

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota State Highway Department, November 1966, Standard Drawings currently in effect, and other Contract Provisions submitted hereto.

DESIGN DATA

TRAFFIC	ARRIVAL ONLY		EST. MAX. DEL.
CURRENT TRAFFIC (R06) 200 PARS	30 WEEKS	250 TOTAL	30
TRAFFIC FORECAST (2006) 305 PARS	45 WEEKS	350 TOTAL	45
DESIGN SPEED	60	800	
TRAFFIC CLASSIFICATION IN			
MINIMUM SIGHT DISTANCE (STOPPING)		600'	
MINIMUM SIGHT DISTANCE (SAFE PASSING)		2200'	
MINIMUM SIGHT DISTANCE (SAFE PASSING)		4000'	
DESIGNER: M.S. PO			



SCALES { LAYOUT SHEET: 1 IN. = 500 FT
PLAN AND { HOR. 1 IN. = 100 FT
PROFILE DRAWINGS { VERT. 1 IN. = 10 FT.
STRUCTURAL DRAWINGS: AS SHOWN
CROSS SECTION SHEETS: 1 IN. = 10 FT VERT.
LIN. = 20 FT HORZ.

PLANS

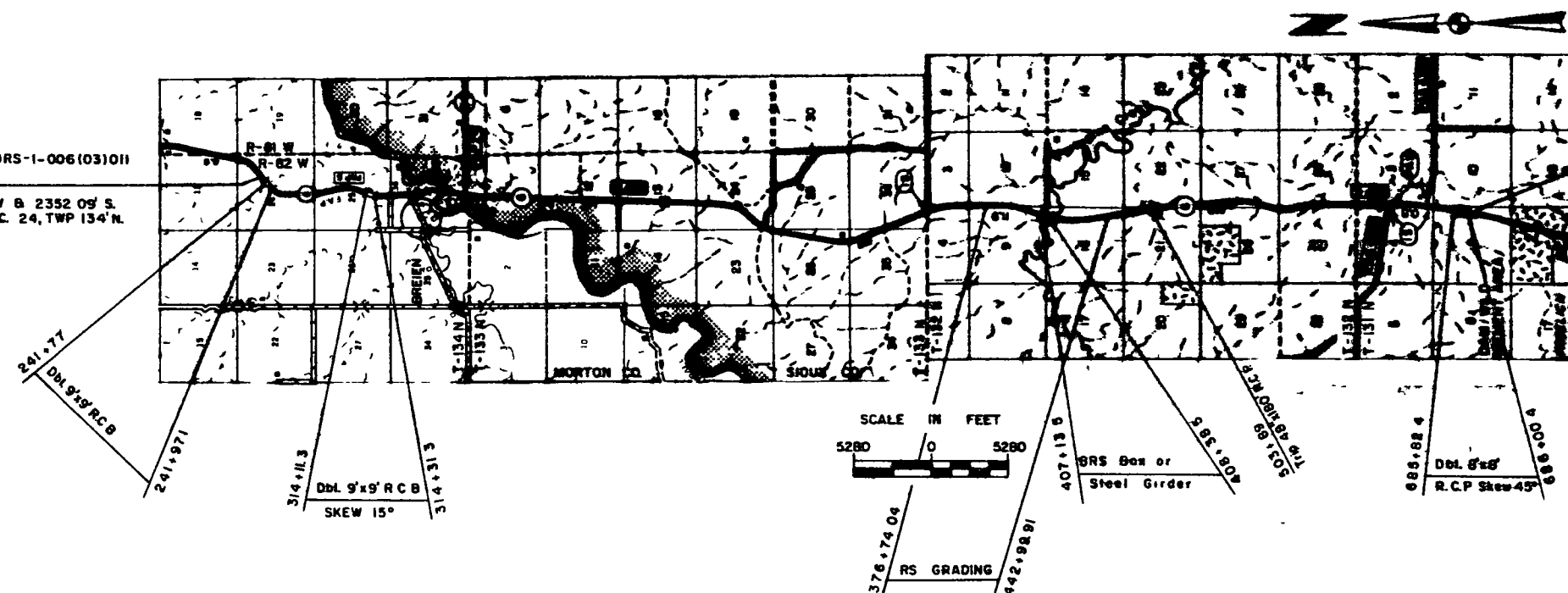
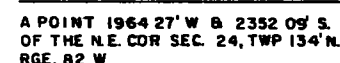
FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN MORTON & SIOUX COUNTIES

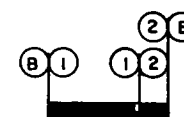
FEDERAL AID PROJECT NO. RS - BRS - 1 - 006(03)011

GRADING & STRUCTURES



A POINT 1034.13' S. & 270.00' E.
OF THE N.E. COR. SEC. 9, TWP.
131 N., RGE. 22 W.

PROJECT RSRS-1-006(03)011, HUNTON & TIOUX COUNTIES
CONSISTS OF STRUCTURAL REPLACEMENT (4), GRADING AND
SURFACING (1.2 MILES). ON SITE DISTURBES WILL BE USED
ON THREE LOCATIONS WITH RC BOX CULVERTS, ON ONE LOCATION
A REALIGNMENT WILL BE USED.



BARRIER STRIPING DIAGRAM LEGEND

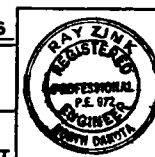
PASSING ZONES (1100' MIN S.D.)

NON PASSING ZONES (BARRIER STRIPS)

He = 3 50 Ft Hg = 4 25 Ft

APPROVED DATE 9-19-88

**CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT**



U S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER **DATE**

SYMBOLS

STATE & NATIONAL LINES	BUILDINGS
COUNTY LINE	TELEGRAPH LINES
TOWNSHIP & RANGE LINES	TELEPHONE LINES
SECTION LINE	POWER LINES
QUARTER SECTION LINE	CULVERTS (in Place)
SECTION CORNER	CULVERTS (Install)
QUARTER SECTION CORNER	CONCRETE BOX CULVERTS (Install)
OLD RIGHT OF WAY LINE	BRIDGES (Install)
NEW RIGHT OF WAY LINE	CONCRETE CURB
GRADE LINE	CONCRETE CURB AND GUTTER
CENTERLINE OF CONSTRUCTION	CONCRETE WALK
RAILROAD RIGHT OF WAY LINE	CATCH BASIN (Existing)
CITY OR VILLAGE CORPORATE LIMITS	CATCH BASIN (New)
PROPERTY LINE	MANHOLE (Existing)
EASEMENT LINE	MANHOLE (New)
FENCES	CURB INLET (Existing)
SNOW FENCE	CURB INLET (New)
DRAINAGE	GROUND MOUNTED SIGNS
WATERS EDGE	OVERHEAD SIGNS
MARSH OR SWAMP	HYDRANT
RIPRAP	LIGHT STANDARDS
DRAINAGE DITCH	TRAFFIC SIGNALS (Plan & Profile Sheets)
APPROACH	HIGH MAST LIGHTING ASSEMBLY
TRAVELED WAY	GROUND ELEVATION
RAILROADS	GRADE
GUARD RAIL	CENTERLINE
GUIDE POSTS	SECTION LINE
DELINEATORS	DEFLECTION ANGLE (Delta)
HEDGES AND TREES	SOD OR JUTE MESH
INTERCHANGE	POLES TO BE MOVED
HIGHWAY GRADE SEPARATION - NO CONNECTION	POLES TO BE LOWERED
OTHER BRIDGE	CONCRETE FOUNDATION
SERVICE ROAD	CONDUIT
TERMINATED CROSS-ROAD	CONDUCTOR
	CONCRETE PULL BOX
	FEED POINT
	250 WATT LIGHT STANDARDS
	400 WATT LIGHT STANDARDS
	700 WATT LIGHT STANDARDS
	1000 WATT LIGHT STANDARDS
	FLASHING BEACON
	TRAFFIC SIGNAL - MAST ARM MOUNTED
	TRAFFIC SIGNAL - POST MOUNTED
	SIGNAL HEAD
	PEDESTRIAN PUSHBUTTON POST
	TRAFFIC SIGNAL CONTROLLER
	FEED POINT PAD MOUNTED

ABBREVIATIONS

Aggr	Aggregate	M L	Main Line
Ahd	Ahead	N R	North Roadway
Alt	Alternate	Off Loc	Office Location
Approx	Approximate or Approximately	O to O	Out to Out
Appr	Approach	P B P	Plan and Profile
Asph Cem or A C	Asphalt Cement	P C	Point of Curvature
Asph Conc	Asphaltic Concrete	P C C	Point of Compound Curve
Btl	Bituminous or Bitumen	P C C Pvmt	Portland Cement Concrete Pavement
Bk	Back	P D	Private Drive
B M	Bench Mark	Pen	Penetration
Bldg	Building	Perf	Perforated
Br	Bridge	P I	Point of Intersection
C A E S	Corrugated Aluminum End Section	P O C	Point on Curve
C A P	Corrugated Aluminum Pipe	P O T	Point on Tangent
C B	Catch Basin	P P	Power Pole
C B G	Curb and Gutter	P R "	Point of Reverse Curvature
Ch Bk	Channel Block	Prof	Profiled
Ch Ch	Channel Change	P S D	Passing Sight Distance
C I	Curb Inlet	P T	Point of Tangency
C I P	Cast Iron Pipe	P V C	Polyvinyl Chloride Sewer Pipe
Cl	Class	Quant	Quantity or Quantities
C S E S	Corrugated Steel End Section	R	Radius
C S P	Corrugated Steel Pipe	R or Rge	Range
CMS	Cationic Medium Setting	RC	Rapid Curing
Comp	Compression	R C E S	Reinforced Concrete End Section
Const	Construction	R C P	Reinforced Concrete Pipe
Conc	Concrete	R C P S	Reinforced Concrete Pipe Sewer
Cont Reinf Conc	Continuously Reinforced Concrete	RD	Road
Pvmt	Pavement	Rdbs	Roadbed
Contr	Contraction	Rdwy	Roadway
Crn	Crown	Refi	Reflectorized
CRS	Cationic Rapid Setting	R R	Railroad
Cree	Course	Rt	Right
C S	Curve to Spiral	R/W	Right of Way
C to C	Center to Center	Salv	Salvage
C Y	Cubic Yard	San	Sanitary
D	Degree of Curvature	S C	Spiral to Curve
D-Load	Dead Load	SC	Slow Curing
D B	Ditch Block	Sc	Spiral Deflection Angle
Def	Deformed	S D	Sight Distance
Del	Deliver	S E	Superelevation
D G	Ditch Grade	Sec	Section
El or Elev	Elevation	Sec Line Appr	Section Line Approach
Ellipt	Elliptical	Sep	Separation
Emb	Embankment	Serv	Service
Emul	Emulsified	Sgr Prep	Subgrade Preparation
Engr	Engineer	Shldr	Shoulder
Eq	Equation	SP	Special Provision
E R	East Roadway	S P P	Structural Plate Pipe
E S	End Section	S P P A	Structural Plate Pipe Arch
Esmt	Easement	S R	South Roadway
Exc	Excavation	SS	Slow Setting or Supplement Specification
Exp	Expansion	S S D	Stopping Sight Distance
F C	Field Drive	S T	Spiral to Tangent
Found	Foundation	Sta	Station
F P	Fence Post	Std	Standard
Furn	Furnish	Std Specs	Standard Specifications
Ga	Gage or Gauge	Struct	Structure
Gr	Gravel	Surf	Surface or Surfacing
Grd	Graded	Surv	Survey
G V	Gate Valve	S W	Sidewalk
Hol	Helical	S Y	Square Yard
Hyd	Hydrant	T	Tangent Length (circular curve)
Ident	Identification	T or Twp	Township
Inchg	Interchange	Tel	Telephone
I M	Iron Monument	Temp	Temporary
Inst	Install	T P	Telephone Pole
Inter	Intersection	Tr	Traffic
Invt	Invert	Trans	Transverse or Transition
Jt	Joint	Trtd	Treated
L	Length of Curve	Ts	Tangent Length (curve with spirals)
Lc	Length of Spiral	T S	Tangent to Spiral
Levlg	Leveling	U S C & G S	United States Coast and Geodetic Survey
L F	Linear or Lineal Foot	V C	Vertical Curve
Liq	Liquid	V C P	Victorized Clay Pipe
Long	Longitudinal	WM	Water Main
L P	Light Pole	W M V	Water Main Valve
LT	Left	W R	West Roadway
M	One Thousand	Wring	Wearing
Matl	Material	W S V	Water Service Valve
Max	Maximum	X Sec	Cross Section
MC	Medium Curing	Xc	Spiral Coordinate
M H	Manhole	Yc	Spiral Coordinate
Min	Minimum		

GENERAL NOTES

100 GENERAL: The engineer will see to the removal of existing
010 fences to the highway right of way line and to the relocation or
adjustment of utility facilities as shown on the plans. All
privately-owned light poles, guard posts, signs, etc., within the
right of way limits shall be removed by the owners.

100 Cross sections for this project are available for inspection at
014 the Design Division, North Dakota State Highway Department, 600
East Boulevard Avenue, Bismarck, North Dakota 58505-0178 and also
at the North Dakota State Highway Department District Office in
Bismarck.

100 WORK SCHEDULE: In order to minimize interference with traffic
020 operations, a detailed schedule shall be agreed to prior to
beginning work, between the engineer, utility companies, and the
contractor and subcontractors, if any.

100 UNDERGROUND UTILITIES: The contractor shall notify the local
030 utility companies prior to the beginning of construction, so they
may stake location and depth of all utilities in the project
area. Subcutting or scarifying over utility lines may be
eliminated if, in the opinion of the engineer, a hazardous
situation exists. Separate plans, if any, showing relocation or
adjustment work to be performed by utility companies to
accommodate highway construction will be made available to the
contractor, upon request to the engineer.

100 Excavate, if necessary, where the new surfacing meets existing
120 pavement, bridge ends, or railroad crossings to allow placement
of the full depth of the surfacing course. If excavation is
required, it shall be paid for as "Extra Work."

100 TREES, SHRUBS, AND NATIVE GRASSES: The contractor shall exercise
130 care in his construction operations to ensure that trees,
shrubs, and native grasses within the right of way and outside
the construction area are not disturbed.

200 SHRINKAGE AND SUBCUT: Twenty-five percent additional volume
011 in yardage computed by the end area method is allowed for
shrinkage in earth embankment. Twenty-five percent of the subcut
excavation has been added to the excavation and embankment
quantities to allow for shrinkage in subcut excavation and shall
be obtained within the right of way limits.

200 SCARIFYING AND RECOMPACTION OF EMBANKMENT AREAS: After removing
090 6" of topsoil from original ground under all roadway embankment
areas, an additional one foot shall be scarified and recompactd.
All scarifying and recompacting shall be included in price bid
for "Common Excavation."

200 TOPSOIL: Removal of topsoil from excavation areas will be paid
130 for as "Common Excavation." Removal of topsoil from embankment
areas will be included in the price bid for "Clearing and
Grubbing." Total topsoil from clearing and grubbing areas is
approximately 5,265 cubic yards.

200 BACKSLOPES: The backslopes going into and out of a deep cut
280 section shall be flattened as directed by the field engineer.

200 INTERCEPTING DITCH: Intercepting ditches shall be constructed
290 wherever considered necessary by the engineer.

200 WATER: The cost of applying water for compaction and for use as
301 a dust palliative, as required, shall be included in the price
bid for "Water."

200 TEMPORARY BYPASSES: Approximate quantities for the temporary
440 bypasses are as follows:

Location	Suggested Minimum Waterway Opening	Fill Material	Aggregate Base Course
242+47.1 E	10 S.F.	2150 C.Y.	316 Ton
314+21.3 E	10 S.F.	2100 C.Y.	310 Ton
685+91.4 E	10 S.F.	3500 C.Y.	295 Ton

These items are not separate pay items, but shall be included in
the price bid.

SURFACING LIMITS:

Bituminous pavement has been provided for the following locations:

242+47.1 E	- 150' of surfacing
314+21.3 E	- 150' of surfacing
376+74.04 - 440+99.91	- 6,426' of surfacing
503+89 E	- 150' of surfacing
685+91.4 E	- 150' of surfacing

210 BOX CULVERT: Class 1 excavation shall be measured from the
110 ground line to the bottom of the foundation fill. Width
limitations for foundation fill shall conform to Section 210.04
of the Standard Specifications.

400 HOT BITUMINOUS PAVEMENT: The 3" hot bituminous pavement
290 shall be laid in two lifts--1½" base course and 1 1/2" surface
course.

GENERAL NOTES

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND.	BS-BRS-1-006(03)011	4

764 REMOVE W-BEAM GUARDRAIL: The sections of W-Beam Guardrail shown
201 on the plans to be removed shall have the rail, post, and end anchor removed. The removed guardrail, hardware, and posts not used in the reset operation shall be stockpiled on the right of way in location designated by the Engineer. Rail removed and not to be reset shall be removed in 12½ foot sections and disassembled at every joint. All miscellaneous hardware for the removed guardrail shall be placed in containers at the stockpile site. The stockpiled material shall remain the property of the state. If, in the opinion of the engineer, the concrete end anchor will not interfere with other construction, they may be cut off 1' (one foot) below ground line and the surface restored to match the surrounding area. Rail removed and reset shall be in length no longer than 50 feet. The cost of removing the rail, posts, end anchor, and stockpiling shall be incidental in the price bid for "Remove Beam Guardrail and Posts."

OBSERVATION WELL: The well located at Station 391+45 - 9' Lt. is not to be disturbed. This well is to be adjusted by the North Dakota Water Commission. The engineer in the field is to contact Mr. Milt Lindvig, State Water Commission, Bismarck, North Dakota, Telephone No. 224-2754, who will make all the necessary adjustments. Mr. Lindvig shall be notified prior to construction in this area. Contractor to exercise care when working around observation wells.

EXISTING SURFACING: The contracto shall have the option of salvaging the existing surfacing for his own use. Should the contractor salvage the existing surfacing, he shall replace this material with an equal amount of borrow at his own expense.

900 This project will take place on the Standing Rock Indian
360 Reservation. The Standing Rock Sioux Tribe has enacted an ordinance requiring all employers subject to the Tribe's jurisdiction to give preference in training, employment, contracting, and subcontracting to Indians. For more information about these requirements, contact:

Perry Many Wounds, TERO Officer
Tribal Employment Rights Office
Fort Yates, ND 58538
(701) 854-7231

Please note that the State is not a party to these Indian preference requirements. It is a matter solely between the Tribe and the contractor. The State will not assist the Tribe to enforce these requirements. Nor will it assist a contractor who has been charged by the Tribe with violating these requirements or will it consider requests for contract modifications to cover additional costs incurred because of such violations.

NOTE: The quantity listing for traffic control construction area has sufficient quantities for traffic control at all sites. The contractor will be paid for the signs and devices used at each site even though he may move signs from one completed site to the next.

NOTES - CONCRETE ALTERNATE

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND	RS-BRS-1-006(003)011	6

- 100 GENERAL: The cost of furnishing and placing preformed expansion joint filler, concrete inserts, tie wire, bar spacers, bar supports, and other miscellaneous items shall be included in the price bid for Class AE-3 and AAE-3 concrete.
- 202 REMOVAL OF STRUCTURE: The existing bridge is a 3 span structure, 96 feet long with a clear roadway of 20 feet. The substructures are made of concrete. All materials removed shall become the property of the contractor and shall be disposed of properly.
- 202 All concrete removed must be broken into pieces no larger than 18 inches if used as riprap. Concrete riprap shall be placed in a manner that minimizes the exposure of any protruding steel and presents a finished appearance acceptable to the engineer.
- 210 EXCAVATION: Class 1 excavation, at the abutments, shall extend from the bottom of the footing to the upper limits as shown on the bridge layout drawing.
- 210 Excavation Class 2, at the piers, shall extend from the bottom of the pier wall to the finished channel slope elevation.
- 210 BACKFILL: Select backfill shall be compacted in accordance with Section 203.02 F. Select backfill shall not be placed above the elevation of the berm until the superstructure has cured.
- 550 BRIDGE APPROACH SLABS: Mechanical finishing of the approach slabs shall be required. Transverse metal tine finish and the surface tolerance of 3/16" in 10 feet are also required.
- Contractor has the option of placing the concrete in one continuous operation or two pours with the split determined by a centerline joint.
- 602 SURFACE FINISH "D": Surface Finish "D" shall be required for the inside and top surfaces of the barrier.
- 602 PENETRATING WATER REPELLENT: Penetrating water repellent shall be applied to the driving surface of the concrete deck.
- 602 CONCRETE: All superstructure concrete shall be Class AAE-3 or AAE-4. Concrete for the substructure shall be AE-3 or AE-4. The class of concrete paid for will be that class shown on the plans. Type I or Type II cement may be used.
- 602 Deflection of the deck shoring shall be computed using the total dead load plus the weight of the finishing machine. The forming shall be adjusted properly to accommodate the deflection and thereby maintain the total slab thickness specified in the plans.
- 602 The design deck thickness shown on the plans must be maintained by adjusting deck forms and risers.

612 REINFORCING STEEL: Dimensions for bent bars are given out to out and to tangent intersections unless otherwise noted. Bent bars shall be bent around ACI standard size pins.

612 The bar fabricator shall add a prefix to all bar designations to differentiate between the several parts of the structure.

612 All reinforcing steel shall be Grade 60.

622 PILING: The contractor may be required to predrill to obtain proper minimum penetration of the piling. All pilot holes not completely filled by the piles shall be backfilled with sand or fine gravel before the substructure is placed. All costs associated with predrilling shall be incidental to the pay item "Steel Piling HP 10x42" or "Steel Piling HP 12x53."

622 PILING: Piling shall be driven with a steam, air, or diesel hammer with a rated energy and ram weight not less than 22,179 foot-pound-tons, as computed by the formula $W(E-10,819) + .41E$, where W is the weight of the ram in tons and E is the rated hammer energy. In no case shall the ram weight be less than 2,800 pounds.

SHOP DRAWINGS: The contractor shall submit the following shop drawings to the Construction office for approval;

1. Prestressed box girders.

DESIGN STRENGTH:

F'C	3,000 PSI	C1. AE-3 or AE-4 concrete
F'C	4,000 PSI	C1. AAE-3 or AAE-4 concrete
FY	60,000 PSI	GR. 60 reinforced steel
F'C	5,000 PSI	prestressed girder concrete
FY	36,000 PSI	structural steel

NOTES - STEEL ALTERNATE

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	ND.	RS-BRS-1-006(003)011	5

100 GENERAL: The cost of furnishing and placing preformed expansion joint filler, concrete inserts, tie wire, bar spacers, bar supports, and other miscellaneous items shall be included in the price bid for Class AE-3 and AAE-3 concrete.

202 REMOVAL OF STRUCTURE: The existing bridge is a 3 span structure, 96 feet long with a clear roadway of 20 feet. The substructures are made of concrete. All materials removed shall become the property of the contractor and shall be disposed of properly.

202 All concrete removed must be broken into pieces no larger than 18 inches if used as riprap. Concrete riprap shall be placed in a manner that minimizes the exposure of any protruding steel and presents a finished appearance acceptable to the engineer.

210 EXCAVATION: Class 1 excavation, at the abutments, shall extend from the bottom of the footing to the upper limits as shown on the bridge layout drawing.

210 Excavation Class 2, at the piers, shall extend from the bottom of the pier wall to the finished channel slope elevation.

210 BACKFILL: Select backfill shall be compacted in accordance with Section 203.02 F. Select backfill shall not be placed above the elevation of the berm until the superstructure has cured.

550 BRIDGE APPROACH SLABS: Mechanical finishing of the approach slabs shall be required. Transverse metal tine finish and the surface tolerance of 3/16" in 10 feet are also required.

Contractor has the option of placing the concrete in one continuous operation or two pours with the split determined by a centerline joint.

602 Deflection of the deck shoring shall be computed using the total dead load plus the weight of the finishing machine. The forming shall be adjusted properly to accommodate the deflection and thereby maintain the total slab thickness specified in the plans.

602 SURFACE FINISH "D": Surface Finish "D" shall be required for the inside and top surfaces of the barrier.

602 PENETRATING WATER REPELLENT: Penetrating water repellent shall be applied to the driving surface of the concrete deck.

602 CONCRETE: All superstructure concrete shall be Class AAE-3 or AAE-4. Concrete for the substructure shall be AE-3 or AE-4. The class of concrete paid for will be that class shown on the plans. Type I or Type II cement may be used.

602 The design deck thickness shown on the plans must be maintained by adjusting deck forms and risers.

612 The bar fabricator shall add a prefix to all bar designations to differentiate between the several parts of the structure.

612 REINFORCING STEEL: Dimensions for bent bars are given out to out and to tangent intersections unless otherwise noted. Bent bars shall be bent around ACI standard size pins.

612 All reinforcing steel shall be Grade 60.

616 STRUCTURAL STEEL: Structural steel shall be AASHTO M 223. Requirements for Charpy V-Notch tests are designated on the girder detail sheets.

616 Shear connector on splice plates shall be moved to clear bolt holes.

616 Field connections shall be made with 7/8 inch diameter, AASHTO M 164 high-strength bolts unless otherwise shown.

616 Temporary or permanent attachments or devices that are not shown on the plans as part of the structure shall not be welded to the structural steel members during the fabrication and construction process.

616 The cost of swedge bolts shall be included in the total cost of structural steel.

622 PILING: The contractor may be required to predrill to obtain proper minimum penetration of the piling. All pilot holes not completely filled by the piles shall be backfilled with sand or fine gravel before the substructure is placed. All costs associated with predrilling shall be incidental to the pay item "Steel Piling HP 10x42" or "Steel Piling HP 12x53."

622 PILING: Piling shall be driven with a steam, air, or diesel hammer with a rated energy and ram weight not less than 22,179 foot-pound-tons, as computed by the formula $W(E-10,819) + .41E$, where W is the weight of the ram in tons and E is the rated hammer energy. In no case shall the ram weight be less than 2,800 pounds.

630 PAINT AND PAINTING: Paint shall conform to the Standard Specifications, Section 852.01 A and 852.01 Q. The finish coats shall be blue color no. 25184 and shall meet Federal Standard No. 595 colors. The dry thickness of each finish and spot coat shall not be less than 1.5 mil for any reading. The dry thickness of the shop coat shall not be less than 1.5 mil for any reading.

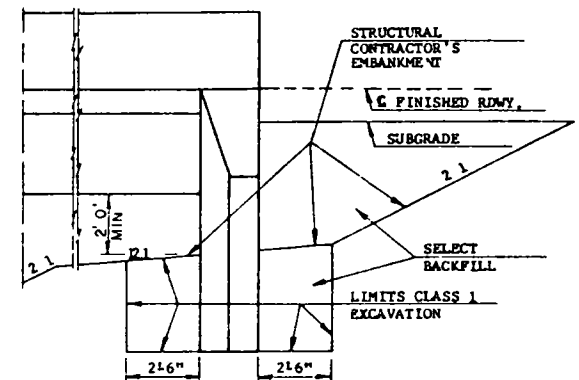
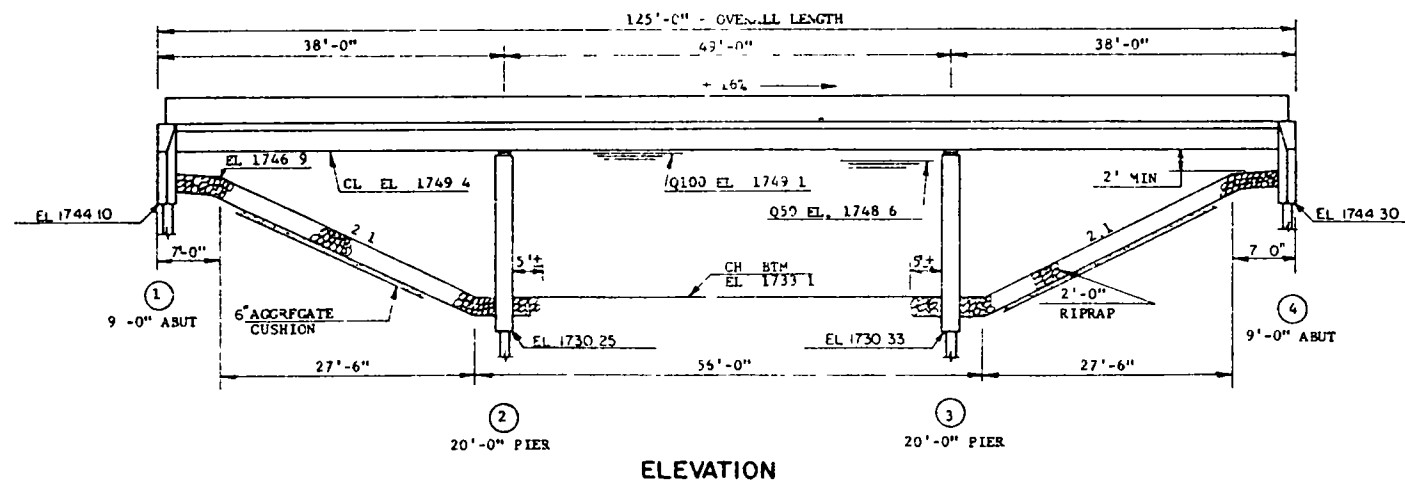
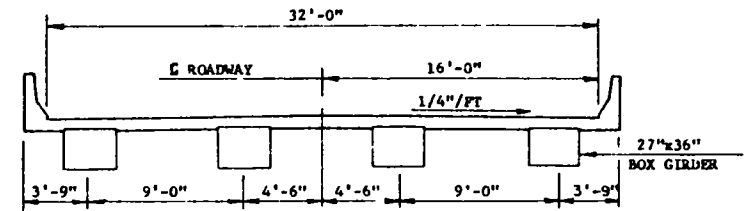
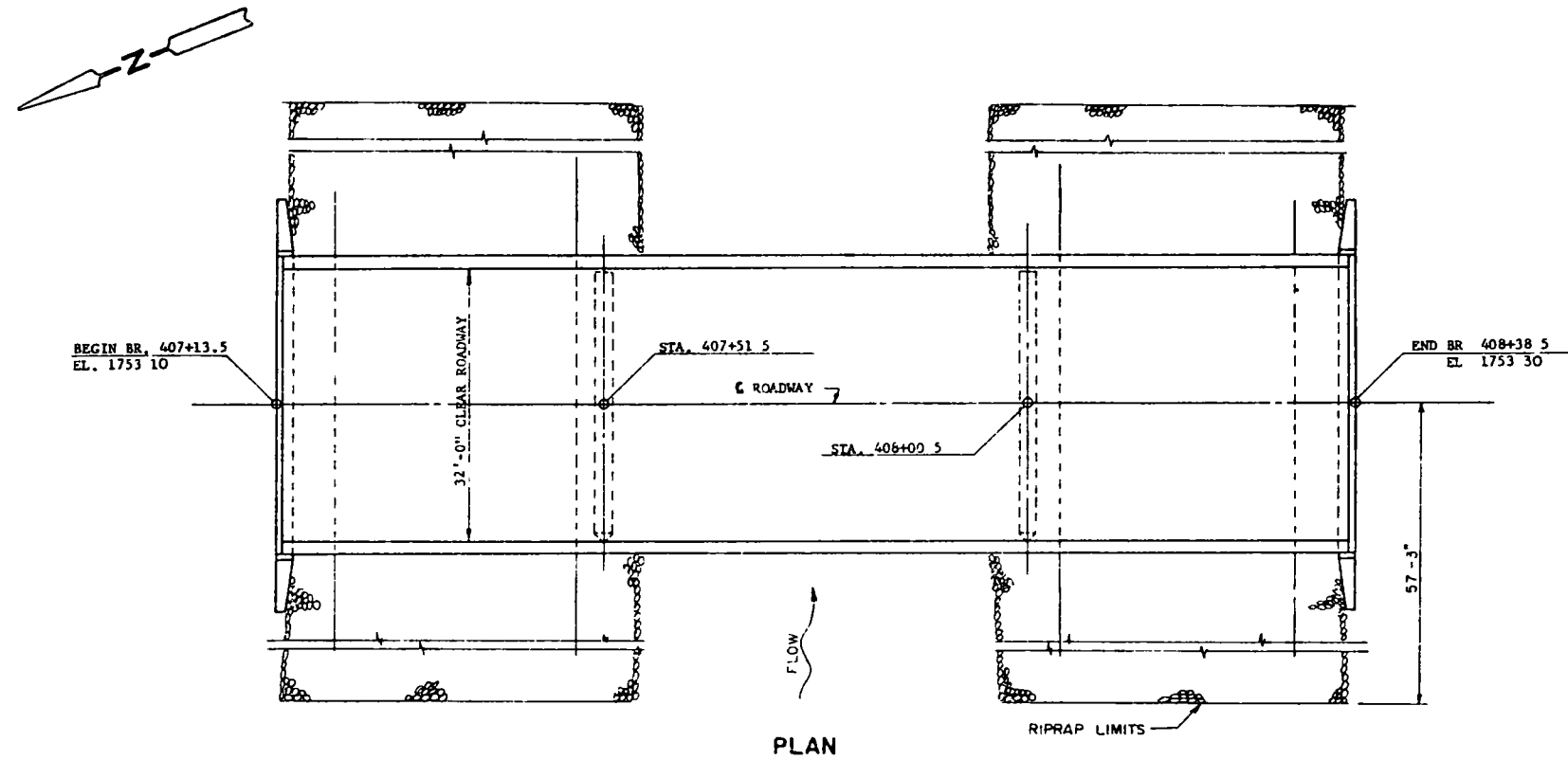
630 NEW STEEL: Painting shall conform to Section 630.03 B and 630.03 C.

SHOP DRAWINGS: The contractor shall submit the following shop drawings to the Construction office for approval;

1. Structural Steel items.

DESIGN STRENGTH: F'C 3,000 PSI C1. AE-3 or AE-4 concrete
F'C 4,000 PSI C1. AAE-3 or AAE-4 concrete
FY 60,000 PSI GR. 60 reinforced steel
FY 50,000 PSI structural steel

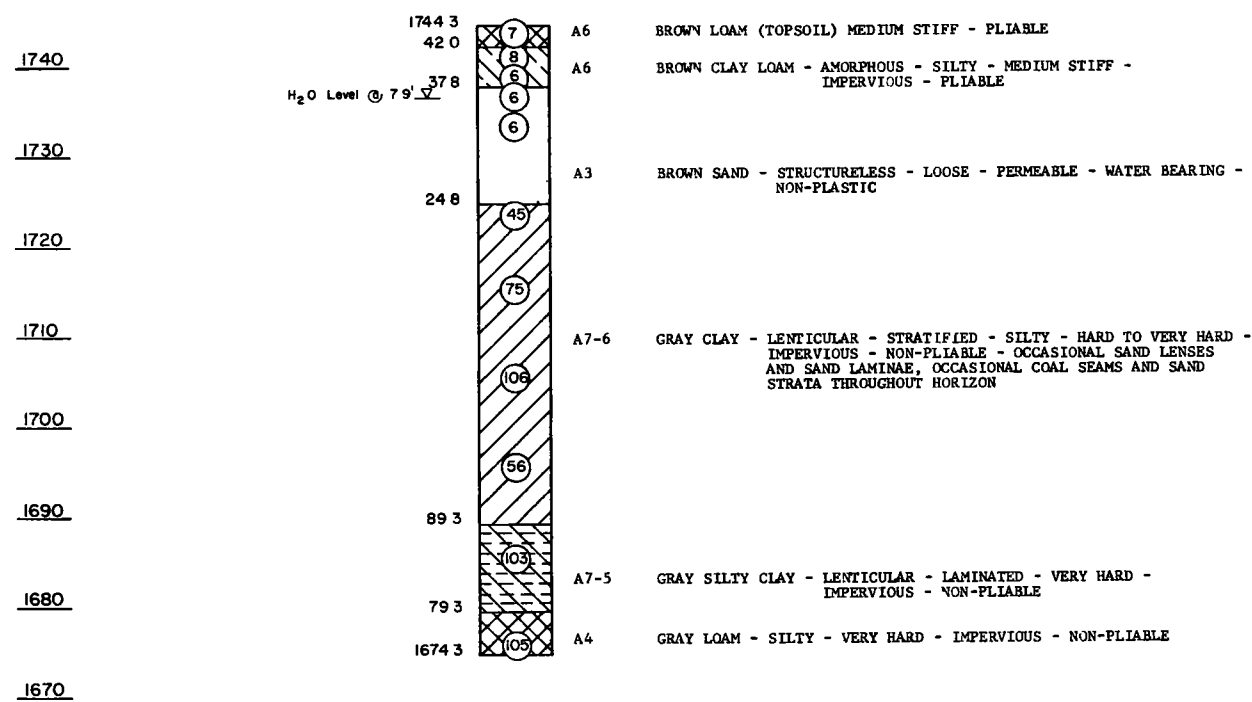
CODE	FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
X-081	8	N. D.	BRS-I-00610031011	50



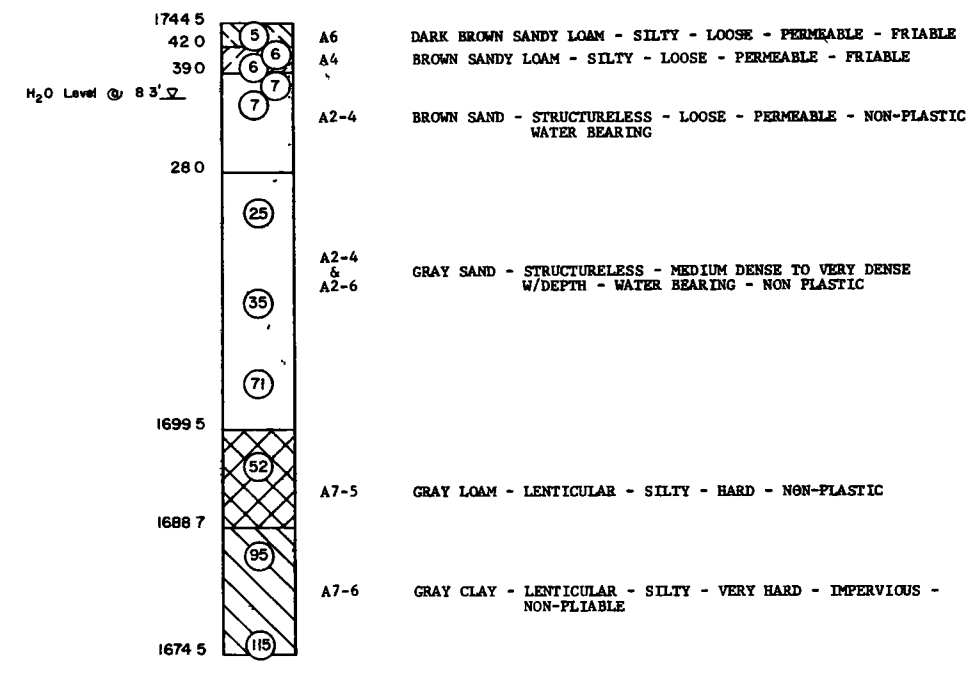
Roger Wenzel
BRIDGE ENGINEER
6 12 86
DATE

GENERAL LAYOUT
PORCUPINE CREEK
PROJECT NO BRS-I-00610031011
CONCRETE ALTERNATE
006-027176

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRS-1-006(03)011	5



BORING NO. 1
STA 407+50.5 - 15' RT OF C



BORING NO. 2
STA 408+31.5 - 15' LT OF C

NOTES

ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE CORE TUBE 1.0'

THE BORING LOG DATA SHOWN IS FOR DESIGN PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

SYMBOLS

P - MAXIMUM LOAD (LBS/SQ FT)
 Ø - ANGLE OF INTERNAL FRICTION (DEGREES)
 C - COHESION (LBS/SQ FT)
 M - MOISTURE (PERCENT)
 W - DRY WEIGHT (LBS CU FT)
 ** - TRIAXIAL

PORCUPINE CREEK
BORING LOG
SIOUX COUNTY
CONCRETE ALTERNATE

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRS-I-0060031011	2

* MEASURED BELOW BOTTOM OF FOOTING

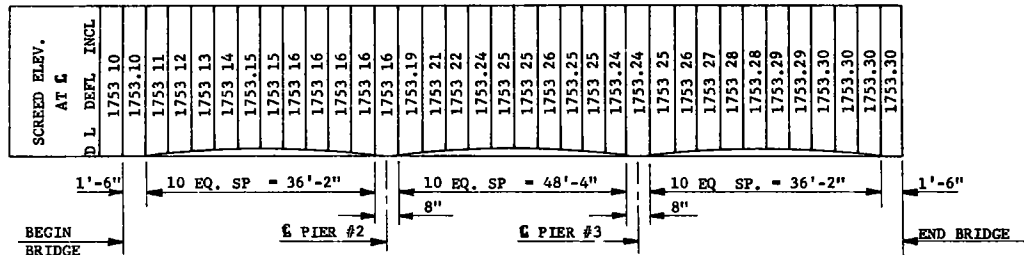
PILE LOADING				
LOCATION	DEAD LOAD	LIVE LOAD	DESIGN LOAD	MINIMUM * PENETRATION
ABUT 1 & 4	28 9 T	11 7 T	40 6 T	30'
PIER 2 & 3	51 6 T	17 2 T	68 8 T	20'

HYDRAULIC DESIGN DATA

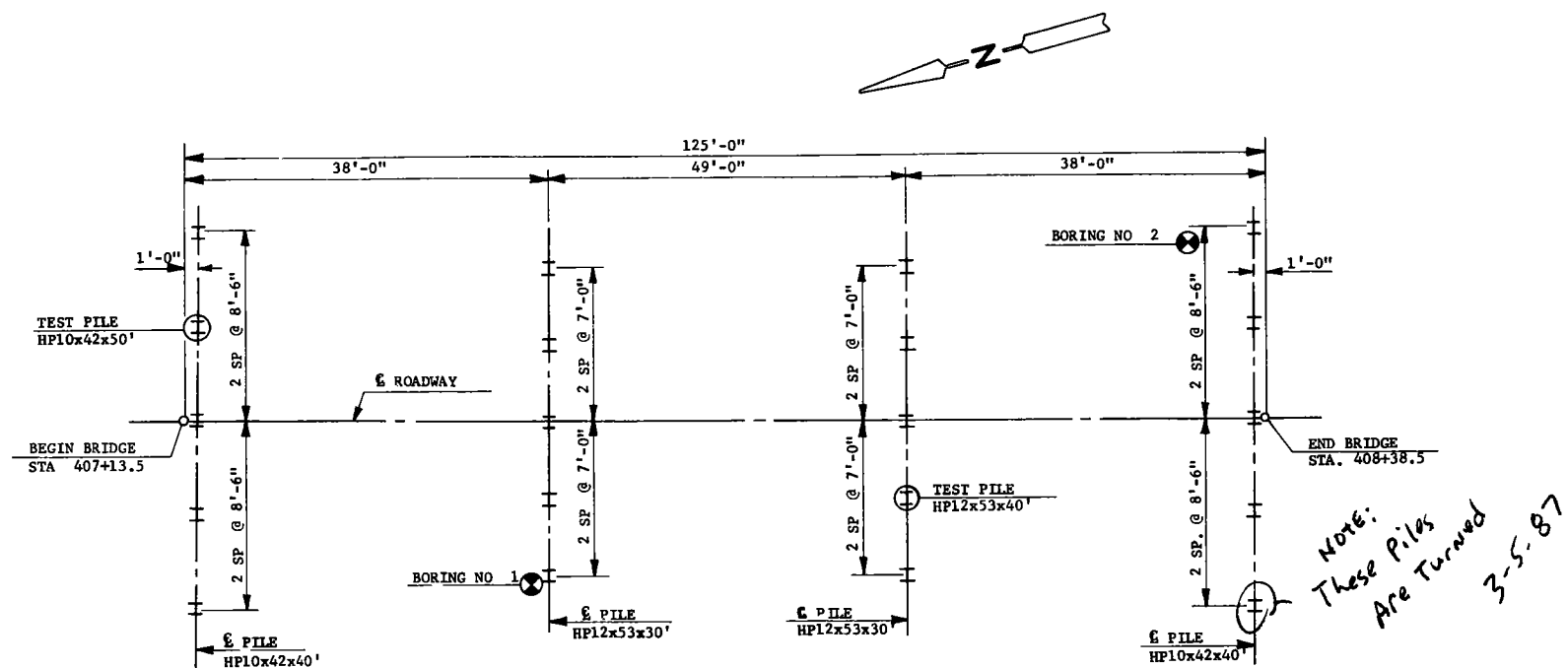
DRAINAGE AREA _____ 120 SQ MI
DESIGN FREQUENCY _____ 50 YEAR
DESIGN DISCHARGE _____ 6300 CFS
DESIGN STAGE _____ 1748.6
STREAM GRADIENT _____ 00188 FT/FT
AVERAGE VELOCITY OF FLOW IN NATURAL CHANNEL _____ 5.66 FT/SEC
DEPTH OF FLOW _____ 15.5 FEET
MAXIMUM RECORDED STAGE (1950) _____ 1749.9
MAXIMUM RECORDED DISCHARGE () _____ UNKNOWN
100-YEAR FREQUENCY STAGE _____ 1749.1
100-YEAR FREQUENCY DISCHARGE _____ 7700 CFS

INDEX OF STRUCTURAL DRAWINGS

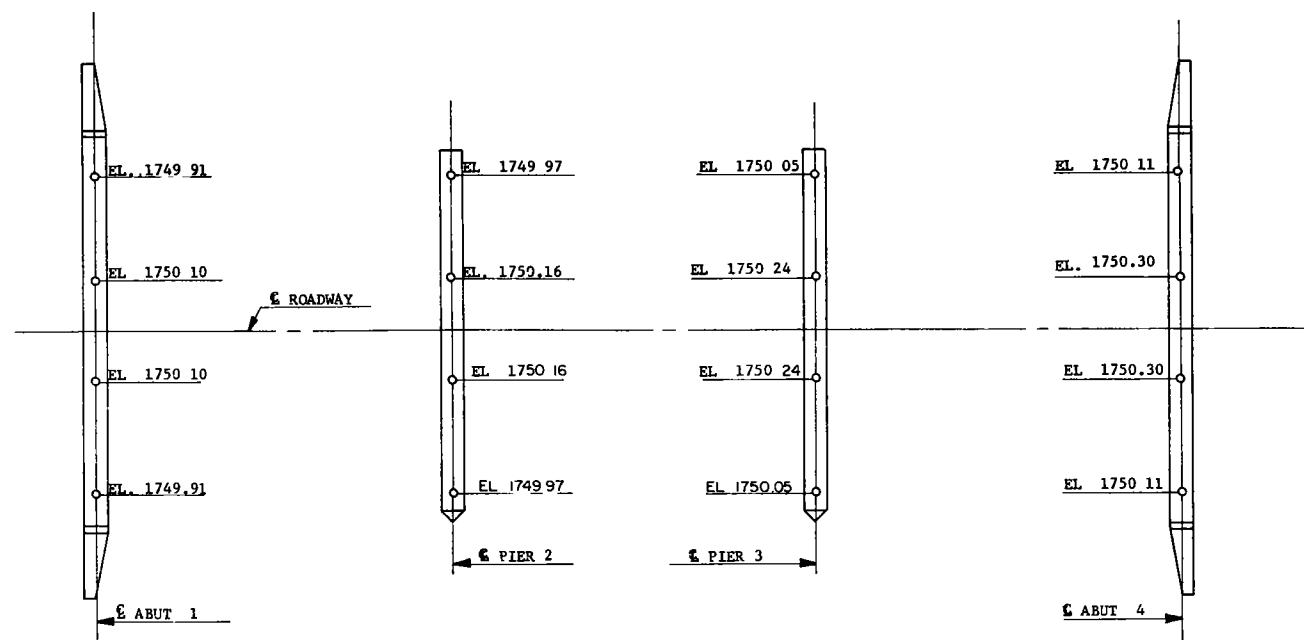
DESCRIPTION	DRAWING NUMBER
LAYOUT	006-027.176
NOTES	006-027.176-1
BORING LOG	006-027.176-2
MISCELLANEOUS DETAILS	006-027.176-3
PILE LAYOUT & ELEVATIONS	006-027.176-4
ABUTMENT DETAILS	006-027.176-5
PIER DETAILS	006-027.176-6
SUPERSTRUCTURE DETAILS	006-027.176-7
SUPERSTRUCTURE DETAILS	006-027.176-8
BAR REINFORCING DETAILS	006-027.176-9
APPROACH SLAB	006-027.176-10



FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRS-I-006(003)011	52



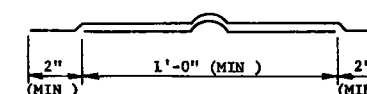
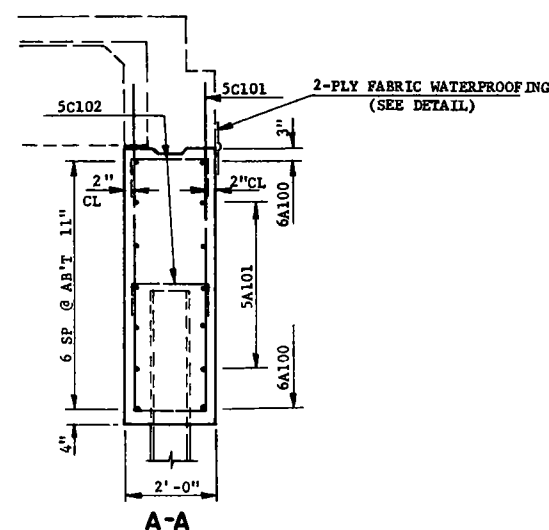
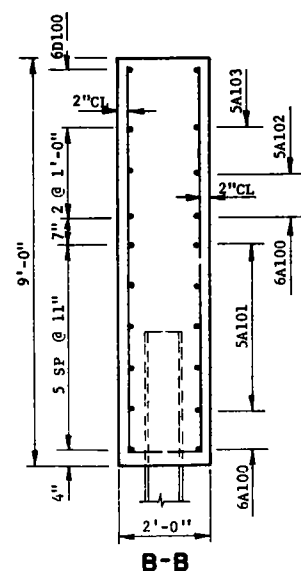
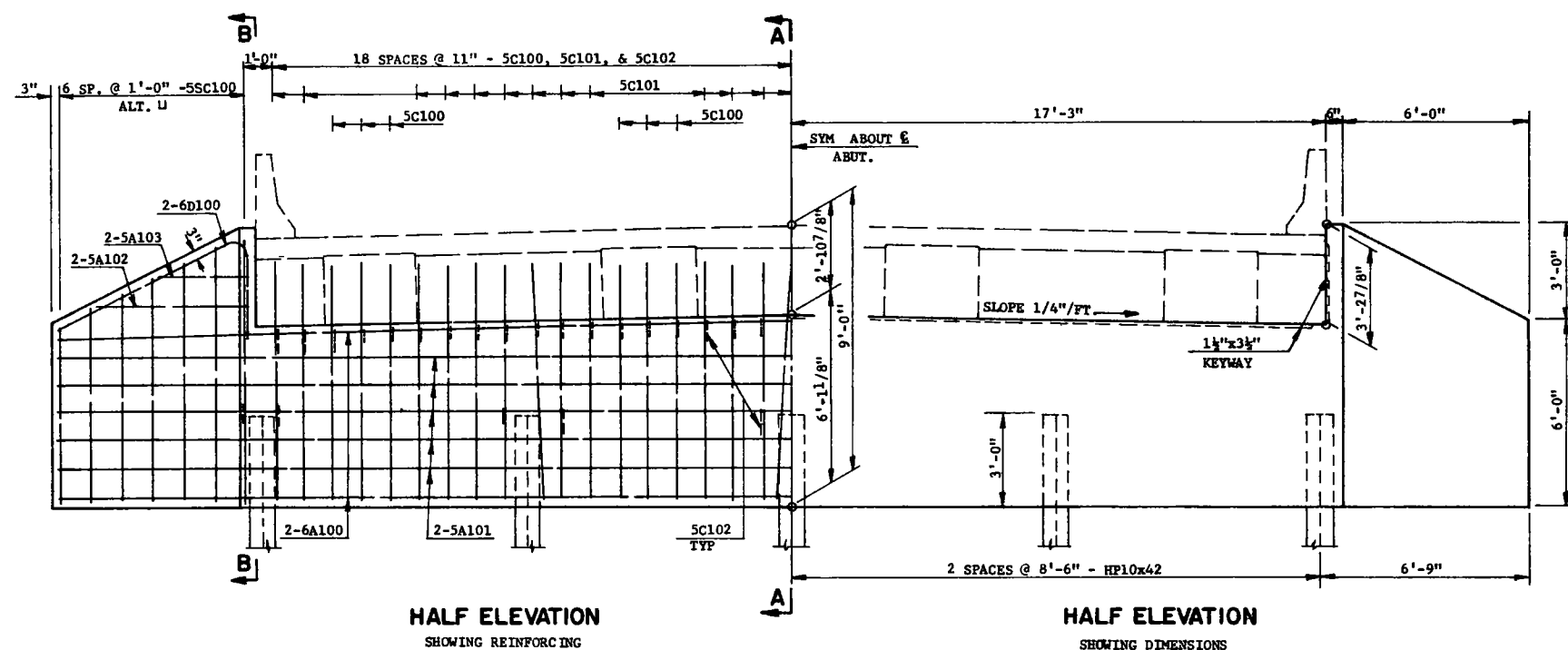
PILE LAYOUT



ABUTMENT & PIER ELEVATIONS

ELEVATIONS ARE TO TOP OF FINISHED CONCRETE

PORCUPINE CREEK
**PILE LAYOUT & ABUTMENT
 & PIER CAP ELEVATIONS**
 CONCRETE ALTERNATE



FABRIC WATERPROOFING DETAIL

NOTE

TWO PLY FABRIC WATERPROOFING SHALL CONSIST OF FURNISHING MATERIALS AND PLACING DAMPPROOFING AND FABRIC WATERPROOFING AT AREAS DESIGNATED ON THIS SHEET IN ACCORDANCE WITH SEC. 740 OF THE STANDARD SPECIFICATIONS FOR TWO PLY FABRIC WATERPROOFING. ALL MATERIALS AND WORK SHALL BE CONSIDERED INCIDENTAL TO THE PAY ITEM FOR CLASS. AE-3 CONCRETE.

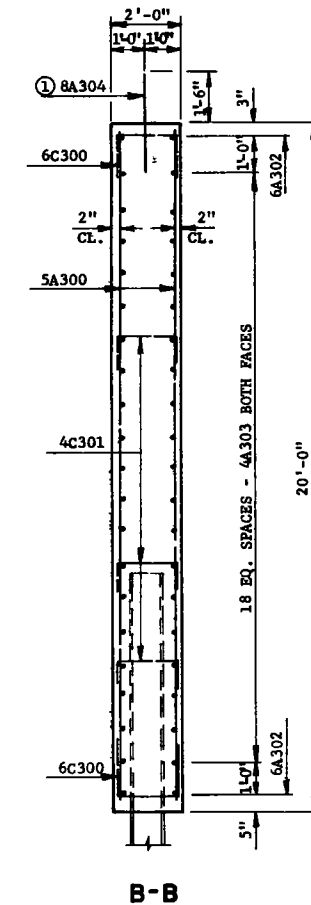
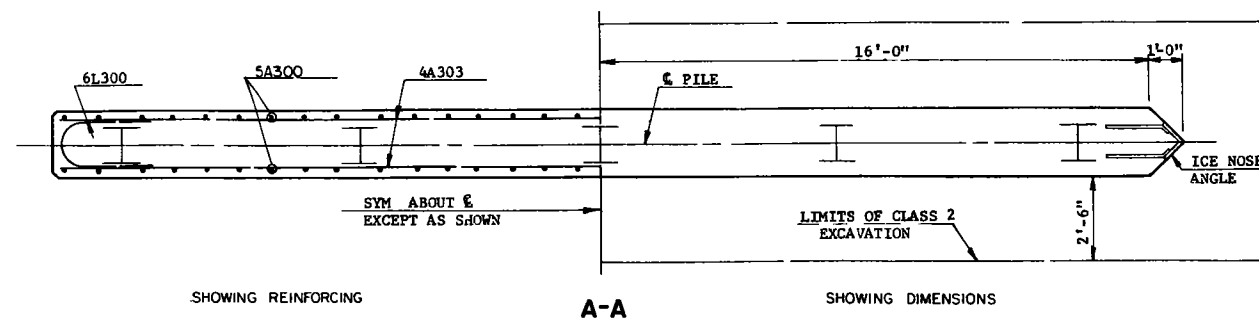
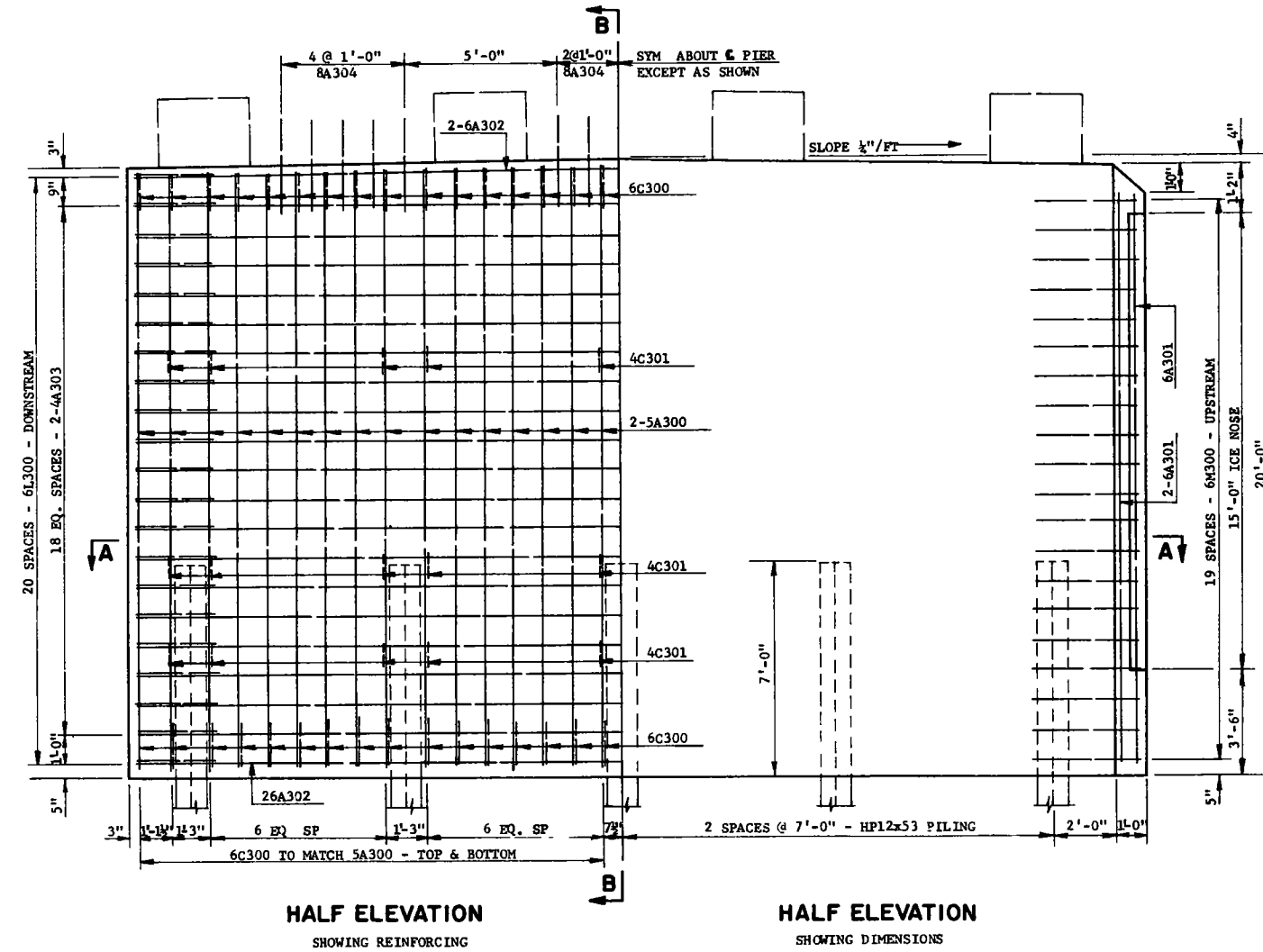
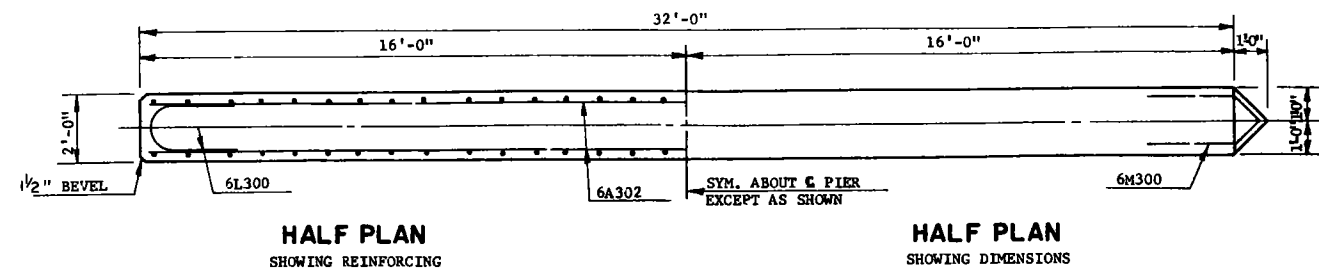
QUANTITIES (ONE ABUT.)	
CLASS AE-3 CONCRETE	209 C Y
REINFORCING STEEL	1.79 LBS

PORCUPINE CREEK

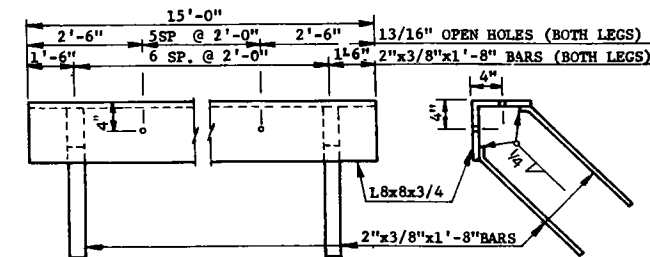
ABUTMENT DETAILS

32'-0 ROADWAY

CONCRETE ALTERNATE



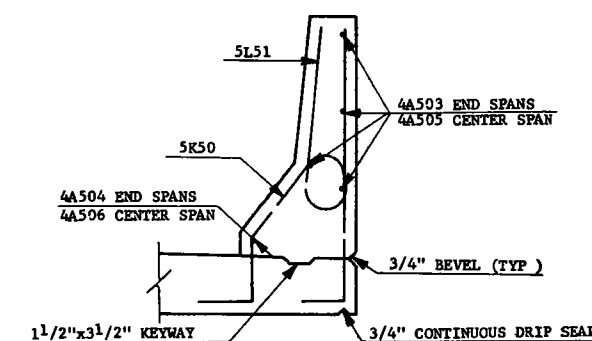
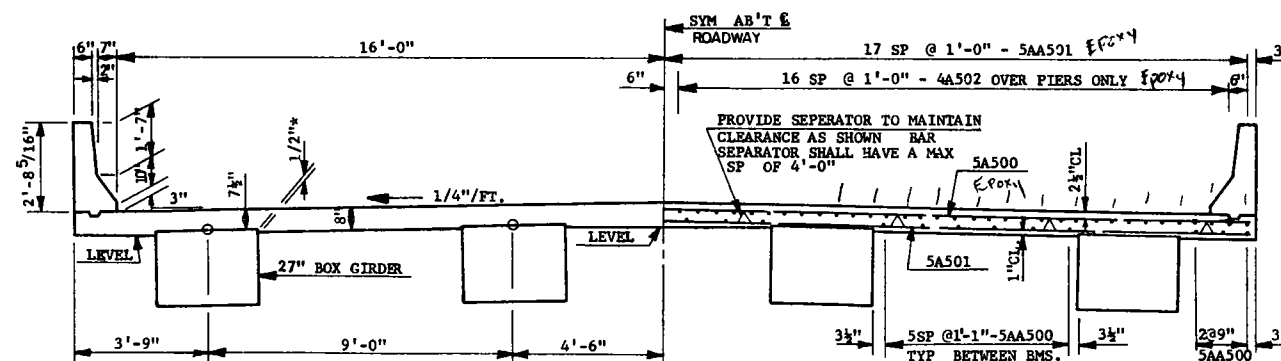
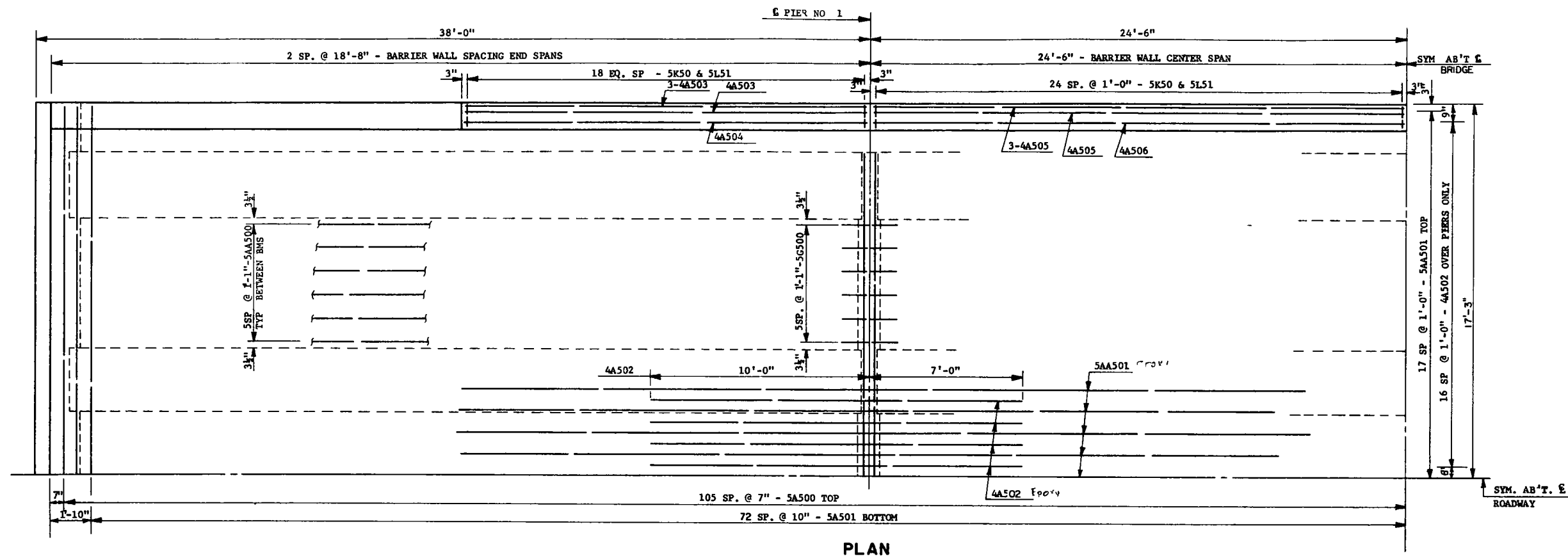
① 8A304 BARS SHALL BE PLAIN ROUND MILD STEEL. THE UPPER HALF OF THIS BAR SHALL BE GREASED BEFORE PLACING THE DIAPHRAGM



ICE NOSE ANGLE

QUANTITIES (ONE PIER)	
CLASS AE-3 CONCRETE	48.5 C.Y.
REINFORCING STEEL	3,607 LBS
STRUCTURAL STEEL	584 LBS.
PORCUPINE CREEK	
PIER DETAILS	
32'-0 ROADWAY	
CONCRETE ALTERNATE	

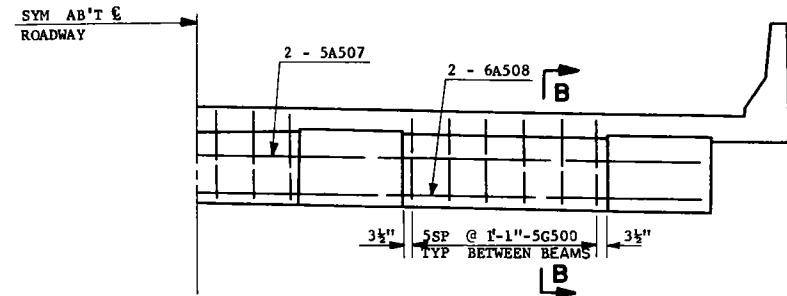
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRS-I-006(003)011	56



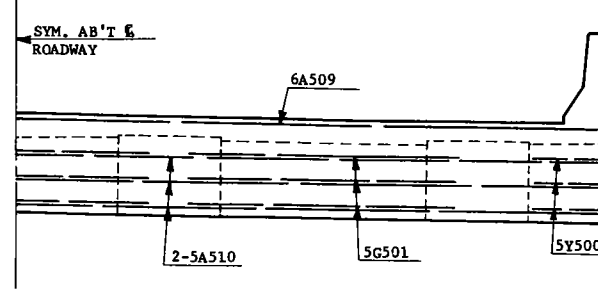
*NOTE
THESE DIMENSIONS WILL VARY DUE
TO THE VARIABLE CAMBER OF THE
PRESTRESSED BOX GIRDERS

PORCUPINE CREEK
SUPERSTRUCTURE DETAILS
32'-0" ROADWAY
CONCRETE ALTERNATE

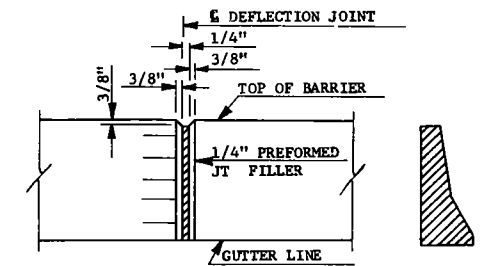
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
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PIER DIAPHRAGM

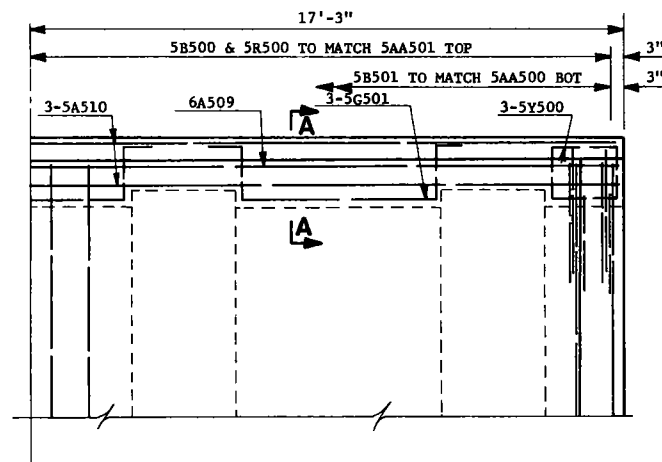


ENDWALL ELEVATION

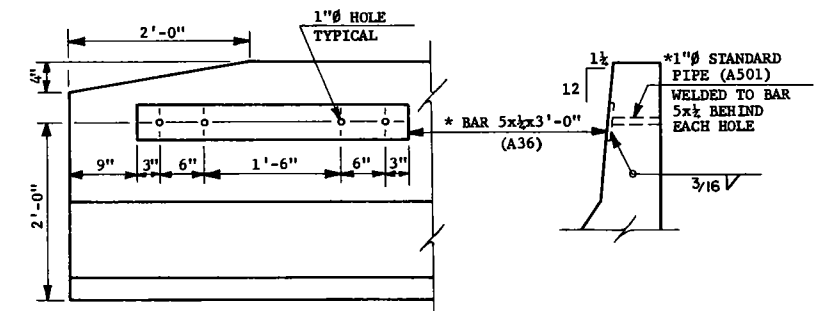


DETAIL AT JOINT

USE NAILS TO HOLD PREFORMED JOINT FILLER IN PLACE. PROVIDE ADEQUATE TIE WIRES ON THE BARRIER FORMS TO AVOID ANY SHIFTING DURING THE PLACEMENT. FORM A 3/4" TRIANGULAR GROOVE AT THE MIDPOINT OF EACH BARRIER SECTION. GROOVE BOTH VERTICAL FACES AND ACROSS TOP.



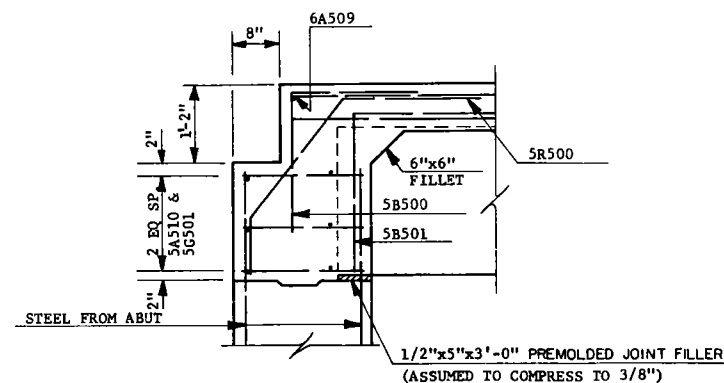
HALF PLAN OF ENDWALL



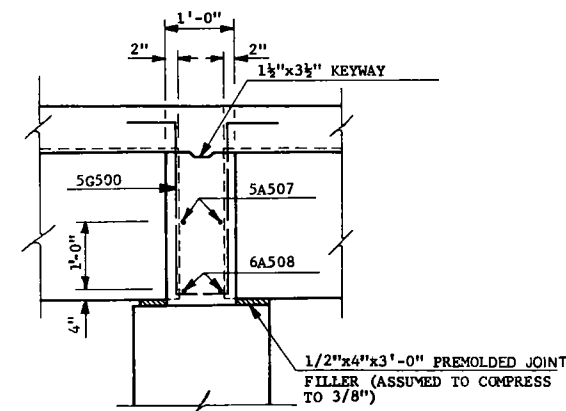
ELEVATION

BARRIER END DETAIL

* GALVANIZE AFTER FABRICATION. ALL WORK AND MATERIALS SHALL BE INCIDENTAL TO CLASS AAE-3 CONCRETE.



A-A



B-B

QUANTITIES

CLASS AAE-3 CONCRETE	137.3	C YD.
REINFORCING STEEL	11,912	LBS
REINFORCING STEEL (EPOXY)	15,240	LBS

PORCUPINE CREEK

SUPERSTRUCTURE DETAILS

32'-0" ROADWAY

CONCRETE ALTERNATE

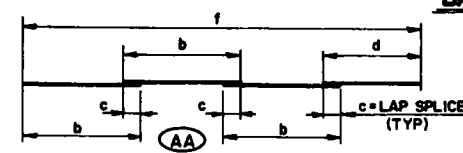
[illegible]

SEE BAR BENDING & CUTTING DIAGRAMS													
LOCATION	SIZE	MAP#	NUMBER EACH OR SETS	NOMINAL LENGTH	DETAILING DIMENSIONS								
					a	b	c	d	e	f	g	h	k
SUPERSTRUCTURE	REGULAR	5	A501	145	34'-0"		34'-0"						
		5	A507	4	29'-8"		29'-8"						
		6	A508	4	29'-8"		29'-8"						
		5	A510	12	34'-0"		34'-0"						
		5	AA500	24	125'-10"		60'-0"	1'-3"	5'-10"	2	123'-4"		
		5	B501	48	5'-0"		2'-0"	3'-0"					
		5	G500	36	7'-8"	2'-6"	8"	2'-6"	1'-0"				
		5	G501	18	11'-0"	1'-8"	5'-8"	1'-8"	1'-0"				
	5	Y500	12	7'-8"	1'-11"	1'-8"	3"						
	5	A500	211	34'-0"		34'-0"							
	4	A502	68	17'-0"		17'-0"							
	EPOXY	6	A509	2	34'-0"		34'-0"						
5		AA501	35	125'-10"		60'-0"	1'-3"	5'-10"	2	123'-4"			
5		B500	70	5'-0"		2'-0"	3'-0"						
5		R500	70	4'-4"	9"	2'-4"	1'-3"				12	12	
BARRIER WALL	REGULAR	4	A503	32	18'-4"		18'-4"						
		4	A505	16	24'-2"		24'-2"						
		5	L51	252	5'-4"		2'-3"	10"	2'-3"		3"	1 1/4	12
EPOXY	4	A504	8	18'-4"		18'-4"							
	4	A506	4	24'-2"		24'-2"							
	5	K50	252	5'-6"	1'-5"	7 1/4"	11 3/4"	9"	10 1/2"	2 7/8"	12	8 3/8	
			</										

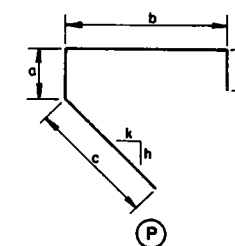
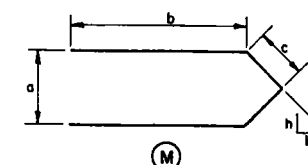
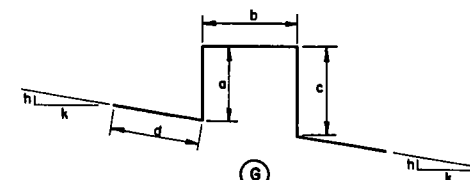
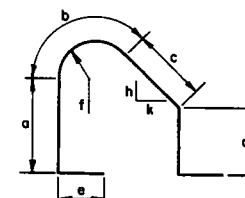
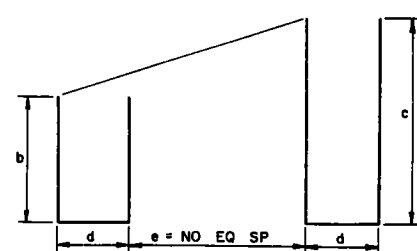
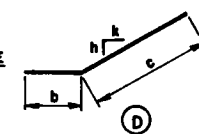
NOTES

1. FABRICATION AND TOLERANCES SHALL BE IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE
2. ALL DIMENSIONS ARE OUT TO OUT OF BARS.
3. NOMINAL LENGTH OF EACH BENT BAR OR CUT BAR IS THE SUM TOTAL OF THE DETAILING DIMENSIONS FOR THAT BAR, UNLESS OTHERWISE NOTED.
4. ADJACENT AA BARS SHALL BE TURNED END FOR END SO THAT THE SPlice LOCATIONS ARE STAGGERED.

BAR BENDING AND CUTTING DIAGRAMS

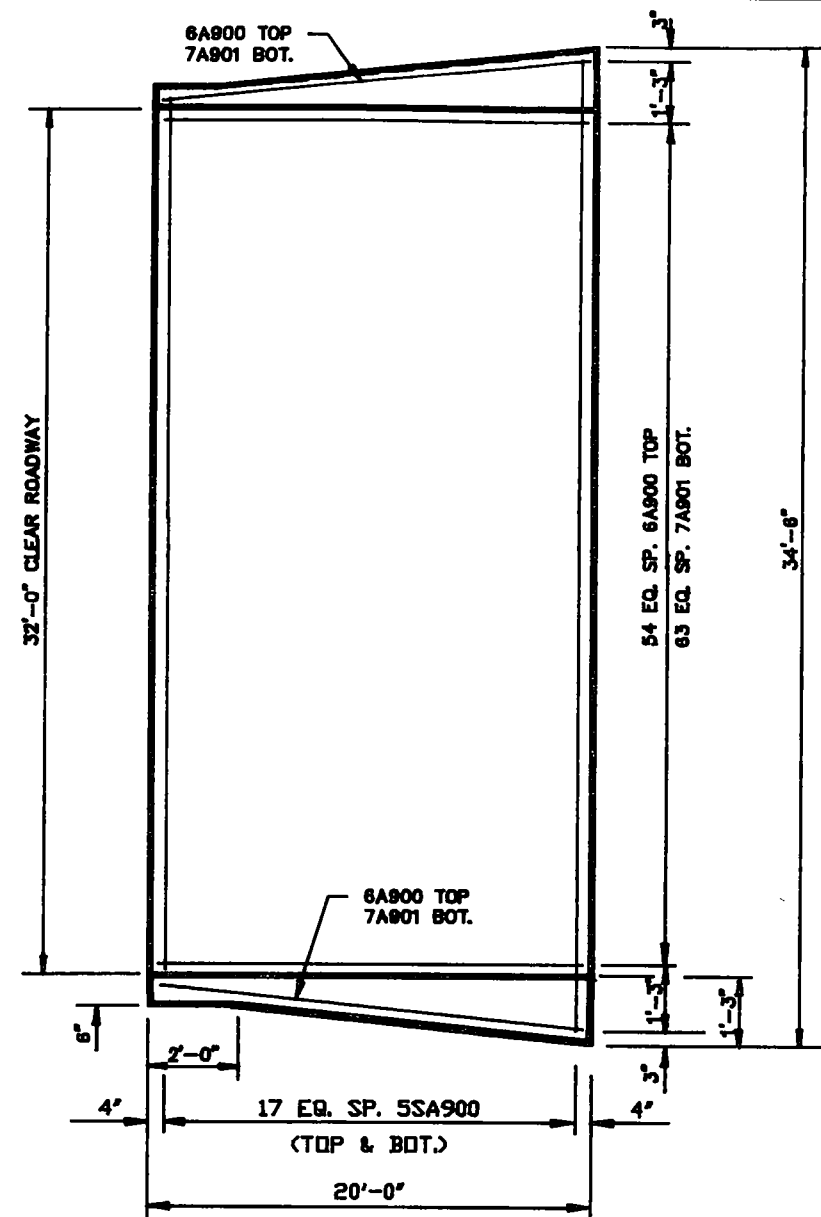


e = NUMBER OF b-LENGTH PIECES IN A SET
TOTAL LENGTH PER SET = e x b + d

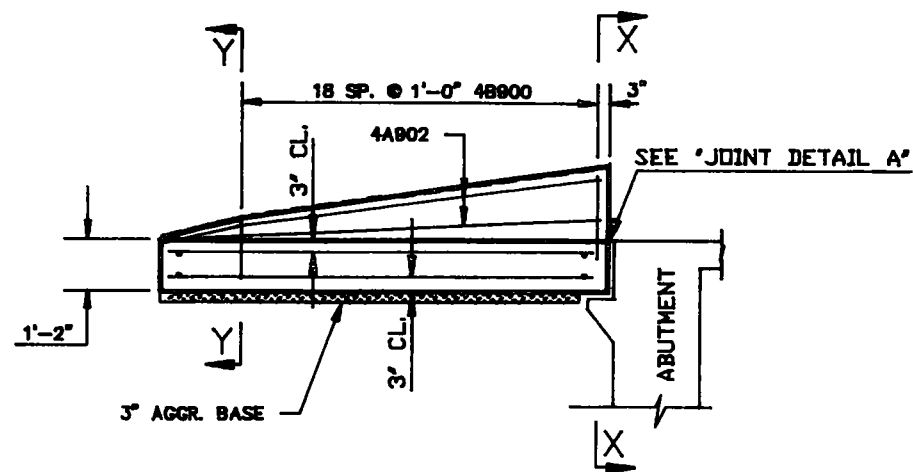


PORCUPINE CREEK
REINFORCEMENT BAR
DETAILS
CONCRETE ALTERNATE

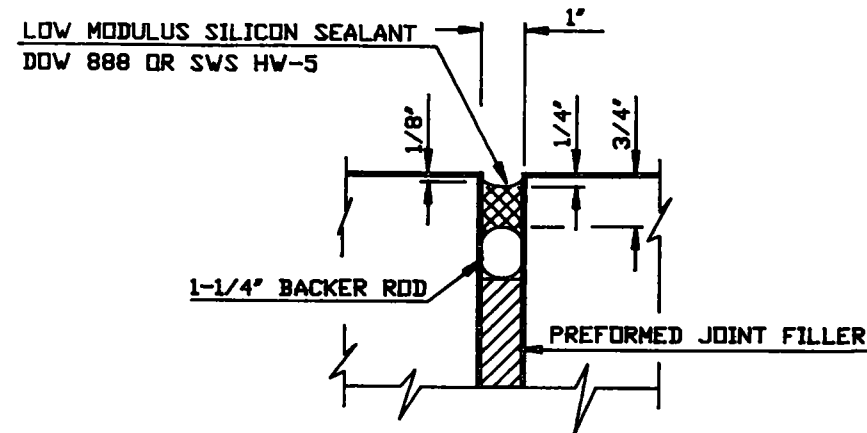
FYVA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRS-1-008(003)01	59



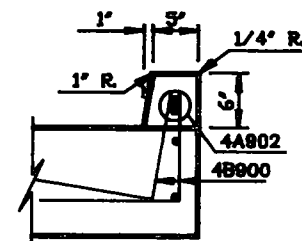
PLAN



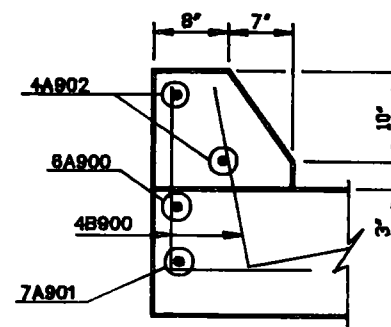
ELEVATION



JOINT DETAIL A



Y-Y



X-X

NOTE:

THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING SUB-BASE AGGREGATE, BACKER ROD, SILICON SEALANT, PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS SHALL BE INCIDENTAL TO THE PAY ITEM, "BRIDGE APPROACH SLABS".

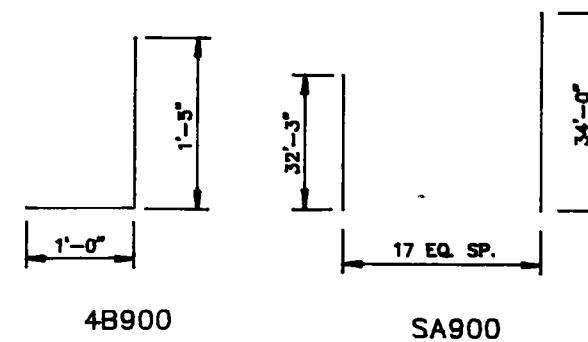
THE JOINT, WHERE THE APPROACH SLAB ABUTS THE EXISTING PAVEMENT, SHALL BE SAW CUT TO PROVIDE A NEAT LINE.

THE CONCRETE SHALL BE CLASS AE-3 AND THE REINFORCING STEEL SHALL BE GRADE 60.

ONE SLAB				
SIZE	MARK	NUMBER	LENGTH	WEIGHT
6	A900	57	18'-8"	1683.7
7	A901	66	19'-8"	2653.1
4	A902	4	19'-8"	52.5
4	B900	76	2'-6"	122.7
5	SA900	2	596'-3"	1243.8

ONE SLAB
ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL	5766 LBS.
CONCRETE	30.0 C.Y.



QUANTITIES (ONE SLAB)	
APPROACH SLAB	74.8 S.Y.
PORCUPINE CREEK CONCRETE ALTERNATE	
APPROACH SLAB	

LEFT SLOPE STAKE				RIGHT SLOPE STAKE			
BASCLN STA	CENTR LATION	PG. LLEV	CL-OFFSET	SLOPE	C/F	OFFSET	ELEVATION
376+74.46	376+74.46	1796.69	0.0	4.00	2.96	-56.63	1793.73
376+94.46	376+94.46	1796.06	0.0	4.00	3.66	-53.37	1792.40
377+0.0	377+0.0	1795.88	0.0	4.00	3.68	-53.39	1792.20
377+14.46	377+14.46	1795.43	0.0	4.00	3.23	-55.11	1792.20
377+34.46	377+34.46	1794.79	0.0	4.00	3.40	-64.06	1791.40
377+54.46	377+54.46	1794.16	0.0	4.00	2.53	-67.23	1791.63
377+74.46	377+74.46	1793.53	0.0	4.00	1.47	-71.42	1791.16
377+94.46	377+94.46	1792.90	0.0	4.00	0.81	-73.56	1792.09
378+0.0	378+0.0	1792.71	0.0	4.00	0.60	-74.35	1792.13
378+14.46	378+14.46	1792.27	0.0	4.00	1.39	-75.64	1792.04
378+34.46	378+34.46	1791.64	0.0	4.00	0.17	-75.57	1791.47
378+54.46	378+54.46	1791.01	0.0	4.00	-0.19	-76.57	1791.20
378+74.46	378+74.46	1790.38	0.0	4.00	-0.76	-78.38	1791.16
379+0.0	379+0.0	1789.54	0.0	4.00	-0.88	-78.78	1790.45
380+0.0	380+0.0	1788.44	0.0	4.00	-2.31	-84.50	1788.73
380+50.00	380+50.00	1788.85	0.0	4.00	-4.15	-84.91	1789.00
381+0.0	381+0.0	1783.27	0.0	4.00	-5.35	-87.49	1788.62
382+0.0	382+0.0	1780.12	0.0	4.00	-1.26	-84.22	1784.38
382+26.00	382+26.00	1779.30	0.0	4.00	-2.77	-86.38	1776.30
382+57.00	382+57.00	1778.32	0.0	4.00	-1.25	-80.28	1779.57
383+0.0	383+0.0	1776.96	0.0	4.00	1.57	-65.76	1774.59
384+0.0	384+0.0	1773.81	0.0	4.00	-7.91	-96.36	1765.90
384+36.00	384+36.00	1772.67	0.0	4.00	8.27	-57.82	1764.40
385+0.0	385+0.0	1770.66	0.0	4.00	7.53	-57.35	1763.30
386+0.0	386+0.0	1767.50	0.0	4.00	5.66	-55.32	1761.95
387+0.0	387+0.0	1764.35	0.0	4.00	3.72	-60.41	1760.64
388+0.0	388+0.0	1759.83	0.0	4.00	0.41	-67.55	1759.43
389+0.0	389+0.0	1758.55	0.0	4.00	-0.46	-77.11	1759.01
389+50.00	389+50.00	1758.50	0.0	4.00	-0.28	-76.44	1759.67
390+0.0	390+0.0	1756.38	0.0	4.00	1.20	-82.48	1755.18
390+70.00	390+70.00	1755.17	0.0	4.00	1.67	-88.59	1753.50
391+0.0	391+0.0	1752.44	0.0	4.00	0.97	-71.39	1752.62
392+0.0	392+0.0	1752.97	0.0	4.00	1.37	-69.79	1751.60
393+0.0	393+0.0	1752.83	0.0	4.00	1.14	-70.71	1751.69
393+78.00	393+78.00	1752.83	0.0	4.00	1.14	-70.71	1751.69
394+0.0	394+0.0	1752.82	0.0	4.00	1.35	-69.85	1751.47
395+0.0	395+0.0	1752.77	0.0	4.00	-0.05	-75.53	1752.18
396+0.0	396+0.0	1752.72	0.0	4.00	-0.42	-76.93	1753.11
396+59.18	396+59.18	1752.69	0.0	4.00	-0.61	-78.72	1753.29
397+0.0	397+0.0	1752.67	0.0	4.00	-0.76	-79.44	1753.42
397+9.18	397+9.18	1752.65	0.0	4.00	-1.05	-81.00	1753.30
397+29.18	397+29.18	1752.65	0.0	4.00	-0.66	-79.75	1753.31
397+49.18	397+49.18	1752.64	0.0	4.00	-0.85	-81.05	1753.47
397+69.18	397+69.18	1752.62	0.0	4.00	-0.63	-80.29	1753.24
398+0.0	398+0.0	1752.62	0.0	4.00	-0.51	-80.25	1753.11
398+29.18	398+29.18	1752.60	0.0	4.00	-0.67	-81.14	1753.26
398+49.18	398+49.18	1752.59	0.0	4.00	-1.43	-74.12	1751.10
399+0.0	399+0.0	1752.51	0.0	4.00	2.11	-71.40	1750.40
400+0.0	400+0.0	1752.44	0.0	4.00	1.66	-73.00	1750.72
401+0.0	401+0.0	1752.36	0.0	4.00	3.65	-55.25	1748.71
402+0.0	402+0.0	1752.30	0.0	4.00	4.41	-62.22	1747.90
403+0.0	403+0.0	1752.25	0.0	4.00	4.05	-63.64	1748.20
404+0.0	404+0.0	1752.24	0.0	4.00	3.94	-64.10	1748.30
405+0.0	405+0.0	1752.24	0.0	4.00	4.41	-62.22	1747.83
406+0.0	406+0.0	1752.25	0.0	4.00	5.15	-60.76	1747.10
407+0.0	407+0.0	1752.26	0.0	4.00	5.07	-63.62	1746.39
408+0.0	408+0.0	1752.28	0.0	4.00	4.88	-60.35	1747.40
409+0.0	409+0.0	1752.30	0.0	4.00	5.22	-61.03	1747.08
410+0.0	410+0.0	1752.33	0.0	4.00	6.83	0.0	1745.50
411+0.0	411+0.0	1752.34	0.0	4.00	7.34	0.0	1745.00
412+0.0	412+0.0	1752.37	0.0	4.00	8.17	0.0	1743.20
413+0.0	413+0.0	1752.39	0.0	4.00	17.09	0.0	1734.70
414+0.0	414+0.0	1752.40	0.0	4.00	19.80	0.0	1734.00
415+0.0	415+0.0	1752.41	0.0	4.00	13.91	0.0	1736.50
416+0.0	416+0.0	1752.42	0.0	4.00	8.53	0.0	1743.60
417+0.0	417+0.0	1752.43	0.0	4.00	7.36	0.0	1745.10
418+0.0	418+0.0	1752.44	0.0	4.00	7.85	-51.57	1744.61
419+0.0	419+0.0	1752.45	0.0	4.00	7.43	-49.87	1745.15
420+0.0	420+0.0	1752.46	0.0	4.00	7.21	-49.00	1745.50
421+0.0	421+0.0	1752.47	0.0	4.00	7.77	-47.77	1746.12
422+0.0	422+0.0	1752.48	0.0	4.00	5.25	-41.14	1748.13
423+0.0	423+0.0	1752.49	0.0	4.00	6.57	-34.42	1745.47
424+0.0	424+0.0	1752.50	0.0	4.00	9.23	-57.08	1745.22
425+0.0	425+0.0	1752.51	0.0	4.00	9.81	-59.41	1745.09
426+0.0	426+0.0	1752.51	0.0	4.00	11.00	-64.16	1744.41
427+0.0	427+0.0	1752.51	0.0	4.00	12.84	-65.70	1743.11
428+0.0	428+0.0	1752.51	0.0	4.00	12.26	-64.59	1745.92
429+0.0	429+0.0	1752.51	0.0	4.00	16.24	-72.56	1743.90
430+0.0	430+0.0	1752.51	0.0	4.00	16.70	-73.48	1743.00
431+0.0	431+0.0	1752.51	0.0	4.00	17.85	-75.78	1745.01
432+0.0	432+0.0	1752.51	0.0	4.00	17.20	-74.48	1747.55
433+0.0	433+0.0	1752.51	0.0	4.00	17.43	-74.14	1749.34
434+0.0	434+0.0	1752.51	0.0	4.00	14.89	-69.86	1752.22
435+0.0	435+0.0	1752.51	0.0	4.00	14.68	-69.45	1754.42
436+0.0	436+0.0	1752.51	0.0	4.00	14.11	-68.38	1754.77
437+0.0	437+0.0	1752.51	0.0	4.00	17.05	-74.18	1753.94
438+0.0	438+0.0	1752.51	0.0	4.00	12.44	-69.94	1761.77
439+0.0	439+0.0	1752.51	0.0	4.00	11.68	-68.26	1769.88
440+0.0	440+0.0	1752.51	0.0	4.00	11.55	-68.15	1765.04
441+0.0	441+0.0	1752.51	0.0	4.00	11.55	-68.22	1766.40
442+0.0	442+0.0	1752.51	0.0	4.00	7.86	-51.59	1772.30
443+0.0	443+0.0	1752.51	0.0	4.00	6.22	-45.03	1777.48
444+0.0	444+0.0	1752.51	0.0	4.00	3.96	-43.91	1784.40
445+0.0	445+0.0	1752.51	0.0	4.00	0.96	-75.99	1792.15
446+0.0	446+0.0	1752.51	0.0	4.00	0.59	-80.15	1802.90
447+0.0	447+0.0	1752.51	0.0	4.00	-11.36	-87.65	1811.90
448+0.0	448+0.0	1752.51	0.0	4.00	-15.30	-90.52	1817.50
449+0.0	449+0.0	1752.51	0.0	4.00	-20.40	-98.71	1826.77
450+0.0	450+0.0	1752.51	0.0	4.00	-11.39	-88.10	1821.75
451+0.0	451+0.0	1752.51	0.0	4.00	-9.57	-85.99	1821.20
452+0.0	452+0.0	1752.51	0.0	4.00	-7.24	-86.59	1823.99
453+0.0	453+0.0	1752.51	0.0	4.00	-18.20	-104.95	1834.36
454+0.0	454+0.0	1752.51	0.0	4.00	-4.98	-84.83	1824.54
455+0.0	455+0.0	1752.51	0.0	4.00	-4.30	-92.79	1825.14
456+0.0	456+0.0	1752.51	0.0	4.00	-2.74	-94.98	1825.07
457+0.0	457+0.0	1752.51	0.0	4.00	-5.46	-96.26	1828.02
458+0.0	458+0.0	1752.51	0.0	4.00	-3.37	-94.98	1827.56
459+0.0	459+0.0	1752.51	0.0	4.00	-2.08	-91.19	1827.47
460+0.0	460+0.0	1752.51	0.0	4.00	-0.00	-89.85	1826.02
461+0.0	461+0.0	1752.51	0.0	4.00	1.25	-84.67	1825.51
462+0.0	462+0.0	1752.51	0.0	4.00	3.09	-80.06	1825.69
463+0.0	463+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
464+0.0	464+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
465+0.0	465+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
466+0.0	466+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
467+0.0	467+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
468+0.0	468+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
469+0.0	469+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
470+0.0	470+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
471+0.0	471+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
472+0.0	472+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
473+0.0	473+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
474+0.0	474+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
475+0.0	475+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
476+0.0	476+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
477+0.0	477+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
478+0.0	478+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
479+0.0	479+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
480+0.0	480+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
481+0.0	481+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
482+0.0	482+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
483+0.0	483+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
484+0.0	484+0.0	1752.51	0.0	4.00	4.08	-53.54	1824.59
485+0.0	485+0.0	1752.51	0.0	4.00	4.08</		

NORTH DAKOTA
CONCRETE PRODUCTS
COMPANY

6-027,174

DRAWN BY:
HARVEY KADRMAS

DESIGN DATA

CONCRETE
DESIGN - 5,000 P.S.I.
DETENSION - 4,000 P.S.I.
STRAND - 270 K.S.I. LOW-LAX
REINFORCING STEEL - GR. 60
(Except as noted)
PRESTRESS LOSSES - 27,383 P.S.I. for 36'-2"
39,959 P.S.I. for 48'-4"
LOADING - HS-20

SHOP DRAWINGS
STRUCTURE

QUANTITIES

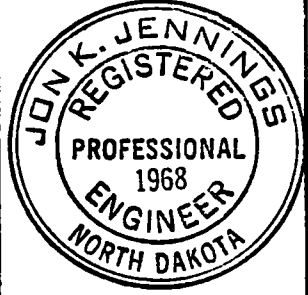
	SPAN		
SKEW NONE	1	2	3
NO. OF BEAMS	4	4	4
HEIGHT	27"	27"	27"
LENGTH	36'-2"	48'-4"	36'-2"

INDEX OF SHEETS

1 TITLE SHEET
2 BRIDGE LAYOUT
3-4 BEAM DIMENSIONS
5-6 PRESTRESS
7-9 REINFORCING
10-11 BENT BAR DETAILS
12-14 EXTERIOR BEAMS

PROJECT NO. — RS-BRS-1-006(03)011
COUNTY — MORTON & SIOUX
ENGINEER — NO. DAK. STATE
HIGHWAY DEPT.
CONTRACTOR — ANNCO

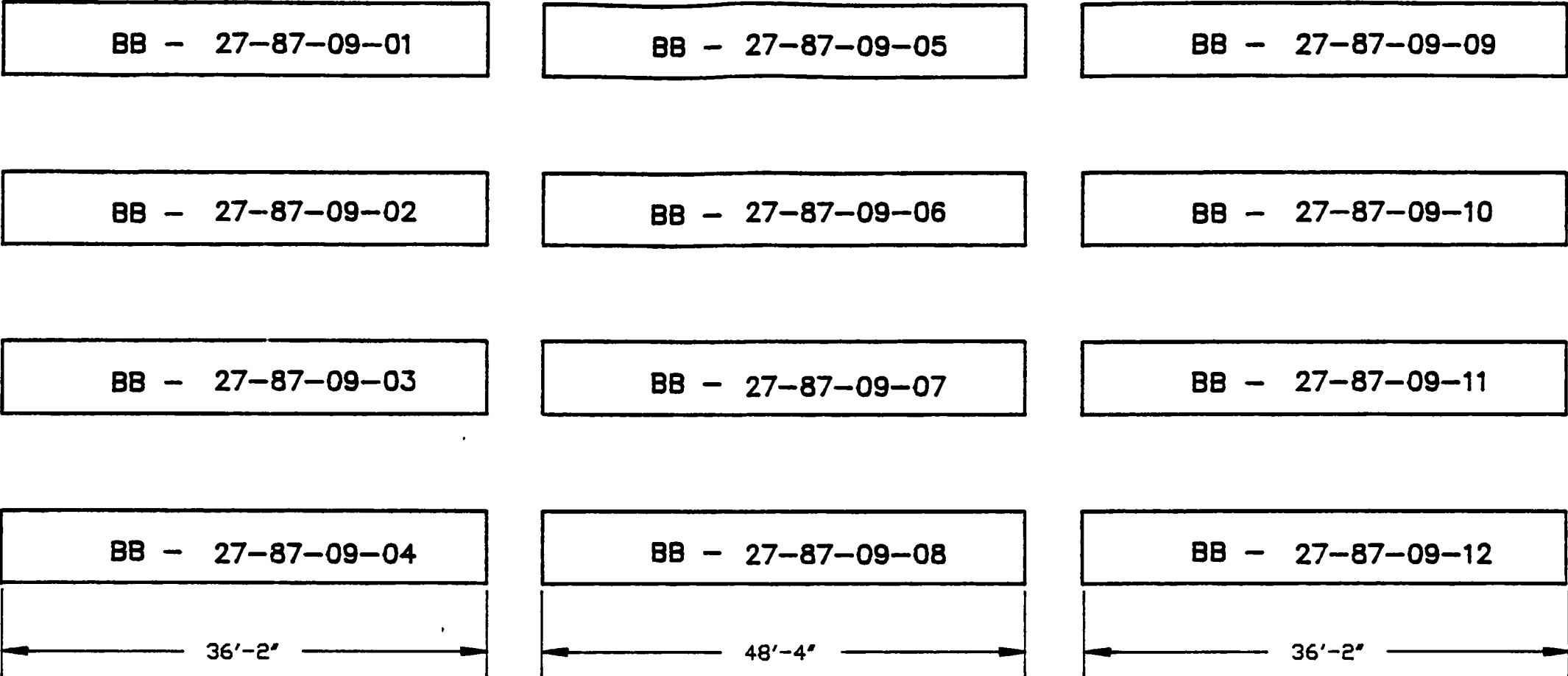

JON K. JENNINGS
P.E. 1968
DATE: 4-15-87



TITLE SHEET

BB-27-87-09

Void Drains to be located on NORTH side of each beam.



SPAN 1

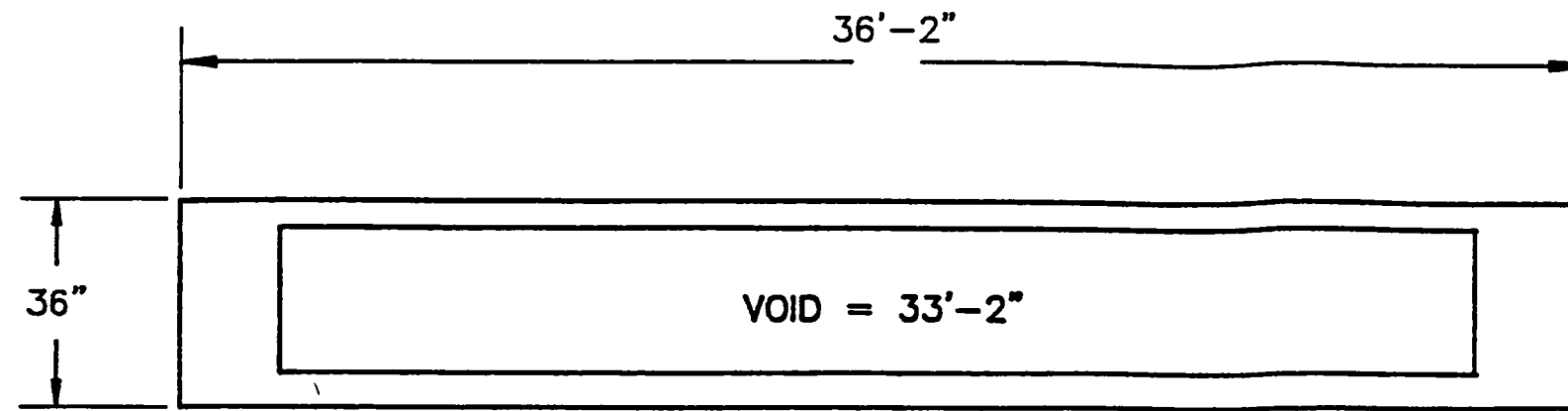
SPAN 2

SPAN 3

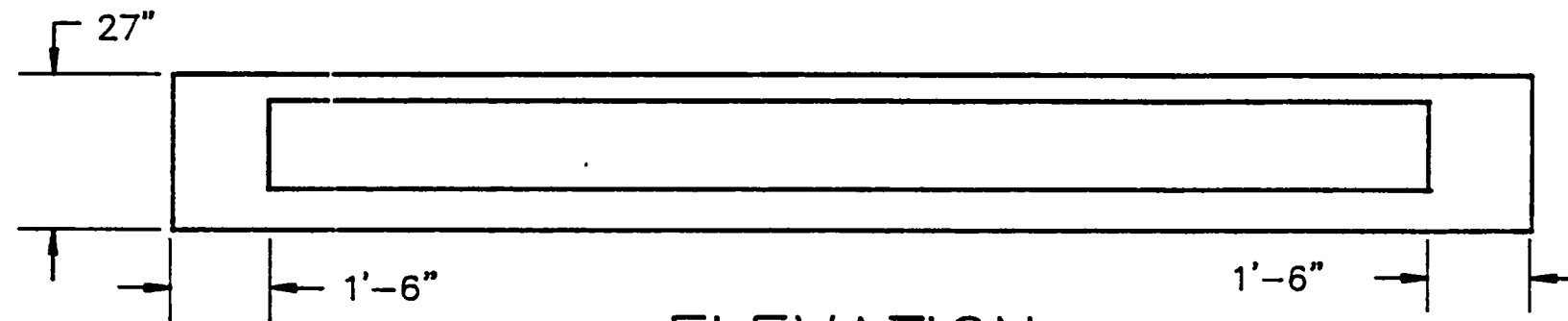


PLAN
NO SCALE

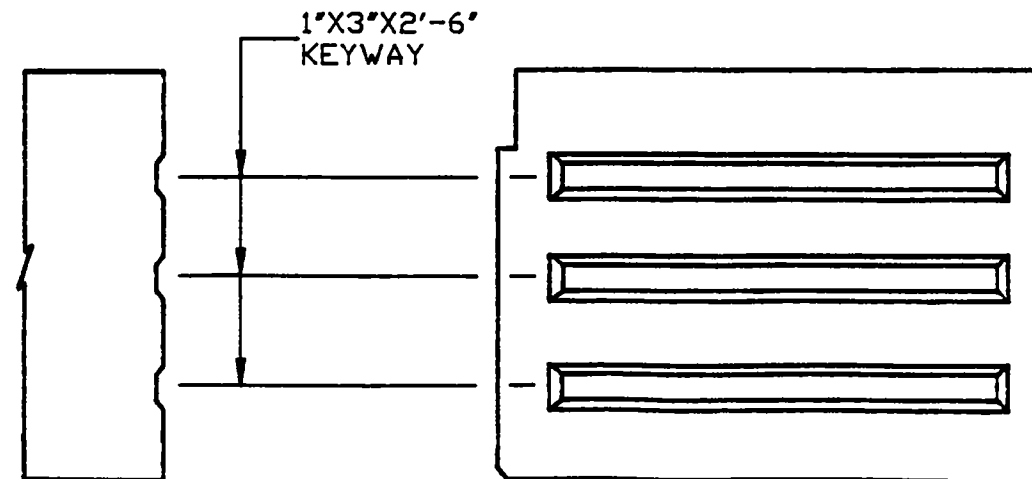
BRIDGE LAYOUT
BB-27-87-09



PLAN
NO SCALE

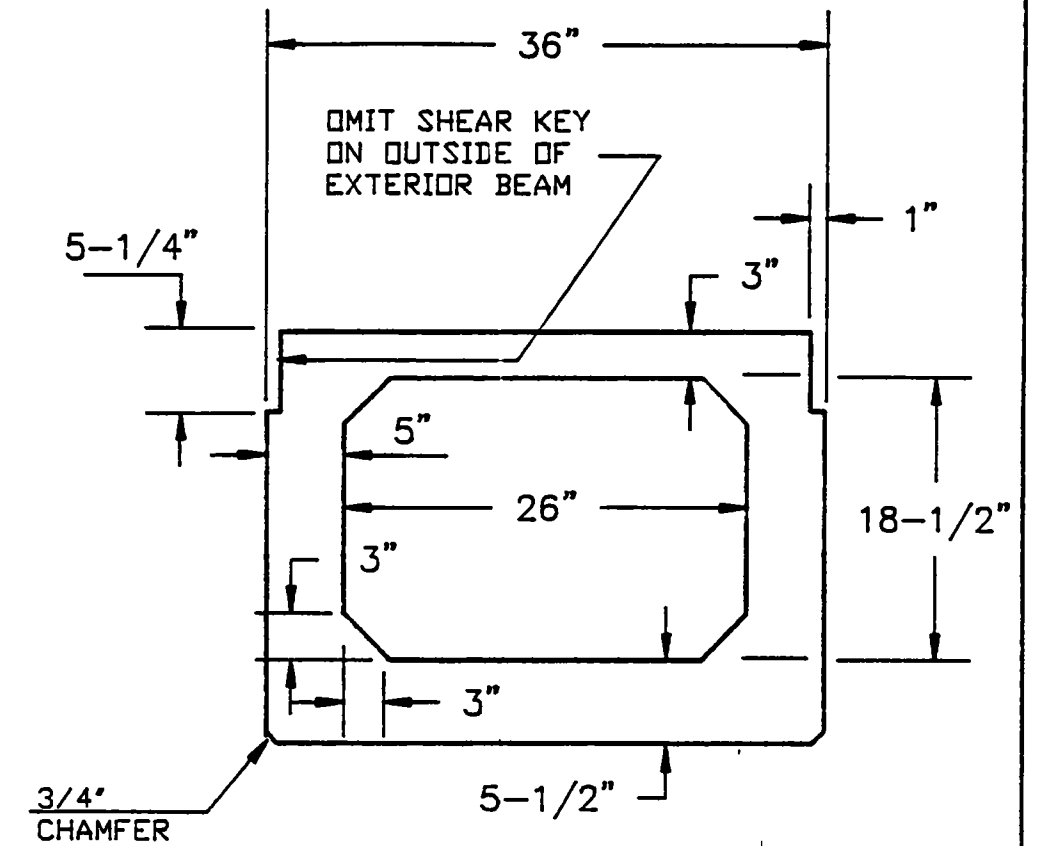


ELEVATION
NO SCALE



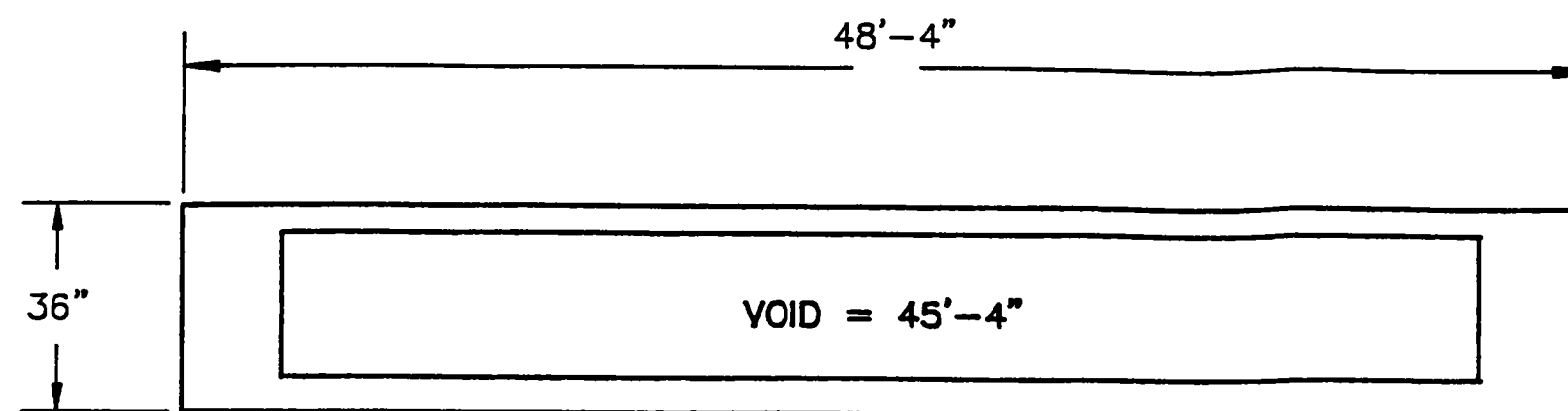
PART ELEVATION
SHOWING KEYWAYS

SECTION
SHOWING KEYWAYS

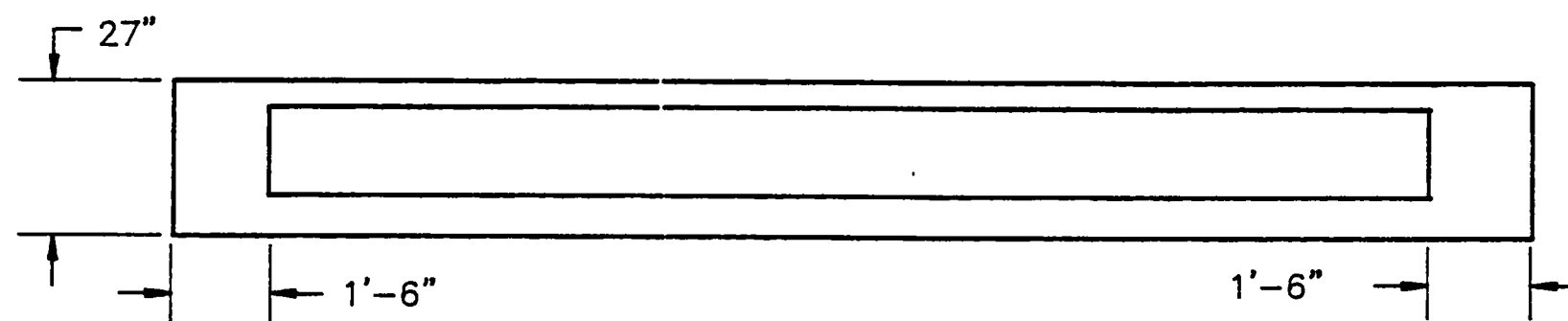


SECTION

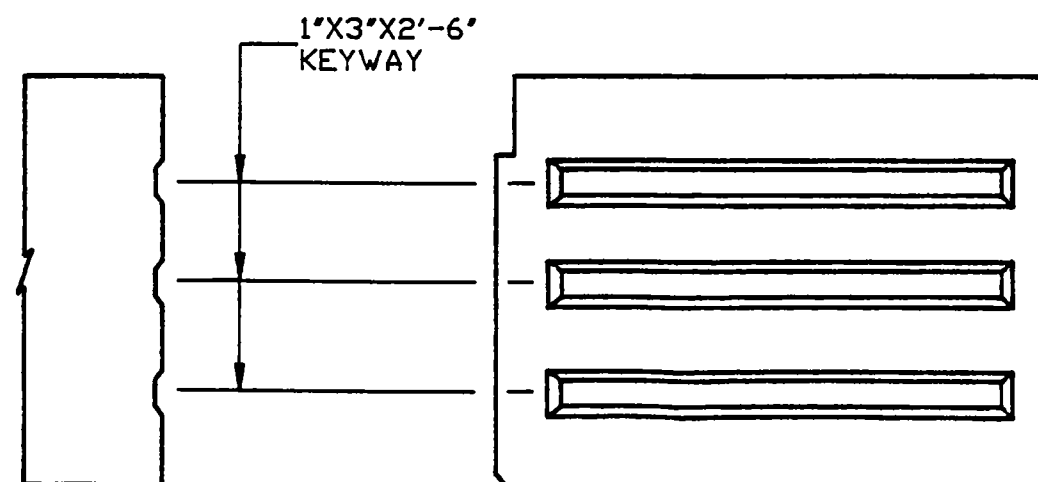
DIMENSIONS
SPAN 1 & 3
BB-27-87-09



PLAN
NO SCALE

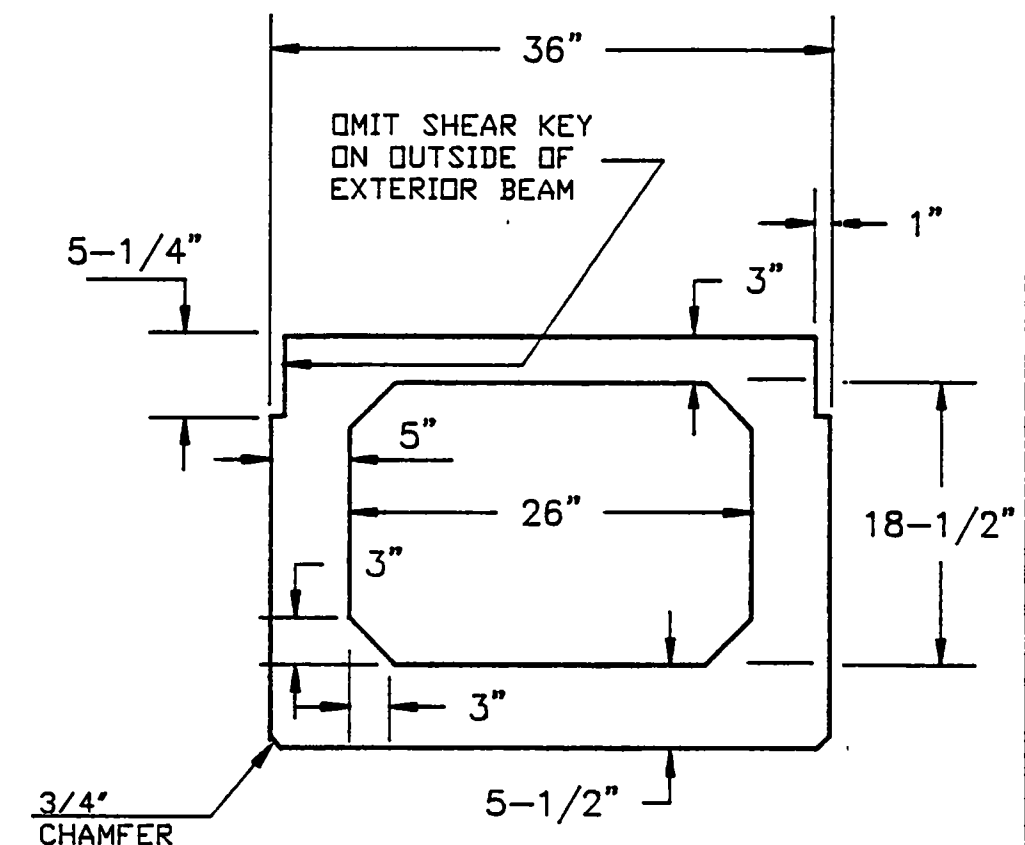


ELEVATION
NO SCALE



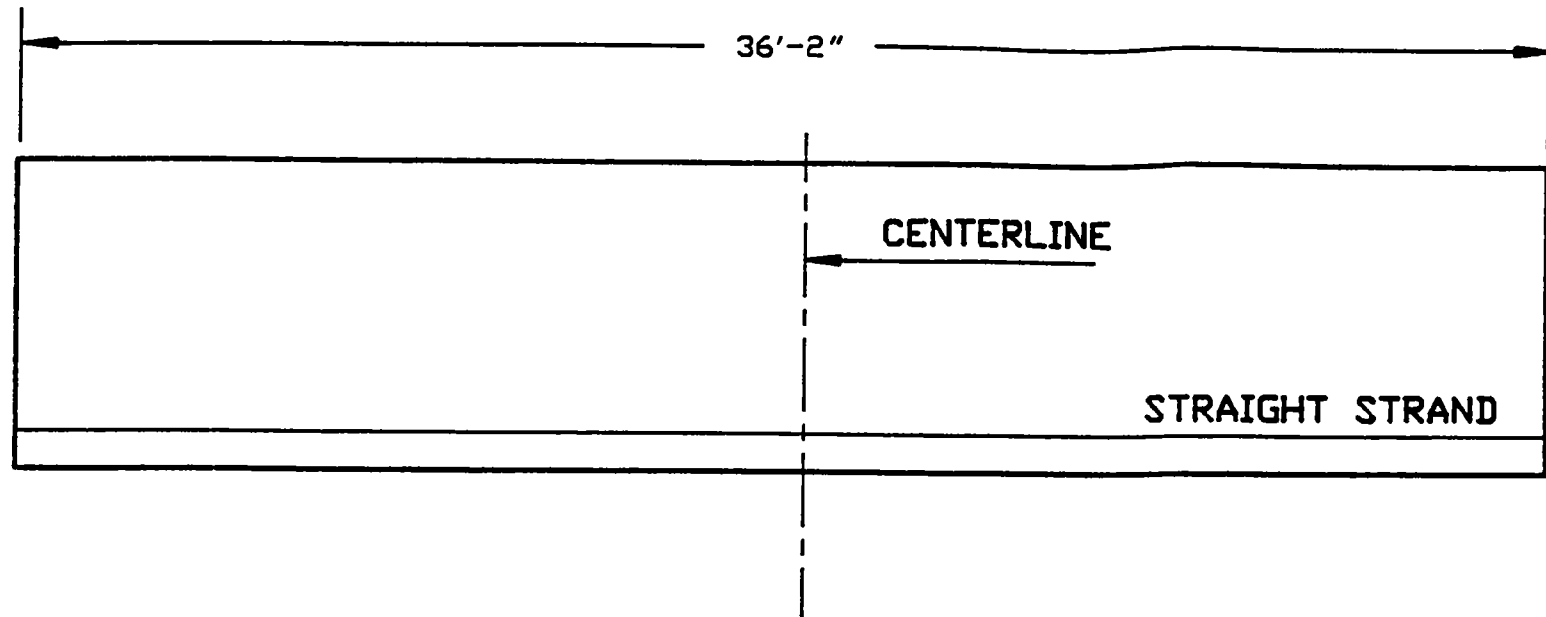
PART ELEVATION
SHOWING KEYWAYS

SECTION
SHOWING KEYWAYS



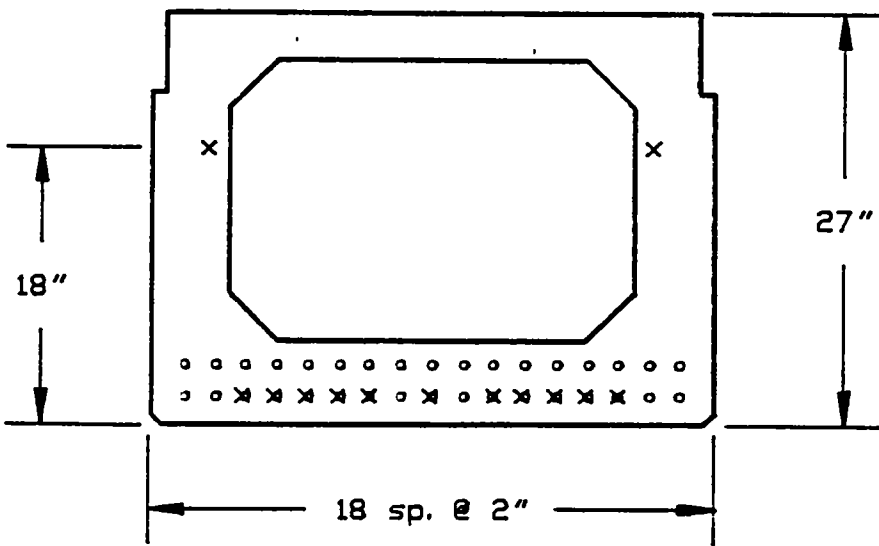
SECTION

DIMENSIONS
SPAN 2
BB-27-87-09

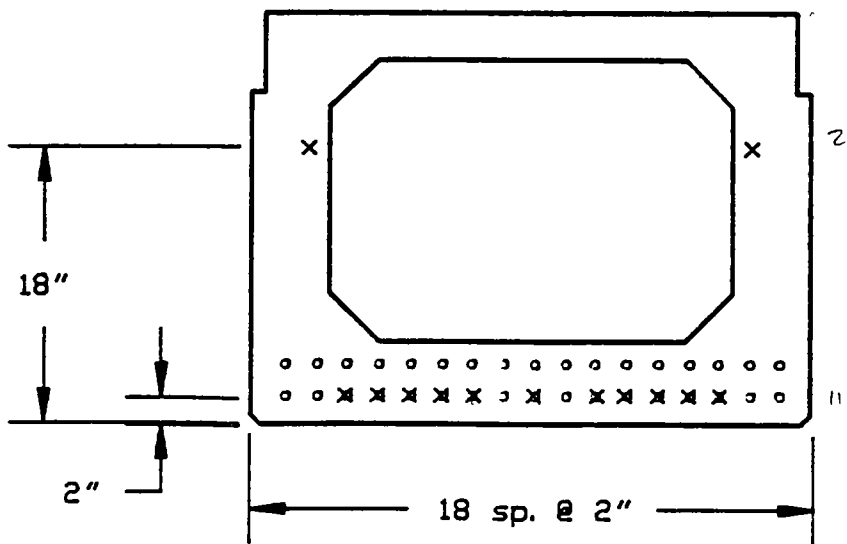


NO. OF DRAPED STRAND = 0
NO. OF STRAIGHT STRAND = 13
TOTAL NO. 1/2" Ø STRAND = 13
CENTER OF GRAVITY AT END = 4.46"
CENTER OF GRAVITY AT CNTRLN = 4.46"
INITIAL FORCE = 402.77 K
FINAL FORCE = 348.31 K

ELEVATION

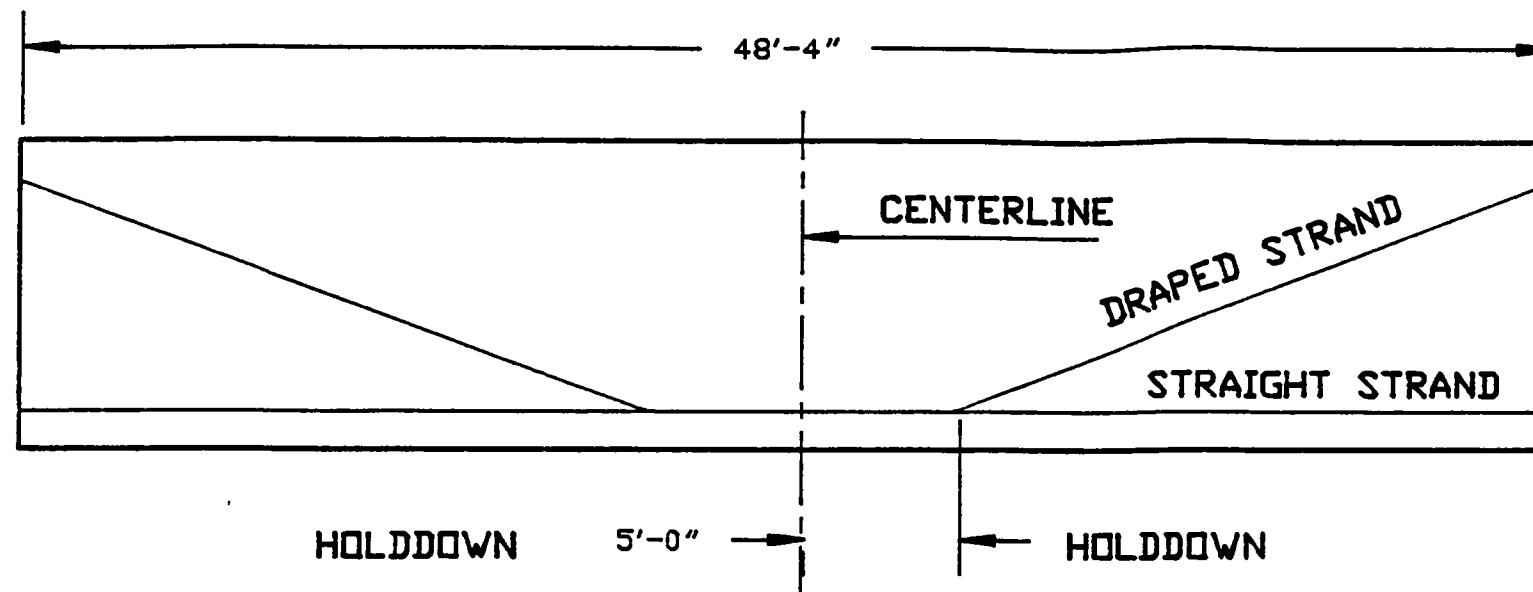


SECTION
AT
END



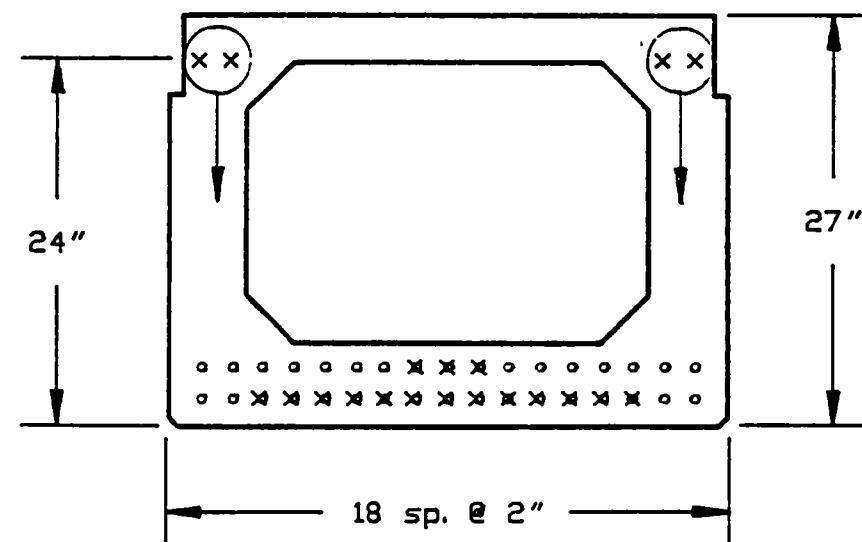
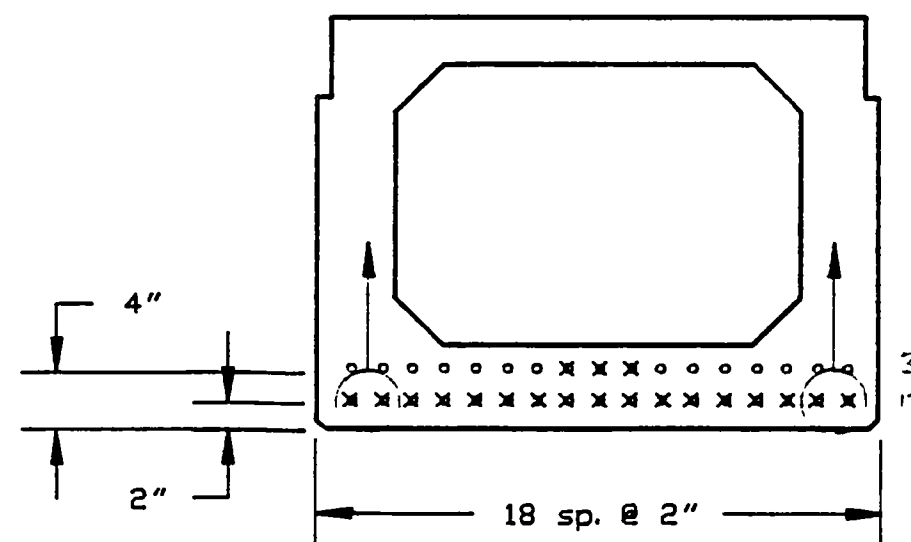
SECTION
AT
CENTERLINE

STRAND
SPAN 1 & 3
BB-27-87-09

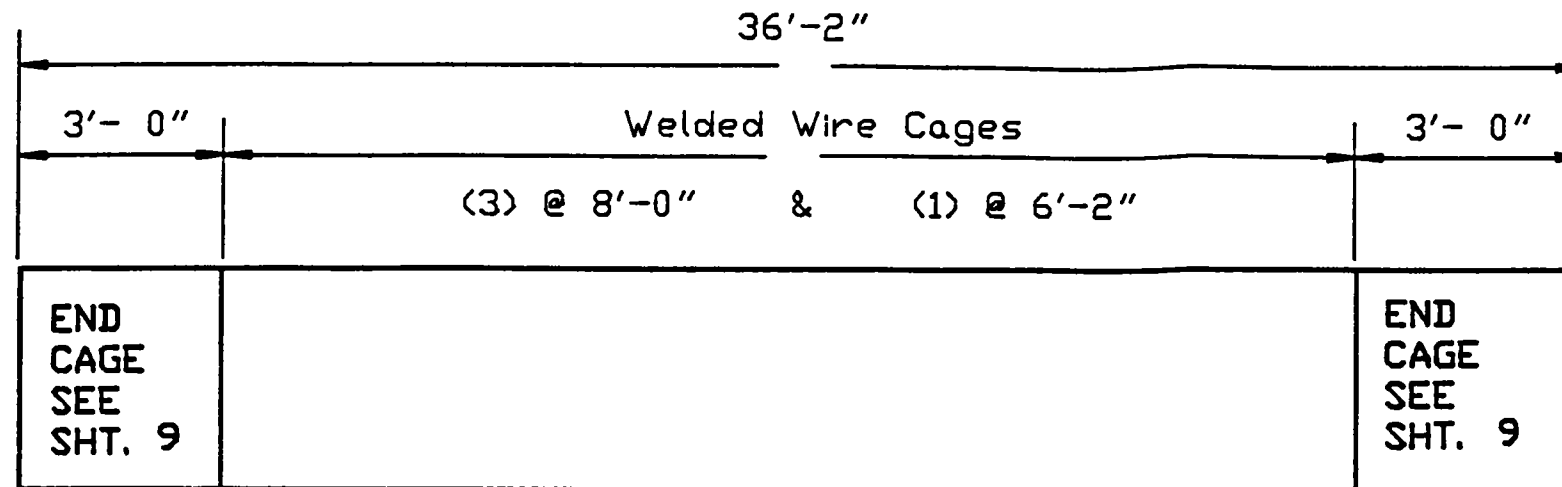


ELEVATION

NO. OF DRAPED STRAND	= 4
NO. OF STRAIGHT STRAND	= 16
TOTAL NO. 1/2" Ø STRAND	= 20
CENTER OF GRAVITY AT END	= 6.70"
CENTER OF GRAVITY AT CNTRLN	= 2.30"
INITIAL FORCE	= 619.65 K
FINAL FORCE	= 497.38 K

SECTION
AT
ENDSECTION
AT
CENTERLINE

STRAND
SPAN 2
BB-27-87-09

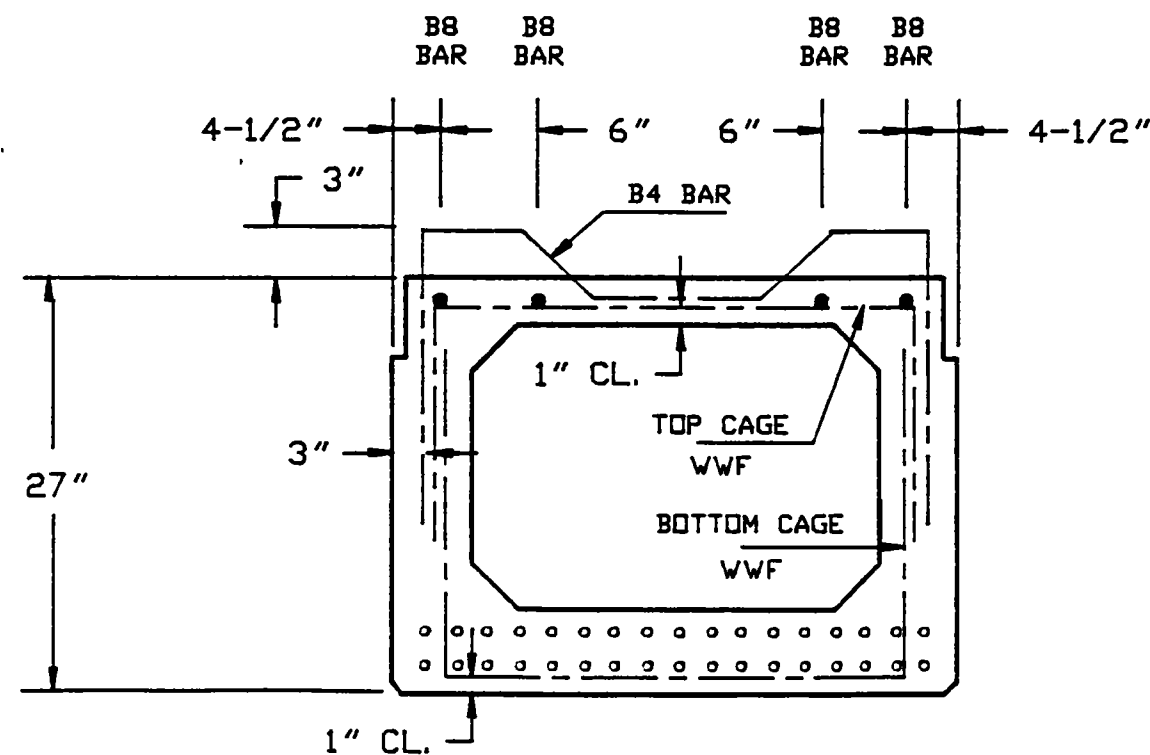


ELEVATION
NO SCALE

NOTES :

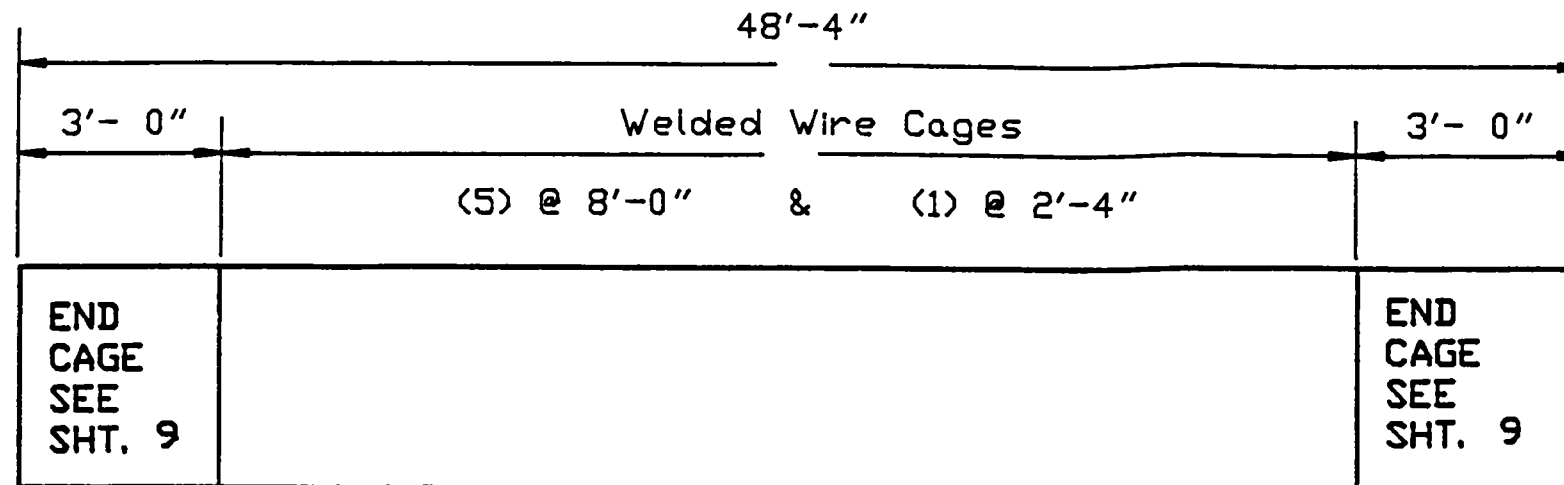
WELDED WIRE FABRIC WILL BE USED TOP AND BOTTOM WITH A CIRCUMFERENTIAL STEEL AREA EQUAL TO A MINIMUM OF 0.15 SQUARE INCHES PER FOOT. TOP AND BOTTOM CAGE LEGS TO OVERLAP A MINIMUM OF 12 INCHES.

B4 BAR IS TO BE SPACED A MAXIMUM OF 1'-4" ACROSS BEAM AND HAVE A MINIMUM OF 15" LEG EMBEDMENT INTO BEAM



SECTION

REINFORCING
SPAN 1 & 3
BB-27-87-09

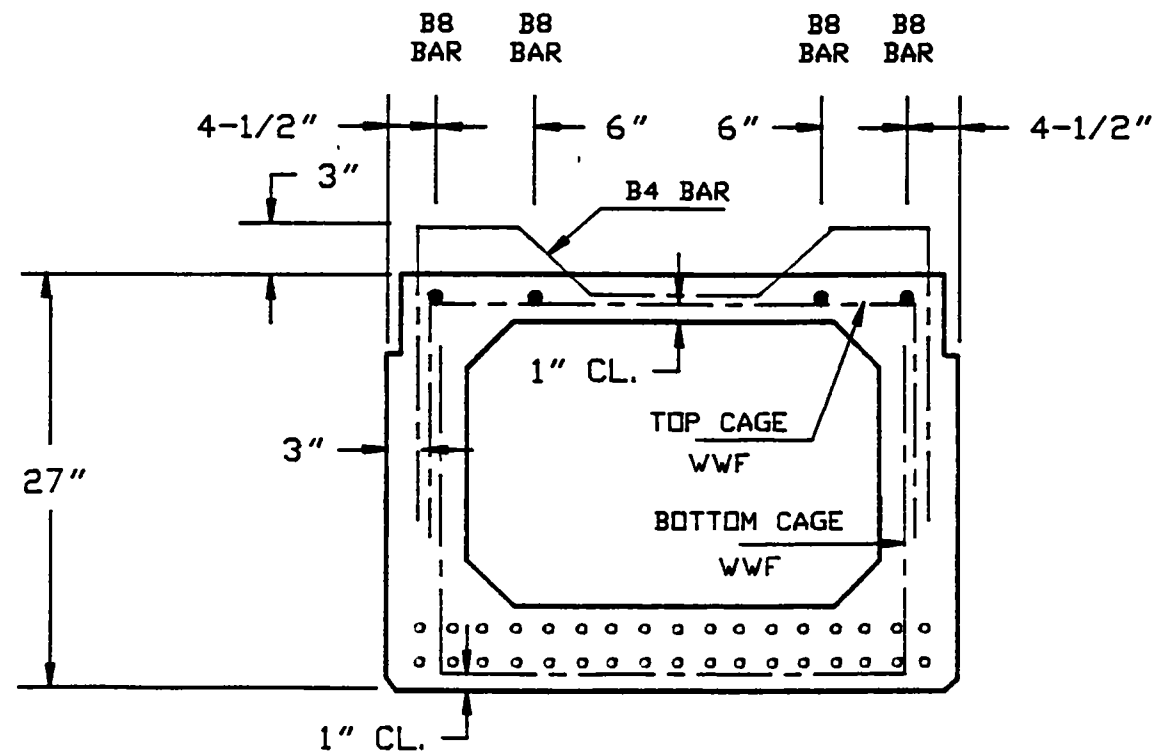


ELEVATION
NO SCALE

NOTES :

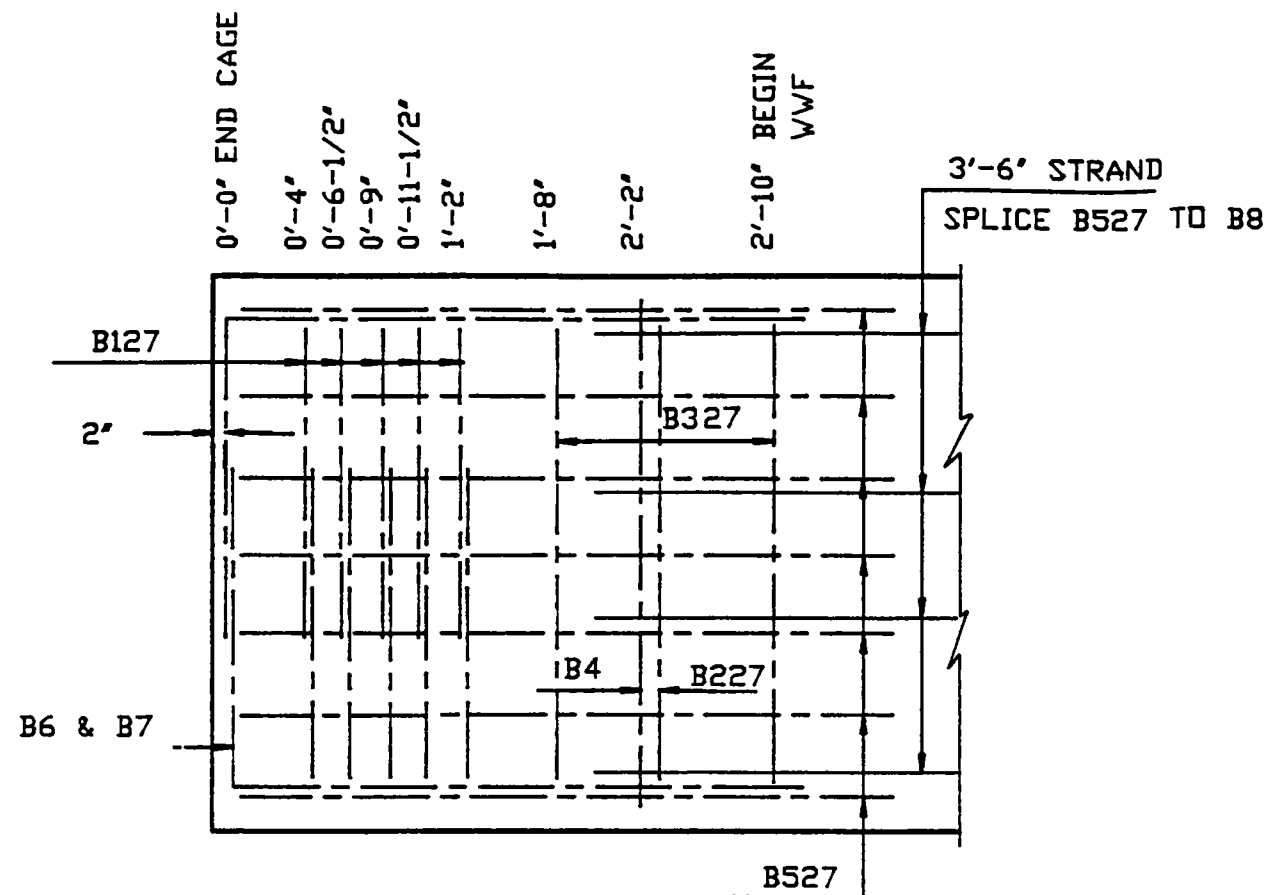
WELDED WIRE FABRIC WILL BE USED TOP AND BOTTOM WITH A CIRCUMFERENTIAL STEEL AREA EQUAL TO A MINIMUM OF 0.15 SQUARE INCHES PER FOOT. TOP AND BOTTOM CAGE LEGS TO OVERLAP A MINIMUM OF 12 INCHES.

B4 BAR IS TO BE SPACED A MAXIMUM OF 1'-4" ACROSS BEAM AND HAVE A MINIMUM OF 15" LEG EMBEDMENT INTO BEAM

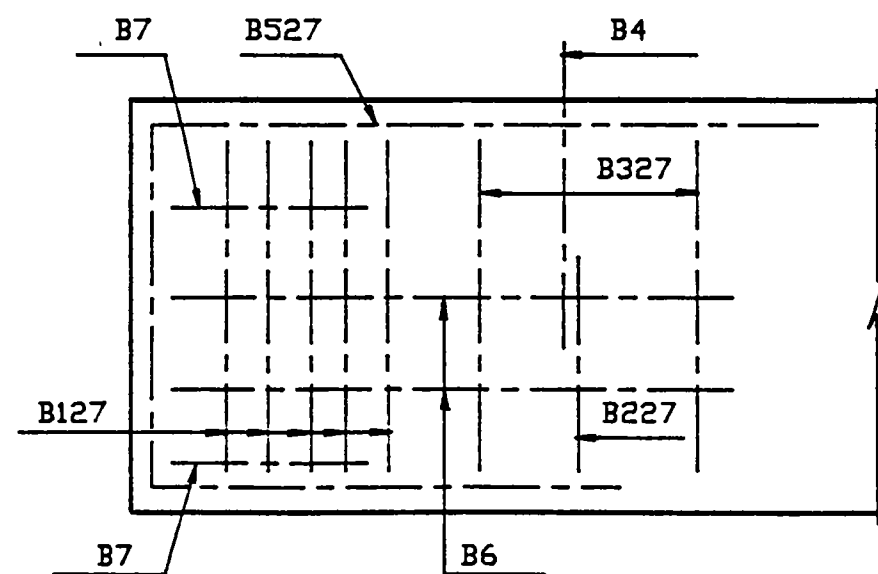


SECTION

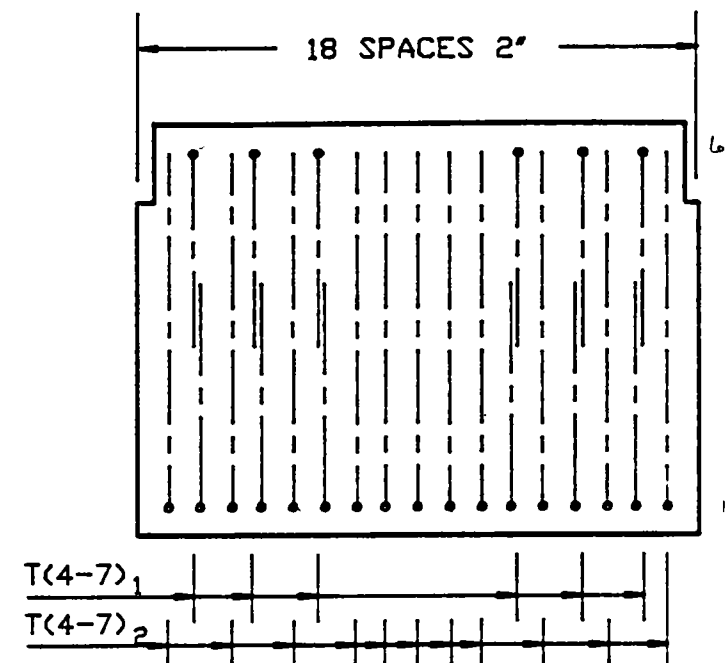
REINFORCING
SPAN 2
BB-27-87-09



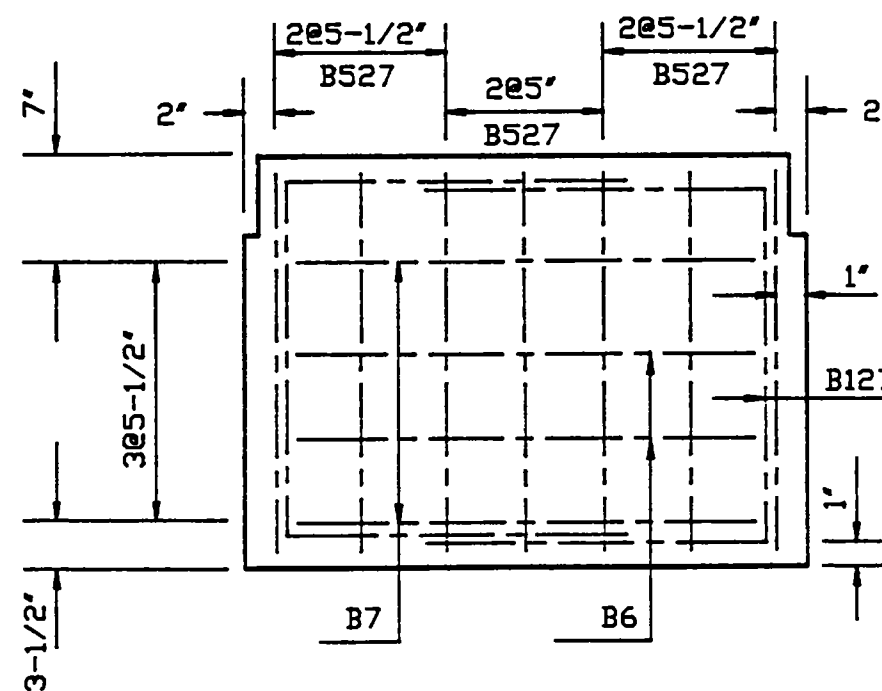
PLAN



ELEVATION

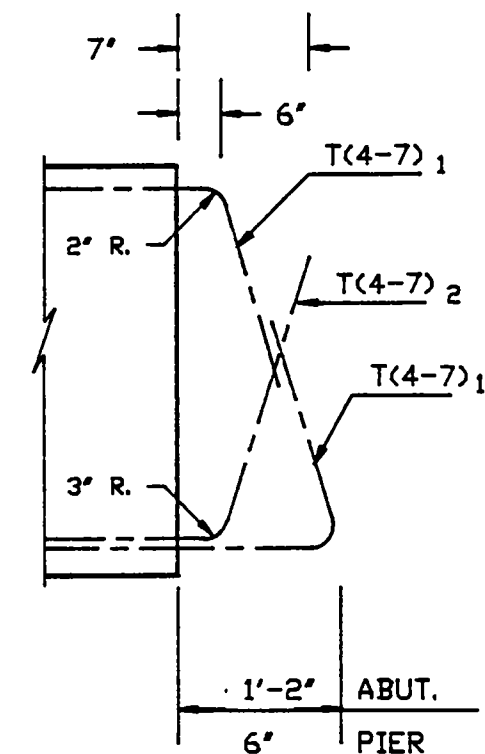


SECTION
SHOWING T BARS



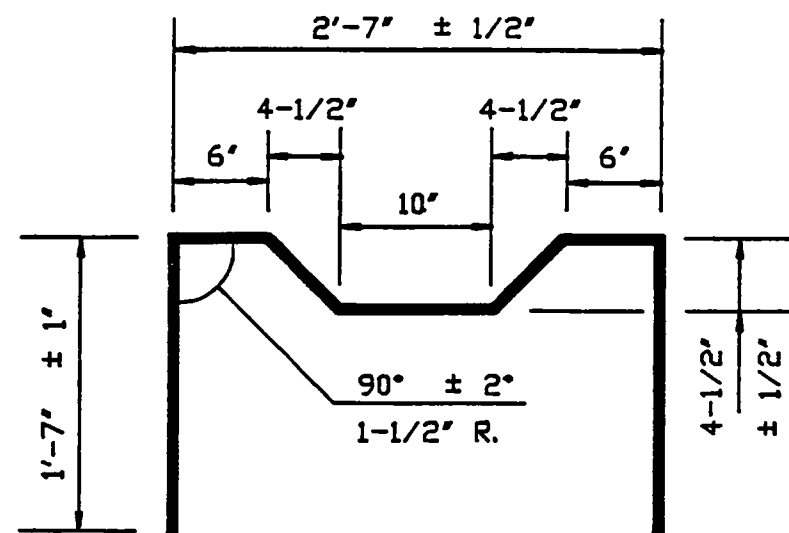
SECTION

T BARS TO EXTEND 2'-1"
FROM END OF BEAM

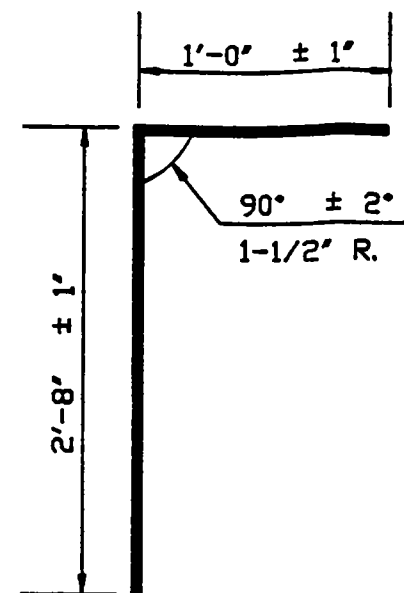


ELEVATION
SHOWING T BARS

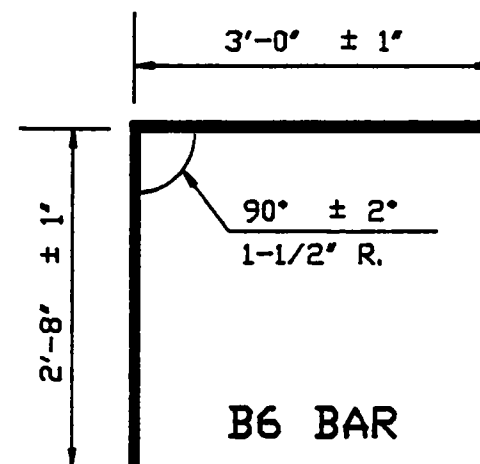
END STEEL
SPAN 1, 2 & 3
BB-27-87-09



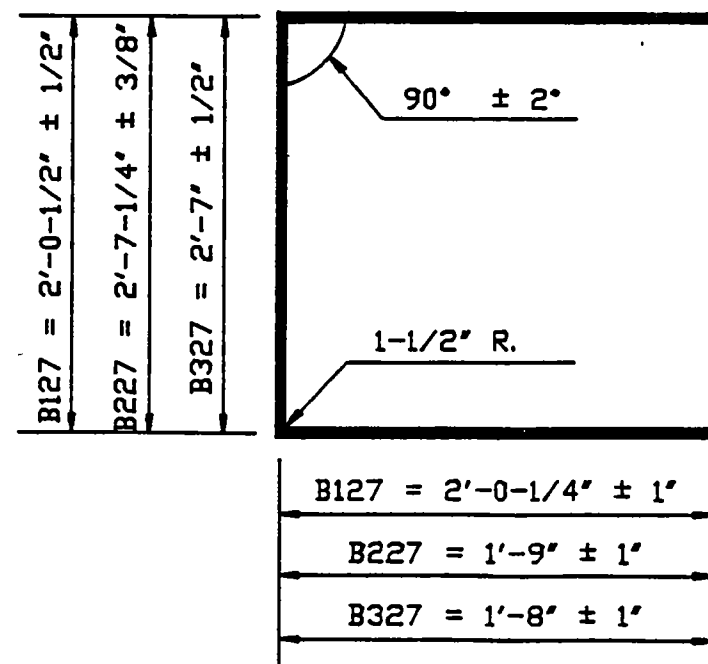
B4 BAR



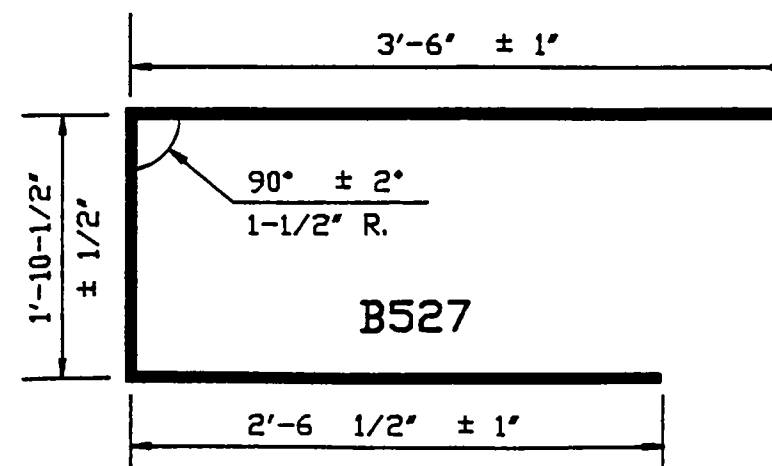
B7 BAR



B6 BAR



B127, B227, B327 BARS



B527

REINFORCING STEEL SCHEDULE

MARK	TYPE	SIZE	LENGTH	QTY\BEAM	TOTAL
B127	BENT	4	6'-1"	20 ✓	160
B227	BENT	4	6'-1"	2 ✓	16
B327	BENT	4	5'-11"	4 ✓	32
B4	BENT	4	6'-0"	25 ✓	200
B527	BENT	4	7'-11"	14	112
B6	BENT	4	5'-8"	8 ✓	64
B7	BENT	4	3'-8"	8 ✓	64
B8	STR	4	9'-6"	16 ✓	128
T(4-7)	STR	4	4'-7"	46	368

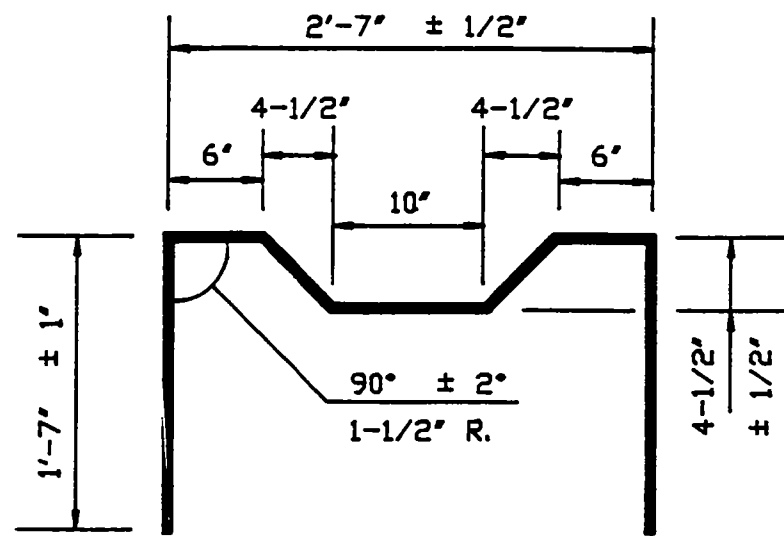
ALL REBAR TO BE GRADE 60
EXCEPT T BARS TO BE
GRADE 40.

ALL DIMENSIONS ARE OUT TO OUT.

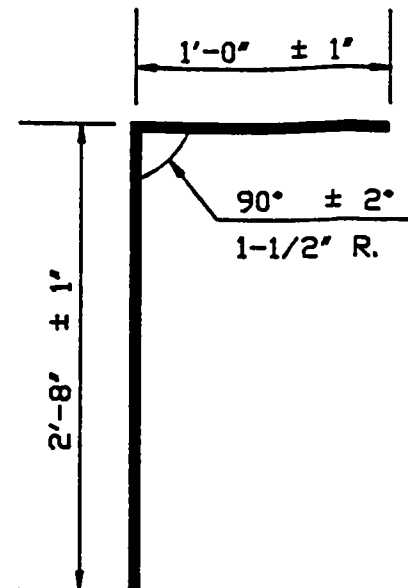
REBAR DETAILS

SPAN 1 & 3

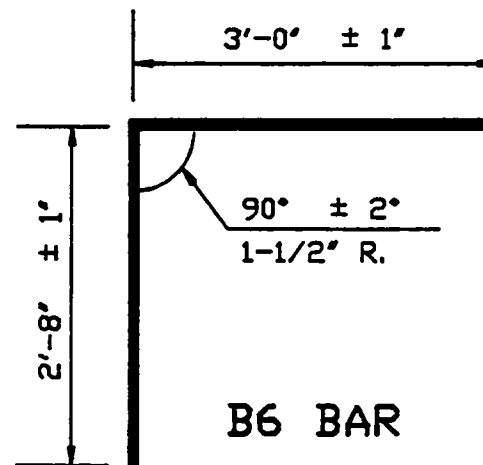
BB-27-87-09



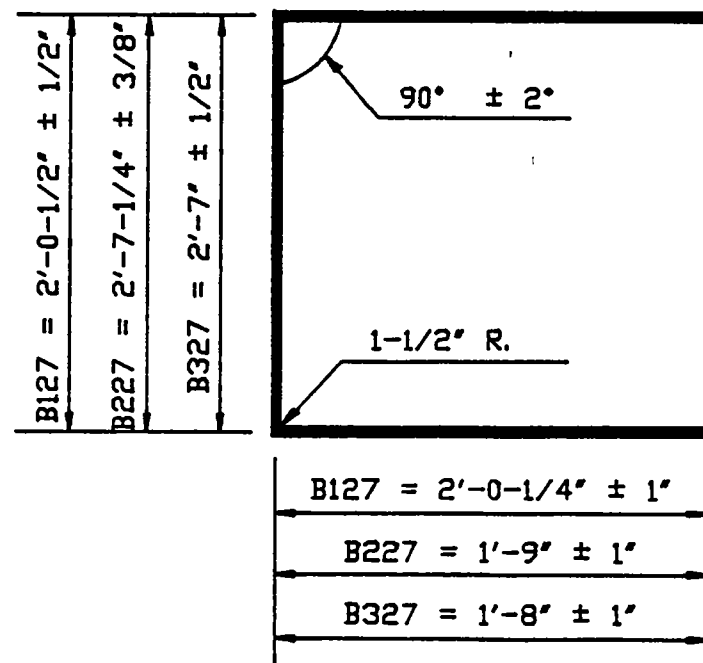
B4 BAR



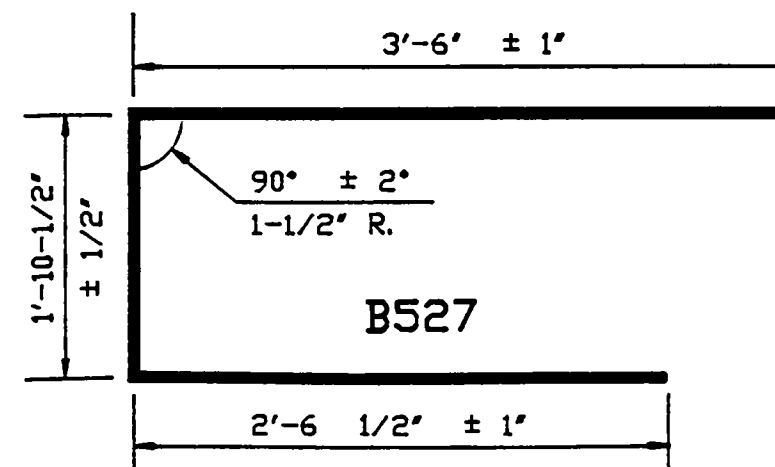
B7 BAR



B6 BAR



B127, B227, B327 BARS



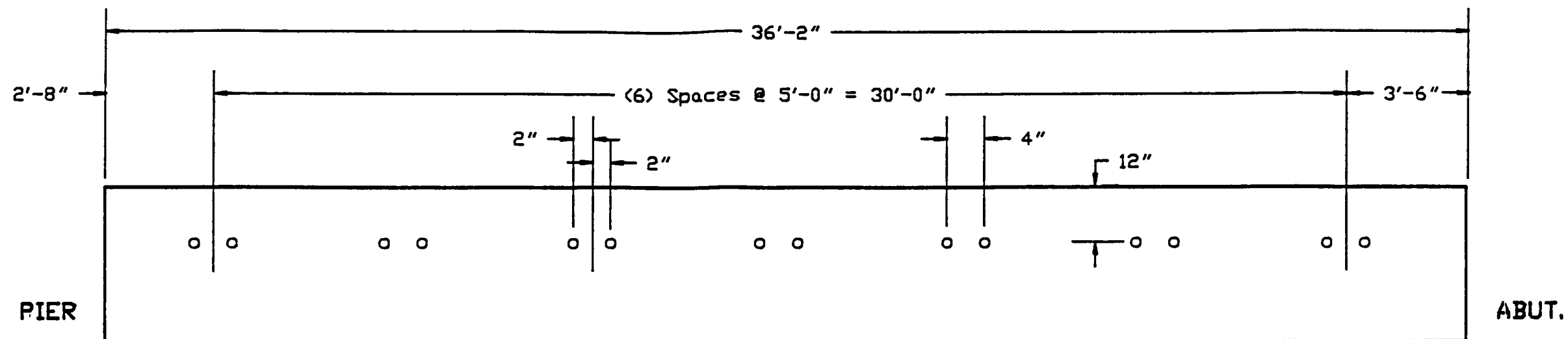
B527

REINFORCING STEEL SCHEDULE					
MARK	TYPE	SIZE	LENGTH	QTY\BEAM	TOTAL
B127	BENT	4	6'-1"	20	80
B227	BENT	4	6'-1"	2	8
B327	BENT	4	5'-11"	4	16
B4	BENT	4	6'-0"	34	136
B527	BENT	4	7'-11"	14	56
B6	BENT	4	5'-8"	8	32
B7	BENT	4	3'-8"	8	32
B8	STR	4	9'-6"	22	88
T(4-7)	STR	4	4'-7"	46	184

ALL REBAR TO BE GRADE 60
EXCEPT T BARS TO BE
GRADE 40.

ALL DIMENSIONS ARE OUT TO OUT.

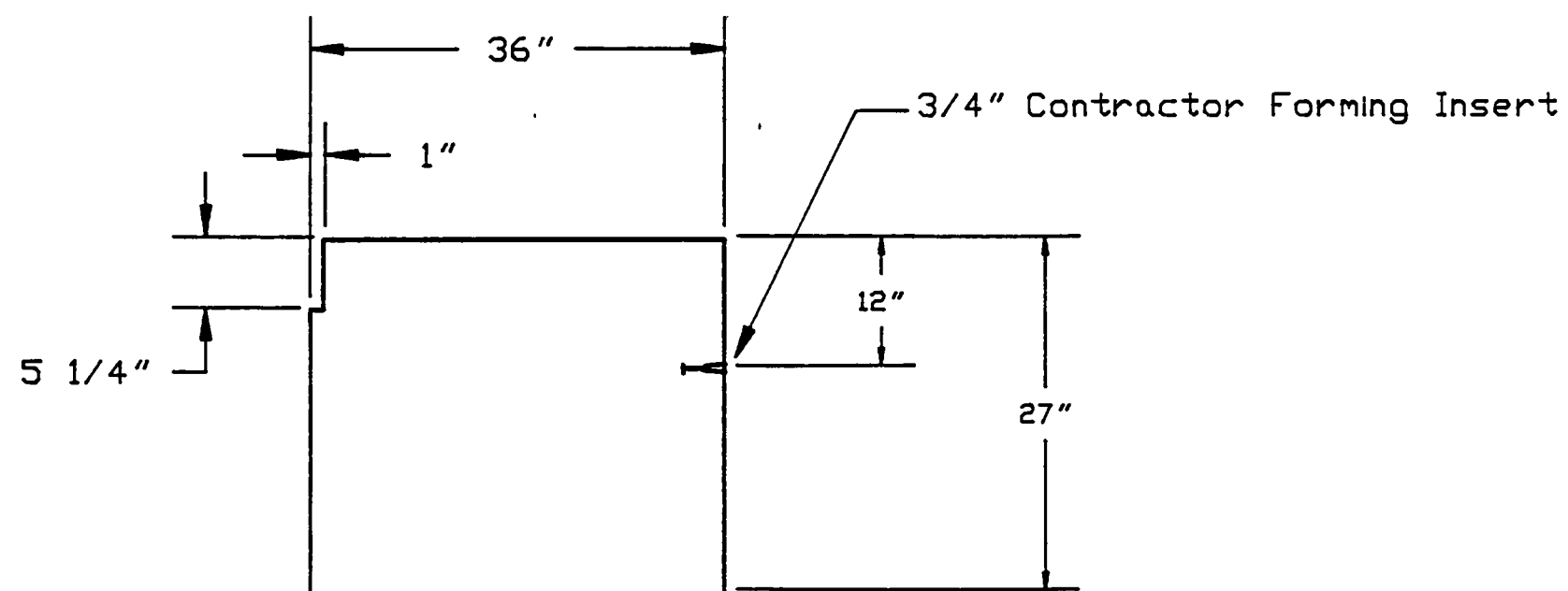
REBAR DETAILS
SPAN 2
BB-27-87-09



BEAM NO. BB-27-87-09-01 & BB-27-87-09-12

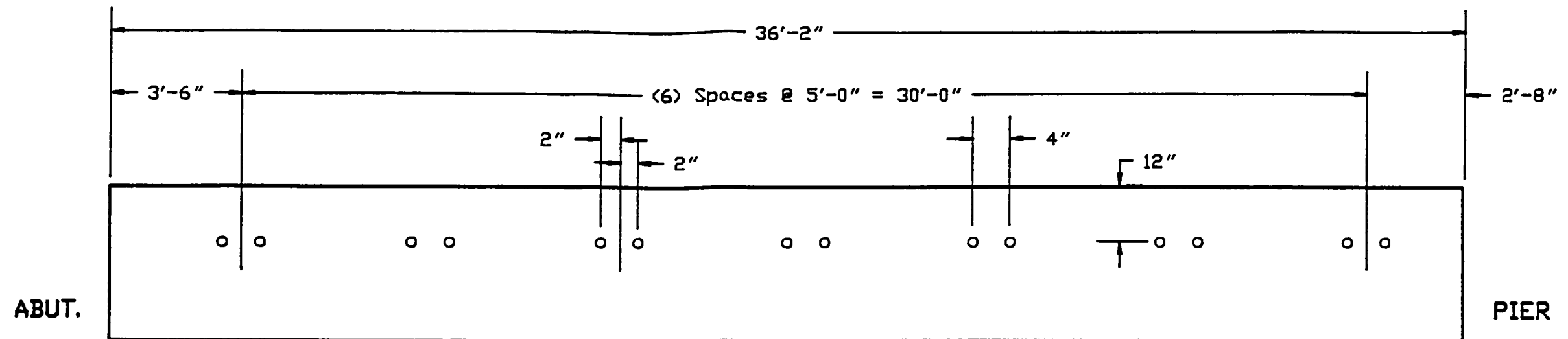
Spacing of Contractor Forming Inserts.

(Inserts supplied by the contractor)



EXTERIOR BEAM

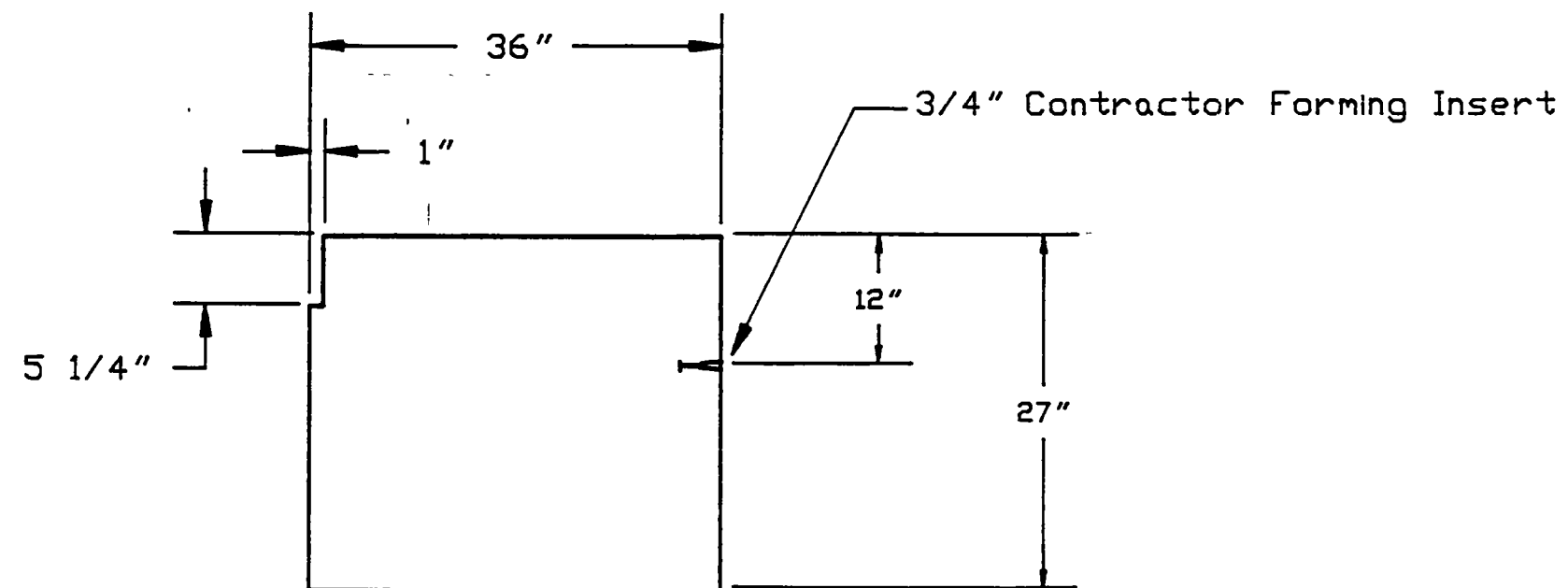
BB-27-87-09



BEAM NO. BB-27-87-09-04 & BB-27-87-09-09

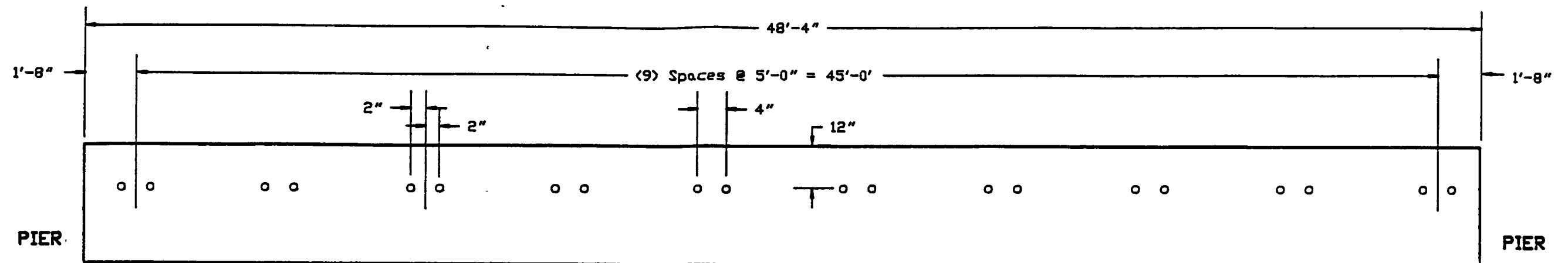
Spacing of Contractor Forming Inserts.

(Inserts supplied by the contractor)



EXTERIOR BEAM

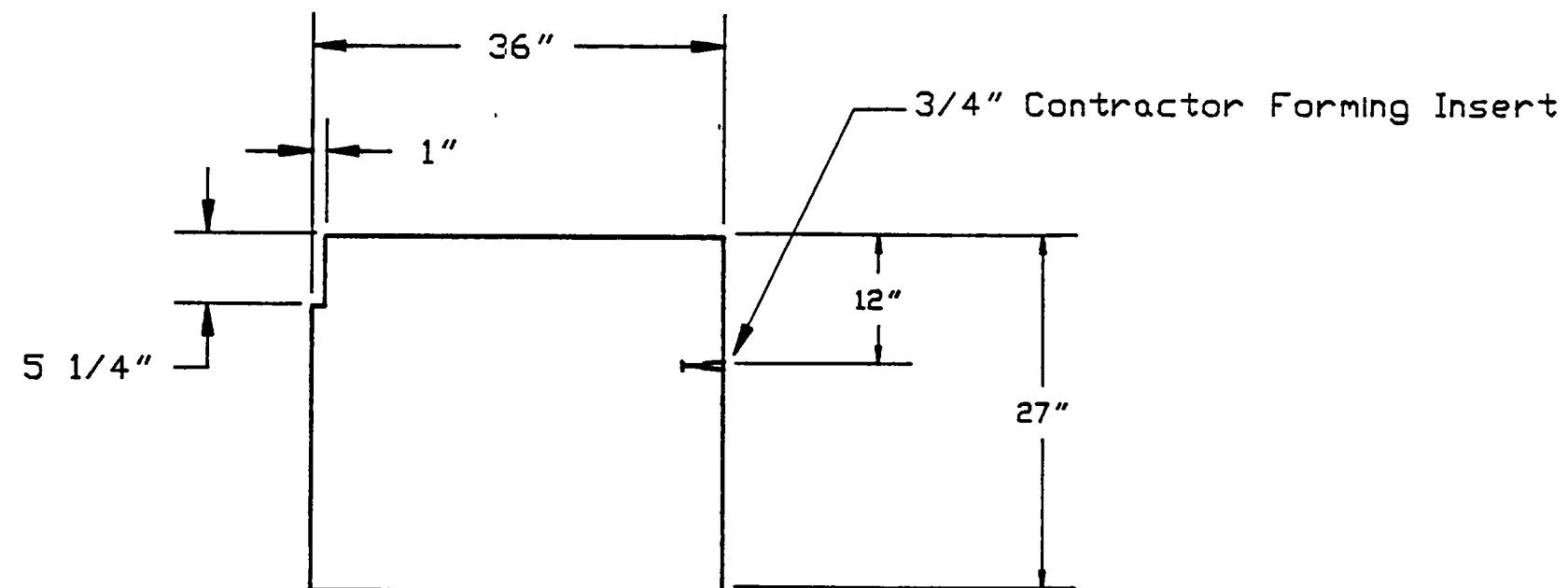
BB-27-87-09



BEAM NO. BB-27-87-09-05 & BB-27-87-09-08

Spacing of Contractor Forming Inserts.

(Inserts supplied by the contractor)



EXTERIOR BEAM

BB-27-87-09