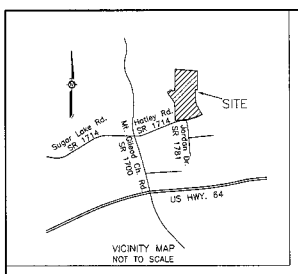

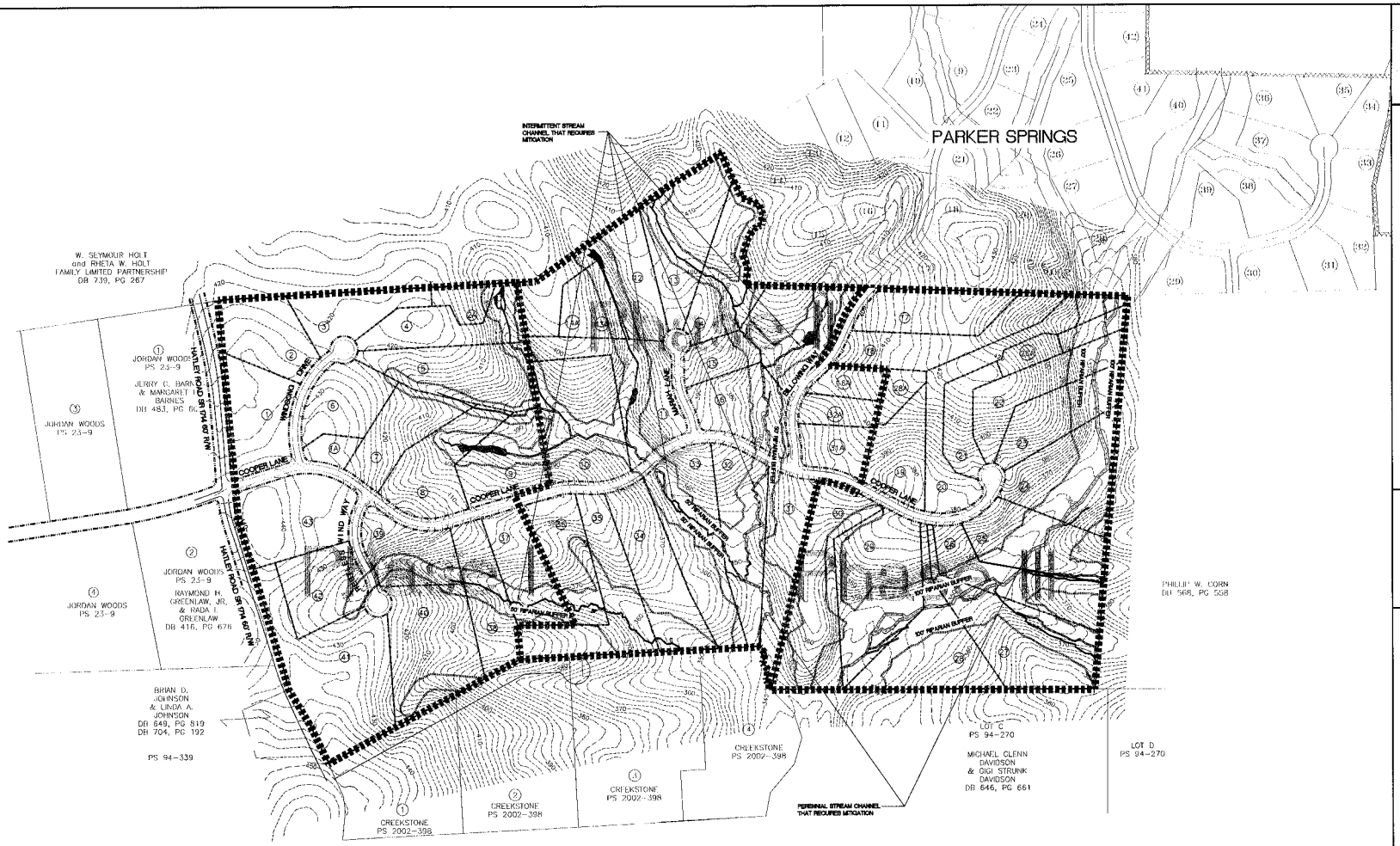

COOPER SUBDIVISION

TOWNSHIP: NEW HOPE
CHATHAM COUNTY, NC

DEVELOPMENT SCHEDULE

APRIL 2009 TO APRIL 2010
TOTAL LOTS: 43 LOTS

NOTE:

MINIMUM ALLOWABLE LOT WIDTH = 100'
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SHEET INDEX

COVER SHEET 1
SOILS SURVEY 2
SITE/UTILITY PLAN (SOUTH) 3
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DRAINAGE DELINEATION (SOUTH) 5
DRAINAGE DELINEATION (NORTH) 6
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COOPER LANE PLAN AND PROFILE STA: 0+00-15+50 9
COOPER LANE PLAN AND PROFILE STA: 15+50-30+00 10
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BILLOWING WAY PLAN AND PROFILE STA: 0+00-END 15
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DETAILS 17
DETAILS 18
DETAILS 19

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MAGNETIC

GRAPHIC SCALE

200 0 100 200 400 800

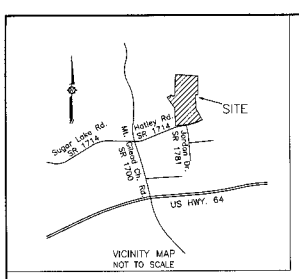
(IN FEET)
1 inch = 200 ft.

John W. Harris, P.E.
Consulting Engineer, Inc.
5112 Bur Oak Circle
Raleigh, N.C. 27612
(919) 789-0744

Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CLS/LER
Job #: 38-0206
File: Cooper43dwg/Cooper final-water rev.dwg
Revision: 1/14/09

Cover Sheet For Cooper Subdivision

1



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19) DISTURBED AREA = 10.85 ACRES

SUITABLE SEPTIC SOILS LEGEND

- AREAS CONTAIN SOILS WITH 30 INCHES OR MORE OF USEABLE MATERIAL AND HAVE POTENTIAL FOR CONVENTIONAL OR MODIFIED CONVENTIONAL SEPTIC SYSTEMS. THERE MAY BE INCLUSIONS OF SOILS 24-29 INCHES THAT WOULD SUPPORT LPP OR ULTRA-SHALLOW CONV. SEPTIC SYSTEMS IN THE AREAS MAPPED AS CONVENTIONAL.
- AREAS CONTAIN SOILS WITH 24 TO 29 INCHES OR MORE OF USEABLE MATERIAL AND HAVE POTENTIAL FOR LPP OR ULTRA-SHALLOW CONVENTIONAL SEPTIC SYSTEMS.
- AREAS CONTAIN SOILS WITH 12 INCHES OR MORE OF SUITABLE SOILS AND HAVE POTENTIAL FOR PRETREATMENT SUBSURFACE DRIP SEPTIC SYSTEMS. THESE AREAS WILL REQUIRE HYDRAULIC CONDUCTIVITY ANALYSIS PRIOR TO TO APPROVAL BY THE LOCAL HEALTH DEPARTMENT.

**SOILS EVALUATION PROVIDED BY CENTRAL CAROLINA SOIL CONSULTING, 9325-9 FALLS OF THE NEUSE ROAD, RALEIGH, NC. 27615, (918) 784-9079

CHATHAM COUNTY SOILS LEGEND

	SOILS BOUNDARY
BaE	BADIN-NANFORD COMPLEX, 15 TO 30% SLOPE
CmB	CID-LIGNUM COMPLEX, 2 TO 6% SLOPES
GaC	GEORGEVILLE SILT LOAM, 6 TO 10% SLOPES
GaB	GEORGEVILLE SILT LOAM, 2 TO 6% SLOPES
NaB	NANFORD-BADIN COMPLEX, 2 TO 6% SLOPES
NaC	NANFORD-BADIN COMPLEX, 6 TO 10% SLOPES
NaD	NANFORD-BADIN COMPLEX, 10 TO 15% SLOPES

**SOILS SURVEY TAKEN FROM CHATHAM COUNTY GIS AND NATURAL RESOURCES CONSERVATION SERVICE

MAGNETIC

GRAPHIC SCALE

200 0 100 200 400 600

(IN FEET)
1 inch = 200 ft.

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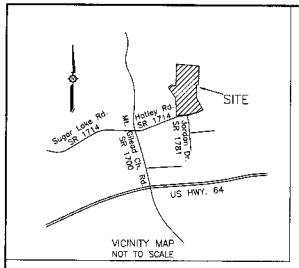
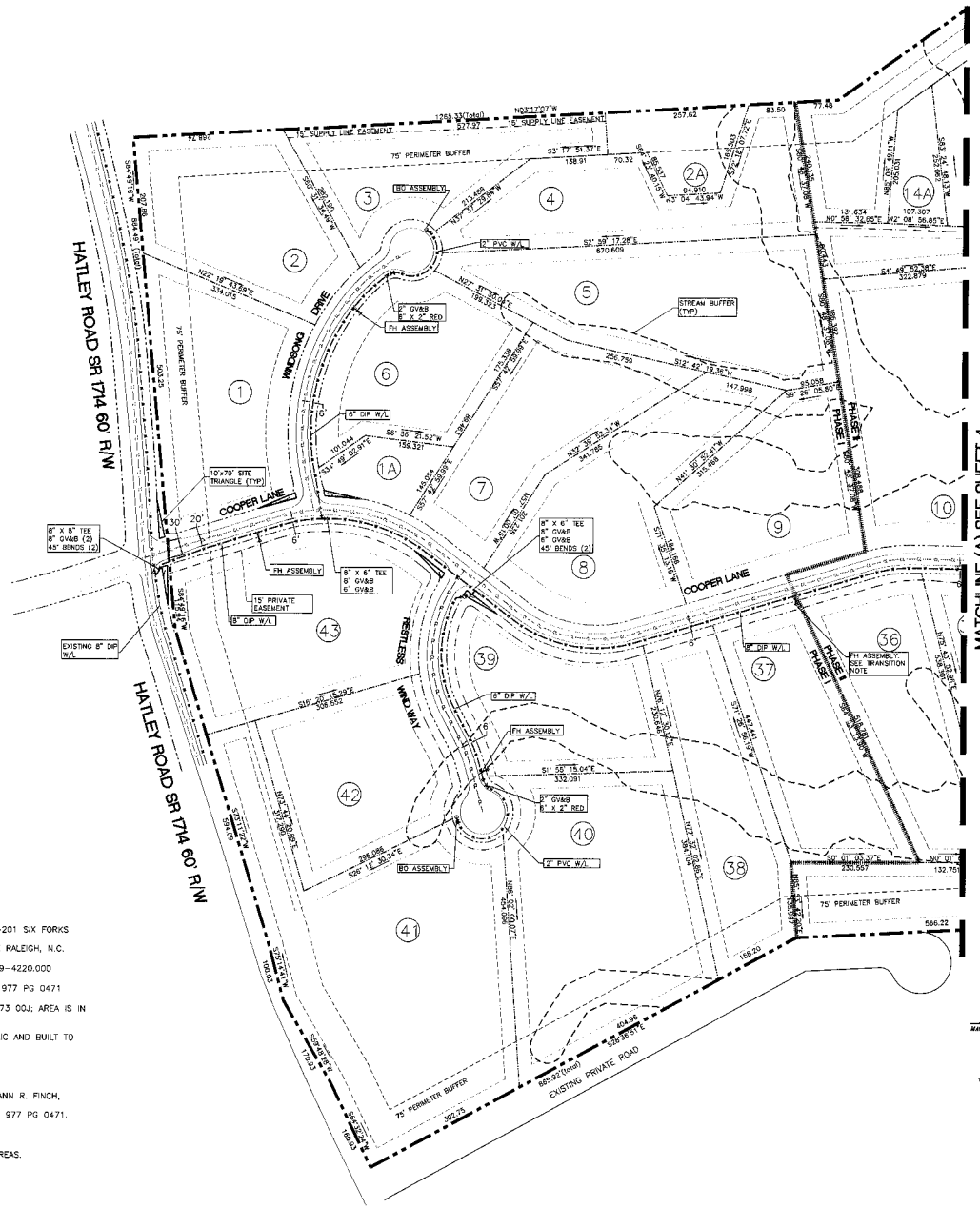
Raleigh, N.C. 27612
(919) 789-0744

Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CES/LER
Job #: 38-0306
File: Cooper53.dwg/Cooper final-water rev.dwg
Revision: 1/14/09

Soils Survey For Cooper Subdivision

2





COOPER SUBDIVISION

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CHATHAM COUNTY, NC

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TRANSITION NOTE:

TRANSITION BETWEEN CONSTRUCTION OF PHASE ONE AND THE CONTINUATION WITH PHASE TWO WILL REQUIRE THE WATERLINE BE CONSTRUCTED TO THE FIRE HYDRANT AT THE LOT 37/38 PROPERTY LINE AND PLACEMENT OF A PLUG AT THE FIRE HYDRANT TEE. WHEN PHASE TWO IS READY FOR CONSTUCTION, THE PLUG SHALL BE REMOVED FOR CONTINUATION OF THE WATERLINE.

MAGNETIC

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
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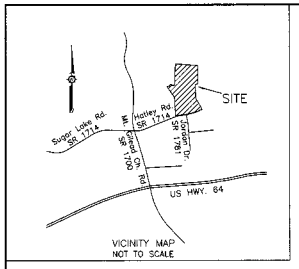
(919) 789-0744

Date: 11/12/2008
Scale: 1"=200'
Drawn By: CES/LER
Job #: 38-0206
File: Cooper4/Minor/Cooper
Engineer: Harris
Revisions: 1/14/09

Site/Utility Plan (South)
For
Cooper Subdivision

3



VICINITY MAP
NOT TO SCALE

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TOWNSHIP- NEW HOPE
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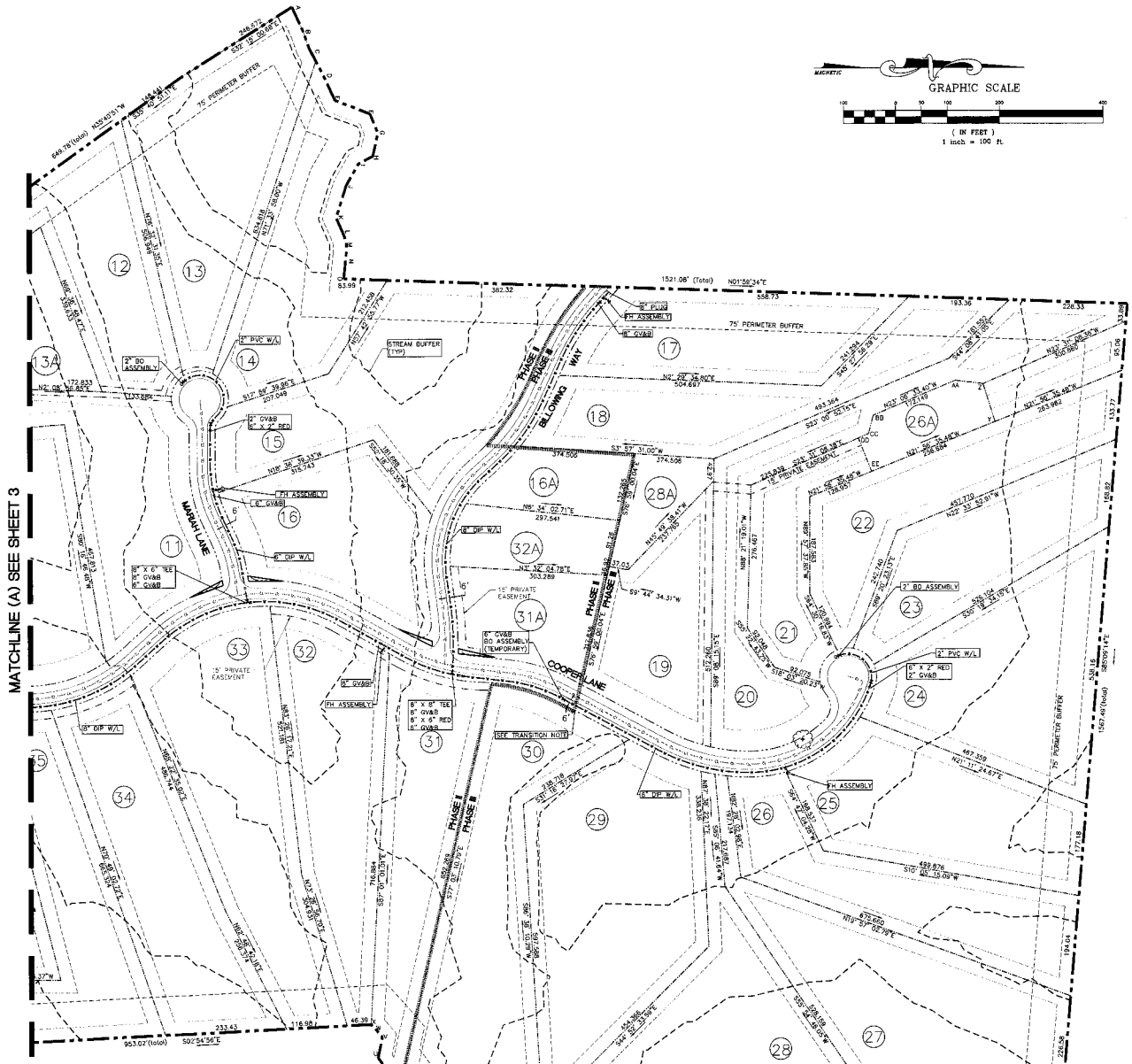
THE PHASE TWO WATER LINE SHALL TEMPORARILY END AT STATION 25+13, APPROXIMATELY THE POINT OF LOTS 31 & 30. THE PIPE SHALL BE INSTALLED WITH A PLUG TAPPED WITH A 2" BLOW-OFF ASSEMBLY. WHEN THE WATERLINE IS EXTENDED INTO PHASE THREE, THE 2" BLOW-OFF ASSEMBLY WILL BE REMOVED (AND RELOCATED) AND THE WATERLINE CONSTRUCTION WILL EXTEND AS INDICATED.

LINE TABLE		
LINE	LENGTH	BEARING
A to B	55.52	N65°33'11"E
B to C	29.34	N71°34'43"E
C to D	65.84	N62°38'58"E
D to E	47.88	N65°33'26"E
E to F	72.66	N21°15'45"E
F to G	40.02	N67°59'16"E
G to H	45.70	S77°32'06"E
H to I	31.06	S27°46'16"E
I to J	47.96	S60°09'09"E
J to K	65.72	S72°35'04"E
K to L	31.53	N66°15'41"E
L to M	19.95	N68°59'04"E
M to N	20.30	S89°03'39"E
N to O	50.35	S83°50'48"E
P to Q	5.53	S50°05'15"W
Q to R	20.61	S78°07'52"W
R to S	18.00	S57°48'30"W
S to T	39.66	N79°37'09"W
T to U	35.32	S34°48'41"W
U to V	40.69	N78°06'59"W
V to W	15.53	S49°33'21"W
W to X	17.05	S47°45'28"W

NOTE: POINT A IS AN EXISTING IRON PIPE, POINTS B THROUGH X ARE COMPUTED POINTS IN CENTERLINE OF BRAZINGTON BRANCH.

LINE TABLE		
LINE	LENGTH	BEARING
Y to Z	76.77	S72°35'4.16"W
Z to AA	54.01	S06°58'59.58"W
BB to CC	36.18	S75°52'34.98"E
CC to DD	21.57	S23°31'8.38"E
DD to EE	69.37	N68°27'39.07"E



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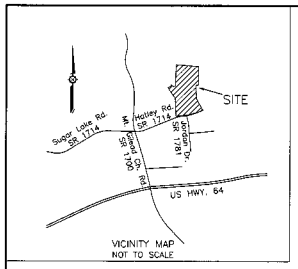
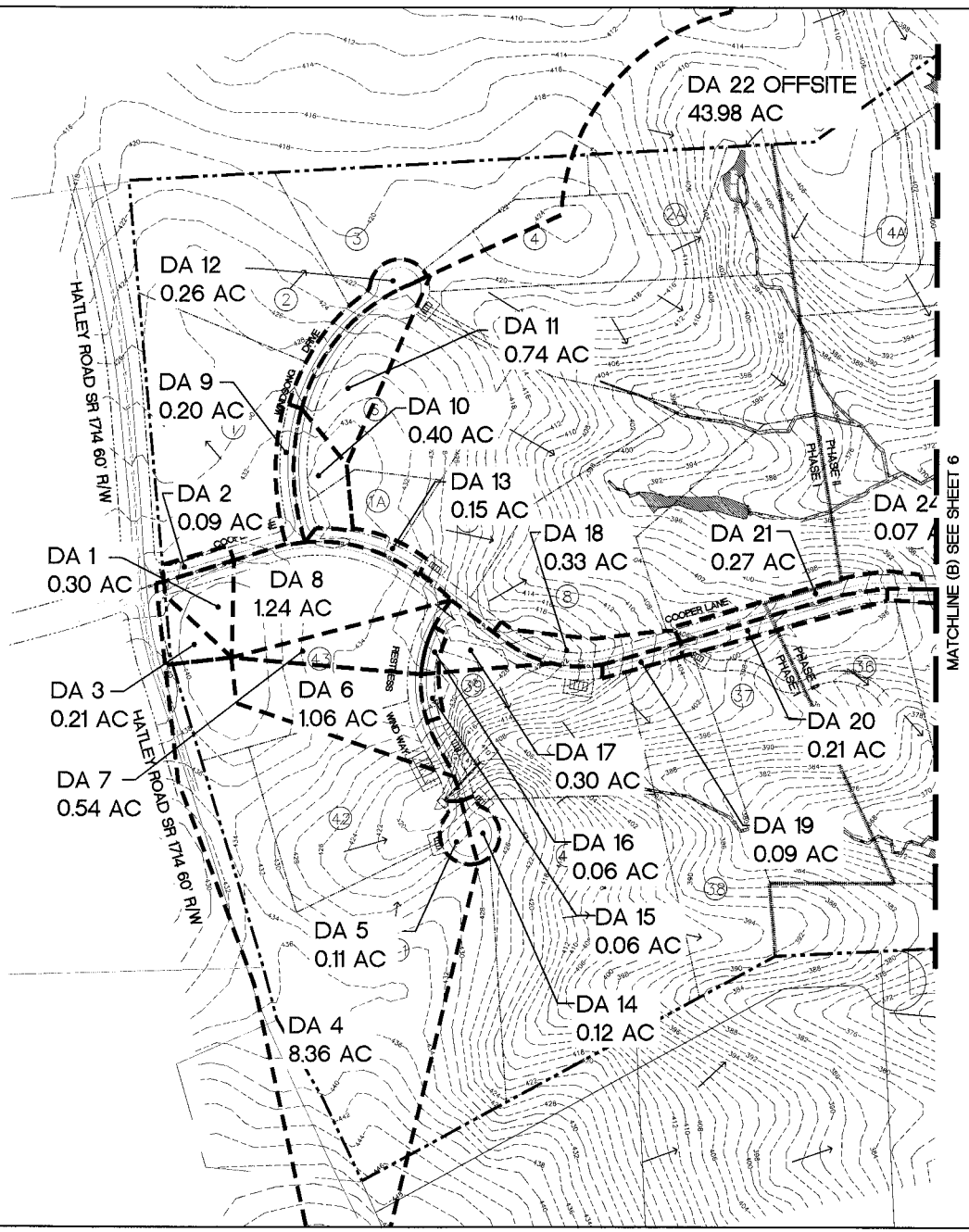
File: Cooper43dwg/Cooper final-water rev.dwg
Revision: 11/14/09

Site/Utility Plan (North) For Cooper Subdivision

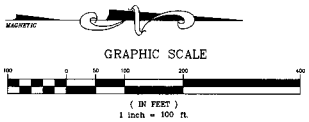
4





DRAINAGE DELINEATION LEGEND

- DRAINAGE AREA BOUNDARY
- FLOW ARROWS
- DA — DRAINAGE AREA
- SEDIMENT BASIN
- STORM PIPE



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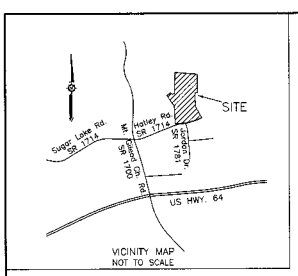
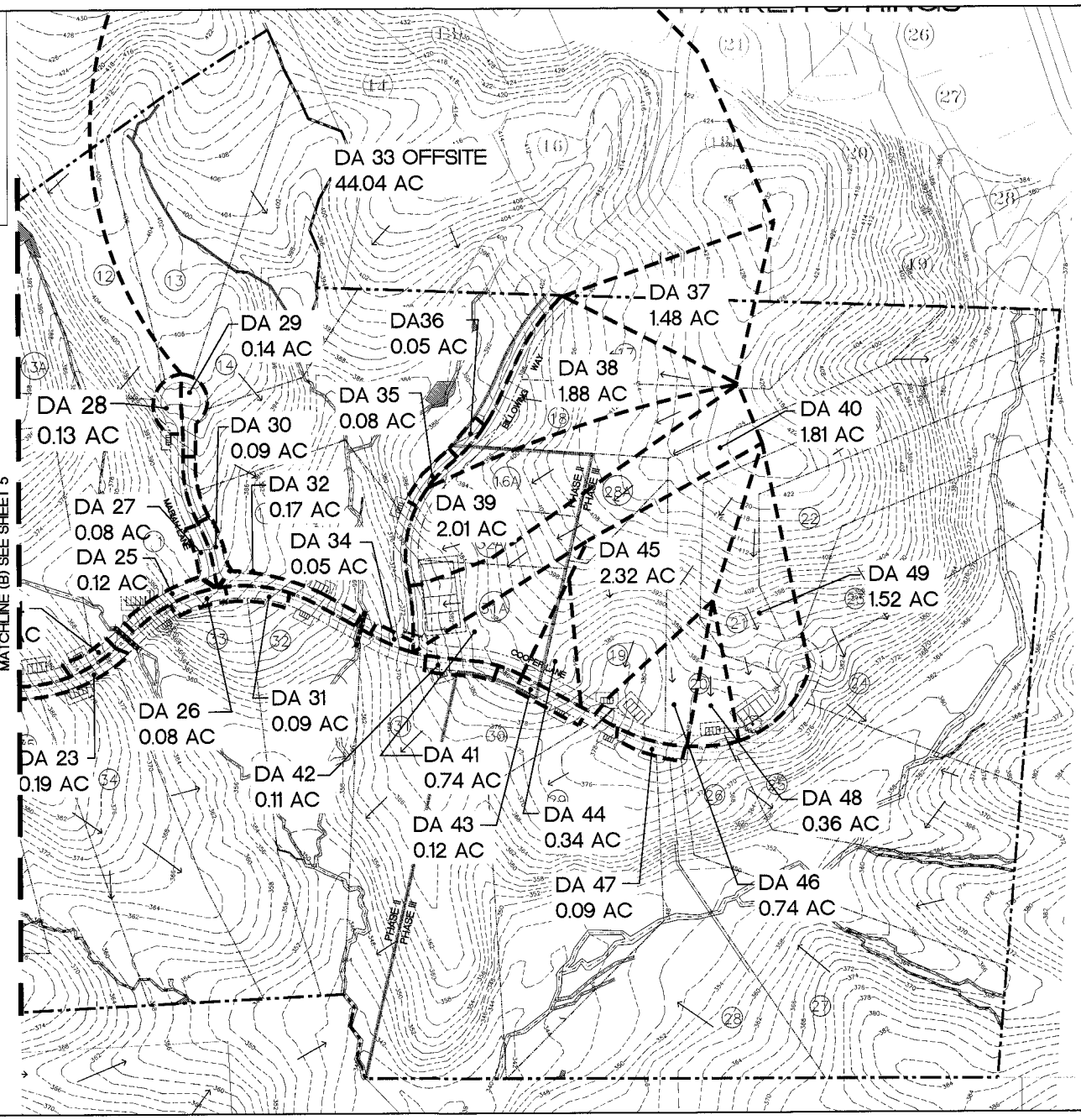
Revision: 1/14/09

Drainage Delineation (South) For Cooper Subdivision

5





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final-water rev.dwg
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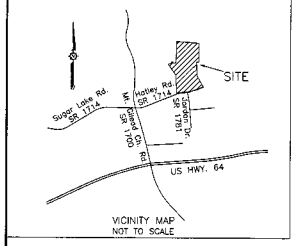
Drainage Delineation (North)
For
Cooper Subdivision



DITCHLINER (DL) INFORMATION

DITCH	C	I10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.30	0.96	1.30	S575
B	0.45	7.08	0.07	0.22	1.30	S575
C	0.45	7.08	1.43	3.99	5.07	S125
D	0.45	7.08	0.54	1.72	4.77	S150
E	0.45	7.08	1.07	3.41	2.87	S150HN
F	0.45	7.08	0.06	0.16	4.77	S575
G	0.45	7.08	0.07	0.19	4.07	S575
H	0.45	7.08	0.10	0.32	2.87	S575
I	0.45	7.08	0.10	0.32	4.87	S575
J	0.45	7.08	0.40	1.27	1.36	S575
K	0.45	7.08	0.15	0.48	1.36	S575
L	0.45	7.08	1.10	3.50	3.01	S575
M	0.45	7.08	0.40	1.27	3.01	S575
N	0.45	7.08	0.10	0.32	5.01	S575
O	0.45	7.08	0.31	0.99	1.00	S575
P	0.45	7.08	0.02	0.06	2.18	S575
Q	0.45	7.08	0.32	1.02	2.18	S150
R	0.45	7.08	0.09	0.29	2.92	S575
S	0.45	7.08	0.53	1.68	2.92	S575
T	0.45	7.08	0.06	0.19	2.71	S575
U	0.45	7.08	0.48	1.53	2.71	S125
V	0.45	7.08	0.56	1.78	3.22	S575
W	0.45	7.08	0.06	0.19	3.22	S575
X	0.45	7.08	0.17	0.54	3.00	S575
Y	0.45	7.08	0.10	0.32	8.73	S575
Z1	0.45	7.08	0.15	0.48	5.73	S575
Z2	0.45	7.08	0.22	0.70	8.94	S150
AA	0.45	7.08	0.26	0.82	2.00	S575
BB	0.45	7.08	0.08	0.25	2.00	S575
CC	0.45	7.08	0.13	0.41	4.46	S575
DD	0.45	7.08	0.68	2.03	1.00	S575
EE	0.45	7.08	3.90	12.43	6.61	S550
FF	0.45	7.08	0.13	0.41	1.61	S575
GG	0.45	7.08	0.05	0.16	1.61	S575
HH	0.45	7.08	0.54	1.72	4.34	S125HN
II	0.45	7.08	0.08	0.25	5.71	S575
JJ	0.45	7.08	0.05	0.16	3.71	S575
KK 2	0.45	7.08	0.85	2.71	2.87	S575
KK	0.45	7.08	0.21	0.67	2.87	S575
LL 1	0.45	7.08	0.89	2.83	2.20	S575
LL 2	0.45	7.08	0.31	0.99	2.80	S575
MM	0.45	7.08	1.54	4.91	1.58	S575
NN	0.45	7.08	0.09	0.29	4.80	S575
OO	0.45	7.08	0.07	0.22	2.80	S575
PP	0.45	7.08	0.06	0.19	2.52	S550

NOTE: SEE PLAN AND PROFILES (SHEETS 9 – 15) FOR ENLARGED EROSION CONTROL STRUCTURES ALONG WITH STORM PIPE INVERTS AND DISSIPATOR INFORMATION

SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33,464 x 3'	2"
2	10,420 x 3'	2"
3	10,420 x 3'	2"
4	27,455 x 3'	2"
5	10,420 x 3'	2"
6	10,420 x 3'	2"
7	18,439 x 3'	2"
8	33,482 x 3'	2"
9	10,420 x 3'	2"
10	18,748 x 3'	2"
11	12,924 x 3'	2"
12	10,420 x 3'	2"
13	10,420 x 3'	2"
14	17,431 x 3'	2"
15	10,420 x 3'	2"
16	75,147 x 3'	2.5"
17	10,420 x 3'	2"
18	10,420 x 3'	2"
19	18,335 x 3'	2"
20	10,420 x 3'	2"
21	23,455 x 3'	2"
22	18,432 x 3'	2"
23	33,494 x 3'	2"
24	10,420 x 3'	2"
25	10,420 x 3'	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.78	1.00	1	18"	RCP	48	NO	NO
2	0.45	7.78	43.38	153.97	3.84	2	48" & 60"	RCP	65	YES	NO
3	0.45	7.78	44.04	154.18	1.09	2	48" & 60"	RCP	75	YES	NO
4	0.45	7.78	2.71	9.45	1.00	1	24"	RCP	48	NO	YES
5	0.45	7.78	1.47	5.05	4.04	1	18"	RCP	48	NO	NO
6	0.45	7.78	1.38	5.39	1.00	1	18"	RCP	42	NO	NO
7	0.45	7.78	9.88	34.84	6.98	1	36"	RCP	96	YES	NO
8	0.45	7.78	8.28	28.99	2.92	1	36"	RCP	48	YES	NO

EROSION CONTROL LEGEND

- CHECK DAM
- SILT FENCE
- GRAVEL CONSTRUCTION ENTRANCE
- SEDIMENT BASIN (SB) – SEE CHART
- LIMITS OF DISTURBANCE/CLEARING (INCLUDES RIGHT-OF-WAY)
- PIPE INLET PROTECTION
- DITCH LINER (DL) – SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CHECKED AND REPAIRED ON A DAILY BASIS

SEDIMENT BASINS SHALL BE CONSTRUCTED SO AS TO BE LOCATED OUTSIDE OF ANY PROPOSED FILL AREAS AND RIGHT OF WAYS

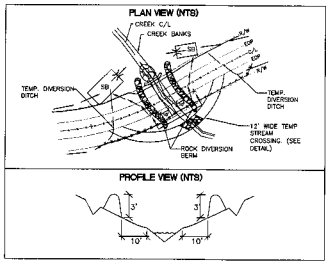
ALL CHECK DAMS SHALL BE PLACED AT INTERVALS SUCH THAT THE TOP OF THE DOWNSTEAM CHECK DAM AND THE FOOT OF THE UPSTREAM CHECK DAM ARE EQUAL ELEVATIONS

DIVERSION DITCHES SHALL BE INSTALLED TO ASSURE STORMWATER DRAINAGE WILL BE DIRECTED TO THE SEDIMENT BASINS

GENERAL NOTES:

1) THE DEVELOPER IS: CONTENTNEA CREEK DEVELOPMENT COMPANY; C/O DAN SULLIVAN; 8502-201 SIX FORKS RD. RALEIGH, NC 27615.
2) THE ENGINEER IS: JOHN W. HARRIS, P.E. CONSULTING ENGINEER INC. 5112 BUR OAK CIRCLE RALEIGH, N.C. 27612; (919) 789-0744.
3) PIN #9772-79-4220.000 (TRACT-A), PIN # 9772-89-2400.000 (TRACT-B), PIN # 9772-79-4220.000 (TRACT-C).
4) DEED REFERENCE: BOOK 977 PG 0471 (TRACT-A), BOOK 977 PG 0471 (TRACT-B), BOOK 977 PG 0471 (TRACT-C).
5) ZONING RA-90; WATERSHED DESIGNATION WS-IV PA; FEMA MAPS 37109772 00J & 37109773 00J; AREA IS IN ZONE X.
6) APPROXIMATE TOTAL ACRES OF LAND TO BE SUBDIVIDED: = 130 ACRES.
7) APPROXIMATE TOTAL LINEAR FEET OF PROPOSED ROAD: 5796 L.F. ALL ROADS WILL BE PUBLIC AND BUILT TO NCDOT STANDARDS AND SPECIFICATIONS.
8) ALL LOTS WILL BE SINGLE FAMILY RESIDENTIAL.
9) ALL LOTS WILL BE SERVED WITH PUBLIC COUNTY WATER & INDIVIDUAL SEPTIC TANKS.
10) TOPOGRAPHIC INFORMATION WAS TAKEN FROM USGS QUADRANGLE MAPS.
11) ALL LOTS WILL HAVE A MINIMUM LOT SIZE OF 2 ACRES..
12) BOUNDARY SURVEY AND TOPOGRAPHIC INFORMATION TAKEN FROM SURVEYS PROVIDED BY: VANN R. FINCH, LAND SURVEYS, PA , 109 HILLSBORO ST. PO BOX 973, NC 27312.
13) THE PROPERTY OWNER IS COOPER FAMILY LLC ETAL, PARCEL# 17357, 82822, & 82823 DB 977 PG 0471.
14) RIGHT-OF-WAY WIDTHS SHALL BE 50'.
15) CUL-DE-SACS SHALL HAVE A 55' RADIUS.
16) PAVEMENT RADII IN CUL-DE-SAC'S SHALL BE 40'.
17) NO STRUCTURES OR SEPTIC SYSTEMS SHALL BE LOCATED IN THE WATER HAZARD BUFFER AREAS.
18) SITE IMPERVIOUS SURFACES ARE TO BE LESS THAN 10%.
19) DISTURBED AREA = 10.85 ACRES
20) SURVEY INFORMATION WAS DONE BY VAN R. FINCH, PLS LAND SURVEYS, PA, 109 HILLSBORO STREET, PO BOX 973, PITTSBORO, NC 27312.

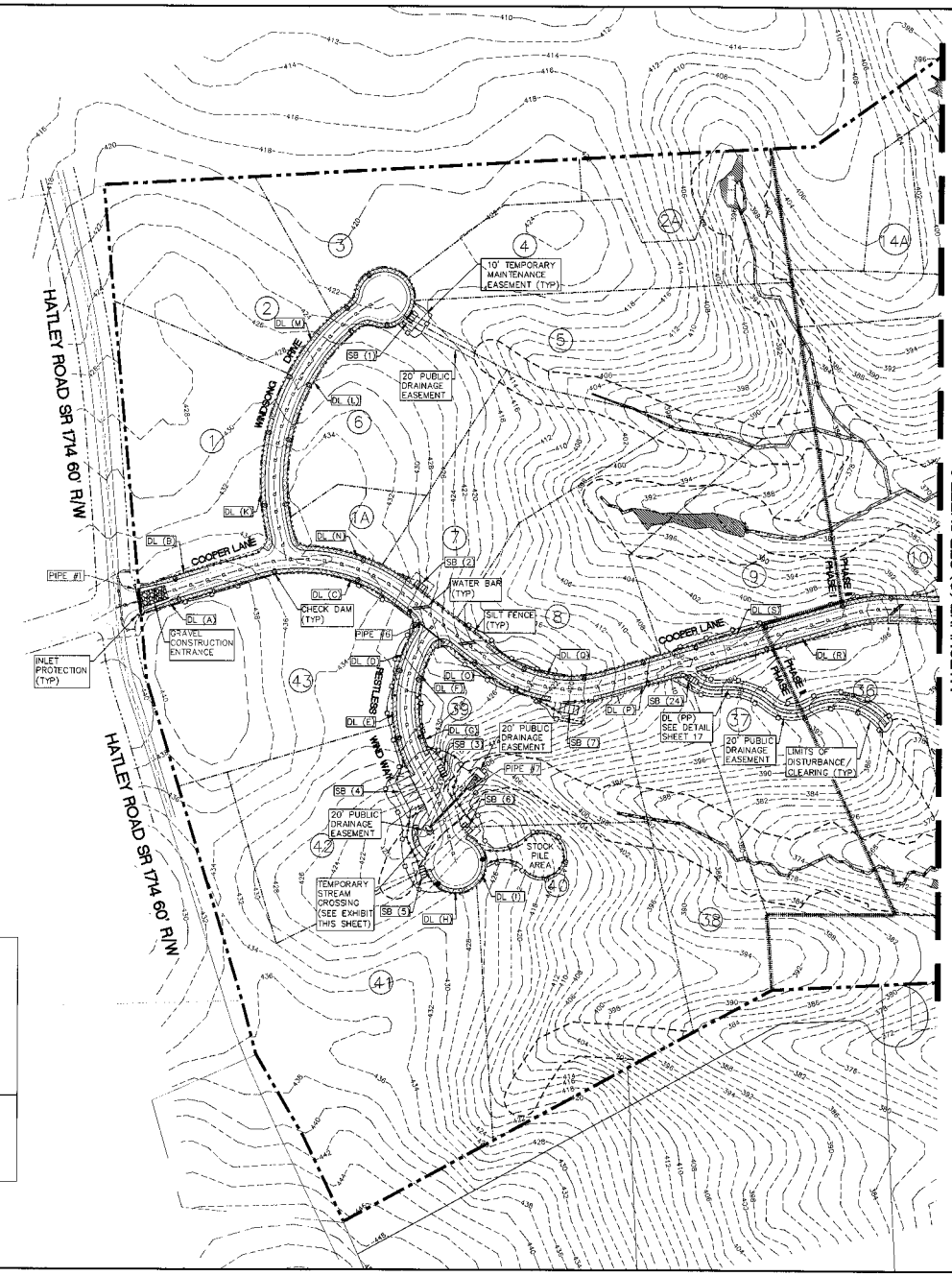
STREAM CROSSING AREA EXHIBIT



GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

MAGNETIC

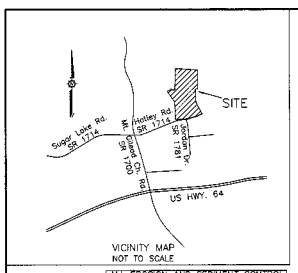


John W. Harris, P.E.
Consulting Engineer, Inc.
5112 Bur Oak Circle
Raleigh, N.C. 27612
(919) 789-0744

Date: 11/12/2008
Scale: 1" = 200'
Drawn By: JWH
Job #: 38-2006
File: Cooper-S3-dwg/Cooper final-water rev.dwg
Revision: 1/14/09

Erosion Control Plan (South)
For
Cooper Subdivision

7



VICINITY MAP
NOT TO SCALE

ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CHECKED AND REPAIRED ON A DAILY BASIS

SEDIMENT BASINS SHALL BE CONSTRUCTED SO AS TO BE LOCATED OUTSIDE OF ANY PROPOSED FILL AREAS AND RIGHT OF WAYS

ALL CHECK DAMS SHALL BE PLACED AT INTERVALS SUCH THAT THE TOP OF THE DOWNSTEAM CHECK DAM AND THE FOOT OF THE UPSTREAM CHECK DAM ARE EQUAL ELEVATIONS

DIVERSION DITCHES SHALL BE INSTALLED TO ASSURE STORMWATER DRAINAGE WILL BE DIRECTED TO THE SEDIMENT BASINS

DITCHLINER (DL) INFORMATION

DITCH	C	110	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.30	0.96	1.00	DS75
B	0.45	7.08	0.07	0.22	1.32	DS75
C	0.45	7.08	0.23	3.92	5.07	DS75
D	0.45	7.08	0.54	1.72	4.77	DS75
E	0.45	7.08	1.07	3.41	4.87	SC150BN
F	0.45	7.08	0.05	0.16	4.87	DS75
G	0.45	7.08	0.05	0.16	4.87	DS75
H	0.45	7.08	0.10	0.32	4.87	DS75
I	0.45	7.08	0.10	0.32	4.87	DS75
J	0.45	7.08	0.40	1.27	1.35	DS75
K	0.45	7.08	0.15	0.48	1.35	DS75
L	0.45	7.08	1.10	3.50	3.01	DS75
M	0.45	7.08	0.45	1.43	3.01	DS75
N	0.45	7.08	0.10	0.32	3.01	DS75
O	0.45	7.08	0.31	0.99	1.00	DS75
P	0.45	7.08	0.02	0.06	7.18	DS75
Q	0.45	7.08	0.32	1.02	7.18	S150
R	0.45	7.08	0.08	0.19	2.53	DS75
S	0.45	7.08	0.51	1.68	6.86	DS75
T	0.45	7.08	0.05	0.15	2.71	DS75
U	0.45	7.08	0.58	1.83	2.71	C125
V	0.45	7.08	0.55	1.76	3.22	DS75
W	0.45	7.08	0.08	0.19	3.22	DS75
X	0.45	7.08	0.17	0.54	8.05	DS75
Y	0.45	7.08	0.19	0.60	5.73	DS75
Z1	0.45	7.08	0.13	0.46	5.73	DS75
Z2	0.45	7.08	0.22	0.70	6.94	SC150
AA	0.45	7.08	0.08	0.89	1.80	DS75
BB	0.45	7.08	0.08	0.25	2.18	DS75
CC	0.45	7.08	0.25	0.87	4.16	DS75
DD	0.45	7.08	2.60	8.03	1.00	DS75
EE	0.45	7.08	1.90	12.43	5.61	DS75
FF	0.45	7.08	0.13	0.41	5.61	DS75
GG	0.45	7.08	0.05	0.16	1.21	DS75
HH	0.45	7.08	1.93	6.12	6.36	C125BN
II	0.45	7.08	0.08	0.25	3.71	DS75
JJ	0.45	7.08	0.05	0.16	3.71	DS75
JJ2	0.45	7.08	0.85	2.71	3.71	DS75
KK	0.45	7.08	0.21	0.67	2.87	DS75
LL	0.45	7.08	0.26	0.82	2.87	DS75
LL2	0.45	7.08	0.31	0.99	2.60	DS75
MM	0.45	7.08	1.54	4.91	1.59	DS75
NN	0.45	7.08	0.09	0.29	2.90	DS75
OO	0.45	7.08	0.07	0.22	2.90	DS75
PP	0.45	7.08	0.06	0.19	2.52	SC250

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.79	1.00	1	18"	RCP	48	NO	NO
2	0.45	7.78	43.98	153.97	3.94	2	48" X 60"	RCP	66	YES	NO
3	0.45	7.78	44.04	154.18	1.00	2	48" X 60"	RCP	76	YES	NO
4	0.45	7.78	2.71	9.49	1.00	1	24"	RCP	48	NO	YES
5	0.45	7.78	2.47	8.65	5.04	1	18"	RCP	48	NO	NO
6	0.45	7.78	1.80	6.30	1.00	1	18"	RCP	52	NO	NO
7	0.45	7.78	9.18	32.84	6.38	1	18"	RCP	95	YES	NO
8	0.45	7.78	8.28	29.99	2.92	1	36"	RCP	48	YES	NO

NOTE: SEE PLAN AND PROFILES (SHEETS 9 - 15) FOR ENLARGED EROSION CONTROL STRUCTURES ALONG WITH STORM PIPE INVERTS AND DISSIPATOR INFORMATION

SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33'x64'x3'	2"
2	10'x20'x3'	2"
3	10'x20'x3'	2"
4	27'x58'x3'	2"
5	10'x20'x3'	2"
6	10'x20'x3'	2"
7	15'x32'x3'	2"
8	22'x42'x3'	2"
9	10'x20'x3'	2"
10	18'x34'x3'	2"
11	16'x32'x3'	2"
12	10'x20'x3'	2"
13	10'x20'x3'	2"
14	17'x33'x3'	2"
15	10'x20'x3'	2"
16	78'x142'x3'	2.5"
17	10'x20'x3'	2"
18	10'x20'x3'	2"
19	15'x30'x3'	2"
20	10'x20'x3'	2"
21	23'x45'x3'	2"
22	12'x22'x3'	2"
23	33'x64'x3'	2"
24	10'x20'x3'	2"
25	10'x20'x3'	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

EROSION CONTROL LEGEND

- CHECK DAM
- SILT FENCE
- GRAVEL CONSTRUCTION ENTRANCE
- SEDIMENT BASIN (SB) - SEE CHART
- LIMITS OF DISTURBANCE/CLEARING (INCLUDES RIGHT-OF-WAY)
- PIPE INLET PROTECTION
- DITCH LINER (DL) - SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

GENERAL NOTES:

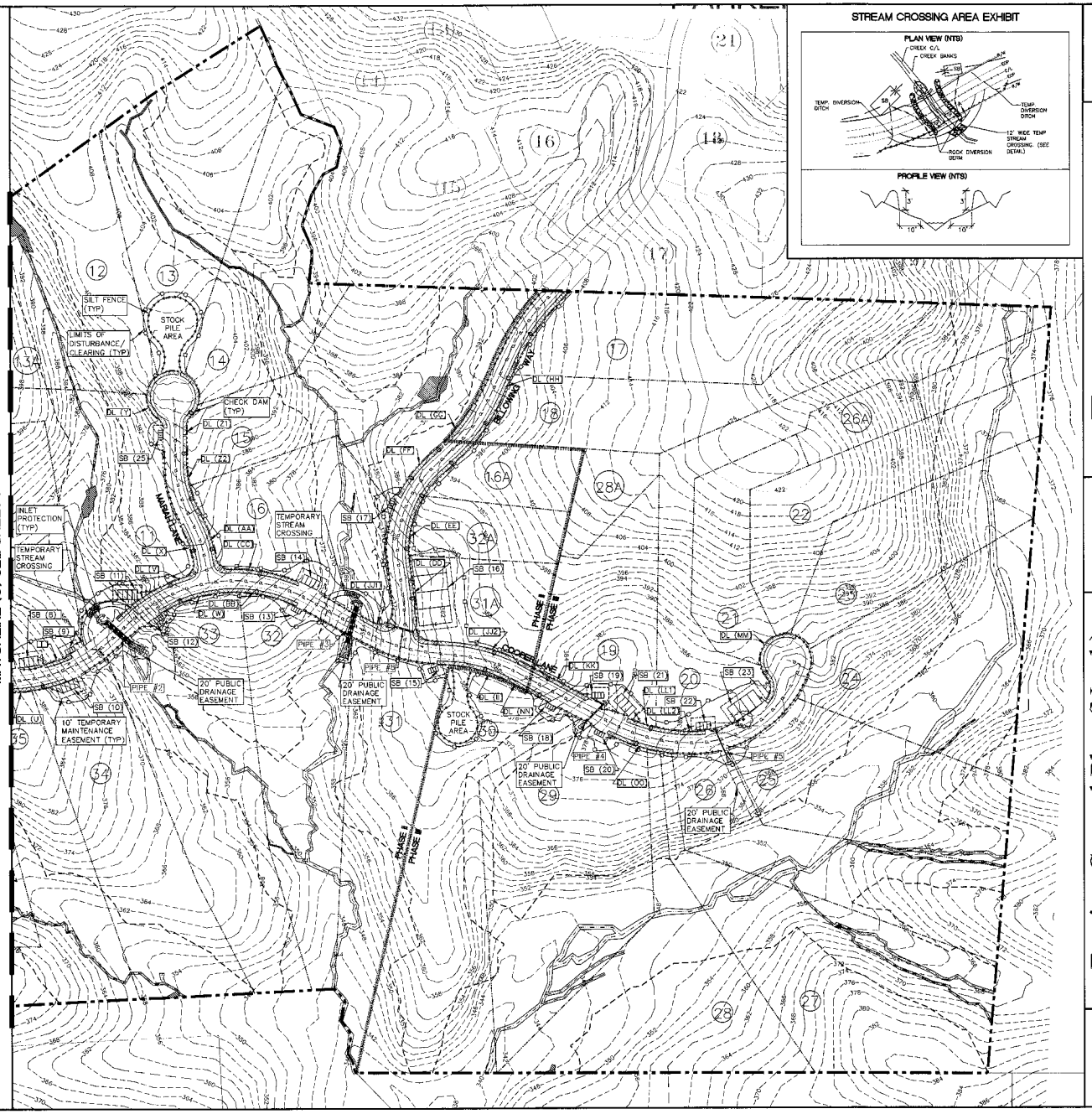
1) THE DEVELOPER IS: CONTENTNEA CREEK DEVELOPMENT COMPANY; C/O DAN SULLIVAN; 8502-201 SIX FORKS RD. RALEIGH, NC 27615.
2) THE ENGINEER IS: JOHN W. HARRIS, P.E. CONSULTING ENGINEER INC, 5112 BUR OAK CIRCLE RALEIGH, N.C. 27612, (919) 789-0744.
3) PIN #9772-79-4220.000 (TRACT-A), PIN # 9772-89-2400.000 (TRACT-B), PIN # 9772-79-4220.000 (TRACT-C)
4) DEED REFERENCE: BOOK 977 PG 0471 (TRACT-A), BOOK 977 PG 0471 (TRACT-B), BOOK 977 PG 0471 (TRACT-C).
5) ZONING RA-90; WATERSHED DESIGNATION WS-IV PA; FEMA MAPS 37109772 00J & 37109773 00J; AREA IS IN ZONE X.
6) APPROXIMATE TOTAL ACRES OF LAND TO BE SUBDIVIDED: = 130 ACRES.
7) APPROXIMATE TOTAL LINEAR FEET OF PROPOSED ROAD: 5796 LF. ALL ROADS WILL BE PUBLIC AND BUILT TO NCDOT STANDARDS AND SPECIFICATIONS.
8) ALL LOTS WILL BE SINGLE FAMILY RESIDENTIAL.
9) ALL LOTS WILL BE SERVED WITH PUBLIC COUNTY WATER & INDIVIDUAL SEPTIC TANKS.
10) TOPOGRAPHIC INFORMATION WAS TAKEN FROM USGS QUADRANGLE MAPS.
11) ALL LOTS WILL HAVE A MINIMUM LOT SIZE OF 2 ACRES.
12) BOUNDARY SURVEY AND TOPOGRAPHIC INFORMATION TAKEN FROM SURVEYS PROVIDED BY: VANN R. FINCH, LAND SURVEYS, PA , 109 HILLSBORO ST. PO BOX 973, NC 27312.
13) THE PROPERTY OWNER IS COOPER FAMILY LLC ETAL, PARCEL# 17357, 82822, & 82823 DB 977 PG 0471.
14) RIGHT-OF-WAY WIDTHS SHALL BE 50'.
15) CUL-DE-SACS SHALL HAVE A 55' RADIUS.
16) PAVEMENT RADII IN CUL-DE-SAC'S SHALL BE 40'.
17) NO STRUCTURES OR SEPTIC SYSTEMS SHALL BE LOCATED IN THE WATER HAZARD BUFFER AREAS.
18) SITE IMPERVIOUS SURFACES ARE TO BE LESS THAN 10%.
19) DISTURBED AREA = 10.85 ACRES
20) SURVEY INFORMATION WAS DONE BY VAN R. FINCH, PLS LAND SURVEYS, PA, 109 HILLSBORO STREET, PO BOX 973, PITTSBORO, NC 27312.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

MATCHLINE (C) SEE SHEET 7

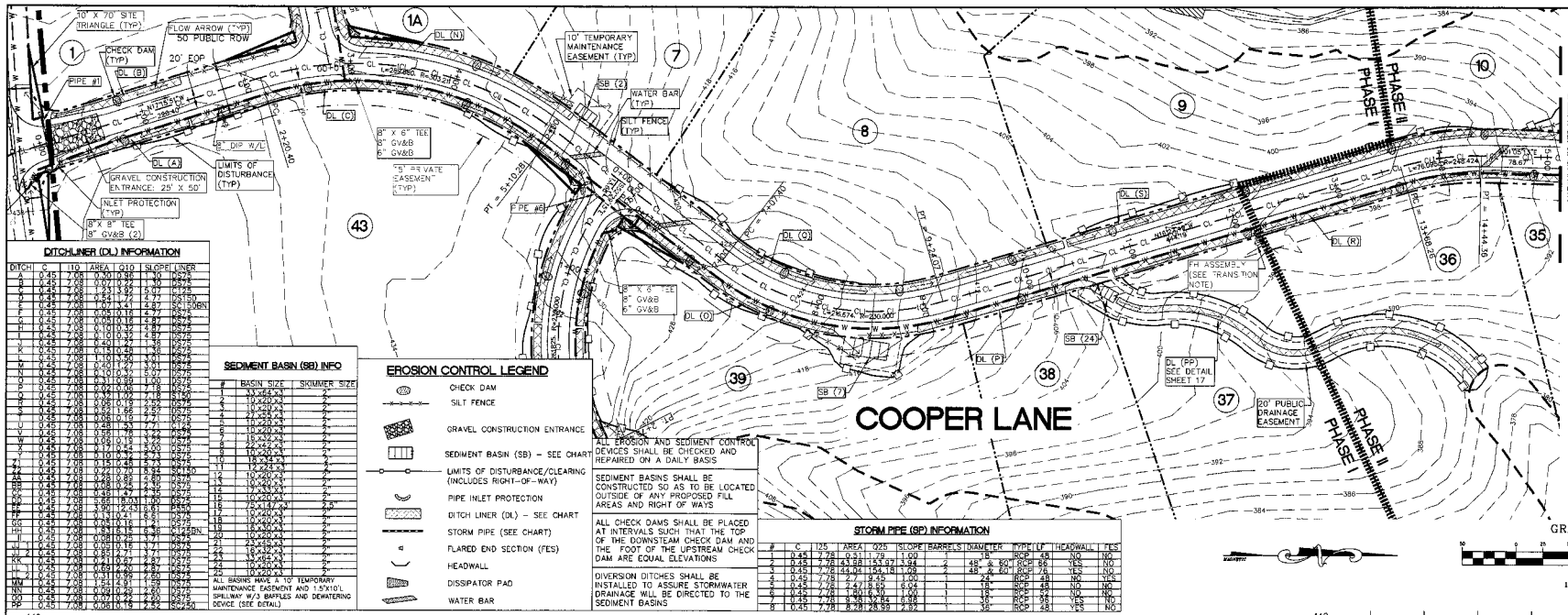


STREAM CROSSING AREA EXHIBIT

John W. Harris, P.E.
Consulting Engineer, Inc.
5112 Bur Oak Circle
Raleigh, N.C. 27612
(919) 789-0744

Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CESTER
Job #: 38-0206
File: Cooper43.dwg\Cooper
final-water rev.dwg
Revision: 11/14/09

Erosion Control Plan (North)
For
Cooper Subdivision



DITCHLINER (DL) INFORMATION

DITCH	C	T10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.30	0.96	1.30	DS75
B	0.45	7.08	0.90	2.84	1.30	DS75
C	0.45	7.08	1.23	3.92	5.07	C125
D	0.45	7.08	0.54	1.72	2.77	SC150
E	0.45	7.08	1.07	3.41	4.87	SC150BN
F	0.45	7.08	0.05	0.15	4.77	DS75
G	0.45	7.08	0.05	0.16	4.87	DS75
H	0.45	7.08	0.10	0.32	4.87	DS75
I	0.45	7.08	0.10	0.32	4.87	DS75
J	0.45	7.08	0.49	1.57	1.36	DS75
K	0.45	7.08	0.18	0.58	1.36	DS75
L	0.45	7.08	1.10	3.50	3.01	DS75
M	0.45	7.08	0.50	1.59	3.01	DS75
N	0.45	7.08	0.10	0.32	8.92	DS75
O	0.45	7.08	0.31	0.99	1.00	DS75
P	0.45	7.08	0.02	0.06	7.18	DS75
Q	0.45	7.08	0.32	1.02	7.18	SC150
R	0.45	7.08	0.05	0.16	7.18	DS75
S	0.45	7.08	0.49	1.56	2.57	DS75
T	0.45	7.08	0.05	0.15	7.71	DS75
U	0.45	7.08	0.48	1.53	7.71	DS75
V	0.45	7.08	0.56	1.78	3.22	DS75
W	0.45	7.08	0.06	0.19	3.22	DS75
X	0.45	7.08	0.13	0.42	8.00	DS75
Y	0.45	7.08	0.10	0.32	5.41	DS75
Z	0.45	7.08	0.15	0.48	5.73	DS75
AA	0.45	7.08	0.22	0.70	6.94	SC150
BB	0.45	7.08	0.28	0.89	1.80	DS75
CC	0.45	7.08	0.08	0.25	2.36	DS75
DD	0.45	7.08	0.45	1.42	4.50	DS75
EE	0.45	7.08	0.66	2.09	1.00	DS75
FF	0.45	7.08	3.90	12.43	6.61	P550
GG	0.45	7.08	0.13	0.41	5.57	DS75
HH	0.45	7.08	0.05	0.16	1.23	DS75
II	0.45	7.08	1.31	4.15	6.36	C125BN
JJ	0.45	7.08	0.08	0.25	4.91	DS75
KK	0.45	7.08	0.05	0.16	3.71	DS75
LL 1	0.45	7.08	0.85	2.71	3.71	DS75
LL 2	0.45	7.08	0.21	0.67	2.87	DS75
MM	0.45	7.08	0.69	2.20	2.87	DS75
NN	0.45	7.08	0.31	0.99	2.60	DS75
OO	0.45	7.08	0.07	0.22	2.60	DS75
PP	0.45	7.08	0.06	0.19	2.32	SC250

SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33x66x3'	2"
2	10x20x3'	2"
3	10x20x3'	2"
4	20x35x3'	2"
5	10x20x3'	2"
6	10x20x3'	2"
7	18x34x3'	2"
8	22x42x3'	2"
9	10x20x3'	2"
10	18x34x3'	2"
11	18x34x3'	2"
12	10x20x3'	2"
13	10x20x3'	2"
14	10x20x3'	2"
15	10x20x3'	2"
16	75x147x3'	2.5"
17	10x20x3'	2"
18	10x20x3'	2"
19	10x20x3'	2"
20	10x20x3'	2"
21	23x42x3'	2"
22	18x42x3'	2"
23	10x20x3'	2"
24	10x20x3'	2"
25	10x20x3'	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

EROSION CONTROL LEGEND

- CHECK DAM
- SILT FENCE
- GRAVEL CONSTRUCTION ENTRANCE
- SEDIMENT BASIN (SB) – SEE CHART
- LIMITS OF DISTURBANCE/CLEARING (INCLUDES RIGHT-OF-WAY)
- PIPE INLET PROTECTION
- DITCH LINER (DL) – SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CHECKED AND REPAIRED ON A DAILY BASIS

SEDIMENT BASINS SHALL BE CONSTRUCTED SO AS TO BE LOCATED OUTSIDE OF ANY PROPOSED FILL AREAS AND RIGHT OF WAYS

ALL CHECK DAMS SHALL BE PLACED AT INTERVALS SUCH THAT THE TOP OF THE DOWNSTEAM CHECK DAM AND THE FOOT OF THE UPSTREAM CHECK DAM ARE EQUAL ELEVATIONS

DIVERSION DITCHES SHALL BE INSTALLED TO ASSURE STORMWATER DRAINAGE WILL BE DIRECTED TO THE SEDIMENT BASINS

STORM PIPE (SP) INFORMATION

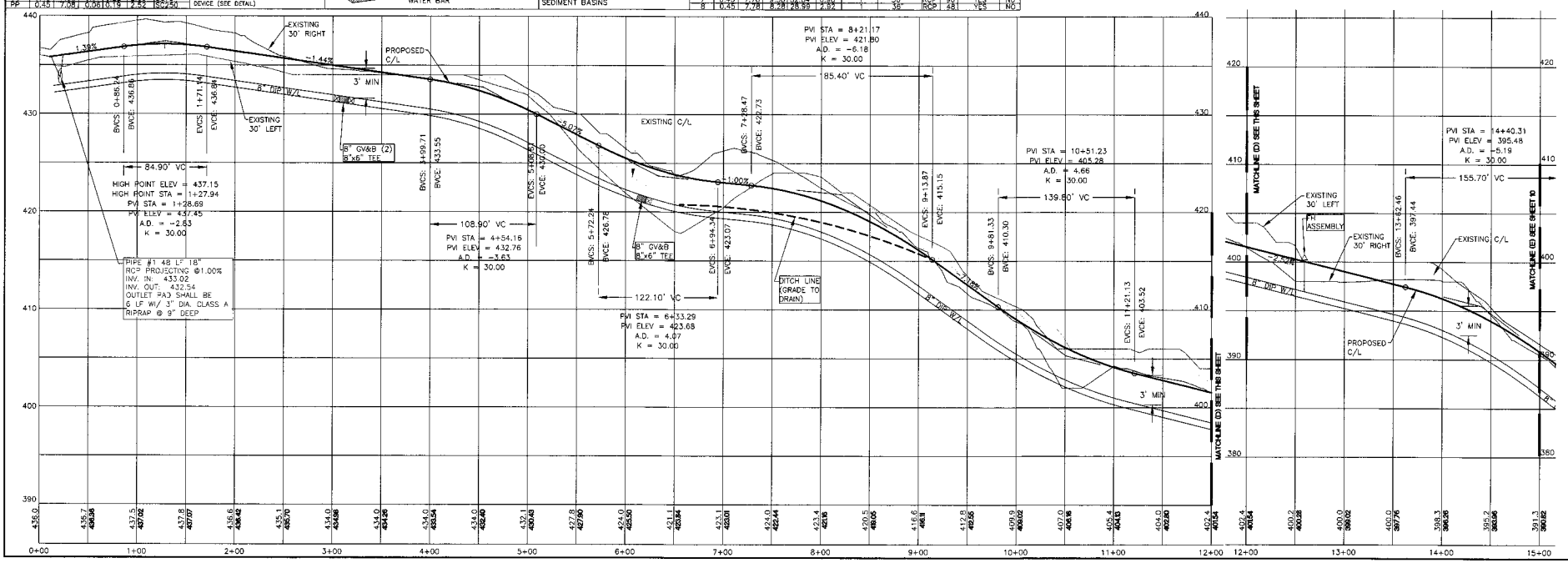
#	C	T25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.79	1.00	1	18"	RCP	48	NO	NO
2	0.45	7.78	43.88	153.97	3.94	2	48" & 60"	RCP	66	YES	NO
3	0.45	7.78	44.04	154.18	1.78	2	48" & 60"	RCP	76	YES	NO
4	0.45	7.78	2.7	9.49	1.00	1	24"	RCP	48	NO	YES
5	0.45	7.78	2.47	8.65	6.04	1	18"	RCP	48	NO	NO
6	0.45	7.78	1.80	6.30	1.00	1	18"	RCP	32	NO	NO
7	0.45	7.78	9.38	32.84	6.98	1	36"	RCP	98	YES	NO
8	0.45	7.78	8.28	28.99	2.92	1	36"	RCP	48	YES	NO

TRANSITION NOTE:

TRANSITION BETWEEN CONSTRUCTION OF PHASE ONE AND THE CONTINUATION WITH PHASE TWO WILL REQUIRE THE WATERLINE BE CONSTRUCTED TO THE FIRE HYDRANT AT THE LOT 37/36 PROPERTY LINE AND PLACEMENT OF A PLUG AT THE FIRE HYDRANT TEE. WHEN PHASE TWO IS READY FOR CONSTUCTION, THE PLUG SHALL BE REMOVED FOR CONTINUATION OF THE WATERLINE.

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.



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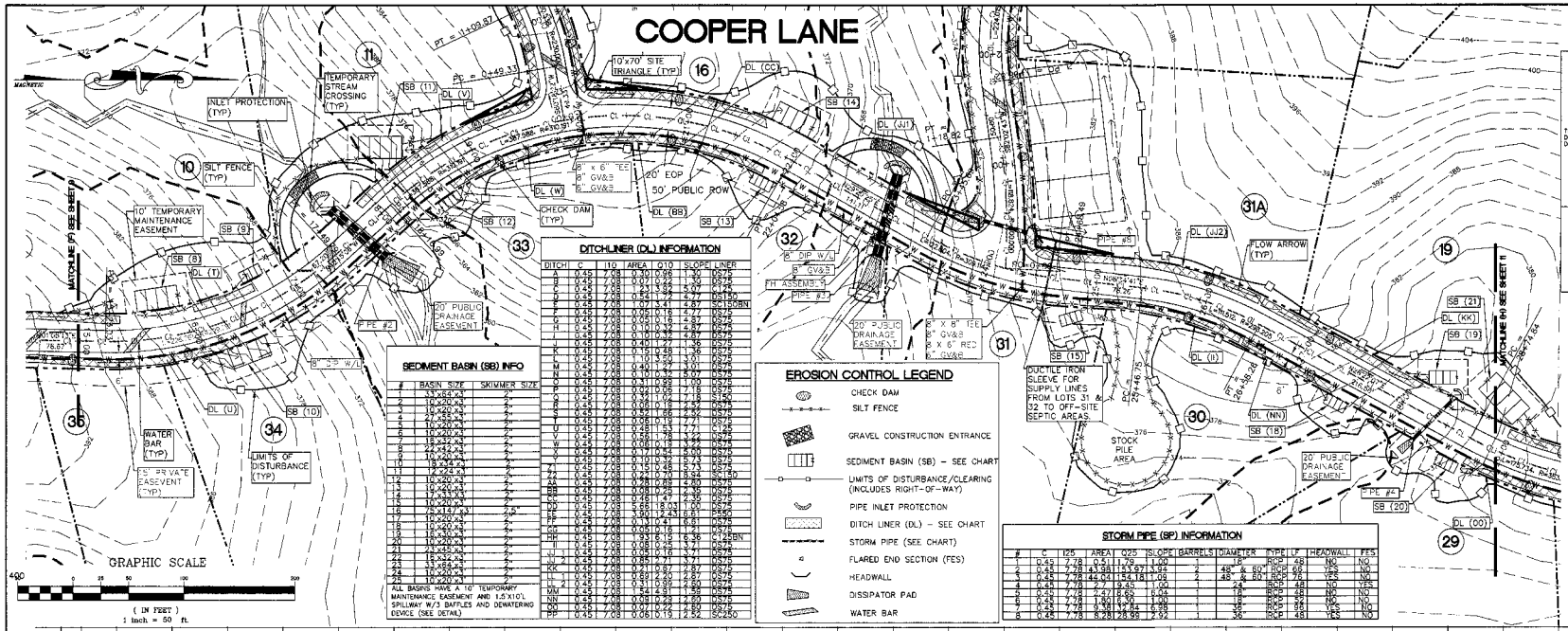
Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CESTLER
Job #: 38-0206
File: Cooper43dwg/Cooper final-water rev.dwg
Revision: 1/14/09

Cooper Lane Plan & Profile Sta: 0+00-15+50

For

Cooper Subdivision

COOPER LANE



SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33'x84'x3'	2"
2	10'x20'x3'	2"
3	10'x20'x3'	2"
4	27'x33'x3'	2"
5	10'x20'x3'	2"
6	10'x20'x3'	2"
7	15'x44'x3'	2"
8	27'x33'x3'	2"
9	10'x20'x3'	2"
10	15'x44'x3'	2"
11	17'x34'x3'	2"
12	10'x20'x3'	2"
13	10'x20'x3'	2"
14	17'x33'x3'	2"
15	10'x20'x3'	2"
16	25'x147'x3'	2.5"
17	10'x20'x3'	2"
18	10'x20'x3'	2"
19	15'x30'x3'	2"
20	10'x20'x3'	2"
21	15'x45'x3'	2"
22	15'x33'x3'	2"
23	33'x84'x3'	2"
24	10'x20'x3'	2"
25	10'x20'x3'	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

DITCHLINER (DL) INFORMATION

DITCH	C	I10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.30	0.96	1.30	D575
B	0.45	7.08	0.01	0.03	3.39	D575
C	0.45	7.08	0.23	0.82	5.07	C125
D	0.45	7.08	0.54	1.72	4.27	D5150
E	0.45	7.08	1.07	3.41	4.87	C5150BN
F	0.45	7.08	0.05	0.16	4.77	D575
G	0.45	7.08	0.05	0.15	2.87	D575
H	0.45	7.08	0.09	0.32	4.87	D575
I	0.45	7.08	0.10	0.32	4.87	D575
J	0.45	7.08	0.40	1.27	1.36	D575
K	0.45	7.08	0.15	0.48	1.36	D575
L	0.45	7.08	0.31	0.99	1.01	D575
M	0.45	7.08	0.40	1.27	3.01	D575
N	0.45	7.08	0.10	0.32	5.07	D575
O	0.45	7.08	0.31	0.99	1.09	D575
P	0.45	7.08	0.02	0.05	7.18	D575
Q	0.45	7.08	0.32	1.02	7.18	D5150
R	0.45	7.08	0.05	0.15	2.57	D575
S	0.45	7.08	0.26	0.83	2.56	D575
T	0.45	7.08	0.05	0.15	2.71	D575
U	0.45	7.08	0.48	1.53	7.71	C125
V	0.45	7.08	0.55	1.76	1.22	D575
W	0.45	7.08	0.05	0.15	1.22	D575
X	0.45	7.08	0.10	0.32	5.07	D575
Y	0.45	7.08	0.10	0.32	5.07	D575
Z	0.45	7.08	0.19	0.60	5.73	D575
AA	0.45	7.08	0.15	0.48	5.73	D575
BB	0.45	7.08	0.22	0.70	8.34	D5150
CC	0.45	7.08	0.26	0.83	4.80	D575
DD	0.45	7.08	0.05	0.16	2.35	D575
EE	0.45	7.08	0.49	1.57	2.39	D575
FF	0.45	7.08	0.65	2.03	1.00	D575
GG	0.45	7.08	1.00	3.23	0.61	D5150
HH	0.45	7.08	0.13	0.41	6.61	D575
II	0.45	7.08	0.05	0.16	2.71	D575
JJ	0.45	7.08	1.93	6.15	6.36	C125BN
KK	0.45	7.08	0.05	0.16	5.71	D575
LL	0.45	7.08	0.05	0.16	5.71	D575
JJ 1	0.45	7.08	0.85	2.71	3.71	D575
JJ 2	0.45	7.08	0.21	0.67	2.87	D575
MM	0.45	7.08	0.09	0.28	2.87	D575
NN	0.45	7.08	0.69	2.20	2.87	D575
OO	0.45	7.08	0.31	0.99	1.84	D575
PP	0.45	7.08	0.06	0.19	2.52	C5250

EROSION CONTROL LEGEND

- CHECK DAM
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- SEDIMENT BASIN (SB) - SEE CHART
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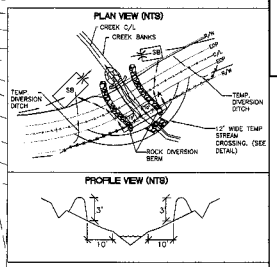
- PIPE INLET PROTECTION
- DITCH LINER (DL) - SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.79	1.00	1	18"	RCP	48	NO	NO
2	0.45	7.78	43.58	153.97	3.09	2	48" & 60"	RCP	66	YES	NO
3	0.45	7.78	44.04	154.18	1.09	2	48" & 60"	RCP	76	YES	NO
4	0.45	7.78	2.7	9.45	1.00	1	24"	RCP	48	NO	YES
5	0.45	7.78	2.47	8.62	1.00	1	18"	RCP	48	NO	NO
6	0.45	7.78	1.80	6.30	1.00	1	18"	RCP	52	NO	NO
7	0.45	7.78	9.38	32.84	6.25	1	36"	RCP	58	YES	NO
8	0.45	7.78	8.28	28.98	2.92	1	36"	RCP	48	YES	NO

STREAM CROSSING AREA EXHIBIT



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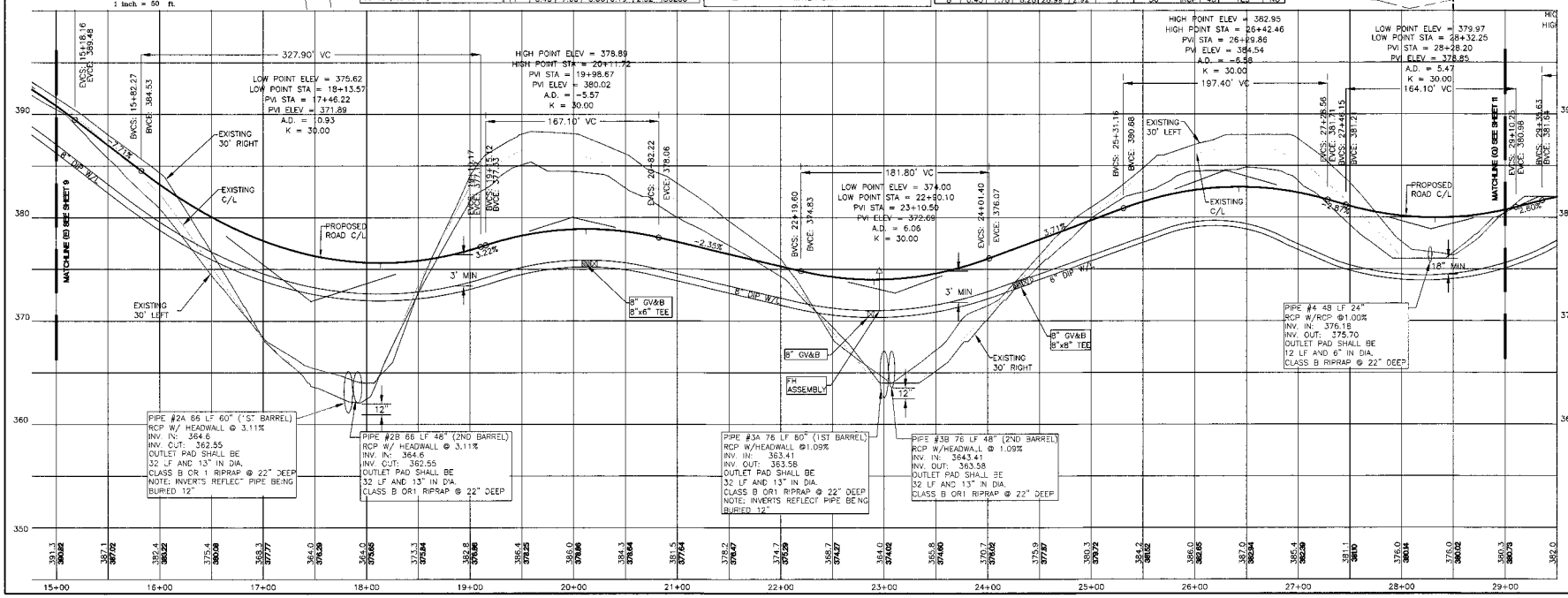

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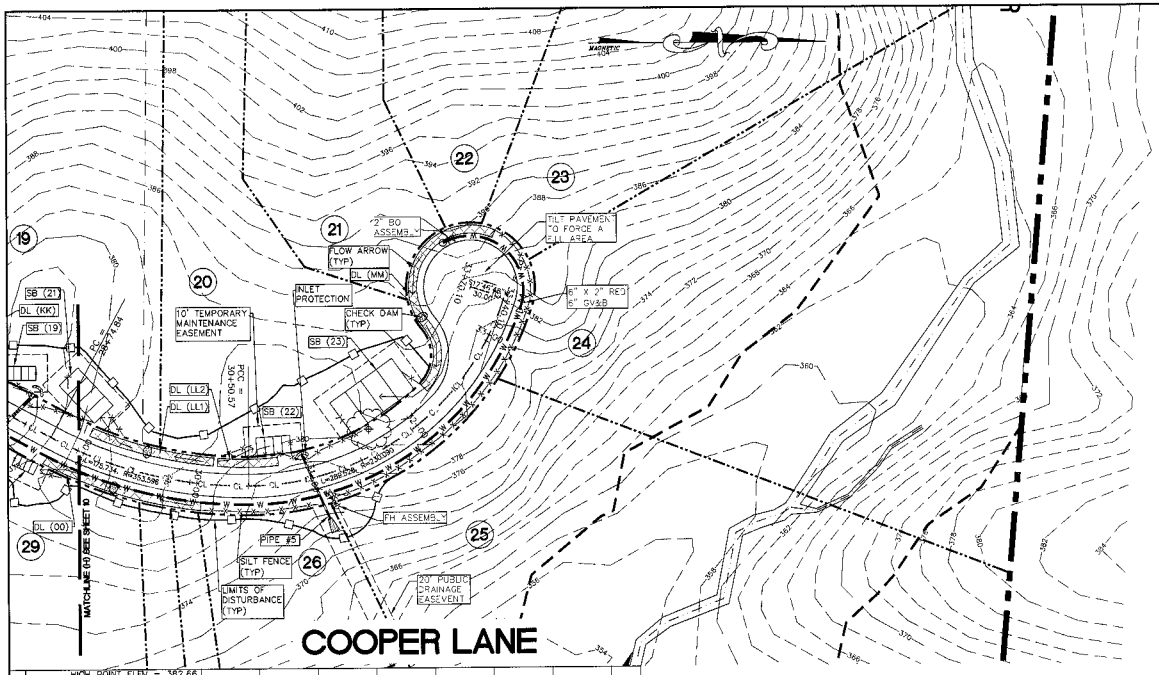
File: Cooper43.dwg/Cooper final-water rev.dwg
Revision: 1/14/09

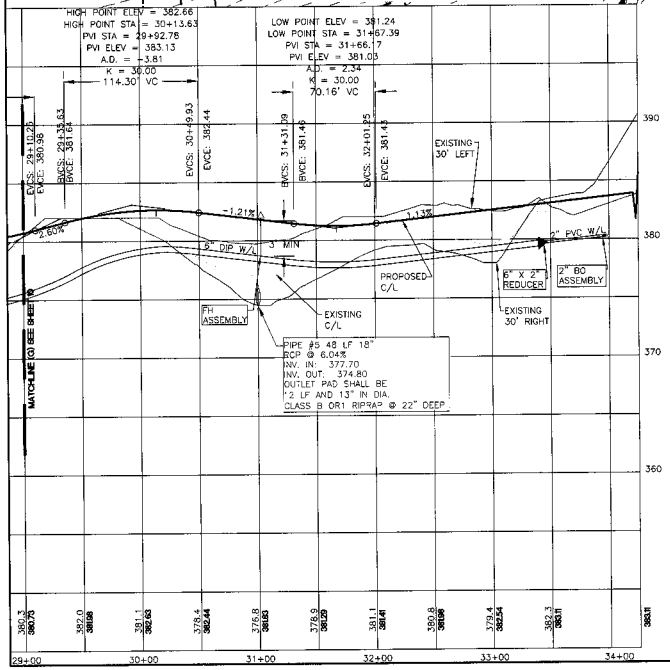
Cooper Lane Plan & Profile Sta: 15+00- 30+00

For

Cooper Subdivision

10





DITCH LINER (DL) INFORMATION

DITCH	C	I10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.70	0.96	1.30	DS75
B	0.45	7.08	0.91	1.29	1.30	DS75
C	0.45	7.08	1.21	1.82	3.07	DS150
D	0.45	7.08	0.54	1.72	4.77	DS150
E	0.45	7.08	1.07	1.41	4.87	DS150BN
F	0.45	7.08	0.05	0.16	4.77	DS75
G	0.45	7.08	0.05	0.16	4.87	DS75
H	0.45	7.08	0.10	0.32	4.87	DS75
I	0.45	7.08	0.10	0.32	4.87	DS75
J	0.50	7.08	0.45	1.27	1.36	DS75
K	0.45	7.08	0.15	0.48	1.36	DS75
L	0.45	7.08	0.10	0.50	3.01	DS75
M	0.45	7.08	0.49	1.47	3.01	DS75
N	0.45	7.08	0.10	0.32	4.07	DS75
O	0.50	7.08	0.41	0.89	1.06	DS75
P	0.45	7.08	0.02	0.05	7.18	DS75
Q	0.45	7.08	0.20	1.02	7.18	DS150
R	0.45	7.08	0.05	0.16	4.32	DS75
S	0.45	7.08	0.05	0.16	4.32	DS75
T	0.45	7.08	0.08	0.15	7.71	DS75
U	0.45	7.08	0.48	1.53	7.71	DS150
V	0.45	7.08	0.56	1.78	4.22	DS75
W	0.45	7.08	0.05	0.16	4.22	DS75
X	0.45	7.08	0.19	0.54	8.00	DS75
Y	0.45	7.08	0.10	0.32	8.00	DS75
Z	0.45	7.08	0.15	0.48	8.23	DS75
AA	0.45	7.08	2.40	7.70	8.23	DS150
AB	0.45	7.08	2.38	0.89	4.80	DS75
BB	0.45	7.08	0.08	0.25	2.45	DS75
CC	0.45	7.08	0.28	1.47	2.45	DS75
DD	0.45	7.08	5.66	15.03	1.06	DS75
EE	0.45	7.08	1.50	4.23	2.61	DS75
FF	0.45	7.08	0.13	0.41	6.61	DS75
GG	0.45	7.08	0.05	0.16	7.71	DS75
HH	0.45	7.08	1.93	6.15	6.36	DS150BN
II	0.45	7.08	0.08	0.25	4.71	DS75
JJ	0.45	7.08	0.05	0.16	4.71	DS75
JJ 1	0.45	7.08	0.05	0.16	4.71	DS75
JJ 2	0.45	7.08	0.85	2.71	4.71	DS75
KK	0.45	7.08	0.21	0.67	2.87	DS75
LL	0.45	7.08	0.89	2.80	2.87	DS75
LL 1	0.45	7.08	0.31	0.99	2.60	DS75
MM	0.45	7.08	1.54	4.91	1.88	DS75
NN	0.45	7.08	0.09	0.29	2.60	DS75
OO	0.45	7.08	0.07	0.22	2.60	DS75
PP	0.45	7.08	0.05	0.19	2.52	SC250

SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33x44x3'	2"
2	10x20x3'	2"
3	27x40x3'	2"
4	10x20x3'	2"
5	10x20x3'	2"
6	10x20x3'	2"
7	16x24x3'	2"
8	27x42x3'	2"
9	10x20x3'	2"
10	18x32x3'	2"
11	19x28x3'	2"
12	10x20x3'	2"
13	10x20x3'	2"
14	17x33x3'	2"
15	10x20x3'	2"
16	28x41x3'	2.5"
17	10x20x3'	2"
18	10x20x3'	2"
19	10x20x3'	2"
20	10x20x3'	2"
21	23x49x3'	2"
22	18x32x3'	2"
23	13x26x3'	2"
24	10x20x3'	2"
25	10x20x3'	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.79	1.00	1	18"	RCP	68	NO	NO
2	0.45	7.78	14.58	45.97	1.34	2	48" & 60"	RCP	66	YES	NO
3	0.45	7.78	44.04	154.18	1.09	2	48" & 60"	RCP	78	YES	NO
4	0.50	7.78	2.7	9.49	1.00	1	24"	RCP	48	NO	YES
5	0.45	7.78	1.67	5.66	6.04	1	18"	RCP	48	NO	NO
6	0.45	7.78	1.69	5.70	1.00	1	18"	RCP	52	NO	NO
7	0.45	7.78	9.48	32.84	5.83	1	36"	RCP	96	YES	NO
8	0.45	7.78	8.28	28.99	2.62	1	36"	RCP	48	YES	NO

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ALL CHECK DAMS SHALL BE PLACED AT INTERVALS SUCH THAT THE TOP OF THE DOWNSTEAM CHECK DAM AND THE FOOT OF THE UPSTREAM CHECK DAM ARE EQUAL ELEVATIONS

DIVERSION DITCHES SHALL BE INSTALLED TO ASSURE STORMWATER DRAINAGE WILL BE DIRECTED TO THE SEDIMENT BASINS

EROSION CONTROL LEGEND

- CHECK DAM
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- HEADWALL
- DISSIPATOR PAD
- WATER BAR

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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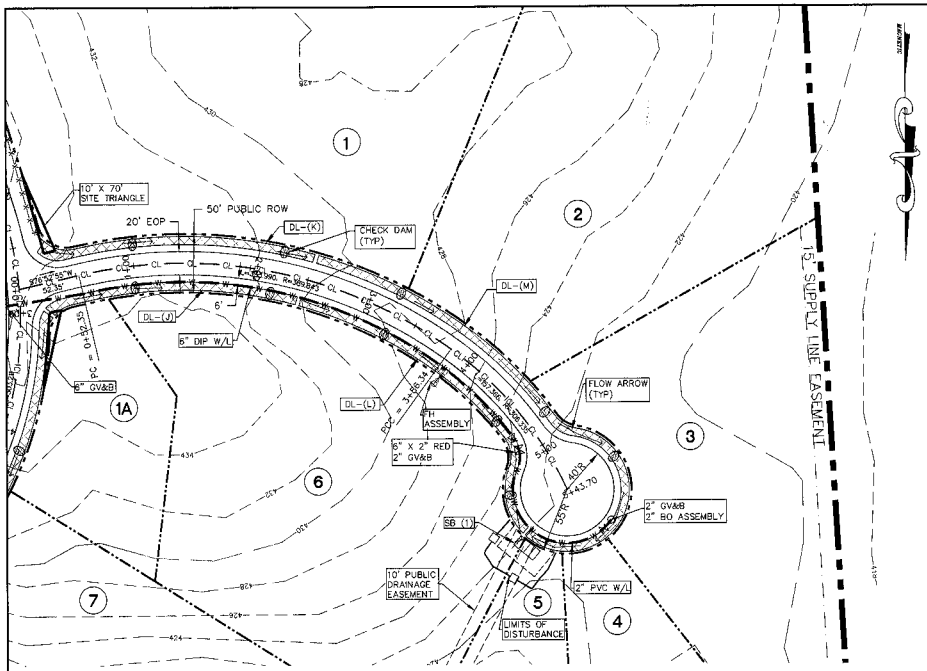
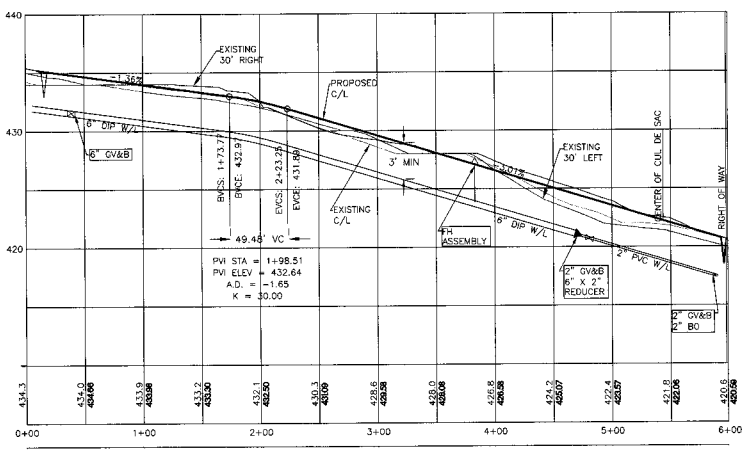
For

Cooper Subdivision

1 1



WINDSONG DRIVE



SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33x64x3'	2"
2	10x20x3'	2"
3	10x20x3'	2"
4	23x55x3'	2"
5	10x20x3'	2"
6	10x20x3'	2"
7	22x32x3'	2"
8	22x32x3'	2"
9	10x20x3'	2"
10	18x34x3'	2"
11	12x24x3'	2"
12	10x20x3'	2"
13	10x20x3'	2"
14	17x33x3'	2"
15	10x20x3'	2"
16	75x147x3'	2.5"
17	10x20x3'	2"
18	10x20x3'	2"
19	18x30x3'	2"
20	10x20x3'	2"
21	23x55x3'	2"
22	12x32x3'	2"
23	33x64x3'	2"
24	10x20x3'	2"
25	10x20x3'	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

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DITCHLINER (DL) INFORMATION

DITCH	C	I10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.50	0.96	1.10	DS75
B	0.45	7.08	0.67	1.63	1.50	DS75
C	0.45	7.08	2.31	3.87	5.07	DS75
D	0.45	7.08	0.42	1.77	4.77	DS150
E	0.45	7.08	1.07	3.41	4.87	SC150BN
F	0.45	7.08	0.05	0.16	4.87	DS75
G	0.45	7.08	0.05	0.16	4.87	DS75
H	0.45	7.08	0.10	0.32	4.87	DS75
I	0.45	7.08	0.10	0.32	4.87	DS75
J	0.45	7.08	0.40	1.27	1.36	DS75
K	0.45	7.08	0.15	0.48	1.36	DS75
L	0.45	7.08	1.10	3.50	1.01	DS75
M	0.45	7.08	0.40	1.27	1.01	DS75
N	0.45	7.08	0.10	0.32	5.07	DS75
O	0.45	7.08	0.31	0.98	1.00	DS75
P	0.45	7.08	0.02	0.05	7.18	DS75
Q	0.45	7.08	0.32	1.02	7.18	S150
R	0.45	7.08	0.08	0.19	2.52	DS75
S	0.45	7.08	0.57	1.86	2.52	DS75
T	0.45	7.08	0.05	0.13	7.71	DS75
U	0.45	7.08	0.48	1.53	7.71	DS75
V	0.45	7.08	0.56	1.78	3.22	DS75
W	0.45	7.08	0.06	0.19	3.22	DS75
X	0.45	7.08	0.17	0.54	5.50	DS75
Y	0.45	7.08	0.16	0.51	5.73	DS75
Z	0.45	7.08	0.15	0.48	5.73	DS75
AA	0.45	7.08	0.24	0.76	6.84	SC150
BB	0.45	7.08	0.28	0.89	4.80	DS75
CC	0.45	7.08	0.08	0.25	2.35	DS75
DD	0.45	7.08	0.51	1.47	2.35	DS75
EE	0.45	7.08	5.66	18.03	1.00	DS75
FF	0.45	7.08	3.80	12.11	6.61	S150
GG	0.45	7.08	0.10	0.31	5.61	DS75
HH	0.45	7.08	0.05	0.16	1.4	DS75
II	0.45	7.08	1.93	6.15	6.56	SC150BN
JJ	0.45	7.08	0.08	0.25	3.71	DS75
JJ 1	0.45	7.08	0.05	0.16	3.71	DS75
JJ 2	0.45	7.08	0.69	2.21	3.71	DS75
KK	0.45	7.08	0.21	0.67	2.87	DS75
LL 1	0.45	7.08	0.69	2.20	2.87	DS75
LL 2	0.45	7.08	0.31	0.99	2.80	DS75
MM	0.45	7.08	1.54	4.91	1.59	DS75
NN	0.45	7.08	0.09	0.29	2.50	DS75
OO	0.45	7.08	0.07	0.22	2.50	DS75
PP	0.45	7.08	0.06	0.19	2.52	SC250

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.79	1.00	1	18"	RCP	48	NO	NO
2	0.45	7.78	43.98	153.97	3.34	2	48" & 60"	RCP	86	YES	NO
3	0.45	7.78	44.04	154.18	1.09	2	48" & 60"	RCP	78	YES	NO
4	0.45	7.78	2.7	9.45	1.00	1	24"	RCP	48	NO	YES
5	0.45	7.78	2.47	8.65	6.04	1	18"	RCP	48	NO	NO
6	0.45	7.78	1.85	6.47	1.00	1	18"	RCP	57	NO	NO
7	0.45	7.78	9.39	32.84	0.98	1	36"	RCP	96	YES	NO
8	0.45	7.78	8.28	28.99	2.82	1	36"	RCP	48	YES	NO

EROSION CONTROL LEGEND

- CHECK DAM
- SILT FENCE
- GRAVEL CONSTRUCTION ENTRANCE
- SEDIMENT BASIN (SB) – SEE CHART
- LIMITS OF DISTURBANCE/CLEARING (INCLUDES RIGHT-OF-WAY)
- PIPE INLET PROTECTION
- DITCH LINER (DL) – SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

John W. Harris, P.E.
Consulting Engineer, Inc.
5112 Bur Oak Circle
Raleigh, N.C. 27612
(919) 789-0744

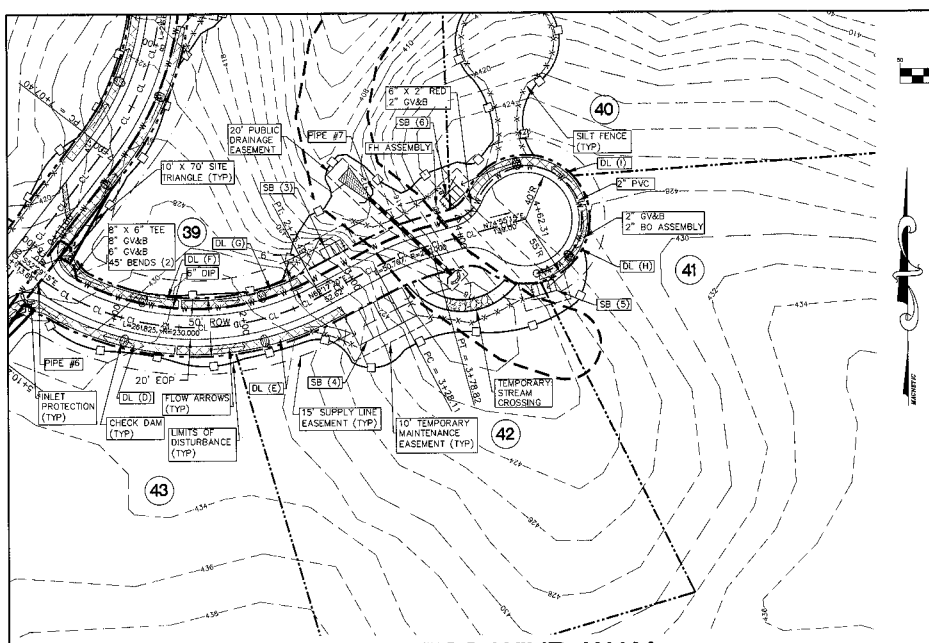
Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CES/LER
Job #: 38-0206
File: Cooper43dwgs\Cooper final-water rev.dwgs
Revision: 1/14/09

Windsong Drive Plan & Profile Sta 0+00- EOP

For

Cooper Subdivision

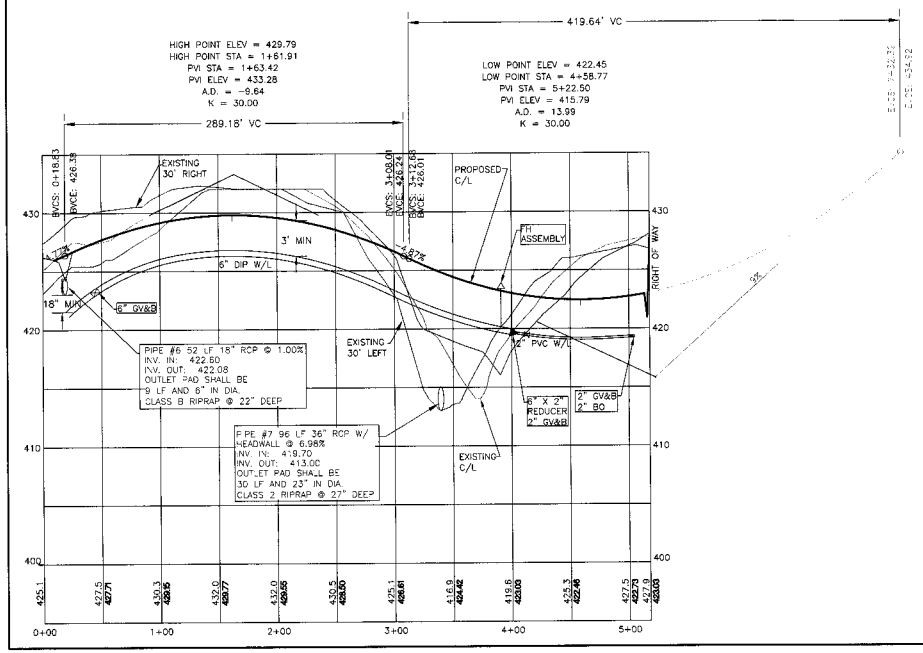
1 2



GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

RESTLESS WIND WAY



DITCH/LINER (DL) INFORMATION

DITCH	C	I10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.30	0.96	1.00	DS75
B	0.45	7.08	0.07	0.22	1.00	DS75
C	0.45	7.08	0.43	1.37	2.00	DS75
D	0.45	7.08	0.61	1.74	2.00	DS150
E	0.45	7.08	1.07	3.41	4.87	DS150BN
F	0.45	7.08	0.05	0.16	4.77	DS75
G	0.45	7.08	0.05	0.16	4.87	DS75
H	0.45	7.08	0.10	0.32	4.87	DS75
I	0.45	7.08	0.10	0.32	4.87	DS75
J	0.45	7.08	0.40	1.27	1.38	DS75
K	0.45	7.08	0.18	0.58	1.38	DS75
L	0.45	7.08	1.10	1.50	3.01	DS75
M	0.45	7.08	0.40	1.27	3.01	DS75
N	0.45	7.08	0.10	0.32	5.00	DS75
O	0.45	7.08	0.3	0.95	1.00	DS75
P	0.45	7.08	0.01	0.03	7.18	DS75
Q	0.45	7.08	0.32	1.02	7.18	S150
R	0.45	7.08	0.05	0.16	2.52	DS75
S	0.45	7.08	0.52	1.65	2.52	DS75
T	0.45	7.08	0.05	0.16	4.77	DS75
U	0.45	7.08	0.45	1.43	7.71	DS75
V	0.45	7.08	0.56	1.78	4.22	DS75
W	0.45	7.08	0.05	0.16	2.44	DS75
X	0.45	7.08	0.17	0.54	5.00	DS75
Y	0.45	7.08	0.10	0.32	2.73	DS75
Z	0.45	7.08	0.15	0.48	3.73	DS75
AA	0.45	7.08	0.42	1.34	8.93	DS150
AB	0.45	7.08	0.28	0.89	4.82	DS75
BB	0.45	7.08	0.08	0.25	2.45	DS75
CC	0.45	7.08	0.46	1.47	2.00	DS75
DD	0.45	7.08	5.68	18.03	1.00	DS75
EE	0.45	7.08	1.90	2.43	2.61	DS50
FF	0.45	7.08	0.13	0.41	2.61	DS75
GG	0.45	7.08	0.05	0.16	4.87	DS75
HH	0.45	7.08	1.91	6.12	6.36	S150BN
II	0.45	7.08	0.08	0.25	3.73	DS75
JJ	0.45	7.08	0.05	0.16	3.73	DS75
KK	0.45	7.08	0.85	2.71	3.73	DS75
LL	0.45	7.08	0.31	0.97	2.87	DS75
MM	0.45	7.08	0.89	2.82	2.87	DS75
NN	0.45	7.08	0.09	0.29	2.60	DS75
OO	0.45	7.08	0.07	0.22	2.60	DS75
PP	0.45	7.08	0.06	0.19	2.52	DS450

SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33x64x3	2"
2	10x20x3	2"
3	10x20x3	2"
4	27x50x3	2"
5	10x20x3	2"
6	10x20x3	2"
7	16x33x3	2"
8	22x45x3	2"
9	10x20x3	2"
10	18x34x3	2"
11	12x24x3	2"
12	10x20x3	2"
13	10x20x3	2"
14	10x20x3	2"
15	10x20x3	2"
16	75x147x3	2.5"
17	10x20x3	2"
18	10x20x3	2"
19	10x20x3	2"
20	10x20x3	2"
21	23x43x3	2"
22	18x33x3	2"
23	33x64x3	2"
24	10x20x3	2"
25	10x20x3	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.79	1.00	1	18"	RCP	48	NO	NO
2	0.45	7.78	43.98	153.97	3.94	2	48" & 60"	RCP	66	YES	NO
3	0.45	7.78	44.04	154.18	1.08	2	48" & 60"	RCP	78	YES	NO
4	0.45	7.78	2.7	9.45	1.00	1	24"	RCP	48	NO	YES
5	0.45	7.78	2.47	8.65	6.04	1	18"	RCP	45	NO	NO
6	0.45	7.78	1.84	6.30	1.00	1	18"	RCP	62	NO	NO
7	0.45	7.78	8.56	29.84	6.98	1	36"	RCP	96	YES	NO
8	0.45	7.78	8.28	28.99	2.92	1	36"	RCP	48	YES	NO

ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CHECKED AND REPAIRED ON A DAILY BASIS

SEDIMENT BASINS SHALL BE CONSTRUCTED SO AS TO BE LOCATED OUTSIDE OF ANY PROPOSED FILL AREAS AND RIGHT OF WAYS

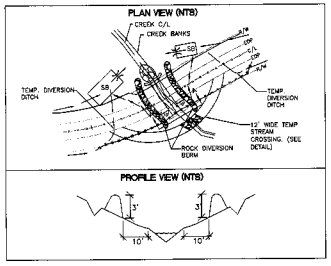
ALL CHECK DAMS SHALL BE PLACED AT INTERVALS SUCH THAT THE TOP OF THE DOWNSTEAM CHECK DAM AND THE FOOT OF THE UPSTREAM CHECK DAM ARE EQUAL ELEVATIONS

DIVERSION DITCHES SHALL BE INSTALLED TO ASSURE STORMWATER DRAINAGE WILL BE DIRECTED TO THE SEDIMENT BASINS

EROSION CONTROL LEGEND

- CHECK DAM
- SILT FENCE
- GRAVEL CONSTRUCTION ENTRANCE
- SEDIMENT BASIN (SB) - SEE CHART
- LIMITS OF DISTURBANCE/CLEARING (INCLUDES RIGHT-OF-WAY)
- PIPE INLET PROTECTION
- DITCH LINER (DL) - SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

STREAM CROSSING AREA EXHIBIT

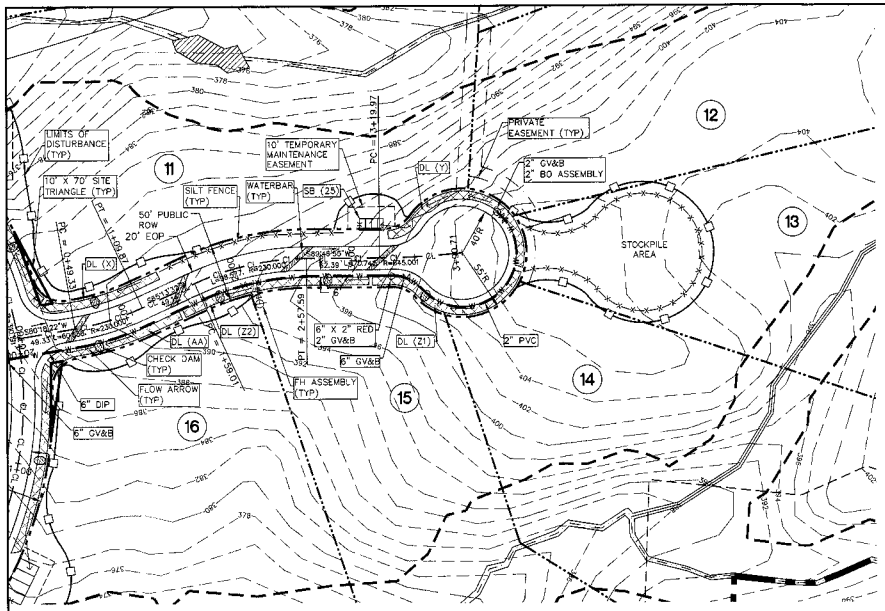


John W. Harris, P.E.
Consulting Engineer, Inc.
5112 Bur Oak Circle
Raleigh, N.C. 27612
(919) 789-0744

Date: 09/20/2008
Scale: 1" = 50'
Drawn By: CES
Job #: 38-0206
File: Cooper33dwg\Cooperfinal
Revision:

Restless Wind Way Plan & Profile
Sta: 0+00-EOP
For
Cooper Subdivision

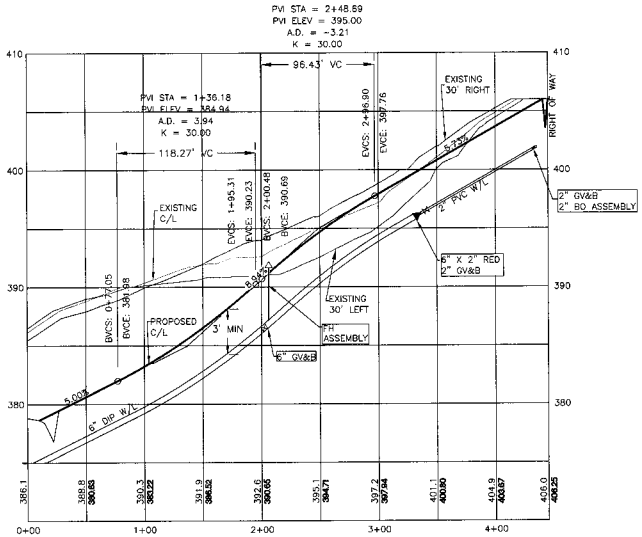
13



GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

MARIAH LANE



DITCHLINER (DL) INFORMATION

DITCH	C	I10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.30	0.95	1.30	0575
B	0.45	7.08	0.07	0.22	1.30	0575
C	0.45	7.08	1.47	4.82	5.07	C125
D	0.45	7.08	0.54	1.72	2.71	S6150
E	0.45	7.08	1.07	3.41	4.87	S6150BN
F	0.45	7.08	0.05	0.18	4.87	0575
G	0.45	7.08	0.03	0.10	4.87	0575
H	0.45	7.08	0.10	0.32	4.87	0575
I	0.45	7.08	0.10	0.32	4.87	0575
J	0.45	7.08	0.40	1.27	1.36	0575
K	0.45	7.08	0.15	0.48	1.36	0575
L	0.45	7.08	1.10	3.50	3.01	0575
M	0.45	7.08	0.40	1.27	5.07	0575
N	0.45	7.08	0.10	0.32	5.07	0575
O	0.45	7.08	0.31	0.99	1.00	0575
P	0.45	7.08	0.02	0.06	7.18	0575
Q	0.45	7.08	0.32	1.02	7.18	S150
R	0.45	7.08	0.53	1.69	2.63	S6750
S	0.45	7.08	0.52	1.66	2.63	0575
T	0.45	7.08	0.06	0.19	2.71	0575
U	0.45	7.08	0.48	1.53	2.71	C125
V	0.45	7.08	0.56	1.78	3.22	0575
W	0.45	7.08	0.06	0.19	3.22	0575
X	0.45	7.08	0.17	0.54	5.00	0575
Y	0.45	7.08	0.10	0.32	5.23	0575
Z1	0.45	7.08	0.15	0.48	5.23	0575
Z2	0.45	7.08	0.22	0.70	8.81	S6150
AA	0.45	7.08	0.28	0.89	4.60	0575
BB	0.45	7.08	0.08	0.25	2.35	0575
CC	0.45	7.08	0.41	1.31	4.60	0575
DD	0.45	7.08	5.66	18.00	1.00	0575
EE	0.45	7.08	3.80	12.13	5.61	0575
FF	0.45	7.08	0.13	0.41	5.61	0575
GG	0.45	7.08	0.05	0.16	1.4	0575
HH	0.45	7.08	1.31	4.15	6.46	C125BN
II	0.45	7.08	0.08	0.25	3.71	0575
JJ 1	0.45	7.08	0.05	0.16	3.71	0575
JJ 2	0.45	7.08	0.35	1.11	3.71	0575
KK	0.45	7.08	0.21	0.67	2.87	0575
LL 1	0.45	7.08	0.69	2.20	2.87	0575
LL 2	0.45	7.08	0.31	0.99	2.60	0575
MM	0.45	7.08	1.51	4.81	1.00	0575
NN	0.45	7.08	0.09	0.29	2.60	0575
OO	0.45	7.08	0.07	0.22	2.60	0575
PP	0.45	7.08	0.06	0.19	2.52	S6250

SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33,464 cf	2"
2	10,420 cf	2"
3	10,420 cf	2"
4	23,255 cf	2"
5	10,420 cf	2"
6	10,420 cf	2"
7	18,432 cf	2"
8	22,243 cf	2"
9	10,420 cf	2"
10	18,224 cf	2"
11	18,224 cf	2"
12	10,420 cf	2"
13	10,420 cf	2"
14	17,933 cf	2"
15	10,420 cf	2"
16	75,147 cf	2.5"
17	10,420 cf	2"
18	10,420 cf	2"
19	18,420 cf	2"
20	10,420 cf	2"
21	23,455 cf	2"
22	18,330 cf	2"
23	33,464 cf	2"
24	18,420 cf	2"
25	10,420 cf	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10' SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.79	1.00	1	18"	RCP	46	NO	NO
2	0.45	7.78	14.98	53.97	3.94	2	48" & 60"	RCP	66	YES	NO
3	0.45	7.78	44.04	154.18	1.09	2	48" & 60"	RCP	76	YES	NO
4	0.45	7.78	0.7	2.45	1.00	1	18"	RCP	46	NO	YES
5	0.45	7.78	2.47	8.65	6.04	1	18"	RCP	46	NO	NO
6	0.45	7.78	1.60	5.59	1.00	1	18"	RCP	46	NO	NO
7	0.45	7.78	3.98	13.94	6.88	1	18"	RCP	96	YES	NO
8	0.45	7.78	8.28	28.99	2.92	1	36"	RCP	48	YES	NO

ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CHECKED AND REPAIRED ON A DAILY BASIS

SEDIMENT BASINS SHALL BE CONSTRUCTED SO AS TO BE LOCATED OUTSIDE OF ANY PROPOSED FILL AREAS AND RIGHT OF WAYS

ALL CHECK DAMS SHALL BE PLACED AT INTERVALS SUCH THAT THE TOP OF THE DOWNSTEAM CHECK DAM AND THE FOOT OF THE UPSTREAM CHECK DAM ARE EQUAL ELEVATIONS

DIVERSION DITCHES SHALL BE INSTALLED TO ASSURE STORMWATER DRAINAGE WILL BE DIRECTED TO THE SEDIMENT BASINS

EROSION CONTROL LEGEND

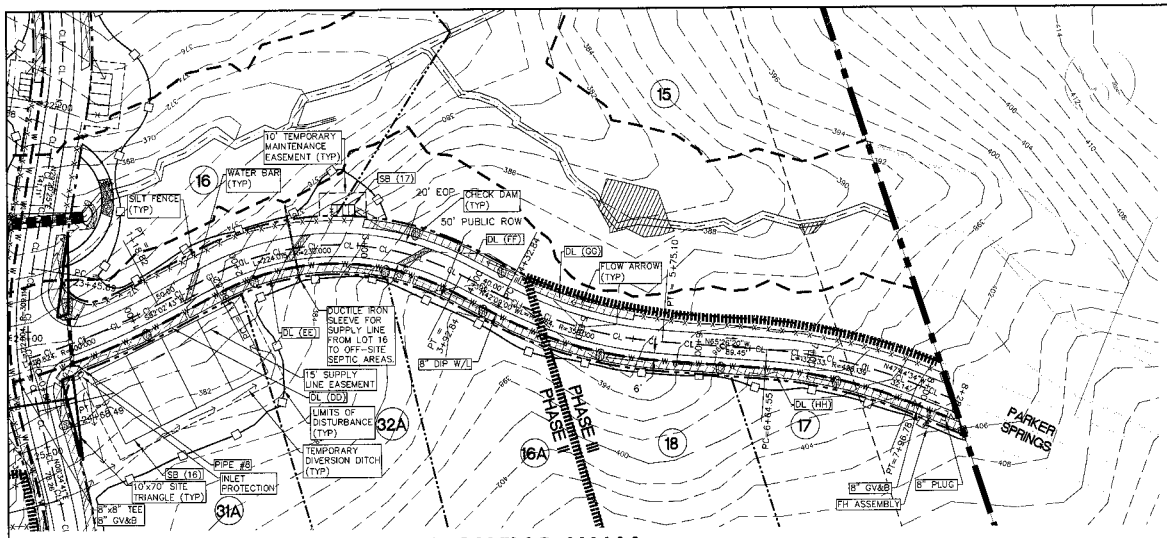
- CHECK DAM
- SILT FENCE
- GRAVEL CONSTRUCTION ENTRANCE
- SEDIMENT BASIN (SB) – SEE CHART
- LIMITS OF DISTURBANCE/CLEARING (INCLUDES RIGHT-OF-WAY)
- PIPE INLET PROTECTION
- DITCH LNER (DL) – SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

John W. Harris, P.E.
Consulting Engineer, Inc.
5112 Bur Oak Circle
Raleigh, N.C. 27612
(919) 789-0744

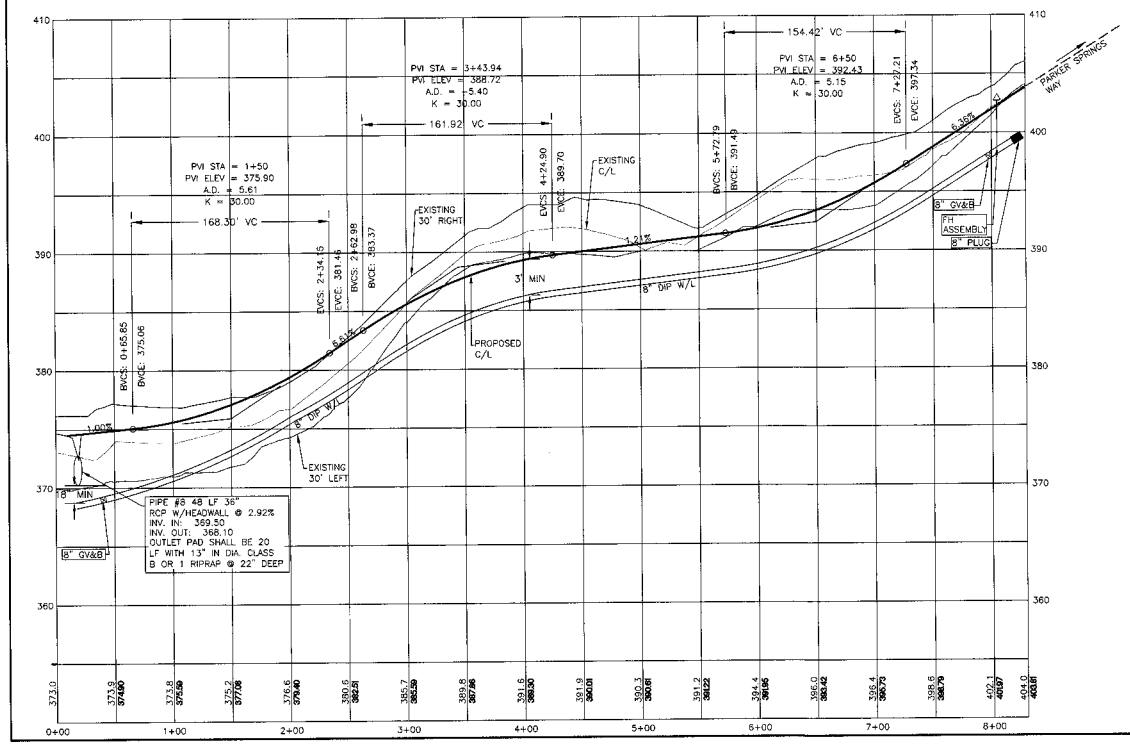
Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CESSLER
Job #: 38-02106
File: Cooper43\dwg\Cooper final-water rev.dwg
Revision: 7/14/09

Mariah Lane Plan & Profile Sta: 0+00-EOP
For
Cooper Subdivision

14



BILLOWING WAY



GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

NORTH

DITCHLINER (DL) INFORMATION

DITCH	C	I10	AREA	Q10	SLOPE	LINER
A	0.45	7.08	0.30	0.95	1.30	6575
B	0.45	7.08	0.07	0.22	1.30	6575
C	0.45	7.08	1.21	3.82	5.07	6125
D	0.45	7.08	0.54	1.72	4.27	5c150
E	0.45	7.08	1.07	3.41	4.87	5c150BN
F	0.45	7.08	0.05	0.16	4.27	6575
G	0.45	7.08	0.05	0.16	4.87	6575
H	0.45	7.08	0.10	0.32	4.87	6575
I	0.45	7.08	0.10	0.32	4.87	6575
J	0.45	7.08	0.40	1.27	1.30	6575
K	0.45	7.08	0.15	0.48	1.30	6575
L	0.45	7.08	0.51	1.62	3.01	6575
M	0.45	7.08	0.20	1.27	3.01	6575
N	0.45	7.08	0.10	0.32	5.07	6575
O	0.45	7.08	0.31	0.99	1.00	6575
P	0.45	7.08	0.02	0.06	7.18	6575
Q	0.45	7.08	0.49	1.56	2.19	6125
R	0.45	7.08	0.06	0.19	2.92	6575
S	0.45	7.08	0.52	1.65	2.92	6575
T	0.45	7.08	0.06	0.19	2.92	6575
U	0.45	7.08	0.48	1.53	7.71	6125
V	0.45	7.08	1.61	5.18	3.22	6575
W	0.45	7.08	0.06	0.19	3.22	6575
X	0.45	7.08	0.17	0.54	5.23	6575
Y	0.45	7.08	0.10	0.32	5.23	6575
Z	0.45	7.08	0.15	0.48	5.23	6575
Z1	0.45	7.08	0.22	0.70	5.34	5c150
AA	0.45	7.08	0.28	0.89	4.80	6575
BB	0.45	7.08	0.06	0.19	2.92	6575
CC	0.45	7.08	0.51	1.47	2.35	6575
DD	0.45	7.08	5.66	18.03	1.00	6575
EE	0.45	7.08	3.90	12.43	6.61	6500
FF	0.45	7.08	0.13	0.41	6.61	6575
GG	0.45	7.08	0.05	0.16	1.21	6575
HH	0.45	7.08	1.93	6.15	6.35	6125BN
II	0.45	7.08	0.06	0.19	3.71	6575
JJ 1	0.45	7.08	0.06	0.19	3.71	6575
JJ 2	0.45	7.08	0.86	2.71	3.71	6575
KK	0.45	7.08	0.21	0.67	2.87	6575
LL 1	0.45	7.08	0.69	2.20	2.87	6575
LL 2	0.45	7.08	3.11	9.89	2.50	6575
MM	0.45	7.08	1.54	4.91	2.50	6575
NN	0.45	7.08	0.09	0.29	2.50	6575
OO	0.45	7.08	0.07	0.22	2.50	6575
PP	0.45	7.08	0.06	0.19	2.52	5c250

SEDIMENT BASIN (SB) INFO

#	BASIN SIZE	SKIMMER SIZE
1	33'x64'x3'	2"
2	10'x20'x3'	2"
3	10'x20'x3'	2"
4	13'x35'x3'	2"
5	10'x20'x3'	2"
6	10'x20'x3'	2"
7	18'x32'x3'	2"
8	22'x42'x3'	2"
9	10'x20'x3'	2"
10	18'x34'x3'	2"
11	12'x24'x3'	2"
12	10'x20'x3'	2"
13	10'x20'x3'	2"
14	10'x20'x3'	2"
15	10'x20'x3'	2"
16	18'x18'x3'	2.5"
17	10'x20'x3'	2"
18	10'x20'x3'	2"
19	10'x20'x3'	2"
20	10'x20'x3'	2"
21	33'x54'x3'	2"
22	18'x32'x3'	2"
23	33'x54'x3'	2"
24	10'x20'x3'	2"
25	10'x20'x3'	2"

ALL BASINS HAVE A 10' TEMPORARY MAINTENANCE EASEMENT AND 1.5'X10'L SPILLWAY W/3 BAFFLES AND DEWATERING DEVICE (SEE DETAIL)

STORM PIPE (SP) INFORMATION

#	C	I25	AREA	Q25	SLOPE	BARRELS	DIAMETER	TYPE	LF	HEADWALL	FES
1	0.45	7.78	0.51	1.78	1.00	1	18"	RCP	48	NO	NO
2	0.45	7.78	43.58	153.87	3.94	2	48" & 60"	RCP	66	YES	NO
3	0.45	7.78	44.04	154.18	1.09	2	48" & 60"	RCP	76	YES	NO
4	0.45	7.78	2.0	6.95	1.00	1	24"	RCP	49	NO	YES
5	0.45	7.78	2.47	8.55	6.04	1	18"	RCP	48	NO	NO
6	0.45	7.78	1.60	5.60	1.00	1	18"	RCP	52	NO	NO
7	0.45	7.78	9.38	32.84	6.95	1	36"	RCP	56	YES	NO
8	0.45	7.78	8.28	28.99	2.92	1	36"	RCP	48	YES	NO

ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CHECKED AND REPAIRED ON A DAILY BASIS

SEDIMENT BASINS SHALL BE CONSTRUCTED SO AS TO BE LOCATED OUTSIDE OF ANY PROPOSED FILL AREAS AND RIGHT OF WAYS

ALL CHECK DAMS SHALL BE PLACED AT INTERVALS SUCH THAT THE TOP OF THE DOWNSTEAM CHECK DAM AND THE FOOT OF THE UPSTREAM CHECK DAM ARE EQUAL ELEVATIONS

DIVERSION DITCHES SHALL BE INSTALLED TO ASSURE STORMWATER DRAINAGE WILL BE DIRECTED TO THE SEDIMENT BASINS

EROSION CONTROL LEGEND

- CHECK DAM
- SILT FENCE
- GRAVEL CONSTRUCTION ENTRANCE
- SEDIMENT BASIN (SB) - SEE CHART
- LIMITS OF DISTURBANCE/CLEARING (INCLUDES RIGHT-OF-WAY)
- PIPE INLET PROTECTION
- DITCH LINER (DL) - SEE CHART
- STORM PIPE (SEE CHART)
- FLARED END SECTION (FES)
- HEADWALL
- DISSIPATOR PAD
- WATER BAR

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(919) 789-0744

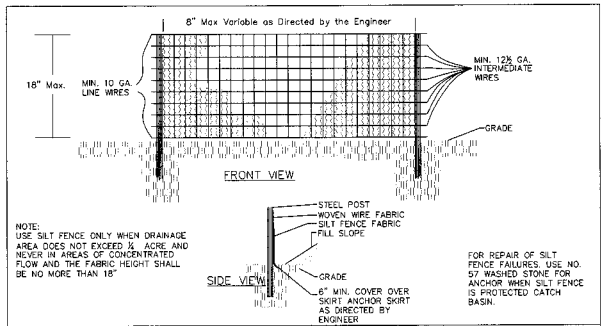
Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CTS/LER
Job #: 38-0206
File: Cooper43/dwg/Cooper
final water rev.dwg
Revision: 11/14/09

Billowing Way Plan & Profile Sta: 0+00-EOP

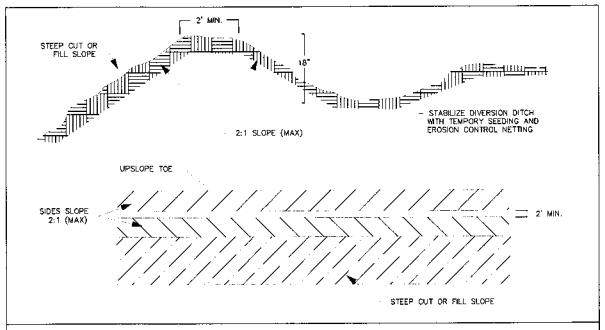
For

Cooper Subdivision

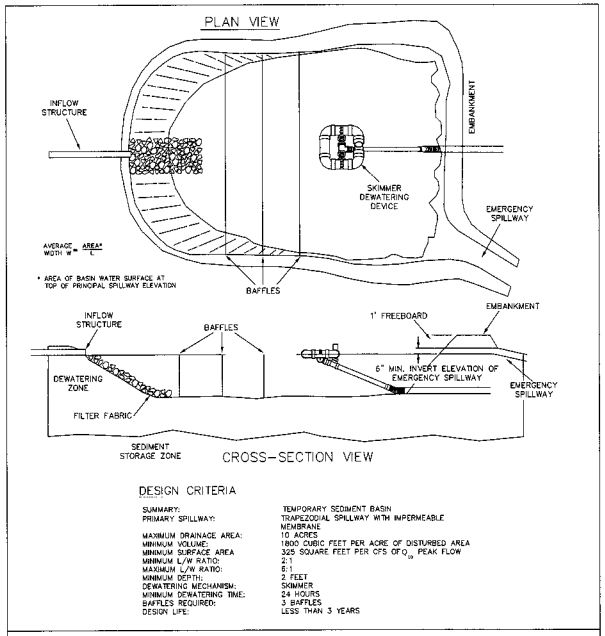
15



STANDARD TEMPORARY SILT FENCE



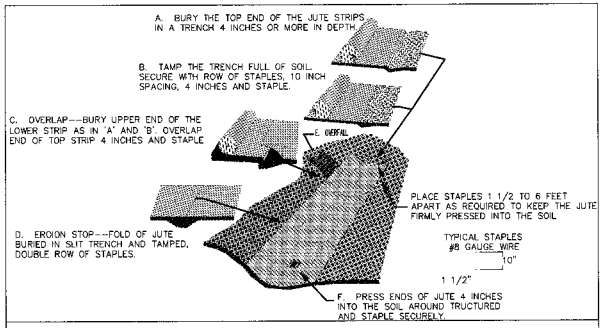
DIVERSION DITCH



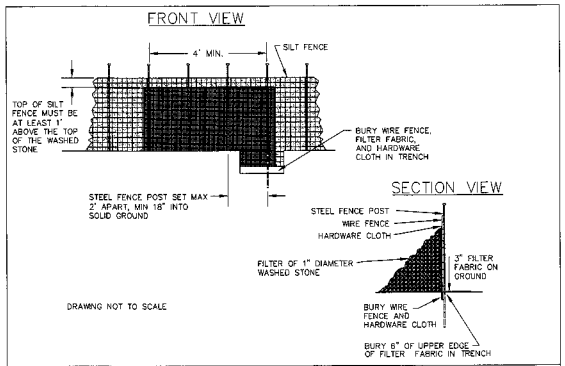
DESIGN CRITERIA

SUMMARY:	TEMPORARY SEDIMENT BASIN
PRIMARY SPILLWAY:	TRAPEZODIAL SPILLWAY WITH IMPERMEABLE MEMBRANE
MAXIMUM DRAINAGE AREA:	10 ACRES
MINIMUM VOLUME:	1800 CUBIC FEET PER ACRE OF DISTURBED AREA
MINIMUM SURFACE AREA	325 SQUARE FEET PER CFS OF Q_{10} PEAK FLOW
MINIMUM L/W RATIO:	2:1
MAXIMUM L/W RATIO:	5:1
MINIMUM DEPTH:	2 FEET
DEWATERING MECHANISM:	SKIMMER
MINIMUM DEWATERING TIME:	24 HOURS
BAFFLES REQUIRED:	3 BAFFLES
DESIGN LIFE:	LESS THAN 3 YEARS

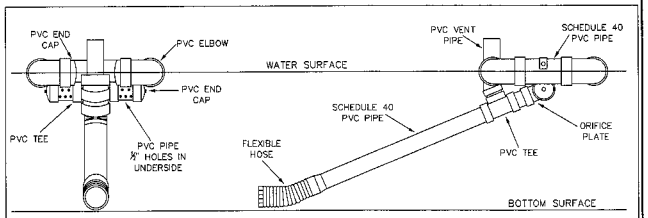
SEDIMENT BASIN DETAIL



DITCH LINER INSTALLATION



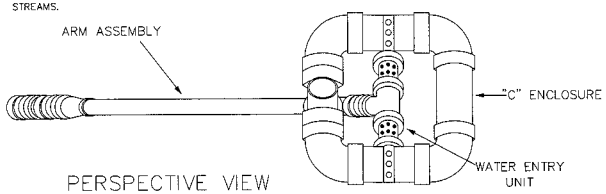
SILT FENCE OUTLET



END VIEW

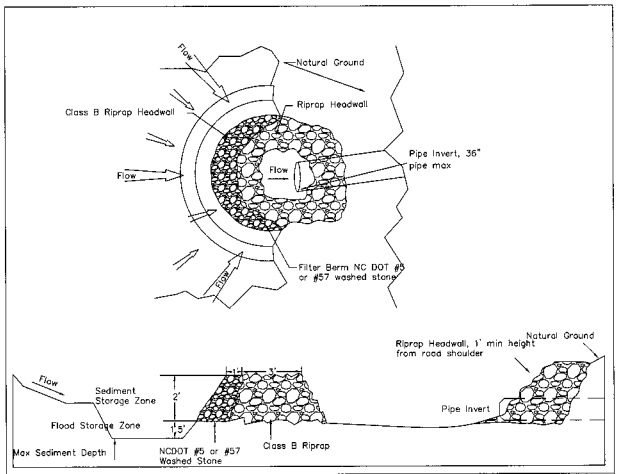
FRONT VIEW

SKIMMER SEDIMENT BASINS ARE NEEDED WHERE DRAINAGE AREAS ARE TOO LARGE FOR TEMPORARY TRAPS. DO NOT LOCATE THE SKIMMER SEDIMENT BASIN IN INTERMITTENT OR PERENNIAL STREAMS.

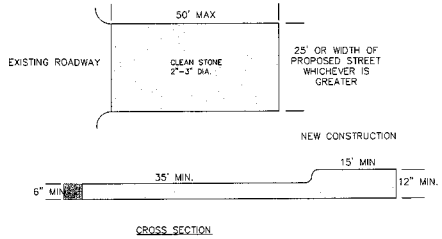


PERSPECTIVE VIEW

SKIMMER DETAIL



ROCK INLET FILTER



CROSS SECTION

CONSTRUCTION ENTRANCE

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Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CES/LER
Job #: 38-0206
File: Cooper43.dwg/Cooper
final-water rev.dwg
Revision: 1/14/09

Details For Cooper Subdivision

SEEDBED PREPARATION:

GOOD SEEDBED PREPARATION IS ESSENTIAL TO SUCCESSFUL PLANT ESTABLISHMENT. A GOOD SEEDBED IS WELL-PULVERIZED, LOOSE, AND UNIFORM. WHERE HYDROSEEDING METHODS ARE USED, THE SURFACE MAY BE LEFT WITH A MORE IRREGULAR SURFACE OF LARGE CLODS AND STONES.

LIMING--- APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS. IF THE PH (ACIDITY) OF THE SOIL IS NOT KNOWN, AN APPLICATION OF GROUND AGRICULTURAL LIMESTONE AT THE RATE OF 1 TO 1 1/2 TONS PER ACRE ON COURSE-TEXTURED SOILS AND 2-3 TONS PER ACRE ON FINE TEXTURED SOILS IS USUALLY SUFFICIENT. APPLY LIMESTONE UNIFORMLY AND INCORPORATE INTO THE TOP 4-6 INCHES OF SOIL. SOILS WITH A PH OF 6 OR HIGHER NEED NOT BE LIMED.

FERTILIZER--- BASE APPLICATION RATES ON SOIL TESTS. WHEN THESE ARE NOT POSSIBLE, APPLY A 10-10-10 GRADE FERTILIZER AT 700- 1,000 LB PER ACRE. BOTH FERTILIZER AND LIME SHOULD BE INCORPORATED INTO THE TOP 4-6 INCHES OF SOIL. IF A HYDRAULIC SEEDER IS USED, DO NOT MIX SEED AND FERTILIZER MORE THAN 30 MINUTES BEFORE APPLICATION.

SURFACE ROUGHENING---- IF RECENT TILLAGE OPERATIONS HAVE RESULTED IN A LOOSE SURFACE, ADDITIONAL ROUGHENING MAY NOT BE REQUIRED EXCEPT TO BREAK UP LARGE CLODS. IF RAINFALL CAUSES THE SURFACE TO BECOME SEALED OR CRUSTED, LOOSEN IT JUST PRIOR TO SEEDING BY DISKING, RAKING, HARROWING, OR OTHER SUITABLE METHODS. GROOVE OR FURROW SLOPES STEEPER THAN 3:1 ON THE CONTOUR BEFORE SEEDING (PRACTICE 6.03, SURFACE ROUGHENING).

SEEDBED PREPARATION

CONSTRUCTION SEQUENCE

1) OBTAIN A LAND-DISTURBING PERMIT. SCHEDULE A PRE-CONSTRUCTION CONFERENCE WITH CHATHAM COUNTY'S ENVIROMENTAL ENGINEER.

2) FLAG THE WORK LIMITS AND HOLD PRECONSTRUCTION MEETING AT LEAST ONE WEEK PRIOR TO STARTING CONSTRUCTION. INSTALL THE TEMPORARY GRAVEL CONSTRUCTION ENTRANCES.

3) INSTALL SILT FENCING AND SILT FENCE OUTLETS AS INDICATED ON THE APPROVED PLAN. VEGETATE DISTURBED AREAS.

4) INSTALL TEMPORARY CROSSINGS PER DETAIL.

5) INSTALL INLET PROTECTION (FILTER) AND RIPRAP APRONS FOR ALL PROPOSED PIPE OUTLETS AT TIME OF INSTALLATION.

6) CLEAR AND ROUGH GRADE SITE TO FACILITATE DRAINAGE INTO PROPER EROSION AND SEDIMENTATION CONTROL STRUCTURES. FINISH THE SLOPE ON AND AROUND THE PROPOSED ROAD AND STRUCTURES AS SOON AS ROUGH GRADING IS COMPLETE. LEAVE THE SITE SLIGHTLY ROUGHENED AND VEGETATE WITH TEMPORARY OR PERMANENT SEED MIX AND MULCH IMMEDIATELY.

7) WHEN FILL AREAS BEGIN TO BUILD UP, EROSION CONTROL DEVICES SHALL BE ADJUSTED APPROPRIATELY TO CONTINUE FUNCTIONALITY.

8) COMPLETE FINAL GRADING OF GROUNDS, TOPSOIL CRITICAL AREAS, AND PERMANENTLY VEGETATE, LANDSCAPE, AND MULCH AS PROJECT INDICATES.

9) ALL EROSION CONTROL PRACTICES WILL BE INSPECTED WEEKLY AND AFTER RAINFALL EVENTS. REPAIRS WILL BE MADE IMMEDIATELY.

10) AFTER EACH PORTION OF THE SITE IS STABILIZED , REMOVE ALL TEMPORARY MEASURES AND INSTALL PERMANENT VEGETATION FOR THAT PORTION OF THE SITE.

11) RELOCATE SURFACE WATER CONTROLS OR EROSION CONTROL MEASURES SO AS SITE CONDITIONS CHANGE, THE EROSION CONTROL IS ALWAYS IN ACCORDANCE WITH NCDENR-LQS STANDARDS.

12) ALL AREAS DISTURBED BY CONSTRUCTION UNLESS OTHERWISE IMPROVED SHALL BE SODDED OR SEEDED AS INDICATED WITHIN 15 DAYS AFTER CESSATION OF DISTURBANCE.

13) COVER ALL AREAS THAT WILL NOT BE WORKED ON MORE THAN SEVEN DAYS WITH STRAW, WOOD FIBER MULCH, COMPOST, OR EQUIVALENT. ALSO COVER AREAS BEFORE MAJOR STORM EVENTS.

14) ESTIMATED TIME BEFORE FINAL STABILIZATION – 18 MONTHS.

15) ALL INSPECTIONS AND REPORTING DONE AS A CONDITION OF THE NCG010000 STORMWATER DISCHARGE PERMIT TO BE COPIED TO CHATHAM COUNTY EROSION CONTROL OFFICE.

CHECK DAM: MAINTENANCE REQUIREMENTS

INSPECT CHECK DAMS AND CHANNELS FOR DAMAGE AFTER EACH RUNOFF EVENT.

ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, INSTALL A PROTECTIVE RIP RAP LINER IN THAT PORTION OF THE CHANNEL.

REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE 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.

CONSTRUCTION ENTRANCE: MAINTENANCE REQUIREMENTS

MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 2-INCH STONE. AFTER EACH RAINFALL INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

LAND GRADING: MAINTENANCE REQUIREMENTS

PERIODICALLY CHECK ALL GRADED AREAS AND THE SUPPORTING EROSION AND SEDIMENTATION CONTROL PRACTICES, ESPECIALLY AFTER HEAVY RAINFALLS. PROMPTLY REMOVE ALL SEDIMENT FROM DIVERSIONS AND OTHER WATER-DISPOSAL PRACTICES. IF WASHOUTS OR BREAKS OCCUR, REPAIR THEM IMMEDIATELY. PROMPT MAINTENANCE OF SMALL ERODED AREAS BEFORE THEY BECOME SIGNIFICANT GULLIES IS AN ESSENTIAL PART OF AN EFFECTIVE EROSION AND SEDIMENTATION CONTROL PLAN.

SEEDING: MAINTENANCE REQUIREMENTS

RESEED AND MULCH AREAS WHERE SEEDING EMERGENCE IS POOR, OR WHERE EROSION OCCURS, AS SOON AS POSSIBLE. DO NOT MOW. PROTECT FROM TRAFFIC AS MUCH AS POSSIBLE. GENERALLY, A STAND OF VEGETATION CANNOT BE DETERMINED TO BE FULLY ESTABLISHED UNTIL SOIL COVER HAS BEEN MAINTAINED FOR ONE FULL YEAR FROM PLANTING. INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RESEEDINGS WITHIN THE SAME SEASON, IF POSSIBLE. RESEEDING- IF A STAND HAS INADEQUATE COVER, RE-EVALUATE CHOICE OF PLANT MATERIALS AND QUANTITIES OF LIME AND FERTILIZER. RE-ESTABLISH THE STAND AFTER SEEDBED PREPARATION OR OVER-SEED THE STAND. CONSIDER SEEDING TEMPORARY, ANNUAL SPECIES IF THE TIME OF YEAR IS NOT APPROPRIATE FOR PERMANENT SEEDING.

SEDIMENT BASIN: MAINTENANCE REQUIREMENTS

INSPECT TEMPORARY SEDIMENT TRAPS AFTER EACH SIGNIFICANT RAINFALL. REMOVE SEDIMENT AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL.

CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING. PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MINIMUM OF 1.5 FT BELOW THE LOW POINT OF THE EMBANKMENT. IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBANKMENT TO SLIGHTLY ABOVE DESIGN GRADE.

AFTER ALL SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS AND STABILIZE PROPERLY.

CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.

RIP RAP CHANNELS: MAINTENANCE REQUIREMENTS

INSPECT CHANNELS AT REGULAR INTERVALS AS WELL AS AFTER MAJOR RAINS, AND MAKE REPAIRS PROMPTLY. GIVE SPECIAL ATTENTION TO THE OUTLET AND INLET SECTIONS AND OTHER POINTS WHERE CONCENTRATED FLOW ENTERS. CAREFULLY CHECK STABILITY AT ROAD CROSSINGS AND LOOK FOR INDICATIONS OF PIPING, SCOUR HOLES, OR BANK FAILURES. MAKE REPAIRS IMMEDIATELY. MAINTAIN ALL VEGETATION ADJACENT TO THE CHANNEL IN A HEALTHY, VIGOROUS CONDITION TO PROTECT THE AREA FROM EROSION AND SCOUR DURING OUT-OF-BANK FLOW.

DIVERSION DITCH: MAINTENANCE REQUIREMENTS

INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL. IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR THE DIVERSION RIDGE. CAREFULLY CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED. WHEN THE AREA PROTECTED IS PERMANENTLY STABILIZED, REMOVE THE RIDGE AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND APPROPRIATELY STABILIZE IT.

SILT FENCE: MAINTENANCE REQUIREMENTS

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. REPLACE BURLAP EVERY 60 DAYS.

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 CLEAN OUT.

REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

RIP RAP OUTLET: MAINTENANCE REQUIREMENTS

INSPECT RIP RAP OUTLET STRUCTURES AFTER HEAVY RAINS TO SEE IF ANY EROSION AROUND OR BELOW THE RIP RAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

DITCH LINER: MAINTENANCE REQUIREMENTS

INSPECT ALL MULCHES PERIODICALLY, AND AFTER RAINSTORMS TO CHECK FOR RILL EROSION, DISLOCATION OR FAILURE. WHERE EROSION IS OBSERVED, APPLY ADDITIONAL MULCH. CONTINUE INSPECTIONS UNTIL VEGETATION IS FIRMLY ESTABLISHED.

IN GENERAL, ONCE A RIP RAP INSTALLATION HAS BEEN PROPERLY DESIGNED AND INSTALLED IT REQUIRES VERY LITTLE MAINTENANCE. RIP RAP SHOULD BE INSPECTED PERIODICALLY FOR SCOUR OR DISLODGED STONES. CONTROL OF WEED AND BRUSH GROWTH MAY BE NEEDED IN SOME LOCATIONS.

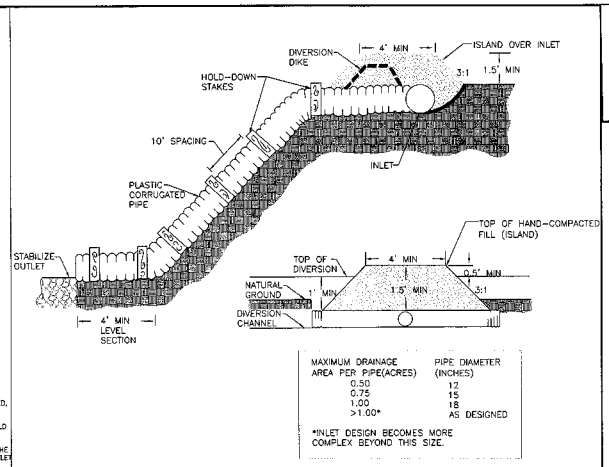
DURING THE ESTABLISHMENT PERIOD, CHECK GRASS-LINED CHANNELS AFTER EVERY RAINFALL. AFTER GRASS IS ESTABLISHED, PERIODICALLY CHECK THE CHANNEL; CHECK IT AFTER EVERY HEAVY RAINFALL EVENT. IMMEDIATELY MAKE REPAIRS. IT IS PARTICULARLY IMPORTANT TO CHECK THE CHANNEL OUTLET AND ALL ROAD CROSSINGS FOR BANK STABILITY AND EVIDENCE OF PIPING OR SCOUR HOLES. REMOVE ALL SIGNIFICANT SEDIMENT ACCUMULATION TO MAINTAIN THE DESIGNED CARRYING CAPACITY. KEEP THE GRASS IN A HEALTHY VIGOROUS CONDITION AT ALL TIMES, SINCE IT IS THE PRIMARY EROSION PROTECTION FOR THE CHANNEL.

PIPE INLET PROTECTION: (PLYWOOD) MAINTENANCE REQUIREMENTS

INSPECT THE BARRIER AFTER EACH RAIN AND MAKE REPAIRS AS NEEDED. REMOVE SEDIMENT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS. WHEN THE CONTRIBUTING DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED, REMOVE ALL MATERIALS AND ANY UNSTABLE SOIL, AND EITHER SALVAGE OR DISPOSE OF IT PROPERLY. BRING THE DISTURBED AREA TO PROPER GRADE, THEN SMOOTH AND COMPACT IT. APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.

PIPE INLET PROTECTION: (FABRIC AND FOAM) MAINTENANCE REQUIREMENTS

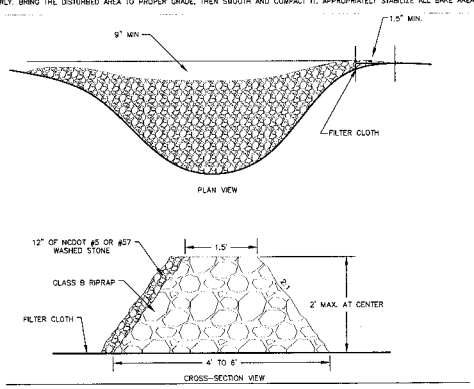
INSPECT THE BARRIER AFTER EACH RAIN AND MAKE REPAIRS AS NEEDED. REMOVE SEDIMENT FROM THE POOL AREA AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS. TAKE CARE NOT TO DAMAGE OR UNDERCUT THE FABRIC DURING SEDIMENT REMOVAL. WHEN THE CONTRIBUTING DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED, REMOVE ALL MATERIALS AND ANY UNSTABLE SOIL, AND EITHER SALVAGE OR DISPOSE OF IT PROPERLY. BRING THE DISTURBED AREA TO PROPER GRADE, THEN SMOOTH AND COMPACT IT. APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.



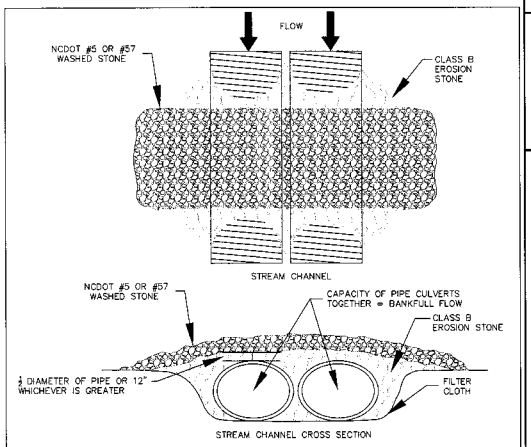
MAXIMUM DRAINAGE AREA PER PIPE(ACRES)	PIPE DIAMETER (INCHES)
0.50	12
0.75	15
1.00	18
>1.00*	AS DESIGNED

*INLET DESIGN BECOMES MORE COMPLEX BEYOND THIS SIZE.

TEMPORARY SLOPE DRAIN



CHECK DAM



TEMPORARY STREAM CROSSING

DATE	TYPE	PLANTING RATE
MARCH 1- JUNE 1	SERICA LESPEDEZA (SCARIFIED) AND	50 LBS/ACRE
MARCH 1 - APRIL 15	ADD TALL FESCUE OR	120 LBS/ACRE
MARCH 1 - JUNE 30	ADD HULLED COMMON BERMUDAGRASS	25 LBS/ACRE
JUNE 1 - SEPTEMBER 1	* TALL FECUE AND * BROWNTOP MILLET * OR SORGHUM - SUDAN HYBIRDS	120 LBS/ACRE 25 LBS/ACRE 30 LBS/ACRE
SEPTEMBER 1 - MARCH 1	SERICEA LESPEDEZA (UNHULLED & UNSCAIFIED) AND TALL FECUE ADD ABRUZZI RYE	70 LBS/ACRE 120 LBS/ACRE 25 LBS/ACRE

PURSUANT TO G.S. 113A-57(2), THE ANGLE FOR GRADED SLOPES AND FILLS BE NO GREATER THAN THE ANGLE THAT CAN BE RETAINED BY VEGETATIVE COVER OR OTHER ADEQUATE EROSION-CONTROL DEVICES OR STRUCTURES. IN ANY EVENT, SLOPES LEFT EXPOSED WILL, WITHIN 21 CALENDAR DAYS OF COMPLETION OF ANY PHASE OF GRADING, BE PLANTED OR OTHERWISE PROVIDED WITH TEMPORARY OR PERMANENT GROUND COVER, DEVICES, OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION.
PURSUANT TO G.S. 113A-57(3), PROVISIONS FOR PERMANENT GROUND COVER SUFFICIENT TO RESTRAIN EROSION MUST BE ACCOMPLISHED FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.

AGRICULTURAL LIMESTONE	2 TONS/ACRE
FERTILIZER	1000 LBS/ACRE 10-10-10
SUPERPHOSPHATE	500 LBS/ACRE 20% ANALYSIS
MULCH	2 TONS/ACRE SMALL GRAIN STRAW
ANCHOR	ASPHALT EMULSION @ 300 GALS/ACRE

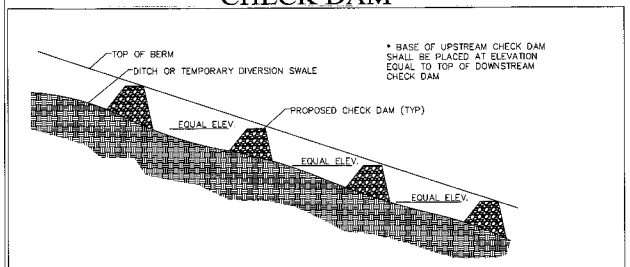
* ONLY PERMANENT SEEDING IS ALLOWED-NO TEMPORARY SEEDING WILL BE USED.

FERTILIZER APPLICATION

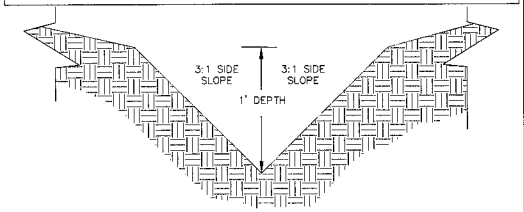
* TEMPORARY - RE-SEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW OVER 12 INCHES IN HEIGHT BEFORE MOWING; OTHERWISE FESCUE MAY BE SHADED OUT.

CONSULT EROSION CONTROL ENGINEER OR SOIL CONSERVATION SERVICE FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS.
THE ABOVE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDITIONS; OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

SEEDING SCHEDULE



CHECK DAM PLACEMENT DETAIL



DITCH (PP) CROSS SECTION

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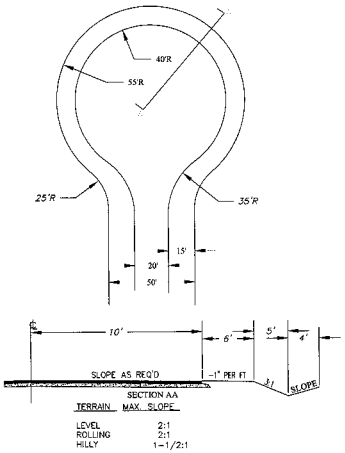
Date: 11/12/2008
Scale: 1" = 200'
Drawn By: CES/LER
Job #: 38-0206
File: Cooper43dwg/Cooper
final-water rev.dwgs
Revision: 1/14/09

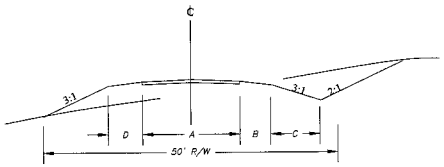
Details For Cooper Subdivision



TERRAIN	MAX. SLOPE
LEVEL	2:1
ROLLING	2:1
HILLY	1-1/2:1

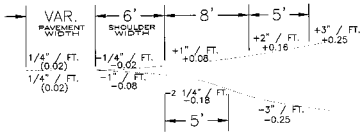
NO CURB & GUTTER

SYMMETRICAL CUL-DE-SAC



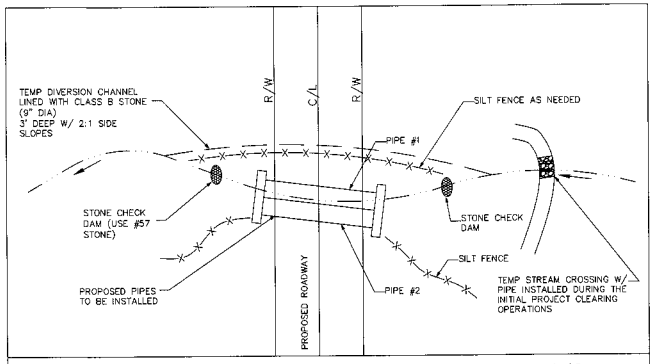
	A	B	C	D	DRIVING SURFACE
NCDOT (PUBLIC ROAD)	20'	6'	6'	8'	W/8" CABC & 2" SF9.5A SUPERPAVE @ 1/2"/FT. (WITH PRIME COAT)

TYPICAL ROADWAY SECTION

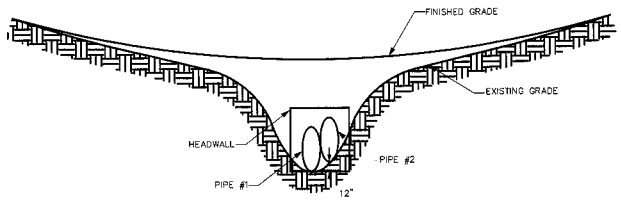


B. SHOULDER SECTION

DRIVEWAY TURNOUT GRADES



PIPE INSTALLATION PROFILE 1/3



PIPE INSTALLATION CROSS SECTION 2/3

CONSTRUCTION SEQUENCE FOR PIPE INSTALLATION:

1. CONSTRUCT DIVERSION CHANNEL TO PLACE WATER FLOW AWAY FROM PIPE CONSTRUCTION ZONE. USE A 3' DEEP CHANNEL W/ 2:1 SIDE SLOPES.

2. PLACE STONE DAMS TO PREVENT WATER FROM ENTERING PIPE CONSTRUCTION ZONE.

3. PLACE AND CONSTRUCT PIPE #1.

4. CONSTRUCT AND PLACE PIPE #2 AND COMPLETE FILL GRADING OVER PIPES.

5. PLACE AND CONSTRUCT HEADWALLS.

6. REDIRECT STREAM FLOW THRU PIPE #1 REMOVING STONE DAMS. (PIPE #2 IS FOR FLOWS EXCEEDING NORMAL OR Q10 EVENTS.)

7. FILL AND COMPACT DIVERSION CHANNEL.

8. SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS OUTSIDE OF THE ROADWAY CONSTRUCTION ZONE.

9. REMOVE TEMP. STREAM CROSSING - CONSTRUCTION ACCESS WILL NOW OPERATE OVER THE PIPE & FILL GRADE.

10. ALL UTILITIES, WATER, POWER, GAS,TEL., ETC. WILL BE REQUIRED TO CONSTRUCT ONLY IN THE EXISTING ROADWAY FILL GRADE AND WILL COMPLY WITH ALL OSHA STDS DEPENDING UPON THE TRENCH DEPTHS.

PIPE INSTALLATION SEQUENCE 3/3

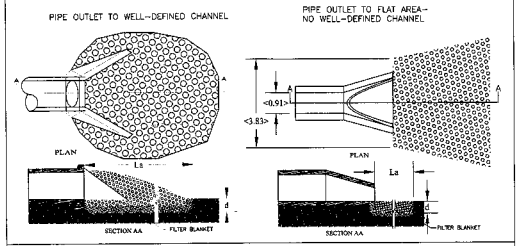
NOTES:

1. La IS THE LENGH OF THE RIP RAP APRON

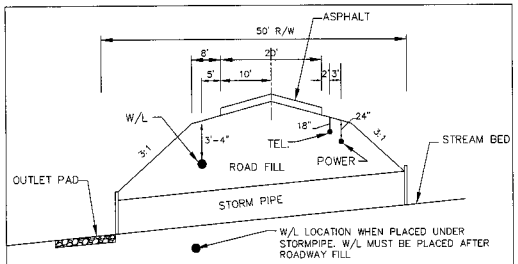
2. d= 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6"

3. IN A WELL-DEFINED CHANNEL EXTENDED THE APRON UP THE CHANNES BANKS TO AN ELEVATION OF 4" ABOVE THE MAXIMUM TAILWATERDEPTH OR TO THE TOP OF THE BANK, WHICHEVER IS LESS.

4. A FILTER BLANKET OR FILTER FABRIC SHOULDBE INSTALL BETWEEN THE RIP RAP AND SOIL FOUNDATION.

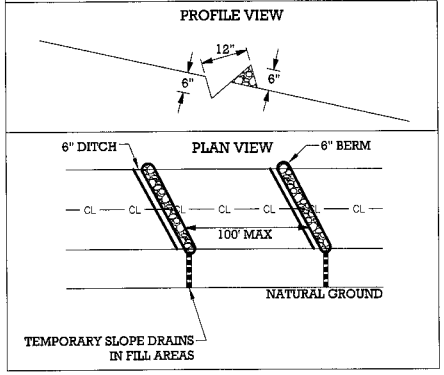


PIPE OUTLET DETAIL



UTILITY INSTALLATION DETAIL

WATER BAR DETAIL
FOR ROAD SLOPE 5% OR GREATER



PIPE INSTALLATION AT STREAM CROSSINGS

1) NO WATERLINE CONSTRUCTION ACROSS A STREAM SHALL OCCUR UNTIL ROADWAY FILL HAS BEEN BROUGHT TO WITHIN 24" OF FINAL GRADE AND COMPACTED (PIPES & FILL HAVE BEEN PLACED ACROSS STREAMS).

2) CONSTRUCT WATERLINE BY TRENCH METHOD. WHEN CROSSING UNDER STORM PIPES, BE SURE TO CONTAIN ALL WORK WITHIN THE ROADWAY GRADE.

3) CONSTRUCT TRENCH DEEP ENOUGH TO ALLOW APPROPRIATE (12" DIA.) ACCESS UNDER THE EXISTING STORM PIPE.

4) CONSTRUCT WATER LINE.

5) REPLACE FILL, COMPACT & STABILIZE CONSTRUCTION GRADE.

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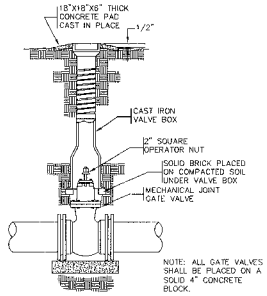
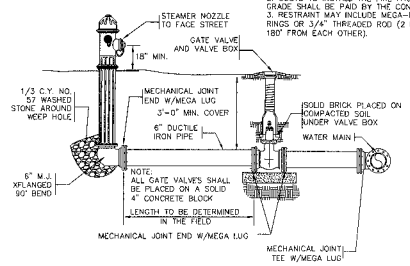


GATE VALVE ASSEMBLY
N.T.S

CHATHAM COUNTY WATER SYSTEM DETAIL

D-2

FIRE HYDRANT NOTES:
1. FIRE HYDRANTS SHALL BE INSTALLED AT THE EDGE OF THE N.C. DOT RIGHTS-OF-WAY. THE DISTANCE FROM THE WATER MAIN TO THE FIRE HYDRANT VARIES. THE CONTRACTORS BID PRICE FOR FIRE HYDRANT ASSEMBLIES SHALL INCLUDE THE COST FOR THE VARYING FIRE HYDRANT LEG LENGTH.
2. COSTS TO INSTALL THE FIRE HYDRANT TO GRADE SHALL BE PAID BY THE CONTRACTOR.
3. RESTRAINT MAY INCLUDE MEGA-LUGS, GRIP RINGS OR 3/4" THREADED ROD (2 RODS AT 180° FROM EACH OTHER).

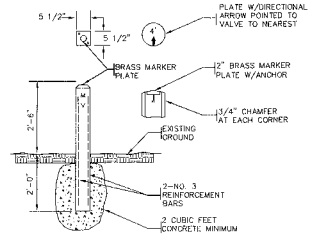


FIRE HYDRANT AND VALVE DETAIL
N.T.S

CHATHAM COUNTY WATER SYSTEM DETAIL

D-4

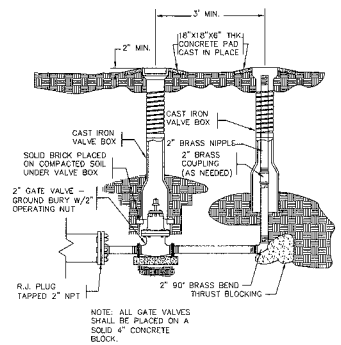
NOTES:
1.) INSTALL MARKER POSTS ON EDGE OF THE DOT R/W LINE.
2.) PROVIDE MARKER POSTS AT ALL LINE VALVES.
3.) ABBREVIATIONS STAMPED ON POST AS FOLLOWS:
MV=MAIN VALVE BO=BLOW OFF VALVE



VALVE MARKER POST DETAIL
N.T.S

CHATHAM COUNTY WATER SYSTEM DETAIL

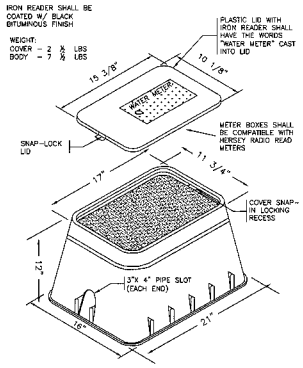
D-7



TYPICAL 2' BLOWOFF ASSEMBLY AT END OF WATER MAIN
N.T.S

CHATHAM COUNTY WATER SYSTEM DETAIL

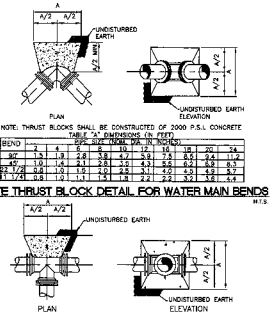
D-8



TYPICAL METER BOX
N.T.S.

CHATHAM COUNTY WATER SYSTEM DETAIL

D-13



NOTE: THRUST BLOCKS SHALL BE CONSTRUCTED OF 2000 P.S.I. CONCRETE

TABLE "A" DIMENSIONS (IN FEET)

BEND	PIPE SIZE (NOM. DIA. IN INCHES)										
	2	4	6	8	10	12	16	18	20	24
90°	1.3	1.9	2.8	3.8	4.7	5.8	7.5	8.5	9.4	11.2
45°	1.0	1.4	2.1	2.8	3.5	4.3	5.5	6.2	6.9	8.3
22 1/2	0.8	1.0	1.5	2.0	2.5	3.1	4.0	4.5	4.9	5.7
11 1/4	0.8	1.0	1.1	1.5	1.8	2.2	2.2	3.3	3.5	4.4

CONCRETE THRUST BLOCK DETAIL FOR WATER MAIN BENDS
N.T.S

NOTE: THRUST BLOCK SIZE DETERMINED BY SMALLEST DIA. OF TEE

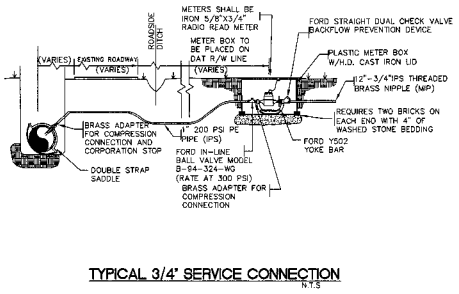
DIA. (IN INCHES)	PIPE SIZE (INCHES)									
	2	4	6	8	10	12	14	16	18	20
A	1.6	1.9	2.8	3.8	4.7	5.8	5.6	7.5	8.5	9.4

CONCRETE THRUST BLOCK DETAIL FOR TEES
N.T.S

CHATHAM COUNTY WATER SYSTEM DETAIL

D-14

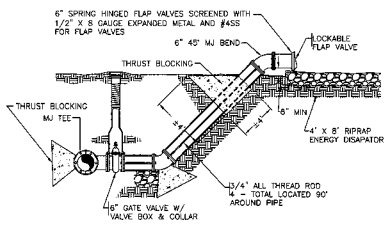
NOTE:
METERS SHALL BE FURNISHED AND INSTALLED BY CHATHAM COUNTY



TYPICAL 3/4" SERVICE CONNECTION
N.T.S

CHATHAM COUNTY WATER SYSTEM DETAIL

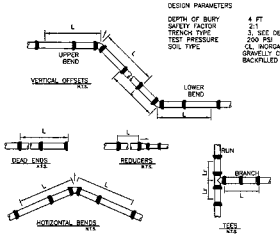
D-12



6" BLOWOFF ASSEMBLY
NTS

CHATHAM COUNTY WATER SYSTEM DETAIL

D-9



DESIGN PARAMETERS

DEPTH OF BURY	4 FT
SAFETY FACTOR	2.1
TRENCH TYPE	3, SEE DETAIL
TEST PRESSURE	200 PSI
SOIL TYPE	CL, INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS LEAN CLAYS. BACKFILLED USING NATIVE SOILS.

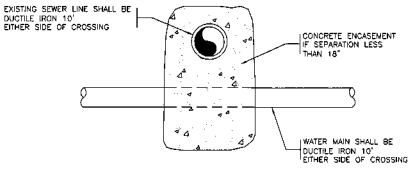
NOTES:
1. THE CONTRACTOR SHALL INSTALL RESTRAINED JOINT PROTECTION AT 45° BENDS, TEES, REDUCERS, VERTICAL 45° BENDS, DEAD ENDS, OR WHERE MINIMUM LENGTHS REQUIRED FOR THE DESIGN PARAMETERS SHOWN ABOVE. THESE RESTRAINING CONDITIONS ARE COMMON CONDITIONS ENCOUNTERED IN NORMAL PIPELINE CONTRUCTION. ANY OTHER CONDITIONS SHALL BE APPROVED BY THE PROJECT ENGINEER.
2. WHEN USING MECHANICAL JOINT RESTRAINTS SUCH AS MEGA-LUGS FOR PVC & DIP OR TR FLEX GRIPPIN SNAP-LOK, CONCRETE BLOCKING SHALL BE EXCLUDED FROM THE INSTALLATION.

Size & Material	Horizontal Bend (Degrees)			Tee Reducer		Dead End	Vertical Offset 45° Bend	
	90°	45	22.5	11.25	(Branch) X 33"		Upper	Lower
8" D.I.P. Length Restrained (ft)	64	28.5	6	1	26	81	52	33
12" D.I.P. Length Restrained (ft)	48	20.5	5	10	N/A	70	40	26

MECHANICAL JOINT RESTRAINT DETAILS

CHATHAM COUNTY WATER SYSTEM DETAIL

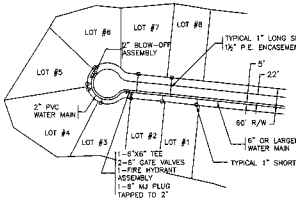
D-15



SEWER AND WATER CROSSING
N.T.S.

CHATHAM COUNTY WATER SYSTEM DETAIL

D-16



TYPICAL CUL-DE-SAC WATER MAIN INSTALLATION
N.T.S.

CHATHAM COUNTY WATER SYSTEM DETAIL

D-20

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