

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

LOR-611-3.53 CITY OF LORAIN LORAIN COUNTY

LOR-611-3.53	OHIO FHW REGION 5	1 33
BHM-9C28(3)	FEDERAL PROJECT	

THE FEDERAL NUMBER SHALL READ BHM-9C28(3) EVEN THOUGH SHOWN OTHERWISE IN THE PLANS

LOR-611-0358
SUBSTRUCTURE WORK

DESIGN DESIGNATION

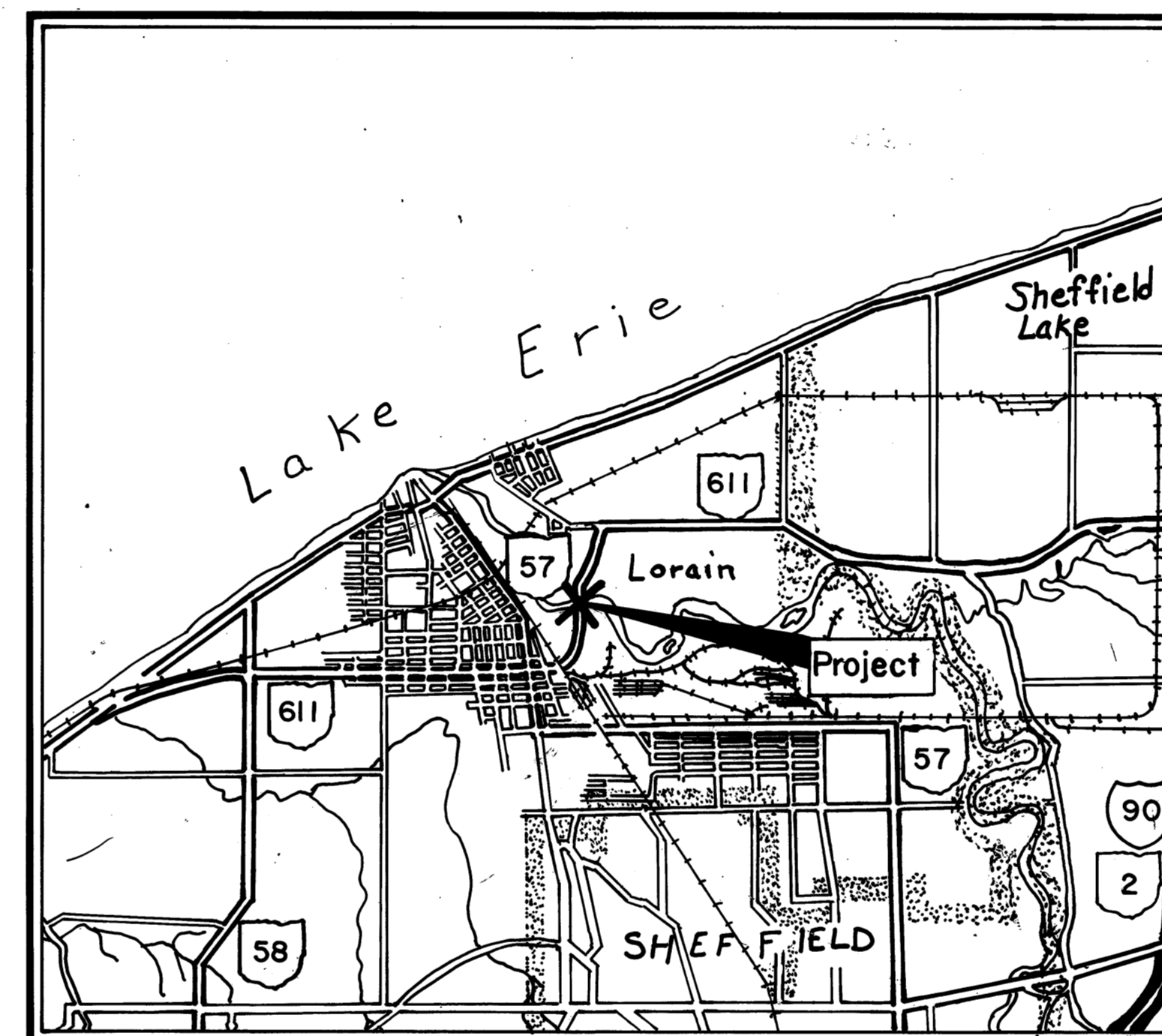
1986 ADT = 16,600
 2006 ADT = 24,100
 DHV = 1,900
 D = 55%
 T = 4%
 V = 35 MPH
 LEGAL SPEED = 35 MPH

CONVENTIONAL SIGNS

County Line	-----	Limited Access (only)	----- LA
Township Line	-----	Right of Way (only)	----- RW
Section Line	-----	Limited Access & Right of Way	----- LA & RW
Corporation Line	----- or -----	Existing Right of Way	-----
Fence Line (existing)	-x-x- (proposed) -x-x-	Property Line	— (in existing fence) -x-x-
Center Line	352 or 353	Railroad	----- or -----
Trees, Stumps, (to be removed)	⊗, ⊗, ⊗	Guardrail (existing)	— (proposed) —
Utility Poles: Telephone, Power, Light	⊕, ⊕, ⊕		

INDEX OF SHEETS

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LOCATION MAP

SCALE IN MILES



Portion to be improved: _____
 State & Federal Routes: _____
 Other Roads: _____

SCALES

Plan: _____
 Profile: Horizontal _____, Vertical _____
 Cross Section: Horizontal _____, Vertical _____

SUPPLEMENTAL SPECIFICATIONS	
840	5-16-84
836	11-12-85

Approved: Sary W. P... District Deputy Director of Transportation
 Date: 9/18/86

Approved: Walter J. Feutings, Jr. Engineer, Bureau of Bridges and Structural Design
 Date: 11-25-86

Approved: Wayne H. K... Chief Engineer, Planning and Design
 Date: 5-28-87

Approved: W... Director, Department of Transportation
 Date: 5-28-87

LINE DATA

Project Length: 0.00 Lin. Ft. or 0.000 Miles
 Begin Work: Sta. 186+40
 End Work: Sta. 205+96
 Net Work Length: 1956.00 Lin. Ft. or 0.370 Miles

UNDERGROUND UTILITIES
 TWO WORKING DAYS BEFORE YOU DIG
 Call 800-362-2764 (Toll free)
 OHIO UTILITIES PROTECTION SERVICE
 NON-MEMBERS MUST BE CALLED DIRECTLY

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS			
F-1	11-10-83	HL-11	6-1-79
F-3	5-1-76		
CB-4	11-10-83		
HW-4B	4-1-80		
MC-4	7-26-76		
MC-11	8-1-78		

Plan Prepared By:
 Richland Engineering Limited and
 District 3 Design

SEAL

DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 APPROVED: _____
 DIVISION ADMINISTRATOR DATE

Project: LOR-611-3.53 Lorain County
 Date of Letting: 19__ Contract No. _____

GENERAL NOTES

CALC. BY DDA 1/86
 CHK'D. BY _____

FHWA REGION	STATE	PROJECT
5	OHIO	

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LOR-611-3.53

FIELD OFFICE

THE CONTRACTOR SHALL PROVIDE A SUITABLE FIELD OFFICE HAVING A MINIMUM OF 300 SQ. FT. OF FLOOR SPACE. PAYMENT SHALL BE AT THE LUMP SUM PRICE BID FOR ITEM 619, FIELD OFFICE.

UNDERGROUND UTILITIES

THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 ORC.

NOTE: NO UNDERGROUND UTILITIES ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT.

UTILITY OWNERSHIP

THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:

ELECTRIC	OHIO EDISON CO. 76 SOUTH MAIN STREET AKRON, OHIO 44308 (216) 384-5715
TELEPHONE	LORAIN TELEPHONE COMPANY 1730 WEST 19TH STREET LORAIN, OHIO 44052 (216) 244-8271

CONTINGENCY QUANTITIES

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK LISTED IN THE GENERAL SUMMARY FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY ENGINEER". THE ACTUAL WORK LOCATIONS AND QUANTITIES USED AT THE ENGINEER'S DISCRETION SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

SEEDING LIMITS

QUANTITIES FOR SEEDING ARE CALCULATED FOR THE SOIL AREAS BETWEEN THE RIGHT-OF-WAY FENCE LINES OR TO THE LIMITS AS SHOWN ON THE GRADING PLAN SHEETS 6 TO 9.

WATERING PERMANENT SEEDED AREAS

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH OF THE PERMANENT SEEDED AREAS AS PER 659.09:

659 WATER 26 M GAL.

EROSION CONTROL

ITEM 601 IS PROVIDED IN THE PLAN FOR EROSION CONTROL. ROCK OF A STABLE NATURE WILL NOT BE REMOVED IN ORDER TO PLACE THIS ITEM. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES FOR THIS ITEM WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

CONNECTION TO EXISTING PIPE

WHERE THE PLANS PROVIDE FOR PROPOSED CONDUIT TO BE CONNECTED TO, OR TO CROSS EITHER OVER OR UNDER AN EXISTING SEWER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE HE STARTS TO LAY THE PROPOSED CONDUIT.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT 603 CONDUIT ITEMS.

DUST CONTROL

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN PROVIDED IN THE GENERAL SUMMARY TO BE USED FOR DUST CONTROL AS DIRECTED BY THE ENGINEER:

ITEM 616 - WATER	50	M-GAL.
ITEM 616 - CALCIUM CHLORIDE	5	TONS

614 MAINTAINING TRAFFIC

THE CONTRACTOR SHALL MAINTAIN TRAFFIC ON STATE ROUTE 611 AT ALL TIMES IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIFICATION 614. TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES EXCEPT FOR MINIMUM PERIODS OF TIME TO ALLOW TRUCKS CARRYING CONSTRUCTION MATERIALS TO ENTER AND EXIT THE CONSTRUCTION ACCESS DRIVE ON THE SOUTH SIDE OF THE BRIDGE. DURING THESE PERIODS, A ONE-WAY TRAFFIC ZONE MAY BE ESTABLISHED AND IF USED, FLAGMEN SHALL BE PROVIDED.

DURING THE CONSTRUCTION PERIOD OF THIS PROJECT, THE CONTRACTOR SHALL ERECT OW-75-36 "TRUCK ENTRANCE" SIGNS ON BOTH APPROACHES TO THE CONSTRUCTION ACCESS DRIVE ON THE SOUTH SIDE OF THE BRIDGE.

ITEM 659 SEEDING AND MULCHING USING CROWN VETCH, AS PER PLAN

THE FOLLOWING SHALL REPLACE THE FIRST SENTENCE OF 659.09: ALL AREAS TO BE SEEDED SHALL BE FREE OF ROCK AND OTHER FOREIGN MATERIAL THREE INCHES OR GREATER IN ANY DIMENSION IN THE TOP SIX INCHES OF SOIL DEPTH. THE SOIL SHALL BE LOOSE, FRIABLE, AND LOAMY. THE TOP SIX INCHES SHALL BE TESTED FOR PH, AND AGRICULTURAL LIME SHALL BE APPLIED PER 659.08 TO ADJUST FOR ANY DEFICIENCY. BEFORE FINAL INSPECTION, SEEDING AND MULCHING SHALL HAVE BEEN IN PLACE AND MAINTAINED BY THE CONTRACTOR FOR ONE GROWING SEASON (JUNE 1 TO OCTOBER 1). THE ENGINEER SHALL INSPECT THE AREA AT THE END OF THIS PERIOD, AND ANY AREAS WITHOUT VEGETATIVE COVER SHALL BE RESEEDED AT THE CONTRACTORS EXPENSE.

PAYMENT FOR ALL OF THE ABOVE, INCLUDING AGRICULTURAL LIMING, SHALL BE INCLUDED IN THE UNIT PRICE BID PER SQ. YD. OF ITEM 659 SEEDING AND MULCHING USING CROWN VETCH, AS PER PLAN.

FOR ADDITIONAL NOTES

ITEM 603, 84" CONDUIT, TYPE C, 706.02 1000 D-LOAD, AS PER PLAN SEE SHEET 18.

ITEM 603, 16" CONDUIT, TYPE F USING DUCTILE IRON PIPE, AS PER PLAN SEE SHEET 19.

** GENERAL NOTES CONTINUED ON SHEET 3 **

GENERAL NOTES

FHWA REGION	STATE	PROJECT	
5	OHIO	BHM-1D37(5)	

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LORAIN COUNTY
LOR-611-3.53

DESIGN SPECIFICATIONS: This structure conforms to "Standard Specifications for Highway Bridges adopted by the American Association of State Highway and Transportation Officials, 1983, including the 1984 Interim Specifications and the Ohio "Supplement" to these specifications.

DESIGN DATA:

Design loading - HS20-44 for new portions of structure.

Concrete Class C - unit stress 1330 p.s.i.

Reinforcing steel-ASTM A615, A616 OR A617,
Grade 60 - unit stress 24,000 p.s.i.

SEQUENCE OF CONSTRUCTION: The existing Piers 1 and 2 have moved from their original positions laterally and longitudinally as much as 0.5 foot. The movements are due to soft subsurface conditions and unequal surcharges on adjacent slopes. The following sequence of construction for work between Stations 189+50 and 195+00 shall be followed to minimize additional movement of Piers 1 and 2.

1. Perform all excavation work to slopes shown on the cross-sections down to Elevation 610.0. No excavation work is to be performed below Elevation 610.0 except as necessary for construction of the pier foundations, 84 inch conduit installation, and temporary stream relocation.
2. Install new 84-inch conduit, collar and headwall and backfill.
3. Temporarily relocate drainage channel away from new Pier 2 footing line.
4. Excavate footings, install steel bearing piles and construct new footings and buttresses at Piers 1 and 2. Note: Holes in existing concrete pier columns for new buttresses shall not be open in both columns of a pier at the same time. Cut one column and construct new buttress tie before cutting second column at the same pier.
5. Backfill pier footings and complete all excavation, embankment, grading, backfilling, channel protection and seeding work.
6. The excavation performed per Item 203 shall remove material equally from the east side and the west side of the centerline survey, south of the Black River. There shall be no more than 5 feet elevation difference between excavations on the east side and west side. For example, all material should be removed above elevation 610, then 605, 600, etc. until final grade is reached.

The cost of performing the described work in sequence shall be included as incidental to the pertinent work items.

PIER MONITORING: During the period of construction activity south of the Black River, the Contractor shall avoid having heavy equipment close to Piers 1 and 2 and shall monitor the position of Piers 1 and 2 to detect movements. Monitoring shall consist of: 1) Installation of two tilt sensors (Sperry Tilt Sensing System, or equivalent) on each pier column oriented to measure longitudinal and transverse tilt; (2) Measurement of the position of the top of Piers 1 and 2 relative to the Rear Abutment, Piers 3 and 4; or 3) An approved alternative method acceptable to the Director. Measurements and equipment shall have sufficient accuracy to detect a 0.02 foot change in longitudinal or transverse location at the top of the pier columns. Measurements shall be taken and recorded by the Engineer at least daily during construction activity in the vicinity of Piers 1 and 2. Procedures and proposed equipment for monitoring the pier positions shall be submitted to the Director for approval prior to beginning work.

Should monitoring indicate that pier movement is occurring as a result of construction activities, the Engineer shall determine and implement the necessary procedures to restrict detrimental movements of the structure. Detrimental movement would include a continual movement of the top of a pier column in one direction at a uniform or accelerating rate, or total movements in excess of 0.20 feet.

Payment for this work shall be considered as incidental to the construction of the foundation for Piers 1 and 2.

EXISTING STRUCTURE PLANS including design plans and shop drawings may be examined by prospective bidders at the Lorain County Engineer's office, 247 Hadaway Street, Elyria, Ohio, and ODOT District #3 office, 906 North Clark Street, Ashland, Ohio.

EXISTING STRUCTURE VERIFICATION: Details and dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and/or from field observations and measurements. Consequently, they are indicative of the existing structure and the proposed work but they shall be considered tentative and approximate. The contractor is referred to CMS Sections 102.05, 105.02 and 513.02.

Contract bid prices shall be based upon a recognition of the uncertainties described above and upon a prebid examination of the existing structure by the contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the contractor in the field.

REMOVAL OF TREES OR STUMPS: All trees and stumps within the seeding limits, and those specifically marked for removal within the construction limits of this project shall be removed under the lump sum price bid for Item 201, Clearing and Grubbing, except that those trees for which protection and preservation work is indicated elsewhere in these plans shall not be removed.

The following is an approximate estimate of the number of trees and stumps to be removed:

Sizes	No. Trees	No. Stumps	TOTAL
18"	84	0	84
30"	10	0	10
48"	1	1	2
60"	0	0	0

The above estimate is approximate and the State of Ohio reserves the right to order the removal of additional trees or stumps outside of the limits of construction but within the right of way and/or easement lines. Payment for the removal of these additional trees or stumps shall be included in the lump sum price bid for Item 201, Clearing and Grubbing.

EXCAVATION NOT INCLUDING EMBANKMENT: The area east of the bridge and south of the Black River is a slag storage area which periodically changes in volume of slag. The cross-sections and estimated quantities are based on conditions found in January, 1984. Actual quantities for payment will be established by cross-sectioning the excavation area before and after the work is performed.

SURFACE GRADING: The work consists of grading the area under the bridge north of the Black River within the limits shown on the plans. The grading is intended to smooth out irregularities in the ground surface, and ensure that the area will drain with no low areas to collect water. A drainage swale with the low point on centerline survey shall be graded to drain to the catch basin at Station 201+90.0 from Station 205+24.0. Areas requiring fill shall be filled using earth from within the graded area. All areas graded shall be compacted to at least 75% of the maximum dry weight. When finished the tolerance for surface irregularities shall be 3 inches in 10 feet. Protrusions above the finished surface shall be not greater than 1 inch. The Engineer's approval of the complete grading area shall be required prior to placing any slope protection or seeding.

Payment for this item shall be at the unit price bid per square yard for Item Special - Surface grading, and shall include all equipment and labor required to complete this item.

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL: The following estimated quantities are to be used as directed by the Engineer, for temporary erosion and sediment control measures:

207 Temporary Seeding and Mulching	4720 Sq. Yd.
207 Straw or Hay Bales	50 Each
207 Temporary Slope Drains	120 Lin. Ft.
601 Rock Channel Protection, Type C, without filter	50 Cu. Yd.
659 Repair Seeding and Mulching	1180 Sq. Yd.
659 Water	10 M. Gal.
659 Commercial Fertilizer	0.21 Ton

CONDUIT END TREATMENT: Immediately after placement of any conduits, the contractor shall construct the end treatments required by the plans at both the outlet and inlet ends. This shall include headwalls, concrete riprap, rock channel protection, sodding, etc.


PORTIONS OF STRUCTURE REMOVED: Concrete shall be removed by means of approved pneumatic hammers employing pointed and blunt chisel tools. Hydraulic hoe-rams will not be permitted. The weight of hammer shall be approved by the engineer. The weight of the hammer shall not be more than 35 pounds for removal within 18-in. of portions to be preserved. Outside the 18-in. limit, a hammer heavier than 35 pounds, but not to exceed 85 pounds, may be used at the approval of the engineer. Pneumatic hammers shall not be placed in direct contact with reinforcing steel that is to be retained in the rebuilt structure. Exposed reinforcing steel shall be sandblasted to Sa 2 1/2 to remove all loose particles of concrete or rust. Existing reinforcing steel shall be cut and/or maintained as indicated in the plans, or as directed by the engineer.

PILES shall be driven to refusal on shale bedrock. Refusal shall be considered as attained by penetrating soft bedrock with a minimum resistance of 20 blows per inch, or refusal shall be considered as attained after the pile has contacted hard bedrock and the pile has then received at least 20 blows.

The design load is 70 tons per pile for the pier piles.

GENERAL NOTES CONTINUED

See sheet 2/28

		1/28	
		RICHLAND ENGINEERING LIMITED MANSFIELD, OHIO	
GENERAL NOTES SUBSTRUCTURE BRIDGE NO. LOR-611-0358 OVER BLACK RIVER			
LORAIN COUNTY		S. R. 611	
DESIGNED	DRAWN	TRACED	CHECKED
DAP	TWH	TWH	RHU
REVIEWED	DATE	REVISOR	REVISION
RDN	9/12/88		

LORAIN COUNTY
LOR-611-3.53

QUANTITIES	
CALCULATED	BLN DATE 9/86
CHECKED	TWH DATE 9/86

GENERAL SUMMARY

ITEM	SHEET NUMBER					ITEM	TOTAL	UNIT	DESCRIPTION
	2	3	6	7	8				
201			Lump			201	Lump		ROADWAY ITEMS Clearing and grubbing
202					73	202	113	Lin. Ft.	Pipe removed, 24" and under
202				18		202	18	Lin. Ft.	Pipe removed, over 24"
202					1	202	1	Each	Catch basin or inlet abandoned
203				23,891	30,397	203	54,543	Cu. Yd.	Excavation not including embankment construction
203				4513	6,555	203	11,173	Cu. Yd.	Embankment
607				756	968	607	1906	Lin. Ft.	Fence, Type CL
607				1		607	2	Each	14' Gate, Type CL
616		5				616	5	Ton	Calcium chloride
616		50				616	50	M. Gal.	Water
625				2	1	625	3	Each	Ground rod
Special						Special	3195	Sq. Yd.	Surface grading
EROSION CONTROL ITEMS									
207				50		207	50	Each	Straw or hay bales
207				4720		207	4720	Sq. Yd.	Temporary seeding and mulching
207				120		207	120	Lin. Ft.	Temporary slope drains
601				50		601	50	Cu. Yd.	Rock channel protection, Type C, without filter
601					1018	601	1018	Cu. Yd.	Rock channel protection, Type B, with fabric filter
601						601	767	Cu. Yd.	Rock channel protection, Type A, with fabric filter
601				157		601	612	Sq. Yd.	Crushed aggregate slope protection
659				8,758	11,976	659	23,599	Sq. Yd.	Seeding and mulching using crown vetch, as per plan.
659				1180		659	1180	Sq. Yd.	Repair seeding and mulching
659		26		10		659	36	M. Gal.	Water
659				0.21	0.79	659	2.34	Ton	Commercial Fertilizer
840				210		840	210	Sq. Yd.	Seeding and nylon fiber matting, Type 2
DRAINAGE									
602				6	4	602	14	Cu. Yd.	Concrete masonry
603				246	100	603	346	Lin. Ft.	84" Conduit, Type C, 706.02, 1000 D-load, as per plan.
603					79	603	121	Lin. Ft.	16" Conduit, Type F using ductile iron pipe, as per plan.
604						604	1	Each	Catch basin, Standard No. 4
STRUCTURE									
202						202	Lump		Portions of structure removed
503						503	Lump		Cofferdams, cribs and sheeting
503						503	2639	Cu. Yd.	Unclassified excavation
505						505	Lump		Pile driving equipment mobilization
507						507	6820	Lin. Ft.	Steel piles HP 12 x 53
507						507	124	Each	Steel points
509						509	273,979	Lb.	Reinforcing steel, Grade 60
511						511	594	Cu. Yd.	Class C concrete, using Type K cement, piers above footings, as per plan.
511						511	1041	Cu. Yd.	Class C concrete, footings
Special						Special	14	Each	Permanent reference point
MISCELLANEOUS									
614				Lump		614	Lump		Maintaining traffic
619				Lump		619	Lump		Field office
623				Lump		623	Lump		Construction layout stakes
624				Lump		624	Lump		Mobilization

GENERAL NOTES (CONT'D)

PILE POINTS: Steel pile points shall be used to protect the tips of the proposed piling. The steel points shall be furnished by Associated Pile and Fitting Corporation, 262 Rutherford Boulevard, Clifton, New Jersey 07014; International Construction Equipment, Inc., 301 Warehouse Drive, Matthews, North Carolina 28015; Dougherty Foundation Products, Inc., P.O. Box 688, Franklin Lakes, New Jersey 07417; Versa Steel Inc., 3601 N. W. Yeon Ave., P.O. Box 10559, Portland, Oregon 97210 or by a manufacturer that can furnish a steel point that is acceptable to the Director.

CLASS C CONCRETE USING TYPE K CEMENT. The cement in the concrete for the piers above footings shall be shrinkage compensating cement, 701.08. The following restrictions shall apply to the concrete:


- Cement shall be expansive hydraulic cement, ASTM C845, Type K.
- The maximum water/cement ratio given for Class C concrete in 499.03 shall be revised from 0.50 to 0.56.
- Maximum slump at the time and place of concrete placement shall be 6 inches.
- Chemical admixtures shall be limited to 705.12 Type D.
- Maximum ambient temperature at time of placement of concrete shall be 80° F.
- Membrane curing per SS836 will not be permitted for any concrete placed between September 1 and March 31. Such concrete shall be cured by Method (a) Water Curing.
- If required by the Engineer, the surface of the concrete shall be given a fog spray of water. This may be required prior to either water curing or membrane curing if weather conditions dictate. Equipment shall be on hand.

PERMANENT REFERENCE POINTS shall be installed at locations shown on the tops of substructure units. Existing reference points shall not be disturbed unless a hole for a new permanent reference point interferes with an existing reference point, in which case the existing reference point shall be referenced prior to removing the existing reference point. Permanent reference points shall be located from existing reference points.

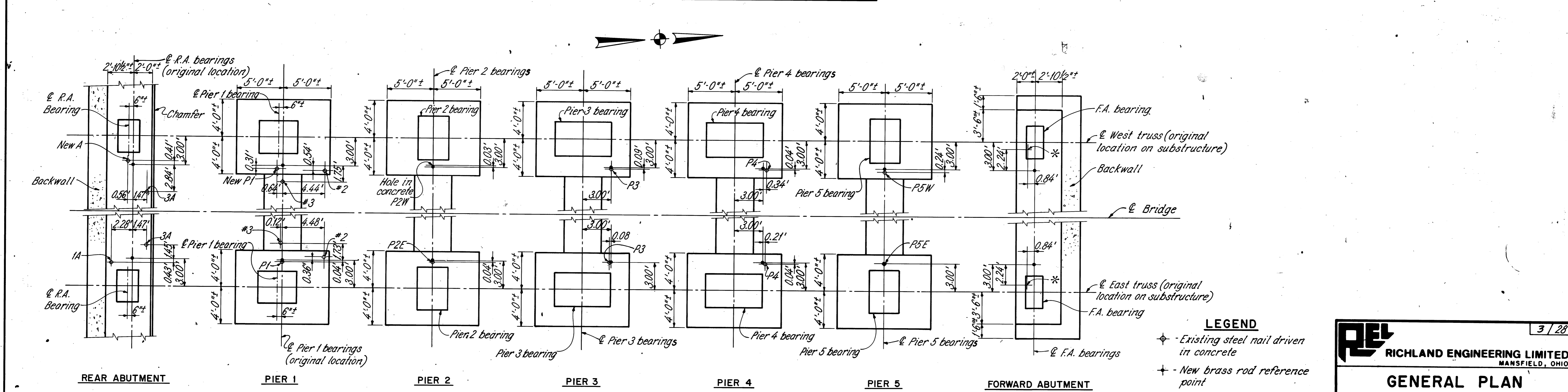
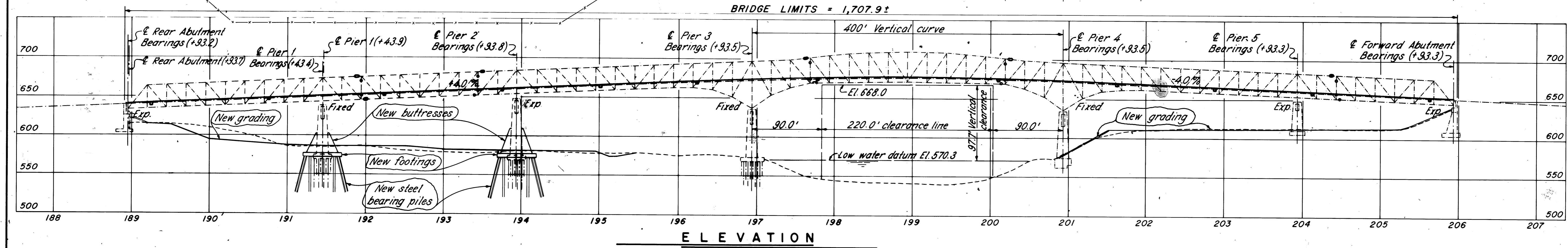
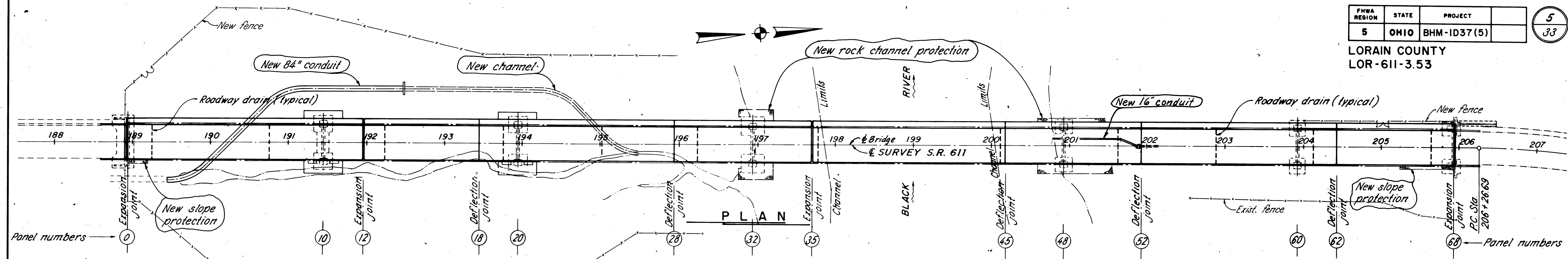
The permanent reference points shall consist of a 3/4 inch diameter by 4 inch long brass rod set in non-shrink grout or epoxy adhesive, in a minimum 1-1/4 inch diameter hole cored 4-1/2 inches into the concrete. The top of the brass rod shall be set flush with the existing concrete surface. After the grout sets, the brass rod shall be centerpunched at the exact reference point location.

All measurements, references and location work shall be performed under the supervision of a Professional Surveyor registered in the State of Ohio.

The cost of all labor, materials and equipment necessary for measurements, reference points, and installation shall be included for payment, per each location, for Item Special - Permanent Reference Point.

 RICHLAND ENGINEERING LIMITED MANSFIELD, OHIO		2/28	
		GENERAL NOTES & GENERAL SUMMARY SUBSTRUCTURE BRIDGE NO. LOR-611-0358 OVER BLACK RIVER	
LORAIN COUNTY		S.R. 611	
DESIGNED	DRAWN	TRACED	CHECKED
DAP	TWH	TWH	RHU
REVIEWED	DATE	REVISOR	REVISION
RDN	9/12/86		

LORAIN COUNTY
LOR-611-3.53



LEGEND
 * - Existing steel nail driven in concrete
 + - New brass rod reference point

* - Centerpunch mark in base casting
 1/2" ± above concrete bridge seat.

PERMANENT REFERENCE POINT LOCATIONS
 See note, sheet 2/28

RE		3/28	
RICHLAND ENGINEERING LIMITED MANSFIELD, OHIO			
GENERAL PLAN			
SUBSTRUCTURE			
BRIDGE NO. LOR-611-0358			
OVER BLACK RIVER			
LORAIN COUNTY		S.R. 611	
DESIGNED	DRAWN	TRACED	CHECKED
DAP	DAP	WW	RHL
REVIEWED	DATE	REVISION	
RDN	9/12/88		

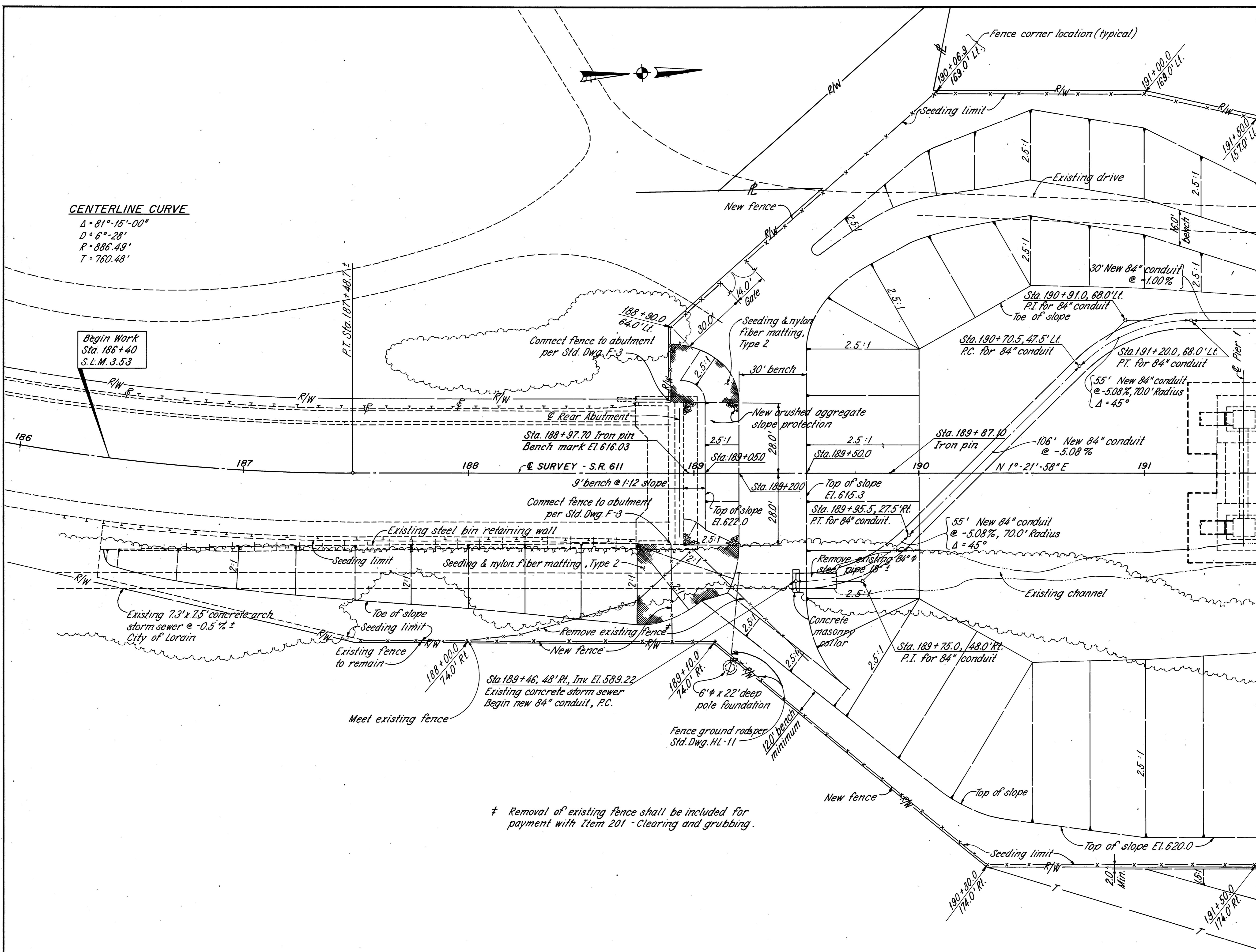
FHWA REGION	STATE	PROJECT
5	OHIO	BHM-1D37(5)

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LORAIN COUNTY
LOR-611-3.53

CENTERLINE CURVE

$\Delta = 81^{\circ}15'00''$
 $D = 6^{\circ}28'$
 $R = 886.49'$
 $T = 760.48'$



ITEM	DESCRIPTION	SIDE	FROM STATION	TO STATION	QUANTITY
202	Pipe removed, over 24"	Right	189+46	189+64	18 L.F.
203	Excavation not incl. embankment construction	Left & Right	189+00	191+50	23,891 C.Y.
203	Embankment	Left & Right	186+50	191+50	4,513 C.Y.
601	Crushed aggregate slope protection	Left & Right	188+96	189+20	157 S.Y.
602	Concrete masonry	Right	189+44.5	189+47.5	6 C.Y.
603	84" Conduit, Type C, 706.02, as per plan	Left & Right	189+46	191+50	246 L.F.
607	Fence, Type CL	Left & Right	188+00	191+50	756 L.F.
607	Gate, Type CL	Left	189+12	189+22	1 Ea.
659	Seeding & mulching using crown vetch, as per plan	Left & Right	186+40	191+50	8,758 S.Y.
625	Ground rod	Right	189+20		2 Ea.
840	Seeding & nylon fiber matting, Type 2	Left & Right	188+64	189+20	210 S.Y.
659	Fertilizer	Left & Right	186+40	191+50	0.79 Ton

QUANTITIES	
CALCULATED	BLN DATE: 3/86
CHECKED	TWH DATE: 3/86

NOTES

NEW 84" CONDUIT See Detail sheet 16/28

The Contractor shall remove the top five (5) feet of the existing slope indicator tubes located at each of the foundation investigation boring locations B-1 to B-8 as shown on Sheet 2/5 of the foundation investigation. Cost of removal shall be included for payment under Item 201, Clearing and Grubbing.

EARTHWORK limits shown are approximate. Actual slopes shall conform to plan cross sections.

‡ Removal of existing fence shall be included for payment with Item 201 - Clearing and grubbing.

4/28

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GRADING PLAN
STA. 186+00 TO STA. 191+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	WH	RHL	PDN	3/12/86	

FHWA REGION	STATE	PROJECT	
5	OHIO	BHM-1D37(5)	

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LORAIN COUNTY
LOR-611-3.53

ITEM	DESCRIPTION	SIDE	FROM STATION	TO STATION	QUANTITY
203	Excavation not incl. embankment construction	Left & Right	191+50	195+50	30,397 C.Y.
203	Embankment	Left & Right	191+50	195+50	6,555 C.Y.
601	Rock channel protection, Type B, with fabric filter	Left & Right	192+50	195+50	1,018 C.Y.
602	Concrete masonry	Left	192+49	192+50	4 C.Y.
603	84" Conduit, Type C, 706.02, as per plan	Left	191+50	192+50	100 L.F.
659	Seeding & mulching using crown vetch, as per plan	Left & Right	191+50	196+50	11,976 S.Y.
625	Ground rod	Right	195+60		1 Ea.
607	Fence, Type CL	Left & Right	191+50	196+39.5	968 L.F.
659	Fertilizer	Left & Right	191+50	196+50	1.08 Ton

QUANTITIES	
CALCULATED	B.L.N. DATE: 9/86
CHECKED	T.W.H. DATE: 9/86

NOTES

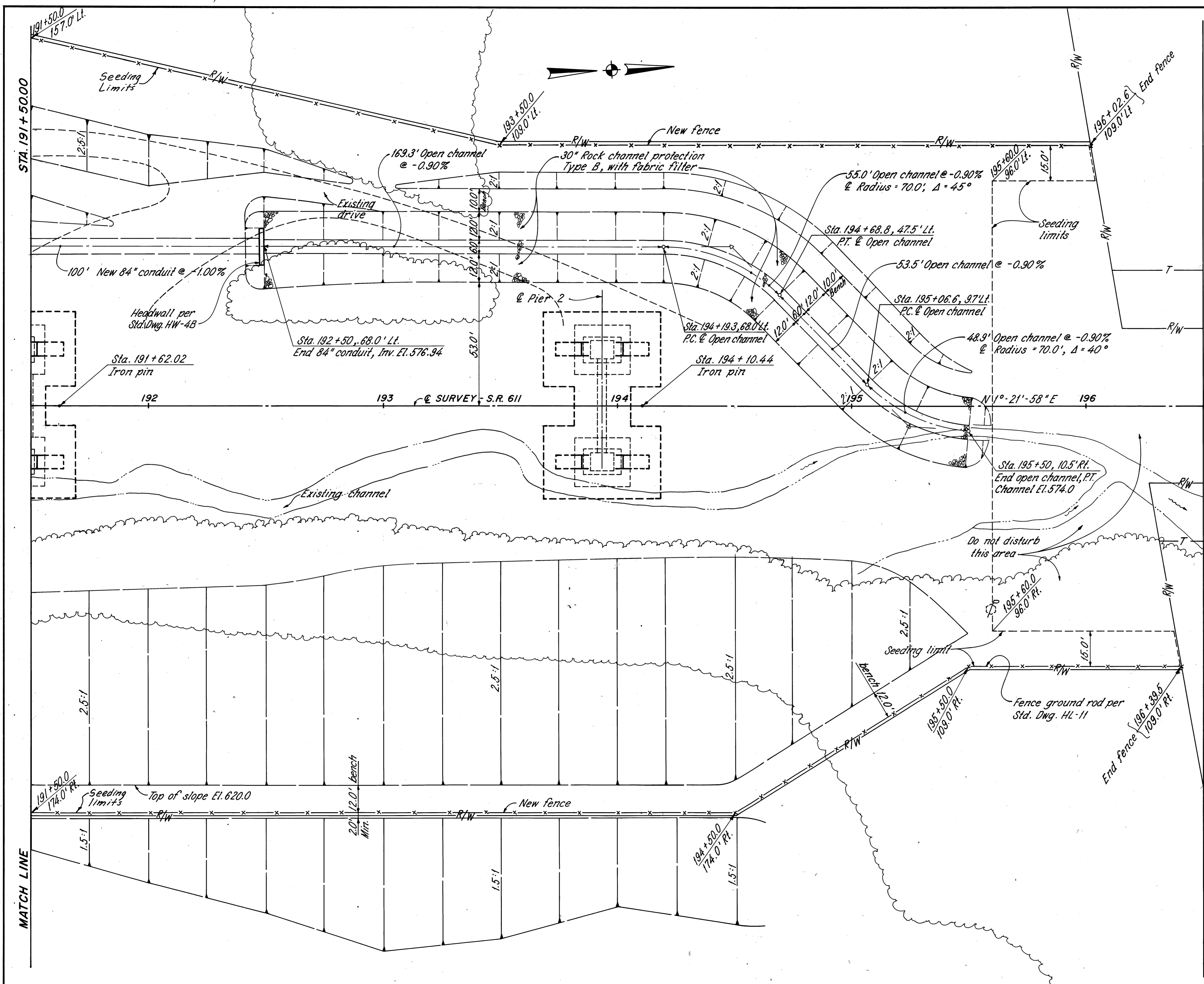
NEW 84" CONDUIT AND OPEN CHANNEL See Detail sheet 16/28

The Contractor shall remove the top five (5) feet of the existing slope indicator tubes located at each of the foundation investigation boring locations B-1 to B-8 as shown on Sheet 2/5 of the foundation investigation. Cost of removal shall be included for payment under Item 201, Clearing and Grubbing.

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

5/28
GRADING PLAN
STA. 191+50 TO STA. 196+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY	S.R. 611
DESIGNED	DAP
DRAWN	T.W.H.
TRACED	T.W.H.
CHECKED	R.H.U.
REVIEWED	R.D.N.
DATE	9/12/86
REVISED	



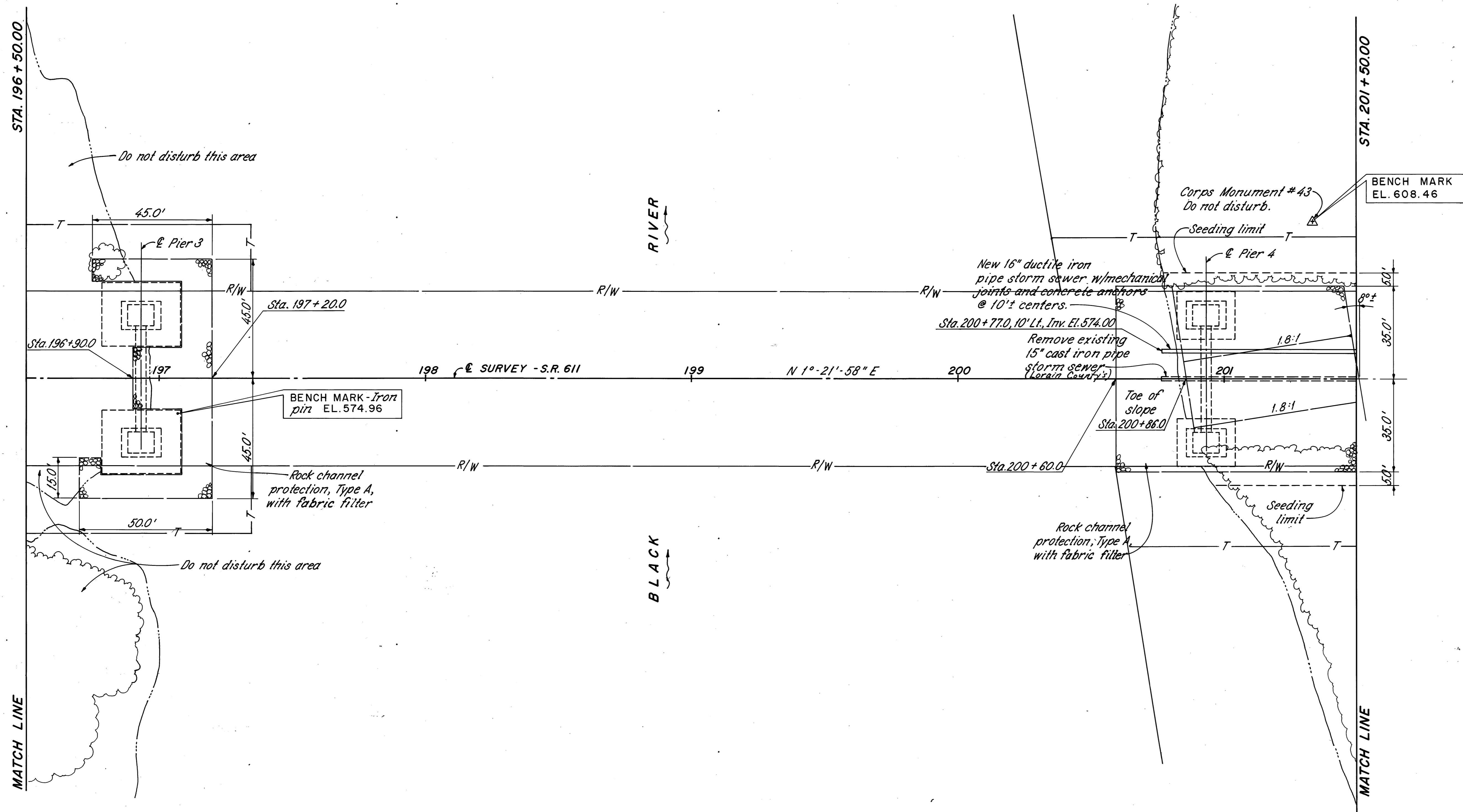
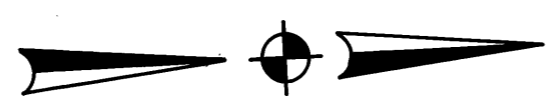
MATCH LINE

MATCH LINE

FHWA REGION	STATE	PROJECT
5	OHIO	BHM-1D37(5)

8
33

LORAIN COUNTY
LOR-611-3.53



ITEM	DESCRIPTION	SIDE	FROM STATION	TO STATION	QUANTITY
202	Pipe removed, 24" and under	℄	200+77	201+50	73 L.F.
203	Excavation not incl. embankment construction	Left & Right	200+75	201+50	251 C.Y.
203	Embankment	Left & Right	201+00	201+50	93 C.Y.
601	Rock channel protection, Type A, with fabric filter	Left & Right	196+70	197+20	756 C.Y.
602	Concrete masonry	Left	201+02	201+42	4 C.Y.
603	16" Conduit Type F using ductile iron pipe, as per plan	Left	200+77	201+50	79 L.F.
659	Seeding & mulching using crown vetch, as per plan	Left & Right	200+77	201+50	78 S.Y.
659	Fertilizer	Left & Right	200+77	201+50	0.01 Ton

QUANTITIES	
CALCULATED	B.L.N. DATE: 3/86
CHECKED	T.W.H. DATE: 3/86

NOTES

NEW 16" CONDUIT: See Detail sheet 17/28

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

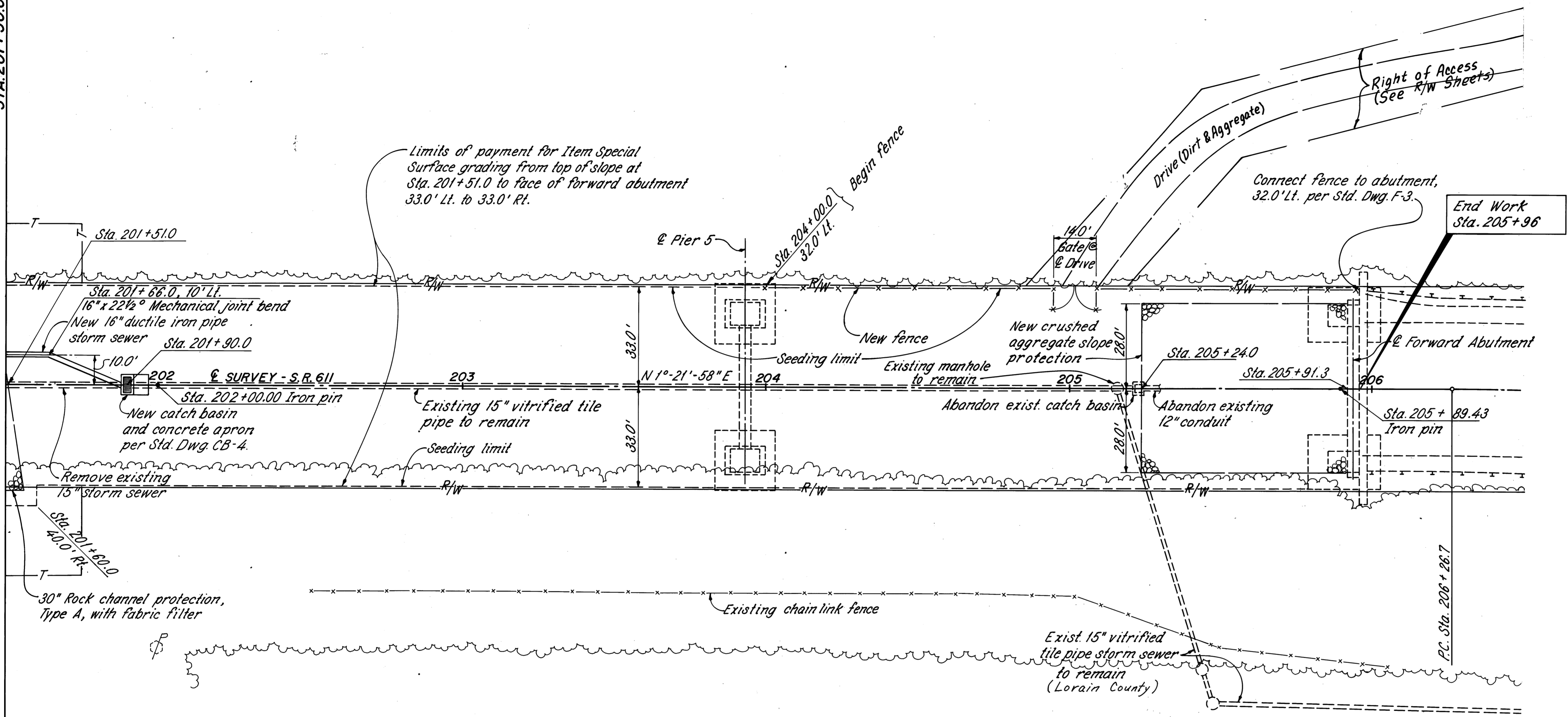
GRADING PLAN
STA. 196+50 TO STA. 201+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	T.W.H.	T.W.H.	R.H.U.	R.D.N.	3/12/86	

6/28

STA. 201+50.00

MATCH LINE



ITEM	DESCRIPTION	SIDE	FROM STATION	TO STATION	QUANTITY
202	Catch basin or inlet abandoned	℄	205+21	205+26	1 Ea.
202	Pipe removed, 24" and under	℄	201+50	201+90	40 L.F.
203	Excavation not incl. embankment construction	Left	201+50	201+51	4 C.Y.
203	Embankment	Left & Right	201+50	201+51	12 C.Y.
601	Rock channel protection, Type "A" with fabric filter	Left & Right	201+50	201+56	11 C.Y.
601	Crushed aggregate slope protection	Left & Right	205+24	205+91.3	455 S.Y.
603	16" Conduit Type Fusing ductile iron pipe, as per plan	Left	201+50	201+90	42 L.F.
604	Catch basin Std. No. 4	Left & Right	201+90		1 Ea.
607	Gate, Type CL	Left	204+96	205+10	1 Ea.
607	Fence, Type CL	Left	204+00	205+96	182 L.F.
659	Seeding & mulching using crown vetch, as per plan	Left & Right	201+50	205+96	2787 S.Y.
Spec.	Surface grading	Left & Right	201+51	205+96	3,195 S.Y.
659	Fertilizer	L&R	201+50	205+96	0.25 Ton

QUANTITIES	
CALCULATED	BLN DATE: 9/86
CHECKED	TWH DATE: 9/86

NOTES

NEW 16" CONDUIT: See Detail sheet 17/28

7/28

RE RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**GRADING PLAN
STA. 201+50 TO STA. 206+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER**

LORAIN COUNTY S.R. 611

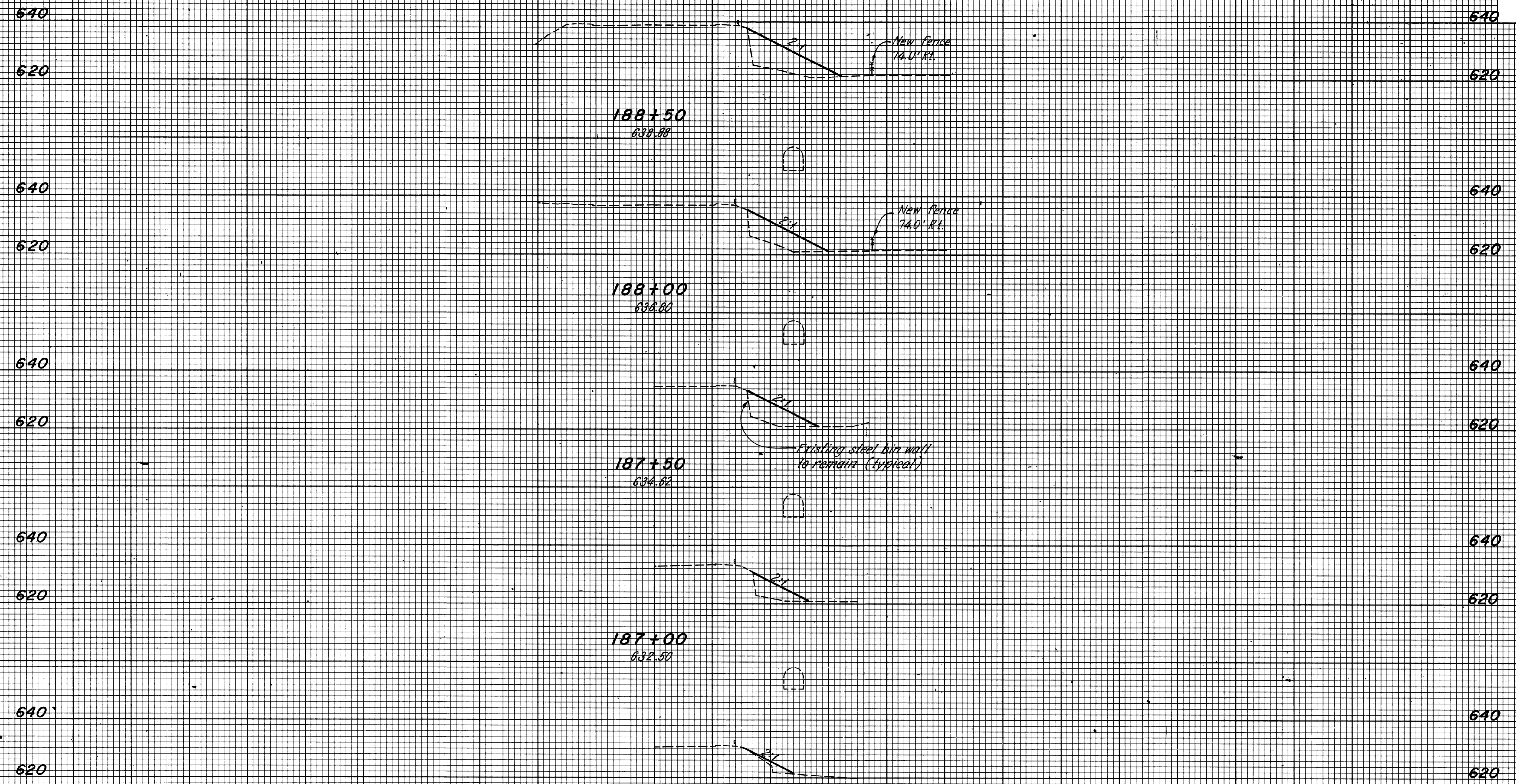
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	RHU	RDN	9/12/86	

SEEDING
END WIDTH SQ. YDS.

QUANTITIES		FHWA REGION	STATE	PROJECT
CALCULATED	BLN DATE 9/86	5	OHIO	BHM-1D37(5)
CHECKED	TWH DATE 9/86			

10
33

LORAIN COUNTY
LOR-611-3.53



END AREA		VOLUME	
CUT	FILL	CUT	FILL
	182		
			292
	133		
			207
	91		
			144
	64		
			73
	15		
			3
	0	0	0

180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**CROSS SECTIONS
STA. 186+50 TO STA. 188+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER**

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	RHU	RDN	9/12/86	

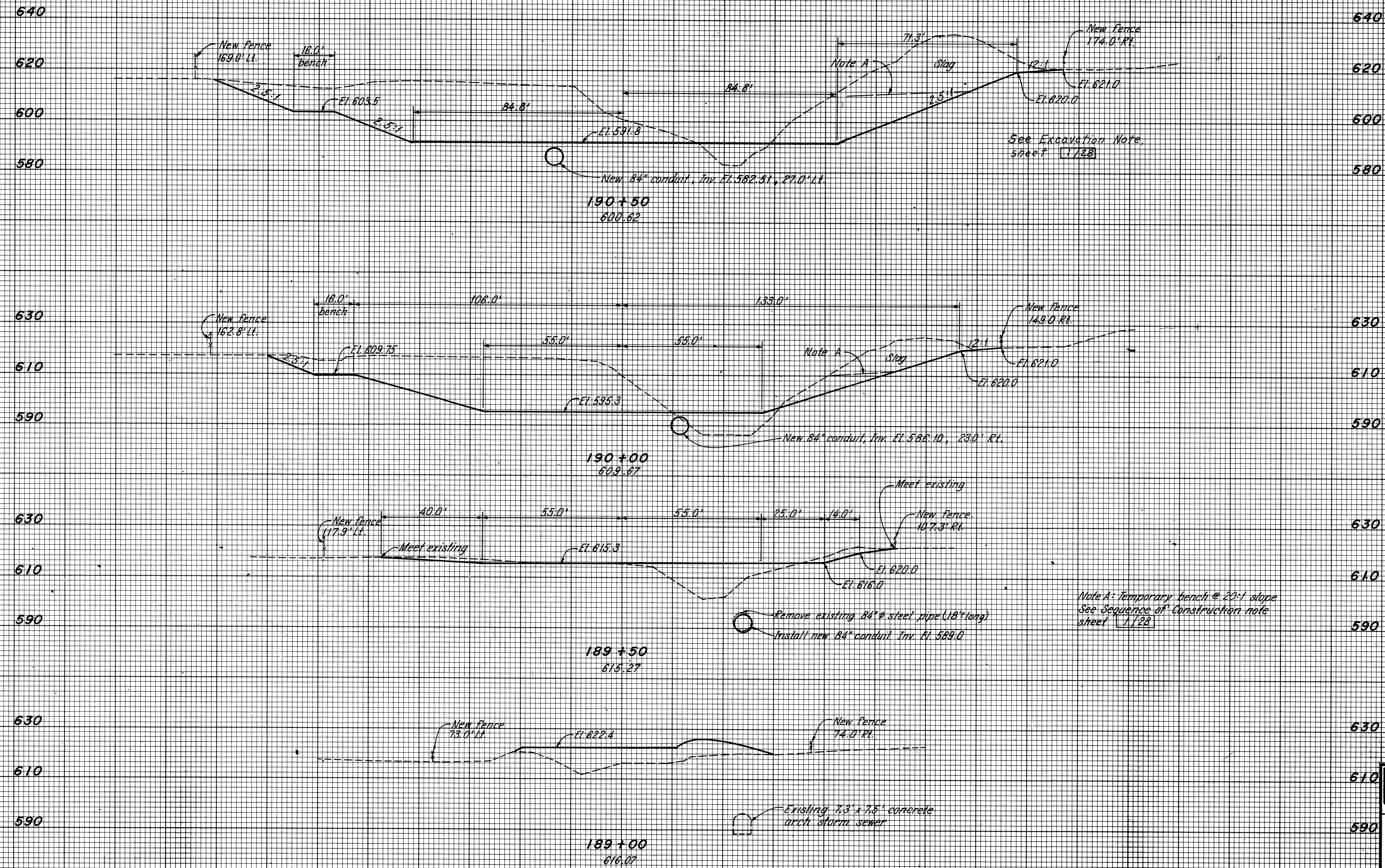
SEEDING
END WIDTH SQ. YDS.

QUANTITIES		FHWA REGION	STATE	PROJECT
CALCULATED	BLN DATE 9/86	5	OHIO	BHM-ID37(5)
CHECKED	TWH DATE 9/86			

11
33

LORAIN COUNTY
LOR-611-3.53

FL² C.Y.
END AREA VOLUME
CUT FILL CUT FILL



640	640		
620	620	4800	180
600	600		
580	580		
		7074	407
630	630		
610	610	2840	260
590	590		
		2730	631
630	630		
610	610	108	422
590	590		
		50	361
630	630	0	616
610	610	0	739
590	590		
			9/28

RE RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**CROSS SECTIONS:
STA. 189+00 TO STA. 190+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER**

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	RHU	RDN	9/12/86	

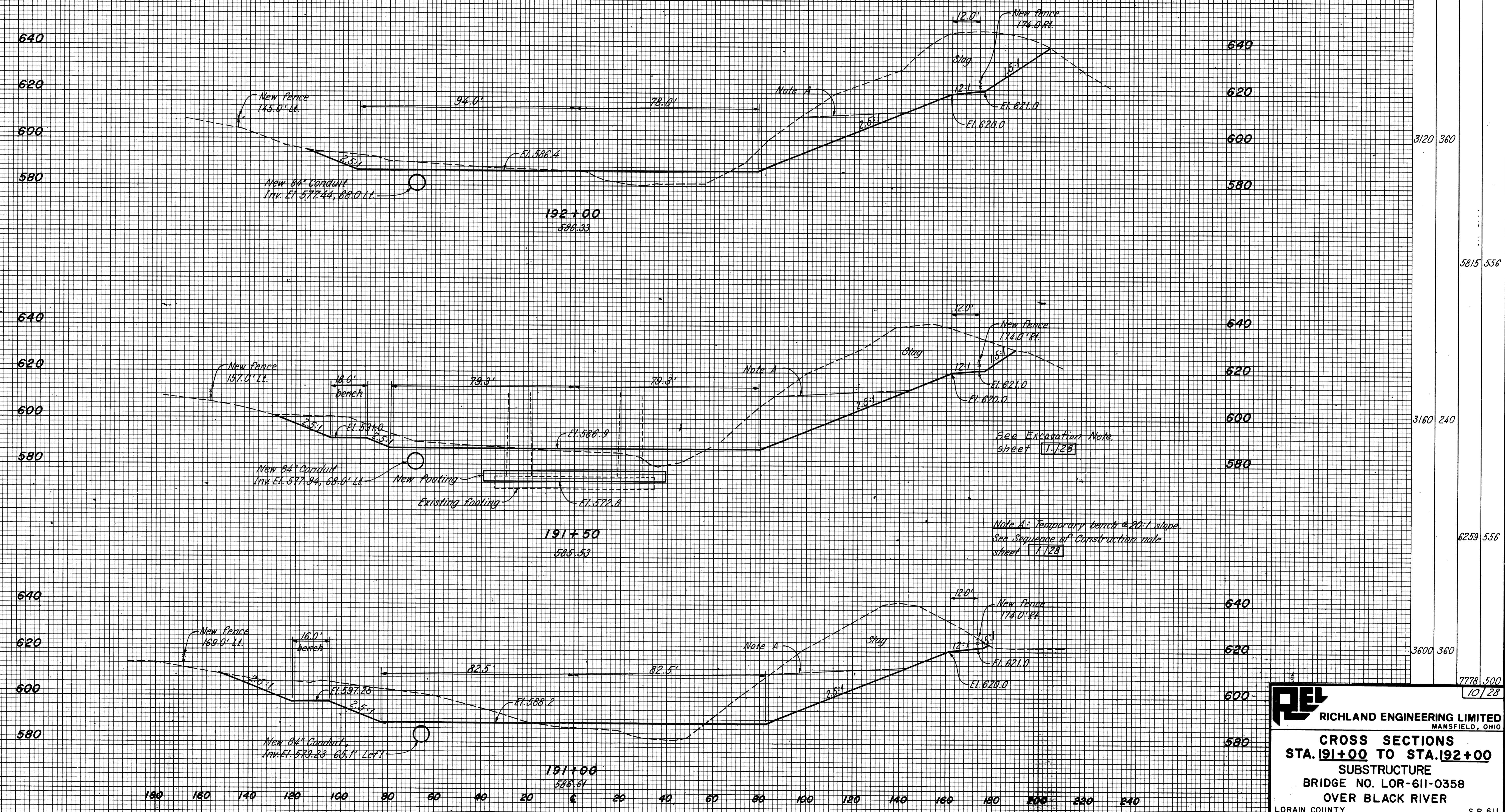
SEEDING
END WIDTH SQ. YDS.

QUANTITIES		FMWA REGION	STATE	PROJECT
CALCULATED	BLN DATE 9/86	5	OHIO	BHM-ID37(5)
CHECKED	TWH DATE 9/86			

LORAIN COUNTY
LOR-611-3.53

12
33

END AREA		VOLUME	
CUT	FILL	CUT	FILL



		3120	360		
		3160	240		
		3600	360	7778	500
				10	28

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**CROSS SECTIONS
STA. 191+00 TO STA. 192+00
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER**

LORAIN COUNTY S.R. 611

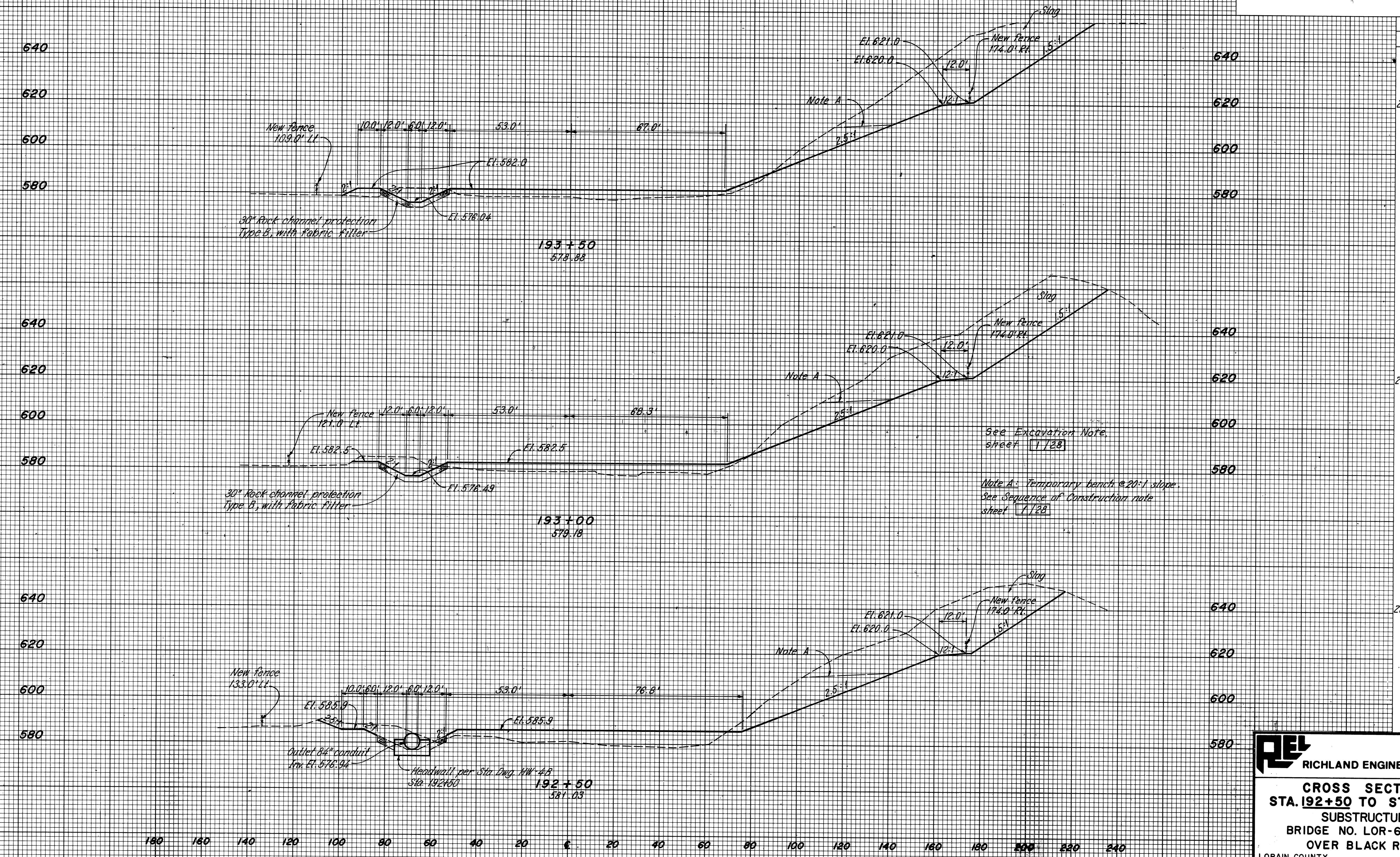
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	RHU	RDN	9/12/86	

SEEDING
END WIDTH SO. YDS.

QUANTITIES		FHWA REGION	STATE	PROJECT
CALCULATED	BLN DATE 9/86	5	OHIO	BHM-ID37(5)
CHECKED	TWH DATE 9/86			

13
33

LORAIN COUNTY
LOR-611-3.53



END AREA	FILL		CUT	
	CUT	FILL	CUT	FILL
2360	720			
4741	1148			
2760	520			
5000	1074			
2640	640			
5333	926			
				17/28

See Excavation Note sheet 1/28

Note A: Temporary bench @ 20:1 slope. See Sequence of Construction note sheet 1/28

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**CROSS SECTIONS
STA. 192+50 TO STA. 193+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER**

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE REVISION
DAP	TWH	WH	PHU	RDN	3/12/86

SEEDING
END WIDTH SO. YDS.

QUANTITIES	
CALCULATED	BLN DATE 9/86
CHECKED	TWH DATE 9/86

FHWA REGION	STATE	PROJECT
5	OHIO	BHM-1D37(5)

15
33

LORAIN COUNTY
LOR-611-3.53

END AREA		VOLUME	
CUT	FILL	CUT	FILL

580

580

560

560

196+50
576.99

New Fence
103.0' Lt.

New Fence
103.0' Rt.

580

580

560

560

196+00
576.09

180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240

13/28

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**CROSS SECTIONS
STA. 196+00 TO STA. 196+50
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER**

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	RHU	RDN	9/2/86	

SEEDING
END WIDTH SQ. YDS.

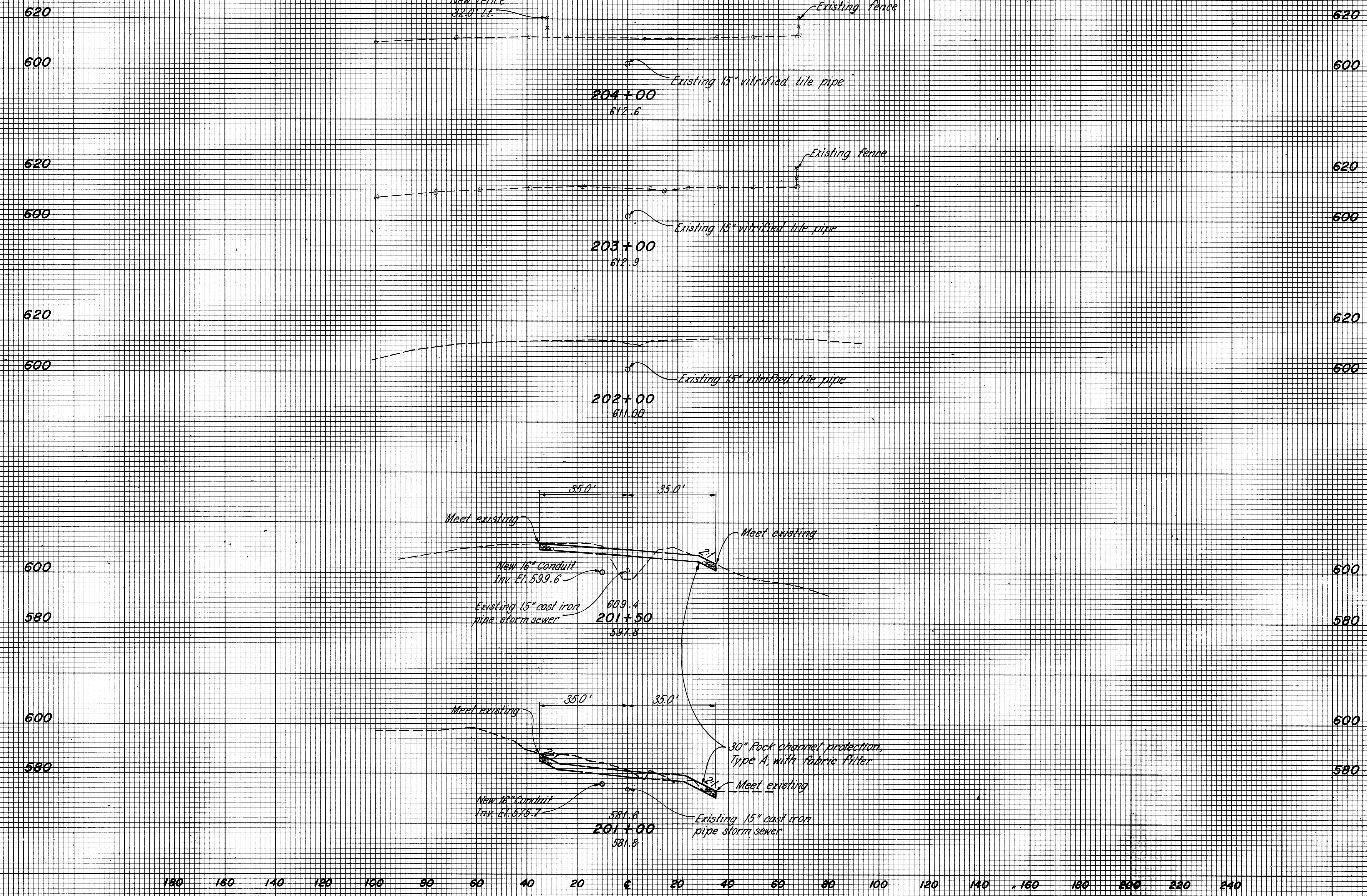
QUANTITIES		FHW REGION	STATE	PROJECT
CALCULATED	BLN DATE 9/86			
CHECKED	TWH DATE 9/86	5	OHIO	BHM-ID37(5)

16
33

LORAIN COUNTY
LOR-611-3.53

Ft² C.Y.

END AREA		VOLUME	
CUT	FILL	CUT	FILL



201+56	Ahead	0	0
	Back	0	0
		4	12
		30	100
			139 93
		120	0
			112
200+75	Ahead	0	0
	Back	0	0

RE RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**CROSS SECTIONS
STA. 201+00 TO STA. 204+00
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER**

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TW	RHU	RDN	9/12/86	

SEEDING
END WIDTH SQ. YDS.

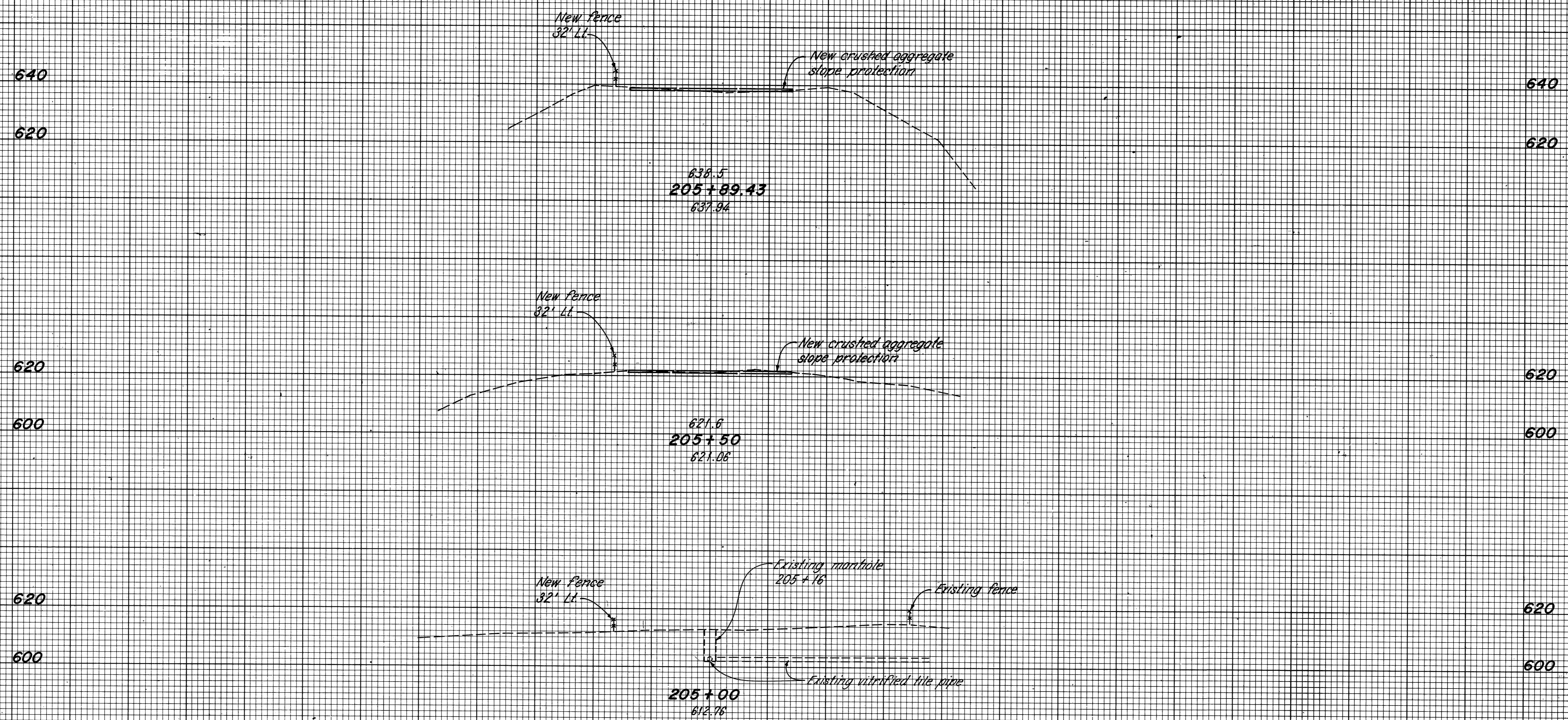
QUANTITIES		FWWA REGION	STATE	PROJECT
CALCULATED	BLN DATE 9/86	5	OHIO	BHM-1D37(5)
CHECKED	TWH DATE 9/86			

17
33

LORAIN COUNTY
LOR-611-3.53

END AREA		VOLUME	
CUT	FILL	CUT	FILL

END WORK
205+96

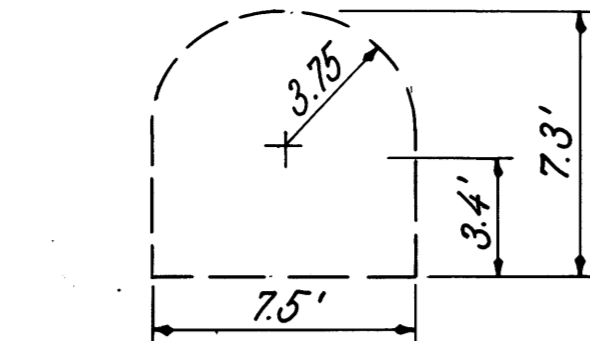


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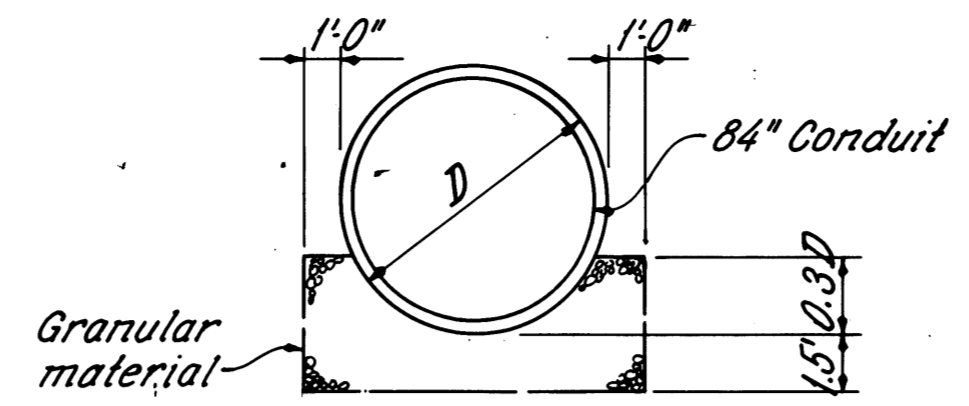
REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

CROSS SECTIONS
STA. 205+00 TO STA. 205+89.43
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

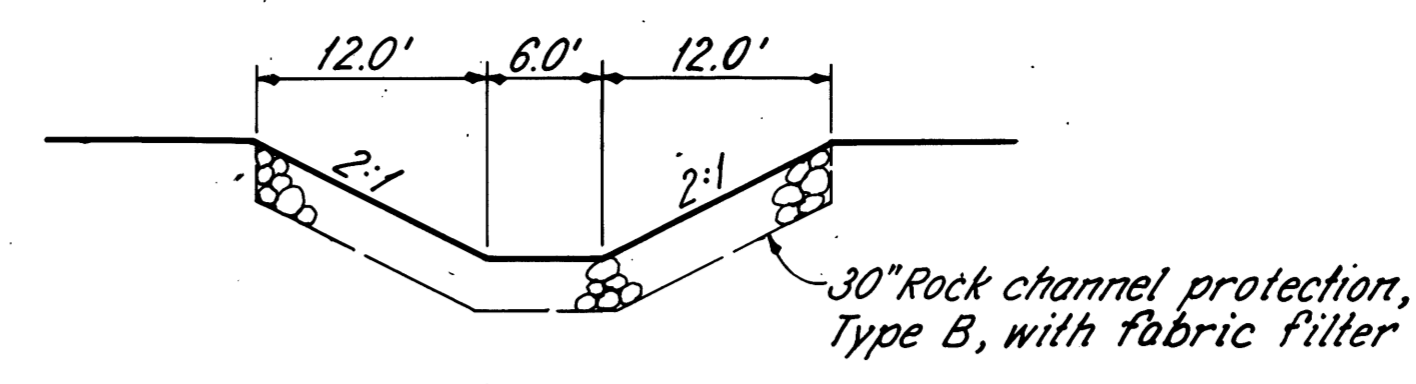
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	RHU	RDN	9/12/86	



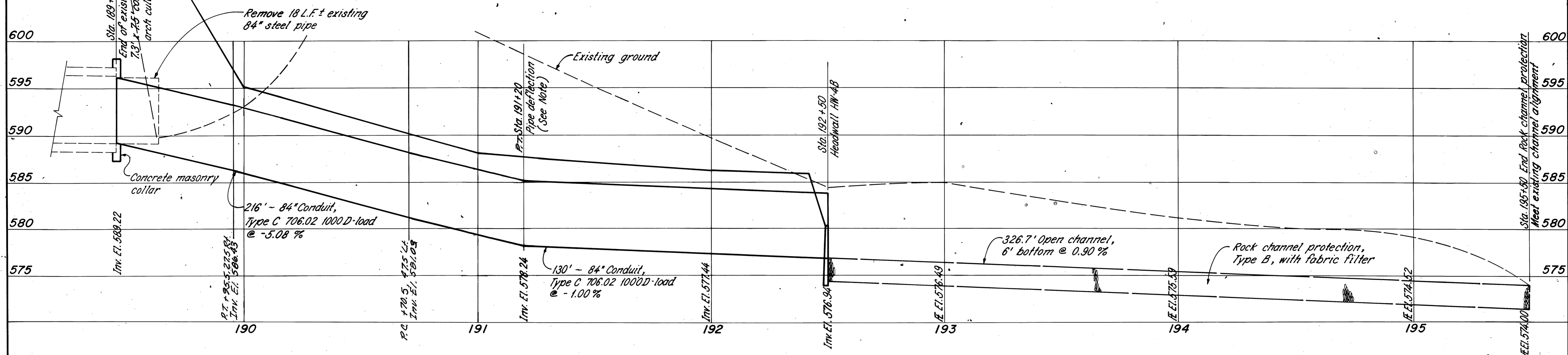
SECTION THRU EXISTING CULVERT



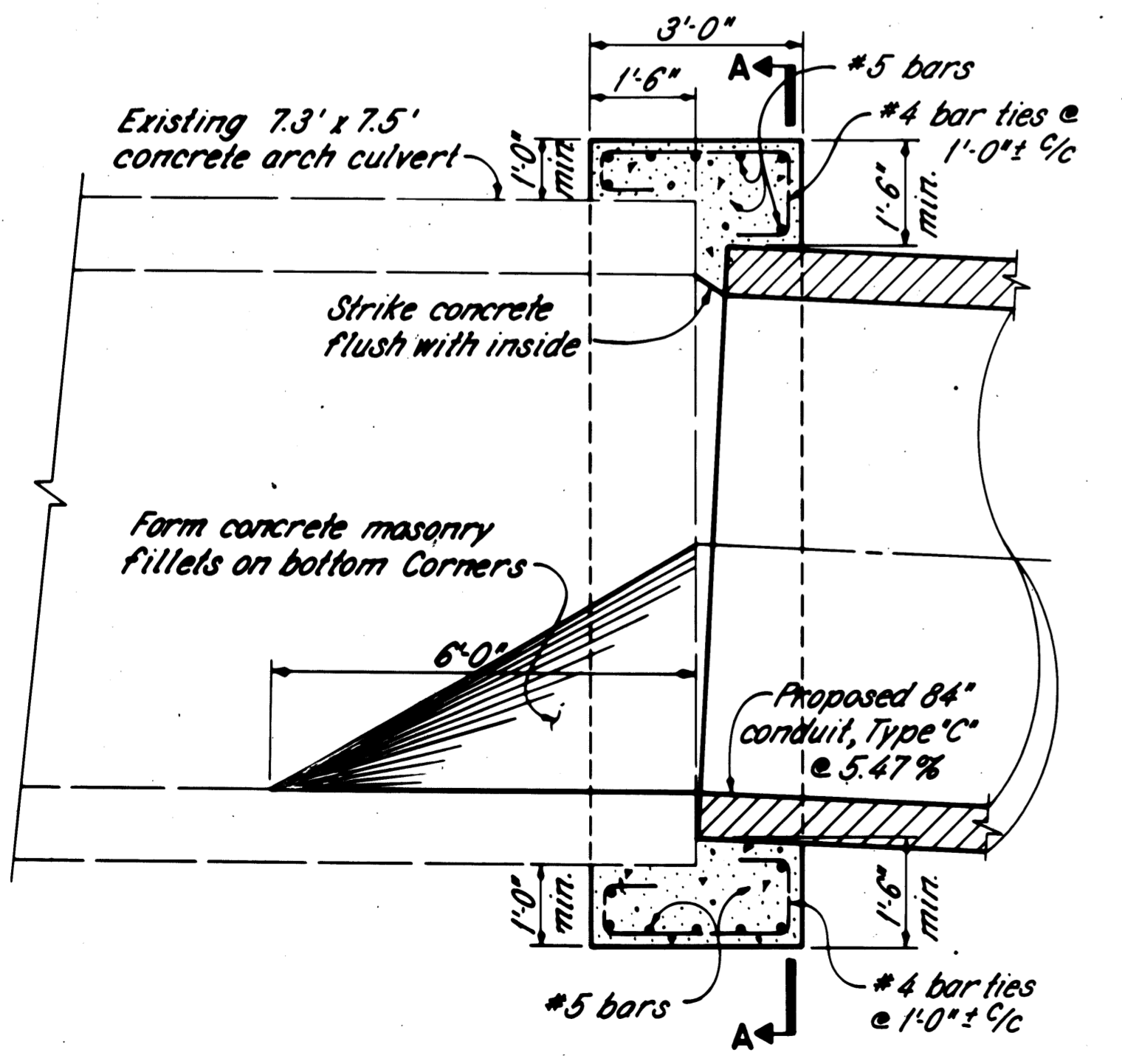
BEDDING



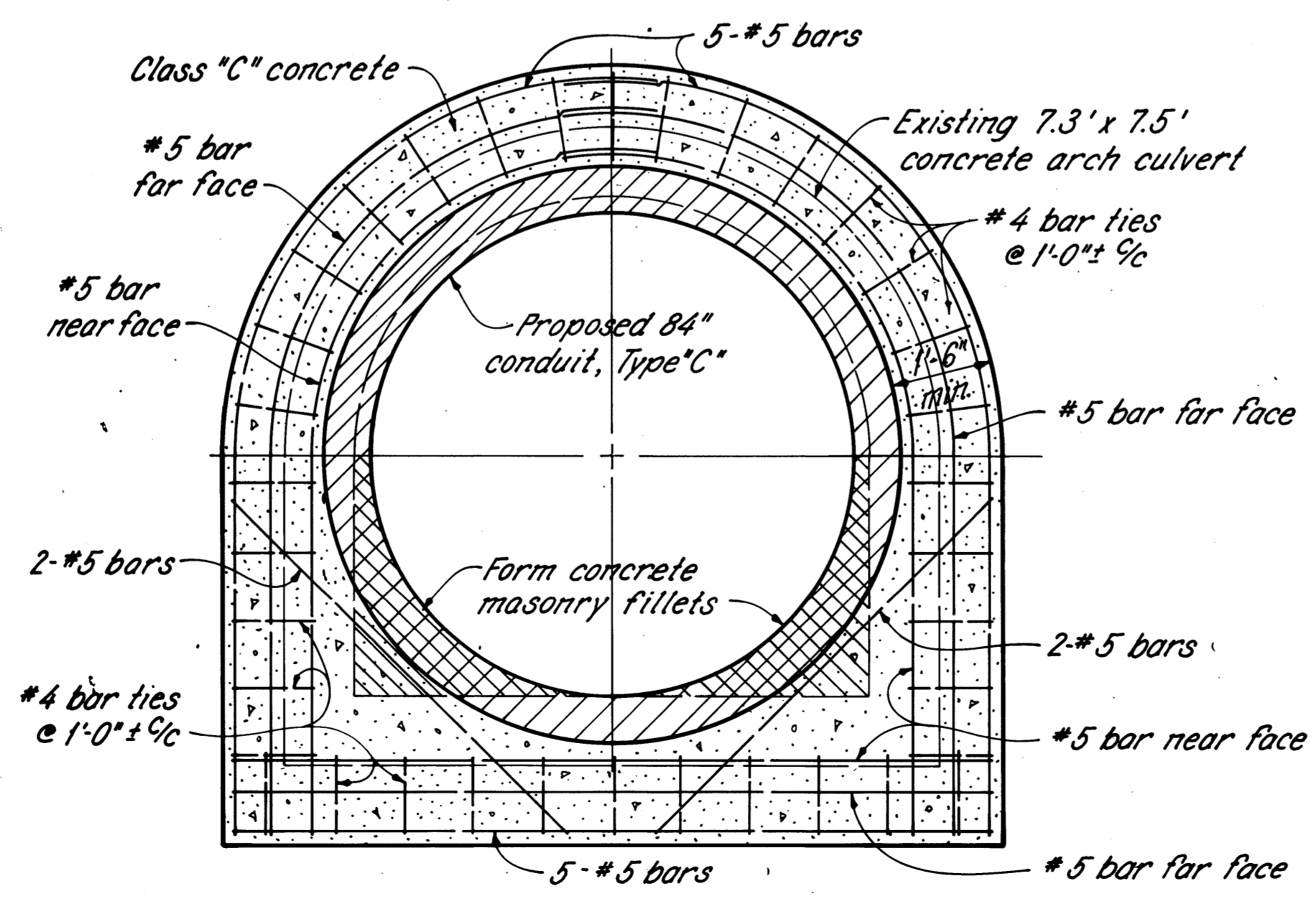
OPEN CHANNEL TYPICAL SECTION



PROFILE 84" STORM SEWER & OPEN CHANNEL

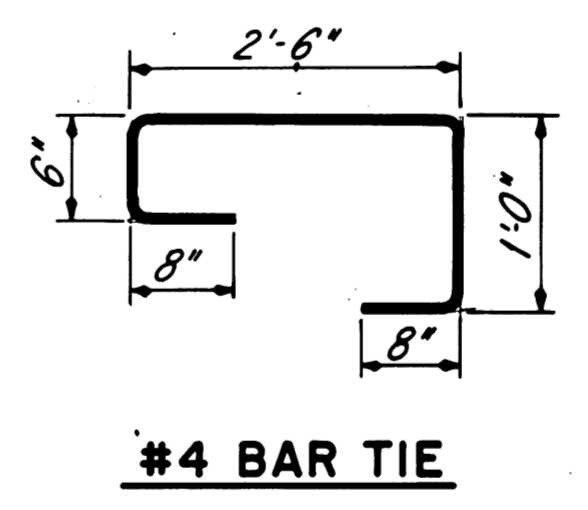


PROFILE



SECTION A-A

CONCRETE MASONRY COLLAR



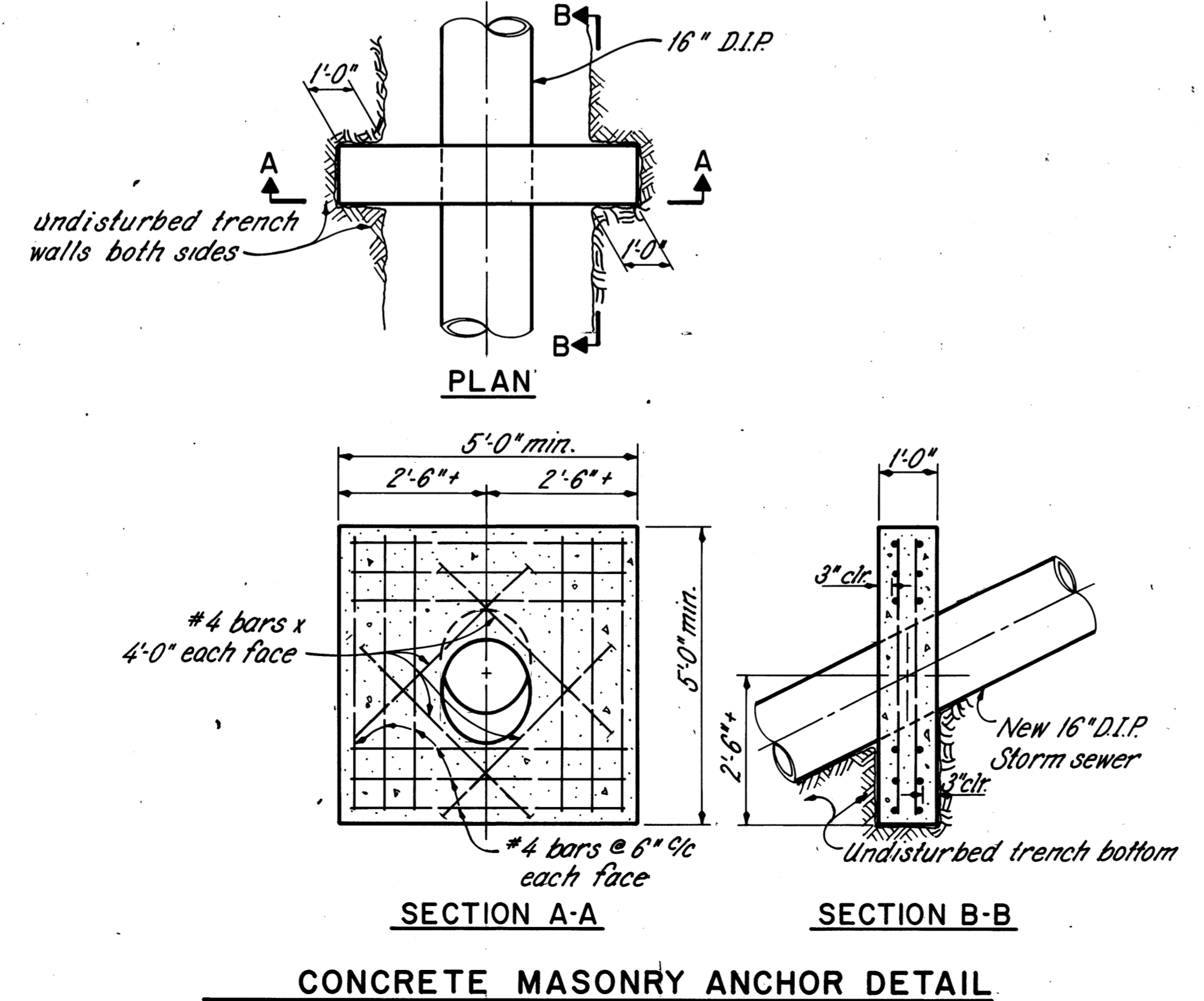
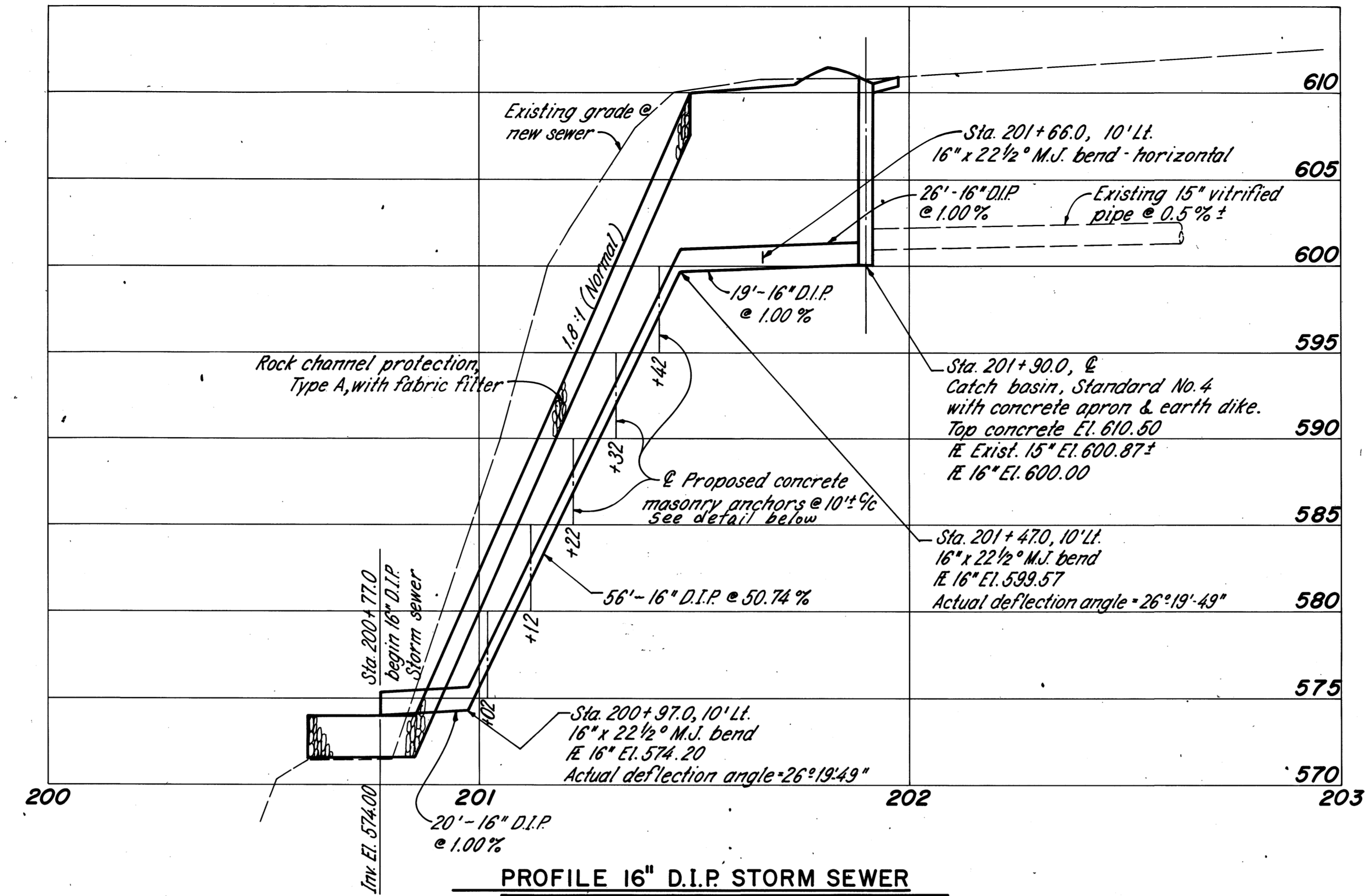
#4 BAR TIE

NOTES

- REINFORCING STEEL** is included for payment with Item 602 Concrete Masonry. Splice length for #5 bar = 1'-4"
- BEDDING** for the 84" conduit shall be per 603.04, Class B except the thickness of the granular material below the bottom of the pipe shall be at least 18 inches and extend one foot beyond each side of the pipe. The bedding cost shall be included for payment with Item 603 - 84" Conduit, Type C, 706.02, 1000 D-load, as per plan.
- LOCATION OF 84" CONDUIT** See sheet 4/28 & 5/28
- PIPE DEFLECTION** for change in grade or curved horizontal alignment shall be obtained with curved or bevel end pipe. Contractor shall furnish and install a manufactured bend or beveled end pipe to obtain the required deflection angle. Deflecting standard pipe joints will not be permitted. Cost of furnishing and installing the bend or beveled end pipe shall be included in the unit price bid for Item 603 84" Conduit, Type C, 706.02 1000 D-load.

REL		16/28	
RICHLAND ENGINEERING LIMITED MANSFIELD, OHIO			
DRAINAGE DETAIL			
84" STORM SEWER			
SUBSTRUCTURE			
BRIDGE NO. LOR-611-0358			
OVER BLACK RIVER			
LORAIN COUNTY			S.R. 611
DESIGNED	DRAWN	TRACED	CHECKED
TL	TL	TH	RHU
REVIEWED	DATE	REVISED	
RDN	9/12/86		

LORAIN COUNTY
LOR-611-3.53



NOTES:

REINFORCING STEEL is included for payment with Item 602 Concrete Masonry.

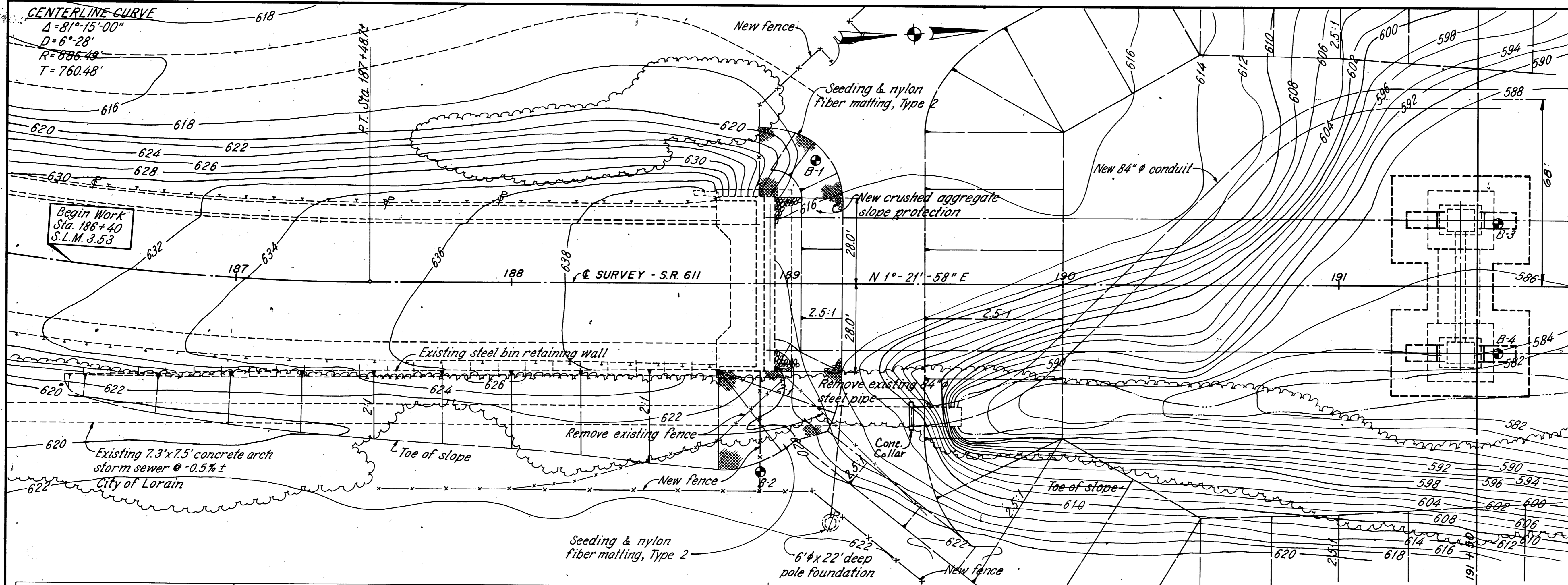
NOTATION

D.I.P. - Ductile Iron Pipe
M.J. - Mechanical Joint

16" CONDUIT, TYPE F shall be ductile iron pipe conforming to ANSI A21.51, class 50. Ductile iron shall be ASTM A536, Grade 60-45-10. Connections shall be mechanical joints with rubber sealing gaskets and iron follower rings. Joints shall conform to ANSI A21.11. Mechanical joints, pipe and fittings shall be included for payment with Item 603 - 16" Conduit, Type F using ductile iron pipe, as per plan.

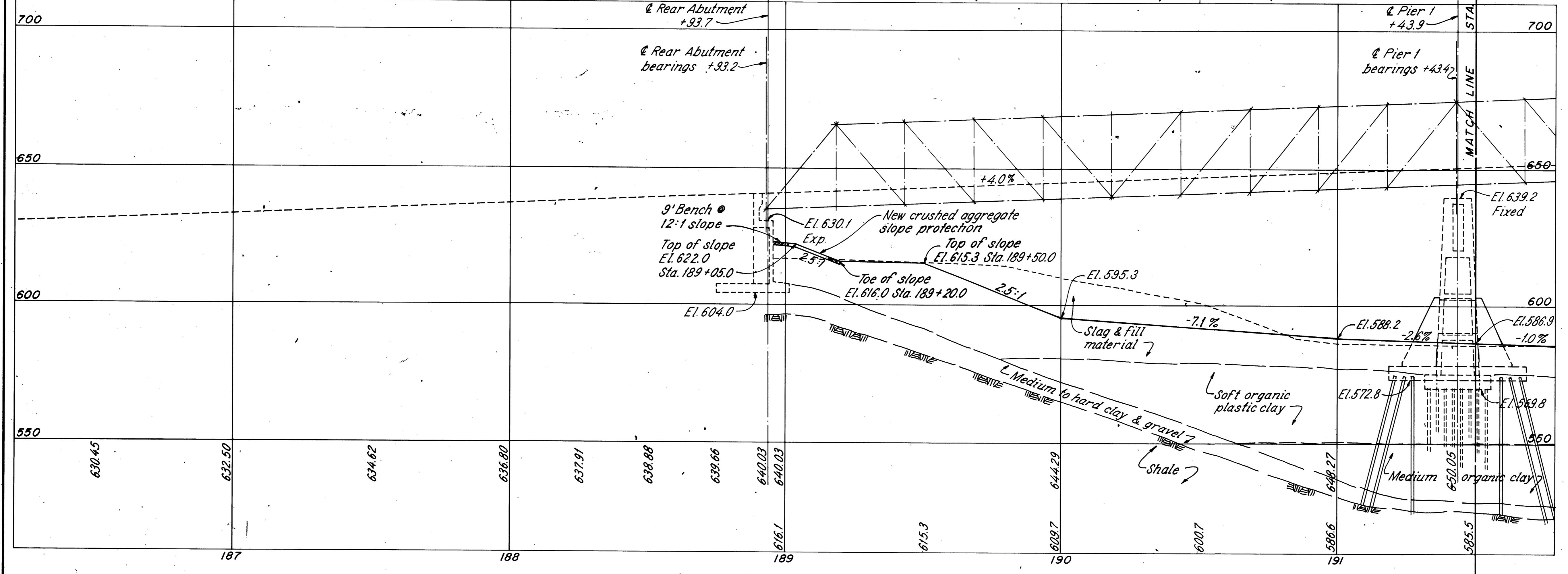
LOCATION OF 16" CONDUIT See sheets 6/28 & 7/28

RE		17/28	
RICHLAND ENGINEERING LIMITED MANSFIELD, OHIO			
DRAINAGE DETAIL 16" STORM SEWER SUBSTRUCTURE BRIDGE NO. LOR-611-0358 OVER BLACK RIVER			
LORAIN COUNTY		S. R. 611	
DESIGNED	DRAWN	TRACED	CHECKED
7L	7L	TW	DAP
REVIEWED	DATE	REVISION	
RDN	3/12/86		



FHWA REGION	STATE	PROJECT	20
5	OHIO	BHM-ID37(5)	33

LORAIN COUNTY
 LOR-611-3.53



EXISTING STRUCTURE

PROPOSED STRUCTURE

LEGEND

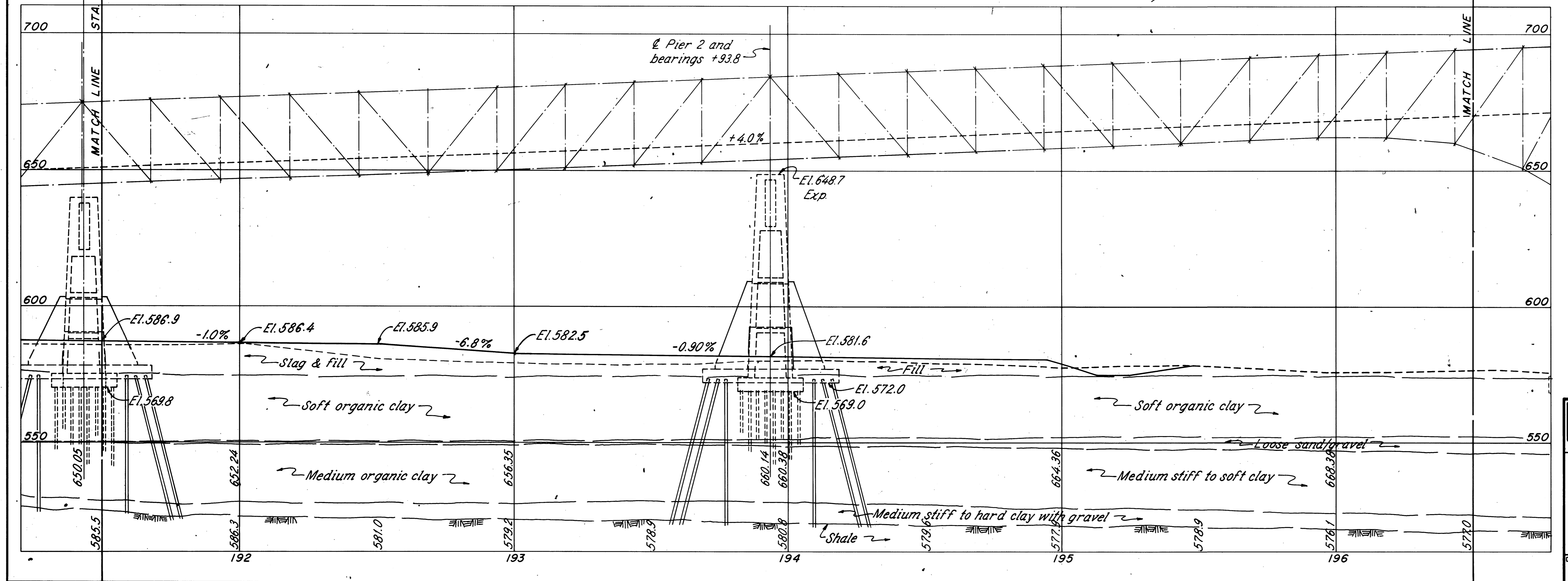
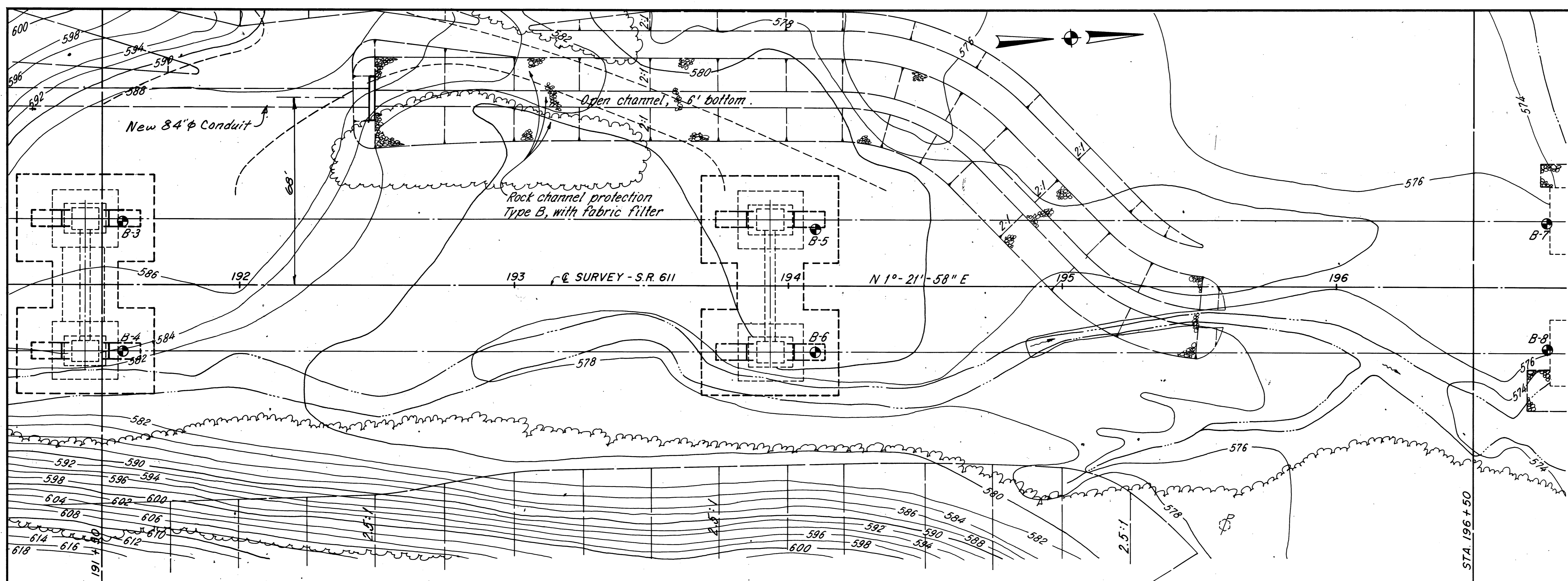
EARTHWORK limits shown are approximate. Actual slopes shall conform to plan cross sections.

RICHLAND ENGINEERING LIMITED
 MANSFIELD, OHIO

SITE PLAN - 1
 SUBSTRUCTURE
 BRIDGE NO. LOR-611-0358
 OVER BLACK RIVER

LORAIN COUNTY S.R. 611
 DESIGNED DRAWN TRACED CHECKED REVIEWED DATE REVISED
 DAP DAP RHU JCR RDN 9/12/86

LORAIN COUNTY
LOR-611-3.53



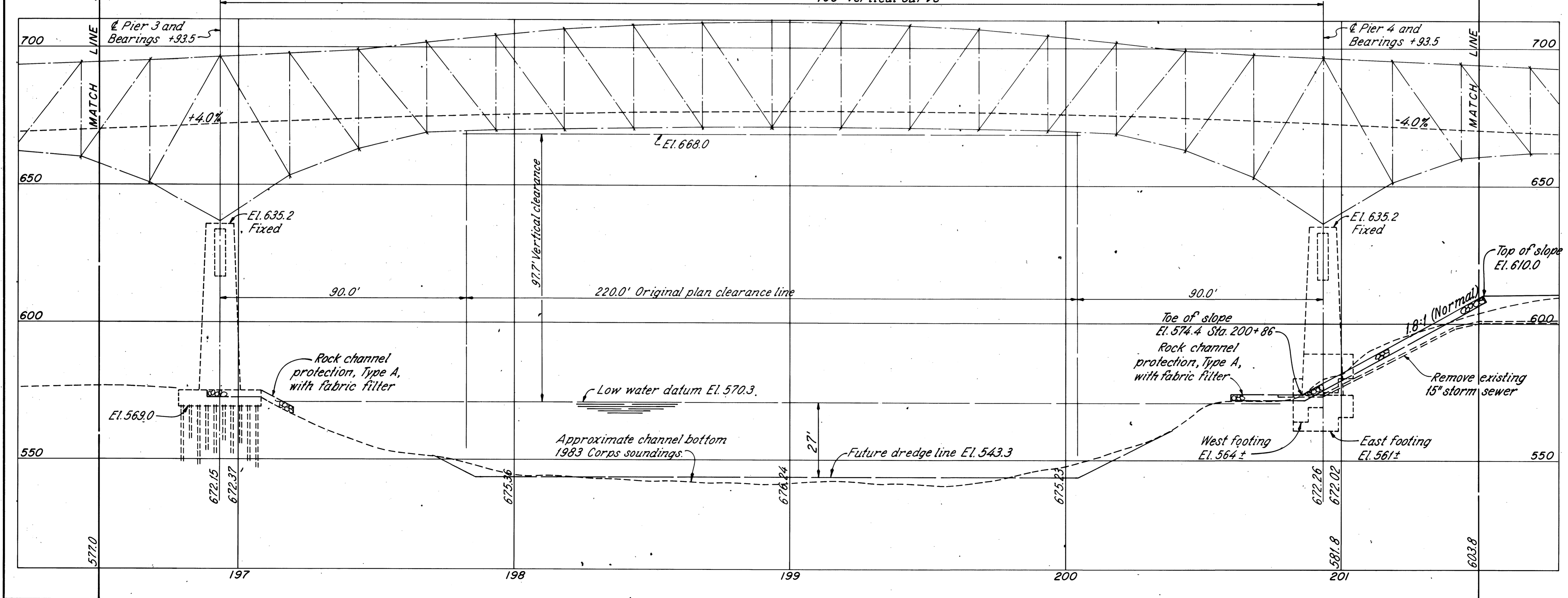
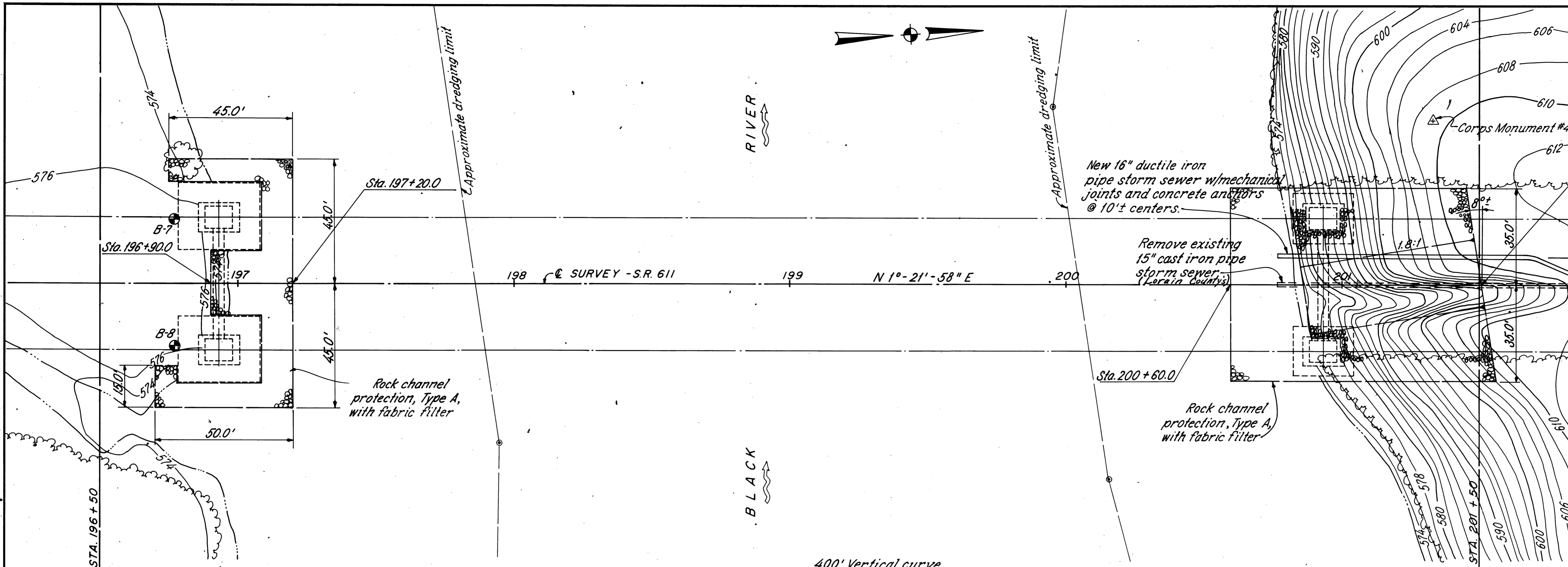
LEGEND
 ● Foundation boring location

RE RICHLAND ENGINEERING LIMITED
 MANSFIELD, OHIO

SITE PLAN - 2
 SUBSTRUCTURE
 BRIDGE NO. LOR-611-0358
 OVER BLACK RIVER

LORAIN COUNTY					S.R. 611
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
DAP	DAP	RHU	JCR	RDN	9/12/86

LORAIN COUNTY
LOR-611-3.53

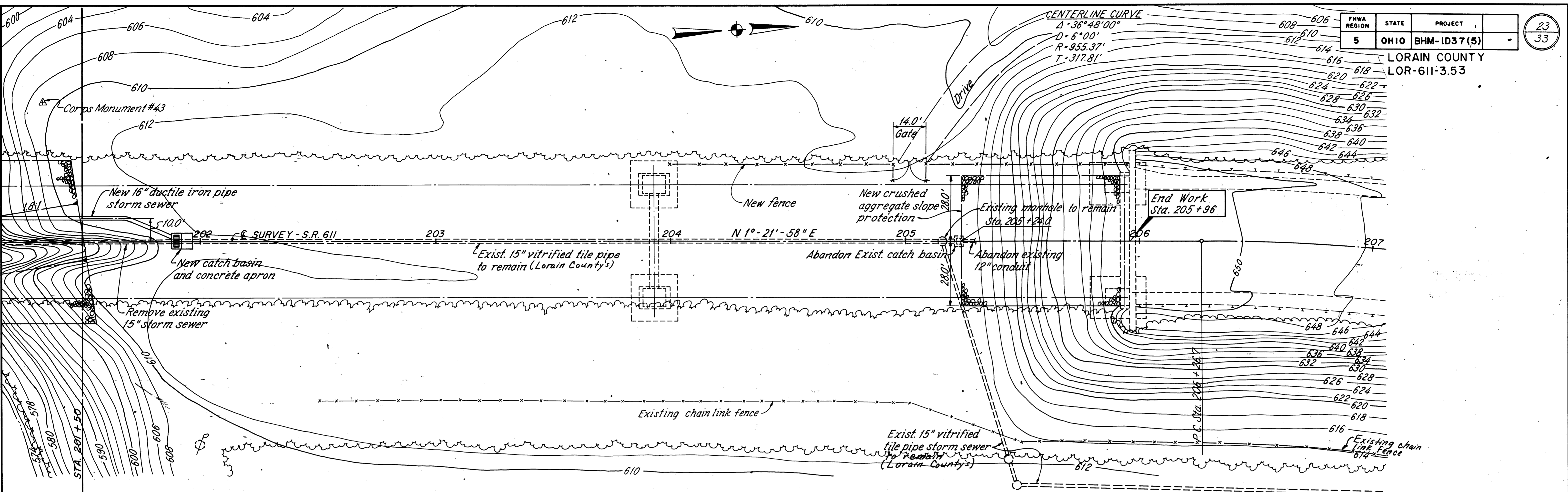


LEGEND
 ● Foundation boring location

REI RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

SITE PLAN - 3
SUBSTRUCTURE
 BRIDGE NO. LOR-611-0358
 OVER BLACK RIVER

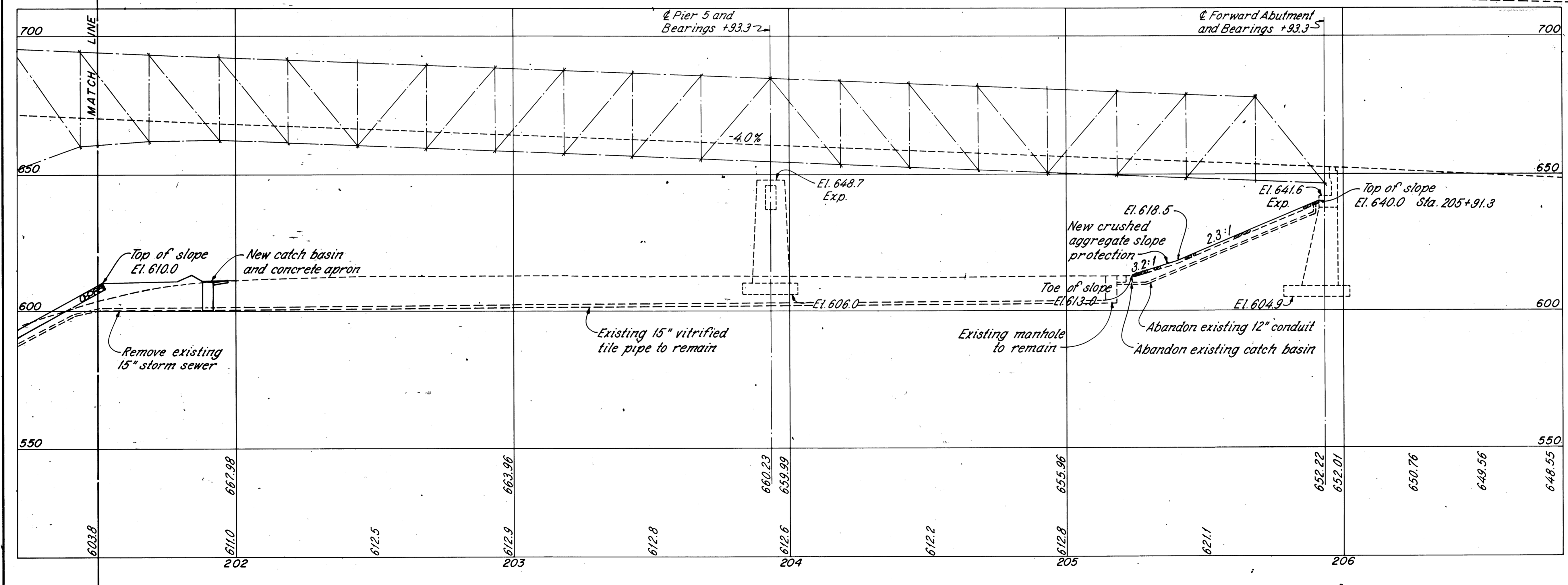
LORAIN COUNTY S.R. 611
 DESIGNED DAP DRAWN DAP TRACED RNU CHECKED JCR REVIEWED RDN DATE 3/12/86



FHWA REGION	STATE	PROJECT	
5	OHIO	BHM-ID37(5)	

LORAIN COUNTY
 LOR-611-3.53

23
 33



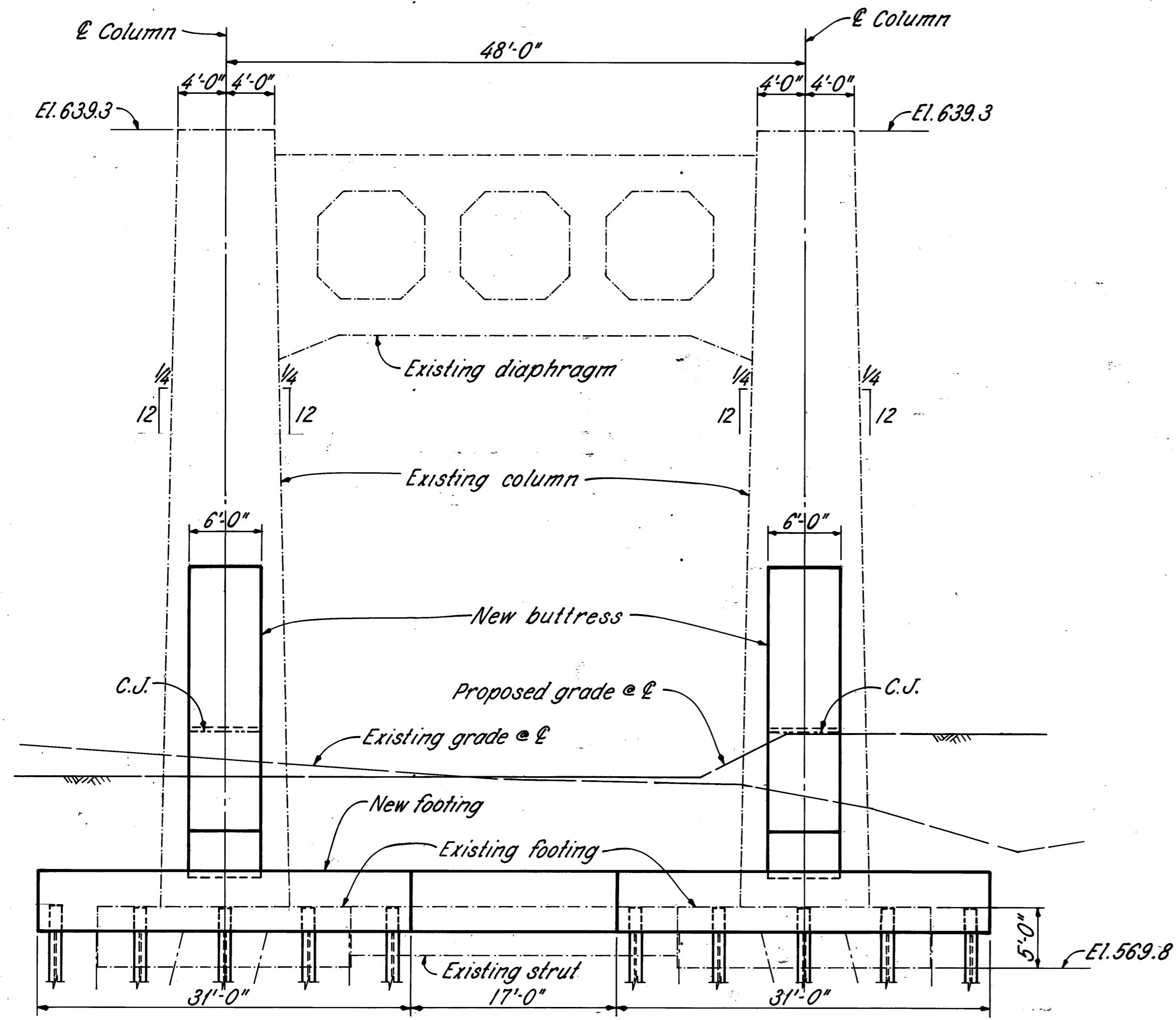
REL RICHLAND ENGINEERING LIMITED
 MANSFIELD, OHIO

SITE PLAN - 4
 SUBSTRUCTURE
 BRIDGE NO. LOR-611-0358
 OVER BLACK RIVER

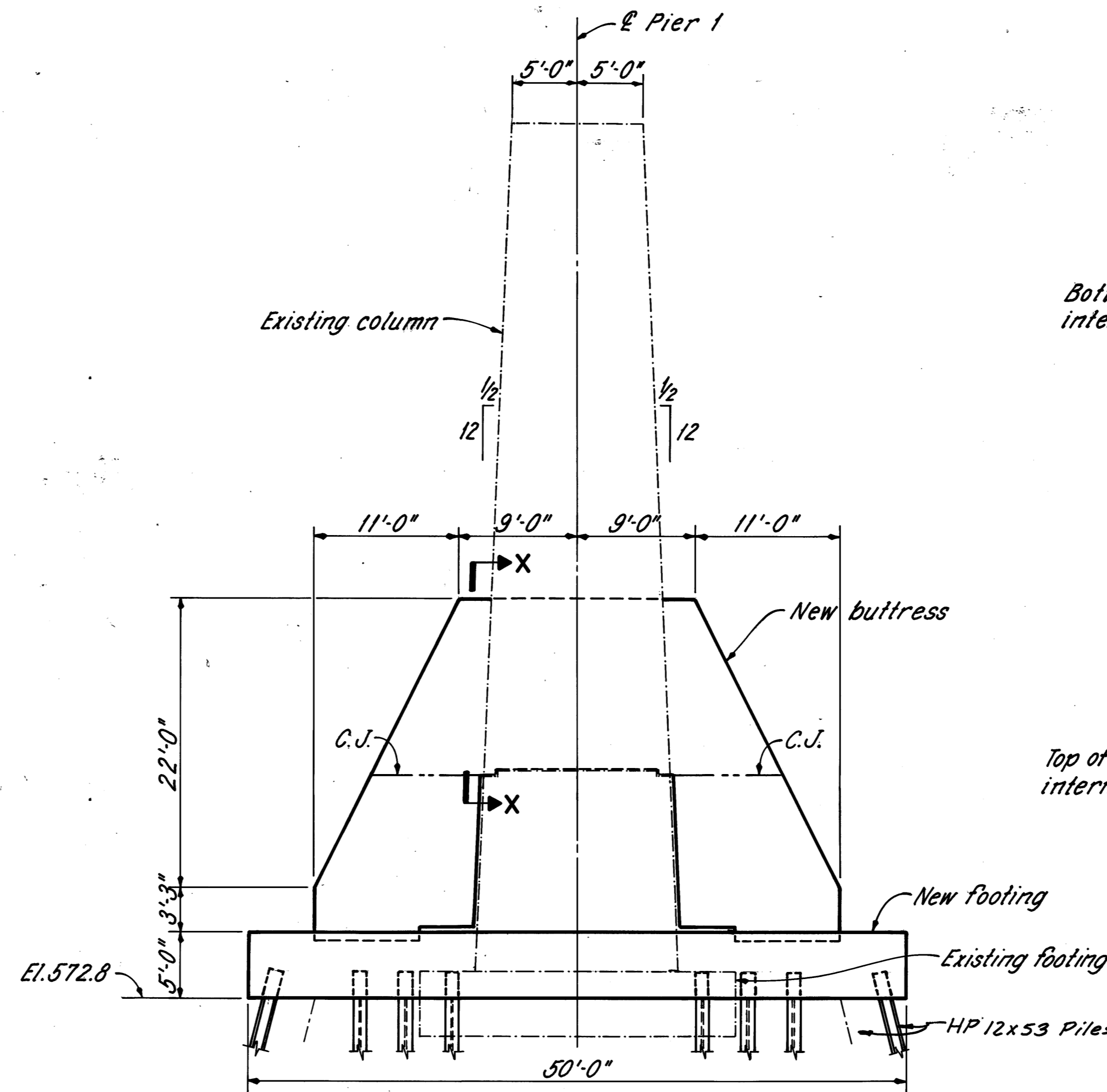
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	DAP	RHU	JCR	RDN	9/12/86	

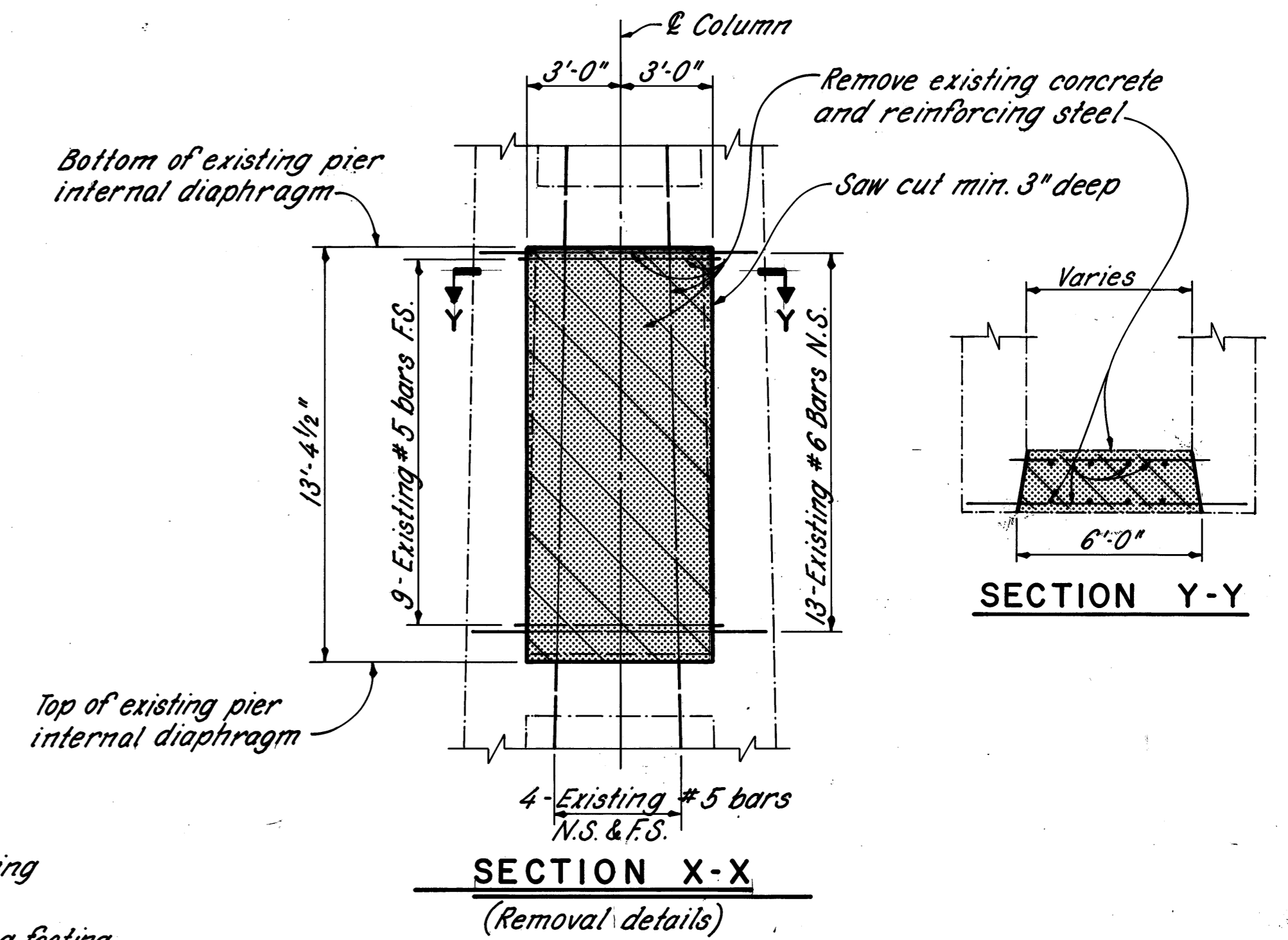
LORAIN COUNTY
LOR-611-3.53



ELEVATION

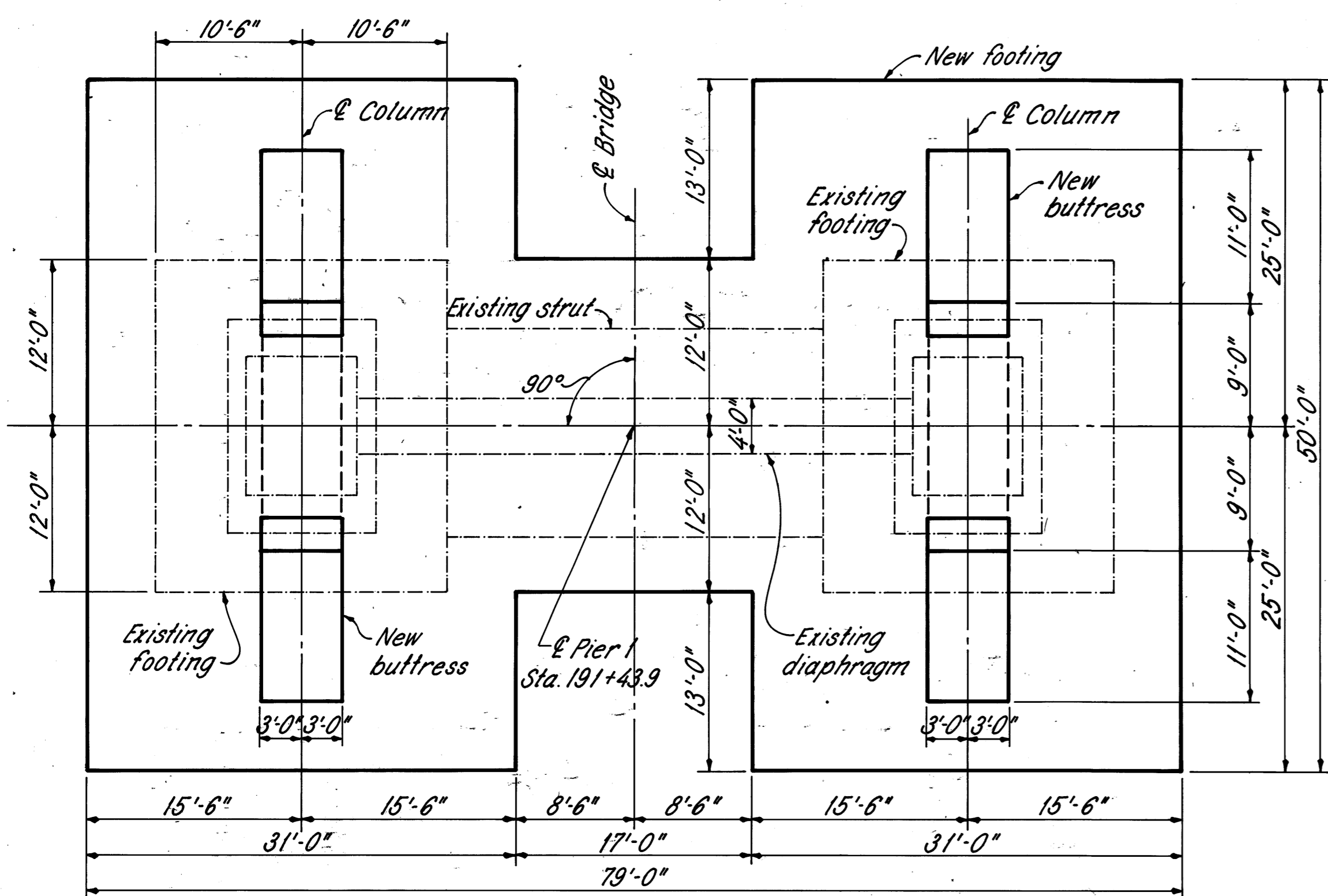


SIDE VIEW

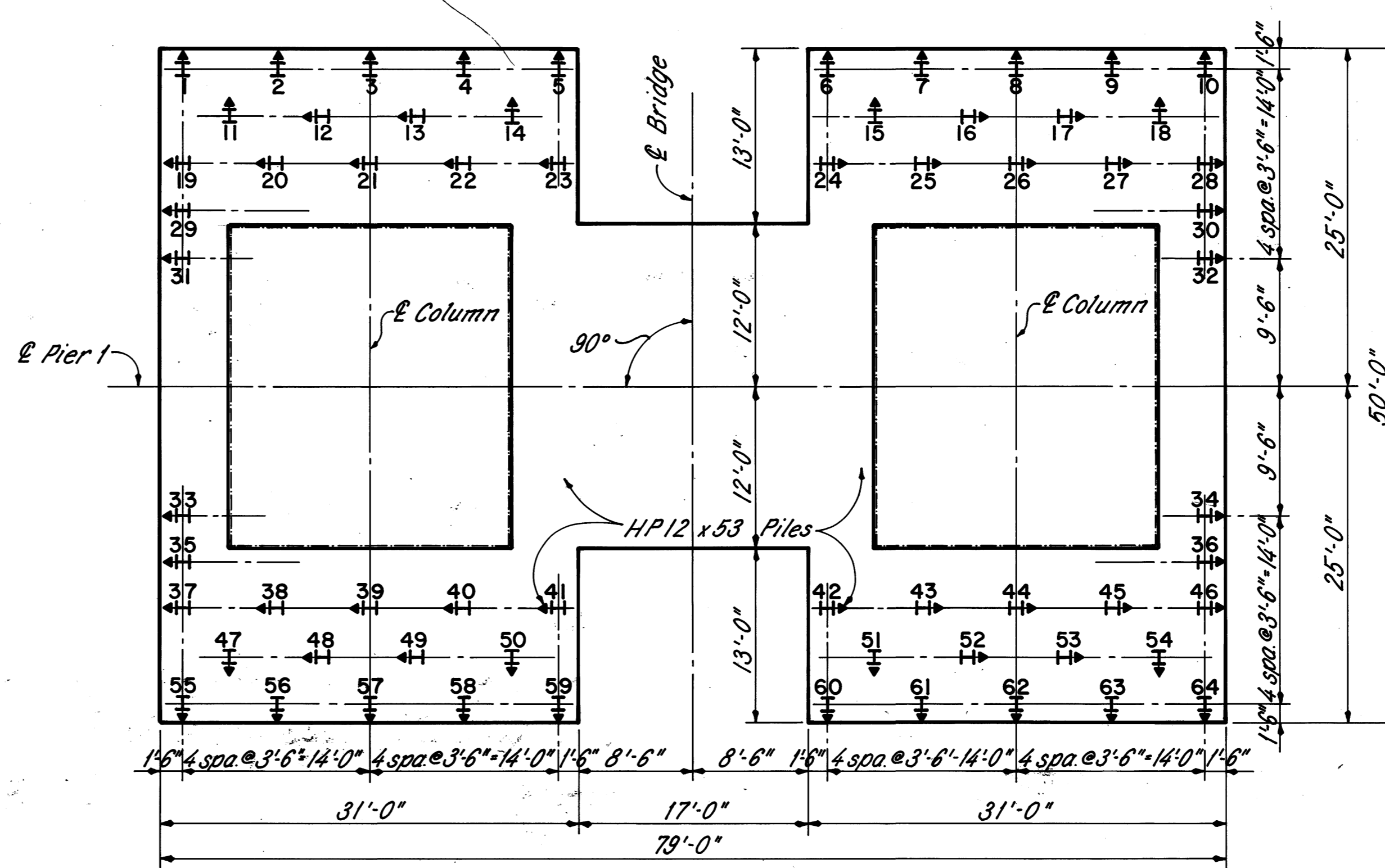


SECTION X-X
(Removal details)

Indicates concrete and reinforcing steel to be removed per Item 202. Portions of structure removed.
Note: Cut one column and construct new buttress tie before cutting second column at the same pier.



PLAN



PILE LOCATION PLAN

NOTES

FOOTING DETAILS: See sheet 23/28

BUTTRESS DETAILS: See sheet 24/28

STEEL BEARING PILES shall be HP12x53. All piles are battered 1:4 and extended 2'-0" into footing. Estimated average pay length = 55'.

N.S. & F.S. = Near Side & Far Side

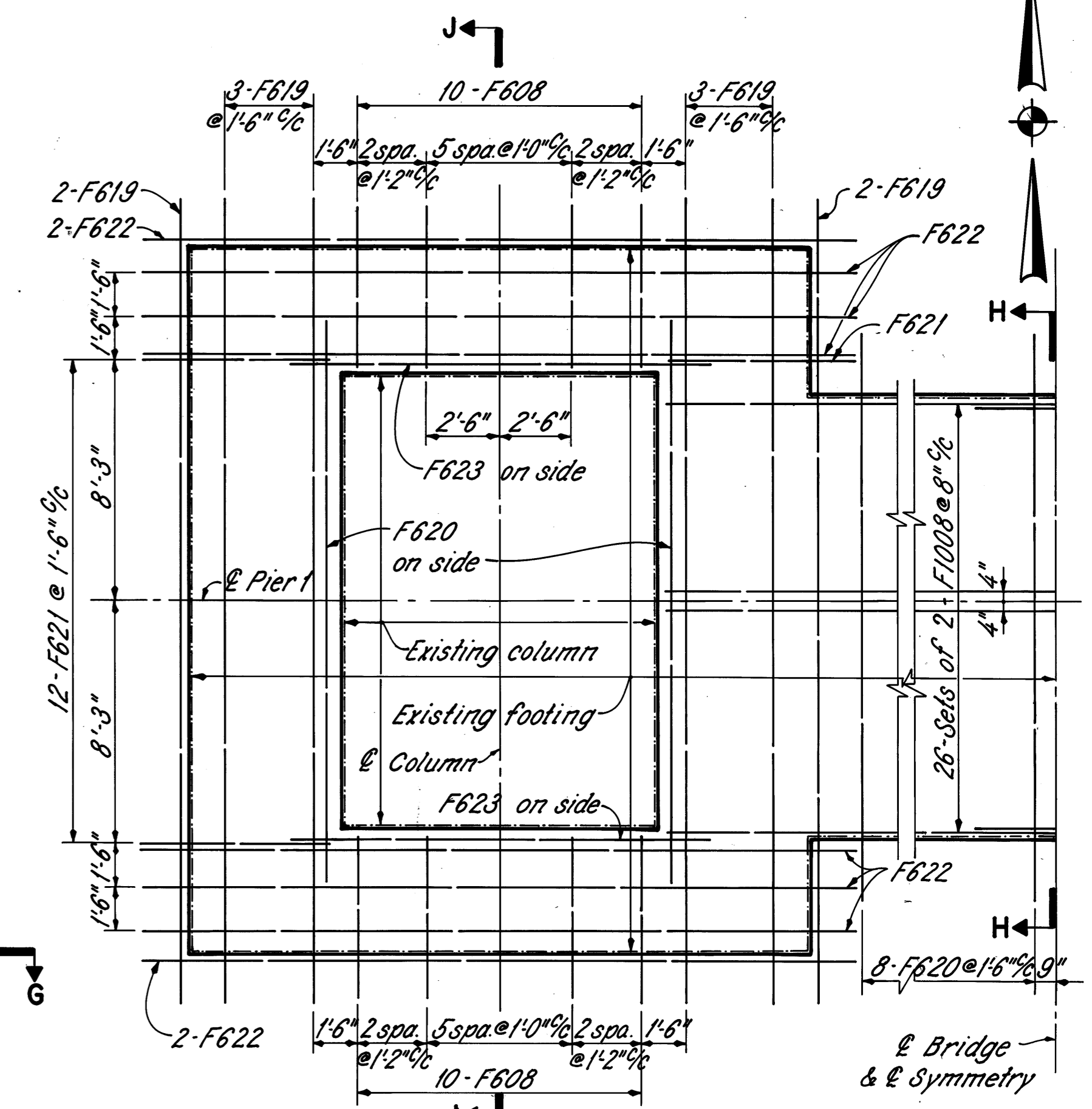
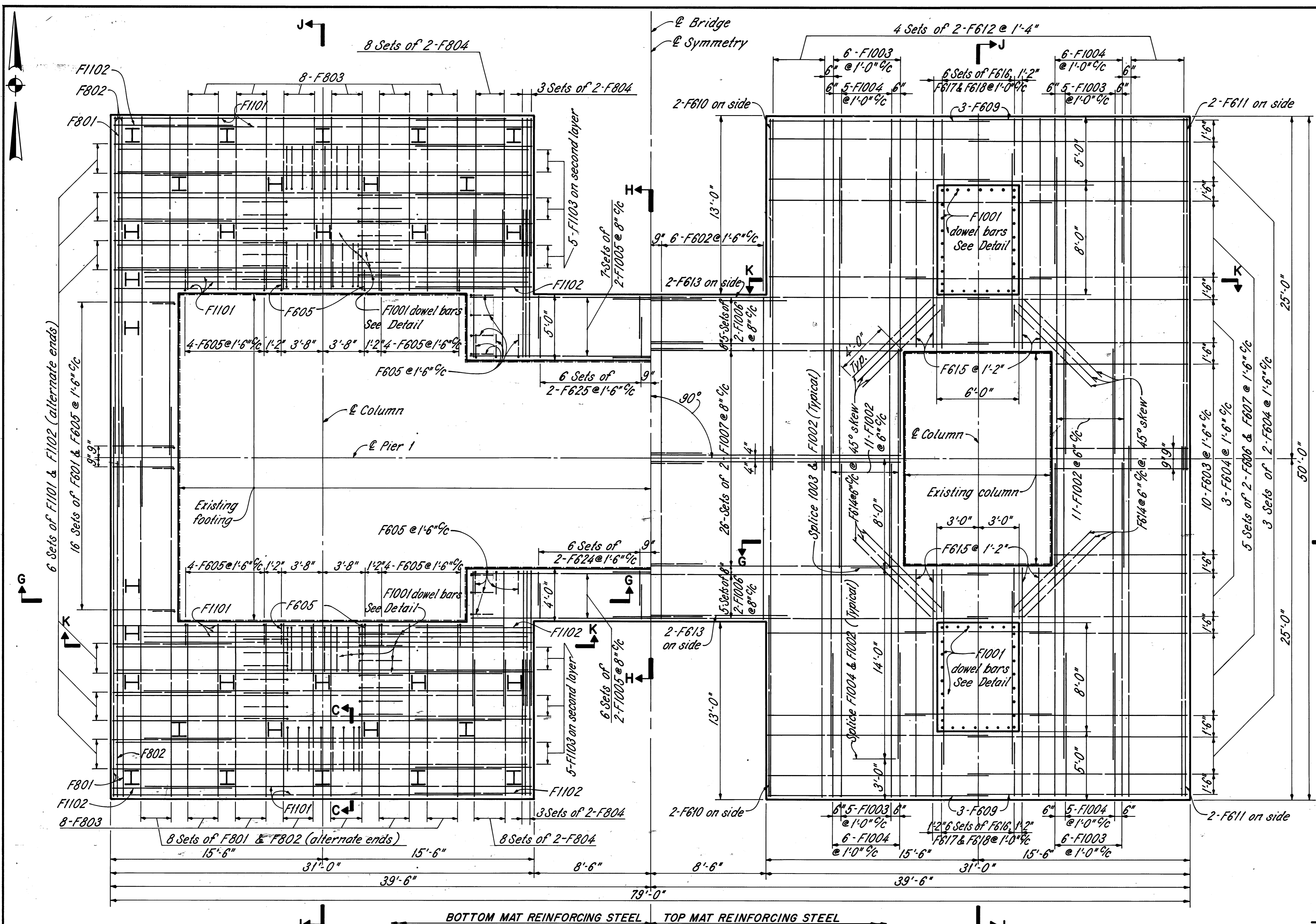
C.J. - Construction Joint

RE RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

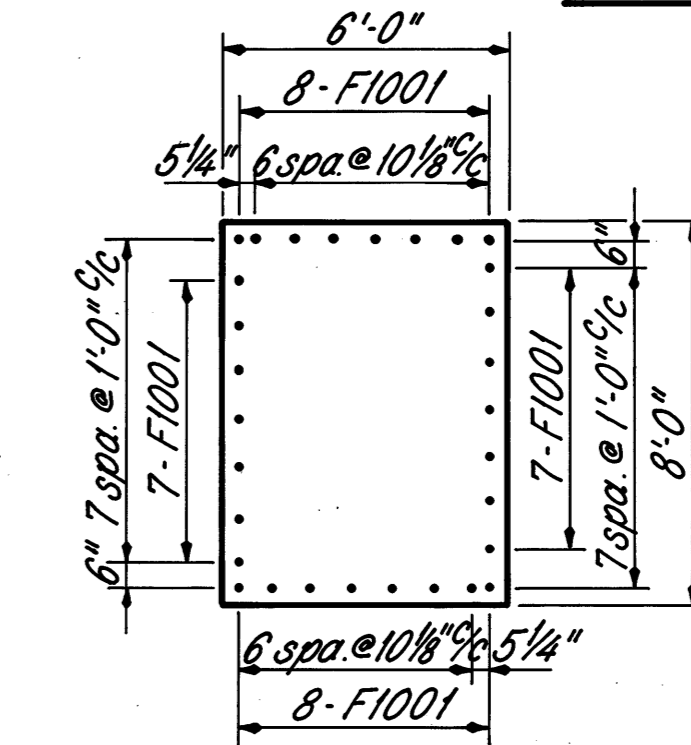
PIER 1
GENERAL LAYOUT & PILE LOCATION
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
BLN	TWH	TWH	DAP	RDN	9/12/86	

LORAIN COUNTY
LOR-611-3.5.3

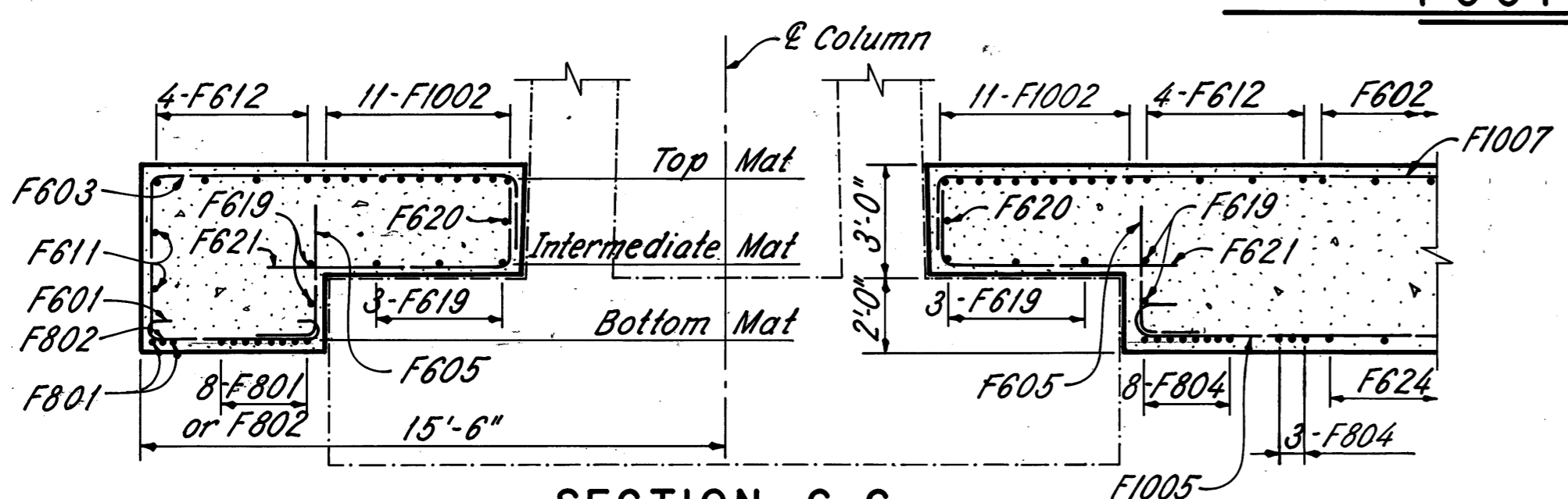


INTERMEDIATE MAT REINFORCING STEEL
FOOTING PLAN

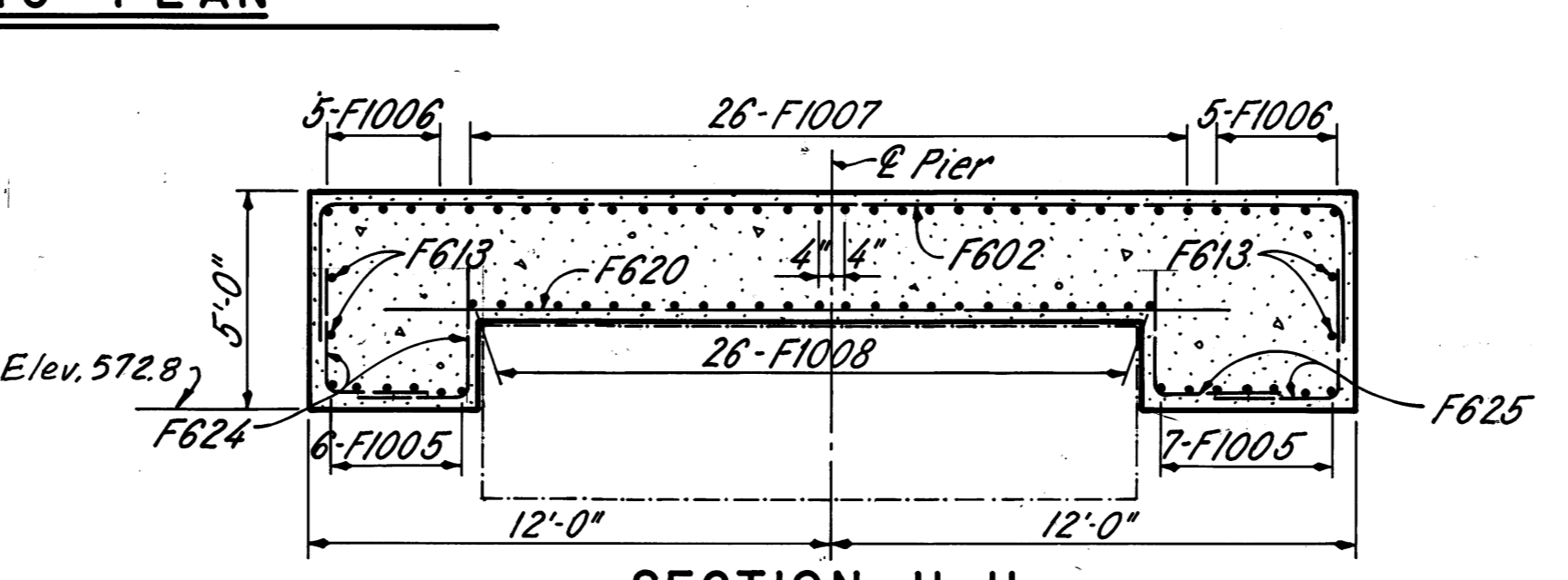


FIOOI DOWEL BAR PLACEMENT DETAIL

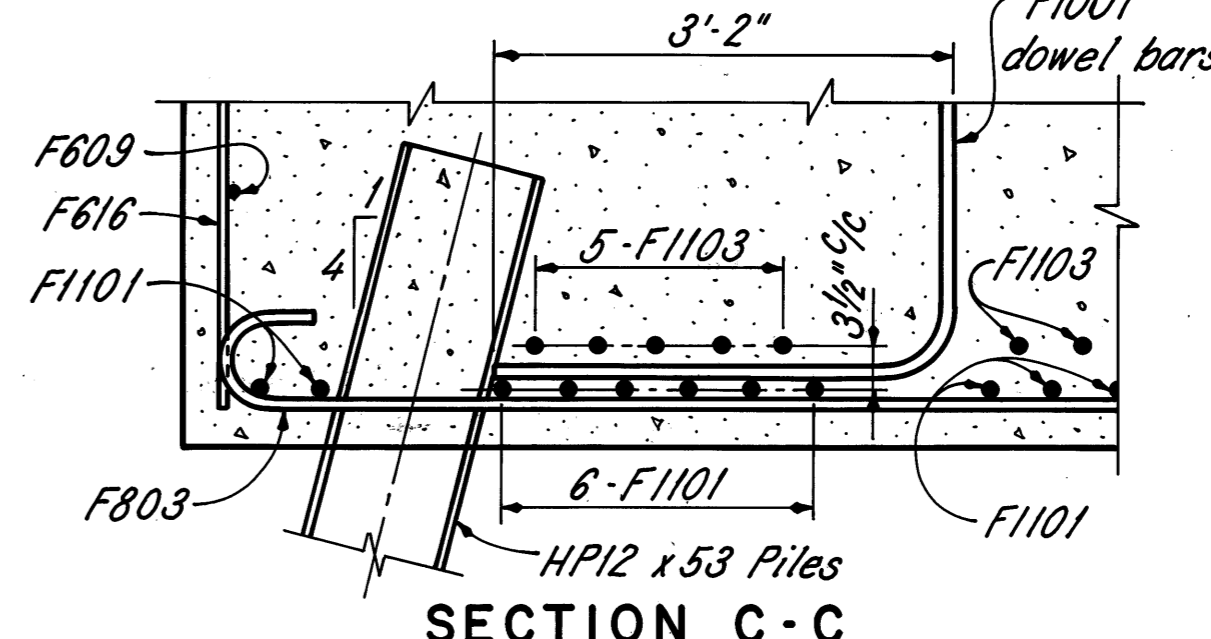
NOTES
SECTION J-J & K-K See sheet 24/28
REINFORCING STEEL SPLICE LENGTHS:
#6 bars = 1'-7", #8 bars = 3'-5",
#10 bars = 5'-6" bottom, #10 bars = 7'-8" top
& #11 bars = 6'-5"
REINFORCING STEEL CLEARANCE is 3" for the footing.
PIER GENERAL LAYOUT See sheet 22/28



SECTION G-G



SECTION H-H

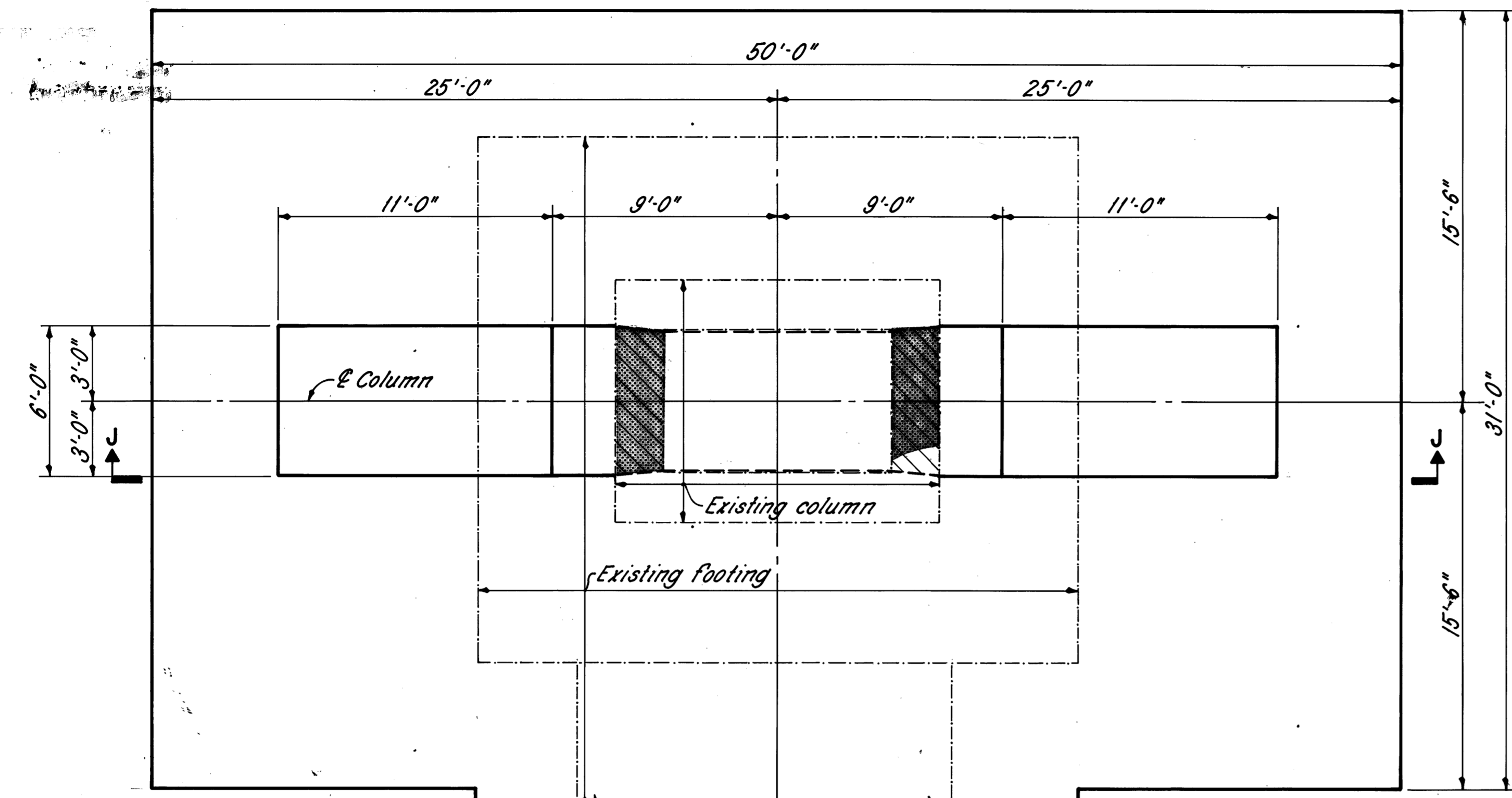


SECTION C-C
BOTTOM MAT REINFORCING PLACEMENT

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

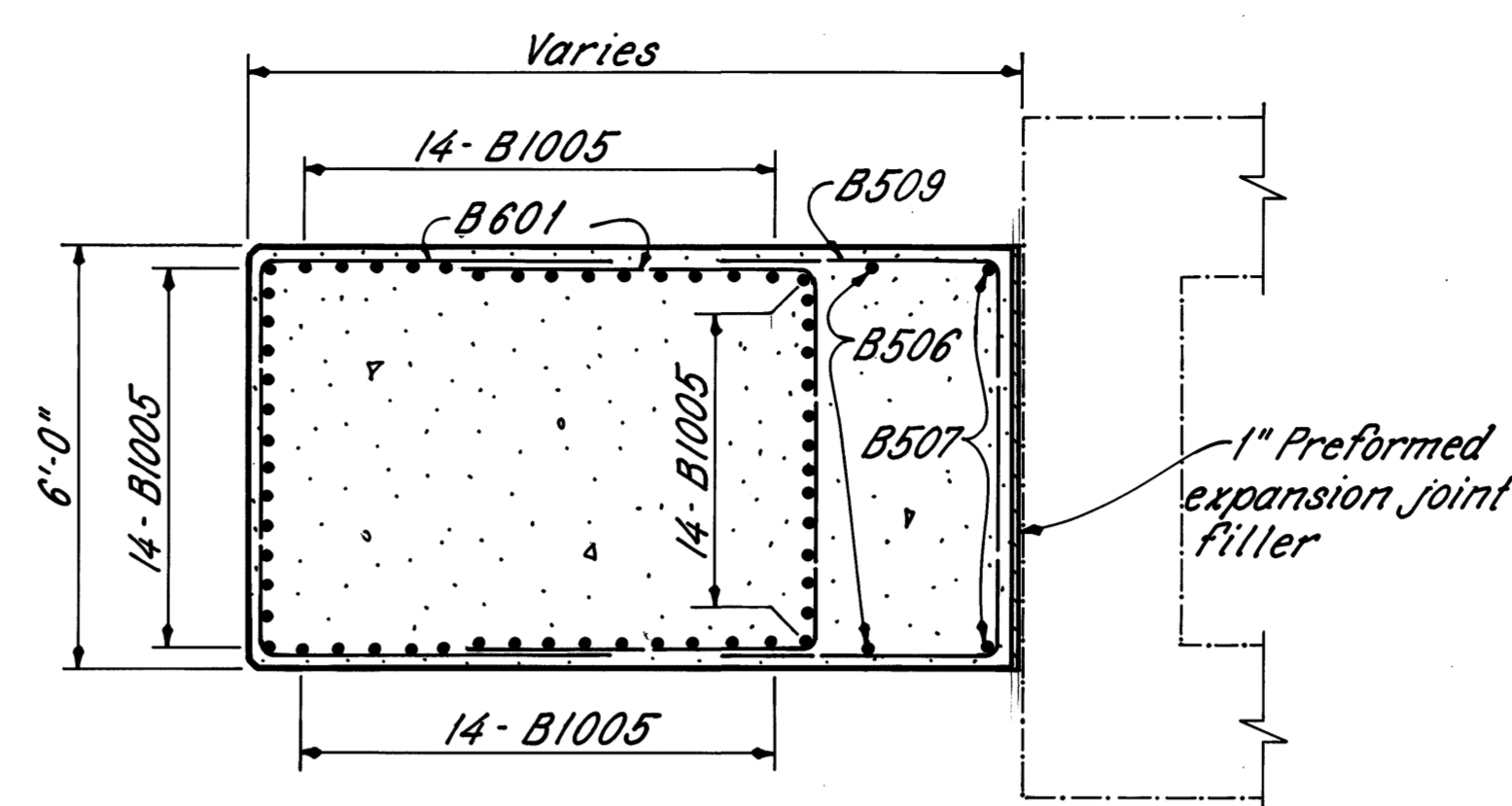
PIER 1
FOOTING DETAILS
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
BLN	TWH	TWH	DAP	RDN	9/12/86	

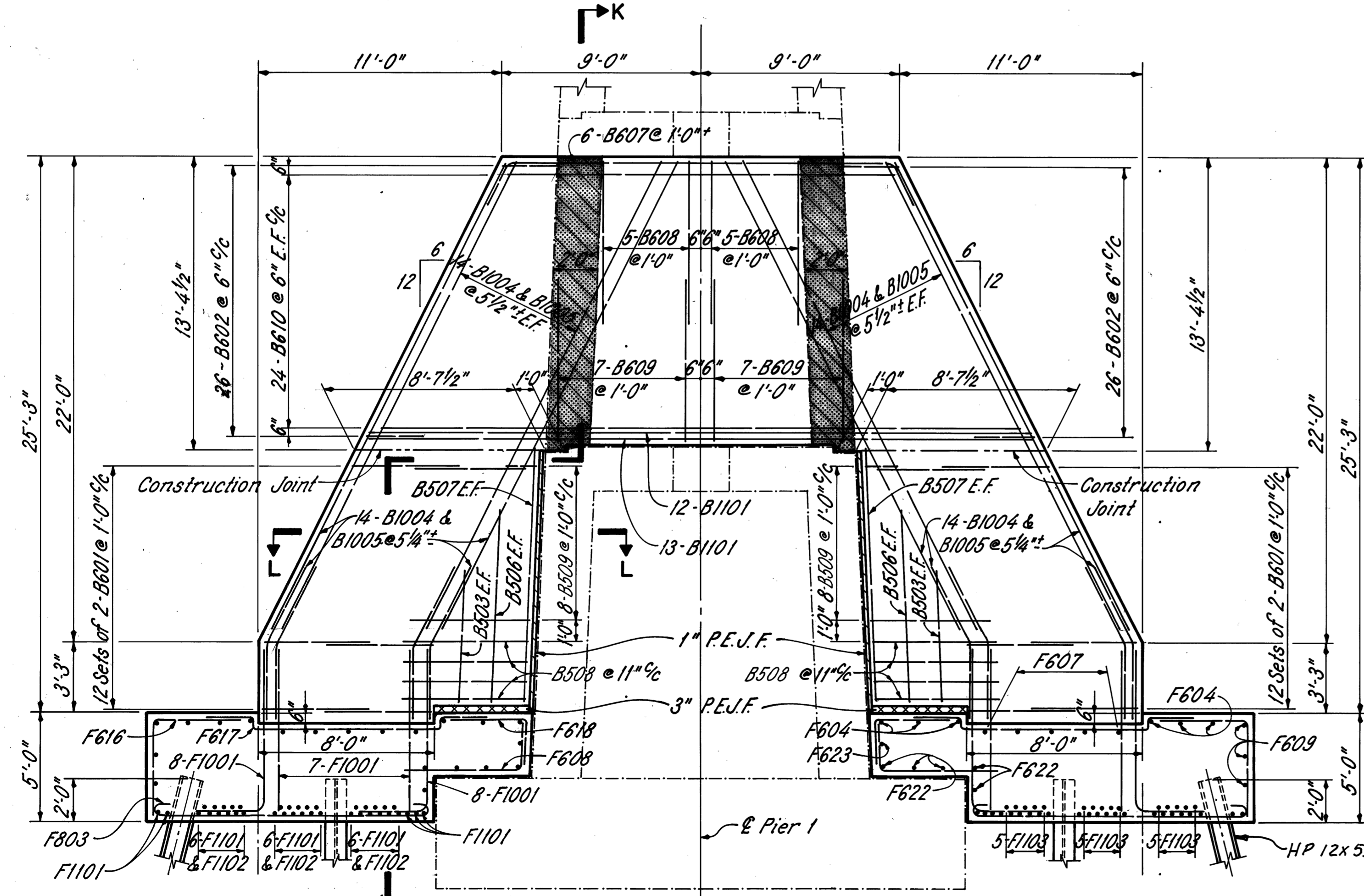


PLAN

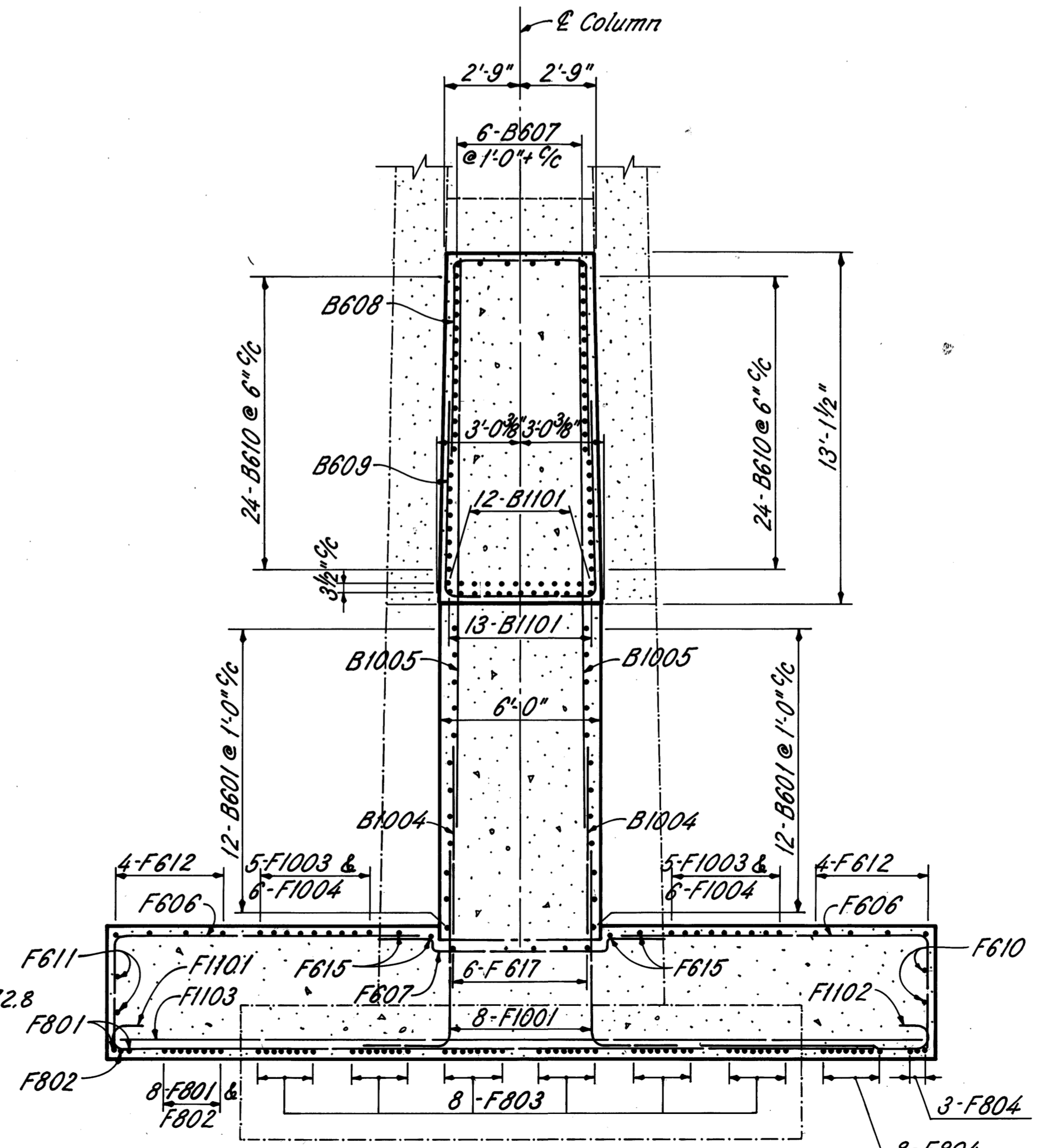
█ - Indicates concrete and reinforcing steel to be removed per Item 202. Portions of structure removed.



SECTION L-L



SECTION J-J



SECTION K-K

NOTES

REINFORCING STEEL SPLICE LENGTHS:
 * 5 bars = 1'-4"
 * 6 bars = 2'-0" &
 * 10 bars = 3'-2"

REINFORCING STEEL CLEARANCE is 2" for the buttress.

NOTATION: E.F. - Each Face

PE.J.F. - Preformed Expansion Joint Filler

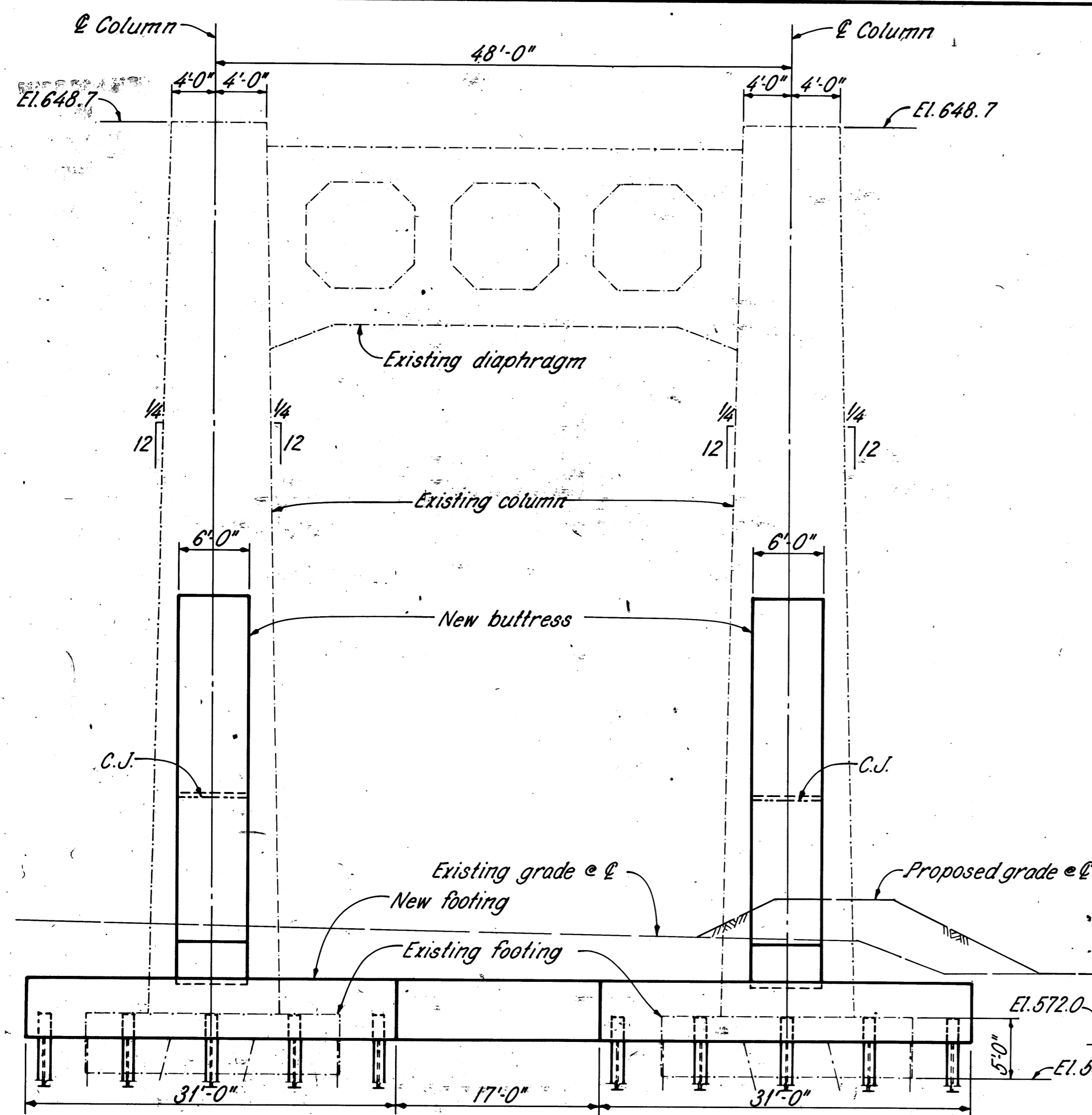
PIER GENERAL LAYOUT See sheet 22/28

REL RICHLAND ENGINEERING LIMITED
 MANSFIELD, OHIO

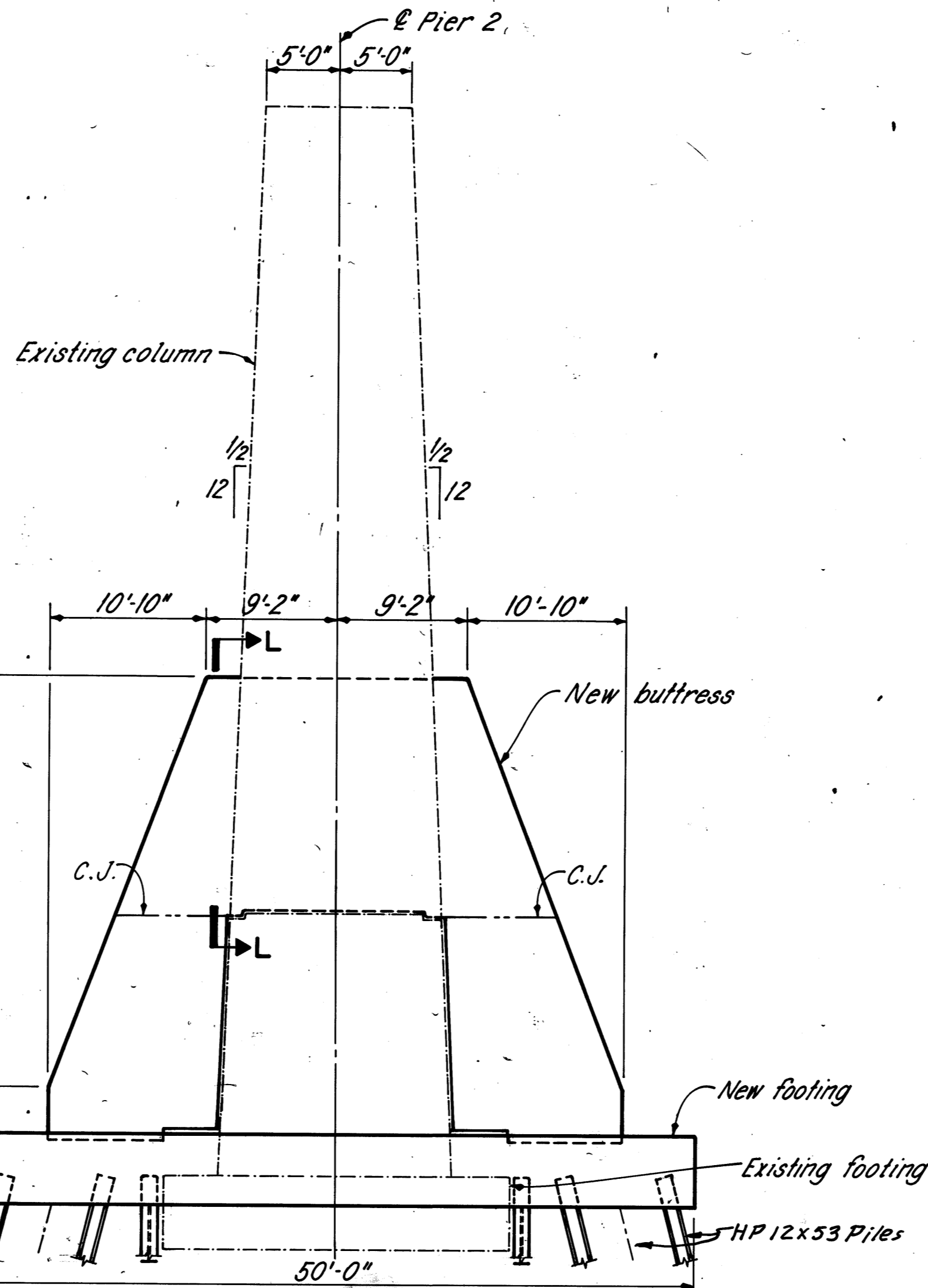
PIER 1
 BUTTRESS DETAILS
 SUBSTRUCTURE
 BRIDGE NO. LOR-611-0358
 OVER BLACK RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
BLN	TWH	TWH	DAP	RDN	9/12/86	

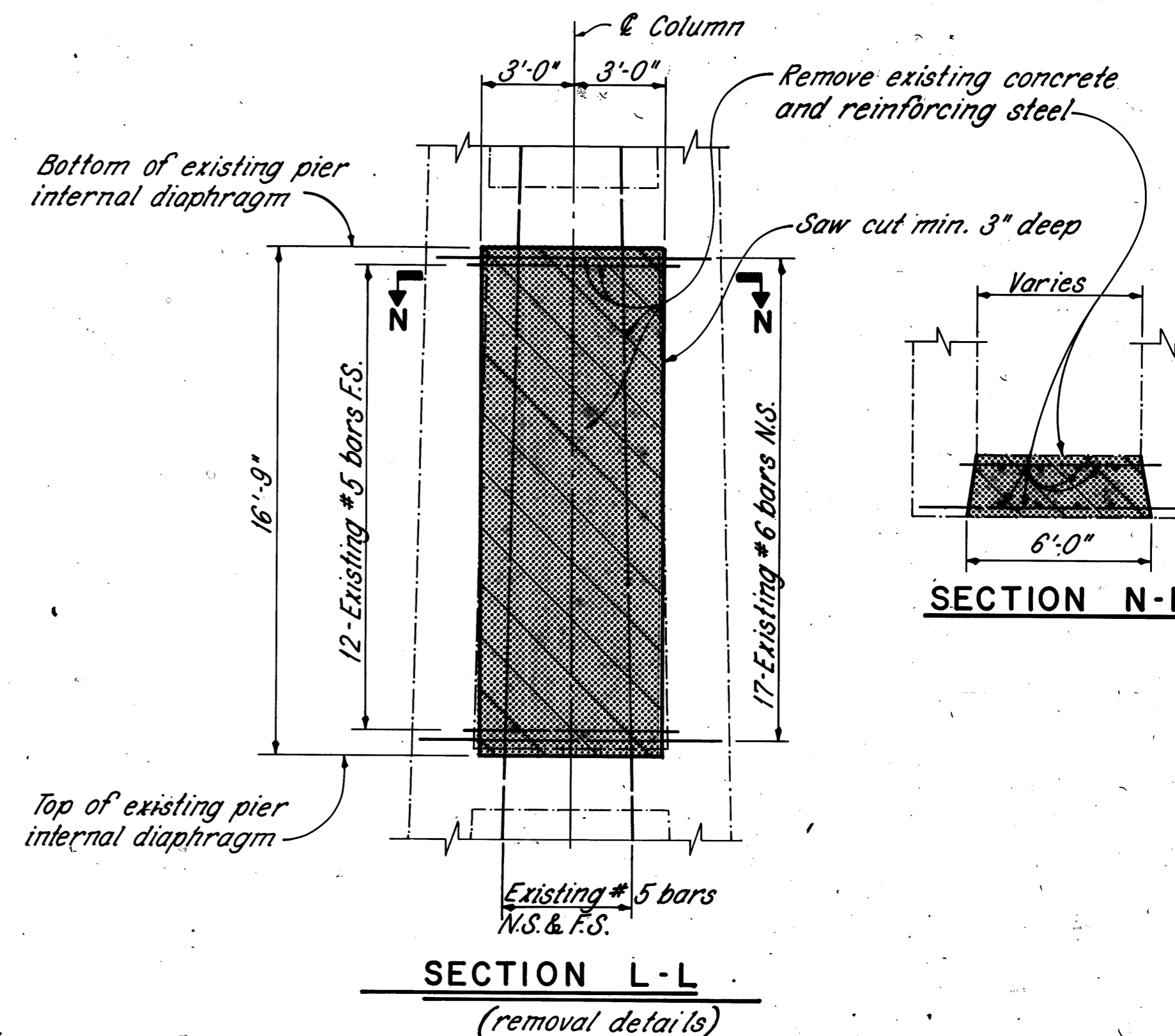
LORAIN COUNTY
LOR-611-3.53



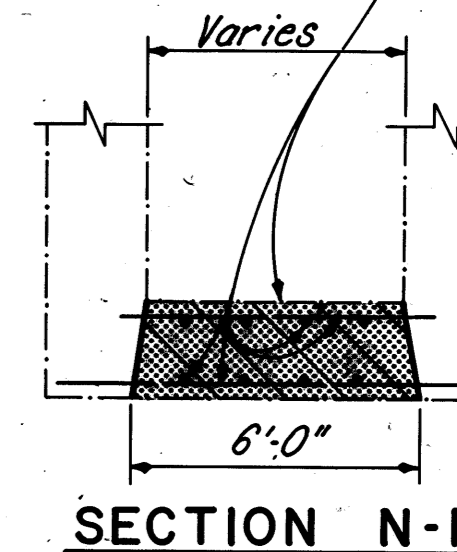
ELEVATION



SIDE VIEW



SECTION L-L
(removal details)



SECTION N-N

Indicates concrete and reinforcing steel to be removed per Item 202. Portions of structure removed.
Note: Cut one column and construct new buttress tie before cutting second column at the same pier.

NOTES

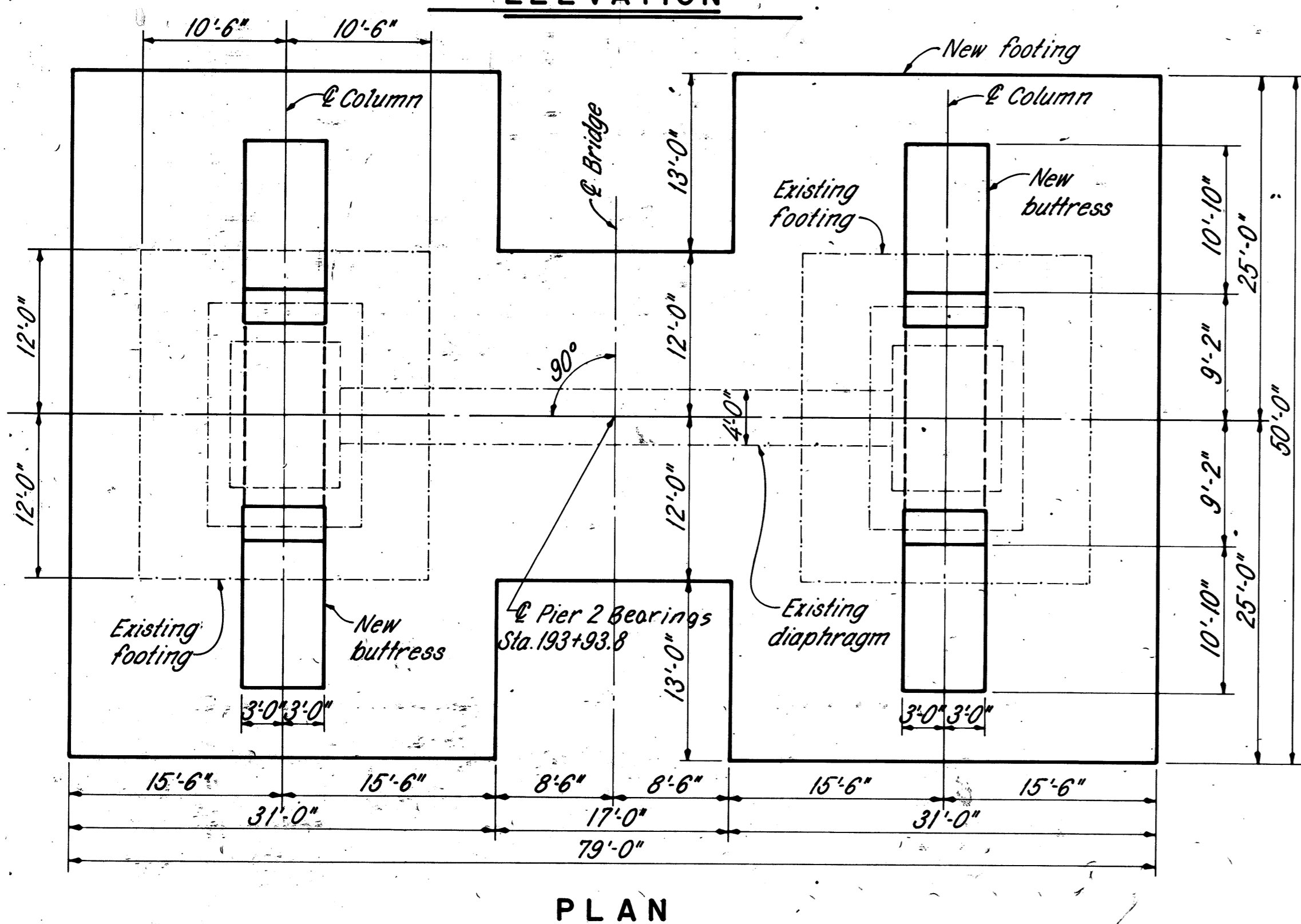
FOOTING DETAILS: See sheet 28/28

BUTTRESS DETAILS: See sheet 27/28

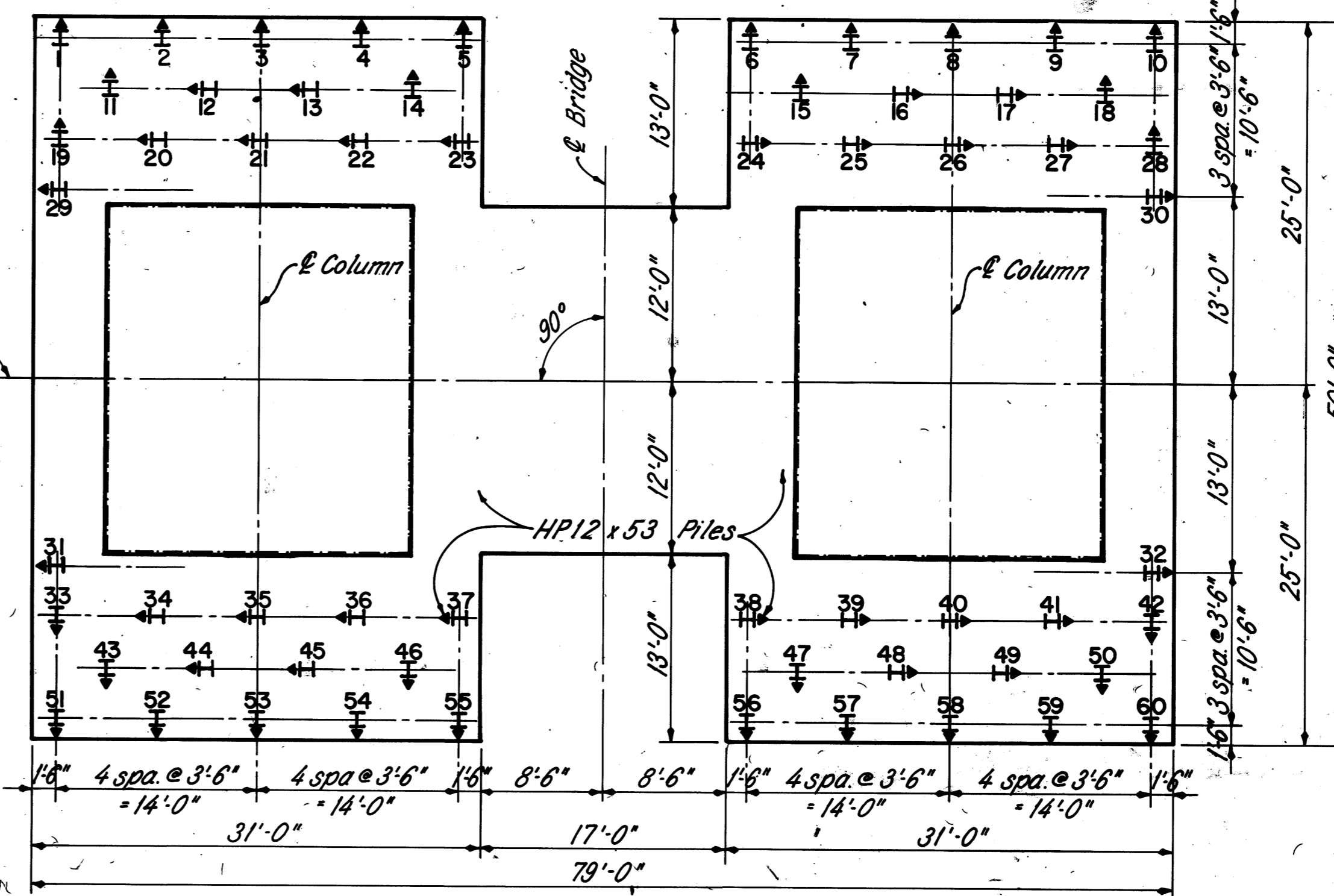
STEEL BEARING PILES shall be HP12 x 53. All piles are battered 1:4 and extended 2'-0" into footing. Estimated average pay length = 55'.

N.S. & F.S. = Near Side & Far Side

C.J. - Construction Joint



PLAN



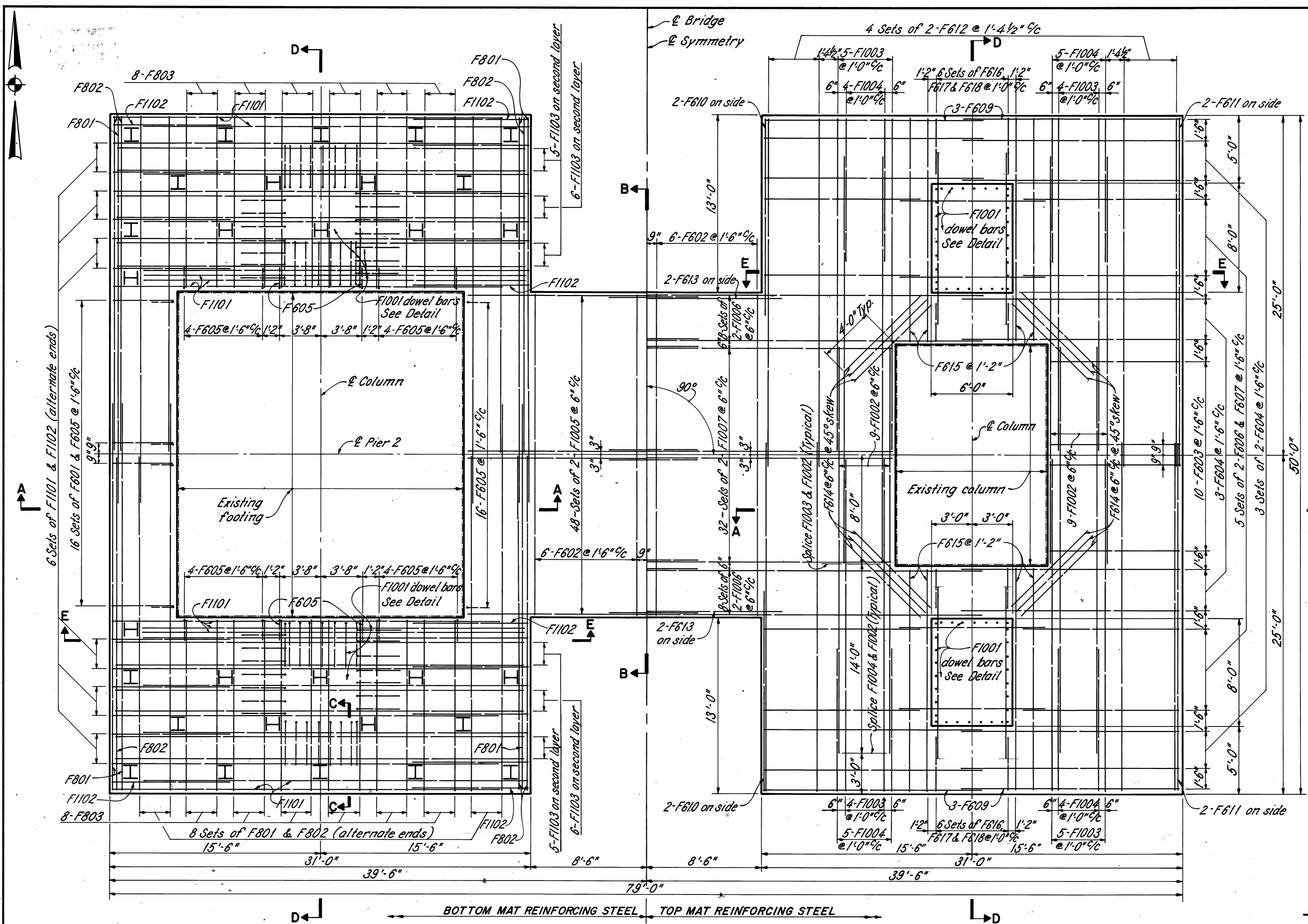
PILE LOCATION PLAN

REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

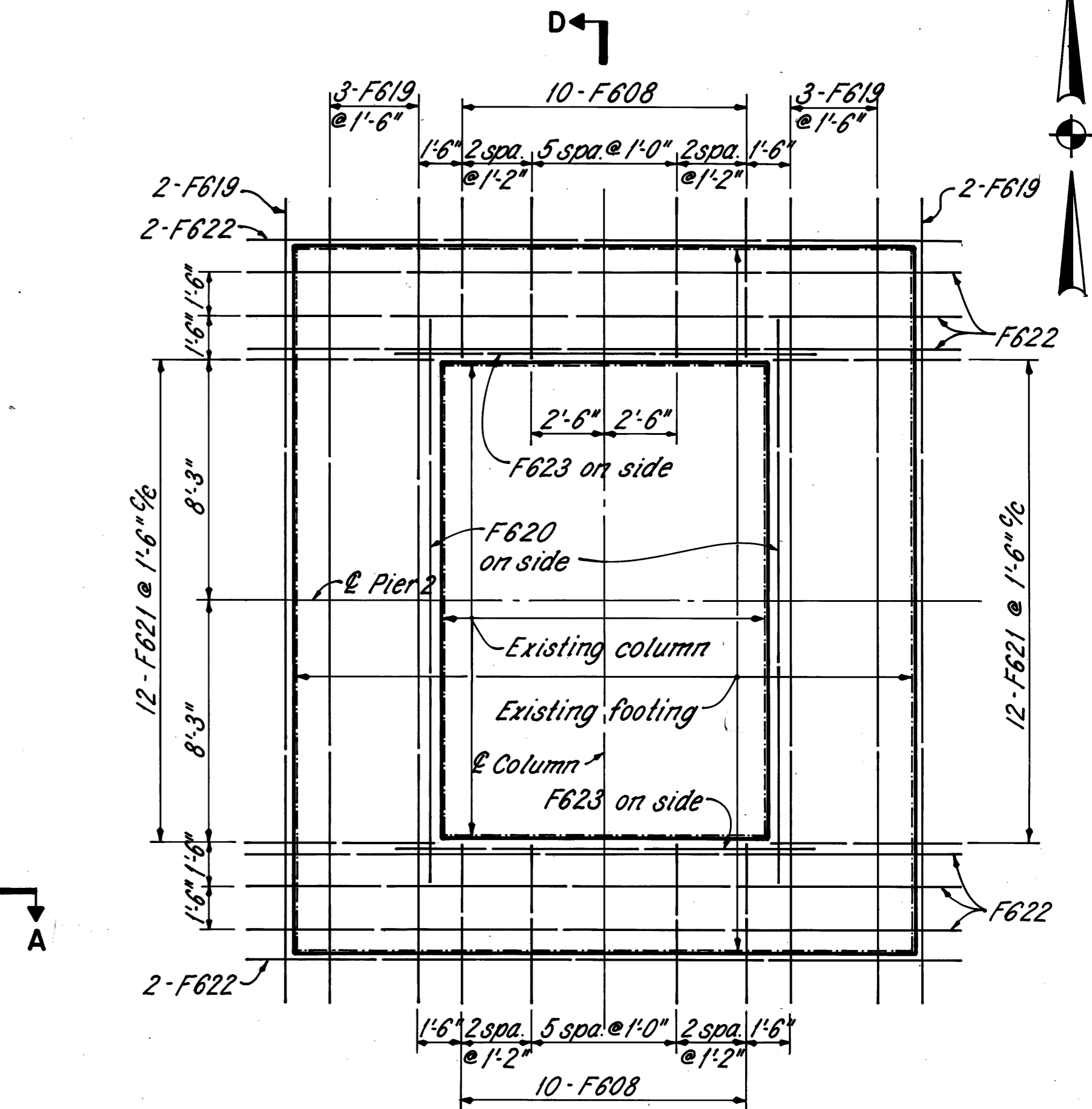
PIER 2
GENERAL LAYOUT & PILE LOCATION
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	BLN	RDN	9/12/86	

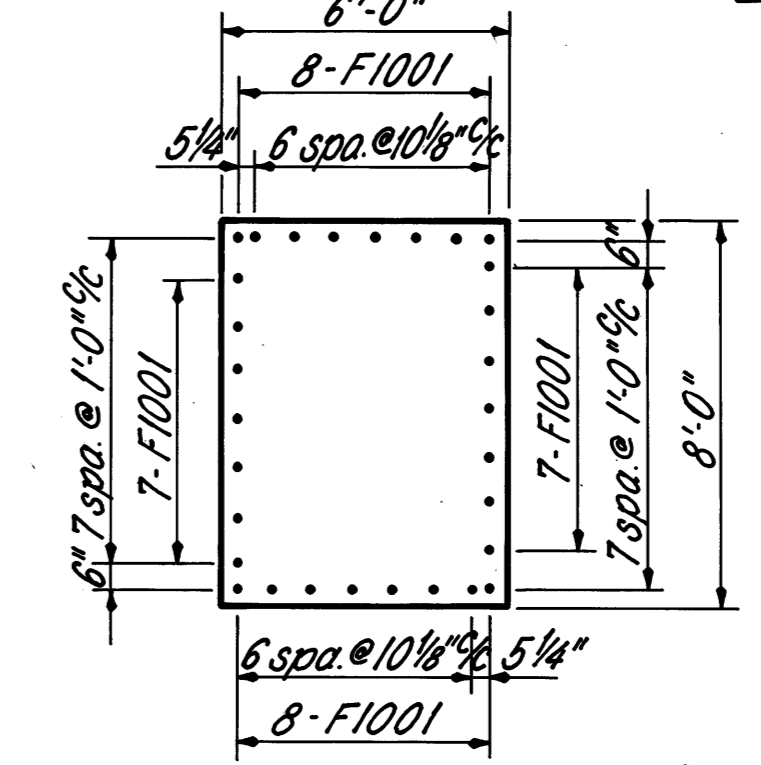
LORAIN COUNTY
LOR-611-3.5.3



FOOTING PLAN

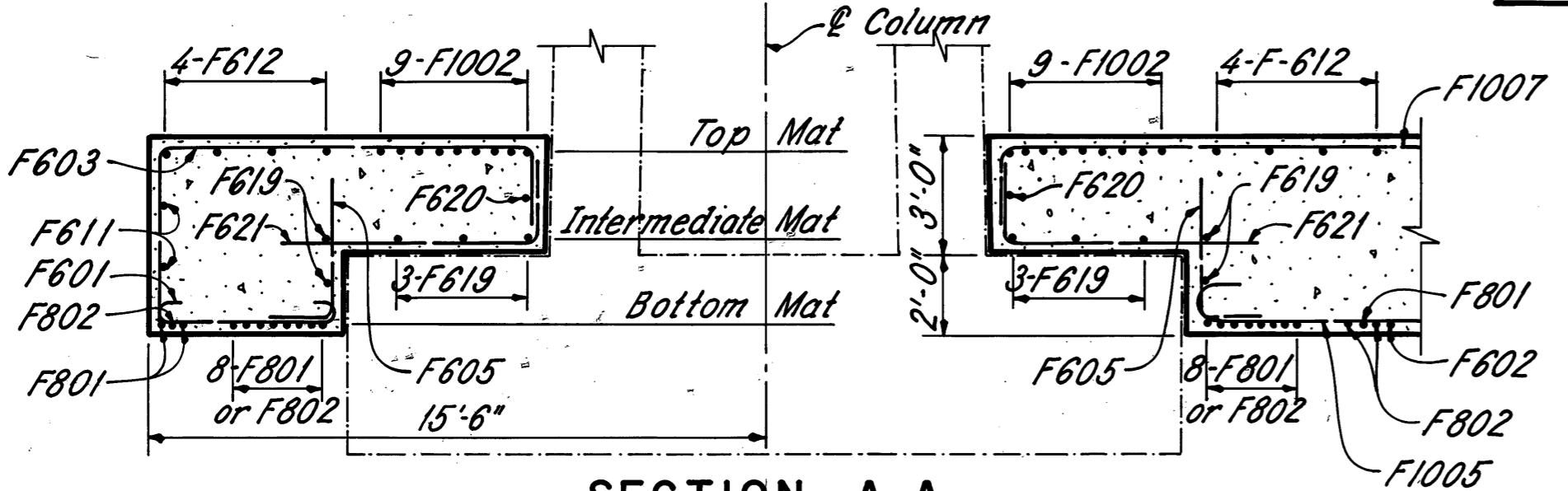


INTERMEDIATE MAT REINFORCING STEEL
FOOTING PLAN

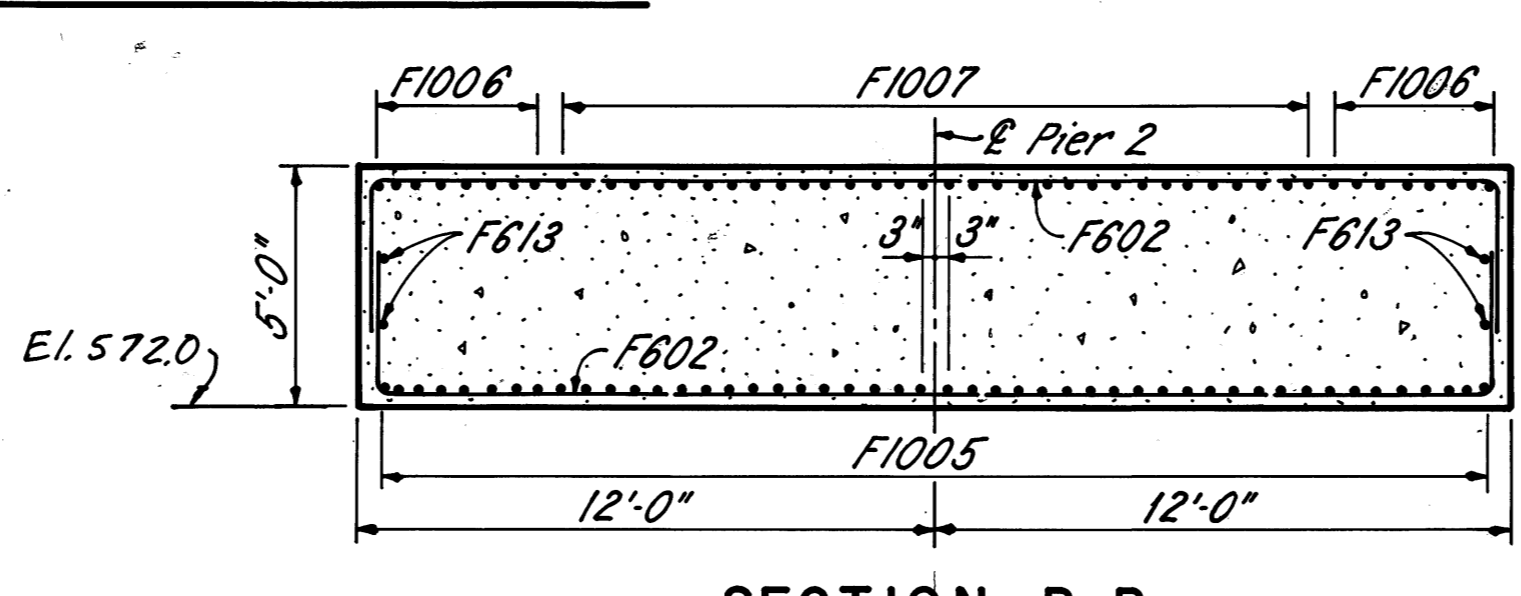


F1001 DOWEL BAR
PLACEMENT DETAIL

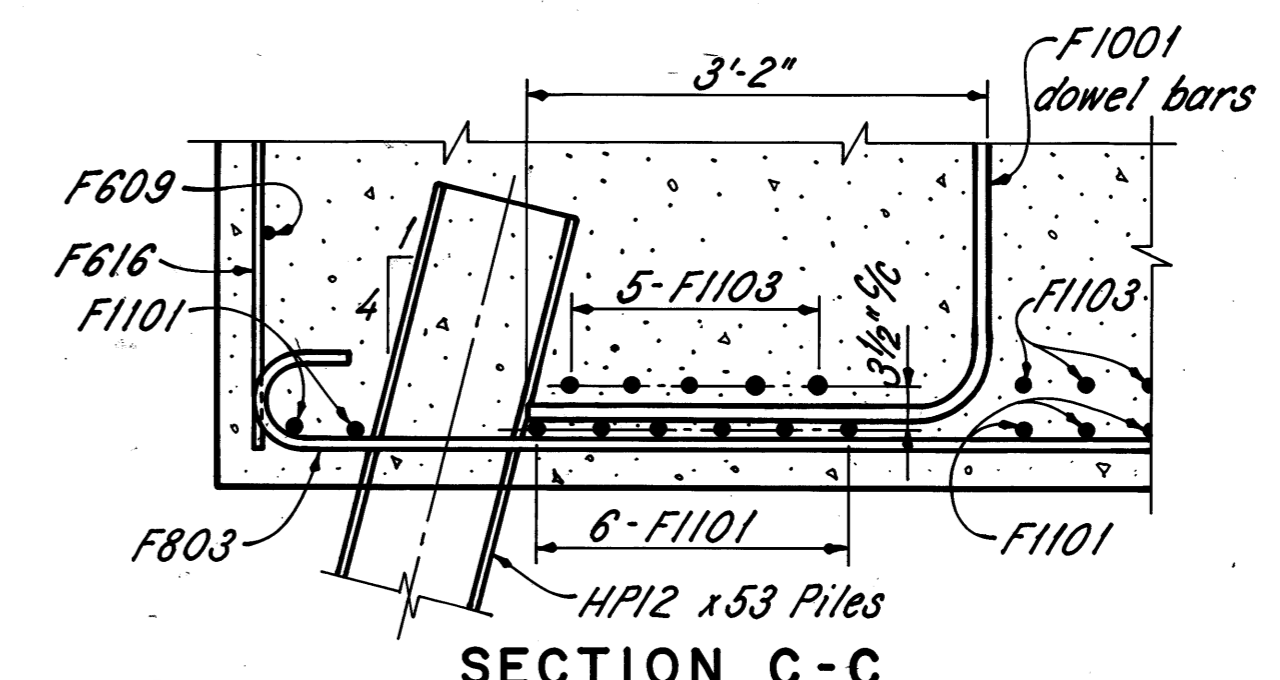
- NOTES**
- SECTION D-D & E-E See sheet 27/28
 - REINFORCING STEEL SPLICE LENGTHS:
#6 bars = 1'-7", #8 bars = 3'-5",
#10 bars = 5'-6" bottom, #10 bars = 7'-8" top
& #11 bars = 6'-5"
 - REINFORCING STEEL CLEARANCE is 3" for the footing
 - PIER GENERAL LAYOUT See sheet 25/28



SECTION A-A



SECTION B-B



SECTION C-C
BOTTOM MAT REINFORCING PLACEMENT

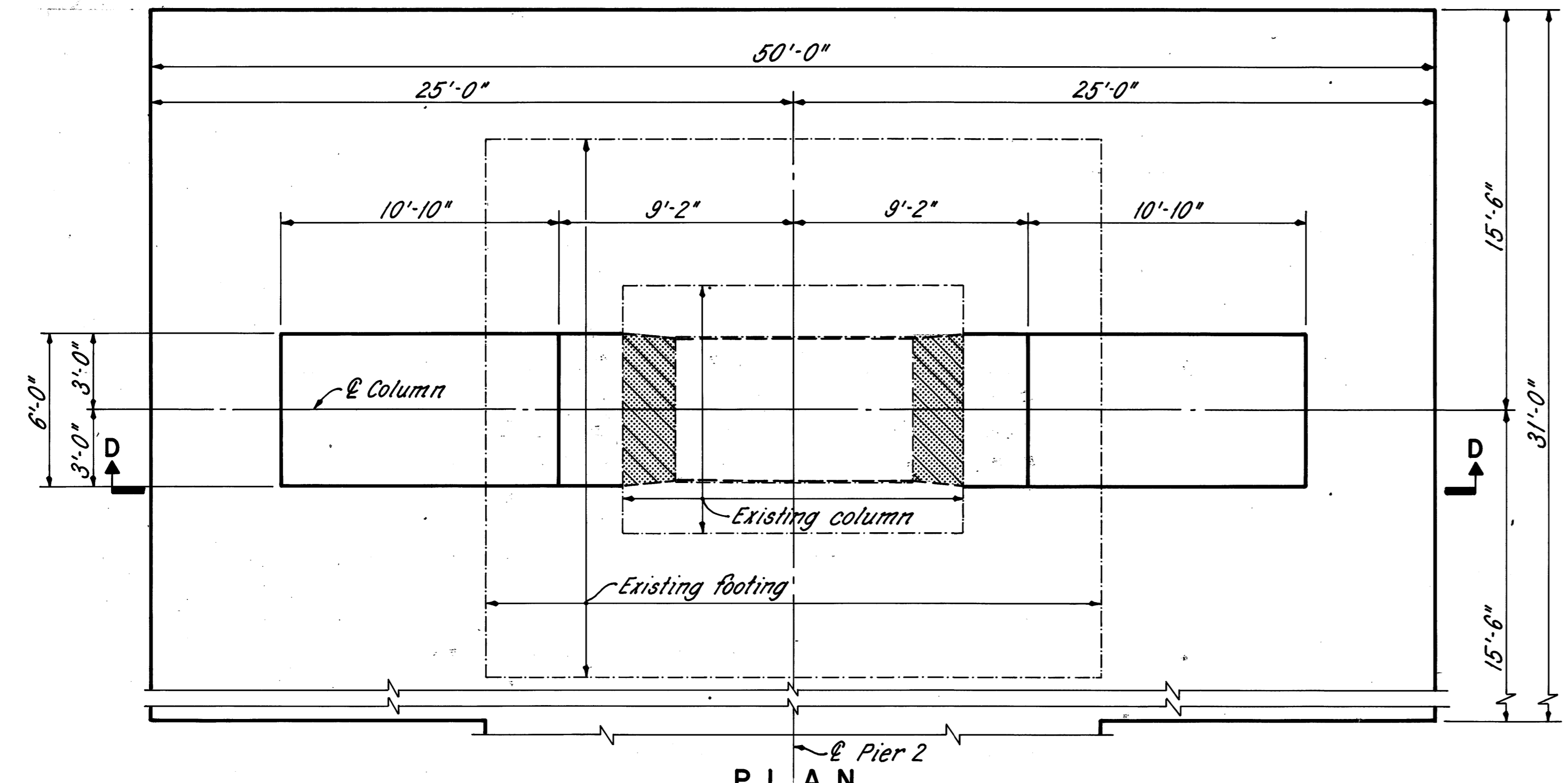
REL RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

**PIER 2
FOOTING DETAILS**
SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

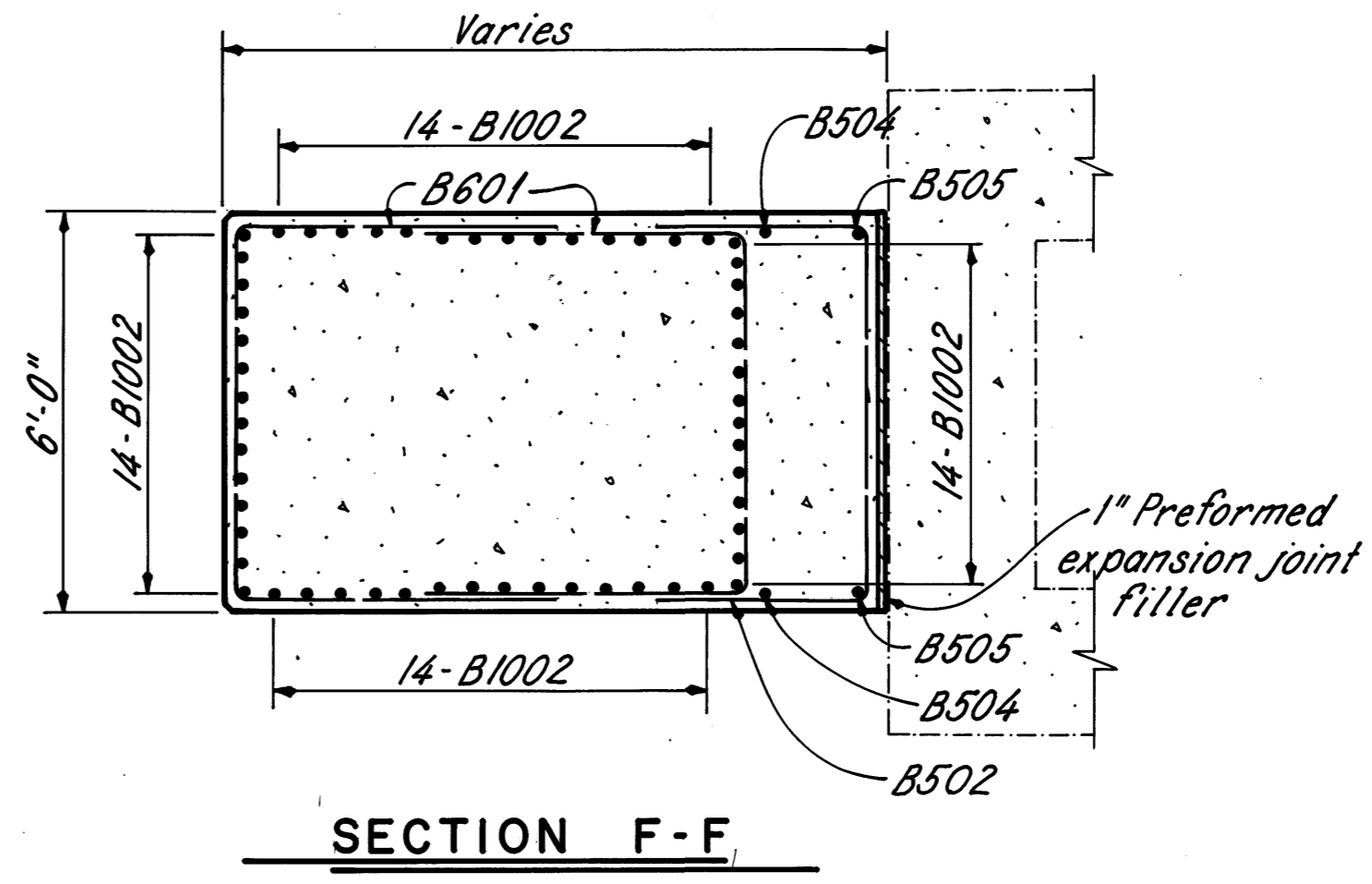
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	BLN	RDN	9/12/86	

LORAIN COUNTY S.R. 611

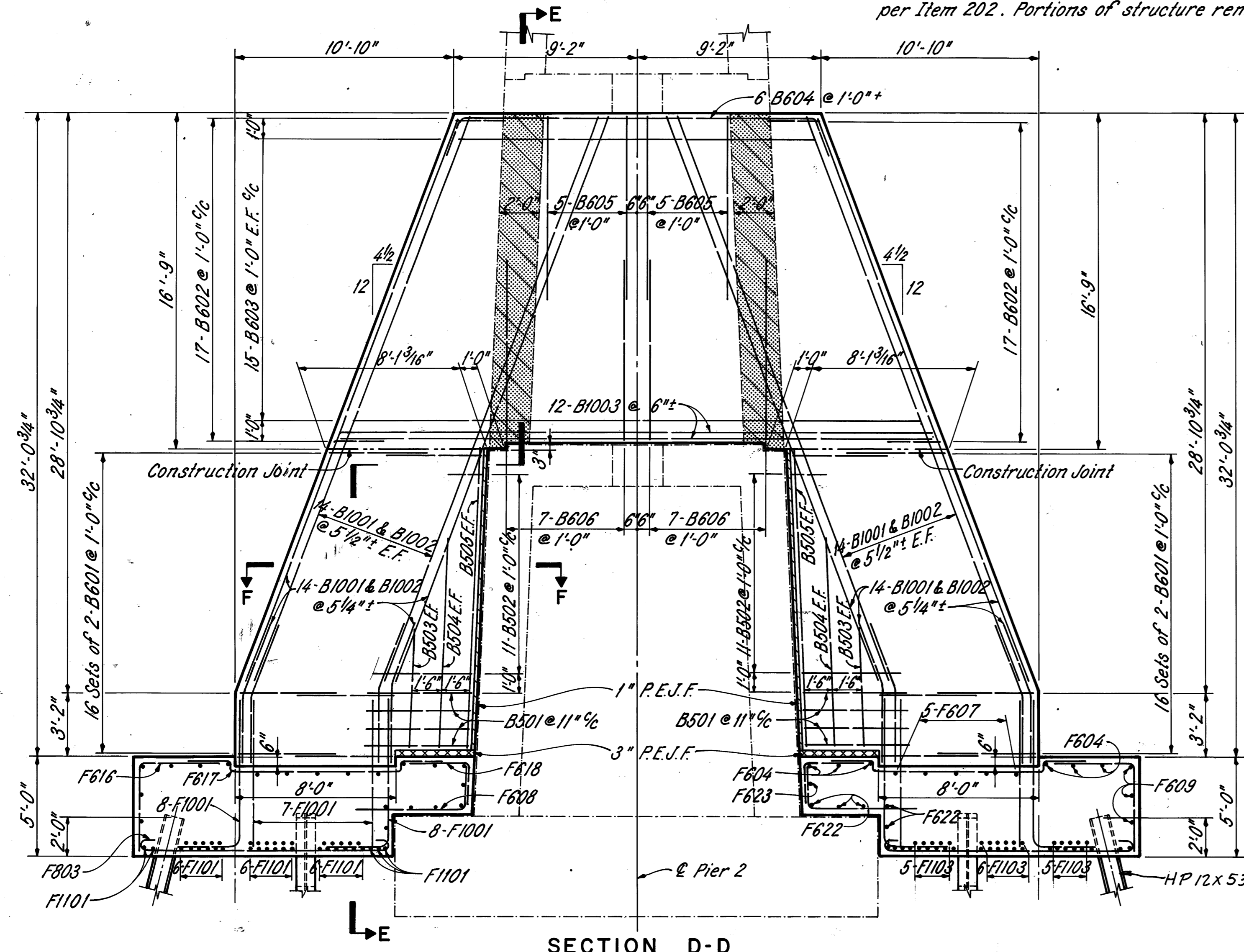
LORAIN COUNTY
LOR-611-3.53



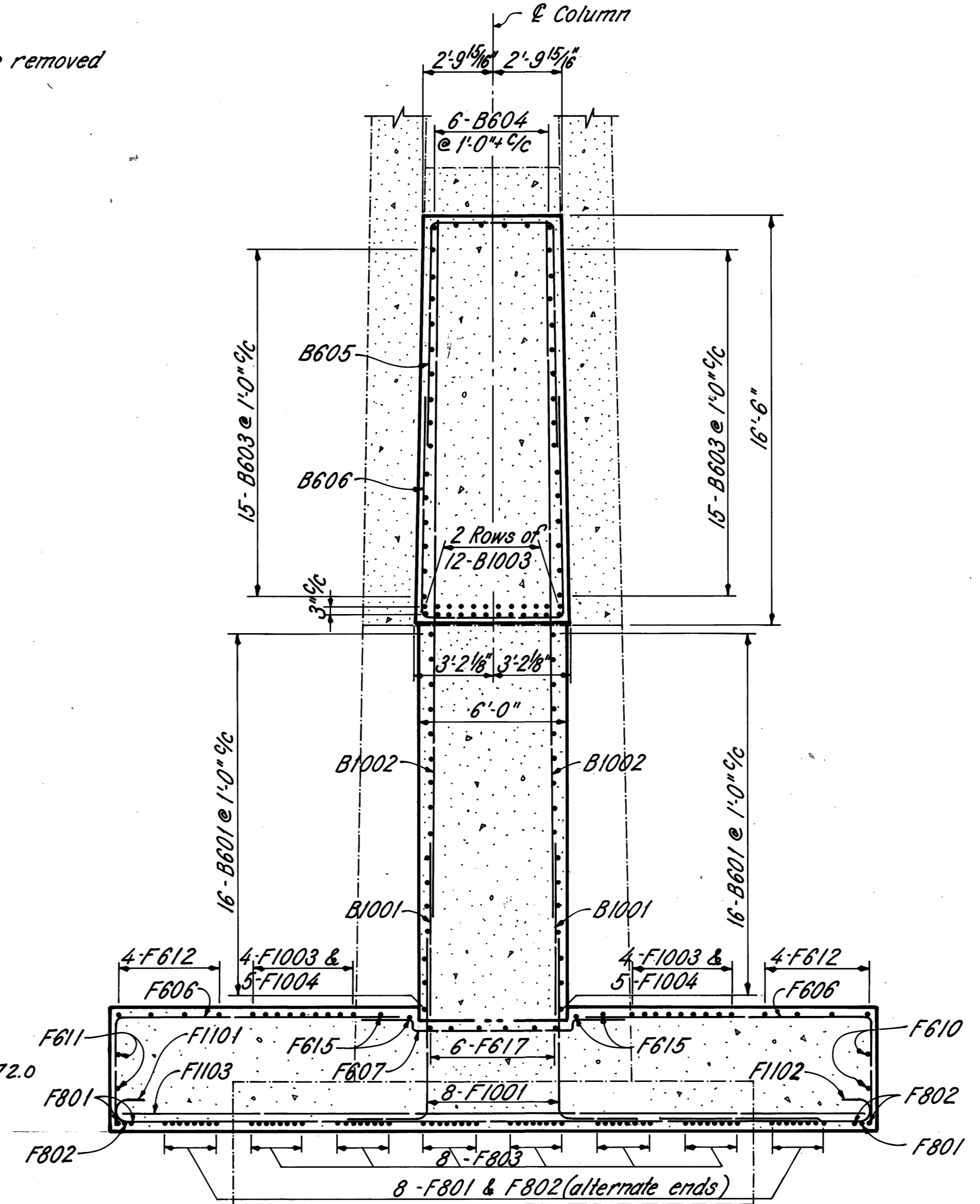
PLAN
- Indicates concrete and reinforcing steel to be removed per Item 202. Portions of structure removed.



SECTION F-F



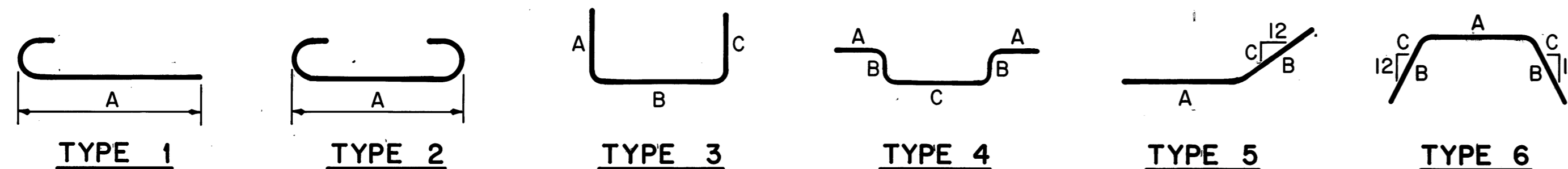
SECTION D-D



SECTION E-E

NOTES
REINFORCING STEEL SPLICE LENGTHS:
 #5 bars = 1'-4", #6 bars = 2'-0" &
 #10 bars = 3'-2"
REINFORCING STEEL CLEARANCE is 2"
 for the buttress.
NOTATION: E.F. - Each Face
 P.E.J.F. - Preformed expansion joint filler
PIER GENERAL LAYOUT See sheet 25/28

RE		RICHLAND ENGINEERING LIMITED MANSFIELD, OHIO		27/28
PIER 2 BUTTRESS DETAILS				
SUBSTRUCTURE				
BRIDGE NO. LOR-611-0358				
OVER BLACK RIVER				
LORAIN COUNTY		S.R. 611		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED
DAP	TWH	TWH	BLN	RDN
				DATE REVISION
				9/12/06



REINFORCING STEEL - PIERS 1 & 2

MARK	P-1	P-2	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
F601	32	32	64	4'-6"	2						433
F602	12	24	36	29'-3"	3	3'-0 1/2"	23'-6"	3'-0 1/2"			1,582
F603	20	20	40	15'-9"	3	4'-6"	9'-6"	2'-1"			946
F604	24	24	48	20'-5"	3	4'-6"	16'-1"	0			1,472
F605	104	104	202	5'-1"	3	1'-7"	3'-6"	0			1,542
F606	40	40	80	15'-10"	3	4'-6"	11'-6"	0			1,903
F607	20	20	40	11'-0"	4	2'-1"	6"	6'-6"			661
F608	40	40	80	7'-4"	3	5'-5"	2'-1"	0			881
F609	24	24	48	16'-1"	Str.						1,160
F610	8	8	16	14'-6"	Str.						348
F611	8	8	16	25'-7"	Str.						615
F612	32	32	64	30'-0"	3	4'-6"	25'-8"	0			2,884
F613	4	4	8	20'-6"	Str.						246
F614	24	24	48	8'-0"	Str.						577
F615	16	16	32	22'-9"	3	4'-6"	16'-6"	2'-1"			1,093
F616	24	24	48	8'-4"	3	4'-6"	4'-0"	0			601
F617	24	24	48	13'-0"	4	2'-1"	6"	8'-6"			937
F618	24	24	48	5'-4"	3	3'-5"	2'-1"	0			385
F619	20	20	40	27'-6"	Str.						1,652
F620	20	4	24	19'-6"	Str.						703
F621	26	48	74	8'-4"	3	6'-5"	2'-1"	0			926
F622	20	20	40	24'-6"	Str.						1,472
F623	4	4	8	14'-6"	Str.						174
F624	24		24	5'-6"	3	3'-1"	2'-7"	0			198
F625	24		24	6'-0"	3	3'-1"	3'-1"	0			216
F801	22	44	66	30'-0"	1	29'-1"					5,287
F802	22	44	66	24'-9"	1	23'-10"					4,361
F803	192	192	384	14'-4"	2	12'-6"					14,696
F804	88		88	11'-0"	1	10'-1"					2,585
F1001	120	120	240	10'-3"	3	7'-4 1/2"	3'-2"	0			10,585
F1002	44	36	80	30'-0"	Str.						10,327
F1003	44	36	80	28'-8"	3	24'-5"	4'-6"	0			9,868
F1004	44	36	80	14'-8"	3	10'-5"	4'-6"	0			5,049
F1005	26	96	122	17'-5"	1	16'-0"					9,143
F1006	20	32	52	17'-7"	Str.						3,934
F1007	52	64	116	23'-11"	3	22'-1"	2'-1"	0			11,938
F1008	52		52	23'-0"	3	21'-2"	2'-1"	0			5,146
F1101	92	92	184	30'-0"	1	28'-5"					29,328
F1102	84	84	168	10'-1"	1	8'-6"					9,000
F1103	60	64	124	30'-0"	Str.						19,764

MARK	P-1	P-2	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
B501		16	16	16'-3"	3	5'-5"	5'-8"	5'-5"			271
B502		4 Series of 11	4 Series of 11	8'-0" to 15'-6" ②	3	1'-3 1/2" to 5'-0 1/2" ①	5'-8"	1'-3 1/2" to 5'-0 1/2" ①			539
B503	8	8	16	6'-0"	Str.						100
B504		8	8	10'-6"	Str.						88
B505		8	8	15'-0"	Str.						125
B506	8		8	8'-8"	Str.						72
B507	8		8	11'-6"	Str.						96
B508	16		16	17'-4"	3	6'-0"	5'-8"	6'-0"			289
B509	4 Series of 8		4 Series of 8	8'-1" to 16'-9" ⑤	3	1'-4" to 5'-8" ④	5'-8"	1'-4" to 5'-8" ④			414
B601	96	128	224	15'-4"	3	5'-0"	5'-8"	5'-0"			5,159
B602	104	68	172	10'-4"	3	2'-6"	5'-8"	2'-6"			2,670
B603		4 Series of 15	4 Series of 15	17'-9" to 28'-3" ②	Str.						2,073
B604		12	12	22'-9"	6	18'-0"	2'-6"	4 1/2"			410
B605		20	20	23'-2"	3	9'-1"	5'-4"	9'-1"			696
B606		28	28	23'-8"	3	9'-1"	5'-10"	9'-1"			995
B607	12		12	22'-5"	6	17'-8"	2'-6"	6"			404
B608	20		20	19'-8"	3	7'-5"	5'-2"	7'-5"			591
B609	28		28	20'-2"	3	7'-5"	5'-8"	7'-5"			848
B610	4 Series of 24		4 Series of 24	17'-6" to 29'-0" ③	Str.						3,352
B1001		224	224	7'-3"	5	3'-6"	3'-10"	4 1/2"			6,988
B1002		224	224	30'-0"	Str.						28,916
B1003		48	48	29'-6"	Str.						6,094
B1004	224		224	7'-4"	5	3'-7"	3'-10"	6"			7,068
B1005	224		224	24'-0"	Str.						23,133
B1101	50		50	30'-0"	Str.						7,970
TOTAL WEIGHT											273,979

- ① Varies by 4 1/2" increments
- ② Varies by 9" increments
- ③ Varies by 6" increments
- ④ Varies by 7 1/2" increments
- ⑤ Varies by 14" increments

28/28

REI RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

REINFORCING STEEL

SUBSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

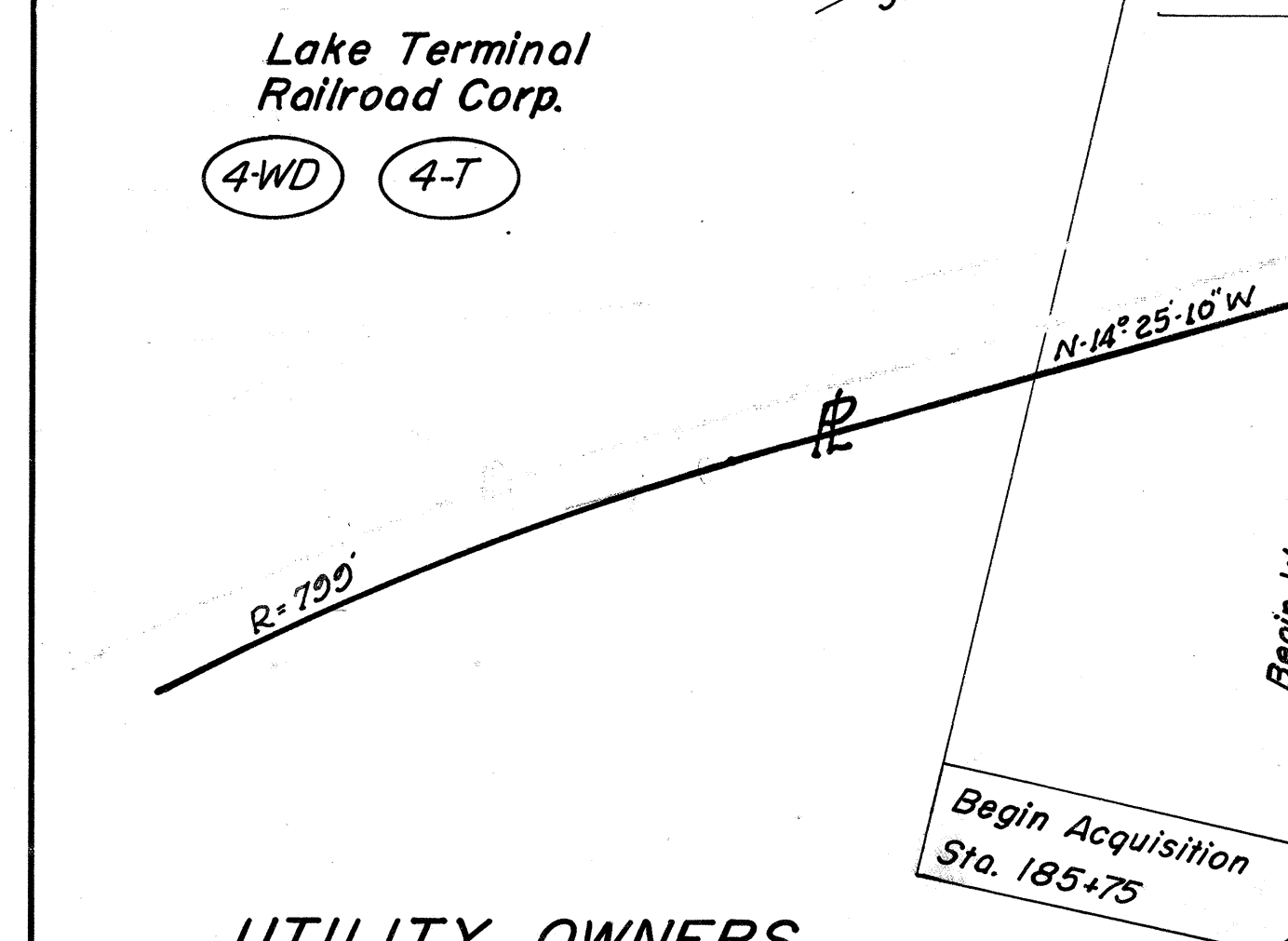
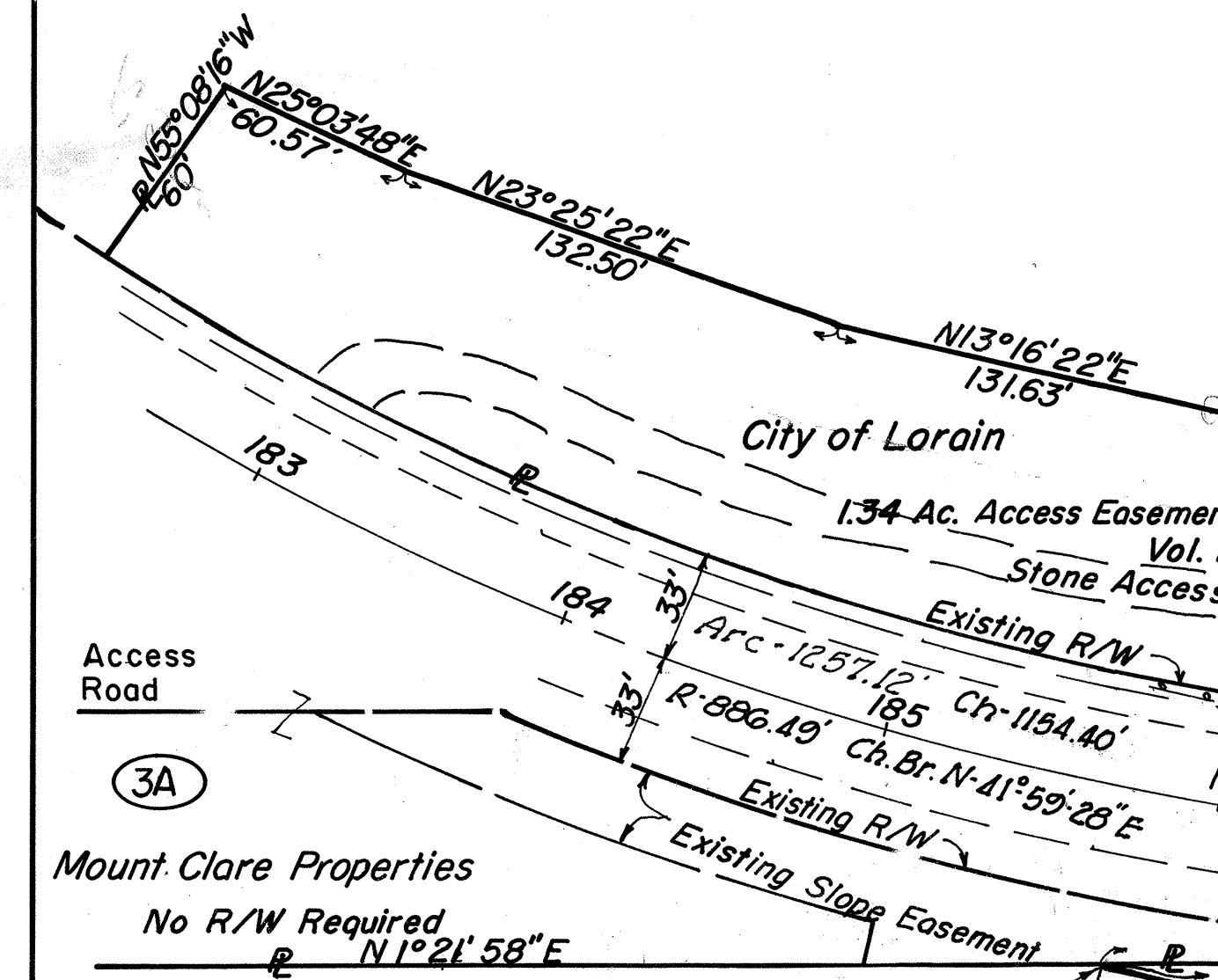
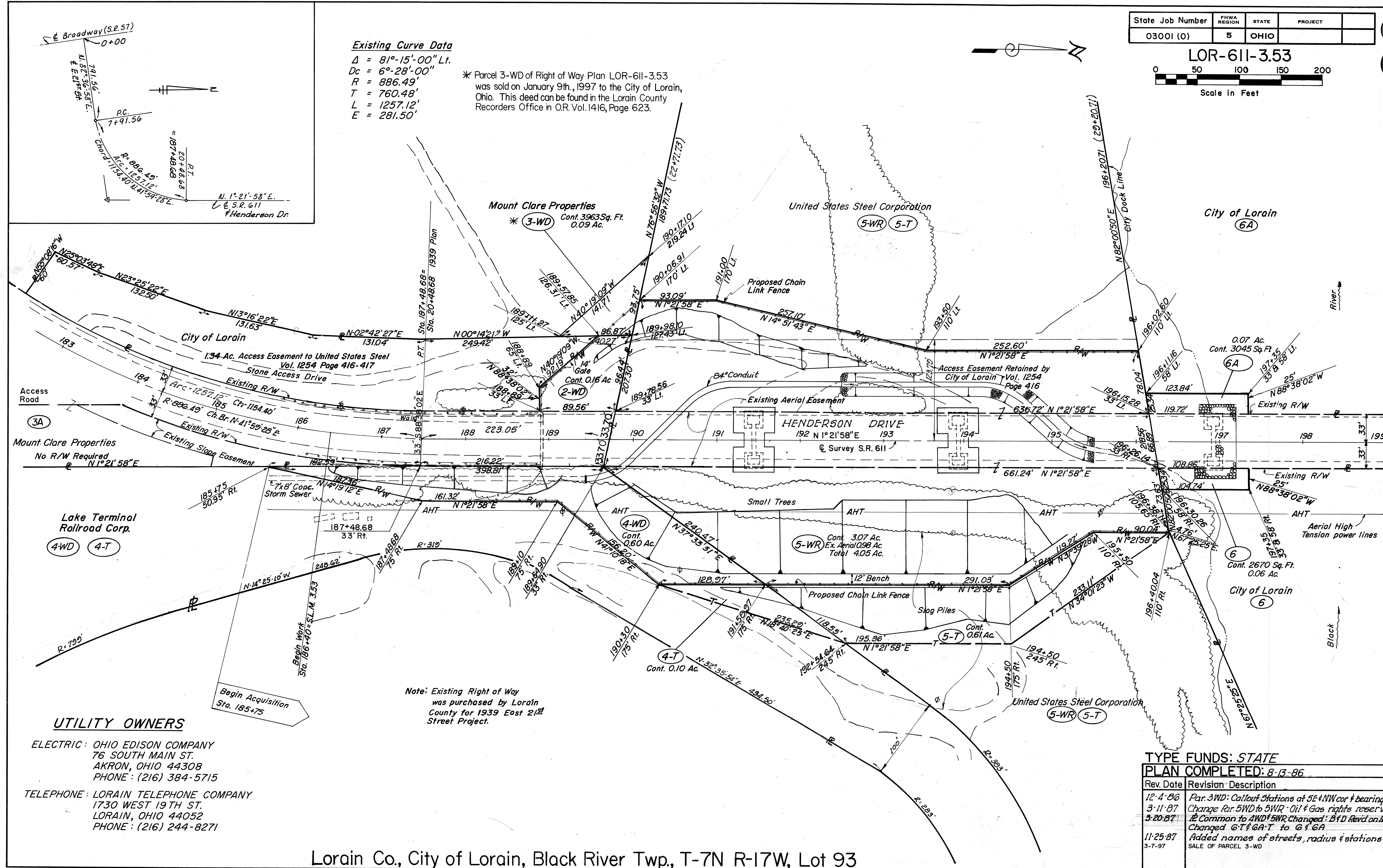
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	YH	BLN	RDN	9/12/86	

Existing Curve Data

Δ = 81°-15'-00" Lt.
 Dc = 6°-28'-00"
 R = 886.49'
 T = 760.48'
 L = 1257.12'
 E = 281.50'

* Parcel 3-WD of Right of Way Plan LOR-611-3.53 was sold on January 9th., 1997 to the City of Lorain, Ohio. This deed can be found in the Lorain County Recorders Office in O.R. Vol. 1416, Page 623.



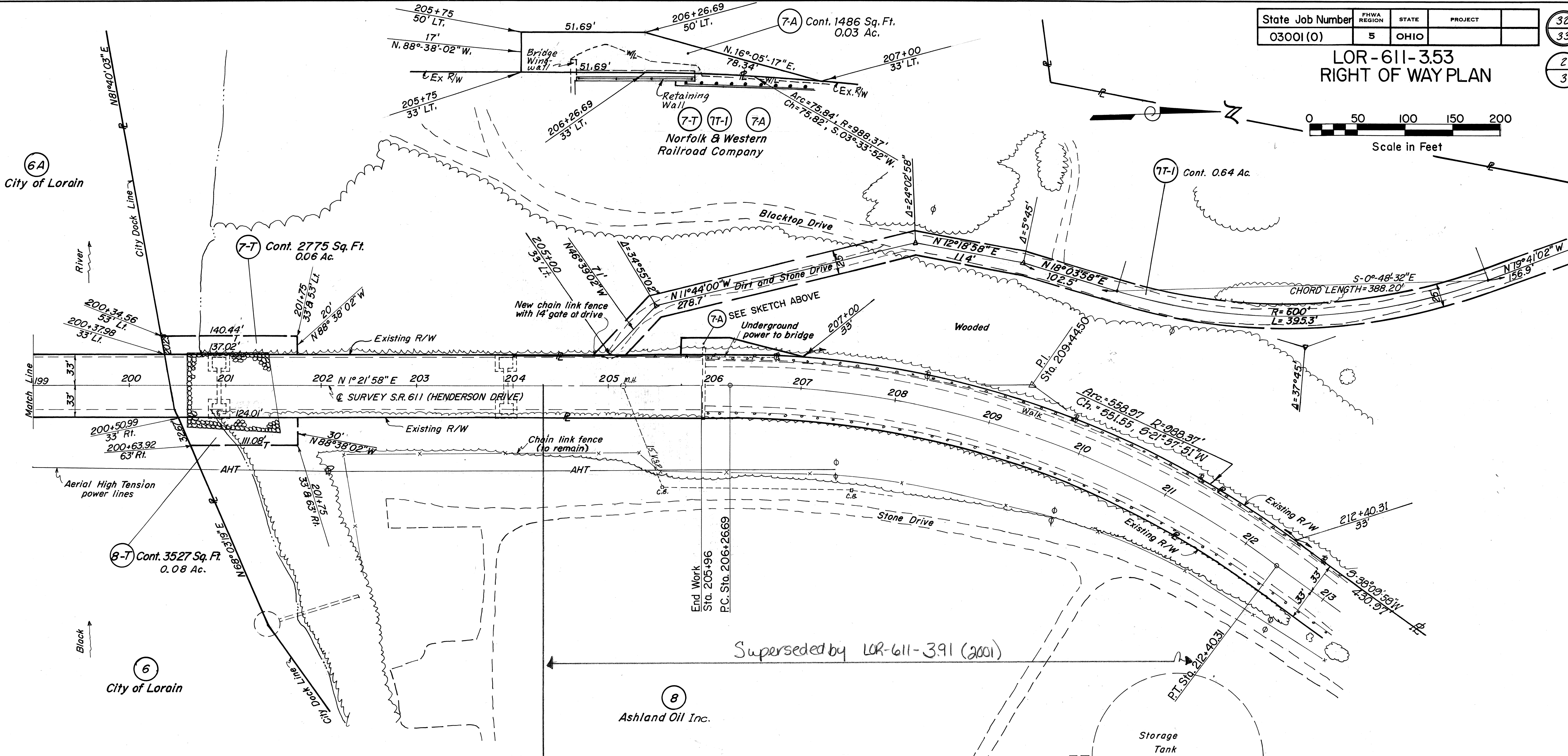
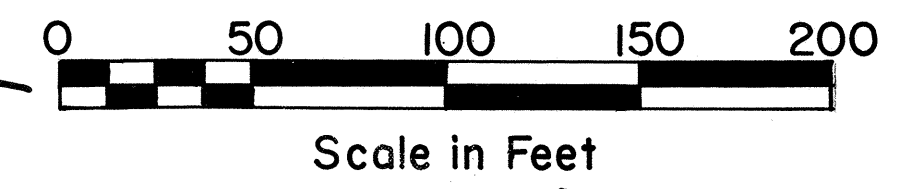
UTILITY OWNERS

ELECTRIC: OHIO EDISON COMPANY
 76 SOUTH MAIN ST.
 AKRON, OHIO 44308
 PHONE: (216) 384-5715

TELEPHONE: LORAIN TELEPHONE COMPANY
 1730 WEST 19TH ST.
 LORAIN, OHIO 44052
 PHONE: (216) 244-8271

Note: Existing Right of Way was purchased by Lorain County for 1939 East 21st Street Project.

TYPE FUNDS: STATE	
PLAN COMPLETED: 8-3-86	
Rev. Date	Revision Description
12-4-86	Par. 3WD: Callout Stations at SE & NW cor & bearing between
3-11-87	Change Par. 5WD to 5WR - Oil & Gas rights reserved.
3-20-87	Common to 4WD & 5WR Changed: BTD Revid on 12' R/W. Changed 6-T & 6A-T to 6 & 6A
11-25-87	Added names of streets, radius & stations.
3-7-97	SALE OF PARCEL 3-WD



Superseded by LOR-611-391 (2001)

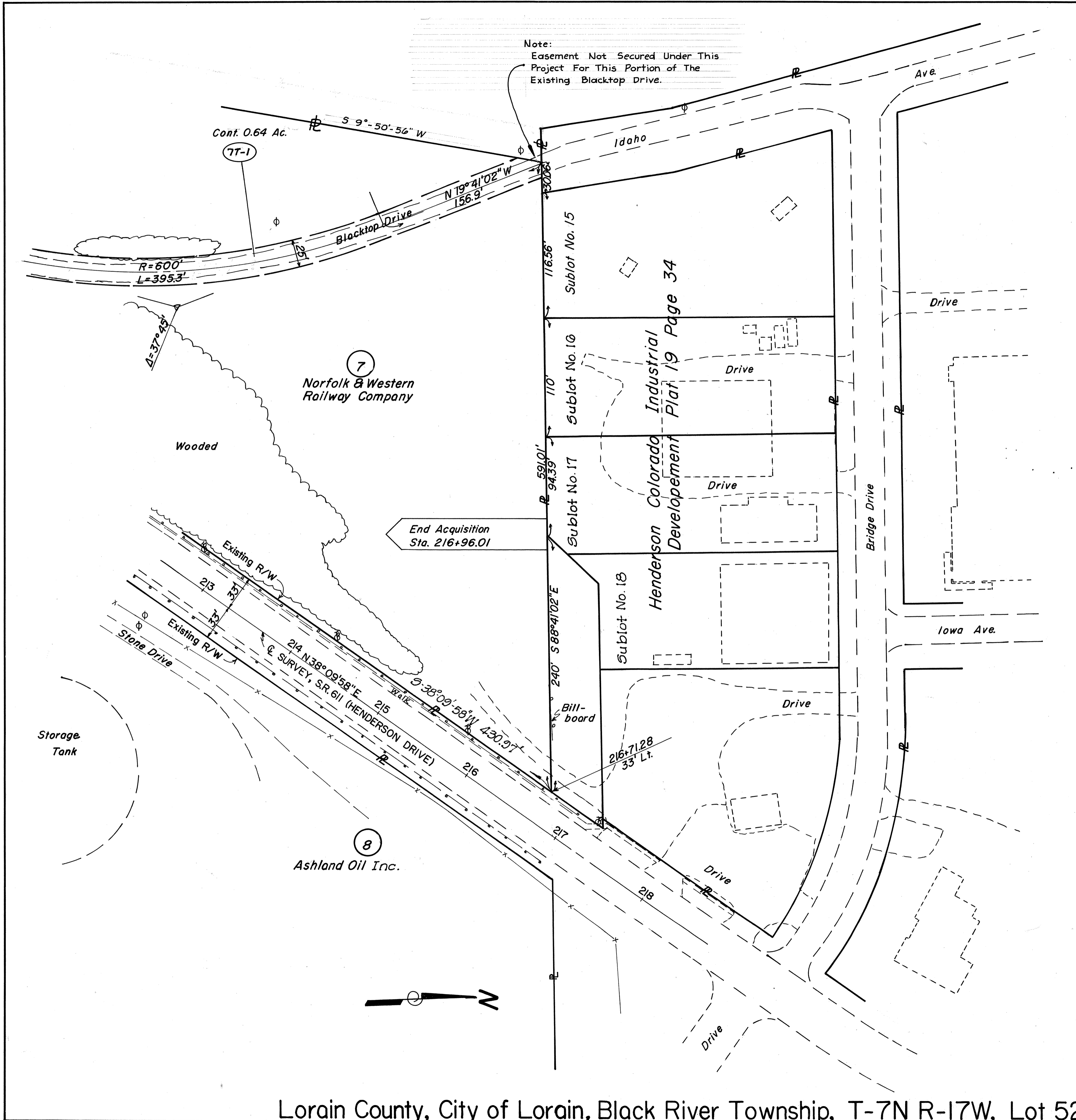
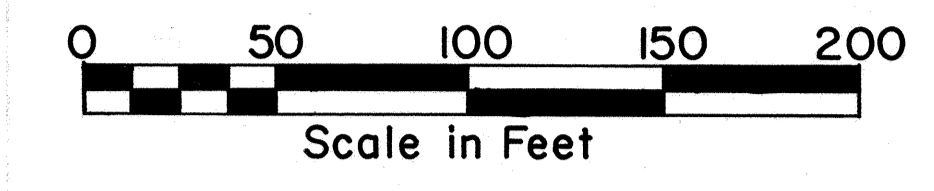
Existing Curve Data
 $\Delta = 36^\circ 48' 00''$ Rt.
 $Dc = 6' 00''$
 $R = 955.37'$
 $T = 317.81'$
 $L = 613.62'$
 $E = 51.48'$
 $Lc = 603.123'$

TYPE FUNDS: STATE
 PLAN COMPLETED: 8-13-86

Rev. Date	Revision Description
3-8-88	ADDED PARCEL 7A
1-20-90	Revised Parcel 7 to 7T-1

Lorain Co., City of Lorain, Black River Twp., T-7N R-17W, Lot 52

LOR - 611-3.53
RIGHT OF WAY PLAN



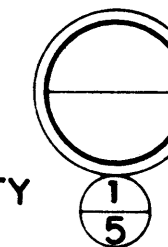
SUMMARY OF ADDITIONAL RIGHT OF WAY REQ'D.

PARCEL NO.	TYPE FUNDS	PROPERTY OWNER	NO. OF STRUCTURES		NO. OF PROPERTY OWNERS		NO. OF TAKES		TOTAL GROSS TAKE	P.R.O. TAKE	NET TAKE	NET RESIDUE	BLOG.	SHEET NO.	REMARKS
			RECORDED VOL.	PAGE	DEED AREA	P.R.O. TAKE	GROSS TAKE	P.R.O. TAKE							
2-WD		City of Lorain	947	455	1.34	—	0.16	—	0.16	1.18	—	—	No	1	No R/W Required
3-A		Mount Clare Properties	1230	734	14.14	—	0.09	—	0.09	14.05	—	—	No	1	Vol. 40 # 947
3-WD		Mount Clare Properties	153	446	—	—	0.60	—	0.60	—	—	—	No	1	Temporary
4-WD		Lake Terminal Railroad Company	—	—	—	—	0.10	—	0.10	—	—	—	No	1	Temporary
4-T		Lake Terminal Railroad Company	—	—	—	—	—	—	—	—	—	—	No	1	Temporary
5-WR		United States Steel Corporation	533	439	—	—	0.98	405	3.07	8.10	—	—	P *	1	* Slag Ex. Aerial
5-T		United States Steel Corporation	1254	415	—	—	0.61	—	0.61	—	—	—	P *	1	Temporary * Slag
6		City of Lorain	—	—	—	—	—	—	—	—	—	—	No	1	
6A		City of Lorain	75	49	—	—	0.06	—	0.06	—	—	—	No	1	
7-A		Norfolk & Western Railway Company	79	579	—	—	0.07	—	0.07	—	—	—	No	1	
7-T		Norfolk & Western Railway Company	687	364	16.56	—	0.03	—	0.03	—	—	—	No	2	
7-T		Norfolk & Western Railway Company	—	—	—	—	0.64	—	0.64	—	—	—	No	2	Access Road
8-T		Ashland Oil Inc.	1358	317	32.33	—	0.06	—	0.06	—	—	—	No	2	Temporary
							0.08	—	0.08	—	—	—	No	2	Temporary

TYPE FUNDS: STATE
PLAN COMPLETED: 8-13-86

Rev. Date	Revision Description
J.E.C. 10/28/86	Rev. & Added Areas in Net Take column of Summary.
J.E.C. 3/1/87	Change Par. 5WD to 5WR.
J.E.C. 3/20/87	Changed Par. 6-T to 6-A; Par. 6A-T to 6A.
PWS 3-8-88	Added Parcel 7-A to Summary
DES 11-30-88	Rev. Parcel 7
DES 1-26-90	Revised Parcel 7 to 7T-1

Lorain County, City of Lorain, Black River Township, T-7N R-17W, Lot 52



GEOLOGY OF THE SITE

THE STRUCTURE SITE IS LOCATED IN THE RELATIVELY FLAT GLACIATED LAKE PLAIN REGION ON THE NARROW FLOODPLAIN OF AND OVER THE BLACK RIVER, IN AN AREA WHERE MODERATELY DEEP TO EXTREMELY DEEP ORGANIC SOILS AND PEAT, ALLUVIAL DEPOSITS AND FILL MATERIAL OVERLIE SHALE BEDROCK, OF DEVONIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF FOUR DRIVE SAMPLE-CORE BORINGS AND FOUR DRIVE-PRESS SAMPLE-CORE BORINGS MADE BY MEANS OF A MECHANICALLY-POWERED HOLLOW STEM AUGER MOUNTED ON A MOBILE PLATFORM, PERFORMED BETWEEN JULY 7 AND AUGUST 3, 1981. IN ADDITION TO NORMAL SAMPLING PROCEDURES, SLOPE INCLINOMETERS WERE INSTALLED IN EACH OF THE TEST BORINGS PERFORMED AND THEY WILL BE MONITORED FOR AN INDEFINITE PERIOD OF TIME TO DETERMINE SUBSURFACE MOVEMENT.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE BORINGS DISCLOSED THAT INTERVALS OF EXTREMELY LOOSE TO EXTREMELY DENSE UNSTRATIFIED SILTS AND CLAYS MODIFIED WITH VARIOUS PERCENTAGES OF SAND AND GRAVEL THAT GRADUALLY INCREASE IN DENSITY WITH INCREASE IN DEPTH OVERLIE SLOPING BEDROCK SURFACE. PEAT WAS ENCOUNTERED IN BORING B-5 AT ZERO TO 16.5-FOOT DEPTH, ELEVATION 581.5 TO 565.0 FEET. ORGANIC MATERIAL AND MATERIAL BEARING A TRACE OF ORGANIC WAS ENCOUNTERED IN BORINGS B-3, B-4, B-5, B-6, B-7 AND B-8 AS NOTED ON LOGS. FILL MATERIAL CONSISTING OF SLAG, STONE FRAGMENTS AND FINES WAS ENCOUNTERED IN BORINGS B-2 AT ZERO TO 6.5-FOOT DEPTH, ELEVATION 621.3 TO 614.8 FEET, B-3 AT ZERO TO 14.0-FOOT DEPTH, ELEVATION 587.6 TO 573.6 FEET, B-4 AT 10.0 TO 11.5-FOOT DEPTH, ELEVATION 577.3 TO 575.8 FEET, B-5 AT 32.5 TO 36.5-FOOT DEPTH, ELEVATION 549.0 TO 545.0 FEET AND B-8 AT ZERO TO 6.5-FOOT DEPTH, ELEVATION 575.8 TO 569.3 FEET. BEDROCK SURFACE WAS ENCOUNTERED AS SHOWN IN THE FOLLOWING TABLE:

ELEMENT	APPROX. ELEV. TOP OF ROCK (LEFT SIDE)	APPROX. ELEV. TOP OF ROCK (RIGHT SIDE)
REAR ABUTMENT	595.9'	591.3'
1st PIER	525.1'	522.3'
2nd PIER	519.0'	519.5'
3rd PIER	516.7'	518.3'

NO FREE WATER OBSERVATIONS WERE MADE DURING OR AT THE CONCLUSION OF DRILLING OPERATIONS, HOWEVER, WET BONES WERE NOTED AS FOLLOWS: BORINGS B-4 AT 10.0-FOOT DEPTH, ELEVATION 577.3 FEET, B-7 AT 30.0-FOOT DEPTH, ELEVATION 546.7 FEET, B-8 AT 30.3-FOOT DEPTH, ELEVATION 545.5 FEET.

LEGEND

- Auger Boring Location - Plan View.
- Press and / or Drive Sample and / or Core Boring Location - Plan View.
- Drive Rod Penetration Resistance Sounding Location - Plan View.
- Capped Pile
- Footing
- Footing on Pile
- Top of Rock

- Horizontal Bar on Boring Log Indicates the Depth the Sample Was Taken.
- Figures Beside the Boring Log in Profile Indicate the Number of Blows for Standard Penetration Test.
X = Number of Blows for First 6 inches.
Y = Number of Blows for Second 6 inches.
Z = Number of Blows for Third 6 inches.
- Drive Rod Penetration Resistance Sounding Log - Profile
- Casing
- Resistance "R" < 10,000 lbs.
- Resistance "R" > 10,000 lbs.
- Z Indicates Final Measurement of Penetration, in Inches.
- W Indicates Free Water Elevation.
- Indicates Static Water Elevation.

SYMBOLS OF ROCK TYPES

- Coal
- Weathered Mudstone or Claystone
- Mudstone or Claystone
- Weathered Shale
- Shale
- Weathered Siltstone
- Siltstone
- Weathered Sandstone
- Sandstone
- Leached Dolomite
- Dolomite
- Leached Limestone
- Limestone
- Boulders or Cobbles

GENERAL INFORMATION

Drive Rod Penetration Sounding Tests

Drive rod penetration resistance tests constitute driving a 1.315-inch diameter steel rod, with a 45° cone point, into the ground, using a 122-pound drop-hammer with a free fall of five feet. At one or two-foot depth intervals, a measurement is taken to determine the amount of penetration achieved in three hammer drops. This reading is converted to an empirical value for capacity "R", in thousands of pounds (which is a measure of both the point resistance and frictional resistance on the rod), by using charts prepared by the Ohio Department of Highways, Bureau of Bridges, on the basis of correlation study of rod penetration with past performance of pile driving. For interpretation, a graph is prepared by plotting the value "R" against the depth at which the reading was taken, and connecting the plotted points. The curve so obtained reflects the density of subsurface materials in a manner that can be readily compared with data from similar tests at other locations on the structure site. From this comparison, the overall uniformity of subsurface condition may be evaluated.

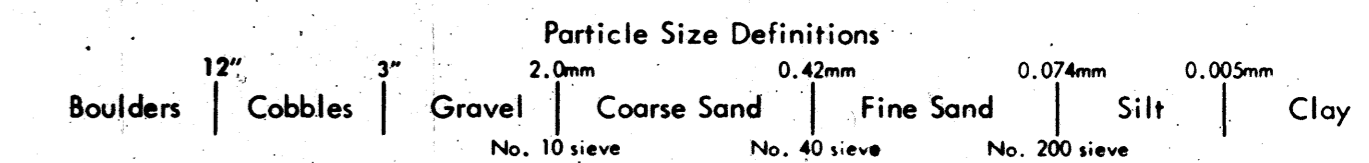
Drive Sample Borings - Drive-Press Sample Borings

Drive sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. sampler, at 2-1/2 and / or 5-foot depth intervals, driven by means of a 140-pound drop-hammer with a free fall of 30 inches. The number of blows required to drive the sampler 18 inches is considered the standard penetration test.

Drive-press sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. drive sampler, and 3" O.D. thin-wall press sampler. The press sampler is advanced by continuous uniform pressure, applied by the drill rig.

The boring log sheets show a graphic plot of the information obtained, including depth and elevation of the sample, number of blows for the standard penetration tests in three 6-inch increments, depth of press samples, field sample number, sample description - based on laboratory tests and the Casagrande AC classification system - and gradation, plasticity, and moisture content determinations. Results of strength and consolidation testing, if performed, appear on separate enclosures.

At depths where materials are bouldery or gravelly to the extent that the sampler can not be driven, a wash sample is procured for visual classification, in order to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.



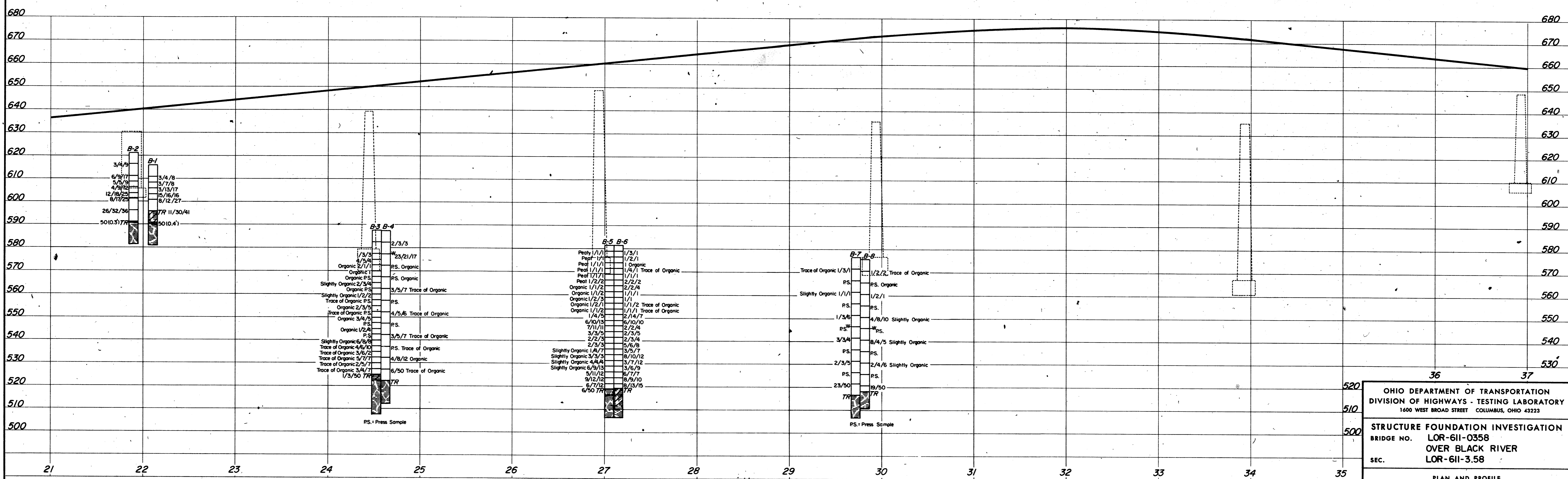
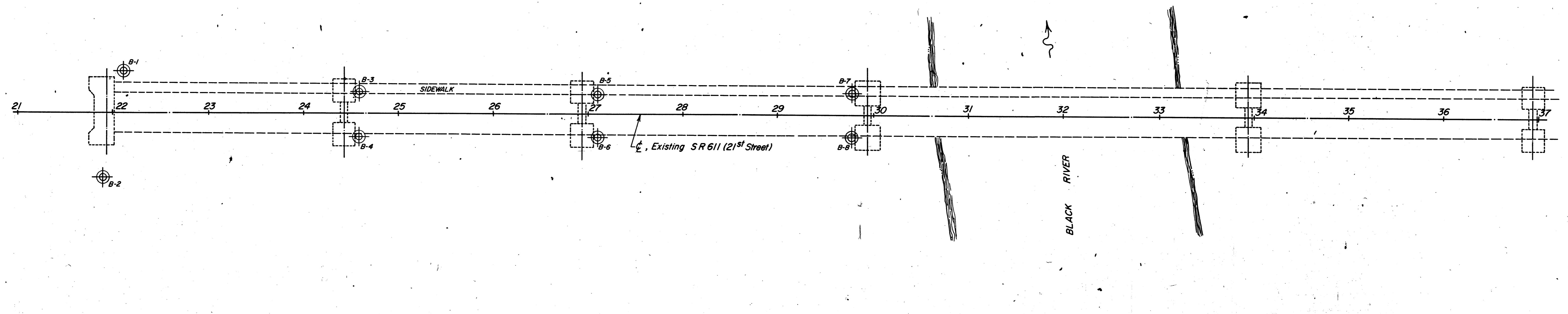
NOTE - ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1600 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of this data and it is not to be construed as a part of the plans governing construction of the project.

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - TESTING LABORATORY
1600 WEST BROAD STREET, COLUMBUS, OHIO 43223

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
SEC. LOR-611-3.58

CHECKED BY L. N. L.	REVIEWED BY R. D. R.	DATE 10/1/81
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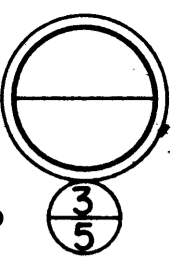
OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - TESTING LABORATORY
1600 WEST BROAD STREET COLUMBUS, OHIO 43223

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LOR-611-3.58

PLAN AND PROFILE

DRAWN BY L. N. L.	CHECKED BY L. N. L.	REVIEWED BY R. D. R.	DATE 10/1/81
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SCALE HOR. = 1" = 50'
VERT. = 1" = 20'



LOG OF BORING

Date Started 7/15/81 Sampler Type SS Dia. 1 3/8" Water Elev. _____
Date Completed 7/14/81 Casing Length Dia. _____
Boring No. B-1 Station & Offset 22+11, 44' LT. (REAR ABUTMENT) Surface Elev. 615.9'

Table with columns: Elev., Depth, Std. Pen. (N), Rec. Loss ft., Description, Sample No., Physical Characteristics (% Agg., % C.S., % F.S., % Silt, % Clay, L.L., P.I., W.C.), SHTL Class.

BOTTOM OF BORING

INSTALLED 36 FEET OF SLOPE INDICATOR PIPE (EXTENDS 1 FOOT ABOVE GROUND)

LOG OF BORING

Date Started 7/15/81 Sampler Type SS Dia. 1 3/8" Water Elev. _____
Date Completed 7/15/81 Casing Length Dia. _____
Boring No. B-2 Station & Offset 21+90, 67' RT. (REAR ABUTMENT) Surface Elev. 621.3'

Table with columns: Elev., Depth, Std. Pen. (N), Rec. Loss ft., Description, Sample No., Physical Characteristics (% Agg., % C.S., % F.S., % Silt, % Clay, L.L., P.I., W.C.), SHTL Class.

BOTTOM OF BORING

INSTALLED 41.5 FEET OF SLOPE INDICATOR PIPE (EXTENDS 1.5 FEET ABOVE GROUND)

LOG OF BORING

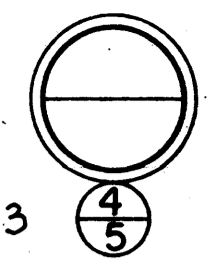
Date Started 7/15/81 Sampler Type SS Dia. 1 3/8" Water Elev. _____
Date Completed 7/21/81 Casing Length Dia. _____
Boring No. B-3 Station & Offset 24+58 - 23' LT. (PIER 1) Surface Elev. 587.6'

Table with columns: Elev., Depth, Std. Pen. (N), Rec. Loss ft., Description, Sample No., Physical Characteristics (% Agg., % C.S., % F.S., % Silt, % Clay, L.L., P.I., W.C.), SHTL Class.

BOTTOM OF BORING

INSTALLED 82.0 FEET OF SLOPE INDICATOR PIPE. (EXTENDS 2.0 FEET ABOVE GROUND)

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - TESTING LABORATORY
1600 WEST BROAD STREET COLUMBUS, OHIO 43223
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
SEC. LOR-611-3.58
BORING DATA
TYPED BY S. M. G. CHECKED BY L. N. L. REVIEWED BY R. D. R. DATE 10/1/81



LOG OF BORING
Date Started 7/22/81 Sampler Type SS Dia 1 3/8"
Date Completed 7/28/81 Casing Length Dia
Boring No. B-4 Station & Offset 24+58, 24' RT. (PIER 1) Surface Elev. 587.3'

Table with columns: Elev., Depth, Std. Pen. (N), Rec. ft., Loss ft., Description, Sample No., Physical Characteristics (% Agg., % C.S., % F.S., % Silt, % Clay, L.L., P.I., W.C.), SHTL Class.

INSTALLLED 76.5 FEET OF SLOPE INDICATOR PIPE (EXTENDS 1.5 FEET ABOVE GROUND)

LOG OF BORING
Date Started 7/8/81 Sampler Type SS Dia 1 3/8"
Date Completed 7/14/81 Casing Length Dia
Boring No. B-5 Station & Offset 27+10, 21' LT. (2ND PIER) Surface Elev. 581.5'

Table with columns: Elev., Depth, Std. Pen. (N), Rec. ft., Loss ft., Description, Sample No., Physical Characteristics (% Agg., % C.S., % F.S., % Silt, % Clay, L.L., P.I., W.C.), SHTL Class.

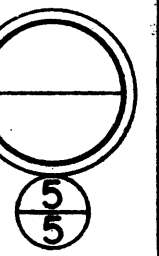
INSTALLLED 76.5 FEET OF SLOPE INDICATOR PIPE (EXTENDS 1.5 FEET ABOVE GROUND)

LOG OF BORING
Date Started 7/22/81 Sampler Type SS Dia 1 3/8"
Date Completed 7/28/81 Casing Length Dia
Boring No. B-6 Station & Offset 27+10, 24' RT. (2ND PIER) Surface Elev. 581.5'

Table with columns: Elev., Depth, Std. Pen. (N), Rec. ft., Loss ft., Description, Sample No., Physical Characteristics (% Agg., % C.S., % F.S., % Silt, % Clay, L.L., P.I., W.C.), SHTL Class.

INSTALLLED 76.3 FEET OF SLOPE INDICATOR PIPE (EXTENDS 1.3 FEET ABOVE GROUND)

OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS - TESTING LABORATORY 1600 WEST BROAD STREET COLUMBUS, OHIO 43223
STRUCTURE FOUNDATION INVESTIGATION BRIDGE NO. LOR-611-0358 OVER BLACK RIVER SEC. LOR-611-3.58
BORING DATA
TYPED BY S. M. G. CHECKED BY L. N. L. REVIEWED BY R. D. R. DATE 10/1/81



LOG OF BORING
MET ZONE ELEV. 546.7'
Water Elev. _____

Date Started 7/29/81 Sampler Type SS Dia 1 3/8"
Date Completed 8/3/81 Casing Length _____ Dia _____
Boring No. B-7 Station & Offset 29+77.23' LT. (3rd PIER) Surface Elev. 576.7'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics								SHTL Class.			
							% Agg.	% C.S.	% F.S.	% Sil.	% Clay	L.L.	P.I.	W.C.				
576.7	0																	
571.7	5	1/3/1			BROWN-GRAY SANDY SILT, TRACE OF ORGANIC	1	0	0	22	47	31	31	8	33			A-4a	
566.7	10				BROWN-GRAY SILT AND CLAY	2	0	0	5	48	47	35	13	30			A-6a	
561.7	15	1/1/1			GRAY-BROWN SANDY SILT, SLIGHTLY ORGANIC	3	9	1	26	39	25	27	7	28			A-4a	
556.7	20				BROWN-GRAY CLAYEY SANDY SILT DARK GRAY SILT AND CLAY	4 4A	0 0	2 1	41 16	32 48	25 35	NP 30	NP 11	31 41			A-4a A-6a	
551.7	25	1/3/6			BROWN-GRAY SANDY SILT WITH WOOD FRAGMENTS	5	3	6	43	29	19	NP	NP	32			A-4a	
546.7	30				DARK GRAY CLAYEY SANDY SILT (AVERAGE GRADINGS ONLY)	6, 6A+B	4	11	34	28	23	10	2	42			A-4a	
541.7	35	3/3/4			GRAY-BROWN SANDY SILT	7	9	2	14	54	21	29	8	29			A-4b	
536.7	40				DARK GRAY, CLAYEY SILT DARK GRAY CLAYEY SILT	8 8A	0 0	1 1	11 9	66 51	36 39	31 31	8 8	32 30			A-4b A-4a	
531.7	45	2/3/5			GRAY SANDY SILT	9	0	1	27	41	31	27	7	26			A-4a	
526.7	50				DARK GRAY CLAYEY SANDY SILT W/SHALE FRAGS. (GRADING ONLY)	10	32	15	17	22	14	NP	NP	25			A-4a	
521.7	55	23/50			GRAY GRAVELLY CLAY	11	32	5	4	27	32	35	15	20			A-6a	
516.7	60				TOP OF ROCK													
	62		3.0	2.0	CLAY SHALE, DARK GRAY, FIRM, FISSILE WITH SCATTERED THIN CLAY SEAMS, CARBONACEOUS, BROKEN. CORE LOSS 20%.													
	64																	
	66																	
	68		5.0	0.0														
506.7	70																	

BOTTOM OF BORING
INSTALLED 71.5 FEET OF SLOPE INDICATOR PIPE (EXTENDS 1.5 FEET ABOVE GROUND)

LOG OF BORING
MET ZONE ELEV. 545.5'
Water Elev. _____

Date Started 7/29/81 Sampler Type SS Dia 1 3/8"
Date Completed 7/29/81 Casing Length _____ Dia _____
Boring No. B-8 Station & Offset 29+77.23' RT. (3rd PIER) Surface Elev. 575.8'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics								SHTL Class.			
							% Agg.	% C.S.	% F.S.	% Sil.	% Clay	L.L.	P.I.	W.C.				
575.8	0																	
570.8	5	1/2/2			BROWN-GRAY SANDY CLAY W/SLAG, TRACE OF ORGANIC	1	12	7	15	38	28	36	13	26			VISUAL	
565.8	10				DARK GRAY ORGANIC CLAYEY SILT (GRADING ONLY) BROWN-GRAY SILT AND CLAY (AVERAGE)	2 2A+B	0 0	1 0	4 5	53 49	42 46	31 38	9 14	31 32			A-4b A-6a	
560.8	15	1/2/1			GRAY-BROWN SANDY SILT	3	0	1	21	45	33	29	9	34			A-4a	
555.8	20				GRAY SANDY CLAYEY SILT GRAY CLAYEY SANDY SILT WITH SHALE FRAGMENTS (AVERAGE) (GRADING ONLY)	4 4A+B	0 14	1 5	19 23	47 36	33 22	33 31	5 7	30 28			A-4a A-4a	
550.8	25	4/8/10			GRAY SANDY SILT, SLIGHTLY ORGANIC	5	5	6	22	38	29	29	8	33			A-4a	
545.8	30				GRAY GRAVEL AND STONE FRAGS W/FINES (GRADING ONLY) GRAY SANDY SILT AND CLAY	6 6A	43 0	19 0	12 14	15 43	11 43	29 33	6 8	17 32			A-2-4 A-4a	
540.8	35	8/4/5			BROWN-GRAY CLAYEY SILT, SLIGHTLY ORGANIC	7	2	2	13	47	36	31	8	31			A-4a	
536.8	40				GRAY CLAYEY SILT DARK GRAY SANDY CLAYEY SILT	8 8A	0 4	1 1	12 29	54 39	33 27	28 25	7 5	28 27			A-4b A-4a	
530.8	45	2/4/6			GRAY SANDY SILT, SLIGHTLY ORGANIC	9	4	1	30	34	31	28	8	28			A-4a	
525.8	50				GRAY CLAYEY SANDY SILT (GRADING ONLY) GRAY SANDY CLAYEY SILT (GRADING ONLY) GRAY CLAYEY SILTY SAND (GRADING ONLY)	10 10A 10B	3 0 0	2 1 47	36 29 18	31 34 18	28 36 17	27 28 NP	8 8 NP	28 28 18			A-4a A-4a A-3a	
520.8	55	19/50			GRAY GRAVELLY SANDY CLAY	11	15	19	11	27	28	50	30	21			A-7-6	
518.3	58				TOP OF ROCK													
	60		2.2	0.3	CLAY SHALE, DARK-GRAY, FIRM, FISSILE WITH SCATTERED THIN CLAY SEAMS, CARBONACEOUS, BADLY BROKEN. CORE LOSS 17%.													
	62																	
	64		4.0	1.0														
510.8	64																	

BOTTOM OF BORING
INSTALLED 66.0 FEET OF SLOPE INDICATOR PIPE. (EXTENDS 1.0 FOOT ABOVE GROUND)

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - TESTING LABORATORY
1600 WEST BROAD STREET COLUMBUS, OHIO 43223

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
SEC. LOR-611-3.58

BORING DATA

TYPED BY S. M. G.	CHECKED BY L. N. L.	REVIEWED BY R. D. R.	DATE 10/1/81
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