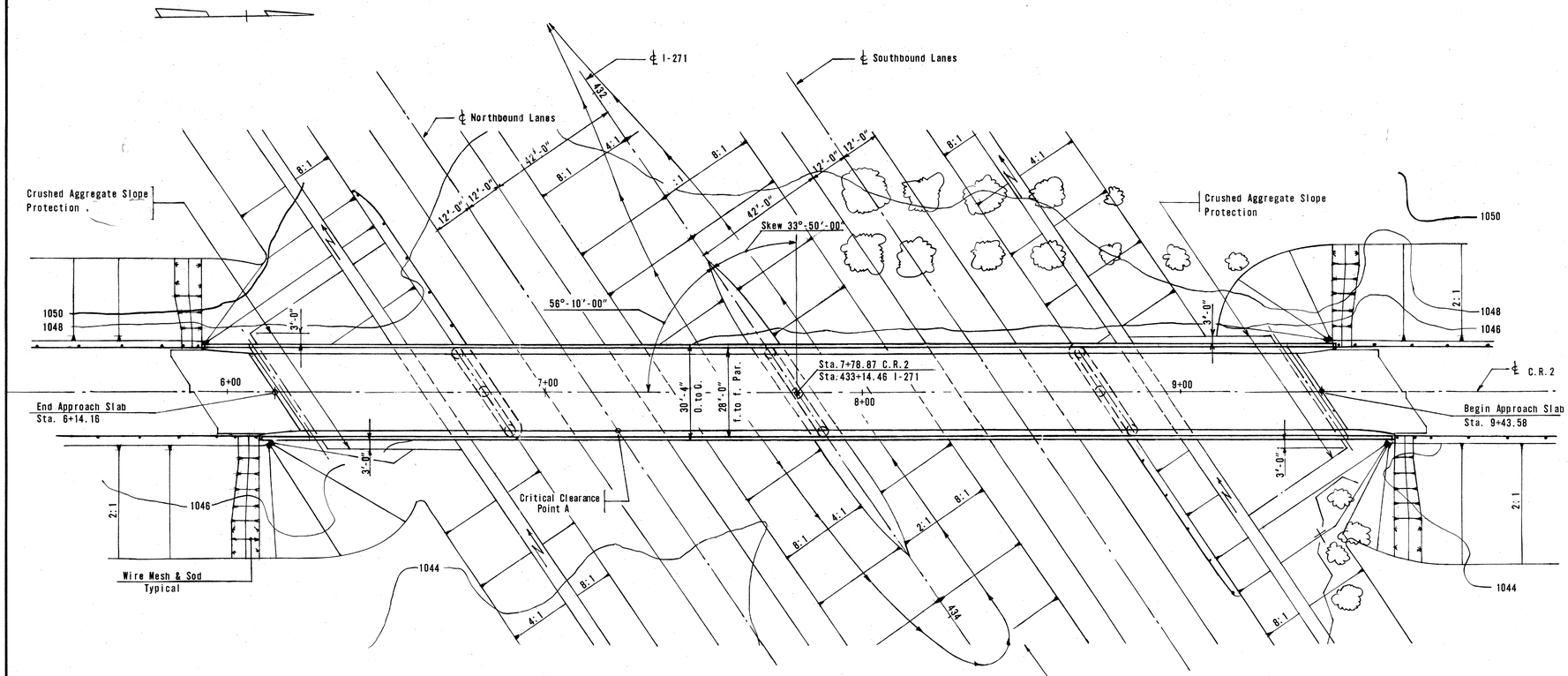
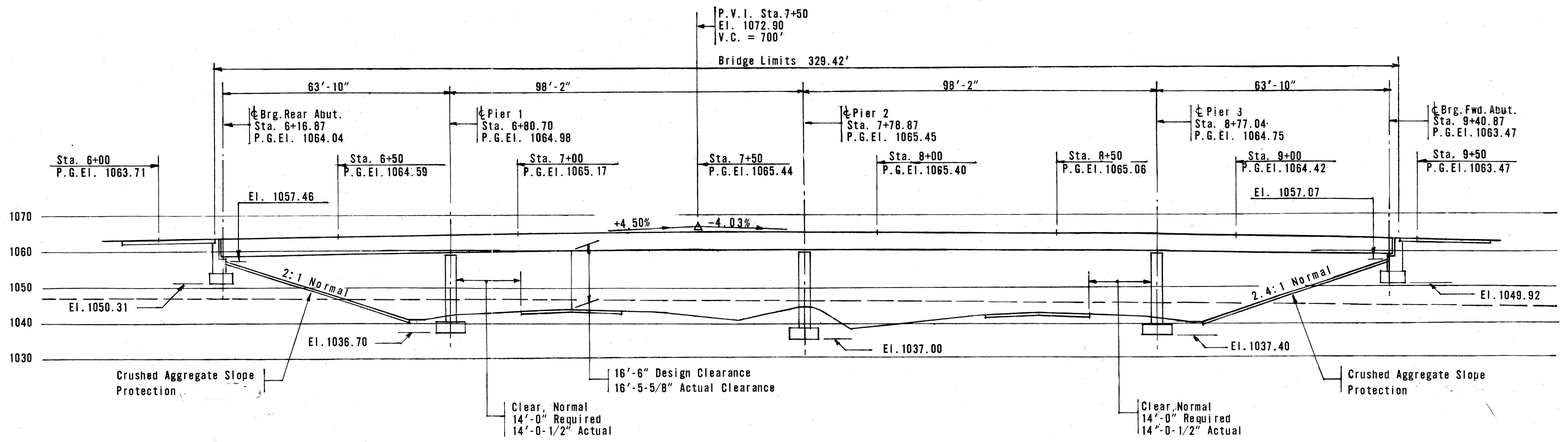
SUMMIT COUNTY
MED-271-4.53
SUM-271-0.00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-271-6(14)224	

152
178





PROPOSED STRUCTURE

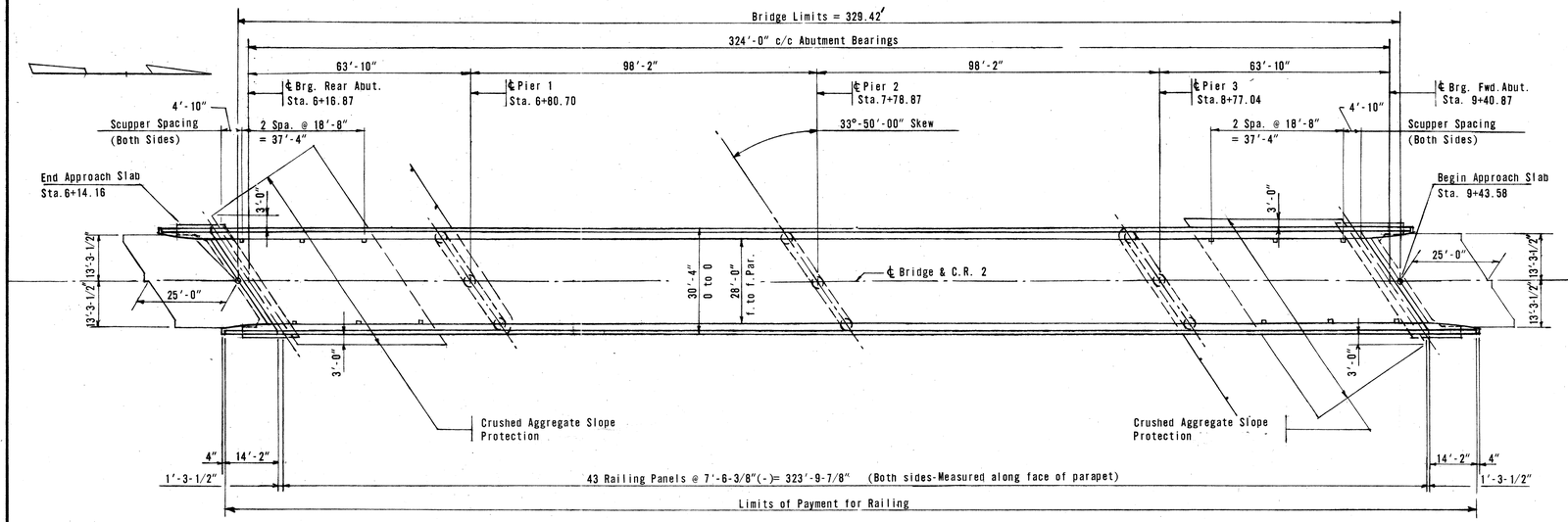
TYPE: Continuous welded girders with reinforced concrete deck and substructure.
SPANS: 63'-10"; 98'-2"; 98'-2"; 63'-10"
ROADWAY: 24'-0" face to face of 2'-0" safety curbs.
LOAD FREQUENCY: C.F.= 130(57)
SKEW: 33°-50'-00"(R.F.)
WEARING SURFACE: 1" Monolithic Concrete
APPROACH SLABS: AS-1-54(25' long)
ALIGNMENT: Tangent
TRAFFIC VOLUME: 10410, ADT-1975, 1-271
833, DDHV-1975, 1-271
800, ADT-1975, C.R.2

J.E. GREINER CO.
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

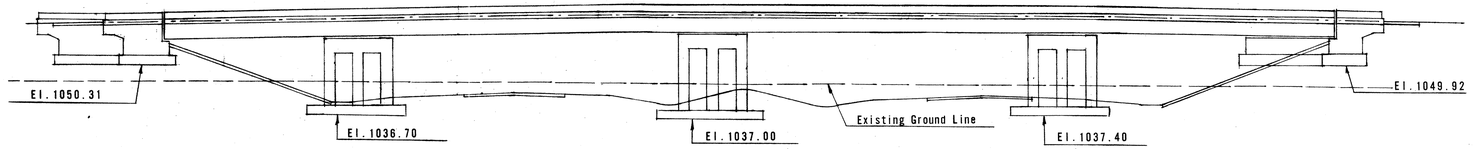
SITE PLAN
BRIDGE NO. SUM-271-0046
INTERSTATE HIGHWAY 271 UNDER SUMMIT COUNTY ROAD NO. 2

SUMMIT CO. **STA. 433+14.46**

PRESENT TOPOGRAPHY		PROPOSED WORK			
SURVEYED	DRAWN	DESIGNED	DRAWN	CHECKED	REVIEWED
HENRY	AIR SURVEYS CORP.	SHERMAN	BERGER	ROTHEN-HOEFER	MUDD



GENERAL PLAN



ELEVATION

GENERAL NOTES

DESIGN SPECIFICATIONS: This structure conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated 9-1-57, together with current revisions thereof.
REFERENCE should be made to:
Standard Drawing FSB-1-62, revised 1-15-63, and AS-1-54, revised 8-10-65
" " SD-1-63, Sheets 2, 3 & 4, dated 11-12-63.
" " BR-1-65, Type 1, Sheet 1, dated 2-1-65

Supplemental Specifications:
808 dated 7-19-65
811 dated 3-29-65
825 " 4-22-65

EXCAVATION QUANTITY includes the removal of fill material between the surface of the proposed embankment and the bottom of the abutment.

ESTIMATED QUANTITIES

Item	Total	Unit	DESCRIPTION	Super.	Abuts.	Piers	General		
503	503	Cu.Yds.	Unclassified excavation		260	243			
511	307	Cu.Yds.	Class "C" concrete, superstructure	307					
511	80	Cu.Yds.	Class "C" concrete, piers above footings			80			
511	110	Cu.Yds.	Class "E" concrete, abutments above footings		110				
511	140	Cu.Yds.	Class "E" concrete, footings		44	96			
909	118,767	Lbs.	Reinforcing Steel	77,835	8,774	32,158			
513	266,410	Lbs.	Structural Steel	266,410					
514	266,410	Lbs.	Field painting of structural steel	266,410					
517	709.49	Lin.Ft.	Railing(Type 1)	652.82	56.67				
518	60	Lin.Ft.	6" Helical perforated CMP, 70706 including specials		60				
518	78	Lin.Ft.	6" Helical CMP, 70706 non-perforated		78				
518	12	Each	Scuppers, including supports	12					
518	34	Cu.Yds.	Porous backfill		34				
808	307	Each	Water-reducing, set-retarding admixture	307					
601	410	Sq.Yds.	Crushed aggregate slope protection				410		
825	1345	Sq.Yds.	Concrete Surface Treatment				1345		

SUMMIT COUNTY
MED-271-4.53
SUM-271-0.00

FED.RD. DIVISION	STATE	PROJECT	
2	OHIO	I-271-6(14)224	

153
178

REINFORCING STEEL LIST

MARK	NO.	LENGTH	WEIGHT	SHP.
ABUTMENTS				
A501	4	11'-7"	48	S
A502	4	6'-0"	25	S
A503	44	7'-10"	359	B
A504	44	7'-0"	321	B
A505	12	10'-1"	126	B
A506	12	4'-0"	50	S
A507	4	16'-0"	87	S
A508	12	8'-0"	100	S
A509	20	7'-6"	156	B
A510	4	8'-0"	33	B
A511	4	8'-10"	37	B
A512	4	9'-8"	40	B
A513	4	10'-6"	44	B
A514	4	11'-4"	47	B
A515	58	5'-10"	353	S
A516	4	2'-10"	12	B
A517	4	3'-10"	16	B
A518	4	4'-8"	19	B
A519	4	5'-4"	22	B
A520	24	5'-10"	146	B
A521	32	2'-10"	94	B
A522	40	5'-7"	233	B
A523	8	7'-7"	63	B
A524	12	8'-6"	106	S
A525	12	5'-0"	63	S
⊕ A526	16	13'-10"	231	S
A527	8	10'-6"	88	S
A528	20	32'-9"	683	S
⊕ A529	20	36'-8"	765	B
A530	16	4'-3"	71	S
A531	6	35'-4"	221	S
A532	48	3'-1"	154	B
A533	8	13'-0"	109	S
A534	12	5'-6"	69	S
A535	4	16'-6"	69	S
A601	44	12'-11"	854	B
A602	8	37'-9"	454	S
A603	66	15'-11"	1575	B
A604	68	8'-4"	851	B
PIERS				
P501	120	7'-8"	960	B
P502	12	28'-10"	361	S
P503	18	7'-5"	139	B
P901	3	31'-5"	320	S
P902	6	31'-2"	636	S
P903	6	29'-6"	602	S
P904	6	28'-10"	588	S
P905	6	9'-9"	199	B

BENDING DIAGRAMS

35'-6"± A529
2'-1"± A532
1'-4"± S501
2'-6"± S502

7'-4"± A503
7'-10"± A604
5'-10"± F1101

MARK	A±	B±
A504	1'-11"	3'-5"
P501	2'-8"	2'-8"
P1001	3'-8"	31'-5"
P1002	3'-8"	31'-0"
P1003	3'-8"	28'-10"

MARK	A±	B±
A505	6	4'-11"
A509	11"	3'-5"
A510	11"	3'-8"
A511	11"	4'-1"
A512	11"	4'-6"
A513	11"	4'-11"
A514	11"	5'-4"

MARK	A±	B±	C%
A516	10"	1'-0"	1'-3"
A517	1'-4"	1'-6"	1'-3"
A518	1'-9"	1'-11"	1'-3"
A519	2'-1"	2'-3"	1'-3"
A520	2'-4"	2'-6"	1'-3"

A521: 10"± , 2"%, 8", 1'-3"%, 1'-0"±
A522 S503: 6-1/2"%, 3/4", 3/4", R503 1'-6"%, 8"%, 8"%, 2'-2"%
A523: 1'-7"±, 8", 6'-0"±
A603: 5'-6"±, 1'-11"±, 1'-5"%, 11"%, 6'-10"±
A601: 5'-5"±, 7'-8"±
P503 P905: 2'-8"%, 1'-8"±, 2'-10"±
RE401: 5'-3"±, I.R=1'-3-1/2"
R504: 3'-4"%, 2'-8-1/2", 7-1/2", 2-3/8", 7-5/8", 9", 3/4", I.R.=7-3/8", 1'-7"±

SPIRAL BARS

MARK	NO.	CORE DIA % SPIRAL	LENGTH	PITCH	NO. TURNS	WEIGHT
SP401	3	32"	16'-1"	4-1/2"	46	774
SP402	3	32"	16'-0"	4-1/2"	46	774
SP403	3	32"	15'-2"	4-1/2"	44	738

MARK	NO.	LENGTH	WEIGHT	SHP.
PIERS (cont'd.)				
P1001	3	38'-2"	493	B
P1002	6	37'-9"	975	B
P1003	6	35'-7"	919	B
P1004	12	11'-0"	568	S
P1101	24	19'-11"	2540	S
P1102	24	19'-0"	2423	S
P1103	24	19'-10"	2529	S
P1104	24	10'-0"	1275	S
F601	72	8'-8"	937	S
F602	38	10'-8"	609	S
F701	72	8'-8"	1275	S
F702	11	15'-0"	337	S
F703	24	36'-8"	1799	S
F801	18	14'-0"	673	S
F802	44	34'-8"	4073	S
F803	38	10'-8"	1082	S
F1101	96	7'-0"	3560	B
SUPERSTRUCTURE				
S501	956	2'-4"	2327	B
S502	478	3'-6"	1745	B
S503	478	5'-7"	2784	B
S601	369	29'-8"	16442	S
S602	510	34'-3"	26236	S
S603	57	39'-0"	3389	S
S604 to S623	2 of Ea.	27'-5" to 3'-8"	934	S
S624	2	3'-9"	11	S
S625	2	3'-6"	11	S
S626	2	3'-3"	10	S
S627	4	18'-0"	108	S
S701	369	29'-8"	22376	S
S702 to S721	2 of Ea.	27'-5" to 3'-8"	1271	S
S722	2	3'-9"	15	S
S723	2	3'-6"	14	S
S724	2	3'-3"	13	S
S725	4	18'-2"	149	S
PARAPET RAILING				
R501	16	13'-11"	*	S
R502	16	4'-6"	*	S
R503	12	4'-2"	*	B
R504	8	5'-4"	*	B
R505	168	14'-9"	*	S
REPLACEMENT BARS				
RE401	1	5'-3"	-	B
RE501	1	5'-7"	-	S
RE601	3	5'-11"	-	S
RE701	2	6'-3"	-	S
RE801	1	6'-6"	-	S
RE901	1	6'-10"	-	S
RE1001	1	7'-3"	-	S
RE1101	1	7'-7"	-	S

* Parapet railing bars are included with S-14 for payment.

SPIRAL REINFORCING BARS: The "Length" shown in the steel list for the spiral bars is the distance from the top of the footing to the bottom of the pier cap. The "No. of Turns" shown is the "Length" divided by the pitch, plus 3 turns (total number of closed coils), expressed as the nearest whole number.

Spiral reinforcing bars shall not have deformations but shall in other respects conform to Item 517. 1-1/2 closed coils shall be provided at the ends of each spiral unit. Four steel channel, tee or angle spacers, weighing approximately 0.68 lb. per lin. ft. of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 0.68 lb.per lin.ft., will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.
BAR SIZE is indicated in the bar mark. The first digit where three digits are used, and the first two digits where four are used indicate the bar size number. For example, A701 is a No. 7 size bar and P1002 is a No. 10 size bar.
⊕ Cost of field bending and cutting to be included with Item 517, for payment.

Design Loading - CF(130)57
Concrete Class "C" - basic unit stress 1333 p.s.i.
Concrete Class "E" - basic unit stress 1133 p.s.i.
Structural Steel - ASTM A36 - basic unit stress 20,000 p.s.i.

Reinforcing Steel - ASTM A15, A16, A160, Deformed, Intermediate or Hard Grade. Basic unit stress 20,000 p.s.i. Except, spiral reinforcement may be plain, Structural Grade with basic unit stress of 18,000 p.s.i.

J.E GREINER COMPANY
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

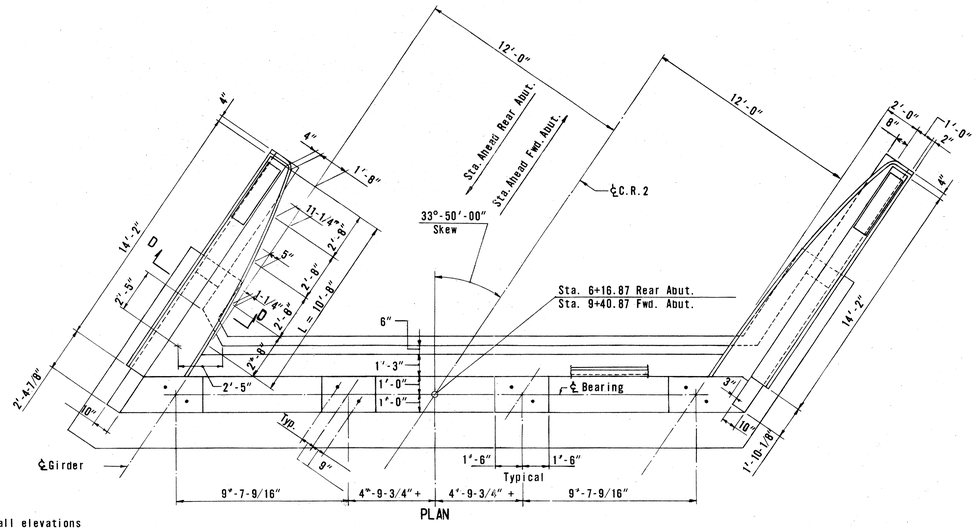
GENERAL PLAN AND ELEVATION, NOTES, ESTIMATED QUANTITIES AND REINFORCING STEEL LIST
BRIDGE NO. SUM-271-0046
I.R.*271 UNDER SUMMIT CO. RD. NO. 2
SUMMIT CO. STA. 433+14.46

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SHERMAN	BERGER	BERGER	KOHLER	MUDD	6-18-65	

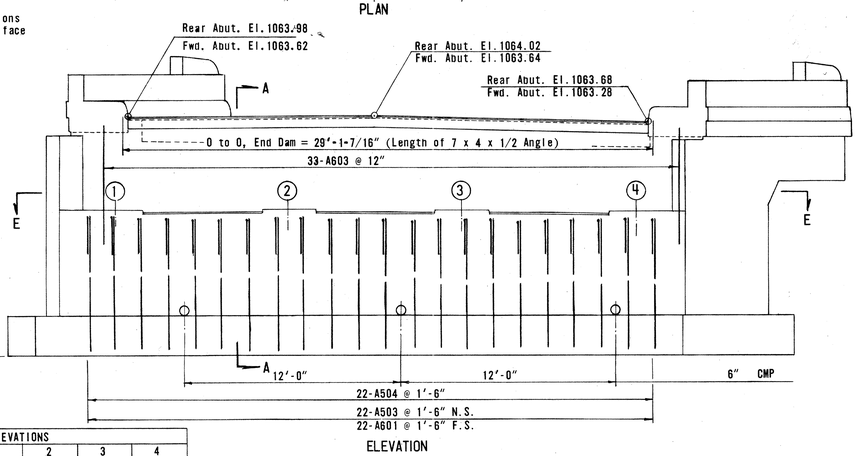
SUMMIT COUNTY
MED-271-4.53
SUM-271-0.00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-271-6(14)224	

154
178

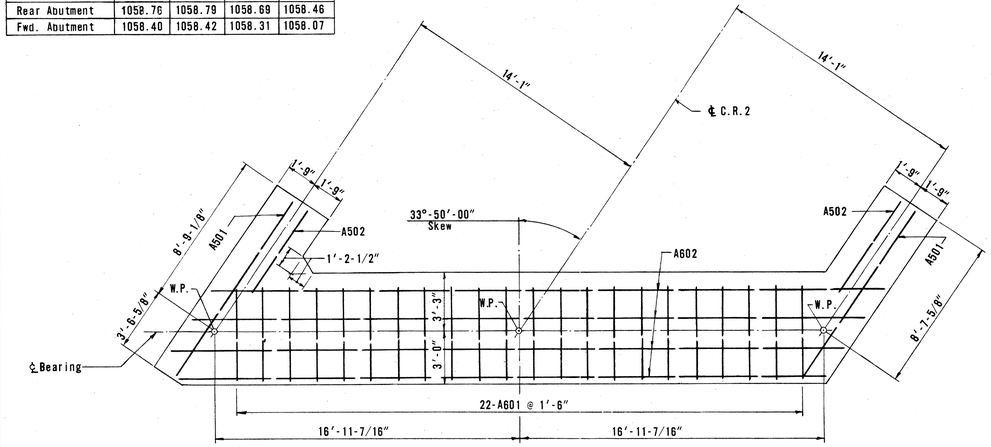


NOTE: Backwall elevations are finished grade at face of backwall.

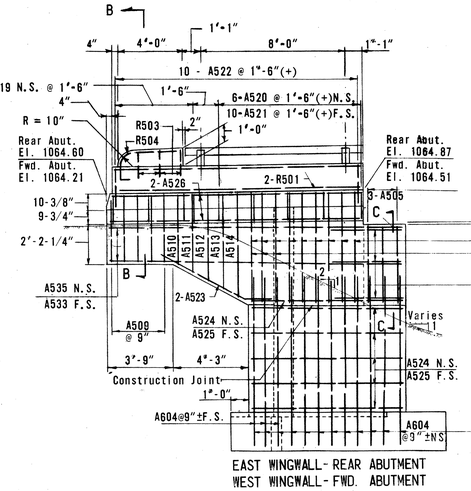


ELEVATION

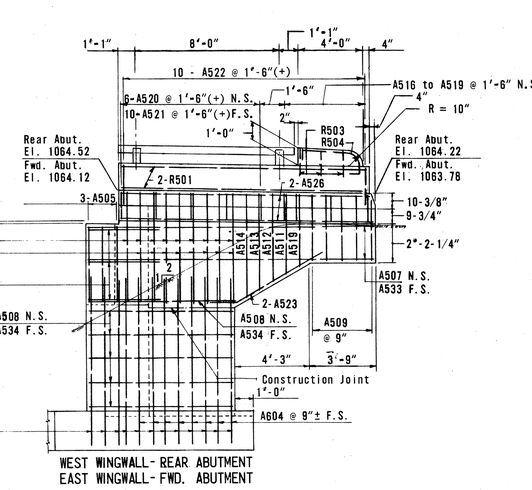
ELEVATIONS				
GIRDER	1	2	3	4
Rear Abutment	1058.76	1058.79	1058.69	1058.46
Fwd. Abutment	1058.40	1058.42	1058.31	1058.07



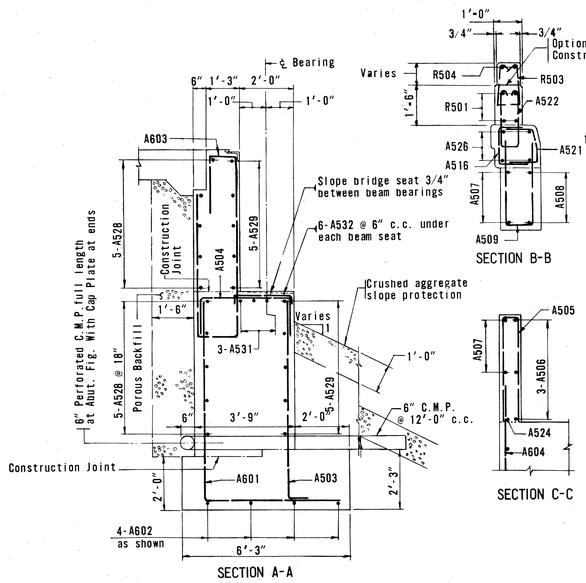
FOOTING PLAN



EAST WINGWALL- REAR ABUTMENT
WEST WINGWALL- FWD. ABUTMENT



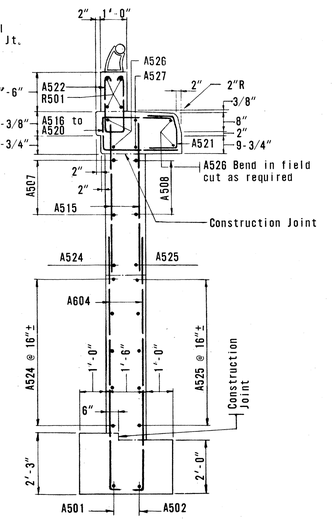
WEST WINGWALL- REAR ABUTMENT
EAST WINGWALL- FWD. ABUTMENT



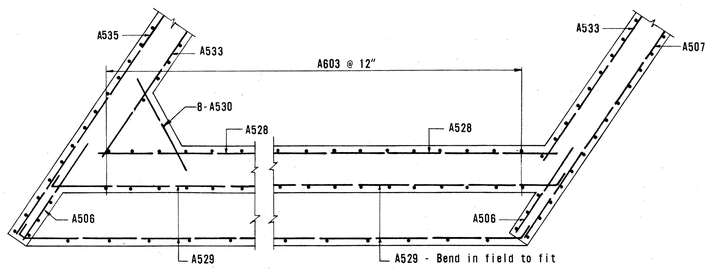
SECTION A-A

SECTION B-B

SECTION C-C



SECTION D-D



SECTION E-E

FOUNDATION BEARING PRESSURE: Abutment footings are designed for a maximum bearing pressure of 2 Tons per Sq. Ft.

CLEARANCE of reinforcing steel from face of concrete shall be 3" in bottom of footing, 1-1/2" in parapet and safety curb and 2" elsewhere.

POROUS BACKFILL shall extend upward to the approach slab and outward to the wingwalls. Excavation therefore, in excess of that required for the construction of the abutment, shall be considered as paid for in the bid price per cu. yd. paid for porous backfill.

PROCEDURE: The embankment shall be placed and compacted up to the finished spill-thru slope and to the level of the subgrade for a distance of 200 feet back of the abutments. Excavation shall be made for the abutments after a 60 day waiting period.

Abutment backwalls above the bridge seat shall not be placed until all steel is erected. Abutment backwalls shall be completed prior to placing bridge deck slab.

BRIDGE SEAT REINFORCING: Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor rod holes.

CONCRETE shall be Class E.

LEGEND:
N.S. - Near Side
F.S. - Far Side

For details of roadway end finish see Standard Drawing SD-1-63, Sheets 2 and 4.

J.E GREINER COMPANY
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

ABUTMENT DETAILS

BRIDGE NO. SUM-271-0046
I.R.*271 UNDER SUMMIT CO. RD. NO. 2

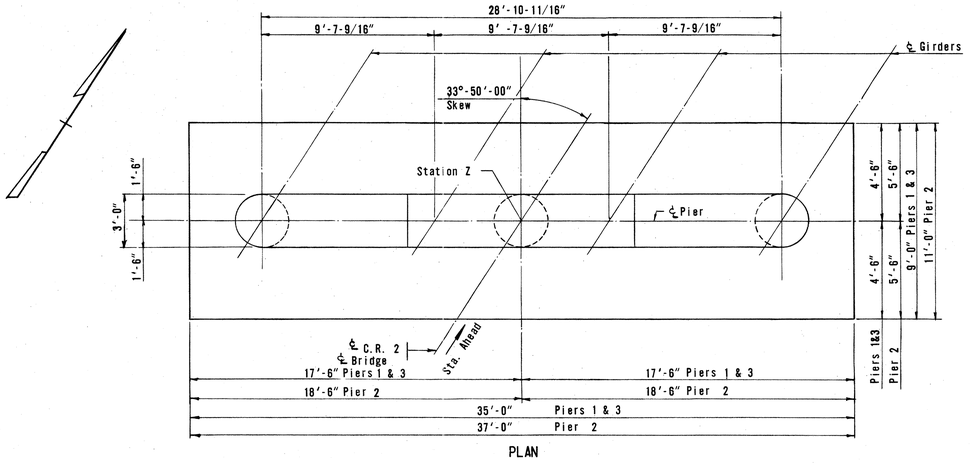
SUMMIT CO. **STA. 433+14.46**

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
HENDERSON	ALLEN	ALLEN	KOHLER	MUDD	6-18-65	

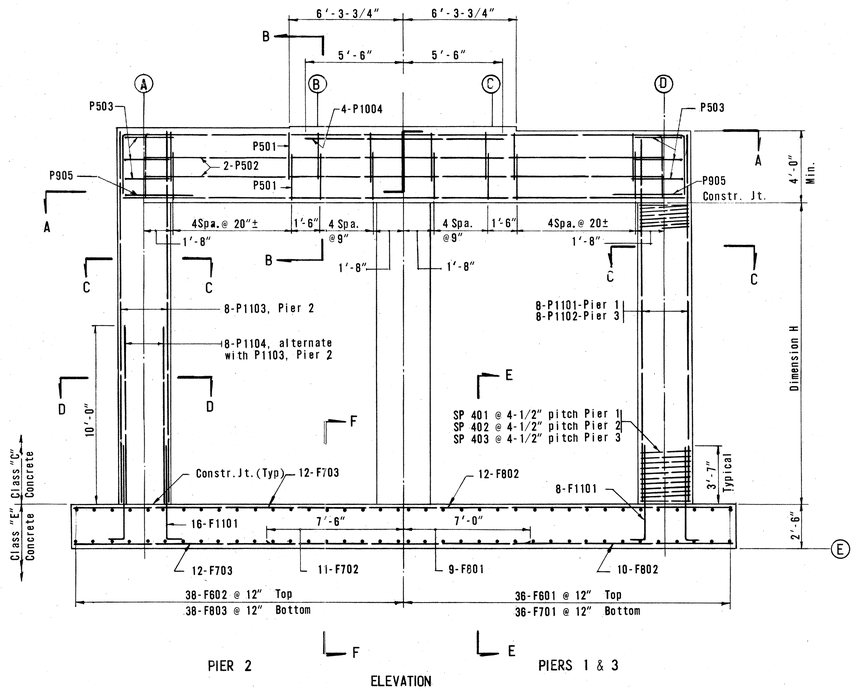
SUMMIT COUNTY
MED-271-4.53
SUM-271-0.00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-271-6(14)224	

155
178

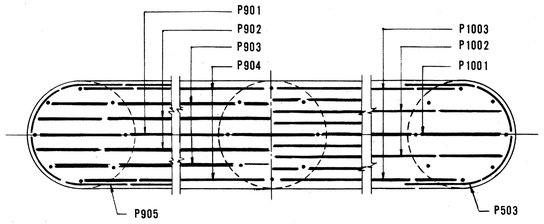


PLAN

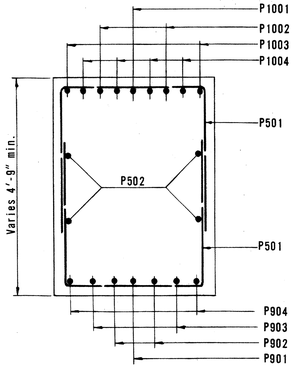


PIER 2 ELEVATION PIERS 1 & 3

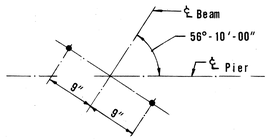
	STATION Z	ELEVATION A	B	C	D	E	DIMENSION H
PIER 1	6+80.70	1059.33	1059.52	1059.58	1059.51	1036.70	16'-1-9/16"
PIER 2	7+78.87	1059.54	1059.67	1059.65	1059.52	1037.00	16'-0-1/4"
PIER 3	8+77.04	1059.30	1059.35	1059.28	1059.09	1037.40	15'-2-1/4"



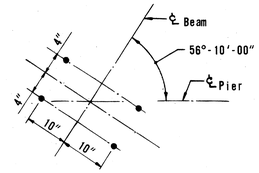
SECTION A-A



SECTION B-B



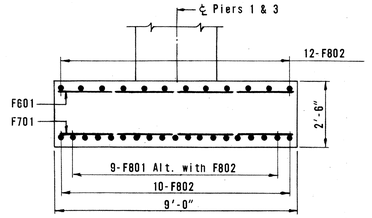
LOCATION OF ANCHOR RODS
EXPANSION BEARING E-250
PIERS 1 & 3



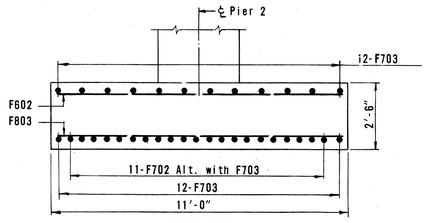
LOCATION OF ANCHOR RODS
FIXED BEARING F-250
PIER 2

SECTION C-C

SECTION D-D
(Pier 2 Only)



SECTION E-E



SECTION F-F

FOUNDATION BEARING PRESSURE: Pier Footings are designed for a maximum bearing pressure of 2 Tons per Sq. ft.

CLEARANCE of reinforcing steel from face of concrete shall be 3" in bottom of footings and 2" elsewhere.

For details of Fixed and Sliding Bearings See Std. Dwg. No. FSB-1-62.

CONCRETE shall be Class E in Footings and Class C above Footings.

BRIDGE SEAT REINFORCING: Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor rod holes.

J.E GREINER COMPANY
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

PIER DETAILS

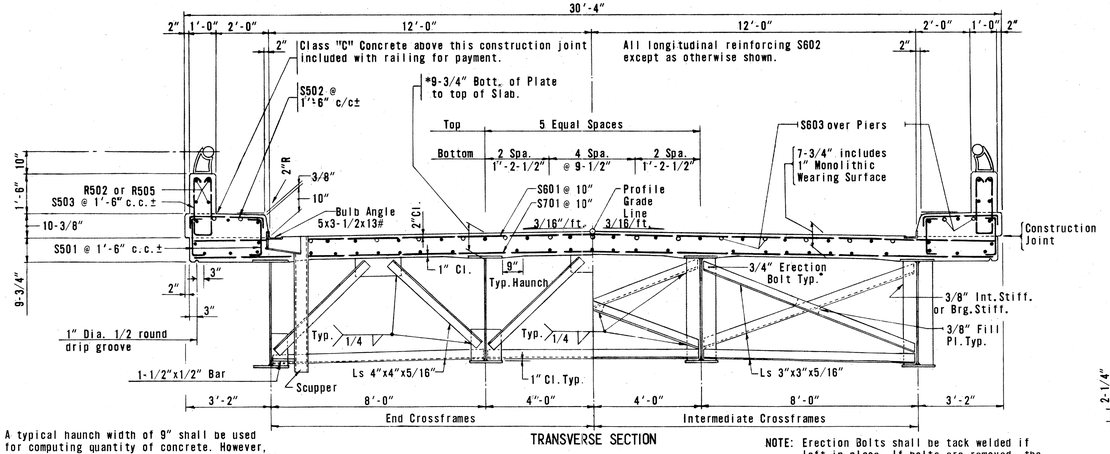
BRIDGE NO. SUM-271-0046
I.R. 271 UNDER SUMMIT CO. RD. NO. 2

SUMMIT CO. **STA. 433+14.46**

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ROTHEN-HOEFER	ALLEN	ALLEN	KOHLER	MUDD	6-18-65	

*This is the nominal dimension. The quantity of deck concrete to be paid for shall be based upon this dimension, even though deviation from it may be necessary because the top flange of the girder may not have the exact camber or conformation required to place it parallel to the finished grade. Deduction shall be made for volume of encased steel plates as per Sec. 511.19 of the Construction and Material Specifications.

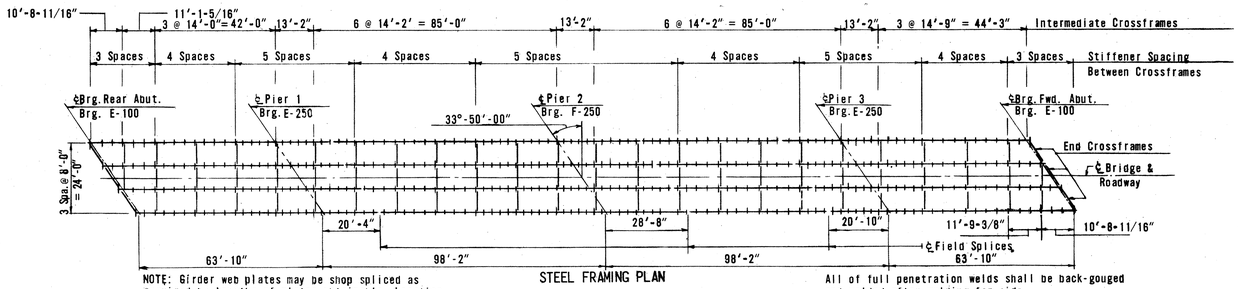
Location of the bearing stiffeners at the centerline of bearings and the intermediate crossframes shall be as shown the Steel Framing Plan. Intermediate stiffeners adjacent to bearing stiffeners shall be spaced equally between the bearing stiffener and the adjacent crossframes. Field splices in any girder shall be moved to clear intermediate crossframes and/or stiffeners.



TRANSVERSE SECTION

A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.

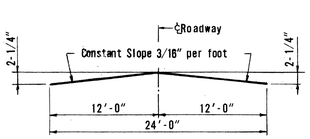
NOTE: Erection Bolts shall be tack welded if left in place. If bolts are removed, the holes shall be plug welded.



STEEL FRAMING PLAN

NOTE: Girder web plates may be shop spliced as required by lengths of plates obtainable. Location of shop splices shall be submitted to the Director for approval.

All of full penetration welds shall be back-gouged and welded after welding far side. Butt welds on beam and girder flange and web plates shall be ground flush, the finish grinding being parallel to the direction of stress.



BRIDGE ROADWAY CROWN

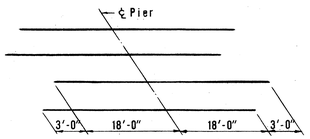
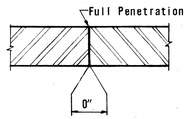
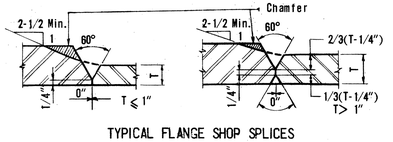


DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS



SHOP WELD SPLICE



TYPICAL FLANGE SHOP SPLICES

SUPERSTRUCTURE NOTES

CONCRETE DECK PLACING: In order to facilitate water curing of the concrete of the deck slab, the placing of concrete shall progress upgrade. The slab may be placed in sections, between transverse construction joints which are parallel to transverse reinforcing steel and are located near the center of any span.

MACHINE FINISH: The concrete bridge deck shall be finished by the use of a finishing machine.

For details of roadway end-finish girder cutoff at backwall, and welded butt joint in end finish angles at centerline of roadway, see Standard Drawing SD-1-63, Sheet 2.

For details of scuppers, curb plates and gutter supports, see Standard Drawing SD-1-63, Sheets 3 & 4.

For details of fixed and sliding bearings see Standard Drawing FSB-1-62.

For details of aluminum railing see Standard Drawing BR-1-65, Type 1.

For Scupper spacing see Sheet No. 153.

REINFORCING STEEL shall be 1-1/2" clear of surfaces in parapets and safety curbs. Place transverse reinforcing normal to center line of roadway.

INTERMEDIATE STIFFENERS of welded built-up girders shall have contact bearing with the compression flange, but may have a clearance of not more than 1/8 inch from the tension flange. In shop painting, care shall be taken to make certain that paint is forced through from one side to the other of the 1/8" opening.

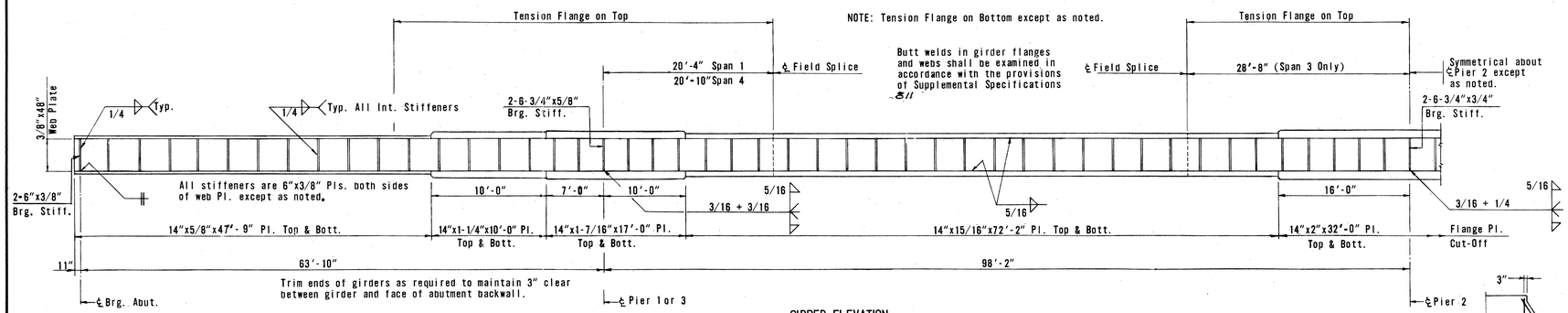
HIGH-STRENGTH STEEL BOLTS, NUTS AND WASHERS: Under Item 7.7.10, paragraph two (2), shall be completely revised and the last sentence of paragraph four (4), revised to read as follows:

"In the final assembly of the parts to be bolted, drift pins shall be placed in a sufficient number of holes (not less than 25 percent for field erection) to provide and maintain accurate alignment of holes and parts, and sufficient bolts shall be installed and brought to a snug tight condition to bring the parts into complete contact. Bolts shall then be installed in any remaining open holes and tightened to a snug tight fit, after which all bolts shall be tightened completely by calibrated wrenches or by the turn-of-nut method. Drift pins shall then be replaced with bolts, tightened in the same manner.

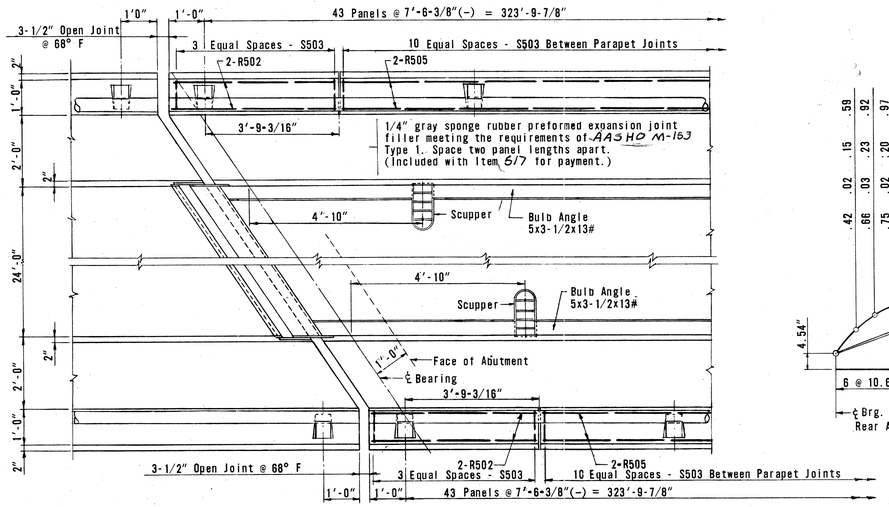
Bolt lengths determined by the use of Table No.1 shall be adjusted to the next 1/4-inch length increment."

1" Dia. High-strength bolts shall be used for all Field Splices.

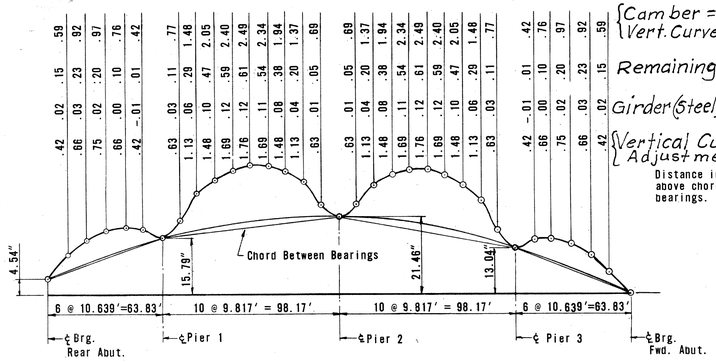
PROCEDURE: The Contractor shall submit to the Director, for approval, 3 prints showing his proposed erection procedure for plate girder.



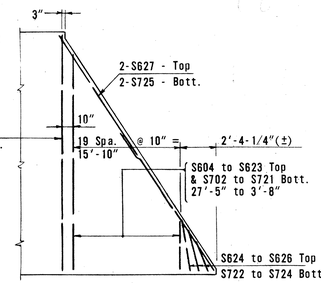
GIRDER ELEVATION



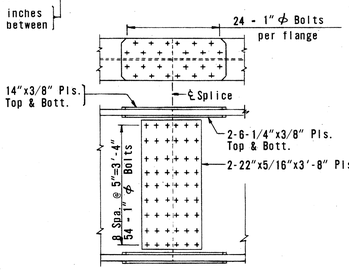
PART PLAN AT ABUTMENTS



CAMBER DIAGRAM



SLAB REINFORCING STEEL LAYOUT



TYPICAL FIELD SPLICE DETAIL

J.E GREINER COMPANY
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

SUPERSTRUCTURE DETAILS
BRIDGE NO. SUM-271-0046
I.R. 271 UNDER SUMMIT CO. RD. NO. 2

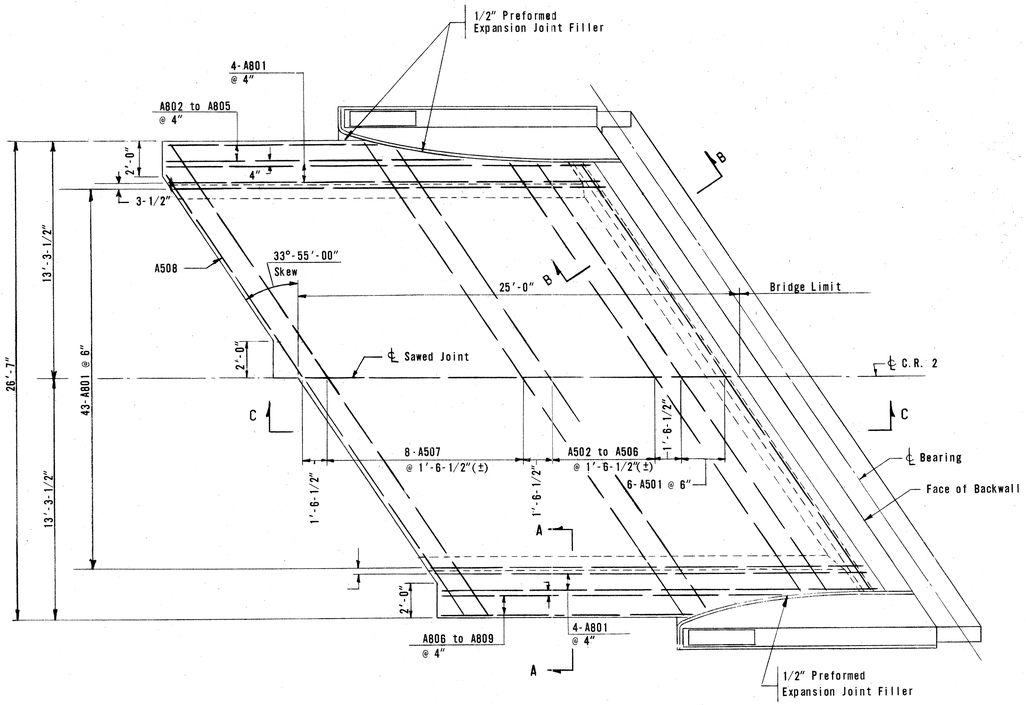
SUMMIT CO. STA. 433+14.46

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
HUANG	ALLEN	ALLEN	ROTHEN-HOEFER	MUDD	6-18-65	

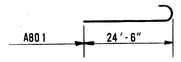
MEDINA COUNTY
MED-271-4.53
SUM-271-0.00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-271-6(14)224	

157
178



REINFORCING STEEL LIST				
MARK	NO.	LENGTH	WEIGHT	SHP.
A801	102	25'-7"	6967	B
A802 to A805	2 Series of 4 bars 1'-6" Incr.	12'-4" to 16'-10"	312	S
A806 to A809	2 Series of 4 bars 1'-7" Incr.	14'-3" to 19'-0"	355	S
A501	12	28'-7"	358	S
A502 to A506	2 Series of 5 bars 6" Incr.	28'-10" to 30'-10"	311	S
A507	16	31'-8"	528	S
A508	2	29'-6"	62	S



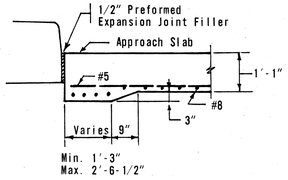
Quantities are for two (2) Approach Slabs

NOTES:
1/2" Preformed Expansion Joint Filler shall be included in Item 611 "Reinforced Concrete Approach Slab" for payment.

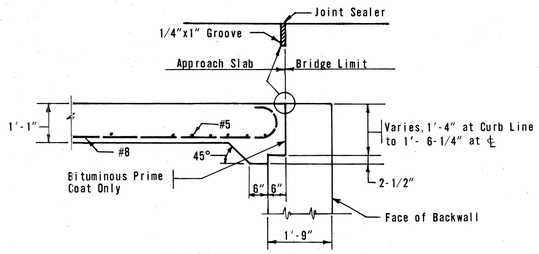
Bar Size is indicated in the Bar Mark. The first digit indicates the Bar Size Number. For example: A801 is a No. 8 Bar Size.

Work this sheet with Standard Drawing No. AS-1-54 (Revised 8-10-66)

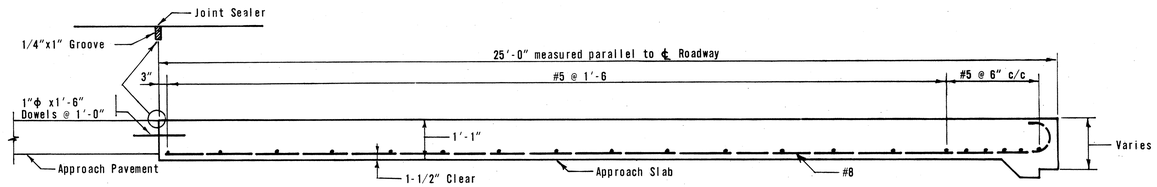
Concrete in Approach Slabs shall be Class C.



SECTION A-A



SECTION B-B



SECTION C-C

J.E GREINER COMPANY
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

APPROACH SLAB DETAILS

BRIDGE NO. SUM-271-0046
I.R. 271 UNDER SUMMIT CO. RD. NO. 2

SUMMIT CO. STA. 433+14.46

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
BARTO	BARTO	BARTO	KOHLER	MUDD	6-18-65	