LETTING DATE
MAR. 16, 2010

CRAWFORD COUNTY
RCB CULVERT REPLACEMENT - TWIN BOX
BROS-C024(93)--8J-24

IOWA ONE CALL
800/292-8989
CALL BEFORE YOU DIG

Iowa Department of Transportation
Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

SECONDARY ROAD SYSTEM
CRAWFORD COUNTY

PROJECT NO. BROS-C024(93)--8J-24

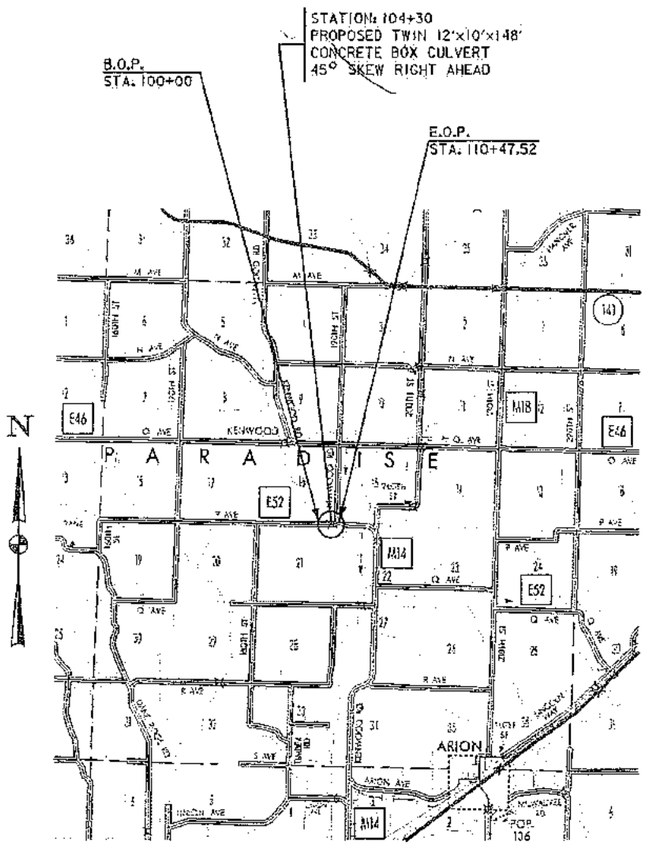
RCB CULVERT REPLACEMENT - TWIN BOX

ON P AVENUE OVER NEDDERMEYER CREEK
NEAR INTERSECTION WITH COUNTY ROAD M-14

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2009, PLUS GENERAL SUPPLEMENTAL SPECIFICATIONS; AND APPLICABLE SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, AND SPECIAL PROVISIONS, SHALL APPLY TO CONSTRUCTION ON THIS PROJECT.

VALUE ENGINEERING SAVES. REFER TO THE GENERAL NOTES IN THESE PLANS.

THIS PROJECT IS COVERED BY THE IOWA DEPARTMENT OF NATURAL RESOURCES NPDES GENERAL PERMIT NO. 2. THE CONTRACTOR SHALL CARRY OUT THE TERMS AND CONDITIONS OF GENERAL PERMIT NO. 2 AND THE STORM WATER POLLUTION PREVENTION PLAN WHICH IS A PART OF THESE CONTRACT DOCUMENTS. REFER TO SECTION 2602 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL INFORMATION.



LOCATION MAP
(NOT TO SCALE)

MILEAGE SUMMARY

DIV.	LOCATION	LIN. FT.	MILES
1	100+00 TO 110+47.52	1047.52	0.1984

ENGLISH STANDARD CULVERT PLANS

STANDARD	ISSUED	REVISED
TWRCB-G1-87	07-87	01-09
TWRCB 12-10-87	07-87	12-98
TWH 45-1-87	07-87	12-98
TWH 45-2-87	07-87	
TWH 45-3-87	07-87	
TWH 45-4-87	07-87	04-07
TWH 45-5-87	07-87	
TWH 45-6-87	07-87	01-98

THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF U.S ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 14, PERMIT NO. CEMVR-OD-P-2009-1610 A COPY OF THIS PERMIT IS AVAILABLE FROM THE IOWA DOT OFFICE OF CONTRACTS UPON REQUEST. THE U.S. ARMY CORPS OF ENGINEERS RESERVES THE RIGHT TO VISIT THE SITE WITHOUT PRIOR NOTICE.

SEE SHEET 3 FOR STANDARD ROAD PLANS

SEE SHEET 3 FOR TRAFFIC CONTROL PLAN

DESIGN DATA RURAL

2004 AADT 60 V.P.D.
2030 AADT 100 V.P.D.

TOTAL SHEETS
17
PROJECT NUMBER
BROS-C024(93)--8J-24
FHWA NUMBER
128110

INDEX OF SHEETS

APPROVAL

12/9/09
CRAWFORD COUNTY ENGINEER DATE

Mark Lynch
Robert Lohmann
Dan Mullen
BOARD OF SUPERVISORS DATE

REVISIONS

DRAWING APPROVAL:
ALL SHOP DRAWINGS AND FALSEWORK DRAWINGS THAT REQUIRE APPROVAL SHALL BE APPROVED BY KIRKHAM MICHAEL.

ADDRESS:
11021 AURORA AVENUE
URBANDALE, IA 50322
TELEPHONE: (515) 270-0848
FAX: (515) 270-1067

THESE SHOP DRAWINGS SHALL NOT BE SENT TO IOWA D.O.T. OFFICE OF BRIDGE AND STRUCTURES.

LICENSED PROFESSIONAL ENGINEER
STEVEN B. RENEKER
11455
IOWA

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

Steven B. Renker 12/9/09
STEVEN B. RENEKER, P.E. DATE

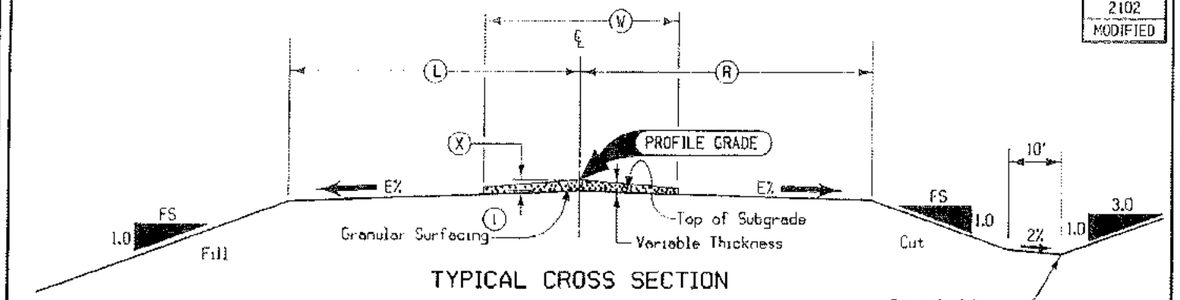
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2010
LICENSE NO.: 11455

PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

DESIGN TEAM KIRKHAM MICHAEL	ENGLISH		CRAWFORD COUNTY	PROJECT NUMBER BROS-C024(93)--8J-24	SHEET NUMBER

128110

2102
MODIFIED



TYPICAL CROSS SECTION
GRADING AND GRANULAR SURFACING

Notes:

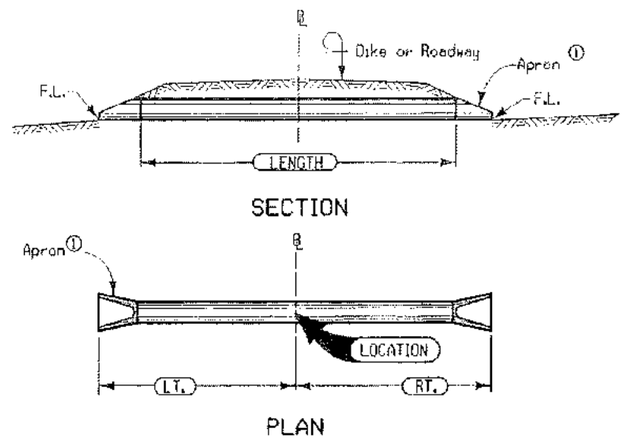
See appropriate Typical Sections in this plan for details of ditches and backslopes.

Normal sections shown may be modified appropriately in area of culvert or other locations specifically designated by the Engineer.

(1) Design rate of application for Granular Surfacing is 2000 tons per mile.

LOCATION			(L)	(R)	(X)	(W)	FS	E%
ROAD IDENTIFICATION	STATION TO STATION		Feet	Feet	Inches	Feet		
P AVENUE	100+00	100+50	Varies	Varies	4	22	Varies	Varies
P AVENUE	100+50	109+80	15	15	4	22	3	3.3
P AVENUE	109+80	110+47.52	Varies	Varies	4	22	Varies	Varies

1101
04-30-02



Notes:

℄ shall be ℄ of roadway, dike, survey, or other; as detailed on plans.

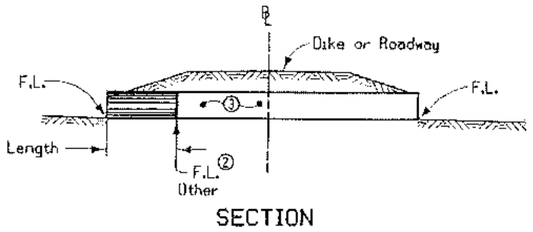
Skew angle is the angle which one end of the pipe is ahead (by stationing) of line perpendicular to the ℄ (example skew Rt. ahead 30°).

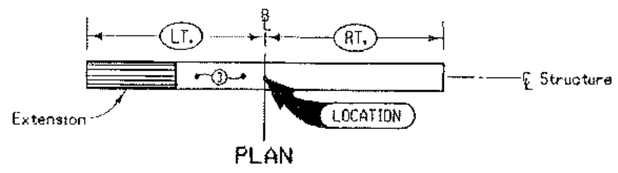
Refer to tabular listing and other plans for additional information.

(1) See Standard Road Plan RF-3 For Conc. or RF-5 for Metal.

PIPE CULVERT

1301
MODIFIED





Notes:

℄ shall be ℄ of roadway, dike, survey, or other; as detailed on plans.

Extension shall be on line of existing structure to Lt., Rt. or both as specified. Adapters may be required, see Standard Road Plan RF-2.

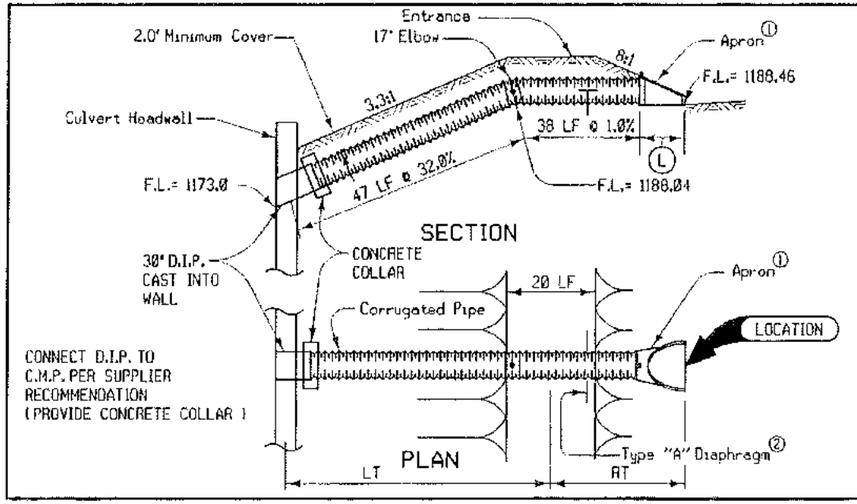
Refer to tabular listing and other plans for additional information.

(2) Optional type "D" section only when specified in tabulation.

(3) Existing structure.

PIPE EXTENSION

1403
MODIFIED



Notes:

Refer to tabular listing and other plans for additional information.

Standard type joint couplings are required. (See Materials I.M. 441)

If more than one diaphragm is specified, they will be installed 15' apart or as specified.

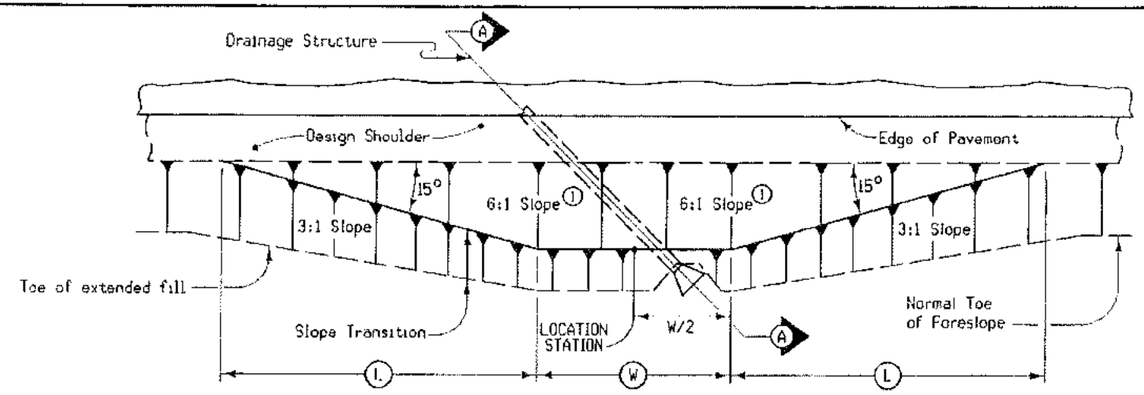
(1) See Standard Road Plan RF-5 for Metal and Polyethylene.

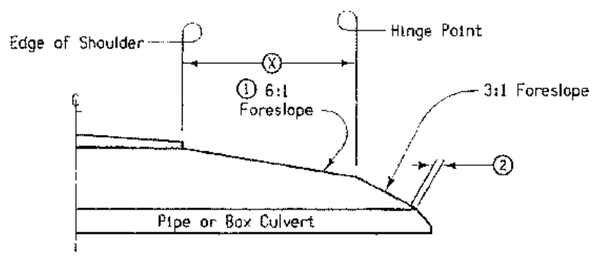
(2) See Standard Road Plan RF-7.

(3) Connection to outlet, if required, shall be incidental.

CORRUGATED PIPE
LETDOWN STRUCTURE

4311
MODIFIED





SECTION A-A

STRUCTURE LOCATION		(W)	(L)	(X)
LOCATION STATION	SIDE	Feet	Feet	Feet
103+73.5	LT	240	40	10
104+80.2	RT	225	40	10

Notes:

At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, the foreslope shall be flattened as indicated so as to cover the structure. Minimum earth cover is 6".

(1) 6:1 Maximum - Slope may be flatter.

(2) 6" Minimum for pipe installations or to top of headwall on R.C.B.

(W) = Pipe or R.C.B. width plus 20 feet min. each side.

(X) = Clear Zone.

DETAILS OF
BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE

ESTIMATED PROJECT QUANTITIES

ITEM NO.	ITEM CODE	ITEM DESCRIPTION	UNIT	TOTAL
1	2101-0850001	CLEARING AND GRUBBING	AC.	0.46
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	4837
3	2104-2710020	EXCAVATION CLASS 10 CHANNEL	CY	6792
4	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TONS	425
5	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1
6	2402-2720000	EXCAVATION, CLASS 20	CY	2498
7	2403-0100020	STRUCTURAL CONCRETE (R.C.B. CULVERT)	CY	662.5
8	2404-7775000	REINFORCING STEEL	LBS.	89832
9	2417-0225024	APRON, METAL, 24 IN. DIA.	EACH	2
10	2417-0225030	APRON, METAL, 30 IN. DIA.	EACH	1
11	2417-1040024	CULVERT, CORRUGATED METAL ENTRANCE PIPE, 24 IN. DIA.	LF	30
12	2417-1040030	CULVERT, CORRUGATED METAL ENTRANCE PIPE, 30 IN. DIA.	LF	85
13	2417-1060060	CULVERT, CORRUGATED METAL ROADWAY PIPE, 60 IN. DIA.	LF	12
14	2507-3250005	ENGINEERING FABRIC	SY	1949
15	2507-4011100	CONCRETE GROUT FOR REVETMENT OR GABION	CY	14
16	2507-6800061	REVETMENT, CLASS E	TONS	1253
17	2518-6910000	SAFETY CLOSURE	EACH	4
18	2528-8445110	TRAFFIC CONTROL	LS	1
19	2533-4980005	MOBILIZATION	LS	1
20	2601-2634100	MULCHING	ACRE	3.0
21	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	3.0
22	2602-0000020	SILT FENCE	LF	320
23	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	140

STANDARD ROAD PLANS

105-4
10-16-07

The following Standard Road Plans shall be considered applicable to construction work on this project.

Number	Date	Sheets	Title
RC-17	10-20-09	2	SILT FENCE
RF-5	10-03-00	1	METAL PIPE APRONS AND BEVELED ENDS
RF-7	10-16-07	1	CORRUGATED METAL TYPE 'A' DIAPHRAGM
RF-30A	10-20-09	1	CULVERT (BEDDING AND BACKFILL)
RF-30C	04-30-02	1	PIPE CULVERT (INSTALLATION DETAILS)
RF-32	10-20-09	2	DEPTH OF COVER TABLES FOR CORRUGATED PIPE
RL-1A	10-03-00	1	DETAILS OF EMBANKMENT AND REBUILDING EMBANKMENTS
RL-1B	10-17-06	1	DETAILS OF EMBANKMENT (ALLOWABLE PLACEMENT OF UNSUITABLE MATERIAL)
RL-4	09-21-99	1	DITCH BLOCKS AND DIKES
RL-8	10-20-09	1	RURAL ENTRANCE
RL-16	10-20-09	1	TEMPORARY STREAM CROSSING, CAUSEWAY, OR EQUIPMENT PAD
TC-252	10-20-09	2	ROAD CLOSURE

TRAFFIC CONTROL PLAN

THE PROJECT ROUTE WILL BE CLOSED TO TRAFFIC. TRAFFIC CONTROL DEVICES, PROCEDURES, LAYOUTS, SIGNING AND PAVEMENT MARKINGS INSTALLED WITHIN THE LIMITS OF THIS PROJECT SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC) CHAPTER 130.

PLASTIC SAFETY FENCE SHALL BE PLACED ON BOTH SIDES OF THE BRIDGE SITE. IN ADDITION, A TYPE III BARRICADE SHALL BE PLACED IN ADVANCE OF THE PLASTIC SAFETY FENCE. A "ROAD CLOSED" SIGN (R-11, 48" x 30") SHALL BE PLACED ON EACH TYPE III BARRICADE ALONG WITH TWO TYPE "A" LOW INTENSITY FLASHING WARNING LIGHTS.

CRAWFORD COUNTY MAINTENANCE SHALL SALVAGE ALL ROAD MARKERS AFTER THE ROAD IS CLOSED.

THE BID ITEM "TRAFFIC CONTROL" SHALL INCLUDE THE COST FOR ALL TRAFFIC CONTROL MEASURES REQUIRED OF THE CONTRACTOR EXCEPT FOR THOSE WHICH ARE SEPARATE BID ITEMS OR ARE INCIDENTAL TO OTHER BID ITEMS.

ALL CONTRACTOR FURNISHED TRAFFIC CONTROL SIGNS USED ON THIS PROJECT SHALL BE SHEETED WITH ENCAPSULATED LENS SHEETING.

TYPE "C" STEADY BURN WARNING LIGHTS ARE NOT REQUIRED FOR VERTICAL PANELS, BARRICADES AND DRUMS WHEN THESE TRAFFIC CONTROL DEVICES ARE SHEETED WITH ENCAPSULATED LENS SHEETING.

ESTIMATE REFERENCE INFORMATION

DATA LISTED BELOW IS FOR INFORMATION PURPOSES ONLY AND SHALL NOT CONSTITUTE A BASIS FOR ANY EXTRA WORK ORDERS.

ITEM NO.	DESCRIPTION
1	CLEARING AND GRUBBING: REFER TO SHEET 7 FOR LIMITS.
2	EXCAVATION, CLASS 10, ROADWAY AND BORROW: ROADWAY CONSTRUCTION REQUIRES 4837 C.Y. OF FILL MATERIAL, 2322 C.Y. IS AVAILABLE FROM DITCH CUTS, 1578 C.Y. IS AVAILABLE FROM "EXCAVATION, CLASS 20", AND 937 C.Y. IS AVAILABLE FROM "EXCAVATION, CLASS 10 CHANNEL." TYPE "A" COMPACTION WILL BE REQUIRED. INCLUDES MATERIAL FOR ENTRANCES. THE QUANTITY INCLUDES AN ADDITIONAL 30% TO COMPENSATE FOR SHRINKAGE. NO PAYMENT FOR OVERHAUL SHALL BE MADE ON THIS PROJECT. ROUNDING OF BACKSLOPE IS NOT REQUIRED. PAY QUANTITY WILL BE PLAN QUANTITY ADJUSTED FOR OBVIOUS ERRORS, PLAN REVISIONS OR CHANGE ORDERS. EXCEPT WHERE NOTED OTHERWISE ON THE PLANS, ALL ENTRANCE AND ROADWAY CULVERTS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AS PART OF "EXCAVATION, CLASS 10, ROADWAY AND BORROW".
3	EXCAVATION CLASS 10 CHANNEL: INCLUDES COSTS TO CLEAR THE CHANNEL TO THE SHAPE, DEPTH, AND EXTENT SHOWN ON SHEET 7. UNSUITABLE OR EXCESS MATERIAL SHALL BE WASTED ON-SITE AS DIRECTED BY THE ENGINEER. INCLUDES COSTS TO REMOVE AND RELOCATE BROKEN CONCRETE REVETEMENT AS NECESSARY TO SHAPE CHANNEL BANKS.
4	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE: SURFACING TO BE FURNISHED AND PLACED BY THE CONTRACTOR IN TWO PASSES (1400 AND 600 TONS /MILE).
5	REMOVAL OF EXISTING BRIDGE: SEE SHEET 6 FOR DESCRIPTION OF EXISTING BRIDGE. STEEL BEAMS AND DECK PLANK ARE TO REMAIN THE PROPERTY OF CRAWFORD COUNTY. CONTRACTOR WILL PLACE SALVAGED MATERIAL ON A TRUCK PROVIDED BY CRAWFORD COUNTY. ALL OTHER MATERIAL FROM THE EXISTING BRIDGE IS TO BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR. SEE HAZARDOUS MATERIALS NOTES, SHEET 5, FOR PAINT SCRAPE SAMPLE RESULTS. AN INSPECTION FOR THE PRESENCE OF ASBESTOS CONTAINING MATERIALS WAS COMPLETED AND NO SUSPECT MATERIALS WERE FOUND. IF MATERIALS SUSPECTED OF CONTAINING ASBESTOS ARE DISCOVERED DURING DEMOLITION OF THE BRIDGE, WORK SHALL BE STOPPED IMMEDIATELY AND THE ENGINEER NOTIFIED. THE EXISTING STRUCTURE SHALL BE REMOVED TO AN ELEVATION AT LEAST 1' BELOW FINISHED GROUNDLINE AND TO THE EXTENT THAT IT WILL NOT INTERFERE WITH THE NEW CONSTRUCTION. INCLUDES REMOVAL OF TIMBER PILES FROM PREVIOUS BRIDGE.
6	EXCAVATION, CLASS 20: SUITABLE MATERIAL MAY BE USED FOR CONSTRUCTION OF APPROACH ROADWAY AND ENTRANCES IN ACCORDANCE WITH IDOT ROAD STANDARD RL-1A AND RL-1B. SUITABLE SOILS SHALL BE AS DEFINED BY ARTICLE 2102.02.D.2 OF THE STANDARD SPECIFICATIONS. SUITABLE MATERIAL SHALL BE USED TO BACKFILL THE CULVERT. BACKFILL SHALL BE COMPACTED IN ACCORDANCE WITH SECT. 2107. APPROXIMATELY 1420 C.Y. OF MATERIAL ARE REQUIRED TO BACKFILL THE CULVERT. UNSUITABLE OR EXCESS MATERIAL SHALL BE WASTED ON-SITE AS DIRECTED BY THE ENGINEER.
7	STRUCTURAL CONCRETE (R.C.B. CULVERT): CERTIFIED PLANT INSPECTION IS REQUIRED. INCLUDES ALL COSTS FOR LABOR, EQUIPMENT, AND MATERIALS TO INSTALL LET DOWN PIPE THROUGH CULVERT HEADWALL. IF THE CONTRACTOR ELECTS TO USE A GRANULAR MATERIAL TO IMPROVE WET AND MUDDY CONDITIONS ALONG THE BOTTOM OF THE EXCAVATION THE COST TO FURNISH AND PLACE THIS MATERIAL SHALL BE INCIDENTAL TO "STRUCTURAL CONCRETE (R.C.B. CULVERT)". GRANULAR MATERIAL SHALL MEET SPECIFICATION 4120 OR OTHER SUITABLE MATERIAL MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER.
8	REINFORCING STEEL: ALL REINFORCING SHALL BE GRADE 60. QUANTITY INCLUDES 46 LBS. FOR B-5c13 BARS, SEE DETAIL SHEET 5. LONGITUDINAL BARS MAY BE SPLICED IN ACCORDANCE WITH THE MINIMUM SPLICE LENGTH SHOWN IN THE CULVERT NOTES ON SHEET 5. SPLICES WILL BE AT CONTRACTOR EXPENSE.
9-10	APRON, METAL: REFER TO SHEETS 4 AND 7 FOR LOCATION.
11-12	CULVERT, CORRUGATED METAL ENTRANCE PIPE: REFER TO SHEETS 4 AND 7 FOR LOCATION AND DETAILS. ALL PIPE SHALL BE STANDARD CORRUGATIONS, NO HELICALLY CORRUGATED PIPE WILL BE ALLOWED. ALL CONNECTING BANDS SHALL BE 24" WIDE. INCLUDES ONE CORRUGATED METAL, TYPE 'A' DIAPHRAGM, AND ONE ELBOW AT LETDOWN STRUCTURE. INCLUDES COSTS TO PROVIDE DUCTILE IRON PIPE CAST INTO CULVERT HEADWALL AND CONNECTION TO C.M.P.
13	CULVERT, CORRUGATED METAL ROADWAY PIPE, 60 IN. DIA.: REFER TO SHEET 7 FOR LOCATION. PIPE SHALL BE STANDARD CORRUGATIONS, MATCHING EXISTING PIPE. NO HELICALLY CORRUGATED PIPE WILL BE ALLOWED. CONNECTING BAND SHALL BE 24" WIDE. INCLUDES EXCAVATION NECESSARY TO INSTALL CULVERT EXTENSION.
15	CONCRETE GROUT FOR REVETMENT OR GABION FOR USE AT OUTLET OF 60" CMP CULVERT. SEE SHEET 7 FOR LOCATION.
16	REVETMENT, CLASS E: REVETMENT IS TO BE PLACED AT A THICKNESS OF 1'-6. SEE SHEET 7 FOR LIMITS. THE UNIT PRICE BID FOR "REVETMENT, CLASS E" SHALL INCLUDE COST OF LABOR, EQUIPMENT, AND MATERIALS REQUIRED TO SHAPE THE CHANNEL BANKS AND PLACE CLASS E REVETMENT STONE, IN ACCORDANCE WITH SECTION 2507 OF THE STANDARD SPECIFICATIONS.
17	SAFETY CLOSURE: SEE TABULATION, SHEET 4.
18	TRAFFIC CONTROL: SEE SHEET 3.
22-23	SILT FENCE SILT FENCE FOR DITCH CHECKS: SEE TABULATION, SHEET 4. SILT FENCES THAT HAVE LOST MORE THAN 50% OF THEIR CAPACITY SHALL BE REMOVED AND REPLACED. CONTRACTOR WILL BE PAID CONTRACT UNIT PRICE FOR REPLACING SILT FENCE THAT HAS LOST CAPACITY. SILT FENCE DAMAGED BY THE CONTRACTOR IS TO BE REPLACED AT THE CONTRACTOR'S COST.

DESIGN FOR 45° SKEW RT. AHEAD

TWIN 12'x10'x148'-0 REINFORCED CONCRETE BOX CULVERT

2 - 38'-0 STANDARD SECTIONS 36'-0 END SECTIONS

QUANTITIES AND NOTES

STA. 104+30 DECEMBER, 2009

CRAWFORD COUNTY

DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

POLLUTION PREVENTION PLAN

110-12X

All contractors/subcontractors shall conduct their operations in a manner that minimizes erosion and prevents sediments from leaving the highway right-of-way. The prime contractor shall be responsible for compliance and implementation of the Pollution Prevention Plan (PPP) for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

1. SITE DESCRIPTION

This Pollution Prevention Plan (PPP) is for the replacement of an existing steel beam bridge and timber deck with a reinforced concrete box culvert on P Avenue over Neddermeyer Creek near the intersection with County Road M-14. This PPP covers approximately 4.2 acres with an estimated 3.4 acres being disturbed.

The PPP is located in an area of Monona-Ida-Hamburg soil association. The estimated average SCS runoff curve number for this PPP after completion will be 62.

Refer to the plans for locations of typical slopes, ditch grades, and major structural and non-structural controls. Runoff from this work will flow into the Boyer River via Neddermeyer Creek.

POTENTIAL SOURCES OF POLLUTION:
Site sources of pollution generated as a result of this work relate to silts and sediment which may be transported as a result of a storm event. However, this PPP provides conveyance for other (non-project related) operations. These other operations have storm water runoff, the regulation of which is beyond the control of this PPP. Potentially this runoff can contain various pollutants related to site-specific land uses. Examples are:

Rural Agricultural Activities:
Runoff from agricultural land use can potentially contain chemicals including herbicides, pesticides, fungicides and fertilizers.

Commercial and Industrial Activities:
Runoff from commercial, industrial, and commerce land use may contain constituents associated with the specific operation. Such operations are subject to potential leaks and spills which could be commingled with run-off from the facility. Pollutants associated with commercial and industrial activities are not readily available since they are typically proprietary.

2. CONTROLS

At locations where runoff can move offsite, silt fence shall be placed along the perimeter of the areas to be disturbed prior to beginning grading, excavation or clearing and grubbing operations. Vegetation in areas not needed for construction shall be preserved. As areas reach their final grade, additional silt fences, silt basins, intercepting ditches, sod flumes, letdowns, bridge end drains, and earth dikes shall be installed as specified in the plans and/or as required by the project engineer. This will include using silt fence as ditch checks and to protect intakes. Temporary stabilizing seeding shall be completed as the disturbed areas are constructed. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days. Other stabilizing methods shall be used outside the seeding time period. This work shall be done in accordance with Section 2602 of the Standard Specification. If the work involved is not applicable to any contract items, the work shall be paid for according to Article 1109.03 paragraph B.

As the work progresses, additional erosion control items may be required as determined by the contractor after field investigation. The contractor will complete the construction with the establishment of permanent perennial vegetation of all disturbed areas.

3. OTHER CONTROLS

Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

APPROVED STATE OR LOCAL PLANS:
During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

4. MAINTENANCE

The contractor is required to maintain all temporary erosion control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. Cleaning of silt control devices shall begin when the features have lost 50% of their capacity.

5. INSPECTIONS

Inspections shall be made jointly by the contractor and the contracting authority every seven calendar days and after each rain event that is ½" or greater. The contractor shall immediately begin corrective action on all deficiencies found. The findings of this inspection shall be recorded in the project diary. This PPP may be revised based on the findings of the inspection. The contractor shall implement all revisions. All corrective actions shall be completed within 3 calendar days of the inspection.

6. NON-STORM DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains), slope drains and bridge end drains. The velocity of the discharge from these features may be controlled by the use of patio blocks, Class A stone or erosion stone.

TABULATION OF SAFETY CLOSURES

108-13A
10-28-97

Refer to Section 2518 of the Standard Specifications

STATION	CLOSURE TYPE Road Qty.	CLOSURE TYPE Hazard Qty.	REMARKS
99+00	1	-	
110+50	1	-	
103+00	-	1	
106+00	-	1	

SUMMARY OF EARTHWORK

STATION	AREAS IN SQ. FT. CUT	AREAS IN SQ. FT. FILL	VOLUMES IN CU. YDS. CUT	ADJ. CUT	FILL	ADJ. FILL	FILL+30%
100+50	3	4	18		16		21
101+00	17	13	41		32		41
101+50	27	21	67		50		65
102+00	45	33	105		94		122
102+50	68	69	156		147		192
103+00	100	90	223		205		267
103+50	142	131	211		722		938
104+00	87	648	80	* 937	1264	99	1772
104+50	0	717	61		766		996
105+00	66	110	176	Δ 1578	109	49	205
105+50	125	7	322		7		9
106+00	223	0	356		35		46
106+50	162	38	183		38		49
107+00	36	3	80		2		3
107+50	51	0	86		0	50	65
108+00	42	0	79		0		0
108+50	43	0	55		3		3
109+00	17	3	16		18		23
109+50	1	17	5		15		20
110+00	5	0					
	TOTALS		2322	2515			4837

* = CLASS 10 CHANNEL
Δ = CLASS 20 CULVERT EXCAVATION

TABULATION OF SILT FENCES FOR DITCH CHECKS

100-18
11-10-83

Location Station	Side	Lin. Ft.	Remarks
101+50	RT	20	
102+50	RT	20	
103+85	RT	20	UPSTREAM OF FES
108+00	LT	20	
SUBTOTAL		80	
CONTINGENCY		60	
TOTAL		140	

TABULATION OF SILT FENCES

100-17
11-10-83

Location Station to Station		Side	Length (Lin. Ft.)	Remarks
101+00	102+50	LT	150	ALONG TOE
104+00	104+80	LT	80	ALONG TOE
105+15	105+60	LT	45	ALONG TOE
102+75	-	LT	40	TOP OF BANK
106+70	-	LT	30	TOP OF BANK
105+50	108+50	RT	300	ALONG TOE
SUBTOTAL			645	
CONTINGENCY			175	
TOTAL			820	

① Refer to RB-3
② Refer to RL-8

POINTS OF ACCESS

102-3
04-21-09

Refer to Cross-Sections

Location Station	Side	② Type A, B, or C	Length of Opening ① Case 1, 2, or 3	1½" Dropped Curb Lin. Ft.	3" Dropped Curb Lin. Ft.	(W) Ft.	①② (PR) Ft.	② (SR) Ft.	Pipe Culvert (RF-30A or RF-30B) (H) Ft.	Size Inches	Pipe Length Lin. Ft.	Lt.② Lin. Ft.	Rt.② Lin. Ft.	Aprons No.	Driveway Surface Area H.M.A. Sq. Yds.	P.C.C. Sq. Yds.	Driveway Surfacing Material Tons	Remarks
104+10	RT.	C	-	-	-	20	-	15	2	30	85	57	32.5	1	-	-	-	
105+00	LT.	C	-	-	-	20	-	15							-	-	-	
105+85	LT.	C	-	-	-	20	-	15							-	-	-	
107+40	LT.	C	-	-	-	20	-	15	2	24	30	16.5	20.5	2	-	-	-	

DESIGN FOR 45° SKEW RT. AHEAD

TWIN 12'x10'x148'-0 REINFORCED CONCRETE BOX CULVERT

2 - 38'-0 STANDARD SECTIONS 36'-0 END SECTIONS

TABULATIONS AND NOTES

STA. 104+30 DECEMBER, 2009

CRAWFORD COUNTY

DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

SPECIFICATIONS:

REFER TO STANDARD SHEET TWRCB-GI-07

CONSTRUCTION:

STANDARD SPECIFICATION OF THE IOWA DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION, SERIES OF 2009, PLUS GENERAL SUPPLEMENTAL SPECIFICATIONS, AND APPLICABLE DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1992, PLUS INTERIM SPECIFICATIONS.

CONCRETE	SECTION 8	f'c = 3,500 PSI
REINFORCING STEEL	SECTION 8	
ASTM A615	GRADE 60,	fs = 24,000 PSI

404 PERMIT NOTE:

THIS PROJECT IS TO BE BUILT UNDER THE CONDITIONS OF ARMY CORPS OF ENGINEERS 404 PERMIT NUMBER CEMVR-OD-P-2009-784. THIS IS A NATIONWIDE PERMIT AND MAY CONTAIN SPECIAL CONDITIONS. WORK REQUIRED UNDER THIS PERMIT IS CONSIDERED INCIDENTAL TO OTHER WORK. A COPY OF THE PERMIT IS AVAILABLE AT THE COUNTY ENGINEER'S OFFICE. THE ARMY CORPS OF ENGINEERS RESERVES THE RIGHT TO VISIT THE SITE WITHOUT PRIOR NOTICE.

GENERAL NOTES:

THIS CULVERT IS DESIGNED FOR HS20-44 LOADING AND 12' OF FILL. VERTICAL EARTH LOAD IS ASSUMED AS 140 P.C.F. AND LATERAL EARTH LOADS AS AN EQUIVALENT FLUID PRESSURE OF 36 PSF/FT.

ACCESS SHALL BE MAINTAINED TO INDIVIDUAL PROPERTIES DURING CONSTRUCTION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

THE PRIME CONTRACTOR SHALL EMPLOY CONTROLS TO REDUCE THE EROSIVENESS OF LAND ADJACENT TO SURFACE WATERS AND WETLANDS, INCLUDING ESTABLISHMENT AND MAINTENANCE OF EROSION CONTROL DURING AND AFTER CONSTRUCTION AND REVEGETATION OF ALL DISTURBED AREAS UPON PROJECT COMPLETION. THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF ALL EROSION CONTROL MEASURES.

THE CONTRACTOR IS ENCOURAGED TO TAKE FULL ADVANTAGE OF SPECIFICATION 1105.15 -VALUE ENGINEERING INCENTIVE PROPOSAL, A PAMPHLET AND CONCEPTUAL PROPOSAL FORM WILL BE AVAILABLE AT THE PRECONSTRUCTION CONFERENCE.

STANDARD ROAD PLANS ARE AVAILABLE FROM THE IOWA DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION, AMES, IOWA.

HAZARDOUS MATERIALS:

A SCRAPE SAMPLE OF THE EXISTING PAINT WAS TAKEN TO GET AN INDICATION OF THE EXISTENCE AND LEVEL OF TOTAL CHROMIUM AND TOTAL LEAD. SAMPLE ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 66,700 MG/KG AND TOTAL CHROMIUM ON THIS SAMPLE WAS 6,460 MG/KG. THIS ANALYSIS SHOWS THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THIS TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

THE CONTRACTOR SHALL CONDUCT THEIR OPERATIONS IN SUCH A MANNER THAT ANY PAINT REMOVED DURING REMOVAL IS CONTAINED, COLLECTED, AND DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL AND STATE REGULATIONS.

WASTE AND DISPOSAL NOTE:

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL OR BROKEN CONCRETE) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT. THESE AREAS SHALL NOT IMPACT WETLANDS OR "WATERS OF THE U.S." NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. NO MATERIAL SHALL BE PLACED WITHIN THE RIGHT-OF-WAY AND SHALL NOT CREATE AN UNSIGHTLY CONDITION WHEN VIEWED FROM PUBLIC HIGHWAYS, UNLESS SPECIFICALLY STATED IN THE PLANS OR APPROVED BY THE ENGINEER.

STREAM CROSSING NOTES:

THE CONTRACTOR IS ENCOURAGED TO CONDUCT CONSTRUCTION ACTIVITIES DURING A PERIOD OF LOW FLOW. ANY TEMPORARY CROSSINGS SHALL INCLUDE ENOUGH CULVERTS TO ACCOMMODATE LOW FLOWS AND MUST BE REMOVED AFTER COMPLETION OF WORK ON THIS PROJECT. TEMPORARY STREAM CROSSINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD ROAD PLAN RL-16. THE COST OF INSTALLATION, MAINTENANCE, AND REMOVAL OF TEMPORARY CROSSINGS, INCLUDING CULVERTS, SHALL BE INCIDENTAL TO THE PROJECT. EQUIPMENT FOR HANDLING AND CONVEYING MATERIALS DURING CONSTRUCTION SHALL BE OPERATED TO PREVENT DUMPING OR SPILLING THE MATERIAL INTO WATERBODIES, STREAMS OR WETLANDS EXCEPT AS APPROVED HEREIN.

CARE SHALL BE TAKEN TO PREVENT ANY PETROLEUM PRODUCTS, CHEMICALS, OR OTHER DELETERIOUS MATERIALS FROM ENTERING WATERBODIES, STREAMS OR WETLANDS.

CONSTRUCTION EQUIPMENT, ACTIVITIES, AND MATERIALS SHALL BE KEPT OUT OF THE STREAMS AND WETLANDS TO THE MAXIMUM EXTENT POSSIBLE.

CONCRETE AND REINFORCING STEEL NOTES:

THESE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5@1 IS $\frac{5}{8}$INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

ALL REINFORCING STEEL SHALL BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED. BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS IN EITHER DIRECTION SHALL BE USED TO SUPPORT ALL REINFORCING IN ACCORDANCE WITH THE SECTION 2404 OF THE STANDARD SPECIFICATIONS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ALL EXPOSED CORNERS 90 DEGREES OR SHARPER ARE TO BE FILLETED WITH A $\frac{3}{4}$" DRESSED AND BEVELED STRIP.

CULVERT NOTES:

THE CONTRACTOR SHALL SUBMIT A PLAN FOR TEMPORARY STREAM DIVERSION PRIOR TO CONSTRUCTION OF THE CULVERT. THE PLAN IS TO BE REVIEWED AND APPROVED BY THE ENGINEER. ANY TEMPORARY STREAM CROSSINGS SHALL HAVE PIPE CULVERTS TO ACCOMMODATE LOW FLOWS.

THE CULVERT FLOOR SHALL BE FINISHED SMOOTH. SIDES OF THE FOOTING SHALL BE FORMED TO ENSURE CORRECT LINE AND GRADE.

THE PERMISSIBLE CONSTRUCTION JOINT AT THE TOP OF THE WALLS MAY BE LOWERED 2'-4 AT THE CONTRACTOR'S OPTION.

KEYWAYS IN CONSTRUCTION JOINTS ARE TO BE FORMED WITH BEVELED 2 X 4s UNLESS OTHERWISE NOTED.

THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

BAR SIZE	4	5	6	7	9
MINIMUM SPLICE LENGTH	21"	26"	31"	43"	55"

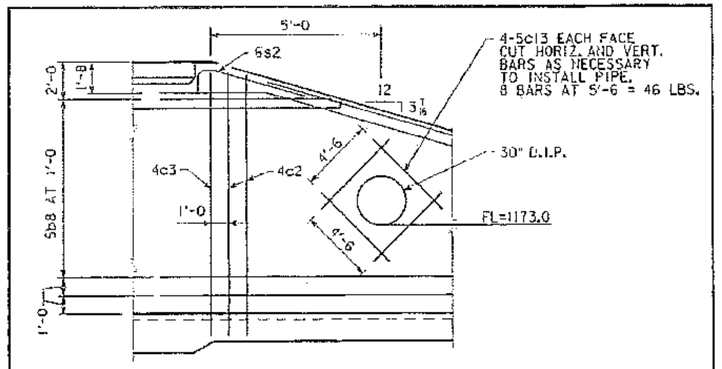
THIS SPLICE, IF USED, WILL BE AT THE CONTRACTOR'S EXPENSE.

LONGITUDINAL REINFORCING SHALL NOT EXTEND THROUGH CONSTRUCTION JOINTS, EXCEPT FOR 5@1 SLAB DOWEL BARS.

WHEN DE-WATERING PRESENTS A PROBLEM FOR PLACING THE CURTAIN WALLS AS DETAILED, ALTERNATE METHODS SUCH AS STEEL SHEET PILE AND PRECAST CONCRETE WALLS MAY BE APPROVED BUT AT NO ADDITIONAL COST. THE CULVERT CONTRACTOR IS TO SUBMIT TO THE ENGINEER FOR APPROVAL, COMPLETE DRAWINGS OF THE PROPOSED CURTAIN WALL ALTERNATE BEFORE BEGINNING CONSTRUCTION.

CONTRACTOR'S WORK AREA:

THE CONTRACTOR'S WORK AND MATERIAL STORAGE AREA SHALL BE DEFINED BY THE CONTRACTOR AND NOTED TO THE ENGINEER. THE CONTRACTOR SHALL SHAPE, FERTILIZE, AND SEED THIS CONTRACTOR'S AREA IN ORDER TO RETURN IT TO ITS ORIGINAL CONDITION. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR EXCAVATION BID ITEMS. AREAS OUTSIDE THE CONTRACTOR'S AREA DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED TO THEIR ORIGINAL CONDITION, AS DETERMINED BY THE ENGINEER. NO ADDITIONAL PAYMENT WILL BE AUTHORIZED FOR THIS WORK.



DETAIL FOR SUPPLEMENTAL REINFORCING FOR INSTALLING CMP LETDOWN THROUGH CULVERT HEADWALL.

DESIGN FOR 45° SKEW RT. AHEAD

TWIN 12'x10'x148'-0 REINFORCED CONCRETE BOX CULVERT

2 - 38'-0 STANDARD SECTIONS 36'-0 END SECTIONS

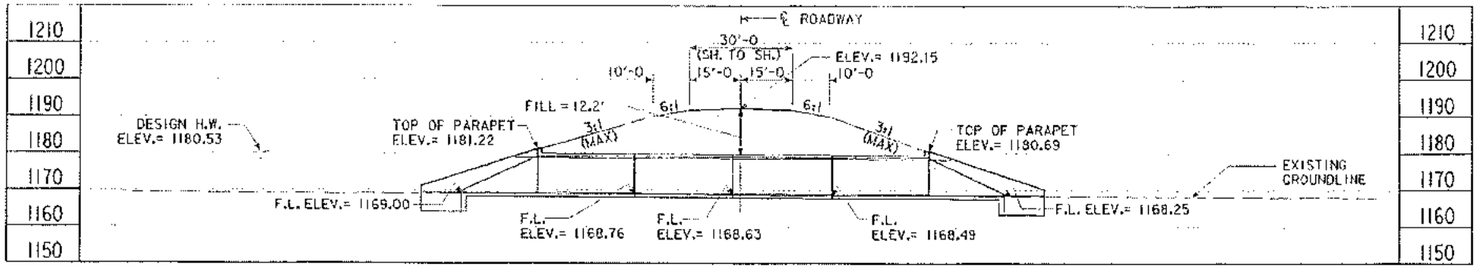
GENERAL NOTES AND DETAILS

STA. 104+30 DECEMBER, 2009

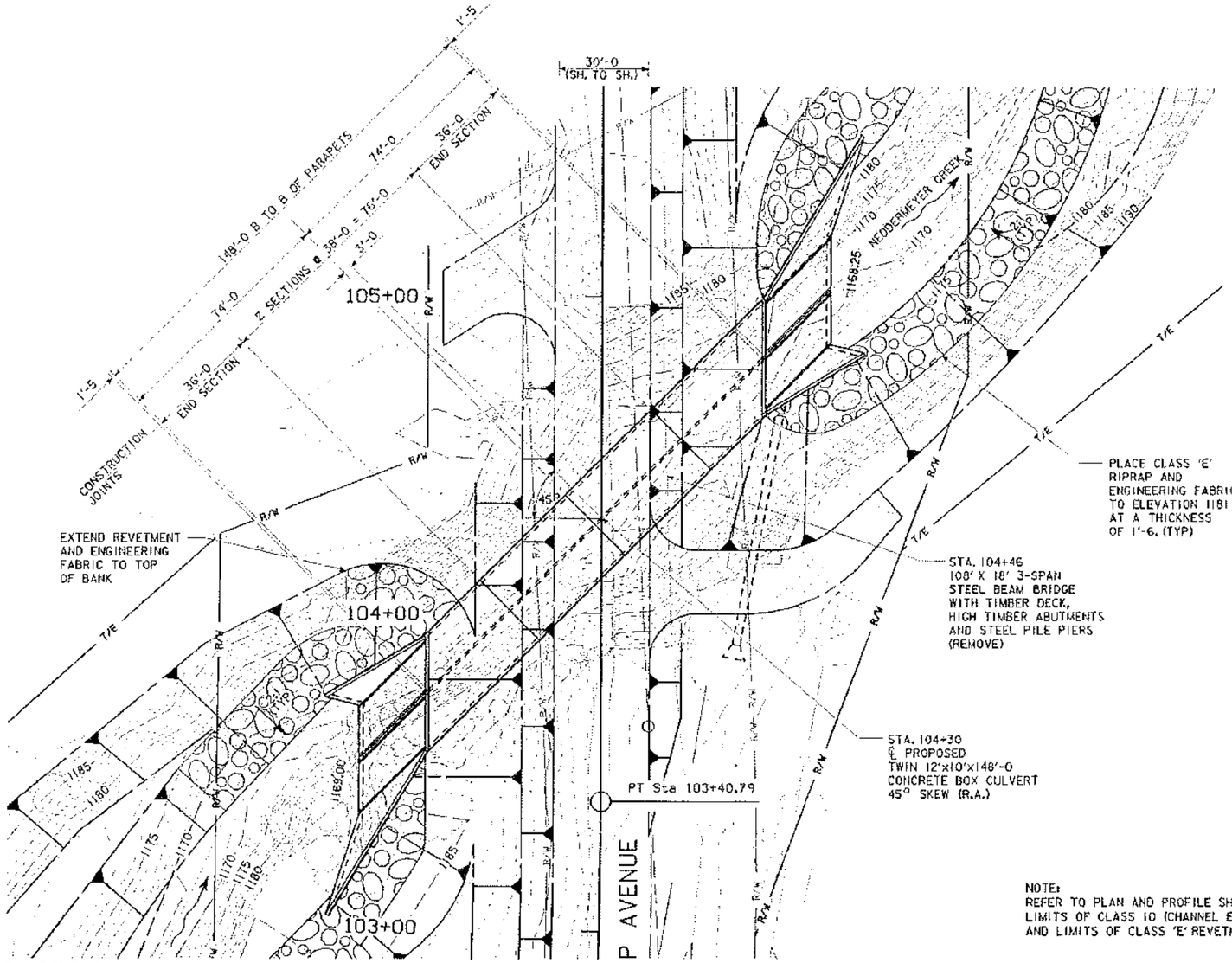
CRAWFORD COUNTY

DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

DESIGN TEAM	KIRKHAM MICHAEL	ENGLISH		CRAWFORD COUNTY	PROJECT NUMBER BROS-C024(93)--8J-24	SHEET NUMBER 5



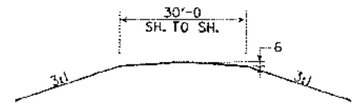
LONGITUDINAL SECTION ALONG ℄ CULVERT



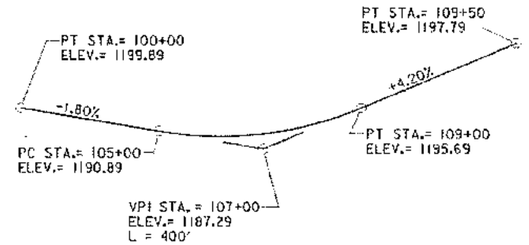
NOTE:
REFER TO PLAN AND PROFILE SHEET FOR LIMITS OF CLASS 10 (CHANNEL EXCAVATION) AND LIMITS OF CLASS 'E' REVETMENT.

BENCH MARK #1: SPIKE IN POWER POLE
STA. 100+55.83, 32.76' RT.
N= 9976.02
E= 9279.18
Z= 1200.49

BENCH MARK #2: SPIKE IN CORNER POST
STA. 110+01.65, 40.04' LT.
N= 10222.60
E= 10183.05
Z= 1195.38



TYPICAL APPROACH SECTION



PROPOSED GRADE

HYDRAULIC DATA

DRAINAGE AREA= 7.42 SQ. MI.
STREAM SLOPE= 0.0062 FT./FT.

Q_{25} = 2450 CFS (DESIGN)
NATURAL STAGE AT RCB = 1180.53

Q_{50}= 3000 CFS
NATURAL STAGE AT RCB = 1183.00

Q_{100}= 3600 CFS
NATURAL STAGE AT RCB = 1185.38

Q_{500}= 5000 CFS
NATURAL STAGE = 1192.64

AVG. LOW WATER STAGE = 1169.50

LOCATION

OVER NEDDERMEYER CREEK
T-83 N R-40 W
SECTION 16, 21
PARADISE TOWNSHIP
CRAWFORD COUNTY
BRIDGE MAINT. NO. 128110

DESIGN FOR 45° SKEW RT. AHEAD

TWIN 12'x10'x148'-0
REINFORCED CONCRETE BOX CULVERT

2 - 38'-0 STANDARD SECTIONS 36'-0 END SECTIONS

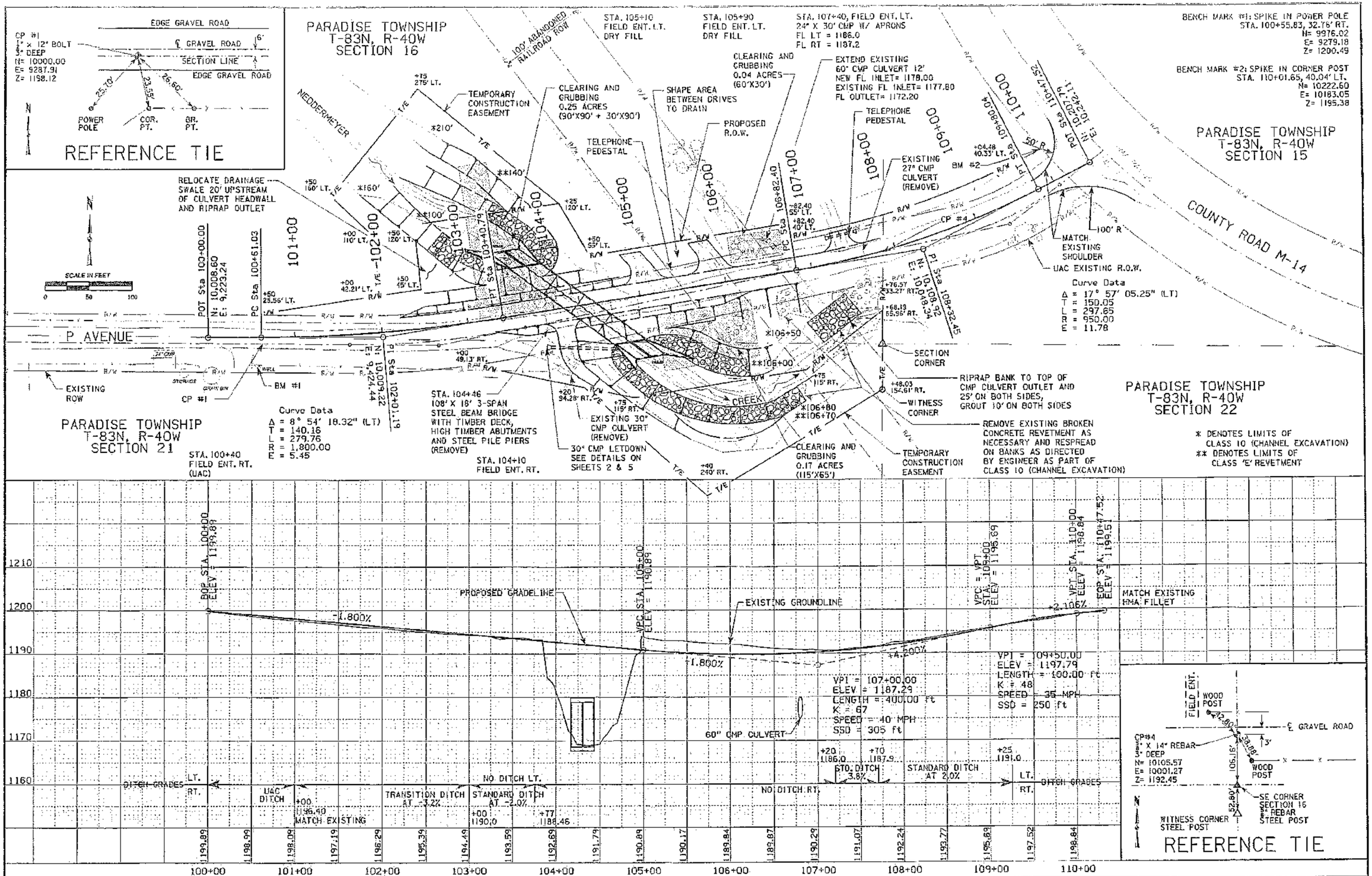
SITUATION PLAN

STA. 104+30 DECEMBER, 2009

CRAWFORD COUNTY

DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

DESIGN TEAM KIRKHAM MICHAEL	ENGLISH		CRAWFORD COUNTY	PROJECT NUMBER BROS-C024(93)--8J-24	SHEET NUMBER 6



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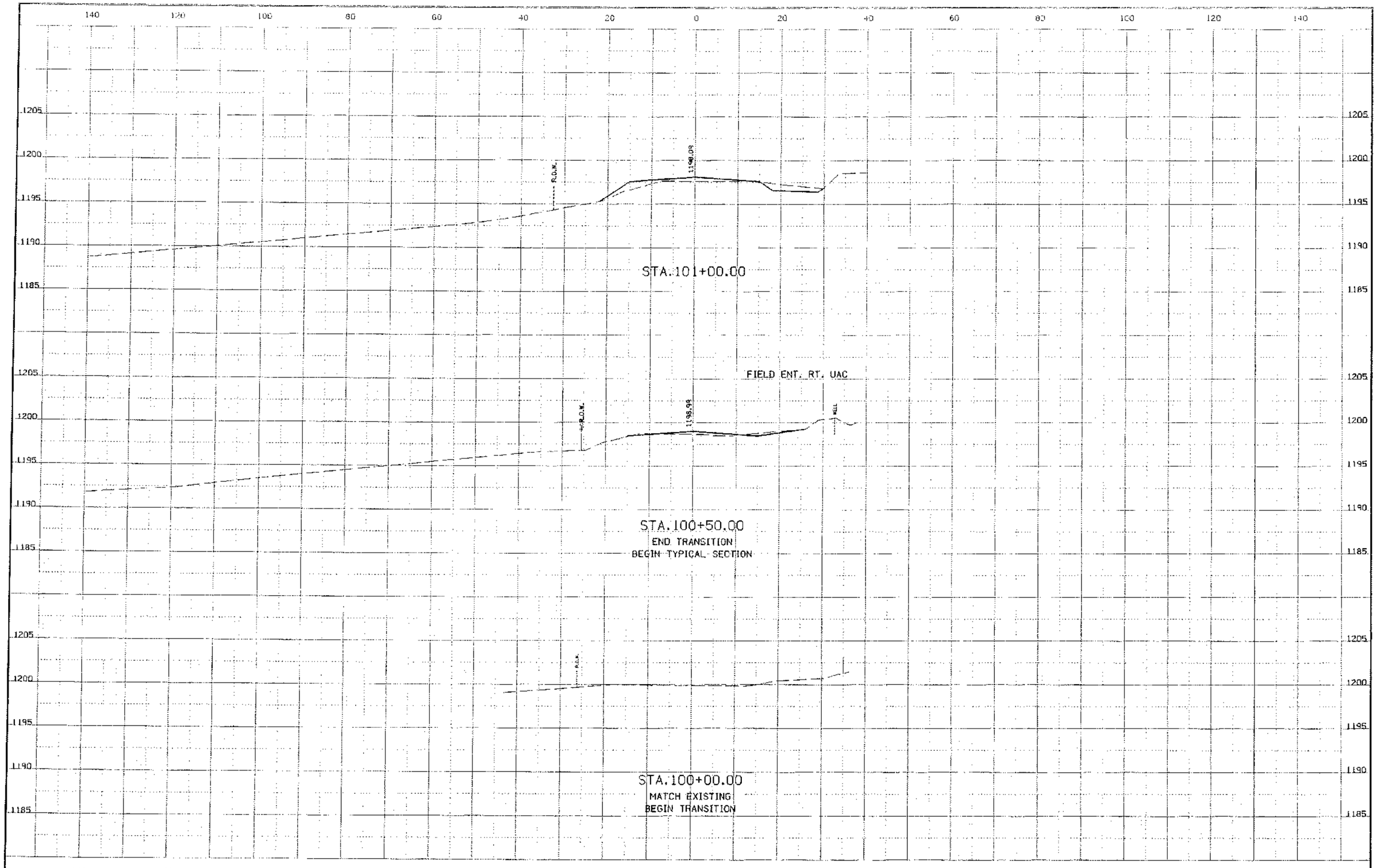

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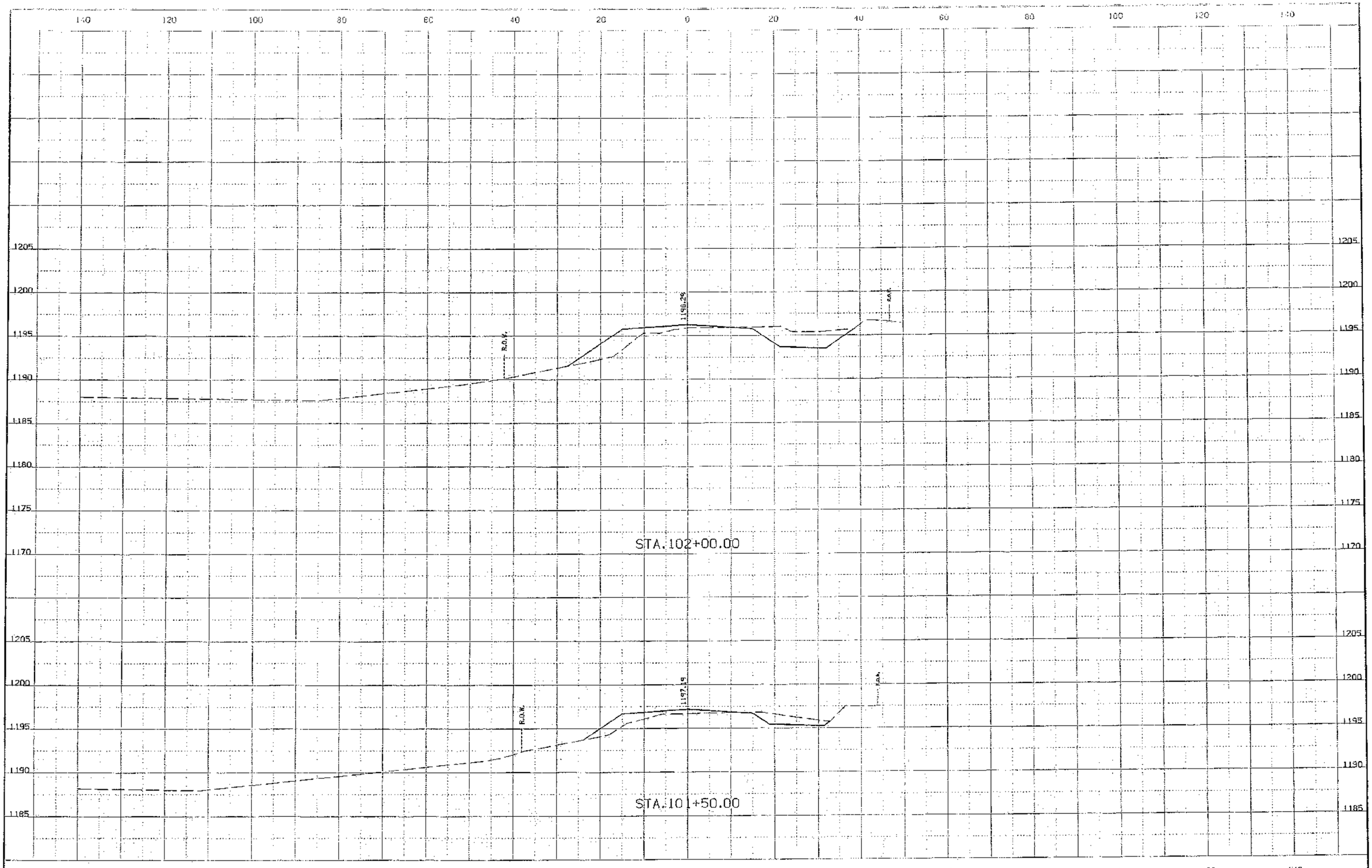

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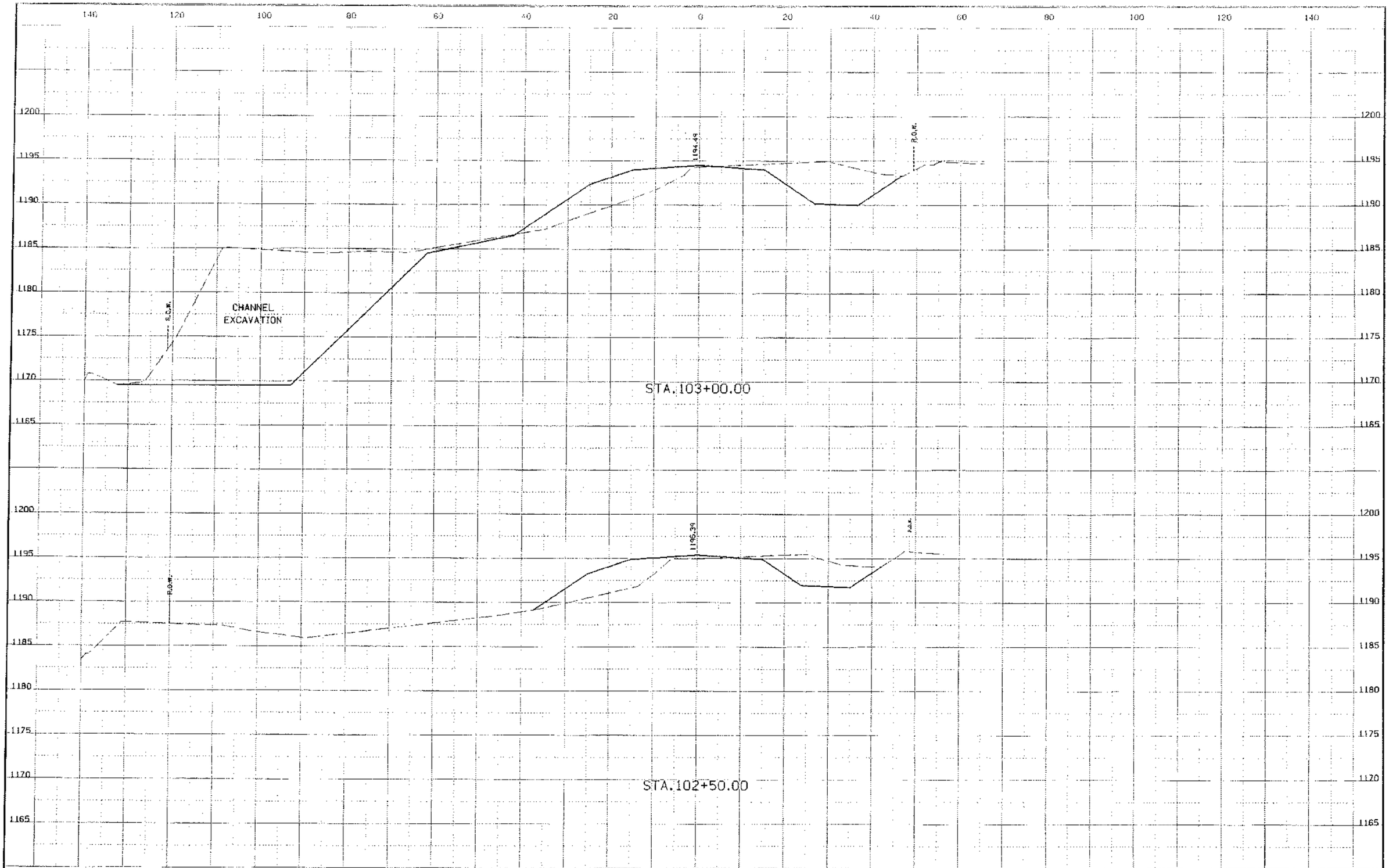

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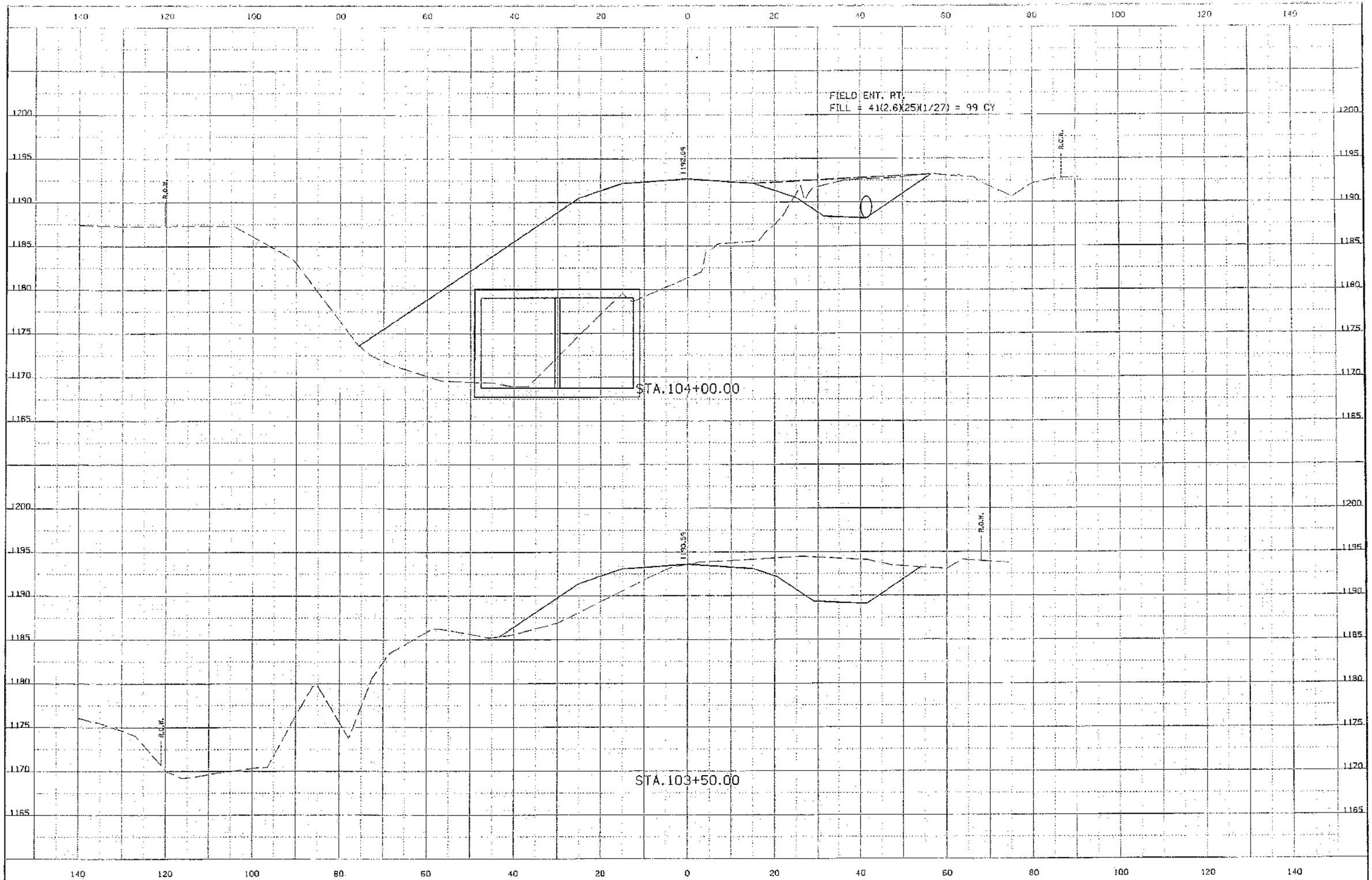
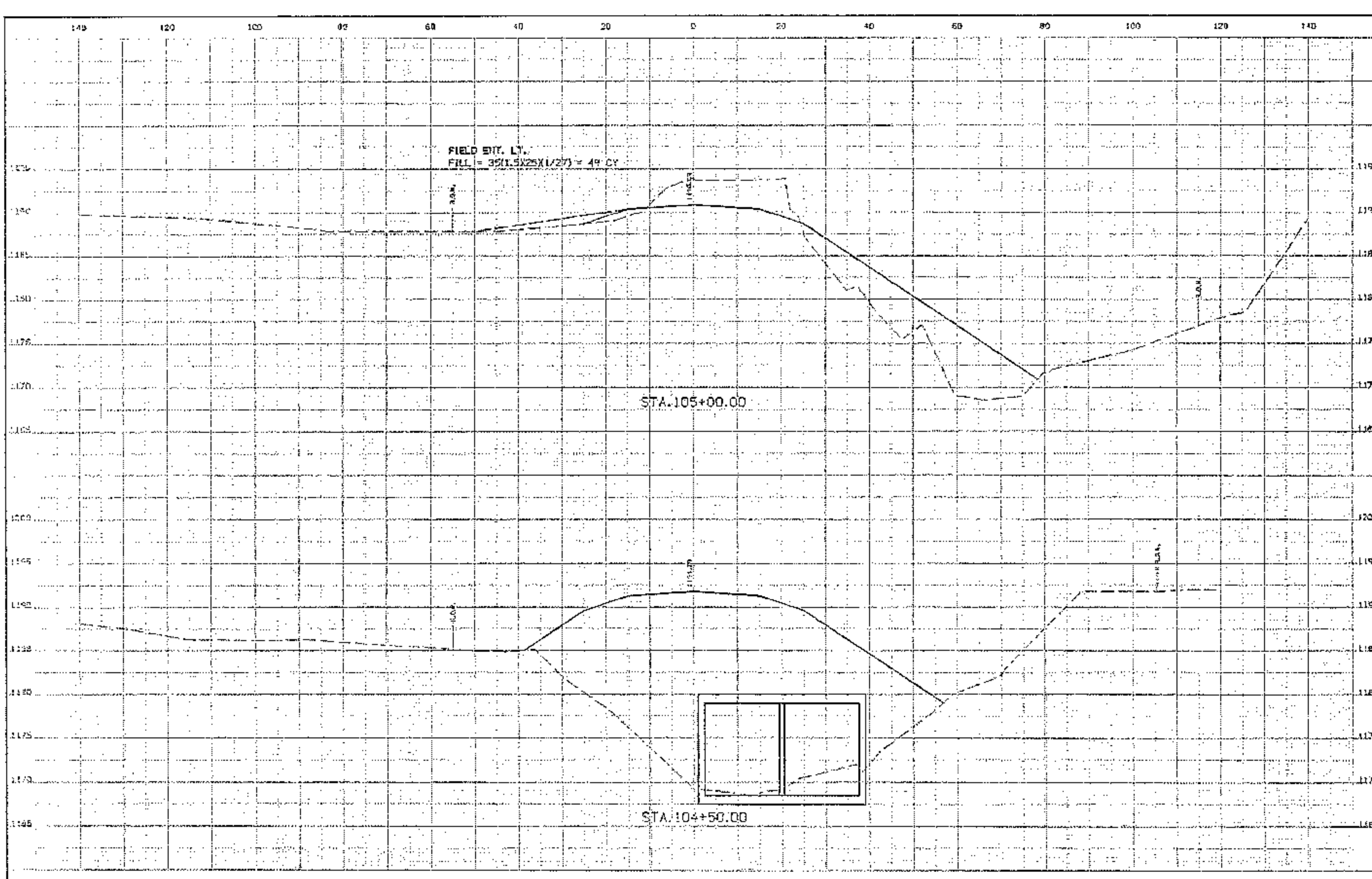


DESIGN TEAM KIRKHAM MICHAEL	ENGLISH		CRAWFORD COUNTY	PROJECT NUMBER BROS-C024(93)--8J-24	SHEET NUMBER



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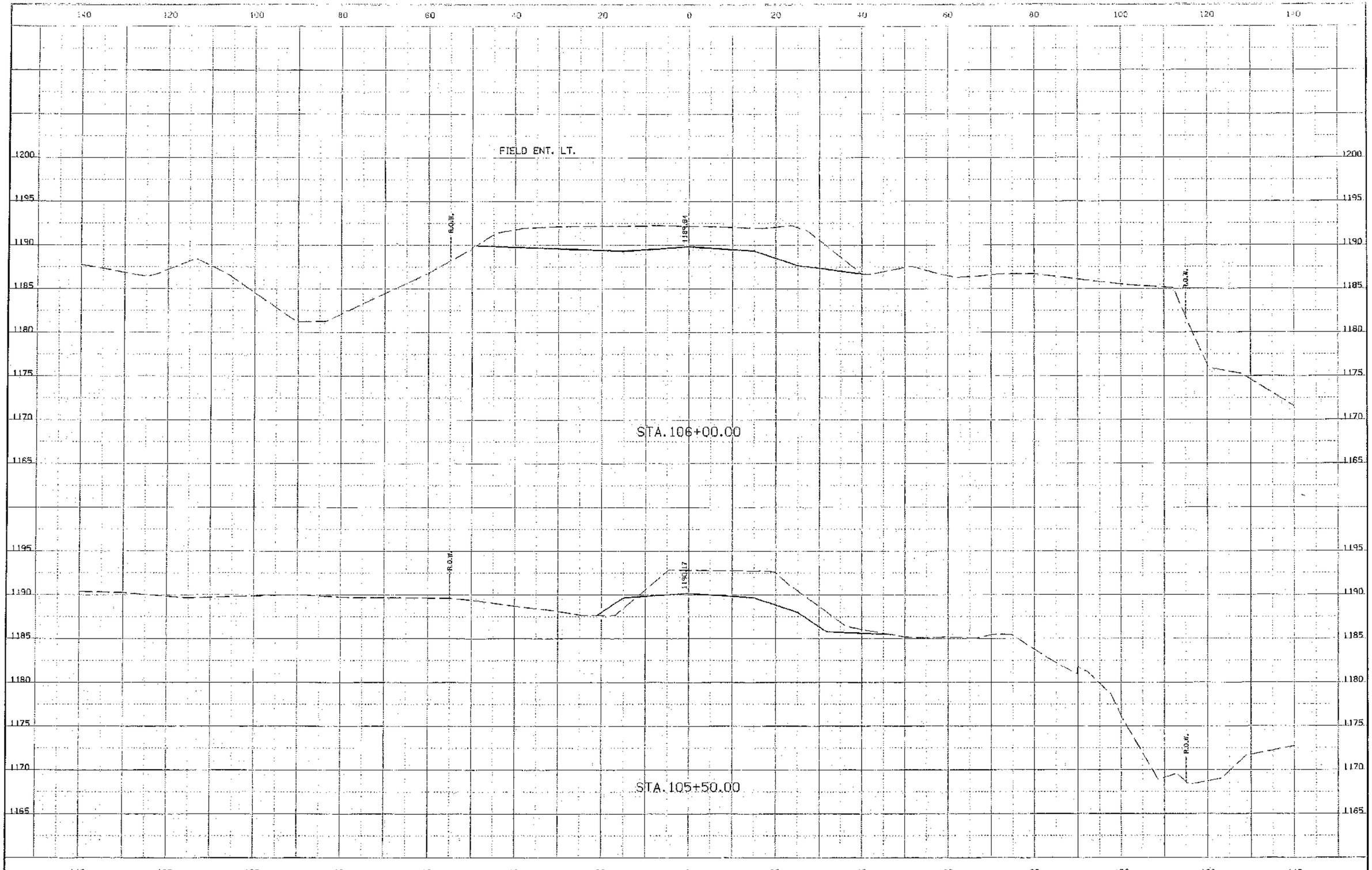

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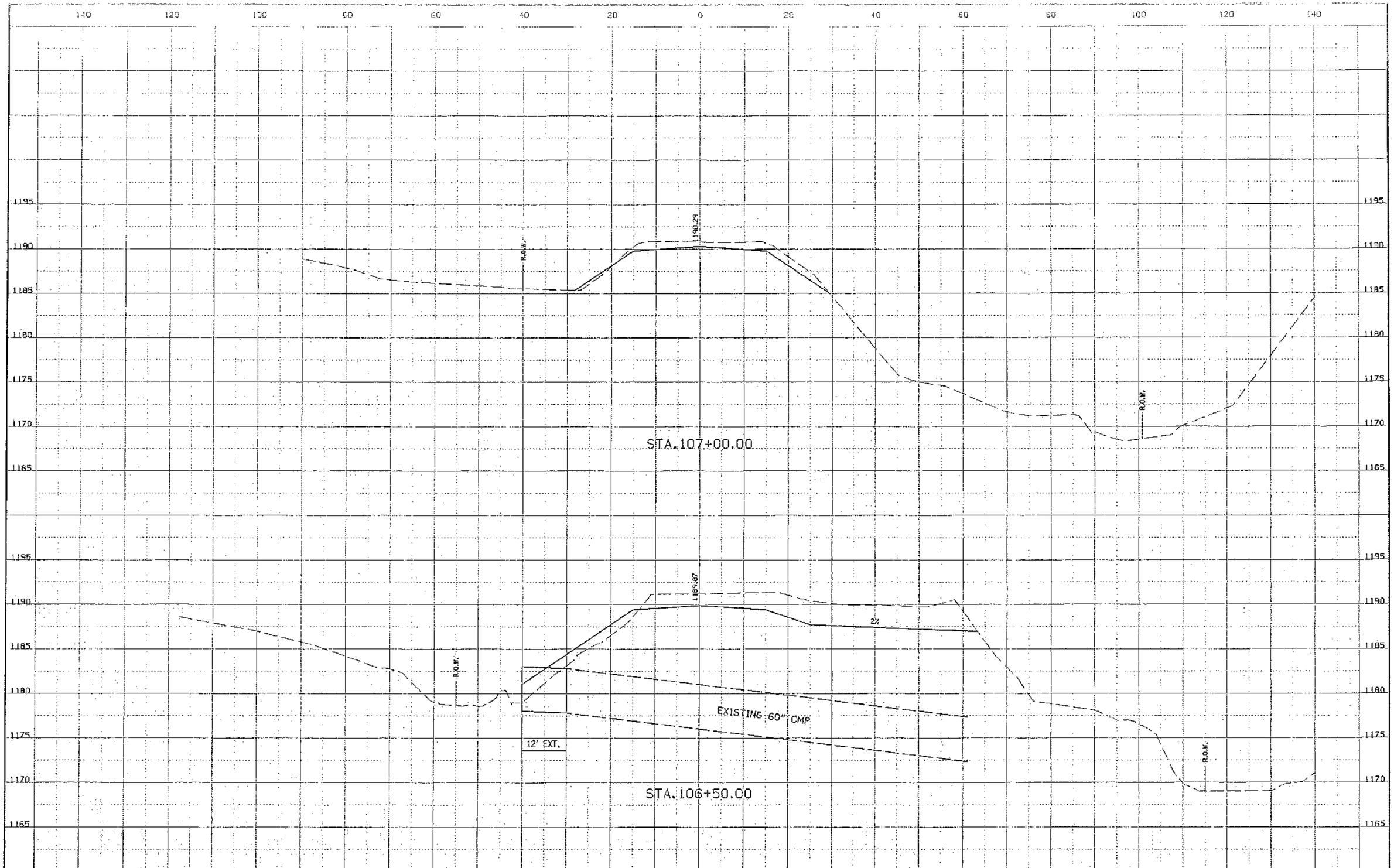

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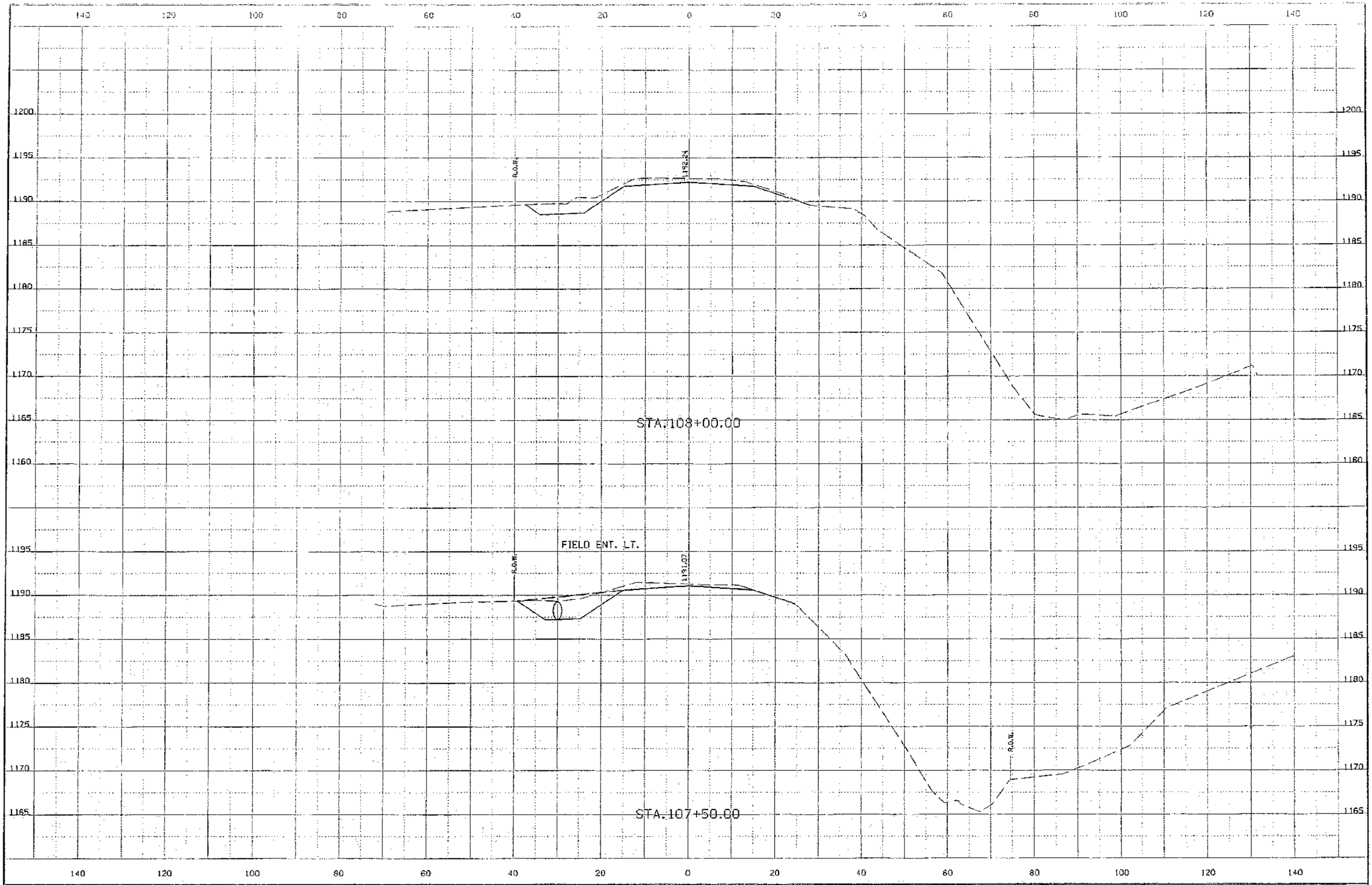

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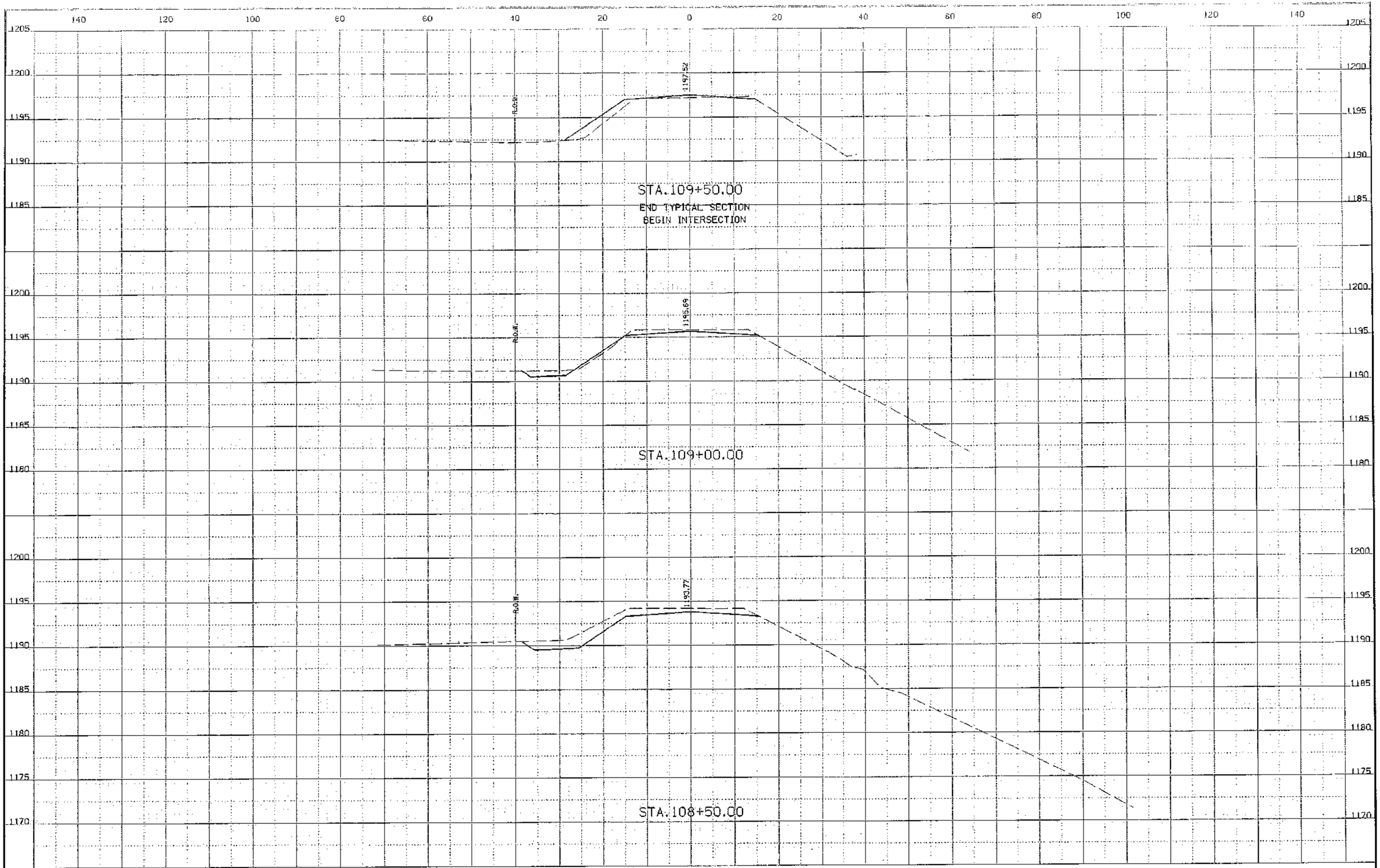


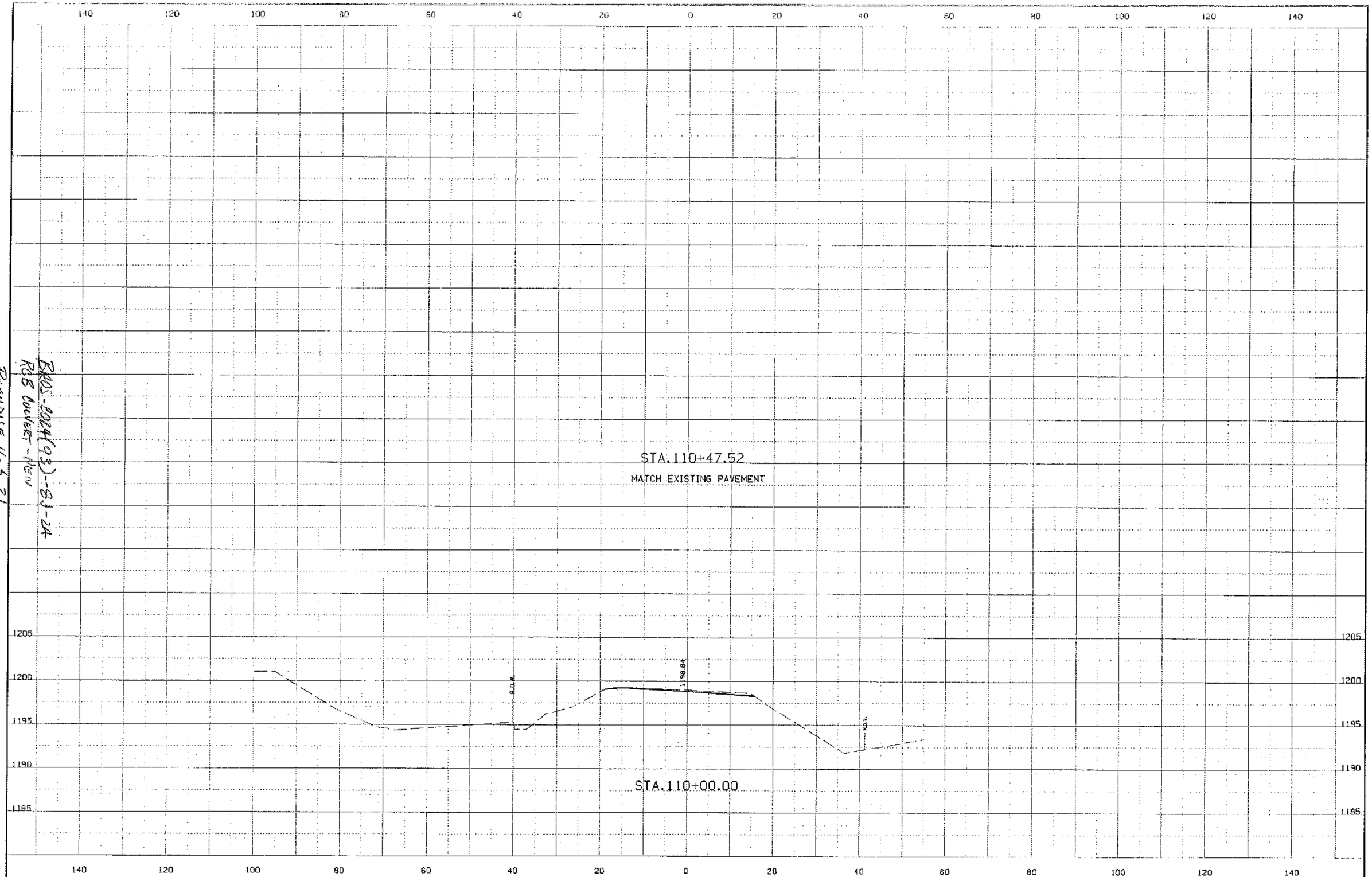
DESIGN TEAM KIRKHAM MICHAEL	ENGLISH		CRAWFORD COUNTY	PROJECT NUMBER BROS-C024(93)--8J-24	SHEET NUMBER 6

BROS-C024(93)--8J-24
R&B Culvert - New

PAVEMENT IS 8 1/2

STA.110+47.52

MATCH EXISTING PAVEMENT



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