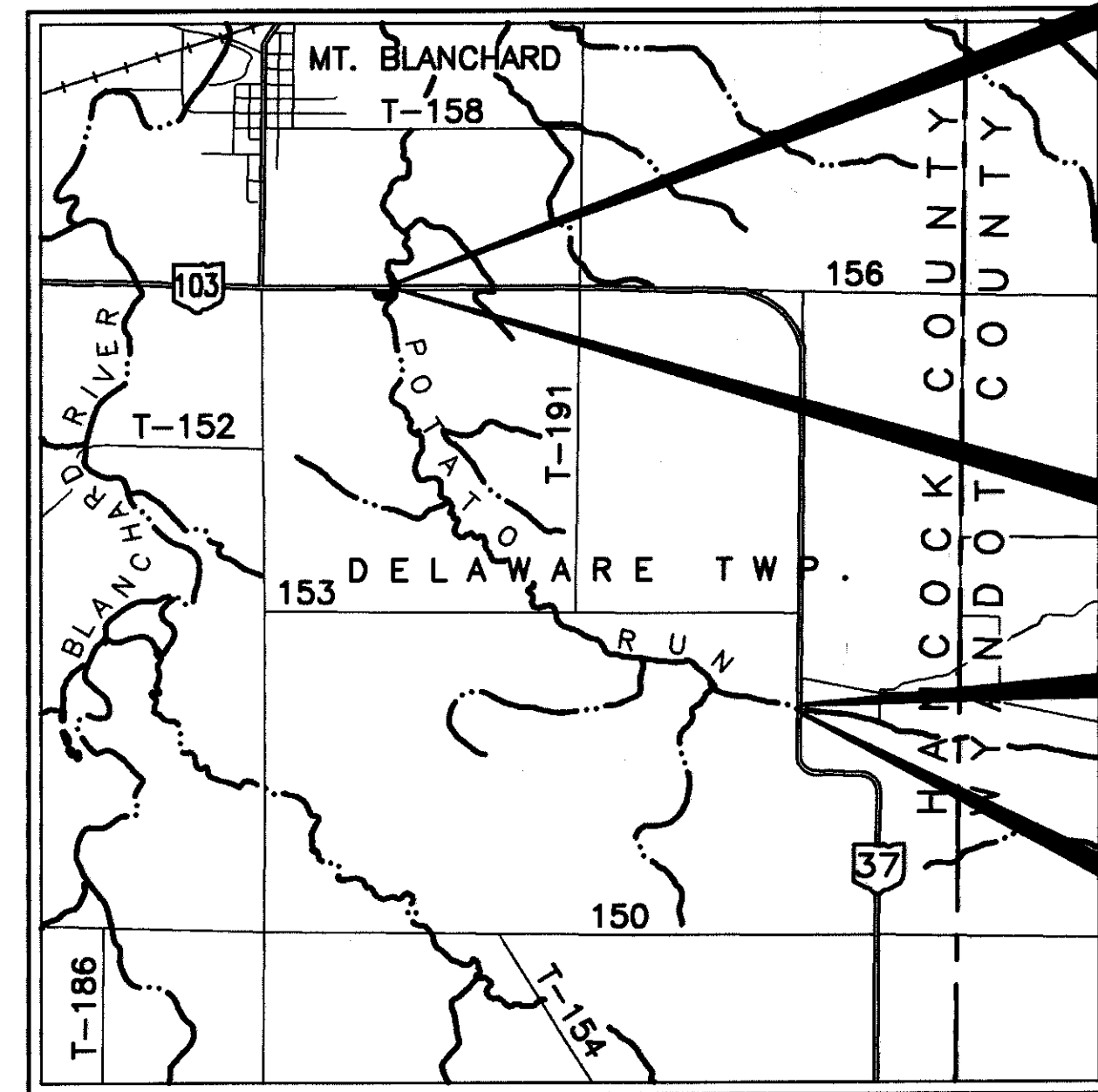
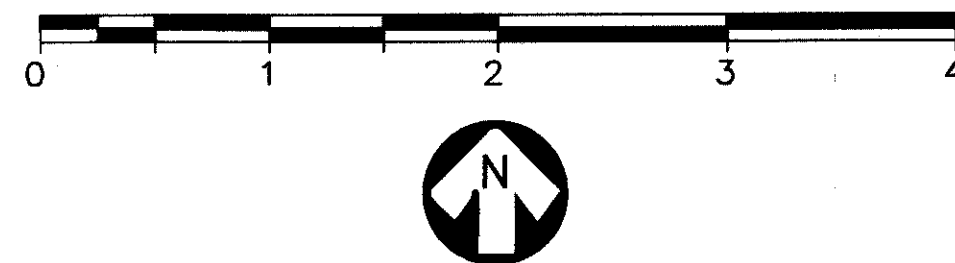




LOCATION MAP
Scale in Kilometers



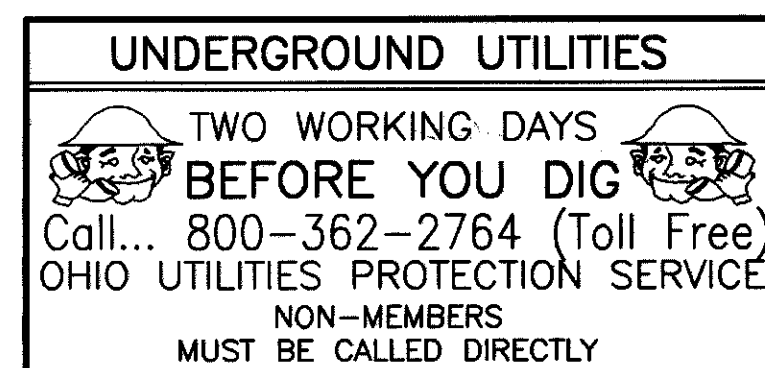
Portion to be improved
State & Federal Routes
Other Roads
County Line
Township Line

DESIGN DESIGNATION

CURRENT ADT (1999) = 1670
DESIGN ADT (2019) = 2540
DHV = 254
D = 0.55
T = 3%
V (DESIGN SPEED) = 90 km/h
V (LEGAL SPEED) = 55 mph
FUNCTIONAL CLASSIFICATION = MAJOR RURAL COLLECTOR

DESIGN EXCEPTIONS

No Design Exceptions Required



Plan Prepared By:

Kohli and Kaliher Assoc., Inc.
311 East Market Street
Lima, Ohio

BEGIN PROJECT
STA. 22+070

LATITUDE: 40°53'27" NORTH
LONGITUDE: 83°32'56" WEST

SUSPEND PROJECT
STA. 22+110

RESUME PROJECT
STA. 26+080

LATITUDE: 40°52'20" NORTH
LONGITUDE: 83°31'30" WEST

END PROJECT
STA. 26+120

STATE OF OHIO DEPARTMENT OF TRANSPORTATION HAN-37-22.070(13.71)/26.080(16.21) DELAWARE TOWNSHIP HANCOCK COUNTY



metric
units

PROJECT DESCRIPTION

HAN-37-22.070(13.71)

REPLACEMENT OF A STRUCTURALLY DEFICIENT BRIDGE OVER
POTATO RUN WITH IMPROVEMENT OF 23 m OF APPROACH
ROADWAY.

TOTAL PROJECT LENGTH = 40 m

HAN-37-26.080(16.21)

REPLACEMENT OF A STRUCTURALLY DEFICIENT BRIDGE OVER
POTATO RUN WITH IMPROVEMENT OF 23 m OF APPROACH
ROADWAY.

TOTAL PROJECT LENGTH = 40 m

INDEX OF SHEETS

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GENERAL SUMMARY	8-9
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STRUCTURE OVER 6 m SPAN HAN 37-22.070	20-26
STRUCTURE OVER 6 m SPAN HAN 37-26.080	27-33

1997 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, 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 require the closing to traffic of the highway and that detours will be provided as indicated on Sheet 2.

Approved [Signature]
Date 1/22/99 District Deputy Director

Approved [Signature]
Date 2-2-99 Director, Department of Transportation

ENGINEERS SEAL



SIGNED: Mark A. Droll
DATE: December 17, 1998

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS				SUPPLEMENTAL SPECIFICATIONS	SPECIAL PROVISIONS
AS-1-81M 10-25-94		MT-99.10M 1-30-95			U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT NO. 3 AND 14. 9-30-98
BP-3.1M 10-28-94	DS-1-94M 12-15-94	MT-101.60M 4-25-94	TC-41.20M 7-1-94		
	GR-1.1M 10-21-97	MT-105.10M 4-25-94	TC-52.10M 7-29-94		
DBR-2-73M 8-18-95	GR-1.2M 1-3-96	MT-105.11M 4-25-94	TC-52.20M 7-29-94		
DM-1.1M 10-21-97	GR-2.1M 4-14-98			806 9-9-97	
DM-4.3M 6-30-95	GR-3.4M 10-21-97	PSBD-1-93M 12-19-94			
DM-4.4M 6-30-95				865 1-6-98	

FEDERAL PROJECT NO.
TE21 G990(77)

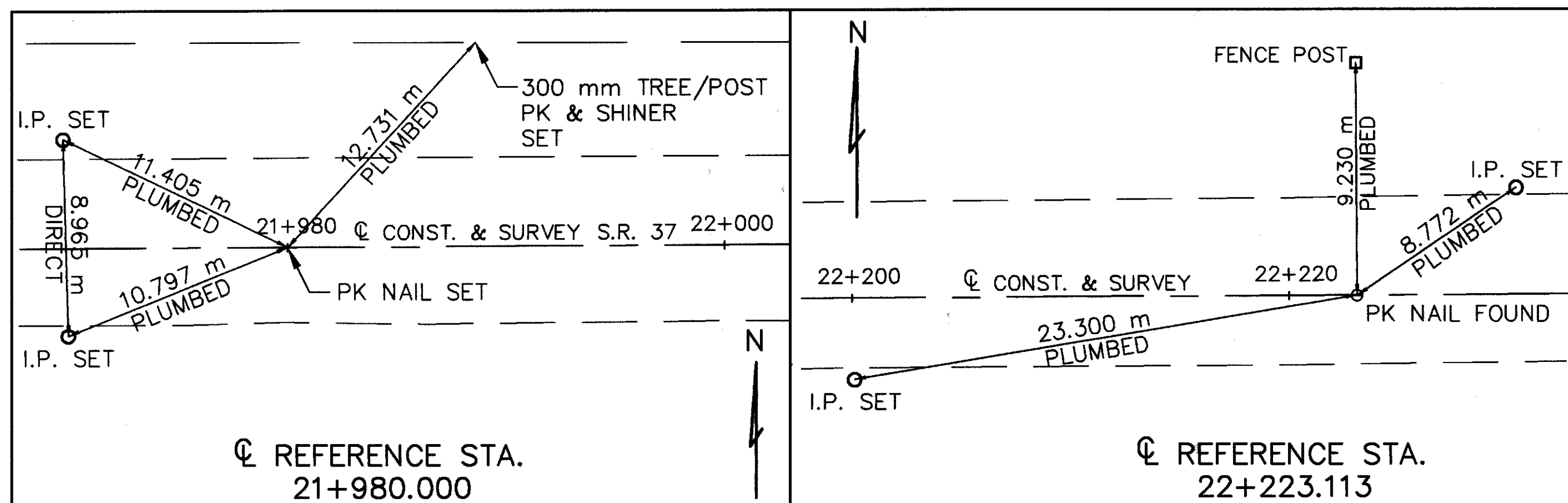
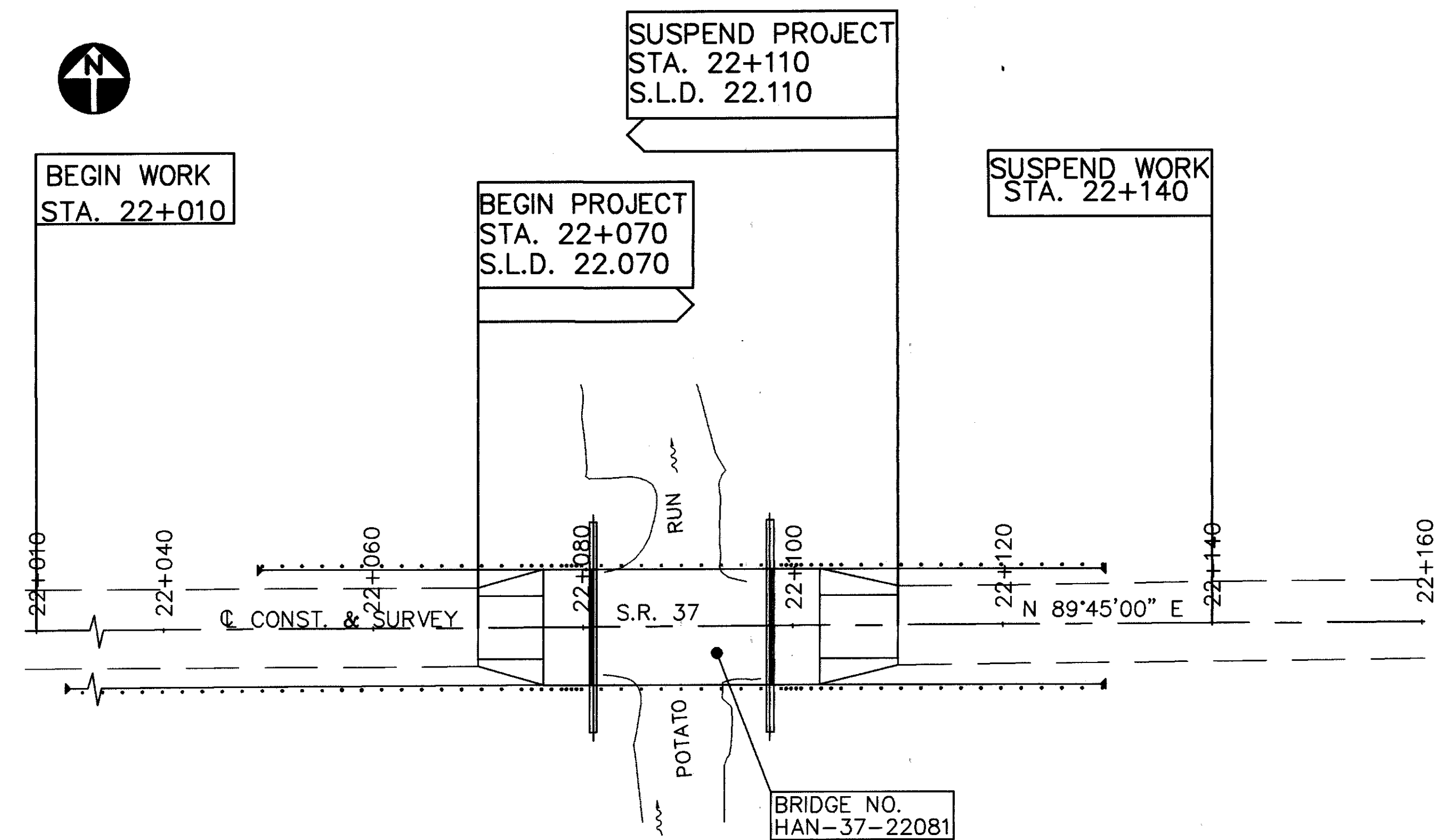
PID NO.
15987

CONSTRUCTION PROJECT NO.

RAILROAD INVOLVEMENT
NONE

HAN-37-22.070/26.080

33



DESIGNATED LOCAL DETOUR ROUTE

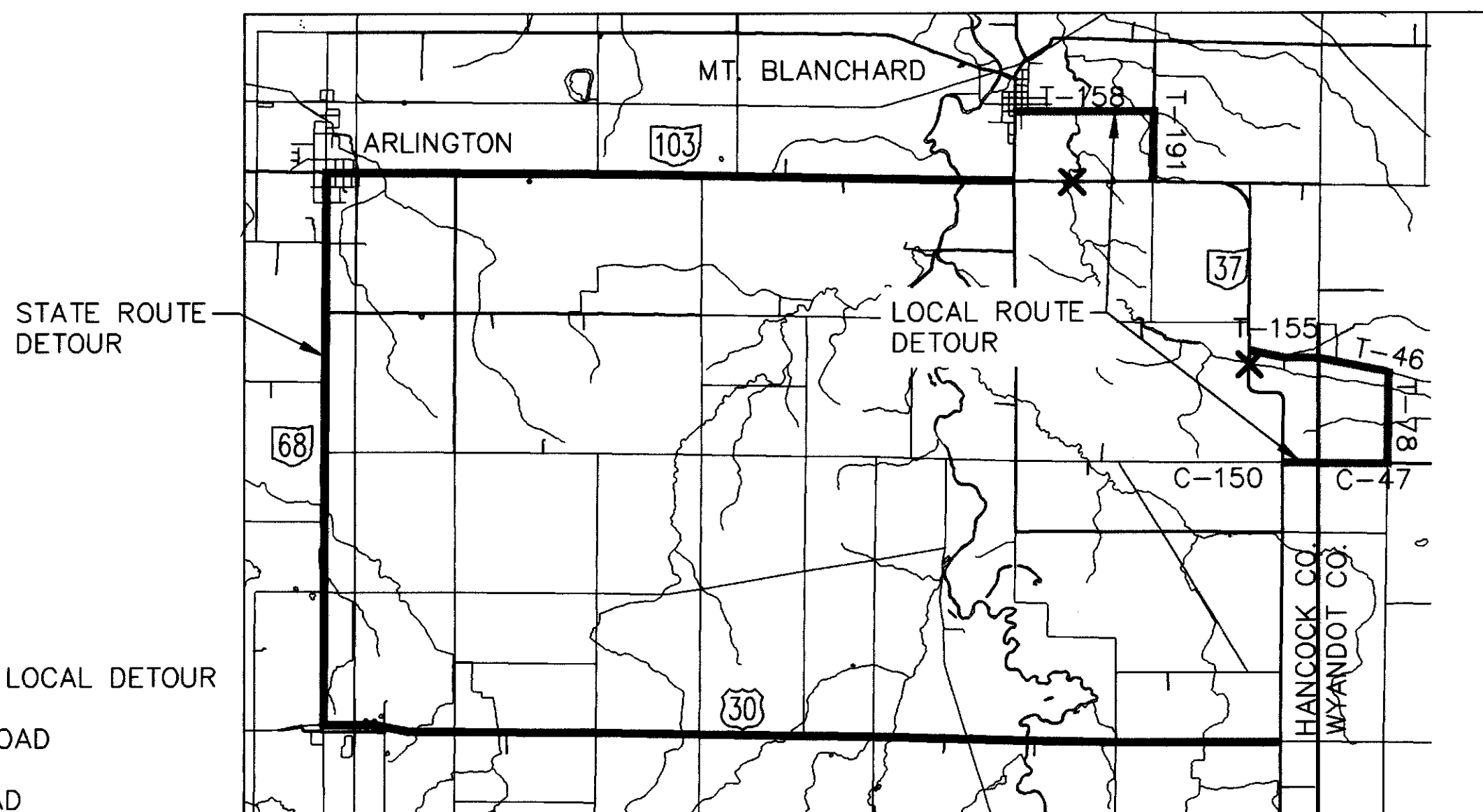
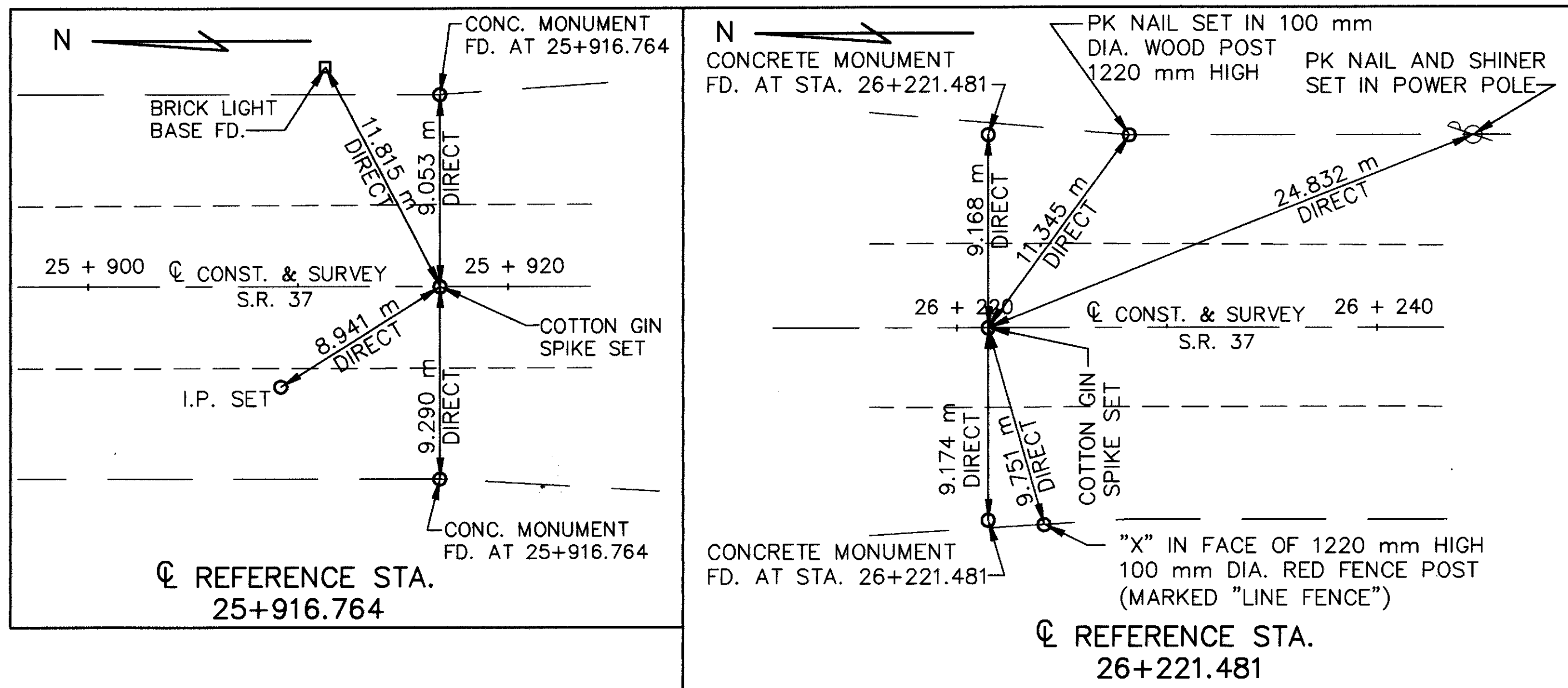
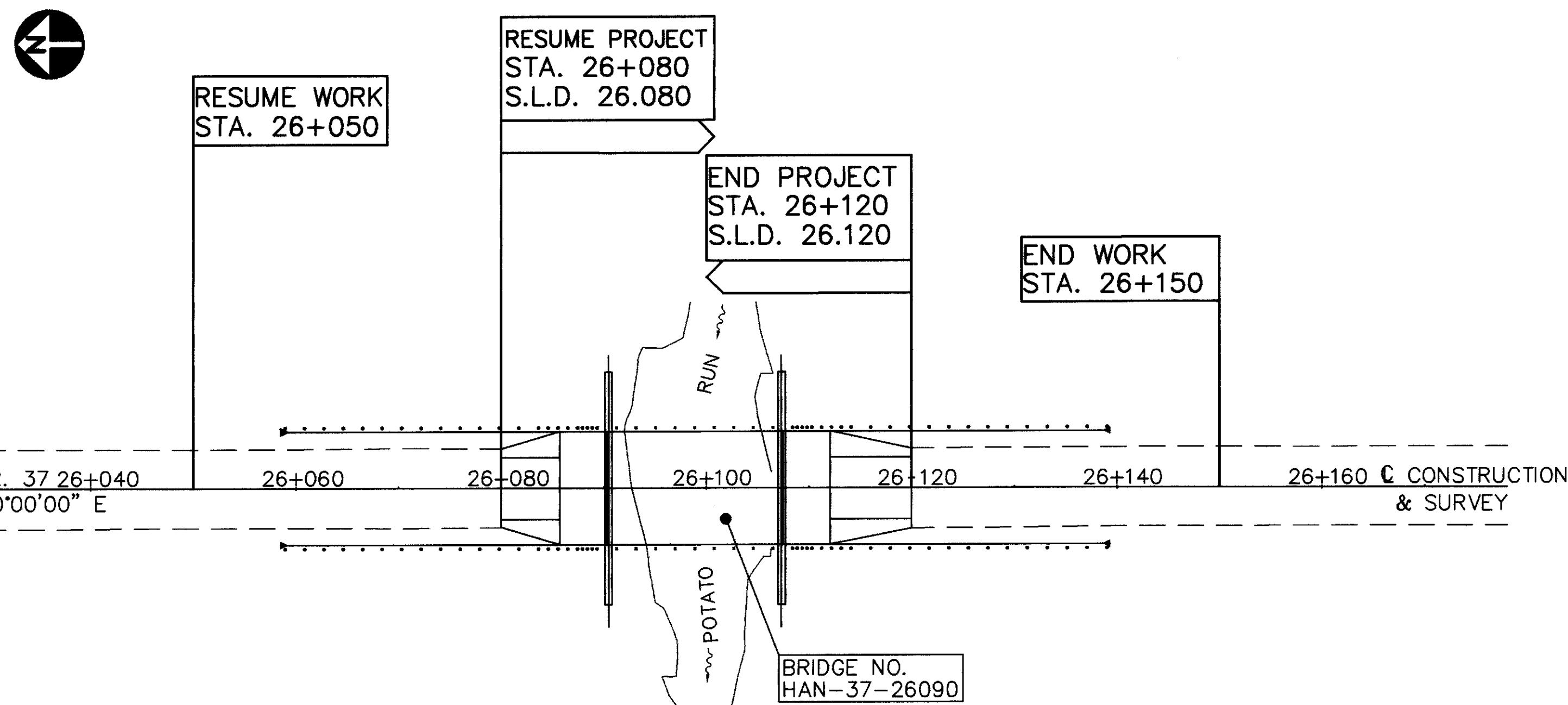
IN ADDITION TO THE OFFICIAL, SIGNED DETOUR ROUTE, A LOCAL ROUTE HAS BEEN DETERMINED TO BE THE SECONDARY, UNSIGNED, DETOUR ROUTE OR "DESIGNATED LOCAL DETOUR ROUTE". THIS ROUTE IS SHOWN ON THIS SHEET. DURING THE TIME THAT TRAFFIC IS DETOURED, THE CONTRACTOR SHALL MAINTAIN THIS ROUTE IN A CONDITION WHICH IS REASONABLY SMOOTH AND FREE FROM HOLES, RUTS, RIDGES, BUMPS, DUST AND STANDING WATER. ONCE THE DETOUR IS REMOVED AND TRAFFIC RETURNED TO ITS NORMAL PATTERN, THE DESIGNATED LOCAL DETOUR ROUTE SHALL BE RESTORED TO A CONDITION THAT IS EQUIVALENT TO THAT WHICH EXISTED PRIOR TO ITS USE FOR THIS PURPOSE. ALL SUCH WORK SHALL BE PERFORMED WHEN AND AS DIRECTED BY THE ENGINEER.

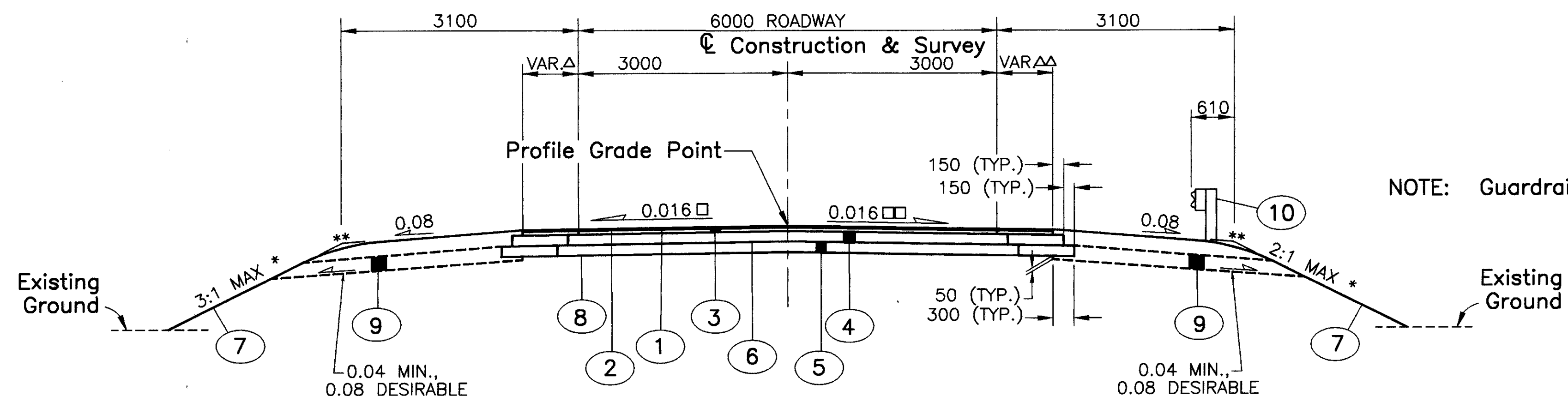
THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED FOR USE AS DIRECTED BY THE ENGINEER TO MAINTAIN AND SUBSEQUENTLY RESTORE THE DESIGNATED LOCAL DETOUR ROUTE:

ITEM	QUANTITY	DESCRIPTION
448.....	100 m ³	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22
407.....	1000 LITER	TACK COAT
616.....	8 m ³	WATER
616.....	2 METRIC TON.....	CALCIUM CHLORIDE
617.....	100 m ³	COMPACTED AGGREGATE, TYPE A

DETOUR MAP

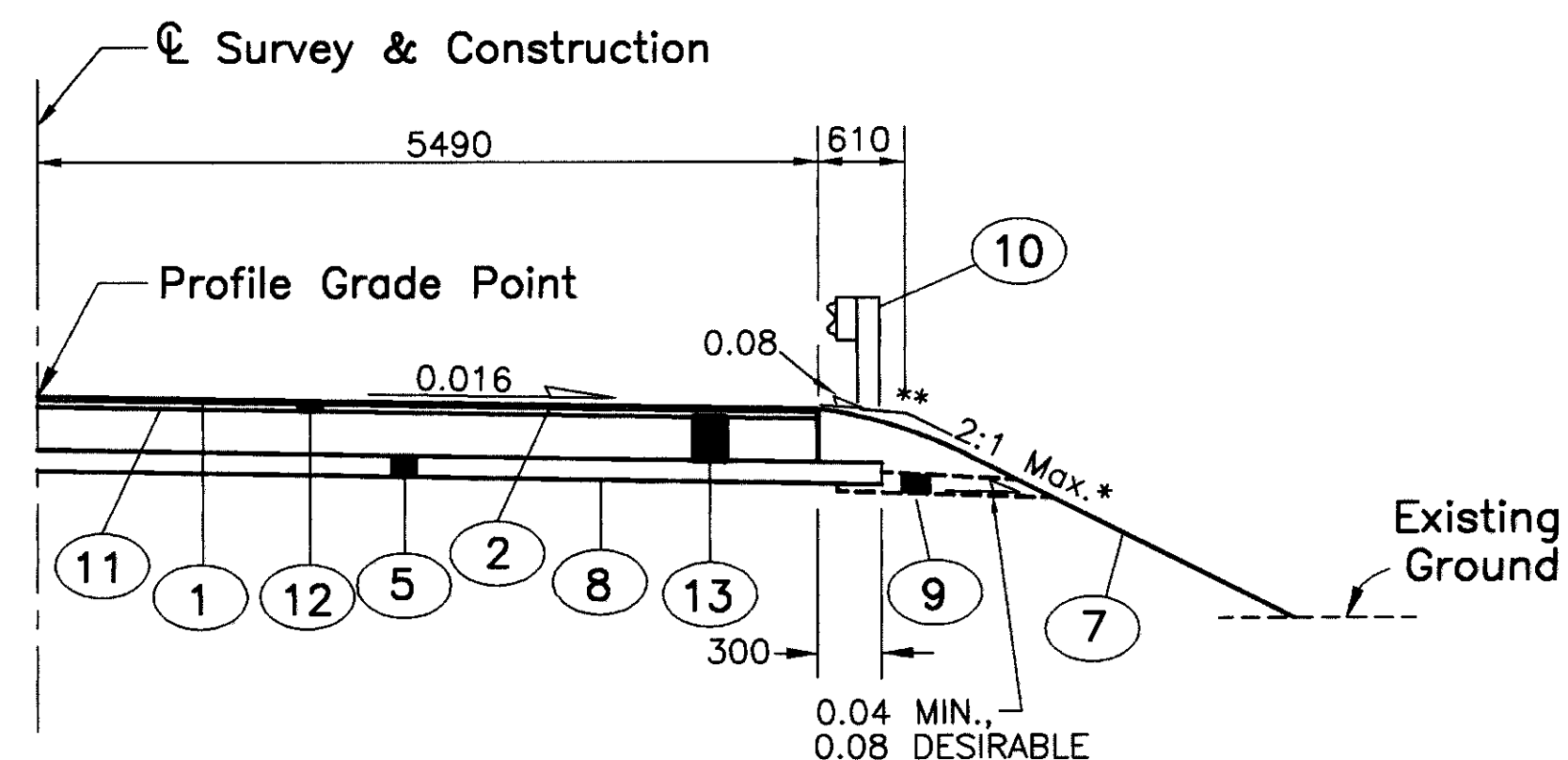
- PROJECT
- DETOUR
- DESIGNATED LOCAL DETOUR
- T-XXX TOWNSHIP ROAD
- C-XXX COUNTY ROAD





TYPICAL SECTION "A"
Typical Section "A" applies:

HAN-37-22.070		
From Sta 22+070 to Sta. 22+076.225	=	6.225 m
From Sta 22+102.575 to Sta. 22+110	=	7.425 m
Total	=	13.650 m
HAN-37-26.080		
From Sta 26+080 to Sta. 26+085.725	=	5.725 m
From Sta 26+112.075 to Sta. 26+120	=	7.925 m
Total	=	13.650 m



**HALF TYPICAL SECTION
BRIDGE APPROACH SLAB**

Bridge Approach Slab Section Applies:

HAN-37-22.070		
From Sta. 22+076.225 to Sta. 22+102.575	=	26.350 m
Deduct for Structure HAN-37-22081:		
From Sta. 22+080.825 to Sta. 22+097.975	=	-17.150 m
Total	=	9.200 m
HAN-37-26.080		
From Sta. 26+085.725 to Sta. 26+112.075	=	26.350 m
Deduct for Structure HAN-37-26090:		
From Sta. 26+090.325 to Sta. 26+107.475	=	-17.150 m
Total	=	9.200 m

NOTE: Guardrail Applies Either Side.

LEGEND

①	Item 448	32 mm Asphalt Concrete Surface Course, Type 1H, As Per Plan
②	Item 407	Tack Coat for Intermediate Course
③	Item 448	45 mm Asphalt Concrete Intermediate Course, Type 1, PG64-28
④	Item 301	180 mm Bituminous Aggregate Base, PG64-22
⑤	Item 304	150 mm Aggregate Base
⑥	Item 408	Bituminous Prime Coat, applied at 1.8 Liters per Sq. Meter
⑦	Item 659	Seeding and Mulching (See General Note)
⑧	Item 203	Subgrade Compaction
⑨	Item 605	Aggregate Drains
⑩	Item 606	Guardrail, Type 5
⑪	Item 407	Tack Coat
⑫	Item 448	32 mm to 99 mm Asphalt Concrete Intermediate Course, Type 1, PG64-28
⑬	Item 611	Reinforced Concrete Approach Slab (T=305 mm)

NOTES:

ALL DIMENSIONS ARE IN MILLIMETERS AND ALL STATIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

* UNLESS OTHERWISE SHOWN ON CROSS SECTIONS

** 1.2 m ROUNDING

△ HAN-37-22.070	0.793m AT STA. 22+070 TO 2.490m AT STA. 22+076.225 2.490m AT STA. 22+102.575 TO 0.679m AT STA. 22+110
HAN-37-26.080	0.843m AT STA. 26+080 TO 2.490m AT STA. 26+085.725 2.490m AT STA. 26+112.075 TO 0.837m AT STA. 26+120
△△ HAN-37-22.070	0.633m AT STA. 22+070 TO 2.490m AT STA. 22+076.225 2.490m AT STA. 22+102.575 TO 0.785m AT STA. 22+110
HAN-37-26.080	0.818m AT STA. 26+080 TO 2.490m AT STA. 26+085.725 2.490m AT STA. 26+112.075 TO 0.914m AT STA. 26+120
□ HAN-37-22.070	0.021 AT STA. 22+070 TO 0.016 AT STA. 22+076.225 0.016 AT STA. 22+102.575 TO 0.023 AT STA. 22+110
HAN-37-26.080	0.029 AT STA. 26+080 TO 0.016 AT STA. 26+085.725 0.016 AT STA. 26+112.075 TO 0.016 AT STA. 26+120
▢ HAN-37-22.070	0.016 AT STA. 22+070 TO 0.016 AT STA. 22+076.225 0.016 AT STA. 22+102.575 TO 0.022 AT STA. 22+110
HAN-37-26.080	0.018 AT STA. 26+080 TO 0.016 AT STA. 26+085.725 0.016 AT STA. 26+112.075 TO 0.023 AT STA. 26+120

CALCULATED
T.H.H.

CHECKED
A.M.V.

DESIGN AGENCY
KOHLI & KALHER ASSOCIATES, INC.
CONSULTING ENGINEERS AND SURVEYORS
LIMA, OHIO

KK
KOHLI & KALHER ASSOCIATES, INC.
CONSULTING ENGINEERS AND SURVEYORS
LIMA, OHIO

TYPICAL SECTION

HAN-37-22.070/26.080

3/3

SHOULDERS

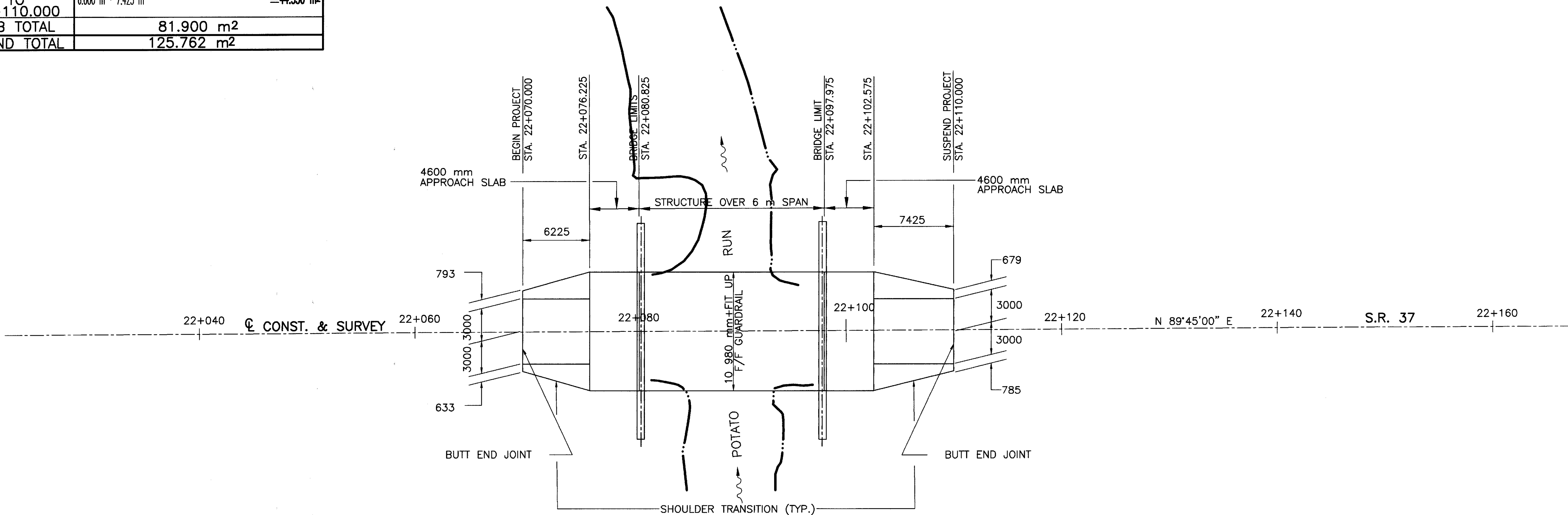
ROADWAY

CONST. STA.	ITEM 448 – 32 mm ASPHALT CONCRETE SURFACE COURSE, A.P.P.	ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE	ITEM 448 – 45 mm ASPHALT CONCRETE INTERMEDIATE COURSE	ITEM 301 – 180 mm BIT. AGGREGATE BASE	ITEM 408 – BITUMINOUS PRIME COAT	ITEM 304 – 150 mm AGGREGATE BASE
22+070.000 TO 22+076.225	$\frac{1.426 \text{ m} + 4.980 \text{ m}}{2} * 6.225 \text{ m} * 32 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 0.638 \text{ m}^3$	$\frac{1.426 \text{ m} + 4.980 \text{ m}}{2} * 6.225 \text{ m} * \frac{0.340 \text{ LITER}}{\text{m}^2} = 6.779 \text{ Liter}$	$\frac{1.426 \text{ m} + 4.980 \text{ m}}{2} * 6.225 \text{ m} * 45 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 0.897 \text{ m}^3$	$\frac{1.726 \text{ m} + 5.280 \text{ m}}{2} * 6.225 \text{ m} * 180 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 3.925 \text{ m}^3$	$\frac{1.726 \text{ m} + 5.280 \text{ m}}{2} * 6.225 \text{ m} * \frac{1.800 \text{ LITER}}{\text{m}^2} = 39.251 \text{ Liter}$	$\frac{2.026 \text{ m} + 5.580 \text{ m}}{2} * 6.225 \text{ m} * 150 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 3.551 \text{ m}^3$
22+102.575 TO 22+110.000	$\frac{1.464 \text{ m} + 4.980 \text{ m}}{2} * 7.425 \text{ m} * 32 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 0.766 \text{ m}^3$	$\frac{1.464 \text{ m} + 4.980 \text{ m}}{2} * 7.425 \text{ m} * \frac{0.340 \text{ LITER}}{\text{m}^2} = 8.134 \text{ Liter}$	$\frac{1.464 \text{ m} + 4.980 \text{ m}}{2} * 7.425 \text{ m} * 45 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 1.077 \text{ m}^3$	$\frac{1.764 \text{ m} + 5.280 \text{ m}}{2} * 7.425 \text{ m} * 180 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 4.707 \text{ m}^3$	$\frac{1.764 \text{ m} + 5.280 \text{ m}}{2} * 7.425 \text{ m} * \frac{1.800 \text{ LITER}}{\text{m}^2} = 47.072 \text{ Liter}$	$\frac{2.064 \text{ m} + 5.580 \text{ m}}{2} * 7.425 \text{ m} * 150 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 4.257 \text{ m}^3$
SUB TOTAL	1.404 m ³	14.913 LITER	1.974 m ³	8.632 m ³	86.323 LITER	7.808 m ³

CONST. STA.	ITEM 203 – SUBGRADE COMPACTION
22+070.000 TO 22+076.225	$\frac{1.426 \text{ m} + 4.980 \text{ m}}{2} * 6.225 \text{ m} = 19.939 \text{ m}^2$
22+102.575 TO 22+110.000	$\frac{1.464 \text{ m} + 4.980 \text{ m}}{2} * 7.425 \text{ m} = 23.923 \text{ m}^2$
SUB TOTAL	43.862 m ²

CONST. STA.	ITEM 448 – 32 mm ASPHALT CONCRETE SURFACE COURSE, A.P.P.	ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE	ITEM 448 – 45 mm ASPHALT CONCRETE INTERMEDIATE COURSE	ITEM 301 – 180 mm BIT. AGGREGATE BASE	ITEM 408 – BITUMINOUS PRIME COAT	ITEM 304 – 150 mm AGGREGATE BASE
22+070.000 TO 22+076.225	$6.000 \text{ m} * 6.225 \text{ m} * 32 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 1.195 \text{ m}^3$	$6.000 \text{ m} * 6.225 \text{ m} * \frac{0.340 \text{ LITER}}{\text{m}^2} = 12.699 \text{ LITER}$	$6.000 \text{ m} * 6.225 \text{ m} * 45 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 1.681 \text{ m}^3$	$6.000 \text{ m} * 6.225 \text{ m} * 180 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 6.723 \text{ m}^3$	$6.000 \text{ m} * 6.225 \text{ m} * \frac{1.800 \text{ LITER}}{\text{m}^2} = 67.230 \text{ Liter}$	$6.000 \text{ m} * 6.225 \text{ m} * 150 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 5.602 \text{ m}^3$
22+102.575 TO 22+110.000	$6.000 \text{ m} * 7.425 \text{ m} * 32 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 1.426 \text{ m}^3$	$6.000 \text{ m} * 7.425 \text{ m} * \frac{0.340 \text{ LITER}}{\text{m}^2} = 15.147 \text{ LITER}$	$6.000 \text{ m} * 7.425 \text{ m} * 45 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 2.005 \text{ m}^3$	$6.000 \text{ m} * 7.425 \text{ m} * 180 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 8.019 \text{ m}^3$	$6.000 \text{ m} * 7.425 \text{ m} * \frac{1.800 \text{ LITER}}{\text{m}^2} = 80.190 \text{ Liter}$	$6.000 \text{ m} * 7.425 \text{ m} * 150 \text{ mm} \div \frac{1000 \text{ mm}}{\text{m}} = 6.683 \text{ m}^3$
SUB TOTAL	2.621 m ³	27.846 LITER	3.686 m ³	14.742 m ³	147.420 LITER	12.285 m ³
GRAND TOTAL	4.025 m ³	42.759 LITER	5.660 m ³	23.374 m ³	233.743 LITER	20.093 m ³

CONST. STA.	ITEM 203 – SUBGRADE COMPACTION
22+070.000 TO 22+076.225	$6.000 \text{ m} * 6.225 \text{ m} = 37.350 \text{ m}^2$
22+102.575 TO 22+110.000	$6.000 \text{ m} * 7.425 \text{ m} = 44.550 \text{ m}^2$
SUB TOTAL	81.900 m ²
GRAND TOTAL	125.762 m ²



GRAND TOTAL QUANTITIES CARRIED TO SHEETS 8 AND 9.

HAN 37-22.070

SHOULDERS

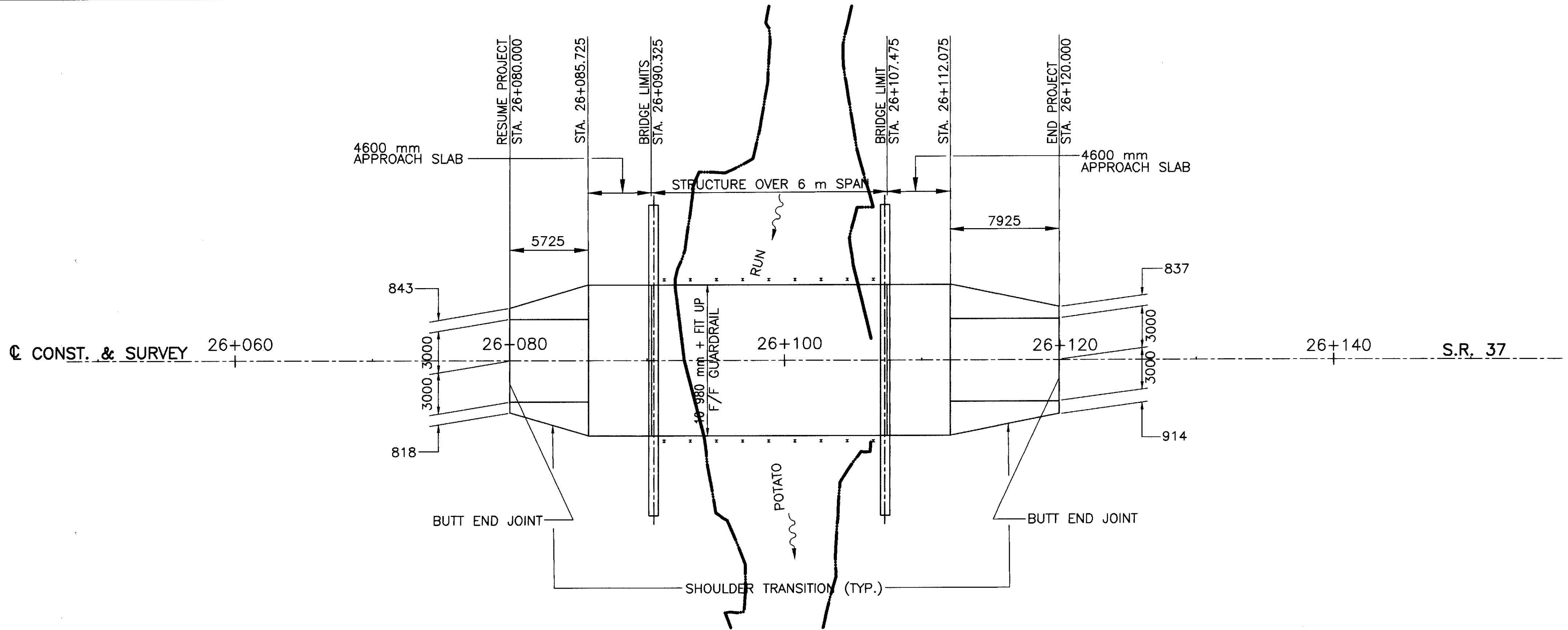
ROADWAY

CONST. STA.	ITEM 448 – 32 mm ASPHALT CONCRETE SURFACE COURSE, A.P.P.	ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE	ITEM 448 – 45 mm ASPHALT CONCRETE INTERMEDIATE COURSE	ITEM 301 – 180 mm BIT. AGGREGATE BASE	ITEM 408 – BITUMINOUS PRIME COAT	ITEM 304 – 150 mm AGGREGATE BASE
26+080.000 TO 26+085.725	$\frac{1.661\text{m}+4.980\text{m}}{2} \times 5.725\text{ m} \times 32\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 0.608\text{m}^3$	$\frac{1.661\text{m}+4.980\text{m}}{2} \times 5.725\text{ m} \times \frac{0.340\text{ LITER}}{\text{m}} = 6.463\text{ Liter}$	$\frac{1.661\text{ m}+4.980\text{ m}}{2} \times 5.725\text{ m} \times 45\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 0.855\text{ m}^3$	$\frac{1.961\text{ m}+5.280\text{ m}}{2} \times 5.725\text{m} \times 180\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 3.731\text{m}^3$	$\frac{1.961\text{m}+5.280\text{m}}{2} \times 5.725\text{ m} \times \frac{1.800\text{ LITER}}{\text{m}^2} = 37.309\text{Liter}$	$\frac{2.261\text{ m}+5.580\text{ m}}{2} \times 5.725\text{m} \times 150\text{mm} \div \frac{1000\text{ mm}}{\text{m}} = 3.367\text{m}^3$
26+112.075 TO 26+120.000	$\frac{1.751\text{ m}+4.980\text{ m}}{2} \times 7.925\text{ m} \times 32\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 0.853\text{ m}^3$	$\frac{1.751\text{m}+4.980\text{m}}{2} \times 7.925\text{ m} \times \frac{0.340\text{ LITER}}{\text{m}} = 9.068\text{ Liter}$	$\frac{1.751\text{ m}+4.980\text{ m}}{2} \times 7.925\text{ m} \times 45\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 1.200\text{ m}^3$	$\frac{2.051\text{ m}+5.280\text{ m}}{2} \times 7.925\text{m} \times 180\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 5.229\text{m}^3$	$\frac{2.051\text{ m}+5.280\text{ m}}{2} \times 7.925\text{m} \times \frac{1.800\text{ LITER}}{\text{m}^2} = 52.288\text{Liter}$	$\frac{2.351\text{ m}+5.580\text{ m}}{2} \times 7.925\text{m} \times 150\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 4.714\text{m}^3$
SUB TOTAL	1.461m ³	15.531 LITER	2.055 m ³	8.960 m ³	89.597 LITER	8.081 m ³

CONST. STA.	ITEM 203 – SUBGRADE COMPACTION
26+080.000 TO 26+085.725	$\frac{1.661\text{m}+4.980\text{m}}{2} \times 5.725\text{ m} = 19.010\text{ m}^2$
26+112.075 TO 26+120.000	$\frac{1.751\text{m}+4.980\text{m}}{2} \times 7.925\text{ m} = 26.672\text{ m}^2$
SUB TOTAL	45.682 m ²

CONST. STA.	ITEM 448 – 32 mm ASPHALT CONCRETE SURFACE COURSE, A.P.P.	ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE	ITEM 448 – 45 mm ASPHALT CONCRETE INTERMEDIATE COURSE	ITEM 301 – 180 mm BIT. AGGREGATE BASE
26+080.000 TO 26+085.725	$6.000\text{ m} \times 5.725\text{m} \times 32\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 1.099\text{ m}^3$	$6.000\text{m} \times 5.725\text{ m} \times \frac{0.340\text{ LITER}}{\text{m}} = 11.679\text{ Liter}$	$6.000\text{ m} \times 5.725\text{ m} \times 45\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 1.546\text{ m}^3$	$6.000\text{ m} \times 5.725\text{ m} \times 180\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 6.183\text{m}^3$
26+112.075 TO 26+120.000	$6.000\text{m} \times 7.925\text{ m} \times 32\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 1.522\text{ m}^3$	$6.000\text{ m} \times 7.925\text{ m} \times \frac{0.340\text{ LITER}}{\text{m}} = 16.167\text{ Liter}$	$6.000\text{ m} \times 7.925\text{ m} \times 45\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 2.140\text{ m}^3$	$6.000\text{ m} \times 7.925\text{ m} \times 180\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 8.559\text{ m}^3$
SUB TOTAL	2.621 m ³	27.846 LITER	3.686 m ³	14.742 m ³
GRAND TOTAL	4.082 m ³	43.377 LITER	5.741 m ³	23.702 m ³

CONST. STA.	ITEM 408 – BITUMINOUS PRIME COAT	ITEM 304 – 150 mm AGGREGATE BASE	ITEM 203 – SUBGRADE COMPACTION
26+080.000 TO 26+085.725	$6.000\text{ m} \times 5.725\text{ m} \times \frac{1.800\text{ LITER}}{\text{m}^2} = 61.830\text{Liter}$	$6.000\text{ m} \times 5.725\text{ m} \times 150\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 5.153\text{ m}^3$	$6.000\text{ m} \times 5.725\text{ m} = 34.350\text{ m}^2$
26+112.075 TO 26+120.000	$6.000\text{ m} \times 7.925\text{m} \times \frac{1.800\text{ LITER}}{\text{m}^2} = 85.590\text{ Liter}$	$6.000\text{ m} \times 7.925\text{ m} \times 150\text{ mm} \div \frac{1000\text{ mm}}{\text{m}} = 7.133\text{ m}^3$	$6.000\text{ m} \times 7.925\text{ m} = 47.550\text{ m}^2$
SUB TOTAL	147.420 LITER	12.286 m ³	81.900 m ²
GRAND TOTAL	237.017 LITER	20.367 m ³	127.582 m ²



GRAND TOTAL QUANTITIES CARRIED TO SHEETS 8 AND 9.

HAN 37-26.080



10
5
0
HORIZONTAL SCALE
IN METERS

CALCULATED
M.A.D.
CHECKED
J.R.H.

DESIGN AGENCY
KOHJI & KALHER ASSOCIATES, INC.
311 EAST MARKET STREET
LIMA, OHIO 45001

PAVEMENT CALCULATIONS

HAN-37-22.070/26.080



APPROACH SLAB	CONST. STA.	ITEM 448 – 32 mm ASPHALT CONCRETE SURFACE COURSE, A.P.P.	ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE	ITEM 448 – 32 TO 99 mm ASPHALT CONCRETE INT. COURSE	ITEM 407 – TACK COAT	ITEM 611 – REINFORCED CONCRETE APPROACH SLAB	ITEM 304 – 150 mm AGGREGATE BASE
	22+076.225 TO 22+080.825	10.980 m * 4.600 m * 32 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 1.616 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITERS}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m * $\frac{32\text{ mm} + 99\text{ mm}}{2} \div \frac{1000\text{ mm}}{\text{m}}$ = 3.308 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITER}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m = 50.508 m²	11.580 m * 3.790 m * 150 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 6.583 m³
	22+097.975 TO 22+102.575	10.980 m * 4.600 m * 32 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 1.616 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITERS}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m * $\frac{32\text{ mm} + 99\text{ mm}}{2} \div \frac{1000\text{ mm}}{\text{m}}$ = 3.308 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITER}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m = 50.508 m²	11.580 m * 3.790 m * 150 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 6.583 m³
	SUB TOTAL	3.232 m³	34.346 LITER	6.616 m³	34.346 LITER	101.016 m²	13.166 m³
APPROACH SLAB	CONST. STA.	ITEM 203 – SUBGRADE COMPACTION					
	22+076.225 TO 22+080.825	10.980 m * 3.790 m = 41.614 m²					
	22+097.975 TO 22+102.575	10.980 m * 3.790 m = 41.614 m²					
	SUB TOTAL	83.228 m²					
APPROACH SLAB	CONST. STA.	ITEM 448 – 32 mm ASPHALT CONCRETE SURFACE COURSE, A.P.P.	ITEM 407 – TACK COAT FOR INTERMEDIATE COURSE	ITEM 448 – 32 TO 99 mm ASPHALT CONCRETE INT. COURSE	ITEM 407 – TACK COAT	ITEM 611 – REINFORCED CONCRETE APPROACH SLAB	ITEM 304 – 150 mm AGGREGATE BASE
	26+085.725 TO 26+090.325	10.980 m * 4.600 m * 32 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 1.616 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITERS}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m * $\frac{32\text{ mm} + 99\text{ mm}}{2} \div \frac{1000\text{ mm}}{\text{m}}$ = 3.308 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITER}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m = 50.508 m²	11.580 m * 3.790 m * 150 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 6.583 m³
	26+107.475 TO 26+112.075	10.980 m * 4.600 m * 32 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 1.616 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITERS}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m * $\frac{32\text{ mm} + 99\text{ mm}}{2} \div \frac{1000\text{ mm}}{\text{m}}$ = 3.308 m³	10.980 m * 4.600 m * $\frac{0.340\text{ LITER}}{\text{m}^2}$ = 17.173 LITER	10.980 m * 4.600 m = 50.508 m²	11.580 m * 3.790 m * 150 mm ÷ $\frac{1000\text{ mm}}{\text{m}}$ = 6.583 m³
	SUB TOTAL	3.232 m³	34.346 LITER	6.616 m³	34.346 LITER	101.016 m²	13.166 m³
APPROACH SLAB	CONST. STA.	ITEM 203 – SUBGRADE COMPACTION					
	26+085.725 TO 26+090.325	10.980 m * 3.790 m = 41.614 m²					
	26+107.475 TO 26+112.075	10.980 m * 3.790 m = 41.614 m²					
	SUB TOTAL	83.228 m²					

ITEM 605 – AGGREGATE DRAIN		
STATION	SIDE	LENGTH (m)
22+071	RT. & LT.	3.6
22+076.5	RT. & LT.	1.6
22+102	RT. & LT.	1.6
22+109	RT. & LT.	3.6
26+081	RT. & LT.	3.6
26+086	RT. & LT.	1.6
26+112	RT. & LT.	1.6
26+119	RT. & LT.	3.6
TOTAL		41.6

ITEM 614 – TEMP. CENTER LINE, CLASS II	
STATION	KILOMETER
22+070 TO 22+110	0.040
26+080 TO 26+120	0.040
TOTAL	0.080

HAN 37–22.070

ITEM 659 – WATER

$1079\text{ m}^2 * \frac{5\text{ m}^3}{1000\text{ m}^2} * 2\text{ APPLICATIONS} = 11\text{ m}^3$
(QUANTITY CARRIED TO SHEET 4)

ITEM 659 – COMMERCIAL FERTILIZER

$1079\text{ m}^2 * \frac{0.1\text{ kg}}{\text{m}^2} = 108\text{ kg}$

HAN 37–26.080

ITEM 659 – WATER

$1366\text{ m}^2 * \frac{5\text{ m}^3}{1000\text{ m}^2} * 2\text{ APPLICATIONS} = 14\text{ m}^3$
(QUANTITY CARRIED TO SHEET 4)

ITEM 659 – COMMERCIAL FERTILIZER

$1366\text{ m}^2 * \frac{0.1\text{ kg}}{\text{m}^2} = 137\text{ kg}$

GRAND TOTAL QUANTITIES CARRIED TO SHEETS 8 AND 9.

10
5
0

HORIZONTAL SCALE
IN METERS

CALCULATED
M.A.D.

CHECKED
J.R.H.

DESIGN AGENCY

KOHLI & KALHER ASSOCIATES, INC.
311 EAST MARKET STREET
LIMA, OHIO 45801

PAVEMENT CALCULATIONS

HAN-37-22.070/26.080

7
33

GENERAL SUMMARY

SHEET NUMBERS																											
ITEM	4	5	6	7	10	11	16																				
201	LUMP																										
202						179	189																				
202					23	130	123																				
203						67	114																				
203						98	57																				
203		125.8	127.6	166.5																							
606					5.845	85.595	60.960																				
606					1	3	4																				
606						4	4																				
207	489																										
207	320																										
207	100																										
659						1079	1366																				
659	123			245																							
659	49																										
603	30																										
603	30																										
603							6																				
603	30																										
603							7																				
605				42																							

CALCULATED
J.R.H.
CHECKED
M.A.D.

 KOHLI & KAUHER ASSOCIATES, INC.
CONSULTING ENGINEERS AND SURVEYORS
LIMA, OHIO

GENERAL SUMMARY

HAN-37-22.070/26.080

26.080

GENERAL SUMMARY

SHEET NUMBERS

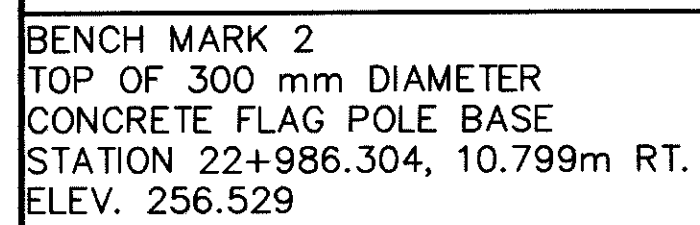
[illegible]

K&K KOHLI & KALIHAR ASSOCIATES, INC.
CONSULTING ENGINEERS AND SURVEYORS LIMA, OHIO

GENERAL SUMMARY

HAN-37-22.070/26.080

$$\frac{9}{33}$$



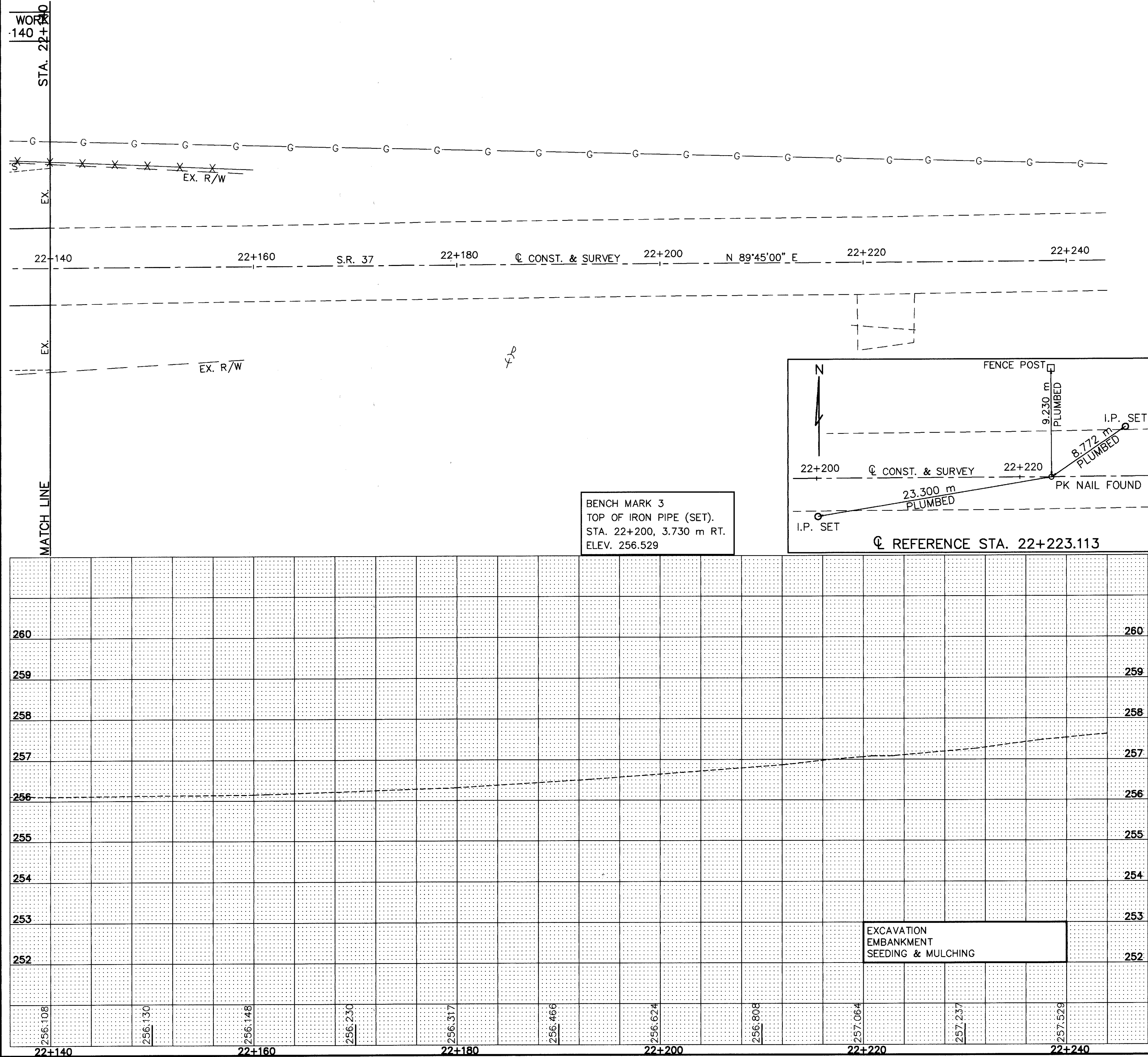
REF. NO.	STATION TO STATION	SIDE	202 GUARDRAIL REMOVED	606 GUARDRAIL TYPE 5 STR.	606 ANCHOR ASSEMBLY TYPE E-98	606 BARRIER/ REFLECTOR TYPE A2
1-R	22+017 TO 22+040	RT.	METER	METER	EACH	EACH
1-G	22+18.915 TO 22+040	RT.		5.845	1	2
TOTALS			23	5.845	1	2

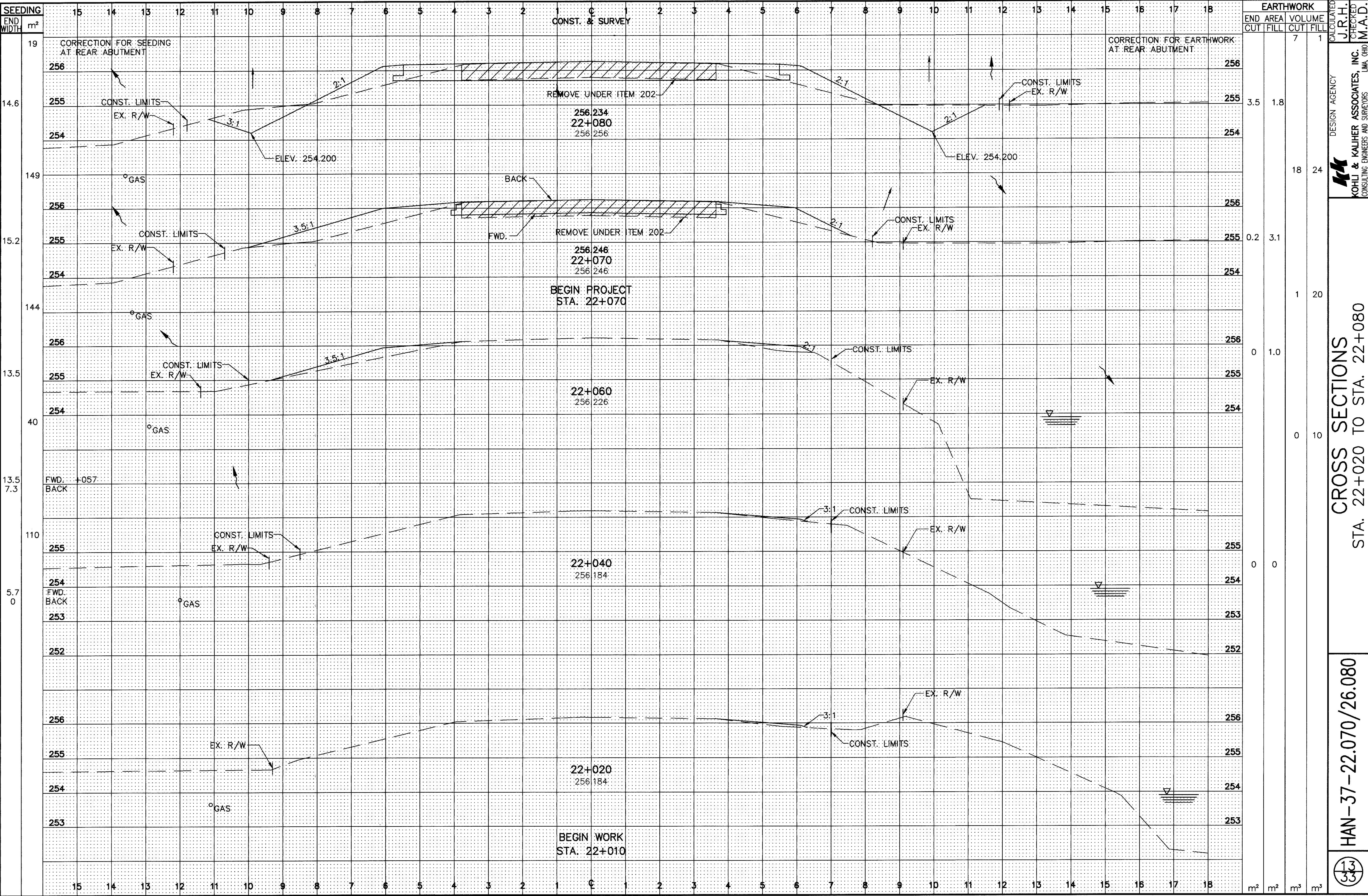
HORIZONTAL SCALE
IN METERS

CALCULATED J.R.H.
 CHECKED M.A.D.
 DESIGN AGENCY KOHLI & KALHER ASSOCIATES, INC.
 CONSULTING ENGINEERS AND SURVEYORS LIMA, OHIO

HAN-37-22.070/26.080

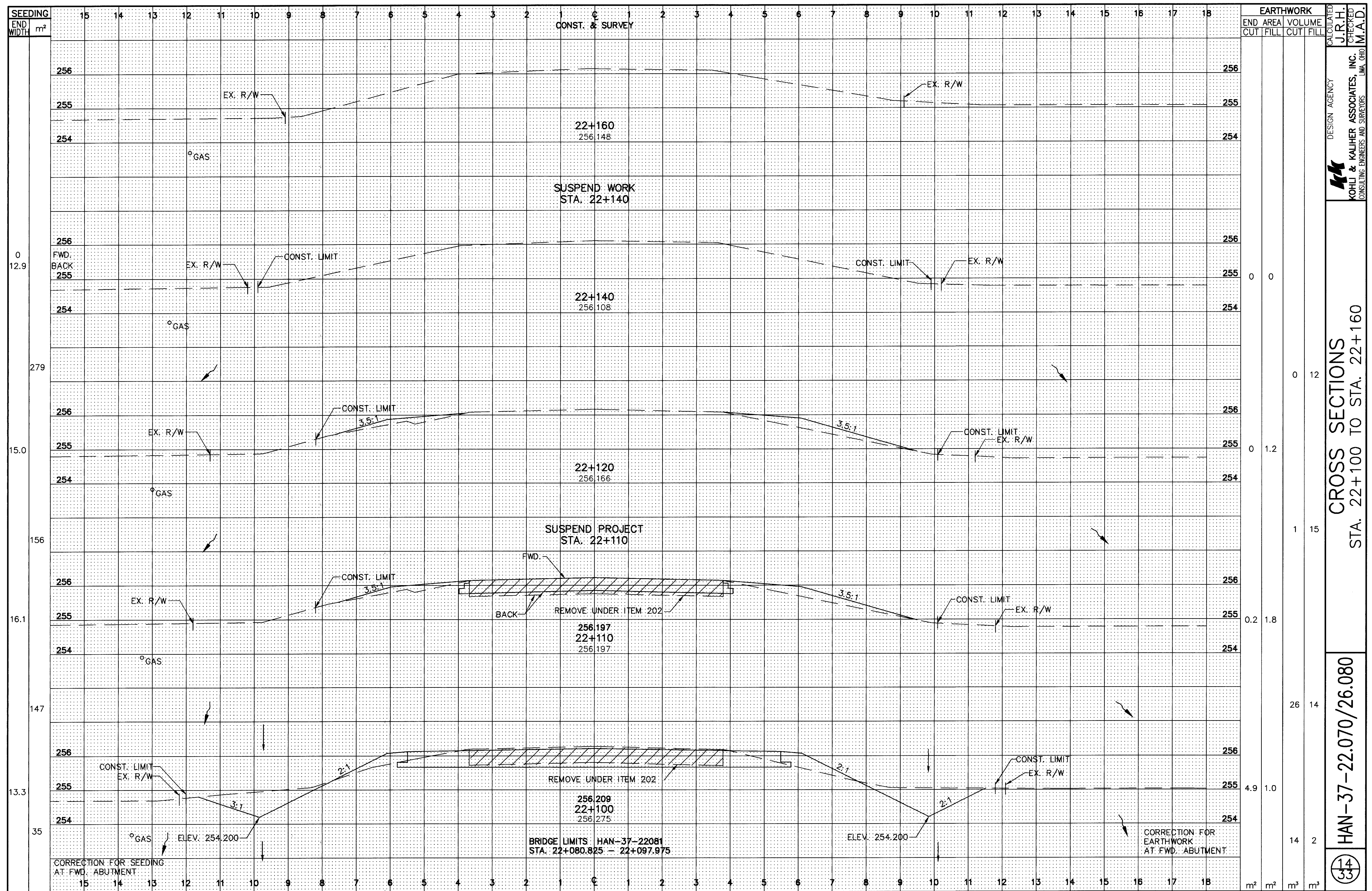
PLAN AND PROFILE
 STA. 21+940 TO STA. 22+040

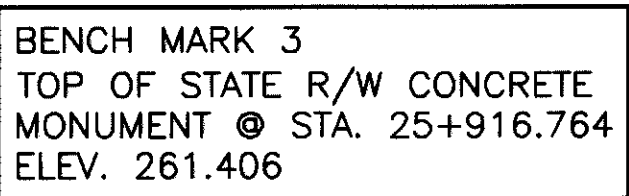
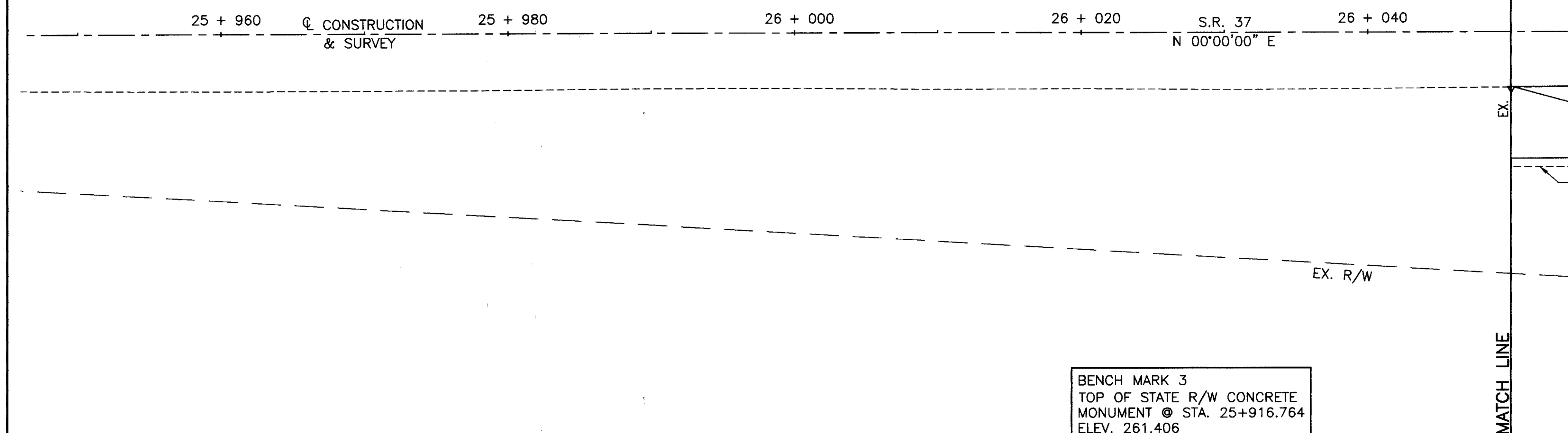




CROSS SECTIONS
STA. 22+020 TO STA. 22+080

HAN-37-22.070/26.080



[illegible]

ORK
+150

STA. 26+150

TS

S

MATCH LINE

26 + 160

Q CONSTRUCTION
& SURVEY

26 + 180

26 + 200

26 + 220

S.R. 37

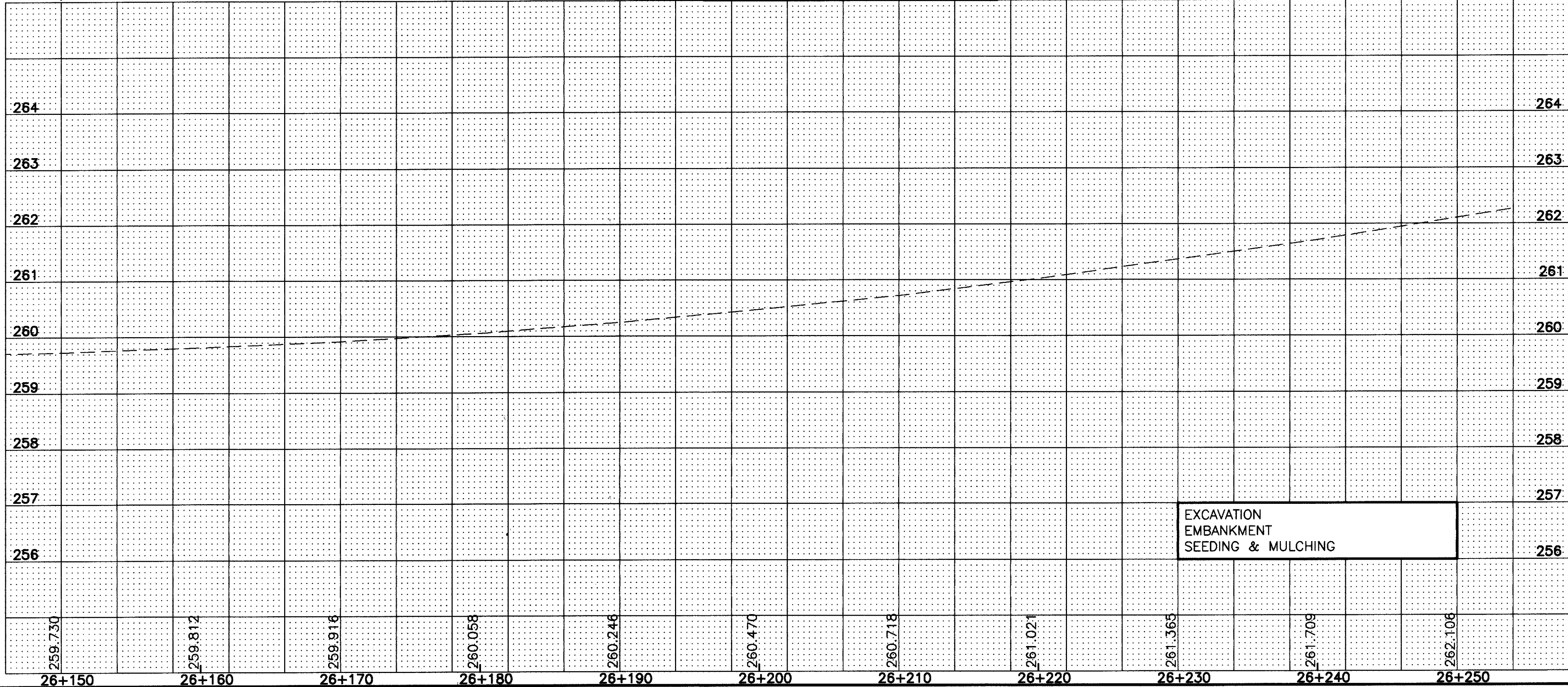
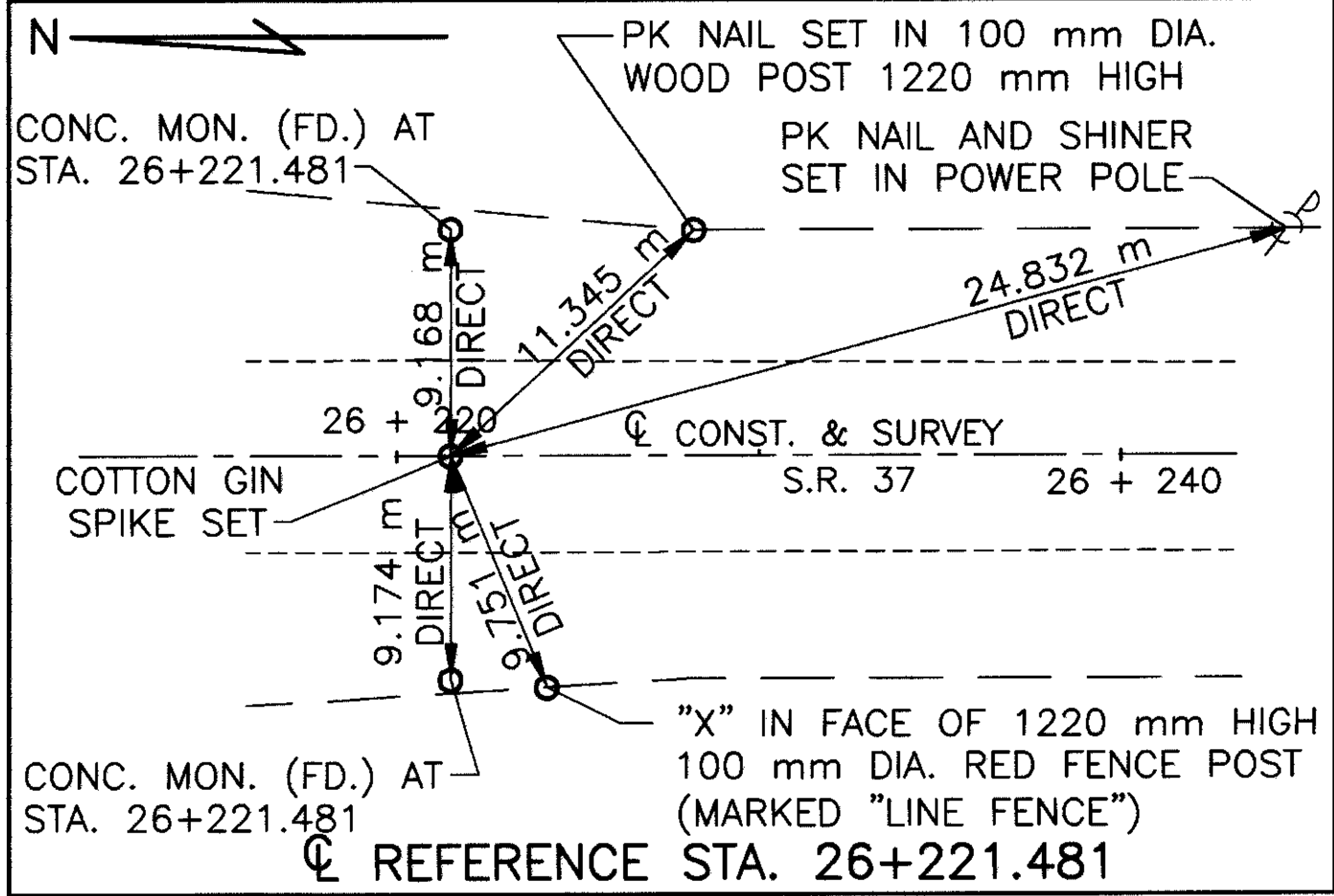
26 + 240

N 00°00'00" E

EX. R/W

EX. R/W

BENCH MARK 2
TOP OF STATE R/W CONCRETE
MONUMENT @ STA. 26+221.481
ELEV. 260.771



ESTIMATED QUANTITIES

REF. NO.

STATION TO STATION

SIDE

TOTALS

37

HAN-37-22.070/26.080

PLAN AND PROFILE
26+150 TO 26+260

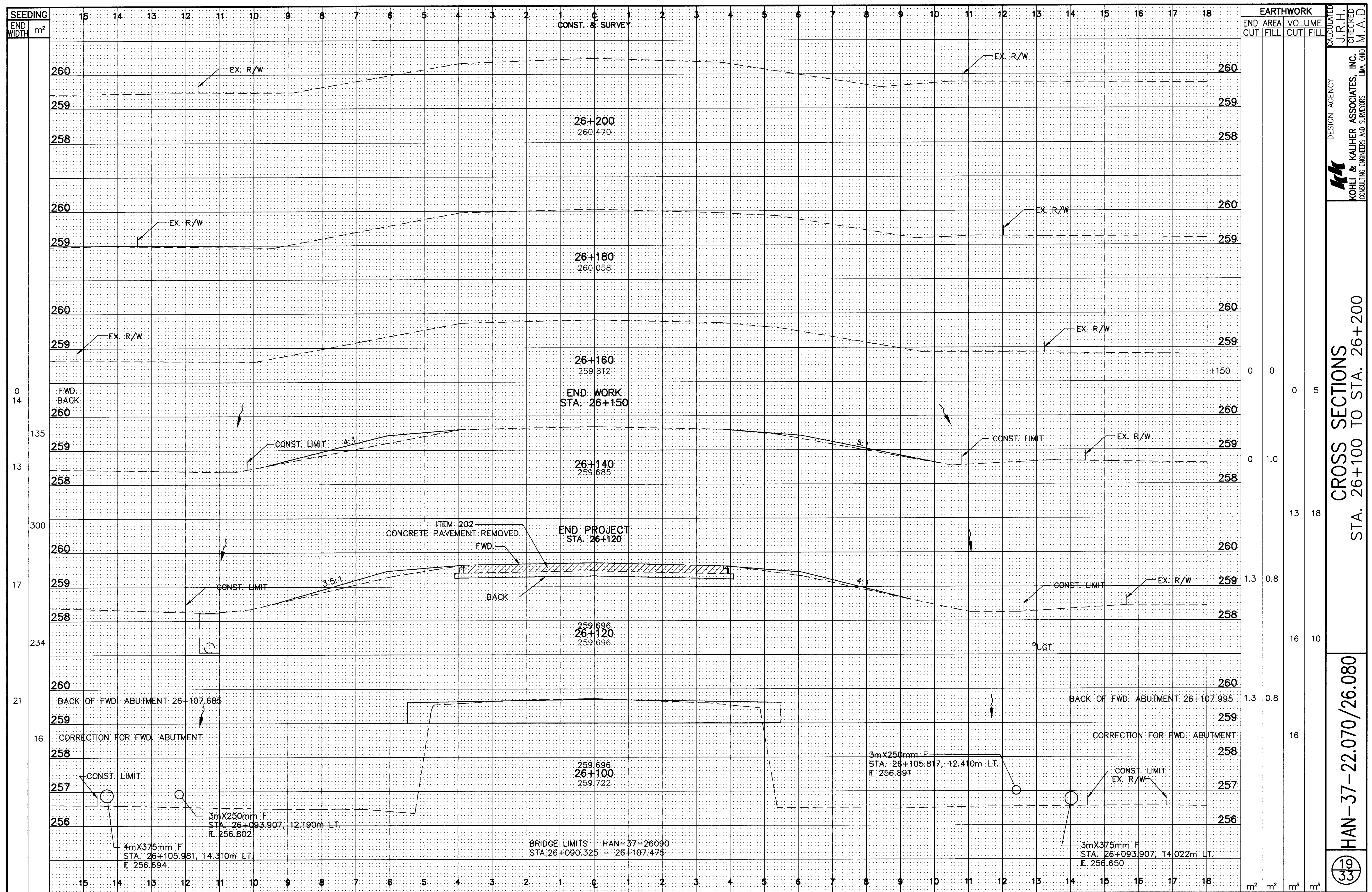
DESIGN AGENCY
KOHLL & KAUHER ASSOCIATES, INC.
CONSULTING ENGINEERS AND SURVEYORS
LIMA, OHIO

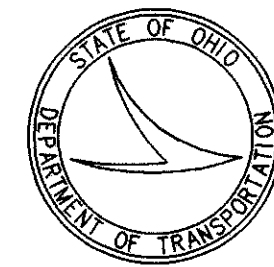
CHECKED
J.R.H.
M.A.D.

CALCULATED
J.R.H.
M.A.D.



HORIZONTAL SCALE
1" = 10'
IN METERS





metric
units

DESIGN AGENCY
KOHLL & KALHER ASSOCIATES, INC.
CONSULTING ENGINEERS AND SURVEYORS
LMA, OHIO

DATE
9-4-98

DESIGNED
T.H.H.

CHECKED
A.M.V.

REVIEWED
D.G.B.

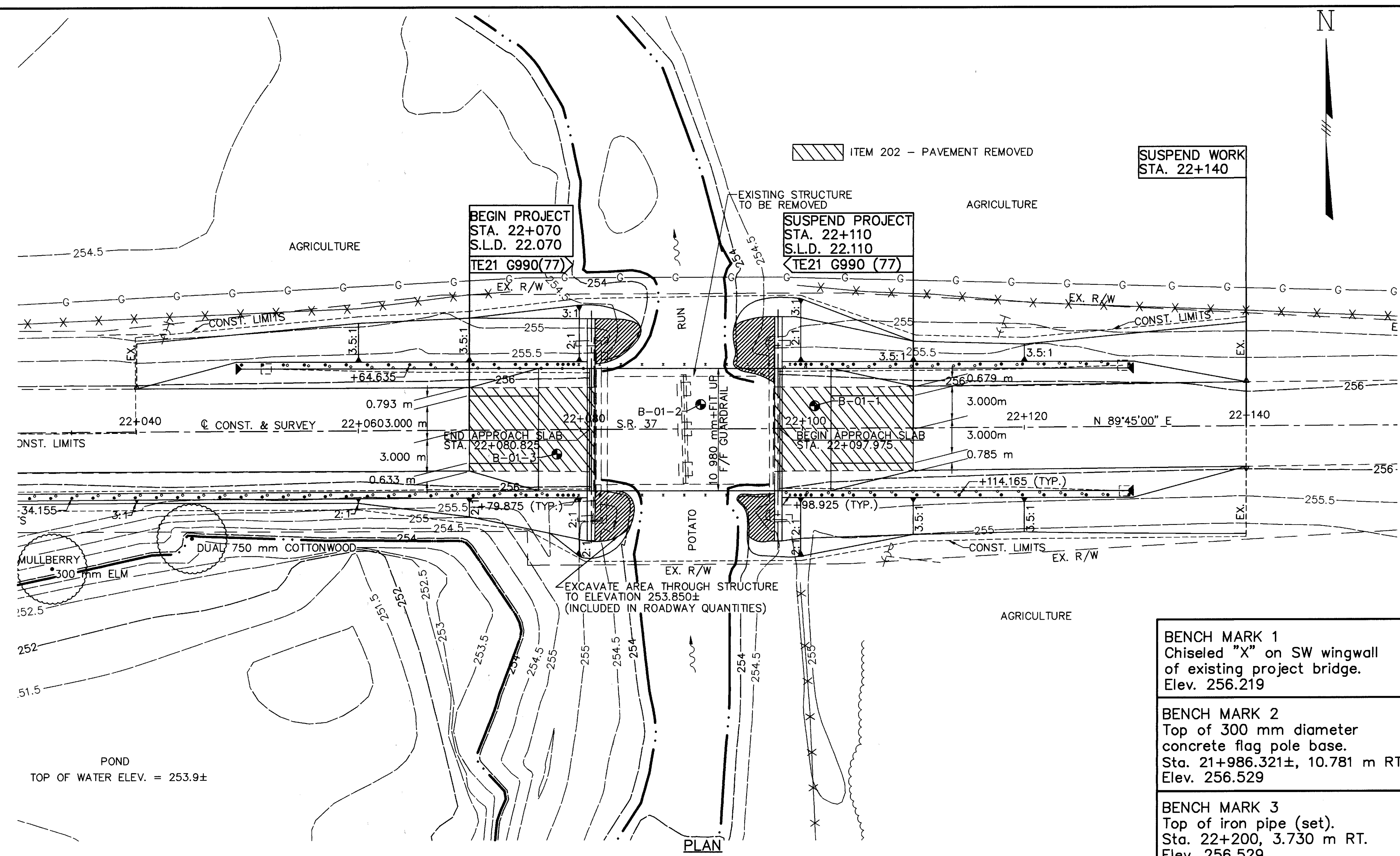
HANCOCK COUNTY
STA. 22+080.825
STA. 22+097.975

SITE PLAN
BRIDGE NO. HAN-37-22081
OVER POTATO RUN

HAN-37-22.070/26.080

1/7

3201783



SUSPEND WORK
STA. 22+140

BEGIN PROJECT
STA. 22+070
S.L.D. 22.070
TE21 G990(77)

SUSPEND PROJECT
STA. 22+110
S.L.D. 22.110
TE21 G990 (77)

NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS AND ALL ELEVATIONS AND STATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
- EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.
- DISPOSITION OF UTILITIES: NO UTILITIES WILL BE ATTACHED TO THE PROPOSED STRUCTURE.
- SEE SHEET 2/33 FOR Q REFERENCES.

BORING	STA.	DISTANCE	ELEV.
B-01-1	22+101.253	2.029 m LT	256.22
B-01-2	22+090.846	2.193 m LT	256.22
B-01-3	22+077.865	2.186 m RT	256.25

SOIL BORING LOCATION

DESIGN TRAFFIC

1999	1670 ADT
2019	2540 ADT
2019	76 ADTT

HYDRAULIC DATA

DRAINAGE AREA = 57 km²
Q₂₅ = 37 m³/sec ELEV. 255.472 V₂₅ = 1.54 m/sec
Q₁₀₀ = 46 m³/sec ELEV. 255.661 V₁₀₀ = 1.79 m/sec
STRUCTURE CLEARS 25-YEAR DESIGN HIGHWATER BY 6 mm±

EXISTING STRUCTURE

TYPE: TWO-SPAN CONTINUOUS CONCRETE SLAB ON CONCRETE ABUTMENTS
SPANS: 7620 mm± C/C BEARINGS 7620 mm±
ROADWAY: 9754 mm± F/F GUARDRAIL
APPROACH SLABS: 4572 mm±
SKEW: 0°
WEARING SURFACE: BITUMINOUS
ALIGNMENT: TANGENT
CONDITION: POOR
DISPOSITION: TO BE REMOVED
STRUCTURE FILE N': 3201775

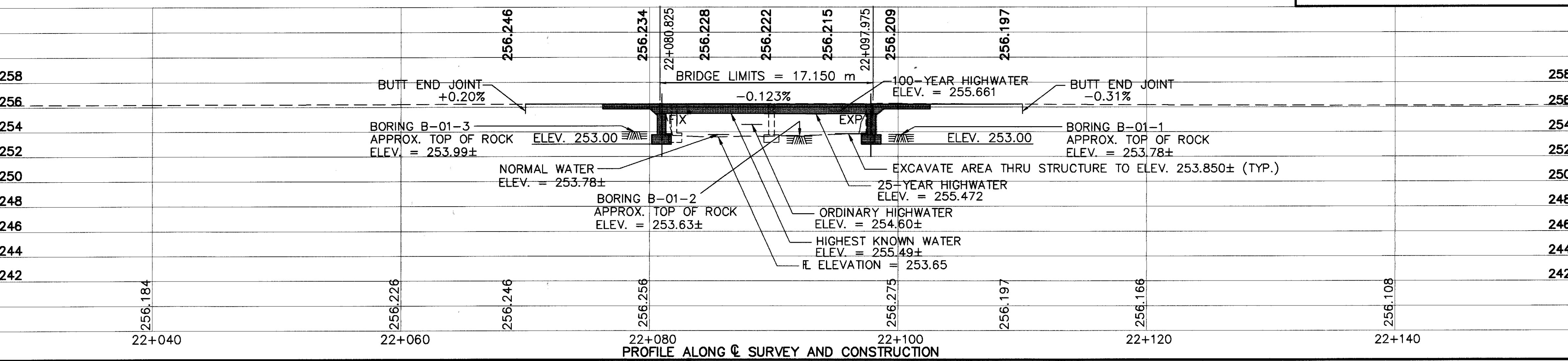
PROPOSED STRUCTURE

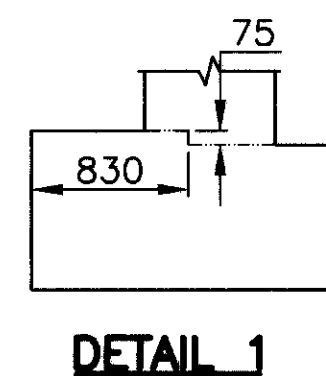
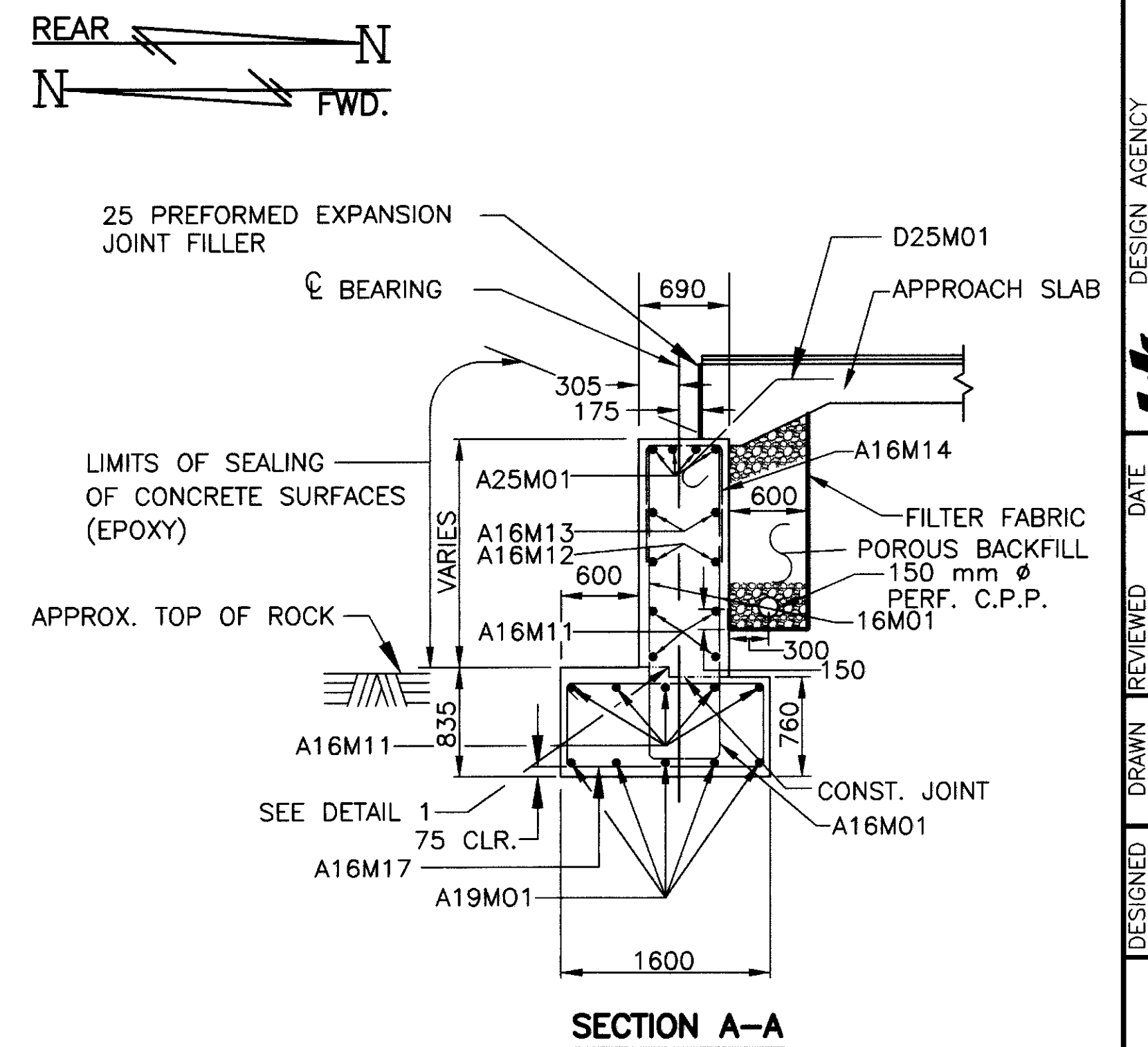
TYPE: SINGLE-SPAN NON-COMPOSITE PRESTRESSED CONCRETE BOX BEAMS WITH WALL ABUTMENTS SUPPORTED BY SPREAD FOOTERS
SPAN: 16 800 mm C/C BEARINGS
LOADING: MS18 AND ALTERNATE MILITARY LOADING
ROADWAY: 10 980 mm PLUS FIT-UP F/F GUARDRAIL
APPROACH SLABS: AS-1-81M (4600 mm)
SKEW: NONE
WEARING SURFACE: 64 mm MINIMUM ASPHALT CONCRETE
ALIGNMENT: TANGENT
CROWN: 0.016
LATITUDE: 40°-53'-27" NORTH
LONGITUDE: 83°-32'-56" WEST

BENCH MARK 1
Chiseled "X" on SW wingwall
of existing project bridge.
Elev. 256.219

BENCH MARK 2
Top of 300 mm diameter
concrete flag pole base.
Sta. 21+986.321±, 10.781 m RT.
Elev. 256.529

BENCH MARK 3
Top of iron pipe (set).
Sta. 22+200, 3.730 m RT.
Elev. 256.529

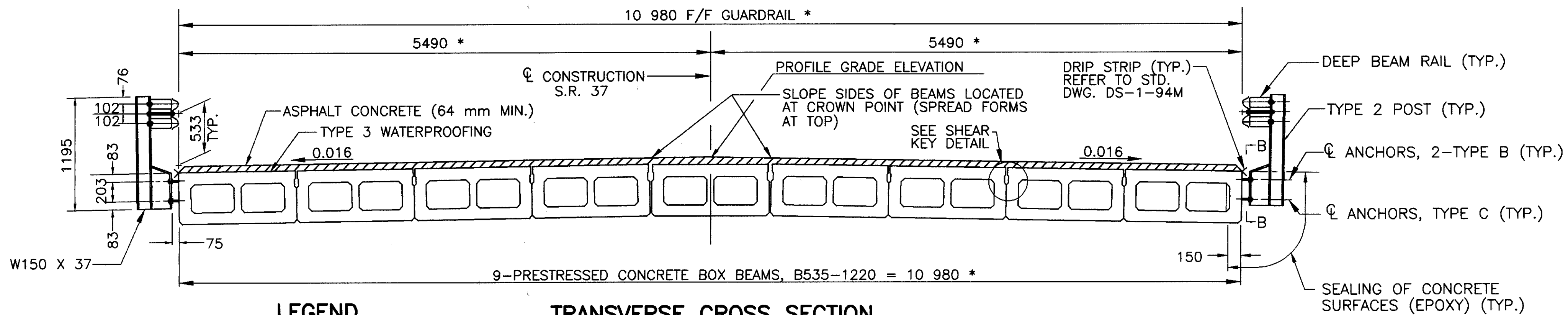




The diagram illustrates a cross-section of a concrete dam structure. Key components and dimensions include:

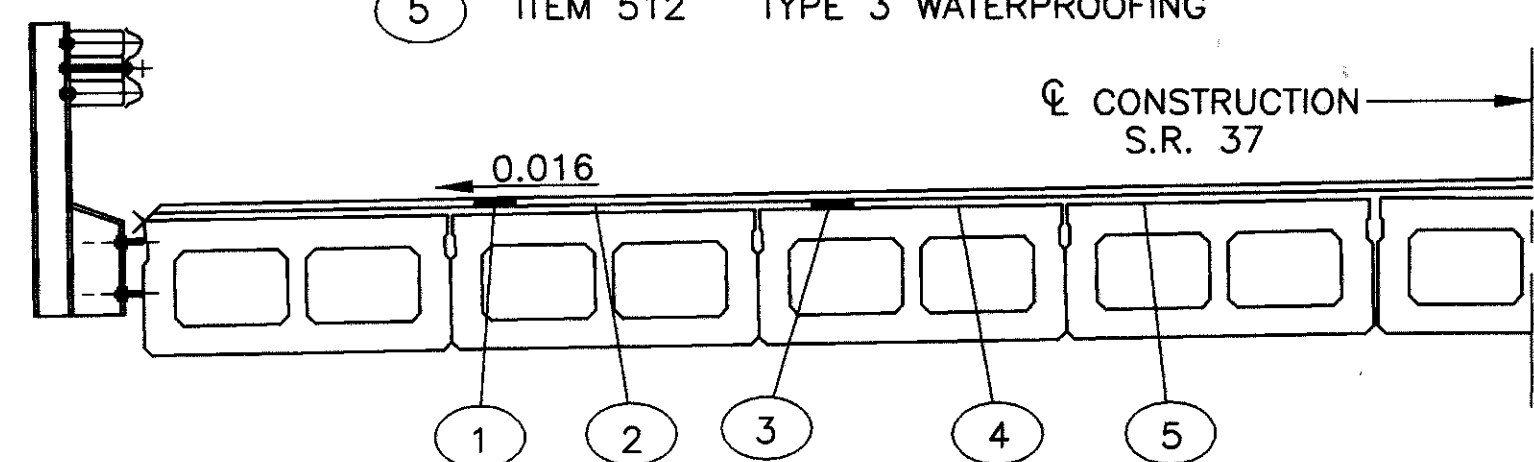
- Top Section:** A horizontal layer with a width of 690 and a height of 300.
- Sealing Layer:** A layer labeled "LIMITS OF SEALING OF CONCRETE SURFACES (EPOXY)" with a height of 300.
- Filter Fabric and Porous Backfill:** A section labeled "FILTER FABRIC POROUS BACKFILL" with a width of 600 and a height of 300.
- Reinforcement:** Various reinforcement bars are shown, including A16M16, A16M15, A16M02, A25M01, A16M13, A16M12, A16M11, A16M17, and A19M01.
- Dimensions:**
 - Overall width: 1600
 - Overall height: 835
 - Section width: 690
 - Section height: 760
 - Reinforcement spacing: 600
 - Reinforcement diameter: 150 mm ϕ PERF. C.P.P.
- Labels:**
 - CONST. JOINT
 - VARIES
 - APPROX. TOP OF ROCK
 - SEE DETAIL 1

SECTION B-B



LEGEND

- ① ITEM 448 32 mm ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN
- ② ITEM 407 TACK COAT FOR INTERMEDIATE COURSE
- ③ ITEM 448 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG64-28
- ④ ITEM 407 TACK COAT
- ⑤ ITEM 512 TYPE 3 WATERPROOFING



HALF TYPICAL SECTION BRIDGE DECK

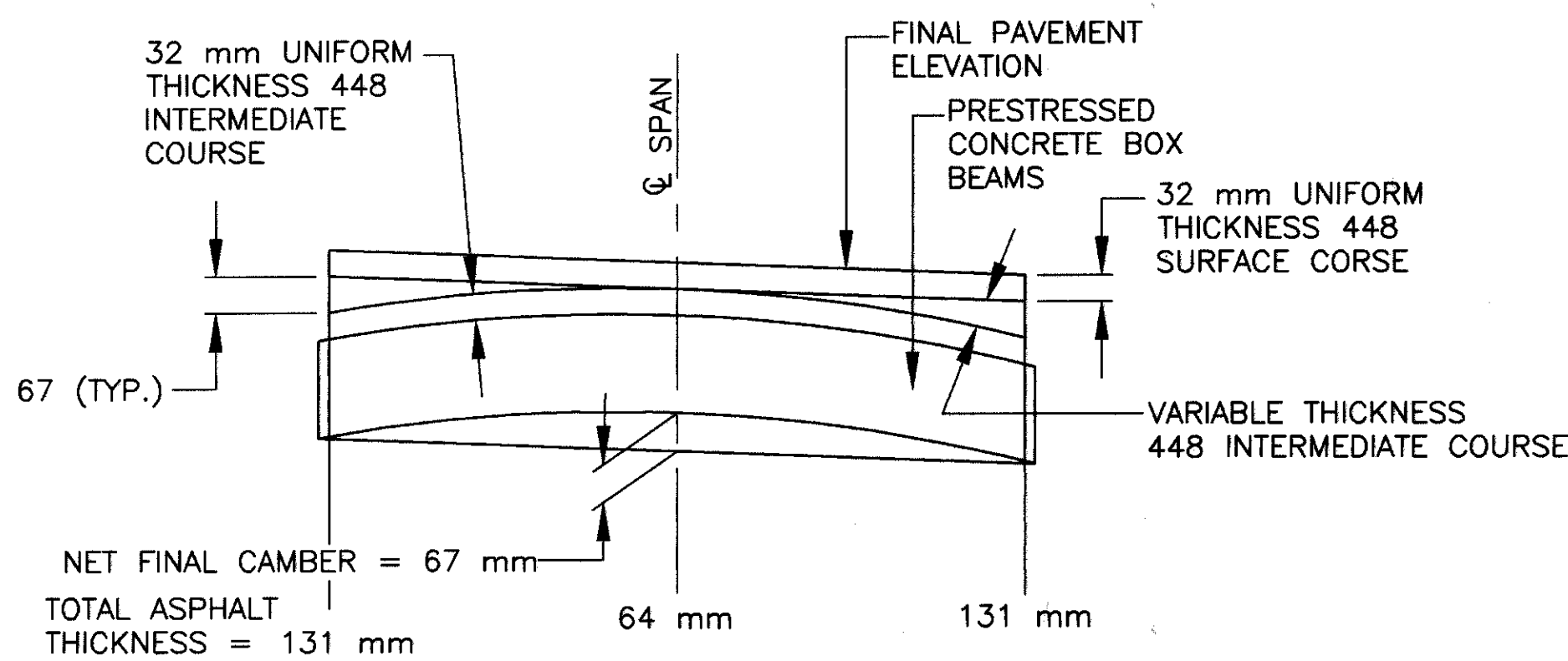
ASPHALT THICKNESS

CALCULATED CAMBER AT TIME OF PAVING, INCLUDING ALLOWANCE FOR CAMBER GROWTH DUE TO CREEP, IS 74 mm.

CALCULATED DEFLECTION DUE TO WEIGHT OF SURFACE COURSE AND RAILING, IS 7 mm.

NET FINAL CAMBER OF BEAMS IS 67 mm. THIS IS 67 mm IN EXCESS OF THE AMOUNT REQUIRED TO PLACE THE TOP OF THE BEAM PARALLEL TO THE PROFILE GRADE. THIS EXCESS AMOUNT SHALL BE COMPENSATED FOR BY THICKENING THE 448 INTERMEDIATE COURSE FROM 32 mm AT CENTER OF SPAN TO 99 mm AT ENDS OF SPAN.

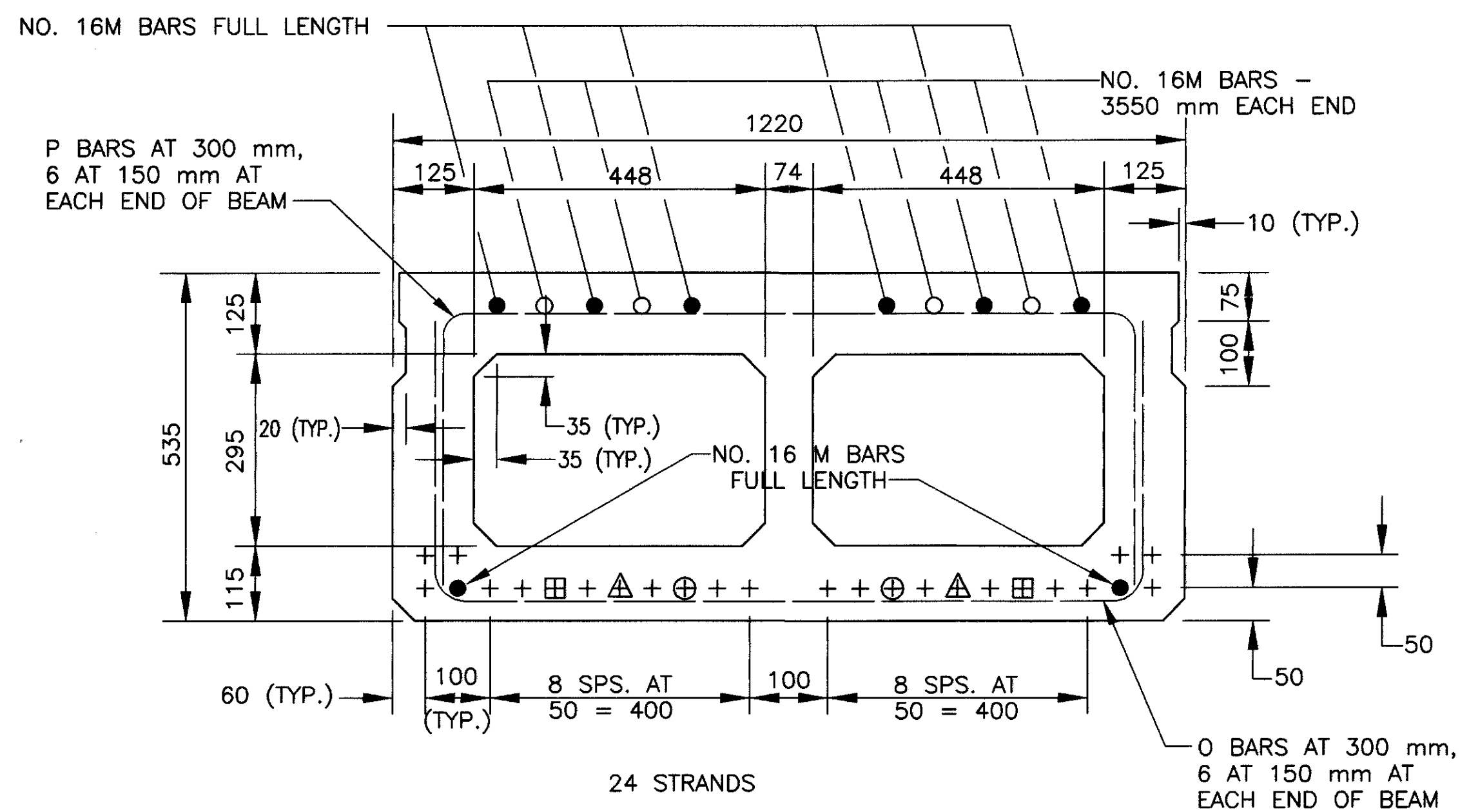
ASPHALT CONCRETE SURFACE COURSE SHALL CONSIST OF A VARIABLE THICKNESS OF 448 INTERMEDIATE COURSE AND 32 mm THICKNESS OF 448 SURFACE COURSE. THE 448 INTERMEDIATE COURSE SHALL BE PLACED IN TWO OPERATIONS. THE FIRST COURSE SHALL BE OF 32 mm UNIFORM THICKNESS. THE SECOND COURSE SHALL BE FEATHERED TO PLACE THE SURFACE PARALLEL TO AND 32 mm BELOW FINAL PAVEMENT SURFACE ELEVATION.



ASPHALT THICKNESS DIAGRAM

TRANSVERSE CROSS SECTION

* PLUS FIT-UP

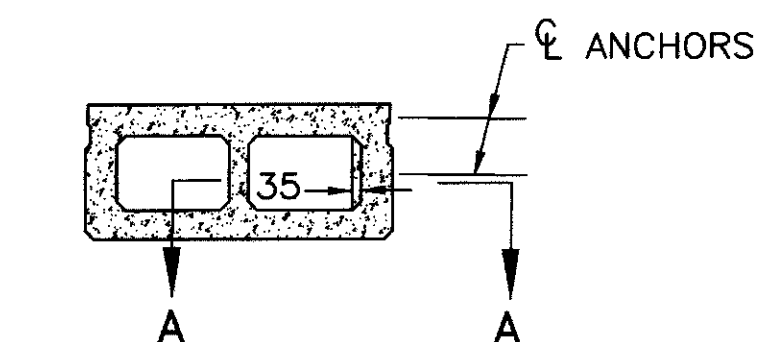


STRAND PATTERN DETAILS - B535-1220

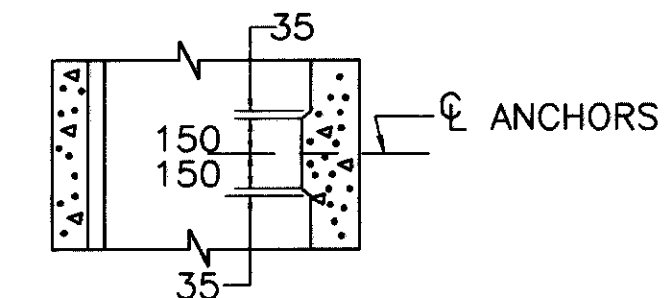
NOTES:

- FASCIA BEAMS: TO AVOID INTERFERENCE WITH THE ANCHORS FOR THE BRIDGE RAILING POSTS, THE LONGITUDINAL REINFORCING BARS NEAR THE FASCIA SHALL BE SHIFTED AS NECESSARY. FABRICATOR'S SHOP DRAWINGS SHALL SHOW COMPLETE DETAILS OF THE BEAM REINFORCEMENT.
- FOR ADDITIONAL DETAILS SEE SHEET 5/7 AND STANDARD DRAWING PSBD-1-93M.
- MINIMUM CONCRETE STRENGTH AT 28 DAYS $F'c=38.0$ MPa. MINIMUM CONCRETE STRENGTH AT TIME OF INITIAL PRESTRESS $F'ci=27.5$ MPa.
- PRESTRESSING STRANDS: 12.7 mm DIAMETER, GRADE 270, SEVEN-WIRE UNCOATED LOW-RELAXATION STRAND, AS=99 SQUARE mm ASTM A416.
- INITIAL STRESS $0.75 F'S=1400$ MPa. STRESS AT RELEASE $0.69 F'S=1280$ MPa.

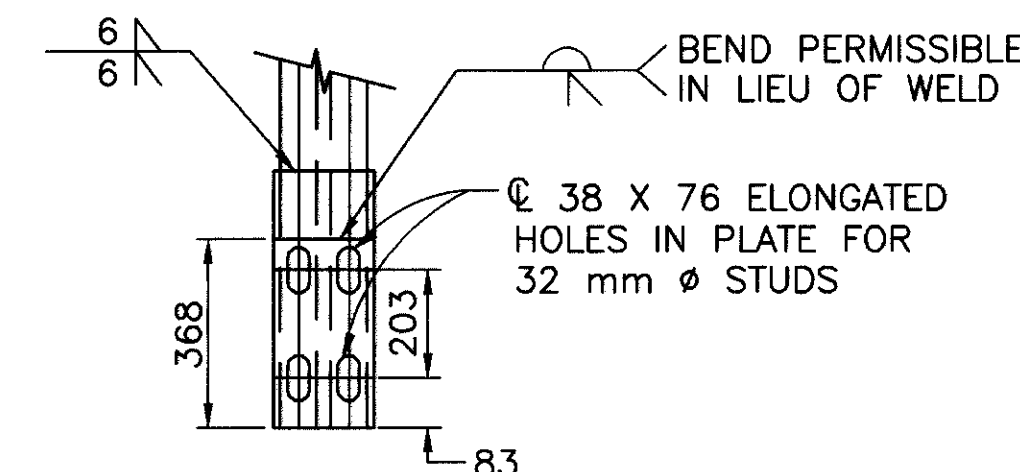
- NOTES:
- SLOTS SHALL BE PROVIDED IN ALL GUARDRAIL POSTS, SO THAT VERTICAL ADJUSTMENTS MAY BE MADE AFTER PLACEMENT TO PROVIDE A STRAIGHT-SMOOTH GUARDRAIL LINE ACROSS THE STRUCTURE. SEE SECTION B-B THIS SHEET.
 - THE KEYWAY ON THE FASCIA OF THE EXTERIOR BEAMS SHALL BE OMITTED.
 - SEE STD. DWG. DBR-2-73M TYPE 2 POST FOR ADDITIONAL RAILING DETAILS.
 - METRIC DIMENSIONS: ALL DIMENSIONS ARE IN MILLIMETERS AND STATIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.



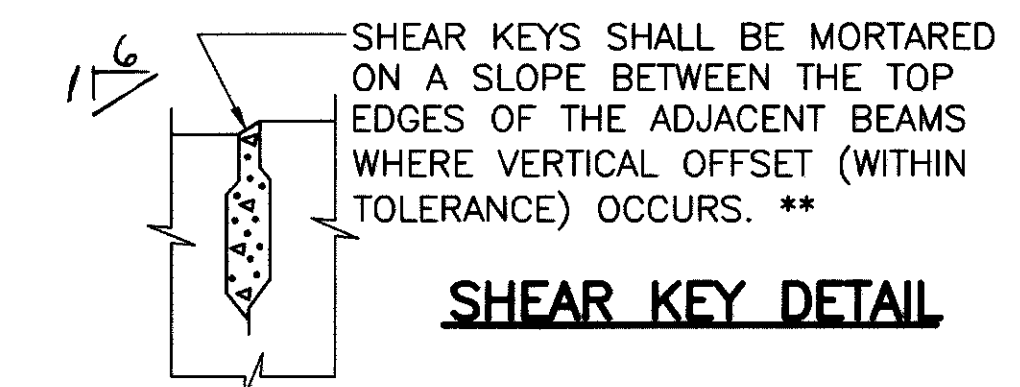
SECTION SHOWING WALL THICKENING AT GUARDRAIL ANCHORS



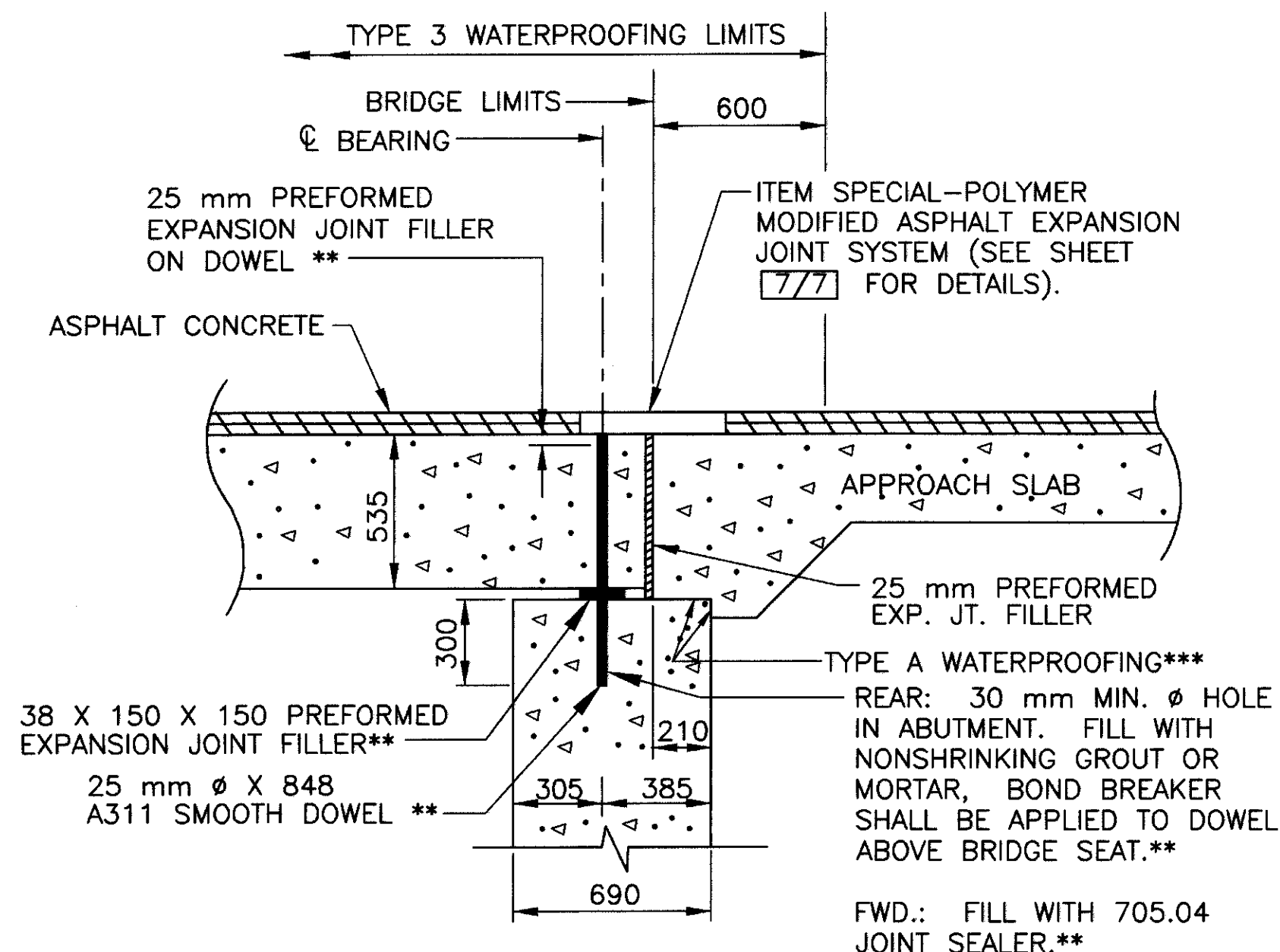
SECTION A-A



SECTION B-B



SHEAR KEY DETAIL



BEARING AT ABUTMENT

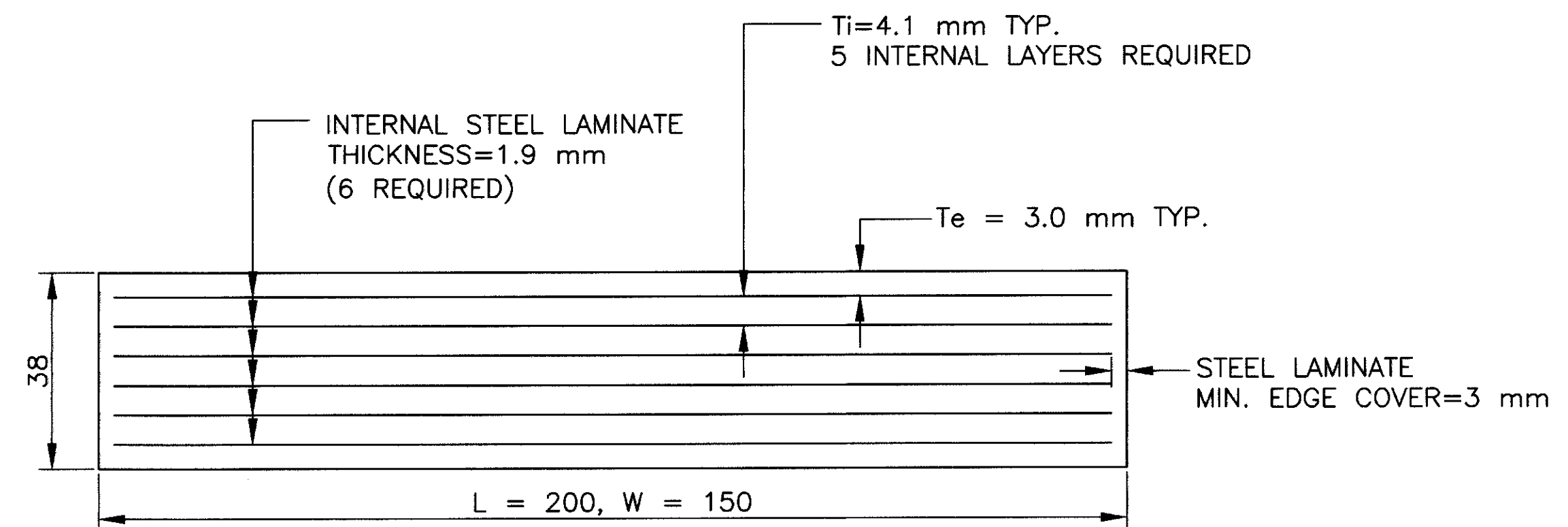
** - INCLUDED WITH ITEM 515 FOR PAYMENT

*** - INCLUDED WITH ITEM 611 FOR PAYMENT

N

 $\frac{4}{3}$ $\frac{2}{3}$

REINFORCING STEEL LIST

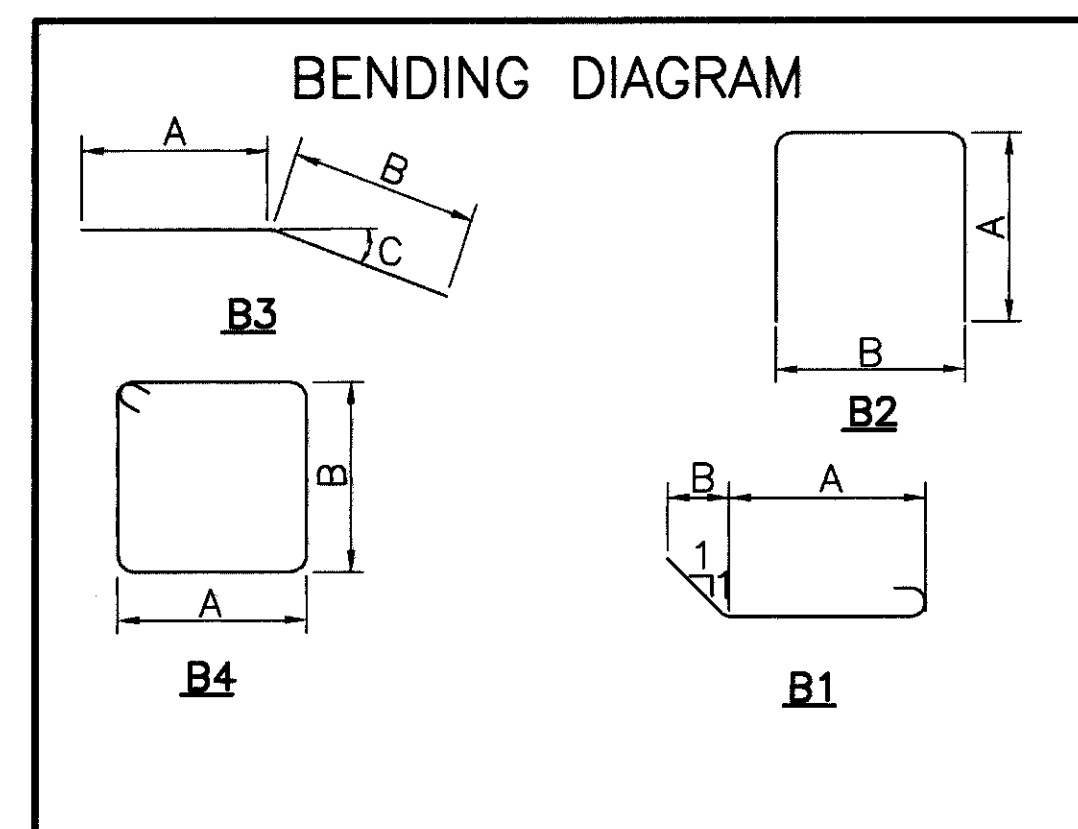


LAMINATED ELASTOMERIC FIXED AND EXPANSION BEARINGS

50 DUROMETER ABUTMENTS

DEAD LOAD REACTION = 72.6 kN
LIVE LOAD REACTION = 133.0 kN
MAXIMUM DESIGN LOAD = 205.6 kN

ELASTOMERIC BEARINGS: SHALL COMPLY WITH 516 AND ARTICLES 18.2.5 THROUGH 18.2.8 OF SECTION 18, BEARING DEVICES, DIVISION II, CONSTRUCTION, OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES. BEARINGS SHALL BE GRADE 3, 50-DUROMETER ELASTOMER, AND SHALL BE SUBJECTED TO THE LOAD TESTING REQUIREMENTS CORRESPONDING TO DESIGN METHOD A. TESTING SHALL BE INCLUDED IN THE PRICE BID FOR THE BEARINGS, EACH.



NOTES:

1. ALL DIMENSIONS ARE OUT TO OUT.
2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
3. AN "S" IN THE "SHP" COLUMN INDICATES STRAIGHT BARS.
4. REFER TO CMS SECTION 509.05 FOR STANDARD BEND DIMENSIONS.

REINFORCING BAR SPLICE

REINFORCING BAR SPLICE
REINFORCING BAR SPLICE LENGTHS SHALL CONFORM TO THE
MINIMUM LENGTHS SPECIFIED BY 509.08 OF THE
CONSTRUCTION AND MATERIAL SPECIFICATIONS UNLESS
OTHERWISE NOTED ON THE PLANS.

REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05 AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPICED IN ACCORDANCE WITH 509.08.

METRIC DIMENSIONS: ALL DIMENSIONS ARE IN MILLIMETERS
AND STATIONS AND ELEVATIONS ARE IN METERS UNLESS
OTHERWISE NOTED.

GENERAL NOTES AND DETAILS FOR POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM

ITEM SPECIAL - POLYMER-MODIFIED ASPHALT EXPANSION
JOINT SYSTEM

THIS ITEM WILL BE USED TO SEAL THE EXPANSION/CONTRACTION JOINTS AS PER THESE DETAILS AND THE MANUFACTURER'S REQUIREMENTS USING A POLYMER-MODIFIED ASPHALT SYSTEM. THE PRIME CONTRACTOR WILL OBTAIN THE SERVICES OF ONE OF THE FOLLOWING APPROVED APPLICATORS WHO WILL FURNISH AND INSTALL THE NEW BRIDGE EXPANSION JOINT SYSTEM AFTER ALL PAVING ON THE AFFECTED BRIDGE(S) HAS BEEN COMPLETED.

PAVETECH INTERNATIONAL, INC.	LINEAR DYNAMICS, INC.	BRIDGESAVER, INC.	EXPANDEX
P.O. BOX 498969	RD #2 BOX 311	1801-A Willis Road	95 PINEVIEW DR.
12066 MONTGOMERY RD.	MUNCY, PA 17756	Richmond, VA 23237	AMHERST, NY 14228
CINCINNATI, OH 45249	TEL: (717) 546-6041	TEL: 1-800-448-3636	TEL: (716) 691-7566
TEL: 1-800-258-0162			

MATERIALS:

BRIDGING PLATE:

MILD STEEL 3 mm OR 6 mm THICK PLATE, 200 mm WIDE OR 18 GAUGE
(APPROX. 1.3 mm) ALUMINUM, 204 mm WIDE.

BINDER:

TYPE:	POLYMER MODIFIED ASPHALT
SOFTENING POINT:	180 DEGREES F. MIN.
FLOW:	3 mm. MAX. AT 140 DEGREES F.
PENETRATION:	9 mm. MAX. AT 77 DEGREES F. 1 mm. MAX AT 0 DEGREES F. ASTM D 3407
DUCTILITY:	40 cm. MIN. ASTM D 113
RESILIENCE:	60% MIN. AT 77 DEGREES F.
TENSILE ADHESION:	700% MIN.
SPECIFIC GRAVITY:	1.10 ± 0.05
POURING TEMP:	350 - 390 DEGREES F.

AGGREGATE:

TYPE: CRUSHED, DOUBLE WASHED, AND
DRIED GRANITE OR BASALT

GRADATION THE GRADATION OF THE AGGREGATE VARIES BY MANUFACTURER AND WILL BE AS PER THE MANUFACTURER'S RECOMMENDATIONS FOR THE SYSTEM BEING USED ON THIS PROJECT.

BACKER ROD:

THE BACKER ROD SHALL BE A CLOSED CELL FOAM EXPANSION JOINT FILLER CAPABLE OF WITHSTANDING THE PLACEMENT TEMPERATURE OF THE POLYMER MODIFIED ASPHALT.

INSTALLATION PROCEDURES:

SAWING AND SURFACE PREPARATION:

AFTER ALL PAVING OPERATIONS ARE COMPLETE, THE OVERLAY IS TO BE TRANSVERSELY SAW CUT FULL DEPTH NO LESS THAN 51 MILLIMETERS DEEP (508 mm CENTERED OVER JOINT OPENING, UNLESS OTHERWISE NOTED). REMOVE ALL MATERIAL, INCLUDING WATER-PROOFING MATERIAL, BETWEEN SAW CUTS. THOROUGHLY CLEAN AND DRY EXPOSED CONCRETE, STEEL, AND CUT SURFACES USING COMPRESSED AIR AND A HOT COMPRESSED AIR (HCA) LANCE. THE LANCE MUST PRODUCE A FLAME RETARDED AIR STREAM TEMPERATURE OF 1649 DEGREES C. AT A VELOCITY OF 914 METERS PER SECOND WITH 103.4 kPa GAGE CHAMBER PRESSURE. IF THERE IS AN INTERRUPTION DUE TO WEATHER OR OTHER CAUSES, THE OPERATION WILL BE REPEATED WITH THE HCA LANCE IMMEDIATELY BEFORE THE BINDER COAT OPERATION. ALSO, 152 mm OF THE ROAD SURFACE ON EITHER SIDE OF THE JOINT WILL BE DRIED SO THAT A SUITABLE SURFACE FOR BITUMEN ADHESION IS OBTAINED.

SEALING OF EXPANSION JOINT: (PRE-STRESSED BOX OR CONCRETE SLAB)

THE EXPANSION JOINT GAP IS TO BE SEALED AND A BRIDGING PLATE CENTERED ALONG IT. A VERY NARROW GAP WILL BE SEALED BY POURING HOT BINDER INTO THE GAP. GAPS OF 3 mm OR MORE WILL FIRST BE FILLED WITH AN APPROPRIATELY SIZED BACKER ROD. THE BACKER ROD WILL BE INSTALLED SO THAT IT IS BETWEEN 3 mm AND 30 mm BELOW THE TOP OF THE EXISTING GAP. THE GAP WILL THEN BE FILLED WITH BINDER.

BOND BREAKER:

SPREAD BINDER OVER SURFACE AREA WHERE THE METAL BRIDGING PLATE WILL BE PLACED. CENTER THE BRIDGING PLATE OVER THE EXISTING JOINT AND BED INTO THE HOT BINDER. BUTT JOINT THE BRIDGING PLATES TO ACCOMMODATE THE ENTIRE JOINT LENGTH. SPIKE HOLES WILL BE DRILLED AT 300 mm INTERVALS ALONG THE LONGITUDINAL CENTERLINE OF THE PLATES. SECURE BRIDGING PLATE WITH NAILS OR SPIKES. SEAL BUTT JOINTS WITH HOT BINDER AND ALLOW BINDER TO SETUP BEFORE NEXT OPERATION. WHEN ALUMINUM BRIDGING PLATES ARE USED, ONLY THE BINDER IS REQUIRED TO SECURE THE INDIVIDUAL PLATES.

BINDER COAT:

SEAL ALL PREPARED, EXPOSED SURFACES OF THE JOINT WITH BINDER. POUR THE HOT BINDER OVER THE FLOOR AREA OF THE JOINT AND SPREAD TO COAT ALL EXPOSED SURFACES. THE BINDER WILL BE A MINIMUM OF 1 mm THICK ON THE BOTTOM OF THE JOINT CAVITY, WITH POOLS OF GREATER THICKNESS WHERE SURFACE IRREGULARITIES EXIST. THE BINDER APPLICATION TEMPERATURE WILL BE BETWEEN 177 AND 199 DEGREES C. THE BINDER WILL NOT BE ALLOWED TO BE HEATED ABOVE 210 DEGREES C. NOR ALLOWED TO EXCEED 199 DEGREES C. FOR MORE THAN 1 HOUR. A DOUBLE JACKETED OIL MELTER WILL BE USED TO HEAT THE BINDER. THE MELTER WILL BE EQUIPPED WITH A CONTINUOUS AGITATION SYSTEM, TEMPERATURE CONTROLS, AND A CALIBRATED THERMOMETER. ALSO A SYSTEM FOR ACCURATELY MEASURING THE WEIGHTS OF THE BINDER AND THE AGGREGATE WILL BE REQUIRED.

BUILD-UP OF JOINT LAYERS:

AGGREGATE PREPARATION:

HEAT THE AGGREGATE TO A TEMPERATURE OF 135 TO 163 DEGREES C., WITH A SUITABLE ROTATING DRUM WITH ATTACHED HEAT SOURCE OR A HOT COMPRESSED AIR LANCE, TO REMOVE DUST AND MOISTURE.

AGGREGATE PROPORTION AND LAYER THICKNESS:

MIX THE AGGREGATE WITH THE BINDER SUCH THAT THE MINIMUM AGGREGATE CONTENT BY WEIGHT WILL BE 68%. THE HEATED AGGREGATE AND BINDER WILL BE COMBINED IN LAYERS NOT LESS THAN 13 MILLIMETERS NOR EXCEEDING 64 MILLIMETERS. THE THICKNESS OF EACH LAYER CAN BE VARIED, WITHIN THESE LIMITS, TO ACHIEVE THE REQUIRED JOINT THICKNESS (MINIMUM 51 mm). THE OBJECTIVE IS TO COAT EACH STONE AND FILL THE VOIDS WHILE AVOIDING AN EXCESS OF BINDER. THIS WILL ACHIEVE THE MAXIMUM CONTENT OF STONE CONSISTENT WITH ALL STONES BEING COATED WITH BINDER. RAKE THE MIXTURE TO MIX AND LEVEL.

THE TOP LAYER THICKNESS WILL VARY BETWEEN 13 mm AND 25 mm.
IN PREPARING THE TOP LAYER, THE RATIO OF AGGREGATE TO BINDER WILL
BE APPROXIMATELY 6:1 BY WEIGHT. OVERFILL THE TOP LAYER AND COMPACT
TO THE LEVEL OF THE ADJACENT SURFACES USING A ROLLER OR VIBRATORY PLATE
COMPACTOR. IMMEDIATELY AFTER COMPLETION OF THE COMPACTION, POUR
SUFFICIENT BINDER OVER THE JOINT TO FILL THE SURFACE VOIDS AND COAT
THE SURFACE STONE. DUST THE FINISHED JOINT WITH A FINE, DRY AGGREGATE
TO PREVENT TACKINESS.

MAINTENANCE OF TRAFFIC:

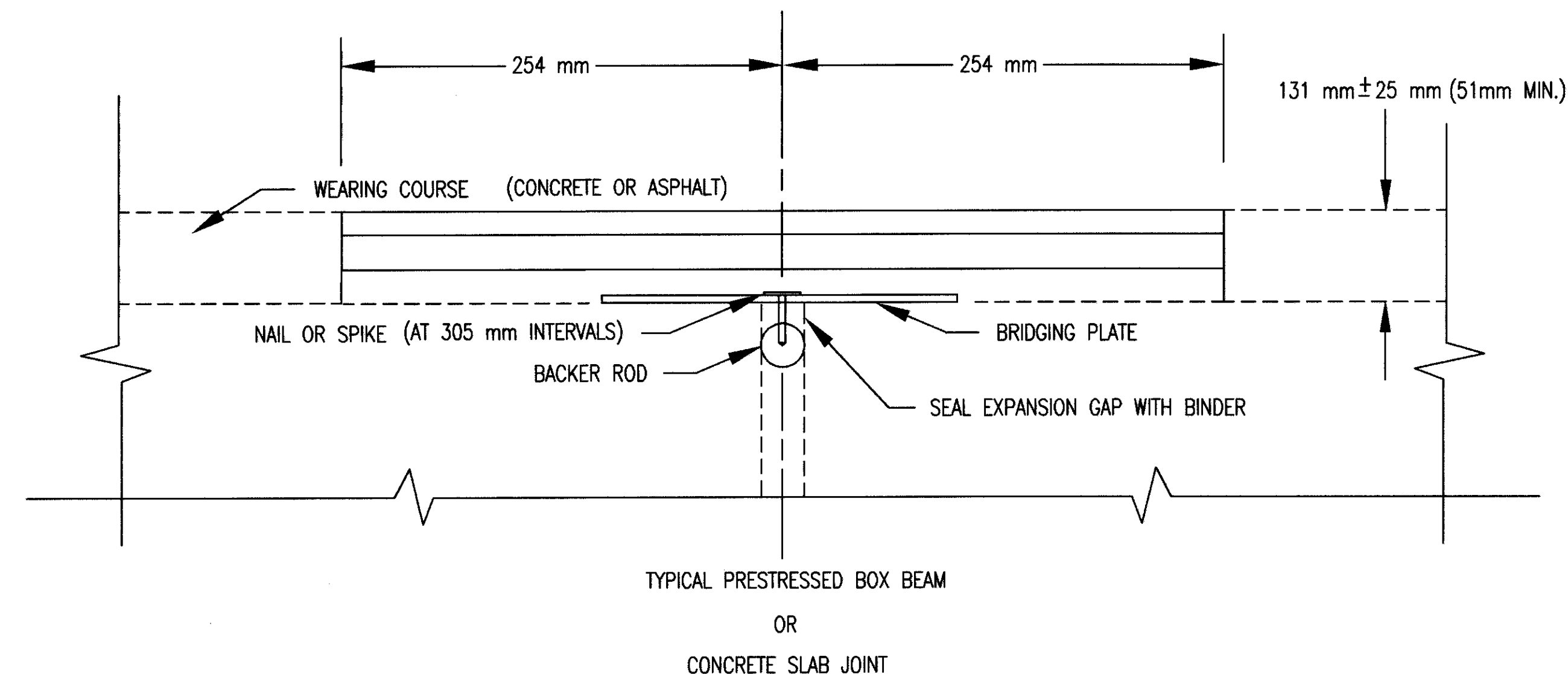
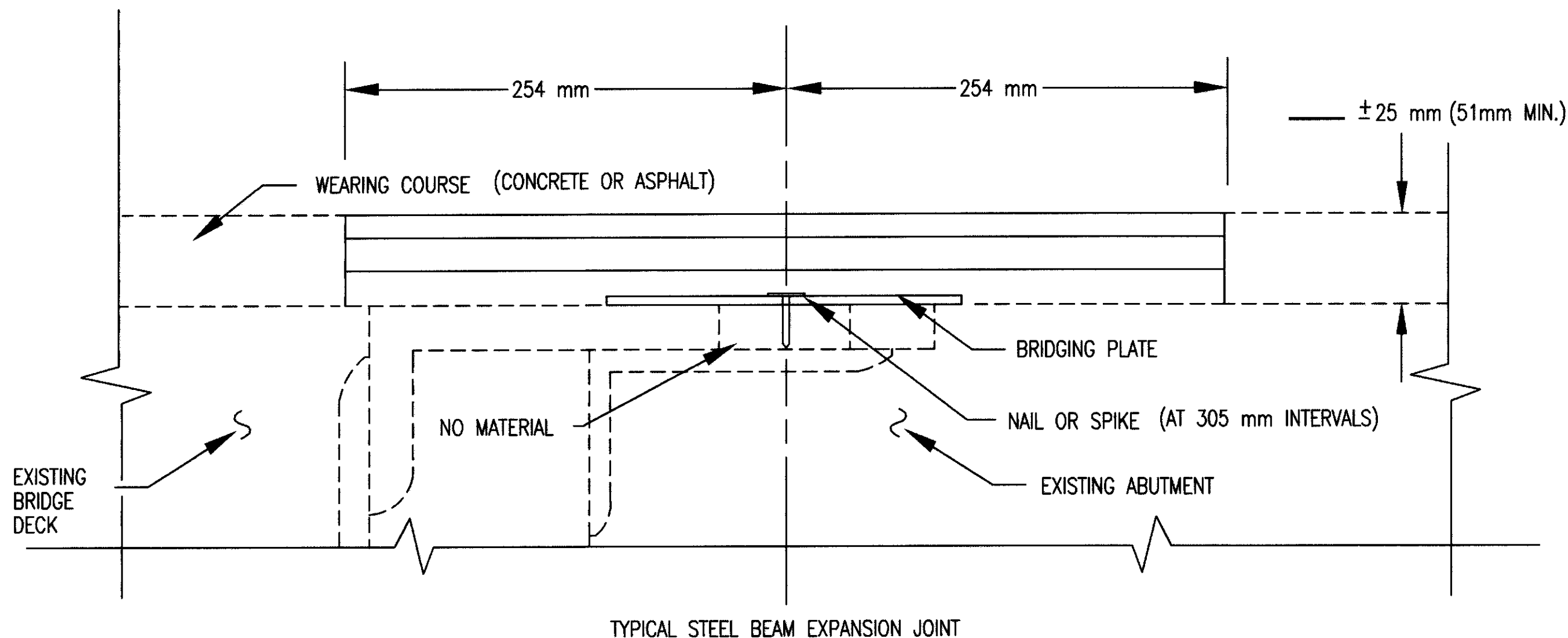
IF NECESSARY TO FACILITATE TRAFFIC MAINTENANCE, THE JOINT WILL BE INSTALLED IN TWO (2) HALF-WIDTH PHASES. DURING PHASE 1 APPROXIMATELY HALF OF THE TOTAL JOINT WILL BE INSTALLED. DURING PHASE 2, A MINIMUM OF 51 MILLIMETERS OF THE PHASE 1 JOINT WILL BE REMOVED, AT OR NEAR THE CENTERLINE, WITH THE REMAINDER OF THE JOINT INSTALLED. IN ALL CASES, OPERATIONS WILL BE SCHEDULED SO THAT ALL LANES CAN BE OPEN TO TRAFFIC DURING ALL NON-WORKING HOURS

TESTING:

CERTIFICATION WILL BE SUPPLIED FOR EACH PROJECT SHOWING BINDER COMPLIANCE WITH REQUIRED PROPERTIES. A ONE LITER SAMPLE OF BINDER WILL BE RETRIEVED FROM EACH BRIDGE FOR FURTHER TESTING BY THE O.D.O.T. TESTING LABORATORY.

PAYMENT:

PAYMENT FOR ALL THE ABOVE WILL BE AT THE UNIT PRICE BID PER LINEAR METER OF SEALED JOINT IN PLACE FOR ITEM SPECIAL 516 31300, POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM (131 MILLIMETERS THICK). THIS WILL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.



GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

AS-1-81M	DATED	10-25-94
DBR-2-73M	DATED	8-18-95
DS-1-94M	DATED	12-15-94
PSBD-1-93M	DATED	12-19-94

AND TO SUPPLEMENTAL SPECIFICATIONS

865 DATED 1-6-98

DESIGN SPECIFICATIONS: THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS 1996, INCLUDING THE 1997 INTERIM SPECIFICATIONS AND TO THE ODOT BRIDGE DESIGN MANUAL.

DESIGN DATA:

DESIGN LOADING: MS 18 AND ALTERNATE MILITARY LOADING
CONCRETE CLASS C: COMPRESSIVE STRENGTH 27.5 MPa (SUBSTRUCTURE)
REINFORCING STEEL: ASTM A615M, A616M, A617M - GRADE 420, MINIMUM
YIELD STRENGTH: 420 MPa
CONCRETE FOR PRESTRESSED CONCRETE BEAMS:
COMPRESSIVE STRENGTH - 38 MPa
UNIT STRESS - 15.2 MPa COMPRESSION; 3.1 MPa TENSION
PRESTRESSING STRAND: ASTM A416M - F'S = 1860 MPa
INITIAL STRESS: 0.75 F'S (LOW RELAXATION STRANDS)
MILD REINFORCING STEEL FOR PRESTRESSED BEAMS - GRADE 420,
MINIMUM YIELD STRENGTH 420 MPa

REMOVAL OF EXISTING STRUCTURE:

WHEN NO LONGER NEEDED TO
MAINTAIN TRAFFIC THE EXISTING STRUCTURE SHALL BE REMOVED
UPON RECEIVING PERMISSION FROM THE ENGINEER.

METRIC DIMENSIONS:

ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS
AND STATIONS ARE IN METERS UNLESS OTHERWISE NOTED.

UTILITY LINES: ALL EXPENSE INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE UTILITIES. THE CONTRACTOR AND UTILITIES ARE TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

REMOVAL OVER WATER: REASONABLE CARE SHALL BE USED BY THE CONTRACTOR TO PREVENT REMOVED MATERIALS FROM FALLING INTO THE WATER. ANY DROPPED MATERIALS SHALL BE IMMEDIATELY RECOVERED AND DISPOSED OF AWAY FROM THE SITE EXCEPT FOR APPROVED MASONRY MATERIAL WHICH MAY BE USED AS BANK PROTECTION AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR UNDER ITEM 202 "STRUCTURE REMOVED, OVER 6 METER SPAN." REFER TO 104.06 OF THE O.D.O.T. C.M.S. FOR ADDITIONAL REQUIREMENTS.

DECK PROTECTION METHOD: TYPE 3 WATERPROOFING, ASPHALT CONCRETE OVERLAY, STEEL DRIP STRIP, EPOXY COATED REINFORCING STEEL, AND SEALING OF CONCRETE SURFACES.

ITEM 407. TACK COAT: THE RATE OF APPLICATION OF THE 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF 0.34 LITERS PER SQUARE METER OF TACK COAT FOR ESTIMATING PURPOSES ONLY.

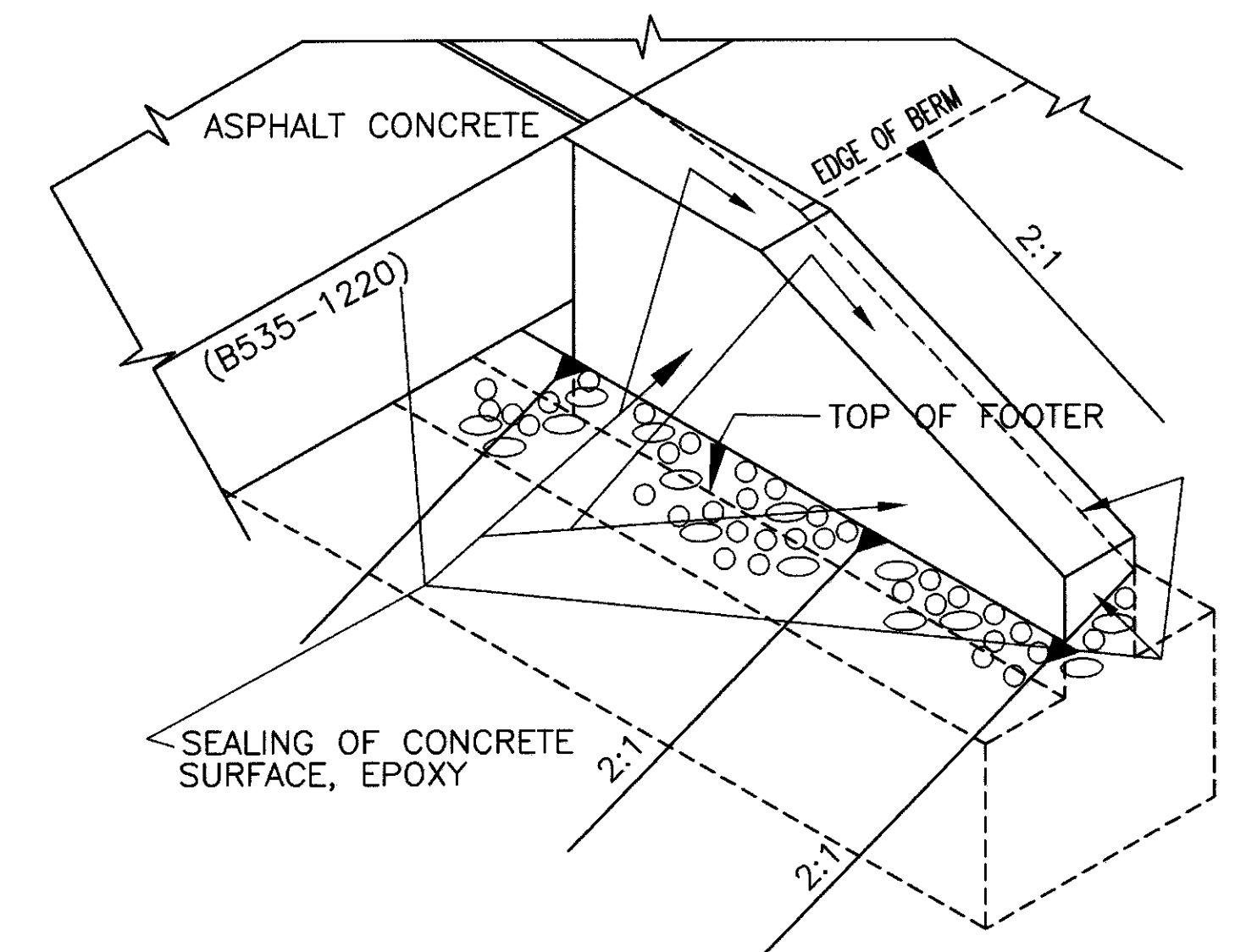
ITEM 448 ASPHALT CONCRETE SURFACE COURSE TYPE 1H, AS PER PLAN; THIS ITEM SHALL MEET ALL REQUIREMENTS OF SPECS 401, 441 AND 448 WITH THE FOLLOWING EXCEPTION:

1) NO RECYCLED ASPHALT PAVEMENT SHALL BE USED IN THE SURFACE COURSE.

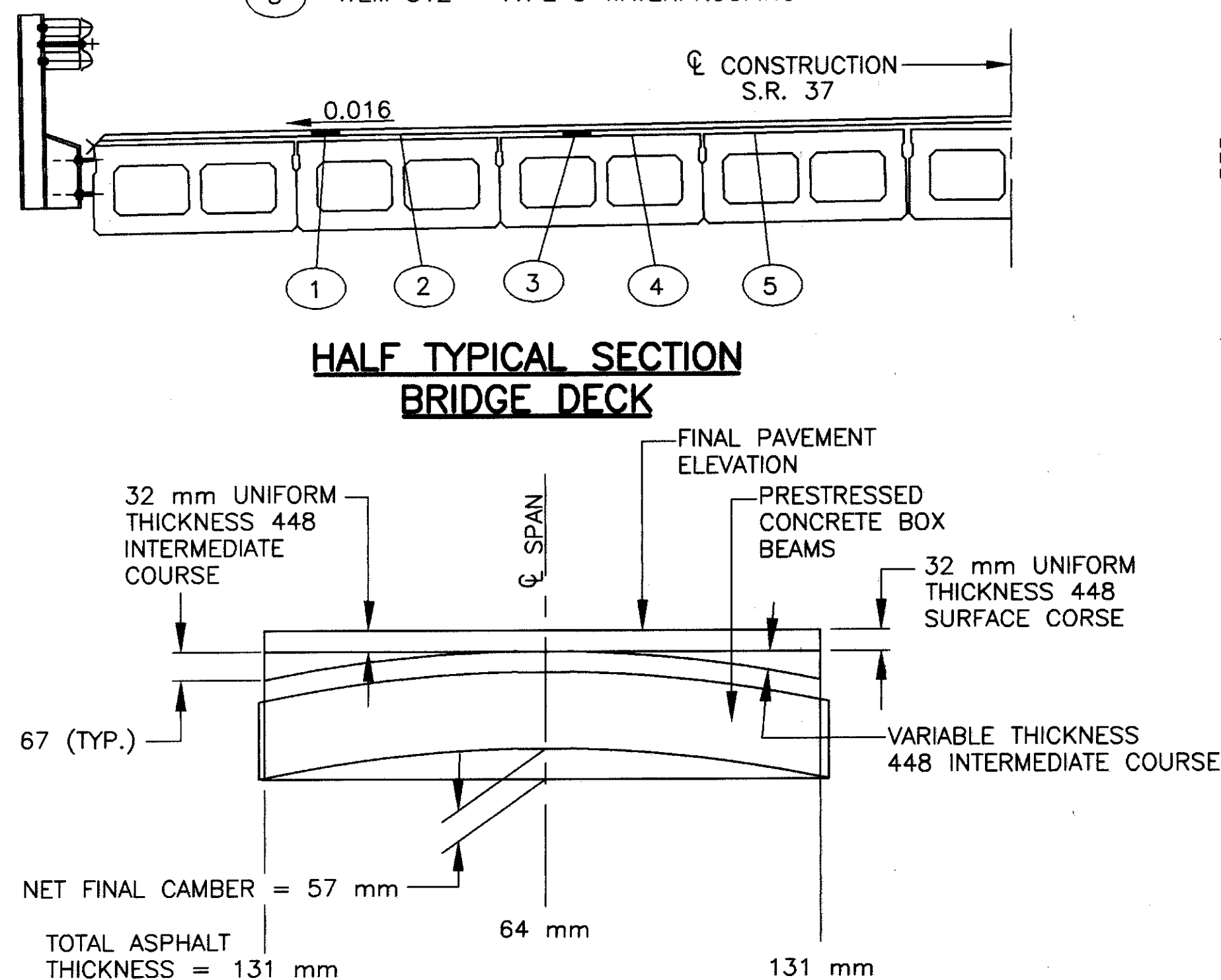
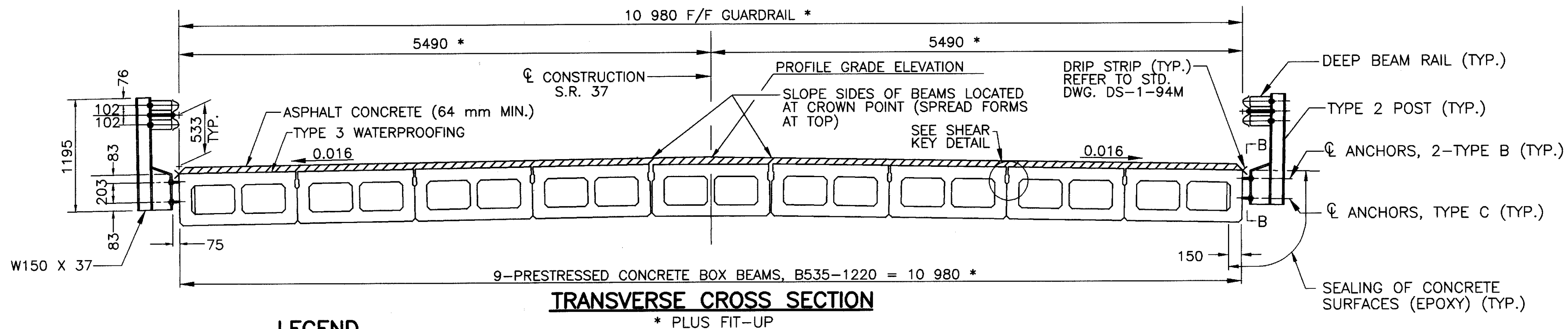
ALL COSTS ASSOCIATED WITH THE EQUIPMENT, LABOR AND MATERIALS NECESSARY FOR SUPPLYING AND PLACING THIS ITEM SHALL BE INCLUDED IN THE PRICE BID PER CUBIC METER FOR ITEM 448 ASPHALT CONCRETE SURFACE COURSE TYPE 1H, AS PER PLAN.

BEARING PAD SHIMS: 3 mm THICK PREFORMED BEARING PAD SHIMS, PLAN AREA 150 mm BY 200 mm SHALL BE PLACED UNDER THE ELASTOMERIC BEARING PADS WHERE REQUIRED FOR PROPER BEARING. THE AMOUNT SUPPLIED IS SUFFICIENT FOR 2 SHIMS PER BEAM. PAYMENT WILL BE MADE AT THE CONTRACT PRICE BID FOR ITEM 516-3 mm PREFORMED BEARING PAD. ANY UNUSED SHIMS SHALL BECOME THE PROPERTY OF THE STATE.

ESTIMATED QUANTITIES				QUANTITIES CALCULATED BY <u>J.R.H.</u>	DATE <u>3-26-98</u>		
				QUANTITIES CHECKED BY <u>M.A.D.</u>	DATE <u>8-10-98</u>		
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT'S	GEN'L
202	11002	LUMP		STRUCTURE REMOVED, OVER 6 METER SPAN			LUMP
407	10000	65	LITER	TACK COAT	65		
407	14000	65	LITER	TACK COAT FOR INTERMEDIATE COURSE	65		
448	46010	10	CU METER	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE1, PG64-28	10		
448	50001	6	CU METER	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN (SEE SHEET 2/7.)	6		
503	11100	LUMP		COFFERDAMS, CRIBS AND SHEETING			LUMP
503	21300	LUMP		UNCLASSIFIED EXCAVATION		LUMP	
503	31100	62	CU METER	ROCK EXCAVATION		62	
511	43500	195	CU METER	CLASS C CONCRETE, ABUTMENT INCLUDING FOOTING		195	
512	55910	LUMP		TYPE 3 WATERPROOFING	LUMP		
SPECIAL	51267502	165	SQ. METER	SEALING OF CONCRETE SURFACES (EPOXY)(SEE PROPOSAL NOTE)	24	141	
516	13600	14	SQ. METER	25 mm PREFORMED EXPANSION JOINT FILLER		14	
SPECIAL	51631300	23	METER	POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM (SEE SHEET <u>7/7</u> .)	23		
516	41200	0.54	SQ. METER	3 mm PREFORMED BEARING PAD, 711.21	0.54		
516	43100	36	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES ONLY (NEOPRENE) 38 mm x 150 mm x 200 mm		36	
517	72300	38.10	METER	RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS AND ANCHOR BOLTS)(SEE PROPOSAL NOTE)	38.10		
518	21230	LUMP		POROUS BACKFILL WITH FILTER FABRIC		LUMP	
SPECIAL	51822300	38	METER	STEEL DRIP STRIP	38		
518	40000	41	METER	150 mm PERFORATED CORRUGATED PLASTIC PIPE		41	
865	10050	9	EACH	PRESTRESSED CONCRETE NON-COMPOSITE BOX BEAM BRIDGE MEMBERS, LEVEL 1, B535-1220	9		



CONCRETE PROTECTION DETAIL
TYPICAL FOR ALL CORNERS



ASPHALT THICKNESS DIAGRAM

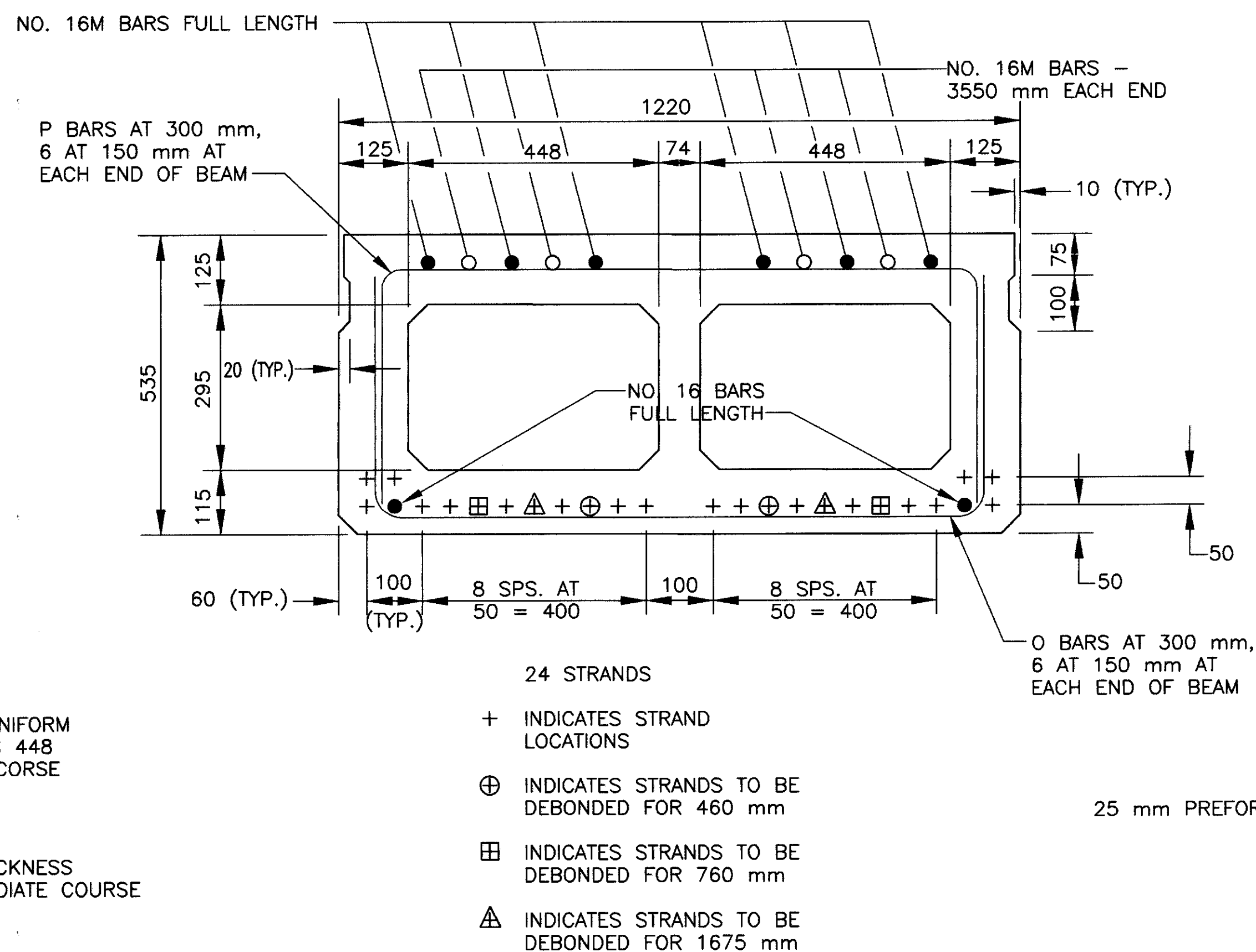
ASPHALT THICKNESS

CALCULATED CAMBER AT TIME OF PAVING, INCLUDING ALLOWANCE FOR CAMBER GROWTH DUE TO CREEP, IS 74 mm.

CALCULATED DEFLECTION DUE TO WEIGHT OF SURFACE COURSE AND RAILING, IS 7 mm.

NET FINAL CAMBER OF BEAMS IS 67 mm. THIS IS 67 mm IN EXCESS OF THE AMOUNT REQUIRED TO PLACE THE TOP OF THE BEAM PARALLEL TO THE PROFILE GRADE. THIS EXCESS AMOUNT SHALL BE COMPENSATED FOR BY THICKENING THE 448 INTERMEDIATE COURSE FROM 32 mm AT CENTER OF SPAN TO 99 mm AT ENDS OF SPAN.

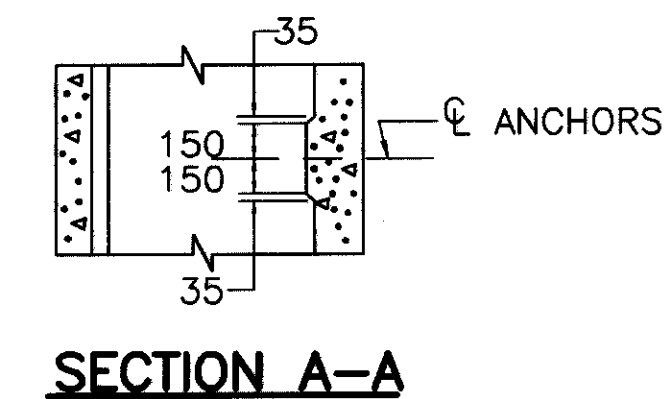
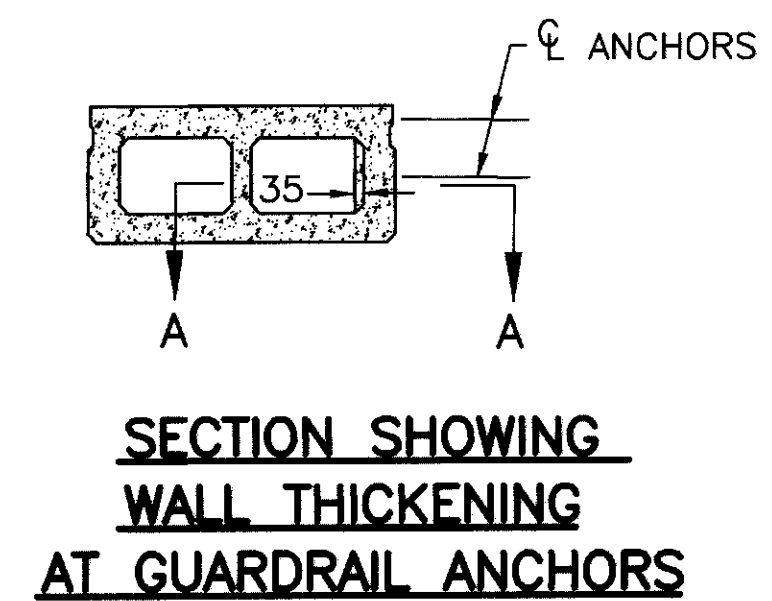
ASPHALT CONCRETE SURFACE COURSE SHALL CONSIST OF A VARIABLE THICKNESS OF 448 INTERMEDIATE COURSE AND 32 mm THICKNESS OF 448 SURFACE COURSE. THE 448 INTERMEDIATE COURSE SHALL BE PLACED IN TWO OPERATIONS. THE FIRST COURSE SHALL BE OF 32 mm UNIFORM THICKNESS. THE SECOND COURSE SHALL BE FEATHERED TO PLACE THE SURFACE PARALLEL TO AND 32 mm BELOW FINAL PAVEMENT SURFACE ELEVATION.



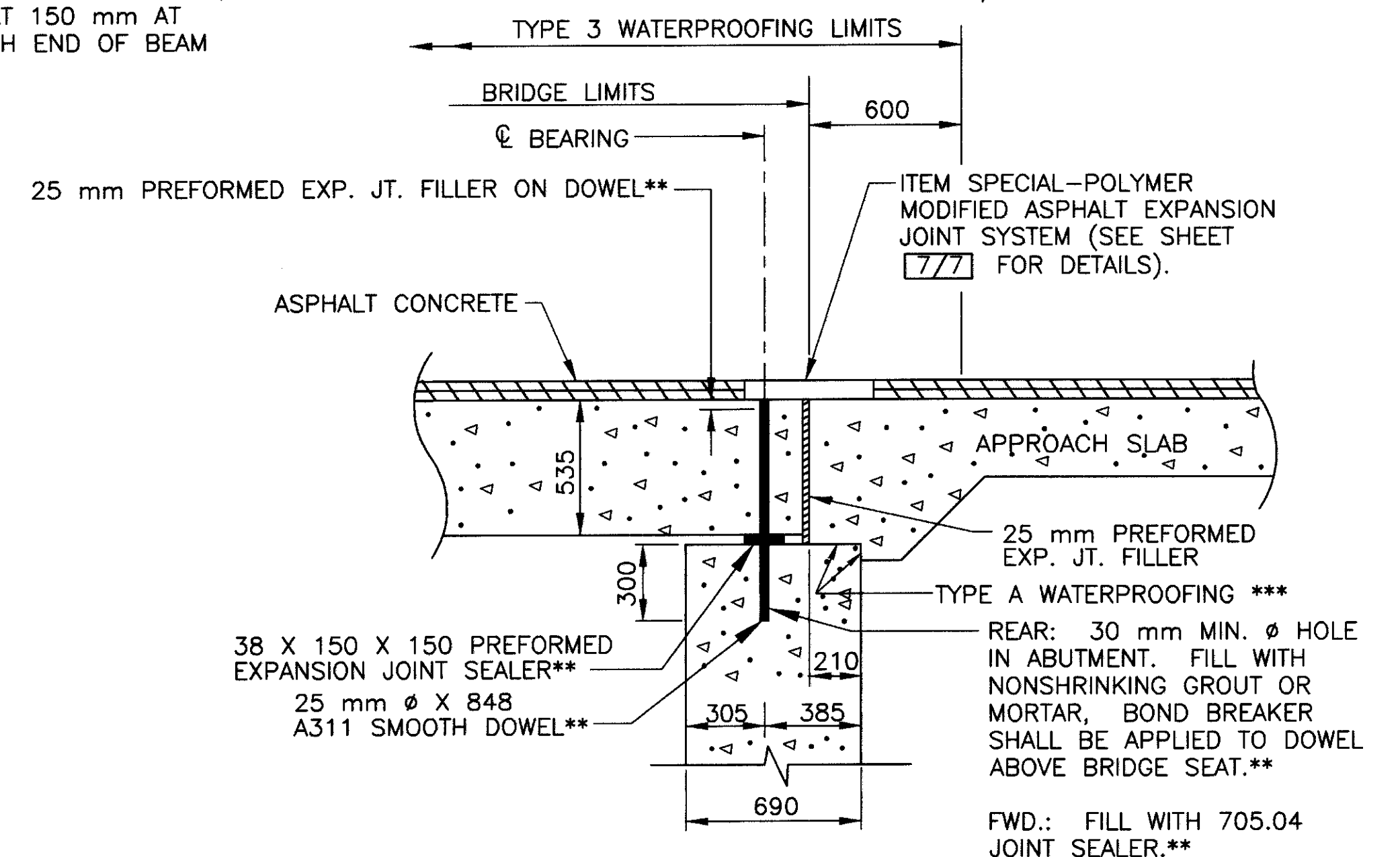
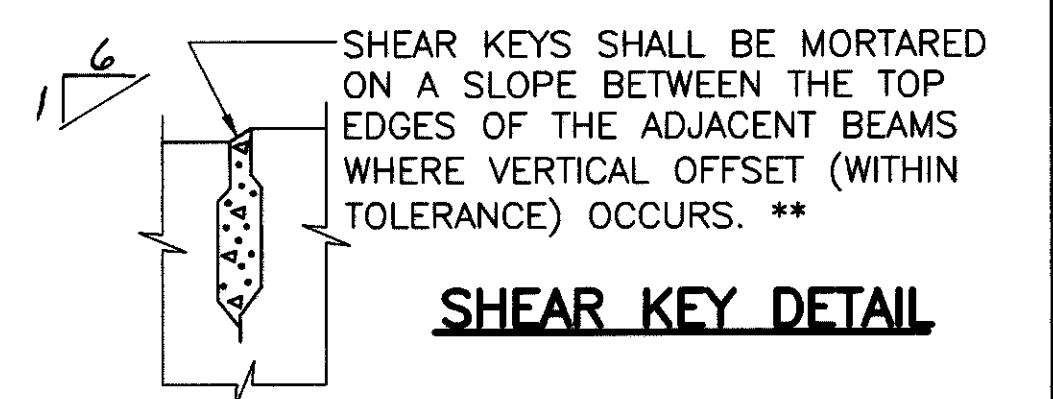
NOTES:

- FASCIA BEAMS: TO AVOID INTERFERENCE WITH THE ANCHORS FOR THE BRIDGE RAILING POSTS, THE LONGITUDINAL REINFORCING BARS NEAR THE FASCIA SHALL BE SHIFTED AS NECESSARY. FABRICATOR'S SHOP DRAWINGS SHALL SHOW COMPLETE DETAILS OF THE BEAM REINFORCEMENT.
- FOR ADDITIONAL DETAILS SEE SHEET 5/7 AND STANDARD DRAWING PSBD-1-93M.
- MINIMUM CONCRETE STRENGTH AT 28 DAYS $F'c=38.0$ MPa. MINIMUM CONCRETE STRENGTH AT TIME OF INITIAL PRESTRESS $F'ci=27.5$ MPa.
- PRESTRESSING STRANDS: 12.7 mm DIAMETER, GRADE 270, SEVEN-WIRE UNCOATED LOW-RELAXATION STRAND, AS=99 SQUARE mm ASTM A416.
- INITIAL STRESS $0.75 F'S=1400$ MPa. STRESS AT RELEASE $0.69 F'S=1280$ MPa.

- NOTES: 1. SLOTS SHALL BE PROVIDED IN ALL GUARDRAIL POSTS, SO THAT VERTICAL ADJUSTMENTS MAY BE MADE AFTER PLACEMENT TO PROVIDE A STRAIGHT-SMOOTH GUARDRAIL LINE ACROSS THE STRUCTURE. SEE SECTION B-B THIS SHEET.
2. THE KEYWAY ON THE FASCIA OF THE EXTERIOR BEAMS SHALL BE OMITTED.
3. SEE STD. DWG. DBR-2-73M TYPE 2 POST FOR ADDITIONAL RAILING DETAILS.
4. METRIC DIMENSIONS: ALL DIMENSIONS ARE IN MILLIMETERS AND STATIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.

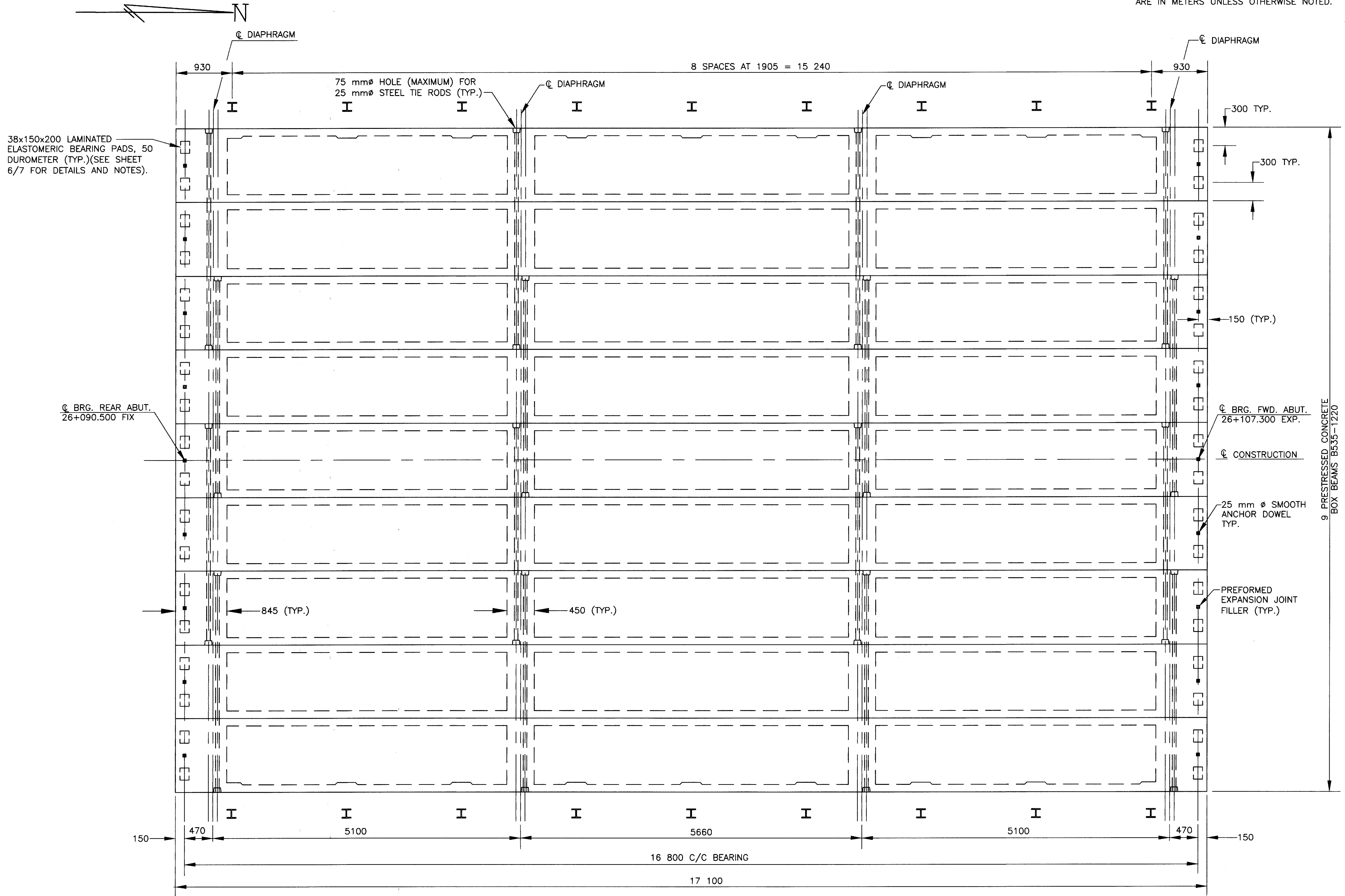


SECTION B-B



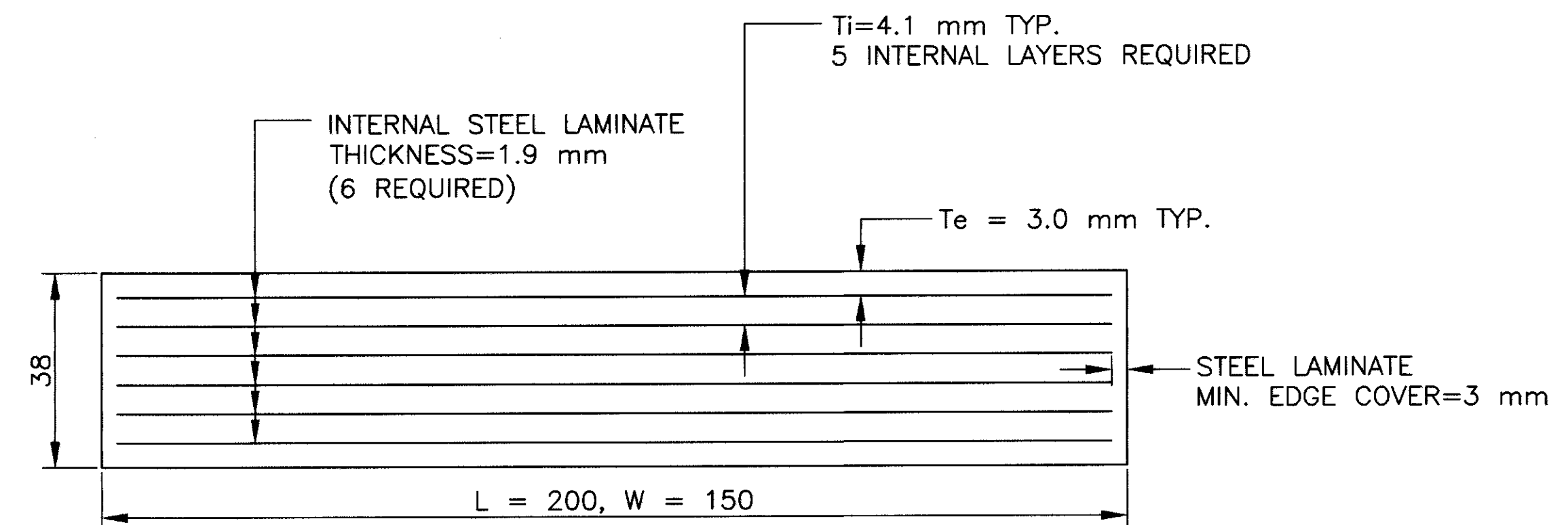
- ** - INCLUDED WITH ITEM 515 FOR PAYMENT**
- *** - INCLUDED WITH ITEM 611 FOR PAYMENT**

METRIC DIMENSIONS: ALL DIMENSIONS ARE IN MILLIMETERS AND STATIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.



31 33	5/7	HAN-37-22.070/26.080		SUPERSTRUCTURE DETAILS		BRIDGE NO. HAN-37-26090 OVER POTATO RUN	
		DESIGNED J.R.H.		CHECKED M.A.D.		DRAWN J.R.H.	
		REVIEWED D.C.B.		STRUCTURE FILE NUMBER 3201813		DATE 9-4-98	
				DESIGN AGENCY KOHLL & KALHER ASSOCIATES, INC. CONSULTING ENGINEERS AND SURVEYORS LIMA, OHIO			

REINFORCING STEEL LIST

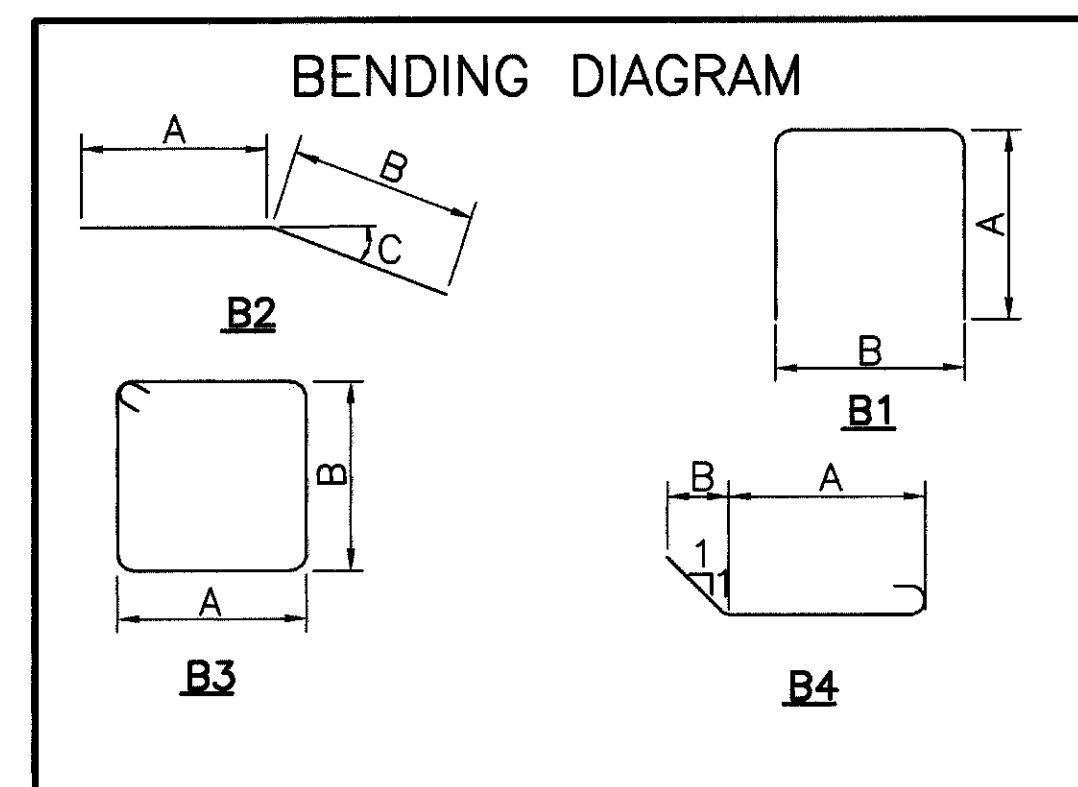
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LAMINATED ELASTOMERIC FIXED AND EXPANSION BEARINGS

50 DUROMETER
ABUTMENTS

DEAD LOAD REACTION = 72.6 kN
LIVE LOAD REACTION = 133.0 kN
MAXIMUM DESIGN LOAD = 205.6 kN

ELASTOMERIC BEARINGS: SHALL COMPLY WITH 516 AND ARTICLES 18.2.5 OF SECTION 18, BEARING DEVICES, DIVISION II, CONSTRUCTION, OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES. BEARINGS SHALL BE GRADE 3, 50-DUROMETER ELASTOMER, AND SHALL BE SUBJECTED TO THE LOAD TESTING REQUIREMENTS CORRESPONDING TO DESIGN METHOD A. TESTING SHALL BE INCLUDED IN THE PRICE BID FOR THE BEARINGS, EACH.



NOTES:

1. ALL DIMENSIONS ARE OUT TO OUT.
2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
3. AN "S" IN THE "SHP" COLUMN INDICATES STRAIGHT BARS.
4. REFER TO CMS SECTION 509.05 FOR STANDARD BEND DIMENSIONS.

REINFORCING BAR SPLICE

REINFORCING BAR SPLICE
REINFORCING BAR SPLICE LENGTHS SHALL CONFORM TO THE
MINIMUM LENGTHS SPECIFIED BY 509.08 OF THE
CONSTRUCTION AND MATERIAL SPECIFICATIONS UNLESS
OTHERWISE NOTED ON THE PLANS.

REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05 AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

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EXPANSION JOINT SYSTEM

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JOINT SYSTEM

THIS ITEM WILL BE USED TO SEAL THE EXPANSION/CONTRACTION JOINTS AS PER THESE DETAILS AND THE MANUFACTURER'S REQUIREMENTS USING A POLYMER-MODIFIED ASPHALT SYSTEM. THE PRIME CONTRACTOR WILL OBTAIN THE SERVICES OF ONE OF THE FOLLOWING APPROVED APPLICATORS WHO WILL FURNISH AND INSTALL THE NEW BRIDGE EXPANSION JOINT SYSTEM AFTER ALL PAVING ON THE AFFECTED BRIDGE(S) HAS BEEN COMPLETED.

PAVETECH INTERNATIONAL, INC. P.O. BOX 498969 12066 MONTGOMERY RD. CINCINNATI, OH 45249 TEL: 1-800-258-0162	LINEAR DYNAMICS, INC. RD #2 BOX 311 MUNCY, PA 17756 TEL: (717) 546-6041	BRIDGESAVER, INC. 1801-A Willis Road Richmond, VA 23237 TEL: 1-800-448-3636	EXPANDEX 95 PINEVIEW DR. AMHERST, NY 14228 TEL: (716) 691-7566
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MATERIALS:

BRIDGING PLATE:

MILD STEEL 3 mm OR 6 mm THICK PLATE, 200 mm WIDE OR 18 GAUGE
(APPROX. 1.3 mm) ALUMINUM, 204 mm WIDE.

BINDER:

TYPE:	POLYMER MODIFIED ASPHALT
SOFTENING POINT:	180 DEGREES F. MIN.
FLOW:	3 mm. MAX. AT 140 DEGREES F.
PENETRATION:	9 mm. MAX. AT 77 DEGREES F. 1 mm. MAX AT 0 DEGREES F. ASTM D 3407
DUCTILITY:	40 cm. MIN. ASTM D 113
RESILIENCE:	60% MIN. AT 77 DEGREES F.
TENSILE ADHESION:	700% MIN.
SPECIFIC GRAVITY:	1.10 ± 0.05
POURING TEMP:	350 – 390 DEGREES F.

AGGREGATE:

TYPE:	CRUSHED, DOUBLE WASHED, AND DRIED GRANITE OR BASALT
GRADATION	THE GRADATION OF THE AGGREGATE VARIES BY MANUFACTURER AND WILL BE AS PER THE MANUFACTURER'S RECOMMENDATIONS FOR THE SYSTEM BEING USED ON THIS PROJECT.

BACKER ROD:

THE BACKER ROD SHALL BE A CLOSED CELL FOAM EXPANSION JOINT FILLER CAPABLE OF WITHSTANDING THE PLACEMENT TEMPERATURE OF THE POLYMER MODIFIED ASPHALT.

INSTALLATION PROCEDURES:

SAWING AND SURFACE PREPARATION:

AFTER ALL PAVING OPERATIONS ARE COMPLETE, THE OVERLAY IS TO BE TRANSVERSELY SAW CUT FULL DEPTH NO LESS THAN 51 MILLIMETERS DEEP (508 mm CENTERED OVER JOINT OPENING, UNLESS OTHERWISE NOTED). REMOVE ALL MATERIAL, INCLUDING WATER-PROOFING MATERIAL, BETWEEN SAW CUTS. THOROUGHLY CLEAN AND DRY EXPOSED CONCRETE, STEEL, AND CUT SURFACES USING COMPRESSED AIR AND A HOT COMPRESSED AIR (HCA) LANCE. THE LANCE MUST PRODUCE A FLAME RETARDED AIR STREAM TEMPERATURE OF 1649 DEGREES C. AT A VELOCITY OF 914 METERS PER SECOND WITH 103.4 kPa GAGE CHAMBER PRESSURE. IF THERE IS AN INTERRUPTION DUE TO WEATHER OR OTHER CAUSES, THE OPERATION WILL BE REPEATED WITH THE HCA LANCE IMMEDIATELY BEFORE THE BINDER COAT OPERATION. ALSO, 152 mm OF THE ROAD SURFACE ON EITHER SIDE OF THE JOINT WILL BE DRIED SO THAT A SUITABLE SURFACE FOR BITUMEN ADHESION IS OBTAINED.

SEALING OF EXPANSION JOINT: (PRE-STRESSED BOX OR CONCRETE SLAB)

THE EXPANSION JOINT GAP IS TO BE SEALED AND A BRIDGING PLATE CENTERED ALONG IT. A VERY NARROW GAP WILL BE SEALED BY POURING HOT BINDER INTO THE GAP. GAPS OF 3 mm OR MORE WILL FIRST BE FILLED WITH AN APPROPRIATELY SIZED BACKER ROD. THE BACKER ROD WILL BE INSTALLED SO THAT IT IS BETWEEN 3 mm AND 30 mm BELOW THE TOP OF THE EXISTING GAP. THE GAP WILL THEN BE FILLED WITH BINDER.

BOND BREAKER:

SPREAD BINDER OVER SURFACE AREA WHERE THE METAL BRIDGING PLATE WILL BE PLACED. CENTER THE BRIDGING PLATE OVER THE EXISTING JOINT AND BED INTO THE HOT BINDER. BUTT JOINT THE BRIDGING PLATES TO ACCOMMODATE THE ENTIRE JOINT LENGTH. SPIKE HOLES WILL BE DRILLED AT 300 mm INTERVALS ALONG THE LONGITUDINAL CENTERLINE OF THE PLATES. SECURE BRIDGING PLATE WITH NAILS OR SPIKES. SEAL BUTT JOINTS WITH HOT BINDER AND ALLOW BINDER TO SETUP BEFORE NEXT OPERATION. WHEN ALUMINUM BRIDGING PLATES ARE USED, ONLY THE BINDER IS REQUIRED TO SECURE THE INDIVIDUAL PLATES.

BINDER COAT:

SEAL ALL PREPARED, EXPOSED SURFACES OF THE JOINT WITH BINDER. POUR THE HOT BINDER OVER THE FLOOR AREA OF THE JOINT AND SPREAD TO COAT ALL EXPOSED SURFACES. THE BINDER WILL BE A MINIMUM OF 1 mm THICK ON THE BOTTOM OF THE JOINT CAVITY, WITH POOLS OF GREATER THICKNESS WHERE SURFACE IRREGULARITIES EXIST. THE BINDER APPLICATION TEMPERATURE WILL BE BETWEEN 177 AND 199 DEGREES C. THE BINDER WILL NOT BE ALLOWED TO BE HEATED ABOVE 210 DEGREES C. NOR ALLOWED TO EXCEED 199 DEGREES C. FOR MORE THAN 1 HOUR. A DOUBLE JACKETED OIL MELTER WILL BE USED TO HEAT THE BINDER. THE MELTER WILL BE EQUIPPED WITH A CONTINUOUS AGITATION SYSTEM, TEMPERATURE CONTROLS, AND A CALIBRATED THERMOMETER. ALSO A SYSTEM FOR ACCURATELY MEASURING THE WEIGHTS OF THE BINDER AND THE AGGREGATE WILL BE REQUIRED.

BUILD-UP OF JOINT LAYERS:

AGGREGATE PREPARATION:

HEAT THE AGGREGATE TO A TEMPERATURE OF 135 TO 163 DEGREES C., WITH A SUITABLE ROTATING DRUM WITH ATTACHED HEAT SOURCE OR A HOT COMPRESSED AIR LANCE, TO REMOVE DUST AND MOISTURE.

AGGREGATE PROPORTION AND LAYER THICKNESS:

MIX THE AGGREGATE WITH THE BINDER SUCH THAT THE MINIMUM AGGREGATE CONTENT BY WEIGHT WILL BE 68%. THE HEATED AGGREGATE AND BINDER WILL BE COMBINED IN LAYERS NOT LESS THAN 13 MILLIMETERS NOR EXCEEDING 64 MILLIMETERS. THE THICKNESS OF EACH LAYER CAN BE VARRIED, WITHIN THESE LIMITS, TO ACHIEVE THE REQUIRED JOINT THICKNESS (MINIMUM 51 mm). THE OBJECTIVE IS TO COAT EACH STONE AND FILL THE VOIDS WHILE AVOIDING AN EXCESS OF BINDER. THIS WILL ACHIEVE THE MAXIMUM CONTENT OF STONE CONSISTENT WITH ALL STONES BEING COATED WITH BINDER. RAKE THE MIXTURE TO MIX AND LEVEL.

THE TOP LAYER THICKNESS WILL VARY BETWEEN 13 mm AND 25 mm. IN PREPARING THE TOP LAYER, THE RATIO OF AGGREGATE TO BINDER WILL BE APPROXIMATELY 6:1 BY WEIGHT. OVERFILL THE TOP LAYER AND COMPACT TO THE LEVEL OF THE ADJACENT SURFACES USING A ROLLER OR VIBRATORY PLATE COMPACTOR. IMMEDIATELY AFTER COMPLETION OF THE COMPACTION, POUR SUFFICIENT BINDER OVER THE JOINT TO FILL THE SURFACE VOIDS AND COAT THE SURFACE STONE. DUST THE FINISHED JOINT WITH A FINE, DRY AGGREGATE TO PREVENT TACKINESS.

MAINTENANCE OF TRAFFIC:

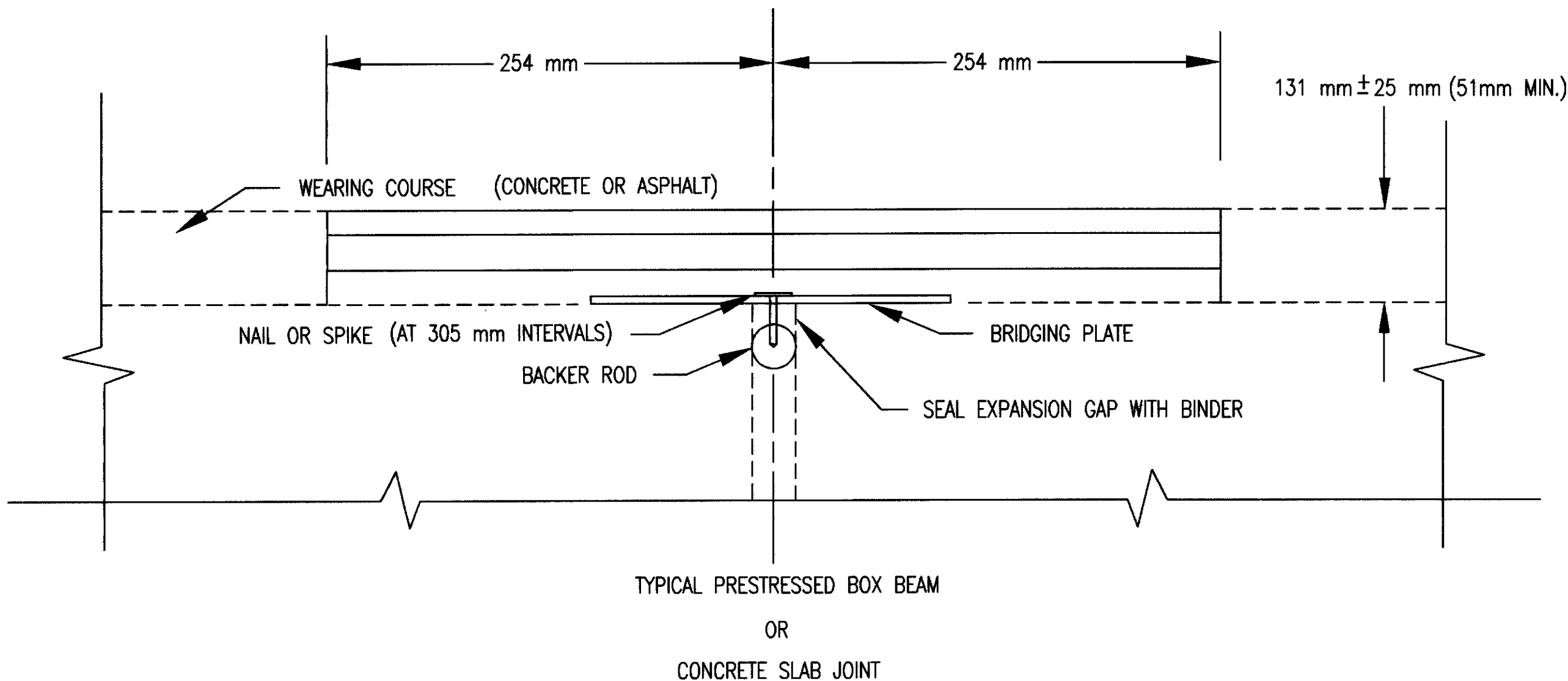
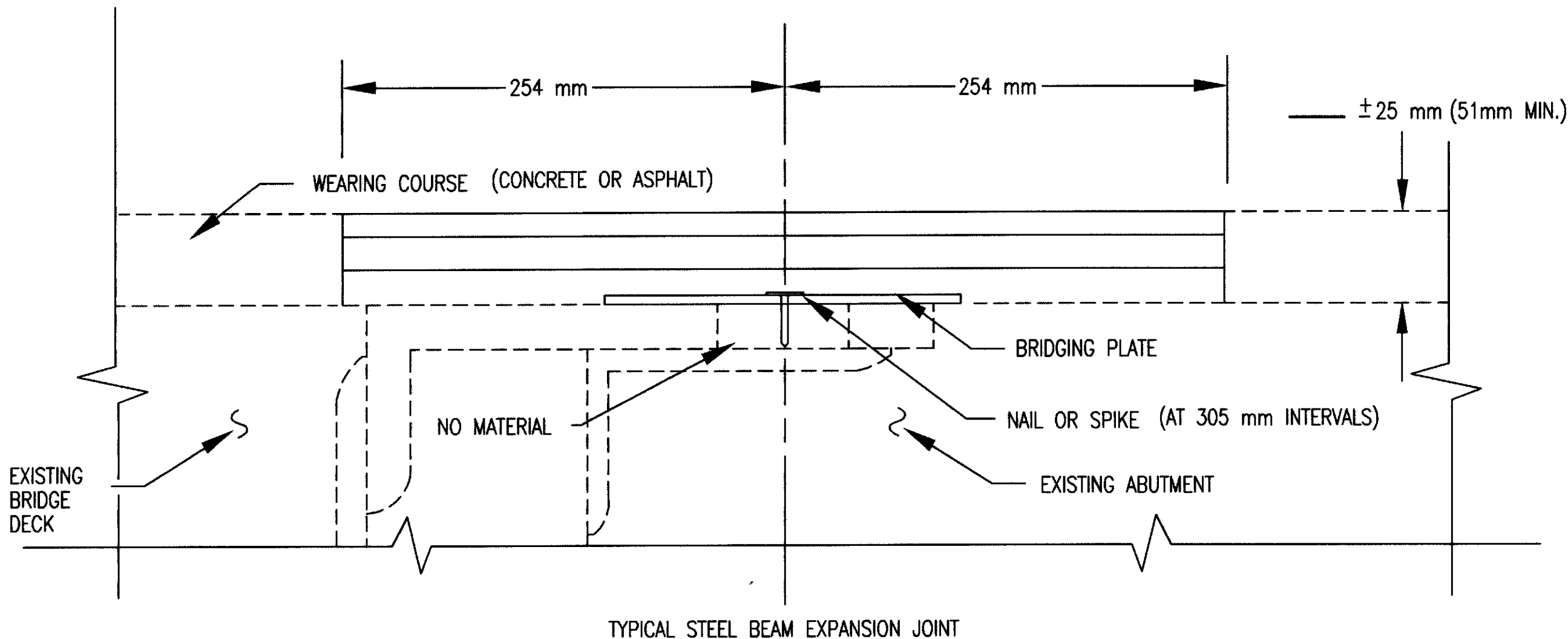
IF NECESSARY TO FACILITATE TRAFFIC MAINTENANCE, THE JOINT WILL BE INSTALLED IN TWO (2) HALF-WIDTH PHASES. DURING PHASE 1 APPROXIMATELY HALF OF THE TOTAL JOINT WILL BE INSTALLED. DURING PHASE 2, A MINIMUM OF 51 MILLIMETERS OF THE PHASE 1 JOINT WILL BE REMOVED, AT OR NEAR THE CENTERLINE, WITH THE REMAINDER OF THE JOINT INSTALLED. IN ALL CASES, OPERATIONS WILL BE SCHEDULED SO THAT ALL LANES CAN BE OPEN TO TRAFFIC DURING ALL NON-WORKING HOURS.

TESTING:

CERTIFICATION WILL BE SUPPLIED FOR EACH PROJECT SHOWING BINDER COMPLIANCE WITH REQUIRED PROPERTIES. A ONE LITER SAMPLE OF BINDER WILL BE RETRIEVED FROM EACH BRIDGE FOR FURTHER TESTING BY THE O.D.O.T. TESTING LABORATORY.

PAYMENT:

PAYMENT FOR ALL THE ABOVE WILL BE AT THE UNIT PRICE BID PER LINEAR METER OF SEALED JOINT IN PLACE FOR ITEM SPECIAL 516 31300, POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM (131 MILLIMETERS THICK). THIS WILL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.



2410 (1)

SPECIAL PROVISIONS

WATERWAY PERMITS FOR CRS: HAN-37-22.070/26.080

U.S. ARMY CORPS OF ENGINEERS
PERMIT NUMBER: 3 and 14

DATE: 9-30-98

NATIONWIDE PERMIT

3. Maintenance. The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area including those due to changes in materials, construction techniques, or current construction codes or safety standards which are necessary to make repair, rehabilitation, or replacement, are permitted provided the environmental effects resulting from such repair, rehabilitation, or replacement are minimal. Currently serviceable means useable as is or with some maintenance but not so degraded as to essentially require reconstruction. This NWP authorizes the repair, rehabilitation, or replacement of those structures destroyed by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced or under contract to commence within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the District Engineer, provided the permittee can demonstrate funding, contract, or other similar delays. Maintenance dredging and beach restoration are not authorized by this NWP. (Sections 10 and 404)

For activities involving a discharge, the Ohio State Certification General Conditions apply to this nationwide permit.

NATIONWIDE PERMIT

14. Road Crossings. Fills for roads crossing waters of the United States (including wetlands and other special aquatic sites) provided the activity meets all of the following criteria:

- a. The width of the fill is limited to the minimum necessary for the actual crossing;
- b. The fill placed in waters of the United States is limited to a filled area of no more than 1/3 acre. Furthermore, no more than a total of 200 linear feet of the fill for the roadway can occur in special aquatic sites, including wetlands;
- c. The crossing is culverted, bridged or otherwise designed to prevent the restriction of, and to withstand, expected high flows and tidal flows, and to prevent the restriction of low flows and the movement of aquatic organisms;
- d. The crossing, including all attendant features, both temporary and permanent, is part of a single and complete project for crossing of a water of the United States; and,
- e. For fills in special aquatic sites, including wetlands, the permittee notifies the District Engineer in accordance with the "Notification" general condition. The notification must also include a delineation of affected special aquatic sites, including wetlands.

This NWP may not be combined with NWP 18 or NWP 26 for the purpose of increasing the footprint of the road crossing. Some road fills may be eligible for an exemption from the need for a Section 404 permit altogether (see 33 CFR 323.4). Also, where local circumstances indicate the need, District Engineers will define the term "expected high flows" for the purpose of establishing applicability of this NWP. (Sections 10 and 404)

The Ohio State Certification General Conditions apply to this nationwide permit.

OHIO STATE CERTIFICATION GENERAL CONDITIONS FOR NATIONWIDE PERMITS.

The following general conditions apply to Nationwide Permits 3, 4, 5, 6, 7, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 25, 26, 27, 29, 30, 31, 32, 33, 34, 36, 37, 38, and 40.

Steps shall be taken, upon completion of the projects, to ensure bank stability. This may include, but is not limited to, the placement of riprap or bank seeding.

Any damages to the immediate environment of the project by equipment needed for construction or hauling will be repaired immediately.

Care must be employed throughout the course of this project to avoid the creation of unnecessary turbidity which may degrade water quality or adversely affect aquatic life outside the project areas.

For Nationwide Permits 14, 21, 26 (1-3 acres), 29, 33, 37, and 38, that require Agency coordination, in accordance with the Nationwide Permit General Condition entitled "Notification", Number 13(e)(i), the Corps shall submit a pre-construction notification to Ohio EPA for review and comment.

NATIONWIDE PERMIT CONDITIONS

GENERAL CONDITIONS:

The following general conditions must be followed in order for any authorization by a NWP to be valid:

- 1. Navigation.** No activity may cause more than a minimal adverse effect on navigation.
- 2. Proper maintenance.** Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
- 3. Erosion and siltation controls.** Appropriate erosion and siltation controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.
- 4. Aquatic life movements.** No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity @ s primary purpose is to impound water.
- 5. Equipment.** Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
- 6. Regional and case-by-case conditions.** The activity must comply with any regional conditions which may have been added by the Division Engineer (see 33 CFR 330.4(e) and with any case specific conditions added by the Corps or by the State or tribe in its section 401 water quality certification.
- 7. Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely effect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service.)
- 8. Tribal rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
- 9. Water quality certification.** In certain states, an individual Section 401 water quality certification must be obtained or waived (see 33 CFR 330.4(c)).

10. Coastal zone management. In certain states, an individual State coastal zone management consistency concurrence must be obtained or waived (see Section 330.4(d))

11. Endangered Species.

(a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project, and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized.

(b) Authorization of an activity by a nationwide permit does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. Fish and Wildlife Service and National Marine Fisheries Service or their world wide web pages at <http://www.fws.gov/~r9endspp/endspp.html> and http://kingfish.spp.mnfs.gov/tmcintyr/prot_res.html#ES and Recovery, respectively.

12. Historic properties. No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR Part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)).

13. Notification.

(a) **Timing:** Where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a Pre-Construction Notification (PCN) as early as possible and shall not begin the activity: (1) Until notified by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division

Engineer; or (2) If notified by the District or Division Engineer that an individual permit is required; or (3) Unless 30 days (or 45 days for NWP 26 only) have passed from the District Engineer's receipt of the notification and the prospective permittee has not received notice from the District or Division Engineer Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed project;
- (3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s) or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity; and
- (4) For NWPs S 18, 21, 26, 29, 34, and 38, the PCN must also include a delineation of affected special aquatic sites, including wetlands (see paragraph 13(f));
- (5) For NWP 21 - Surface Coal Mining Activities, the PCN must include an OSM or State approved mitigation plan.
- (6) For NWP 29-Single-Family Housing, the PCN must also include:
 - (i) Any past use of this NWP by the individual permittee and/or the permittee's spouse;
 - (ii) A statement that the single-family housing activity is for a personal residence of the permittee;
 - (iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 0.5 acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 0.5 acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));
 - (iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(7) For NWP 31 Maintenance of Existing Flood Control Projects, the prospective permittee must either notify the District Engineer with a Pre-Construction Notification (PCN) prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

- (I) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided that the approved flood control protection or drainage is not increased;
- (ii) A delineation of any affected special aquatic sites, including wetlands; and,
- (iii) Location of the dredged material disposal site.

(8) For NWP 33-Temporary Construction, Access, and Deterring, the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic sources.

(c) Form of Notification: The standard individual permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(7) of General Condition 13. A letter may also be used.

(d) District Engineer's Decision: In reviewing the pre-construction notification for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative-adverse environmental effects or may be contrary to the public interest. The prospective permittee may, optionally, submit a proposed mitigation plan with the pre-construction notification to expedite the process and the District Engineer will consider any optional mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects are minimal, the District Engineer will notify the permittee and include any conditions the DE deems necessary.

Any mitigation proposal must be approved by the District Engineer prior to commencing work. If the prospective permittee elects to submit a mitigation plan, the District Engineer will expeditiously review the proposed mitigation plan, but will not commence a second 30-day (or 45-day for NWP 26) notification procedure. If the net adverse effects of the project (with the mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant stating that the project can proceed under the terms and conditions of the nationwide permit

If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then he will notify the applicant either: (1) that the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submitting a mitigation proposal that would reduce the adverse effects to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and State agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(i) For NWP 14, 21, 26 (between 1 and 3 acres of impact), 29, 33, 37, and 38. The District Engineer will, upon receipt of a notification, provide immediately, e.g., facsimile transmission, overnight mail or other expeditious manner, a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have 5 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 10 calendar days (16 calendar days for NWP 26 PCNs) before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(ii) Optional Agency Coordination For NWPs 5, 7, 12, 13, 17, 18, 27, 31, and 34, where a Regional Administrator of EPA, a Regional Director of USFWS, or Regional Director of NMFS has formally requested general notification from the District Engineer for the activities covered by any of these NWPs, the Corps will provide the requesting agency with notification on the particular NWPs. However, where the agencies have a record of not generally submitting substantive comments on activities covered by any of these NWPs, the Corps district may discontinue providing notification to those regional agency offices. The District Engineer will coordinate with the resource agencies to identify which activities involving a PCN that the agencies will provide substantive comments to the Corps. The District Engineer may also request comments from the agencies on a case by case basis when the District Engineer determines that such comments would assist the Corps in reaching a decision whether effects are more than minimal either individually or cumulatively.

(iii) Optional Agency Coordination, 401 Denial. For NWP 26 only, where the State has denied its 401 water quality certification for activities with less than 1 acre of wetland impact, the EPA regional administrator may request agency coordination of PCNs between 1/3 and 1 acre. The request may only include acreage limitations within the 1/3 to 1 acre range for which the state has denied water quality certification. In cases where the EPA has requested coordination of projects as described here, the Corps will forward the PCN to EPA only. The PCN will then be forwarded to the Fish and Wildlife Service and the National Marine Fisheries Service by EPA under agreements among those agencies. Any agency receiving the PCN will be bound by the time frames for providing comments to the Corps.

(f) Wetlands Delineations: Wetland delineations must be prepared in accordance with the current method required by the Corps. For NWP 29 see paragraph (b)(6)(iii) for parcels less than 0.5 acres in size. The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 30-day period (45 days for NWP 26) will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

(g) Mitigation: Factors that the District Engineer will consider when determining the acceptability of appropriate and practicable mitigation include, but are not limited to:

(I) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes;

(ii) To the extent appropriate, permittees should consider mitigation banking and other forms of mitigation including contributions to wetland trust funds, "in lieu fees" to organizations such as The Nature Conservancy, state or county natural resource management agencies, where such fees contribute to the restoration, creation, replacement, enhancement, or preservation of wetlands. Furthermore, examples of mitigation that may be appropriate and practicable include but are not limited to: reducing the size of the project; establishing wetland or upland buffer zones to protect aquatic resource values; and replacing the loss of aquatic resource values by creating, restoring, and enhancing similar functions and values. In addition, mitigation must address wetland impacts, such as functions and values, and cannot be simply used to offset the acreage of wetland losses that would occur in order to meet the acreage limits of some of the NWPs (e.g., for NWP 26, 5 acres of wetlands cannot be created to change a 6-acre loss of wetlands to a 1 acre loss; however, 2 created acres can be used to reduce the impacts of a 3-acre loss.).

14. Compliance certification. Every permittee who has received a Nationwide permit verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter and will include:

- a. A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions;
- b. A statement that any required mitigation was completed in accordance with the permit conditions;
- c. The signature of the permittee certifying the completion of the work and mitigation.

15. Multiple use of Nationwide permits. In any case where any NWP number 12 through 40 is combined with any other NWP number 12 through 40, as part of a single and complete project, the permittee must notify the District Engineer in accordance with paragraphs a, b, and c on the "Notification General Condition number 13. Any NWP number 1 through 11 may be combined with any other NWP without notification to the Corps, unless notification is otherwise required by the terms of the NWPs. As provided at 33 CFR 330.6(c) two or more different NWPs can be combined to authorize a single and complete project. However, the same NWP cannot be used more than once for a single and complete project.

SECTION 404 ONLY CONDITIONS:

In addition to the General Conditions, the following conditions apply only to activities that involve the discharge of dredged or fill material into waters of the U.S., and must be followed in order for authorization by the NWP's to be valid:

1. Water supply intakes. No discharge of dredged or fill material may occur in the proximity of a public water supply intake except where the discharge is for repair of the public water supply intake structures or adjacent bank stabilization.

2. Shellfish production. No discharge of dredged or fill material may occur in areas of concentrated shellfish production, unless the discharge is directly related to a shellfish harvesting activity authorized by NWP 4.

3. Suitable material. No discharge of dredged or fill material may consist of unsuitable material (e.g. trash, debris, car bodies, asphalt, etc.) and material discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

4. Mitigation. Discharges of dredged or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site), unless the District Engineer approves a compensation plan that the District Engineer determines is more beneficial to the environment than on-site minimization or avoidance measures.

5. Spawning areas. Discharges in spawning areas during spawning seasons must be avoided to the maximum extent practicable.

6. Obstruction of high flows. To the maximum extent practicable, discharges must not permanently restrict or impede the passage of normal or expected high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).

7. Adverse effects from impoundments. If the discharge creates an impoundment of water, adverse effects on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.

8. Waterfowl breeding areas. Discharges into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

9. Removal of temporary Fills. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

GEOLOGY OF THE SITE

GENERALIZED GEOLOGICAL REFERENCES REPORT THAT THE SITE WAS COVERED BY GLACIERS OF THE ILLINOIS AND WISCONSIN ERA. OVERBURDEN AT THE SITE IS BELIEVED TO BE ICE-LAID DEPOSITS OF CLAY, SILT, SAND, AND COARSER FRAGMENTS.

THE UNDERLYING BEDROCK AT THE SITE IS REPORTED TO BE LIMESTONE AND DOLOMITE.

EXPLORATION

THE EXPLORATION CONSISTED OF DRILLING THREE STRUCTURE BORINGS, BORINGS B-01-1 THROUGH B-01-3, AT THE SITE OF THE PROPOSED BRIDGE REPLACEMENT. THE BORINGS WERE DRILLED ON JUNE 9, 1997 USING A TRUCK-MOUNTED DRILL RIG.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

1. SOILS

IN ABUTMENT BORING B-01-1, THE THICKNESS OF THE APPROACH PAVEMENT MEASURED 0.460 METERS AND CONSISTED OF 0.178 METERS OF ASPHALT CONCRETE OVER 0.178 METERS OF PORTLAND CEMENT CONCRETE. 0.102 METERS OF AGGREGATE BASE WERE THEN ENCOUNTERED UNDERLYING THIS PORTLAND CEMENT CONCRETE. IN ABUTMENT BORING B-01-3, THE THICKNESS OF THE APPROACH PAVEMENT MEASURED 0.460 METERS AS WELL AND CONSISTED OF 0.229 METERS OF ASPHALT CONCRETE OVER 0.229 METERS OF PORTLAND CEMENT CONCRETE. BORING B-01-2 WAS DRILLED THROUGH THE EXISTING BRIDGE DECK AND INTO THE STREAM BED.

IN BORING B-01-1, FILL MATERIAL CONSISTING OF VERY STIFF SILT AND CLAY (A-6a) WAS ENCOUNTERED TO A DEPTH OF 1.07 METERS. BELOW THIS FILL MATERIAL NATURALLY OCCURRING SOILS CONSISTING OF STIFF TO VERY STIFF SILT AND CLAY (A-6a) WERE ENCOUNTERED TO A DEPTH OF 2.44 METERS WHERE BEDROCK WAS ENCOUNTERED.

IN BORING B-01-3, FILL MATERIAL CONSISTING OF HARD SILT AND CLAY (A-6a) WAS ENCOUNTERED TO A DEPTH OF 1.07 METERS. BELOW THIS FILL MATERIAL NATURALLY OCCURRING SOILS CONSISTING OF STIFF TO VERY STIFF SILT AND CLAY (A-6a) WERE ENCOUNTERED TO A DEPTH OF 2.26 METERS WHERE BEDROCK WAS ENCOUNTERED. SOME OF THESE MATERIALS WERE SLIGHTLY ORGANIC OR CONTAINED ORGANIC MATTER.

2. BEDROCK

BEDROCK WAS ENCOUNTERED IN ALL THREE BORINGS AT ELEVATIONS OF BETWEEN 253.63 METERS AND 253.99 METERS. THE BEDROCK CONSISTED OF MEDIUM HARD TO HARD LIMESTONE CHARACTERIZED BY OCCASIONAL SHALE AND DOLOMITE LAMINATIONS AND CLAY SEAMS. THE ROCK WAS GENERALLY BROKEN, WITH ROCK QUALITY DESIGNATION (RQD) VALUES BETWEEN 0% AND 20%.

3. GROUNDWATER

GROUNDWATER SEEPAGE WAS ENCOUNTERED IN BORING B-01-1 AT A DEPTH OF 2.44 METERS. AT COMPLETION OF DRILLING THE DEPTH TO WATER IN BORING B-01-1 WITH THE DRILLING AUGERS REMOVED WAS 1.01 METERS AND THE DEPTH TO WATER IN BORING B-01-3 WITH THE DRILLING AUGERS REMOVED WAS 1.74 METERS. THESE DEPTHS INCLUDE DRILLING WATER USED DURING THE ROCK-CORING PROCESS, AND, THEREFORE, MAY NOT BE INDICATIVE OF TRUE GROUNDWATER LEVELS AT THE SITE. GROUNDWATER MEASUREMENTS WERE NOT MADE IN BORING B-01-2 BECAUSE IT WAS ADVANCED THROUGH THE STREAM.

	DRIVE SAMPLE AND/OR CORE BORING LOCATION - PLAN VIEW
	DRIVE SAMPLE AND/OR CORE BORING LOCATION - PROFILE VIEW HORIZONTAL BAR INDICATES DEPTH AT WHICH SAMPLE WAS TAKEN
	INDICATES FREE WATER ELEVATION
	INDICATES STATIC WATER ELEVATION (DRILLING WATER USED)
	INDICATES STATIC WATER ELEVATION (MEASURED INSIDE HOLLOWSTEM AUGERS)
	TOP OF ROCK
	FIGURES BESIDE THE BORING IN PROFILE INDICATE THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST. X = NUMBER OF BLOWS FOR FIRST 0.15 METERS Y = NUMBER OF BLOWS FOR SECOND 0.15 METERS Z = NUMBER OF BLOWS FOR THIRD 0.15 METERS
	INDICATES NUMBER OF BLOWS (50) TO DRIVE A SPLIT-BARREL SAMPLER A DEPTH OF (n) METERS OTHER THAN THE NORMAL 0.15 METER INCREMENT.

SYMBOL OF ROCK TYPES

	LIMESTONE
--	-----------

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 50.80 mm O.D., 34.93 mm I.D., SPLIT-SPOON SAMPLER, AT CONTINUOUS, 0.75 m AND/OR 1.50 m DEPTH INTERVALS, DRIVEN BY MEANS OF A 63.5 kg HAMMER WITH A FREE FALL OF 0.76 m. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER THREE 0.15 m INCREMENTS IS CONSIDERED THE STANDARD PENETRATION TEST.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF MECHANICALLY POWERED, ROTARY -TYPE DRILL RIG, EMPLOYING A 76 mm O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE APPLIED BY THE DRILL RIG.

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING AN NQ2 OR NXM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.15 m INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS, UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

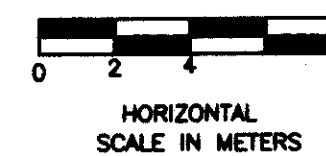
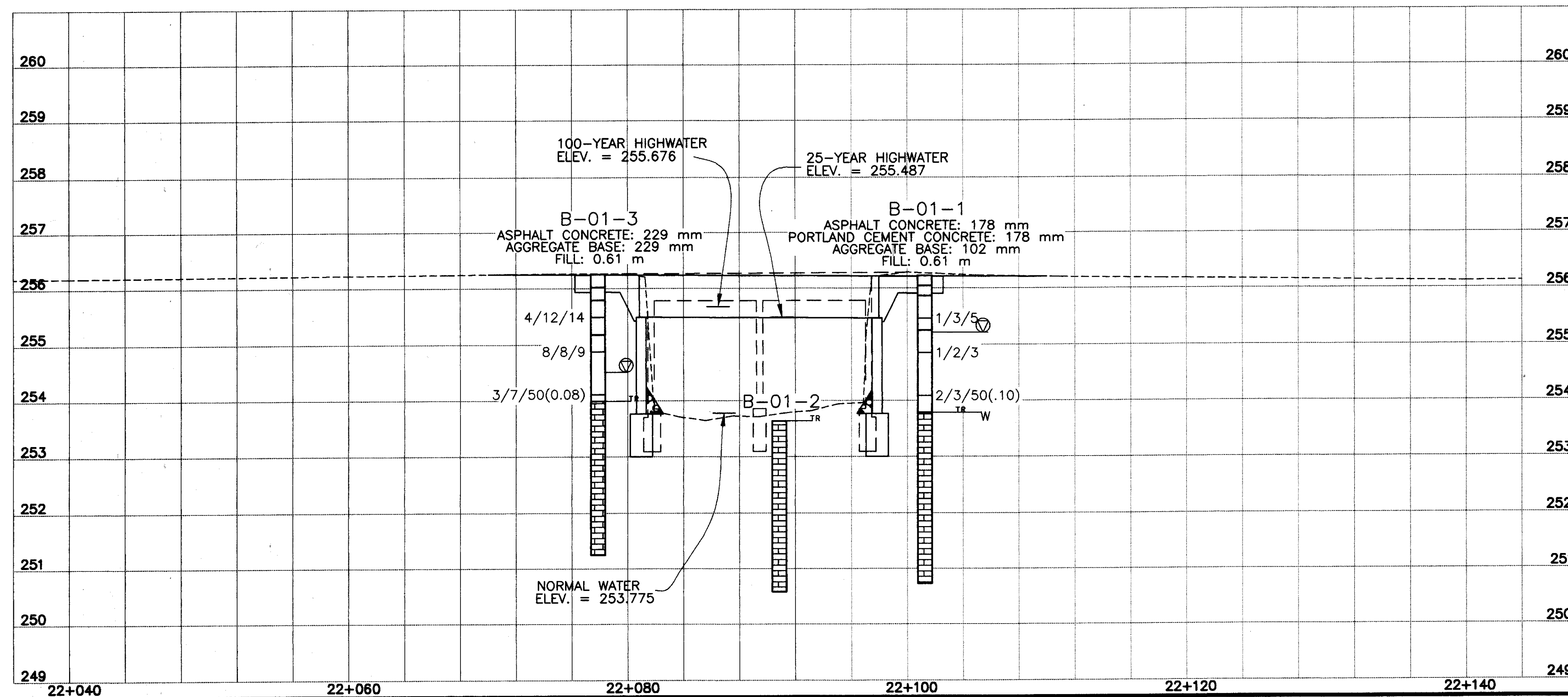
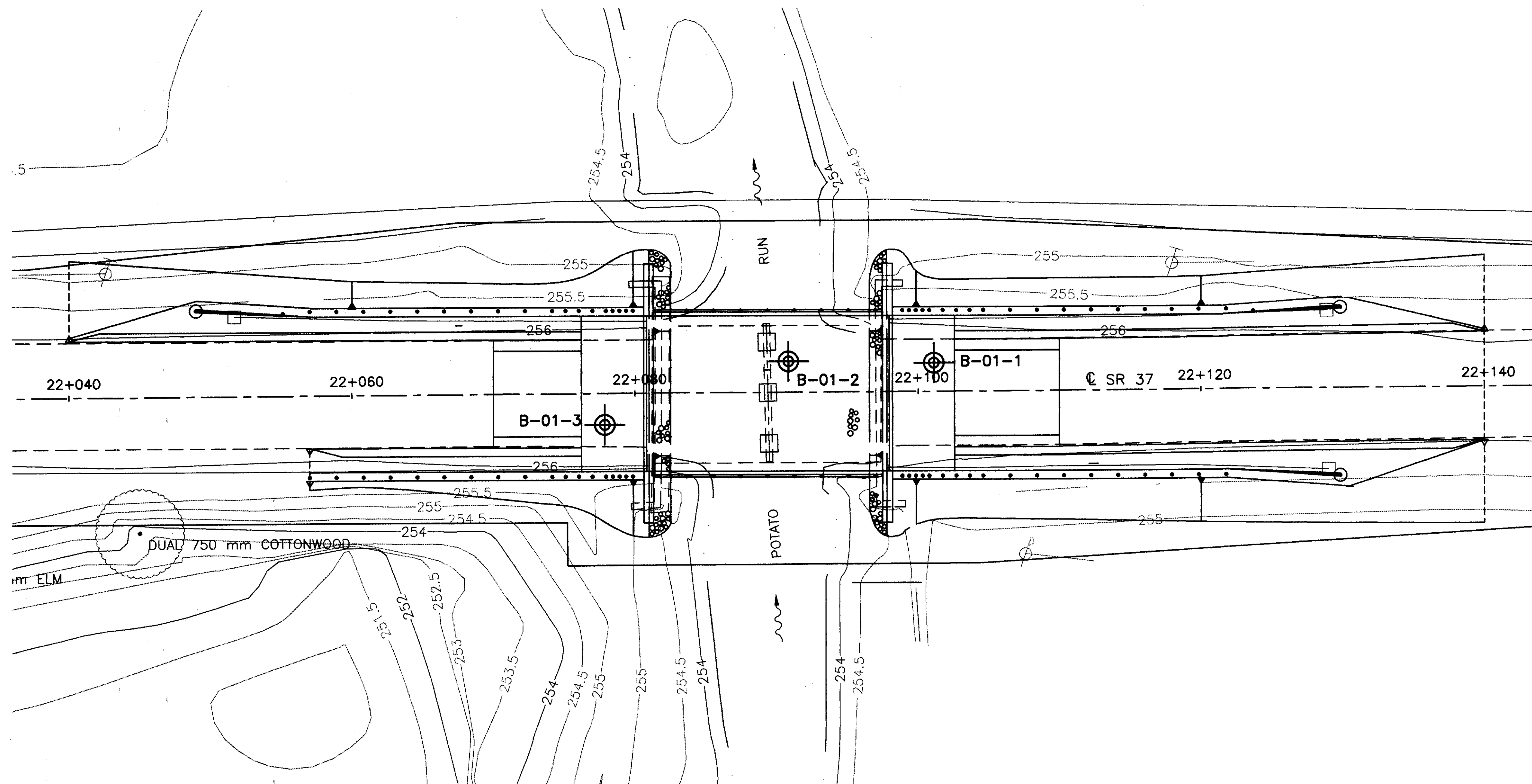
PARTICLE SIZE DEFINITIONS

300 mm	75 mm	2.0 mm	0.42 mm	0.074 mm	0.005 mm	
BOULDERS	COBBLES	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY
			NO. 10 SIEVE	NO. 40 SIEVE	NO. 200 SIEVE	

NOTES

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATIONS SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

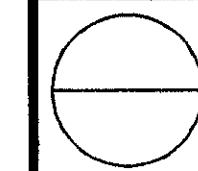
INFORMATION SHOWN BY THIS SUBSURFACE INVESTIGATION WAS OBTAINED SOLELY FOR USE IN ESTABLISHING DESIGN CONTROLS FOR THE PROJECT. THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THIS DATA AND IT IS NOT TO BE CONSTRUED AS A PART OF THE PLAN GOVERNING CONSTRUCTION OF THIS PROJECT.



STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. HAN-37-22081
OVER POTATO RUN

HAN-37-22.070

2 / 3



DODSON-STILSON INC.
6121 HUNTLEY RD.
COLUMBUS, OH 43229

DATE	10/15/97
REVIEWED	AEN
DRAWN	DMC
CHECKED	TAH
CALCULATED	

Client: Kohli & Kolher Associates, Inc.				Project: Han 37-22.070 (Potato Run)				Job No. 9721-3069.01			
LOG OF: Boring B-01-1				Location: Sta. 22+101.253, 2.029 m Lt.				Date Drilled: 6/9/97			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: 2.44 m [8.0] Water level at completion: 1.01 m [3.3]	GRADATION					STANDARD PENETRATION (N) Blows per 0.30 m
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	
0	256.72 [840.6]				Asphalt Concrete Pavement - 0.178 m [7"] Portland Cement Concrete - 0.178 m [7"] Aggregate Base - 0.102 m [4"]						
0.46	255.76 [839.1]	1	3	279 [111]		30	12	-	13	25	20
1.07	255.15 [837.1]	1	2	279 [111]	FILL: Very stiff dark brown SILT AND CLAY (A-6a), some to "and" fine to coarse sand, some gravel; moist.	3	7	-	18	35	37
1.52		2	3	356 [141]	Stiff to very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp. @ 1.68 m [5.5], "and" fine to coarse sand.	6	21	-	41	14	18
2.44	253.76 [832.6]	50(10)			Medium hard to hard mottled gray and brown LIMESTONE, occasional black shale and dolomite laminations, occasional clay seams, slightly to very broken. @ 3.66 m - 4.21 m [12.0' - 13.8'], vuggy.						
3.05	253.17 [830.6]		Core .610 m [24"]	Rec .610 m [24"]							
4.57	251.65 [825.6]		Core 0.914 m [36"]	Rec 0.914 m [36"]							
5.49	250.73 [822.6]				Bottom of Boring - 5.49 m [18.0']						
6.10											
7.62											

Client: Kohli & Kolher Associates, Inc.				Project: Han 37-22.070 (Potato Run)				Job No. 9721-3069.01			
LOG OF: Boring B-01-2				Location: Sta. 22+090.846, 2.193 m Lt.				Date Drilled: 6/9/97			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: none	GRADATION					STANDARD PENETRATION (N) Blows per 0.30 m
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	
0	253.63 [832.1]				Medium hard to hard mottled gray and brown LIMESTONE, thinly laminated to thinly bedded with black shale and dolomite, occasional clay seams, very broken to massive. @ 1.46 m - 2.01 m [4.8' - 6.6'], vuggy.						
0.46	253.17 [830.6]		Core 0.457 m [18"]	Rec 0.457 m [18"]							
1.52			Core 1.524 m [60"]	Rec 1.473 m [58"]							
1.98	251.65 [825.6]										
3.05	250.58 [822.1]		Core 1.067 m [42"]	Rec 1.041 m [41"]							
4.57											
6.10					Bottom of Boring - 3.05 m [10.0']						
7.62											

Client: Kohli & Kolher Associates, Inc.				Project: Han 37-22.070 (Potato Run)				Job No. 9721-3069.01			
LOG OF: Boring B-01-3				Location: Sta. 22+077.865, 2.186 m Rt.				Date Drilled: 6/9/97			
Depth (m) [ft]	Elev. (m) [ft]	Blows per 0.15 m [in]	Sample No.	Hand Penetro- meter (kN/m ²) [tsf]	WATER OBSERVATIONS: Water seepage at: none Water level at completion: 1.74 m [5.7]	GRADATION					STANDARD PENETRATION (N) Blows per 0.30 m
						% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	
0	256.72 [840.7]				Asphalt Concrete Pavement - 0.229 m [9"] Aggregate Base - 0.229 m [9"]						
0.46	255.79 [839.2]	4	12	203 [81]							
1.07	255.18 [837.2]	6	8	229 [91]	FILL: Hard dark gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.	2	6	-	18	40	34
1.52	254.57 [835.2]		3	279 [111]	Very stiff brown SILTY CLAY (CL), some fine to coarse sand, trace gravel; moist.	18	8	-	26	27	21
2.26	253.99 [833.3]	50(08)			Stiff gray SILTY CLAY (CL), some to "and" fine to coarse sand, little gravel; moist. @ 1.68 m - 2.13 m [5.5' - 7.0'], organic.						
2.58	253.66 [832.3]		Core 0.305 m [12"]	Rec 0.305 m [12"]	Medium hard to hard gray and brown LIMESTONE, thinly laminated to thickly bedded with black shale and dolomite, occasional clay seams, very to slightly broken. @ 3.02 m - 4.08 m [9.9' - 13.4'], vuggy.						
3.05			Core 1.524 m [60"]	Rec 1.524 m [60"]							
4.08	252.17 [827.3]		Core 0.914 m [36"]	Rec 0.914 m [36"]							
5.00	251.25 [824.3]				Bottom of Boring - 5.00 m [16.4']						
6.10											
7.62											

D50 VALUES	
BORING B-01-1	BORING B-01-3
SAMPLE NO. 1 = 0.14 mm	SAMPLE NO. 2 = 0.01 mm
SAMPLE NO. 2 = 0.01 mm	SAMPLE NO. 3 = 0.09 mm
SAMPLE NO. 3 = 0.17 mm	

GEOLOGY OF THE SITE

GENERALIZED GEOLOGICAL REFERENCES REPORT THAT THE SITE WAS COVERED BY GLACIERS OF THE ILLINOIS AND WISCONSIN ERA. OVERBURDEN AT THE SITE IS BELIEVED TO BE ICE-LAID DEPOSITS OF CLAY, SILT, SAND, AND COARSER FRAGMENTS.

THE UNDERLYING BEDROCK AT THE SITE IS REPORTED TO BE LIMESTONE AND DOLOMITE.

EXPLORATION

THE EXPLORATION CONSISTED OF DRILLING THREE STRUCTURE BORINGS, BORINGS B-02-01 THROUGH B-02-3, AT THE SITE OF THE PROPOSED BRIDGE REPLACEMENT. THE BORINGS WERE DRILLED ON JUNE 9, 1997 USING A TRUCK-MOUNTED DRILL RIG.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

1. SOILS

IN THE TWO ABUTMENT BORINGS, B-02-1 AND B-02-3, THE THICKNESS OF THE APPROACH PAVEMENT MEASURED 0.229 METERS AND CONSISTED OF 0.127 METERS OF ASPHALT CONCRETE OVER 0.102 METERS OF PORTLAND CEMENT CONCRETE. BORING B-02-2 WAS DRILLED THROUGH THE EXISTING BRIDGE DECK AND INTO THE STREAM BED.

IN BORING B-02-1, POSSIBLE FILL MATERIAL CONSISTING OF VERY STIFF, SLIGHTLY ORGANIC SILT AND CLAY (A-6a) WAS ENCOUNTERED TO A DEPTH OF 1.68 METERS. BELOW THIS POSSIBLE FILL MATERIAL NATURALLY OCCURRING SOILS CONSISTING OF STIFF SILT AND CLAY (A-6a) WERE ENCOUNTERED TO A DEPTH OF 3.05 METERS WHERE BEDROCK WAS ENCOUNTERED.

IN BORING B-02-2, NATURALLY OCCURRING MEDIUM DENSE TO DENSE COARSE AND FINE SAND (A-3a) WAS ENCOUNTERED TO A DEPTH OF 0.46 METERS WHERE BEDROCK WAS ENCOUNTERED.

IN BORING B-02-3, NATURALLY OCCURRING SOILS CONSISTING OF STIFF SILT AND CLAY (A-6a) AND SILTY CLAY (A-6b) WERE ENCOUNTERED TO A DEPTH OF 3.66 METERS WHERE BEDROCK WAS ENCOUNTERED. SOME OF THESE MATERIALS WERE SLIGHTLY ORGANIC OR CONTAINED ORGANIC MATTER.

2. BEDROCK

BEDROCK WAS ENCOUNTERED IN ALL THREE BORINGS AT ELEVATIONS OF BETWEEN 256.03 METERS AND 256.66 METERS. THE BEDROCK CONSISTED OF HARD LIMESTONE CHARACTERIZED BY OCCASIONAL SHALE LAMINATIONS AND CLAY SEAMS. THE ROCK WAS GENERALLY BROKEN, WITH ROCK QUALITY DESIGNATION (RQD) VALUES BETWEEN 0% AND 39%.

3. GROUNDWATER

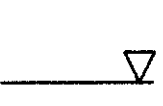
GROUNDWATER SEEPAGE WAS ENCOUNTERED IN BORINGS B-02-1 AND B-02-3 AT DEPTHS OF 2.59 METERS. AT COMPLETION OF DRILLING THE DEPTH TO WATER IN THESE TWO BORINGS WITH THE DRILLING AUGERS REMOVED WAS APPROXIMATELY 1. METER. THESE DEPTHS INCLUDE DRILLING WATER USED DURING THE ROCK-CORING PROCESS, AND THEREFORE MAY NOT BE INDICATIVE OF TRUE GROUNDWATER LEVELS AT THE SITE. GROUNDWATER MEASUREMENTS WERE NOT MADE IN BORING B-02-2 BECAUSE IT WAS ADVANCED THROUGH THE STREAM.

LEGEND

- 

DRIVE SAMPLE AND/OR CORE BORING LOCATION - PLAN VIEW
- 

DRIVE SAMPLE AND/OR CORE BORING LOCATION - PROFILE VIEW
HORIZONTAL BAR INDICATES DEPTH AT WHICH SAMPLE WAS TAKEN
- 

INDICATES FREE WATER ELEVATION
- 

INDICATES STATIC WATER ELEVATION
(DRILLING WATER USED)
- 

INDICATES STATIC WATER ELEVATION
(MEASURED INSIDE HOLLOWSTEM AUGERS)
- 

TOP OF ROCK
- X/Y/Z

FIGURES BESIDE THE BORING IN PROFILE INDICATE THE NUMBER OF BLOWS FOR STANDARD PENETRATION TEST.
X = NUMBER OF BLOWS FOR FIRST 0.15 METERS
Y = NUMBER OF BLOWS FOR SECOND 0.15 METERS
Z = NUMBER OF BLOWS FOR THIRD 0.15 METERS
- 50 (n)

INDICATES NUMBER OF BLOWS (50) TO DRIVE A SPLIT-BARREL SAMPLER A DEPTH OF (n) METERS OTHER THAN THE NORMAL 0.15 METER INCREMENT.

SYMBOL OF ROCK TYPES

- 

LIMESTONE

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 50.80 mm O.D., 34.93 mm I.D., SPLIT-SPOON SAMPLER, AT CONTINUOUS, 0.75 m AND/OR 1.50 m DEPTH INTERVALS, DRIVEN BY MEANS OF A 63.5 kg HAMMER WITH A FREE FALL OF 0.76 m. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER THREE 0.15 m INCREMENTS IS CONSIDERED THE STANDARD PENETRATION TEST.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF MECHANICALLY POWERED, ROTARY -TYPE DRILL RIG, EMPLOYING A 76 mm O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE APPLIED BY THE DRILL RIG.

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY-POWERED, ROTARY-TYPE DRILL RIG, EMPLOYING AN NQ2 OR NXM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD.

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.15 m INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS, UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PARTICLE SIZE DEFINITIONS

300 mm	75 mm	2.0 mm	0.42 mm	0.074 mm	0.005 mm	
BOULDERS	COBBLES	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY
			NO. 10 SIEVE	NO. 40 SIEVE	NO. 200 SIEVE	

NOTES

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATIONS SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF MATERIALS MANAGEMENT AT 1600 WEST BROAD STREET, THE OFFICE OF ROADWAY ENGINEERING OR THE OFFICE OF STRUCTURAL ENGINEERING AT 25 SOUTH FRONT STREET, COLUMBUS, OHIO 43215.

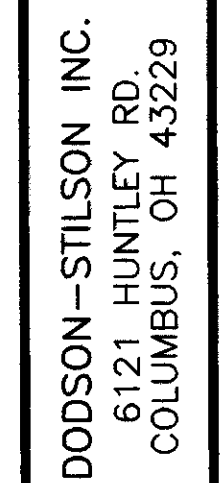
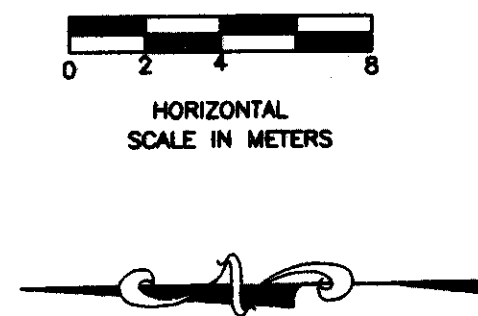
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DODSON-STILSON INC.
6121 HUNTLEY RD.
COLUMBUS, OH 43229

REVIEWED	CALCULATED	CHECKED
AEN	10/15/97	TAH
DRAWN	DMC	

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. HAN-37-26090
OVER POTATO RUN

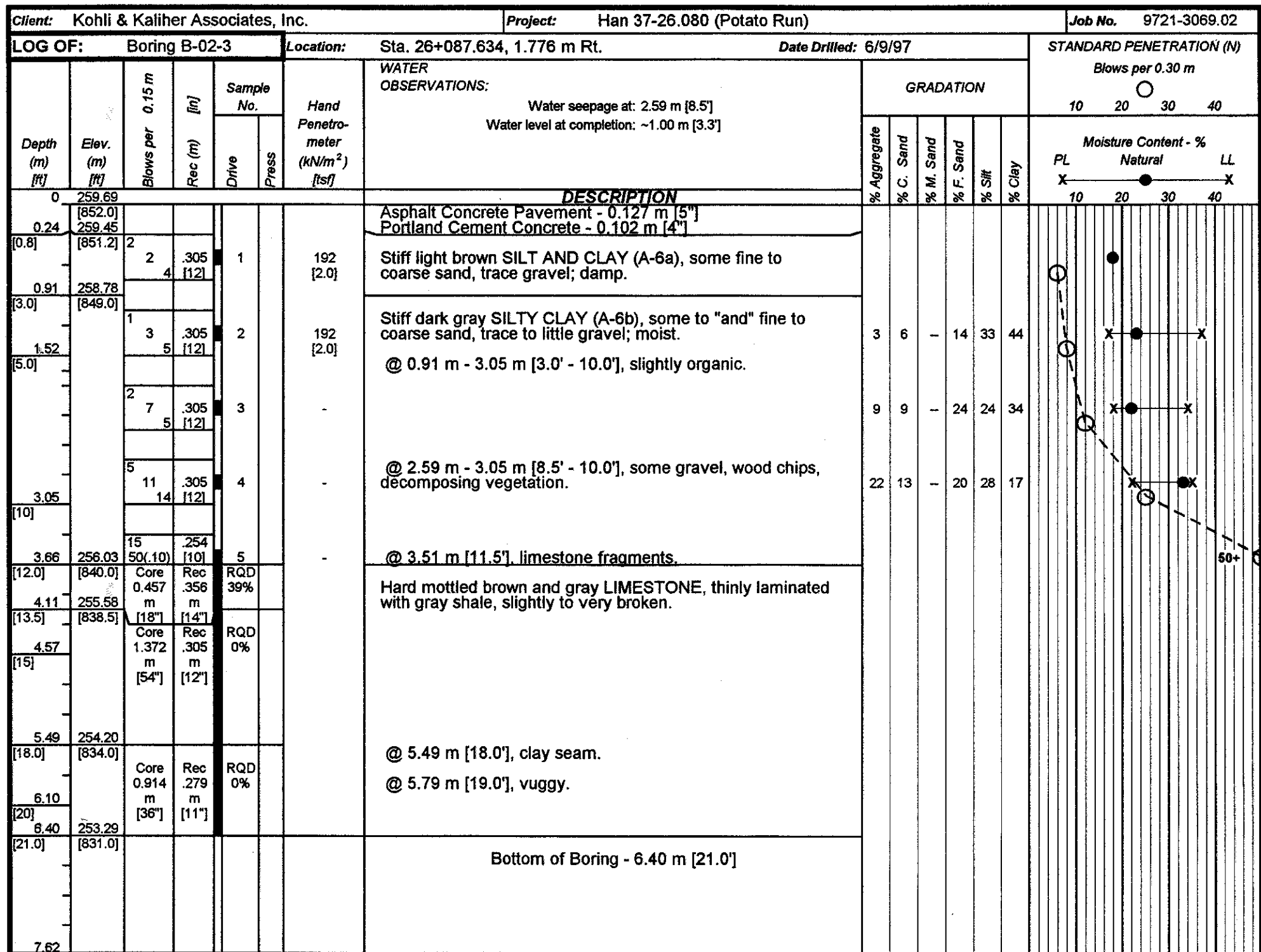
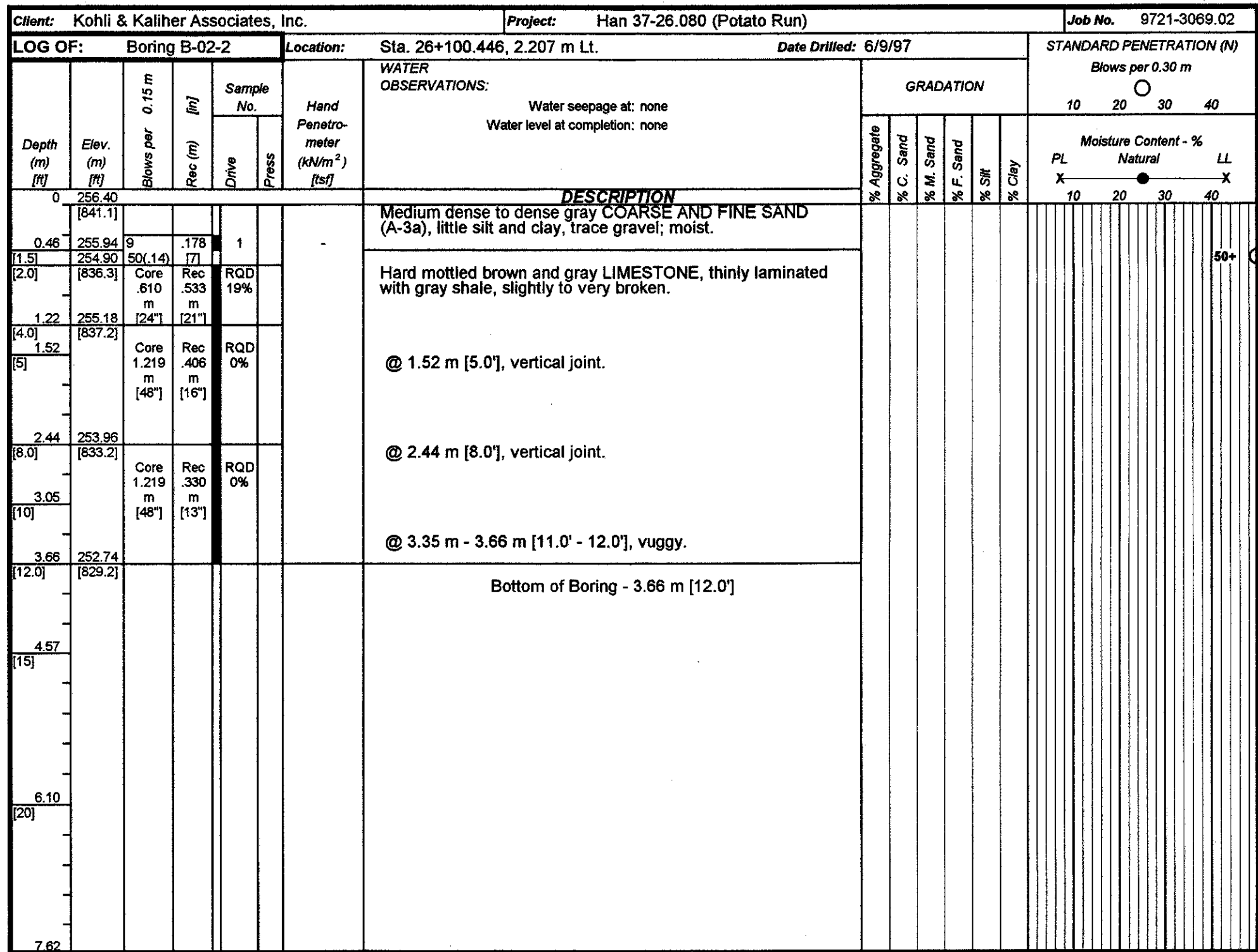
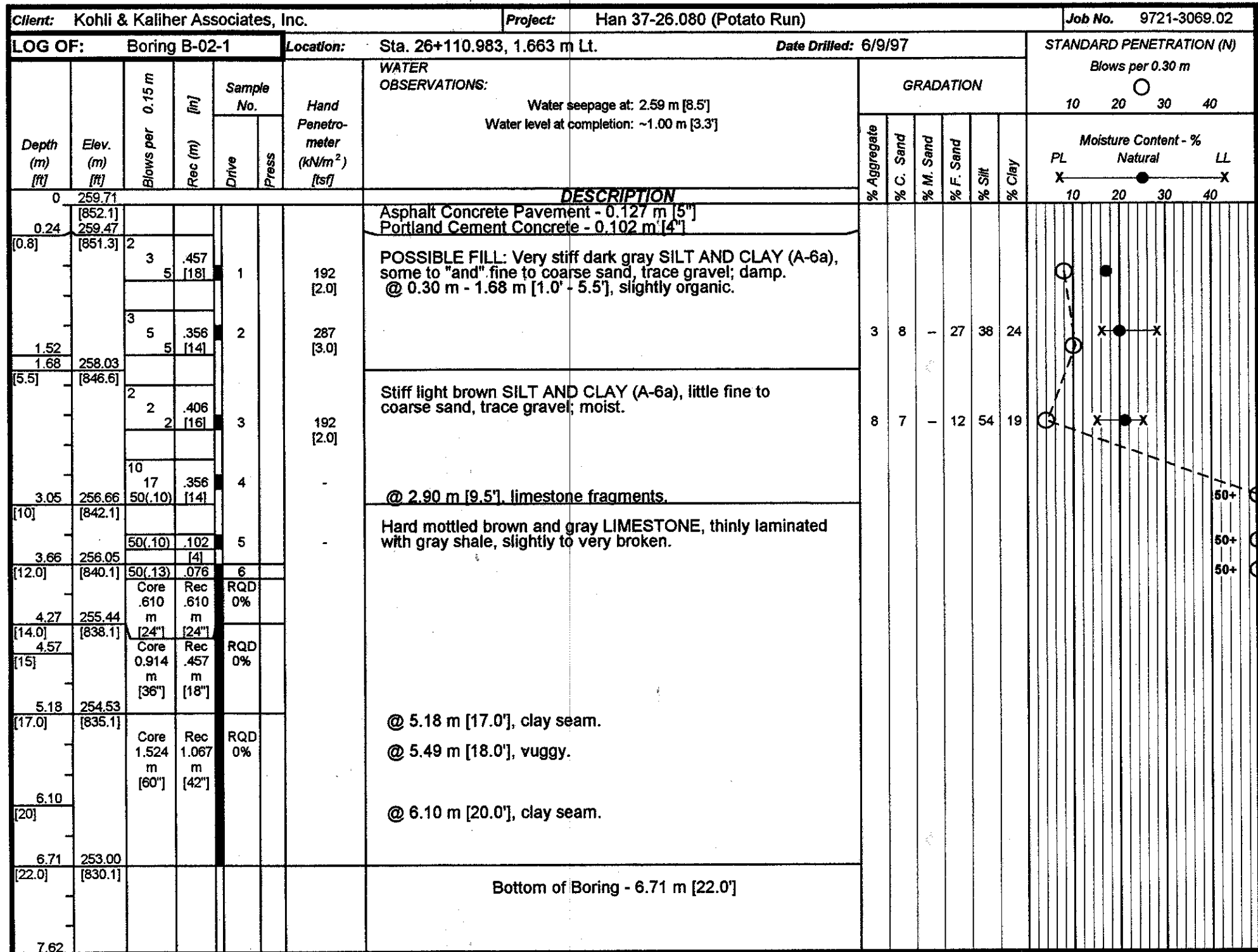
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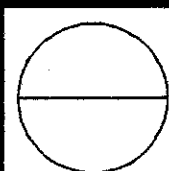
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			CHECKED TAH

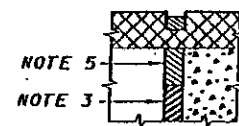
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. HAN-37-26090
OVER POTOTO RUN

HAN-37-26.080



D50 VALUES	
BORING B-02-1	BORING B-02-3
SAMPLE NO. 2 = 0.03 mm	SAMPLE NO. 2 = 0.01 mm
SAMPLE NO. 3 = 0.02 mm	SAMPLE NO. 3 = 0.03 mm
	SAMPLE NO. 4 = 0.11 mm





DETAIL A

CONCRETE WEARING
SURFACE ON BRIDGE DECK
AND APPROACH SLAB

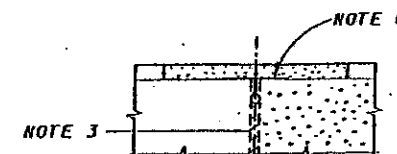


DETAIL B

CONCRETE WEARING
SURFACE ON BRIDGE DECK
AND APPROACH SLAB

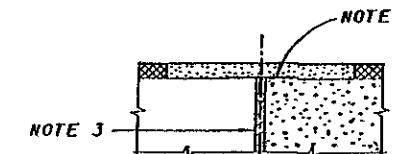


DETAIL C

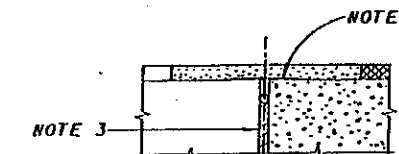


DETAIL D

CONCRETE WEARING
SURFACE ON BRIDGE
DECK ONLY



DETAIL E



DETAIL F

NOTE 1 : PREFORMED ELASTOMERIC JOINT SEALER
705.11 (32 mm FOR 13 mm JOINT) DEPRESSED 3 mm
BELOW ROADWAY, PLACED IN 13 mm x 55 mm
GROOVE.

NOTE 2 : PREFORMED ELASTOMERIC JOINT SEALER
705.11 (32 mm FOR 13 mm JOINT) PLACED IN
13 mm x 55 mm GROOVE.

NOTE 3 : 25 mm PREFORMED EXPANSION JOINT FILLER
705.03

NOTE 4 : TYPE "A" WATERPROOFING.

NOTE 5 : SEE PLAN INSERT SHEET. ABUTMENT JOINTS IN
BITUMINOUS CONCRETE BOX BEAM BRIDGES.

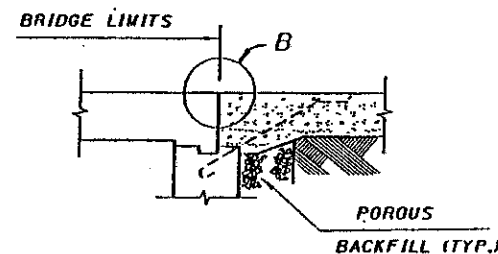
NOTE 6 : SEE PLAN INSERT SHEET. POLYMER MODIFIED
ASPHALT EXPANSION JOINT SYSTEM.

TYPE "A" WATERPROOFING SHALL NOT EXTEND ABOVE
THE BOTTOM OF THE GROOVE INTO WHICH THE PREFORMED
ELASTOMERIC JOINT SEALER IS TO BE PLACED. IT SHALL
BE APPLIED TO THE ENTIRE AREA OF THE ABUTMENT
OR SUPERSTRUCTURE WHICH COMES INTO CONTACT WITH
THE APPROACH SLAB.

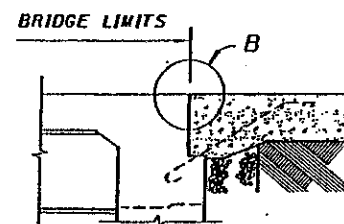
FOR PRESTRESSED CONCRETE BOX BEAM BRIDGES WITH
ASPHALT CONCRETE ON BOTH BRIDGE DECK AND APPROACH
SLAB, THE TOP OF APPROACH SLAB AT THE BRIDGE END
SHALL BE CONSTRUCTED TO THE LEVEL OF THE TOP OF THE
BEAMS TO FACILITATE WATERPROOFING OF THE JOINT. THE
THICKNESS OF ASPHALT CONCRETE AT THE APPROACH END
SHALL BE THE THICKNESS OF ASPHALT CONCRETE USED ON
THE ROADWAY PAVEMENT. THE THICKNESS OF ASPHALT
CONCRETE SHALL VARY UNIFORMLY, IF NECESSARY, IN THE
LENGTH OF THE APPROACH SLAB. THE BASE SHALL BE
GRADED TO PERMIT THE BOTTOM OF THE APPROACH SLAB
TO BE PARALLEL TO THE TOP.

FOR STRUCTURES HAVING ASPHALT CONCRETE WEARING
SURFACE ON BOTH BRIDGE DECK AND APPROACH SLABS AND WHERE NO
DECK EXPANSION DEVICES ARE PROVIDED, THE DECK MEMBRANE
WATERPROOFING SHALL EXTEND BEYOND THE BRIDGE LIMITS
A DISTANCE OF 600 mm.

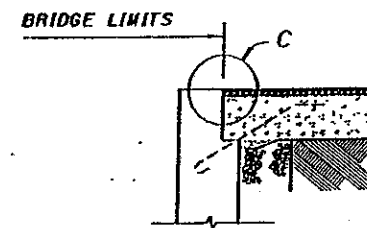
NOTE : APPROACH SLAB SEAT ON PRESTRESSED
CONCRETE BOX BEAM BRIDGES IS SHOWN
AT SAME ELEVATION AS BEAM SEAT.
HOWEVER, IT MAY ACTUALLY BE HIGHER
OR LOWER THAN THE BEAM SEAT DEPENDING
ON BOX BEAM DEPTH.



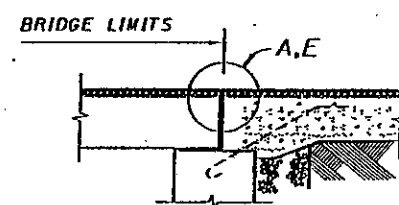
ON SLAB BRIDGES



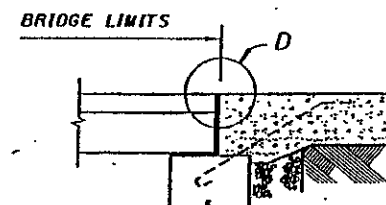
ON BRIDGES WITH INTEGRAL CONSTRUCTION



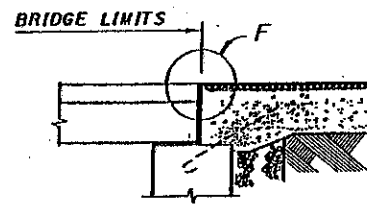
APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL



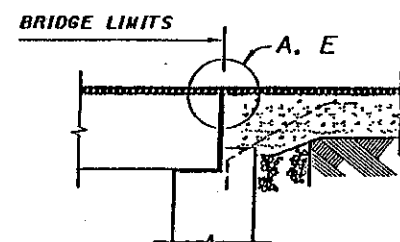
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



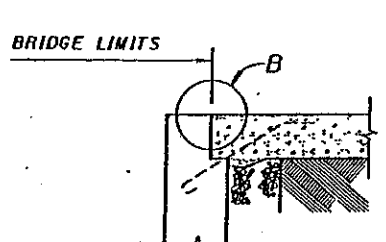
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



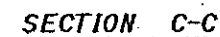
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



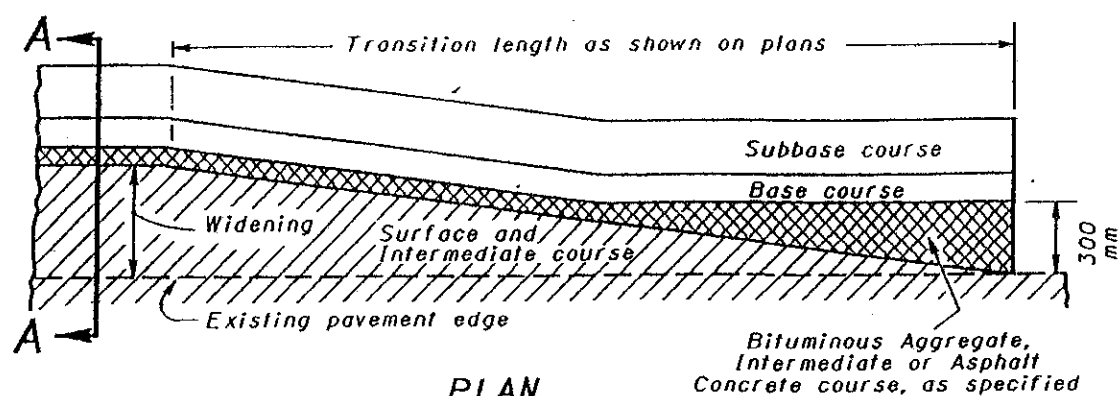
APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL



APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

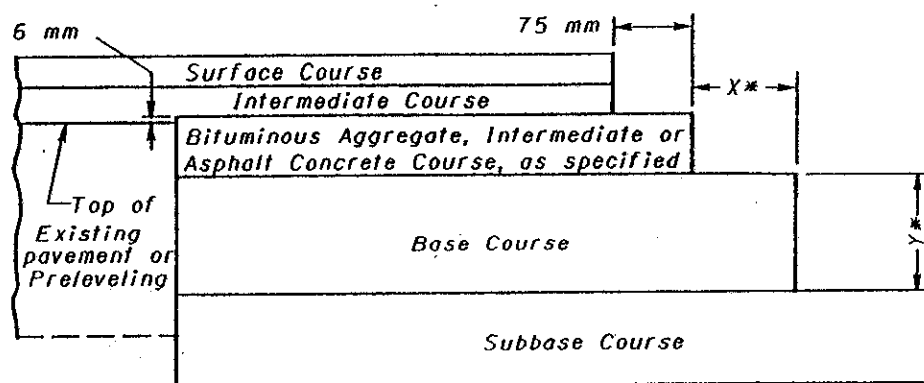


TYPE 4-A OR TYPE 4-B CURB.
SEE STANDARD CONSTRUCTION
DRAWING BP-5.1 M



PLAN

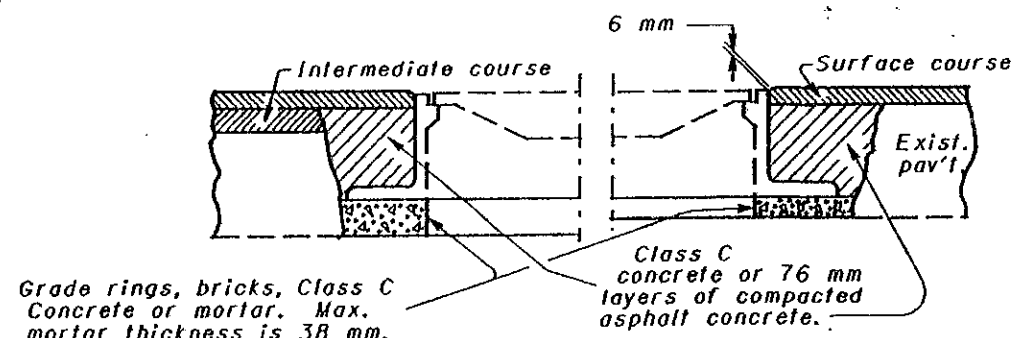
MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



The Bituminous Aggregate in the upper part of the base widening shall finish approximately 6 mm above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 6 mm above the preleveling.

*The extended width (X) of a base or subbase course shall be equal to the depth (Y) of that particular course, unless otherwise specified in the plans.

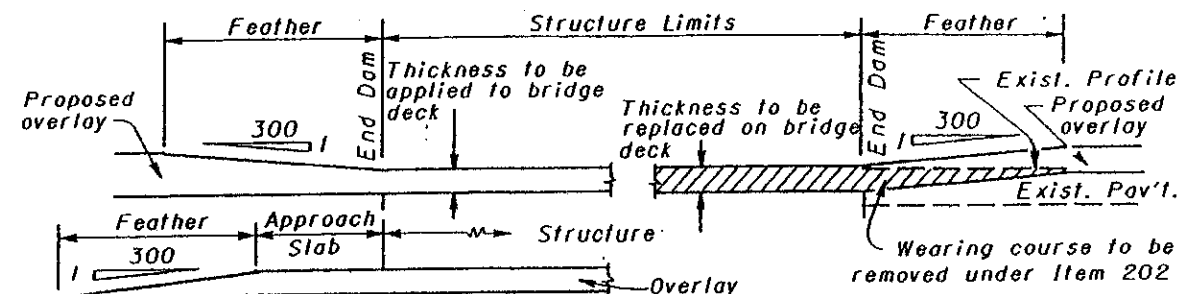
SECTION A-A COURSE DETAIL FOR WIDENING



USING CONCRETE OR MORTAR

Metal adjusting rings shall: (a) attach securely to the existing frame by welding or mechanical devices; (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and (c) provide an even seat for the manhole cover. In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the Contractor at his expense.

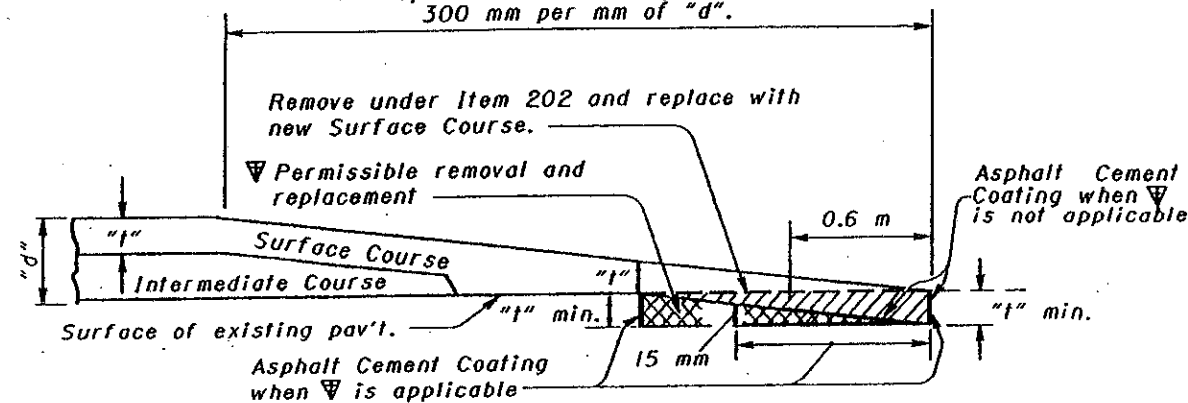
MANHOLES ADJUSTED TO GRADE



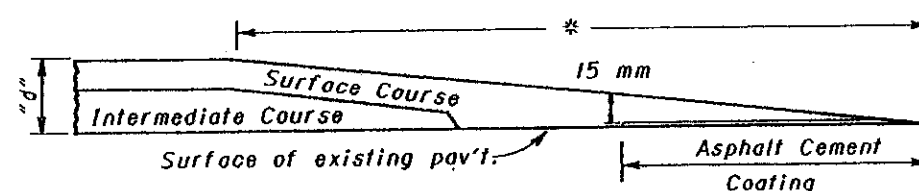
Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES

* Min length - 120 mm per mm of "d".
For speeds 80 km/h or greater, use 300 mm per mm of "d".



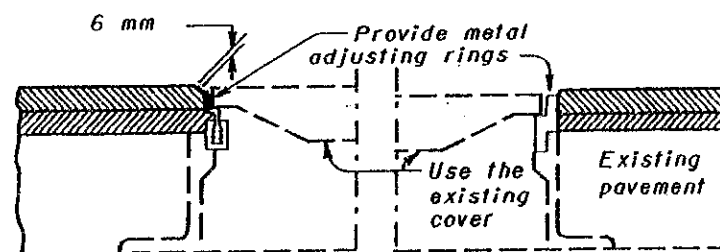
BUTT JOINT TYPE



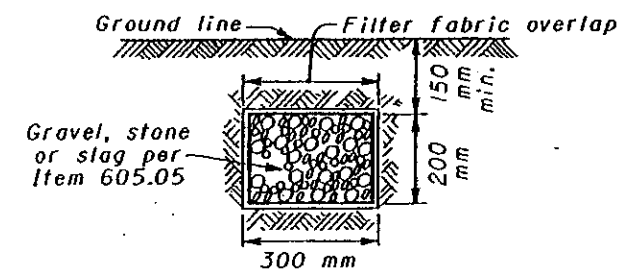
TAPER EDGE TYPE

NOTE: Either butt or taper type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS

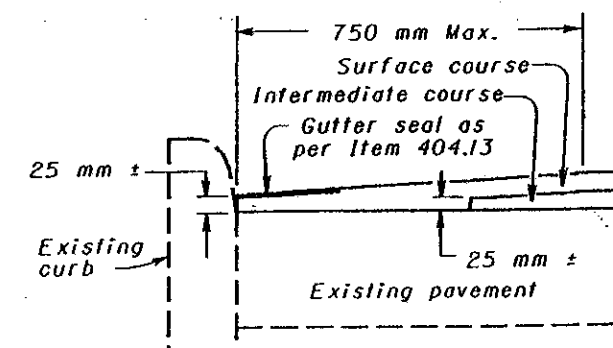


USING METAL ADJUSTING RINGS



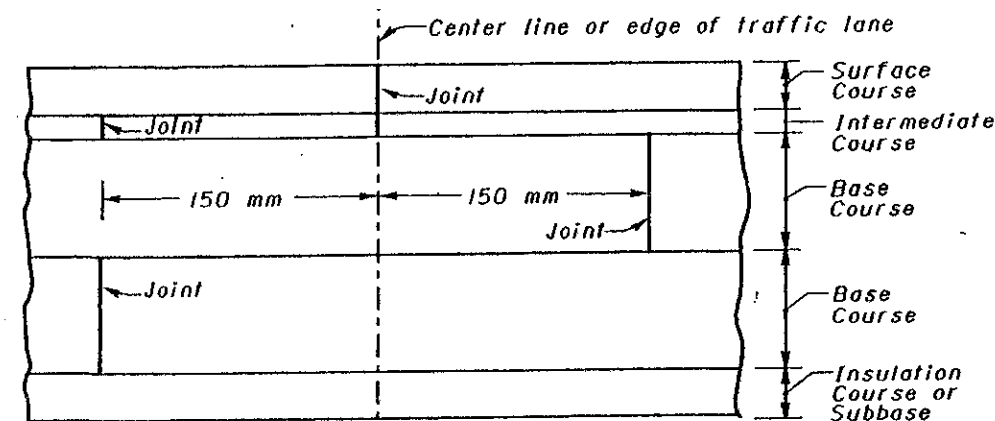
Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item.

AGGREGATE DRAIN



Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

GUTTER FINISH



LAPPING LONGITUDINAL JOINTS

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

RESURFACING

STANDARD CONSTRUCTION DRAWING
BP-3.1M

APPROVED *W.K. Hulman*

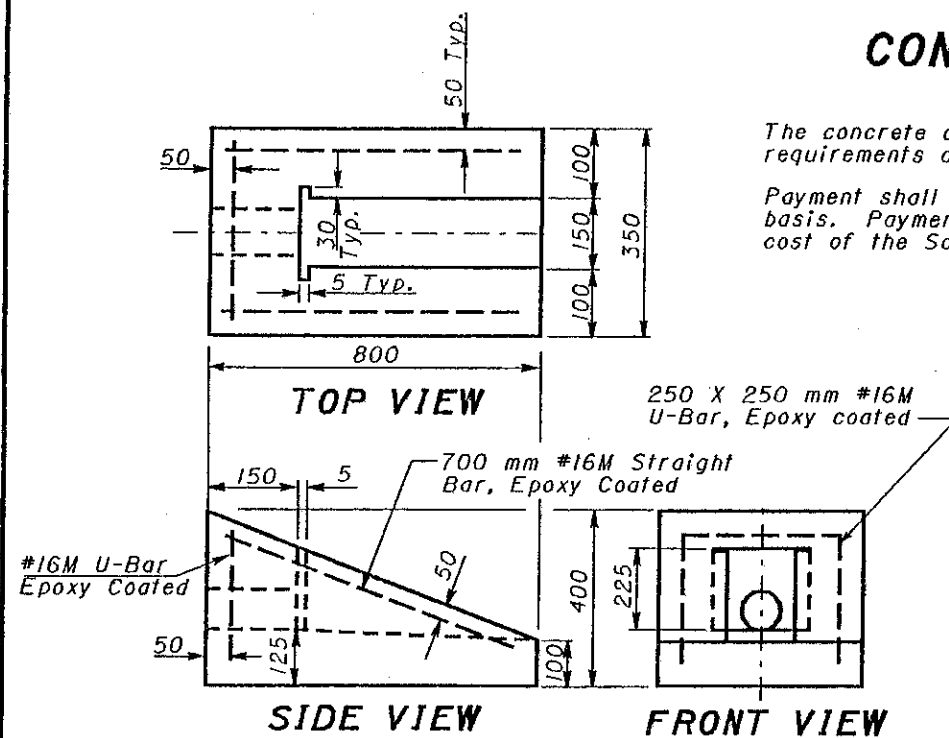
ENGR., L & D

DATE

10-28-94

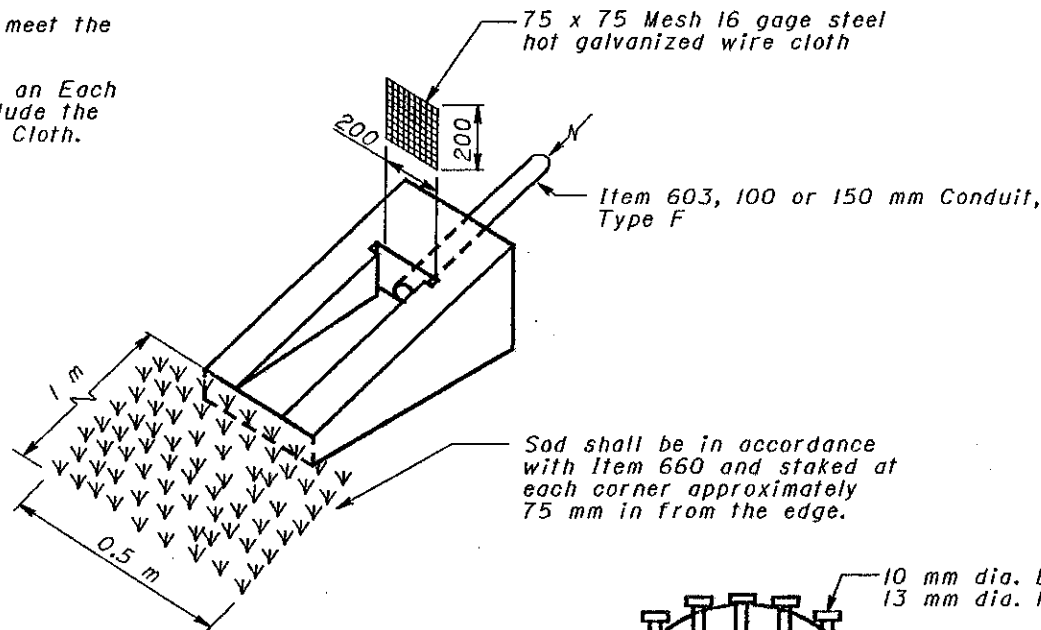


CONSTRUCTION METHODS

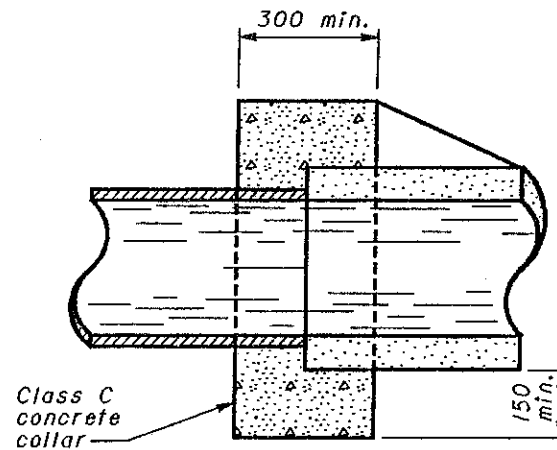
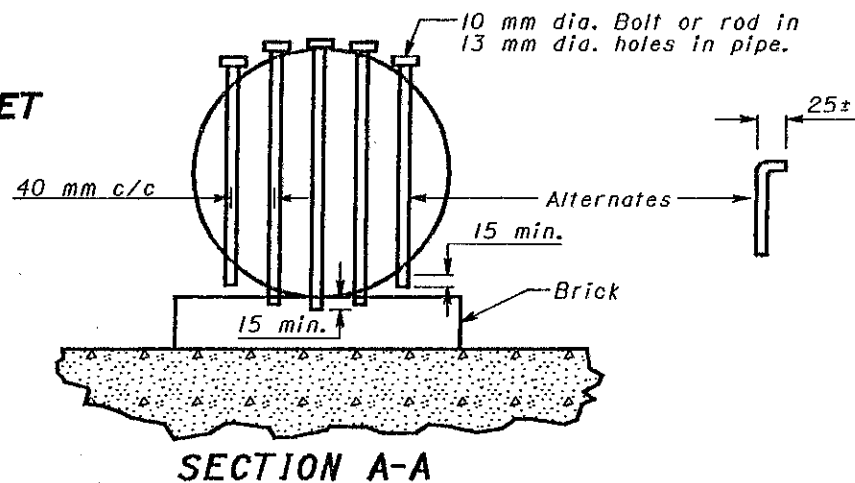
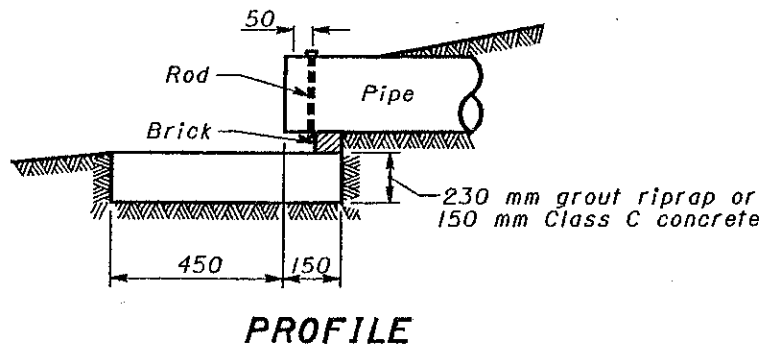
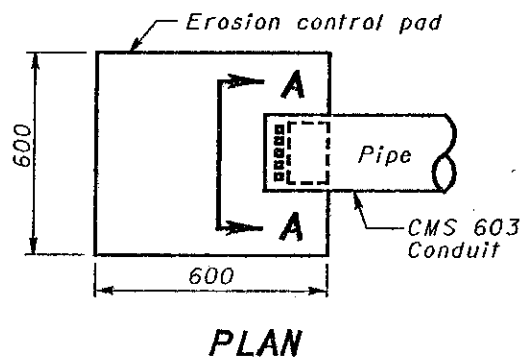


The concrete outlet shall meet the requirements of CMS 604.

Payment shall be made on an Each basis. Payment shall include the cost of the Sod and Wire Cloth.



PRECAST REINFORCED CONCRETE OUTLET

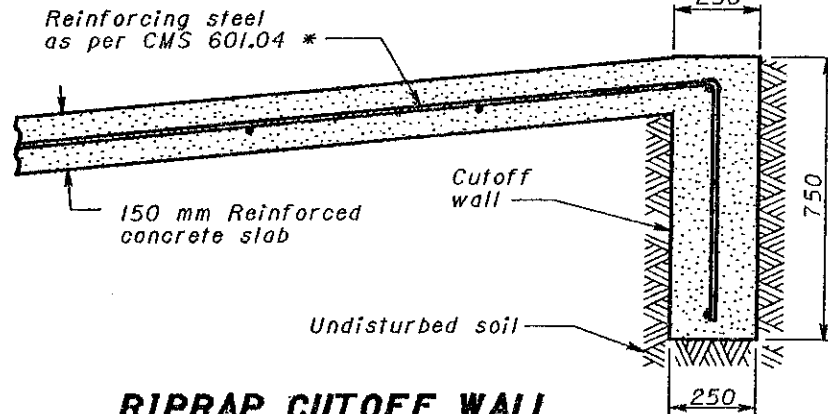


MASONRY COLLAR

EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE

Conduit Size (mm)	100	150	200	250	300	375	450
No. of Bolts	2	3	5	6	7	9	11

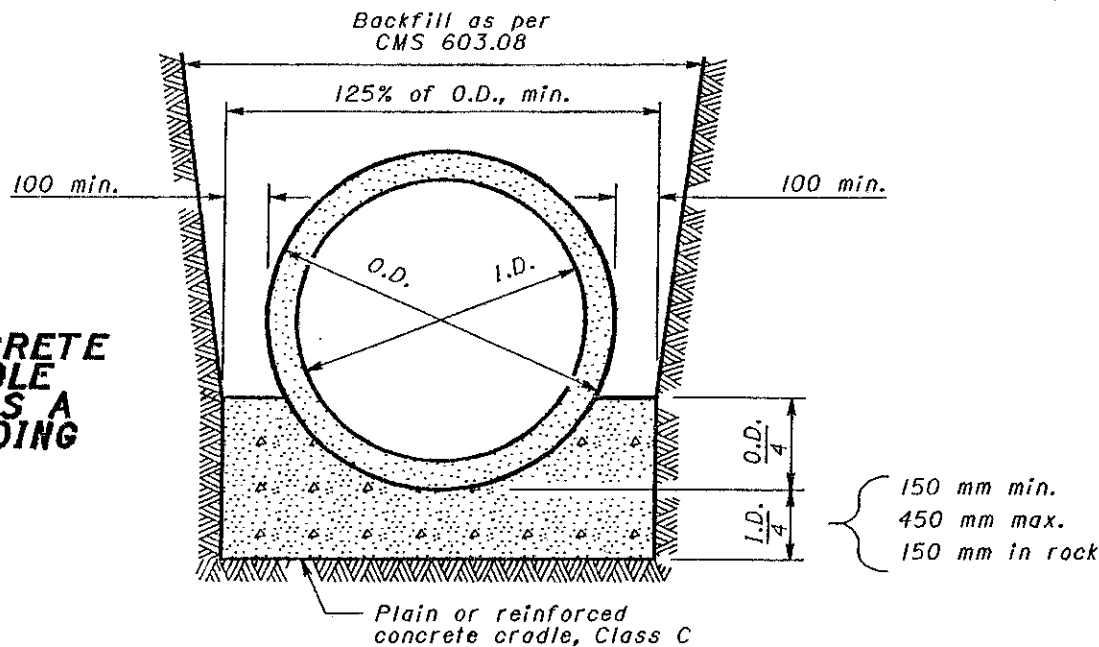
* If wire fabric is used in the slab, #10M bars at 600 mm overlapping the fabric. 300 mm, or wire fabric in accordance with SCD BP-1.1M may be used.



RIPRAP CUTOFF WALL

The cost of the cutoff wall shall be included in the unit price bid for Item 601 Riprap using 150 mm reinforced concrete slab

CONCRETE CRADLE CLASS A BEDDING



NOTES

MASONRY COLLARS: A masonry collar shall be provide where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint. The cost shall be included in the unit price bid for the new conduit.

EROSION CONTROL PAD AND ANIMAL GUARDS: These items shall be provided at the outlet end of all farm drains except where they outlet into a drainage structure. The steel bolts or rods for the animal guard shall be galvanized per CMS 710.06. In lieu of drilling or punching the 13 mm diameter holes into the pipe, a metal collar meeting all of the above requirements may be clamped onto the pipe if approved by the Engineer. Payment for the erosion control pads and animal guards shall be included in the unit price bid for Item 603 — mm Conduit, Type —.

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces MC-4.

OHIO DEPARTMENT OF TRANSPORTATION

OUTLETS,
DRAINS AND
SEWERS

STANDARD
CONSTRUCTION
DRAWING

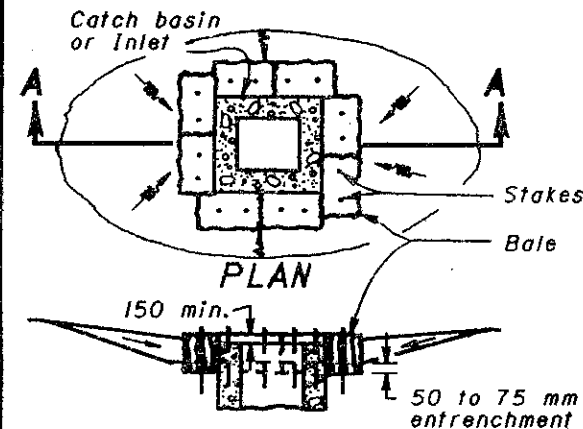
DM-1.1M

APPROVED *Roy F. Sutherland*

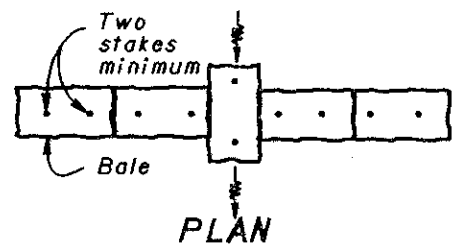
DATE

6-30-95
10-21-97

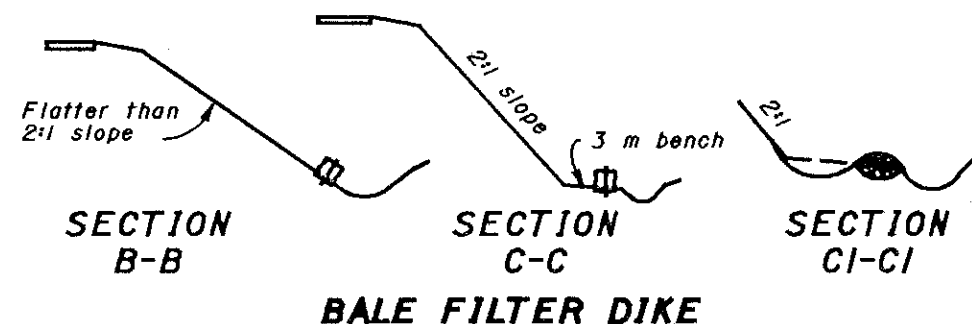
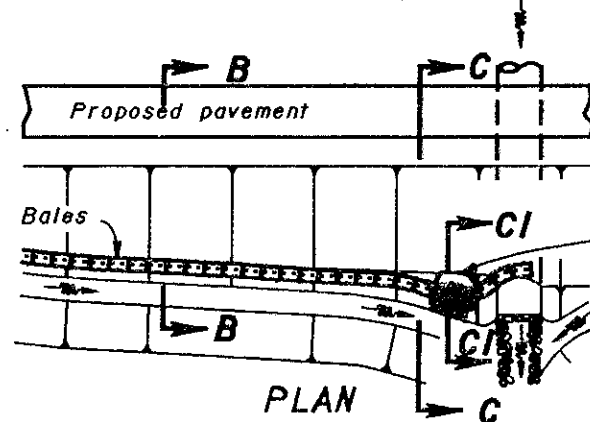
STRAW OR HAY BALES



SECTION A-A
BALE INLET FILTER



PLAN
ELEVATION
BALE DITCH CHECK



SECTION B-B
SECTION C-C
BALE FILTER DIKE

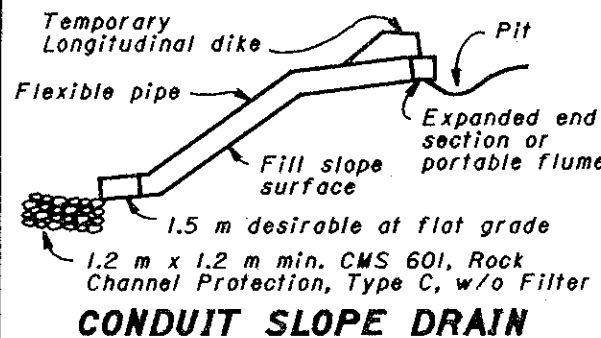
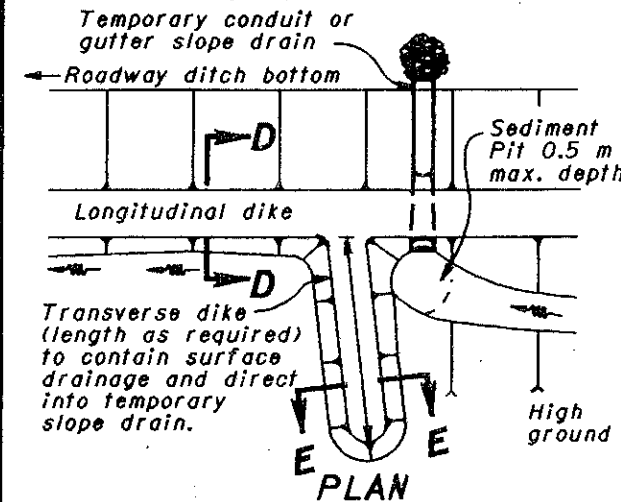
BALE PLACEMENT: Bales shall be tightly placed adjacently and entrenched 50 mm to 75 mm before staking; or a small amount of loose soil shall be lightly compacted along the upstream edge of the bales. Each bale shall be firmly staked with a minimum of two stakes at least 1 m in length. Stakes shall be wooden 50 x 50 mm, reinforcing bars or fence posts, as approved by the Engineer. Loose straw or hay shall be scattered for a distance of 3 m on the upstream side of each ditch check, and shall be wedged between and under staked bales.

PITS: Sediment pits shall be provided where directed by the Engineer, and their cost included in the unit price bid for the adjacent CMS 207 items.

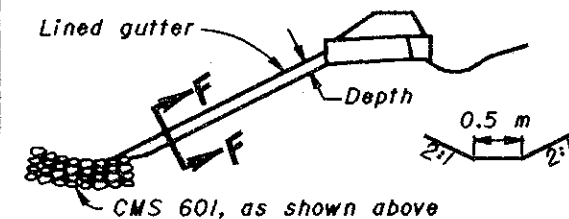
MAINTENANCE: Sediment shall be removed when its depth reaches half the height of the exposed portion of the lowest bale.

BASIS OF PAYMENT: Straw or hay bale installation shall be paid for under Item 207, Straw or Hay Bales. Cost will include placing, staking, maintaining and removing.

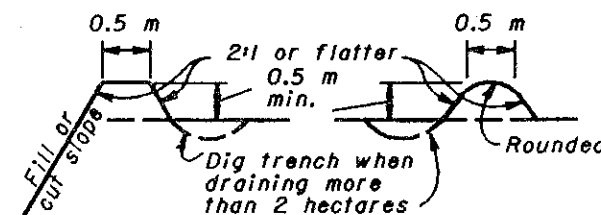
DIKES AND SLOPE PROTECTION



CONDUIT SLOPE DRAIN



SECTION F-F
GUTTER SLOPE DRAIN



SECTION D-D
SECTION E-E

TEMPORARY SLOPE DRAINS RECOMMENDED SIZES				
Area (hectares)	Pipe Sizes (mm)			Gutter depth (mm)
	Smooth	Corru- gated	Half- round	
0-1.6	150	150	450	200
1.6-3.2	200	300	450	200
3.2-4.9	250	375	525	300

GENERAL: Dikes & drains shown shall be used when earthwork operations on slopes higher than 2.5 m are suspended for three weeks or more and/or as directed by the Engineer. Smaller dikes used at the end of a day's operation shall be considered as part of the earthwork. Temporary slope drains shall be suitably positioned and anchored to prevent movement or undermining, as directed by the Engineer.

LONGITUDINAL DIKES: shall be constructed of suitable material as per CMS 203 and compacted to 85% maximum density.

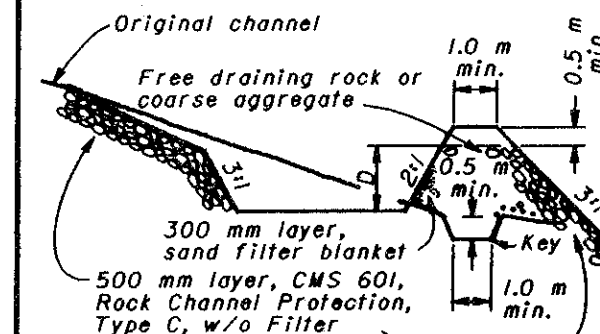
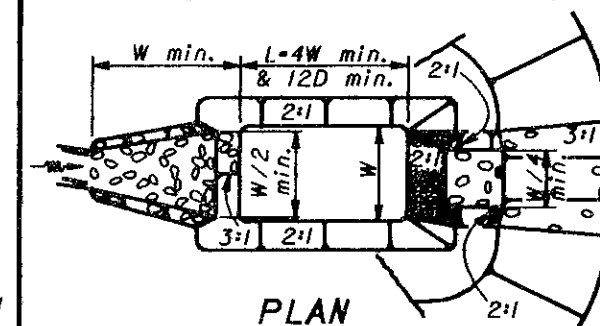
CONDUITS: Conduits for slope drains shall be corrugated steel pipe, corrugated or smooth plastic pipe, rubber conduit, or an approved equal.

GUTTERS: Gutters for slope drains shall be lined with Type C rock channel protection, crushed aggregate slope protection, portland cement concrete, bituminous concrete, plastic sheeting (on slopes 4:1 max.), partial pipe sections or approved equal.

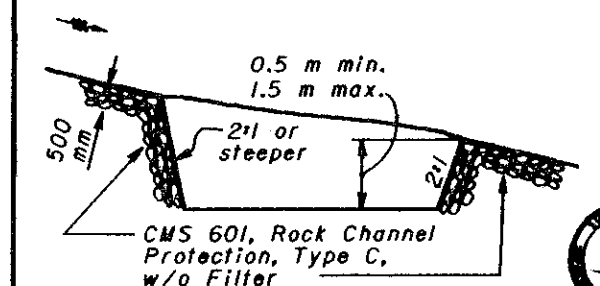
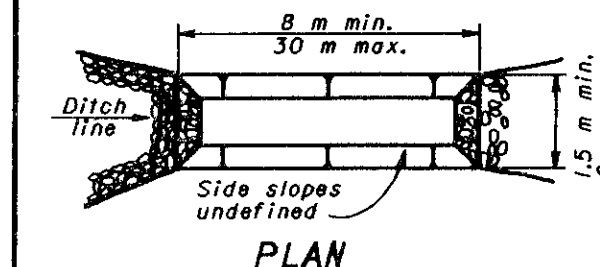
PITS: Sediment pits shall be provided where directed by the Engineer and their cost included in the price bid for adjacent CMS 207 items.

BASIS OF PAYMENT: Temporary dikes shall be paid for under Item 207, Temporary Dikes. Temporary slope drains shall be paid for under Item 207, Temporary Slope Drains. Rock required shall be paid for under Item 601, Rock Channel Protection, Type C, w/o Filter.

SEDIMENT BASINS & DAMS



PROFILE
SEDIMENT DAM



PROFILE
SEDIMENT BASIN

EMBANKMENT: Sediment basin embankment construction shall be as per CMS 203 compacted as directed by the Engineer.

MAINTENANCE: Sediment pits, dams and basins shall be acceptably maintained. Deposited sediment shall be removed when the initial volume has been reduced one-half. The sand filter blanket on sediment basins shall be replaced when deposited sediment is removed. The cost of maintenance shall be included in the unit price bid for the appropriate CMS 207 item.

FILTERS: Plastic filter fabric, as approved by the Engineer, may be substituted for the sand filter blanket on sediment dams. Such fabrics may be cleaned in lieu of replacement, when approved by the Engineer.

SIZE: The volume shown on the plans is the total storage volume required for the sediment basin or dam. A series of smaller basins or dams may be substituted for a larger basin or dam when approved by the Engineer.

BASIS OF PAYMENT: Sediment Dams and Basins shall be paid for under Item 207, Temporary Basins, Dams and Sediment Basins. The pay quantity shall be the actual number of cubic meters of excavation and embankment required to construct the basin or dam. Rock required shall be paid for under Item 601, Rock Channel Protection, Type C, w/o Filter.



This Drawing Replaces MC-II.

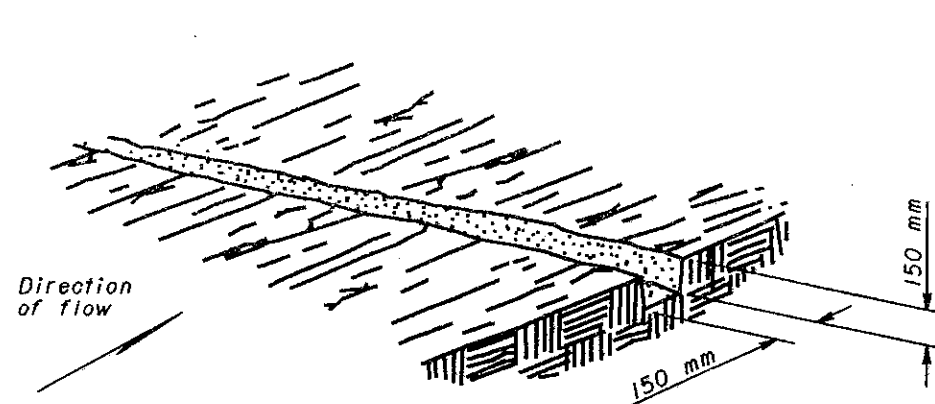
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TEMPORARY
EROSION
CONTROL

DATE
6-30-95

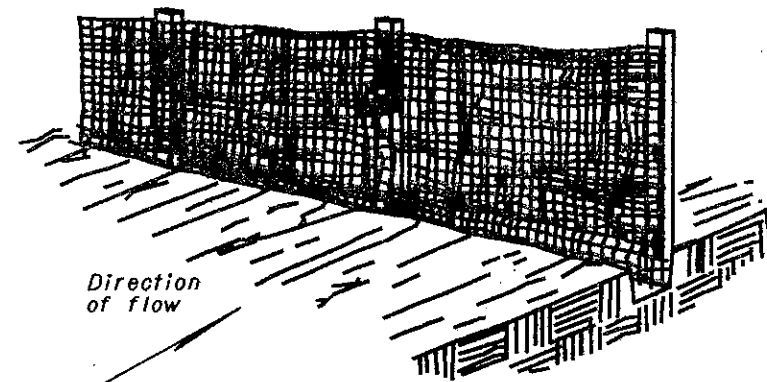
STANDARD
CONSTRUCTION
DRAWING

APPROVED *W.K. Huhman*
ENGR. L & D



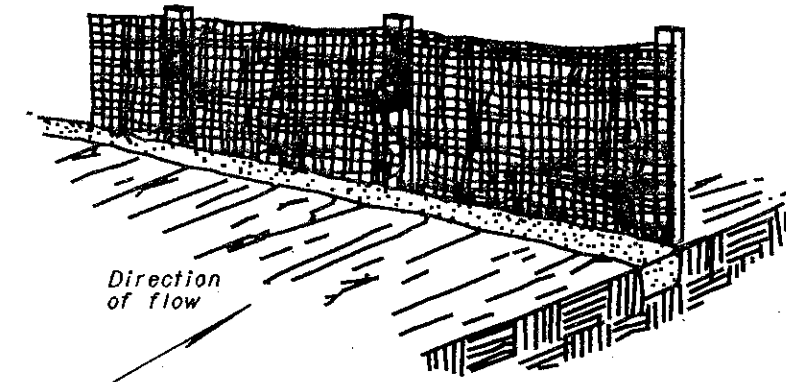
Excavate a 150 mm by 150 mm trench along the proposed fence line.

STEP 1



Place fabric and support stakes and extend fabric into the trench.

STEP 2



Backfill and compact the excavated soil.

STEP 3

CONSTRUCTION OF A FILTER BARRIER

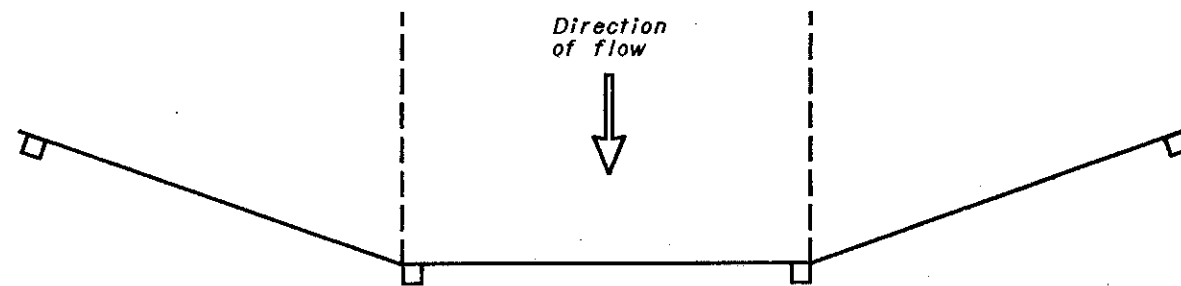
NOTES

MATERIALS: Filter fabric shall meet the requirements of CMS 207.02.

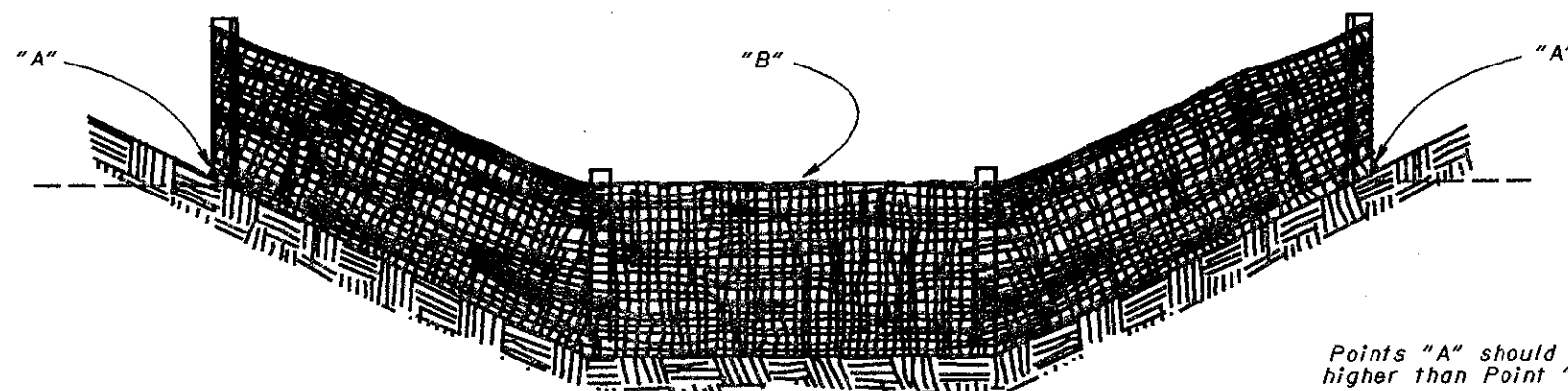
CONSTRUCTION: The bottom of the fabric shall be buried 150 mm below the ground. The fabric shall be high enough to retain sediment-laden water and adequately supported to prevent collapse or bursting. The ground elevation of the fence shall be held constant except that the end elevations shall be raised to prevent flow around the end of the fence.

MAINTENANCE: The filter fabric fence shall be maintained to be functional, at the direction of the Engineer. This shall include removal of trapped sediment and required cleaning, repair, and/or replacement of the filter fabric. Sediment shall be removed when its depth reaches half the height of the lowest section of fence.

PAYMENT: The cost of all materials, construction, maintenance and removal shall be paid for under Item 207, Meter, Filter Fabric Fence.



PLAN VIEW



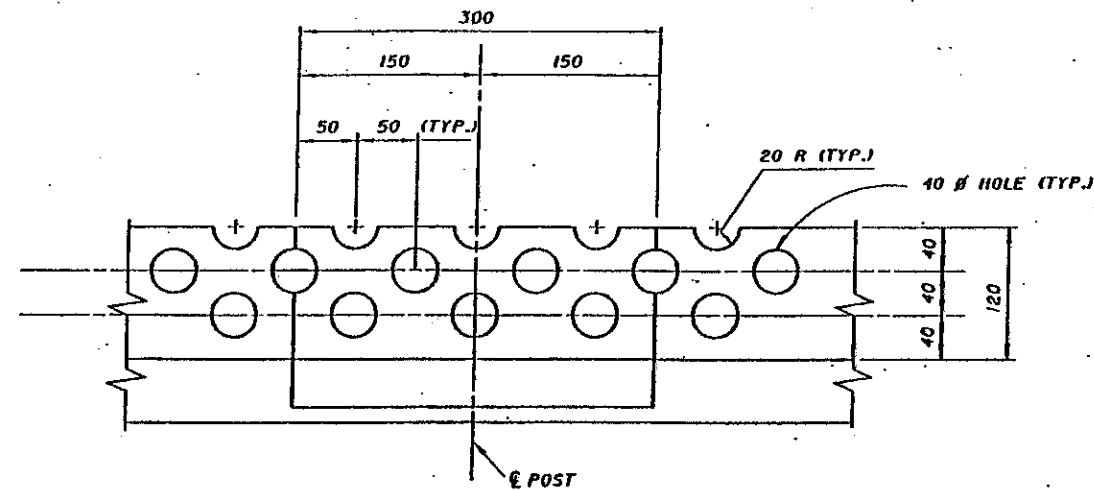
Points "A" should be higher than Point "B"

ELEVATION VIEW

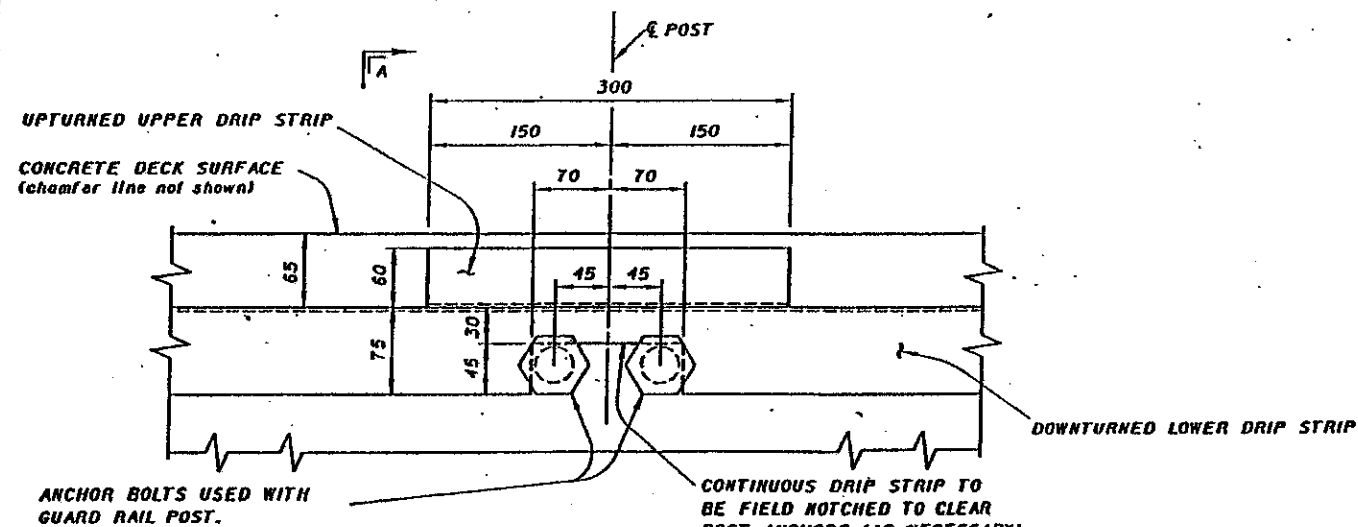
PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY



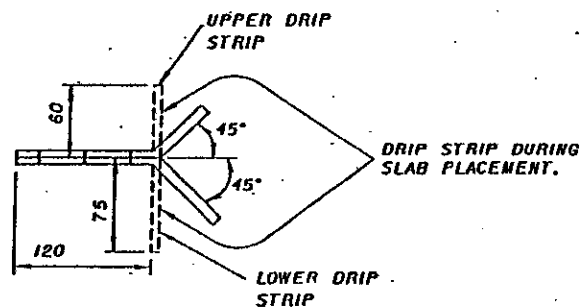
BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
TEMPORARY EROSION CONTROL	DATE 6-30-95
STANDARD CONSTRUCTION DRAWING	
APPROVED <i>W. K. Hulman</i> ENGR., L & D	



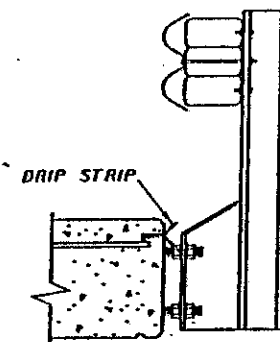
PARTIAL PLAN



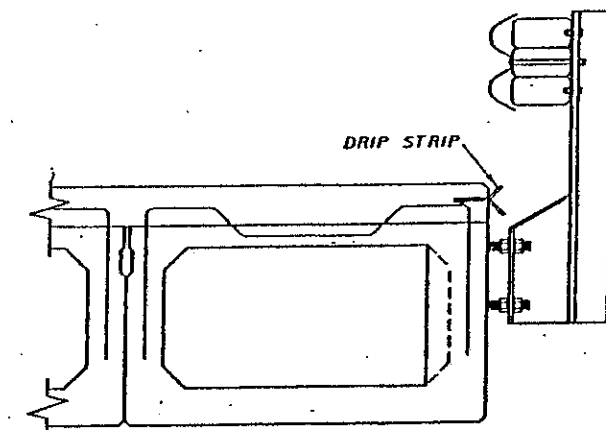
ELEVATION



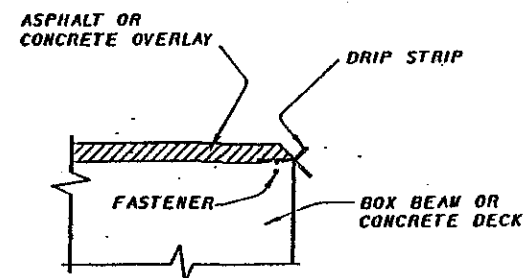
SECTION A-A



SECTION AT EDGE OF CONCRETE DECK SLAB



SECTION AT EDGE OF COMPOSITE PRESTRESSED BOX BEAM DECK



SECTION AT EDGE OF ASPHALT OR CONCRETE OVERLAY

D RIP STRIP NOTES:

LOWER STAINLESS STEEL DRIP STRIP, AS DETAILED, SHALL BE INSTALLED ALONG THE FULL LENGTH OF EACH SIDE OF THE BRIDGE. IF SPLICES ARE REQUIRED IN THE LOWER DRIP STRIP, THE INDIVIDUAL PIECES SHALL BE BUTTED TIGHTLY TOGETHER, NOT LAPPED. A 300 mm LONG UPPER DRIP STRIP SHALL BE INSTALLED AT EACH RAILING POST. STRIPS SHALL BE BENT UP AT 90° AGAINST THE INSIDE FACE OF THE FORMS BEFORE CONCRETE IS PLACED. AFTER THE FORMS ARE REMOVED, THE DRIP STRIPS SHALL BE BENT TO A FINAL POSITION OF 45° AS SHOWN IN SECTION A-A.

STAINLESS STEEL SHALL BE A MINIMUM OF 0.8 mm ASTM A167, TYPE 304, MILL FINISH.

CARE SHALL BE USED WHEN STRIPPING FORMWORK SO AS NOT TO DAMAGE OR WRINKLE THE STAINLESS STEEL DRIP STRIP. TO FURTHER ENSURE THAT WRINKLING OF THE STRIPS DOES NOT OCCUR, AN ADEQUATE LENGTH BACKUP BAR SHALL BE USED DURING THE BENDING OUT OPERATION.

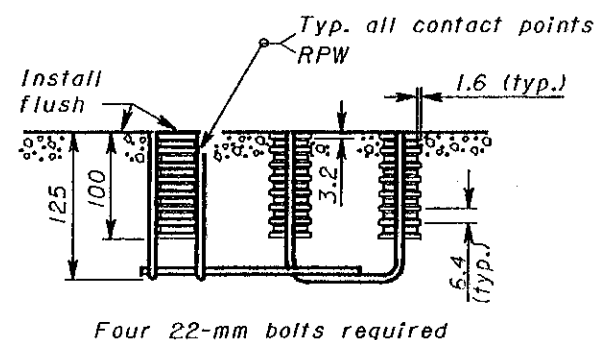
TOTAL QUANTITY FOR BID ITEM SHALL INCLUDE LINEAR FOOTAGE OF BOTH LOWER AND UPPER DRIP STRIPS.

PAYMENT SHALL BE AT THE CONTRACT PRICE BID FOR ITEM SPECIAL, LK.FT. STEEL DRIP STRIP AND SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM.

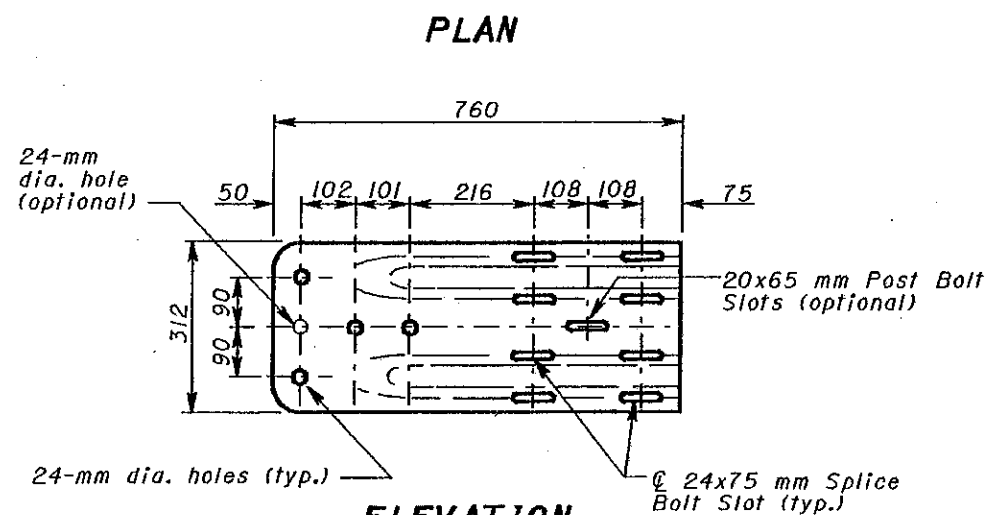
✱ PRIOR TO PLACING AN ASPHALT OR CONCRETE OVERLAY, THE BENT DRIP STRIPS SHALL BE INSTALLED ALONG THE EDGE OF THE SLAB OR PRESTRESSED BOX BEAM AS SHOWN. THE DRIP STRIPS SHALL BE FASTENED WITH (32 mm length, 3 mm shank diameter) BUTTON HEAD SPIKES WITH DEFORMED SHANKS OR EXPANSION ANCHORS AT 450 mm C/C MAX. ALL INSTALLATION DEVICES SHALL EITHER BE GALVANIZED OR STAINLESS STEEL.

OTHER SIMILAR DEVICES WHICH WILL NOT DAMAGE THE CONCRETE MAY BE USED SUBJECT TO THE APPROVAL OF THE ENGINEER.

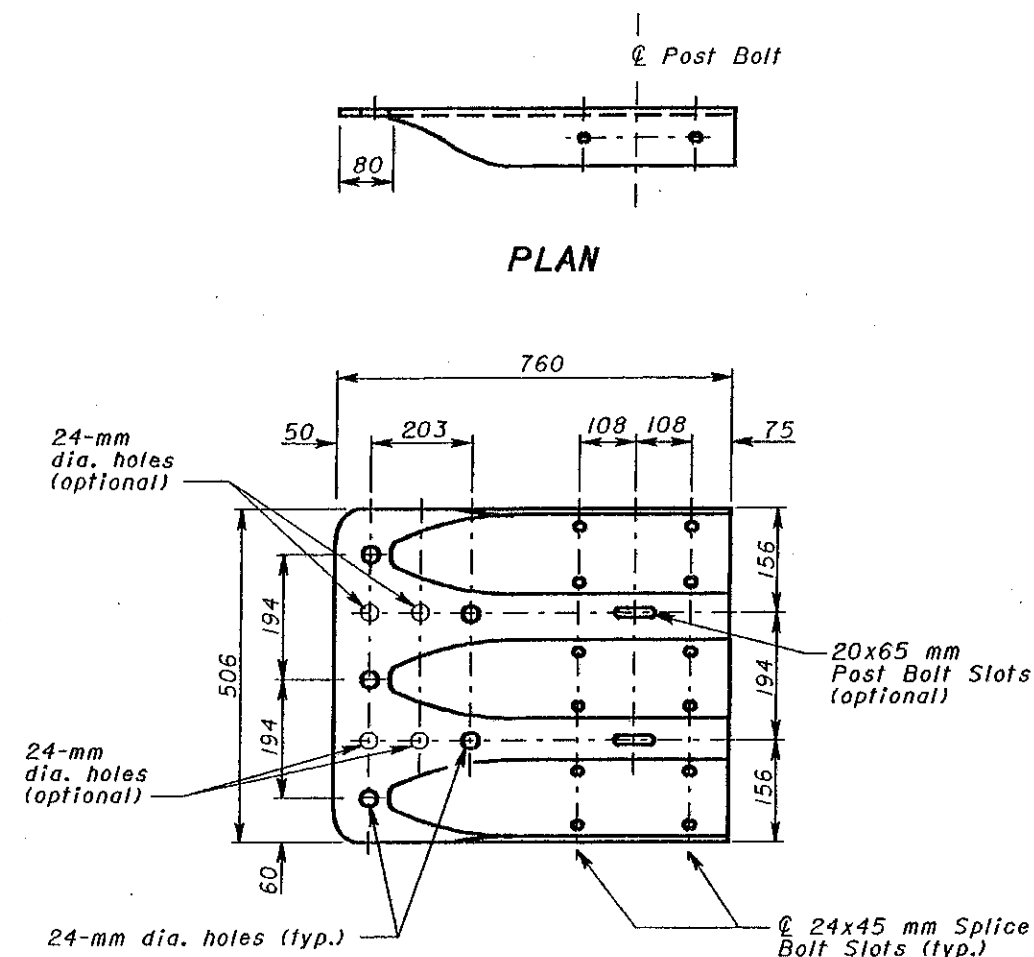
DESIGN NO. 12-15-94		BUREAU OF BRIDGES AND STRUCTURAL DESIGN	
STATE OF OHIO DEPARTMENT OF TRANSPORTATION		DATE	
DESIGNED BY REZA		CHECKED BY JS	
DRAWN BY REZA		LWN	
REVISIONS		DS-1-94U	
STANDARD		DRIP STRIP DETAIL FOR STRUCTURES WITH OVER THE SIDE DRAINAGE	
1		1	



CONCRETE INSERT ANCHOR ASSEMBLY (W-BEAM ONLY)



W-BEAM TERMINAL CONNECTOR



THREE-BEAM TERMINAL CONNECTOR

*All dimensions are in millimeters
unless otherwise noted.*



L (mm)	T m/n. (mm)	Bolt Use
455 (Standard Rail)	85	Type 5: WP/WB, PB
660 (Barrier Rail)		
255	60	Type 4: WP Type 5: SP/WB, PB
50	35	Type 4: SP
32	Full	Splice Bolt

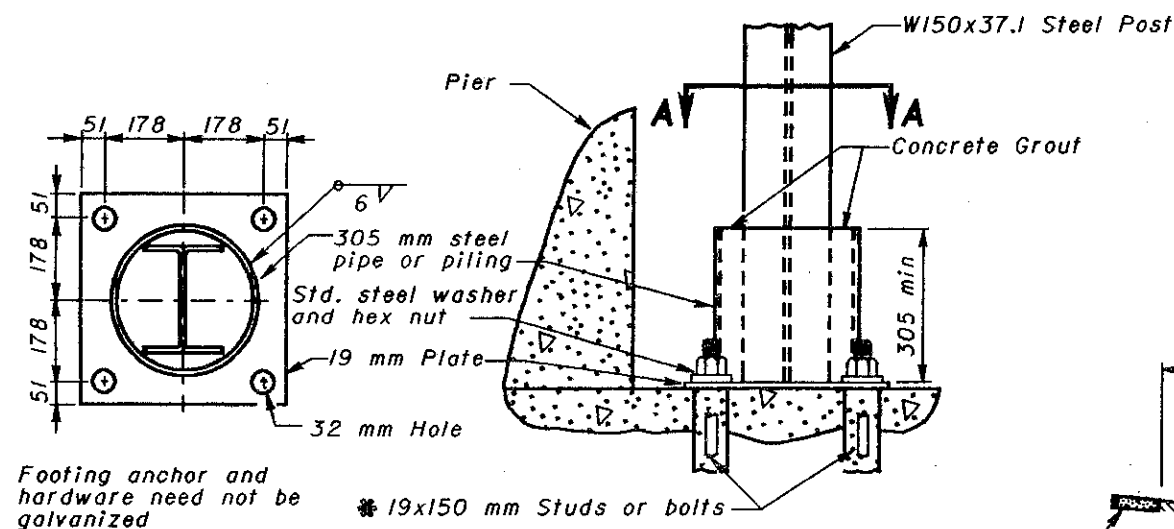
WP- wood post WB- wood blackout
SP- steel post PB- plastic blackout
Longer bolt may be needed for
round WP larger than 200 mm dia.

BUTTON HEAD BOLT
(For post and splice bolts)

NOTE

Refer to AASHTO M 180 for dimensional details of W-Beam and Thrie-Beam rail elements, related buffer and end sections, beam splices, post and splice bolts and nuts, and Type I W-Beam to Thrie-Beam Transition section.

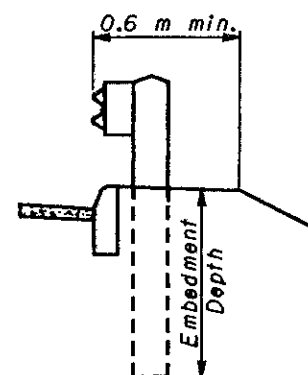
OHIO DEPARTMENT OF TRANSPORTATION	
GUARDRAIL DETAILS	DATE 11-30-94 10-21-97
STANDARD CONSTRUCTION DRAWING	GR-1.1M
APPROVED <i>[Signature]</i>	



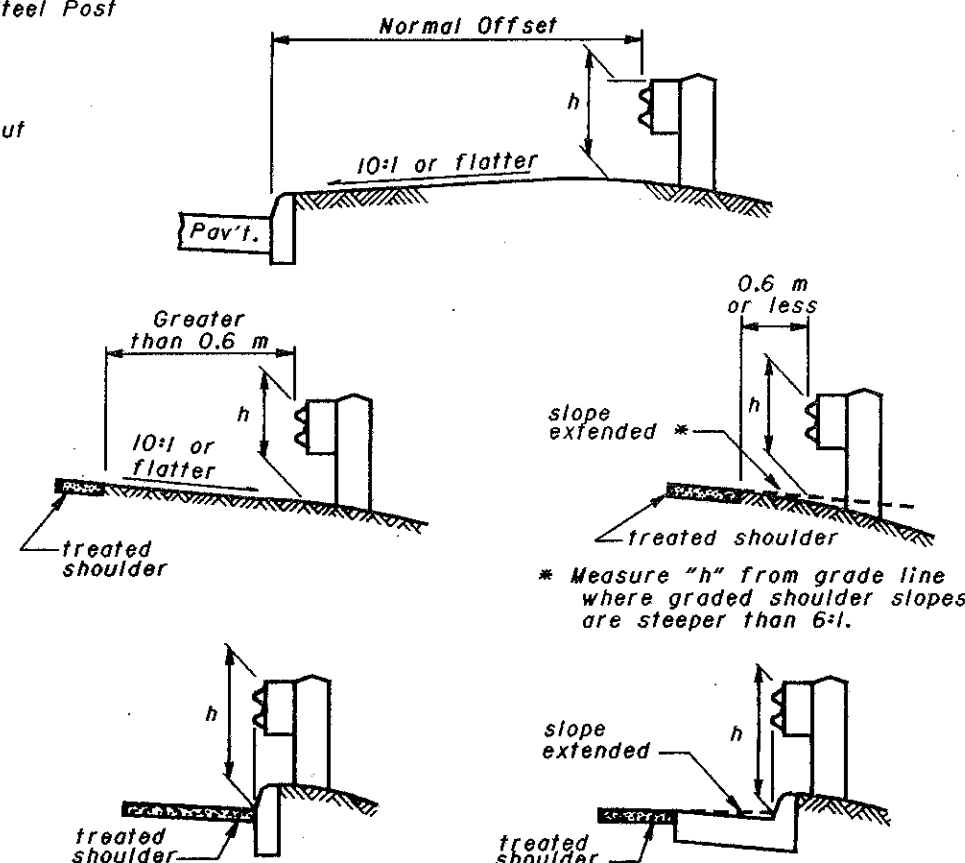
SECTION A-A

ELEVATION

FOOTING ANCHOR



DETAIL A



h = Standard height (Tolerance ± 25 mm)

MEASURING GUARDRAIL HEIGHT

NOTES

BEAM RAIL ELEMENTS: Elements shall be 3.81 m effective length, unless otherwise specified, with 19x64 mm post bolt slots on 1,905 m centers regardless of post spacing. Field punching or drilling of bolt holes or slots for irregularly spaced posts shall be according to CMS 606.05.

BEAM RAIL SPLICE between two rail elements or between a rail and terminal connector shall be lapped in the direction of traffic. The buffer or flared end sections shall lap on the traffic face. A 305 mm length of beam rail (Back-up Plate), with a 19 mm diameter bolt hole or a 19x64 mm slot, shall be provided at steel posts not having a rail splice.

EMBEDMENT DEPTH: Where less than 0.6 m of graded shoulder width (10:1 or flatter) exists, measured from the face of the guardrail (see Detail "A"), longer posts shall be used so that a minimum of 1.65 m embedment depth is provided. Payment for the longer posts will be made at the unit price bid per Each, Item 606 - Guardrail Post, 2.75 m.

PROTECTIVE COATING: In lieu of the requirements of CMS 710.06, expansion shields, anchors and insert anchor assemblies installed (embedded) in concrete shall be coated in accordance with ASTM A 153 or be of stainless steel. Any bolts screwed into these embedded devices shall meet CMS 710.06.

SPECIAL POST MOUNTINGS:

Posts located over a drainage inlet or structure shall be encased or anchored per the details shown on Standard Construction Drawing GR-2.2M.

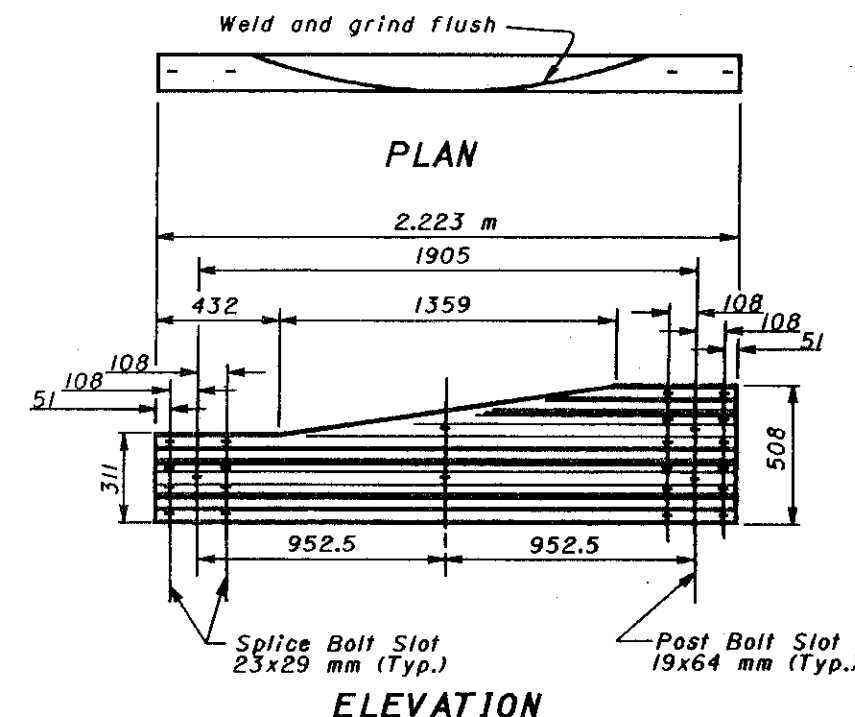
Posts located over a footing with a cover of less than 0.75 m shall be installed with a footing anchor as detailed hereon. (A plate, as detailed on Section B-B of Standard Construction Drawing GR-2.2M, may be used as an alternate attachment method.) Where the cover is between 0.75 m and 1.04 m, the footing anchor may be omitted and the post encased instead with 100 mm (min.) of concrete.

Posts located over a culvert with less than 1.3 m of cover shall not be driven, but shall be set in drilled or dug holes. Where the available post embedment depth is less than 1.04 m, the post shall be encased with 100 mm (min.) of concrete.

All costs associated with special post mountings shall be included in the unit price bid for 606 Guardrail of the type specified in the plans.

*** ANCHORS:** Holes and grouting shall comply with CMS 510. Either cement or nonshrink, nonmetallic grout may be used.

Expansion shield anchors conforming to CMS 712.01 may be substituted except where concrete deterioration has occurred, as determined by the Engineer. The same bolt diameter specified shall be required. Where self-drilling anchors are used, the holes shall be drilled with the expansion shield (not by a drill bit) and the shield installed flush with the concrete surface.



TYPE 2
TRANSITION SECTION *
(W-Beam to Thrie-Beam)

* For details of Type 1 Transition Section, refer to AASHTO M 180, Figure 4.

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces GR-1.2.

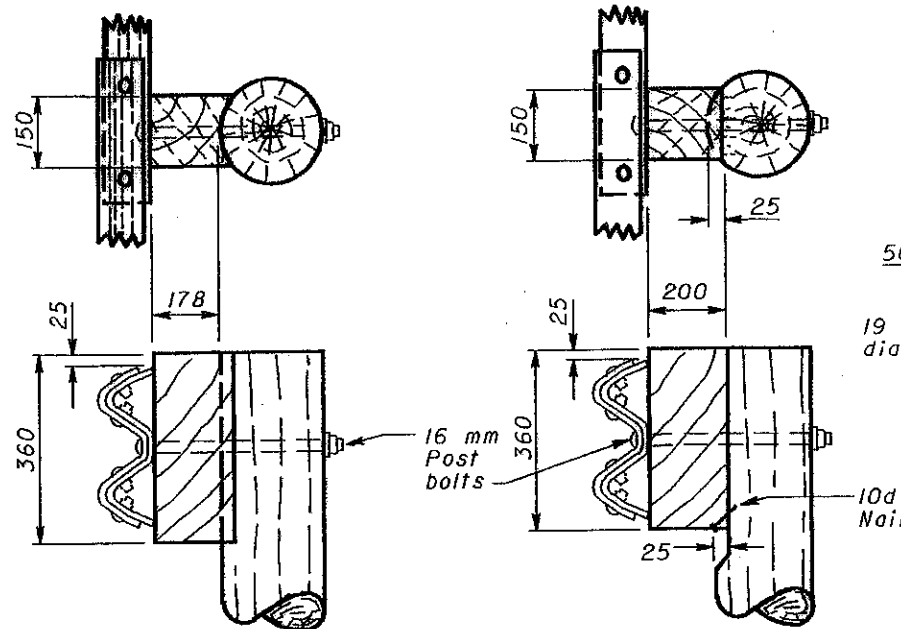
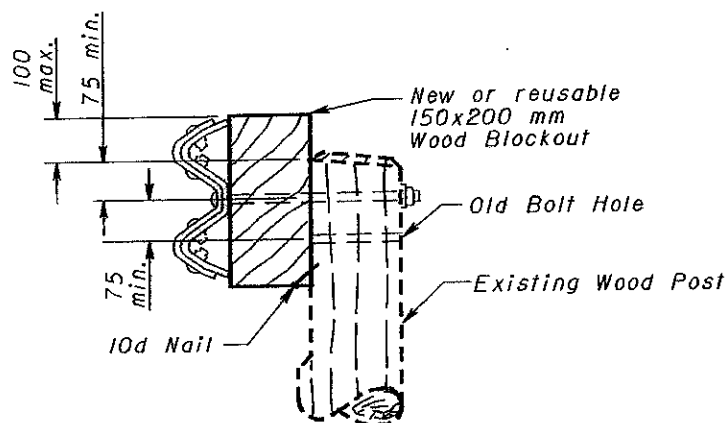
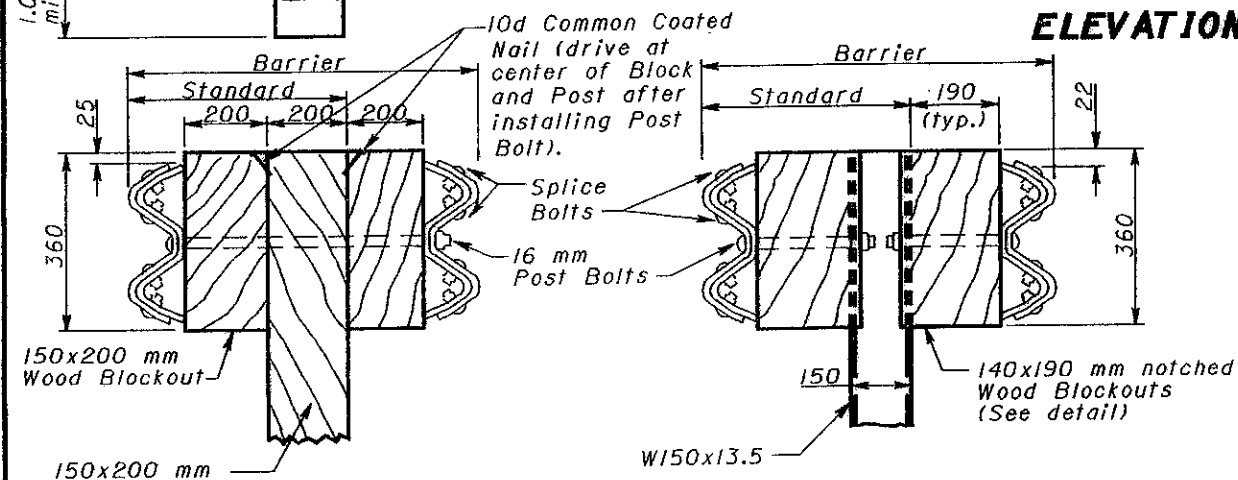
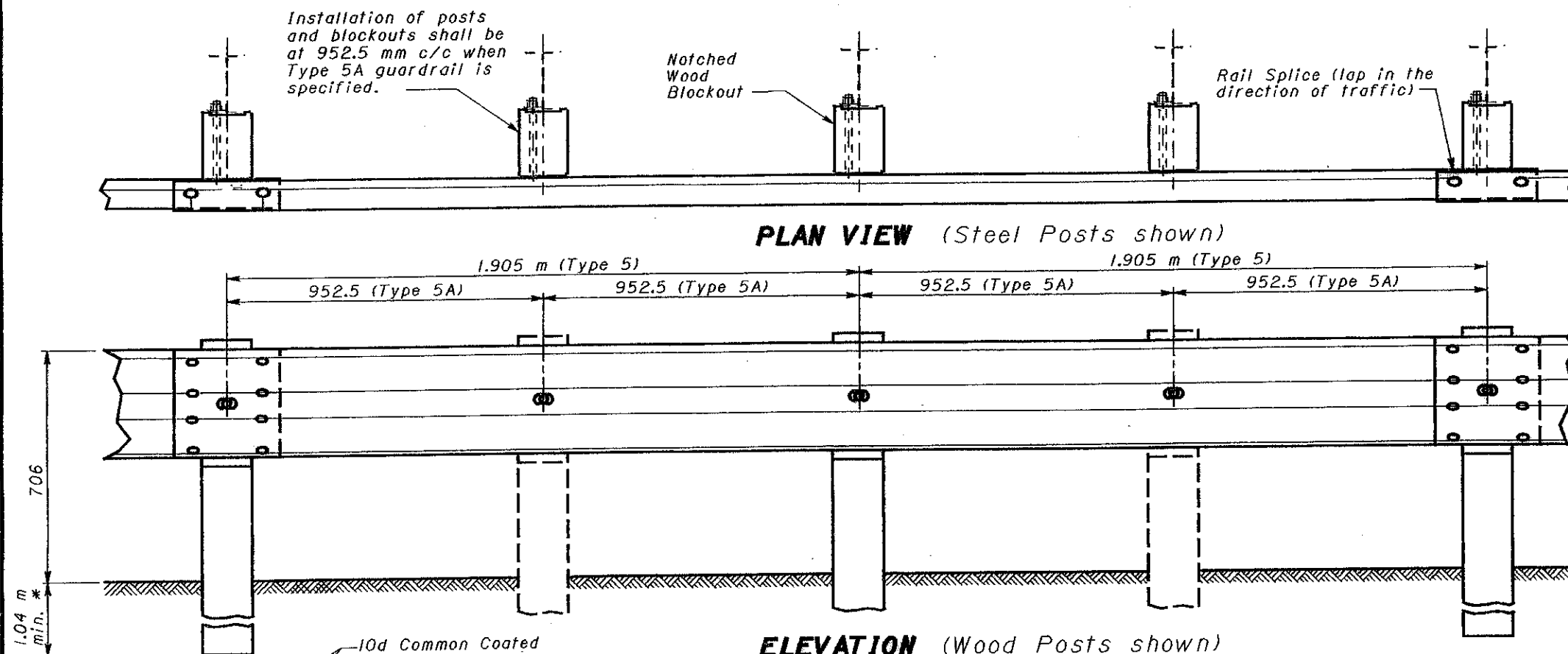
OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL
DETAILS

DATE
1-3-96

STANDARD
CONSTRUCTION DRAWING
GR-1.2M

APPROVED D.K. Hulman, P.E.
ADMINISTRATOR



ROUND WOOD POSTS

Alternate methods of placing the blockouts on round posts may be submitted for consideration and approved by the Engineer.

All dimensions are in millimeters unless otherwise noted.



NOTES

POSTS: Posts may be round (standard single rail only) or 150x200 mm square-sawn pressure-treated wood or W150x13.5 galvanized steel. The same type post shall be used throughout the length of the project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 200 mm $\pm$ 25 mm in diameter at the top and not more than 75 mm larger at the butt with a uniform taper. Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and blockouts shall be pressure-treated per CMS 710.14. Bolt holes shall be bored and the tops of posts shall be trimmed as shown, if required, after posts are set.

ALTERNATE BLOCKOUTS: Approved plastic blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the Office of Materials Management.

WASHERS: Standard galvanized steel washers of the appropriate size shall be installed on the nut side of bolts through wood posts.

WELDED BEAMS: Welded beam guardrail posts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A 769M, Class 1 using Grade 36 steel (250 MPa yield point) with the following exceptions:

Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.

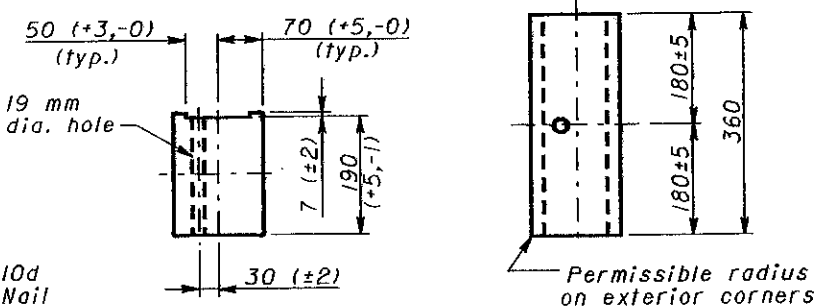
Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.

Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

*** POST EMBEDMENT DEPTH:** For specific depth requirements, see SCD GR-1.2M.

STEEL BEAM POSTS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x12.6	148 mm	100 mm	4.9 mm	4.3 mm
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x12.6	152 mm	100 mm	4.9 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

MISCELLANEOUS: For details not shown see SCD's GR-1.1M and GR-1.2M.



PLAN NOTCHED BLOCKOUTS FOR STEEL POSTS

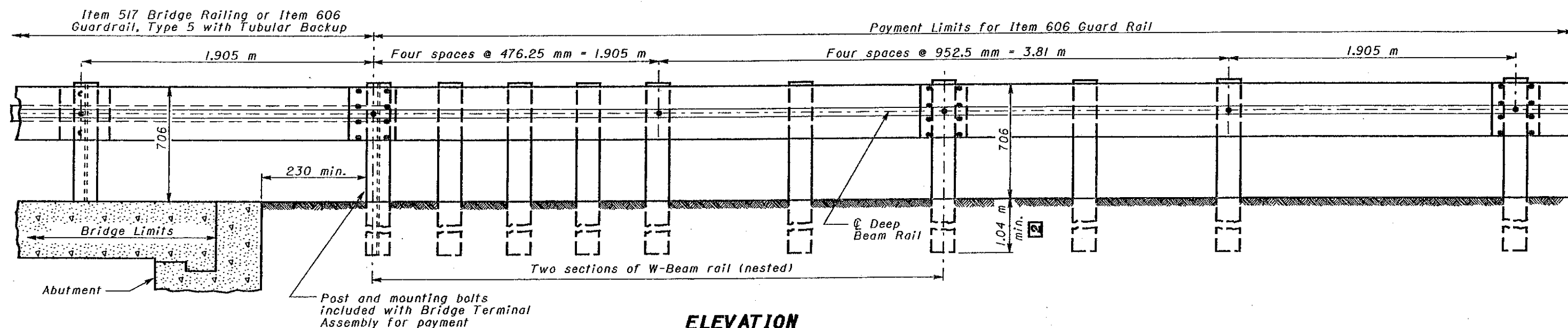
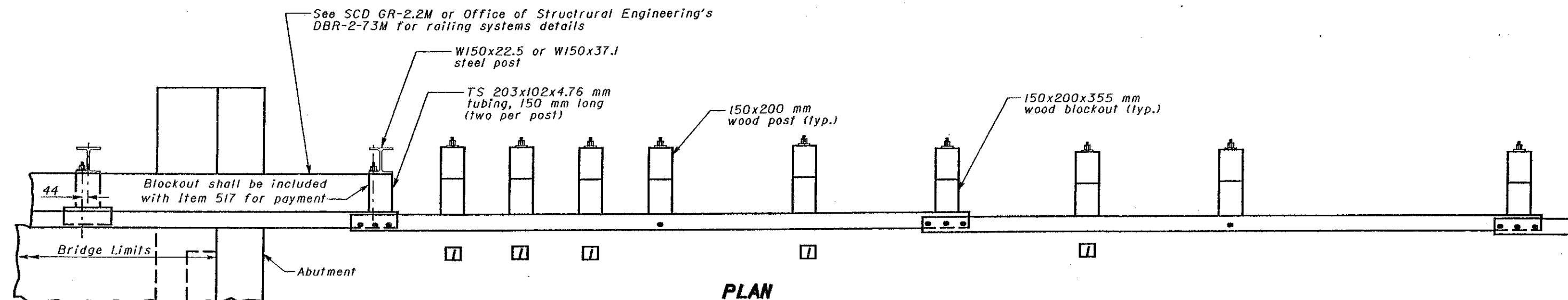
OHIO DEPARTMENT OF TRANSPORTATION

**GUARDRAIL
TYPE 5 & 5A**

STANDARD
CONSTRUCTION
DRAWING

APPROVED *Larry T. Linderland*

DATE
11-30-94
10-21-97
4-14-98



1 Guardrail not attached to posts. Blockout fastened to post with standard post bolt.

2 See SCD GR-1.2M for additional post embedment details.

NOTES

GENERAL: For additional details, see SCD's GR-1.1M, GR-1.2M and other Drawings pertaining to the design of specific guardrail types.

APPLICATION: The Type 4 Bridge Terminal Assembly shall be used to connect guardrail runs to bridges having W-Beam railing with Tubular Backup.

DETAIL INFORMATION: The first post off the bridge shall be steel (W150x22.5 or W150x37.1). All holes in the off-structure end of the approach panel W-Beam rail section that spans the abutment shall be slotted 19x64 mm and the bolts shall be tightened as specified for expansion joints in Item 606.05.

POSTS: General - Posts may be set in drilled holes or driven to grade.

Wood Posts shall be square-sawn pressure treated wood, as per CMS 710.14, and fabricated with square ends. Bolt holes shall be bored and tops of posts trimmed, if required, after posts are set.

Steel Posts and Blockouts for Type 4 Bridge Terminal Assemblies may be furnished as an alternate. The steel alternate for the 150 mm by 200 mm wood posts and blockouts shall be W150x13.5.

PAYMENT: Payment for Item 606 - Each, Bridge Terminal Assembly, Type 4, shall include the extra cost, in excess of normal guardrail costs, for additional posts and other hardware. The TS 203x102 mm spacers and tubular backup rail extending to the first post off the bridge shall be included with Item 517 - Railing, or Item 606 - Guardrail, Type 5, with Tubular Backup, for payment.

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces GR-3.4.

OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE TERMINAL
ASSEMBLY, TYPE 4

DATE
1-3-96
10-21-97

STANDARD
CONSTRUCTION
DRAWING

GR-3.4M

APPROVED *Ray T. Lathrop*

614 WORK ZONE
PAVEMENT MARKINGS

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND WHEN NECESSARY, REMOVE WORK ZONE RETROREFLECTIVE PAVEMENT MARKINGS ON EXISTING, RECONSTRUCTED, RESURFACED OR TEMPORARY ROADS WITHIN THE WORK LIMITS, IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE MARKINGS SHALL BE EVALUATED BY THE ENGINEER IN ACCORDANCE WITH THE THREE PERFORMANCE PARAMETERS CONTAINED IN SUPPLEMENT 1047. THE MARKINGS SHALL BE REPAIRED OR REPLACED WHEN THE NUMERICAL RATING OF A PARAMETER IS (a) SIX OR LOWER FOR DURABILITY, (b) FOUR OR LOWER FOR VISUAL EFFECTIVENESS AND (c) FOUR OR LOWER FOR NIGHT VISIBILITY. THE CONTRACTOR SHALL REPAIR OR REPLACE UNSATISFACTORY MARKINGS IMMEDIATELY AND AT NO ADDITIONAL COST TO THE STATE.

TEMPORARY PAVEMENT MARKING MATERIALS

UNLESS OTHERWISE INDICATED ON THE PLANS, TEMPORARY PAVEMENT MARKINGS MAY BE EITHER 641.02 PAINT OR 740.05 TYPE B OR TYPE C PREFORMED MATERIAL.

PAINT

PAINTED MARKINGS SHALL BE IN ACCORDANCE WITH 642 EXCEPT THAT (a) PARAGRAPH 641.11 SHALL NOT APPLY, (b) WHERE THE MARKINGS ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 641.02 AND (c) WHEN APPLIED TO NEW ASPHALT PAVEMENT SURFACES PLACED BY THIS PROJECT, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

LITERS PER KILOMETER OF LINE	WIDTH OF LINE (MILLIMETERS)				
	100	200	300		
SOLID LINE	56.6	113.3	169.9	-	-
3.0 m DASHED LINE	14.2	-	-	-	-
1.2 m DASHED LINE	5.7	-	-	-	-
DOTTED LINE	19.0	-	-	-	-

(d) WHEN APPLIED TO PLANED ASPHALT PAVEMENT SURFACES, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

LITERS PER KILOMETER OF LINE	WIDTH OF LINE (MILLIMETERS)				
	100	200	300		
SOLID LINE	67.9	135.9	203.8	-	-
3.0 m DASHED LINE	17.0	-	-	-	-
1.2 m DASHED LINE	6.8	-	-	-	-
DOTTED LINE	22.7	-	-	-	-

TYPE B AND TYPE C PREFORMED MATERIAL

PREFORMED MATERIAL SHALL COMPLY WITH 740.05 EXCEPT THAT NO PREFORMED MATERIAL CONTAINING METAL SHALL BE PLACED ON ANY SURFACE UNLESS IT WILL BE REMOVED LATER BY THE CONTRACTOR. TEMPORARY PAVEMENT MARKINGS OF 740.05 PREFORMED MATERIAL SHALL BE REMOVED PRIOR TO PLACEMENT OF 642 OR 644 SURFACE COURSE MARKINGS AT THAT LOCATION. PREFORMED MATERIAL SHALL BE IN ACCORDANCE WITH 644 EXCEPT AS MODIFIED HEREIN.

PLACEMENT

TEMPORARY MARKINGS SHALL BE COMPLETE AND IN PLACE ON ALL PAVEMENT, INCLUDING RAMPS, PRIOR TO EXPOSING IT TO TRAFFIC. WHEN TEMPORARY MARKINGS CONFLICT WITH THE TRAFFIC PATTERN, THEY SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH 641.10.

LINE PLACEMENT TOLERANCE FOR FINAL SURFACES SHALL BE IN ACCORDANCE WITH 641.07. ON SURFACES OTHER THAN THE FINAL, THE TOLERANCE PERMITTED SHALL BE TWICE THAT IN 641.07. LAYOUT AND PREMARKING SHALL BE IN ACCORDANCE WITH 641.06.

TEMPORARY MARKING CLASSES

CLASS I MARKINGS

CLASS I MARKINGS SHALL BE APPLIED TO THE STANDARD DIMENSIONS AS DEFINED IN 642 WITH THE FOLLOWING EXCEPTION:

1. TRANSVERSE LINES SHALL BE 200 mm IN WIDTH.
2. STOP LINES SHALL BE 300 mm IN WIDTH.
3. CROSSWALK LINES SHALL BE 200 mm IN WIDTH.

CLASS II MARKINGS

CLASS II MARKINGS (ABBREVIATED) SHALL BE DEFINED AS FOLLOWS:

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 100 mm WIDE BY A MINIMUM OF 1.2 m LONG DASHES SPACED AT A MAXIMUM OF 12.0 m INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 100 mm WIDE BY A MINIMUM OF 1.2 m LONG DASHES SPACED AT A MAXIMUM OF 12.0 m INTERVALS.

GORE MARKINGS SHALL BE CONTINUOUS, WHITE 100 mm LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

CONFLICTING EXISTING MARKINGS

THE CONTRACTOR SHALL, PRIOR TO PLACING TEMPORARY MARKINGS, REMOVE ALL CONFLICTING EXISTING MARKINGS VISIBLE TO THE TRAVELING PUBLIC DURING DAYLIGHT OR NIGHTTIME HOURS IN ACCORDANCE WITH 641.10. THE COST FOR REMOVAL OF CONFLICTING MARKINGS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SPECIFICALLY ITEMIZED.

THE CONTRACTOR SHALL ALSO REMOVE THE PRISMATIC RETRO-REFLECTOR WITHIN ANY RAISED PAVEMENT MARKER (RPM) WHICH IS IN CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS. WHEN THE TEMPORARY PAVEMENT MARKINGS ARE REMOVED AND THE RPM IS NO LONGER IN CONFLICT, THE CONTRACTOR SHALL THOROUGHLY CLEAN THE RECESSED REFLECTOR ATTACHMENT AREA OF THE CASTING AND INSTALL A NEW PRISMATIC RETRO-REFLECTOR OF THE SAME KIND AND COLOR. THE COST FOR THIS WORK SHALL BE INCIDENTAL TO THE VARIOUS PAY ITEMS.

ALLOWABLE DURATION OF CLASS II CENTER LINES

EXCEPT AS NOTED BELOW, ANYTIME EXISTING PERMANENT NO PASSING ZONE MARKINGS HAVE BEEN REMOVED OR OBLITERATED AS THE RESULT OF A CONSTRUCTION OPERATION (PAVEMENT GRINDING, ASPHALT PAVEMENT OVERLAYS, ETC.) AND THE SECTION OF PAVEMENT CONTINUES TO BE USED BY THE TRAVELING PUBLIC, THE CONTRACTOR MUST WITHIN 3 CALENDAR DAYS PLACE FINAL CENTER LINE MARKINGS AS SPECIFIED BY THE PLAN. EQUIVALENT 614 CLASS I CENTER LINE MARKINGS MAY BE USED IN LIEU OF FINAL MARKINGS. IN THIS EVENT, THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I MARKINGS AS PART OF THE LUMP SUM BID FOR MAINTAINING TRAFFIC.

IF AFTER THE ORIGINAL MARKINGS ARE REMOVED OR OBLITERATED, THE CONTRACTOR RETURNS TO THE SUBJECT NO PASSING ZONE AND PLACES A PLAN SPECIFIED PAVEMENT COURSE WITHIN THE 3 CALENDAR DAY LIMIT, OR PERFORMS WORK IN PREPARATION FOR A SUBSEQUENT PAVEMENT COURSE, THE CONTRACTOR WILL HAVE TEMPORARILY SATISFIED THE CONDITIONS OF THE PREVIOUS PARAGRAPH. IN THIS EVENT THE 3 CALENDAR DAY LIMIT WILL BEGIN AGAIN.

SECTIONS OF PAVEMENT WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS SHALL BE GOVERNED BY THE 21 DAY LIMIT DESCRIBED BELOW IN THE PARAGRAPH ENTITLED 'ALLOWABLE DURATION OF CLASS II LANE LINES, GORE MARKINGS AND ABSENCE OF EDGE LINES.'

FOR EACH CALENDAR DAY BEYOND 3 DAYS THAT THIS WORK SHALL REMAIN UNCOMPLETED, THE SUM OF \$200 PER CALENDAR DAY WILL BE DEDUCTED FROM ANY MONEY DUE THE CONTRACTOR, NOT AS A PENALTY BUT AS LIQUIDATED DAMAGES.

ALLOWABLE DURATION OF CLASS II LANE LINES
AND GORE MARKINGS AND ABSENCE OF EDGE LINES

ANYTIME EXISTING PERMANENT LANE LINES, GORE MARKINGS OR EDGE LINES HAVE BEEN REMOVED OR OBLITERATED AS THE RESULT OF A CONSTRUCTION OPERATION (PAVEMENT GRINDING, ASPHALT PAVEMENT OVERLAYS, PAVEMENT WIDENING, ETC.) AND THE SECTION OF PAVEMENT CONTINUES TO BE USED BY THE TRAVELING PUBLIC, THE CONTRACTOR MUST WITHIN 21 CALENDAR DAYS PLACE FINAL PAVEMENT MARKINGS AS SPECIFIED BY THE PLAN. EQUIVALENT 614 CLASS I MARKINGS MAY BE USED IN LIEU OF FINAL MARKINGS. IN THIS EVENT, THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I MARKINGS AS PART OF THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC.

IF, AFTER THE ORIGINAL MARKINGS ARE REMOVED OR OBLITERATED, THE CONTRACTOR RETURNS TO THE SUBJECT SECTION OF PAVEMENT AND PLACES A PLAN SPECIFIED PAVEMENT COURSE WITHIN THE 21 CALENDAR DAY LIMIT, OR PERFORMS SPECIFIED WORK WHICH REQUIRES A LANE CLOSURE, EXCEPT ROUTINE MAINTENANCE REQUIRED BY 614.02, THE CONTRACTOR WILL HAVE TEMPORARILY SATISFIED THE CONDITIONS OF THE PREVIOUS PARAGRAPH. IN THIS EVENT, THE 21 CALENDAR DAY LIMIT WILL BEGIN AGAIN.

FOR EACH CALENDAR DAY BEYOND 21 DAYS THAT THIS WORK SHALL REMAIN UNCOMPLETED, THE SUM OF \$200 PER CALENDAR DAY WILL BE DEDUCTED FROM ANY MONEY DUE THE CONTRACTOR, NOT AS A PENALTY BUT AS LIQUIDATED DAMAGES.

IF A SECTION OF PAVEMENT IS IN A CONTINUOUS PART OF THE PROJECT THEN A NEW 21 DAY LIMIT FOR RENEWED WORK ON A SECTION SHALL APPLY TO ALL SECTIONS IN THAT PART. IF THE PROJECT IS IN PARTS AND THE TRAVELING PUBLIC WOULD NOT DISCERN THE PARTS AS ONE CONTINUOUS PROJECT, THEN A NEW 21 DAY LIMIT IN ONE PART WILL NOT APPLY TO THE OTHER PARTS. THE TWO DIRECTIONAL SIDES OF A FREEWAY SHALL BE TREATED AS SEPARATE PARTS. WORK ON ONE SIDE OF A FREEWAY SHALL NOT CREATE A NEW 21 DAY LIMIT FOR THE OTHER SIDE.

METHOD OF MEASUREMENT

TEMPORARY PAVEMENT MARKINGS WILL BE MEASURED COMPLETE IN PLACE, BY CLASS AND MATERIAL, IN THE UNITS DESIGNATED. LINE QUANTITIES WILL BE THE LENGTH OF THE COMPLETED STRIPE, INCLUDING GAPS, INTERSECTIONS, AND OTHER SECTIONS OF PAVEMENT NOT NORMALLY MARKED.

TEMPORARY PAVEMENT MARKINGS WILL INCLUDE THE LAYOUT, APPLICATION AND REMOVAL OF THE MARKINGS, WHEN REQUIRED.

BASIS OF PAYMENT

PAYMENT FOR ACCEPTED QUANTITIES COMPLETE IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND NECESSARY REMOVAL OF MARKINGS.

ITEM	UNIT	DESCRIPTION
614	KILOMETER	TEMPORARY LANE LINES, CLASS _____, _____
614	KILOMETER	TEMPORARY CENTER LINES, CLASS _____, _____
614	METER	TEMPORARY CHANNELIZING LINES, CLASS I, _____
614	KILOMETER	TEMPORARY EDGE LINES, CLASS I, _____
614	METER	TEMPORARY GORE MARKINGS, CLASS II, _____
614	METER	TEMPORARY STOP LINES, CLASS I, _____
614	METER	TEMPORARY CROSSWALK LINES, CLASS I, _____
614	METER	TEMPORARY DOTTED LINES, CLASS I, _____

* TYPE MATERIAL (642 PAINT, 740.05 TYPE B OR 740.05 TYPE C OR LEFT BLANK TO PERMIT ANY OF THE THREE)

614 WORK ZONE
MARKING SIGNS

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE WORK ZONE MARKING SIGNS (OW-167, R-33 AND R-34) AND THEIR SUPPORTS WITHIN THE WORK LIMITS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE CONTRACTOR SHALL, IN ADVANCE OF ANY SECTION OF ROADWAY LACKING OMUTCD STANDARD EDGE LINE MARKINGS, ERECT A 'NO EDGE LINES' (OW-167-36) SIGN. ON FREEWAYS AND EXPRESSWAYS AN OW-167-48 SIGN SHALL BE USED. THESE SIGNS SHALL BE IN PLACE PRIOR TO EXPOSING THE ROADWAY TO TRAFFIC. THESE SIGNS SHALL ALSO BE ERECTED ON EACH ENTRANCE RAMP, AT INTERSECTIONS OF THROUGH ROADS TO WARN ENTERING OR TURNING TRAFFIC OF THE CONDITIONS AND AT LEAST ONCE EVERY 3.2 km ALONG THE ROADWAY. THESE SIGNS SHALL BE REMOVED WHEN THEY DO NOT APPLY.

THE CONTRACTOR SHALL AT THE BEGINNING OF EACH NO-PASSING ZONE LACKING OMUTCD STANDARD CENTER LINE MARKINGS, ERECT A 'DO NOT PASS' (R-33-30) SIGN AND AT THE END OF EACH NO-PASSING ZONE, ERECT A 'PASS WITH CARE' (R-34-30) SIGN.

MATERIALS

THE CONTRACTOR MAY USE SIGNS AND SUPPORTS IN USED BUT GOOD CONDITION. SIGN FACES SHALL BE REFLECTORIZED WITH TYPE C SHEETING COMPLYING WITH THE REQUIREMENTS OF 730.19. WORK ZONE MARKING SIGNS SHALL BE PROVIDED WITH SUITABLE YIELDING SUPPORTS OF SUFFICIENT STRENGTH AND STABILITY.

METHOD OF MEASUREMENT

WORK ZONE MARKING SIGNS WILL BE MEASURED AS THE NUMBER OF SIGN INSTALLATIONS, INCLUDING THE SIGN, NECESSARY SUPPORTS AND ALL ATTACHMENT HARDWARE. ALL OTHER WORK ZONE SIGNS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SEPARATELY ITEMIZED.

BASIS OF PAYMENT

PAYMENT FOR ACCEPTED QUANTITIES, COMPLETE, IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND REMOVAL OF THE SIGNS.

ITEM	UNIT	DESCRIPTION
614	EACH	WORK ZONE MARKING SIGNS

M E T R I C

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

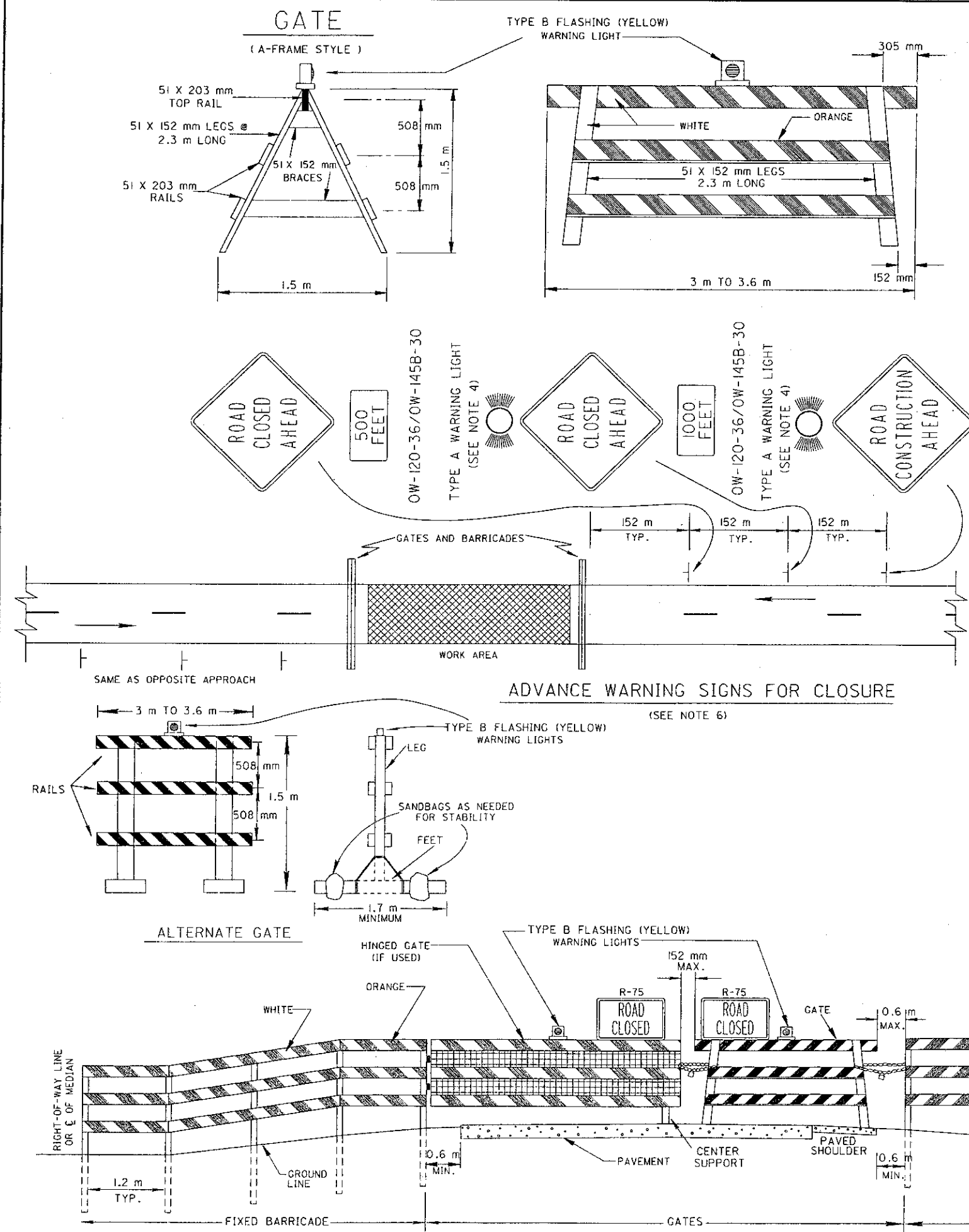
WORK ZONE PAVEMENT
MARKINGS AND SIGNS

STANDARD
CONSTRUCTION
DRAWING

MT-99.10M

APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

DATE
01/30/95



GENERAL NOTES

- BARRICADES:** BARRICADES SHALL BE CONSTRUCTED ACCORDING TO DETAILS SHOWN. WHEN THE ROAD IS CLOSED TO TRAFFIC, BARRICADES AND GATES SHALL BE USED TO EFFECTIVELY CLOSE THE ENTIRE ROADWAY INCLUDING THE MEDIAN OF DIVIDED HIGHWAYS. IN URBAN AREAS AND AT LOCATIONS WHERE IT IS IMPRACTICAL TO EXTEND THE BARRICADE TO THE RIGHT-OF-WAY LINE BECAUSE OF A SIDEWALK WHICH IS TO REMAIN OPEN OR OTHER OBSTRUCTION, THE ENDS OF THE BARRICADE SHALL BE LOCATED AS DIRECTED BY THE ENGINEER TO EFFECT THE DESIRED CLOSING OF THE HIGHWAY.
- PAINTING AND REFLECTORIZATION:** IN CONSTRUCTION OR MAINTENANCE AREAS ALL RAILS OF THE BARRICADES AND GATES SHALL BE REFLECTORIZED WITH ORANGE AND WHITE REFLECTORIZED TYPE G SHEETING IN 152 mm WIDE ALTERNATE STRIPES WHICH SLOPE DOWNWARD TOWARD THE CENTER LINE OF THE ROAD AT AN ANGLE OF 45°. THE TOP RAIL OF THE A-FRAME AND ALL THREE RAILS OF THE HINGED GATE SHALL BE STRIPED ON BOTH SIDES. ALL POST, BRACES, GATE LEGS, AND ANY UNSTRIPED RAILS SHALL BE PAINTED WHITE. (GATES AND BARRICADES USED IN PERMANENT OR SEMIPERMANENT APPLICATION SHALL DIFFER ONLY IN THAT THEY SHALL USE RED AND WHITE STRIPES).
- GATES:** ONE GATE SHALL BE ERECTED FOR EACH TRAFFIC LANE. GATES SHALL BE CHAINED AND PADLOCKED TO ONE ANOTHER AND TO ADJACENT POST OF THE BARRICADES. CHAINS SHALL BE 6.4 mm STOCK OR LARGER WITH WELDED LINKS. A HINGED GATE MAY BE USED AND SHALL BE SUPPORTED AT THE CENTER IN AN APPROVED MANNER.
- TYPE A FLASHING WARNING LIGHTS:** TYPE A FLASHING WARNING LIGHTS ARE REQUIRED ON THE OW-128 AND THE FIRST OW-120 SIGNS.
- TYPE B FLASHING WARNING LIGHTS:** EACH GATE SHALL BE EQUIPPED WITH A TYPE B FLASHING WARNING LIGHT, CONSPICUOUSLY VISIBLE AT ALL DISTANCES UP TO 305 m UNDER NORMAL ATMOSPHERIC CONDITIONS. THE LIGHT SHALL BE IN OPERATION AT ALL TIMES DURING THE PERIOD THE HIGHWAY IS CLOSED.
- SIGNS:** WHERE THE ROAD IS CLOSED TO TRAFFIC BY THE ERECTION OF GATES AND BARRICADES, R-75 SIGNS SHALL BE MOUNTED ON THE GATES AS SHOWN. THE ADVANCE WARNING SIGNS SHOWN ON THIS DRAWING WILL NOT BE REQUIRED WHEN ALL TRAFFIC HAS BEEN DIRECTED FROM THE ROADWAY AT OR JUST IN ADVANCE OF THE GATES AND BARRICADES SUCH AS ON A LIMITED ACCESS HIGHWAY OR WHEN A TEMPORARY RUNAROUND SIMILAR TO FIGURE C-24 OF THE OHIO MANUAL IS USED. ADVANCE WARNING SIGNS SHALL BE REQUIRED IN ALL OTHER SITUATIONS AND WHEN REQUIRED IN THE PLANS. ADVANCE WARNING SIGNS ON AN APPROACH SHALL CONSIST OF TWO OW-120 SIGNS WITH DISTANCE PLAQUES PLACED ABOUT 152 m AND 305 m FROM THE CLOSURE AND A OW-128 PLACED ABOUT 457 m FROM CLOSURE. THE SIGNS SHALL BE PLACED ON BOTH SIDES OF THE ROAD (DUALLED) FOR 4-LANE DIVIDED HIGHWAYS OR WHEN REQUIRED BY THE PLANS.

7. OPERATION: ON A 2-LANE 2-WAY ROADWAY THE CONTRACTOR WILL NORMALLY OPEN ONLY THE LEFT HAND GATE AS NECESSARY TO ALLOW VEHICLES TO ENTER AND IMMEDIATELY CLOSE IT. BOTH GATES WILL NOT NORMALLY BE OPENED AT THE SAME TIME. THE CONTRACTOR SHALL ASSIGN AN EMPLOYEE TO ASSURE THAT GATES ARE CLOSED AND CHAINED SHUT AT THE END OF EACH WORKDAY.

8. MATERIALS: GATES OR BARRICADES SHALL BE FABRICATED OF THE FOLLOWING MATERIALS:

FIXED BARRICADE:

POST: - 102 X 102 mm SQUARE OR 127 mm DIA. (MAXIMUM) WOOD (MAY BE TREATED)

- NO. 3, DRIVE POST (712.20)
- UP TO 51 mm SQUARE, 14 GAUGE PUNCHED STEEL TUBING

RAILS: - 25 X 203 mm OR 51 X 203 mm COMMON LUMBER

- 203 X (16 TO 25 mm) THICK EXTERIOR PLYWOOD
- EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICIENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 1436 pascals, BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

FASTENERS: - SPIKES (OF SUFFICIENT LENGTH TO CLINCH)

- SCREWS/BOLTS (8 mm MIN. DIA.) METAL GUSSET PLATES AND FORMED OR WELDED METAL JOINTS OF SUFFICIENT SIZE AND QUANTITY TO RESIST THE WIND LOAD SPECIFIED ABOVE. ALL SLIPFIT CONNECTIONS SHALL ALSO BE BOLTED TO PREVENT UNAUTHORIZED DISASSEMBLY

GATES:

LEGS: - 51 X 152 mm COMMON LUMBER ("A FRAME" ONLY)

- 102 X 102 mm WOOD
- UP TO 51 mm SQUARE, 14 GAUGE PUNCHED STEEL TUBING
- NO. 3 DRIVE POST (712.20)

RAILS: - 51 X 203 mm COMMON LUMBER

FASTENERS: (SAME AS BARRICADES ABOVE)

FEET: - 152 X 152 mm WOOD

- NO. 3 DRIVE POST (712.20)
- UP TO 57 mm SQUARE, 12 GAUGE PUNCHED STEEL TUBING

BRACES: - 51 X 152 mm (MAXIMUM) COMMON LUMBER

- 102 mm WIDE X 19 mm THICK PLYWOOD STRIPS
- NO. 2 DRIVE POST (712.20)

HINGED GATE:

GATE: - 3.6 m X 1.2 m STEEL FRAME, FARM GATE

RAILS: (SAME AS FIXED BARRICADES ABOVE)

HARDWARE: - HINGED SCREWHOOKS FOR HANGING GATE TO POST

9. LUMBER: LUMBER USED IN THE CONSTRUCTION OF GATES AND BARRICADES SHALL BE COMMON YELLOW PINE OR COMMON DOUGLAS FIR, SURFACED ON FOUR SIDES STANDARD, ALL SIZES ARE NOMINAL.

METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 04/25/94
GATES AND BARRICADES IN POSITION	
STANDARD CONSTRUCTION DRAWING MT-101.60M	
APPROVED <i>[Signature]</i>	ENGR. OF DESIGN SERVICES

TEMPORARY SIGN SUPPORT REQUIREMENTS

A. PLACEMENT OF SIGNS WHICH WILL REMAIN MORE THAN ONE DAY:

- 1) LATERAL PLACEMENT TO NEAREST EDGE OF SIGNS SHALL BE AS FOLLOWS:
 - a) ON THE RIGHT SIDE OF THE ROAD FOR APPROACHING TRAFFIC (EXCEPT FOR DUAL MOUNTED SIGNS AND SIGNS DESIGNATED IN THE PLANS FOR LEFT SIDE MOUNTING).
 - b) CURBED ROADWAY - MINIMUM 0.6 m BEHIND FACE OF CURB.
 - c) UNCURBED ROADWAY- 3.7 m FROM EDGE OF TRAFFIC LANE OR 1.8 m FROM EDGE OF PAVED OR USEABLE SHOULDER, WHICHEVER IS GREATER.
 - d) BEHIND GUARDRAIL OR BARRIER - PREFERABLY 0.6 m BEHIND FACE OF GUARDRAIL (MINIMUM 0.3 m) FOR SIGNS ON CLASS A SUPPORTS; 1.2 m FOR CLASS B OR C SUPPORTS; 0.3 m BEHIND FACE OF CONCRETE BARRIER UNLESS BARRIER TOP MOUNTING IS REQUIRED BY THE PLAN.
- 2) VERTICAL CLEARANCE OF SIGNS, MEASURED ABOVE ROADWAY ELEVATION, SHALL BE AS FOLLOWS:
 - a) RURAL - 1.5 m WHEN PARKED CARS, CONSTRUCTION EQUIPMENT, ETC WILL NOT OBSCURE SIGN VISIBILITY.
 - b) RURAL AREAS WITH PARKED CARS OR CONSTRUCTION EQUIPMENT - 2.1 m
 - c) URBAN - 2.1 m
 - d) CARE SHALL BE TAKEN TO ASSURE THAT SIGNS WILL NOT BE OBSCURED BY CONSTRUCTION EQUIPMENT, TREES, WEEDS OR OTHER OBSTACLES. BRUSH, WEEDS OR GRASS WITHIN THE RIGHT OF WAY SHALL BE TRIMMED AS NECESSARY. SIGNS SHALL NORMALLY BE VISIBLE TO TRAFFIC 122 m TO 183 m IN ADVANCE OF THE SIGN.
- 3) SUPPORTS FOR SIGNS WHICH WILL REMAIN IN PLACE MORE THAN ONE DAY SHALL BE FIXED RATHER THAN PORTABLE EXCEPT IN SITUATIONS WHERE THE SIGN MUST REST ON PERMANENT PAVEMENT OR OTHER SURFACE WHICH WOULD BE DAMAGED BY INSERTION OF POST TYPE SUPPORTS.

B. PLACEMENT OF SIGNS WHICH WILL REMAIN FOR ONE DAY OR LESS:

- 1) SAME AS A-1 ABOVE EXCEPT THAT SIGNS MAY BE PLACED ON THE ROADWAY ONLY IF THEY DO NOT INTRUDE INTO A TRAFFIC LANE IN USE.
- 2) MINIMUM OF 0.3 m ABOVE ROADWAY

C. CLASSES OF SUPPORTS:

ALL TEMPORARY SIGN SUPPORTS SHALL BE OF THE FOLLOWING TYPES:

1) CLASS A:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF 40 MPH AND HIGHER ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL OTHER LOCATIONS.

2) CLASS B:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF LESS THAN 40 MPH ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL APPLICATIONS DEFINED FOR CLASS C SUPPORTS.

3) CLASS C:

SUPPORTS MAY ONLY BE USED WHERE FULLY PROTECTED BY GUARDRAIL, CONCRETE BARRIER AND IN LOCATIONS POSITIVELY PROTECTED FROM TRAFFIC SUCH AS ON RETAINING WALLS OR WHERE TRAFFIC APPROACH SPEEDS ARE LESS THAN 25 MPH.

D. TRAFFIC APPROACH SPEEDS:

TRAFFIC APPROACH SPEEDS SHALL BE THE LOCALLY POSTED SPEED (NOT ADVISORY SPEED SIGNS) OR THE MEASURED ACTUAL (85TH PERCENTILE) SPEED (IF AVAILABLE) OF APPROACHING TRAFFIC, WHICHEVER IS HIGHER, ADJACENT TO THE SIGN LOCATION.

TABLE

APPROACH SPEED (MPH)	COMPLETELY PROTECTED BY GUARDRAIL OR BARRIER	PARTLY PROTECTED BY GUARDRAIL OR BARRIER *	GREATER THAN 9 m FROM EDGE OF PAVEMENT	WITHIN 9 m FROM EDGE OF PAVEMENT
40 AND HIGHER	A, B OR C	A OR B	A OR B ***	A ONLY
26 TO 39	A, B OR C	A OR B	A OR B	A OR B
0 TO 25	A, B OR C	A, B OR C	A, B OR C	A, B OR C

* IF SUPPORTS ARE BEHIND GUARDRAIL BUT NOT FULLY 1.7 m BEHIND FACE OF RAIL OR IF SIGN IS NOT 0.3 m BEHIND FACE OF CONCRETE BARRIER.

*** 9 m CRITERION IS BASED UPON STRAIGHT ROADWAY AND A SLOPE OF 6 TO 1 OR FLATTER. SUPPORTS ON THE OUTSIDE OF CURVES OR LOCATED DOWN A SLOPE (STEEPER THAN 6 : 1) WILL REQUIRE USE OF CLASS A SUPPORTS.

E. BALLASTING

BALLASTING OF PORTABLE SUPPORTS SHALL BE WITH SANDBAGS PLACED WITHIN 0.3 m OF THE GROUND. IN NO CASE SHALL HARD OBJECTS BE USED FOR BALLAST.

F. STRENGTH OF SIGN SUPPORTS

THE CONTRACTOR SHALL CHOOSE SIGN SUPPORTS OF ADEQUATE STRENGTH AND WITH ADEQUATE FOUNDATIONS AND ANCHORAGE TO SUPPORT THE SIGN SIZES ERRECTED. PROPRIETARY DEVICES SHALL NOT BE LOADED BEYOND THE LIMITS RECOMMENDED BY THE MANUFACTURER. SLIP BASE TYPE BREAKAWAY BEAM CONNECTIONS SHALL BE AT LEAST PARTIALLY EMBEDDED IN CONCRETE CONSISTING OF A 0.3 m DEEP BY 0.3 m DIAMETER COLLAR. SIGN SUPPORTS WHICH FAIL UNDER TYPICAL WIND LOAD CONDITIONS SHALL BE IMMEDIATELY MODIFIED OR REPLACED WITH A SUPPORT OF ADEQUATE STRENGTH.

G. PROHIBITED SUPPORTS

THE FOLLOWING SUPPORT TYPES SHALL NOT BE PERMITTED ON PROJECTS:

- 1) SUPPORTS FABRICATED FROM AUTOMOTIVE AXLE DIFFERENTIAL ASSEMBLIES AND SIMILARLY HEAVY ASSEMBLIES WHICH CANNOT BE CONSIDERED BREAKAWAY TYPE.
- 2) SUPPORTS CONSISTING OF VERTICAL POSTS WITH ANGLED BRACES MADE FROM DRIVEPOST OR OTHER RIGID ELEMENTS.

CLASS A SUPPORTS

FIXED SUPPORTS

- 1) ALL #2 AND #3 POST WHEN INSTALLED SINGLY OR IN PAIRS (SIDE BY SIDE) ACCORDING TO THE DETAILS OF TC-41.20M. THE NUMBER OF SUPPORTS SHALL BE AS SHOWN ON TC-52.10M AND TC-52.20M.
- 2) THE FOLLOWING POST TYPES, WHEN INSTALLED SINGLY, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m.
 - a) - UP TO 102 X 102 mm WOOD.
 - b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
 - c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
 - d) - UP TO 56.4 mm SQUARE, 12 GAUGE WALL, PUNCHED STEEL POST.
 - e) - UP TO 152 X 203 mm WOOD WITH BREAKAWAY HOLES SHOWN BELOW.
- 3) THE FOLLOWING POST TYPES WHEN INSTALLED IN PAIRS (SIDE BY SIDE) WITH LESS THAN 2 m BETWEEN POSTS, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m:
 - a) - UP TO 102 X 102 mm WOOD.
 - b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
 - c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
 - d) - UP TO 51 mm SQUARE, 14 GAUGE WALL, PUNCHED STEEL POST.
- 4) FIXED TYPE III BARRICADES:
- 5) ALL BREAKAWAY CONNECTION BEAM SUPPORTS, WHEN INSTALLED ACCORDING TO THE PROPER DETAILS SHOWN ON TC-41.10M WITH A MINIMUM CLEAR DISTANCE BETWEEN SUPPORTS OF 2.1 m FOR SUPPORTS LARGER THAN W6 X 9.
- 6) ANY BREAKAWAY POST OR POST AND CONNECTION WHICH HAS BEEN CRASH TESTED AND APPROVED BY THE FHWA AS SATISFYING THE BREAKAWAY CRITERIA DESCRIBED IN 630.06.

(CONTINUED ON MT-105.11M)

M E T R I C

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

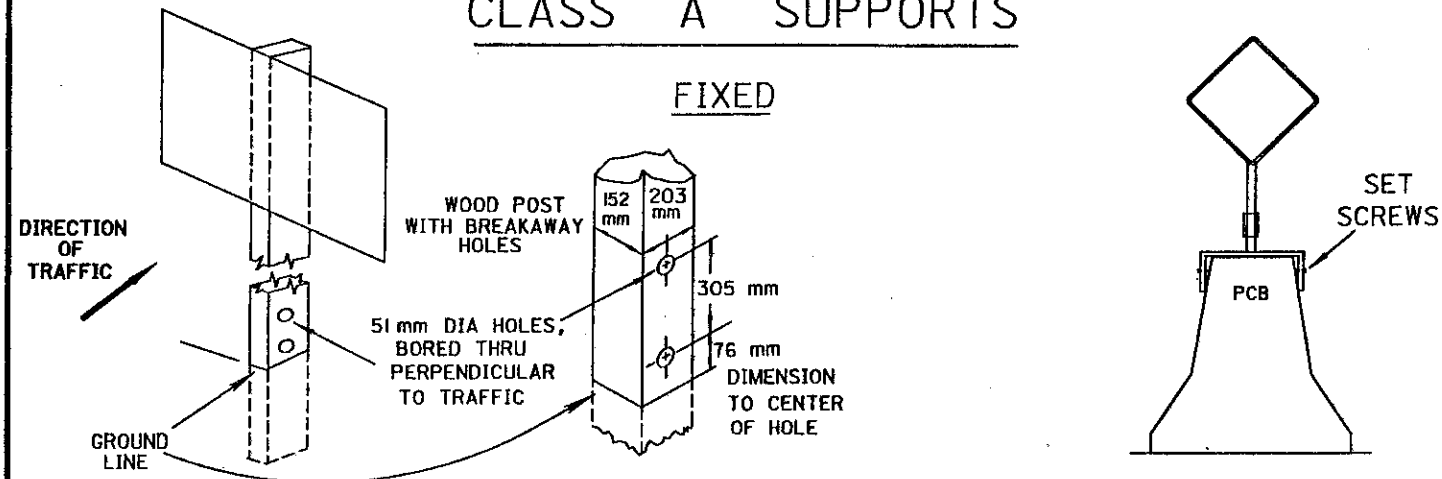
DATE
04/25/94

TEMPORARY SIGN SUPPORT

STANDARD
CONSTRUCTION
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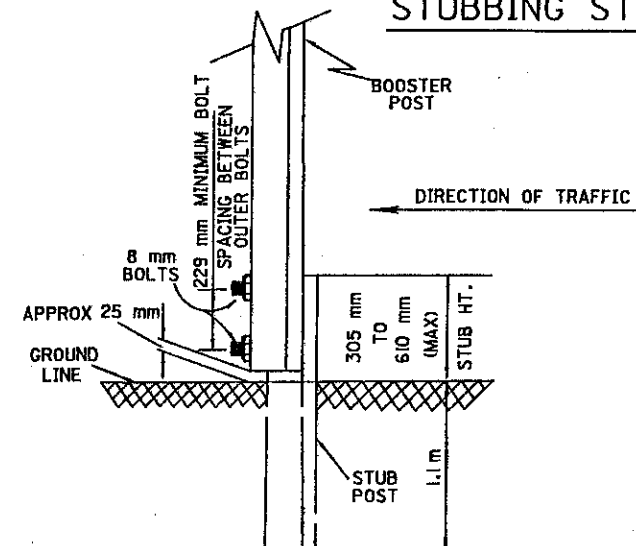
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CLASS A SUPPORTS



CLASS A SUPPORTS

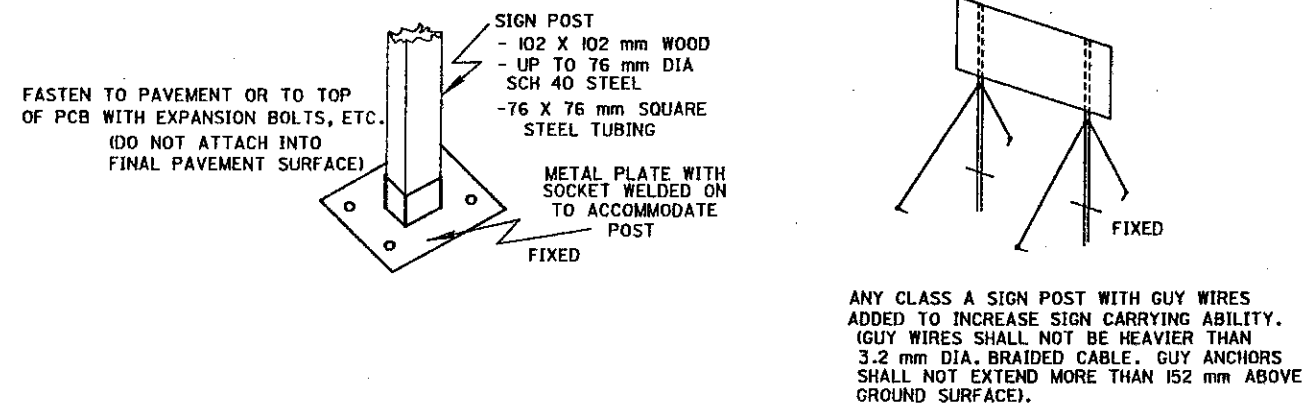
STUBBING STANDARD



NOTES

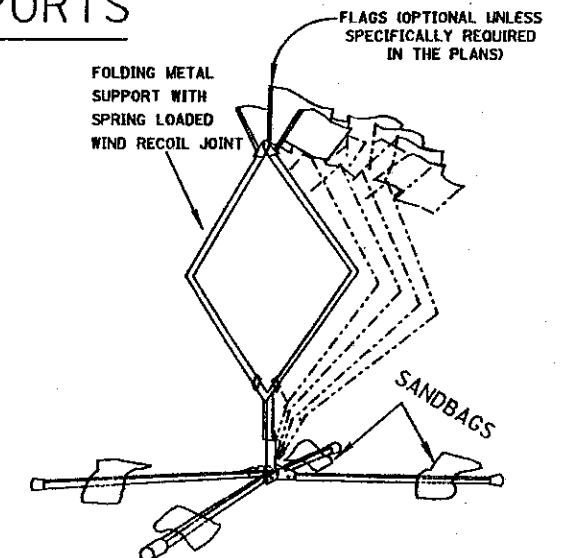
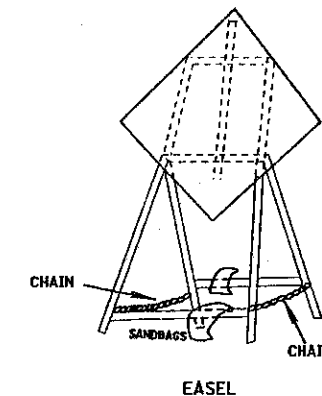
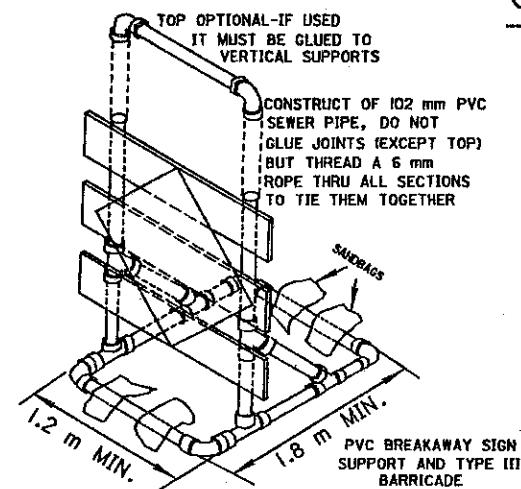
1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1.5 kg/m LESS THAN STUB POST

CLASS B SUPPORTS



CLASS A SUPPORTS

PORTABLE

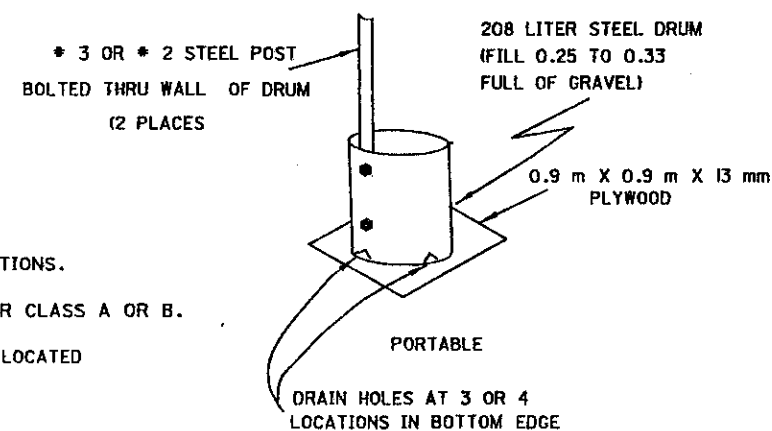


NOTES

RAIL MATERIALS:

25 X 203 mm OR 51 X 203 mm COMMON LUMBER
203 mm X (16 mm TO 25 mm) THICK EXTERIOR PLYWOOD
EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICIENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 147 kg/m², BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

CLASS C SUPPORTS



1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

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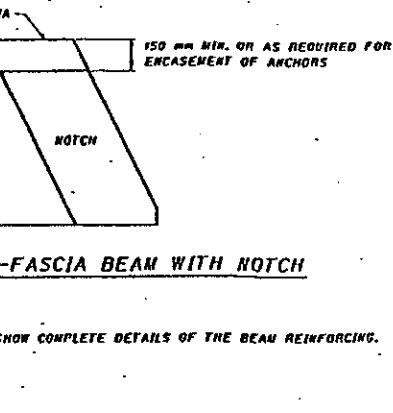
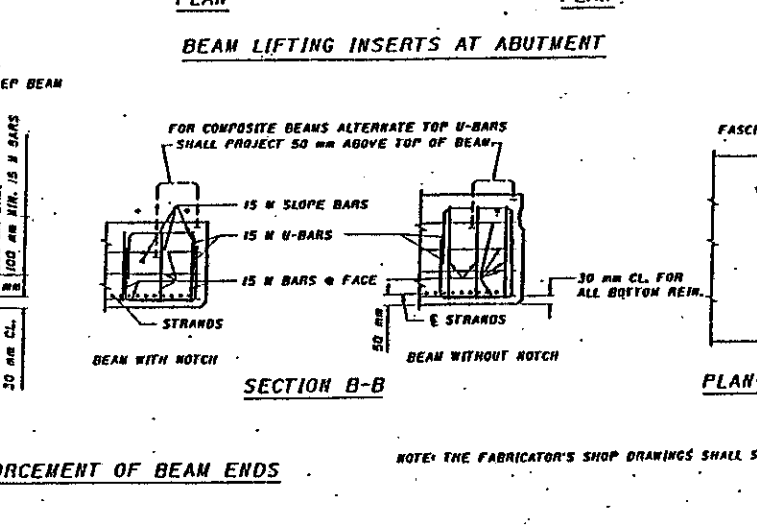
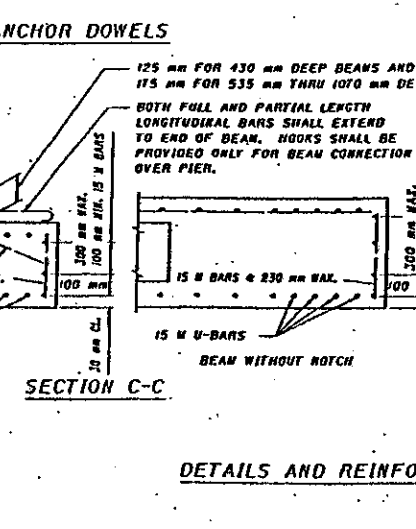
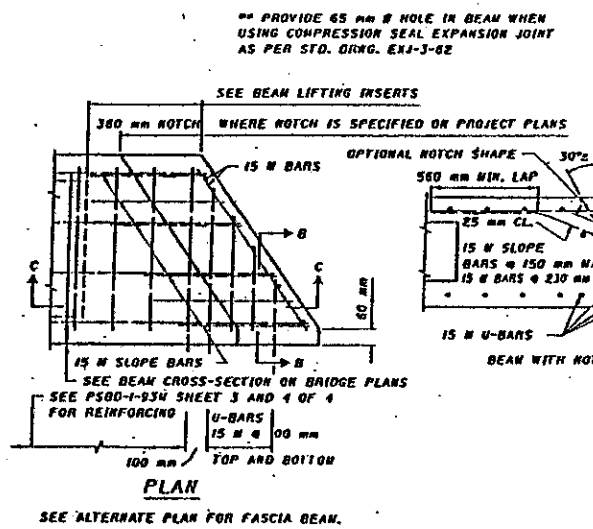
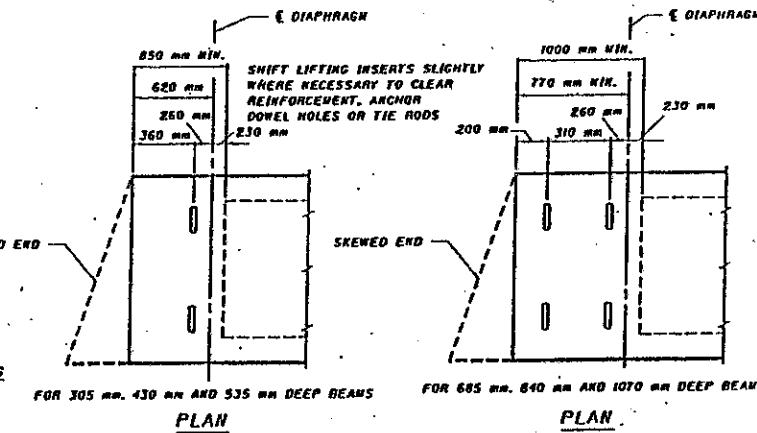
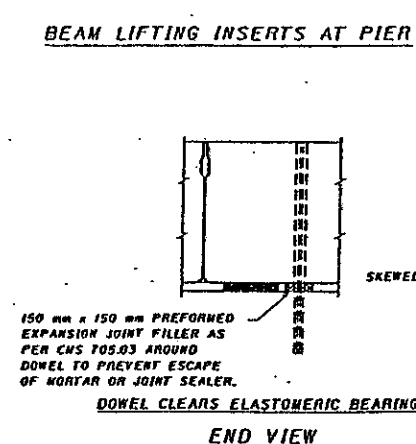
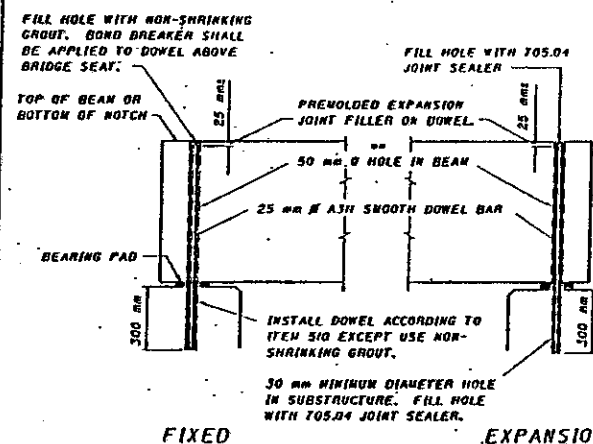
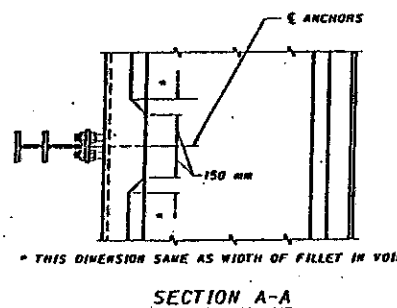
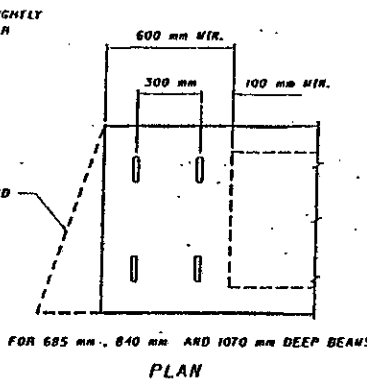
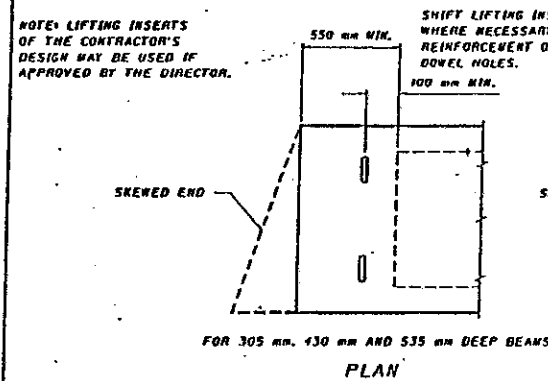
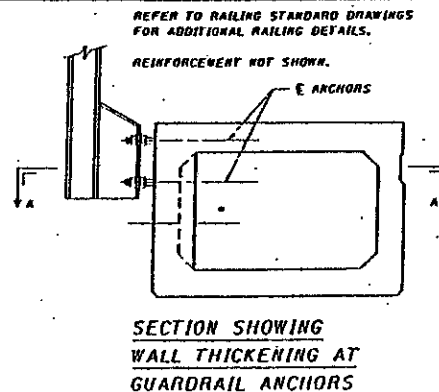
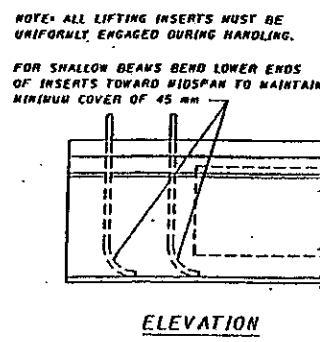
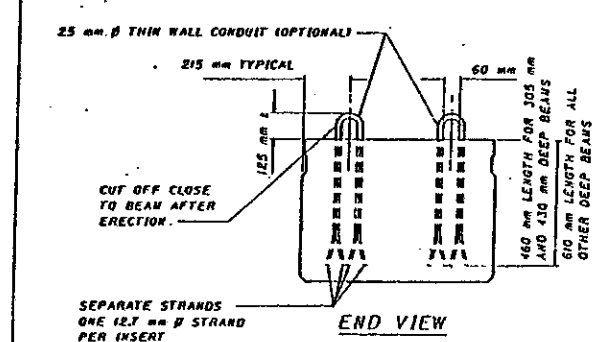
MAINTENANCE OF TRAFFIC

DATE
04/25/94

TEMPORARY SIGN SUPPORT

STANDARD
CONSTRUCTION
DRAWING
APPROVED *David J. Cramer* ENGR. OF DESIGN SERVICES

MT-105.IIM



NOTES:
TRANSVERSE TIE RODS SHALL BE 25 mm DIAMETER STEEL RODS OF GRADE A313 G1018 STEEL, THREADED BOTH ENDS, AND WITH NUT AND WASHER AT EACH END. THREADS MAY BE CUT OR ROLLED. IF ROLLED THREADS ARE USED, MINIMUM DIAMETER OF ROD AT ROOT OF THREADS SHALL BE 21 mm. TENSION SHALL BE APPLIED BY A TORQUE OF APPROXIMATELY 340 N·M AFTER THE TIE RODS ARE TIGHTENED THE RECESSES IN THE FASCIA BEAMS SHALL BE FILLED WITH NON-SHRINKING MORTAR OF THE SAME COLOR AS THE BEAM. ONE TRANSVERSE TIE ROD WILL BE PERMITTED TO TIE A MAXIMUM OF THREE BEAMS TOGETHER.

PRESTRESSING STRANDS: SHALL BE A313 416 GRADE 270, 12.7 mm DIAMETER SEVEN-WIRE UNCOATED, LOW-RELAXATION STRANDS.

GALVANIZING: ALL ANCHOR BOLTS, STUDS, INSERTS, TIE RODS, NUTS AND WASHERS SHALL BE GALVANIZED PER T11.02.

ANCHOR DOWELS: THE BEAM ENDS TO BE ANCHORED SHALL BE INDICATED ON THE PROJECT PLANS. ANCHOR DOWEL HOLES AND PRESTRESSING STRANDS SHALL BE LOCATED TO AVOID MUTUAL INTERFERENCE. THE LATERAL SPACING OF THE HOLES IN THE BEAM SHALL BE SUCH THAT THE ANCHOR DOWELS CLEAR THE ELASTOMERIC BEARING, AND ARE AS CLOSE TO THE E OF BEAM AS POSSIBLE.

AFTER TENSIONING OF THE TRANSVERSE TIE RODS THE DOWEL HOLES SHALL BE DRILLED INTO THE ABUTMENT OR PIER SEAT AND DOWELS INSTALLED.

ELASTOMERIC BEARINGS: FOUR ELASTOMERIC BEARINGS ARE REQUIRED PER BEAM. POSITIONED AS SHOWN ON SHEET 4 OF 4.

PREFORMED BEARING PADS ON SKEWED BRIDGES: PREFORMED BEARING PADS PER T11.02, 3 mm THICK AND OF THE SAME PLAN DIMENSIONS AS THE ELASTOMERIC BEARING PADS SHOULD BE PROVIDED AS SHIMS.

NOTCHES SHALL BE PROVIDED IN BEAM ENDS WHERE SHOWN ON THE PROJECT PLANS TO ELIMINATE AN OPEN JOINT OVER PIERS (SEE SHEET 4 OF 4) OR TO ACCOMMODATE ANCHORAGE FOR END DASH OR EXPANSION JOINTS.

ENDS OF BEAMS, AGAINST WHICH CONCRETE IS NOT TO BE PLACED, SHALL BE PROTECTED BY TYPE B WATER PROOFING AS PER 512.06 AND APPLIED IN THE FIELD.

SEALING OF CONCRETE SURFACES (NON-DEPTH) SHALL BE PROVIDED FOR THE FASCIA AND THE BOTTOM OF THE EXTERIOR BEAMS.

DRIP GROOVES: ON THE UNDERSIDE OF THE FASCIA BEAM SHALL NOT BE PERMITTED.

PREPARATION OF CONCRETE SURFACES IN CONTACT WITH MORTAR: THE KEYWAY SURFACES SHALL BE GIVEN A MEDIUM SANDBLAST AT THE PLANT WITHIN FOUR DAYS BEFORE THE BEAMS LEAVE THE PLANT. BEFORE MORTARING, THE KEYWAYS SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST AND OTHER FOREIGN MATTER BY MEANS OF HIGH PRESSURE WASHING OF AT LEAST 7 MPa AND A DELIVERY RATE OF NOT LESS THAN 16 L/MIN.

MORTAR: MORTAR OR GROUT FOR KEYWAYS BETWEEN PRESTRESSED CONCRETE BOX BEAMS, FOR TIE ROD RECESSES AND FOR ANCHOR DOWEL HOLES SHALL BE A NON-SHRINKING MORTAR. THE MORTAR SELECTED AS DEFINED IN THE BELOW ALTERNATIVES SHALL BE PREPARED, PLACED AND CURED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. AT LEAST THREE (3) 75 mm DIAMETER BY 150 mm LONG MORTAR TEST CYLINDERS OF THE GROUTING MATERIAL SHALL BE TAKEN DURING THE ACTUAL GROUTING OPERATION AND SUBMITTED TO THE TESTING LABORATORY FOR COMPRESSION TESTING OF MINIMUM STRENGTH OF GROUT.

ALTERNATE 1: IF EITHER CONSTRUCTION OR NORMAL VEHICLE TRAFFIC WILL NOT BE ON THE BOX BEAMS WITHIN 1 DAYS OF PLACEMENT OF THE MORTAR OR GROUT, THE MORTAR MATERIAL SHALL CONFORM WITH CORPS OF ENGINEER'S SPECIFICATION CRD-C621-89A OR SHEAR KEY MORTAR AS PER PROPOSAL NOTE. MINIMUM STRENGTH OF THE MORTAR SHALL BE 35 MPa BEFORE ANY TRAFFIC IS ALLOWED ON THE STRUCTURE.

ALTERNATE 2: IF PART-WIDTH CONSTRUCTION IS BEING USED, OR ANY CONSTRUCTION OR NORMAL VEHICLE TRAFFIC WILL BE ON THE BOX BEAMS WITHIN 7 DAYS OF PLACEMENT OF THE MORTAR OR GROUT, THE MORTAR MATERIAL SHALL BE SHEAR KEY MORTAR AS PER PROPOSAL NOTE. MINIMUM STRENGTH OF THE MORTAR SHALL BE 35 MPa BEFORE ANY TRAFFIC IS ALLOWED ON THE STRUCTURE.

MORTARING OF SHEAR KEYS: AFTER THE TRANSVERSE TIE RODS HAVE BEEN TIGHTENED, SHEAR KEYS SHALL BE FILLED WITH NON-SHRINKING MORTAR. BEFORE MORTARING WITH CRD-C621-89A, THE KEYWAY SURFACES SHALL BE WETTED, BUT NO FREE WATER SHALL BE ALLOWED TO REMAIN IN THE KEYWAYS. SURFACES WHEN OTHER MORTAR IS USED SHALL BE AS PER MANUFACTURER'S RECOMMENDATION. MORTAR SHALL BE PLACED INTO THE KEYWAYS IN A MANNER THAT INSURES COMPLETE AND SOLID FILLING.

COMPOSITE BRIDGES: THE FOLLOWING NOTES APPLY TO COMPOSITE BRIDGES ONLY:
1. **CLEANING:** PRIOR TO PLACEMENT OF COMPOSITE SLAB, BEFORE PLACEMENT OF THE SLAB CONCRETE, THE TOPS OF ALL BEAMS SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST AND OTHER FOREIGN MATTER. THE SURFACE SHALL BE FLUSHED WITH CLEAR WATER AND SHALL BE WET, WITHOUT FREE WATER, WHEN THE CONCRETE IS PLACED.

2. **SLAB PLACEMENT:** ON MULTI-SPAN BRIDGES WITH SLAB CONTINUOUS OVER PIERS, CONSTRUCTION JOINTS PERPENDICULAR TO THE CENTERLINE OF ROADWAY MAY BE PLACED NEAR THE CENTER OF A SPAN. HOWEVER, COMPOSITE SLAB JOINTS SHALL BE AS LONG AS PRACTICABLE. ON MULTI-SPAN BRIDGES WITH JOINTS AT PIERS, COMPOSITE SLABS SHALL BE PLACED BETWEEN JOINTS WITHOUT ADDITIONAL CONSTRUCTION JOINTS, BUT SHALL COMPLY WITH THE REQUIREMENTS OF ITEM 511.

PROJECT PLANS: SHALL SPECIFY THE DETAILS OF THE STANDARD DRAWING WHICH ARE TO APPLY AND WILL INCLUDE THE FOLLOWING:
A. BEAM LAYOUT PLAN SHOWING SPAN LENGTH, BEAM LENGTH, SKEW ANGLE, FIXED AND EXPANSION ENDS OF BEAMS, LOCATION OF ANCHOR DOWELS, SIZE, LOCATION AND HARDNESS OF ELASTOMERIC BEARING PADS, LOCATION OF DIAPHRAGM CENTERLINES AND LOCATIONS OF RAILING POSTS.
B. A TRANSVERSE CROSS-SECTION THRU THE DECK.
C. A CROSS-SECTION OF THE BEAM SHOWING BEAM TYPE, SIZE, NUMBER, STRENGTH AND LOCATION OF STRANDS, DEBENDED STRANDS, ALL REINFORCING STEEL DETAILS AND THE DESIGN DATA.

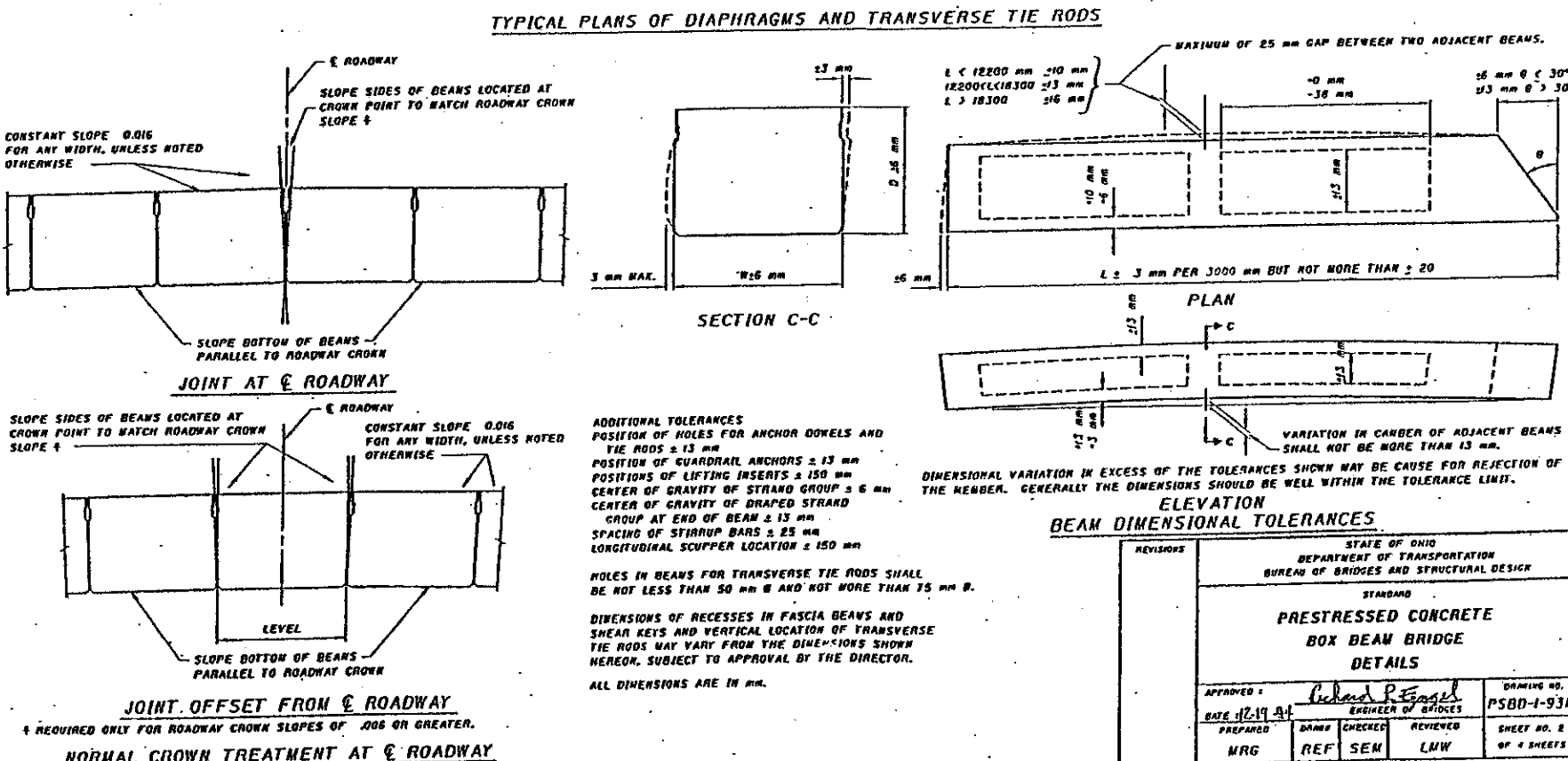
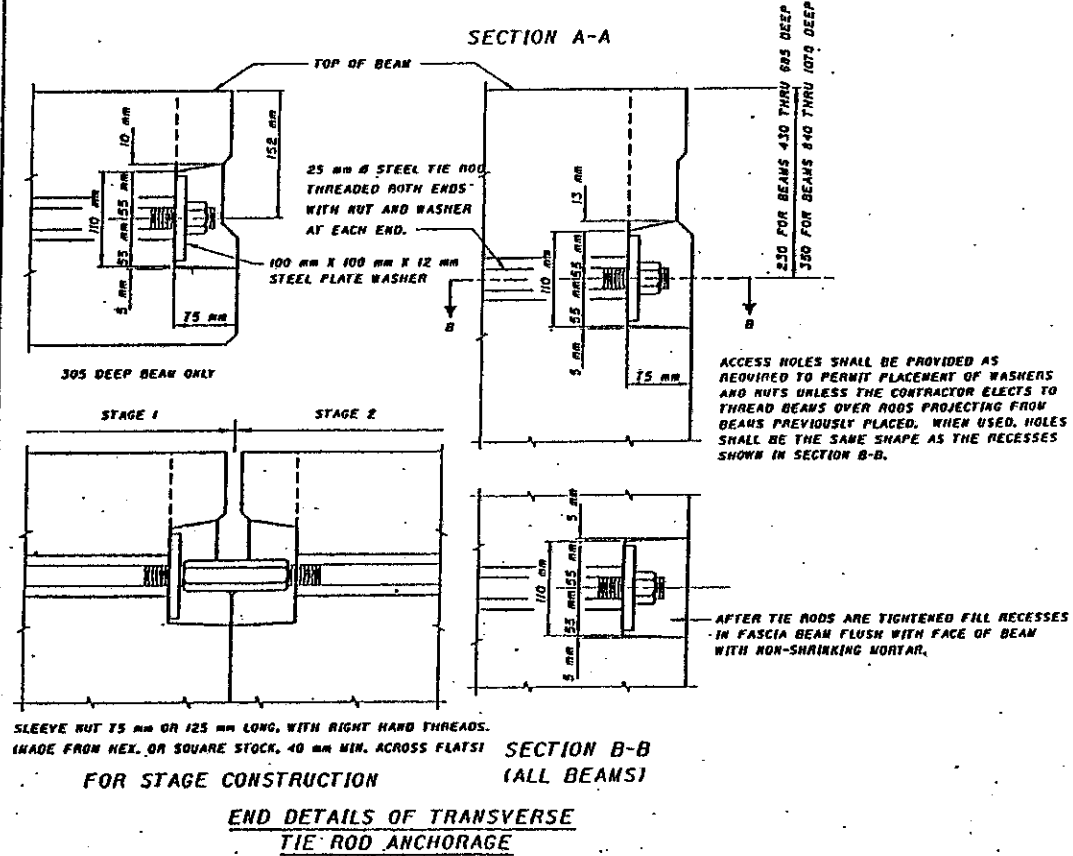
DETAILS AT ABUTMENTS AND PIERS. ALL OTHER NECESSARY DETAILS AND INFORMATION. IT IS NOT INTENDED THAT DETAILS SHOWN ON THIS STANDARD DRAWING BE REPEATED ON THE PROJECT PLANS EXCEPT AS MAY BE REQUIRED FOR CLARITY.

ITEMS INCLUDED WITH ITEM 515 FOR PAYMENT:

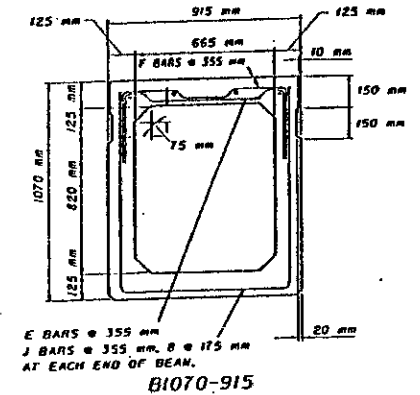
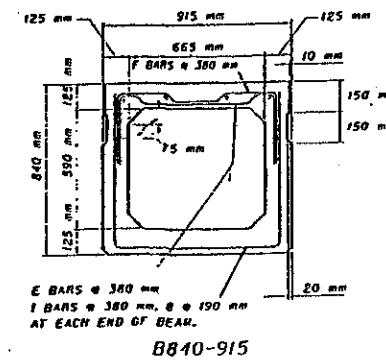
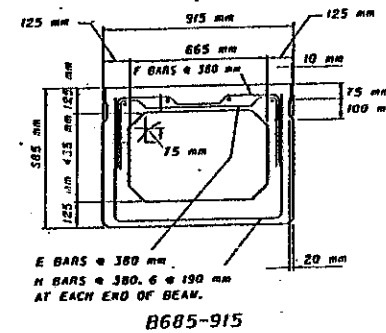
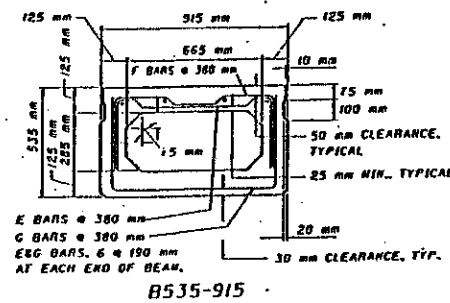
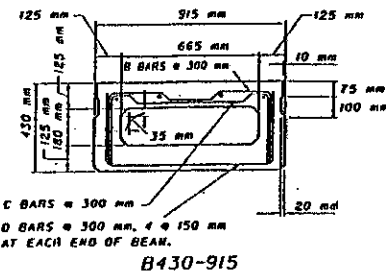
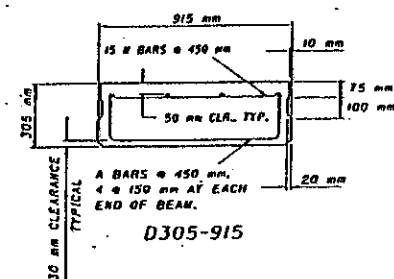
1. ANCHOR DOWELS AND INSTALLATION
2. ALL PREFORMED EXPANSION JOINT FILLER REQUIRED.
3. TYPE B WATER PROOFING AT ENDS OF BEAMS
4. MORTAR AND LABOR REQUIRED.
5. ALL OTHER MATERIAL & LABOR REQUIRED FOR FABRICATION AND ERECTION.

ALL DIMENSIONS ARE IN MM

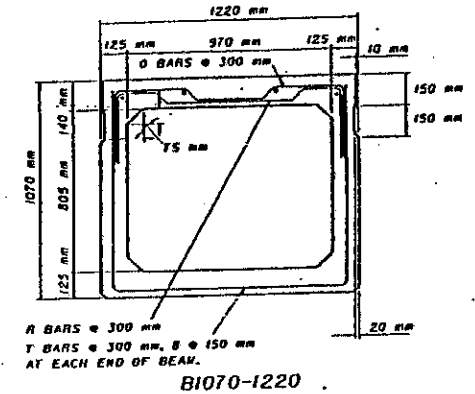
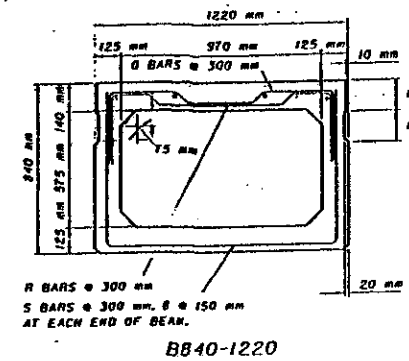
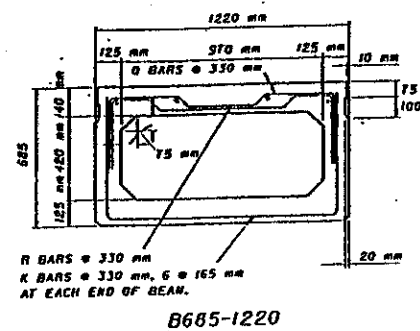
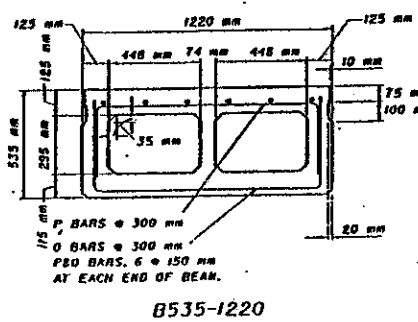
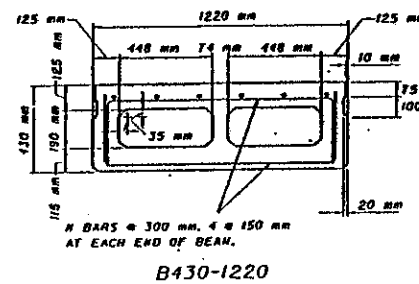
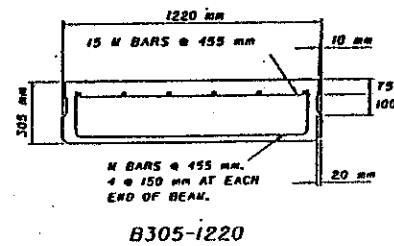
REVISIONS				
STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN				
STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS				
APPROVED:	Richard P. Engel ENGINEER OF BRIDGES			DRAWING NO. PSBD-1-93H
DATE: 11-11-91	PREPARED:	DRWG:	CHECKED:	REVISED:
	MRG	REF	SEN	LWJ
				SHEET NO. 1 OF 4 SHEETS



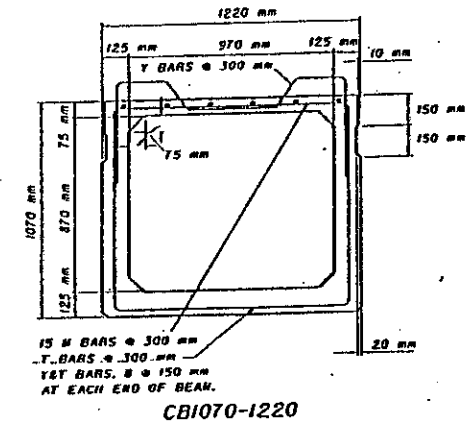
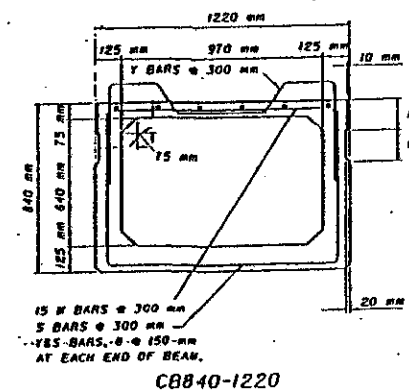
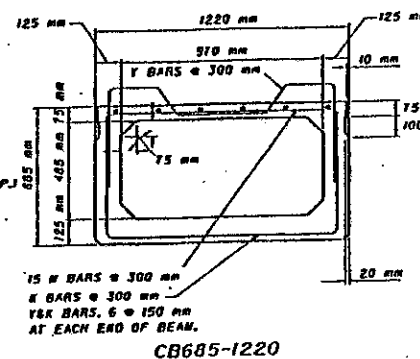
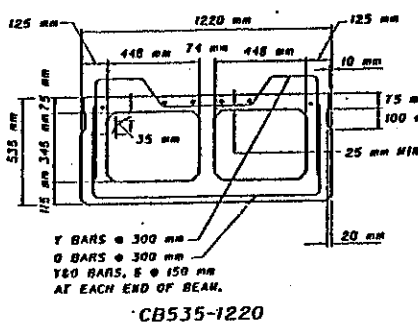
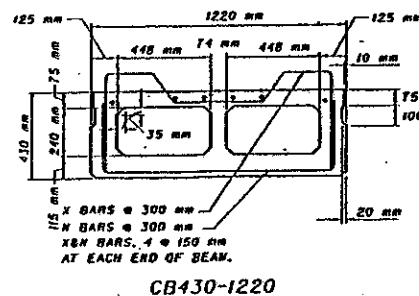
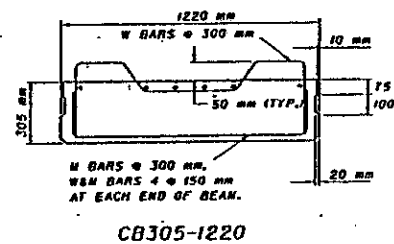
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN			
	STANDARD			
	PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS			
APPROVED :	 ENGINEER OF BRIDGES			DRAWING NO. P500-1-93
DATE 12-19-94	DESIGNED MRG	CHECKED REF	REVIEWED SEM	SHEET NO. 2 OF 4 SHEETS



915 mm WIDE NON-COMPOSITE BEAMS

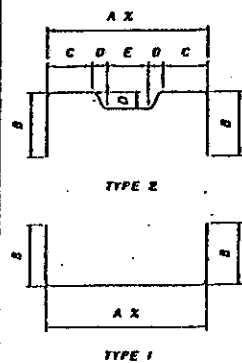


1220 mm WIDE NON-COMPOSITE BEAMS



1220 mm WIDE COMPOSITE BEAMS

DEPT REINFORCING BARS					
MARK	TYPE	A	B	C	D
A	1	785 mm	200 mm	250 mm	40 mm
B	2	785 mm	330 mm	250 mm	40 mm
C	2	785 mm	330 mm	100 mm	40 mm
D	1	785 mm	330 mm		
E	2	785 mm	430 mm	100 mm	40 mm
F	2	785 mm	430 mm	250 mm	40 mm
G	1	785 mm	430 mm		
H	1	785 mm	585 mm		
I	1	785 mm	735 mm		
J	1	785 mm	985 mm		
K	1	1090 mm	585 mm		
L	1	1090 mm	200 mm		
M	1	1090 mm	330 mm		
N	1	1090 mm	430 mm		
O	1	1090 mm	430 mm		
P	2	1090 mm	430 mm	330 mm	50 mm
Q	2	1090 mm	430 mm	178 mm	50 mm
R	2	1090 mm	735 mm		
S	1	1090 mm	985 mm		
T	2	1090 mm	295 mm	230 mm	100 mm
U	2	1090 mm	430 mm	230 mm	100 mm
V	2	1090 mm	530 mm	230 mm	100 mm
W	2	785 mm	300 mm	150 mm	100 mm
XX	2	785 mm	430 mm	150 mm	100 mm
YY	2	785 mm	530 mm	150 mm	100 mm



NOTE: ALL BARS ARE 15 #

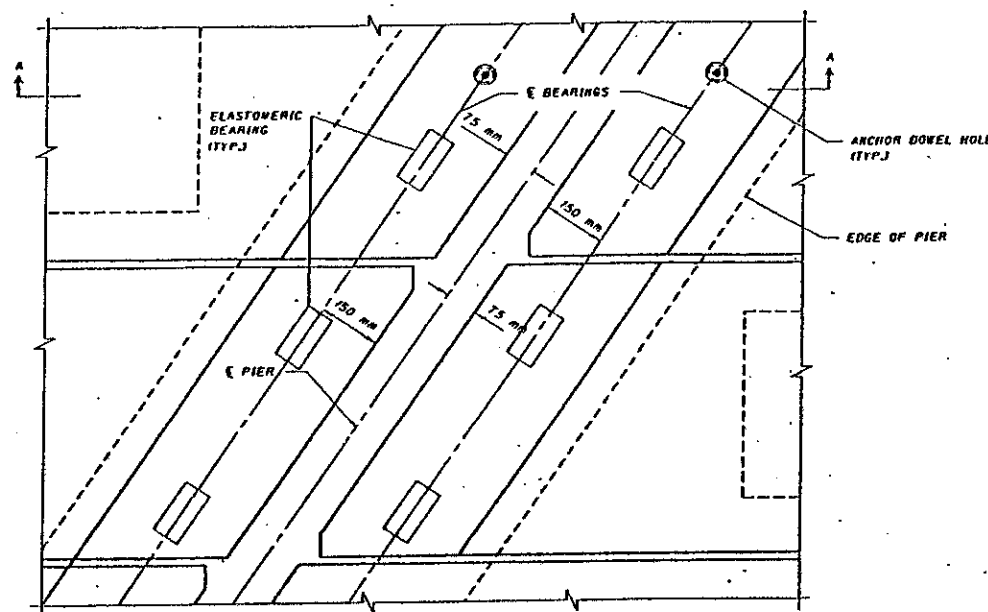
NOTE:
ALTERNATE TOP STIRRUPS TO LAP BOTTOM STIRRUPS AT EACH
END OF BEAM WHERE TWO TYPES OF TOP STIRRUPS ARE PROVIDED.
915 mm WIDE COMPOSITE BEAMS ARE SHOWN ON SHEET 4 OF 4.

MINIMUM TOP LONGITUDINAL REINFORCING STEEL
915 mm WIDE NON-COMPOSITE & COMPOSITE BEAMS: 4-15 # BARS.
1220 mm WIDE NON-COMPOSITE BEAMS: B305 THRU B535, 6-15 # BARS
B685 THRU B1070, 4-15 # BARS

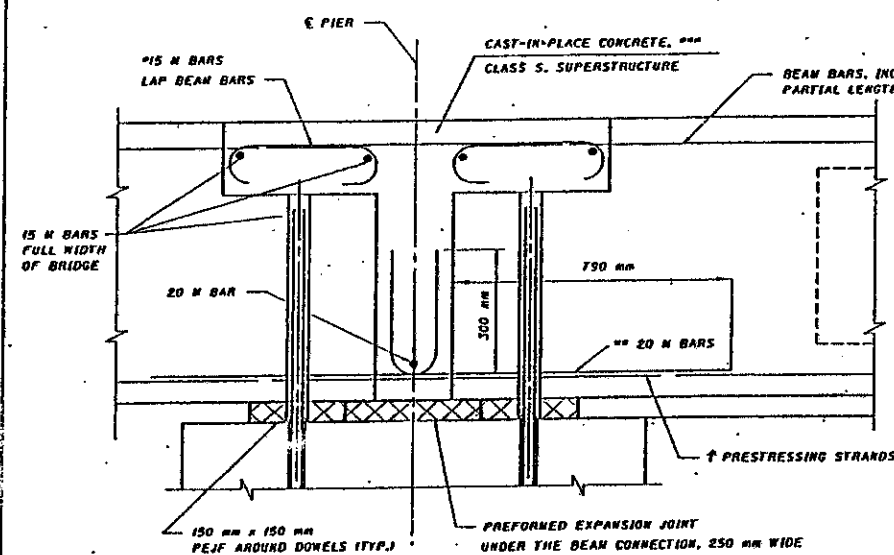
1220 mm WIDE COMPOSITE BEAMS: 6-15 # BARS
SEE PROJECT PLANS FOR ANY ADDITIONAL LONGITUDINAL
REINFORCING STEEL BARS REQUIRED.
ALL REINFORCING STEEL ARE GRADE 400 BARS

FABRICATOR'S SHOP DRAWINGS SHALL SHOW COMPLETE DETAILS OF
BEAM REINFORCING.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN			
STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS			
APPROVED:	Richard P. Engel	ENGINEER OF BRIDGES	DRAWING NO. P580-1-93H
DATE: 12/19/94			
PREPARED:	MRG	CHECKED:	REF
		REVIEWED:	LNW
			SHEET NO. 3 OF 4 SHEETS



PARTIAL PLAN OF BEAM CONNECTION OVER PIER



SECTION A-A

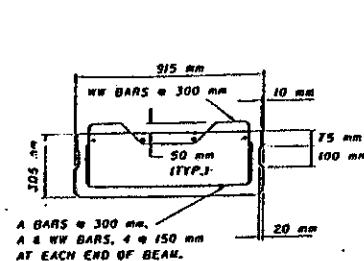
* LAP BARS SAME SIZE AND NUMBER AS BEAM BARS. NOOKS MAY BE ROTATED FROM THE VERTICAL POSITION TO PROVIDE THE REQUIRED CLEARANCE.

** PROVIDE 6-20 M BARS EACH BEAM END IN 1220 mm WIDE BEAMS AND 4-20 M BARS EACH BEAM END IN 915 mm WIDE BEAMS. 20 M BARS SHALL BE LOCATED ON TOP OF STIRRUPS AND SHALL BE UNIFORMLY SPACED ACROSS THE BEAM.

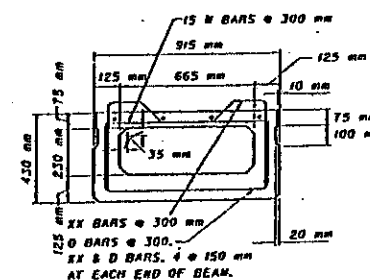
† AT THE FABRICATOR'S OPTION, STRANDS MAY BE EXTENDED AND BENT UP IN LIEU OF 20 M BARS. 1220 mm WIDE BEAMS WITH A TOTAL OF 12 OR MORE STRANDS SHALL HAVE A MINIMUM OF 6 STRANDS BENT UP. 1220 mm WIDE BEAMS WITH LESS THAN 12 STRANDS TOTAL SHALL HAVE APPROXIMATELY ONE HALF OF THE TOTAL NUMBER OF STRANDS BENT UP. 915 mm WIDE BEAMS WITH A TOTAL OF 8 OR MORE STRANDS SHALL HAVE A MINIMUM OF 4 STRANDS BENT UP. 915 mm WIDE BEAMS WITH LESS THAN 8 STRANDS TOTAL SHALL HAVE APPROXIMATELY ONE HALF OF THE TOTAL NUMBER OF STRANDS BENT UP.

*** IN LIEU OF CLASS S CONCRETE, THE CONTRACTOR AT HIS OPTION MAY USE OTHER CONCRETE MIXTURES IN ACCORDANCE WITH CMS 499.03 FOR ACHIEVING THE REQUIRED STRENGTH EARLIER.

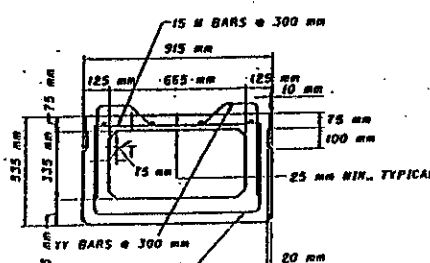
NOTE: THE PRESTRESSING STRANDS WHICH ARE BENT UP SHALL BE STAGGERED IN ADJUTING BEAM ENDS TO AVOID INTERFERENCE.



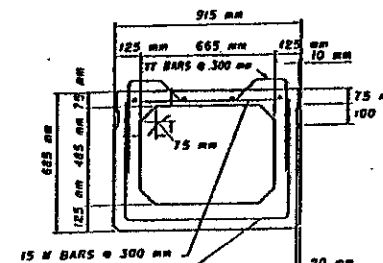
CB305-915



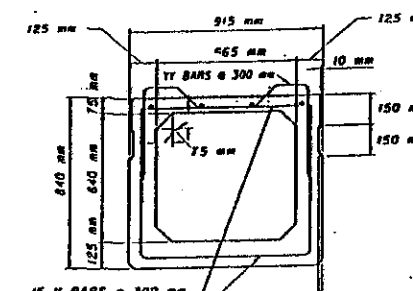
CB430-915



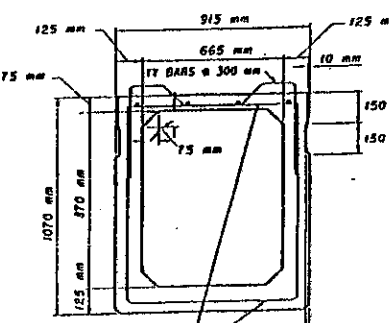
CB535-915



CB685-915



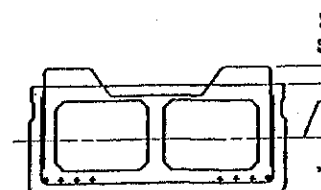
CB840-915



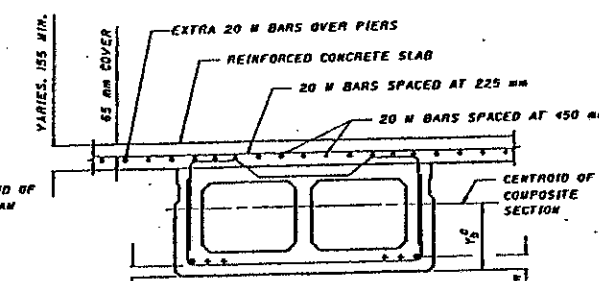
CB1070-915

915 mm WIDE COMPOSITE BEAMS

		SECTION PROPERTIES					
		1220 mm WIDE COMPOSITE BOX BEAM					
BEAM ONLY	COMPOSITE SECTION	CB305-1220	CB430-1220	CB535-1220	CB685-1220	CB840-1220	CB1070-1220
		$A_b \times 10^3$	366.3	312.5	346.1	376.7	411.9
		$I_b \times 10^6$	2844.1	6971.5	12183.9	23231.5	38515.6
		y_b	151.9	201.7	248.2	309.4	377.4
		$Z_b \times 10^6$	18.6	30.3	42.7	61.7	83.6
		$Z_b \times 10^6$	18.7	34.6	49.1	75.1	102.0
		$I_c \times 10^6$	7777.3	15497.5	24498.1	43179.0	67429.9
		y_c	211.8	292.6	348.7	428.5	510.5
		$Z_c \times 10^6$	83.6	111.3	132.6	167.9	205.7
		$Z_c \times 10^6$	36.7	53.0	70.3	100.7	132.1



915 mm OR 1220 mm WIDE COMPOSITE BEAM



915 mm OR 1220 mm WIDE COMPOSITE BEAM WITH SLAB

NOTE: REINFORCING BAR DATA AND NOTES ARE SHOWN ON SHEET 3 OF 4.

SECTION PROPERTIES FOR COMPOSITE SECTIONS ARE COMPUTED WITH A SLAB THICKNESS OF 125 mm. TOTAL THICKNESS OF SLAB IS 150 mm WHICH INCLUDES 25 mm MONOLITHIC WEARING SURFACE.

SLAB CONCRETE IS CLASS S CONCRETE $f'_c = 31.0 \text{ MPa}$ MINIMUM BEAM CONCRETE STRENGTH AT 28 DAYS $f'_c = 38.0 \text{ MPa}$

ALL REINFORCING STEEL IN THE COMPOSITE DECK SLAB AND BARS PROJECTING FROM THE PRESTRESSED BOX BEAMS SHALL BE GRADE 400 EPOXY COATED BARS.

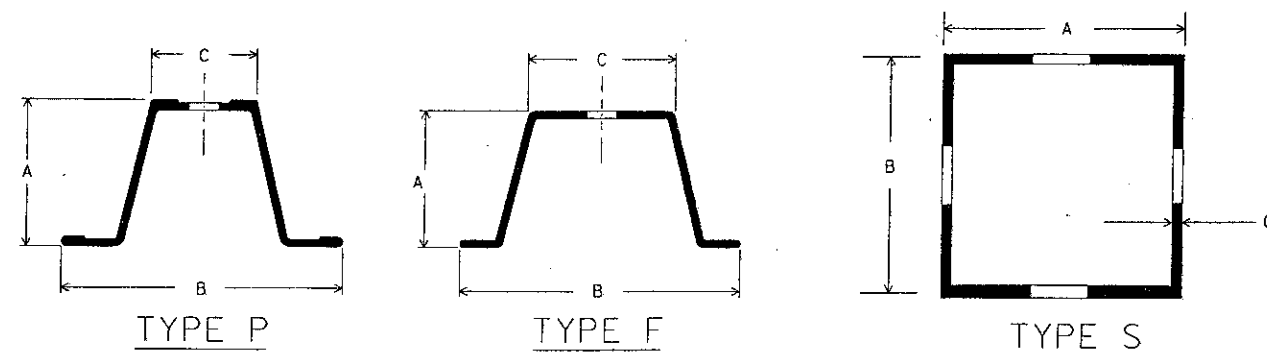
$E_{slab} = 0.90$

E_{beam}

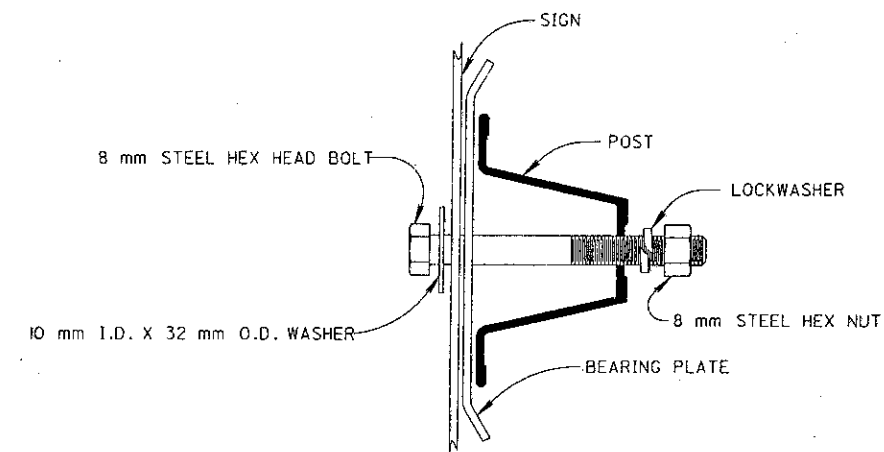
ALL DIMENSIONS ARE IN mm

		SECTION PROPERTIES					
		915 mm WIDE COMPOSITE BOX BEAM					
BEAM ONLY	COMPOSITE SECTION	CB305-915	CB430-915	CB535-915	CB685-915	CB840-915	CB1070-915
		$A_b \times 10^3$	273.5	241.5	276.1	314.8	350.2
		$I_b \times 10^6$	2124.9	5242.8	9377.3	18145.6	30467.7
		y_b	151.6	198.4	245.1	314.7	384.0
		$Z_b \times 10^6$	13.9	22.4	32.5	48.9	67.1
		$Z_b \times 10^6$	14.0	26.4	38.3	57.6	79.3
		$I_c \times 10^6$	5828.5	11849.3	18934.8	33162.0	52259.1
		y_c	211.8	288.3	342.1	423.4	503.4
		$Z_c \times 10^6$	62.6	82.5	99.0	126.4	156.2
		$Z_c \times 10^6$	27.5	41.1	55.4	78.3	103.8

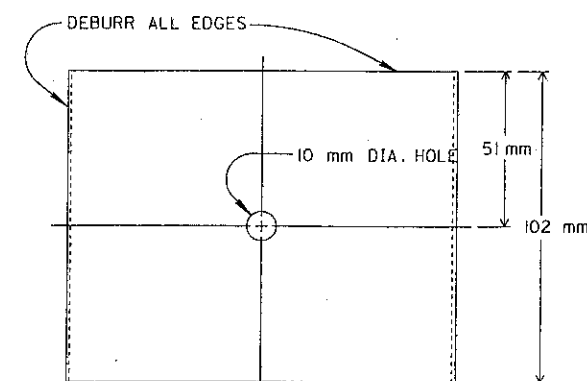
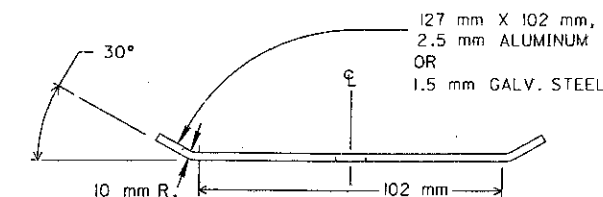
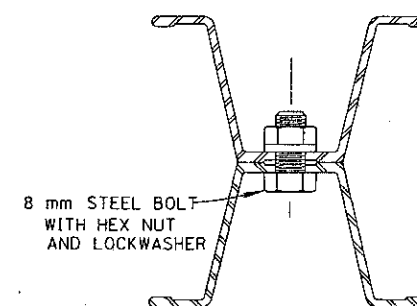
STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN					
STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS					
APPROVED:	DATE: 12/19/94				DRAWING NO. PSBD-1-93W
PREPARED:	DRAWN:	CHECKED:	REVIEWED:	SHEET NO. 4 OF 4 SHEETS	
MRC	REF	SEN	LHW		



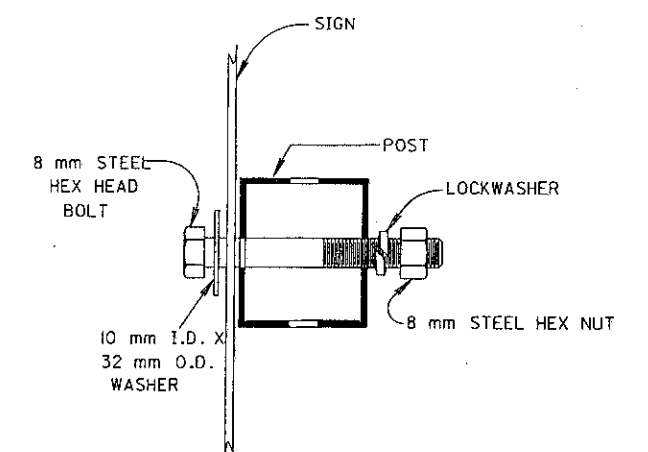
POST NO.	TYPE	Kg/m	POST DIMENSIONS MILLIMETERS			ANCHOR DIMENSIONS			NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
			A	B	C	A	B	C	
1	F	1.7	22	52	21				
2	P	3.0	37	78	33				2
	F	3.0	39	79	32				2
	S		51	51	2.1	57	57	2.7	2
3	P	4.5	48	89	33				2
	F	4.5	44	89	41				2
	S		51	51	2.1	57	57	2.7	2
4	P	6.0	TWO NO.2 POST						0
	F	6.0	TWO NO.2 POST						0
	S		63	63	2.7	76	76	4.8	1
6	P	9.0	TWO NO.3 POST						0
	F	9.0	TWO NO.3 POST						0



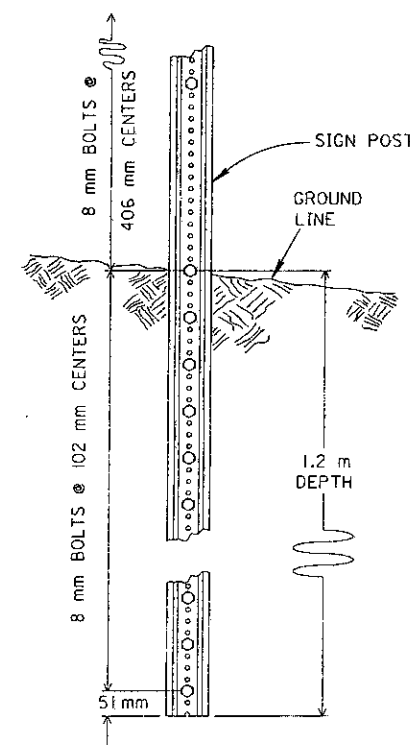
U - CHANNEL
SIGN ATTACHMENT DETAIL



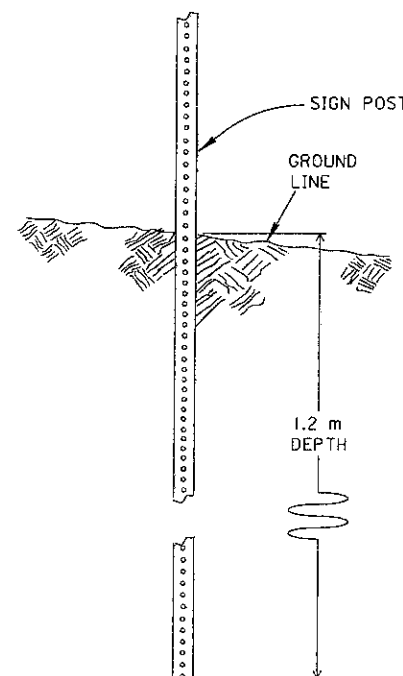
BEARING PLATE



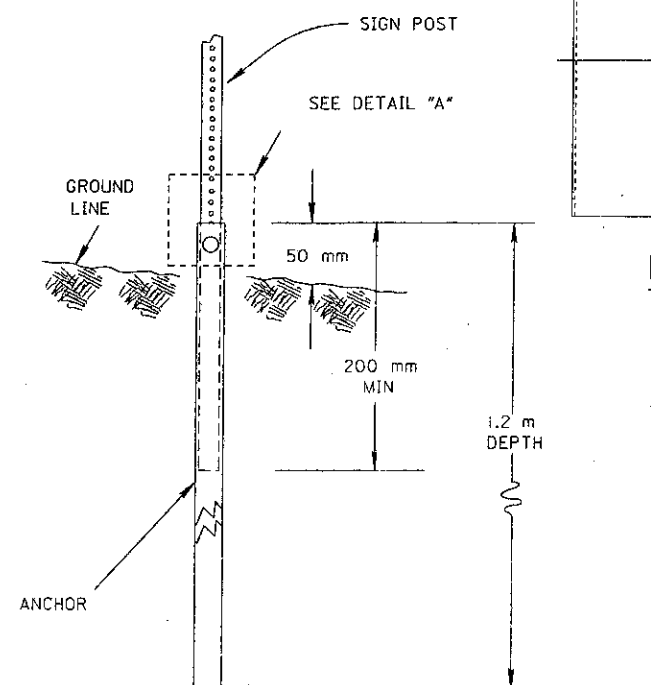
SQUARE POST
SIGN ATTACHMENT DETAIL



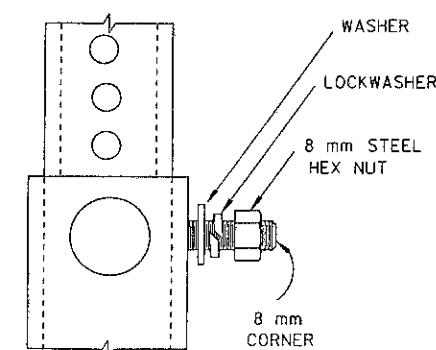
TYPICAL U - CHANNEL
DRIVEN INSTALLATION



TYPICAL SQUARE POST
DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR
BASE INSTALLATION



DETAIL "A"

NOTES

1. NUMBER 4 TYPE P AND F POST, AND NUMBER 6 TYPE P AND F POST, SHALL ONLY BE INSTALLED IN PROTECTED LOCATIONS (e.g. BEHIND GUARDRAIL). TWO POST INSTALLATIONS OF NUMBER 4 TYPE S POST SHALL BE INSTALLED IN PROTECTED LOCATIONS.
2. USE OF ANCHOR BASE WITH SQUARE POST IS OPTIONAL.
3. SQUARE POST MAY HAVE DIE-CUT KNOCKOUTS OR OPEN HOLES.

M E T R I C

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

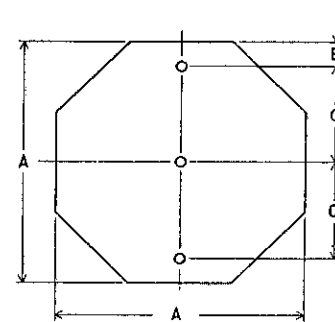
DATE
07/01/94

YIELDING POST

STANDARD
CONSTRUCTION
DRAWING

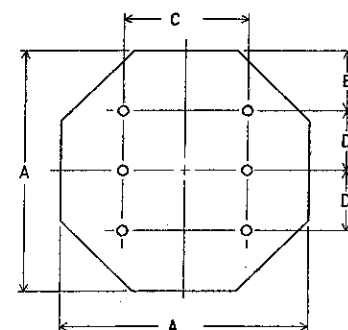
TC-41.20M

APPROVED: *Ray Krueger* ENGR. OF DESIGN SERVICES



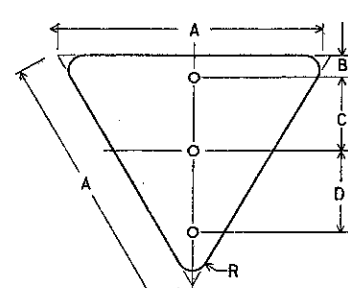
OCTA-1-3

A	B	C	THICKNESS	m ²
750	75	300	2.0	0.56
900	150	300	2.0	0.81



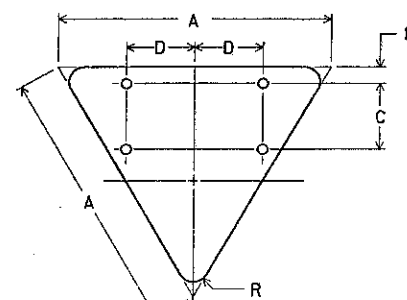
OCTA-2-6

A	B	C	D	THICKNESS	m ²
1200	300	600	300	2.5	1.44



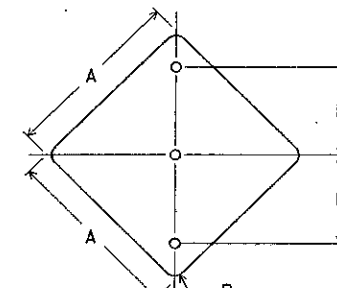
TRI-1-3

A	B	C	D	R	THICKNESS	m ²
900	75	250	275	50	2.5	0.35



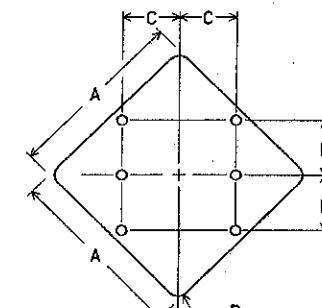
TRI-2-4

A	B	C	D	R	THICKNESS	m ²
1200	75	300	300	75	2.5	0.62
1500	75	450	375	100	2.5	0.97



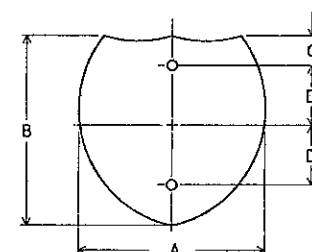
DIA-1-3

A	B	R	THICKNESS	m ²
600	300	38	1.6	0.36
750	375	48	2.0	0.56
900	450	57	2.0	0.81



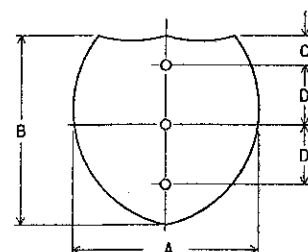
DIA-2-6

A	B	C	R	THICKNESS	m ²
1200	375	375	75	2.5	1.44
1500	450	450	95	2.5	2.25



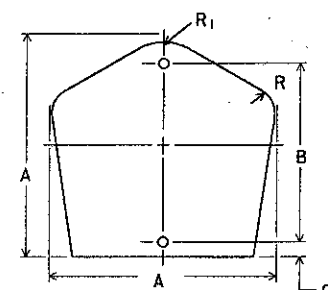
I.S.-1-2

A	B	C	D	THICKNESS	m ²
600	600	75	225	1.6	0.36
750	600	75	225	2.0	0.45
750	750	75	300	2.0	0.56
1000	750	75	300	2.0	0.75



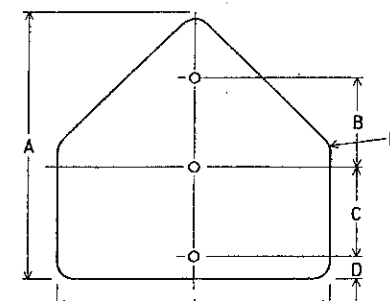
I.S.-1-3

A	B	C	D	THICKNESS	m ²
900	900	150	300	2.0	0.81
1200	900	150	300	2.5	1.08



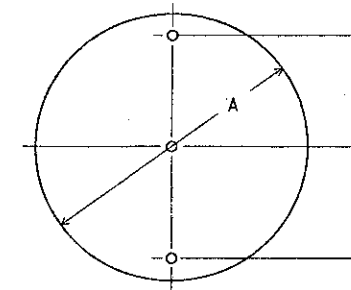
CO-1-2

A	B	C	R1	R	THICKNESS	m ²
450	375	25	125	50	1.6	0.20
600	450	50	135	68	1.6	0.36
750	600	50	168	86	2.0	0.56



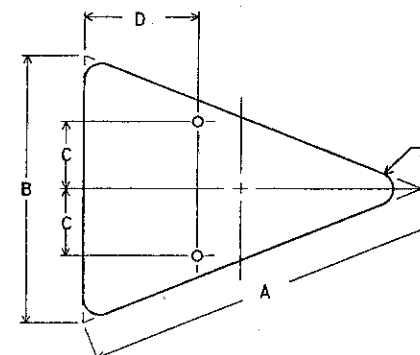
PENT-1-3

A	B	C	D	R	THICKNESS	m ²
750	250	275	75	48	2.0	0.56
900	300	300	75	57	2.0	0.81
1050	350	325	100	64	2.5	1.10



CIR-1-3

A	B	THICKNESS	m ²
750	300	1.6	0.56
900	375	2.0	0.81

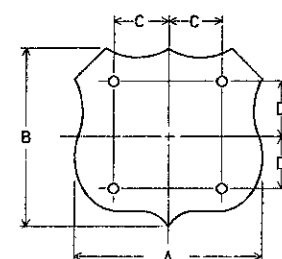


ISOS-1-2

A	B	C	D	R	THICKNESS	m ²
1000	750	187	300	48	2.0	0.35
1200	900	225	375	57	2.5	0.50

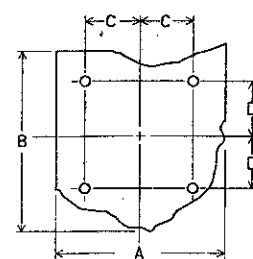
ROUTE SHIELDS

(FOR GUIDE SIGNS ONLY)



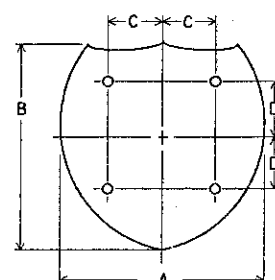
M-1C-

A	B	C	D
610	600	175	175
750	600	200	200
750	750	225	225
937	750	225	225
900	900	250	250
1125	900	375	250



M-2C-

A	B	C	D
600	600	175	175
750	600	200	200
750	750	225	225
937	750	225	225
900	900	250	250
1125	900	375	250



M-5C-

A	B	C	D
600	600	175	175
750	600	200	200
750	750	225	225
1000	750	225	225
900	900	250	250
1200	900	375	250

ALL SHIELDS SHALL BE 1.6 mm THICK

SHAPE NO. BOLTS REQUIRED

OCTA-2-6

NO. SUPPORTS REQUIRED

NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
- ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
- DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF ± 0.8 MILLIMETER.
- FOR ADDITIONAL BLANK DETAILS, SEE SIGN LAYOUT DRAWING.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

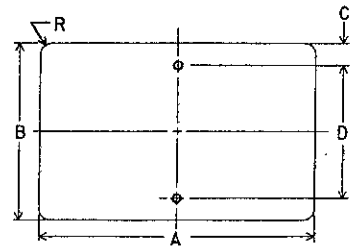
SIGN BLANK DETAILS I

DATE
07/29/94

STANDARD
CONSTRUCTION
DRAWING

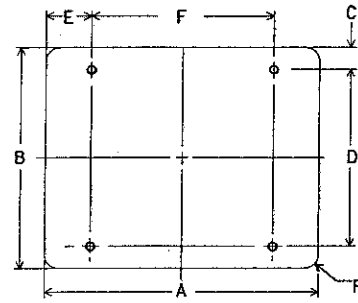
TC-52.10M

APPROVED *Ray C. Cooper* ENGR. OF DESIGN SERVICES



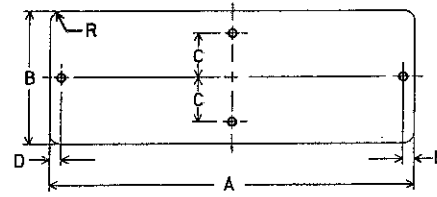
H-REC-1-2

A	B	C	D	R	THICKNESS	m ²
300	150	37.5	75	38	1.6	0.05
450	150	37.5	75	38	1.6	0.07
450	300	37.5	225	38	1.6	0.14
525	375	37.5	300	38	1.6	0.20
525	450	75	300	38	1.6	0.24
600	150	37.5	75	38	1.6	0.09
600	200	37.5	125	38	1.6	0.12
600	250	37.5	175	38	1.6	0.15
600	300	37.5	225	38	1.6	0.18
600	450	75	300	38	1.6	0.27
750	200	37.5	125	38	1.6	0.15
750	250	37.5	175	38	1.6	0.19
750	300	37.5	225	38	2.0	0.23
750	375	37.5	300	38	2.0	0.28
750	400	37.5	325	38	2.0	0.30
750	450	75	300	38	2.0	0.34
750	600	75	450	38	2.0	0.45
900	150	37.5	75	38	2.0	0.14
900	300	37.5	225	38	2.0	0.27
900	375	37.5	300	38	2.0	0.34
900	450	75	300	38	2.0	0.41
900	600	75	450	38	2.0	0.54
937	750	75	600	38	2.0	0.70
1050	375	37.5	300	38	2.0	0.39
1200	500	75	350	38	2.0	0.60



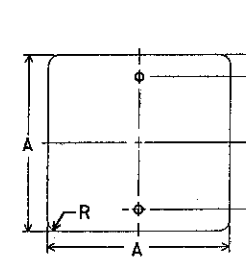
H-REC-2-4

A	B	C	D	E	F	R	THICKNESS	m ²
900	600	75	450	150	600	38	2.0	0.54
900	750	75	600	150	600	48	2.0	0.68
1000	500	75	350	150	700	38	2.0	0.50
1050	900	150	600	225	600	57	2.5	0.95
1125	900	150	600	225	675	57	2.5	1.01
1200	200	37.5	125	225	750	38	2.0	0.24
1200	212	37.5	137	225	750	38	2.0	0.25
1200	350	37.5	275	225	750	38	2.0	0.42
1200	400	37.5	325	225	750	38	2.0	0.48
1200	450	75	300	225	750	38	2.0	0.54
1200	600	75	450	225	750	48	2.5	0.72
1200	750	75	600	225	750	48	2.5	0.90
1200	900	150	600	225	750	57	2.5	1.08
1200	1050	150	750	225	750	57	2.5	1.26
1400	200	37.5	125	300	800	38	2.5	0.28
1500	300	37.5	225	300	900	38	2.0	0.45
1500	600	75	450	300	900	38	2.5	0.90
1500	750	75	600	300	900	48	2.5	1.13
1500	900	150	600	300	900	57	2.5	1.35
1500	1000	150	700	300	900	57	2.5	1.50
1600	200	37.5	125	300	1000	38	2.5	0.32
1650	600	75	450	300	1050	38	2.5	0.99
1650	900	150	600	300	1050	57	2.5	1.49
1800	300	37.5	225	300	1200	38	2.5	0.54
1800	450	75	300	300	1200	38	2.5	0.81
1800	600	75	450	300	1200	38	2.5	1.08
1800	900	75	600	300	1200	38	2.5	1.62



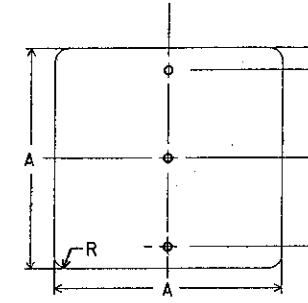
H-REC-1-4 (ONE WAY)

A	B	C	D	R	THICKNESS	m ²
900	300	100	25	38	2.0	0.27
1200	450	150	38	38	2.5	0.54



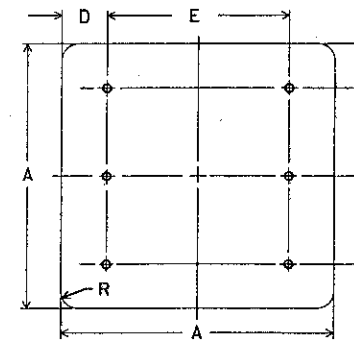
SQ-1-2

A	B	C	R	THICKNESS	m ²
375	75	112.5	38	1.6	0.14
450	75	150	38	1.6	0.20
600	75	225	38	1.6	0.36



SQ-1-3

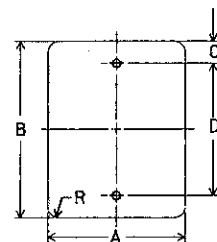
A	B	C	R	THICKNESS	m ²
750	75	300	48	2.0	0.56
900	150	300	57	2.0	0.81



SQ-2-6

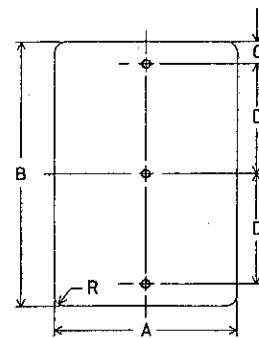
A	B	C	D	E	R	THICKNESS	m ²
* 900	150	300	150	600	57	2.0	0.81
* 1200	150	450	225	750	75	2.5	1.44

* "DO NOT ENTER" SIGN.



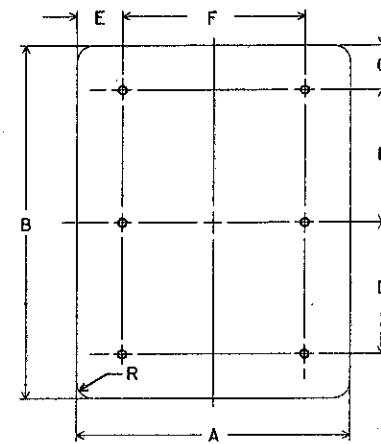
V-REC-1-2

A	B	C	D	R	THICKNESS	m ²
200	650	125	400	38	1.6	0.13
225	300	37.5	225	38	1.6	0.07
300	450	37.5	375	38	1.6	0.14
300	600	75	450	38	1.6	0.18
450	600	75	450	38	1.6	0.27



V-REC-1-3

A	B	C	D	R	THICKNESS	m ²
150	1350	225	450	38	2.0	0.20
300	900	75	375	38	1.6	0.27
300	1200	150	450	38	2.0	0.36
600	750	75	300	38	2.0	0.45
600	900	75	375	38	2.0	0.54
600	1200	225	375	38	2.5	0.72
750	900	75	375	48	2.0	0.68
750	950	75	400	38	2.0	0.68
750	1050	225	300	38	2.0	0.79
900	1050	225	300	57	2.5	0.95



V-REC-2-6

A	B	C	D	E	F	R	THICKNESS	m ²
900	1200	150	450	150	600	57	2.0	1.08
900	1350	150	525	150	600	57	2.5	1.22
900	1500	150	600	150	600	57	2.5	1.35
900	1800	225	675	150	600	57	2.5	1.62
1200	1350	150	525	225	750	75	2.5	1.62
1200	1500	150	600	225	750	75	2.5	1.80
1200	2400	300	900	225	750	75	2.5	2.88

SHAPE H-REC-2-4 NO. BOLTS REQUIRED
NO. SUPPORTS REQUIRED

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF ± 0.8 MILLIMETER.
4. FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

M E T R I C

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

DATE
07/29/94

SIGN BLANK DETAILS II

STANDARD
CONSTRUCTION
DRAWING
APPROVED *Don A. Crisp* ENGR. OF DESIGN SERVICES

TC-52.20M