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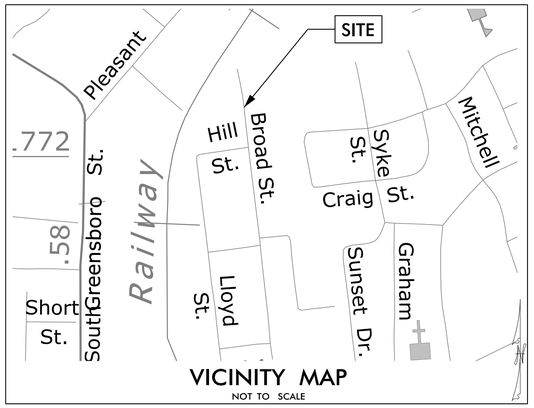


VICINITY MAP
NOT TO SCALE

TOWN OF CARRBORO
PUBLIC WORKS

BROAD STREET CULVERT REPLACEMENT

STATE		SHEET NO.	TOTAL SHEETS
N.C.		1	--

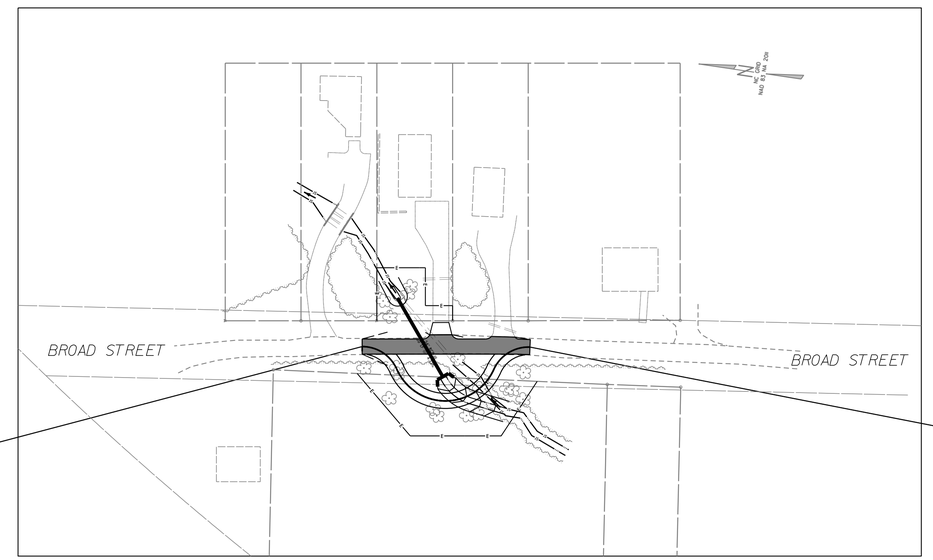
INDEX OF SHEETS

C101	SYMBOL LEGEND
C102	GENERAL NOTES & TYPICALS
C103A–D	PLAN DETAILS
C201	EXISTING CONDITIONS
C202	DEMOLITION PLAN
C203	TREE SURVEY & EASEMENT PLAN
C301	DETOUR PLAN & PROFILE
C401	PLAN SHEET
C402	PROFILE SHEET
C501A–E	CROSS SECTIONS
E101	CLEARING & GRUBBING E&SC PLAN
E102	CULVERT PHASING PLAN
E103	DETOUR E&SC PLAN
E104	FINAL GRADE E&SC PLAN
E201	STREAMBANK REFORESTATION PLAN
E301A–D	EROSION CONTROL DETAILS
U101	UTILITY PLAN
U201	UTILITY DETAILS

LOCATION: BROAD STREET NORTH OF HILL STREET

TYPE OF WORK: CLEARING & GRUBBING, GRADING, DRAINAGE, UTILITY RELOCATION, PLANTING, & EROSION CONTROL

FINAL 100% PLANS
07–27–2020



BEGIN CONSTRUCTION
Sta. 10+00.00 -DET-

END CONSTRUCTION
Sta. 11+39.54 -DET-

CLEARING ON THIS PROJECT SHALL BE PERFORMED
TO THE LIMITS ESTABLISHED BY METHOD II

GRAPHIC SCALES

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA

NCDOT – JANUARY 2018
STANDARD SPECIFICATION

OWASA – MANUAL OF SPECIFICATIONS, STANDARDS AND DESIGN, APRIL 2015

TOWN OF CARRBORO STANDARDS

PROJECT LENGTH

Prepared in the Office of:

SUNGATE DESIGN GROUP, P.A.

905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

SUNGATE DESIGN GROUP, P.A. PROFESSIONAL ENGINEERING COMPANY C-890 NORTH CAROLINA RALEIGH, N.C.

JOSHUA G. DALTON, P. E.
PROJECT ENGINEER
7/28/2020

DocuSigned by: Joshua G Dalton
108BADBC1499413
SIGNATURE: P.E.

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

OWNER: TOWN OF CARRBORO
CONTACT: BEN SCHMADEKE
PUBLIC WORKS DEPT.
CAPITAL PROJECTS MANAGER
(919) 918–7424
301 W. MAIN STREET
CARRBORO, NC 27510

TOWN OF CARRBORO MARCH 3, 1911 NORTH CAROLINA

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CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 851-1912
ENGINEERING LICENSE NO. C-890

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
DocuSigned by: Joshua G. Dalton
7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

SYMBOL LEGEND

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_C101
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C101**

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7/27/2020
BROAD_ST_Rdy_psh_C101.dgn
rhoward

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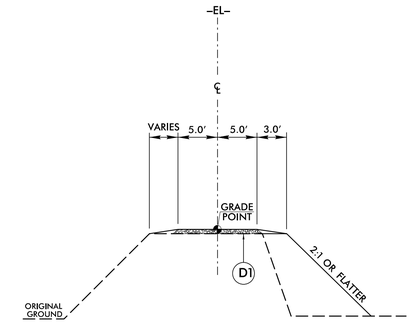
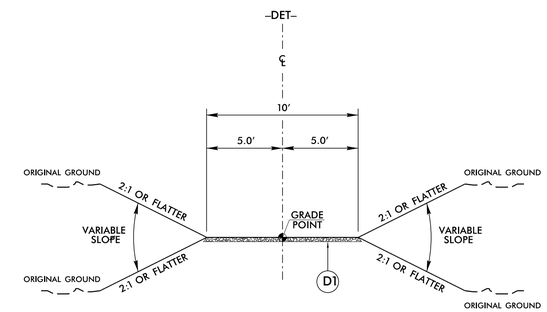
General Notes

1. All construction shall be in accordance with the latest edition of "NCDOT Standards and Specifications for Roads and Structures" and "NCDOT Roadway Standard Drawings" and with the standards and specifications of the Town of Carrboro and Orange Water and Sewer Authority (OWASA).
2. Existing utilities noted at the time of the field survey are shown for size, material, type, and relative location only. This plan is not a comprehensive inventory or an as-built survey of existing site utilities. The Contractor is to determine the existence and location of all utilities within the work area.
3. The Contractor shall be responsible for the location and/or relocation of all utilities in coordination with the appropriate utility agency or company. The Contractor is required to call 'The NC One Call Center' (1-800-632-4949) before digging.
4. The Contractor shall be responsible for repairing or replacing any existing site features, facilities or improvements that are damaged during the demolition or construction operation that are not indicated to be removed or abandoned.
5. All construction shall be in accordance with current state and local standards and regulations and the specifications of the appropriate governmental agency, OWASA, Town of Carrboro, NCDEQ, the County of Orange
6. Install tree protection fence and clearing and grubbing erosion control measures prior to any demolition and/or construction activity on site.
7. All disturbed slopes must be stabilized within the time frame indicated on the Ground Stabilization Table (see Erosion Control Plan). All other disturbed areas must be stabilized with the time frame indicated on the Ground Stabilization Table.
8. Contractor is to field locate proposed site improvements that require demolition of existing structures for verification by the Engineer prior to demolition.
9. Construction debris to be removed from the site and properly disposed of by the Contractor. All project waste and demolition materials to be disposed of in accordance with applicable NCDEQ-DWM Standards. Contractor to provide written verification of proper disposal to owner.
10. Any buried waste, construction debris or trash which is found during the construction operation shall be thoroughly excavated and removed from the site to an approved facility prior to the placement of any permanent fill material or pavement construction.
11. All stockpile areas and temporary spoil areas shall be protected by silt fence.
12. The Contractor shall keep the project work area clean of litter and excess debris at all times.
13. All site work shall produce surface grades adequate for storm water runoff to prevent standing water on all developed areas and to meet existing grades in smooth transition.
14. To minimize damage to existing trees, the Contractor shall cut, rather than tear roots.
15. Topography, existing site data and right-of-way boundary obtained from field surveys by Sungate Design Group, P.A. Coordinates shown on plans are based on NAD 83 horizontal datum and NAVD 88 vertical datum.
16. The Contractor is responsible for furnishing and maintaining all work zone signage relative to the work to be performed for the location indicated on the project plan set. All barricading and signage shall conform to the latest edition of "NC-Manual on Uniform Traffic Control Devices for Work Zone."
17. An on-site pre-construction meeting must be held prior to any construction activity.
15. All existing site features shall remain unless noted to be removed or demolished.
16. Construction staging and access limits to be approved by the Owner prior to any construction activity on site.
17. The Contractor is responsible for all site layout, construction staking, and as-built surveys.
18. The Contractor shall note that the drawings may not show every offset, transition, fitting, etc. that may be required. The contractor shall install such standard appurtenances as required to closely follow the grades and alignments depicted on the plans.
19. If departures from the specifications or drawings are deemed necessary by the Contractor, details of such departures and reasons therefore shall be submitted to the Owner for review. No departures from contract documents shall be made without the written permission of the Owner.
20. **All dimensions and grades shown on the plans shall be field verified by the Contractor prior to the start of construction in the area. The Contractor shall notify the Owner if any errors or discrepancies exist between the project plans and the field conditions that require plan or grade modification prior to the start of construction of the improvements in the area. No extra compensation shall be paid to the Contractor for any work redone due to grades or dimensions shown incorrectly on these plans, if such notification is not provided to the Owner prior to the initiation of the subject construction and receipt of authorization to proceed with the plans construction as revised by the Engineer.**
21. Construction operations shall be limited to the hours during the day as specified by the Owner.



TYPICAL SECTION No. 1

–EL– STA. 11+75.00 TO STA. 12+50.00



TYPICAL SECTION No. 2

–DET– STA. 10+00.00 TO STA. 11+39.54

PAVEMENT SCHEDULE	
D1	6" ABC

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
FEE FIRM LICENSE NO. C-0782
ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
D8BADBC14D8C3...
PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

GENERAL NOTES & TYPICALS

PROJECT # : 1083-20003
DRAWING NAME: BROAD ST_Rdy_psh_C102
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C102

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7/27/2020
BROAD ST_Rdy_psh_C102.dgn
rhoward

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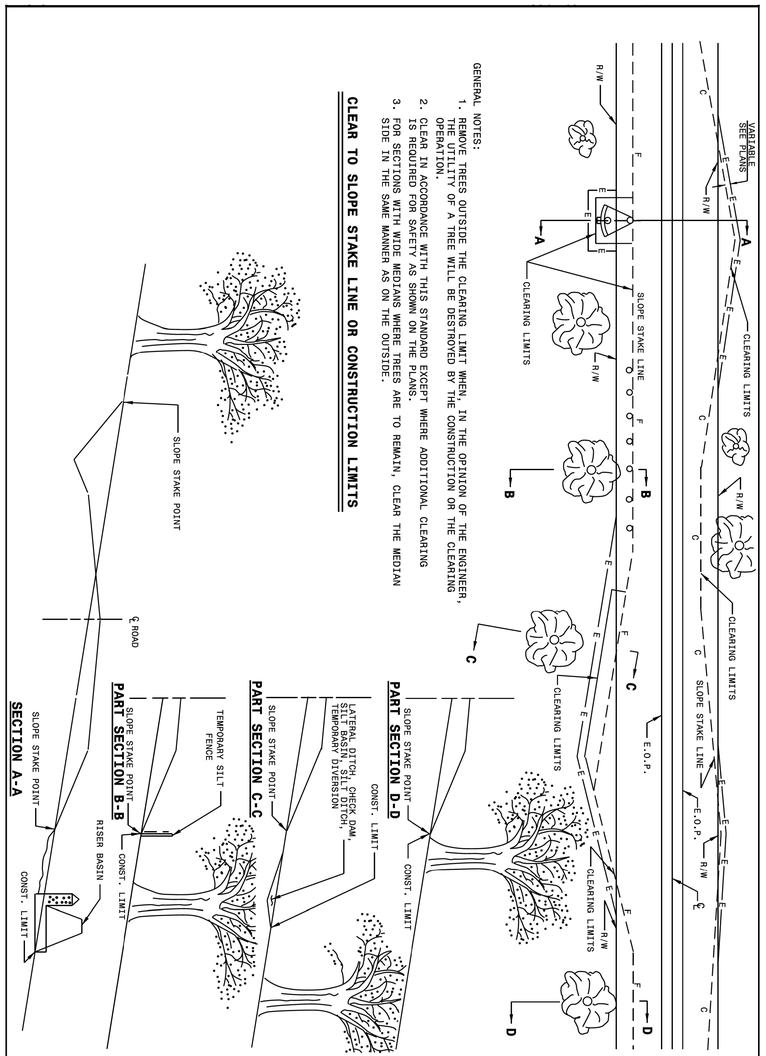


GENERAL NOTES:

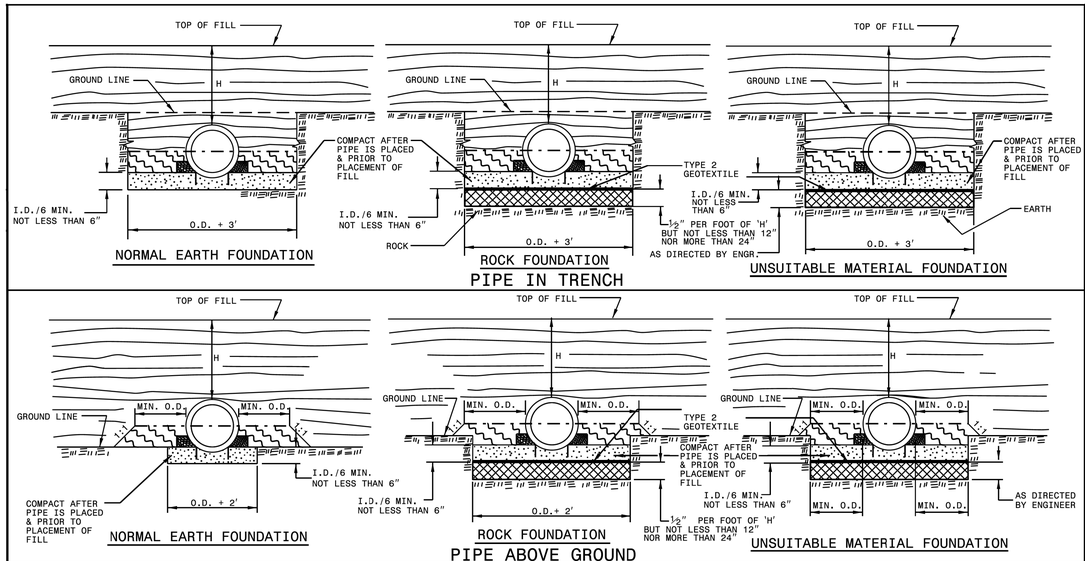
1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.
3. FOR SECTIONS WITH WIDE MEDIANS WHERE TREES ARE TO REMAIN, CLEAR THE MEDIAN SIDE IN THE SAME MANNER AS ON THE OUTSIDE.

CLEAR TO SLOPE STAKE LINE OR CONSTRUCTION LIMITS

ROADWAY STANDARD DRAWING FOR
METHOD OF CLEARING
METHOD - II

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 1 OF 1
200.02



GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

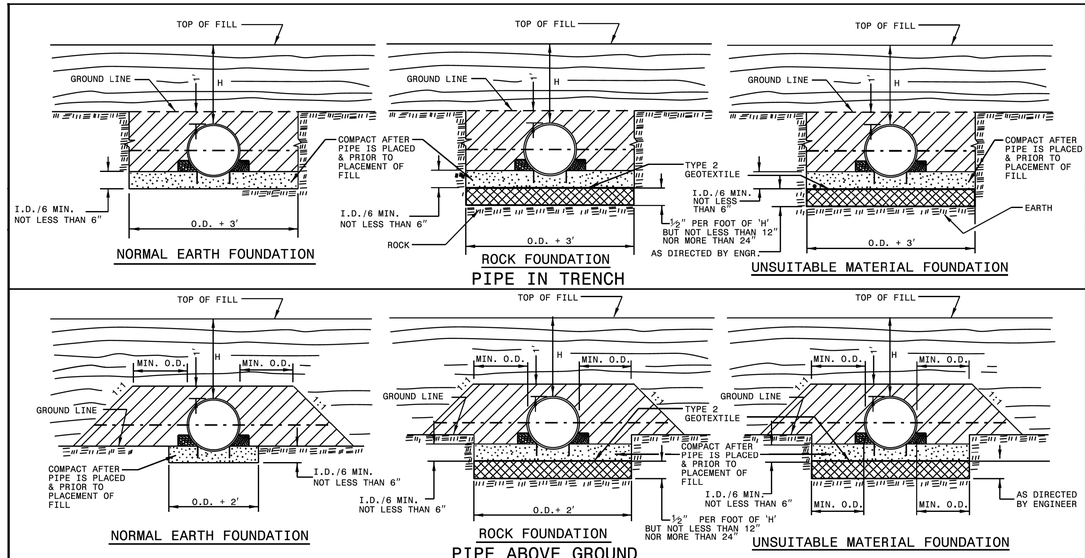
UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE 2 GEOTEXTILE AS DIRECTED BY THE ENGINEER.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 3
300.01



GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE 2 GEOTEXTILE AS DIRECTED BY THE ENGINEER.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 3
300.01

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(919) 851-9000
ENGINEERING FIRM LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

PLAN DETAILS

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_C103
DATE: 03032020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C103A

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$$$$SYSTIME$$$$ $$$$JCN$$$$ $$$$USERNAME$$$$

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GENERAL NOTES:

USE CLASS "A" CONCRETE.

CHAMFER ALL EXPOSED CORNERS 1".

ALL DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING STEEL ARE TO CENTERS OF BARS.

PLACE A STONE DRAIN CONSISTING OF ONE (1) CUBIC FOOT OF NUMBER 78M STONE CONTAINED IN A POROUS FABRIC AT EACH WEEP HOLE. PLACE SUBDRAIN FINE AGGREGATE BENEATH, AROUND AND OVER THE STONE DRAIN SO THE STONE DRAIN IS COMPLETELY COVERED BY A LAYER OF SUBDRAIN FINE AGGREGATE AT LEAST ONE (1) FOOT THICK. WHERE THERE IS MORE THAN ONE WEEP HOLE IN A WING WALL, PLACE A HORIZONTAL DRAIN OF SUBDRAIN FINE AGGREGATE AT LEAST ONE (1) FOOT SQUARE IN CROSS SECTION TO CONNECT ALL STONE DRAINS. PLACE A VERTICAL DRAIN OF SUBDRAIN FINE AGGREGATE AT LEAST ONE (1) FOOT SQUARE IN CROSS SECTION AT EACH WEEP HOLE TO AN ELEVATION OF TWO (2) FEET BELOW THE SURFACE OF THE EMBANKMENT.

ROADWAY STANDARD DRAWING FOR

NOTES FOR REINFORCED CONCRETE ENDWALL

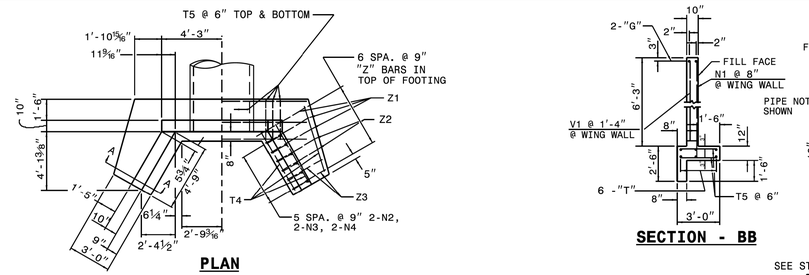
STANDARD DRAWINGS 838.21 THRU 838.40

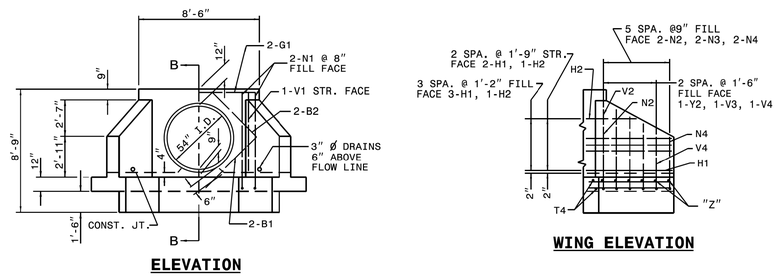
1-18

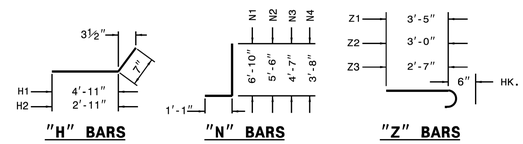
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

SHEET 1 OF 1

838.45







"H", "N", & "Z" BAR DIMENSIONS ARE OUT TO OUT.

SEE STD. DWG. 838.45 FOR GENERAL NOTES.

BILL OF MATERIAL FOR ENDWALL

REINF. STEEL			1 PIPE	
BAR	SIZE	LENGTH	NO.	WEIGHT
B1	#4	5'-6"	4	15
B2	#4	4'-6"	4	12
G1	#7	8'-2"	2	33
H1	#4	5'-6"	10	37
H2	#4	3'-6"	4	9
N1	#4	7'-11"	4	21
N2	#4	6'-7"	4	18
N3	#4	5'-8"	4	15
N4	#4	4'-9"	4	13
T1	#4	11'-10"	6	47
T4	#4	5'-3"	6	21
T5	#4	2'-6"	34	57
V1	#4	5'-9"	2	8
V2	#4	4'-10"	2	6
V3	#4	3'-11"	2	5
V4	#4	3'-1"	2	4
Z1	#4	3'-11"	6	16
Z2	#4	3'-6"	4	9
Z3	#4	3'-1"	4	8
REINF. STEEL LBS.				354
CON./R.C. CU. YDS			5.0	

1-18

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

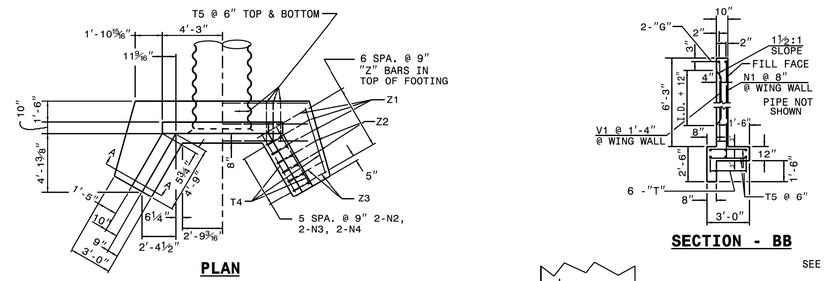
ROADWAY STANDARD DRAWING FOR

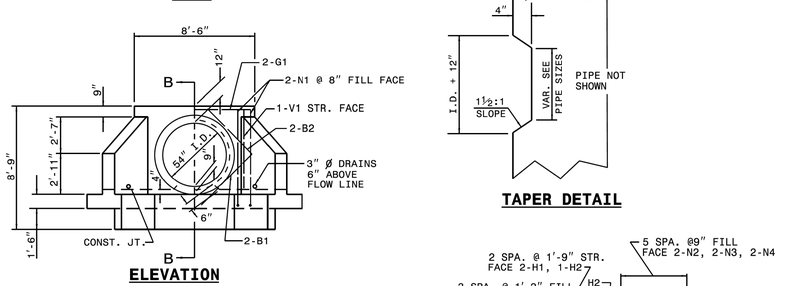
REINFORCED CONCRETE ENDWALL

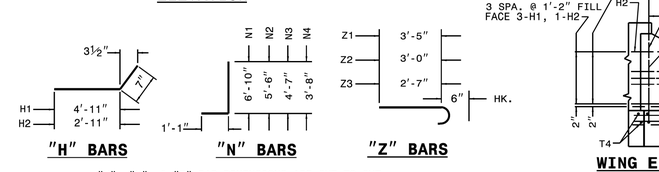
FOR SINGLE 54" PIPE - 90° SKEW

SHEET 1 OF 2

838.21







"H", "N", & "Z" BAR DIMENSIONS ARE OUT TO OUT.

SEE STD. DWG. 838.45 FOR GENERAL NOTES.

BILL OF MATERIAL FOR ENDWALL

REINF. STEEL			1 PIPE	
BAR	SIZE	LENGTH	NO.	WEIGHT
B1	#4	5'-6"	4	15
B2	#4	4'-6"	4	12
G1	#7	8'-2"	2	33
H1	#4	5'-6"	10	37
H2	#4	3'-6"	4	9
N1	#4	7'-11"	4	21
N2	#4	6'-7"	4	18
N3	#4	5'-8"	4	15
N4	#4	4'-9"	4	13
T1	#4	11'-10"	6	47
T4	#4	5'-3"	6	21
T5	#4	2'-6"	34	57
V1	#4	5'-9"	2	8
V2	#4	4'-10"	2	6
V3	#4	3'-11"	2	5
V4	#4	3'-1"	2	4
Z1	#4	3'-11"	6	16
Z2	#4	3'-6"	4	9
Z3	#4	3'-1"	4	8
REINF. STEEL LBS.				354
CON./C.S. CU. YDS			5.2	

1-18

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

ROADWAY STANDARD DRAWING FOR

REINFORCED CONCRETE ENDWALL

FOR SINGLE 54" PIPE - 90° SKEW

SHEET 2 OF 2

838.21

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
(919) 851-9022
ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
C03BAD8C1A9AE3...
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

PLAN DETAILS

PROJECT # : 1083-20003

DRAWING NAME: BROAD ST_Rdy_psh_C103

DATE: 03/03/2020

DRAWN BY: RCH

REVIEWED BY: JGD

REVISIONS:

SHEET NO.

C103B

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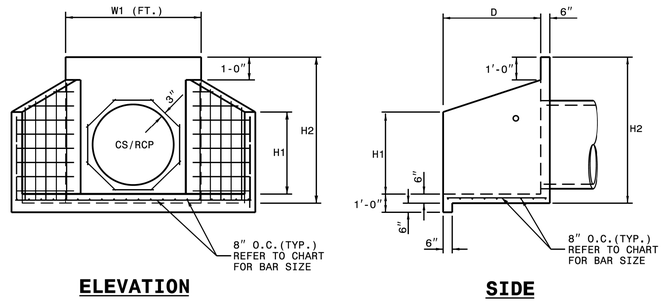
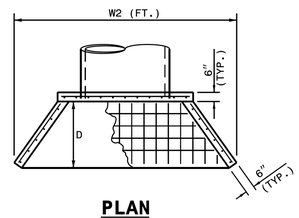


ELEVATION

SIDE



PLAN

NOTES:

* THIS PRECAST ENDWALL MAY BE USED FOR THE FOLLOWING STANDARDS: 838.01, 838.11, 838.21, 838.27, 838.33, 838.39, 838.51, 838.57, 838.63 AND 838.69.
* INSTALL PRECAST ENDWALLS WITH WINGS AND PAY FOR IN ACCORDANCE WITH SPECIFICATION SECTION 838.
* USE 4000 PSI CONCRETE.
* PROVIDE ALL REINFORCING STEEL WHICH MEETS ASTM A615 FOR GRADE 60 AND WELDED WIRE FABRIC CONFORMING TO ASTM A185 WITH 2" MIN. CLEARANCE.
* PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704.
* PIPE TO BE GROUTED INTO HEADWALL AT JOB SITE BY CONTRACTOR
* ALL ELEMENTS PRECAST TO MEET ASTM C913.
* WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR AS LONG AS THE SAME AREA OF STEEL IS PROVIDED.
* CHAMFER ALL CORNERS 1" OR HAVE A RADIUS OF 1".

NOTE: THE MINIMUM BAR SIZE SHALL BE #5 BARS AT 8" CTS.THE CONTRACTOR WILL HAVE THE OPTION TO INCREASE THIS BAR SIZE AS NEEDED.

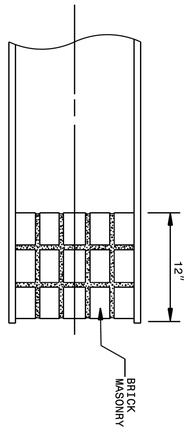
ENDWALL DIMENSIONS

FT.	MINIMUM	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.
PIPE DIA.	BAR SIZE	H1(FT.)	H2(FT.)	D (FT.)	W1	W2
1.0	#5 @ 8"	1.25/2.00	2.00/3.75	1.25/1.75	3.00/3.75	5.50/6.00
1.25	#5 @ 8"	1.25/2.00	3.00/3.75	1.25/2.00	3.50/3.75	6.50/6.75
1.50	#5 @ 8"	1.25/2.00	3.00/4.25	1.50/2.50	3.50/3.75	6.50/6.75
2.0	#5 @ 8"	1.50/2.50	4.00/4.75	1.75/2.50	4.00/4.25	7.50/8.25
2.5	#5 @ 8"	2.50/3.50	4.00/6.00	2.00/3.00	4.50/5.50	10.00/11.50
3.0	#5 @ 8"	3.00/3.50	5.00/6.00	2.75/3.50	5.25/5.75	11.50/11.75
3.5	#5 @ 8"	3.25/4.50	6.00/6.75	3.25/3.50	6.00/6.75	12.00/13.25
4.0	#5 @ 8"	3.50/4.50	6.50/7.00	3.25/3.50	6.50/6.75	13.00/13.25
4.5	#5 @ 8"	4.00/5.00	6.50/8.50	3.25/4.00	7.00/9.25	13.50/15.75
5.0	#5 @ 8"	4.50/5.00	7.00/8.50	3.25/4.00	7.25/9.25	13.75/15.75
5.5	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.25/9.25	14.00/15.75
6.0	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.75/9.25	14.75/16.75

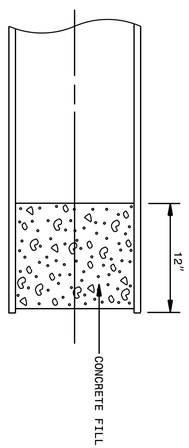
ROADWAY STANDARD DRAWING FOR
PRECAST CONCRETE ENDWALL
FOR SINGLE 12" THRU 72" PIPE - 90° SKEW

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 1 OF 1
838.80



SECTION OF MASONRY
PIPE PLUG



SECTION OF CONCRETE
PIPE PLUG

QUANTITIES	
PIPE SIZE	CUBIC YARDS
12"	0.029
15"	0.045
18"	0.065
24"	0.116
30"	0.182
36"	0.262
42"	0.356
48"	0.465
54"	0.589
60"	0.727
66"	0.880

NOTE:
EITHER BRICK MASONRY OR CONCRETE MAY BE USED.
CONCRETE BRICK MAY BE USED IN LIEU OF CLAY BRICK. JUMBO BRICK WILL BE PERMITTED.

NOTE:
USE PAY LIMITS (C.Y.) FOR PIPE PLUGS 12" IN THICKNESS ONLY.

ROADWAY STANDARD DRAWING FOR
CONCRETE AND BRICK PIPE PLUG

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 1 OF 1
840.71

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(919) 851-9200
ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
SEAL 26971
ENGINEER JOSHUA G. DALTON
7/28/2020

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BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

PLAN DETAILS

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_C103
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C103C

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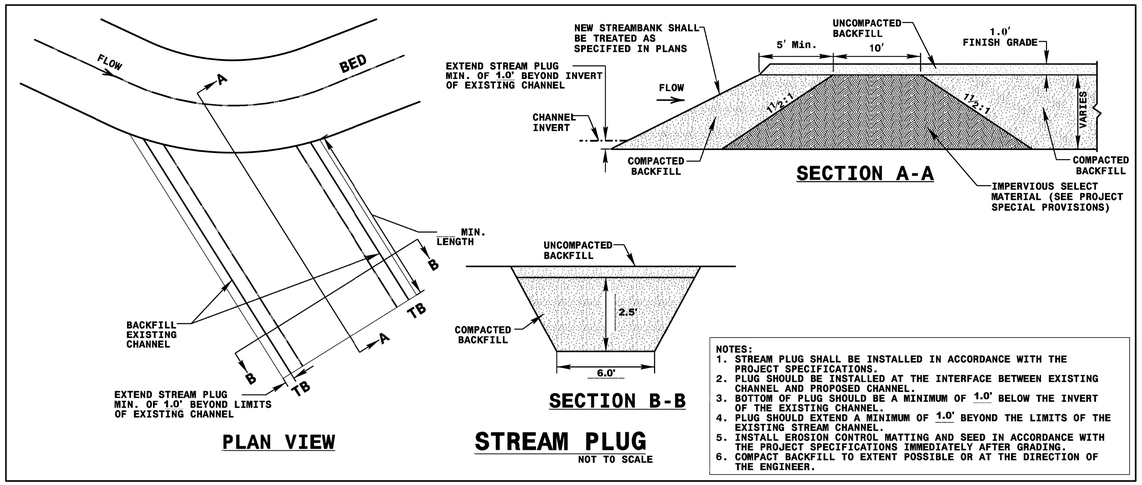
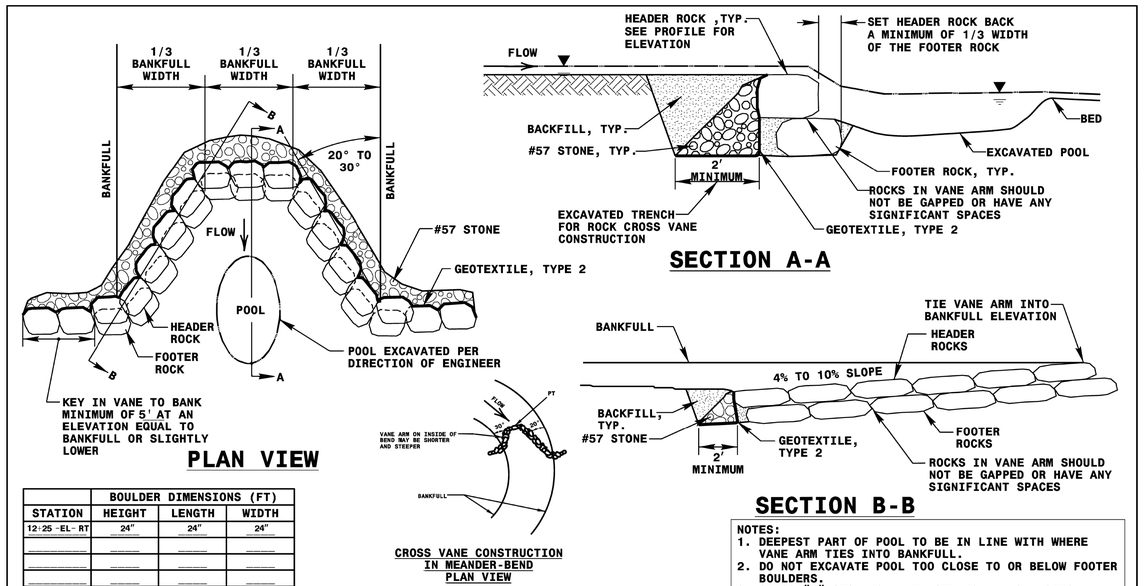


STREAM PLUG

NOT TO SCALE

NOTES:
1. STREAM PLUG SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2. PLUG SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3. BOTTOM OF PLUG SHOULD BE A MINIMUM OF 1.0' BELOW THE INVERT OF THE EXISTING CHANNEL.
4. PLUG SHOULD EXTEND A MINIMUM OF 1.0' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5. INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.



	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
12+25 -EL- RT	24"	24"	24"

CROSS VANE CONSTRUCTION IN MEANDER-BEND PLAN VIEW

ROCK CROSS VANE DETAIL

NOT TO SCALE

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO OR BELOW FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

SUNGATE DESIGN GROUP, P.A.
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ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

PLAN DETAILS

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_C103
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C103D

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$$$$USERNAME$$$$

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20 10 0 20 40

PLANS SCALE: 1" = 20'

7/27/2020
BROAD ST_Rdy_psh_C201.dgn
r.howard

SUNGATE DESIGN GROUP, P.A.

905 JONES FRANKLIN ROAD
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TEL: (919) 829-9909
ENGINEERING LICENSE NO. C-890

DocuSigned by:
Randal C. Howard
5781929805567...
NORTH CAROLINA PROFESSIONAL SEAL L-5015 LAND SURVEYOR RANDAL C. HOWARD

7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

EXISTING CONDITIONS

PROJECT # : 1083-20003

DRAWING NAME: BROAD ST_Rdy_psh_C201

DATE: 03/03/2020

DRAWN BY: RCH

REVIEWED BY: JGD

REVISIONS:

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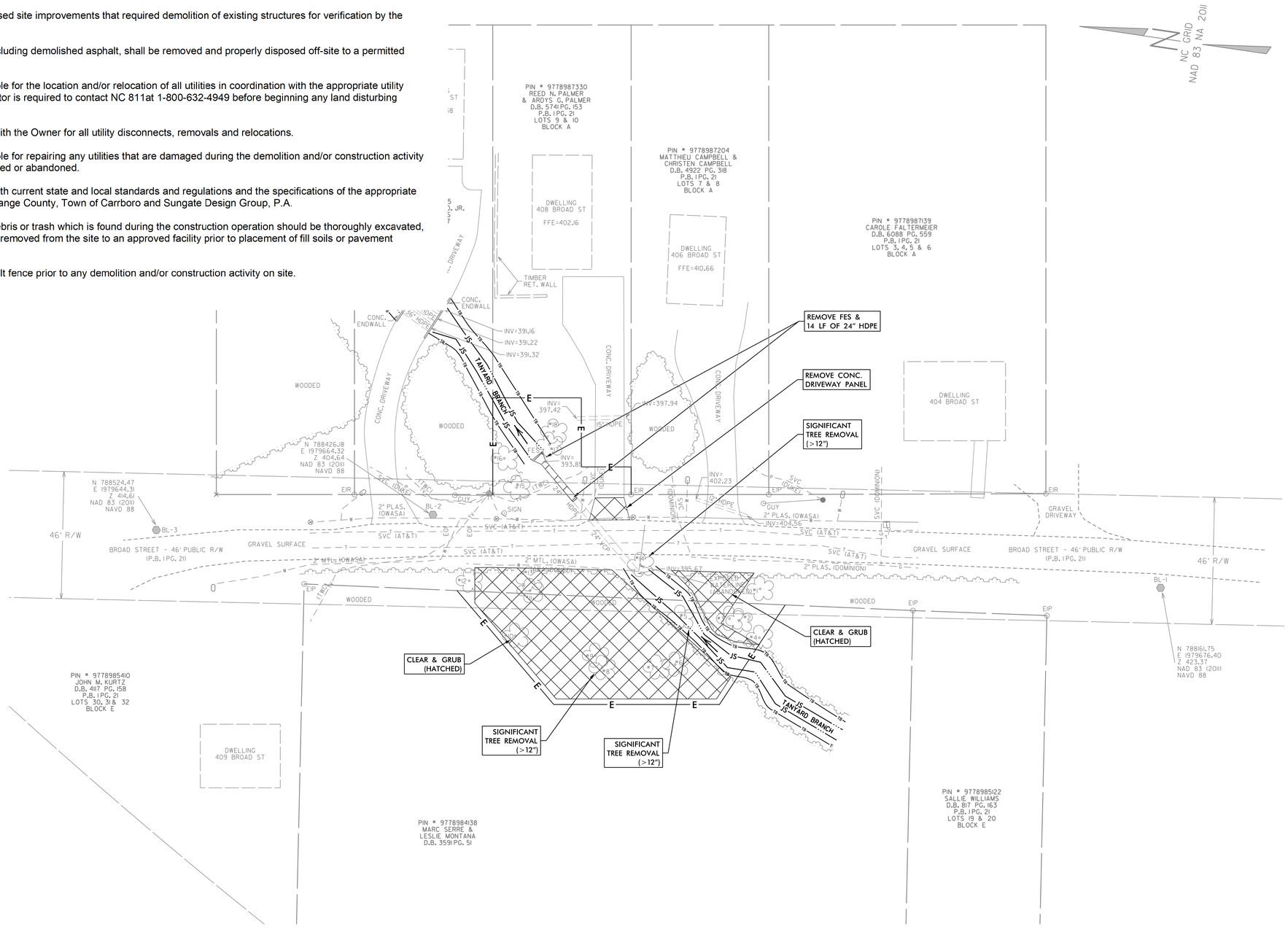
Demolition Notes

1. An on-site pre-construction meeting is required prior to the commencement of any demolition activity.
2. All existing site features shall remain unless noted to be removed or demolished.
3. Contractor is to field locate proposed site improvements that required demolition of existing structures for verification by the Engineer prior to demolition.
4. All excess demolition material, including demolished asphalt, shall be removed and properly disposed off-site to a permitted site.
5. The Contractor shall be responsible for the location and/or relocation of all utilities in coordination with the appropriate utility agency or company. The Contractor is required to contact NC 811at 1-800-632-4949 before beginning any land disturbing activity.
6. The Contractor shall coordinate with the Owner for all utility disconnects, removals and relocations.
7. The Contractor shall be responsible for repairing any utilities that are damaged during the demolition and/or construction activity that are not indicated to be removed or abandoned.
8. All work shall be in accordance with current state and local standards and regulations and the specifications of the appropriate government agency, OWASA, Orange County, Town of Carrboro and Sungate Design Group, P.A.
9. Any buried waste, construction debris or trash which is found during the construction operation should be thoroughly excavated, and the waste material should be removed from the site to an approved facility prior to placement of fill soils or pavement construction.
10. Install tree protection fence and silt fence prior to any demolition and/or construction activity on site.



20 10 0 20 40
PLANS SCALE: 1" = 20'

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(919) 851-1912
ENGINEERING LICENSE NO. C-890

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PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON
7/28/2020

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BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

DEMOLITION PLAN

PROJECT # : 1083-20003
DRAWING NAME: BROAD ST_Rdy_psh_C202
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C202

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EASEMENT COORDINATES (NAD 83)		
PT. #	NORTH (FT)	EAST (FT)
PT. 1	788405.81	1979674.71
PT. 2	788410.89	1979709.34
PT. 3	788379.18	1979713.99
PT. 4	788377.00	1979699.15
PT. 5	788375.55	1979689.26
PT. 6	788357.72	1979691.87
PT. 7	788356.27	1979681.99
PT. 8	788374.10	1979679.36
PT. 9	788400.86	1979675.44
PT. 10	788403.76	1979695.22
PT. 11	788295.30	1979650.53
PT. 12	788313.59	1979611.43
PT. 13	788372.95	1979602.72
PT. 14	788413.57	1979638.42
PT. 15	788368.76	1979643.01
PT. 16	788338.88	1979646.07
PT. 17	788336.86	1979632.27
PT. 18	788366.54	1979627.92

TREE SURVEY			
#	DIA. (IN.)	COMMON NAME	NOTES
1	10"	SWEETGUM	RETAIN
2	30"	ELM	RETAIN
3	12"	ELM	RETAIN
4	6"	ELM	TWIN 6"; RETAIN
5	20"	ELM	REMOVE
6	10"	ELM	REMOVE
7	12"	UNKNOWN	DEAD; REMOVE
8	26"	PINE	REMOVE
9	11"	MAPLE	REMOVE
10	9"	MAPLE	REMOVE
11	11"	ASH	REMOVE
12	11"	TULIP	RETAIN
13	8"	HACKBERRY	REMOVE
14	24"	SWEETGUM	REMOVE
15	3"	DWARF REDBUD	RETAIN
16	5"	RIVER BIRCH	TRIPLE 5"; RETAIN
17	5"	PRIVET	REMOVE
18	1"	PAWPAW	RETAIN

20 10 0 20 40
PLANS SCALE: 1" = 20'

SUNGATE DESIGN GROUP, P.A.
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TEL: (919) 832-0294
ENGINEERING LICENSE NO. C-890

NORTH CAROLINA PROFESSIONAL SEAL L-5015 LAND SURVEYOR RANDAL C. HOWARD
Randal C. Howard
DocuSigned by:
7/28/2020

7/28/2020

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BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

TREE SURVEY & EASEMENT PLAN

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_C203
DATE: 03032020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C203**

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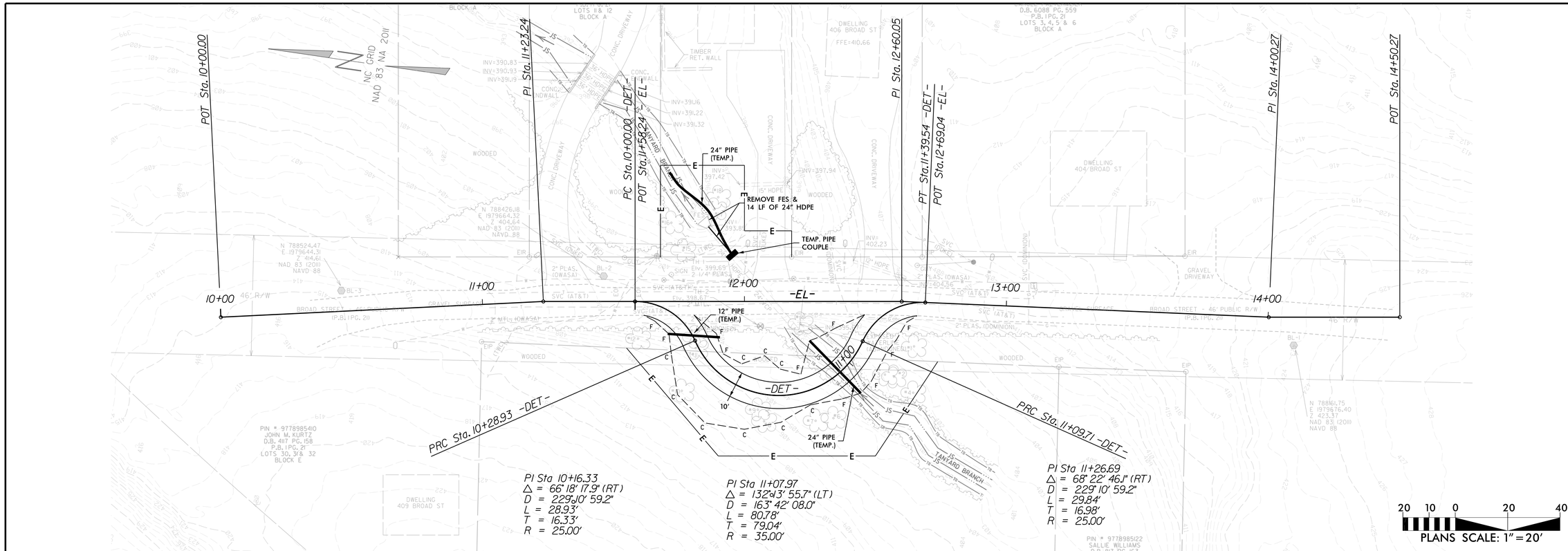

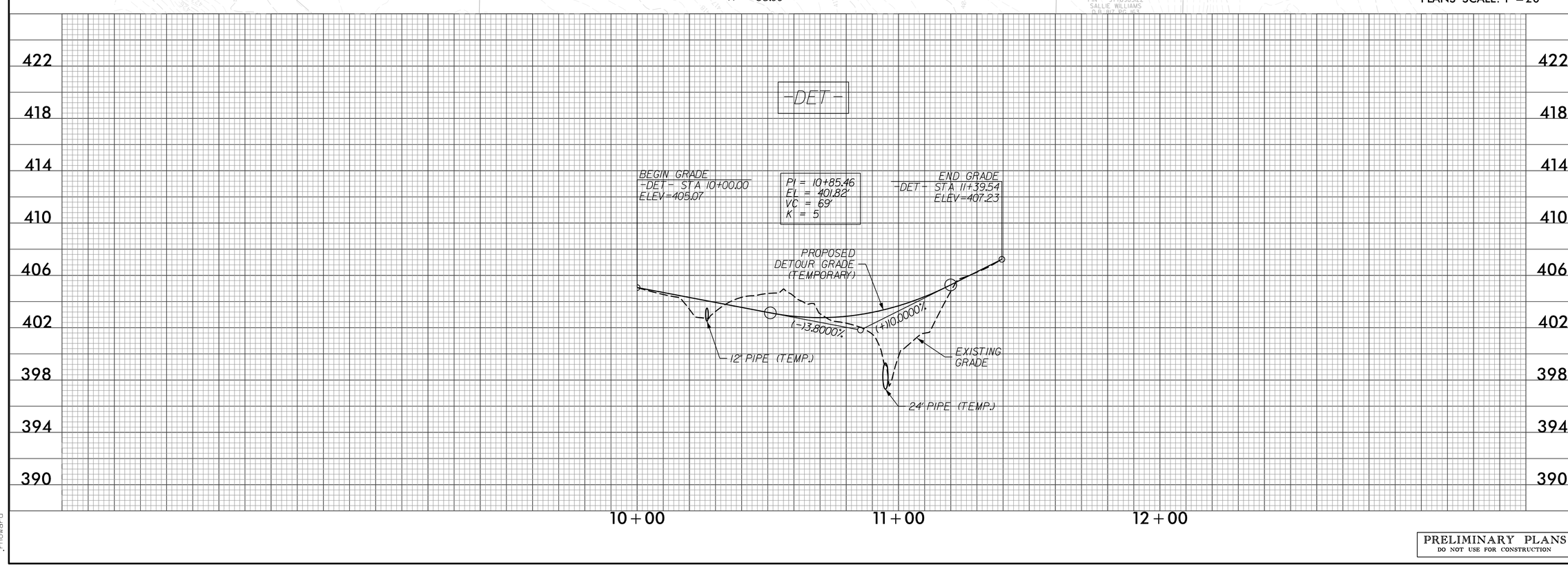

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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ENGINEERING LICENSE NO. C-0890

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7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

DETOUR PLAN & PROFILE

PROJECT # : 1083-20003
DRAWING NAME: BROAD ST_Rdy_psh_C301
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C301**

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rhoward

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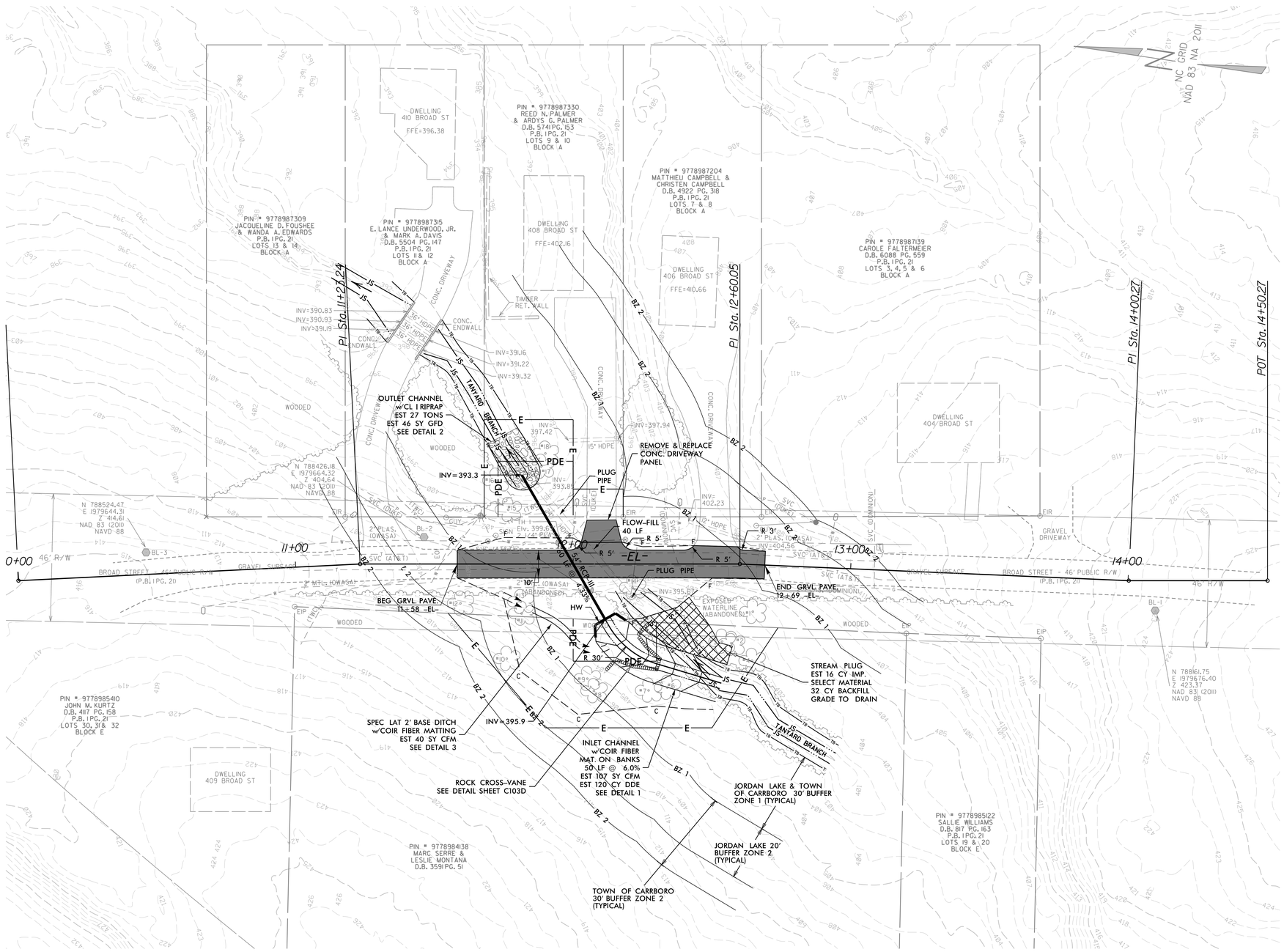
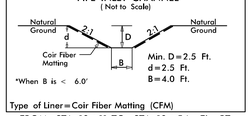


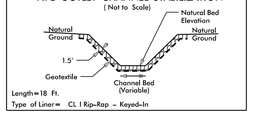
DETAIL 1
PIPE INLET CHANNEL
(Not to Scale)



Type of Liner = Coir Fiber Matting (CFM)

FROM STA. 12+11 TO STA. 12+54 -EL- RT

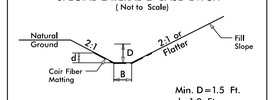
DETAIL 2
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length = 18 Ft.
Type of Liner = CL I Rip-Rap - Keyed-In

FROM STA. 11+69 TO STA. 11+89 -EL- LT

DETAIL 3
SPECIAL LATERAL 2' BASE DITCH
(Not to Scale)



Type of Liner = Coir Fiber Matting

FROM STA. 11+75 TO STA. 12+12 -EL- RT

20 10 0 20 40
PLANS SCALE: 1" = 20'

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ENGINEERING LICENSE NO. C-890

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7/28/2020

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BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

PLAN VIEW

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_C401
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C401

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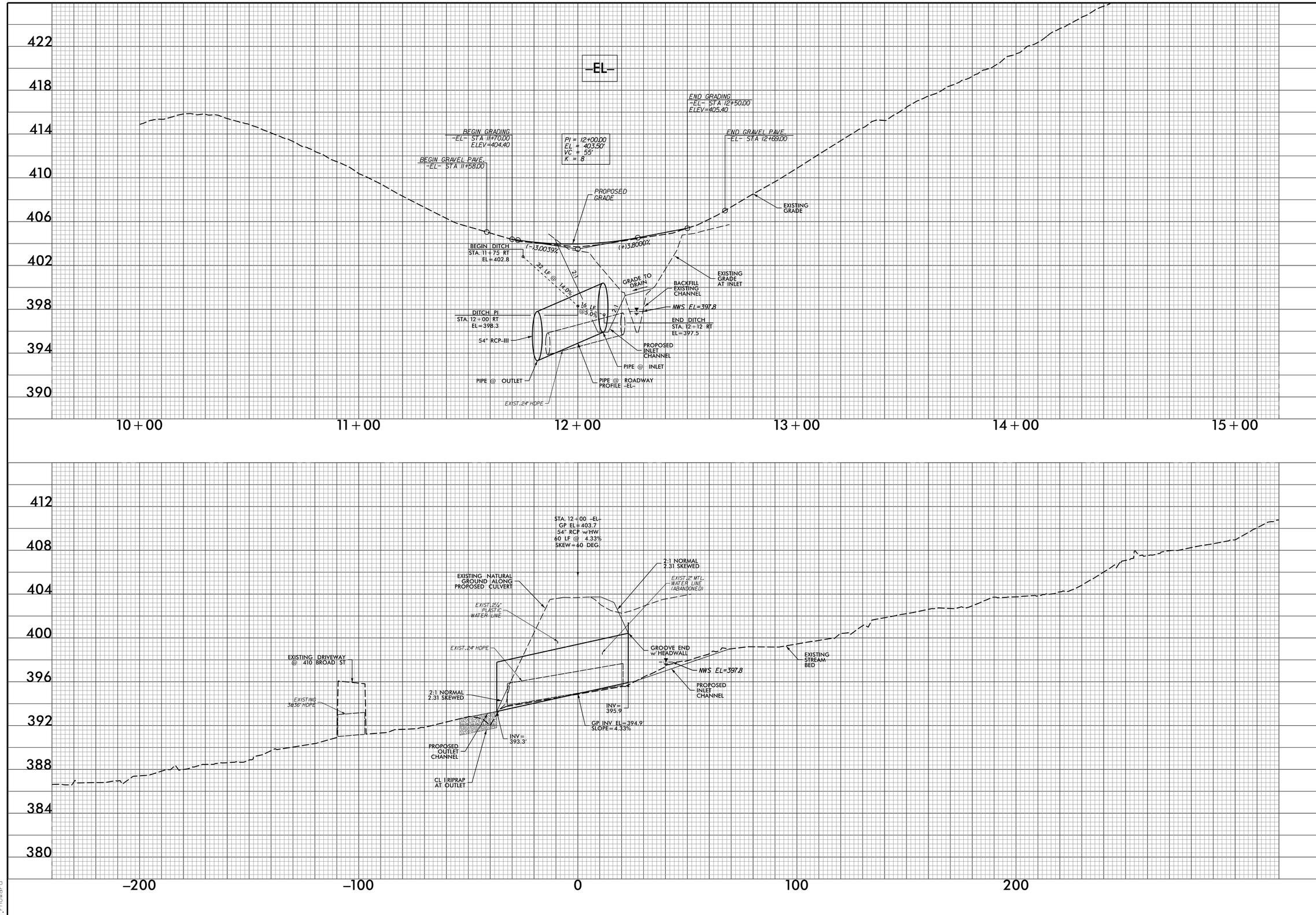

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

PROFILE VIEW

PROJECT # : 1083-20003
DRAWING NAME: BROAD ST_Rdy_psh_C402
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

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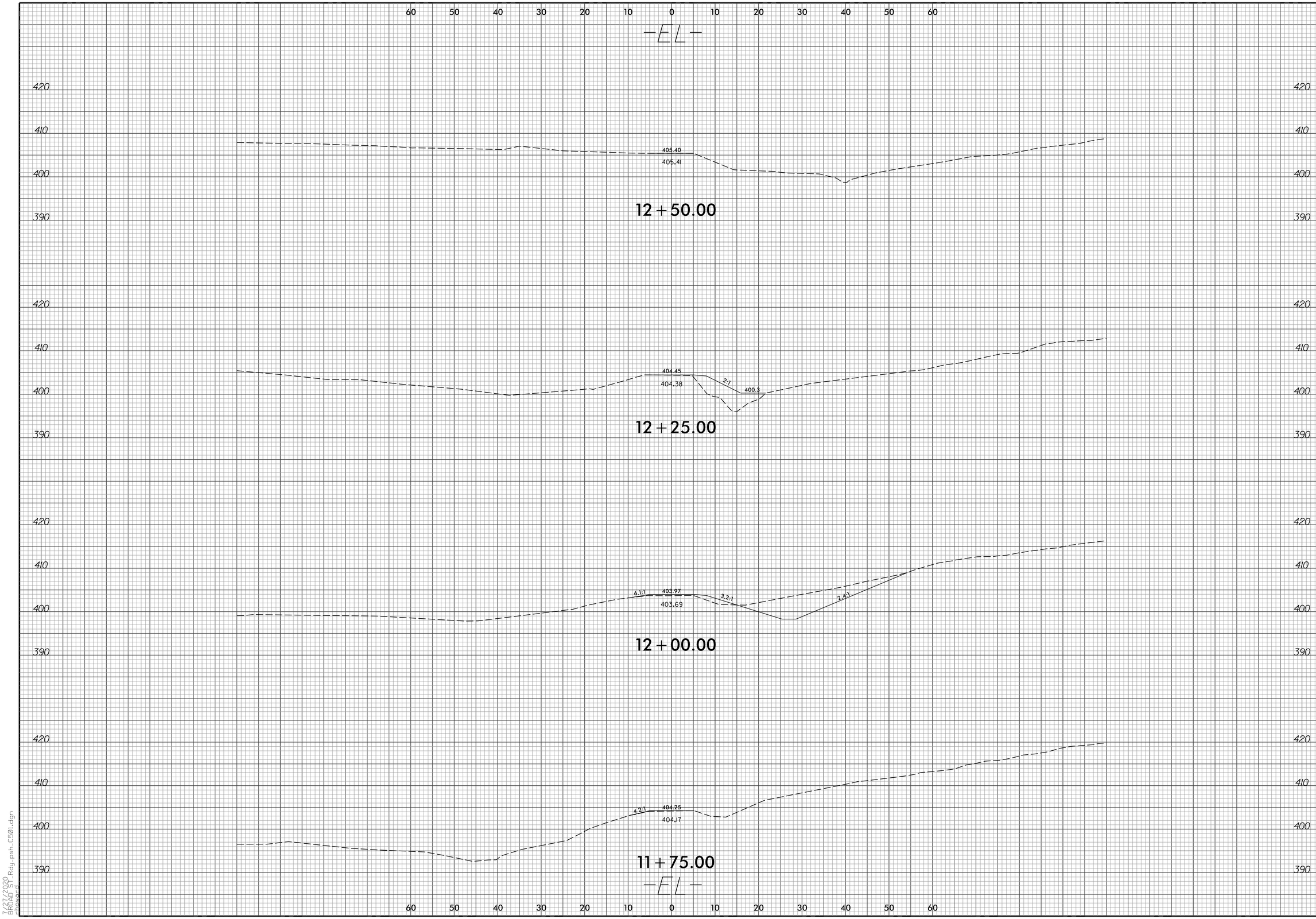

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

CROSS SECTIONS

PROJECT # :

DRAWING NAME:

DATE: 03/03/2020

DRAWN BY: RCH

REVIEWED BY: JGD

REVISIONS:

SHEET NO.

C501A

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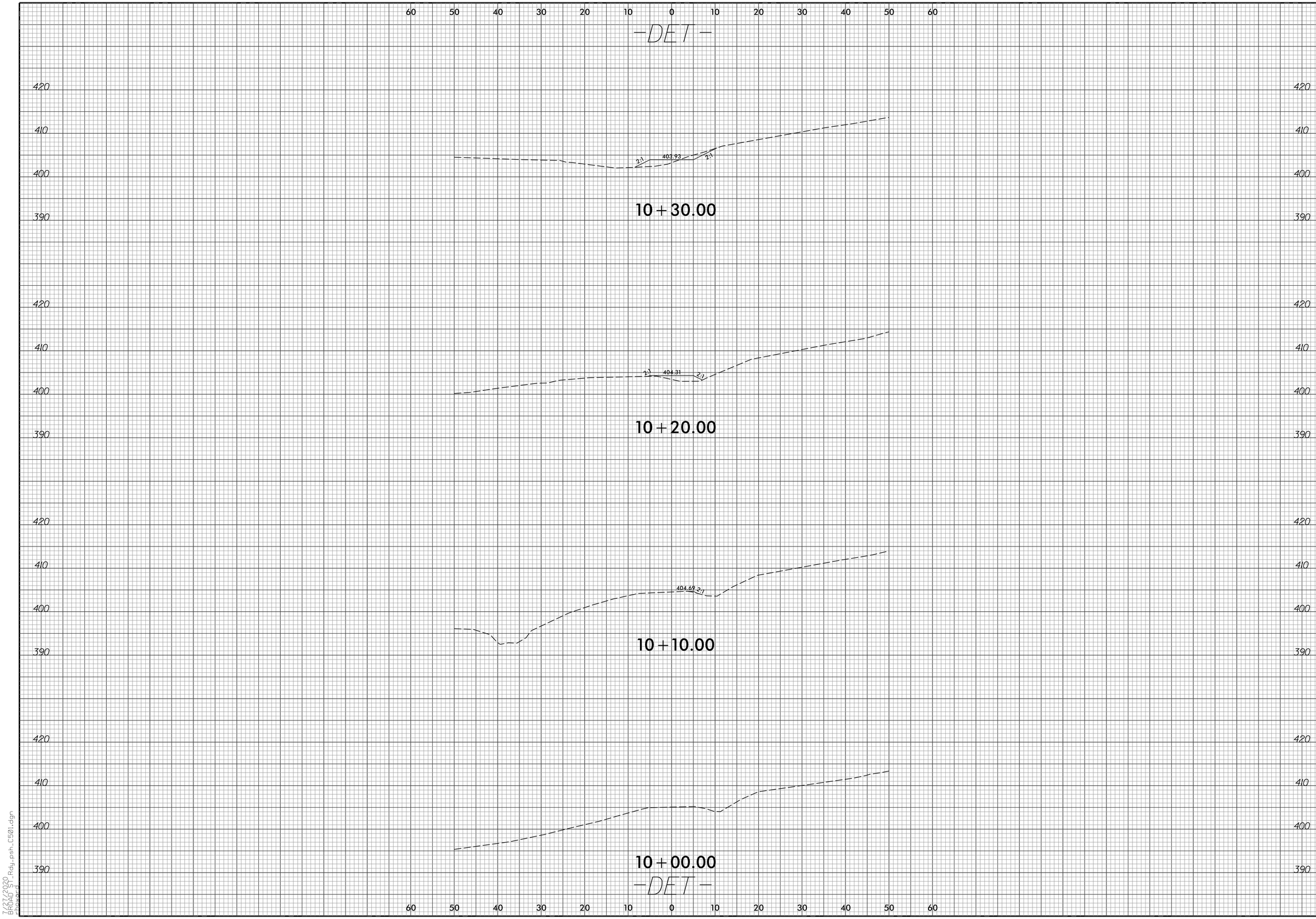

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7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

CROSS SECTIONS

PROJECT # :

DRAWING NAME:

DATE: 03/03/2020

DRAWN BY: RCH

REVIEWED BY: JGD

REVISIONS:

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C501B

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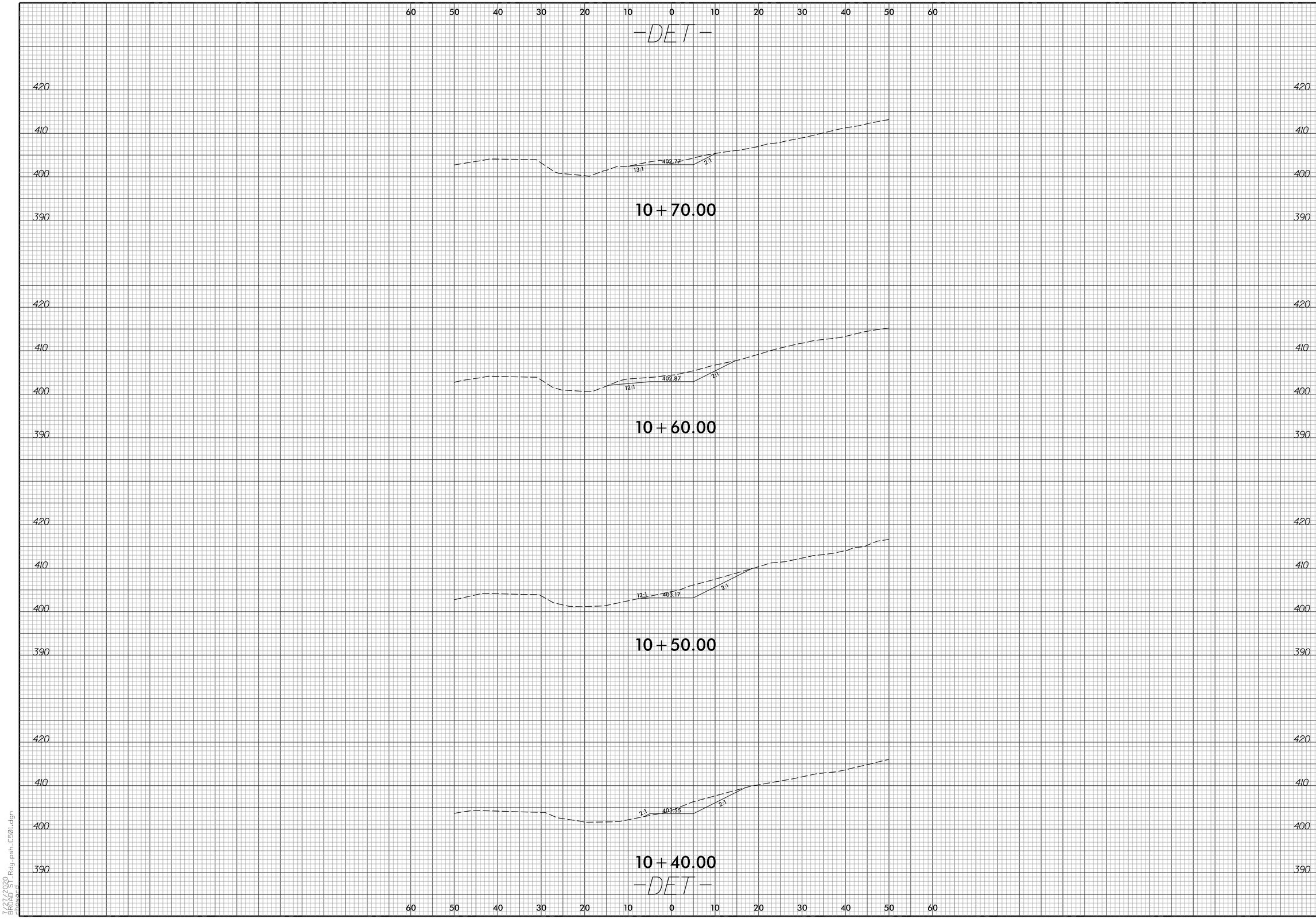

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

CROSS SECTIONS

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PROJECT # :

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DATE: 03/03/2020

DRAWN BY: RCH

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REVISIONS:

SHEET NO. C501C

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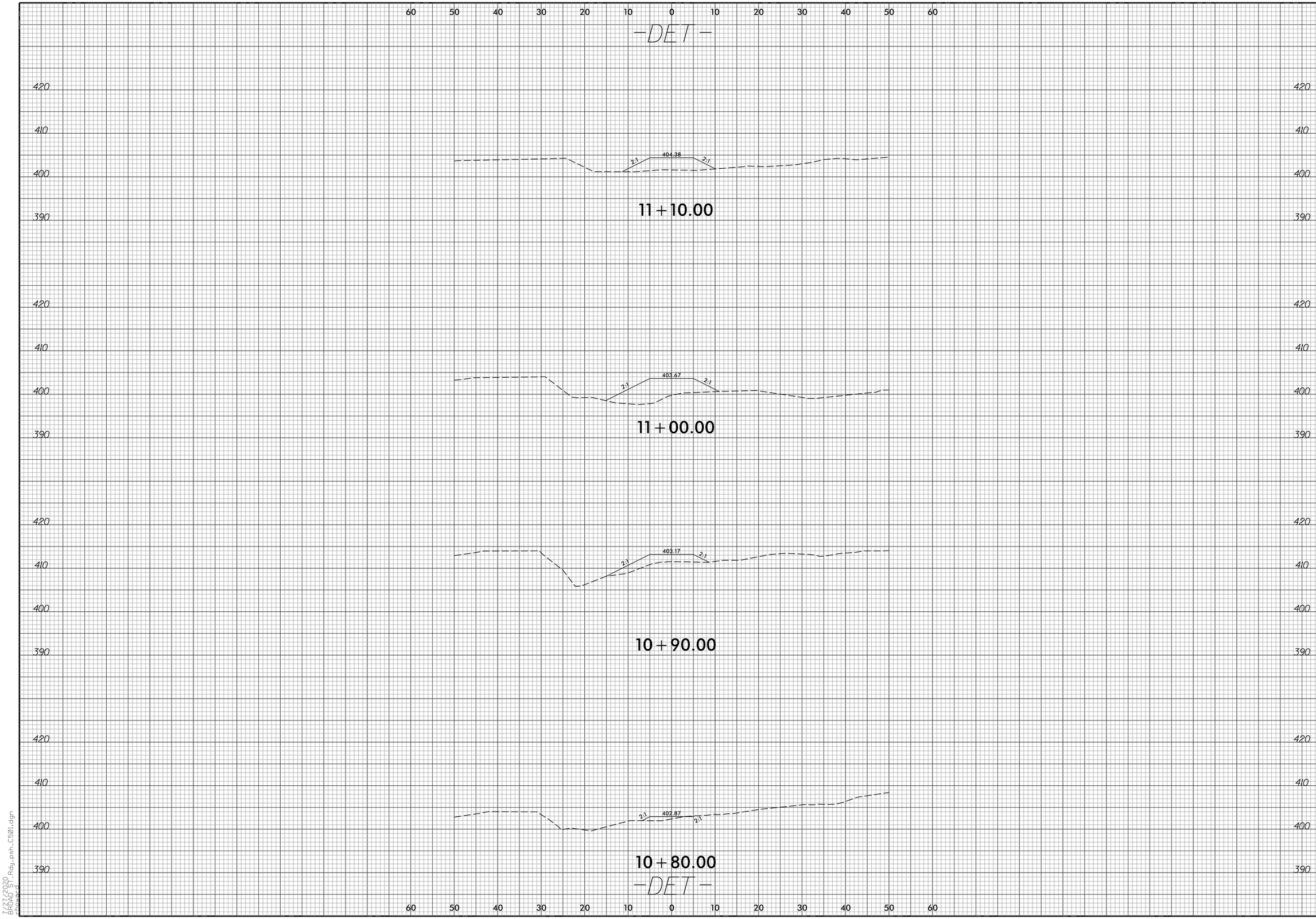

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7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

CROSS SECTIONS

PROJECT # :

DRAWING NAME:

DATE: 03/03/2020

DRAWN BY: RCH

REVIEWED BY: JGD

REVISIONS:

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C501D

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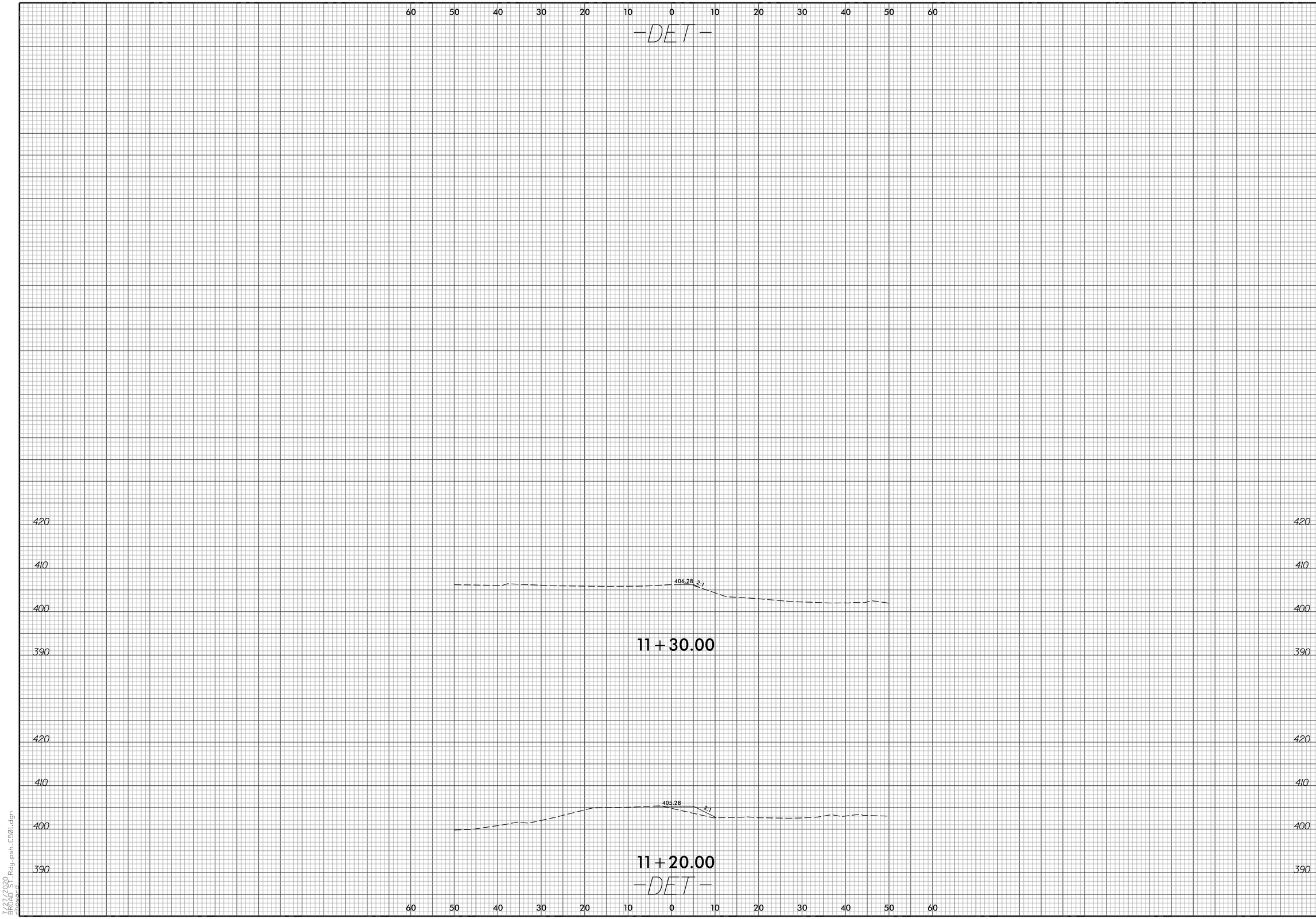

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Docu Signed by: Joshua G. Dalton
7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

CROSS SECTIONS

PROJECT # :

DRAWING NAME:

DATE: 03/03/2020

DRAWN BY: RCH

REVIEWED BY: JGD

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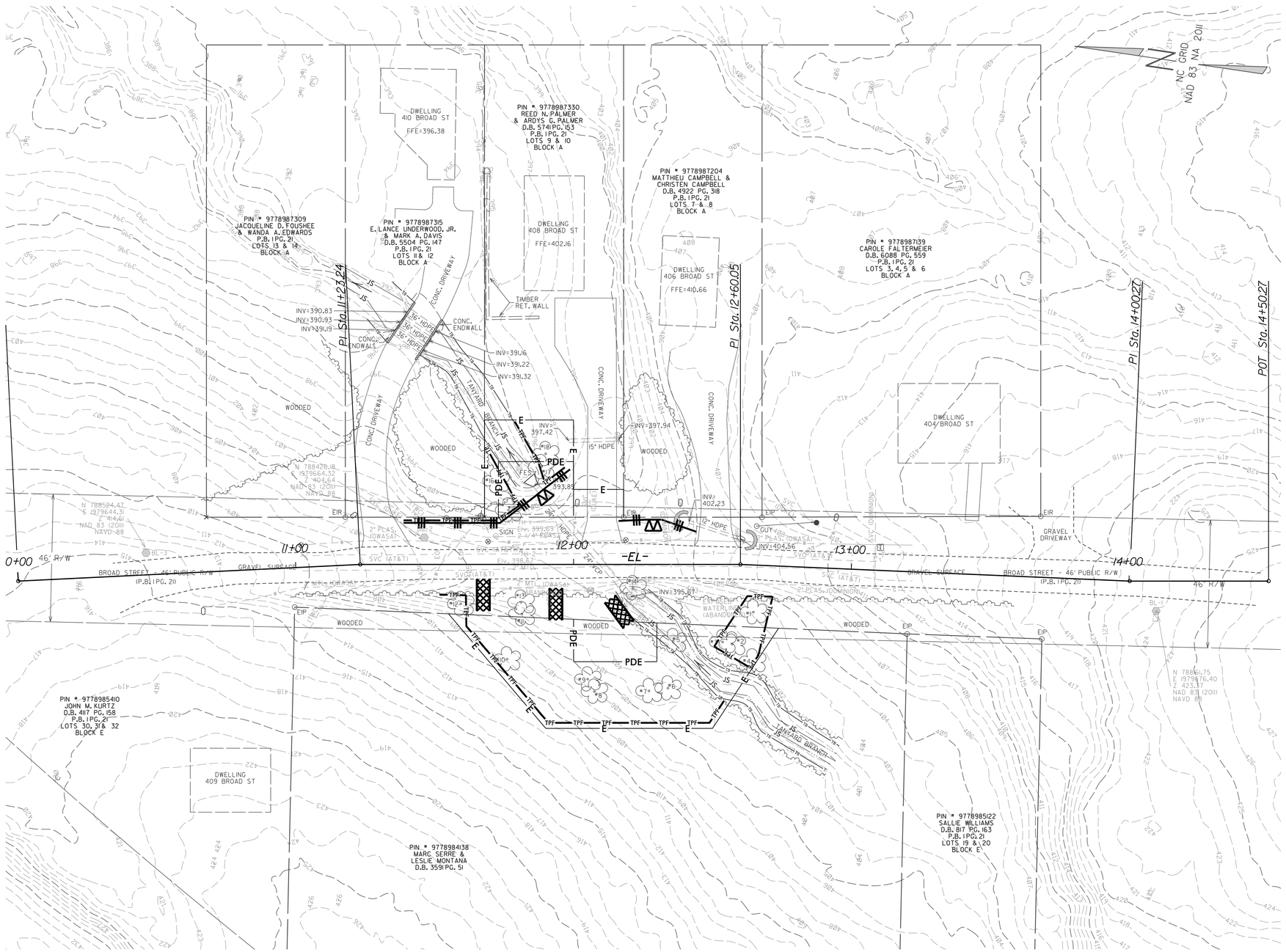
EROSION CONTROL PLAN



CLEARING AND GRUBBING EROSION CONTROL

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

SYMBOL LEGEND

- TEMPORARY SILT FENCE
- TREE PROTECTION FENCE
- SILT FENCE OUTLET
- ROCK SILT CHECK TYPE-A
- COIR FIBER WATTLE

DISTURBED AREA 8240 SF

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) Slopes 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) Slopes 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 calendar 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 • Plastic 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

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

20 10 0 20 40
PLANS SCALE: 1" = 20'

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7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

CLEARING & GRUBBING E&SC PLAN

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_E101
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **E101**

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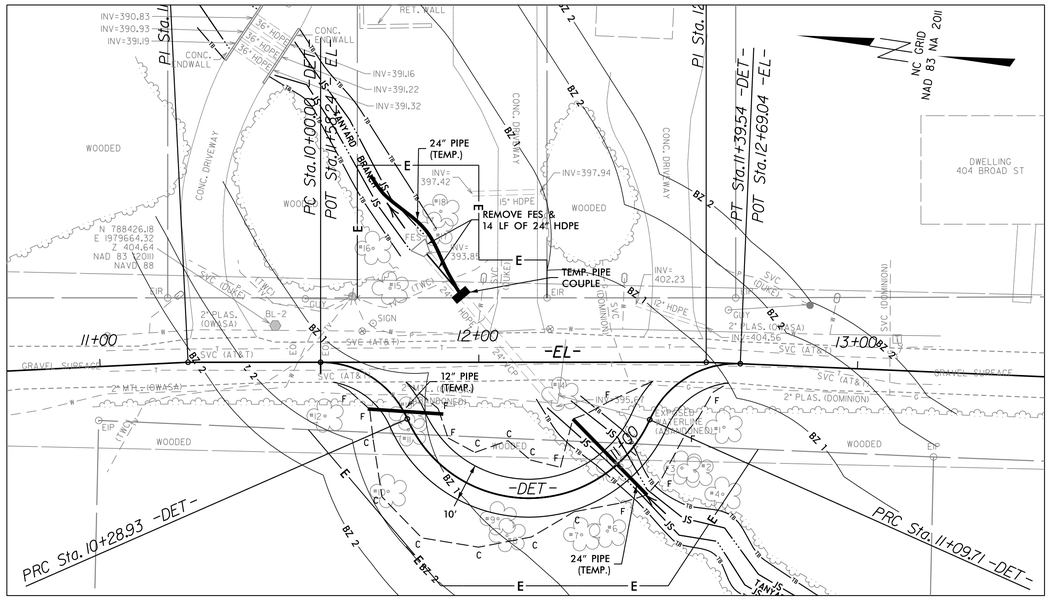
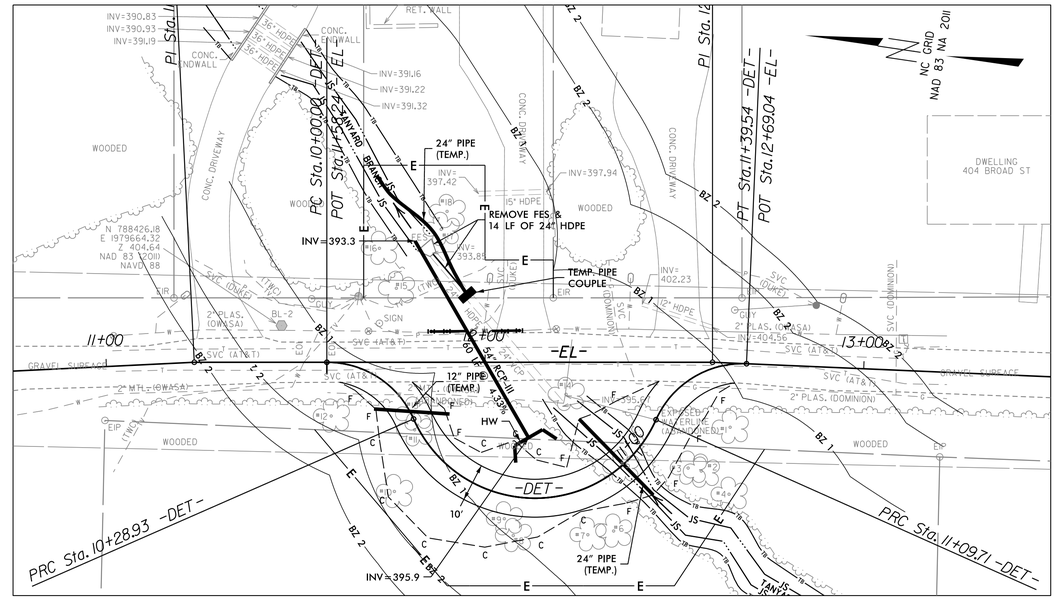
PHASE 1



PHASE 1

1.1 INSTALL DETOUR EROSION CONTROL.
1.2 INSTALL 12" & 24" TEMP. PIPES FOR DETOUR ALIGNMENT.
1.3 CONSTRUCT DETOUR.
1.4 REMOVE EXISTING FES AND 14 LF OF 24" HDPE.
1.5 INSTALL 24" TEMP. PIPE AND COUPLE ON OUTLET OF EXISTING 24" HDPE.

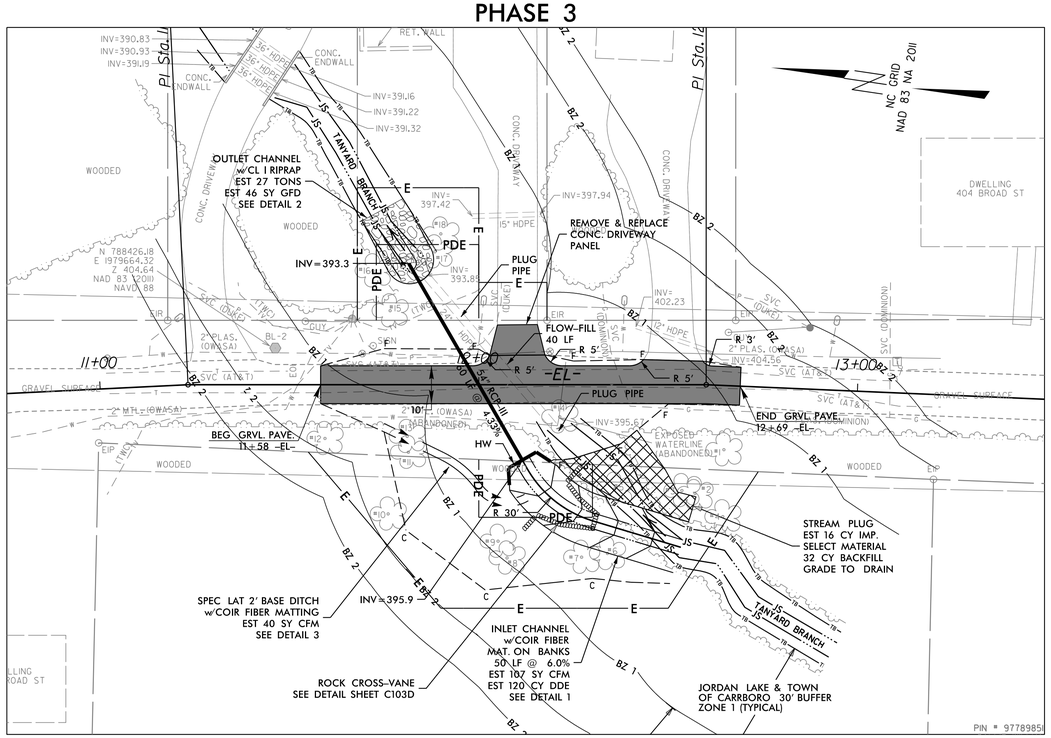
PHASE 2



PHASE 2

2.1 DIVERT TRAFFIC TO DETOUR ALIGNMENT.
2.2 INSTALL 60 LF OF 54" RCP-III.
2.3 CONSTRUCT WATER LINE.
2.4 CONSTRUCT HEADWALL (HW).
2.5 SHIFT TRAFFIC BACK TO BROAD ST.

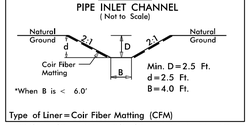
PHASE 3



PHASE 3

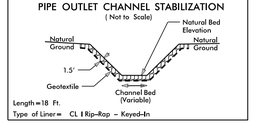
3.1 REMOVE DETOUR AND TEMP. PIPES.
3.2 CONSTRUCT INLET AND OUTLET CHANNEL IMPROVEMENTS.
3.3 REMOVE 24" TEMP. PIPE AT OUTLET.
3.4 DIVERT FLOW TO NEW CHANNEL.
3.5 FLOW FILL AND PLUG REMAINDER OF 24" HDPE / VCP.
3.6 CONSTRUCT SHOULDER, STREAMPLUG, AND SPEC. LAT. 2' BASE DITCH.
3.7 GRADE AND GRAVEL PAVE BROAD ST.

DETAIL 1
PIPE INLET CHANNEL
(Not to Scale)



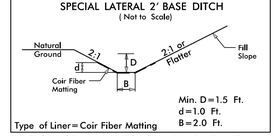
Type of Liner=Coir Fiber Matting (CFM)
FROM STA. 12+11 TO STA. 12+54 -EL- RT

DETAIL 2
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



FROM STA. 11+69 TO STA. 11+89 -EL- LT

DETAIL 3
SPECIAL LATERAL 2' BASE DITCH
(Not to Scale)



Type of Liner=Coir Fiber Matting
FROM STA. 11+75 TO STA. 12+12 -EL- RT

20 10 0 20 40
PLANS SCALE: 1"=20'

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NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
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7/28/2020

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BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

CULVERT PHASING PLAN

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_E102
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **E102**

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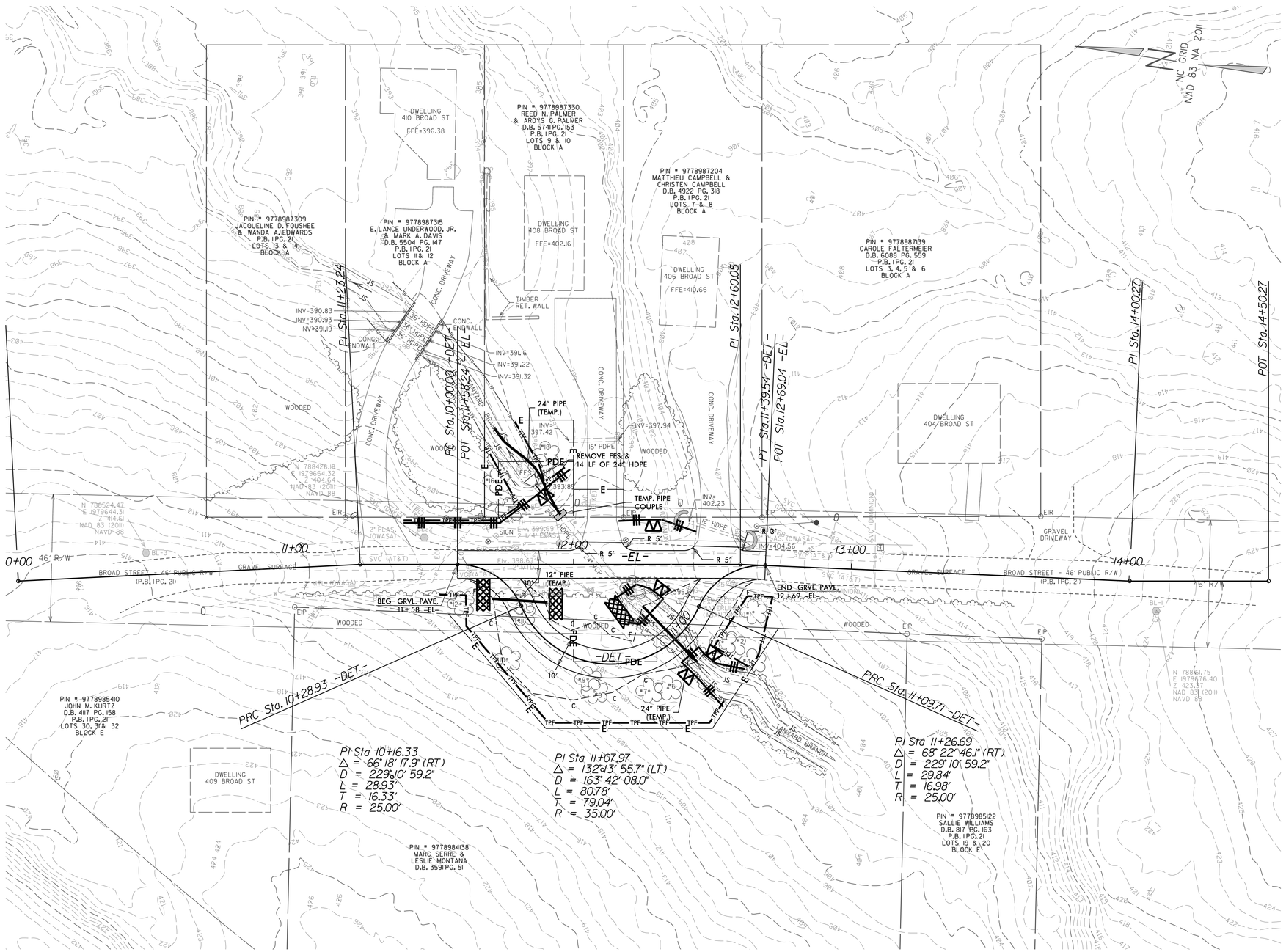
EROSION CONTROL PLAN



DETOUR EROSION CONTROL

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

SYMBOL LEGEND

- TEMPORARY SILT FENCE
- TREE PROTECTION FENCE
- SILT FENCE OUTLET
- ROCK SILT CHECK TYPE-A
- COIR FIBER WATTLE

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) Slopes 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) Slopes 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 calendar 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 • Plastic 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

20 10 0 20 40

PLANS SCALE: 1" = 20'

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

DETOUR E&SC PLAN

PROJECT # : 1083-20003

DRAWING NAME: BROAD_ST_Rdy_psh_E103

DATE: 03/03/2020

DRAWN BY: RCH

REVIEWED BY: JGD

REVISIONS:

SHEET NO. **E103**

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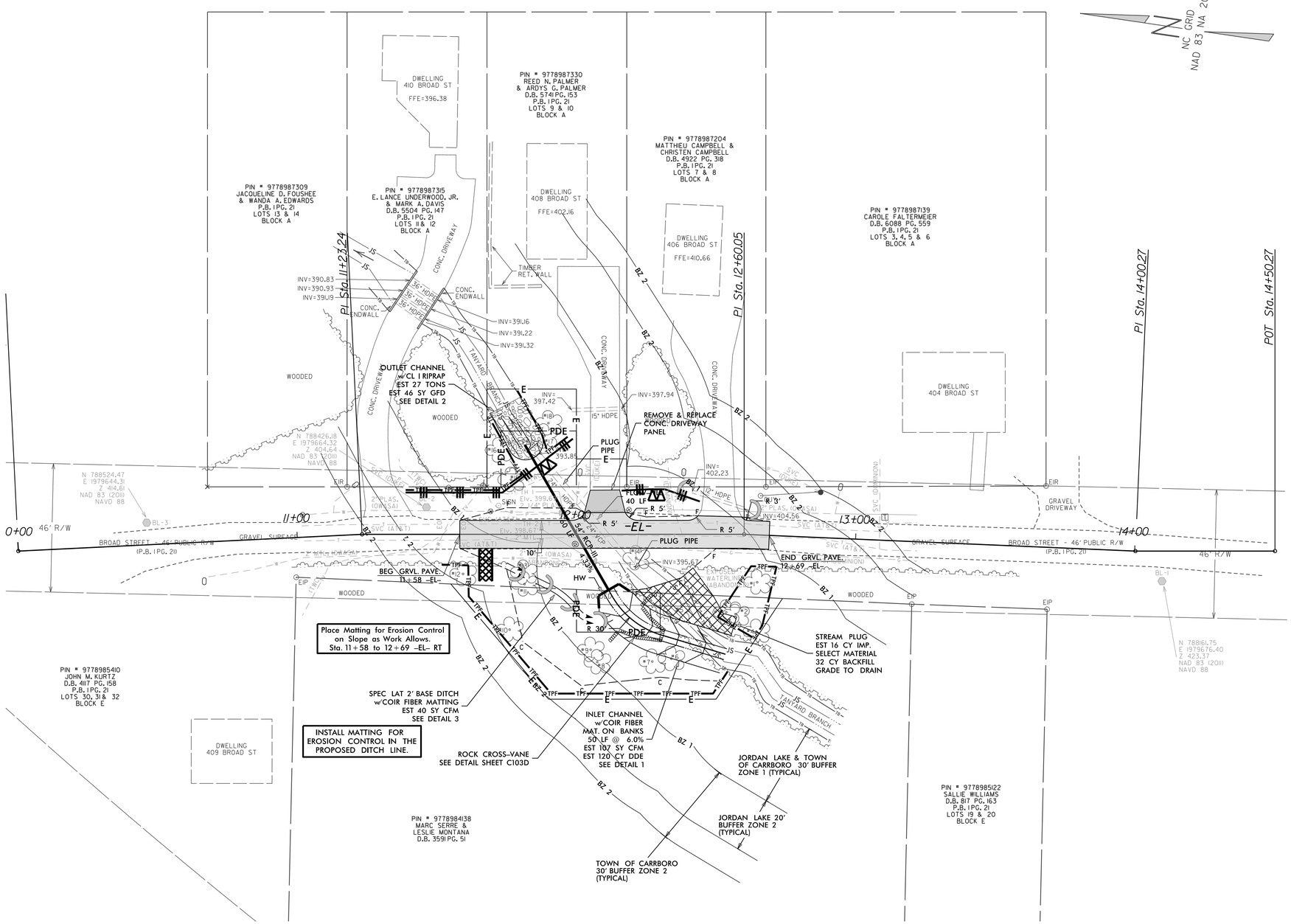
EROSION CONTROL PLAN



FINAL GRADE EROSION CONTROL

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

SYMBOL LEGEND

- TEMPORARY SILT FENCE
- TREE PROTECTION FENCE
- SILT FENCE OUTLET
- ROCK SILT CHECK TYPE-A
- COIR FIBER WATTLE

DISTURBED AREA 8240 SF

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) Slopes 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) Slopes 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

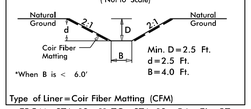
Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization 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 • Plastic 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

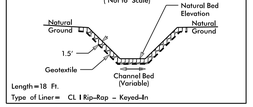
DETAIL 1
PIPE INLET CHANNEL
(Not to Scale)



Type of Liner=Coir Fiber Matting (CFM)

FROM STA. 12+11 TO STA. 12+54 -EL- RT

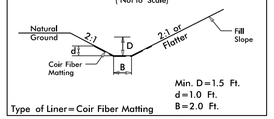
DETAIL 2
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



Type of Liner= CL I Rip-Rap - Keyed-In

FROM STA. 11+69 TO STA. 11+89 -EL- LT

DETAIL 3
SPECIAL LATERAL 2' BASE DITCH
(Not to Scale)



Type of Liner=Coir Fiber Matting

FROM STA. 11+75 TO STA. 12+12 -EL- RT

20 10 0 20 40
PLANS SCALE: 1"=20'

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
(919) 851-9229
ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

FINAL GRADE E&SC PLAN

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_E104
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **E104**

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7/27/2020
BROAD_ST_Rdy_psh_E104.dgn
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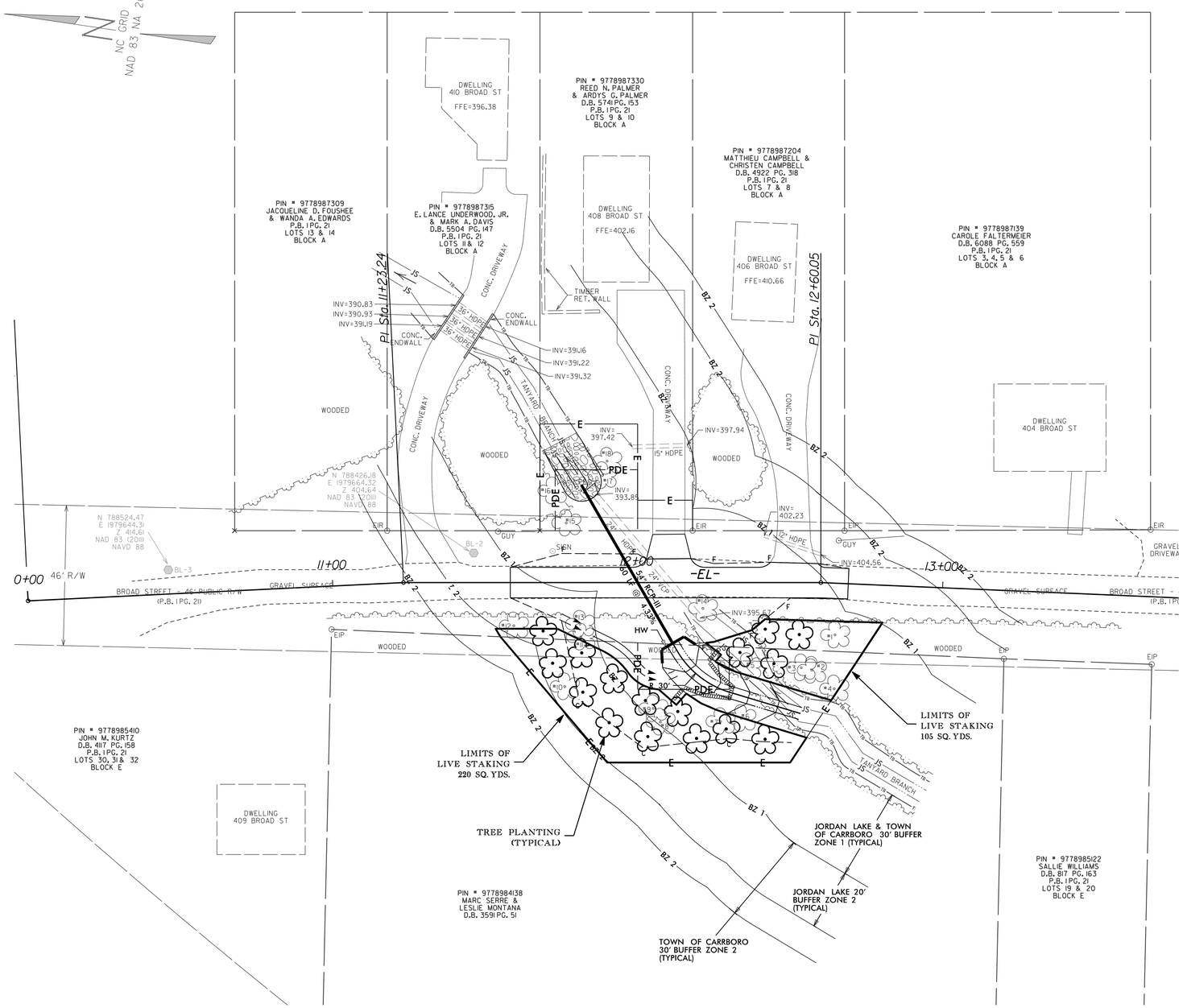
DocuSign Envelope ID: 60CF575F-3060-4CEC-93E5-2BACC46A3FDF



TREE PLANTING

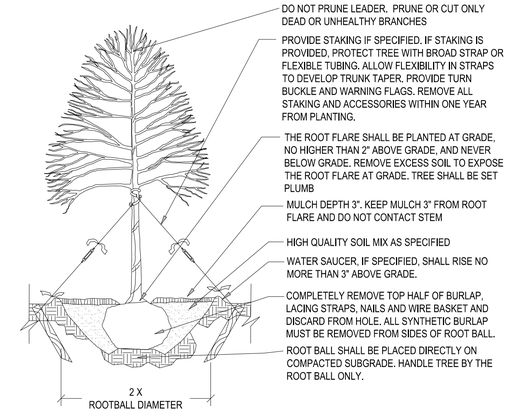
QUANTITY, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

4	CERCIS CANADENSIS	EASTERN REDBUD	4 TO 6 FT. TALL IN 5-GAL POT
4	CORNUS FLORIDA	FLOWERING DOGWOOD	4 TO 6 FT. TALL IN 5-GAL POT
4	ACER FLORIDANUM	SOUTHERN SUGAR MAPLE	8 TO 10 FT. TALL IN 15-GAL POT
4	QUERCUS BICOLOR	SWAMP WHITE OAK	8 TO 10 FT. TALL IN 15-GAL POT

PLANTED RANDOMLY AT APPROXIMATE EQUAL SPACING.

☐ SPECIES OF TREES LISTED MAY BE SUBSTITUTED BASED ON QUALITY AND AVAILABILITY AT THE TIME OF PLANTING. SUBSTITUTE SPECIES MUST BE NORTH CAROLINA NATIVE SPECIES SUITABLE FOR EXISTING SITE CONDITIONS.

TREE PLANTING DETAIL

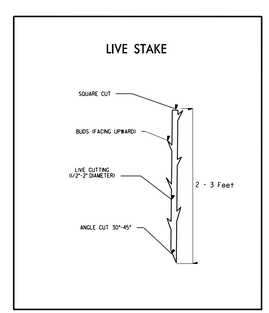


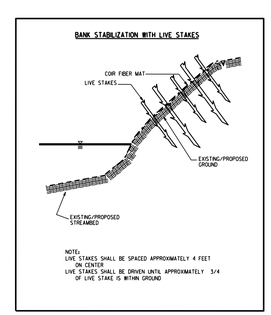
LIVE STAKES

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

50% SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50% CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES

LIVE STAKES PLANTING DETAIL

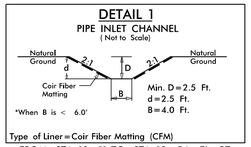




☐ LIVE STAKING SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.

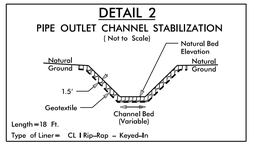
☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

DETAIL 1
PIPE INLET CHANNEL
(Not to Scale)



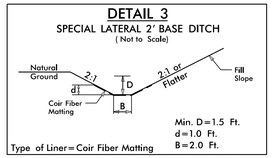
FROM STA. 12+11 TO STA. 12+54 –EL– RT

DETAIL 2
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



FROM STA. 11+69 TO STA. 11+89 –EL– LT

DETAIL 3
SPECIAL LATERAL 2' BASE DITCH
(Not to Scale)



FROM STA. 11+75 TO STA. 12+12 –EL– RT

20 10 0 20 40
PLANS SCALE: 1"=20'

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
(919) 832-0309
ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
C1C9BA0BC149404...
PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

RIPARIAN BUFFER RESTORATION PLAN

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_E201
DATE: 03032020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **E201**

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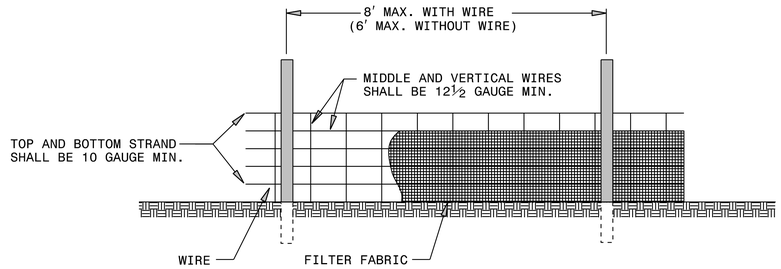
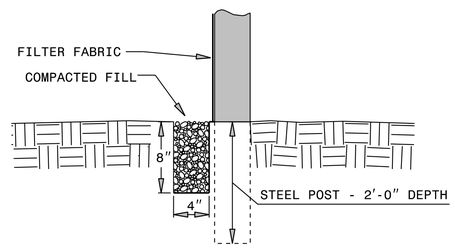
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY SILT FENCE



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.



EXTENSION OF FABRIC AND WIRE INTO TRENCH

SHEET 1 OF 1
1605.01

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.

ENGLISH STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

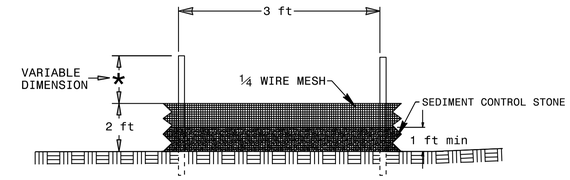
GENERAL NOTES:

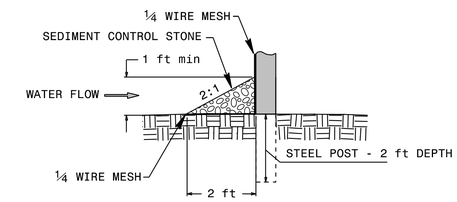
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

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.



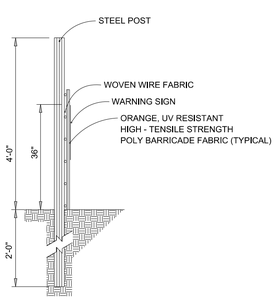


SHEET 1 OF 1
1606.01

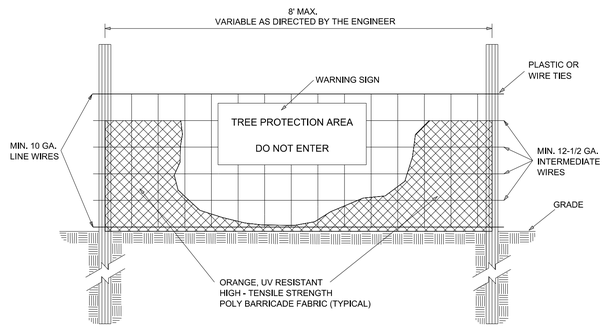
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1
1606.01

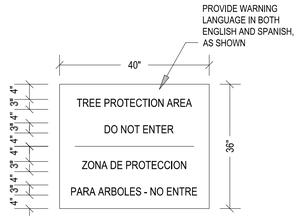


SIDE VIEW



FRONT VIEW

NOTE: FOR TREE PROTECTION ONLY



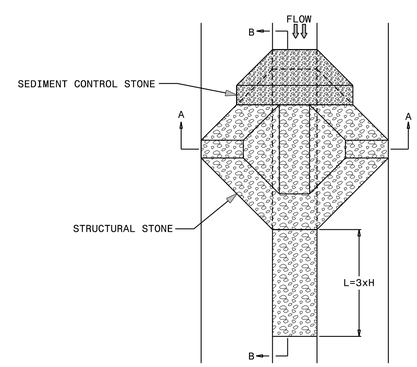
WARNING SIGN DETAIL

NOTES:
1. TREE PROTECTION FENCING MUST BE INSTALLED AT A MINIMUM RADIUS OF THE CRITICAL ROOT ZONE
2. THE TREE PROTECTION FENCING MUST REMAIN IN PLACE FOR THE DURATION OF THE PROJECT UNLESS OTHERWISE APPROVED BY ENGINEER.
3. APPROVED IMPACT PROTECTION DEVICES MUST BE REMOVED AFTER CONSTRUCTION WHEN APPLICABLE.
4. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER FOR THE REMAINDER
5. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTED AREA.
6. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
7. ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OF RALEIGH BASED ON ACTUAL FIELD CONDITIONS.
8. SIGNS ARE TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL WITH LETTERS A MINIMUM OF 3" HIGH, CLEARLY LEGIBLE AND SPACED AS SHOWN.

STANDARD TREE PROTECTION DETAIL

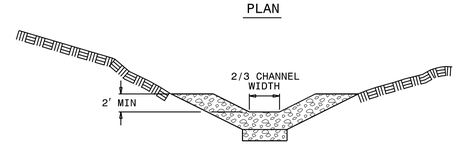
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
TEMPORARY ROCK SILT CHECK TYPE 'A'

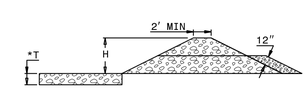


PLAN

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



SECTION A-A



SECTION B-B
*T = 12" MIN., 18" MAX.

SHEET 1 OF 1
1633.01

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

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 832-2203
ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

EROSION CONTROL DETAILS

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_E301
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E301A

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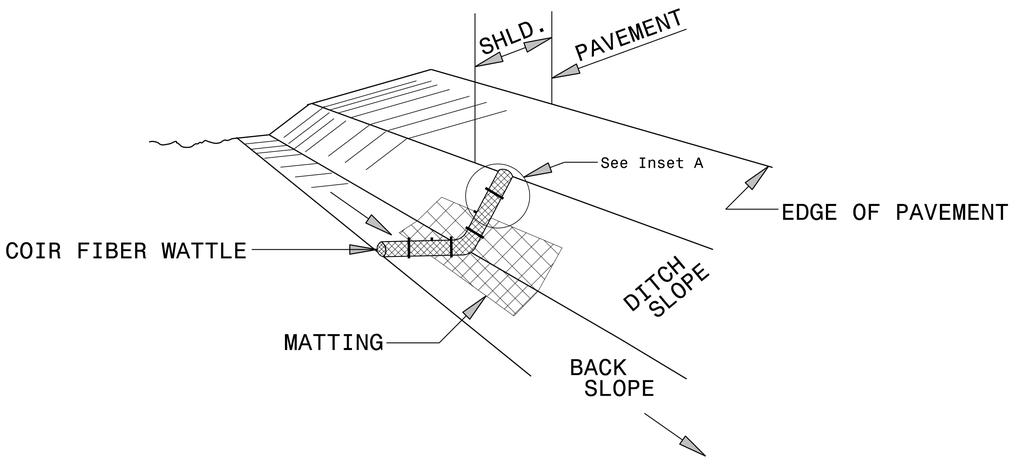
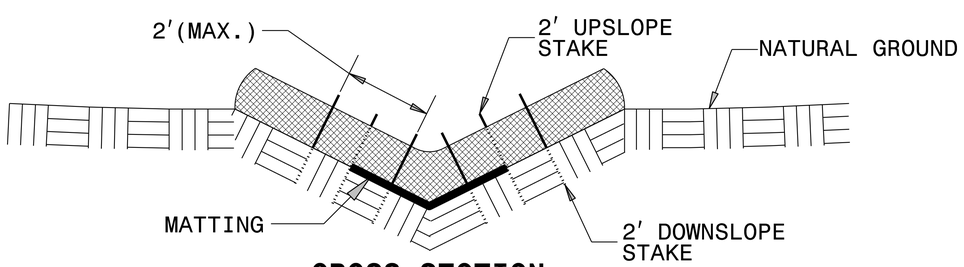
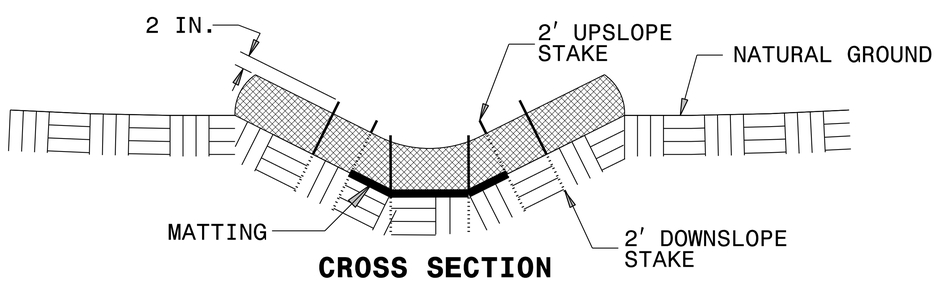
COIR FIBER WATTLE DETAIL



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.

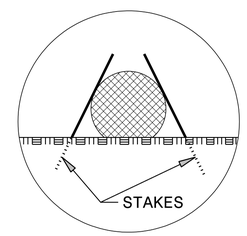
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

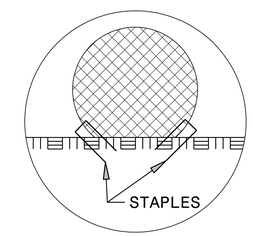
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

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

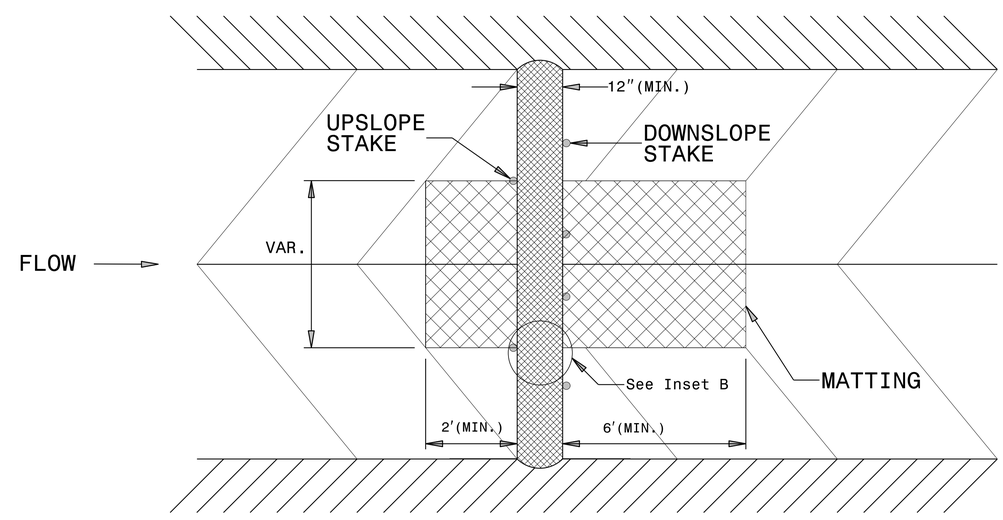
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



INSET B



TOP VIEW

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
FIRM LICENSE NO. C-0782
ENGINEERING
ELECTRICAL LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
1D59ADBC1459BC...
PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

EROSION CONTROL DETAILS

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_E301
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E301B

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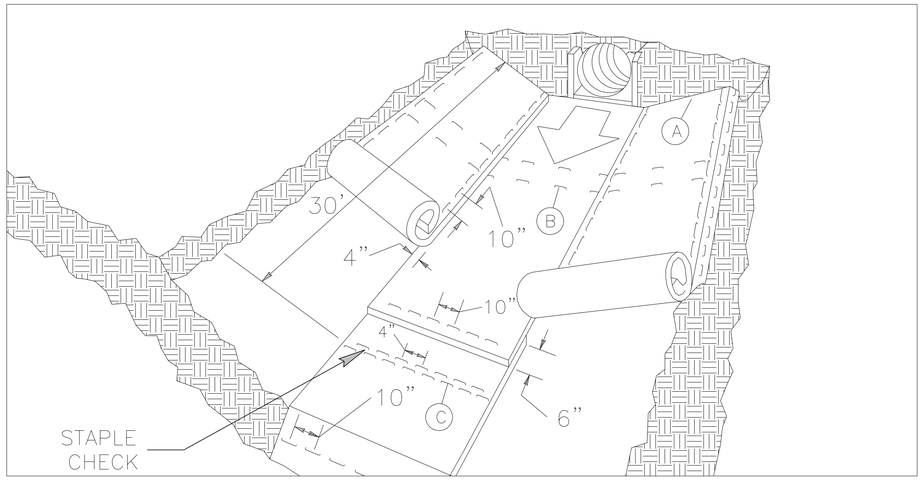
MATTING INSTALLATION DETAIL



MATTING IN DITCHES

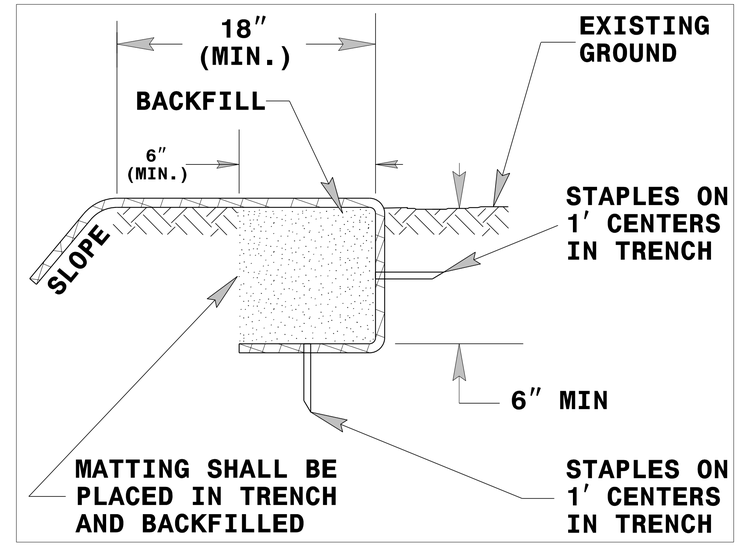
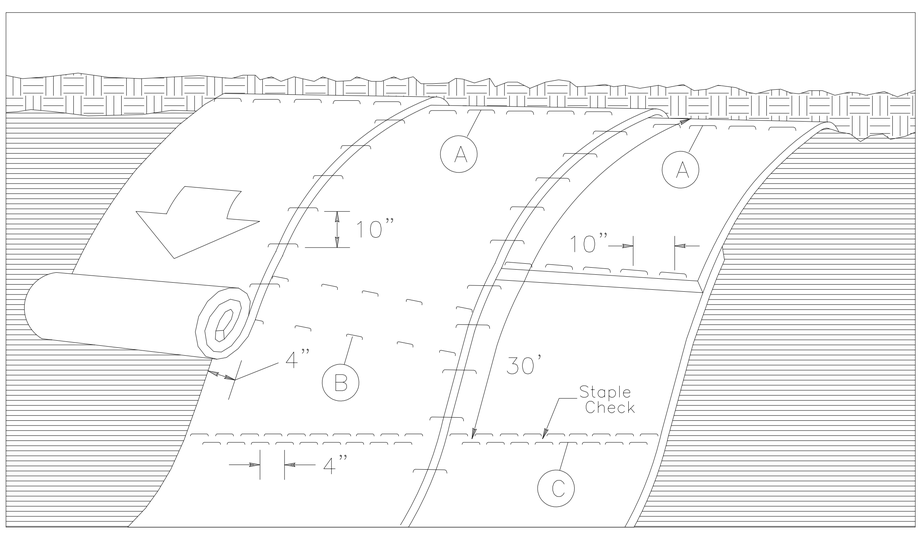


DIAGRAM A



MATTING ON SLOPES

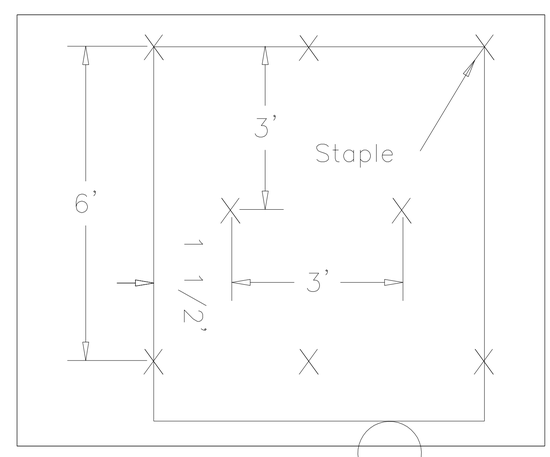


DIAGRAM B

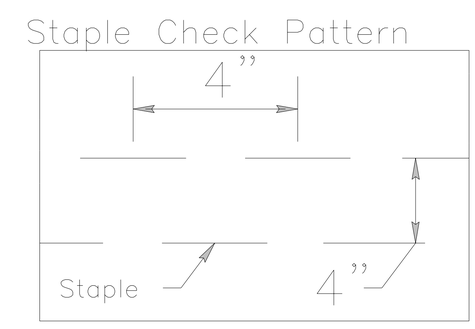


DIAGRAM C

NOTES:

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, COIR FIBER, 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

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
(919) 851-1912
ENGINEERING LICENSE NO. C-890

DocuSigned by: Joshua G. Dalton
F2B8ADBC149943...
PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

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BROAD ST CULVERT REPLACEMENT
OWNER: TOWN OF CARRBORO, NC

EROSION CONTROL DETAILS

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_E301
DATE: 03032020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. E301C

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7/27/2020
BROAD_ST_Rdy_psh_E301.dgn
rhoward

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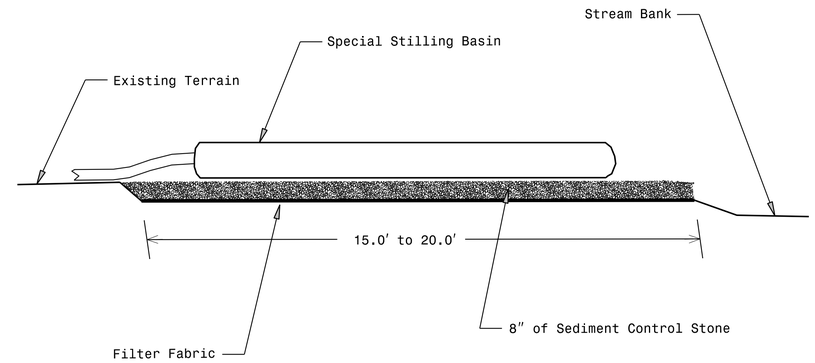
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH STANDARD DRAWING FOR
SPECIAL STILLING BASIN

SHEET 1 OF 1
1630.06



Note: Provide Stabilized Outlet to Streambank
Not To Scale

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

7-06

ENGLISH STANDARD DRAWING FOR
SPECIAL STILLING BASIN

SHEET 1 OF 1
1630.06

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(919) 851-1918
ENGINEERING LICENSE NO. C-890

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

DocuSigned by: Joshua G. Dalton
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7/28/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

EROSION CONTROL DETAILS

PROJECT # :
1083-20003

DRAWING NAME:
BROAD ST_Rdy_psh_E301

DATE:
07/20/2020

DRAWN BY:
RCH

REVIEWED BY:
JGD

REVISIONS:

SHEET NO.
E301D

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BROAD ST_Rdy_psh_E301.dgn
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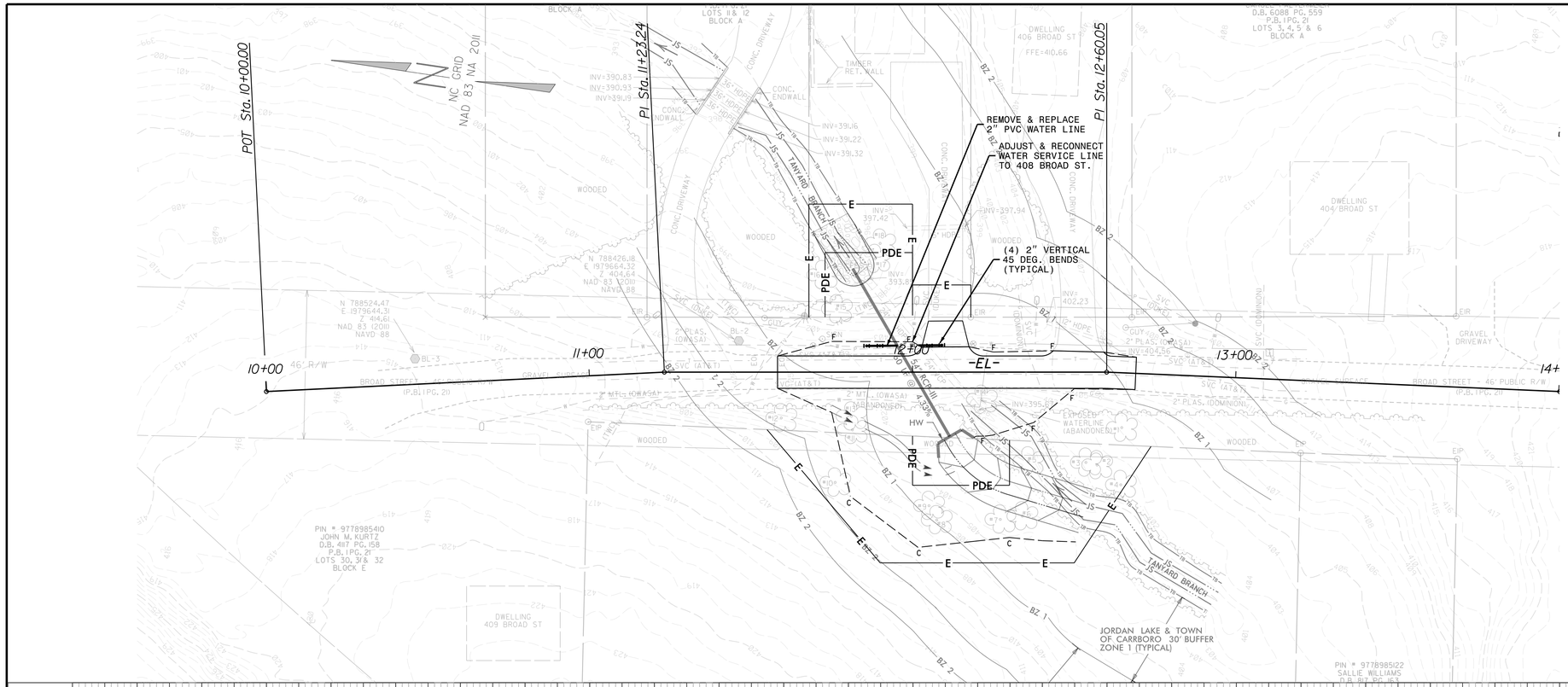


GENERAL UTILITY NOTES:

1. CONTRACTOR SHALL NOTIFY "NORTH CAROLINA ONE CALL" (1-800-632-4949) AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION OR EXCAVATION.

2. ALL WATER AND SEWER MAINS WITHIN PUBLIC EASEMENTS AND RIGHT-OF-WAY TO BE OWNED, OPERATED AND MAINTAINED BY ORANGE WATER AND SEWER AUTHORITY (OWASA).

3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWN OF CARRBORO AND OWASA STANDARDS AND SPECIFICAITONS.

4. CONTRACTOR SHALL CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION.

5. ALL DIMENSIONS AND GRADES SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE OWNER IF ANY DISCREPANCIES ARE FOUND.

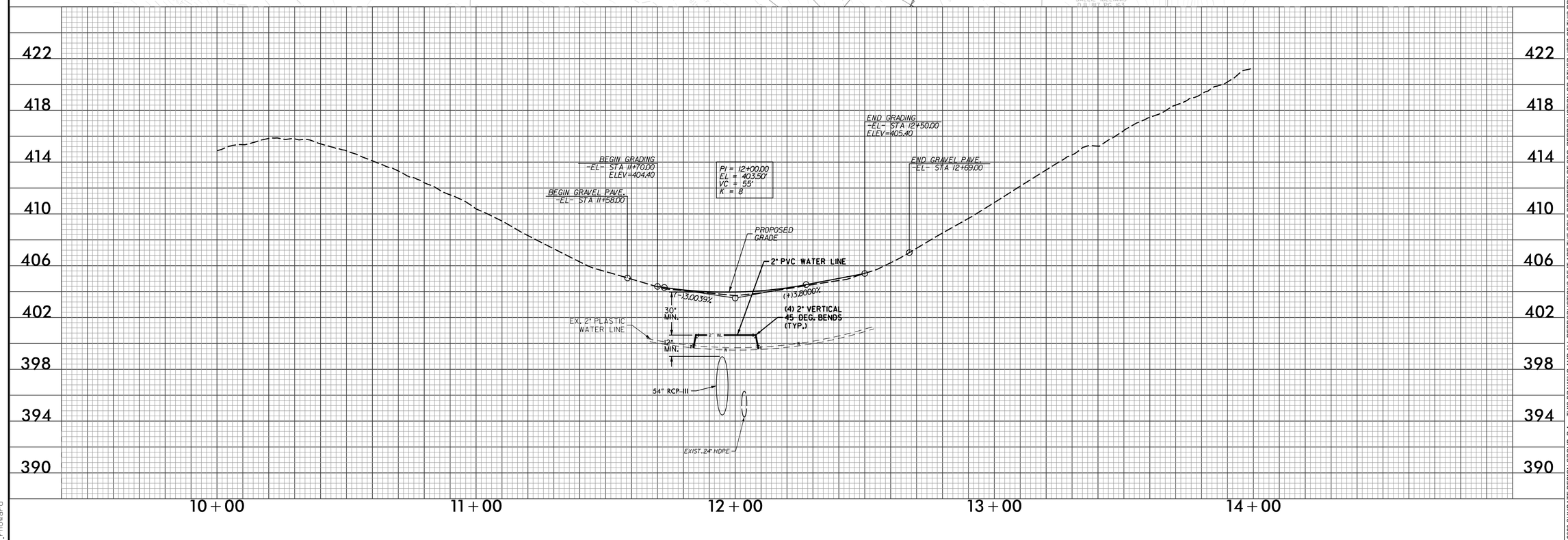
6. INSTALLER TO SUBMIT OUTAGE PLAN AND DETAILS FOR WATER LINE CONNECTIONS TO OWASA FOR REVIEW AND APPROVAL PRIOR TO BEGINNING UTILITY WORK.

ALTERNATE NO. 1

WATER LINE WORK WILL BE BID AS ALTERNATE NO. 1. IF THE ALTERNATE IS NOT ACCEPTED BY THE OWNER, WATER LINE WORK WILL BE PERFORMED BY OTHERS.

20 10 0 20 40

PLANS SCALE: 1" = 20'



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DocuSigned by: Joshua G. Dalton
PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON
7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

UTILITY PLAN – ALTERNATE NO. 1

PROJECT # : 1083-20003
DRAWING NAME: BROAD ST_Rdy_psh_U101
DATE: 03/03/2020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. U101

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7/27/2020 BROAD ST_Rdy_psh_U101.dgn rhoward

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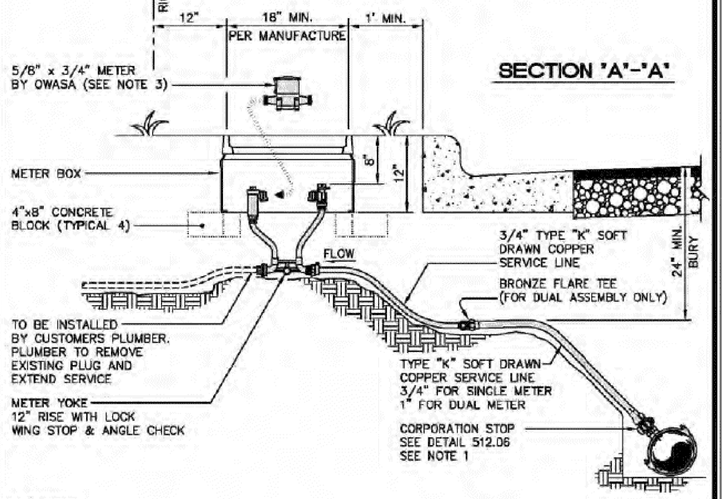
PART	MANUFACTURER MODEL / Cat. No.
METER BOX	OLDCASTLE / 1118-12 BCFXL BODY B-W O OR 2 MSHI PAVING
METER BOX LID	NICOR, INC / B12
METER SETTER	FORD (3/4") / VBHH72-12W-11-33 FORD (1") / VBHH74-12W-11-44 MUELLER (3/4" & 1") / H-2404-2A & TWO H-14222 COUPLINGS SPECIFY SIZE OF YOKE WHEN ORDERING MUELLER SETTER
METER	INSTALLED BY OWASA UPON PAYMENT OF FEES
TAPPING	SEE DETAIL 512.06



NOTES:

1. Bronze service saddles shall be used on all service connections. Direct taps shall be made only as directed by an OWASA representative. See tapping detail 512.06.
2. Omitted
3. If installation is for stub-out meter, meter should be purchased from OWASA. (At applicants expense)
4. Meter must be level across meter connections.
5. Substitution requires approval by OWASA's Director of Engineering.

OWASA Quality Service Since 1977

400 Jones Ferry Road
PO Box 366
Carrboro, NC 27510-0366

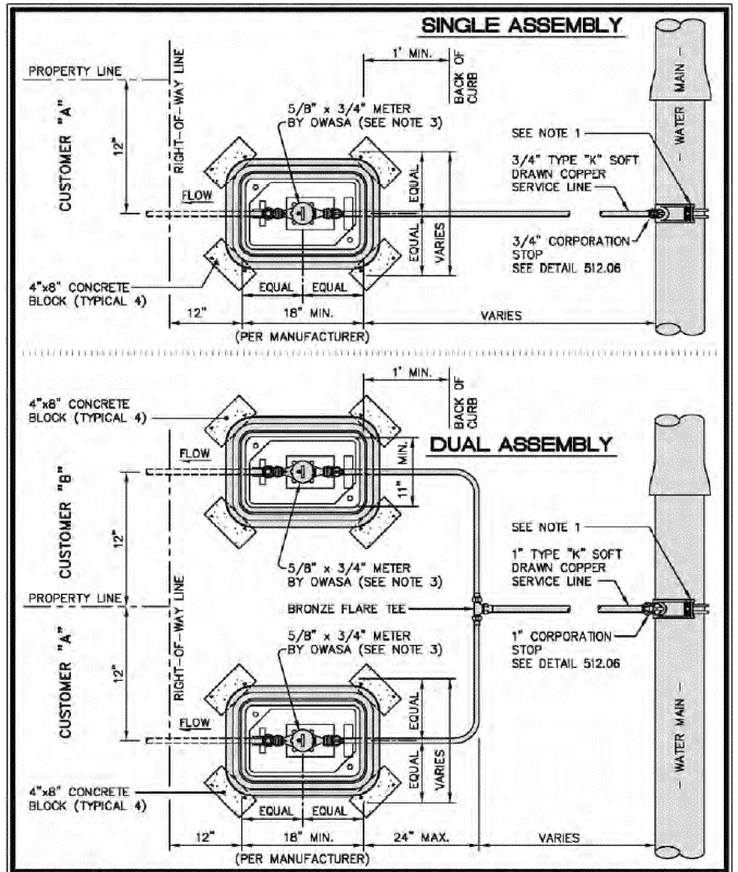
ORANGE WATER AND SEWER AUTHORITY

USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

Voice (919) 968-4421
FAX (919) 968-4464
www.owasa.org

3/4" SINGLE & 1" DUAL SERVICE INSTALLATION

SCALE:	DETAIL #
Not To Scale	515.01
REVISION DATE: May 16, 2019	SHEET #: 1 of 2



OWASA Quality Service Since 1977

400 Jones Ferry Road
PO Box 366
Carrboro, NC 27510-0366

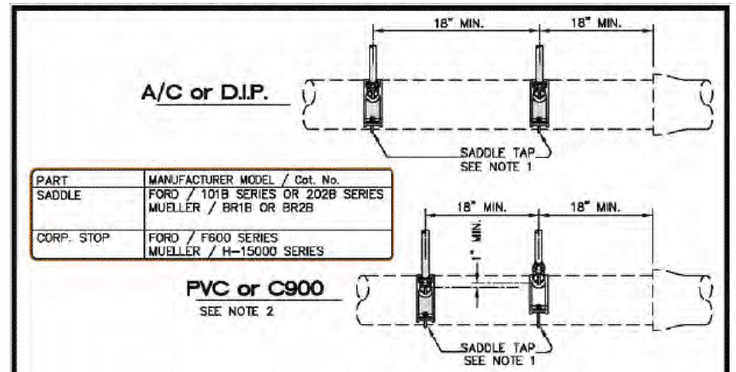
ORANGE WATER AND SEWER AUTHORITY

USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

Voice (919) 968-4421
FAX (919) 968-4464
www.owasa.org

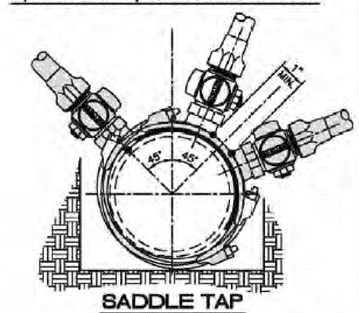
3/4" SINGLE & 1" DUAL SERVICE INSTALLATION

SCALE:	DETAIL #
Not To Scale	515.01
REVISION DATE: May 16, 2019	SHEET #: 2 of 2



PART	MANUFACTURER MODEL / Cat. No.
SADDLE	FORD / 101B SERIES OR 202B SERIES MUELLER / BR1B OR BR2B
CORP. STOP	FORD / F600 SERIES MUELLER / H-15000 SERIES

3/4" and 1" A/C, DIP, PVC, or C900



SADDLE TAP

NOTES:

1. All bronze saddle (Single or double strap for 3/4" and 1")
2. If 2 taps are made on each side of the main there shall be a minimum of 18" horizontal separation. Multiple taps on the same side shall have a minimum 18" horizontal separation and staggered a minimum of 1" vertically to prevent damage to the main.

OWASA Quality Service Since 1977

400 Jones Ferry Road
PO Box 366
Carrboro, NC 27510-0366

ORANGE WATER AND SEWER AUTHORITY

USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY

Voice (919) 968-4421
FAX (919) 968-4464
www.owasa.org

STANDARD 3/4" and 1" WATER TAPPING DETAIL

SCALE:	DETAIL #
Not To Scale	512.06
REVISION DATE: October, 2011	SHEET #: 1 of 1

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PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
7/28/2020

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BROAD ST CULVERT REPLACEMENT

OWNER: TOWN OF CARRBORO, NC

UTILITY DETAILS – ALTERNATE NO. 1

PROJECT # : 1083-20003
DRAWING NAME: BROAD_ST_Rdy_psh_U201
DATE: 03032020
DRAWN BY: RCH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. U201

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