CUY-90-14.90

PID 77332/85531

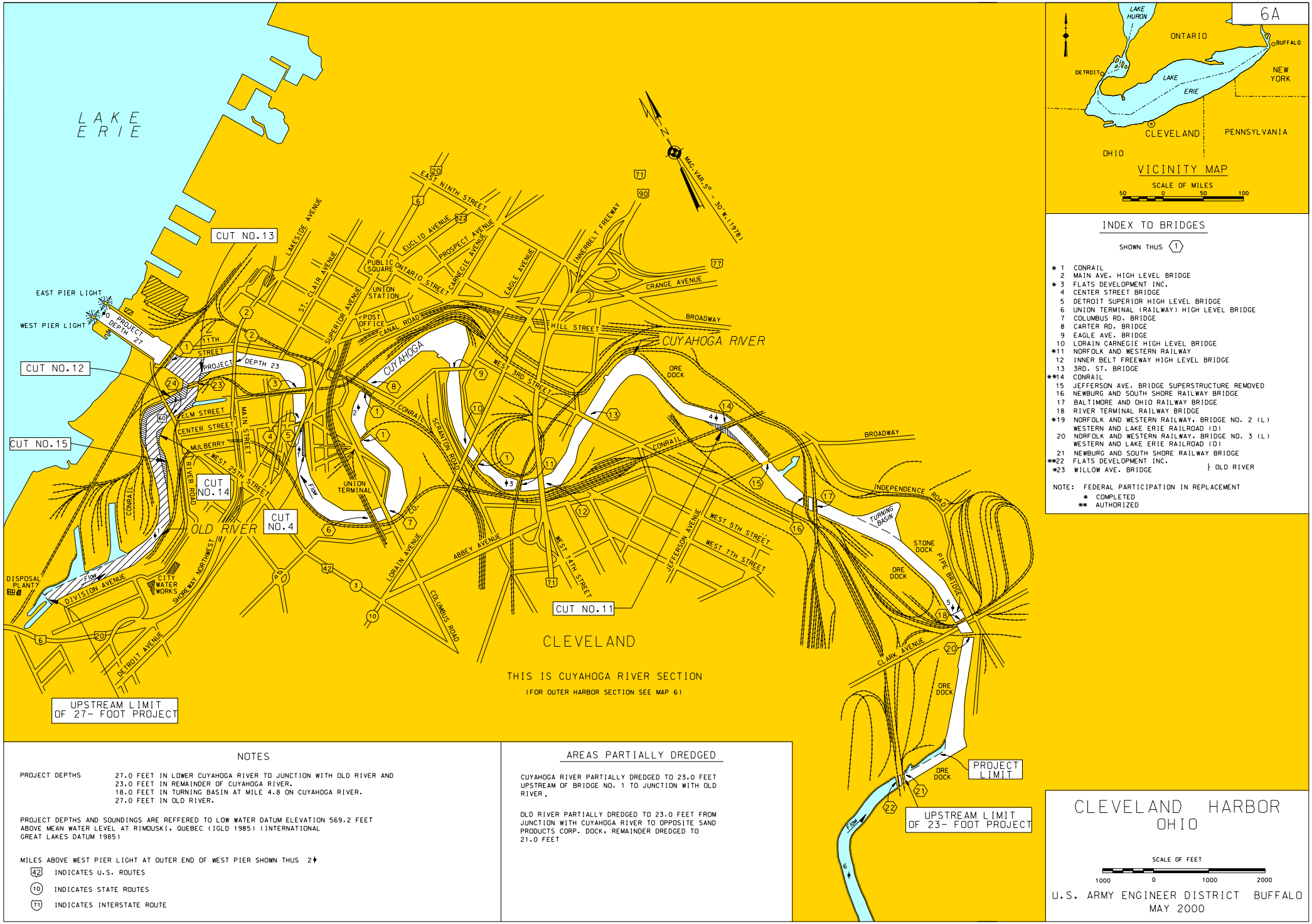
APPENDIX ST-04

Bulkhead Reference Information
(Reference Document)

State of Ohio
Department of Transportation
Jolene M. Molitoris, Director

Innerbelt Bridge
Construction Contract Group 1 (CCG1)

Revision Date: September 22, 2009



INDEX TO BRIDGES

SHOWN THUS (1)

* 1	CONRAIL
2	MAIN AVE. HIGH LEVEL BRIDGE
* 3	FLATS DEVELOPMENT INC.
4	CENTER STREET BRIDGE
5	DETROIT SUPERIOR HIGH LEVEL BRIDGE
6	UNION TERMINAL (RAILWAY) HIGH LEVEL BRIDGE
7	COLUMBUS RD. BRIDGE
8	CARTER RD. BRIDGE
9	EAGLE AVE. BRIDGE
10	LORAIN CARNEGIE HIGH LEVEL BRIDGE
*11	NORFOLK AND WESTERN RAILWAY
12	INNER BELT FREEWAY HIGH LEVEL BRIDGE
13	3RD. ST. BRIDGE
**14	CONRAIL
15	JEFFERSON AVE. BRIDGE SUPERSTRUCTURE REMOVED
16	NEWBURG AND SOUTH SHORE RAILWAY BRIDGE
17	BALTIMORE AND OHIO RAILWAY BRIDGE
18	RIVER TERMINAL RAILWAY BRIDGE
*19	NORFOLK AND WESTERN RAILWAY, BRIDGE NO. 2 (L) WESTERN AND LAKE ERIE RAILROAD (O)
20	NORFOLK AND WESTERN RAILWAY, BRIDGE NO. 3 (L) WESTERN AND LAKE ERIE RAILROAD (O)
21	NEWBURG AND SOUTH SHORE RAILWAY BRIDGE
**22	FLATS DEVELOPMENT INC. } OLD RIVER
*23	WILLOW AVE. BRIDGE } OLD RIVER

NOTE: FEDERAL PARTICIPATION IN REPLACEMENT
* COMPLETED
** AUTHORIZED

NOTES

PROJECT DEPTHS
27.0 FEET IN LOWER CUYAHOGA RIVER TO JUNCTION WITH OLD RIVER AND
23.0 FEET IN REMAINDER OF CUYAHOGA RIVER.
18.0 FEET IN TURNING BASIN AT MILE 4.8 ON CUYAHOGA RIVER.
27.0 FEET IN OLD RIVER.

PROJECT DEPTHS AND SOUNDINGS ARE REFFERED TO LOW WATER DATUM ELEVATION 569.2 FEET ABOVE MEAN WATER LEVEL AT RIMOUSKI, QUEBEC (IGLD 1985) (INTERNATIONAL GREAT LAKES DATUM 1985)

MILES ABOVE WEST PIER LIGHT AT OUTER END OF WEST PIER SHOWN THUS 2

(42) INDICATES U.S. ROUTES

(10) INDICATES STATE ROUTES

(71) INDICATES INTERSTATE ROUTE

AREAS PARTIALLY DREDGED

CUYAHOGA RIVER PARTIALLY DREDGED TO 23.0 FEET UPSTREAM OF BRIDGE NO. 1 TO JUNCTION WITH OLD RIVER.

OLD RIVER PARTIALLY DREDGED TO 23.0 FEET FROM JUNCTION WITH CUYAHOGA RIVER TO OPPOSITE SAND PRODUCTS CORP. DOCK, REMAINDER DREDGED TO 21.0 FEET

CLEVELAND HARBOR
OHIO

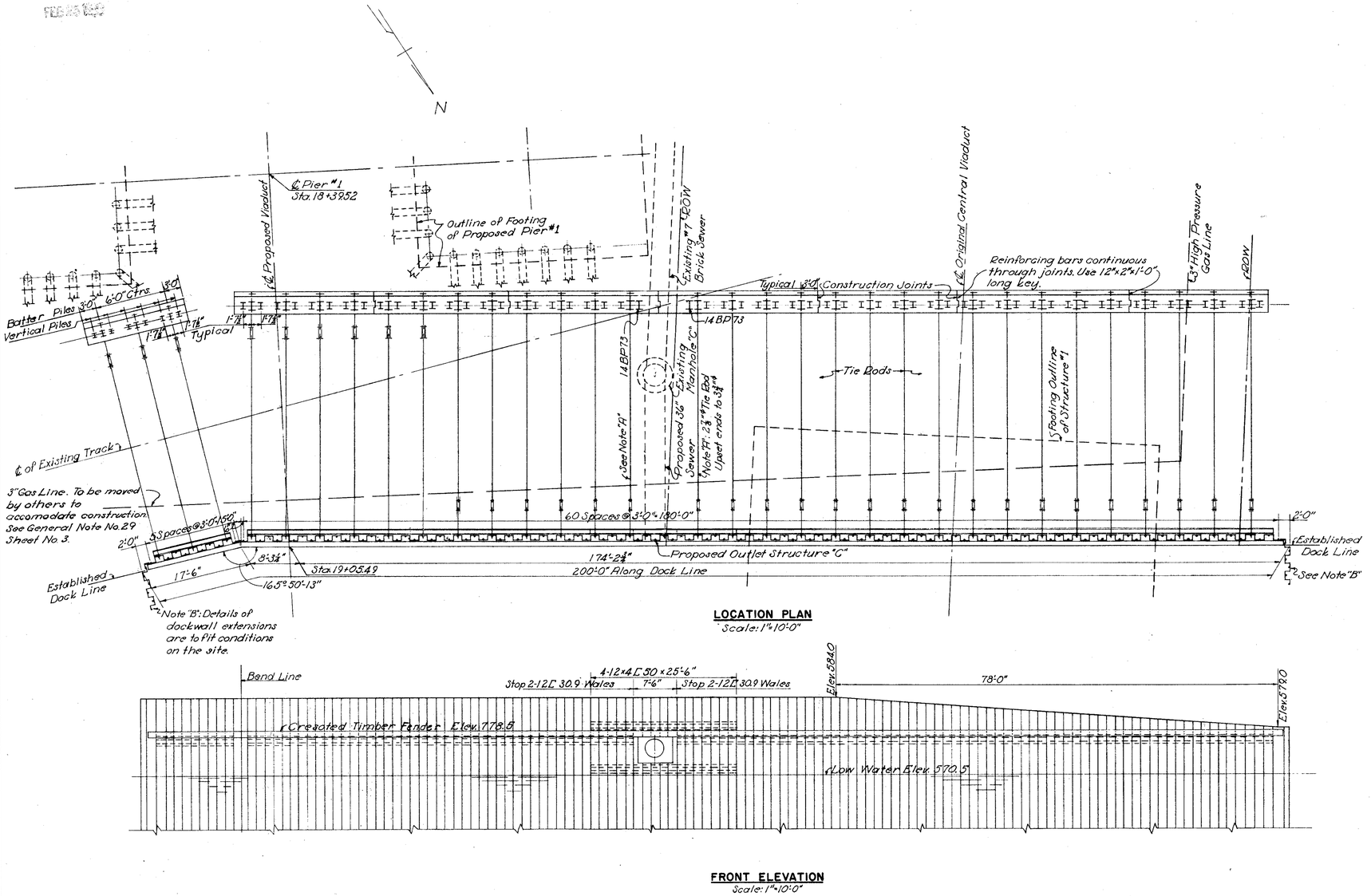
SCALE OF FEET
1000 0 1000 2000

U.S. ARMY ENGINEER DISTRICT BUFFALO
MAY 2000

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	TYPE FUNDS
2	OHIO	UI 1057 (4)	

38
43

CUYAHOGA COUNTY
CITY OF CLEVELAND
INNER BELT FREEWAY
CENTRAL VIADUCT
CUY-42R-17.50

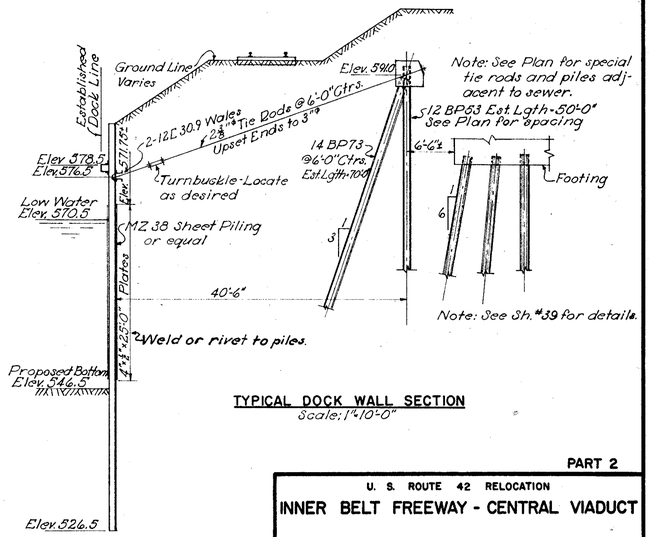


LOCATION PLAN
Scale: 1"=10'-0"

FRONT ELEVATION
Scale: 1"=10'-0"

GENERAL NOTES

All splice plates to be fillet welded in shop to structural members.
All bolted connections, including anchor rods, shall have the threads jammed to form a definite lock.
The concrete anchor pile cap must be constructed in sections. Bar splices for the six construction joints shown are included in the estimated quantities. Locations may be shifted to any typical position.



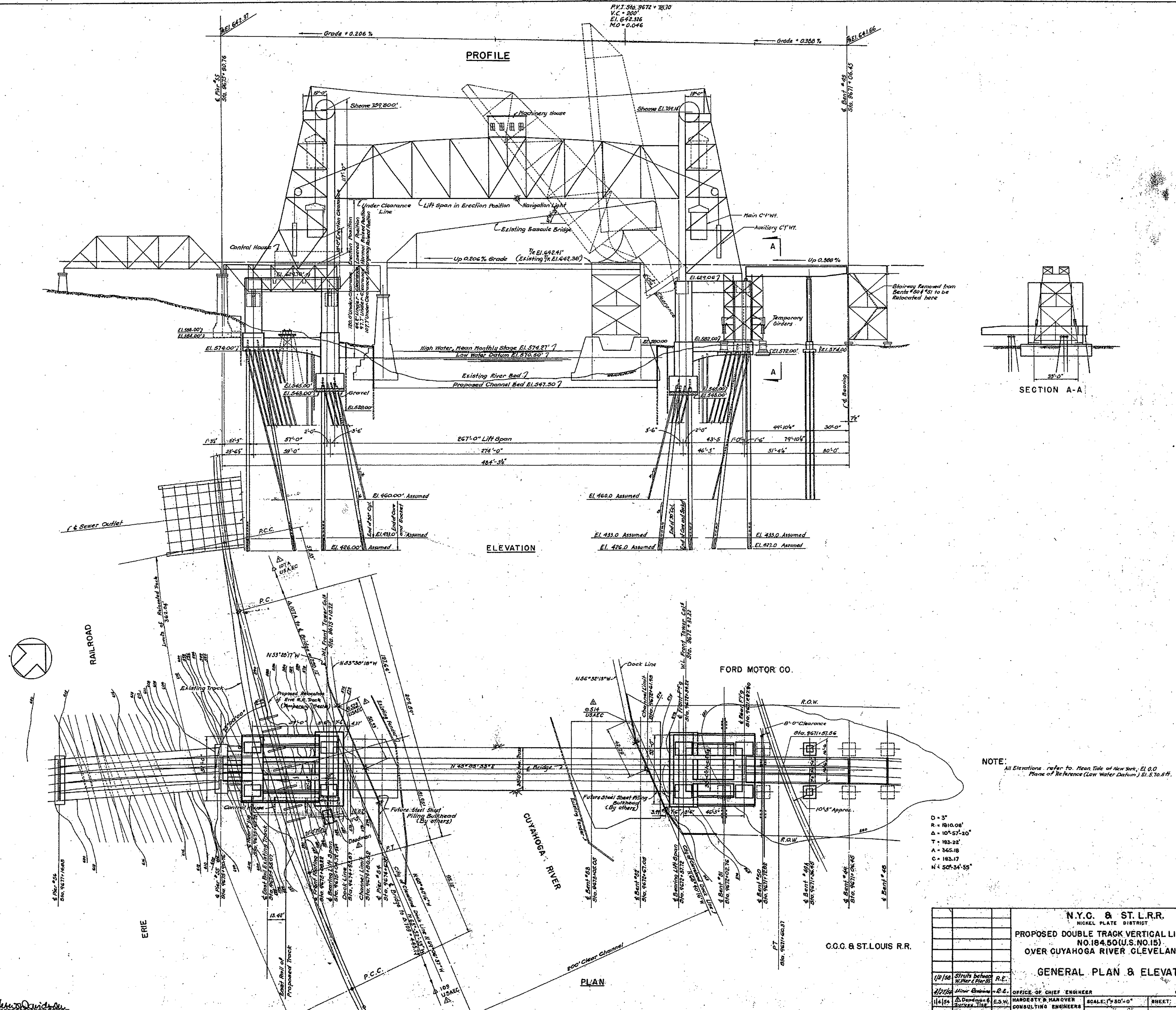
TYPICAL DOCK WALL SECTION
Scale: 1"=10'-0"

PART 2

U. S. ROUTE 42 RELOCATION
INNER BELT FREEWAY - CENTRAL VIADUCT
DOCKWALL
LOCATION PLAN AND TYPICAL SECTION
CLEVELAND CUYAHOGA COUNTY OHIO

SCALE 1"=10'-0"
MADE CJC DATE 3-31-54
TRCD. CJC DATE 4-1-54
CKD. JK DATE 8-31-54
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
914-1A SHEET- 1.38

Superseded by Sheet 38A
2-15-55



NOTE:
All Elevations refer to Mean Tide at New York, El. 0.0
Plane of Reference (Low Water Datum) El. 570.50

DRAWN G.F.F.
TRACED A.D.P.
CHECKED R.E. E.S.W.
IN CHARGE
ENGINEER IN CHARGE

DATE:	REVISIONS	BY
1/2/58	Struts between W. Pier & Pier 55	R.E.
4/27/54	Minor Revisions	R.E.
1/4/54	Δ Deadman & Survey Ties	E.S.W.

N.Y.C. & ST. L.R.R.
NICKEL PLATE DISTRICT

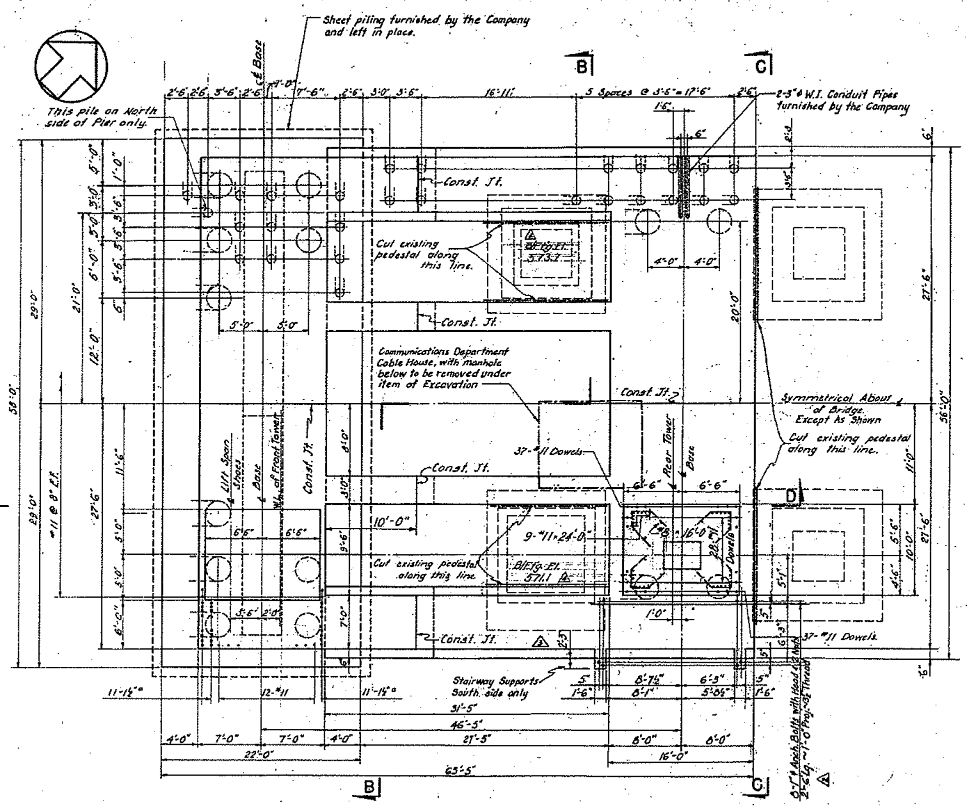
PROPOSED DOUBLE TRACK VERTICAL LIFT BRIDGE NO.184.50 (U.S. NO.15) OVER CUYAHOGA RIVER CLEVELAND, OHIO

GENERAL PLAN & ELEVATION

OFFICE OF CHIEF ENGINEER — CLEVELAND, OHIO

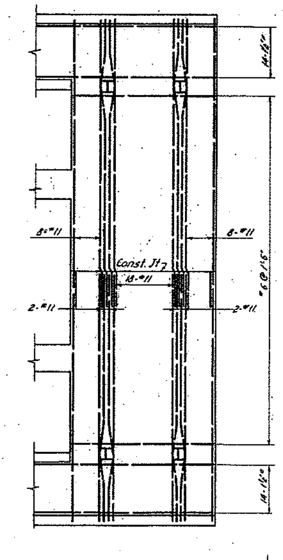
HARDESTY & HANOVER CONSULTING ENGINEERS NEW YORK, N.Y.

SCALE: 1" = 30'-0" | SHEET: 1 OF 10
DATE: DEC. 4, 1953 | NO. N - 184.50 - 631

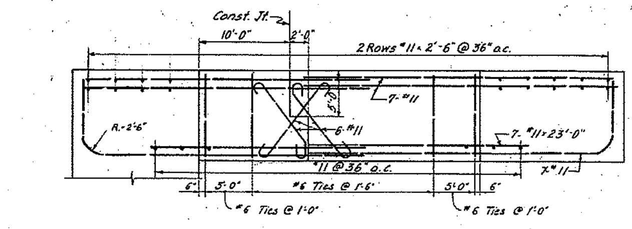


SECTION A-A

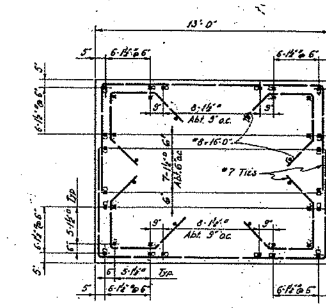
53 - 10" ϕ Pipe Piles
14 - 30" ϕ Cylinders
10 - 14 W 211 Cores - Front Base
4 - 14 W 136 Cores - Rear Base



SECTION E-E

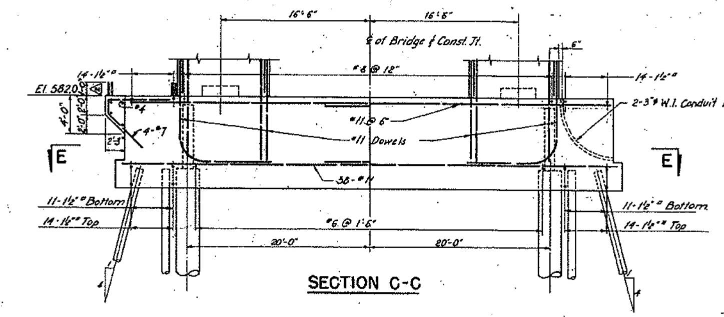


SECTION D-D

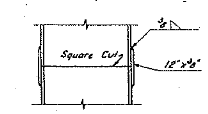


SECTION F-F

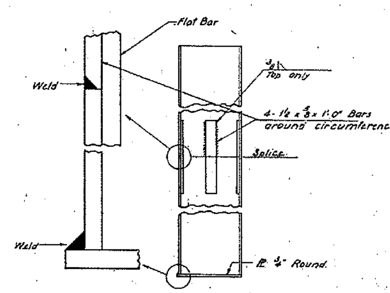
Scale: ½" = 1'-0"



SECTION C-C

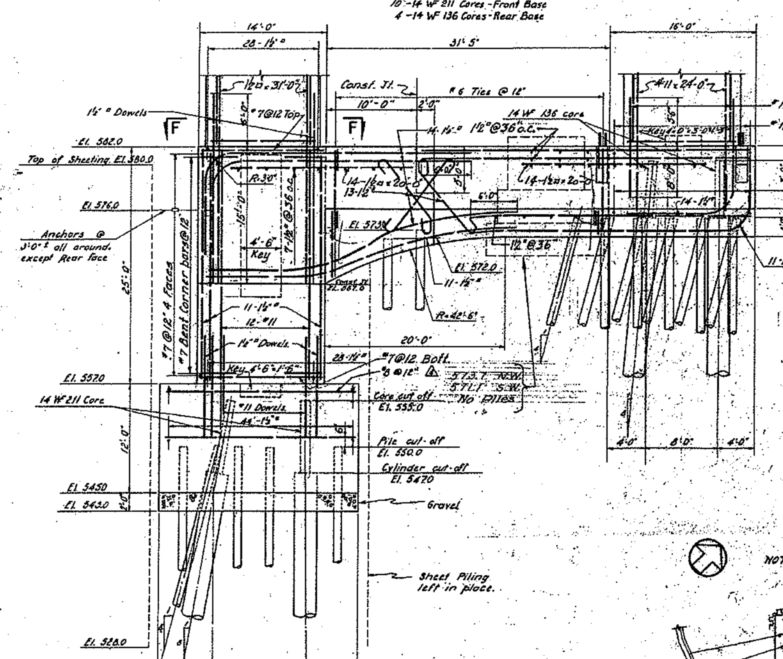


SPLICE OF 30" CYLINDER

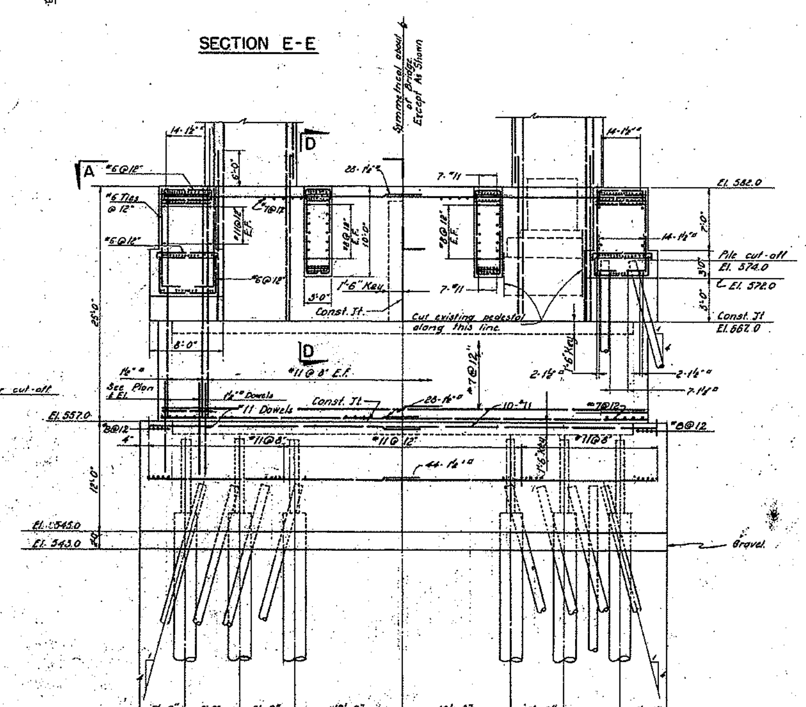


TYPICAL PILE DETAIL

Scale: 1" = 1'-0"



ELEVATION



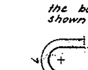
SECTION B-B

GENERAL NOTES:

1. Loading: Cooper E-63.
2. Welding in accordance with the current specifications for Welded Highway and Railway Bridges of the American Welding Society.
3. The upper surfaces of bridge seats or other bearing surfaces under metal shall be built up monolithic approximately ¼ of an inch high and after the concrete has hardened, bush hammered or ground to the exact elevations required.
4. Before setting Anchor Bolts the Contractor must verify their position with the Engineer.

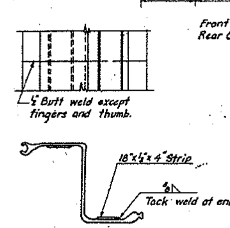
CONCRETE NOTES:

1. The minimum cover of reinforcing bars shall be 4" unless otherwise noted.
2. All dimensions are to the center of reinforcing bars and the surface of finished concrete.
3. The minimum Diameter for bends shall be 15 diameters of the bar, except for Hooks shall be of the dimensions shown in the following sketch:

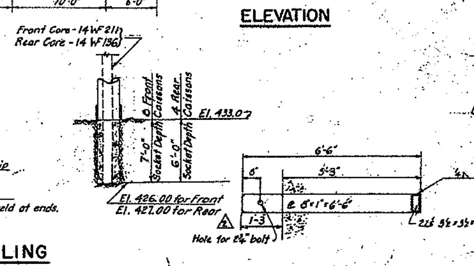


D = Not less than 6 diameters of the bar.
L = Not less than 16 diameters of the bar.

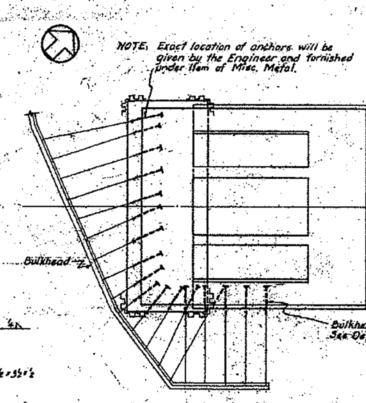
4. Bars are to be securely wired at intersections.
5. All reinforcing bars shall meet ASTM-A305-50 T
6. For splicing, the bars shall be overlapped 46 diameters for plain bars and according to specifications for deformed bars, or as shown.
7. All exposed corners of concrete are to be finished to a 1" bevel, unless otherwise shown.
8. Concrete Surfaces to be formed according to specifications.



SPLICE OF SHEET PILING

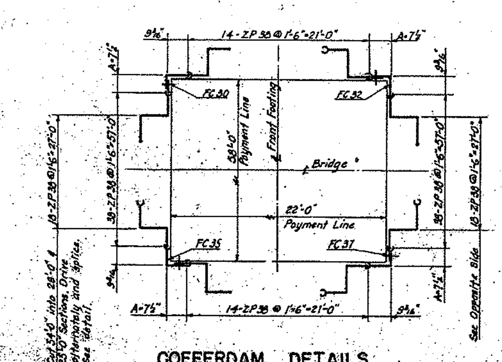


DETAIL OF BULKHEAD ANCHORS



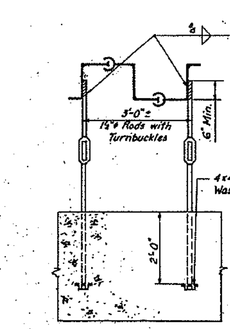
PLAN OF BULKHEAD ANCHORS

Scale: 1" = 20'-0"



COFFERDAM DETAILS

No Scale



DETAIL OF ANCHORS FOR COFFERDAM

Scale: 1" = 1'-0"

DRAWN H.H.
TRACED H.W.
CHECKED
IN CHARGE
ENGINEER IN CHARGE

DATE	REVISIONS	BY
12/22/60	B/F15 E15	J.R.S.
10/8/54	Minor Corr.	R.E.
3/24/54	Minor Corr.	R.E.
1/4/54	Bulkhead Anchor Detail added	R.E.

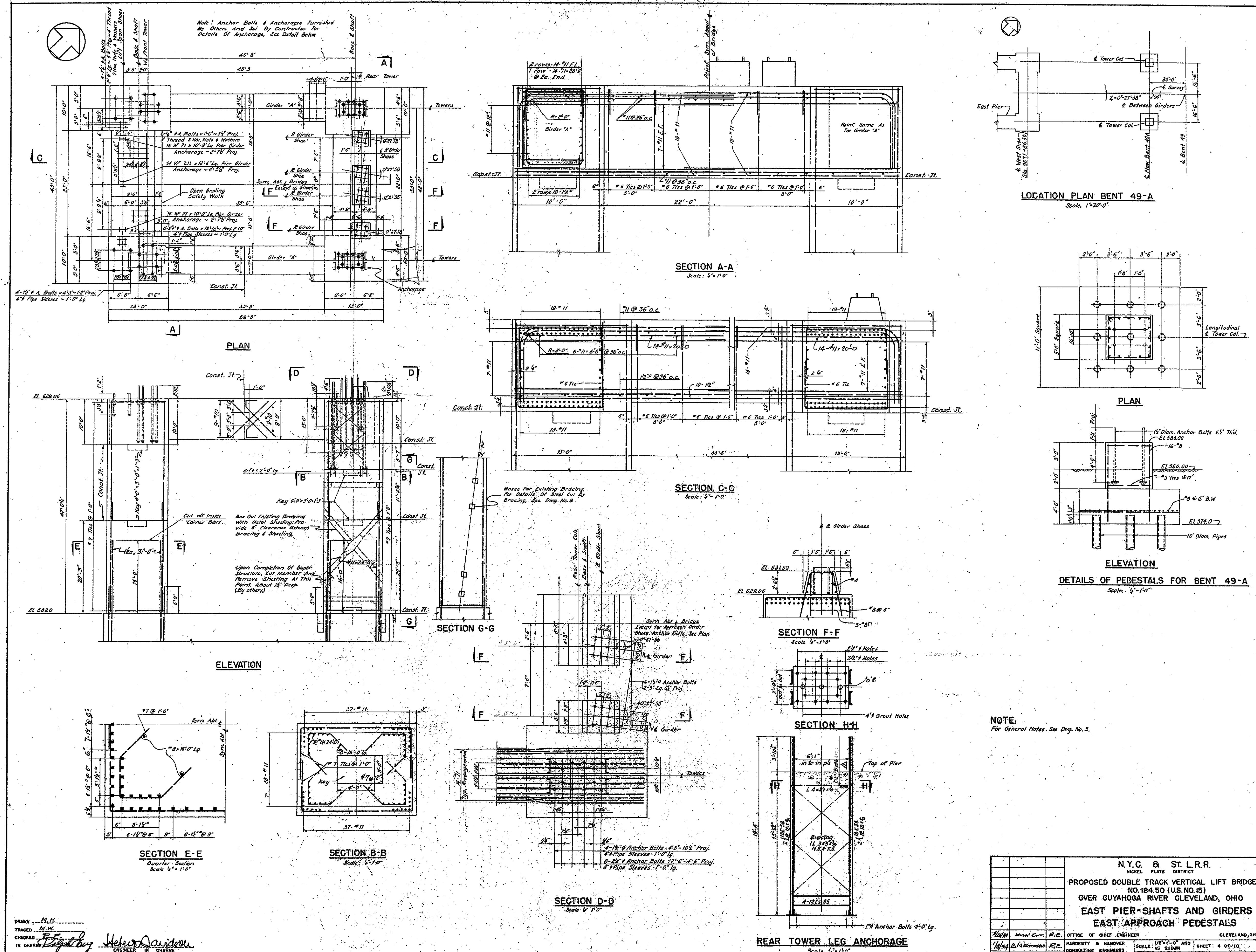
N.Y.C. & ST. L.R.R.
NICKEL PLATE DISTRICT

PROPOSED DOUBLE TRACK VERTICAL LIFT BRIDGE NO. 18450 (U.S. NO. 15) OVER CUYAHOGA RIVER CLEVELAND, OHIO

EAST PIER - BASE

OFFICE OF CHIEF ENGINEER CLEVELAND, OHIO

HARDESTY & HANOVER CONSULTING ENGINEERS NEW YORK, N.Y.	SCALE: 1/8" = 1'-0" & AS SHOWN	SHEET 3 OF 10
	DATE: DEC. 4 - 1953	NO. N. 184.50 - 851



N.Y.C. & ST. L.R.R.
NICKEL PLATE DISTRICT

PROPOSED DOUBLE TRACK VERTICAL LIFT BRIDGE
NO. 184.50 (U.S. NO. 15)
OVER CUYAHOGA RIVER CLEVELAND, OHIO

EAST PIER-SHAFTS AND GIRDERS
EAST APPROACH PEDESTALS

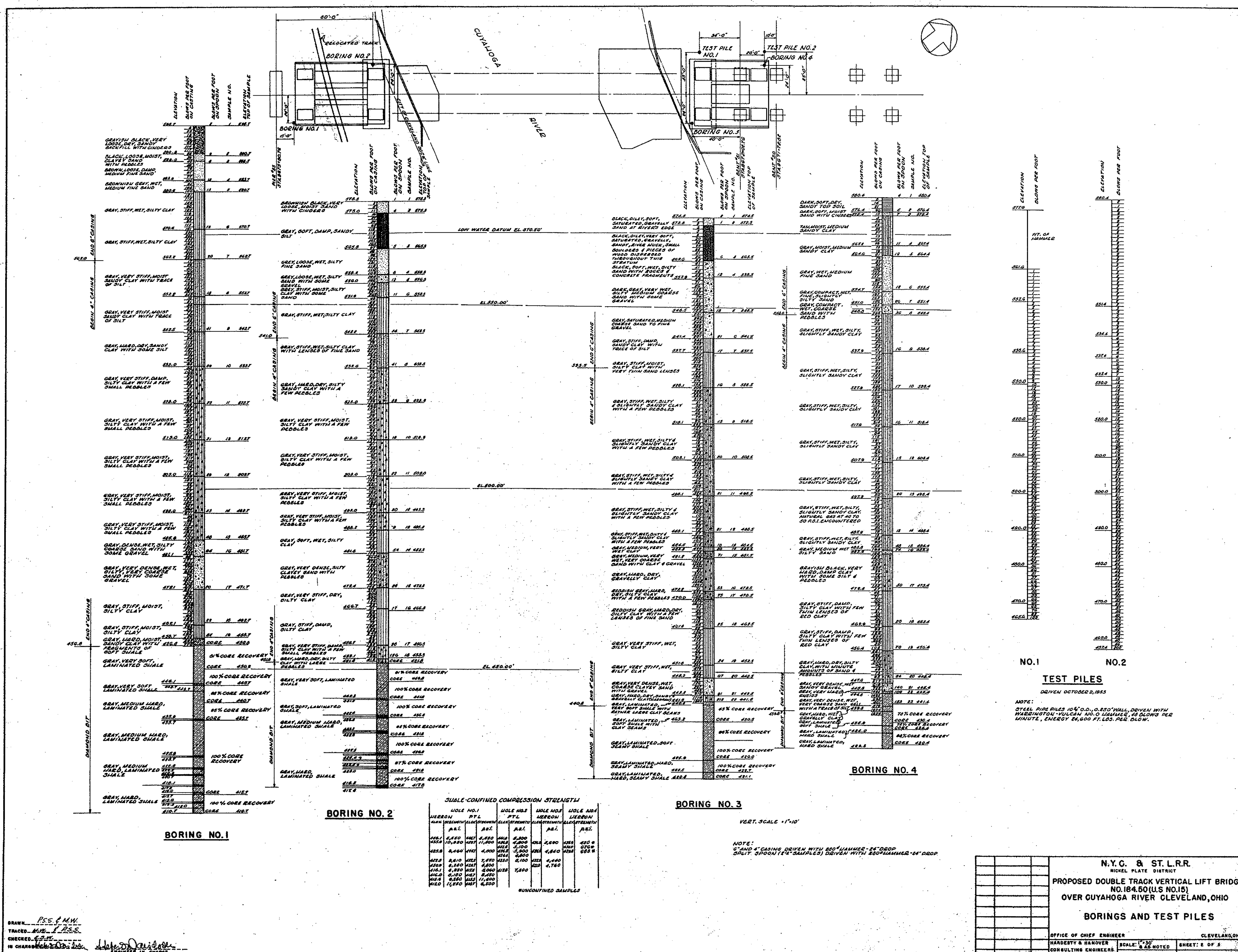
DATE	REVISIONS	BY
1/14/54	Minor Corr.	R.E.
1/4/54	Δ 1-3 Dim. added	R.E.

OFFICE OF CHIEF ENGINEER — CLEVELAND, OHIO

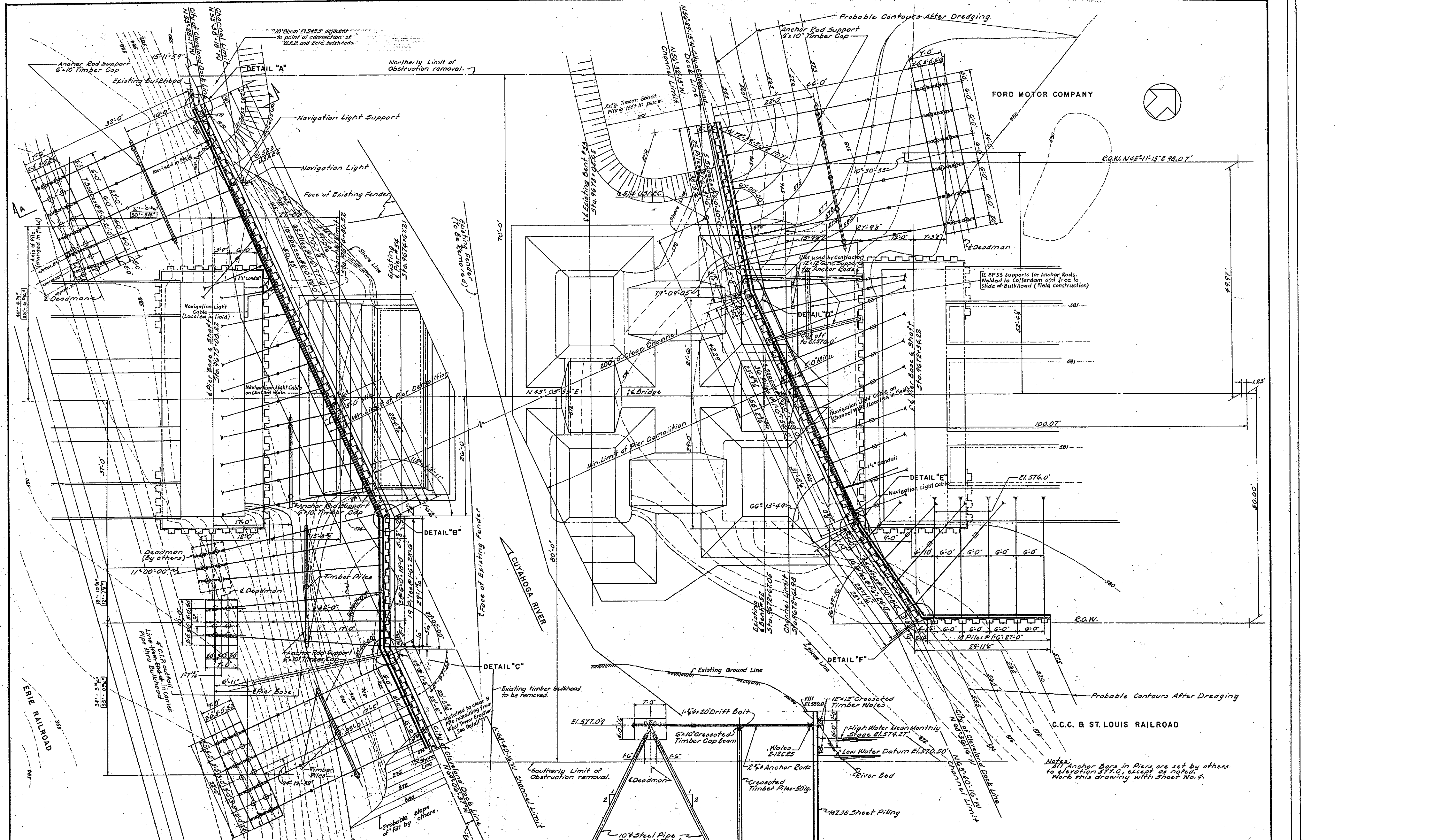
HARDESTY & HANOVER CONSULTING ENGINEERS NEW YORK, N.Y.

SCALE: 1/8"=1'-0" AND AS SHOWN — SHEET: 4 OF 10

DATE: DEC. 4-1953 — NO. N-184.50-531



CUYAHOGA
RIVER
RELOCATED TRACK
BORING NO.1
BORING NO.2
BORING NO.3
BORING NO.4
TEST PILE NO.1
TEST PILE NO.2
LOW WATER DATUM EL. 570.50'
EL. 550.00'
EL. 500.00'
EL. 450.00'
BORING NO.1
BORING NO.2
BORING NO.3
BORING NO.4
SHALE-CONFINED COMPRESSION STRENGTH
*UNCONFINED SAMPLES
VERT. SCALE = 1"=10'
NOTE:
6" AND 4" CASING DRIVEN WITH 280# HAMMER - 24" DROP
SPLIT SPOON (2"Ø SAMPLES) DRIVEN WITH 280# HAMMER - 24" DROP
NO.1
NO.2
TEST PILES
DRIVEN OCTOBER 2, 1955
NOTE:
STEEL PIPE PILES 10¾" O.D., 0.250" WALL, DRIVEN WITH WARRINGTON-VULCAN NO.0 HAMMER, 48 BLOWS PER MINUTE, ENERGY 24,600 FT. LBS. PER BLOW.
N.Y.C. & ST. L.R.R.
NICKEL PLATE DISTRICT
PROPOSED DOUBLE TRACK VERTICAL LIFT BRIDGE
NO.184.50 (U.S NO.15)
OVER CUYAHOGA RIVER CLEVELAND, OHIO
BORINGS AND TEST PILES
OFFICE OF CHIEF ENGINEER
CLEVELAND, OHIO
HARDESTY & HANOVER
CONSULTING ENGINEERS
NEW YORK, N.Y.
SCALE: 1"=30' & AS NOTED
DATE: FEB. 14, 1958
SHEET: 2 OF 5
NO. H-184.50-651
DATE
REVISIONS
BY
DRAWN
TRACED
CHECKED
IN CHARGE
ENGINEER IN CHARGE



12/27/60	As-Built	L.A.S.	
DATE	REVISIONS	BY	

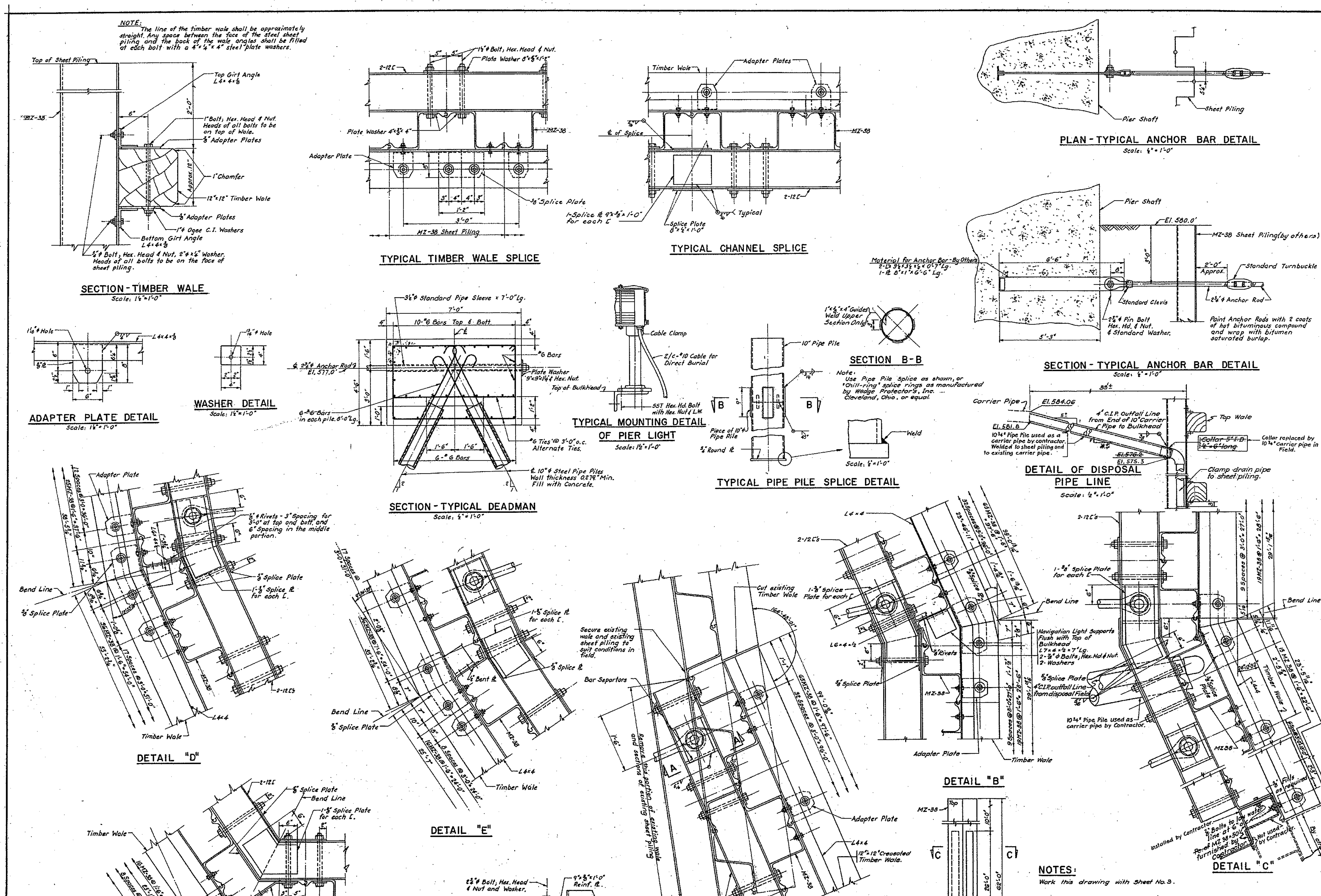
N.Y.C. & ST.L.R.R.
NICKEL PLATE DISTRICT

PROPOSED DOUBLE TRACK VERTICAL LIFT BRIDGE
NO. 184.50 (U.S. NO. 15)
OVER CUYAHOGA RIVER CLEVELAND, OHIO

PLAN OF BULKHEADS AND EXISTING RIVER PIERS

OFFICE OF CHIEF ENGINEER — CLEVELAND, OHIO

HARDESTY & HANOVER CONSULTING ENGINEERS NEW YORK, N.Y.	SCALE: 1/8" = 1'-0"	SHEET: 3 OF 5
	DATE: FEB. 14, 1958	NO. N-184.50-531



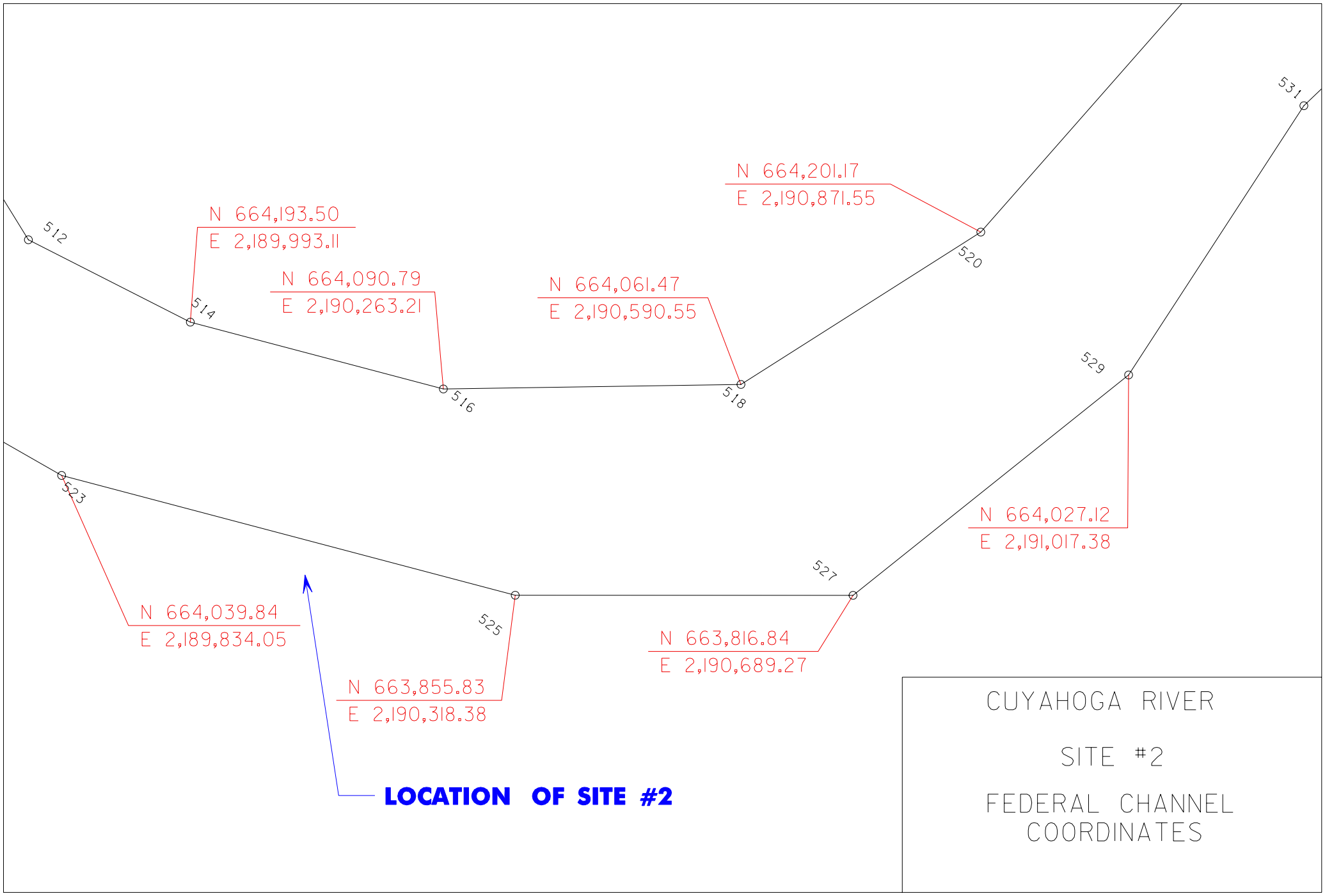
NOTE: The line of the timber wale shall be approximately straight. Any space between the face of the steel sheet piling and the back of the wale angles shall be filled at each bolt with a 4"x4"x4" steel plate washers.
SECTION - TIMBER WALE
Scale: 1½"=1'-0"
TYPICAL TIMBER WALE SPLICE
TYPICAL CHANNEL SPLICE
PLAN - TYPICAL ANCHOR BAR DETAIL
Scale: ¼"=1'-0"
SECTION - TYPICAL ANCHOR BAR DETAIL
Scale: ¼"=1'-0"
Paint Anchor Rods with 2 coats of hot bituminous compound and wrap with bitumen saturated burlap.
ADAPTER PLATE DETAIL
Scale: 1½"=1'-0"
WASHER DETAIL
Scale: 1½"=1'-0"
SECTION - TYPICAL DEADMAN
Scale: ½"=1'-0"
TYPICAL MOUNTING DETAIL OF PIER LIGHT
Scale: 1½"=1'-0"
SECTION B-B
Note: Use Pipe Pile Splice as shown, or "Chill-ring" splice rings as manufactured by Wedge Protector's, Inc. Cleveland, Ohio, or equal.
TYPICAL PIPE PILE SPLICE DETAIL
DETAIL OF DISPOSAL PIPE LINE
Scale: ½"=1'-0"
DETAIL "D"
DETAIL "E"
DETAIL "A"
Note: Detail "C" on Sheet 5 used by Contractor instead of Detail "A"
DETAIL "B"
DETAIL "C"
DETAIL "F"
SECTION A-A
SECTION C-C
Scale: 1½"=1'-0"
STEEL SHEET PILING DETAIL
Scale: ¾"=1'-0"
NOTES:
Work this drawing with Sheet No. 3.

N.Y.C. & ST. L.R.R.
NICKEL PLATE DISTRICT
PROPOSED DOUBLE TRACK VERTICAL LIFT BRIDGE
NO. 184.50 (U.S. NO. 15)
OVER CUYAHOGA RIVER CLEVELAND, OHIO
BULKHEAD DETAILS

OFFICE OF CHIEF ENGINEER — CLEVELAND, OHIO
HARDESTY & HANOVER CONSULTING ENGINEERS NEW YORK, N.Y.
SCALE: 1½"=1'-0" & AS NOTED — SHEET: 4 OF 5
DATE: FEB. 14, 1938 — NO. N-184.50-331

DATE	REVISIONS	BY

DRAWN P.S.S.
TRACED P.L.
CHECKED E.S.W.
IN CHARGE
ENGINEER IN CHARGE


512
514
516
518
520
523
525
527
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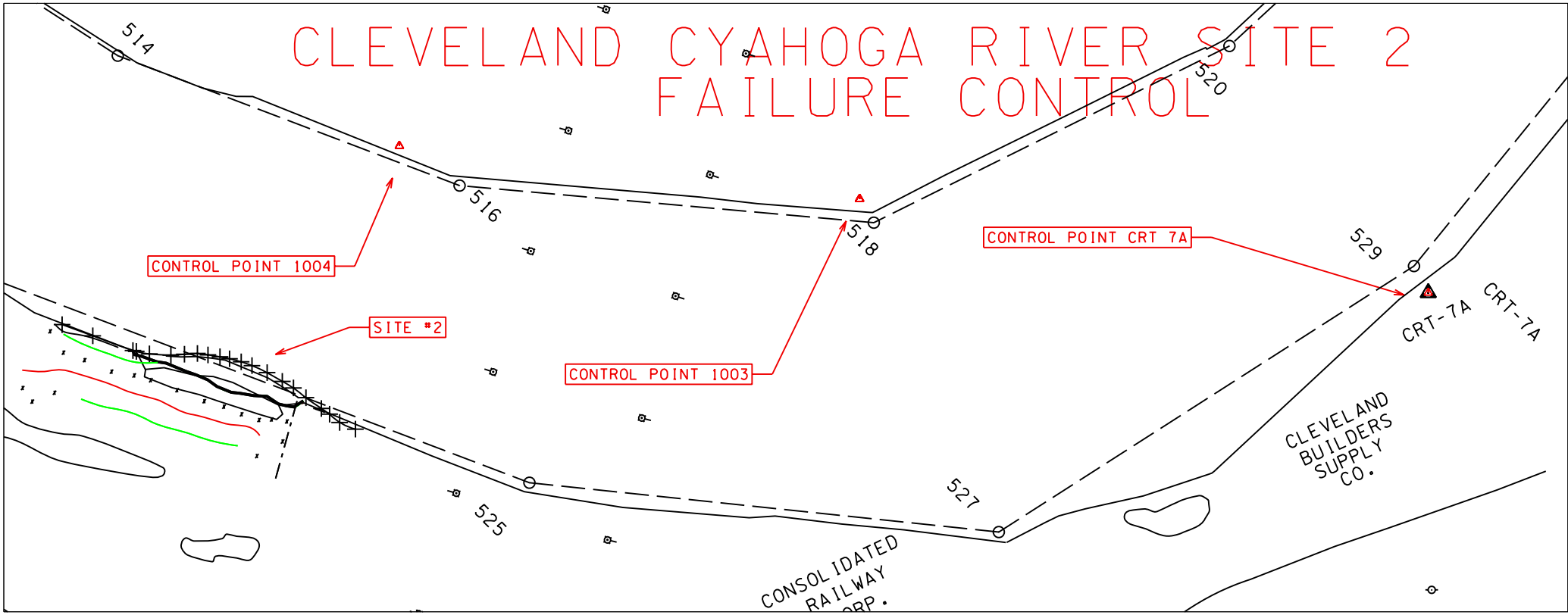
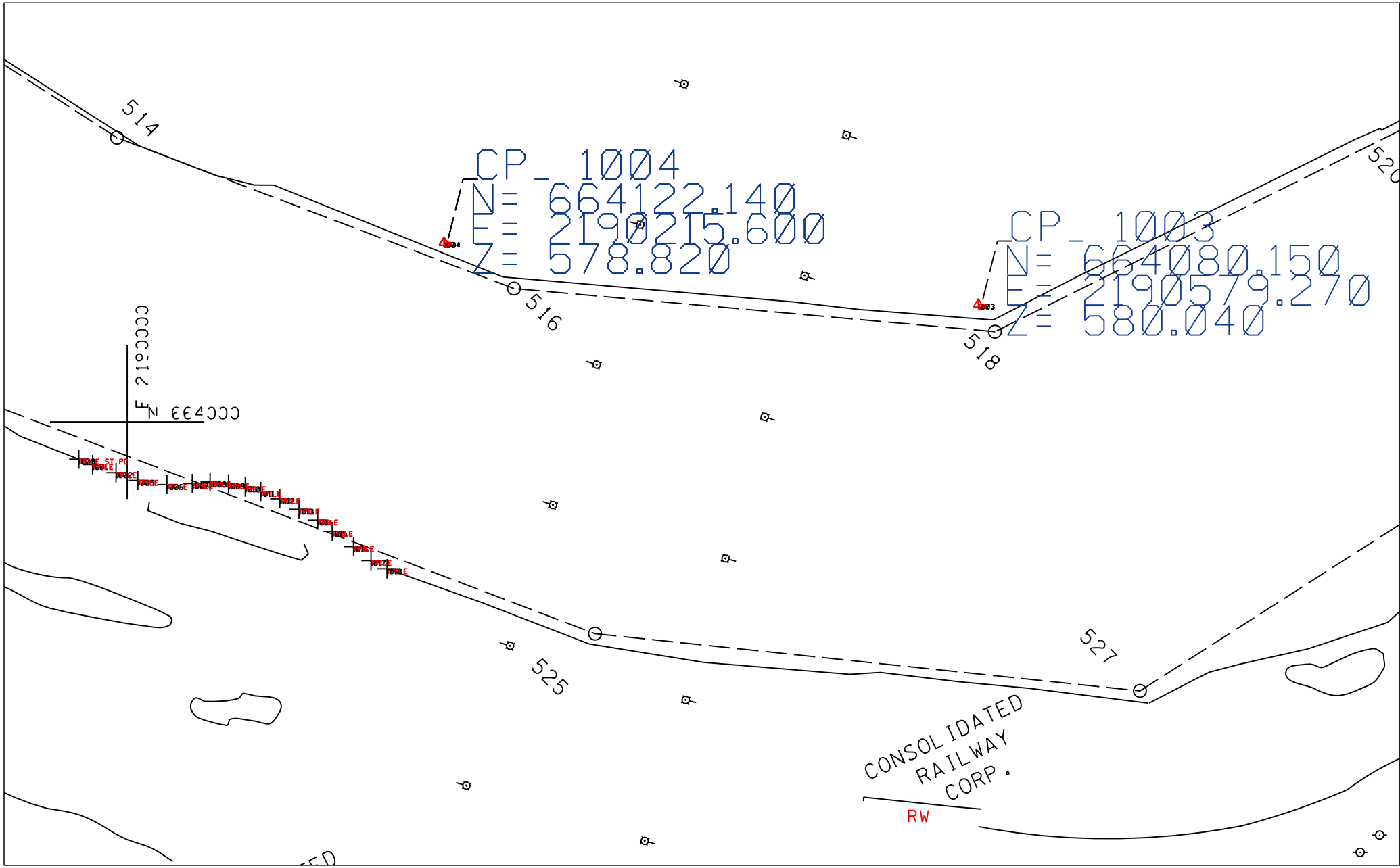
531
N 664,193.50
E 2,189,993.11
N 664,090.79
E 2,190,263.21
N 664,061.47
E 2,190,590.55
N 664,201.17
E 2,190,871.55
N 664,039.84
E 2,189,834.05
N 663,855.83
E 2,190,318.38
N 663,816.84
E 2,190,689.27
N 664,027.12
E 2,191,017.38
LOCATION OF SITE #2
CUYAHOGA RIVER
SITE #2
FEDERAL CHANNEL
COORDINATES



...\cyrSITE2(2003-2005)_failures.d 1/9/2006 1:44:14 PM



...\site2lwd(2005).dgn 1/9/2006 12:26:24 PM

CONTROL STATION RECORD

McINTOSH & McINTOSH P.C.

429 PINE STREET LOCKPORT, NEW YORK

Town CITY OF CLEVELAND County CUYAHOGA Party Chief FJD

Draftsman EMO

Job No. 6159-C Date 8-15-95 Station PT. CRT-7A Checked By RCS

Sheet No. 22 OF 43

DATUM NAD 83

LATITUDE 41°-29'-10.92625" LONGITUDE 81°-41'-16.06431"

NORTHING (Y) 202,389.443 M. EASTING (X) 667,826.870 M.

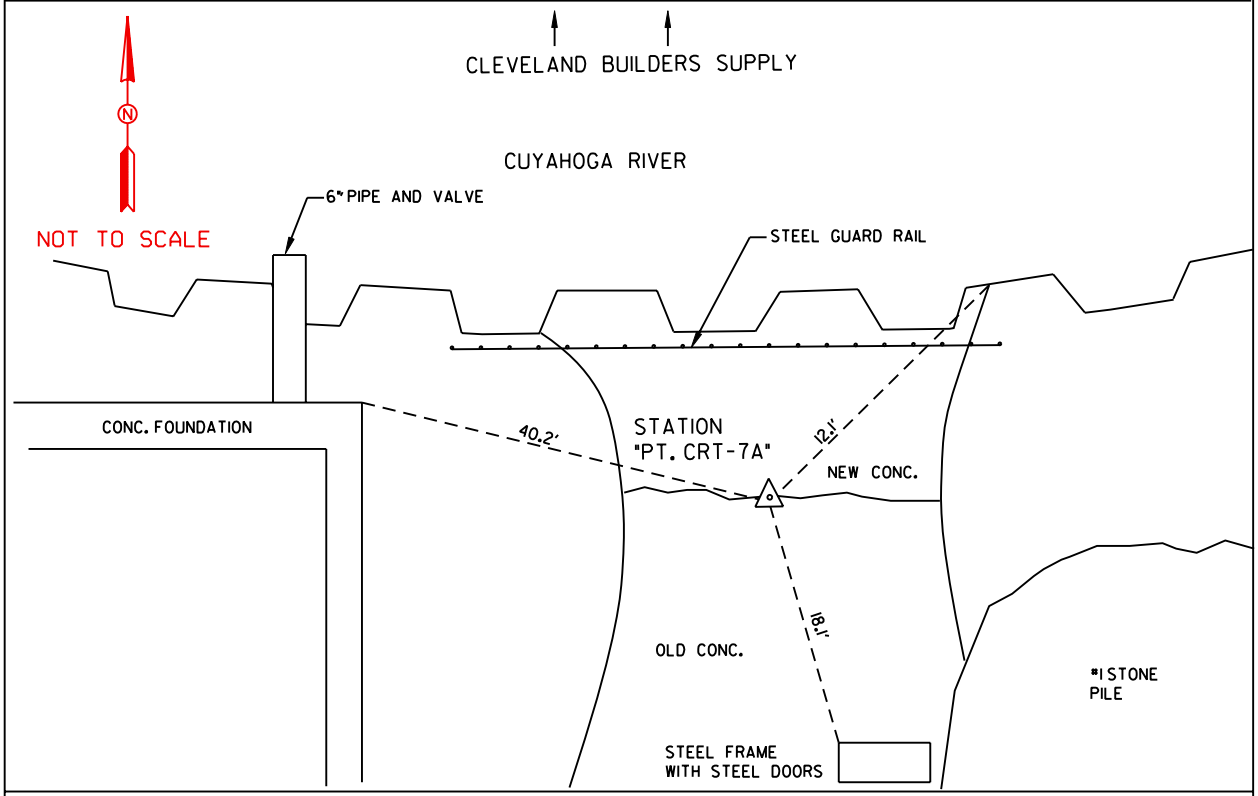
ELEVATION N.A. COORDINATE SYSTEM OHIO - NORTH ZONE

DATUM NAD 83 FEET

LATITUDE LONGITUDE

NORTHING (Y) 664,006.030 FEET EASTING (X) 2,191,028.654 FEET

ELEVATION 577.73 FEET IGLD 1985 COORDINATE SYSTEM OHIO - NORTH ZONE



STATION DESCRIPTION: STATION IS A P.K. NAIL SET IN THE JOINT BETWEEN THE NEW AND CONCRETE.

TO REACH DESCRIPTION: FROM ROUTE I-90 AND ROUTE 2, EXIT AT MARTIN LUTHER KING PKWY., TRAVEL NORTH TO GORDON PARK MUNICIPAL BOAT DOCKS, ACCESS BY BOAT. TRAVEL WEST THROUGH THE EAST BASIN TO THE CUYAHOGA RIVER. TRAVEL UP THE RIVER FOR ±2 MILES. STATION IS ON THE SOUTH SIDE OF THE RIVER ACROSS FROM CLEVELAND BUILDERS SUPPLY.

SURVEYING METHOD		ALL TIES	
GPS [X]	CONVENTIONAL [ ]	DIRECT [X]	LEVELED [ ]

DATE 16 Jan 03 / 28 Jan 03 FILE No. Cleve – 635

PROJECT Cleveland Cuyahoga River

SURVEY BY [illegible]

NATURE OF NOTES

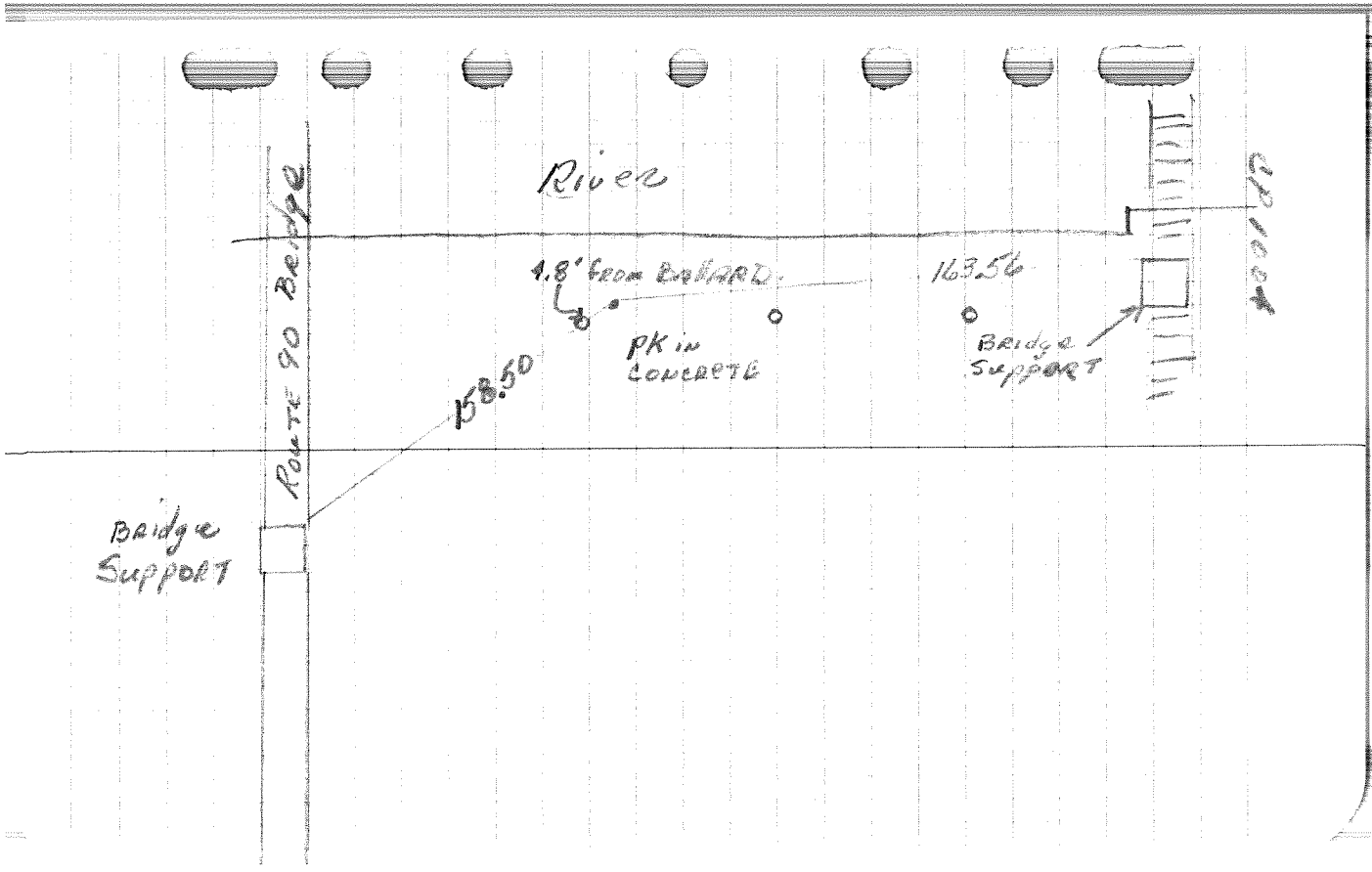
Level Run [illegible]

Ties for control Points 1003–1009

PLOTTED BY _____ MAP FILE No. _____

CP 1003

PK Top of 9Th Ballast u/s
River from NJ PR Bridge #2
Near W 3 ST Lift Bridge


River
Bridge
Route 90
1.8' from Bollard
PK in Concrete
163.56
Bridge Support
58.50
Bridge Support

U.S. WEST BREAKWATER
WEST BASIN
U.S. HARBOR LINE
N.Y.C.R.R.
ORIGINAL ℄ OF CLEVE. AND & TOLEDO R.R. VOL. 13 PAGE 19
OLD RIVER BED & SHIP CHANNEL
O.L. 31
O.L. 50
DIVISION AVE. N.W. 66'
CRESCENT AVE. N.W. 66'
W. 58 ST.
W. 54 ST. 66'
W. 53 ST. 50'
W. 45 ST. 66'
W. 29 ST. 66'
RIVER RD.
FRONT AVE. N.W. 80'
W. 11 PL. 50'
W. 10 ST. 50'
W. 9 ST. 99'
MAIN AVE. N.W. 40'
ST. CLAIR AVE. N.W.
SUPERIOR AVE. N.W.
N.Y.C. R.R. BRIDGE
ALBERT ST.
LLOYD ST.
TOLEDO
WILLOW ST. BRIDGE
RIVERBED ST.
SYCAMORE ST. N.W. 66'
ELM ST. N.W. 66'
CENTER ST. N.W. 66'
MULBERRY ST. N.W. 66'
HEMLOCK AVE. N.W. 66'
SPRUCE AVE. N.W. 66'
MAIN AVE. N.W. 80'
WINSLOW AVE. N.W. 66'
WASHINGTON AVE. N.W.
CATHAN ST. N.W. 40'
W. 25 ST. 60'
SUPERIOR VIADUCT
DETROIT
DETROIT AVE. N.W. 66
HIGH LEVEL BRIDGE
MERWIN ST. N.W. 60'
JAMES ST. N.W.
COLUMBUS RD. RAMP
WEST ST. N.W. 50'
COLUMBUS RD.
LEONARD ST. N.W. 20'
SIMMS ST. N.W. 50
FALL ST. N.W. 50'
FRENCH ST. N.W. 50'
BRITISH ST. N.W. 50'
"A" See Detail
Proposed Dock Line
Established Dock Line
RIVERBED ST. N.W. 60'
CANAL RD. N.W.
℄ W. 3 ST.
C.C. Base Line
LIME ST. N.W. 60
CARTER RD. N.W. 60'
C.C.C. & ST. L. R.R.
CANAL ST.
W. 3 ST. 70'
W. 4 ST. 50'
STONES LEVEE SW. 70'
W. 7 ST. 50
CENTRAL AVE. SW. 66'
RT. OF WAY 100'
SCRANTON RD. 60'
CARTER RD. N.W. 35'
LEONARD ST. N.W. 50'
VOLTAIRE ST. N.W. 30'
GIRARD ST. N.W. 50'
HUME ST. N.W. 30
"B" See Detail
ERIE RD. 50'
UNIVERSITY RD. SW. 60'
FRANKLIN AVE. N.W. 60'
COLUMBUS RD.
W. 20 ST. 66
W. 19 ST. 40
LORAIN AVE.
W. 18 ST. 60
W. 19 ST. 60
W. 17 ST.
BRADFORD AVE. SW. 50'
MOORE AVE. N.W. 66'
MERWIN ST. N.W. 60'
BRITISH ST. N.W. 50'
Est. Dock Line
Prop. Dock Line
Detail at "A"
Scale 1" = 40'
MERWIN ST. N.W. 60'
Stone
Prop. Dock Line
Est. Dock Line
The City of Cleveland
Temporary Bulkhead
Detail at "B"
Scale 1" = 40'
N
CITY OF CLEVELAND
DIVISION OF ENGINEERING & CONSTRUCTION
CUYAHOGA RIVER
DOCK LINE MAP
SHEET No. 1 OF 3
SCALE 1" = 200' DEC. 1941
J.B.
C-35-M

C-52-5-

CITY OF CLEVELAND

DIVISION OF ENGINEERING & CONSTRUCTION

CUYAHOGA RIVER

DOCK LINE MAP

SHEET No. 2 OF 3

SCALE 1"=200' DEC. 1941

J.B.