWG THWN COPPER)

*NOTE: LOCATION OF THE NEW TYPE 332 CONTROLLER CABINET TO BE APPROVED BY THE ENGINEER



DISPLAY KEY

- RED X
- DOWNWARD GREEN ARROW
- YELLOW X

Prepared in the Offices of: Traffic Engineering Branch, Traffic Engineering Division, Traffic Engineering Unit, Signal Section, Transportation Mobility and Safety Division, Transportation, State of North Carolina
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

EXISTING SIGN GANTRY "H" REVISIONS

DIVISION 05 WAKE COUNTY RALEIGH

PLAN DATE:	APRIL 2012	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

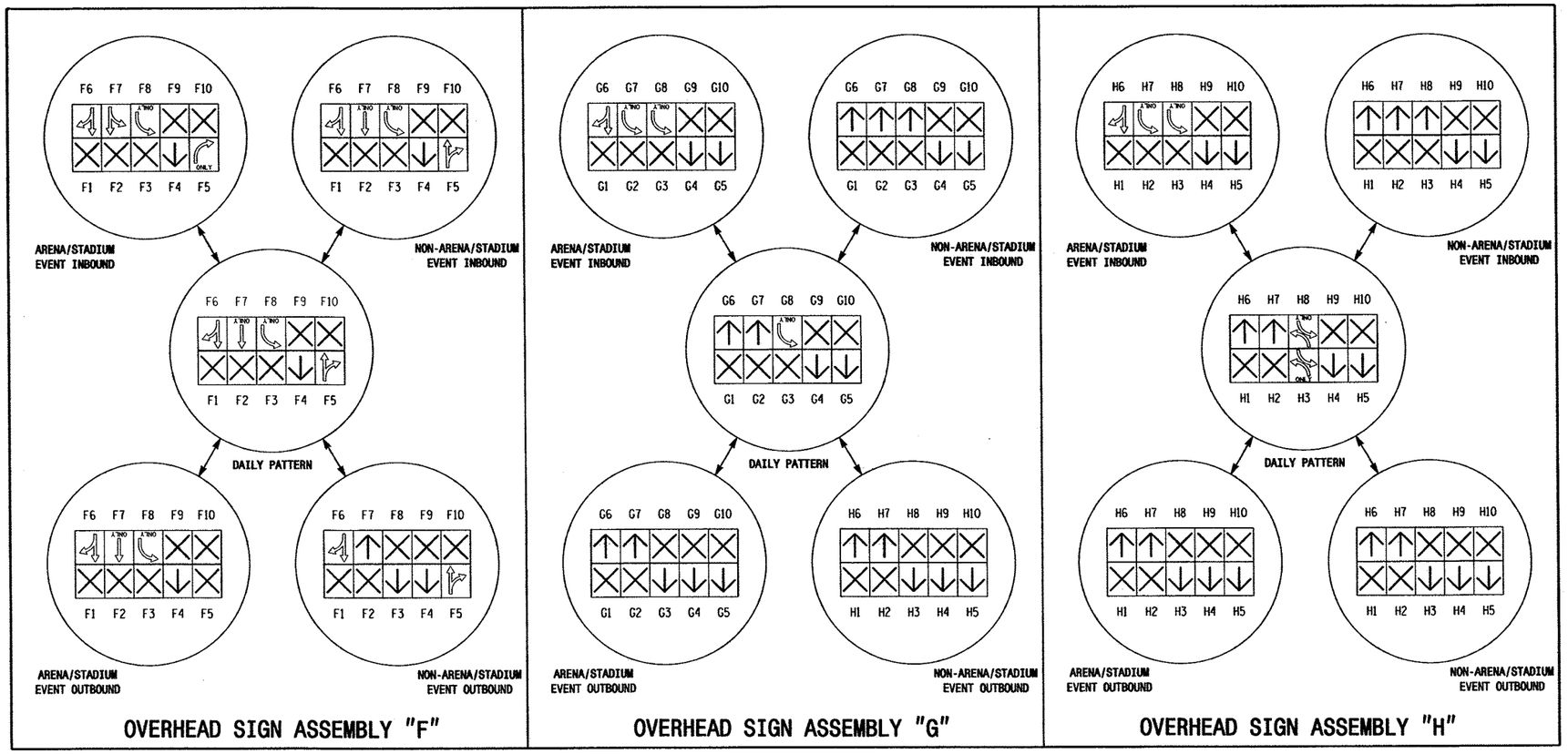
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE DATE 4/18/12

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	Sig. 1



SIGNAL FACE CLEARANCES

FROM	TO: ↓ 1	↓ 2	↑ ONLY 1	↑ ONLY 2	↱ 1	↱ 2	↰ ONLY 1	↰ ONLY 2	↰↱ ONLY 1	↰↱ ONLY 2	↱↰ ONLY 1	↱↰ ONLY 2	X 1	X 2	↱ 1	↱ 2
↓	↓	↓	↓	↓	↓	↓	↓	↓	X	X	↓	↓	X	X		
↑ ONLY	↓	↓	↑ ONLY	↑ ONLY									X	X	↑ ONLY	↑ ONLY
↱	↓	↓			↱	↱					↱	↱	X	X		
↰ ONLY	↓	↓					↰ ONLY	↰ ONLY	X	X			X	X		
↰↱ ONLY	↰↱ ONLY	↰↱ ONLY					↰↱ ONLY	↰↱ ONLY	↰↱ ONLY	↰↱ ONLY			X	X		
↱↰ ONLY	↓	↓			↱↰ ONLY	↱↰ ONLY					↱↰ ONLY	↱↰ ONLY	X	X		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
↱			↱	↱											↱	↱

↓ Downward Green Arrow

X Yellow X

X Red X

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

3/2 Traffic Pattern Phasing Diagrams

Division 5 Wake County Raleigh

PLAN DATE: April 2012	REVIEWED BY:
PREPARED BY: RJZ	REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE DATE 4/17/12
SIG. INVENTORY NO.

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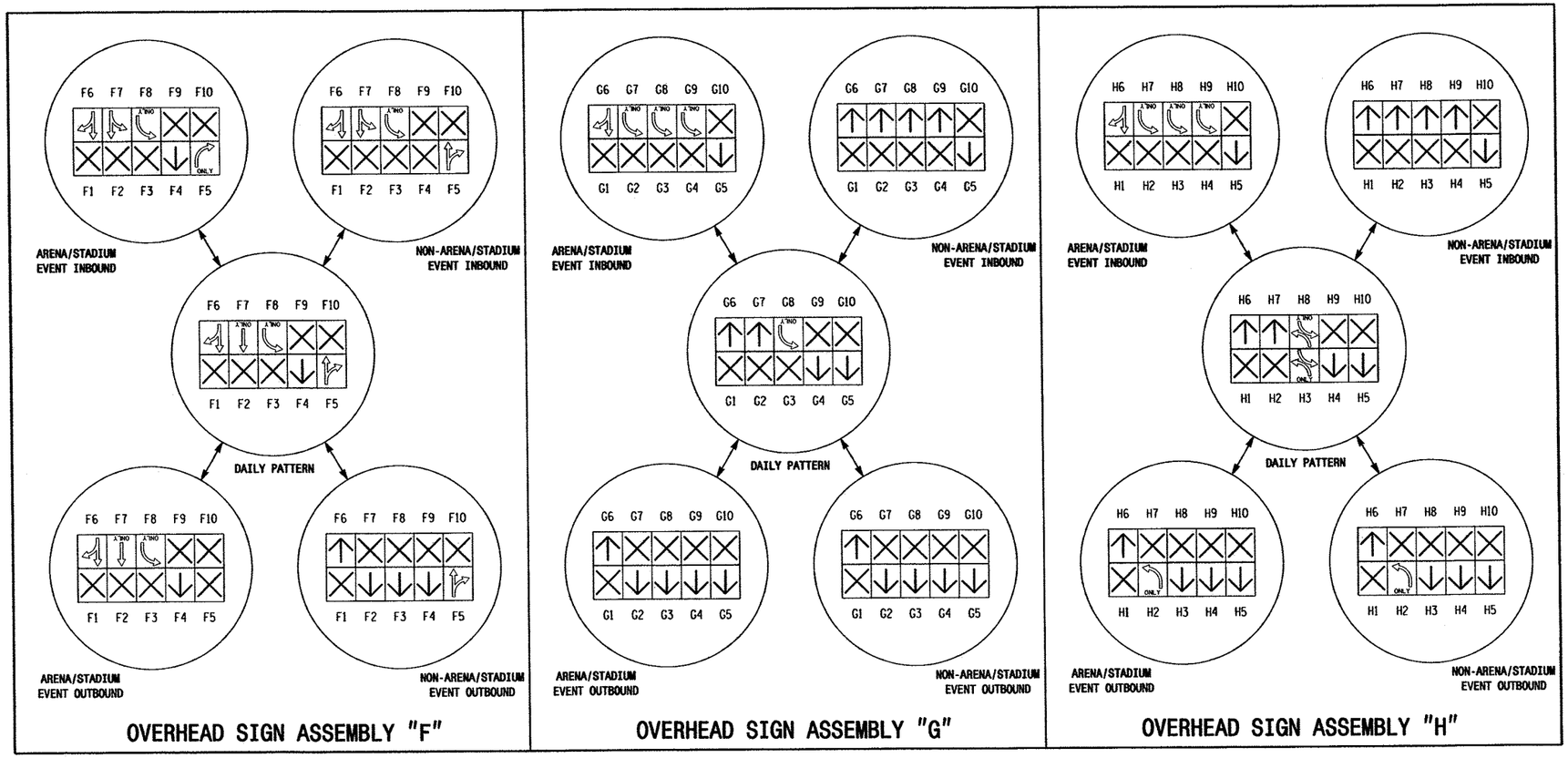
PROJECT REFERENCE NO.	SHEET NO.
34601.3.6	Sig.2



OVERHEAD SIGN ASSEMBLY "F"

OVERHEAD SIGN ASSEMBLY "G"

OVERHEAD SIGN ASSEMBLY "H"

SIGNAL FACE CLEARANCES

FROM \ TO	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
↓	↓	↓	↓	↓	↓	↓	↓	↓	X	X	↓	↓	X	X		
↑ ONLY	↓	↓	↑ ONLY	↑ ONLY									X	X	↑ ONLY	↑ ONLY
↱	↓	↓			↱	↱					↱	↱	X	X		
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↱ ONLY	↱ ONLY	↱ ONLY					↱ ONLY	↱ ONLY	↱ ONLY	↱ ONLY			X	X		
↱ ONLY	↓	↓			↱ ONLY	↱ ONLY					↱ ONLY	↱ ONLY	X	X		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
↰			↰	↰											↰	↰

↓ Downward Green Arrow

X Yellow X

X Red X

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

4/1 Traffic Pattern Phasing Diagrams

Division 5 Wake County Raleigh

PLAN DATE:	April 2012	REVIEWED BY:	
PREPARED BY:	RJZ	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA
SIGNATURE 4/17/12 DATE
SIG. INVENTORY NO.

17-APR-2012 18:03
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rziemba