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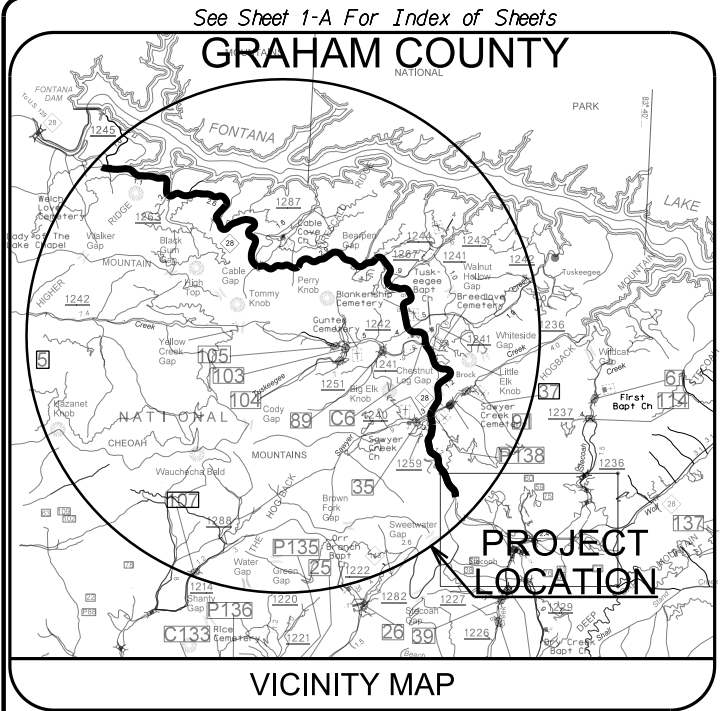
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09/08/99

WBS ELEMENT: 44588.3.1

CONTRACT: DN00510



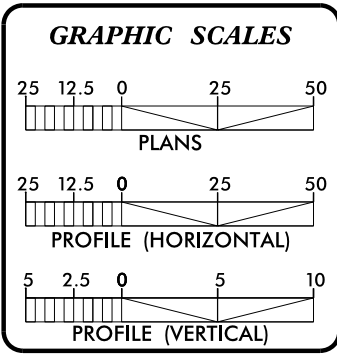
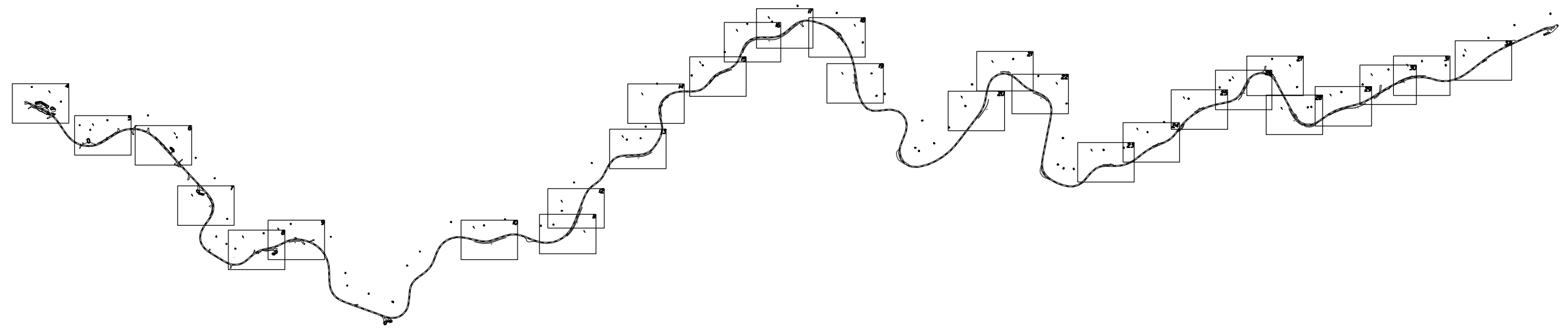
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GRAHAM COUNTY

LOCATION: ALONG NC HWY. 28 FROM HWY 143 TO INTERSECTION WITH SR-1245 FONTANA DAM RD.

TYPE OF WORK: GUARDRAIL INSTALLATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	44588.3.1	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	



PROJECT LENGTH

7.29 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
 191 Robbinsville Rd., Andrews NC, 28901

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: _____

LETTING DATE: _____

WESLEY GRINDSTAFF P.E.
 PROJECT ENGINEER

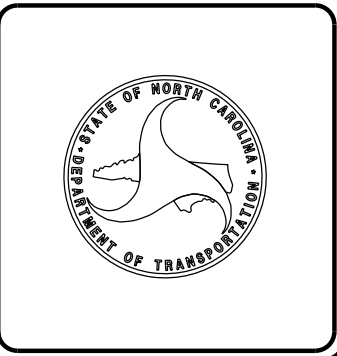
 PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

 P.E.

ROADWAY DESIGN ENGINEER

 P.E.



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

1	TITLE SHEET
2	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARDS
3	CONVENTIONAL SYMBOLS
3A	GUARDRAIL SUMMARY SHEET
4-32	PLAN SHEETS

GENERAL NOTES

- GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
- CARE SHALL BE TAKEN TO PREVENT DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION. ANY DAMAGE TO THESE UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
 - THE CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY.

LIST OF ROADWAY STANDARDS

- 2012 ROADWAY STANDARD DRAWINGS
- The following Roadway Standards as appear in "Roadway Standard Drawings" - Highway Design Branch - N.C. Department of Transportation - Raleigh, N.C., dated January 17, 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.
- | STD. NO. | TITLE |
|--------------------------|------------------------|
| DIVISION 8 - INCIDENTALS | |
| 862.01 | Guardrail Placement |
| 862.02 | Guardrail Installation |
| 862.03 | Structure Anchor Units |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

12/05/11

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	⊙
Property Corner	-----
Property Monument	⊠
Parcel/Sequence Number	Ⓣ
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	⊠
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	W.B.
Proposed Wetland Boundary	W.B.
Existing Endangered Animal Boundary	E.A.B.
Existing Endangered Plant Boundary	E.P.B.
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	⊙
Well	⊙
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	W.B.
Proposed Lateral, Tail, Head Ditch	-----
False Sump	⊠

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	⊙
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	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	⊙
Proposed Right of Way Line with Concrete or Granite R/W Marker	⊙
Proposed Control of Access Line with Concrete C/A Marker	⊙
Existing Control of Access	⊙
Proposed Control of Access	⊙
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
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	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	Ⓢ
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	⊠

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	⊙
Storm Sewer	S

UTILITIES:

POWER:	
Existing Power Pole	⊙
Proposed Power Pole	⊙
Existing Joint Use Pole	⊙
Proposed Joint Use Pole	⊙
Power Manhole	⊙
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	⊙
Telephone Booth	⊠
Telephone Pedestal	⊠
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	⊙
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	⊠
TV Tower	⊙
U/G TV Cable Hand Hole	⊠
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

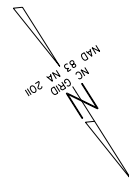
SANITARY SEWER:

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	⊠
Utility Unknown U/G Line	U/UL
U/G Tank; Water, Gas, Oil	⊠
Underground Storage Tank, Approx. Loc.	UST
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.

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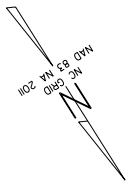
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GRAU 350

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PAGE 5



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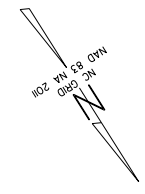
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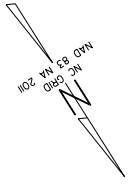
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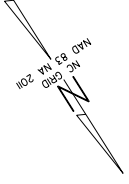
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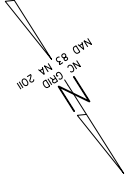
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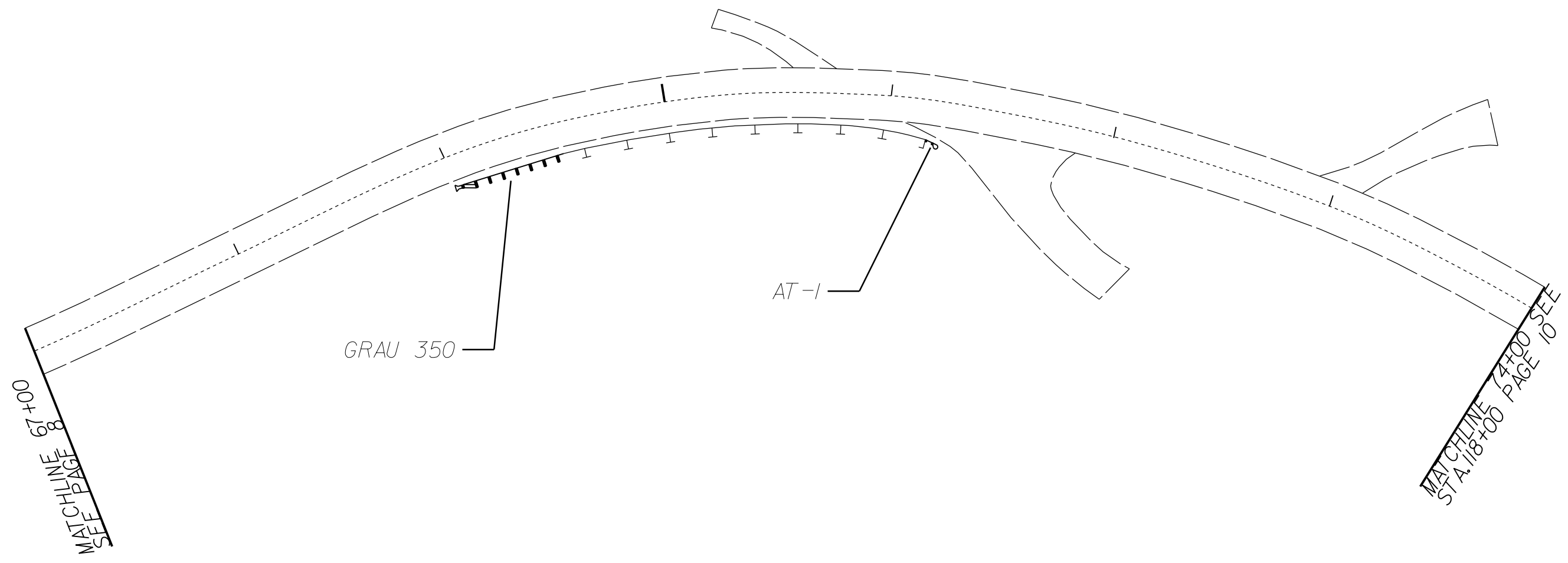
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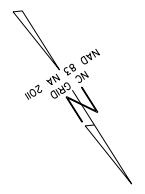
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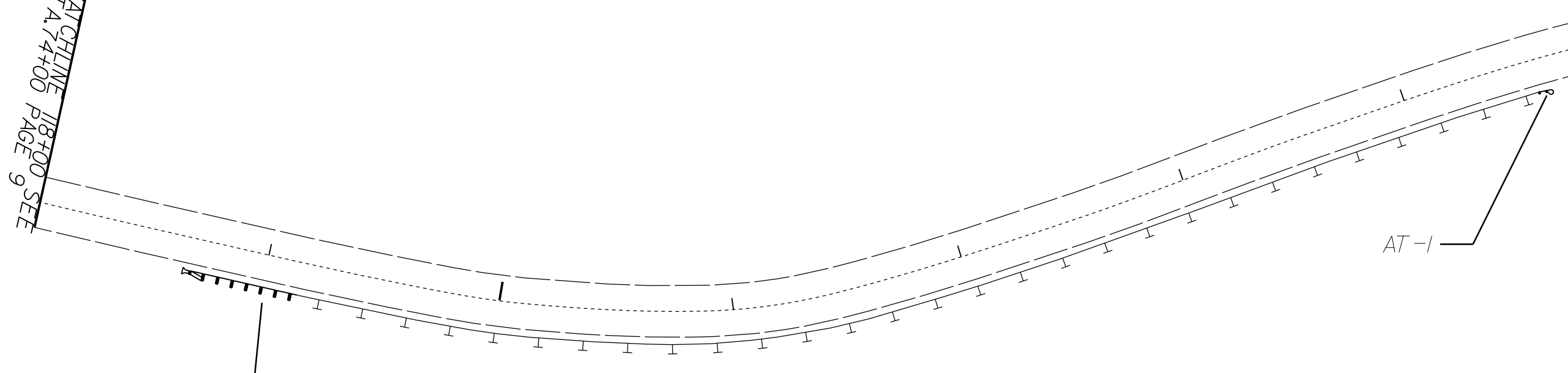


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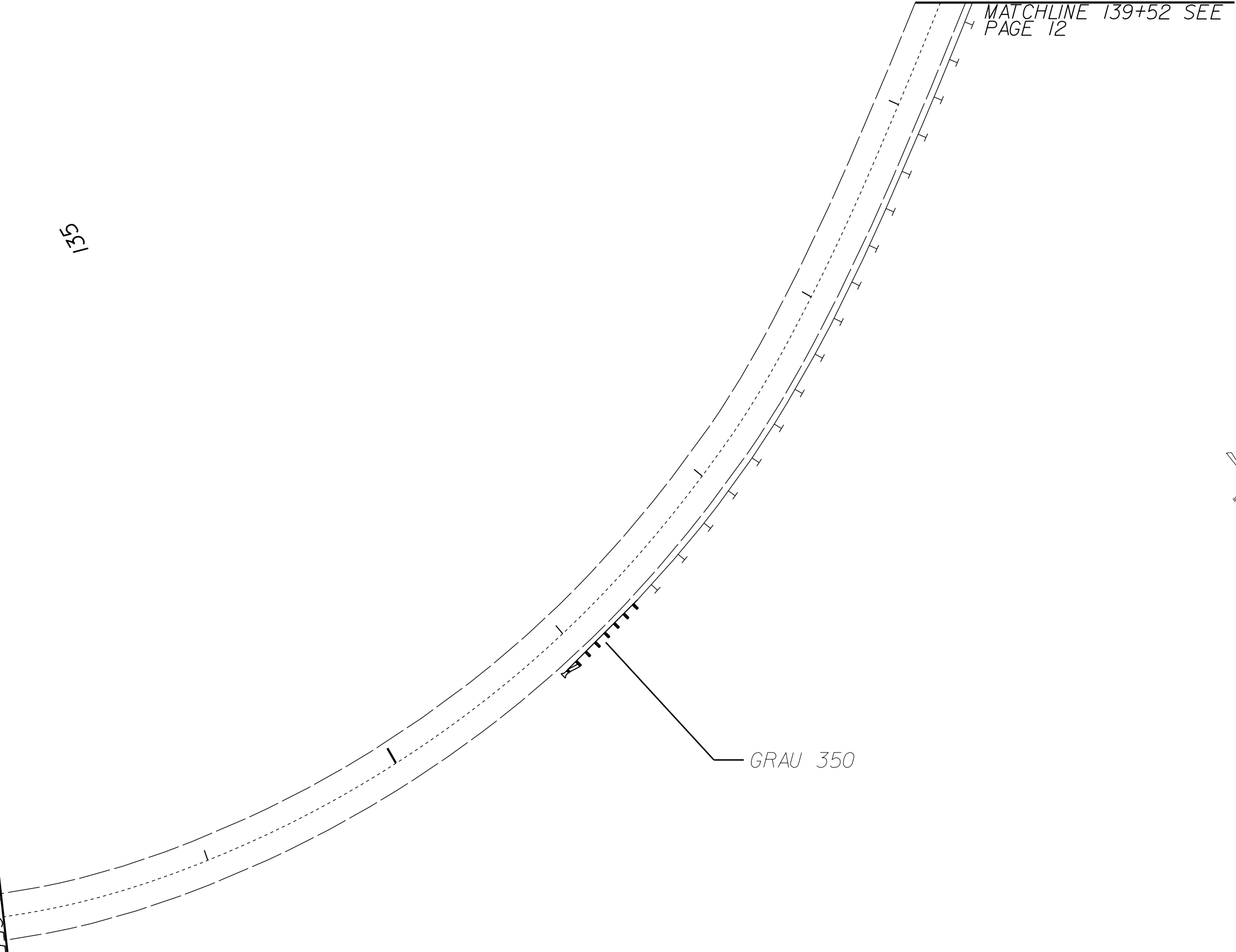


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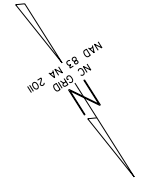
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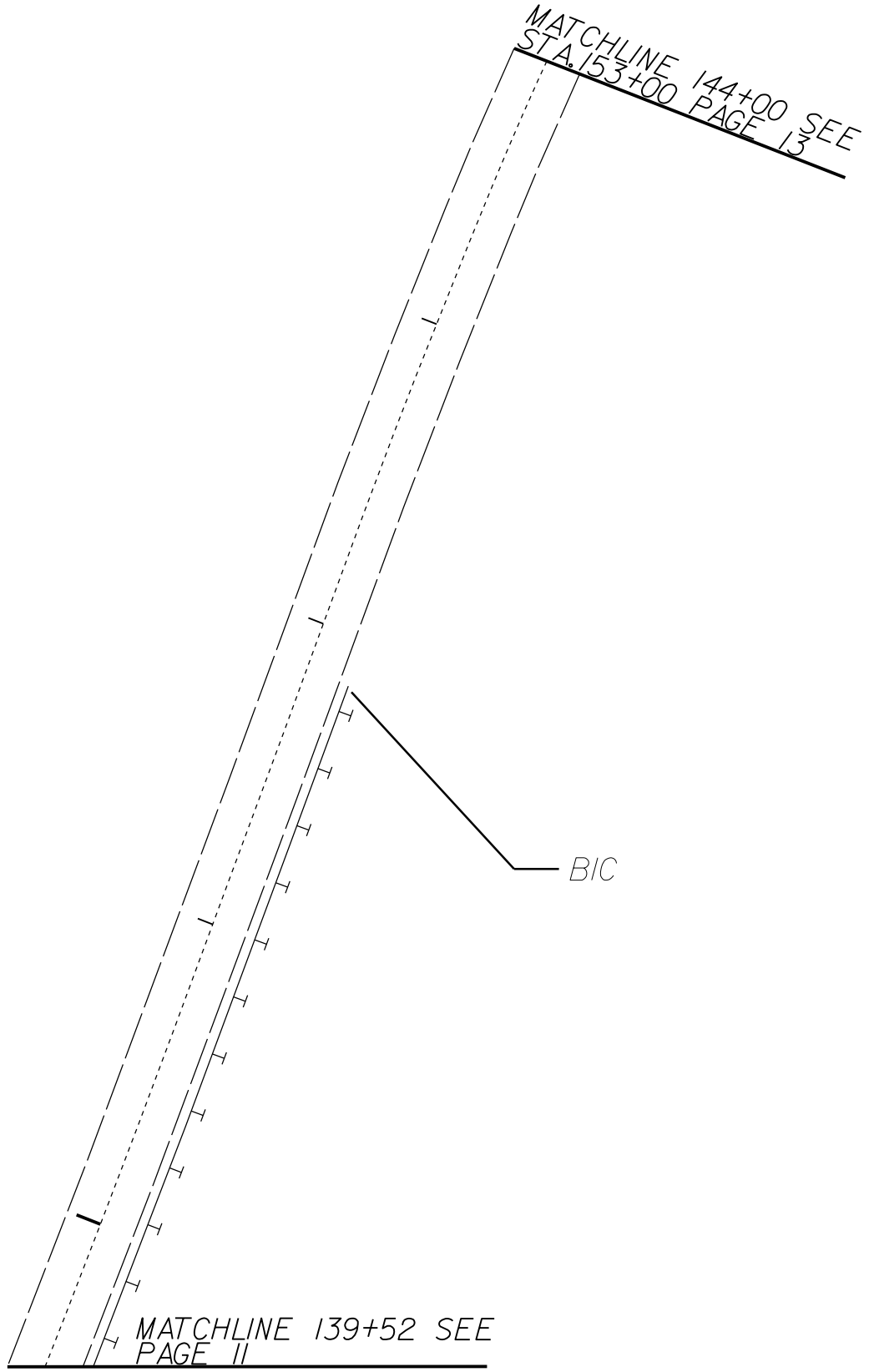
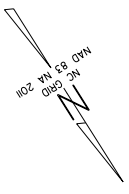
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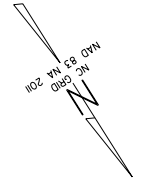
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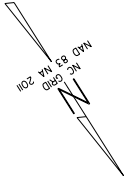
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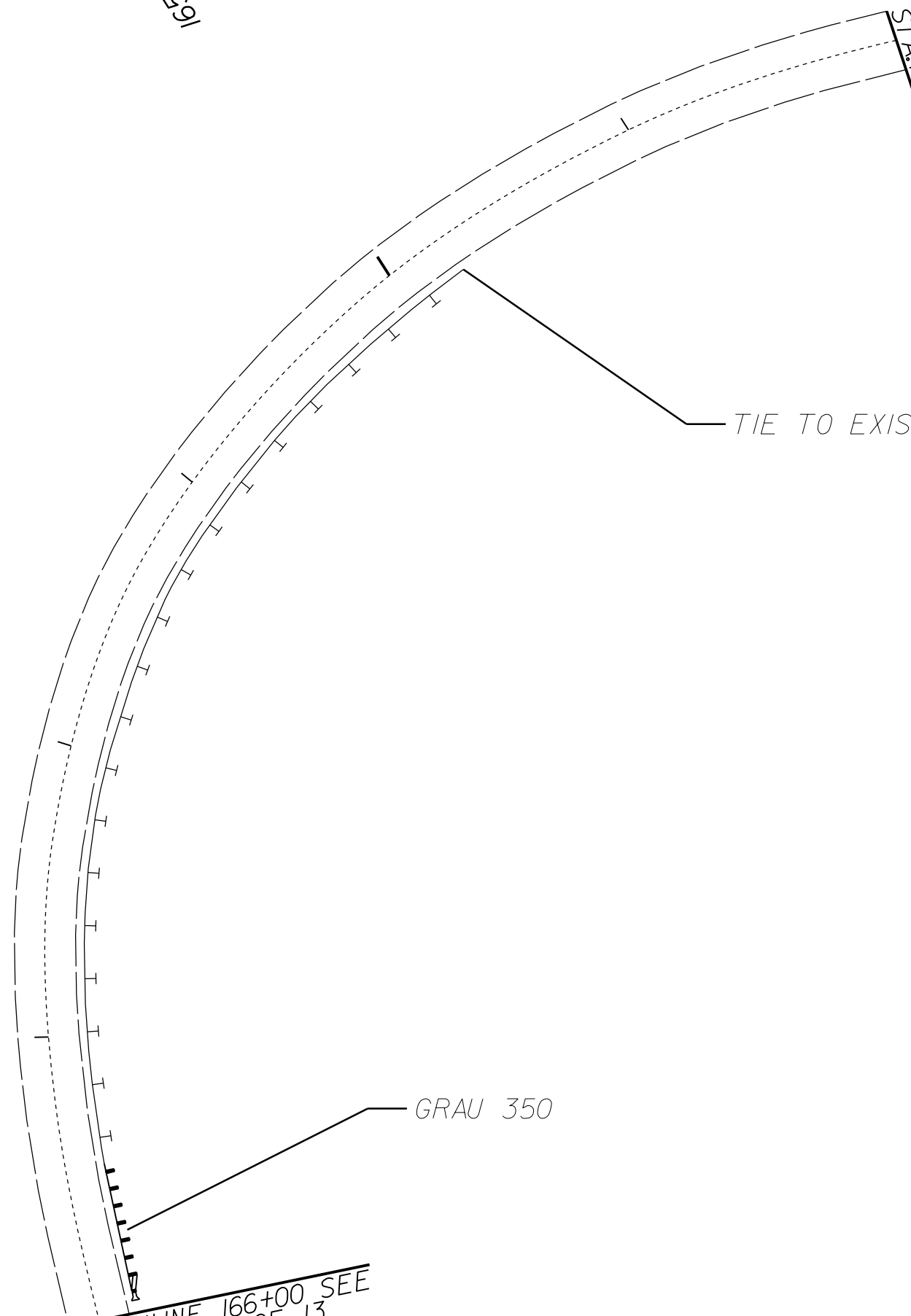
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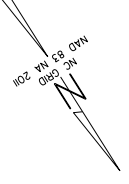
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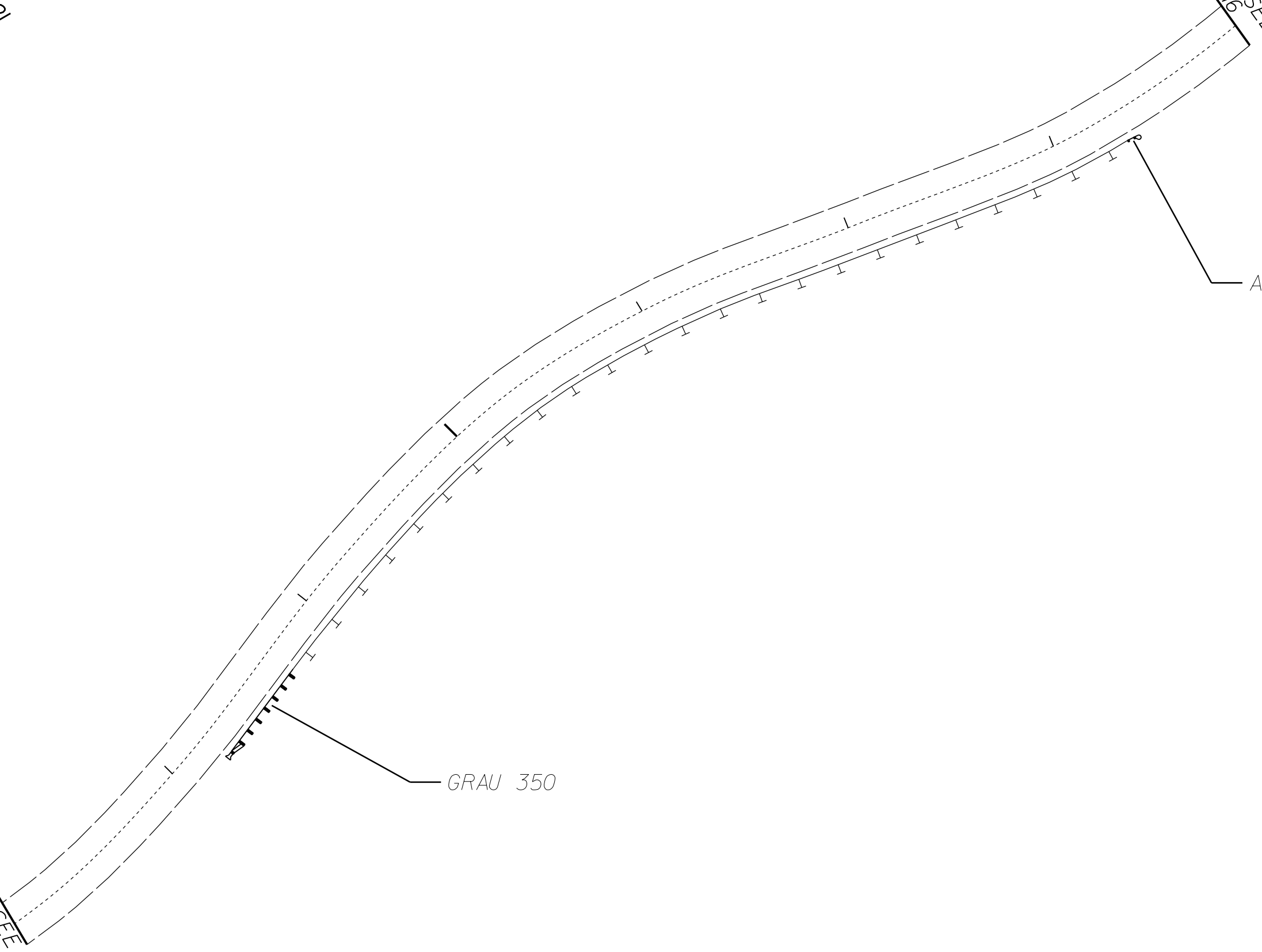
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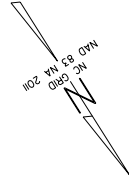
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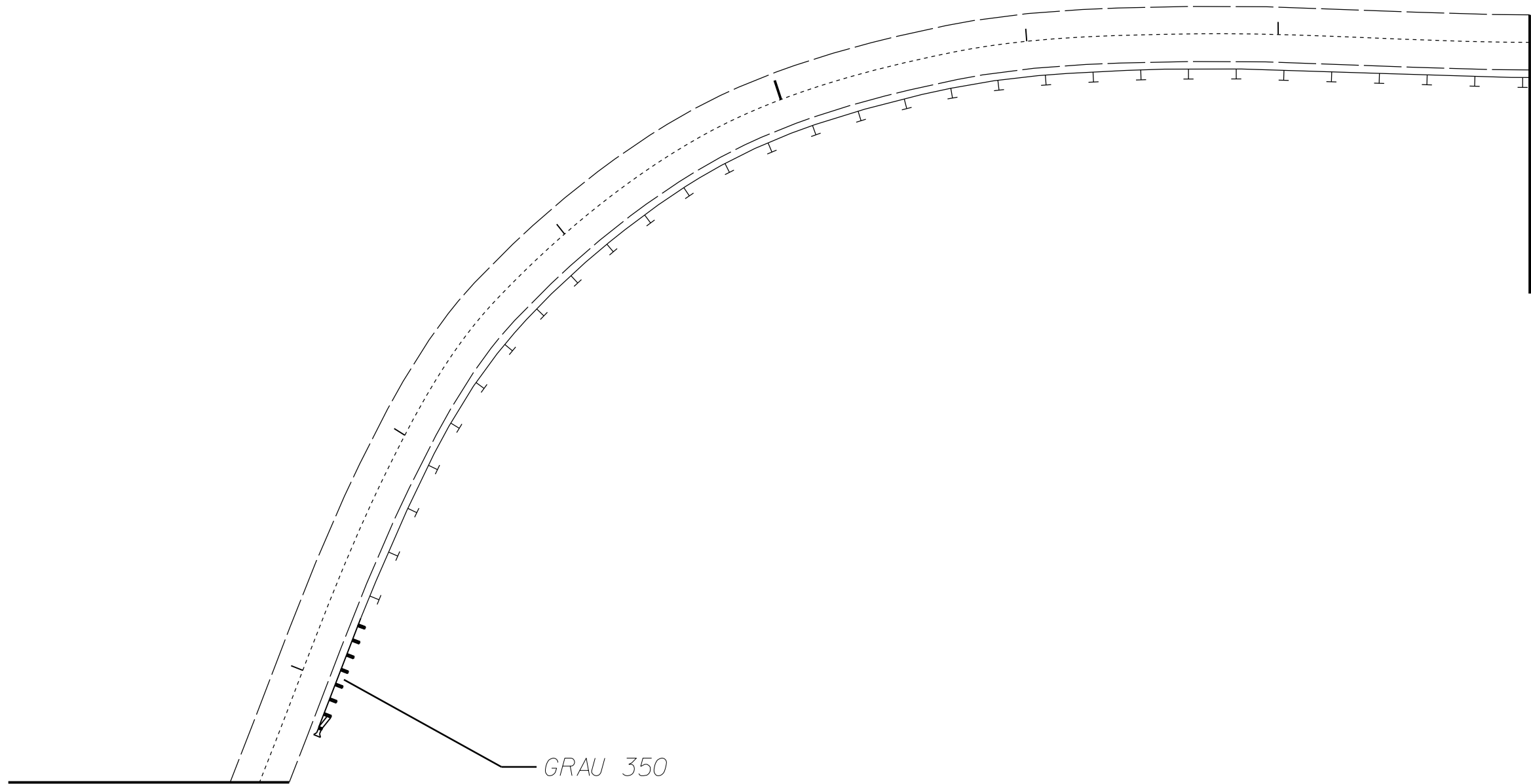
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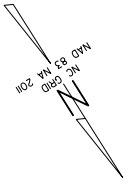


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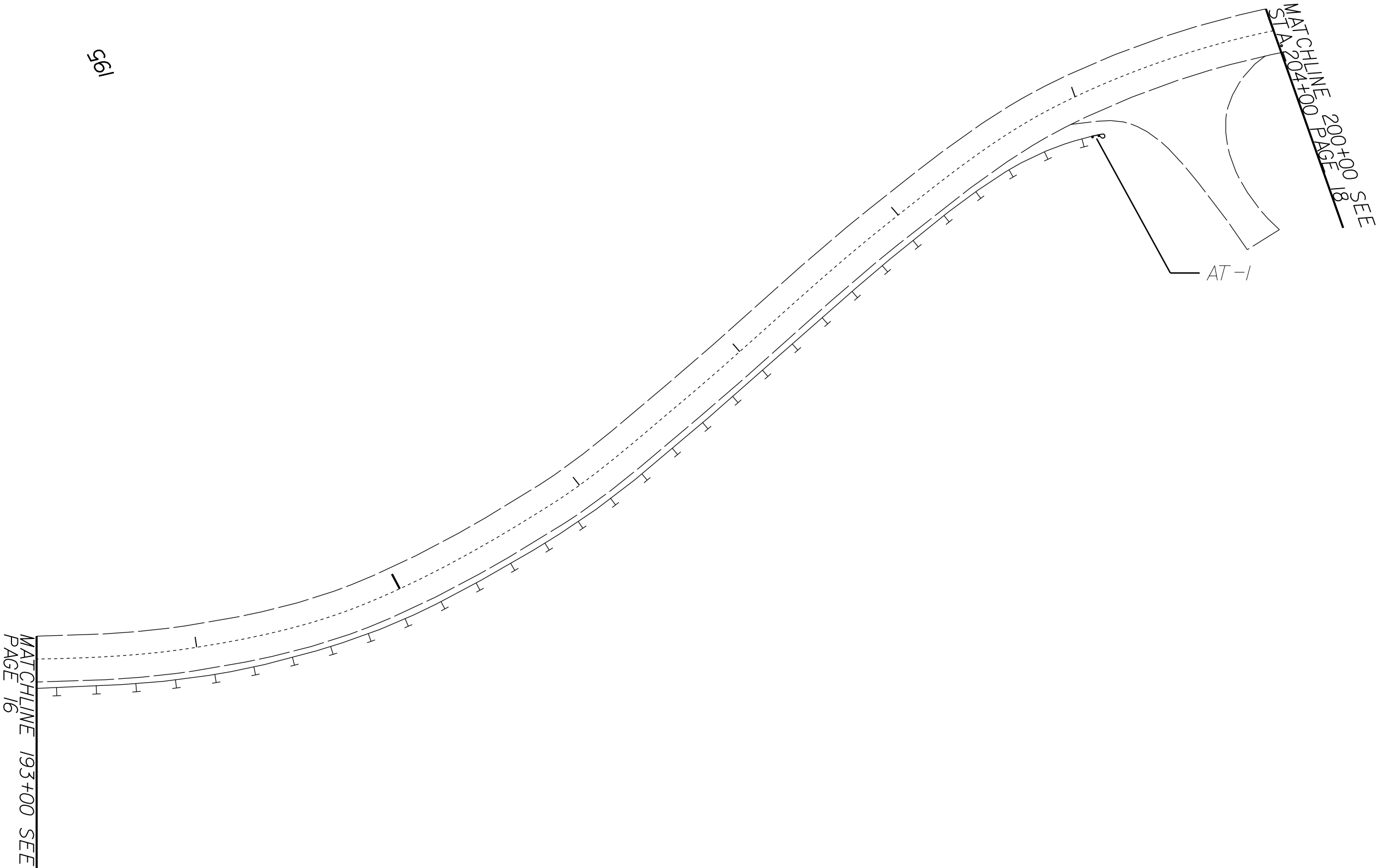
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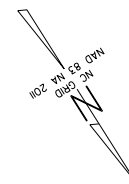
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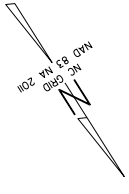
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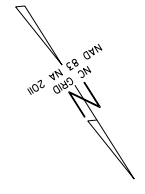
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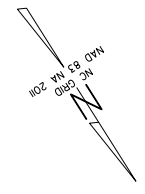
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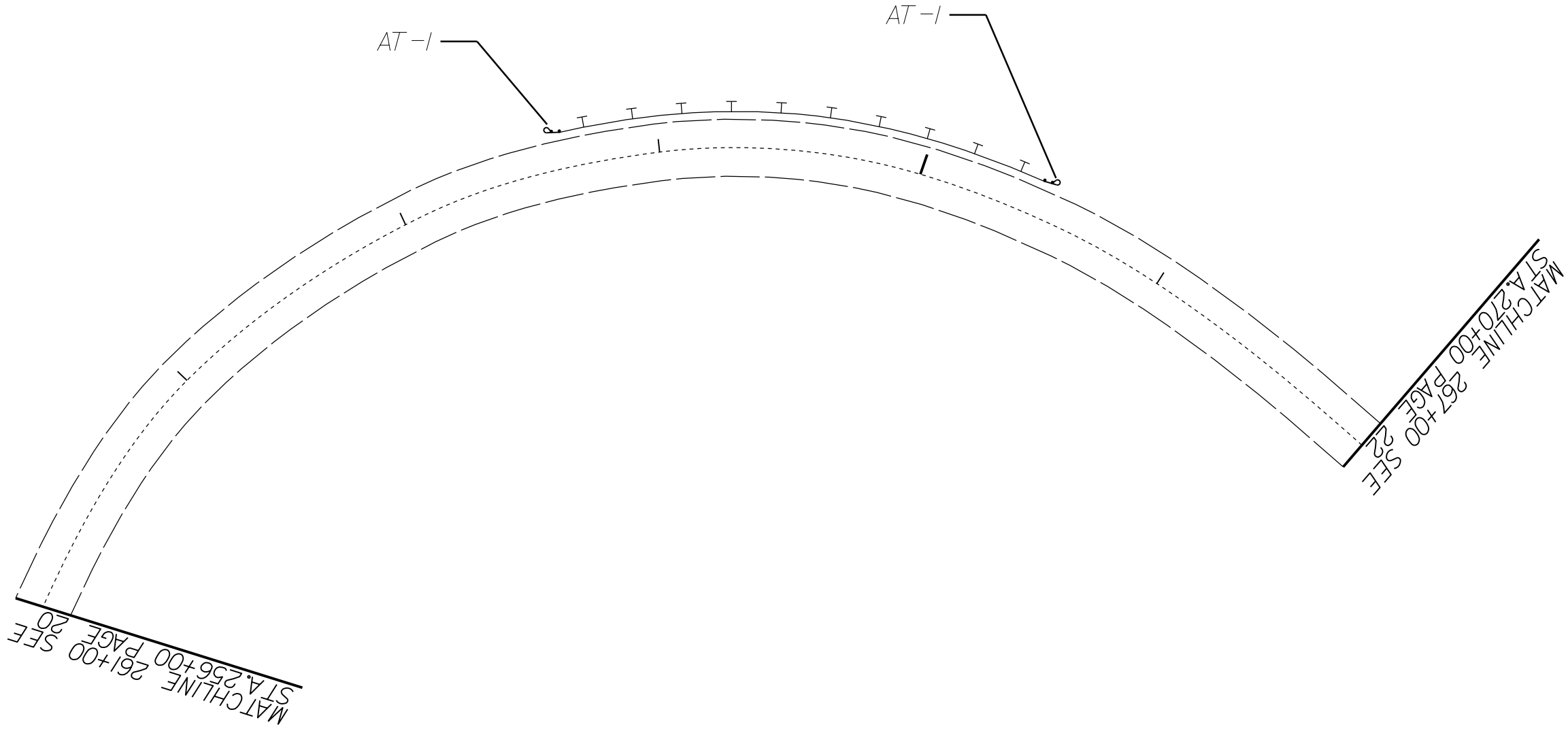
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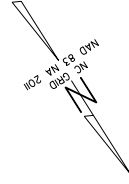
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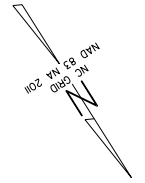
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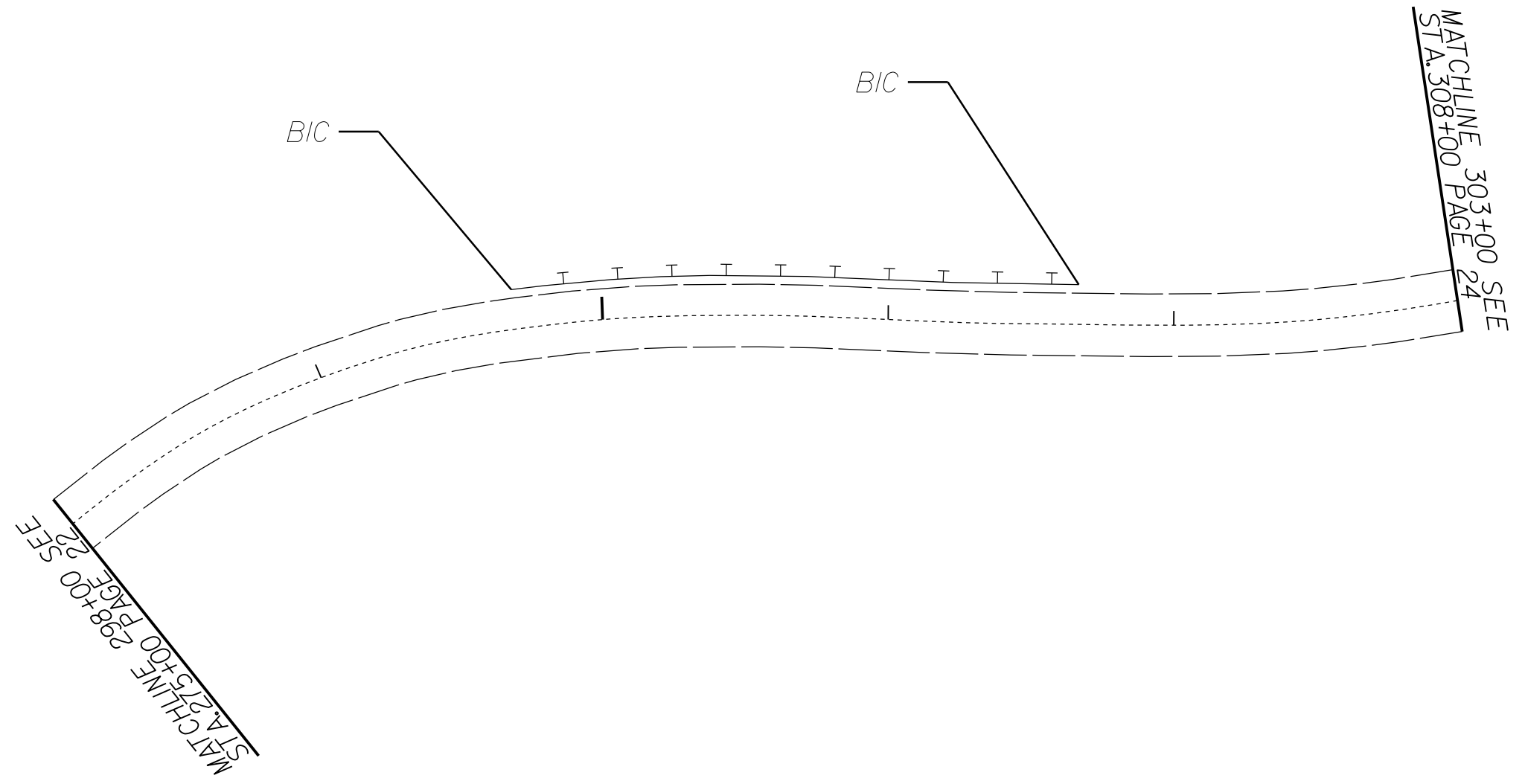
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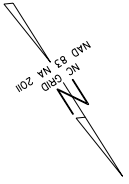
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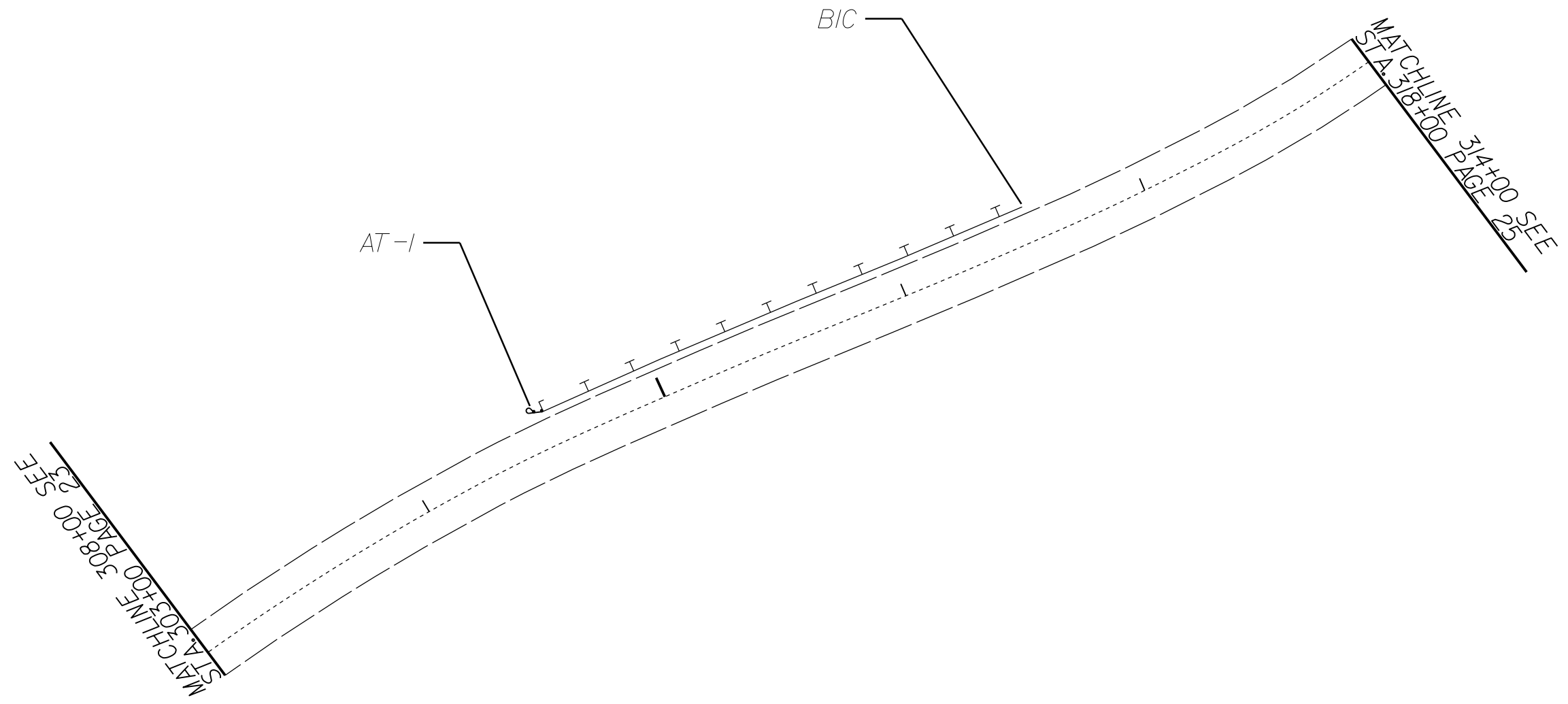


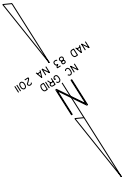
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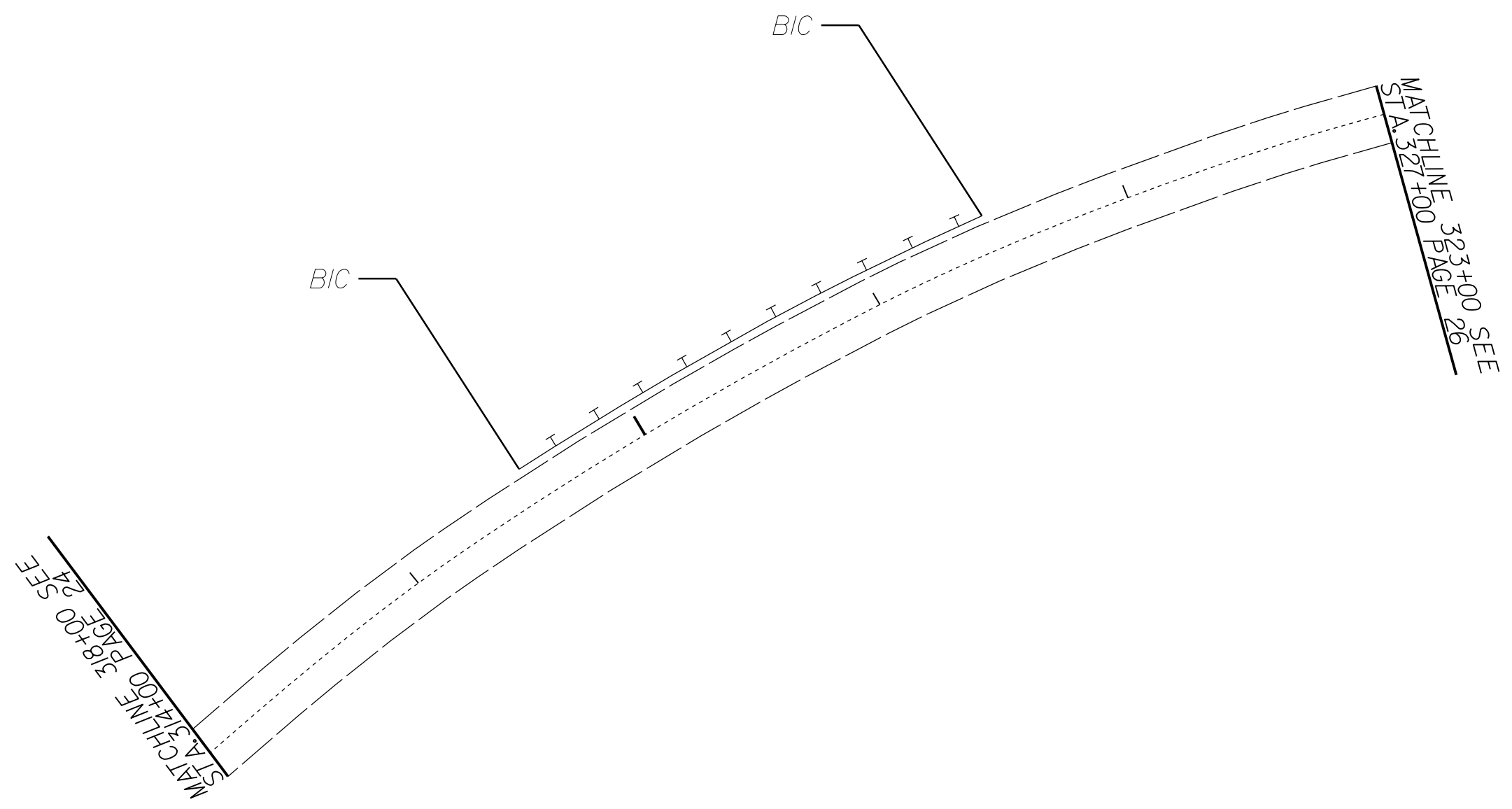


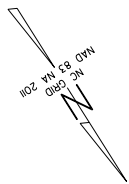
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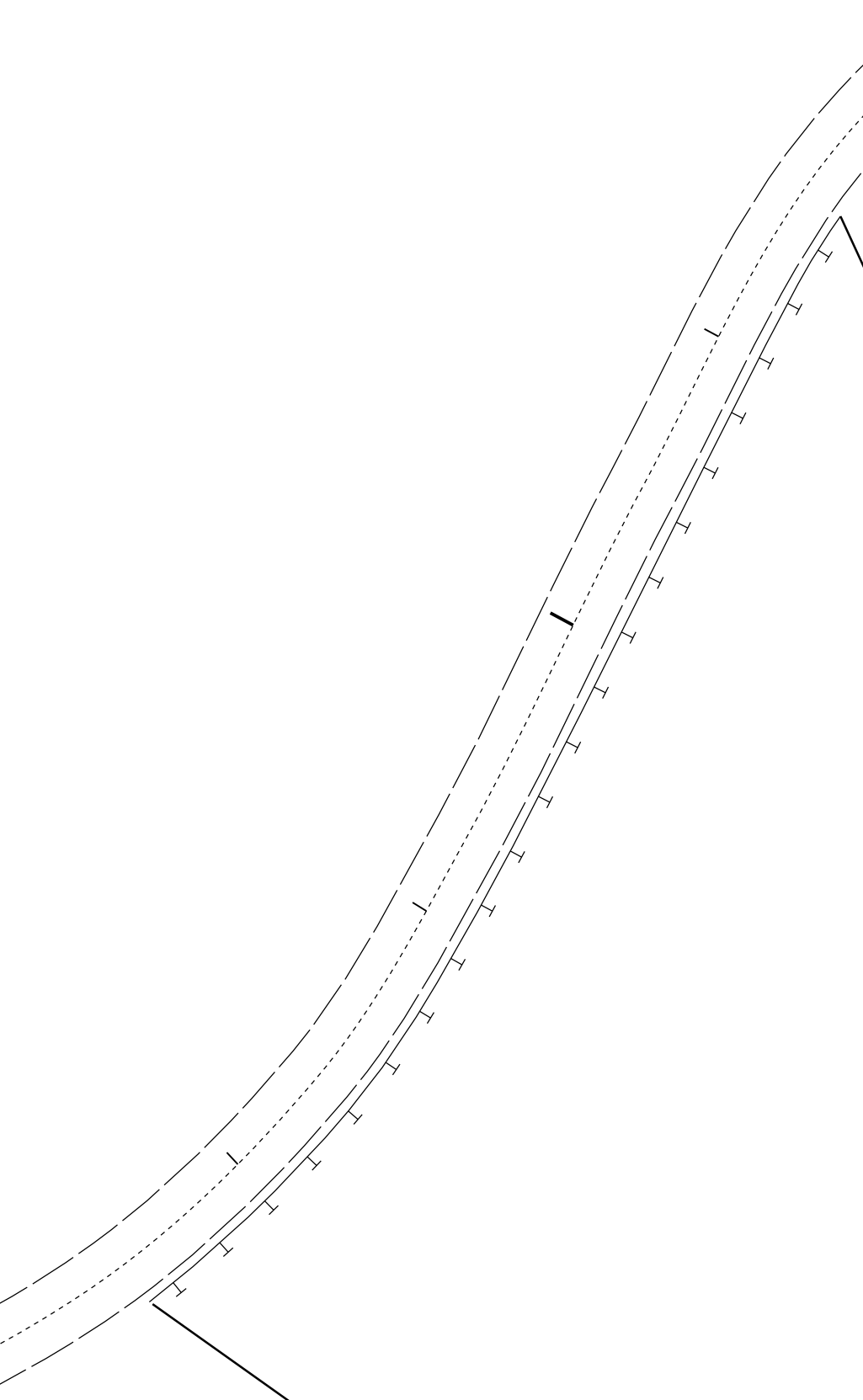
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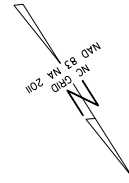
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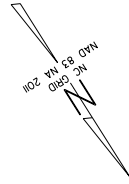
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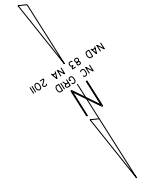
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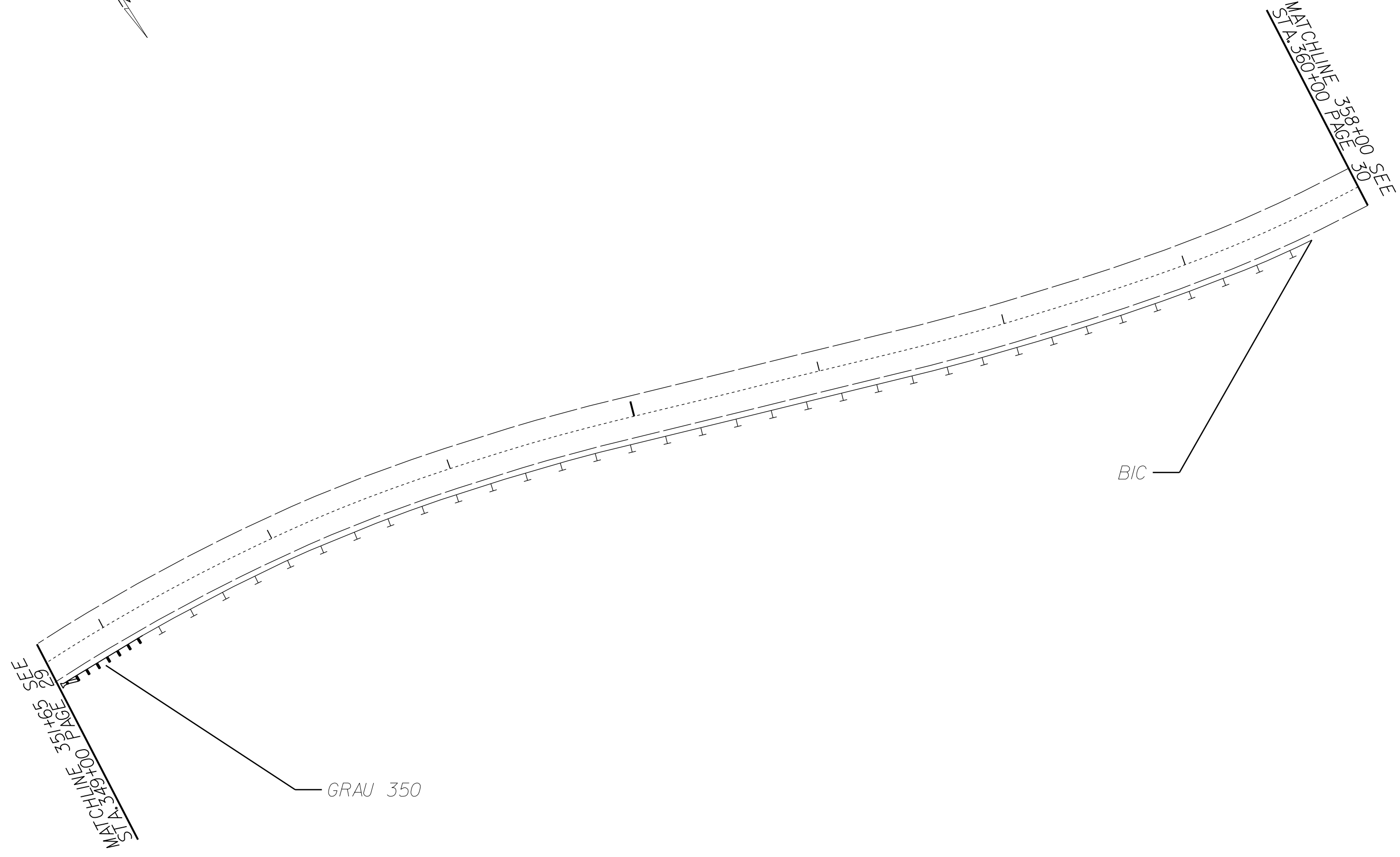
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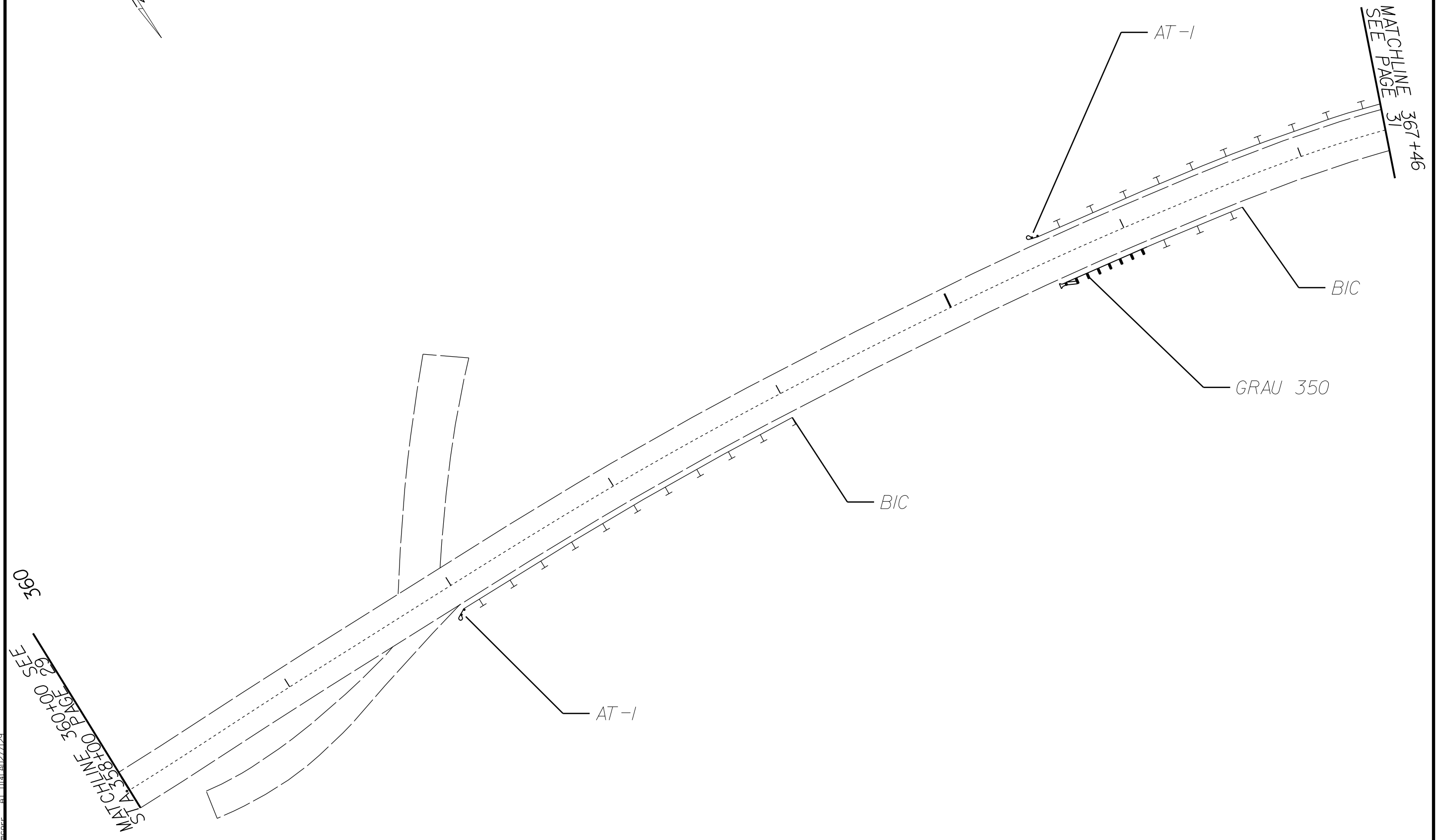
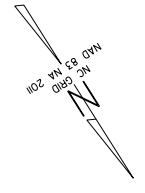
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GRAU 350

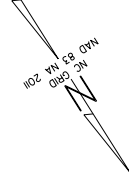
MATCHLINE 349+00
SEE STA. 347+00
PAGE 29

MATCHLINE 358+00
SEE STA. 360+00
PAGE 30

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6/2/19

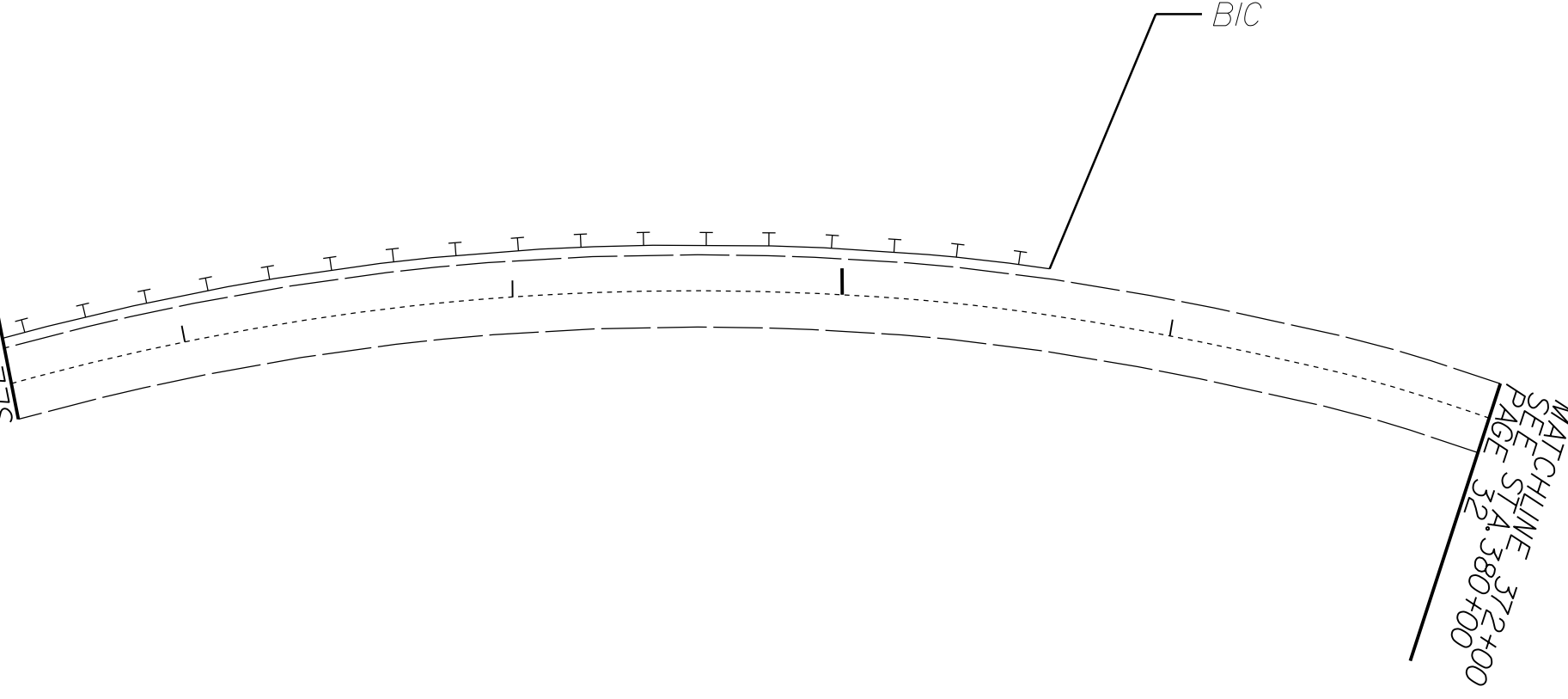


6/2/99
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370

MATCHLINE 367+46
SEE PAGE 31

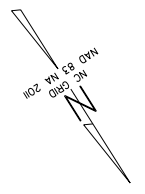


MATCHLINE 372+00
SEE STA. 380+00
PAGE 32

END PROJECT 44588.3J
-L- POT STA 385+00.00

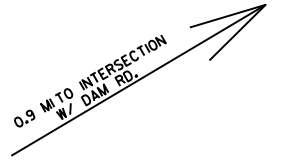
385

380

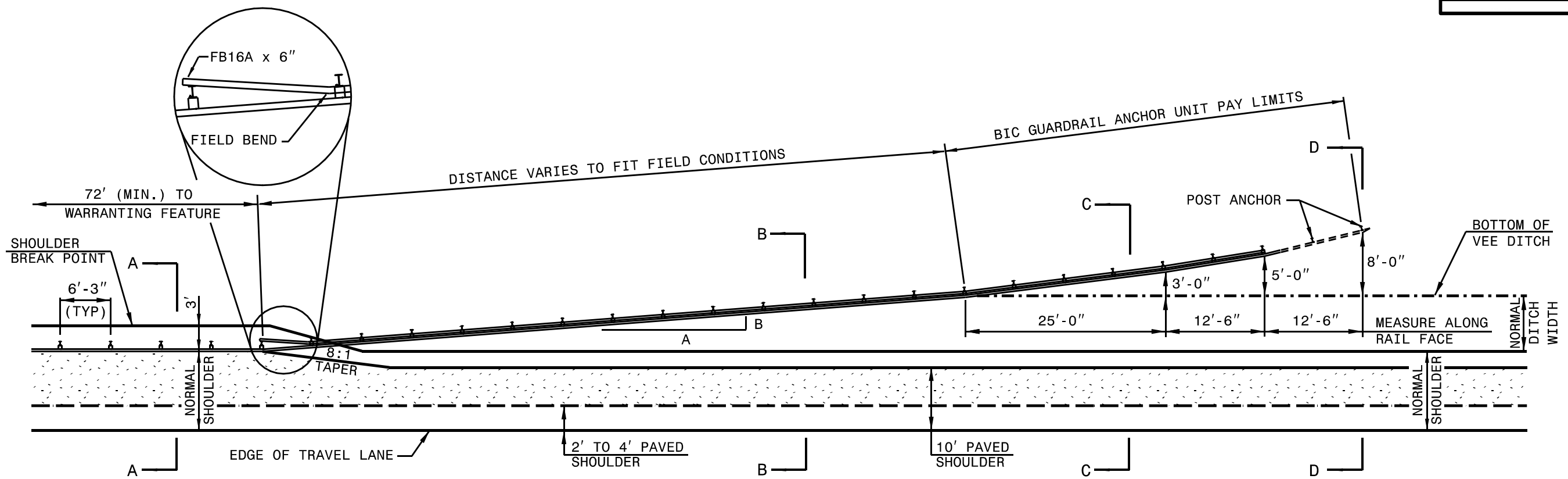


MATCHLINE 380+00
PAGE STA. 372+00

GRAU 350

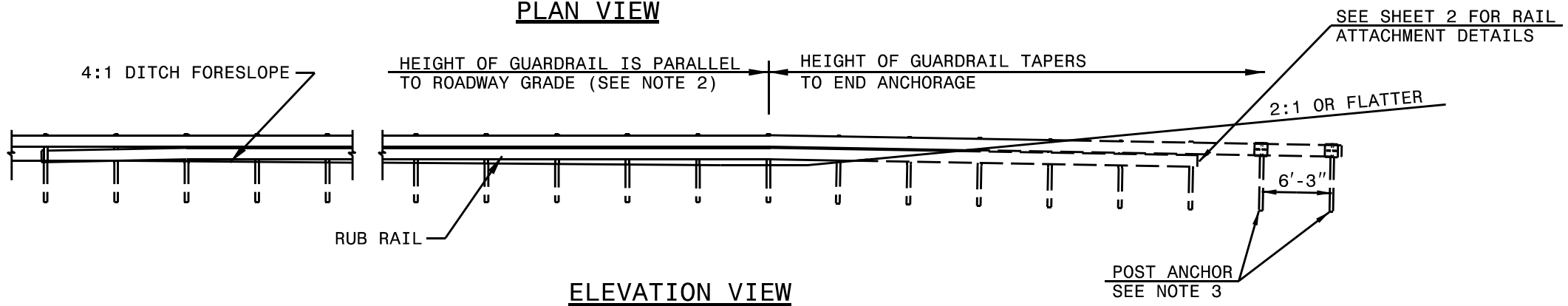


0.9 MI TO INTERSECTION
W/ DAM RD.

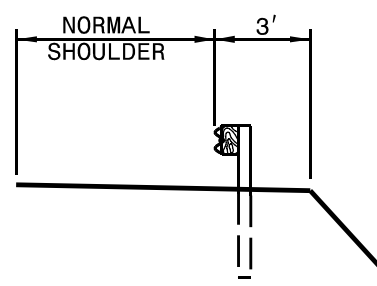


PLAN VIEW

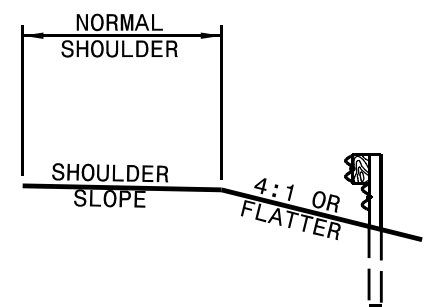
DESIGN SPEED mph	A:B
> 60	13:1
55	12:1
50	11:1
45	10:1
40	9:1
30 or less	7:1



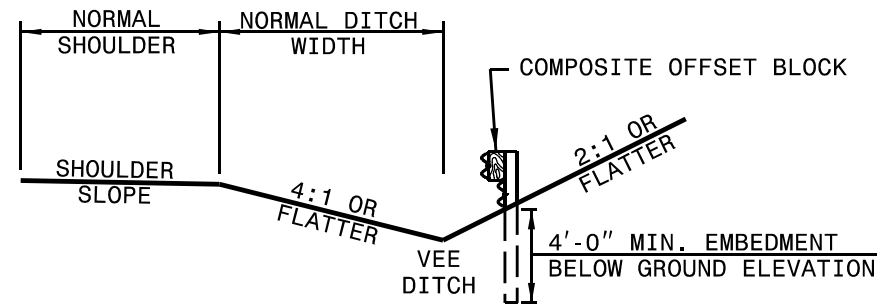
ELEVATION VIEW



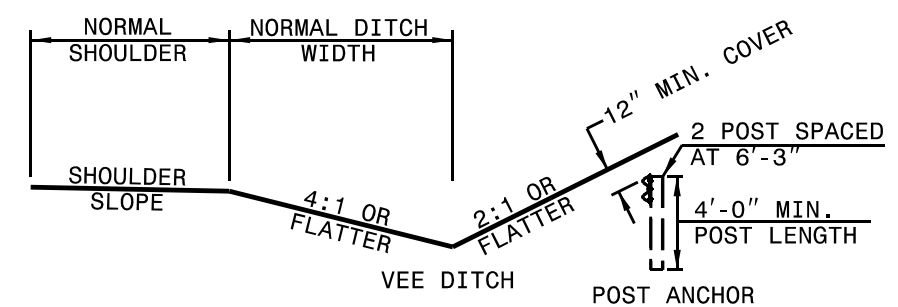
SECTION A-A



SECTION B-B
(WITH RUBRAIL)



SECTION C-C
(WITH RUBRAIL)



SECTION D-D

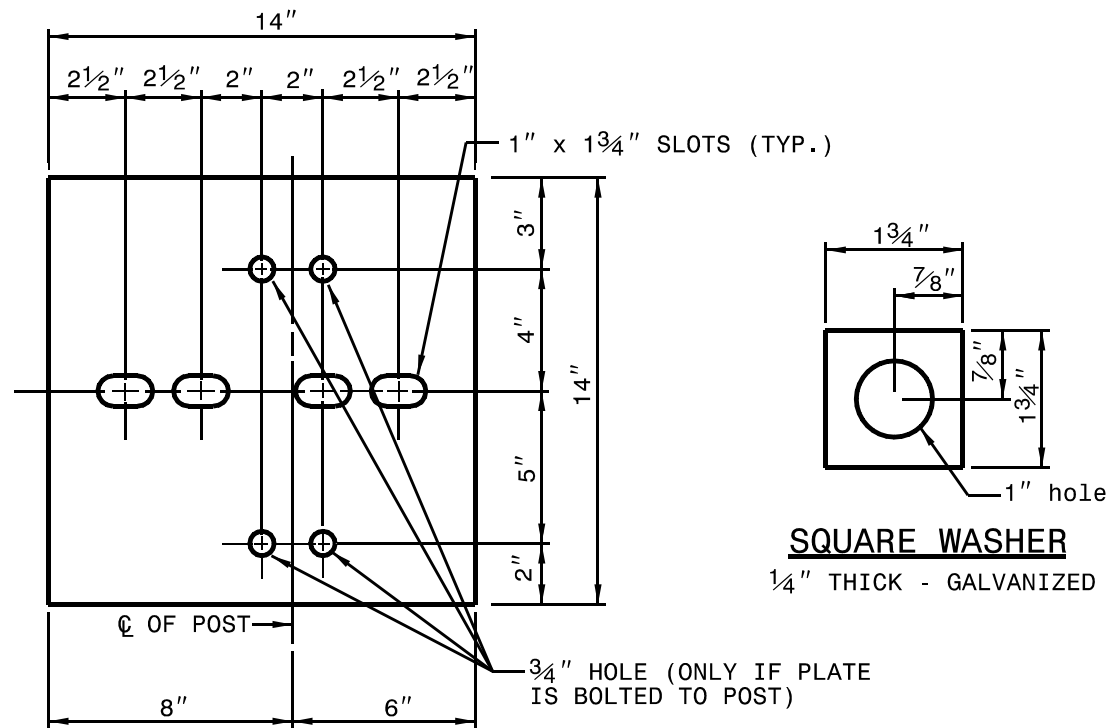
- NOTES:
- VARIABLE DITCH OFFSETS MAY BE USED TO FIT FIELD CONDITIONS.
 - HEIGHT OF GUARDRAIL MAY BE TAPERED DOWN IN ELEVATION TO MAINTAIN 3'-9" MAXIMUM HEIGHT.
 - ALL POSTS ARE 8'-0" IN LENGTH FROM WHERE THE GUARDRAIL FLARES AWAY FROM THE SHOULDER BACK TO THE DITCH FLOW LINE. GUARDRAIL POSTS BEYOND THE DITCH FLOW LINE MAY BE SHORTENED AS LONG AS A MINIMUM OF 4 FT. EMBEDMENT REMAINS BELOW THE EXISTING GROUND LINE. POST FOR POST ANCHOR MAY BE REDUCED TO 4 FT., ALL OF WHICH WILL BE BELOW GROUND.
 - REFER TO NCDOT STANDARD DRAWINGS 862.02 FOR GUARDRAIL INSTALLATION NOT COVERED IN THIS DETAIL AND INSTALL IN ACCORDANCE WITH SECTION 862 OF THE STANDARDS SPECIFICATIONS.
 - PAYMENT FOR ANY RUBRAIL INSTALLATION BEYOND BIC GUARDRAIL ANCHOR UNIT PAY LIMITS WILL BE INCIDENTAL TO PAYMENT FOR BIC ANCHOR UNIT.

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

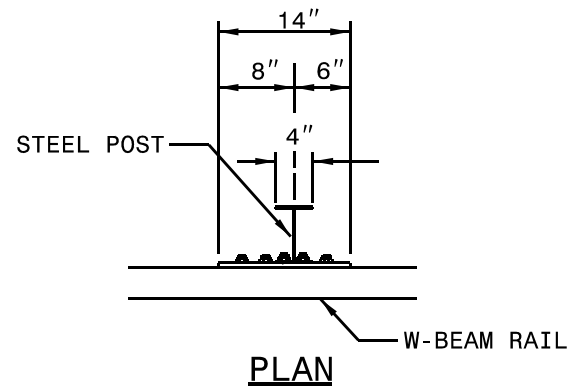
DETAIL OF GUARDRAIL BURIED IN CUT (BIC)

ORIGINAL BY: FHWA-G4 SYSTEM DATE: 8-13-98
MODIFIED BY: J. E. WARD DATE: 12-7-01
CHECKED BY: DATE:
FILE SPEC.: ericward/misc_guardrail/BIC.dwg

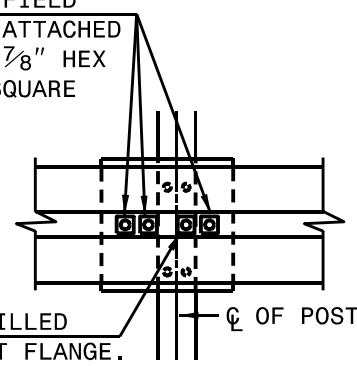
5/14/98 SYSTEMS DESIGN USER NAME



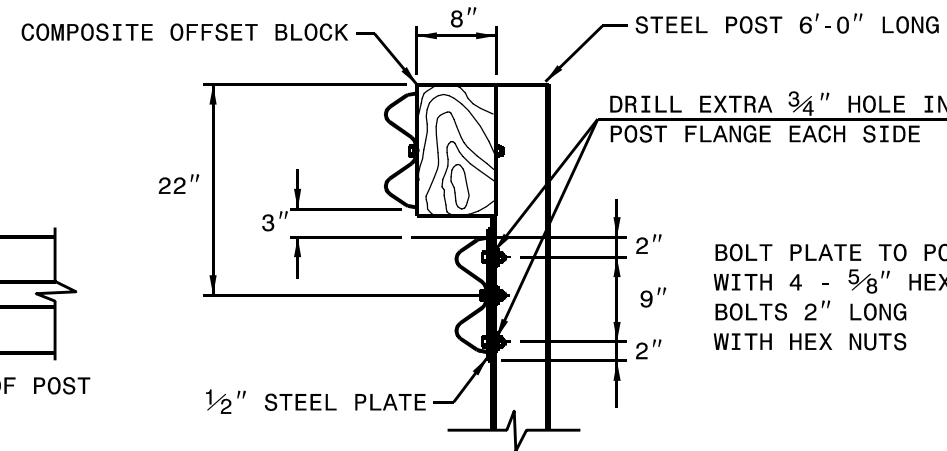
STEEL PLATE - 1/2"
GALVANIZED
WELDED OR BOLTED TO POST



3 - 7/8" HOLES TO BE FIELD DRILLED IN RAIL AND ATTACHED TO STEEL PLATE WITH 7/8" HEX BOLTS 2" LONG WITH SQUARE WASHER

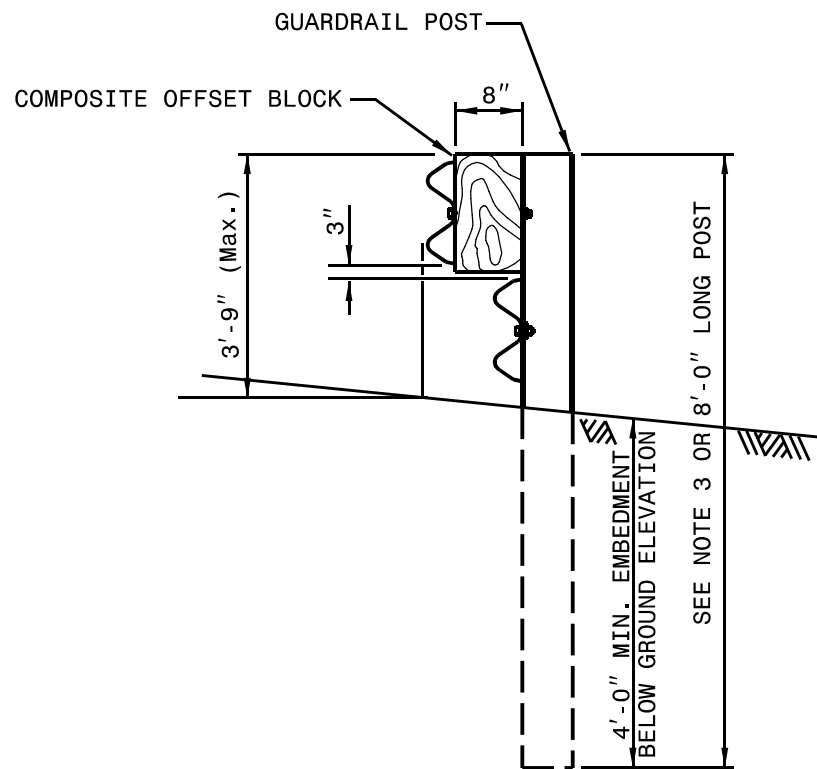


1" HOLES TO BE FIELD DRILLED IN RAIL AND THROUGH POST FLANGE. ATTACH TO STEEL PLATE WITH 7/8" HEX BOLTS 2" LONG WITH SQUARE WASHER

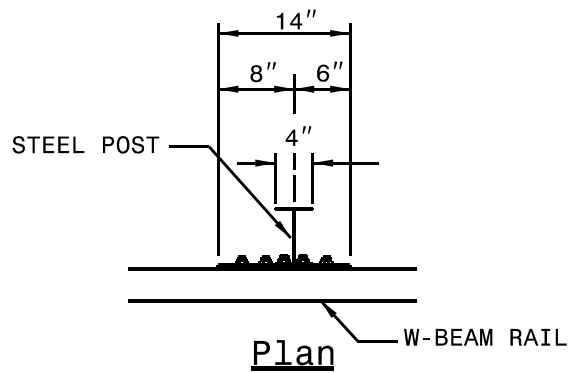


BOLT PLATE TO POST WITH 4 - 5/8" HEX BOLTS 2" LONG WITH HEX NUTS

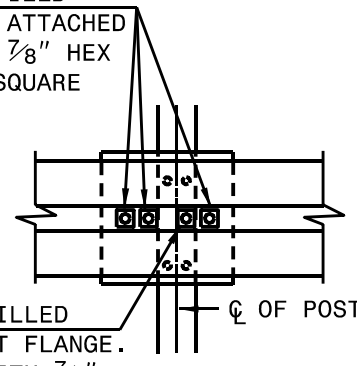
RUBRAIL ANCHOR DETAILS



RAIL ATTACHMENT DETAIL

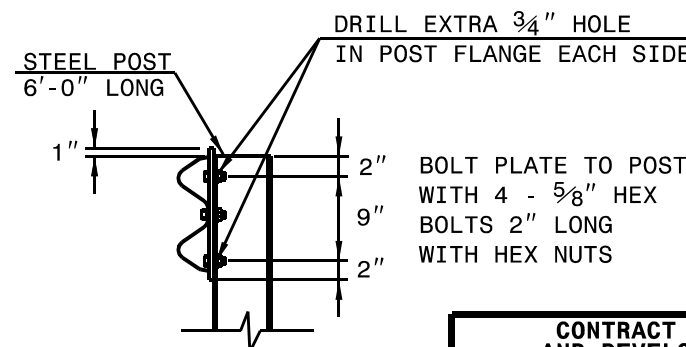


3 - 1" HOLES TO BE FIELD DRILLED IN RAIL AND ATTACHED TO STEEL PLATE WITH 7/8" HEX BOLTS 2" LONG WITH SQUARE WASHER



1" HOLES TO BE FIELD DRILLED IN RAIL AND THROUGH POST FLANGE. ATTACH TO STEEL PLATE WITH 7/8" HEX BOLTS 2" LONG WITH SQUARE WASHER.

POST ANCHOR DETAILS



BOLT PLATE TO POST WITH 4 - 5/8" HEX BOLTS 2" LONG WITH HEX NUTS

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DETAIL OF GUARDRAIL BURIED IN CUT (BIC)

ORIGINAL BY: FHWA-G4 SYSTEM DATE: 8-13-98
MODIFIED BY: F.E. WARD DATE: 12-7-01
CHECKED BY: DATE:
FILE SPEC.: ericward/misc_guardrail/BIC.dwg

5/14/99
SYSTEM DESIGN
USER NAME