STATE OF OHIO
DEPARTMENT OF HIGHWAYS

U-687(6)

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS	1
2	OHIO	U-687(6)	POST WAR	44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

Additions made to this Sheet 6-7-50 C.A.S.

Part-2-

AKRON EXPRESSWAY SYSTEM

SUM-5-12.31
SUMMIT COUNTY
CITY OF AKRON

PART 2 - MAIN VIADUCT SUPERSTRUCTURE

INDEX OF SHEETS

APPROVED _____
DATE 5/19/50 DIRECTOR OF PUBLIC SERVICE, CITY OF AKRON

APPROVED F.J. Bishop
DATE 5/19/50 CHIEF ENGINEER, A.C.&Y. RAILROAD

APPROVED I.H. Shream
DATE 5/22/50 CHIEF ENGINEER, ERIE RAILROAD

APPROVED D.L. Sommerville
DATE 5/18/50 CHIEF ENGINEER, PENNSYLVANIA RAILROAD

APPROVED A.L. Clarke
DATE 5/19/50 CHIEF ENGINEER, B. & O. RAILROAD

LINE DATA

BEGIN PART 2	STA. 24+85.75
END PART 2	STA. 40+68.50
NET LENGTH PART 2	1582.75 FT. OR 0.300 MI.

PREPARED AND RECOMMENDED BY

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

K.H. Bergendoff

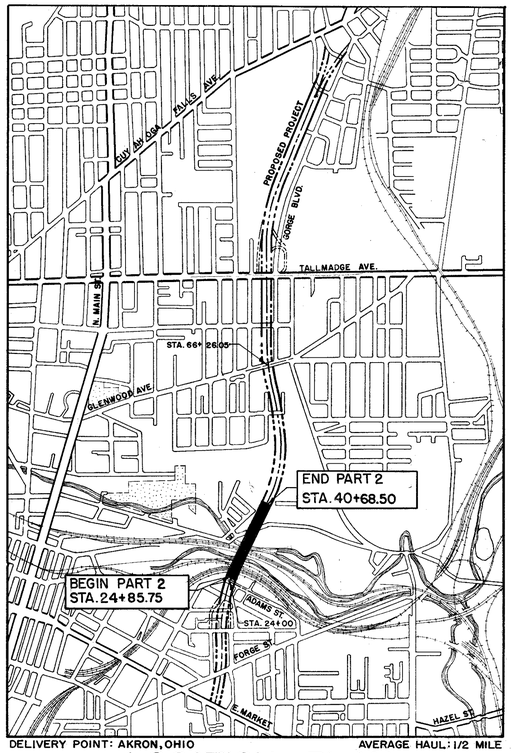
STATE OF OHIO K.H. BERGENDOFF 11867 REGISTERED PROFESSIONAL ENGINEER

FILE NO.	SUMMIT COUNTY
	SEC. SUM-5-12.31, PART 2
	DATE OF LETTING _____, 195__
	CONTRACT NO. _____

NOTE:
THIS SET OF PLANS, THE SUPERSTRUCTURE OF THE MAIN VIADUCT, COVERS ONLY PART 2 OF THIS PROJECT. PART 1, THE SUBSTRUCTURE OF THE MAIN VIADUCT, IS IN AN EARLIER CONTRACT, AND THE CONTIGUOUS HIGHWAY WORK WILL BE LET LATER.

SUPPLEMENTAL SPECIFICATIONS

NUMBER	DATE
19 REV.	3-20-50
M-206.14	7-15-49



DELIVERY POINT: AKRON, OHIO AVERAGE HAUL: 1/2 MILE

LOCATION PLAN

0' 1000' 2000' 4000'
0" 3/4" 1 1/2" 3"
SCALE IN FEET

PORTION TO BE IMPROVED
STATE HIGHWAYS
OTHER HIGHWAYS

N

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO DEPARTMENT OF HIGHWAYS, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH IN THE PLANS AND ESTIMATE.

THE RIGHT OF WAY FOR THIS IMPROVEMENT WILL BE PROVIDED BY THE STATE OF OHIO.

APPROVED W. L. Fessler
DATE 5/20/1950 DIVISION DEPUTY DIRECTOR

APPROVED _____
DATE _____ CHIEF ENGINEER, BUREAU OF MAINTENANCE

APPROVED _____
DATE _____ CHIEF ENGINEER, BUREAU OF BRIDGES & R.R. CROSSINGS

APPROVED _____
DATE 5-10-50 CHIEF ENGINEER, BUREAU OF LOCATION & DESIGN

APPROVED _____
DATE 5-10-50 FIRST ASSISTANT DIRECTOR & CHIEF ENGINEER

APPROVED _____
DATE 5-11-50 DIRECTOR OF HIGHWAYS

CONSTRUCTION BUREAU OCT 27 1955 GROUND PHOTO LAB

STANDARD DRAWINGS

NUMBER	DATE
I-1,2,3,4&5	2-20-45

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

RECOMMENDED FOR APPROVAL

_____ _____
DISTRICT ENGINEER DATE

APPROVED

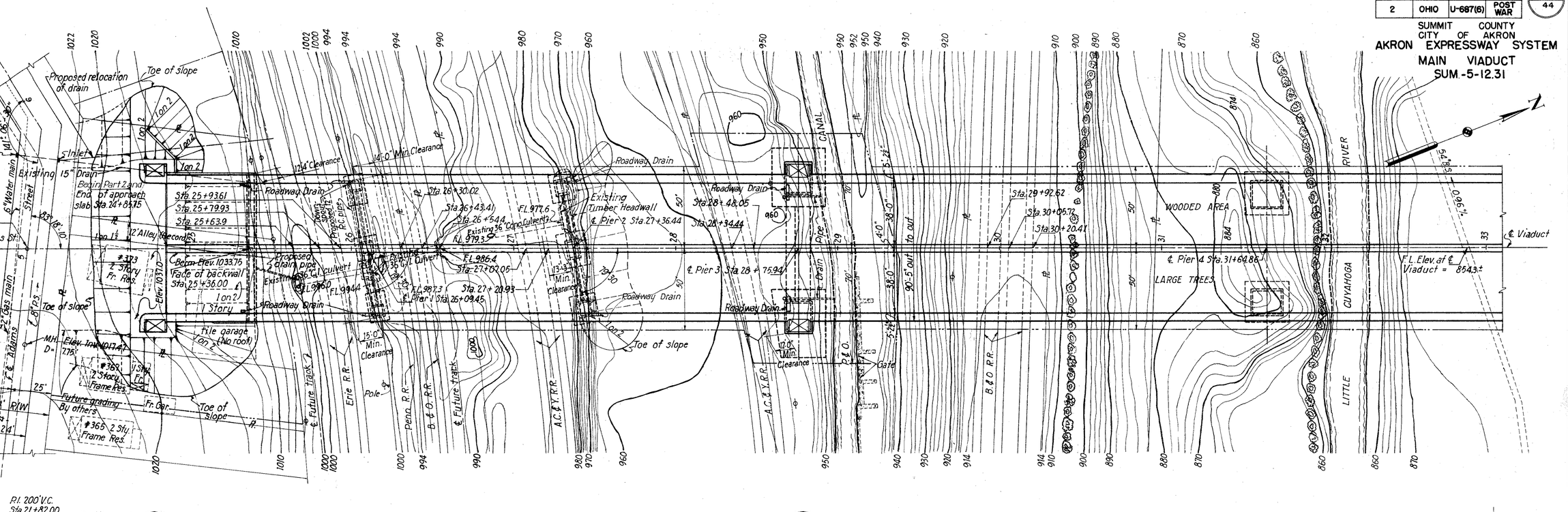
_____ _____
DIVISION ENGINEER DATE

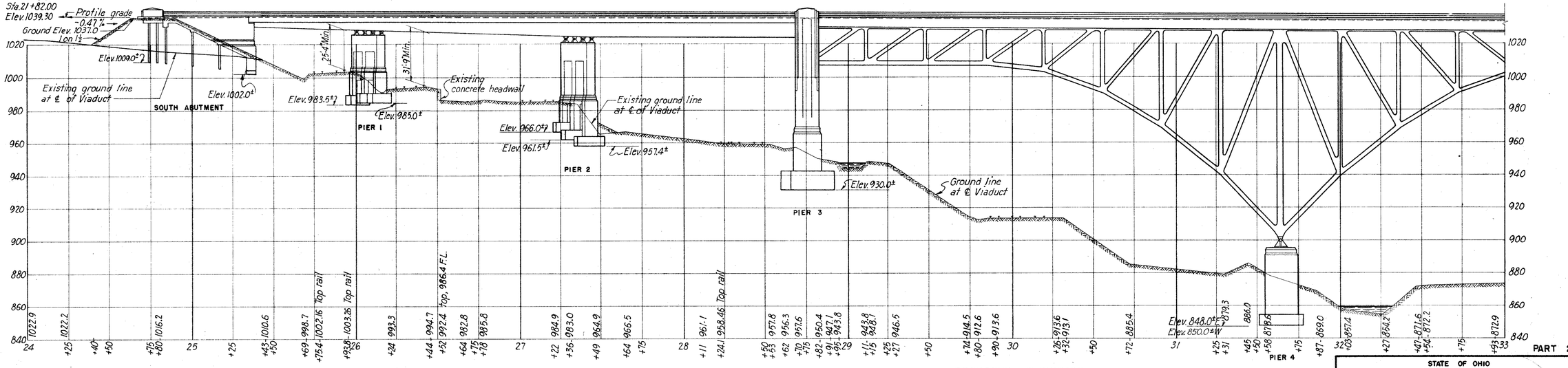
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

2
44

SUMMIT COUNTY
CITY OF AKRON

AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM.-5-12.31





PROPOSED STRUCTURE

Type - Deck trusses on low piers with continuous girder approaches.
Spans - Unit 1 - 3 span continuous deck girder 72'-127'-135' center to center bearings.
Unit 2 - 3 span continuous deck truss 288'-360'-288' center to center bearings.
Unit 3 - 2 span continuous deck girder 110'-110' center to center bearings.
Roadway - 2-38' roadways, 4' median, 2-3' sidewalks.
Loading - Standard specifications of the State of Ohio, Department of Highways - 3-20-46. (Revised)
Skew - 10°30' for Piers 1 and 2.
Surface course - 2½" asphaltic concrete surface course.
Bridge Alignment - Tangent

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU.-5-124

SITE PLAN

AKRON, SUMMIT COUNTY, OHIO

SCALE 1"=30'
MADE G.M. DATE 7-12-49
TRCD. R.R. DATE 7-18-49
CHKD. R.R.M. DATE 7-20-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

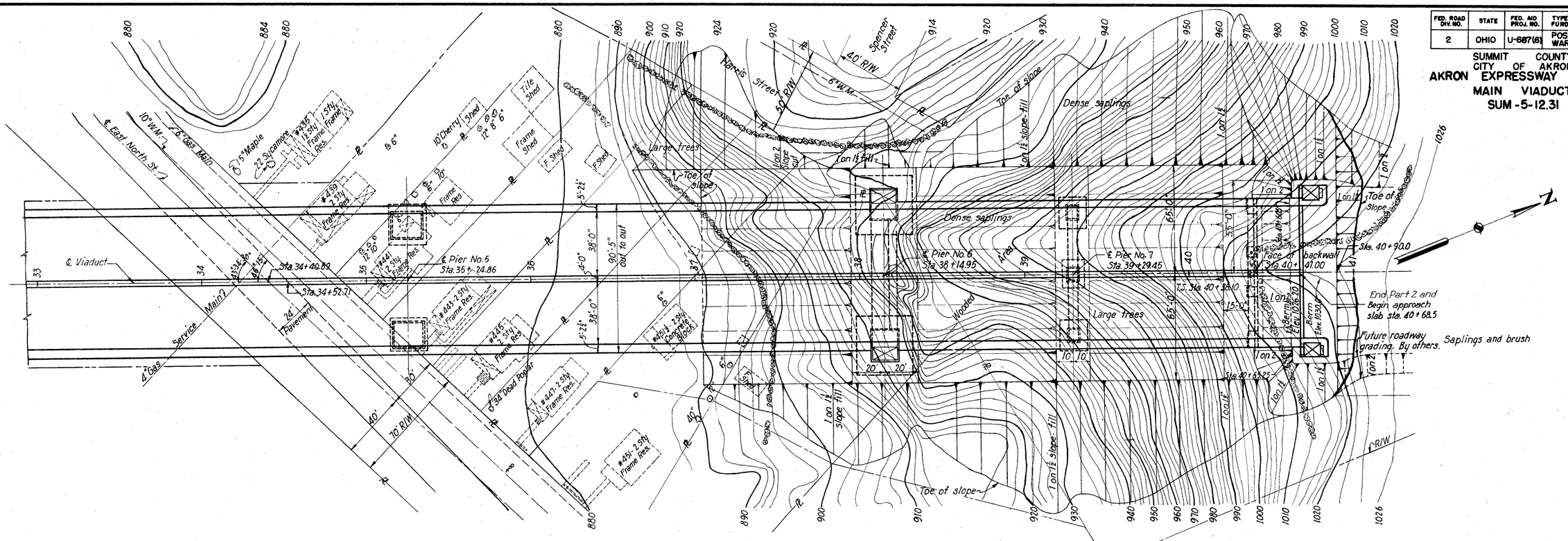
766 SHEET V36

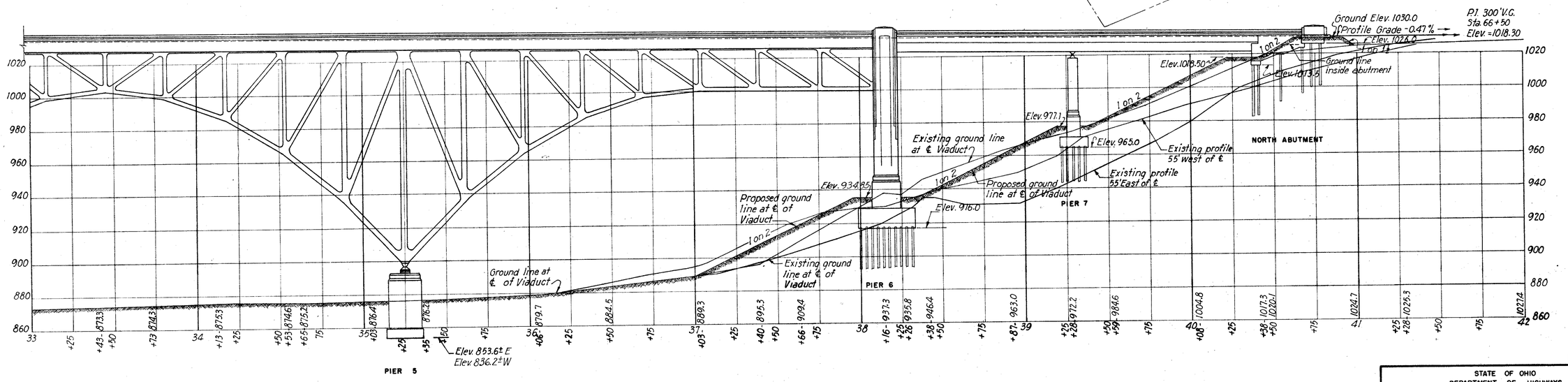
102

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

3
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31





PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU.-5-124

SITE PLAN

AKRON, SUMMIT COUNTY, OHIO

SCALE 1" = 30'
MADE R.R.M. DATE 7-11-49
TRCD. G.O.R. DATE 7-14-49
CHKD. G.M. DATE 7-18-49

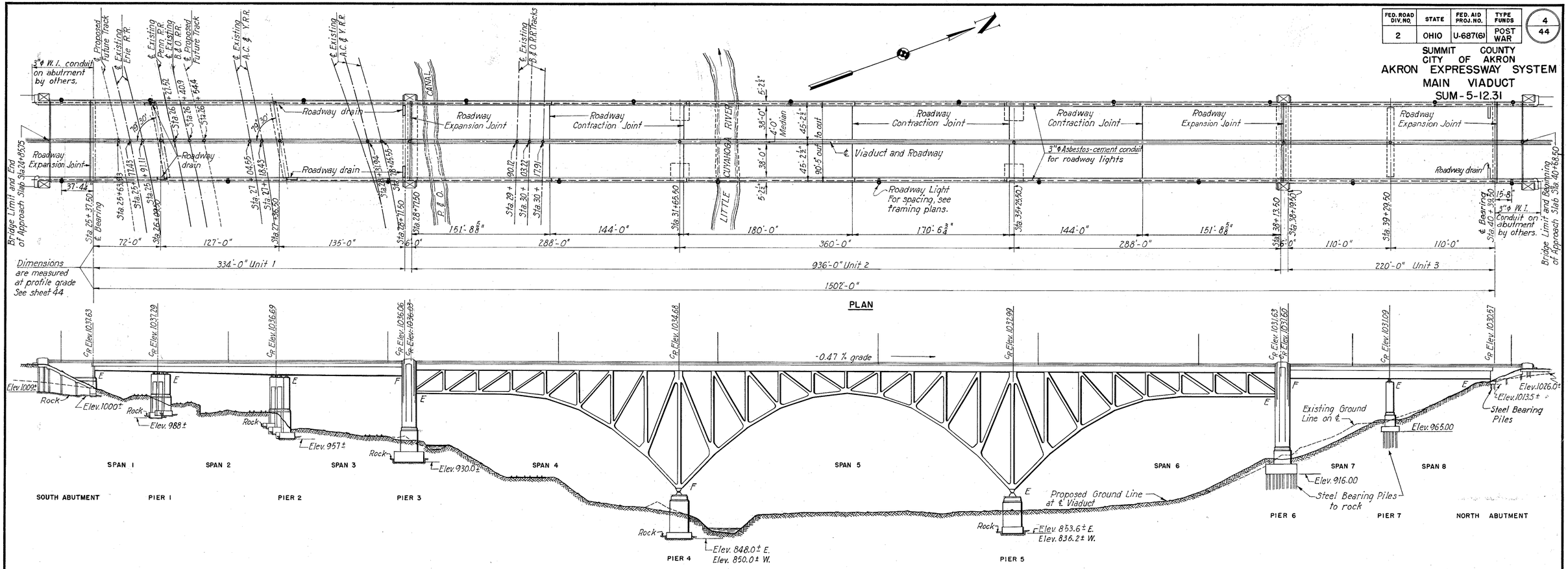
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V 37

103

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS	4 / 44
2	OHIO	U-687(6)	POST WAR	

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



PLAN

ELEVATION

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE								
Item	Description	So. Abut.	Unit 1	Unit 2	Unit 3	No. Abut.	Unit	Total
S-1	Class "C" Concrete	5	678	1822	432	5	Cu. Yds.	2,942
S-3	Type "C" Waterproofing	418	2,814	7,857	1860	227	Sq. Yds.	13,176
S-4	Reinforcing Steel		194,780	549,780	127,430	460⊕	Lbs.	872,450
S-7	Structural Steel +	15,200	1,650,000	7,575,400	1,032,500	14,500	Lbs.	10,287,600
S-8	Field Painting of Structural Steel +						Lbs.	10,287,600
S-14	Handrail, Steel	102	668	1,852	440	58	Lin. Ft.	3,120
S-25	Roadway Lighting Equipment						Lump	Lump Sum
S-26	Name Plates, Bronze						Lump	Lump Sum
S-29	Roadway Drains *						Lump	Lump Sum
S-29	Sub-drainage for Wearing Surface Course on Abutments	985				51	Lin. Ft.	1495
T50	2½" Hot-mixed, Hot-laid Asphaltic Concrete Surface Course, Type "B" (60-70)	412	2,785	7,753	1841	224	Sq. Yds.	13,015
SS-19	White Concrete Reflecting Median Strip	100	672	1,880	444	54	Lin. Ft.	3,150
S-25	Electrical Grounds for Superstructure Metalwork						Lump	Lump Sum

+ Includes all metals listed under Superstructure Metalwork on sheet 5 of this set of plans.
* Includes roadway inlets, gratings, downspouts, fastenings and accessories shown on these plans.
⊕ Replacement bars.

Note: ℄R Elevs. are crown of roadway elevations along profile grade. See sheet 10.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124
GENERAL PLAN AND ELEVATION
AND ESTIMATED QUANTITIES
AKRON, SUMMIT COUNTY, OHIO

SCALE 1"=30'.... HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE D.L.S.-M.E. DATE 5-5-49. CONSULTING ENGINEERS
TRCD. B.R. DATE 10-28-49. KANSAS CITY NEW YORK
CHKD. A.C.A. DATE 6-23-49.
766 SHEET V38

101

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

NOTES

SUPERSTRUCTURE WORK REQUIRED ON THE ABUTMENTS INCLUDES RAILING, LIGHTING STANDARDS AND BRACKETS, WATERPROOFING OF ROADWAY SLABS, ASPHALTIC CONCRETE SURFACE COURSE, DRAINAGE ANGLES ALONG GUTTERS OVER DRAIN TUBES, STEEL CURBS, FINGERED EXPANSION JOINTS, NAME PLATES, WHITE CONCRETE MEDIAN STRIPS AND CONCRETE FOR FILLING RECESSES FOR EXPANSION JOINTS AND CURB POSTS LEFT BY THE CONTRACTOR FOR SUBSTRUCTURE.

MINIMUM TEMPORARY CONSTRUCTION CLEARANCES FOR RAILROAD TRACKS:

RAILROAD	VERTICAL CLEARANCE ABOVE TOP OF RAIL	HORIZONTAL CLEARANCE FROM CENTERLINE OF TRACK
A.C.&Y.	23'-0"	8'-0"
ERIE	21'-0"	8'-0"
PENNSYLVANIA	23'-0"	8'-8"
B.&O.	23'-0"	8'-8"

CLASS "C" CONCRETE, SUPERSTRUCTURE.

A. ALL CONCRETE FOR SUPERSTRUCTURE SHALL BE CLASS "C" INCLUDING THAT FOR TRUSS SHOE PADS DESCRIBED BELOW. MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF ITEM S-1 OF THE SPECIFICATIONS AND TO THE FOLLOWING SUPPLEMENTAL PROVISIONS.

B. CAMBER AND SCREED SETTINGS: THE CONCRETE FLOOR SLABS SHALL BE SO CONSTRUCTED THAT, AFTER COMPLETION AND AFTER REMOVAL OF FORMS AND ANY FALSEWORK, AND AFTER THE STEELWORK HAS DEFLECTED UNDER THE WEIGHT OF THE CONCRETE, THE TOP SURFACE OF THE CONCRETE FLOOR SLABS, FINISHED AS PAVEMENT BASE, SHALL CONFORM IN GRADE AND ELEVATION AS NEARLY AS PRACTICABLE TO THE GRADES AND ELEVATIONS STIPULATED IN THE PLANS, WITHOUT SAGS, HUMPS OR OTHER IRREGULARITIES. THE SUPERSTRUCTURE STEELWORK OF THE TRUSS SPANS AND SPAN 3 OF THE GIRDER SPANS WILL HAVE BEEN FABRICATED WITH CAMBER TO COMPENSATE FOR DEFLECTION DUE TO DEAD LOAD OF STEEL AND CONCRETE. FOR THESE SPANS, ADJUSTMENT OF SCREEDS FOR THE SLAB WILL BE ONLY THAT NECESSARY TO CORRECT FOR MINOR ERRORS IN FABRICATION AND FOR ANTICIPATED DEFLECTION OF STRINGERS.

C. FOR THE OTHER SPANS WHICH ARE GIRDER SPANS, THE STEELWORK AS ERECTED SHALL BE IN ACCEPTABLY CORRECT ELEVATION AT EACH ABUTMENT AND PIER AND SHALL BE SO ADJUSTED. BETWEEN SUCH SUBSTRUCTURE SUPPORTS THE STEELWORK MAY NOT BE PARALLEL TO THE SPECIFIED FINISHED GRADE LINES OF THE FLOOR BY REASON OF IRREGULARITIES OF FABRICATION AND ERECTION, AND FROM DEAD LOAD DEFLECTIONS OF THE STEELWORK. TO COMPENSATE FOR THE ADDITIONAL DEFLECTIONS OF SPANS NOT CAMBERED WHICH WILL RESULT FROM THE DEAD LOAD OF THE CONCRETE, THE SCREEDS USED TO STRIKE OFF THE TOP SURFACE OF THE CONCRETE SLAB SHALL BE SET UP WITH CAMBER SUFFICIENTLY ABOVE THE FINAL DESIRED GRADE LINE TO OFFSET SUCH DEFLECTIONS. THE CONCRETE FLOOR SLABS IN GENERAL SHALL BE OF UNIFORM THICKNESS AS SHOWN ON PLANS AND WILL BE BUILT UP TO THE DESIRED CAMBERED POSITION BY VARYING THE THICKNESSES OF THE SLAB HAUNCHES WHICH OCCUR ABOVE EACH BEAM. THE SLAB PLUS HAUNCH THICKNESSES, THAT IS, THE DISTANCES FROM THE TOP OF STEEL TO THE TOP OF THE CONCRETE FLOOR SLABS, SHOWN ON THE PLANS ARE THOSE REQUIRED IMMEDIATELY ABOVE PIERS AND ABUTMENTS. BETWEEN SUCH SUBSTRUCTURE SUPPORTS THESE HAUNCH THICKNESSES WILL VARY BOTH FOR THE IRREGULARITIES OF POSITION OF STEELWORK AND FOR THE CAMBER DESIRED.

D. THE THEORETICAL DEFLECTIONS FOR EACH SPAN ARE TABULATED ON THE PLANS. THE ALLOWANCES TO BE MADE IN SCREED SETTING TO COMPENSATE FOR THE DEFLECTIONS DUE TO THE DEAD LOAD WEIGHT OF THE CONCRETE ARE INDICATED IN THIS TABULATION; SUCH ALLOWANCES TO BE MADE ABOVE THE ELEVATIONS STIPULATED ON THE PLANS FOR FINISHED PAVEMENT SURFACES.

E. SEQUENCE OF FLOOR SLAB CONSTRUCTION: THE CONCRETE ROADWAY SLABS ON THE CONTINUOUS STEEL SPANS MUST BE POURED IN SPECIAL SEQUENCE AND MAY NOT BE POURED CONTINUOUSLY FROM ONE END OF THE STRUCTURE, OR FROM ONE END OF A SPAN TO THE OTHER. THERE ARE SHOWN ON THE PLANS SEQUENCES IN WHICH VARIOUS SECTIONS OF SLABS SHALL BE POURED, THE SIZE OF EACH SECTION, AND THE DIRECTION IN WHICH POURING IN EACH SECTION IS TO PROGRESS. THIS SEQUENCE OF FLOOR SLAB CONSTRUCTION DOES NOT APPLY TO THE MEDIAN STRIP.

F. FLOOR SLAB CONSTRUCTION JOINTS: THE LOCATIONS OF REQUIRED TRANSVERSE CONSTRUCTION JOINTS ARE SHOWN ON THE PLANS. THE CONTRACTOR MAY PROVIDE ADDITIONAL TRANSVERSE CONSTRUCTION JOINTS AT OTHER LOCATIONS, SUBJECT TO APPROVAL OF THE ENGINEER. AT EACH LOCATION THE CONTRACTOR SHALL CONSTRUCT A KEYED JOINT.

CONCRETE FOR SHOE PADS.

A. FOR SUPERSTRUCTURE SHOES SUPPORTED ON PIERS 4 AND 5, THE CONTRACTOR FOR SUBSTRUCTURE WILL HAVE PROVIDED SINKAGES IN THE TOPS OF PIERS. THE CONTRACTOR FOR SUPERSTRUCTURE SHALL FILL THE SINKAGES WITH CLASS "C" CONCRETE CONSTRUCTED AS PADS TO RECEIVE SUPERSTRUCTURE SHOES.

B. THE SIDE FORMS FOR SHOE PADS SHALL BE SUBSTANTIAL, ACCURATELY MADE FRAMES PROVIDING TOP SURFACES IN TRUE PLANES FOR SCREEDING. THESE SIDE FORMS SHALL BE SET ACCURATELY IN POSITION AND ADJUSTED BY WEDGES SO THAT THE TOP SURFACES WILL BE AT THE EXACT ELEVATION REQUIRED FOR BOTTOM OF LEAD PLATES. CONCRETE SHALL BE PLACED AND SCREEDED OFF WITH A STEEL STRAIGHTEDGE AND SO FINISHED AS TO GIVE TRUE PLANE SURFACES WITH SMOOTH TROWELED FINISH. ANY IRREGULARITIES IN THE SURFACE WHICH MAY APPEAR AFTER THE CONCRETE HAS SET SHALL BE CORRECTED BY RUBBING WITH CARBORUNDUM BRICKS.

WATERPROOFING.

ALL SURFACES IN CONTACT WITH BITUMINOUS ROADWAY SURFACING SHALL BE WATERPROOFED WITH TYPE "C" WATERPROOFING.

SUPERSTRUCTURE METALWORK.

A. CHARACTER OF METAL. METAL NOT OTHERWISE SPECIFIED SHALL BE OF COPPER-BEARING CARBON STRUCTURAL STEEL. RIVETS AND BOLTS SHALL BE OF COPPER-BEARING RIVET STEEL. PINS NOT OTHERWISE SPECIFIED SHALL BE OF COLD ROLLED STEEL OR FORGED. CASTINGS NOT OTHERWISE SPECIFIED SHALL BE OF STEEL.

B. COPPER-BEARING CARBON STRUCTURAL AND RIVET STEEL. COPPER-BEARING CARBON STRUCTURAL AND RIVET STEEL SHALL CONFORM TO SECTION M-7.4 (B) OF THE SPECIFICATIONS.

C. STRUCTURAL SILICON STEEL. SILICON STEEL SHALL CONFORM TO A.S.T.M. SPECIFICATIONS FOR STRUCTURAL SILICON STEEL, DESIGNATION A94. ALL PARTS OF SILICON STEEL SHALL BE IDENTIFIED BY PAINT MARKS AND STAMPING AT THE MILL, AND THESE IDENTIFICATION MARKS WITH SOME CHARACTERISTIC PAINTING SHALL BE RETAINED THROUGHOUT THE WORK OF FABRICATION, SO THAT THERE MAY BE NO MISTAKES IN THE USE OF SILICON STEEL PARTS WHERE REQUIRED.

D. CHROME-NICKEL STEEL. CHROME-NICKEL STEEL SHALL BE AN ALLOY OF STEEL, CHROMIUM AND NICKEL, AND RELATED ALLOYS WHICH SHALL HAVE A MINIMUM YIELD POINT OF AT LEAST 75,000 LBS PSI, AN ULTIMATE STRENGTH OF AT LEAST 125,000 LBS PSI AND A BRINNELL HARDNESS OF AT LEAST 250, AND SHALL OTHERWISE MEET THE REQUIREMENTS OF A.S.T.M. DESIGNATION A177.

E. STRUCTURAL NICKEL STEEL. STRUCTURAL NICKEL STEEL SHALL CONFORM TO A.S.T.M. SPECIFICATIONS FOR STRUCTURAL NICKEL STEEL, DESIGNATION A8.

F. WROUGHT IRON. WROUGHT IRON PLATES SHALL CONFORM TO A.S.T.M. SPECIFICATIONS FOR WROUGHT IRON PLATES, DESIGNATION A42. WROUGHT IRON RIVETS SHALL CONFORM TO A.S.T.M. SPECIFICATIONS FOR WROUGHT IRON RIVETS, DESIGNATION A152.

G. STEEL CASTINGS. MEDIUM STEEL CASTINGS NOT OTHERWISE SPECIFIED SHALL CONFORM TO SECTION M-7.7 OF THE SPECIFICATIONS.

HIGH STRENGTH STEEL CASTINGS NOT OTHERWISE STIPULATED SHALL CONFORM TO A.S.T.M. TENTATIVE SPECIFICATIONS FOR HIGH STRENGTH STEEL CASTINGS FOR STRUCTURAL PURPOSES, DESIGNATION A148, AND SHALL BE GRADE 80-50, FULLY ANNEALED AND PHYSICALLY TESTED.

H. STEEL FORGINGS. ALLOY STEEL FORGINGS SHALL CONFORM TO A.S.T.M. SPECIFICATIONS FOR ALLOY STEEL FORGINGS FOR LOCOMOTIVES AND CARS, DESIGNATION A238, AND SHALL BE CLASS C, NORMALIZED AND TEMPERED.

I. COLD ROLLED STEEL SHALL CONFORM TO SECTION M-7.17 OF THE SPECIFICATIONS.

J. SOFT STEEL IN BENT CURB PLATES SHALL CONFORM TO A.S.T.M. TENTATIVE SPECIFICATIONS FOR LOW AND INTERMEDIATE TENSILE STRENGTH CARBON STEEL PLATES OF STRUCTURAL QUALITY, DESIGNATION A283, AND SHALL BE GRADE A.

K. DRAIN HOLES OF CHARACTER AND LOCATIONS AS APPROVED BY THE ENGINEER SHALL BE PROVIDED IN METALWORK PARTS WHEREVER WATER MIGHT COLLECT AND HAVE NO OTHER MEANS OF DRAINAGE. SHOULD IT BECOME EVIDENT AFTER ERECTION THAT SUFFICIENT DRAIN HOLES HAVE NOT BEEN PROVIDED IN FABRICATION, THE CONTRACTOR ERECTING THE STEELWORK SHALL PROVIDE ADDITIONAL DRAINAGE HOLES OF CHARACTER AND LOCATIONS AS MAY BE APPROVED.

L. RIVET SPACING. IN THE PREPARATION OF WORKING DRAWINGS, THE SPACING OF RIVET HOLES SHALL BE MADE TO MAINTAIN THE FULL NET SECTION SHOWN ON THE PLANS FOR ALL TENSION MEMBERS.

OUTSTANDING LEGS OF ALL BACK TO BACK STIFFENER ANGLES ON GIRDERS SHALL BE STITCH RIVETED AT 6 IN. MAXIMUM STAGGERED PITCH.

M. SHOP ASSEMBLIES AND CAMBER. THE TRUSSES OF THE DECK TRUSS SPANS SHALL BE CAMBERED SO THAT WHEN ERECTED AND UNDER FULL DEAD LOAD THEY WILL HAVE THEIR NORMAL OUTLINE WITH ALL MEMBERS OF THE NORMAL LENGTH SHOWN ON THE PLANS. THE LENGTHS OF UNSTRESSED MEMBERS SHALL BE SO DETERMINED. EXCEPT AS OTHERWISE APPROVED EACH TRUSS SHALL BE SEPARATELY COMPLETELY ASSEMBLED IN THE SHOP. THE CHORD MEMBERS OF EACH TRUSS SHALL BE ASSEMBLED IN CORRECT GEOMETRIC PATTERN CONFORMING TO THE FINAL OUTLINE AND THE HOLES FOR FIELD RIVETS IN THE SPLICES OF THE CHORDS SHALL BE REAMED. THESE SPLICES SHALL THEN BE FITTED WITH SUFFICIENT NUMBERS OF TIGHT FITTING BOLTS AND PINS TO PREVENT ANY MOVEMENT OF THE MEMBERS AT THE SPLICES AS THE CHORDS ARE ADJUSTED INTO CAMBERED POSITION. THE ASSEMBLY OF EACH TRUSS IN THE SHOP IN CAMBERED POSITION SHALL BE COMPLETED BY ADDITION OF THE WEB MEMBERS, AND THE HOLES FOR FIELD RIVETS IN WEB MEMBER CONNECTIONS SHALL BE REAMED OR DRILLED WHILE THE TRUSS IS SO ASSEMBLED. CARE SHALL BE TAKEN TO KEEP THE CENTERLINES OF ALL TRUSS MEMBERS IN A PLANE AND TO SET THE WEB MEMBERS AT THEIR CORRECT GEOMETRIC ANGLES WITH THE CHORDS.

IN LIEU OF THE COMPLETE SHOP ASSEMBLY OF EACH TRUSS AS SPECIFIED ABOVE, ALTERNATE PROCEDURES WILL BE CONSIDERED WHICH WILL PROVIDE FOR THE ASSEMBLY AND REAMING OF TRUSS CHORDS AND TRUSS WEB MEMBERS ACCORDING TO AN APPROVED PLAN WHICH WILL INSURE ACCURACY OF FIELD HOLES AND FITTING OF PARTS EQUIVALENT TO THAT TO BE SECURED BY COMPLETE ASSEMBLY. IN CASE THE CONTRACTOR SHOULD DESIRE TO USE SUCH A METHOD, COMPLETE DATA REGARDING THE METHOD TO BE USED AND PRECAUTIONS WHICH WILL BE FOLLOWED TO ASSURE ACCURACY SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL OR MODIFICATION. FINAL APPROVAL OF THE EXACT DETAILS OF THE OPERATIONS MUST BE SECURED BEFORE THE WORK PROGRESSES, AND IF NOT APPROVED THERE SHALL BE COMPLETE ASSEMBLY OF THE TRUSSES.

THE GIRDERS OF SPAN 3 SHALL BE CAMBERED AS SHOWN ON THE PLANS. GIRDERS OF OTHER SPANS NEED NOT BE CAMBERED, BUT MAY BE FABRICATED IN STRAIGHT LINES. ALL GIRDERS SHALL BE ASSEMBLED AT THEIR FIELD SPLICES IN THE SHOP AND HOLES FOR RIVETS IN SPLICES SHALL BE REAMED WHILE THE GIRDERS ARE ASSEMBLED.

THE FLOOR BEAM TRUSSES NEED NOT BE ASSEMBLED IN THE SHOP FOR REAMING OR DRILLING OF CONNECTIONS BUT ALL FIELD HOLES SHALL BE REAMED OR DRILLED TO METAL TEMPLATES.

N. RIVETS. RIVETS SHALL BE 7/8 IN. IN DIAMETER UNLESS OTHERWISE SPECIFIED.

O. SHOE PINS. FOR SHOE PINS THE DIFFERENCE IN DIAMETER BETWEEN PINS AND PIN HOLES SHALL BE 1/16 IN.

P. FLAME CUTTING. FLAME CUTTING WITH OXY-ACETYLENE BLOW PIPE MAY BE USED AS APPROVED BY THE ENGINEER. FLAME CUTTING SHALL BE DONE ONLY WITH EXPERIENCED OPERATORS AND SO AS TO AVOID BURNING THE EDGES OF THE CUT. THE CUT SHALL BE MADE BY USE OF MACHINES DESIGNED TO GUIDE THE BLOW PIPE SO AS TO GIVE A SMOOTH CUT CORRESPONDING TO THE DESIRED OUTLINE. ANY RAGGED EDGES MUST BE CAREFULLY GROUND OFF.

WHEREVER THERE IS FLAME CUTTING OF SILICON STEEL THE FLAME CUT EDGES SHALL BE MACHINED OFF OR GROUND OFF TO A DEPTH NOT LESS THAN 1/4 IN. IN LIEU OF SUCH MACHINING OR GRINDING, THE FLAME CUT EDGES OF SILICON STEEL MAY BE FLAME SOFTENED OR ANNEALED, PROVIDED THESE OPERATIONS RESTORE THE METAL TO SUBSTANTIALLY ITS ORIGINAL DEGREE OF HARDNESS AND OTHER PHYSICAL PROPERTIES. FLAME SOFTENING OR ANNEALING SHALL BE DONE WITH SUITABLE EQUIPMENT OPERATED BY EXPERIENCED OPERATORS AND IN GENERAL SHALL CONSIST OF HEATING WITH A GAS FLAME DIRECTED AT RIGHT ANGLES TO THE CUT SURFACE SO THAT THE EDGE OF THE WORK IS HEATED 1/8 IN. DEEP ALONG ITS ENTIRE LENGTH TO A CHERRY RED COLOR VISIBLE IN DAYLIGHT. TO DEMONSTRATE THE EFFICIENCY OF THE FLAME SOFTENING OR ANNEALING, THE CONTRACTOR MAY BE REQUIRED TO PREPARE SAMPLES BY FLAME CUTTING AND FLAME SOFTENING OR ANNEALING OF PORTIONS OF THE SILICON STEEL CUT AWAY, AND SHALL TEST THESE FOR TENSILE STRENGTH, BENDING AND FOR HARDNESS, AND FOR COMPARISON SHALL PREPARE SIMILAR SAMPLES FROM SILICON STEEL BY MACHINING OR OTHER METHODS NOT INVOLVING FLAME CUTTING AND SHALL TEST THESE CONTROL SAMPLES SIMILARLY FOR THE SAME QUALITIES. THE NUMBERS OF SUCH TESTS SHALL DEPEND UPON THE EXTENT OF FLAME CUTTING OF SILICON STEEL, AND SHALL BE MADE AT INTERVALS OF TIME AS THE WORK PROGRESSES SUFFICIENT TO DEMONSTRATE THE EFFICIENCY AND UNIFORMITY OF THE OPERATIONS.

L-1. DIAPHRAMS IN TRUSS MEMBERS. TO ASSURE PROPER FIT OF BOX MEMBERS AT TRUSS JOINTS A PLATE AND ANGLE DIAPHRAGM, SHOP RIVETED TO THE FOUR SIDES OF THE MEMBERS, SHALL BE PROVIDED AT EACH END OF EACH BOX MEMBER AND LOCATED AS CLOSE AS CONVENIENT TO THE EDGES OF THE GUSSET PLATES. SUCH DIAPHRAGMS SHALL BE COMPLETELY DETAILED ON THE SHOP DRAWINGS SUBMITTED FOR APPROVAL.

Q. ERECTION OF SUPERSTRUCTURE METALWORK. UNLESS OTHERWISE REQUIRED AND APPROVED FOR PARTICULAR ERECTION CONDITIONS, LATERALS SHALL NOT BE RIVETED UNTIL AFTER SPANS ARE SWUNG AND ARE SUPPORTING THEIR OWN DEAD LOAD WEIGHT OF STEEL. IN CANTILEVER ERECTION, LATERALS MAY BE RIVETED AT ANY TIME WHEN THE STRESSES IN THE CHORD MEMBERS ADJACENT TO THE SPECIFIC LATERALS ARE APPROXIMATELY THE SAME AS THE FINAL DEAD LOAD STRESSES WHICH WILL BE IN THESE CHORD MEMBERS AFTER THE SPAN IS COMPLETED. PRIOR TO RIVETING, LATERALS SUBJECT TO WIND LOADS AND OTHER STRESSES UNDER ERECTION CONDITIONS SHALL BE CONNECTED WITH SUFFICIENT BOLTS AND DRIFT PINS TO PROVIDE SUITABLY FOR ALL SUCH POSSIBLE STRESSES.

SHOULD THE CONTRACTOR ELECT TO PROVIDE INCREASED SECTIONS IN CERTAIN TRUSS MEMBERS OR IN OTHER PARTS OF THE SUPERSTRUCTURE METALWORK, FOR METHODS OF ERECTION WHICH THE CONTRACTOR MAY ADOPT, SUCH INCREASES OF SECTIONS AND PARTS MAY BE INCORPORATED IN THE STRUCTURE, SUBJECT TO THE APPROVAL OF THE ENGINEER, BUT SHALL BE PAID FOR BY THE CONTRACTOR AND WILL NOT BE INCLUDED IN FINAL PAY QUANTITIES.

THE CONTRACTOR MAY ALSO PROVIDE ANY OTHER ADDITIONAL MEMBERS OR PARTS TO BE TEMPORARILY ATTACHED TO BUT NOT PERMANENTLY INCORPORATED IN THE FINAL STRUCTURE FOR ANY ERECTION PURPOSE. ALL SUCH PARTS SHALL BE CLASSED AS ERECTION EQUIPMENT AND FALSEWORK AND SHALL NOT BE INCLUDED IN THE FINAL PAY QUANTITIES.

SHOULD CHANGES IN ANY MEMBERS OR OTHER PORTIONS OF THE TRUSS SPANS, MADE FOR PURPOSES OF ERECTION, INCREASE THE WEIGHTS OF THE TRUSSES, THE CONTRACTOR SHALL RE-CALCULATE THE CAMBER OF THE STRUCTURE AS AFFECTED BY SUCH MODIFICATIONS, AND SHALL MODIFY THE CAMBER OF THE TRUSSES AS THE CHANGED CONDITIONS MAKE NECESSARY. THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY TO PROVIDE THE COMPLETED STRUCTURE, ADJUSTED AND IN CORRECT FINAL POSITION WITH THE CAMBER STIPULATED.

R. WELDING SHALL BE CLASS "A".

S. EXPANSION JOINTS. STEEL CASTINGS FOR ROADWAY EXPANSION JOINTS SHALL BE MACHINED ON BOTTOM SURFACES WHICH WILL CONTACT SUPPORTING STEEL, AND ON ENDS OF ADJOINING SECTIONS. ALL SECTIONS FOR BOTH SIDES OF EACH JOINT SHALL BE SHOP ASSEMBLED WITH NOMINAL CLEARANCE OF 3/4 IN. BETWEEN ENDS AND ROOTS OF MATING PROJECTIONS. WHILE THUS ASSEMBLED THE JOINT SHALL BE CHECKED AND CORRECTED TO PROVIDE NOT LESS THAN 1/8 IN. CLEARANCE BETWEEN SIDES OF PROJECTIONS AND NOT LESS THAN 5/8 IN. CLEARANCE BETWEEN ENDS AND ROOTS OF PROJECTIONS. ALL PARTS OF ROADWAY JOINTS SO ASSEMBLED SHALL BE MATCHMARKED. JOINT CASTINGS SHALL BE GALVANIZED.

ROADWAY EXPANSION JOINT CASTINGS SHALL BE ERECTED ACCORDING TO THE SHOP MATCHMARKING AND SHALL BE SET TO THE LONGITUDINAL CLEARANCE REQUIRED FOR THE TEMPERATURE AT THE TIME OF SETTING, TO THE REQUIRED GRADE AND CROWN OF ROADWAY, AND TO PROVIDE EQUAL SIDE CLEARANCE BETWEEN MATING PROJECTIONS. FOR JOINT CASTINGS SUPPORTED ON STRUCTURAL STEEL, THE HOLES IN THE SUPPORTING STEEL SHALL BE DRILLED IN THE FIELD AFTER THE CASTINGS ARE ADJUSTED IN FINAL POSITION. FOR JOINT CASTINGS SUPPORTED ON CONCRETE ABUTMENTS, OVERSIZE HOLES SHALL BE PROVIDED IN THE CASTINGS TO ALLOW FOR VARIATION IN ANCHOR BOLT SETTINGS. AFTER ADJUSTMENT OF THESE CASTINGS IN FINAL POSITION ON THE ABUTMENTS, THE SPACES BETWEEN CASTINGS AND ANCHOR BOLTS SHALL BE FILLED WITH MOLTEN LEAD.

SIDEWALK AND CURB JOINTS SHALL BE SHOP ASSEMBLED, CORRECTED TO PROVIDE UNIFORM CLOSE CONTACT BETWEEN THE TWO MATING PARTS OF EACH JOINT, GALVANIZED, MATCHMARKED AND ERECTED TO REQUIRED LINES AND GRADES.

PAINTING.

ALL SUPERSTRUCTURE METALWORK SHALL HAVE ONE RED LEAD SHOP COAT. ALL METALWORK INCLUDING EXPOSED SURFACES OF METAL FURNISHED UNDER SUBSTRUCTURE CONTRACT SHALL BE GIVEN TWO FIELD COATS OF ALUMINUM PAINT CONFORMING TO SEC. M-9.12 OF THE SPECIFICATIONS, EXCEPT METALWORK IN SPANS 1 AND 2 WHICH SHALL BE PAINTED THREE ALUMINUM FIELD COATS. IN SPANS 1 AND 2 THE SECOND ALUMINUM COAT SHALL BE TINTED.

HANDRAIL.

A. THE HANDRAILS, MADE UP OF PLATE POSTS AND METAL PIPES, SHALL BE FABRICATED IN THE SHOP IN LENGTHS SUITABLE FOR SHIPMENT. METAL PIPES SHALL CONFORM TO SECTION M-6.9 OF THE SPECIFICATIONS AND SHALL BE STANDARD WEIGHT SEAMLESS PIPE, GRADE B. PIPE SHALL HAVE PLAIN ENDS. AFTER ERECTION THE SEVERAL LENGTHS OF TUBES SHALL BE WELDED TOGETHER TO PROVIDE CONTINUOUS RAILS FOR THE LENGTHS BETWEEN HANDRAIL EXPANSION JOINTS, AS INDICATED ON THE PLANS OR AS MAY BE APPROVED. THE COMPLETED HANDRAIL SHALL BE FREE OF BURRS, SHARP CORNERS AND ROUGH SURFACES. THE CONNECTION OF THE HANDRAIL POSTS TO THE SUPERSTRUCTURE METALWORK IS IN GENERAL BY FIELD RIVETS. CONNECTION OF POSTS TO ABUTMENTS IS BY ANCHOR BOLTS SET BY THE CONTRACTOR FOR SUBSTRUCTURE. AFTER THE HANDRAILS HAVE BEEN SET IN PLACE, THEY SHALL BE ADJUSTED BY MOVING THE POSTS INWARD OR OUTWARD UNTIL THE TOP RAIL SHALL CONFORM TO A STRAIGHT LINE PARALLEL TO THE CENTER OF ROADWAY. FOR THE POSTS ON THE SPANS THE ERECTION BOLTS SHALL BE TIGHTENED TO HOLD THE HANDRAIL POSTS IN CORRECT POSITION WHILE VERTICAL ADJUSTMENT OF THE RAIL IS MADE, AND FIELD RIVETS DRIVEN. IF THE CLEARANCE PROVIDED BY THE FIELD HOLES IS INADEQUATE TO PERMIT THE ADJUSTMENT, THE FIELD HOLES SHALL BE REAMED WITH POSTS IN THE ADJUSTED POSITION. THE POSTS ATTACHED TO ABUTMENT CONCRETE SHALL BE ADJUSTED BY SHIMMING TO CORRECT ALIGNMENT AND GRADE. THE ADJUSTMENT OF THE HANDRAIL SHALL BE SUCH THAT THE TOP RAIL SHALL NOT DEPART MORE THAN 1/8 IN. FROM CORRECT LINE OR GRADE.

B. PAYMENT FOR HANDRAIL SHALL BE MADE AT THE CONTRACT UNIT PRICE PER LINEAR FOOT BID FOR ITEM S-14, HANDRAIL (STEEL) AND SHALL INCLUDE PLATE POSTS AND BASES FOR LIGHT POLES.

NAME PLATES.

A. THERE SHALL BE PROVIDED TWO DUPLICATE NAME PLATES, ONE AT EACH END OF THE VIADUCT. EACH NAME PLATE SHALL BE MOUNTED ON THE ROADWAY FACE OF THE STONE TERMINAL POST AT THE RIGHT HAND SIDE APPROACHING EACH END OF THE VIADUCT. NAME PLATES SHALL BE OF STATUARY BRONZE OF THE SIZE AND GENERAL SECTION INDICATED ON THE PLANS AND SHALL CONTAIN IN RAISED LETTERING, INSCRIPTION INFORMATION TO BE FURNISHED LATER. THE SURFACE OF LETTERING AND THE BORDER MOULDING SHALL BE POLISHED AND THE BACKGROUND BETWEEN BORDERS SHALL BE ETCHED. THE LETTERS SHALL BE NEATLY FORMED OF DIMENSIONS SUITABLE TO THE PLATE DIMENSIONS, PROPERLY SPACED AND ARRANGED. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS IN ADVANCE OF MAKING PATTERN AND RUBBINGS FROM THE FINAL PATTERN FOR APPROVAL BEFORE THE CASTINGS ARE MADE. PLATES SHALL BE SUBSTANTIALLY ATTACHED AND ANCHORED TO THE STONE POSTS IN THE MANNER SHOWN ON THE PLANS.

B. PAYMENT FOR THE TWO NAME PLATES SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM S-26, NAME PLATES.

ASPHALTIC CONCRETE SURFACE COURSE.

THE ASPHALTIC CONCRETE SURFACE COURSE SHALL CONSIST OF A 1" THICK TYPE B WEARING COURSE ON A 1½" THICK NO. 4 BINDER COURSE, CONFORMING TO SEC. T-50 OF THE SPECIFICATIONS AND SPREAD AND FINISHED AS DESCRIBED UNDER METHOD "A".

WHITE CONCRETE REFLECTING MEDIAN STRIP.

THE MEDIAN STRIP SHALL BE OF WHITE CEMENT CONCRETE CONSTRUCTED IN A REFLECTING RIBBED PATTERN AS SHOWN ON THE PLANS AND AS DESCRIBED IN SUPPLEMENTAL SPECIFICATION NO. 19.

PAYMENT FOR MEDIAN STRIP WILL BE MADE AT THE PRICE PER LINEAR FOOT OF TWO FT. WIDTH MEDIAN STRIP ON EACH SIDE OF CENTER LINE OF STRUCTURE.

CLEANING AND REPAIRING SUBSTRUCTURE.

THE CONTRACTOR SHALL, WITHOUT ADDITIONAL COMPENSATION, CLEAN AND REPAIR ANY PORTION OF THE SUBSTRUCTURE WHICH IS SOILED OR DAMAGED AS A RESULT OF HIS OPERATIONS.

FIELD OFFICE.

THE CONTRACTOR SHALL PROVIDE A FIELD OFFICE AS SOON AS POSSIBLE AFTER THE AWARD OF THE CONTRACT, HAVING A MINIMUM OF 250 SQ.FT. OF FLOOR SPACE, IN ACCORDANCE WITH SECTION S-0.01 (b). HE SHALL HAVE A TELEPHONE INSTALLED AND SHALL MAINTAIN IT UNTIL THE COMPLETION OF PART 2 OF THIS PROJECT.

ELECTRICAL GROUNDS.

THE SUPERSTRUCTURE METALWORK SHALL BE THOROUGHLY GROUNDED AT EACH ABUTMENT. THE TWO OUTSIDE GIRDERS AT EACH ABUTMENT SHALL BE GROUNDED BY A NO. 6 BARE STRANDED TINNED COPPER WIRE BRAZED OR BOLTED TO THE BOTTOM FLANGE OF THE GIRDER AND THE LOWER CASTING OF THE EXPANSION SHOE AND THEN EXTENDED, WITH NO. 6 SOLID TINNED COPPER WIRE, ALONG THE TOP OF THE CONCRETE BRIDGE SEAT TO THE WESTERLY END OF THE ABUTMENT WHERE THE TWO WIRES SHALL BE JOINED AND A SINGLE WIRE EXTENDED DOWN THE FACE OF THE ABUTMENT TO ATTACHMENT TO A CLUSTER OF THREE 3/4" DIAMETER BY 8 FT COPPERWELD OR EQUAL GROUND RODS LOCATED NEAR THE CORNER OF THE ABUTMENT. WIRES SHALL BE SECURELY FASTENED TO THE CONCRETE SURFACES AT ABOUT 3-FT CENTERS. BETWEEN GIRDERS AND SHOES THE WIRES SHALL BE SUITABLY LOOPED TO ALLOW FOR EXPANSION IN THE VIADUCT. AT THE SOUTH ABUTMENT THE GROUND WIRE SHALL BE PROTECTED FROM ITS CONNECTION TO THE GROUND ROD CLUSTER AT THE GROUND SURFACE UP FOR A HEIGHT OF 15 FT. BY MEANS OF METAL CABLE GUARD EQUAL TO HUBBARD HOT GALVANIZED U-CABLE GUARD NO. 7531½ WITH NO. 7538 STRAPS AT 1-FT. INTERVALS.

ACROSS THE EXPANSION JOINTS AT PIERS 3 AND 6 AT EACH OUTSIDE STRINGER THERE SHALL BE PROVIDED A CONNECTING GROUND OF NO. 6 STRANDED TINNED COPPER WIRE SUITABLY LOOPED TO ALLOW FOR EXPANSION OF THE STEELWORK AND CONNECTED TO THE LOWER FLANGES OF THE STRINGERS BY BOLTING OR BRAZING SO AS TO PROVIDE AN EFFECTIVE ELECTRICAL CONNECTION ACROSS THE JOINT AND THUS ELECTRICALLY CONNECTING FOR GROUNDING THE ENTIRE SUPERSTRUCTURE.

ROADWAY LIGHTING.

THE ROADWAY LIGHTING INSTALLATION ON THE VIADUCT SHALL COMPRISE TWO COMPLETE 20-AMPERE SERIES SYSTEMS OF INCANDESCENT LIGHTS, ONE ALONG EACH SIDE OF THE VIADUCT. CURRENT WILL BE SUPPLIED TO THESE CIRCUITS BY TWO TRANSFORMER STATIONS AT ADAMS STREET, ONE ON EACH SIDE OF THE EXPRESSWAY. THE FOUR JUNCTION BOXES AND THE CONDUITS ON THE ABUTMENTS AND THE TWO TRANSFORMER STATIONS WILL BE FURNISHED AND INSTALLED BY OTHERS. ALL OTHER JUNCTION BOXES AND CONDUITS AND ALL WIRING, CABLES, CAST STEEL ADAPTORS AT TOP OF HANDRAIL, LIGHT STANDARDS, BRACKETS, LUMINAIRES, LAMPS AND ALL APPURTENANT EQUIPMENT NECESSARY TO THE COMPLETE LIGHTING SYSTEM, TESTED AND READY FOR USE, SHALL BE FURNISHED AND INSTALLED UNDER THIS ITEM S-25.

ALL LIGHTING CABLE SHALL BE EQUAL TO SINGLE-CONDUCTOR, NO. 6 AWG, CORONAL INSULATED, GEOPRENE JACKETED CABLE INSULATED FOR 3000 VOLTS. CABLE ENDS AT THE LUMINAIRES SHALL BE REINFORCED BACK SIX INCHES FROM THE ENDS BY WRAPPING WITH GLASS TAPE AND COVERING WITH CLEAR INSULATING LACQUER.

UPON COMPLETION OF THE INSTALLATION OF THE LIGHTING SYSTEM, THE FOLLOWING TESTS WILL BE CONDUCTED BY THE OHIO EDISON COMPANY, SUCH TESTS TO BE PAID FOR BY THE CONTRACTOR:

POTENTIAL TEST: THE POTENTIAL OF THE SYSTEM SHALL BE CONSIDERED SATISFACTORY WHEN THE TEST VOLTAGE OF TWICE THE OPERATING VOLTAGE PLUS 1000 VOLTS IS HELD FOR ONE MINUTE.

BURNING TEST: THE COMPLETED LIGHTING SYSTEM SHALL BE OPERATED FROM SUNSET TO SUNRISE EACH NIGHT FOR A PERIOD OF ONE WEEK PRIOR TO ACCEPTANCE. DURING THIS TRIAL OPERATION THE CONTRACTOR SHALL CORRECT ANY DEFECTS WHICH MAY DEVELOP.

FOR THESE TESTS THE CONTRACTOR WILL BE REQUIRED TO PROVIDE A TEMPORARY EXTENSION OF THE TWO CIRCUITS FROM THE END JUNCTION BOXES IN THE SOUTH ABUTMENT TO THEIR RESPECTIVE TRANSFORMER STATIONS AT ADAMS STREET.

REVISED 5-16-50

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

NOTES

AKRON SUMMIT COUNTY, OHIO

SCALE..................
MADE. I.C.W. DATE. 9-9-49
TRCD. L.G. DATE. 2-3-50
CHKD. C.L.E. DATE. 2-2-50

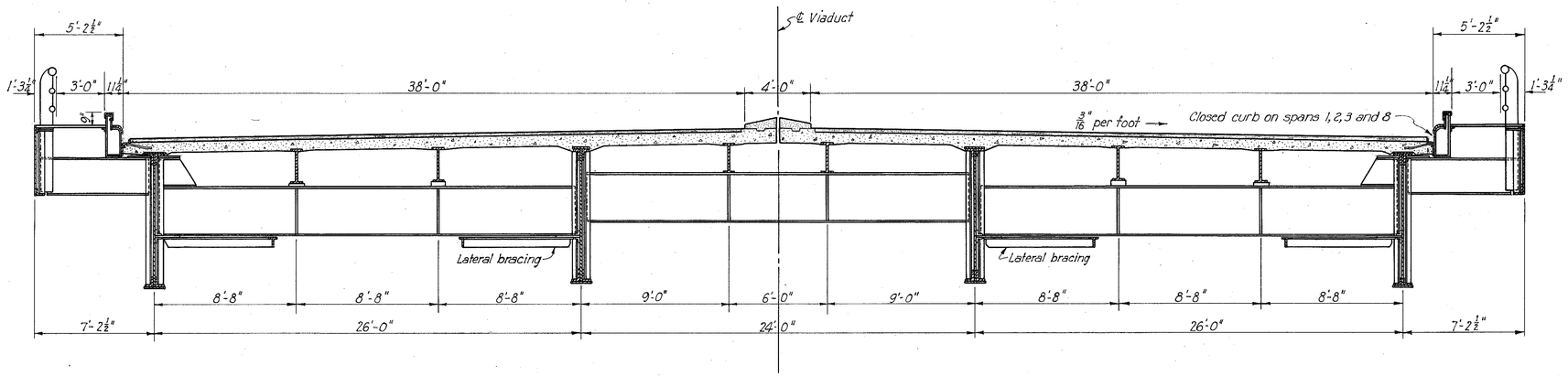
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V39

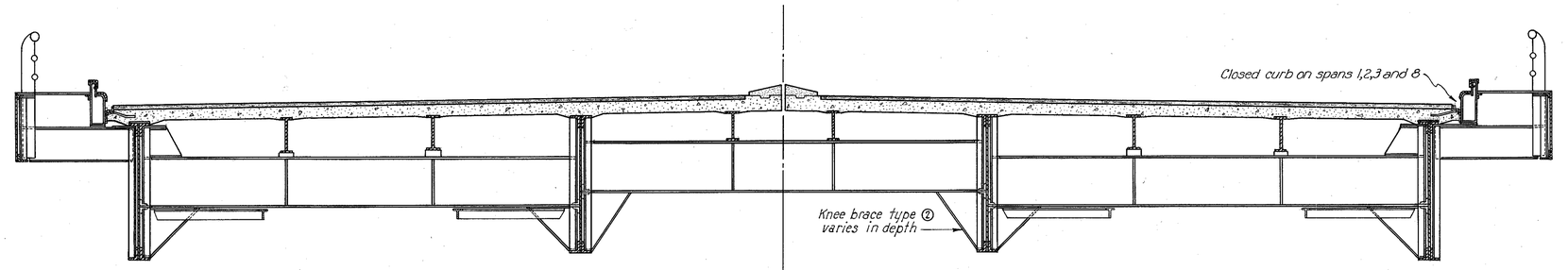
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

6
44

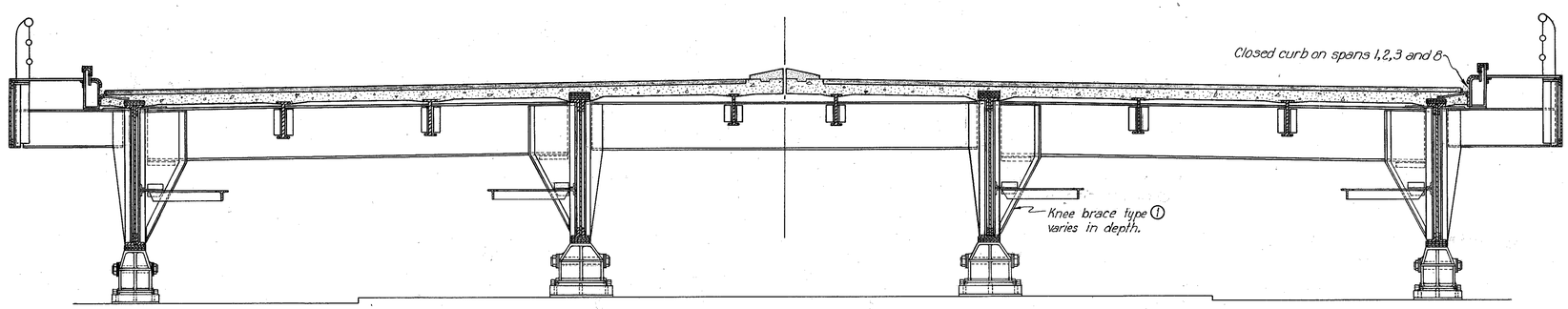
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12,31



TYPICAL CROSS SECTION AT INTERMEDIATE FLOORBEAMS - UNITS 1 AND 3



TYPICAL CROSS SECTION AT INTERMEDIATE FLOORBEAMS WITH KNEE BRACING - UNITS 1 AND 3



TYPICAL CROSS SECTION AT BEARINGS - UNIT 3 AND SOUTH ABUTMENT

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GENERAL ROADWAY CROSS SECTIONS

AKRON, SUMMIT COUNTY, OHIO

SCALE 1"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE M.B. DATE 4-26-49 CONSULTING ENGINEERS
TRCD R.C.B., R.R. DATE 7-15-49 KANSAS CITY NEW YORK
CHKD. R.R.M. DATE 10-26-49

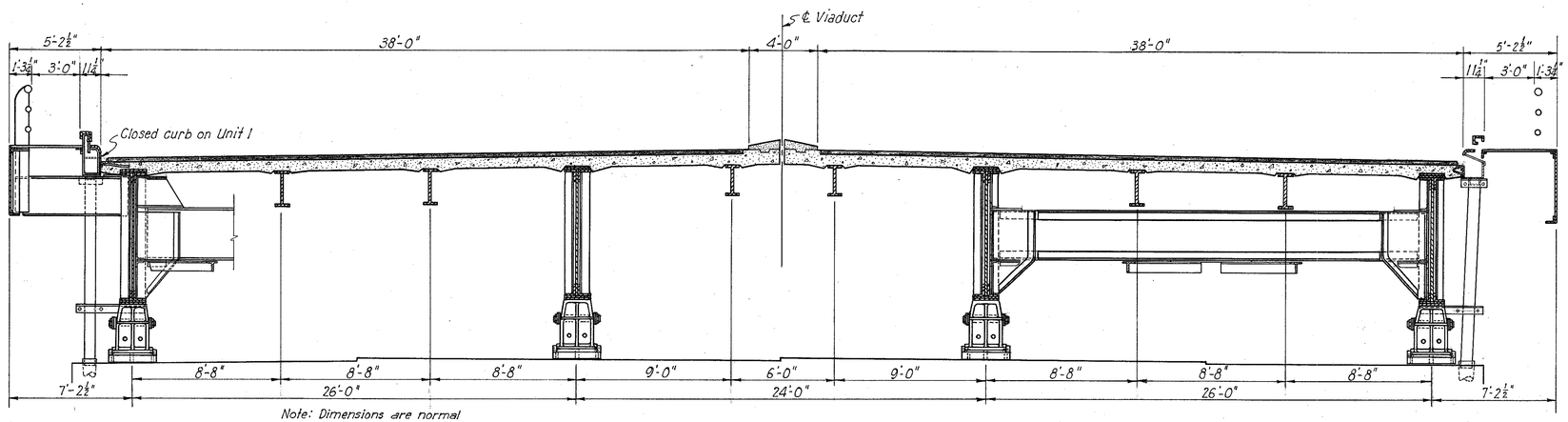
766 SHEET V40

119

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

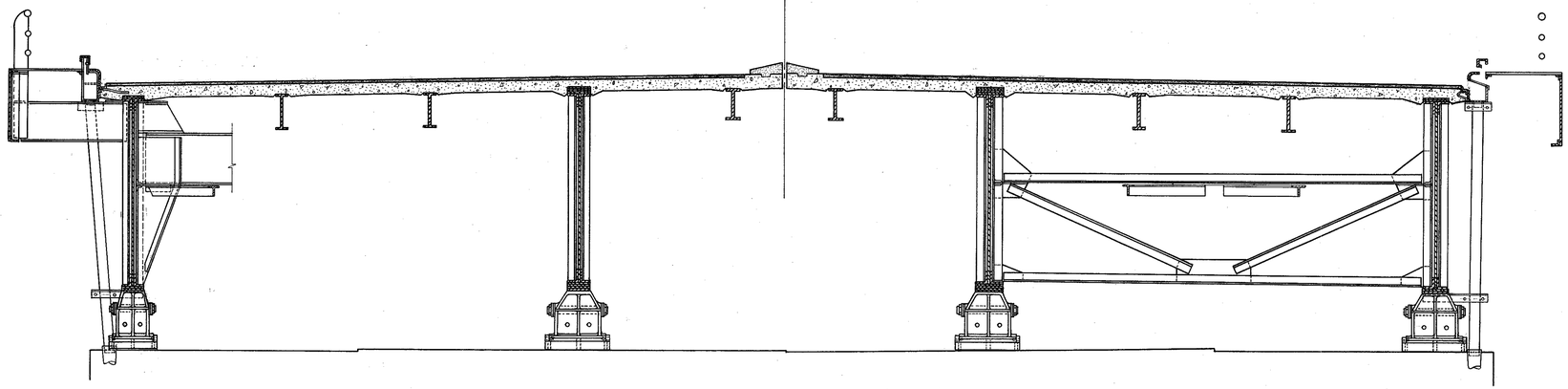
7
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

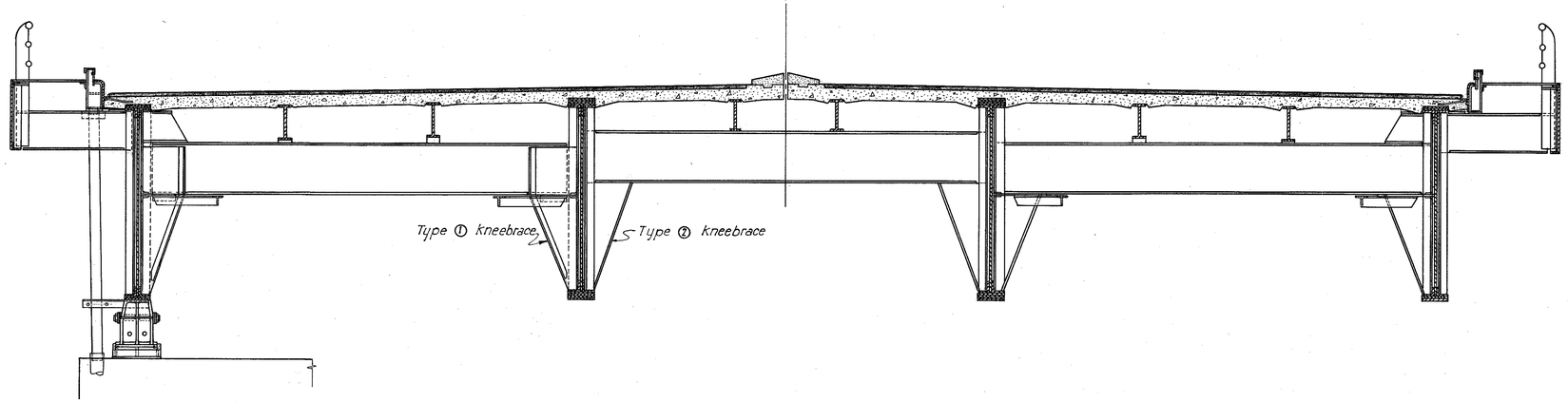


Note: Dimensions are normal to ℄ Viaduct.

CROSS SECTION AT ℄ PIER 1



CROSS SECTION AT ℄ PIER 2



CROSS SECTION NEAR PIERS 1 AND 2

Scale: $\frac{1}{4}$"=1'-0"

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GENERAL ROADWAY CROSS SECTIONS

AKRON, SUMMIT COUNTY, OHIO

SCALE 4"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE W.L.G. DATE 2-17-49. CONSULTING ENGINEERS
TRCD. R.C.B. DATE 2-19-49. KANSAS CITY NEW YORK
CHKD. R.R.M. DATE 10-27-49.

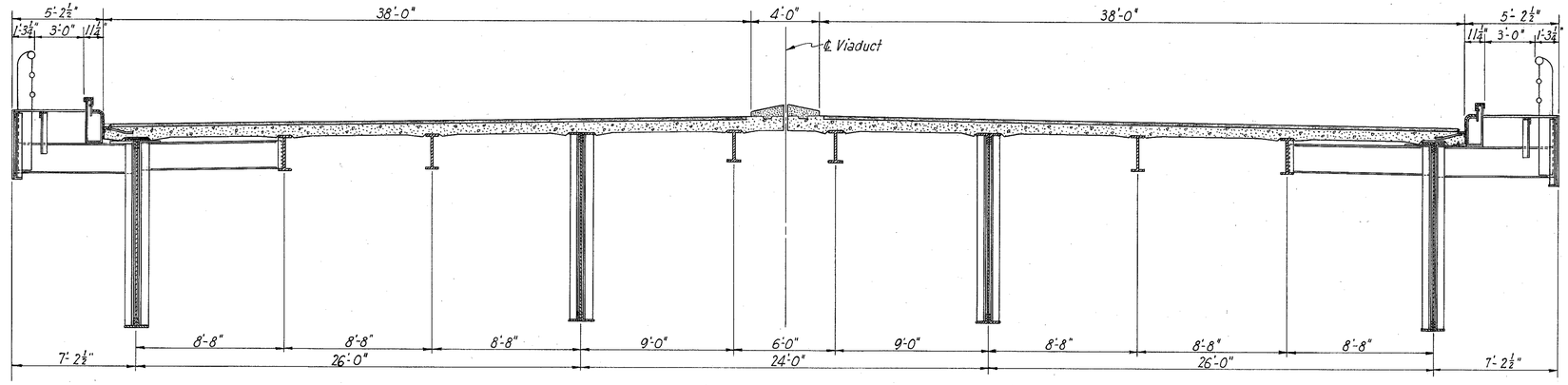
766 SHEET V41

143

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

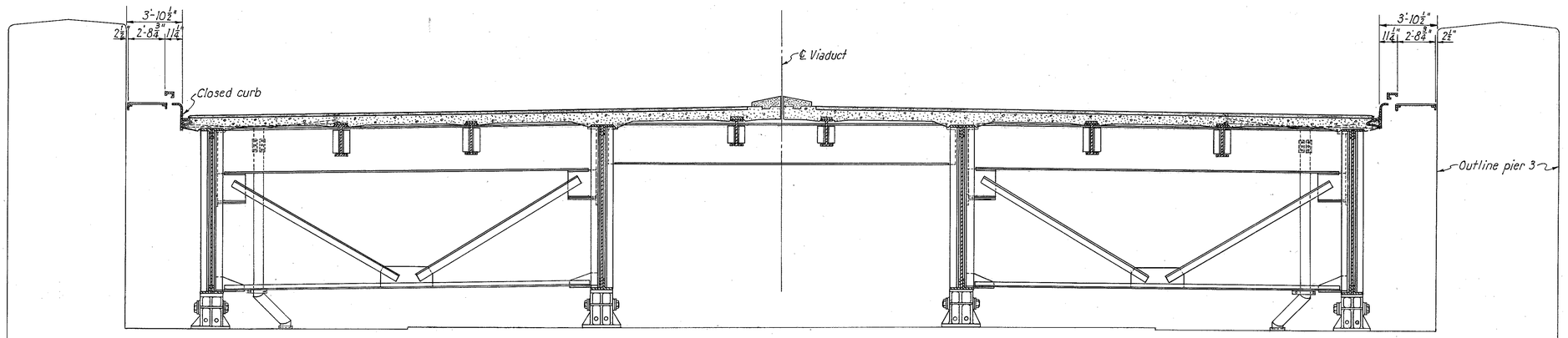
8
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



CROSS SECTION AT PIER 3 END SIDEWALK SUPPORT

Cross section at pier 6 similar



CROSS SECTION AT PIER 3 END FLOORBEAM

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GENERAL ROADWAY CROSS SECTIONS

AKRON, SUMMIT COUNTY, OHIO

SCALE 1/4"=1'-0"
MADE W.L.S. DATE 5-12-49
TRCD R.C.B. & R.R. DATE 8-12-49
CHKD. R.R.H. DATE 10-27-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

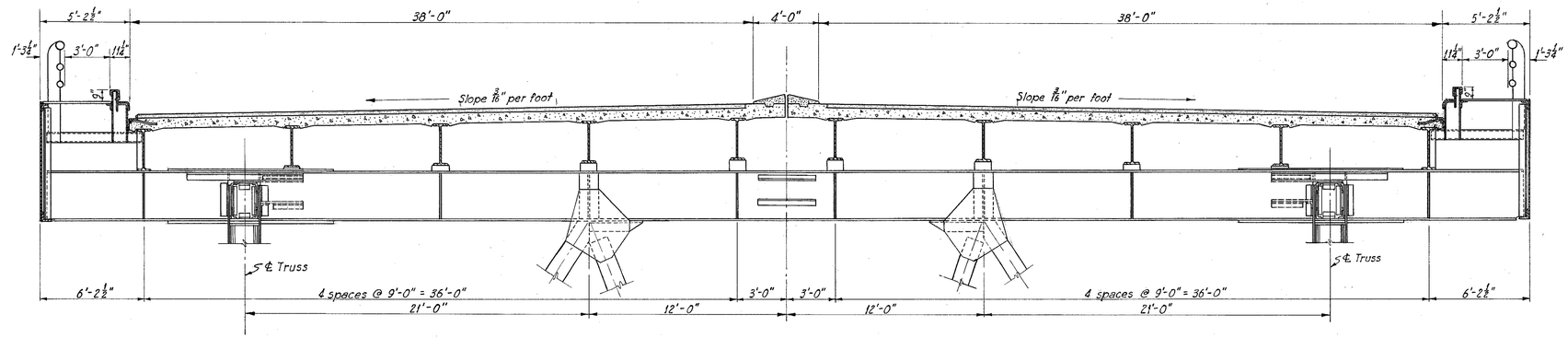
766 SHEET V42

144

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

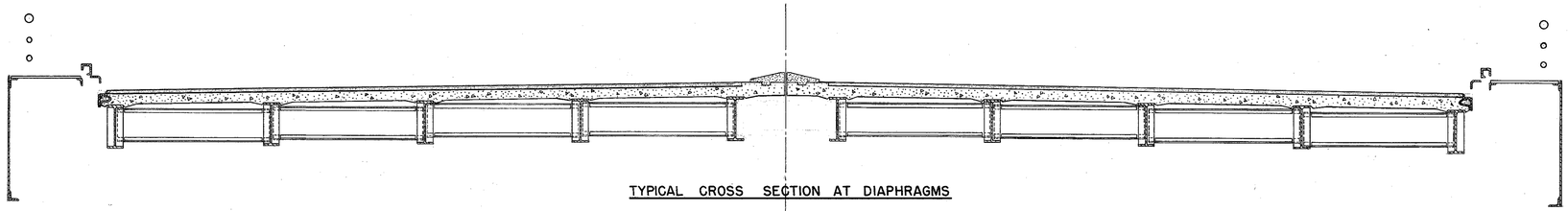
9
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



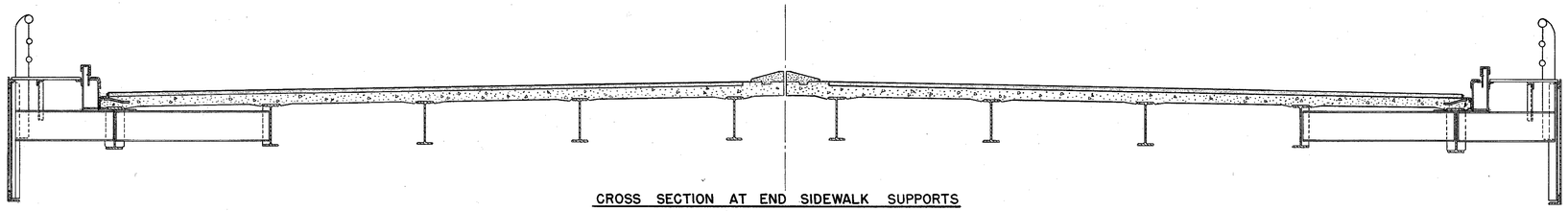
TYPICAL CROSS SECTION AT INTERMEDIATE FLOOR BEAMS

UNIT 2



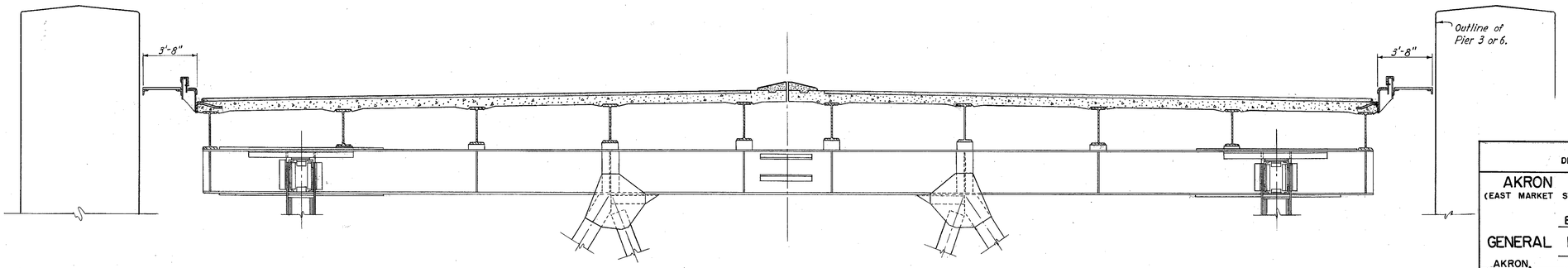
TYPICAL CROSS SECTION AT DIAPHRAGMS

UNIT 2



CROSS SECTION AT END SIDEWALK SUPPORTS

UNIT 2



CROSS SECTION AT END FLOOR BEAMS

UNIT 2

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GENERAL ROADWAY CROSS SECTIONS

AKRON, SUMMIT COUNTY, OHIO

SCALE 1/4"=1'-0"
MADE. M.B. DATE 7-14-49
TRCD. M.B. DATE 7-20-49
CHKD. R.R.M. DATE 10-27-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

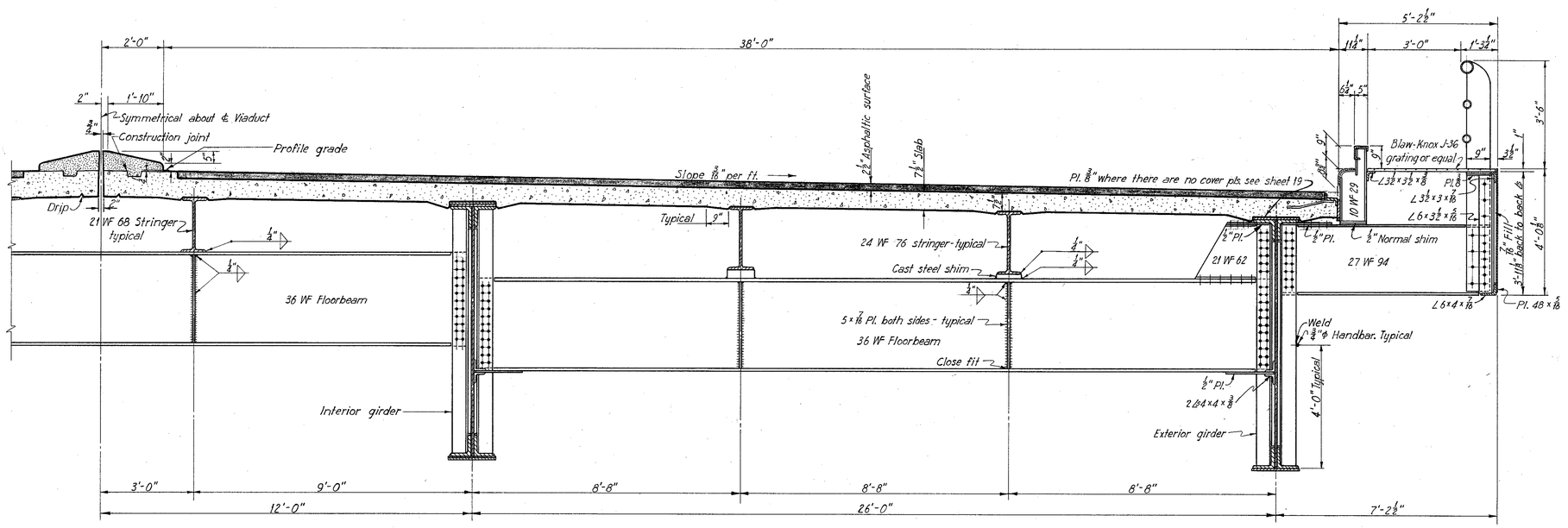
766 SHEET V43

157

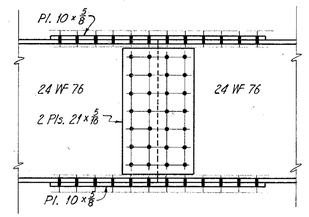
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

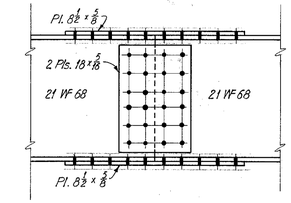
10
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

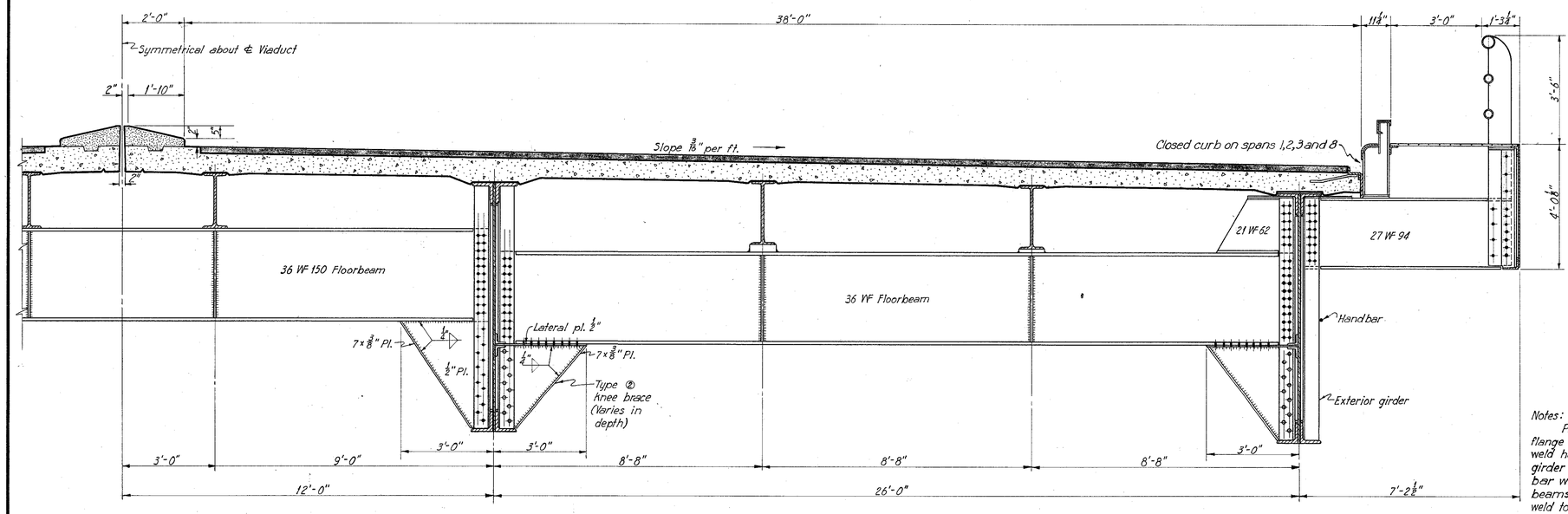


TYPICAL HALF CROSS SECTION AT INTERMEDIATE FLOORBEAMS WITHOUT KNEEBRACES
Scale: ½" = 1'-0"

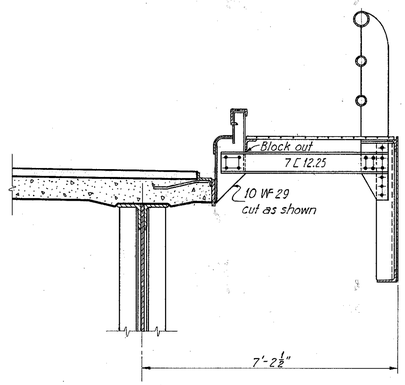




STRINGER SPLICES
Scale: 1" = 1'-0"



HALF CROSS SECTION AT INTERMEDIATE FLOORBEAMS WITH KNEEBRACES
Scale: ½" = 1'-0"



INTERMEDIATE SIDEWALK SUPPORT
Scale: ½" = 1'-0"

Notes:
Provide ¾" ϕ handbars 4'-0" above lower flange on both sides of each girder. Shop weld handbars to outstanding legs of girder stiffener angles. Provide breaks in bar where required for kneebraces, floorbeams and field splices. Bend bar 90° and weld to girder web when break occurs between stiffener angles.
For detail of handrail and curb see sheet 40.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

ROADWAY CROSS SECTIONS-UNITS 1 & 3

AKRON, SUMMIT COUNTY, OHIO

SCALE 1" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE M.E.E. DATE 5-3-49 CONSULTING ENGINEERS
TRCD. G.D. DATE 8-22-49 KANSAS CITY NEW YORK
CHKD. D.W.K. DATE 10-27-49

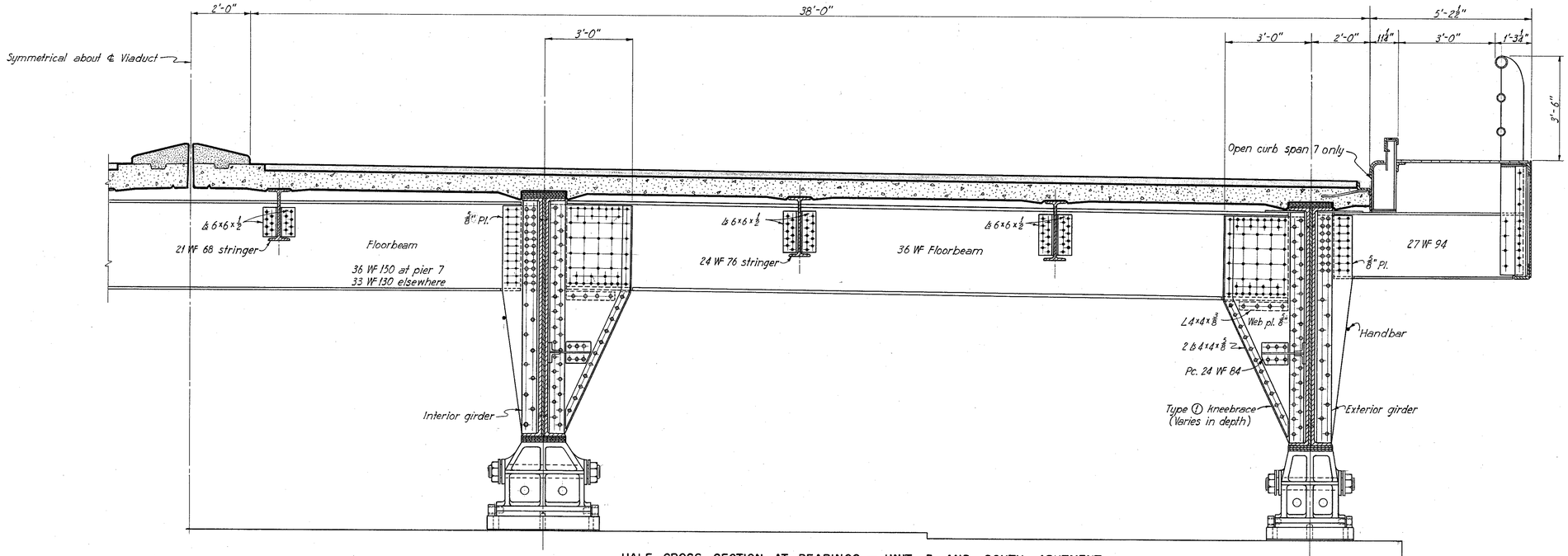
766 SHEET V44

121

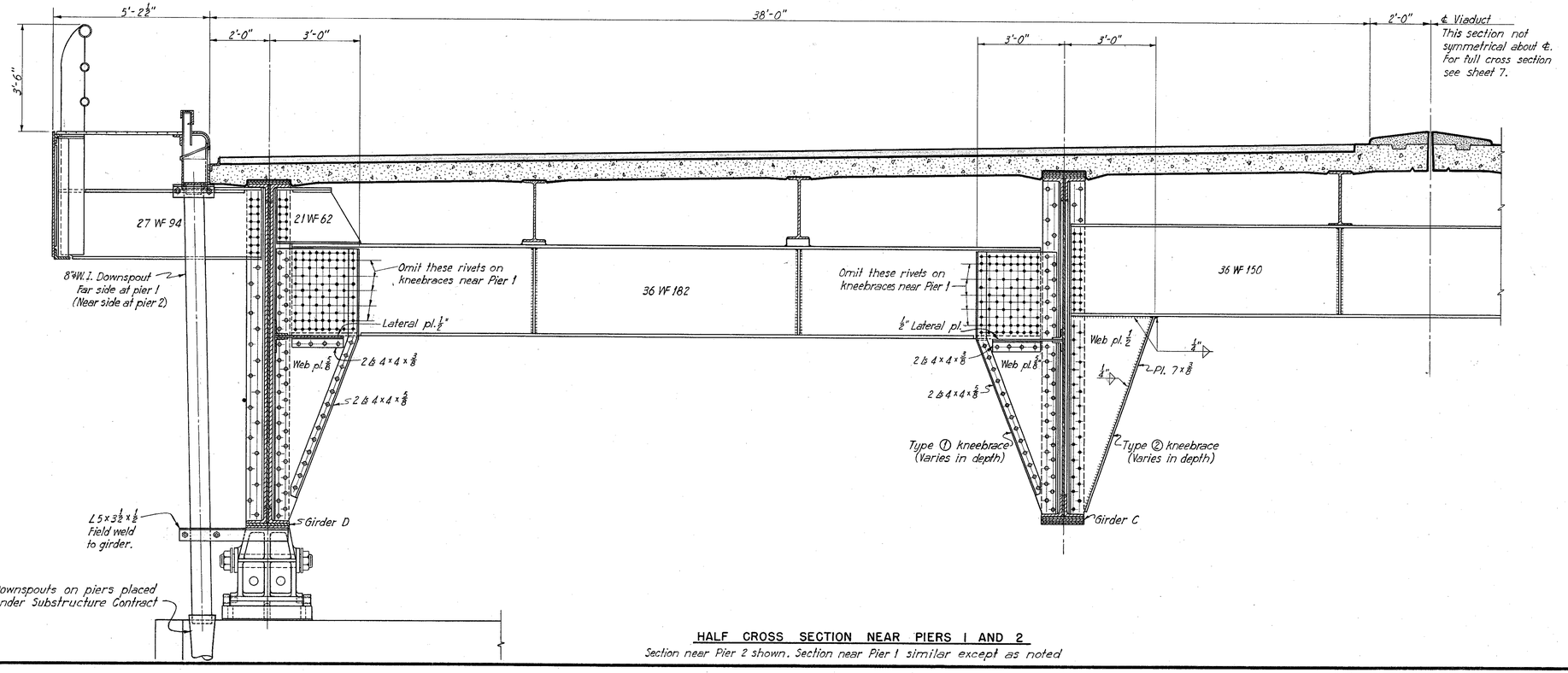
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

11
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

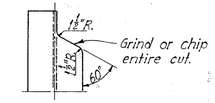


HALF CROSS SECTION AT BEARINGS — UNIT 3 AND SOUTH ABUTMENT



HALF CROSS SECTION NEAR PIERS 1 AND 2

Section near Pier 2 shown. Section near Pier 1 similar except as noted



All floorbeams, stringers and other wide flange and channel sections which require coping shall have flanges cut as shown.

FLANGE COPING DETAIL

Pier 7: As shown.

Pier 6: Floor beams as shown except top flanges of outside floor beams are to be flush with top flanges of exterior girders and top flange of center floor beam to be flush with top flanges of interior girders. Omit sidewalk bracket and connections across girder to floor beam. See girder details.

No. Abut: Same as at pier 6 except provide sidewalk bracket and connections. See girder details.

So. Abut: Same as at north abutment except girders and kneebraces are shallower. Lateral bracing connection as detailed sheet 20.

for drainage details see sheet 41.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

ROADWAY CROSS SECTIONS-UNITS 1 & 3

AKRON, SUMMIT COUNTY, OHIO

SCALE 1"=1'-0"
MADE H.L.S. DATE 5-16-49
TRCD. G.D. DATE 8-22-49
CHKD. D.W.K. DATE 10-27-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

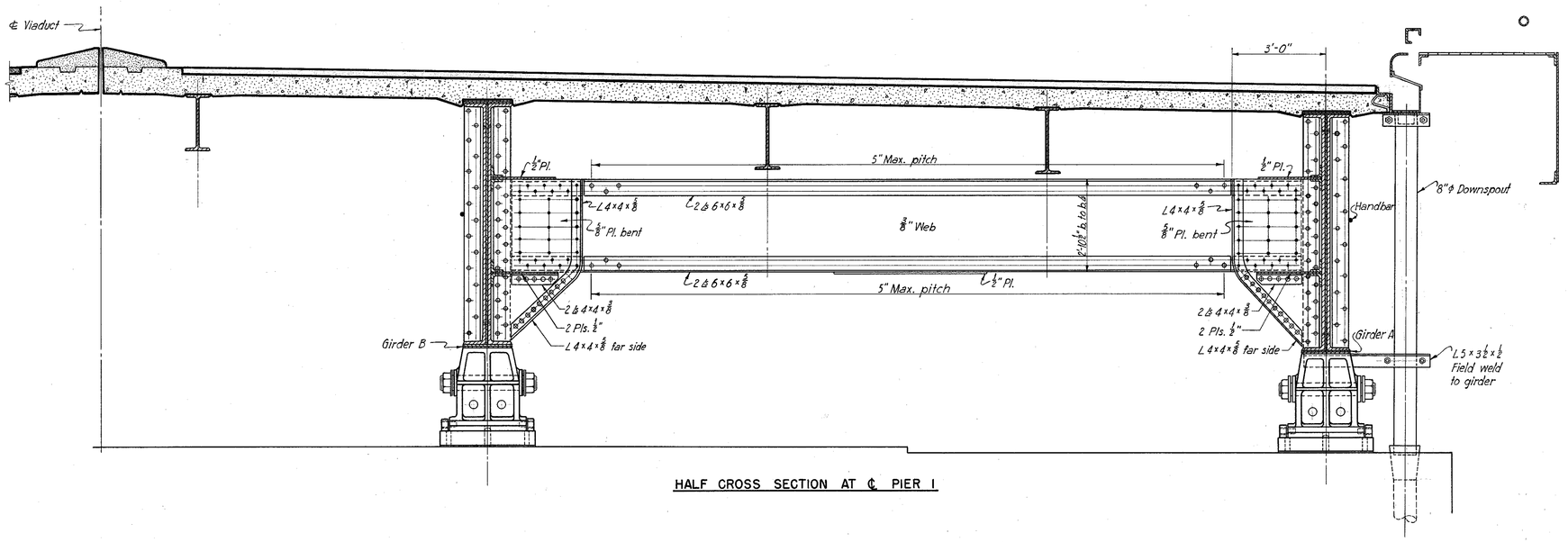
766 SHEET V45

131

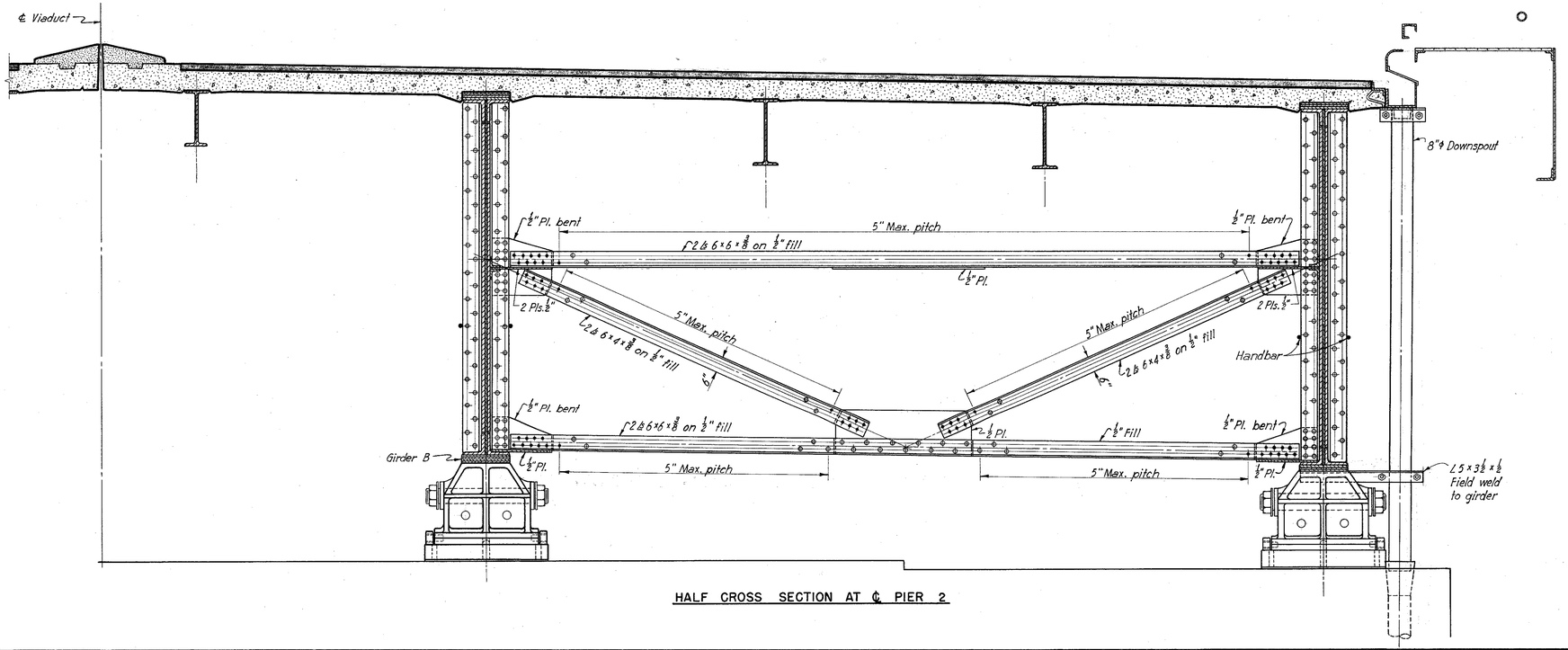
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

12
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



HALF CROSS SECTION AT ℄ PIER 1



HALF CROSS SECTION AT ℄ PIER 2

Note:
Cross Sections on this sheet are not symmetrical about ℄ Viaduct. For full cross sections see sheet 7.
For drainage details see sheet 41.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

ROADWAY CROSS SECTIONS-UNIT 1

AKRON, SUMMIT COUNTY, OHIO

SCALE..½"=1'-0"
MADE..M.E.F..DATE..5-16-49
TRCD..G.D...DATE..8-25-49
CHKD..D.W.K..DATE..10-27-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

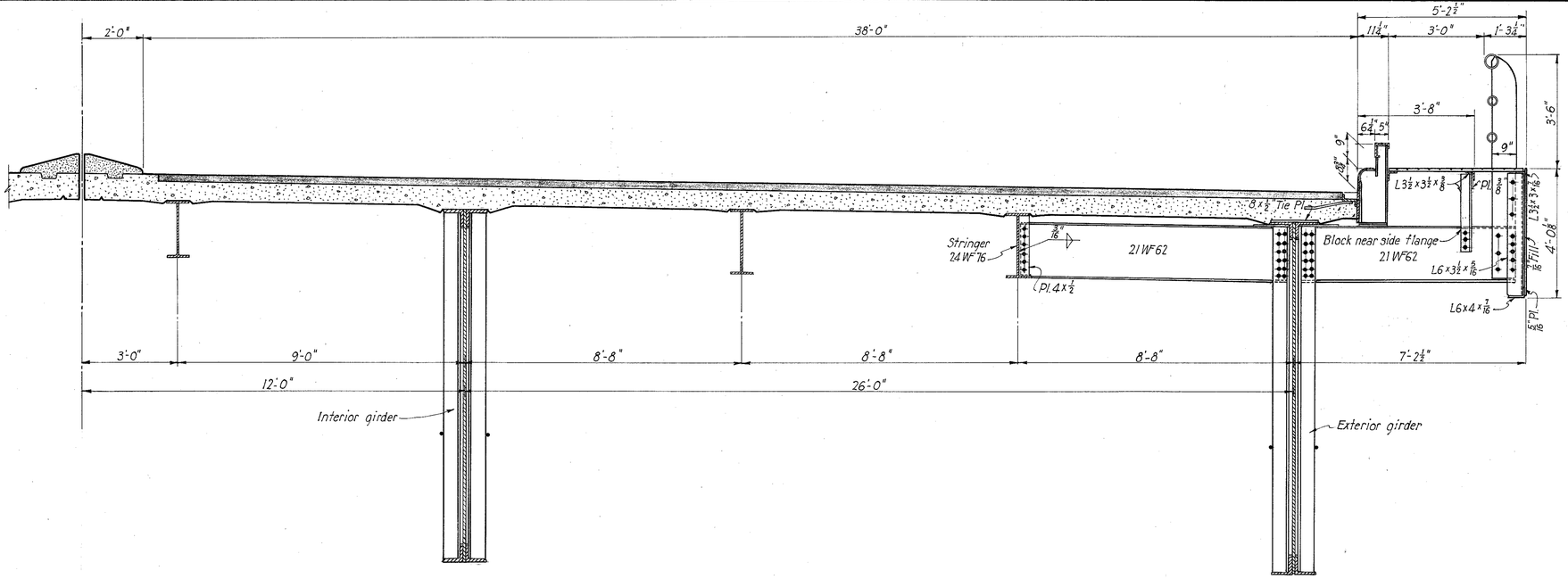
766. SHEET V46

120

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

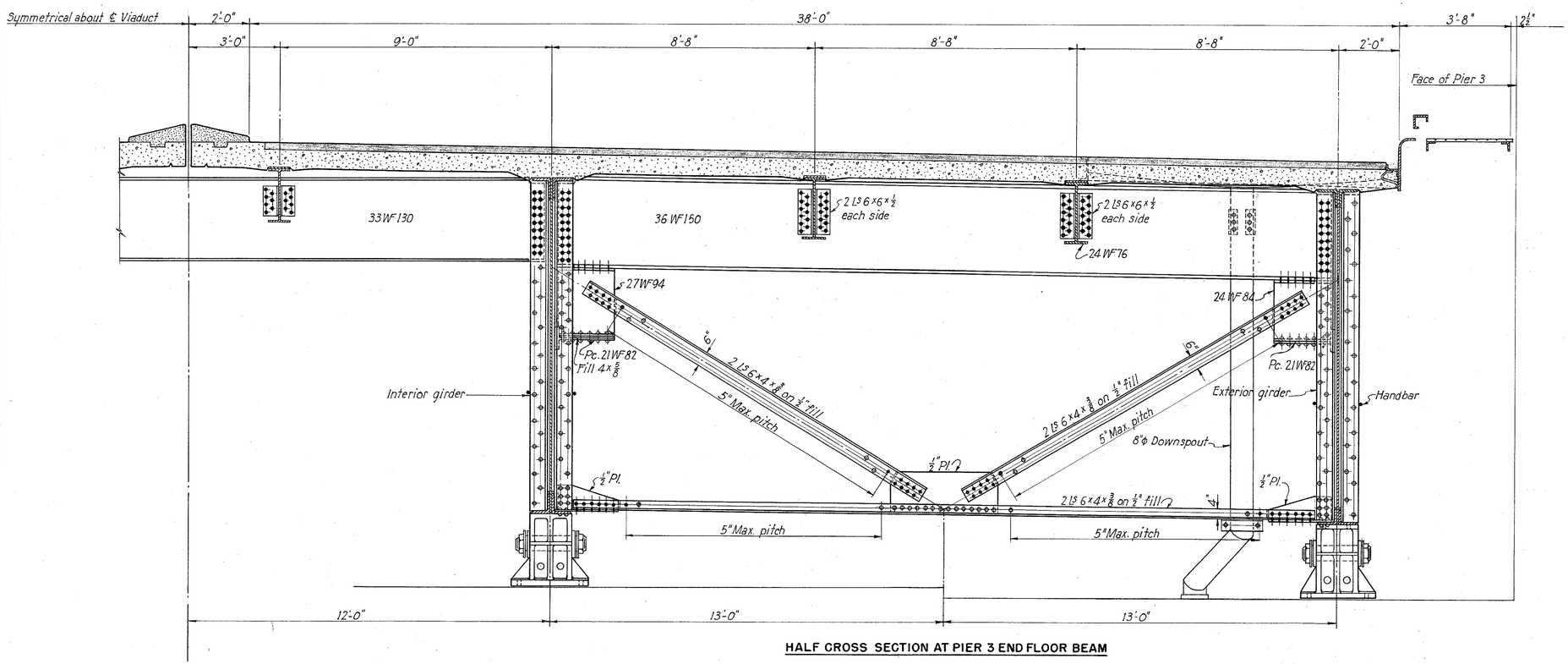
13
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



HALF CROSS SECTION AT PIER 3 END SIDEWALK SUPPORT

Cross Section at Pier 6 similar.



HALF CROSS SECTION AT PIER 3 END FLOOR BEAM

Note: For details of drainage and downspout at Pier 3, see sheet 41.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

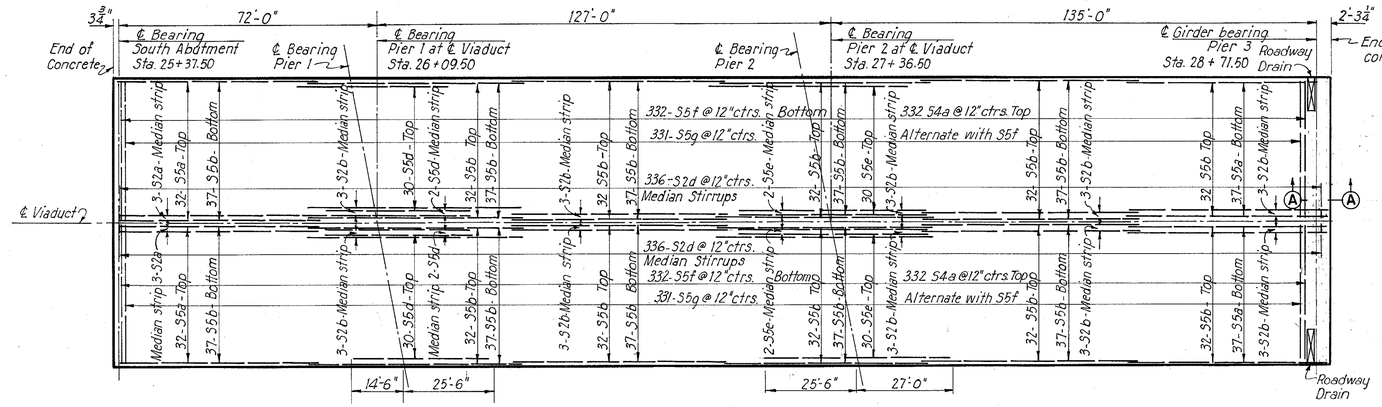
ROADWAY CROSS SECTIONS-UNITS 1 & 3

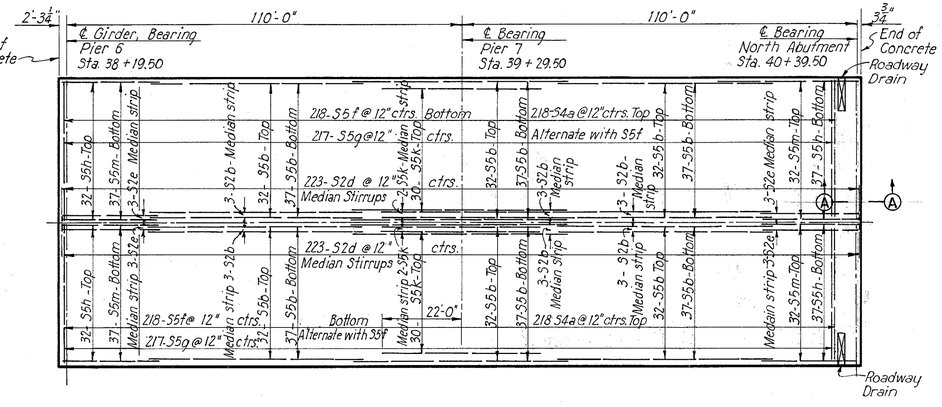
AKRON, SUMMIT COUNTY, OHIO

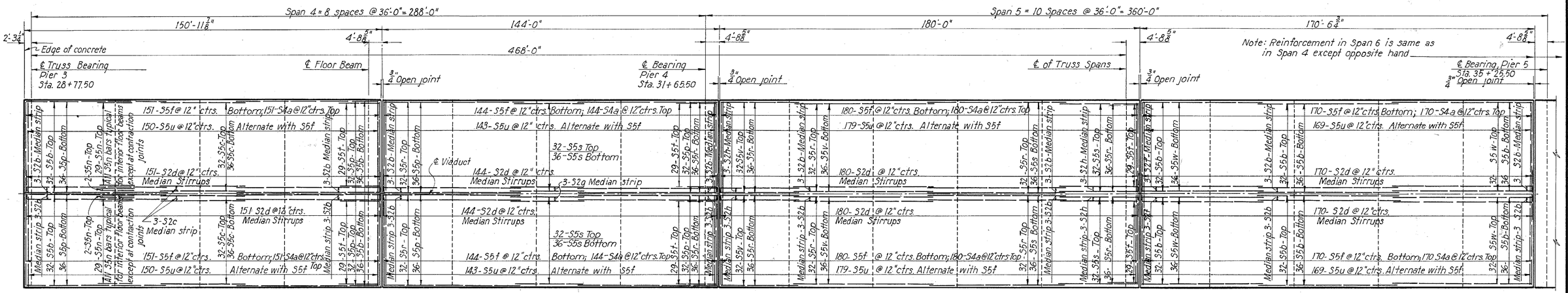
SCALE 1/2" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE H.L.S. DATE 5-16-49
TRCD. B.R. DATE 8-20-49
CHKD. D.W.W. DATE 10-27-49
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V47

131







FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS	14
2	OHIO	U-687 6	POST WAR	44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

UNIT 1

SLAB PLAN - SPANS 1, 2 AND 3

UNIT 3

SLAB PLAN - SPANS 7 AND 8

UNIT 2

SLAB PLAN - SPANS 4, 5 AND 6

POURING SEQUENCE

No Scale

SECTION A-A

Scale: ¾" = 1'-0"

Notes: Spacing of longitudinal reinforcing steel shown on sheet 15.
The Contractor may submit alternate pouring sequences, subject to the approval of the Engineers.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

ROADWAY SLAB PLANS

AKRON, SUMMIT COUNTY, OHIO

SCALE No Scale
MADE H.F.S. DATE 5-5-49
TRCD. R.R. DATE 8-1-49
CHKD. A.C.A. DATE 7-19-49

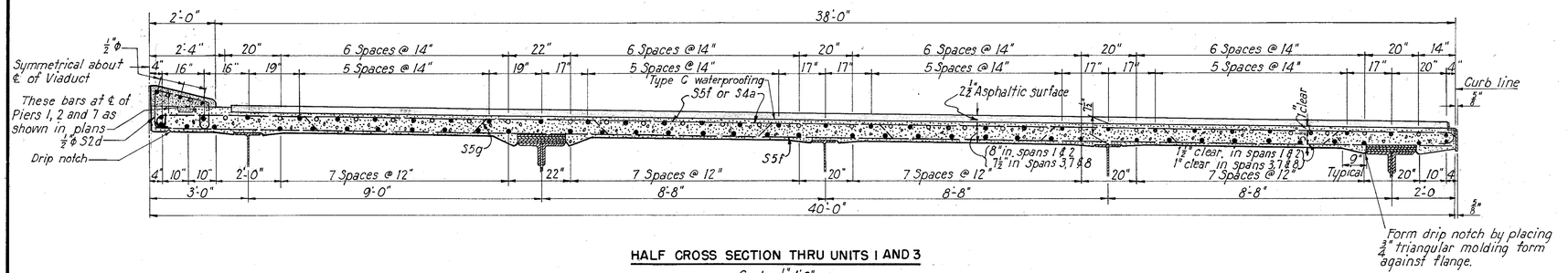
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V48

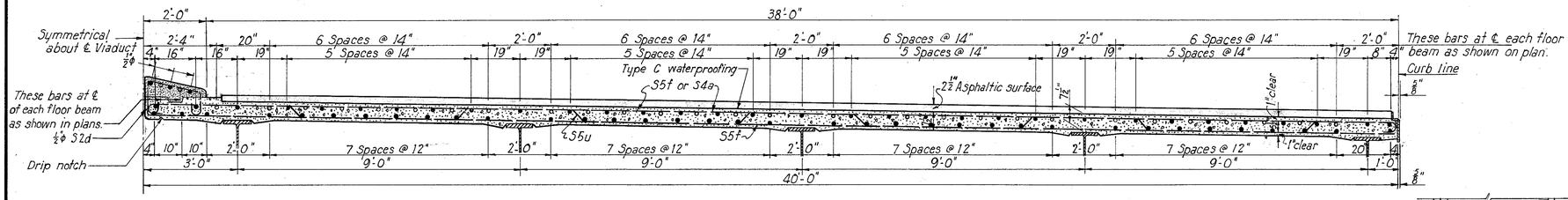
122

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS	15 / 44
2	OHIO	U-687(6)	POST WAR	

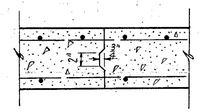
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



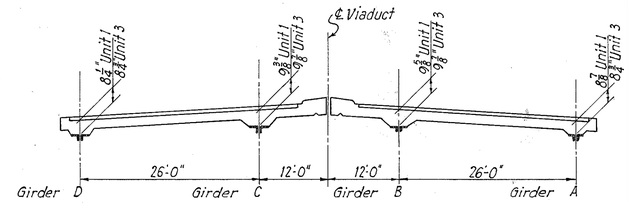
HALF CROSS SECTION THRU UNITS 1 AND 3
Scale: 1½"=1'-0"



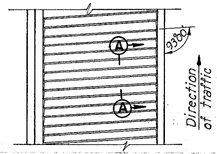
HALF CROSS SECTION THRU UNIT 2
Scale: 1½"=1'-0"



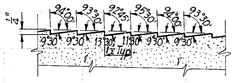
TRANSVERSE CONSTRUCTION JOINT
Scale: 1½"=1'-0"



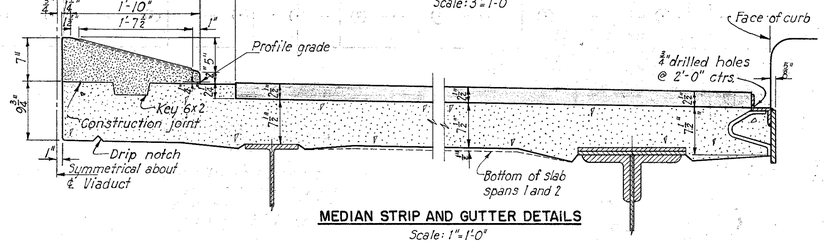
SLAB HAUNCHES AT GIRDERS
Over ℄ of Bearings at Piers and Abutments.
Note: Distances given top of concrete to back of angles.
No Scale



PLAN OF MEDIAN
Scale: 1½"=1'-0"



SECTION A-A
Scale: 3"=1'-0"



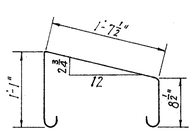
MEDIAN STRIP AND GUTTER DETAILS
Scale: 1"=1'-0"

UNIT 1 SLAB					
Mark	Size	No.	Length	Type	Weight
S5a	¾"ϕ	138	48'-9"	Str.	10,100
S5b	¾"ϕ	690	60'-0"	Str.	62,180
S5d	¾"ϕ	64	40'-0"	Str.	3,850
S5e	¾"ϕ	64	52'-6"	Str.	5,050
S5f	¾"ϕ	670	39'-6"	Str.	39,750
S5g	¾"ϕ	664	42'-6"	130	42,390
S5x	¾"ϕ	16	29'-0"	Str.	700
S4a	⅝"ϕ	664	39'-6"	Str.	27,360
S2a	½"ϕ	6	45'-0"	Str.	180
S2b	½"ϕ	30	60'-0"	Str.	1,200
S2d	½"ϕ	672	4'-6"	131	2,020

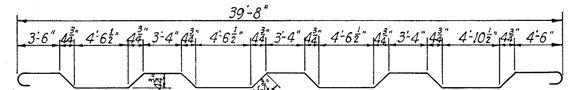
UNIT 2 SLAB					
Mark	Size	No.	Length	Type	Weight
S5b	¾"ϕ	544	60'-0"	Str.	49,030
S5c	¾"ϕ	272	38'-9"	Str.	15,830
S5f	¾"ϕ	1880	39'-6"	Str.	111,540
S5n	¾"ϕ	1240	15'-0"	Str.	27,940
S5p	¾"ϕ	544	57'-0"	Str.	46,570
S5r	¾"ϕ	544	50'-0"	Str.	40,850
S5s	¾"ϕ	408	42'-0"	Str.	25,740
S5t	¾"ϕ	290	12'-6"	Str.	5,440
S5u	¾"ϕ	1868	42'-6"	132	119,240
S5v	¾"ϕ	136	45'-6"	Str.	9,300
S5w	¾"ϕ	136	55'-6"	Str.	11,340
S4a	⅝"ϕ	1880	39'-6"	Str.	77,460
S2b	½"ϕ	72	60'-0"	Str.	2,890
S2c	½"ϕ	12	34'-0"	Str.	270
S2d	½"ϕ	1880	4'-6"	131	5,650
S2f	½"ϕ	6	53'-6"	Str.	210
S2g	½"ϕ	12	27'-0"	Str.	220
S2h	½"ϕ	12	32'-9"	Str.	260

UNIT 3 SLAB					
Mark	Size	No.	Length	Type	Weight
S5b	¾"ϕ	414	60'-0"	Str.	37,310
S5f	¾"ϕ	442	39'-6"	Str.	26,220
S5q	¾"ϕ	436	42'-6"	130	27,830
S5h	¾"ϕ	138	31'-6"	Str.	6,530
S5k	¾"ϕ	64	44'-0"	Str.	4,230
S5m	¾"ϕ	138	20'-9"	Str.	4,300
S5x	¾"ϕ	16	29'-0"	Str.	700
S4a	⅝"ϕ	438	39'-6"	Str.	18,050
S2b	½"ϕ	18	60'-0"	Str.	720
S2d	½"ϕ	446	4'-6"	131	1,340
S2e	½"ϕ	12	24'-9"	Str.	200

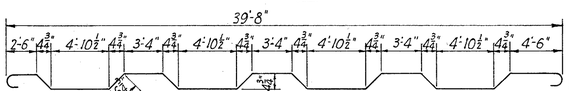
REPLACEMENT BARS					
R2a	½"ϕ	1	6'-0"	Str.	50
R4a	⅝"ϕ	8	6'-0"	Str.	4
R5a	¾"ϕ	41	6'-6"	Str.	400



131



130



132

BENDING DIAGRAMS

Note: For details of contraction joints in Unit 2, see sheet 29.
For details of gutter and curb, see sheet 40.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

ROADWAY SLAB DETAILS

AKRON, SUMMIT COUNTY, OHIO

SCALE 3/4"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE H.E.S. DATE 5-5-49 CONSULTING ENGINEERS
TRCD R.R. DATE 6-16-49 KANSAS CITY NEW YORK
CHKD B.C.A. DATE 7-19-49

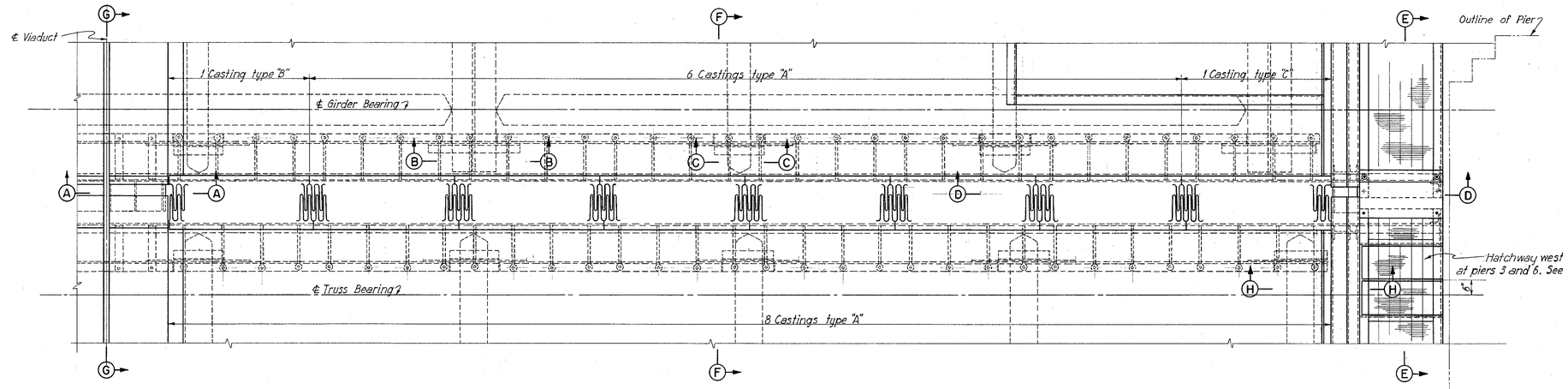
766 SHEET V49

159

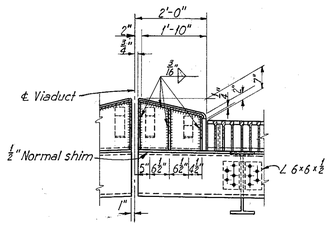
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687 6	POST WAR

16
44

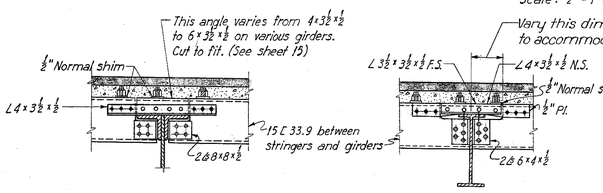
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



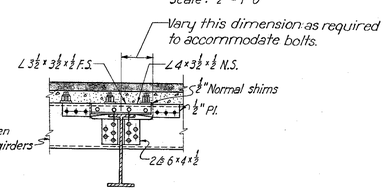
HALF PLAN OF EXPANSION JOINT PIER 3
Joint at Pier 6 opposite hand
Scale: 1/8" = 1'-0"



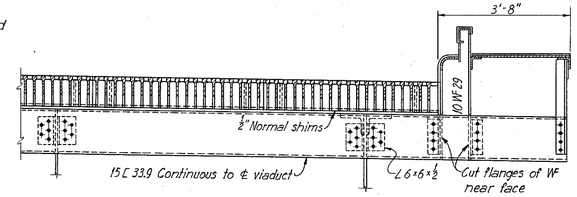
SECTION A-A
Scale: 1/2" = 1'-0"



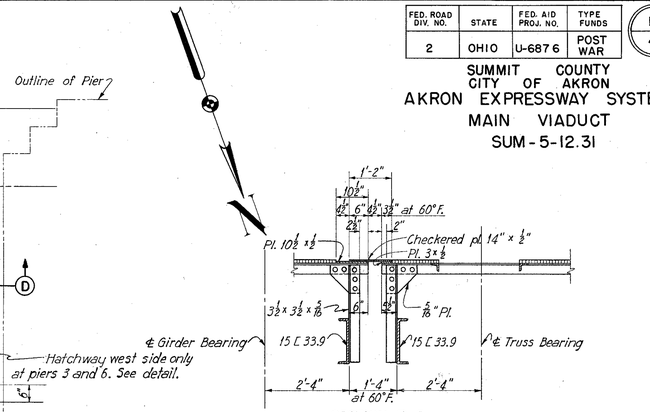
SECTION B-B
Scale: 1/2" = 1'-0"



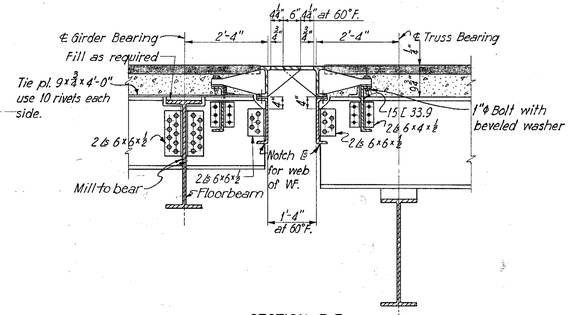
SECTION C-C
Scale: 1/2" = 1'-0"



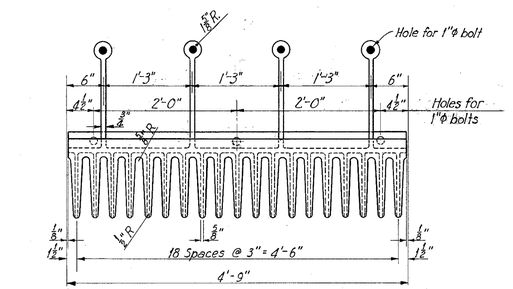
SECTION D-D
Scale: 1/2" = 1'-0"



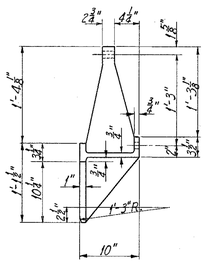
SECTION E-E
Scale: 1/2" = 1'-0"



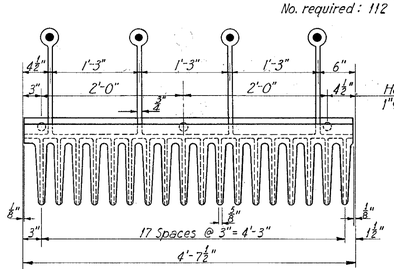
SECTION F-F
Scale: 1/2" = 1'-0"



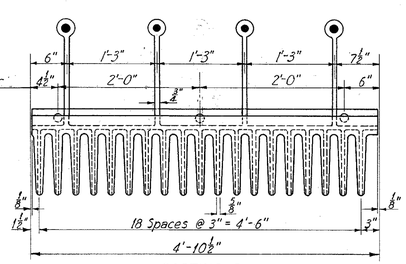
CASTING A
Scale: 1" = 1'-0"
Material: Cast steel
No. required: 112



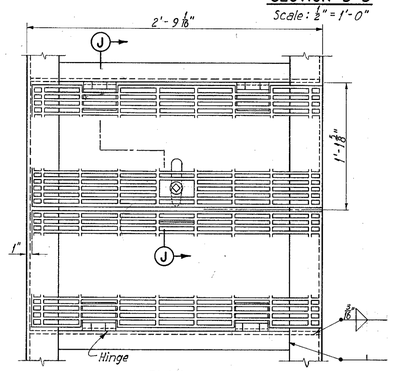
Note: Anchor bolt holes in castings supported on concrete abutments shall be 1 1/2"ϕ. Anchor bolt holes in castings supported on steel shall be 1 1/8" ϕ drilled. See Notes sheet 5.



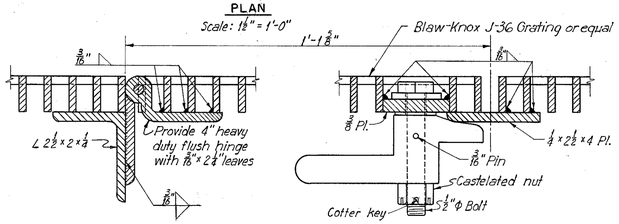
CASTING B
Scale: 1" = 1'-0"
Material: Cast steel
No. required: 4 as shown
4 opposite hand



CASTING C
Scale: 1" = 1'-0"
Material: Cast steel
No. required: 4 as shown
4 opposite hand



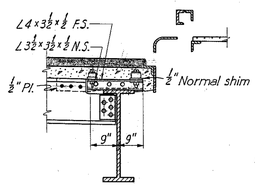
PLAN
Scale: 1 1/2" = 1'-0"



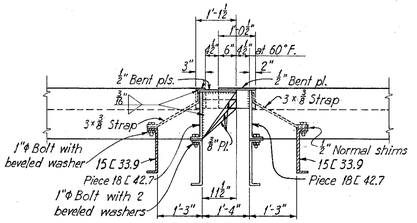
SECTION J-J
Scale: Half size

HATCHWAY DETAILS
(for access to inspection walkway)

Note: Provide latch similar to one shown to be opened with wrench or key from top and provide handle on bottom.



SECTION H-H
Scale: 1/2" = 1'-0"



SECTION G-G
Scale: 1/2" = 1'-0"

Notes:
All fillets in castings shall have 1/2" radius unless shown otherwise.
Top of expansion castings shall be set to roadway grade elevations and conform to cross sections of slab.
For expansion joint in handrail and curb see sheet 40.
Provide hatchway at piers 3 and 6 for access to inspection walkway. See sheet 37.

PART 2

CASTINGS REQUIRED

Location	Castings As Shown			Castings Opposite Hand		
	A	B	C	A	B	C
So. Abutment	28	1	1		1	1
No. Abutment	28	1	1		1	1
Pier 3	28	1	1		1	1
Pier 6	28	1	1		1	1
Totals	112	4	4		4	4

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124
EXPANSION JOINTS AND HATCHWAY AT PIERS 3 AND 6
AKRON, SUMMIT COUNTY, OHIO

SCALE A: 1" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE D.L.J. DATE 6-10-49 CONSULTING ENGINEERS
TRCD. G.D. DATE 9-14-49 KANSAS CITY NEW YORK
CHKD. A.C.A. DATE 9-28-49

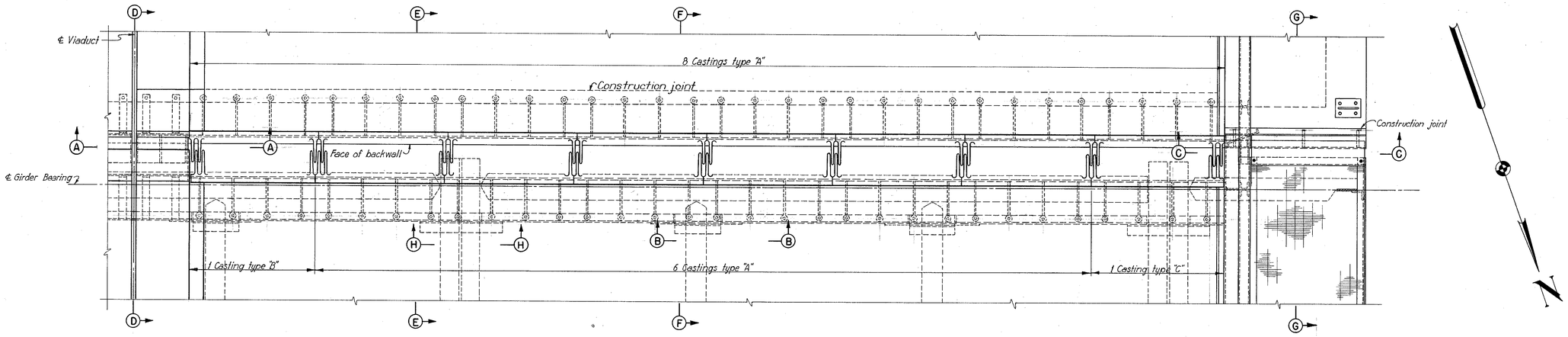
766 SHEET V50

123

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

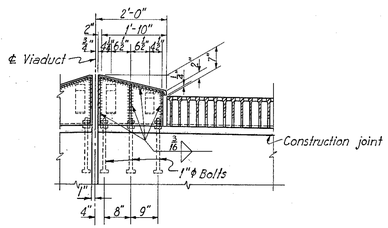
17
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

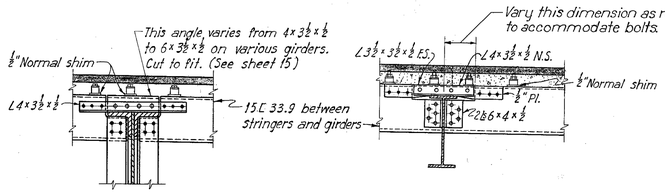


HALF PLAN OF EXPANSION JOINT AT SOUTH ABUTMENT

Joint at North Abutment opposite hand
Scale: $\frac{1}{8}$" = 1'-0"

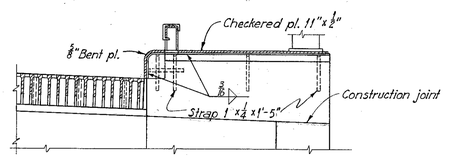


SECTION A-A
Scale: $\frac{1}{2}$" = 1'-0"

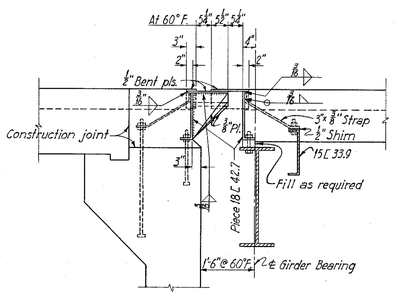


SECTION H-H
Scale: $\frac{1}{2}$" = 1'-0"

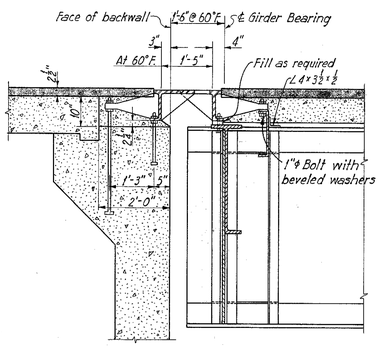
SECTION B-B
Typical at all stringers
Scale: $\frac{1}{2}$" = 1'-0"



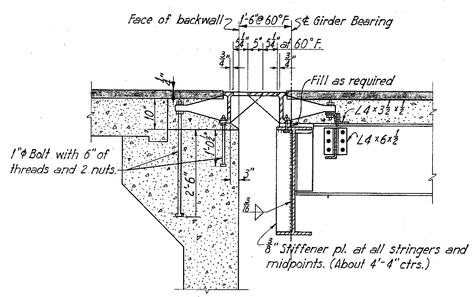
SECTION C-C
Scale: $\frac{1}{2}$" = 1'-0"



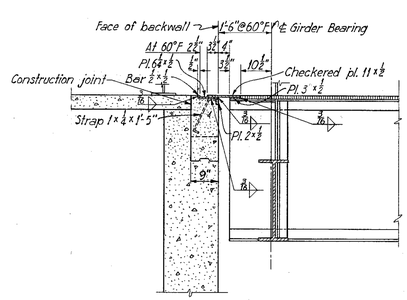
SECTION D-D
Scale: $\frac{1}{2}$" = 1'-0"



SECTION E-E
Scale: $\frac{1}{2}$" = 1'-0"



SECTION F-F
Scale: $\frac{1}{2}$" = 1'-0"



SECTION G-G
Scale: $\frac{1}{2}$" = 1'-0"

Notes:

For casting detail see sheet 16.

Top of expansion castings shall be set to roadway grade elevations and conform to cross section of slab.

For number of castings required see sheet 16.

For expansion joint in handrail and curb see sheet 40.

Anchor bolts in abutments will be furnished and placed under substructure contract.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

EXPANSION JOINTS AT ABUTMENTS

AKRON, SUMMIT COUNTY, OHIO

SCALE $\frac{1}{2}$" = 1'-0"
MADE D.L.J. DATE 6-28-49
TRCD. G.D. DATE 9-8-49
CHKD. A.C.A. DATE 9-24-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

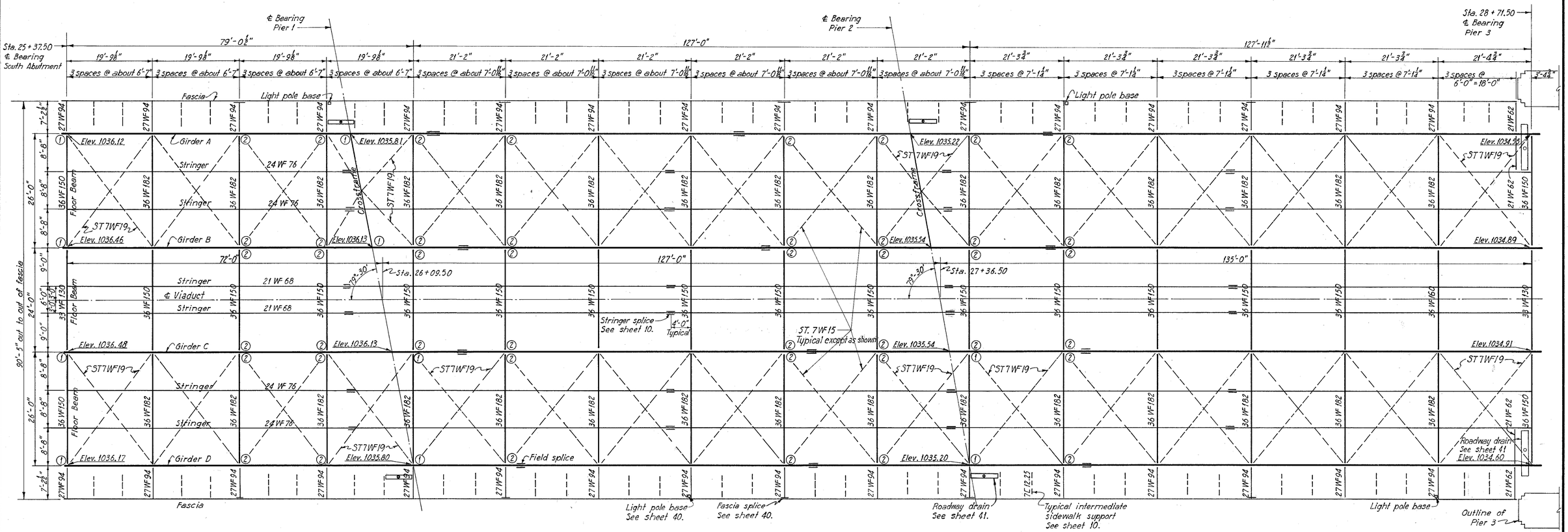
766 SHEET V51

124

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

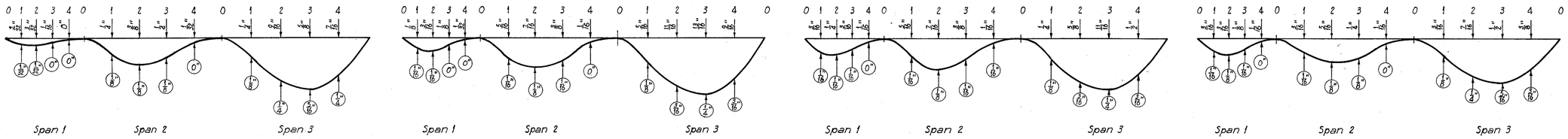
18
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



FRAMING PLAN - SPANS 1, 2 AND 3

Note:
Elevations given are to backs of top flange angles.
Figures ① and ② indicate locations of kneebraces. For details, see sheets 10 and 11.



GIRDER A

GIRDER B

GIRDER C

GIRDER D

GIRDER DEFLECTION DIAGRAMS

Notes:
Dimensions in ◯ are deflections which may be expected in the steel girders when in place.
Dimensions shown above base line are additional deflections to be expected when concrete is in place.

All girders in span 3 shall be cambered 1". Dead load deflections in all other girder spans shall be compensated for by haunching concrete slab over girders.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

FRAMING PLAN - UNIT 1

AKRON, SUMMIT COUNTY, OHIO

SCALE 1" = 10'
MADE M.B. DATE 5-9-49
TRCD WLG-GD DATE 7-27-49
CHKD. J.T. DATE 7-12-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

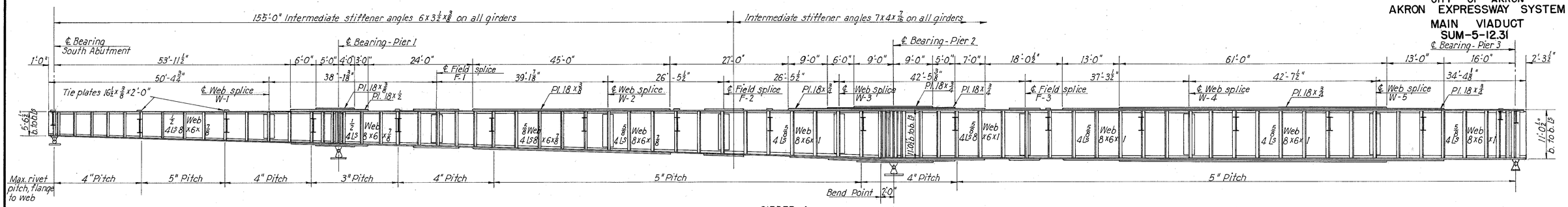
766 SHEET V52

125

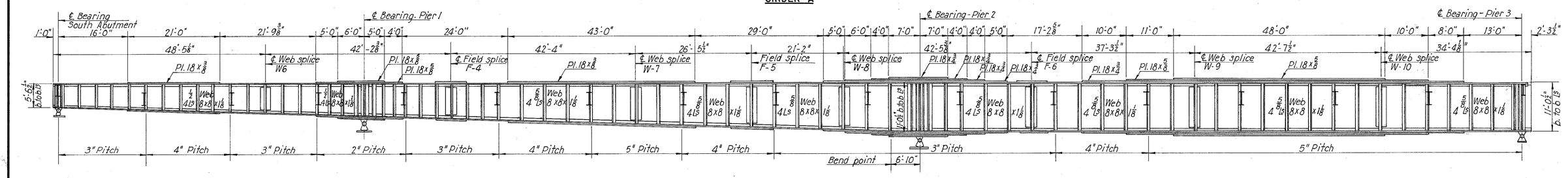
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

19
44

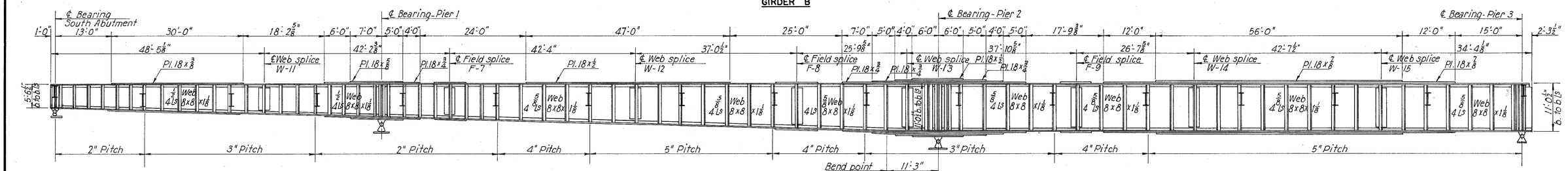
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



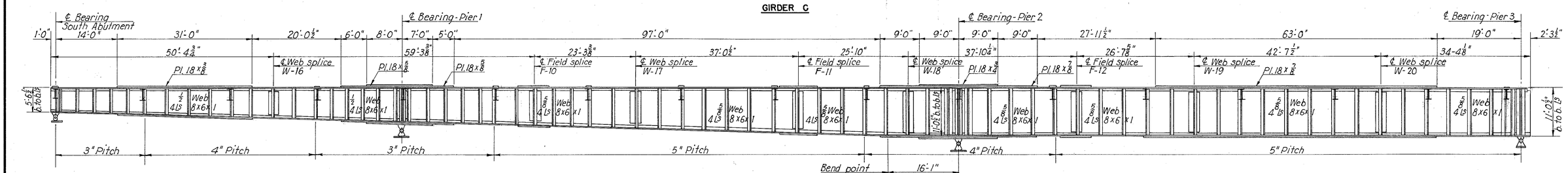
GIRDER A



GIRDER B



GIRDER C



GIRDER D

STIFFENER ANGLES FOR UNIT I

Location	Girder A	Girder B	Girder C	Girder D
Intermediate stiffeners from South Abutment to 155' from abutment	2 LS 6 x 3½ x ⅜	2 LS 6 x 3½ x ⅜	2 LS 6 x 3½ x ⅜	2 LS 6 x 3½ x ⅜
Intermediate stiffeners 155' from South Abutment to Pier 3	2 LS 7 x 4 x 7/16	2 LS 7 x 4 x 7/16	2 LS 7 x 4 x 7/16	2 LS 7 x 4 x 7/16
Bearing stiffeners, South Abut.	2 LS 7 x 4 x ⅝	4 LS 7 x 4 x ⅝	4 LS 7 x 4 x ⅝	2 LS 7 x 4 x ⅝
Jacking stiffeners, South Abut.	2 LS 7 x 4 x ⅝	2 LS 7 x 4 x ⅝	2 LS 7 x 4 x ⅝	2 LS 7 x 4 x ⅝
Bearing stiffeners, Pier 1	4 LS 7 x 4 x ⅞	4 LS 7 x 4 x ⅞ *	4 LS 7 x 4 x ⅞ *	4 LS 7 x 4 x ⅞ *
Jacking stiffeners, Pier 1	2 Sets of 2 LS 7 x 4 x ⅝	2 Sets of 2 LS 7 x 4 x ⅞	2 Sets of 2 LS 7 x 4 x ⅞	2 Sets of 2 LS 7 x 4 x ⅝
Bearing stiffeners, Pier 2	4 LS 7 x 4 x ⅞ *	4 LS 8 x 4 x 1 *	4 LS 7 x 4 x ⅞ *	4 LS 7 x 4 x ⅞ *
Jacking stiffeners, Pier 2	2 Sets of 4 LS 7 x 4 x ⅝	2 Sets of 4 LS 7 x 4 x ⅞	2 Sets of 4 LS 7 x 4 x ⅝	2 Sets of 4 LS 7 x 4 x ⅝
Bearing stiffeners, Pier 3	4 LS 7 x 4 x ⅞	4 LS 7 x 4 x ⅞	4 LS 7 x 4 x ⅞	4 LS 7 x 4 x ⅞
Jacking stiffeners, Pier 3	2 LS 7 x 4 x ⅝	4 LS 7 x 4 x ⅝	4 LS 7 x 4 x ⅝	2 LS 7 x 4 x ⅝

*These stiffeners require fills between outstanding legs. See Girder Details.

Note: Tie plates on girders A & D occur at all floorbeams where there are no coverplates.
For girder splices and details, See sheets 20 to 24.
Ends of bearing and jacking stiffeners are milled to bear.
Intermediate stiffeners shall be crimped except at floorbeam locations.
All other stiffeners shall be on fills with a thickness equal to the flange L thickness except at splices.
Top and bottom cover plates and flange angles are the same.
For riveting of cover plates see sheet 25.
Provide hand bars on all girders. See sheet 10.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GIRDERS - UNIT I

AKRON, SUMMIT COUNTY, OHIO

SCALE 1" = 10'
MADE R.O.D. DATE 5-11-49
TRCD R.O.B., R.R. DATE 8-2-49
CHKD. E.L. DATE 9-20-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

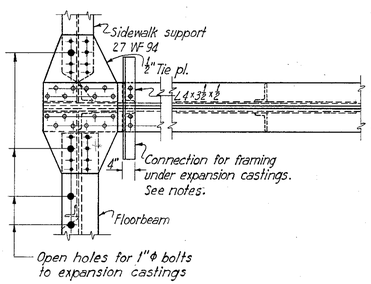
766 SHEET V53

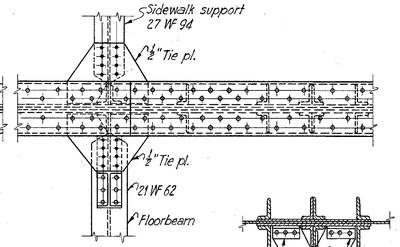
126

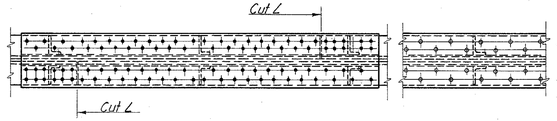
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

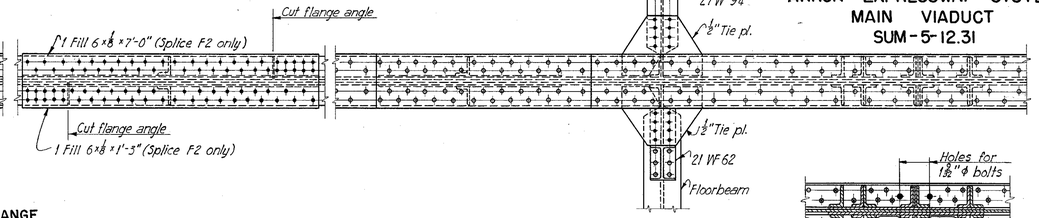
20
44

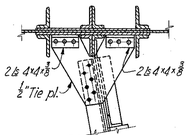
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



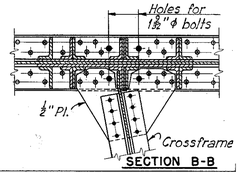






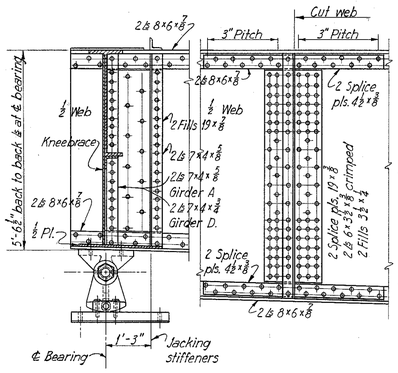


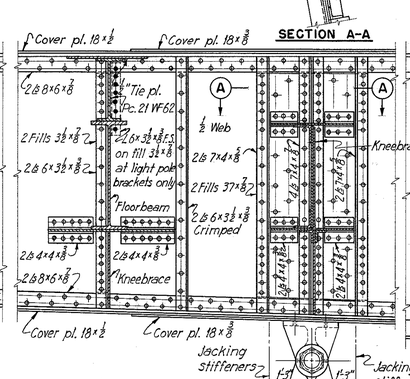
SECTION A-A

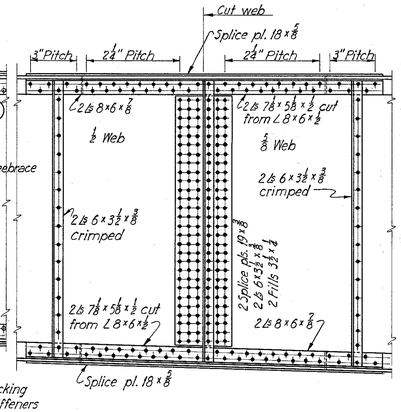


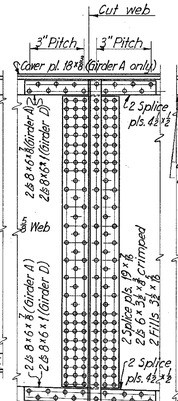
SECTION B-B

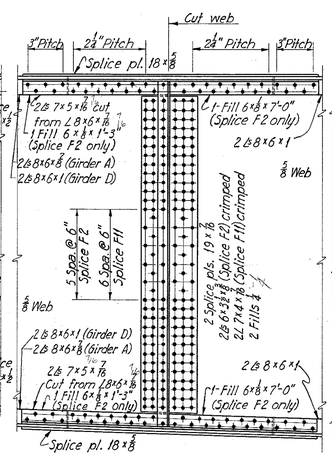
PLAN AT TOP FLANGE

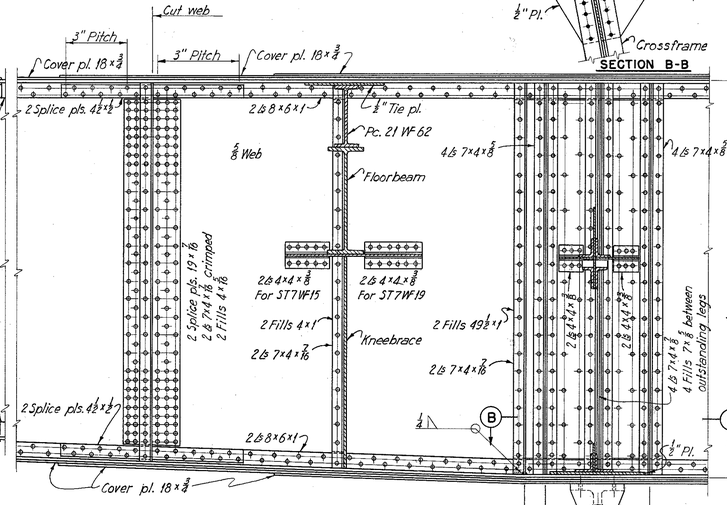






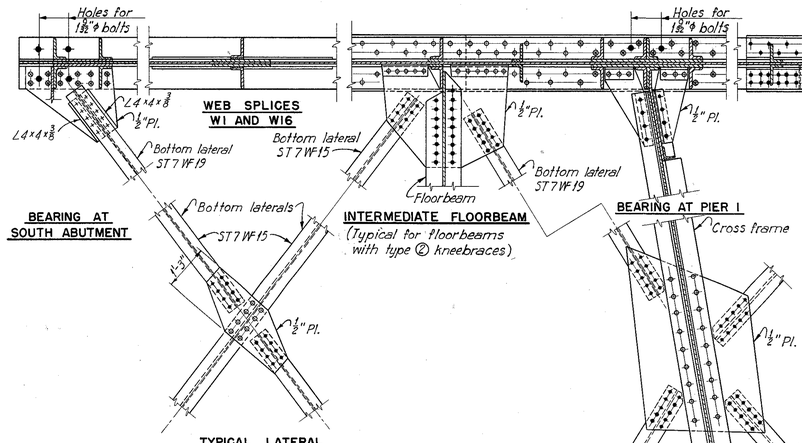






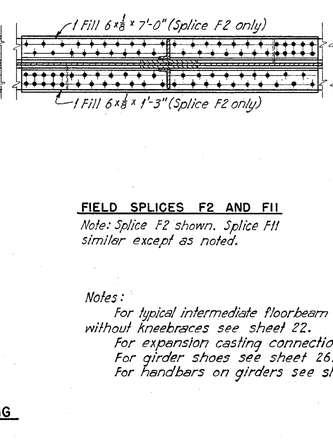
ELEVATION OF GIRDER A

Details of Girder D similar except as noted.



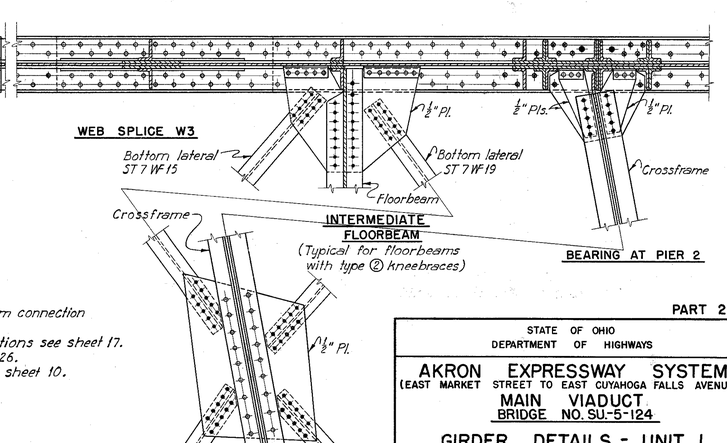
FIELD SPLICE F1

WEB SPLICES W2 AND W17



FIELD SPLICES F2 AND F11

Note: Splice F2 shown. Splice F11 similar except as noted.



Notes:
For typical intermediate floorbeam connection without kneebraces see sheet 22.
For expansion casting connections see sheet 17.
For girder shoes see sheet 26.
For handbars on girders see sheet 10.

PLAN AT LATERAL BRACING

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GIRDER DETAILS - UNIT 1

SCALE 1" = 1'-0"
MADE R.O.D. DATE 5-20-69
TRCD. A.P. DATE 8-18-69
CHKD. A.L.J. DATE 8-30-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

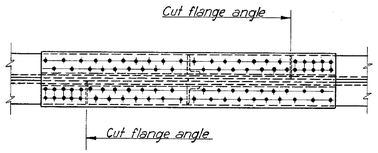
766 SHEET V54

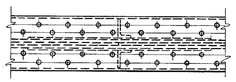
146

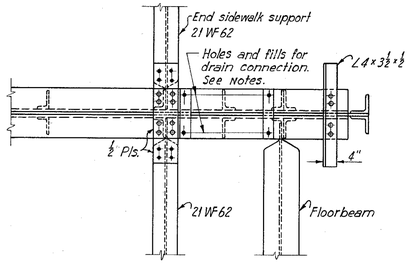
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

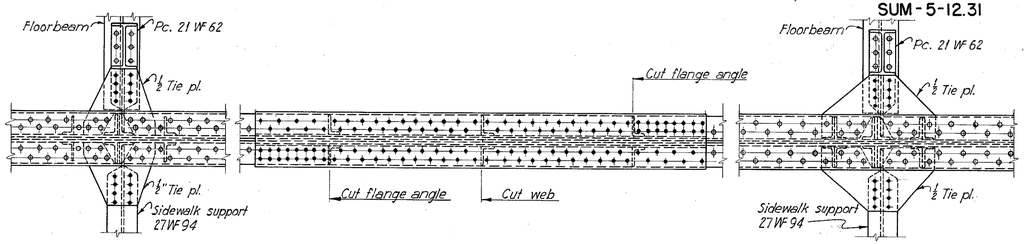
21
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

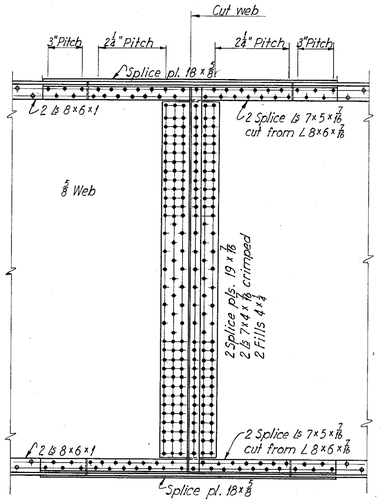


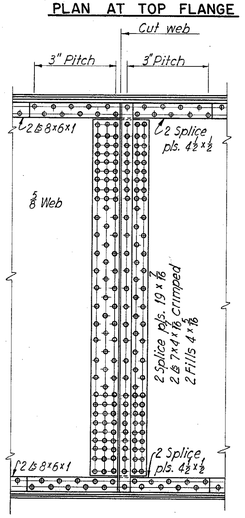


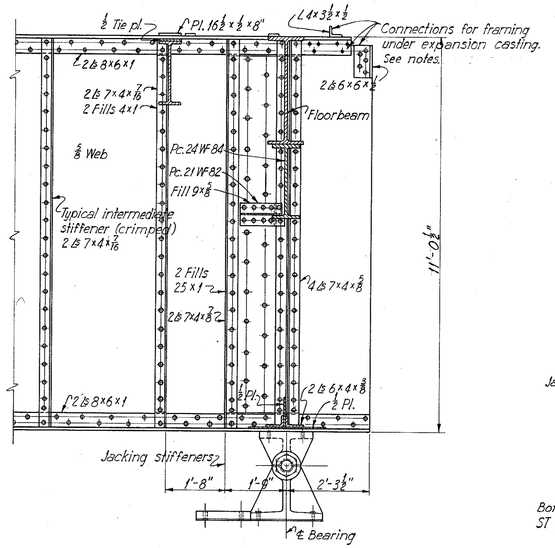




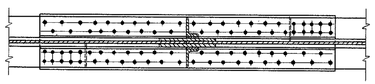
PLAN AT TOP FLANGE



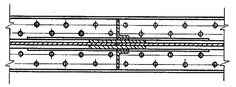




ELEVATION OF GIRDER A

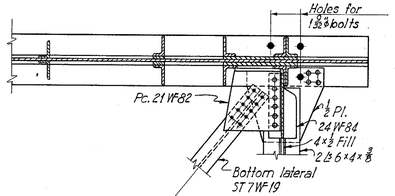


FIELD SPLICES F3 AND F12

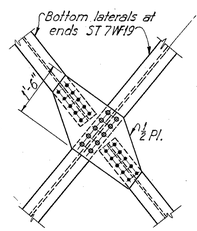


WEB SPLICES
W4, W5, W18, W19 AND W20

PLAN AT LATERAL BRACING

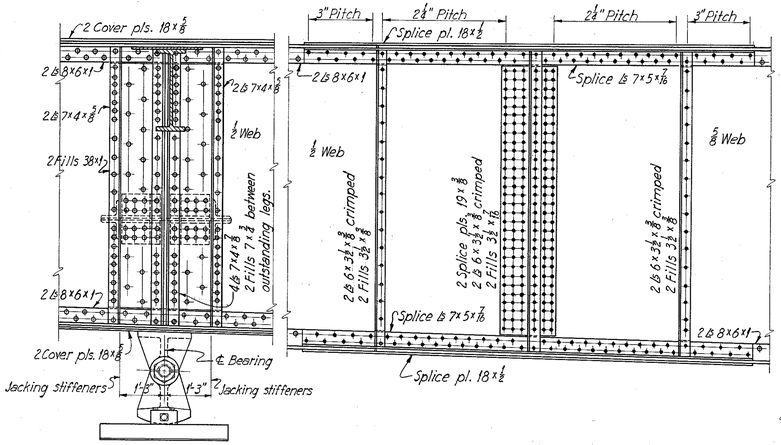


BEARING AT PIER 3

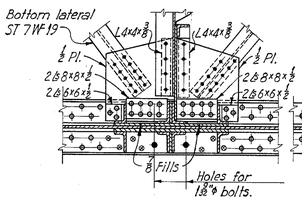


LATERAL INTERSECTION IN END PANELS

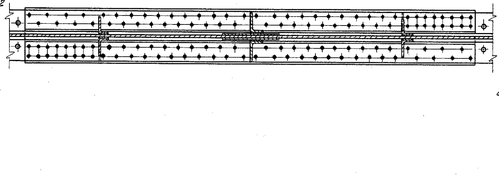
PLAN AT TOP FLANGE



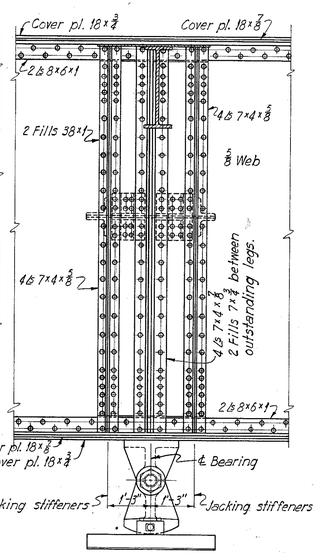
ELEVATION OF GIRDER D

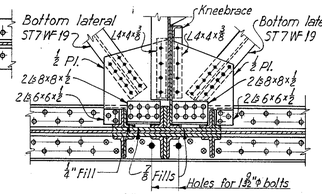


BEARING AT PIER 1



FIELD SPLICE F10





BEARING AT PIER 2

PLAN AT LATERAL BRACING

Notes: for details of expansion castings and connections see sheet 16.
For drain details see sheet 41.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124
GIRDER DETAILS - UNIT 1

AKRON, SUMMIT COUNTY, OHIO

SCALE 1" = 1'-0"
MADE R.O.D. DATE 5-27-49
TRCD. R.D. DATE 9-26-49
CHKD. R.L.J. DATE 10-30-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

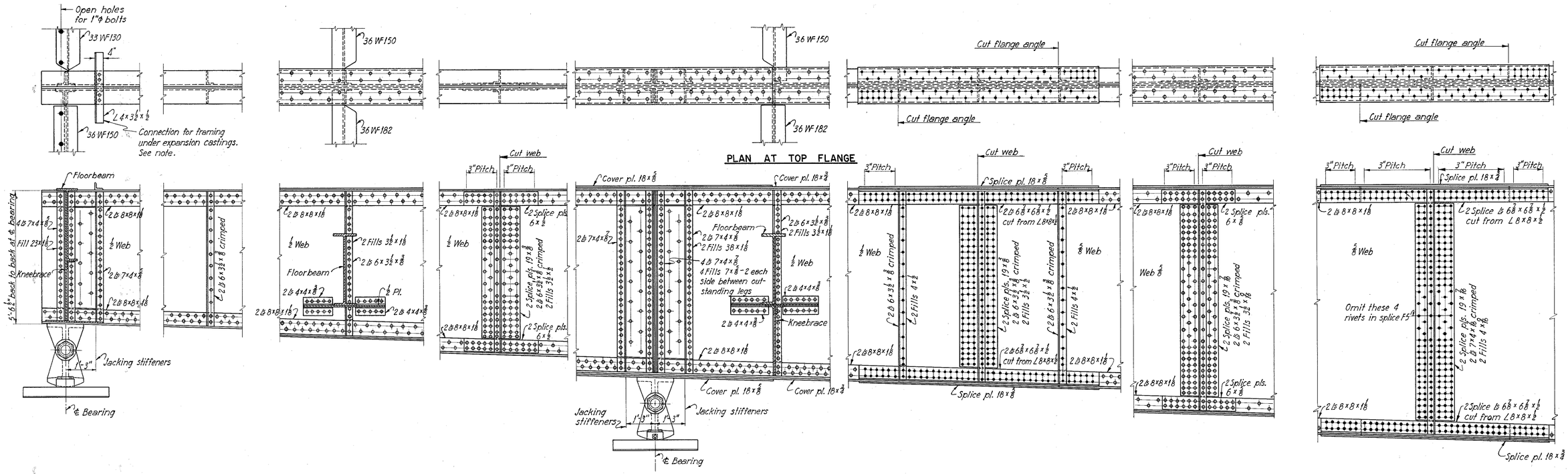
766 SHEET V55

147

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

22
44

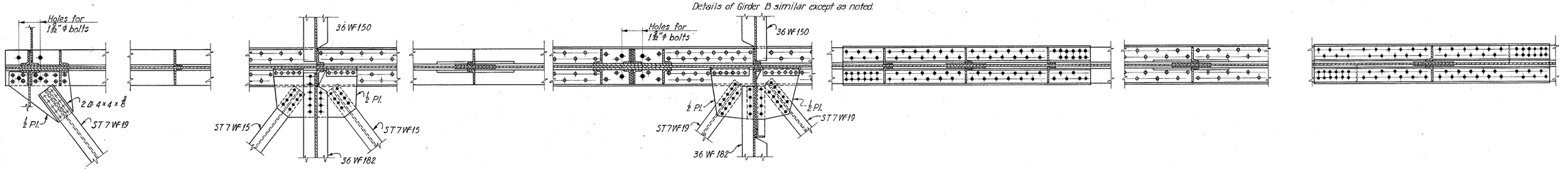
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



PLAN AT TOP FLANGE

ELEVATION OF GIRDER C

Details of Girder B similar except as noted.



BEARING AT SOUTH ABUTMENT

INTERMEDIATE STIFFENER

INTERMEDIATE FLOORBEAM
(Typical for floorbeams without kneebraces)

WEB SPLICES W6 AND W11

BEARING AT PIER 1

INTERMEDIATE FLOORBEAM
(Typical for floobeams with type ① kneebraces)

FIELD SPLICES F4 AND F7

WEB SPLICES W7 AND W12

FIELD SPLICES F5 AND F8

Note: In splice F5 omit one horizontal row of rivets near center of web.

PLAN AT LATERAL BRACING

Note: for expansion casting connections see sheet 17.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GIRDER DETAILS - UNIT 1

AKRON, SUMMIT COUNTY, OHIO

SCALE 1"=1'-0" ....
MADE E.L. ... DATE 6-10-49
TRCD. G.D. ... DATE 10-29-49
CHKD. O.L.V. ... DATE 11-30-49

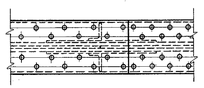
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

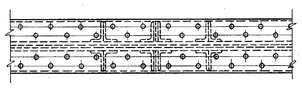
766 SHEET V56

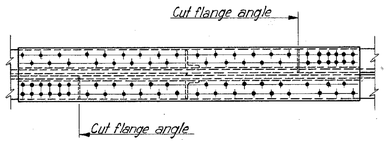
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687 (6)	POST WAR

23
44

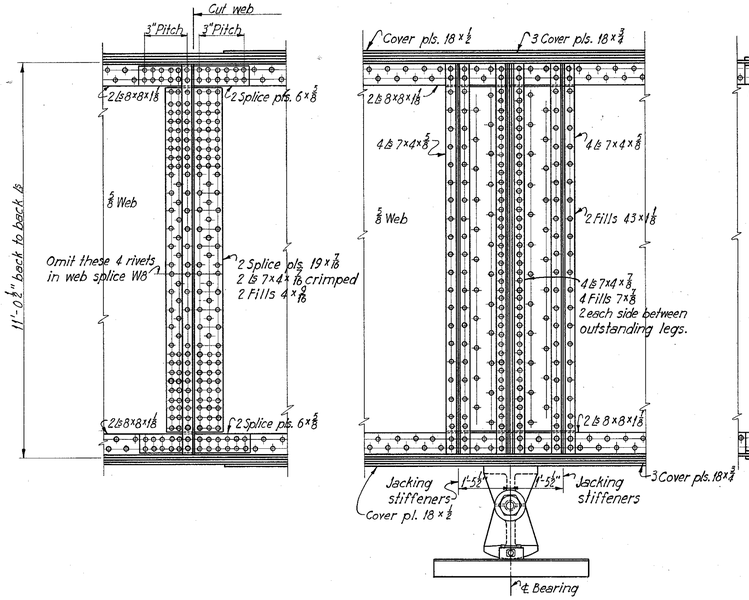
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



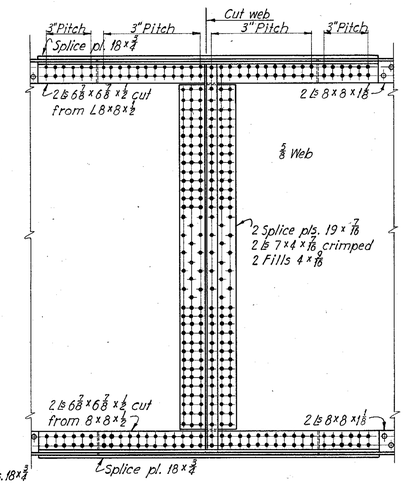


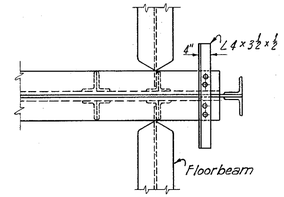


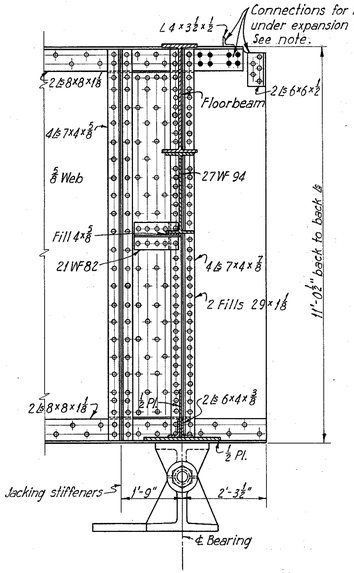
PLAN AT TOP FLANGE



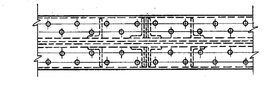
ELEVATION OF GIRDER C

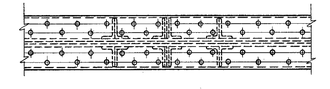


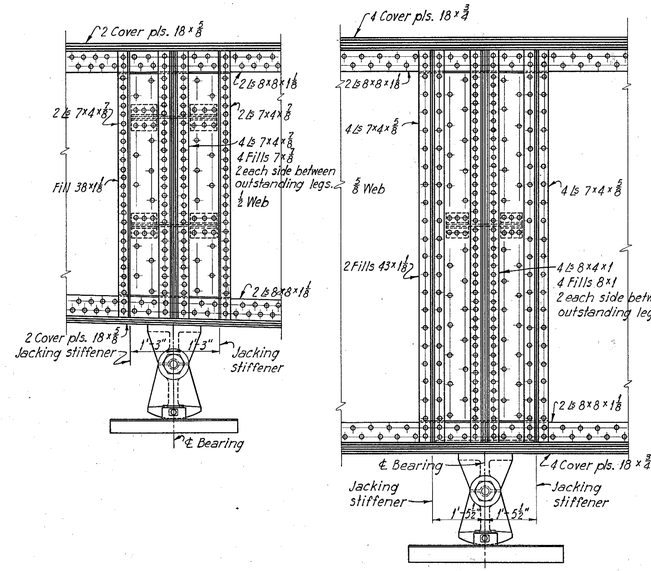




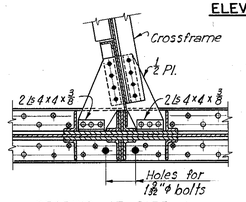
PLAN AT TOP FLANGE



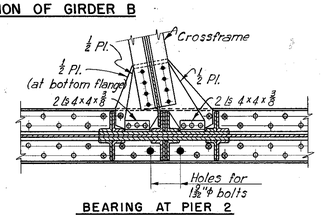




ELEVATION OF GIRDER B

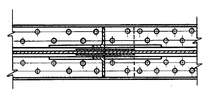


BEARING AT PIER 1



BEARING AT PIER 2

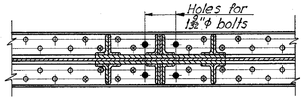
PLAN AT LATERAL BRACING



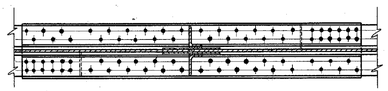
WEB SPLICES

W8, W9, W10, W13, W14, W15

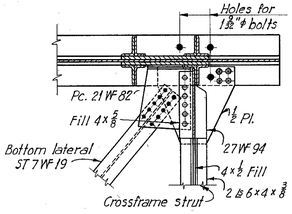
Web splices similar except as noted



BEARING AT PIER 2



FIELD SPLICES F6 AND F9



BEARING AT PIER 3

Note: For expansion casting connections see sheet 16.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GIRDER DETAILS - UNIT 1

AKRON, SUMMIT COUNTY, OHIO

SCALE 1"=1'-0"
MADE E.L. DATE 6-17-49
TRCD G.D. DATE 10-17-49
CHKD O.K.J. DATE 4-30-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

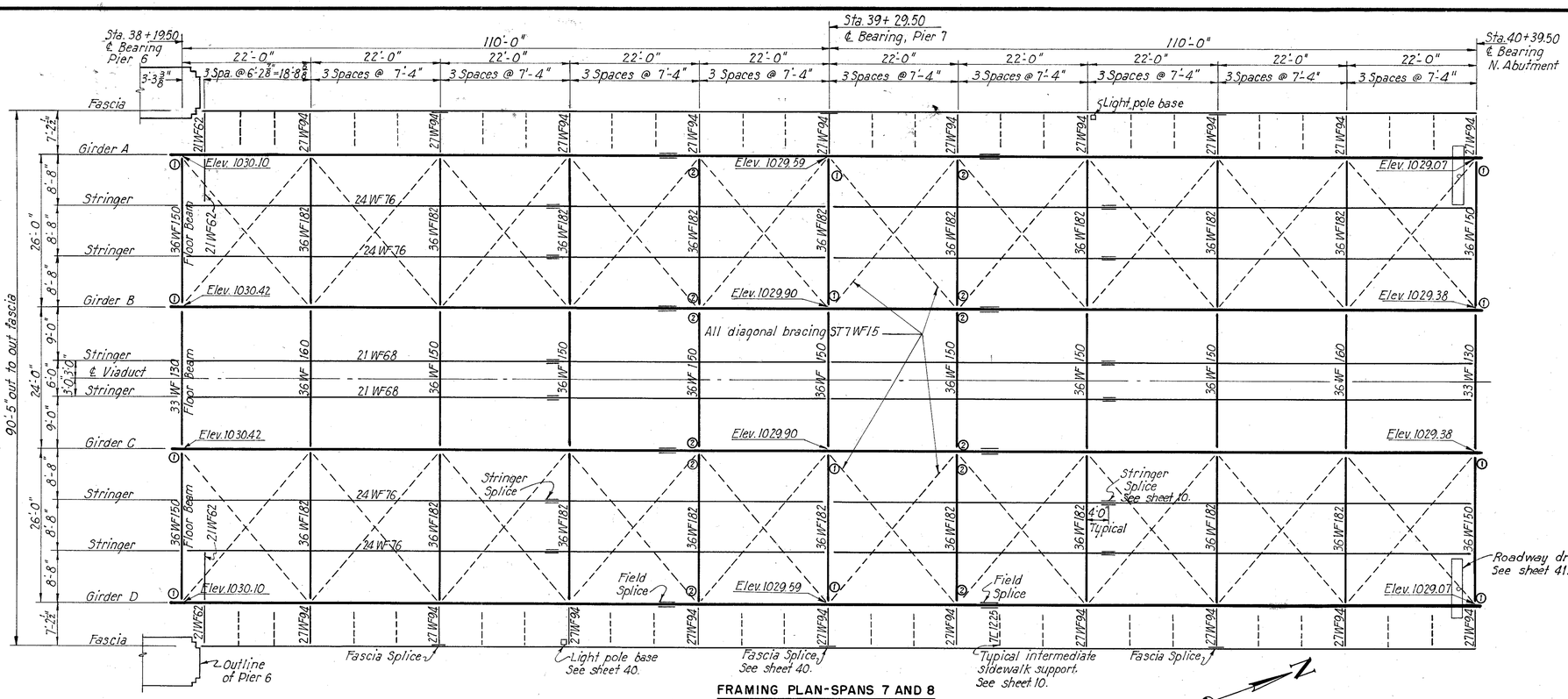
766 SHEET V57

142

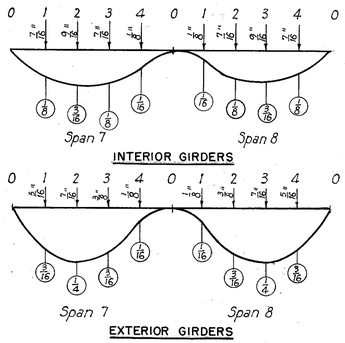
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

24
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



FRAMING PLAN-SPANS 7 AND 8

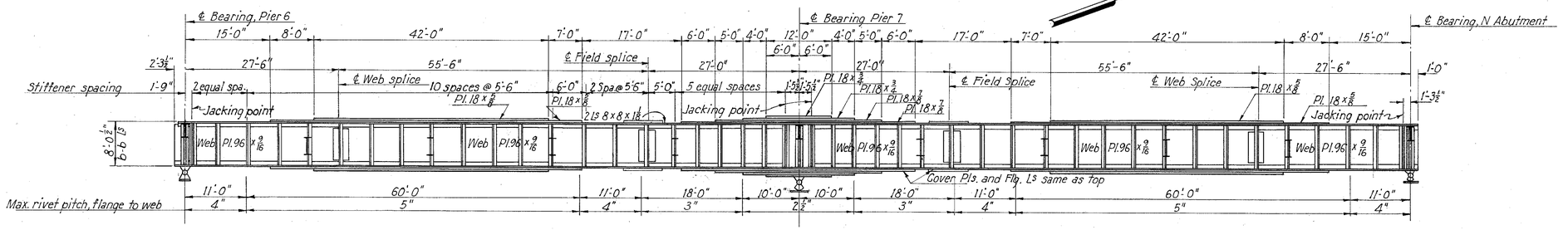


INTERIOR GIRDERS

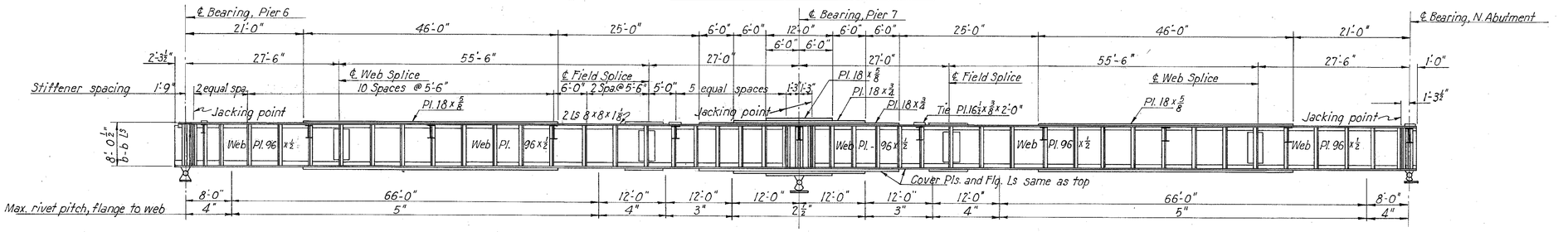
EXTERIOR GIRDERS

GIRDER DEFLECTION DIAGRAMS

Note:
Dimensions in ◯ are deflections which may be expected in the steel girders in place.
Dimensions shown above Base Line are additional deflections to be expected when concrete is in place.
Deflections shall be compensated for by haunching concrete slab over girders.



ELEVATION- INTERIOR GIRDERS B AND C



ELEVATION- EXTERIOR GIRDERS A AND D

STIFFENER ANGLES FOR UNIT 3

Location	Interior Girder	Exterior Girder
Intermediate stiffeners	2 L 6 x 3½ x ⅜	2 L 6 x 3½ x ⅜
Bearing stiffeners, Pier 6 ℄ North Abut.	4 L 6 x 4 x ⅜	4 L 6 x 4 x ½
Jacking stiffeners, Pier 6 ℄ North Abut.	4 L 6 x 4 x ½	4 L 6 x 4 x ½
Bearing stiffeners, Pier 7	4 L 7 x 4 x ⅜ *	4 L 7 x 4 x ⅝ *
Jacking stiffeners, Pier 7	8 L 6 x 4 x ⅜	8 L 6 x 4 x ½

* These stiffeners require fills between outstanding legs. See girder details.

Note: Intermediate stiffeners shall be crimped except at floor-beam locations.
All other stiffeners shall be on fills with a thickness equal to the flange L thickness.
Figures ① and ② indicate locations of kneebraces. For details, see sheets 10 and 11.
Elevations given are to backs of top flange angles.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

FRAMING PLAN & GIRDERS-UNIT 3

AKRON, SUMMIT COUNTY, OHIO

SCALE ⅜" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE H.F.S. DATE 4-26-49 CONSULTING ENGINEERS
TRCD M.B. R.P. DATE 6-23-49 KANSAS CITY NEW YORK
CHKD. R.O.D. DATE 6-21-49

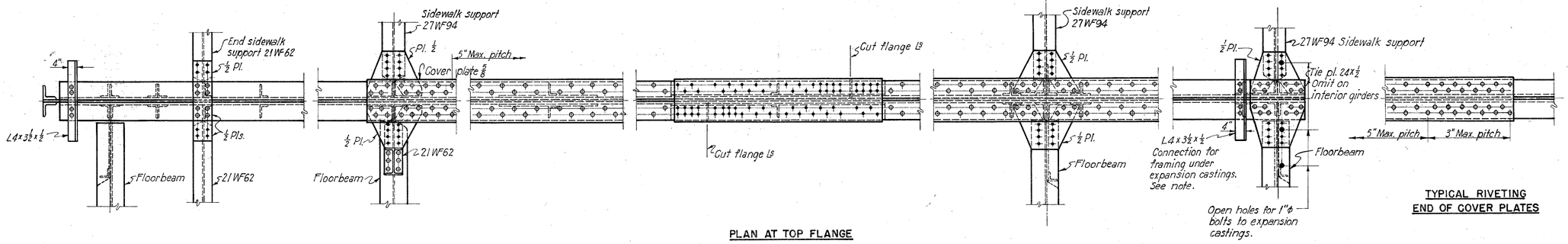
766 SHEET V58

127

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687 6	POST WAR

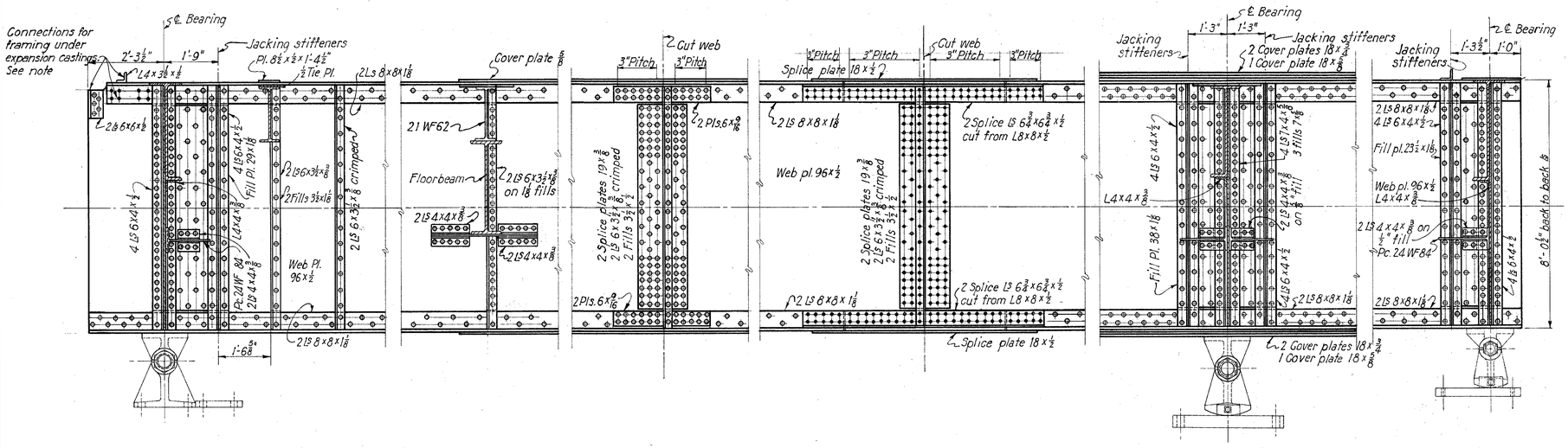
25
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

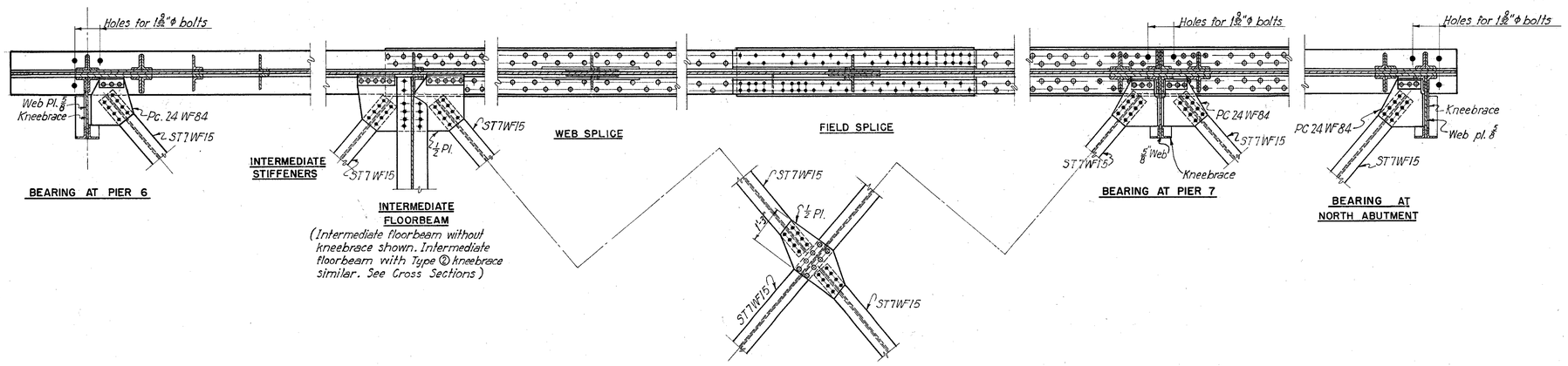


PLAN AT TOP FLANGE

TYPICAL RIVETING END OF COVER PLATES



ELEVATION



Note: Exterior girder A or D as detailed. Interior girder B or C similar except for web thickness, cover plates, sidewalk supports and size of stiffeners. See sheet 24.

For details of expansion castings and connections, see sheets 16 and 17.

For details of girder shoes see sheet 26.

For hand bars on girders see sheet 10.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GIRDER DETAILS - UNIT 3

AKRON, SUMMIT COUNTY, OHIO

SCALE ⅜"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE E.L. DATE 5-18-49 CONSULTING ENGINEERS
TRCD L.A.J.R.R. DATE 8-8-49 KANSAS CITY NEW YORK
CHKD. R.O.D. DATE 8-21-49

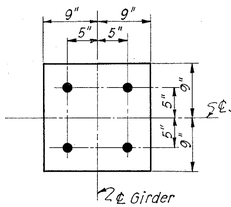
766 SHEET V59

128

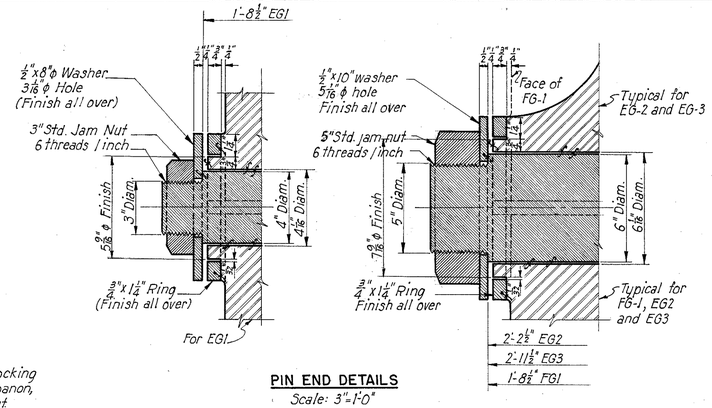
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

26
44

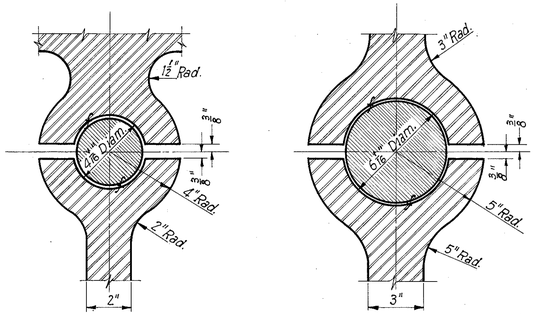
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



Note:
Holes shown for $1\frac{9}{32}$"ϕ turned bolts. Bolts to have hex heads and "Ancho" self locking nut as made by the Automatic Nut Co. of Lebanon, Pa. or equal. Use $\frac{1}{4}$" washer under head and nut.
Top plan typical for all shoes.



PIN END DETAILS
Scale: 3"=1'-0"

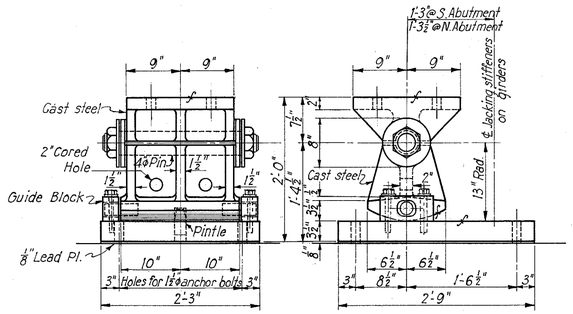


4"ϕ PIN

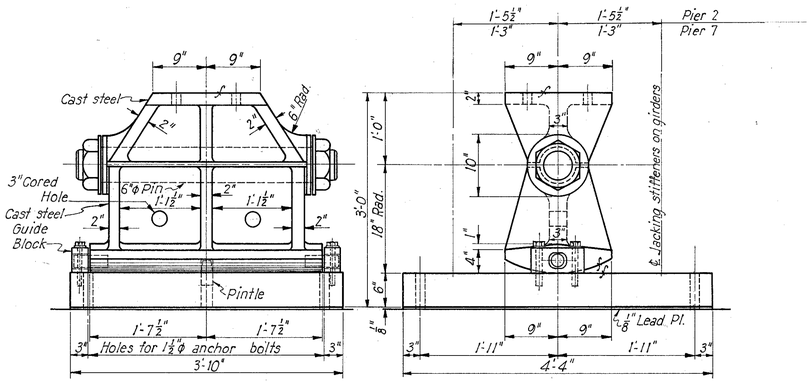
6"ϕ PIN

SECTIONS THRU PINS
Scale: 3"=1'-0"

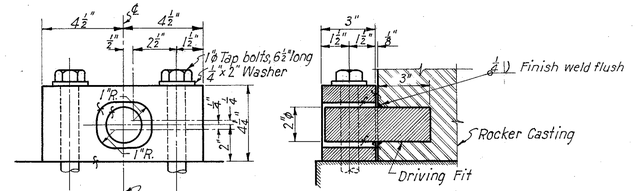
TOP PLAN
Scale: 1½"=1'-0"



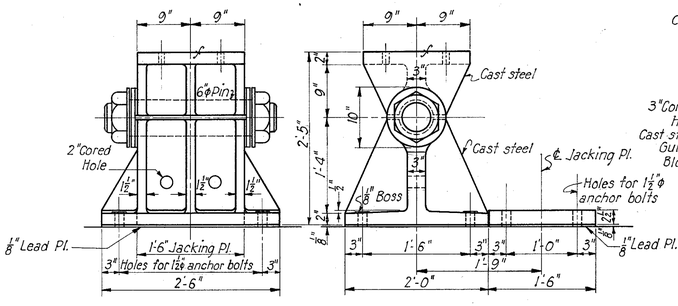
SHOE EG-1
Scale: 1"=1'-0"
Number required=8



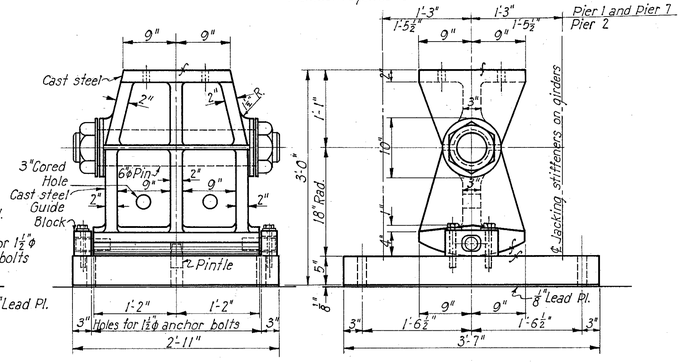
SHOE EG-3
Scale: 1"=1'-0"
Number required=6



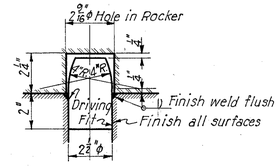
TYPICAL GUIDE BLOCK DETAIL
Scale: 3"=1'-0"



SHOE EG-1
Scale: 1"=1'-0"
Number required=8



SHOE EG-2
Scale: 1"=1'-0"
Number required=7



TYPICAL PINTLE DETAIL
Scale: 3"=1'-0"

PIER OR ABUTMENT	TYPE SHOE UNDER GIRDER			
	A	B	C	D
So. Abut.	EG-1	EG-1	EG-1	EG-1
1	EG-2	EG-2	EG-2	EG-2
2	EG-3	EG-3	EG-3	EG-2
3	FG-1	FG-1	FG-1	FG-1
6	FG-1	FG-1	FG-1	FG-1
7	EG-2	EG-3	EG-3	EG-2
No. Abut.	EG-1	EG-1	EG-1	EG-1

Notes:
For General Notes, see sheet 5.
Pins shall be of cold rolled steel or shall be forged as per Item S-720 of the specifications.
Castings to be high strength steel castings ASTM Designation A148 Grade 80-90.
Bearing plates under rocker castings to be structural nickel steel ASTM Designation ASTM A8. Bearing castings in contact with lead plates shall be rough finished according to Section S-723 of the Specs.
Machined surfaces of rockers which bear on base plates and all other exposed surfaces shall be painted.
All contact surfaces between metal parts shall be finished.
Lower castings of all shoes to be centered both ways under upper castings for a temperature of 60°F. All base plates and shoe castings shall be scribed with longitudinal and transverse center lines.
Holes in base plates and lower fixed shoe castings for anchor bolts shall be ½" larger than anchor bolts. The Superstructure Contractor shall fill all spaces in holes around bolts with an approved metallic filler poured in place before setting nuts.
For anchor bolt details, see sheet 27.
All fillets to be ¾" unless otherwise noted.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

GIRDER SHOES

AKRON, SUMMIT COUNTY, OHIO

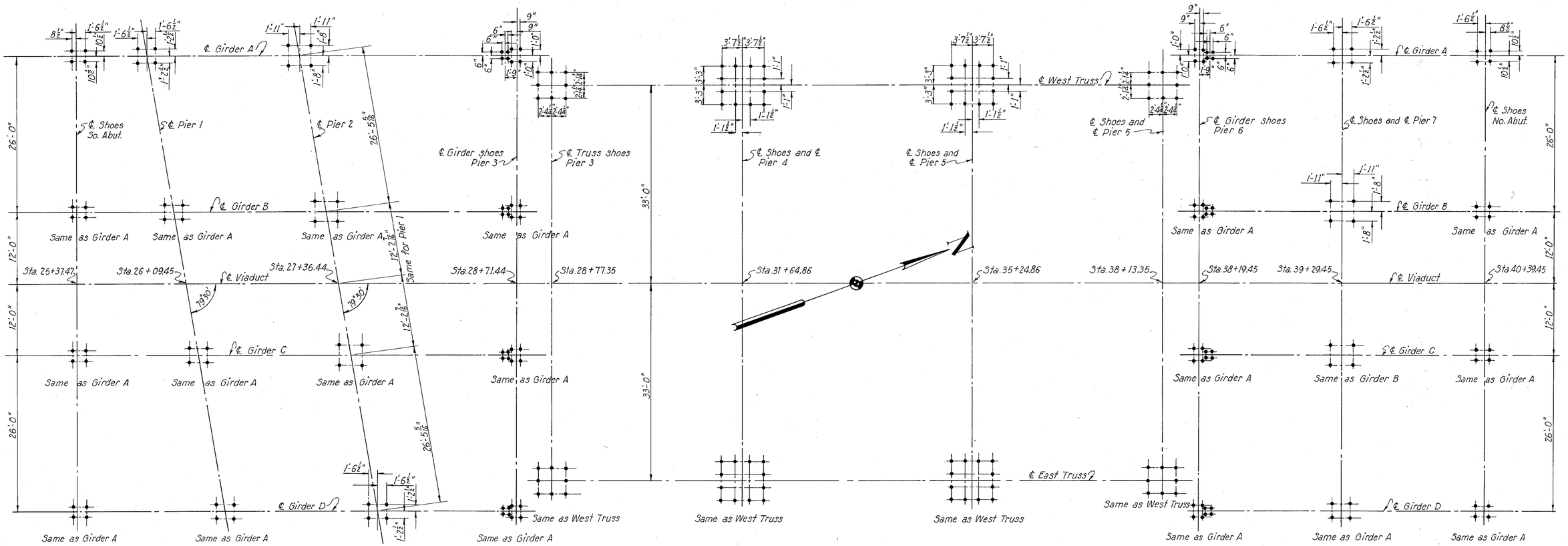
SCALE 1"℄ 3"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE A.F.H. DATE 5-18-49 CONSULTING ENGINEERS
TRCD I.L., R.R. DATE 7-15-49 KANSAS CITY NEW YORK
CHKD. R.O.D. DATE 8-23-49

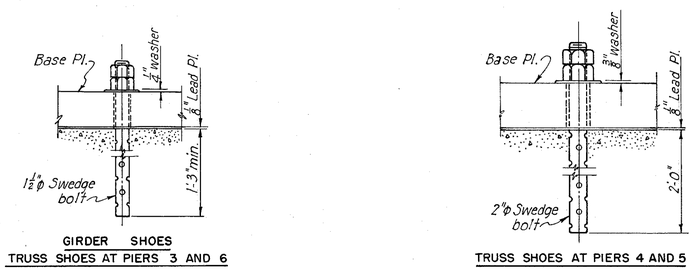
766 SHEET V60

118

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS	27
2	OHIO	U-687 6	POST WAR	44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31





TYPICAL ANCHOR BOLT DETAILS
Scale: 1½"=1'-0"

TOP MASONRY ELEVATIONS

PIER OR ABUTMENT	TOP MASONRY UNDER GIRDER A	B	C	D	TOP MASONRY UNDER W. TRUSS	E. TRUSS
So. Abut.	1028.57	1028.91	1028.93	1028.62		
1	1025.31	1025.46	1025.32	1024.85		
2	1020.98	1021.24	1021.26	1021.01		
3	1021.08	1021.42	1021.44	1021.13	999.63	999.63
4					895.32	895.32
5					892.18	892.18
6	1019.63	1019.95	1019.95	1019.63	995.23	995.23
7	1018.36	1018.58	1018.58	1018.36		
No. Abut.	1019.02	1019.33	1019.33	1019.02		

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

ANCHOR BOLT PLAN

AKRON, SUMMIT COUNTY, OHIO

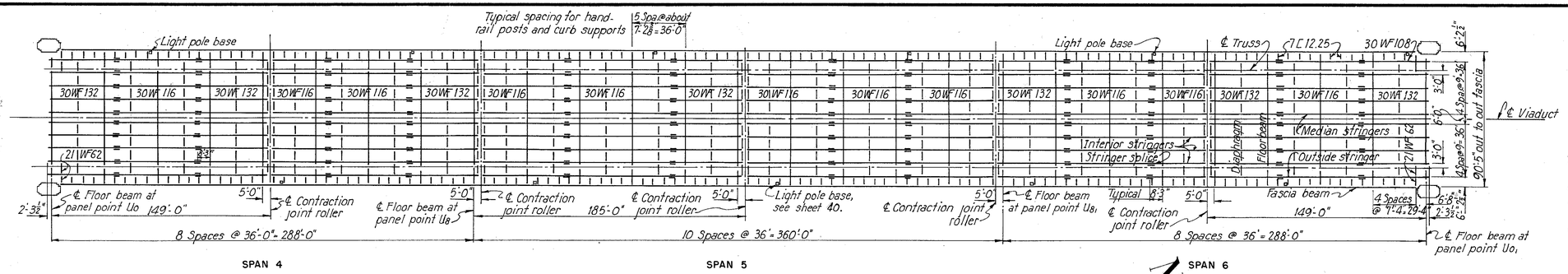
SCALE 1"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE A.F.H. DATE 3-20-49 CONSULTING ENGINEERS
TRCD P.E.J.-R.R. DATE 7-6-49 KANSAS CITY NEW YORK
CHKD. A.C.A. DATE 8-30-49

766 SHEET V61

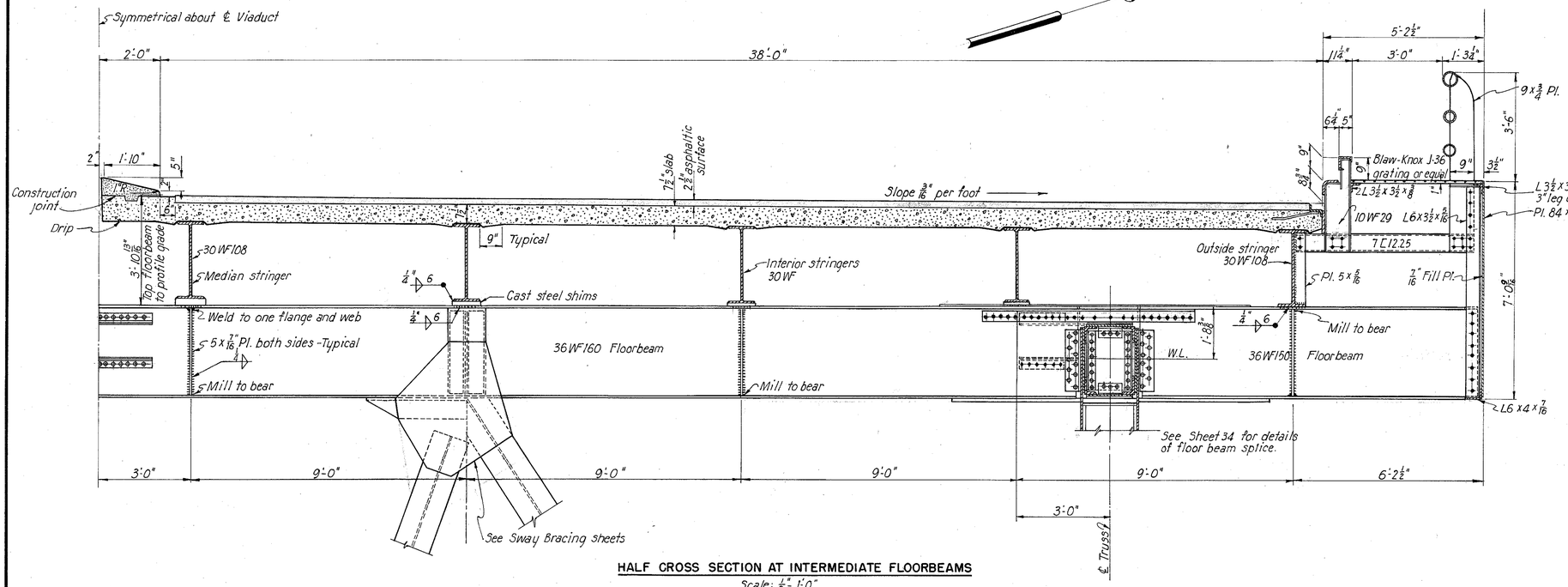
117

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS	28 / 44
2	OHIO	U-687 6	POST WAR	

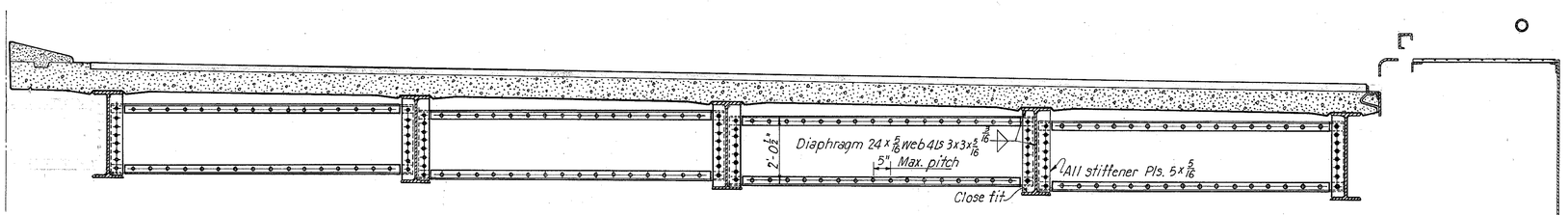
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



FLOOR FRAMING PLAN - SPANS 4,5 AND 6
Scale: 1" = 40'

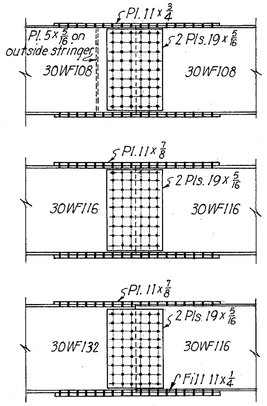


HALF CROSS SECTION AT INTERMEDIATE FLOORBEAMS
Scale: ½" = 1'-0"

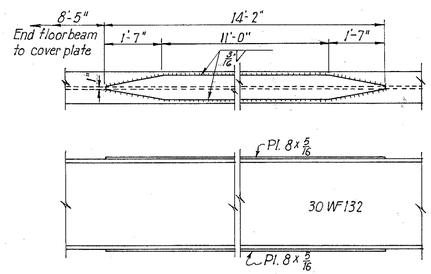


HALF CROSS SECTION AT DIAPHRAGMS
Scale: ½" = 1'-0"

All interior stringers are similar. Outside and median stringers are 30WF108.
Contraction joints to be in slab, stringers, curb, handrail and walk. Fascia beam to be continuous through joints.
Splice fascia at each floor beam. For splice details, see sheet 40.
All interior floor beams are 36WF160.
Two end floor beams 36WF150.
Cantilever portions of all floor beams are 36WF150.
See sheet 29 for details of framing at Piers 3 and 6.
See sheet 15 for details of median strip.



STRINGER SPLICES
Scale: ½" = 1'-0"



INTERIOR STRINGER COVER PLATE DETAIL
SPAN 4 & SPAN 6
Scale: ½" = 1'-0"

Note: Interior stringers to have cover plates in end panels only.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO SU-5-124
ROADWAY CROSS SECTIONS AND FRAMING PLAN - UNIT 2
AKRON, SUMMIT COUNTY, OHIO

SCALE ½" = 1'-0" & 1" = 40'
MADE M.B. DATE 6-22-49
TRCD. R.R. DATE 8-1-49
CHKD. A.C.A. DATE 7-27-49.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

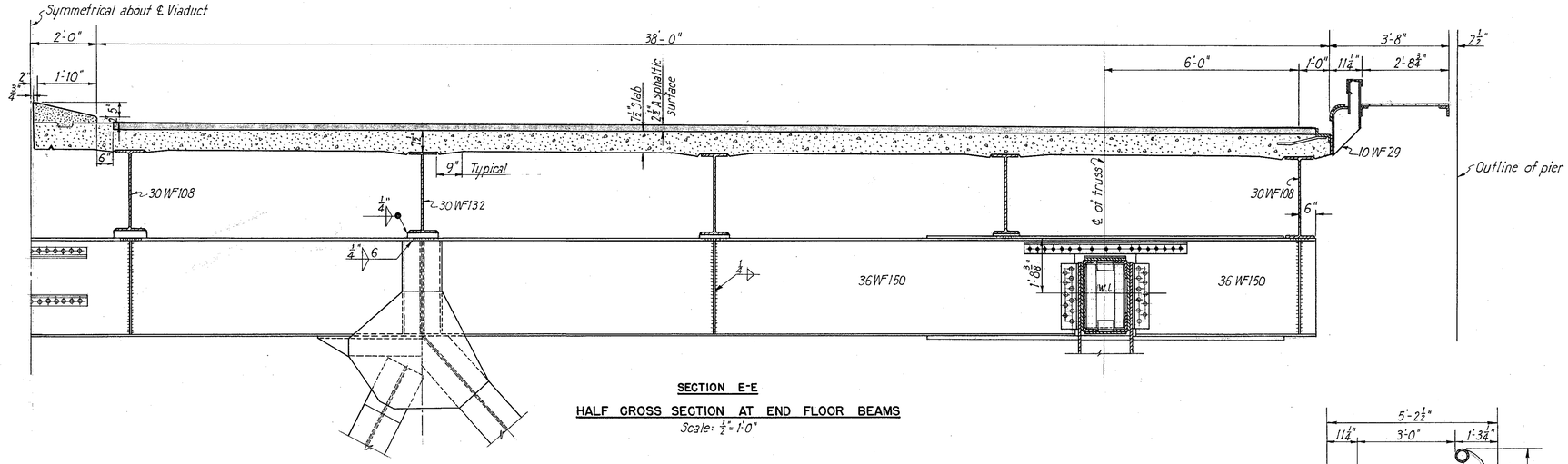
766 SHEET V62

129

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

29
44

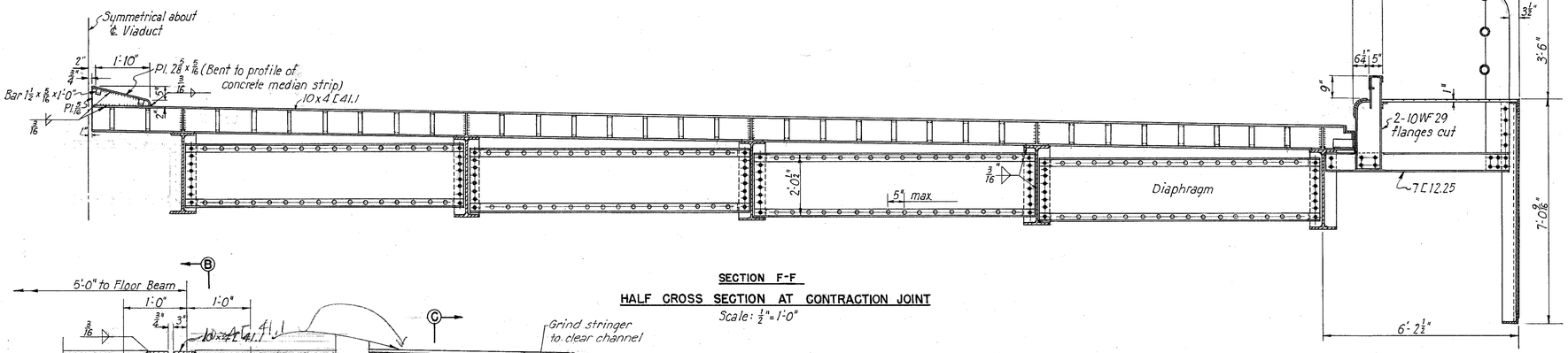
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



SECTION E-E

HALF CROSS SECTION AT END FLOOR BEAMS

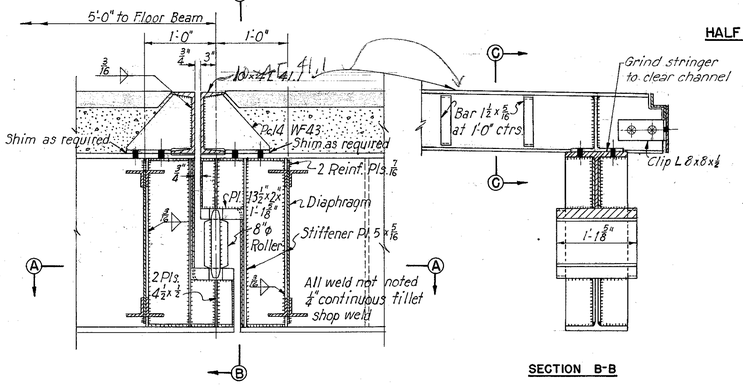
Scale: ½" = 1'-0"



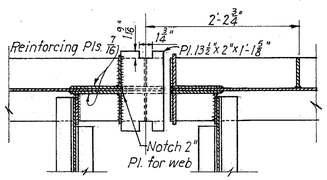
SECTION F-F

HALF CROSS SECTION AT CONTRACTION JOINT

Scale: ½" = 1'-0"

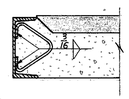


ELEVATION

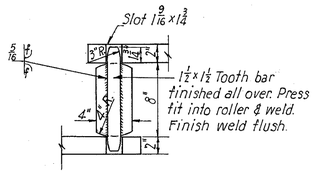


SECTION A-A

SECTION B-B



SECTION C-C



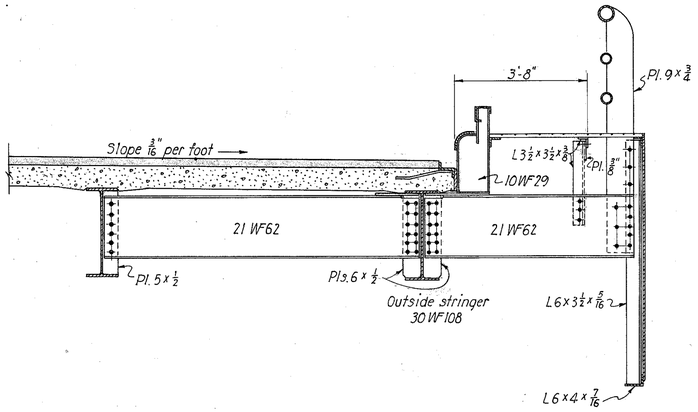
SIDE BAR

Scale: 1½" = 1'-0"

Note: Outside stringer shown. Joint in other stringers to be similar. Material in rollers shall be alloy steel forgings, A.S.T.M. designation A-238 class C. Material in 2" bearing plates and side bars shall be structural nickel steel, A.S.T.M. designation A8

STRINGER CONTRACTION JOINT

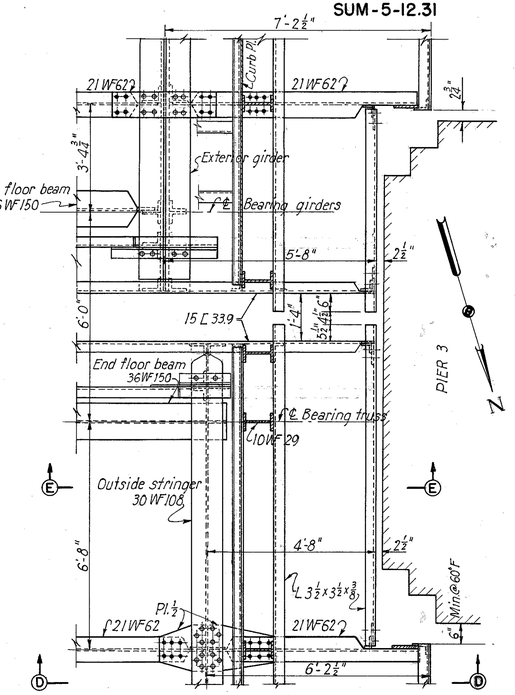
Scale: 1" = 1'-0"



SECTION D-D

PART CROSS SECTION AT END SIDEWALK SUPPORT

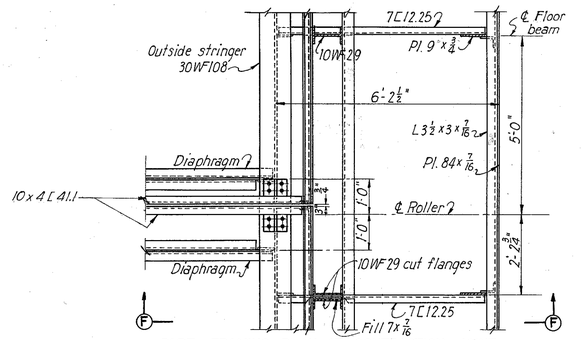
Scale: ½" = 1'-0"



PART FRAMING PLAN AT PIER 3

Scale: ¼" = 1'-0"

Framing at pier 6 similar



PART FRAMING PLAN AT CONTRACTION JOINT

Scale: ½" = 1'-0"

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

ROADWAY CROSS SECTIONS-UNIT 2

AKRON, SUMMIT COUNTY, OHIO

SCALE 1", ½", 1/4", 1/8" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.G. DATE 7-14-49 CONSULTING ENGINEERS
TRCD. R.C.B. & E. DATE 8-15-49 KANSAS CITY NEW YORK
CHKD. A.C.A. DATE 9-27-49

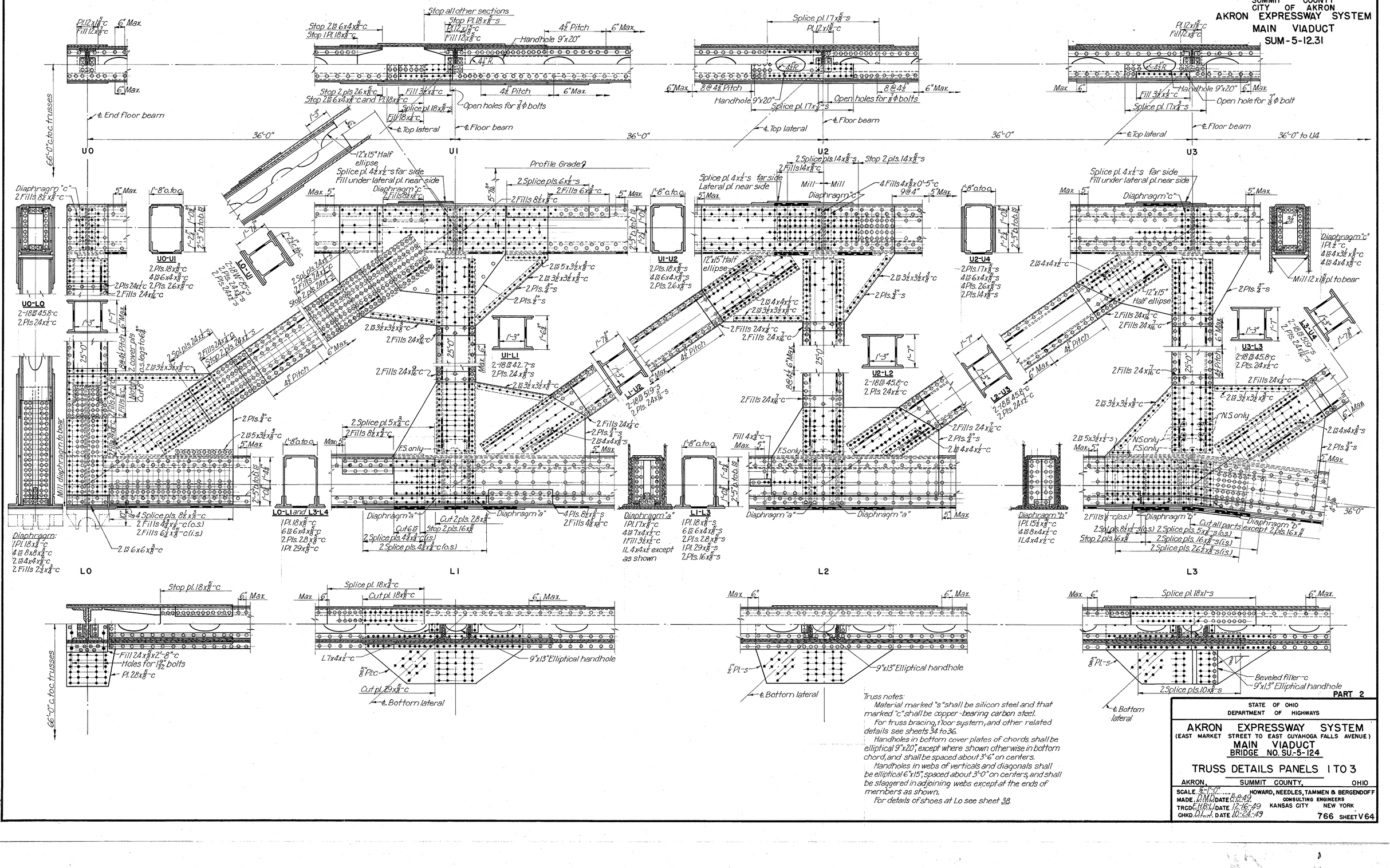
766 SHEET V63

132

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

30
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



Truss notes:

Material marked "s" shall be silicon steel and that marked "c" shall be copper-bearing carbon steel.

For truss bracing, floor system, and other related details see sheets 34 to 36.

Handholes in bottom cover plates of chords shall be elliptical 9"x20", except where shown otherwise in bottom chord, and shall be spaced about 3'-6" on centers.

Handholes in webs of verticals and diagonals shall be elliptical 6"x15", spaced about 3'-0" on centers, and shall be staggered in adjoining webs except at the ends of members as shown.

For details of shoes at Lo see sheet 38.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

TRUSS DETAILS PANELS 1 TO 3

AKRON, SUMMIT COUNTY, OHIO

SCALE ½"-1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE DMD DATE 6-6-49 CONSULTING ENGINEERS
TRCD EHBJ DATE 12-16-49 KANSAS CITY NEW YORK
CHKD. DJ.J. DATE 10-24-49

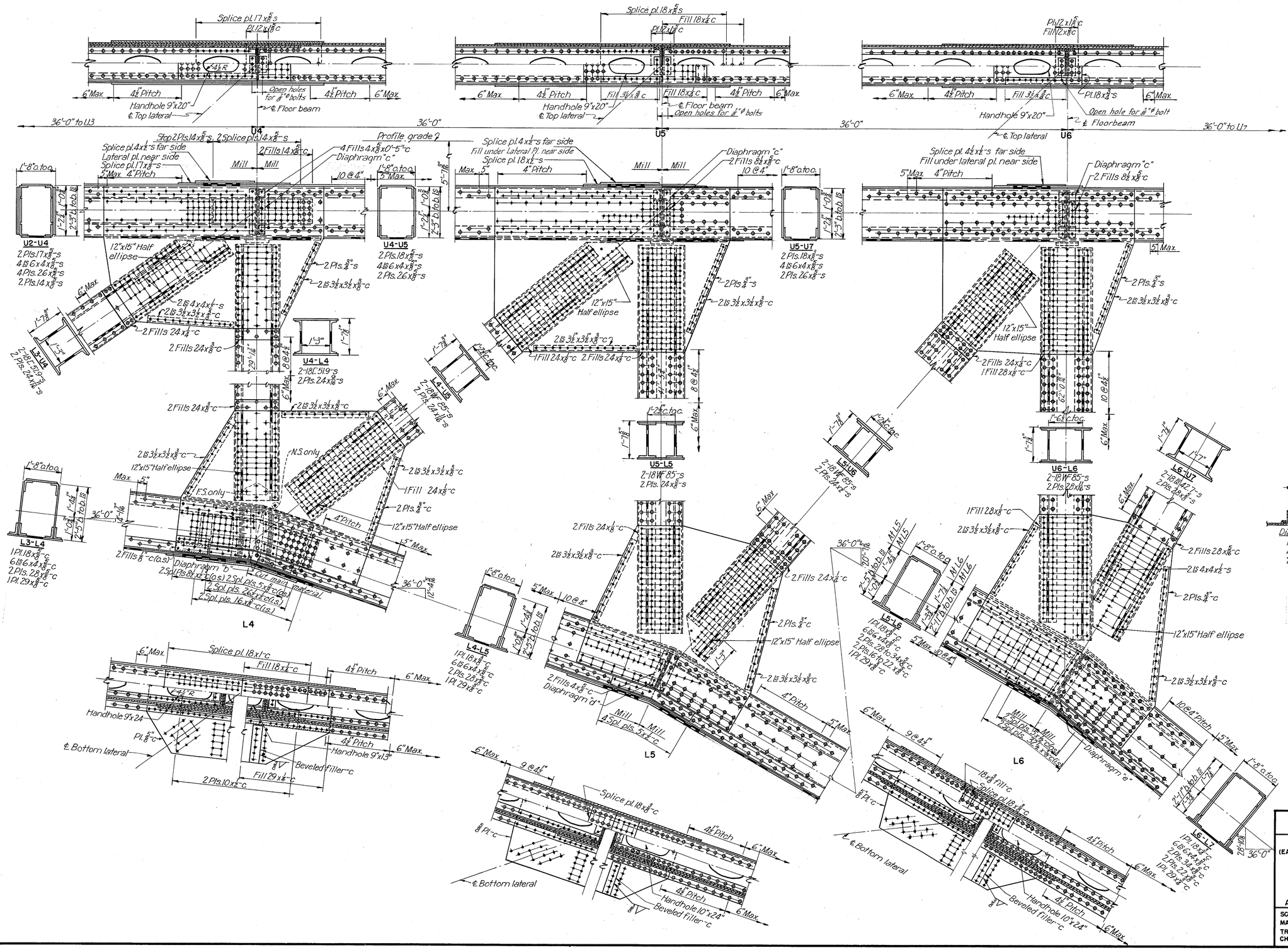
766 SHEET V64

133

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

31
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



For truss notes see sheet 30.
For diaphragm "a", "b", and "c" see sheet 30.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

TRUSS DETAILS PANELS 4 TO 6

AKRON, SUMMIT COUNTY, OHIO

SCALE, 1/2"-1'-0"
MADE D.M.Q. DATE 8-30-49
TRCD W.L.G.L. DATE 12-14-49
CHKD O.L.J. DATE 10-24-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V65

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

32
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

U6-U7
4 Ls 6x4x⅝-s
2 Pls. 26x⅝-s
2 Pls. 18x⅝-s

U7-U8
4 Ls 6x4x⅝-s
2 Pls. 26x⅝-s
2 Pls 18x⅝-s

U8-U9
4 Ls 6x4x⅝-s
2 Pls. 26x⅝-s
2 Pls. 18x⅝-s

U9-U10
4 Ls 6x4x⅝-s
2 Pls. 26x⅝-s
2 Pls. 18x⅝-s

U7-L7
2-18 WF 85-s
2 Pls. 32x 11/16-s

L7-U8
2-18 L 42.7-c
2 Pls. 32x⅝-s

U8-L8
3-18 WF 85-s
2 Pls. 42x⅝-s

L7-L8 and L8-L9
6 Ls 6x4x⅝-s
2 Pls. 34x⅝-s
1 Pl. 18x¾-s
2 Pls. 22x⅝-s
1 Pl. 29x⅝-s

U8-L9
2-18 L 42.7-c
2 Pls. 32x⅝-s

U9-L9
2-18 L 58-c
2 Pls. 32x½-c

U9-L10
2-18 L 45.6-c
2 Pls. 28x⅝-s

L6-U7
2-18 L 42.7-s
2 Pls. 28x⅝-s

L6-L7
6 Ls 6x4x⅝-c
2 Pls. 34x⅝-c
2 Pls. 18x¾-c
2 Pls. 22x⅝-c
1 Pl. 29x⅝-c

L9-L10
6 Ls 6x4x⅝-s
2 Pls. 34x⅝-s
2 Pls. 18x⅝-s
2 Pls. 22x⅝-s
1 Pl. 29x⅝-s

For truss notes see sheet 30
For diaphragms "a","b" and "c", see sheet 30
For diaphragms "d" and "e", see sheet 31
For details of shoe at L6 see sheet 32

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

TRUSS DETAILS PANELS 7 TO 9

AKRON, SUMMIT COUNTY, OHIO

SCALE 1"-1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE D.J.W. DATE 8-24-49 CONSULTING ENGINEERS
TRCD W.L.G.L. DATE 12-22-49 KANSAS CITY NEW YORK
CHKD. W.C.P. DATE 10-13-49

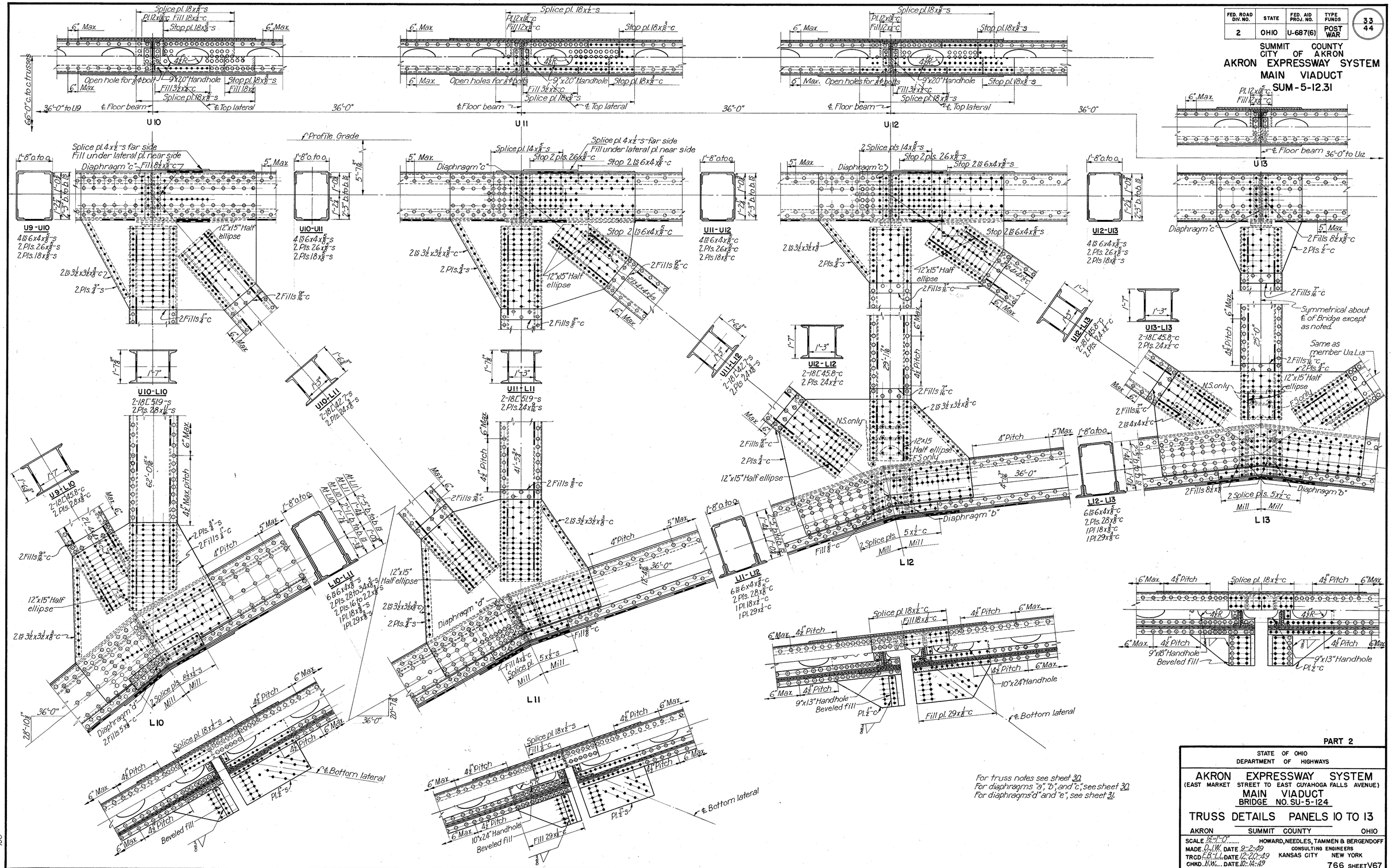
766 SHEET V66

135

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

33
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



For truss notes see sheet 30
For diaphragms "a", "b", and "c", see sheet 30
For diaphragms "d" and "e", see sheet 31.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

TRUSS DETAILS PANELS 10 TO 13

AKRON SUMMIT COUNTY OHIO

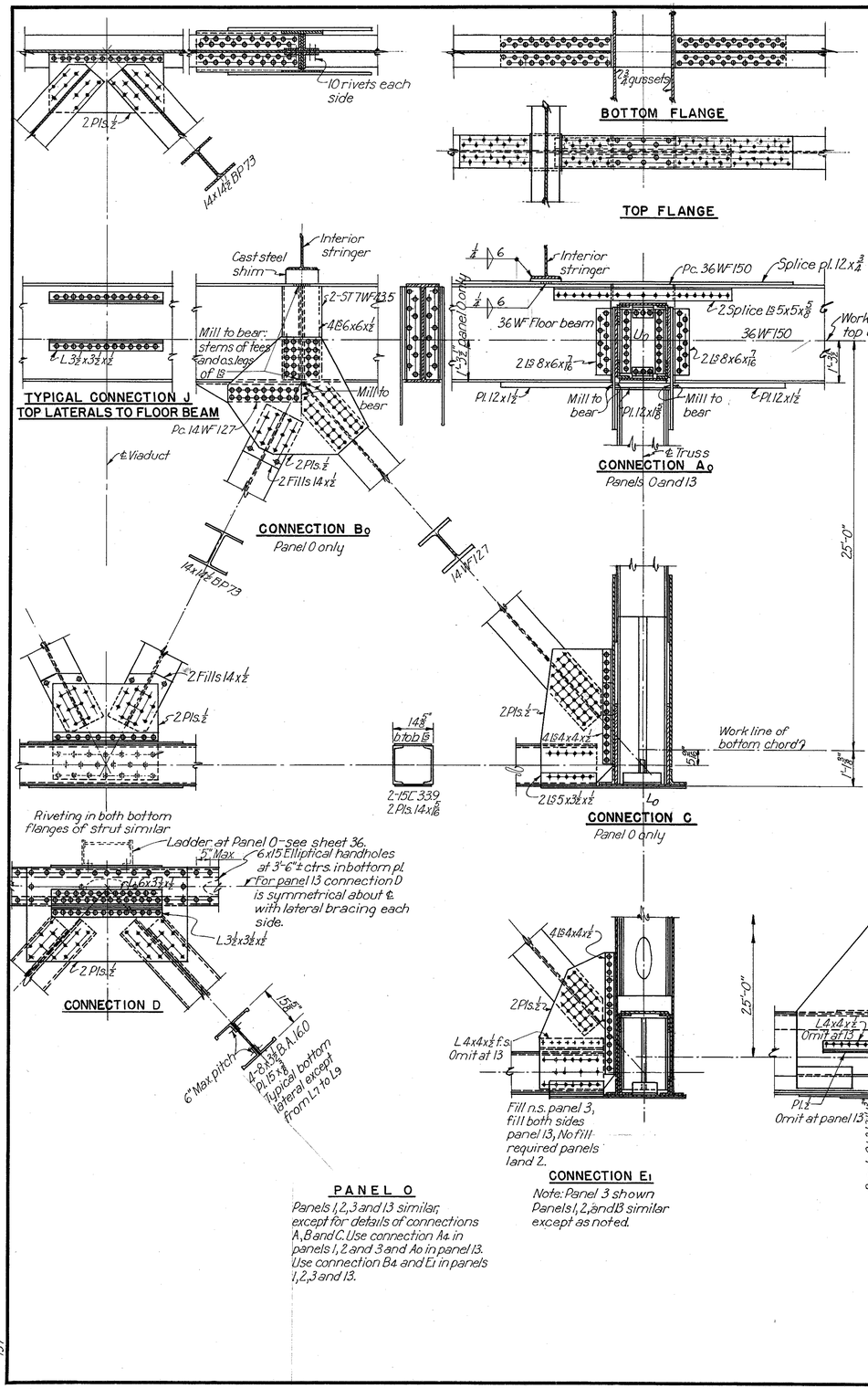
SCALE 1"=1'-0" ..... HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE D.W. DATE 9-2-49 CONSULTING ENGINEERS
TRCD E.R.L. DATE 12-20-49 KANSAS CITY NEW YORK
CHKD. H.W. DATE 12-14-49

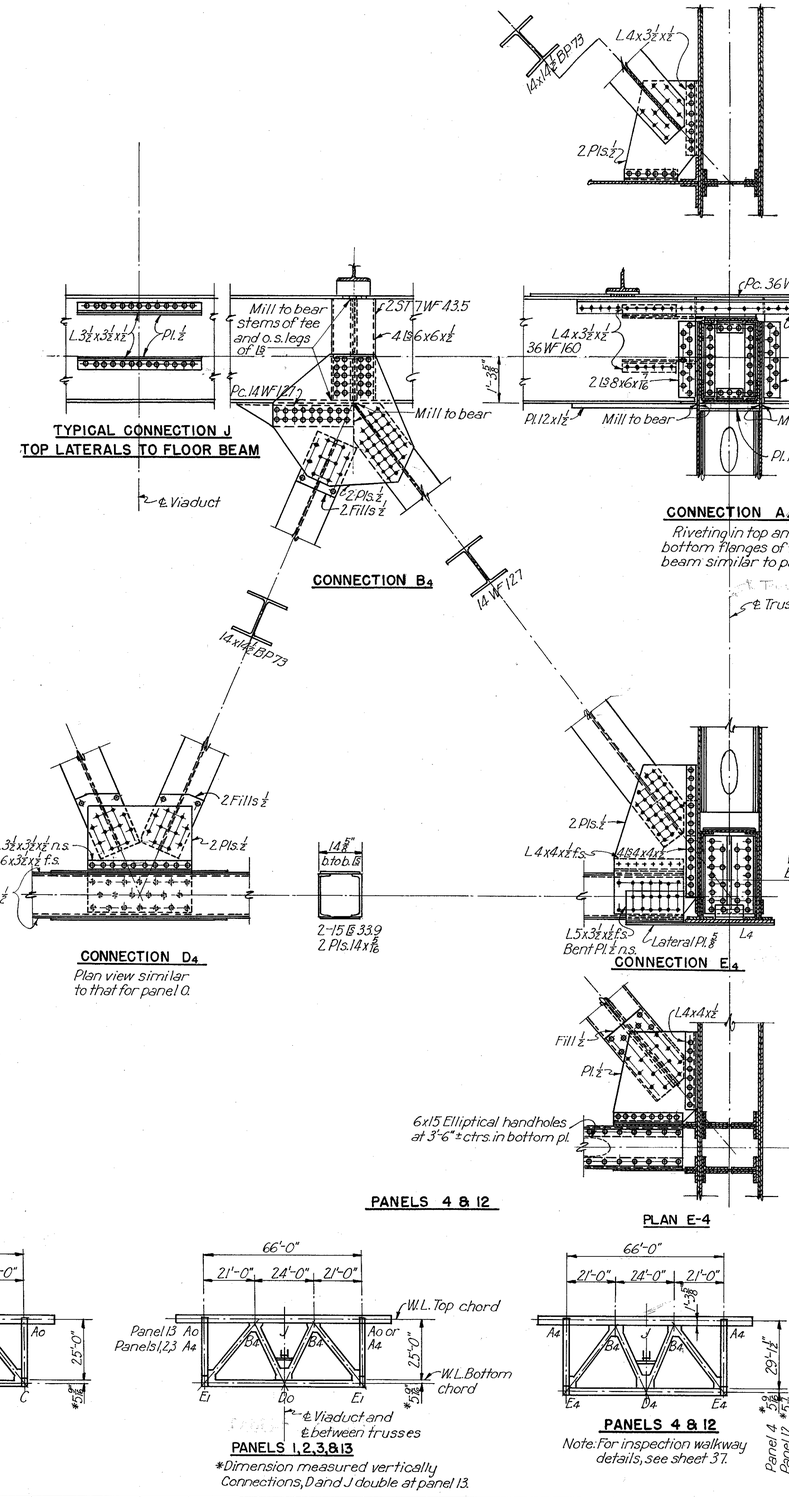
766 SHEET V67

136

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS	34 / 44
2	OHIO	U-687(6)	POST WAR	

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31





Note: All material is structural copper-bearing carbon steel unless otherwise noted.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

TRUSS LATERALS AND SWAY FRAMES

AKRON, SUMMIT COUNTY, OHIO

SCALE 1/2" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE F.L.T. DATE 8-30-49 CONSULTING ENGINEERS
TRCD W.G.T. DATE 12-27-49 KANSAS CITY NEW YORK
CHKD W.C.D. DATE 10-17-42

766 SHEET V68

137

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31


See panel 0 for connection J.
Work line of top chord
CONNECTION A4
Details same as for panel 4
CONNECTION B5
Details same as for panel o except number of rivets.
2 Fills ½
2 Pls. ½
14x14½ BP 73
14 WF 127
CONNECTION G5
2-15 [33.9
2 Pls. 14x5/16
Handholes as in bottom strut.
2 Fills ½
2 Ls 4x4x½ panel 11 only.
4 Ls 4x4x½ 76 rivets in outstanding legs.
CONNECTION F5
℄ Viaduct
2 Pls. ½ Bent
L 3½x3½x½ n.s.
L 6x3½x½ f.s.
2 Pls. 13x5/16
L 4x4x½
Lateral Pl. ½
Work line of bottom chord
L 5x3½x½ f.s.
Bent Pl. ½ n.s.
Lateral Pl. 5/8
CONNECTION D5
CONNECTION H5
Panel 5 1'-1⅛"
Panel 11 1'-1⅛"
20'-8⅝"
41'-5¾"
PANEL 5
Panel 11 similar except as shown for connection F.
6x15 Elliptical handholes at 3'-6" ctrs. in bottom Pl.
SECTION A-A
Bottom Lateral
PLAN H5
66'-0"
21'-0" 24'-0" 21'-0"
PANELS 5 & 11
* Dimensions measured at Rt. Ls to L4 L5 or L11 L12.
Note: For inspection walkway details, see sheet 37.
PANELS 6 & 10
* Dimensions measured at Rt. Ls to L5 L6 or L10 L11
9⅞" panel 6
9⅞" panel 10
9⅞" panel 7
9⅞" panel 9
PANELS 7 & 9
℄ Viaduct and ℄ between trusses
* Dimensions measured at Rt. Ls to L6 L7 or L9 L10
See panel o for connection J.
CONNECTION B7
Details same as for panel o except number of rivets.
CONNECTION G7
2-15 [33.9
2 Pls. 14x5/16
Handholes as in bottom strut.
2 Pcs. 16 WF 88
CONNECTION F7
2" Drain hole
DIAPHRAGM
3 Ls 3½x3½x⅜
Pl. ⅜
ST 4 WF 29
2 Fills ⅛
CONNECTION M7
2 Pls. 13x5/16
Riveting in both bottom flanges of strut similar
6x15 Elliptical handholes at 3'-6" ctrs. in bottom pl.
PLAN D7
Handholes See truss details
CONNECTION L7
L 3½x3½x½ n.s.
L 6x3½x½ f.s.
CONNECTION D7
PANEL 7
Panels 6 and 10 similar except as shown.
Work Line of bottom chord
2 Ls 5x3½x½
CONNECTION H7
30'-3¼"±
30'-11"
CONNECTION F9
These rivets K9 only
2 Ls 8x4x½
2 Ls 6x4x½
CONNECTION L9
PANEL 9
Connections not shown are similar to those in panel 7.
Note: All material to be structural copper-bearing carbon steel unless otherwise noted.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

TRUSS LATERALS AND SWAY FRAMES

AKRON, SUMMIT COUNTY, OHIO

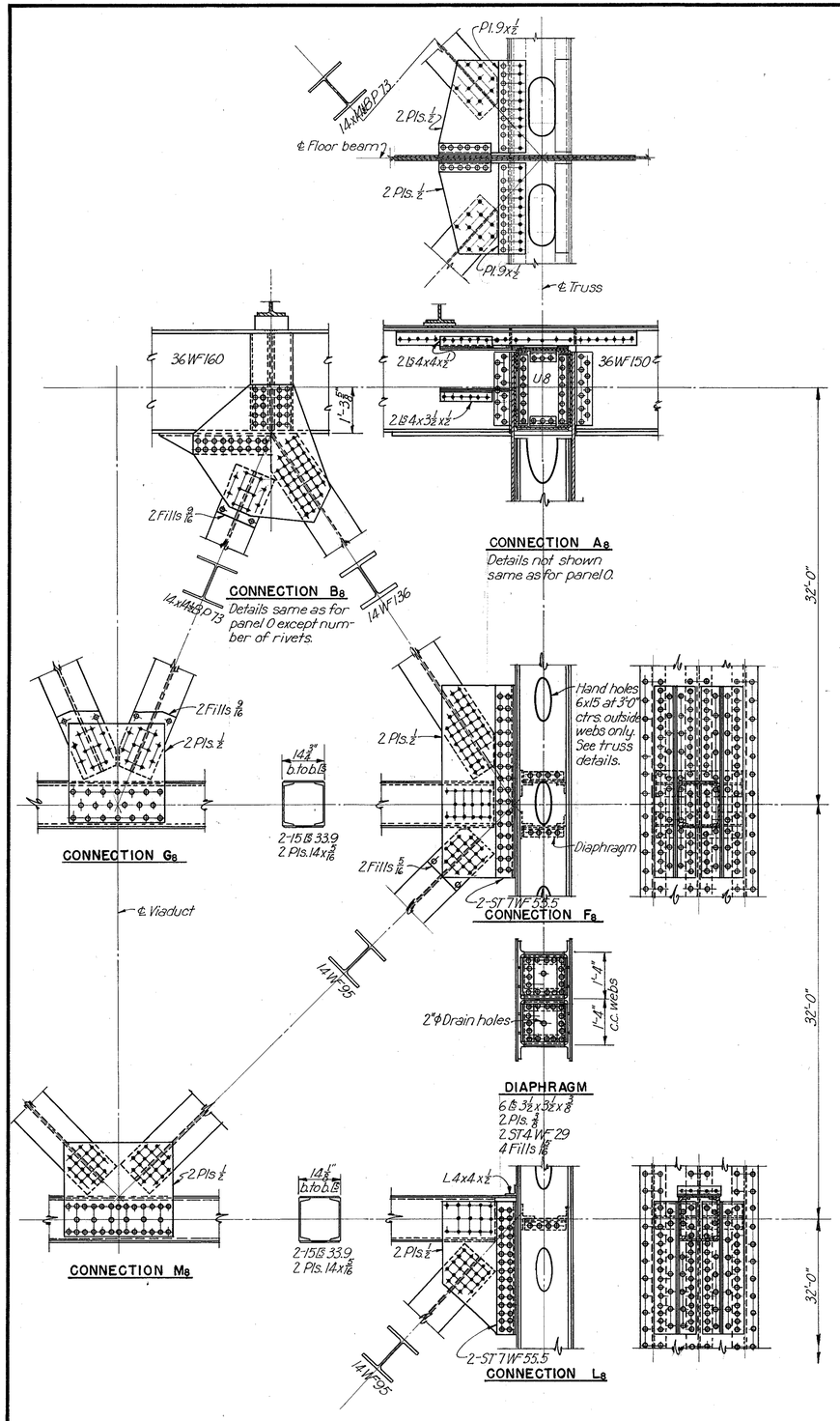
SCALE ¼"=1'-0" — HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE E.L.-J.T. DATE 8-31-49 — CONSULTING ENGINEERS
TRCD W.C. & H.B. DATE 10-20-49 — KANSAS CITY NEW YORK
CHKD W.C.R. DATE 10-7-49 — 766 SHEET V69

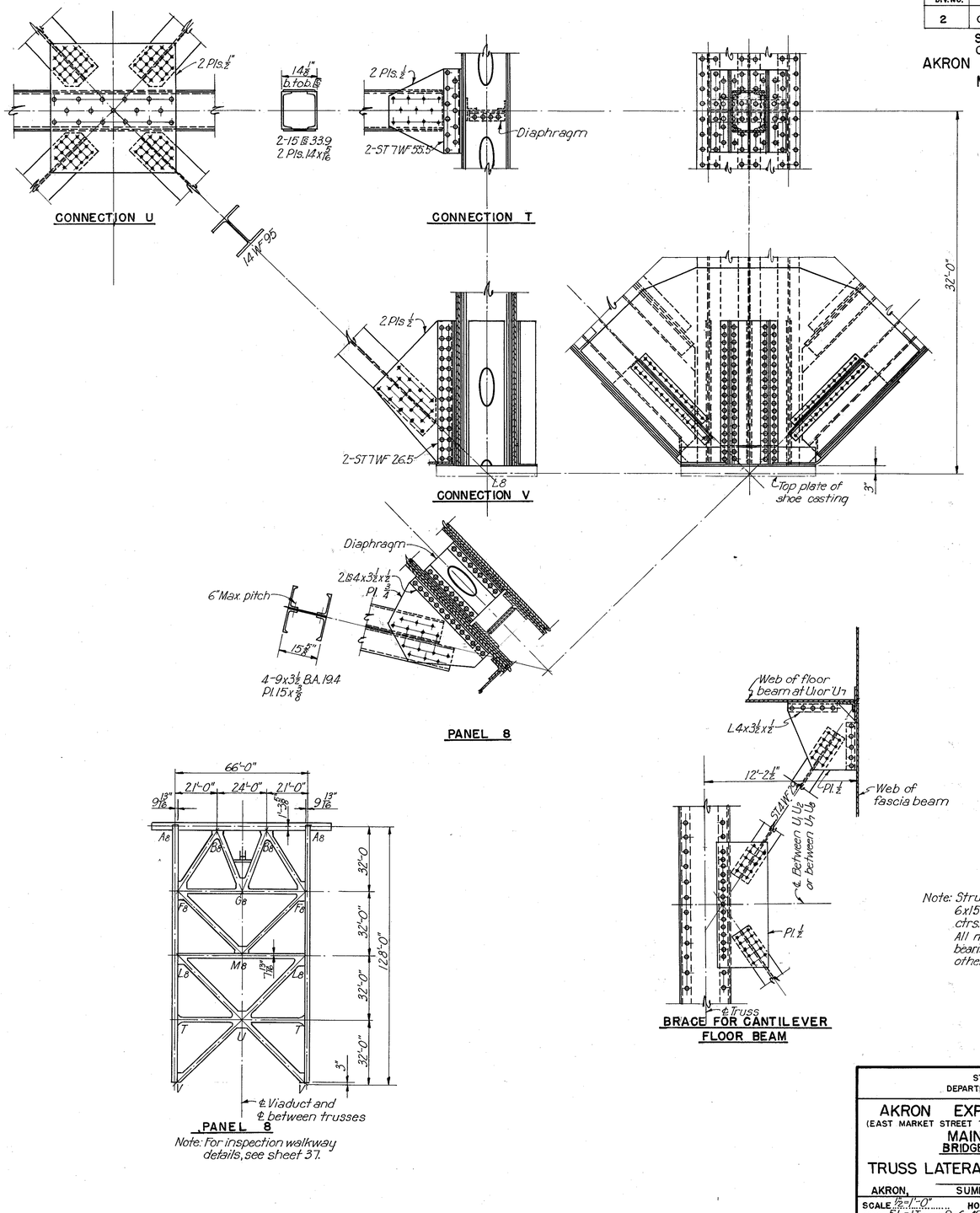
152

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. No.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

36
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31





Note: Struts F-F, L-L, and T-T to have 6x15 elliptical handholes at 3'-6"± ctrs. in bottom pl.
All material is structural copper-bearing carbon steel unless otherwise noted.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU.-5-124

TRUSS LATERALS AND SWAY FRAMES

AKRON, SUMMIT COUNTY, OHIO

SCALE 1/2"=1'-0"
MADE C.L.H. DATE 9-6-49
TRCD W.C.B. DATE 12-27-49
CHKD W.C.B. DATE 10-17-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V70

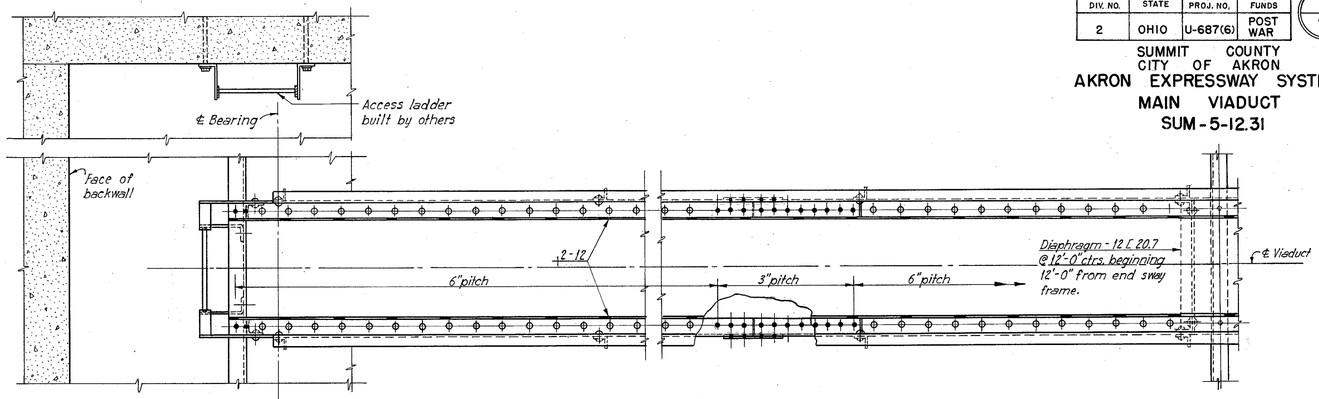
155

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

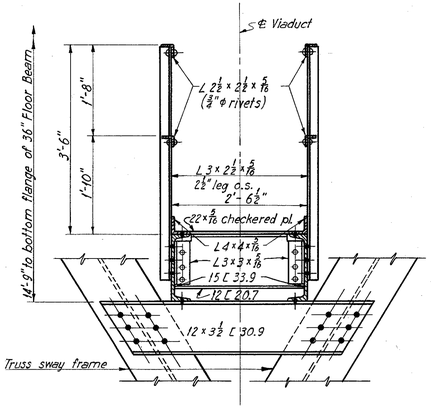
37
44

SUMMIT COUNTY
CITY OF AKRON

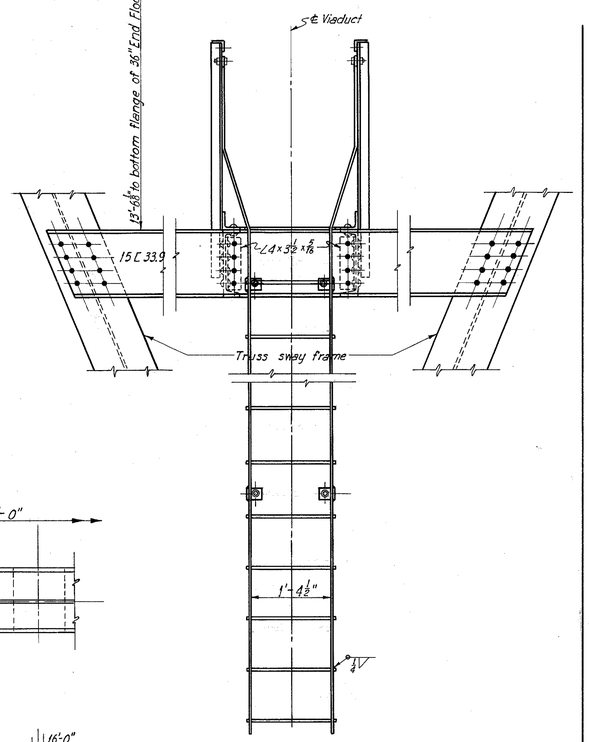
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



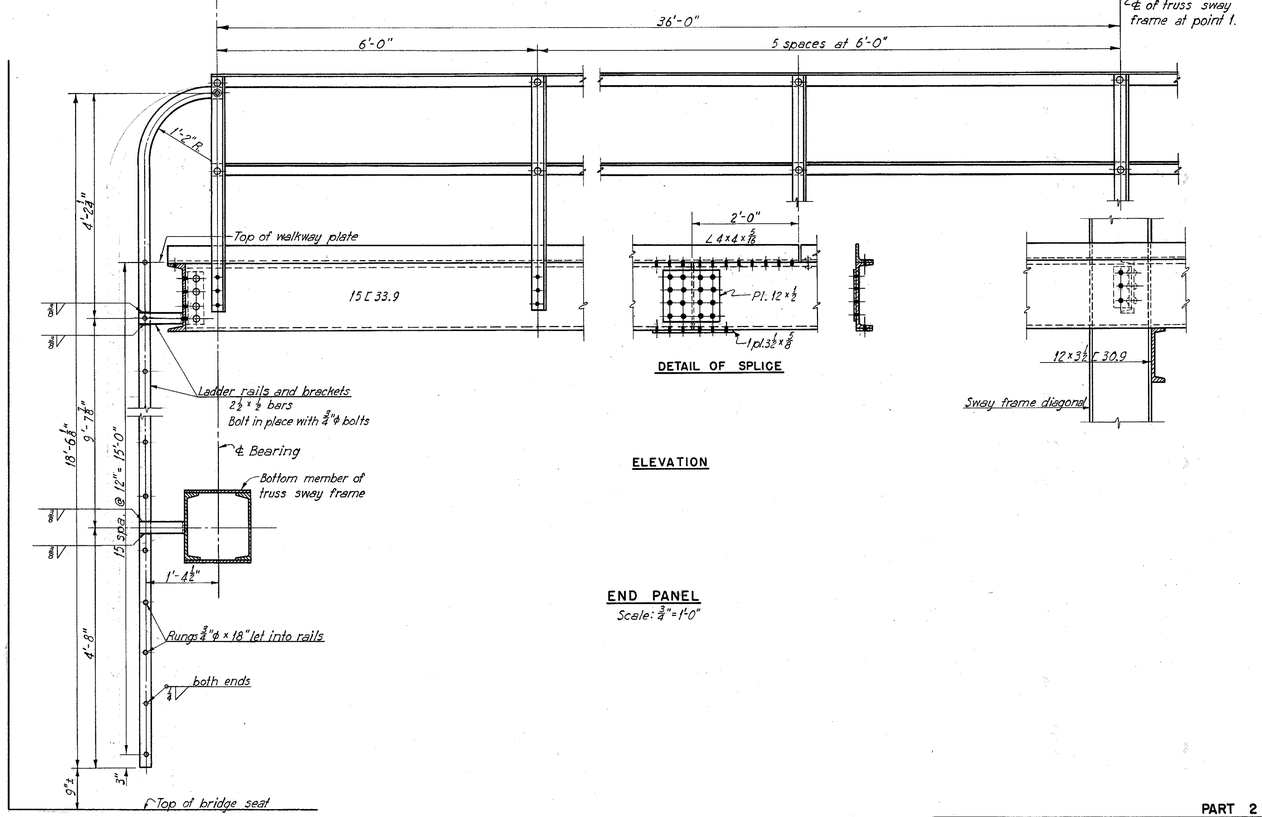
PLAN



TYPICAL SECTION
Scale: ¾"=1'-0"



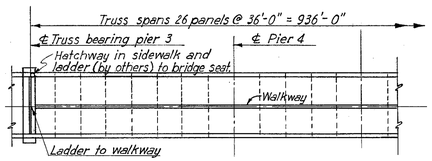
END ELEVATION
Scale: ¾"=1'-0"



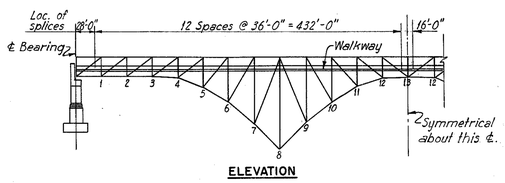
END PANEL
Scale: ¾"=1'-0"

DETAIL OF SPLICE

ELEVATION



PLAN



ELEVATION

GENERAL LOCATION DIAGRAM
Scale: 1"=100'

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

INSPECTION WALKWAY

AKRON, SUMMIT COUNTY, OHIO

SCALE 3/4"=1'-0", 1"=100'
MADE H.E.S. DATE 6-27-49
TRCD. P.E.L. 60 DATE 7-23-49
CHKD. A.C.A. DATE 7-21-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

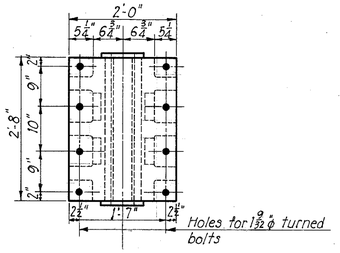
766 SHEET V71

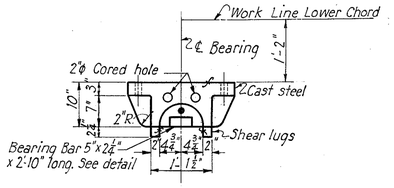
138

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

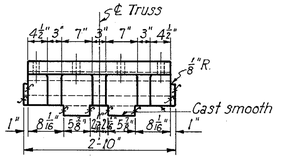
38
44

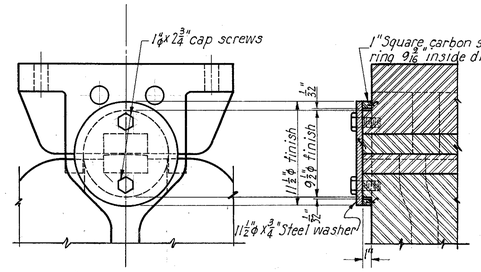
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31





UPPER SHOE CASTING
4 Required
Scale: ¾"=1'-0"

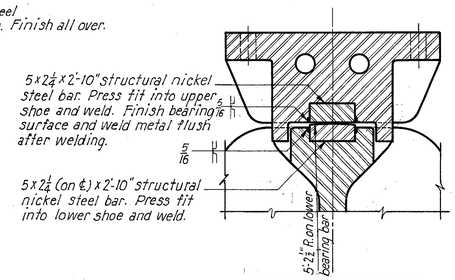




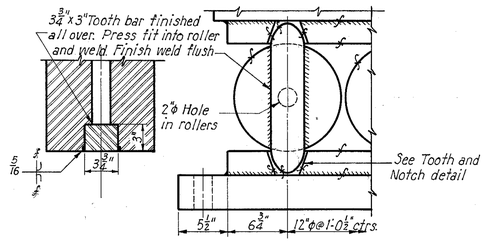
END ELEVATION

SECTION THRU BARS

BEARING BAR DETAILS
Scale: 1½"=1'-0"

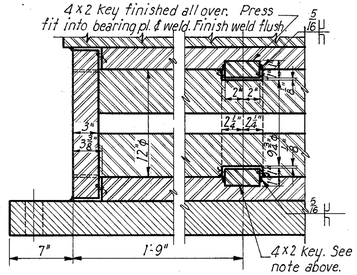


SECTION THRU SHEAR LUGS



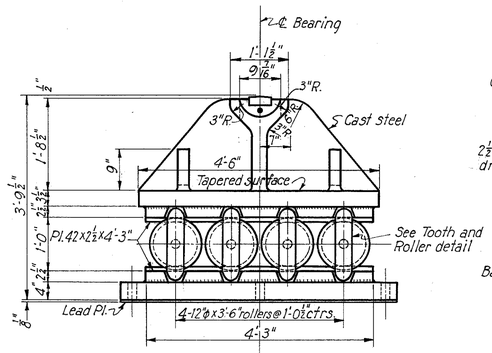
SECTION THRU TOOTH

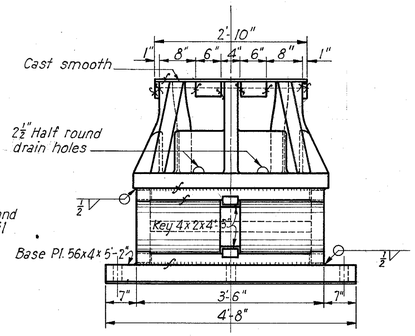
END ELEVATION

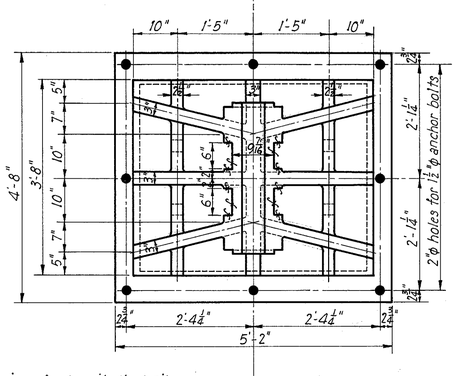


LONGITUDINAL SECTION

TOOTH AND ROLLER DETAILS
Scale: 1½"=1'-0"



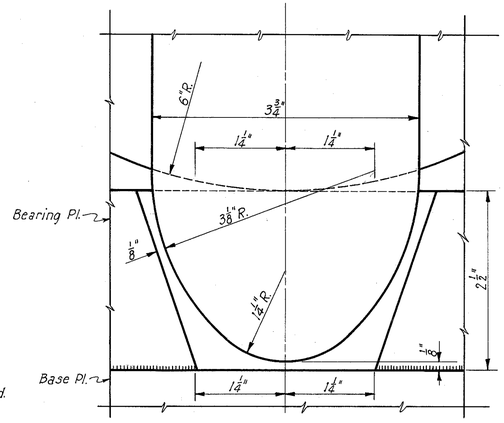




Note:
Dimensions given for longitudinal ribs are for center rib. Edges of skewed ribs are to lie in same plane. Depth of casting base to be 4½" at center, tapering to 3½" at edges.

LOWER SHOE
4 required
Scale: ¾"=1'-0"

For general notes, see sheet 5.
Castings to be high strength steel castings, ASTM A148: Grade 80-50.
Bearing bars, bearing plates, tooth bars and keys to be structural nickel steel, ASTM A8.
Rollers to be alloy steel forgings. ASTM A238. Class C.
Base plates to be rolled carbon steel.
All base plates and shoe castings shall be scribed with longitudinal and transverse center lines.
Contact surfaces between metal parts shall be finished.
Machined surfaces of rollers and bearing plates to be painted.
Holes in base plates for anchor bolts shall be ¼" larger in diameter than the anchor bolts. The Superstructure Contractor shall fill all spaces in holes around bolts with an approved metallic filler poured in place before setting nuts.
Upper shoe casting to be attached to truss with 1 9/32" turned bolts using hex. heads and "Ancho" self locking nuts as made by the Automatic Nut Co. of Lebanon, Pa. or equal with ¼" washer under head and nut.
Base plates shall be set on ⅛" lead plates.
For anchor bolt details, see sheet 27.
All fillets ¼" radius unless otherwise noted.
Bearing castings in contact with lead plates shall be rough finished according to Section 5-7.23 of the Specifications.



TOOTH AND NOTCH DETAIL
Scale: Full Size

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

TRUSS SHOES AT PIERS 3 AND 6

AKRON, SUMMIT COUNTY, OHIO

SCALE 2, 12"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE D.J.W. DATE 5-12-49 CONSULTING ENGINEERS
TRCD'L., R.R. DATE 7-21-49 KANSAS CITY NEW YORK
CHKD. A.L. DATE 7-11-49

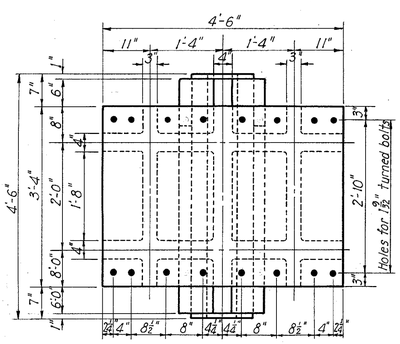
766 SHEET V72

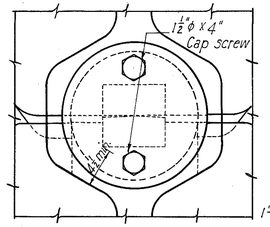
139

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

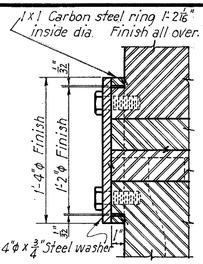
39
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

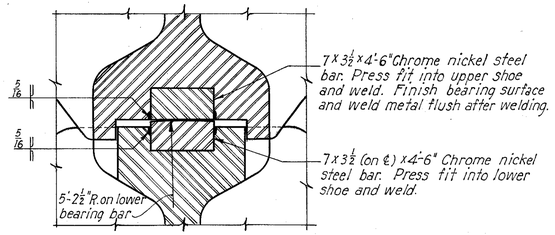




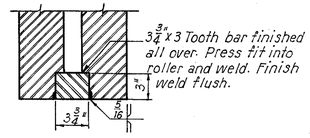
END ELEVATION



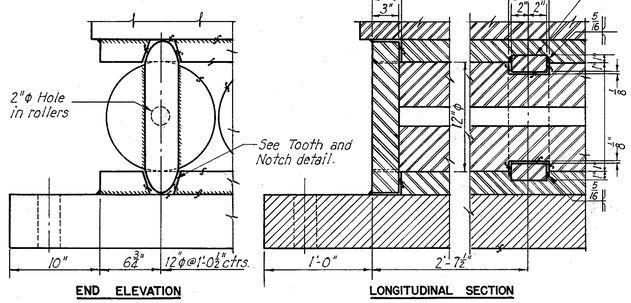
SECTION THRU BARS



SECTION THRU SHEAR LUGS



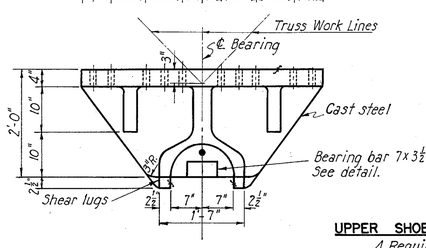
SECTION THRU TOOTH



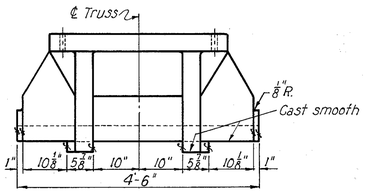
END ELEVATION

LONGITUDINAL SECTION

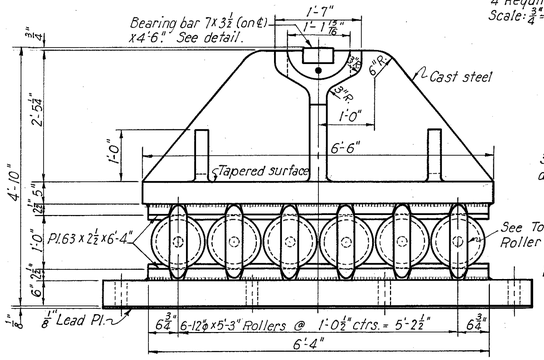
TOOTH AND ROLLER DETAIL
Scale: 1½" = 1'-0"

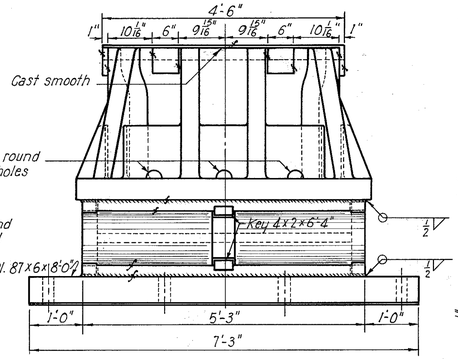


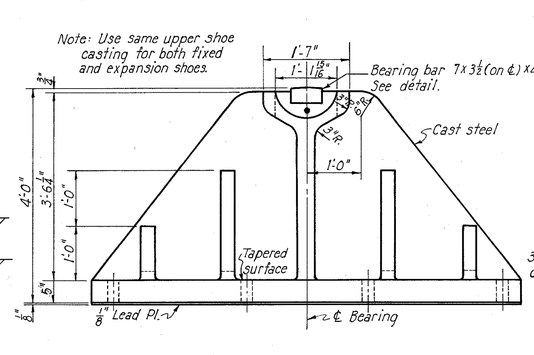
UPPER SHOE CASTING
4 Required
Scale: ¾" = 1'-0"

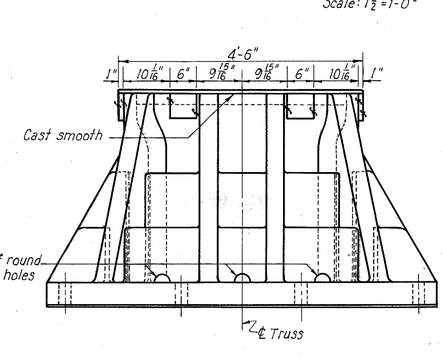


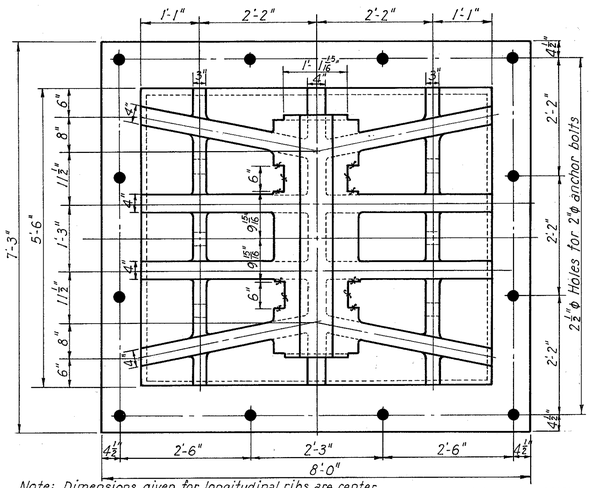
BEARING BAR DETAILS
Scale: 1½" = 1'-0"





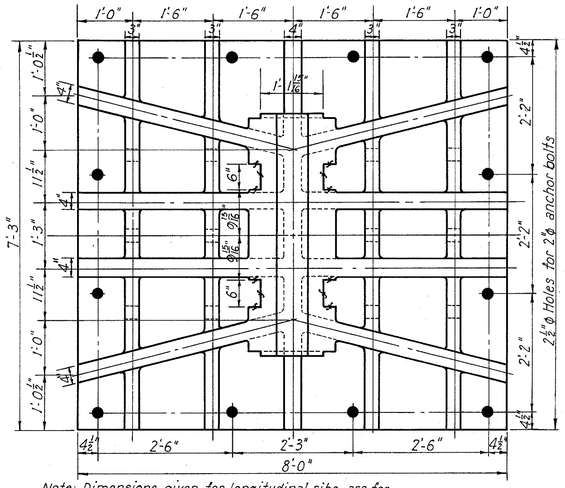






Note: Dimensions given for longitudinal ribs are center ribs. Edges of skewed ribs are to lie in same plane. Depth of casting base to be 6" at center tapering to 5" at edges.

LOWER EXPANSION SHOE
2 Required
Scale: ¾" = 1'-0"



Note: Dimensions given for longitudinal ribs are for center ribs. Edges of skewed ribs are to lie in same plane. Depth of casting base to be 6" at center tapering to 5" at edges.

LOWER FIXED SHOE
2 Required
Scale: ¾" = 1'-0"

NOTES

For General Notes, see sheet 5.
Castings to be high strength steel castings, A.S.T.M. A148: Grade 80-50.
Bearing bars, bearing plates, tooth bars and keys to be Chrome Nickel alloy steel with a minimum yield point of 75,000 psi..
Rollers to be alloy steel forgings. A.S.T.M. A238. Class C.
Base plates to be rolled carbon steel.
All base plates and shoe castings shall be scribed with longitudinal and transverse center lines.
Contact surfaces between metal parts shall be finished.
Machined surfaces of rollers and bearing plates to be painted.
Holes in base plates for anchor bolts shall be ½" larger in diameter than the anchor bolts. The Superstructure Contractor shall fill all spaces in holes around bolts with an approved metallic filler poured in place before setting nuts.
Upper shoe casting to be attached to truss with 1 9/32"φ turned bolts using hex heads and Anco self locking nuts as made by the Automatic Nut Co. of Lebanon, Pa., or equal, with ¼" washer under head and nut.
Base plates shall be set on ⅛" lead plates.
For Tooth and Notch detail, see Truss Shoes, sheet 38.
For anchor bolt details, see sheet 27.
All fillets to be ¾" radius, unless otherwise noted.
Bearing castings in contact with lead plates shall be rough finished according to Section 5-7.23 of the Specifications.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT

TRUSS SHOES AT PIERS 4 AND 5

AKRON, SUMMIT COUNTY, OHIO

SCALE 3" x 12" = 1'-0"
MADE D.W. DATE 5-18-49
TRCD W.C.B./R.R. DATE 7-21-49
CHKD. F.L. DATE 7-11-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

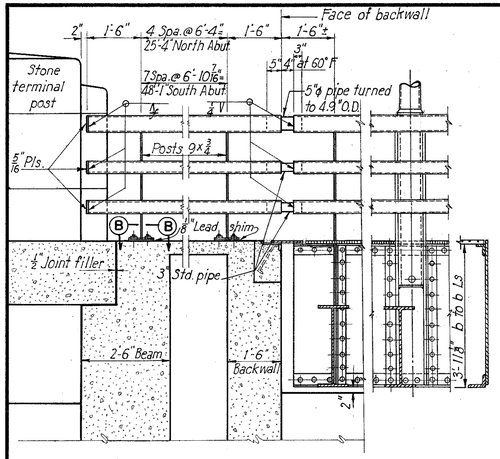
766 SHEET V73

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

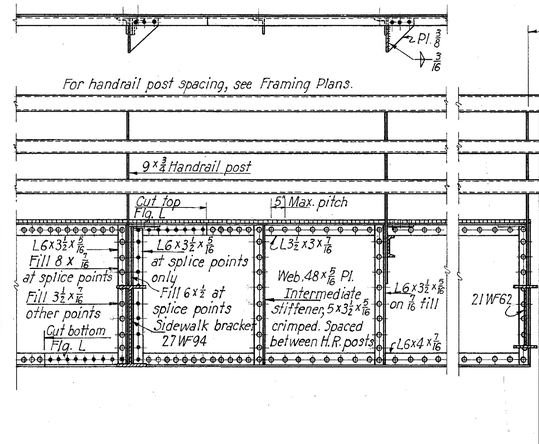
40
44

SUMMIT COUNTY
CITY OF AKRON

AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



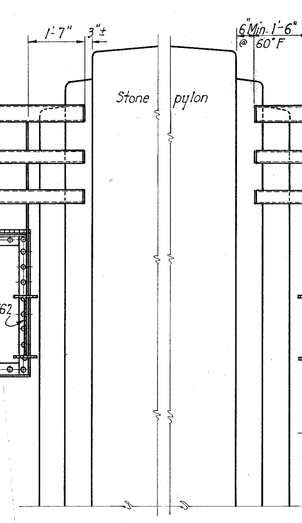
TERMINAL POST



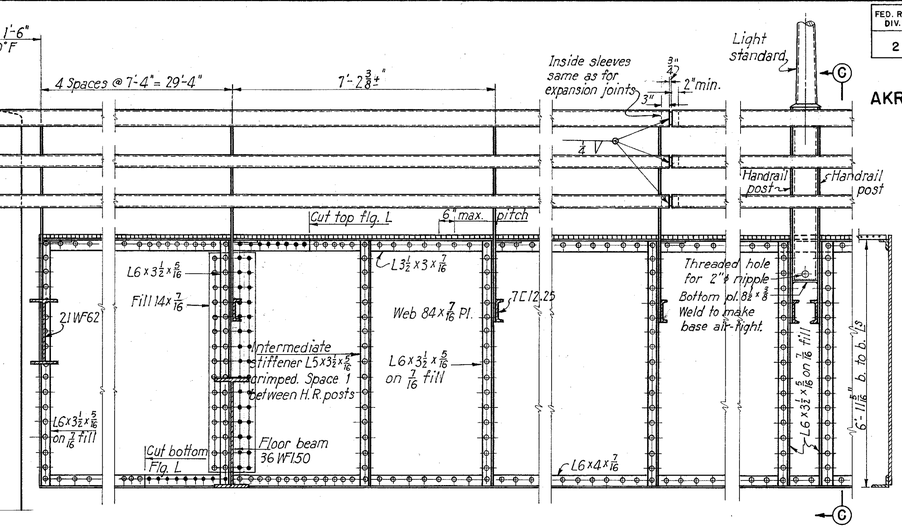
EXPANSION JOINT AT ABUTMENT

LIGHT POLE

INTERMEDIATE POSTS—UNITS 1 AND 3



PIERS 3 AND 6

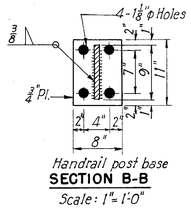


INTERMEDIATE POSTS—UNIT 2

CONTRACTION JOINT

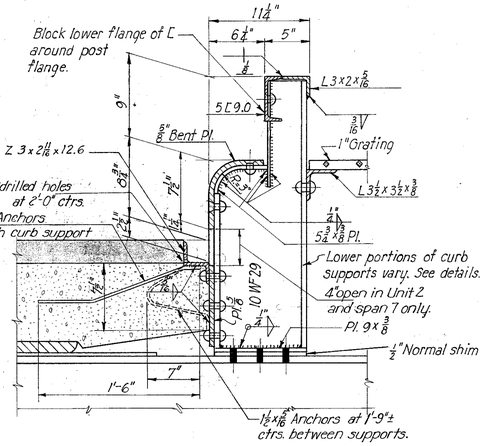
LIGHT POLE

HANDRAIL AND FASCIA BEAM DETAILS
Scale: 1/2" = 1'-0"

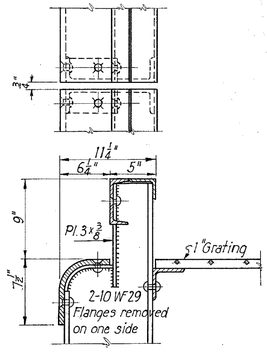


Handrail post base
SECTION B-B
Scale: 1" = 1'-0"

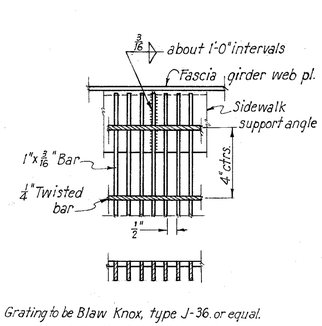
Light pole base
SECTION B-B
Scale: 1" = 1'-0"



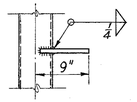
TYPICAL CURB CROSS SECTION
All curb rivets, 3/4" φ
Scale: 1 1/2" = 1'-0"



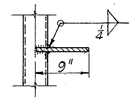
SECTION A-A
Construction same as Typical except as shown.
Scale: 1 1/2" = 1'-0"



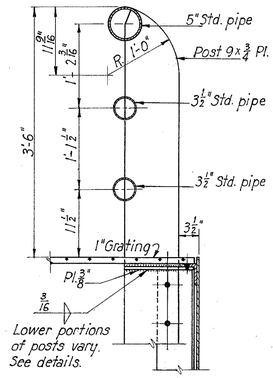
Grating to be Blaw Knox, type J-36, or equal.
SIDEWALK GRATING DETAIL
Scale: 3" = 1'-0"



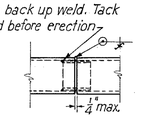
PLAN OF TOP RAIL
Notch pipe and weld to exclude moisture.



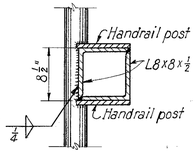
PLAN OF LOWER RAILS
Notch pipe and weld to exclude moisture.



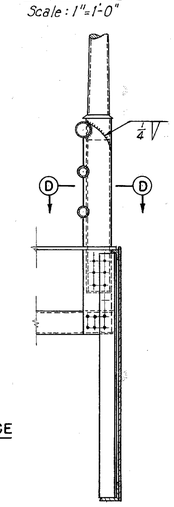
TYPICAL SECTION THROUGH HANDRAIL
Scale: 1" = 1'-0"



TYPICAL HANDRAIL SPLICE
Scale: 1" = 1'-0"

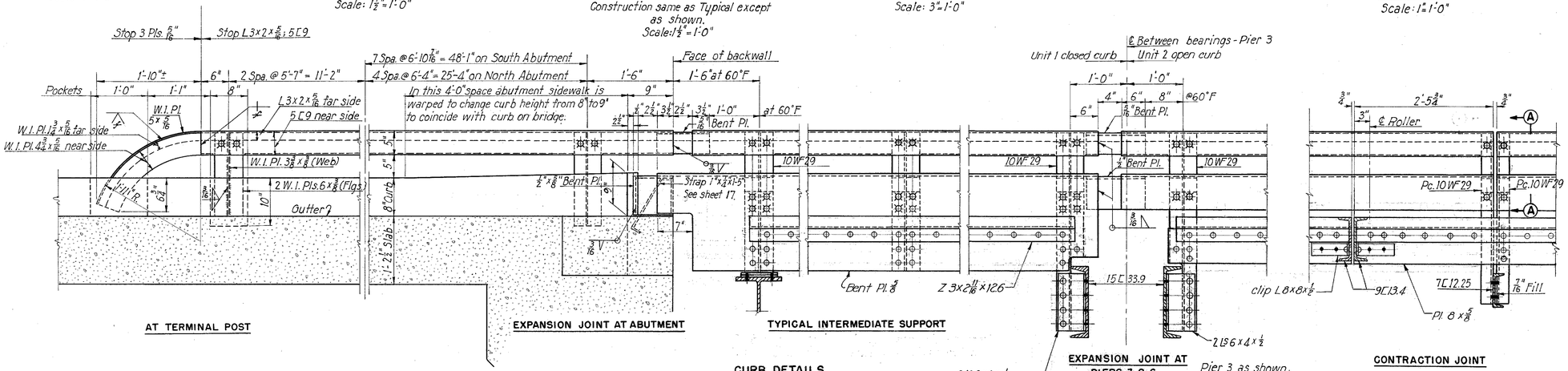


SECTION D-D
Scale: 1" = 1'-0"



SECTION C-C
Scale: 1 1/2" = 1'-0"

Notes:
Fascia in Unit 2 to be spliced at each floor beam. Splices in Units 1 and 3 as shown on Framing Plans.
For additional views of handrail and curb, see roadway cross sections.
For additional details at expansion joints, see sheets 16 and 17.
For additional light pole detail, see sheet 42.
Curb shall be fabricated in lengths of not less than three panels and may be spliced at any intermediate support. Provide 1/4" clear between abutting members.



AT TERMINAL POST

EXPANSION JOINT AT ABUTMENT

TYPICAL INTERMEDIATE SUPPORT

CURB DETAILS
Scale: 1" = 1'-0"

EXPANSION JOINT AT PIERS 3 & 6

Pier 3 as shown. Pier 6 opposite hand.

CONTRACTION JOINT

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

HANDRAIL AND CURB

AKRON, SUMMIT COUNTY, OHIO

SCALE 1" 1'-0" 1 1/2" = 1'-0" 3" = 1'-0"
MADE H.E.S. DATE 7-12-68
TRCD. M.B.R. DATE 8-16-68
CHKD. E.H.B. DATE 9-27-68

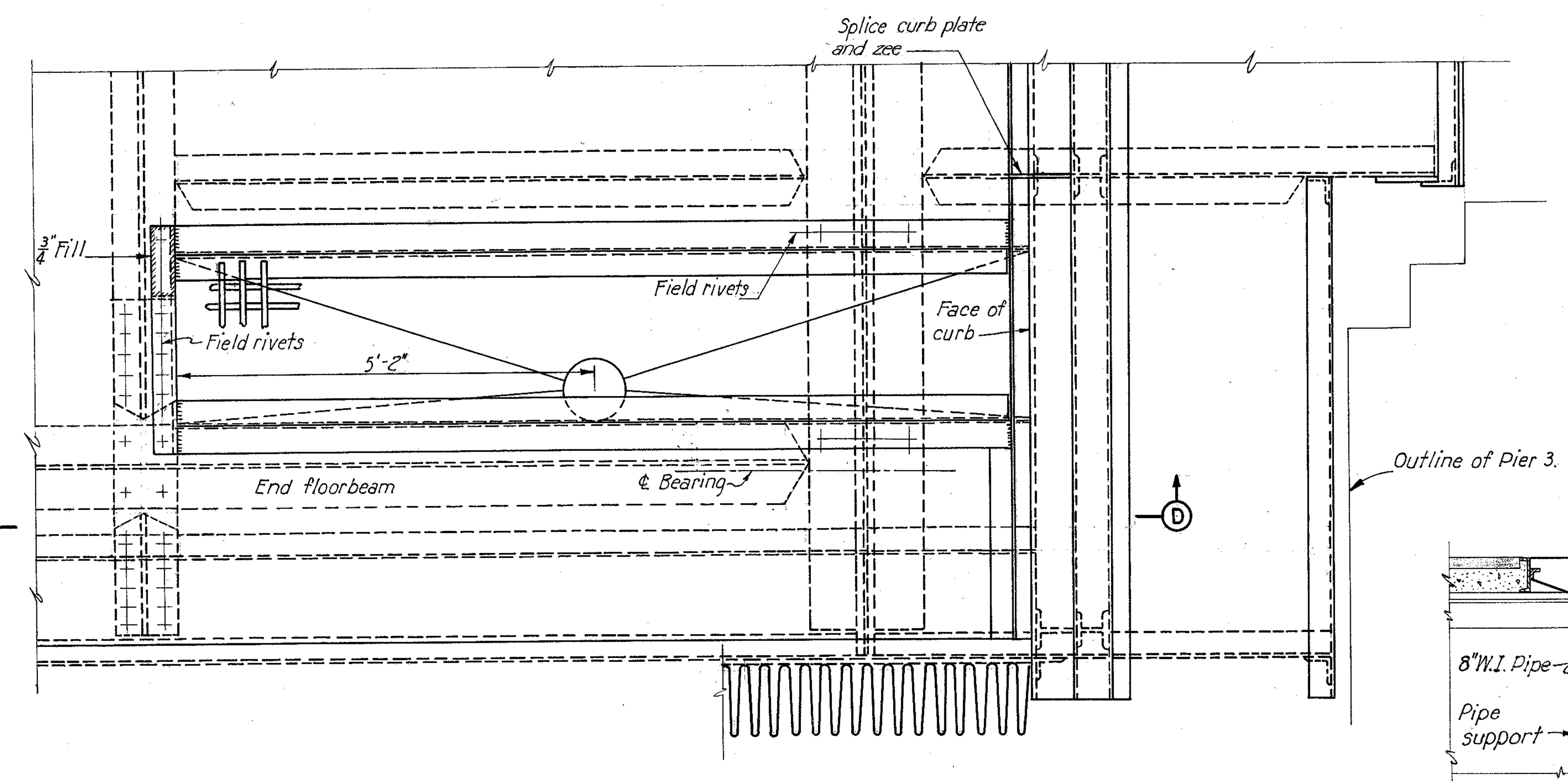
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V 74

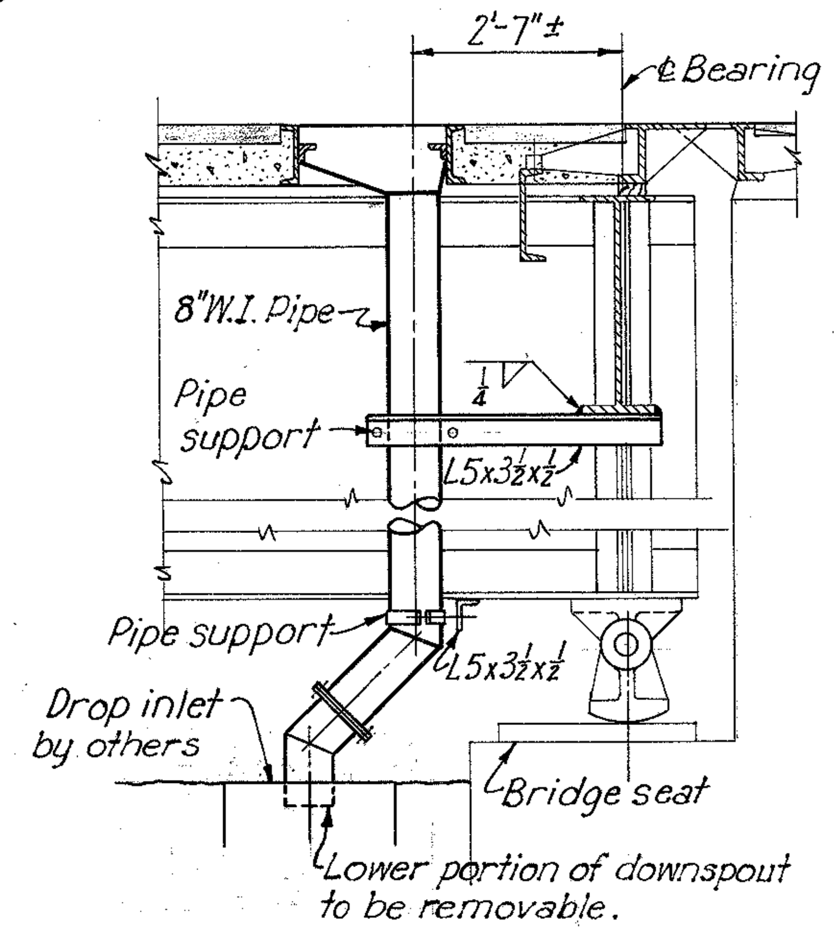
153

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687 6	POST WAR

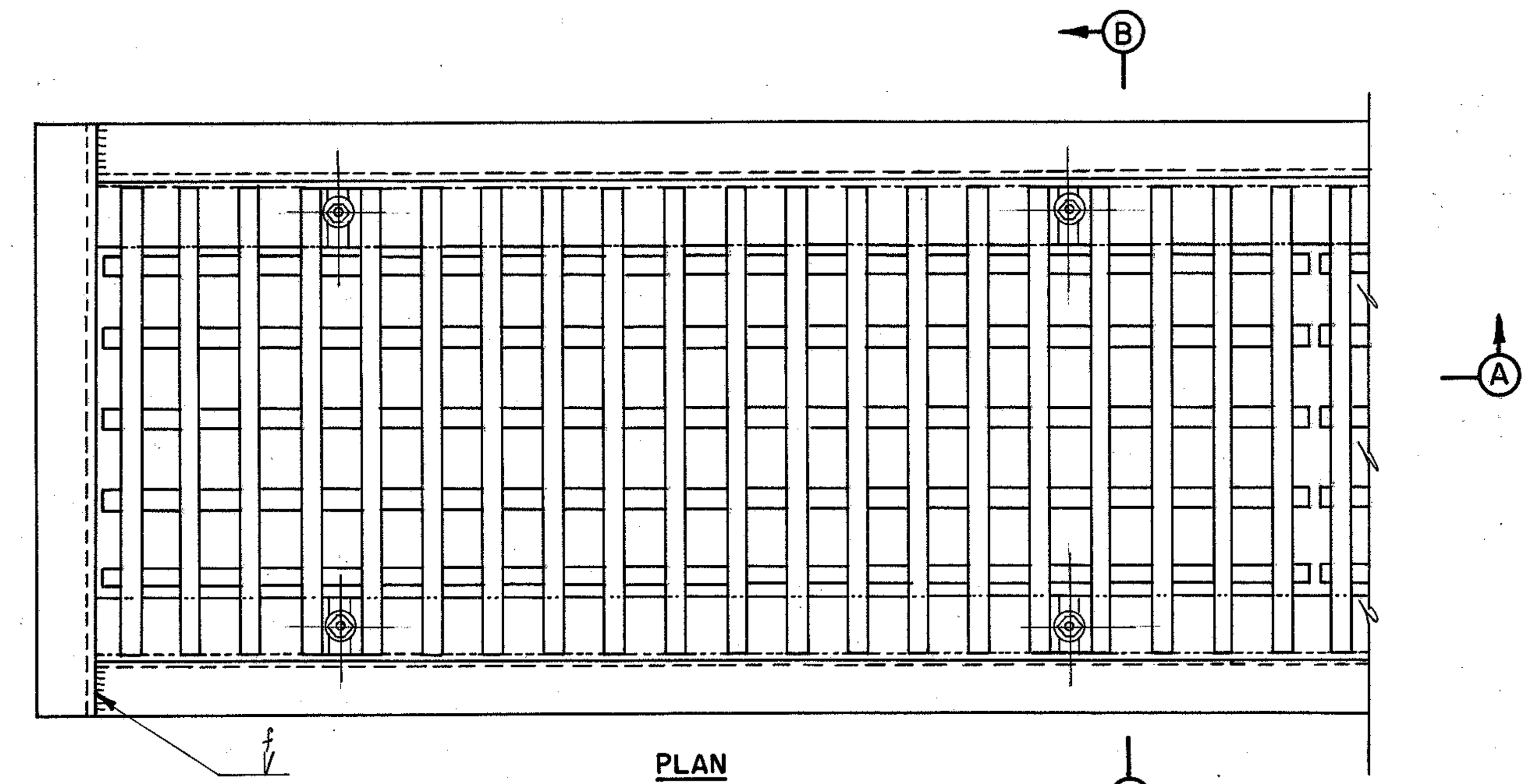
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



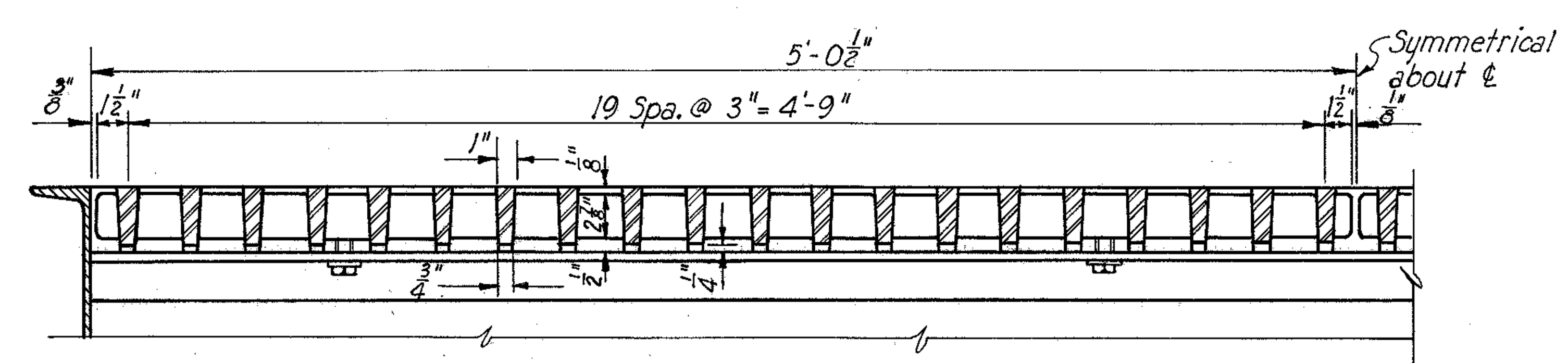
PLAN



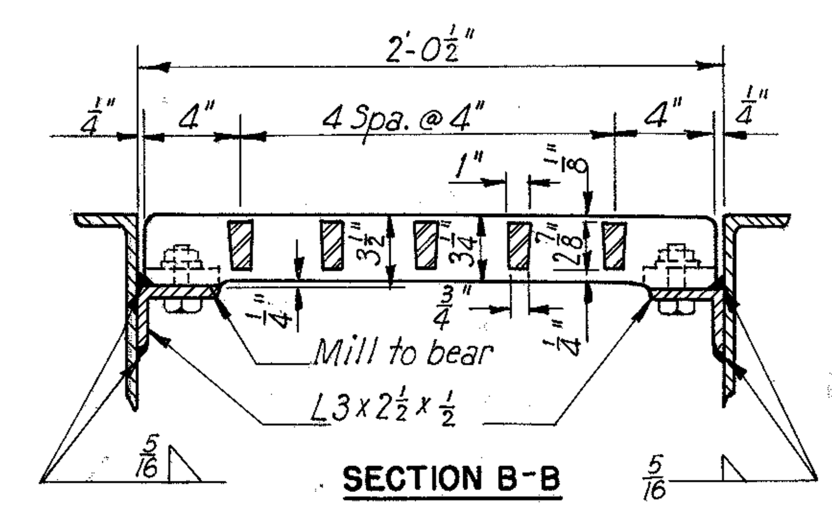
SECTION C-C
At North Abutment
Scale: 3/8"=1'-0"



PLAN

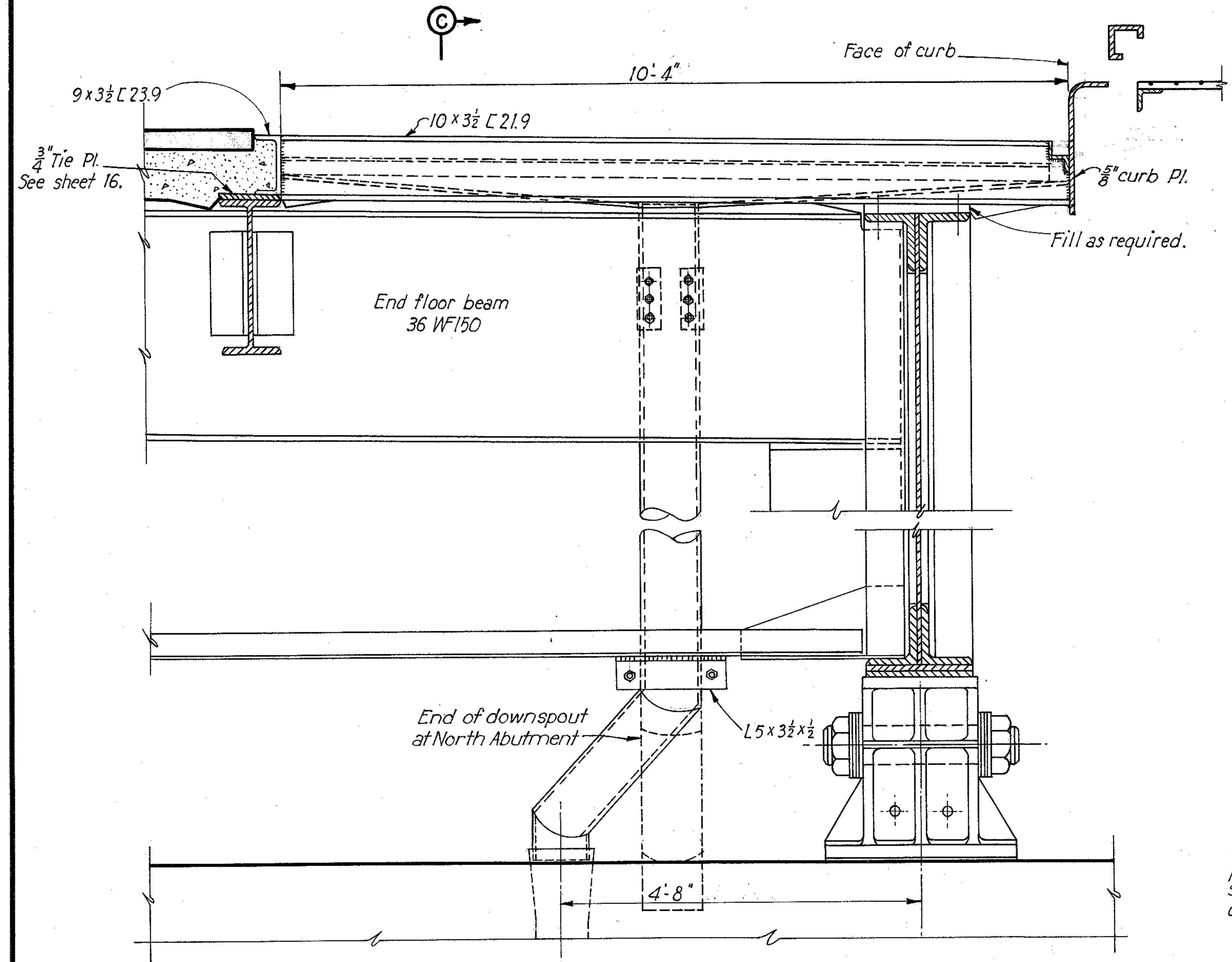


SECTION A-A

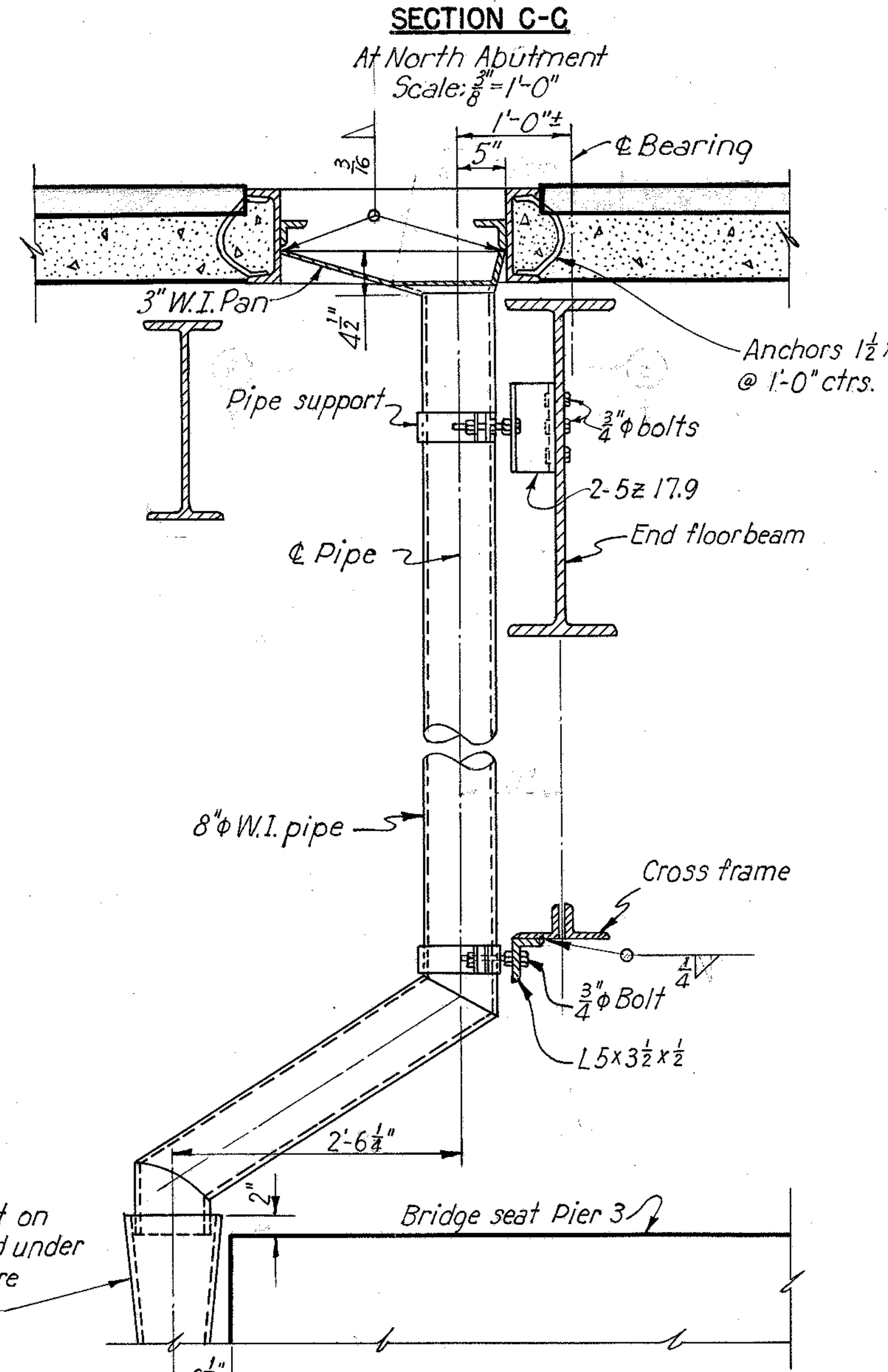


SECTION B-B

GRATING DETAIL
Scale: 1½"=1'-0"
Eight gratings required (Four drains)
Material: cast steel

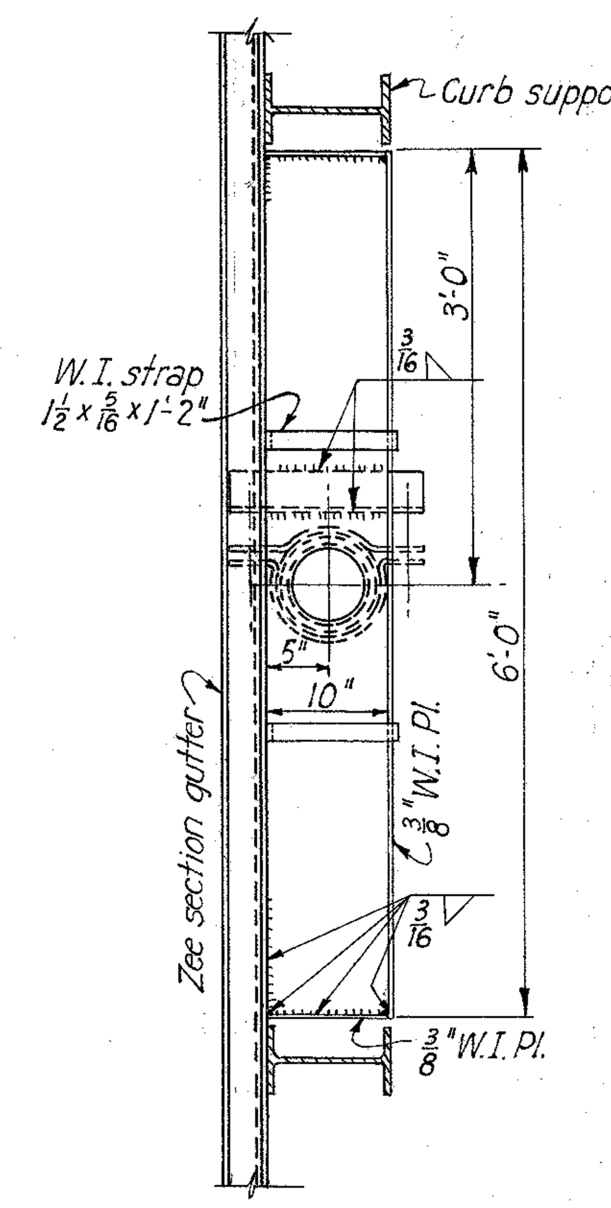


SECTION D-D

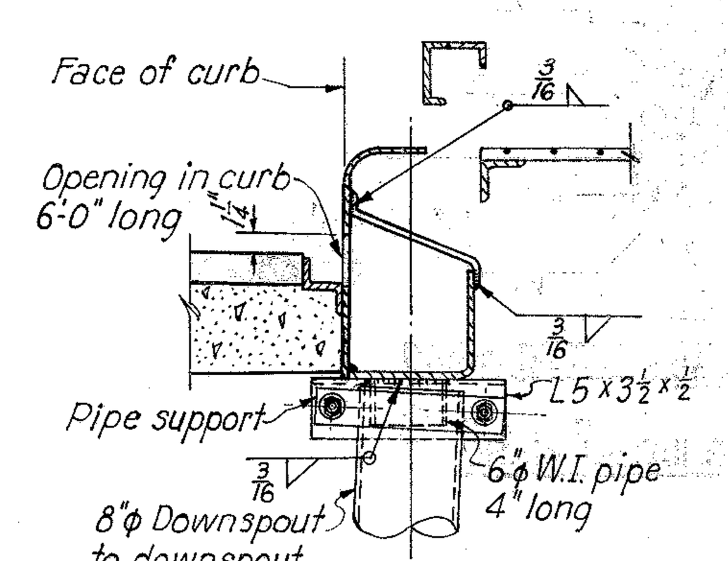


SECTION C-C

DRAIN DETAILS AT PIER 3
Scale: 3/4"=1'-0"
Drains at North Abutment similar except as shown

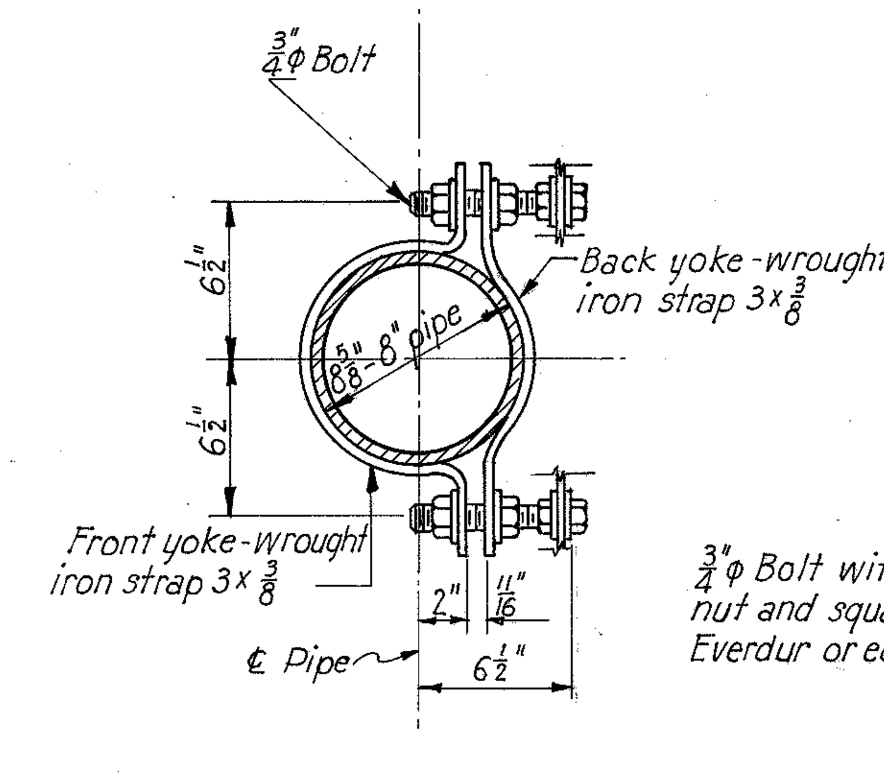


PLAN

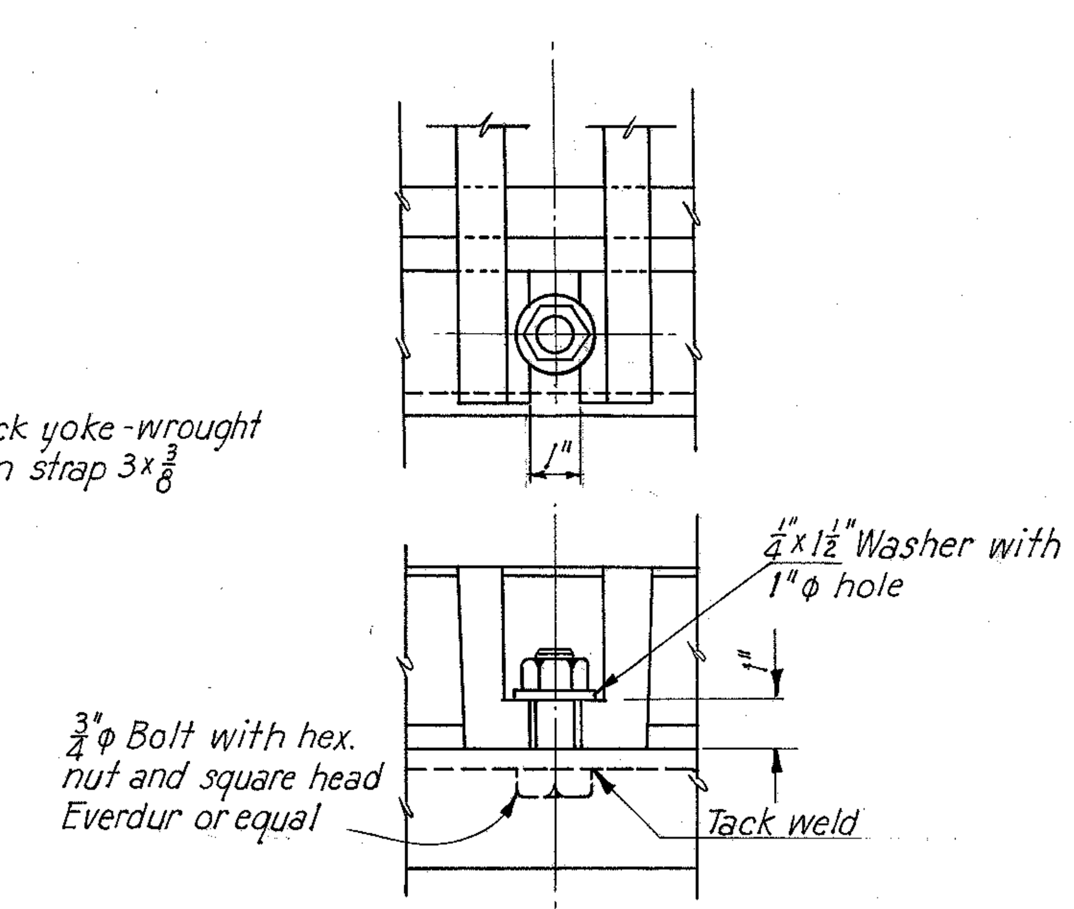


SECTION

DRAIN DETAILS AT PIERS 1 AND 2
Scale: 3/4"=1'-0"
4 Required



PIPE SUPPORT
Scale: 1½"=1'-0"



GRATING BOLT DETAILS
Scale: 3"=1'-0"

Notes:
See sheets 11 and 12 for cross sections showing downspouts. For location of drains at piers 1 and 2, see sheet 18.

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124
ROADWAY DRAINAGE
AKRON, SUMMIT COUNTY, OHIO

SCALE 3/4", 3/8", 1½"=1'-0"
MADE E.H.B. DATE 7-21-49
TRCD. J.H.G. R.R. DATE 11-3-49
CHKD. D.L.J. DATE 11-7-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

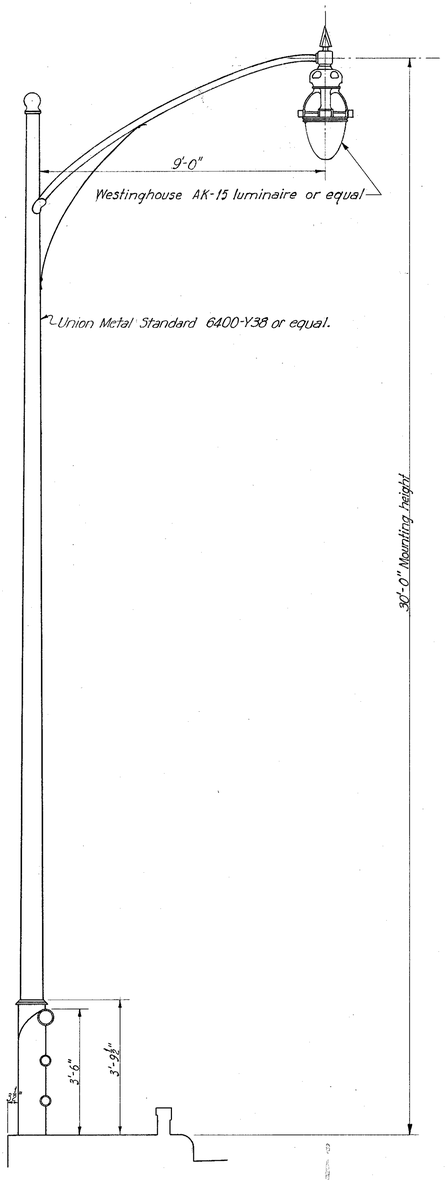
766 SHEET V75

156

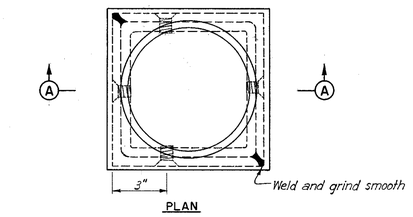
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

42
44

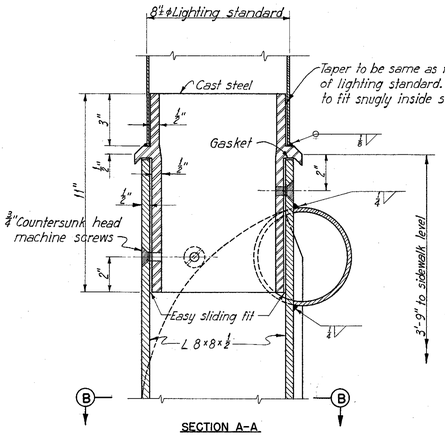
SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31



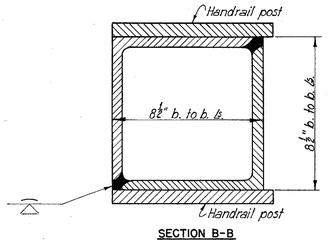
LIGHTING STANDARD
Scale: ½" = 1'-0"
21 Required



PLAN

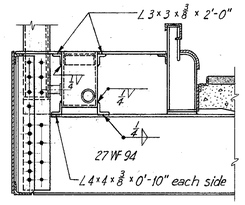


SECTION A-A

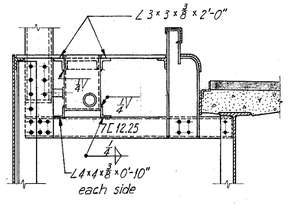


SECTION B-B

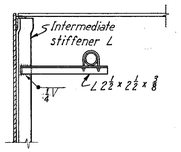
LIGHT POLE ADAPTER
Scale: 3" = 1'-0"
21 Required



GIRDER SPANS

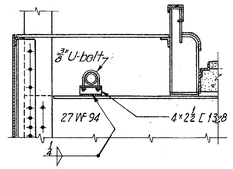


TRUSS SPANS

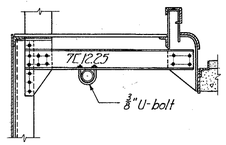


CONDUIT SUPPORTS BETWEEN HANDRAIL POSTS

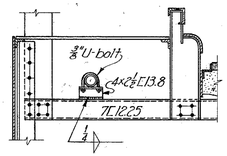
JUNCTION BOX SUPPORTS
Scale: ½" = 1'-0"



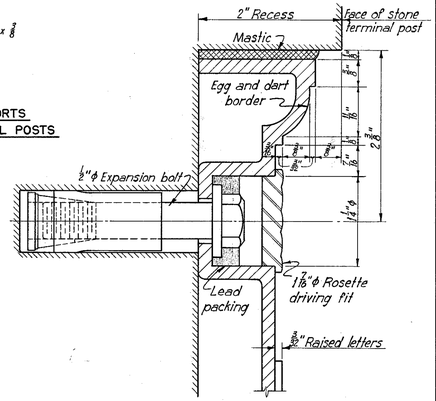
GIRDER SPANS AT FLOORBEAMS



GIRDER SPANS BETWEEN FLOORBEAMS

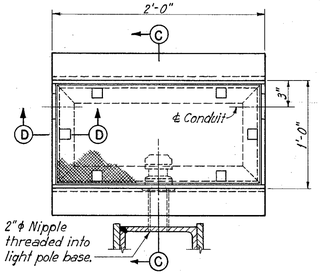


TRUSS SPANS

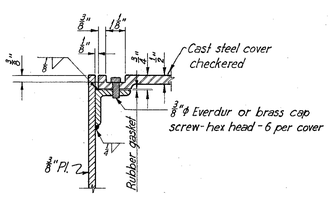


SECTION THRU PLATE AT BOLT
Full size

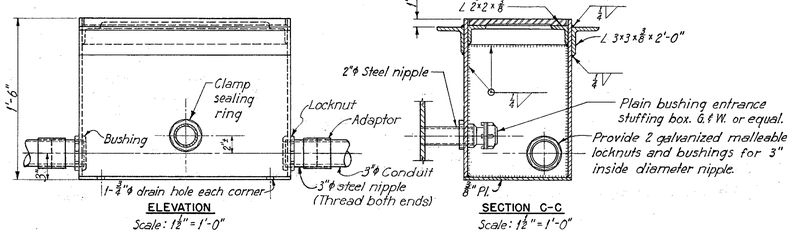
INTERMEDIATE CONDUIT SUPPORTS
Scale: ½"=1'-0"



PLAN



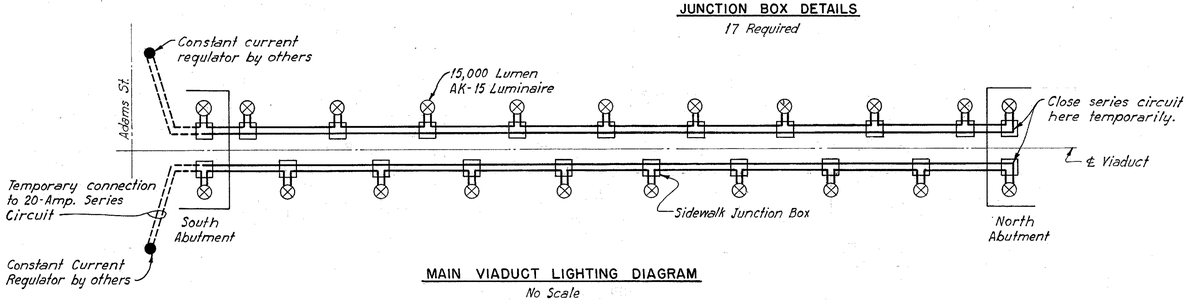
SECTION D-D
Scale: 3" = 1'-0"



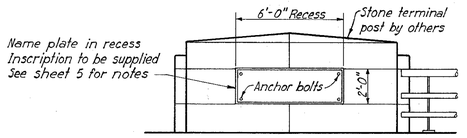
ELEVATION
Scale: 1½" = 1'-0"

SECTION C-C
Scale: 1½" = 1'-0"

JUNCTION BOX DETAILS
17 Required



MAIN VIADUCT LIGHTING DIAGRAM
No Scale



NAME PLATE DETAILS
(2 Plates required)

Notes:

The alignment of the conduit shall change gradually from the last junction boxes at each end of the superstructure to match the W.I. conduit on the abutments.

Junction boxes shall be galvanized.

One junction box shall be used for each light pole.

For location of light poles on abutments, see sheet 4.

For location of light poles on viaduct, see framing plans, sheets 18, 24 and 28.

Conduit shall be supported at each sidewalk support, and midway between.

Conduit supports shall be galvanized.

Conduit expansion couplings shall be located not more than 40 ft apart.

For details of light pole base see sheet 40.

At roadway expansion joints provide expansion couplings in conduit which will allow 8" of total expansion.

The lighting standards shall be made air-tight between junction box and luminaire. Finial cap, bracket attachments, base, etc. shall be gasketed or otherwise sealed.

Conduits shall be 3"ϕ asbestos-cement pipe as described in Supplemental Specification M-206.14

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

LIGHTING AND NAMEPLATES

AKRON, SUMMIT COUNTY, OHIO

SCALE 1"=1'-0" & 3"=1'-0"
MADE R.D.D. DATE 8-9-49
TRCD. G.D. DATE 8-3-49
CHKD. G.D. DATE 8-22-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V76

161

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687 (6)	POST WAR

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM - 5-12.31

UNIT 2 - TRUSS STRESS IN KIPS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	28	29	30	31
Member	Gravity Loads					100% Overload	* Reversal	*Total Cols. 2+3+4+7+8	50# T.W.	Total Cols. 2+10	50# L.W.	Total Cols. 2+12	Traction	30# T.W.	Total Cols. 6+14+15	30# L.W.	Total Cols. 6+14+17	Design for		Area provided		l/r	Unit stress in lbs./sq.in.				Allow Unit Stress #/□"		Sil. or Car.	Make-up-of section	Shape
	D.L.	L.L.	Imp.	Reversal	Total													Col.	Stress	Ag	An		fc	ft	fb	Total	fc.	ft.			
U_0U_1	0	0	0		0	0		0												69.5	54.6	49.3			935	935	14390	18000	c	2 Pls.18x$\frac{3}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	▯
U_1U_2	-924	-383	-44		-1351	-407		-1758	±49	-973	±87	-1011	-8	±42	-1401	±64	-1423	6	-1351	78.4	72.8	50.7	18580		728	19308	18820		s	2 Pls.18x$\frac{5}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_2U_3	-1365	-614	-71		-2050	-653		-2703	±83	-1448	±175	-1540	-18	±71	-2139	±131	-2199	6	-2050	127.2	121.6	50.5	16860		936	17796	18830		s	2 Pls.17x$\frac{5}{8}$; 2 Pls.14x$\frac{5}{8}$; 4 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_3U_4	-1320	-700	-80		-2100	-740		-2840	±101	-1421	±265	-1585	-47	±86	-2233	±198	-2345	6	-2100	127.2	121.6	50.5	17300		936	18236	18830		s	2 Pls.17x$\frac{5}{8}$; 2 Pls.14x$\frac{5}{8}$; 4 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_4U_5	-679	-574	-65		-1318	-604		-1922	±105	-784	±298	-977	-52	±89	-1459	±223	-1593	6	-1318	78.4	72.8	50.7	18100		728	18828	18820		s	2 Pls.18x$\frac{5}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_5U_6	+138	+446 -341	+51 -39	±141	+776 -424	+472 -359	±301	+1408 -902	±93	+231	±245	+383	+41 -40	±79	+896 -543	±183	+1000 -647	9	+1408 -902	69.5	54.6 66.1	49.3	13650	25,800	+935 -730	+26735 -14380	21600	27000	c	2 Pls.18x$\frac{3}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_6U_7	+706	+358	+41		+1105	+379		+1484	±66	+772	±177	+883	+33	±55	+1193	±131	+1269	6	+1105	69.5	54.6			20,200	970	21170		24000	s	2 Pls.18x$\frac{3}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_7U_8	+1048	+307	+35		+1390	+322		+1712	±70	+1118	±155	+1203	+37	±60	+1487	±116	+1543	6	+1390	78.4	60.3			23,050	926	23976		24000	s	2 Pls.18x$\frac{5}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_8U_9	+1149	+301	+34		+1484	+315		+1799	±65	+1214	±148	+1297	+38	±55	+1577	±111	+1633	6	+1484	82.9	63.2			23,500	930	24430		24000	s	2 Pls.18x$\frac{3}{4}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
U_9U_{10}	+1000	+305	+35		+1340	+321		+1661	±45	+1045	±137	+1137	+36	±37	+1413	±102	+1478	6	+1340	78.4	60.3			22,200	926	23126		24000	s	2 Pls.18x$\frac{5}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
$U_{10}U_{11}$	+782	+318	+36		+1136	+337		+1473	±82	+864	±98	+880	+27	±70	+1233	±74	+1237	6	+1136	69.5	54.6			20,800	970	21770		24000	s	2 Pls.18x$\frac{3}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
$U_{11}U_{12}$	+514	+329 -334	+38 -38	±6	+887 -18	+349 -355	±107	+1336 -321	±104	+618	±147	+661	+28 -18	±89	+1004 -125	±110	+1025 -146	9	+1336 -321	69.5	54.6 66.1	49.3	4860	24,500	+935 -730	+25435 -5590	21600	27000	c	2 Pls.18x$\frac{3}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
$U_{12}U_{13}$	+369	+350 -430	+40 -49	±111	+870 -331	+367 -457	±284	+1409 -851	±111	+480	±120	+489	+21 -18	±95	+986 -444	±89	+980 -438	9	+1409 -851	69.5	54.6 66.1	49.3	12900	25800	+935 -730	+27935 -26735	28320	36000	s	2 Pls.18x$\frac{3}{8}$; 2 Pls.26x$\frac{5}{8}$; 4 Ls 6x4x$\frac{5}{8}$	
L_0L_1	+924	+383	+44		+1351	+407		+1758			±99	+1023	+15		+1366	±74	+1440	6	+1351	99.5	77.0			17540	830	18370		18000	c	Pl.18x$\frac{5}{8}$; Pl.29x$\frac{5}{8}$; 2 Pls.28x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_1L_2	+1365	+614	+71		+2050	+653		+2703	±25	+1390	±200	+1565	+30	±15	+2095	±149	+2229	6	+2050	119.5	90.8			22600	950	23550		24000	s	Pl.18x$\frac{5}{8}$; Pl.29x$\frac{5}{8}$; 2 Pls.28x$\frac{5}{8}$; 2 Pls.16x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	⊓
L_2L_3	+1320	+700	+80		+2100	+740		+2840	±42	+1362	±300	+1620	+60	±25	+2185	±224	+2384	6	+2100	119.5	90.8			23100	950	24050		24000	s	Pl.18x$\frac{5}{8}$; Pl.29x$\frac{5}{8}$; 2 Pls.28x$\frac{5}{8}$; 2 Pls.16x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_3L_4	+683	+579	+66		+1328	+610		+1938	±53	+736	±347	+1030	+69	±32	+1492	±259	+1656	6	+1328	99.5	77.0			17250	830	18080		18000	c	Pl.18x$\frac{5}{8}$; Pl.29x$\frac{5}{8}$; 2 Pls.28x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_4L_5	-146	-472 +362	-54 +41	±150	-822 +451	-499 +381	±319	-1490 +957	±60	-206	±320	-466	-43 +63	±36	-901 +550	±239	-1104 +753	9	-1490 +957	87.8	84.4 69.0	49.1	17650	13860	-720 +940	-18370 +14,800	21600	27000	c	Pl.18x$\frac{3}{8}$; Pl.29x$\frac{3}{8}$; 2 Pls.28x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_5L_6	-812	-413	-47		-1272	-437		-1709	±62	-874	±295	-1107	-38	±37	-1347	±220	-1530	6	-1272	105.8	96.4	53.6	13200		910	14110	14300		c	Pl.18x$\frac{3}{8}$; 2 Pls.16 to 22x$\frac{3}{8}$; Pl.29x$\frac{3}{8}$; 2 Pls.28 to 34x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_6L_7	-1343	-396	-45		-1784	-415		-2199	±53	-1396	±252	-1595	-53	±32	-1869	±188	-2025	6	-1784	140.4	133.7	60.5	13400		790	14190	14100		c	Pl.18x$\frac{3}{4}$; 2 Pls.34x$\frac{5}{8}$; Pl. 29x$\frac{3}{4}$; 2 Pls.22x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_7L_8	-1807	-450	-51		-2308	-471		-2779	±55	-1862	±235	-2042	-48	±33	-2389	±175	-2531	6	-2308	140.4	133.7	67.8	17300		880	18180	17890		s	Pl.18x$\frac{3}{4}$; 2 Pls.34x$\frac{5}{8}$; Pl. 29x$\frac{3}{4}$; 2 Pls.22x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_8L_9	-1807	-450	-51		-2308	-471		-2779	±55	-1862	±235	-2042	-48	±33	-2389	±175	-2531	6	-2308	140.4	133.7	67.8	17300		880	18180	17890		s	Pl.18x$\frac{3}{4}$; 2 Pls.34x$\frac{5}{8}$; Pl. 29x$\frac{3}{4}$; 2 Pls.22x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
L_9L_{10}	-1473	-385	-44		-1902	-404		-2306	±37	-1510	±243	-1716	-48	±22	-1972	±181	-2131	6	-1902	111.8	108.4	59.4	17560		800	18360	18380		s	Pl.18x$\frac{3}{8}$; 2 Pls.34x$\frac{5}{8}$; Pl.29x$\frac{3}{8}$; 2 Pls.22x$\frac{3}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
$L_{10}L_{11}$	-1151	-352	-40		-1543	-370		-1913	±57	-1208	±267	-1418	-52	±34	-1629	±199	-1794	6	-1543	105.8	96.4	53.6	16030		910	16940	18710		s	Pl.18x$\frac{3}{8}$; 2 Pls.16 to 22x$\frac{3}{8}$; Pl.29x$\frac{3}{8}$; 2 Pls.28 to 34x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
$L_{11}L_{12}$	-827	-337	-38		-1202	-356		-1558	±65	-892	-303	-1130	-29	±39	-1270	±226	-1457	6	-1202	93.7	89.2	49.4	13500		704	14204	14390		c	Pl.18x$\frac{1}{2}$; Pl.29x$\frac{1}{2}$; 2 Pls.28x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
$L_{12}L_{13}$	-517	-331 +336	-18 +17	±7	-893 +20	-351 +358	±107	-1343 +321	±65	-582	±327	-844	-29 +48	±39	-961 +107	±244	-1166 +312	18	-1166 +312	87.8	84.4 69.0	46.6	13800	4520	-680 +890	-14480 +5410	18000	22500	c	Pl.18x$\frac{3}{8}$; Pl.29x$\frac{3}{8}$; 2 Pls.28x$\frac{5}{8}$; 6 Ls 6x4x$\frac{5}{8}$	
U_0L_0	-84	-62	-7		-153	-67		-220										6	-153	50.8	44.8	38.5	3420			3420	14630		c	2 Pls.24x$\frac{1}{2}$; 2-18 [s 45.8	
U_1L_1	+469	+211	+24		+704	+224		+928			±68	+537	+10			±51	+765	6	+704	43.0	32.8			21500		21500		24000	s	2 Pls.24x$\frac{3}{8}$; 2-18 [s 42.7	] [
U_2L_2	+133	+138 -109	+16 -12	±14	+301 -42	+146 -115	±52	+485 -155			±68	+201	+14 -10			±51	+366 -103	9	+485 -155	50.8	39.3 44.8	38.5	3460	12350		+12350 -3460	21900	27000	c	2 Pls.24x$\frac{1}{2}$; 2-18 [s 45.8	
U_3L_3	-206	-140	-16		-362	-148		-510			±68	-274	-10			±51	-423	6	-362	50.8	44.8	38.5	8080			8080	14630		c	2 Pls.24x$\frac{1}{2}$; 2-18 [s 45.8	
U_4L_4	-621	-192	-22		-835	-204		-1039			±28	-649	-5			±21	-861	6	-835	57.4	50.2	45.0	16700			16700	19060		s	2 Pls.24x$\frac{9}{16}$; 2-18 [s 51.9	
U_5L_5	-962	-341	-39		-1342	-363		-1705			±36	-998	-7			±27	-1376	6	-1342	79.9	73.6	68.2	18200			18200	17840		s	2 Pls.24x$\frac{5}{8}$; 2-18 WF 85	I I
U_6L_6	-963	-368	-42		-1373	-391		-1764			±71	-1034	-15			±53	-1441	6	-1373	88.4	82.1	84.1	16720			16720	16740		s	2 Pls.28x$\frac{11}{16}$; 2-18 WF 85	
U_7L_7	-909	-354	-41		-1304	-377		-1681			±91	-1000	-19			±68	-1391	6	-1304	93.9	87.6	104.0	14900			14900	15030		s	2 Pls.32x$\frac{11}{16}$; 2-18 WF 85	
U_8L_8	-1162	-335	-38		-1535	-356		-1891	±478	-1640	±12	-1174	-12	30#T.W.±409 Temp.±-41	-1985	±9	-1556	16	-1985	127.4	121.1	122	16380			16380	16420		s	2 Pls.42x$\frac{5}{8}$; 3-18 WF 85	III
U_9L_9	-575	-298	-35		-908	-318		-1226			±83	-658	-12			±62	-982	6	-908	82.0	73.6	104	12340			12340	12300		c	2 Pls.32x$\frac{3}{4}$; 2-18 [s 58	][
$U_{10}L_{10}$	-553	-305	-35		-893	-325		-1218			±66	-619	-9			±49	-951	6	-893	68.9	61.7	81.6	14500			14500	16940		s	2 Pls.28x$\frac{11}{16}$; 2-18 [s 51.9	
$U_{11}L_{11}$	-511	-295	-34		-840	-314		-1154			±83	-594	-11			±62	-913	6	-840	57.4	50.2	64.5	16800			16800	18100		s	2 Pls.24x$\frac{9}{16}$; 2-18 [s 51.9	
$U_{12}L_{12}$	-268	-179	-21		-468	-191		-659			±87	-355	-15			±65	-548	6	-468	50.8	44.8	44.9	10450			10450	14500		c	2 Pls.24x$\frac{1}{2}$; 2-18 [s 45.8	
$U_{13}L_{13}$	-162	-88	-10		-260	-94		-354										6	-260	50.8	44.8	38.6	5800			5800	14640		c	2 Pls.24x$\frac{1}{2}$; 2-18 [s 45.8	
L_0U_1	-1124	-468	-54		-1646	-498		-2144			±119	-1243	-15			±89	-1750	6	-1646	109.9	103.6	73.0	15900		1480	17380	17550		s	2 Pls.24x$\frac{1}{2}$; 2 Pls.24x$\frac{3}{4}$; 2-18 WF 85	II
L_1U_2	-537	-329	-38		-904	-351		-1255			±119	-656	-15			±89	-1008	6	-904	63.4	56.2	68.4	16100		1390	17490	17850		s	2 Pls.24x$\frac{11}{16}$; 2-18 [s 51.9	][
L_2U_3	+54	+244 -228	+28 -26	±108	+434 -324	+258 -242	±221	+804 -663			±119	-173	+24 -22			±89	+547 -435	9	+804 -663	50.8	39.3 44.8	67.6	14800	20500	+1630 -1360	+22130 -16160	20900	27000	c	2 Pls.24x$\frac{1}{2}$; 2-18 [s 45.8	
L_3U_4	+781	+274	+31		+1086	+291		+1377			+52	+833	+11			±39	+1136	6	+1086	63.4	49.5			21900	1650	23550		24000	s	2 Pls.24x$\frac{11}{16}$; 2-18 [s 51.9	
L_4U_5	+1051	+389	+46		+1486	+416		+1902			±58	+1109	+8			±43	+1537	6	+1486	82.9	67.0			22100	1880	23980		24000	s	2 Pls.24x$\frac{11}{16}$; 2-18 WF 85	II
L_5U_6	+866	+357	+41		+1264	+380		+1644			±95	+961	+14			±71	+1349	6	+1264	73.9	59.2			21400	2240	23640		24000	s	2 Pls.24x$\frac{1}{2}$; 2-18 WF 85	
L_6U_7	+684	+301	+35		+1020	+321		+1341			±104	+788	+15			±78	+1113	6	+1020	60.0	47.1			21700	2120	23820		24000	s	2 Pls.28x$\frac{5}{8}$; 2-18 [s 42.7	][
L_7U_8	+573	+258	+30		+861	+275		+1136			±107	+680	+15			±80	+956	6	+861	53.0	40.7			21200	2470	23670		24000	s	2 Pls.32x$\frac{7}{16}$; 2-18 [s 42.7	
U_8L_9	+294	+221	+25		+540	+235		+775			±102	+396	+14			±76	+630	6	+540	49.0	37.3			14500	2420	16920		18000	c	2 Pls.32x$\frac{3}{8}$; 2-18 [s 42.7	
U_9L_{10}	+299	+236	+27		+562	+252		+814			±96	+395	+14			±72	+648	6	+562	47.8	36.3			15500	2140	17640		18000	c	2 Pls.28x$\frac{3}{8}$; 2-18 [s 45.8	
$U_{10}L_{11}$	+333	+276	+32		+641	+294		+935			±87	+420	+12			±65	+718	6	+641	43.0	32.8			19600	2040	21640		24000	s	2 Pls.24x$\frac{3}{8}$; 2-18 [s 42.7	
$U_{11}L_{12}$	+344	+325	+37		+706	+346		+1052			±134	+478	+20			±100	+826	6	+706	43.0	32.8			21500	1720	23220		24000	s	2 Pls.24x$\frac{3}{8}$; 2-18 [s 42.7	
$U_{12}L_{13}$	+176	+293 -226	+34 -26	±65	+568 -194	+312 -239	±158	+973 -473			±149	+325	±35			±111	+714 -340	9	+973 -473	50.8	39.3 44.8	67.6	10600	24700	+1630 -1360	+26330 -11960	20900	27000	c	2 Pls.24x$\frac{1}{2}$; 2-18 [s 45.8	

* Where live load and dead load stresses are of opposite sign, only 70% of the dead load stress is considered as effective in counteracting the live load stress.

Girder and Load		UNIT 1-GIRDERS													UNIT 3-GIRDERS							
		Reactions and shears in kips								Moments in foot kips					Reactions and shears in kips					Moment in ft. kips		
		So.Abut	Pier 1			Pier 2			Pier 3	Span 1	Pier 1	Span 2	Pier 2	Span 3	Pier 6	Pier 7			No.Abut	Span 7	Pier 7	Span 8
		R	Vs	Vn	R	Vs	Vn	R	R	+M	-M	+M	-M	+M	R	Vs	Vn	R	R	+M	-M	+M
Girder A	D.L.	67.9	143.3	174.4	317.7	263.2	309.4	572.6	198.6	709	2446	1990	7872	5500	140.3	246.0	246.0	491.0	140.3	2780	5800	2780
	U.L.L.	38.3	58.2	77.0	135.2	91.8	101.9	193.7	77.5	578	1200	1345	2750	2420	57.8	85.3	85.3	170.7	57.8	1363	2010	1363
	C.L.L.	52.6	52.6	52.6	52.6	50.1	50.1	50.1	52.6	495	327	809	589	1148	52.6	52.6	52.6	52.6	52.6	868	456	868
	Imp.	23.9	29.1	34.1	49.4	39.2	41.9	64.6	34.2	282	401	566	879	940	23.6	29.4	29.4	47.5	23.6	475	525	475
	Sdwk.L.L.	6.6	10.0	13.2	23.2	16.5	18.4	34.9	13.1	100	206	232	498	415	9.9	14.6	14.6	29.3	9.9	235	345	235
	Total	189.3	293.2	351.3	578.1	460.8	521.7	915.9	376.0	2164	4580	4942	12,588	10,423	284.2	427.9	427.9	791.1	284.2	5721	9136	5721
	100% O.L.	114.8	139.9	163.7	237.2	181.1	193.9	308.4	164.3	1355	1928	2720	4218	4508	134.0	167.3	167.3	270.8	134.0	2706	2991	2706
	Total	304.1	433.1	515.0	815.3	641.9	715.6	1224.3	540.3	3519	6508	7662	16806	14931	418.2	595.2	595.2	1,061.9	418.2	8427	12,127	8427
	Equiv. Norm.	202.7*	288.7	343.3	543.5	427.9	477.1	816.2	360.2	2346*	4339	5108*	11,204	9954	278.8	396.8	396.8	707.9	278.8	5618	8085	5618
Girder B	D.L.	111.0	224.2	262.3	486.5	370.7	434.8	805.5	277.2	1226	3948	2910	10,821	7400	191.9	336.1	336.1	672.2	191.9	3800	7930	3800
	U.L.L.	53.4	80.1	102.6	182.7	118.5	129.4	247.9	97.8	872	1694	1748	3446	2968	76.0	112.0	112.0	224.0	76.0	1795	2640	1795
	C.L.L.	68.8	69.1	69.1	69.1	66.0	66.0	66.0	68.8	705	471	1054	697	1457	69.1	69.1	69.1	69.1	69.1	1144	600	1144
	Imp.	31.4	38.3	44.1	64.6	47.4	50.3	80.6	42.7	405	556	720	1064	1138	30.9	38.6	38.6	62.5	30.9	626	690	626
	Total	264.6	411.7	478.1	802.9	602.6	680.5	1200.0	486.5	3208	6669	6432	16,028	12,963	367.9	555.8	555.8	1027.8	367.9	7,365	11,860	7,365
	100% O.L.	153.6	187.5	215.8	316.4	231.9	245.7	394.5	209.3	1982	2721	3522	5207	5563	176.0	219.7	219.7	355.6	176.0	3565	3930	3565
	Total	418.2	599.2	693.9	1,119.3	834.5	926.2	1,594.5	695.8	5190	9390	9954	21,235	18,526	543.9	775.5	775.5	1,383.4	543.9	10,930	15,790	10,930
	Equiv. Norm.	278.8*	399.5	462.6	746.2	556.3	617.5	1,063.0	463.9	3460*	6260	6636*	14,157	12,351	362.6	517.0	517.0	922.3	362.6	7287	10,527	7,287
Girder C	D.L.	126.4	239.2	274.1	513.3	370.9	426.3	797.2	270.3	1576	4184	3180	10,332	6967								
	U.L.L.	55.4	82.3	103.3	185.6	117.8	126.6	244.4	94.7	939	1710	1917	3291	2798								
	C.L.L.	68.8	69.1	69.1	69.1	66.2	66.2	66.2	68.8	744	455	1064	709	1410								
	Imp.	31.1	37.9	43.1	63.7	46.0	48.2	77.7	40.9	421	541	745	1000	1052								
	Total	281.7	428.5	489.2	831.7	600.9	667.3	1185.5	474.7	3680	6890	6906	15,332	12,227		Same as Girder B						
	100% O.L.	155.3	189.3	215.5	318.4	230.0	241.0	388.3	204.4	2104	2706	3726	5000	5260								
	Total	437.0	617.8	704.7	1,150.1	830.9	908.3	1,573.8	679.1	5784	9596	10,632	20,332	17,487								
	Equiv. Norm.	291.3*	411.9	469.8	766.7	553.9	605.5	1,049.2	452.7	3856*	6397	7088*	13,555	11,658								
Girder D	D.L.	89.3	176.3	195.6	371.9	247.2	281.3	528.5	176.7	1140	3436	1959	6707	4338								
	U.L.L.	44.6	67.2	81.0	148.2	88.5	93.8	182.3	69.4	800	1516	1357	2413	1957								
	C.L.L.	52.3	52.4	52.4	52.4	50.6	50.6	50.6	52.3	600	378	822	477	1020								
	Imp.	24.2	29.9	33.3	50.2	34.8	36.1	58.2	30.4	350	474	545	723	744		Same as Girder A						
	Sdwk.L.L.	7.7	11.6	14.0	25.6	15.8	16.8	32.6	12.0	138	262	234	432	338								
	Total	218.1	337.4	376.3	648.3	436.9	478.6	852.2	340.8	3028	6066	4917	10,752	8397								
	100% O.L.	121.1	149.5	166.7	250.8	173.9	180.5	291.1	152.1	1750	2368	2724	3613	3721								
	Total	339.2	486.9	543.0	899.1	610.8	659.1	1,143.3	492.9	4778	8434	7641	14,365	12,118								
	Equiv. Norm.	226.1*	324.6	362.0	599.4	407.2	439.4	762.2	328.6	3185*	5623	5094*	9577	8079								

* Design governed by overload.

DEAD LOAD PANEL CONCENTRATIONS PER TRUSS IN KIPS

Panel Point	#/Lin.Ft.	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Roadway Concrete	3982	72	143	143	143	143	143	143	143	143	143	143	143	143	143
Handrail, Curbs and Sidewalk	240	4	9	9	9	9	9	9	9	9	9	9	9	9	9
Stringers and Fascia Beam	940	17	34	34	34	34	34	34	34	34	34	34	34	34	34
½ Floorbeam	228	4	8	8	8	8	8	8	8	8	8	8	8	8	8
½ Bottom Laterals	290±	7	10	10	10	10	10	10	11	12	11	10	10	10	10
½ Top Laterals	170	3	6	6	6	6	6	6	6	6	6	6	6	6	6
½ Sway Frames	450±	8	8	8	8	8	14	18	26	42	26	18	14	8	8
Truss	1790±	29	48	51	53	53	58	75	94	129	85	61	46	39	33
Wearing Surface	1900	34	68	68	68	68	68	68	68	68	68	68	68	68	68
Miscellaneous															
Total	9990±	178	334	337	339	339	350	371	399	451	390	357	338	325	319

TRUSS REACTIONS IN KIPS (FOR ONE TRUSS)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Shoe Location	Vertical Loads									Longitudinal Loads ①				Transverse Loads ②				
	D.L.	L.L.	Imp.	S.W. L.L.	Total	30#T.W.	50#T.W.	Max.R.at Nor. stress	Max.R.at 1.25 Nor.	30#L.W.	50#L.W.	Traction	30#L.W.+ Traction	30#T.W.	50#T.W.	Temp.	30#T.W.+ Temp.	50#T.W.+ Temp.
Pier 3 or 6	819	327	40	16	1202	30	41	1202	1232					61	79	117	178	196
Pier 4 (Fixed)	3849	754	91	54	4748	660	841	4748	5408	244	332	65	309	209	284	43	252	327
Pier 5	3849	754	91	54	4748	660	841	4748	5408					209	284	43	252	327

① Longitudinal loads are applied 4'-0" above top of masonry at pier 4.

② Transverse loads are applied 3'-9" above top of masonry at piers 3 and 6, 4'-0" above top of masonry at pier 4 and 4'-9" above top of masonry at pier 5.

D.L.	Dead load
L.L.	Live load
U.L.L.	Uniform live load
C.L.L.	Concentrated live load
Imp.	Impact
O.L.	Overload
Col.	Column
T.W.	Transverse wind
L.W.	Longitudinal wind
Ag.	Gross area
An	Net effective area or gross effective area
fc	Unit compressive stress
ft	Unit tensile stress
fb	Unit bending stress
S	Silicon steel
C	Carbon steel (Copper-bearing)
R	Reaction
Vs	Shear to south of support
Vn	Shear to north of support
+M	Maximum positive moment
-M	Maximum negative moment
S.W.	Sidewalk
Temp.	Temperature

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124
STRESS SHEET
AKRON, SUMMIT COUNTY, OHIO

SCALE No Scale
MADE W.C.B. DATE 8-29-49
TRCD. R.R. DATE 9-19-49
CHKD. A.O.K. DATE 10-12-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

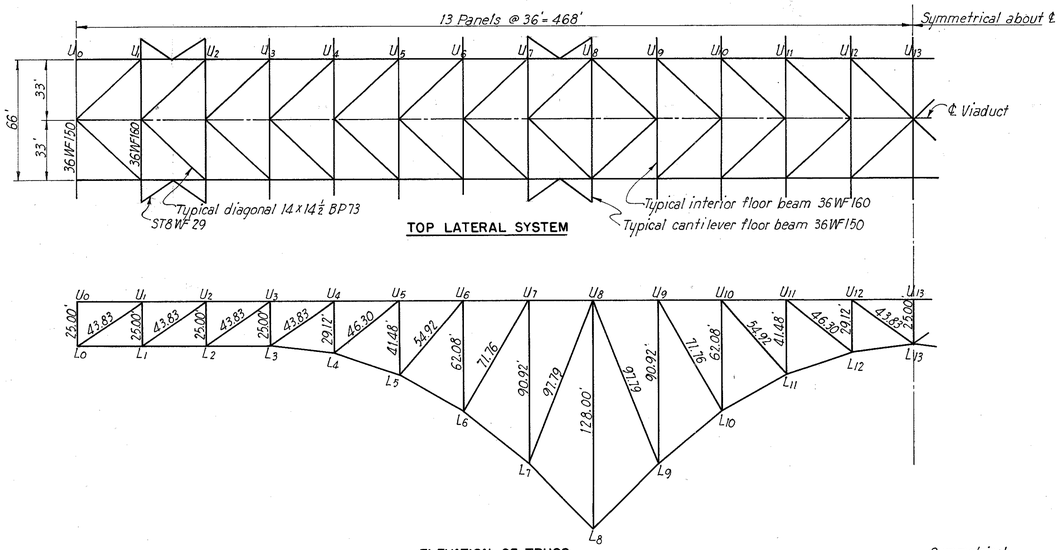
766 SHEET V77

162

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO	U-687(6)	POST WAR

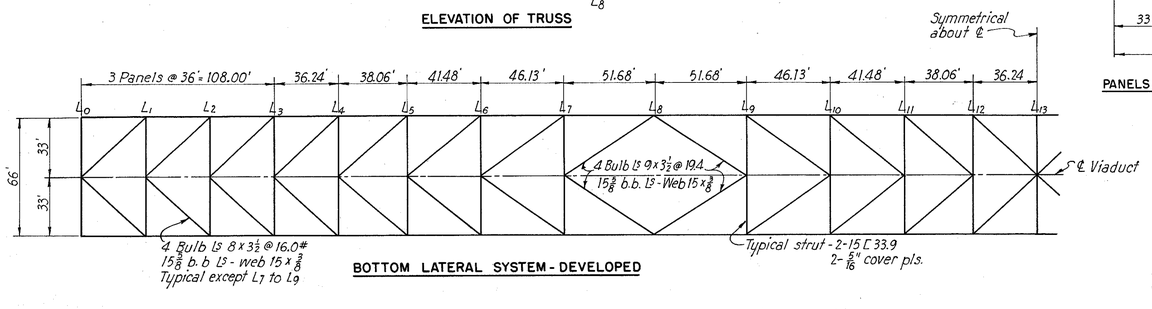
44
44

SUMMIT COUNTY
CITY OF AKRON
AKRON EXPRESSWAY SYSTEM
MAIN VIADUCT
SUM-5-12.31

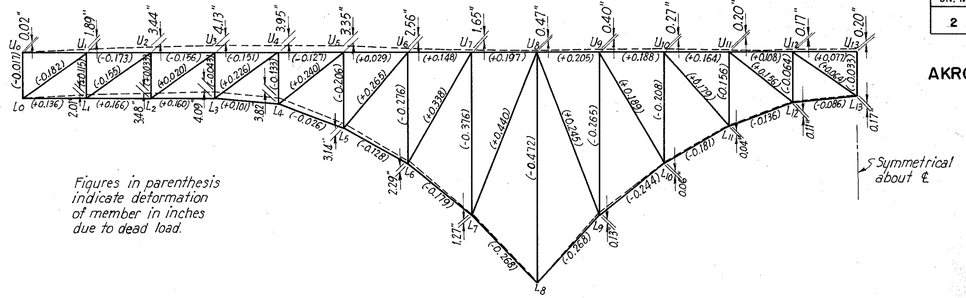


TOP LATERAL SYSTEM

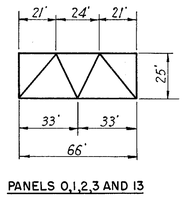
ELEVATION OF TRUSS



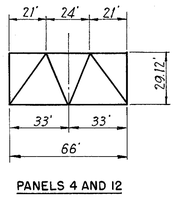
BOTTOM LATERAL SYSTEM - DEVELOPED



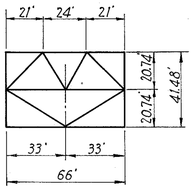
CHORD CAMBER DIAGRAM
No Scale



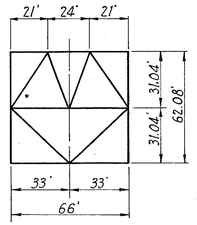
PANELS 0,1,2,3 AND 13



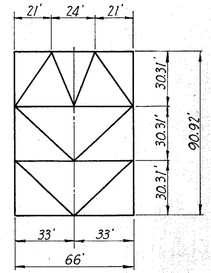
PANELS 4 AND 12



PANELS 5 AND 11

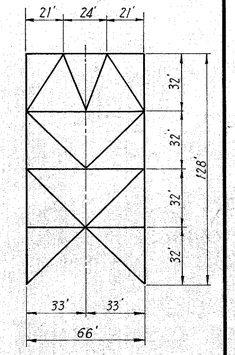


PANELS 6 AND 10

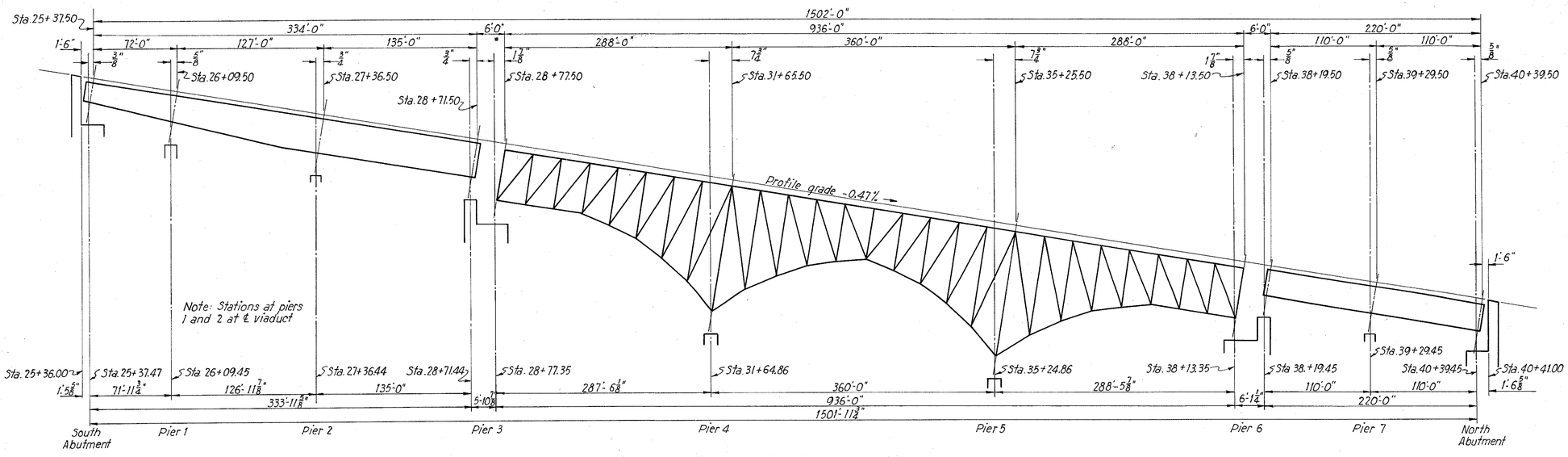


PANELS 7 AND 9

TRUSS SWAY FRAMES



PANEL 8



VIADUCT DIMENSIONING DIAGRAM
No Scale

PART 2

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

AKRON EXPRESSWAY SYSTEM
(EAST MARKET STREET TO EAST CUYAHOGA FALLS AVENUE)
MAIN VIADUCT
BRIDGE NO. SU-5-124

STRESS SHEET

AKRON, SUMMIT COUNTY, OHIO

SCALE No Scale...
MADE R.A.D. DATE 8-24-49
TRCD. R.R. DATE 10-11-49
CHKD. W.C.B. DATE 10-18-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

766 SHEET V78

163