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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	2D-5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027373 SUSAN C. LANCASTER — DocuSigned by: Susan C Lancaster 5/13/2021 4EB965A26CFC495

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON — DocuSigned by: Joshua G Dalton 5/13/2021 1089AD8C14994C3...

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SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 NC COA No. C-0890

DETAIL 1
SPECIAL CUT DITCH (Not to Scale)

Min. D=2.0 Ft.

FROM STA. 1285+17 TO STA. 1291+50 –L– RT
FROM STA. 1288+50 TO STA. 1290+00 –L– LT
FROM STA. 1290+20 TO STA. 1294+27 –L– LT
FROM STA. 1295+50 TO STA. 1298+50 –L– RT
FROM STA. 1296+50 TO STA. 1298+50 –L– LT
FROM STA. 1298+50 TO STA. 1300+00 –L– RT
FROM STA. 1322+71.61 TO STA. 1326+00 –L– RT
FROM STA. 1339+85 TO STA. 1341+10 –L– LT
FROM STA. 1340+50 TO STA. 1341+35 –L– RT
FROM STA. 1347+46 TO STA. 1348+75 –L– RT
FROM STA. 19+42 TO STA. 23+32 –Y18RPD– LT
FROM STA. 27+43.67 TO STA. 27+83 –Y29– RT
FROM STA. 34+94 TO STA. 36+01 –Y29– LT
FROM STA. 36+26 TO STA. 36+53 –Y29– LT
FROM STA. 15+15.9 TO STA. 18+88 –Y29A– RT
FROM STA. 35+75.76 TO STA. 39+44 –Y29A– RT

DETAIL 2
STANDARD BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
B=3.0 Ft.

FROM STA. 1290+10 TO STA. 1290+21 –L– LT
FROM STA. 1316+85 TO STA. 1316+96 –L– LT
FROM STA. 33+92 TO STA. 34+04 –Y33– LT

DETAIL 3
LATERAL 'V' DITCH (Not to Scale)

Min. D=2.0 Ft.
b=5.0 Ft.

FROM STA. 22+60 TO STA. 27+43.67 –Y29– RT
FROM STA. 34+29.08 TO STA. 35+75.76 –Y29A– RT

DETAIL 4
SPECIAL CUT BASE DITCH (Not to Scale)

Min. D=2.5 Ft.
B=3.0 Ft.

FROM STA. 1298+50 TO STA. 1306+00 –L– LT

DETAIL 5
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.0 Ft.

FROM STA. 1233+50 TO STA. 1238+50 –L– RT
FROM STA. 17+92 TO STA. 18+41.81 –Y29A– LT

DETAIL 6
SPECIAL CUT DITCH (Not to Scale)

Min. D=2.0 Ft.

FROM STA. 1301+00 TO STA. 1302+43 –L– RT
FROM STA. 1302+43 TO STA. 1304+00 –L– RT
FROM STA. 1306+50 TO STA. 1312+10 –L– RT
FROM STA. 1313+50 TO STA. 1316+82 –L– RT
FROM STA. 1318+50 TO STA. 1322+71.61 –L– RT
FROM STA. 1351+00 TO STA. 1352+00 –L– RT

DETAIL 7
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.0 Ft.

FROM STA. 1324+50 TO STA. 1327+00 –L– LT
FROM STA. 15+75 TO STA. 18+00 –Y28– RT
FROM STA. 19+00 TO STA. 21+31 –Y28– LT
FROM STA. 43+74.75 TO STA. 46+88 –Y33– RT

DETAIL 8
LATERAL BASE DITCH (Not to Scale)

Min. D=2.5 Ft.
B=5.0 Ft.
b=5.0 Ft.

FROM STA. 1267+50 TO STA. 1267+85 –L– RT

DETAIL 9
LATERAL BASE DITCH (Not to Scale)

B=10.0 Ft.
b=5.0 Ft.

FROM STA. 1265+60 TO STA. 1267+50 –L– RT

DETAIL 10
LATERAL BASE DITCH (Not to Scale)

Max. d=Top of Bank
B=10.0 Ft.
b=5.0 Ft.
Type of Liner= Class I Rip–Rap

FROM STA. 1265+35 TO STA. 1265+60 –L– RT

DETAIL 11
SPECIAL CUT DITCH (Not to Scale)

Min. D=2.0 Ft.

FROM STA. 1337+50 TO STA. 1340+50 –L– RT
FROM STA. 1365+50 TO STA. 1369+00 –L– RT
FROM STA. 22+85 TO STA. 25+10 –Y19RPB– RT
FROM STA. 23+00 TO STA. 25+56 –Y19RPB– LT

DETAIL 12
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.5 Ft.

FROM STA. 1367+00 TO STA. 1369+00 –L– LT
FROM STA. 1401+00 TO STA. 1405+50 –L– RT
FROM STA. 38+12 TO STA. 41+05.50 –Y33– LT
FROM STA. 40+10 TO STA. 40+60 –Y33– RT

DETAIL 13
SPECIAL CUT BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
B=3.0 Ft.

FROM STA. 1308+50 TO STA. 1311+00 –L– LT

DETAIL 14
LATERAL BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
B=3.0 Ft.
b=5.0 Ft.

FROM STA. 1311+00 TO STA. 1316+90 –L– LT

DETAIL 15
SPECIAL CUT BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
B=2.0 Ft.

FROM STA. 1374+00 TO STA. 1376+00 –L– LT
FROM STA. 11+97.27 TO STA. 17+24 –Y18RPC– RT

DETAIL 16
SPECIAL CUT BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
B=2.0 Ft.

FROM STA. 1405+50 TO STA. 1415+28 –L– RT
FROM STA. 63+28.34 TO STA. 65+60 –SR17– RT

DETAIL 17
LATERAL BASE DITCH (Not to Scale)

Min. D=2.5 Ft.
B=4.0 Ft.
b=5.0 Ft.

FROM STA. 18+15 TO STA. 19+75.5 –Y33– RT
FROM STA. 33+50 TO STA. 35+56 –Y33– LT

DETAIL 18
STANDARD BASE DITCH (Not to Scale)

Min. D=4.0 – 6.0 Ft.
B=7.0 Ft.

STA. 19+20 –Y18RPD– LT

DETAIL 19
STANDARD BASE DITCH (Not to Scale)

Min. D=7.0 Ft.
d=7.0 Ft.
B=7.0 Ft.
Type of Liner= Class I Rip–Rap Keyed–In (2' Thick)

STA. 1347+25 –L– RT
STA. 19+40 –Y18RPD– LT

DETAIL 20
STANDARD BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
B=2.0 Ft.

FROM STA. 18+65 TO STA. 19+61 –Y18RPC– LT
FROM STA. 30+88 TO STA. 31+42 –Y18– LT

DETAIL 21
STANDARD BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=2.0 Ft.
*When B is < 6.0'
Type of Liner= Class B Rip–Rap

FROM STA. 20+09 TO STA. 20+50 –Y30– LT

DETAIL 22
SPECIAL CUT BASE DITCH (Not to Scale)

Min. D=3.0 Ft.
B=5.0 Ft.

FROM STA. 1345+00 TO STA. 1347+15 –L– RT

DETAIL 23
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.5 Ft.

FROM STA. 1326+00 TO STA. 1327+87 –L– RT

DETAIL 24
STANDARD 'V' DITCH (Not to Scale)

Min. D=1.0 Ft.

FROM STA. 30+26 TO STA. 31+00 –Y18– RT
FROM STA. 23+39 TO STA. 23+58 –Y30– RT

DETAIL 25
LATERAL BASE DITCH (Not to Scale)

Min. D=2.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 18+88 TO STA. 34+23 –Y29A– RT

DETAIL 26
LATERAL 'V' DITCH (Not to Scale)

Min. D=1.0 Ft.
b=5.0 Ft.

FROM STA. 29+50 TO STA. 31+00 –Y29– LT

DETAIL 27
LATERAL 'V' DITCH (Not to Scale)

Min. D=1.5 Ft.
b=5.0 Ft.

FROM STA. 31+00 TO STA. 34+34 –Y29– LT

DETAIL 28
SPECIAL CUT DITCH w/HINGE (Not to Scale)

Min. D=1.5 Ft.

FROM STA. 1285+00 TO STA. 1288+00 –L– LT
FROM STA. 1355+00 TO STA. 1355+50 –L– LT
FROM STA. 1357+50 TO STA. 1363+00 –L– LT
FROM STA. 1399+00 TO STA. 1406+00 –L– LT
FROM STA. 1408+00 TO STA. 1415+81 –L– LT

DETAIL 29
LATERAL BASE DITCH (Not to Scale)

Min. D=1.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 35+87 TO STA. 38+12 –Y33– LT

DETAIL 30
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.5 Ft.

FROM STA. 12+02.79 TO STA. 16+97.56 –SR19– LT

DETAIL 31
STANDARD BASE DITCH (Not to Scale)

Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner= Class B Rip–Rap

FROM STA. 1249+67 TO STA. 1250+36 –L– LT

DETAIL 32
TOE PROTECTION (Not to Scale)

d=1.0 Ft.
b=2.0 Ft.
Type of Liner= Class I Rip–Rap

FROM STA. 1391+27 TO STA. 1394+20 –L– LT

DETAIL 33
FALSE SUMP (Not to Scale)

S=Ditch Slope

STA. 1267+59 –L– LT
STA. 1271+35 –L– LT
STA. 1275+34 –L– LT
STA. 1278+35 –L– LT
STA. 1281+69 –L– LT
STA. 1284+85 –L– LT
STA. 1312+25 –L– RT
STA. 1324+16 –L– RT
STA. 1358+85 –L– LT
STA. 1375+84 –L– RT
STA. 17+79 –Y33– RT
STA. 29+62 –Y33– RT

DETAIL 34
FALSE SUMP (Not to Scale)

S=Ditch Slope

STA. 1249+60 –L– LT
STA. 1251+14 –L– LT
STA. 1268+35 –L– RT
STA. 1272+35 –L– RT
STA. 1276+34 –L –RT
STA. 1338+65 –L– LT
STA. 1358+84 –L– RT
STA. 1365+88 –L– LT
STA. 1369+51 –L– LT
STA. 1373+15 –L– LT
STA. 1376+25 –L– LT
STA. 1380+15 –L– LT
STA. 1383+15 –L– LT
STA. 1387+15 –L– LT
STA. 1396+15 –L– LT
STA. 1398+15 –L– LT
STA. 1402+15 –L– LT
STA. 12+97 –Y18RPD– LT
STA. 15+30 –Y18RPD– LT
STA. 16+67 –Y33– LT

DETAIL 35
FALSE SUMP (Not to Scale)

S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 1410+47 –L–
STA. 1414+48 –L–

DETAIL 36
TOE PROTECTION (Not to Scale)

d=1.0 Ft.
b=2.0 Ft.
Type of Liner= Class B Rip–Rap

FROM STA. 14+50 TO STA. 14+70 –Y18RPA– RT

DETAIL 37
STANDARD 'V' DITCH (Not to Scale)

Min. D=1.0 Ft.

FROM STA. 19+72 TO STA. 23+00 –Y19RPB– LT

DETAIL 38
BASE CHANNEL (Not to Scale)

Min. D=5 Ft.
B=50 Ft.
Type of Liner= Class II Rip–Rap (2' Thick)

FROM STA. 1259+98 TO STA. 1260+70 –L–

DETAIL 39
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.0 Ft.

FROM STA. 12+92.94 TO STA. 13+43.18 –Y18RPB– LT

DETAIL 40
SPECIAL CUT DITCH (Not to Scale)

Min. D=0.5 Ft.
Max. d=Top of Bank
Type of Liner= Class B Rip–Rap

FROM STA. 13+43.18 TO STA. 14+05 –Y18RPB– LT

DETAIL 41
INLET CHANNEL (Not to Scale)

Min. D=6.0 Ft.
Max. d=7.0 Ft.
B=13.0 Ft.
Type of Liner= Class II Rip–Rap – Keyed–In (2' Thick)

FROM STA. 35+67 TO STA. 35+79 –Y33– LT

DETAIL 42
OUTLET CHANNEL (Not to Scale)

Min. D=4.0 Ft.
Max. d=6.0 Ft.
B=VARIES 8 – 12 Ft.
When B is > 6.0'
Std. No. 876.01
Type of Liner= Class I Rip–Rap – Keyed–In (2' Thick)

FROM STA. 36+03 TO STA. 36+17 –Y33– LT

DETAIL 43
CHANNEL CHANGE (Not to Scale)

Min. D=4.0 Ft.
B=VARIES 8.0 Ft.

FROM STA. 36+17 TO STA. 37+58 –Y33– LT

DETAIL 44
BASE CHANNEL (Not to Scale)

1.5:1 Normal
1.73:1 Skewed
Sloping Abutments
Min. D=5.0 Ft.
B=12.0 Ft.
Type of Liner= Class II Rip–Rap – Keyed–In (2' Thick)

FROM STA. 1390+63 TO STA. 1392+05 –L–

DETAIL 45
SPECIAL CUT DITCH w/HINGE (Not to Scale)

Min. D=2.0 Ft.
Max. d=Top of Bank
Type of Liner= Class B Rip–Rap

FROM STA. 1376+50 TO STA. 1378+00 –L– LT

DETAIL 46
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.5 Ft.
Max. d=1.0 Ft.
Type of Liner= Class B Rip–Rap

FROM STA. 24+43.50 TO STA. 33+50 –Y33– LT

DETAIL 47
TOE PROTECTION (Not to Scale)

d=1.5 Ft.
Type of Liner= Class B Rip–Rap

FROM STA. 35+33 TO STA. 35+89 –Y33– RT

DETAIL 48
PIPE INLET/OUTLET CHANNEL STABILIZATION (Not to Scale)

Length=4xDia. of Pipe (Min. 10 Ft.)
Type of Liner on Banks= CLASS I Rip–Rap – Keyed–In
Type of Liner in Channel Bed= CLASS I Rip–Rap – Keyed–In

STA. 1285+32 –L– RT
STA. 1344+55 –L– LT
STA. 34+26 –Y29A– RT
STA. 19+69 –Y33– RT

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