Finance
Purchasing Division
929 N Front St., 10th Floor
Post Office Box 1810
Wilmington, NC 28402-1810

910 341-7830
910 341-7842 fax
wilmingtonnc.gov
Dial 711 TTY/Voice

ADDENDUM NUMBER 2

Masonboro Loop Road Phase II MUP From Parsley Elementary to Andrews Reach Development

MUP-STE-0724

July 17, 2024

To all holders of Bid Documents, please be advised to the following:

1) **Please see the additional sheets for the Erosion Control & Signal design.**

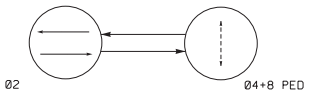
Acknowledge receipt of this Addendum in the space provided in the Proposal. Failure to do so may disqualify the Bidder.

All other terms and conditions remain unchanged.

Daryle L. Parker, Purchasing Manager
Purchasing Division
END OF ADDENDUM TWO

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

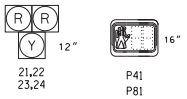
SIGNAL FACE	PHASE 02 DARK	02 ACTIVATION	02 STEADY YELLOW	02 ALL RED	04+8 PED WALK	04+8 PED CLEAR	FLASH
21,22	DRK	FY	Y	R	R	FR*	Y
23,24	DRK	FY	Y	R	R	FR*	Y
P41	DW	DW	DW	DW	W	FDW	DRK
P81	DW	DW	DW	DW	W	FDW	DRK

*ALTERNATING FLASH

Y- STEADY YELLOW
FY- FLASHING YELLOW
R- STEADY RED
FR- FLASHING RED
W- WALK
DW- DON'T WALK
FDW- FLASHING DON'T WALK
DRK- DARK

SIGNAL FACE I.D.

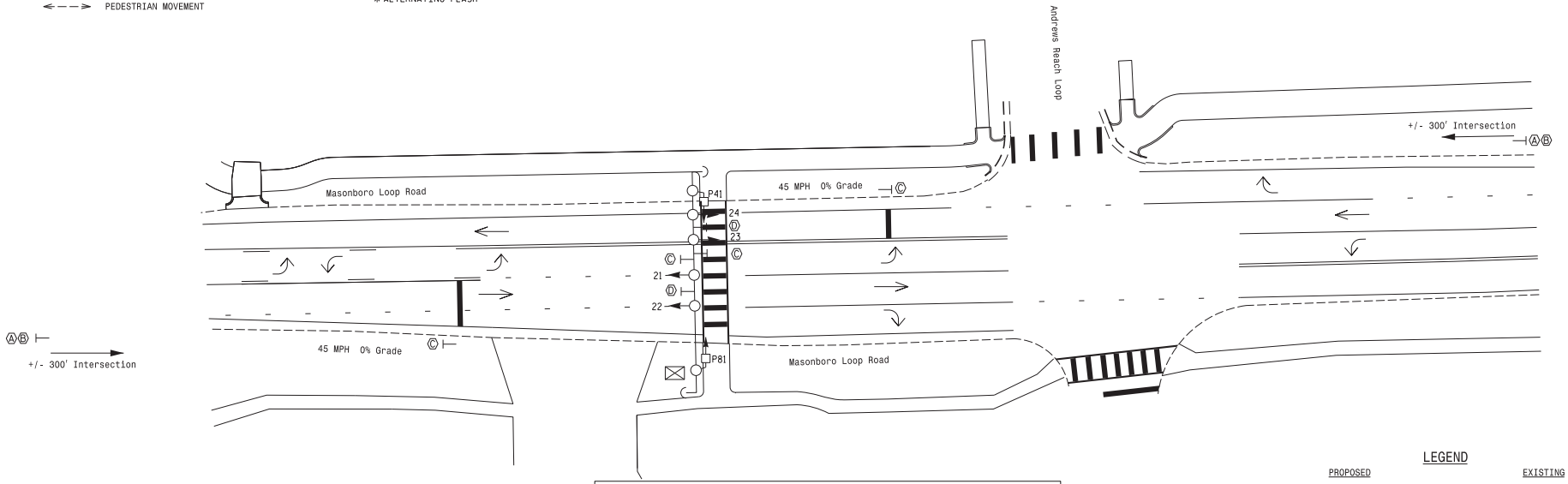
All Heads L.E.D.



2 Phase
Pedestrian Hybrid Beacon
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
3. Enable Ped Yellow Clear for phase 4 + 8.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	4 PED	8 PED	OLA
Min Green 1 *	10	7	7	5
Extension 1 *	0.0	0.0	0.0	
Max Green 1 *	30	0	0	
Yellow Clearance	5.0	3.0	3.0	3.8
Red Clearance	2.0	0.0	0.0	5.0
Walk 1 *	-	7	7	
Don't Walk 1	-	12	12	
Seconds Per Actuation *	-	-	-	
Max Variable Initial *	-	-	-	
Time Before Reduction *	-	-	-	
Time To Reduce *	-	-	-	
Minimum Gap	-	-	-	
Recall Mode	MAX RECALL	-	-	
Vehicle Call Memory	-	-	-	
Dual Entry	-	-	-	
Simultaneous Gap	ON	ON	ON	

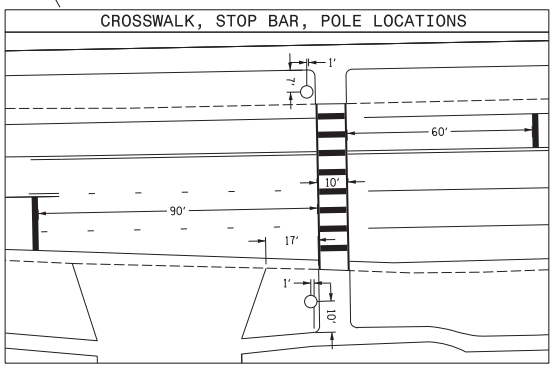
Serves as Flashing Yellow Time

Serves as Steady Yellow Clearance Time

Serves as All Red Clearance Time

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

CROSSWALK, STOP BAR, POLE LOCATIONS



SIGNS

PROPOSED		EXISTING
Ⓐ	Pedestrian Warning Sign (W11-2)	Ⓐ
Ⓑ	"AHEAD" (W16-9P)	Ⓑ
Ⓒ	"CROSSWALK-STOP ON RED" Sign (R10-23)	Ⓒ
Ⓓ	"PEDESTRIAN CROSSWALK" Sign (R9-8)	Ⓓ

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: City of Wilmington

Masonboro Loop Road at Mid Block Crosswalk North of Jasper Place

Division 3 New Hanover County Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZW Esposito	RKA PROJ. NO.:	20303 (040)

SCALE 1"=20' (0 20)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM JAMES HAMILTON

SIGNATURE

1/25/2022 DATE

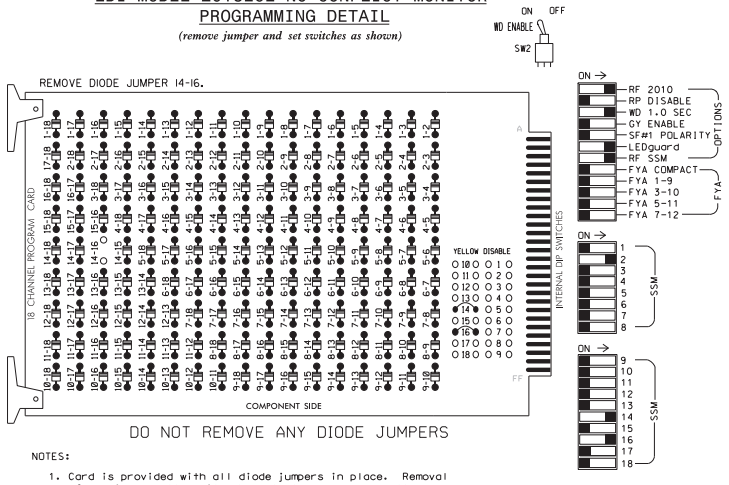
SIG. INVENTORY NO. N/A

RKA RAMEY KEMP ASSOCIATES
1809 Eastpoint Place Raleigh, North Carolina 27560
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



DO NOT REMOVE ANY DIODE JUMPERS

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.
5. Be sure to install YELLOW DISABLE JUMPER for channel 14 (4 PED) and channel 16 (PED).

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	NOT USED	FS DC ISOLATOR
FILE "I" L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
PED PUSH BUTTONS											
P41	T88-5,6	I12L	69	31	PED 4	4 PED					
P81	T88-8,9	I13L	70	32	PED 8	8 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for PED YELLOW CLEAR.
3. Program phase 2 for STARTUP IN GREEN.
4. Program phases 4 and 8 for STARTUP PED CALL.
5. Program phase 2 for YELLOW FLASH.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S6,S12
PHASES USED.....2,*4,4 PED,*8,8 PED
OVERLAP "A".....2**
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

** Denotes used to control clearance intervals.
* Phase used for timing purposes only.

OPERATIONAL NOTES

1. In order for controller to perform the "Pedestrian Hybrid Beacon" (aka. HAWK signal) sequence, special logic and output programming is necessary. See programming details on sheet 2 of this electrical detail.
2. This sequence uses PHASE 2 YELLOW to produce "flashing yellow clearance" and also uses overlap "A" assigned as phase 2 to provide "steady yellow" clearance interval. Time for this interval shall be implemented in "OLA YELLOW CLEAR" timing. See signal plan for timing.
3. Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal. This is necessary so that when flashing yellow clear ends, the steady yellow clear begins.

   Phase 4 and 8 RED CLEAR time must be set to 0.0 sec.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          :12345678910111213141516
VEH OVL PARENTS:: X
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT:: X
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........5
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..3.8
RED CLEAR (0=PARENT,0.1-25.5 SEC)...5.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE TIMING INTERVALS

OVERLAP PROGRAMMING COMPLETE

TIMING INTERVAL SCHEDULE

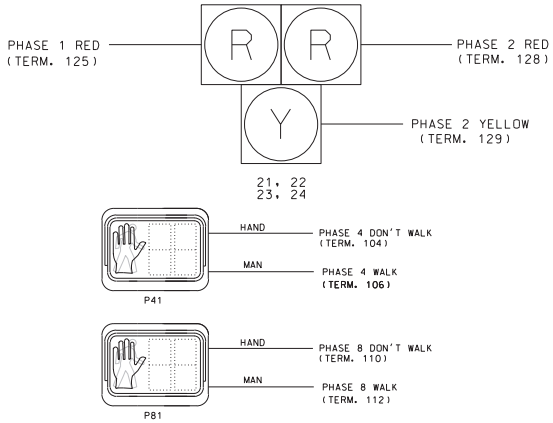
PHASE 2 YELLOW CLEAR TIME = FLASHING YELLOW CLEARANCE INTERVAL
OVERLAP "A" YELLOW CLEAR TIME = STEADY YELLOW CLEARANCE INTERVAL
OVERLAP "A" RED CLEAR TIME = ALL RED CLEARANCE INTERVAL

NOTE: Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal.

RKA
RAMEY KEMP ASSOCIATES
5809 Harrington Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | rameykemp.com | NC License No. C-0910

SIGNAL HEAD WIRING DETAIL

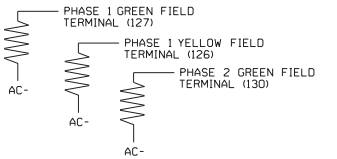
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

WILMINGTON

Masonboro Loop Road
at
Mid Block Crosswalk
North of Jasper Place

Division 3 | New Hanover County | Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZW Esposito	RKA PROJ. NO.:	20303 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM JAMES HAMILTON

SIGNATURE 1/25/2022 DATE

SIG. INVENTORY NO. N/A

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF PED CLEAR ON PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #1 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #11 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF PED CLEAR ON PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #1 IS OFF
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #14 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF VEH CALL ON PHASE #4 IS ON
OR VEH CALL ON PHASE #8 IS ON
SCROLL DOWN
THEN:
SET INPUT ASSIGNMENT #31 ON

NOTE: LOGIC TO ENSURE THAT PHASE 4 PED IS ALWAYS SERVED WITH PHASE 4 VEHICLE.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

I/O REFERENCE SCHEDULE

OUTPUT 1 = PHASE 4 DON'T WALK
OUTPUT 4 = PHASE 4 YELLOW
OUTPUT 11 = OLA RED
OUTPUT 14 = OLA RED (DUPLICATE)
INPUT 31 = PHASE 4 & 8 PED CALL

Outputs 11 and 14 have been remapped.
See detail on this sheet.

OUTPUT REMAPPING DETAIL FOR SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "11"

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................11
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY TO ADVANCE TO OUTPUT 12

```
PAGE:1  C1 PIN:13  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH).............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

MODIFY DATA AS SHOWN TO MAKE OUTPUT 12 A FLASHING OUTPUT

NOTE: THIS MODIFIES THE PHASE 2 YELLOW LOAD SWITCH DRIVER TO FLASH, WHICH WILL PROVIDE THE FLASHING YELLOW CLEARANCE INTERVAL.

PRESS "+" KEY TWICE TO ADVANCE TO OUTPUT 14

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................14
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S1 RED.

PRESS "+" KEY TO MULTIPLE TIMES TO ADVANCE TO OUTPUT 51

CHANGE C1 PIN NUMBER FROM 98 TO 13 AS SHOWN

```
PAGE:1  C1 PIN:13  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................51
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

NOTE: THIS CHANGE REMAPS THE OVERLAP "A" YELLOW DRIVER TO THE SAME PIN AS PHASE 2 YELLOW. WHICH WILL PROVIDE THE OUTPUT FOR THE STEADY YELLOW CLEARANCE.

OUTPUT PROGRAMMING COMPLETE

PEDESTRIAN DETECTOR ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS). PRESS '+' UNTIL PED DETECTOR #4 IS REACHED.

```
PED DETECTOR #4  SETTINGS   (+/- DET)
PHASE#          :12345678910111213141516
PHASES ASSIGNED :   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................Y
ENABLE DIAGNOSTICS..................N
RECALL IF FAILED....................Y
MAX CALLS/MINUTE (0-255).............255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%).............100
```

PRESS '+' FOUR TIMES

```
PED DETECTOR #8  SETTINGS   (+/- DET)
PHASE#          :12345678910111213141516
PHASES ASSIGNED :   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................Y
ENABLE DIAGNOSTICS..................N
RECALL IF FAILED....................Y
MAX CALLS/MINUTE (0-255).............255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%).............100
```

PROGRAMMING COMPLETE

RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

CITY OF WILMINGTON

Masonboro Loop Road
at
Mid Block Crosswalk
North of Jasper Place

Division 3 New Hanover County Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZW Esposito	RKA PROJ. NO.:	20303 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM JAMES HAMILTON

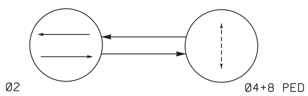
SIGNATURE

4/25/2022
DATE

SIG. INVENTORY NO. N/A

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

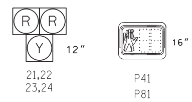
SIGNAL FACE	PHASE Ø2 DARK	ACTIVATION	STEADY YELLOW	ALL RED	Ø4+8 PED WALK	Ø4+8 PED CLEAR	FLASH
21,22	DRK	FY	Y	R	R	FR✳	Y
23,24	DRK	FY	Y	R	R	FR✳	Y
P41	DW	DW	DW	DW	W	FDW	DRK
P81	DW	DW	DW	DW	W	FDW	DRK

✳ ALTERNATING FLASH

Y- STEADY YELLOW
FY- FLASHING YELLOW
R- STEADY RED
FR- FLASHING RED
W- WALK
DW- DON'T WALK
FDW- FLASHING DON'T WALK
DRK- DARK

SIGNAL FACE I.D.

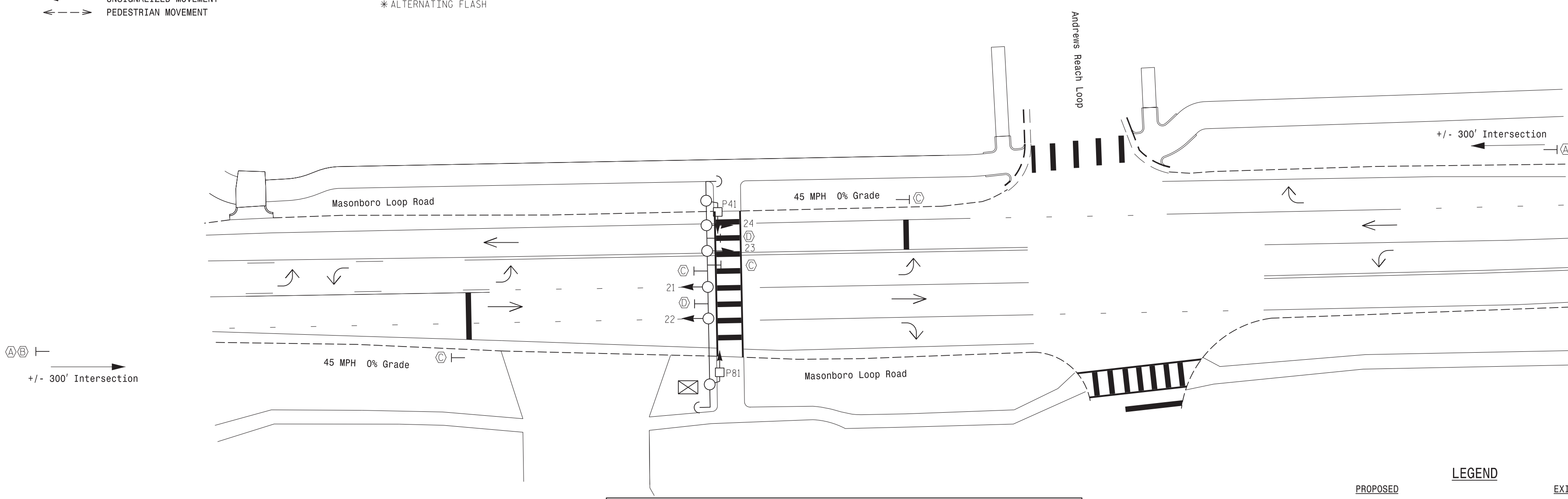
All Heads L.E.D.



2 Phase
Pedestrian Hybrid Beacon
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
3. Enable Ped Yellow Clear for phase 4 + 8.



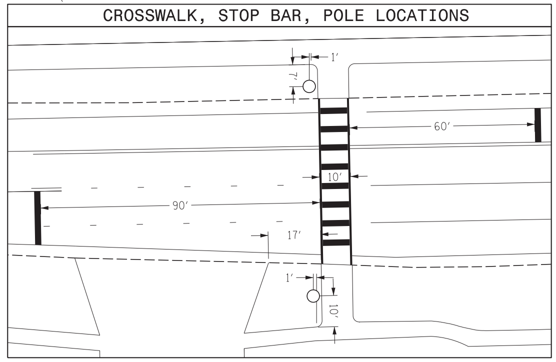
OASIS 2070 TIMING CHART

FEATURE	PHASE 2	4 PED	8 PED	OLA
Min Green 1 *	10	7	7	5
Extension 1 *	0.0	0.0	0.0	
Max Green 1 *	30	0	0	
Yellow Clearance	5.0	3.0	3.0	3.8
Red Clearance	2.0	0.0	0.0	5.0
Walk 1 *	-	7	7	
Don't Walk 1	-	12	12	
Seconds Per Actuation *	-	-	-	
Max Variable Initial *	-	-	-	
Time Before Reduction *	-	-	-	
Time To Reduce *	-	-	-	
Minimum Gap	-	-	-	
Recall Mode	MAX RECALL	-	-	
Vehicle Call Memory	-	-	-	
Dual Entry	-	-	-	
Simultaneous Gap	ON	ON	ON	

Serves as Flashing Yellow Time (Yellow Clearance, phase 2)
Serves as Steady Yellow Clearance Time (OLA Yellow Clearance)
Serves as All Red Clearance Time (OLA Red Clearance)

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

CROSSWALK, STOP BAR, POLE LOCATIONS



SIGNS

PROPOSED		EXISTING
Ⓐ	Pedestrian Warning Sign (W11-2)	Ⓐ
Ⓑ	"AHEAD" (W16-9P)	Ⓑ
Ⓒ	"CROSSWALK-STOP ON RED" Sign (R10-23)	Ⓒ
Ⓓ	"PEDESTRIAN CROSSWALK" Sign (R9-8)	Ⓓ

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: WILMINGTON

Masonboro Loop Road
at
Mid Block Crosswalk
North of Jasper Place

Division 3 New Hanover County Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZM Esposito	RKA PROJ. NO.:	20303 (040)

REVISIONS	INIT.	DATE

SCALE 0 20 1"=20'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER

SIGNATURE 1/25/2022 DATE

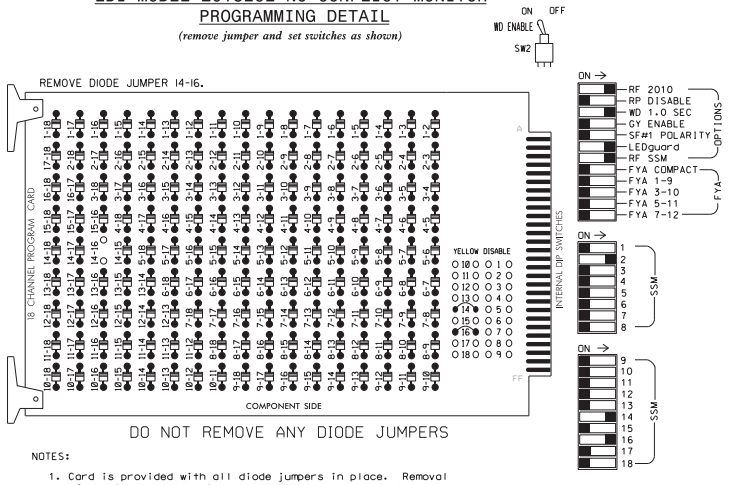
SIG. INVENTORY NO. N/A

RKA
RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



DO NOT REMOVE ANY DIODE JUMPERS

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.
5. Be sure to install YELLOW DISABLE JUMPER for channel 14 (4 PED) and channel 16 (PED).

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	NOT USED	FS DC ISOLATOR
FILE "I" L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
PED PUSH BUTTONS											
P41	T88-5,6	I12L	69	31	PED 4	4 PED					
P81	T88-8,9	I13L	70	32	PED 8	8 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for PED YELLOW CLEAR.
3. Program phase 2 for STARTUP IN GREEN.
4. Program phases 4 and 8 for STARTUP PED CALL.
5. Program phase 2 for YELLOW FLASH.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S6,S12
PHASES USED.....2,*4,4 PED,*8,8 PED
OVERLAP "A".....2**
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

** Denotes used to control clearance intervals.
* Phase used for timing purposes only.

OPERATIONAL NOTES

1. In order for controller to perform the "Pedestrian Hybrid Beacon" (aka. HAWK signal) sequence, special logic and output programming is necessary. See programming details on sheet 2 of this electrical detail.
2. This sequence uses PHASE 2 YELLOW to produce "flashing yellow clearance" and also uses overlap "A" assigned as phase 2 to provide "steady yellow" clearance interval. Time for this interval shall be implemented in "OLA YELLOW CLEAR" timing. See signal plan for timing.
3. Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal. This is necessary so that when flashing yellow clear ends, the steady yellow clear begins.

   Phase 4 and 8 RED CLEAR time must be set to 0.0 sec.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          :12345678910111213141516
VEH OVL PARENTS:: X
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT:: X
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........5
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..3.8
RED CLEAR (0=PARENT,0.1-25.5 SEC)...5.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE TIMING INTERVALS

OVERLAP PROGRAMMING COMPLETE

TIMING INTERVAL SCHEDULE

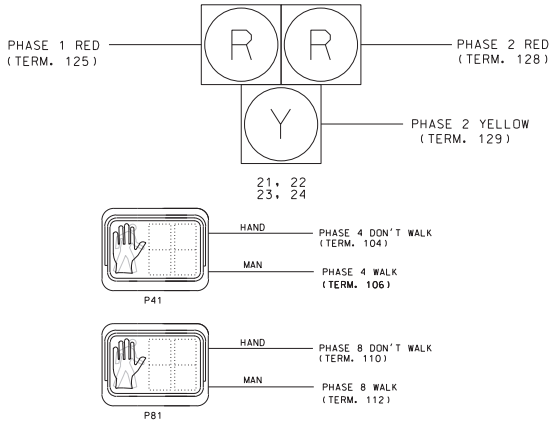
PHASE 2 YELLOW CLEAR TIME = FLASHING YELLOW CLEARANCE INTERVAL
OVERLAP "A" YELLOW CLEAR TIME = STEADY YELLOW CLEARANCE INTERVAL
OVERLAP "A" RED CLEAR TIME = ALL RED CLEARANCE INTERVAL

NOTE: Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal.

RKA
RAMEY KEMP ASSOCIATES
5809 Harrington Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | rameykemp.com | NC License No. C-0910

SIGNAL HEAD WIRING DETAIL

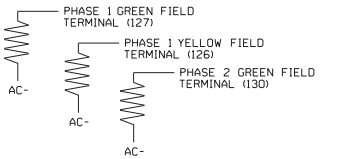
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

WILMINGTON

Masonboro Loop Road
at
Mid Block Crosswalk
North of Jasper Place

Division 3 | New Hanover County | Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZW Esposito	RKA PROJ. NO.:	20303 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM JAMES HAMILTON

SIGNATURE 1/25/2022 DATE

SIG. INVENTORY NO. N/A

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF PED CLEAR ON PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #1 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #11 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF PED CLEAR ON PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #1 IS OFF
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #14 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF VEH CALL ON PHASE #4 IS ON
OR VEH CALL ON PHASE #8 IS ON
SCROLL DOWN
THEN:
SET INPUT ASSIGNMENT #31 ON

NOTE: LOGIC TO ENSURE THAT PHASE 4 PED IS ALWAYS SERVED WITH PHASE 4 VEHICLE.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

I/O REFERENCE SCHEDULE

OUTPUT 1 = PHASE 4 DON'T WALK
OUTPUT 4 = PHASE 4 YELLOW
OUTPUT 11 = OLA RED
OUTPUT 14 = OLA RED (DUPLICATE)
INPUT 31 = PHASE 4 & 8 PED CALL

Outputs 11 and 14 have been remapped.
See detail on this sheet.

OUTPUT REMAPPING DETAIL FOR SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "11"

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................11
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY TO ADVANCE TO OUTPUT 12

```
PAGE:1  C1 PIN:13  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH).............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

MODIFY DATA AS SHOWN TO MAKE OUTPUT 12 A FLASHING OUTPUT

NOTE: THIS MODIFIES THE PHASE 2 YELLOW LOAD SWITCH DRIVER TO FLASH, WHICH WILL PROVIDE THE FLASHING YELLOW CLEARANCE INTERVAL.

PRESS "+" KEY TWICE TO ADVANCE TO OUTPUT 14

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................14
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S1 RED.

PRESS "+" KEY TO MULTIPLE TIMES TO ADVANCE TO OUTPUT 51

CHANGE C1 PIN NUMBER FROM 98 TO 13 AS SHOWN

```
PAGE:1  C1 PIN:13  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................51
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

NOTE: THIS CHANGE REMAPS THE OVERLAP "A" YELLOW DRIVER TO THE SAME PIN AS PHASE 2 YELLOW. WHICH WILL PROVIDE THE OUTPUT FOR THE STEADY YELLOW CLEARANCE.

OUTPUT PROGRAMMING COMPLETE

PEDESTRIAN DETECTOR ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS). PRESS '+' UNTIL PED DETECTOR #4 IS REACHED.

```
PED DETECTOR #4  SETTINGS   (+/- DET)
PHASE#          :12345678910111213141516
PHASES ASSIGNED :   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................Y
ENABLE DIAGNOSTICS..................N
RECALL IF FAILED....................Y
MAX CALLS/MINUTE (0-255).............255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%).............100
```

PRESS '+' FOUR TIMES

```
PED DETECTOR #8  SETTINGS   (+/- DET)
PHASE#          :12345678910111213141516
PHASES ASSIGNED :   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................Y
ENABLE DIAGNOSTICS..................N
RECALL IF FAILED....................Y
MAX CALLS/MINUTE (0-255).............255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%).............100
```

PROGRAMMING COMPLETE

RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

CITY OF WILMINGTON

Masonboro Loop Road
at
Mid Block Crosswalk
North of Jasper Place

Division 3 New Hanover County Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZW Esposito	RKA PROJ. NO.:	20303 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM JAMES HAMILTON

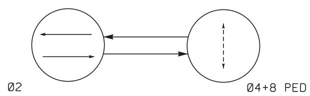
SIGNATURE

4/25/2022
DATE

SIG. INVENTORY NO. N/A

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

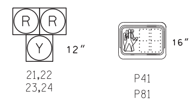
SIGNAL FACE	PHASE						
	Ø2 DARK	ACTIVATION	STEADY YELLOW	ALL RED	Ø4+8 PED WALK	Ø4+8 PED CLEAR	FLASH
21,22	DRK	FY	Y	R	R	FR✳	Y
23,24	DRK	FY	Y	R	R	FR✳	Y
P41	DW	DW	DW	DW	W	FDW	DRK
P81	DW	DW	DW	DW	W	FDW	DRK

✳ ALTERNATING FLASH

Y- STEADY YELLOW
FY- FLASHING YELLOW
R- STEADY RED
FR- FLASHING RED
W- WALK
DW- DON'T WALK
FDW- FLASHING DON'T WALK
DRK- DARK

SIGNAL FACE I.D.

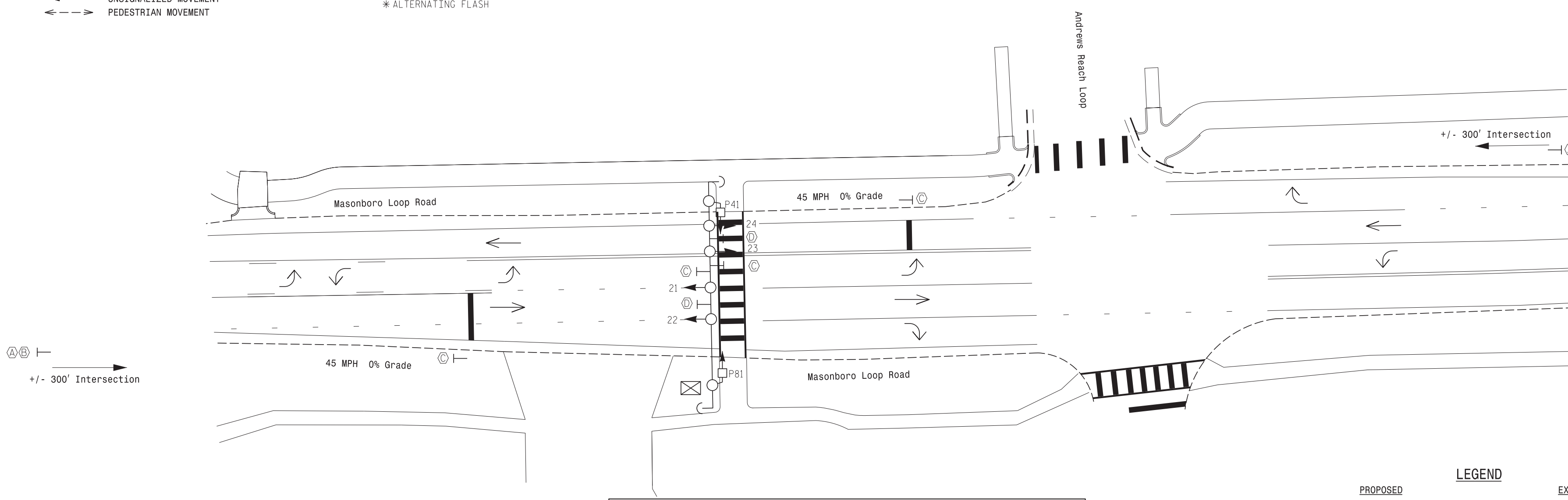
All Heads L.E.D.



2 Phase
Pedestrian Hybrid Beacon
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
3. Enable Ped Yellow Clear for phase 4 + 8.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4 PED	PHASE 8 PED	PHASE OLA
Min Green 1 *	10	7	7	5
Extension 1 *	0.0	0.0	0.0	
Max Green 1 *	30	0	0	
Yellow Clearance	5.0	3.0	3.0	3.8
Red Clearance	2.0	0.0	0.0	5.0
Walk 1 *	-	7	7	
Don't Walk 1	-	12	12	
Seconds Per Actuation *	-	-	-	
Max Variable Initial *	-	-	-	
Time Before Reduction *	-	-	-	
Time To Reduce *	-	-	-	
Minimum Gap	-	-	-	
Recall Mode	MAX RECALL	-	-	
Vehicle Call Memory	-	-	-	
Dual Entry	-	-	-	
Simultaneous Gap	ON	ON	ON	

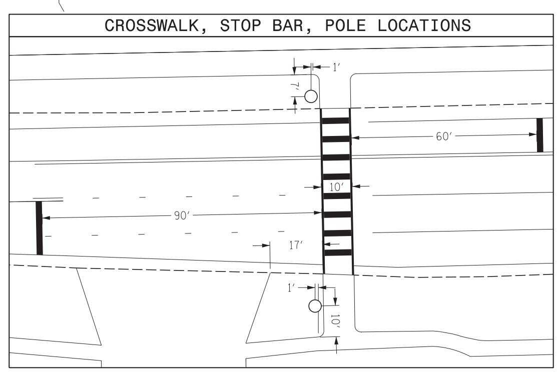
Serves as Flashing Yellow Time (Phase 2 Yellow Clearance)

Serves as Steady Yellow Clearance Time (OLA Yellow Clearance)

Serves as All Red Clearance Time (OLA Red Clearance)

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

CROSSWALK, STOP BAR, POLE LOCATIONS



SIGNS

PROPOSED		EXISTING
Ⓐ	Pedestrian Warning Sign (W11-2)	Ⓐ
Ⓑ	"AHEAD" (W16-9P)	Ⓑ
Ⓒ	"CROSSWALK-STOP ON RED" Sign (R10-23)	Ⓒ
Ⓓ	"PEDESTRIAN CROSSWALK" Sign (R9-8)	Ⓓ

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○—)	Signal Pole with Guy	●—◗
○⌐	Signal Pole with Sidewalk Guy	●⌐
▭	Inductive Loop Detector	⌐- - -¬
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - -	2-in Underground Conduit	- · - · -
N/A	Right of Way	— — —
→	Directional Arrow	→
N/A	Curb Ramp	⩚

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: WILMINGTON

RAMEY KEMP ASSOCIATES

Masonboro Loop Road at Mid Block Crosswalk North of Jasper Place

Division 3 New Hanover County Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZM Esposito	RKA PROJ. NO.:	20303 (040)

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32396

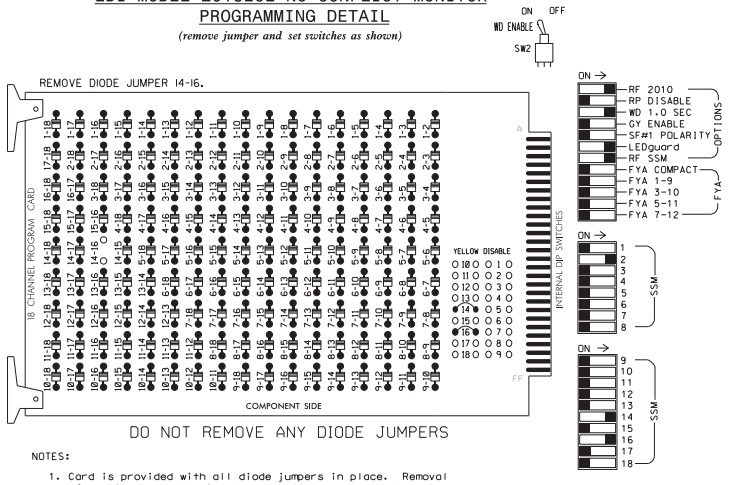
SIGNATURE 1/25/2022 DATE

SIG. INVENTORY NO. N/A

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



DO NOT REMOVE ANY DIODE JUMPERS

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.
5. Be sure to install YELLOW DISABLE JUMPER for channel 14 (4 PED) and channel 16 (PED).

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	NOT USED	FS DC ISOLATOR
FILE "I" L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
PED PUSH BUTTONS											
P41	T88-5,6	I12L	69	31	PED 4	4 PED					
P81	T88-8,9	I13L	70	32	PED 8	8 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for PED YELLOW CLEAR.
3. Program phase 2 for STARTUP IN GREEN.
4. Program phases 4 and 8 for STARTUP PED CALL.
5. Program phase 2 for YELLOW FLASH.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S6,S12
PHASES USED.....2,*4,4 PED,*8,8 PED
OVERLAP "A".....2**
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

** Denotes used to control clearance intervals.
* Phase used for timing purposes only.

OPERATIONAL NOTES

1. In order for controller to perform the "Pedestrian Hybrid Beacon" (aka. HAWK signal) sequence, special logic and output programming is necessary. See programming details on sheet 2 of this electrical detail.
2. This sequence uses PHASE 2 YELLOW to produce "flashing yellow clearance" and also uses overlap "A" assigned as phase 2 to provide "steady yellow" clearance interval. Time for this interval shall be implemented in "OLA YELLOW CLEAR" timing. See signal plan for timing.
3. Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal. This is necessary so that when flashing yellow clear ends, the steady yellow clear begins.

   Phase 4 and 8 RED CLEAR time must be set to 0.0 sec.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          :12345678910111213141516
VEH OVL PARENTS:: X
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT:: X
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........5
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..3.8
RED CLEAR (0=PARENT,0.1-25.5 SEC)...5.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE TIMING INTERVALS

OVERLAP PROGRAMMING COMPLETE

TIMING INTERVAL SCHEDULE

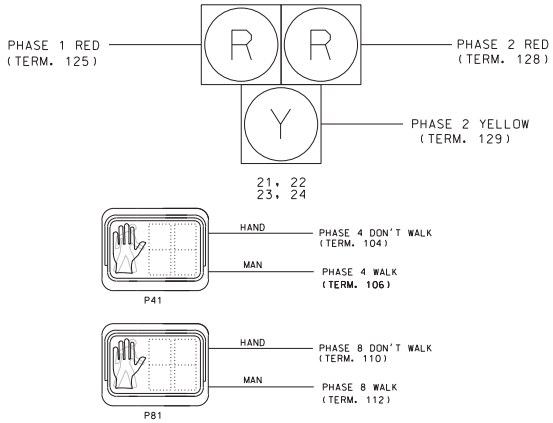
PHASE 2 YELLOW CLEAR TIME = FLASHING YELLOW CLEARANCE INTERVAL
OVERLAP "A" YELLOW CLEAR TIME = STEADY YELLOW CLEARANCE INTERVAL
OVERLAP "A" RED CLEAR TIME = ALL RED CLEARANCE INTERVAL

NOTE: Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal.

RKA
RAMEY KEMP ASSOCIATES
5809 Harrington Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | rameykemp.com | NC License No. C-0910

SIGNAL HEAD WIRING DETAIL

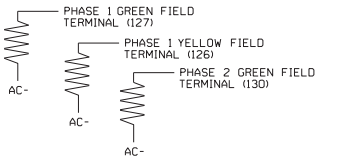
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

WILMINGTON

Masonboro Loop Road
at
Mid Block Crosswalk
North of Jasper Place

Division 3 | New Hanover County | Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZW Esposito	RKA PROJ. NO.:	20303 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM JAMES HAMILTON

SIGNATURE 1/25/2022 DATE

SIG. INVENTORY NO. N/A

PROJECT REFERENCE NO.	SHEET NO.
N/A	Sig-1.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF PED CLEAR ON PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #1 IS ON
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #11 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF PED CLEAR ON PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #1 IS OFF
SCROLL DOWN
THEN:
SET OUTPUT ASSIGNMENT #14 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4 PED CLEAR.

PRESS '+'

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF VEH CALL ON PHASE #4 IS ON
OR VEH CALL ON PHASE #8 IS ON
SCROLL DOWN
THEN:
SET INPUT ASSIGNMENT #31 ON

NOTE: LOGIC TO ENSURE THAT PHASE 4 PED IS ALWAYS SERVED WITH PHASE 4 VEHICLE.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

I/O REFERENCE SCHEDULE

OUTPUT 1 = PHASE 4 DON'T WALK
OUTPUT 4 = PHASE 4 YELLOW
OUTPUT 11 = OLA RED
OUTPUT 14 = OLA RED (DUPLICATE)
INPUT 31 = PHASE 4 & 8 PED CALL

Outputs 11 and 14 have been remapped.
See detail on this sheet.

OUTPUT REMAPPING DETAIL FOR SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "11"

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................11
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:12  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY TO ADVANCE TO OUTPUT 12

```
PAGE:1  C1 PIN:13  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH).............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

MODIFY DATA AS SHOWN TO MAKE OUTPUT 12 A FLASHING OUTPUT

NOTE: THIS MODIFIES THE PHASE 2 YELLOW LOAD SWITCH DRIVER TO FLASH, WHICH WILL PROVIDE THE FLASHING YELLOW CLEARANCE INTERVAL.

PRESS "+" KEY TWICE TO ADVANCE TO OUTPUT 14

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................14
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:16  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA. THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S1 RED.

PRESS "+" KEY TO MULTIPLE TIMES TO ADVANCE TO OUTPUT 51

CHANGE C1 PIN NUMBER FROM 98 TO 13 AS SHOWN

```
PAGE:1  C1 PIN:13  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................51
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP.................
WATCHDOG...........................
DETECTOR RESET.....................
ADVANCE BEACON.....................
OUT OF PHASE FLASHER...............
CONTROLLER FLASH...................
RUN FREE...........................
RESERVED...........................
PREEMPT............................
SOFT PREEMPT.......................
ANY PREEMPT........................
COORDINATION PLAN..................
OFFSET.............................
PHASE CHECK........................
PHASE ON...........................
PHASE NEXT.........................
```

NOTE: THIS CHANGE REMAPS THE OVERLAP "A" YELLOW DRIVER TO THE SAME PIN AS PHASE 2 YELLOW. WHICH WILL PROVIDE THE OUTPUT FOR THE STEADY YELLOW CLEARANCE.

OUTPUT PROGRAMMING COMPLETE

PEDESTRIAN DETECTOR ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS). PRESS '+' UNTIL PED DETECTOR #4 IS REACHED.

```
PED DETECTOR #4  SETTINGS   (+/- DET)
PHASE#          :12345678910111213141516
PHASES ASSIGNED :   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................Y
ENABLE DIAGNOSTICS..................N
RECALL IF FAILED....................Y
MAX CALLS/MINUTE (0-255).............255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%).............100
```

PRESS '+' FOUR TIMES

```
PED DETECTOR #8  SETTINGS   (+/- DET)
PHASE#          :12345678910111213141516
PHASES ASSIGNED :   X   X
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................Y
ENABLE DIAGNOSTICS..................N
RECALL IF FAILED....................Y
MAX CALLS/MINUTE (0-255).............255
MAX CALLS/DIAG PERIOD (0-255).......0
MAX OCCUPANCY % (0-100%).............100
```

PROGRAMMING COMPLETE

RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

CITY OF WILMINGTON

Masonboro Loop Road
at
Mid Block Crosswalk
North of Jasper Place

Division 3 New Hanover County Wilmington

PLAN DATE:	April 2022	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZW Esposito	RKA PROJ. NO.:	20303 (040)

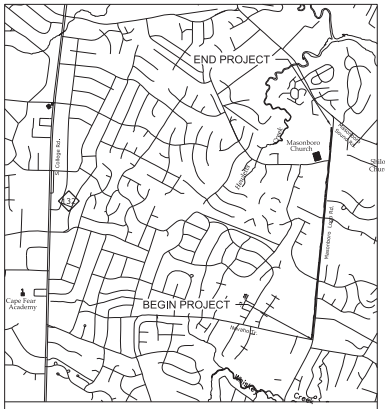
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM JAMES HAMILTON

SIGNATURE

4/25/2022
DATE

SIG. INVENTORY NO. N/A



VICINITY MAP

CITY OF WILMINGTON
NORTH CAROLINA

MASONBORO LOOP ROAD
MULTI-USE TRAIL

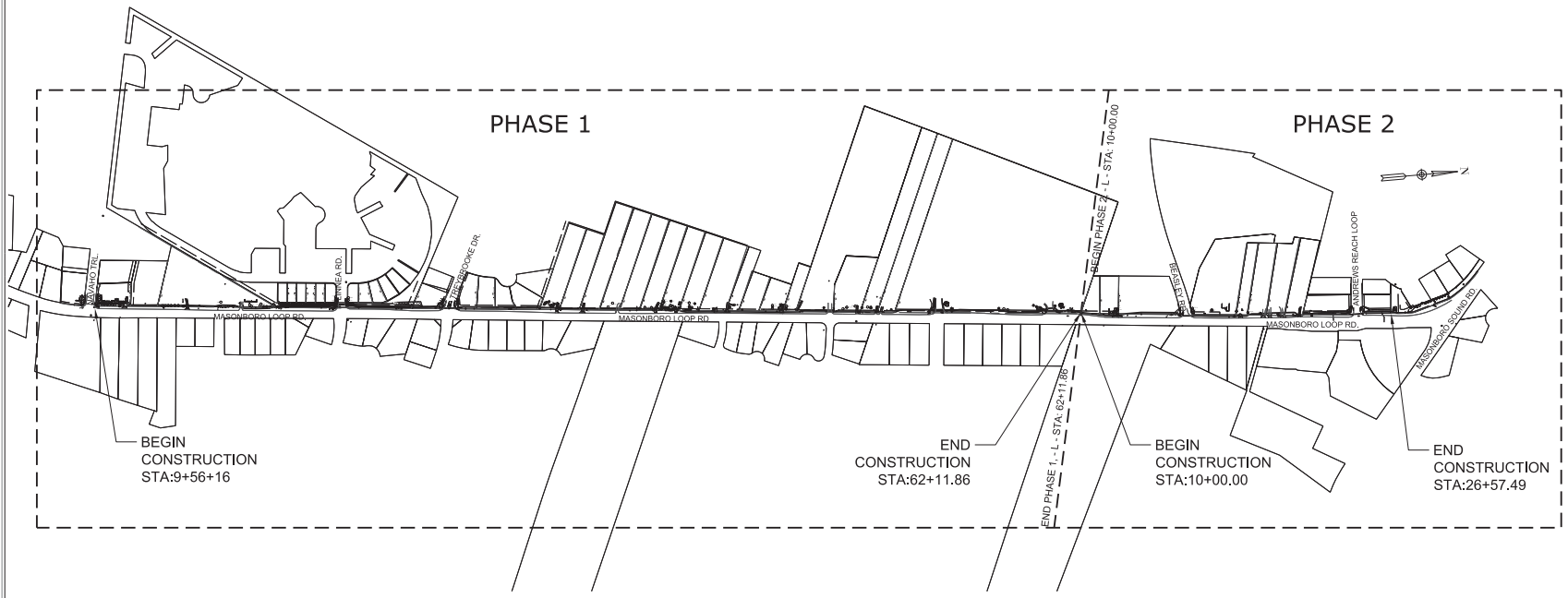
LOCATION:
FROM NAVAHO TRAIL TO
NORTH OF ANDREWS
REACH LOOP

TYPE OF WORK:
GRADING, PAVING,
DRAINAGE, EROSION
CONTROL

INDEX OF SHEETS

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	WW CWW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C



DESIGN DATA	PROJECT LENGTH - PHASE 1	PROJECT LENGTH - PHASE 2
DESIGN SPEED = 20 MPH LEAN ANGLE = 20 DEGREES FUNC. CLASSIFICATION = MULTI-USE PATH	LENGTH OF PROJECT = 1.00 MILES LENGTH OF BOARDWALK = NA LENGTH OF BRIDGE = NA	LENGTH OF PROJECT = 0.31 MILES LENGTH OF BOARDWALK = NA LENGTH OF BRIDGE = NA

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

101 N. TRYON ST., SUITE 1400
CHARLOTTE, NC 28202
T 704.334.7925

FIRM LICENSE # C-1951
www.stewartinc.com
PROJECT # A16010

Client:

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

Seal:

Issued for:

PHASE 1 & 2

No.	Date	Description

(HORIZONTAL)
0 300' 600'

Title:

EC1

PROJECT DESCRIPTION

THE PROJECT SITE IS LOCATED IN NEW HANOVER COUNTY WITHIN THE CITY OF WILMINGTON AND IS WITHIN THE WHITE OAK RIVER BASIN. THE PROPOSED PROJECT INCLUDES THE CONSTRUCTION OF APPROXIMATELY 1.3 MILES OF ROADWAY IMPROVEMENTS AND MULTI-USE TRAIL INSTALLATION ALONG MASONBORO LOOP ROAD BETWEEN NAVAHO TRAIL AND ANDREWS REACH LOOP. THE PROPOSED PROJECT INCLUDES GRADING, PAVING, CURB AND GUTTER, DRAINAGE AND A MULTI-USE TRAIL.

THE LIMITS OF DISTURBANCE WAS CALCULATED AS 4.6 ACRES FOR THIS SITE. ALL DISTURBED AREAS WILL BE STABILIZED WITH VEGETATION BY SEEDING AND MULCHING.

THE PROJECT DESIGN SHALL COMPLY WITH NORTH CAROLINA LAND QUALITY GUIDELINES AND PROCEDURES AND ALL APPLICABLE FEDERAL, STATE, AND CITY REQUIREMENTS AND STANDARDS; IDENTIFYING AREAS WHERE RIGHT-OF-WAY OR EASEMENT ACQUISITION MAY BE NECESSARY TO ACCOMMODATE THE ROADWAY WIDENING; AND PROVIDING PLANS, SPECIFICATIONS AND ESTIMATES. THE PLANS SHALL BE COMPLETED TO SHOW THE DESIGN, SITE PLANS, LANDSCAPING, DRAINAGE, EASEMENTS AND UTILITY CONFLICTS.

GENERAL NOTES

1. ANY STAGING, MATERIAL LAY DOWN, DIRT OR WASTE PILES WILL BE LOCATED WITHIN THE LIMITS OF DISTURBANCE AND A MINIMUM OF 50' FROM ANY STORM DRAIN INLET OR SURFACE WATERS. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING ADEQUATE EROSION CONTROL MEASURES FOR ANY SUCH AREAS. IF ANY ADDITIONAL STAGING AREAS ARE REQUIRED BY THE CONTRACTOR, ANY ADDITIONAL EASEMENTS, AND REGULATORY PERMITS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. ALL MATERIALS WILL BE CONTAINED WITHIN LIMITS OF DISTURBANCE AND WILL BE LOCATED A MINIMUM OF 50' FROM ANY WATERCOURSE OR DRAINAGE STRUCTURES.
3. NO CONCRETE TRUCK WASHOUT IS ALLOWED WITHIN THE CONSTRUCTION LIMITS AND MUST BE PERFORMED AT AN APPROVED OFFSITE LOCATION.

CONSTRUCTION SEQUENCE

1. SUBMIT DOCUMENTATION REQUIRED UNDER THE SITE NPDES STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY (NCG010000) TO STORMWATER INSPECTIONS THROUGHOUT THE PROJECT.
2. PRIOR TO STARTING CONSTRUCTION, CALL ENVIRONMENTAL SPECIALIST BRIAN LAMBE AT (910) 796-7344 TO SCHEDULE AN ON-SITE PRE-CONSTRUCTION MEETING.
3. FLAG WORK LIMITS AND INSTALL TEMPORARY SILT FENCE AND OTHER MEASURES AS SHOWN ON THE CLEARING AND GRUBBING PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. NO CLEARING CAN TAKE PLACE UNTIL EROSION CONTROL MEASURES ARE INSTALLED AND IF CLEARING IS REQUIRED TO INSTALL EROSION CONTROL MEASURES, ONLY CLEAR THE AREA NEEDED TO INSTALL EROSION CONTROL DEVICES.
4. CALL ENVIRONMENTAL SPECIALIST BRIAN LAMBE AT (910) 796-7344 TO SCHEDULE A STORMWATER SITE INSPECTION. CONTACT THE DEMLR WILMINGTON REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO COMMENCING LAND DISTURBING ACTIVITY. THE CONTACT NUMBER IS (910) 796-7215.
5. UPON APPROVAL OF THE STORMWATER SITE INSPECTION, COMMENCE PERMITTED LAND DISTURBING ACTIVITY-CLEARING AND GRUBBING. EROSION AND SEDIMENT CONTROL PERMIT MUST BE OBTAINED BEFORE ANY LAND DISTURBING ACTIVITIES OCCUR. A COPY OF THIS PERMIT AND A HARD COPY OF THE PLAN MUST BE KEPT ON SITE AND ACCESSIBLE DURING INSPECTION. A PERMIT BOX AND RAIN GAUGE SHALL BE ERECTED NEAR THE CONSTRUCTION ENTRANCE. THE PERMIT BOX SHALL INCLUDE A COPY OF THE APPROVED PLANS, THE PERMIT, UPDATED RAINFALL DATA, AND UPDATED SELF-INSPECTION REPORTS.
6. SELF-INSPECTIONS FOR EROSION AND SEDIMENTATION CONTROL MEASURES ARE TO BE PERFORMED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF EVERY RAIN EVENT OF GREATER THAN 0.5 INCH. ANY NEEDED REPAIRS SHALL BE MADE IMMEDIATELY TO MAINTAIN MEASURES AS DESIGNED. ALL ESC MEASURES SHALL BE MAINTAINED AS SPECIFIED IN THE CONSTRUCTION DETAILS ON THIS PLAN. A RAIN GAUGE SHALL BE INSTALLED AT THE PROJECT SITE FOR MONITORING.
7. GROUND STABILIZATION WILL BE APPLIED WITHIN 14 CALENDAR DAYS FROM LAST LAND DISTURBING ACTIVITY. FOR STEEP SLOPES, THAT AREA MUST BE STABILIZED WITHIN 7 DAYS.
8. PERFORM GRADING OPERATIONS AND INSTALL PROPOSED DRAINAGE NETWORK. ENSURE THAT EXISTING DRAINAGE SYSTEMS CONTINUE TO FUNCTION UNTIL SUCH TIME AS PROPOSED SYSTEMS ARE INSTALLED. INSTALL FINAL GRADING EROSION CONTROL DEVICES AS THE DRAINAGE NETWORK IS CONSTRUCTED. USE A SILT BAG FOR DEWATERING OF WORK AREAS AS NEEDED AND FOR CLEANING OUT SEDIMENT CONTAINMENT DEVICES.
9. SITE STABILIZATION IS REQUIRED PRIOR TO FINAL APPROVAL OF GRADING PERMIT AND ISSUANCE OF CERTIFICATE OF OCCUPANCY. GRASS UTILIZED AS PERMANENT GROUND COVER MUST BE AT A MOWABLE HEIGHT THAT GENERALLY PROVIDES AT LEAST 80% COVERAGE THROUGHOUT THE SITE, WITH NO LARGE BARE PATCHES OR EVIDENCE OF EROSION.
10. STABILIZE ALL DENUDED AREAS IN ACCORDANCE WITH THE SOIL STABILIZATION TIMEFRAMES INCLUDED IN THIS DOCUMENT.
11. EROSION CONTROL MEASURES MAY NOT BE REMOVED UNTIL PERMANENT GROUND COVER HAS BEEN WELL ESTABLISHED. ONCE PERMANENT GROUND COVER HAS BEEN ESTABLISHED THROUGHOUT THE SITE, ALL EROSION CONTROL MEASURES MAY BE REMOVED.
12. CALL ENVIRONMENTAL SPECIALIST BRIAN LAMBE AT (910) 796-7344 TO SCHEDULE A STORMWATER FINAL INSPECTION.

NURSE CROP SEEDING

PREPERATION FOR PRIMARY/PERMANENT STABALIZATION SHALL NOT BEGIN UNTIL ALL CONSTRUCTION AND UTILITY WORK WITHIN THE PREPARATION AREA IS COMPLETE. HOWEVER, IT MAY BE NECESSARY TO PREPARE FOR NURSE CROPS PRIOR TO COMPLETION OF CONSTRUCTION AND INSTALLATION OF UTILITIES.

A QUICKLY GERMINATING NURSE CROP OF NON-INVASIVE, NON-COMPETITIVE ANNUAL GRASS SPECIES SHOULD BE USED ALONG WITH NATIVE SEEDING AND/OR MATTING. THESE TEMPORARY MEASURES SHOULD BE PLANTED AT MINIMUM DENSITY AS TO NOT INHIBIT THE GROWTH AND ESTABLISHMENT OF THE PERMANENT, NATIVE SPECIES. REFER TO THE TEMPORARY SEEDING SCHEDULE FOR SPECIFIC NURSE CROP SPECIES AND SEEDING RATES.

TEMPORARY SEEDING SCHEDULE

FERTILIZER SHALL BE THE SAME ANALYSIS AS SPECIFIED FOR PERMANENT SEEDING AND APPLIED AT THE RATE OF 400 POUNDS AND SEEDED AT THE RATE OF 50 POUNDS PER ACRE. SWEET SUDAN GRASS, GERMAN MILLET, OR BROWNTOP MILLET SHALL BE USED IN SUMMER MONTHS AND RYE GRAIN DURING THE REMAINDER OF THE YEAR. THE ENGINEER WILL DETERMINE THE EXACT DATES FOR USING EACH KIND OF SEED.

PERMANENT SEEDING SCHEDULE

SEEDING MIXTURE RATES

MARCH 1 – AUGUST 31		SEPTEMBER 1 – FEBRUARY 28	
LB/ACRE	TYPE	LB/ACRE	TYPE
240	TALL FESCUE	240	TALL FESCUE
10	CENTIPEDE	10	CENTIPEDE
25	BERMUDAGRASS (HULLED)	35	BERMUDAGRASS (HULLED)

ON CUT AND FILL SLOPES 2:1 OR STEEPER CENTIPEDE SHALL BE APPLIED AT THE RATE OF 5 LBS/ACRE AND ADD 20 LBS OF SWITCHGRASS (PANICUM VIRGATUM) FROM JANUARY 1 TO DECEMBER 31.

SOIL AMENDMENTS

APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY A MINIMUM OF 2 TONS/ACRE GROUND AGRICULTURAL LIMESTONE AND 3 TONS/ACRE IN CLAY SOILS, AND 500 LB/ACRE 10-20-20 FERTILIZER. A DIFFERENT ANALYSIS OF FERTILIZER MAY BE USED PROVIDED THE 1-2-2 RATIO IS MAINTAINED AND THE RATE OF APPLICATION ADJUSTED TO PROVIDE THE SAME AMOUNT OF PLANT FOOD AS A 10-20-20 ANALYSIS AND AS DIRECTED.

MULCH

APPLY 4,000 LB/ACRE GRAIN STRAW OR EQUIVALENT COVER OF ANOTHER SUITABLE MULCH. ANCHOR STRAW BY TACKING WITH ASPHALT AT A RATE OF 400 GALLONS OF ASPHALT PER ACRE.

MAINTENANCE

REFERTILIZE IN THE SECOND YEAR UNLESS GROWTH IS FULLY ADEQUATE. MAY BE MOWED ONCE OR TWICE A YEAR, BUT MOWING IS NOT NECESSARY. THE MINIMUM MOWING HEIGHT SHALL BE 4". RESEED, FERTILIZE, AND MULCH DAMAGED AREAS IMMEDIATELY.

24 HR CONTACT: ANTHONY GEATHERS
CITY OF WILMINGTON
(910) 341-5889

WETLAND SEEDING MIXTURE

SEEDING MIXTURE TO BE USED FOR RESTORATION OF ANY DISTURBED WETLAND DURING CONSTRUCTION.

COMMON NAME	SPECIES NAME	PERCENT	RATE (LBS/ACRE)
AUTUMN BENTGRASS	AGROSTIS PERENNANS	25	20
BEGGAR TICKS	BIDENS ARISTOSA	5	20
BLACK-EYED SUSAN	RUDBECKIA HIRTA	2.5	20
BLUE FLAG	IRIS VERSICOLOR	2.5	20
BLUE VERVAIN	VERBENA HASTATE	2.5	20
BUSHY BLUESTEM	ANDROPOGON GLOMERATUS	2.5	20
CARDINAL FLOWER	LOBELIA CARDINALIS	2.5	20
COREOPSIS	COREOPSIS LANCEOLATA	5	20
DEER TONGUE	PANICUM CLANDESTINUM	5	20
FOX SEDGE	CAREX VELPINOIDEA	10	20
INDIAN GRASS	SORGHASTRUM NUTANAS	2.5	20
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM	25	20
PARTRIDGE PEA	CHAMAECRISTA FASCICULATA	2.5	20
PENNSYLVANIA SMARTWEED	POLYGONUM PENNSYLVANICUM	2.5	20
RIVER OATS	UNIOLA LATIFOLIA	2.5	20
SNOWY TICK TREFOIL	DESMODIUM CANADENSE	2.5	20
SOFT RUSH	JUNCUS EFFUSUS	2.5	20
SWITCHGRASS	PANICUM VIRGATUM	7	20
VIRGINIA WILD RYE	ELYMUS VIRGINICUS	13	20

MAINTENANCE REQUIREMENTS

1. EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF-PRODUCING RAINFALL OR AT A MINIMUM ONCE A WEEK. IF REPAIRS ARE NEEDED THEY WILL BE DONE SO IMMEDIATELY.
2. SEDIMENT WILL BE REMOVED FROM BEHIND SILT FENCING WHEN IT BECOMES 0.5 FT DEEP OR GREATER. SILT FENCING WILL BE REPLACED AS NECESSARY TO MAINTAIN AN ADEQUATE BARRIER.
3. EROSION AND SEDIMENT CONTROL PRACTICES INCLUDING: SILT CHECKS, PIPE INLET SEDIMENT TRAPS, AND ROCK INLET SEDIMENT TRAPS WILL BE CLEANED OUT AS NECESSARY.
4. ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDED AS NECESSARY, AND MULCHED ACCORDING TO THE SPECIAL PROVISIONS IN ORDER TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER.

SOIL PREPARATION

FOR AREAS THAT ARE TO BE SEEDED ALL STONES LARGER THAN 3 INCHES, STICKS, ROOTS, AND OTHER MATERIALS SHALL BE REMOVED. AREAS TO BE SEEDED OR PLANTED SHALL BE TILLED OR RIPPED TO A MINIMUM DEPTH OF 4 INCHES. LIME AND FERTILIZER SHALL BE APPLIED AS SPECIFIED IN THE SEEDING SCHEDULE.

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1951
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

NORTH CAROLINA REGISTERED 13328 PROFESSIONAL ENGINEER TREY G. GOEN

Issued for:

No.	Date	Description

Title:

DETAILS

Sheet No.:

EC-3A

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

TEMPORARY SILT FENCE

SHEET 1 OF 1

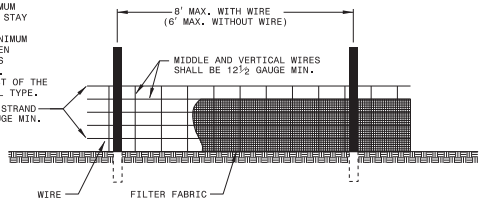
1605.01

NOTES

USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.

USE FILTER FABRIC A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.

PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.

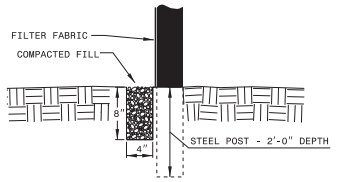


MAINTENANCE:
INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.

SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.

REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABALIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERTLY STABALIZED.



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

TEMPORARY SILT FENCE

SHEET 1 OF 1

1605.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

7-06

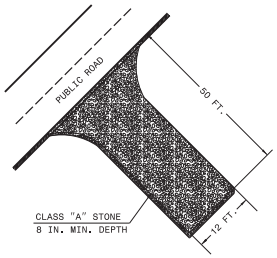
ENGLISH STANDARD DRAWING FOR

GRAVEL CONSTRUCTION ENTRANCE

SHEET 1 OF 1

1607.01

NOTES:
1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
2. LOCATE ENTRANCE(S) TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. LOCATE GRAVEL CONSTRUCTION ENTRANCE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. PROVIDE FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE.
6. NUMBER AND LOCATION OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE ENGINEER.
7. USE CLASS 'A' STONE OR OTHER COARSE AGGREGATE APPROVED BY THE ENGINEER.



MAINTENANCE:
ADD ADDITIONAL STONE AND "FLUFF" TOP DRESSING WITH 2" STONE.
SEE N. C. DEPT. OF ENVIRONMENT AND NATURAL RESOURCES, EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR CONDITIONS WHERE PRACTICE APPLIES.

NOTE: PLACE FILTER FABRIC BENEATH STONE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR

GRAVEL CONSTRUCTION ENTRANCE

SHEET 1 OF 1

1607.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1

1606.01

GENERAL NOTES:

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH 1/4 INCH MESH OPENINGS.

INSTALL 5 FT. SELF FASTENER ANGLE STEEL POST 2 FT. DEEP MINIMUM.

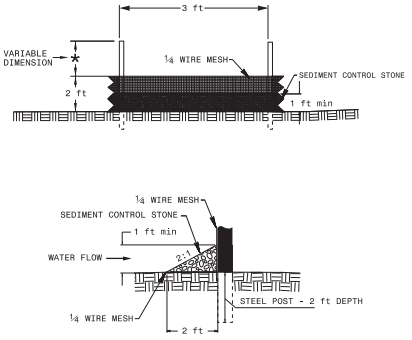
SPACE POST A MAXIMUM OF 3 FT.

MAINTENANCE:
INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.

SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.

REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABALIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERTLY STABALIZED.



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1

1606.01

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

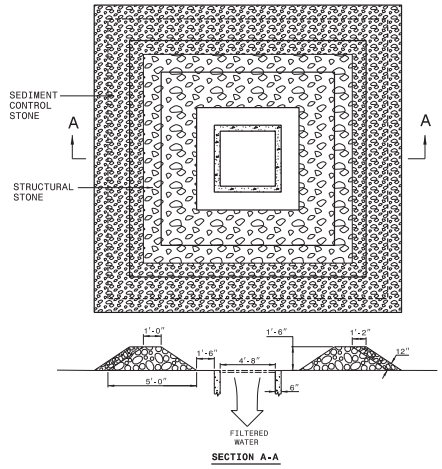
7-06

ENGLISH STANDARD DRAWING FOR

ROCK INLET SEDIMENT TRAP TYPE 'B'

SHEET 1 OF 1

1632.02



SECTION A-A

NOTE:
USE CLASS 'A' STONE FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL.
DIMENSIONS SHOWN ARE MINIMUM ACCEPTABLE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
CONSTRUCT TOP OF BERM A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR ANY DIVERSION POINT.

MAINTENANCE:
INSPECT INLETS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (0.5" OR GREATER) RAINFALL EVENT. CLEAR THE MESH WIRE OF ANY DEBRIS OR OTHER OBJETS TO PROVIDE ADEQUATE FLOW FOR SUBSEQUENT RAINS. TAKE CARE NOT TO DAMAGE OR UNDERCUT THE WIRE MESH DURING SEDIMENT REMOVAL. REPLACE STONE AS NEEDED.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR

ROCK INLET SEDIMENT TRAP TYPE 'B'

SHEET 1 OF 1

1632.02

STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

Issued for:

No.	Date	Description

Title:

DETAILS

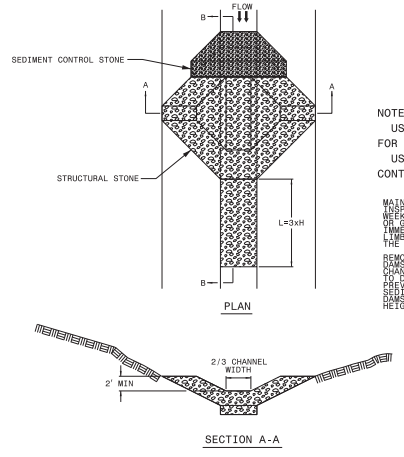
Sheet No.:

EC-3B

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

TEMPORARY ROCK SILT CHECK TYPE 'A'



NOTE
USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

MAINTENANCE:
INSPECT CHECK DAMS AND CHANNELS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (0.5" OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE AND DISPOSE STRAW, LIMBS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED.

REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION. ALLOW THE CHANNEL TO DRAIN THROUGH THE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

TEMPORARY ROCK SILT CHECK TYPE 'A'

SHEET 1 OF 1 — 1633.01

SHEET 1 OF 1 — 1633.01

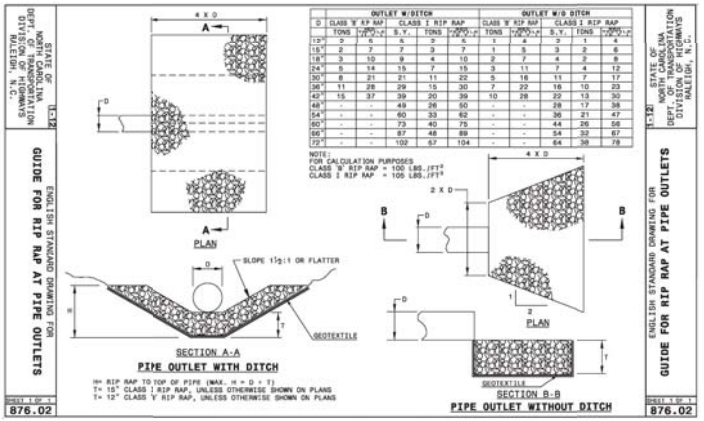
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR

GUIDE FOR RIP RAP AT PIPE OUTLETS

SHEET 1 OF 1 — 876.02



D	OUTLET W/DITCH CLASS 'B' RIP RAP TONS	TONS	S.Y.	CLASS I RIP RAP TONS	TONS	S.Y.	OUTLET W/O DITCH CLASS 'B' RIP RAP TONS	TONS	S.Y.	CLASS I RIP RAP TONS	TONS	S.Y.
12"	2	5	4	2	5	1	4	3	1	4		
15"	2	7	7	3	7	1	5	3	2	6		
18"	3	10	9	4	10	2	7	4	2	6		
24"	5	14	15	7	15	3	11	7	4	12		
30"	8	21	21	11	22	5	18	11	7	17		
36"	11	28	29	15	30	7	22	16	10	23		
42"	15	37	39	20	39	10	28	22	13	30		
48"	-	-	49	26	50	-	-	28	17	38		
54"	-	-	60	33	62	-	-	36	21	47		
60"	-	-	73	40	75	-	-	44	26	56		
66"	-	-	87	48	89	-	-	54	32	67		
72"	-	-	102	57	104	-	-	64	38	79		

NOTE:
FOR CALCULATION PURPOSES
CLASS 'B' RIP RAP = 100 LBS./FT³
CLASS I RIP RAP = 105 LBS./FT³

H= RIP RAP TO TOP OF PIPE (MAX. H = D + T)
T= 15" CLASS I RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS
T= 12" CLASS 'B' RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR

GUIDE FOR RIP RAP AT PIPE OUTLETS

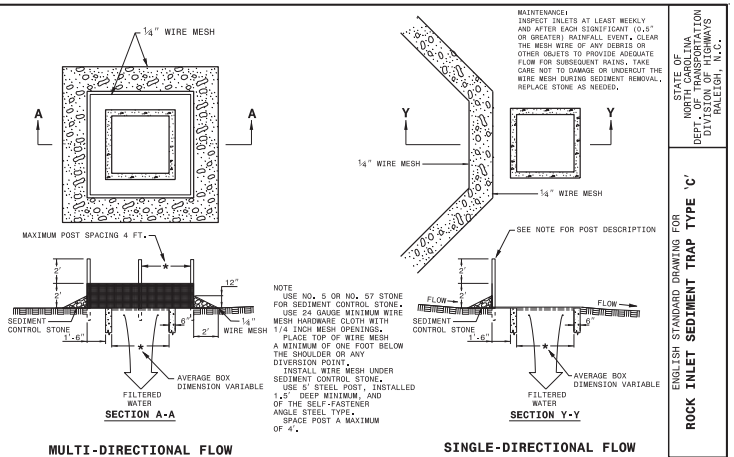
SHEET 1 OF 1 — 876.02

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

ROCK INLET SEDIMENT TRAP TYPE 'C'

SHEET 1 OF 1 — 1632.03



MAINTENANCE:
INSPECT INLETS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (0.5" OR GREATER) RAINFALL EVENT. CLEAR THE MESH WIRE OF ANY DEBRIS OR OTHER OBJETS TO PROVIDE ADEQUATE FLOW FOR SUBSEQUENT RAINS. TAKE CARE NOT TO DAMAGE OR UNDERCUT THE WIRE MESH DURING SEDIMENT REMOVAL. REPLACE STONE AS NEEDED.

NOTE
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.
USE 24 GAUGE MINIMUM WIRE MESH HARDWARE CLOTH WITH 1/4 INCH MESH OPENINGS.
PLACE TOP OF WIRE MESH A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR ANY DIVERSION POINT.
INSTALL WIRE MESH UNDER SEDIMENT CONTROL STONE.
USE 5' STEEL POST, INSTALLED 1.5' DEEP MINIMUM, AND OF THE SELF-FASTENER ANGLE STEEL TYPE.
SPACE POST A MAXIMUM OF 4'.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

ROCK INLET SEDIMENT TRAP TYPE 'C'

SHEET 1 OF 1 — 1632.03

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

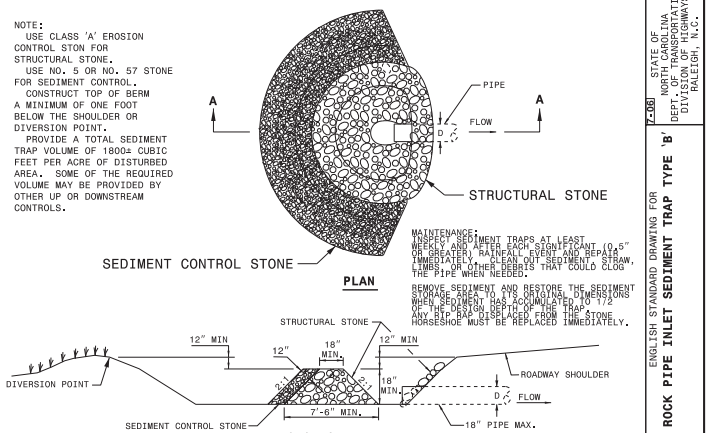
7-08

ENGLISH STANDARD DRAWING FOR

ROCK PIPE INLET SEDIMENT TRAP TYPE 'B'

SHEET 1 OF 1 — 1635.02

NOTE:
USE CLASS 'A' EROSION CONTROL STON FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL.
CONSTRUCT TOP OF BERM A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR DIVERSION POINT.
PROVIDE A TOTAL SEDIMENT TRAP VOLUME OF 1800± CUBIC FEET PER ACRE OF DISTURBED AREA. SOME OF THE REQUIRED VOLUME MAY BE PROVIDED BY OTHER UP OR DOWNSTREAM CONTROLS.



MAINTENANCE:
INSPECT SEDIMENT TRAPS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (0.5" OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. CLEAN OUT SEDIMENT, STRAW, LIMBS, OR OTHER DEBRIS THAT WILL CLOG THE PIPE WHEN NEEDED.

REMOVE SEDIMENT AND RESTORE THE SEDIMENT STORAGE AREA TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO 1/2 OF THE DESIGN DEPTH OF THE TRAP. ANY RIP RAP DISPLACED FROM THE STONE HORSESHOE MUST BE REPLACED IMMEDIATELY.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

ROCK PIPE INLET SEDIMENT TRAP TYPE 'B'

SHEET 1 OF 1 — 1635.02

STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE #: C-1951
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

Issued for:

No.	Date	Description

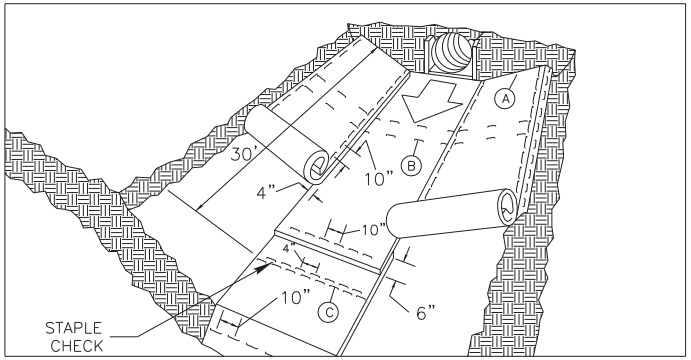
Title:

DETAILS

Sheet No.:

EC-3C

MATTING INSTALLATION DETAIL



MATTING IN DITCHES

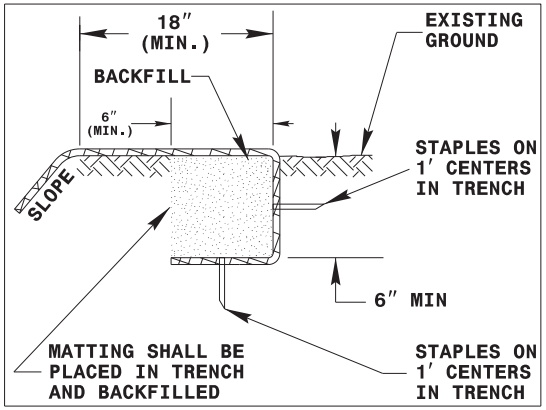
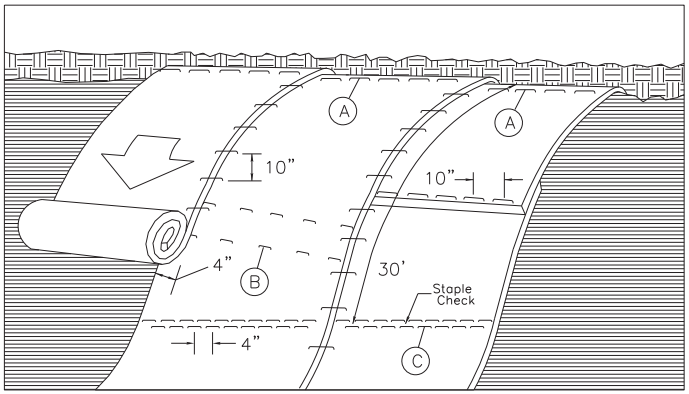


DIAGRAM (A)



MATTING ON SLOPES

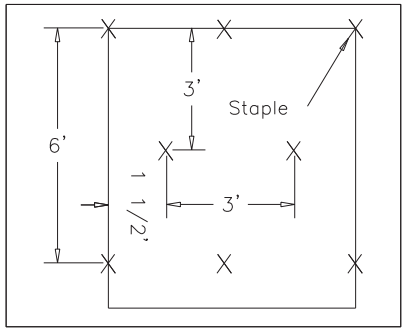


DIAGRAM (B)

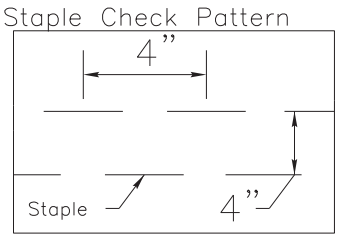


DIAGRAM (C)

NOTES:

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION.

STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

NOT TO SCALE

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A19010.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

8/8/2022

Issued for:

No.	Date	Description

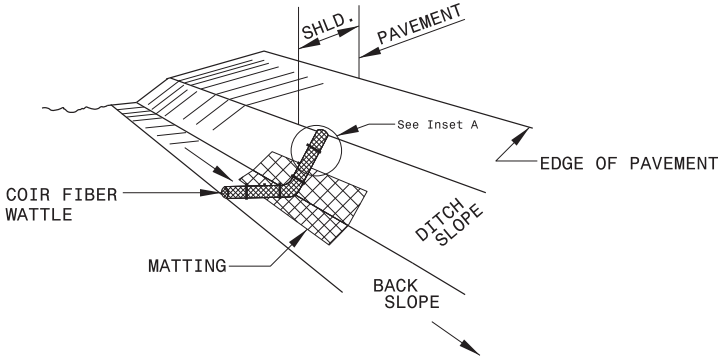
Title:

DETAILS

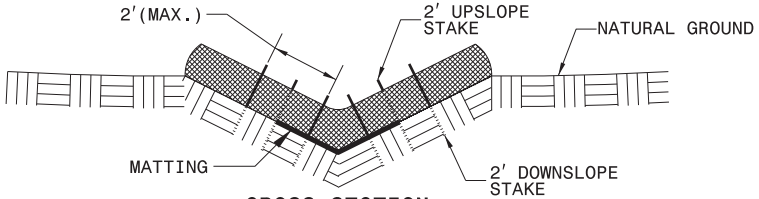
Sheet No.:

EC-3D

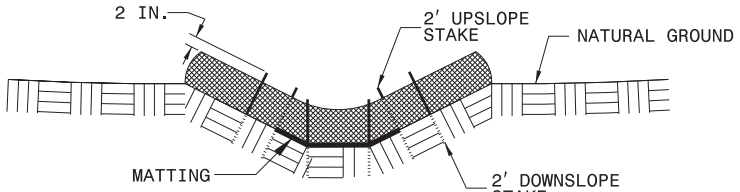
COIR FIBER WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

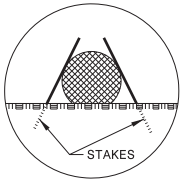
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

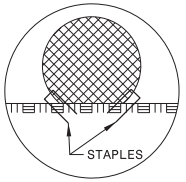
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

12″ WATTLE INSTALLATION SHALL BE AT THE FOLLOWING SPACING:

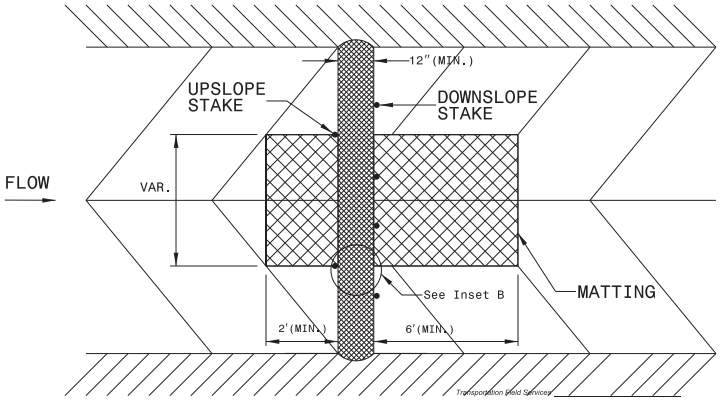
CHANNEL SLOPE (%)	SPACING BETWEEN WATTLES (FT)
1	100
2	50
3	33
4	25
5	20



INSET A



INSET B



TOP VIEW

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A19010.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

8/8/2022

Issued for:

No.	Date	Description

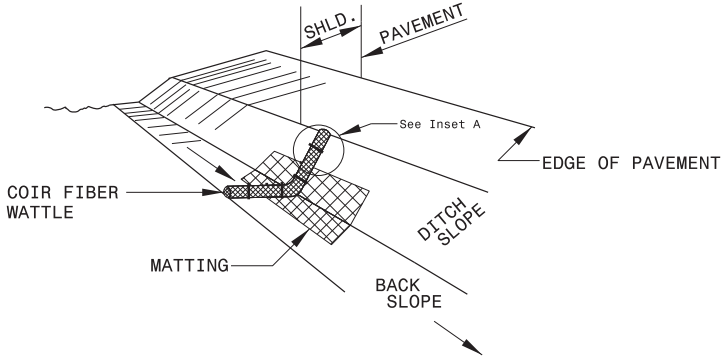
Title:

DETAILS

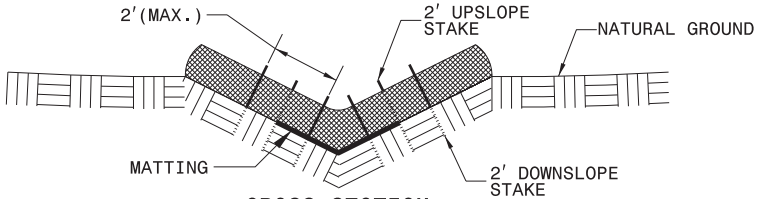
Sheet No.:

EC-3E

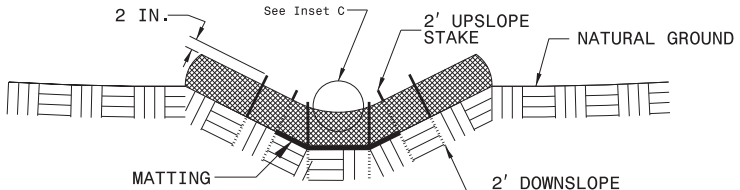
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

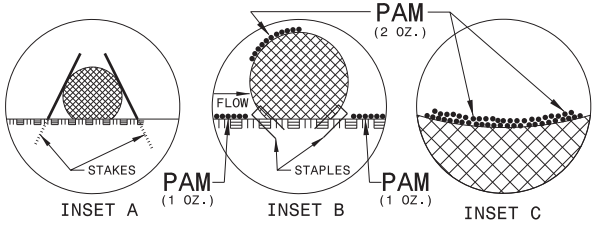
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

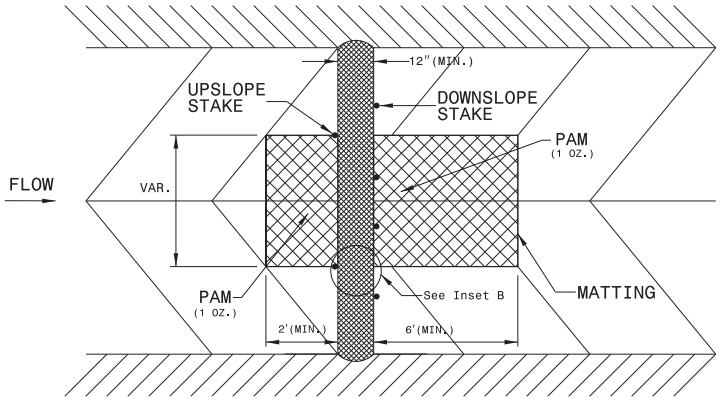
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

WATTLES SHALL BE INSTALLED AT 50' MAXIMUM SPACING.





TOP VIEW

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A19010.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

8/8/2022

Issued for:

No.	Date	Description

Title:

DETAILS

Sheet No.:

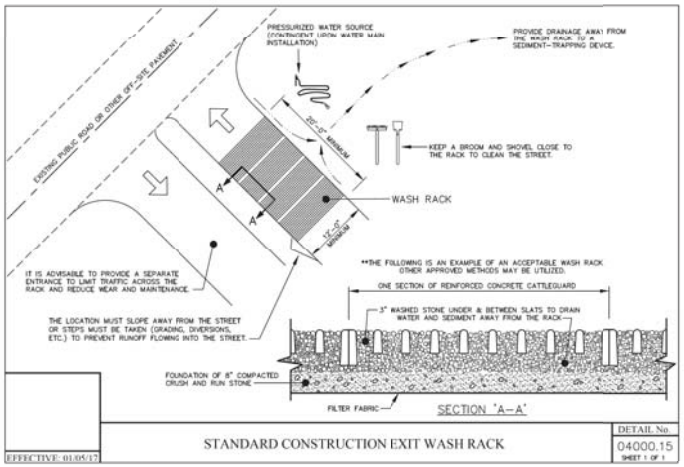
EC-3F

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L1	11+62	13+00	RT.	140
4	L1	14+75	17+25	RT.	240
5	L1	19+50	19+75	RT.	35
5	L1	19+75	22+25	RT.	275
5	L1	25+75	27+85	RT.	275
5,6	L1	29+35	36+00	RT.	805
6	L1	36+00	40+40	RT.	530
4	L1	16+25	16+25	LT.	25
				SUBTOTAL	2,325
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					530
				TOTAL	2,855
				SAY	3,000



STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A19010.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

NORTH CAROLINA PROFESSIONAL ENGINEER 13328 TREY G. GOEN
8/8/2022

Issued for:

No.	Date	Description

Title:

DETAILS

Sheet No.:

EC-3G

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Sopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Sopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calerdar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plasic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved FAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

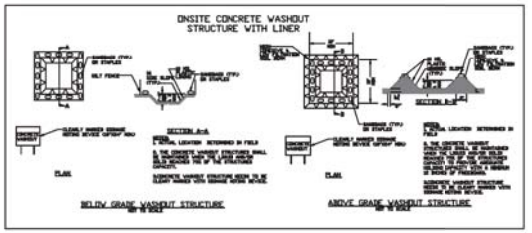
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

NORTH CAROLINA Environmental Quality



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

Issued for:

No.	Date	Description

Title:

DETAILS

Sheet No.:

EC-3H

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (and this will determine if a site inspection is required). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication if whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDCs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication if visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (when accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(c) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment [40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,

(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,

(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,

(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,

(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and

(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NORTH CAROLINA Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A19010.00

Client:

CITY OF WILMINGTON NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASES 1&2

Seal:

Issued for:

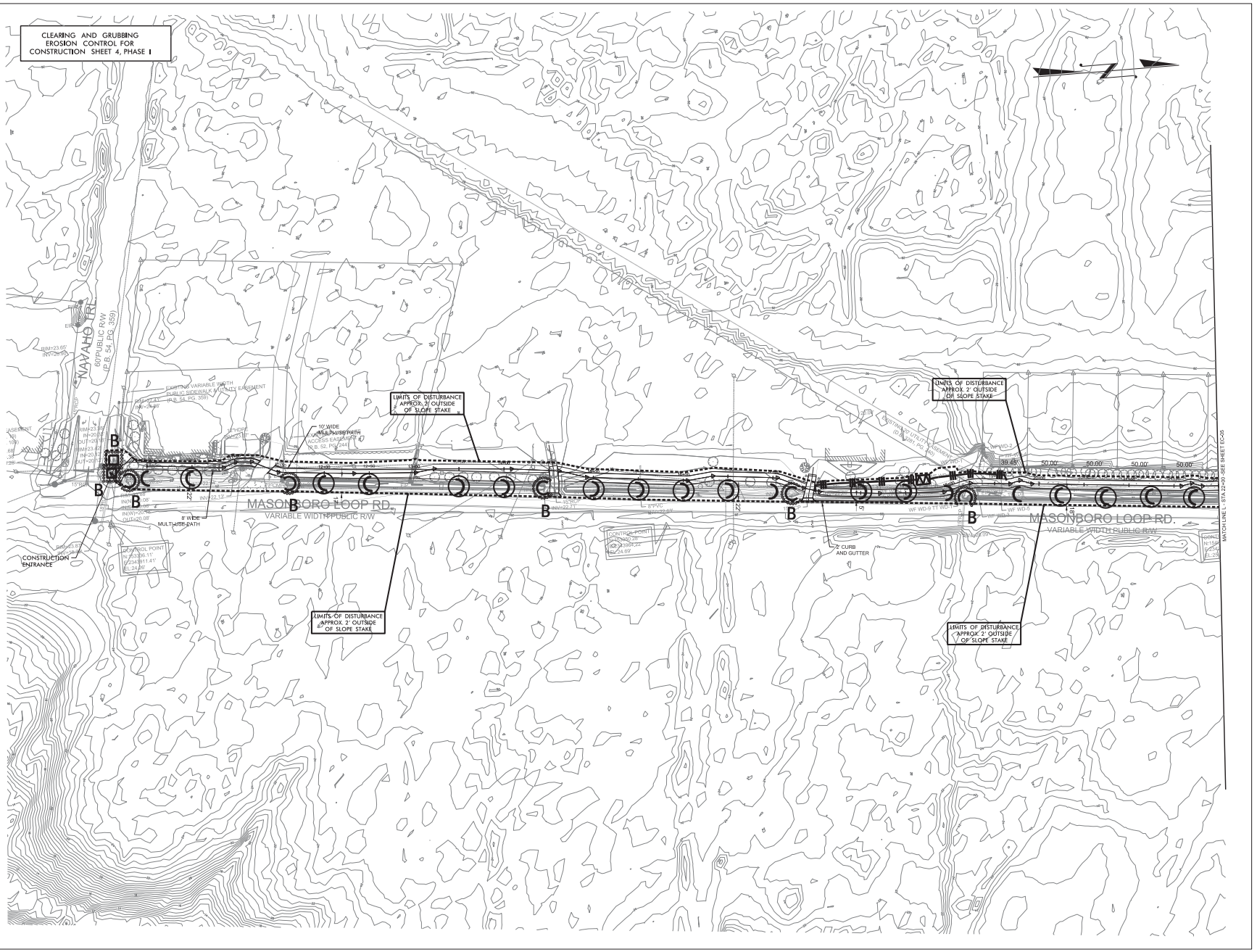
No.	Date	Description

Title:

DETAILS

Sheet No.:

EC-3I



STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

NORTH CAROLINA
13328
PROFESSIONAL ENGINEER
TREY C. GOIN

8/8/2022

Issued for:

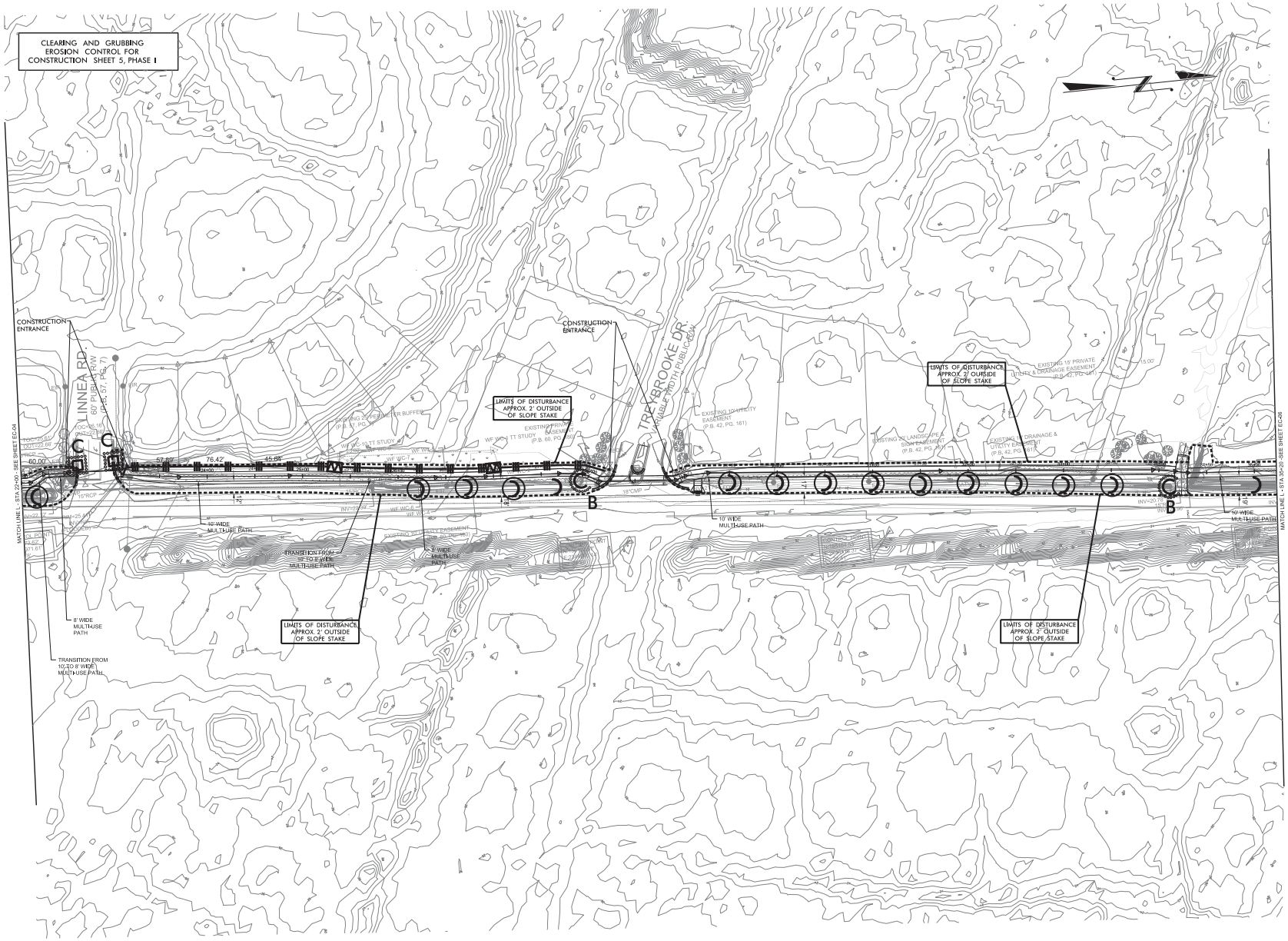
No.	Date	Description

Title:

CLEARING & GRUBBING

Sheet No.:

EC-04/ CONST.04



STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

NORTH CAROLINA REGISTERED 13328 PROFESSIONAL ENGINEER TREY G. GOIN
8/8/2022

Issued for:

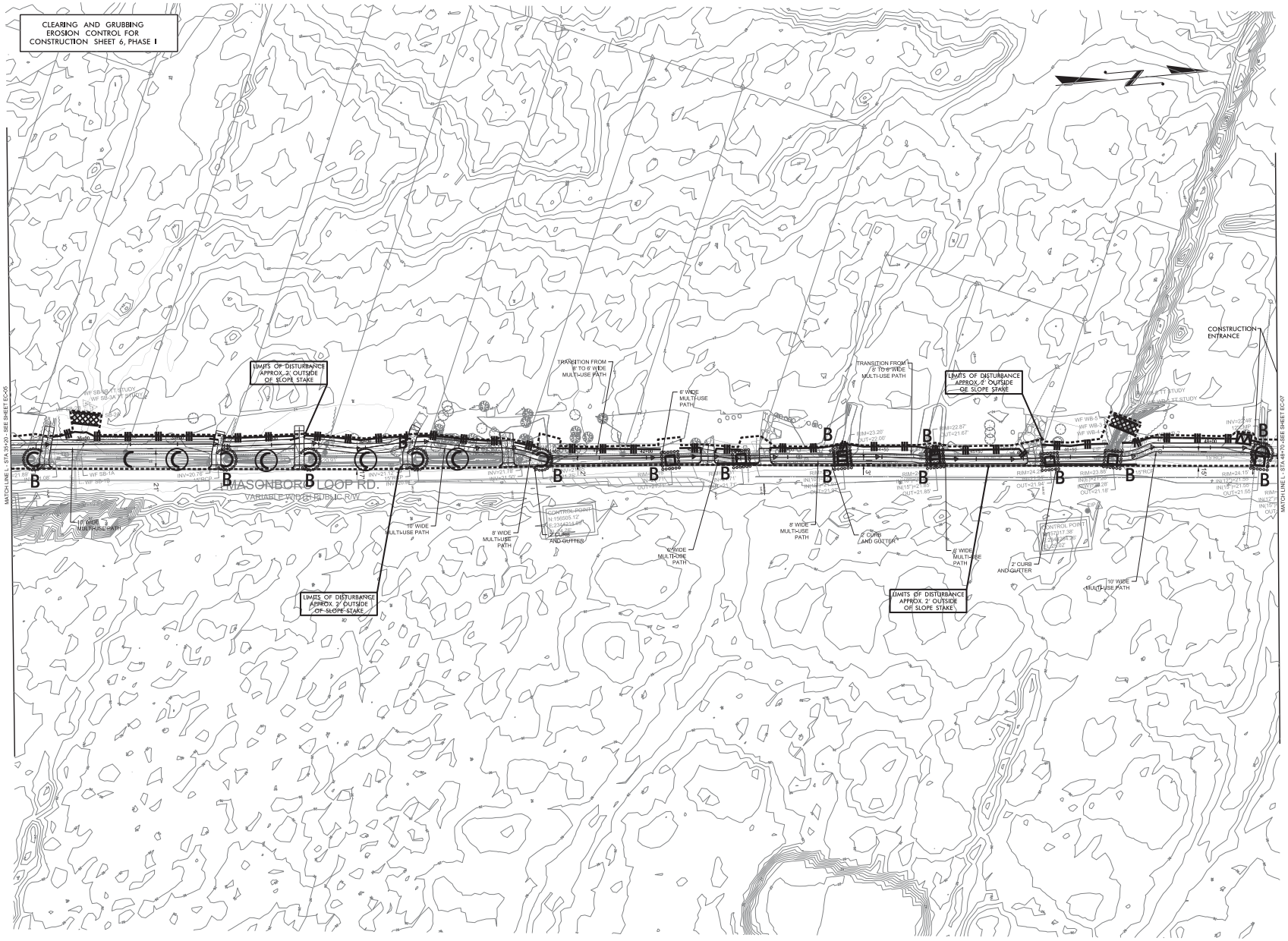
No.	Date	Description

Title:

CLEARING & GRUBBING

Sheet No.:

EC-05/ CONST.05



STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

NORTH CAROLINA
13328
PROFESSIONAL ENGINEER
TREY C. GOEN
8/8/2022

Issued for:

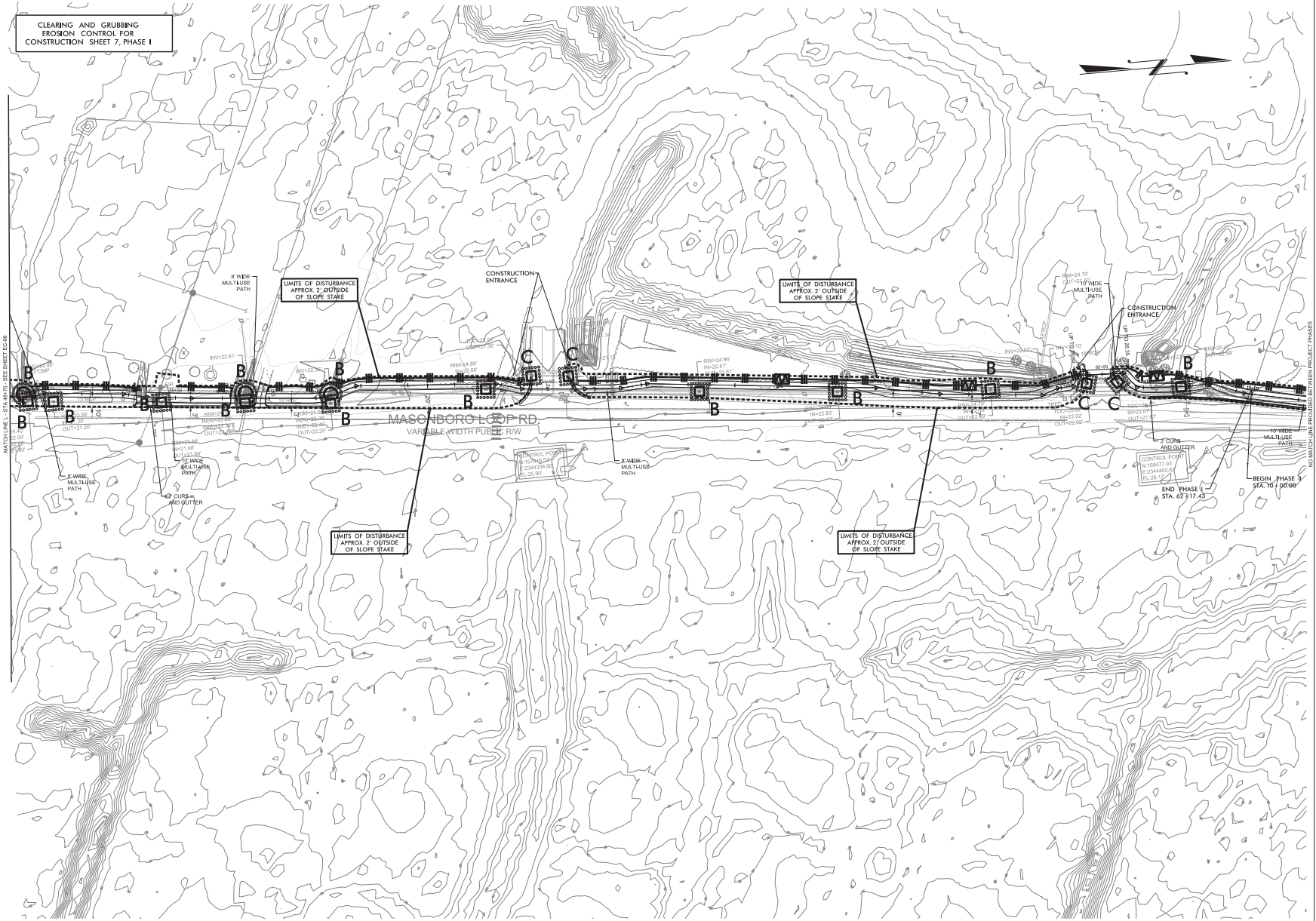
No.	Date	Description

Title:

CLEARING & GRUBBING

Sheet No.:

EC-06/ CONST.06



STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

NORTH CAROLINA PROFESSIONAL ENGINEER 13328 TREY C. GOEN
8/8/2022

Issued for:

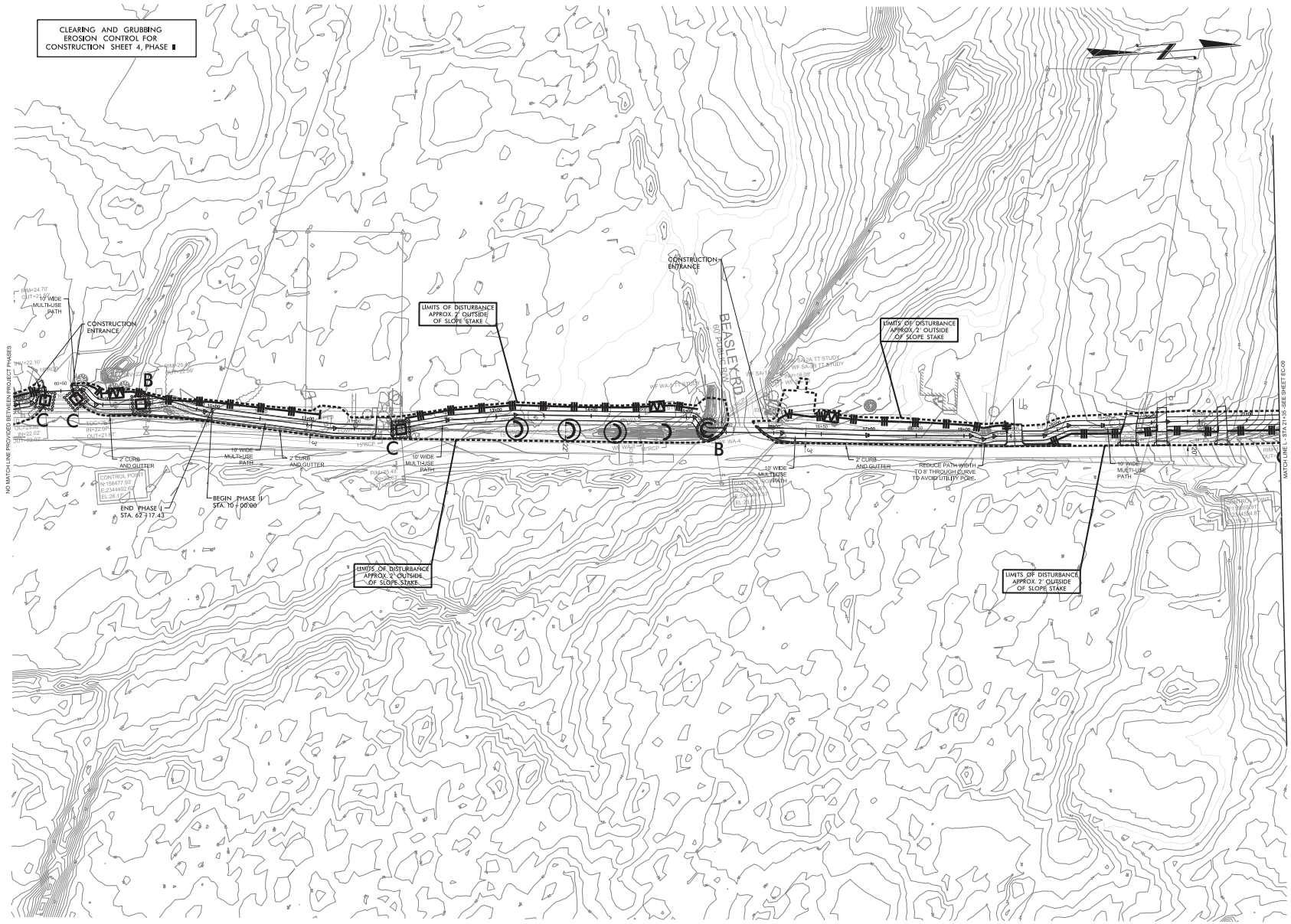
No.	Date	Description

Title:

CLEARING & GRUBBING

Sheet No.:

EC-07/ CONST.07



STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A180102.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 2

Seal:

NORTH CAROLINA PROFESSIONAL ENGINEER 13328 TREY C. GOEN

8/8/2022

Issued for:

No.	Date	Description

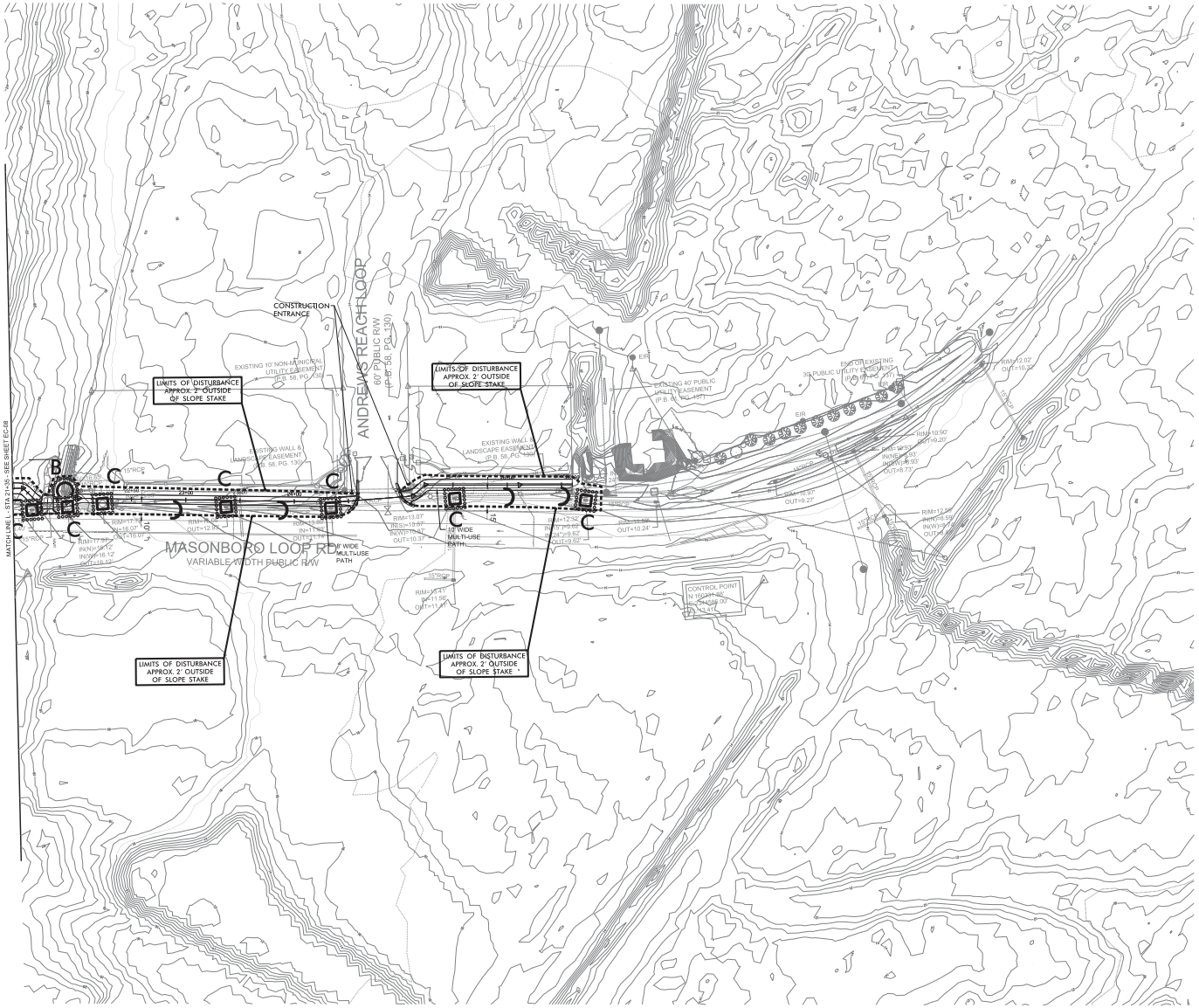
Title:

CLEARING & GRUBBING

Sheet No.:

EC-08/ CONST.04

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5, PHASE II



STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 2

Seal:

NORTH CAROLINA REGISTERED 13328 PROFESSIONAL ENGINEER TREY C. GOLD

8/8/2022

Issued for:

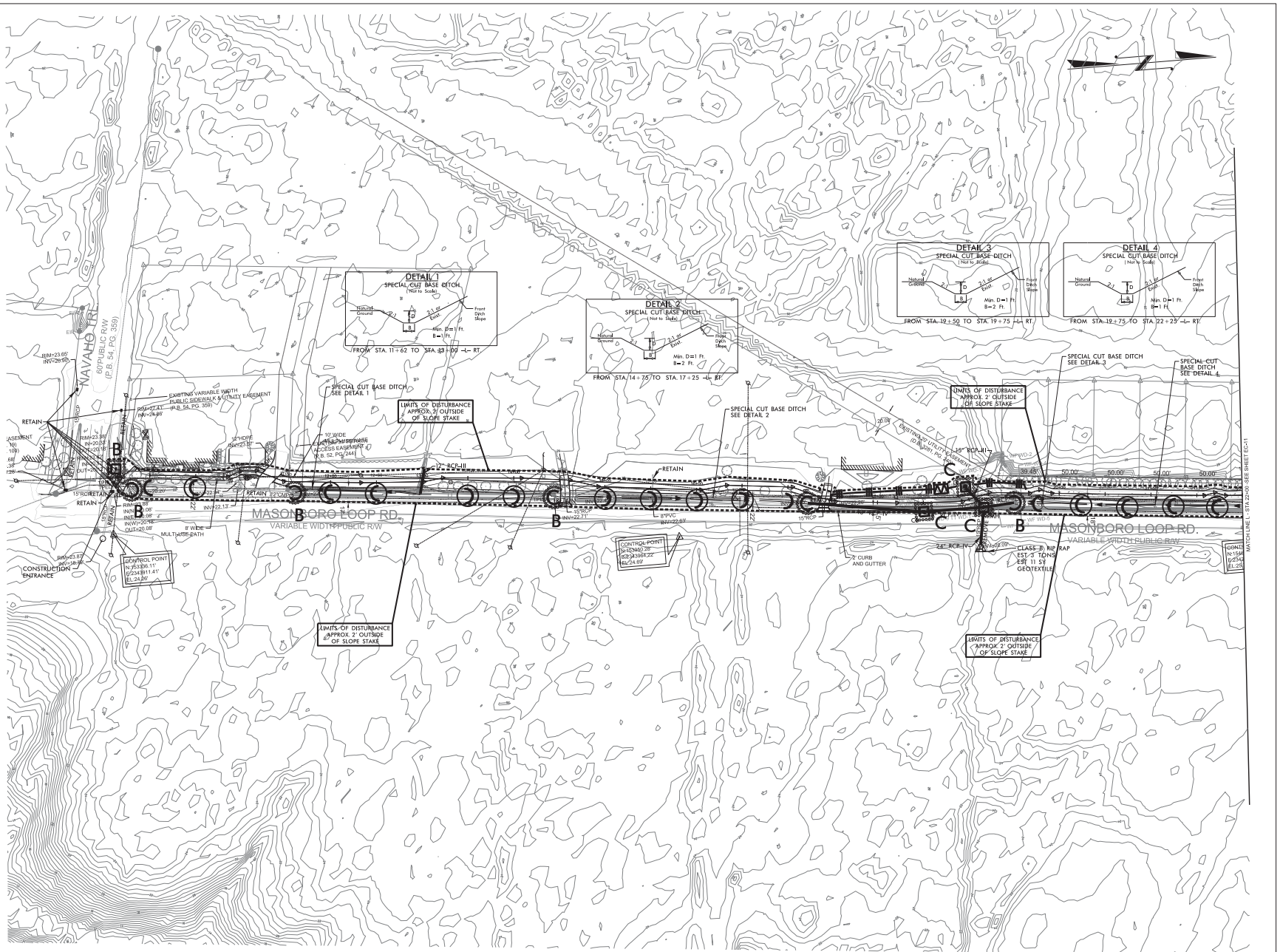
No.	Date	Description

Title:

CLEARING & GRUBBING

Sheet No.:

EC-09/ CONST.05



STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

NORTH CAROLINA REGISTERED 13328 PROFESSIONAL ENGINEER TREY C. GOIN

8/8/2022

Issued for:

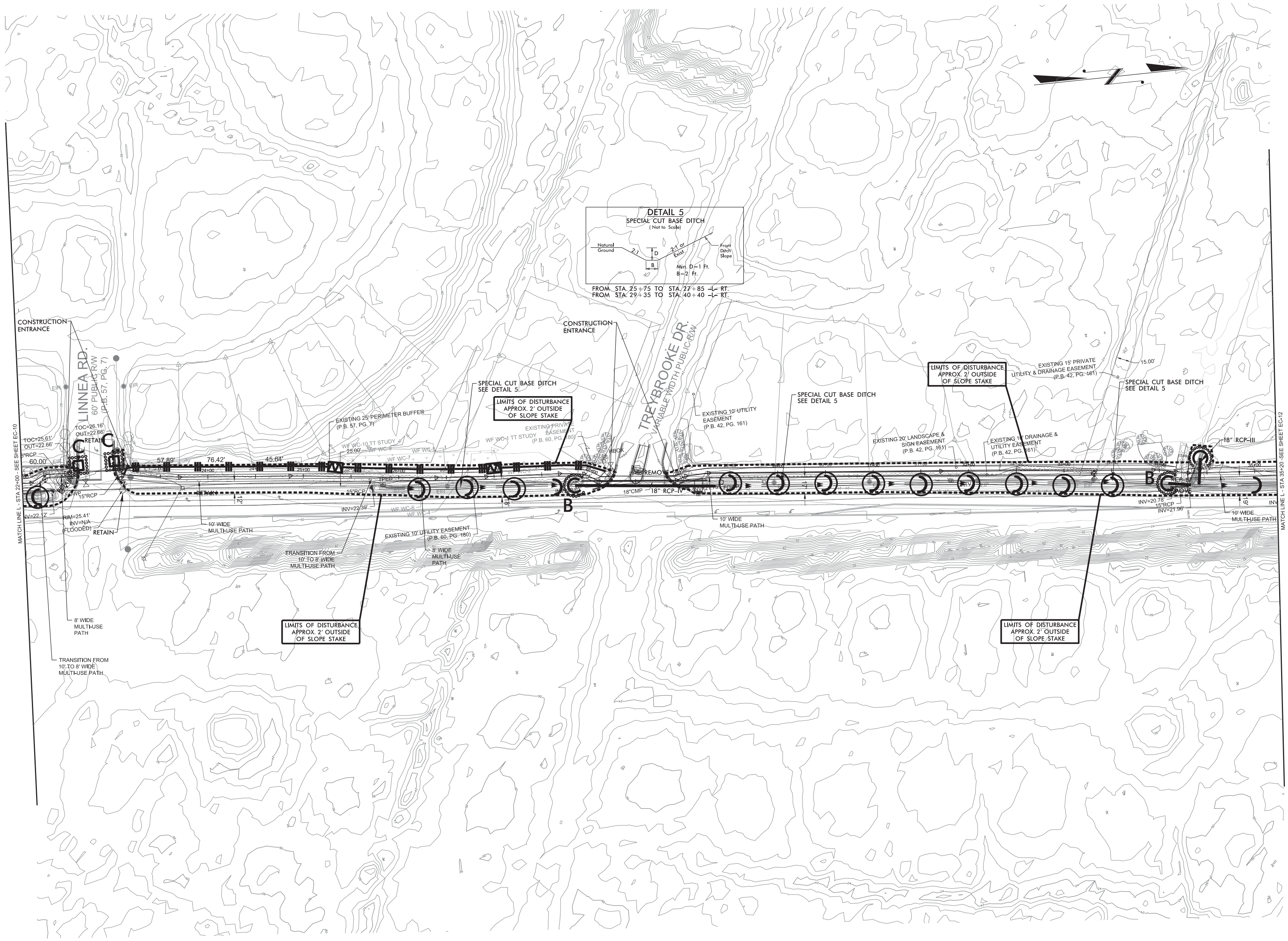
No.	Date	Description

Title:

FINAL

Sheet No.:

EC-10/
CONST.04



STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

8/8/2022

Issued for:

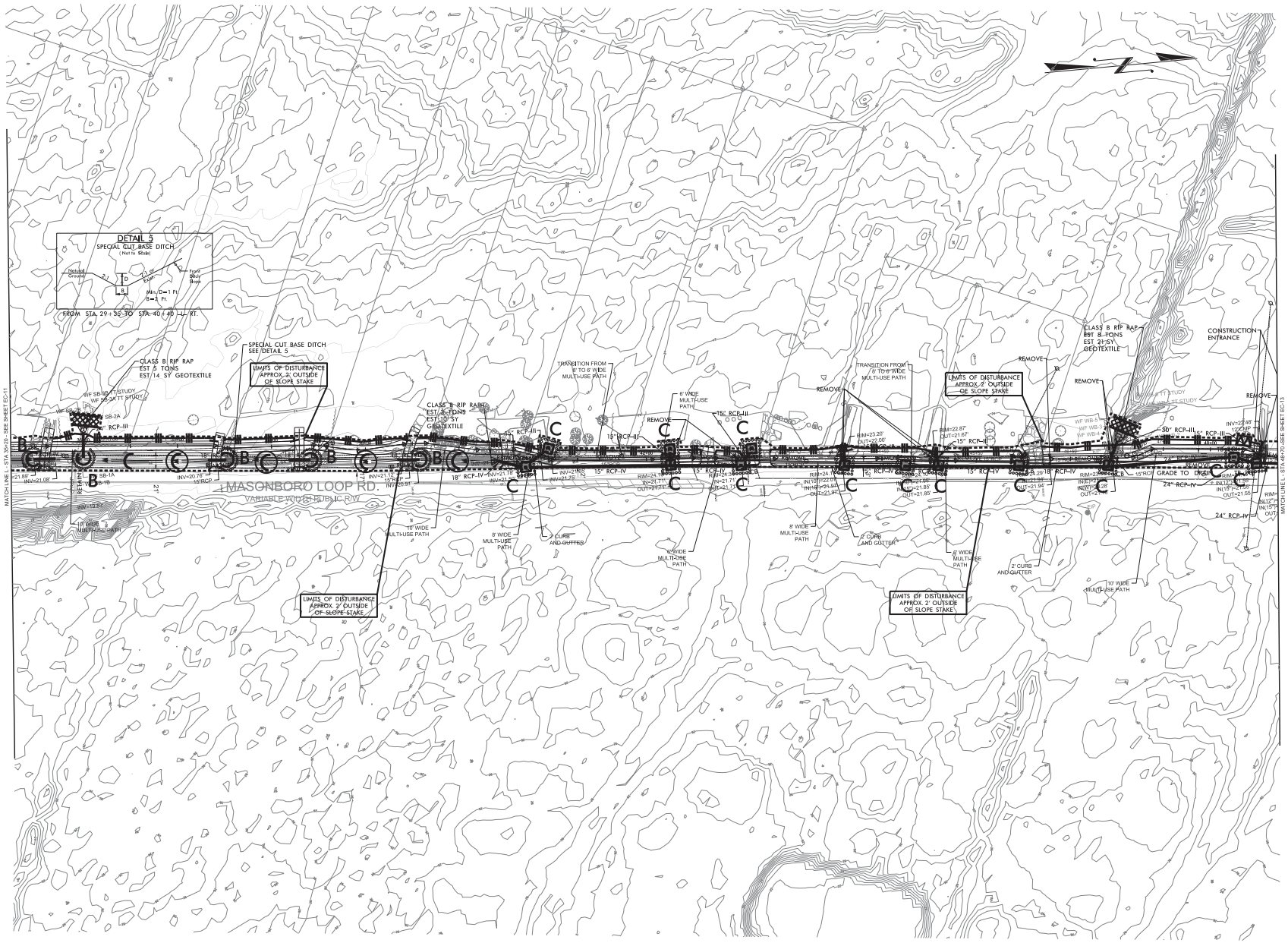
No.	Date	Description

Title:

FINAL

Sheet No.:

EC-11/ CONST.05



STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

NORTH CAROLINA REGISTERED 13328 PROFESSIONAL ENGINEER TREY C. GOEN

8/8/2022

Issued for:

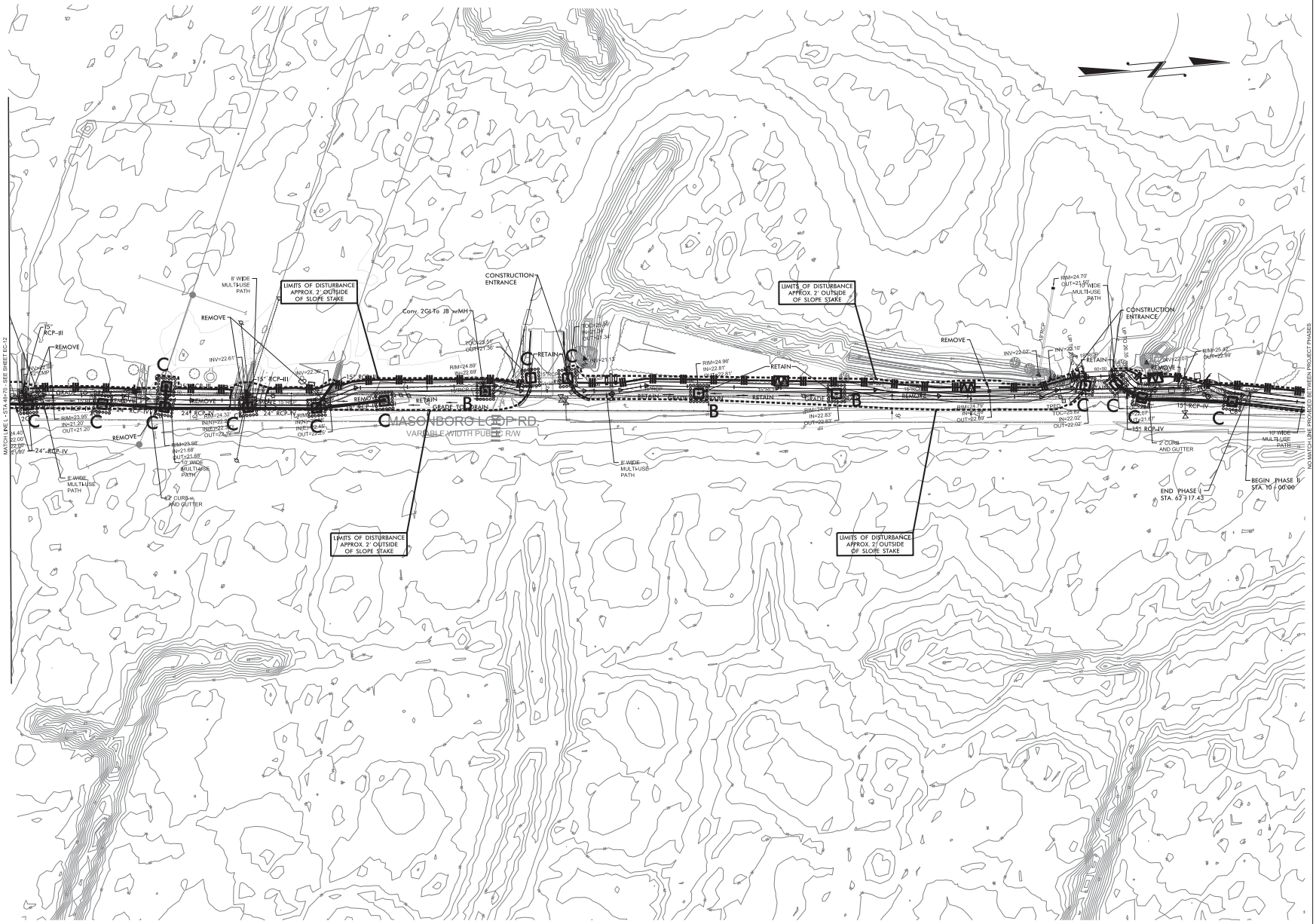
No.	Date	Description

Title:

FINAL

Sheet No.:

EC-12/
CONST.06



STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE # C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 1

Seal:

NORTH CAROLINA REGISTERED 13328 ENGINEER TREY G. GOIN

8/8/2022

Issued for:

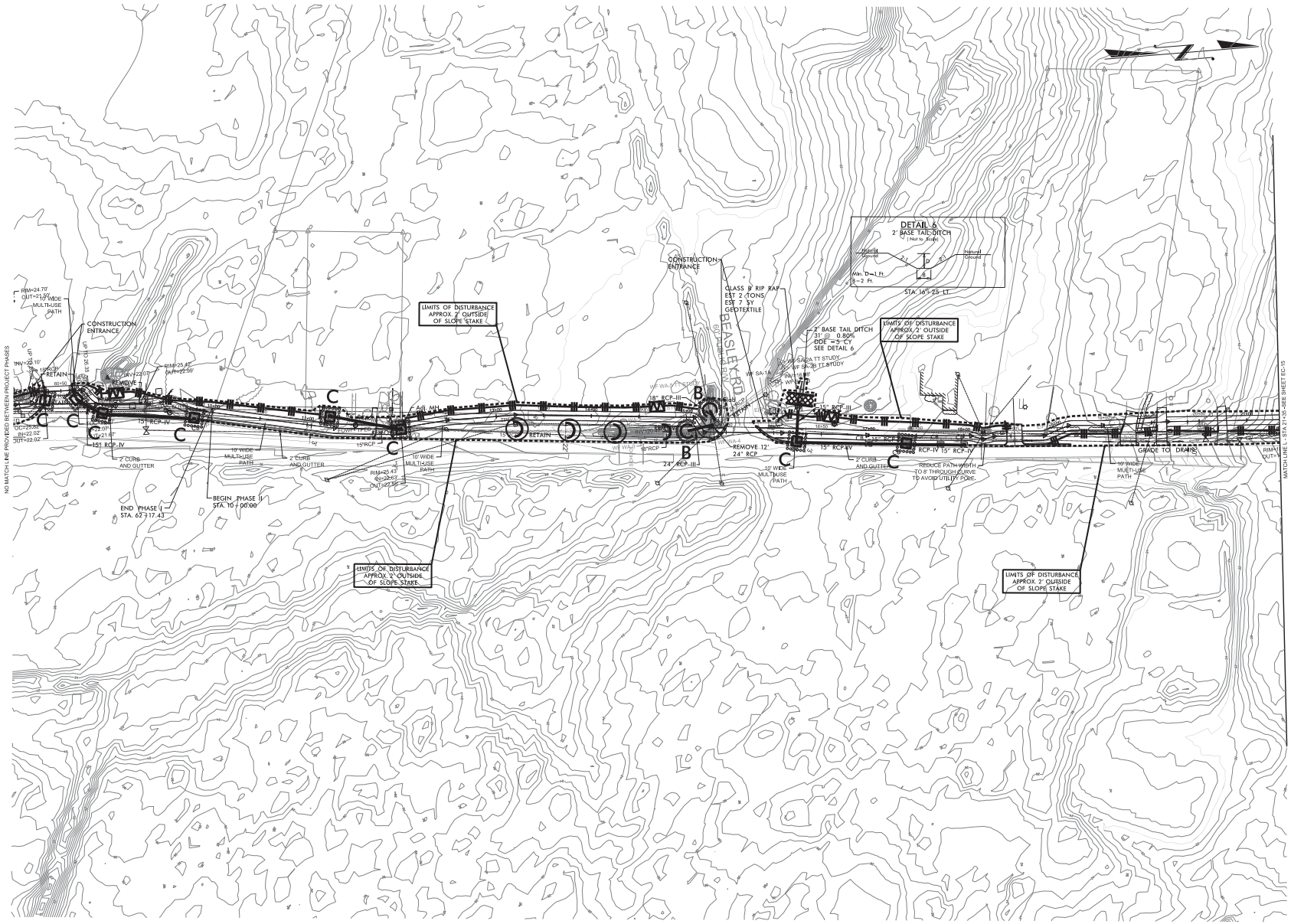
No.	Date	Description

Title:

FINAL

Sheet No.:

EC-13/
CONST.07



STEWART

223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750

FIRM LICENSE # C-1051
www.stewartinc.com
PROJECT #: A160102.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 2

Seal:

NORTH CAROLINA PROFESSIONAL ENGINEER 13328 TREY G. GOEN

8/8/2022

Issued for:

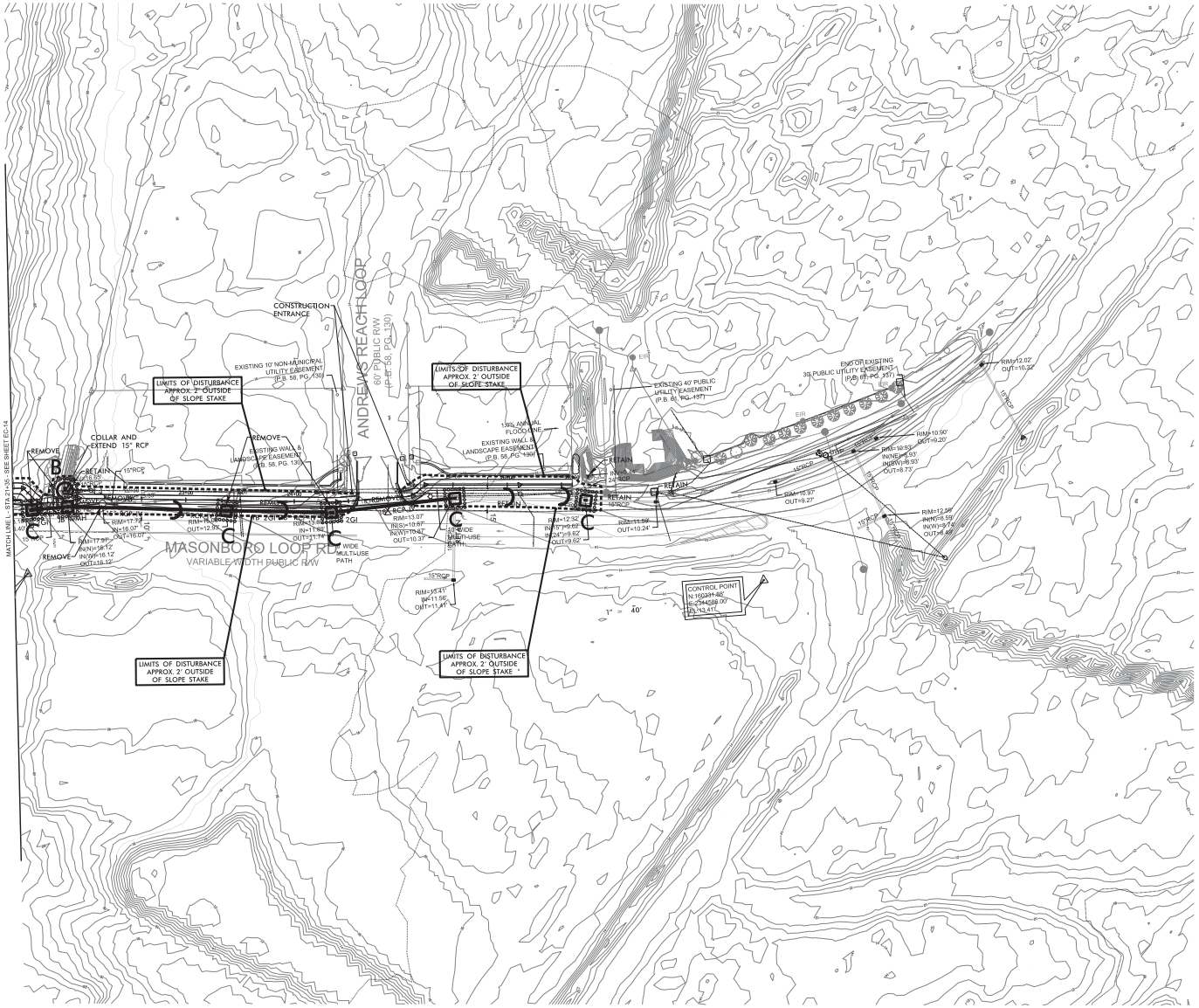
No.	Date	Description

Title:

FINAL

Sheet No.:

EC-14/
CONST.04



STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
NORTH CAROLINA

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 2

Seal:

NORTH CAROLINA REGISTERED 13328 PROFESSIONAL ENGINEER TREY C. GOLDEN
8/8/2022

Issued for:

No.	Date	Description

Title:

FINAL

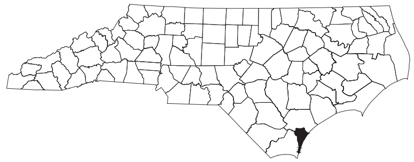
Sheet No.:

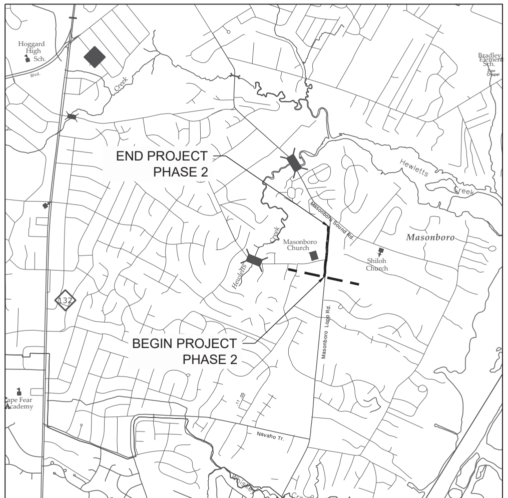
EC-15/
CONST.05

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

NEW HANOVER COUNTY





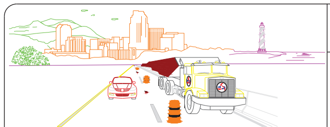
VICINITY MAP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP1	TITLE SHEET AND INDEX OF SHEETS
TMP1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKING
TMP1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES AND LOCAL NOTES)
TMP2	TRAFFIC MANAGEMENT PLAN
TMP3	TEMPORARY TRAFFIC CONTROL PHASING

SHEET NO.
TMP1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

ROBERT WILLIAMS, PE — TRAFFIC CONTROL PROJECT ENGINEER
ERIC DOMONELL — TRAFFIC CONTROL PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS — STATE OF NORTH CAROLINA — DEPARTMENT OF TRANSPORTATION — WORK ZONE TRAFFIC CONTROL

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com
PROJECT #:A16010.00

APPROVED:
DATE:
SEAL
NORTH CAROLINA ENGINEER 13328 FREY D. ODEN
8/8/2022

CITY PROJECT NUMBER: 15ST94

M:\Projects\2016\A16010.00_Masonboro Loop MUP\8.00 - ROADWAY\8.10 - PLANS\C3D\Sheets\08-TMP\A16010.00_TMP_01_Cover_Phase2.dwg May 03, 2022 - 3:10pm

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY - DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- DETOUR ROUTE
- WORK AREA
- REMOVAL
- TEMPORARY PAVEMENT

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

EXISTING PROPOSED TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

STEWART
223 S. WEST STREET, STE 1100
RALEIGH, NC 27603
T 919.380.8750
FIRM LICENSE #: C-1051
www.stewartinc.com
PROJECT #: A16010.00

Client:

CITY OF WILMINGTON
ENGINEERING DIVISION
P.O. BOX 1810
WILMINGTON, NC 28402
T 910.341.7807
F 910.341.5881

Project:

MASONBORO LOOP ROAD MULTI-USE TRAIL

PHASE 2

Seal:

NORTH CAROLINA 13328 ENGINEER GREY D. GREEN

8/8/2022

Issued for:

PRELIMINARY - DO NOT USE FOR CONSTRUCTION

No.	Date	Description
---	---	---
---	---	---
---	---	---
---	---	---
---	---	---
---	---	---

Title:

TRAFFIC MANAGEMENT PLAN NOTES

Project number: A16010.00
Date: 05/03/2022
Drawn by: JM/SM
Approved by: TD
Sheet: TMP1A