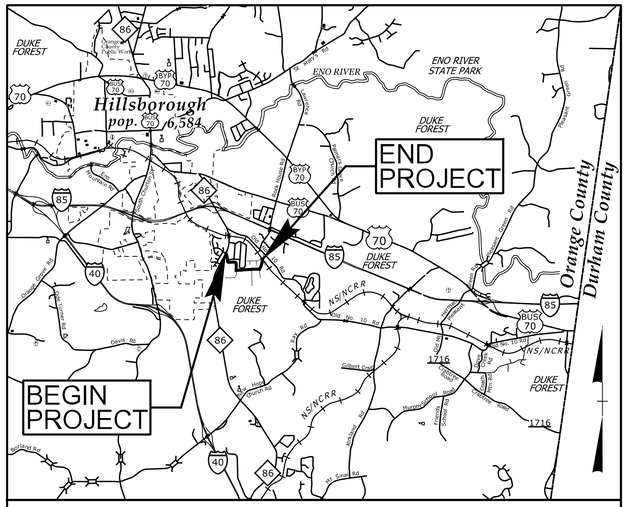
0007T_P210

DGN

TIP PROJECT: P–4405 K

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

NOTE: THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

STATE OF NORTH CAROLINA
RAIL DIVISION

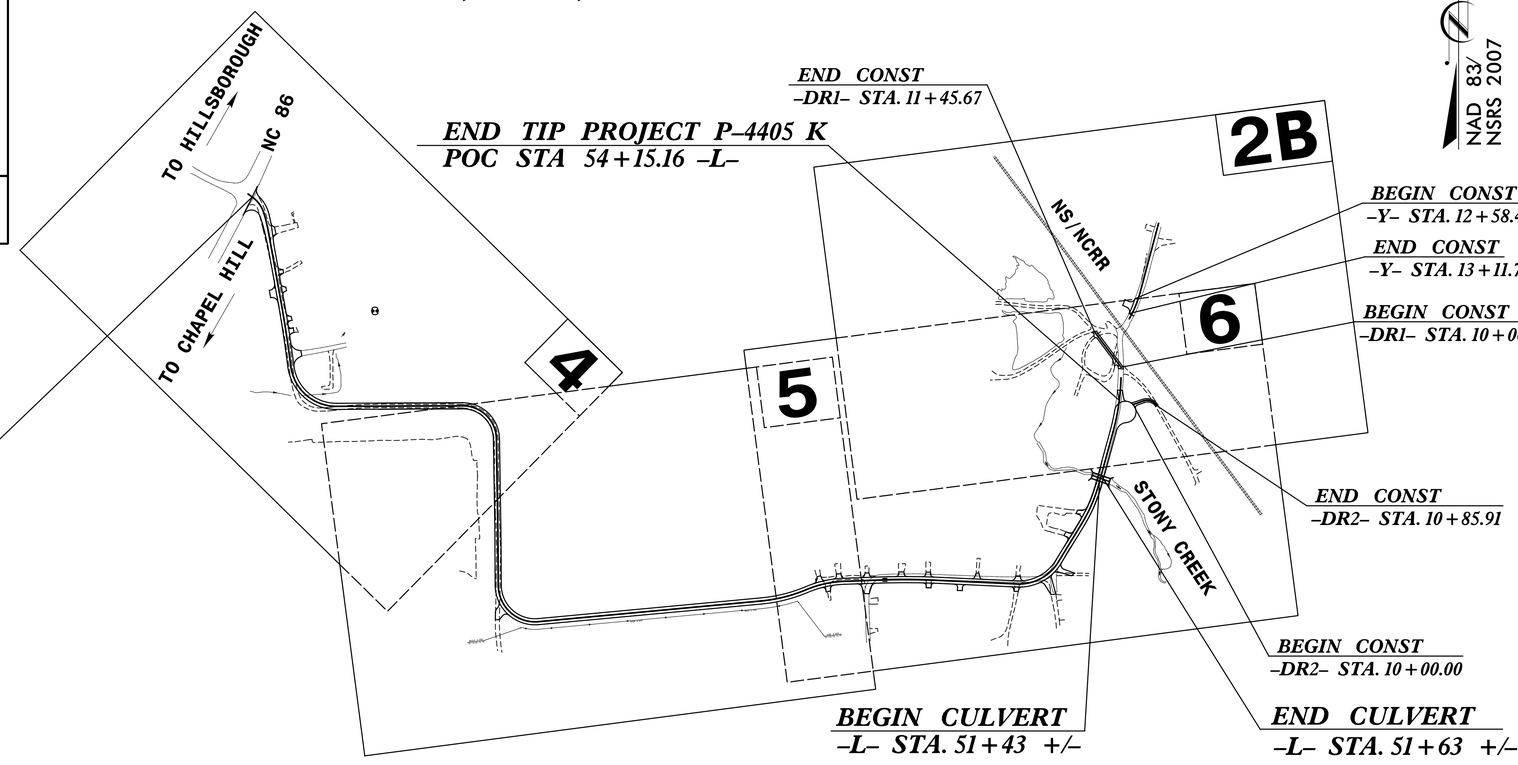
ORANGE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P–4405 K	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
62000.7.STR28T1B		PE

LOCATION: BYRDSVILLE ROAD – EXTENSION FROM NS/NCRR TO NC 86 AND CROSSING CLOSURE

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SUBMITTAL: ROW PLANS
DATE: MARCH 11, 2015

NCDOT CONTACT: DAN HAVENER, PE
PROJECT MANAGER

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

CONTRACT:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT =
ADT =
DHV = %
D = %
T = % *
V = 30 MPH
* TTST =
* DUAL =
FUNC CLASS =SUBDIVISION
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT P–4405 K = 0.828 MILE
LENGTH STRUCTURE TIP PROJECT P–4405 K = 0.004 MILE
TOTAL LENGTH TIP PROJECT P–4405 K = 0.832 MILE

Prepared In the Office of:
ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: P-0258

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 11, 2015

LETTING DATE:
MARCH 22, 2016

DAVID C. WALLER, PE
PROJECT ENGINEER

ALEXANDER D. SNIDER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
ENGINEERING COORDINATION AND SAFETY

3/11/2015
R:\Roadway\Proj\p4405k_rdy_tsh.dgn
ICA ENGINEERING, INC.

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	1B

0007T_P21o

DGN

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- 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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

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:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

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
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (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
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

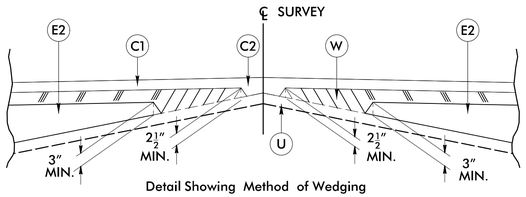
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DCN 0007T_P21o

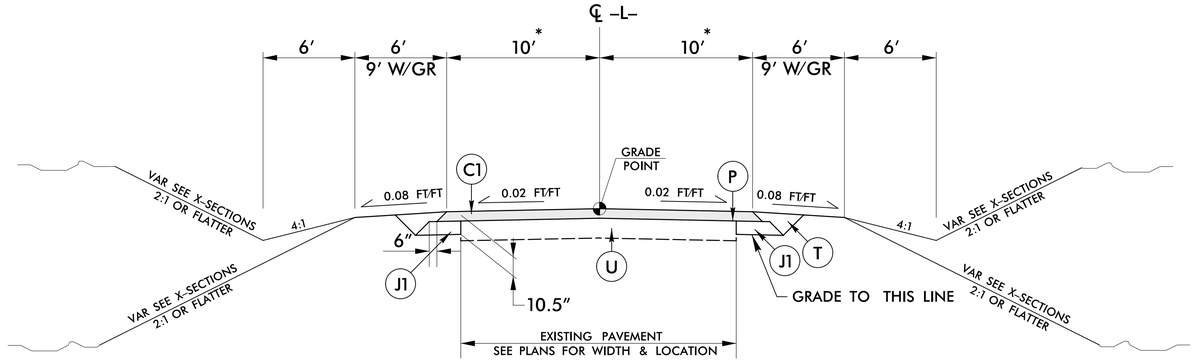
PRELIMINARY PAVEMENT SCHEDULE

C1	PROP. APPROX 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 5.5" IN DEPTH.
J1	8" AGGREGATE BASE COURSE.
P	PRIME COAT
T	EARTH MATERIAL
U	EXISTING ABC PAVEMENT
U1	EXISTING ASPALT PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS PAGE.)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. FOR CROSSOVER AREAS, PLEASE SEE PLANS.



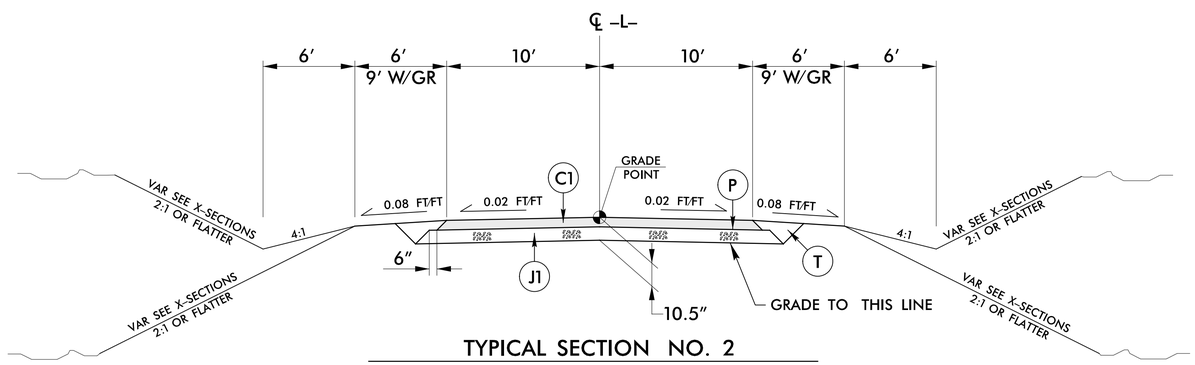
Detail Showing Method of Wedging



TYPICAL SECTION NO. 1
-L- BYRDSVILLE ROAD

* VARIES 15' TO 10' FROM 10+93.64 TO 11+93.64

USE TYPICAL SECTION NO. 1 FROM:
-L- PC 10+19.76 TO -L- POC 29+45.47



TYPICAL SECTION NO. 2
-L- BYRDSVILLE ROAD

* VARIES 10' TO 35' FROM 53+17.17 TO 53+81.29

USE TYPICAL SECTION NO. 2 FROM:
-L- POC 29+45.47 TO -L- POC 42+00.00
-L- POT 46+00.00 TO -L- POC 54+07.85

3/11/2015
R:\Roadway\Proj\p4405k_rdy_typ.dgn
ICA ENGINEERING, INC.

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

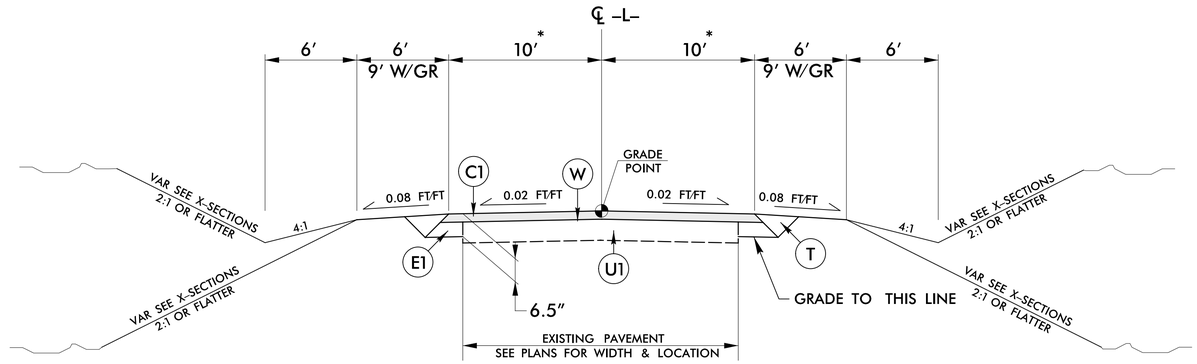
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DCN 0007T_P21o

PRELIMINARY PAVEMENT SCHEDULE

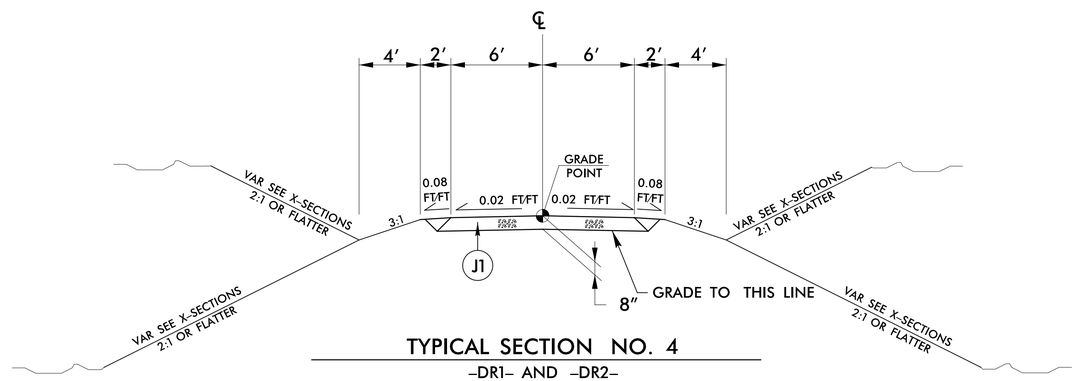
C1	PROP. APPROX 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 5.5" IN DEPTH.
J1	8" AGGREGATE BASE COURSE.
P	PRIME COAT
T	EARTH MATERIAL
U	EXISTING ABC PAVEMENT
U1	EXISTING ASPALT PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS PAGE.)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. FOR CROSSOVER AREAS, PLEASE SEE PLANS.



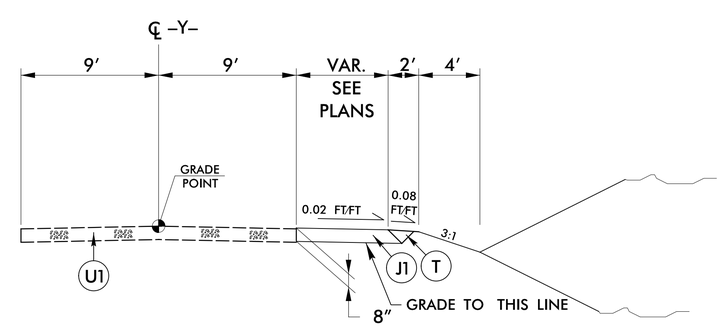
TYPICAL SECTION NO. 3
-L- BYRDSVILLE ROAD

USE TYPICAL SECTION NO. 3 FROM:
-L- POC 42+00.00 TO -L- POT 46+00.00



TYPICAL SECTION NO. 4
-DR1- AND -DR2-

USE TYPICAL SECTION NO. 4 FROM:
-DR1- POT 10+00.00 TO -DR1- POT 11+45.67
-DR2- POT 10+00.00 TO -DR2- POT 10+85.91



TYPICAL SECTION NO. 5
-Y- BYRD ROAD

USE TYPICAL SECTION NO. 5 FROM:
-Y- PC 12+58.43 TO -Y- PC 13+11.75

3/11/2015
R:\Roadway\Proj\p4405k_rdy_typ.dgn
ICA ENGINEERING, INC.

CROSSING CLOSURE DETAIL

BYRD RD

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

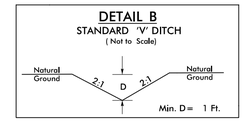
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DGN 0007T_P210

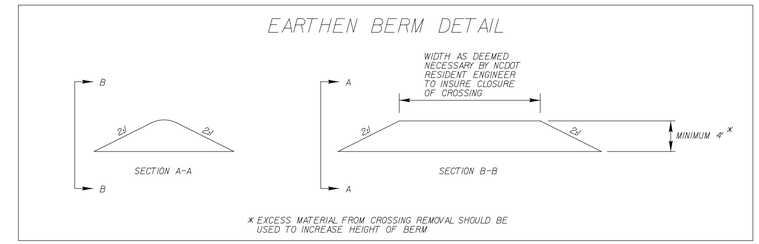
REVISIONS

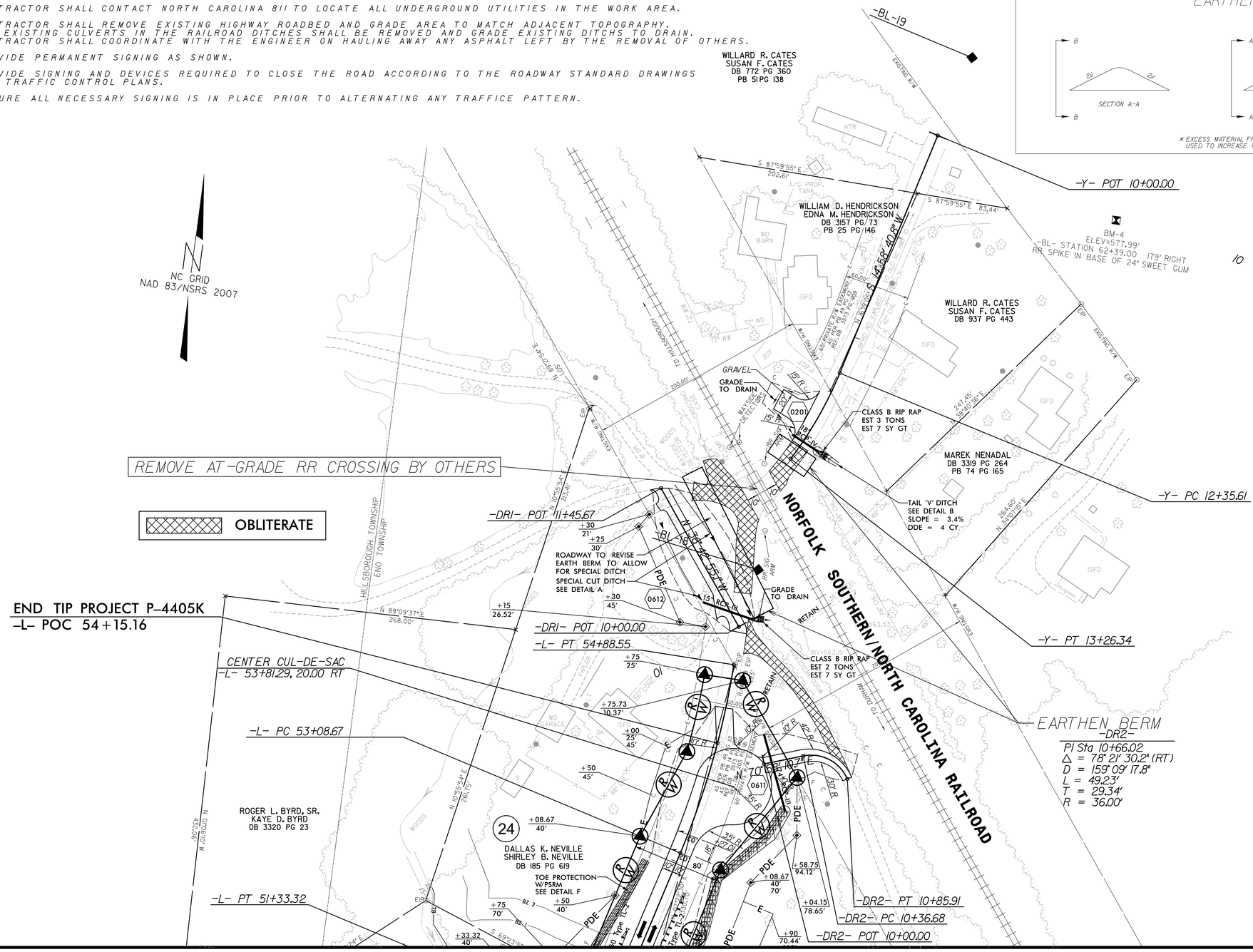
NOTES:

1. CONTACT THE NCDOT RESIDENT ENGINEER TO SCHEDULE THE CLOSURE OF BYRD ROAD.
2. THE EXISTING PAVEMENT WITHIN 10' OF THE CENTERLINE OF THE TRACK, WILL BE REMOVED BY OTHERS. THE TIMBER AND RAIL SEAL FLANGES WILL ALSO BE REMOVED BY OTHERS. THE EXISTING CROSSBUCKS WILL BE REMOVED BY OTHERS. CROSSING SIGNAL WILL BE REMOVED BY OTHERS.
3. CONTRACTOR SHALL SEED AND MULCH THE DISTURBED AREA OUTSIDE THE RAILROAD BALLAST LINE.
4. CONTRACTOR SHALL CONTACT NORTH CAROLINA 811 TO LOCATE ALL UNDERGROUND UTILITIES IN THE WORK AREA.
5. CONTRACTOR SHALL REMOVE EXISTING HIGHWAY ROADBED AND GRADE AREA TO MATCH ADJACENT TOPOGRAPHY. ANY EXISTING CULVERTS IN THE RAILROAD DITCHES SHALL BE REMOVED AND GRADE EXISTING DITCHS TO DRAIN. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER ON HAULING AWAY ANY ASPHALT LEFT BY THE REMOVAL OF OTHERS.
6. PROVIDE PERMANENT SIGNING AS SHOWN.
7. PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.
8. ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERNATING ANY TRAFFICE PATTERN.



STA. 13+07 -Y- RT





-Y-
PI Sta 12+83.28
Δ = 15° 30' 36.5" (RT)
D = 16° 22' 12.8"
L = 94.75'
T = 47.66'
R = 350.00'

FOR -L- PROFILE, SEE SHEET 10
FOR -DR1- PROFILE, SEE SHEET 11
FOR -DR2- PROFILE, SEE SHEET 11

3/11/2015
ICA Engineering
P:\Projects\P-4405k_rdy_psh02B.dgn

COMPUTED BY: ADS DATE: 3/4/2015
CHECKED BY: DCW DATE: 3/4/2015

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	3B

DCN 0007T_P21o

SUMMARY OF EARTHWORK
IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
–L– 10+00.00 R 1	–L– 20+67.25 R 2	1601	1237		364
–L– 20+67.25 R 2	–L– 31+00.00 R 2	713	1272	559	
–L– 31+00.00 R 2	–L– 51+50.00 R 2	1477	4488	3011	
–L– 51+50.00 R 2	–L– 54+00.00 R 2	119	1590	1471	
SUBTOTALS:		3910	8587	5041	364
–DR1– 10+00.00	–DR1– 11+45.67	373	68		305
SUBTOTALS:		373	68		305
–DR2– 10+00.00	–DR2– 10+85.91	30	338	308	
SUBTOTALS:		30	338	308	
PROJECT TOTALS:				5349	669
MATERIAL FOR SHOULDER CONSTRUCTION				234	
WASTE IN LIEU OF BORROW				–669	–669
MATERIAL FOR BERM CONSTRUCTION				8112	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				651	
GRAND TOTALS:		4313		13677	
SAY:		4400		13400	

Note: Approximate quantities only. Clearing and Grubbing, Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
–DR1–	10+20.56	11+45.67	RT	296
–Y–	13+11.61	13+26.34	CL	78
			TOTAL:	374
			SAY:	375

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
–L–	50+25.00	52+75.00	RT	250			51+50.00	52+75.00	6	9	50	50	1	1			2													
–L–	50+75.00	52+25.00	LT	150			51+00.00	50+75.00	6	9	50	50	1	1			2													
	TOTAL			400													4													
	SAY			400													4													

3/11/2015
R:\Roadway\Proj\p4405k_rdy_psh03B.dgn
TCA ENGINEERING, INC.

0007T_P21o

PROJ. REFERENCE NO.	SHEET NO.
P-4405 K	3P

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	JAMES J. FREELAND & MAXINE H. FREELAND
2	4	HILLSBOROUGH CHURCH OF GOD
3	4, 5	PIEDMONT ELECTRIC MEMBERSHIP CORP.
4	4	HILLSBOROUGH CHURCH OF GOD
5	4	HILLSBOROUGH CHURCH OF GOD
6	4	HILLSBOROUGH CHURCH OF GOD
7	4	HILLSBOROUGH CHURCH OF GOD
8	4	JAMES A. GOOCH
9	4	LARRY W. WHITE JR. & JEFFERY A. WHITE
10	4	RICKY W. FLETCHER
11	4	JAMES M. RAY
12	5	MICOL PROPERTIES, LLC
13	5	ALFONSO N. GALEANA
14	5	ERNEST W. COUCH JR.
15	5	JESUS A. MINTA GALVEZ & NOE SALGADO ALVARADO
16	5, 6	DUKE UNIVERSITY SCHOOL OF FORESTRY
17	5	VIRGINIA TAYLOR
18	5	ROBERT E. REINHEIMER & PATRICIA M. REINHEIMER
19	5, 6	WILLARD R. CATES & SUSAN F. CATES
20	5, 6	WILLARD R. CATES & SUSAN F. CATES
21	6	WILLARD R. CATES & SUSAN F. CATES
22	6	WILLARD R. CATES & SUSAN F. CATES
23	6	WANDA D. BYRD
24	6	DALLAS K. NEVILLE & SHIRLEY B. NEVILLE
25	6	DALLAS K. NEVILLE, SHIRLEY B. NEVILLE, DEAN K NEVILLE, & WANDA J. NEVILLE

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

0007T_P210

DGN

REVISIONS

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

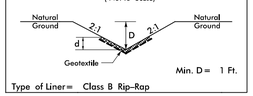
PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 10+80 TO STA. 11+50 -L- RT
FROM STA. 15+35 TO STA. 16+73 -L- RT
FROM STA. 20+67.25 TO STA. 21+50 -L- RT
FROM STA. 22+50 TO STA. 23+50 -L- LT
FROM STA. 23+50 TO STA. 24+36 -L- RT

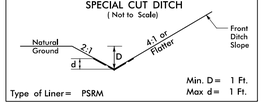
DETAIL J
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

STA. 15+40 -L- LT

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= PSRM

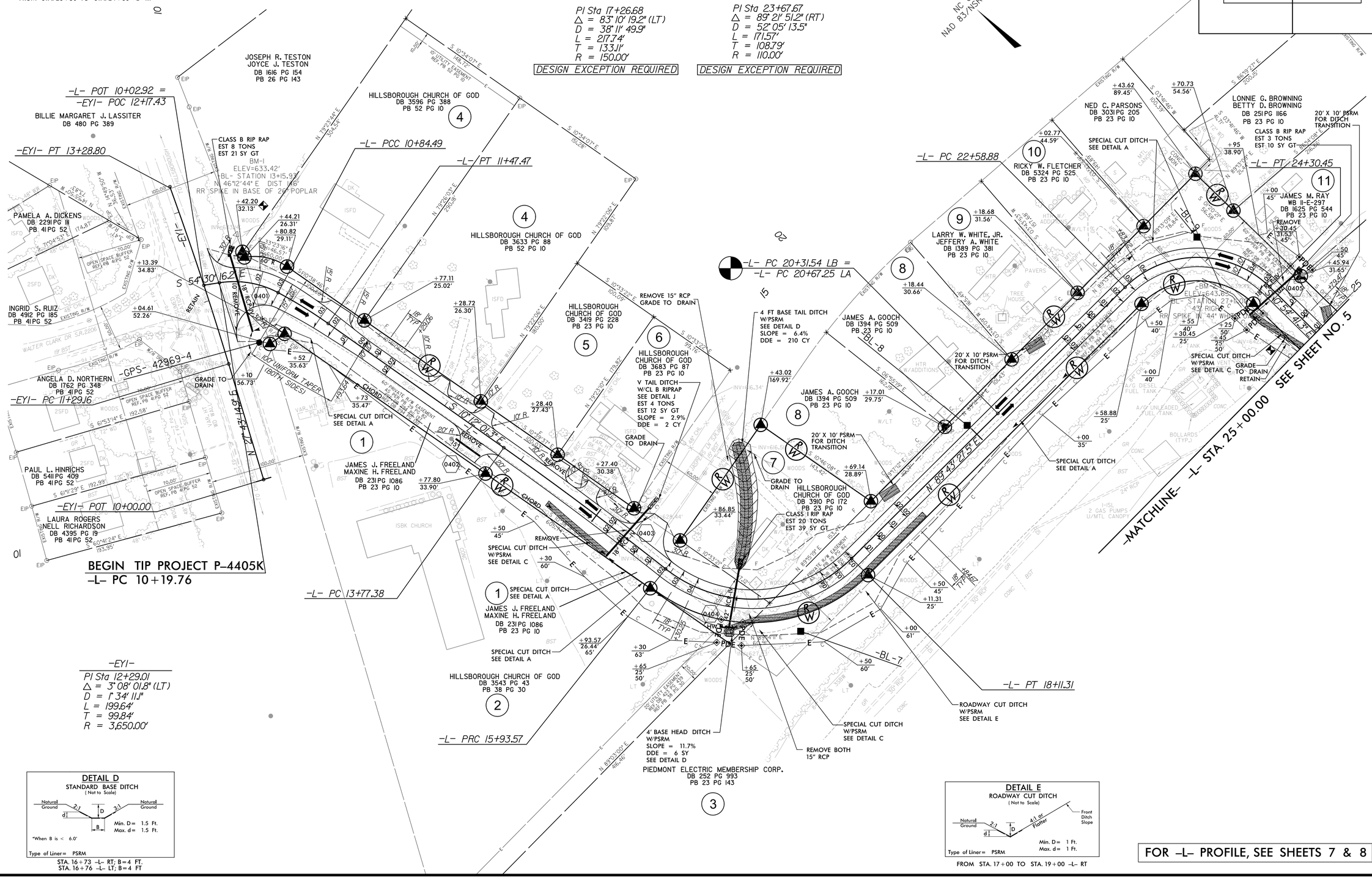
FROM STA. 14+50 TO STA.15+35 -L- RT
FROM STA. 16+73 TO STA. 17+00 -L- RT
FROM STA. 24+36 TO STA. 25+00 -L- RT

-L-

PI Sta 10+53.30	PI Sta 11+16.02	PI Sta 14+85.50
Δ = 37° 05' 12.9" (RT)	Δ = 7° 13' 02.0" (RT)	Δ = 3° 05' 48.0" (RT)
D = 57° 17' 44.8"	D = 11° 27' 33.0"	D = 1° 25' 56.6"
L = 64.73'	L = 62.98'	L = 216.19'
T = 33.54'	T = 31.53'	T = 108.12'
R = 100.00'	R = 500.00'	R = 4,000.00'

PI Sta 17+26.68	PI Sta 23+67.67
Δ = 83° 10' 19.2" (LT)	Δ = 89° 21' 51.2" (RT)
D = 38° 11' 49.9"	D = 52° 05' 13.5"
L = 217.74'	L = 171.57'
T = 133.11'	T = 108.79'
R = 150.00'	R = 110.00'
DESIGN EXCEPTION REQUIRED	DESIGN EXCEPTION REQUIRED

NC GRID NAD 83/NSRS 2007



-EY1-
PI Sta 12+29.01
Δ = 3° 08' 01.8" (LT)
D = 1° 34' 11.1"
L = 199.64'
T = 99.84'
R = 3,650.00'

DETAIL D
STANDARD BASE DITCH
(Not to Scale)

*When B is < 6.0'

Type of Liner= PSRM

STA. 16+73 -L- RT; B=4 FT.
STA. 16+76 -L- LT; B=4 FT

DETAIL E
ROADWAY CUT DITCH
(Not to Scale)

Type of Liner= PSRM

FROM STA. 17+00 TO STA. 19+00 -L- RT

FOR -L- PROFILE, SEE SHEETS 7 & 8

3/12/2015
FILENAME: P:\Roadway\Proj\p4405k_rdy_psh04.dgn

0007T_P210

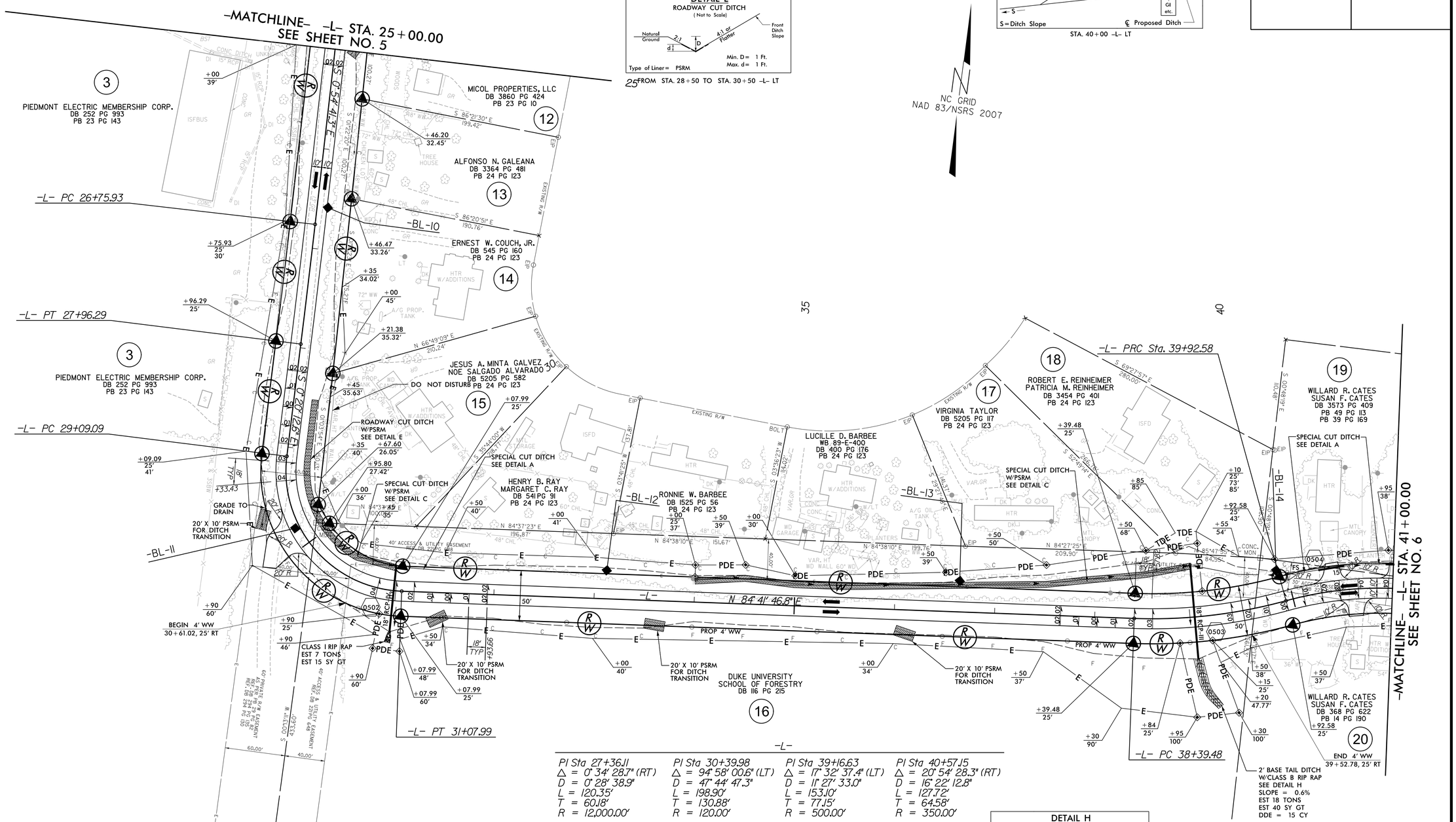
DGN

REVISIONS

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1 Ft.

FROM STA. 31+00 TO STA. 31+50 -L- LT
FROM STA. 39+00 TO STA. 41+00 -L- LT

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1 Ft.
Max. d= 1 Ft.
Type of Liner= PSRM

FROM STA. 30+50 TO STA. 31+00 -L- LT
FROM STA. 34+00 TO STA. 39+00 -L- LT

DETAIL E
ROADWAY CUT DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1 Ft.
Max. d= 1 Ft.
Type of Liner= PSRM

FROM STA. 28+50 TO STA. 30+50 -L- LT

DETAIL I
FALSE SUMP
(Not to Scale)

Outside Ditch Traffic Flow, 10:1, 20:1, 1.0', 2.0', GI etc., S, S=Ditch Slope, ℄ Proposed Ditch

STA. 40+00 -L- LT

PI Sta 27+36.11	PI Sta 30+39.98	PI Sta 39+16.63	PI Sta 40+57.15
Δ = 0° 34' 28.7" (RT)	Δ = 94° 58' 00.6" (LT)	Δ = 17° 32' 37.4" (LT)	Δ = 20° 54' 28.3" (RT)
D = 0° 28' 38.9"	D = 47° 44' 47.3"	D = 11° 27' 33.0"	D = 16° 22' 12.8"
L = 120.35'	L = 198.90'	L = 153.10'	L = 127.72'
T = 60.18'	T = 130.88'	T = 77.15'	T = 64.58'
R = 12,000.00'	R = 120.00'	R = 500.00'	R = 350.00'

DESIGN EXCEPTION REQUIRED

DETAIL H
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, Natural Ground, Geotextile, B
Min. D= 1 Ft.
Max. d= 1 Ft.
B= 2 Ft.
*When B is < 6.0'
Type of Liner= Classs B Rip-Rap

STA.39+00 -L- RT

FOR -L- PROFILE, SEE SHEETS 8 & 9

3/11/2015
ITA\Groups\Proj\p4405k_rdy_psh05.dgn

0007T_P210

DGN

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -L- PROFILE, SEE SHEETS 9 & 10
FOR -DR1- PROFILE, SEE SHEET 11
FOR -DR2- PROFILE, SEE SHEET 11

NC GRID
NAD 83/NSRS 2007

REMOVE AT-GRADE RR CROSSING BY OTHERS

OBLITERATE

END TIP PROJECT P-4405K
-L- POC 54+15.16

CENTER CUL-DE-SAC
-L- 53+81.29, 20.00 RT

-L-

PI Sta 43+35.41	PI Sta 47+73.50
△ = 4° 35' 10.4" (RT)	△ = 61° 18' 40.9" (LT)
D = 2° 20' 53.5"	D = 38° 11' 49.9"
L = 195.31'	L = 160.51'
T = 97.71'	T = 88.91'
R = 2,440.00'	R = 150.00'

DESIGN EXCEPTION REQUIRED

PI Sta 50+63.79	PI Sta 53+99.05
△ = 16° 02' 24.4" (LT)	△ = 13° 44' 31.3" (LT)
D = 11° 27' 33.0"	D = 7° 38' 22.0"
L = 139.98'	L = 179.88'
T = 70.45'	T = 90.37'
R = 500.00'	R = 750.00'

-MATCHLINE- -L- STA. 41+00.00 SEE SHEET NO. 6

-L- PT 41+20.30

-L- PC 42+37.70

-L- PT 44+33.01

-L- PC 46+84.59

-L- PT 48+45.10

-L- PC 49+98.34

-L- PT 51+33.32

-L- PC 53+08.67

-DR1- POT 11+45.67

-DR1- POT 10+00.00

-L- PT 54+88.55

-Y- PT 13+26.34

-DR2- PT 10+85.91

-DR2- PC 10+36.68

-DR2- POT 10+00.00

NORFOLK SOUTHERN / NORTH CAROLINA RAILROAD

EARTHEN BERM
-DR2-
PI Sta 10+66.02
△ = 78° 21' 30.2" (RT)
D = 159° 09' 17.8"
L = 49.23'
T = 29.34'
R = 36.00'

ROADWAY TO REVISE EARTH BERM TO ALLOW FOR SPECIAL DITCH
SPECIAL CUT DITCH SEE DETAIL A

TAIL 'V' DITCH SEE DETAIL B
SLOPE = 3.4%
DDE = 4 CY

GRADE TO DRAIN

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GT

ROGER L. BYRD, SR.
KAYE D. BYRD
DB 3320 PG 23

DALLAS K. NEVILLE
SHIRLEY B. NEVILLE
DB 185 PG 619

TOE PROTECTION W/PSRM SEE DETAIL F

30 LF OF INLET CHANNEL IMPROVEMENT

2' SILLS IN SOUTH BARREL AT INLET

2 @ 10' x 6' RCBC

DALLAS K. NEVILLE
SHIRLEY B. NEVILLE
DEAN K. NEVILLE
WANDA J. NEVILLE
DB 1841 PG 208

1' HIGH SILLS IN NORTH BARREL AT INLET AND OUTLET

2' LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL G

30 LF OF OUTLET CHANNEL IMPROVEMENT
EST. 60 TONS CLASS II RIP RAP
EST. 65 SY GEOTEXTILE

2' SILLS IN SOUTH BARREL AT OUTLET

WANDA D. BYRD
DB 1554 PG 237
PB 49 PG 113

SPECIAL CUT DITCH W/PSRM SEE DETAIL C

REMOVE TAIL 'V' DITCH W/CLASS B RIPRAP SEE DETAIL J
EST 4 TONS
EST 12 SY GT
DDE = 1 CY
SLOPE = 1.8%

20' X 10' PSRM FOR DITCH TRANSITION

SPECIAL CUT DITCH SEE DETAIL A

WILLARD R. CATES
SUSAN F. CATES
DB 435 PG 357
PB 49 PG 113

WILLARD R. CATES
SUSAN F. CATES
DB 368 PG 622
PB 49 PG 113
PB 39 PG 169

WILLARD R. CATES
SUSAN F. CATES
DB 368 PG 622
PB 14 PG 190

BM-3
ELEV=599.42'
-BL- STATION 46+49.00 79' LEFT
RR SPIKE IN BASE OF 15" WHITE OAK

SPECIAL CUT DITCH SEE DETAIL A

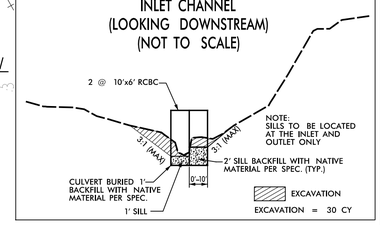
ROADWAY CUT DITCH W/PSRM SEE DETAIL E

SPECIAL CUT DITCH W/PSRM SEE DETAIL C

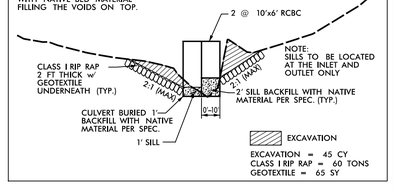
TAIL 'V' DITCH SEE DETAIL B
SLOPE = 1.2%
DDE = 3 CY

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GT

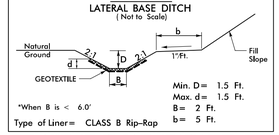
INLET CHANNEL
(LOOKING DOWNSTREAM)
(NOT TO SCALE)



OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(NOT TO SCALE)



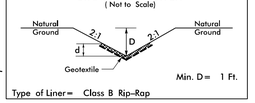
DETAIL G
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2 Ft.
b= 5 Ft.
*When B is < 6.0'
Type of Liner= CLASS B Rip-Rap

FROM STA. 51+51 TO STA. 53+75 -L- RT

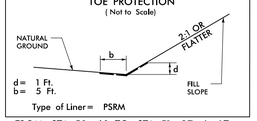
DETAIL J
STANDARD 'V' DITCH
(Not to Scale)



Min. D= 1 Ft.
Type of Liner= Class B Rip-Rap

STA. 50+00 -L- LT

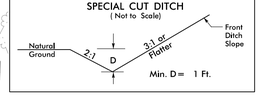
DETAIL F
TOE PROTECTION
(Not to Scale)



d= 1 Ft.
b= 5 Ft.
Type of Liner= PSRM

FROM STA. 50+60 TO STA. 51+37 -L- LT
FROM STA. 51+73 TO STA. 52+90 -L- LT

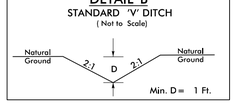
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1 Ft.

FROM STA. 41+00 TO STA. 42+50 -L- LT
FROM STA. 48+20 TO STA. 49+25 -L- RT
FROM STA. 10+35 TO STA. 11+22 -DR1- LT
FROM STA. 10+00 TO STA. 11+46 -DR1- RT

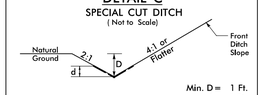
DETAIL B
STANDARD 'V' DITCH
(Not to Scale)



Min. D= 1 Ft.

STA. 42+18 -L- RT

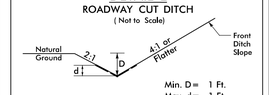
DETAIL C
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max d= 1 Ft.
Type of Liner= PSRM

FROM STA. 46+00 TO STA. 47+50 -L- LT
FROM STA. 48+00 TO STA. 48+20 -L- RT
FROM STA. 49+50 TO STA. 50+00 -L- LT

DETAIL E
ROADWAY CUT DITCH
(Not to Scale)



Min. D= 1 Ft.
Max. d= 1 Ft.
Type of Liner= PSRM

FROM STA. 44+20 TO STA. 46+00 -L- LT
FROM STA. 47+50 TO STA. 49+50 -L- LT

3/14/2015
R:\Roadway\Proj\p4405k_rdy_psh06.dgn

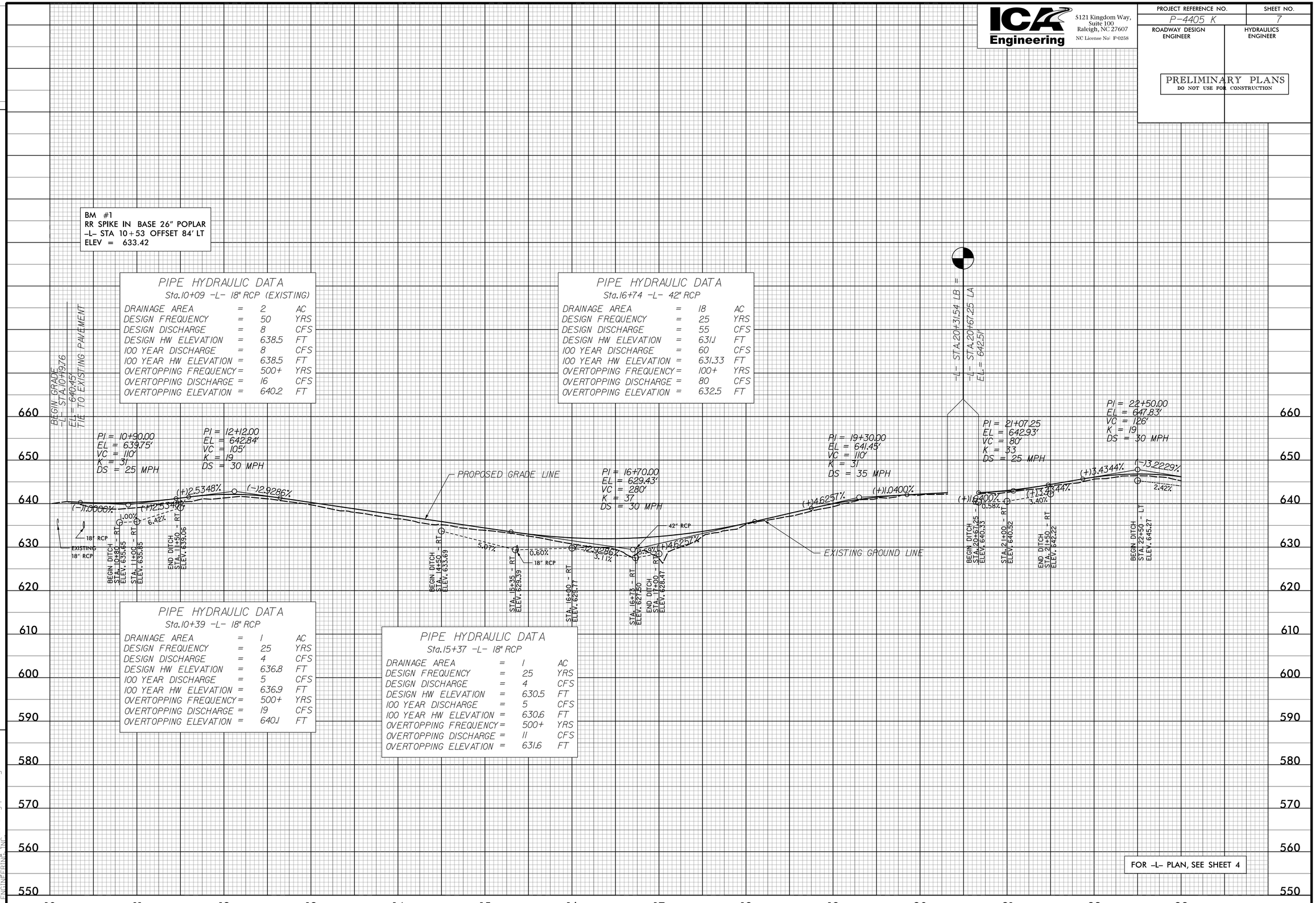
ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DGN 0007T_P21o

REVISIONS



PIPE HYDRAULIC DATA
Sta.10+09 -L- 18" RCP (EXISTING)

DRAINAGE AREA	=	2	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	8	CFS
DESIGN HW ELEVATION	=	638.5	FT
100 YEAR DISCHARGE	=	8	CFS
100 YEAR HW ELEVATION	=	638.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	16	CFS
OVERTOPPING ELEVATION	=	640.2	FT

PIPE HYDRAULIC DATA
Sta.16+74 -L- 42" RCP

DRAINAGE AREA	=	18	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	55	CFS
DESIGN HW ELEVATION	=	631.1	FT
100 YEAR DISCHARGE	=	60	CFS
100 YEAR HW ELEVATION	=	631.33	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	80	CFS
OVERTOPPING ELEVATION	=	632.5	FT

PIPE HYDRAULIC DATA
Sta.10+39 -L- 18" RCP

DRAINAGE AREA	=	1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	4	CFS
DESIGN HW ELEVATION	=	636.8	FT
100 YEAR DISCHARGE	=	5	CFS
100 YEAR HW ELEVATION	=	636.9	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	19	CFS
OVERTOPPING ELEVATION	=	640.1	FT

PIPE HYDRAULIC DATA
Sta.15+37 -L- 18" RCP

DRAINAGE AREA	=	1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	4	CFS
DESIGN HW ELEVATION	=	630.5	FT
100 YEAR DISCHARGE	=	5	CFS
100 YEAR HW ELEVATION	=	630.6	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	11	CFS
OVERTOPPING ELEVATION	=	631.6	FT

FOR -L- PLAN, SEE SHEET 4

3/11/2015
R:\Roadway\Proj\p4405k_rdy_pf107.dgn
ICA ENGINEERING, INC.

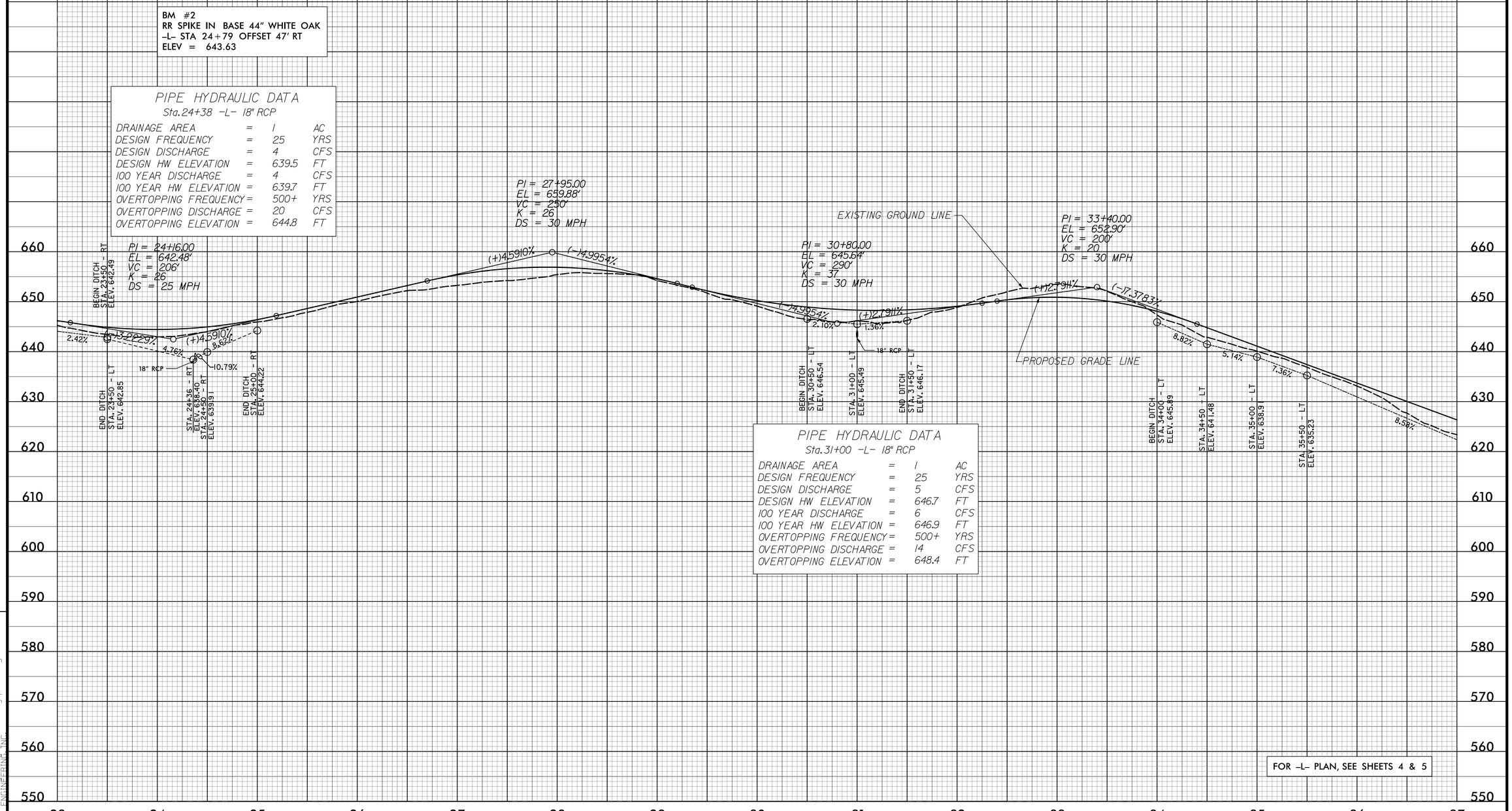
ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DGN 0007T_P21o

REVISIONS



PIPE HYDRAULIC DATA
Sta. 24+38 -L- 18" RCP

DRAINAGE AREA	=	1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	4	CFS
DESIGN HW ELEVATION	=	639.5	FT
100 YEAR DISCHARGE	=	4	CFS
100 YEAR HW ELEVATION	=	639.7	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	20	CFS
OVERTOPPING ELEVATION	=	644.8	FT

PIPE HYDRAULIC DATA
Sta. 31+00 -L- 18" RCP

DRAINAGE AREA	=	1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	5	CFS
DESIGN HW ELEVATION	=	646.7	FT
100 YEAR DISCHARGE	=	6	CFS
100 YEAR HW ELEVATION	=	646.9	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	14	CFS
OVERTOPPING ELEVATION	=	648.4	FT

FOR -L- PLAN, SEE SHEETS 4 & 5

3/11/2015
R:\Roadway\Proj\p4405k_rdy_pf108.dgn
ICA ENGINEERING, INC.

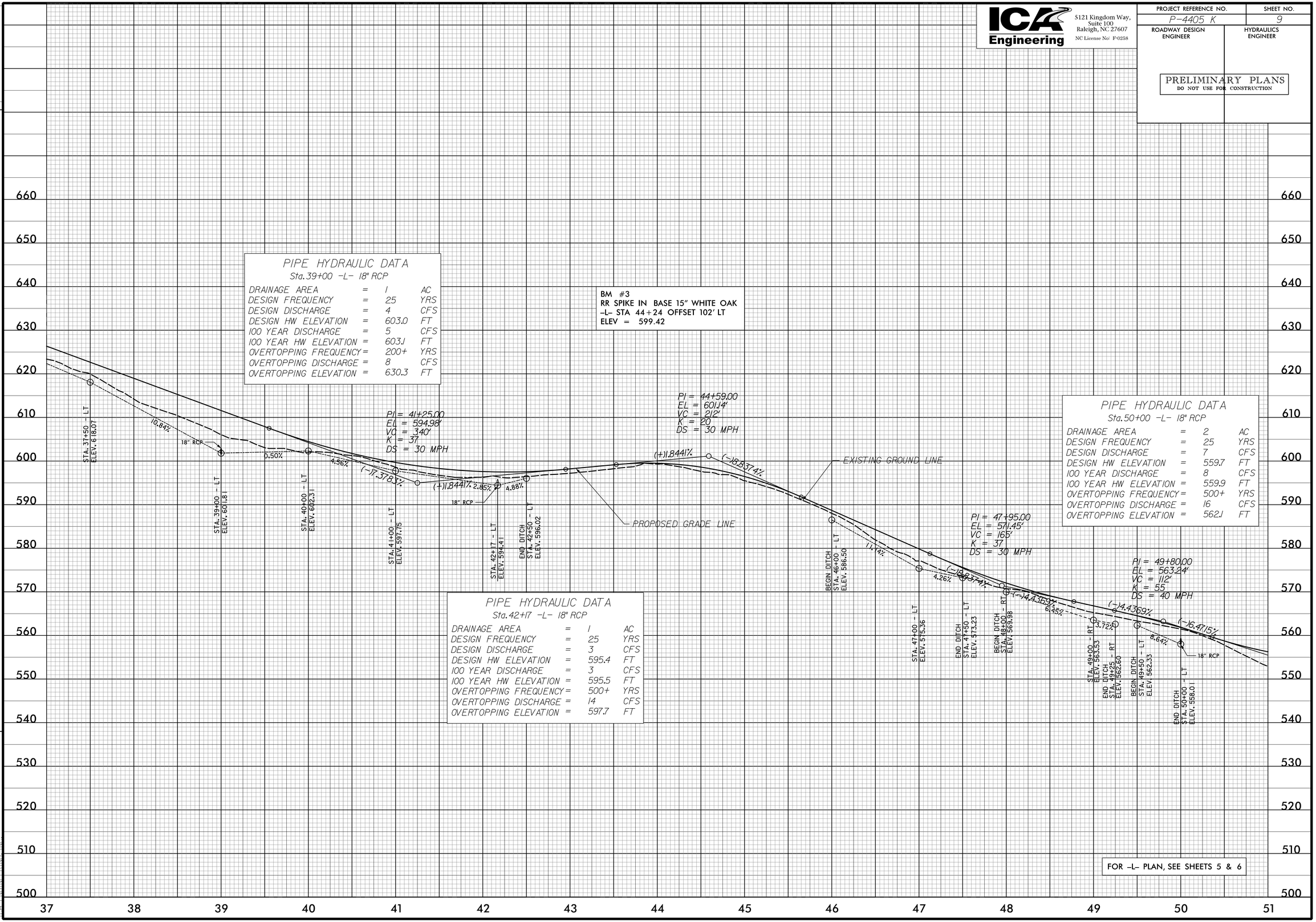
ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DGN 0007T_P210

REVISIONS



PIPE HYDRAULIC DATA
Sta. 39+00 -L- 18" RCP

DRAINAGE AREA	=	1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	4	CFS
DESIGN HW ELEVATION	=	603.0	FT
100 YEAR DISCHARGE	=	5	CFS
100 YEAR HW ELEVATION	=	603.1	FT
OVERTOPPING FREQUENCY	=	200+	YRS
OVERTOPPING DISCHARGE	=	8	CFS
OVERTOPPING ELEVATION	=	630.3	FT

BM #3
RR SPIKE IN BASE 15" WHITE OAK
-L- STA 44+24 OFFSET 102' LT
ELEV = 599.42

PIPE HYDRAULIC DATA
Sta. 50+00 -L- 18" RCP

DRAINAGE AREA	=	2	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	7	CFS
DESIGN HW ELEVATION	=	559.7	FT
100 YEAR DISCHARGE	=	8	CFS
100 YEAR HW ELEVATION	=	559.9	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	16	CFS
OVERTOPPING ELEVATION	=	562.1	FT

PIPE HYDRAULIC DATA
Sta. 42+17 -L- 18" RCP

DRAINAGE AREA	=	1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	3	CFS
DESIGN HW ELEVATION	=	595.4	FT
100 YEAR DISCHARGE	=	3	CFS
100 YEAR HW ELEVATION	=	595.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	14	CFS
OVERTOPPING ELEVATION	=	597.7	FT

FOR -L- PLAN, SEE SHEETS 5 & 6

3/16/2015
H:\Roadway\Proj\p4405k_rdy_pf101.dgn

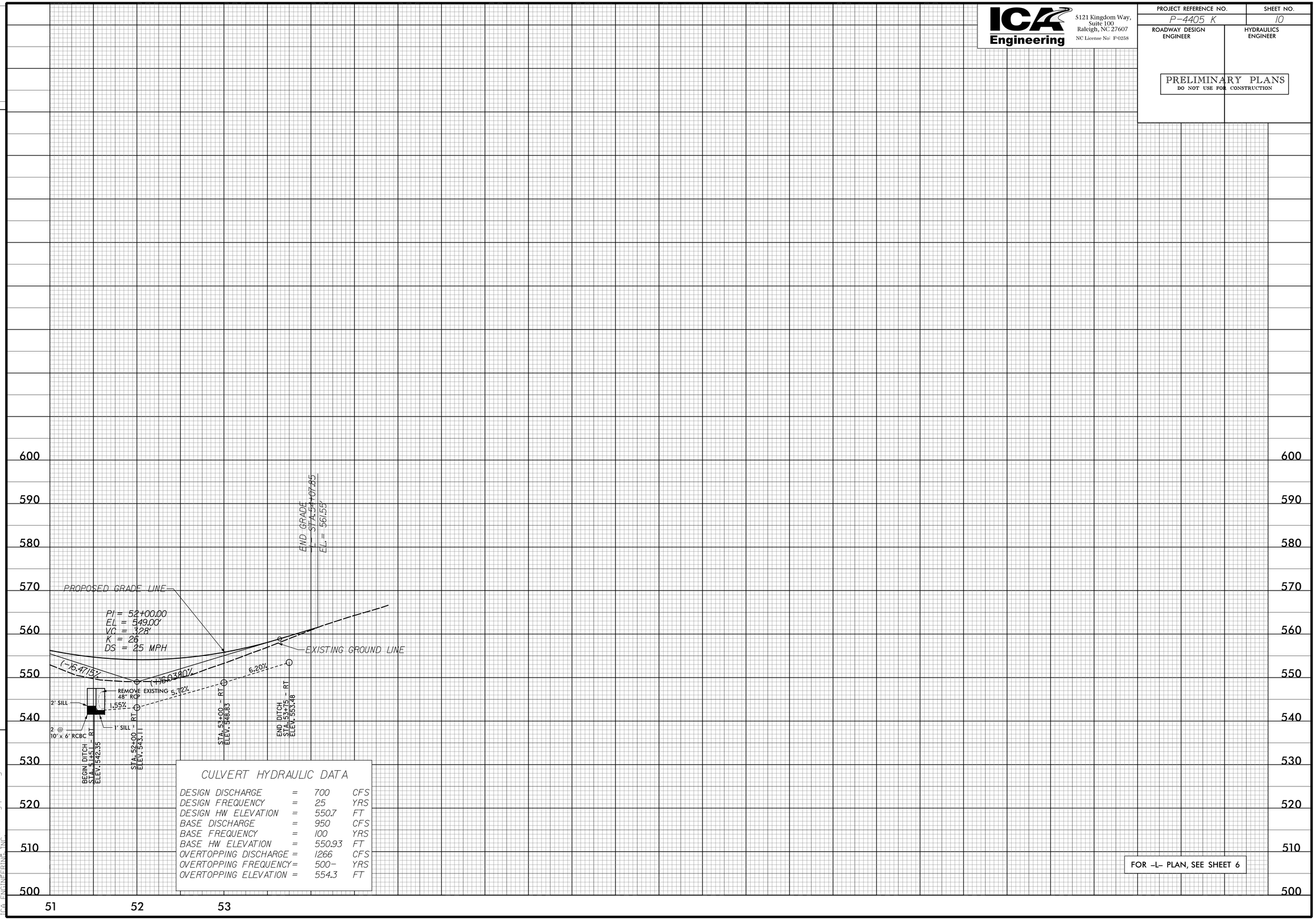
ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DGN 0007T_P21o

REVISIONS



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	700	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	550.7	FT
BASE DISCHARGE	=	950	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	550.93	FT
OVERTOPPING DISCHARGE	=	1266	CFS
OVERTOPPING FREQUENCY	=	500-	YRS
OVERTOPPING ELEVATION	=	554.3	FT

3/11/2015
R:\Roadway\Proj\p4405k_rdy_pf110.dgn
ICA ENGINEERING, INC.

0007T_P210

DGN

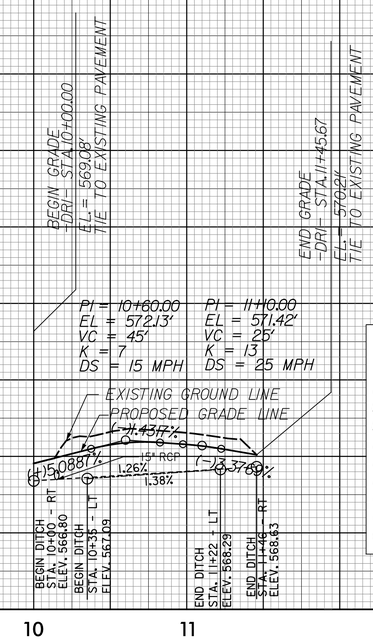
REVISIONS

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
P-4405 K	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DR1-

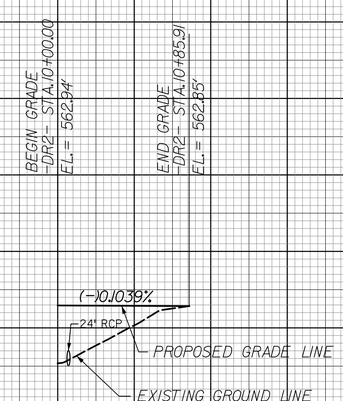


PIPE HYDRAULIC DATA
Sta.10+15 -L- 15" RCP

DRAINAGE AREA	=	0.2	AC
DESIGN FREQUENCY	=	10	YRS
DESIGN DISCHARGE	=	1	CFS
DESIGN HW ELEVATION	=	567.6	FT
100 YEAR DISCHARGE	=	1	CFS
100 YEAR HW ELEVATION	=	567.6	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	10	CFS
OVERTOPPING ELEVATION	=	570.1	FT

FOR -DR1- PLAN, SEE SHEET 6

-DR2-



PIPE HYDRAULIC DATA
Sta.10+07 -L- 24" RCP

DRAINAGE AREA	=	5	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	18	CFS
DESIGN HW ELEVATION	=	559.0	FT
100 YEAR DISCHARGE	=	22	CFS
100 YEAR HW ELEVATION	=	559.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	40	CFS
OVERTOPPING ELEVATION	=	562.9	FT

FOR -DR2- PLAN, SEE SHEET 6

3/11/2015
File: R:\Roadway\Proj\4405k_rdy_pf11.dgn
Date: 11:01 AM