STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

April 29, 2011

US Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Dr., Suite 105
Wake Forest, NC 27587

Attention: Mr. John Thomas
NCDOT Coordinator, Division 9

Subject: **Application for a Modification to Section 404 Individual Permit and Individual Section 401 Water Quality Certification** for the widening of I-85 from just north of NC 150 to just north of I-85 Business in Davidson County. Federal Aid Project No. NHF-85-3(164)80, WBS 34156.3.6, Division 9, TIP No. I-2304AD.

Reference: Individual 401 Certification No. 3455 issued March 19, 2004
Individual 401 Certification No. 3455 Modification issued November 22, 2004
Individual 404 Permit USACE Action ID 1998-21203 issued December 16, 2004
Individual 404 Permit Extension issued April 1, 2009

Debit $570.00 from WBS 34156.2.2GV2

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes a modification to the existing Individual Section 404 Permit and Section 401 Water Quality Certification for the above referenced project. Originally, the project was permitted with Sections AA and AB; however, the project is now being referred to as Sections AC and AD in order to accommodate contracts and financing. Section AC encompasses what was previously referred to as AA. Section AD includes the area previously referred to as AB. The Design Build contract for Section AD was awarded on January 26, 2011. Impact summary tables and revised permit drawings are enclosed with this application.

The revised design does not compromise NCDOT's compliance with the existing permit conditions. The revision has been evaluated for compliance with the avoidance/minimization criteria and is in compliance with all previous issues, including the following:

- Protected Species
- Aquatic life passage
- FEMA compliance
- Cultural resources

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
NATURAL ENVIRONMENT UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE:
919-707-6000
FAX: 919-212-5785
WWW.NCDOT.ORG

LOCATION:
CENTURY CENTER, BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Permit Site 9

The project is located in HUC 03040103 of the Yadkin River Basin. This modification application is specific to Site 9 for which a 404 Permit was issued on December 16, 2004 and a 401 Permit Modification was issued on November 22, 2004. A 404 Permit Extension was issued on April 1, 2009. Based on the 2004 permit drawings, Site 9 stream impacts total 395 linear feet. Through the Design-Build process, the roadway grade has been lowered through Site 9, which lowers the fill heights and shortens the required culvert length at Site 9. In addition, updated hydraulic data gathered through the Design-Build process warrants extending the inlet and outlet protection to allow for a smoother transition to the existing channel. Class I rip-rap and boulders will be used to stabilize the banks at the outlet of the culvert and construct a low flow bench on the right bank. Coir fiber matting, Class I rip-rap, and boulders will be used to stabilize the banks at the inlet of the culvert and construct a low flow bench on the right bank. Temporary impacts resulting from construction of the temporary diversion channel will total 75 feet. In order to implement these design improvements, NCDOT is requesting a permit modification to reduce permanent stream impacts from 395 linear feet to 366 linear feet (29 linear feet reduction of impacts). Of the 366 linear feet of stream impacts 111 linear feet are for bank stabilization. In addition, NCDOT is requesting to include 75 feet of temporary stream impacts that are not accounted for in the 2004 permit. Wetland impacts at Site 9 remain unchanged from the 2004 permit.

The following table presents the total impacts associated with the previous permit (2004), the current design impacts, and illustrates the differences. For specific site details, please see the attached permit impact summary tables and permit drawings.

ORIGINAL PERMIT IMPACTS							REVISED IMPACTS					
Site No.	Perm. Fill In Wetland (ac)	Excavation In Wetlands (ac)	Mech. Cleanng In Wetland (ac)	Perm. SW Impacts (ac)	Fill In SW (Pond) (ac)	Existing Channel Impacts Perm. (ft)	Perm. Fill in Wetland (ac)	Mech. Cleanng/ Excavat in Wetland (ac)	Perm. SW impact (ac)	*Temp SW impact (ac)	Existing Channel Impacts Perm. (ft)	Existing Channel Impacts Temp. (ft)
1	0.033		0.019									
2				0.021		219						
3	0.463	0.016	0.171	0.062		216						
4	0.071		0.036									
5				0.034		270						
6	0.037		0.026		0.003							
7				0.030		272						
8 (54" RCP)	0.263		0.005	0.009		179						
8 (42" RCP)			0.009	0.014		201						
9	0.039			0.042		395	0.04		0.06	0.01	366	75
10				0.006		59						
TOTALS***:	0.906	0.016	0.266	0.218	0.003	1,811	0.04	0.00	0.06	0.01	366	75
NET CHANGE IN IMPACTS:							0.00	0.00	+0.18	+0.01	-29	+75

*There were no Temporary Impacts noted in the 2004 Permit.

Mitigation

Mitigation through the Ecosystem Enhancement Program (EEP) has been set aside for this project at the time of the 2004 permit. However, additional mitigation will not be required as a result of this modification because the proposed design revisions reduce the amount of permanent stream impacts and wetland impacts remain unchanged.

REGULATORY APPROVAL

Section 404
Request is hereby made for a modification to the USACE Individual 404 Permit as required for the above-described activities.

Section 401
We are hereby requesting a modification to the Section 401 Water Quality Certification from the N.C. Division of Water Quality In compliance with the NCAC Section 143 215.3D(e), we will provide $570.00 to act as payment for processing the Section 401 permit modification. We are providing five (5) copies of this modification request to the NCDWQ for their review and approval.

A copy of this permit modification application will be posted on the DOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Sara Easterly at seeasterly@ncdot.gov or (919) 707-6113.

Sincerely,

E. L. Lusk

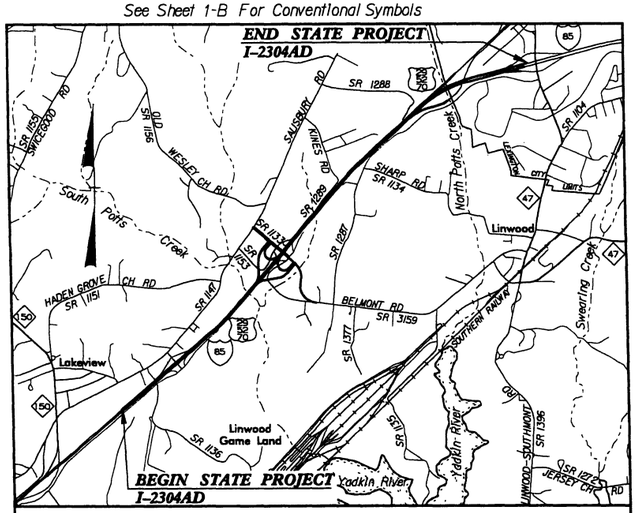
for Gregory J. Thorpe, Ph.D., Manager
Project Development & Environmental Analysis Branch

cc:
NCDOT Permit Application Standard
Distribution List.

09/08/99

CONTRACT: C202382 TIP PROJECT: I-2304AD

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



SKETCH MAP SHOWING THE VICINITY OF STATE PROJECT I-2304AD

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DAVIDSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2304AD	1	

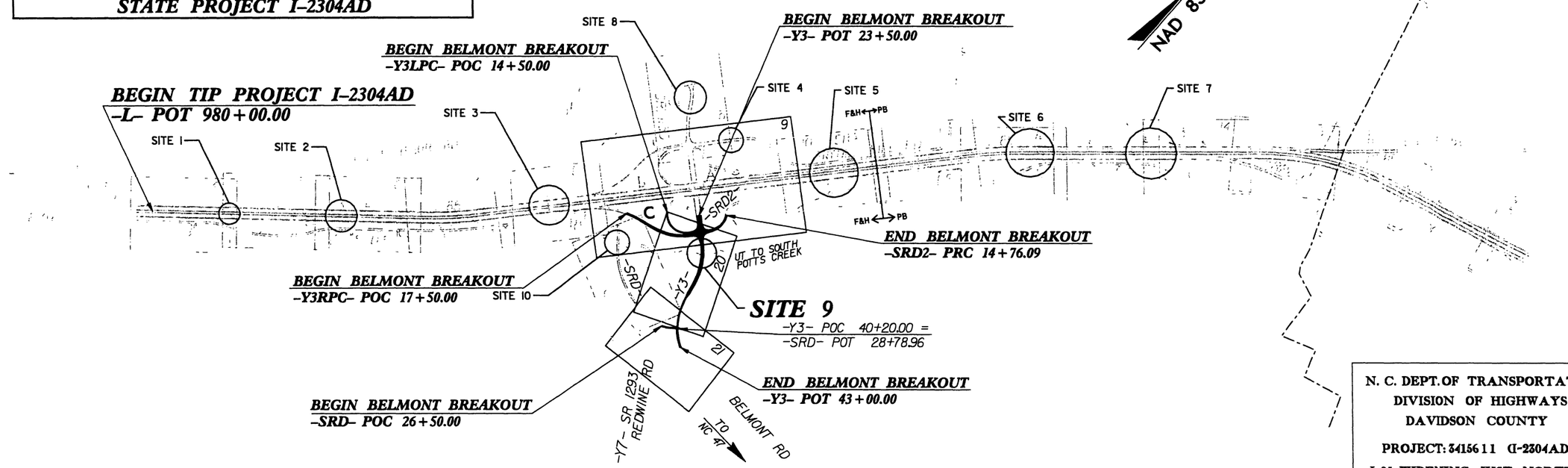
STATE PROJ NO.	F.A. PROJ NO.	DESCRIPTION
34156.1.1	NHF-85-3(164)80	P.E.
34156.2.3		R/W, UTIL
34156.3.6		CONST.

PERMIT IMPACT DRAWINGS
(BELMONT EAST BREAKOUT)
SUBMITTAL NO: D-010
DATE APRIL 13, 2011

LOCATION: I-85 WIDENING FROM JUST NORTH OF NC 150 TO JUST NORTH OF I-85 BUSINESS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, RESURFACING, STRUCTURES, CULVERTS, SIGNING, & ITS

BELMONT EAST BREAKOUT WETLAND & STREAM IMPACTS



THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DAVIDSON COUNTY

PROJECT: 34156.1.1 (I-2304AD)

I-85 WIDENING JUST NORTH OF NC 150 TO JUST NORTH OF I-85 BUSINESS

SHEET 1 OF 6

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 2009 = 59,600
ADT 2035 = 110,200
DHV = 10 %
D = 55 %
T = 25 % *
V = 70 MPH
* 19% TTST + 6% DUALS
FUNC CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-2304AD	= 3.789 MILES
LENGTH STRUCTURES TIP PROJECT I-2304AD	= 0.012 MILES
TOTAL LENGTH TIP PROJECT I-2304AD	= 3.801 MILES

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 21, 2010

LETTING DATE: JANUARY 18, 2011

Prepared In the Office of:

Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-861-0266
NC LIC NO F-0258

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
704-342-8401
NC LIC NO F-0195

STEPHEN R. WHITLEY, PE
PROJECT ENGINEER

DAVID C. WALLER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

4/13/2011
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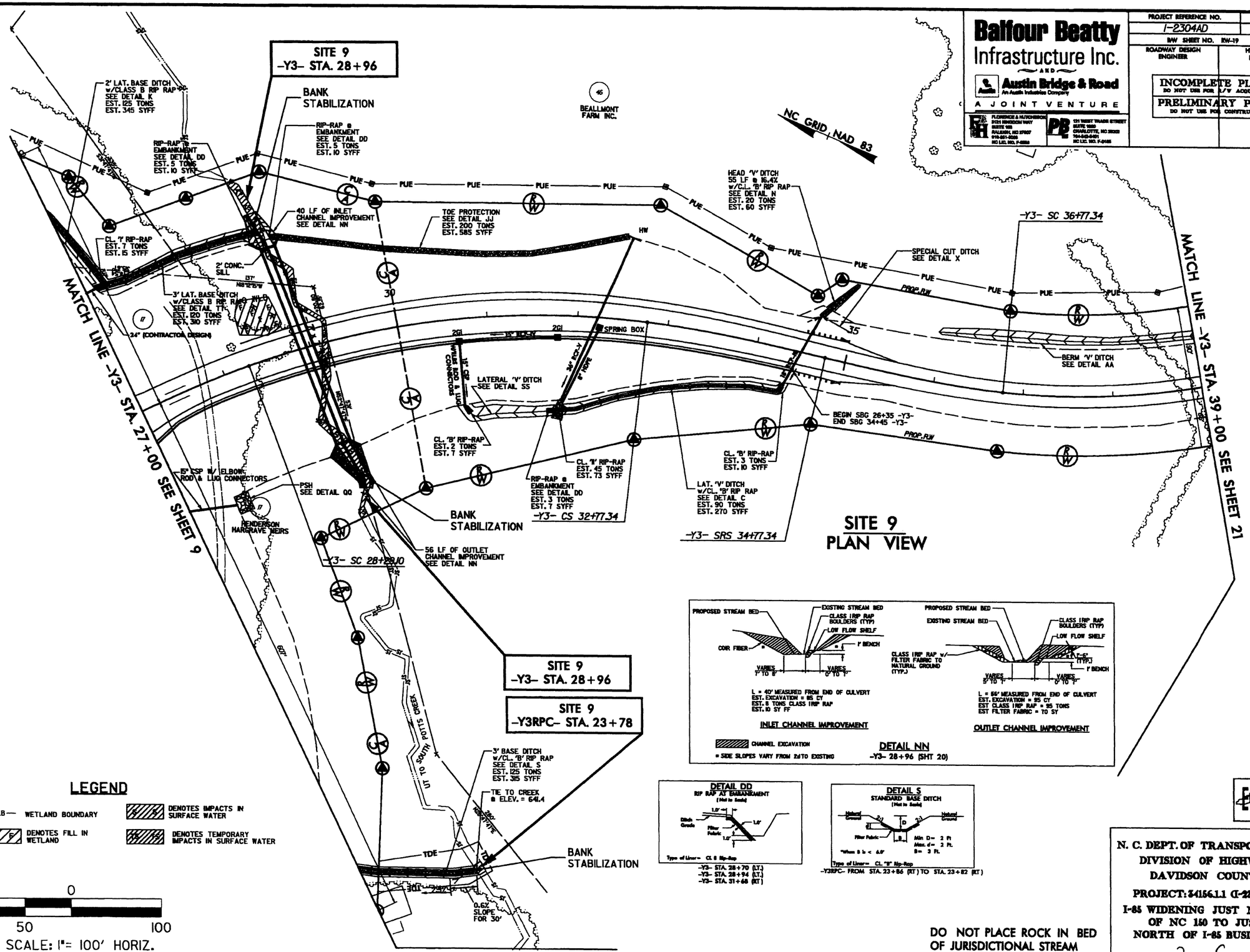
Florence & Hutcheson, Inc.

8/17/99



Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON 3101 INTERCOM WAY SUITE 100 RALEIGH, NC 27607 919-851-2003 NC LIC. NO. F-0893

PB 121 WEST TRADE STREET SUITE 2600 CHARLOTTE, NC 28202 704-342-0451 NC LIC. NO. F-0845

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	20
R/W SHEET NO. RW-19	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAM

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DAVIDSON COUNTY

PROJECT: 34156.1.1 (I-2304AD)
I-85 WIDENING JUST NORTH OF NC 150 TO JUST NORTH OF I-85 BUSINESS

SHEET 2 OF 6

4/28/2011
R:\Highways\PERMITS_Environmental\Drawings\I2304ad_hyd_prm_wet_psh20.dgn
Bentley Systems, Inc.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	20
R/W SHEET NO. RW-19	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

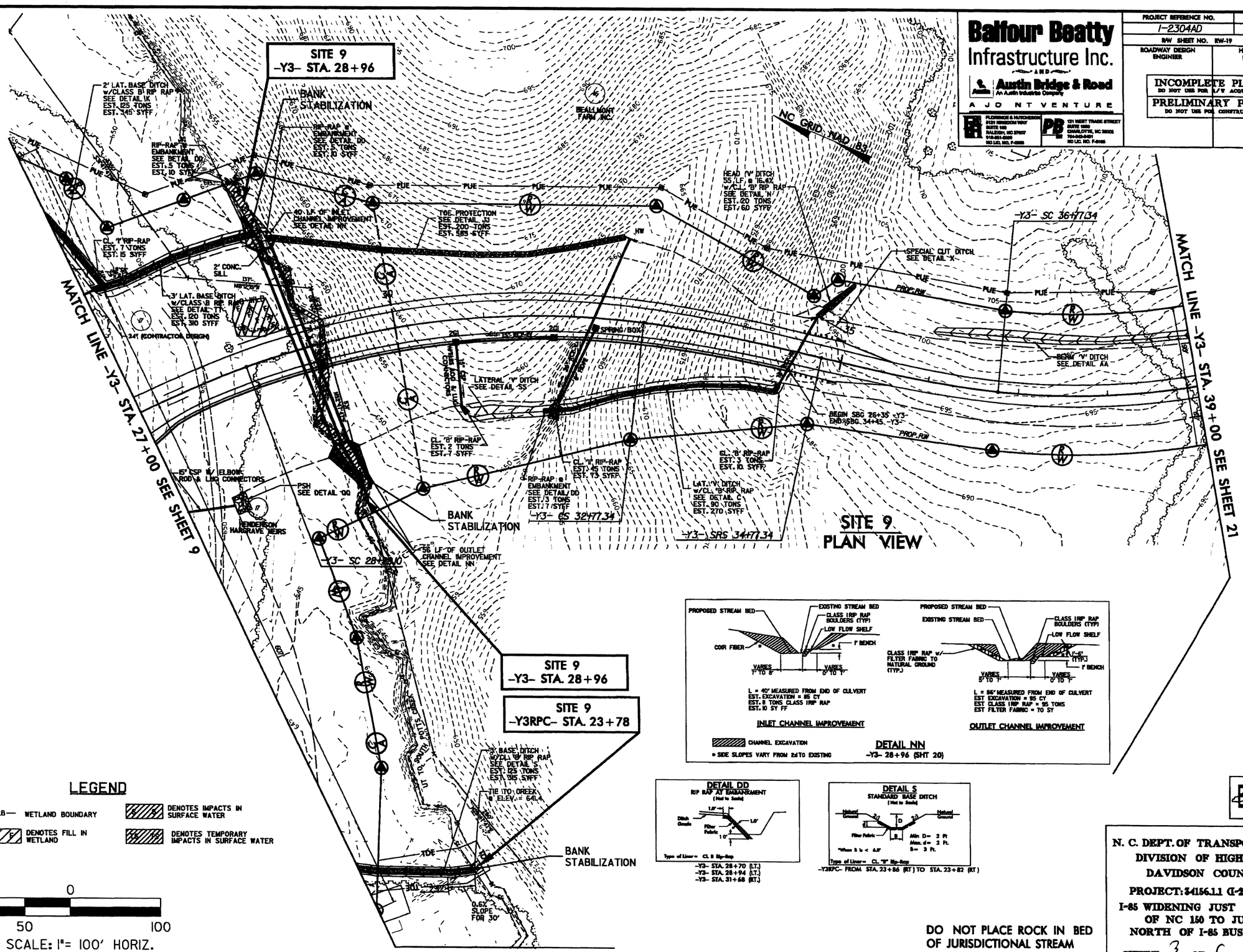
Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGSWAY
SUITE 100
RALEIGH, NC 27607
919-851-9020
NO LIC. NO. F-0893

PB
121 WEST TRADE STREET
SUITE 1900
CHARLOTTE, NC 28202
704-345-8401
NO LIC. NO. F-0116

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DETAIL NN
-Y3- 28+96 (SHT 20)

-Y3- STA. 28+70 (LT.)
-Y3- STA. 28+94 (LT.)
-Y3- STA. 31+68 (RT.)

-Y3RPC- FROM STA. 23+86 (RT.) TO STA. 23+82 (RT.)

DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAM

ENGLISH

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 34156.1.1 (I-2304AD)
I-85 WIDENING JUST NORTH OF NC 150 TO JUST NORTH OF I-85 BUSINESS

SHEET 3 OF 6

4/28/201
R:\Groups\PERMITS_Environmental\Drawings\2304ad_hyd_prm_vet_psh20.dgn
Florence & Hutcheson, Inc.

5/28/99

-Y3-

NOT A PART OF THIS SUBMITTAL

Balfour Beatty Infrastructure Inc. AND **Austin Bridge & Road** An Austin Industries Company

A JOINT VENTURE

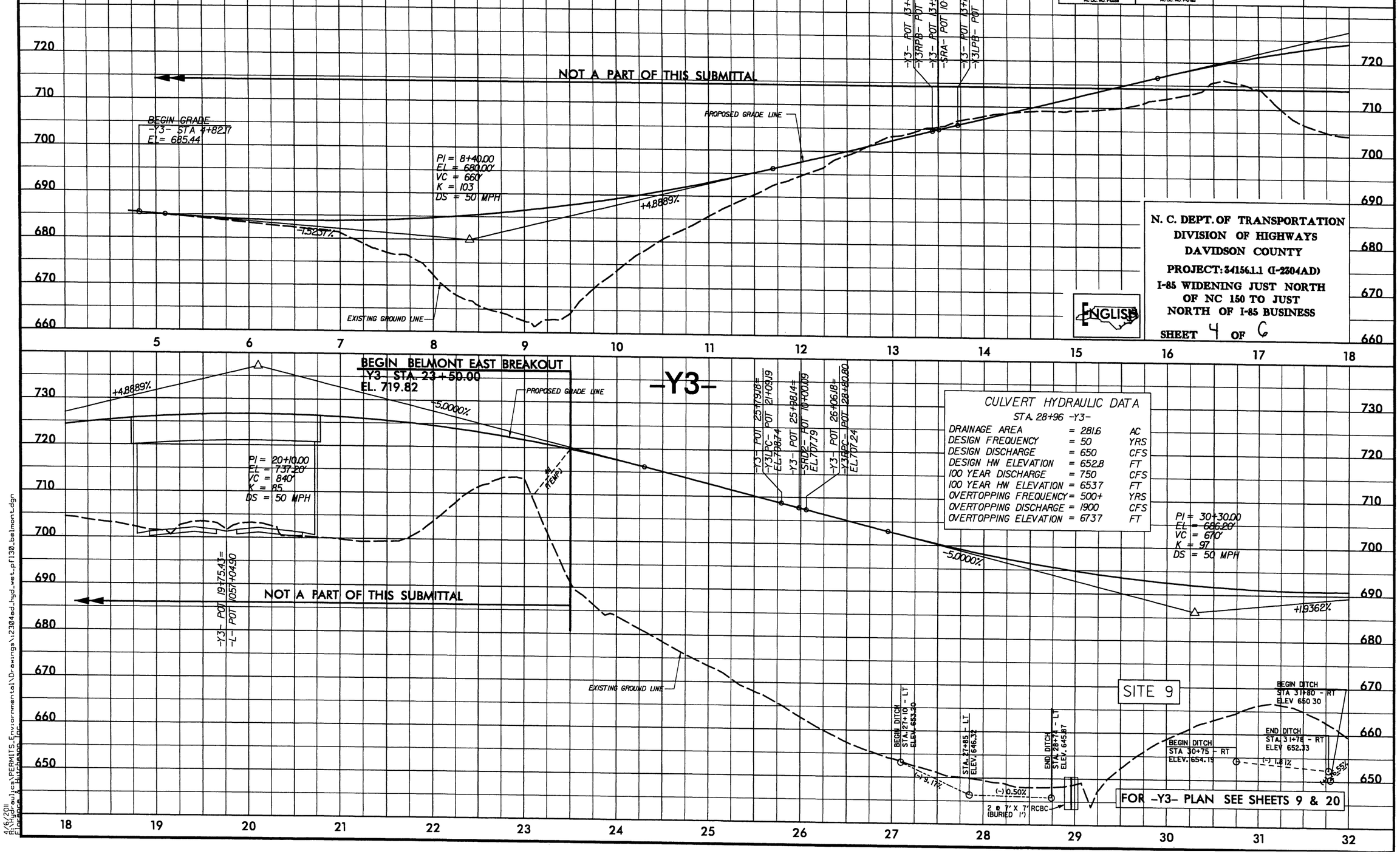
FLORENCE & HUTCHESON, 5121 KINGSDOWN WAY, SUITE 100, RALEIGH, NC 27607, 919-851-9286, NC LIC. NO. F-0258

PB, 121 WEST TRADE STREET, SUITE 1950, CHARLOTTE, NC 28202, 704-342-5401, NC LIC. NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 34156.1.1 (I-2304AD)
I-85 WIDENING JUST NORTH OF NC 150 TO JUST NORTH OF I-85 BUSINESS
SHEET 4 OF 6

ENGLISH

4/6/(201)
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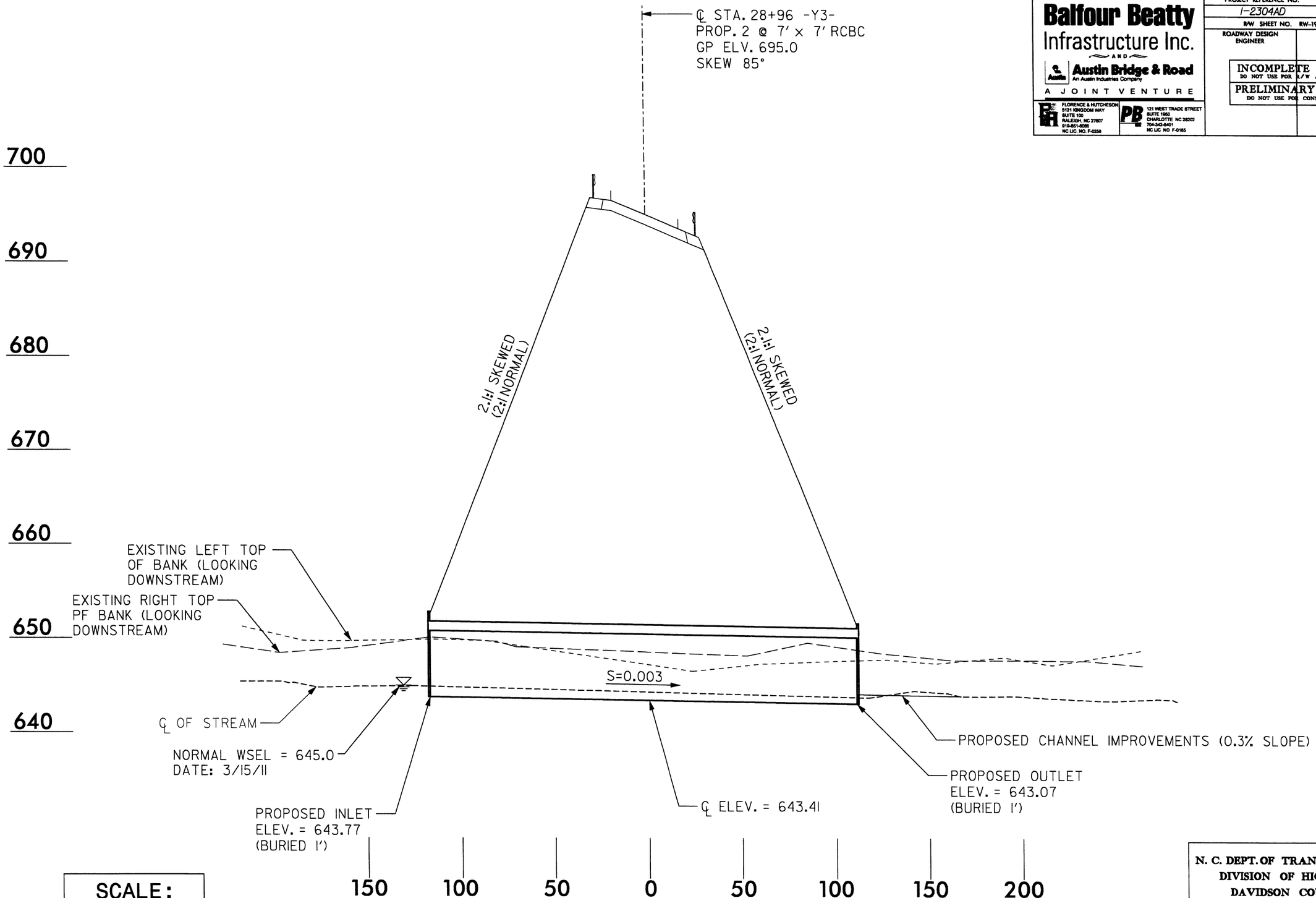
Florence & Hutcheson, Inc.

8/17/99

Balfour Beatty Infrastructure Inc. AND Austin Bridge & Road An Austin Industries Company — A JOINT VENTURE	PROJECT REFERENCE NO.	SHEET NO.
	I-2304AD	
	R/W SHEET NO. RW-19	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS — DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION		

FLORENCE & HUTCHESON, 5121 KINGDOM WAY, SUITE 100, RALEIGH, NC 27607, 919-851-6055, NC LIC. NO. F-0258

PB, 121 WEST TRADE STREET, SUITE 1950, CHARLOTTE, NC 28202, 704-342-6401, NC LIC NO F-0165



SCALE:
1" = 50' HORIZONTAL
1" = 10' VERTICAL

PROFILE ALONG STRUCTURE
SITE 9

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 34156.1.1 (I-2304AD)
I-85 WIDENING JUST NORTH OF NC 150 TO JUST NORTH OF I-85 BUSINESS

SHEET 5 OF 6

ENGLISH

4/6/2011
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Florence & Hutcheson, Inc.

			REVISED - WETLAND PERMIT IMPACT SUMMARY										
			WETLAND IMPACTS					SURFACE WATER IMPACTS					
Site No	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW Impacts (ac)	Fill in SW Pond (ac)	Temp SW Impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp (ft)	Natural Stream Design (ft)
1													
2													
3													
4													
5													
6													
7													
8													
9	-Y3- 28+70L / -Y3- 29+67R	2 @ 7' x 7' RCBC w/2' CONC. SILL	0.04					0.04		0.01	255	75	
	BANK STABILIZATION							0.02			111		
10													
TOTALS.				0.00	0.00	0.00	0.00	0.06	0.00	0.01	366	75	0.00
											441		

NOTE:

1 **TEMPORARY SW IMPACTS HAVE BEEN QUANTIFIED ON THE REVISED IMPACT SUMMARY**

2 **BANK STABILIZATION, AN ALLOWABLE PERMANENT IMPACT, HAS BEEN QUANTIFIED, SEPARATELY ON THE REVISED IMPACT SUMMARY**

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BELMONT EAST BREAKOUT
DAVIDSON COUNTY
WBS - 34156 1 1 (I-2304AD)

SHEET 6 of 6

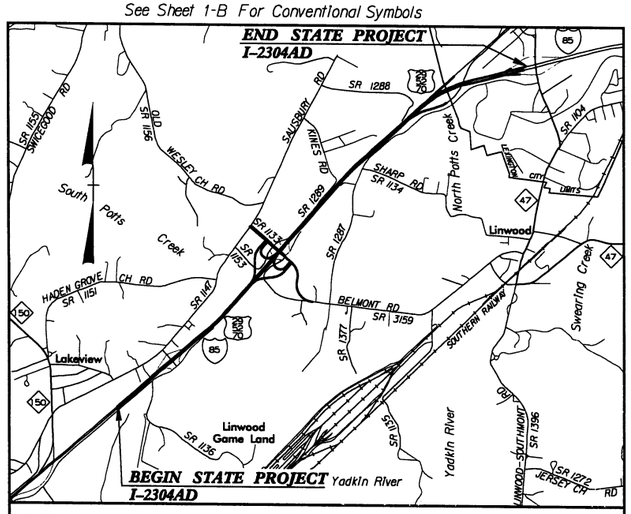
4/13/2011

ATN Revised 3/31/05

09/08/99

CONTRACT: C202382 TIP PROJECT: I-2304AD

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



SKETCH MAP SHOWING THE VICINITY OF STATE PROJECT I-2304AD

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DAVIDSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2304AD	1	

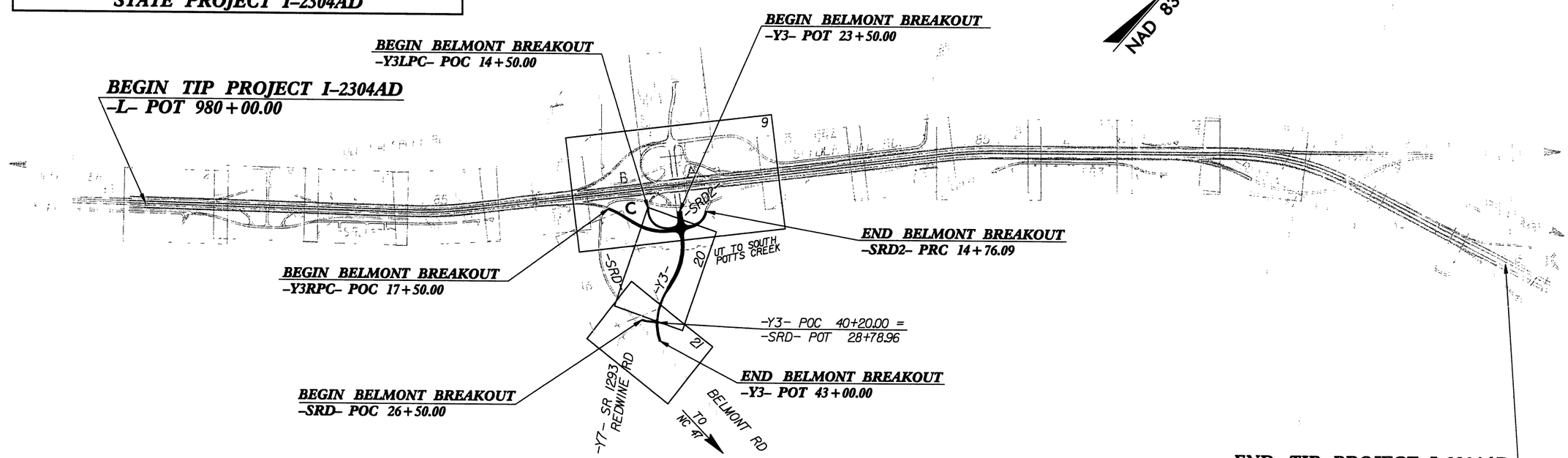
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34156.1.1	NHF-85-3(164)80	P.E.
34156.2.3		R/W, UTIL
34156.3.6		CONST.

LOCATION: I-85 WIDENING FROM JUST NORTH OF NC 150 TO JUST NORTH OF I-85 BUSINESS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, RESURFACING, STRUCTURES, CULVERTS, SIGNING, & ITS

FINAL PLANS
(BELMONT EAST BREAKOUT)
SUBMITTAL NO: D-006
DATE: APRIL 7, 2011

BELMONT EAST BREAKOUT



THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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 2009 = 59,600
ADT 2035 = 110,200
DHV = 10 %
D = 55 %
T = 25 % *
V = 70 MPH
* 19% TTST + 6% DUALS
FUNC CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-2304AD	= 3.789 MILES
LENGTH STRUCTURES TIP PROJECT I-2304AD	= 0.012 MILES
TOTAL LENGTH TIP PROJECT I-2304AD	= 3 801 MILES

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 21, 2010

LETTING DATE: JANUARY 18, 2011

Prepared in the Office of:

Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
8121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-9056
NC LIC. NO. F-0255

121 WEST TRADE STREET
SUITE 1860
CHARLOTTE NC 28202
704-343-6401
NC LIC. NO. F-0195

STEPHEN R. WHITLEY, PE
PROJECT ENGINEER

DAVID C. WALLER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

4/13/2011
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Florence & Hutcheson, Inc.

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	I-A

ROADWAY DESIGN ENGINEER

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2 thru 2-F	PAVEMENT SCHEDULE TYPICAL SECTIONS AND WEDGING DETAILS
2-G	DITCH DETAILS
2-J	INTERSECTION DETAILS
9 20 21	PLAN SHEETS
30 31 32 34 36 39	PROFILE SHEETS
RW-9 RW-19 RW-20	RIGHT-OF-WAY PLANS
X-1 THRU X-42	CROSS-SECTIONS

GENERAL NOTES:

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-30-08

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD NO 225 04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS

SHOULDER CONSTRUCTION:

ASPHALT EARTH AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD NO 560 01

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS STREETS AND DRIVES ENTERING THIS PROJECT THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD NO 240 01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD NO 816 03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER

DRIVEWAYS:

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD NO 848 04 USING THE RADII NOTED ON PLANS

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT

EFF 07-18-06
REV 01-02-07

2006 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in Roadway Standard Drawings Highway Design Branch - N C Department of Transportation - Raleigh N C Dated July 18 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD NO	TITLE
DIVISION 2 - EARTHWORK	
200 03	Method of Clearing - Method III
225 01	Guide for Grading Subgrade - Interstate and Freeway
225 02	Guide for Grading Subgrade - Secondary and Local
225 04	Method of Obtaining Superelevation - Two Lane Pavement
225 06	Method of Grading Sight Distance at Intersections
240 01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
310 02	Parallel Pipe End Section - Precast Concrete Section for 15 to 24 Pipe
310 03	Cross Pipe End Section - Precast Concrete Section for 18 to 30 Pipe
310 10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE BASES AND SHOULDERS	
560 01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560 02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 8 - INCIDENTALS	
806 01	Concrete Right-of-Way Marker
806 02	Granite Right-of-Way Marker
816 01	Concrete Pads - for Shoulder Drain Installation
816 04	Markers for Drainage Structure and Concrete Pad
838 01	Concrete Endwall for Single and Double Pipe Culverts - 15 thru 48 Pipe 90 Skew
838 80	Precast Endwalls - 12' thru 72" Pipe 90 Skew
840 00	Concrete Base Pad for Drainage Structures
840 01	Brick Catch Basin - 12' thru 54' Pipe
840 02	Concrete Catch Basin - 12' thru 54' Pipe
840 03	Frame Grates and Hood - for Use on Standard Catch Basin
840 04	Concrete Open Throat Catch Basin - 12' thru 48" Pipe
840 16	Drop Inlet Frame and Grates - for use with Std Dwg 840 14 and 840 15
840 18	Concrete Grated Drop Inlet Type 'B' - 12' thru 36" Pipe
840 25	Anchorage for Frames - Brick or Concrete (Beg January 2007 Let Use Detail in Lieu of Standard)
840 27	Brick Grated Drop Inlet Type 'B' - 12" thru 36 Pipe
840 31	Concrete Junction Box - 12' thru 66' Pipe
840 32	Brick Junction Box - 12 thru 66 Pipe
840 41	Spring Box - Concrete or Brick
840 45	Precast Drainage Structure
840 51	Brick Manhole - 12' thru 36 Pipe
840 52	Precast Manhole - 4 5' and 6' Diameter
840 54	Manhole Frame and Cover
846 01	Concrete Curb Gutter and Curb & Gutter
846 04	Drop Inlet Installation in Shoulder Berm Gutter
848 04	Street Turnout
850 10	Guide for Berm Drainage Outlet - 15 and 18 Pipe
852 01	Concrete Islands
862 01	Guardrail Placement
862 02	Guardrail Installation
866 02	Woven Wire Fence - with Wood Post
876 01	Rip Rap in Channels
876 02	Guide for Rip Rap at Pipe Outlets
876 04	Drainage Ditches with Class 'B' Rip Rap

8/17/99
(13/20)
\\Roadway\Proj\Belmont\i2304ad_rdy_sheets_belmont.dgn
Parsons & Hutchison Inc

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	I-B

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 — CIP
- Property Corner
- Property Monument — CM
- 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

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
- 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 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 Wheel Chair Ramp — WCR
- 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 — HH
- 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 — HH
- 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
- Designated U/G Water Line (S U E *)
- 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 — PUTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S U E *)
- Abandoned According to Utility Records — AATUR
- End of Information — E O I

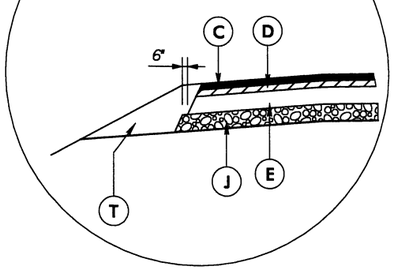
8/17/99

PAVEMENT SCHEDULE

A1	14" PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED WITH DOWELS)	E4	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25 0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 5 5" IN DEPTH OR LESS THAN 3" IN DEPTH
C1	PROP. APPROX 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YARD.		
C2	PROP. APPROX 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD.	J1	PROP 6" AGGREGATE BASE COURSE
C3	PROP. APPROX 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.	J2	PROP 8" AGGREGATE BASE COURSE
C4	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 2 0" IN DEPTH OR LESS THAN 1 5" IN DEPTH	J3	PROP 10" AGGREGATE BASE COURSE
D1	PROP. APPROX 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19 0B, AT AN AVERAGE RATE OF 285 LBS.PER SQ. YARD.	K	LIME STABILIZATION: (METHOD–SLURRY) 75% OF PROJECT: DEPTH OF 8", AT A RATE OF 36 LBS. PER SQ. YD. OR CEMENT STABILIZATION: 25% OF PROJECT: DEPTH OF 7", AT A RATE OF 54 LBS PER SQ YD
D2	PROP. APPROX 3.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19 0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YARD.	P	PRIME COAT AT THE RATE OF 35 GAL PER SQ YD
D3	PROP. APPROX. 4.0" ASPHALT CONCRETE INTER–MEDIATE COURSE, TYPE I19 0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'–6" CONCRETE CURB AND GUTTER
D4	PROP. VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19 0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 4 0" IN DEPTH OR LESS THAN 2 5" IN DEPTH	R2	4'–0" CONCRETE EXPRESSWAY GUTTER
		R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
E1	PROP. APPROX 3.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YARD.	T	EARTH MATERIAL
E2	PROP. APPROX 3.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YARD.	U	EXISTING PAVEMENT
E3	PROP. APPROX 7.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 428 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.	W	WEDGING

BITUMINOUS CONCRETE PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

PAVEMENT EDGE DETAIL WITH ABC



Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-6066
NC LIC. NO. F-0258

121 WEST TRADE STREET
SUITE 1950
CHARLOTTE NC 28202
704-342-5401
NC LIC NO F-0155

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/13/2011
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Florence & Hutcheson Inc.

8/17/99

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Austin Bridge & Road
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919-851-6095
NC LIC. NO. F-0258

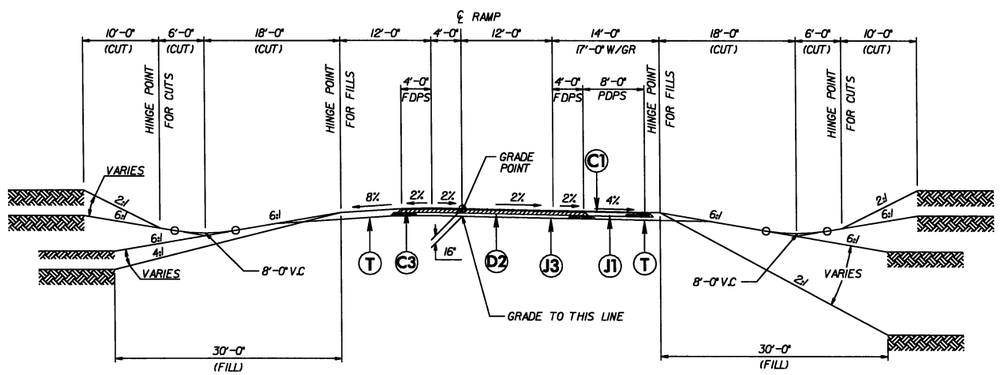
PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE NC 28202
704-342-5401
NC LIC NO F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTES:
* SHOULDER WIDTH INCREASED 3' WHERE GUARDRAIL IS USED
** FILL SLOPES WITHIN THE INTERCHANGES WILL BE 4:1 OR FLATTER
*** SEE CROSS SECTIONS FOR VARIABLE SLOPES
FOR PAVEMENT EDGE DETAIL WITH ABC, SEE TYPICAL SHEET 2



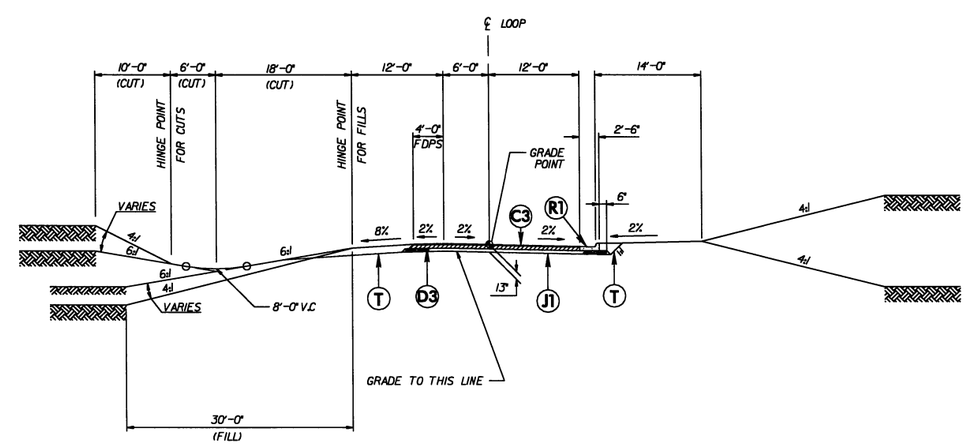
TYPICAL SECTION NO. 2

RAMPS –Y3– INTERCHANGE

USE TYPICAL SECTION NO. 2 AT THE FOLLOWING STATIONS

–Y3RPC– Sta 17+50 00 TO 28+12 15

C2	1.5" ACSC TYPE S9.5B
C3	3" ACSC TYPE S9.5B
D2	3" ACIC TYPE I19.0B
D3	4" ACIC TYPE I19.0B
E3	7.5" ACBC TYPE B25.0B
E4	VAR. DP. ACBC TYPE B25.0B
J1	6" ABC
J3	10" ABC
R1	2'-6" CURB & GUTTER
T	EARTH MATERIAL



TYPICAL SECTION NO. 3

LOOPS –Y3– INTERCHANGE

USE TYPICAL SECTION NO. 3 AT THE FOLLOWING STATIONS

–Y3LPC– Sta 14+50 00 TO 20+40 53

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Balfour Beatty Infrastructure Inc. AND Austin Bridge & Road An Austin Industries Company — A JOINT VENTURE	PROJECT REFERENCE NO.	SHEET NO.
	I-2304AD	2-B
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

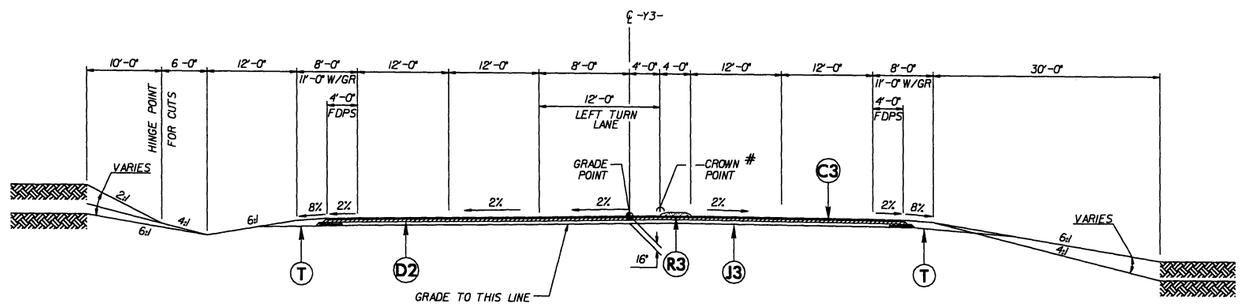
FLORENCE & HUTCHESON, 5121 KINGDOM WAY, SUITE 100, RALEIGH, NC 27607, 919-851-6066, NC LIC. NO. F-0258

PB, 121 WEST TRADE STREET, SUITE 1950, CHARLOTTE, NC 28202, 704-342-5401, NC LIC NO F-0155

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTES:
* SHOULDER WIDTH INCREASED 3' WHERE GUARDRAIL IS USED
** FILL SLOPES WITHIN THE INTERCHANGES WILL BE 4:1 OR FLATTER
*** SEE CROSS SECTIONS FOR VARIABLE SLOPES
FOR PAVEMENT EDGE DETAIL WITH ABC, SEE TYPICAL SHEET 2



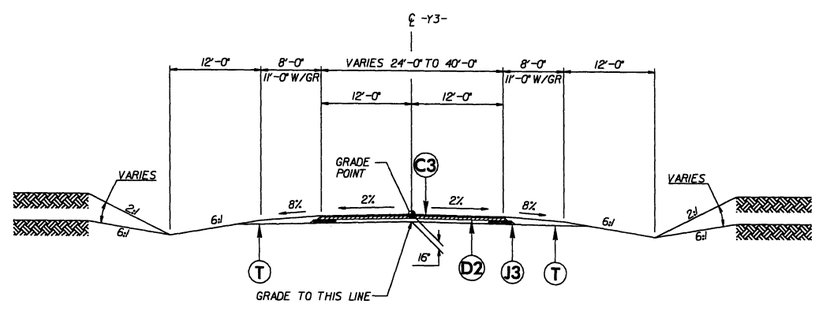
TYPICAL SECTION NO. 5

BELMONT RD. -Y3-
INSIDE INTERCHANGE

USE TYPICAL SECTION NO. 5 AT THE FOLLOWING STATIONS

-Y3- Sta 23+50 00 TO Sta 26+06 18

#CROWN POINT AND ISLAND LOCATION VARIES, SEE PLANS



TYPICAL SECTION NO. 6

BELMONT RD. -Y3-
EAST OF INTERCHANGE

USE TYPICAL SECTION NO. 6 AT THE FOLLOWING STATIONS

-Y3- Sta 26+06 18 TO 43+00 00

C3	3" ACSC TYPE S9.5B
D2	3" ACIC I19.0B
J3	10" ABC
R3	5" MONO CONC. ISLAND (KEYED IN)
T	EARTH MATERIAL

13/2011
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ersence & Hutcheson, Inc.

8/17/99

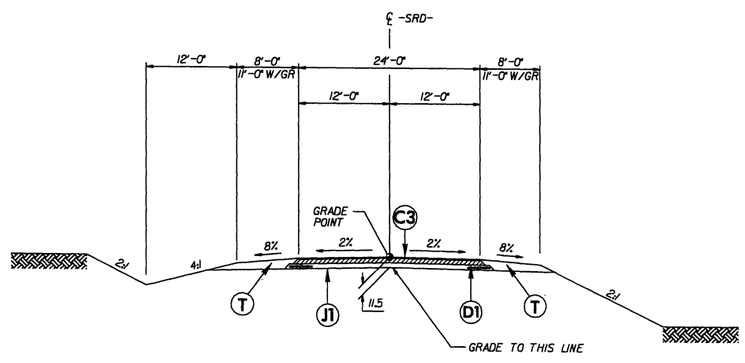
Balfour Beatty Infrastructure Inc. AND Austin Bridge & Road An Austin Industries Company A JOINT VENTURE	PROJECT REFERENCE NO.	SHEET NO.
	I-2304AD	2-D
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

FLORENCE & HUTCHESON 5121 KINGDOM WAY SUITE 100 RALEIGH, NC 27607 919-851-8085 NC LIC. NO. F-0258

PB 121 WEST TRADE STREET SUITE 1850 CHARLOTTE, NC 28202 704-343-5401 NC LIC NO F-0165

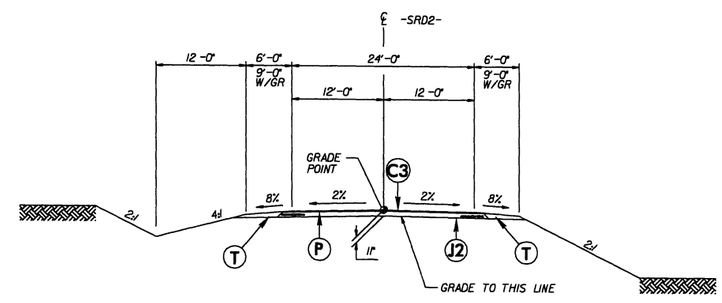
NOTES:
* SHOULDER WIDTH INCREASED 3' WHERE GUARDRAIL IS USED
** FILL SLOPES WITHIN THE INTERCHANGES WILL BE 4:1 OR FLATTER
*** SEE CROSS SECTIONS FOR VARIABLE SLOPES
FOR PAVEMENT EDGE DETAIL WITH ABC, SEE TYPICAL SHEET 2

C3	3" ACSC TYPE S9.5B
C4	VAR. DP. ACSC TYPE S9.5B
D1	2.5" ACIC TYPE I19.0B
D4	VAR. DP. ACIC TYPE I19.0B
J1	6" ABC
J2	8" ABC
R2	4' EXPRESSWAY GUTTER
P	PRIME COAT
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 9A

USE TYPICAL SECTION NO. 9A AT THE FOLLOWING STATIONS
-SRD- Sta 26+50 00 TO 28+66 96



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO 10 AT THE FOLLOWING STATIONS
-SRD2- Sta 10+20 00 TO 14+76 09

9/13/2011
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Florence & Hutcheson Inc.

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	2-G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGDOM WAY
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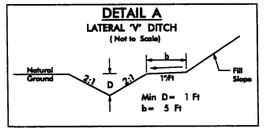
CHARLOTTE, NC 28202
704-342-5401
NC LIC NO F-0165

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

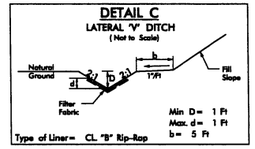
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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



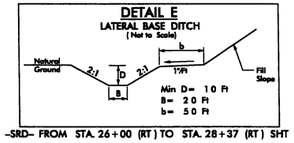
-Y3- FROM STA. 42+00 (LT) TO STA 42+42 (LT) SHT 21

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



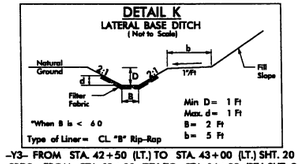
-Y3- FROM STA. 31+80 (RT) TO STA. 34+35 (RT) SHT 20

DETAIL E
LATERAL BASE DITCH
(Not to Scale)



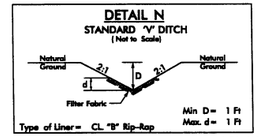
-SRD- FROM STA. 26+00 (RT) TO STA. 28+37 (RT) SHT 9

DETAIL K
LATERAL BASE DITCH
(Not to Scale)



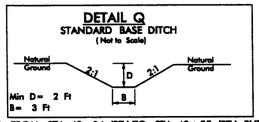
-Y3- FROM STA. 42+50 (LT.) TO STA. 43+00 (LT.) SHT. 20
-SRD2- FROM STA. 12+00 (RT) TO STA. 14+00 (RT) SHT 9
-SRD2- FROM STA. 11+29 (RT) TO STA. 12+00 (RT) SHT 20

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



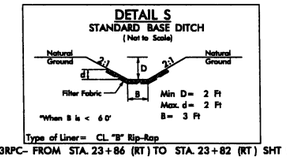
-Y3- FROM STA. 34+64 (LT) TO STA. 34+98 (LT) SHT 21

DETAIL Q
STANDARD BASE DITCH
(Not to Scale)



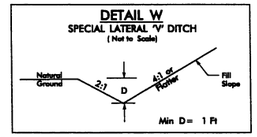
-Y3- FROM STA. 42+04 (RT) TO STA. 42+55 (RT) SHT 21

DETAIL S
STANDARD BASE DITCH
(Not to Scale)



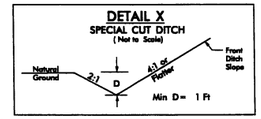
-Y3RPC- FROM STA. 23+86 (RT) TO STA. 23+82 (RT) SHT 9

DETAIL W
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



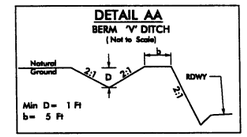
-SRD- FROM STA. 26+00 (LT) TO STA. 28+50 (LT) SHT 9

DETAIL X
SPECIAL CUT DITCH
(Not to Scale)



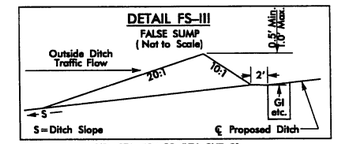
-Y3- FROM STA. 34+50 (LT) TO STA. 34+64 (LT) SHT 20
-Y3- FROM STA. 34+64 (LT.) TO STA. 35+00 (LT.) SHT. 20
-Y3- FROM STA. 39+50 (RT) TO STA. 39+87 (RT) SHT 21
-Y3- FROM STA. 41+50 (LT) TO STA. 42+00 (LT) SHT 21

DETAIL AA
BERM 'V' DITCH
(Not to Scale)



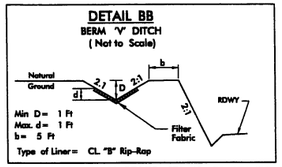
-Y3- FROM STA. 36+00 (LT.) TO STA. 39+00 (LT.) SHT. 20
-Y3- FROM STA. 39+00 (LT.) TO STA. 40+00 (LT.) SHT 21

DETAIL FS-III
FALSE SUMP
(Not to Scale)



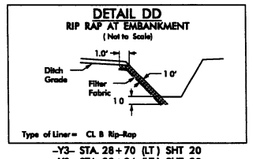
-Y3- STA. 40+55 (LT) SHT 21

DETAIL BB
BERM 'V' DITCH
(Not to Scale)



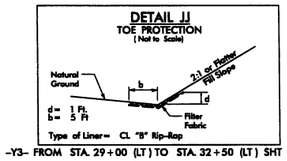
-Y3- FROM STA. 40+00 (LT) TO STA. 40+56 (LT) SHT 21

DETAIL DD
RIP RAP AT EMBANKMENT
(Not to Scale)

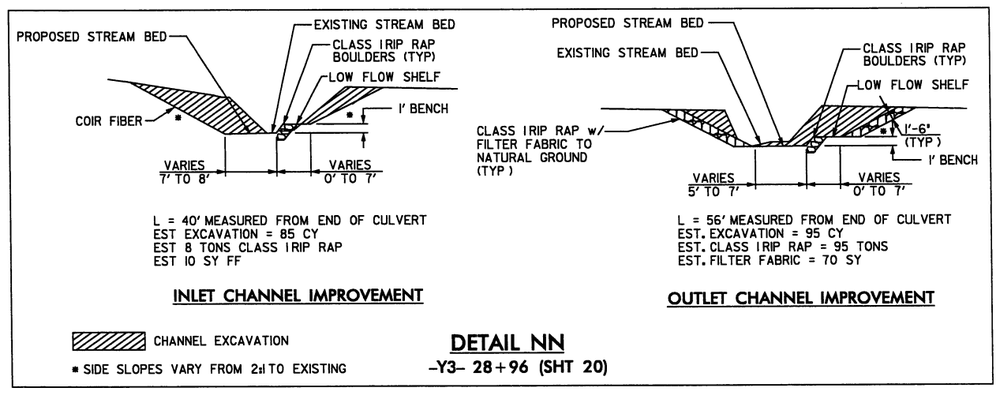


-Y3- STA. 28+70 (LT) SHT 20
-Y3- STA. 28+94 (LT) SHT 20
-Y3- STA. 31+68 (RT) SHT 20

DETAIL JJ
TOE PROTECTION
(Not to Scale)

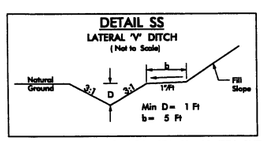


-Y3- FROM STA. 29+00 (LT) TO STA. 32+50 (LT) SHT 20



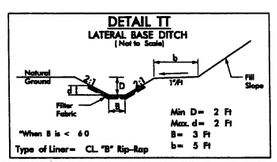
DETAIL NN
-Y3- 28+96 (SHT 20)

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



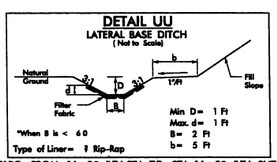
-Y3- FROM STA. 30+75 (RT) TO STA. 31+68 (RT) SHT 20

DETAIL TT
LATERAL BASE DITCH
(Not to Scale)



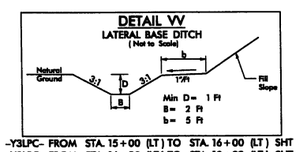
-Y3- FROM STA. 27+10 (LT) TO STA. 28+74 (LT) SHT 20

DETAIL UU
LATERAL BASE DITCH
(Not to Scale)



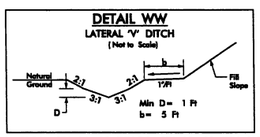
-Y3LPC- FROM 16+20 (LT) STA. TO STA. 16+90 (LT) SHT 9

DETAIL VV
LATERAL BASE DITCH
(Not to Scale)



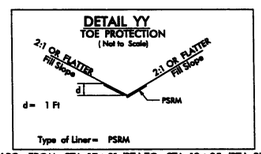
-Y3LPC- FROM STA. 15+00 (LT) TO STA. 16+00 (LT) SHT 9
-Y3LPC- FROM STA. 16+90 (LT) TO STA. 18+82 (LT) SHT 9

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



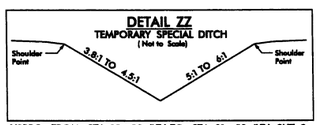
-SRD2- FROM STA 14+00 (RT) TO STA. 15+00 (RT) SHT 9

DETAIL YY
TOE PROTECTION
(Not to Scale)



-Y3LPC- FROM STA. 17+31 (RT) TO STA 18+85 (RT) SHT 9

DETAIL ZZ
TEMPORARY SPECIAL DITCH
(Not to Scale)



-Y3RPC- FROM STA. 18+93 (LT) TO STA. 21+50 (LT) SHT 9

4/13/2011
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Florence & Hutcheson, Inc.

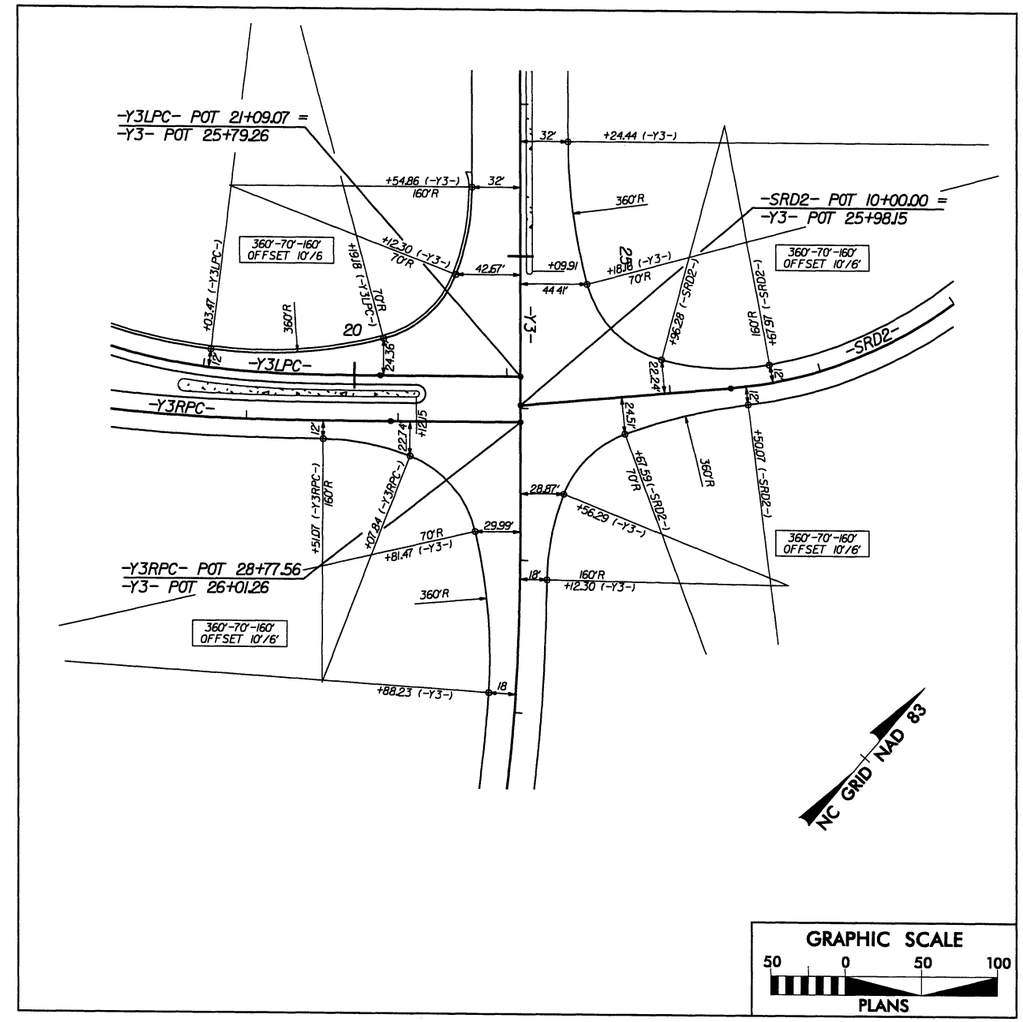
Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-6086
NC LIC. NO. F-0258

121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
704-342-5401
NC LIC NO F-0155

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



INTERSECTION DETAIL

-Y3- (BELMONT RD.) & -Y3RPC-/-Y3LPC-/-SRD2-

FOR PLAN, SEE SHEET NO. 9

8/17/0
4/13/2011
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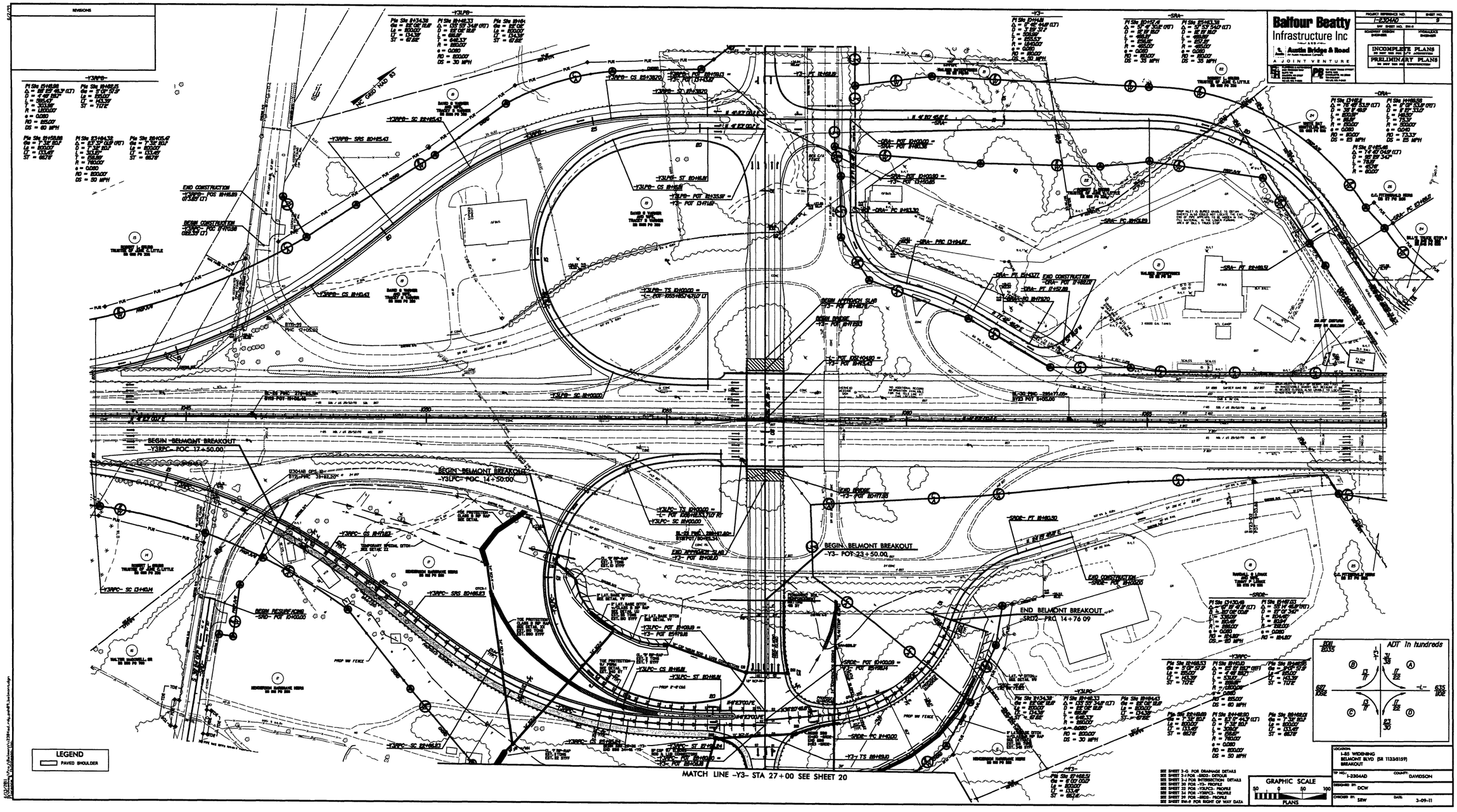
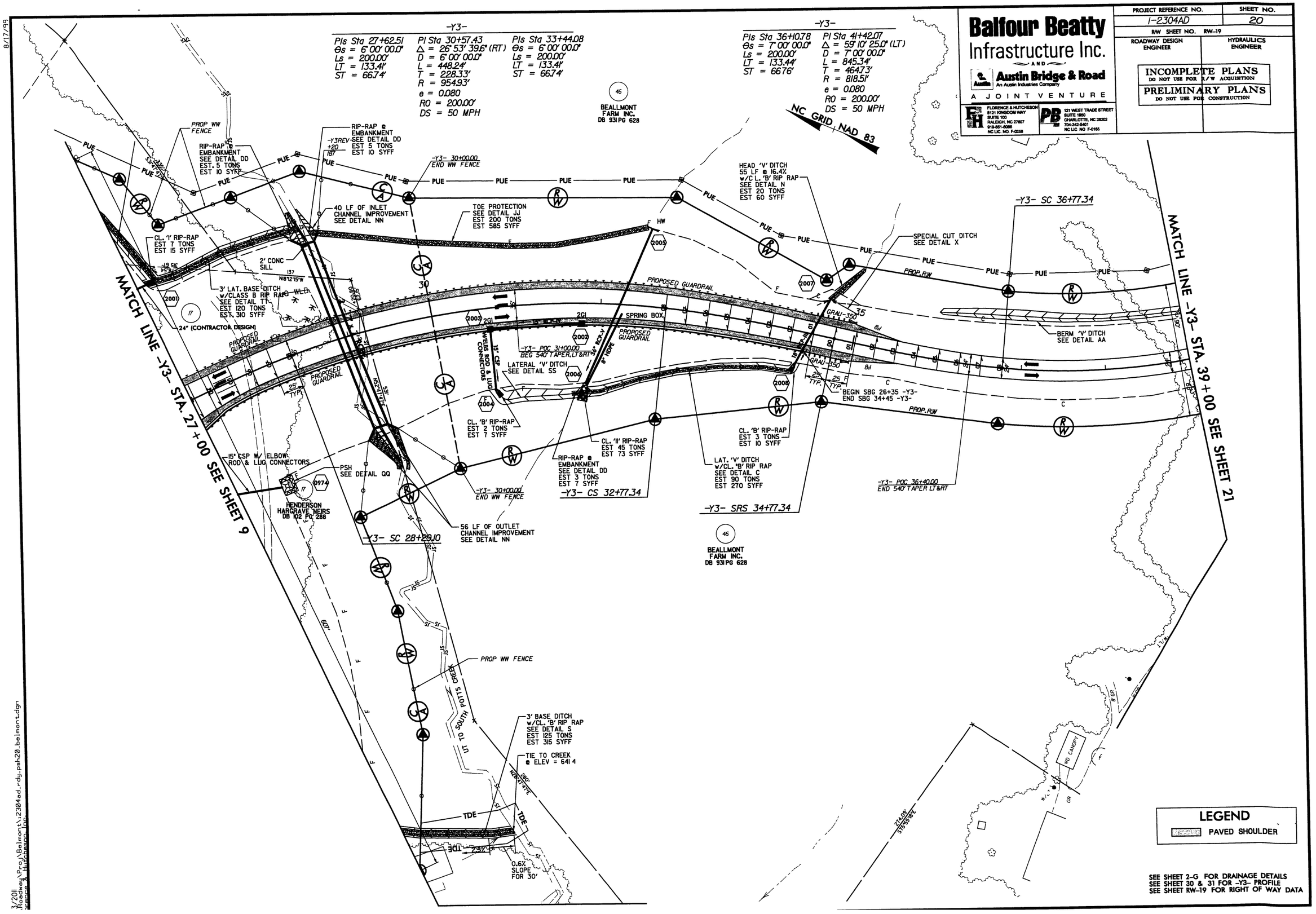
Florence & Hutcheson Inc.



Balfour Beatty
Infrastructure Inc
Austin Bridge & Road
A JOINT VENTURE
INCOMPLETE PLANS
PRELIMINARY PLANS
BEGIN BELMONT BREAKOUT
-Y3RPC- POC 17+50.00
BEGIN BELMONT BREAKOUT
-Y3LPC- POC 14+50.00
BEGIN BELMONT BREAKOUT
-Y3- POT 23+50.00
END BELMONT BREAKOUT
-SRD2- PRC 14+76.09
END CONSTRUCTION
BEGIN CONSTRUCTION
BEGIN APPROACH SLAB
BEGIN BRIDGE
END BRIDGE
END APPROACH SLAB
BEGIN RESURFACING
MATCH LINE -Y3- STA 27+00 SEE SHEET 20
LEGEND
PAVED SHOULDER
ADT in hundreds
GRAPHIC SCALE
PLANS
LOCATION:
I-85 WIDENING
BELMONT BLVD (SR 1133/S159)
BREAKOUT
TIP NO.: I-2304AD
COUNTY: DAVIDSON
DESIGNED BY: DCW
CHECKED BY: SRW
DATE: 3-09-11



Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-8086
NC LIC. NO. F-0258

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
704-342-5401
NC LIC NO F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	20
R/W SHEET NO. RW-19	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

3/2011
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Florence & Hutcheson Inc.

8/17/9

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Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

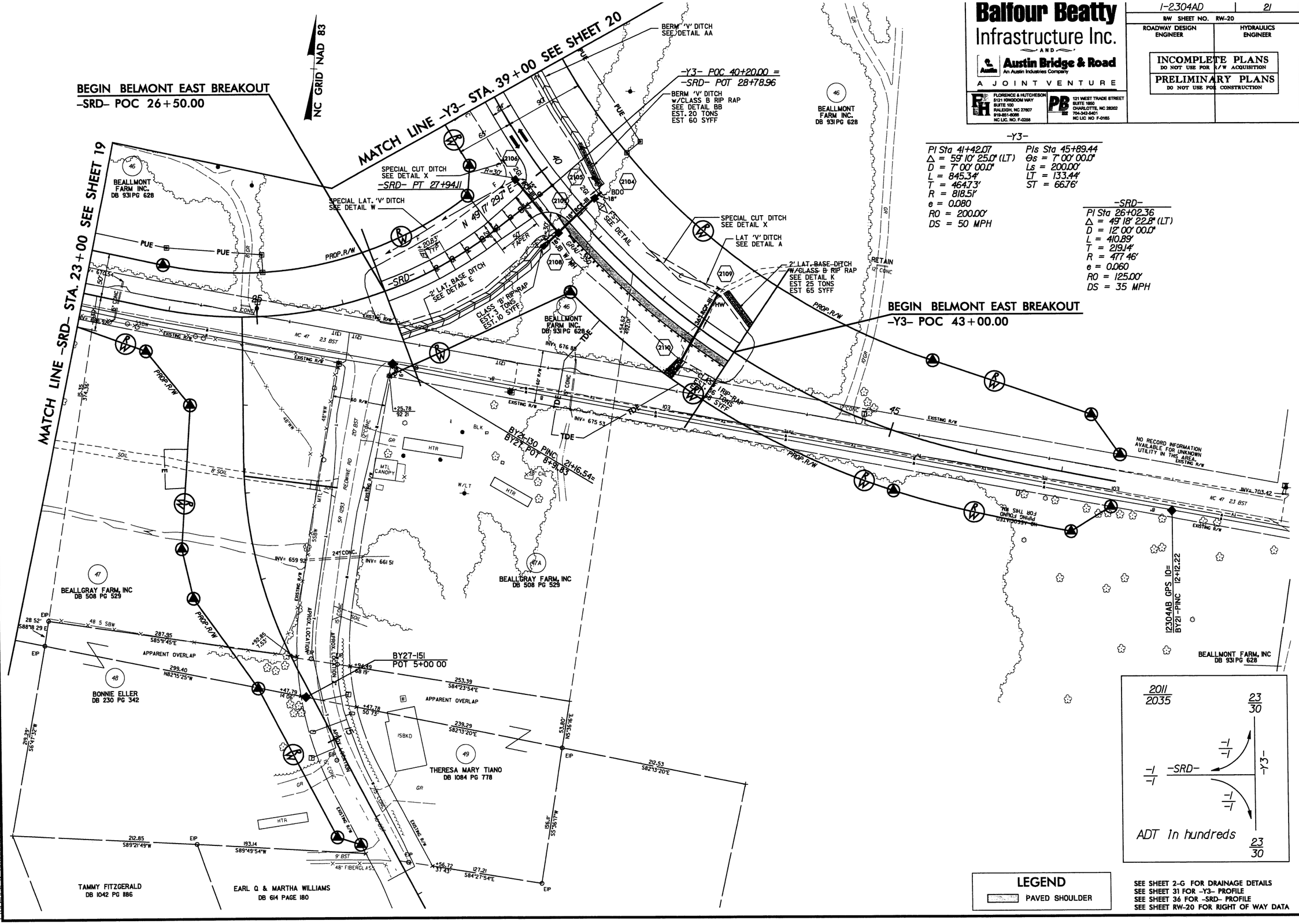
FLORENCE & HUTCHESON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-6056
NC LIC. NO. F-0258

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
704-342-5401
NC LIC NO F-0165

1-2304AD	21
R/W SHEET NO. RW-20	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y3-

PI Sta 41+42.07	PIs Sta 45+89.44
Δ = 59° 10' 25.0" (LT)	Θs = 7° 00' 00.0"
D = 7° 00' 00.0"	Ls = 200.00'
L = 845.34'	LT = 133.44'
T = 464.73'	ST = 66.76'
R = 818.51'	
e = 0.080	
RO = 200.00'	
DS = 50 MPH	

-SRD-

PI Sta 26+02.36
Δ = 49° 18' 22.8" (LT)
D = 12° 00' 00.0"
L = 410.89'
T = 219.14'
R = 477.46'
e = 0.060
RO = 125.00'
DS = 35 MPH

LEGEND
PAVED SHOULDER

SEE SHEET 2-G FOR DRAINAGE DETAILS
SEE SHEET 31 FOR -Y3- PROFILE
SEE SHEET 36 FOR -SRD- PROFILE
SEE SHEET RW-20 FOR RIGHT OF WAY DATA

4/13/2011
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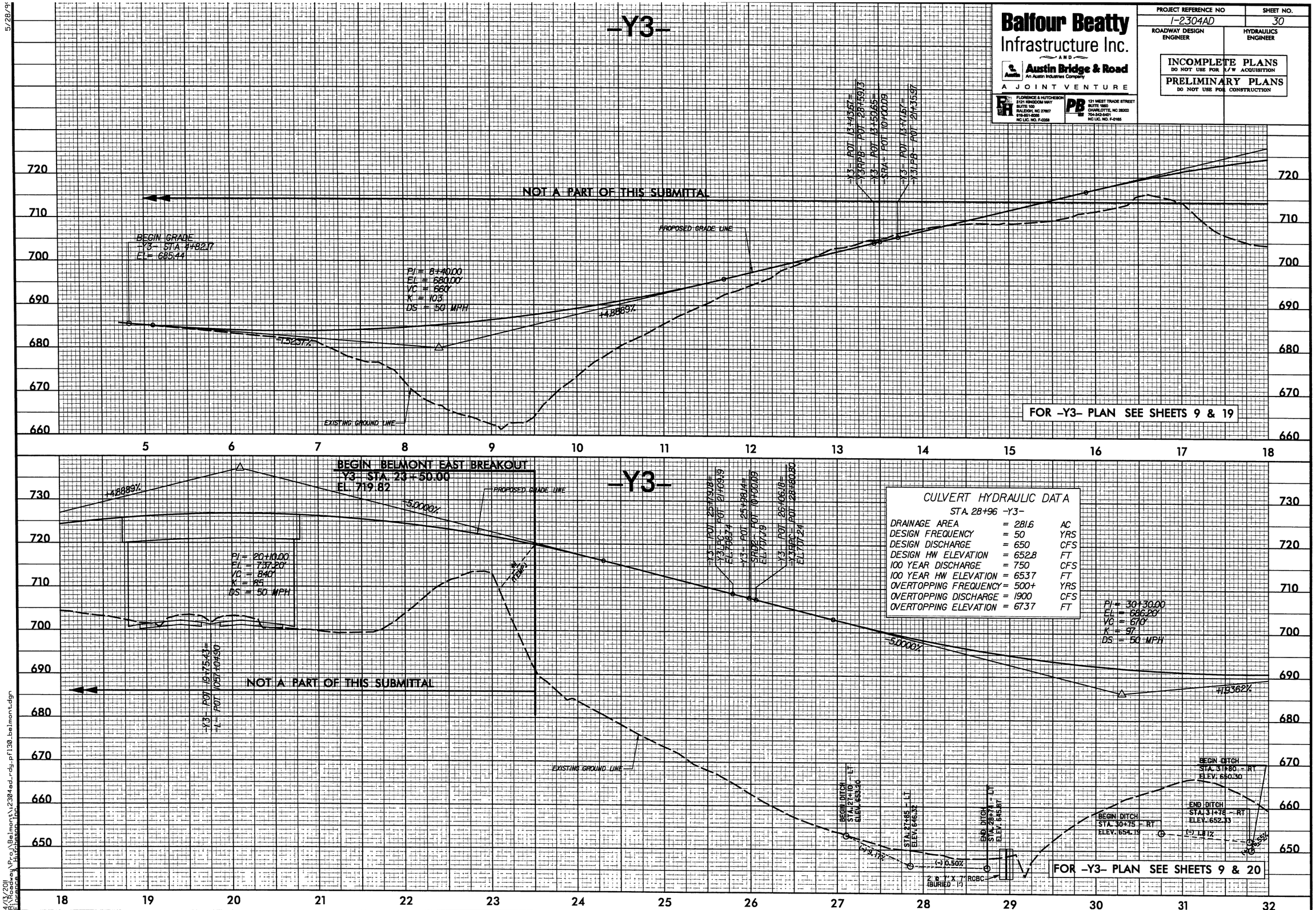
FLORENCE & HUTCHISON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-9095
NC LIC. NO. F-0258

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
704-343-5401
NC LIC. NO. F-0165

PROJECT REFERENCE NO	SHEET NO.
I-2304AD	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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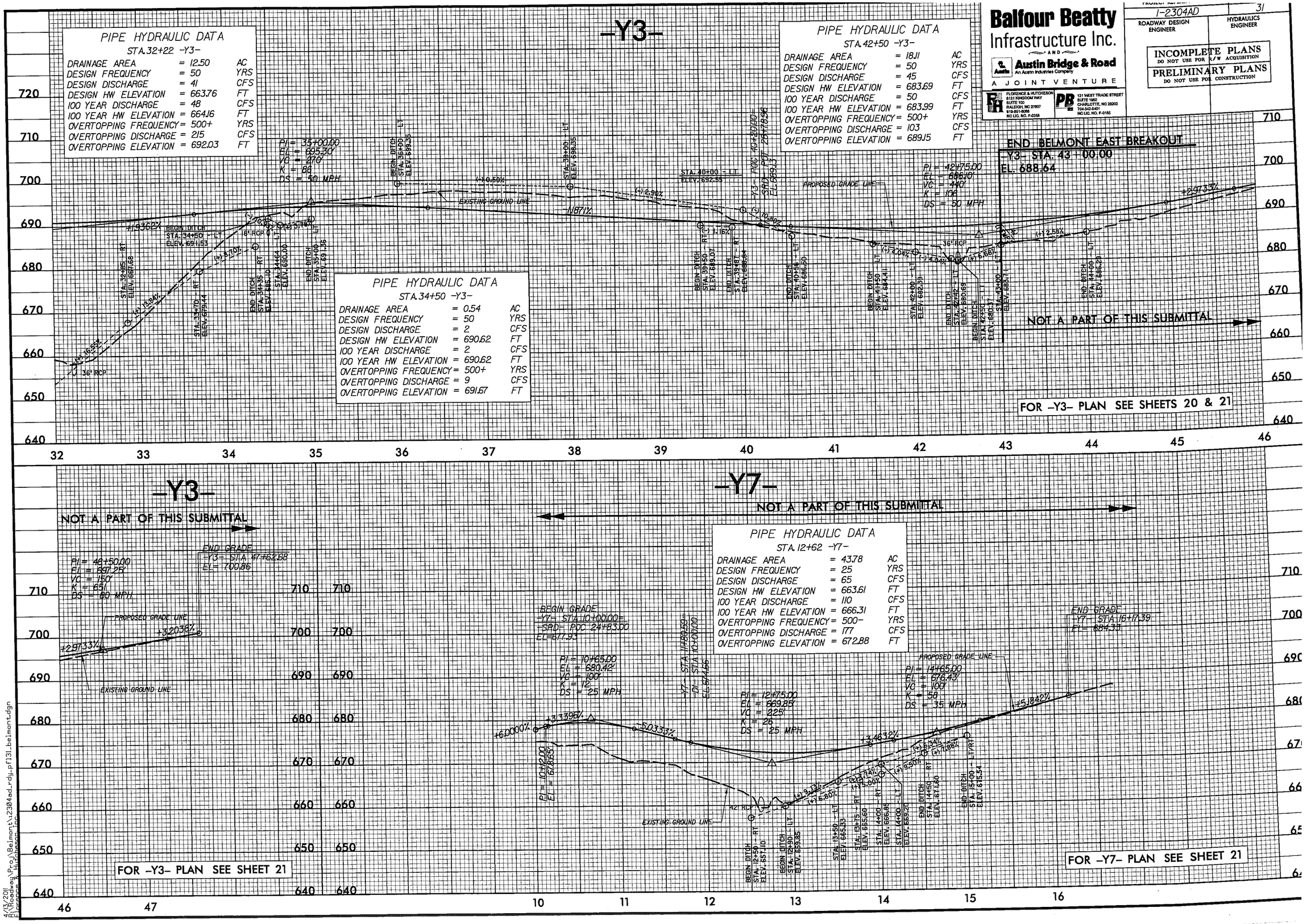
Florence & Hutchison, Inc.


-Y3-
PIPE HYDRAULIC DATA
STA. 32+22 -Y3-
DRAINAGE AREA = 12.50 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 41 CFS
DESIGN HW ELEVATION = 663.76 FT
100 YEAR DISCHARGE = 48 CFS
100 YEAR HW ELEVATION = 664.16 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 215 CFS
OVERTOPPING ELEVATION = 692.03 FT
PIPE HYDRAULIC DATA
STA. 42+50 -Y3-
DRAINAGE AREA = 18.11 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 45 CFS
DESIGN HW ELEVATION = 683.69 FT
100 YEAR DISCHARGE = 50 CFS
100 YEAR HW ELEVATION = 683.99 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 103 CFS
OVERTOPPING ELEVATION = 689.15 FT
PIPE HYDRAULIC DATA
STA. 34+50 -Y3-
DRAINAGE AREA = 0.54 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 2 CFS
DESIGN HW ELEVATION = 690.62 FT
100 YEAR DISCHARGE = 2 CFS
100 YEAR HW ELEVATION = 690.62 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 9 CFS
OVERTOPPING ELEVATION = 691.67 FT
Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE
FLORENCE & HUTCHESON
PB
1-2304AD
31
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
END BELMONT EAST BREAKOUT
-Y3- STA. 43+00.00
EL. 688.64
NOT A PART OF THIS SUBMITTAL
FOR -Y3- PLAN SEE SHEETS 20 & 21
-Y3-
NOT A PART OF THIS SUBMITTAL
-Y7-
NOT A PART OF THIS SUBMITTAL
PIPE HYDRAULIC DATA
STA. 12+62 -Y7-
DRAINAGE AREA = 43.78 AC
DESIGN FREQUENCY = 25 YRS
DESIGN DISCHARGE = 65 CFS
DESIGN HW ELEVATION = 663.61 FT
100 YEAR DISCHARGE = 110 CFS
100 YEAR HW ELEVATION = 666.31 FT
OVERTOPPING FREQUENCY = 500- YRS
OVERTOPPING DISCHARGE = 177 CFS
OVERTOPPING ELEVATION = 672.88 FT
FOR -Y3- PLAN SEE SHEET 21
FOR -Y7- PLAN SEE SHEET 21
EXISTING GROUND LINE
PROPOSED GRADE LINE

5/28/99

Balfour Beatty Infrastructure Inc.
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Austin Bridge & Road
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A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-6055
NC LIC. NO. F-0368

PB
121 WEST TRADE STREET
SUITE 1880
CHARLOTTE, NC 28202
704-342-6421
NC LIC. NO. F-0195

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

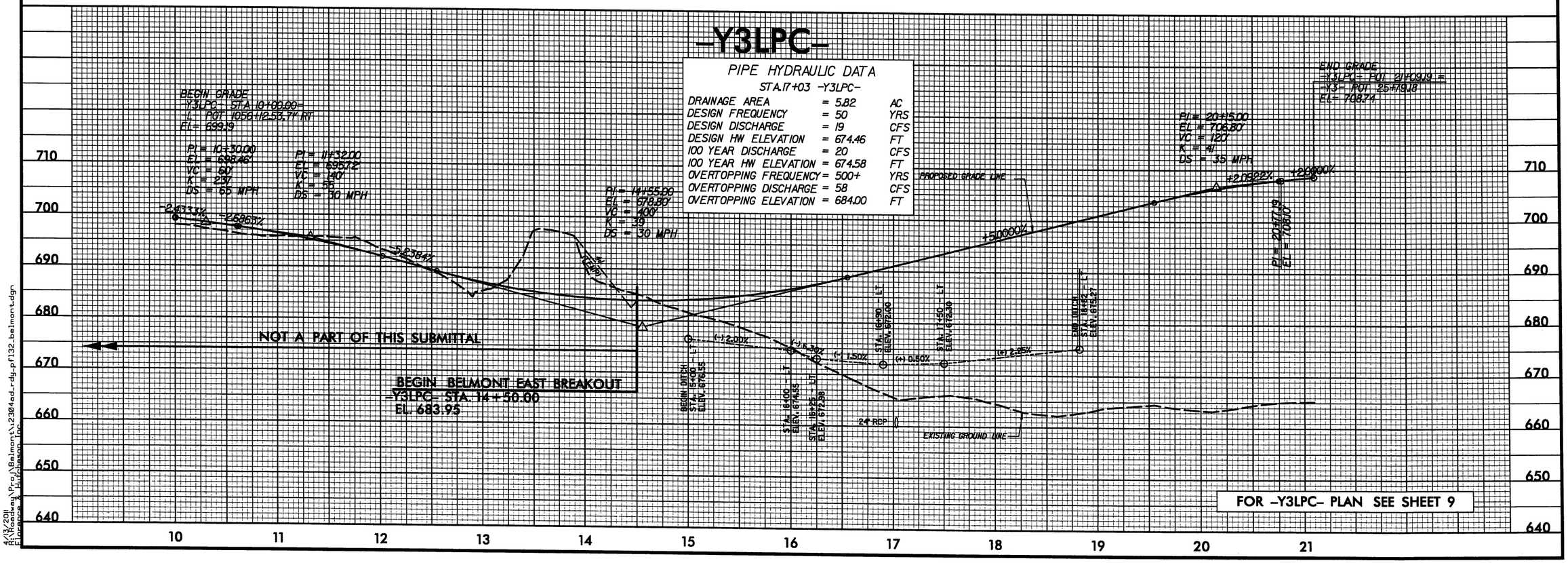
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y3LPC-

PIPE HYDRAULIC DATA

STA.17+03 -Y3LPC-

DRAINAGE AREA	= 5.82	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 19	CFS
DESIGN HW ELEVATION	= 674.46	FT
100 YEAR DISCHARGE	= 20	CFS
100 YEAR HW ELEVATION	= 674.58	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 58	CFS
OVERTOPPING ELEVATION	= 684.00	FT



FOR -Y3LPC- PLAN SEE SHEET 9

4/13/2011
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Florence & Hutcheson Inc.

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road An Austin Industries Company
A JOINT VENTURE

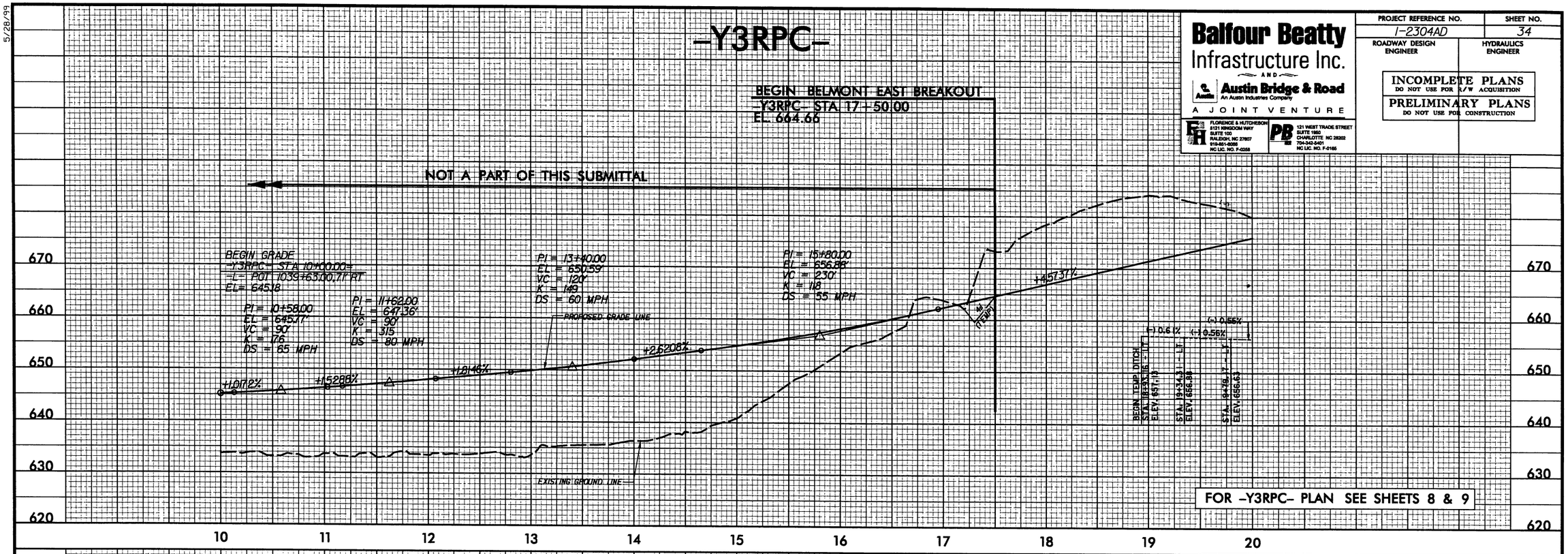
FLORENCE & HUTCHESON 5121 KINGDOM WAY SUITE 100 RALEIGH, NC 27607 919-851-6000 NC LIC. NO. F-0258

PB 121 WEST TRADE STREET SUITE 1660 CHARLOTTE, NC 28202 704-342-5401 NC LIC. NO. F-0165

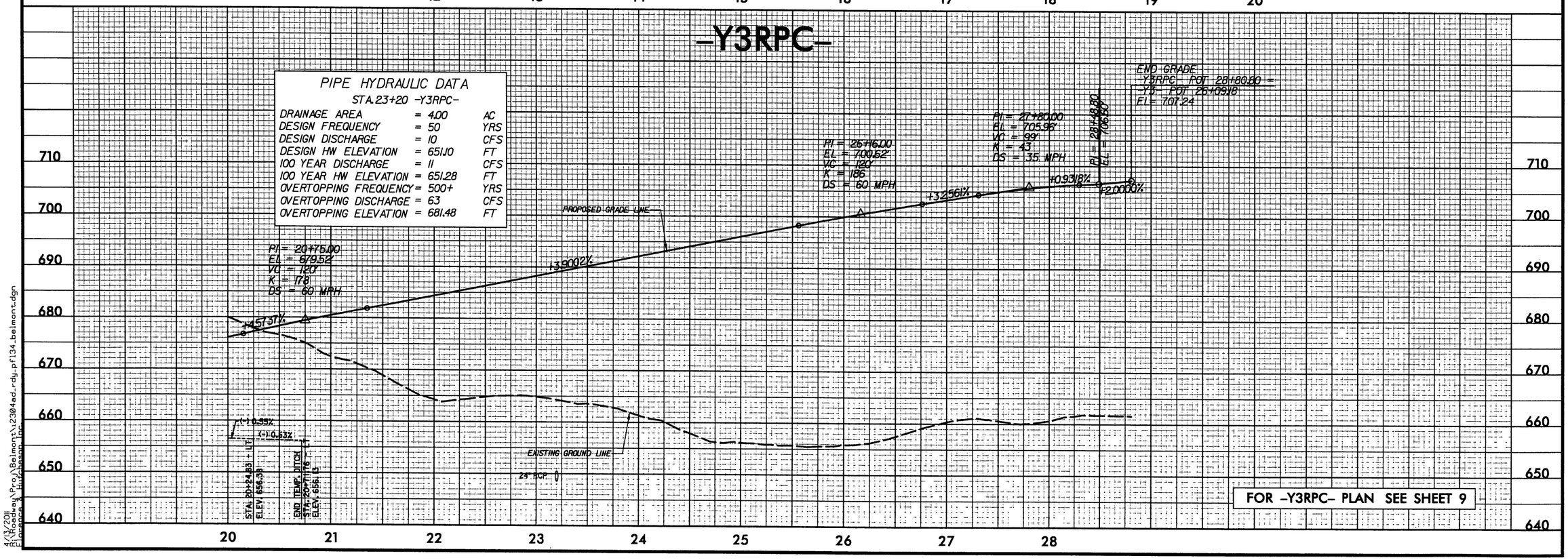
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y3RPC-



-Y3RPC-



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Florence & Hutcheson, Inc.

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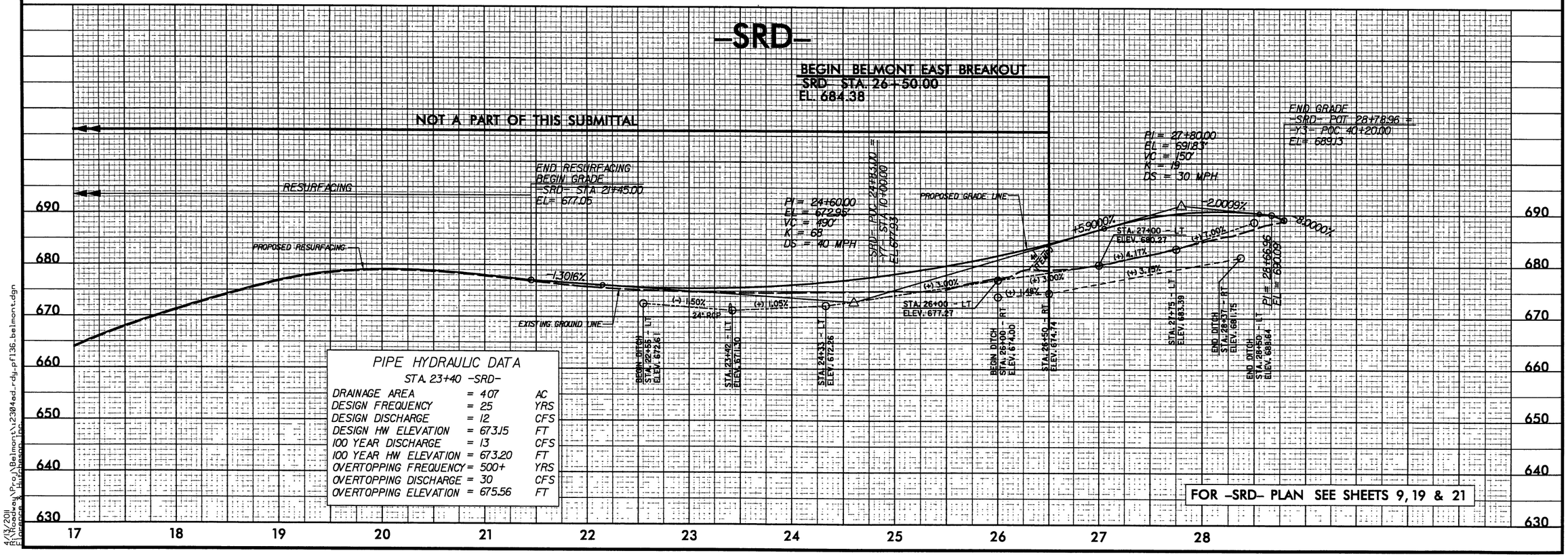
Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
5121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-861-8083
NC LIC. NO. F-0258

PB
121 WEST TRADE STREET
SUITE 1960
CHARLOTTE NC 28202
704-342-5401
NC LIC. NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PIPE HYDRAULIC DATA
STA. 23+40 -SRD-

DRAINAGE AREA	= 407	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 12	CFS
DESIGN HW ELEVATION	= 673.15	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 673.20	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 30	CFS
OVERTOPPING ELEVATION	= 675.56	FT

FOR -SRD- PLAN SEE SHEETS 9, 19 & 21

4/13/2011
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Florence & Hutcheson, Inc.

5/28/99

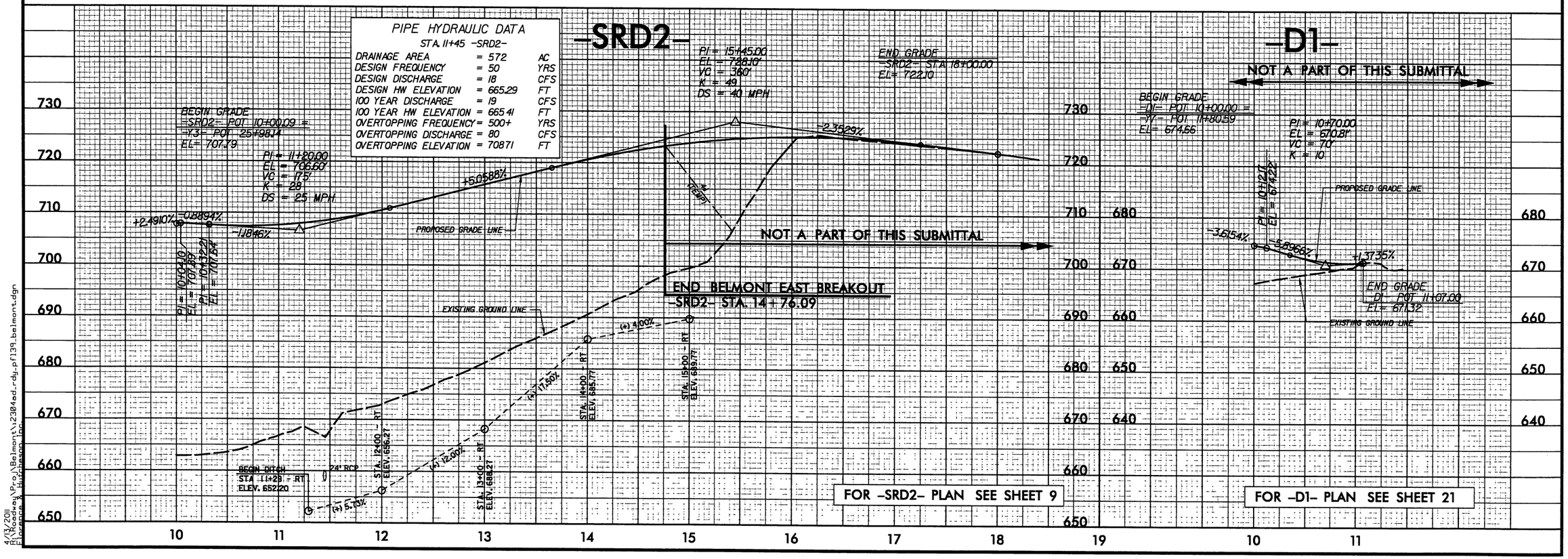
Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON
6121 KINGDOM WAY
SUITE 100
RALEIGH, NC 27607
919-851-8089
NC LIC. NO. F-0258

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
704-342-5401
NC LIC. NO. F-0165

PROJECT REFERENCE NO	SHEET NO.
I-2304AD	39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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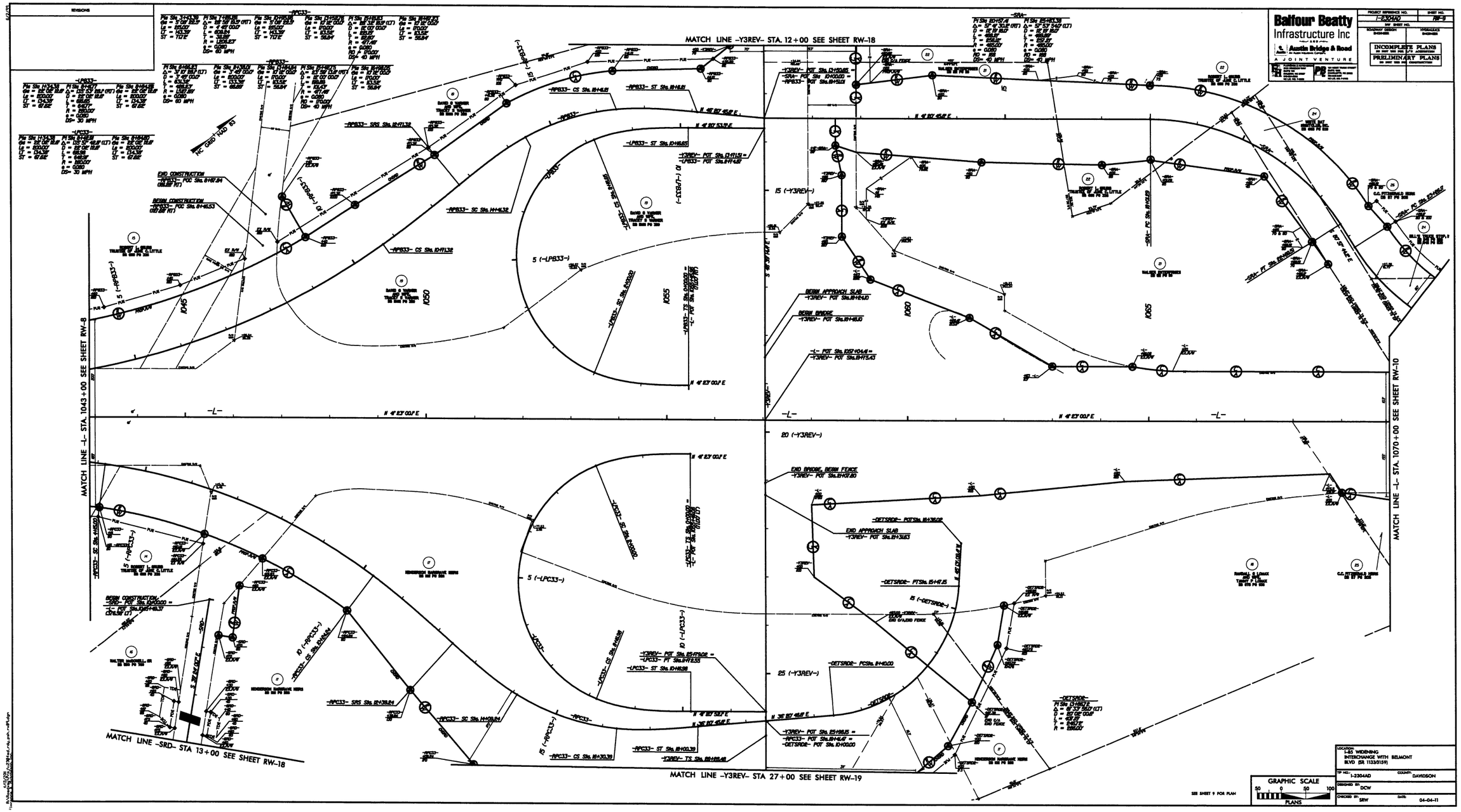
Florence & Hutcheson, Inc.


MATCH LINE -Y3REV- STA. 12+00 SEE SHEET RW-18
MATCH LINE -L- STA. 1043+00 SEE SHEET RW-8
MATCH LINE -L- STA. 1070+00 SEE SHEET RW-10
MATCH LINE -SRD- STA 13+00 SEE SHEET RW-18
MATCH LINE -Y3REV- STA 27+00 SEE SHEET RW-19
Balfour Beatty Infrastructure Inc
Austin Bridge & Road
A JOINT VENTURE
INCOMPLETE PLANS
PRELIMINARY PLANS
GRAPHIC SCALE
PLANS
LOCATION: I-85 WIDENING INTERCHANGE WITH BELMONT BLVD (SR 1133/3159)
TIP NO: I-2304AD
COUNTY: DAVIDSON
DESIGNED BY: DCW
CHECKED BY: SRW
DATE: 04-04-11

8/17/99

REVISIONS

Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

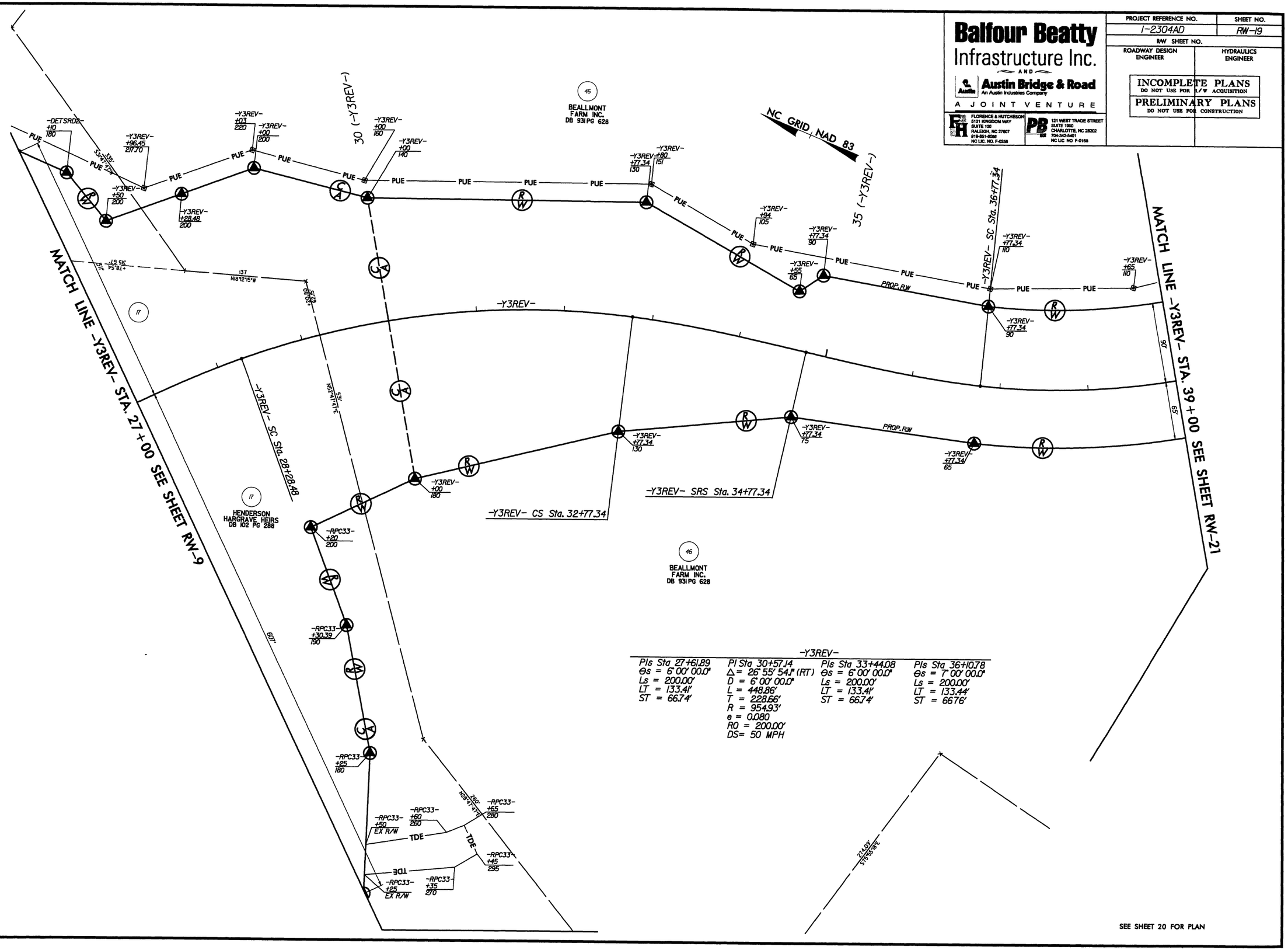
FLORENCE & HUTCHESON
5121 KINGSDOWN WAY
SUITE 100
RALEIGH, NC 27607
919-851-9095
NC LIC. NO. F-0258

121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
704-342-5401
NC LIC NO F-0155

PROJECT REFERENCE NO.	SHEET NO.
I-2304AD	RW-19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y3REV-

Pls Sta 27+61.89	Pl Sta 30+57.14	Pls Sta 33+44.08	Pls Sta 36+10.78
Θs = 6° 00' 00.0"	Δ = 26° 55' 54.1" (RT)	Θs = 6° 00' 00.0"	Θs = 7° 00' 00.0"
Ls = 200.00'	D = 6° 00' 00.0"	Ls = 200.00'	Ls = 200.00'
LT = 133.41'	L = 448.86'	LT = 133.41'	LT = 133.44'
ST = 66.74'	T = 228.66'	ST = 66.74'	ST = 66.76'
	R = 954.93'		
	e = 0.080		
	RO = 200.00'		
	DS= 50 MPH		

SEE SHEET 20 FOR PLAN

4/13/2011
H:\roadway\Proj\i2304ad_rdy_psh_rw19.dgn
FL:proofed by: HUTCHESON, INC.

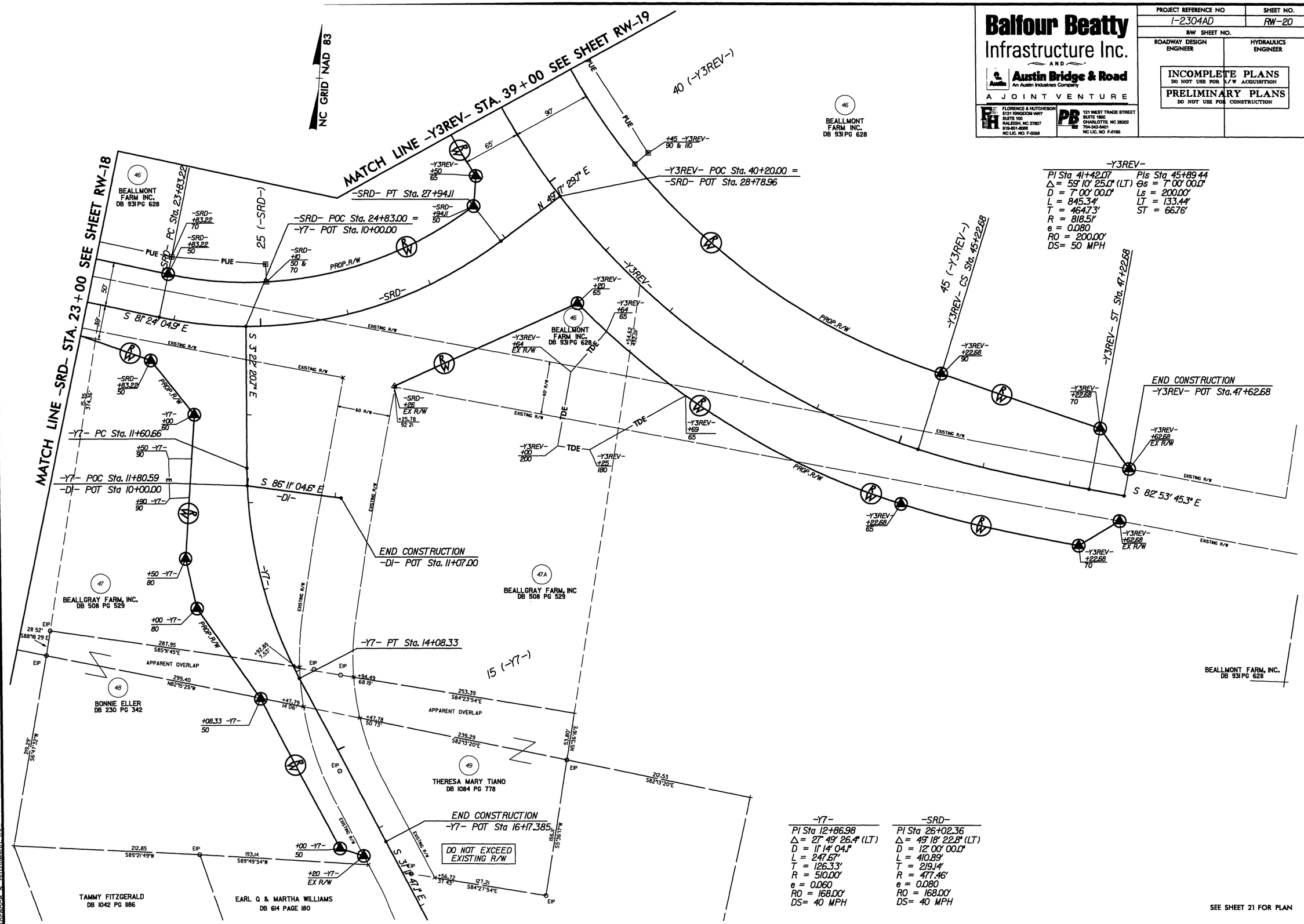
PROJECT REFERENCE NO	SHEET NO.
I-2304AD	RW-20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Balfour Beatty Infrastructure Inc.
AND
Austin Bridge & Road
An Austin Industries Company
A JOINT VENTURE

FLORENCE & HUTCHESON, 5131 KINGDOM WAY, SUITE 100, RALEIGH, NC 27607, 919-851-6066, NC LIC. NO. F-0266
PB 121 WEST TRADE STREET, SUITE 1950, CHARLOTTE NC 28202, 704-343-5401, NC LIC. NO F-0165

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



8/17/99

4/13/2011
R:\Roadway\Proj\i2304ad_rdy_psh_rw20.dgn
Florence & Hutcheson, Inc.