STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT COUNTY

LOCATION: BRIDGE #28, ON NC92, OVER BATH CREEK
TYPE OF WORK: REPAIR OF PILES AND BENT CAPS.

VICINITY MAP

END BENT #1

END BENT #2

BATH CREEK
1. FOR EXAMPLES OF TYPICAL CAP REPAIRS SEE SHEET #9.
2. FOR EXAMPLES OF PILE JACKETS SEE SHEETS #12 AND #13.
3. FOR EXAMPLES OF TYPICAL ENCAPSULATION OF PILES SEE SHEETS #9 AND #10.

**BENT CAP REPAIRS**

<table>
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<tr>
<th>BENT</th>
<th>DESCRIPTION</th>
<th>LENGTH (FEET)</th>
<th>WIDTH (FEET)</th>
<th>DEPTH (FEET)</th>
<th>VOLUME (CU.FT.)</th>
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**PILE ENCAPSULATION LOCATIONS**

**PILE JACKET LOCATIONS**

**PROJECT NO.** B-4700AG
**COUNTY:** BEAUFORT
**BRIDGE NO.** 28
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

REVISIONS

NO.

NO.

BY

DATE

SHEET NO.

COUNTY:

TOTAL SHEETS

DATE: 01/2010

DRAWN BY:

CHECKED BY:

S. T. SANDOR

$$$$USERNAME$$$$

$$$$SYSTIME$$$$

$$$$DGN$$$$

1. FOR EXAMPLES OF TYPICAL CAP REPAIRS SEE SHEET #8.
2. FOR EXAMPLES OF PILE JACKETS SEE SHEETS #12 AND #13.
3. FOR EXAMPLES OF TYPICAL ENCAPSULATION OF PILES SEE SHEETS #9 AND #10.

NOTES

PILE ENCAPSULATION LOCATIONS

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PILE JACKET LOCATIONS

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PROJECT NO.: B-4700AG
COUNTY: BEAUFORT
BRIDGE NO.: 28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BENT REPAIRS

BENTS: 2, 6, 10, 14, 18, 22, 24, 31, 35, 39, 43 & 47.
1. For examples of typical cap repairs see Sheet #8.
2. For examples of pile jackets see Sheets #12 and #13.
3. For examples of typical encapsulation of piles see Sheets #9 and #10.

NOTES

PILE ENCAPSULATION LOCATIONS

PILE JACKET LOCATIONS

NOTES

ALL QUANTITIES ARE APPROXIMATE.
1. For examples of typical encapsulation of piles see sheets #9 and #10.

PILE ENCAPSULATION LOCATIONS

<table>
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ELEVATION VIEW BENT No. 25

PLAN OF BENT No. 25
BENT No. 24 similar by rotation

BEND NO. 25

PROJECT NO. B-4700AG
COUNTY: BEAUFORT
BRIDGE NO. 28

BENT REPAIRS

BENTS #24 AND #25
**TYPICAL ELEVATION VIEW (BENT CAPS)**

**DETAIL "A"**

**DETAIL "B"**

**DETAIL "C"**

**GENERAL NOTES**

1. Spall dimensions shown are approximate.
2. Reinforcing steel shall be Grade 60.
3. For adhesively anchored dowels see special provisions.
4. Field testing for adhesive bonding system is not required.
5. Repair material for cap spalls shall be polymer modified concrete or Shotcrete.

**DETAILS**

- **SECTION A-A**
- **DETAIL "A"**
- **DETAIL "B"**
- **DETAIL "C"**

**PROJECT NO.** B-4700AG
**COUNTY:** BEAUFORT
**BRIDGE NO.** 28
PILE ENCAPSULATION FOR SQUARE PILES

REPAIR SEQUENCES:

1. AFTER SURFACE PREPARATION, PLACE JACKET IN PROPER LOCATION AROUND PILE AND SEAL LONGITUDINAL SEAMS AS DETAIL "A" INSTALL TEMPORARY BRACING.

2. CONFIRM SPACING BETWEEN JACKET AND EXISTING PILE JACKET AND BOTTOM SEAL AS DETAIL "C" ALLOW BOTTOM SEAL TO CURE APPROX. 6 WEEKS.

3. ATTACH GROUT HOSE TO LOWERMOST INJECTION PORT AND PUMP GROUT FOR 30-MIN CHECK FOR LEAKS ALONG SEAMS AND BOTTOM SEAL. OPTIONAL ALLOW THIS GROUT TO CURE AND PROCEED WITH GROUT INJECTION FROM 2ND PORTS.

4. PLACE UPPER INJECTION PORTS AND PUMP GROUT INTO LOWER PORT UNTIL GROUT HEARDS TOP OF JACKETS. ONLY USE UPPER PORTS IF INJECTION BECOMES DIFFICULT.

NOTES:

ALL PILE JACKETS ARE ESTIMATED 7 FT. IN LENGTH AND START 2 FEET ABOVE MEAN WATER ELEVATION. APPROXIMATELY 5 FEET OF PILE JACKET WILL BE PLACED BELOW WATER ELEVATION DEPENDING ON THE WATER SURFACE ELEVATION. SOME PILE JACKET LOCATIONS ARE SHALLOW AND IN THOSE AREAS THE PILE JACKET WILL ONLY NEED TO EXTEND 1 FOOT BELOW WATER LINE.
PILE ENCAPSULATION FOR OCTOGONAL PILES

1. AFTER SURFACE PREPARATION, PLACE JACKET IN PROPER LOCATION AROUND PILE AND SEAL LONGITUDINAL SEAMS (SEE DETAIL "A"). INSTALL TEMPORARY BRACING.

2. CONFIRM SPACING BETWEEN JACKET STRAPS SUPPLIED BY CONTRACTOR PLACED OVER FIXED STANDOFFS. ALLOW BOTTOM SEAL TO CURE APPX. 4 HOURS.

3. ATTACH GROUT HOSE TO LOWERMOST INJECTION PORT AND PUMP A-P-E GROUT FOR 30-60 MIN. CHECK FOR LEAKS ALONG SEAMS AND BOTTOM SEAL. OPTIMALLY ALLOW GROUT TO CURE AND PROCEED W/INJECTION FROM 2ND PORT.

4. PLUG UPPER INJECTION PORTS AND PUMP GROUT INTO LOWER PORT UNTIL GROUT REACHES TOP OF JACKET. ONLY USE UPPER PORTS IF INJECTION BECOMES DIFFICULT.

REPAIR SEQUENCES:

NOTES:

ALL PILE JACKETS ARE ESTIMATED 7 FT. IN LENGTH AND START 2 FEET ABOVE MEAN WATER ELEVATION. APPROXIMATELY 5 FEET OF PILE JACKET WILL BE PLACED BELOW WATER ELEVATION DEPENDING ON THE WATER SURFACE ELEVATION. SOME PILE JACKET LOCATIONS ARE SHALLOW AND IN THOSE AREAS THE PILE JACKET WILL ONLY NEED TO EXTEND 1 FOOT BELOW MUD LINE.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PROJECT NO. B-470040
COUNTY BEAUFORT
BRIDGE NO. 28

PILE ELEVATION
ABOVE GRADE REPAIR

PILE ELEVATION
BELOW GRADE REPAIR

SECTION A-A

BEAUFORT
PILE ENCAPSULATION FOR
SOME PILE JACKET LOCATIONS ARE SHALLOW AND ON THE WATER SURFACE ELEVATION. IN THOSE AREAS THE PILE JACKET WILL ONLY NEED TO EXTEND 1 FOOT BELOW MUD LINE.

OCTOGONAL CONCRETE PILE
EXISTING PILE ELEVATION
MIN. TO 2nD PORT
MIN. TO 1ST PORT
6 " | (TYP.)
5 '-0 " | (TYP.)

TOTAL SHEETS 13

SHEET NO. 10

DRAWN BY: S. T. SANDOR
CHECKED BY: A. ABRAHA

DATE: 02/10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
PROJECT NO. B-470040
COUNTY BEAUFORT
BRIDGE NO. 28

PILE ELEVATION
ABOVE GRADE REPAIR

PILE ELEVATION
BELOW GRADE REPAIR

SECTION A-A

BEAUFORT
PILE ENCAPSULATION FOR
SOME PILE JACKET LOCATIONS ARE SHALLOW AND ON THE WATER SURFACE ELEVATION. IN THOSE AREAS THE PILE JACKET WILL ONLY NEED TO EXTEND 1 FOOT BELOW MUD LINE.

OCTOGONAL CONCRETE PILE
EXISTING PILE ELEVATION
MIN. TO 2nD PORT
MIN. TO 1ST PORT
6 " | (TYP.)
5 '-0 " | (TYP.)

TOTAL SHEETS 13

SHEET NO. 10

DRAWN BY: S. T. SANDOR
CHECKED BY: A. ABRAHA

DATE: 02/10
**JACKETS.**

- Stainless Steel Rivets
  - 1/2"-13 S.S. rivets, supplied with jacket
  - Rivets field welded to jacket
- 1/2" Min. Annular Space

**JACKET. INSIDE DIA.**

- 1" Min.

**STAINLESS STEEL RIVETS**

- Supplied with jacket
- 1/4-3/8" Grip, 3/16" Dia.

**STAGE OR OCTAGONAL**

- Stagger Left to Right

**SQUARE OR OCTAGONAL STAGE OR OCTAGONAL**

- Supplied with jacket
- 1/4-3/8" Grip, 3/16" Dia.

**STAINLESS STEEL RIVETS**

- Supplied with jacket
- 1/4-3/8" Grip, 3/16" Dia.

**STAINLESS STEEL RIVETS**

- Supplied with jacket
- 1/4-3/8" Grip, 3/16" Dia.

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**STAINLESS STEEL RIVETS**

- Supplied with jacket
- 1/4-3/8" Grip, 3/16" Dia.
PILE JACKET to be installed on 12" SQUARE PILE.

All pile jackets are estimated 7 ft. length and span 3 feet above mean water elevation.

Approximately 1 foot of pile jacket will be placed below water elevation.

Elevation depends on the elevation of pile.

Some pile jacket elevations are shallow and pile jacket will only need to extend 1 foot below mud line.

Approximately 5 feet of pile jacket will be placed below water elevation depending on the elevation of pile.

Some pile jacket elevations are shallow and pile jacket will only need to extend 1 foot below mud line.

PILE JACKET W/ PUMP PORTS

PILE JACKET DETAILS

NOTES:

PROJECT: B-4700AG
COUNTY: BEAUFORT
REPLACES BRIDGE NO. 28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

REVISIONS
NO.

DRAWN BY:
S. T. SANDOR
DATE: 02/13
CHECKED BY:
DATE: 02/13

ELEVATION VIEW

SECTION A-A
REPAIR SEQUENCE

1) Completely remove all loose, damaged, and weak concrete, oil, grease, rust and other contaminants. Prepare concrete using acceptable mechanical means and concrete cleaners and preservatives as necessary to obtain clean, sound and rough surfaces. Coast aggregate shall be removed. Concrete pile surfaces should be sound and free of contamination. Marine growth or other contaminants exists, excluding "visible signs of corrosion," high pressure water should be used to ensure a clean, sound, contaminant-free surface for optimum bond.

2) Clean reinforcing steel & columns or pile of all rust and foreign material.

3) Determine fiberglass integral form length. Minimum length is 2' above and below clean, sound, contaminant-free surface.

4) Drill "+" holes and place #4 dowels w/ epoxy grout.

5) Build the rebar cage by placing the #4 stirrups and vertical reinforcing steel in accordance with the project drawings.

6) Install form spacers to ensure adequate concrete cover at all parts of the sleeve.

7) Install the sleeve. In place fiberglass form (also called jacket or collar) the bottom of the form should be large enough to ensure the pile while providing a minimum of 2" of inside clearance. Provide clearance between the pile and the reinforcing steel, and 2" of clearance between the reinforcing steel and the form-free jacket sizing chart.

8) Insert concrete pump hose at top of jacket and extend to just above the bottom and pump at a flow rate to the desired fill elevation. If site conditions permit, inserting pump hose at top of jacket then double pump points and place concrete as shown in the detail.

9) Place concrete fill, install pump ports in jacket for underwater applications. Ports should have a true vertical to keep back flow of concrete once pump nozzle is removed. Concrete placement stopped when 3 multiple points spaced 3' vertically and alternating 3' from previous point. A minimum of 2' of concrete head is needed above point prior to changing point.

10) Remove form work after 24 hours.
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  

PLAN FOR PROPOSED 
TRAFFIC CONTROL 

BEAUFORT COUNTY  

LOCATION: BRIDGE NO. 28, ON NC 92, OVER BATH CREEK  
TYPE OF WORK: TRAFFIC CONTROL FOR BRIDGE REPAIR  

ROADWAY STANDARD DRAWINGS  

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" -  
PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C.,  
DATED JULY 2006 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE  
CONSIDERED A PART OF THESE PLANS:  

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<th>STD. NO.</th>
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<td>1101.04</td>
<td>TEMPORARY SHOULDER CLOSURES</td>
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<td>TRAFFIC CONTROL DESIGN TABLES</td>
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<td>1180.01</td>
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<td>LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND INDEX OF SHEETS</td>
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<td>TCP-2</td>
<td>GENERAL NOTES AND PHASING</td>
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<tr>
<td>TCP-3</td>
<td>TEMPORARY LANE CLOSURE DETAIL</td>
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LEGEND  

GENERAL  

← DIRECTION OF TRAFFIC FLOW  
← NORTH ARROW  
← WORK AREA  

TRAFFIC CONTROL DEVICES  

- TYPE III BARRIERS  
  ▲ CONE  
  ◆ DRUM  
  ◊ SKINNY DRUM  
  ➥ FLASHING ARROW PANEL (TYPE C)  
  □ STATIONARY SIGN  
  □ PORTABLE SIGN  
  □ STATIONARY OR PORTABLE SIGN  
  □ TEMPORARY CRASH CUSHION  
  ◊ CHANGEABLE MESSAGE SIGN  
  □ TRUCK MOUNTED IMPACT ATTENUATOR (THIA)  
  ◊ POLICE  
  ◊ FLAGGER  

APPROVED  

DATE  

PLAN PREPARED By:  

RETSA L. WATSON, PE  
GEORGE KANAGEOGE  

TRAFFIC CONTROL ENGINEER  
TRAFFIC CONTROL DESIGNER
GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS AND ROADWAY DETAILS ARE NOT ATTAINABLE TO WEST FIELD CONDITIONS, OR RESULT IN DUPLICATE, OR UNDESIRABLE OVERLAPPING OF DEVICES.
MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING OR REMOVAL OF DEVICES, AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS
A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:
ROAD NAME: NC 52
DAY AND TIME RESTRICTIONS: 6:00 A.M.-8:30 A.M. MONDAY THRU SUNDAY (EVERYDAY)
B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:
ROAD NAME: NC 52
HOLIDAY: 1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 6:00 P.M. DECEMBER 31ST TO 6:00 A.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UN TIL 6:00 A.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 P.M. THURSDAY AND 6:00 A.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 P.M. FRIDAY TO 6:00 A.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 P.M. THE DAY BEFORE INDEPENDENCE DAY AND 6:00 A.M. THE DAY AFTER INDEPENDENCE DAY.
   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 P.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 6:00 A.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 P.M. FRIDAY AND 6:00 A.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 P.M. TUESDAY TO 6:00 A.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 P.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 6:00 A.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

LANE AND SHOULDER CLOSURE REQUIREMENTS
C) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1011.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING SHEET TCP-3 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLAN, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
G) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

TRAFFIC CONTROL PHASING

PERFORM BRIDGE REPAIR WORK USING FLAGGING OPERATION LANE CLOSURES ACCORDING TO SHEET TCP-3 AND THE TIME RESTRICTIONS SET FORTH ON SHEET TCP-2.

AT THE END OF EACH DAY'S OPERATIONS MOVE EQUIPMENT TO A STAGING AREA AT LEAST 40 FEET AWAY FROM ANY TRAVEL LANE AND REMOVE LANE CLOSURES AND DEVICES AS DIRECTED BY THE ENGINEER.

UPON COMPLETION OF THE PROJECT, REMOVE ALL TRAFFIC CONTROL DEVICES.
NOTE:
DO NOT LOCATE FLAGGER STATIONS ON BRIDGE.

1. INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC.

2. REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.

3. PLACE CONE CHANNELIZING DEVICES THRU THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.

4. DRUM OR SKINNY DRUM CHANNELIZING DEVICES MAY BE USED INSTEAD OF CONES.

5. IF THE TRAVELWAY WIDTH IS 28' OR LESS, OR IF A PILOT CAR IS USED, CHANNELIZING DEVICES MAY NOT BE REQUIRED ALONG THE WORK AREA. CHANNELIZING DEVICES ARE ALWAYS REQUIRED IN THE TWO-WAY TRAFFIC TAPER AND DOWNSTREAM TAPER.

6. DO NOT INSTALL MORE THAN ONE (1) WIDE OF LANE CLOSURE, MEASURED FROM THE BEGINNING OF THE TWO-WAY TRAFFIC TAPER TO THE END OF THE LANE CLOSURE.

7. EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE FLAGGER.
   (REFER TO MINIMUM STOPPING SIGHT DISTANCE TABLE ON ROADWAY STD. DWG. 1101.11, SHEET 2)

8. DO NOT STOP TRAFFIC IN ANY ONE DIRECTION FOR MORE THAN 5 MINUTES AT A TIME.

9. USE FLAGGERS TO CONTROL TRAFFIC AT INTERSECTIONS AFFECTED BY THE LANE CLOSURE. SUPPLEMENT FLAGGERS LOCATED AT INTERSECTIONS WITH FLAGGERS AHEAD STOPS (WO-7a) PLACED APPROXIMATELY 250 FT. IN ADVANCE OF THE FLAGGER. WHERE INTERSECTIONS ARE SIGNALIZED PLACE SIGNALS IN THE FLASH MODE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

10. FLAGGERS SHALL NOT STAND IN A LANE USED BY MOVING TRAFFIC. FLAGGERS SHALL STAND ON THE SHOULDER, WITHIN A CLOSED LANE, OR IN A LANE ONLY ONCE TRAFFIC IS STOPPED.

11. USE THE PILOT CAR METHOD WHEN DIRECTED BY THE ENGINEER. MOUNT SIGN 620-4 "PILOT CAR FOLLOW ME" AT A VISIBLE LOCATION ON THE REAR OF THE PILOT VEHICLE.

12. ADVISE RESIDENTS AND BUSINESSES WITHIN OR NEAR THE LANE CLOSURE LIMITS ABOUT METHODS OF SAFE EGRESS AND INGRESS FROM DRIVEWAYS DURING LANE CLOSURE OPERATIONS.

13. CHANGEABLE MESSAGE SIGN WORD MESSAGES AND LOCATIONS ARE TO BE APPROVED BY THE ENGINEER. ADDITIONAL MESSAGES MAY BE REQUIRED SUCH AS FOR PUBLIC INFORMATION OR DURING SPECIAL EVENTS.