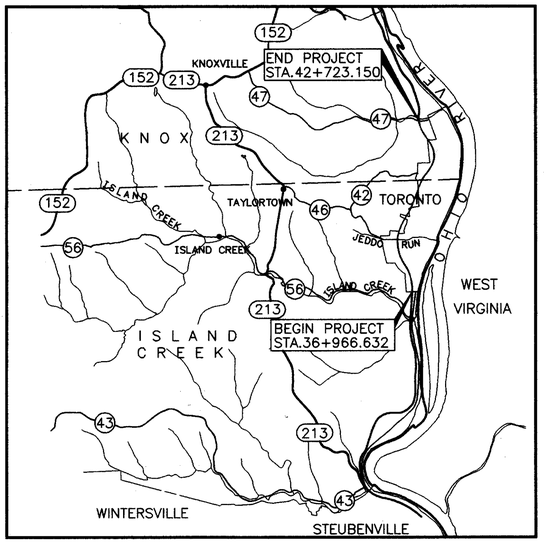
STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
JEF-7-36.967

ISLAND CREEK & KNOX TOWNSHIPS
JEFFERSON COUNTY



LOCATION MAP

Latitude: 40° 26' 05" Longitude: 80° 36' 55"

0 2000 4000
SCALE IN METERS

N

DESIGN DESIGNATION

Current A.D.T. (1995)	7180
Design A.D.T. (2015)	9350
D.H.V. (2015)	935
Directional Distribution	55%
Trucks (24 Hour B & C)	25%
Design Speed	90 km/h
Legal Speed	55 mph (89 km/h)

Design Functional Classification = Divided Arterial (Rural)

DESIGN EXCEPTIONS

Design Feature	Approval Dates	Sheet Numbers
Shoulder Width	October 24, 1995	4–7
Bridge Width	October 24, 1995	50, 54, 58, 60

UNDERGROUND UTILITIES

TWO WORKING DAYS
BEFORE YOU DIG
Call 800–362–2764 (Toll free)
OHIO UTILITIES PROTECTION SERVICE

NON–MEMBERS
MUST BE CALLED DIRECTLY

Plan Prepared By:
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD, SUITE D
AKRON, OHIO 44321–1698

INDEX OF SHEETS

ENGINEERS SEAL:
FOR ENTIRE PLAN AND BRIDGE NO'S. JEF-7-38769 & JEF-7-40478.
STATE OF OHIO JOSEPH E. UNDERWOOD E-49877 REGISTERED PROFESSIONAL ENGINEER
SIGNED: Joseph E. Underwood
DATE: 11-28-99

ENGINEERS SEAL:
FOR BRIDGE NO'S. JEF-7-41877 & JEF-7-42630.
STATE OF OHIO THOMAS D.Y. FOX 24579 REGISTERED PROFESSIONAL ENGINEER
SIGNED: Thomas D.Y. Fox
DATE: 2-6-99

ENGINEERS SEAL:
FOR REVISIONS ON SHEET NO'S. 1, 4, 11, 13, 30, 31, 37, 38, 39, 45, 60, AND 65.
STATE OF OHIO SCOTT HARLEN GANYARD 52767 REGISTERED PROFESSIONAL ENGINEER
SIGNED: Scott H. Ganyard
DATE: 1-26-99

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

										SUPPLEMENTAL SPECIFICATIONS	
AS–1–81M	10–25–94	GR–1.1M	10–21–97	~~EXJ–4–87M~~	~~3–20–95~~	TC–52.10M	7–29–94	MT–95.30M	4–25–94	845	7–17–95
BR–1M	1–6–99	GR–1.2M	1–3–96	PCB–9/M	3–20–95	TC–52.20M	7–29–94	MT–95.70M	1–30–95		
BP–2.1M	4–8–97	GR–1.3M	11–30–94	RM–1.1M	4–8–97	TC–61.10M	3–31–94	MT–98.12M	6–24–93		
BP–2.4M	10–28–94	GR–2.1M	4–14–98	RM–4.1M	10–21–97	TC–65.10M	11–1–95	MT–98.13M	6–24–93	806	9–9–97
BP–2.5M	4–8–97	GR–3.1M	10–21–97	RM–4.2M	10–21–97	TC–65.11M	11–1–95	MT–98.14M	6–24–93		
BP–3.1M	10–28–94	GR–3.2M	10–21–97	RM–4.3M	10–21–97	TC–65.12M	11–1–95	MT–98.15M	6–24–93		
BP–6.1M	10–28–94	GR–4.1M	11–30–94					MT–98.16M	6–24–93	842	1–6–99
		GR–4.2M	10–21–97	TC–41.20M	7–1–94	TC–71.10M	9–1–93	MT–99.20M	1–30–95		
DM–1.1M	10–21–97	GR–5.3M	11–30–94	TC–41.50M	7–1–94	TC–72.20M	9–1–93	MT–100.00M	4–25–94	899	10–21–98
DM–1.2M	10–21–97			TC–42.10M	3–31–94			MT–105.10M	4–25–94		
DM–4.3M	6–30–95	I–2.2M	9–6–95	TC–42.20M	3–31–94			MT–105.11M	4–25–94		
DM–4.4M	6–30–95			TC–51.11M	9–30–94						

metric units

PROJECT DESCRIPTION

Improvement of 5.76 kilometers of S.R. 7 in Island Creek and Knox Townships, Jefferson County by resurfacing existing roadway, ramps, and bridges including upgrading of guardrail, signing, pavement markings and new concrete median barriers.

LIMITED ACCESS

This improvement is especially designed for through traffic and has been declared a Limited Access Highway or Freeway by action of the Director in accordance with the provisions of Section 5511.02 of the Revised Code of Ohio.

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 not require the closing to traffic of the highway and that provisions for the maintenance and safety of traffic will be as set forth on the on the plans and estimates.

Under Authority of Section 4511.21 Division (1) of the Revised Code of Ohio, the revised Prima Facie Speed Limits as indicated herein are determined to be reasonable and safe, and are hereby established for the duration of this project. The Prima Facie Speed Limit or Limits hereby established shall become effective when appropriate signs giving notice thereof are erected.

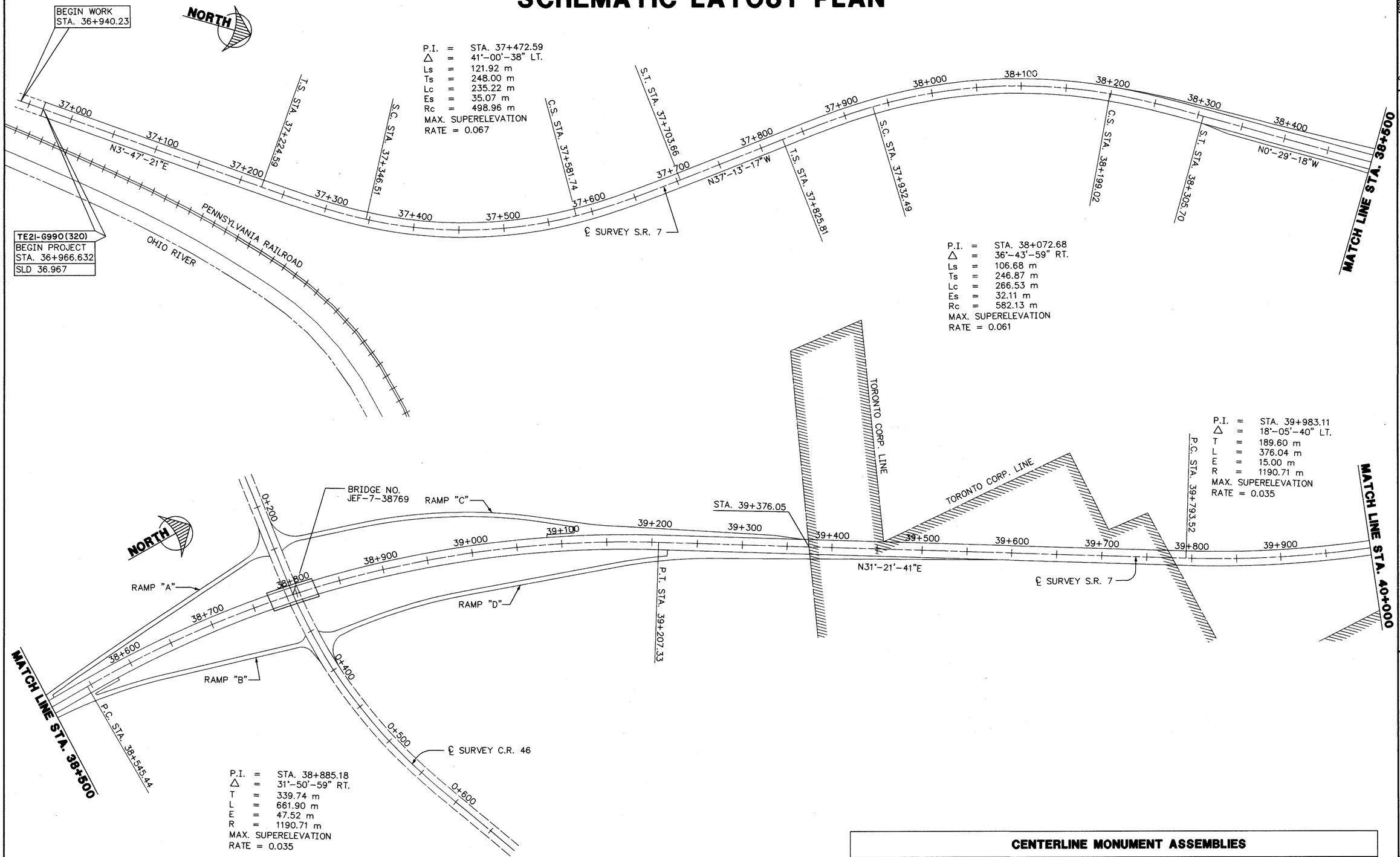
Approved Michael D. Cope /SJB
Date 2/9/99 District Deputy Director

Approved Gordon Proctor /SJB
Date 3-10-99 Director, Department of Transportation

FEDERAL PROJECT NO. TE21-G990(320)
PID NO. 11349
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
JEF-7-36.967
1 / 123

JEF-7-36.967
990399
DIST. 11
05-26-99
PID# 11349

SCHEMATIC LAYOUT PLAN



CENTERLINE MONUMENT ASSEMBLIES

SEE GENERAL NOTES, SHEET NO. 12 FOR LOCATIONS OF EXISTING CENTERLINE MONUMENT ASSEMBLIES AND STATIONS AND OFFSETS FOR PROPOSED MONUMENT ASSEMBLIES.

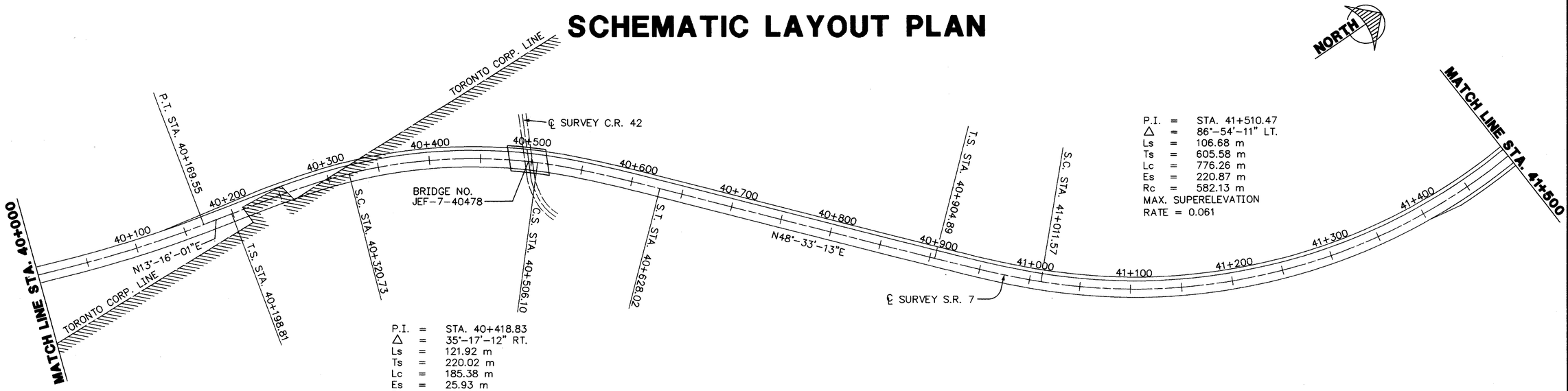
CALCULATED T.D.D.
CHECKED J.E.U.

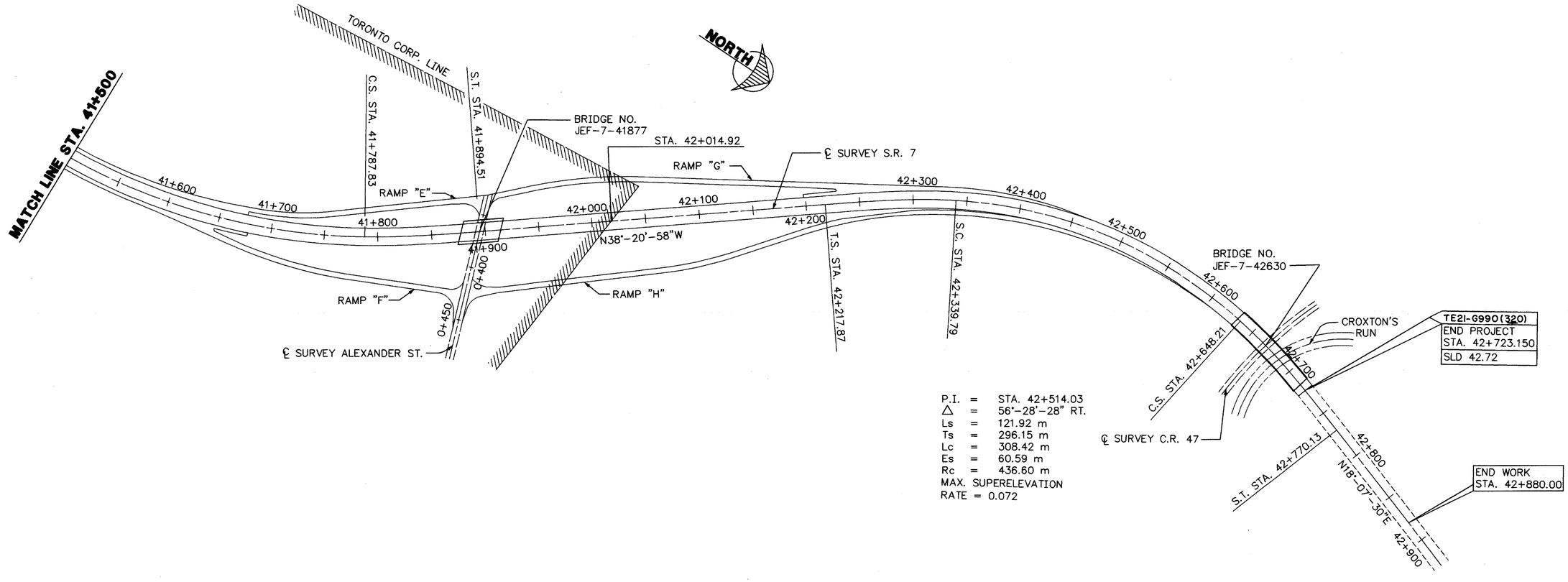
HORIZONTAL SCALE IN METERS
0 2000 4000

SCHEMATIC LAYOUT PLAN

JEF-7-36.967

SCHEMATIC LAYOUT PLAN



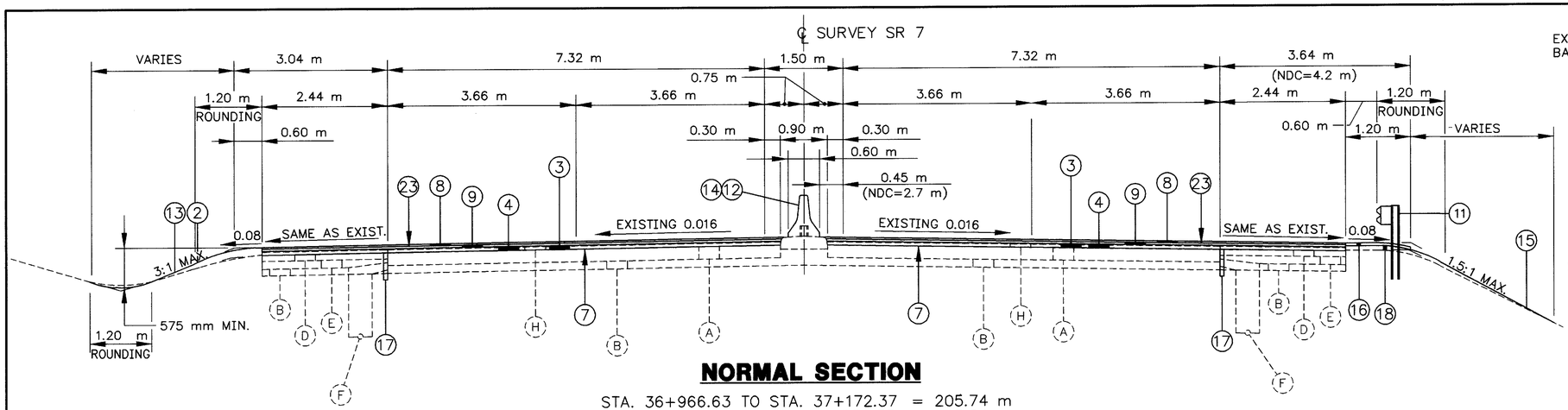


CALCULATED T.D.D.
CHECKED J.E.U.

0 2000 4000
HORIZONTAL SCALE IN METERS

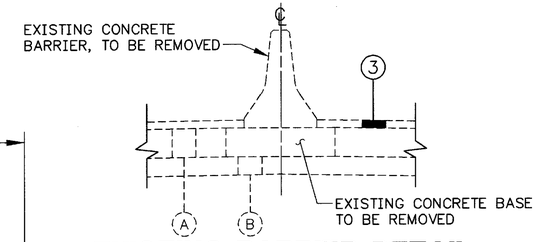
SCHEMATIC LAYOUT PLAN

JEF-7-96.967



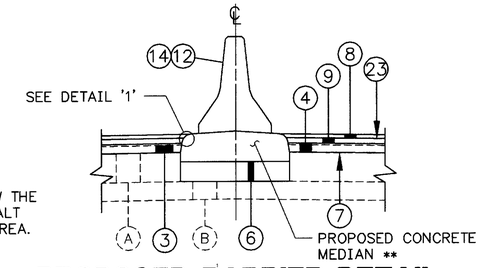
NORMAL SECTION

STA. 36+966.63 TO STA. 37+172.37 = 205.74 m
STA. 37+759.11 TO STA. 37+774.35 = 15.24 m
STA. 38+345.85 TO STA. 38+490.63 = 144.78 m
STA. 39+275.49 TO STA. 39+740.31 = 464.82 m
STA. 41+927.26 TO STA. 42+171.10 = 243.84 m
TOTAL LENGTH = 1074.42 m



EXISTING BARRIER DETAIL

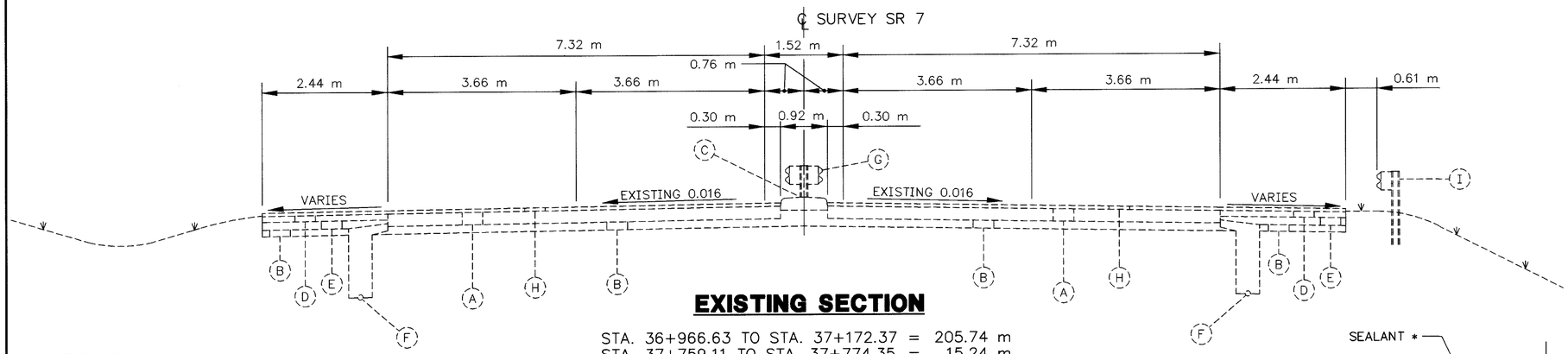
STA. 36+940.23 TO STA. 37+167.20 = 226.97 m



** THE HEIGHT OF THE PROPOSED CONCRETE MEDIAN SHALL FOLLOW THE HEIGHT OF THE PROPOSED ASPHALT OVERLAY WITHIN THE FEATHER AREA.

PROPOSED BARRIER DETAIL

STA. 36+940.23 TO STA. 37+167.20 = 226.97 m



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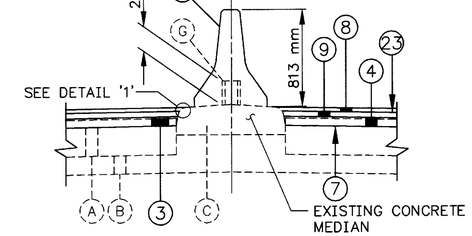
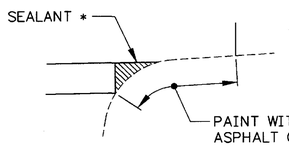


CONCRETE BARRIER, TYPE A, AS PER PLAN 'A'



* INCLUDED IN THE COST OF THE 446 SURFACE COURSE

LEGEND:

(1) ITEM 203 SUBGRADE COMPACTION
(2) ITEM 203 LINEAR GRADING, METHOD A
(3) ITEM 202 WEARING COURSE REMOVED (64 mm NOMINAL THICKNESS)
(4) ITEM 301 75 mm BITUMINOUS AGGREGATE BASE, PG 64-22
(5) ITEM 301 150 mm BITUMINOUS AGGREGATE BASE, PG 64-22
(6) ITEM 304 AGGREGATE BASE
(7) ITEM 407 TACK COAT
(8) ITEM 446 32 mm ASPHALT CONCRETE SURFACE COURSE, TYPE 1H , AS PER PLAN
(9) ITEM 446 45 mm ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG 64-28
(10) ITEM 605 150 mm SHALLOW PIPE UNDERDRAIN, 707.31
(11) ITEM 606 GUARDRAIL, TYPE 5
(12) ITEM 622 CONCRETE BARRIER, TYPE A, AS PER PLAN 'A'
(13) ITEM 659 SEEDING & MULCHING, AND WATER
(14) ITEM SPECIAL SEALING OF CONCRETE SURFACES (EPOXY)
(15) ITEM 670 SLOPE EROSION PROTECTION
(16) ITEM 448 50 mm ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER GUARDRAIL) AS PER PLAN
(17) ITEM 605 SHALLOW UNDERDRAIN
(18) ITEM 203 LINEAR GRADING, METHOD B
(19) ITEM 611 REINFORCED CONCRETE APPROACH SLAB, (T= 380 mm), AS PER PLAN
(20) ITEM 622 CONCRETE BARRIER, TYPE A, AS PER PLAN 'B' (SEE SHEET 66 FOR DETAILS)
(21) ITEM 622 CONCRETE BARRIER, TYPE A
(22) LONGITUDINAL PAVEMENT JOINT AS PER STD. CONST. DWG. BP-2.1M.
(23) ITEM 407 TACK COAT FOR INTERMEDIATE COURSE

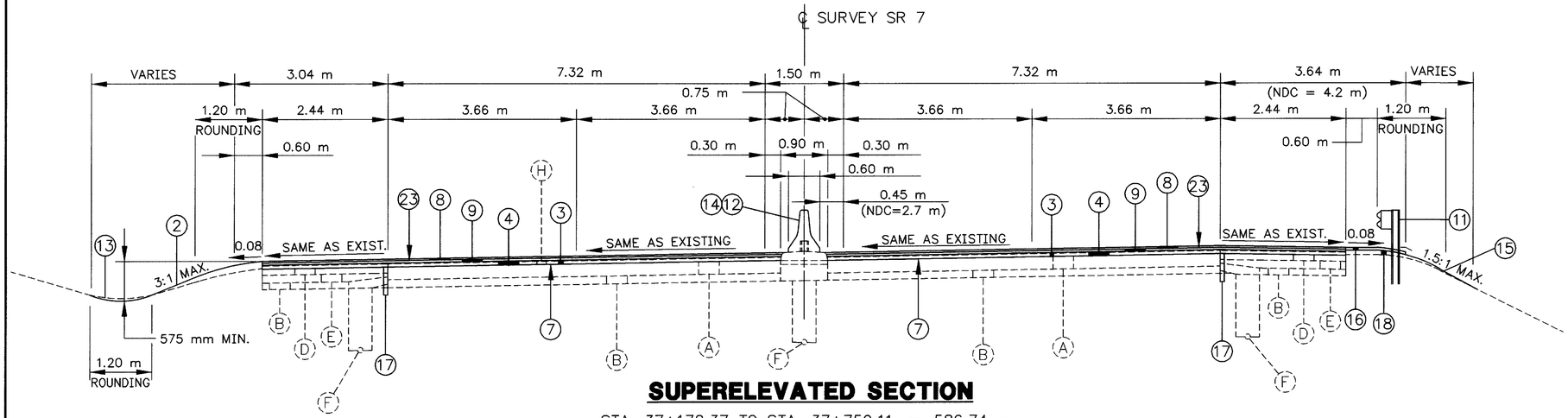
DETAIL '1'

(A) EXISTING REINFORCED CONCRETE PAVEMENT
(B) EXISTING SUBBASE
(C) EXISTING CONCRETE MEDIAN, TO REMAIN
(D) EXISTING BITUMINOUS AGGREGATE BASE
(E) EXISTING AGGREGATE BASE
(F) EXISTING 150 mm UNDERDRAIN (TO REMAIN AND FUNCTION)
(G) EXISTING TYPE 5 GUARDRAIL, BARRIER DESIGN, PORTION TO BE REMOVED
(H) EXISTING ASPHALT CONCRETE (64 mm±)
(I) EXISTING TYPE 5 GUARDRAIL, TO BE REMOVED

CALCULATED T.D.D.
CHECKED J.E.U.

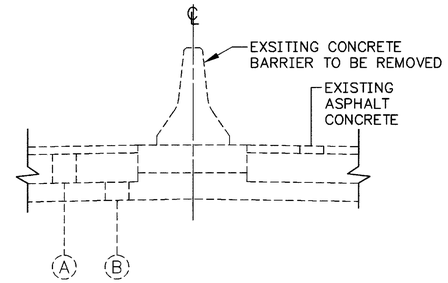
TYPICAL SECTIONS

JEF-7-36.967



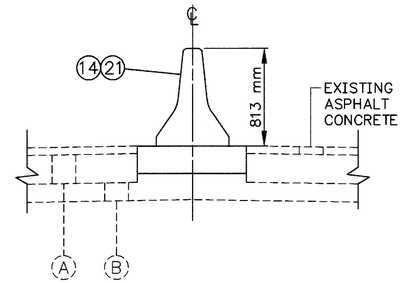
SUPERELEVATED SECTION

STA. 37+172.37 TO STA. 37+759.11	=	586.74 m
STA. 37+774.35 TO STA. 38+345.85	=	571.50 m
STA. 38+490.63 TO STA. 38+761.84	=	271.21 m
STA. 38+829.63 TO STA. 39+275.49	=	445.86 m
STA. 39+740.31 TO STA. 40+227.99	=	487.68 m
STA. 41+517.30 TO STA. 41+869.50	=	352.20 m
STA. 41+920.89 TO STA. 41+927.25	=	6.36 m
STA. 42+171.10 TO STA. 42+622.73	=	451.63 m
TOTAL LENGTH	=	3173.18 m



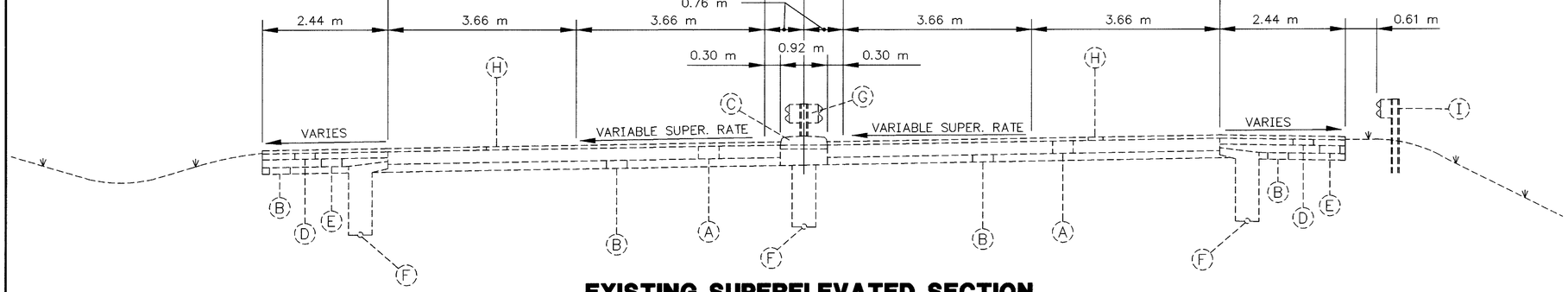
EXISTING BARRIER DETAIL

STA. 42+730.77 TO STA. 42+742.15	=	11.38 m
STA. 42+770.00 TO STA. 42+880.00	=	110.00 m
TOTAL LENGTH	=	121.38 m



PROPOSED BARRIER DETAIL

STA. 42+723.15 TO STA. 42+742.15	=	19.00 m
STA. 42+770.00 TO STA. 42+880.00	=	110.00 m
TOTAL LENGTH	=	129.00 m



FOR LEGEND, SEE SHEET 4/123

EXISTING SUPERELEVATED SECTION

STA. 37+172.37 TO STA. 37+759.11	=	586.74 m
STA. 37+774.35 TO STA. 38+345.85	=	571.50 m
STA. 38+490.63 TO STA. 38+761.84	=	271.21 m
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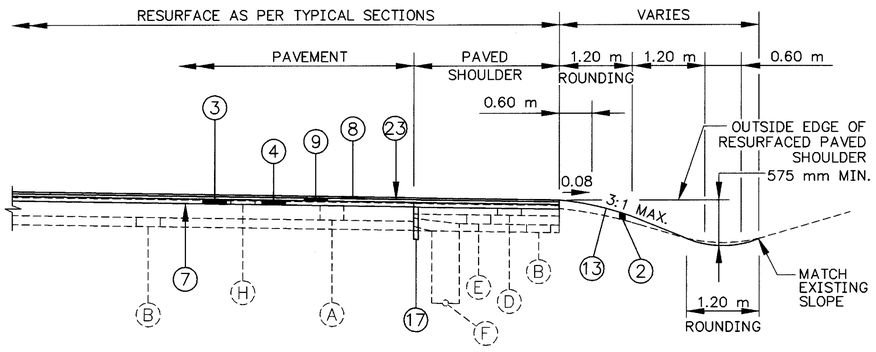
STA. 39+740.31 TO STA. 40+227.99	=	487.68 m
STA. 41+517.30 TO STA. 41+869.50	=	352.20 m
STA. 41+920.89 TO STA. 41+927.25	=	6.36 m
STA. 42+171.10 TO STA. 42+622.73	=	451.63 m
TOTAL LENGTH	=	3173.18 m

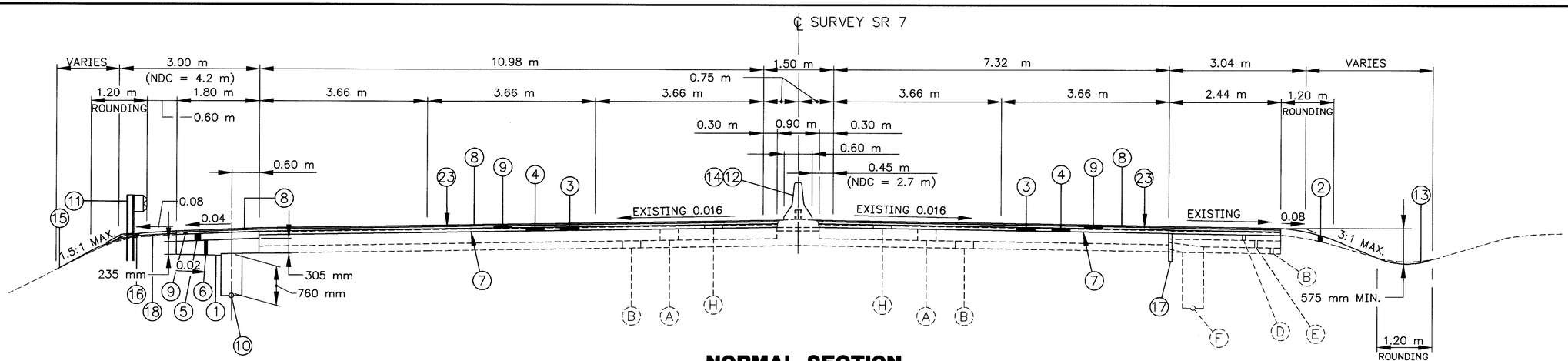


LINEAR GRADING & DITCH CLEANOUT DETAIL

CALCULATED T.D.D.
CHECKED J.E.U.

TYPICAL SECTIONS

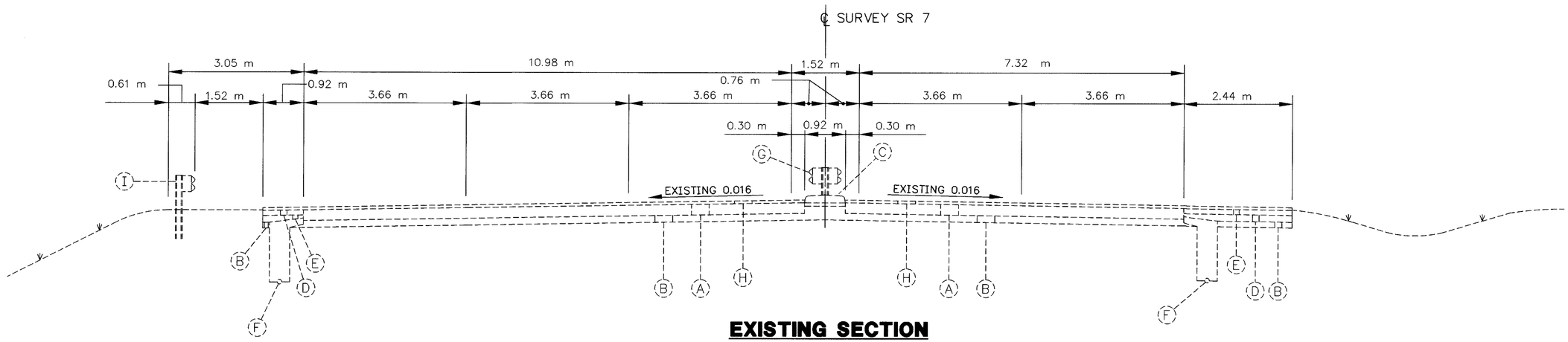
JEF-7-36.967



NORMAL SECTION

STA. 40+662.33 TO STA. 40+860.45 = 198.12 m

TOTAL LENGTH = 198.12 m

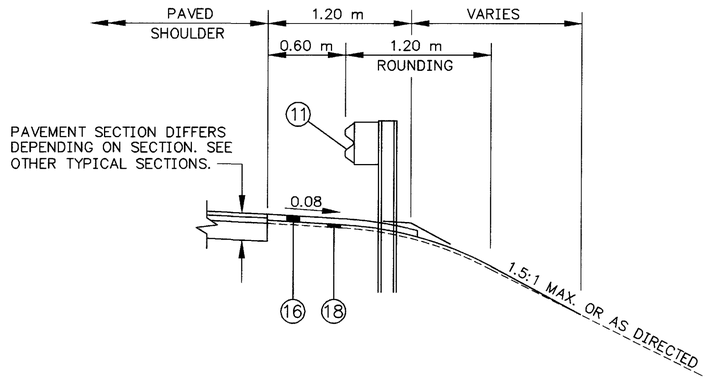


EXISTING SECTION

STA. 40+662.33 TO STA. 40+860.45 = 198.12 m

TOTAL LENGTH = 198.12 m

FOR LEGEND, SEE SHEET 4/123

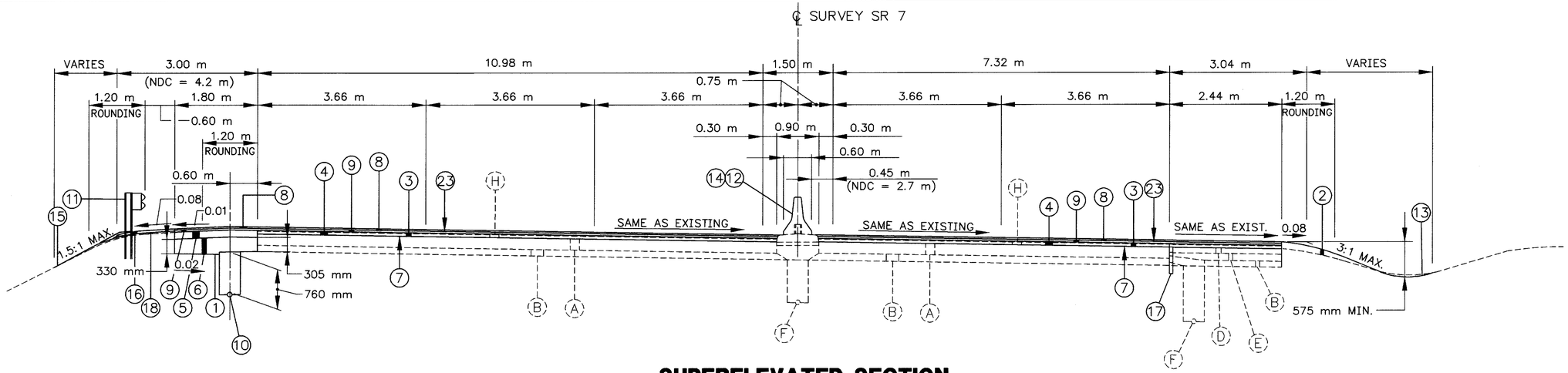


ASPHALT PAVING AND ROUNDING DETAIL

CALCULATED T.D.D.
CHECKED J.E.U.

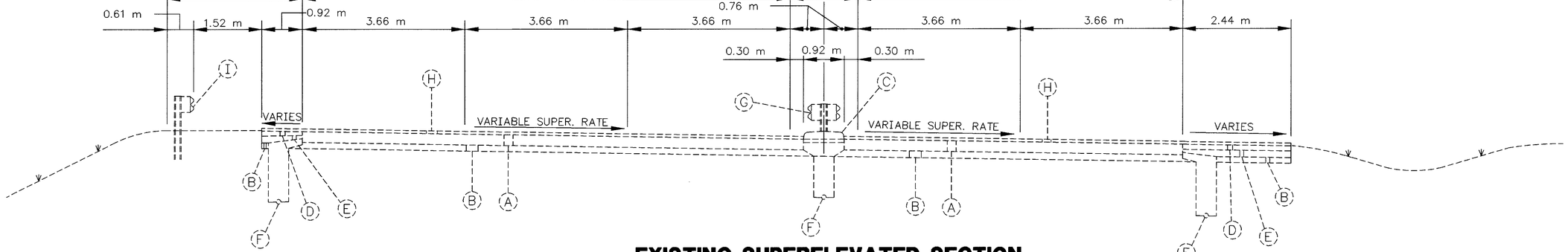
TYPICAL SECTIONS

JEF-7-36.967



SUPERELEVATED SECTION

STA. 40+227.99 TO STA. 40+470.63 = 242.64 m
STA. 40+523.83 TO STA. 40+662.33 = 138.50 m
STA. 40+860.45 TO STA. 41+517.30 = 656.85 m
TOTAL LENGTH = 1037.99 m



EXISTING SUPERELEVATED SECTION

STA. 40+227.99 TO STA. 40+470.63 = 242.64 m
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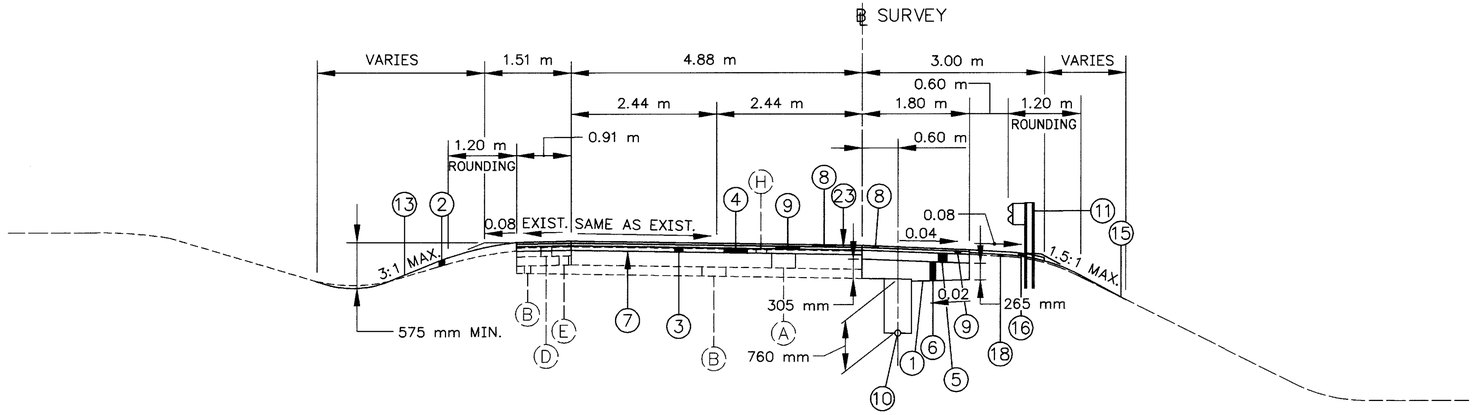
FOR LEGEND, SEE SHEET 4/123

CALCULATED T.D.D.
CHECKED J.E.U.

TYPICAL SECTIONS

JEF-7-36.967

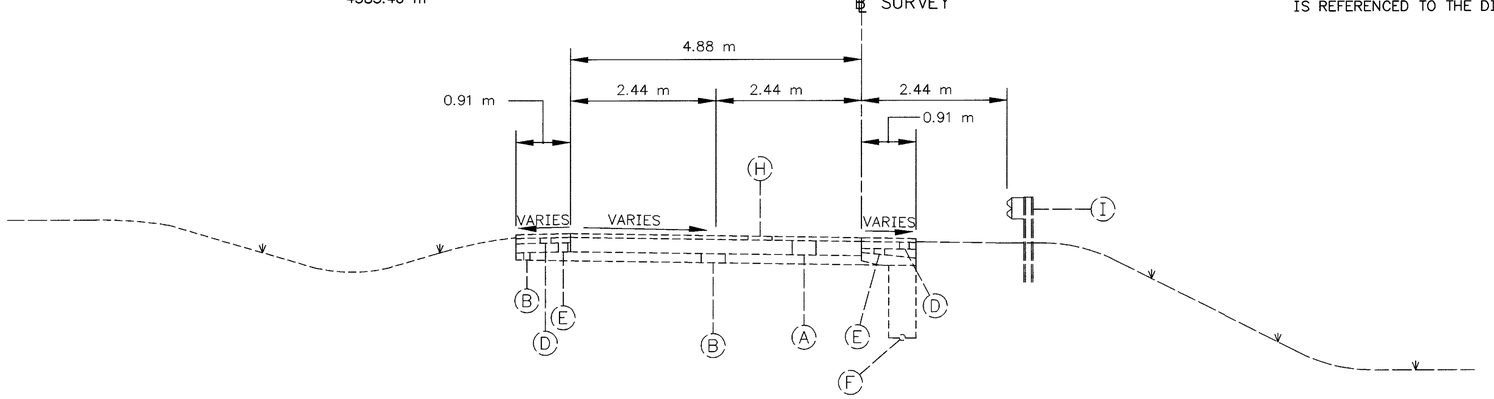


RAMP SECTION

RAMP LIMITING STATIONS

RAMP A – STA. 0+000 TO STA. 0+590.25	=	590.25 m
RAMP B – STA. 0+000 TO STA. 0+486.35	=	486.35 m
RAMP C – STA. 0+007.43 TO STA. 0+592.03	=	584.60 m
RAMP D – STA. 0+007.66 TO STA. 0+772.75	=	765.09 m
RAMP E – STA. 41+517.30 TO STA. 41+895.73	=	378.43 m
RAMP F – STA. 41+404.31 TO STA. 41+889.95	=	485.64 m
RAMP G – STA. 41+905.71 TO STA. 42+472.44	=	566.73 m
RAMP H – STA. 41+877.07 TO STA. 42+605.44	=	728.37 m
		4585.46 m

NOTE: LEFT AND RIGHT SIDE CONFIGURATION ON RAMPS IS REFERENCED TO THE DIRECTION OF TRAVEL.



EXISTING RAMP SECTION

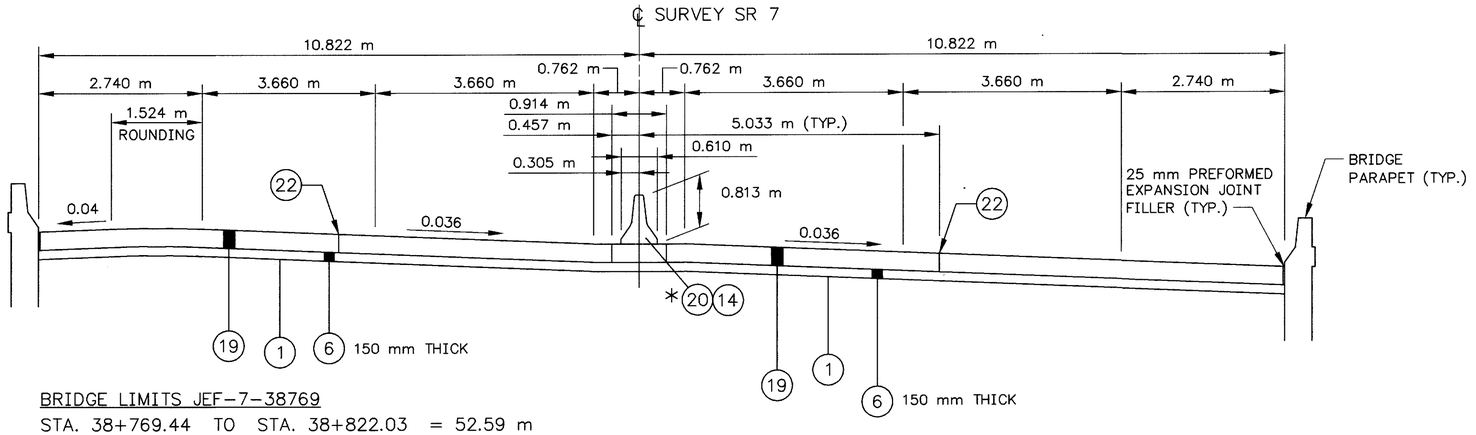
FOR LEGEND, SEE SHEET 4/123

CALCULATED T.D.D.
CHECKED J.E.U.

TYPICAL SECTIONS

JEF-7-36.967

8
123

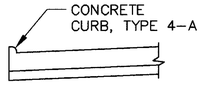


BRIDGE LIMITS JEF-7-38769
STA. 38+769.44 TO STA. 38+822.03 = 52.59 m

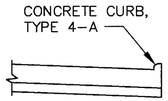
SUPERELEVATED APPROACH SLAB SECTION

STA. 38+761.84 TO STA. 38+769.44 = 7.60 m
STA. 38+822.03 TO STA. 38+829.63 = 7.60 m
15.20 m

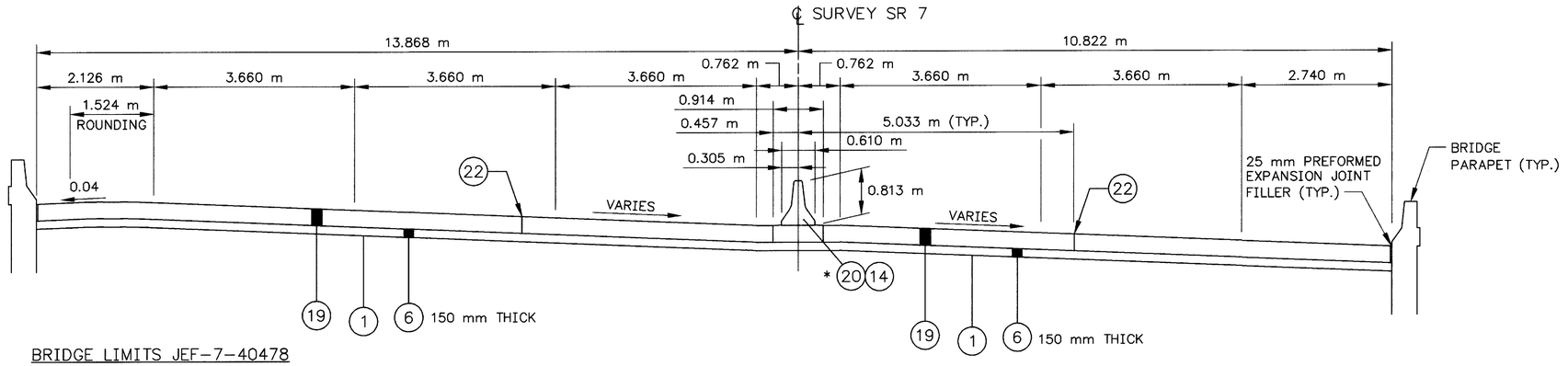
* MEDIAN CONCRETE BARRIER TO TRANSITION ACROSS THE FULL LENGTH OF THE APPROACH SLAB. SEE SHEET 66 FOR ADDITIONAL DETAILS.



TYPICAL SECTION WITH CURB



TYPICAL SECTION WITH CURB



BRIDGE LIMITS JEF-7-40478
STA. 40+478.23 TO STA. 40+516.23 = 38.00 m

SUPERELEVATED APPROACH SLAB SECTION

STA. 40+470.63 TO STA. 40+478.23 = 7.60 m
STA. 40+516.23 TO STA. 40+523.83 = 7.60 m
15.20 m

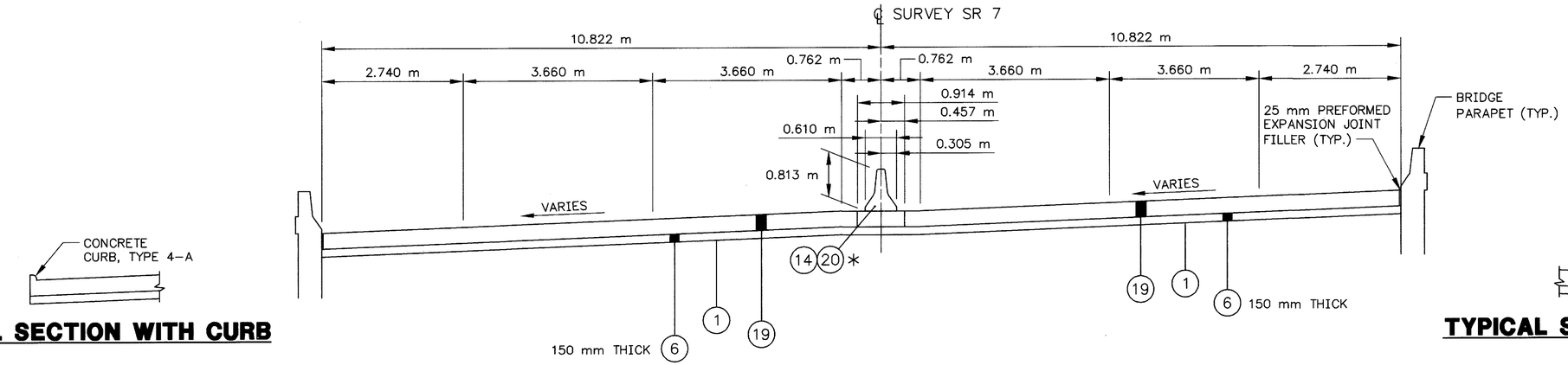
FOR LEGEND, SEE SHEET 4/123

NOTES:
1. TRANSITION CURB ON APPROACH SLAB FROM 100 mm AT THE END OF THE DEFLECTOR PARAPETS TO 0 mm AT THE END OF THE APPROACH SLABS.
2. FOR ADDITIONAL APPROACH SLAB DETAILS SEE STANDARD CONSTRUCTION DRAWING AS-1-81M.
3. FOR PLACEMENT OF THE LONGITUDINAL CONSTRUCTION JOINT IN THE APPROACH SLAB SEE THE MAINTENANCE OF TRAFFIC SECTIONS OF THE BRIDGE PLANS FOR BRIDGE NO'S. JEF-7-38769 AND JEF-7-40478.

CALCULATED T.D.D.
CHECKED J.E.U.

TYPICAL SECTIONS

JEF 7-36.967



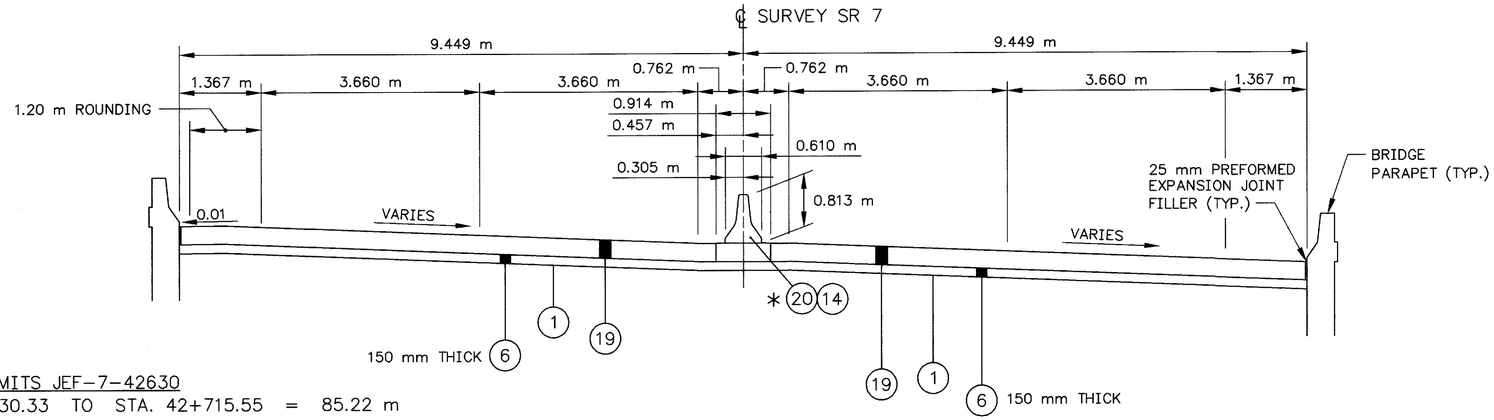
TYPICAL SECTION WITH CURB

TYPICAL SECTION WITH CURB

BRIDGE LIMITS JEF–7–41877
STA. 41+877.10 TO STA. 41+913.29 = 36.19 m

SUPERELEVATED APPROACH SLAB SECTION

STA. 41+869.50 TO STA. 41+877.10 = 7.60 m
STA. 41+913.29 TO STA. 41+920.89 = 7.60 m
15.20 m



BRIDGE LIMITS JEF–7–42630
STA. 42+630.33 TO STA. 42+715.55 = 85.22 m

SUPERELEVATED APPROACH SLAB SECTION

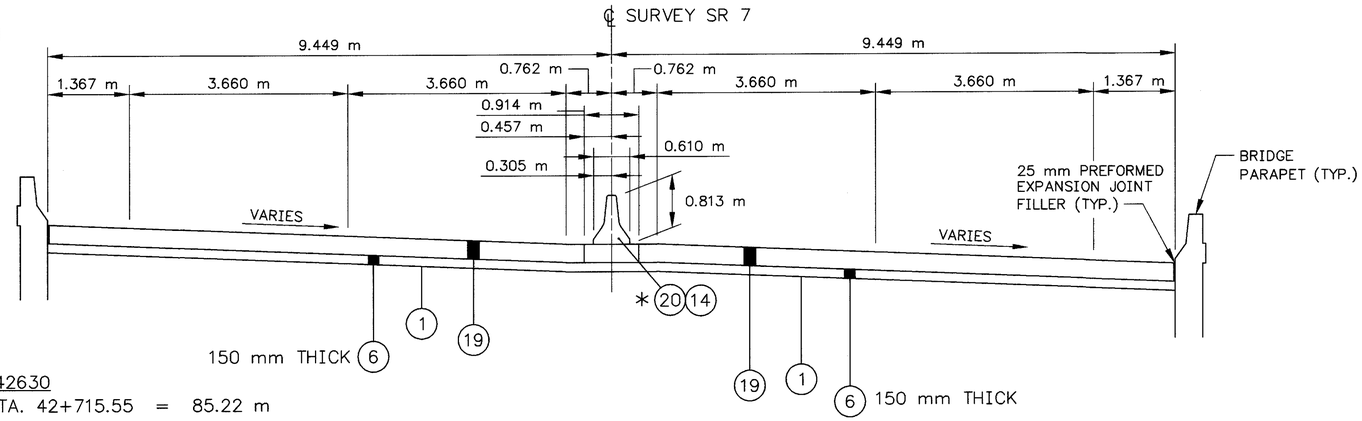
STA. 42+622.73 TO STA. 42+630.33 = 7.60 m
7.60 m

* MEDIAN CONCRETE BARRIER TO TRANSITION ACROSS THE FULL LENGTH OF THE APPROACH SLAB. SEE SHEET 66 FOR ADDITIONAL DETAILS.

FOR LEGEND, SEE SHEET 4/123

NOTES: 1. TRANSITION CURB ON APPROACH SLABS FROM 100 mm AT THE END OF THE DEFLECTOR PARAPETS TO 0 mm AT THE END OF THE APPROACH SLABS.

2. FOR ADDITIONAL APPROACH SLAB DETAILS SEE STANDARD CONSTRUCTION DRAWING AS–1–81M.



BRIDGE LIMITS JEF–7–42630
STA. 42+630.33 TO STA. 42+715.55 = 85.22 m

SUPERELEVATED APPROACH SLAB SECTION

STA. 42+715.55 TO STA. 42+723.15 = 7.60 m
7.60 m

CALCULATED T.D.D.
CHECKED J.E.U.

TYPICAL SECTIONS

JEF 7-36.967

PREVIOUS CONSTRUCTION PLANS:

THE FOLLOWING CONSTRUCTION PLANS ARE AVAILABLE FOR REFERENCE BY CONTACTING THE DISTRICT 11 OFFICE IN NEW PHILADELPHIA, OHIO:

JEF-7-23.00	FENCE RECONSTRUCTION	1992
JEF-7-22.97	UPGRADING PLAN	1985
JEF-7-23.37	ORIGINAL CONSTRUCTION PLAN	1967

PART-WIDTH CONSTRUCTION:

BECAUSE OF THE NECESSITY TO BUILD THIS PROJECT UNDER TRAFFIC, AND CONSTRUCT THE FULL PAVEMENT WIDTH IN STAGES, EXTREME CARE SHALL BE TAKEN TO PREVENT THE CONSTRUCTION OF A BUTT JOINT IN THE BASE COURSES. LONGITUDINAL JOINTS SHALL BE LAPPED AS SHOWN ON STANDARD CONSTRUCTION DRAWING BP-3.1M.

ELEVATION DATUM:

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM.

CONTINGENCY QUANTITIES:

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR PLAN ITEMS SET UP TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED AT THE ENGINEER'S DISCRETION SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

GUARDRAIL REPLACEMENT:

NO HAZARD SHALL BE LEFT UNPROTECTED EXCEPT FOR THE ACTUAL TIME NECESSARY TO REMOVE, GRADE, AND REINSTALL GUARDRAIL IN A CONTINUOUS OPERATION. THE REMOVAL OF ALL GUARDRAIL SHALL, AT ALL TIMES, BE AS DIRECTED BY THE ENGINEER. NO GUARDRAIL SHALL BE REMOVED UNTIL THE REPLACEMENT MATERIAL IS ON THE SITE, READY FOR INSTALLATION. FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL BE DEEMED SUFFICIENT CAUSE TO ORDER WORK SUSPENDED ON THIS PROJECT UNTIL SUCH TIME THE ENGINEER IS ASSURED OF SAID COMPLIANCE.

CONNECTION BETWEEN EXISTING AND PROPOSED GUARDRAIL:

WHEN IT IS NECESSARY TO SPLICE PROPOSED GUARDRAIL TO EXISTING GUARDRAIL, ONLY THE EXISTING GUARDRAIL SHALL BE CUT, DRILLED, OR PUNCHED. THE CONNECTION SHALL BE MADE USING A "W-BEAM RAIL SPLICE" AS SHOWN ON STANDARD CONSTRUCTION DRAWING GR-1.1M. PAYMENT SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE RESPECTIVE GUARDRAIL ITEMS.

SEEDING:

QUANTITIES FOR SEEDING ARE CALCULATED FOR SOIL AREAS BETWEEN THE WORK LIMITS, AS SHOWN ON THE TYPICAL SECTIONS.

WATERING PERMANENT SEEDED AREAS:

THE FOLLOWING ESTIMATED QUANTITY IS TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH AND TO CARE FOR PERMANENT SEEDED AREAS PER 659.09:

ITEM 659, WATER 331 CU. METER

EROSION CONTROL:

ITEMS 601 AND 670 ARE PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE THESE ITEMS. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES OF THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION. IN ADDITION, THESE ITEMS SHALL MEET THE REQUIREMENT OF 108.04.

EROSION CORRECTION:

THE FOLLOWING QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY, TO BE USED AS DIRECTED BY THE ENGINEER, FOR FILLING IN THE ERODED AREAS AT THE REAR AND FORWARD ABUTMENT SLOPES OF BRIDGE NO. JEF-7-42630. EMBANKMENT SHALL BE PLACED BEFORE THE 601 CRUSHED AGGREGATE SLOPE PROTECTION AT THE REAR ABUTMENT SLOPE.

ITEM 203, EMBANKMENT 123 CU. METER

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 446, ASPHALT CONCRETE SURFACE COURSE, TYPE 1H , AS PER PLAN:

MATERIALS FURNISHED FOR FINE AND COURSE AGGREGATES USED IN THIS ITEM SHALL EXCLUDE ALL STONE AND CRUSHED CARBONATE STONE.

CLEARING AND GRUBBING:

ALTHOUGH THERE ARE NO TRESS AND/OR STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE LIMITS OF THIS PROJECT, A LUMP SUM QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR ITEM 201, CLEARING AND GRUBBING. ALL PROVISIONS AS SET FORTH IN THE SPECIFICATIONS UNDER THIS ITEM SHALL BE FOLLOWED AND ALL COST SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

UNDERGROUND UTILITIES:

THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 ORC.

UTILITY OWNERSHIP:

THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT.

1. AMERITECH
   150 E. GAY STREET
   ROOM 6C
   COLUMBUS, OHIO 43215
   ATTN: KAREN KNISLEY
   PH.# (614) 454-3455
2. COLUMBIA GAS TRANSMISSION CORP.
   CORK BOCKTOWN ROAD
   RT. 1, BOX 96C
   CLINTON, PA 15026
   ATTN: DAVE NARIGON
   PH.# (412) 899-3814
3. COLUMBIA GAS OF OHIO
   300 LURAY DRIVE
   P.O. BOX 2160
   WINTERSVILLE, OHIO 43952
   ATTN: PHILLIP HUNTER
   PH.# (614) 264-5577
4. TORONTO WATER DEPARTMENT
   308 NORTH SIXTH STREET
   TORONTO, OHIO 43964
   ATTN: GEORGE WISE
   PH.# (614) 537-2591
5. OHIO DEPARTMENT OF TRANSPORTATION
   HIGHWAY LIGHTING DEPARTMENT
   2201 REISER AVE. S.W.
   NEW PHILADELPHIA, OHIO 44663-1000
   ATTN: ROADWAY SERVICES MANAGER
   PH.# (330) 339-6633
6. OHIO POWER COMPANY
   215 NORTH FRONT STREET
   COLUMBUS, OHIO 43215-2291
   ATTN: STANLEY E. WILSON
   PH.# (614) 464-7700
7. JEFFERSON COUNTY CABLE
   16 SOUTH FOURTH STREET
   TORONTO, OHIO 43964
   ATTN: DAVID BATES
   PH.# (614) 537-2214

ITEM SPECIAL, SEALING OF CONCRETE SURFACES (EPOXY)

AN EPOXY CONCRETE SEALER SHALL BE APPLIED TO THE PROPOSED 622 TYPE A CONCRETE BARRIER AS SHOWN IN THE TYPICAL SECTIONS:

THE SEALING OPERATIONS SHALL BE COMPLETED PRIOR TO MOUNTING THE 626 BARRIER REFLECTORS.

REFER TO THE PROPOSAL NOTE FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS, AND APPLICATION PROCEDURES.

THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY TO SEAL THE CONCRETE SURFACES AS SPECIFIED ABOVE:

ITEM SPECIAL, SEALING OF CONCRETE SURFACES (EPOXY) 10 845 SQ. M.

PAVEMENT REPAIR QUANTITIES:

ALTHOUGH PAVEMENT CORES INDICATE THAT THE EXISTING JOINTS ARE IN GOOD CONDITION, THE ENGINEER SHALL INSPECT THE MAINLINE AND RAMP PAVEMENTS AFTER THE CONTRACTOR HAS REMOVED THE ASPHALT WEARING COURSE TO DECIDE WHETHER ANY JOINTS OR MID-SLAB CRACKS NEED TO BE REPAIRED.

THE CONTRACTOR SHALL REPAIR JOINTS OR CRACKS AT THE LOCATIONS DESIGNATED BY THE ENGINEER, PER SECTION 255 AND THE DETAILS ON SHEET NO. 68.

THE FOLLOWING QUANTITIES, TO BE USED AS DIRECTED BY THE ENGINEER, HAVE BEEN CARRIED TO THE GENERAL SUMMARY FOR PAVEMENT REPAIR:

ITEM 255, FULL DEPTH PAVEMENT SAWING	7332	METER
ITEM 255, FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS C	5359	SQ. METER

THE PRECEEDING QUANTITIES, HAVE BEEN BASED ON THE FOLLOWING CALCULATIONS:

MAINLINE:
STA. 36+966.63 TO STA. 42+723.17 = 5756.54 METER
DEDUCT FOR BRIDGES AND APPROACH SLABS:
JEF-7-38769: 52.59 + 2(7.62) = 67.83 METER
JEF-7-40478: 38.00 + 2(7.62) = 53.24 METER
JEF-7-41877: 36.18 + 2(7.62) = 51.42 METER
JEF-7-42630: 85.22 + 2(7.62) = 100.46 METER
MAINLINE LENGTH: = 5483.59 METER

MAINLINE AREA:
4 LANES X 3.66 METER X 5483.59 METER = 80279.76 SQ. METER

PAVEMENT REPAIR QUANTITIES (CONTINUED):

MAINLINE TRUCK LANE:
STA. 40+227.99 TO STA. 41+517.30 = 1289.31 METER
DEDUCT FOR BRIDGE AND APPROACH SLABS:
JEF-7-40478: 38.00 + 2(7.62) = 53.24 METER
TRUCK LANE LENGTH: = 1236.07 METER

TRUCK LANE AREA:
1 LANES X 3.66 METER X 1236.07 METER = 4524.02 SQ. METER

TOTAL AREA:
MAINLINE = 80279.76 SQ. METER
TRUCK LANE = 4524.02 SQ. METER
= 84803.78 SQ. METER

FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS C (MAINLINE/TRUCK LANE)
= 84803.78 SQ. METER X 0.05 = 4240.19 SQ. METER

TYPICAL JOINT REPAIR AREA:
WIDTH = 3.66 METER LENGTH = 1.80 METER AREA = 6.59 SQ. METER

NO. OF REPAIRS:
= 4240.19 SQ. METER / 6.59 SQ. METER = 643 REPAIRS

FULL DEPTH PAVEMENT SAWING (MAINLINE/TRUCK LANE)
= 643 REPAIRS X [(2 X 3.66)+1.80] = 5864.16 METER

RAMPS:
RAMP LENGTH (SEE SHEET 8) = 4585.46 METER

RAMP AREA:
= 4.88 METER X 4585.46 METER = 22377.04 SQ. METER

FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS C (RAMPS)
= 22377.04 SQ. METER X 0.05 = 1118.85 SQ. METER

TYPICAL JOINT REPAIR AREA:
WIDTH = 4.88 METER LENGTH = 1.80 METER AREA = 8.78 SQ. METER

NO. OF REPAIRS:
= 1118.85 SQ. METER / 8.78 SQ. METER = 127 REPAIRS

FULL DEPTH PAVEMENT SAWING (RAMPS)
=127 REPAIRS X [(2 X 4.88)+1.80] = 1468.12 METER

PAVING UNDER GUARDRAIL

THIS OPERATION SHALL INCLUDE PREPARATION OF THE GRADED SHOULDER USING ITEM 203, LINEAR GRADING, METHOD B, AND PAVING UNDER THE GUARDRAIL USING ITEM 448, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER GUARDRAIL), AS PER PLAN.

ITEM 203, LINEAR GRADING, METHOD B, SHALL CONSIST OF EXCAVATING TOPSOIL, PLACING GRANULAR MATERIAL, AND APPLYING HERBICIDE AS SPECIFIED IN THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING:

ALL COLLECTED DEBRIS AND TOPSOIL, INCLUDING RHIZOMES, ROOTS, AND OTHER VEGETATIVE PLANT MATERIAL, SHALL BE REMOVED AND DISPOSED OF AS SPECIFIED IN 203.05.

THE REMOVED MATERIAL SHALL BE REPLACED WITH COMPACTABLE GRANULAR MATERIAL CONFORMING TO 203.02 PLACED TO GRADE AS DETAILED ON SHEET NO. 6 OR AS APPROVED BY THE ENGINEER.

HERBICIDE SHALL BE TREFLAN E. C., SPIKE, OR AN APPROVED EQUAL, AND SHALL BE APPLIED TO THE PREPARED AREA AFTER FINAL LEVELING AND GRADING HAS BEEN COMPLETED. THE APPLICATION SHALL BE JUST PRIOR TO PAVING, AND SHALL STRICTLY ADHERE TO THE MANUFACTURER'S INSTRUCTIONS.

ONLY PROPERLY LICENSED PERSONNEL SHALL APPLY HERBICIDES AS REQUIRED BY THE OHIO REVISED CODE.

ALL EQUIPMENT, MATERIALS, AND LABOR REQUIRED TO PREPARE THE GRADED SHOULDER AS OUTLINED ABOVE SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 203, LINEAR GRADING, METHOD B.

PAVING UNDER GUARDRAIL SHALL CONSIST OF PLACING A 50 mm COURSE OF ITEM 448 USING THE FOLLOWING METHOD:

1. PLACE ITEM 448
2. BORE ASPHALT AT POST LOCATIONS (MAY BE OMITTED IF STEEL POSTS ARE USED)
3. SET GUARDRAIL POSTS
4. PATCH AROUND POSTS. THE MATERIALS USED FOR PATCHING SHALL BE A BITUMINOUS CONCRETE APPROVED BY THE ENGINEER. PATCHED AREAS SHALL BE COMPACTED USING EITHER HAND OR MECHANICAL METHODS. FINISHED SURFACES SHALL BE SMOOTH AND SLOPED TO DRAIN AWAY FROM THE POSTS.

ALL EQUIPMENT, MATERIALS, AND LABOR REQUIRED TO PAVE UNDER GUARDRAIL, WITH THE EXCEPTION OF SETTING GUARDRAIL POSTS, SHALL BE INCLUDED IN PAYMENT UNDER ITEM 448, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER GUARDRAIL), AS PER PLAN.

CALCULATED T.D.D.
CHECKED J.E.U.

GENERAL NOTES

JEF-7-30.967

CALCULATED T.D.D.
CHECKED J.E.U.

GENERAL NOTES

ITEM 203, LINEAR GRADING, METHOD A

THIS WORK SHALL INCLUDE THE EXCAVATION AND EMBANKMENT REQUIRED TO GRADE BEYOND THE PAVED SHOULDERS. THE EXCAVATED MATERIAL SHALL BE REPLACED WITH COMPACTABLE GRANULAR MATERIAL CONFORMING TO 203.02, PLACED TO GRADE AS DETAILED ON SHEET NO. 5. VEGETATION, MATERIAL BUILDUP, AND COLLECTED DEBRIS ON THE SHOULDER OR WITHIN THE LINEAR GRADING LIMITS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AS PER 203.05, OR WASTED OVER FILL SLOPES AT THE DIRECTION OF THE ENGINEER. ANY EMBANKMENT PLACED AROUND BREAK-AWAY SIGN SUPPORTS SHALL BE PERFORMED WITHOUT COVERING THE BREAK-AWAY CONNECTIONS. THE GRADED AREA SHALL BE SEEDED PER 659.

THIS ITEM APPLIES TO MAINLINE AND RAMP SHOULDER AREAS WITHOUT PAVING UNDER THE GUARDRAIL.

LINEAR GRADING WIDTHS SHOWN ON THE PLAN REPRESENT MINIMUM REQUIREMENTS, AND THE ENGINEER MAY INCREASE THESE WIDTHS AS DETERMINED BY HIS ANALYSIS OF PROJECT CONDITIONS AT NO ADDITIONAL COST TO THE STATE.

THE METHOD OF MEASUREMENT SHALL BE KILOMETERS AND MEASURED SEPARATELY FOR THE OUTSIDE SHOULDERS ON MAINLINE, AND THE LEFT AND RIGHT SHOULDERS ON EACH RAMP.

PAYMENT FOR THE ABOVE WORK WILL BE MADE AT THE CONTRACT PRICE FOR ITEM 203, KILOMETER, LINEAR GRADING, METHOD A, AND SHALL INCLUDE THE COST OF ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS, AS NECESSARY TO COMPLETE THE WORK.

A QUANTITY OF 10 CUBIC METER OF ITEM 203, BORROW, TO BE USED AS DIRECTED BY THE ENGINEER, HAS BEEN INCLUDED IN THE GENERAL SUMMARY AS PER 203.04(G).

ITEM 203, LINEAR GRADING, (DITCH CLEANOUT)

THIS WORK SHALL INCLUDE THE EXCAVATION AND EMBANKMENT REQUIRED TO RECONSTRUCT TO GRADE THE ROADWAY DITCHES IN CUT SECTIONS AS DETAILED ON SHEET NO. 5. SEEDING AND MULCHING IS REQUIRED ONLY ON A PORTION OF THE GRADED AREA AS SHOWN ON THE DETAIL. COLLECTED DEBRIS ON THE SHOULDER OR WITHIN THE LINEAR GRADING LIMITS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AS PER 203.05, OR WASTED OVER FILL SLOPES AT THE DIRECTION OF THE ENGINEER.

THE ENGINEER SHALL DETERMINE THE NEED FOR THIS ITEM AT EACH LOCATION DURING CONSTRUCTION, AND SHALL NON-PERFORM THIS WORK IN ANY AREAS WHERE IT IS DEEMED UNNECESSARY.

THE METHOD OF MEASUREMENT SHALL BE KILOMETERS AND MEASURED SEPARATELY FOR THE NORTHBOUND AND SOUTHBOUND LANES.

PAYMENT FOR THE ABOVE WORK WILL BE MADE AT THE CONTRACT PRICE FOR ITEM 203, KILOMETER, LINEAR GRADING, (DITCH CLEANOUT) AND SHALL INCLUDE THE COST OF ALL LABOR, MATERIALS, AND INCIDENTALS AS NECESSARY TO COMPLETE THE WORK.

ITEM 611, REINFORCED CONCRETE APPROACH SLAB (T = 380 mm), AS PER PLAN:

THE REINFORCING STEEL FOR THE APPROACH SLABS OF THESE STRUCTURES SHALL BE EPOXY COATED IN CONFORMANCE WITH 509. MATERIALS, LABOR AND INSTALLATION SHALL BE INCLUDED WITH APPROACH SLABS FOR PAYMENT.

MEDIAN AND/OR CURBING ON APPROACH SLABS:

THE SHAPE OF THE MEDIAN AND/OR CURBING ON APPROACH SLABS SHALL BE TRANSITIONED, FROM THE STANDARD SECTION ON THE APPROACHES TO THE SECTION USED ON THE BRIDGE, WITHIN THE LIMITS OF THE APPROACH SLAB.

PROFILE AND ALIGNMENT:

THE PROPOSED PAVEMENT RESURFACING SHALL FOLLOW THE ALIGNMENT AND PROFILE OF THE EXISTING PAVEMENT. PREVIOUS CONSTRUCTION PLANS, PROJECT JEF-7-23.37, SHOWING THE ORIGINAL ALIGNMENT AND PROFILE, ARE AVAILABLE FOR INSPECTION AT THE ODOT DISTRICT 11 OFFICE. THE PROPOSED ASPHALT CONCRETE OVERLAY SHALL BE AS SHOWN ON THE TYPICAL SECTIONS.

ITEM 202, MEDIAN INLET CLEANOUT:

THIS ITEM SHALL CONSIST OF REMOVING ALL FOREIGN MATERIAL, MATERIAL BUILDUP, AND OBSTRUCTIONS FROM THE INSIDE OF EXISTING MEDIAN INLETS.

THE CLEANOUT SHALL BE ACCOMPLISHED BY USING A HIGH PRESSURE WATER JET, VACU-JET, OR ANY OTHER METHOD AS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL DISPOSE OF ALL COLLECTED MATERIAL AND DEBRIS AS PER 203.05.

FOR LOCATIONS AND QUANTITIES, SEE SHEET NO. 29.

PAYMENT FOR THE ABOVE WORK WILL BE MADE AT THE CONTRACT PRICE FOR ITEM 202, EACH, REMOVAL MISC.: MEDIAN INLET CLEANOUT, AND SHALL INCLUDE THE COST OF ALL LABOR, TOOLS, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

ITEM 620, DELINEATOR REMOVED FOR DISPOSAL:

THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY TO REMOVE EXISTING ROADWAY DELINEATORS:

ITEM 620, DELINEATOR REMOVED FOR DISPOSAL 282 EACH

ITEM 622, CONCRETE BARRIER, TYPE A, AS PER PLAN 'A' AND 'B':

ITEM 622, CONCRETE BARRIER, TYPE A, AS PER PLAN 'A' SHALL CONSIST OF POURING THE STANDARD CONCRETE BARRIER, TYPE A SHAPE, WITHOUT THE CONCRETE BASE, ON TOP OF THE EXISTING CONCRETE MEDIAN AS DETAILED ON SHEET 4. SEE STANDARD CONSTRUCTION DRAWING RM-4.3M FOR ADDITIONAL DETAILS.

ITEM 622, CONCRETE BARRIER, TYPE A, AS PER PLAN 'B' SHALL BE AS DETAILED ON SHEET 66. CONCRETE BARRIER, TYPE A, AS PER PLAN 'B' SHALL TRANSITION FROM THE CONCRETE BARRIER, TYPE A, AS PER PLAN 'A' SHAPE TO THE MEDIAN BRIDGE BARRIER SHAPE WITHIN THE LENGTH OF THE APPROACH SLABS.

THE FOLLOWING QUANTITIES, TO BE USED AS DIRECTED BY THE ENGINEER, HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR PATCHING OR REPLACING DETERIORATED CONCRETE MEDIAN:

ITEM 202, CONCRETE MEDIAN REMOVED	100 SQ. M.
ITEM 519, PATCHING CONCRETE STRUCTURE	30 SQ. M.
ITEM 612, CONCRETE MEDIAN	100 SQ. M.

STATION MARKING IN CONCRETE BARRIER:

CENTERLINE STATIONING SHALL BE IMPRESSED IN THE "GREEN" CONCRETE ON BOTH SIDES OF 622 TYPE A CONCRETE BARRIER.

THE STATIONING SHALL BE MARKED AT EVEN 20 METER STATIONS IN THE FORMAT OF XXX+XXX.

PAYMENT FOR THE ABOVE SHALL BE INCIDENTAL TO THE COST OF THE PERTINENT 622 CONCRETE BARRIER ITEMS.

WORK LIMITS:

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

ITEM 202, RAISED PAVEMENT MARKER REMOVED FOR STORAGE, AS PER PLAN:

EXSITING RAISED PAVEMENT MARKERS SHALL BE REMOVED PER SECTION 202.071, EXCEPT THAT THE REQUIREMENT TO FILL THE DEPRESSIONS SHALL BE WAIVED.

THE FOLLOWING QUANTITY OF ITEM 202 - RAISED PAVEMENT MARKER REMOVED FOR STORAGE, AS PER PLAN HAS BEEN CARRIED TO THE GENERAL SUMMARY:

NORTHBOUND LANES	- 240 EACH
SOUTHBOUND LANES	- 240 EACH
SOUTHBOUND TRUCK LANES	- 54 EACH
RAMP A	- 24 EACH
RAMP B	- 27 EACH
RAMP C	- 14 EACH
RAMP D	- 24 EACH
RAMP E	- 25 EACH
RAMP F	- 23 EACH
RAMP G	- 15 EACH
RAMP H	- 19 EACH
TOTAL	705 EACH

ITEM 626 BARRIER REFLECTORS:

SEE THE SUBSUMMARY TABLE ON SHEET NO. 30 FOR LIMITING STATIONS OF BARRIER REFLECTORS, TYPE A.

THE FOLLOWING QUANTITY OF ITEM 626 - BARRIER REFLECTOR, TYPE B HAS BEEN CARRIED TO THE GENERAL SUMMARY FOR THE MEDIAN BARRIER BASED UPON THE FOLLOWING CALCULATIONS.

NORTHBOUND LANES STA. 36+966.63 TO STA. 42+880.00 = 5913.37 METERS
SOUTHBOUND LANES STA. 36+966.63 TO STA. 42+880.00 = 5913.37 METERS

(5913.37 METER/30 METER SPACING) + 1 = 198 EACH X 2 = 396 EACH

ITEM 604 MONUMENT ASSEMBLIES:

EXISTING CENTERLINE MONUMENT ASSEMBLIES ARE LOCATED AT THE FOLLOWING LOCATIONS IN THE EXISTING CONCRETE MEDIAN OF S.R. 7 AND THE CENTERLINE OF INTERSECTING ROADWAYS. THE FOLLOWING TABLE SHOWS THEIR METRIC STATIONING ALONG WITH THEIR ENGLISH EQUIVALENTS.

EXISTING CENTERLINE MONUMENT ASSEMBLIES

JEF-7-36.967

	STATION			STATION	
	METRIC	ENGLISH		METRIC	ENGLISH
P.O.T	37+088.55	1240+00	P.C.	39+793.52	1328+74.56
T.S.	37+224.59	1244+46.35	P.O.C.	39+923.19	1333+00
S.C.	37+346.51	1248+46.35	P.O.C.	40+045.11	1337+00
P.O.C.	37+469.55	1252+50	P.T.	40+169.55	1341+08.27
C.S.	37+581.74	1256+18.08	T.S.	40+198.81	1342+04.25
S.T.	37+703.66	1260+18.08	S.C.	40+320.73	1346+04.25
T.S.	37+825.81	1264+18.84	P.O.C.	40+456.59	1350+50
S.C.	37+932.49	1267+68.84	S.T.	40+628.02	1356+12.44
P.O.C.	38+033.43	1271+00	P.O.T.	40+746.15	1360+00
P.O.C.	38+124.87	1274+00	T.S.	40+904.89	1365+20.79
C.S.	38+199.02	1276+43.28	S.C.	41+011.57	1368+70.79
S.T.	38+305.70	1279+93.28	P.O.C.	41+203.35	1375+00
P.O.T.	38+429.67	1284+00	P.O.C.	41+355.75	1380+00
P.C.	38+545.44	1287+79.82	P.O.C.	41+508.15	1385+00
P.O.C.	38+703.99	1293+00	P.O.C.	41+660.55	1390+00
P.O.C.	38+825.91	1297+00	C.S.	41+787.83	1394+17.56
P.O.C.	38+947.83	1301+00	P.O.T.	41+934.87	1399+00
P.O.C.	39+069.75	1305+00	P.O.T.	42+087.28	1404+00
P.T.	39+207.33	1309+51.39	T.S.	42+217.87	1408+28.47
P.O.T.	39+374.55	1315+00	S.C.	42+339.79	1412+28.47
P.O.T.	39+526.95	1320+00	P.O.C.	42+483.51	1417+00
P.O.T.	39+724.58	1326+48.38			

CO. RD. 46			ALEXANDER ST.		
	STATION			STATION	
	METRIC	ENGLISH		METRIC	ENGLISH
P.O.T	0+167.64	5+50	P.O.T.	0+457.20	15+00
T.S.	0+254.12	8+33.73	P.O.T.	0+609.60	20+00
S.C.	0+315.08	10+33.73	P.O.T.	0+762.00	25+00
P.O.C.	0+426.72	14+00			

THE EXISTING CENTERLINE MONUMENT ASSEMBLIES SHALL BE REPLACED WITH NEW REFERENCE MONUMENTS AT THE FOLLOWING LOCATIONS. MONUMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS AS SHOWN ON STANDARD CONSTRUCTION DRAWING RM-1.1M.

PROPOSED REFERENCE MONUMENTS

JEF-7-36.967

	STATION	OFFSET (m)			STATION	OFFSET (m)	
	METRIC	LT.	RT.		METRIC	LT.	RT.
P.O.T	37+088.55	11.13	11.74	P.C.	39+793.52	11.13	11.13
T.S.	37+224.59	11.13	11.13	P.O.C.	39+923.19	11.13	11.74
S.C.	37+346.51	11.13	11.74	P.O.C.	40+045.11	11.13	11.74
P.O.C.	37+469.55	11.74	11.74	P.T.	40+169.55	12.49	11.74
C.S.	37+581.74	11.74	11.13	T.S.	40+198.81	13.32	11.74
S.T.	37+703.66	11.13	11.13	S.C.	40+320.73	14.15	11.74
T.S.	37+825.81	11.13	11.13	P.O.C.	40+456.59	14.76	11.74
S.C.	37+932.49	11.13	11.13	S.T.	40+628.02	14.15	11.74
P.O.C.	38+033.43	11.74	11.13	P.O.T.	40+746.15	14.15	11.74
P.O.C.	38+124.87	11.74	11.13	T.S.	40+904.89	14.76	11.74
C.S.	38+199.02	11.13	11.13	S.C.	41+011.57	14.15	11.74
S.T.	38+305.70	12.99	11.13	P.O.C.	41+203.35	14.15	11.74
P.O.T.	38+429.67	16.92	15.33	P.O.C.	41+355.75	14.15	11.74
P.C.	38+545.44	21.72	21.84	P.O.C.	41+508.15	14.15	14.71
P.O.C.	38+703.99	11.74	11.74	P.O.C.	41+660.55	17.51	24.58
P.O.C.	38+825.91	11.74	11.74	C.S.	41+787.83	11.74	11.13
P.O.C.	38+947.83	11.13	11.13	P.O.T.	41+934.87	11.74	11.74
P.O.C.	39+069.75	11.13	11.13	P.O.T.	42+087.28	11.13	11.13
P.T.	39+207.33	18.35	11.13	T.S.	42+217.87	22.92	11.13
P.O.T.	39+374.55	11.74	15.87	S.C.	42+339.79	15.24	16.64
P.O.T.	39+526.95	11.13	13.28	P.O.C.	42+483.52	11.74	22.65
P.O.T.	39+724.58	11.13	11.13				

THE FOLLOWING QUANTITY OF ITEM 604 - REFERENCE MONUMENT HAS BEEN CARRIED TO TO THE GENERAL SUMMARY.

ITEM 604, REFERENCE MONUMENT 86 EACH

JEF-7-36.967

ITEM 630 – REFURBISHING SIGN, AS PER PLAN:

THIS ITEM OF WORK SHALL CONSIST OF CLEANING, REPAIR PANEL (IF NEEDED), REPLACEMENT OF DAMAGED OR MISSING COPY AND BORDER, REMOVE EXISTING ROUTE SHIELD AND FURNISH AND INSTALL NEW ROUTE SHIELD ON EXISTING SIGN. THE CONTRACTOR SHALL CLEAN THE EXISTING SIGN BY USING A CLEANING SOLUTION THAT WILL NOT DAMAGE THE REFLECTIVITY OF THE EXISTING SIGN. THE CONTRACTOR SHALL REPLACE ALL DAMAGED OR MISSING COPY WITH THE SAME TYPE OF COPY USED ON THE EXISTING SIGN. THE CONTRACTOR SHALL REMOVE THE EXISTING ROUTE SHIELD FROM THE EXISTING SIGN BEFORE CLEANING THE SIGN. THE CONTRACTOR SHALL THEN PLACE A NEW ROUTE SHIELD IN THE SAME LOCATION ON THE SIGN AS THE EXISTING ROUTE SHIELD. THE NEW ROUTE SHIELD SHALL BE FURNISHED AS PART OF THIS ITEM.

ALL NEW ROUTE SHIELDS AND COPY SHALL BE THE SAME SIZE AS EXISTING.

ALL MATERIAL REMOVED FROM THE EXISTING SIGN SHALL BE DISPOSED OF BY THE CONTRACTOR AS PART OF THIS ITEM.

ALL MATERIAL. LABOR AND INCIDENTALS REQUIRED TO DO THE WORK SHALL BE INCLUDED IN THE UNIT BID PER SQUARE METER OF EXISTING SIGN REFURBISHED.

RAISED PAVEMENT MARKERS SUPPLIED BY ODOT:

ALL MATERIALS ARE TO BE CONTRACTOR FURNISHED, EXCEPT THAT THE OHIO DEPARTMENT OF TRANSPORTATION SHALL SUPPLY TO THE CONTRACTOR RAISED PAVEMENT MARKER MATERIALS IN THE QUANTITIES SHOWN IN THE PLAN. PAY ITEMS FOR ODOT SUPPLIED MATERIALS SHALL BE INDICATED AS "INSTALLATION ONLY". THE QUANTITY AND TYPE OF ODOT SUPPLIED MATERIALS ARE SHOWN IN THE PLAN.

THE CONTRACTOR WILL BE INFORMED AT THE PRE-CONSTRUCTION CONFERENCE OF THE LOCATION IN COLUMBUS OF THE ODOT SUPPLIED MATERIALS. WHEN SPECIFIED, ADDITIONAL RAISED PAVEMENT MARKER MATERIALS WILL BE STORED WITHIN THE DISTRICT FOR USE ON THIS PROJECT, THE CONTRACTOR SHALL PICK UP ODOT SUPPLIED RAISED PAVEMENT MARKER MATERIALS AT THE SPECIFIED LOCATION(S) FOR TRANSPORT TO THE WORK SITE OR TO THE CONTRACTOR'S STORAGE FACILITY. AN AUTHORIZATION FOR PICK UP FORM WILL BE FURNISHED BY THE DISTRICT CONSTRUCTION ENGINEER TO THE CONTRACTOR AT THE PRE-CONSTRUCTION CONFERENCE. THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND/OR THE PARTIES LISTED ON THE AUTHORIZATION FORM (DEPENDANT ON THE STORAGE LOCATIONS OF THE MATERIALS) IN WRITING AT LEAST 5 CALENDAR DAYS PRIOR TO PICK UP OF ODOT SUPPLIED MATERIALS. HE SHALL STORE THEM WITHOUT DAMAGE OR CONTAMINATION WITH FOREIGN MATTER. A DEDUCTION IN THE AMOUNT OF THE ACTUAL COST TO ODOT SHALL BE MADE FOR MATERIALS DAMAGED BY THE CONTRACTOR OR FOR CASTINGS RECEIVED BY THE CONTRACTOR WHICH WERE NOT INSTALLED AND WERE NOT RETURNED TO ODOT.

PAYMENT FOR INSTALLING THE ODOT FURNISHED RAISED PAVEMENT MARKER SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH ITEM 621 RAISED PAVEMENT MARKER, INSTALLATION ONLY SHALL INCLUDE ALL MATERIAL, EQUIPMENT, LABOR AND INCIDENTALS REQUIRED TO PERFORM THE ABOVE WORK.

THE FOLLOWING QUANTITY OF ITEM 621 – RAISED PAVEMENT MARKER, INSTALLATION ONLY WITH WHITE ONE-WAY PRISMATIC RETROREFLECTORS HAS BEEN CARRIED TO THE GENERAL SUMMARY:

NORTHBOUND LANES	– 240 EACH
SOUTHBOUND LANES	– 240 EACH
SOUTHBOUND TRUCK LANES	– 54 EACH
TOTAL	534 EACH

ITEM 621 – RAISED PAVEMENT MARKER CASTING INSTALLATION ONLY, AS PER PLAN:

THIS ITEM SHALL CONSIST OF INSTALLING A TWO-WAY PLOWABLE RAISED PAVEMENT MARKER CASTING FURNISHED TO THE CONTRACTOR BY THE OHIO DEPARTMENT OF TRANSPORTATION. THE CASTING WILL NOT BE EQUIPPED WITH AN ATTACHED PRISMATIC RETROREFLECTOR. THE CONTRACTOR WILL BE PAID FOR SEPARATELY FOR PRISMATIC RETROREFLECTOR TO BE ATTACHED TO THESE CASTINGS. THE RAISED PAVEMENT MARKER SHALL BE INSTALLED AS SHOWN IN ITEM 621. PRISMATIC RETROREFLECTORS WILL BE PAID FOR SEPARATELY AS ITEM 621 PRISMATIC RETROREFLECTOR.

PAYMENT FOR INSTALLING THE ODOT FURNISHED RAISED PAVEMENT MARKER CASTINGS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH ITEM 621 RAISED PAVEMENT MARKER CASTING INSTALLATION ONLY, AS PER PLAN SHALL INCLUDE ALL MATERIAL, EQUIPMENT, LABOR AND INCIDENTALS REQUIRED TO PERFORM THE ABOVE WORK.

THE FOLLOWING QUANTITY OF ITEM 621 – RAISED PAVEMENT MARKER CASTING INSTALLATION ONLY, AS PER PLAN AND ITEM 621 – PRISMATIC RETROREFLECTOR HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

	RAISED PAVEMENT MARKER CASTING INSTALLATION ONLY, AS PER PLAN	PRISMATIC RETROREFLECTOR (2-WAY WHITE/RED)	(2-WAY YELLOW/RED)
RAMP A	16	4	12
RAMP B	19	9	10
RAMP C	24	9	15
RAMP D	23	4	19
RAMP E	12	3	9
RAMP F	19	9	10
RAMP G	25	11	14
RAMP H	19	3	16
TOTAL	157	52	105

ITEM 202 – INLET REMOVED, AS PER PLAN:

THIS ITEM OF WORK SHALL CONSIST OF REMOVING INLETS IN ACCORDANCE WITH LIMITS AND DIMENSIONS AS SHOWN ON SHEET 67. THE BASE PORTION OF THE EXISTING INLET SHALL BE SALVAGED AND INCORPORATED INTO ITEM 604 – INLET NO. 3C, TYPE A, AS PER PLAN.

ALL MATERIAL REMOVED FROM THE EXISTING INLET SHALL BE DISPOSED OF BY THE CONTRACTOR AS PART OF THIS ITEM.

ALL MATERIAL. LABOR AND INCIDENTALS REQUIRED TO DO THE WORK SHALL BE INCLUDED IN THE UNIT BID PER EACH EXISTING INLET REMOVED.

ITEM 604 – INLET NO. 3C, TYPE A, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF CONSTRUCTING INLET ON TOP OF SALVAGED BASE PORTION OF EXISTING INLET IN ACCORDANCE WITH LIMITS AND DIMENSIONS AS SHOWN ON SHEET 67 AND STANDARD CONSTRUCTION DRAWING I-2.2M. THE TOP OF SALVAGED BASE SHALL BE EXTENDED BY USE OF BRICK MASONRY TO THE PROPER ELEVATION FOR SEATING THE TROUGH PORTION OF THE INLET ASSEMBLY.

ALL MATERIAL, LABOR AND INCIDENTALS REQUIRED TO DO THE WORK SHALL BE INCLUDED IN THE UNIT BID PER EACH INLET NO. 3C, TYPE A, AS PER PLAN.

ITEM 606, ANCHOR ASSEMBLY, TYPE E-98

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING EITHER OF THE FOLLOWING GUARDRAIL END TERMINALS:

1). THE ET-2000 (1997) MANUFACTURED BY SYRO INC., 1170 N. STATE STREET, GIRARD, OHIO 44420 (TELEPHONE: 330-545-4373).

THE LENGTH OF THE ET-2000 (1997) SYSTEM IS CONSIDERED TO BE 15.24 M, INCLUSIVE OF TWO 7.62 M LONG RAIL ELEMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, PER THE MANUFACTURER'S SPECIFICATIONS AS DETAILED ON THE FOLLOWING PRE-APPROVED SHOP DRAWINGS:

DWG. #	DRAWING NAME	DWG./REV. DATE	ODOT APPROVAL DATE
SS265M	ET-2000 (1997) PLAN, ELEVATION & SECTIONS	6/20/97	3/6/98

2). THE SKT-350 MANUFACTURED BY ROAD SYSTEMS, INC., 7631 NEW CASTLE DRIVE, FRANKFORT, ILLINOIS 60423 (TELEPHONE 815-464-5917).

THE LENGTH OF THE SKT-350 SYSTEM IS CONSIDERED TO BE 15.24 M, INCLUSIVE OF FOUR 3.81 M LONG RAIL ELEMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, PER THE MANUFACTURER'S SPECIFICATIONS AS DETAILED ON THE FOLLOWING PRE-APPROVED SHOP DRAWINGS:

DWG. #	DRAWING NAME	DWG./REV. DATE	ODOT APPROVAL DATE
SKT-4M	SEQUENTIAL KINKING TERMINAL (SKT-350) ASSEMBLY WITH 4 FOUNDATION TUBES	12/11/98	3/6/98

THE FACE OF THE TYPE E-98 IMPACT HEAD SHALL BE COVERED WITH TYPE G REFLECTIVE SHEETING, PER CMS 730.19, APPROXIMATELY 450 MM X 450 MM.

PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID OF EACH FOR ITEM 606, ANCHOR ASSEMBLY, TYPE E-98, AND SHALL INCLUDE ALL LABOR, TOOLS EQUIPMENT, AND MATERIALS NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL ANCHOR ASSEMBLY SYSTEM, INCLUDING ALL RELATED TRANSITIONS, REFLECTIVE SHEETING, AND ALL RELATED HARDWARE AND GRADING, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

DEMOLITION DEBRIS

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO AVOID AND/OR LIMIT DEMOLITION DEBRIS FROM ENTERING THE STREAM. ANY MATERIAL THAT DOES FALL INTO THE STREAM SHALL BE REMOVED AS SOON AS POSSIBLE.

STORM WATER POLLUTION PREVENTION PLAN

THE CONDITIONS OF THE NPDES CONSTRUCTION STORM WATER GENERAL PERMIT (SEE PROPOSAL) SHALL BE MET DURING ALL STAGES OF CONSTRUCTION. THE LOCATION AND TIMING OF ALL EROSION AND SEDIMENT CONTROL ITEMS SHALL BE FIELD ADJUSTED TO PREVENT SIGNIFICANT IMPACTS ON RECEIVING WATERS. IMPLEMENTATION OF THIS STORM WATER POLLUTION PREVENTION PLAN SHALL CONTINUE THROUGHOUT THE DURATION OF THE PROJECT OR UNTIL SUCH TIME THAT THE UPSLOPE DISTURBED AREAS ARE STABILIZED.

INSTALLATION OF SEDIMENT BASINS/DAMS, PERIMETER FILTER FABRIC FENCE, AND DITCH CHECKS SHALL BE CONCURRENT WITH CLEARING AND GRUBBING AND/OR GRADING OPERATIONS.

ALL REASONABLE ATTEMPTS SHOULD BE MADE TO MINIMIZE THE TOTAL AREA OF DISTURBED LAND.

AREAS TO REMAIN DORMANT FOR MORE THAN 45 DAYS SHOULD BE IMMEDIATELY STABILIZED WITH TEMPORARY SEEDING AND MULCHING, EROSION CONTROL MATTING, OR OTHER APPROPRIATE EROSION CONTROL MEASURES.

ADDITIONAL QUANTITIES OF TEMPORARY SOIL EROSION AND SEDIMENT CONTROL ITEMS ARE GIVEN IN THE GENERAL NOTES.

PAVEMENT GRINDINGS

THE CONTRACTOR SHALL DELIVER A PORTION OF THE PAVEMENT GRINDINGS OBTAINED FROM ITEM 202, WEARING COURSE REMOVED, AT HIS EXPENSE, TO THE FOLLOWING ADDRESSES:

QUANTITY	LOCATION
3000 TONS	WELLSVILLE CITY BUILDING 1200 MAIN STREET WELLSVILLE, OHIO 43968 TELEPHONE (330) 532-2524
2000 TONS	TORONTO OUTPOST OLD S.R. 7 POTTERY ADDITION STEUBENVILLE OHIO 43952 TELEPHONE (614) 282-8965

ALL REMAINING PAVEMENT GRINDINGS SHALL BECOME THE PROPERTY OF THE CONTRACTOR, AND SHALL BE DISPOSED OF BY HIM.

CALCULATED T.D.D.
CHECKED J.E.U.

GENERAL NOTES

JEF-7-30.907

MAINTENANCE OF TRAFFIC:

ITEM 614, MAINTAINING TRAFFIC:

AT LEAST ONE LANE OF TRAFFIC SHALL BE MAINTAINED IN EACH DIRECTION AT ALL TIMES AS PER STANDARD CONSTRUCTION DRAWINGS MT-95.30M OR MT-95.40M. THE LENGTH OF RESTRICTED TRAFFIC LANES SHALL BE KEPT TO A MINIMUM CONSISTENT WITH THE SPECIFICATION REQUIREMENTS FOR THE PROTECTION OF WORK ITEMS WHICH NECESSITATE THE RESTRICTION.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

ANY OPEN PAVEMENT TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH BARRICADES, DRUMS, VERTICAL PANELS, OR PORTABLE CONCRETE BARRIER. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR BE PERMITTED TO HAVE WORK ZONES WHICH ALTERNATELY CLOSE THE PASSING LANE AND TRAVEL LANE UNLESS THE DISTANCE BETWEEN LANE RESTRICTIONS EXCEEDS 3.2 KILOMETERS.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR THE REPAIR OF THE EXISTING ASPHALT SURFACE DURING THE MAINTENANCE OF TRAFFIC PROCEDURE.

ITEM 614, BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC 20 CU. METER

TEMPORARY MEDIAN CROSSOVERS:

TWO-LANE, TWO-WAY OPERATION (TLTWO) SHALL BE MAINTAINED ON A DIRECTIONAL ROADWAY BY USE OF TEMPORARY MEDIAN CROSSOVERS DURING RECONSTRUCTION OF BRIDGE NO'S. JEF-7-41877, AND JEF-7-42630 AS FOLLOWS.

1) REMOVE EXISTING CONCRETE MEDIAN AND MEDIAN GUARDRAIL, AND CONSTRUCT THE TEMPORARY PAVEMENT AS DETAILED ON SHEETS 18-21 AND 24-27 OF THE MAINTENANCE OF TRAFFIC PLANS. IMMEDIATELY UPON COMPLETION, THE CROSSOVER SHALL BE ADEQUATELY BARRICADED, IN A MANNER ACCEPTABLE TO THE ENGINEER, TO PREVENT USE BY THE TRAVELING PUBLIC.

2) ERECT TEMPORARY SIGNS AND TEMPORARY CROSSOVER LIGHTING, INSTALL PORTABLE CONCRETE BARRIER, OBJECT MARKERS, BARRIER REFLECTORS, TEMPORARY RAISED PAVEMENT MARKERS, APPLY TEMPORARY EDGE LINES, INSTALL THE IMPACT ATTENUATORS, AND PLACE DRUMS AS SHOWN FOR PHASE 1.

3) OPEN THE CROSSOVERS TO TRAFFIC. MAINTAIN TRAFFIC USING TLTWO FOR THE DURATION OF CONSTRUCTION FOR PHASE 1.

4) RECONSTRUCT THE NORTHBOUND LANES OF S.R. 7 AND PERFORM BRIDGE WORK.

5) UPON COMPLETION OF THE WORK IN STEP 4, THE CONTRACTOR SHALL REMOVE ALL OF THE TEMPORARY TRAFFIC MAINTENANCE ITEMS PLACED IN STEP 2 EXCEPT THE TEMPORARY LIGHTING, BARRICADE THE CROSSOVERS AS DESCRIBED IN STEP 1, RESTORE THE MAINLINE PAVEMENT MARKINGS, AND OPEN ALL LANES TO TRAFFIC.

6) REPEAT STEPS 2-5 FOR PHASE 2 SOUTHBOUND RECONSTRUCTION OF S.R. 7.

7) REMOVE THE TEMPORARY PAVEMENT, AND COMPLETE ALL REMAINING PROJECT CONSTRUCTION.

SEE THE MAINTENANCE OF TRAFFIC SUB-SUMMARY SHEET, SHEET NO. 35 FOR QUANTITIES FOR THE PURPOSE OF MAINTAINING TRAFFIC UTILIZING THE TLTWO DURING MAINLINE S.R. 7 RECONSTRUCTION.

THE CONTRACTOR SHALL NOT PERFORM ANY WORK WHICH NECESSITATES A LANE CLOSURE IN THE VICINITY OF THE TLTWO UNLESS THE DISTANCE BETWEEN THE END OF THE TLTWO AND THE BEGINNING OF THE LANE RESTRICTION EXCEEDS 3.2 KILOMETERS.

INTERCHANGE RAMPS:

RAMP TRAFFIC SHALL BE MAINTAINED BY USE OF PORTIONS OF THE EXISTING OR RESURFACED PAVEMENT, AND THE EXISTING OR WIDENED SHOULDERS OR AS SHOWN ON SHEET NO'S. 19 AND 25 FOR RAMPS WITHIN THE TLTWO.

RAMP TRAFFIC MAY BE STOPPED BY UTILIZING FLAGGERS FOR INTERMITTENT PERIODS NOT TO EXCEED TEN MINUTES DURING RAMP RESURFACING OPERATIONS.

TRAFFIC SHALL NOT BE ALLOWED TO FORM A QUEUE WHICH EXTENDS BEYOND THE LIMITS OF THE RAMP ONTO THE SPEED CHANGE LANE, MAINLINE, OR CROSSROAD PAVEMENT. THE LIMITS AND DURATION OF ANY TRAFFIC STOPPAGE SHALL AT ALL TIMES BE SUBJECT TO THE DIRECTION OF THE ENGINEER.

SPEED CHANGE LANES:

SPEED CHANGE LANE TRAFFIC SHALL BE MAINTAINED AT ALL TIMES BY USE OF PORTIONS OF THE EXISTING OR RESURFACED PAVEMENT, AND THE EXISTING OR RESURFACED SHOULDERS. SEE STANDARD CONSTRUCTION DRAWINGS MT-98.12M, MT-98.13M, MT-98.14M, MT-98.15M, AND MT-98.16M.

BRIDGES:

TRAFFIC SHALL BE MAINTAINED ON BRIDGE NO'S. JEF-7-38769, JEF-7-40478, JEF-7-41877, AND JEF-7-42630 AS SHOWN IN STANDARD CONSTRUCTION DRAWING MT-95.30M. TWO LANES OF DIRECTIONAL TRAFFIC IS STRICTLY PROHIBITED IF ONLY ONE LANE OF REHABILITATION HAS BEEN COMPLETED.

PORTABLE CONCRETE BARRIER (PCB) SHALL BE USED FOR BRIDGE NO'S. JEF-7-38769 AND JEF-7-40478 AS SHOWN IN STANDARD CONSTRUCTION DRAWING MT-95.40M.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR MAINTAINING TRAFFIC ON BRIDGE NO'S. JEF-7-38769 AND JEF-7-40478. SEE THE MAINTENANCE OF TRAFFIC SECTIONS IN THE BRIDGE PLANS FOR PLACEMENT OF THE PORTABLE CONCRETE BARRIER.

ITEM 614, BARRIER REFLECTOR, TYPE B	72 EACH
ITEM 614, OBJECT MARKER	48 EACH
ITEM 622, PORTABLE CONCRETE BARRIER, 813 mm	530 m

DURING CONSTRUCTION OF BRIDGE NO'S. JEF-7-41877 AND JEF-7-42630, TRAFFIC SHALL BE MAINTAINED UTILIZING TLTWO AS DESCRIBED UNDER "TEMPORARY MEDIAN CROSSOVERS."

GENERAL:

IF THE PROJECT IS SHUT DOWN FOR THE WINTER, AND THE PERMANENT PAVEMENT MARKINGS HAVE NOT BEEN APPLIED, 614 TEMPORARY EDGE LINES, CLASS I, AND 614 TEMPORARY LANE LINES SHALL BE APPLIED TO THE NORTHBOUND AND SOUTHBOUND LANES FOR THE ENTIRE LENGTH OF THE PROJECT, AND THE INTERCHANGE RAMPS.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH ITEM 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR:

IN ADDITION TO THE REQUIREMENTS OF 614 AND THE LATEST EDITION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD), A UNIFORMED LAW ENFORCEMENT OFFICER AND OFFICIAL PATROL CAR WITH WORKING TOP MOUNTED EMERGENCY FLASHING LIGHTS SHALL BE PROVIDED FOR CONTROLLING TRAFFIC FOR THE FOLLOWING TASK:

1) DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE FOR THE TEMPORARY CROSSOVERS WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED FOR PHASE 1 AND PHASE 2 RECONSTRUCTION OF BRIDGE NO'S. JEF-7-41877 AND JEF-7-42630.

2) FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT, OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED.

3) FOR PATROLLING ANY OR ALL OF THE PROJECT AREA AS DEEMED APPROPRIATE BY THE ENGINEER.

LAW ENFORCEMENT OFFICERS (LEO'S) SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED. THE LEO'S ARE CONSIDERED TO BE EMPLOYED BY THE CONTRACTOR, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR ACTIONS. ALTHOUGH THEY ARE EMPLOYED BY THE CONTRACTOR, THE PROJECT ENGINEER SHALL HAVE CONTROL OVER THEIR PLACEMENT. THE OFFICIAL PATROL CAR SHALL BE A PUBLIC SAFETY VEHICLE AS REQUIRED BY THE OHIO REVISED CODE.

THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THESE SERVICES WITH THE OHIO HIGHWAY PATROL, STEUBENVILLE POST, 901 CADIZ ROAD, STEUBENVILLE, OHIO, TELEPHONE 614-264-1641.

LAW ENFORCEMENT OFFICERS WITH PATROL CAR REQUIRED BY THE TRAFFIC MAINTENANCE TASK ABOVE SHALL BE PAID FOR ON AN HOURLY BASIS UNDER ITEM SPECIAL, LAW ENFORCEMENT OFFICER WITH PATROL CAR. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO SHEET NO. 39:

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR 300 HOURS

THE HOURS PAID SHALL INCLUDE MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

IF THE CONTRACTOR WISHES TO UTILIZE LEO'S FOR FLAGGING AND TRAFFIC CONTROL OTHER THAN THAT REQUIRED IN THESE PLANS, HE MAY DO SO AT HIS OWN EXPENSE. PAYMENT FOR THE EXCESS ABOVE THE CONTRACT REQUIREMENTS WILL BE INCLUDED UNDER ITEM 614, MAINTAINING TRAFFIC.

TEMPORARY WORK ZONE SIGNS:

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR TEMPORARY WORK ZONE SIGNS PER THE REQUIREMENTS OF CMS SECTION 614.04:

ITEM 614, WORK ZONE MARKING SIGN 8 EACH

ITEM 622, PORTABLE CONCRETE BARRIER:

IT IS ANTICIPATED THAT THE SAME BARRIER WILL BE USED IN VARIOUS PHASES OF CONSTRUCTION. MOVEMENT OF THE CONCRETE BARRIER BETWEEN PHASES SHALL BE ACCOMPLISHED IN ONE WORKING DAY. FLAGGERS SHALL BE UTILIZED FOR PROTECTION OF VEHICULAR TRAFFIC UNTIL MOVEMENT OF THE BARRIER IS COMPLETE.

COVERING OF SIGNS:

WHERE THE PLANS CALL FOR A PERMANENT SIGN TO BE COVERED, THE CONTRACTOR SHALL DO SO IN SUCH A MANNER AS TO AVOID DAMAGING THE PERMANENT SIGN WHEN THE COVER IS REMOVED. THE COVER SHALL BE TOTALLY OPAQUE. THE USE OF ADHESIVE TAPE APPLIED DIRECTLY TO A SIGN IS STRICTLY PROHIBITED.

ITEM 614, BARRIER REFLECTORS:

REFLECTORS AND THEIR MOUNTINGS SHALL CONFORM TO ITEM 626 EXCEPT THAT THE SPACING SHALL BE AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS.

NOTIFICATION OF WORK ZONE LANE RESTRICTIONS:

THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST EIGHTEEN (18) DAYS PRIOR TO IMPLEMENTING ANY WORK ZONE RESTRICTIONS WHICH WILL REDUCE THE WIDTH OR VERTICAL CLEARANCE OF ANY LANE ON WHICH TRAFFIC WILL BE MAINTAINED DURING CONSTRUCTION.

THE ENGINEER SHALL IMMEDIATELY NOTIFY THE DISTRICT ROADWAY SERVICES MANAGER TO ADVISE THE OFFICE OF HIGHWAY MANAGEMENT OF THE RESTRICTIONS.

MEDIAN BARRIER MOUNTED SIGNS:

ALL SIGNS SHALL BE OF THE SIZE SHOWN EXCEPT THOSE MOUNTED ON THE MEDIAN BARRIER. ANY SIGNS MOUNTED ON THE MEDIAN BARRIER SHALL BE 24" WIDE DUE TO THE NARROW SHOULDER WIDTH.

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC GENERAL NOTES

JEF-7-30.967

ITEM 614, WORK ZONE SPEED LIMIT SIGN:

THE CONTRACTOR SHALL FURNISH, MAINTAIN, COVER DURING SUSPENSION OF WORK, AND SUBSEQUENTLY REMOVE WORK ZONE SPEED LIMIT SIGNS AND SUPPORTS (R-10-48) (45 MPH) WITHIN THE WORK LIMITS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE CONTRACTOR SHALL COVER OR REMOVE ANY EXISTING SPEED LIMIT OR MINIMUM SPEED SIGNS WITHIN THE REDUCED SPEED ZONE. THESE SIGNS SHALL BE RESTORED DURING SUSPENSION OR TERMINATION OF THE REDUCED SPEED LIMIT. THE EXPENSE OF COVERING OR REMOVAL AND RESTORATION OF EXISTING SPEED LIMIT OR MINIMUM SPEED SIGNS SHALL BE INCLUDED IN THE PAY ITEM FOR THE WORK ZONE SPEED LIMIT SIGNS.

THE WORK ZONE SPEED LIMIT SIGNS MAY BE ERECTED OR UNCOVERED NO MORE THAN 4 HOURS BEFORE THE ACTUAL START OF WORK. THE SIGNS SHALL BE REMOVED OR COVERED NO LATER THAN 4 HOURS FOLLOWING RESTORATION OF ALL LANES TO TRAFFIC WITH NO RESTRICTIONS, OR SOONER AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL ERECT A WORK ZONE SPEED LIMIT SIGN IN ADVANCE OF ANY LANE RESTRICTION EXPECTED TO LAST AT LEAST 30 DAYS, OR AS DIRECTED BY THE ENGINEER. THE SIGN SHALL BE MOUNTED ON BOTH SIDES OF DIVIDED HIGHWAYS, 150 METERS IN ADVANCE OF THE LANE REDUCTION TAPER. THE SIGN SHALL BE MOUNTED ON THE RIGHT SIDE, 75 METERS IN ADVANCE OF THE LANE REDUCTION TAPER ON UNDIVIDED HIGHWAYS. THE SIGN SHALL BE REPEATED, ON THE SIDE NEAREST TRAFFIC, EVERY 1600 METERS FOR 55 MPH ZONES, AND EVERY 800 METERS FOR 45 MPH ZONES. THESE SIGNS SHALL ALSO BE ERECTED IMMEDIATELY AFTER EACH OPEN ENTRANCE RAMP WITHIN THE ZONE. A SIGN TO INDICATE THE RESUMPTION OF THE STATUTORY SPEED LIMIT SHALL BE ERECTED AT THE END OF ANY REDUCED SPEED ZONE. THIS SIGN SHALL BE AN R-8A.

THE CONTRACTOR MAY USE SIGNS AND SUPPORTS IN USED BUT GOOD CONDITION PROVIDED THE SIGNS MEET CURRENT ODOT SPECIFICATIONS. SIGN FACES SHALL BE REFLECTORIZED WITH TYPE G SHEETING COMPLYING WITH THE REQUIREMENTS OF 730.19 AND U.S. DEPARTMENT OF TRANSPORTATION SUPPLEMENTAL SPECIFICATION FOR TYPE III-C SHEETING, FP-85. WORK ZONE SPEED LIMIT SIGNS SHALL BE MOUNTED ON TWO (2) ITEM 630 GROUND MOUNTED SUPPORTS, NO. 4 POSTS.

THE CONTRACTOR SHALL ERECT "CONSTRUCTION ZONE FINES DOUBLED" SIGNS ON BOTH SIDES OF EACH DIRECTIONAL ROADWAY, AND ON THE RIGHT SIDE OF EACH ENTRANCE RAMP. THE FIRST DIRECTIONAL ROADWAY SIGN SHALL BE PLACED BETWEEN THE "ROAD CONSTRUCTION AHEAD" (OW-128) SIGN, AND THE NEXT SIGN IN THE SEQUENCE. THE SIGNS SHALL BE REPEATED EVERY 3.2 KILOMETERS THEREAFTER THROUGHOUT THE CONSTRUCTION WORK LIMITS. THE ENTRANCE RAMP SIGN SHALL BE PLACED NEAR THE INTERSECTION WITH THE THROUGH ROAD. THESE SIGNS WILL BE FURNISHED BY THE STATE AND REMAIN THE PROPERTY OF THE STATE WHEN SUBSEQUENTLY REMOVED.

WORK ZONE SPEED LIMIT SIGNS AND SUPPORTS WILL BE MEASURED AS THE NUMBER OF SIGN INSTALLATIONS, INCLUDING THE SIGNS AND NECESSARY SUPPORTS. IF A SIGN AND SUPPORT COMBINATION IS REMOVED AND REERECTED AT ANOTHER LOCATION WITH THE PROJECT DUE TO CHANGES IN THE SPEED ZONE DIRECTED BY THE ENGINEER, IT SHALL BE CONSIDERED ANOTHER UNIT.

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 FURNISHING, ERECTING, MAINTAINING, COVERING DURING SUSPENSION OF WORK, AND REMOVING THE SIGNS AND SUPPORTS.

ITEM 614, WORK ZONE SPEED LIMIT SIGN	32 EACH
ITEM 614, DOUBLED FINES IN WORK ZONE SIGN	24 EACH

ITEM 614, TEMPORARY IMPACT ATTENUATOR (G.R.E.A.T. TYPE):

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING IMPACT ATTENUATORS AS REQUIRED IN THE PLANS, AND SHALL ALSO INCLUDE ALL RELATED HARDWARE, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER TO CONSTRUCT A COMPLETE AND FUNCTIONAL G.R.E.A.T. IMPACT ATTENUATOR SYSTEM.

THE ATTENUATOR SHALL BE PLACED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS, AND IN CLOSE CONFORMITY AS DETAILED ON THE MAINTENANCE OF TRAFFIC PLANS. THE ATTENUATOR SHALL BE MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC., AND IS DISTRIBUTED BY BALDWIN & SOURS, 5263 TRAUBE ROAD, COLUMBUS, OHIO 43228 (TELEPHONE 614-851-8800).

THE NOSE COVER OF THE ATTENUATOR SHALL MEET THE REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING MT-95.81M.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING, REPAIRING, AND OTHERWISE RESTORING THE ATTENUATOR ACCORDING TO THE MANUFACTURER'S MAINTENANCE INSTRUCTIONS WHILE THE ATTENUATOR IS IN USE DURING CONSTRUCTION OF THE PROJECT. IF THE ATTENUATOR GETS DAMAGED BEYOND REPAIR DUE TO VEHICULAR IMPACT BEFORE ACCEPTANCE BY THE STATE, IT SHALL BE REPAIRED AS SPECIFIED IN THE PROPOSAL WITHIN 24 HOURS OF THE INCIDENT WHICH CAUSED DAMAGE TO THE ATTENUATOR. BESIDES ANY EXTRA UNITS SUPPLIED FOR THIS PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ALL NECESSARY MATERIALS, LABOR, AND EQUIPMENT REQUIRED TO PERFORM THE ABOVE DESCRIBED RESTORATION OF THE ATTENUATOR.

ITEM 614, TEMPORARY IMPACT ATTENUATOR (G.R.E.A.T. TYPE) (CONT.):

THE ESTIMATED QUANTITY BELOW SHALL BE USED AS DIRECTED BY THE ENGINEER FOR USE IN THE ABOVE MENTIONED RESTORATION ONLY WHEN THE ENGINEER DECIDES THAT MINOR OR MAJOR REPAIRS CANNOT BE PERFORMED WITHIN THE 24 HOUR TIME LIMITATION:

ITEM 614, TEMPORARY IMPACT ATTENUATOR, G.R.E.A.T. TYPE (REPLACEMENT) 1 EACH

TEMPORARILY INSTALLED IMPACT ATTENUATORS SHALL BE BID AS ITEM 614, EACH, TEMPORARY IMPACT ATTENUATOR (G.R.E.A.T. TYPE)

THE MODEL NUMBER OF THE TEMPORARY UNIT SHALL BE 206206NF6CZ, BI-DIRECTIONAL OR UNI-DIRECTIONAL AS SPECIFIED IN THE PLANS. THE MODEL NUMBER OF THE REPLACEMENT UNIT SHALL BE 206206NF6CZ, UNI-DIRECTIONAL.

ERECT TEMPORARY IMPACT ATTENUATORS AS DETAILED ON SHEETS 18, 20, 24, 25, AND 27 OF THE MAINTENANCE OF TRAFFIC PLANS.

PAYMENT FOR THE ABOVE WORK, INCLUDING FURNISHING, INSTALLING, MAINTAINING, AND RESTORING THE ATTENUATOR AFTER EACH VEHICULAR IMPACT, WILL BE MADE AT THE RESPECTIVE CONTRACT PRICE FOR ITEM 614, EACH, TEMPORARY IMPACT ATTENUATOR, G.R.E.A.T. TYPE (REPLACEMENT), AND ITEM 614, EACH, TEMPORARY IMPACT ATTENUATOR (G.R.E.A.T. TYPE), AND SHALL INCLUDE THE COST OF ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

ITEM 622, PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN:

THIS WORK SHALL CONSIST OF FURNISHING, INSTALLING, MAINTAINING, AND SUBSEQUENTLY REMOVING A 1270 MILLIMETER HIGH PORTABLE CONCRETE BARRIER AT THE LOCATIONS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS. FOR DETAILS, SEE STANDARD CONSTRUCTION DRAWING RM-4.1M.

PORTABLE CONCRETE BARRIER WHICH IS 813 MILLIMETERS HIGH WITH A 457 MILLIMETER MINIMUM HEIGHT GLARE SCREEN MAY BE USED AT THE OPTION OF THE CONTRACTOR. THE GLARE SCREEN SHALL BE CONSTRUCTED USING ONE OF THE FOLLOWING SYSTEMS, OR AN APPROVED EQUAL:

CARSONITE MODULAR GLARE SCREEN
CARSONITE INTERNATIONAL
2900 LOCKHEED WAY, CARSON CITY, NEVADA 89701
PHONE 702-883-5104 OR 800-648-7974

FORWARD GLARE SCREEN
PROVEN PRODUCTS, INC.
7560 SW LAVIEW DRIVE, PORTLAND, OREGON 97219
PHONE 503-244-9185

SYRO GLAREFOIL
SYRO STEEL COMPANY
1170 NORTH STATE STREET, GIRARD, OHIO 44420
PHONE 330-545-4373

PADDLE OR INTERMITTENT TYPE GLARE SCREENS SHALL BE DESIGNED USING A 20 DEGREE ANGLE BASED ON TANGENT ALIGNMENT. THAT SPACING SHALL BE USED THROUGHOUT THE BARRIER LENGTH WITHOUT REGARD TO BARRIER CURVATURE.

THE GLARE SCREEN SHALL BE SECURELY FASTENED TO THE 813 MILLIMETER PORTABLE CONCRETE BARRIER USING THE HARDWARE AND PROCEDURES SPECIFIED BY THE MANUFACTURER.

PAYMENT FOR THE ABOVE WORK WILL BE MADE AT THE CONTRACT PRICE FOR ITEM 622, METER, PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN, AND SHALL INCLUDE THE COST OF ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

ITEM 614, TEMPORARY CROSSOVER LIGHTING SYSTEM:

THIS WORK SHALL CONSIST OF FURNISHING, ERECTING, OPERATING, MAINTAINING, AND REMOVING A TEMPORARY LIGHTING SYSTEM FOR A SINGLE CROSSOVER OR OVERLAPPING A PAIR OF CROSSOVERS ON A TWO LANE TWO WAY OPERATION (TLTWO). THE SYSTEM SHALL BE AS SHOWN IN STANDARD CONSTRUCTION DRAWING MT-100.00M, AND ON SHEETS 17, 18, 20, 21, 23, 24, 26, AND 27 OF THE MAINTENANCE OF TRAFFIC PLANS. THE CONTRACTOR SHALL ARRANGE FOR AND PAY FOR POWER.

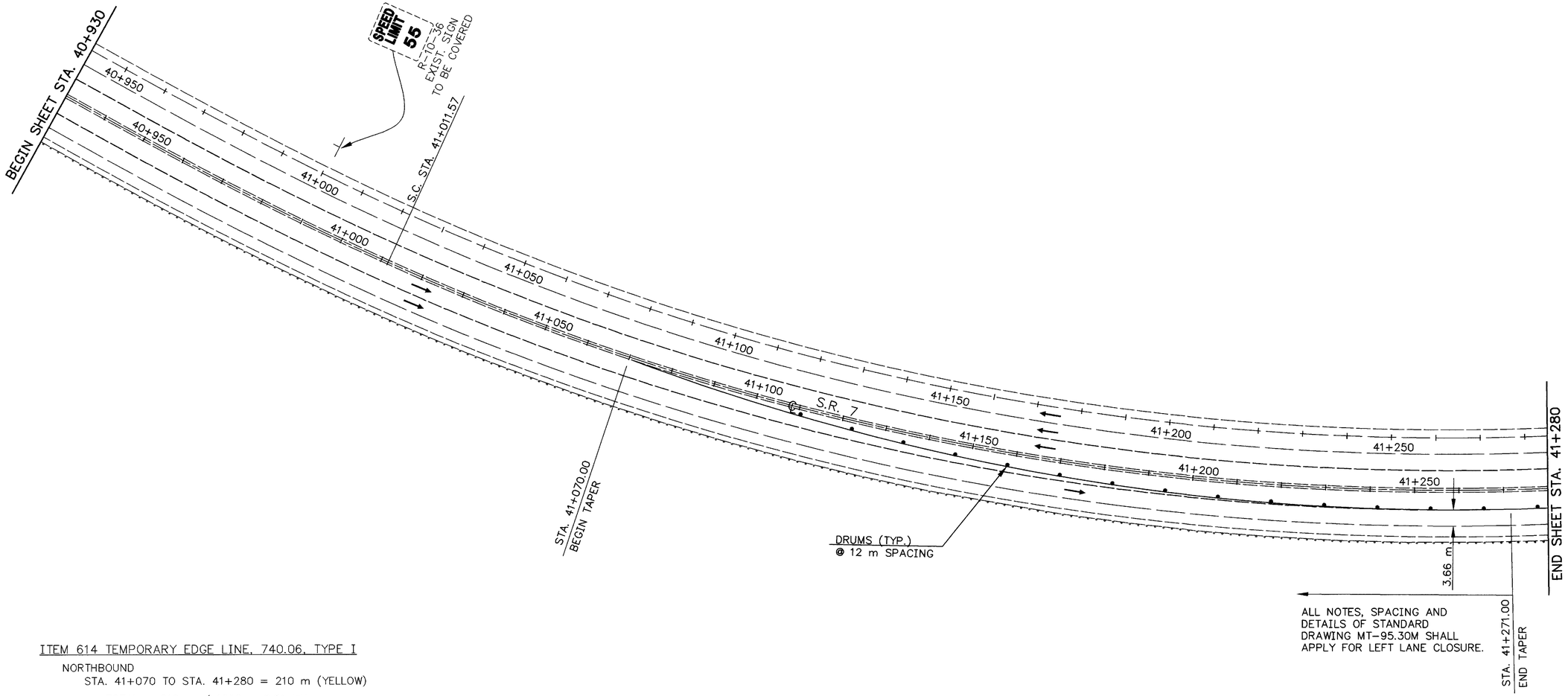
THE ENGINEER MAY ADJUST THE STATIONS AND OFFSETS OF THE LIGHT POLES AS DEEMED NECESSARY TO SATISFY FIELD CONDITIONS.

PAYMENT WILL BE MADE AT THE UNIT PRICE PER EACH TEMPORARY CROSSOVER LIGHTING SYSTEM THROUGHOUT ALL PHASES OF WORK WHEN THE CROSS-OVER ROADWAYS ARE USED.

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC GENERAL NOTES

JEF-7-30.067



ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND

STA. 41+070 TO STA. 41+280 = 210 m (YELLOW)

TOTAL = 210 m / 1000 = 0.21 KM

MAINTENANCE OF TRAFFIC LEGEND

▨	– TEMPORARY PAVEMENT, CLASS A	PCB	– PORTABLE CONCRETE BARRIER
▩	– WORK AREA	⇕	– LUMINAIRE
●	– DRUM	→	– DIRECTION OF TRAFFIC

SEE STANDARD CONSTRUCTION DRAWING MT-95.30M FOR CLOSING LEFT LANE OF A MULTILANE UNDIVIDED HIGHWAY WITH DRUMS.

NOTE: USE OF TONGUE AND GROOVE TYPE PORTABLE CONCRETE BARRIER ON THIS PROJECT SHALL BE STRICTLY PROHIBITED.

FOR MAINTENANCE OF TRAFFIC QUANTITIES SEE SHEET 35.

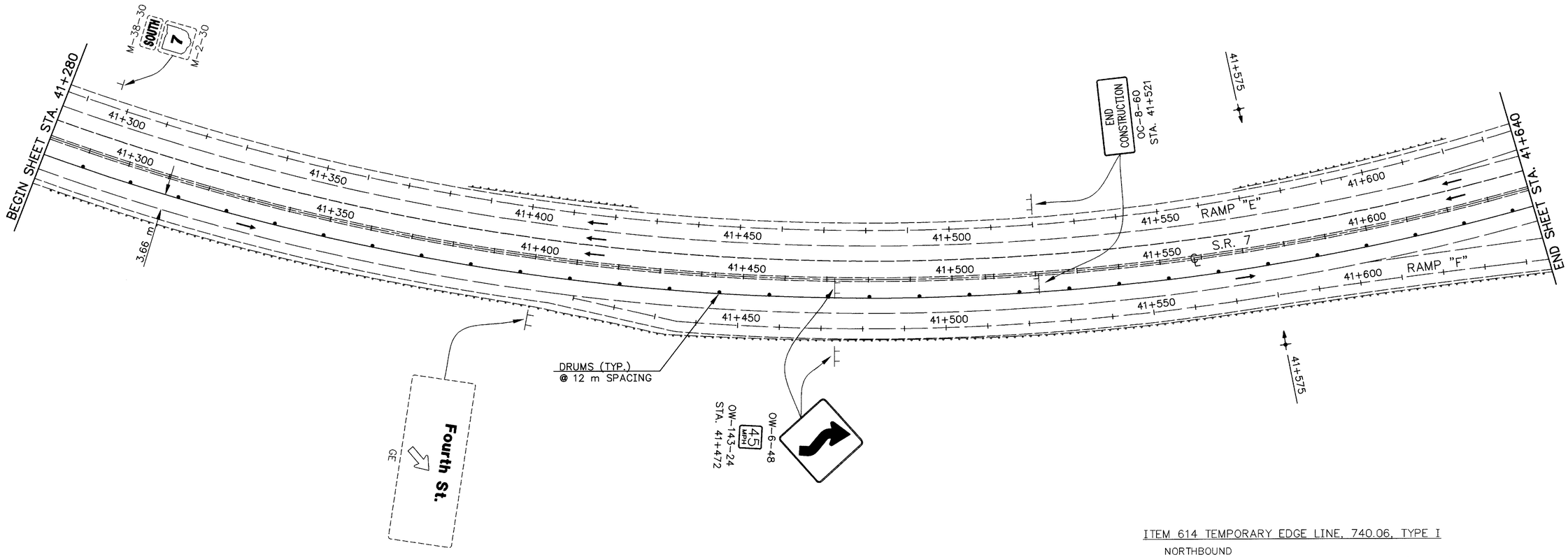
CALCULATED T.D.D.
CHECKED J.E.U.

0 500 1000
HORIZONTAL SCALE IN METERS

MAINTENANCE OF TRAFFIC PLAN
PHASE I

JEF-7-30.967

16
123



ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND

STA. 41+280 TO STA. 41+640 = 360 m (YELLOW)

TOTAL = 360 m / 1000 = 0.36 KM

SEE SHEET NO. 16 FOR LEGEND.

0 500 1000 HORIZONTAL SCALE IN METERS

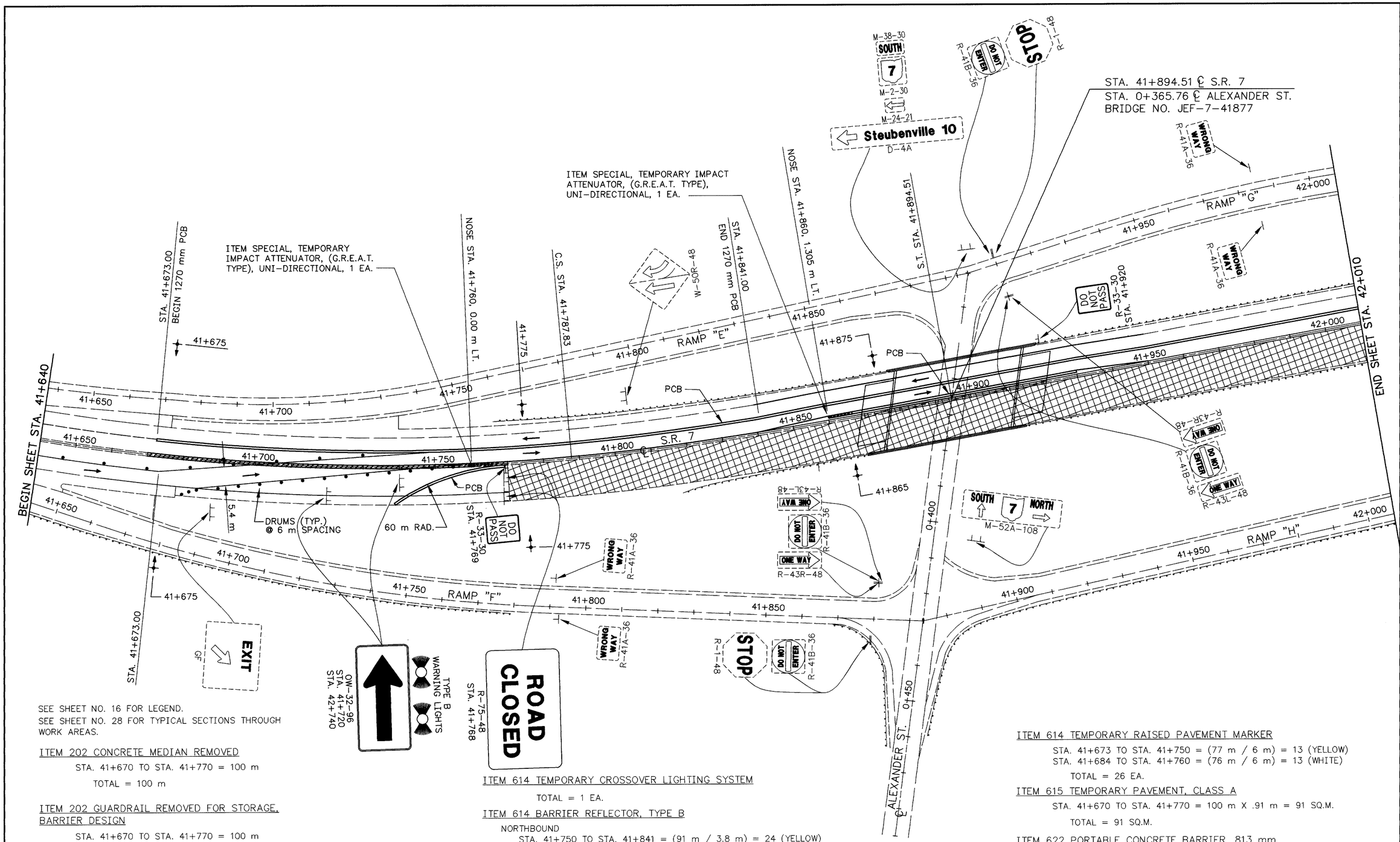
CALCULATED T.D.D.

CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN

PHASE I

JEF-7-39.997



SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

ITEM 202 CONCRETE MEDIAN REMOVED

STA. 41+670 TO STA. 41+770 = 100 m

TOTAL = 100 m

ITEM 202 GUARDRAIL REMOVED FOR STORAGE, BARRIER DESIGN

STA. 41+670 TO STA. 41+770 = 100 m

TOTAL = 100 m

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND
STA. 41+640 TO STA. 41+750 = 110 m (YELLOW)
STA. 41+684 TO STA. 41+760 = 76 m (WHITE)
STA. 41+840 TO STA. 41+950 = 110 m (WHITE)

SOUTHBOUND
STA. 41+840 TO STA. 41+950 = 110 m (WHITE)

TOTAL = 406 m / 1000 = 0.41 KM

ITEM 614 TEMPORARY CROSSOVER LIGHTING SYSTEM

TOTAL = 1 EA.

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND
STA. 41+750 TO STA. 41+841 = (91 m / 3.8 m) = 24 (YELLOW)
STA. 41+841 TO STA. 42+010 = (169 m / 7.6 m) = 22 (YELLOW)

SOUTHBOUND
STA. 41+673 TO STA. 41+841 = (168 m / 3.8 m) = 44 (YELLOW)
STA. 41+841 TO STA. 42+010 = (169 m / 7.6 m) = 22 (YELLOW)

TOTAL = 112 EA.

ITEM 614 OBJECT MARKER

STA. 41+841 TO STA. 42+010 = (169 m / 7.6 m)X2 = 44 (YELLOW)
STA. 41+860 TO STA. 41+930 = (70 m / 7.6 m)X2 = 18 (WHITE)

TOTAL = 62 EA.

ITEM 614 TEMPORARY RAISED PAVEMENT MARKER

STA. 41+673 TO STA. 41+750 = (77 m / 6 m) = 13 (YELLOW)
STA. 41+684 TO STA. 41+760 = (76 m / 6 m) = 13 (WHITE)

TOTAL = 26 EA.

ITEM 615 TEMPORARY PAVEMENT, CLASS A

STA. 41+670 TO STA. 41+770 = 100 m X .91 m = 91 SQ.M.

TOTAL = 91 SQ.M.

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 41+841 TO STA. 42+010 = 169 m
STA. 41+867 TO STA. 41+930 = 63 m
STA. 41+739 TO STA. 41+769 = 33 m

TOTAL = 265 m

ITEM 622 PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN

STA. 41+673 TO STA. 41+841 = 168 m

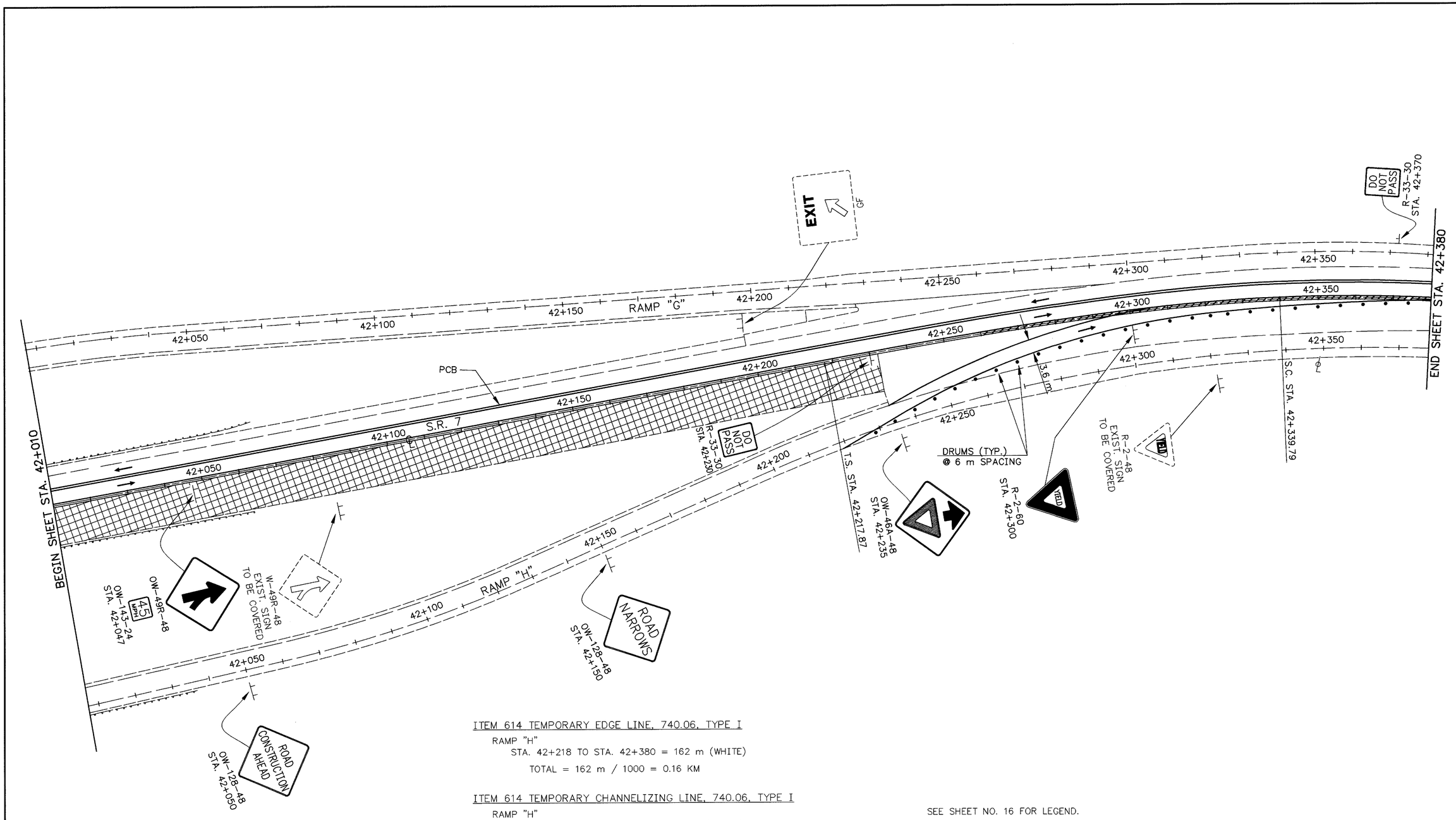
TOTAL = 168 m

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN
PHASE I

JEF-7-36.967



ITEM 202 CONCRETE MEDIAN REMOVED

STA. 42+260 TO STA. 42+380 = 120 m

TOTAL = 120 m

ITEM 202 GUARDRAIL REMOVED FOR STORAGE, BARRIER DESIGN

STA. 42+260 TO STA. 42+380 = 120 m

TOTAL = 120 m

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

RAMP "H"

STA. 42+218 TO STA. 42+380 = 162 m (WHITE)

TOTAL = 162 m / 1000 = 0.16 KM

ITEM 614 TEMPORARY CHANNELIZING LINE, 740.06, TYPE I

RAMP "H"

STA. 42+232 TO STA. 42+306 = 74 m (WHITE)

TOTAL = 74 m

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND

STA. 42+010 TO STA. 42+380 = (370 m / 7.6 m) = 49 (YELLOW)

SOUTHBOUND

STA. 42+010 TO STA. 42+380 = (370 m / 7.6 m) = 49 (YELLOW)

TOTAL = 98 EA.

ITEM 614 OBJECT MARKER

STA. 42+010 TO STA. 42+380 = (370 m / 7.6 m)X2 = 98 (YELLOW)

TOTAL = 98 EA.

SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

ITEM 615 TEMPORARY PAVEMENT, CLASS A

STA. 42+260 TO STA. 42+380 = 120 m X .91 m = 109.2 SQ.M.

TOTAL = 109.2 SQ.M.

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 42+010 TO STA. 42+380 = 370 m

TOTAL = 370 m

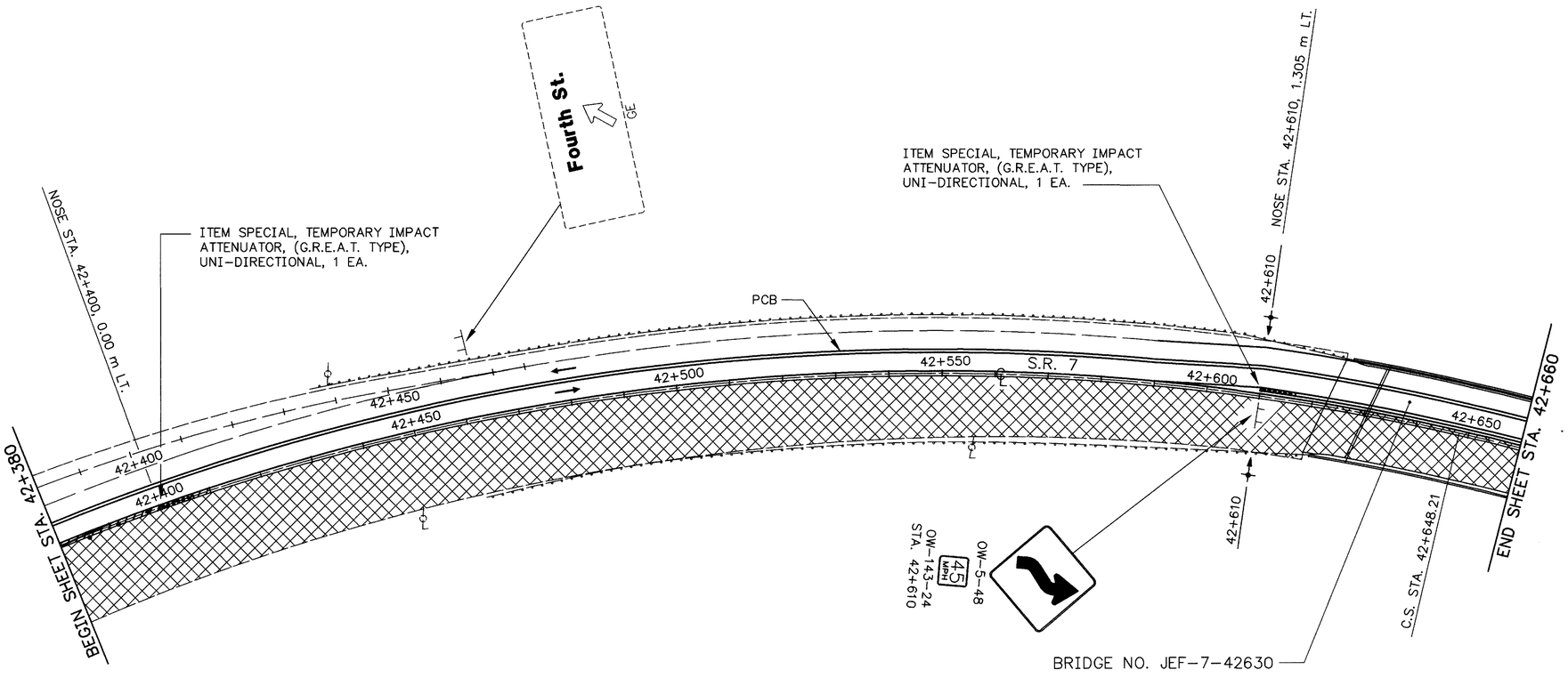
CALCULATED T.D.D.
CHECKED J.E.U.

0 500 1000
HORIZONTAL SCALE IN METERS

MAINTENANCE OF TRAFFIC PLAN

PHASE I

JEF-7-30.967



ITEM 202 CONCRETE MEDIAN REMOVED

STA. 42+380 TO STA. 42+410 = 30 m

TOTAL = 30 m

ITEM 202 GUARDRAIL REMOVED FOR STORAGE, BARRIER DESIGN

STA. 42+380 TO STA. 42+410 = 30 m

TOTAL = 30 m

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND

STA. 42+590 TO STA. 42+660 = 70 m (WHITE)

SOUTHBOUND

STA. 42+590 TO STA. 42+660 = 70 m (WHITE)

RAMP "H"

STA. 42+380 TO STA. 42+400 = 20 m (WHITE)

TOTAL = 160 m / 1000 = 0.16 KM

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND

STA. 42+380 TO STA. 42+660 = (280 m / 7.6 m) = 37 (YELLOW)

SOUTHBOUND

STA. 42+380 TO STA. 42+660 = (280 m / 7.6 m) = 37 (YELLOW)

TOTAL = 74 EA.

ITEM 614 OBJECT MARKER

STA. 42+380 TO STA. 42+660 = (280 m / 7.6 m)X2 = 74 (YELLOW)
STA. 42+610 TO STA. 42+660 = (50 m / 7.6 m)X2 = 14 (WHITE)

TOTAL = 88 EA.

ITEM 615 TEMPORARY PAVEMENT, CLASS A

STA. 42+380 TO STA. 42+410 = 30 m X .91 m = 27.3 SQ.M.

TOTAL = 27.3 SQ.M.

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 42+380 TO STA. 42+660 = 280 m
STA. 42+617 TO STA. 42+660 = 43 m

TOTAL = 323 m

SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

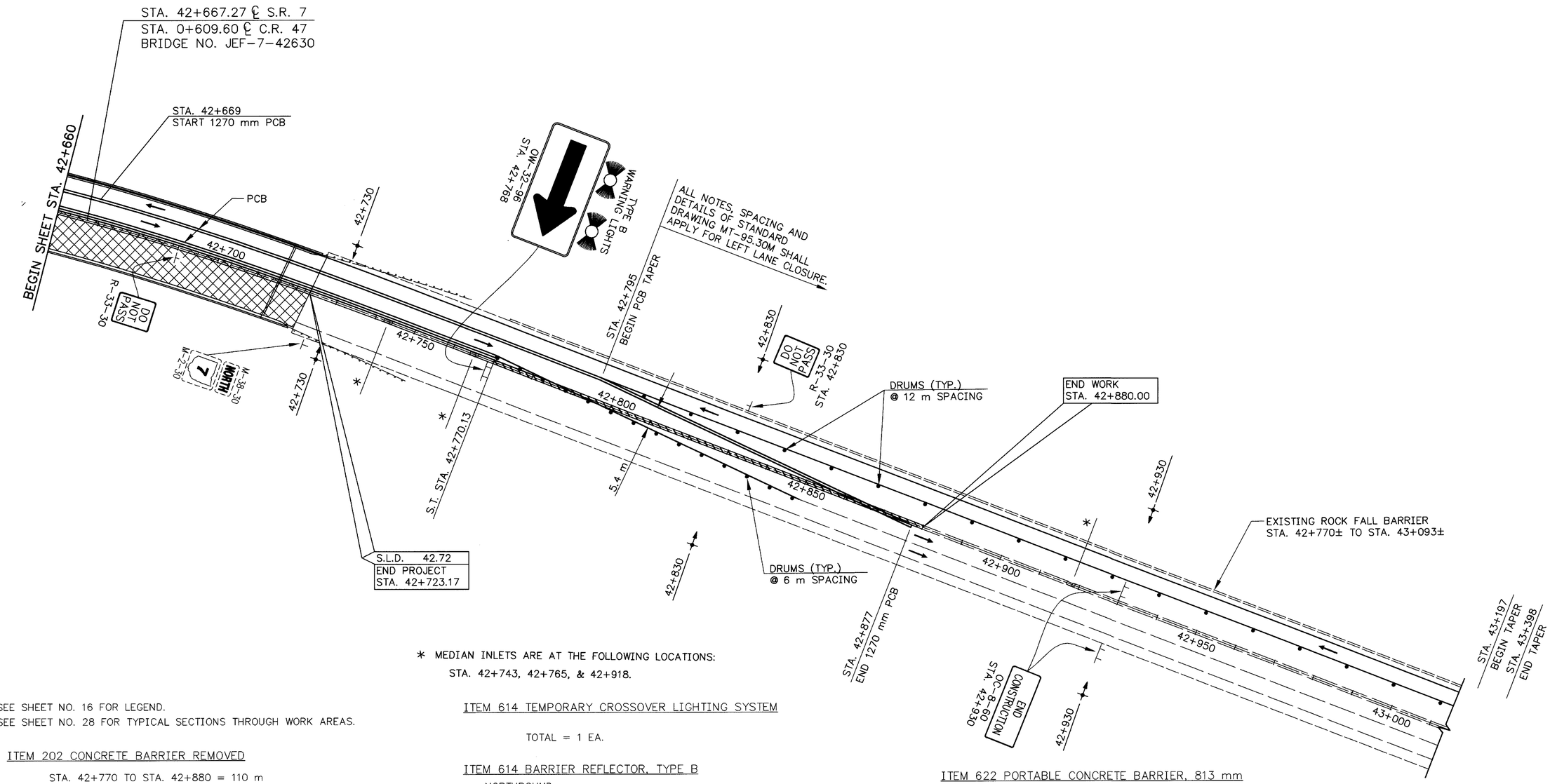
0 500 1000
HORIZONTAL SCALE IN METERS

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN

PHASE I

JEF-7-36.967



* MEDIAN INLETS ARE AT THE FOLLOWING LOCATIONS:
STA. 42+743, 42+765, & 42+918.

SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

ITEM 202 CONCRETE BARRIER REMOVED

STA. 42+770 TO STA. 42+880 = 110 m

TOTAL = 110 m

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND
STA. 42+770 TO STA. 42+850 = 80 m (WHITE)
SOUTHBOUND
STA. 42+660 TO STA. 43+197 = 537 m (WHITE)
STA. 42+795 TO STA. 43+398 = 603 m (YELLOW)

TOTAL = 1220 m / 1000 = 1.22 KM

ITEM 614 TEMPORARY CROSSOVER LIGHTING SYSTEM

TOTAL = 1 EA.

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND
STA. 42+660 TO STA. 42+669 = (9 m / 7.6 m) = 1 (YELLOW)
STA. 42+669 TO STA. 42+877 = (208 m / 3.8 m) = 55 (YELLOW)
SOUTHBOUND
STA. 42+660 TO STA. 42+669 = (9 m / 7.6 m) = 1 (YELLOW)
STA. 42+669 TO STA. 42+795 = (126 m / 3.8 m) = 33 (YELLOW)

TOTAL = 90 EA.

ITEM 614 OBJECT MARKER

STA. 42+660 TO STA. 42+669 = (9 m / 7.6 m)X2 = 2 (YELLOW)
STA. 42+660 TO STA. 42+770 = (110 m / 7.6 m)X2 = 30 (WHITE)

TOTAL = 32 EA.

ITEM 615 TEMPORARY PAVEMENT, CLASS A

STA. 42+770 TO STA. 42+880 = 110 m X .91 m = 100.1 SQ.M.

TOTAL = 100.1 SQ.M.

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 42+660 TO STA. 42+669 = 9 m
STA. 42+660 TO STA. 42+770 = 110 m

TOTAL = 119 m

ITEM 622 PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN

STA. 42+669 TO STA. 42+877 = 208 m

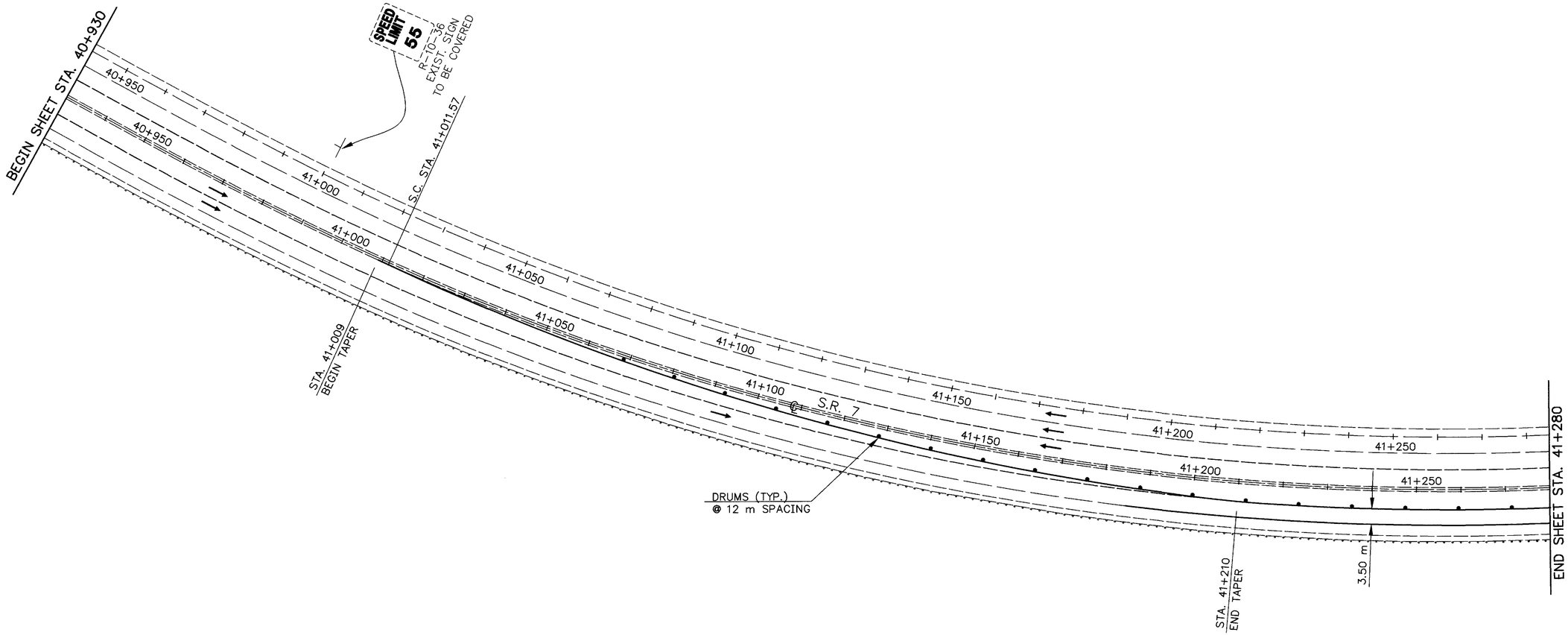
TOTAL = 208 m

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN
PHASE I

JEF-7-36.967



SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND
STA. 41+009 TO STA. 41+280 = 271 m (YELLOW)
STA. 41+185 TO STA. 41+280 = 95 m (WHITE)

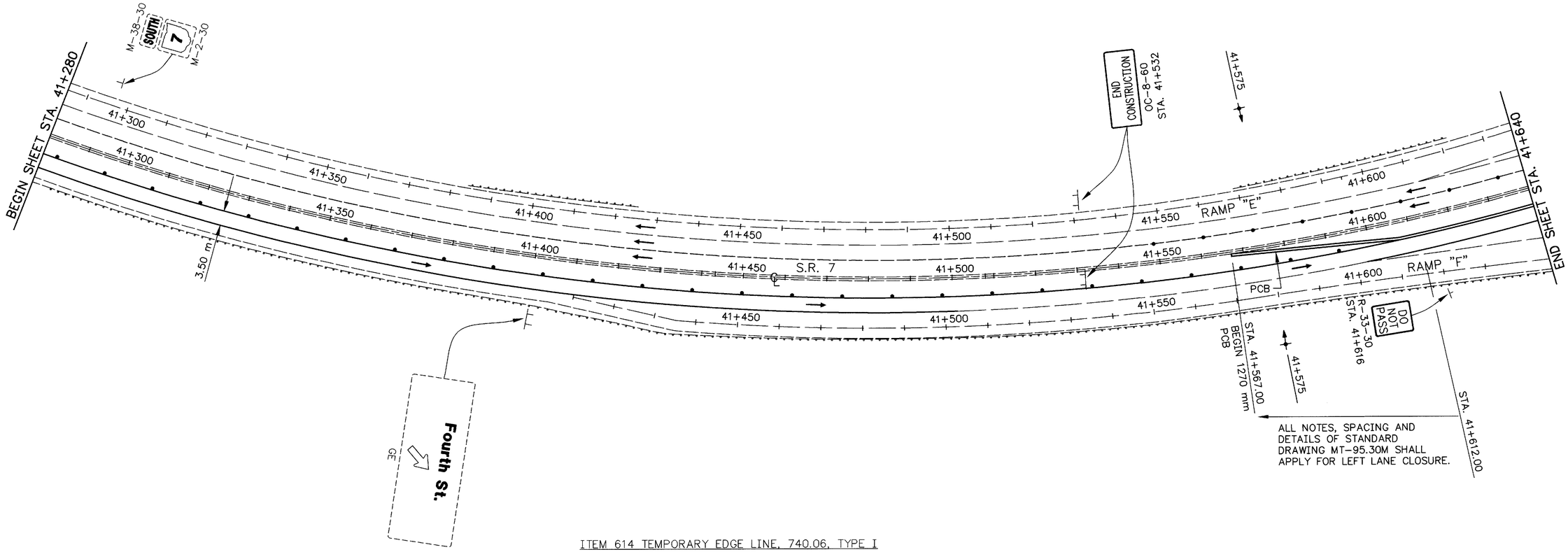
TOTAL = 366 m / 1000 = 0.37 KM

0 500 1000
HORIZONTAL SCALE IN METERS

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN
PHASE II

JEF-7-36.967



ALL NOTES, SPACING AND DETAILS OF STANDARD DRAWING MT-95.30M SHALL APPLY FOR LEFT LANE CLOSURE.

SEE SHEET NO. 16 FOR LEGEND.

SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND

STA. 41+280 TO STA. 41+612 = 332 m (YELLOW)
STA. 41+280 TO STA. 41+501 = 221 m (WHITE)
STA. 41+599 TO STA. 41+640 = 41 m (WHITE)

TOTAL = 594 m / 1000 = 0.59 KM

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND

STA. 41+612 TO STA. 41+640 = (28 m / 3.8 m) = 7 (YELLOW)

TOTAL = 7 EA.

ITEM 622 PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN

STA. 41+567 TO STA. 41+640 = 73 m

TOTAL = 73 m

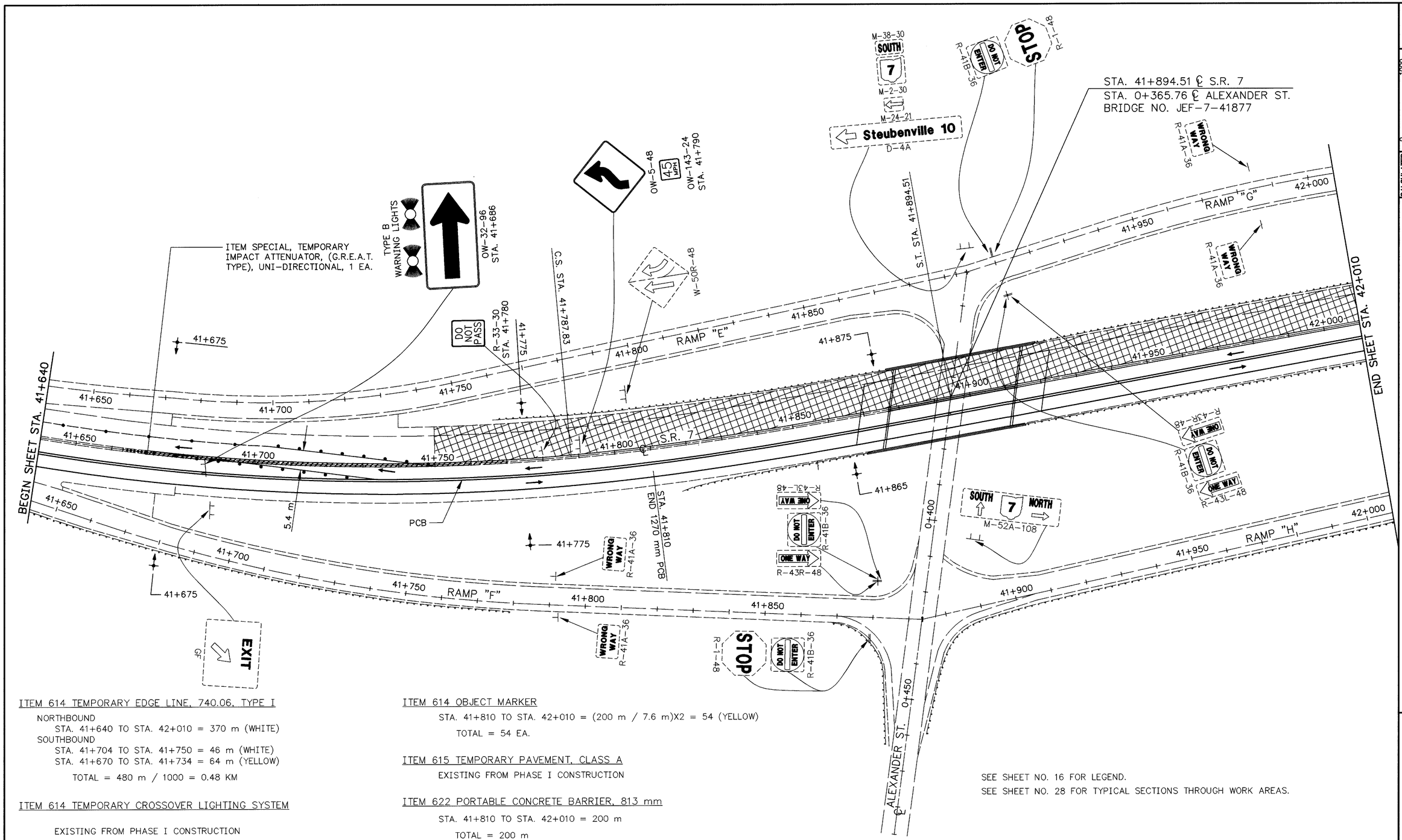
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN

PHASE II

JEF-7-36.967



ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND
STA. 41+640 TO STA. 42+010 = 370 m (WHITE)
SOUTHBOUND
STA. 41+704 TO STA. 41+750 = 46 m (WHITE)
STA. 41+670 TO STA. 41+734 = 64 m (YELLOW)
TOTAL = 480 m / 1000 = 0.48 KM

ITEM 614 TEMPORARY CROSSOVER LIGHTING SYSTEM

EXISTING FROM PHASE I CONSTRUCTION

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND
STA. 41+640 TO STA. 41+810 = (170 m / 3.8 m) = 45 (YELLOW)
STA. 41+810 TO STA. 42+010 = (200 m / 7.6 m) = 26 (YELLOW)
SOUTHBOUND
STA. 41+734 TO STA. 41+810 = (76 m / 3.8 m) = 20 (YELLOW)
STA. 41+810 TO STA. 42+010 = (200 m / 7.6 m) = 26 (YELLOW)
TOTAL = 117 EA.

ITEM 614 OBJECT MARKER

STA. 41+810 TO STA. 42+010 = (200 m / 7.6 m)X2 = 54 (YELLOW)
TOTAL = 54 EA.

ITEM 615 TEMPORARY PAVEMENT, CLASS A

EXISTING FROM PHASE I CONSTRUCTION

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 41+810 TO STA. 42+010 = 200 m
TOTAL = 200 m

ITEM 622 PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN

STA. 41+640 TO STA. 41+810 = 170 m
TOTAL = 170 m

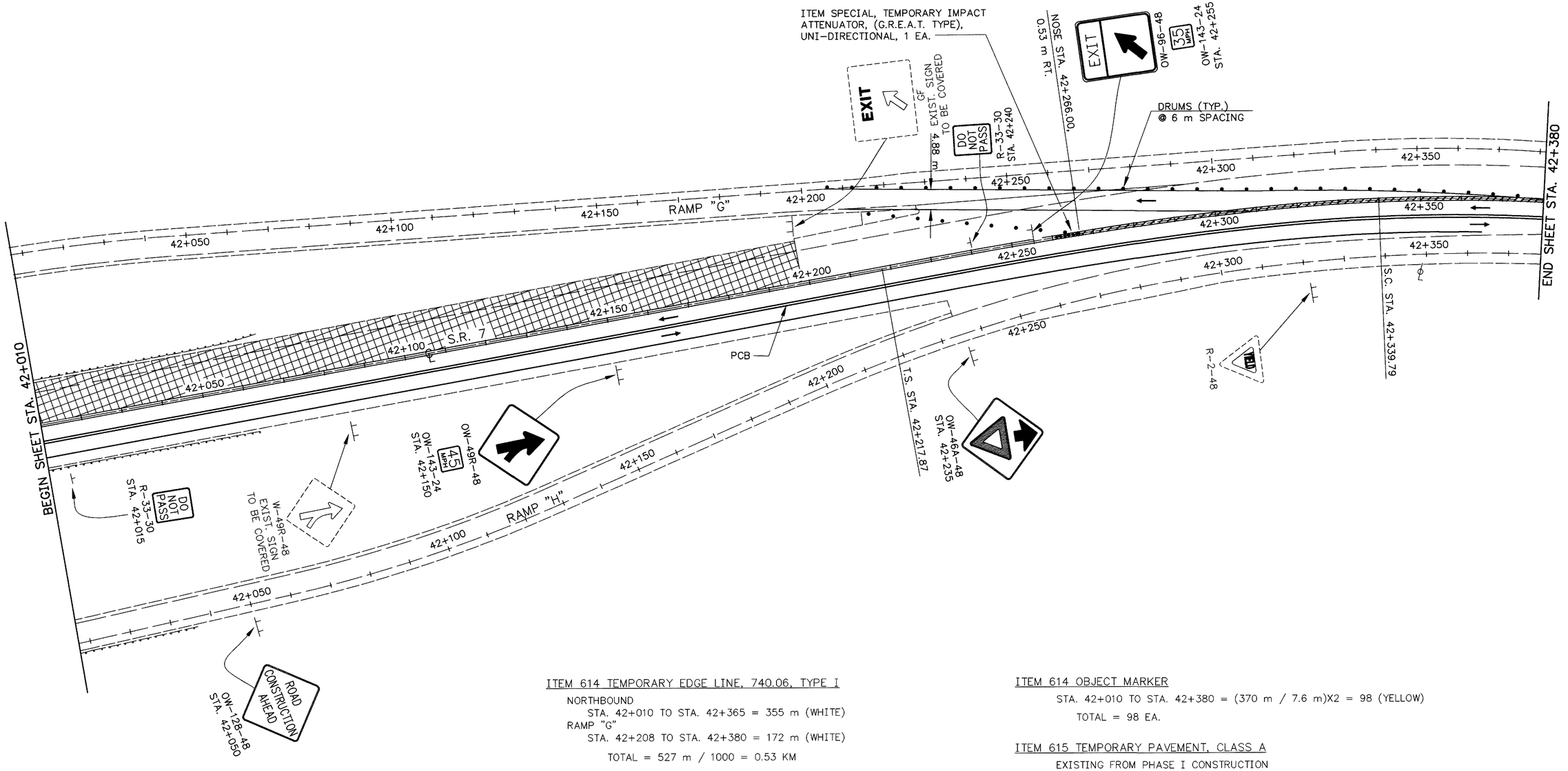
SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

1000 0 500 HORIZONTAL SCALE IN METERS

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN
PHASE II

JEF-7-30.967



SEE SHEET NO. 16 FOR LEGEND.

SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND
STA. 42+010 TO STA. 42+365 = 355 m (WHITE)
RAMP "G"
STA. 42+208 TO STA. 42+380 = 172 m (WHITE)
TOTAL = 527 m / 1000 = 0.53 KM

ITEM 614 TEMPORARY GORE MARKING, 740.06, TYPE I

RAMP "G"
STA. 42+210 TO STA. 42+310 = 100 m (WHITE)
TOTAL = 100 m

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND
STA. 42+010 TO STA. 42+380 = (370 m / 7.6 m) = 49 (YELLOW)
SOUTHBOUND
STA. 42+010 TO STA. 42+380 = (370 m / 7.6 m) = 49 (YELLOW)
TOTAL = 98 EA.

ITEM 614 OBJECT MARKER

STA. 42+010 TO STA. 42+380 = (370 m / 7.6 m)X2 = 98 (YELLOW)
TOTAL = 98 EA.

ITEM 615 TEMPORARY PAVEMENT, CLASS A

EXISTING FROM PHASE I CONSTRUCTION

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 42+010 TO STA. 42+380 = 370 m
TOTAL = 370 m

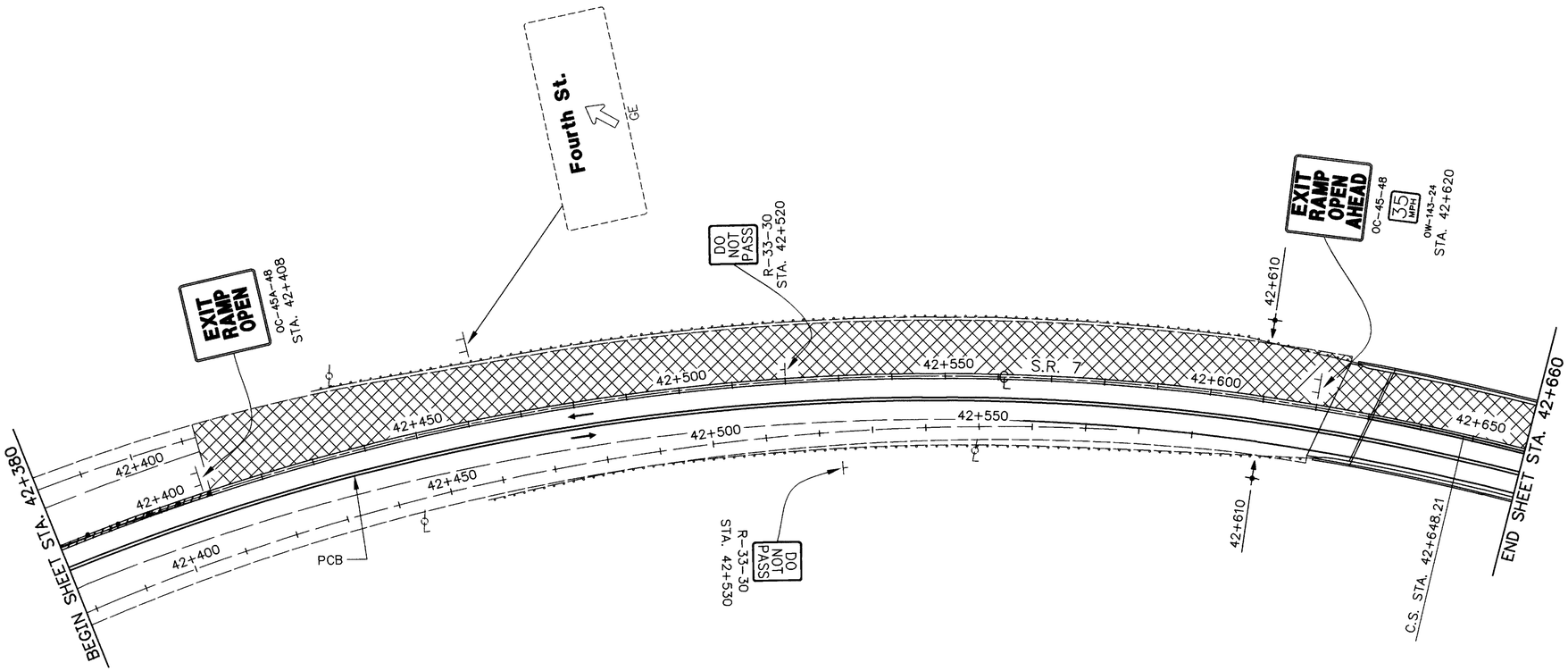
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC PLAN

PHASE II

JEF-7-36.967



ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND
STA. 42+565 TO STA. 42+660 = 95 (WHITE)
RAMP "G"
STA. 42+380 TO STA. 42+410 = 30 (WHITE)
TOTAL = 125 m / 1000 = 0.13 KM

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND
STA. 42+380 TO STA. 42+660 = (280 m / 7.6 m) = 37 (YELLOW)
SOUTHBOUND
STA. 42+380 TO STA. 42+660 = (280 m / 7.6 m) = 37 (YELLOW)
TOTAL = 74 EA.

ITEM 614 OBJECT MARKER

STA. 42+380 TO STA. 42+660 = (280 m / 7.6 m)X2 = 74 (YELLOW)
TOTAL = 74 EA.

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 42+380 TO STA. 42+660 = 280 m
TOTAL = 280 m

SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

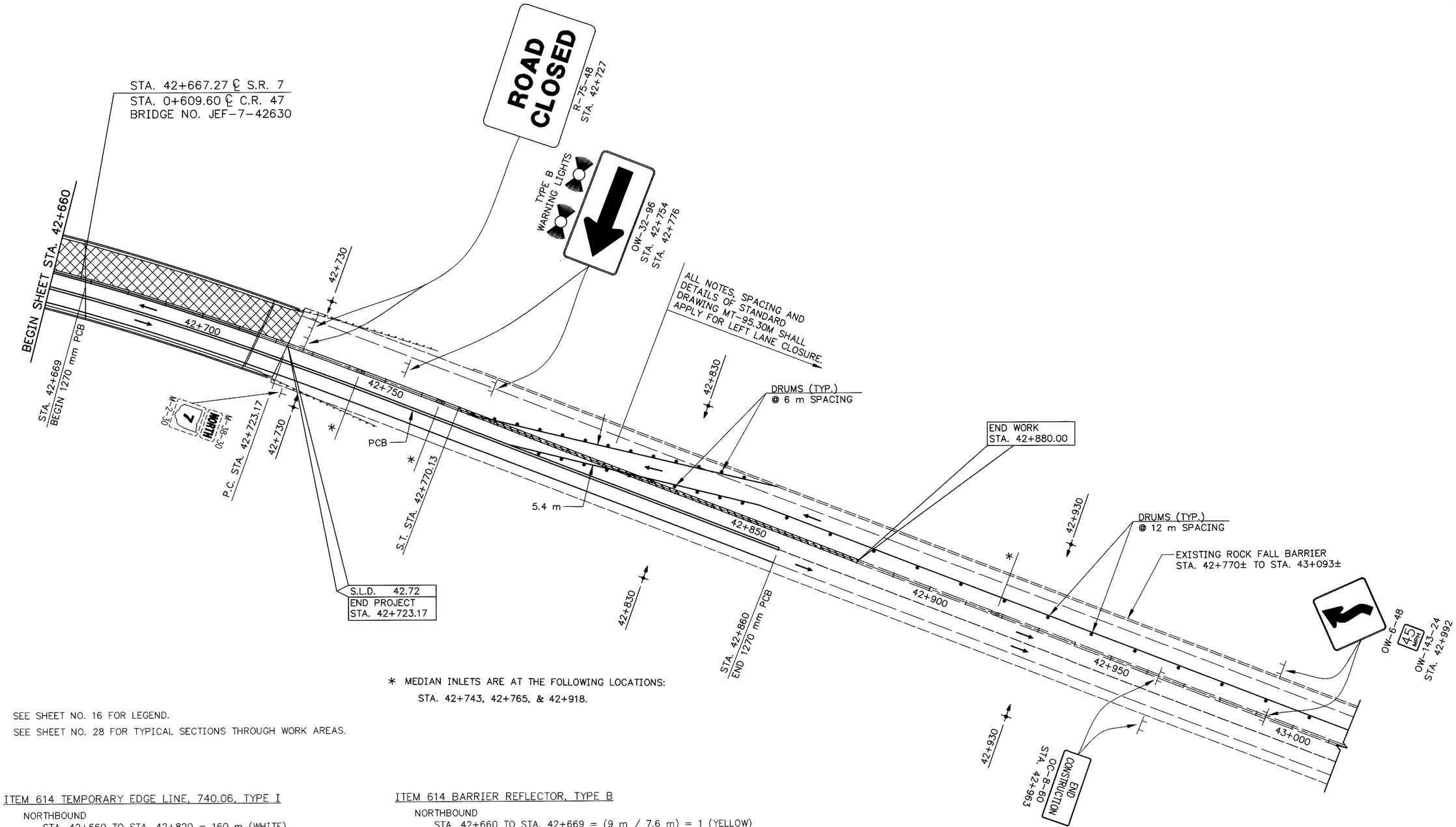
CALCULATED T.D.D.
CHECKED J.E.U.

0 500 1000
HORIZONTAL SCALE IN METERS

MAINTENANCE OF TRAFFIC PLAN

PHASE II

JEF-7-36.967



* MEDIAN INLETS ARE AT THE FOLLOWING LOCATIONS:
STA. 42+743, 42+765, & 42+918.

SEE SHEET NO. 16 FOR LEGEND.
SEE SHEET NO. 28 FOR TYPICAL SECTIONS THROUGH WORK AREAS.

ITEM 614 TEMPORARY EDGE LINE, 740.06, TYPE I

NORTHBOUND
STA. 42+660 TO STA. 42+820 = 160 m (WHITE)
SOUTHBOUND
STA. 42+730 TO STA. 42+814 = 84 m (WHITE)
STA. 42+740 TO STA. 43+414 = 674 m (YELLOW)

TOTAL = 918 m / 1000 = 0.92 KM

ITEM 614 TEMPORARY CROSSOVER LIGHTING SYSTEM

EXISTING FROM PHASE I CONSTRUCTION

ITEM 614 BARRIER REFLECTOR, TYPE B

NORTHBOUND
STA. 42+660 TO STA. 42+669 = (9 m / 7.6 m) = 1 (YELLOW)
STA. 42+669 TO STA. 42+820 = (151 m / 3.8 m) = 40 (YELLOW)
SOUTHBOUND
STA. 42+660 TO STA. 42+669 = (9 m / 7.6 m) = 1 (YELLOW)
STA. 42+669 TO STA. 42+740 = (71 m / 3.8 m) = 19 (YELLOW)

TOTAL = 61 EA.

ITEM 614 OBJECT MARKER

STA. 42+660 TO STA. 42+669 = (9 m / 7.6 m)X2 = 2 (YELLOW)

TOTAL = 2 EA.

ITEM 615 TEMPORARY PAVEMENT, CLASS A

EXISTING FROM PHASE I CONSTRUCTION

ITEM 622 PORTABLE CONCRETE BARRIER, 813 mm

STA. 42+660 TO STA. 42+669 = 9 m

TOTAL = 9 m

ITEM 622 PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN

STA. 42+669 TO STA. 42+820 = 151 m

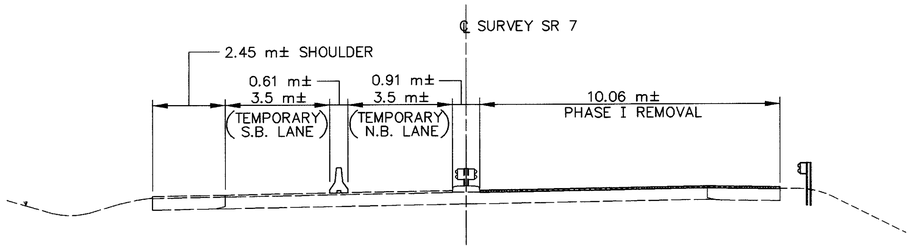
TOTAL = 151 m

CALCULATED T.D.D.
CHECKED J.E.U.

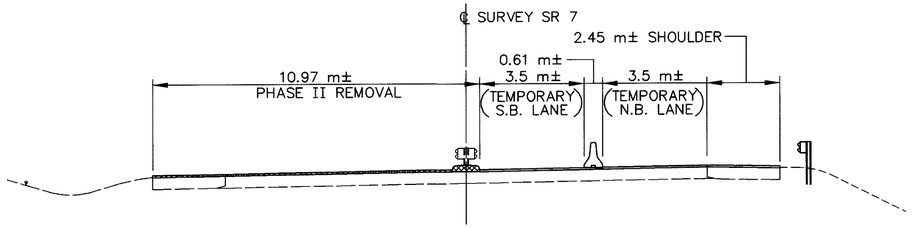
0 500 1000
HORIZONTAL SCALE IN METERS

MAINTENANCE OF TRAFFIC PLAN
PHASE II

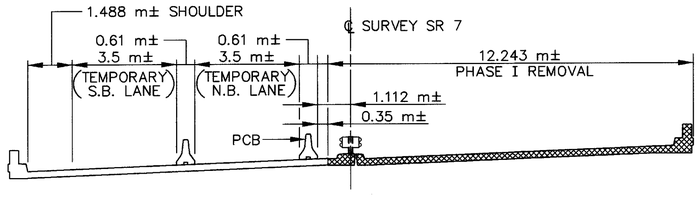
JEF-7-36.967



PHASE I ROADWAY SECTION

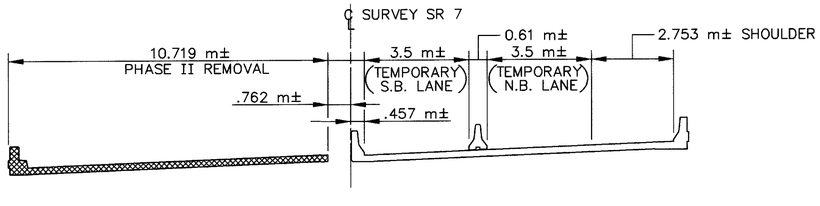


PHASE II ROADWAY SECTION



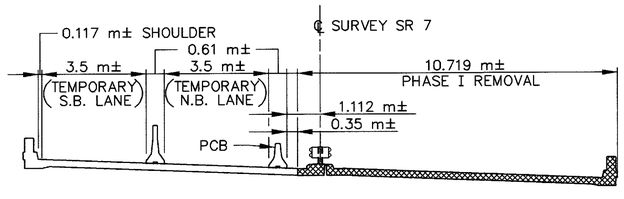
PHASE I SECTION THROUGH BRIDGE NO. JEF-7-41877

PCB LIMITING STATIONS: STA. 41+860 TO STA. 41+930



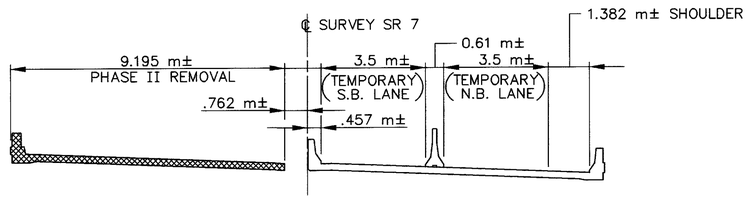
PHASE II SECTION THROUGH BRIDGE NO. JEF-7-41877

PCB LIMITING STATIONS: STA. 41+877.10 TO STA. 41+913.29



PHASE I SECTION THROUGH BRIDGE NO. JEF-7-42630

PCB LIMITING STATIONS: STA. 42+610 TO STA. 42+730



PHASE II SECTION THROUGH BRIDGE NO. JEF-7-42630

PCB LIMITING STATIONS: STA. 42+630.33 TO STA. 42+715.55

CALCULATED TDD
CHECKED JEU

MAINTENANCE OF TRAFFIC TYPICAL SECTIONS

JEF-7-30.967

REFERENCE NO.	PLAN SHEET NO.	STATION TO STATION		SIDE	202 APPROACH SLAB REMOVED	202 CONCRETE MEDIAN REMOVED	202 CONCRETE BARRIER REMOVED	202 INLET REMOVED, AS PER PLAN	202 REMOVAL MISC.: MEDIAN INLET CLEANOUT	203 EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	203 SUBGRADE COMPACTION	304 AGGREGATE BASE	604 CATCH BASIN ADJUSTED TO GRADE	604 INLET, NO. 3C, TYPE A, AS PER PLAN	611 REINFORCED CONCRETE APPROACH SLAB (T=380 mm), AS PER PLAN	612 CONCRETE MEDIAN	622 CONCRETE BARRIER, TYPE A	622 CONCRETE BARRIER, TYPE A, AS PER PLAN 'A'	622 CONCRETE BARRIER, TYPE A, AS PER PLAN 'B'	COMMENTS	SEE SHEET NO.
		FROM	TO		SQ. M.	METER	METER	EACH	EACH	CU. M.	SQ. M.	CU. M.	EACH	EACH	SQ. M.	SQ. M.	METER	METER	METER		
AS-1	50	38+761.84	38+769.44	RT.	57.95					22.63	78.77	11.82			78.77						40
AS-2	50	38+761.84	38+769.44	LT.	57.95					22.63	78.77	11.82			78.77						40
AS-3	50	38+822.03	38+829.63	RT.	57.95					22.63	78.77	11.82			78.77						40
AS-4	50	38+822.03	38+829.63	LT.	57.95					22.63	78.77	11.82			78.77						40
AS-5	54	40+470.63	40+478.23	RT.	57.95					22.63	78.77	11.82			78.77						40
AS-6	54	40+470.63	40+478.23	LT.	85.77					25.71	101.92	15.29			101.92						40
AS-7	54	40+516.23	40+523.83	RT.	57.95					22.63	78.77	11.82			78.77						40
AS-8	54	40+516.23	40+523.83	LT.	85.77					25.71	101.92	15.29			101.92						40
AS-9	58	41+869.50	41+877.10	RT.	57.95					19.73	78.77	11.82			78.77						40
AS-10	58	41+869.50	41+877.10	LT.	57.95					19.73	78.77	11.82			78.77						40
AS-11	58	41+913.29	41+920.89	RT.	57.95					19.73	78.77	11.82			78.77						40
AS-12	58	41+913.29	41+920.89	LT.	57.95					19.73	78.77	11.82			78.77						40
AS-13	60	42+622.73	42+630.33	RT.	57.95					14.20	68.34	10.25			68.34						40
AS-14	60	42+622.73	42+630.33	LT.	57.95					14.20	68.34	10.25			68.34						40
AS-15	60	42+715.55	42+723.15	RT.	57.95					14.20	68.34	10.25			68.34						40
AS-16	60	42+715.55	42+723.15	LT.	57.95					14.20	68.34	10.25			68.34						40
MR-1	50	38+761.84	38+769.44	℄		7.60															
MR-2	50	38+822.03	38+829.63	℄		7.60															
MR-3	54	40+470.63	40+478.23	℄		7.60															
MR-4	54	40+516.23	41+523.83	℄		7.60															
MR-5	58	41+869.50	41+877.10	℄		7.60															
MR-6	58	41+913.29	41+920.89	℄		7.60															
MR-7	60	42+622.73	42+630.33	℄		7.60															
MR-8	60	42+715.55	42+730.77	℄		15.22															
BR-1	45	36+940.23	37+167.20	℄			226.97					30.64									
BR-2	60	42+730.77	42+742.15	℄			11.38														
B-1	45-50	36+940.23	38+761.84	℄														1821.61			
B-2	50	38+761.84	38+769.44	℄								1.03							7.60		66
B-3	50	38+822.03	38+829.63	℄								1.03							7.60		66
B-4	50-54	38+829.63	40+470.63	℄														1641.00			
B-5	54	40+470.63	40+478.23	℄								1.03							7.60		66
B-6	54	40+516.23	40+523.83	℄								1.03							7.60		66
B-7	54-58	40+523.83	41+869.50	℄														1345.67			
B-8	58	41+869.50	41+877.10	℄								1.03							7.60		66
B-9	58	41+913.29	41+920.89	℄								1.03							7.60		66
B-10	58-60	41+920.89	42+622.73	℄														701.84			
B-11	60	42+622.73	42+630.33	℄								1.03							7.60		66
B-12	60	42+715.55	42+723.15	℄								1.03							7.60		66
B-13	60	42+723.15	42+730.77	℄													7.62				
B-14	60	42+770.00	42+880.00	℄													110.00				
M-1	45	36+940.23	37+167.20	℄												204.27					
CB-1	49	38+536		LT.									1							RAISE 88 mm	
CB-2	58	41+678		RT.									1							RAISE 88 mm	
CB-3	58	41+649		LT.									1							RAISE 88 mm	
I-1	45	37+240.95		℄		3.2		1	1					1		2.88					13
I-2	45	37+256.19		℄		3.2		1	1					1		2.88					13
I-3	47	37+842.93		℄		3.0		1	1					1		2.70					13
I-4	47	37+865.79		℄		3.0		1	1					1		2.70					13
I-5	48	38+292.52		℄		3.6		1	1					1		3.24					13
I-6	49	38+543.98		℄		4.2		1	1					1		3.78					13
I-7	49	38+565.31		℄		4.2		1	1					1		3.78					13
I-8	49	38+586.65		℄		4.2		1	1					1		3.78					13
I-9	50	38+832.01		℄		3.2		1	1					1		2.88					13
I-10	52	39+786.04		℄		3.6		1	1					1		3.24					13
I-11	52	39+801.28		℄		3.2		1	1					1		2.88					13
I-12	54	40+220.38		℄		3.2		1	1					1		2.88					13
I-13	54	40+466.66		℄		4.2		1	1					1		3.78					13
I-14	55	40+616.62		℄		3.2		1	1					1		2.88					13
I-15	57	41+591.68		℄		3.2		1	1					1		2.88					13
I-16	57	41+614.84		℄		4.2		1	1					1		3.78					13
I-17	57	41+637.70		℄		4.2		1	1					1		3.78					13
I-18	60	42+619.16		℄		3.2		1	1					1		2.88					13
DEDUCTIONS:																					
I-2.2M TYPE 3C INLETS (I-1 THRU I-18) 18 EACH X 6.0 m = 108 m																		-108.00			
TOTALS					982.84	132.42	238.35	18	18	322.92	1264.90	228.66	3	18	1264.90	261.87	117.62	5402.12	60.80		
TOTALS CARRIED TO GENERAL SUMMARY					983	132	238	18	18	323	1265	229	3	18	1265	262	118	5402	61		

CALCULATED T.D.D.
CHECKED J.E.U.

QUANTITY

JEF-7-36.967

REFERENCE NO.	PLAN SHEET NO.	STATION TO STATION		SIDE	202 GUARDRAIL REMOVED FOR STORAGE	202 GUARDRAIL REMOVED FOR STORAGE, BARRIER DESIGN, AS PER PLAN	448 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (UNDER GUARDRAIL), AS PER PLAN	SPECIAL PRESSURE RELIEF JOINT, TYPE C	SPECIAL APPROACH SLAB PRESSURE RELIEF JOINT	601 CRUSHED AGGREGATE SLOPE PROTECTION	606 GUARDRAIL, TYPE 5	606 ANCHOR ASSEMBLY TYPE A	606 ANCHOR ASSEMBLY TYPE E-98	606 ANCHOR ASSEMBLY TYPE T	606 BRIDGE TERMINAL ASSEMBLY, TYPE 1	606 BRIDGE TERMINAL ASSEMBLY, TYPE 2	626 BARRIER REFLECTOR, TYPE A	626 BARRIER REFLECTOR, TYPE B								COMMENTS	SEE SHEET NO.
		FROM	TO		METER	METER	CU. M.	METER	METER	CU. M.	METER	EACH	EACH	EACH	EACH	EACH	EACH	EACH									
GR-1	45	36+940.23	37+088.82	RT.	148.59		8.92				144.78			1			6									CONNECT TO EXISTING	40
GR-2	45-46	37+291.67	37+493.60	RT.	201.93		12.12				182.88		1	1			8										40
GR-3	46-47	37+358.10	37+697.19	LT.	339.09		20.34				320.04		1	1			12										40
GR-4	47-48	38+001.85	38+184.73	LT.	182.88		10.97				163.83		1	1			7										40
GR-5	48	38+157.35	38+187.83	RT.	30.48		1.83				11.43		1	1			3										40
GR-6	49	0+305.88 RAMP "B"	0+351.60 RAMP "B"	RT.	45.72		2.74				26.67		1	1			3										40
GR-7	49-50	38+696.397	38+764.977	LT.	68.58		4.11				64.77			1		1	3										40
GR-8	49-50	38+696.265	38+766.750	RT.	68.58		4.23				55.245		1		1		3	2									40
GR-9	49-50	0+435.90 RAMP "B"	0+474.00 RAMP "B"	LT.	38.10		2.29				19.05		1	1			3										40
GR-10	50	0+441.90 RAMP "B"	0+480.00 RAMP "B"	RT.	38.10		2.29				19.05		1	1			3										40
GR-11	50	0+557.58 RAMP "A"	0+584.25 RAMP "A"	LT.	26.67		1.60				15.24	1		1			3										40
GR-12	50	0+554.00 RAMP "A"	0+217.61 C.R. 46	RT.	41.91		2.51				30.48	1		1			3										40
GR-13	50	38+824.156	38+875.591	LT.	49.53		3.09				36.195		1		1		2	2									40
GR-14	50	38+827.092	38+853.762	RT.	26.67																						40
GR-15	50-51	0+238.00 RAMP "D"	0+596.14 RAMP "D"	RT.	358.14		21.49				339.09		1	1			13										40
GR-16	51	39+159.25	39+387.85	LT.	228.60		13.72				209.55		1	1			9										40
GR-17	52-54	39+816.568	40+477.603	RT.	659.13		39.66				645.795		1		1		22	2									40
GR-18	53-54	40+199.45	40+241.36	LT.	41.91		2.51				22.86		1	1			3										40
GR-19	54	40+338.718	40+472.068	LT.	133.35		8.00				129.54			1		1	5										40
GR-20	54	40+516.381	40+544.956	LT.	26.67		1.71				13.335		1		1		1	2									40
GR-21	54-58	40+523.206	41+784.215 RAMP "F"	RT.	1272.54		76.35				1268.73			1		1	43										40
GR-22	55-56	40+832.00	40+931.06	LT.	99.06		5.94				80.01		1	1			4										40
GR-23	57	41+381.45	41+423.36	LT.	41.91		2.51				22.86		1	1			3										40
GR-24	57	41+570.00	41+623.34	LT.	53.34		3.20				34.29		1	1			3										40
GR-25	58	41+763.141	41+877.441	LT.	114.30		6.86				110.49			1		1	4										40
GR-26	58	41+810.213	41+869.268	RT.	57.15		3.54				43.815		1		1		2	2									40
GR-27	58	41+859.10 RAMP "F"	0+470.00 ALEXANDER ST.	RT.	57.15		3.43				49.53	1					3									CONNECT TO EXISTING	40
GR-28	58-59	0+470.00 ALEXANDER ST.	42+036.35 RAMP "H"	RT.	194.31		11.66				190.50			1			7									CONNECT TO EXISTING	40
GR-29	58-59	41+913.869	42+066.269	RT.	152.40		9.14				148.59			1		1	6										40
GR-30	58-59	41+920.154	42+070.649	LT.	148.59		9.03				135.255		1		1		5	2									40
GR-31	60	42+428.857	42+626.977	LT.	198.12		11.89				194.31			1		1	7										40
GR-32	60	42+456.416	42+622.151	RT.	163.83		9.94				150.495		1		1		6	3									40
GR-33	60	42+720.542	42+754.832	RT.	34.29																						40
GR-34	60	42+722.043	42+765.858	LT.	41.91		2.63				28.575		1		1		2	3									40
GR-35	45-50	37+167.20	38+769.44	℄		1602.24																					
GR-36	50-54	38+822.03	40+478.23	℄		1656.20																					
GR-37	54-58	40+516.23	41+670	℄		1153.77																					
GR-38	58	41+770	41+877.10	℄		107.10																					
GR-39	58-59	41+913.29	42+260	℄		346.71																					
GR-40	60	42+410	42+630.33	℄		220.33																					
GR-41	60	42+715.55	42+730.77	℄		15.22																					
RJ-1	49	38+737.84		LT.				7.62																			
RJ-2	49	38+737.84		RT.				7.62																			
RJ-3	50	38+853.63		LT.				7.62																			
RJ-4	50	38+853.63		RT.				7.62																			
RJ-5	54	40+446.63		LT.				11.28																			
RJ-6	54	40+446.63		RT.				7.62																			
RJ-7	54	40+547.83		LT.				11.28																			
RJ-8	54	40+547.83		RT.				7.62																			
RJ-9	58	41+869.50		LT.					7.62																		
RJ-10	58	41+869.50		RT.					7.62																		
RJ-11	58	41+920.89		LT.					7.62																		
RJ-12	58	41+920.89		RT.					7.62																		
RJ-13	60	42+598.73		LT.				7.62																			
RJ-14	60	42+598.73		RT.				7.62																			
E-1	60	42+631	42+660	LT.RT.						246																	
TOTALS					5383.53	5101.57	320.25	83.52	30.48	246	4907.28	3	21	23	8	6	207	18									
TOTALS CARRIED TO GENERAL SUMMARY					5383.53	5102	320	84	30	246	4907.28	3	21	23	8	6	207	18									

CALCULATED T.D.D.
CHECKED J.E.U.

QUANTITY SUB-SUMMARY

JEF-7-36.967

REFERENCE NO.	PLAN SHEET NO.	STATION TO STATION		SIDE	202	203	203	301	304	407	407	446	446	605															SEE SHEET NO.
					WEARING COURSE REMOVED	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	SUBGRADE COMPACTION	BITUMINOUS AGGREGATE BASE, PG 64-22	AGGREGATE BASE	TACK COAT	TACK COAT FOR INTERMEDIATE COURSE	ASPHALT CONCRETE INTERMEDIATE COURSE TYPE 2, PG 64-28	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN	SHALLOW UNDERDRAIN													
		FROM	TO		SQ. M.	CU. M.	SQ. M.	CU. M.	CU. M.	LITER	LITER	CU. M.	CU. M.	METER													
P-1	45-48	36+940.23	38+306.60	RT.	13745.68			1030.93		4674	4674	618.56	439.86																40
P-2	45-48	36+940.23	38+204.40	LT.	12717.55			953.82		4324	4324	572.29	406.96																40
P-3	48-49	38+204.40	38+591.70	LT.	2951.23			221.34		1003	1003	132.80	94.44																40
P-4	48-49	38+306.60	38+580.00	RT.	2083.31			156.25		708	708	93.75	66.66																40
P-5	48-50	0+000 RAMP "A"	0+590.25 RAMP "A"	LT.	4001.57	283.54	553.80	383.19	157.83	1549	1549	204.99	145.77																40
P-6	48-50	0+000 RAMP "B"	0+486.35 RAMP "B"	RT.	3275.34	245.18	478.86	317.48	136.48	1276	1276	168.94	120.13																40
P-7	49-50	38+580.00	38+761.84	RT.	1829.31			137.20		622	622	82.32	58.54																40
P-8	49-50	38+591.70	38+761.84	LT.	1711.61			128.37		582	582	77.02	54.77																40
P-9	50	38+829.63	39+084.10	LT.	2559.97			192.00		870	870	115.20	81.92																40
P-10	50-51	38+829.63	39+217.67	RT.	3903.68			292.78		1327	1327	175.66	124.92																40
P-11	50-51	39+084.10	39+367.76	LT.	2161.49			162.11		735	735	97.27	69.17																40
P-12	50-52	0+007.66 RAMP "D"	0+772.75 RAMP "D"	RT.	4986.56	444.31	867.79	504.16	247.32	1990	1990	263.44	187.34																40
P-13	50-51	0+007.43 RAMP "C"	0+592.03 RAMP "C"	LT.	3747.52	326.95	638.58	376.85	182.00	1491	1491	197.37	140.36																40
P-14	51-52	39+217.67	39+590.12	RT.	2838.07			212.86		965	965	127.71	90.82																40
P-15	51-53	39+367.76	40+121.32	LT.	7580.81			568.56		2577	2577	341.14	242.58																40
P-16	52-54	39+590.12	40+470.63	RT.	8857.93			664.34		3012	3012	398.61	283.45																40
P-17	53-54	40+121.32	40+227.99	LT.	1008.03	123.25	226.14	109.52	71.80	420	420	55.54	39.49																40
P-18	54	40+227.99	40+470.63	LT.	2736.98	238.03	436.75	270.78	138.67	1079	1079	142.82	101.56																40
P-19	54-57	40+523.83	41+404.31	RT.	8857.63			664.32		3012	3012	398.59	283.44																40
P-20	54-57	40+523.83	41+517.30	LT.	11206.34	974.60	1788.25	1108.72	567.77	4418	4418	584.76	415.83																40
P-21	57-58	41+404.31	41+678.65	RT.	2090.47			156.78		711	711	94.07	66.90																40
P-22	57-58	41+517.30	41+739.82	LT.	1695.60			127.17		576	576	76.30	54.26																40
P-23	57-58	41+404.31 RAMP "F"	41+889.95 RAMP "F"	RT.	3388.46	242.91	474.43	325.29	135.21	1313	1313	173.83	123.61																41
P-24	57-58	41+517.30 RAMP "E"	41+895.73 RAMP "E"	LT.	2661.35	205.86	402.08	259.91	114.59	1042	1042	137.85	98.03																41
P-25	58	41+678.65	41+869.50	RT.	1919.95			144.00		653	653	86.40	61.44																41
P-26	58	41+739.82	41+869.50	LT.	1304.58			97.84		444	444	58.71	41.75																41
P-27	58-59	41+920.89	42+231.74	RT.	3127.15			234.54		1063	1063	140.72	100.07																41
P-28	58-59	41+920.89	42+198.14	LT.	2789.14			209.18		948	948	125.51	89.25																41
P-29	58-60	41+877.07 RAMP "H"	42+605.44 RAMP "H"	RT.	4484.18	410.59	801.93	456.60	228.55	1797	1797	237.87	169.16																41
P-30	58-60	41+905.71 RAMP "G"	42+472.44 RAMP "G"	LT.	3678.14	300.20	586.32	363.81	167.10	1450	1450	191.90	136.46																41
P-31	59-60	42+231.74	42+605.44	RT.	2847.59			213.57		968	968	128.14	91.12																41
P-32	60	42+605.44	42+622.73	RT.	173.94			13.04		59	59	7.83	5.57																41
P-33	59-60	42+198.14	42+472.44	LT.	2090.17			156.76		711	711	94.06	66.88																41
P-34	60	42+472.44	42+622.73	LT.	1511.92			113.39		514	514	68.04	48.38																41
P-35	60	42+723.15	42+749.55	RT.	265.58			19.92		90	90	11.95	8.50																41
P-36	60	42+723.15	42+749.55	LT.	265.58			19.92		90	90	11.95	8.50																41
UD-1	45	36+966.63	37+140.98	LT.										174.35															
UD-2	45	36+970.00	37+256.19	RT.										286.19															
UD-3	45-46	37+145.00	37+378.78	LT.										233.78															
UD-4	46-47	37+380.00	37+842.32	LT.										462.32															
UD-5	46-47	37+500.00	37+841.71	RT.										341.71															
UD-6	47-48	37+842.93	38+239.17	RT.										396.24															
UD-7	47	37+845.00	38+008.44	LT.										163.44															
UD-8	48-49	38+194.67	38+505.00	LT.										310.33															
UD-9	48-49	38+240.39	38+550.00	RT.										309.61															
UD-10	49-50	38+595.00	38+758.86	RT.										163.86															
UD-11	50	38+830.00	39+085.00	LT.										255.00															
UD-12	50-51	38+830.00	39+237.40	RT.										407.40															
UD-13	51	39+230.00	39+353.78	LT.										123.78															
UD-14	51	39+295.00	39+393.78	RT.										98.78															
UD-15	51-53	39+355.00	39+851.87	LT.										496.87															
UD-16	51-52	39+395.00	39+822.61	RT.										427.61															
UD-17	53	39+830.00	40+106.08	RT.										276.08															
UD-18	53	39+855.00	40+121.32	LT.										266.32															
UD-19	54	40+215.00	40+403.26	RT.										188.26															
UD-20	54	40+404.48	40+470.00	RT.										65.52															
UD-21	54-55	40+526.40	40+855.00	RT.										328.60															
UD-22	57	41+397.67	41+585.00	RT.										187.33															
UD-23	58	41+775.00	41+871.48	LT.										96.48															
UD-24	58-59	41+925.00	42+193.96	LT.										268.96															
UD-25	58-59	41+923.60	42+193.96	RT.										270.36															
UD-26	59-60	42+232.00	42+530.00	LT.										298.00															
UD-27	59-60	42+300.64	42+500.00	RT.										199.36															
UD-28	60	42+501.22	42+600.00	RT.										98.78															
TOTALS					137 054.41	3795.42	7254.93	11 367.30	2147.32	49 063	49 063	6493.91	4617.89	7195.32															
TOTALS CARRIED TO GENERAL SUMMARY					137 054	3795	7255	11 367	2147	49 063	49 063	6494	4618	7195															

CALCULATED T.D.D.
CHECKED J.E.U.

QUANTITY SUB-SUMMARY

JEF-7-36.907

REFERENCE NO.	PLAN SHEET NO.	STATION TO STATION		SIDE	603	604	605										BENDS AND BRANCHES FOR INFORMATION ONLY					COMMENTS	SEE SHEET NO.
					150 mm CONDUIT, TYPE F 707.33, 707.41 OR 707.42	PRECAST REINFORCED CONCRETE OUTLET	150 mm SHALLOW PIPE UNDERDRAIN										150 mm X 60°	150 mm X 90°	100 mm X 150 mm WYE	150 mm X 150 mm TEE	150 mm PLUG		
		FROM	TO		METER	EACH	METER										EACH	EACH	EACH	EACH	EACH		
UD-29	49	0+305.00 RAMP "A"	0+434.30 RAMP "A"	LT.			129.30																
UD-30	49-50	0+435.50 RAMP "A"	0+580.00 RAMP "A"	LT.			144.50																
UD-31	49-50	0+240.00 RAMP "B"	0+475.00 RAMP "B"	RT.			235.00																
UD-32	50-51	0+024.00 RAMP "C"	0+339.20 RAMP "C"	LT.			315.20																
UD-33	50-51	0+030.00 RAMP "D"	0+467.86 RAMP "D"	RT.			437.86																
UD-34	55-57	40+628.02	41+585.00	LT.			956.98																
UD-35	57-58	41+595.00 RAMP "E"	41+891.60 RAMP "E"	LT.			296.60																
UD-36	58-59	41+890.00 RAMP "H"	42+059.00 RAMP "H"	RT.			169.00																
UD-37	59	42+045.00 RAMP "G"	42+228.60 RAMP "G"	LT.			183.60																
U-1	45	36+970.00		RT.	5	1													1				
U-2	45	36+966.63		LT.																		CONNECT TO EXISTING PIPE UNDERDRAIN	
U-3	45	37+145.00		LT.	3	1													1				
U-4	46	37+380.00		LT.	5	1													1				
U-5	46	37+500.00		RT.	8	1													1				
U-6	46	37+530.00		LT.	5	1													1		1		
U-7	47	37+680.00		LT.	5	1													1		1		
U-8	47	37+842.93		RT.																		CONNECT TO EXISTING PIPE UNDERDRAIN	
U-9	47	37+845.00		LT.	8	1													1				
U-10	48	38+360.00		LT.	8	1													1		1		
U-11	49	38+505.00		LT.	8	1													1				
U-12	49	0+305.00 RAMP "A"		LT.	6	1												1					
U-13	49	0+240.00 RAMP "B"		RT.	6	1												1	1			CONNECT SHALLOW UNDERDRAIN TO PROPOSED PIPE UNDERDRAIN OUTLET	
U-14	49	38+595.00		RT.	6	1													1				
U-15	49	0+335.00 RAMP "B"		RT.	4	1														1			
U-16	50	0+580.00 RAMP "A"		LT.	6	1												1					
U-17	50	0+475.00 RAMP "B"		RT.	6	1												1					
U-18	50	0+024.00 RAMP "C"		LT.	6												1					CONNECT TO CATCH BASIN	
U-19	50	0+030.00 RAMP "D"		RT.	6	1												1					
U-20	50	38+830.00		LT.	5	1													1				
U-21	50	38+830.00		RT.	5	1													1				
U-22	50	39+070.00		RT.	6	1													1		1		
U-23	51	0+315.00 RAMP "D"		RT.	4	1														1			
U-24	51	39+230.00		LT.	4	1													1				
U-25	51	39+295.00		RT.	4	1													1				
U-26	51	39+355.00		LT.	5	1													1				
U-27	51	39+395.00		RT.	4	1													1				
U-28	53	39+830.00		RT.	5	1													1				
U-29	53	39+855.00		LT.	8	1													1				
U-30	53	39+970.00		RT.	4	1													1		1		
U-31	54	40+215.00		RT.	4	1													1				
U-32	54	40+470.00		RT.	4	1													1				
U-33	55	40+690.00		RT.	4	1													1		1		
U-34	55	40+840.00		LT.	4	1														1			
U-35	55	40+855.00		RT.	4	1													1				
U-36	56	41+215.00		LT.	6	1														1			
U-37	57	41+395.00		LT.	6	1														1			
U-38	57	41+585.00		RT.	6	1													1				
U-39	57	41+585.00		LT.	4	1												1					
U-40	57	41+595.00		LT.	4	1												1					
U-41	58	41+775.00		LT.	6	1													1				
U-42	58	41+890.00 RAMP "H"		RT.	4	1												1					
U-43	58	41+925.00		LT.	6	1													1				
U-44	58	41+923.60		RT.																		CONNECT TO EXISTING PIPE UNDERDRAIN	
U-45	59	42+025.00		RT.	5	1													1				
U-46	59	42+045.00 RAMP "G"		LT.	4	1												1					
U-47	60	42+500.00		RT.	5	1													1				
U-48	60	42+530.00		LT.	6	1													1				
U-49	60	42+600.00		RT.	4	1													1				
TOTALS					241	45	2868.04										1	9	32	5	6		
TOTALS CARRIED TO GENERAL SUMMARY					241	45	2868										1	9	32	5	6		

CALCULATED T.D.D.
CHECKED J.E.U.

QUANTITY SUB-SUMMARY

JEF-7-36.907

REFERENCE NO.	PLAN SHEET NO.	STATION	SIDE	CODE	SIZE (mm)	630 GROUND MOUNTED SUPPORT, NO. 2 POST METER	GROUND MOUNTED SUPPORT, NO. 3 POST METER	ONE WAY SUPPORT, NO. 3 POST METER	SIGN, FLAT SHEET SQ. M	SIGN, FLAT SHEET, TYPE G SQ. M	SIGN, EXTRUSHEET, TYPE G SQ. M	EXISTING SIGN REVISED WITH DEMOUNTABLE COPY EACH	REFURBISHING SIGN, AS PER PLAN SQ. M	REMOVAL OF GROUND MOUNTED SIGN & DISPOSAL EACH	REMOVAL OF GROUND MOUNTED MAJOR SIGN & DISPOSAL EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT & DISPOSAL EACH	COMMENTS
		S.R. 7 – MAINLINE															
S–1	45	36+992	LT.	N–45–12	300X325	2.9			0.1					1		1	
S–2	45	36+992	RT.	N–45–12	300X325	2.9			0.1					1		1	
S–3	45	37+019	LT.	GM	4800X2100								10.1				
S–4	45	37+090	RT.	R–10–48	1200X1500		5.3/5.5		1.8					1		2	
S–5	45	37+153	RT.	GA–1	3300X1500								5.0				
S–6	45	37+159	LT.	W–139L–48	1200X1200		4.7/4.9		1.4					1		2	
S–7	46	37+400	RT.	GB	3900X1500								5.9				
S–8	46	37+502	LT.	GJ	4800X1200								5.8				
S–9	47	37+757	RT.	GB	3900X1500								5.9				
S–10	47	37+806	LT.	R–10–48	1200X1500		5.1/5.3		1.8					1		2	
S–11	48	38+108	LT.	M–38–30	750X375		4.7		0.3					1		1	
				M–2–30–2	750X750				0.6					1			
S–12	48	38+313	RT.	GE	3900X1500								5.9				
S–13	49	38+585	LT.	GF	1800X1500								2.7				
S–14	49	38+620	RT.	N–45–12	300X325	2.9			0.1					1		1	
S–15	49	38+620	LT.	N–45–12	300X325	2.9			0.1					1		1	
S–16	49	38+667	LT.	W–49R–48	1200X1200		5.2/5.4		1.4					1		2	
S–17	50	38+765	RT.	X–6R	300X900	3.3			0.3					1		1	
S–18	50	38+826	LT.	X–6R	300X900	3.3			0.3					1		1	
S–19	50	38+981	RT.	W–49R–48	1200X1200		5.0/5.3		1.4					1		2	
S–20	50	39+083	LT.	GF	1800X1500								2.7				
S–21	51	39+354	RT.	R–2–48	1200X1200X1200		4.7/5.0			0.6				1		2	
S–22	51	39+374	LT.	GE	4200X1500						6.3				1		
S–23	52	39+634	RT.	M–37–30	750X375		4.4		0.3					1		1	
				M–2–30–2	750X750				0.6					1			
S–24	53	39+894	LT.	GB	3900X1500								5.9				
S–25	53	39+988	RT.	R–10–48	1200X1500		5.0/5.4		1.8					1		2	
S–26	53	40+200	LT.	W–139R–48	1200X1200		5.6/5.8		1.4					1		2	
S–27	54	40+233	LT.	N–45–12	300X325	2.9			0.1					1		1	
S–28	54	40+233	RT.	N–45–12	300X325	2.9			0.1					1		1	
S–29	54	40+257	RT.	GJ	4500X1200							1	5.4				
S–30	54	40+293	LT.	GB	3900X1500								5.9				
S–31	54	40+379	LT.	W–60C–48	1200X1200		5.7/6.1		1.4					1		2	
S–32	54	40+476	RT.	X–6R	300X900	3.3			0.3					1		1	
S–33	54	40+518	LT.	X–6R	300X900	3.3			0.3					1		1	
S–34	54	40+526	LT.	W–53R–48	1200X1200		4.7/5.1		1.4					1		2	
S–35	54	40+534	RT.	GB	3900X1500								5.9				
S–36	55	40+654	LT.	GJ	4500X1200								5.4				
S–37	55	40+835	RT.	GB	3900X1500								5.9				
S–38	56	40+990	LT.	R–10–48	1200X1500		4.2/4.6		1.8					1		2	
S–39	57	40+293	LT.	M–38–30	750X375		5.3		0.3					1		1	
				M–2–30–2	750X750				0.6					1			
S–40	57	41+400	RT.	GE	3300X1500								5.0				
S–41	58	41+688	RT.	GF	1800X1500								2.7				
S–42	58	41+805	LT.	W–50R–48	1200X1200		5.6/5.9		1.4					1		2	
S–43	58	41+840	LT.	N–45–12	300X325	2.9			0.1					1		1	
S–44	58	41+840	RT.	N–45–12	300X325	2.9			0.1					1		1	
S–45	58	41+867	RT.	X–6R	300X900	3.3			0.3					1		1	
S–46	58	41+922	LT.	X–6R	300X900	3.3			0.3					1		1	
S–47	59	42+084	RT.	W–49R–48	1200X1200		4.8/5.2		1.4					1		2	
S–48	59	42+188	LT.	GF	1800X1500								2.7				
S–49	59	42+322	RT.	R–2–48	1200X1200X1200		4.9/5.1			0.6				1		2	
S–50	60	42+462	LT.	GE	3600X1500						5.4				1		
S–51	60	42+620	RT.	X–6R	300X900	3.3			0.3					1		1	
S–52	60	42+724	LT.	X–6R	300X900	3.3			0.3					1		1	
S–53	60	42+826	RT.	M–38–30	750X375		4.8		0.3					1		1	
				M–2–30–2	750X750				0.6					1			
		RAMP "A"															
SA–1	50	0+560	LT.	R–15A	900X900		4.2/4.5		0.8								
		RAMP "B"															
SB–1	49	0+386	LT.	R–41A–36	900X600		4.0			0.5				1		2	
SB–2	49	0+386	RT.	D–4A	3000X600								1.8				
				R–41A–36	900X600					0.5				1			
SB–3	50	0+480	RT.	R–1–48	1200X1200		5.5/5.5			1.4				1		2	
				R–41B–36	900X900					0.8				1			
SB–4	50	0+480	LT.	R–43L–48	1200X450			4.2/4.7		0.5				1		2	
				R–43R–48	1200X450					0.5				1			
				R–41B–36	900X900					0.8				1			
TOTALS CARRIED TO GENERAL SUMMARY						49.6	188.0	8.9	26.0	6.2	11.7	1	90.6	45	2	54	

CALCULATED T.D.D.
CHECKED J.E.U.

QUANTITY SUB-SUMMARY

JEF-7-36.967

REFERENCE NO.	PLAN SHEET NO.	STATION	SIDE	CODE	SIZE (mm)	630 GROUND MOUNTED SUPPORT, NO. 3 POST METER	ONE WAY SUPPORT, NO. 3 POST METER	SIGN, FLAT SHEET SQ. M	SIGN, FLAT SHEET, TYPE G SQ. M	REFURBISHING SIGN, AS PER PLAN SQ. M	REMOVAL OF GROUND MOUNTED SIGN & DISPOSAL EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT & DISPOSAL EACH	COMMENTS
		RAMP "C"											
SC-1	50	0+016	LT.	R-1-48	1200X1200	5.1/5.1			1.4		1	2	
				R-41B-36	900X900				0.8		1		
SC-2	50	0+016	RT.	R-43L-48	1200X450		4.7/4.9		0.5		1	2	
				R-43R-48	1200X450				0.5		1		
				R-41B-36	900X900				0.8		1		
SC-3	50	0+107	LT.	R-41A-36	900X600	3.8			0.5		1	2	
SC-4	50	0+107	RT.	R-41A-36	900X600	3.8			0.5		1	2	
SC-5	50	0+183	LT.	D-4A	3000X600					1.8			
		RAMP "D"											
SD-1	50	0+050	RT.	R-15A	900X900	4.2/4.5		0.8					
		RAMP "E"											
SE-1	58	41+898	LT.	M-38-24	600X300			0.2			1		
				M-2-24-2	600X600			0.4			1		
				M-24-21	525X375			0.2			1		
				D-4A	3600X600					2.2			
SE-2	58	41+860	LT.	R-15A	900X900	4.2/4.5		0.8					
		RAMP "F"											
SF-1	58	41+793	LT.	R-41A-36	900X600	3.9			0.5		1	2	
SF-2	58	41+793	RT.	R-41A-36	900X600	4.1			0.5		1	2	
SF-3	58	41+881	RT.	R-1-48	1200X1200	4.5/4.6			1.4		1	2	
				R-41B-36	900X900				0.8		1		
SF-4	58	41+881	LT.	R-43L-48	1200X450		4.3/4.5		0.5		1	2	
				R-43R-48	1200X450				0.5		1		
				R-41B-36	900X900				0.8		1		
		RAMP "G"											
SG-1	58	41+909	LT.	R-1-48	1200X1200	4.6/4.8			1.4		1	2	
				R-41B-36	900X900				0.8				
SG-2	58	41+909	RT.	R-43L-48	1200X450		4.7/4.9		0.5		1	2	
				R-43R-48	1200X450				0.5		1		
				R-41B-36	900X900				0.8		1		
SG-3	58	41+984	LT.	R-41A-36	900X600	3.6			0.5		1	2	
SG-4	58	41+984	RT.	R-41A-36	900X600	3.9			0.5		1	2	
		RAMP "H"											
SH-1	58	41+910	RT.	R-15A	900X900	4.2/4.5		0.8					
		FRANKLIN STREET											
FR-1	50	0+061	RT.	M-17-24	525X375	4.2		0.2			1	1	
				M-2-24-2	600X600			0.4			1		
FR-2	50	0+152	RT.	D-4B	3300X1200					4.0			
FR-3	50	0+262	RT.	M-52A-108	4500X1200					5.4			
FR-4	50	0+264	LT.	M-38-24	600X300			0.2			1		
				M-2-24-2	600X600			0.4			1		
				M-24-21	525X375			0.2			1		
				D-4A	3600X600					2.2			
FR-5	50	0+336	RT.	M-37-24	600X300			0.2			1		
				M-2-24-2	600X600			0.4			1		
				M-24-21	525X375			0.2			1		
				D-4A	3600X600					2.2			
FR-6	50	0+355	LT.	M-52A-108	4500X1200					5.4			
FR-7	50	0+465	LT.	D-4B	3300X1200					4.0			
FR-8	50	0+555	LT.	M-52A-108	4500X1200					5.4			
FR-9	50	0+648	LT.	M-17-24	525X375	4.6		0.2			1	1	
				M-2-24-2	600X600			0.4			1		
		ALEXANDER STREET											
AL-1	58	0+404	LT.	M-52A-108	4500X1200					5.4			
AL-2	58	0+497	LT.	D-4B	3300X1200					4.0			
AL-3	58	0+640	LT.	M-52A-108	4500X1200					5.4			
AL-4	58	0+733	LT.	M-17-24	525X375	3.9		0.2					
				M-2-24-2	600X600			0.4					
TOTALS CARRIED TO GENERAL SUMMARY						90.6	28.0	6.6	15.0	47.4	33	26	

CALCULATED T.D.D.
CHECKED J.E.U.

QUANTITY SUB-SUMMARY

JEF-7-36.907

SHEET NUMBER												ITEM	UNIT	DESCRIPTION	TOTALS	TOTALS CARRIED TO GENERAL SUMMARY
16	17	18	19	20	21	22	23	24	25	26	27					
														MAINTENANCE OF TRAFFIC		
		100	120	30								202	METER	CONCRETE MEDIAN REMOVED	250	250
					110							202	METER	CONCRETE BARRIER REMOVED	110	110
		100	120	30								202	METER	GUARDRAIL REMOVED FOR STORAGE, BARRIER DESIGN	250	250
		2		2				1	1			614	EACH	TEMPORARY IMPACT ATTENUATOR (G.R.E.A.T. TYPE)	6	6
		1			1							614	EACH	TEMPORARY CROSSOVER LIGHTING SYSTEM	2	2
		26										614	EACH	TEMPORARY RAISED PAVEMENT MARKER	26	26
		112	98	74	90		7	117	98	74	61	614	EACH	BARRIER REFLECTOR, TYPE B	731	731
		62	98	88	32			54	98	74	2	614	EACH	OBJECT MARKER	508	508
0.21	0.36	0.41	0.16	0.16	1.22	0.37	0.59	0.48	0.53	0.13	0.92	614	KILOMETER	TEMPORARY EDGE LINE, 740.06, TYPE I	5.54	5.54
			74									614	METER	TEMPORARY CHANNELIZING LINE, 740.06, TYPE I	74	74
									100			614	METER	TEMPORARY GORE MARKING, 740.06, TYPE I	100	100
		91.0	109.2	27.3	100.1							615	SQ. M.	TEMPORARY PAVEMENT, CLASS A	327.6	328
		265	370	323	119			200	370	280	9	622	METER	PORTABLE CONCRETE BARRIER, 813 mm	1936	1936
		168			208		73	170			151	622	METER	PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN	770	770

CALCULATED T.D.D.
CHECKED J.E.U.

MAINTENANCE OF TRAFFIC QUANTITY SUB-SUMMARY

JEF-7-36.967

PAVEMENT MARKING QUANTITIES

STATION TO STATION		LANE	SIDE	ITEM 642, TYPE 1						
				EDGE LINES			LANE LINES	CHANNELIZING LINES	STOP LINES	TRANSVERSE LINES
				WHITE	YELLOW	TOTAL				
FROM	TO			KILOMETER	KILOMETER	KILOMETER	KILOMETER	METER	METER	METER
36+940.23	42+749.55	NORTH BOUND	CTR.				5.81			
36+940.23	42+749.55		LT.		5.81	5.81				
36+940.23	39+322.50		RT.	2.38		2.38				
39+285.30	42+286.90		RT.	3.00		3.00				
42+300.60	42+749.55		RT.	0.45		0.45				
36+940.23	42+749.55	SOUTH BOUND	CTR.				5.81			
36+940.23	42+749.55		RT.		5.81	5.81				
36+940.23	38+509.20		LT.	1.57		1.57				
38+470.70	41+675.80		LT.	3.20		3.20				
41+651.00	42+749.55		LT.	1.10		1.10				
40+227.99	41+614.83		LT.				1.39			
0+194.13	0+266.10	RAMP 'A'	RT.				0.07			
0+266.10	0+304.80		RT.					38.7		
0+304.80 RAMP "A"	0+221.90 C.R. 46		LT.	0.30		0.30				
0+304.80 RAMP "A"	0+260.00 C.R. 46		RT.		0.28	0.28				
0+109.73	0+190.50	RAMP 'B'	LT.				0.08			
0+190.50	0+242.30		LT.					103.6		58.83
0+242.30 RAMP "B"	0+351.20 FRANK. ST.		LT.		0.24	0.24				
0+242.30 RAMP "B"	0+385.30 FRANK. ST.		RT.	0.26		0.26				
0+483.11			LT.RT.						16	
0+010.67		RAMP 'C'	LT.RT.						16	
0+230.20 C.R. 46	0+339.20 RAMP "C"		LT.	0.35		0.35				
0+257.40 C.R. 46	0+339.20 RAMP "C"		RT.		0.33	0.33				
0+339.20	0+382.10		RT.					85.8		48.77
0+382.10	0+466.00		RT.				0.08			
0+353.80 FRANK. ST.	0+467.86 RAMP "D"	RAMP 'D'	LT.		0.46	0.46				
0+399.25 FRANK. ST.	0+467.86 RAMP "D"		RT.	0.49		0.49				
0+467.86	0+505.20		LT.					37.34		
0+505.20	0+577.20						0.07			
41+614.83	41+648.00 RAMP "E"	RAMP 'E'	RT.				0.03			
41+648.00 RAMP "E"	41+672.15 RAMP "E"							24.15		
41+672.15 RAMP "E"	0+351.38 ALEX. ST.		RT.		0.22	0.22				
41+672.15 RAMP "E"	41+899.60 RAMP "E"		LT.	0.22		0.22				
41+518.80 RAMP "F"	41+605.20 RAMP "F"	RAMP 'F'	LT.				0.09			
41+605.20 RAMP "F"	41+648.36 RAMP "F"		LT.					86.32		50.90
41+648.36 RAMP "F"	0+415.63 ALEX. ST.		LT.		0.24	0.24				
41+648.36 RAMP "F"	0+457.61 ALEX. ST.		RT.	0.26		0.26				
41+887.02			LT.RT.						23	
41+907.44		RAMP 'G'	LT.RT.						6	
41+901.67 RAMP "G"	42+228.60 RAMP "G"		LT.	0.33		0.33				
0+339.15 ALEX. ST.	42+228.60 RAMP "G"		RT.		0.33	0.33				
42+228.60 RAMP "G"	42+293.50 RAMP "G"		RT.					129.8		74.07
42+293.50 RAMP "G"	42+369.10 RAMP "G"		RT.				0.08			
0+409.72 ALEX. ST.	42+265.00 RAMP "H"	RAMP 'H'	LT.		0.39	0.39				
0+450.27 ALEX. ST.	42+265.00 RAMP "H"		RT.	0.41		0.41				
42+265.00 RAMP "H"	42+287.50 RAMP "H"		LT.					22.50		
42+287.50 RAMP "H"	42+385.00 RAMP "H"		LT.				0.10			
TOTALS				14.32	14.11	28.43	13.61	528.21	61	232.57
TOTALS CARRIED TO GENERAL SUMMARY						28.43	13.61	528	61	233

DELINEATOR QUANTITIES

STATION TO STATION		LANE	SIDE	SPACING	620
					DELINEATOR, TYPE C, POST MOUNTED
FROM	TO			METER	EACH
0+000.00 RAMP "A"	0+549.00 RAMP "A"	**RAMP 'A'**	LT.	61	10
0+549.00 RAMP "A"	0+230.00 C.R. 46	**RAMP 'A'**	LT.	15	3
0+000.00 RAMP "B"	0+427.00 RAMP "B"	**RAMP 'B'**	RT.	61	8
0+043.00 RAMP "C"	0+592.00 RAMP "C"	**RAMP 'C'**	LT.	61	10
0+387.00 FRANK. ST.	0+040.75 RAMP "D"	**RAMP 'D'**	RT.	15	3
0+040.75 RAMP "D"	0+772.75 RAMP "D"	**RAMP 'D'**	RT.	61	12
41+517.30 RAMP "E"	41+883.30 RAMP "E"	**RAMP 'E'**	LT.	61	7
41+404.31 RAMP "F"	41+831.31 RAMP "F"	**RAMP 'F'**	RT.	61	8
41+923.44 RAMP "G"	42+472.44 RAMP "G"	**RAMP 'G'**	LT.	61	10
0+467.00 ALEX. ST.	41+934.44 RAMP "H"	**RAMP 'H'**	RT.	15	7
41+934.44 RAMP "H"	42+605.44 RAMP "H"	**RAMP 'H'**	RT.	61	11
TOTALS CARRIED TO GENERAL SUMMARY					89

CALCULATED T.D.D.
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TRAFFIC CONTROL QUANTITY SUB-SUMMARY

JEF-7-36.907

SHEET NUMBER										ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
11	12	29	30	31	32	35	42	44							
														ROADWAY	
LUMP									201	11000	LUMP		CLEARING AND GRUBBING	
		983							202	22900	983	SQ. M.	APPROACH SLAB REMOVED	
				137 054					202	23500	137 054	SQ. M.	WEARING COURSE REMOVED	
		132				250			202	30500	382	METER	CONCRETE MEDIAN REMOVED	
	100								202	30600	100	SQ. M.	CONCRETE MEDIAN REMOVED	
		238				110			202	30700	348	METER	CONCRETE BARRIER REMOVED	
			5383.53						202	38100	5383.53	METER	GUARDRAIL REMOVED FOR STORAGE	
						250			202	38400	250	METER	GUARDRAIL REMOVED FOR STORAGE, BARRIER DESIGN	
			5102						202	38401	5102	METER	GUARDRAIL REMOVED FOR STORAGE, BARRIER DESIGN, AS PER PLAN	4
	705								202	54101	705	EACH	RAISED PAVEMENT MARKER REMOVED FOR STORAGE, AS PER PLAN	12
		18							202	58201	18	EACH	INLET REMOVED, AS PER PLAN	13
		18							202	98100	18	EACH	REMOVAL MISC.: MEDIAN INLET CLEANOUT	
		323		3795					203	12000	4118	CU. M.	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	
123									203	20000	123	CU. M.	EMBANKMENT	
	10								203	40000	10	CU. M.	BORROW	
		1265		7255					203	50000	8520	SQ. M.	SUBGRADE COMPACTION	
							10.25		203	60200	10.25	KILOMETER	LINEAR GRADING, METHOD A	
							5.29		203	60204	5.29	KILOMETER	LINEAR GRADING, METHOD B	
							6.27		203	60408	6.27	KILOMETER	LINEAR GRADING (DITCH CLEANOUT)	
10 845									SPECIAL	51267502	10 845	SQ. M.	SEALING OF CONCRETE SURFACES (EPOXY)	11
	30								519	11100	30	SQ. M.	PATCHING CONCRETE STRUCTURE	
	86								604	40500	86	EACH	REFERENCE MONUMENT	
			4907.28						606	13000	4907.28	METER	GUARDRAIL, TYPE 5	
			21						606	22010	21	EACH	ANCHOR ASSEMBLY, TYPE E-98	13
			3						606	25000	3	EACH	ANCHOR ASSEMBLY, TYPE A	
			23						606	26500	23	EACH	ANCHOR ASSEMBLY, TYPE T	
			8						606	35000	8	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1	
			6						606	35100	6	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 2	
		1265							611	25001	1265	SQ. M.	REINFORCED CONCRETE APPROACH SLAB (T=380 mm), AS PER PLAN	12
	100	262							830	72000	362	SQ. M.	CONCRETE MEDIAN	
		118							622	23300	118	METER	CONCRETE BARRIER, TYPE A	
		5402							622	23301	5402	METER	CONCRETE BARRIER, TYPE A, AS PER PLAN 'A'	4,12
		61							622	23301	61	METER	CONCRETE BARRIER, TYPE A, AS PER PLAN 'B'	12,66
													EROSION CONTROL	
								5325	207	30000	5325	METER	FILTER FABRIC FENCE	
								168	207	70000	168	EACH	STRAW OR HAY BALES	
			246						601	20500	246	CU. M.	CRUSHED AGGREGATE SLOPE PROTECTION	
							33 064		659	10000	33 064	SQ. M.	SEEDING AND MULCHING	
							3306		659	20000	3306	KILOGRAM	COMMERCIAL FERTILIZER	
							18 622		659	30000	18 622	KILOGRAM	AGRICULTURAL LIMING	
							331		659	35000	331	CU. M.	WATER	
							10 536		670	41000	10 536	SQ. M.	SLOPE EROSION PROTECTION	
													DRAINAGE	
					241				603	01500	241	METER	150 mm CONDUIT, TYPE F, 707.33, 707.41, OR 707.42	
		3							604	09000	3	EACH	CATCH BASIN ADJUSTED TO GRADE	
		18							604	15001	18	EACH	INLET, NO. 3C, TYPE A, AS PER PLAN	13
					45				604	36600	45	EACH	PRECAST REINFORCED CONCRETE OUTLET	
					2868				605	11100	2868	METER	150 mm SHALLOW PIPE UNDERDRAIN	
				7195					605	30000	7195	METER	SHALLOW UNDERDRAIN	

CALCULATED T.D.D.
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GENERAL SUMMARY

JEF-7-36.907

SHEET NUMBER									ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
11	12	13	29	30	31	33	34	36						
													PAVEMENT	
5359									255	10000	5359	SQ. M.	FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS C	
7332									255	20000	7332	METER	FULL DEPTH PAVEMENT SAWING	
					11 367				301	46000	11 367	CU. M.	BITUMINOUS AGGREGATE BASE, PG 64–22	
			229		2147				304	20000	2376	CU. M.	AGGREGATE BASE	
					49 063				407	10000	49 063	LITER	TACK COAT	
					49 063				407	14000	49 063	LITER	TACK COAT FOR INTERMEDIATE COURSE	
					6494				446	46040	6494	CU. M.	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG 64–28	
					4618				446	50001	4618	CU. M.	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H , AS PER PLAN	11
				320					448	46061	320	CU. M.	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, UNDER GUARDRAIL, PG64-22, AS PER PLAN	11
				84					SPECIAL	45132000	84	METER	PRESSURE RELIEF JOINT, TYPE C	
				30					SPECIAL	45135000	30	METER	APPROACH SLAB PRESSURE RELIEF JOINT	
													TRAFFIC CONTROL	
								89	620	10300	89	EACH	DELINEATOR, TYPE C, POST MOUNTED	
	282								620	31200	282	EACH	DELINEATOR REMOVED FOR DISPOSAL	
		534							621	00200	534	EACH	RAISED PAVEMENT MARKER, INSTALLATION ONLY	
		157							621	00300	157	EACH	PRISMATIC RETROREFLECTOR	
		157							621	00601	157	EACH	RAISED PAVEMENT MARKER CASTING INSTALLATION ONLY, AS PER PLAN	13
				207					626	00100	207	EACH	BARRIER REFLECTOR, TYPE A	
	396			18					626	00200	414	EACH	BARRIER REFLECTOR, TYPE B	
						49.6			630	02100	49.6	METER	GROUND MOUNTED SUPPORT, NO. 2 POST	
						188.0	90.6		630	03100	278.6	METER	GROUND MOUNTED SUPPORT, NO. 3 POST	
						8.9	28.0		630	08004	36.9	METER	ONE WAY SUPPORT, NO. 3 POST	
						26.0	6.6		630	80100	32.6	SQ. M.	SIGN, FLAT SHEET	
						6.2	15		630	80102	21.2	SQ. M.	SIGN, FLAT SHEET, TYPE G	
						11.7			630	80204	11.7	SQ. M.	SIGN, EXTRUSHEET, TYPE G	
						1			630	82500	1	EACH	EXISTING SIGN REVISED WITH DEMOUNTABLE COPY	
						90.6	47.4		630	82701	138.0	SQ. M.	REFURBISHING SIGN, AS PER PLAN	13
						45	33		630	84900	78	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	
						2			630	85400	2	EACH	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL	
						54	26		630	86002	80	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	
								28.43	642	00100	28.43	KILOMETER	EDGE LINE, TYPE 1	
								13.61	642	00200	13.61	KILOMETER	LANE LINE, TYPE 1	
								528	642	00400	528	METER	CHANNELIZING LINE, TYPE 1	
								61	642	00500	61	METER	STOP LINE, TYPE 1	
								233	642	00700	233	METER	TRANSVERSE LINE, TYPE 1	
													CAST-IN-PLACE STRUCTURES	
													FOR STRUCTURE JEF–7–38769 ESTIMATED QUANTITIES	70
													FOR STRUCTURE JEF–7–40478 ESTIMATED QUANTITIES	83
													FOR STRUCTURE JEF–7–41877 ESTIMATED QUANTITIES	98
													FOR STRUCTURE JEF–7–42630 ESTIMATED QUANTITIES	112

CALCULATED T.D.D.
CHECKED J.E.U.

GENERAL SUMMARY

JEF-7-36.967

SHEET NUMBER										ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
							14	15	35						
														MAINTENANCE OF TRAFFIC	
							20			614	13000	20	CU. M.	BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC	
							300			614	11100	300	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR	
									6	614	12350	6	EACH	TEMPORARY IMPACT ATTENUATOR, G.R.E.A.T. TYPE	
								1		614	12360	1	EACH	TEMPORARY IMPACT ATTENUATOR, G.R.E.A.T. TYPE (REPLACEMENT)	
							8			614	12460	8	EACH	WORK ZONE MARKING SIGN	
								32		614	12470	32	EACH	WORK ZONE SPEED LIMIT SIGN	
								24		614	12480	24	EACH	DOUBLED FINES IN WORK ZONE SIGNS	
									2	614	12756	2	EACH	TEMPORARY CROSSOVER LIGHTING SYSTEM	
									26	614	12800	26	EACH	TEMPORARY RAISED PAVEMENT MARKER	
							72		731	614	13300	803	EACH	BARRIER REFLECTOR, TYPE B	
							48		508	614	13350	556	EACH	OBJECT MARKER	
									5.54	614	22200	5.54	KILOMETER	TEMPORARY EDGE LINE, 740.06, TYPE I	
									74	614	23400	74	METER	TEMPORARY CHANNELIZING LINE, 740.06, TYPE I	
									100	614	28400	100	METER	TEMPORARY GORE MARKING, 740.06, TYPE I	
									328	615	20000	328	SQ. M.	TEMPORARY PAVEMENT, CLASS A	
							530		1936	622	40020	2466	METER	PORTABLE CONCRETE BARRIER, 813 mm	
									770	622	40031	770	METER	PORTABLE CONCRETE BARRIER, 1270 mm, AS PER PLAN	15
										614	11000	LUMP		MAINTAINING TRAFFIC	
										623	10000	LUMP		CONSTRUCTION LAYOUT STAKES	
										624	10000	LUMP		MOBILIZATION	
										806	16010	12	MONTH	FIELD OFFICE, TYPE B	

CALCULATED T.D.D.
CHECKED J.E.U.

GENERAL SUMMARY

JEF-7-36.967

SHOULDER EXCAVATION AND APPROACH SLABS:

AS–1 THRU AS–5, and AS–7:

ITEM 202 – 7.60 m X 7.625 m = 57.95 sq. m.
ITEM 203 – 7.60 m X 2.740 m X 0.530 m = 11.04 cu. m.
57.95 sq m X (.530 m–.330 m) = 11.59 cu. m.
TOTAL 22.63 cu. m.
ITEM 611 – 7.60 m X (7.625 m + 2.740 m) = 78.77 sq. m.
ITEM 304 – 78.77 sq. m. X 0.150 m = 11.82 cu. m.

AS–6, and AS–8:

ITEM 202 – 7.60 m X 11.285 m = 85.77 sq. m.
ITEM 203 – 7.60 m X 2.126 m X 0.530 m = 8.56 cu. m.
85.77 sq m X (.530 m–.330 m) = 17.15 cu. m.
TOTAL 25.71 cu. m.
ITEM 611 – 7.60 m X (11.285 m + 2.126 m) = 101.92 sq. m.
ITEM 304 – 101.92 sq. m. X 0.150 m = 15.29 cu. m.

AS–9 THRU AS–12:

ITEM 202 – 7.60 m X 7.625 m = 57.95 sq. m.
ITEM 203 – 7.60 m X 2.740 m X 0.530 m = 11.04 cu. m.
57.95 sq m X (.530 m–.380 m) = 8.69 cu. m.
TOTAL 19.73 cu. m.
ITEM 611 – 7.60 m X (7.625 m + 2.740 m) = 78.77 sq. m.
ITEM 304 – 78.77 sq. m. X 0.150 m = 11.82 cu. m.

AS–13 THRU AS–16:

ITEM 202 – 7.60 m X 7.625 m = 57.95 sq. m.
ITEM 203 – 7.60 m X 1.367 m X 0.530 m = 5.51 cu. m.
57.95 sq m X (.530 m–.380 m) = 8.69 cu. m.
TOTAL 14.20 cu. m.
ITEM 611 – 7.60 m X (7.625 m + 1.367 m) = 68.34 sq. m.
ITEM 304 – 68.34 sq. m. X 0.150 m = 10.25 cu. m.

PAVING UNDER GUARDRAIL:

GR–1 THRU GR–34:

CROSS SECTIONAL AREA:
– 1.20 m X 0.050 m = 0.06 sq. m.

GR–1 and GR–30 – = 148.59 m
ITEM 448 – 0.06 sq. m. X 148.59 m = 8.92 cu. m.
GR–2 – = 201.93 m
ITEM 448 – 0.06 sq. m. X 201.93 m = 12.12 cu. m.
GR–3 – = 339.09 m
ITEM 448 – 0.06 sq. m. X 339.09 m = 20.34 cu. m.
GR–4 – = 182.88 m
ITEM 448 – 0.06 sq. m. X 182.88 m = 10.97 cu. m.
GR–5 – = 30.48 m
ITEM 448 – 0.06 sq. m. X 30.48 m = 1.83 cu. m.
GR–6 – = 45.72 m
ITEM 448 – 0.06 sq. m. X 45.72 m = 2.74 cu. m.
GR–7 and GR–8 – = 68.58 m
ITEM 448 – 0.06 sq. m. X 68.58 m = 4.11 cu. m.
GR–9, and GR–10 – = 38.10 m
ITEM 448 – 0.06 sq. m. X 38.10 m = 2.29 cu. m.
GR–11 and GR–20 – = 26.67 m
ITEM 448 – 0.06 sq. m. X 26.67 m = 1.60 cu. m.
GR–12, GR–18, GR–23 and GR–34 – = 41.91 m
ITEM 448 – 0.06 sq. m. X 41.91 m = 2.51 cu. m.
GR–13 – = 49.53 m
ITEM 448 – 0.06 sq. m. X 49.53 m = 2.97 cu. m.
GR–15 – = 358.14 m
ITEM 448 – 0.06 sq. m. X 358.14 m = 21.49 cu. m.
GR–16 – = 228.60 m
ITEM 448 – 0.06 sq. m. X 228.60 m = 13.72 cu. m.
GR–17 – = 659.13 m
ITEM 448 – 0.06 sq. m. X 659.13 m = 39.55 cu. m.
GR–19 – = 133.35 m
ITEM 448 – 0.06 sq. m. X 133.35 m = 8.00 cu. m.
GR–21 – = 1272.54 m
ITEM 448 – 0.06 sq. m. X 1272.54 m = 76.35 cu. m.
GR–22 – = 99.06 m
ITEM 448 – 0.06 sq. m. X 99.06 m = 5.94 cu. m.
GR–24 – = 53.34 m
ITEM 448 – 0.06 sq. m. X 53.34 m = 3.20 cu. m.
GR–25 – = 114.30 m
ITEM 448 – 0.06 sq. m. X 114.30 m = 6.86 cu. m.
GR–26 and GR–27 – = 57.15 m
ITEM 448 – 0.06 sq. m. X 57.15 m = 3.43 cu. m.
GR–28 – = 194.31 m
ITEM 448 – 0.06 sq. m. X 194.31 m = 11.66 cu. m.
GR–29 – = 152.40 m
ITEM 448 – 0.06 sq. m. X 152.40 m = 9.14 cu. m.
GR–31 – = 198.12 m
ITEM 448 – 0.06 sq. m. X 198.12 m = 11.89 cu. m.
GR–32 – = 163.83 m
ITEM 448 – 0.06 sq. m. X 163.83 m = 9.83 cu. m.

PAVEMENT:

P–1: 1366.37 m x 10.06 m = 13745.68 sq. m.
ITEM 202 – = 13745.68 sq. m.
ITEM 301 – 0.075 m X 13745.68 sq. m. = 1030.93 cu. m.
ITEM 407 – 0.34 L/sq. m. X 13745.68 sq. m. = 4674 L
ITEM 446 – 0.045 m X 13745.68 sq. m. = 618.56 cu. m.
ITEM 446 – 0.032 m X 13745.68 sq. m. = 439.86 cu. m.

P–2: 1264.17 m x 10.06 m = 12717.55 sq. m.
ITEM 202 – = 12717.55 sq. m.
ITEM 301 – 0.075 m X 12717.55 sq. m. = 953.82 cu. m.
ITEM 407 – 0.34 L/sq. m. X 12717.55 sq. m. = 4324 L
ITEM 446 – 0.045 m X 12717.55 sq. m. = 572.29 cu. m.
ITEM 446 – 0.032 m X 12717.55 sq. m. = 406.96 cu. m.

P–3: 387.30 m x 7.62 m = 2951.23 sq. m.
ITEM 202 – = 2951.23 sq. m.
ITEM 301 – 0.075 m X 2951.23 sq. m. = 221.34 cu. m.
ITEM 407 – 0.34 L/sq. m. X 2951.23 sq. m. = 1003 L
ITEM 446 – 0.045 m X 2951.23 sq. m. = 132.80 cu. m.
ITEM 446 – 0.032 m X 2951.23 sq. m. = 94.44 cu. m.

P–4: 273.40 m x 7.62 m = 2083.31 sq. m.
ITEM 202 – = 2083.31 sq. m.
ITEM 301 – 0.075 m X 2083.31 sq. m. = 156.25 cu. m.
ITEM 407 – 0.34 L/sq. m. X 2083.31 sq. m. = 708 L
ITEM 446 – 0.045 m X 2083.31 sq. m. = 93.75 cu. m.
ITEM 446 – 0.032 m X 2083.31 sq. m. = 66.66 cu. m.

P–5: RAMP "A" AREAS TAKEN FROM SHEET 61 = 2505.03 sq. m.
STA. 0+304.80 TO STA. 0+563.27 = 258.47 m
258.47 m x 5.79 m = 1496.54 sq. m.
TOTAL AREA = 2505.03 + 1496.54 = 4001.57 sq. m.

NEW SHOULDERS:
STA. 0+320.80 TO STA. 0+564.21 = 243.41 m
APPROACH LENGTH = 45.41 m
TOTAL 288.82 m
SHOULDER AREA = 288.82 m X 1.80 m = 519.88 sq. m.
SHOULDER TAPER:
STA. 0+304.80 TO STA. 0+320.80 = 16 m
TAPER AREA = 16 m X (2.44 m + 1.80 m)/2 = 33.92 sq. m.
TOTAL AREA = 519.88 + 33.92 = 553.80 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 553.80 sq. m.
DEPTH = 0.512 m

ITEM 202 – = 4001.57 sq. m.
ITEM 203 – = 553.80 sq. m. X 0.512 m = 283.54 cu. m.
ITEM 203 – = 553.80 sq. m.
ITEM 301 – 0.075 m X 4001.57 sq. m. = 300.12 cu. m.
– 0.150 m X 553.80 sq. m. = 83.07 cu. m.
TOTAL 383.19 cu. m.
ITEM 304 – (.265 m + .305 m)/2 x 553.80 sq. m. = 157.83 cu. m.
ITEM 407 – 0.34 L/sq. m. X 4555.37 sq. m. = 1549 L
ITEM 446 – 0.045 m X 4555.37 sq. m. = 204.99 cu. m.
ITEM 446 – 0.032 m X 4555.37 sq. m. = 145.77 cu. m.

P–6: RAMP "B" AREAS TAKEN FROM SHEET 61 = 1957.54 sq. m.
STA. 0+242.30 TO STA. 0+469.90 = 227.60 m
227.60 m x 5.79 m = 1317.80 sq. m.
TOTAL AREA = 1957.54 + 1317.80 = 3275.34 sq. m.

NEW SHOULDERS:
STA. 0+258.30 TO STA. 0+471.47 = 213.17 m
APPROACH LENGTH = 34.02 m
TOTAL 247.19 m
SHOULDER AREA = 247.19 m X 1.80 m = 444.94 sq. m.
SHOULDER TAPER:
STA. 0+242.30 TO STA. 0+258.30 = 16 m
TAPER AREA = 16 m X (2.44 m + 1.80 m)/2 = 33.92 sq. m.
TOTAL AREA = 444.94 + 33.92 = 478.86 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 478.86 sq. m.
DEPTH = 0.512 m

ITEM 202 – = 3275.34 sq. m.
ITEM 203 – = 478.86 sq. m. X 0.512 m = 245.18 cu. m.
ITEM 203 – = 478.86 sq. m.
ITEM 301 – 0.075 m X 3275.34 sq. m. = 245.65 cu. m.
– 0.150 m X 478.86 sq. m. = 71.83 cu. m.
TOTAL 317.48 cu. m.
ITEM 304 – (.265 m + .305 m)/2 x 478.86 sq. m. = 136.48 cu. m.
ITEM 407 – 0.34 L/sq. m. X 3754.20 sq. m. = 1276 L
ITEM 446 – 0.045 m X 3754.20 sq. m. = 168.94 cu. m.
ITEM 446 – 0.032 m X 3754.20 sq. m. = 120.13 cu. m.

P–7: 181.84 m x 10.06 m = 1829.31 sq. m.
ITEM 202 – = 1829.31 sq. m.
ITEM 301 – 0.075 m X 1829.31 sq. m. = 137.20 cu. m.
ITEM 407 – 0.34 L/sq. m. X 1829.31 sq. m. = 622 L
ITEM 446 – 0.045 m X 1829.31 sq. m. = 82.32 cu. m.
ITEM 446 – 0.032 m X 1829.31 sq. m. = 58.54 cu. m.

PAVEMENT (CONT.):

P–8: 170.14 m x 10.06 m = 1711.61 sq. m.
ITEM 202 – = 1711.61 sq. m.
ITEM 301 – 0.075 m X 1711.61 sq. m. = 128.37 cu. m.
ITEM 407 – 0.34 L/sq. m. X 1711.61 sq. m. = 582 L
ITEM 446 – 0.045 m X 1711.61 sq. m. = 77.02 cu. m.
ITEM 446 – 0.032 m X 1711.61 sq. m. = 54.77 cu. m.

P–9: 254.47 m x 10.06 m = 2559.97 sq. m.
ITEM 202 – = 2559.97 sq. m.
ITEM 301 – 0.075 m X 2559.97 sq. m. = 192.00 cu. m.
ITEM 407 – 0.34 L/sq. m. X 2559.97 sq. m. = 870 L
ITEM 446 – 0.045 m X 2559.97 sq. m. = 115.20 cu. m.
ITEM 446 – 0.032 m X 2559.97 sq. m. = 81.92 cu. m.

P–10: 388.04 m x 10.06 m = 3903.68 sq. m.
ITEM 202 – = 3903.68 sq. m.
ITEM 301 – 0.075 m X 3903.68 sq. m. = 292.78 cu. m.
ITEM 407 – 0.34 L/sq. m. X 3903.68 sq. m. = 1327 L
ITEM 446 – 0.045 m X 3903.68 sq. m. = 175.66 cu. m.
ITEM 446 – 0.032 m X 3903.68 sq. m. = 124.92 cu. m.

P–11: 283.66 m x 7.62 m = 2161.49 sq. m.
ITEM 202 – = 2161.49 sq. m.
ITEM 301 – 0.075 m X 2161.49 sq. m. = 162.11 cu. m.
ITEM 407 – 0.34 L/sq. m. X 2161.49 sq. m. = 735 L
ITEM 446 – 0.045 m X 2161.49 sq. m. = 97.27 cu. m.
ITEM 446 – 0.032 m X 2161.49 sq. m. = 69.17 cu. m.

P–12: RAMP "D" AREAS TAKEN FROM SHEET 62 = 2890.58 sq. m.
STA. 0+039.17 TO STA. 0+401.17 = 362.00 m
362.00 m x 5.79 m = 2095.98 sq. m.
TOTAL AREA = 2890.58 + 2095.98 = 4986.56 sq. m.

NEW SHOULDERS:
STA. 0+039.17 TO STA. 0+451.86 = 412.69 m
APPROACH LENGTH = 50.57 m
TOTAL 463.26 m
SHOULDER AREA = 463.26 m X 1.80 m = 833.87 sq. m.
SHOULDER TAPER:
STA. 0+451.86 TO STA. 0+467.86 = 16 m
TAPER AREA = 16 m X (2.44 m + 1.80 m)/2 = 33.92 sq. m.
TOTAL AREA = 833.87 + 33.92 = 867.79 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 867.79 sq. m.
DEPTH = 0.512 m

ITEM 202 – = 4986.56 sq. m.
ITEM 203 – = 867.79 sq. m. X 0.512 m = 444.31 cu. m.
ITEM 203 – = 867.79 sq. m.
ITEM 301 – 0.075 m X 4986.56 sq. m. = 373.99 cu. m.
– 0.150 m X 867.79 sq. m. = 130.17 cu. m.
TOTAL 504.16 cu. m.
ITEM 304 – (.265 m + .305 m)/2 x 867.79 sq. m. = 247.32 cu. m.
ITEM 407 – 0.34 L/sq. m. X 5854.35 sq. m. = 1990 L
ITEM 446 – 0.045 m X 5854.35 sq. m. = 263.44 cu. m.
ITEM 446 – 0.032 m X 5854.35 sq. m. = 187.34 cu. m.

P–13: RAMP "C" AREAS TAKEN FROM SHEET 62 = 1920.20 sq. m.
STA. 0+023.60 TO STA. 0+339.20 = 315.60 m
315.60 m x 5.79 m = 1827.32 sq. m.
TOTAL AREA = 1920.20 + 1827.32 = 3747.52 sq. m.

NEW SHOULDERS:
STA. 0+023.60 TO STA. 0+323.20 = 299.60 m
APPROACH LENGTH = 36.32 m
TOTAL 335.92 m
SHOULDER AREA = 335.92 m X 1.80 m = 604.66 sq. m.
SHOULDER TAPER:
STA. 0+323.20 TO STA. 0+339.20 = 16 m
TAPER AREA = 16 m X (2.44 m + 1.80 m)/2 = 33.92 sq. m.
TOTAL AREA = 604.66 + 33.92 = 638.58 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 638.58 sq. m.
DEPTH = 0.512 m

ITEM 202 – = 3747.52 sq. m.
ITEM 203 – = 638.58 sq. m. X 0.512 m = 326.95 cu. m.
ITEM 203 – = 638.58 sq. m.
ITEM 301 – 0.075 m X 3747.52 sq. m. = 281.06 cu. m.
– 0.150 m X 638.58 sq. m. = 95.79 cu. m.
TOTAL 376.85 cu. m.
ITEM 304 – (.265 m + .305 m)/2 x 638.58 sq. m. = 182.00 cu. m.
ITEM 407 – 0.34 L/sq. m. X 4386.10 sq. m. = 1491 L
ITEM 446 – 0.045 m X 4386.10 sq. m. = 197.37 cu. m.
ITEM 446 – 0.032 m X 4386.10 sq. m. = 140.36 cu. m.

P–14: 372.45 m x 7.62 m = 2838.07 sq. m.
ITEM 202 – = 2838.07 sq. m.
ITEM 301 – 0.075 m X 2838.07 sq. m. = 212.86 cu. m.
ITEM 407 – 0.34 L/sq. m. X 2838.07 sq. m. = 965 L
ITEM 446 – 0.045 m X 2838.07 sq. m. = 127.71 cu. m.
ITEM 446 – 0.032 m X 2838.07 sq. m. = 90.82 cu. m.

PAVEMENT (CONT.):

P–15: 753.56 m x 10.06 m = 7580.81 sq. m.
ITEM 202 – = 7580.81 sq. m.
ITEM 301 – 0.075 m X 7580.81 sq. m. = 568.56 cu. m.
ITEM 407 – 0.34 L/sq. m. X 7580.81 sq. m. = 2577 L
ITEM 446 – 0.045 m X 7580.81 sq. m. = 341.14 cu. m.
ITEM 446 – 0.032 m X 7580.81 sq. m. = 242.58 cu. m.

P–16: 880.51 m x 10.06 m = 8857.93 sq. m.
ITEM 202 – = 8857.93 sq. m.
ITEM 301 – 0.075 m X 8857.93 sq. m. = 664.34 cu. m.
ITEM 407 – 0.34 L/sq. m. X 8857.93 sq. m. = 3012 L
ITEM 446 – 0.045 m X 8857.93 sq. m. = 398.61 cu. m.
ITEM 446 – 0.032 m X 8857.93 sq. m. = 283.45 cu. m.

P–17: RESURFACING:
106.67 m x [(7.62 m + 11.28 m)/2] = 1008.03 sq. m.
SHOULDER:
106.67 m x [(2.44 m + 1.80 m)/2] = 226.14 sq. m.
TOTAL 1234.17 cu. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 226.14 sq. m.
DEPTH = 0.545 m

ITEM 202 – = 1008.03 sq. m.
ITEM 203 – = 226.14 sq. m. X 0.545 m = 123.25 cu. m.
ITEM 203 – = 226.14 sq. m.
ITEM 301 – 0.075 m X 1008.03 sq. m. = 75.60 cu. m.
– 0.150 m X 226.14 sq. m. = 33.92 cu. m.
TOTAL 109.52 cu. m.
ITEM 304 – (.305 m +.330 m)/2 X 226.14 sq. m. = 71.80 cu. m.
ITEM 407 – 0.34 L/sq. m. X 1234.17 sq. m. = 420 L
ITEM 446 – 0.045 m X 1234.17 sq. m. = 55.54 cu. m.
ITEM 446 – 0.032 m X 1234.17 sq. m. = 39.49 cu. m.

P–18: RESURFACING:
242.64 m x 11.28 m = 2736.98 sq. m.
SHOULDER:
242.64 m x 1.80 m = 436.75 sq. m.
TOTAL 3173.73 cu. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 436.75 sq. m.
DEPTH = 0.545 m

ITEM 202 – = 2736.98 sq. m.
ITEM 203 – = 436.75 sq. m. X 0.545 m = 238.03 cu. m.
ITEM 203 – = 436.75 sq. m.
ITEM 301 – 0.075 m X 2736.98 sq. m. = 205.27 cu. m.
– 0.150 m X 436.75 sq. m. = 65.51 cu. m.
TOTAL 270.78 cu. m.
ITEM 304 – (.305 m +.330 m)/2 X 436.75 sq. m. = 138.67 cu. m.
ITEM 407 – 0.34 L/sq. m. X 3173.73 sq. m. = 1079 L
ITEM 446 – 0.045 m X 3173.73 sq. m. = 142.82 cu. m.
ITEM 446 – 0.032 m X 3173.73 sq. m. = 101.56 cu. m.

P–19: 880.48 m x 10.06 m = 8857.63 sq. m.
ITEM 202 – = 8857.63 sq. m.
ITEM 301 – 0.075 m X 8857.63 sq. m. = 664.32 cu. m.
ITEM 407 – 0.34 L/sq. m. X 8857.63 sq. m. = 3012 L
ITEM 446 – 0.045 m X 8857.63 sq. m. = 398.59 cu. m.
ITEM 446 – 0.032 m X 8857.63 sq. m. = 283.44 cu. m.

P–20: RESURFACING:
993.47 m x 11.28 m = 11206.34 sq. m.
SHOULDER:
993.47 m x 1.80 m = 1788.25 sq. m.
TOTAL 12994.59 cu. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 1788.25 sq. m.
DEPTH = 0.545 m

ITEM 202 – = 11206.34 sq. m.
ITEM 203 – = 1788.25 sq. m. X 0.545 m = 974.60 cu. m.
ITEM 203 – = 1788.25 sq. m.
ITEM 301 – 0.075 m X 11206.34 sq. m. = 840.48 cu. m.
– 0.150 m X 1788.25 sq. m. = 268.24 cu. m.
TOTAL 1108.72 cu. m.
ITEM 304 – (.305 m +.330 m)/2 X 1788.25 sq. m. = 567.77 cu. m.
ITEM 407 – 0.34 L/sq. m. X 12994.59 sq. m. = 4418 L
ITEM 446 – 0.045 m X 12994.59 sq. m. = 584.76 cu. m.
ITEM 446 – 0.032 m X 12994.59 sq. m. = 415.83 cu. m.

P–21: 274.34 m x 7.62 m = 2090.47 sq. m.
ITEM 202 – = 2090.47 sq. m.
ITEM 301 – 0.075 m X 2090.47 sq. m. = 156.78 cu. m.
ITEM 407 – 0.34 L/sq. m. X 2090.47 sq. m. = 711 L
ITEM 446 – 0.045 m X 2090.47 sq. m. = 94.07 cu. m.
ITEM 446 – 0.032 m X 2090.47 sq. m. = 66.90 cu. m.

P–22: 222.52 m x 7.62 m = 1695.60 sq. m.
ITEM 202 – = 1695.60 sq. m.
ITEM 301 – 0.075 m X 1695.60 sq. m. = 127.17 cu. m.
ITEM 407 – 0.34 L/sq. m. X 1695.60 sq. m. = 576 L
ITEM 446 – 0.045 m X 1695.60 sq. m. = 76.30 cu. m.
ITEM 446 – 0.032 m X 1695.60 sq. m. = 54.26 cu. m.

QUANTITIES CARRIED TO SHEET 29–31

CALCULATED T.D.D.
CHECKED J.E.U.

COMPUTATIONS

JEF-7-36.967

PAVEMENT (CONT.):

P-23: RAMP "F" AREAS TAKEN FROM SHEET 63 = 2099.38 sq. m.
STA. 41+648.16 TO STA. 41+870.80 = 222.64 m
222.64 m x 5.79 m = 1289.08 sq. m.
TOTAL AREA = 2099.38 + 1289.08 = 3388.46 sq. m.

NEW SHOULDERS:
STA. 41+664.16 TO STA. 41+870.80 = 206.64 m
APPROACH LENGTH = 38.09 m
TOTAL 244.73 m

SHOULDER AREA = 244.73 m X 1.80 m = 440.51 sq. m.
SHOULDER TAPER:
STA. 41+648.16 TO STA. 41+664.16 = 16 m
TAPER AREA = 16 m X (2.44 m + 1.80 m)/2 = 33.92 sq. m.
TOTAL AREA = 440.51 + 33.92 = 474.43 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 474.43 sq. m.
DEPTH = 0.512 m

ITEM 202 - = 3388.46 sq. m.
ITEM 203 - = 474.43 sq. m. X 0.512 m = 242.91 cu. m.
ITEM 203 - = 474.43 sq. m.
ITEM 301 - 0.075 m X 3388.46 sq. m. = 254.13 cu. m.
- 0.150 m X 474.43 sq. m. = 71.16 cu. m.
TOTAL 325.29 cu. m.
ITEM 304 - (.265 m + .305 m)/2 x 474.43 sq. m. = 135.21 cu. m.
ITEM 407 - 0.34 L/sq. m. X 3862.89 sq. m. = 1313 L
ITEM 446 - 0.045 m X 3862.89 sq. m. = 173.83 cu. m.
ITEM 446 - 0.032 m X 3862.89 sq. m. = 123.61 cu. m.

P-24: RAMP "E" AREAS TAKEN FROM SHEET 63 = 1567.33 sq. m.
STA. 41+672.35 TO STA. 41+861.30 = 188.95 m
188.95 m x 5.79 m = 1094.02 sq. m.
TOTAL AREA = 1567.33 + 1094.02 = 2661.35 sq. m.

NEW SHOULDERS:
STA. 41+672.35 TO STA. 41+895.73 = 223.38 m
SHOULDER AREA = 223.38 m X 1.80 m = 402.08 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 402.08 sq. m.
DEPTH = 0.512 m

ITEM 202 - = 2661.35 sq. m.
ITEM 203 - = 402.08 sq. m. X 0.512 m = 205.86 cu. m.
ITEM 203 - = 402.08 sq. m.
ITEM 301 - 0.075 m X 2661.35 sq. m. = 199.60 cu. m.
- 0.150 m X 402.08 sq. m. = 60.31 cu. m.
TOTAL 259.91 cu. m.
ITEM 304 - (.265 m + .305 m)/2 x 402.08 sq. m. = 114.59 cu. m.
ITEM 407 - 0.34 L/sq. m. X 3063.43 sq. m. = 1042 L
ITEM 446 - 0.045 m X 3063.43 sq. m. = 137.85 cu. m.
ITEM 446 - 0.032 m X 3063.43 sq. m. = 98.03 cu. m.

P-25: 190.85 m x 10.06 m = 1919.95 sq. m.
ITEM 202 - = 1919.95 sq. m.
ITEM 301 - 0.075 m X 1919.95 sq. m. = 144.00 cu. m.
ITEM 407 - 0.34 L/sq. m. X 1919.95 sq. m. = 653 L
ITEM 446 - 0.045 m X 1919.95 sq. m. = 86.40 cu. m.
ITEM 446 - 0.032 m X 1919.95 sq. m. = 61.44 cu. m.

P-26: 129.68 m x 10.06 m = 1304.58 sq. m.
ITEM 202 - = 1304.58 sq. m.
ITEM 301 - 0.075 m X 1304.58 sq. m. = 97.84 cu. m.
ITEM 407 - 0.34 L/sq. m. X 1304.58 sq. m. = 444 L
ITEM 446 - 0.045 m X 1304.58 sq. m. = 58.71 cu. m.
ITEM 446 - 0.032 m X 1304.58 sq. m. = 41.75 cu. m.

P-27: 310.85 m x 10.06 m = 3127.15 sq. m.
ITEM 202 - = 3127.15 sq. m.
ITEM 301 - 0.075 m X 3127.15 sq. m. = 234.54 cu. m.
ITEM 407 - 0.34 L/sq. m. X 3127.15 sq. m. = 1063 L
ITEM 446 - 0.045 m X 3127.15 sq. m. = 140.72 cu. m.
ITEM 446 - 0.032 m X 3127.15 sq. m. = 100.07 cu. m.

P-28: 277.25 m x 10.06 m = 2789.14 sq. m.
ITEM 202 - = 2789.14 sq. m.
ITEM 301 - 0.075 m X 2789.14 sq. m. = 209.18 cu. m.
ITEM 407 - 0.34 L/sq. m. X 2789.14 sq. m. = 948 L
ITEM 446 - 0.045 m X 2789.14 sq. m. = 125.51 cu. m.
ITEM 446 - 0.032 m X 2789.14 sq. m. = 89.25 cu. m.

PAVEMENT (CONT.):

P-29: RAMP "H" AREAS TAKEN FROM SHEET 64 = 2594.50 sq. m.
STA. 41+907.81 TO STA. 42+234.18 = 326.37 m
326.37 m x 5.79 m = 1889.68 sq. m.
TOTAL AREA = 2594.50 + 1889.68 = 4484.18 sq. m.

NEW SHOULDERS:
STA. 41+901.05 TO STA. 42+284.64 = 383.59 m
APPROACH LENGTH = 43.08 m
TOTAL 426.67 m

SHOULDER AREA = 426.67 m X 1.80 m = 768.01 sq. m.
SHOULDER TAPER:
STA. 42+284.64 TO STA. 42+300.64 = 16 m
TAPER AREA = 16 m X (2.44 m + 1.80 m)/2 = 33.92 sq. m.
TOTAL AREA = 768.01 + 33.92 = 801.93 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 801.93 sq. m.
DEPTH = 0.512 m

ITEM 202 - = 4484.18 sq. m.
ITEM 203 - = 801.93 sq. m. X 0.512 m = 410.59 cu. m.
ITEM 203 - = 801.93 sq. m.
ITEM 301 - 0.075 m X 4484.18 sq. m. = 336.31 cu. m.
- 0.150 m X 801.93 sq. m. = 120.29 cu. m.
TOTAL 456.60 cu. m.
ITEM 304 - (.265 m + .305 m)/2 x 801.93 sq. m. = 228.55 cu. m.
ITEM 407 - 0.34 L/sq. m. X 5286.11 sq. m. = 1797 L
ITEM 446 - 0.045 m X 5286.11 sq. m. = 237.87 cu. m.
ITEM 446 - 0.032 m X 5286.11 sq. m. = 169.16 cu. m.

P-30: RAMP "G" AREAS TAKEN FROM SHEET 64 = 1855.10 sq. m.
STA. 41+913.74 TO STA. 42+228.60 = 314.86 m
314.86 m x 5.79 m = 1823.04 sq. m.
TOTAL AREA = 1855.10 + 1823.04 = 3678.14 sq. m.

NEW SHOULDERS:
STA. 41+905.71 TO STA. 42+212.60 = 306.89 m
SHOULDER AREA = 306.89 m X 1.80 m = 552.40 sq. m.
SHOULDER TAPER:
STA. 42+212.60 TO STA. 42+228.60 = 16 m
TAPER AREA = 16 m X (2.44 m + 1.80 m)/2 = 33.92 sq. m.
TOTAL AREA = 552.40 + 33.92 = 586.32 sq. m.

EXCAVATION FOR NEW SHOULDERS:
AREA = 586.32 sq. m.
DEPTH = 0.512 m

ITEM 202 - = 3678.14 sq. m.
ITEM 203 - = 586.32 sq. m. X 0.512 m = 300.20 cu. m.
ITEM 203 - = 586.32 sq. m.
ITEM 301 - 0.075 m X 3678.14 sq. m. = 275.86 cu. m.
- 0.150 m X 586.32 sq. m. = 87.95 cu. m.
TOTAL 363.81 cu. m.
ITEM 304 - (.265 m + .305 m)/2 x 586.32 sq. m. = 167.10 cu. m.
ITEM 407 - 0.34 L/sq. m. X 4264.46 sq. m. = 1450 L
ITEM 446 - 0.045 m X 4264.46 sq. m. = 191.90 cu. m.
ITEM 446 - 0.032 m X 4264.46 sq. m. = 136.46 cu. m.

P-31: 373.70 m x 7.62 m = 2847.59 sq. m.
ITEM 202 - = 2847.59 sq. m.
ITEM 301 - 0.075 m X 2847.59 sq. m. = 213.57 cu. m.
ITEM 407 - 0.34 L/sq. m. X 2847.59 sq. m. = 968 L
ITEM 446 - 0.045 m X 2847.59 sq. m. = 128.14 cu. m.
ITEM 446 - 0.032 m X 2847.59 sq. m. = 91.12 cu. m.

P-32: 17.29 m x 10.06 m = 173.94 sq. m.
ITEM 202 - = 173.94 sq. m.
ITEM 301 - 0.075 m X 173.94 sq. m. = 13.04 cu. m.
ITEM 407 - 0.34 L/sq. m. X 173.94 sq. m. = 59 L
ITEM 446 - 0.045 m X 173.94 sq. m. = 7.83 cu. m.
ITEM 446 - 0.032 m X 173.94 sq. m. = 5.57 cu. m.

P-33: 274.30 m x 7.62 m = 2090.17 sq. m.
ITEM 202 - = 2090.17 sq. m.
ITEM 301 - 0.075 m X 2090.17 sq. m. = 156.76 cu. m.
ITEM 407 - 0.34 L/sq. m. X 2090.17 sq. m. = 711 L
ITEM 446 - 0.045 m X 2090.17 sq. m. = 94.06 cu. m.
ITEM 446 - 0.032 m X 2090.17 sq. m. = 66.88 cu. m.

P-34: 150.29 m x 10.06 m = 1511.92 sq. m.
ITEM 202 - = 1511.92 sq. m.
ITEM 301 - 0.075 m X 1511.92 sq. m. = 113.39 cu. m.
ITEM 407 - 0.34 L/sq. m. X 1511.92 sq. m. = 514 L
ITEM 446 - 0.045 m X 1511.92 sq. m. = 68.04 cu. m.
ITEM 446 - 0.032 m X 1511.92 sq. m. = 48.38 cu. m.

P-35 and P-36: 26.40 m x 10.06 m = 265.58 sq. m.
ITEM 202 - = 265.58 sq. m.
ITEM 301 - 0.075 m X 265.58 sq. m. = 19.92 cu. m.
ITEM 407 - 0.34 L/sq. m. X 265.58 sq. m. = 90 L
ITEM 446 - 0.045 m X 265.58 sq. m. = 11.95 cu. m.
ITEM 446 - 0.032 m X 265.58 sq. m. = 8.50 cu. m.

MEDIAN CONCRETE BARRIER:
B-2, B-3, B-5, B-6, B-8, B-9, B-11, and B-12:
WIDTH = 0.90 m ; LENGTH = 7.6 m ; THICKNESS = 0.150 m
ITEM 304 - 7.6 m X 0.90 m X 0.150 m = 1.03 cu. m.

BR-1:
WIDTH = 0.90 m ; LENGTH = 226.97 m ; THICKNESS = 0.150 m
ITEM 304 - 226.97 m X 0.90 m X 0.150 m = 30.64 cu. m.

CONCRETE MEDIAN:
M-1:
WIDTH = 0.90 m ; LENGTH = 226.97 m
ITEM 612 - 226.97 m X 0.90 m = 204.27 sq. m.

I-1, I-2, I-9, I-11, I-12, I-14, I-15, and I-18:
WIDTH = 0.90 m ; LENGTH = 3.2 m
ITEM 612 - 3.2 m X 0.90 m = 2.88 sq. m.

I-3 and I-4:
WIDTH = 0.90 m ; LENGTH = 3.0 m
ITEM 612 - 3.0 m X 0.90 m = 2.70 sq. m.

I-5 and I-10:
WIDTH = 0.90 m ; LENGTH = 3.6 m
ITEM 612 - 3.6 m X 0.90 m = 3.24 sq. m.

I-6 THRU I-8, I-13, I-16, and I-17:
WIDTH = 0.90 m ; LENGTH = 4.2 m
ITEM 612 - 4.2 m X 0.90 m = 3.78 sq. m.

QUANTITIES CARRIED TO SHEET 29 and 31

CALCULATED T.D.D.
CHECKED J.E.U.

COMPUTATIONS

JEF-7-39.007

LINEAR GRADING (MAINLINE)				
			203	203
STATION TO STATION		LANE	LINEAR GRADING METHOD A	LINEAR GRADING METHOD B
FROM	TO		METER	METER
36+940.23	38+307	NORTH BOUND	985.77	381.00
38+567	38+769.44		131.95	70.49
38+822.03	39+218		395.97	
39+590	40+478.23		227.19	661.04
40+516.23	41+404.31			888.08
41+673	41+877.10		145.04	59.06
41+913.29	42+232		166.31	152.40
42+605.44	42+630.33			24.89
36+966.63	38+204	SOUTH BOUND	715.40	521.97
38+592	38+769.44		108.86	68.58
38+822.03	39+115		241.53	51.44
39+368	40+478.23		915.92	194.31
40+516.23	41+517.30		831.52	169.55
41+740	41+877.10		22.80	114.30
41+913.29	42+215		151.21	150.50
42+472.44	42+630.33			157.89
42+715.55	42+764			50.36
TOTALS			5039	3716
TOTALS IN KILOMETERS			5.04	3.72

LINEAR GRADING (RAMPS)						
					203	203
STATION TO STATION		RAMP	SIDE		LINEAR GRADING METHOD A	LINEAR GRADING METHOD B
FROM	TO				METER	METER
0+000	0+590.25	A	RT.		563.58	26.67
0+387	0+590.25	A	LT.		168.96	34.29
0+260	0+486.35	B	LT.		188.25	38.10
0+000	0+486.35	B	RT.		402.53	83.82
0+007.43	0+592.03	C	RT.		375.05	209.55
0+007.43	0+339	C	LT.		331.57	
0+007.66	0+401	D	LT.		393.34	
0+007.66	0+772.75	D	RT.		406.95	358.14
41+517.30	41+895.73	E	RT.		325.09	53.34
41+734	41+895.73	E	LT.		161.73	
41+676	41+889.95	F	LT.		213.95	
41+404.31	41+889.95	F	RT.		74.16	411.48
41+905.71	42+472.44	G	RT.		524.82	41.91
41+905.71	42+214	G	LT.		308.29	
41+877.07	42+234	H	LT.		356.93	
41+877.07	42+605.44	H	RT.		417.85	310.52
TOTALS					5213	1568
TOTALS IN KILOMETERS					5.21	1.57

LINEAR GRADING (DITCH CLEANOUT)				
				203
STATION TO STATION		SIDE	LOCATION	LINEAR GRADING DITCH CLEANOUT
FROM	TO			METER
36+967	37+332	LT.	MAINLINE S.R. 7	365
37+561	38+552	RT.		991
39+374	40+365	LT.		991
39+420	39+832	RT.		412
40+716	40+822	LT.		106
40+929	41+660	LT.		731
42+270	42+529	LT.		259
42+301	42+468	RT.		167
0+030	0+335	RT.	RAMP "C"	305
0+030	0+335	LT.		305
0+030	0+230	RT.	RAMP "D"	200
0+030	0+244	LT.		214
41+904	42+194	LT.	RAMP "G"	290
41+904	42+209	RT.		305
41+904	42+224	RT.	RAMP "H"	320
41+904	42+209	LT.		305
TOTAL				6266
TOTAL IN KILOMETERS				6.27

NOTE: LEFT AND RIGHT SIDE CONFIGURATION ON RAMPS IS REFERENCED TO THE DIRECTION OF TRAVEL.

ITEM 659 - SEEDING AND MULCHING
LINEAR GRADING METHOD A: (5051 M + 5215 M) X 2.0 M = 20532 SQ. M. LINEAR GRADING (DITCH CLEANOUT): 6266 M X 2.0 M = 12532 SQ. M.
ITEM 659 – SEEDING AND MULCHING TOTAL = 33064 SQ. M.

WIDTH OF SEEDING & MULCHING TAKEN FROM TYPICAL SECTIONS.

ITEM 659 - COMMERCIAL FERTILIZER
$\frac{33064 \text{ SQ. M. X } 0.1 \text{ KG}}{\text{SQ. M.}}$ = 3306 KG
ITEM 659 - AGRICULTURAL LIMING
$\frac{33064 \text{ SQ. M. X } 256 \text{ KG}}{1000 \text{ SQ. M.}}$ X 220% = 18622 KG
ITEM 659 - WATER
$\frac{33064 \text{ SQ. M. X } 5 \text{ CU. M.}}{1000 \text{ SQ. M.}}$ X 2 APPLICATIONS = 331 CU. M.

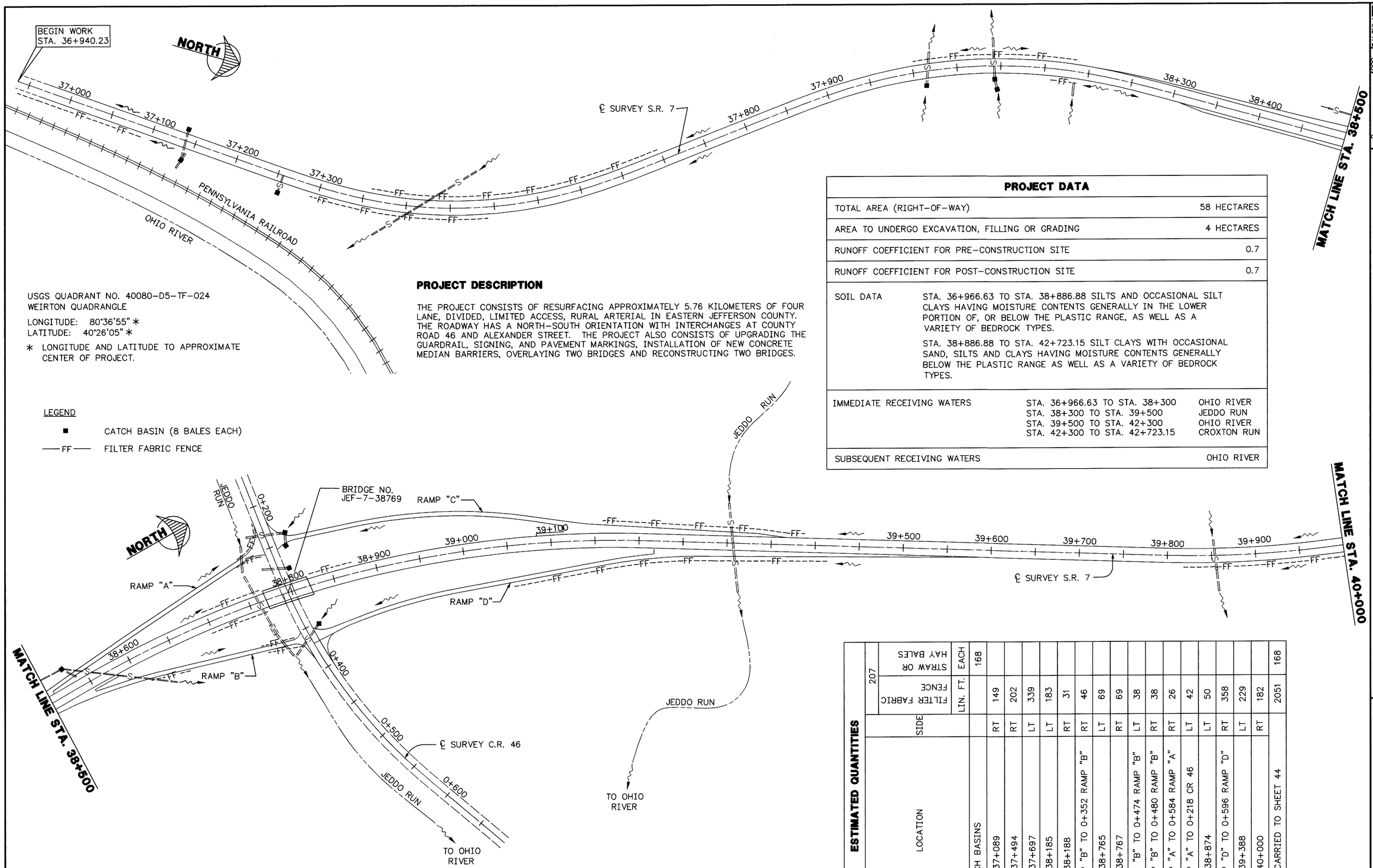
ITEM 670 - SLOPE EROSION PROTECTION
LINEAR GRADING METHOD B: (3702 M + 1566 M) X 2.0 M = 10536 SQ. M.
ITEM 670 – SLOPE EROSION PROTECTION TOTAL = 10536 SQ. M.

NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY.

CALCULATED T.D.D.
CHECKED J.E.U.

COMPUTATIONS

JEF-7-36.997



USGS QUADRANT NO. 40080-D5-TF-024
WEIRTON QUADRANGLE

LONGITUDE: 80°36'55" *
LATITUDE: 40°26'05" *

* LONGITUDE AND LATITUDE TO APPROXIMATE CENTER OF PROJECT.

LEGEND

■ CATCH BASIN (8 BALES EACH)

——FF—— FILTER FABRIC FENCE

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF RESURFACING APPROXIMATELY 5.76 KILOMETERS OF FOUR LANE, DIVIDED, LIMITED ACCESS, RURAL ARTERIAL IN EASTERN JEFFERSON COUNTY. THE ROADWAY HAS A NORTH-SOUTH ORIENTATION WITH INTERCHANGES AT COUNTY ROAD 46 AND ALEXANDER STREET. THE PROJECT ALSO CONSISTS OF UPGRADING THE GUARDRAIL, SIGNING, AND PAVEMENT MARKINGS, INSTALLATION OF NEW CONCRETE MEDIAN BARRIERS, OVERLAYING TWO BRIDGES AND RECONSTRUCTING TWO BRIDGES.

PROJECT DATA

TOTAL AREA (RIGHT-OF-WAY)		58 HECTARES
AREA TO UNDERGO EXCAVATION, FILLING OR GRADING		4 HECTARES
RUNOFF COEFFICIENT FOR PRE-CONSTRUCTION SITE		0.7
RUNOFF COEFFICIENT FOR POST-CONSTRUCTION SITE		0.7
SOIL DATA	STA. 36+966.63 TO STA. 38+886.88 SILTS AND OCCASIONAL SILT CLAYS HAVING MOISTURE CONTENTS GENERALLY IN THE LOWER PORTION OF, OR BELOW THE PLASTIC RANGE, AS WELL AS A VARIETY OF BEDROCK TYPES. STA. 38+886.88 TO STA. 42+723.15 SILT CLAYS WITH OCCASIONAL SAND, SILTS AND CLAYS HAVING MOISTURE CONTENTS GENERALLY BELOW THE PLASTIC RANGE AS WELL AS A VARIETY OF BEDROCK TYPES.	
IMMEDIATE RECEIVING WATERS	STA. 36+966.63 TO STA. 38+300 STA. 38+300 TO STA. 39+500 STA. 39+500 TO STA. 42+300 STA. 42+300 TO STA. 42+723.15	OHIO RIVER JEDDO RUN OHIO RIVER CROXTON RUN
SUBSEQUENT RECEIVING WATERS		OHIO RIVER

ESTIMATED QUANTITIES

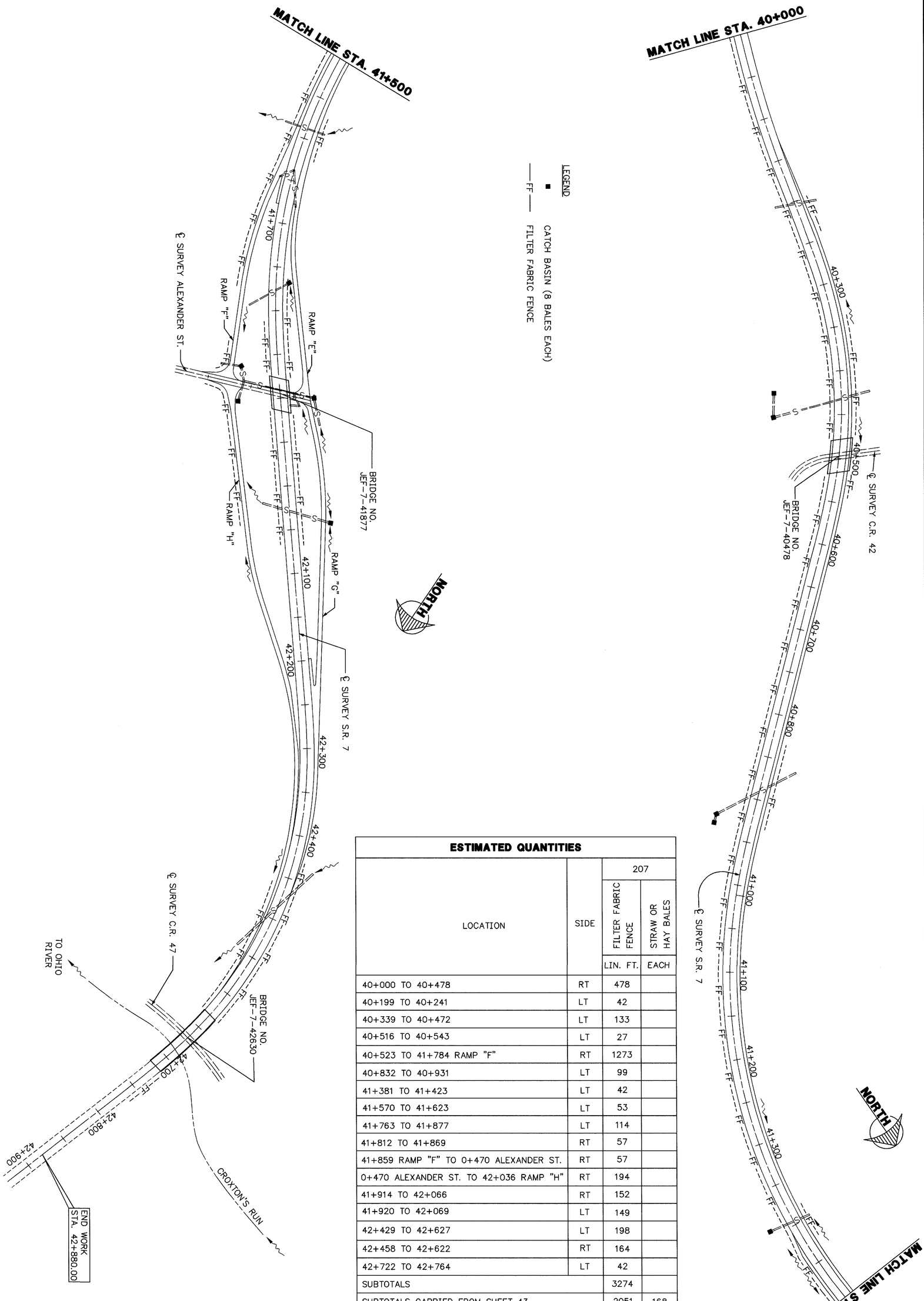
LOCATION	SIDE	207 FILTER FABRIC FENCE LIN. FT.	207 STRAW OR HAY BALES EACH
AT ALL CATCH BASINS			168
36+940 TO 37+089	RT	149	
37+292 TO 37+494	RT	202	
37+358 TO 37+697	LT	339	
38+002 TO 38+185	LT	183	
38+157 TO 38+188	RT	31	
0+306 RAMP "B" TO 0+352 RAMP "B"	RT	46	
38+696 TO 38+765	LT	69	
38+698 TO 38+767	RT	69	
0+436 RAMP "B" TO 0+474 RAMP "B"	LT	38	
0+442 RAMP "B" TO 0+480 RAMP "B"	RT	38	
0+558 RAMP "A" TO 0+584 RAMP "A"	RT	26	
0+564 RAMP "A" TO 0+218 CR 46	LT	42	
38+824 TO 38+874	LT	50	
0+238 RAMP "D" TO 0+596 RAMP "D"	RT	358	
39+159 TO 39+388	LT	229	
39+818 TO 40+000	RT	182	
SUBTOTALS CARRIED TO SHEET 44		2051	168

CALCULATED T.D.D.
CHECKED J.E.U.

0 2000 4000
HORIZONTAL SCALE IN METERS

STORMWATER POLLUTION PREVENTION PLAN

JEF-7-36.967



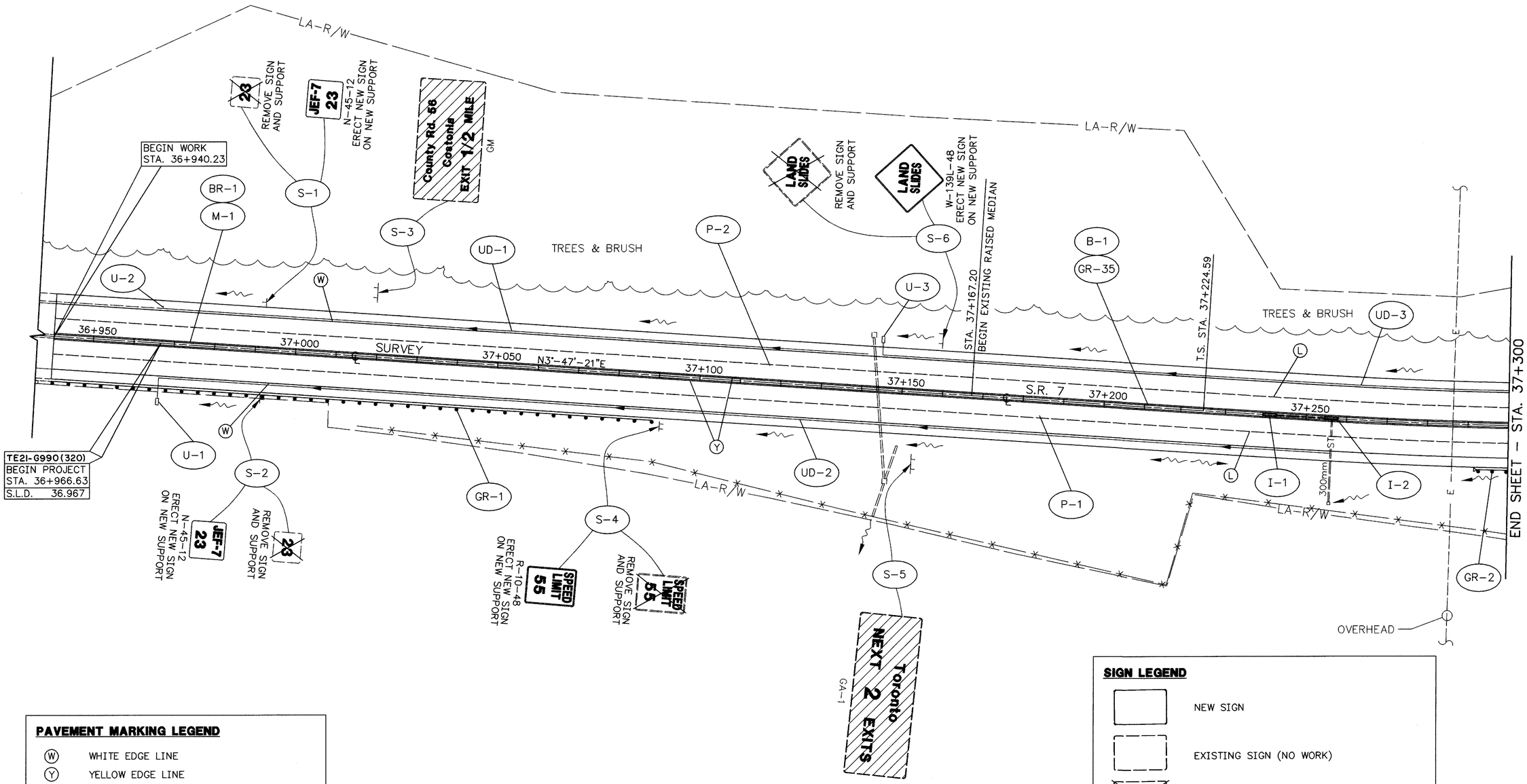
ESTIMATED QUANTITIES			
LOCATION	SIDE	207	
		FILTER FABRIC FENCE	STRAW OR HAY BALES
		LIN. FT.	EACH
40+000 TO 40+478	RT	478	
40+199 TO 40+241	LT	42	
40+339 TO 40+472	LT	133	
40+516 TO 40+543	LT	27	
40+523 TO 41+784 RAMP "F"	RT	1273	
40+832 TO 40+931	LT	99	
41+381 TO 41+423	LT	42	
41+570 TO 41+623	LT	53	
41+763 TO 41+877	LT	114	
41+812 TO 41+869	RT	57	
41+859 RAMP "F" TO 0+470 ALEXANDER ST.	RT	57	
0+470 ALEXANDER ST. TO 42+036 RAMP "H"	RT	194	
41+914 TO 42+066	RT	152	
41+920 TO 42+069	LT	149	
42+429 TO 42+627	LT	198	
42+458 TO 42+622	RT	164	
42+722 TO 42+764	LT	42	
SUBTOTALS		3274	
SUBTOTALS CARRIED FROM SHEET 43		2051	168
TOTALS CARRIED TO GENERAL SUMMARY		5325	168

JEF-7-36.967

STORMWATER POLLUTION PREVENTION PLAN

0 4000
2000
HORIZONTAL SCALE IN METERS

CALCULATED T.D.D.
CHECKED J.E.U.



PAVEMENT MARKING LEGEND

(W)	WHITE EDGE LINE
(Y)	YELLOW EDGE LINE
(L)	LANE LINE
(C)	CHANNELIZING LINE
(S)	STOP LINE
(T)	TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

SIGN LEGEND

- NEW SIGN
- EXISTING SIGN (NO WORK)
- EXISTING SIGN TO BE REMOVED
- EXISTING SIGN CLEANED, DEMOUNTABLE COPY REPAIRED AND ROUTE SHEILD REPLACED

HORIZONTAL SCALE IN METERS
0 500 1000

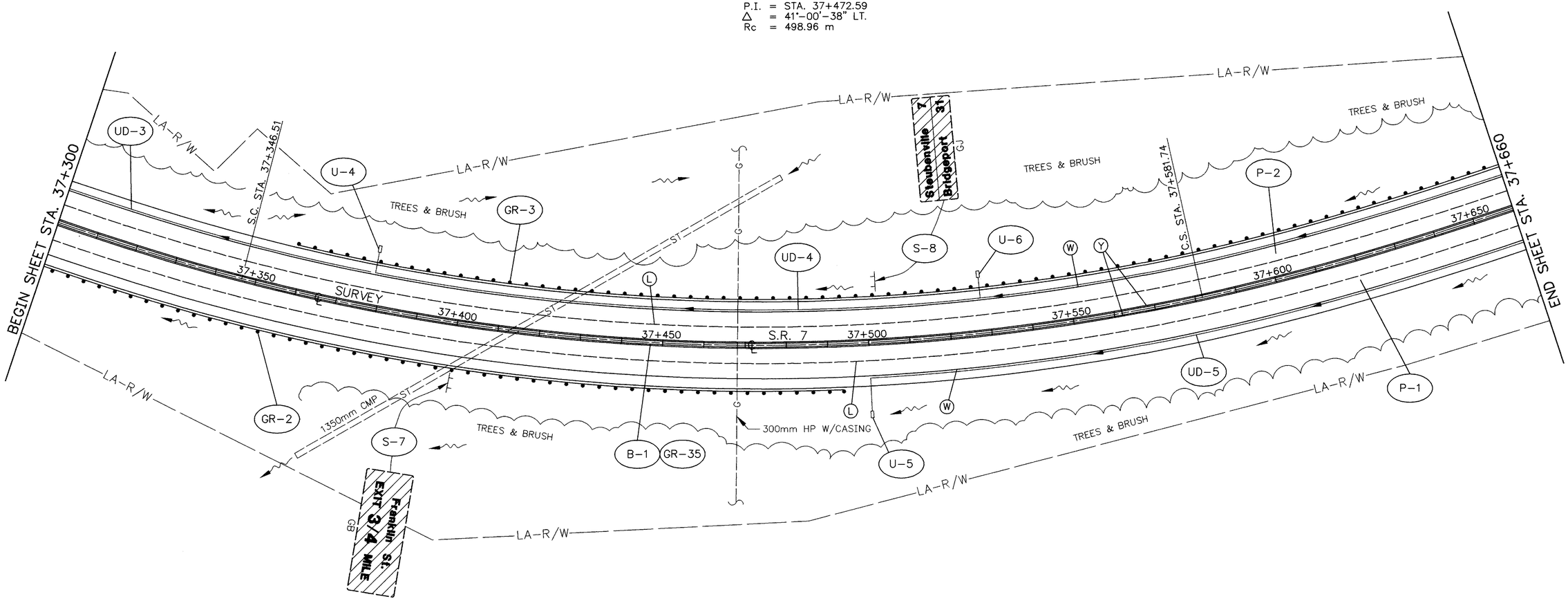
CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 36+936.15 TO STA. 37+300.00

JEF-7-36.967

CURVE DATA

P.I. = STA. 37+472.59
△ = 41°-00'-38" LT.
Rc = 498.96 m



PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

SEE SHEET 45 FOR SIGN LEGEND

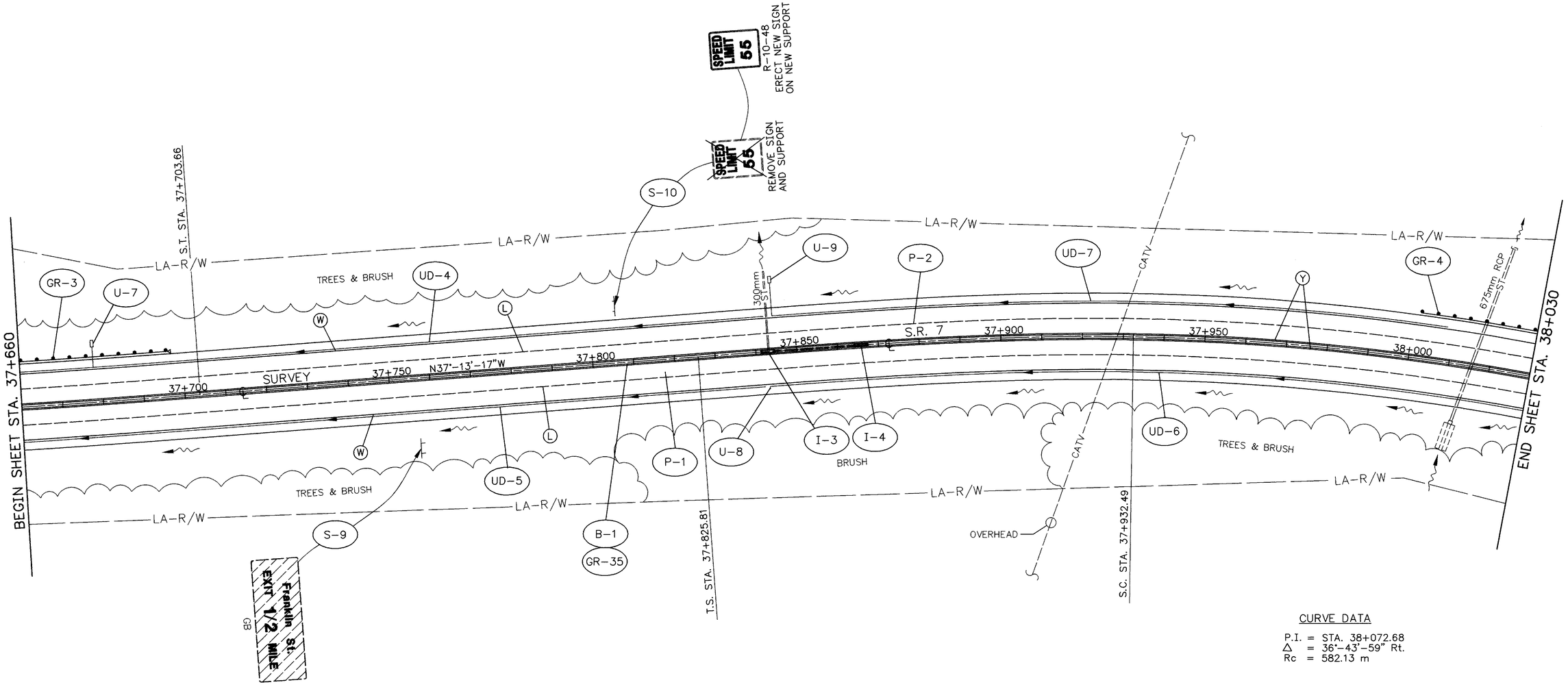
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN

STA. 37+300.00 TO STA. 37+660.00

JEF-7-36.967



CURVE DATA

P.I. = STA. 38+072.68
△ = 36°-43'-59" Rt.
Rc = 582.13 m

PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

SEE SHEET 45 FOR SIGN LEGEND

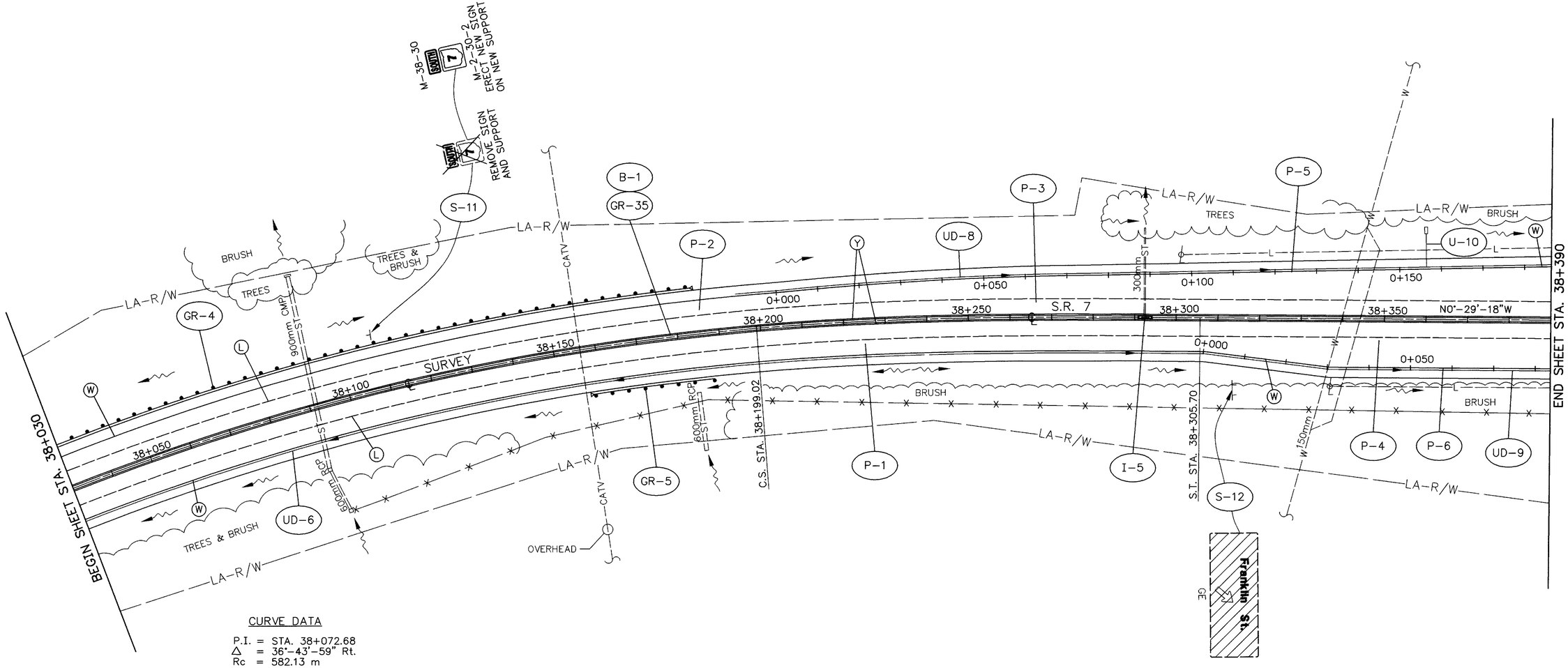
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN

STA. 37+660.00 TO STA. 38+030.00

JEF-7-96.067



CURVE DATA

P.I. = STA. 38+072.68
Δ = 36°-43'-59" Rt.
Rc = 582.13 m

PAVEMENT MARKING LEGEND

(W)	WHITE EDGE LINE
(Y)	YELLOW EDGE LINE
(L)	LANE LINE
(C)	CHANNELIZING LINE
(S)	STOP LINE
(T)	TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

NOTE: SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

SEE SHEET 45 FOR SIGN LEGEND

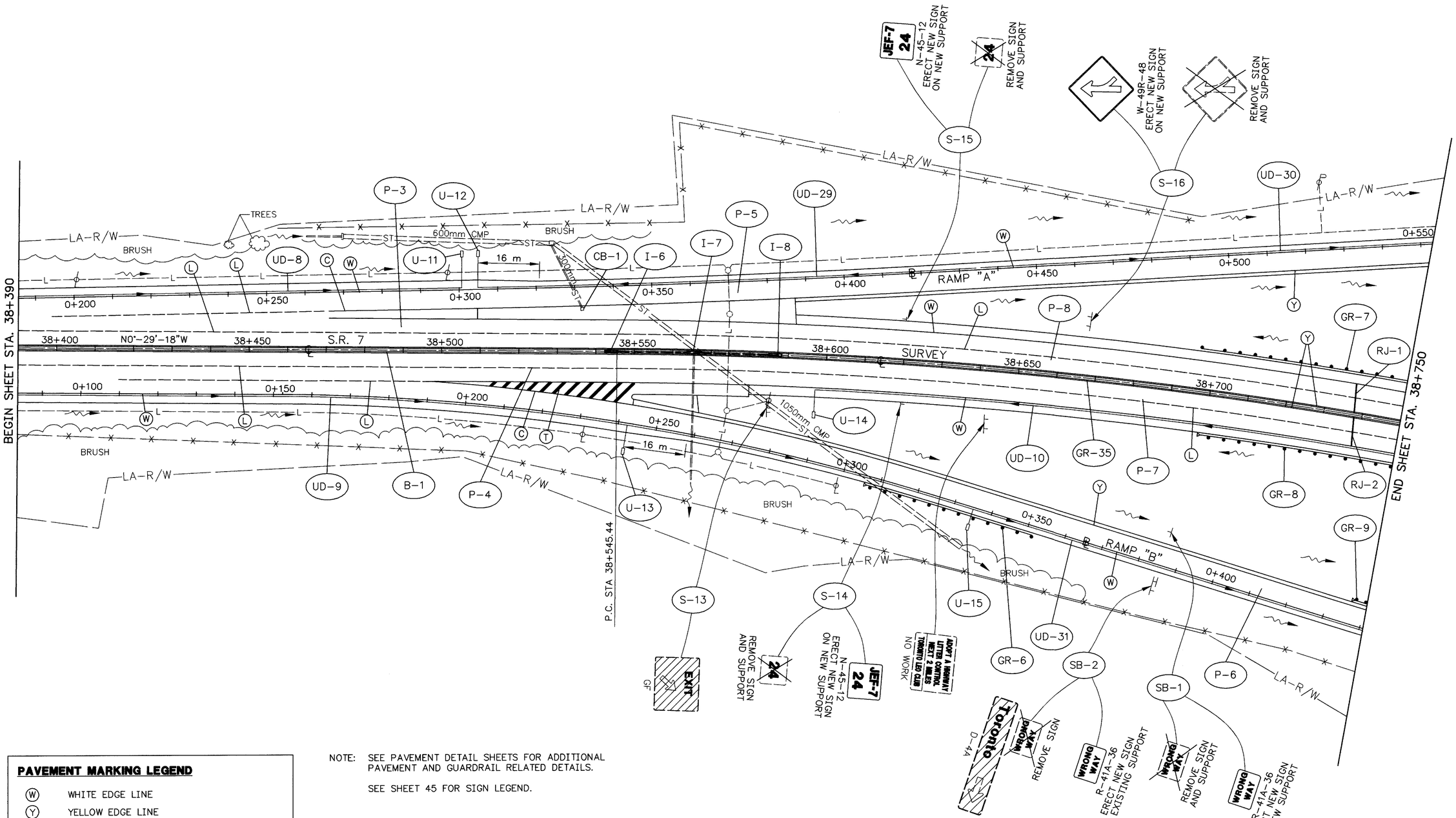
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN

STA. 38+030.00 TO STA. 38+390.00

JEF-7-36.907



PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.
FOR ADDITIONAL PAVEMENT MARKING DETAILS,
SEE STANDARD CONSTRUCTION DRAWING TC-72.20M.

NOTE: SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

SEE SHEET 45 FOR SIGN LEGEND.

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN

STA. 38+390.00 TO STA. 38+750.00

JEF-7-90.007

STA. 38+795.73 ℄ S.R. 7
STA. 0+304.80 ℄ C.R. 46
BRIDGE NO. JEF-7-38769
SEE DWGS. 69 TO 81.

*BRIDGE WIDTH (T/T PARAPETS): 10.363 m
NDC = 11.25 m

NOTE: SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

SEE SHEET 45 FOR SIGN LEGEND

PAVEMENT MARKING LEGEND

(W)	WHITE EDGE LINE
(Y)	YELLOW EDGE LINE
(L)	LANE LINE
(C)	CHANNELIZING LINE
(S)	STOP LINE
(T)	TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

CURVE DATA

P.I.= STA. 38+885.18
△ = 31°-50'-59" Rt.
T = 339.74 m
L = 661.90 m
E = 47.52 m
R = 1190.71 m

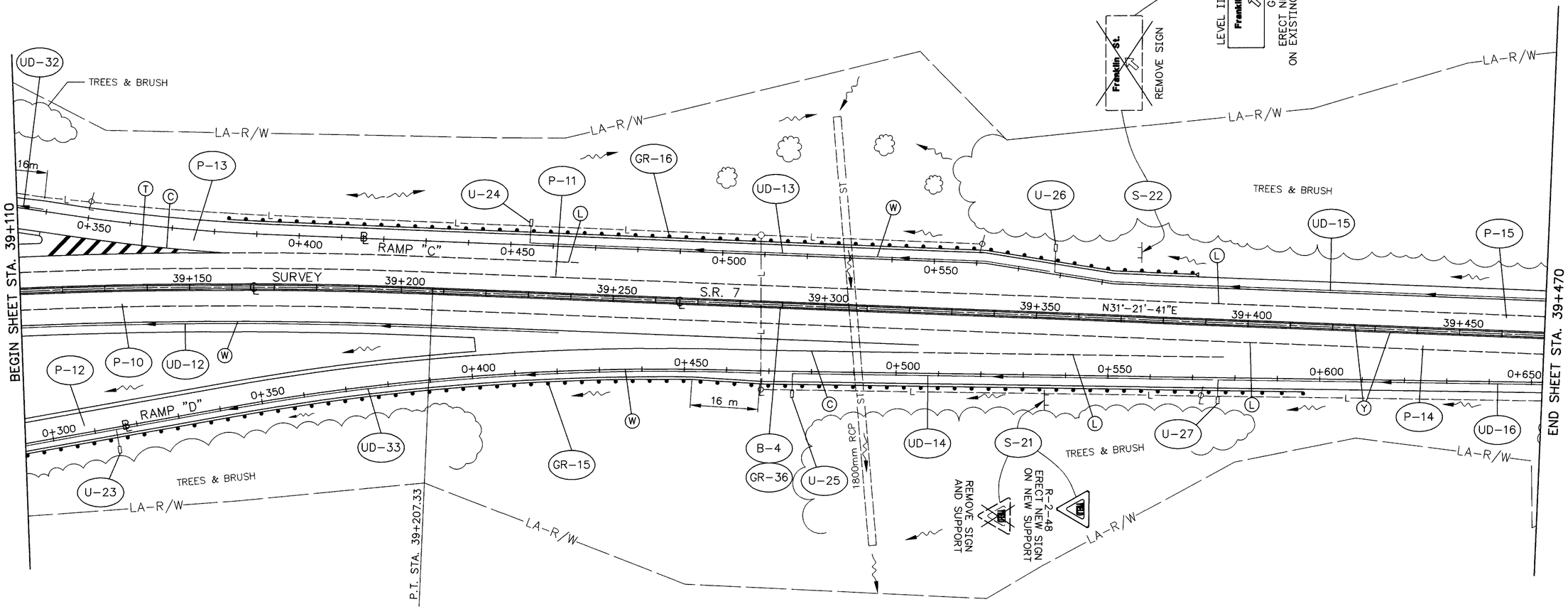
CALCULATED T.D.D.
CHECKED J.E.U.

HORIZONTAL SCALE IN METERS
0 500 1000

ROADWAY PLAN
STA. 38+750.00 TO STA. 39+110.00

JEF-7-36.997

50
123



PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.
FOR ADDITIONAL PAVEMENT MARKING DETAILS,
SEE STANDARD CONSTRUCTION DRAWING TC-72.20M.

NOTE: SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

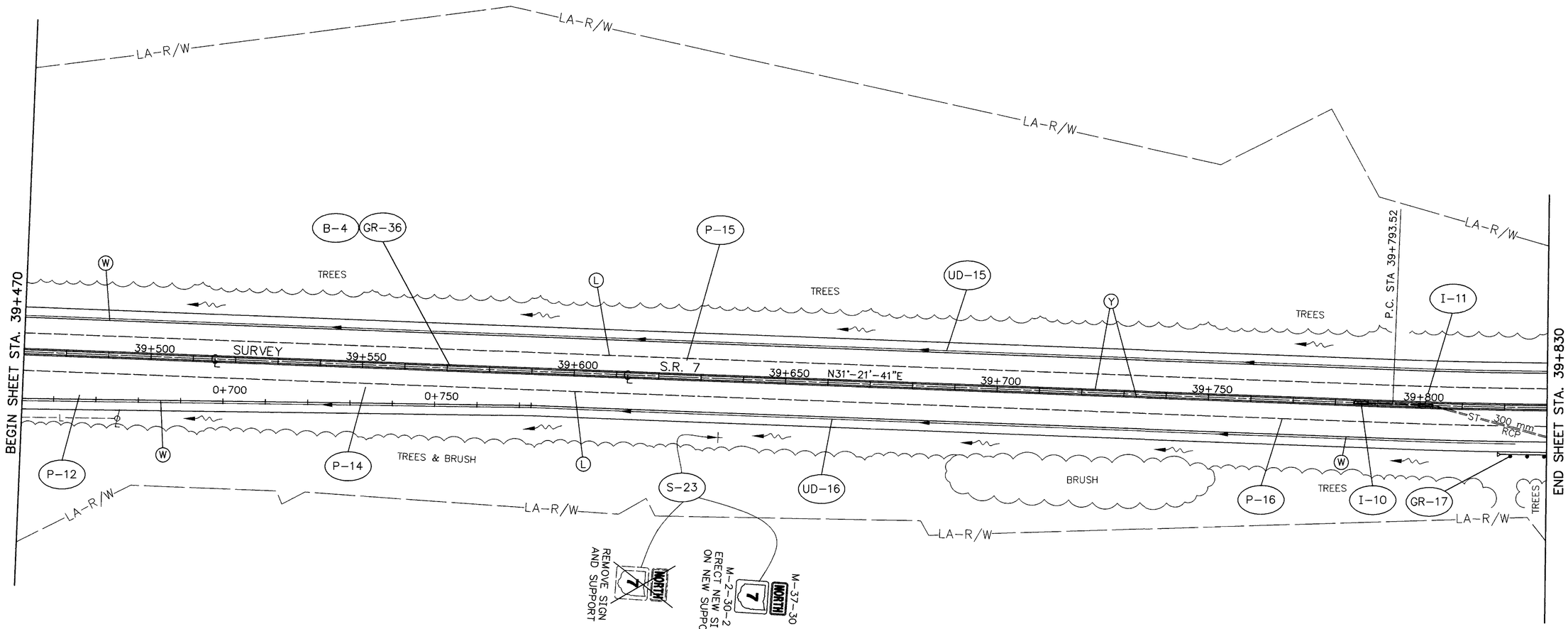
SEE SHEET 45 FOR SIGN LEGEND.

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 39+110.00 TO STA. 39+470.00

JEF-7-36.967



PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

NOTE: SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

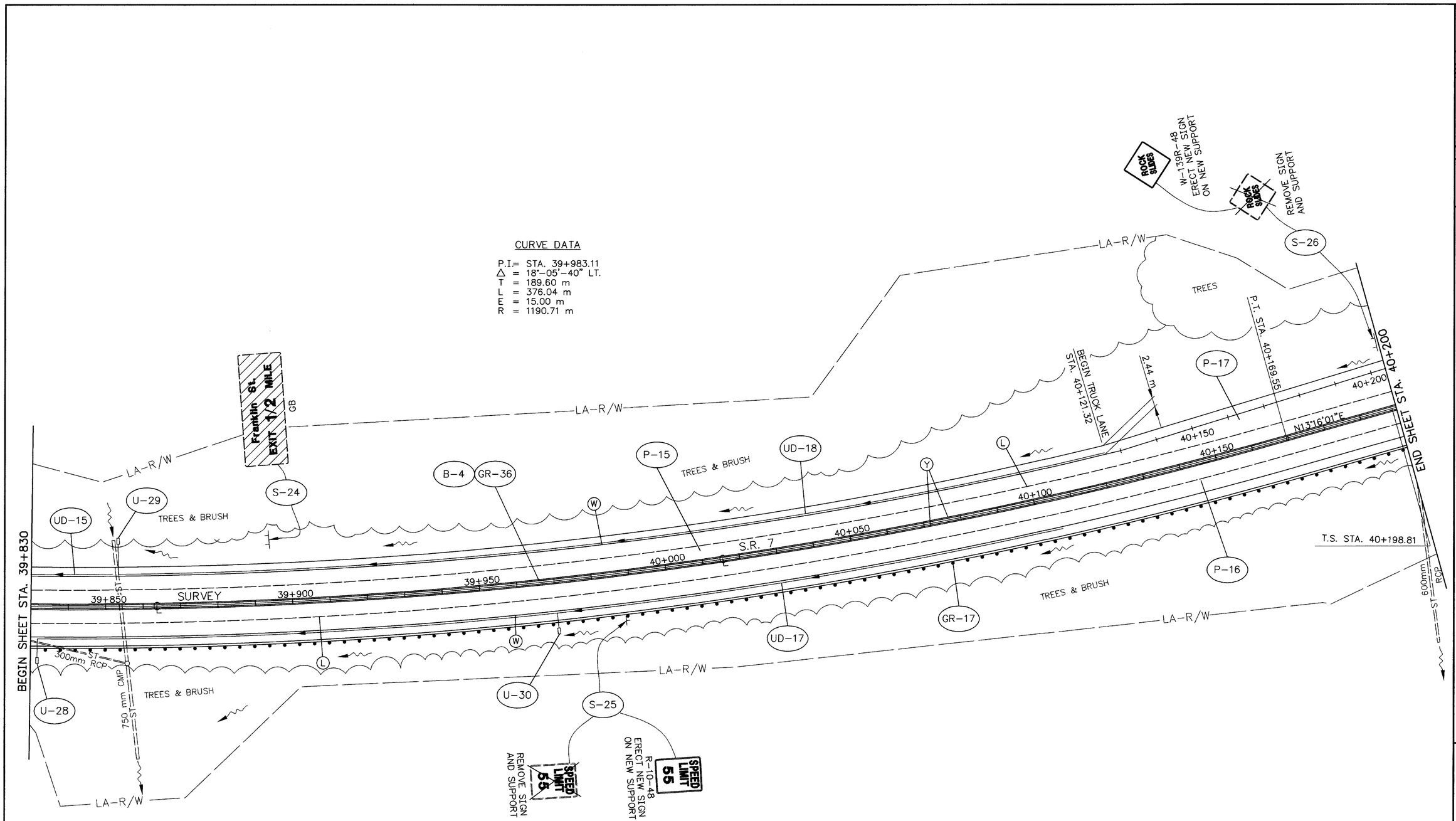
SEE SHEET 45 FOR SIGN LEGEND.

0 500 1000
HORIZONTAL SCALE IN METERS

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 39+470.00 TO STA. 39+830.00

JEF-7-36.967



PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

SEE SHEET 45 FOR SIGN LEGEND.

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 39+830.00 TO STA. 40+200.00

JEF-7-36.967

STA. 40+497.22 ℄ S.R. 7
STA. 0+530.57 ℄ C.R. 42
BRIDGE NO. JEF-7-40478
SEE DWGS. 82 TO 95 .

CURVE DATA
P.I. = STA. 40+418.83
△ = 35°-17'-12" RT.
Rc = 498.96 m

* BRIDGE WIDTH (T/T PARAPETS): 10.363 m
NDC = 11.25 m

SEE SHEET 45 FOR SIGN LEGEND.

PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

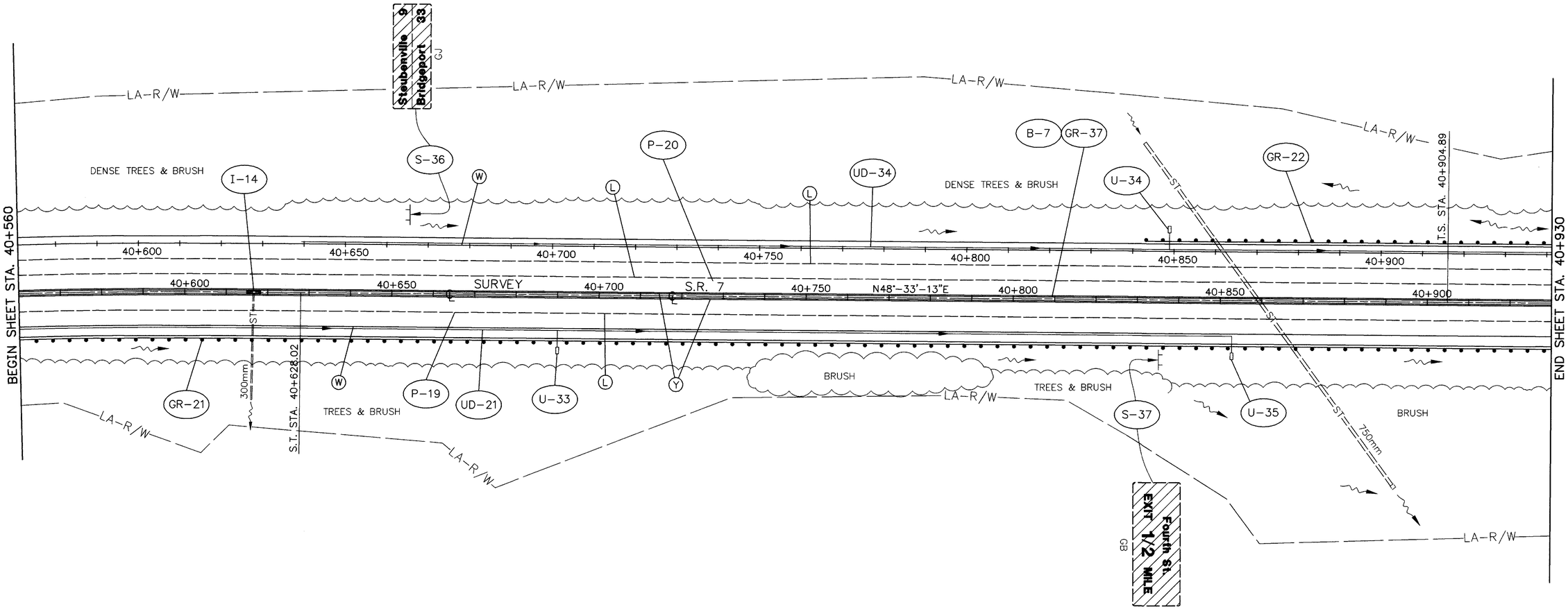
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 40+200.00 TO STA. 40+560.00

JEF-7-30.997

54
123



PAVEMENT MARKING LEGEND

(W)	WHITE EDGE LINE
(Y)	YELLOW EDGE LINE
(L)	LANE LINE
(C)	CHANNELIZING LINE
(S)	STOP LINE
(T)	TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

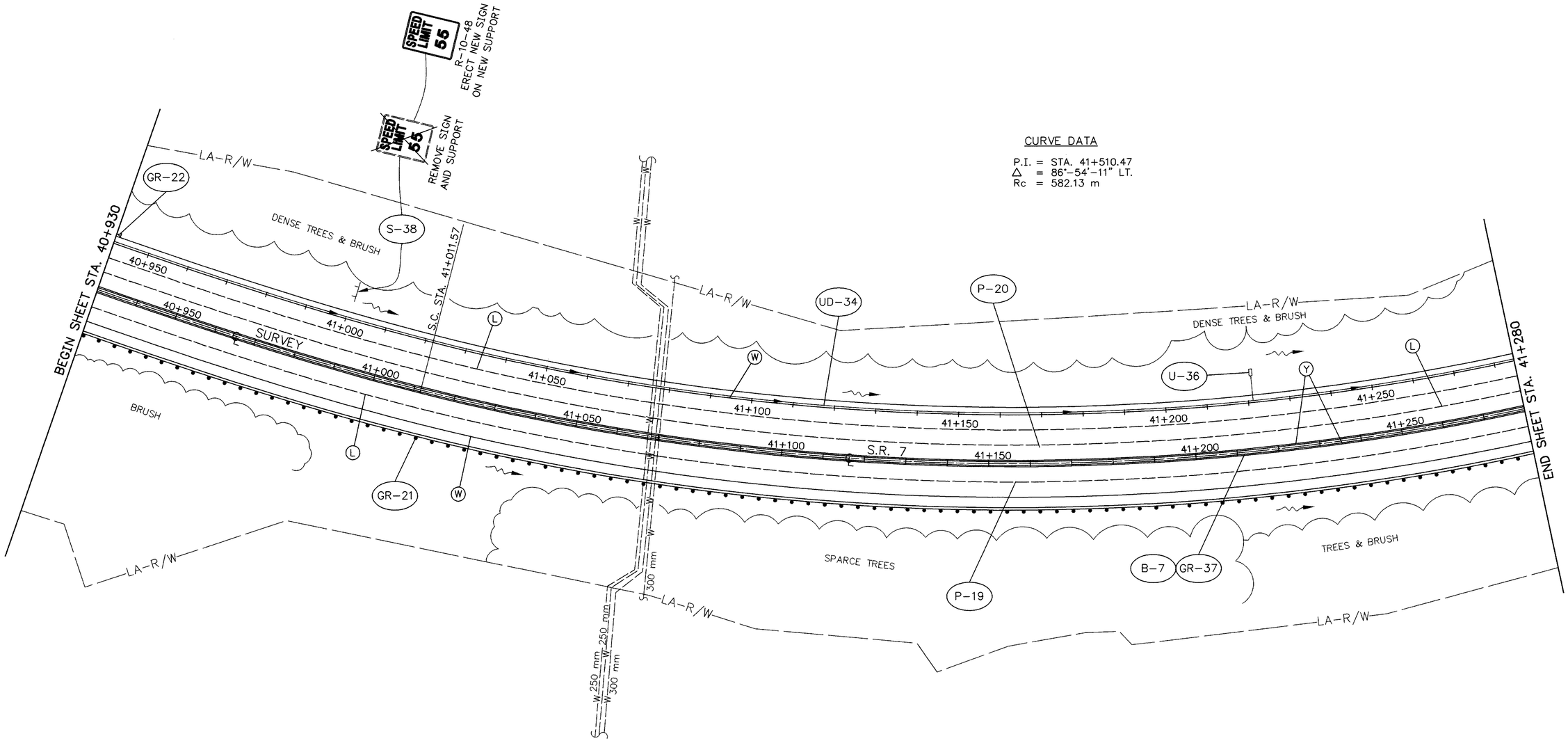
SEE SHEET 45 FOR SIGN LEGEND.

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 40+560.00 TO STA. 40+930.00

JEF-7-36.967



PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

SEE SHEET 45 FOR SIGN LEGEND.

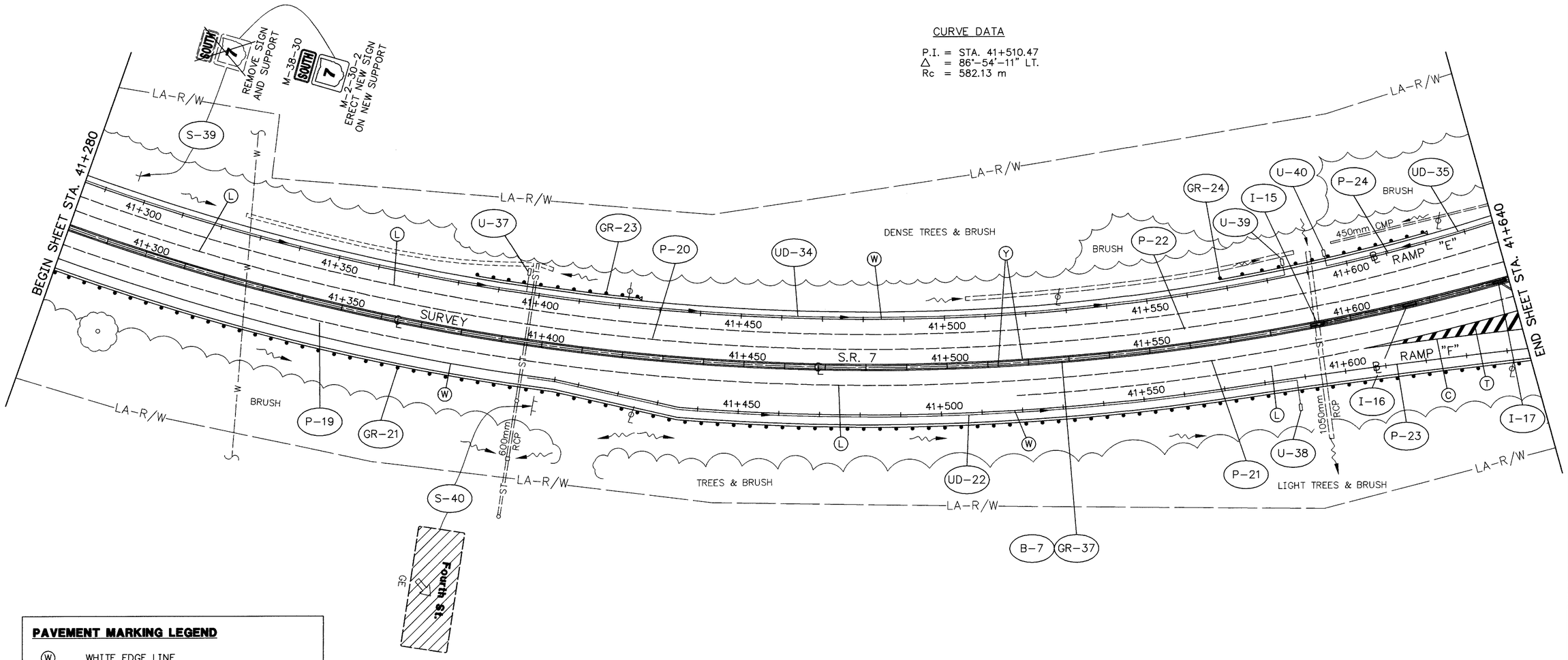
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN

STA. 40+930.00 TO STA. 41+280.00

JEF-7-36.967



PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.
FOR ADDITIONAL PAVEMENT MARKING DETAILS, SEE STANDARD CONSTRUCTION DRAWING TC-72.20M.

NOTE: EXISTING ROADWAY LIGHTING CABLES ARE NOT SHOWN ON THIS PLAN DUE TO LACK OF RECORD INFORMATION.

SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

SEE SHEET 45 FOR SIGN LEGEND.

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 41+280.00 TO STA. 41+640.00

JEF-7-36.967

BENCHMARK: ELEV. 237.830
TOP OF HUB STA. 41+925,
12.36 m RT. OF ℄ S.R. 7.

CURVE DATA

P.I. = STA. 41+510.47
△ = 86°-54'-11" LT.
Rc = 582.13 m

STA. 41+894.51 ℄ S.R. 7
STA. 0+365.76 ℄ ALEXANDER ST.
BRIDGE NO. JEF-7-41877
SEE DWGS. 96 TO 109.

BEGIN SHEET STA. 41+640

END SHEET STA. 42+010

* BRIDGE WIDTH (T/T PARAPETS): 10.489 m
NDC = 11.25 m

PAVEMENT MARKING LEGEND

- (W) WHITE EDGE LINE
- (Y) YELLOW EDGE LINE
- (L) LANE LINE
- (C) CHANNELIZING LINE
- (S) STOP LINE
- (T) TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.
FOR ADDITIONAL PAVEMENT MARKING DETAILS,
SEE STANDARD CONSTRUCTION DRAWING TC-72.20M.

NOTE: THE EXISTING ROADWAY LIGHTING CABLES AND PULLBOXES SHOWN WERE OBTAINED FROM RECORD DRAWINGS. ANY EXISTING ROADWAY LIGHTING CABLES NOT SHOWN ON THIS PLAN IS DUE TO LACK OF RECORD INFORMATION.

SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

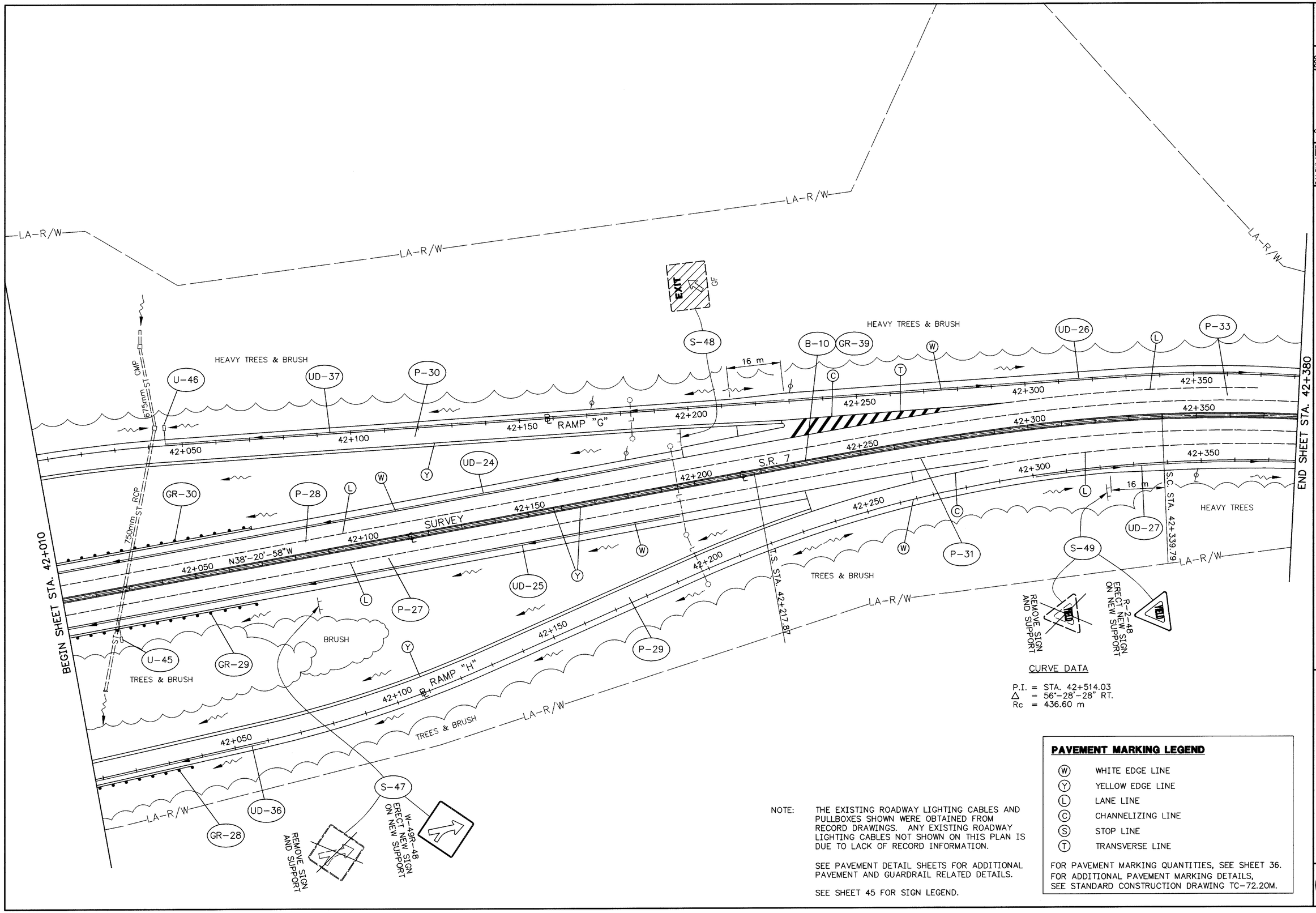
SEE SHEET 45 FOR SIGN LEGEND

CALCULATED T.D.D.
CHECKED J.E.U.

HORIZONTAL SCALE IN METERS
0 500 1000

ROADWAY PLAN
STA. 41+640.00 TO STA. 42+010.00

JEF-7-30.007



CURVE DATA

P.I. = STA. 42+514.03
△ = 56°-28'-28" RT.
Rc = 436.60 m

NOTE: THE EXISTING ROADWAY LIGHTING CABLES AND PULLBOXES SHOWN WERE OBTAINED FROM RECORD DRAWINGS. ANY EXISTING ROADWAY LIGHTING CABLES NOT SHOWN ON THIS PLAN IS DUE TO LACK OF RECORD INFORMATION.

SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

SEE SHEET 45 FOR SIGN LEGEND.

PAVEMENT MARKING LEGEND

(W)	WHITE EDGE LINE
(Y)	YELLOW EDGE LINE
(L)	LANE LINE
(C)	CHANNELIZING LINE
(S)	STOP LINE
(T)	TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.
FOR ADDITIONAL PAVEMENT MARKING DETAILS, SEE STANDARD CONSTRUCTION DRAWING TC-72.20M.

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 42+010.00 TO STA. 42+380.00

JEF-7-30.067

59
123

BENCHMARK: ELEV. 227.432
TOP OF HUB STA. 42+595.830,
11.84 m LT. OF ℄ S.R. 7.

LEVEL II
Fourth St.
ERECT NEW SIGN ON EXISTING SUPPORTS
Fourth St.
REMOVE SIGN AND SUPPORT

STA. 42+667.27 ℄ S.R. 7
STA. 0+609.60 ℄ C.R. 47
BRIDGE NO. JEF-7-42630
SEE DWGS. 110 TO 123 .

* BRIDGE WIDTH
(T/T PARAPETS): 8.965 m
NDC = 11.25 m

ERECT NEW SIGN ON NEW SUPPORT
REMOVE SIGN AND SUPPORT

LA-R/W
HEAVY TREES & BRUSH
BRUSH
TREES & BRUSH
SURVEY
BEGIN SHEET STA. 42+380
1050mm RCP ST
300mm ST
42+400
42+450
42+500
42+550
42+600
42+650
42+700
42+750
42+800
℄ S.R. 7
S-50
S-51
S-52
S-53
P-30
UD-26
P-33
GR-31
B-10
GR-40
U-48
P-34
RJ-13
AS-14
I-18
MR-7
B-11
P-29
UD-27
U-47
GR-32
UD-28
P-31
U-49
P-32
RJ-14
AS-13
E-1
AS-15
AS-16
B-13
BR-2
P-36
GR-34
MR-8
B-12
GR-41
P-35
GR-33
B-14
GR-34
C.S. STA. 42+648.21
S.I. STA. 42+770.13
N18°-07'-30"E
MATCH LINE A
MATCH LINE A
END WORK
STA. 42+880.00
NORTH
M-2-30-2
M-38-30

CURVE DATA

P.I. = STA. 42+514.03
△ = 56°-28'-28" RT.
Rc = 436.60 m

NOTE: EXISTING ROADWAY LIGHTING CABLES ARE NOT SHOWN ON THIS PLAN DUE TO LACK OF RECORD INFORMATION.

SEE PAVEMENT DETAIL SHEETS FOR ADDITIONAL PAVEMENT AND GUARDRAIL RELATED DETAILS.

SEE SHEET 45 FOR SIGN LEGEND.

PAVEMENT MARKING LEGEND

(W)	WHITE EDGE LINE
(Y)	YELLOW EDGE LINE
(L)	LANE LINE
(C)	CHANNELIZING LINE
(S)	STOP LINE
(T)	TRANSVERSE LINE

FOR PAVEMENT MARKING QUANTITIES, SEE SHEET 36.

TE21-G990 (320)
END PROJECT
STA. 42+723.150
S.L.D. 42.723

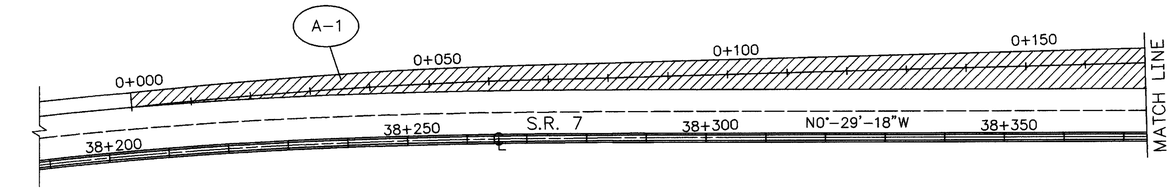
HORIZONTAL SCALE IN METERS
0 500 1000

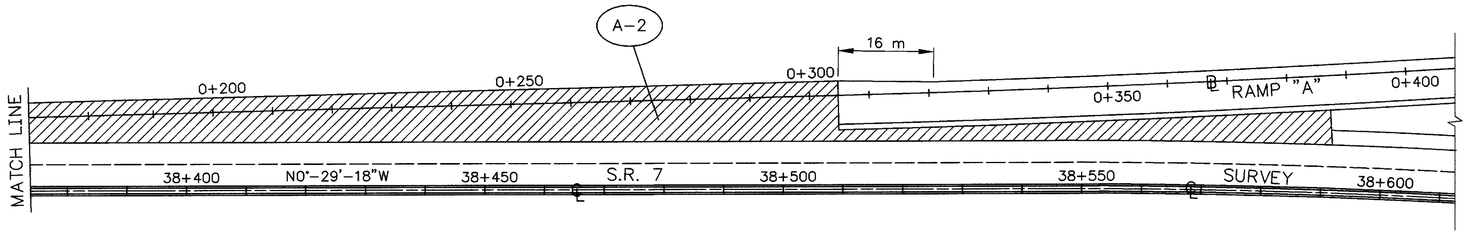
CALCULATED T.D.D.
CHECKED J.E.U.

ROADWAY PLAN
STA. 42+380.00 TO STA. 42+880.00

JEF-7-36.967

60
123





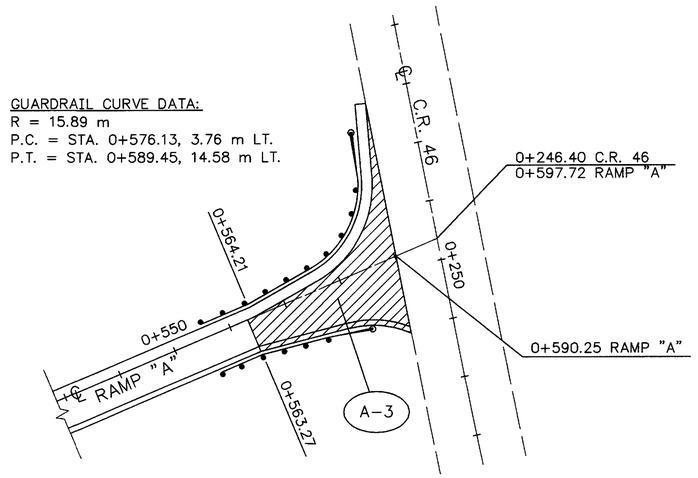
REFERENCE NO.	STATION FROM	STATION TO	AREAS TAKEN FROM CADD SQ. M.
A-1	0+000	0+170.00	781.26
A-2	0+170.00	0+304.80	1417.81
A-3	0+563.27	0+590.25	305.96
TOTAL			2505.03

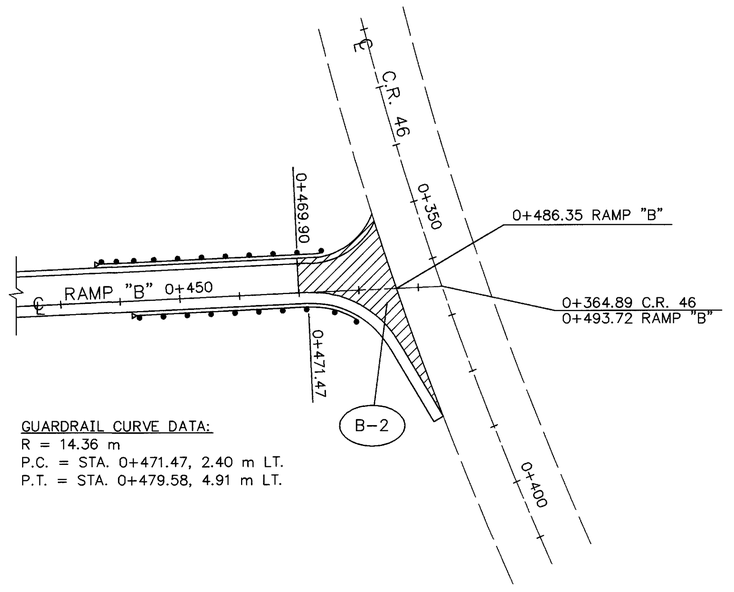
AREAS USED IN CALCULATIONS ON SHEET 40. (SEE P-5)

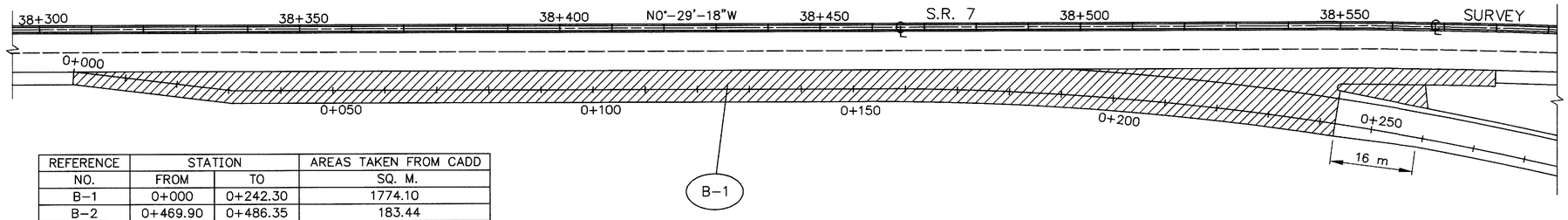
RAMP 'A'

CADD GENERATED AREAS

FOR FEATHER DETAILS, SEE SHEET NO. 65.







REFERENCE NO.	STATION FROM	STATION TO	AREAS TAKEN FROM CADD SQ. M.
B-1	0+000	0+242.30	1774.10
B-2	0+469.90	0+486.35	183.44
TOTAL			1957.54

AREAS USED IN CALCULATIONS ON SHEET 40. (SEE P-6)

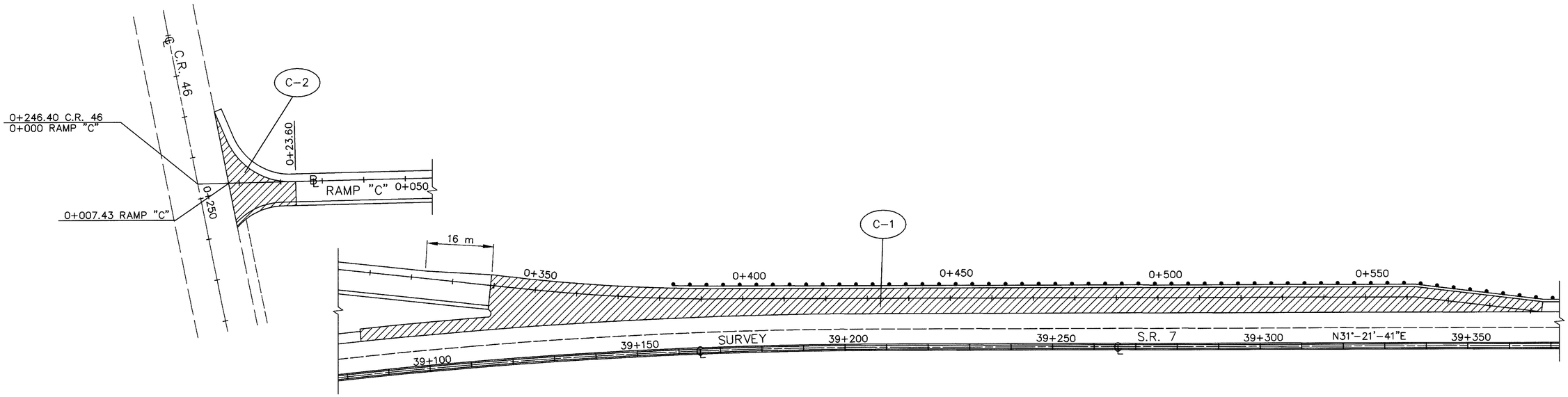
RAMP 'B'

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

PAVEMENT DETAILS

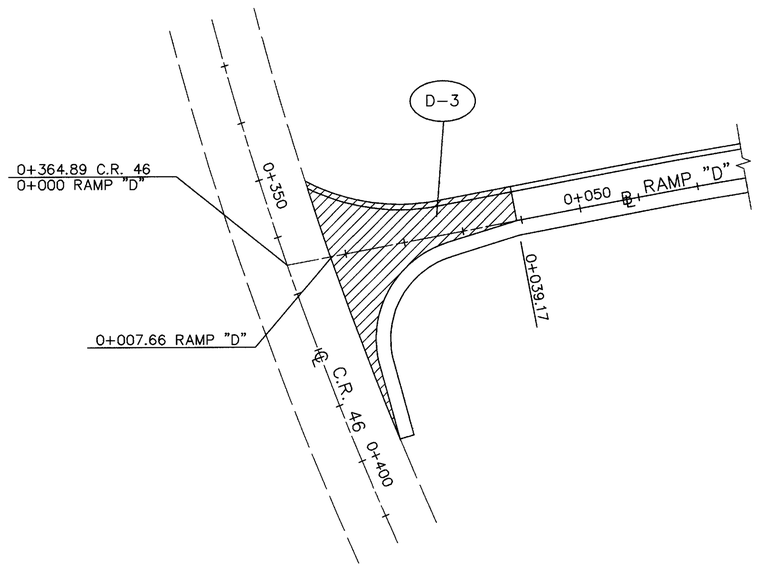
JEF-7-30.967



REFERENCE	STATION		AREAS TAKEN FROM CADD
	FROM	TO	SQ. M.
C-1	0+339.20	0+592.03	1754.46
C-2	0+007.43	0+023.60	165.74
TOTAL			1920.20

AREAS USED IN CALCULATIONS ON SHEET 40. (SEE P-13)

RAMP "C"

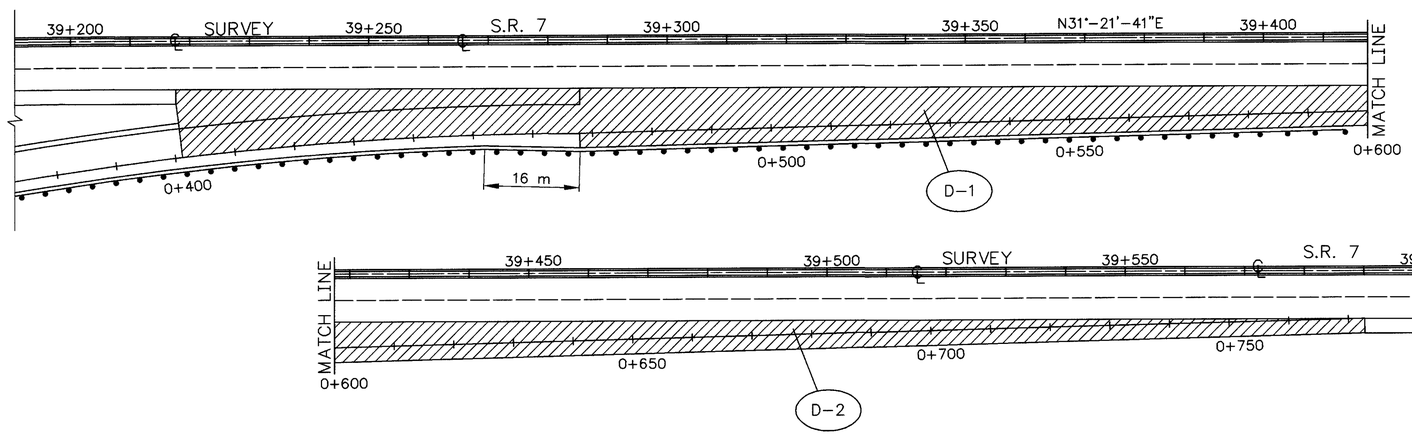


CADD GENERATED AREAS

FOR FEATHER DETAILS, SEE SHEET NO. 65.

REFERENCE	STATION		AREAS TAKEN FROM CADD
	FROM	TO	SQ. M.
D-1	0+401.17	0+600	1707.80
D-2	0+600	0+772.75	793.09
D-3	0+007.66	0+039.17	389.69
TOTAL			2890.58

AREAS USED IN CALCULATIONS ON SHEET 40. (SEE P-12)



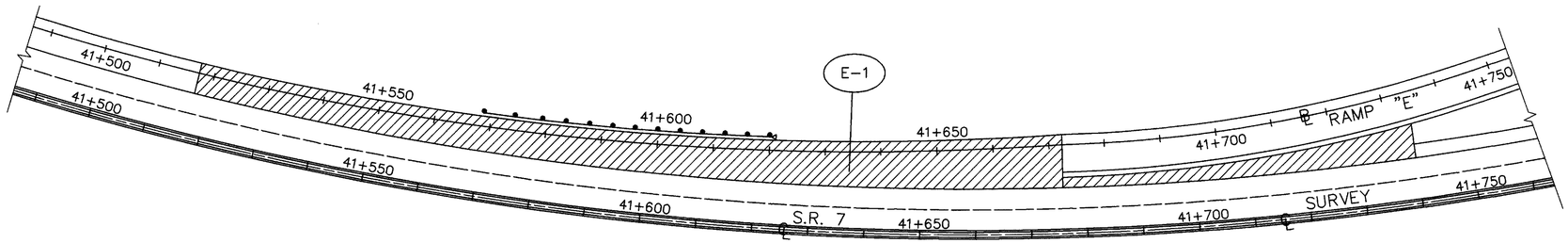
RAMP "D"

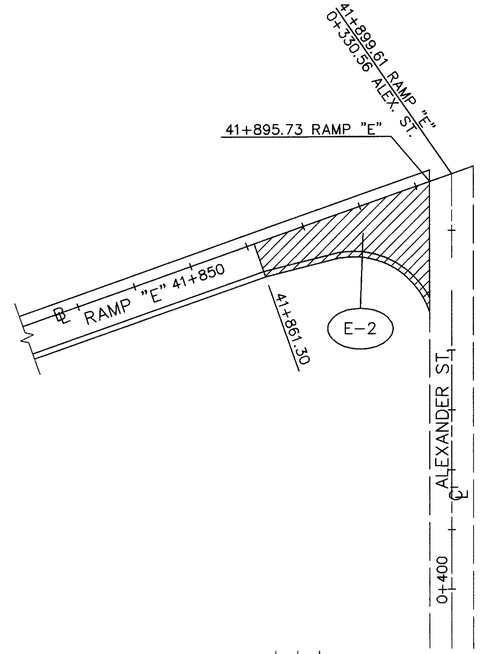
HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

PAVEMENT DETAILS

JEF-7-36.007





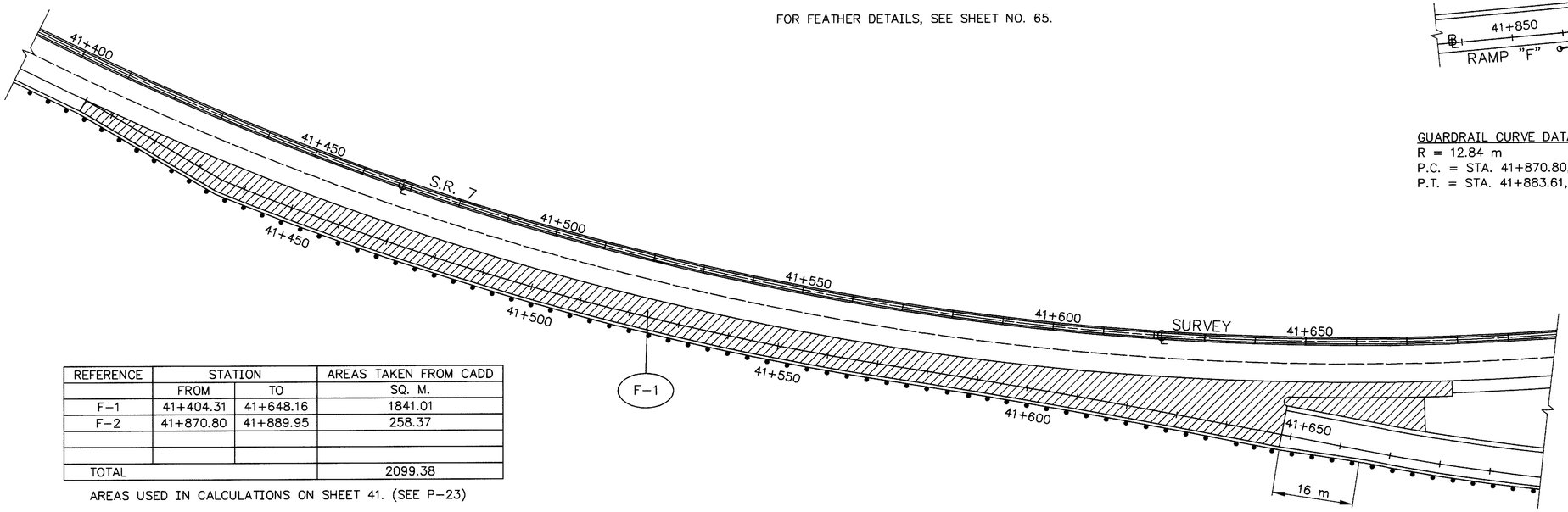
REFERENCE	STATION		AREAS TAKEN FROM CADD
	FROM	TO	SQ. M.
E-1	41+517.30	41+672.35	1297.31
E-2	41+861.30	41+895.73	270.02
TOTAL			1567.33

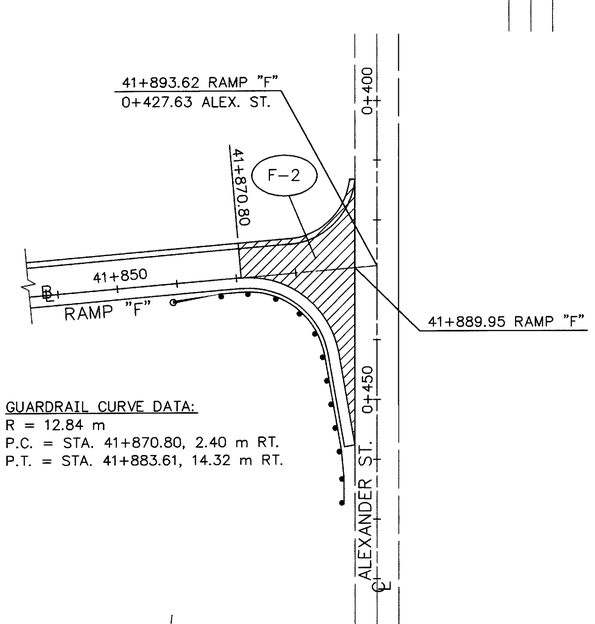
AREAS USED IN CALCULATIONS ON SHEET 41. (SEE P-24)

RAMP "E"

CADD GENERATED AREAS

FOR FEATHER DETAILS, SEE SHEET NO. 65.





GUARDRAIL CURVE DATA:
R = 12.84 m
P.C. = STA. 41+870.80, 2.40 m RT.
P.T. = STA. 41+883.61, 14.32 m RT.

REFERENCE	STATION		AREAS TAKEN FROM CADD
	FROM	TO	SQ. M.
F-1	41+404.31	41+648.16	1841.01
F-2	41+870.80	41+889.95	258.37
TOTAL			2099.38

AREAS USED IN CALCULATIONS ON SHEET 41. (SEE P-23)

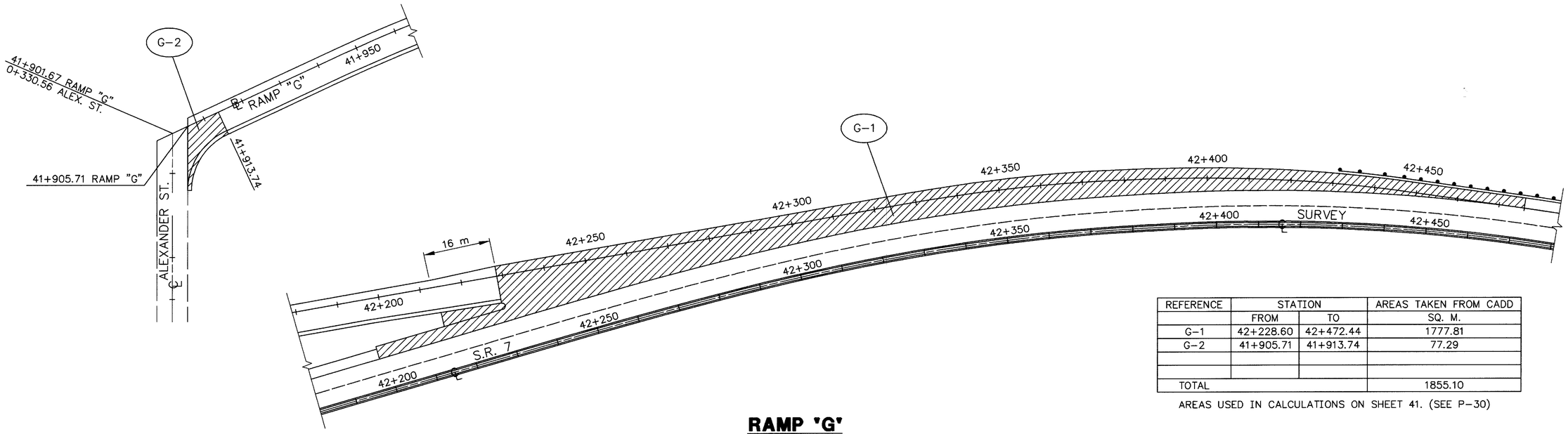
RAMP "F"

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

PAVEMENT DETAILS

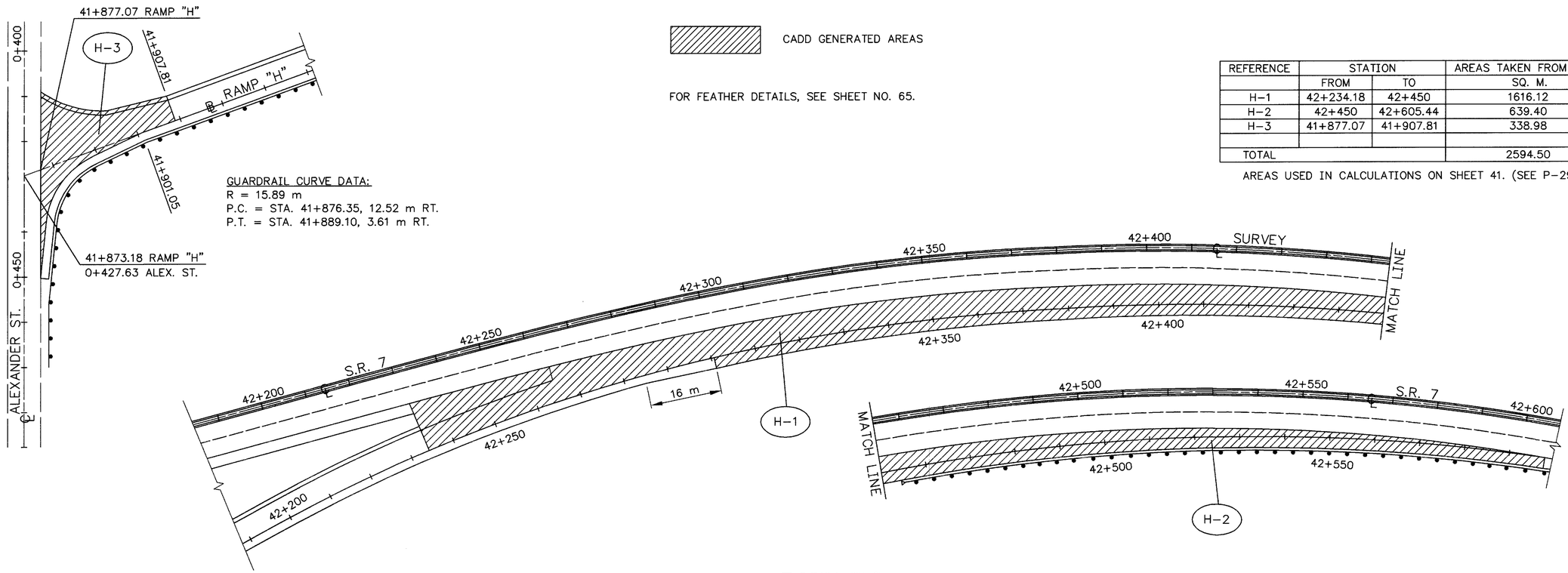
JEF-7-36.907



REFERENCE	STATION		AREAS TAKEN FROM CADD
	FROM	TO	SQ. M.
G-1	42+228.60	42+472.44	1777.81
G-2	41+905.71	41+913.74	77.29
TOTAL			1855.10

AREAS USED IN CALCULATIONS ON SHEET 41. (SEE P-30)

RAMP "G"



REFERENCE	STATION		AREAS TAKEN FROM CADD
	FROM	TO	SQ. M.
H-1	42+234.18	42+450	1616.12
H-2	42+450	42+605.44	639.40
H-3	41+877.07	41+907.81	338.98
TOTAL			2594.50

AREAS USED IN CALCULATIONS ON SHEET 41. (SEE P-29)

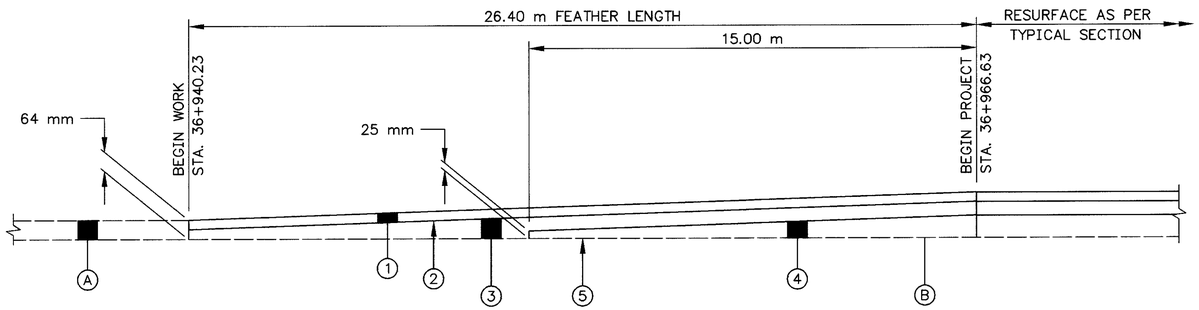
RAMP "H"

HORIZONTAL SCALE IN METERS
0 500 1000

CALCULATED T.D.D.
CHECKED J.E.U.

PAVEMENT DETAILS

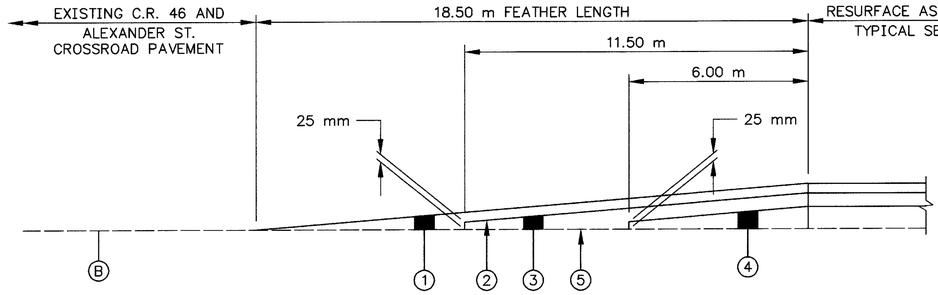
JEF-7-36.907



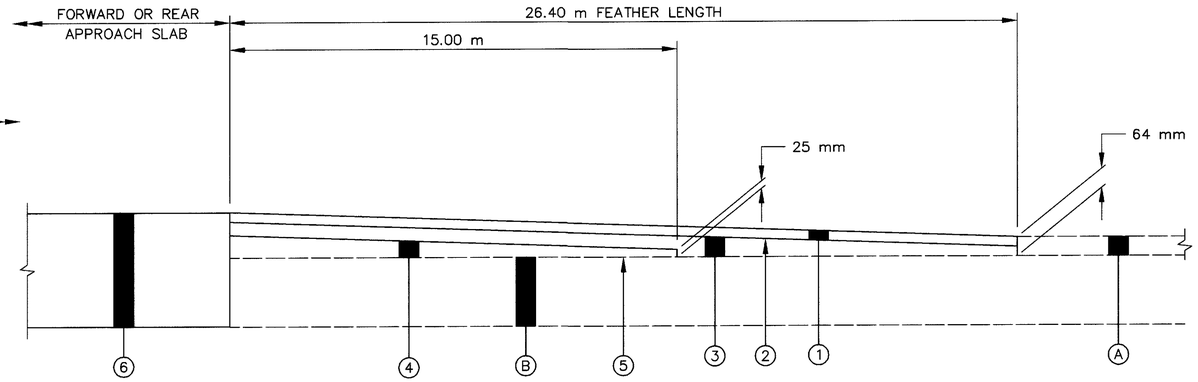
PAVEMENT TRANSITION AT BEGIN PROJECT

LEGEND

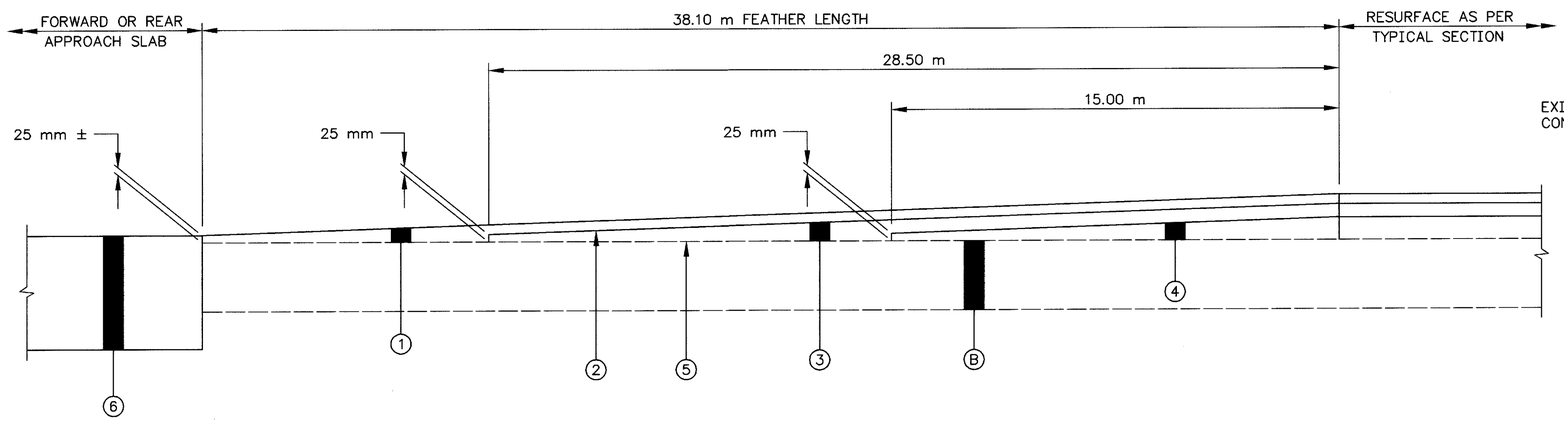
1	ITEM 446 32 mm ASPHALT CONCRETE SURFACE COURSE, TYPE 1H , AS PER PLAN
2	ITEM 407 TACK COAT FOR INTERMEDIATE COURSE
3	ITEM 446 45 mm ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG 64-28
4	ITEM 301 75 mm BITUMINOUS AGGREGATE BASE, AC-20
5	ITEM 407 TACK COAT
6	ITEM 611 REINFORCED CONCRETE APPROACH SLAB, (T=380 mm), AS PER PLAN
A	EXISTING ASPHALT CONCRETE
B	EXISTING CONCRETE PAVEMENT



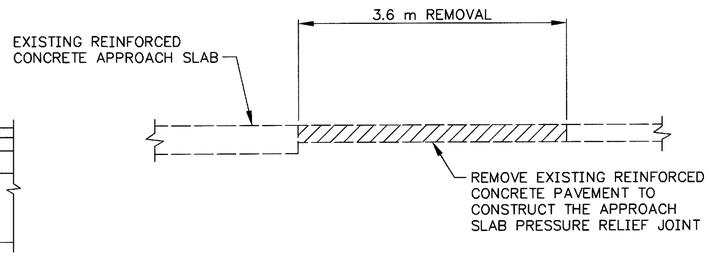
PAVEMENT TRANSITION AT RAMP INTERSECTIONS



PAVEMENT TRANSITION AT BRIDGE NO. 42630



PAVEMENT TRANSITION AT BRIDGE NO. 38769, 40478, AND 41877



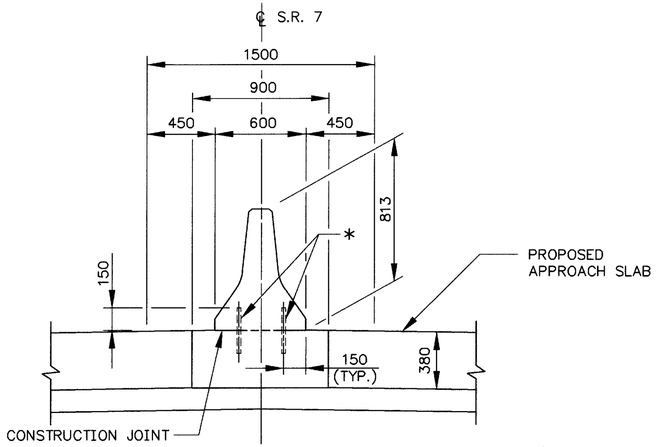
PAVEMENT REMOVAL AT BRIDGE JEF-7-41877

SEE O.D.O.T. STANDARD CONSTRUCTION DRAWING IRJ-8-95M
FOR APPROACH SLAB PRESSURE RELIEF JOINT DETAILS.

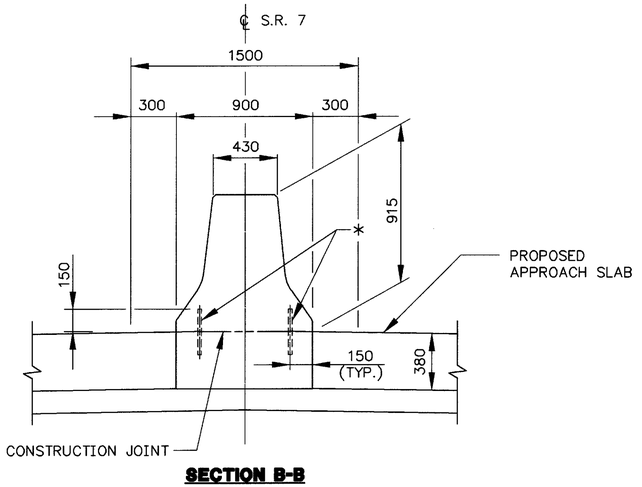
CALCULATED T.D.D.
CHECKED J.E.U.

PAVEMENT TRANSITION AND FEATHER DETAILS - PAVEMENT REMOVAL DETAILS

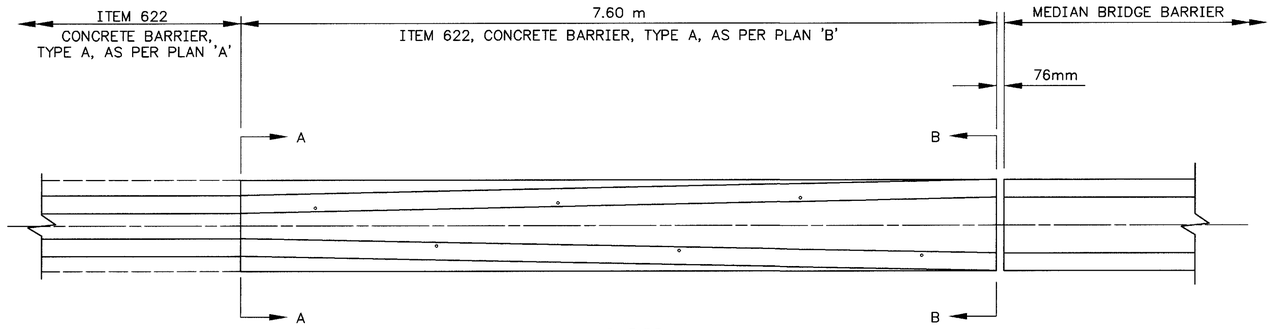
JEF-7-36.967



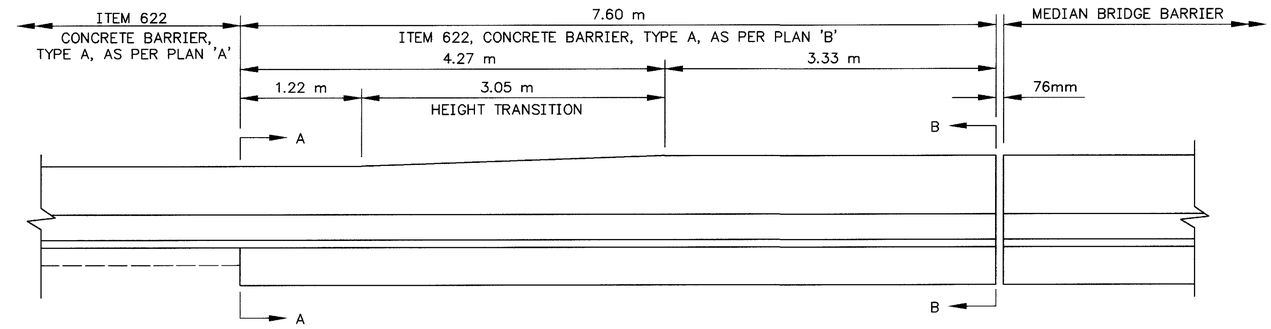
SECTION A-A



SECTION B-B



PLAN



ELEVATION

ELEVATION
TRANSITIONS AT BRIDGES

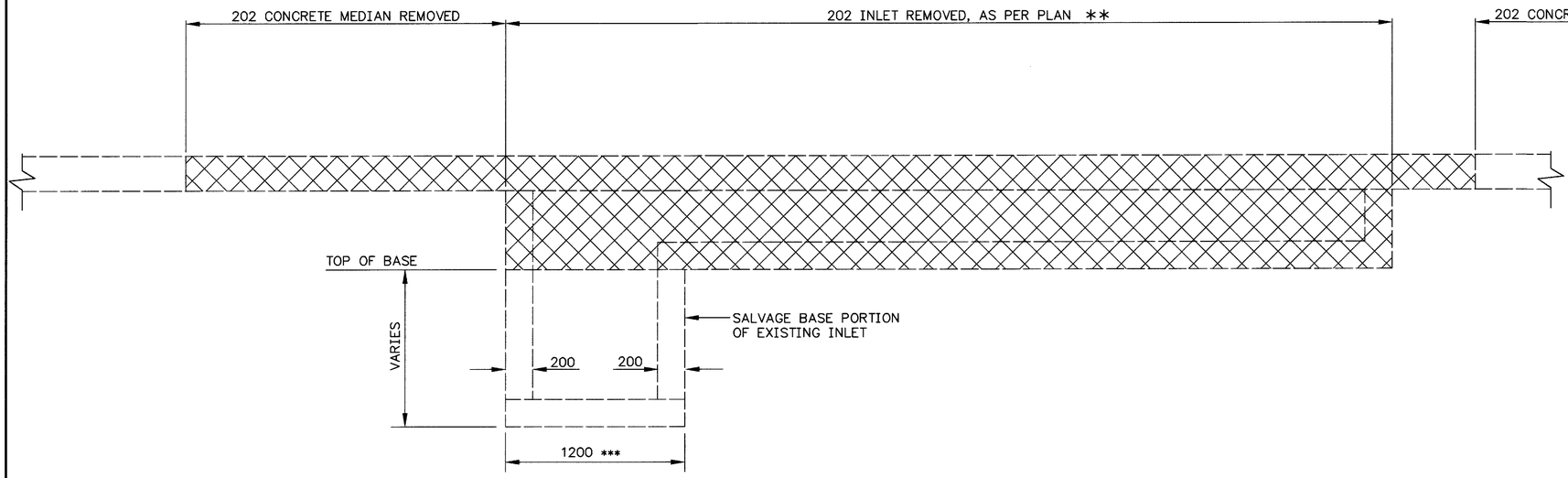
* NO. 25M EPOXY COATED DEFORMED STEEL BARS, 305 mm LONG, SPACED 1.22 m BETWEEN SUCCESSIVE BARS ON A STAGGERED PATTERN, GROUTED INTO DRILLED HOLES.

NOTE: MEDIAN BRIDGE BARRIER IS SKEWED AT BRIDGE NO'S. JEF-7-38769, JEF-7-40478, JEF-7-41877, AND JEF-7-42630. FOR DETAILS SEE SHEET NO'S. 69 THRU 123.

CALCULATED T.D.D.
CHECKED J.E.U.

CONCRETE BARRIER, TYPE A, AS PER PLAN 'B' DETAILS

JEF-7-30.967



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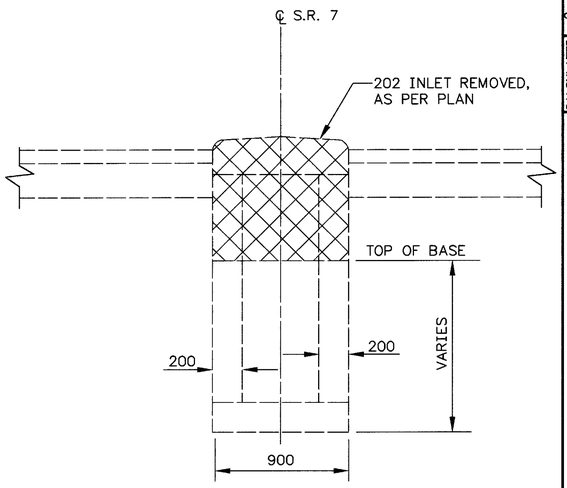

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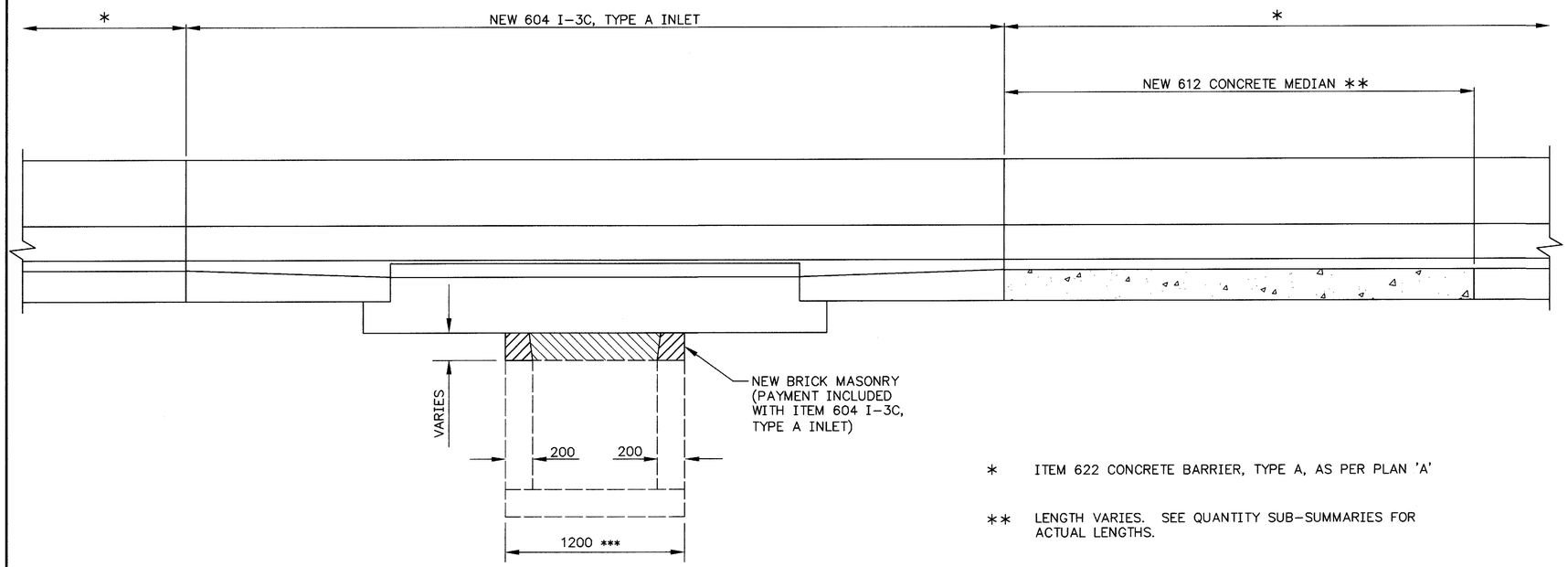
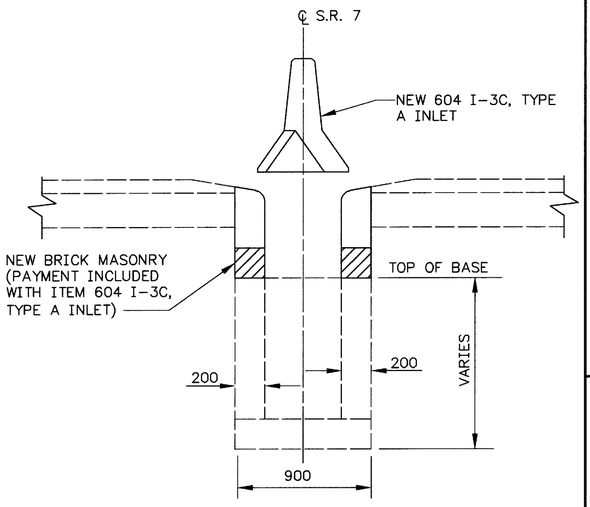


PROPOSED

* ITEM 622 CONCRETE BARRIER, TYPE A, AS PER PLAN 'A'

** LENGTH VARIES. SEE QUANTITY SUB-SUMMARIES FOR ACTUAL LENGTHS.

*** 1780 AT STA. 41+591.68



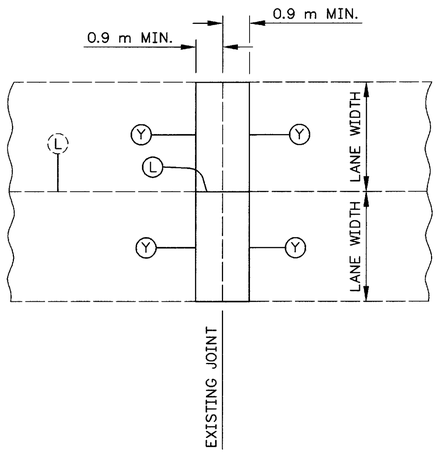
PROPOSED

HORIZONTAL SCALE IN METERS
0 500 1000

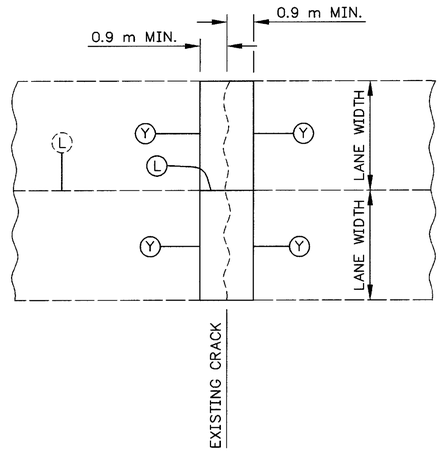
CALCULATED T.D.D.
CHECKED J.E.U.

MEDIAN INLET DETAILS

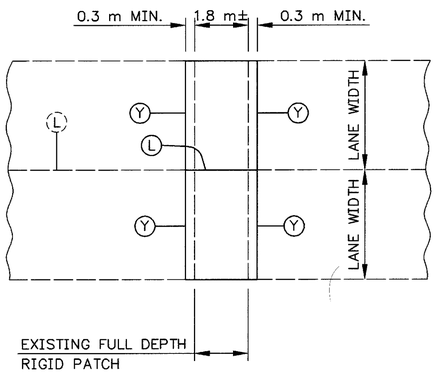
JEF-7-36.907



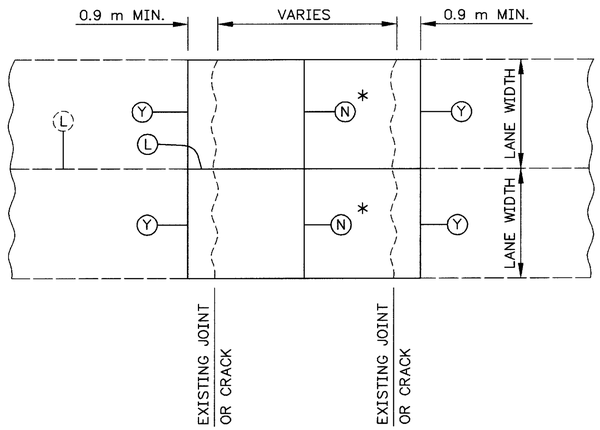
TYPICAL JOINT REPAIR



TYPICAL CRACK REPAIR



TYPICAL PATCH REPAIR



TYPICAL EXPANDED REPAIR

JOINT TYPE LEGEND	
(Y)	TYPE Y – CONTRACTION
(N)	TYPE N – CONTRACTION
(L)	LONGITUDINAL JOINT
(L)	EXISTING LONGITUDINAL JOINT

FOR ADDITIONAL DETAILS AND NOTES, SEE STANDARD DRAWING BP–2.5M.

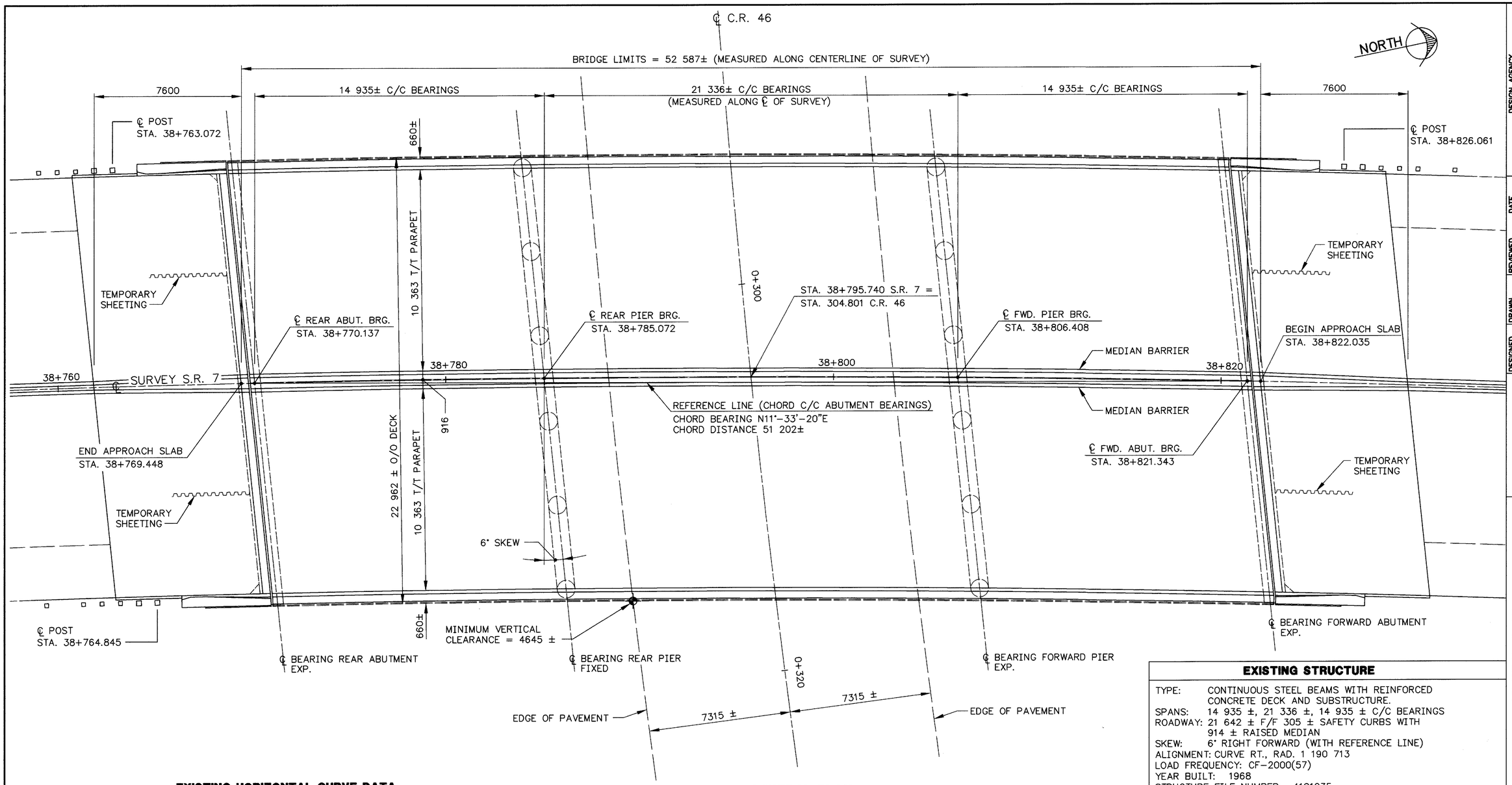
FOR QUANTITIES SEE SHEET NO. 11.

* WHEN THE (Y) JOINT SPACING IS BETWEEN 6.7 m AND 12.8 m, THEN AN ADDITIONAL (N) JOINT SHALL BE PLACED AT THE MID–POINT. WHEN THE (Y) JOINT SPACING EXCEEDS 12.8 m, THEN (N) JOINTS WITH A MINIMUM SPACING OF 3.4 m AND A MAXIMUM SPACING OF 6.4 m SHALL BE EQUALLY SPACED BETWEEN THE (Y) JOINTS.

CALCULATED T.D.D.
CHECKED J.E.U.

TYPICAL PAVEMENT REPAIR DETAILS

JEF-7-30.967



EXISTING HORIZONTAL CURVE DATA

℄ SURVEY

P.I. = STA. 38+885.187
Δ = 31°-50'-59" RT.
T = 339 743
L = 661 896
E = 47 521
R = 1 190 713

GENERAL PLAN

ALL DIMENSIONS ARE IN MILLIMETERS
EXCEPT STATIONS AND ELEVATIONS
WHICH ARE IN METERS.

EXISTING STRUCTURE

TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE.
SPANS: 14 935 ±, 21 336 ±, 14 935 ± C/C BEARINGS
ROADWAY: 21 642 ± F/F 305 ± SAFETY CURBS WITH 914 ± RAISED MEDIAN
SKEW: 6° RIGHT FORWARD (WITH REFERENCE LINE)
ALIGNMENT: CURVE RT., RAD. 1 190 713
LOAD FREQUENCY: CF-2000(57)
YEAR BUILT: 1968
STRUCTURE FILE NUMBER: 4101235
APPROACH SLABS: AS-1-54 MODIFIED, 7620 ± LONG
WEARING SURFACE: 32 mm ± LATEX MODIFIED CONCRETE OVERLAY
SUPERELEVATION: 0.036

PROPOSED STRUCTURE

PROPOSED WORK:
NEW 32 mm MICRO-SILICA CONCRETE OVERLAY
NEW DEFLECTOR PARAPETS AND MEDIAN BARRIER
NEW BACKWALLS WITH SEALED JOINTS
NEW APPROACH SLABS AS-1-81M MODIFIED, 7600 mm LONG
TYPE: 32 mm OVERLAY OVER EXISTING CONTINUOUS STEEL BEAMS, REINFORCED CONCRETE DECK AND SUBSTRUCTURE
SPANS: 14 935 ±, 21 336 ±, 14 935 ± C/C BEARINGS
ROADWAY: 21 642 T/T PARAPETS WITH 916 MEDIAN BARRIER
SKEW: 6° RIGHT FORWARD (WITH REFERENCE LINE)
ALIGNMENT: CURVE RT., RAD. 1 190 713
LOAD FREQUENCY: CF-2000(57)
APPROACH SLABS: 7600 (AS-1-81M)
WEARING SURFACE: 32 mm MICRO-SILICA CONCRETE OVERLAY
SUPERELEVATION: 0.036

AVG. DAILY TRAFFIC: (1995) 7180
(2015) 9350 ADTT 2338

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED T.D.D.
DRAWN T.D.D.
CHECKED J.E.U.
REVIEWED L.D.S.
DATE 5-97
REVISED
STRUCTURE FILE NUMBER 4101235

JEFFERSON COUNTY
STA. 38+769.448
STA. 38+822.035

GENERAL PLAN
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

AS-1-81M	DATED	10/25/94
BR-1M	DATED	~~12/15/94~~ 1/6/99
EXJ-4-87M	DATED	3/20/95
PCB-91M	DATED	3/20/95

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05 AND 105.02.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

ITEM 202 – PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

DESCRIPTION:
THIS WORK SHALL INCLUDE THE ELEMENTS INDICATED IN THE PLANS AND GENERAL NOTES AND ARE NOT SEPARATELY LISTED FOR PAYMENT, EXCEPT FOR WEARING COURSE REMOVAL. ITEMS TO BE REMOVED INCLUDE ALL EXISTING MATERIALS BEING REPLACED BY NEW CONSTRUCTION AND MISCELLANEOUS ITEMS THAT ARE NOT SHOWN TO BE INCORPORATED INTO THE FINAL CONSTRUCTION AND ARE DIRECTED TO BE REMOVED BY THE ENGINEER. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE-RAMS WILL NOT BE PERMITTED. THE METHOD OF REMOVAL AND THE WEIGHT OF HAMMER SHALL BE APPROVED BY THE ENGINEER. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT CUT, ELONGATE OR DAMAGE THE EXISTING REINFORCING STEEL TO BE PRESERVED. CHIPPING HAMMERS SHALL NOT BE HEAVIER THAN THE NOMINAL 41 KILOGRAM CLASS. PNEUMATIC HAMMERS SHALL NOT BE PLACED IN DIRECT CONTACT WITH REINFORCING STEEL THAT IS TO BE RETAINED IN THE REBUILT STRUCTURE.

CUT LINE CONSTRUCTION JOINT PREPARATION:
SAW CUT BOUNDARIES OF PROPOSED CONCRETE REMOVALS 25 mm DEEP. REMOVE CONCRETE TO A ROUGH SURFACE. WHERE PRACTICABLE, THE EXISTING REINFORCING STEEL WHERE REQUIRED IN THE PLANS SHALL BE LEFT IN PLACE. INSTALL DOWEL BARS IF SPECIFIED. PRIOR TO CONCRETE PLACEMENT, ABRASIVELY CLEAN JOINT SURFACE AND EXPOSED REINFORCEMENT TO REMOVE LOOSE AND DISINTEGRATED CONCRETE AND LOOSE RUST. THE JOINT SURFACE AND EXPOSED REINFORCEMENT SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST, OR OTHER FOREIGN MATERIAL BY THE USE OF WATER, AIR UNDER PRESSURE, OR OTHER METHODS THAT PRODUCE SATISFACTORY RESULTS. CONCRETE BONDING SURFACES SHALL BE WET WITHOUT FREE WATER AS CONCRETE IS PLACED.

PROTECTION OF TRAFFIC:
PRIOR TO DEMOLITION OF ANY PORTIONS OF THE EXISTING SUPERSTRUCTURE, THE CONTRACTOR SHALL SUBMIT PLANS FOR THE PROTECTION OF TRAFFIC ADJACENT TO AND/OR UNDER THE STRUCTURE TO THE DIRECTOR FOR APPROVAL. THESE PLANS SHALL INCLUDE PROVISIONS FOR ANY DEVICES AND STRUCTURES THAT MAY BE NECESSARY TO ENSURE SUCH PROTECTION. TEMPORARY VERTICAL CLEARANCES SPECIFIED ON THE PLANS OR IN THE PROPOSAL SHALL BE MAINTAINED AT ALL TIMES EXCEPT AS OTHERWISE APPROVED BY THE DIRECTOR.

PAYMENT:
THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN CONFORMANCE WITH THESE REQUIREMENTS, WITH PERTINENT PROVISIONS OF 202, AND TO THE SATISFACTION OF THE ENGINEER.

ITEM 503– UNCLASSIFIED EXCAVATION

THIS ITEM SHALL COVER THE NECESSARY EXCAVATION AROUND THE ABUTMENTS AND WINGWALLS DURING THE RECONSTRUCTION OF BRIDGE NO. JEF-7-38769.

CONCRETE PARAPETS

AS SOON AS A CONCRETE SAW CAN BE OPERATED WITHOUT DAMAGING THE FRESHLY PLACED CONCRETE, 25 mm DEEP CONTROL JOINTS SHALL BE SAWED INTO THE PERIMETER OF THE CONCRETE PARAPET.

RAILING FACED, AS PER PLAN:
THE SAW CUT SHALL BE MADE IN THE COMPLETE PERIMETER OF THE NEW PARAPET. THE CONTROL JOINT SAW CUTS SHALL BE PLACED IN THE NEW CONCRETE AT THE SAME LOCATION AS THE EXISTING DEFLECTION JOINTS AND SHALL BE MADE AT RIGHT ANGLES TO THE DECK BY SAWING TO MATCH THE ALIGNMENT OF EXISTING DEFLECTION JOINTS.

MEDIAN PARAPETS:
THE SAW CUT SHALL BE MADE IN THE ROADWAY AND TOP FACES OF THE PARAPET. THE CONTROL JOINT SAW CUTS SHALL BE PLACED IN THE NEW CONCRETE AT THE LOCATION AS SHOWN ON THE DRAWINGS AND SHALL BE MADE AT RIGHT ANGLES TO THE DECK BY SAWING.

THE USE OF AN EDGE GUIDE, FENCE OR JIG IS REQUIRED TO INSURE THAT THE CUT IS STRAIGHT, TRUE AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 6 mm. THE PERIMETER OF THE DEFLECTION CONTROL JOINT SHALL BE SEALED WITH A CAULKING MATERIAL CONFORMING TO FEDERAL SPECIFICATION, TT-S-00227E TO A MINIMUM DEPTH OF 25 mm.

ITEM 517– RAILING FACED, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FACING CURB STYLE PARAPETS, USING CAST IN PLACE CONCRETE, TO OBTAIN THE DEFLECTOR SHAPE AS SHOWN IN THE PLANS.

THE CONTRACTOR SHALL CAREFULLY REMOVE AND DISPOSE OF THE EXISTING ALUMINUM RAILING, PORTIONS OF THE CONCRETE SAFETY CURB AND ANY EXISTING REINFORCING STEEL THAT WILL INTERFERE WITH THE FACING SHALL BE REMOVED AS DIRECTED BY THE ENGINEER. SEE PLAN DETAILS FOR SPECIFIC REINFORCING STEEL REMOVAL.

25 mm DIAMETER HOLES, 150 mm DEEP (MIN.) SHALL BE DRILLED AT 300 mm C/C AS SHOWN ON THE DRAWING. THE HOLES SHALL BE THOROUGHLY CLEANED OF ALL DUST AND OTHER DELETERIOUS MATERIAL. REINFORCING STEEL SHALL BE INSTALLED USING EPOXY GROUT (CMS 705.20). ALL EXISTING REINFORCING STEEL BARS IN THE AREA OF THE DOWEL HOLE SHALL BE LOCATED WITH THE AID OF A REINFORCING STEEL BAR LOCATOR (PACHOMETER) PRIOR TO DRILLING THE HOLES. IF AN EXISTING BAR IS ENCOUNTERED AT THE SAME LOCATION AS A PROPOSED DOWEL HOLE, THE DOWEL HOLE SHALL BE MOVED TO EITHER SIDE OF THE EXISTING BAR. ALL REINFORCING STEEL, DOWEL HOLES AND GROUTING SHALL BE INCLUDED WITH ITEM 517 FOR PAYMENT.

ALL LOOSE AND UNSOUND CONCRETE IN THE AREA OF THE PARAPET TO BE FACED SHALL BE REMOVED. ALL REMAINING SOUND CONCRETE SHALL THEN BE SCABBLED OR REMOVED SO THAT THE MINIMUM THICKNESS FOR THE PROPOSED FACING SHALL BE 100 mm. ALL REINFORCING STEEL SHALL BE EPOXY COATED. CONCRETE COVER OVER ALL REINFORCING STEEL SHALL BE 50 mm. THE PARAPET SURFACE NEXT TO THE REFACING SHALL BE THOROUGHLY CLEANED BY ABRASIVE BLASTING FOLLOWED BY AN AIR BLAST. USE OF HAND TOOLS MAY BE NECESSARY TO REMOVE SCALE FROM ANY EXPOSED REINFORCING STEEL. THE SURFACE SHALL BE MADE FREE FROM SPALLS, LAITENCE, AND ALL TRACES OF FOREIGN MATERIAL. DETERGENT CLEANING SHALL PRECEDE BLAST CLEANING AS NECESSARY TO ENSURE REMOVAL OF CONTAMINANTS THAT ARE DETRIMENTAL TO ACHIEVING AN ADEQUATE BOND. THE CONCRETE SURFACES TO BE FACED SHALL BE THOROUGHLY DRENCHED WITH CLEAN WATER AND ALLOWED TO DRY TO A DAMP CONDITION JUST BEFORE PLACING THE CONCRETE.

MATERIALS SHALL BE:
CONCRETE: CLASS S AS PER ITEM 511
REINFORCING STEEL: GRADE 400, EPOXY COATED AS PER ITEM 509

THE QUANTITY SHALL BE THE ACTUAL LENGTH OF RAILING FACED AS MEASURED FROM END OF WINGWALL TO END OF WINGWALL. THIS ITEM SHALL INCLUDE THE FURNISHING OF ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THIS WORK. ALL COSTS OF REMOVAL, DOWEL HOLES, REINFORCING STEEL, CONCRETE AND SHRINKAGE CONTROL JOINTS COMPLETE AND IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR:

ITEM	UNIT	DESCRIPTION
517	METERS	RAILING FACED, AS PER PLAN

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	ABUTMENTS	SUPER-STRUCTURE	GENERAL
202	11201	LUMP		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN			LUMP
202	23500	1068	SQ. M.	WEARING COURSE REMOVED		1068	
503	11100	LUMP		COFFERDAMS, CRIBS AND SHEETING	LUMP		
503	21100	44	CU. M.	UNCLASSIFIED EXCAVATION	44		
842	34400	45	CU. M.	CLASS S CONCRETE, SUPERSTRUCTURE		45	
842	45700	58	CU. M.	CLASS C CONCRETE, ABUTMENTS	58		
SPECIAL	51267502	623	SQ. M.	SEALING OF CONCRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE)	175	448	
516	10000	52	METER	PREFORMED ELASTOMERIC COMPRESSION JOINT SEAL (705.11) (JEENE SEAL OR EQUAL)		52	
516	11210	43.5	METER	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL		43.5	
517	76201	103	METER	RAILING FACED, AS PER PLAN		103	
518	21200	36	CU. M.	POROUS BACKFILL WITH FILTER FABRIC	36		
SPECIAL	51922000	1068	SQ. M.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (32 mm THICK) (SEE PROPOSAL NOTE)		1068	
SPECIAL	51922100	10	CU. M.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (VARIABLE THICKNESS) (SEE PROPOSAL NOTE)		10	
SPECIAL	51922300	LUMP		TEST SLAB (SEE PROPOSAL NOTE)			LUMP

PROPOSED WORK

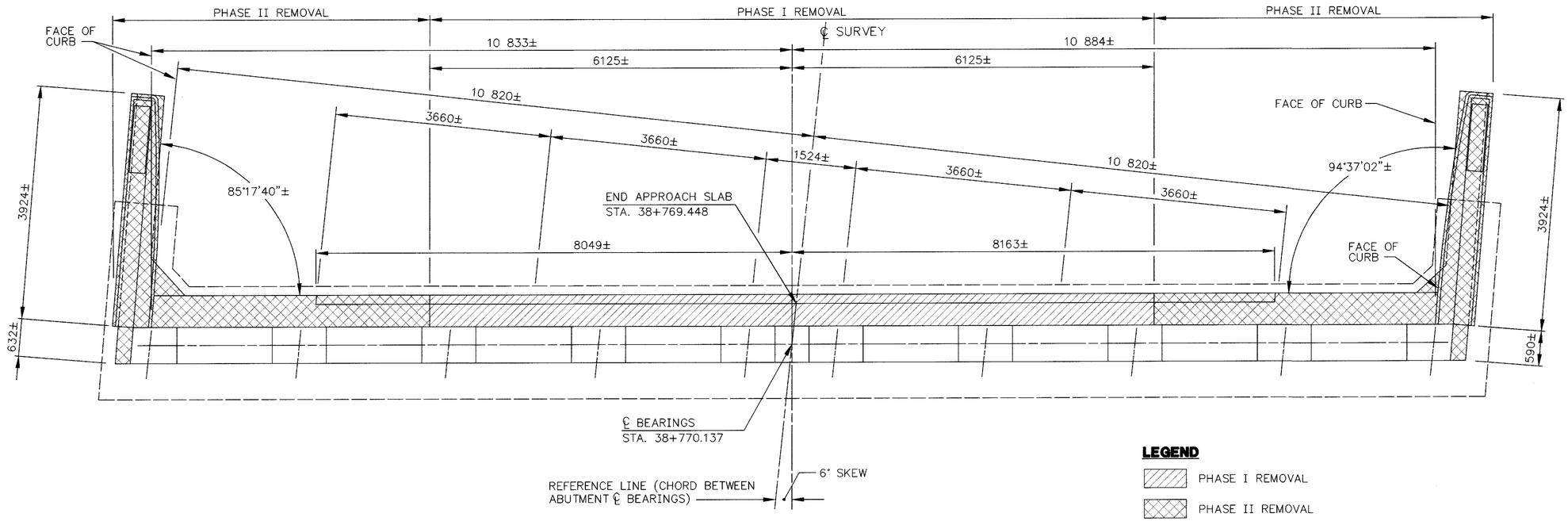
1. SET TRAFFIC CONTROL DEVICES FOR PHASED CONSTRCUTION.
2. REMOVE PHASE 1 (OR PHASE 2) PORTIONS OF EXISTING DECK, MEDIAN, WEARING SURFACES, GUARDRAIL BARRIER AND PORTIONS OF ABUTMENTS, PARAPETS AND APPROACH SLABS.
4. CONSTRUCT PHASE 1 (OR PHASE 2) MEDIAN BARRIERS AND PORTIONS OF PARAPETS, DECK AND ABUTMENTS.
5. INSTALL PHASE 1 (OR PHASE 2) MICRO-SILICA CONCRETE OVERLAY.
6. SEAL CONCRETE SURFACES AS NOTED ON THE PLANS.
7. AFTER THE PHASED WORK IS COMPLETE, OPEN THE STRUCTURE TO TRAFFIC.

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED T.D.D. | DRAWN T.D.D. | CHECKED J.E.U. | REVIEWED L.D.S. | DATE 5-97 | STRUCTURE FILE NUMBER 4101235 | REVISED

GENERAL NOTES AND SUMMARY
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967



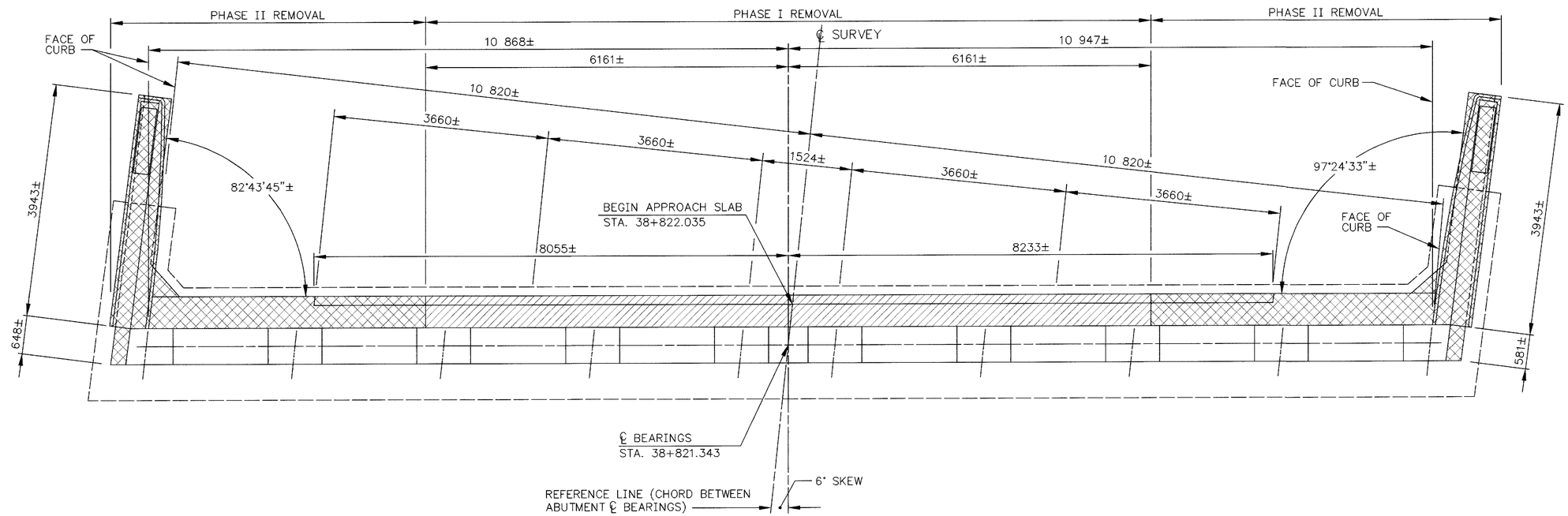
REAR ABUTMENT PLAN

LEGEND

PHASE I REMOVAL

PHASE II REMOVAL

SEE SHEET 4/13 FOR LIMITS OF CONCRETE AND REINFORCING STEEL REMOVAL.



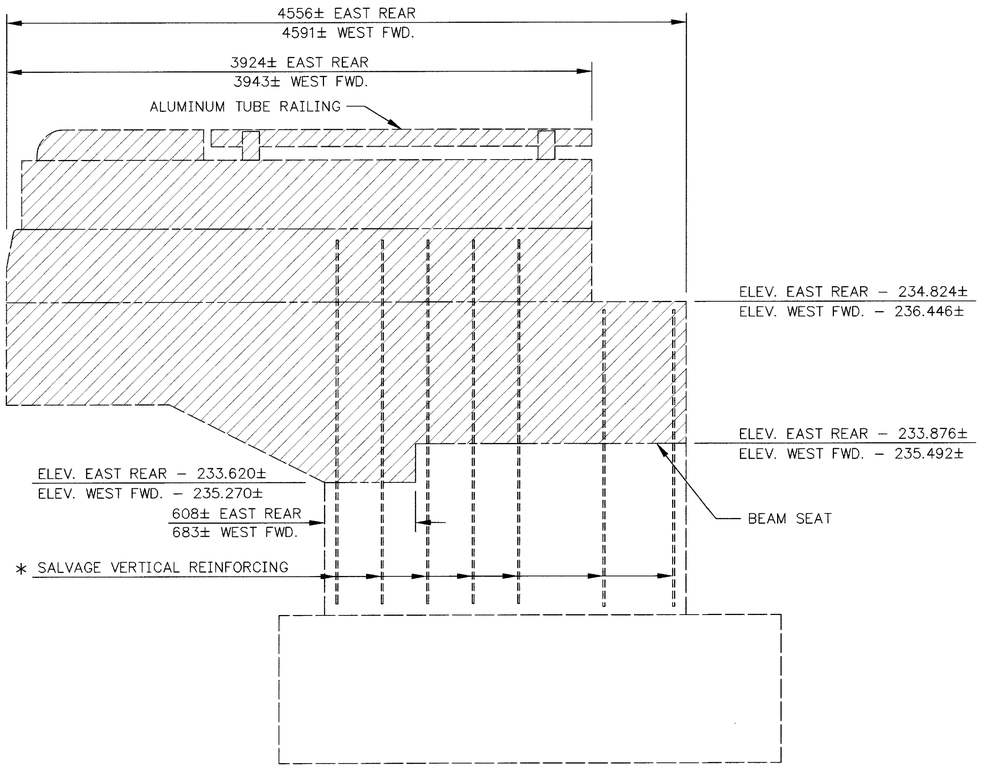
FORWARD ABUTMENT PLAN

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

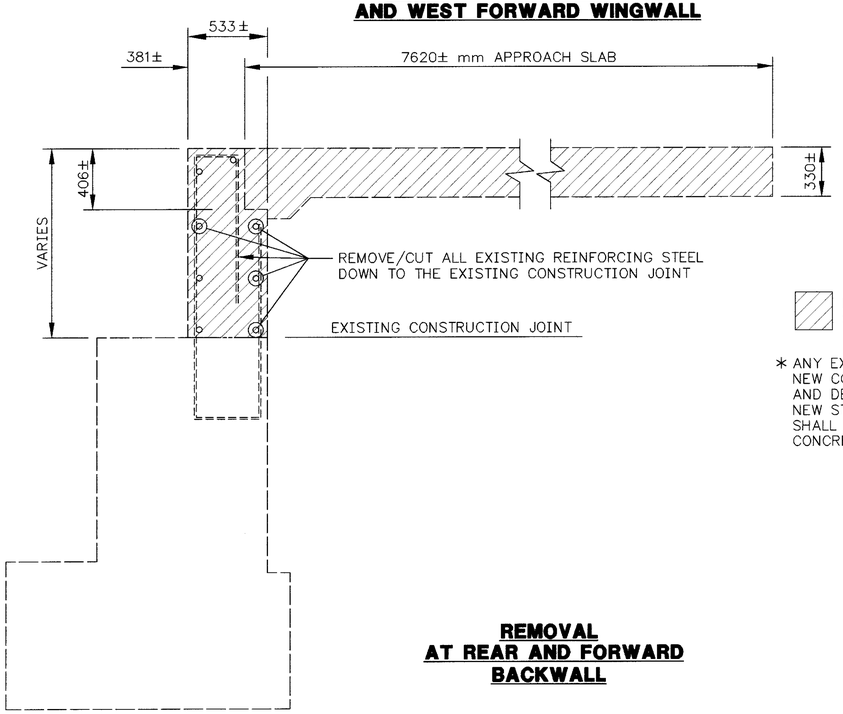
DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5-97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

ABUTMENT DEMOLITION PLAN
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967



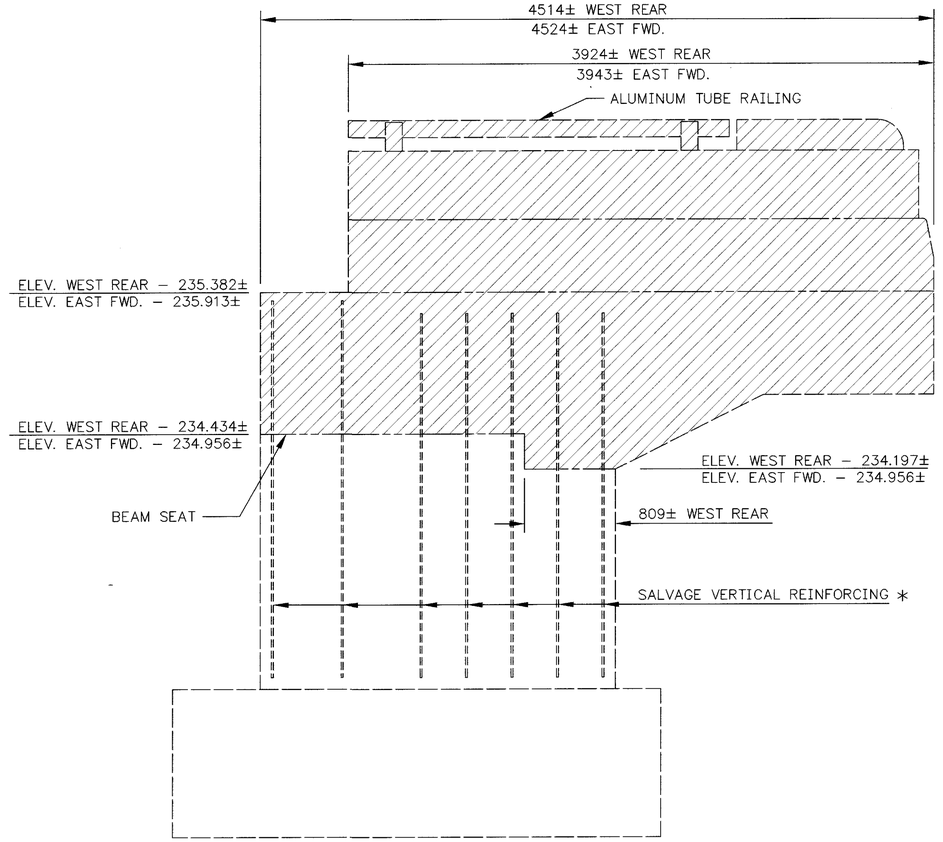
REMOVAL
AT EAST REAR WINGWALL
AND WEST FORWARD WINGWALL



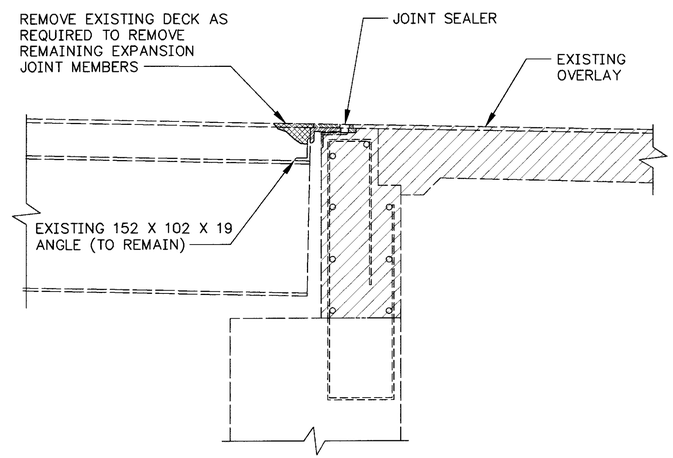
REMOVAL
AT REAR AND FORWARD
BACKWALL

REMOVE ALL CONCRETE AND REINFORCING STEEL UNLESS OTHERWISE NOTED.

* ANY EXISTING REINFORCING STEEL THAT IS TO BE REUSED IN THE NEW CONSTRUCTION, IS DAMAGED BY THE CONTRACTOR'S REMOVAL AND DEEMED UNUSABLE BY THE ENGINEER, SHALL BE REPLACED WITH NEW STEEL AT THE CONTRACTOR'S EXPENSE. NEW REINFORCEMENT STEEL SHALL BE 25M IN SIZE AND DOWELED 660 mm INTO THE EXISTING CONCRETE AS PER ITEM 510 – DOWEL HOLES.



REMOVAL
AT WEST REAR WINGWALL
AND EAST FORWARD WINGWALL



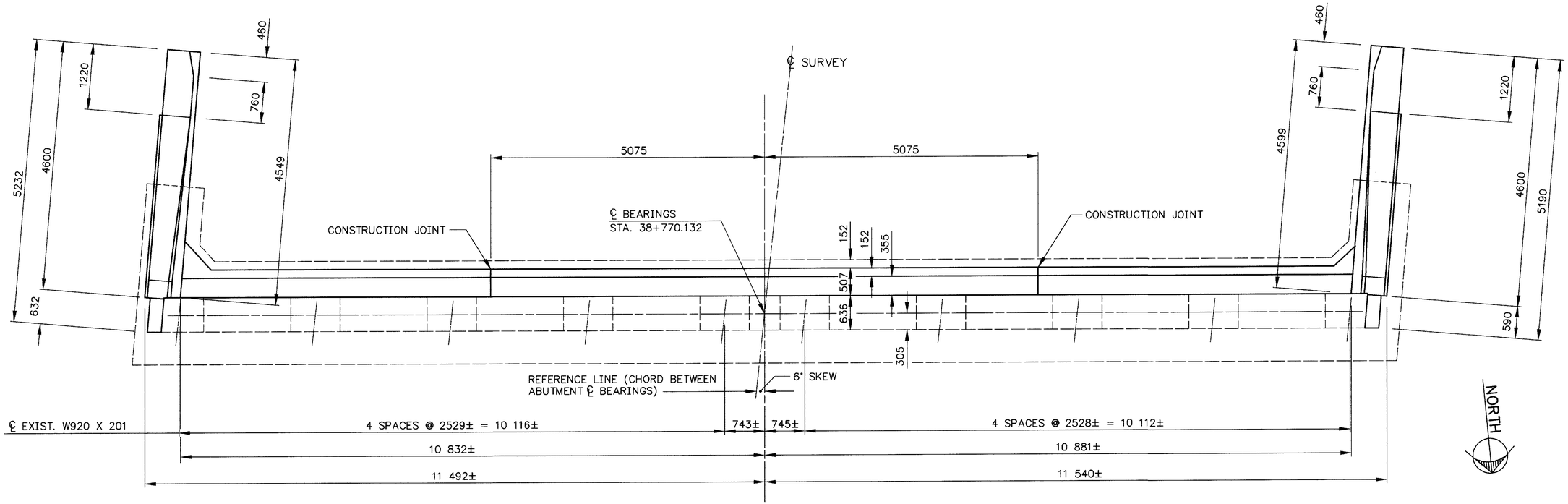
REMOVAL OF EXSITING EXPANSION JOINT

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

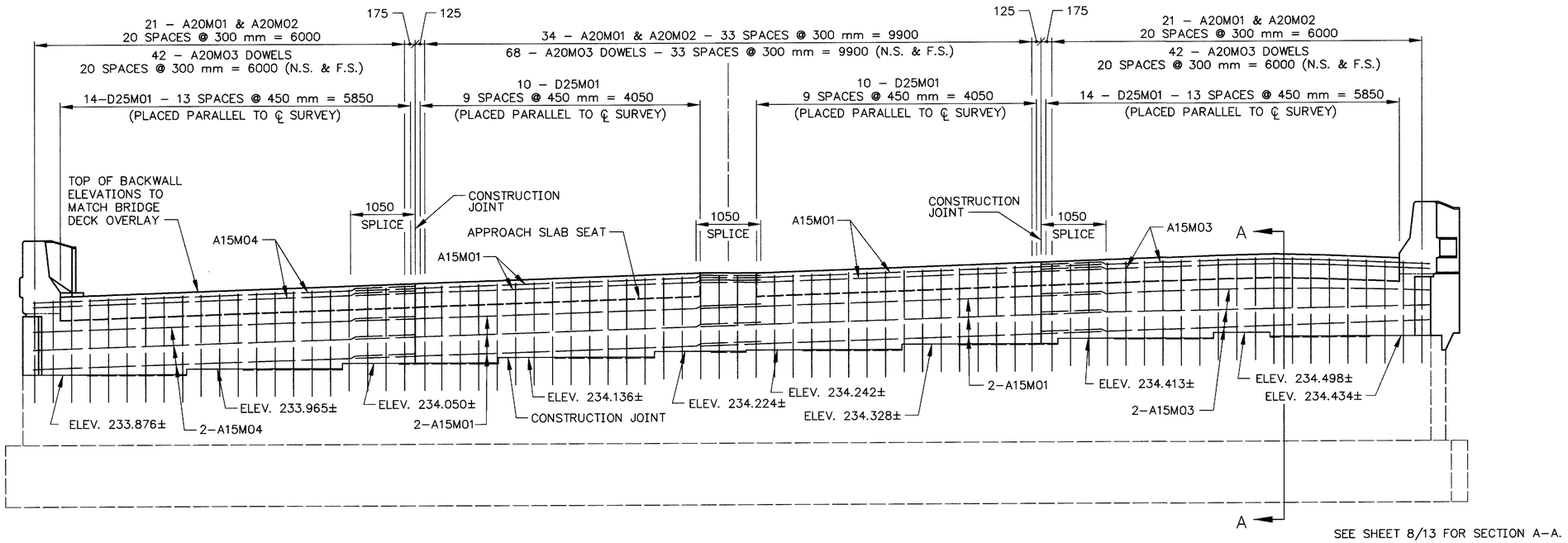
DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5-97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

ABUTMENT AND END FINISH DEMOLITION DETAILS
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967



REAR ABUTMENT PLAN



SEE SHEET 8/13 FOR SECTION A–A.

REAR ABUTMENT ELEVATION

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

REAR ABUTMENT PLAN AND ELEVATION
BRIDGE NO. JEF–7–38769
OVER C.R. 46

JEF–7–36.967

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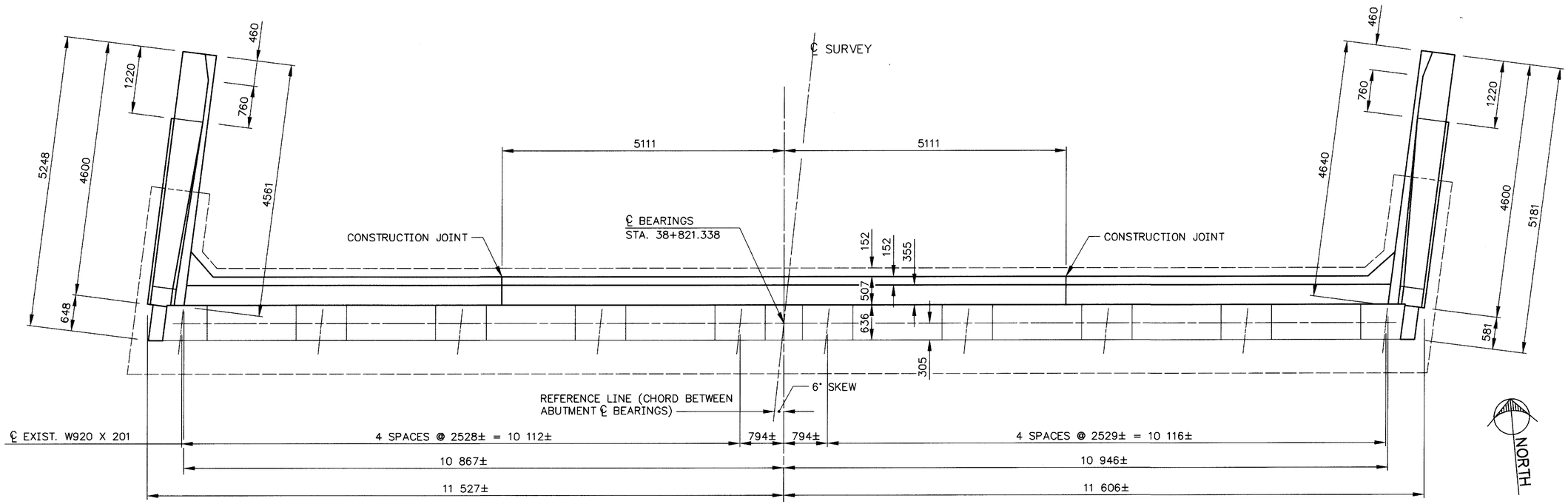
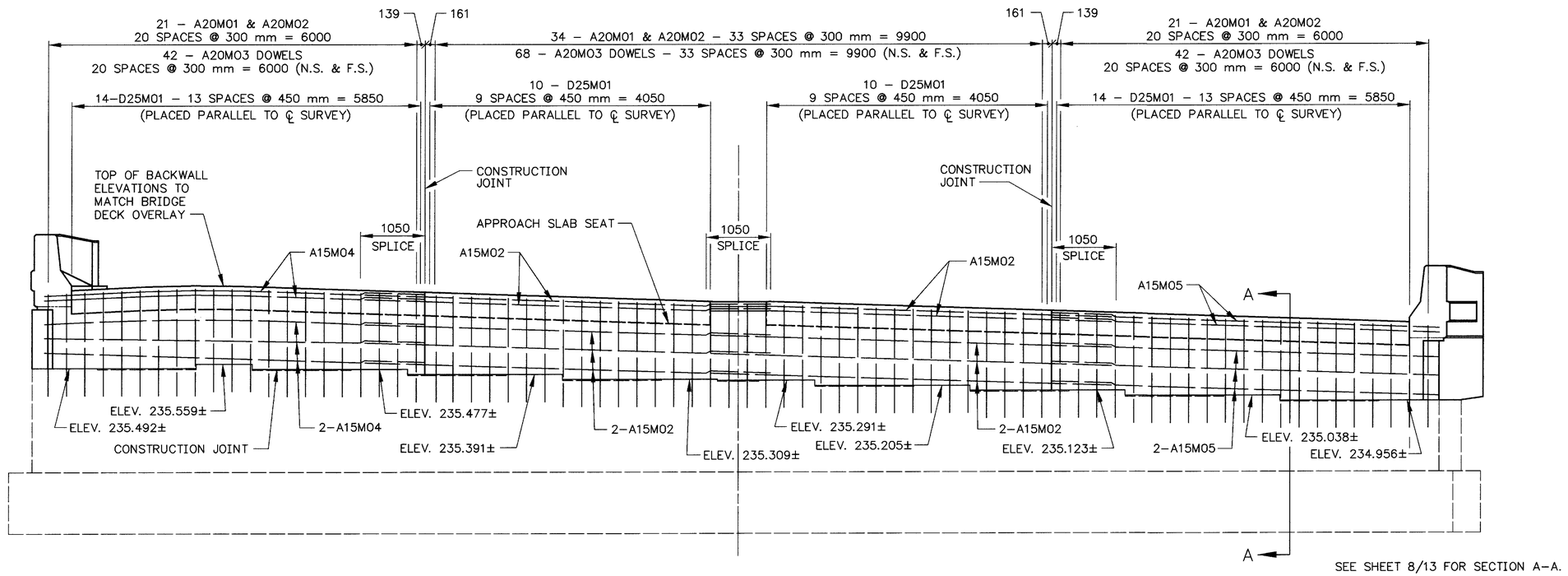


FORWARD ABUTMENT PLAN



SEE SHEET 8/13 FOR SECTION A–A.

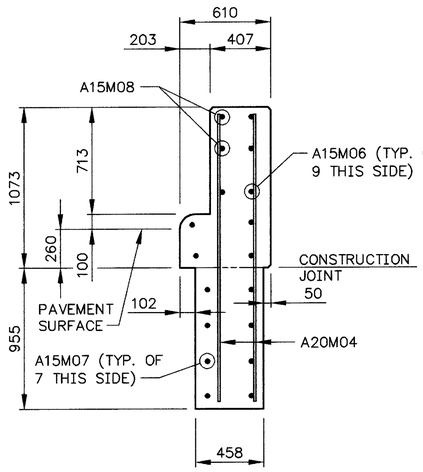
FORWARD ABUTMENT ELEVATION

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

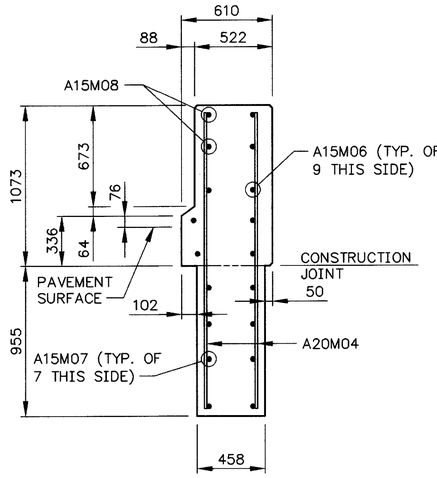
DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

FORWARD ABUTMENT PLAN AND ELEVATION
BRIDGE NO. JEF–7–38769
OVER C.R. 46

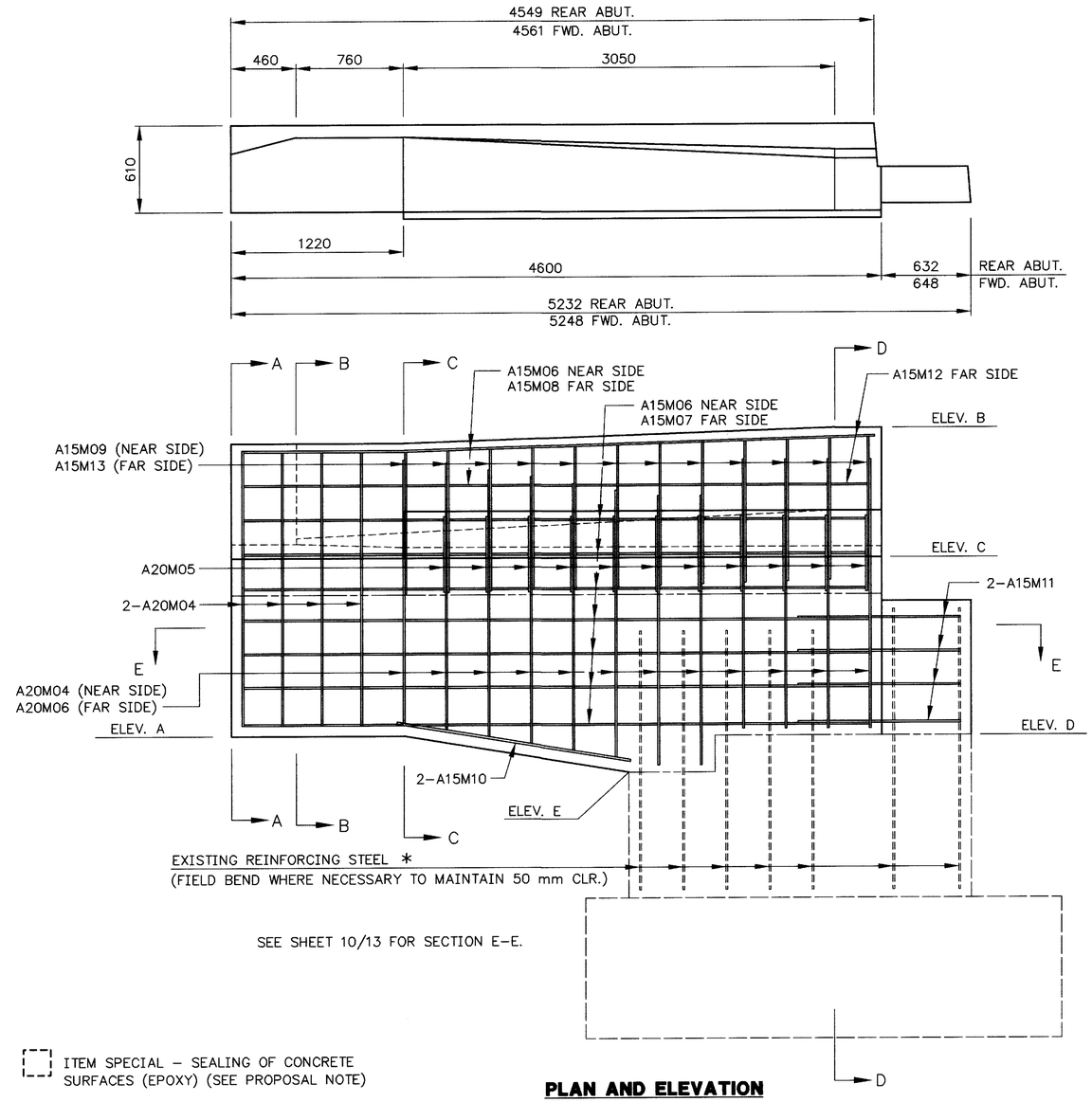
JEF–7–36.967



SECTION A-A

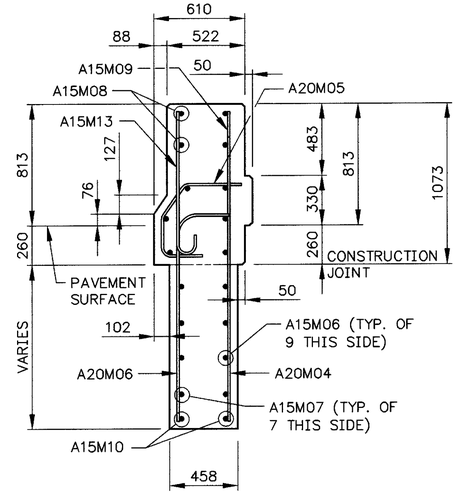


SECTION B-B

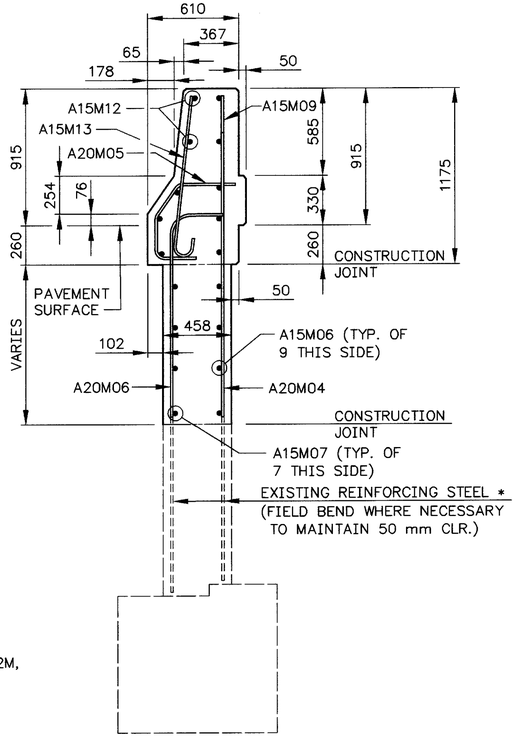


PLAN AND ELEVATION

EAST WINGWALL REAR ABUTMENT
WEST WINGWALL FORWARD ABUTMENT
(EAST WINGWALL REAR ABUTMENT SHOWN, WEST WINGWALL FORWARD ABUTMENT SIMILAR)

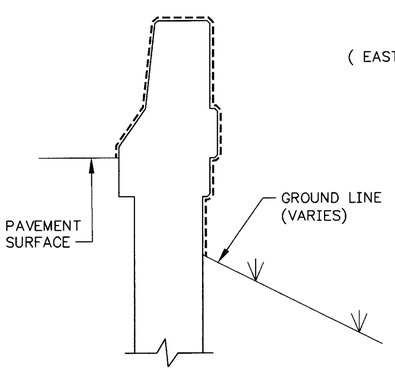


SECTION C-C



SECTION D-D

SEE SHEET 13/13 FOR REINFORCING STEEL LIST.
FOR ADDITIONAL DETAILS SEE STD. DWGS. GR-1.1M, GR-1.2M, AND GR-3.1M.



CONCRETE SEALER

* ANY EXISTING REINFORCING STEEL, THAT IS TO BE REUSED IN THE NEW CONSTRUCTION, THAT IS DAMAGED BY THE CONTRACTOR'S REMOVAL AND DEEMED UNUSABLE BY THE ENGINEER, SHALL BE REPLACED WITH NEW STEEL AT THE CONTRACTOR'S EXPENSE. NEW REINFORCEMENT STEEL SHALL BE 25M IN SIZE AND DOWELED 660 mm INTO THE EXISTING CONCRETE AS PER ITEM 510 - DOWEL HOLES.

TABLE OF ELEVATIONS						
ELEVATION		A	B	C	D	E
FORWARD ABUTMENT	WEST WINGWALL	235.542	237.672	236.757	235.492	235.270
	EAST WINGWALL	235.005	237.135	236.220	234.956	234.956
REAR ABUTMENT	WEST WINGWALL	234.472	236.602	235.687	234.434	234.197
	EAST WINGWALL	233.917	236.047	235.132	233.876	233.620

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CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

ABUTMENT DETAILS
BRIDGE NO. JEF-7-3876
OVER C.R. 46

JEF-7-36.967

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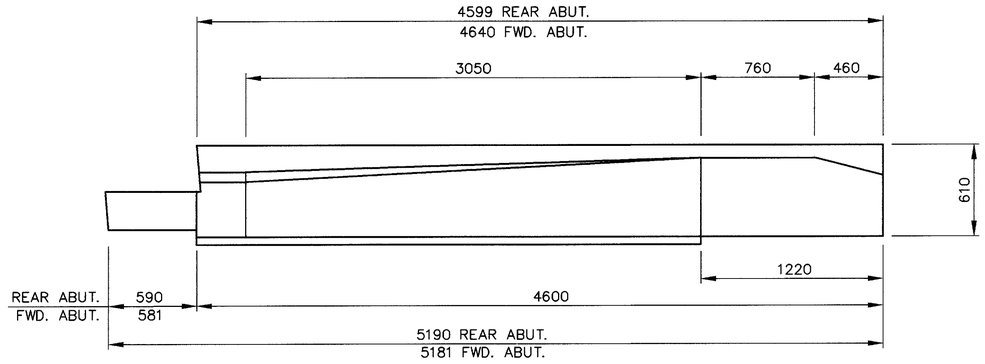
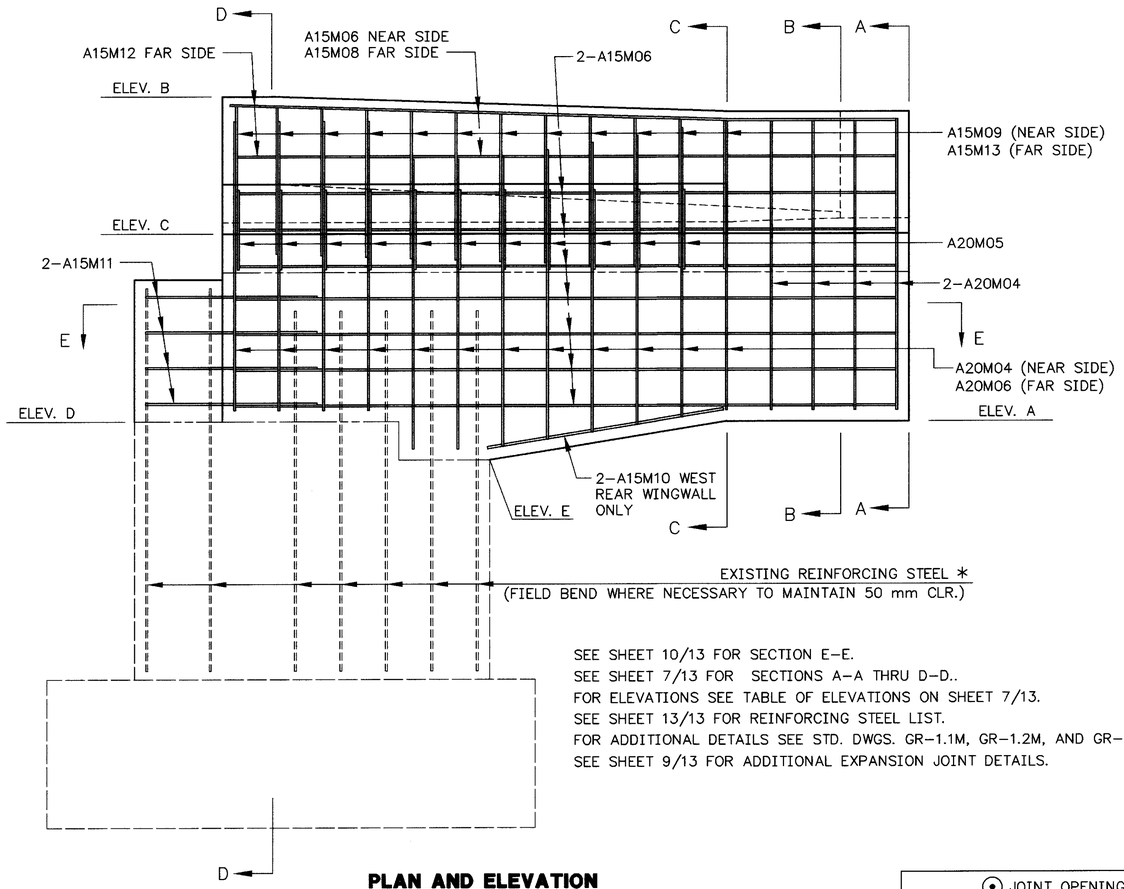


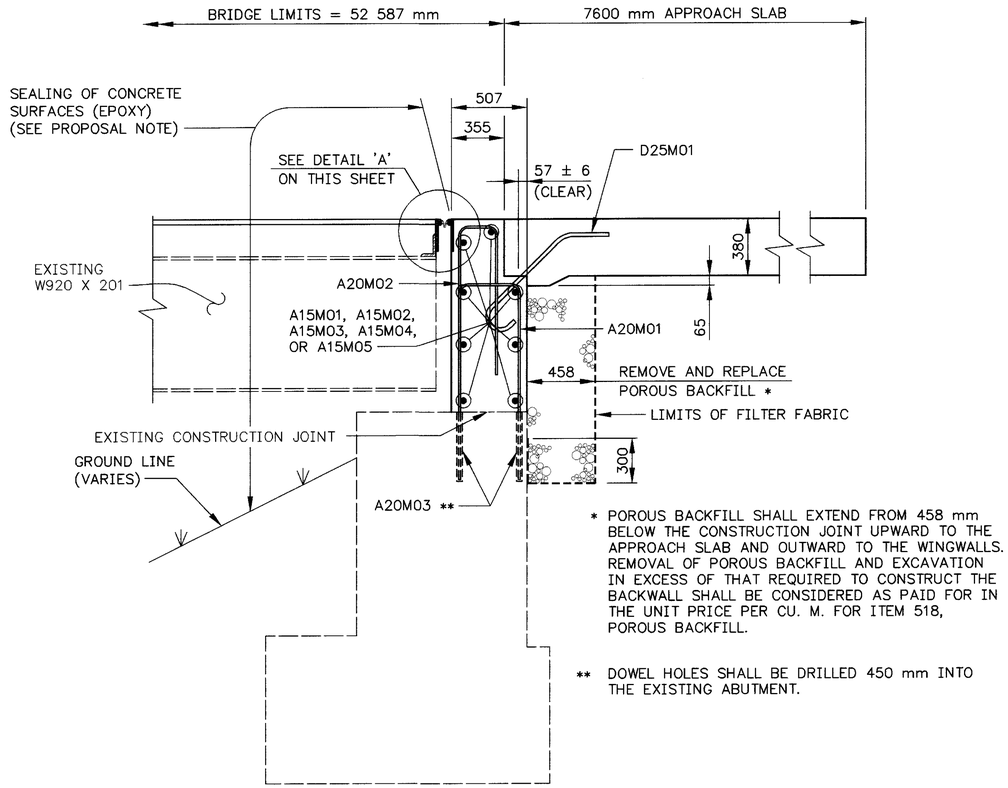


SEE SHEET 10/13 FOR SECTION E–E.
SEE SHEET 7/13 FOR SECTIONS A–A THRU D–D..
FOR ELEVATIONS SEE TABLE OF ELEVATIONS ON SHEET 7/13.
SEE SHEET 13/13 FOR REINFORCING STEEL LIST.
FOR ADDITIONAL DETAILS SEE STD. DWGS. GR–1.1M, GR–1.2M, AND GR–3.1M.
SEE SHEET 9/13 FOR ADDITIONAL EXPANSION JOINT DETAILS.

PLAN AND ELEVATION

WEST WINGWALL REAR ABUTMENT
EAST WINGWALL FORWARD ABUTMENT
(WEST WINGWALL REAR ABUTMENT SHOWN, EAST WINGWALL FORWARD ABUTMENT SIMILAR)

* ANY EXISTING REINFORCING STEEL THAT IS TO BE REUSED IN THE NEW CONSTRUCTION, IS DAMAGED BY THE CONTRACTOR'S REMOVAL AND DEEMED UNUSABLE BY THE ENGINEER, SHALL BE REPLACED WITH NEW STEEL AT THE CONTRACTOR'S EXPENSE. NEW REINFORCEMENT STEEL SHALL BE 25M IN SIZE AND DOWELED 660 mm INTO THE EXISTING CONCRETE AS PER ITEM 510 – DOWEL HOLES.

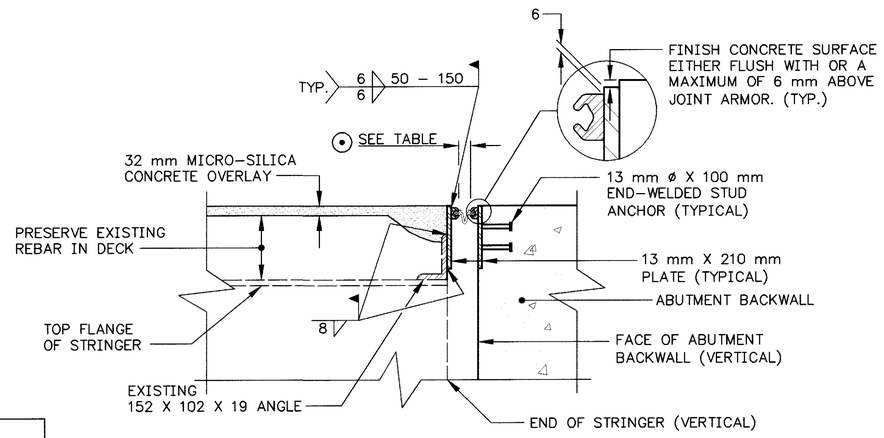


* POROUS BACKFILL SHALL EXTEND FROM 458 mm BELOW THE CONSTRUCTION JOINT UPWARD TO THE APPROACH SLAB AND OUTWARD TO THE WINGWALLS. REMOVAL OF POROUS BACKFILL AND EXCAVATION IN EXCESS OF THAT REQUIRED TO CONSTRUCT THE BACKWALL SHALL BE CONSIDERED AS PAID FOR IN THE UNIT PRICE PER CU. M. FOR ITEM 518, POROUS BACKFILL.

** DOWEL HOLES SHALL BE DRILLED 450 mm INTO THE EXISTING ABUTMENT.

SECTION A THROUGH BACKWALL AT APPROACH SLAB

⊙ JOINT OPENING DIMENSIONS		
TEMPERATURE (°C)	REAR ABUT.	FORWARD ABUT.
0° C	46 mm	47 mm
5° C	45 mm	45 mm
10° C	44 mm	43 mm
15° C	43 mm	41 mm
20° C	42 mm	40 mm
25° C	41 mm	40 mm
30° C	40 mm	40 mm
35° C	40 mm	40 mm



DETAIL A

ALL PARTS OF THE JOINT ASSEMBLY SHALL BE IN ACCORDANCE WITH STD. DWG. EXJ–4–87M SHEET 5 OF 5.

A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT TO ASSIST AND ADVISE IN THE INITIAL INSTALLATION OF THIS SEAL ON THE PROJECT AND AS NEEDED OTHERWISE.

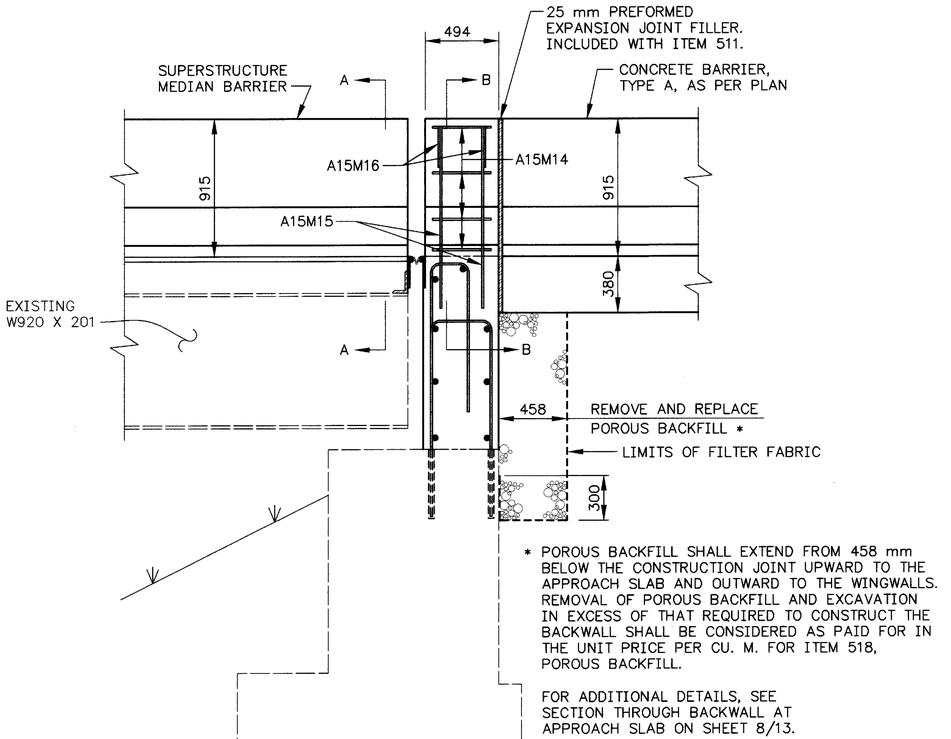
PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIAL, AND INCIDENTALS NEEDED TO PERFORM THIS WORK SHALL BE INCLUDED IN THE METER PRICE BID FOR ITEM 516, STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEAL.

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

ABUTMENT AND END FINISH DETAILS
BRIDGE NO. JEF–7–38769
OVER C.R. 46

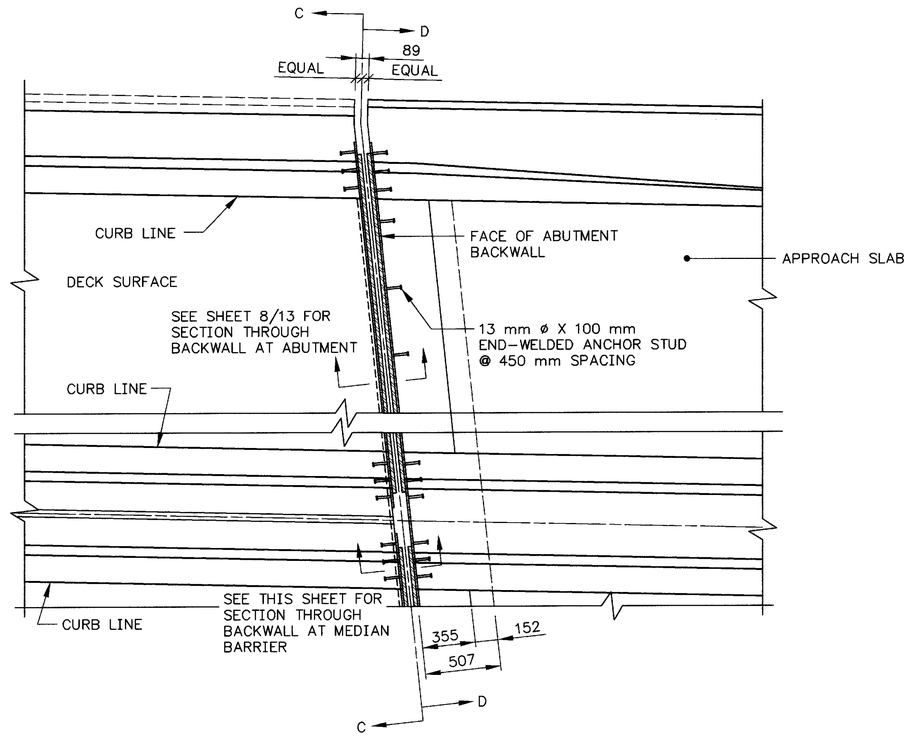
JEF–7–36.967



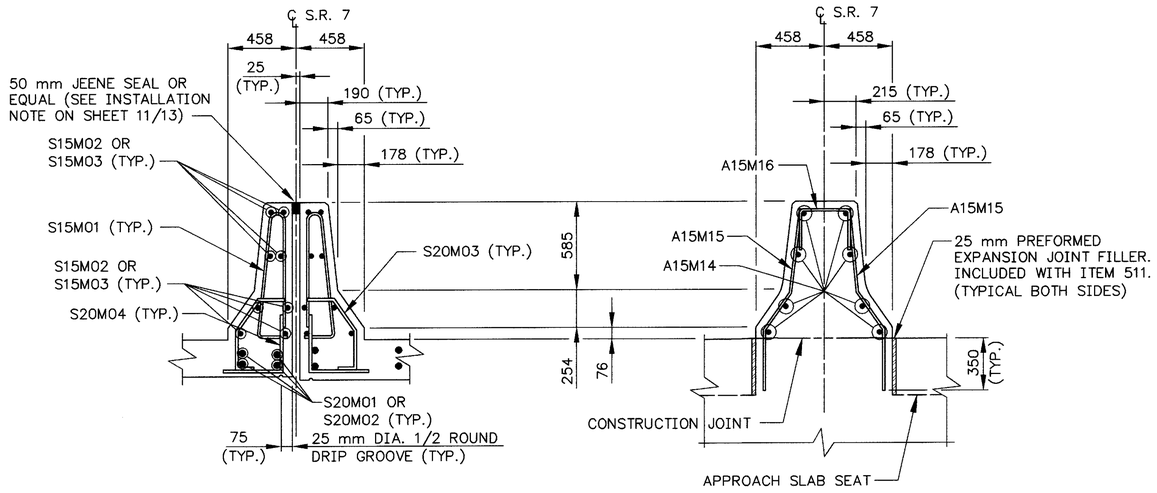
* POROUS BACKFILL SHALL EXTEND FROM 458 mm BELOW THE CONSTRUCTION JOINT UPWARD TO THE APPROACH SLAB AND OUTWARD TO THE WINGWALLS. REMOVAL OF POROUS BACKFILL AND EXCAVATION IN EXCESS OF THAT REQUIRED TO CONSTRUCT THE BACKWALL SHALL BE CONSIDERED AS PAID FOR IN THE UNIT PRICE PER CU. M. FOR ITEM 518, POROUS BACKFILL.

FOR ADDITIONAL DETAILS, SEE SECTION THROUGH BACKWALL AT APPROACH SLAB ON SHEET 8/13.

SECTION THROUGH BACKWALL AT MEDIAN BARRIER

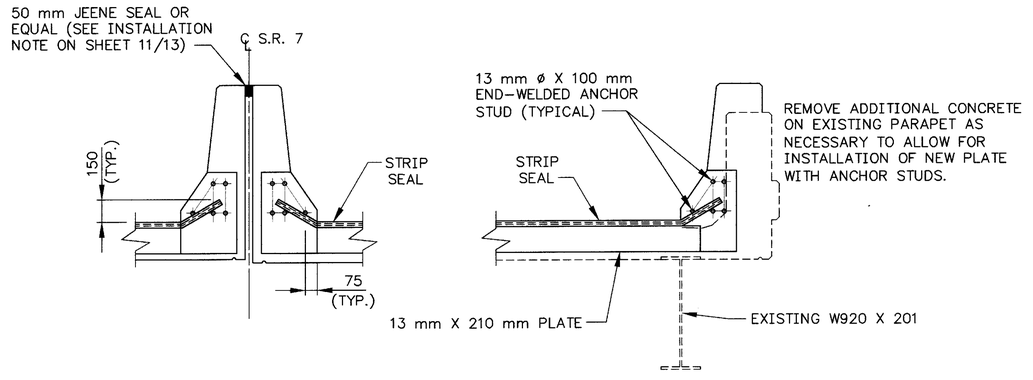


PARTIAL PLAN OF EXPANSION JOINT

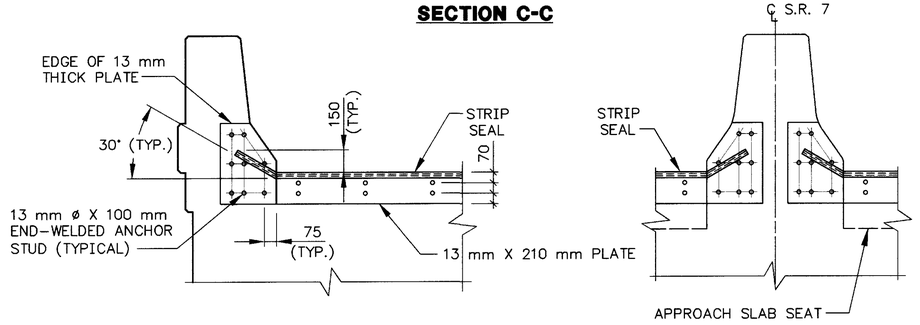


SECTION A-A

SECTION B-B



SECTION C-C



SECTION D-D

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5-97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

ABUTMENT AND END FINISH DETAILS
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967

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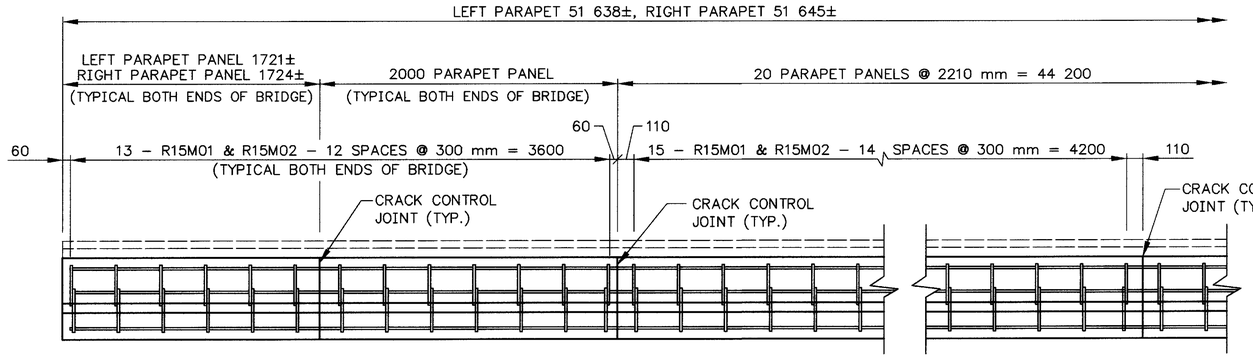
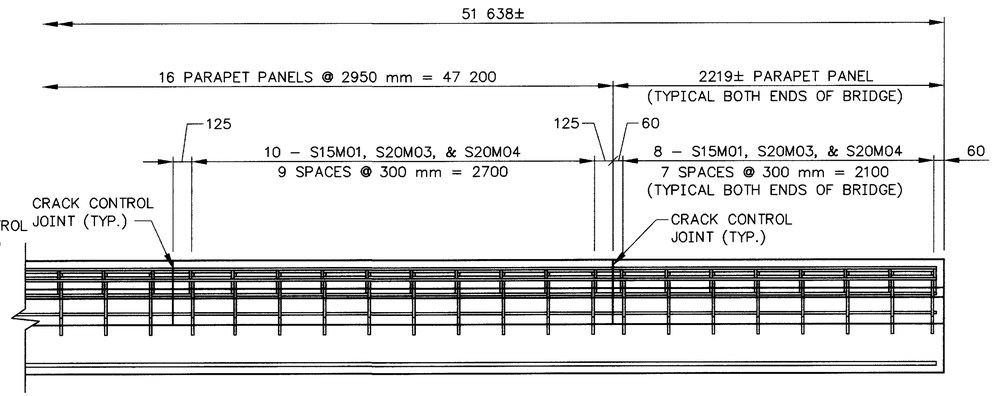


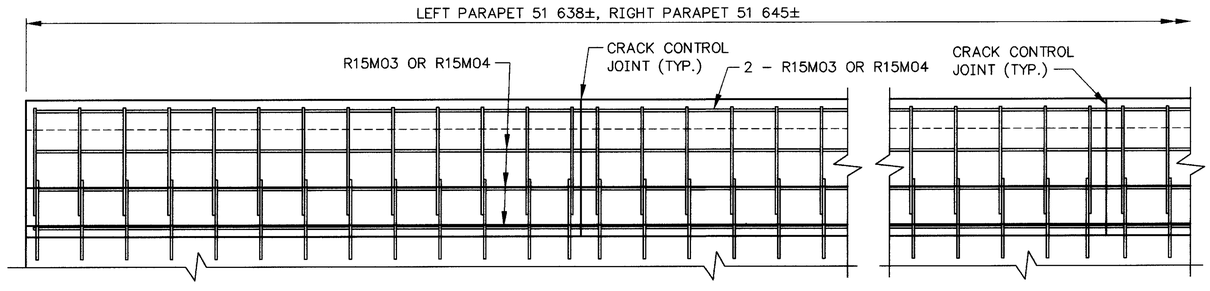
PARAPET PLAN

EACH LONGITUDINAL LINE OF REINFORCING STEEL SHALL CONSIST OF 4–R15M03 AND 1–R15M04 WITH A 1050 mm MIN. LAP SPLICE. THE R15M04 SHALL BE USED IN PLACE OF THE R15M03 TO FINISH OUT THE TOTAL LENGTH OF REINFORCING IN THE DECK.

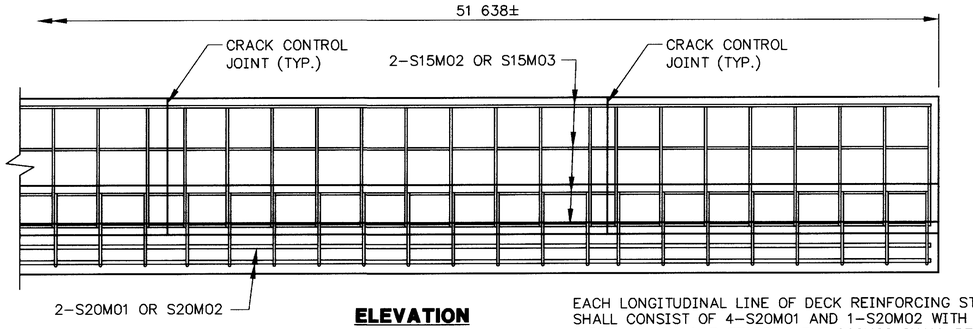


MEDIAN BARRIER PLAN

EACH LONGITUDINAL LINE OF BARRIER REINFORCING STEEL SHALL CONSIST OF 4–S15M02 AND 1–S15M03 WITH A 1050 mm MIN. LAP SPLICE. THE S15M03 SHALL BE USED IN PLACE OF THE S15M02 TO FINISH OUT THE TOTAL LENGTH OF REINFORCING IN THE DECK.

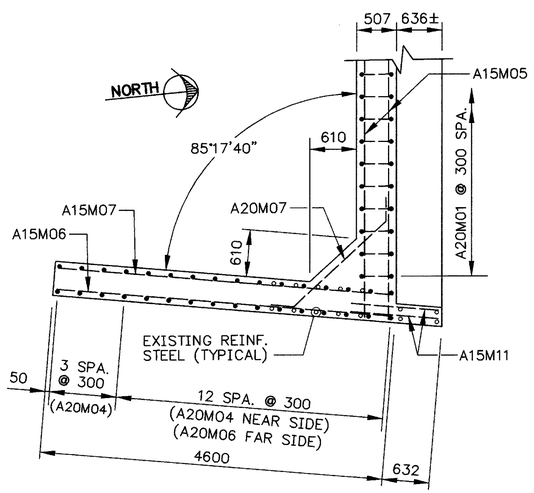


ELEVATION

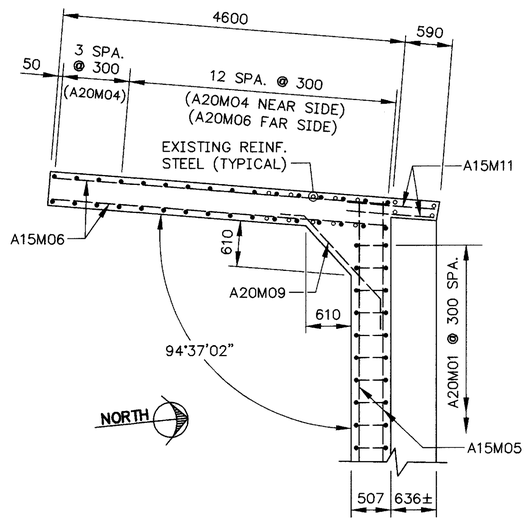


ELEVATION

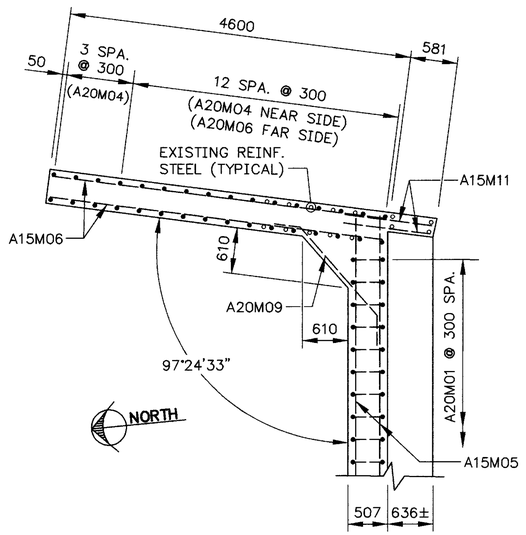
EACH LONGITUDINAL LINE OF DECK REINFORCING STEEL SHALL CONSIST OF 4–S20M01 AND 1–S20M02 WITH A 1150 mm MIN. LAP SPLICE. THE S20M02 SHALL BE USED IN PLACE OF THE S20M01 TO FINISH OUT THE TOTAL LENGTH OF REINFORCING IN THE DECK.



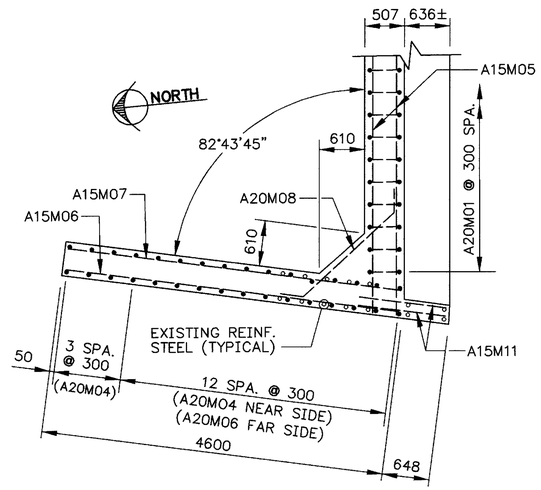
SECTION E-E
EAST WINGWALL REAR ABUTMENT



SECTION E-E
WEST WINGWALL REAR ABUTMENT



SECTION E-E
EAST WINGWALL FORWARD ABUTMENT



SECTION E-E
WEST WINGWALL FORWARD ABUTMENT

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

REVIEWED	DATE	STRUCTURE FILE NUMBER
L.D.S.	5–97	4101235

DRAWN	REVISED
T.D.D.	

DESIGNED	CHECKED
T.D.D.	J.E.U.

PARAPET AND ABUTMENT DETAILS
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967

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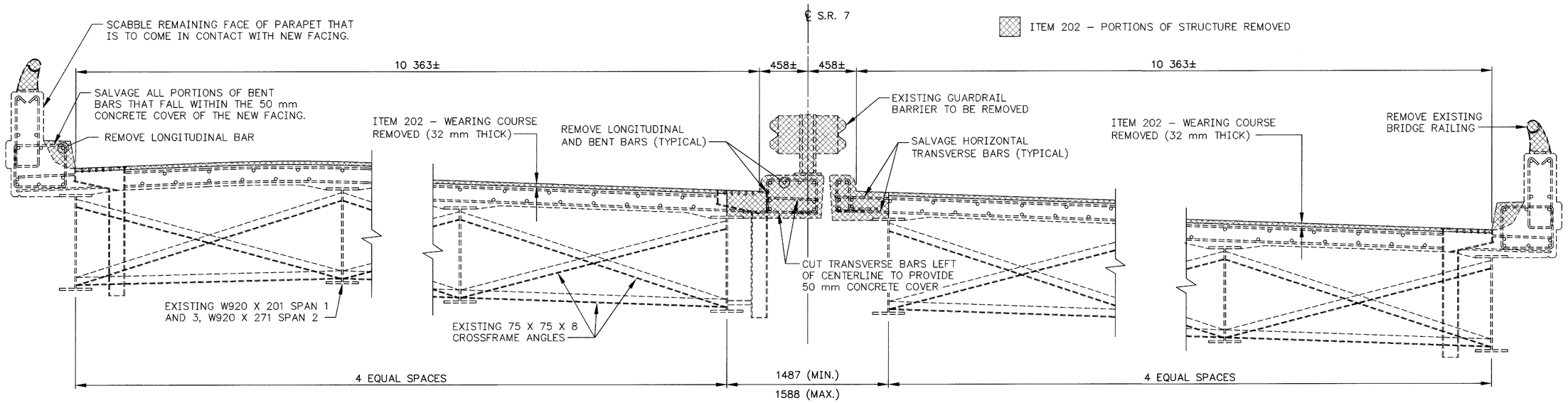
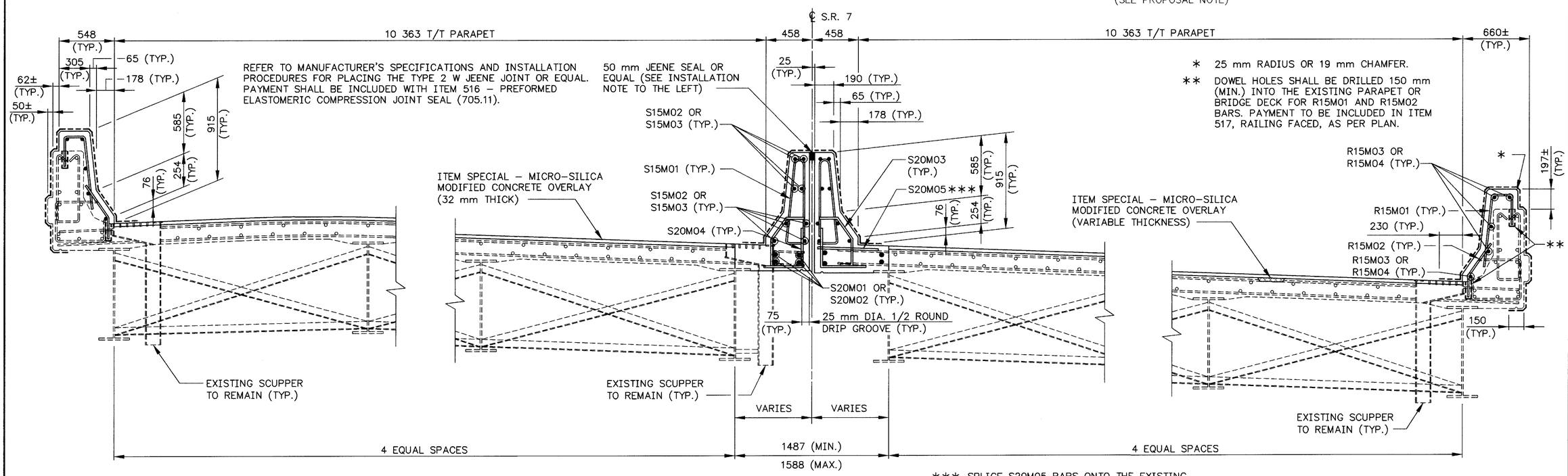


TYPICAL REMOVAL DETAILS



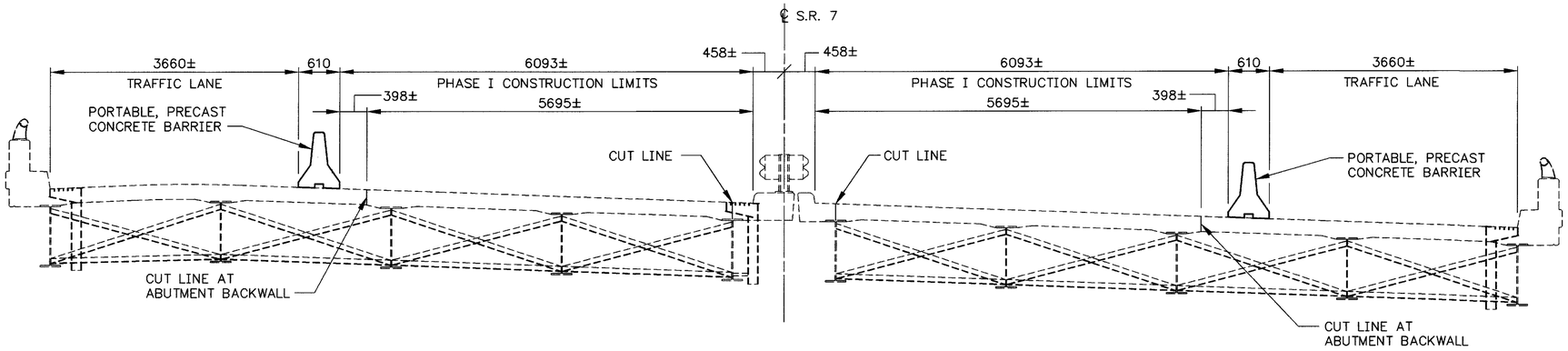
TRANSVERSE SECTION

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101235	

SUPERSTRUCTURE DETAILS
BRIDGE NO. JEF–7–38769
OVER C.R. 46

JEF–7–36.967



NOTE:

TRAFFIC WILL BE MAINTAINED IN THE DRIVING LANE AND SHOULDER DURING PHASE I CONSTRUCTION.

PHASE I TYPICAL SECTION

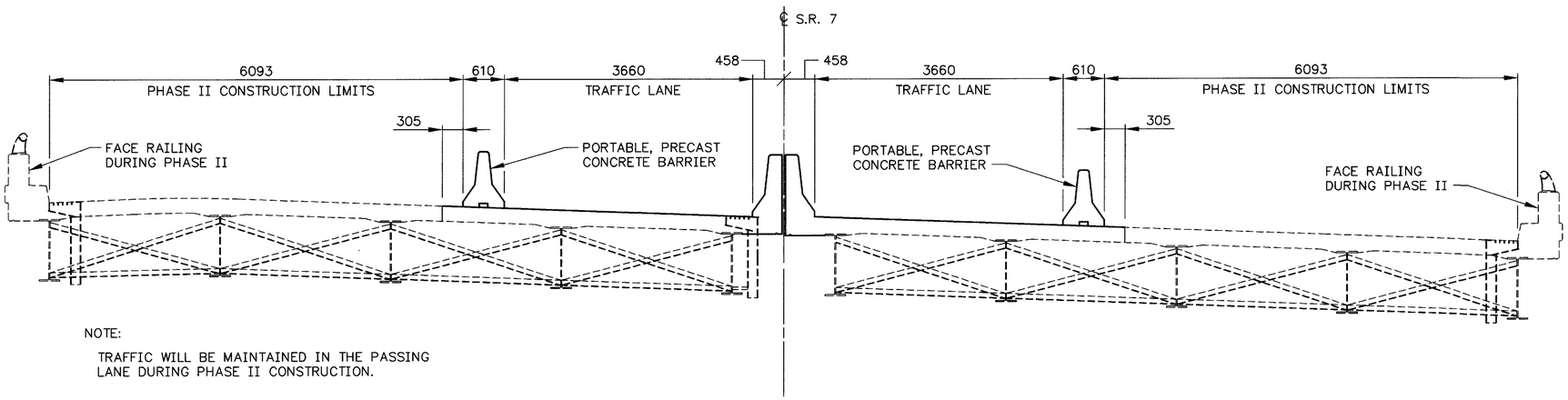
NOTES:

PHASE 1 & 2 REPRESENT THE ORDER AND LOCATION THAT TRAFFIC WILL BE MAINTAINED, WHILE WORK IS DONE ON THE OPPOSITE SIDE.

FOR ADDITIONAL MAINTENANCE OF TRAFFIC SEE STANDARD DRAWING MT-95.40M.

ALL PORTABLE, PRECAST CONCRETE BARRIER AND NEW BRIDGE PARAPETS SHALL HAVE ITEM 614 - BARRIER REFLECTOR, TYPE B @ 7.6 m C/C ON SIDES THAT ARE UP AGAINST THE TRAVELED LANES, IN ACCORDANCE WITH ROADWAY PLANS.

ITEM 614 - OBJECT MARKERS SHALL BE PLACED ON ALL PORTABLE, PRECAST CONCRETE BARRIER IN ACCORDANCE WITH THE ROADWAY PLANS.



NOTE:

TRAFFIC WILL BE MAINTAINED IN THE PASSING LANE DURING PHASE II CONSTRUCTION.

PHASE II TYPICAL SECTION

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

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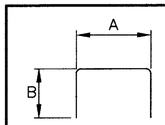
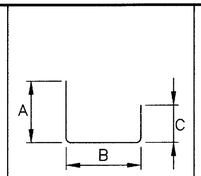
J.E.U.		4101235	

MAINTENANCE OF TRAFFIC SECTIONS
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967



TYPE 1



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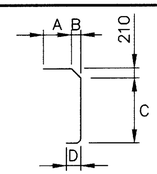

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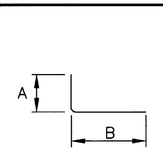

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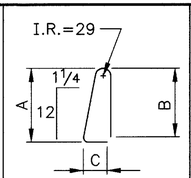

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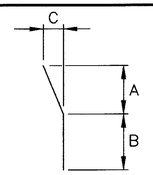

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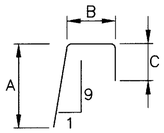

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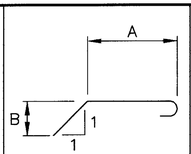

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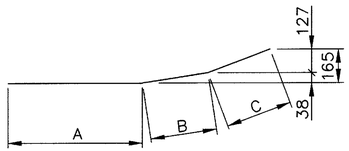

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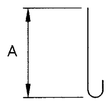

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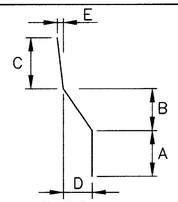

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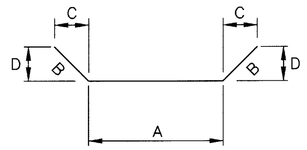


TYPE 12

NOTES:

BAR MARK:
THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST TWO DIGITS INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, A15M01 IS A NO. 15M BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. R INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

REINFORCING STEEL SAMPLES:
REFER TO CMS SECTION 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.

EPOXY COATED REINFORCING STEEL:
ALL REINFORCING STEEL SHALL BE EPOXY COATED. IN ACCORDANCE WITH THE REQUIREMENTS OF CMS SECTION 509 AND 509.09, THE TOP AND BOTTOM OF ALL LONGITUDINAL AND TRANSVERSE EPOXY COATED REINFORCING STEEL SHALL BE SUPPORTED BY APPROVED EPOXY COATED DEVICES WITH SPACING NOT EXCEEDING 915 mm CENTERS IN EACH DIRECTION. BROKEN CONCRETE, BRICKS, ETC. SHALL NOT BE USED FOR SUPPORT OF EPOXY COATED REINFORCING STEEL.

REINFORCING STEEL LIST (ABUTMENTS)

MARK	NUMBER REAR	NUMBER FWD.	NUMBER TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSIONS (mm) A	B	C	D	INC.
A15M01	16		16	6650	167	ST.					
A15M02		16	16	6700	168	ST.					
A15M03	8		8	6300	79	ST.					
A15M04	8	8	16	6200	156	ST.					
A15M05		8	8	6325	79	ST.					
A15M06	25	25	50	4500	353	ST.					
A15M07	7	7	14	4450	98	ST.					
A15M08	4	4	8	4220	53	9	3050	738	432		
A15M09	24	24	48	1000	75	ST.					
A15M10	4	2	6	1600	15	ST.					
A15M11	16	16	32	1150	58	ST.					
A15M12	4	4	8	800	10	ST.					
A15M13	24	24	48	1180	89	10	1000				
A15M14	8	8	16	375	9	ST.					
A15M15	4	4	8	1250	16	11	410	250	550	175	60
A15M16	2	2	4	800	5	1	325	275			
A20M01	76	76	152	1600	573	1	405	650			
A20M02	76	76	152	2350	841	1	255	1100			
A20M03	152	152	304	1150	823	ST.					
A20M04	40	40	80	1900	358	ST.					
A20M05	22	22	44	1125	117	3	380	150	270	275	
A20M06	24	24	48	1750	198	4	350	1450			
A20M07	3		3	2387	17	12	1670	305	216	216	
A20M08		3	3	2691	19	12	1974	305	216	216	
A20M09	3		3	3139	22	12	1874	533	352	400	
A20M10		3	3	3011	21	12	1974	305	400	352	
D25M01	48	48	96	1515	571	8	795	305			
ABUTMENTS TOTAL					4990						

REINFORCING STEEL FOR ABUTMENTS SHALL BE INCLUDED WITH ITEM 511, CLASS C CONCRETE, ABUTMENTS FOR PAYMENT.

REINFORCING STEEL LIST (SUPERSTRUCTURE)

MARK	NUMBER LT.	NUMBER RT.	NUMBER TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSIONS (mm) A	B	C	D	INC.
S15M01	176	176	352	1800	995	5	840	765	180		
S15M02	32	32	64	12 000	1206	ST.					
S15M03	8	8	16	7750	195	ST.					
S20M01	16	16	32	12 000	904	ST.					
S20M02	4	4	8	8150	154	ST.					
S20M03	176	176	352	760	630	3	175	150	260	125	
S20M04	176	176	352	800	663	4	390	450			
S20M05		260	260	600	367	ST.					
SUPERSTRUCTURE TOTAL					5114						

REINFORCING STEEL FOR SUPERSTRUCTURE SHALL BE INCLUDED WITH ITEM 511, CLASS S CONCRETE, SUPERSTRUCTURE FOR PAYMENT.

REINFORCING STEEL LIST (RAILING FACING)

MARK	NUMBER LT.	NUMBER RT.	NUMBER TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSIONS (mm) A	B	C	D
R15M01	176	176	352	1150	636	7	720	205	300	
R15M02	176	176	352	570	315	6	300	210	210	
R15M03	20	20	40	12 000	754	ST.				
R15M04	5	5	10	7750	122	ST.				
RAILING FACING TOTAL					1827					

REINFORCING STEEL FOR RAILING FACING SHALL BE INCLUDED WITH ITEM 517, RAILING, FACED, AS PER PLAN FOR PAYMENT.

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

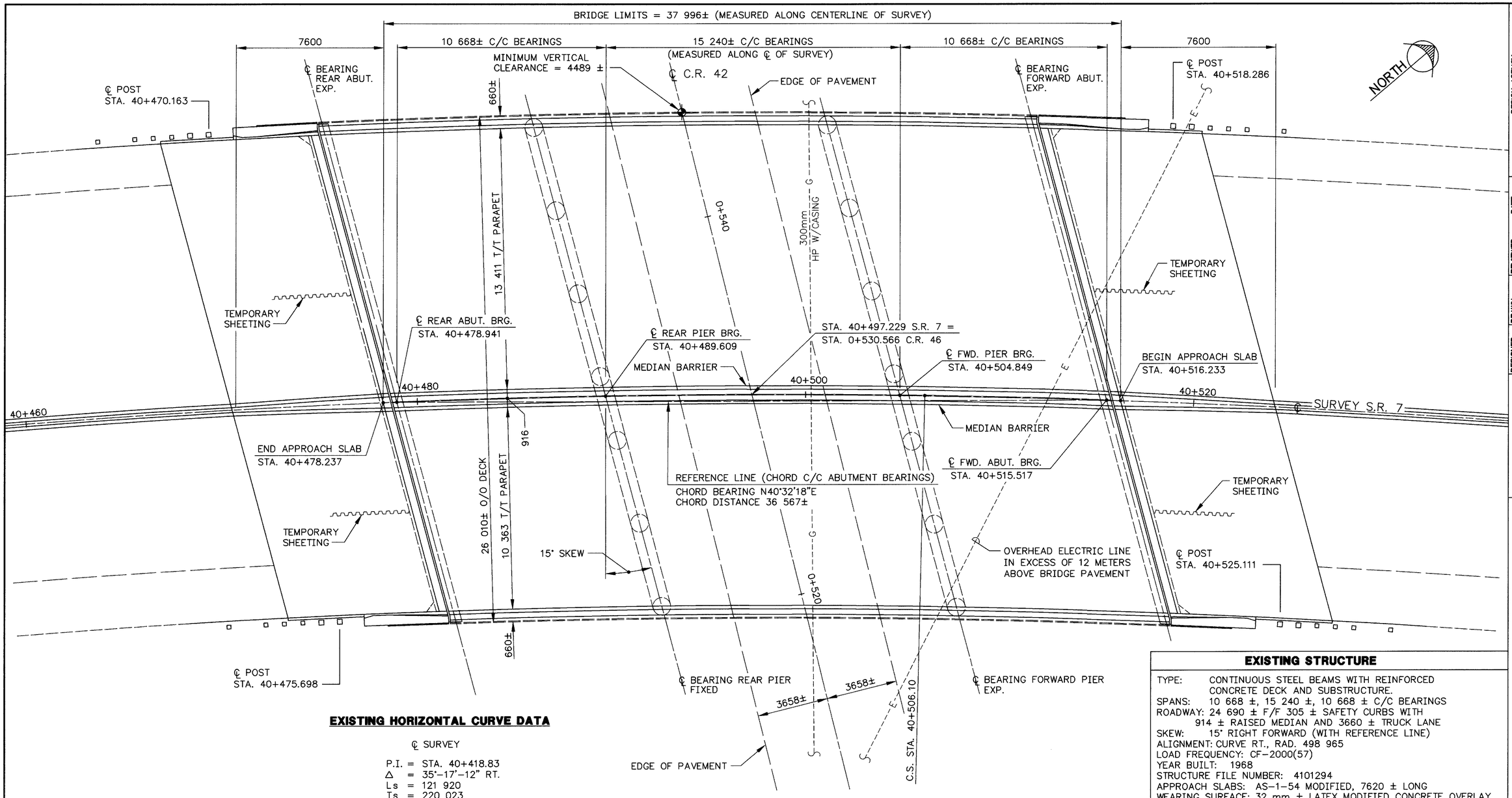
DESIGNED T.D.D. | DRAWN T.D.D. | CHECKED J.E.U. | REVIEWED L.D.S. | DATE 5-97 | REVISED | STRUCTURE FILE NUMBER 4101235

REINFORCING STEEL SCHEDULE
BRIDGE NO. JEF-7-38769
OVER C.R. 46

JEF-7-36.967

13 / 13

81
123



EXISTING HORIZONTAL CURVE DATA

℄ SURVEY

P.I. = STA. 40+418.83
Δ = 35°-17'-12" RT.
Ls = 121 920
Ts = 220 023
Lc = 185 377
Es = 25 932
Rc = 498 965

GENERAL PLAN

ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT STATIONS AND ELEVATIONS WHICH ARE IN METERS.

EXISTING STRUCTURE

TYPE: CONTINUOUS STEEL BEAMS WITH REINFORCED CONCRETE DECK AND SUBSTRUCTURE.
SPANS: 10 668 ±, 15 240 ±, 10 668 ± C/C BEARINGS
ROADWAY: 24 690 ± F/F 305 ± SAFETY CURBS WITH 914 ± RAISED MEDIAN AND 3660 ± TRUCK LANE
SKEW: 15° RIGHT FORWARD (WITH REFERENCE LINE)
ALIGNMENT: CURVE RT., RAD. 498 965
LOAD FREQUENCY: CF-2000(57)
YEAR BUILT: 1968
STRUCTURE FILE NUMBER: 4101294
APPROACH SLABS: AS-1-54 MODIFIED, 7620 ± LONG
WEARING SURFACE: 32 mm ± LATEX MODIFIED CONCRETE OVERLAY
SUPERELEVATION: VARIES

PROPOSED STRUCTURE

PROPOSED WORK:
NEW 32 mm MICRO-SILICA CONCRETE OVERLAY
NEW DEFLECTOR PARAPETS AND MEDIAN BARRIER
NEW BACKWALLS WITH SEALED JOINTS
NEW APPROACH SLABS AS-1-81M, 7600 mm LONG
TYPE: 32 mm OVERLAY OVER EXISTING CONTINUOUS STEEL BEAMS, REINFORCED CONCRETE DECK AND SUBSTRUCTURE.
SPANS: 10 668 ±, 15 240 ±, 10 668 ± C/C BEARINGS
ROADWAY: 24 690 T/T PARAPETS WITH 916 MEDIAN BARRIER 3660 ± TRUCK LANE
SKEW: 15° RIGHT FORWARD (WITH REFERENCE LINE)
ALIGNMENT: CURVE RT., RAD. 498 965
LOAD FREQUENCY: CF-2000(57)
APPROACH SLABS: 7600 (AS-1-81M)
WEARING SURFACE: 32 mm MICRO-SILICA CONCRETE OVERLAY
SUPERELEVATION: VARIES

AVG. DAILY TRAFFIC: (1995) 7180
(2015) 9350 ADTT 2338

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5-97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101294	

JEFFERSON COUNTY
STA. 40+478.237
STA. 40+516.233

GENERAL PLAN
BRIDGE NO. JEF-7-40478
OVER C.R. 42

JEF-7-36.967

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

AS-1-81M	DATED	10/25/94
BR-1M	DATED	~~12/15/94~~ 1/6/99
EXJ-4-87M	DATED	3/20/95
PCB-91M	DATED	3/20/95

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05 AND 105.02.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

ITEM 202 – PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

DESCRIPTION:
THIS WORK SHALL INCLUDE THE ELEMENTS INDICATED IN THE PLANS AND GENERAL NOTES AND ARE NOT SEPARATELY LISTED FOR PAYMENT, EXCEPT FOR WEARING COURSE REMOVAL. ITEMS TO BE REMOVED INCLUDE ALL EXISTING MATERIALS BEING REPLACED BY NEW CONSTRUCTION AND MISCELLANEOUS ITEMS THAT ARE NOT SHOWN TO BE INCORPORATED INTO THE FINAL CONSTRUCTION AND ARE DIRECTED TO BE REMOVED BY THE ENGINEER. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE-RAMS WILL NOT BE PERMITTED. THE METHOD OF REMOVAL AND THE WEIGHT OF HAMMER SHALL BE APPROVED BY THE ENGINEER. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT CUT, ELONGATE OR DAMAGE THE EXISTING REINFORCING STEEL TO BE PRESERVED. CHIPPING HAMMERS SHALL NOT BE HEAVIER THAN THE NOMINAL 41 KILOGRAM CLASS. PNEUMATIC HAMMERS SHALL NOT BE PLACED IN DIRECT CONTACT WITH REINFORCING STEEL THAT IS TO BE RETAINED IN THE REBUILT STRUCTURE.

CUT LINE CONSTRUCTION JOINT PREPARATION:
SAW CUT BOUNDARIES OF PROPOSED CONCRETE REMOVALS 25 mm DEEP. REMOVE CONCRETE TO A ROUGH SURFACE. WHERE PRACTICABLE, THE EXISTING REINFORCING STEEL WHERE REQUIRED IN THE PLANS SHALL BE LEFT IN PLACE. INSTALL DOWEL BARS IF SPECIFIED. PRIOR TO CONCRETE PLACEMENT, ABRASIVELY CLEAN JOINT SURFACE AND EXPOSED REINFORCEMENT TO REMOVE LOOSE AND DISINTEGRATED CONCRETE AND LOOSE RUST. THE JOINT SURFACE AND EXPOSED REINFORCEMENT SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST, OR OTHER FOREIGN MATERIAL BY THE USE OF WATER, AIR UNDER PRESSURE, OR OTHER METHODS THAT PRODUCE SATISFACTORY RESULTS. CONCRETE BONDING SURFACES SHALL BE WET WITHOUT FREE WATER AS CONCRETE IS PLACED.

PROTECTION OF TRAFFIC:
PRIOR TO DEMOLITION OF ANY PORTIONS OF THE EXISTING SUPERSTRUCTURE, THE CONTRACTOR SHALL SUBMIT PLANS FOR THE PROTECTION OF TRAFFIC ADJACENT TO AND/OR UNDER THE STRUCTURE TO THE DIRECTOR FOR APPROVAL. THESE PLANS SHALL INCLUDE PROVISIONS FOR ANY DEVICES AND STRUCTURES THAT MAY BE NECESSARY TO ENSURE SUCH PROTECTION. TEMPORARY VERTICAL CLEARANCES SPECIFIED ON THE PLANS OR IN THE PROPOSAL SHALL BE MAINTAINED AT ALL TIMES EXCEPT AS OTHERWISE APPROVED BY THE DIRECTOR.

PAYMENT:
THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN CONFORMANCE WITH THESE REQUIREMENTS, WITH PERTINENT PROVISIONS OF 202, AND TO THE SATISFACTION OF THE ENGINEER.

ITEM 503- UNCLASSIFIED EXCAVATION

THIS ITEM SHALL COVER THE NECESSARY EXCAVATION AROUND THE ABUTMENTS AND WINGWALLS DURING THE RECONSTRUCTION OF BRIDGE NO. JEF-7-40478.

CONCRETE PARAPETS

AS SOON AS A CONCRETE SAW CAN BE OPERATED WITHOUT DAMAGING THE FRESHLY PLACED CONCRETE, 25 mm DEEP CONTROL JOINTS SHALL BE SAWED INTO THE PERIMETER OF THE CONCRETE PARAPET.

RAILING FACED, AS PER PLAN:
THE SAW CUT SHALL BE MADE IN THE COMPLETE PERIMETER OF THE NEW PARAPET. THE CONTROL JOINT SAW CUTS SHALL BE PLACED IN THE NEW CONCRETE AT THE SAME LOCATION AS THE EXISTING DEFLECTION JOINTS AND SHALL BE MADE AT RIGHT ANGLES TO THE DECK BY SAWING TO MATCH THE ALIGNMENT OF EXISTING DEFLECTION JOINTS.

MEDIAN PARAPETS:
THE SAW CUT SHALL BE MADE IN THE ROADWAY AND TOP FACES OF THE PARAPET. THE CONTROL JOINT SAW CUTS SHALL BE PLACED IN THE NEW CONCRETE AT THE LOCATION AS SHOWN ON THE DRAWINGS AND SHALL BE MADE AT RIGHT ANGLES TO THE DECK BY SAWING.

THE USE OF AN EDGE GUIDE, FENCE OR JIG IS REQUIRED TO INSURE THAT THE CUT IS STRAIGHT, TRUE AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 6 mm. THE PERIMETER OF THE DEFLECTION CONTROL JOINT SHALL BE SEALED WITH A CAULKING MATERIAL CONFORMING TO FEDERAL SPECIFICATION, TT-S-00227E TO A MINIMUM DEPTH OF 25 mm.

ITEM 517- RAILING FACED, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FACING CURB STYLE PARAPETS, USING CAST IN PLACE CONCRETE, TO OBTAIN THE DEFLECTOR SHAPE AS SHOWN IN THE PLANS.

THE CONTRACTOR SHALL CAREFULLY REMOVE AND DISPOSE OF THE EXISTING ALUMINUM RAILING, PORTIONS OF THE CONCRETE SAFETY CURB AND ANY EXISTING REINFORCING STEEL THAT WILL INTERFERE WITH THE FACING SHALL BE REMOVED AS DIRECTED BY THE ENGINEER. SEE PLAN DETAILS FOR SPECIFIC REINFORCING STEEL REMOVAL.

25 mm DIAMETER HOLES, 150 mm DEEP (MIN.) SHALL BE DRILLED AT 300 mm C/C AS SHOWN ON THE DRAWING. THE HOLES SHALL BE THOROUGHLY CLEANED OF ALL DUST AND OTHER DELETERIOUS MATERIAL. REINFORCING STEEL SHALL BE INSTALLED USING EPOXY GROUT (CMS 705.20). ALL EXISTING REINFORCING STEEL BARS IN THE AREA OF THE DOWEL HOLE SHALL BE LOCATED WITH THE AID OF A REINFORCING STEEL BAR LOCATOR (PACHOMETER) PRIOR TO DRILLING THE HOLES. IF AN EXISTING BAR IS ENCOUNTERED AT THE SAME LOCATION AS A PROPOSED DOWEL HOLE, THE DOWEL HOLE SHALL BE MOVED TO EITHER SIDE OF THE EXISTING BAR. ALL REINFORCING STEEL, DOWEL HOLES AND GROUTING SHALL BE INCLUDED WITH ITEM 517 FOR PAYMENT.

ALL LOOSE AND UNSOUND CONCRETE IN THE AREA OF THE PARAPET TO BE FACED SHALL BE REMOVED. ALL REMAINING SOUND CONCRETE SHALL THEN BE SCABBLED OR REMOVED SO THAT THE MINIMUM THICKNESS FOR THE PROPOSED FACING SHALL BE 100 mm. ALL REINFORCING STEEL SHALL BE EPOXY COATED. CONCRETE COVER OVER ALL REINFORCING STEEL SHALL BE 50 mm. THE PARAPET SURFACE NEXT TO THE REFACING SHALL BE THOROUGHLY CLEANED BY ABRASIVE BLASTING FOLLOWED BY AN AIR BLAST. USE OF HAND TOOLS MAY BE NECESSARY TO REMOVE SCALE FROM ANY EXPOSED REINFORCING STEEL. THE SURFACE SHALL BE MADE FREE FROM SPALLS, LAITENCE, AND ALL TRACES OF FOREIGN MATERIAL. DETERGENT CLEANING SHALL PRECEDE BLAST CLEANING AS NECESSARY TO ENSURE REMOVAL OF CONTAMINANTS THAT ARE DETRIMENTAL TO ACHIEVING AN ADEQUATE BOND. THE CONCRETE SURFACES TO BE FACED SHALL BE THOROUGHLY DRENCHED WITH CLEAN WATER AND ALLOWED TO DRY TO A DAMP CONDITION JUST BEFORE PLACING THE CONCRETE.

MATERIALS SHALL BE:
CONCRETE: CLASS S AS PER ITEM 511
REINFORCING STEEL: GRADE 400, EPOXY COATED AS PER ITEM 509

THE QUANTITY SHALL BE THE ACTUAL LENGTH OF RAILING FACED AS MEASURED FROM END OF WINGWALL TO END OF WINGWALL. THIS ITEM SHALL INCLUDE THE FURNISHING OF ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THIS WORK. ALL COSTS OF REMOVAL, DOWEL HOLES, REINFORCING STEEL, CONCRETE AND SHRINKAGE CONTROL JOINTS COMPLETE AND IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR:

ITEM	UNIT	DESCRIPTION
517	METERS	RAILING FACED, AS PER PLAN

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	ABUTMENTS	SUPER-STRUCTURE	GENERAL
202	11201	LUMP		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN			LUMP
202	23500	877	SQ. M.	WEARING COURSE REMOVED		877	
503	11100	LUMP		COFFERDAMS, CRIBS AND SHEETING	LUMP		
503	21100	46	CU. M.	UNCLASSIFIED EXCAVATION	46		
842	34400	33	CU. M.	CLASS S CONCRETE, SUPERSTRUCTURE		33	
842	45700	61	CU. M.	CLASS C CONCRETE, ABUTMENTS	61		
SPECIAL	51267502	511	SQ. M.	SEALING OF CONCRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE)	191	320	
516	10000	37	METER	PREFORMED ELASTOMERIC COMPRESSION JOINT SEALER (905.11) (JEENE SEAL OR EQUAL)		37	
516	11211	51.2	METER	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL		51.2	
517	76201	74	METER	RAILING FACED, AS PER PLAN		74	
518	21200	40	CU. M.	POROUS BACKFILL WITH FILTER FABRIC	40		
SPECIAL	51922000	877	SQ. M.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (32 mm THICK) (SEE PROPOSAL NOTE)		877	
SPECIAL	51922100	36	CU. M.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (VARIABLE THICKNESS) (SEE PROPOSAL NOTE)		36	
SPECIAL	51922300	LUMP		TEST SLAB (SEE PROPOSAL NOTE)			LUMP

PROPOSED WORK

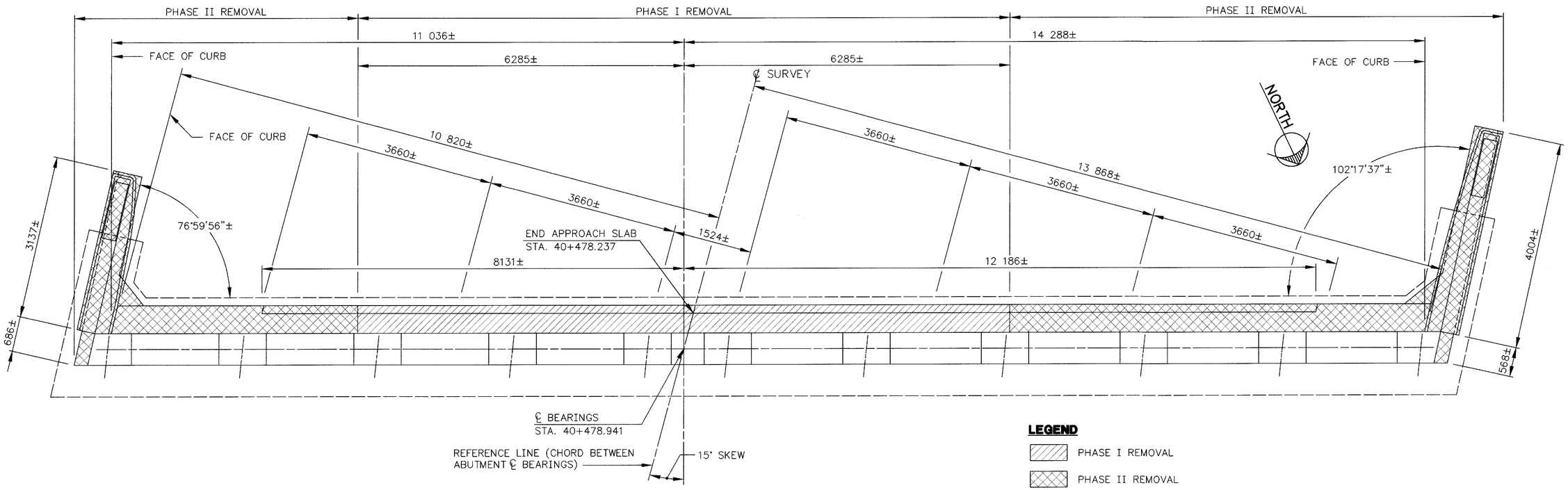
1. SET TRAFFIC CONTROL DEVICES FOR PHASED CONSTRCUTION.
2. REMOVE PHASE 1 (OR PHASE 2) PORTIONS OF EXISTING DECK, MEDIAN, WEARING SURFACES, GUARDRAIL BARRIER AND PORTIONS OF ABUTMENTS, PARAPETS AND APPROACH SLABS.
4. CONSTRUCT PHASE 1 (OR PHASE 2) MEDIAN BARRIERS AND PORTIONS OF PARAPETS, DECK AND ABUTMENTS.
5. INSTALL PHASE 1 (OR PHASE 2) MICRO-SILICA CONCRETE OVERLAY.
6. SEAL CONCRETE SURFACES AS NOTED ON THE PLANS.
7. AFTER THE PHASED WORK IS COMPLETE, OPEN THE STRUCTURE TO TRAFFIC.

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED T.D.D. | DRAWN T.D.D. | CHECKED J.E.U. | REVIEWED L.D.S. | DATE 5-97 | STRUCTURE FILE NUMBER 4101294 | REVISED

GENERAL NOTES AND SUMMARY
BRIDGE NO. JEF-7-40478
OVER C.R. 42

JEF-7-36.967



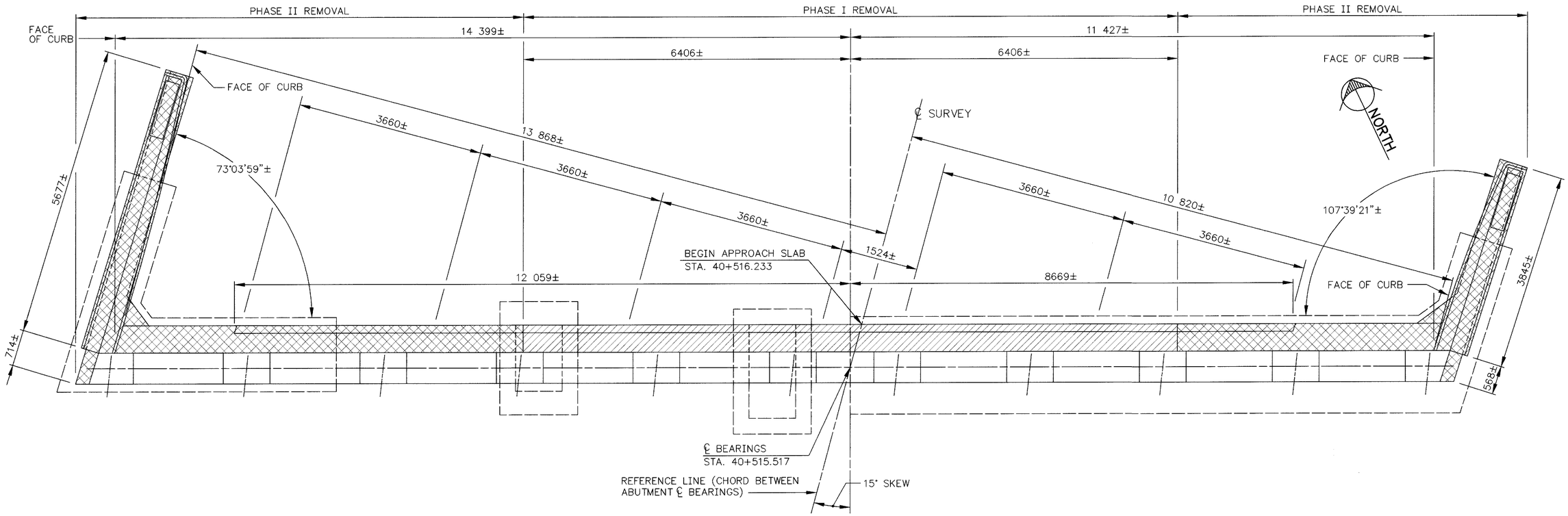
REAR ABUTMENT PLAN

LEGEND

PHASE I REMOVAL

PHASE II REMOVAL

SEE SHEET 4/13 FOR LIMITS OF CONCRETE AND REINFORCING STEEL REMOVAL.



FORWARD ABUTMENT PLAN

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

REVIEWED L.D.S. DATE 5-97
STRUCTURE FILE NUMBER 4101294

DRAWN T.D.D. REVISED

DESIGNED T.D.D. CHECKED J.E.U.

ABUTMENT DEMOLITION PLAN
BRIDGE NO. JEF-7-40478
OVER C.R. 42

JEF-7-36.967

3 / 14

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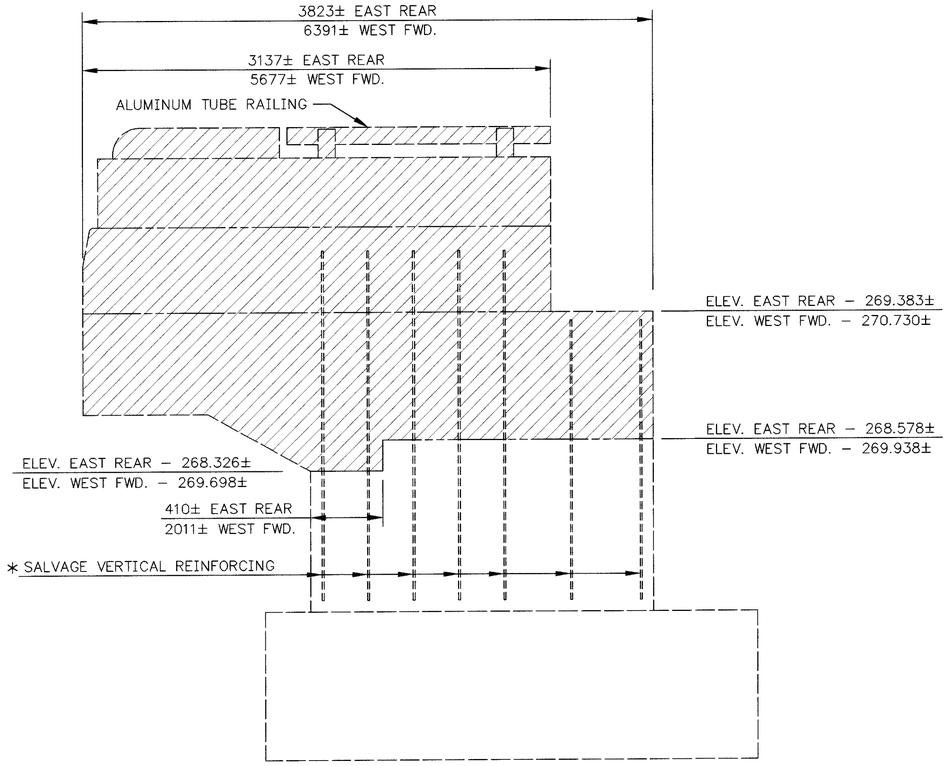
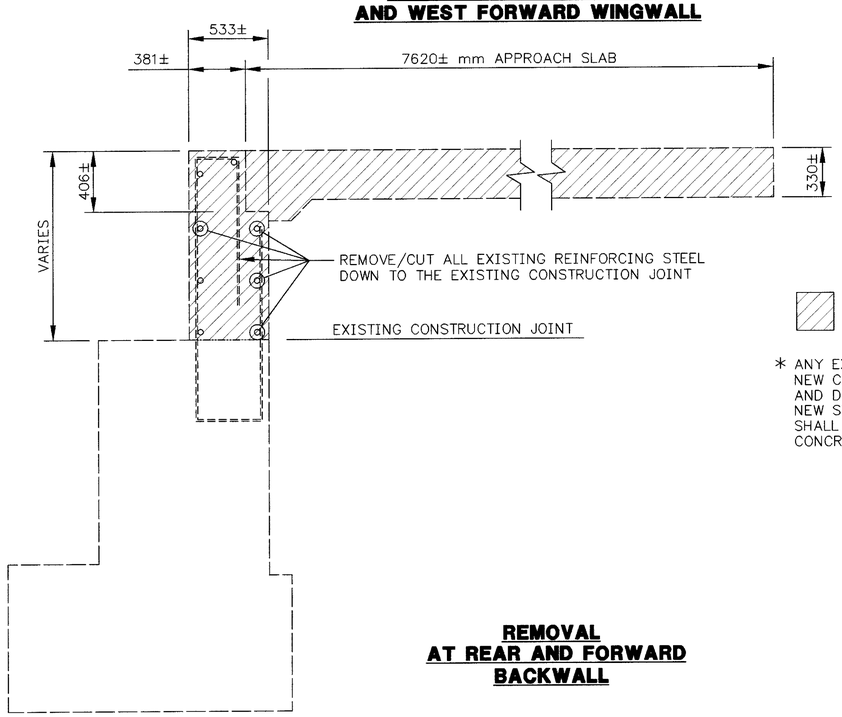


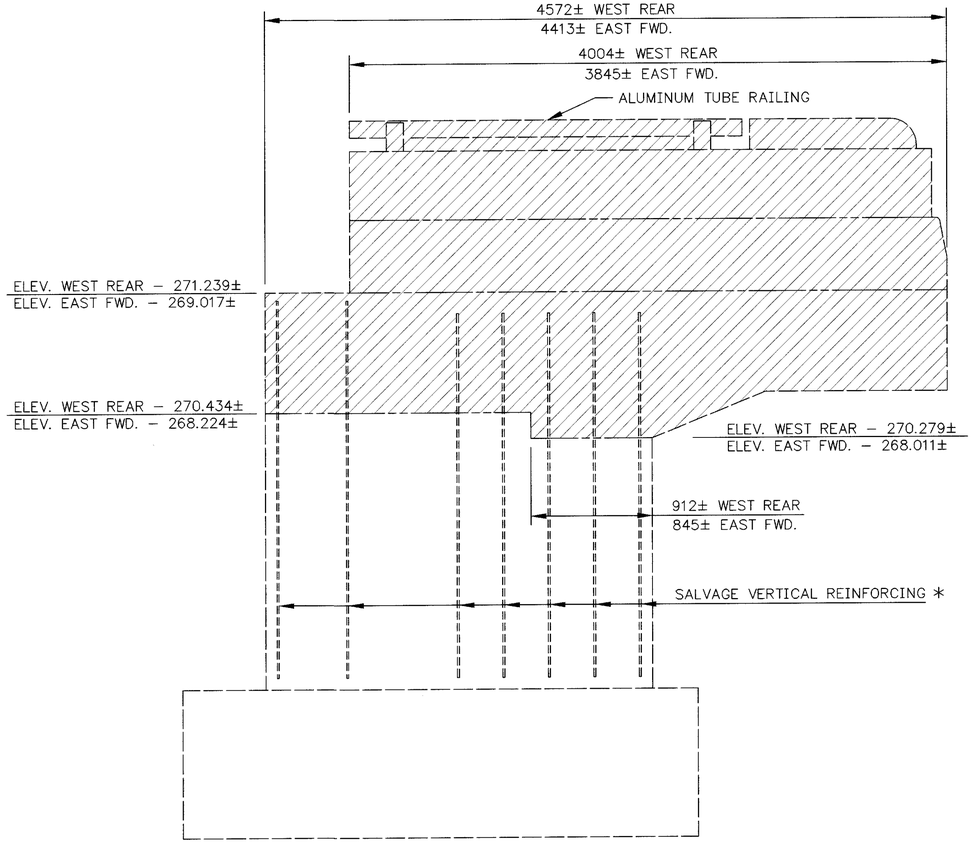
REMOVAL
AT EAST REAR WINGWALL
AND WEST FORWARD WINGWALL



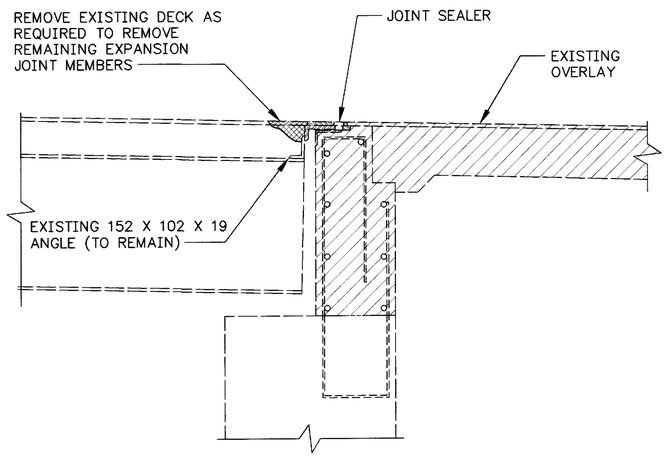
REMOVAL
AT REAR AND FORWARD
BACKWALL

REMOVE ALL CONCRETE AND REINFORCING STEEL UNLESS OTHERWISE NOTED.

* ANY EXISTING REINFORCING STEEL THAT IS TO BE REUSED IN THE NEW CONSTRUCTION, IS DAMAGED BY THE CONTRACTOR'S REMOVAL AND DEEMED UNUSABLE BY THE ENGINEER, SHALL BE REPLACED WITH NEW STEEL AT THE CONTRACTOR'S EXPENSE. NEW REINFORCEMENT STEEL SHALL BE 25M IN SIZE AND DOWELED 660 mm INTO THE EXISTING CONCRETE AS PER ITEM 510 – DOWEL HOLES.



REMOVAL
AT WEST REAR WINGWALL
AND EAST FORWARD WINGWALL



REMOVAL OF EXSITING EXPANSION JOINT

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

REVIEWED	DATE	STRUCTURE FILE NUMBER
L.D.S.	5-97	4101294

DRAWN	REVISED
T.D.D.	

DESIGNED	CHECKED
T.D.D.	J.E.U.

ABUTMENT AND END FINICH DEMOLITION DETAILS
BRIDGE NO. JEF-7-40478
OVER C.R. 42

JEF-7-36.967

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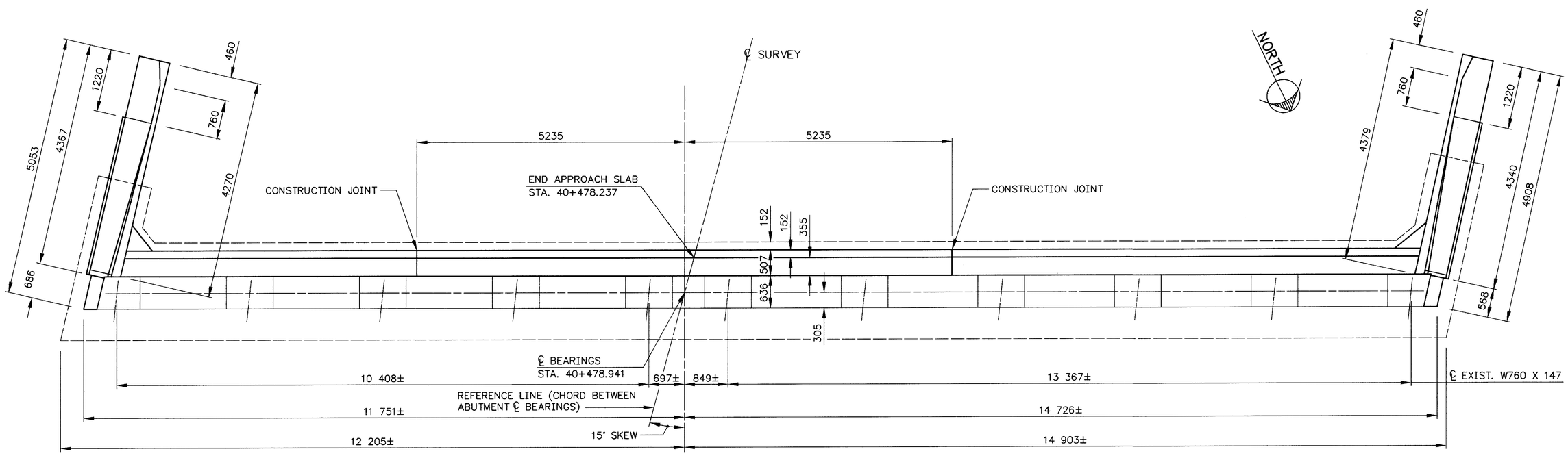
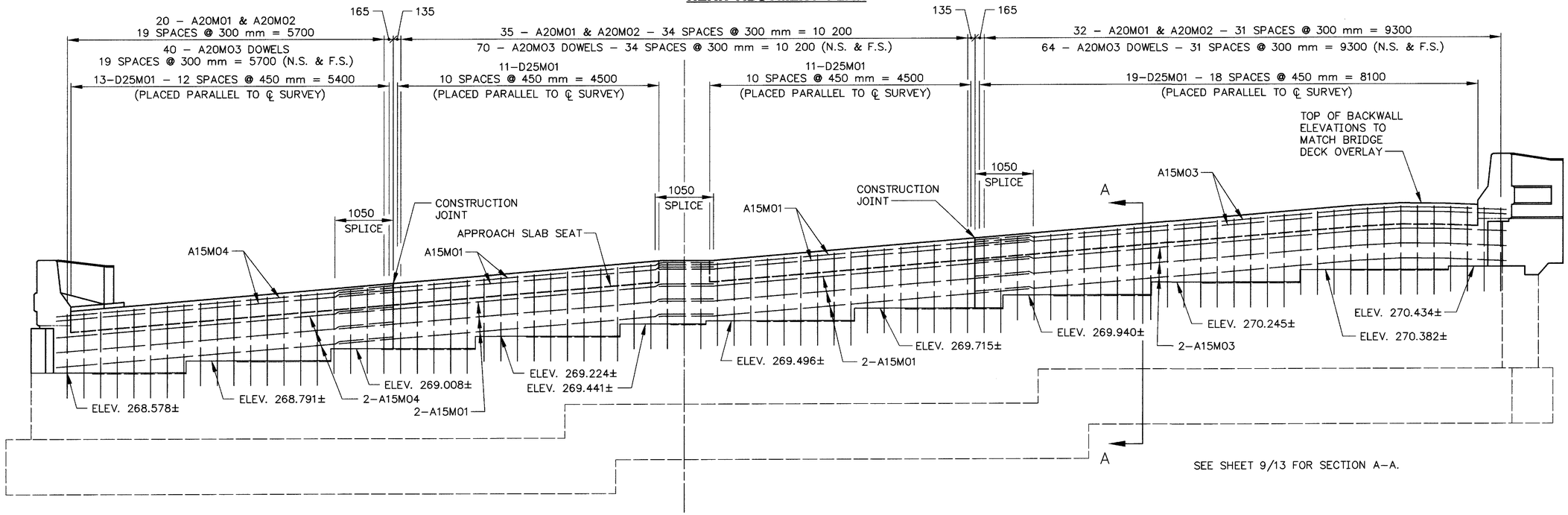


REAR ABUTMENT PLAN



REAR ABUTMENT ELEVATION

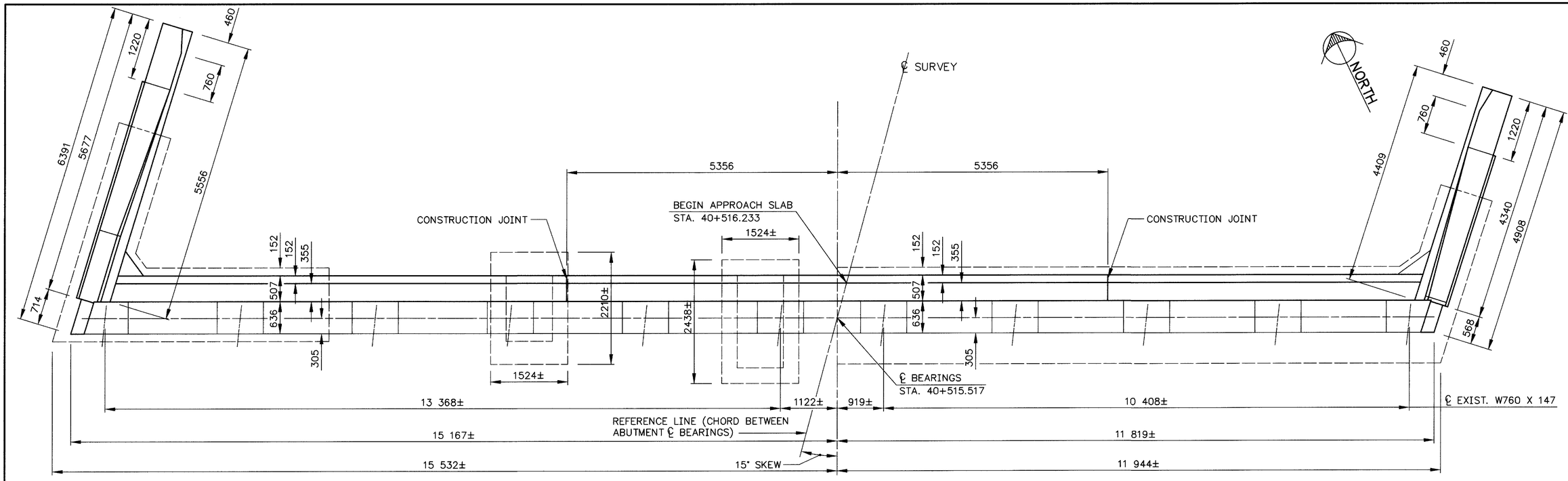
DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

REVIEWED L.D.S. DATE 5–97
STRUCTURE FILE NUMBER 4101294

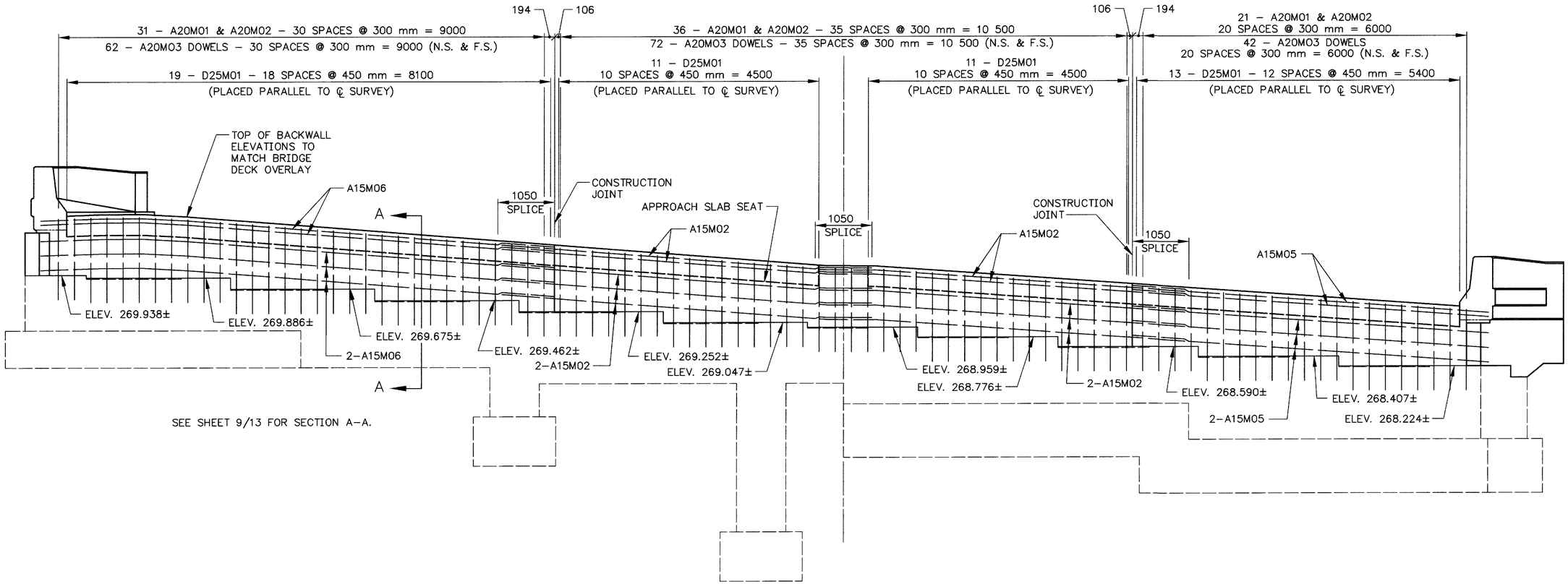
DRAWN T.D.D. REVISED
DESIGNED T.D.D. CHECKED J.E.U.

REAR ABUTMENT PLAN AND ELEVATION
BRIDGE NO. JEF–7–40478
OVER C.R. 42

JEF–7–36.967



FORWARD ABUTMENT PLAN



SEE SHEET 9/13 FOR SECTION A–A.

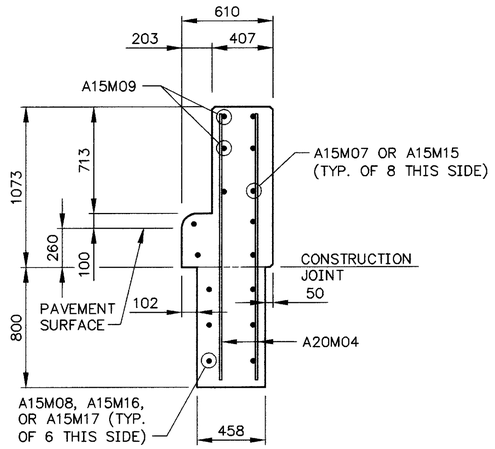
FORWARD ABUTMENT ELEVATION

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

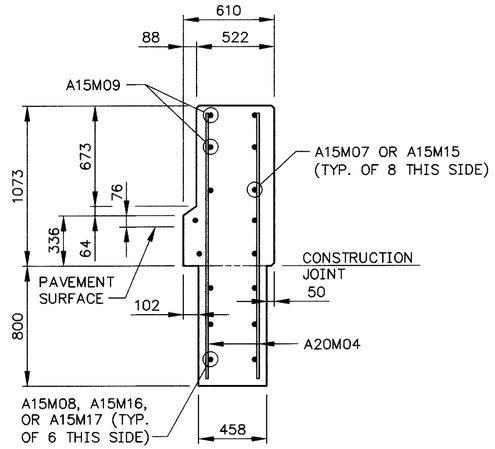
DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101294	

FORWARD ABUTMENT PLAN AND ELEVATION
BRIDGE NO. JEF–7–40478
OVER C.R. 42

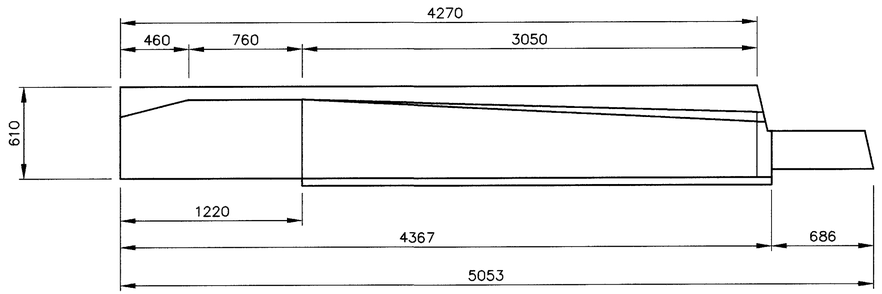
JEF–7–36.967

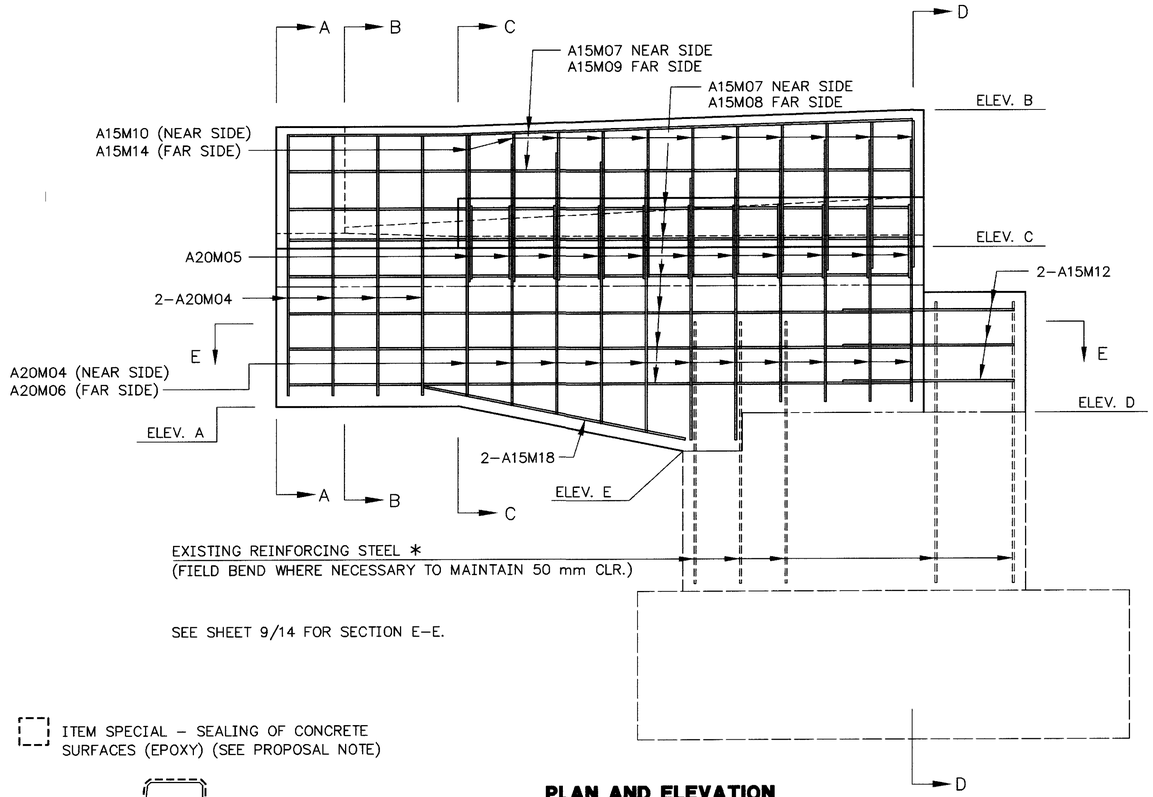


SECTION A-A



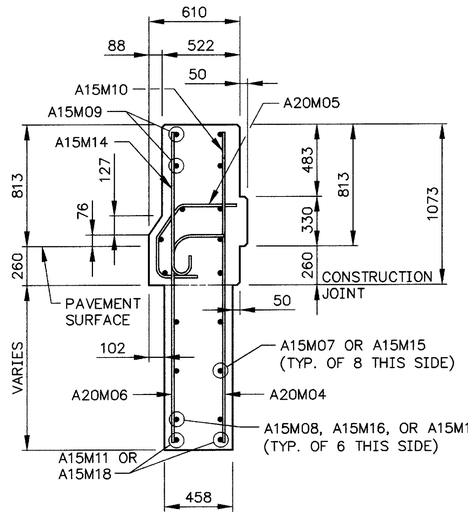
SECTION B-B



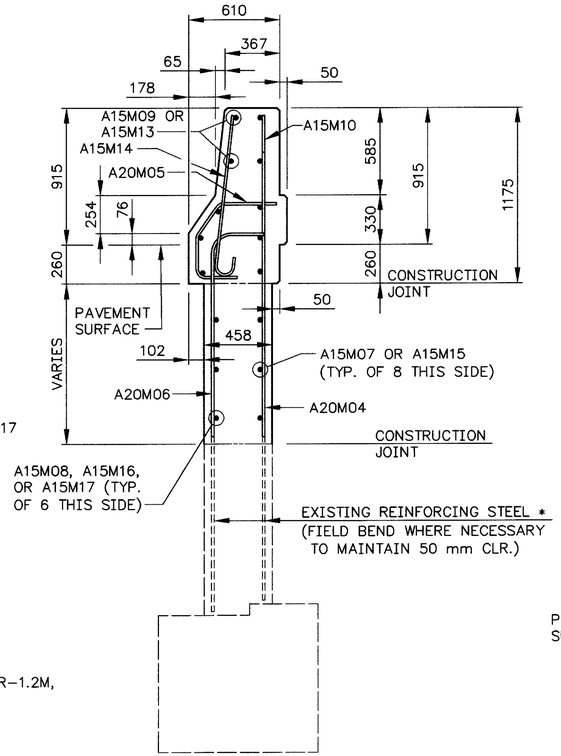


PLAN AND ELEVATION

EAST WINGWALL REAR ABUTMENT



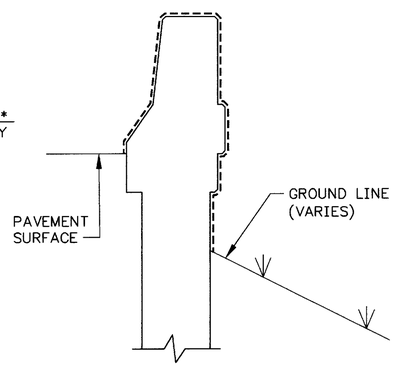
SECTION C-C



SECTION D-D

SEE SHEET 13/13 FOR REINFORCING STEEL LIST.

FOR ADDITIONAL DETAILS SEE STD. DWGS. GR-1.1M, GR-1.2M, AND GR-3.1M.



CONCRETE SEALER

* ANY EXISTING REINFORCING STEEL THAT IS TO BE REUSED IN THE NEW CONSTRUCTION, IS DAMAGED BY THE CONTRACTOR'S REMOVAL AND DEEMED UNUSABLE BY THE ENGINEER, SHALL BE REPLACED WITH NEW STEEL AT THE CONTRACTOR'S EXPENSE. NEW REINFORCEMENT STEEL SHALL BE 25M IN SIZE AND DOWELED 660 mm INTO THE EXISTING CONCRETE AS PER ITEM 510 - DOWEL HOLES.

TABLE OF ELEVATIONS						
ELEVATION		A	B	C	D	E
FORWARD ABUTMENT	WEST WINGWALL	269.975	271.950	271.035	269.938	269.698
	EAST WINGWALL	268.262	270.237	269.322	268.224	268.011
REAR ABUTMENT	WEST WINGWALL	270.484	272.459	271.544	270.434	270.279
	EAST WINGWALL	268.628	270.603	269.688	268.578	268.326

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED T.D.D. | DRAWN T.D.D. | REVIEWED L.D.S. | DATE 5-97
CHECKED J.E.U. | REVISED | STRUCTURE FILE NUMBER 4101294

ABUTMENT DETAILS
BRIDGE NO. JEF-7-40478
OVER C.R. 42

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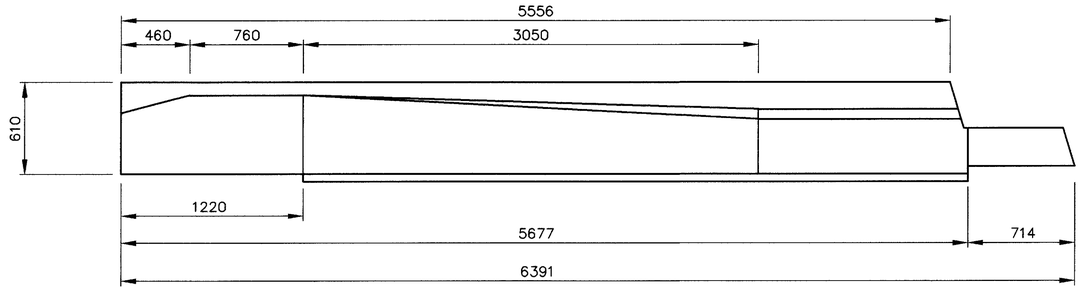
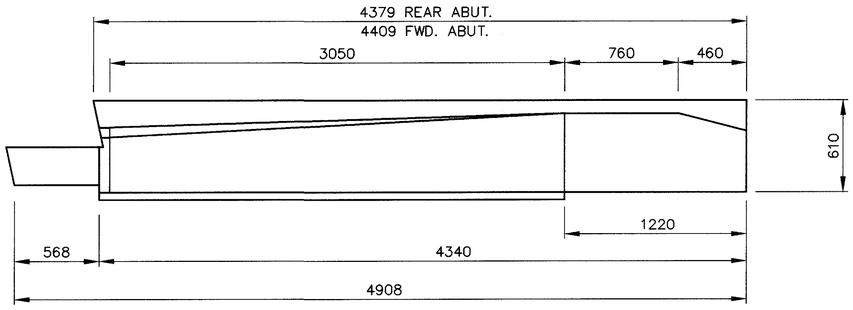
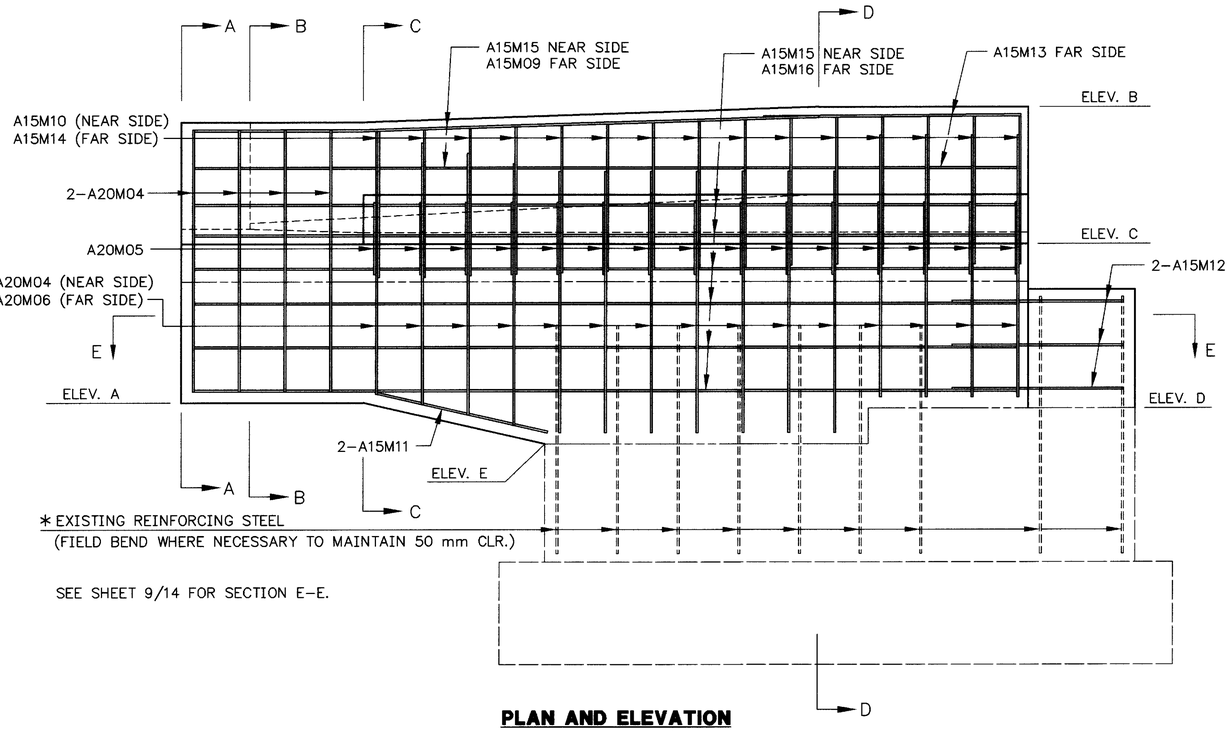
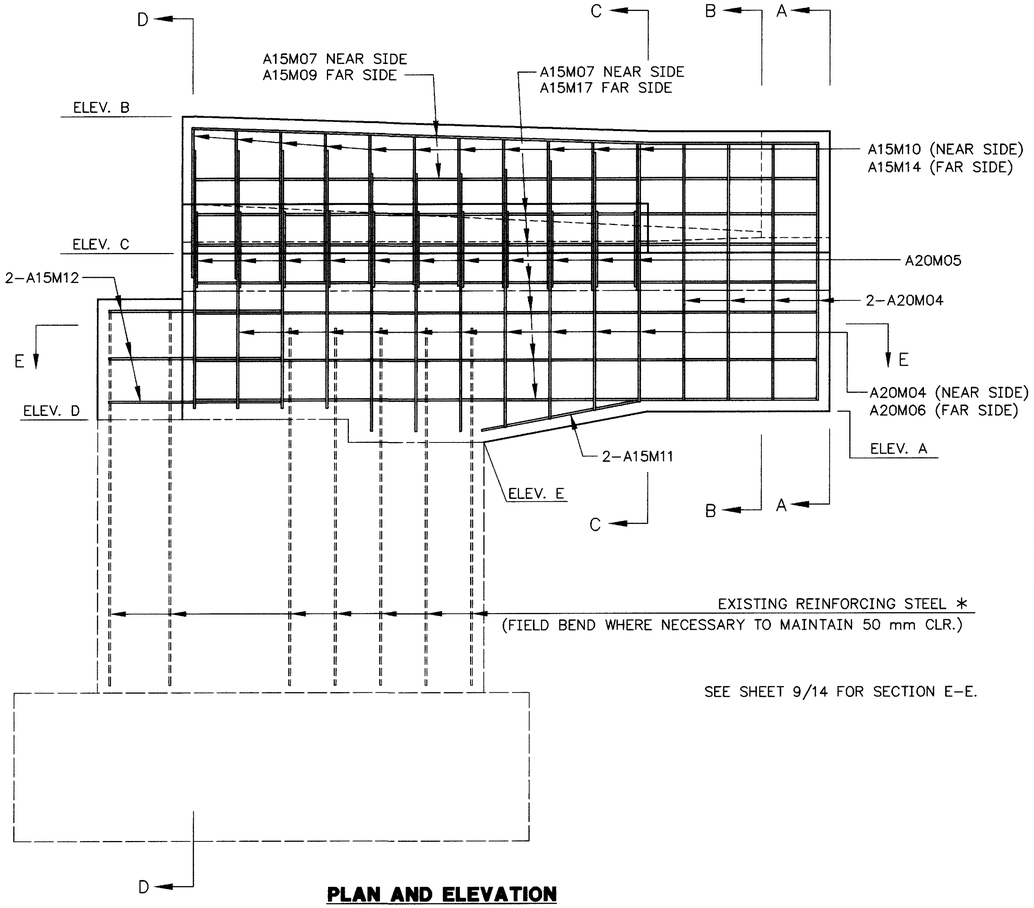






PLAN AND ELEVATION

WEST WINGWALL FORWARD ABUTMENT



PLAN AND ELEVATION

WEST WINGWALL REAR ABUTMENT
EAST WINGWALL FORWARD ABUTMENT
(WEST WINGWALL REAR ABUTMENT SHOWN, EAST WINGWALL FORWARD ABUTMENT SIMILAR)

* ANY EXISTING REINFORCING STEEL THAT IS TO BE REUSED IN THE NEW CONSTRUCTION, IS DAMAGED BY THE CONTRACTOR'S REMOVAL AND DEEMED UNUSABLE BY THE ENGINEER, SHALL BE REPLACED WITH NEW STEEL AT THE CONTRACTOR'S EXPENSE. NEW REINFORCEMENT STEEL SHALL BE 25M IN SIZE AND DOWELED 660 mm INTO THE EXISTING CONCRETE AS PER ITEM 510 – DOWEL HOLES.

SEE SHEET 7/13 FOR WINGWALL SECTIONS.

FOR ELEVATIONS SEE TABLE OF ELEVATIONS ON SHEET 7/13.

SEE SHEET 13/13 FOR REINFORCING STEEL LIST.

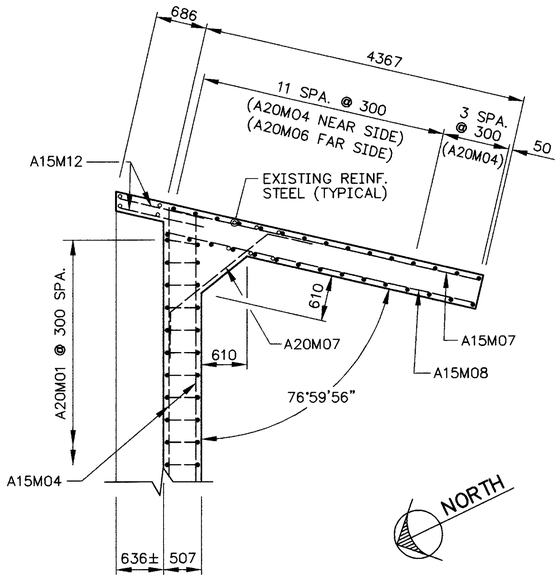
FOR ADDITIONAL DETAILS SEE STD. DWGS. GR–1.1M, GR–1.2M, AND GR–3.1M.

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

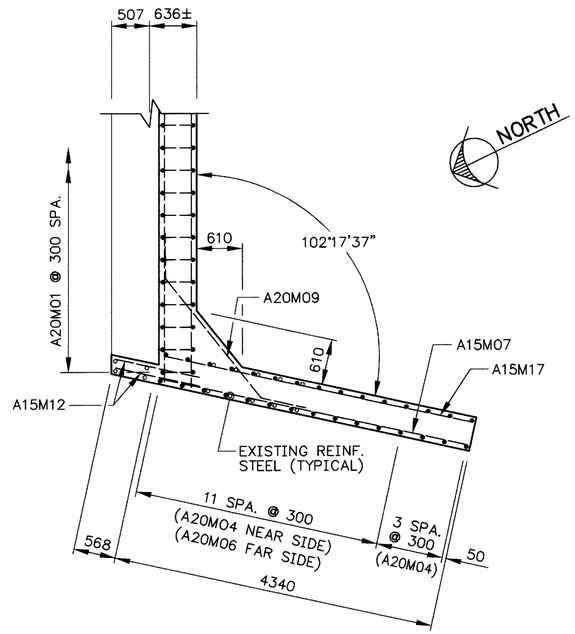
DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
J.E.U.		4101294	

ABUTMENT DETAILS
BRIDGE NO. JEF–7–40478
OVER C.R. 42

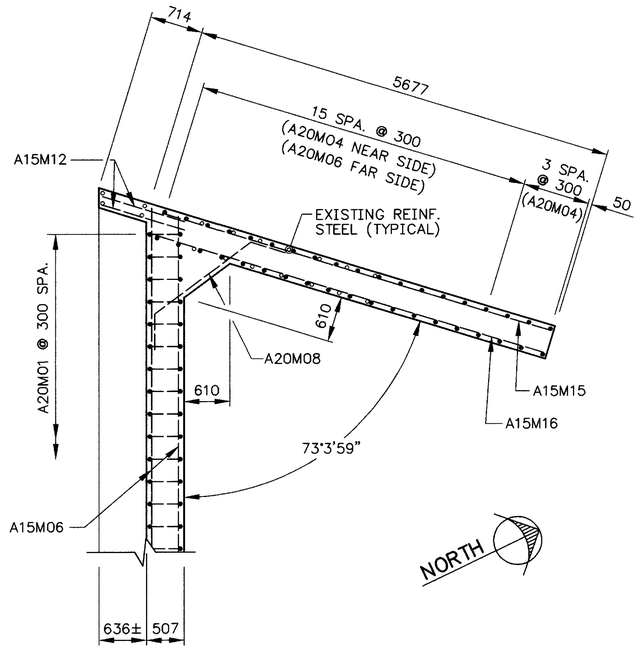
JEF–7–36.967



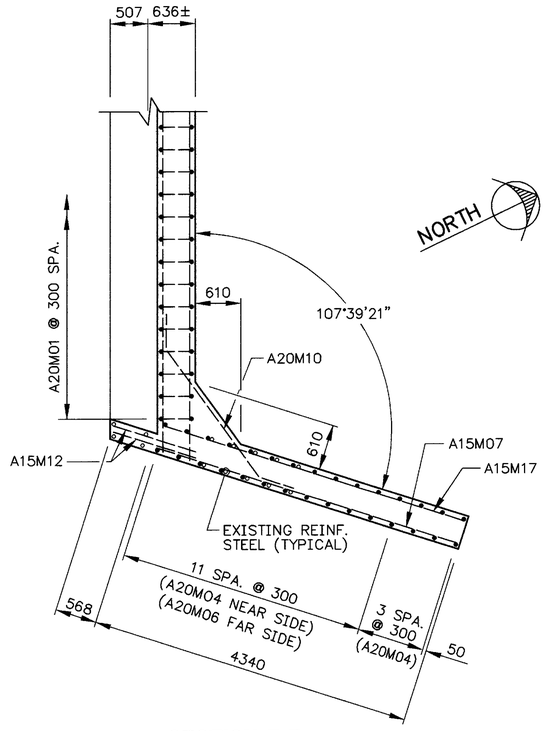
SECTION E-E
EAST WINGWALL REAR ABUTMENT



SECTION E-E
WEST WINGWALL REAR ABUTMENT



SECTION E-E
WEST WINGWALL FORWARD ABUTMENT



SECTION E-E
EAST WINGWALL FORWARD ABUTMENT

DESIGNED T.D.D.
DRAWN T.D.D.
CHECKED J.E.U.
REVIEWED L.D.S.
REVISED
DATE 5-97
STRUCTURE FILE NUMBER 4101294

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

ABUTMENT DETAILS
BRIDGE NO. JEF-7-40478
OVER C.R. 42

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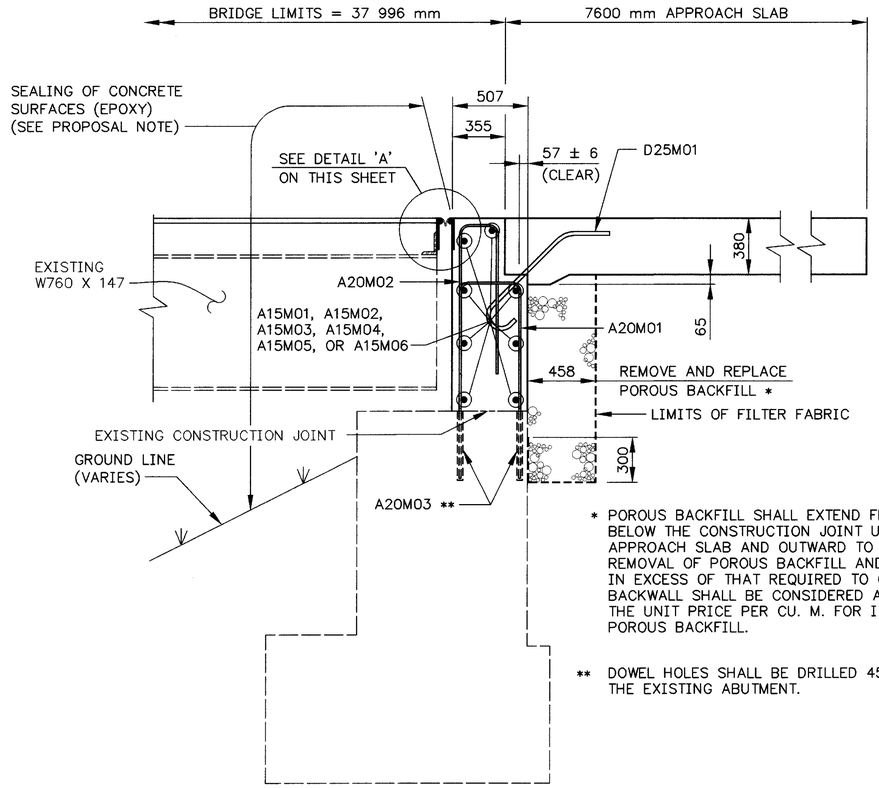
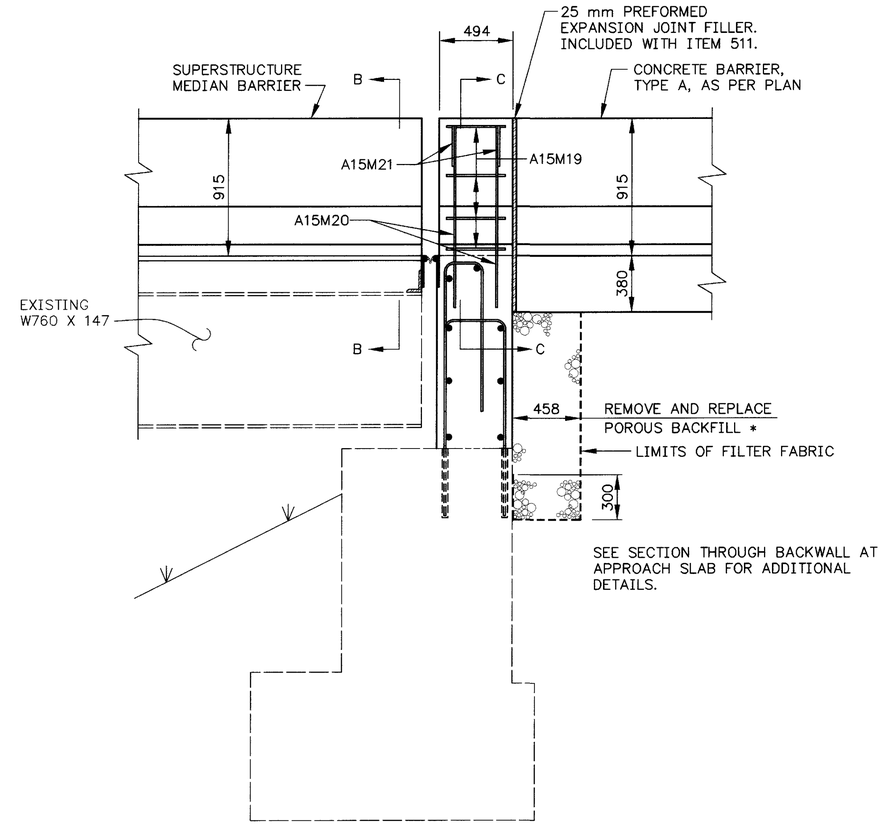


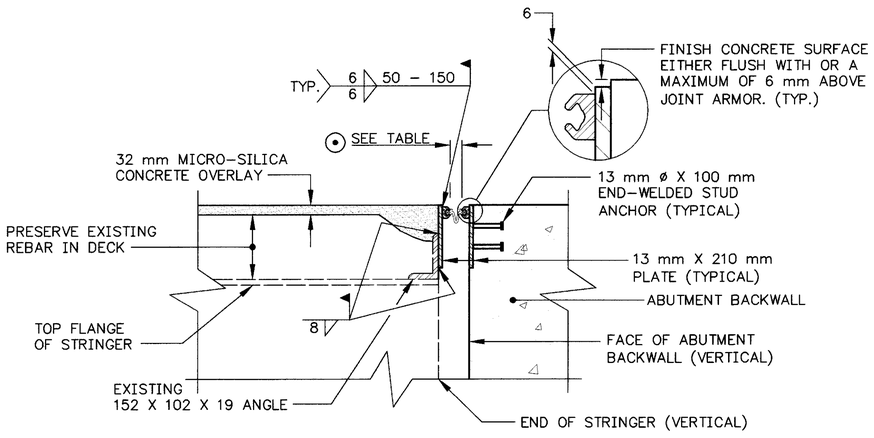
* POROUS BACKFILL SHALL EXTEND FROM 458 mm BELOW THE CONSTRUCTION JOINT UPWARD TO THE APPROACH SLAB AND OUTWARD TO THE WINGWALLS. REMOVAL OF POROUS BACKFILL AND EXCAVATION IN EXCESS OF THAT REQUIRED TO CONSTRUCT THE BACKWALL SHALL BE CONSIDERED AS PAID FOR IN THE UNIT PRICE PER CU. M. FOR ITEM 518, POROUS BACKFILL.

** DOWEL HOLES SHALL BE DRILLED 450 mm INTO THE EXISTING ABUTMENT.



SEE SECTION THROUGH BACKWALL AT APPROACH SLAB FOR ADDITIONAL DETAILS.

SECTION A THROUGH BACKWALL AT APPROACH SLAB



DETAIL A

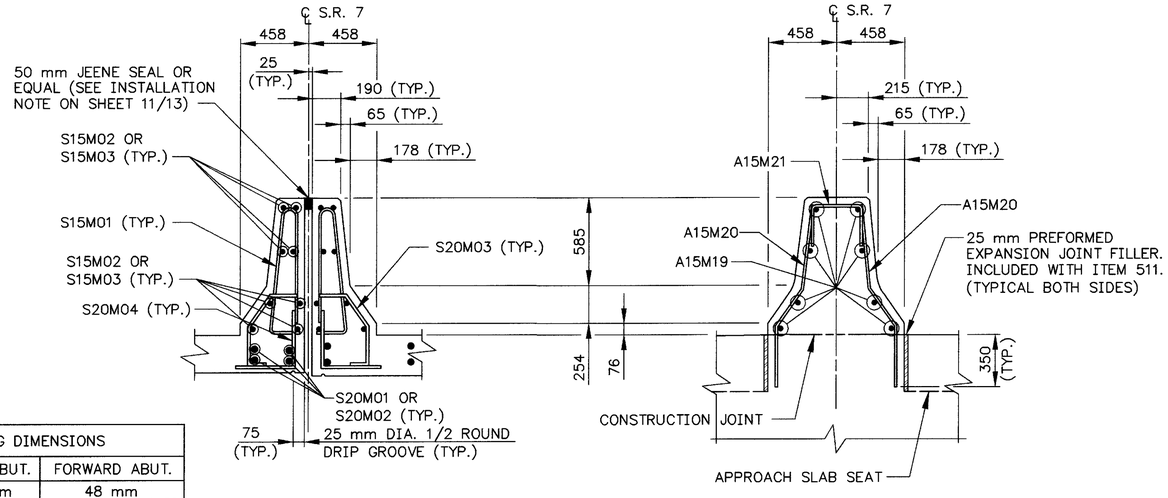
ALL PARTS OF THE JOINT ASSEMBLY SHALL BE IN ACCORDANCE WITH STD. DWG. EXJ-4-87M SHEET 5 OF 5.

A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT TO ASSIST AND ADVISE IN THE INITIAL INSTALLATION OF THIS SEAL ON THE PROJECT AND AS NEEDED OTHERWISE.

PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIAL, AND INCIDENTALS NEEDED TO PERFORM THIS WORK SHALL BE INCLUDED IN THE METER PRICE BID FOR ITEM 516, STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEAL.

⊙ JOINT OPENING DIMENSIONS		
TEMPERATURE (°C)	REAR ABUT.	FORWARD ABUT.
0° C	45 mm	48 mm
5° C	44 mm	46 mm
10° C	43 mm	44 mm
15° C	42 mm	42 mm
20° C	41 mm	40 mm
25° C	40 mm	40 mm
30° C	40 mm	40 mm
35° C	40 mm	40 mm

SECTION THROUGH BACKWALL AT MEDIAN BARRIER



SECTION B-B

SECTION C-C

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED	REVIEWED	DATE	STRUCTURE FILE NUMBER
T.D.D.	L.D.S.	5-97	4101294
DRAWN	REVISED		
T.D.D.			
CHECKED			
J.E.U.			

ABUTMENT AND END FINISH DETAILS
BRIDGE NO. JEF-7-40478
OVER C.R. 42

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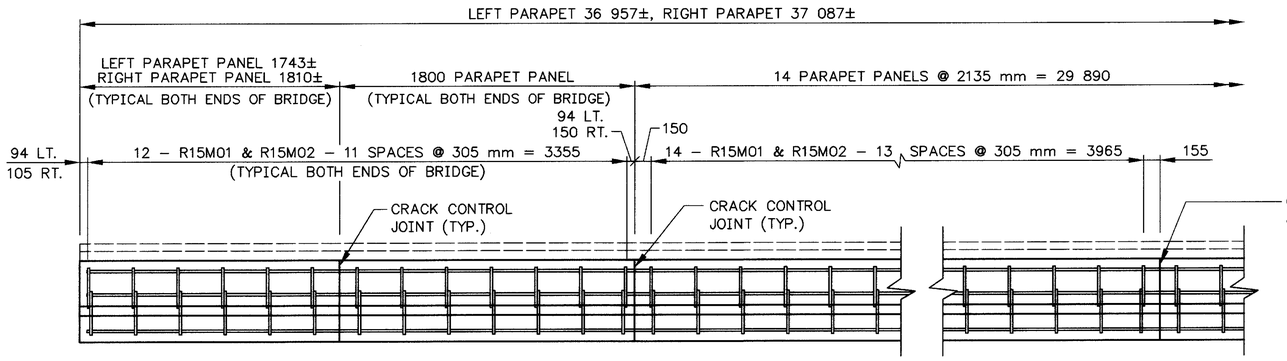
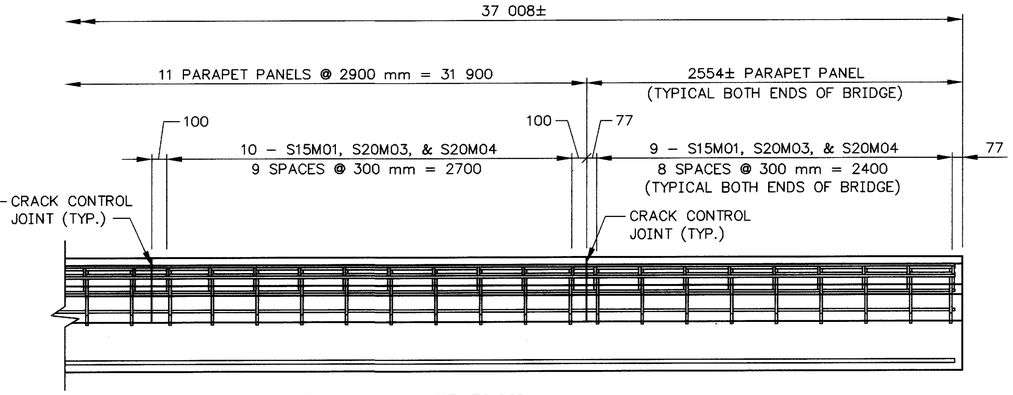


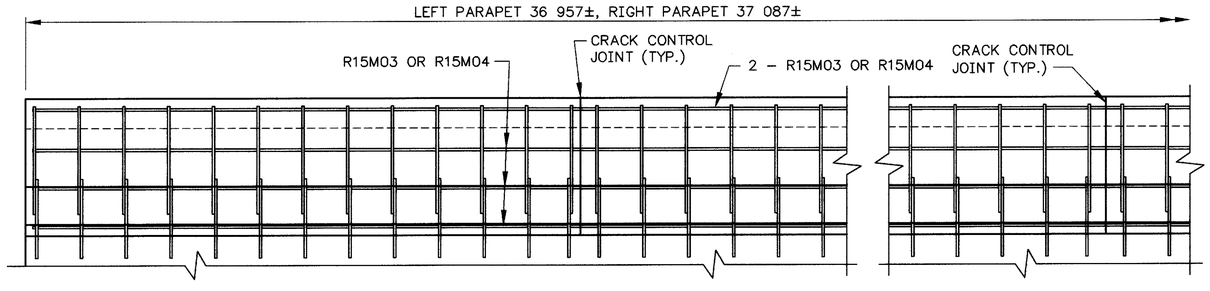
PARAPET PLAN

EACH LONGITUDINAL LINE OF REINFORCING STEEL SHALL CONSIST OF 4–R15M03 AND 1–R15M04 WITH A 1050 mm MIN. LAP SPLICE. THE R15M04 SHALL BE USED IN PLACE OF THE R15M03 TO FINISH OUT THE TOTAL LENGTH OF REINFORCING IN THE DECK.

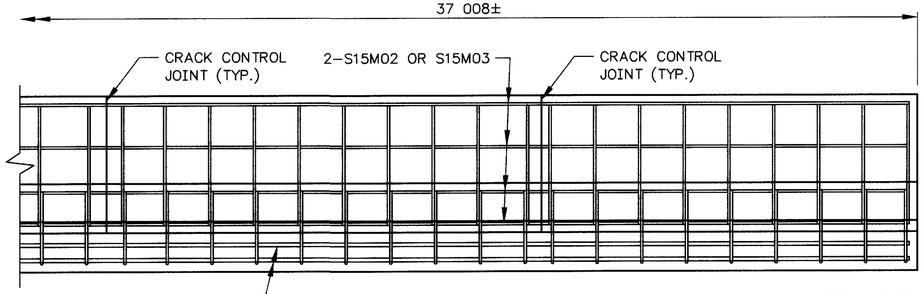


MEDIAN BARRIER PLAN

EACH LONGITUDINAL LINE OF BARRIER REINFORCING STEEL SHALL CONSIST OF 4–S15M02 AND 1–S15M03 WITH A 1050 mm MIN. LAP SPLICE. THE S15M03 SHALL BE USED IN PLACE OF THE S15M02 TO FINISH OUT THE TOTAL LENGTH OF REINFORCING IN THE DECK.

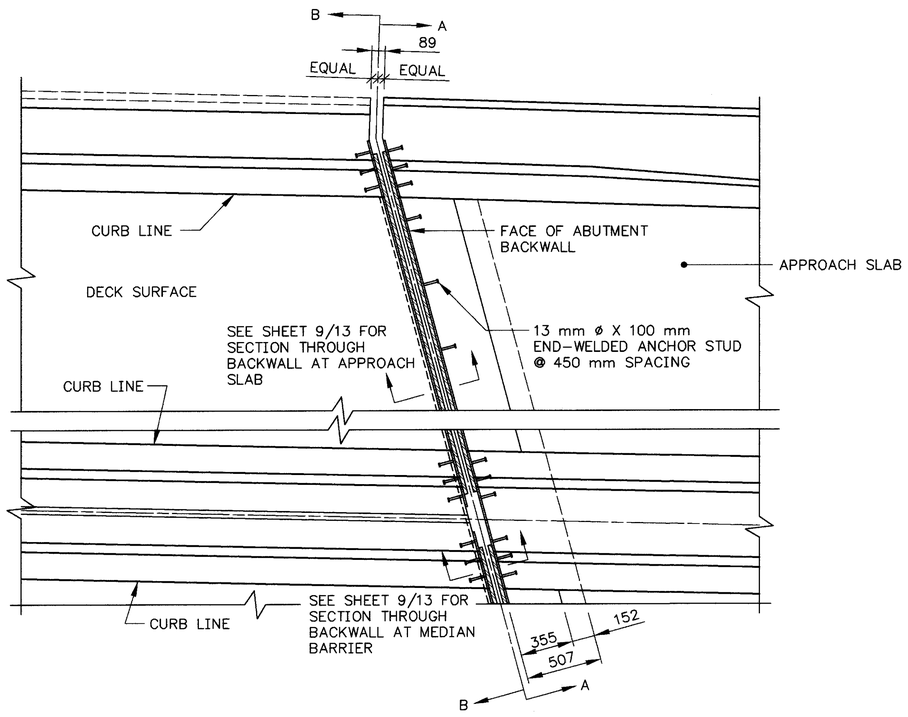


ELEVATION

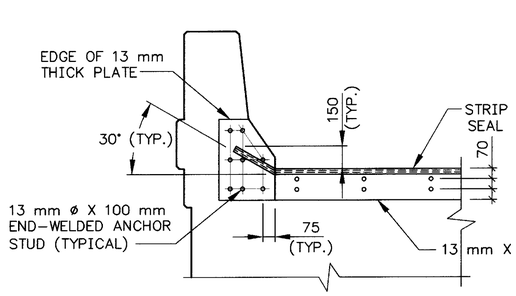


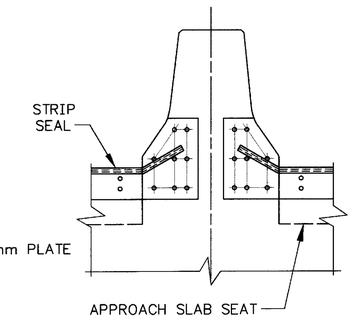
ELEVATION

EACH LONGITUDINAL LINE OF DECK REINFORCING STEEL SHALL CONSIST OF 4–S20M01 AND 1–S20M02 WITH A 1150 mm MIN. LAP SPLICE. THE S20M02 SHALL BE USED IN PLACE OF THE S20M01 TO FINISH OUT THE TOTAL LENGTH OF REINFORCING IN THE DECK.

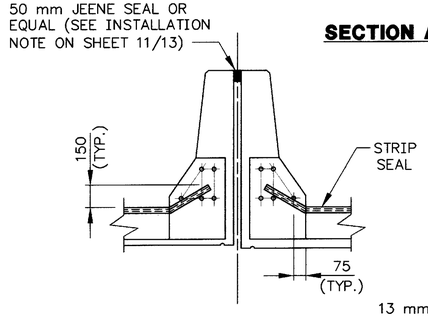


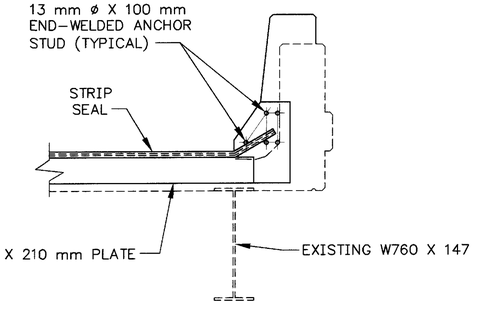
PARTIAL PLAN OF EXPANSION JOINT





SECTION A-A





SECTION B-B

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED	DRAWN	REVIEWED	DATE
T.D.D.	T.D.D.	L.D.S.	5–97
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J.E.U.		4101294	

ABUTMENT, END FINISH AND PARAPET DETAILS
BRIDGE NO. JEF–7–40478
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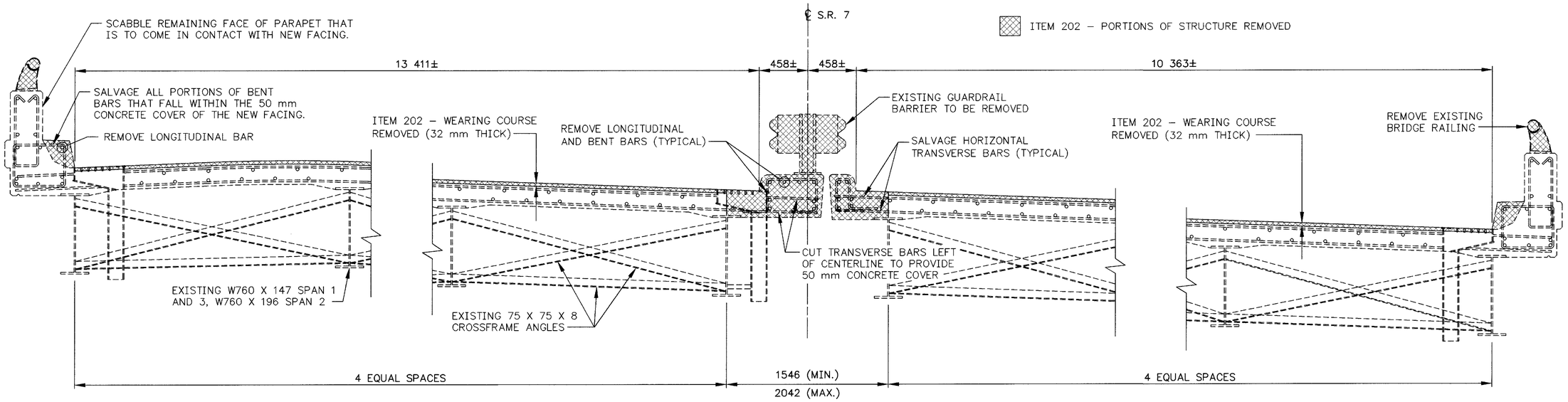
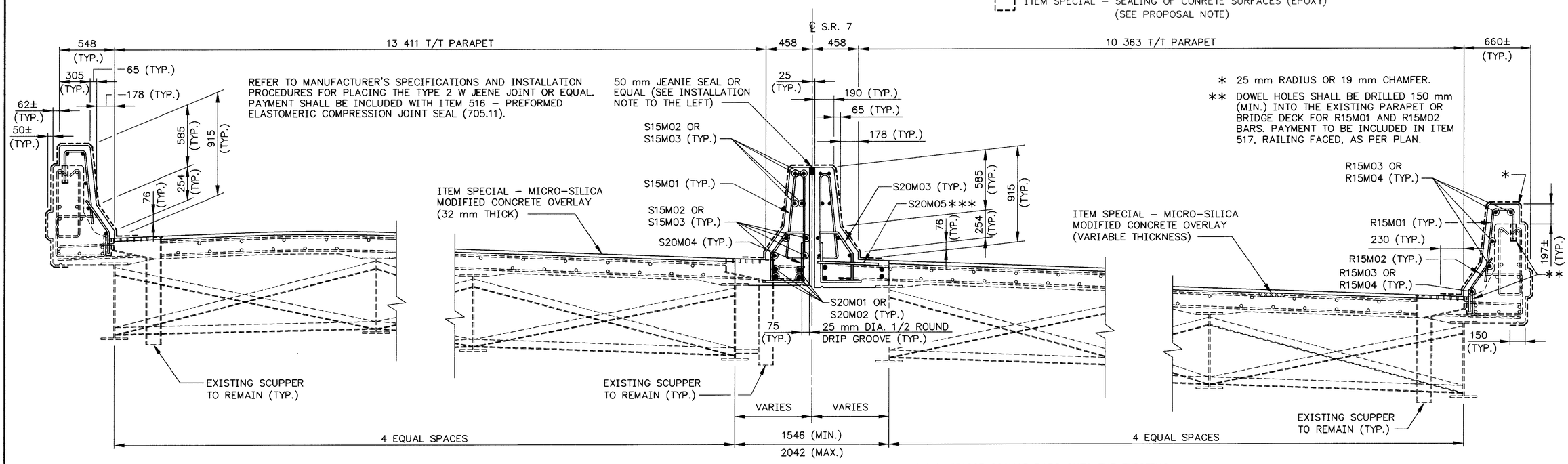


TYPICAL REMOVAL DETAILS

ITEM SPECIAL – SEALING OF CONRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE)



*** SPLICE S20M05 BARS ONTO THE EXISTING TOP TRANSVERSE BAR. FIELD BEND OR CUT S20M05 BARS TO MAINTAIN 50 mm CONCRETE COVER.

TRANSVERSE SECTION

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

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T.D.D.	T.D.D.	L.D.S.	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
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SUPERSTRUCTURE DETAILS
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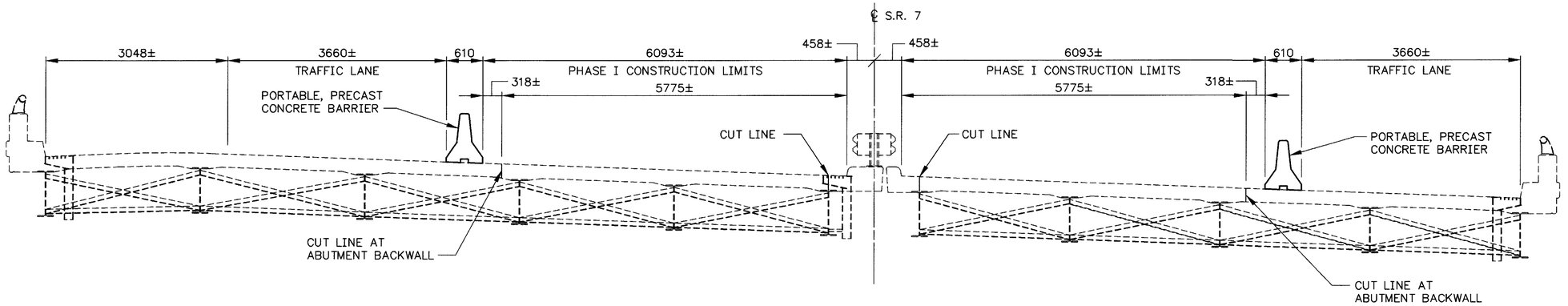
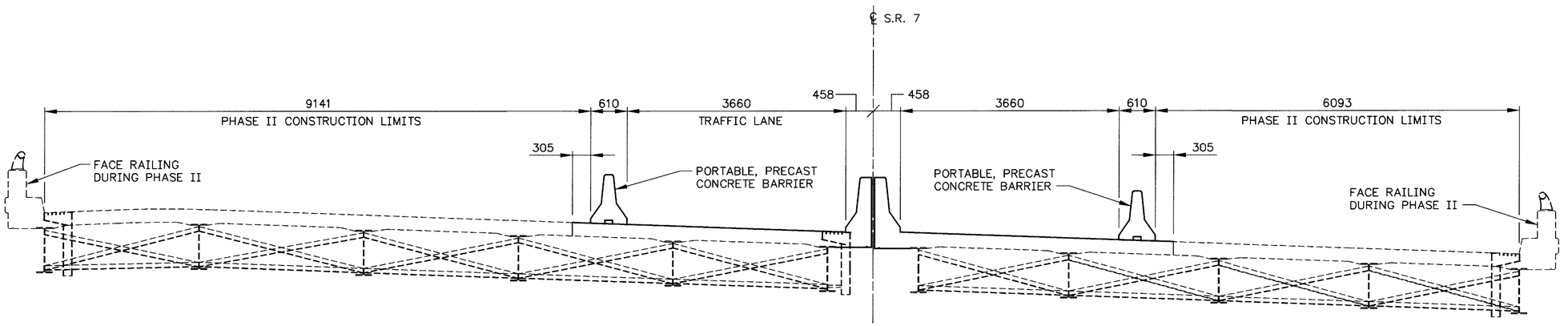


NOTE:

TRAFFIC WILL BE MAINTAINED IN THE DRIVING LANE AND SHOULDER DURING PHASE I CONSTRUCTION.

PHASE I TYPICAL SECTION



NOTE:

TRAFFIC WILL BE MAINTAINED IN THE PASSING LANE DURING PHASE II CONSTRUCTION.

PHASE II TYPICAL SECTION

NOTE:

PHASE 1 & 2 REPRESENT THE ORDER AND LOCATION THAT TRAFFIC WILL BE MAINTAINED, WHILE WORK IS DONE ON THE OPPOSITE SIDE.

FOR ADDITIONAL MAINTENANCE OF TRAFFIC SEE STANDARD DRAWING MT-95.40M.

ALL PORTABLE, PRECAST CONCRETE BARRIER AND NEW BRIDGE PARAPETS WILL HAVE ITEM 614 – BARRIER REFLECTOR, TYPE B @ 7.6 m C/C ON SIDES THAT ARE UP AGAINST THE TRAVELED LANES, IN ACCORDANCE WITH THE ROADWAY PLANS.

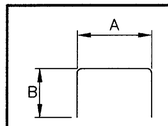
ITEM 614 – OBJECT MARKERS SHALL BE PLACED ON ALL PORTABLE, PRECAST CONCRETE BARRIER IN ACCORDANCE WITH THE ROADWAY PLANS.

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

DESIGNED T.D.D. | DRAWN T.D.D. | REVIEWED L.D.S. | DATE 5-97
CHECKED J.E.U. | REVISED | STRUCTURE FILE NUMBER 4101294

MAINTENANCE OF TRAFFIC SECTIONS
BRIDGE NO. JEF-7-40478
OVER C.R. 42

JEF-7-36.967



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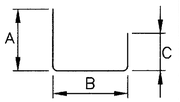

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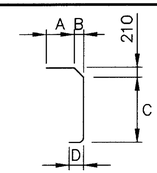

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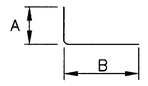

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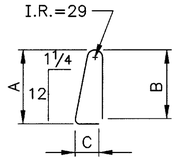

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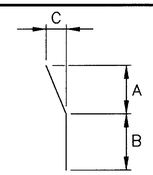

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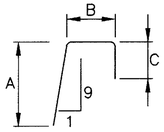

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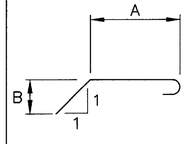

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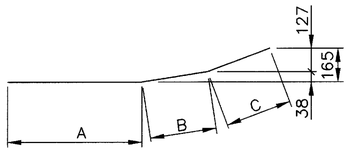

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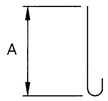

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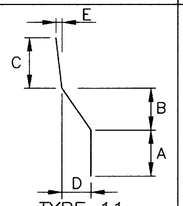

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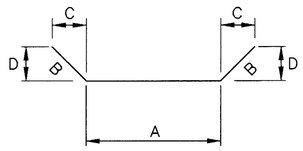

TYPE 12

NOTES:

BAR MARK:
THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST TWO DIGITS INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, A15M01 IS A NO. 15M BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. R INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

REINFORCING STEEL SAMPLES:
REFER TO CMS SECTION 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.

EPOXY COATED REINFORCING STEEL:
ALL REINFORCING STEEL SHALL BE EPOXY COATED. IN ACCORDANCE WITH THE REQUIREMENTS OF CMS SECTION 509 AND 509.09, THE TOP AND BOTTOM OF ALL LONGITUDINAL AND TRANSVERSE EPOXY COATED REINFORCING STEEL SHALL BE SUPPORTED BY APPROVED EPOXY COATED DEVICES WITH SPACING NOT EXCEEDING 915 mm CENTERS IN EACH DIRECTION. BROKEN CONCRETE, BRICKS, ETC. SHALL NOT BE USED FOR SUPPORT OF EPOXY COATED REINFORCING STEEL.

REINFORCING STEEL LIST (ABUTMENTS)

MARK	NUMBER REAR	NUMBER FWD.	NUMBER TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSIONS (mm) A	B	C	D	E
A15M01	16		16	6825	171	ST.					
A15M02		16	16	6950	174	ST.					
A15M03	8		8	9575	120	ST.					
A15M04	8		8	6200	78	ST.					
A15M05		8	8	6600	83	ST.					
A15M06		8	8	9400	118	ST.					
A15M07	16	8	24	4225	159	ST.					
A15M08	6		6	4150	39	ST.					
A15M09	4	4	8	4220	53	9	3050	738	432		
A15M10	22	26	48	1000	75	ST.					
A15M11	2	4	6	1200	11	ST.					
A15M12	12	12	24	1150	43	ST.					
A15M13		2	2	1700	5	ST.					
A15M14	22	26	48	1180	89	10	1000				
A15M15		8	8	5575	70	ST.					
A15M16		6	6	5450	51	ST.					
A15M17	6	6	12	4275	80	ST.					
A15M18	2		2	1750	5	ST.					
A15M19	8	8	16	375	9	ST.					
A15M20	4	4	8	1250	16	11	410	250	550	175	60
A15M21	2	2	4	800	5	1	325	275			
A20M01	87	88	175	1600	659	1	405	650			
A20M02	87	88	175	2350	968	1	255	1100			
A20M03	174	176	350	1150	948	ST.					
A20M04	38	42	80	1750	330	ST.					
A20M05	22	26	48	1125	127	3	380	150	270	275	
A20M06	22	26	48	1600	181	4	350	1300			
A20M07	3		3	3192	23	12	1746	610	380	476	
A20M08		3	3	2778	20	12	1644	482	286	386	
A20M09	3		3	3598	25	12	2152	610	476	380	
A20M10		3	3	3240	23	12	2102	482	390	286	
ABUTMENTS SUBTOTAL					5411						

REINFORCING STEEL FOR ABUTMENTS SHALL BE INCLUDED WITH ITEM 511, CLASS C CONCRETE, ABUTMENTS FOR PAYMENT.

REINFORCING STEEL LIST (ABUTMENTS)

MARK	NUMBER LT.	NUMBER RT.	NUMBER TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSIONS (mm) A	B	C	D	INC.
D25M01	54	54	108	1540	653	8	820	305			
ABUTMENTS SUBTOTAL					653						
ABUTMENTS TOTAL					6064						

REINFORCING STEEL LIST (SUPERSTRUCTURE)

MARK	NUMBER LT.	NUMBER RT.	NUMBER TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSIONS (mm) A	B	C	D	INC.
S15M01	128	128	256	1800	723	5	840	765	180		
S15M02	24	24	48	12 000	904	ST.					
S15M03	8	8	16	4150	104	ST.					
S20M01	12	12	24	12 000	678	ST.					
S20M02	4	4	8	4400	83	ST.					
S20M03	128	128	256	760	458	3	175	150	260	125	
S20M04	128	128	256	750	452	4	390	400			
S20M05		185	185	600	261	ST.					
SUPERSTRUCTURE TOTAL					3663						

REINFORCING STEEL FOR SUPERSTRUCTURE SHALL BE INCLUDED WITH ITEM 511, CLASS S CONCRETE, SUPERSTRUCTURE FOR PAYMENT.

REINFORCING STEEL LIST (RAILING FACING)

MARK	NUMBER LT.	NUMBER RT.	NUMBER TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSIONS (mm) A	B	C	D
R15M01	122	122	244	1150	440	7	720	205	300	
R15M02	122	122	244	570	218	6	300	210	210	
R15M03	15	15	30	12 000	565	ST.				
R15M04	5	5	10	4150	65	ST.				
RAILING FACING TOTAL					1288					

REINFORCING STEEL FOR RAILING FACING SHALL BE INCLUDED WITH ITEM 517, RAILING FACED, AS PER PLAN FOR PAYMENT.

DESIGN AGENCY
KARL R. ROHRER ASSOC. INC.
3810 RIDGEWOOD ROAD
AKRON, OHIO 44321

REVIEWED L.D.S. DATE 5-97 STRUCTURE FILE NUMBER 4101294

DRAWN T.D.D. REVISED

DESIGNED T.D.D. CHECKED J.E.U.

REINFORCING STEEL SCHEDULE
BRIDGE NO. JEF-7-40478
OVER C.R. 42

JEF-7-36.967

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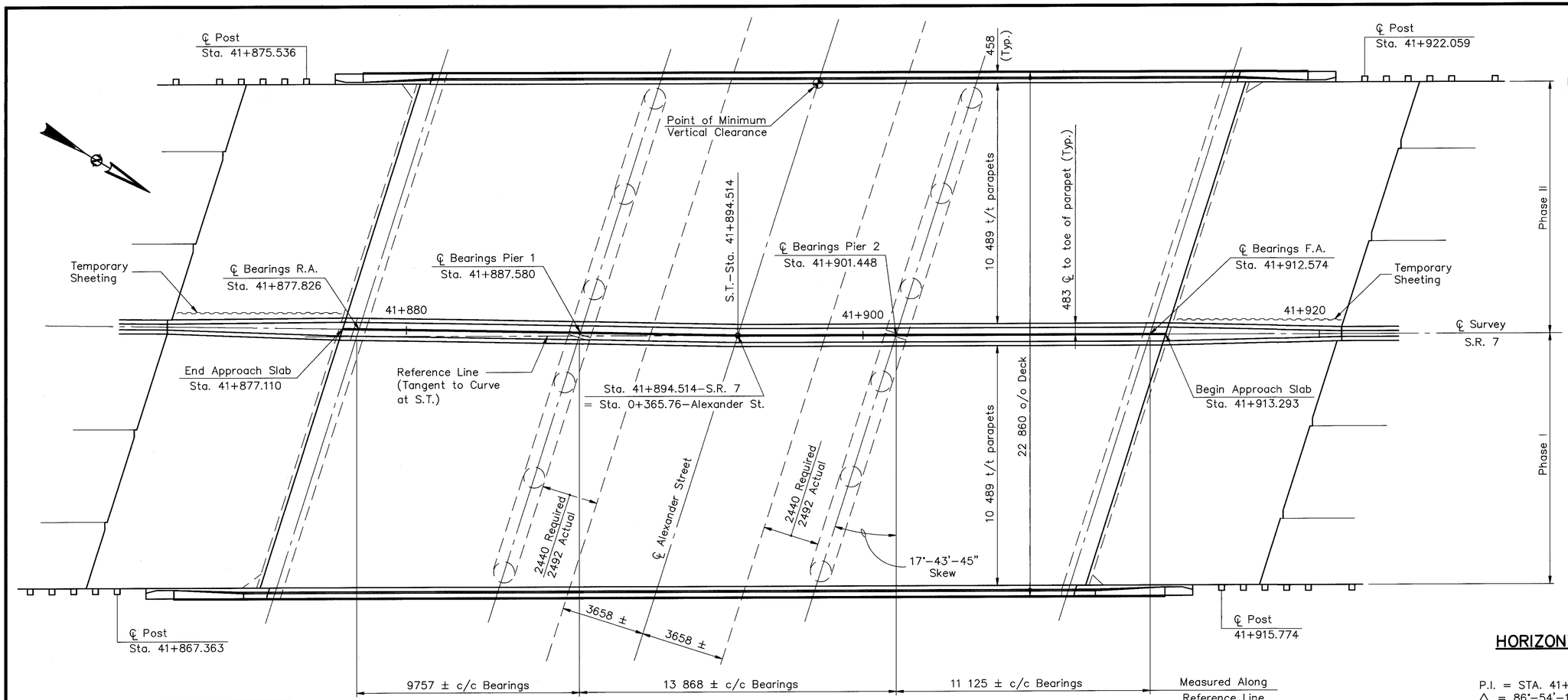
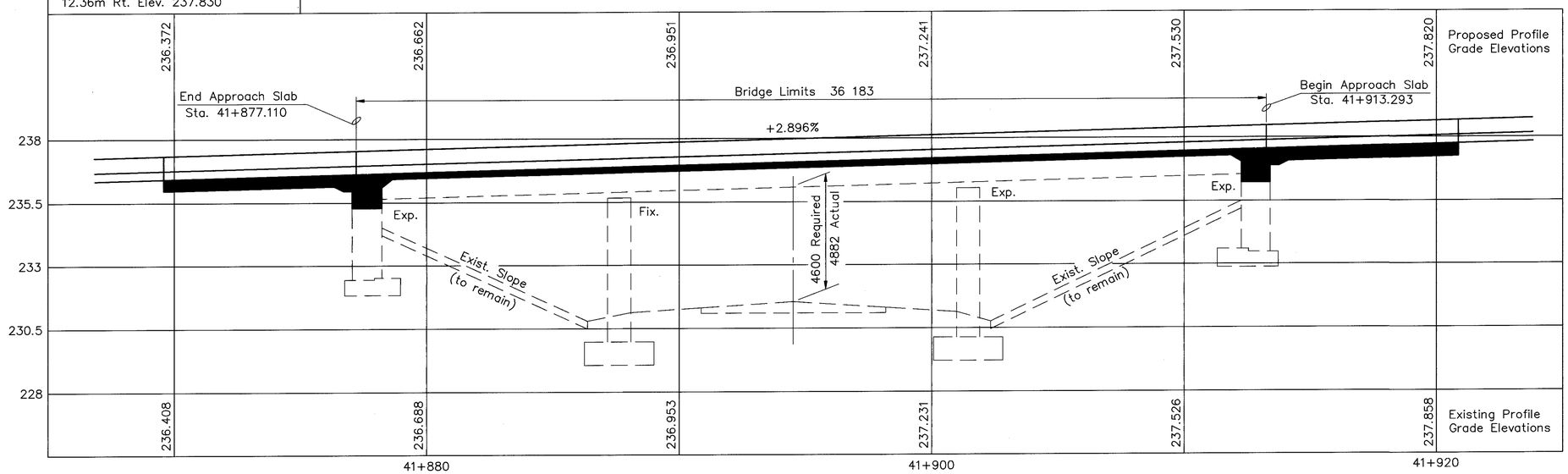


PLAN

BENCHMARK:
Top Hub Sta. 41+925 ℄ SR7,
12.36m Rt. Elev. 237.830



ELEVATION

All Dimensions are in Millimeters.
All Elevations and Stations are in Meters.

HORIZONTAL CURVE DATA

℄ Survey

P.I. = STA. 41+510.474
Δ = 86°–54'–11" Lt.
L_S = 106.680 m
Θ_S = 5°–15'
p = 0.814 m
k = 53.325 m

T_S = 605.577 m
E_S = 220.867 m
Δ_C = 76°–24'–11"
L_C = 776.257 m
R_C = 582.126 m

EXISTING STRUCTURE

TYPE: Continuous Steel Beams with Reinforced Concrete Deck and Substructure
SPANS: 9754 ±, 13 868 ±, 11 125 ± c/c Bearings
ROADWAY: 22 250 ± f/f Parapets with 305 ± Curbs
SKEW: 17°–43'–45" Left Forward
ALIGNMENT: Tangent and Spiral
DESIGN LOADING: CF–2000 (57)
YEAR BUILT: 1968
STRUCTURE FILE NUMBER: 4101324
APPROACH SLABS: 7620 ±
WEARING SURFACE: Concrete Overlay

PROPOSED STRUCTURE

PROPOSED WORK: Replace Deck, Provide Semi–Integral Abutments; Jack Beams for New Elastomeric Bearings, Epoxy Seal Railings, and Provide New Approach Slabs.

TYPE: Continuous Steel Beams with Reinforced Concrete (Composite) Deck and Substructure
SPANS: 9754 ±, 13 868 ±, 11 125 ± c/c Bearings
ROADWAY: 10 489 t/t parapets each way
DESIGN LOADING: MS18 Case II & Alt. Military Loading
SKEW: 17°–43'–45" Left Forward
ALIGNMENT: Tangent and Spiral
WEARING SURFACE: Monolithic Concrete
APPROACH SLABS: 7600 (AS–1–81M)
SUPERELEVATION: Variable
LATITUDE: N40°28'30" LONGITUDE: W80°36'25"

AVG. DAILY TRAFFIC: (1995) 7180
(2015) 9350 ADTT 2338

metric units

DESIGN AGENCY
THOMAS FOK & ASSOC., LTD.
CONSULTING ENGINEERS, SURVEYORS, & PLANNERS
3986 MAHONING AVE., YOUNGSTOWN, OHIO

DESIGNED	DRAWN	REVIEWED	DATE
SJR	KRM	TF/JEU	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JDV		4101324	

GENERAL PLAN
JEF–7–41877
S.R. 7 OVER ALEXANDER STREET

JEF–7–36.97

1 / 14

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123

STRUCTURE GENERAL NOTES

metric units

REFERENCE shall be made to:

Standard Drawings

AS-1-81M	DATED	10-25-94
BR-1M	DATED	1-06-99
EXJ-4-87M	DATED	3-20-95

and Supplemental Specifications

842	DATED	1-06-99
899	DATED	10-21-98

DESIGN SPECIFICATIONS: This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1996, and the ODOT Bridge Design Manual.

DESIGN LOADING: MS18, Case I and the Alternate Military Loading.

DESIGN DATA:

Concrete Class S – compressive strength 31.0 MPa (superstructure)

Concrete Class C – compressive strength 28.0 MPa (substructure)

Reinforcing steel – ASTM A615M, A616M or A617M
Grade 400, minimum yield strength 400 MPa

DECK PROTECTION METHOD:
Epoxy coated reinforcing steel.
65 mm concrete cover.

MONOLITHIC WEARING SURFACE is assumed, for design purposes, to be 25mm thick.

PORTIONS OF STRUCTURE REMOVED, OVER 6 METER SPAN, AS PER PLAN

DESCRIPTION: This work shall consist of the removal, wholly or in part, and satisfactory disposal of portions of the existing structure as per 202 of the Construction and Material Specifications and as directed on the plans. This work shall also include any devices or structures necessary for the protection of traffic, preparation of plans for such structures, and any other work associated with removal of portions of the existing structure as described below. Care shall be taken to protect portions of the structure that are to remain and be incorporated into the proposed structure. In this respect, the use of explosives, headache balls and/or hoe ram type of equipment is prohibited.

PROTECTION OF TRAFFIC: Prior to demolition of any portions of the existing superstructure, the contractor shall submit his plans for the protection of traffic (vehicular, pedestrian, boat, etc.) adjacent to and/or under the structure to the Director for approval. These plans shall include provisions for any devices and structures that may be necessary to ensure such protection. Temporary vertical clearances specified on the plans or in the proposal shall be maintained at all times except as otherwise approved by the Director.

PROTECTION OF STEEL SUPPORT SYSTEMS: Before deck slab cutting is permitted, the outline of primary steel members in contact with the bottom of the deck shall be drawn on the surface of deck. Small diameter pilot holes shall be drilled 50 mm outside these lines to confirm the location of flange edges. Deck cuts over or within 50 mm of flange edges shall not extend lower than the bottom layer of deck slab reinforcing steel. Cuts made outside 50 mm of flange edges may extend the full depth of the deck. During cutting of the deck slab, care shall be taken not to damage steel members that are to be incorporated into the proposed structure.

REMOVAL METHODS: Concrete may be removed by cutting and by means of hand operated pneumatic hammers employing pointed or blunted chisel type tools. For removals above steel members, a hammer heavier than 16 kg but not to exceed 41 kg may be used at the approval of the Engineer, to ensure adequate depth control and to prevent nicking or gouging the primary steel members. Prior to proceding with any removal, the Contractor shall submit the removal procedure to the Engineer for review and approval.

DECK REMOVALS: Due to the possible presence of welded attachments to existing structural steel (finishing machine, scupper and form supports, etc.), care shall be taken during deck removal to avoid damaging stringers which are to remain. Stringers damaged by the Contractor's removal operations shall, at no cost to the state, be replaced or repaired. Proposed repairs, developed by a registered professional engineer, shall be submitted in writing for review and approval by the Director.

EXTRANEOUS MEMBERS: Existing extraneous members (i.e., finishing machine and form supports, etc., and the support for scuppers and bulb angles which are to be removed) attached by welded connections to portions of the top flanges designated "tension" shall be removed and the flange surfaces ground smooth. Grinding shall be carefully done and parallel to the flanges.

LOADING LIMITATIONS: No part of the structure shall be subjected to unit stresses that exceed 136.5% of the allowable unit stresses given in the AASHTO Standard Specifications for Highway Bridges due either to demolition, erection or construction methods, or to the use or movement of demolition or erection equipment on or across the structure. Structural analysis computations, by a registered professional engineer, showing the allowable stresses and the maximum stresses produced by the Contractor's methods or equipment shall be submitted to the Director for review and approval at least two weeks prior to the start of the work.

PAYMENT: This work will be paid for at the contract lump sum price bid, which price and payment shall be full compensation for all labor, equipment, materials and incidentals necessary to complete the work in conformance with these requirements, with pertinent provisions of 202, and to the satisfaction of the Engineer.

CUT LINE CONSTRUCTION JOINT PREPARATION: Saw cut boundaries of proposed concrete removals 25 mm deep. Remove concrete to a rough surface. Where practicable, the existing reinforcing steel where required in the plans shall be left in place. Install dowel bars if specified. Prior to concrete placement abrasively clean joint surface and exposed reinforcement to remove loose and disintegrated concrete and loose rust. The joint surface and exposed reinforcement shall be thoroughly cleaned of all dirt, dust, or other foreign material by the use of water, air under pressure, or other methods that produce satisfactory results. Concrete bonding surfaces shall be wet without free water as concrete is placed.

SUBSTRUCTURE CONCRETE REMOVAL shall be by means of approved pneumatic hammers employing pointed and blunt chisel tools. Hydraulic hoe-ram type hammers will not be permitted. The weight of the hammer shall not be more than 16 kg for removal within 450 mm of portions to be preserved. Outside the 450 mm limit, a hammer heavier than 16 kg, but not to exceed 41 kg, may be used at the approval of the Engineer. Pneumatic hammers shall not be placed in direct contact with reinforcing steel that is to be retained in the rebuilt structure.

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.

EXISTING STRUCTURE VERIFICATION: Details and dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and from field observations and measurements. Consequently, they are indicative of the existing structure and the proposed work but they shall be considered tentative and approximate. The Contractor is referred to CMS Sections 102.05, and 105.02.

Contract bid prices shall be based upon a recognition of the uncertainties described above and upon a prebid examination of the existing structure by the Contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the Contractor in the field.

REPLACEMENT OF EXISTING REINFORCING STEEL: Any existing reinforcing bars which are to be incorporated into the new work and which are made unusable by concrete removal operations shall be replaced with new steel. Any existing reinforcing bars deemed by the Engineer to be unusable because of corrosion shall be replaced with new steel.

EXISTING BRIDGE PLANS: The original construction plans of the existing bridge are available upon request at the District 11 Office of the OHIO DEPARTMENT OF TRANSPORTATION, 1072 W. High Ave., New Philadelphia, Ohio. 44663, Telephone (330) 339-6633.

ITEM 503 – UNCLASSIFIED EXCAVATION, AS PER PLAN: Unclassified excavation shall be in accordance with 503 except that the backfill material behind the abutments shall be 203 material placed in 150 mm lifts and compacted in accordance with 304.04.

ITEM 842, CLASS C CONCRETE, ABUTMENT, AS PER PLAN: Install a 900 mm wide strip, 2.5 mm thick, general purpose, heavy duty neoprene sheet with nylon fabric reinforcement at locations shown in the plans. Secure the 1 meter wide neoprene sheeting to the concrete with 32 x 3 mm (length x shank diameter) galvanized button head spikes through a 25 mm outside diameter, 3 mm galvanized washer. Maximum fastener spacing is 225 mm. Other similar galvanized devices which will not damage either the neoprene or the concrete may be used subject to the approval of the Engineer.

Center the neoprene strips on all joints. For horizontal joints, secure the horizontal neoprene strip by using a single line of fasteners, starting at 150 mm (+/-) from the top of the neoprene strip. For the vertical joints secure the vertical neoprene strip by using a single vertical line of fasteners, starting at 150 mm (+/-) from the vertical edge of the neoprene strip nearest to the centerline of roadway. For vertical joints, install 2 additional fasteners at 150 mm center to center across the top of the neoprene strip on the same side of the vertical joint as the single vertical row of fasteners is located.

The vertical neoprene strips should completely overlap the horizontal strips. Laps in the length of the horizontal strips due to material manufacturing shall be at least 300 mm in length, if not vulcanized or adhesive bonded, or 150 mm in length if the lap is vulcanized or adhesive bonded. No laps are acceptable in vertically installed neoprene strips.

The neoprene sheeting shall be 2.5 mm thick general purpose, heavy duty neoprene sheet with nylon fabric reinforcement. The sheeting shall be "Fairprene Number NN-0003", by E.I. Dupont De Nemours and Company, Inc., "Wingprene" by the Goodyear Tire and Rubber Company, or an approved alternate. The neoprene sheeting shall conform to the following:

Description of Test	ASTM Method	Requirement
Thickness, mm	D 751	2.5 +/- .25
Breaking strength, grab WXF, N, minimum	D 751	3130 x 3130
Adhesive 25 mm strip, 50 mm minimum, N minimum	D 751	27
Burst strength (mullen) MPa, minimum	D 751	9.65
Heat aging 70 hours T 100°C, 180 bend without Cracking	D2136	No Cracking of Coating
Low temperature brittleness 1 hour at -40°C, bend around 6 mm mandrel	D2136	No Cracking of Coating

Ethylene Vinyl Acetate, manufactured as "Evazote 50" by Epoxy Industries Inc., as "Thermal-Chem E.V.A." by Thermal Chem. Inc. or an approved equal, shall be installed with bonder as recommended by the manufacturer at the locations detailed within these plans.

Payment for labor, materials and installation of these items shall be included in Item 842, Class C Concrete, Abutment, as per Plan.

CONCRETE PARAPETS: As soon as a concrete saw can be operated without damaging the freshly placed concrete, 32 mm deep control joints shall be sawed into the perimeter of the concrete parapet. The sawcut shall be made in the complete circumference of the parapet, starting and ending at the elevation of the concrete deck. The sawcuts shall be placed at a minimum of 2000 mm and a maximum of 3000 mm centers. The use of an edge guide, fence, or jig is required to insure that the cut joint is straight, true, and aligned on all faces of the parapet. The joint width shall be the width of the saw blade, a nominal width of 6 mm. The perimeter of the deflection control joint shall be sealed to a minimum depth of 25 mm with a caulking material conforming to Federal Specifications, TT-S-00227E.

COFFERDAMS, CRIBS AND SHEETING, AS PER PLAN: Temporary shoring shall be used to accomplish the proposed construction in stages. The design of the temporary shoring shall be the responsibility of the Contractor, be designed by a Registered Proffesional Engineer, and conform with 501.05. For approval, five copies of the drawings shall be submitted to the Director and concurrently, one copy to the Office of Structural Engineering. Construction of the shoring shall not begin until after written approval has been received from the Director. Portions of the temporary shoring composed of steel or concrete may be left in place at the discretion of the Engineer. Portions composed of other materials shall be removed prior to completion of the work.

STRUCTURE EXCAVATION in addition to that necessary to remove portions of the existing structure and all necessary backfill is included in the Lump Sum Bid Item, "Unclassified Excavation, as per plan" for Payment.

NOTE

For additional Structure General Notes, see Sheet 3 of 14.

DESIGN AGENCY
THOMAS FOK & ASSOC., LTD.
CONSULTING ENGINEERS, SURVEYORS, & PLANNERS
3896 MAHONING AVE., YOUNGSTOWN, OHIO

DESIGNED	DRAWN	REVIEWED	DATE
SJR	KRM	TF/JEU	3-99
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JDV		4101324	

GENERAL NOTES
JEF-7-41877
S.R. 7 OVER ALEXANDER STREET

JEF-7-36.97

ESTIMATED QUANTITIES

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT.	PIERS	GEN'L	AS PER PLAN SHEET NO.
202	11203	Lump		Portions of Structure Removed, Over 6 meter Span, as per plan				Lump	2
503	11101	Lump		Cofferdams, Cribs and Sheeting, as per plan				Lump	2
503	21301	Lump		Unclassified Excavation, as per plan		Lump			2
Special	51267502	362	sq. meter	Sealing of Concrete Surfaces (Epoxy) *	302	60			
513	20000	2880	Each	Welded Stud Shear Connector	2880				
516	10000	36.1	Meter	Preformed Elastomeric Compression Joint Seal (705.11)	36.1				
516	44101	10	Each	Elastomeric Bearing with Internal Laminates and Load Plate (Noeprene) 57.2 mm x 268 mm x 178 mm with 294 mm x 204 mm Beveled Load Plate, as per plan		10			13
516	44100	10	Each	Elastomeric Bearing with Internal Laminates and Load Plate (Noeprene) 57.2 mm x 280 mm x 178 mm with 306 mm x 204 mm Beveled Load Plate, as per plan		10			13
516	47001	Lump		Jacking and Temporary Support of Superstructure, as per plan	Lump				3
518	21100	23	cu. meter	Porous Backfill		23			
519	11100	5	sq. meter	Patching Concrete Structure		5			
842	31502	281	cu. meter	Class S Concrete, Superstructure	281				
842	45701	16.5	cu. meter	Class C Concrete, Abutment, as per plan		16.5			2

* See proposal note

Calculated by S.J.R. Date 12-30-96

Checked by K.R.M. Date 1-10-97

metric units

PROPOSED WORK

1. Set traffic control devices for phase construction.
2. Remove Phase 1 (or Phase 2) portions of existing deck, safety curbs, scuppers, and portions of abutments as noted on the plans.
3. Jack and support Phase 1 (or Phase 2) portions of existing framing and remove existing bearings at abutments.
4. Set new elastomeric bearings at abutments, reset existing stringers.
5. Install Phase 1 (or Phase 2) portions of stud shear connectors and place portions of deck and parapet.
6. Construct Phase 1 (or Phase 2) portions of abutment wingwalls and place new approach slabs.
7. Seal concrete surfaces as noted on the plans.
8. After the phased work is complete, open the structure to traffic.

STRUCTURE GENERAL NOTES

ITEM 516, JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN
This item shall consist of furnishing all necessary labor, materials, and equipment to raise or reposition any existing structures to the dimensions and requirements defined in the project plans.

The contractor shall be responsible for the design, installation and operation of an adequate jacking system, including any temporary or permanent supports necessary to perform the work described in the project plans. Three (3) sets of jacking plans, which include the information described in this note, shall be submitted to the Director for approval at least (30) days before actual work is to begin. The plans shall be prepared and stamped by a registered professional engineer.

Jacking submittals shall include at least the following:

1. The signature and number, or professional seal, of the registered professional engineer who prepared the submittal.
2. Calculations and analysis of the structure to determine and define the actual loading applied at the contractor's selection jacking points.
3. A drawing showing the physical and dimensional position of the jacks with respect to the structure including clearances and center of lift.
4. A schematic layout of jacks, check valves, pumps with 3 way retractor valve, pressure gages, flow control valves, etc. in accordance with manufacturer's recommendations. All jacks for each abutment or pier shall be connected together. All jacks at each abutment or pier shall be the same size.
5. Analysis and calculations of the stresses induced or created in the structure and any temporary or permanent supports. Design calculations for any temporary or permanent supports.
6. Physical dimensions, materials, and fabrication details of any temporary or permanent supports. Horizontal and vertical movement restraint shall be provided.
7. A step by step procedure detailing all steps in the jacking operation.
8. Method of attachment to structural members. Welding to tension areas will not be permitted.

The entire system including jacks shall have 20% more capacity than required based on calculated loads.

For lifts greater than 25 mm, jacks shall have locking nuts to positively lock and support the structure during the lift.

Jacks shall have a swivel load cap, a domed piston head or some other device to protect against the effects of side load on the jack.

Jacks alone shall not be used to support loads except during the actual jacking operation. Temporary supports, blocking or other methods approved by the Director shall be used.

Single acting rams with no over-travel protection system shall not be used.

Spare equipment shall be available on site for the required structure raising to proceed in the event of breakdown. A list of spare equipment shall be provided by the engineer.

At a minimum, a jacking operation shall lift all beams at any one abutment or pier simultaneously. The only exception is the situation where the work involves replacing or rehabilitating individual bearings; no permanent shimming is required and the height of the lift shall not exceed 6 mm.

Maximum differential jacking height between any adjacent abutments or piers shall be 25 mm or less.

The Contractor shall demonstrate to the Engineer that the bridge bearings are fully seated between all contact areas. If full seating is not attained, suitable means of repair, subject to the approval of the Engineer, will be required at the Contractor's expense.

The jacking operation shall be directed by a Professional Engineer employed by the Contractor. Failure to have a Professional Engineer present shall be cause for ceasing jacking operations.

Payment shall be made at the lump sum price bid for Item 516, Jacking and Temporary Support of Superstructures, As Per Plan and shall include all necessary tools, labor, equipment and materials necesary to complete this item of work.

DESIGN AGENCY
THOMAS FOK & ASSOC., LTD.
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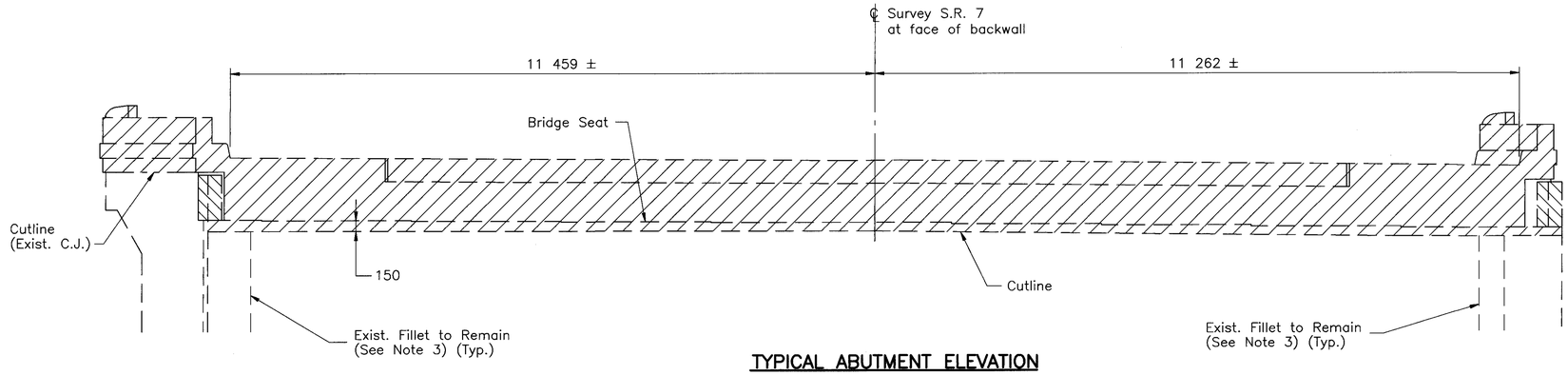
3896 MAHONING AVE., YOUNGSTOWN, OHIO

DATE 3-99
REVIEWED TF/JEU
STRUCTURE FILE NUMBER 4101324
DRAWN KRM
REVISED
DESIGNED SJR
CHECKED JDV

ESTIMATED QUANTITIES, GENERAL NOTES & PROPOSED WORK
JEF-7-41877
S.R. 7 OVER ALEXANDER STREET

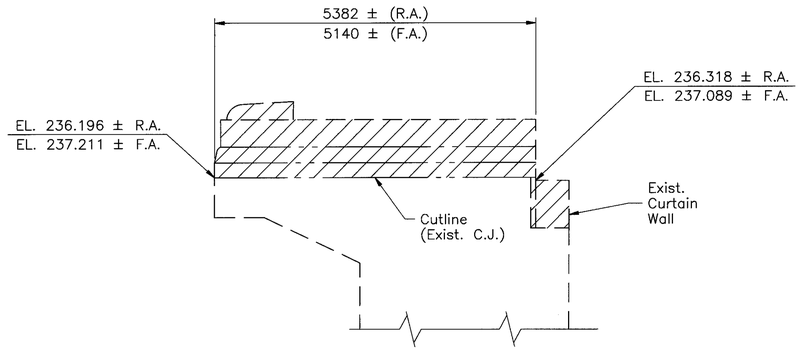
JEF-7-36.97

metric units

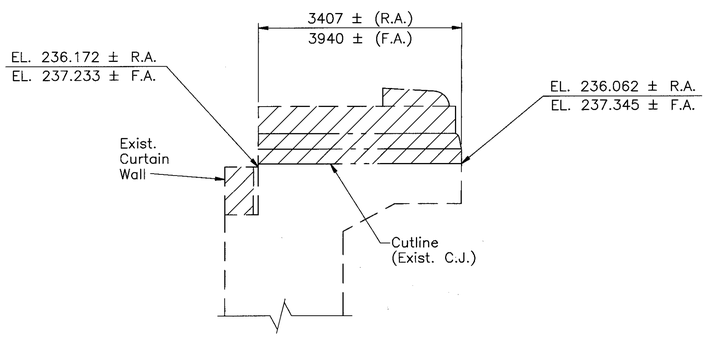


TYPICAL ABUTMENT ELEVATION

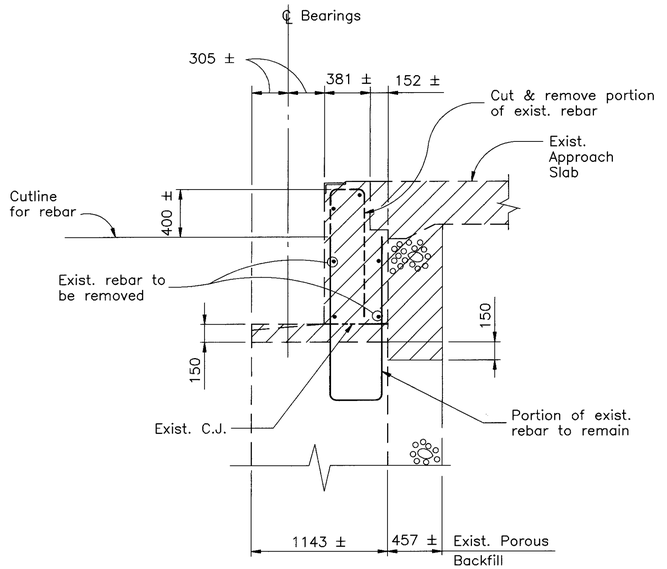
= Areas to be Removed according to Item 202.
(Exist. Reinf. Steel to be Preserved)



ELEVATION – RIGHT REAR WINGWALL
ELEVATION – RIGHT FORWARD WINGWALL (Opposite Hand)

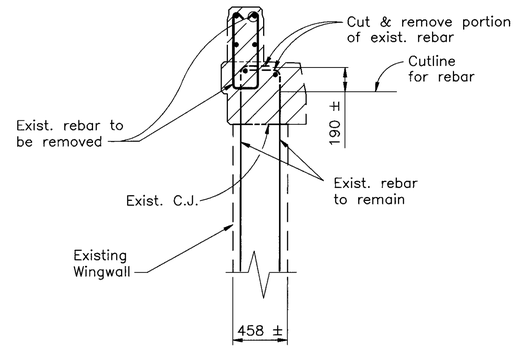


ELEVATION – LEFT REAR WINGWALL
ELEVATION – LEFT FORWARD WINGWALL (Opposite Hand)



TYPICAL ABUTMENT DEMOLITION

NOTE: Beams and bearings not shown.



TYPICAL WINGWALL DEMOLITION

NOTES:

1. For removal notes, see Sheet 2/14.
2. The areas where the existing curtain walls are removed shall be repaired in accordance with Item 519, Patching Concrete Structures. In addition, any areas not shown in the plans deemed repairable by the Engineer shall be repaired in accordance with this specification. Payment will be made at the contract price for:

   Item 519 5 Sq. Meter Patching Concrete Structure
3. Remove existing abutment fillets to 150 mm below existing beam seat.

Note: All Dimensions are in Millimeters.

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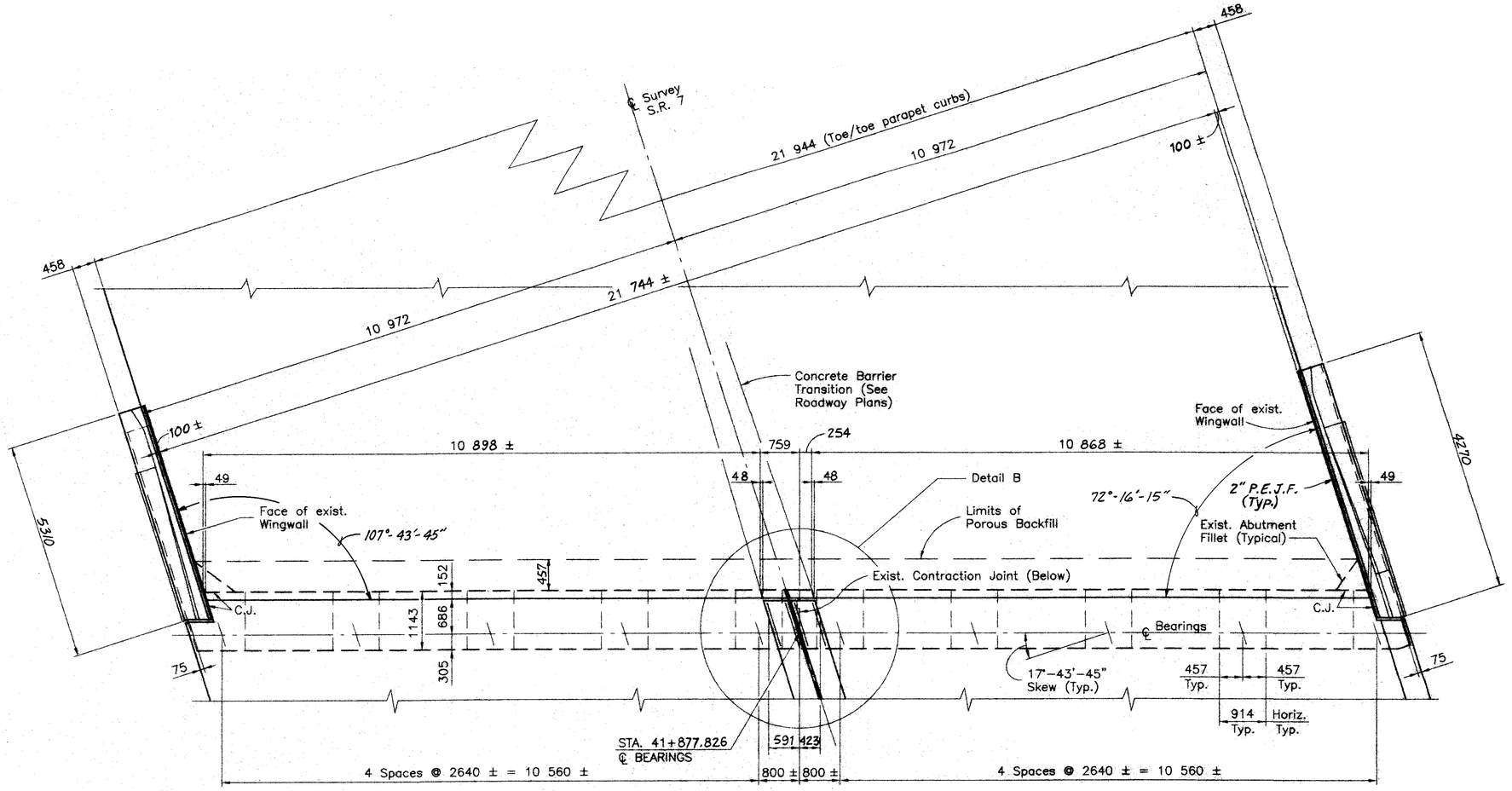
JDV		4101324	

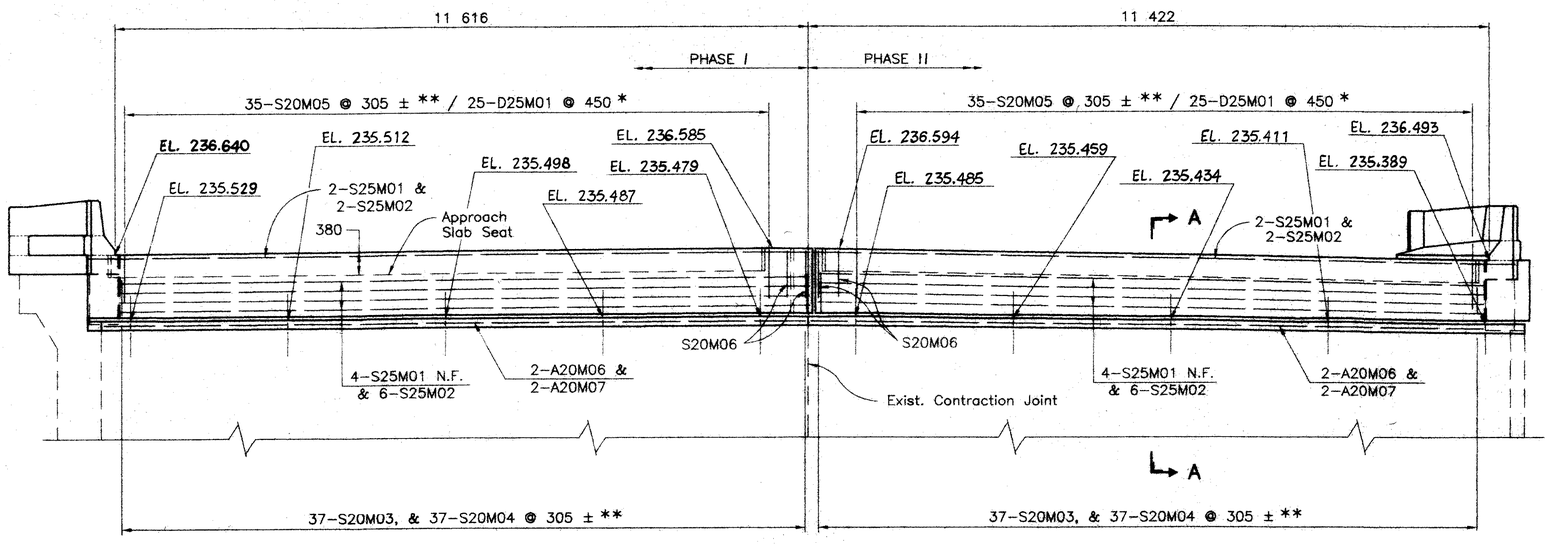
ABUTMENT REMOVAL
JEF-7-41877
S.R. 7 OVER ALEXANDER STREET

JEF-7-36.97

metric units



PLAN



ELEVATION

* Place parallel to ℄ Survey

** Place parallel to ℄ Survey and adjust spacing as required to clear beam flanges by 50 mm ±

NOTES:

1. For Section A–A, and Detail B, see Sheet 9/14.
2. For Abutment notes, Abbreviations and Wingwall Details, see Sheet 8/14.
3. For Wingwall Details see Sheet 7/14.

All Dimensions are in Millimeters.
All Elevations are in Meters.

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SJR	KRM	TF/JEU	5-97
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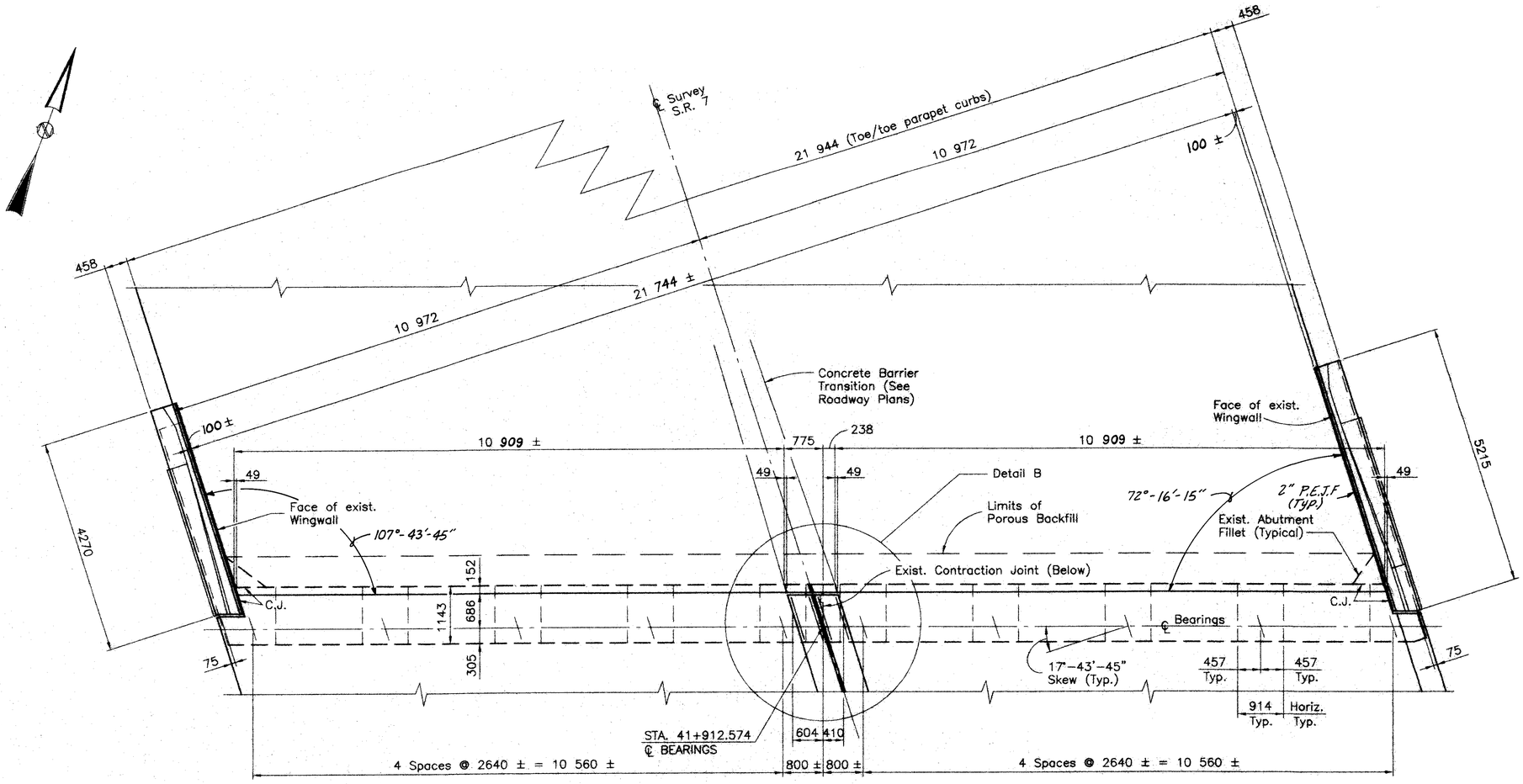
REAR ABUTMENT DETAIL
JEF-7-41877
S.R. 7 OVER ALEXANDER STREET

JEF-7-36.97

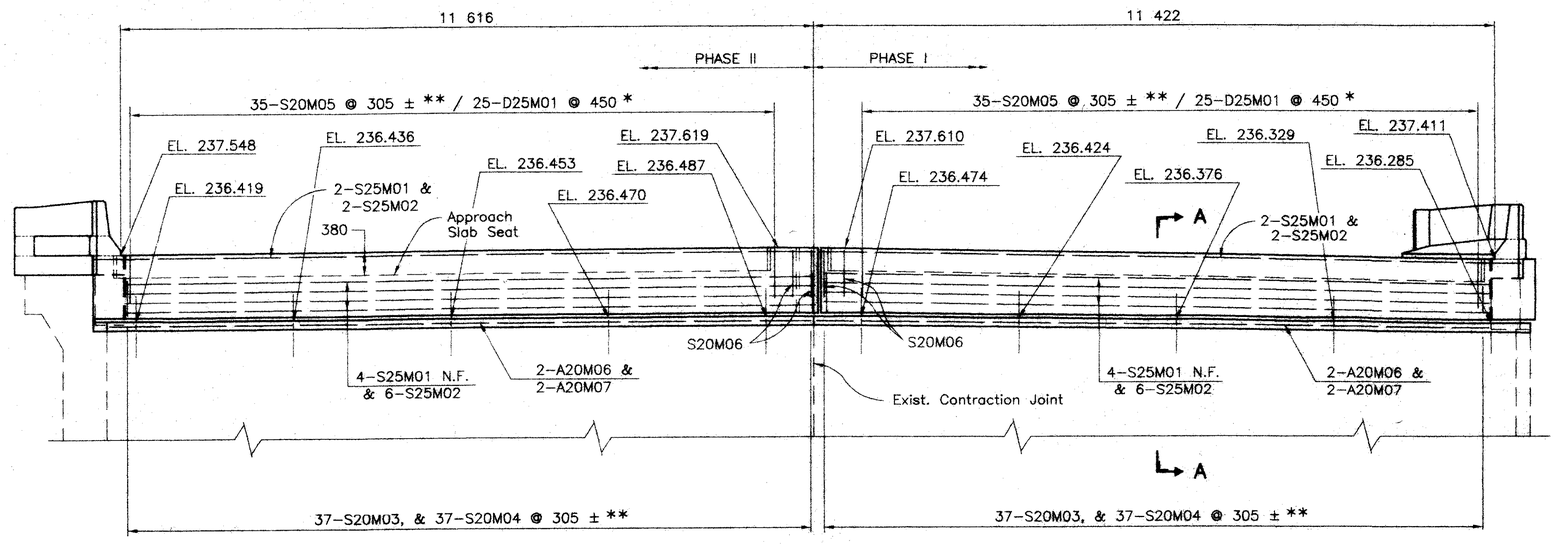
5 / 14

100 / 123

metric units



PLAN



ELEVATION

* Place parallel to ℄ Survey

** Place parallel to ℄ Survey and adjust spacing as required to clear beam flanges by 50 mm ±

NOTES:

1. For Section A–A, and Detail B, see Sheet 9/14.
2. For Abutment notes, Abbreviations and Wingwall Details, see Sheet 8/14.
3. For Wingwall Details see Sheet 7/14.

All Dimensions are in Millimeters.
All Elevations are in Meters.

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DESIGNED SJR | DRAWN KRM | REVISED TF/JEU | DATE 5-97 | CHECKED JDV | REVISED | STRUCTURE FILE NUMBER 41013324

FORWARD ABUTMENT DETAIL

JEF-7-41877

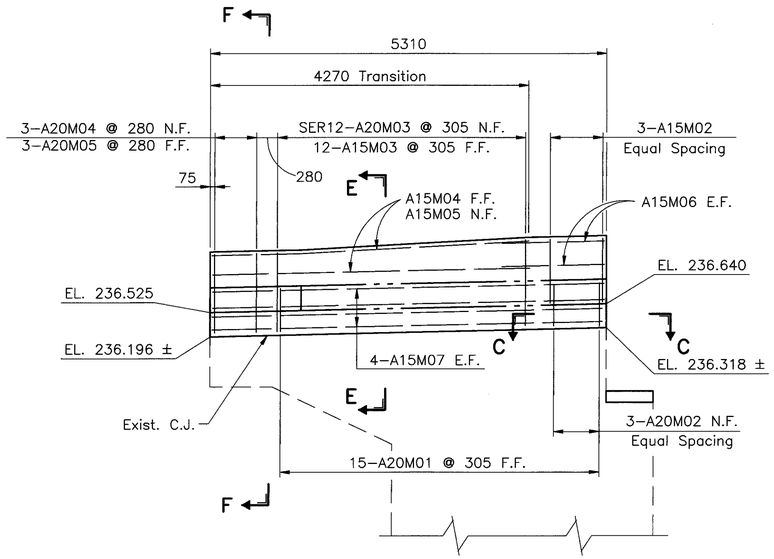
S.R. 7 OVER ALEXANDER STREET

JEF-7-36.97

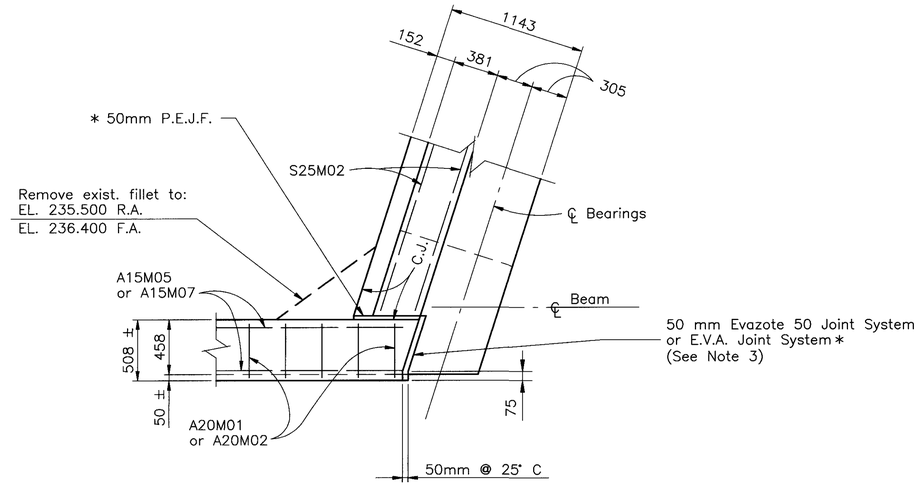
6 / 14

101 / 123

metric units

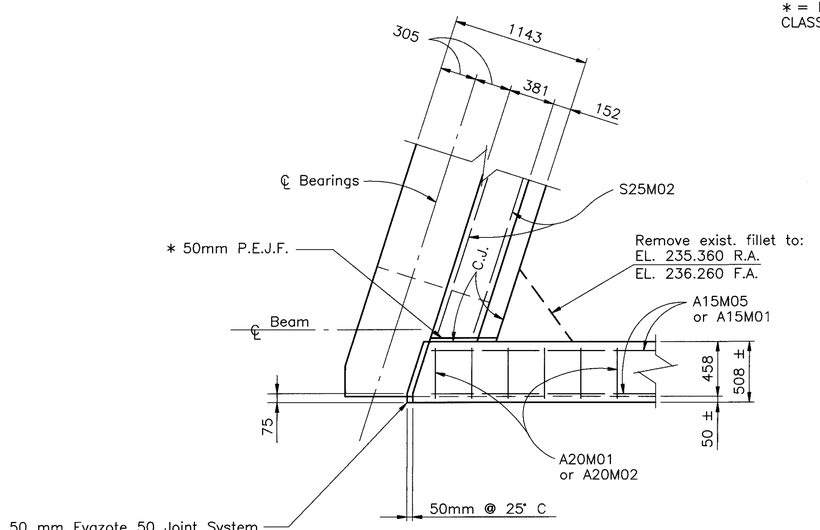


ELEVATION –RIGHT REAR WINGWALL

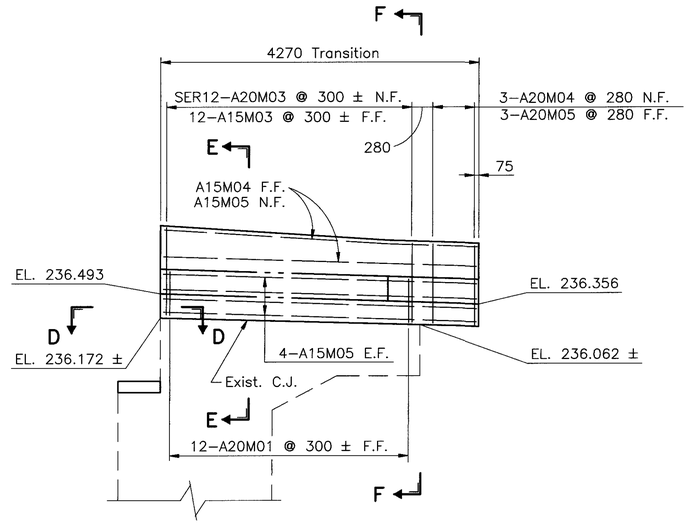


SECTION C–C

* = INCLUDE FOR PAYMENT WITH ITEM 511, CLASS C CONCRETE, ABUTMENT, AS PER PLAN.



SECTION D–D



ELEVATION –LEFT REAR WINGWALL

NOTES:

1. FOR SECTIONS E–E AND F–F, SEE SHEET 8/14.
2. FOR SECTIONS A–A AND B–B, SEE SHEET 9/14.
3. REFER TO MANUFACTURER'S SPECIFICATIONS AND INSTALLATION PROCEDURE FOR PLACING THIS MATERIAL.

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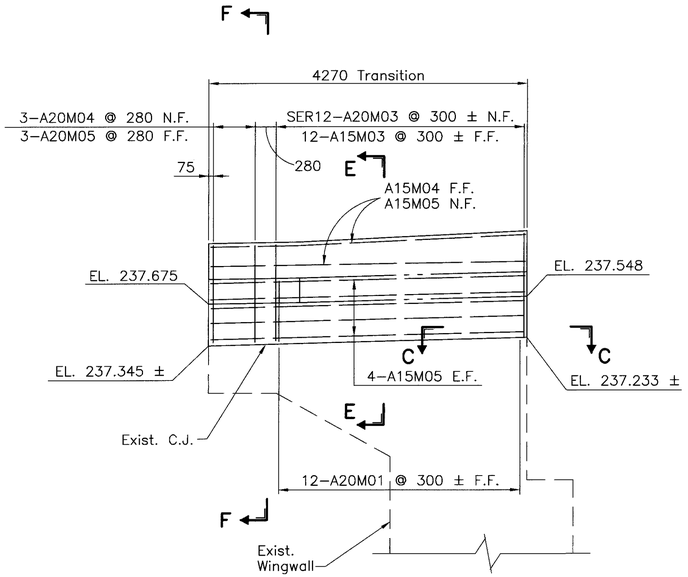
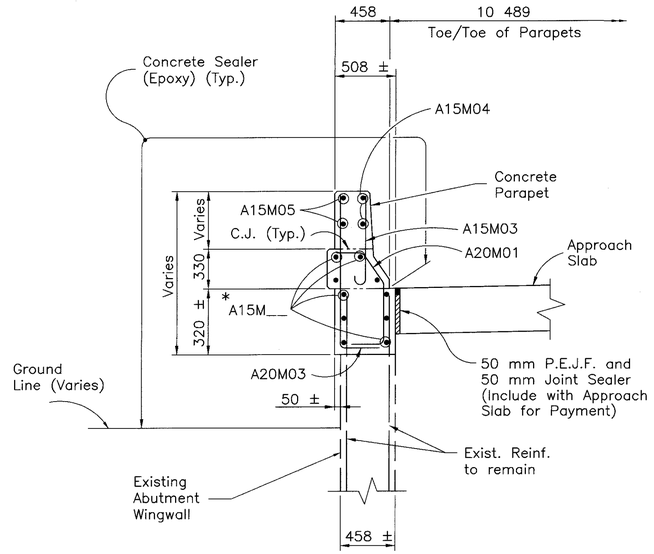
ABUTMENT DETAILS
JEF–7–41877
S.R. 7 OVER ALEXANDER STREET

JEF–7–36.97

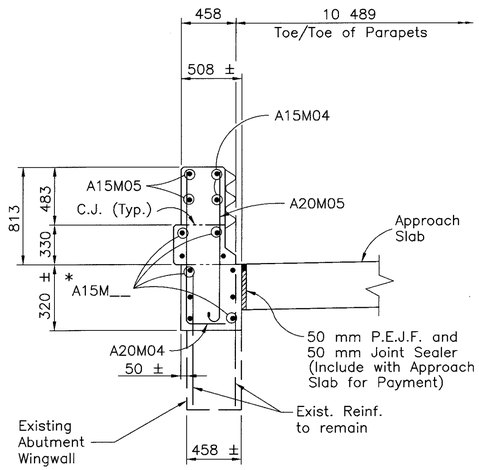


ELEVATION –LEFT FORWARD WINGWALL



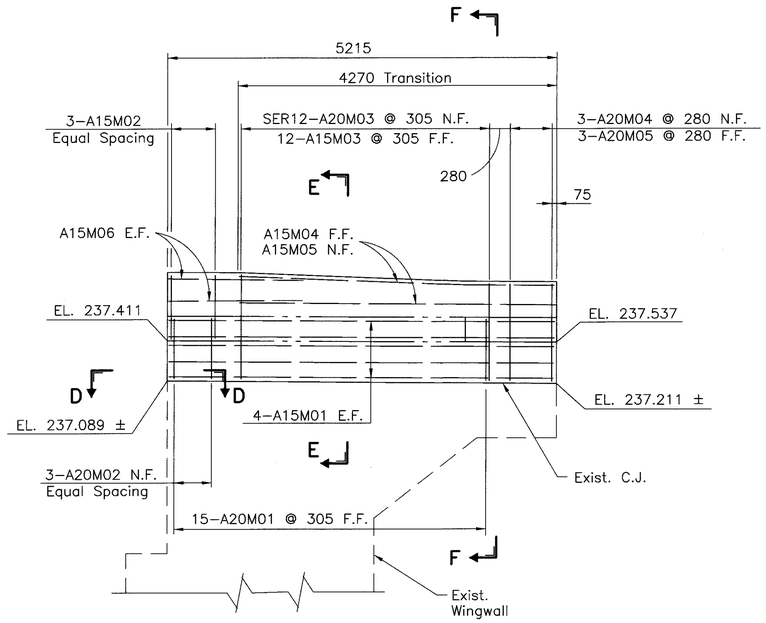
SECTION E–E

* See Elevations for mark numbers



SECTION F–F

* See Elevations for mark numbers



ELEVATION –RIGHT FORWARD WINGWALL

NOTES

1. REFER TO SHEET 9/14, SECTION A–A FOR SEMI–INTEGRAL ABUTMENT DETAIL AND NOTES.
2. POROUS BACKFILL, 457 mm THICK, SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE AND LATERALLY TO THE INSIDE FACE OF WINGWALLS. PAYMENT SHALL BE INCLUDED WITH ITEM 518, POROUS BACKFILL.
3. FOR REINFORCEMENT SCHEDULE, SEE SHEET 14/14.
4. THE FOLLOWING ABBREVIATIONS ARE USED:

N.F. – NEAR FACE	EL. – ELEVATION
F.F. – FAR FACE	R.A. – REAR ABUTMENT
E.F. – EACH FACE	F.A. – FORWARD ABUTMENT
C.J. – CONSTRUCTION JOINT	TYP. – TYPICAL

5. FOR ADDITIONAL DEFLECTOR PARAPET DETAILS, SEE STANDARD BRIDGE DRAWING BR–1M.
6. FOR SECTIONS C–C AND D–D, SEE SHEET 7/14.

All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

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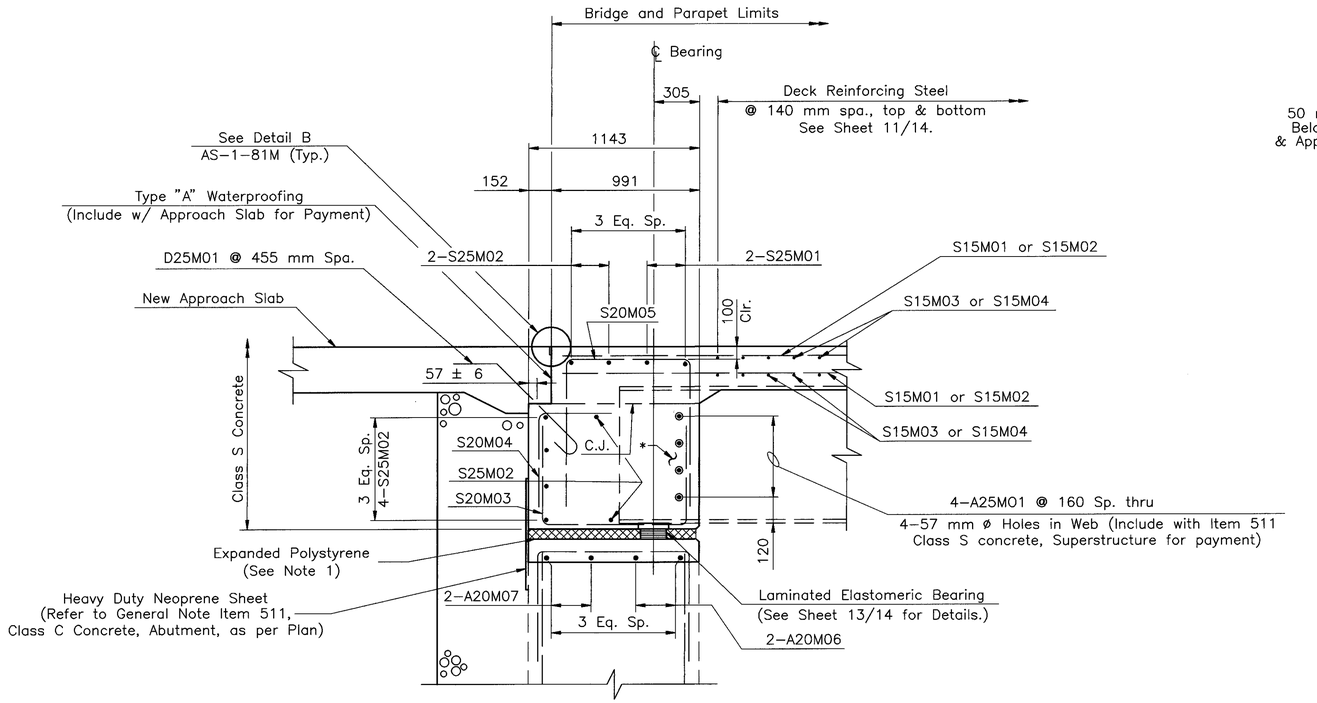
DESIGNED SJR | DRAWN KRM | REVIEWED TF/JEU | DATE 5–97
CHECKED JDV | REVISED | STRUCTURE FILE NUMBER 4101324

ABUTMENT DETAILS

JEF–7–41877
S.R. 7 OVER ALEXANDER STREET

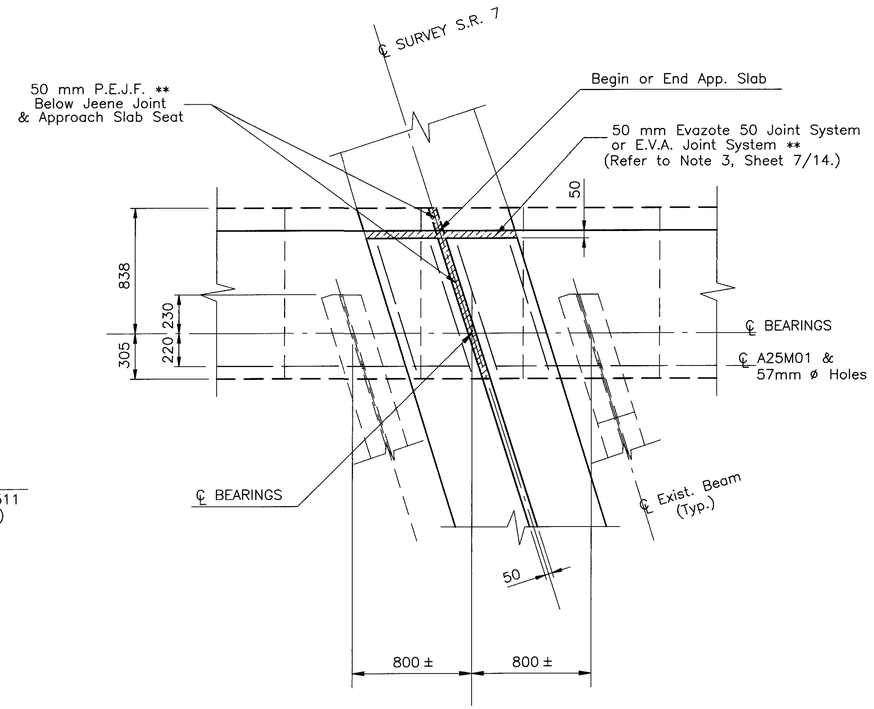
JEF–7–36.97

metric units



SECTION A–A

* All embedded structural steel shall be abrasive blasted to SSPC–SP10. Include for payment with Class S Concrete, Superstructure.



DETAIL B

FORWARD ABUTMENT SHOWN, REAR ABUTMENT SIMILAR

** = Include for payment with Item 511, Class C, Concrete Abutment, as per plan.

NOTES:

1. Expanded Polystrene shall be placed full length of beam seat between beam seat concrete and superstructure concrete above. Include for payment with Item 511, Class C Concrete, Abutment, as per Plan.
2. For spacing of vertical bars, see sheets 5 & 6 of 14.
3. For additional details, see Sheet 7/14.
4. For Bearing Details, see Sheet 13/14.
5. For additional notes, see sheet 8/14.

Note: All Dimensions are in Millimeters.

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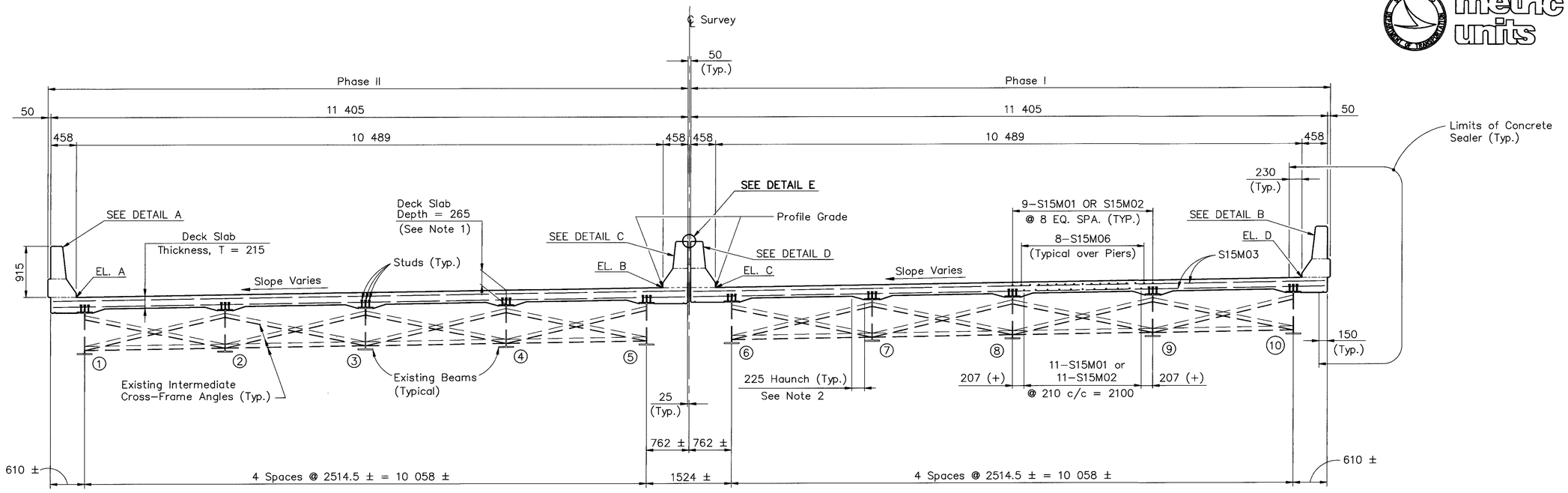
ABUTMENT DETAILS

JEF–7–41877
S.R. 7 OVER ALEXANDER STREET

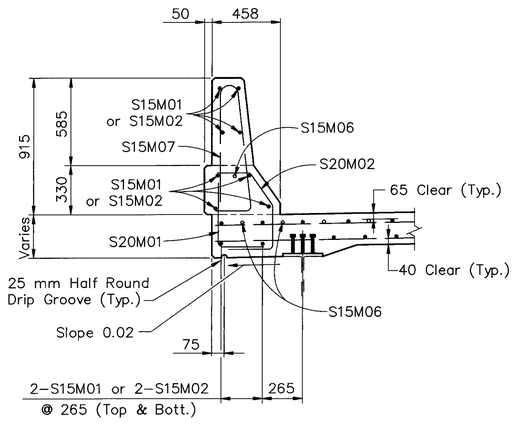
JEF–7–36.97

metric units



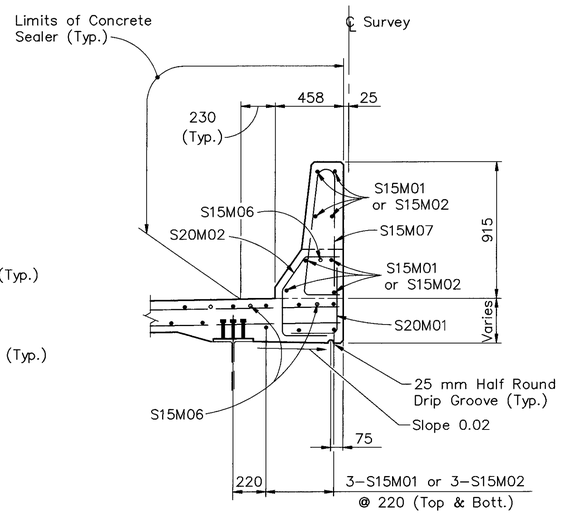
TRANSVERSE SECTION

(AHEAD OF S.T. STA. 41+894.512)



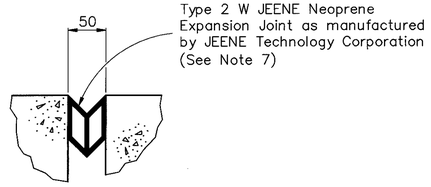
DETAIL A (As shown)

DETAIL B (Opposite Hand)



DETAIL C (As shown)

DETAIL D (Opposite Hand)



DETAIL E

NOTES:

1. DECK SLAB DEPTH: THE DISTANCE SHOWN FROM TOP OF DECK SLAB TO TOP OF STEEL BEAM IS THE THEORETICAL DESIGN DIMENSION INCLUDING THE DESIGN HAUNCH THICKNESS OF 50 MILLIMETERS. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION, MINUS THE DESIGN HAUNCH THICKNESS, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.
2. A HAUNCH WIDTH OF 225 mm SHALL BE USED FOR COMPUTING THE QUANTITY OF CONCRETE. HOWEVER THE HAUNCH WIDTH MAY VARY BETWEEN 150 mm AND 300 mm.
3. FOR DECK SLAB PLAN, SEE SHEET 11 of 14.
4. FOR PARAPET DETAILS, REFER TO ODOT STANDARD BR–1M, DATED 12–15–94.
5. DRIP GROOVES SHALL TERMINATE 600 mm FROM THE FACE OF THE ABUTMENTS.
6. FOR DECK SCREED ELEVATIONS, SEE SHEET 12 of 14.
7. REFER TO MANUFACTURER'S SPECIFICATIONS AND INSTALLATION PROCEDURES FOR PLACING THE TYPE 2 W JEENE JOINT OR EQUIVALENT. PAYMENT SHALL BE INCLUDED WITH "ITEM 516, PREFORMED ELASTOMERIC COMPRESSION JOINT SEAL (705.11)."

All Dimensions are in Millimeters.

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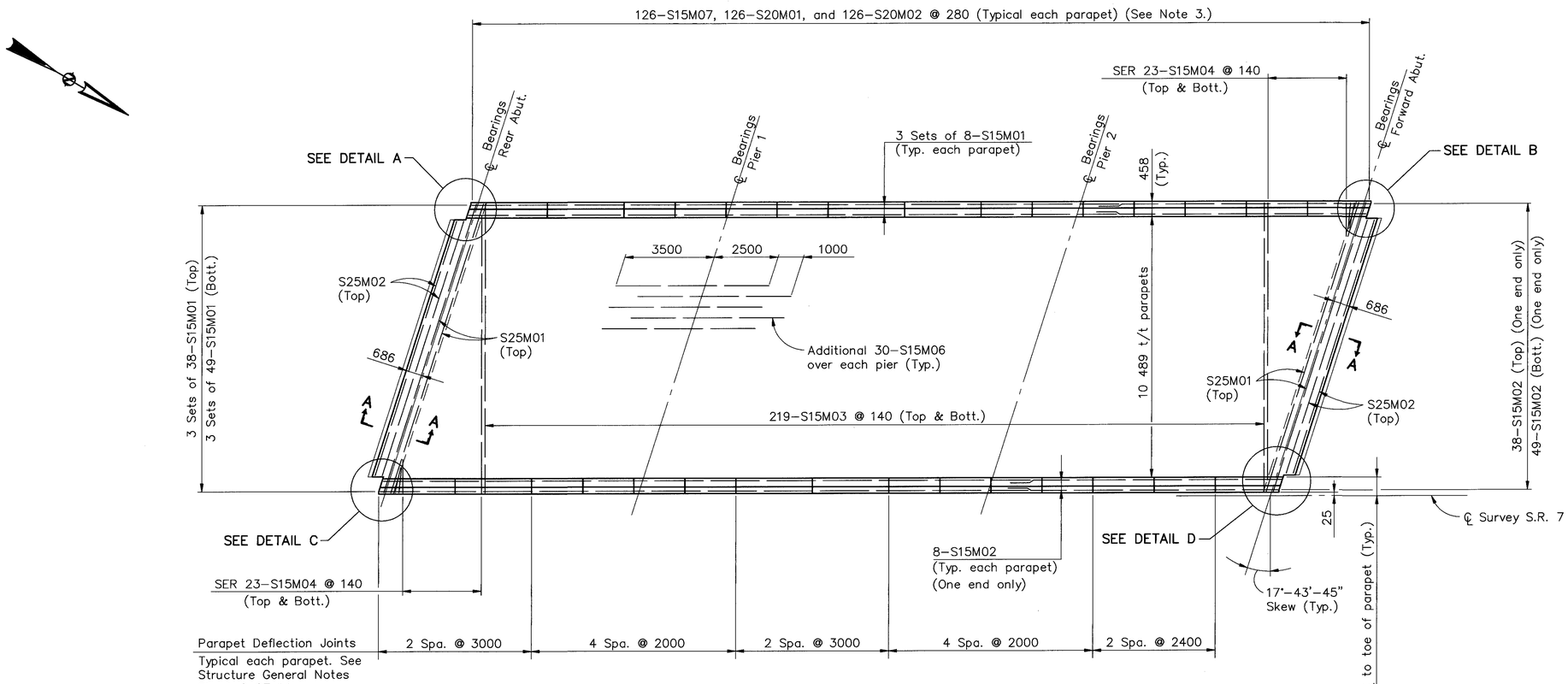
TRANSVERSE SECTION
JEF–7–41877
S.R. 7 OVER ALEXANDER STREET

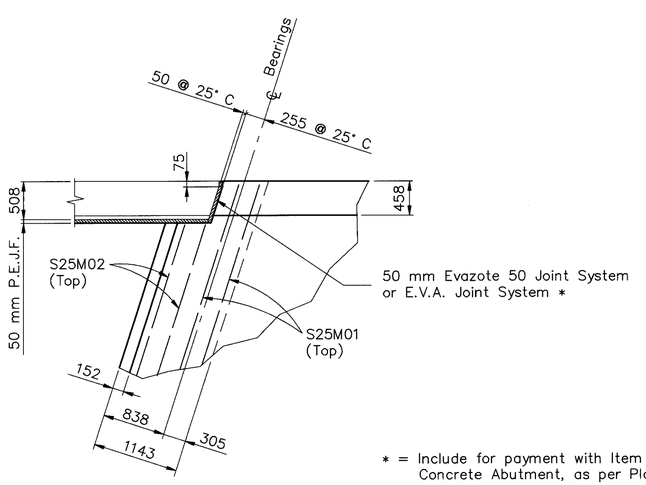
JEF–7–36.97

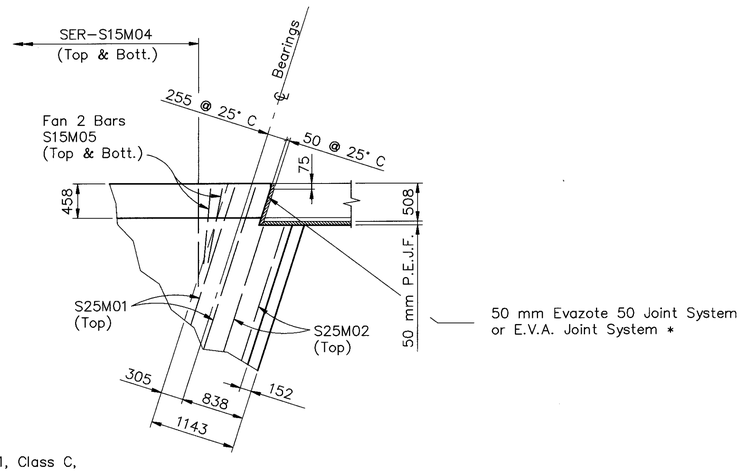


DECK PLAN

NOTE: Reinforcing steel shown is for left half of superstructure. Right half is similar.

MIN. REBAR LAP
#15M = 720 mm





* = Include for payment with Item 511, Class C, Concrete Abutment, as per Plan.

DETAIL A (As shown)
DETAIL D (Similar by rotation)

DETAIL B (As shown)
DETAIL C (Similar by rotation)

NOTES:

1. For Section A–A, see Sheet 9 of 14.
2. For Reinforcing Schedule, see Sheet 14 of 14.
3. Vertical reinforcing bars shall be offset a minimum of 50 mm from the parapet deflection joints.

All Dimensions are in Millimeters.

metric units

DESIGN AGENCY
THOMAS FOK & ASSOC., LTD.
CONSULTING ENGINEERS, SURVEYORS, & PLANNERS
3896 MAHONING AVE., YOUNGSTOWN, OHIO

DESIGNED	DRAWN	REVIEWED	DATE
SJR	KRM	TF/JEU	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JDV		4101324	

DECK PLAN
JEF–7–41877
S.R. 7 OVER ALEXANDER STREET

JEF–7–36.97

DECK SCREED ELEVATIONS (See Note 1)

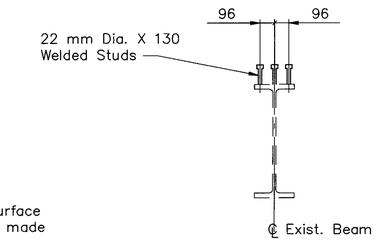
LOCATION		SPAN 1			SPAN 2			SPAN 3		
		℄ BRG. R.A.	1/2 SPAN	℄ BRG. PIER 1	SPLICE	1/2 SPAN	SPLICE	℄ BRG. PIER 2	1/2 SPAN	℄ BRG. F.A.
BEAMS *	1	236.505	236.664	236.813	236.897	237.020	237.138	237.218	237.382	237.540
	2	236.527	236.682	236.829	236.914	237.037	237.155	237.235	237.399	237.557
	3	236.550	236.701	236.847	236.931	237.054	237.172	237.252	237.416	237.574
	4	236.575	236.722	236.865	236.948	237.070	237.189	237.268	237.433	237.591
	5	236.601	236.744	236.883	236.966	237.088	237.206	237.285	237.449	237.608
	6	236.595	236.737	236.875	236.958	237.078	237.195	237.274	237.438	237.595
	7	236.603	236.736	236.865	236.942	237.055	237.165	237.238	237.394	237.545
	8	236.614	236.738	236.859	236.930	237.035	237.137	237.206	237.352	237.497
	9	236.628	236.742	236.854	236.921	237.018	237.112	237.176	237.313	237.450
	10	236.645	236.751	236.853	236.915	237.004	237.091	237.149	237.277	237.406
POINTS *	A	236.504	236.662	236.811	236.896	237.019	237.137	237.217	237.381	237.539
	B	236.603	236.746	236.886	236.968	237.089	237.208	237.287	237.451	237.609
	C	236.594	236.737	236.877	236.959	237.081	237.199	237.278	237.442	237.601
	D	236.646	236.751	236.853	236.913	237.003	237.090	237.147	237.274	237.403

* See Transverse Section, Sheet 10 of 14.

DEAD LOAD DEFLECTIONS (mm)

SPAN 1	SPAN 2				SPAN 3
1/2 SPAN	SPLICE	1/2 SPAN	SPLICE	1/2 SPAN	
2	3	3	2	3	

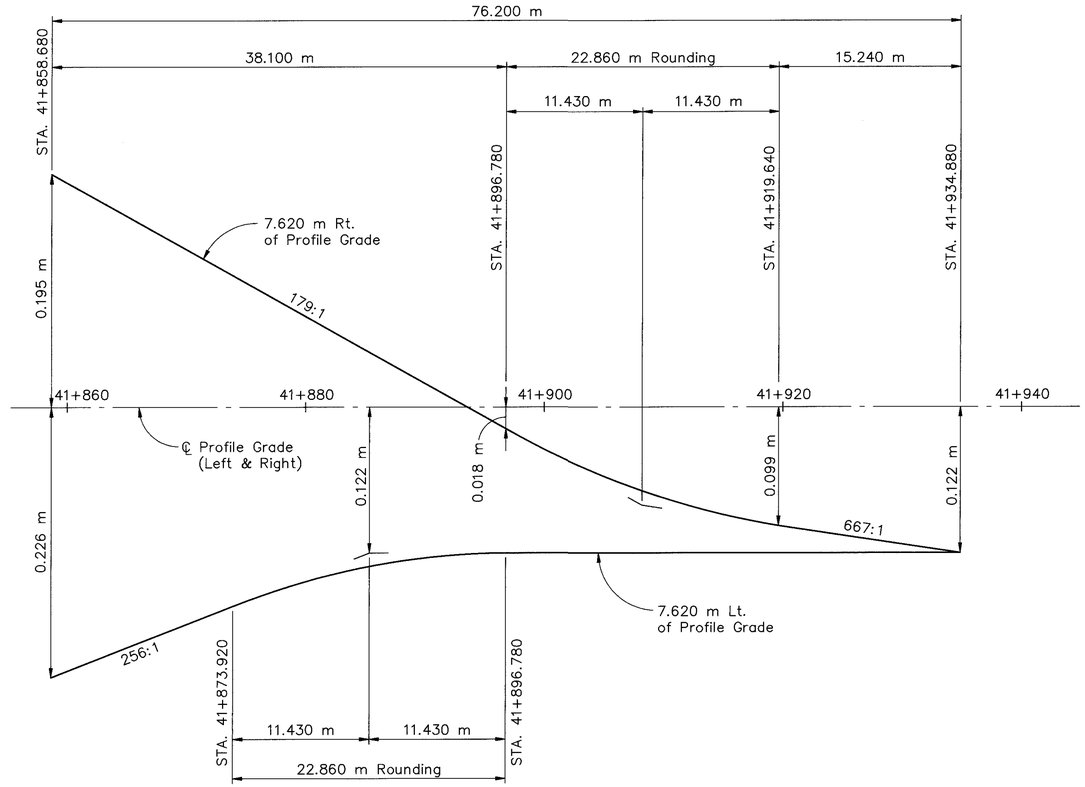
NOTE: Dead load deflections shown are considered the same for all beams and deck screed elevations.



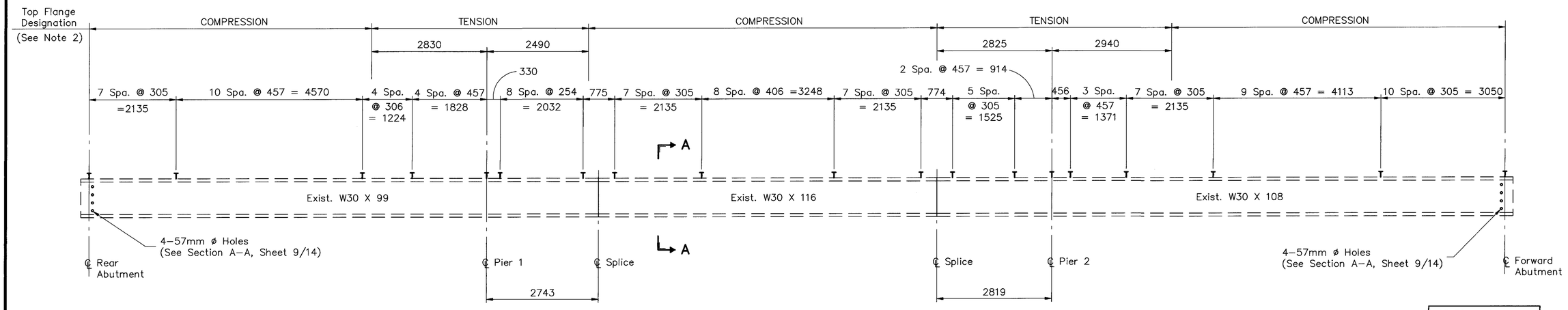
SECTION A–A

NOTES

1. Screed elevations shown are for the deck slab surface prior to concrete placement. Allowance has been made for anticipated calculated dead load deflections.
2. Welded attachment of supports for concrete deck finishing machine may be made to areas of the fascia stringer flanges designated "Compression". Attachments shall not be made to areas designated "Tension". Fillet welds to compression flanges shall be not closer than 25 mm from edge of flange, be not more than 50 mm long, and be not smaller than the minimum size required by AASHTO.



SUPERELEVATION TRANSITION DIAGRAM



TYPICAL BEAM ELEVATION

All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

DESIGN AGENCY
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DESIGNED SJR | DRAWN KRM | REVISED | CHECKED JDV | REVIEWED TF/JEU | DATE 5-97 | STRUCTURE FILE NUMBER 4101324

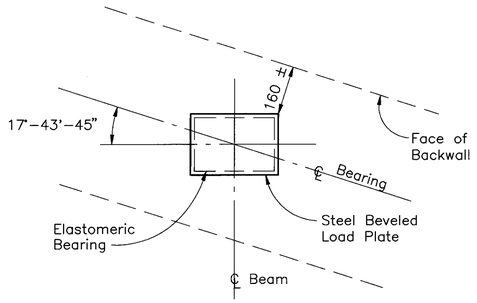
SUPERSTRUCTURE DETAILS
JEF-7-41877
S.R. 7 OVER ALEXANDER STREET

JEF-7-36.97

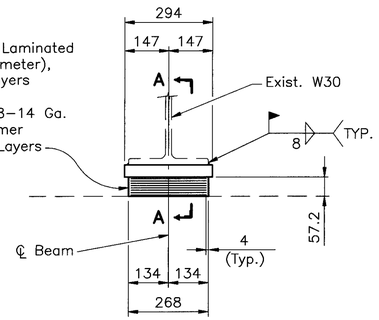
12 / 14

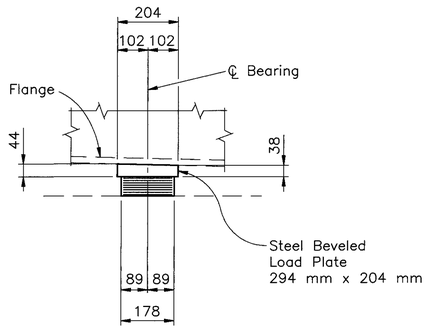
107 / 123

metric units



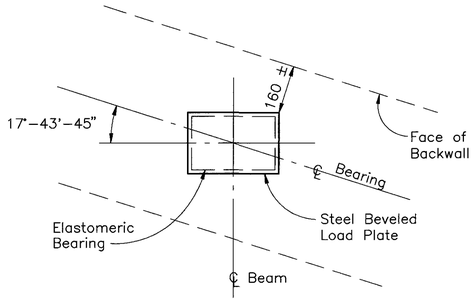
57.2 mm x 268 mm x 178 mm Laminated Elastomeric Bearing Pad (50 Durometer), Thickness of Internal Elastomer Layers t_i = 5 mm, Thickness of External Elastomer Layers t_e = 3.5 mm, 8–14 Ga. Steel Laminates, 7 Internal Elastomer Layers and 2 External Elastomer Layers Required.



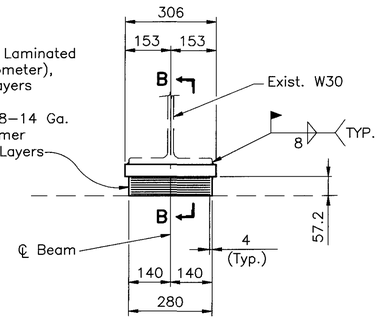


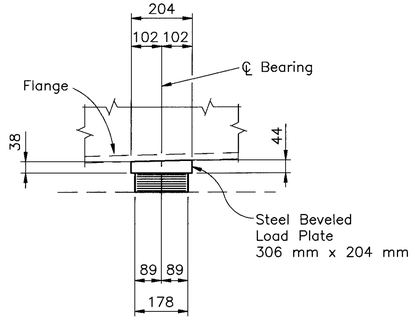
LAMINATED ELASTOMERIC BEARING
REAR ABUTMENT

SECTION A–A



57.2 mm x 280 mm x 178 mm Laminated Elastomeric Bearing Pad (50 Durometer), Thickness of Internal Elastomer Layers t_i = 5 mm, Thickness of External Elastomer Layers t_e = 3.5 mm, 8–14 Ga. Steel Laminates, 7 Internal Elastomer Layers and 2 External Elastomer Layers Required.





LAMINATED ELASTOMERIC BEARING
FORWARD ABUTMENT

SECTION B–B

NOTES

LAMINATED ELASTOMERIC BEARINGS		REAR ABUTMENT	FORWARD ABUTMENT
Design Loading:	Dead Load	= 134 kN	= 151 kN
	Live Load without impact	= 167 kN	= 176 kN
	Maximum Design Load	= 301 kN	= 327 kN

1. Load Plate: The steel load plate shall be bonded by vulcanization to the elastomer during the molding process. Welding of the load plate to the beam shall be controlled so that the plate temperature at the elastomer bonded surface shall not exceed 150 degrees C as determined by the use of pyrometric sticks or other temperature monitoring devices. Steel for the load plates shall be ASTM A36M.

   Basis of payment, the unit bid price shall include all materials, labor and incidentals necessary to furnish and install laminated elastomeric bearings either fixed or expansion.

2. BEARING REPOSITIONING: If placement of Stringers is done at an ambient temperature higher than 27° C or lower than 4° C, and the bearing shear deflection exceeds one–sixth of the bearing height at 15° C ± 5° C, the beams or girders shall be raised when the ambient temperature is 15° C ± 5° C to allow the bearings to return to their undeformed shape.

3. ELASTOMERIC BEARINGS shall comply with Item 516 and Articles 18.2.5 through 18.2.8 of Section 18, Bearing Devices, Division II, Construction of the AASHTO Standard Specification 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 unit price bid for the bearings, each.

Note: All Dimensions are in Millimeters.

DESIGN AGENCY
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DESIGNED	DRAWN	REVIEWED	DATE
SJR	KRM	TF/JEU	5-97
CHECKED	REVISED	STRUCTURE FILE NUMBER	4101324
JDV			

BEARING DETAILS
JEF-7-41877
S.R. 7 OVER ALEXANDER STREET

JEF-7-36.97

13/14

108
123

metric units

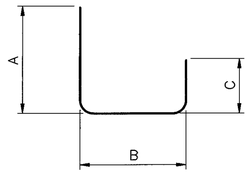
ABUTMENTS

MARK	NO. REQD.	LENGTH	TYPE	DIMENSIONS				INCRM.	WEIGHT kg	NO. REQD.	
				A	B	C	D			R.A.	F.A.
A15M01	8	5000	ST						63		8
A15M02	6	1825	10						17	3	3
A15M03	48	920	16	740					69	24	24
A15M04	8	4100	17						52	4	4
A15M05	24	4050	ST						153	12	12
A15M06	8	1800	ST						23	4	4
A15M07	8	5210	ST						65	8	
A20M01	54	880	4	330	230				112	27	27
A20M02	6	1030	2	550	350	230			16	3	3
A20M03	4 SER OF 12	1320 to 1430	2	1020 to 1130	350			10 mm	155	2 SER OF 12	2 SER OF 12
A20M04	12	1320	2	1020	350				37	6	6
A20M05	12	1240	16	1020					35	6	6
A20M06	8	11 580	ST.						218	4	4
A20M07	8	11 180	ST.						211	4	4
D25M01	100	1540	12						604	50	50
								Sub–Total	1830		

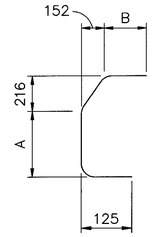
SUPERSTRUCTURE

MARK	NO. REQD.	LENGTH	TYPE	DIMENSIONS				INCRM.	WEIGHT kg
				A	B	C	D		
S15M01	618	9100	ST						8829
S15M02	206	10 900	ST						3525
S15M03	876	11 300	ST						15 541
S15M04	8 SER OF 23	1290 to 10 860	ST					435 mm	1755
S15M05	16	980	ST						25
S15M06	120	6000	ST						1130
S15M07	504	1825	10						1444
S20M01	504	730	2	500	280	0			867
S20M02	504	805	4	280	205				956
S20M03	148	2100	2	570	1080	570			732
S20M04	148	1100	2	570	570	0			383
S20M05	140	2710	2	930	930	930			894
S20M06	8	2860	2	930	1080	930			54
S25M01	24	11 580	ST						1090
S25M02	32	11 180	ST						1404
								Sub–Total	38 629

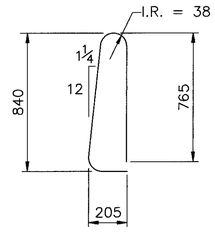
GRAND TOTAL 40 459



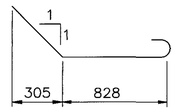
TYPE 2



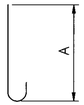
TYPE 4



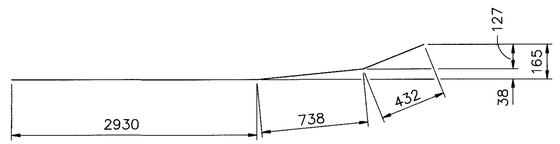
TYPE 10



TYPE 12



TYPE 16



TYPE 17

NOTES:

Bar Size: The bar size is indicated in the bar mark. The first letter identifies the bar location; next two digits and letter indicates the metric bar size designation; and the remaining digits it's sequence number.

Example: A15M01

a) A = Location of the bar in the structure.
b) 15M = Metric bar size designation
c) 01 = Sequence number

Bar dimensions shown are out to out unless otherwise indicated.

All Bars are Epoxy Coated.

ST = Straight

Note: All Dimensions are in Millimeters.

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DESIGNED SJR | DRAWN KRM | REVIEWED TF/JEU | DATE 5–97

STRUCTURE FILE NUMBER 4101324

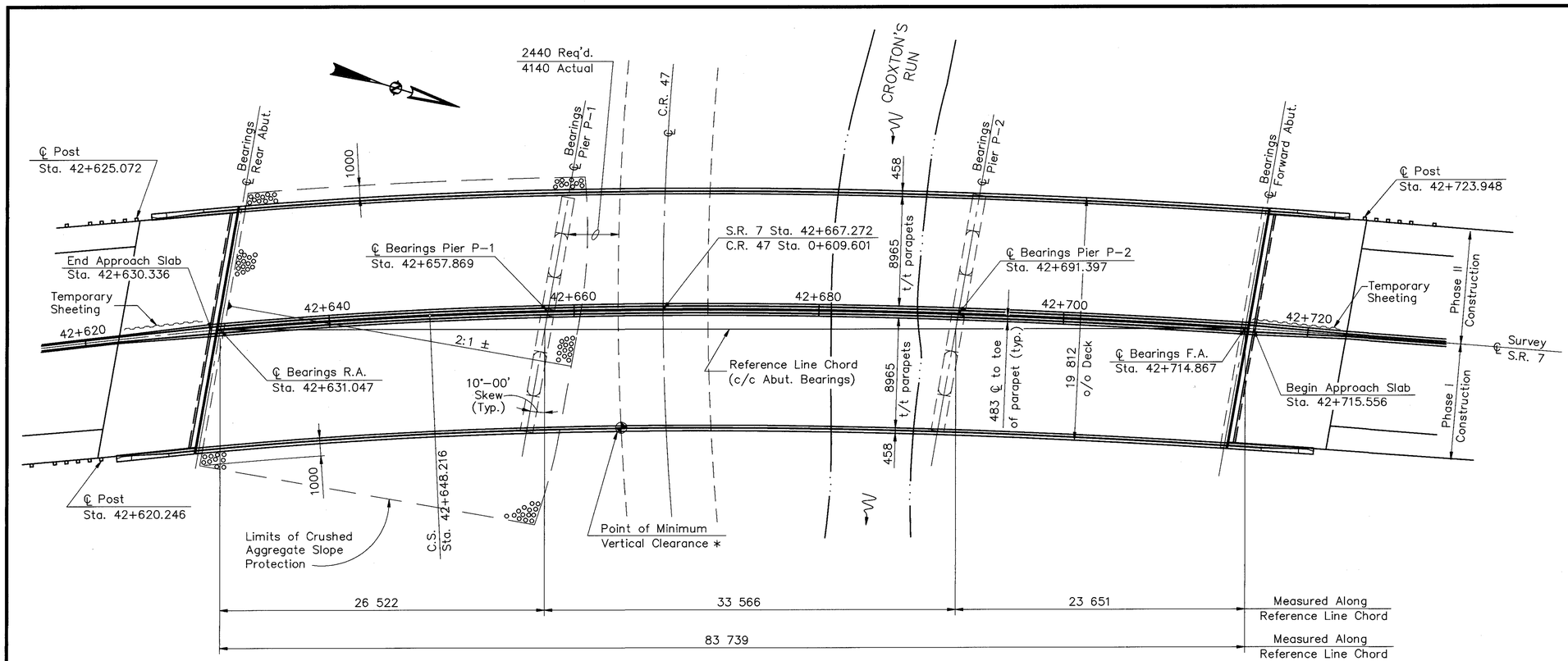
CHECKED JDV | REVISED

REINFORCING STEEL LIST
JEF–7–41877
S.R. 7 OVER ALEXANDER STREET

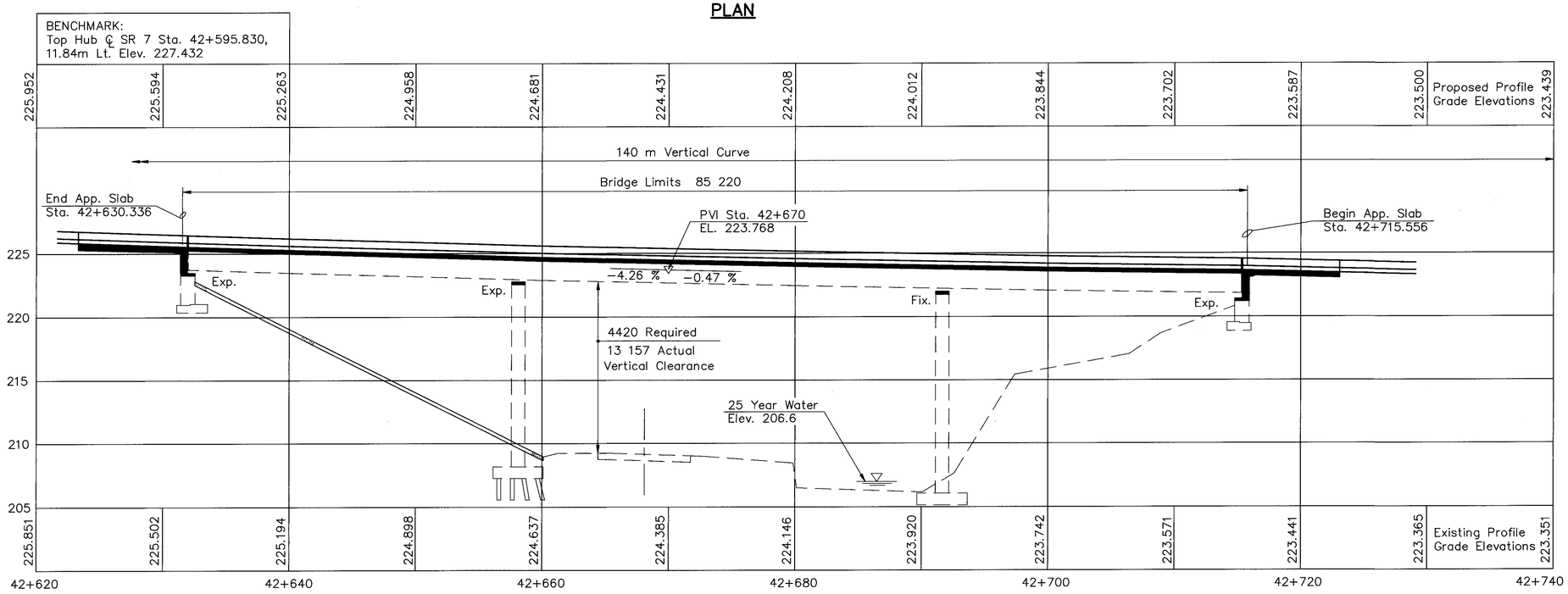
JEF–7–36.97

14 / 14

109
123



PLAN



ELEVATION

VERTICAL CURVE DATA

P.V.I. STA. 42+670.000
P.V.I. EL. 223.768
L = 140.000 m
G1 = – 4.26 %
G2 = – 0.47 %

HORIZONTAL CURVE DATA

℄ Survey

P.I. = STA. 42+514.033
Δ = 56°–28'–28" Rt.
L_S = 121.920 m
Θ_S = 8°–00'
p = 1.418 m
k = 60.920 m

T_S = 296.147 m
E_S = 60.584 m
Δ_C = 40°–28'–28"
L_C = 308.416 m
R_C = 436.593 m

All Dimensions are in Millimeters.
All Elevations and Stations are in Meters.

EXISTING STRUCTURE

TYPE: Continuous Steel Girders with Reinforced Concrete Deck and Substructure
SPANS: 26 822 ±, 33 528 ±, 23 470 ± c/c Bearings
ROADWAY: 19 202 ± f/f Parapets with 152 ± Curbs
SKEW: 10°–00'–00" Left Forward (Measured from Reference Chord)
ALIGNMENT: Curve Right and Spiral
DESIGN LOADING: CF–2000 (57)
YEAR BUILT: 1968
STRUCTURE FILE NUMBER: 4101359
APPROACH SLABS: 7620 ±
WEARING SURFACE: Asphalt Overlay

PROPOSED STRUCTURE

PROPOSED WORK: Replace Deck, and Backwalls, Raise Beams, and Provide New Beam Seats, Patch & Seal Abutments, Paint & Provide new Approach Slabs
TYPE: Continuous Steel Girders with Reinforced Concrete (Composite) Deck and Substructure
SPANS: 26 822 ±, 33 528 ±, 23 470 ± c/c Bearings
ROADWAY: 8965 t/t parapets each way
DESIGN LOADING: MS18 Case II & Alt. Military Loading
SKEW: 10°–00'–00" Left Forward (Measured from Reference Chord)
ALIGNMENT: Curve Right and Spiral
WEARING SURFACE: Monolithic Concrete
APPROACH SLABS: 7600 (AS–1–81M)
SUPERELEVATION: Variable
LATITUDE: N40°28'50" LONGITUDE: W80°36'35"

AVG. DAILY TRAFFIC: (1995) 7180
(2015) 9350 ADTT 2338

metric units

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DESIGNED SJR
DRAWN KRM
CHECKED JDV
REVIEWED JEU/TF
DATE 5–97
STRUCTURE FILE NUMBER 4101359
REVISED

GENERAL PLAN

JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

STRUCTURE GENERAL NOTES

metric units

REFERENCE shall be made to:

Standard Drawings

AS–1–81M	DATED	10–25–94
BR–1M	DATED	1–06–99
EXJ–4–87M	DATED	3–20–95

and to Supplemental Specifications:

815	DATED	7–17–95
842	DATED	1–06–99
899	DATED	10–21–98
910	DATED	7–17–95

DESIGN SPECIFICATIONS: This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1996, and the ODOT Bridge Design Manual.

DESIGN LOADING: MS18, Case II and the Alternate Military Loading.

DESIGN DATA:

Concrete Class S – compressive strength 31.0 MPa (superstructure)

Concrete Class C – compressive strength 28.0 MPa (substructure)

Reinforcing steel – ASTM A615M, A616M or A617M
Grade 400, minimum yield strength 400 MPa

DECK PROTECTION METHOD:
Epoxy coated reinforcing steel.
65 mm concrete cover.

MONOLITHIC WEARING SURFACE is assumed, for design purposes, to be 25 mm thick.

PORTIONS OF STRUCTURE REMOVED, OVER 6 METER SPAN, AS PER PLAN

DESCRIPTION: This work shall consist of the removal, wholly or in part, and satisfactory disposal of portions of the existing structure as per 202 of the Construction and Material Specifications and as directed on the plans. This work shall also include any devices or structures necessary for the protection of traffic, preparation of plans for such structures, and any other work associated with removal of portions of the existing structure as described below. Care shall be taken to protect portions of the structure that are to remain and be incorporated into the proposed structure. In this respect, the use of explosives, headache balls and/or hoe ram type of equipment is prohibited.

PROTECTION OF TRAFFIC: Prior to demolition of any portions of the existing superstructure, the contractor shall submit his plans for the protection of traffic (vehicular, pedestrian, boat, etc.) adjacent to and/or under the structure to the Director for approval. These plans shall include provisions for any devices and structures that may be necessary to ensure such protection. Temporary vertical clearances specified on the plans or in the proposal shall be maintained at all times except as otherwise approved by the Director.

PROTECTION OF STEEL SUPPORT SYSTEMS: Before deck slab cutting is permitted, the outline of primary steel members in contact with the bottom of the deck shall be drawn on the surface of deck. Small diameter pilot holes shall be drilled 50 mm outside these lines to confirm the location of flange edges. Deck cuts over or within 50 mm of flange edges shall not extend lower than the bottom layer of deck slab reinforcing steel. Cuts made outside 50 mm of flange edges may extend the full depth of the deck. During cutting of the deck slab, care shall be taken not to damage steel members that are to be incorporated into the proposed structure.

REMOVAL METHODS: Concrete may be removed by cutting and by means of hand operated pneumatic hammers employing pointed or blunted chisel type tools. For removals above steel members, a hammer heavier than 16 kg but not to exceed 41 kg may be used at the approval of the Engineer, to ensure adequate depth control and to prevent nicking or gouging the primary steel members, Prior to proceding with any removal, the Contractor shall submit the removal procedure to the Engineer for review and approval.

DECK REMOVALS: Due to the possible presence of welded attachments to existing structural steel (finishing machine, scupper and form supports, etc.), care shall be taken during deck removal to avoid damaging stringers which are to remain. Stringers damaged by the Contractor's removal operations shall, at no cost to the state, be replaced or repaired. Proposed repairs, developed by a registered professional engineer, shall be submitted in writing for review and approval by the Director.

During the removal of the bridge deck of bridge no. JEF–7–42630, the Contractor shall take the appropriate precautions to avoid and/or limit demolition debris from entering the stream. Any material that does fall into the stream shall be removed by the Contractor as soon as possible, at his expense.

EXTRANEOUS MEMBERS: Existing extraneous members (i.e., finishing machine and form supports, etc., and the support for scuppers and bulb angles which are to be removed) attached by welded connections to portions of the top flanges designated "tension" shall be removed and the flange surfaces ground smooth. Grinding shall be carefully done and parallel to the flanges.

LOADING LIMITATIONS: No part of the structure shall be subjected to unit stresses that exceed 136.5% of the allowable unit stresses given in the AASHTO Standard Specifications for Highway Bridges due either to demolition, erection or construction methods, or to the use or movement of demolition or erection equipment on or across the structure. Structural analysis computations, by a registered professional engineer, showing the allowable stresses and the maximum stresses produced by the Contractor's methods or equipment shall be submitted to the Director for review and approval at least two weeks prior to the start of the work.

PAYMENT: This work will be paid for at the contract lump sum price bid, which price and payment shall be full compensation for all labor, equipment, materials and incidentals necessary to complete the work in conformance with these requirements, with pertinent provisions of 202, and to the satisfaction of the Engineer.

CUT LINE CONSTRUCTION JOINT PREPARATION: Saw cut boundaries of proposed concrete removals 25 mm deep. Remove concrete to a rough surface. Where practicable, the existing reinforcing steel where required in the plans shall be left in place. Install dowel bars if specified. Prior to concrete placement abrasively clean joint surface and exposed reinforcement to remove loose and disintegrated concrete and loose rust. The joint surface and exposed reinforcement shall be thoroughly cleaned of all dirt, dust, or other foreign material by the use of water, air under pressure, or other methods that produce satisfactory results. Concrete bonding surfaces shall be wet without free water as concrete is placed.

SUBSTRUCTURE CONCRETE REMOVAL shall be by means of approved pneumatic hammers employing pointed and blunt chisel tools. Hydraulic hoe–ram type hammers will not be permitted. The weight of the hammer shall not be more than 16 kg for removal within 450 mm of portions to be preserved. Outside the 450 mm limit, a hammer heavier than 16 kg, but not to exceed 41 kg, may be used at the approval of the Engineer. Pneumatic hammers shall not be placed in direct contact with reinforcing steel that is to be retained in the rebuilt structure.

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.

EXISTING STRUCTURE VERIFICATION: Details and dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and from field observations and measurements. Consequently, they are indicative of the existing structure and the proposed work but they shall be considered tentative and approximate. The Contractor is referred to CMS Sections 102.05, and 105.02.

Contract bid prices shall be based upon a recognition of the uncertainties described above and upon a prebid examination of the existing structure by the Contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the Contractor in the field.

REPLACEMENT OF EXISTING REINFORCING STEEL: Any existing reinforcing bars which are to be incorporated into the new work and which are made unusable by concrete removal operations shall be replaced with new steel. Any existing reinforcing bars deemed by the Engineer to be unusable because of corrosion shall be replaced with new steel.

EXISTING BRIDGE PLANS: The original construction plans of the existing bridge are available upon request at the District 11 Office of the OHIO DEPARTMENT OF TRANSPORTATION, 1072 W. High Ave., New Philadelphia, Ohio. 44663, Telephone (330) 339–6633.

ITEM 516 – REFURBISHING BEARING DEVICES, AS PER PLAN
This item shall include all work necessary to properly align bridge bearings as well as their cleaning and painting. Included shall be the disassembly of the bearings, hand tool cleaning (grinding if necessary), painting as required by System OZEU, replacement of any damaged sheet lead (711.19), installation of any necessary steel shims of the same size as the bearings to provide a snug fit, realignment of the upper bearing plate by removing existing welds and rewelding so that the bearings are vertically aligned at 16° C, lubricating sliding surfaces, and reassembly of the bearings. The Contractor shall be sure that all bearings are shimmed adequately and that no girders and/or bearing devices are "floating". At the option of the Contractor and at no additional cost to the State, new bearings of the same type as the existing may be installed in place of refurbishing the bearings. All work shall be to the satisfaction of the Engineer. Payment for all the above described labor and materials will be made at the contract price bid for Item 516 – Refurbish Bearing Devices, As Per Plan.

CONCRETE PARAPETS: As soon as a concrete saw can be operated without damaging the freshly placed concrete, 32 mm deep control joints shall be sawed into the perimeter of the concrete parapet. The sawcut shall be made in the complete circumference of the parapet, starting and ending at the elevation of the concrete deck. The sawcuts shall be placed at a minimum of 2000 mm and a maximum of 3000 mm centers. The use of an edge guide, fence, or jig is required to insure that the cut joint is straight, true, and aligned on all faces of the parapet. The joint width shall be the width of the saw blade, a nominal width of 6 mm. The perimeter of the deflection control joint shall be sealed to a minimum depth of 25 mm with a caulking material conforming to Federal Specifications, TT–S–00227E.

COFFERDAMS, CRIBS AND SHEETING, AS PER PLAN: Temporary shoring shall be used to accomplish the proposed construction in stages. The design of the temporary shoring shall be the responsibility of the Contractor, be designed by a Registered Proffesional Engineer, and conform with 501.05. For approval, five copies of the drawings shall be submitted to the Director and concurrently, one copy to the Office of Structural Engineering. Construction of the shoring shall not begin until after written approval has been received from the Director. Portions of the temporary shoring composed of steel or concrete may be left in place at the discretion of the Engineer. Portions composed of other materials shall be removed prior to completion of the work.

STRUCTURE EXCAVATION in addition to that necessary to remove portions of the existing structure and all necessary backfill is included in the Lump Sum Bid Item, "Unclassified Excavation, as per plan" for Payment.

ITEM 510 – DOWEL HOLES, AS PER PLAN: This item shall include the drilling of holes into concrete or masonry and the finishing and placing of grout into holes. Nonshrinking epoxy grout shall be used in accordance with CMS 705.20. Payment shall be included with Item 511.

ITEM 503 – UNCLASSIFIED EXCAVATION, AS PER PLAN: Unclassified excavation shall be in accordance with 503 except that the backfill material behind the abutments shall be 203 material placed in 150 mm lifts and compacted in accordance with 304.04.

NOTE

1. For additional Structure General Notes, see sheet 3 of 14.

DESIGN AGENCY
THOMAS FOK & ASSOC., LTD.
CONSULTING ENGINEERS, SURVEYORS, & PLANNERS
3886 MAHONING AVE., YOUNGSTOWN, OHIO

DESIGNED	DRAWN	REVIEWED	DATE
SJR	KRM	TF/JEU	3–99
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JDV		41013 59	

GENERAL NOTES
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

ESTIMATED QUANTITIES

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT.	PIERS	GEN'L	AS PER PLAN SHEET NO.
202	11203	Lump		Portions of Structure Removed, Over 6 meter Span, as per plan				Lump	2
503	11101	Lump		Cofferdams, Cribs and Sheeting, as per plan				Lump	2
503	21301	Lump		Unclassified Excavation, as per plan		Lump			2
Special	51267502	962	sq. meter	Sealing of Concrete Surfaces (Epoxy) *	714	248			
513	15900	1451	Kilogram	Structural Steel, Replacement of deteriorated end cross frames	1451				
513	20000	4872	Each	Welded Stud Shear Connector	4872				
516	10000	85.2	Meter	Preformed Elastomeric Compression Joint Seal (705.11)	85.2				
516	11210	40	Meter	Structural Expansion Joint including Elastomeric Strip Seal *	40				
516	45305	32	Each	Refurbish Bearing Device, as per plan		16	16		2
516	47001	Lump		Jacking and temporary support of superstructure, as per plan	Lump				3
518	21100	41	cu. meter	Porous Backfill		41			
519	11100	7	sq. meter	Patching Concrete Structure		7			
815	00100	Lump		Surface Preparation of Existing Steel, System OZEU	Lump				
815	00200	Lump		Field Painting of Existing Steel, Prime Coat, System OZEU	Lump				
815	00300	Lump		Field Painting of Existing Steel, Intermediate Coat, System OZEU	Lump				
815	00400	Lump		Field Painting of Existing Steel, Finish Coat, System OZEU	Lump				
815	00504	60	Man Hour	Grinding Fins, Tears, Slivers	60				
815	00508	1069	Meter	Grinding Flange Edges	1069				
842	31502	509.0	cu. meter	Class S Concrete, Superstructure	509.0				
842	43200	5.1	cu. meter	Class C Concrete, Pier			5.1		
842	45700	67.7	cu. meter	Class C Concrete, Abutment		67.7			

* See proposal note

Calculated by S.J.R. Date 12-30-96

Checked by K.R.M. Date 1-7-97

metric units

PROPOSED WORK

1. Set traffic control devices for phase construction.
2. Remove Phase 1 (or Phase 2) portions of existing deck, safety curbs, scuppers, and portions of abutments as noted on the plans.
3. Jack and support Phase 1 (or Phase 2) portions of existing framing and remove existing bearings at abutments and piers.
4. Construct reinforced concrete caps at abutments and piers.
5. Refurbish and replace existing bearings at abutments and piers and reset existing stringers.
6. Install Phase 1 (or Phase 2) portions of stud shear connectors and place portions of deck and parapet.
7. Construct Phase 1 (or Phase 2) portions of abutment wingwalls and place new approach slabs.
8. Seal concrete surfaces as noted on the plans.
9. Paint existing structural steel.
10. After the phased work is complete, open the structure to traffic.

STRUCTURE GENERAL NOTES

ITEM 516, JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN
This item shall consist of furnishing all necessary labor, materials, and equipment to raise or reposition any existing structures to the dimensions and requirements defined in the project plans.

The contractor shall be responsible for the design, installation and operation of an adequate jacking system, including any temporary or permanent supports necessary to perform the work described in the project plans. Three (3) sets of jacking plans, which include the information described in this note, shall be submitted to the Director for approval at least (30) days before actual work is to begin. The plans shall be prepared and stamped by a registered professional engineer.

Jacking submittals shall include at least the following:

1. The signature and number, or professional seal, of the registered professional engineer who prepared the submittal.
2. Calculations and analysis of the structure to determine and define the actual loading applied at the contractor's selection jacking points.
3. A drawing showing the physical and dimensional position of the jacks with respect to the structure including clearances and center of lift.
4. A schematic layout of jacks, check valves, pumps with 3 way retractor valve, pressure gages, flow control valves, etc. in accordance with manufacturer's recommendations. All jacks for each abutment or pier shall be connected together. All jacks at each abutment or pier shall be the same size.
5. Analysis and calculations of the stresses induced or created in the structure and any temporary or permanent supports. Design calculations for any temporary or permanent supports.
6. Physical dimensions, materials, and fabrication details of any temporary or permanent supports. Horizontal and vertical movement restraint shall be provided.
7. A step by step procedure detailing all steps in the jacking operation.
8. Method of attachment to structural members. Welding to tension areas will not be permitted.

The entire system including jacks shall have 20% more capacity than required based on calculated loads.

For lifts greater than 25 mm, jacks shall have locking nuts to positively lock and support the structure during the lift.

Jacks shall have a swivel load cap, a domed piston head or some other device to protect against the effects of side load on the jack.

Jacks alone shall not be used to support loads except during the actual jacking operation. Temporary supports, blocking or other methods approved by the Director shall be used.

Single acting rams with no over-travel protection system shall not be used.

Spare equipment shall be available on site for the required structure raising to proceed in the event of breakdown. A list of spare equipment shall be provided by the engineer.

At a minimum, a jacking operation shall lift all beams at any one abutment or pier simultaneously. The only exception is the situation where the work involves replacing or rehabilitating individual bearings; no permanent shimming is required and the height of the lift shall not exceed 6 mm.

Maximum differential jacking height between any adjacent abutments or piers shall be 25 mm or less.

The Contractor shall demonstrate to the Engineer that the bridge bearings are fully seated between all contact areas. If full seating is not attained, suitable means of repair, subject to the approval of the Engineer, will be required at the Contractor's expense.

The jacking operation shall be directed by a Professional Engineer employed by the Contractor. Failure to have a Professional Engineer present shall be cause for ceasing jacking operations.

Payment shall be made at the lump sum price bid for Item 516, Jacking and Temporary Support of Superstructures, As Per Plan and shall include all necessary tools, labor, equipment and materials necesary to complete this item of work.

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SJR	KRM	TF/JEU	3-99
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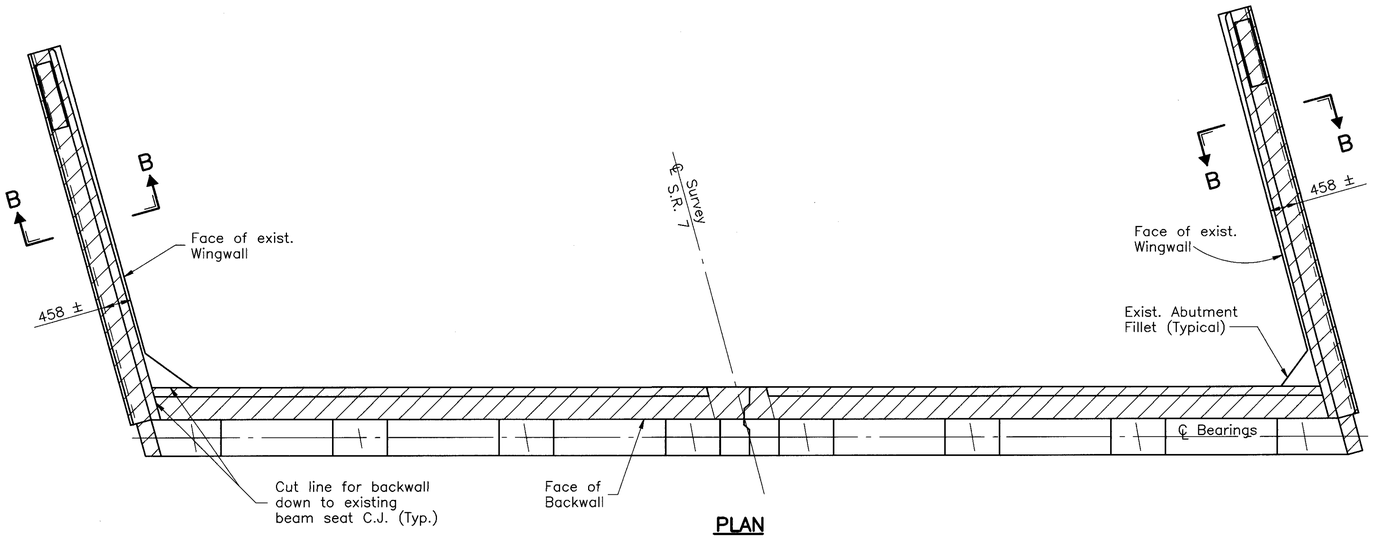
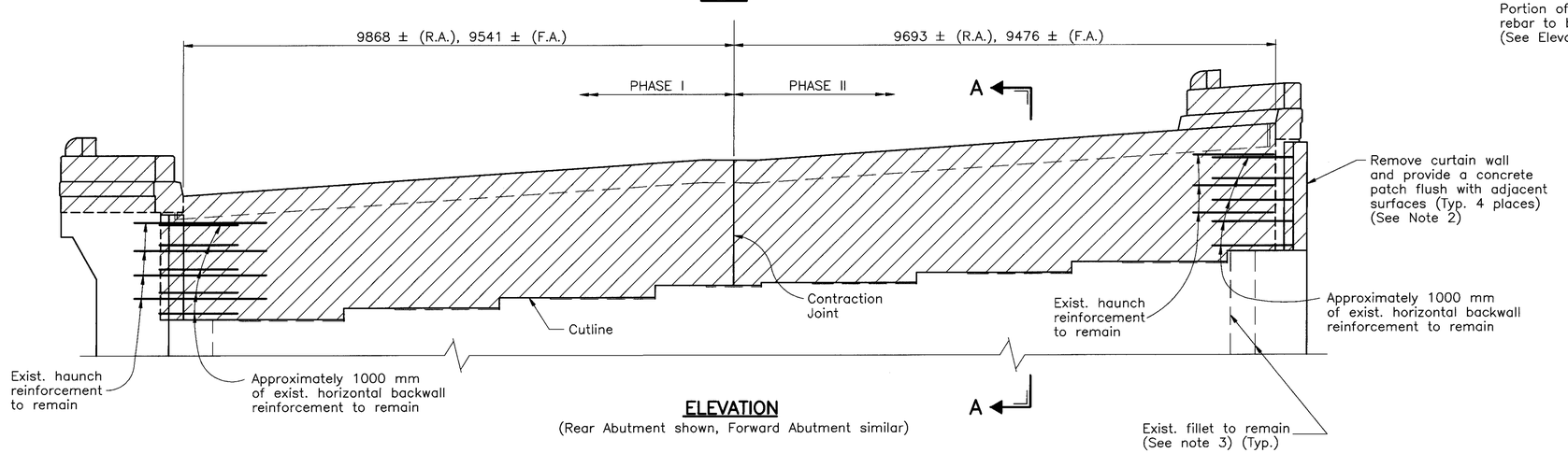
JDV		4101.359	

ESTIMATED QUANTITIES, GENERAL NOTES & PROPOSED WORK
JEF-7-42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF-7-36.97

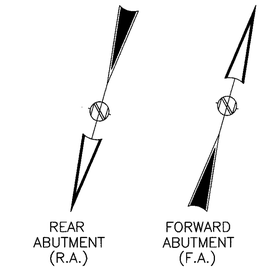


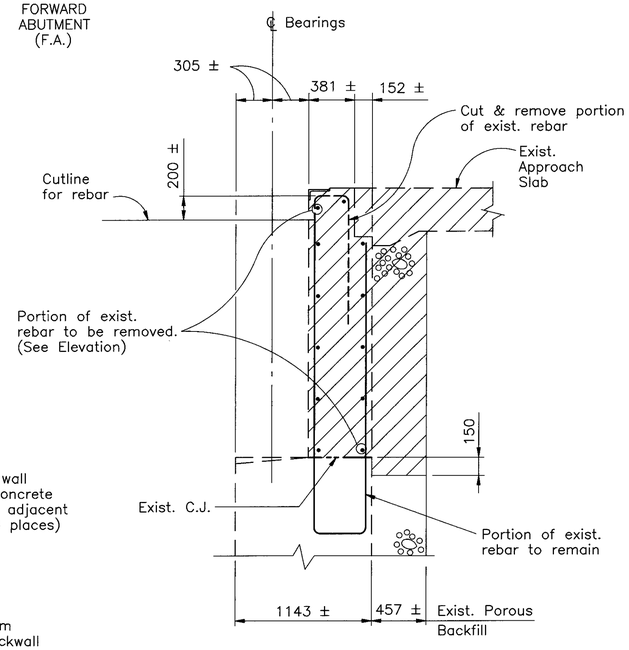
PLAN



ELEVATION

(Rear Abutment shown, Forward Abutment similar)

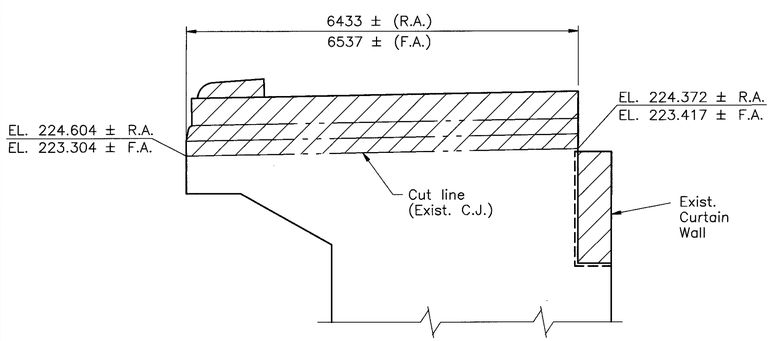




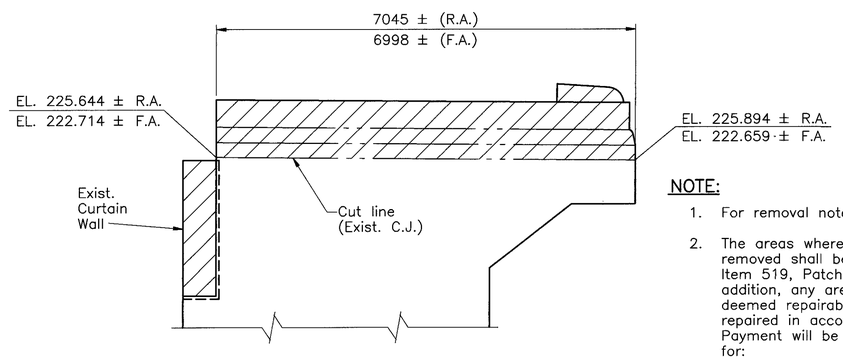
SECTION A–A

NOTE: Girders and bearings not shown.

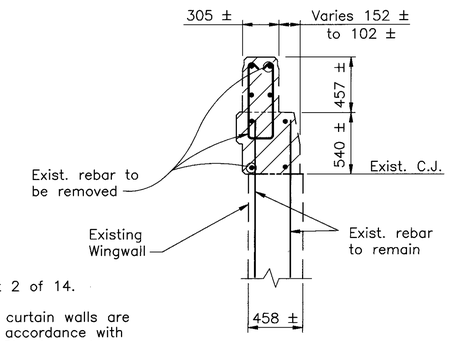
▨ = Areas to be Removed according to Item 202.



ELEVATION – RIGHT REAR WINGWALL
ELEVATION – LEFT FORWARD WINGWALL



ELEVATION – LEFT REAR WINGWALL
ELEVATION – RIGHT FORWARD WINGWALL



SECTION B–B

NOTE:

1. For removal notes, see Sheet 2 of 14.
2. The areas where the existing curtain walls are removed shall be repaired in accordance with Item 519, Patching Concrete Structures. In addition, any areas not shown in the plans deemed repairable by the Engineer shall be repaired in accordance with this specification. Payment will be made at the contract price for:

   Item 519 __7__ Sq. Meter Patching Concrete Structure
3. Remove existing abutment fillets to existing beam seat.

Note: All Dimensions are in Millimeters.

metric units

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CONSULTING ENGINEERS, SURVEYORS, & PLANNERS
3896 MAHONING AVE., YOUNGSTOWN, OHIO

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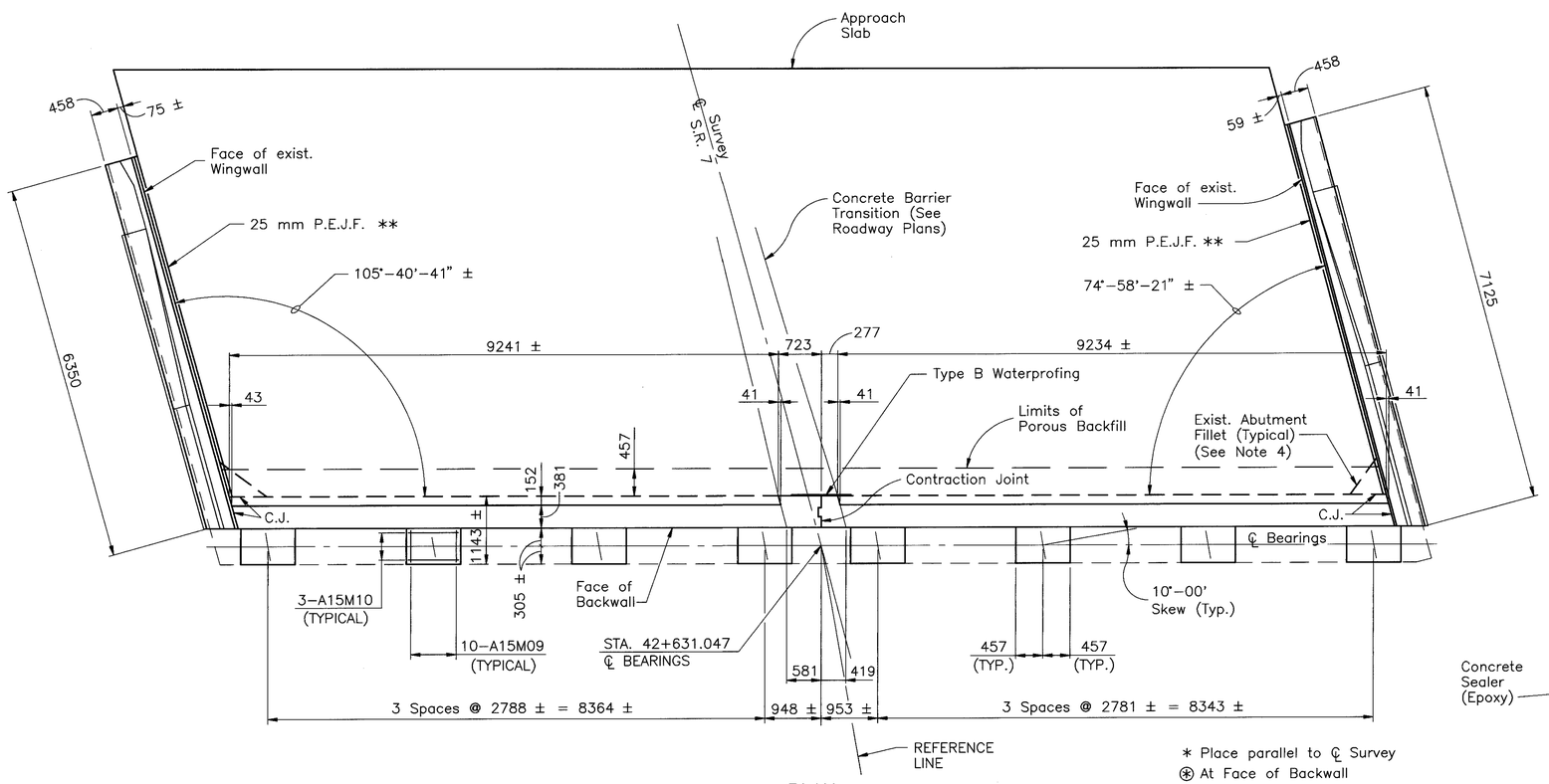
DEMOLITION PLAN – ABUTMENT AND WINGWALL

JEF-7-42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF-7-36.97

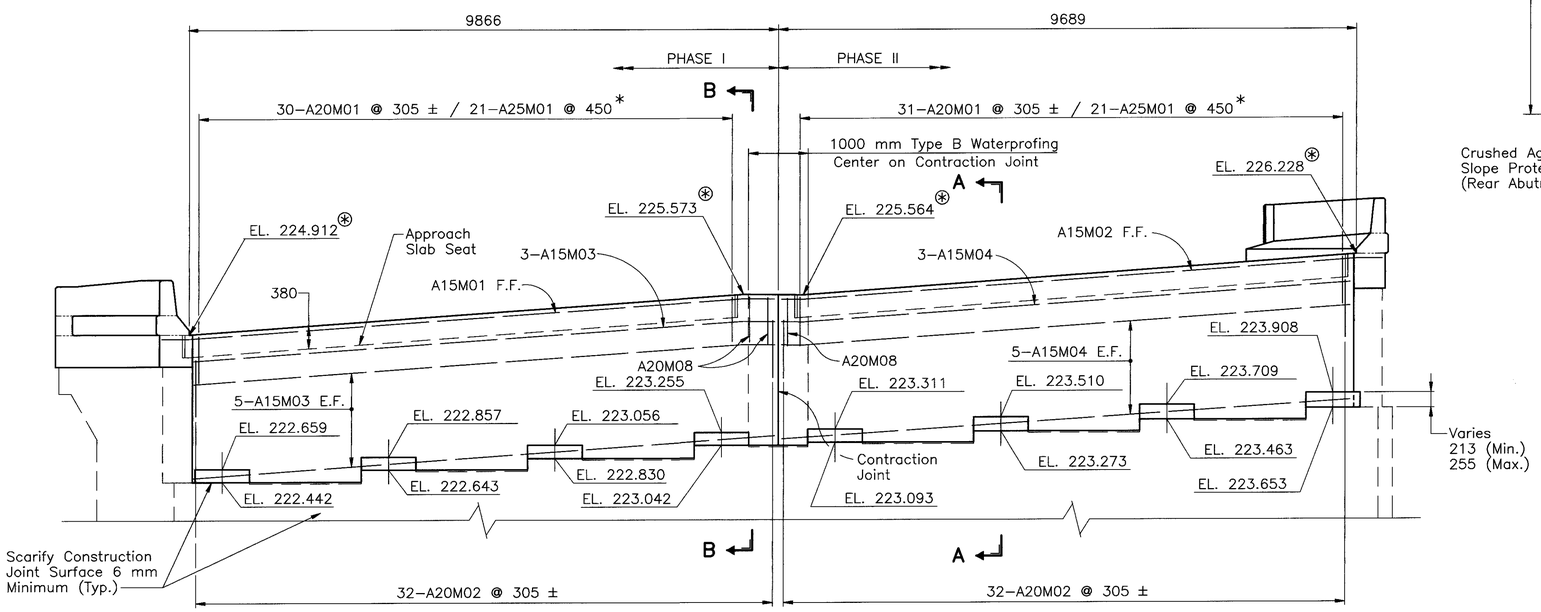


PLAN

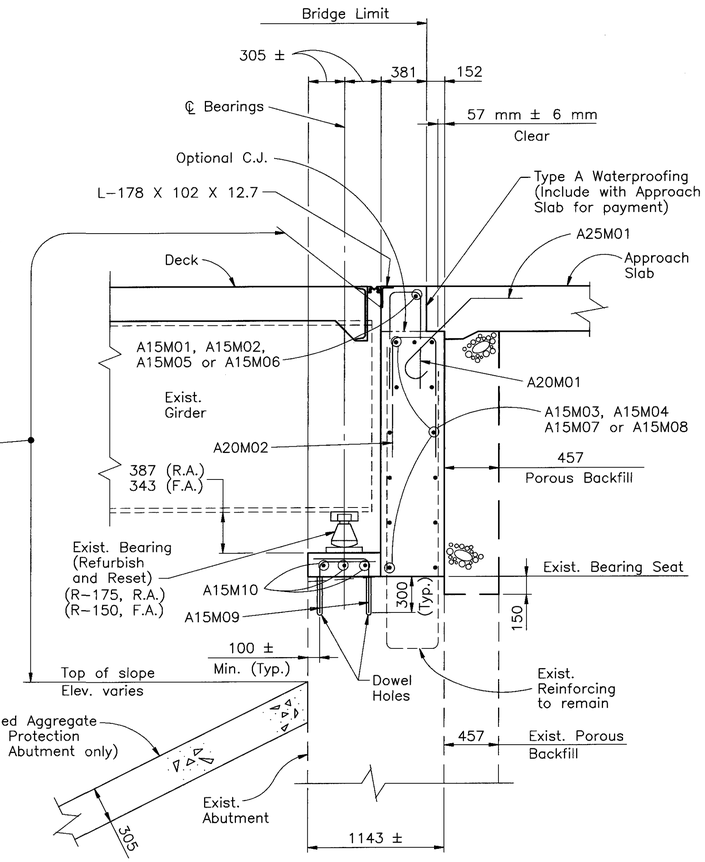
* Place parallel to ℄ Survey

⊛ At Face of Backwall

** Included with Approach Slab for Payment.



ELEVATION



SECTION A–A

NOTES

1. For Section B–B, See Sheet 6 OF 14.
2. For Wingwall details, see Sheet 7 OF 14.
3. For Abutment notes and Abbreviations, see Sheet 8 OF 14.
4. Remove existing abutment fillets to existing beam seat.

All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

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CONSULTING ENGINEERS, SURVEYORS, & PLANNERS
3896 MAHONING AVE., YOUNGSTOWN, OHIO

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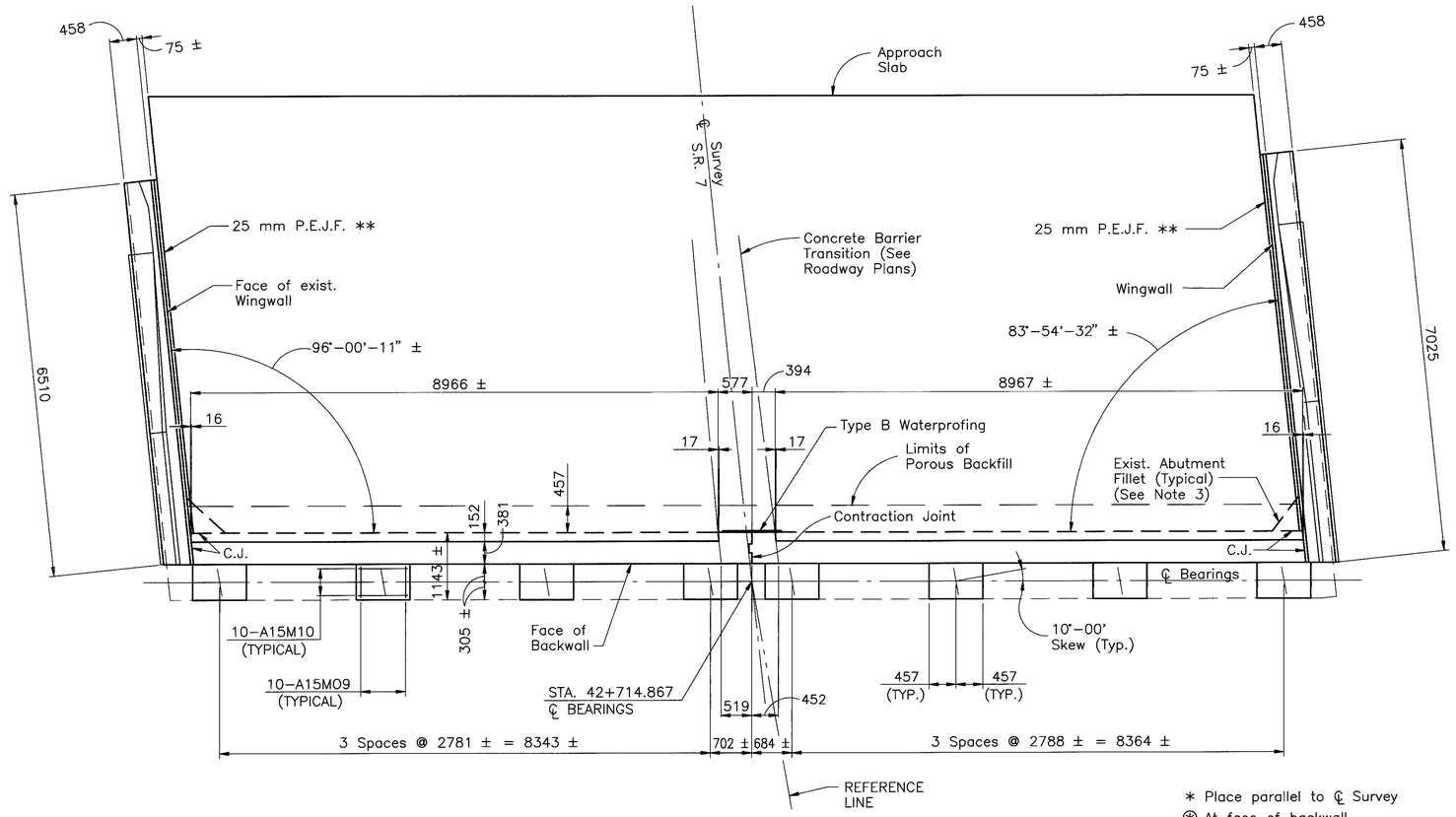
JDV		4101359	

REAR ABUTMENT DETAIL

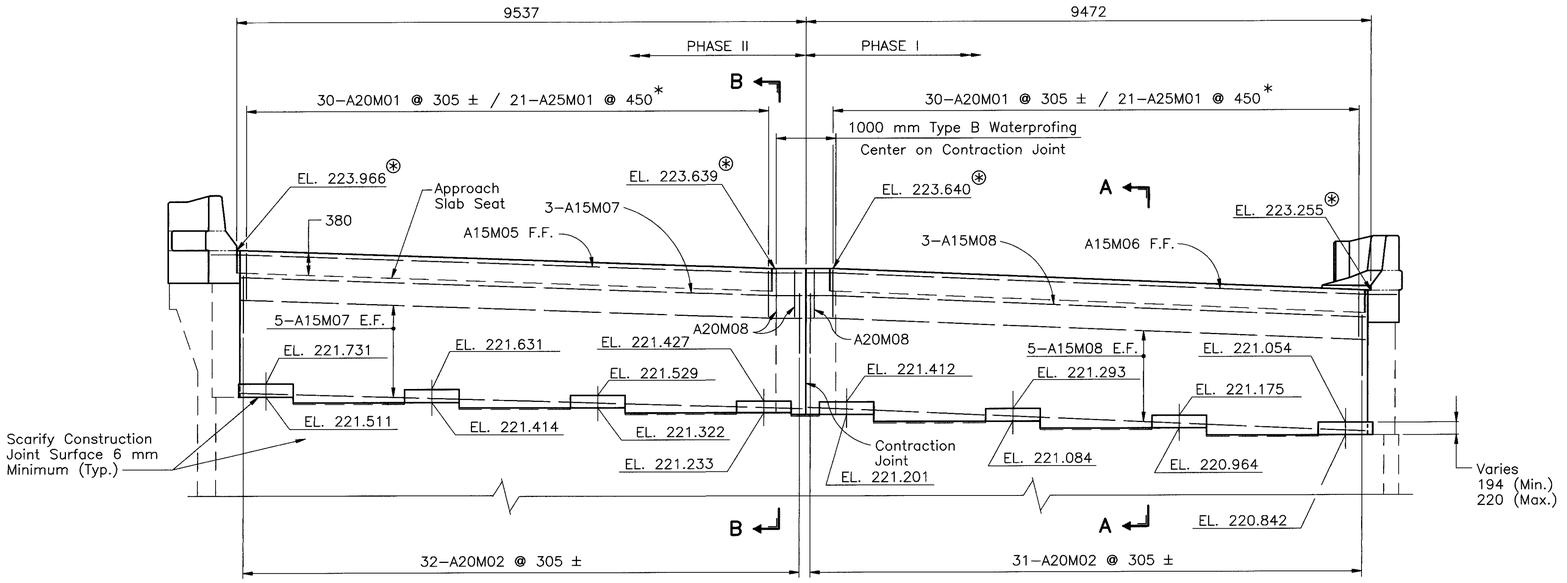
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

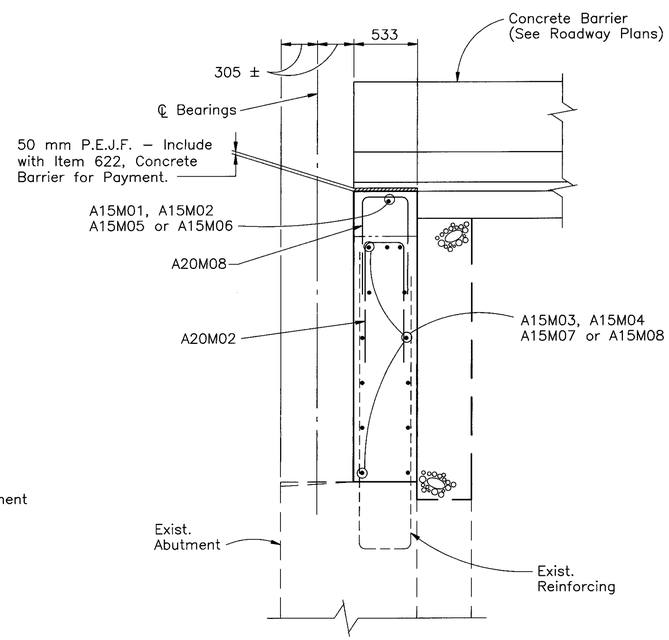


PLAN

* Place parallel to ℄ Survey
⊛ At face of backwall
** Included with Approach Slab for Payment



ELEVATION



SECTION B–B

For detail not shown, see Section A–A

NOTES

1. For Section A–A, see Sheet 5 OF 14.
2. For Abutment notes, Abbreviations and Wingwall Details, see Sheet 8 OF 14.
3. Remove existing abutment fillets to existing beam seat.

All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

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FORWARD ABUTMENT DETAIL

JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

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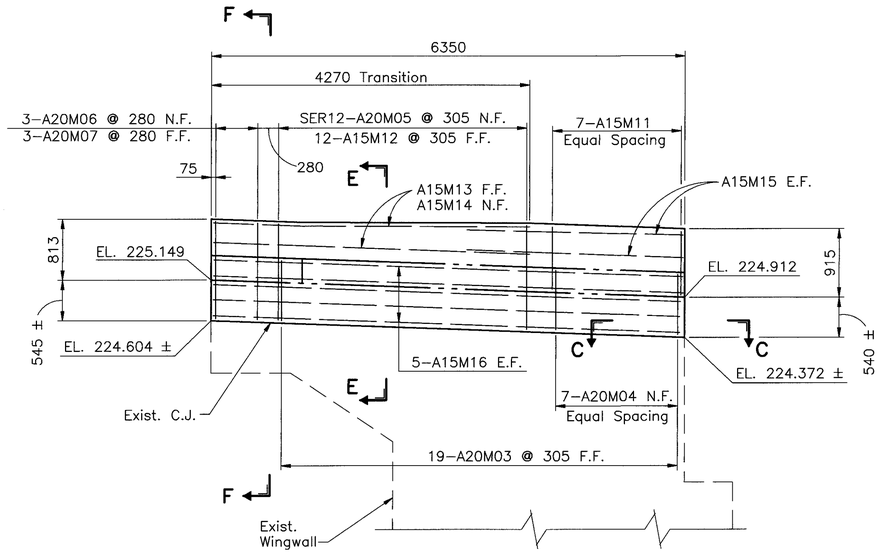
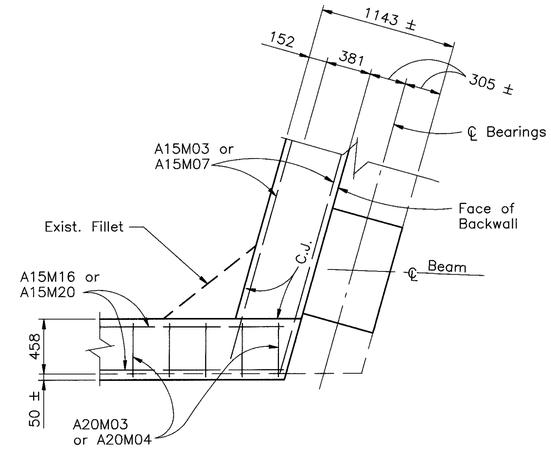
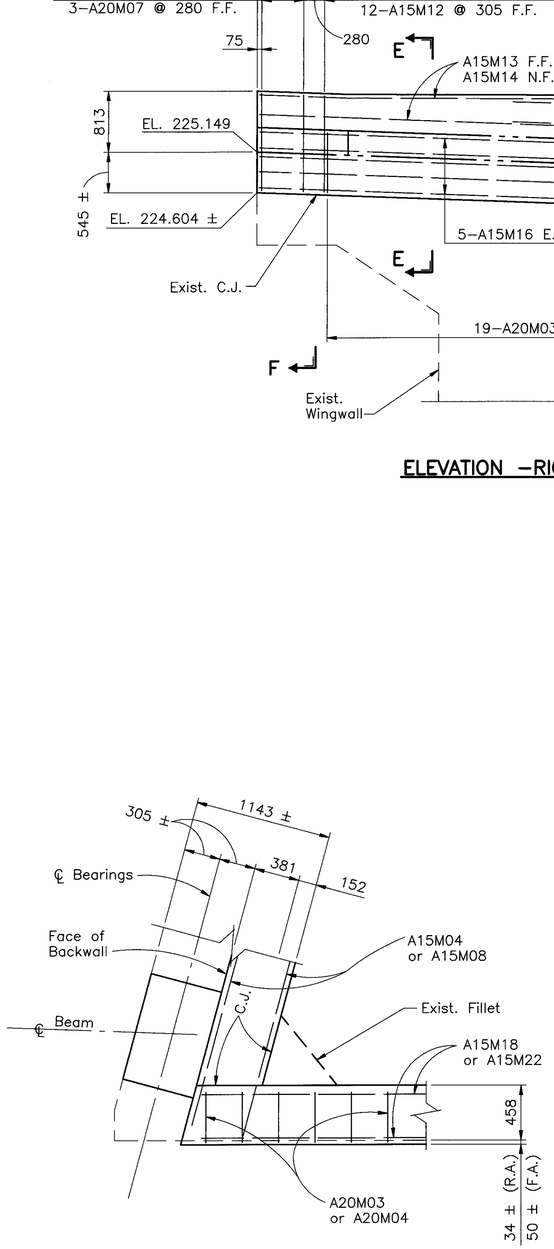


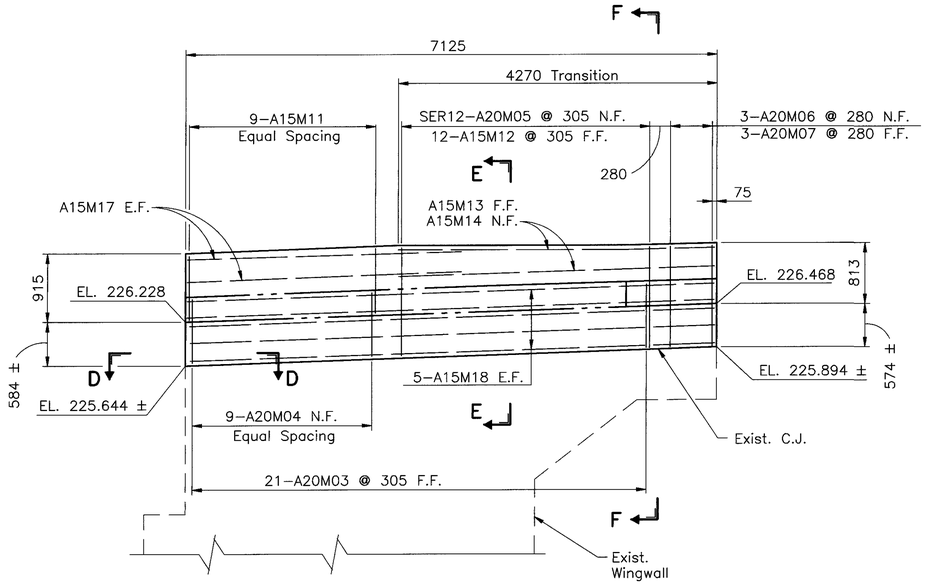
ELEVATION –RIGHT REAR WINGWALL



SECTION C–C



SECTION D–D



ELEVATION –LEFT REAR WINGWALL

NOTE

1. FOR SECTIONS E–E AND F–F, SEE SHEET 8 OF 14.

All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

DESIGN AGENCY
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ABUTMENT DETAILS
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

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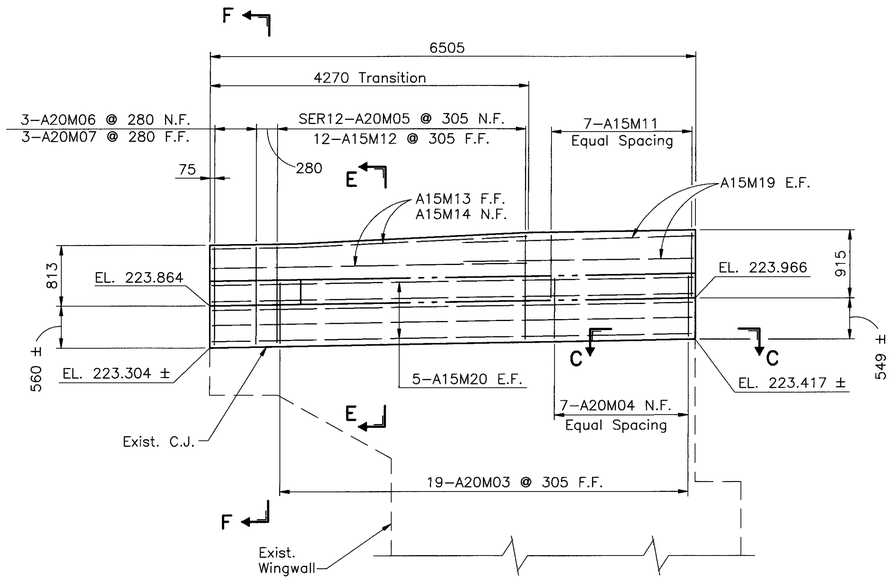
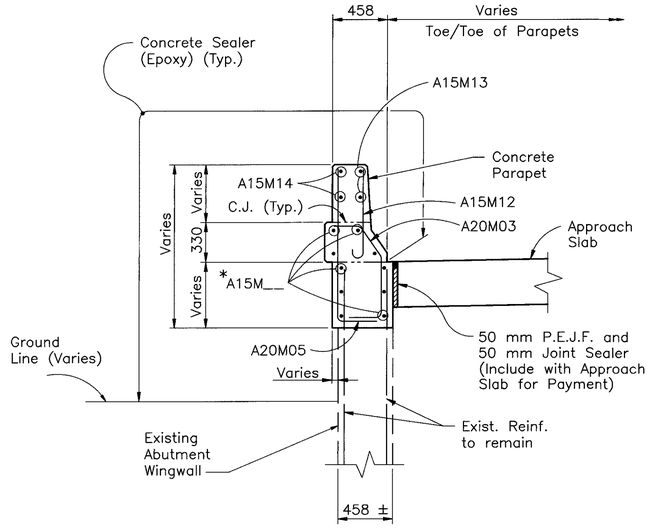
123

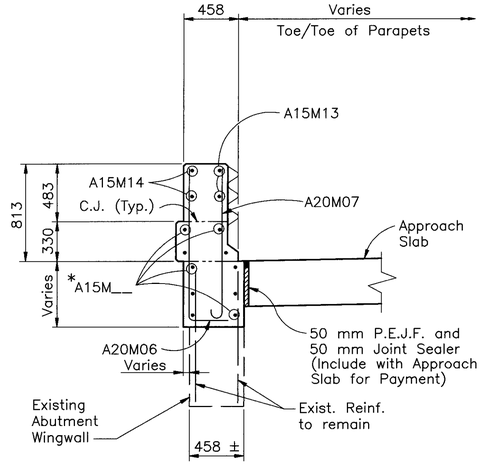


ELEVATION –LEFT FORWARD WINGWALL



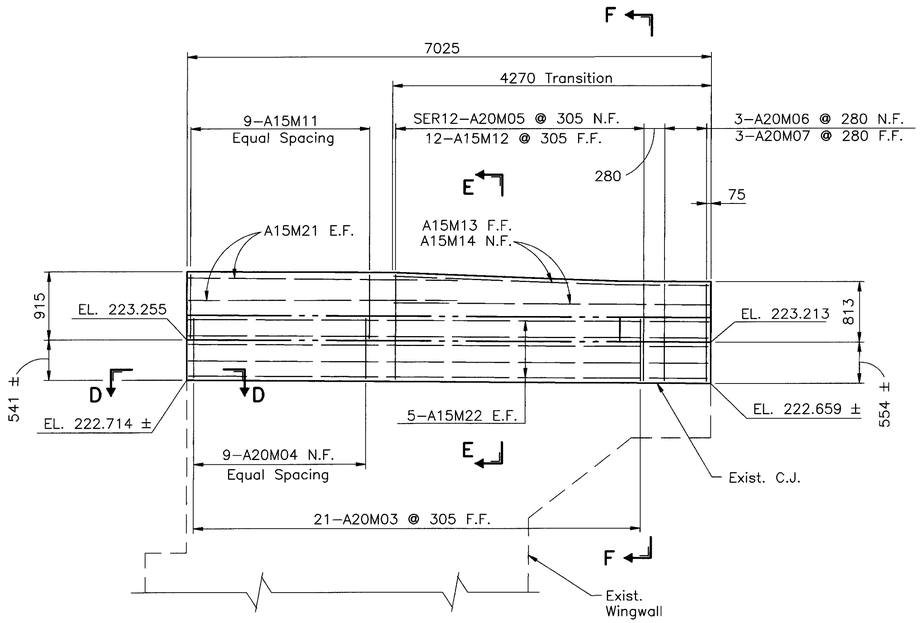
SECTION E–E

* See Elevations for mark numbers



SECTION F–F

* See Elevations for mark numbers



ELEVATION –RIGHT FORWARD WINGWALL

NOTES

1. BACKWALL CONCRETE: IN ADDITION TO THE PROVISIONS OF 511.08, BACKWALL CONCRETE ABOVE THE CONSTRUCTION JOINT CUT LINE AT THE APPROACH SLAB SEAT SHALL NOT BE PLACED UNTIL AFTER THE DECK CONCRETE IN THE SPAN ADJACENT TO THE ABUTMENT HAS BEEN PLACED.
2. POROUS BACKFILL, 457 mm THICK, SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE AND LATERALLY TO THE INSIDE FACE OF WINGWALLS. PAYMENT SHALL BE INCLUDED WITH ITEM 518, POROUS BACKFILL.
3. FOR REINFORCEMENT SCHEDULE, SEE SHEET 14 OF 14.
4. THE FOLLOWING ABBREVIATIONS ARE USED:

N.F. – NEAR FACE	EL. – ELEVATION
F.F. – FAR FACE	R.A. – REAR ABUTMENT
E.F. – EACH FACE	F.A. – FORWARD ABUTMENT
C.J. – CONSTRUCTION JOINT	TYP. – TYPICAL

5. FOR ADDITIONAL DEFLECTOR PARAPET DETAILS, SEE STANDARD BRIDGE DRAWING BR–1M.
5. FOR SECTIONS C–C AND D–D, SEE SHEET 7 OF 14.

All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

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SJR	KRM	TF/JEU	5–97
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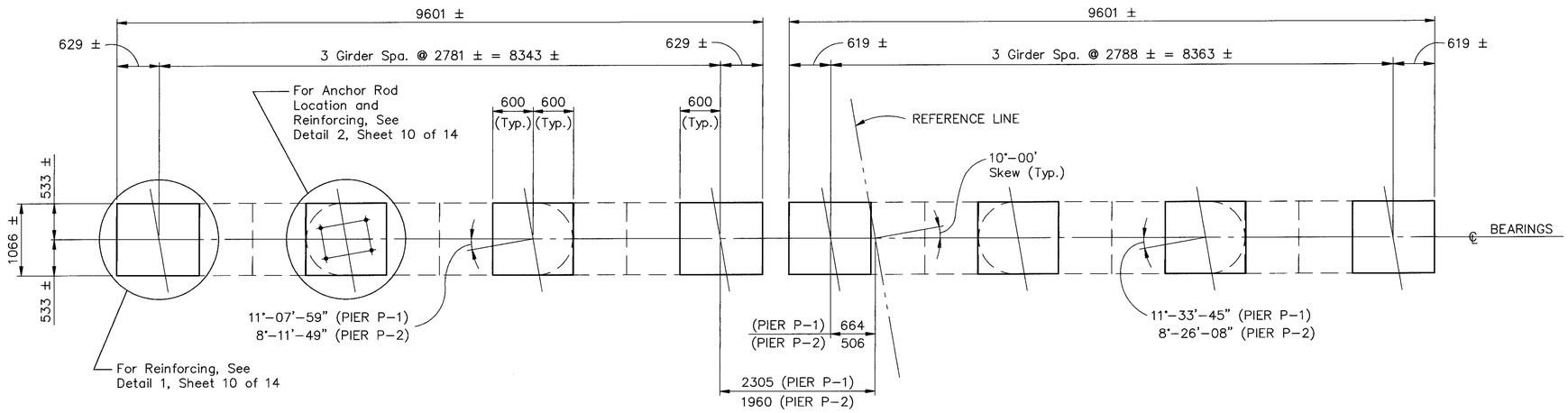
JDV			

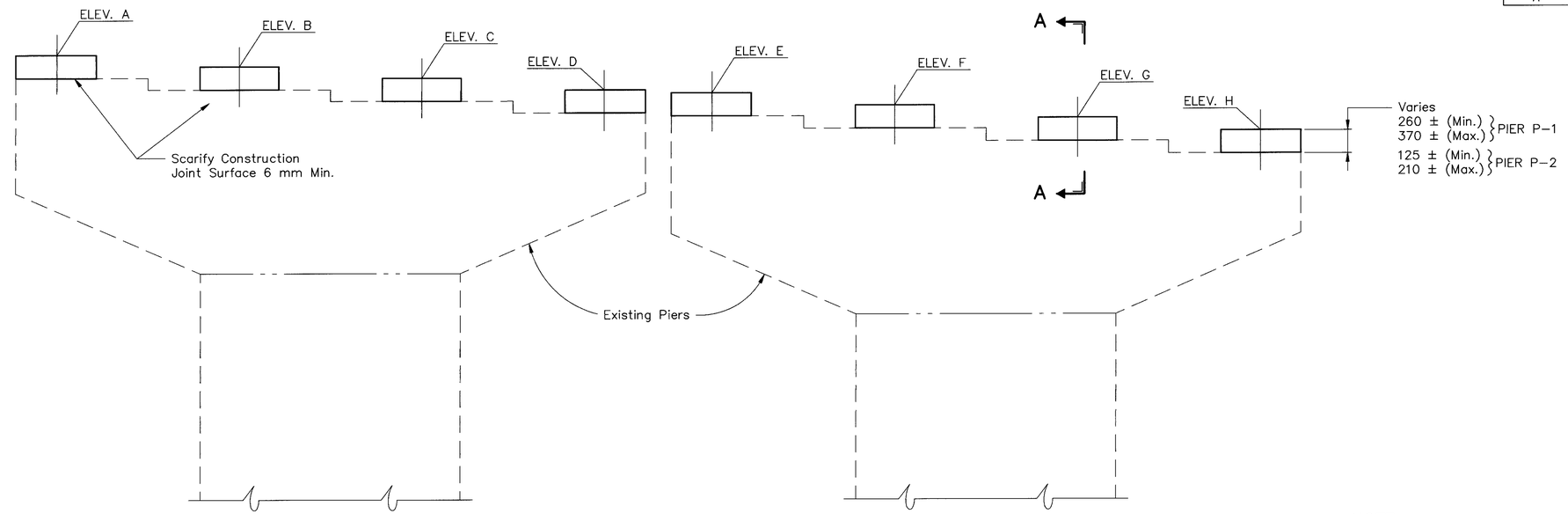
ABUTMENT DETAILS
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97



PLAN

ELEVATION TABLE		
LOCATION	PIER P-1	PIER P-2
A	222.836	221.946
B	222.656	221.812
C	222.475	221.676
D	222.293	221.538
E	222.254	221.516
F	222.065	221.367
G	221.876	221.217
H	221.685	221.066



ELEVATION

NOTE

1. For Section A–A and additional details, see Sheet 10 of 14.

All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

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DESIGNED SJR | DRAWN KRM | REVIEWED TF/JEU | DATE 5-97
CHECKED JDV | REVISED | STRUCTURE FILE NUMBER 4101359

PIER P-1 AND P-2 DETAILS

JEF-7-42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF-7-36.97

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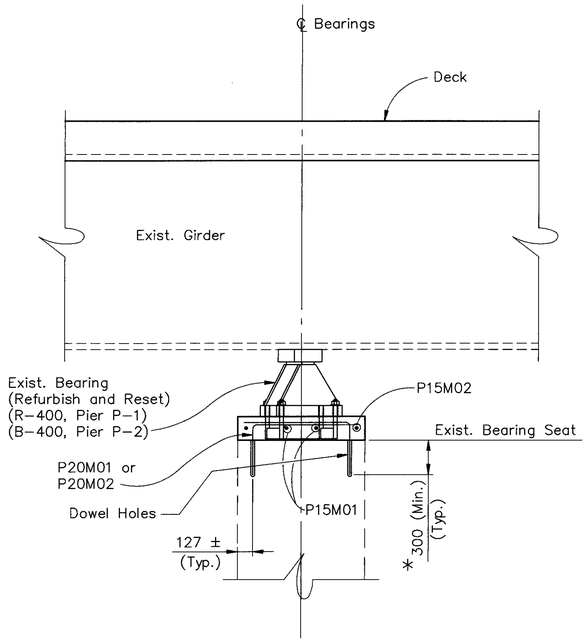
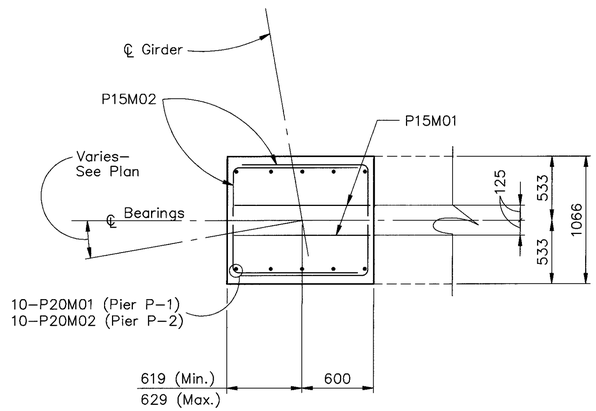
118
123



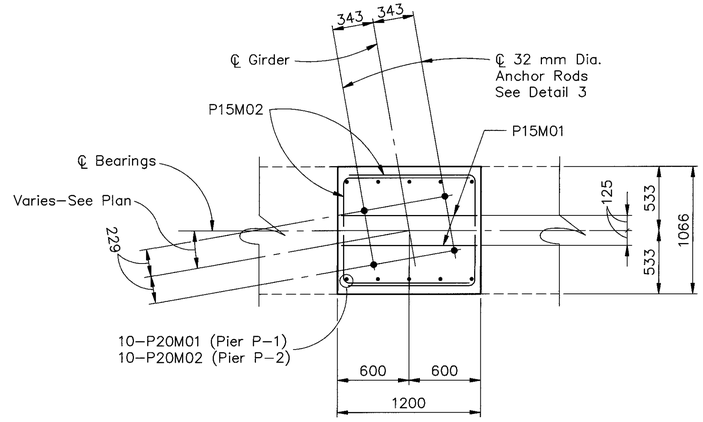
SECTION A–A

* Dowel hole depths vary for P20M01 and P20M02 bars at each girder seat



DETAIL 1

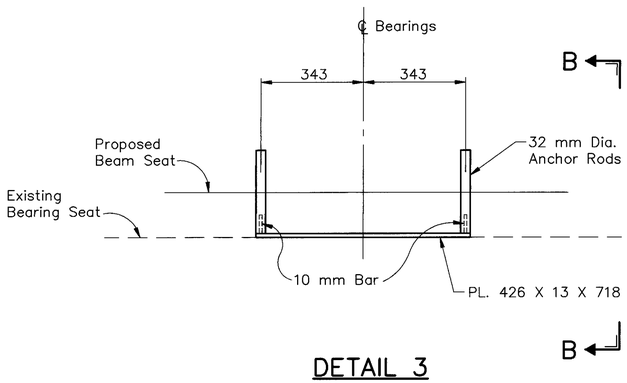
Reinforcing shown is typical at exterior girders for each pier, except as noted.



DETAIL 2

Reinforcing shown is typical at interior girders for each pier, except as noted.

Anchor Location is typical at each girder, Pier P–2 only.

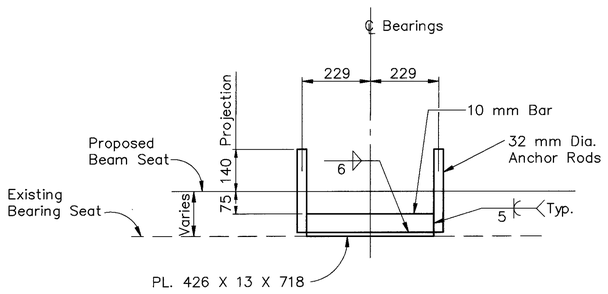


DETAIL 3

Cut existing Anchor Rods flush with top of existing bearing seat.

Bearing Anchor Rods to be Cast–in–place.

Payment for Anchor Rod Weldment shall be included with Item 516, Refurbish and Reset Bearings.



VIEW B–B

NOTES

1. Bridge seat dowels: Care shall be taken to locate bridge seat reinforcement prior to dowel hole drilling. Holes shall be shifted as necessary to clear existing reinforcing steel.
2. For reinforcement schedule, see sheet 14 of 14.

Note: All Dimensions are in Millimeters.

metric units

DESIGN AGENCY
THOMAS FOK & ASSOC., LTD.
CONSULTING ENGINEERS, SURVEYORS, & PLANNERS
3896 MAHONING AVE., YOUNGSTOWN, OHIO

DESIGNED SJR | DRAWN KRM | REVIEWED TF/JEU | DATE 5–97
CHECKED JDV | REVISED | STRUCTURE FILE NUMBER 4101359

PIER P–1 AND P–2 DETAILS
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

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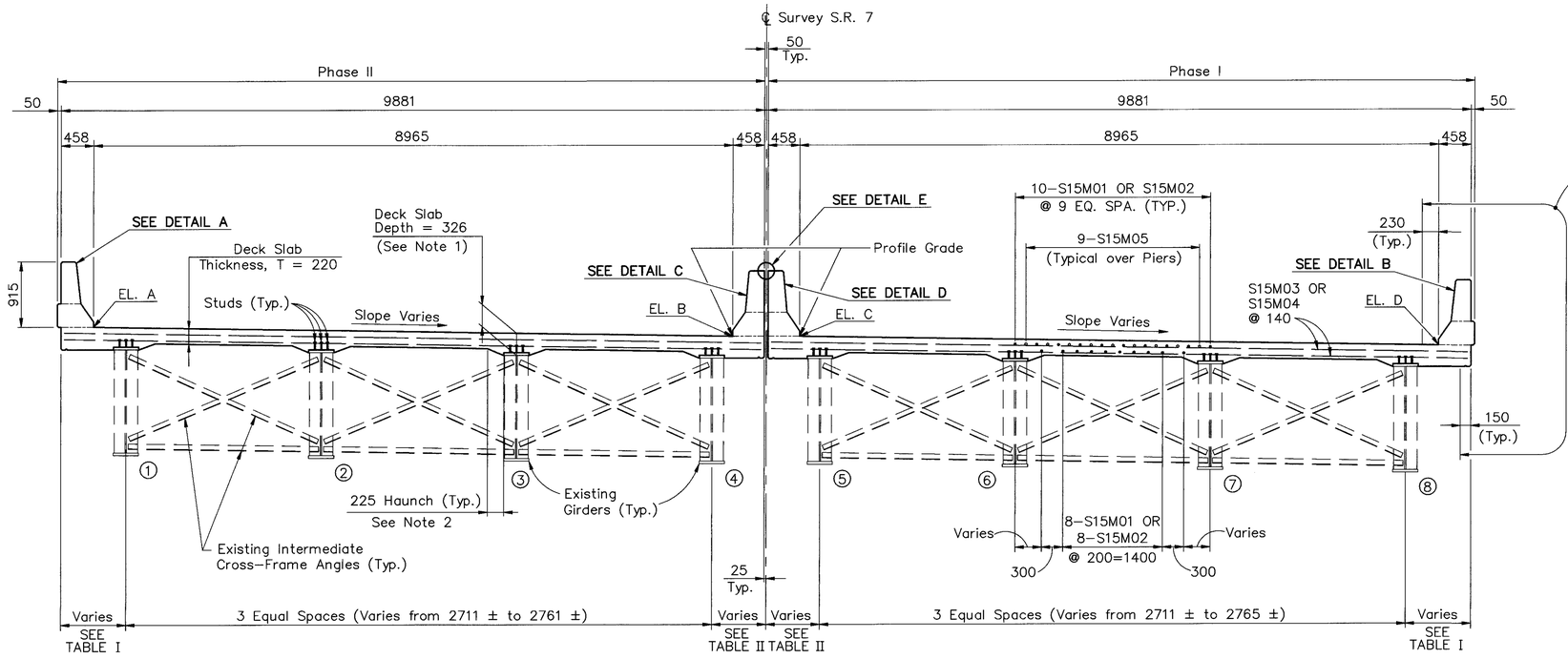


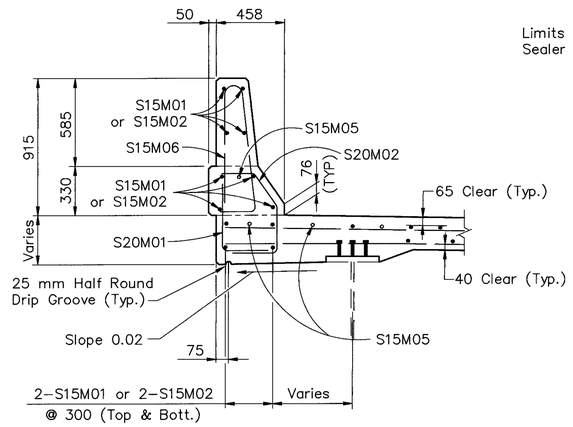
TRANSVERSE SECTION

TABLE I

RADIAL OFFSETS (in mm) FROM CENTERLINE OF EXTERIOR GIRDERS TO FASCIA OF SLAB							
GIRDER	℄ BRGS. REAR ABUT.	℄ SPAN 1	℄ BRGS. PIER 1	℄ SPAN 2	℄ BRGS. PIER 2	℄ SPAN 3	℄ BRGS. FWD. ABUT.
1	914	1114	914	1133	914	991	914
8	914	702	914	654	914	822	914

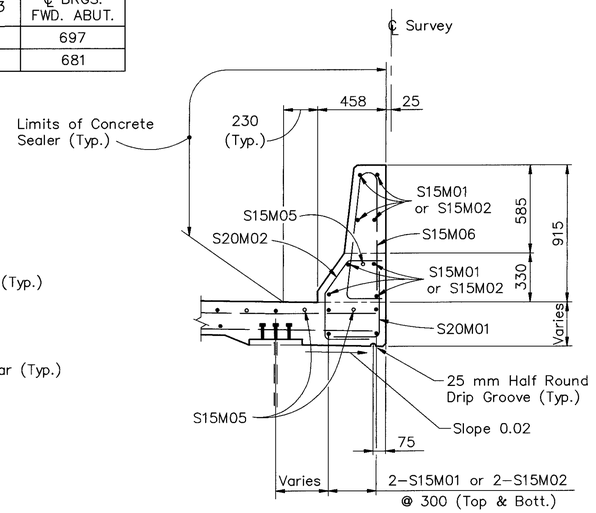
TABLE II

RADIAL OFFSETS (in mm) FROM CENTERLINE OF SURVEY S.R. 7 TO CENTERLINE OF GIRDERS 4 & 5							
GIRDER	℄ BRGS. REAR ABUT.	℄ SPAN 1	℄ BRGS. PIER 1	℄ SPAN 2	℄ BRGS. PIER 2	℄ SPAN 3	℄ BRGS. FWD. ABUT.
4	911	657	808	517	727	626	697
5	917	1063	800	1007	711	782	681



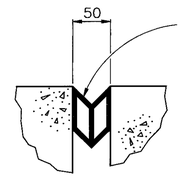
DETAIL A (As shown)

DETAIL B (Opposite Hand)



DETAIL C (As shown)

DETAIL D (Opposite Hand)



DETAIL E

NOTES:

1. DECK SLAB DEPTH: THE DISTANCE SHOWN FROM TOP OF DECK SLAB TO BOTTOM OF THE TOP FLANGE IS THE THEORETICAL DESIGN DIMENSION INCLUDING THE DESIGN HAUNCH THICKNESS OF 50 MILLIMETERS. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION, MINUS THE DESIGN HAUNCH THICKNESS, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE GIRDER MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE. DEDUCTION SHALL BE MADE FOR VOLUME OF ENCASED STEEL PLATES AS PER 511.18.
2. A HAUNCH WIDTH OF 225 mm SHALL BE USED FOR COMPUTING THE QUANTITY OF CONCRETE. HOWEVER THE HAUNCH WIDTH MAY VARY BETWEEN 150 mm AND 300 mm.
3. FOR DECK SLAB PLAN, SEE SHEET 12 OF 14.
4. FOR PARAPET DETAILS, REFER TO ODOT STANDARD BR–1M, DATED 12–15–94.
5. DRIP GROOVES SHALL TERMINATE 600 mm FROM THE FACE OF THE ABUTMENTS.
6. FOR DECK SCREED ELEVATIONS, SEE SHEET 13 OF 14.
7. REFER TO MANUFACTURER'S SPECIFICATIONS AND INSTALLATION PROCEDURES FOR PLACING THE TYPE 2 W JEENE JOINT OR EQUIVALENT. PAYMENT SHALL BE INCLUDED WITH "ITEM 516, PREFORMED ELASTOMERIC COMPRESSION JOINT SEAL (705.11)."

All Dimensions are in Millimeters.

metric units

DESIGN AGENCY
THOMAS FOK & ASSOC., LTD.
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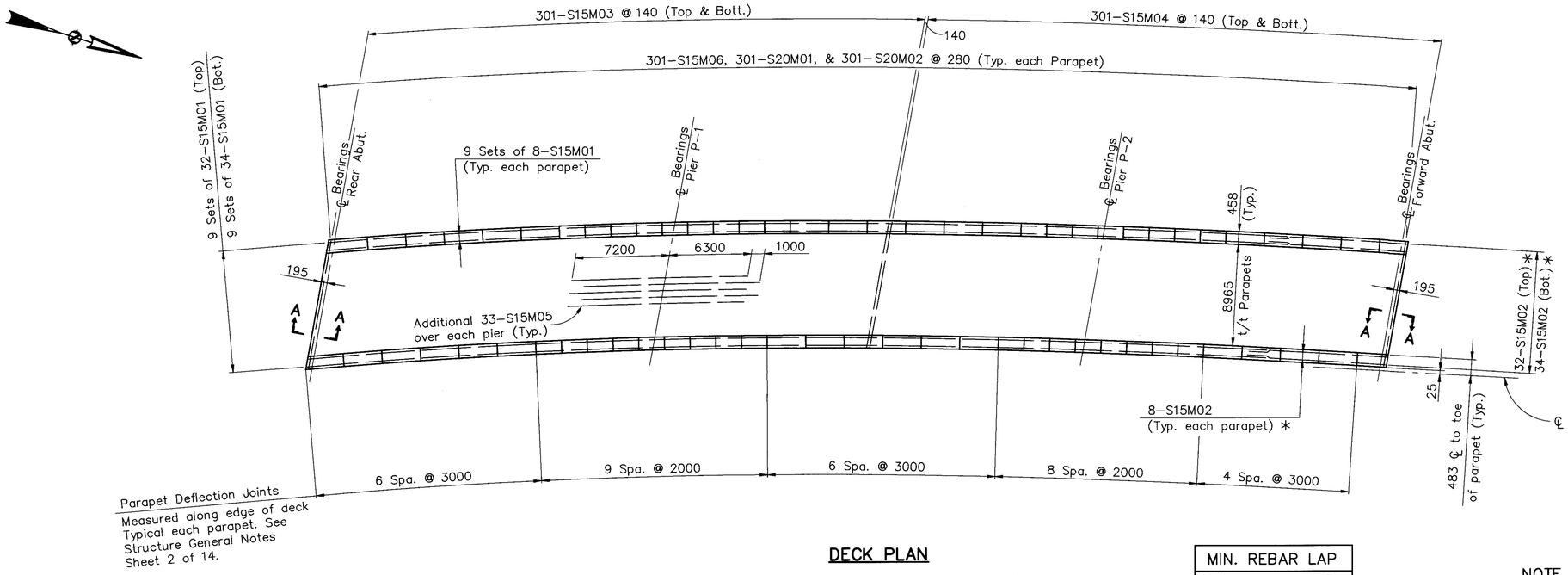
DESIGNED	DRAWN	REVIEWED	DATE
SJR	KRM	TF/JEU	5–97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JDV		4101359	

TRANSVERSE SECTION
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97



DECK PLAN

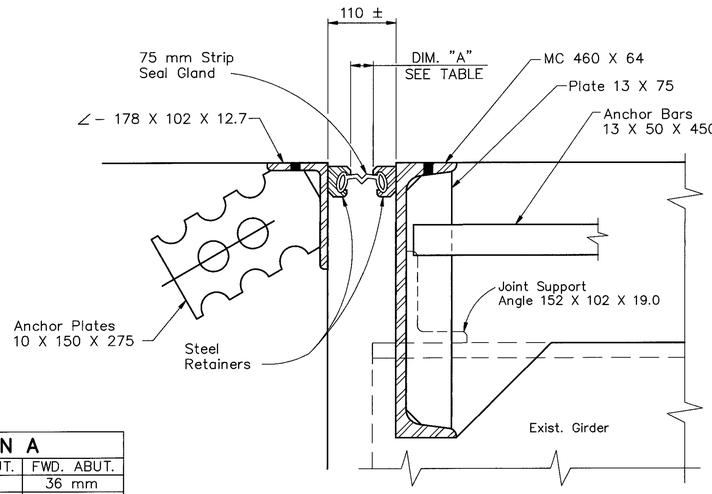
NOTE: Reinforcing steel shown is for left half of superstructure. Right half is similar.

MIN. REBAR LAP
#15M = 720 mm

* One end only

NOTE

1. For reinforcement schedule, see sheet 14 of 14.



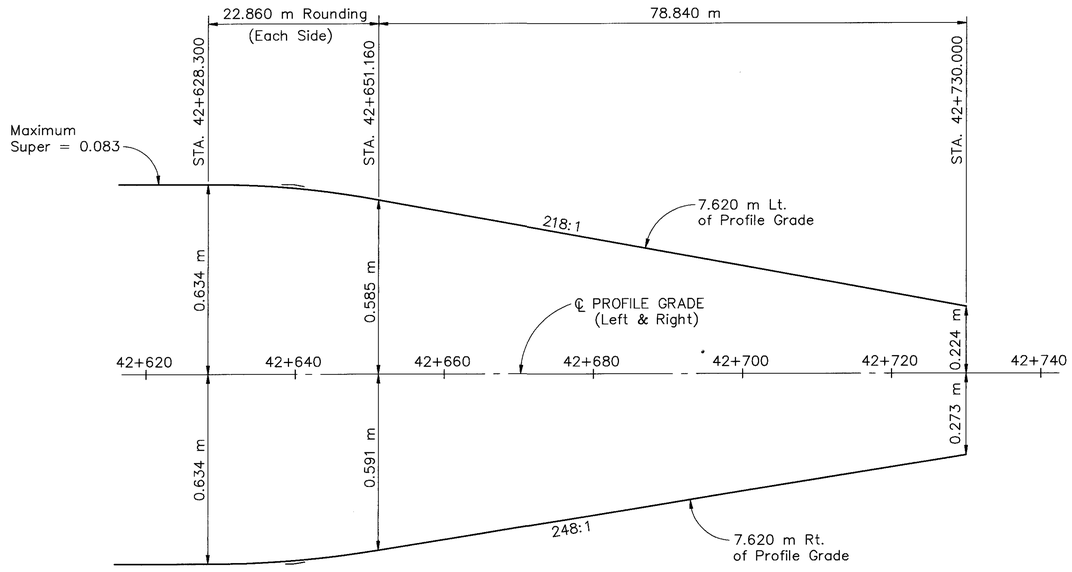
SECTION A–A

STRIP SEAL
EXPANSION JOINT DETAIL

NOTE: FOR ADDITIONAL STRIP SEAL EXPANSION JOINT DETAILS, SEE STANDARD DRAWINGS EXJ–4–87M.

DIMENSION A		
TEMP. †	REAR ABUT.	FWD. ABUT.
35°	24 mm	36 mm
30°	28 mm	38 mm
25°	31 mm	39 mm
20°	35 mm	40 mm
15°	38 mm	42 mm
10°	42 mm	43 mm
5°	45 mm	44 mm
0°	49 mm	46 mm

† AMBIENT AIR TEMPERATURE (°C) AT TIME OF JOINT INSTALLATION



SUPERELEVATION TRANSITION DIAGRAM

All Dimensions are in Millimeters. except as noted.

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CHECKED	REVISED	STRUCTURE FILE NUMBER	
JDV		4101359	

DECK PLAN & SUPERELEVATION TRANSITION DIAGRAM
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

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DECK SCREED ELEVATIONS (See Note 1)

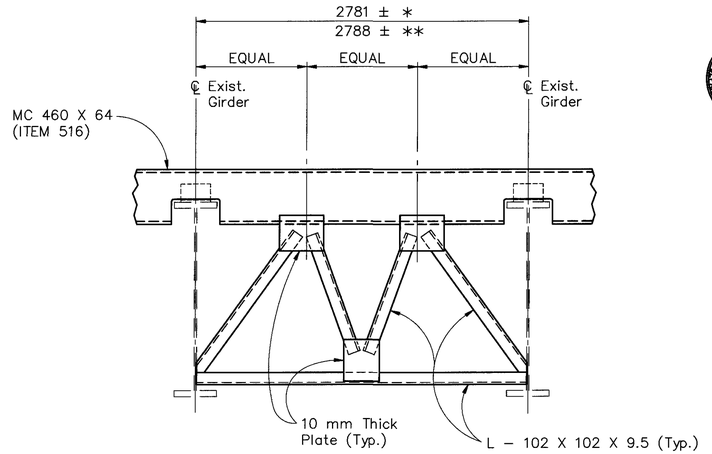
LOCATION		SPAN 1				SPAN 2					SPAN 3				
		℄ BRG. R.A.	1/4 SPAN	1/2 SPAN	3/4 SPAN	℄ BRG. PIER P–1	SPLICE	2/5 SPAN	3/5 SPAN	SPLICE	℄ BRG. PIER P–2	1/4 SPAN	1/2 SPAN	3/4 SPAN	℄ BRG. F.A.
GIRDERS †	1	226.183	225.955	225.729	225.507	225.301	225.092	224.906	224.727	224.549	224.406	224.278	224.164	224.057	223.954
	2	225.984	225.756	225.534	225.319	225.121	224.922	224.742	224.574	224.405	224.272	224.152	224.045	223.947	223.854
	3	225.785	225.557	225.339	225.131	224.940	224.749	224.579	224.419	224.260	224.136	224.025	223.926	223.837	223.752
	4	225.586	225.358	225.142	224.940	224.758	224.575	224.413	224.262	224.114	223.998	223.896	223.807	223.726	223.650
	5	225.530	225.305	225.093	224.896	224.719	224.539	224.381	224.234	224.089	223.976	223.876	223.788	223.708	223.635
	6	225.331	225.104	224.894	224.701	224.530	224.358	224.208	224.068	223.932	223.827	223.734	223.654	223.582	223.516
	7	225.132	224.904	224.694	224.505	224.341	224.177	224.033	223.901	223.775	223.677	223.592	223.519	223.455	223.398
	8	224.934	224.703	224.493	224.308	224.150	223.993	223.857	223.733	223.615	223.526	223.448	223.383	223.327	223.277
POINTS †	A	226.218	226.000	225.777	225.549	225.330	225.132	224.946	224.766	224.581	224.428	224.302	224.187	224.077	223.971
	B	225.554	225.339	225.129	224.926	224.735	224.565	224.410	224.260	224.108	223.986	223.888	223.800	223.719	223.642
	C	225.562	225.347	225.136	224.932	224.741	224.570	224.414	224.264	224.111	223.988	223.894	223.802	223.721	223.643
	D	224.901	224.680	224.475	224.286	224.118	223.973	223.844	223.721	223.597	223.501	223.428	223.365	223.309	223.257

† See Transverse Section, Sheet 11/14

DEAD LOAD DEFLECTIONS (mm)

SPAN 1			SPAN 2				SPAN 3		
1/4 SPAN	1/2 SPAN	3/4 SPAN	SPLICE	2/5 SPAN	3/5 SPAN	SPLICE	1/4 SPAN	1/2 SPAN	3/4 SPAN
8	9	4	5	11	11	6	2	5	5

NOTE: Dead load deflections shown are considered the same for all girders and deck screed elevations.

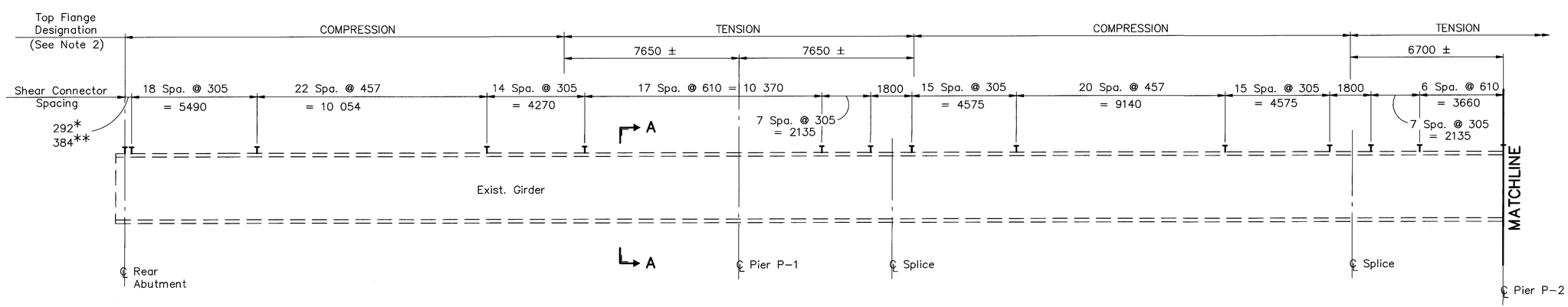


END CROSSFRAME DETAIL

(Typical each Abutment)

NOTE: For additional end crossframe detail, see Standard Drawing EXJ 4–87M

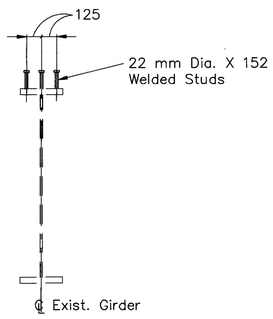
* GIRDERS 1 thru 4
** GIRDERS 5 thru 8



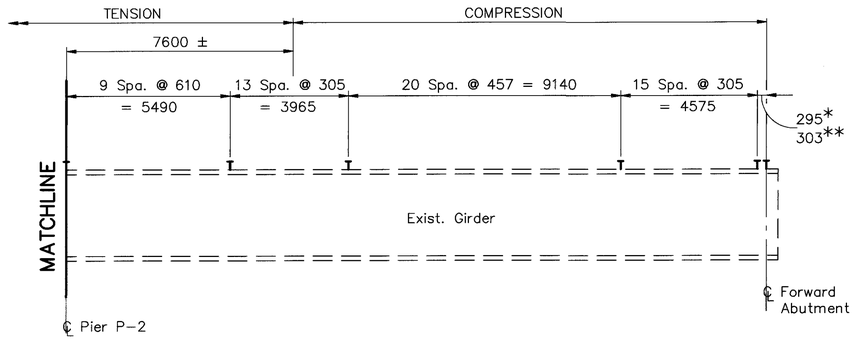
TYPICAL GIRDER ELEVATION

NOTES

1. Screed elevations shown are for the deck slab surface prior to concrete placement. Allowance has been made for anticipated calculated dead load deflections.
2. Welded attachment of supports for concrete deck finishing machine may be made to areas of the fascia stringer flanges designated "Compression". Attachments shall not be made to areas designated "Tension". Fillet welds to compression flanges shall be not closer than 25 mm from edge of flange, be not more than 50 mm long, and be not smaller than the minimum size required by AASHTO.



SECTION A–A



All Dimensions are in Millimeters.
All Elevations are in Meters.

metric units

DESIGN AGENCY
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3896 MAHONING AVE., YOUNGSTOWN, OHIO

DESIGNED SJR | DRAWN KRM | REVIEWED TF/JEU | DATE 5–97
CHECKED JDV | REVISED | STRUCTURE FILE NUMBER 4101359

SUPERSTRUCTURE DETAILS
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

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ABUTMENTS

MARK	NO. REQD.	LENGTH	TYPE	DIMENSIONS A	B	C	D	INCRM.	WEIGHT kg	NO. REQD. R.A.	F.A.
A15M01	1	10 300	ST						16	1	
A15M02	1	10 000	ST						16	1	
A15M03	13	9730	ST						199	13	
A15M04	13	9430	ST						193	13	
A15M05	1	9900	ST						16		1
A15M06	1	9770	ST						15		1
A15M07	13	9400	ST						192		13
A15M08	13	9270	ST						189		13
A15M09	160	880	2	460	460	0			221	80	80
A15M10	48	810	ST						61	24	24
A15M11	32	1825	10						92	16	16
A15M12	48	920	16	740					69	24	24
A15M13	8	4220	17						53	4	4
A15M14	8	4220	ST						53	4	4
A15M15	4	2870	ST						18	4	
A15M16	10	6250	ST						98	10	
A15M17	4	3650	ST						23	4	
A15M18	10	7020	ST						110	10	
A15M19	4	3050	ST						19		4
A15M20	10	6400	ST						101		10
A15M21	4	3550	ST						22		4
A15M22	10	6920	ST						109		10
A20M01	121	1700	2	760	280	760			484	61	60
A20M02	127	2330	2	1000	430	1000			697	64	63
A20M03	80	1100	4	550	230				207	40	40
A20M04	32	1070	2	770	350	0			81	16	16
A20M05	4 SER OF 12	1540 to 1650	2	1240 to 1350	350	0		10 mm	180	2 SER OF 12	2 SER OF 12
A20M06	12	1540	2	1240	350	0			44	6	6
A20M07	12	1460	16	1240					41	6	6
A20M08	6	1850	2	760	430	760			26	3	3
A25M01	84	1510	12						498	42	42
								Sub–Total	4143		

PIERS

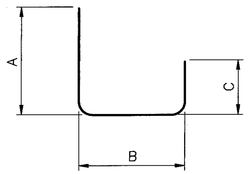
MARK	NO. REQD.	LENGTH	TYPE	DIMENSIONS A	B	C	D	INCRM.	WEIGHT kg	NO. REQD. Pier P–1	Pier P–2
P15M01	32	1100	ST						55	16	16
P15M02	32	3020	2	1100	900	1100			152	16	16
P20M01	80	1445	2	620	875	0			272	80	
P20M02	80	1285	2	460	875	0			242		80
								Sub–Total	721		

SUPERSTRUCTURE

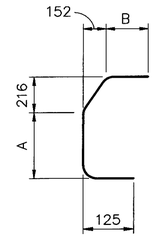
MARK	NO. REQD.	LENGTH	TYPE	DIMENSIONS A	B	C	D	INCRM.	WEIGHT kg
S15M01	1476	9100	ST						21 088
S15M02	164	8800	ST						2266
S15M03	1204	9920	ST						18 752
S15M04	1204	9840	ST						18 600
S15M05	132	13 500	ST						2798
S15M06	1204	1825	10						3450
S20M01	1204	730	2	500	280	0			2070
S20M02	1204	835	4	310	205				2368
								Sub–Total	71 392

GRAND TOTAL 76 256

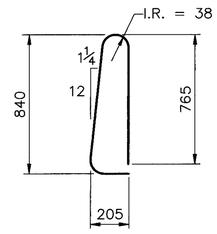
metric units



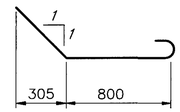
TYPE 2



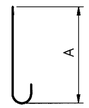
TYPE 4



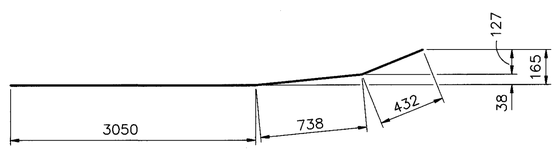
TYPE 10



TYPE 12



TYPE 16



TYPE 17

NOTES:

Bar Size: The bar size is indicated in the bar mark. The first letter identifies the bar location; next two digits and letter indicates the metric bar size designation; and the remaining digits it's sequence number.

Example: A15M01

a) A = Location of the bar in the structure.
b) 15M = Metric bar size designation
c) 01 = Sequence number

Bar dimensions shown are out to out unless otherwise indicated.

All Bars are Epoxy Coated.

ST = Straight

Note: All Dimensions are in Millimeters.

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DESIGNED SJR | DRAWN KRM | REVIEWED TF/JEU | DATE 5–97
CHECKED JDV | REVISED | STRUCTURE FILE NUMBER 4101359

REINFORCING STEEL LIST
JEF–7–42630
S.R. 7 OVER C.R. 47 AND CROXTON'S RUN

JEF–7–36.97

14 / 14

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STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 806

FIELD OFFICE
September 9, 1997

806.01 Description. This item shall consist of providing, maintaining and subsequently removing a field office for the exclusive use of the Department for the duration of the contract at a location approved by the Engineer. The field office will be designated as Type A, B or C.

806.02 General. The field office shall be available and completely functional at a time directed by the Engineer. The office shall have a minimum ceiling height of 2.1 m (7 feet) and have provisions for maintaining room temperature between 20 and 27 C (68 and 80 F). The Type C field office shall have a separate enclosed room for the Engineer. The Contractor shall provide and maintain telephone and electric service. One phone shall be connected to a recorded answering device. One speaker phone shall be required for Type B or Type C facilities. All field office types shall have one copying machine ;the copier shall be provided with all necessary maintenance and paper supplies, and be capable of producing multiple copies of documents up to 216 by 356 mm (8 1/2 by 14-inch) in size. The Type B and Type C field offices shall have a facsimile machine.

The office shall be provided with potable hot and cold water. The office shall also have neat, sanitary, enclosed toilet accommodations; associated lavatory and sanitary supplies shall be furnished. Portable facilities may be provided with the approval of the Engineer.

On all projects requiring moisture and density control of construction materials, the field office shall contain a storage box for a nuclear density gauge in accordance with drawings on file with the Director.

Additional requirements for field office and office equipment are as specified in the following table:

FIELD OFFICE

Item	Type A	Type B	Type C
Floor Space, m^2 (sq. ft.).....	14 (150)	46 (500)	93 (1000)
Telephone	2	4	4
Base Radio & 4-Hand Held Units[1]	--	--	1
10 Column Electronic Calculator with Tape	1	2	3
Desk and Chair Set	1	3	5
Work Tables, 750 by 1800 mm (30 by 72-inch)	1	2	3
4 Drawer, Legal Size, Lockable Metal File Cabinet	--	1	2
2 Drawer, Metal File Cabinet ...	1	2	2
Portable Fire Extinguishers - Type 2A10BC-5#	1	1	2
All Weather Parking Spaces ...	4	8	10
Plan Rack[2]	1	1	2

1. Units shall be capable of transmitting and receiving voice communication between office and any area on the project site.
2. Capable of handling the breakdown of 559x864 mm (22x34 inch) sized plans in to 10 sections.

The preceding requirements for the field office may be modified only upon written approval of the Engineer.

806.03 Computer Equipment for Field Office. Where required, the Contractor shall furnish, install, and maintain the following computer hardware and software in the field office required by this item for the life of the contract. All computer hardware and software furnished shall be for the exclusive use of the Engineer and staff and shall be operable at the same time as the field office.

This system shall not experience down time exceeding 48 hours from notification by the Engineer. The Contractor shall replace stolen, vandalized, or units otherwise inoperable within 48 hours after notification by the Engineer. Upon completion of the contract, the hardware and software furnished by the Contractor shall remain the property of the Contractor.

Computer Hardware

(1) One IBM PC compatible computer with an Intel Pentium processor (or equal) operating at a minimum 200 MHz. The computer shall be provided with the following **minimum** requirements:

a. 2.1 Gigabyte hard disk
b. 32 Megabytes RAM

c. one 3.5 inch., 1.44 MB floppy drive
d. one 8x CD-ROM drive
e. 101 key keyboard
f. 15 inch Hi-Res Super VGA Color Monitor 1024 X 768 resolution with .28 dot pitch and Hi-Res Super VGA Card with 2 Megabytes of Video RAM.
g. 2 Button Microsoft compatible mouse with appropriate software, compatible with required software.
h. At least 1 parallel port and 1 serial interface port and 1 mouse port.
I. one 56K firmware upgradeable 3Com compatible modem

(2) Hewlett Packard LaserJet compatible (PCL3 emulation) 6 page per minute printer or approved equal and parallel printer cable.

(3) Surge Protector. 15 amp six outlet with circuit breaker control, phone line circuit surge protection and a surge indicator light.

Computer Software

The Contractor shall furnish, load, and maintain the following software on the computers provided in the field offices: Microsoft Windows 95 (with games removed) and the Corel Professional Edition Office Suite Version 8.

All computer hardware and software shall be maintained by the Contractor during the life of the contract. Information for proposed "equal" equipment shall be submitted to the Engineer and be approved prior to use.

Along with the furniture under 806.02, the Contractor shall also provide the necessary stands, tables, etc. to accommodate the computer system.

806.04 Basis of Payment. The field office will be paid for at the contract price bid, which price shall be full compensation for furnishing, maintaining and subsequently removing the field office and all incidentals necessary to complete this item. The field office and any required computer equipment shall be paid on a monthly basis. The contract bid price shall be full compensation for furnishing, setting up, maintaining, and subsequently removing the specified computer hardware and software from the field office.

Item	Unit	Description
806	Month	Field office, Type_____
806	Month	Computer equipment for field office

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 842

CONCRETE FOR STRUCTURES

January 6, 1999

842.01 Description. This item shall consist of furnishing and placing portland cement concrete including reinforcing steel in accordance with these specifications and in reasonably close conformity with the lines, grades and dimensions shown on the plans. This item shall also include all costs associated with saw cutting grooves into the surface of superstructure concrete after the concrete has cured. Falsework and forms shall be in accordance with 508.

For prestressed concrete, see Supplemental Specification 865.

Concrete for structures shall met the requirements of Supplemental Specification 899 (Concrete - General), except as modified herein.

842.02 Materials. Materials shall conform to 899.02 except as follows:

Aggregate; all concrete above the ground line in a given substructure unit or all concrete for any given superstructure shall be made of aggregates of the same kind and colors, except upon permission of the Engineer.

Reinforcing materials; 509.02.

Curing materials; 705.05, 705.06 (white opaque), 705.07 Type 1 or 1D.

Joint filler;1/4 inch (6 mm) gray sponge 711.28, or preformed filler 705.03.

Seals; preformed elastomeric compression joint seals, 705.11.

842.03 Proportions. Concrete for structures shall be proportioned according to 899.03, using Class C or Class S as specified.

842.04 Concrete Test Specimens. On structures over 20 foot (6.1 m) span, two test cylinders will be made from each 200 cubic yards (150 m^3), or fraction thereof, of concrete that is incorporated each day in the work. On structures of 20 foot (6.1 m) span or less, not less than two cylinders will be made for each 50 cubic yards (35 m^3) of concrete.

When necessary to permit early removal of falsework or to permit backfilling, concrete test beams shall be made and tested according to standard methods on file in the office of the Director.

842.05 High-Early-Strength Concrete. The use of high-early-strength concrete shall be in accordance with 899.03. Curing and loading shall be in accordance with 842.14.

842.06 Mixing of Concrete. Mixing shall be according to 899.09.

When mixed, all concrete shall have a temperature of not more than 90 ºF (32 ºC), and the concrete shall be maintained under this temperature until deposited in the work.

When an air temperature of 60 ºF (16 ºC) or higher prevails at the time of placing concrete in a bridge superstructure over 20 foot (6.1 m) span, the Contractor shall add an approved chemical admixture (705.12, Type B or D) to the concrete.

842.07 Slump. Concrete shall have a slump such that it will be workable in the required position. It shall be of such a consistency that it will flow around reinforcing steel, but individual particles of coarse aggregate, when isolated, shall show a coating of mortar containing its proportionate amount of sand.

The slump of concrete placed by the vibration method shall be in accordance with 899.03, the slump being determined according to ASTM C 143.

842.08 Placing Concrete. The Contractor shall submit according to 501.06, a description of the procedures he proposes to use and notify the Engineer at least 24 hours in advance of placing concrete.

Superstructure concrete shall be placed only when the surface evaporation rate determined by using Figure 1 in ACI 308 is equal to or less than 0.2 lb./sq. ft./hour(1.0 kg/m^2/hour). The Contractor shall determine and document the ambient air temperature, concrete temperature, deck surface temperature, relative humidity, and wind velocity, subject to verification by the Engineer. No superstructure concrete shall be placed if the ambient air temperature is 85 ºF(30 ºC) or higher or predicted to go above 85 ºF(30 ºC)

during the concrete placement regardless of the surface evaporation rate.

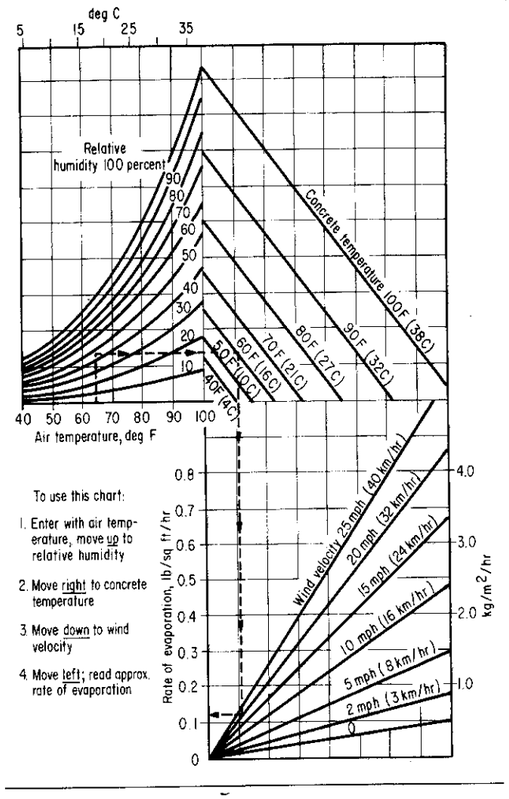
When a concrete deck is to be placed on continuous steel beams or girders, the placing of the concrete deck in any span shall not be started until all of the main beam or girder splices have been completed at least two piers beyond the pier or piers supporting the span in question.

Concrete for backwalls with steel expansion joints shall not be placed until the abutments have been backfilled to within 1 foot (0.3 m) of the bridge seat elevation and all structural steel or prestressed concrete beams have been erected, unless a different procedure is approved by the Director. The steel expansion joint shall serve as a template for the top of the backwall. If temporary bolts are used to support the backwall portion of an expansion device during the placing of the backwall concrete, these bolts shall be removed after the concrete has taken its initial set and before a change in temperature causes superstructure movement sufficient to damage the backwall.

In order that the concrete will be finished during daylight hours, the time of starting the concreting operations shall be subject to the approval of the Engineer.

The Contractor shall furnish assurance to the Engineer of an adequate and uniform source of supply of concrete to permit proper placing and finishing, and of the availability of coverings for protection in case of rain, before work will be permitted to start.

Figure1 ACI 308-81



Before placing the concrete, all forms and structural steel which will be in contact with the concrete shall be thoroughly cleaned and the space to be occupied by the concrete shall be free from all laitance, silt, dirt, shavings, sawdust, loose and built-up rust and other debris. The methods of depositing shall be such as to insure that all reinforcing steel is completely enveloped in concrete mortar and such that this condition can be verified by inspection. The method or device used for conveying the concrete from the mixer to its place in the work shall be such as to insure against separation of the coarse aggregate from the mortar. When concrete is being deposited in shallow members, such as slabs, it shall be placed with as short a vertical drop as practicable. The concrete shall be deposited so as to maintain a surface practically horizontal over the section being placed.

When a chute is used, its slope shall be such as to allow concrete of the proper consistency to flow readily without segregation. Concrete shall be deposited as near as possible to its final position.

Concrete shall not be dropped into the forms a distance of more than 5 feet (1.5 m). Drop chutes shall be used to limit free fall to 5 feet (1.5 m) and the delivery ends shall be as nearly vertical as practicable.

The use of mortar topping for concrete railing caps and other similar surfaces shall not be permitted.

The use of the vibration method of placing all concrete, in structures is required. The Contractor shall furnish and have in use sufficient vibration equipment of an approved type and size to properly compact each batch immediately after it is placed in the forms.

The vibrators shall generally be of a type that is applied directly to the concrete and have a frequency of at least 4500 impulses per minute, but where inaccessibility precludes this method of vibration, the vibrators shall be applied externally to the forms.

The concrete shall be deposited as near its final position as possible and shall not be caused to flow long distances by vibrators. Vibration shall be applied at the point of deposit and in the area of freshly deposited concrete. Vibrators shall be inserted into and withdrawn from the concrete slowly. The vibration shall be of sufficient duration and intensity to thoroughly compact the concrete, but not continued so as to cause segregation. Care must be used not to disturb partially hardened concrete.

Such spading as is necessary to insure smooth surfaces and dense concrete shall be done along form surfaces and in corners and locations impossible to reach with the vibrators, The Engineer shall with the collaboration of the Contractor closely observe the results obtained on the first concrete placed and such alterations shall be made in the mix, as permitted by these specifications, as are necessary to secure the best results.

The surface of the finished concrete shall be covered immediately with wet burlap.

842.081 Slipform Construction of Bridge Railing. Unless the plans eliminate the use of slipforming for this project, the Contractor is permitted the option of slipforming the bridge parapets and medians If the Contractor elects to slipform, the finished concrete shall meet the following tolerances from plan dimensions:

Reinforcing steel cover	-½ inch (-13mm) + ½ inch (+ 13 inch)
Top width dimension	-0 + 1/4 inch (+ 6 mm)
Bottom width dimension	-0 + ½ inch (+ 13mm)
Surface flatness	1/4 inch in 10 feet (6 mm in 3 meters)
Vertical alignment (Deviation from a line parallel to the grade line)	½ inch in 20 feet (13 mm in 6 meters)

All reinforcing steel joints and/or splices in the bridge railing steel shall be tied. A dry run to check for reinforcing clearance and rigidity of the reinforcing cages shall be required before any concrete is placed. The Contractor shall verify reinforcing clearances and make any adjustments to the cage to establish the required clearances during the dry run. Reinforcing steel cages are to be rigid (defined as no movement during the slipforming dry run). If the Engineer determines the cages are not rigid, the Contractor must stabilize the cages before any slipforming is performed. The Contractor may add any additional diagonal reinforcing steel between the front and rear vertical reinforcing faces to establish the required rigidity. Any additional reinforcing steel required to adequately stabilize the cages shall be the Contractor's expense.

Honeycombing, cracking, tearing and other defects shall be repaired or patched immediately upon exit from the slipform equipment. Defects shall be completely filled with concrete. The use of water to smooth or close the surface is not acceptable

Control Joints shall be constructed by sawing 1 1/4 inches (32 mm) deep into the perimeter of the parapet, after the concrete has taken its initial set but before any shrinkage cracks develop. Generally initial set is within 6 hours of batching of the concrete. All joints shall be sawed within 24 hours of placement. Joints shall be sawed by using an edge guide, fence or jig to insure that the joint is straight, true and aligned on all faces of the parapet. The joint width shall be the width of the saw blade, a nominal 1/4 inch (6 mm). The control joints shall be caulked with a polyurethane or polymeric material meeting Federal Specification TT-S-00227E

Slip formed concrete will require different slumps than those listed in 899 or other plan specified concrete. The consistency of the concrete should be such that the concrete exiting the slipform does not pull but is stiff enough to prevent waviness and sags in the finished surfaces. Method A, Water Curing, 842.14 is required. As slipformed concrete has a low water/cement ratio, timely application of the water cure is critical in helping control shrinkage cracks.

No water shall be added or applied to the concrete after it has left the truck.

The Contractor shall furnish all necessary platforms to protect against falling debris during the slipforming operation, to allow access for completing the finishing operation and to allow the inspector access.

The Engineer will inspect the slipformed surface for horizontal cracking no earlier than 21 days after completion of the slipforming operation. All horizontal cracks shall be repaired by epoxy injection. If a concrete sealer has been applied, any damage to the sealer shall be repaired after the epoxy injection has been completed. The aforementioned repairs shall be made at no additional cost to the State

842.09 Construction Joints. When construction joints are shown on the plans, all concrete between consecutive joints shall be placed in a continuous operation. Concrete shall not be placed against the side of any joint for at least 12 hours, or as required by 842.14.

Approval of the Director must be obtained for placing any construction joint not shown on the plans or permitted by 842.08 and 842.16.

The plans on which a day's work is to terminate shall be predetermined before depositing of concrete begins. They shall in general be perpendicular to the lines of principal stress and in regions of small shear. Horizontal joints will not be permitted in concrete girders and beams. Slabs acting with concrete beams or girders shall be deposited continuously with them unless composite construction is specified.

All construction joints shall be made with bulkheads provided with keys which clear all exposed surfaces approximately one-third the thickness of the joint.

Horizontal joints in piers, abutments and retaining walls generally shall be avoided and, when they are used, shall not be located within 2 feet (0.6 m) of the normal water level.

Construction joints not shown on the plans and above ordinary low water, in abutments, and in retaining walls that retain earth fills shall be waterproofed on the back with a 36 inch (1 m) strip of Type B waterproofing according to 512 at the Contractor's expense.

Joints in cantilevered members shall be avoided.

Horizontal construction joints shall have the surface of the concrete below the joint dampened immediately prior to placing adjoining concrete.

Horizontal construction joints between bridge slabs and superimposed curbs, parapets, sidewalks and median strips, shall be placed and protected the same as the remainder of the slab. They shall be cured in accordance with 842.14.

Care shall be exercised to avoid disturbing the bond of curb reinforcing steel protruding from the concrete. If the curb areas are used by workers when placing the deck concrete, the reinforcing steel shall be tied and/or braced to prevent its movement.

Where walls or columns support slabs or beams, the concrete in the vertical member shall be deposited up to the bottom of the supported member and a period of at least 2 hours shall elapse for settlement before placing concrete in the horizontal member.

842.10 Emergency. When the work is unexpectedly interrupted by break-downs, storms or other causes and the concrete as placed would produce an improper construction joint, the Contractor shall rearrange the freshly deposited concrete to provide a suitable construction joint. When such a joint occurs at a section on which there is shearing stress, he shall provide an adequate mechanical bond across the joint by forming a key, inserting reinforcing steel or by some other means satisfactory to the Engineer, which will prevent a plane of weakness.

842.11 Depositing Concrete Under Water. No concrete except for cofferdam seals shall be deposited under water, unless by special permission of the Director. If such permission is granted, care shall be exercised to prevent the formation of laitance.

Concrete shall not be deposited until any laitance, which may have formed on concrete previously placed, has been removed. Pumping shall be discontinued while depositing foundation concrete if it results in a flow of water inside of forms. If concrete other than cofferdam seals is deposited under water, the proportion of cement used shall be increased at least 10 percent at no extra expense to the State, to compensate for losses due to water. Concrete deposited under water shall be carefully placed in a compact mass in its final position by means of a tremie, a closed bottom dump bucket or other approved method and shall not be disturbed after being deposited.

842.12 Depositing and Curing Concrete During Cold Weather. When an atmospheric temperature of 32 ºF (0 ºC) or less exists at the time concrete is placed, or is predicted by weather forecasts to occur during the curing period, the following procedures shall apply:

The water or aggregate or both shall be heated as necessary to make the temperature of the concrete not less than 50 ºF (10 ºC) nor more than 70 ºF (21 ºC) when placed.

Concrete shall not be placed in contact with materials having a temperature of less than 32 ºF (0 ºC). If necessary, the forms, reinforcing steel and foundation materials shall be heated before the concrete is placed.

The concrete shall be protected from freezing and specified temperatures for curing shall be maintained by a heated enclosure, insulated forms or by either of these used in combination with flooding, except that insulation alone may not be used to protect and cure deck slabs less than 10 inches (250 mm) thick.

The heated enclosure shall surround the top, sides and bottom of the concrete to be placed during cold weather except that concrete surfaces which have been flooded need not be enclosed.

The concrete shall be cured by maintaining the surface temperature between 50 ºF and 100 ºF (10 ºC and 38 ºC) for a period of not less than five days except as modified below for concrete flooded with water. At the end of this curing period, the temperature shall be reduced at a rate not to exceed 20 ºF (11 ºC) in 24 hours until it is within 20 ºF (11 ºC) of atmospheric temperature.

Sufficient high-low thermometers shall be furnished and installed by the Contractor in such a manner that the surface temperature of the concrete may be readily determined. For deck slabs, the surface temperature shall include deck bottoms, deck facia and deck top surfaces.

Removal of falsework and opening to traffic shall be not earlier than specified by 842.14.

(a) When a heated enclosure is used. The enclosure and heating devices shall be as nearly complete before any concrete is placed as the placing will permit. Throughout the entire concreting operation, the completion of enclosures and the application of heat shall follow the placing of concrete as closely as possible.

Heat may be supplied by any method which will maintain the required temperature continuously with a reasonable degree of uniformity in all parts of the enclosure without discoloring the concrete.

Combustion-type heating units shall be vented from the enclosure.

If dry heat, other than free steam, is used with method (a) curing, all exposed concrete shall be covered with two thicknesses of burlap as soon after placing the concrete as it can be done without marring the surface. The burlap shall be wetted and kept continuously wet and shall not be removed during the heating period, except as required for rubbing. Wood forms without liners, left in place more than two days after the placing of concrete, shall be thoroughly wet at least once each day for the remainder of the heating period. If forms are removed during the heating period, the concrete shall be thoroughly drenched with water and covered with burlap as noted above for the remainder of the heating period.

Enclosures shall be strong and wind proof, and provide adequate space to allow free circulation of air around the forms and deposited concrete.

(b) When insulation is used. Sufficient thermometers shall be furnished and installed by the Contractor in such a manner that the surface temperature of the concrete may be readily determined. Whenever the surface temperature, as indicated by the thermometer readings, approaches 100 ºF (38 ºC), the forms or insulation shall be loosened or otherwise vented to keep the surface temperature within the specified limits. If the thermometer readings indicate that the minimum required temperature is not maintained, the structure shall be promptly enclosed and heated as provided above or flooded as specified below.

The insulating material shall be wind and water resistant. Precautions shall be taken at edges and corners to insure that such points of extreme exposure are adequately protected. The top surface of the concrete shall be protected by a tarpaulin, or other approved waterproof cover, placed over the insulation.

(c) When the concrete is to be flooded with water. The concrete may be flooded as soon as it can be done without damaging it. Flooding water shall be heated to a temperature of not less than 50 ºF (10 ºC) nor more than 100 ºF (38 ºC). The heated flood water may be discontinued after 48 hours if the concrete remains flooded to a depth of 1 foot (0.3 m) above its highest elevation for at least the subsequent 120-hour period.

842.13 Removal of Forms. In order to facilitate finishing, forms on vertical surfaces which are to receive a rubbed surface finish shall be removed as soon as the concrete has hardened sufficiently that it will not be damaged.

842.14 Curing and Loading. Concrete for structures shall have the falsework removed and be opened to traffic in not less time than is specified by the following table:

		Age of Concrete in Days	
	Span (a)	**No Beam Test**	**Beam Test (b)**
Removing Falsework	Over 10' (3.0 m)	14	5
	10' (3.0 m) or less and all pier caps	7	3
Traffic	Any	14	7

(a) Span in this circumstance is defined as the horizontal distance between faces of the supporting elements when measured parallel to the primary reinforcement.

(b) Applicable only when the average modulus of rupture for two tests is not less than 650 psi (4.5 MPa).

When the temperature of the air surrounding the concrete is above and maintained above 32 ºF (0 ºC) and below 50 ºF (10 ºC) and the provisions of 842.12 are not in force, the duration of the cure shall be based on a beam test, except that the curing time shall not be less than tabulated above.

When a beam test is not performed, the time specified above for removing falsework and opening to traffic shall be extended one day for each day the temperature of the air surrounding the concrete is below 50 ºF (10 ºC).

All superstructure concrete, all concrete which is to have a sealer applied, and all construction joints shall be cured in accordance with Method (a) Water Curing. All other concrete shall be cured either by Method (a) Water Curing or Method (b) Membrane Curing. However, if Method (b) is used on areas to be waterproofed, the membrane shall be removed.

Compression rings are not to be installed on pier columns or similar items of construction for the purpose of supporting falsework or subsequent construction until after a 72-hour curing period.

No load shall be applied or other work conducted that will damage new concrete or interfere with its curing. Where work is necessary on new concrete to complete a structure, such as building forms on a footing, workers and materials shall be kept off such concrete until such time as it will not be damaged by the work in progress, but in no case shall the elapsed time between placing the concrete and working on same be less than 36 hours. No work that will interfere with the curing shall be done on concrete placed during cold weather unless insulating material to retain the heat in the mix is placed during periods in the day when the presence of workers will not interfere with the normal curing procedure. When this is done, the normal protection shall be resumed immediately after work is suspended. Proper curing shall have preference and, if necessary, workers shall be kept off so that the concrete may be thoroughly wetted and kept wet until the curing is completed.

Method (a) Water Curing. All surfaces not covered by forms shall be protected immediately after brooming or final finishing with two thicknesses of wet burlap and kept wet by the continuous application of water for a period of not less than 7 days. Formed surfaces shall, after the removal of forms, be cured in like manner for the remainder of the curing period with the entire surface of the concrete being thoroughly drenched with water and covered immediately after forms are removed.

In lieu of continuous sprinkling, wet burlap covered with white polyethylene sheeting or plastic coated burlap blankets 705.06 may be used. They shall be placed wet with the burlap side against the concrete. Adjoining plastic coated blankets or polyethylene sheets used to cover wet burlap shall be lapped sufficiently and held securely in place at laps and edges so that positive moisture seal is provided. White polyethylene sheeting or plastic coated blankets containing holes or tears shall be covered with an additional covering of sheeting or blankets as directed.

Method (b) Membrane Curing. Immediately after the free water has disappeared on

surfaces not protected by forms and immediately after the removal of forms, if such are removed before the end of the 7-day curing period, the concrete shall be sealed by spraying as a fine mist a uniform application of the curing material 705.07, Type 1 or 1D, in such manner as to provide continuous, uniform, water impermeable film without marring the surface of the concrete.

The membrane curing shall be applied in one or more separate coats at the rate of at least 1 gallon per 200 square feet (1 L/5m^2) of surface. To assure that the proper amount of the curing material is applied, the number of gallons (liters) of curing material in the spray container shall be noted, and the correct area for that volume laid off so that the area of concrete surface to be covered will be such that the approved application rate will be secured. Curing material shall be thoroughly agitated immediately previous to use. If the film is broken or damaged at any time during the specified curing period, the area or areas affected shall be given a complete duplicate treatment of the curing material applied at the same rate as the first treatment.

Unless adequate precautions are taken to protect the surface of the membrane, workers, materials and equipment shall be kept off the membrane for the duration of the curing period.

842.15 Surface Finish. Immediately after the removal of forms, all cavities produced by form ties and all other holes, honeycomb spots, broken corners or edges and other defects shall be cleaned, dampened and completely filled, pointed or trued with a mortar of the same proportions as used in the concrete being finished. Exposed surfaces which are not satisfactory to the Engineer because of excessive patching and/or other corrective work, shall be grout cleaned or rubbed as required by the Engineer. Other contiguous exposed surfaces on the structure shall be finished in a similar manner to the extent required to produce a uniform appearance.

On all exposed surfaces, all fins and irregular projections shall be removed with a stone or power grinder, care being taken to avoid contrasting surface textures. Sufficient white cement shall be substituted for the regular cement in the filling of holes and other corrective work to produce finished patches of the same color as the surrounding concrete.

Grout Cleaning. Where grout cleaning is called for on the plans or is necessary for corrective work, the surface, after wetting, shall be uniformly covered with a grout consisting of one part cement to 1 1/2 parts fine sand, 703.03 and sufficient water to produce a consistency of thick paint. White portland cement shall be used for all or part of the cement in the grout, as directed by the Engineer, to give the color required to match the concrete. The grout shall be uniformly applied with brushes or a spray gun, and all air bubbles and holes shall be completely filled. Immediately after the application of the grout, the surface shall be vigorously scoured with a cork or other suitable float. While the grout is still plastic the surface shall be finished with a sponge rubber or other suitable float removing all excess grout. The finishing shall be done at the time when grout will not be pulled from the holes or depressions. After being allowed to thoroughly dry, the surface shall be vigorously rubbed with a dry burlap to completely remove any dried grout. There shall be no visible film of grout remaining on the surface after this rubbing and the entire cleaning operations of any area must be completed on the day it is started. If any dark spots or streaks remain after this operation, they shall be removed with a fine grained

silicon carbide stone, but the rubbing shall not be sufficient to change the texture of the surface. Unless otherwise directed by the Engineer, grout cleaning shall be delayed until the final clean up of the project.

Rubbed Finish. Forms shall be removed, if possible, within two days after concrete is placed. Corrections shall be made as outlined above. Rubbing of concrete shall be started as soon as the conditions will permit. Immediately before starting this work, the concrete shall be kept thoroughly saturated with water for a minimum period of two hours. Sufficient time shall have elapsed before wetting down to allow the mortar used in pointing insert holes and defects to be thoroughly set. Surfaces to be finished shall be rubbed with a medium coarse silicon carbide stone until all form marks, projections and irregularities have been removed, all voids filled and a uniform surface has been attained. The paste produced by rubbing shall be left in place at this time. No additional material other than water shall be applied to the surface. After all concrete above the surface being finished has been placed, the final finish shall be obtained by rubbing with a fine silicon carbide stone and water. This rubbing shall be continued until the entire surface is of a smooth texture and uniform in color. Any surfaces which have been given a rubbed finish, shall be protected from subsequent construction operations. Any surfaces which are not protected shall be cleaned and again rubbed, if necessary, to secure a uniform and satisfactory surface.

No extra payment will be made for any type of surface finish, the cost being considered as included in the price bid for concrete.

842.16 Roadway Finish. Concrete deck slabs shall be finished in accordance with the requirements of 451.12 except that construction joints shall not be edged, and a strip of surface 9 to 12 inches (220 to 300 mm) wide adjacent to curbs and barriers shall not be grooved. The use of a broom drag on concrete deck slabs may be in the longitudinal or transverse direction. The requirement for use of a finishing machine may be waived by the Engineer for small bridges where their use is impractical.

The finishing machine shall be approved by the Engineer. It shall be self-propelled and equipped with forward and reverse drive mechanisms that enable precision velocity control of the machine while moving in either direction. It shall be equipped with one or more rotating rollers, leveling augers and either a vibrating pan or vibrating rollers. Vibrating frequency for pans or rollers shall be variable from 1500 to 5000 pulses per minute. The Contractor shall furnish the necessary verification of these frequencies. The finishing machine shall be capable of finishing transversely while traveling in either direction across the deck. Screeds shall have provisions for raising them above the concrete surface. The finishing machine shall be of sufficient size to finish the full width of the decks between curbs or parapet walls. The wheels of the finishing machine shall run on temporary riding rails adequately supported on structural steel or falsework. The rail and rail supports shall be made of steel and shall be arranged so that the weight of the finishing machine and the operator cause zero vertical deflection while traveling across the deck. Rail shall be straight with no sections exceeding a tolerance of 1/8 inch in 10 feet (3 mm in 3.0 m) in any direction. All support rails shall be elevated a sufficient distance above the slab to permit the simultaneous finishing by hand of any portions not finished by the machine. Any rail supports shall be fabricated and installed in such manner

as to permit their removal to at least 2 inches (50 mm) below the top of the slab. Holes formed by the removal of such supports shall be filled during the final finishing of the slab. The concrete shall be delivered and distributed at a uniform and adequate rate ahead of the finishing machine by suitable mechanical equipment. Concrete shall be placed no more than 10 feet (3m) directly in front of the finishing machine.

Bridge decks that are to be waterproofed with a membrane shall be given a burlap drag finish.

842.161 Bridge Deck Grooving. After the concrete has cured, transverse grooves shall be sawed into the deck. The grooving shall conform to the following requirements:

Grooving shall be done utilizing diamond blades, mounted on a multi blade arbor on a self-propelled machine which has been built for grooving of concrete surfaces. The groove machine shall have a depth control device which will detect variations in the pavement surface and adjust the cutting head height to maintain the depth of the groove specified. The grooving machine will be provided with devices to control alignment. Flailing or impact type grooving equipment will not be permitted.

Grooves shall begin and end approximately one foot from any curb, parapet toe or deck edge and shall be perpendicular to the bridge center line.

The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimension, and grooving of the surface.

Grooves shall run in a continuous pattern across the surface. The grooving shall be terminated a minimum of 1 foot (300mm) from any device in place in a bridge deck, such as scuppers or expansion joints. The grooves shall be a random pattern spaced at 3/8 to 1 3/4 inch (10 to 45 mm), with 50 percent of spacings being less than 1 inch (25 mm). The grooves shall be approximately 0.15 inches (4 mm) deep and 0.10 inches (3 mm) wide.

At the beginning of each work shift, all grooving machines shall be equipped with a full complement of grooving blades that are capable of cutting grooves of the specified width, depth and spacing.

If during the course of work, a single grooving blade on any individual grooving machine becomes incapable of cutting a groove, work will be permitted to continue for the remainder of the work shift and the Contractor will not be required to otherwise cut the groove omitted because of the failed blade. Should two or more grooving blades on any individual grooving machine become incapable of cutting grooves, the Contractor shall cease operating such equipment until it is repaired.

The removal of all slurry and any remaining residue resulting from the grooving operation shall be continuous. The bridge deck surface shall be left in clean condition, free of all slurry and residue. Residue from grooving operations shall not be permitted to flow across shoulders or lanes occupied by public traffic or flow into gutters or other drainage facilities. Solid residue, resulting from grooving operations, shall be removed from the surface before such residue is blown by the action of traffic or wind.

The Contractor shall be responsible for providing water as necessary to perform the specified grooving in accordance with the specifications.

842.17 Sidewalk Finish. The concrete shall be struck off after placing with a template and finished with a float to produce a sandy texture.

842.18 Method of Measurement. The volume shall be the number of cubic yards (cubic meters) determined by calculations from plan dimensions, in place, completed and accepted.

Reinforcing steel, supports, mechanical connectors, and tie wires shall be incidental in the price bid for structural concrete.

No deduction will be made for the volume of the reinforcing steel, conduits or structural steel other than beam flanges embedded in deck slabs. No deduction will be made for the volume of any embedded timber or concrete piles.

Superstructure concrete includes the concrete in deflective parapets not having a metallic railing.

Deck concrete may be measured by either volume or area. The area of concrete shall be based on plan dimensions.

842.19 Basis of Payment. Payment will be made at contract prices for:

Item	Unit	Description
842	Cubic yard (cubic meter)	Class ___ concrete, _____
842	Cubic yard (Cubic meter), Square yard (square meter)	Class ___ concrete, bridge deck

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 845

BRIDGE DECK REPAIR AND OVERLAY WITH LATEX MODIFIED CONCRETE

July 17, 1995

845.01 Description. This work shall consist of furnishing the necessary labor, materials and equipment to repair and overlay concrete bridge decks in accordance with these specifications and in reasonably close conformity with the grades, thickness, and cross sections shown on the plans or as directed by the Engineer. This work shall include the removal of patches other than sound portland cement concrete and all loose and unsound concrete; scarification of the sound existing concrete surface; removal, forming and concrete for full-depth repairs; blast cleaning; furnishing, placing, finishing, texturing and curing of a latex modified concrete (LMC) overlay, and all other operations necessary to complete this work according to these specifications and to the satisfaction of the Engineer.

The LMC overlay shall be not less than 32 mm (1 1/4 inches) thick (thicker where loose or disintegrated concrete is to be replaced) and be constructed as a single monolithic element of the structure. Its surface shall be finished to 25 mm (1 inch) above the surface of the original concrete deck.

Spalled or delaminated tops of backwalls shall be repaired with LMC (variable thickness).

845.02 Materials. The materials shall conform to the following requirements:

Fine aggregate (natural sand)	703.02*
Coarse aggregate (No. 8)	703.02*
Portland cement, Type I	701.04**
Water	499.02
Portland cement concrete (for full-depth repairs)	511, Class S
Latex emulsion	SS No. 953***
Curing materials	705.05 or 705.06, white opaque
Curing (for full-depth repairs)	511.14

*Deleterious material shall not exceed one half the requirement for superstructure aggregate, and the sodium sulfate soundness loss shall not exceed that specified for superstructure concrete in 703.02.

**705.10 admixture shall not be used.

***The latex emulsion shall be protected from freezing and prolonged exposure to temperatures in excess of 29°C (85°F). Emulsions in storage facilities shall be recirculated in accordance with the manufacturer's recommendations.

845.03 Equipment. Continuous Mobile Mixers: The proportioning and mixing equipment shall be an integral mobile unit having the capacity and continuous mixing capability to permit the finishing operations to proceed at a constant rate so that final finishing can be completed prior to the formation of a plastic film on the LMC surface. It shall consistently produce a uniformly blended mixture within the specified air content and slump limits. The mixer shall also:

(1) Be capable of producing not less than 4.6 m^3 (6 cubic yards) of LMC without recharging.

(2) Be equipped with a recording meter with a ticket printout device to record an indication of the cement quantity being introduced into the mix. The metering device shall be accurate within a tolerance of -1 to +3 percent.

(3) Be equipped with a latex metering device to indicate volume dispensed. The metering device shall be accurate within a tolerance of -1 to +2 percent. In addition the latex tank shall have a stand pipe marked in liters (gallons).

(4) Be equipped with a water flow indicator, and have a water flow control that is readily adjustable to provide for minor variations in aggregate moisture content. The flow indicator shall be accurate within a tolerance of ± 1 percent in the range of expected use.

(5) Be equipped with a control to regulate the quantity of each of the LMC components to permit production of a mix having the specified composition. To ensure that the mixer can accurately proportion and blend all components of the LMC on a continuous or intermittent basis, the mixer shall be calibrated prior to the start of the overlay placement.

The Engineer may require recalibration of the cement, latex, and water metering devices as he deems necessary.

(6) Be capable of discharging mixed LMC through a conventional chute directly in front of the finishing machine.

(7) Be kept clean, free of partially dried or hardened materials, and properly operating at all times.

Finishing Machine: An approved self-propelled finishing machine shall be used with supports outside the scarified deck surface to be overlaid, except where hand finishing equipment is authorized. The finishing machine shall be equipped with forward and reverse drive mechanisms that enable precise velocity control of the machine while it is moving in either direction. It shall be equipped with one or more rotating rollers. It shall be equipped with augers and either a vibrating pan or vibrating rollers. Vibrating frequency for pans and rollers shall be variable from 1500 to 5000 pulses per minute. The Contractor shall furnish the necessary verification of these vibration frequencies. Screeds shall have provisions for raising above the finished concrete surface.

The placing and finishing equipment shall be designed so that the elapsed time between depositing concrete and final finishing shall not exceed 10 minutes.

Finishing Machine Rail and Supports: Finishing machines shall be supported by rail and supports made of steel. Rail shall be furnished in sections not less than 3 m (10 feet) in length and be of sufficient cross-section so that the weight of the finishing machine causes zero vertical deflection while in motion. Rail shall be straight with no sections exceeding a tolerance of 3 mm in 3.0 m (1/8-inch in 10 feet) in any direction. Rail supports shall be screw-type adjustable saddles and shall be of sufficient number

under the rail so that zero vertical deflection occurs under the weight of the finishing machine.

845.04 Proportioning and Mixing. Prior to each day's placement, each mixer shall be checked to assure that specified air content, slump and yield have been attained. Trial concrete shall not be incorporated into the work. Additional testing will be done in accordance with 845.10.

The LMC shall be a workable mixture having a uniform composition and consistency with the following proportions, properties or limits:

QUANTITIES OF MATERIALS PER CUBIC METER (CUBIC YARD) DRY WEIGHT*

Type of Coarse Aggregate	Fine Aggregate kg (lbs)**	Coarse Aggregate kg (lbs)	Cement kg(lbs)	Latex Emulsion L (gal)	Maximum Net Water L gal)
Gravel	974 (1645)	769 (1300)	389 (658)	121 (24.5)	86 (17.5)
Limestone	974 (1645)	778 (1315)	389 (658)	121 (24.5)	86 (17.5)
Slag	974 (1645)	675 (1140)	389 (658)	121 (24.5)	86 (17.5)

Slump*** 100 to 150 mm (4 to 6 inches)

Air content of plastic mix shall not exceed 7 percent.

*The specific gravities used for determining the above weights are: natural sand 2.62, gravel 2.62, limestone 2.65 and slag 2.30.

**The dry weights are approximate. This proportion should produce good workability, but due to gradation variability, the fine aggregate content may be increased, with approval by the Engineer, as much as 8 percent by weight if the coarse aggregate is reduced an equal volume.

***The slump shall not be measured until after the concrete has been discharged from the mixer and left undisturbed for 4 to 5 minutes. The water content may be adjusted to control the slump within the prescribed limits.

845.05 Preparation of Existing Deck. Overlays other than sound portland cement concrete, the top 6 mm (1/4 inch) of the sound existing concrete surface, all

patches other than sound portland cement concrete, and all obviously loose and disintegrated concrete shall be removed. After this initial removal, the Contractor shall sound the deck and outline for removal other areas of loose or unsound concrete subject to the approval of the Engineer. Aerosol spray paint for outlining shall be provided by the Contractor.

Where the bond between the concrete and any reinforcing steel has been destroyed, or where more than one half of the periphery of the steel has been exposed, the adjacent concrete shall be removed to a depth that will provide a minimum 19 mm (3/4-inch) clearance around the steel except where other reinforcing steel makes this impracticable. Reinforcement which has become loose shall be adequately supported and tied back into place. Reinforcement that is damaged during the Contractor's operations shall be replaced at no cost to the Department. Where the deck is sound for less than one half of its original depth, the concrete shall be removed full depth except for areas designated by the Engineer. After completion of each removal operation, the Contractor will re-sound and re-outline unsound areas of the deck subject to the approval of the Engineer to ensure that only sound concrete remains. Final sounding of the deck shall be done by the Engineer and shall not be performed within 24 hours after a rain. In no case shall the final sounding be made when the deck is damp or covered with frost. Final sounding shall consist of as many successive re-soundings as required to ensure that all deteriorated and fractured concrete has been removed.

Concrete shall be removed by chipping, except that the sound existing concrete surface may be removed by power driven scarifiers. Overscarification shall not be allowed. The cost of extra latex modified concrete caused by overscarification shall be borne by the Contractor. Vehicles other than approved construction equipment will not be permitted on those sections of the deck where concrete removal operations or scarification have begun. Contamination of the deck by construction equipment or from any other source shall be prevented. Chipping hammers shall not be heavier than the nominal 16 kg (35-pound) class and shall be operated at an angle of less than 45 degrees with respect to the surface of the deck. Concrete shall be removed in a manner that prevents cutting, elongating or damaging reinforcing steel.

Forms shall be provided to support concrete placed in the full-depth repair areas. The forms for areas of up to 0.4 m^2 (4 square feet) may be suspended by wires from the reinforcing steel; for areas greater than 0.4 m^2 (4 square feet), the forms shall be supported from the primary members of the superstructure or by shoring from below.

Areas of full-depth repair shall have the concrete faces and reinforcing steel cleaned as described below.

Not more than 24 hours prior to placing the overlay, all surfaces to which the overlay is to bond, including exposed reinforcing and structural steel, the work face of a previously placed overlay, and the faces of curbs and barriers up to a height of at least

25 mm (1 inch) above the proposed overlay surface, shall be cleaned by abrasive blasting or an approved method of waterblasting with 48 MPa (7000 psi) minimum pressure. These surfaces shall be made free of spalls, laitance, and all contaminants detrimental to achieving an adequate bond.

Bridge scuppers shall be cleaned of all foreign matter and plugged prior to placement of the overlay. Scuppers shall be unplugged to permit free drainage of water from the deck surface following overlay placement.

845.06 Finishing Machine Dry Run. After the screed rails have been set to proper profile and prior to placing the overlay, the Contractor shall check the finishing machine clearance to assure the Engineer that the specified nominal thickness of overlay will be attained over the entire deck.

845.07 Placing, Consolidating and Finishing. The deck surface which will contact the overlay shall be cleaned with an air blast, wetted and kept wet but free of standing water for at least one hour prior to placing the overlay. Any standing water present shall be removed prior to placement of the bonding grout. A coating of the overlay mixture shall be thoroughly worked onto this damp surface to bond the overlay. Coarser particles of the mixture shall not be segregated when the coating is being worked onto the deck. Coarser particles which cannot be worked into intimate contact with the surface of the deck shall be removed and disposed of in a manner approved by the Engineer. The bonding grout shall be applied in advance of the placement of the overlay for only a short distance not to extend beyond the rear wheels of the mixer or LMC carrier and it shall not be allowed to dry prior to being covered with overlay.

For full-depth repairs, the faces of existing sound concrete shall be similarly wetted and coated with cement grout prior to placing concrete.

Concrete for full-depth repairs shall be 511 concrete or, at the option of the Contractor, LMC placed simultaneously with the overlay. When 511 concrete is used, it shall be placed up to the proposed lower boundary of the 32 mm (1 1/4 inch LMC overlay, given a wire broom finish, and cured as specified in 845.08.

At the option of the Contractor, the deep areas of variable thickness may be pre-placed with 511, Class S concrete using No. 8 coarse aggregate prior to the uniform thickness of LMC. Pre-placed areas must be a minimum of 25 mm (1 inch) in depth. The perimeter of these patches must be nearly vertical or slightly undercut. Prior to placing concrete, the areas of pre-placed variable thickness shall be cleaned as per 845.05. The concrete shall be hand vibrated during placement, given a wire broom finish, water cured and shall have attained a modulus of rupture of 2.8 MPa (400 psi) prior to loading. Before placing the uniform thickness of LMC, all surfaces including the cured pre-placed variable thickness areas shall be blast cleaned as per 845.05.

Contamination of the deck by construction equipment or from any other source shall be prevented by placement of a clean 100 μm (4-mil) polyethylene sheet (or any other covering as approved by the Engineer) on the surface of the deck following the air blast cleaning.

Where reinforcing steel is exposed, the Contractor shall provide adequate supports for the concrete mixer so that reinforcing steel and its bond with the concrete will not be damaged by the weight and movement of the concrete mixer, or shall provide means to convey the mixed concrete from the mixer to the finishing machine.

Immediately following the application of the bonding grout, the LMC overlay shall be placed, consolidated and finished to the plan surface. Hand vibrators shall be used for full-depth repairs, variable depth areas, at all edges, and adjacent to joint bulkheads.

After the LMC has been consolidated and finished, it shall be textured transversely to provide a relatively uniform pattern of grooves spaced on 16 mm (5/8-inch) centers with a tolerance of ± 3 mm (± 1/8 inch). Grooves shall be approximately 4 mm (0.15 inches) deep and 2.5 mm (0.10 inches) wide. A strip of surface 225 to 300 mm (9 to 12 inches) wide adjacent to curbs and barriers shall not be textured. Texturing shall be completed before the characteristic plastic film forms on the surface.

The Contractor shall stencil the date of construction (month and year) and the letters LM into the overlay before it takes its final set. The date shall be located in the right-hand corner of the deck at the forward abutment. It shall be placed parallel to the edge of the overlay and centered at 300 mm (12 inches) in from both the edge of the overlay and end finish. The numerals shall be 75 to 100 mm (3 to 4 inches) in height, 6 mm (1/4-inch) in depth and face the centerline of the roadway.

Longitudinal joints in the latex modified concrete are permitted, but only to the extent necessary to accommodate the width of the finishing machine, to facilitate changes in roadway crown and to permit maintenance of vehicular traffic, except as approved by the Director. Longitudinal joints shall not be used in close proximity to faces of curbs or barriers or at the edges of decks. All joints in the overlay shall be formed.

A 3.0 m (10 foot) straightedge shall be used to check the overlay directly behind the finishing machine, and transversely along edges of the overlay where hand finishing is done. Any irregularities exceeding 3 mm in 3 m (1/8 inch in 10 feet) shall be corrected immediately.

Any ponding problem which is noted prior to final acceptance of the overlay shall be corrected by the Contractor at no cost to the State.

845.08 Curing. Before a full-depth repair made with 511 concrete is overlaid, it shall be water-cured and shall have attained a modulus of rupture of 2.8 MPa (400 psi).

As soon as the tining operation is completed, the finished overlay surface shall be covered with a single layer of clean wet burlap. The burlap shall be kept wet by a continuous flow of water through soaker hoses and covered with a 100 μm (4-mil) white opaque polyethylene film or a wet burlap - white opaque polyethylene sheet for 48 hours. After this initial wet curing period, the covering shall be removed and the surface dry-air cured for an additional 2 days before subjecting the new surface to vehicular traffic.

A cure day shall be defined as a 24-consecutive hour period of time. The temperature of the overlay surface shall be maintained above 2°C (35° F) until the curing period is completed. Any day during which the air temperature at the overlay surface fails below 7° C (45° F) shall not be counted as a cure day.

When curing is completed, all joints and abutting surfaces in the overlay shall be sealed with an approved high molecular weight methacrylate sealer. The sealer shall be prepared and applied in accordance with the manufacturer's recommendations. Joints to be sealed shall include transverse joints in the latex concrete, joints between latex concrete and steel enddams, longitudinal joints between latex concrete placements, and longitudinal joints between latex concrete and safety curb, barriers, parapets, bulb angles, etc. In the edges of decks without curbs, the interface between the overlay and the existing deck shall be sealed in a similar manner. Any cracking which occurs prior to opening to traffic shall be sealed as above or repaired or corrected in another manner as directed by the Engineer at no cost to the State. The deck shall be sounded and any delaminated area shall be removed and replaced at the Contractor's expense.

Traffic will not be permitted on the finished overlay surface until after completion of the 4-day cure.

845.09 Limitation on Placing Operations. Prior to overlay placement, the Contractor shall review his proposed operations with the Engineer. This review shall establish the Contractor's ability to place the overlay on a continuous basis and to consolidate, finish and texture it prior to the formation of the plastic surface film. When directed by the Engineer, a representative of the latex manufacturer shall be present during the proportioning, mixing, placing and finishing of the LMC. Operations and procedures which are considered by this representative to be detrimental to the integrity and durability of the repaired and overlaid bridge deck will not be permitted. Once the finishing machine has made the first pass, workers shall not be allowed to walk in the freshly placed overlay.

No latex concrete shall be placed when it is raining, nor when the ambient air temperature is below 7°C (45° F) or is predicted to fall below 7°C (45°F) for the duration of the curing period.

Overlays shall be placed only when the overlay surface evaporation rate, as affected by ambient air temperature, concrete temperature, deck temperature, relative humidity and wind velocity, is 0.5 kg/m^2 (0.1 pound per square foot) per hour or less. The Contractor shall determine and document the atmospheric conditions, subject to verification by the Engineer. No latex concrete shall be placed if the ambient air temperature is 29°C (85° F) or greater or predicted to go above 29 °C (85 °F) during the overlay placement regardless of the surface evaporation rate.

Figure 1 shall be used to determine graphically the loss of surface moisture for the overlay. In no case shall the temperature of the latex modified concrete exceed 32°C (90°F) during placement. No LMC overlay shall be placed after October 15 except by specific permission of the Director.

If placement of the overlay is to be made at night, the Contractor shall submit a plan which provides adequate lighting for the work area. The plan shall be submitted at least 15 calendar days in advance and be approved by the Engineer before concrete is placed. The lights shall be so directed that they do not affect or distract approaching traffic.

During short delays (no formation of a plastic surface film) in the overlay placement operations, the work face shall be temporarily covered with several layers of wet burlap. If a longer delay is anticipated, a bulkhead shall be installed at the work face and the overlay placement operation terminated.

Unless otherwise authorized by the Engineer, an overlay shall not be placed adjacent to a previous overlay which has cured for less than 36 hours.

Adequate precautions shall be taken to protect the freshly placed LMC from rain.

Vehicles other than approved construction equipment will not be permitted on those sections of the deck where concrete removal operations have begun.

Contamination by construction equipment or from any other source shall not be permitted.

845.10 Sampling and Testing. After each charging of the concrete mixing unit and the discharge of approximately 2 to 3 m^3 (2 to 3 cubic yards), the following testing shall be performed by the Department:

a. Slump
b. Unit weight
c. Air
d. Compressive strength cylinders shall be made on every other truck load

All concrete used for testing purposes shall be furnished by the Contractor at no cost to the State.

In addition the following test shall be performed by the Contractor and verified by the Engineer after each charging of the mixing unit:

With all controls set for the desired mix, activate the mixer and discharge the mixed material into a 0.25 m^3 (one-quarter cubic yard) container 1 x 1 x 0.25 m (36 x 36 x 9 inches). When the cement recording meter indicates a discharge of 97 kg (1 3/4 bags) of cement or 0.25 m^3 (1/4 cubic yard), the container should be filled flush with consolidated LMC. This test will be accepted as evidence of satisfactory performance for each truck.

845.11 Method of Measurement. For measurement of quantities, the overlay is divided by a horizontal plane into two items, consisting of an upper part of uniform thickness "LMC overlay 32 mm (1 1/4 inches) thick" and a lower part of variable thickness "LMC overlay (variable thickness)". "Full-depth repair" is measured as a separate pay item.

LMC overlay 32 mm (1 1/4 inches) thick shall be measured as the actual deck area in square meters (square yards) overlaid. The price bid for this item includes the cost of furnishing, placing, finishing, texturing and curing the 32 mm (1 1/4-inch) thick overlay. It also includes the cost of surface scarifying, removing scarification debris, cleaning, lighting, applying bonding grout, and all other material, labor and equipment required to complete this work, but not specifically included in the other items for payment.

Full-depth repair shall be measured as the volume in cubic meters (cubic yards) based on the measured area of full-depth openings in the deck, and the existing slab thickness less 6 mm (1/4 inch). The price bid for his item includes the cost of removing unsound concrete exclusive of concrete removed by scarification, removing sound concrete where the depth of sound concrete is less than half of the original thickness of the deck, furnishing and installing forms and supports, furnishing and placing either LMC or 511 concrete, and if 511 concrete is used, the finishing and curing required.

LMC overlay (variable thickness) shall be the volume in cubic meters (cubic yards) measured as the difference between the total volume (as indicated by meter printout) of LMC placed and accepted, less the calculated volume of LMC overlay 32 mm (1 1/4 inches) thick and less the volume of LMC used for full-depth repair. The price bid for this item includes the cost of furnishing and placing the variable thickness overlay.

It also includes the cost of removal of all concrete except that removed by scarification and as part of the full-depth repair.

Pre-placed variable thickness areas shall be field measured and the volume calculated in cubic meters (cubic yards). Payment shall be made at the price bid for LMC, variable thickness.

Trial concrete required under 845.04 shall be furnished by the Contractor without charge to the State.

845.12 Basis of Payment. Payment for complete and accepted quantities as measured above will be made at the contract bid price for:

Item	Unit	Description
845	Square meter (Square yard)	Latex modified concrete overlay 32 mm (1 1/4 inches) thick
845	Cubic meter (Cubic yard)	Latex modified concrete overlay (variable thickness)
845	Cubic meter (Cubic yard)	Full-depth repair

(SEE ATTACHED FIGURE 1)

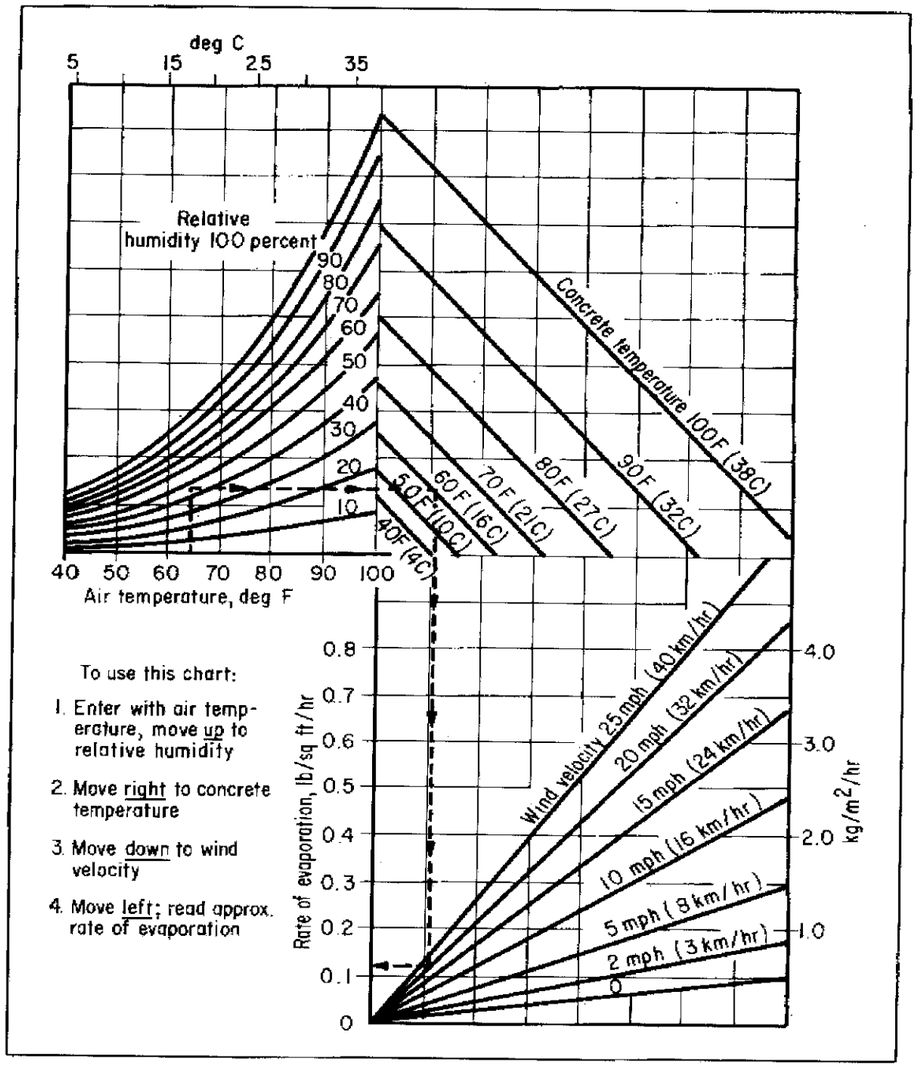


Figure 1* - Effect fo concrete and air temperatures, relative humidity, and wind velocity on the rate of evaportion of surface moisture from concrete. This chart provide a graphic method of estimating the loss of surface moisture for various weather conditions. To use the chart, follow the four steps outlined above.

* ACI Committee 308, "Standard Practice for Curing Concrete (ACI 308-81)", American Concrete Institute, Detroit, 1984, 11pp.

** In using this figure, the concrete temperature shall be taken as the average of the deck surface temperature and the plastic concrete temperature.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 899

CONCRETE - GENERAL

October 21, 1998

899.01 Description. This work shall consist of proportioning and mixing portland cement concrete.

899.02 Materials. Materials shall be:

Fine aggregate*	703.02
Fly ash	705.13
Coarse aggregate	703.02, 703.13***
Portland cement	701.01, 701.02, 701.03
	701.04, 701.05****
Ground granulated blast furnace slag	ASTM C 989, grade 100 or 120
Air entraining admixture.	705.10
Chemical admixture for concrete.	705.12**

*703.02 natural sand is required in 255, 451, 452, 453, 611, and 511 deck slabs.

**Admixtures shall contain no more than 50 parts per million chloride ions by weight of cement.

*** Applies only to 451, 452 and 453.

**** Use of Slag-Modified Portland Cement meeting ASTM C 595M, Type I(SM) is permitted; acceptance shall be in accordance with 701 and Supplement 1028. Type I(SM) may be used only between April 1 to October 1, and when 705.10 Air-Entraining Admixture is added at the mixer. Type I(SM) may not be used with Options 1 and 3.

Water used in concrete shall be free from sewage, oil, acid, strong alkalies or vegetable matter, and also shall be free from clay and loam. Water which is potable is satisfactory for use in concrete.

899.03 Proportioning. Proportioning shall be based on pre-determined cement content. Except as otherwise provided herein, each cubic yard (cubic meter) of concrete shall contain the specified weight of cement as determined by the yield calculation. The yield shall be within ± 1 percent of the theoretical yield of 27.00 cubic feet (1 m^3). The water-cement ratio shall not exceed the maximum specified. Below this limit, the quantity of water shall be adjusted to meet the slump requirements.

Concrete shall contain 6 ± 2 percent of total air, except as noted herein.

Slump shall be maintained within the range shown as nominal slump in the following table. No concrete shall be used in the work that has a slump greater than that shown as maximum in the table. When the slump is found to exceed the limit of nominal slump but is within the maximum limit, occasional loads of concrete may be used, provided an immediate adjustment is made in the mixture to reduce the slump of succeeding loads to within the nominal range shown.

Type of Work	Nom. Slump inch (mm)*	Max. Slump inch (mm)**
Concrete pavement (305, 451, 452, 453, 611, 615)	1-3 (25-75)	4 (100)
Structural Concrete (511, 610, 622)	1-4 (25-100)	5 (125)
Superstructure concrete (511)	2-4 (50-100)	4 (100)
Non-reinforced concrete (601, 602 603, 604, 608, 609, 612, 622)	1-4 (25-100)	5 (125)

*This slump may be increased to 6 inches (150 mm) provided the increase is achieved by the addition of a chemical admixture meeting the requirements of 705.12, Type F or G.

**This slump may be increased to 7 inches (180 mm) provided the increase is achieved by the addition of a chemical admixture meeting the requirements of 705.12, Type F or G.

Tests on the plastic concrete for pavement shall be made at the paving site or at a location designated by the Engineer. Tests for structure concrete shall be made at the site of the work at the point of placement.

The weights of fine and coarse aggregate shall be determined by the Engineer from the weights given in the Concrete Table. If high early strength concrete is specified, the Contractor may use high-early strength cement, additional cement, approved chemical admixtures, or a combination of these materials to achieve a modulus of rupture of 600 psi (4.2 MPa) in three days or less. If high-early-strength concrete is not specified, but is desirable to expedite the work, the Contractor may use these same materials at no additional cost to the state.

The weights specified in the Concrete Table were calculated for aggregates of the following bulk specific gravities: natural sand and gravel 2.62, limestone sand 2.68, limestone 2.65, and slag 2.30. The assumed specific gravities of fly ash and ground granulated blast furnace slag are 2.30 and 2.90, respectively. For aggregates of specific gravities differing more than plus or minus 0.02 from these, the weights in the table shall be corrected as indicated in paragraph (c).

CONCRETE TABLE

Quantities Per Cubic Yard (Meter)

Type of Coarse Aggregate	Dry Aggregates: Fine Aggregate lb (kg)	Dry Aggregates: Coarse Aggregate lb (kg)	Dry Aggregates: Total lb (kg)	Cement Content lb (kg)	Water-Cement Ratio Maximum
CLASS C (Using No. 57 or No. 67 Size)					
Gravel	1160 (688)	1735(1029)	2895(1717)	600 (356)	0.5
Limestone	1285(762)	1630(967)	2915(1729)	600(356)	0.5
Slag	1350(801)	1360(807)	2710(1608)	600(356)	0.5
CLASS F (Using No. 57 or No. 67 Size)					
Gravel	1270(753)	1810(1074)	3080(1827)	470(288)	0.55
Limestone	1345(798)	1730(1026)	3075(1824)	470(288)	0.55
Slag	1380(819)	1470(872)	2850(1691)	470(288)	0.55
CLASS S (Using No. 57 or No. 67 Size)					
Gravel	1125(667)	1735(1029)	2860(1697)	715(424)	0.44
Limestone	1260(747)	1530(908)	2790(1655)	715(424)	0.44
Slag	1280(759)	1370(813)	2650(1572)	715(424)	0.44

On projects specifying 451, 452, or 453, the following requirements shall apply. If No. 57 or 67 Size is approved, the quantities per cubic yard (cubic meter) will be in accordance with the above concrete table. If sizes No. 7, 78, or 8 are approved, the concrete shall contain 8 plus or minus 2 percent air, and the quantities will be in accordance with the following table:

Quantities Per Cubic Yard (Meter)

Type of Coarse Aggregate	Dry Aggregates: Fine Aggregate lb (kg)	Dry Aggregates: Coarse Aggregate lb (kg)	Dry Aggregates: Total lb (kg)	Cement Content lb (kg)	Water-Cement Ratio Maximum
CLASS C (Using No. 7, 78, or No. 8 Size)					
Gravel	1320(783)	1460(866)	2780(1649)	600(356)	0.5
Limestone	1380(819)	1410(837)	2790(1656)	600(356)	0.5

At any time during the construction period, the relative weights of fine and coarse aggregate as determined from the above table may be varied by the Engineer in order to insure a workable mix within the slump range and to control the yield. However, the total weight of aggregate per cubic yard (cubic meter) shall not be changed except as provided in the preceding paragraph as for the following conditions or both.

(a) For batch weights, the weights determined as described above shall be corrected to compensate for moisture contained in the aggregates at the time of use.

(b) If it is found impossible to prepare concrete of the proper consistency without exceeding the maximum water/cement ratio specified, a water reducing admixture conforming to requirements of 705.12 shall be used or the cement content shall be increased. However, the Contractor shall not be compensated for the admixture or additional cement which may be required by reason of such adjustment.

(c) If, during the progress of the work, the specific gravity of one or both of the aggregates changes, the batch weight shall be adjusted to conform to the new specific gravity.

(d) Unit weight determinations shall be made and the yield shall be calculated and maintained in accordance with ASTM C 138. Based on these determinations, the batch weights will be adjusted when necessary. However, the specified cement content shall be maintained within a tolerance of ± 1 percent and the maximum water-cement ratio shall not be exceeded.

(e) The amount of mixing water shall be adjusted for the moisture contained in the aggregate and for the moisture which they will absorb, in order to determine the amount of water to be added at the mixer.

(f) An approved set retarding admixture meeting the requirements of 705.12, Type B or Type D shall be required for concrete when the concrete temperature exceeds a nominal temperature of 75° F (24° C).

899.04 Proportioning Options. The Contractor may substitute one of the following options for all concrete items: The dry weights specified in these tables were calculated using the same specific gravities used in 899.03. The specific gravity used for ground granulated blast furnace (GGBF) slag is 2.90. Adjustments shall be made to the mix design due to specific gravities differing by more than 0.02. Other adjustments may be made as allowed in 899.03 and approved by the Engineer.

The requirements for Proportioning Option 1 are as follows. The cement content may be reduced as much as 15 per cent by weight with the substitution of an equivalent weight of fly ash meeting the requirements of 705.13. The water/cement ratio shall be based on the combined weight of cement and fly ash. Proportioning Option 1 shall meet the following Mix Design Concrete Table:

Quantities Per Cubic Yard (Cubic Meter).

Type of Coarse Aggregate	Dry Aggregates: Fine Aggregate lb (kg)	Dry Aggregates: Coarse Aggregate lb (kg)	Dry Aggregates: Total lb (kg)	Cement Content lb (kg)	Fly Ash lb (kg)	Water-CM Ratio Maximum
CLASS C Option 1 (Using No. 57 or No. 67 Size)						
Gravel	1140(676)	1700(1009)	2840(1685)	510(303)	90(53)	0.50
Limestone	1260(748)	1595(946)	2855(1694)	510(303)	90(53)	0.50
Slag	1320(783)	1330(789)	2650(1572)	510(303)	90(53)	0.50
CLASS F Option 1(Using No. 57 or No. 67 Size)						
Gravel	1260(748)	1800(1068)	3060(1815)	400(237)	70(42)	0.55
Limestone	1350(801)	1730(1026)	3080(1827)	400(237)	70(42)	0.55
Slag	1380(819)	1475(875)	2855(1694)	400(237)	70(42)	0.55
CLASS S Option 1 (Using No. 57 or No. 67 Size)						
Gravel	1060(629)	1640(973)	2700(1602)	608(361)	107(63)	0.44
Limestone	1230(730)	1490(884)	2720(1614)	608(361)	107(63)	0.44
Slag	1220(724)	1300(771)	2520(1495)	608(361)	107(63)	0.44
CLASS C Option 1 (Using No. 7, 78 or 8 Size)						
Gravel	1310(777)	1440(854)	2750(1631)	510(303)	90(53)	0.50
Limestone	1350(801)	1410(837)	2760(1638)	510(303)	90(53)	0.50

The requirements for Proportioning Option 2 are as follows. The cement content may be reduced as much as 50 pounds per cubic yard(30 kg/ m3), with the substitution of an equivalent volume of aggregate, provided the Contractor uses an approved water reducing admixture meeting the requirements of 705.12; Type A or Type D. Proportioning Option 2 shall meet the following Mix Design Concrete Table:

Quantities Per Cubic Yard (Cubic Meter).

Type of Coarse Aggregate	Dry Aggregates: Fine Aggregate lb (kg)	Dry Aggregates: Coarse Aggregate lb (kg)	Dry Aggregates: Total lb (kg)	Cement Content lb (kg)	Water-Cement Ratio Maximum
CLASS C Option 2 (Using No. 57 or No. 67 Size)					
Gravel	1190(706)	1785(1059)	2975(1765)	550(326)	0.50
Limestone	1320(783)	1675(994)	2995(1777)	550(326)	0.50
Slag	1385(822)	1395(828)	2780(1649)	550(326)	0.50
CLASS F Option 2 (Using No. 57 or No. 67 Size)					
Gravel	1315(780)	1880(1115)	3195(1896)	420(249)	0.55
Limestone	1410(837)	1810(1074)	3220(1910)	420(249)	0.55
Slag	1445(857)	1540(914)	2985(1771)	420(249)	0.55
CLASS S Option 2 (Using No. 57 or No. 67 Size)					
Gravel	1120(664)	1710(1015)	2830(1679)	665(395)	0.44
Limestone	1290(765)	1560(926)	2850(1691)	665(395)	0.44
Slag	1270(753)	1370(813)	2640(1566)	655(395)	0.44
CLASS C Option 2 (Using No. 7, 78 or No. 8 Size)					
Gravel	1370(813)	1510(896)	2880(1709)	550(326)	0.50
Limestone	1420(842)	1480(878)	2900(1720)	550(326)	0.50

The requirements for Proportioning Option 3 are as follows. The Portland cement content may be reduced as much as 50 pounds per cubic yard(30 kg/m3) with the substitution of an equivalent volume of aggregate, provided the Contractor uses an approved water-reducing admixture meeting the requirements of 705.12, Type A or D. The cementitious materials content shall consist of a combination, by weight, of a minimum of 70 percent Type I or Type IA Portland cement (701.04 or 701.01), and a maximum of 30 percent ground granulated blast furnace slag, ASTM C 989, grade 100 or 120. Proportioning Option 3 shall meet the following Mix Design Concrete Table:

Quantities Per Cubic Yard (Cubic Meter).

Type of Coarse Aggregate	Dry Aggregates: Fine Aggregate lb (kg)	Dry Aggregates: Coarse Aggregate lb (kg)	Dry Aggregates: Total lb (kg)	Cement Content lb (kg)	GGBF Slag lb (kg)	Water-CM Ratio Maximum
CLASS C Option 3 (Using No. 57 or No. 67 Size)						
Gravel	1185(703)	1775(1053)	2960(1756)	385(228)	165(98)	0.50
Limestone	1310(777)	1670(991)	2980(1768)	385(228)	165(98)	0.50
Slag	1385(822)	1385(822)	2770(1644)	385(228)	165(98)	0.50
CLASS F Option 3(Using No. 57 or No. 67 Size)						
Gravel	1320(783)	1870(1109)	3190(1892)	294(174)	126(75)	0.55
Limestone	1400(831)	1810(1074)	3210(1905)	294(174)	126(75)	0.55
Slag	1440(854)	1535(911)	2975(1765)	294(174)	126(75)	0.55

CLASS S Option 3 (Using No. 57 or No. 67 Size)

Gravel	1105(656)	1715(1017)	2820(1673)	465(276)	200(119)	0.44
Limestone	1280(759)	1555(923)	2835(1682)	465(276)	200(119)	0.44
Slag	1270(753)	1360(807)	2630(1560)	465(276)	200(119)	0.44

CLASS C Option 3 (Using No. 7, 78 or No. 8 Size)

Gravel	1370(813)	1500(890)	2870(1703)	385(228)	165(98)	0.50
Limestone	1410(837)	1480(878)	2890(1715)	385(228)	165(98)	0.50

GGBF = ground granulated blast furnace slag; CM = cementitious material.

The use of coarse aggregate in Portland cement concrete pavements is restricted by 703.13, as modified by the proposal.

Approval of Optional Mix Designs. A request to use any option design must be submitted to the Engineer for approval.

All admixtures used in the concrete mixture must be compatible and shall be dispensed in accordance with the manufacturer's recommendations.

If Portland cement with fly ash as an additive is used as described under Option 1 or ground granulated blast furnace slag is used under Option 3, the mix design shall be used only between April 1 and October 15, unless otherwise authorized by the Director. If Option 1 is used, an approved set retarding admixture meeting the requirements of 705.12, Type B or Type D shall be used if the concrete temperature exceeds a nominal temperature of 75° F (24° C) . If Option 2 or 3 is used, an approved water reducing set retarding admixture meeting the requirements of 705.12, Type D shall be used if the concrete temperature exceeds a nominal temperature of 75° F (24° C).

The proportioning adjustments under Options 1, 2 or 3 shall be the responsibility of the Contractor, and shall be in accordance with the ACI Standard "Recommended Practice for Selecting Proportions for Normal Weight Concrete" (ACI 211.1). The proportioning shall be based on developing an average compressive strength at 28 days of 4000 psi (28.0 MPa) for Class C, 3000 psi (21.0 Mpa) for Class F or 4500 psi (31.0 MPa) for Class S.

Optional mixes are not permitted with concrete bridge deck overlays using microsilica. For mixes used in latex modified and superplasticized dense concrete bridge deck overlays (Supplemental Specifications 847 and 848), and using Option 1 and 2, certified test data shall be provided for all requirements in accordance with Supplement 1045. Option 3 may not be used with concrete bridge deck overlays (Supplemental Specifications 847 and 848). The testing for Absorption, Scaling Resistance, and Volume Change will not be required for mixes used in dense concrete bridge deck overlays.

Only one source of fly ash shall be used in any one structure unless otherwise authorized by the Director. Bulk fly ash shall be stored in waterproof bins.

No option mixes shall be permitted in concrete mixes designed or intended to obtain high early strength.

899.05 Additional Classes of Concrete for Rigid Replacement.

Class FS. This mixture is a fast-setting Portland cement concrete for accelerated setting and strength development. The minimum cement content shall be 900 pounds per cubic yard (534 kg/m^3) and the maximum water — cement ratio shall be 0.40. The rigid replacement may be opened to traffic after four hours provided test beams have attained a modulus of rupture of 400 psi (2.8 MPa).

The concrete shall be kept plastic by means of a Type B or D admixture until the surface has been textured. The Type B or D admixture shall be used in accordance with the manufacturer's recommendations.

Calcium chloride shall be added and mixed with each batch of concrete just prior to placement. If calcium chloride with 94-97 percent purity is used, the addition rate shall be 1.6 percent by weight of the cement. If calcium chloride with 70-80 percent purity is used, the addition rate shall be 2.0 percent by weight of the cement. When calcium chloride in a water solution is used, the water used shall be considered as part of the concrete mixing water and appropriate adjustments shall be made for its inclusion in the total concrete mixture.

Any other approved accelerating admixture may be used at the rate recommended by the manufacturer, provided it will produce the required strength in the allotted time.

Immediately after the curing compound has been applied, the replacements shall be covered with polyethylene sheeting and further covered with building board as specified in ASTM C 208. The building board shall be wrapped in a black polyethylene sheeting and placed tight against the surrounding concrete and weighted down to protect the fresh concrete from the weather.

Class MS. This mixture is a moderate-setting portland cement concrete for accelerated strength development. The rigid replacement may be opened to traffic after 24 hours provided test beams have attained a modulus of rupture of 400 psi (2.8 MPa). The minimum cement content shall be 800 pounds per cubic yard (475 kg/m3) and the maximum water-cement ratio shall be 0.43.

The proportioning of the concrete materials to meet the requirements of each class of rigid replacement concrete specified shall be the responsibility of the Contractor. The coarse aggregate may be any one of the following sizes: No. 57, No. 6, No. 67, or No. 8. When No. 8 size is used, the entrained air content shall be 8 ±2 percent. Otherwise, the entrained air content shall be 6 ±2 percent.

The Engineer's approval of the concrete mix design will be based on the Contractor's submitted proportions and the foregoing information.

899.06 Equipment. Equipment shall be as follows:

(a) Batching Plants. Each plant shall be constructed and operated so that no intermingling of materials occurs prior to batching. The plant shall have weighing mechanisms which provide either a visible means of checking weights or a printed record. Dispensing mechanisms for water and admixtures shall have a visible means of checking quantities or shall produce a printed record.

Weighing mechanisms used for cement and aggregates shall weigh to an accuracy such that the weight indicated on the scale or printed ticket is within ± 0.5 percent of the correct weight. Devices for weighing or metering water shall measure to an accuracy of ± 1.0 percent throughout the range used.

All weighing and metering devices shall have been checked and their accuracy attested to within the 12-month period immediately prior to their use. This service may be performed by the Sealer of Weights and Measures or a scale servicing company. In lieu of the preceeding requirements, the concrete batch facilities may be approved if a Certificate of Performance has been issued by the National Ready Mixed Concrete Association.

To reach a capacity of 500 pounds (227 kg), ten standard test weights or the services of a scale servicing company shall be readily available for testing the weighing devices at the batch plant. All weights used in testing the weighing devices shall be sealed every 3 years by the Ohio Department of Agriculture.

Weighing and dispensing devices shall be tested as often as the Engineer may deem necessary to assure their continued accuracy.

(b) Mixers. Mixers and agitators shall conform to paragraphs 10, 11.2, 11.5 and 11.6 of AASHTO M 157, except that mechanical counters are permitted.

When a truck mixer is used for complete mixing, each batch of concrete shall be mixed for not less than 70 revolutions of the drum or blades at the rate of rotation designated on the metal plate on the mixer as mixing speed.

Bodies of nonagitating hauling equipment for concrete shall be smooth, mortartight, metal containers and shall be capable of discharging the concrete at a satisfactory controlled rate without segregation. Covers shall be provided when required by the Engineer. Trucks having dump bodies with rounded corners and no internal ribs or projections will be permitted for nonagitating hauling.

899.07 Handling, Measuring and Batching Materials. Aggregates from different sources and of different gradings shall not be stockpiled together. Aggregates that have become segregated, or mixed with earth or foreign material, shall be reworked or cleaned as directed by the Engineer, or rejected. Coarse aggregate shall be maintained with a uniform moisture content.

The fine aggregate and coarse aggregate shall be separately weighed in the respective amounts set by the Engineer as outlined in 899.03. Separate weighing devices shall be used for weighing the cement.

Batching shall be so conducted as to result in the weights of each material required within a tolerance of ± 1.0 percent for cement and ± 2.0 percent for aggregates. Water shall be measured by weight or volume to within a tolerance of ± 1.0 percent. Admixtures shall be dispensed to within ± 3.0 percent of the desired amount.

Methods and equipment for adding air-entraining agent or other admixture into the batch, when required, shall be approved by the Engineer.

899.08 Concrete Batch Plant Tickets. The Contractor shall furnish the Engineer a concrete batch

plant ticket for each load of concrete delivered for use on the project. Batch tickets may be computer-generated, handwritten, or a combination. The ticket shall include, at a minimum, the information listed in Table I:

TABLE I - EVERY BATCH TICKET	
Name of ready-mix batch plant	
Batch Plant No	
Batch Plant Location	
Serial number of ticket	
Date	
Truck Number	
Class of Concrete	
JMF#	
Time the load was batched	
Size of Batch [cu yd (cu m)]	
Actual weights of cementitious material:	
Cement [lbs(kg)]	
Fly ash [lbs(kg)]	
Ground granulated blast furnace slag [lbs(kg)]	
Micro-silica [lbs(kg)]	
Other	
Actual weights of aggregates:	
Coarse [lbs(kg)]	
Fine [lbs(kg)]	
Other	
Actual weight of water [lbs(kg)]	
Actual volume of admixtures:	
Air entrainer [fl. oz. (mL)]	
Superplasticizer [fl. oz. (mL)]	
Water reducer [fl. oz.(mL)]	
Retarder [fl. oz. (mL)]	
Other	
Aggregate moisture contents (%):	
Coarse Aggregate	
Fine Aggregate	
Water Cement Ratio, leaving the plant	

Batch tickets for each day's first load of concrete, for each JMF, shall also include the information in Table II below. The Table II information may be either included on the batch ticket or furnished on a separate form. The separate form may be computer-generated or handwritten, but the form must be physically attached to the batch ticket.

If during the concrete manufacturing process any of the information listed in Table II changes, the information in Table II shall be resubmitted with the first concrete batch ticket supplied with the changed concrete.

TABLE II - FIRST TICKET EACH DAY, EACH JMF	
Cementitious Sources and Grade or Type:	
Cement	
Micro - Silica	
Ground granulated Blast Furnace slag	
Fly Ash	
Other	
Admixtures - Brand and Type:	
Air entrainer	
Retarder	
Water reducer	
Superplasticizer	
Other	

Concrete batch ticket information conforms to ASTM C 94, section 13.
Supporting data may be required by the Engineer to validate the basis for the furnished aggregate moisture contents.
Cost for generating and supplying the information and the concrete batch tickets shall be included in the individual concrete items.

899.09 Mixing Concrete. The concrete may be mixed in a central mix plant or in truck mixers. The mixer shall be of an approved type.

When mixed in central mixers, the mixing time shall not be less than 60 seconds. Mixing time begins when all materials are in the drum and ends when the discharge begins. Transfer time in multiple drum mixers is included in mixing time. The contents of an individual mixer drum shall be removed before a succeeding batch is emptied therein.

Ready-mixed concrete shall be mixed and delivered in accordance with 899.04(b). Mixed concrete from the central mixers shall be transported in truck mixers, truck agitators, or trucks having nonagitating bodies. The concrete shall be delivered to the site of the work and discharge shall be completed within one hour after the combining of the water and the cement. If an approved set-retarding (705.12, Type B) or a water-reducing and set-retarding (705.12, Type D or G) admixture is used at the Contractor's expense, discharge shall be completed within 90 minutes after the combining of the water and the cement.

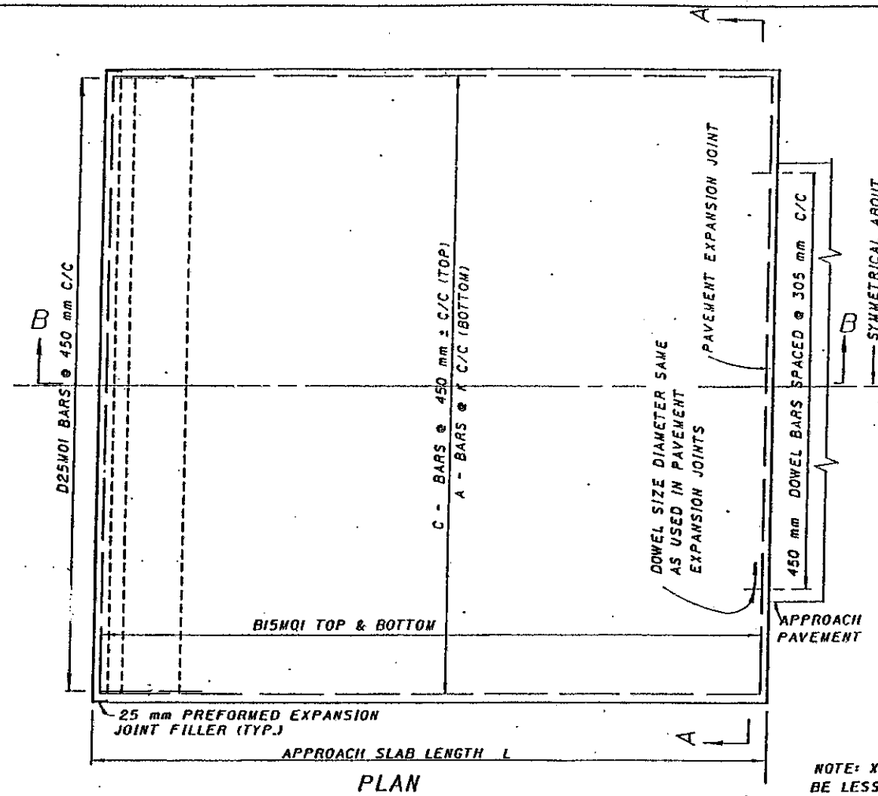
When concrete is delivered in transit mixers or agitators, additional water within the limits specified may be added and sufficient mixing performed to adjust the slump and to regenerate the specified air content throughout the batch, provided all these operations are performed prior to discharging any of the batch and within the above time limitations. When making these adjustments, the concrete shall be mixed a minimum of 30 revolutions at mixing speed.

Retempering after the start of discharge is permitted by the use of approved admixtures (705.12, Type F or G) when approved by the Engineer.

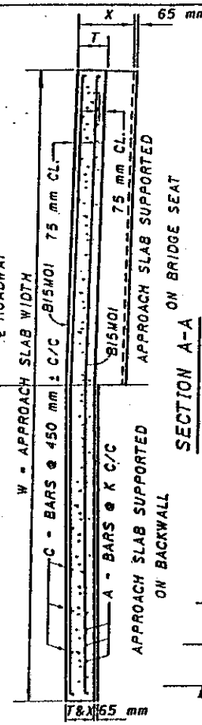
Admixtures containing more than 50 parts per million chloride by weight of cement will be permitted only when provided for in the contract, or upon written permission of the Director.

The procedure for making and testing of concrete beams shall be in accordance with the requirements of Supplement 1023 on file in the Office of the Director.

When mixed, all concrete shall have a temperature of not more than 90° F (32° C), and the concrete shall be maintained under this temperature until deposited in the work.

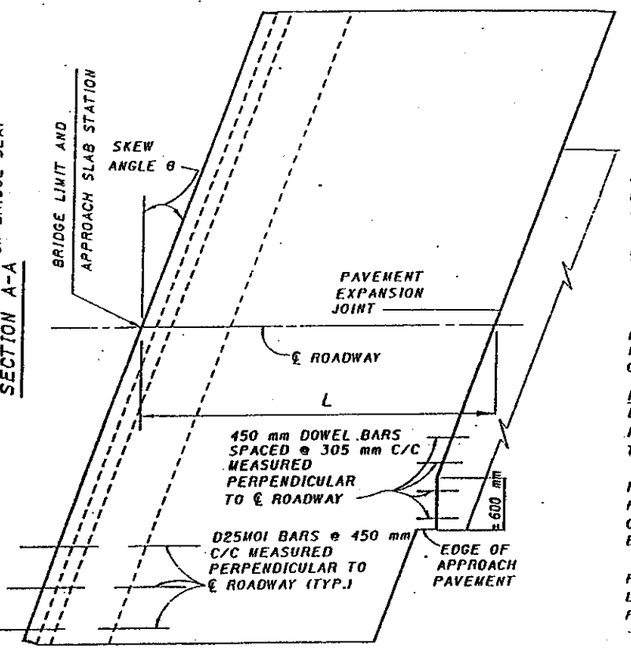


PLAN

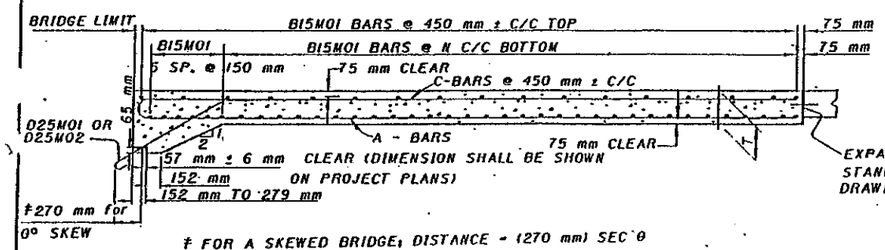


SECTION A-A

NOTE: X SHALL NEVER BE LESS THAN T



* 600 mm FOR SKEWS LARGER THAN 30°; 0 mm FOR SKEWS 30° OR LESS.



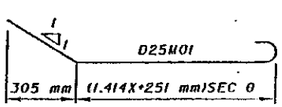
‡ FOR A SKEWED BRIDGE, DISTANCE = (270 mm) SEC θ

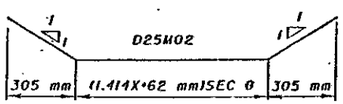
SECTION B-B

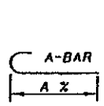
REINFORCING STEEL (FOR ONE APPROACH SLAB)

LENGTH L mm	THICKNESS T mm	A-BARS SP'C'G K	A-BARS MARK	A-BARS LENGTH mm	A-BARS DIMENSION A mm	A-BARS NO. REQ'D	B15M01 (BOTTOM)* LENGTH	B15M01 (BOTTOM)* SP'C'G N	B15M01 (BOTTOM)* NO. REQ'D.	B15M01 (TOP)* LENGTH	B15M01 (TOP)* NO. REQ'D.	C-BARS MARK	C-BARS LENGTH mm	C-BARS NO. REQ'D.	D25M01 OR D25M02 NO. REQ'D.
4600	305	255	A35M01	4880	4450	W-150 / K + 1	(W-150)sec θ	230	22	(W-150)sec θ	11	C15M01	4425	W-150 / 450 + 1	W-150 / 450 + 1
6100	330	190	A35M02	6380	5950			200	31		14	C15M02	5950		
7600	380	180	A35M03	7880	7450			200	39		18	C15M03	7450		
9150	430	165	A35M04	9430	9000			215	44		21	C15M04	9000		

W = APPROACH SLAB WIDTH, OUT TO OUT, IN mm
θ = ANGLE OF SKEW
K = A-BAR SPACING IN mm
N = B-BAR SPACING IN mm
X = APPROACH SLAB THICKNESS AT ABUTMENT END IN mm
℄ = OUT TO OUT







APPROACH SLAB FOR SKEWED STRUCTURE

GENERAL: THIS DRAWING PROVIDES DESIGN AND GENERAL CONSTRUCTION DETAILS. THE PROJECT PLANS WILL SHOW LENGTH, SKEW, CURBS (IF ANY), ESTIMATED QUANTITY (SQUARE METER), AND SPECIAL NOTES AND DETAILS WHERE NECESSARY. FOR CONDITIONS OTHER THAN THOSE INDICATED HEREON, THE APPROACH SLAB SHALL BE ADAPTED TO FIT THE ENDS OF THE BRIDGE AND THE APPROACH PAVEMENT.

ANCHOR BARS D25M01 OR D25M02 SHALL BE DETAILED FOR A SPECIFIC BRIDGE AND SHALL BE INCLUDED WITH ITEM 509 UNDER ABUTMENTS OR SUPERSTRUCTURE FOR PAYMENT. D25M01 BARS CANNOT BE USED AS SHOWN WHERE APPROACH SLABS ARE SUPPORTED ON BACKWALLS LESS THAN 350 mm THICK. D25M02 BARS SHALL BE USED ON PRESTRESSED CONCRETE BOX BEAM BRIDGES WHERE THE APPROACH SLAB IS SUPPORTED ON AN 280 mm THICK BACKWALL.

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST LETTER IDENTIFIES THE BAR LOCATION, NEXT TWO DIGITS AND LETTER INDICATES THE METRIC BAR SIZE DESIGNATION, AND THE REMAINING DIGITS ITS SEQUENCE NUMBER.

EXAMPLE : A35M01

1) A - LOCATION OF THE BAR IN THE STRUCTURE
2) 35M - METRIC BAR SIZE DESIGNATION
3) 01 - SEQUENCE NUMBER

* AT THE OPTION OF THE CONTRACTOR, B15M01 BARS MAY BE LAPPED 500 mm MINIMUM AT THE CENTERLINE OF ROADWAY, OR WHERE REQUIRED FOR LONGITUDINAL CONSTRUCTION JOINTS.

DESIGN SPECIFICATIONS: THIS STANDARD DRAWING CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1977, INCLUDING THE 1978, 1979, 1980 AND 1981 INTERIM SPECIFICATIONS AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS.

DESIGN DATA

DESIGN LOADING: MS18 AND THE ALTERNATE MILITARY LOADING.

CONCRETE CLASS C : COMPRESSIVE STRENGTH 28 MPa

REINFORCING STEEL: ASTM A615M, A616M OR A617M-GRADE 400; MINIMUM YIELD STRENGTH OF 400 MPa AND SHALL BE EPOXY COATED.

REINFORCING STEEL: FOR SKEWED BRIDGES THE A AND C BARS SHALL BE PLACED PARALLEL TO THE CENTER LINE OF ROADWAY AND THE B BARS SHALL BE PLACED PARALLEL TO THE ABUTMENTS.

PREFORMED EXPANSION JOINT FILLER, TYPE "A" WATER PROOFING, AND SEALER AT THE CORNERS AND SIDES OF THE APPROACH SLAB SHALL BE INCLUDED IN THE PRICE BID PER SQUARE METER FOR THE APPROACH SLAB.

PREFORMED ELASTOMERIC JOINT SEALER SHOWN AT THE BRIDGE LIMIT END OF THE APPROACH SLAB SHALL BE INCLUDED IN THE PRICE BID PER SQUARE METER FOR THE APPROACH SLAB.

LONGITUDINAL CONSTRUCTION JOINTS REQUIRED FOR STAGE CONSTRUCTION SHALL BE AS PER 511.09.

CURBS, BRIDGES WITH SIDEWALKS : FOR BRIDGES CONSTRUCTED WITH RAISED SIDEWALKS, DEFLECTOR PARAPETS OR OTHER TYPES OF CONSTRUCTION WHICH RETAIN ROADWAY SURFACE DRAINAGE, THE APPROACH SLABS SHALL EITHER INCLUDE INTEGRAL CURBS OR BE CONSTRUCTED IN CONJUNCTION WITH BRIDGE CURBS. CURB HEIGHT SHALL BE TRANSITIONED UNIFORMLY BETWEEN BRIDGE CURB HEIGHT AND APPROACH CURB HEIGHT IN A LENGTH AS FOLLOWS: WHERE WINGWALL EXTENDS BEYOND END OF APPROACH SLAB, USE A MINIMUM LENGTH OF 3000 mm BEYOND END OF WINGWALL. WHERE THE APPROACH SLAB EXTENDS BEYOND THE END OF WINGWALL, TRANSITION IN THIS LENGTH. HOWEVER, THE TRANSITION LENGTH SHALL NOT BE LESS THAN 3000 mm AND THE TRANSITION SHALL EXTEND BEYOND THE END OF APPROACH SLAB IF NECESSARY.

APPROACH SLAB WIDTH (W): APPROACH SLABS SHALL BE THE SAME WIDTH AS THE BRIDGE ROADWAY.

THE LENGTH OF APPROACH SLABS SHOULD BE BASED ON FACTORS SUCH AS THE SIZE AND AMOUNT OF EXCAVATION BEHIND THE ABUTMENTS, NEW OR EXISTING EMBANKMENTS AND SKEW OF THE BRIDGE.

CROWN SHALL CONFORM TO THAT OF THE APPROACH PAVEMENT AND BRIDGE DECK. IF THE RATE OF CROWN OF THE BRIDGE DECK DIFFERS FROM THAT OF THE APPROACH PAVEMENT, A SMOOTH TRANSITION SHALL BE PROVIDED WITHIN THE LIMITS OF THE APPROACH SLAB.

WEARING SURFACE: GENERALLY APPROACH SLABS SHALL HAVE AN ASPHALT CONCRETE WEARING SURFACE ONLY WHEN BOTH THE APPROACH PAVEMENT SURFACE AND THE BRIDGE WEARING SURFACE ARE ASPHALT CONCRETE.

EXPANSION JOINT DETAILS AT THE APPROACH PAVEMENT END OF THE APPROACH SLAB ARE USED ONLY IN CONJUNCTION WITH CONCRETE PAVEMENT OR CONCRETE BASE COURSE. PAYMENT FOR THE EXPANSION JOINT, INCLUDING DOWEL BARS, PREFORMED EXPANSION JOINT FILLER AND JOINT SEALER, IS INCLUDED IN THE PRICE BID PER SQ. METER FOR THE APPROACH SLAB.

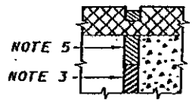
DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES
11-25-94
DATE

REVISIONS

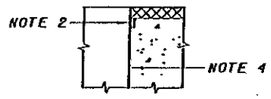
DESIGNED JFF
DRAWN JFF
CHECKED JAM
REVIEWED LMW
AS-1-81M

STANDARD
REINFORCED CONCRETE
APPROACH SLAB - METRIC

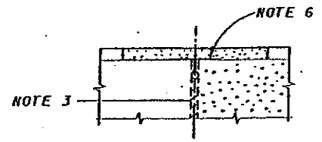


DETAIL A

DETAIL B



DETAIL C



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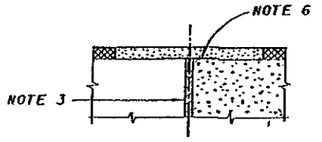

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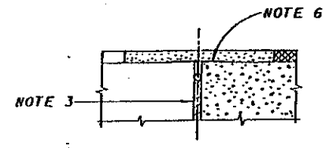
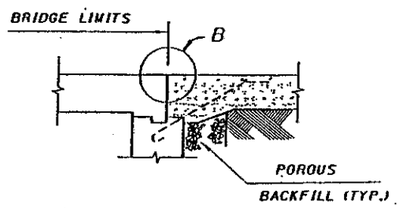


DETAIL F

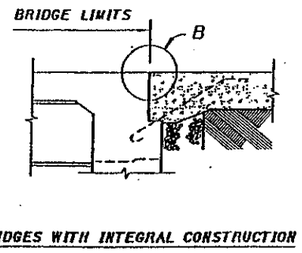
CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

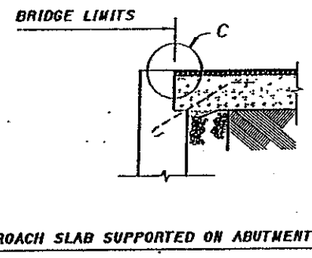
CONCRETE WEARING SURFACE ON BRIDGE DECK ONLY



ON SLAB BRIDGES

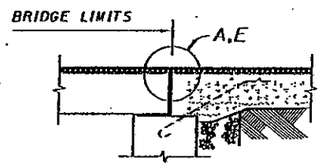


ON BRIDGES WITH INTEGRAL CONSTRUCTION

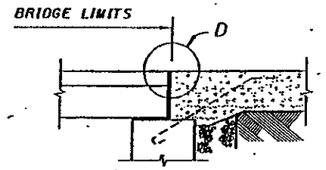


APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

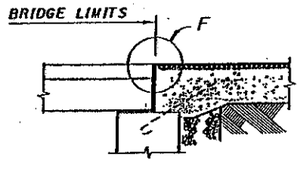
ASPHALT CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB



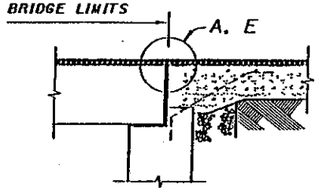
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



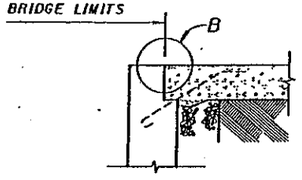
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL



APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

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.

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.

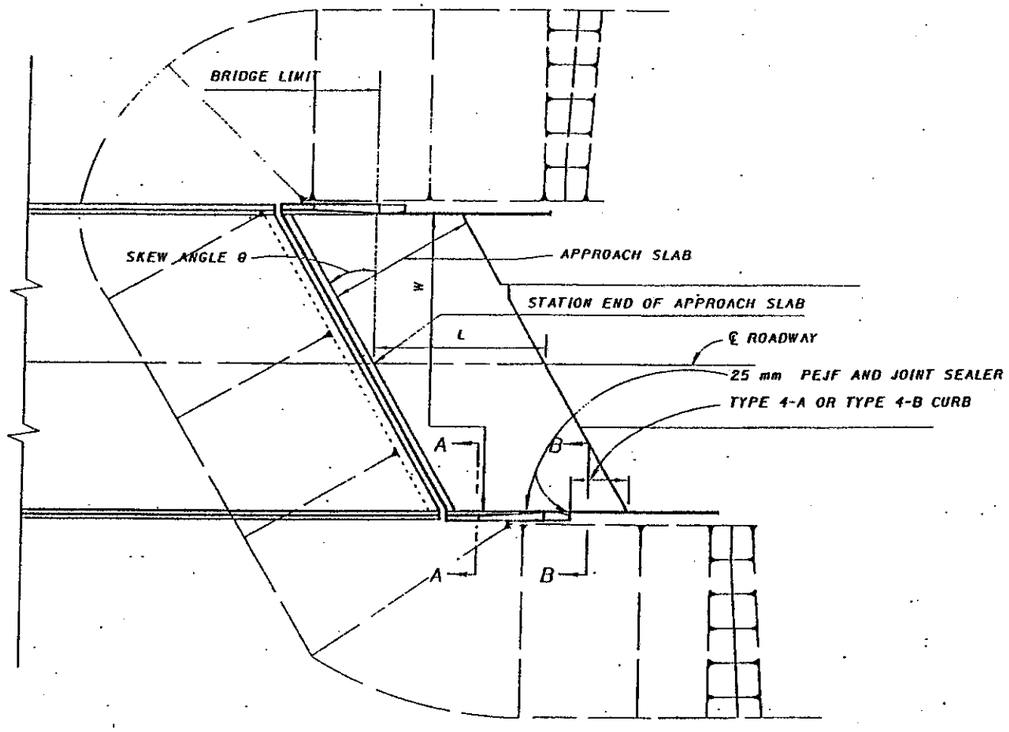
FOR STRUCTURES HAVING ASPHALT CONCRETE WEARING SURFACE ON BOTH BRIDGE DECK AND APPROACH SLABS AND WHERE NO DECK EXPANSION DEVICES ARE PROVIDED, THE DECK MEMBRANE WATERPROOFING SHALL EXTEND BEYOND THE BRIDGE LIMITS A DISTANCE OF 600 mm.

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES
12-26-94
DATE

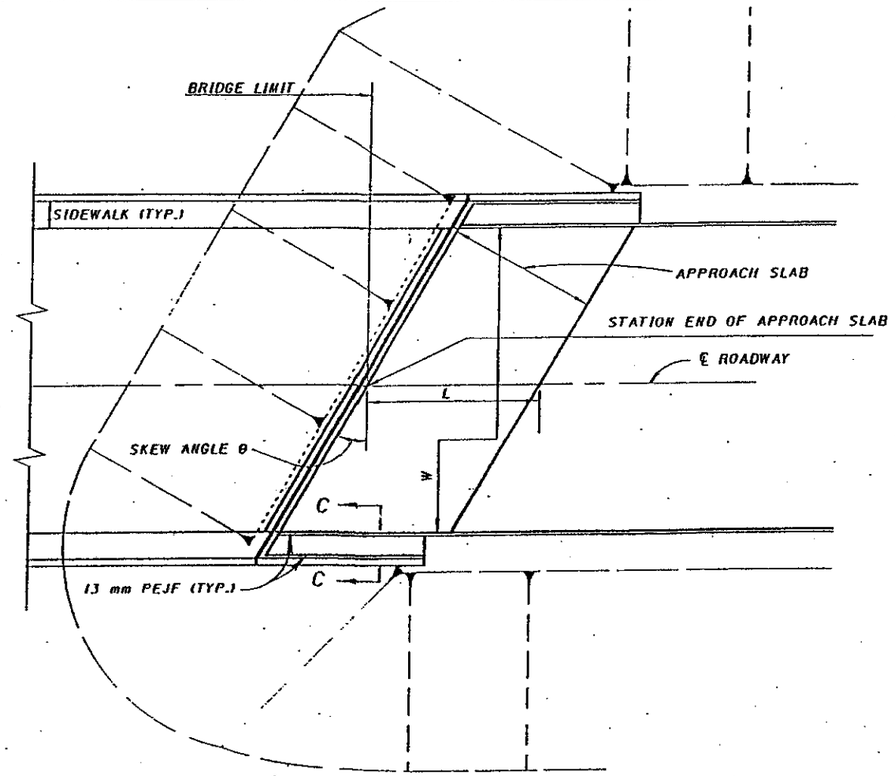
REVISIONS
DESIGNED JFF
DRAWN JFF
CHECKED JAM
REVIEWED LHW
AS-1-81M

STANDARD
REINFORCED CONCRETE APPROACH SLAB - METRIC



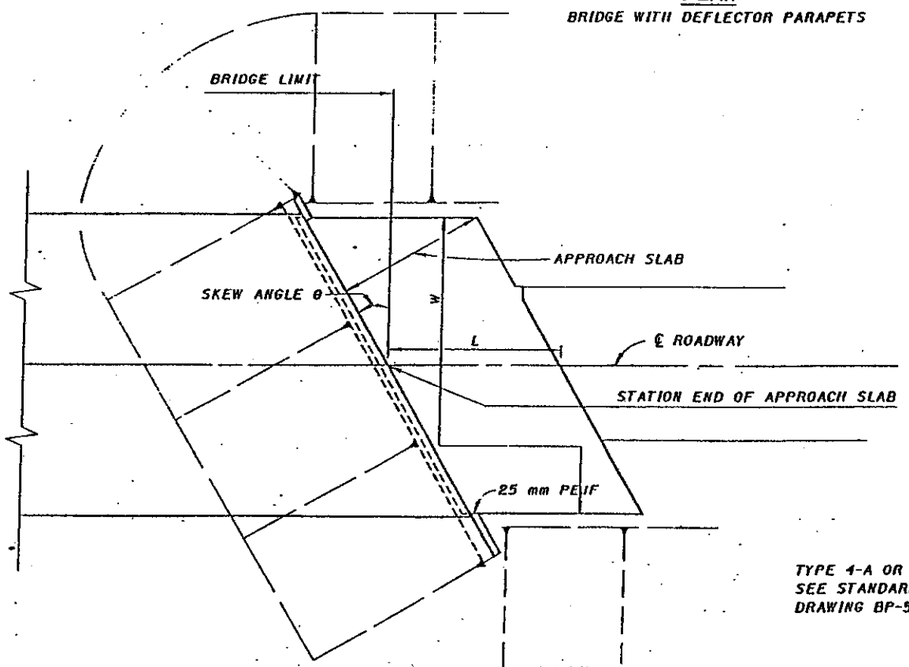
PLAN

BRIDGE WITH DEFLECTOR PARAPETS



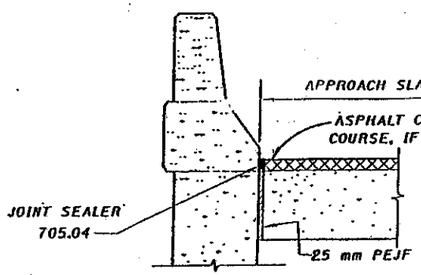
PLAN

BRIDGE WITH SIDEWALKS

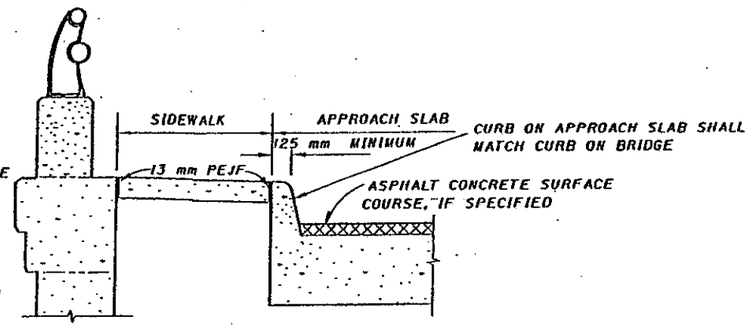


PLAN

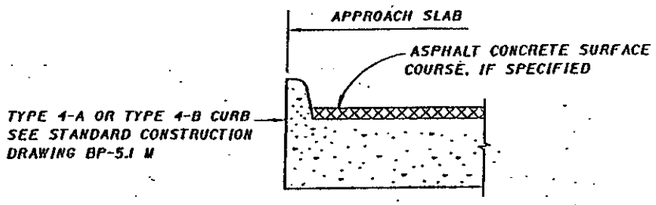
BRIDGE WITHOUT CURBS



SECTION A-A



SECTION C-C



SECTION B-B

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

12-23-94
DATE

ENGINEER OF BRIDGES

REVISIONS

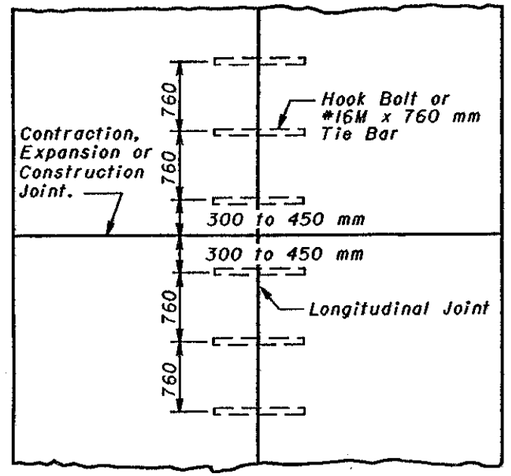
DESIGNED JFF
DRAWN JFF
CHECKED JAM
REVIEWED LMW

AS-1-81M

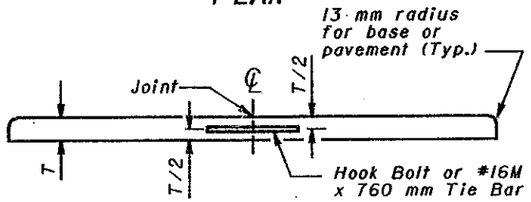
STANDARD
REINFORCED CONCRETE
APPROACH SLAB - METRIC

3 / 3

TIE BAR OR HOOK BOLT SPACING

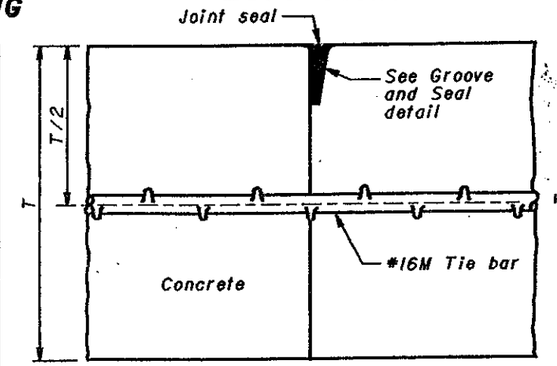


PLAN



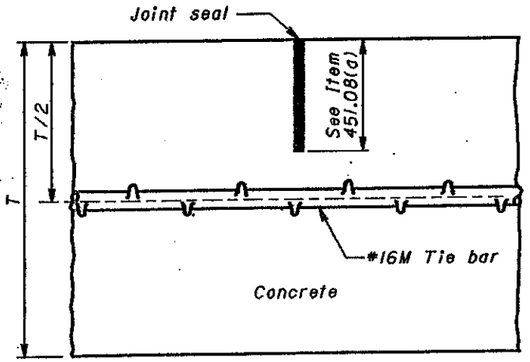
CROSS SECTION

BUTT JOINT



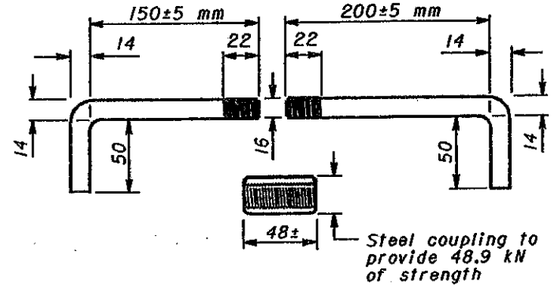
DETAIL OF JOINT

SAWED JOINT



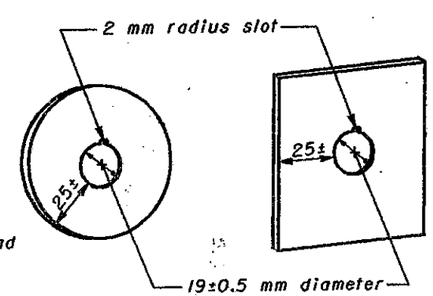
DETAIL OF JOINT

HOOK BOLT

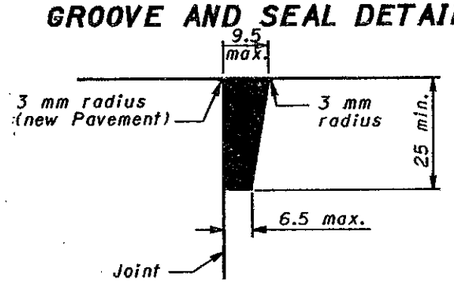


NYLON OR PLASTIC GROUT RETENTION DISCS FOR DOWEL/TIE BARS

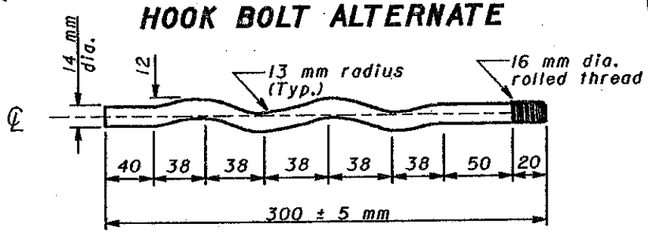
(1.6 mm min. thickness)



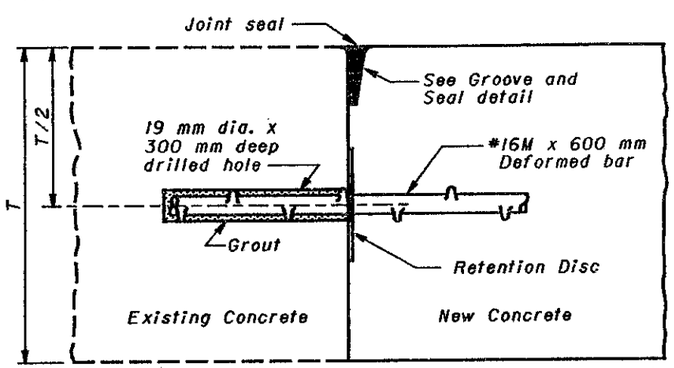
GROOVE AND SEAL DETAIL



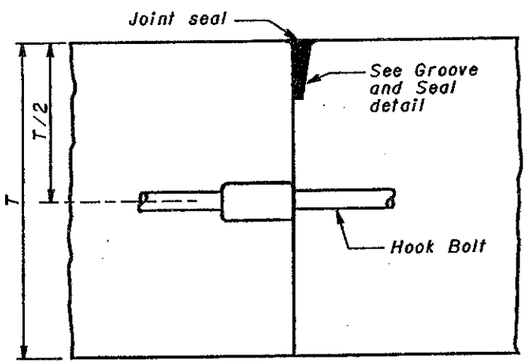
HOOK BOLT ALTERNATE



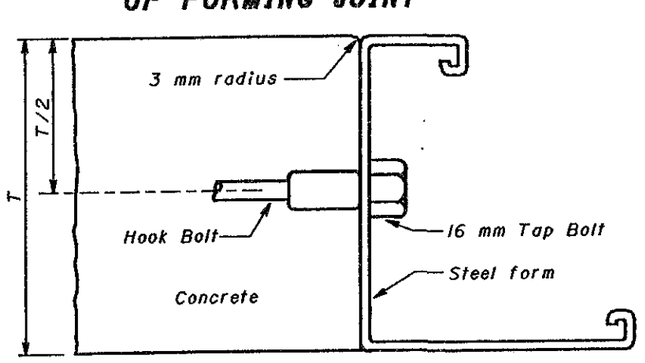
TYPE D (DRILLED TIED LONGITUDINAL) JOINT



BUTT JOINT



ACCEPTABLE METHOD OF FORMING JOINT



NOTES

GENERAL: Longitudinal joints shall be used when specified on the typical section and shall be constructed as shown on this drawing in Items 451 and 452 Pavement and Item 305 Base.

The joint shall be on the centerline of the pavement unless otherwise shown on the plans. Where the pavement width exceeds 5.0 m, an additional longitudinal joint shall be introduced into the jointing details as directed by the Engineer.

Tie bars shall be #16M deformed bars. A satisfactory device shall be used to hold the tie bars in proper position or they may be installed by a mechanical installing device.

BUTT JOINT: The longitudinal joint between adjoining slabs poured in separate operations shall be a butt joint with hook bolts or tie bars, unless otherwise shown on the plans. Bent tie bars shall not be permitted.

TYPE D (DRILLED TIED LONGITUDINAL) JOINT: Type D joints shall be constructed in accordance with Item 255.05. The nylon or plastic retention disc shall be clear or opaque white in color. Grout shall meet the requirements of Item 255.02. 16 mm expansion anchors, FF-S-325, Group VIII, Type I or Group II Type 4, Class I may be used lieu of the #16M x 600 mm deformed bar and shall be installed according to the manufacturer's recommendations.

The use of self drilling expansion shield anchors, FF-S-325, Group III, Type I (a) and (c) shall not be permitted.

GROOVES: Grooves for sealing expansion bolt or butt joints in Item 451 or 452 pavements shall be formed by depressing a device or bar into the newly deposited concrete adjacent to the existing or previously poured lane. The device or bar shall be removed as soon as the concrete is in such condition as to preclude distortion of the concrete.

Adjoining slabs adjacent to grooved joints shall be edged with a thin metal edger having a radius of 3 mm. Any impression left in the surface of the pavement by the flat part of the edging tool shall be eliminated.

In lieu of the above method the longitudinal joint may be constructed in accordance with Item 451.08(a).

After the joint is formed it shall be protected from dirt and foreign matter until the joint seal is placed.

SEALING JOINTS: Sawed or hand-formed joints may be sealed with Item 705.04 or 705.11 joint sealer.

HOOK BOLTS: Hook bolt inserts shall be turned to a tight fit when installed in threaded hook bolts or couplings.

METAL STRENGTH: Tie bars, hook bolt assemblies and the hook bolt alternate shall have a minimum strength of 48.9 kN.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces BP-2.1.

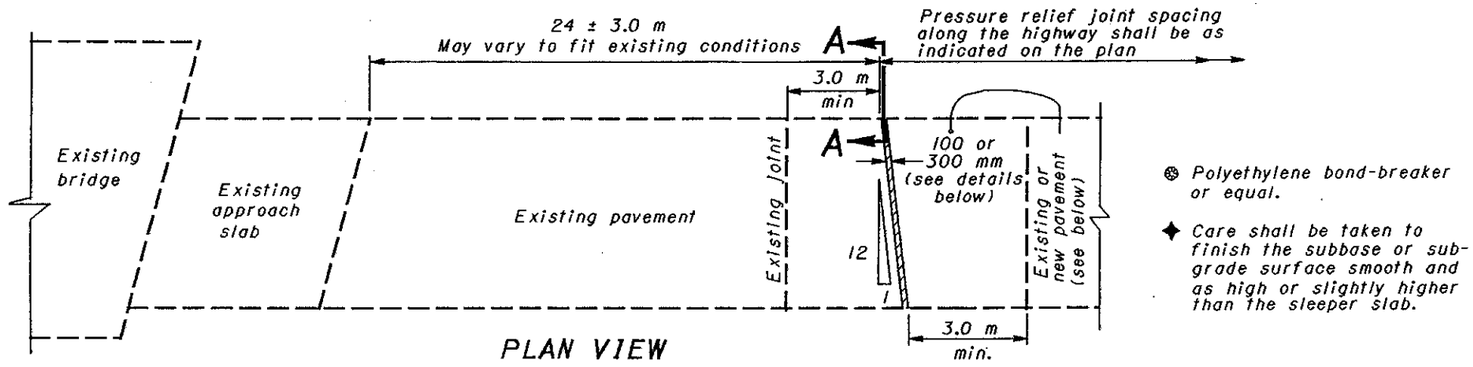
OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

LONGITUDINAL PAVEMENT JOINTS

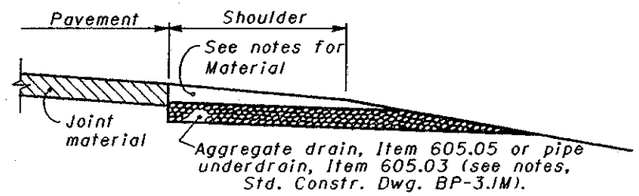
DATE: 10-28-94, 4-8-97

STANDARD CONSTRUCTION DRAWING **BP-2.1M**

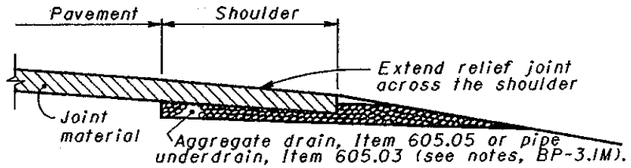
APPROVED Larry F. Sutherland
ADMINISTRATOR



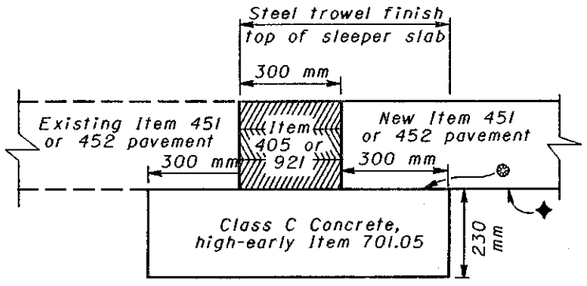
PLAN VIEW



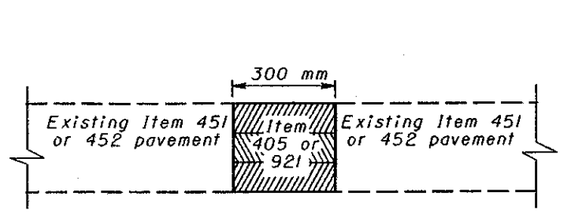
SECTION A-A
WITH ASPHALT SHOULDERS



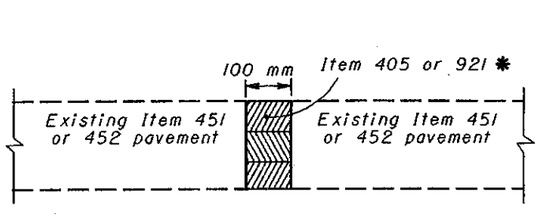
SECTION A-A
WITH CONCRETE SHOULDERS



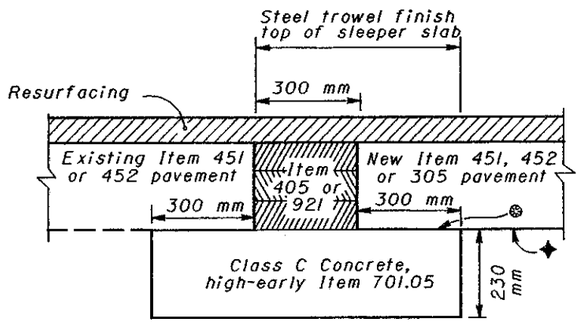
TYPE B



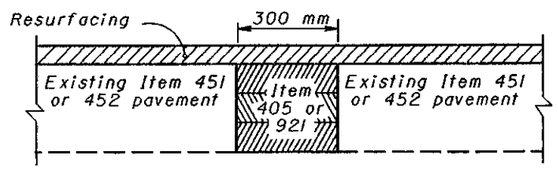
TYPE C



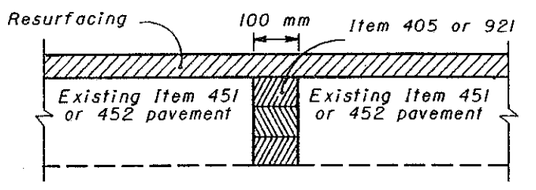
TYPE D



TYPE B - WITH
RESURFACING



TYPE C - WITH
RESURFACING



TYPE D - WITH
RESURFACING

NOTES

JOINTS: All joints shall be sawed full depth, however, the cut may be made in two passes. To reduce the possibility of saw binding, joints should be cut, if possible, on overcast days and/or when the temperature is less than 21° C.

CURBED PAVEMENTS: The pressure relief joint shall be cut through to the back of curb. After filling the joint, asphalt concrete shall be formed and tamped in place to conform to the adjacent curb.

PAVEMENTS WITH CONCRETE SHOULDERS: The pressure relief joint shall be cut through to the outer edge of the shoulder.

SKEW: The pressure relief joint skew shall be 12:1 or greater unless otherwise directed by the Engineer.

ANY OF THE PRESSURE RELIEF JOINT TYPES shown may be filled with two or three lifts of loosely compacted Item 405 or 921 asphalt concrete. ✱In pavement that is not to be resurfaced in the near future the Type D joint may be filled with material manufactured for pressure relief joints (in accordance with manufacturer's instructions), such as Meadows Sealtight Ceramar or Froth Pak urethane foam or approved equal.

AGGREGATE DRAINS: shall be provided from the low end (or ends) of each pressure relief joint to the embankment slope or ditch inslope. A drain will be required at both ends of the joint if the pavement is crowned with transverse slopes toward both edges. If a feasible outlet is not available for aggregate drains, then metal pipe underdrains, with perforated pipe and aggregate backfill, shall be provided instead of aggregate drains and the pipe extended to a suitable outlet. The material above the filter aggregate of the drain in paved shoulder area may be the same as the shoulder pavement or may be the same as the asphalt material used in the pressure relief joint and included in Item 605 for payment.

MEASUREMENT: Pressure relief joint measurement for pay purposes shall be along the centerline of the joint, edge to edge of pavement when asphalt shoulders are used, edge to edge of shoulder when concrete shoulders are used, or back to back of curbs. Payment shall be per meter for Item Special, Pressure Relief Joint, Type ___ , which shall include all work and materials necessary to complete the joint except for the aggregate drains or pipe underdrains which shall be constructed and paid for as Item 605.

CEMENT: Cement other than the Item 701.05 specified may be used if approved by the Engineer, provided an accelerating admixture meeting the requirements of ASTM C 494 Type C or E, and an air entraining admixture meeting the requirements of Item 705.10 is added at the mixer.

metric units

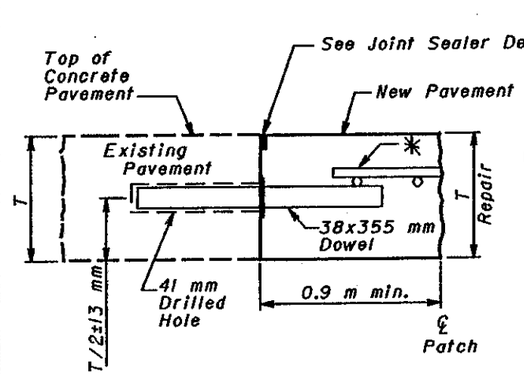
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

PRESSURE RELIEF JOINT TYPES B, C, & D

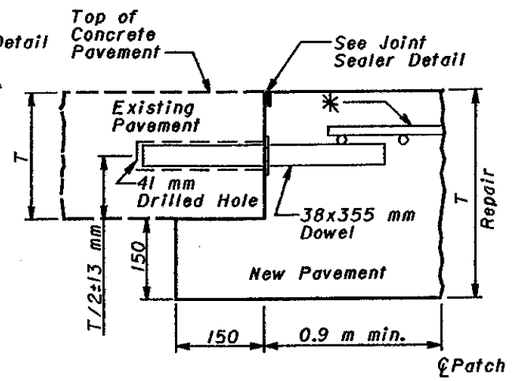
DATE 10-28-94

STANDARD CONSTRUCTION DRAWING **BP-2.4M**

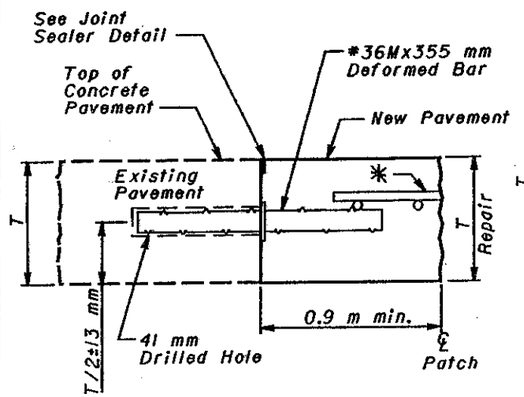
APPROVED D.K. Hedeman
ENGR., L & D



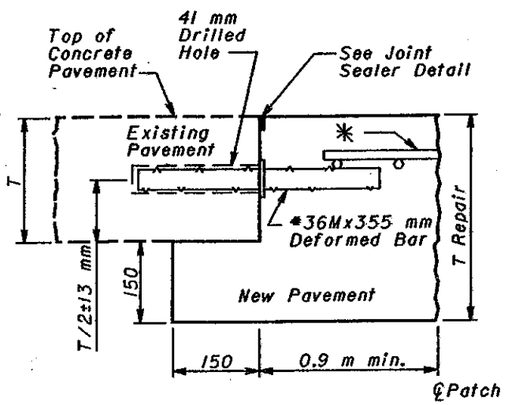
SECTION - TYPE Y
(Contraction)



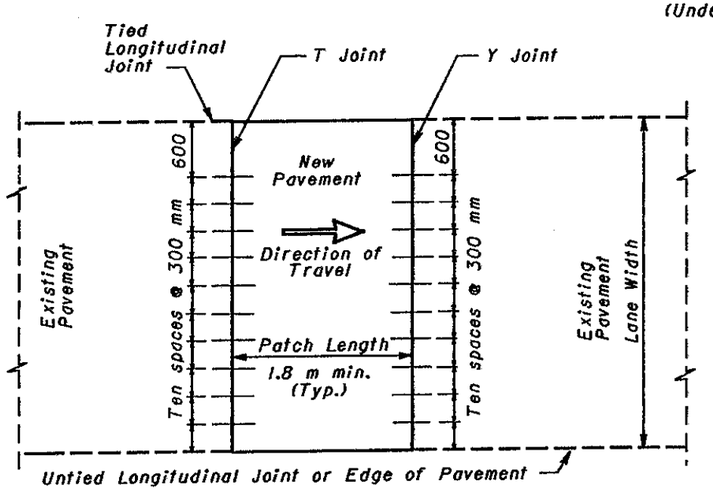
SECTION - TYPE YU
(Undercut : Contraction)



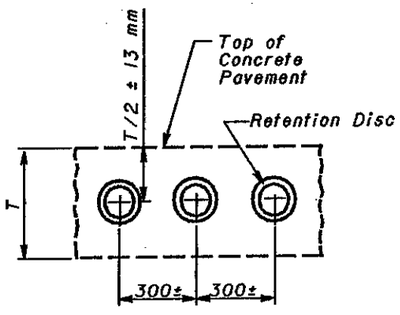
SECTION - TYPE T
(Tied)



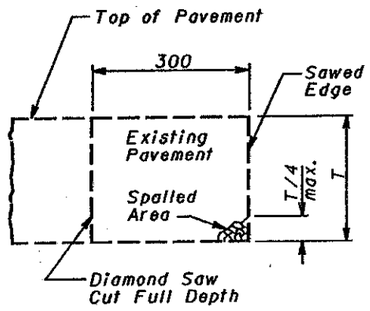
SECTION - TYPE TU
(Undercut : Tied)



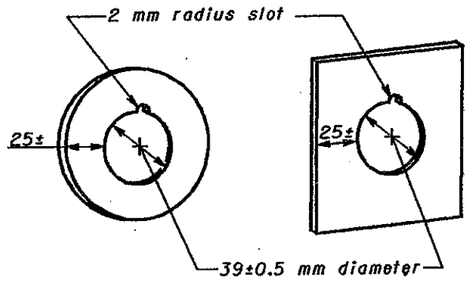
TIE / DOWEL BAR PLACEMENT DETAIL
(See Note ✦ for Bar Placement)



HOLE DRILLING DETAIL



ADDITIONAL PAVEMENT REMOVALS



NYLON OR PLASTIC GROUT RETENSION DISCS FOR DOWEL/TIE BARS ⊛
(1.6 mm min. thickness)

NOTES

GENERAL: All joints shall be constructed normal to the centerline of the pavement lane unless otherwise specified in the plans.

All dowel holes shall be drilled by a mechanical device that will allow independent adjustment of all drill shafts in the horizontal and vertical direction. The device shall be capable of drilling a minimum of three holes at a time.

All smooth dowels shall be coated with a thin layer of oil or other "bond-breaking" material after they have been installed in the existing pavement and just prior to placing the patch. All dowels shall be placed parallel to the pavement surface and the centerline of the pavement lane.

This standard drawing is intended for use in repairing both concrete and composite pavements. For clarity, asphalt overlays are not shown.

When Prefabricated Edge Drains are used, they shall be placed after joint repairs are completed.

TYPE N JOINT: Joints referred to as Type N joints on the plan shall be constructed as contraction joints as per Std. Constr. Dwg. BP-2.2M.

ADDITIONAL PAVEMENT REMOVAL: If, after the sawing and removal of the pavement from the area to be repaired, the face of the remaining pavement is spalled or deteriorated for a height greater than one-fourth (1/4) the thickness of the rigid pavement, an additional saw cut shall be made as shown and as directed by the Engineer. This additional work shall be measured for additional payment for full depth pavement sawing, rigid pavement removal and replacement.

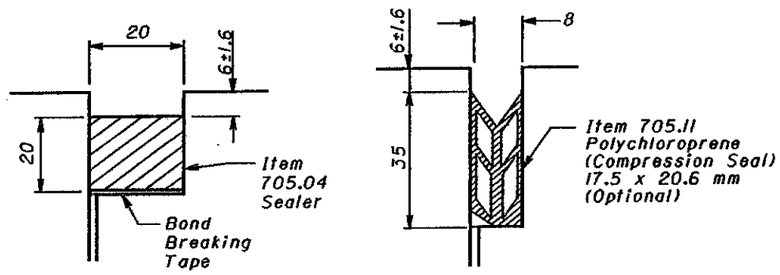
LONGITUDINAL JOINT: For patches 3.0 meters or greater in length, the longitudinal joint shall be constructed as per BP-2.1M.

The tie bars or hook bolts shall be spaced at no more than 760 mm nor less than 610 mm on center.

✦ Bars shall be placed 600 mm from the tied longitudinal joint and continue across with a 300 mm spacing to the edge of pavement or an untied longitudinal joint. Where lane widths are between two tied longitudinaljoints, begin bars 600 mm from each tied longitudinal joint and continue across with a 300 mm spacing.

* Reinforcement will be required for all repairs greater than 3.0 m in length or for repairs which will be opened to traffic within 24 hours of placement. The fabric shall consist of MW55 or MD55 longitudinal wires spaced 152 mm c/c and MW26 or MD26 transverse wires spaced 305 mm c/c. The clearance from the end of the wire fabric to the edge of pavement or new transverse joint shall be 100±50 mm.

⊛ Nylon or plastic grout retention discs shall be clear or opaque white in color.



JOINT SEALER DETAIL

This Drawing Replaces BP-2.5.

metric units

All dimensions are in millimeters unless otherwise noted.

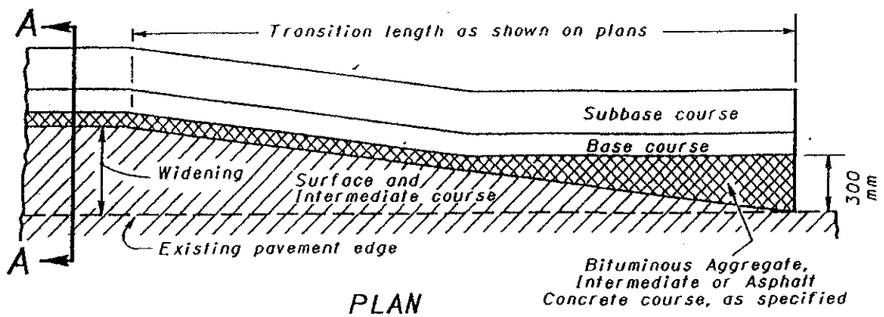
OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

RIGID REPLACEMENT

DATE
10-28-94
4-8-97

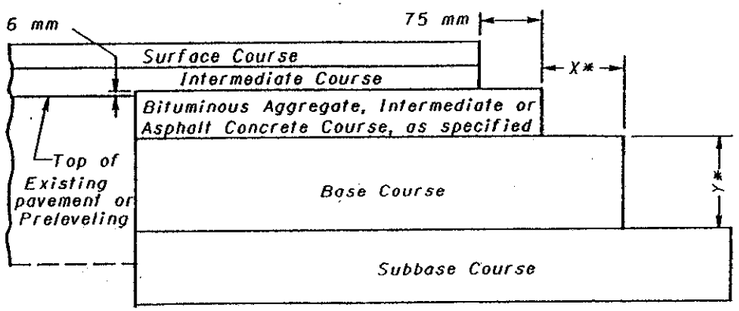
STANDARD CONSTRUCTION DRAWING **BP-2.5M**

APPROVED Larry F. Sutherland
ADMINISTRATOR



PLAN

MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT

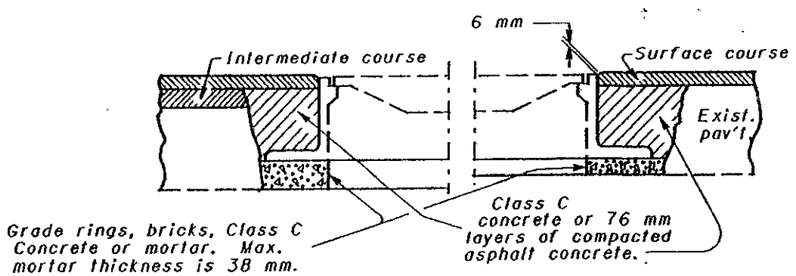


The Bituminous Aggregate in the upper part of the base widening shall finish approximately 6 mm above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and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

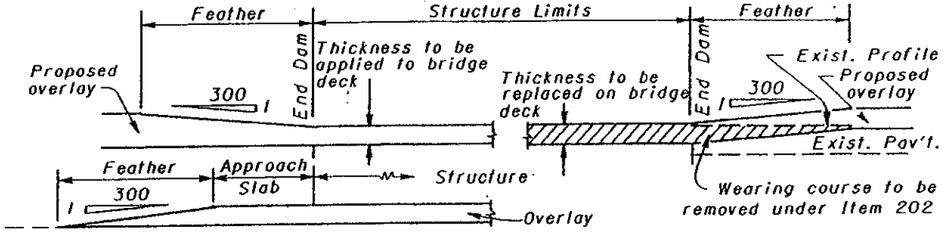
*The extended width (X) of a base or subbase course shall be equal to the depth (Y) of that particular course. unless otherwise specified in the plans.

SECTION A-A

COURSE DETAIL FOR WIDENING

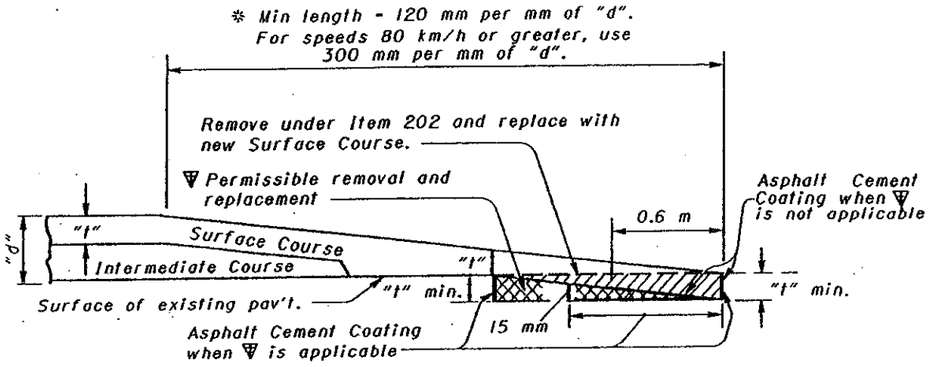


USING CONCRETE OR MORTAR

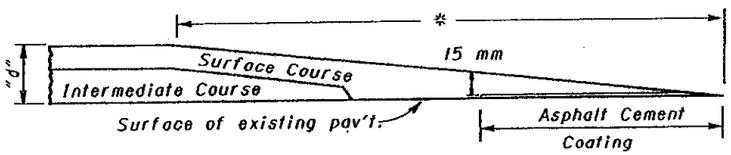


Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES



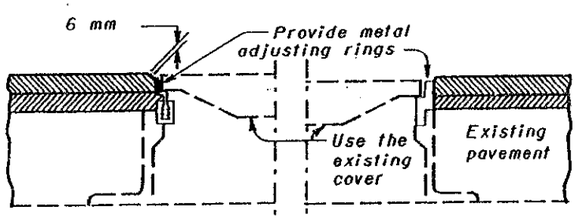
BUTT JOINT TYPE



TAPER EDGE TYPE

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

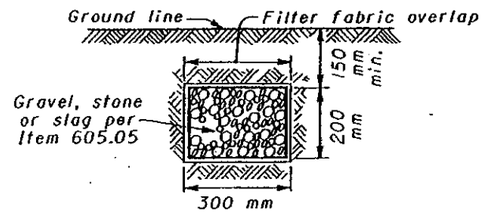
PLACING FEATHERED AREAS



USING METAL ADJUSTING RINGS

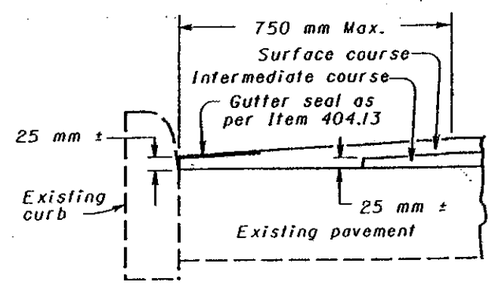
Metal adjusting rings shall: (a) attach securely to the existing frame by welding or mechanical devices; (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and (c) provide an even seat for the manhole cover. In addition, 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



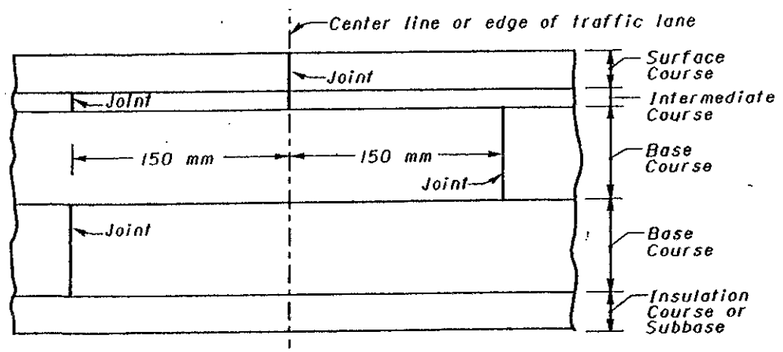
Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item.

AGGREGATE DRAIN



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

GUTTER FINISH



LAPPING LONGITUDINAL JOINTS

metric units

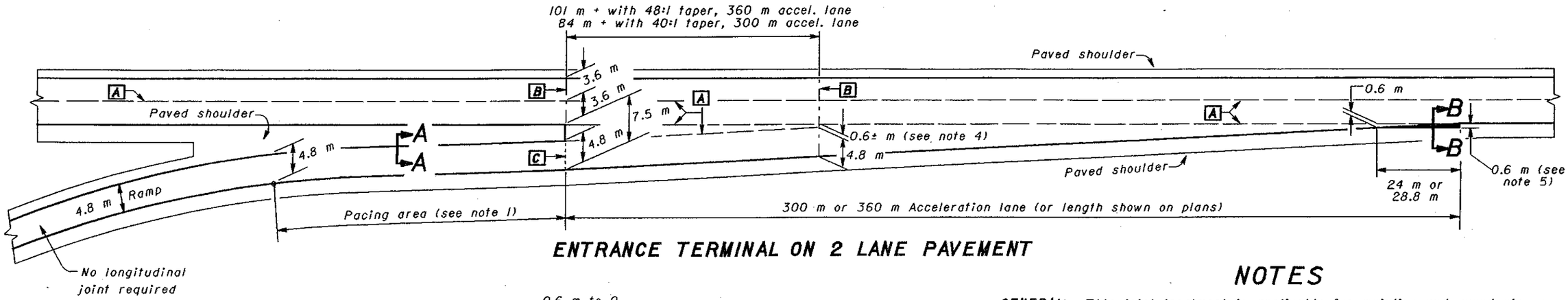
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

DATE 10-28-94

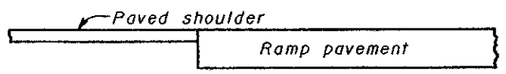
RESURFACING

STANDARD CONSTRUCTION DRAWING **BP-3.1M**

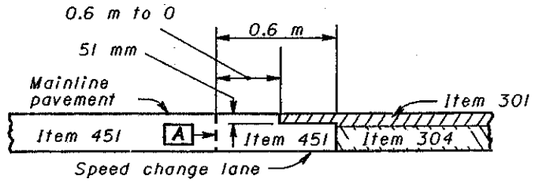
APPROVED W. K. Hukman
ENGR., L & D



ENTRANCE TERMINAL ON 2 LANE PAVEMENT

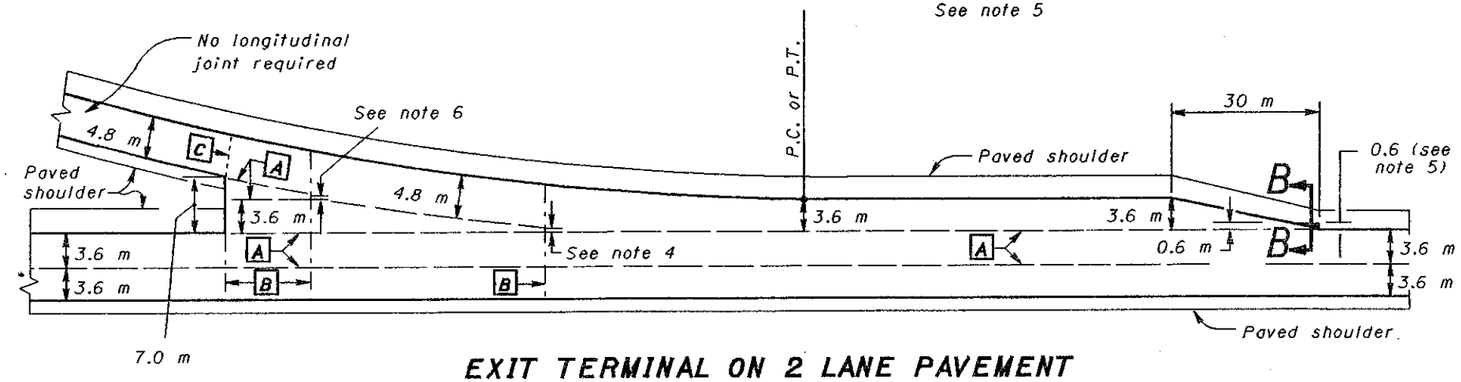


SECTION A-A



SECTION B-B

See note 5



EXIT TERMINAL ON 2 LANE PAVEMENT

NOTES

GENERAL: *This joint treatment is applicable for mainline and speed change lane pavement constructed of Reinforced Portland Cement Concrete.*

1. Although the drawing is based on Class I design standards, it is also applicable to Class II and III standards.

2. Specific location of transverse joints required by the terminal geometrics have been shown. Intervening transverse joints are required as per Std. Constr. Dwg. BP-2.2M. Unless otherwise required, all transverse joints in the speed change lanes are to be continuous in a staight line through the speed change lane and mainline pavement with the exception of the expansion joint at the exit nose which is located radial or normal to the ramp pavement.

3. On 4 lane pavement the joint types and locations shall be as shown for the terminals on 2 and 3 lane pavements with no untied joints, unless otherwise shown on the typical sections.

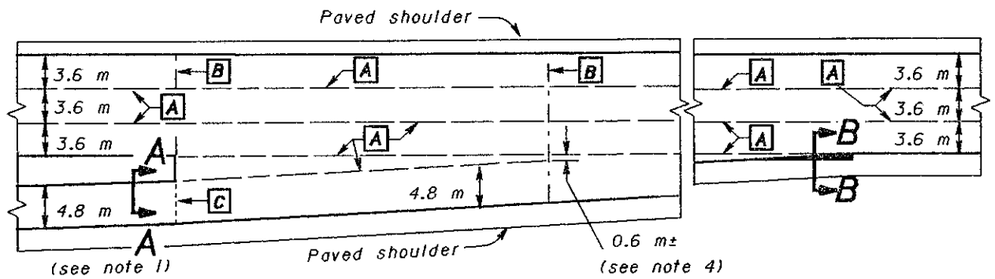
4. The longitudinal joint which extends the 4.8 m ramp slab is to end at any mainline contraction joint where the distance between this longitudinal joint at the edge of the 4.8 m slab and the longitudinal joint at the edge of the mainline pavement is not more than 0.75 m and not less than 0.45 m.

5. When the mainline shoulders are paved with Item 301 material the shaded area of the end taper shall be constructed of concrete pavement to an elevation 51 mm lower than the adjacenet pavement and paved with Item 301. The shaded area shall be paid for as full depth Item 451 and the surface treatment shall be paid for as Item 301. For the bituminous surface treated shoulders and turf shoulders along the mainline pavement the shaded area shall be constructed of full depth concrete pavement.

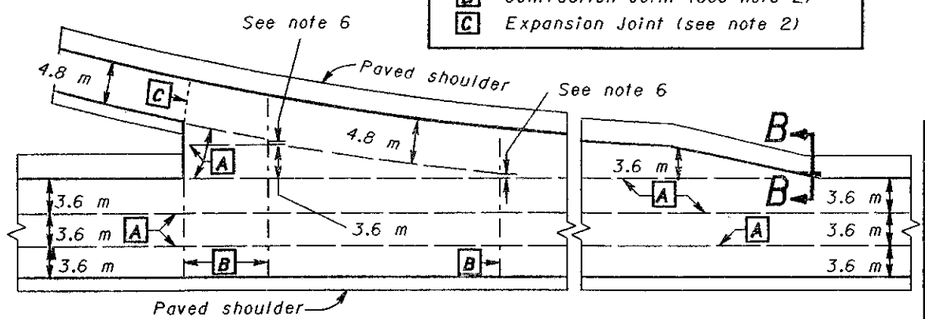
6. Dimension of 0.6 m with a tolerance of plus or minus 150 mm.

JOINT LEGEND

- A — Longitudinal Joint
- B — Contraction Joint (see note 2)
- C — Expansion Joint (see note 2)



ENTRANCE TERMINAL ON 3 LANE PAVEMENT



EXIT TERMINAL ON 3 LANE PAVEMENT

metric units

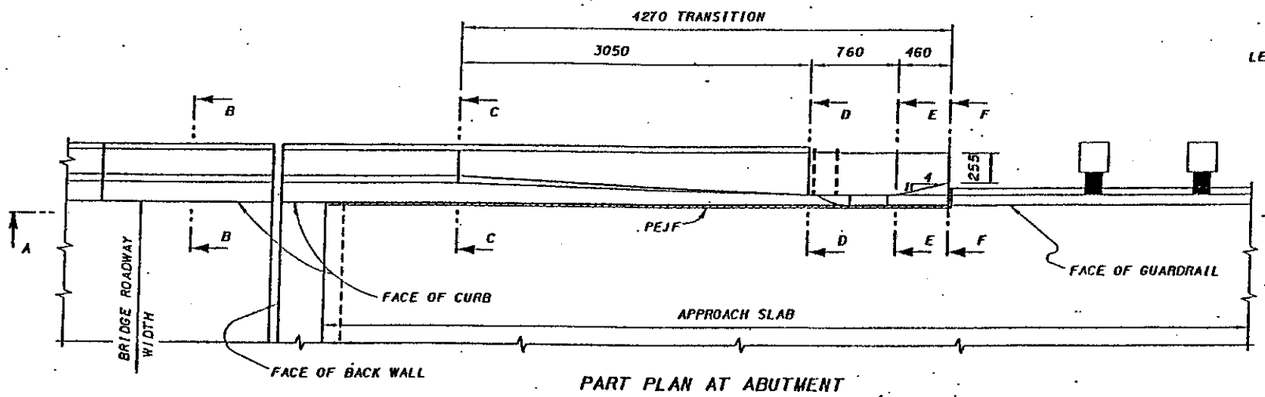
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

PAVEMENT JOINTS AT RAMP TERMINALS

DATE 10-28-94

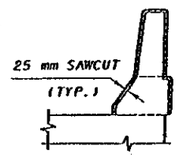
STANDARD CONSTRUCTION DRAWING **BP-6.1M**

APPROVED D. K. Hulman
ENGR., L & D

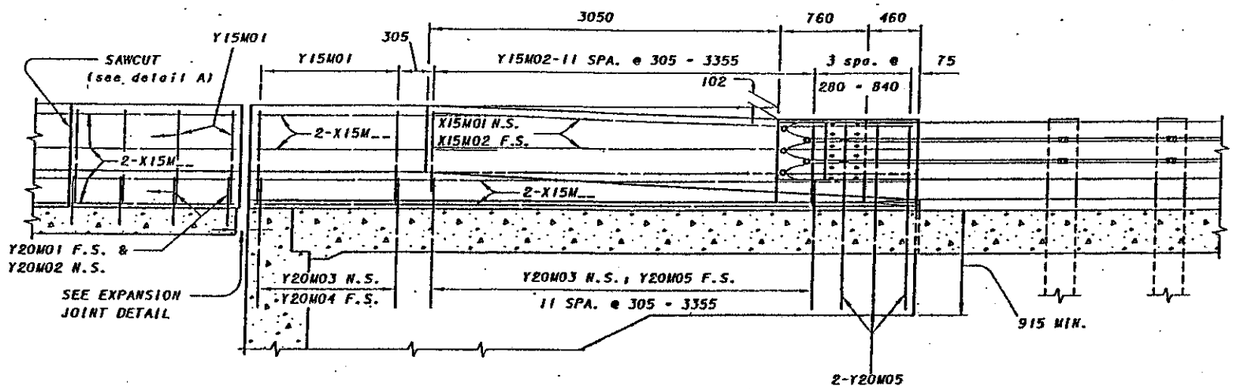


PART PLAN AT ABUTMENT

LEGEND: N.S.-NEAR SIDE
F.S.-FAR SIDE

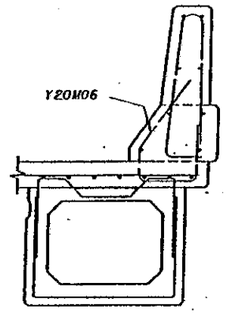


DETAIL A
(section through sawcut)
Sawcut Perimeter- 2160 mm



SECTION A-A

VERTICAL BARS SHALL BE SPACED AT 305 mm MAXIMUM.
(see project plans)



BOX BEAM REINFORCING DETAIL
(composite deck)

DESIGN SPECIFICATIONS: "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY AASHTO, 1992, INCLUDING THE 1993 INTERIM SPECIFICATION.

DESIGN DATA: CONCRETE CLASS S f'c = 31 MPa , REINFORCING STEEL ASTM A615, A617 GRADE 400 fy = 400 MPa.

CONTROL JOINTS FOR CONCRETE PARAPETS: THE JOINTS SHALL BE CONSTRUCTED BY SAWING 25 mm DEEP ALONG PERIMETER OF THE PARAPET AS SOON AS THE SAW CAN BE OPERATED WITH OUT DAMAGING THE CONCRETE.

THE USE OF AN EDGE GUIDE, FENCE, OR JIG IS REQUIRED TO INSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 6 mm.

THE PERIMETER OF THE DEFLECTION CONTROL JOINT SHALL BE SEALED WITH A CAULKING MATERIAL TO A MINIMUM DEPTH OF 25 mm CONFORMING TO FEDERAL SPECIFICATION TT-S-00227E. THE BOTTOM 13 mm OF BOTH THE INSIDE AND OUTSIDE FACES OF THE PARAPET SHOULD BE LEFT UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

SAWCUT SHALL BE PLACED AT A MINIMUM OF 1800 mm AND MAXIMUM OF 3050 mm CENTERS.

QUANTITIES OF CONCRETE, REINFORCING STEEL, DEFLECTION JOINT SAWCUT AND CAULKING MATERIAL FOR PARAPET ARE INCLUDED WITH APPROPRIATE ITEM UNDER EITHER ABUTMENTS OR SUPERSTRUCTURE FOR PAYMENTS.

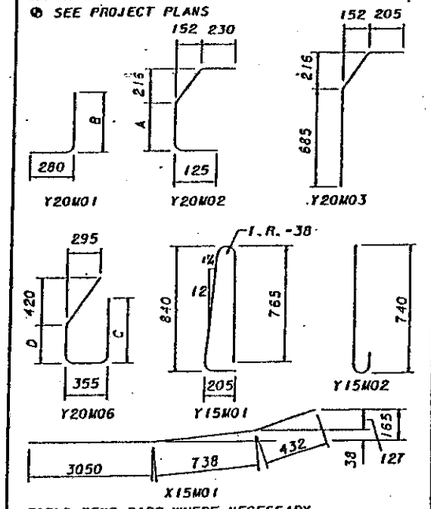
FOR BRIDGE TERMINAL ASSEMBLY SEE STANDARD CONSTRUCTION DRAWING GR-3.1M AND GR-3.2M.

Volume of 4270 mm transition section is 1.3 m^3

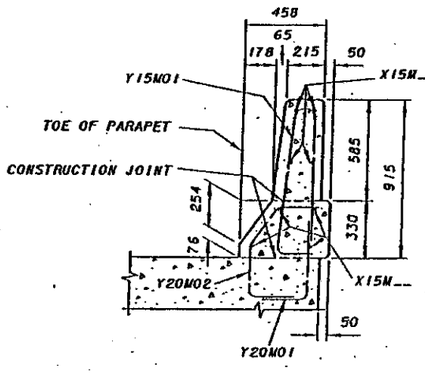
REINFORCING BAR LIST

MARK	LENGTH	SHP.	MARK	LENGTH	SHP.
X15M01	4220	BT.	Y20M01	B+230	BT.
X15M02	4220	STR.	Y20M02	A+550	BT.
			Y20M03	1135	BT.
X15M__	ⓐ	STR.	Y20M04	865	STR.
			Y20M05	1375	STR.
Y15M01	1825	BT.	Y20M06	C+D+760	BT.
Y15M02	920	BT.			

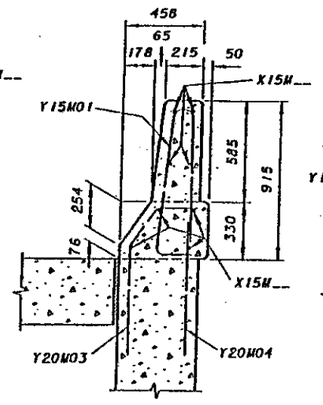
ⓐ SEE PROJECT PLANS



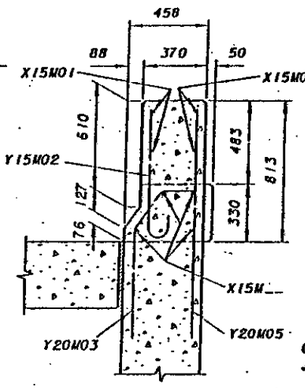
FIELD BEND BARS WHERE NECESSARY.
INCLUDE BENDING DIAGRAMS ON PROJECT PLANS.



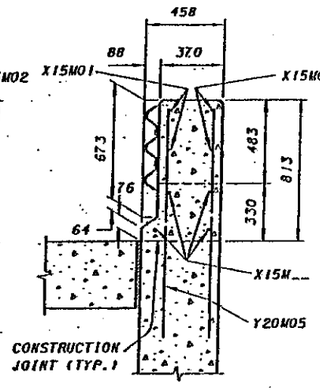
SECTION B-B
(except box beam)
Area- 0.29 m^2



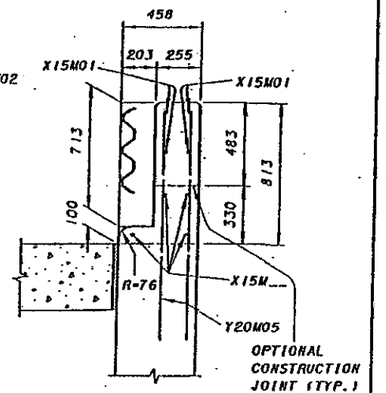
SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

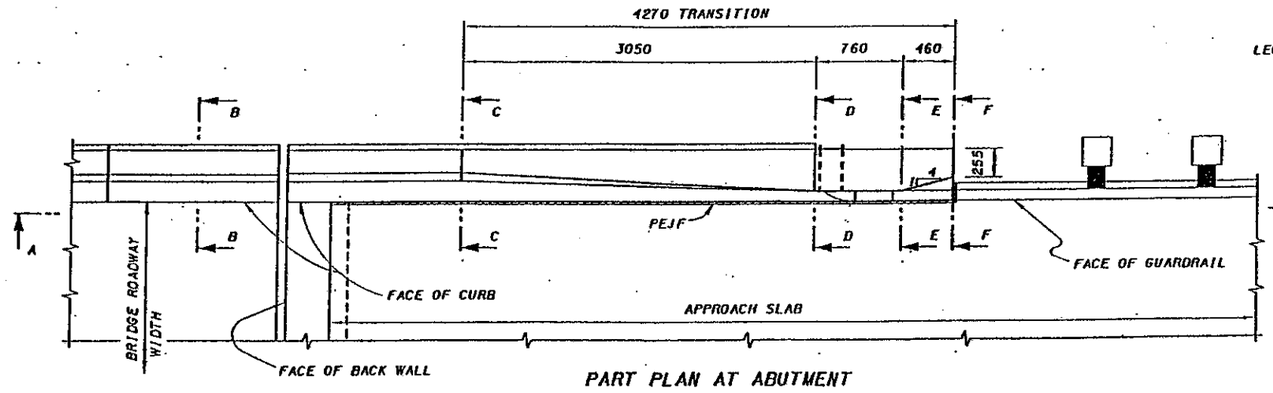
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
BUREAU OF BRIDGES AND STRUCTURAL DESIGN
DESIGN AGENCY
Richard L. Engel
ENGINEER OF BRIDGES
12-15-94
DATE

DESIGNED	REZA	DRAWN	REZA
CHECKED	JS	REVISED	LAW
REVISIONS			

STANDARD
BRIDGE RAILING
DEFLECTOR PARAPET TYPE
915 mm

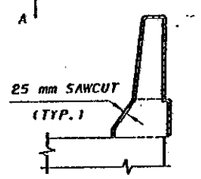
BR-1M

1/2

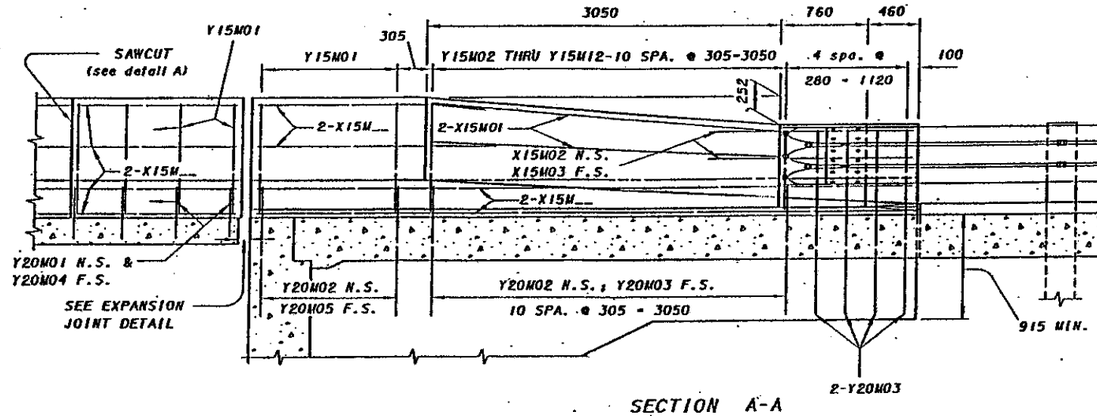


PART PLAN AT ABUTMENT

LEGEND: N.S.-NEAR SIDE
F.S.-FAR SIDE

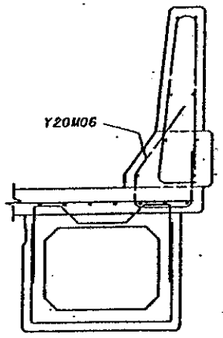


DETAIL A
(section through sawcut)
Sawcut Perimeter= 2464 mm

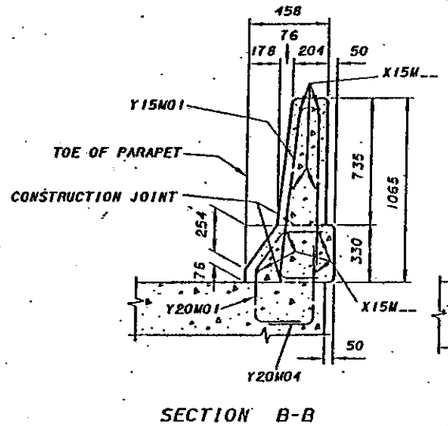


SECTION A-A

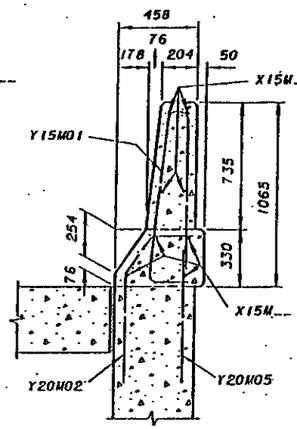
VERTICAL BARS SHALL BE SPACED AT 305 MAXIMUM.
(see project plans)



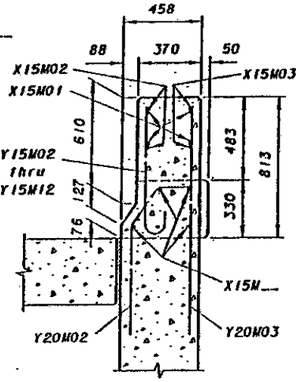
BOX BEAM REINFORCING DETAIL
(composite deck)



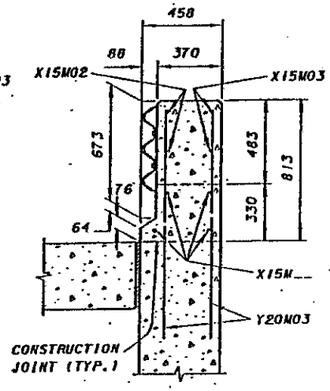
SECTION B-B
(except box beam)
Area= 0.323 m^2



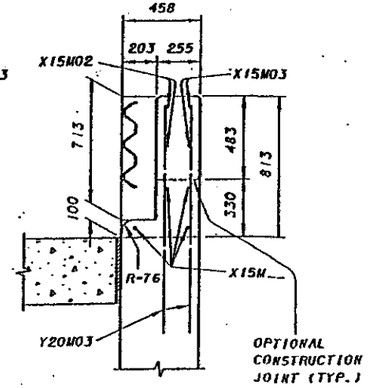
SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

DESIGN SPECIFICATIONS: "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY AASHTO, 1992, INCLUDING THE 1993 INTERIM SPECIFICATION.

DESIGN DATA: CONCRETE CLASS S f'c = 31 MPa , REINFORCING STEEL ASTM A615, A617 GRADE 400 fy = 400 MPa.

CONTROL JOINTS FOR CONCRETE PARAPETS: THE JOINTS SHALL BE CONSTRUCTED BY SAWING 25 mm DEEP ALONG PERIMETER OF THE PARAPET AS SOON AS THE SAW CAN BE OPERATED WITH OUT DAMAGING THE CONCRETE.

THE USE OF AN EDGE GUIDE, FENCE, OR JIG IS REQUIRED TO INSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 6 mm.

THE PERIMETER OF THE DEFLECTION CONTROL JOINT SHALL BE SEALED WITH A CAULKING MATERIAL TO A MINIMUM DEPTH OF 25 mm CONFORMING TO FEDERAL SPECIFICATION TT-S-00227E. THE BOTTOM 13 mm OF BOTH THE INSIDE AND OUTSIDE FACES OF THE PARAPET SHOULD BE LEFT UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

SAWCUT SHALL BE PLACED AT A MINIMUM OF 1800 mm AND MAXIMUM OF 3050 mm CENTERS.

QUANTITIES OF CONCRETE, REINFORCING STEEL, DEFLECTION JOINT SAWCUT AND CAULKING MATERIAL FOR PARAPET ARE INCLUDED WITH APPROPRIATE ITEM UNDER EITHER ABUTMENTS OR SUPERSTRUCTURE FOR PAYMENTS.

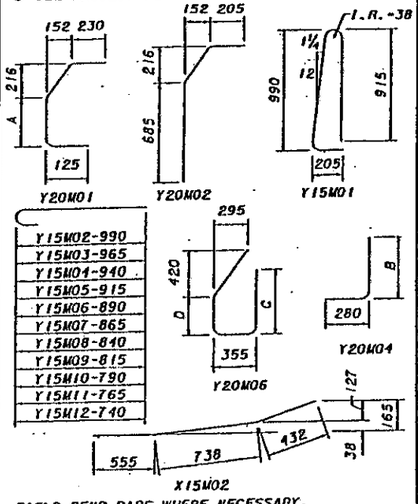
FOR BRIDGE TERMINAL ASSEMBLY SEE STANDARD CONSTRUCTION DRAWING GR-3.1M AND GR-3.2M.

Volume of 4270 mm transition section is 1.36 m^3

REINFORCING BAR LIST

MARK	LENGTH	SHP.	MARK	LENGTH	SHP.
X15M01	3050	STR.	Y15M01	2130	BT.
X15M02	1725	BT.	Y15M02	1170	BT.
X15M03	1725	STR.	Y15M03	1165	BT.
			Y15M04	1120	BT.
X15M__	ⓟ	STR.	Y15M05	1095	BT.
			Y15M06	1070	BT.
Y20M01	A=550	BT.	Y15M07	1045	BT.
Y20M02	1135	BT.	Y15M08	1020	BT.
Y20M03	1375	STR.	Y15M09	995	BT.
Y20M04	B=230	BT.	Y15M10	970	BT.
Y20M05	865	STR.	Y15M11	945	BT.
Y20M06	C=D=T60	BT.	Y15M12	920	BT.

ⓟ SEE PROJECT PLANS



FIELD BEND BARS WHERE NECESSARY.
INCLUDE BENDING DIAGRAMS ON PROJECT PLANS.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
BUREAU OF BRIDGES AND STRUCTURAL DESIGN
DESIGN AGENCY
ENGINEER OF BRIDGES
12-15-94
DATE

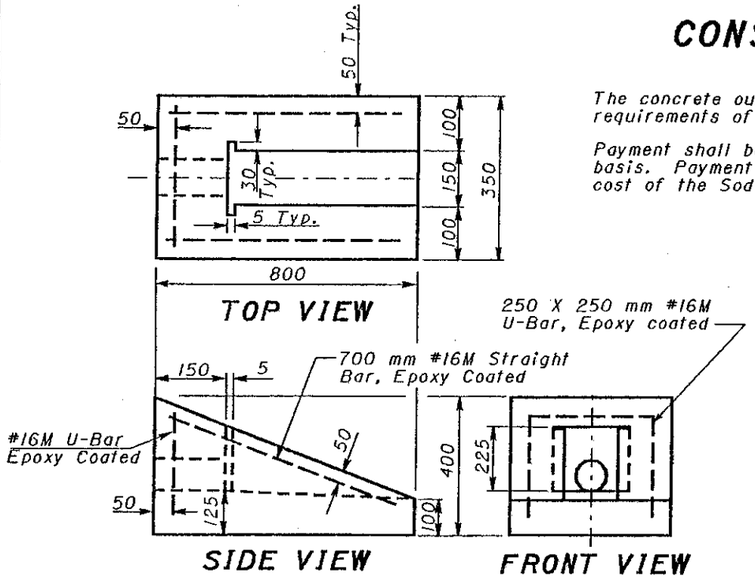
REVISIONS	DESIGNED REZA	CHECKED JS	REVIEWED LAW
	DRAWN REZA		

STANDARD
BRIDGE RAILING
DEFLECTOR PARAPET TYPE
1065 mm

BR-1M

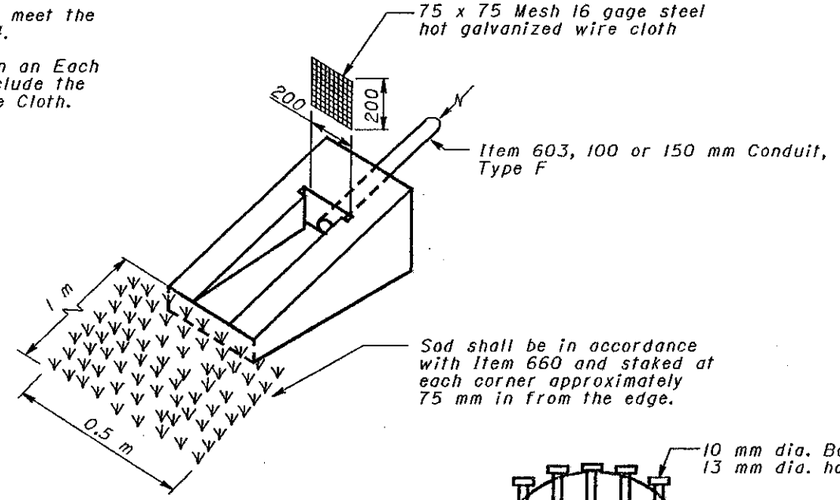
2/2

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.

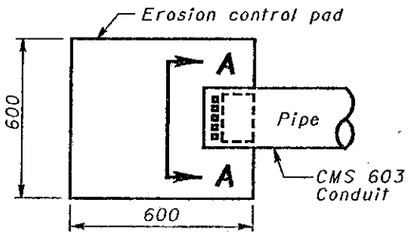


PRECAST REINFORCED CONCRETE OUTLET

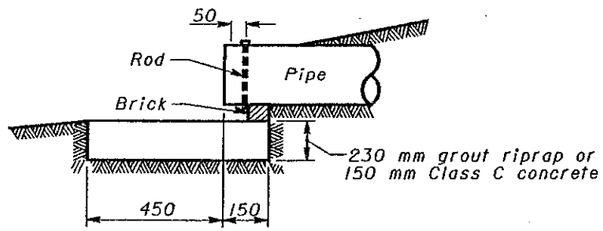
NOTES

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.

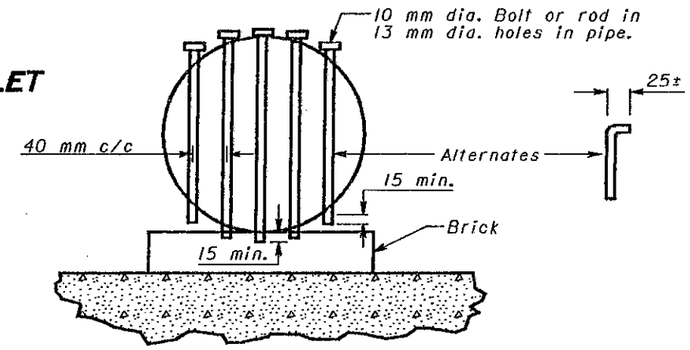
EROSION CONTROL PAD AND ANIMAL GUARDS: These items shall be provided at the outlet end of all farm drains except where they outlet into a drainage structure.
The steel bolts or rods for the animal guard shall be galvanized per CMS 710.06.
In lieu of drilling or punching the 13 mm diameter holes into 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 __ .



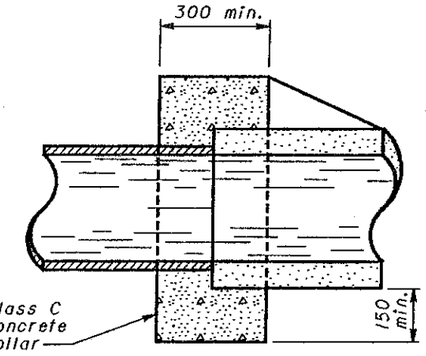
PLAN



PROFILE



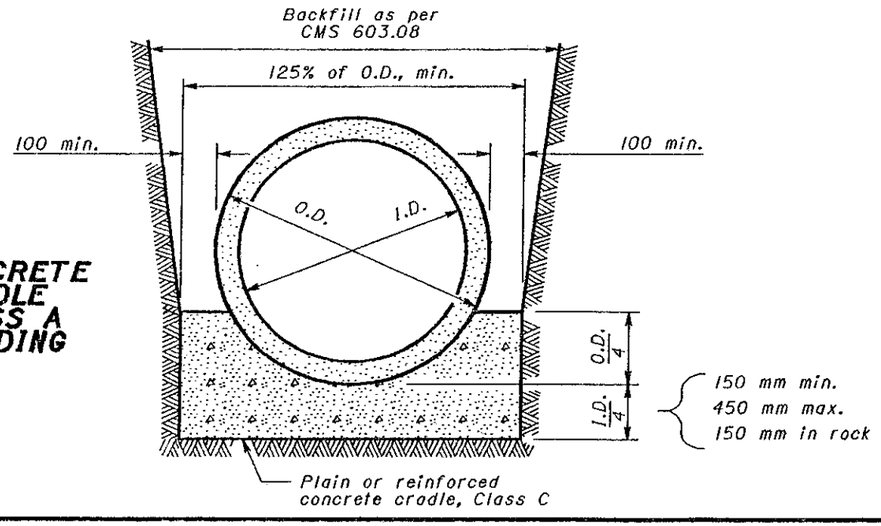
SECTION A-A



MASONRY COLLAR

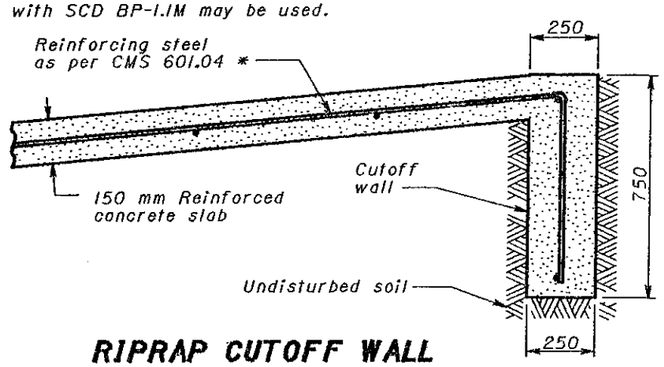
EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE

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



CONCRETE CRADLE CLASS A BEDDING

* 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

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces MC-4.

OHIO DEPARTMENT OF TRANSPORTATION

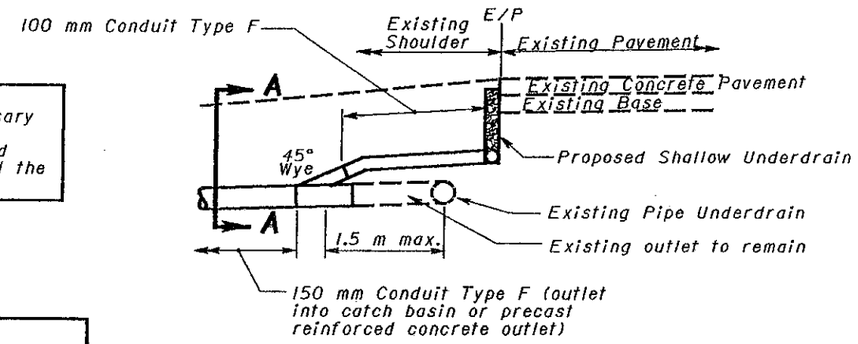
OUTLETS, DRAINS AND SEWERS

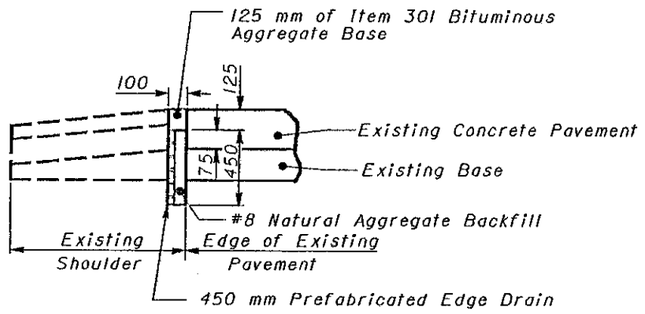
DATE: 6-30-95, 10-21-97

STANDARD CONSTRUCTION DRAWING **DM-1.1M**

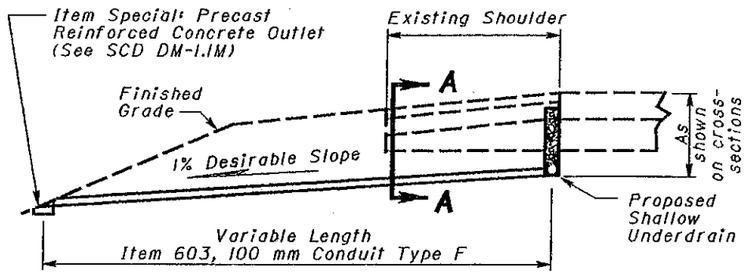
APPROVED Larry L. Sutherland

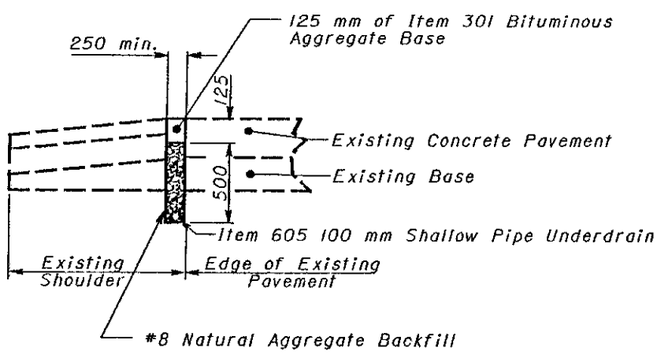
NOTE:
The cost of the 100 mm Conduit Type F and necessary pipe bends and branches needed to connect the existing and proposed underdrains shall be included with the cost of the 150 mm Conduit Type F beyond the existing underdrain.



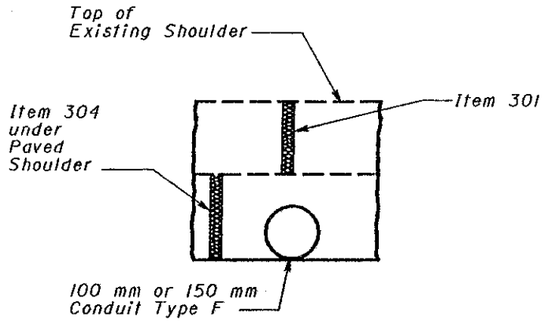


PREFABRICATED EDGE DRAIN SYSTEM





PIPE UNDERDRAIN SYSTEM



SECTION A-A

SHALLOW UNDERDRAIN SYSTEM

NOTES

DESCRIPTION: This item shall consist of furnishing and installing either a pipe underdrain system or a prefabricated edge drain system in accordance with the specifications and with the details on the plans or as directed by the Engineer.

MATERIALS: The underdrain shall either be a pipe underdrain system or a prefabricated edge drain system meeting the requirements of CMS 605.

BASIS OF PAYMENT FOR PIPE UNDERDRAIN SYSTEM ONLY: Work completed, accepted and measured under this item shall be paid for the contract unit price bid for Item 605 - 100 mm Shallow Pipe Underdrain. The price shall be full compensation for excavation and backfill; for furnishing materials, including materials for outlet fittings and Item 301; and for all labor, tools, equipment and incidentals necessary to complete the work.

BASIS OF PAYMENT FOR SHALLOW UNDERDRAIN SYSTEM: Work completed, accepted and measured under this item shall be paid for at the contract unit price bid for Item 605 - Shallow Underdrain. The price shall be full compensation for excavation and backfill; for removing and disposing of all surplus excavation in accordance with CMS 203; for furnishing materials, including materials for splices, outlet fittings, and Item 301; and for all labor, tools, equipment and incidentals necessary to complete the work associated with the installation of prefabricated edge drains or pipe underdrains.

BASIS OF PAYMENT FOR PREFABRICATED EDGE DRAIN SYSTEM: Work completed, accepted and measured under this item shall be paid for at the contract unit price bid for Item 605 - 450 mm Prefabricated Edge Drain. The price shall be full compensation for excavation and backfill; for removing and disposing of all surplus excavation in accordance with CMS 203; for furnishing materials, including materials for splices, outlet fittings, and Item 301; and for all labor, tools, equipment and incidentals necessary to complete the work associated with the installation of prefabricated edge drains or pipe underdrains.

All dimensions are in millimeters unless otherwise noted.

metric units

OHIO DEPARTMENT OF TRANSPORTATION

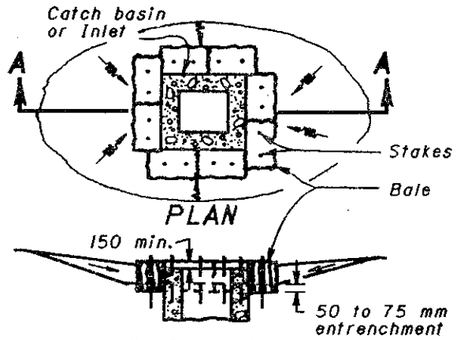
SHALLOW UNDERDRAINS

DATE
6-30-95
10-21-97

STANDARD CONSTRUCTION DRAWING **DM-1.2M**

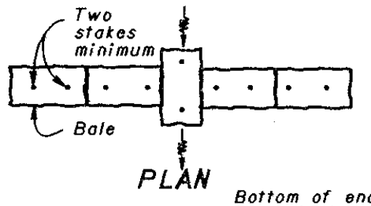
APPROVED Larry T. Sutherland

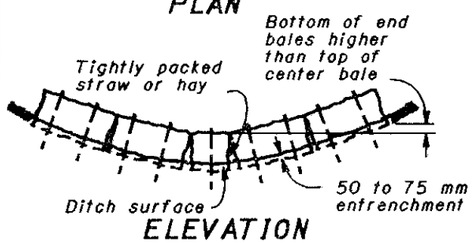
STRAW OR HAY BALES



SECTION A-A

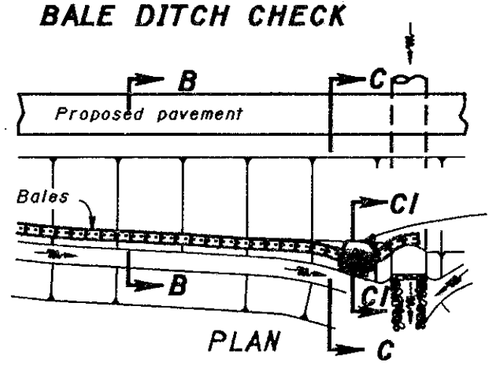
BALE INLET FILTER



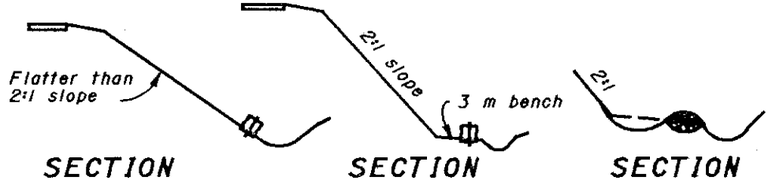


ELEVATION

BALE DITCH CHECK



Sediment pit, 0.5 m max. depth with sand and gravel outlet filter, 0.3 m min. height



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.

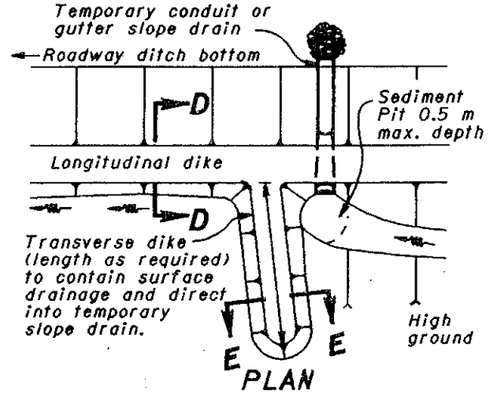
Loose straw or hay shall be scattered for a distance of 3 m on the upstream side of each ditch check, and shall be wedged between and under staked bales.

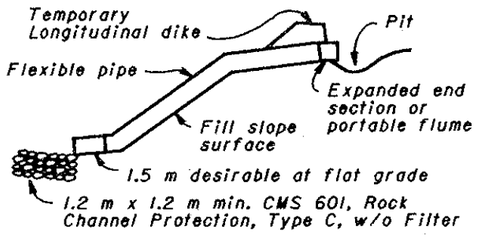
PITS: Sediment pits shall be provided where directed by the Engineer, and their cost included in the unit price bid for the adjacent CMS 207 items.

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

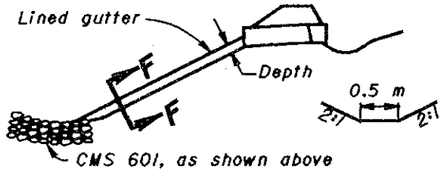
BASIS OF PAYMENT: Straw or hay bale installation shall be paid for under Item 207, Straw or Hay Bales.
Cost will include placing, staking, maintaining and removing.

DIKES AND SLOPE PROTECTION



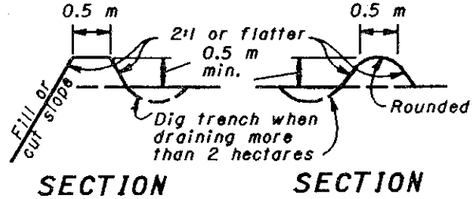


CONDUIT SLOPE DRAIN



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	Corrugated	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.

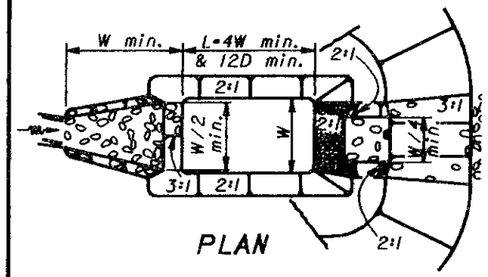
CONDUITS: Conduits for slope drains shall be corrugated steel pipe, corrugated or smooth plastic pipe, rubber conduit, or an approved equal.

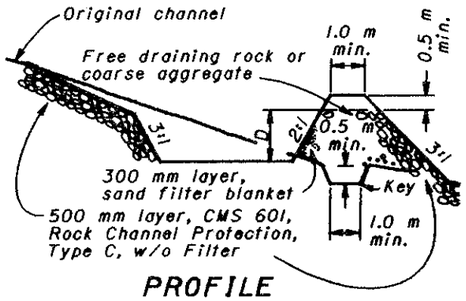
GUTTERS: Gutters for slope drains shall be lined with Type C rock channel protection, crushed aggregate slope protection, portland cement concrete, bituminous concrete, plastic sheeting (on slopes 4:1 max.), partial pipe sections or approved equal.

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.

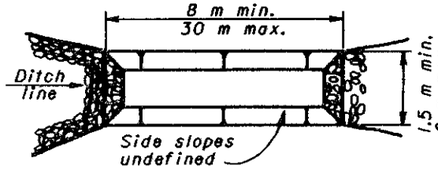
SEDIMENT BASINS & DAMS

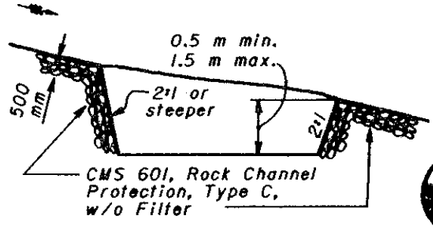




PROFILE

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 Benches, Dams and Sediment Basins. The pay quantity shall be the acutal number of cubic 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.

metric units

This Drawing Replaces MC-11.

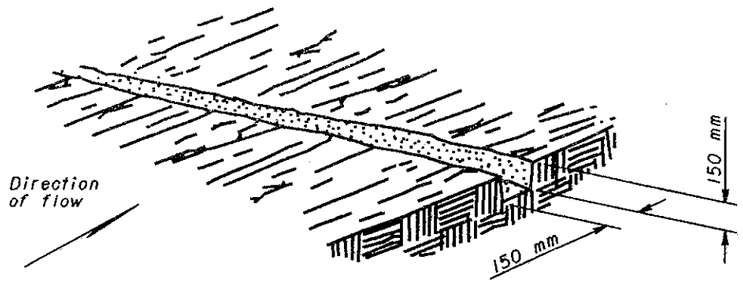
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION CONTROL

DATE 6-30-95

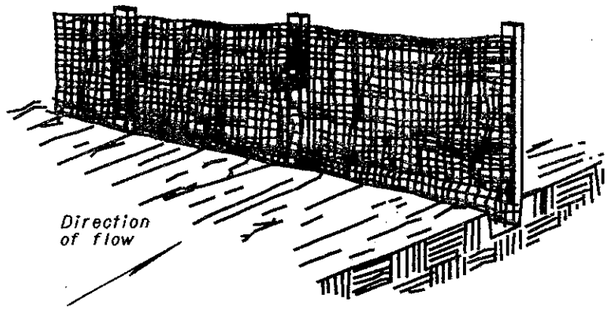
STANDARD CONSTRUCTION DRAWING **DM-4.3M**

APPROVED W.K. Hulman
ENGR. L & D



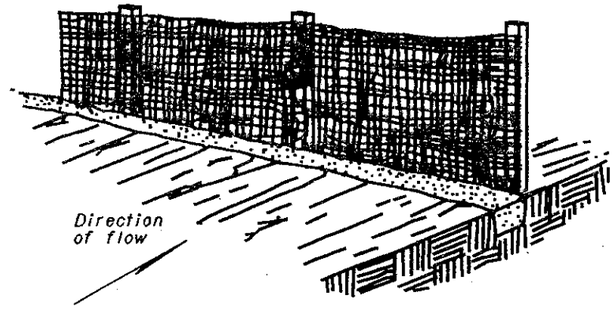
Excavate a 150 mm by 150 mm trench along the proposed fence line.

STEP 1



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

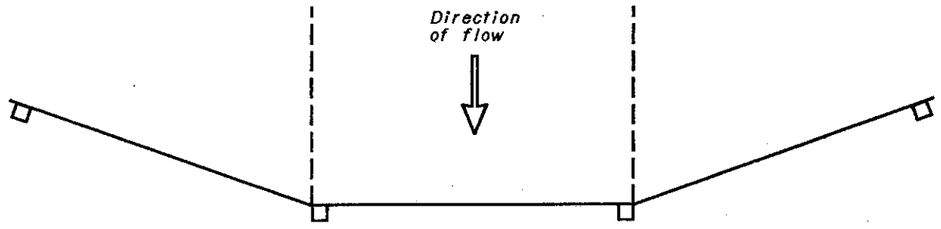
STEP 2



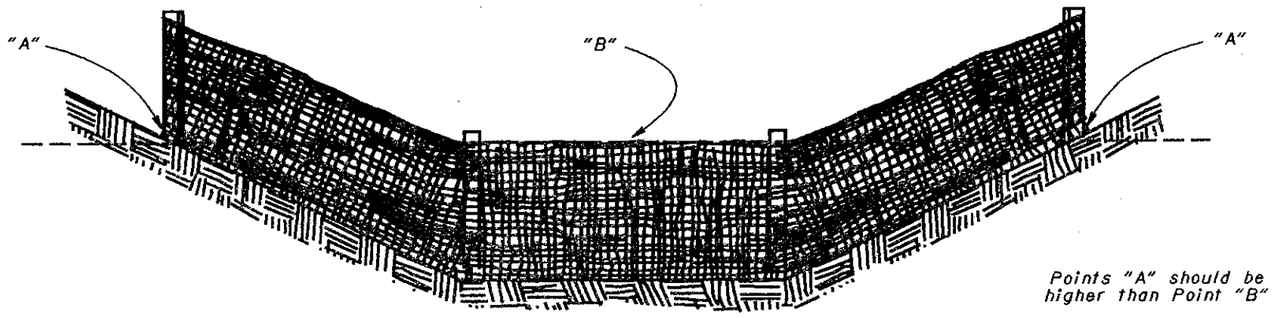
Backfill and compact the excavated soil.

STEP 3

CONSTRUCTION OF A FILTER BARRIER



PLAN VIEW



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

ELEVATION VIEW

PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

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.

metric units

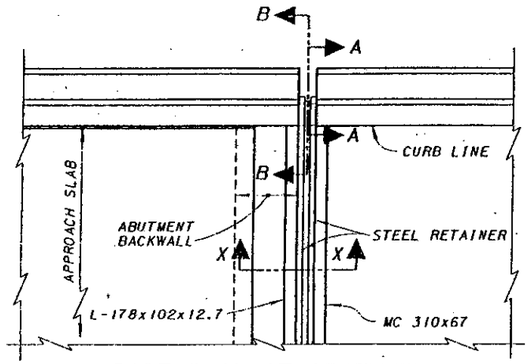
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION CONTROL

DATE 6-30-95

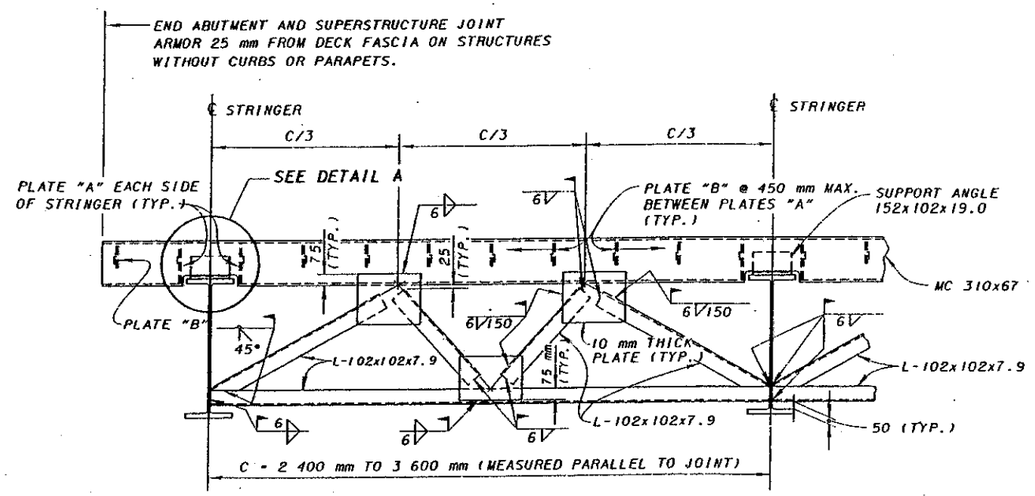
STANDARD CONSTRUCTION DRAWING **DM-4.4M**

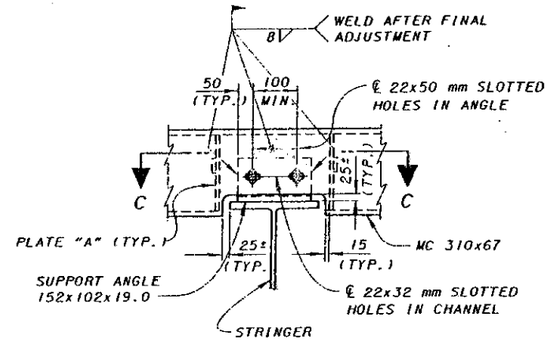
APPROVED W. K. Hudman
ENGR., L & D



PART PLAN AT ABUTMENT

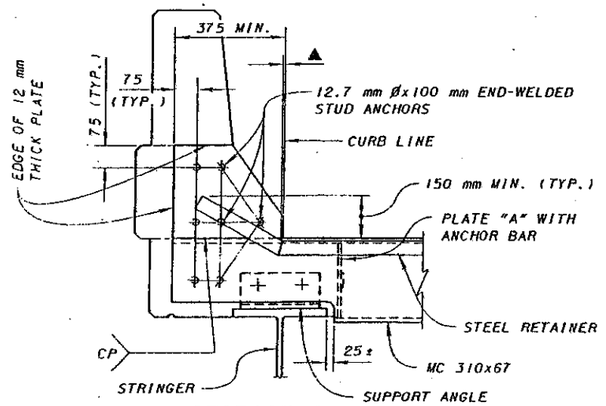
FOR SQUARE OR LOW SKEWED (15° OR LESS) BRIDGES WITH DEFLECTOR PARAPET RAILING





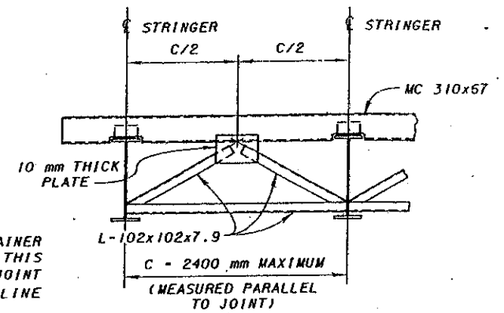
DETAIL A

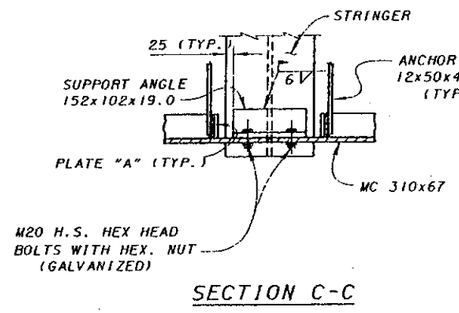
NOTE: THE WELDING SYMBOLS SHOWN ABOVE ARE TYPICAL FOR ALL SIMILAR LOCATIONS OF THIS END CROSSFRAME. ALSO, THE WELDED ATTACHMENT DETAILS AND TYPICAL DIMENSIONS SHOWN ARE TYPICAL FOR THE CROSSFRAMES DETAILED BELOW.



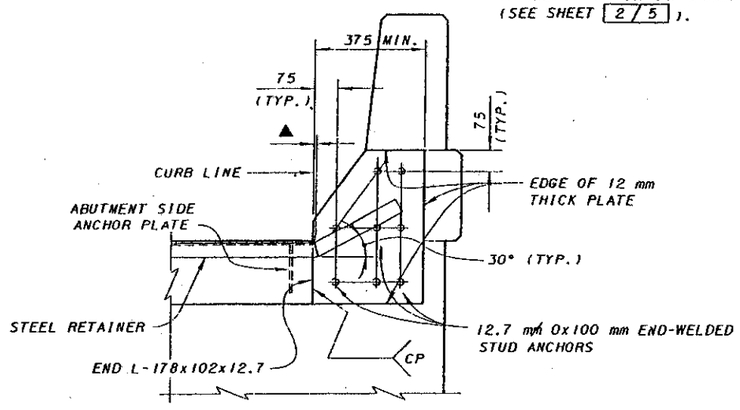
SECTION A-A

▲ - 0 MIN. TO 13 mm MAX. AT BREAKPOINT IN RETAINER FOR SQUARE BRIDGES. ON SKEWED BRIDGES THIS DIMENSION WILL ONLY APPLY TO THE SIDE OF JOINT ASSEMBLY WHICH IS NEAREST TO THE CURB LINE (SEE SHEET 2/5).

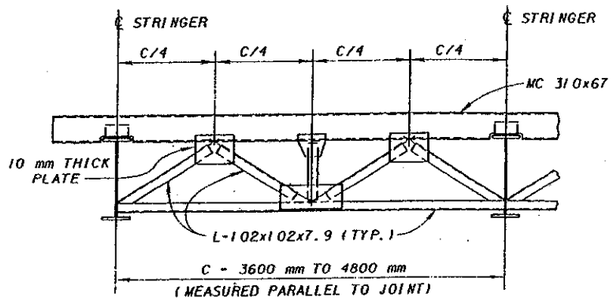




SECTION C-C



SECTION B-B



END CROSSFRAME DETAILS

STEEL RETAINERS ARE NOT SHOWN

NOTES:
FOR SECTION X-X SEE SHEET 2/5.

NOTE: THE JOINT ARMOR SHOULD NOT BE PAINTED, EXCEPT FOR THE METALIZED SURFACES DAMAGED DURING CROSSFRAME INSTALLATION. THESE AREAS SHALL BE CLEANED AND PAINTED IN CONFORMANCE WITH THE STRUCTURE'S PAINT SYSTEM REQUIREMENTS. OVERSPRAY FROM PAINTING NEED NOT BE REMOVED. FOR REPAIR OF ALL OTHER METALIZED SURFACES SEE THE JOINT INSTALLATION NOTES ON SHEET 5/5.

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

3-20-95
DATE

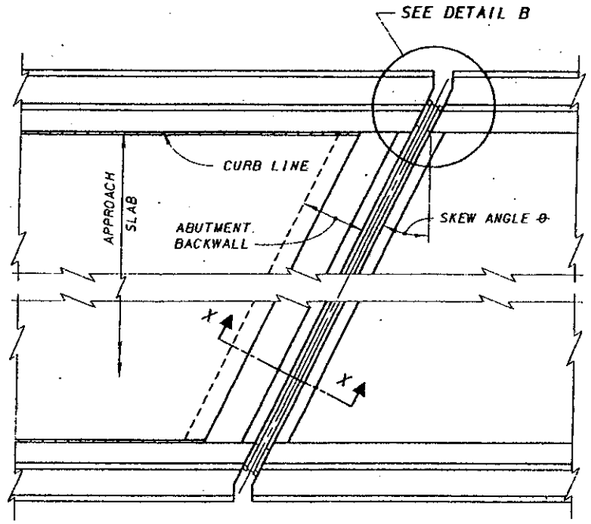
ENGINEER OF BRIDGES

REVIEWED WTL/LMW
CHECKED JS
DESIGNED AJM
DRAWN AJM
EXJ-4-87M

REVISIONS 2-18-97

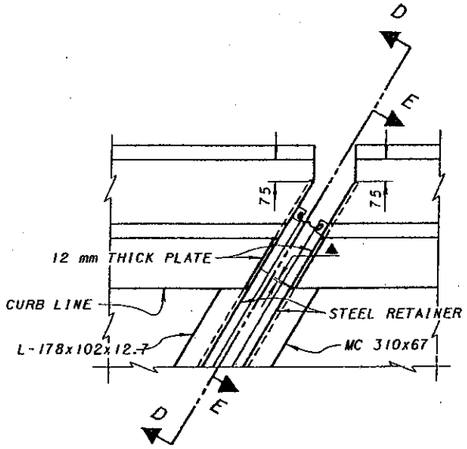
STANDARD
STRIP SEAL EXPANSION JOINTS
FOR STEEL STRINGER STRUCTURES

1/5

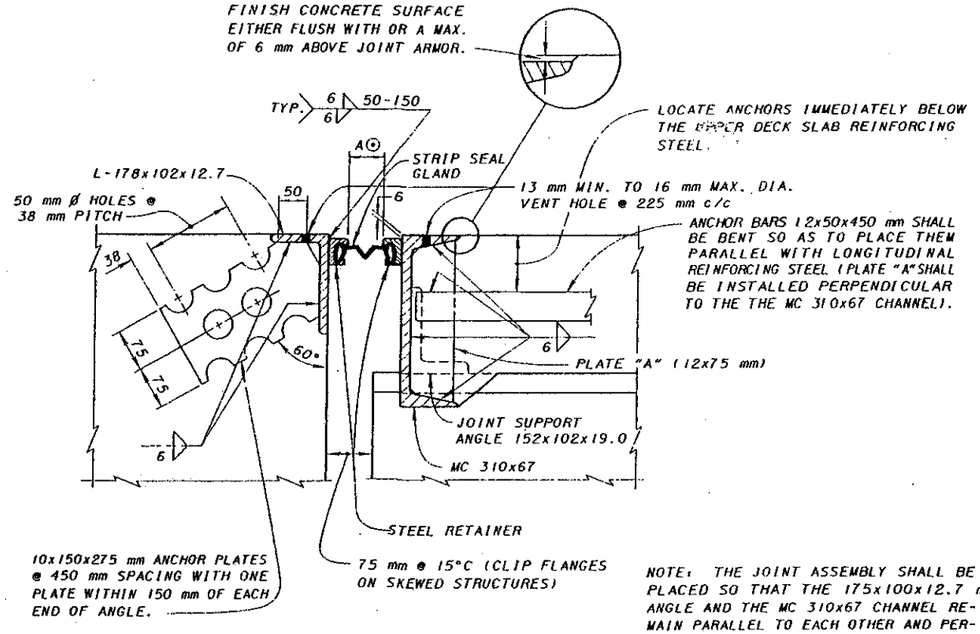


PLAN AT ABUTMENT

FOR SKEWED BRIDGES (OVER 15°) WITH DEFLECTOR PARAPET RAILING

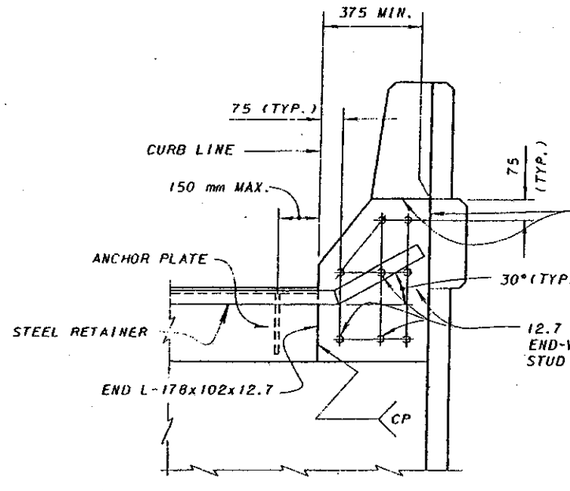


DETAIL B

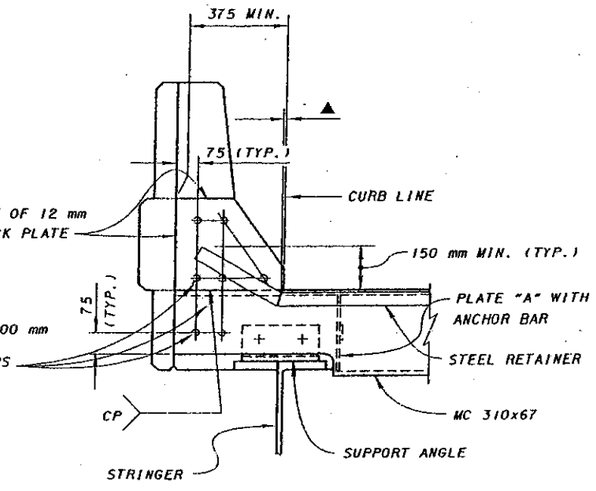


NOTE: THE JOINT ASSEMBLY SHALL BE PLACED SO THAT THE 175x100x12.7 mm ANGLE AND THE MC 310x67 CHANNEL REMAIN PARALLEL TO EACH OTHER AND PERPENDICULAR TO THE ROADWAY GRADIENT.

SECTION X-X



SECTION D-D



SECTION E-E

▲ - 0 MIN. TO 13 mm MAX. AT BREAKPOINT IN RETAINER FOR SQUARE BRIDGES. ON SKEWED BRIDGES THIS DIMENSION WILL ONLY APPLY TO THE SIDE OF JOINT ASSEMBLY WHICH IS NEAREST TO THE CURB LINE (SEE DETAIL "B" ABOVE).

SECTION X-X

⊙ - DIMENSION "A" SHALL BE DETERMINED FROM TABLE "B", TABLE "C" OR TABLE "D" ON SHEET 5/5.

DESIGN NOTES:

JOINTS IN END DAM ARMOR: TRANSVERSE JOINTS IN ARMOR SHALL HAVE COMPLETE PENETRATION BUTT WELDS. BUTT WELDS IN CONTACT WITH THE STEEL RETAINERS SHALL BE GROUND FLUSH.

THE MINIMUM LENGTH OF RETAINER SHALL BE 1800 BETWEEN JOINTS UNLESS OTHERWISE SHOWN.

JOINTS IN RETAINERS SHALL HAVE WATERTIGHT, PARTIAL PENETRATION BUTT WELDS COMPLETELY AROUND THE OUTER PERIPHERY OF THE ABUTTING SURFACES. WELDS IN CONTACT WITH THE SEAL GLAND AND/OR JOINT ARMOR ARMOR SHALL BE GROUND SMOOTH.

PROJECT PLANS SHALL LIST DIMENSION "A" FOR TEMPERATURES BETWEEN 0°C AND 35°C IN 5 DEGREE INCREMENTS.

JOINT SEAL GLANDS AT FIXED BEARINGS SHALL BE THE SAME SIZE AS AT THE EXPANSION BEARINGS WITH A DIMENSION "A" OF 50 AT ANY AMBIENT TEMPERATURE.

CONCRETE UNDER JOINT ARMOR SHALL BE HAND PLACED AND VIBRATED TO ACHIEVE SOLID FILLING.

DESIGN AGENCY: BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

ENGINEER OF BRIDGES — DATE: 3-20-95

REVISIONS: 2-18-97

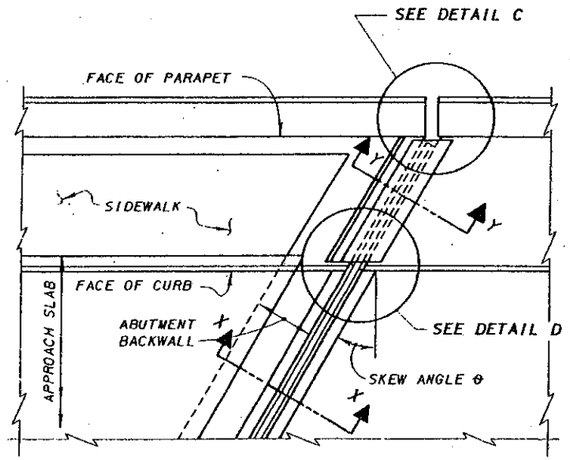
DESIGNED AJW — DRAWN AJW — CHECKED JS — REVIEWED WTL/LKW

STANDARD

STRIP SEAL EXPANSION JOINTS FOR STEEL STRINGER STRUCTURES

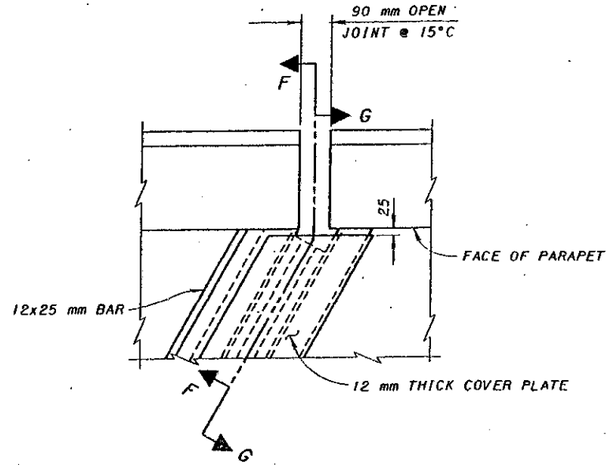
EXJ-4-87M

2 / 5

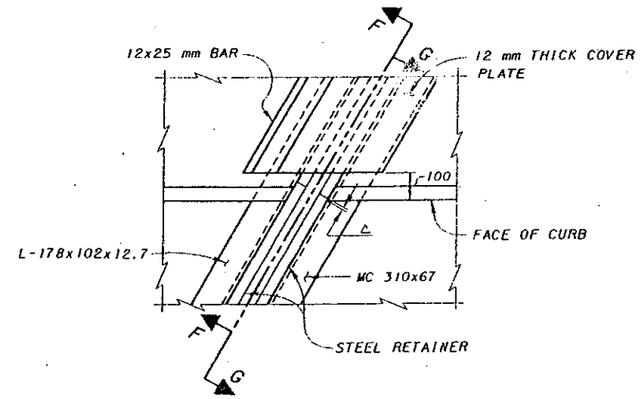


PART PLAN AT ABUTMENT

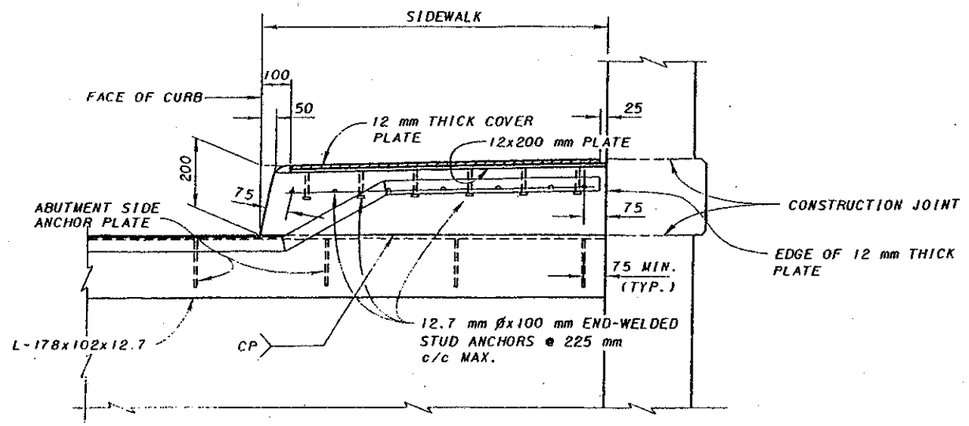
FOR BRIDGES WITH SIDEWALK PARAPET RAILING



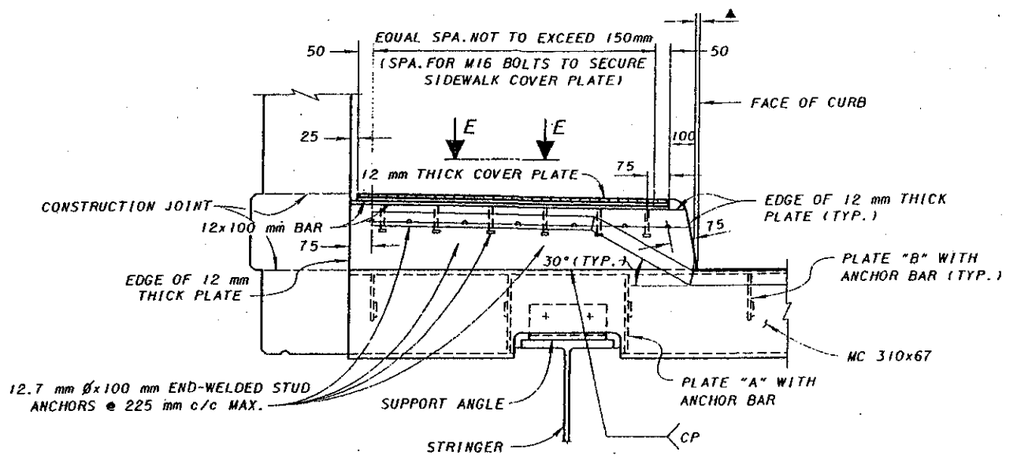
DETAIL C



DETAIL D



SECTION F-F



SECTION G-G

▲ - 0 MIN. TO 13 mm MAX. AT BREAKPOINT IN RETAINER FOR SQUARE BRIDGES. ON SKEWED BRIDGES THIS DIMENSION WILL ONLY APPLY TO THE SIDE OF JOINT ASSEMBLY WHICH IS NEAREST TO THE CURB LINE (SEE DETAIL "D" ABOVE).

NOTES:
FOR VIEW E-E SEE SHEET 4/5.
FOR SECTION X-X SEE SHEET 2/5.
FOR SECTION Y-Y SEE SHEET 4/5.

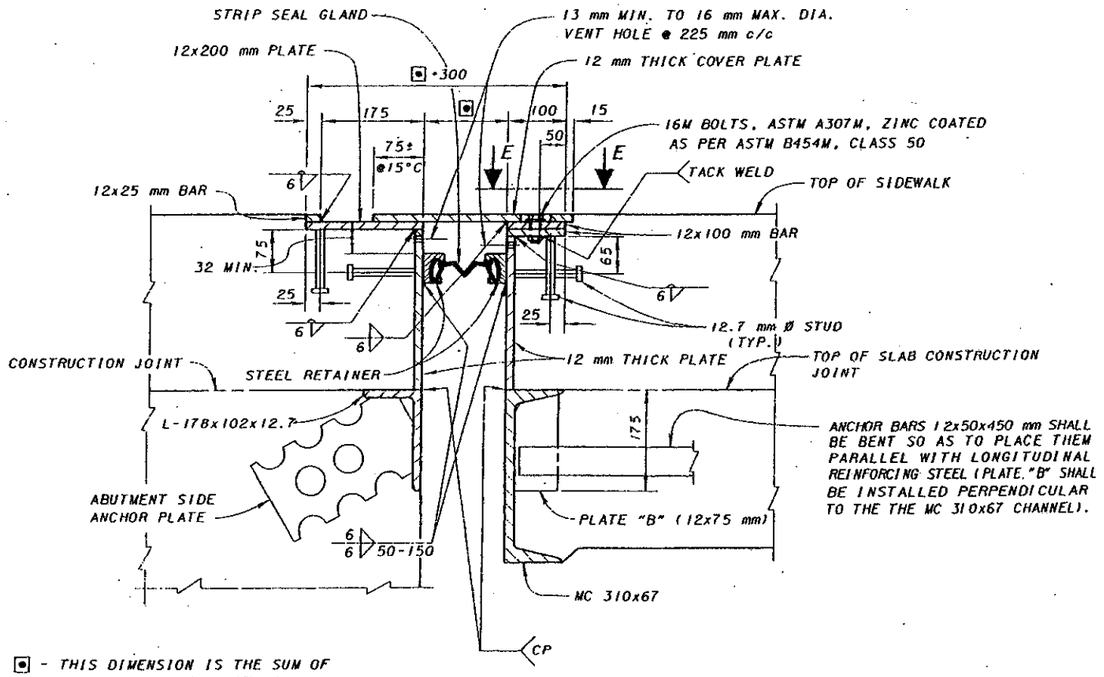
DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES — 3-20-95 DATE

REVISIONS	DESIGNED	CHECKED	REVIEWED
2-18-97	AJM	JS	WTL/LNW
	DRAWN AJM		EXJ-4-87M

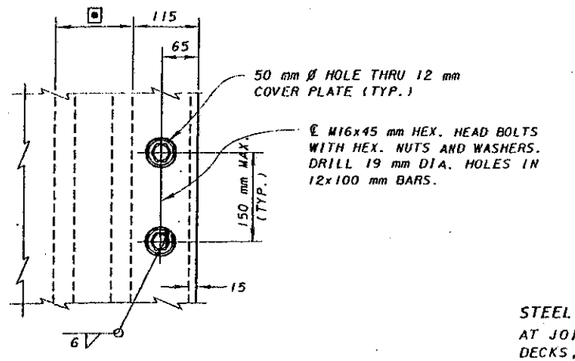
STANDARD
STRIP SEAL EXPANSION JOINTS
FOR STEEL STRINGER STRUCTURES

3/5

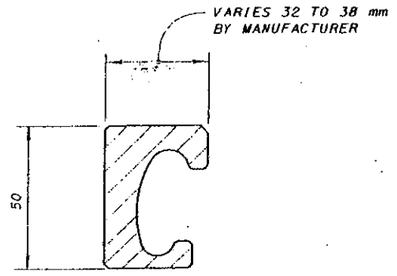


300 - THIS DIMENSION IS THE SUM OF (2xSTEEL RETAINER WIDTH+DIM. "A").

SECTION Y-Y



VIEW E-E



RETAINER DETAIL

STEEL RETAINER REQUIREMENTS:

AT JOINT UPTURNS, ESPECIALLY ON SKEWED BRIDGE DECKS, THE USE OF SPLIT RETAINERS MAY BE NECESSARY TO ENSURE GOOD SEAL GLAND INSTALLATION. WHEN THE SPLIT RETAINER IS USED, THE DESIGN SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL.

THE PROPOSED STEEL RETAINER SHALL CONFORM TO THE DIMENSIONS SHOWN ABOVE. THE RETAINERS SHALL BE PRODUCED AS A SOLID SHAPE EXTRUSION, A HOT ROLLED SOLID SHAPE OR SOLID SHAPE MACHINED FROM A SOLID BAR OF STEEL. STEEL RETAINERS MANUFACTURED BY THE BENDING OF A PLATE OR WELDING OF PIECES TOGETHER ARE NOT ACCEPTABLE. THE INTERNAL DIMENSIONS OF THE STEEL RETAINER SHALL MATCH THE MANUFACTURER'S REQUIREMENTS FOR POSITIVE ANCHORAGE FOR THE GLAND.

ANY DEFECTS IN THE STEEL RETAINER OR THE ACTUAL EXPANSION JOINT THAT COULD CAUSE DAMAGE TO THE GLAND SHALL BE CORRECTED BEFORE THE GLAND IS INSTALLED.

TEMPORARY JOINT ARMOR SUPPORTS

TEMPORARY SUPPORTS SHALL BE INSTALLED THAT ARE CAPABLE OF SUPPORTING SHIPPING AND ERECTION FORCES WITHOUT DAMAGE TO THE EXPANSION DEVICE. FABRICATOR DESIGNED AND INSTALLED TEMPORARY SUPPORTS SHALL BE CAPABLE OF ADJUSTMENT FOR SETTING THE EXPANSION DEVICE IN THE FIELD AND SHALL BE INSTALLED AT THE FABRICATION SHOP AFTER FABRICATION AND COATING IS COMPLETED.

CONSTRUCTION PROCEDURE

1. ABUTMENT BACKWALL CONCRETE SHALL NOT BE PLACED UNTIL AFTER SUPERSTRUCTURE CONCRETE IN THE SPAN ADJACENT TO THE ABUTMENT HAS BEEN PLACED.
2. PLACE BACKWALL CONCRETE DURING STABLE OR RISING AMBIENT TEMPERATURES AND CONCLUDE PLACEMENT AT OR IMMEDIATELY BEFORE THE DAY'S PEAK AMBIENT TEMPERATURE.
3. NOT MORE THAN FOUR HOURS PRIOR TO THE DAY'S PEAK AMBIENT TEMPERATURE, SET ABUTMENT EXPANSION JOINT WIDTH TO DIMENSION "A". SEE DIMENSION "A" TABLE ON PROJECT PLANS.
4. LOOSEN ANY TEMPORARY JOINT ARMOR BOLTS AFTER INITIAL SET OF CONCRETE, PREFERABLY NOT LATER THAN TWO HOURS AFTER CONCLUSION OF CONCRETE PLACEMENT.

DESIGN AGENCY: BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

3-20-95 DATE

ENGINEER OF BRIDGES

DESIGNED	CHECKED	REVIEWED
AJM	JS	WTL/LMW
DRAWN		
AJM		

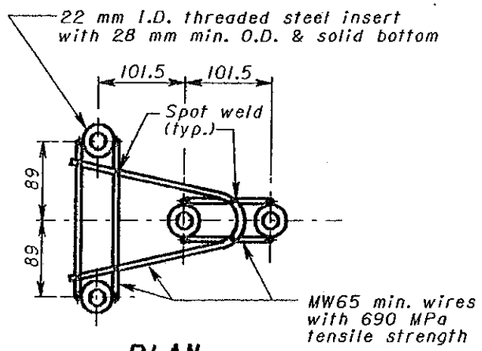
REVISIONS 2-18-97

STANDARD

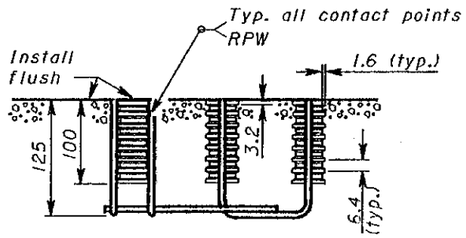
STRIP SEAL EXPANSION JOINTS FOR STEEL STRINGER STRUCTURES

EXJ-4-87M

4 / 5



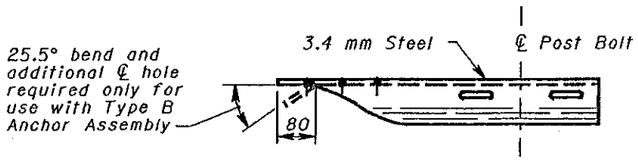
PLAN



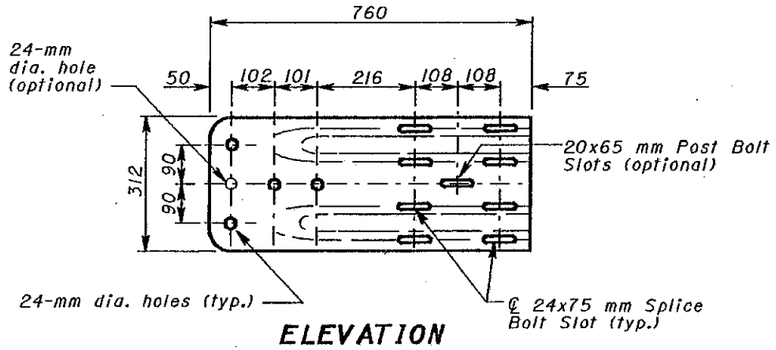
Four 22-mm bolts required

ELEVATION

CONCRETE INSERT ANCHOR ASSEMBLY (W-BEAM ONLY)

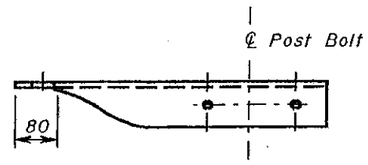


PLAN

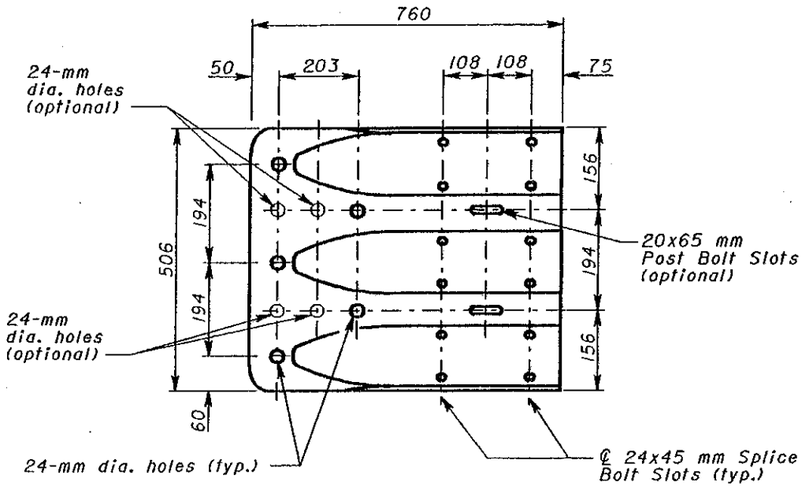


ELEVATION

W-BEAM TERMINAL CONNECTOR

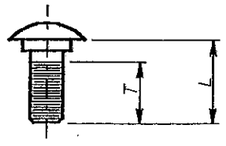


PLAN



ELEVATION

THRIE-BEAM TERMINAL CONNECTOR



L (mm)	T min. (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 blockout
SP- steel post PB- plastic blockout
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 1 W-Beam to Thrie-Beam Transition section.

All dimensions are in millimeters unless otherwise noted.

metric units

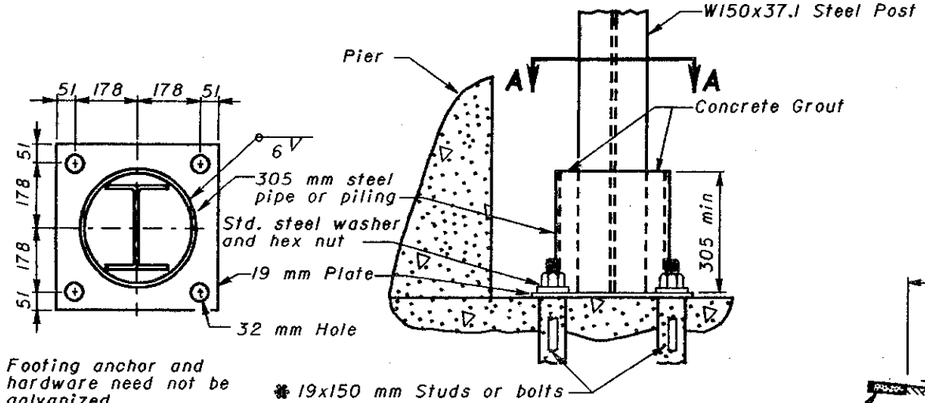
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

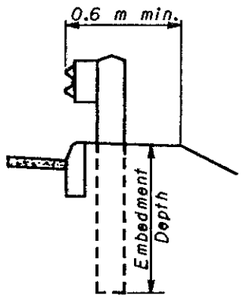
DATE
11-30-94
10-21-97

STANDARD CONSTRUCTION DRAWING GR-1.1M

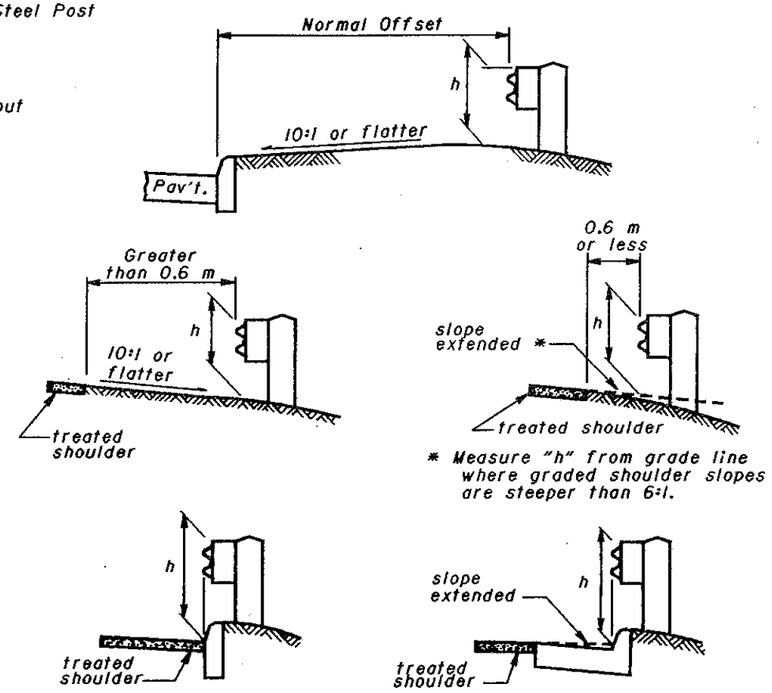
APPROVED Gary L. Sutherland



FOOTING ANCHOR

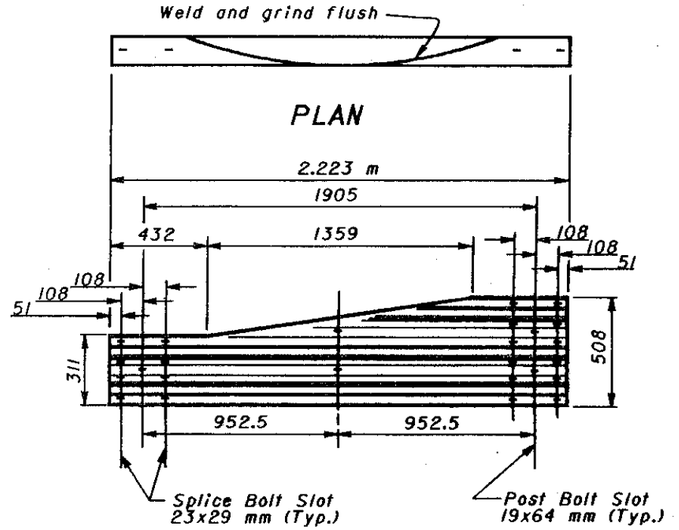


DETAIL A



h = Standard height (Tolerance ±25 mm)

MEASURING GUARDRAIL HEIGHT



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

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

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.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces GR-1.2.

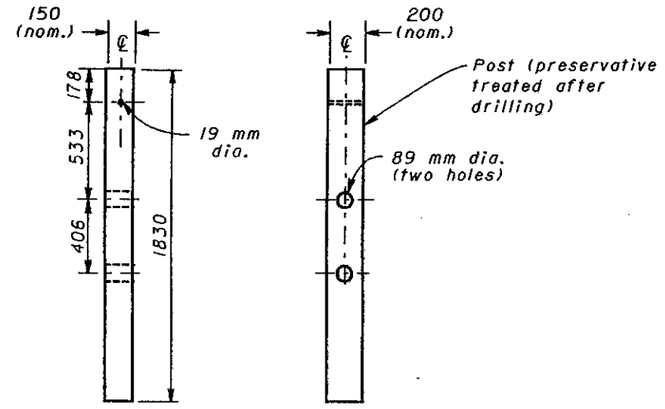
OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

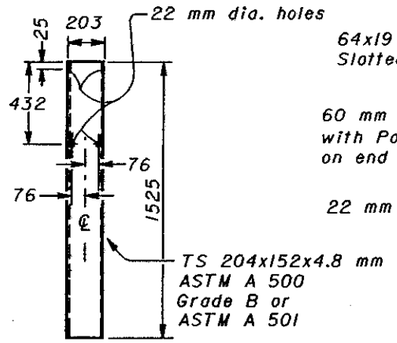
DATE 1-3-96

STANDARD CONSTRUCTION DRAWING **GR-1.2M**

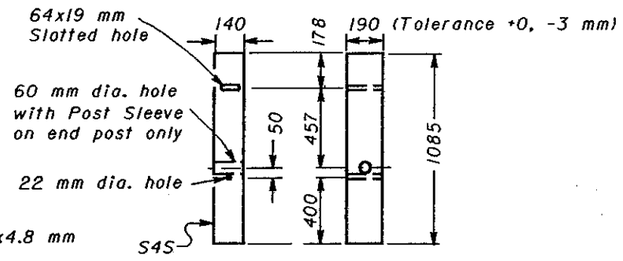
APPROVED D.K. Huelman, P.E.
ADMINISTRATOR



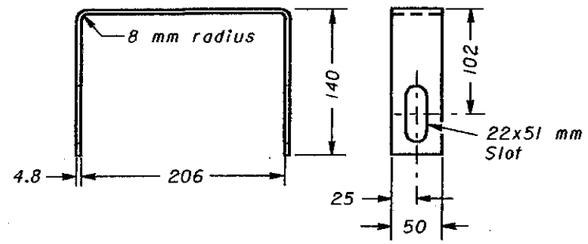
TYPE 1 BREAKAWAY POST



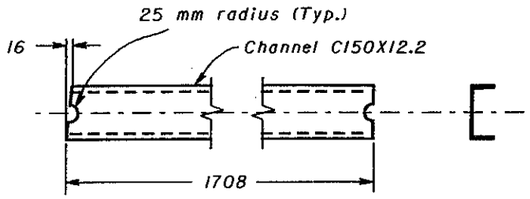
STEEL TUBE



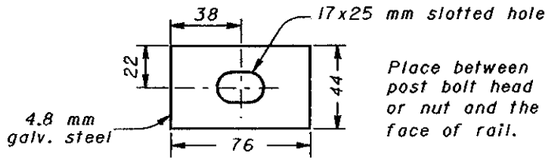
TYPE 2 BREAKAWAY POST



YOKE DETAILS

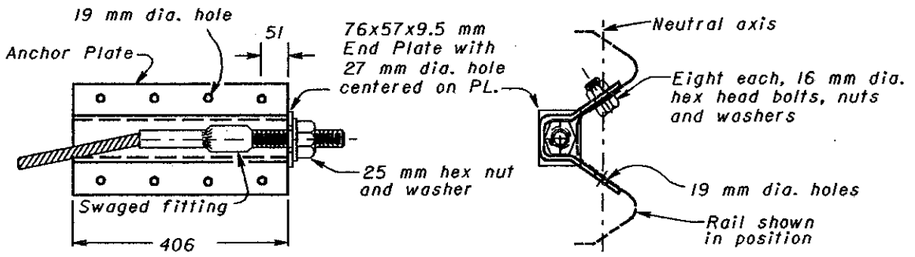


STRUT DETAILS

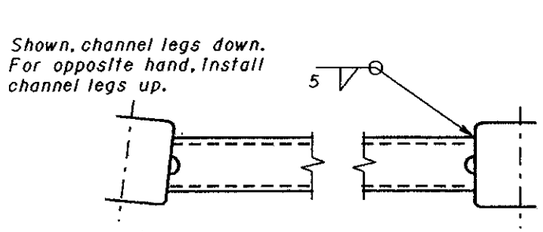


RECTANGULAR WASHER

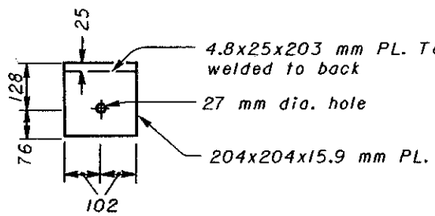
(Not to be used in typical Type 4, 5 or 5A guardrail installations. Use only where specified.)



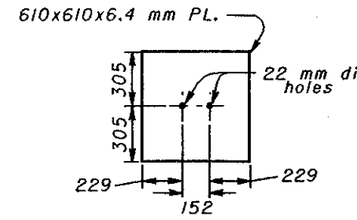
ANCHOR PLATE ASSEMBLY DETAILS



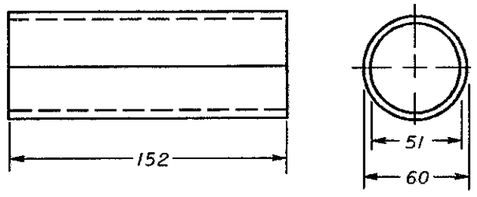
STRUT AND YOKE ASSEMBLY



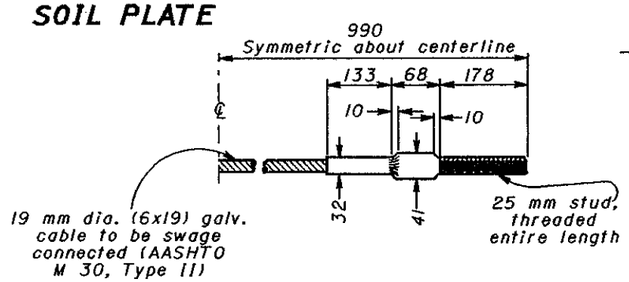
BEARING PLATE



SOIL PLATE

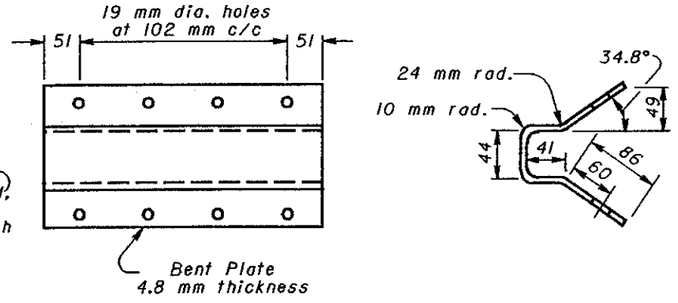


POST SLEEVE



STANDARD SWAGED FITTING AND STUD

CABLE ASSEMBLY



ANCHOR PLATE

All dimensions are in millimeters unless otherwise noted.

metric units

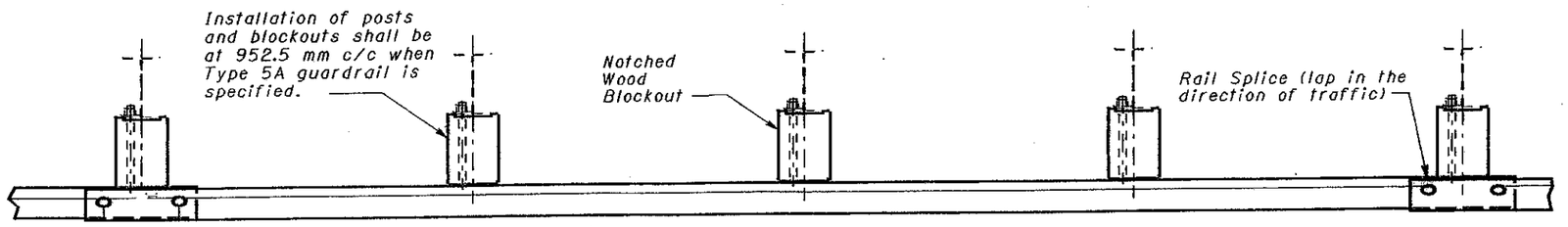
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

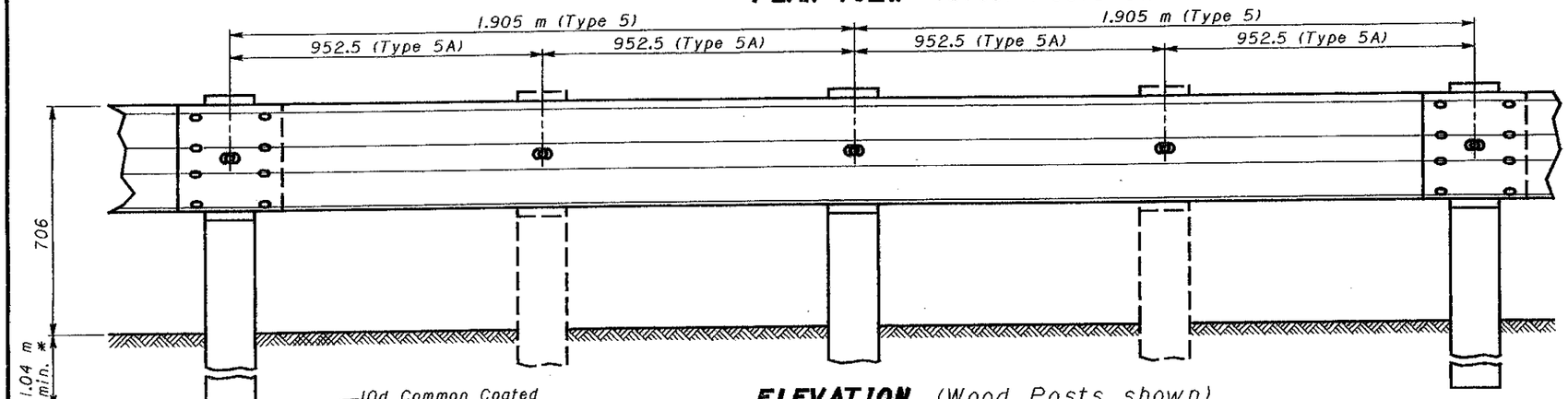
DATE 11-30-94

STANDARD CONSTRUCTION DRAWING **GR-1.3M**

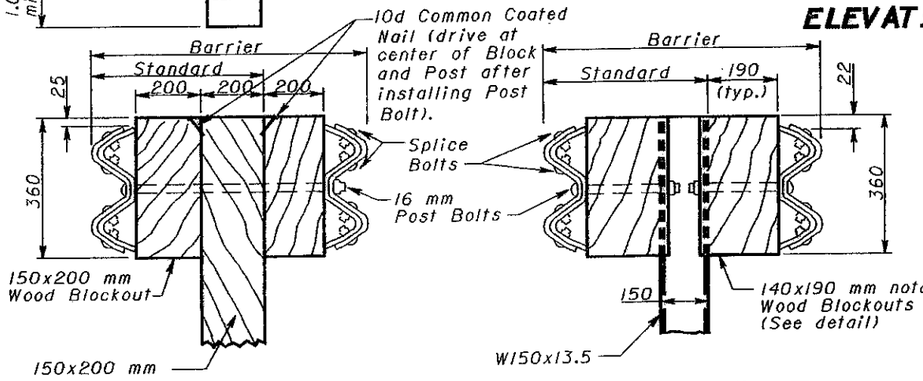
APPROVED R. K. Huhman
ENGR., L & D



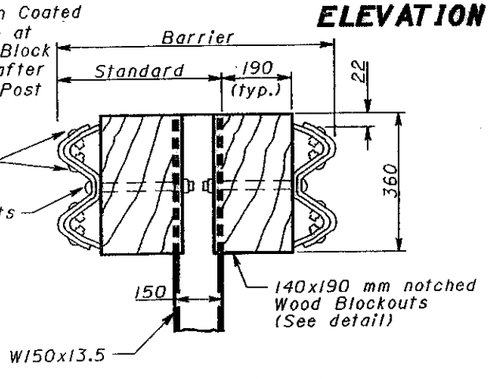
PLAN VIEW (Steel Posts shown)



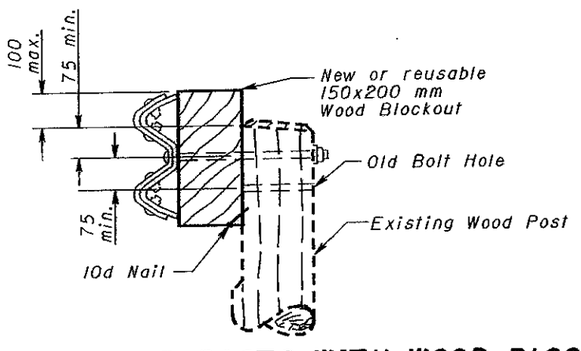
ELEVATION (Wood Posts shown)



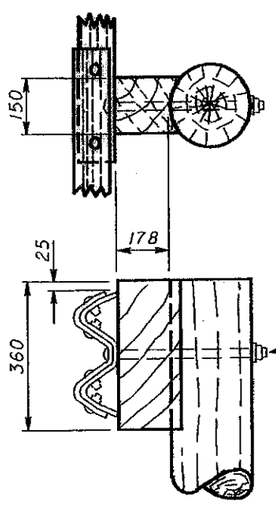
SQUARE WOOD POST



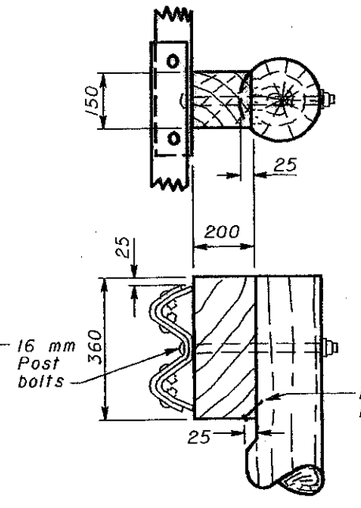
STEEL POST



WOOD POSTS WITH WOOD BLOCK RAISING EXISTING GUARDRAIL HEIGHT



METHOD 1



METHOD 2

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

ROUND WOOD POSTS

All dimensions are in millimeters unless otherwise noted.

NOTES

POSTS: *Posts may be round (standard single rail only) or 150x200 mm square-sawed 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 ± 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 I 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.

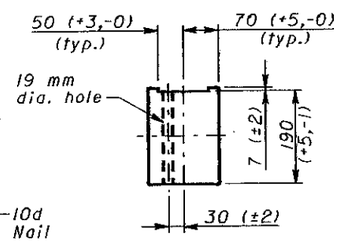
Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.

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

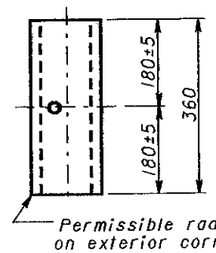
* ***POST EMBEDMENT DEPTH:*** *For specific depth requirements, see SCD GR-1.2M.*

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



ELEVATION

NOTCHED BLOCKOUTS FOR STEEL POSTS

OHIO DEPARTMENT OF TRANSPORTATION

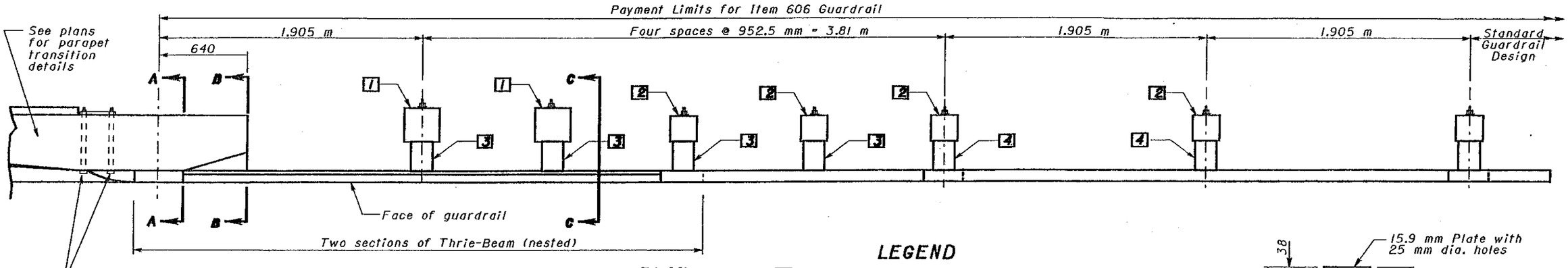
GUARDRAIL TYPE 5 & 5A

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

STANDARD CONSTRUCTION DRAWING **GR-2.1M**

APPROVED Larry F. Sutherland

metric units

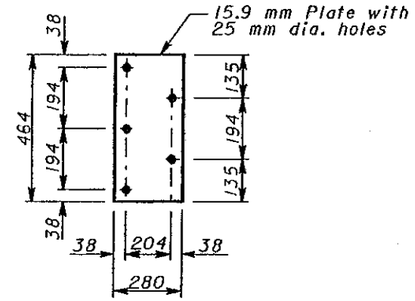


PLAN

22 mm dia. ASTM A 325M through bolts (length to be determined in field in accordance with parapet width) in 25 mm dia.holes with 464 x 280 x 15.9 mm plate with standard washers and hex nuts (See Detail A)

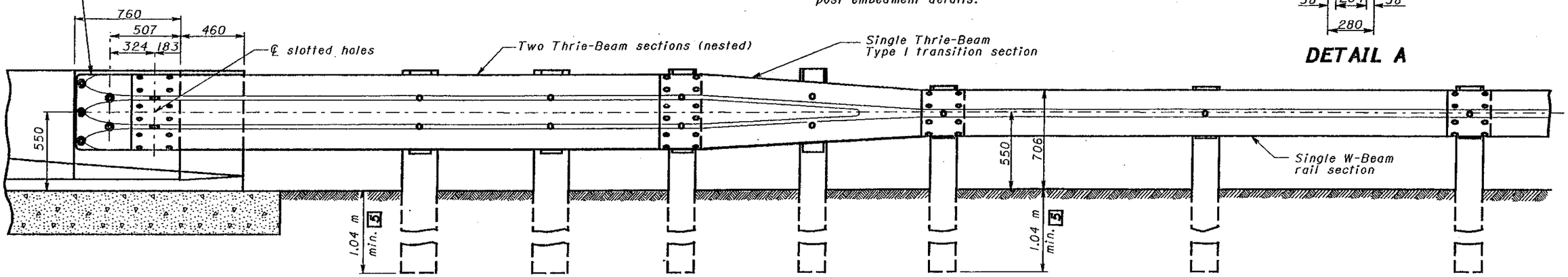
LEGEND

1	250 x 250 mm wood post
2	200 x 200 mm wood post
3	150 x 200 x 570 mm wood blockout (See ALTERNATE POSTS AND BLOCKOUTS note)
4	150 x 200 x 355 mm wood blockout (See ALTERNATE POSTS AND BLOCKOUTS note)
5	See SCD GR-1.2M for additional post embedment details.



DETAIL A

NOTE: The Thrie-Beam terminal connector shall be placed so that the lap is in the direction of traffic.



ELEVATION

All dimensions are in millimeters unless otherwise noted.

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 I Bridge Terminal Assembly shall be used to connect guardrail runs to bridges having concrete deflector parapet railing. It shall be used to connect guardrail runs to the approach end of bridge parapets or other concrete barrier installations and to anchor guardrail runs to the trailing end of bridge parapets or other concrete barrier installations on undivided, bidirectional highways.

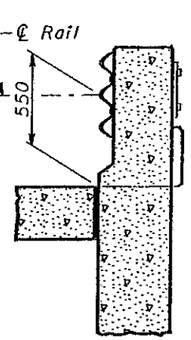
POSTS:
GENERAL - Posts may be set in drilled holes or driven to grade.

WOOD POSTS - shall be square sawed 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.

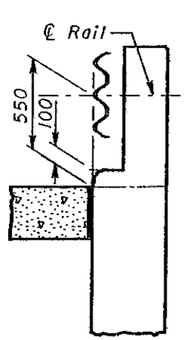
ALTERNATE POSTS AND BLOCKOUTS for Type I Bridge Terminal Assemblies may be furnished according to the following chart. Plastic blockouts shall not be permitted for Type I Bridge Terminal Assemblies.

Wood Posts & Blockouts	250x250 mm	200x200 mm
Steel Posts	W200x35.9	W150x37.1
Wood Blockouts	150x200 mm	
Steel Blockouts	W150x13.5	

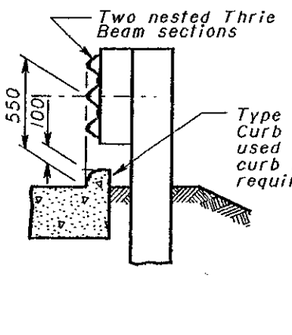
PAYMENT:
Payment for Item 606 - Each, Bridge Terminal Assembly, Type I, shall include the extra cost, in excess of normal guardrail cost, for additional and different type posts and blockouts, nested Thrie-Beam sections, terminal connector, Thrie-Beam transition section, steel plate, bolts, hex nuts, washers, and other hardware.



SECTION A - A



SECTION B - B



SECTION C - C

metric units

This Drawing Replaces GR-3.1.

OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE TERMINAL ASSEMBLY, TYPE 1

DATE
11-30-94
10-21-97

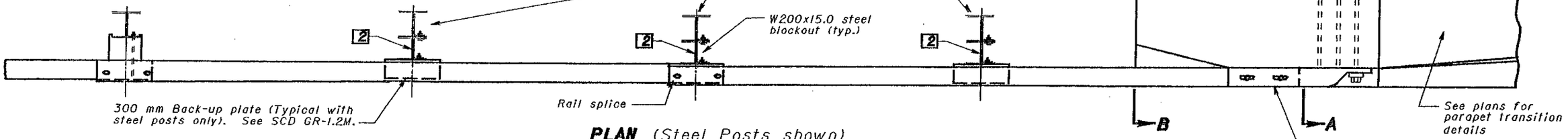
STANDARD CONSTRUCTION DRAWING **GR-3.1M**

APPROVED Larry F. Sutherland

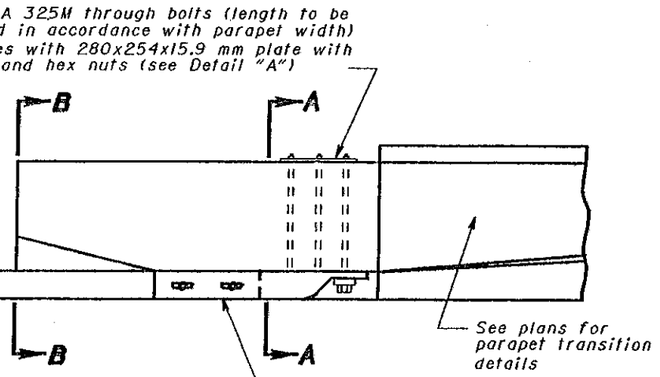
LEGEND

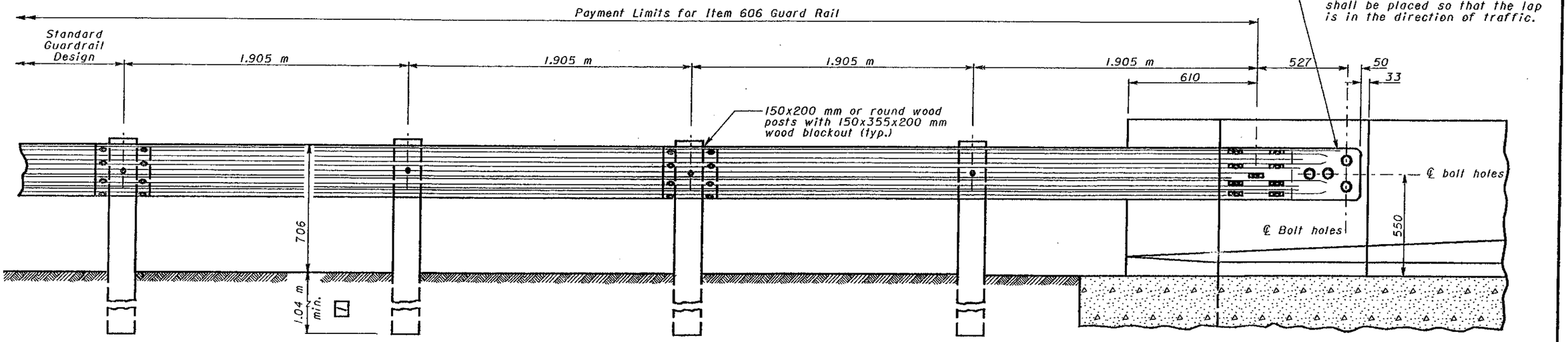
[1] See SCD GR-1.2M for additional post embedment details.

[2] Plastic blockouts shall not be permitted for Type 2 Bridge Terminal Assemblies.



PLAN (Steel Posts shown)





ELEVATION (Wood Posts shown)

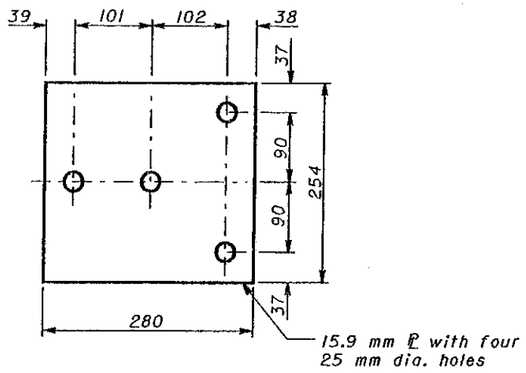
NOTES

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

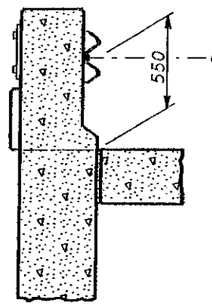
APPLICATION:
The Type 2 Bridge Terminal Assembly shall be used to connect guardrail runs to the trailing end of bridge parapets or other concrete barrier installations on one-direction roadways.

POSTS:
Posts shall be of standard size and material specified for the appropriate type of guardrail to be installed leaving the bridge or barrier.

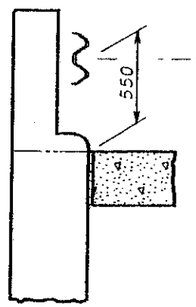
PAYMENT:
Payment for Item 606 - Each, Bridge Terminal Assembly, Type 2 shall include the extra cost, in excess of normal guardrail cost, for the terminal connector, steel blockouts, plates, bolts, hex nuts, washers and other hardware.



DETAIL A



SECTION A - A



SECTION B - B

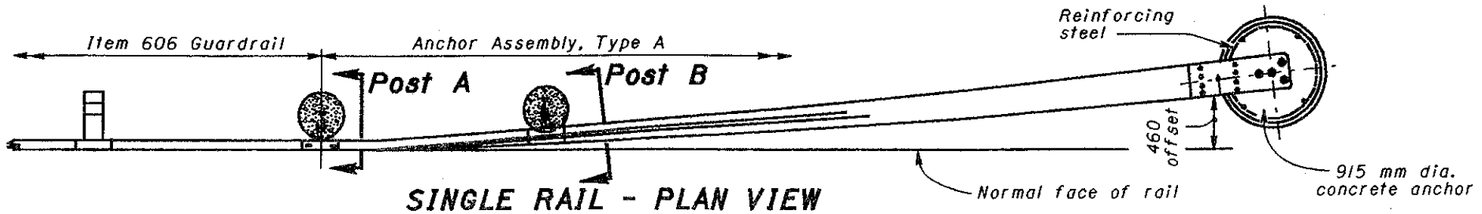
All dimensions are in millimeters unless otherwise noted.

metric units

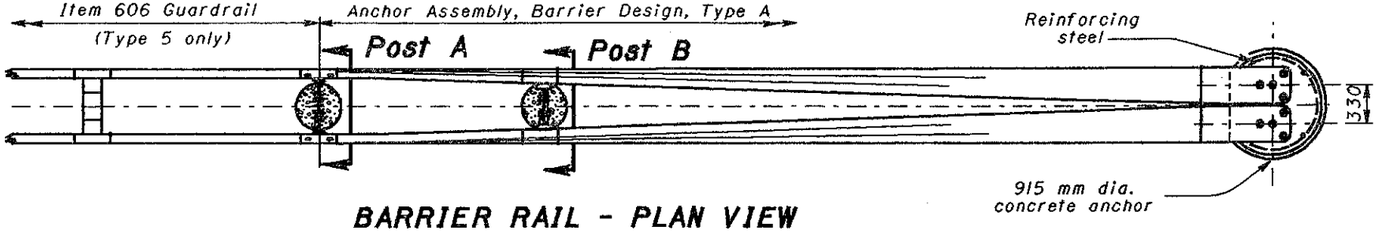
This Drawing Replaces GR-3.2.

OHIO DEPARTMENT OF TRANSPORTATION

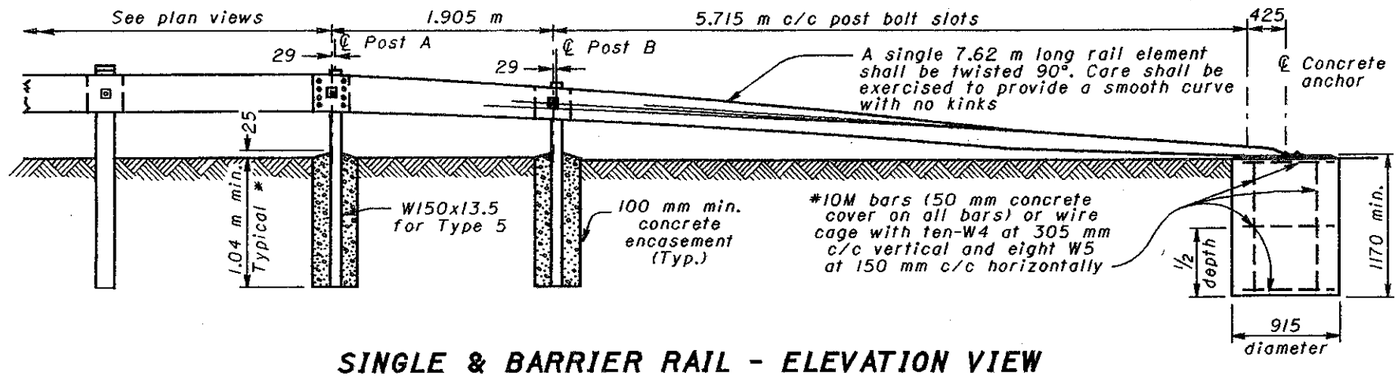
BRIDGE TERMINAL ASSEMBLY, TYPE 2	DATE: 11-30-94, 10-21-97
STANDARD CONSTRUCTION DRAWING GR-3.2M	
APPROVED: Roger F. Sutherland	



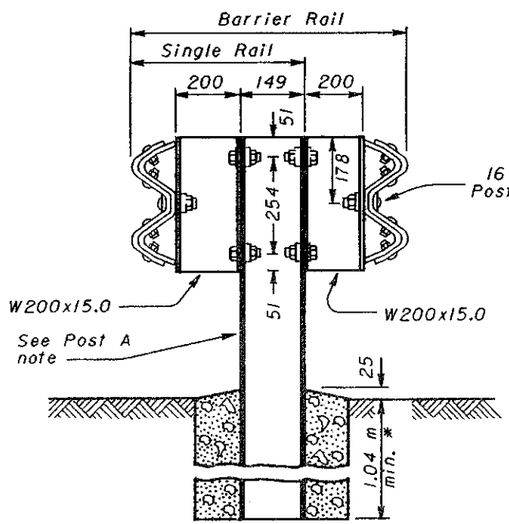
SINGLE RAIL - PLAN VIEW



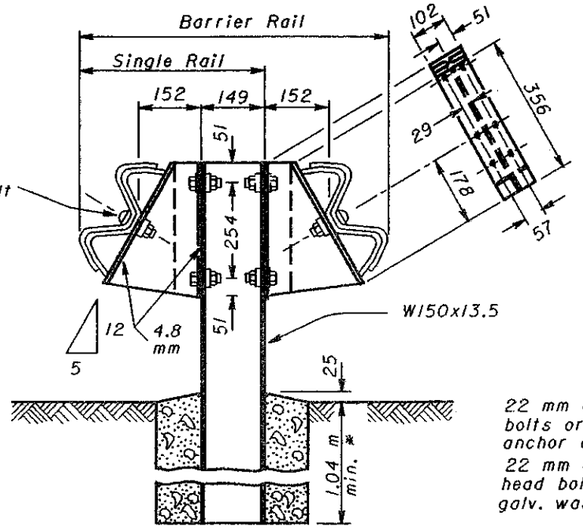
BARRIER RAIL - PLAN VIEW



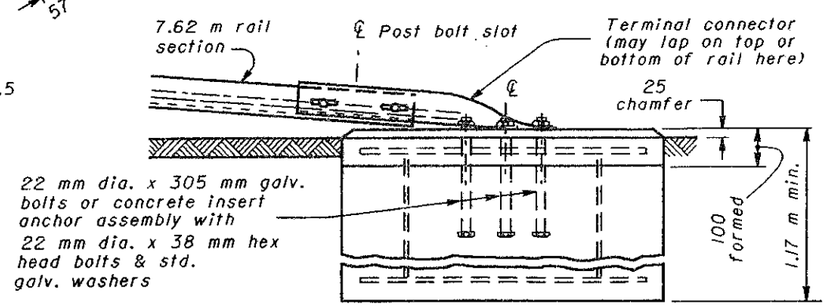
SINGLE & BARRIER RAIL - ELEVATION VIEW



POST A



POST B



CONCRETE ANCHOR

NOTES

GENERAL: For details not shown, see Std. Constr. Dwgs. GR-1.1M, GR-1.2M and other Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

The 460 mm flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets.

SPACERS: Post B spacers shall be made of 4.8 mm steel plate as per CMS 710.15 or two sections of W150x13.5 or W200x15.0 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two 16 mm hexhead bolts and nuts with standard washers on both sides.

WASHERS: All washers indicated on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 100 mm of anchor and slope the top to conform to slope of the adjacent ground. The 915 mm diameter anchor may be replaced by a 760 mm square anchor at the contractor's option.

POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 guardrail, Post A shall be a standard Type 4 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 16 mm in diameter.

* **SINGLE RAIL INSTALLATIONS:** See GR-1.2M for additional post embedment details.

All dimensions are in millimeters unless otherwise noted.

metric units

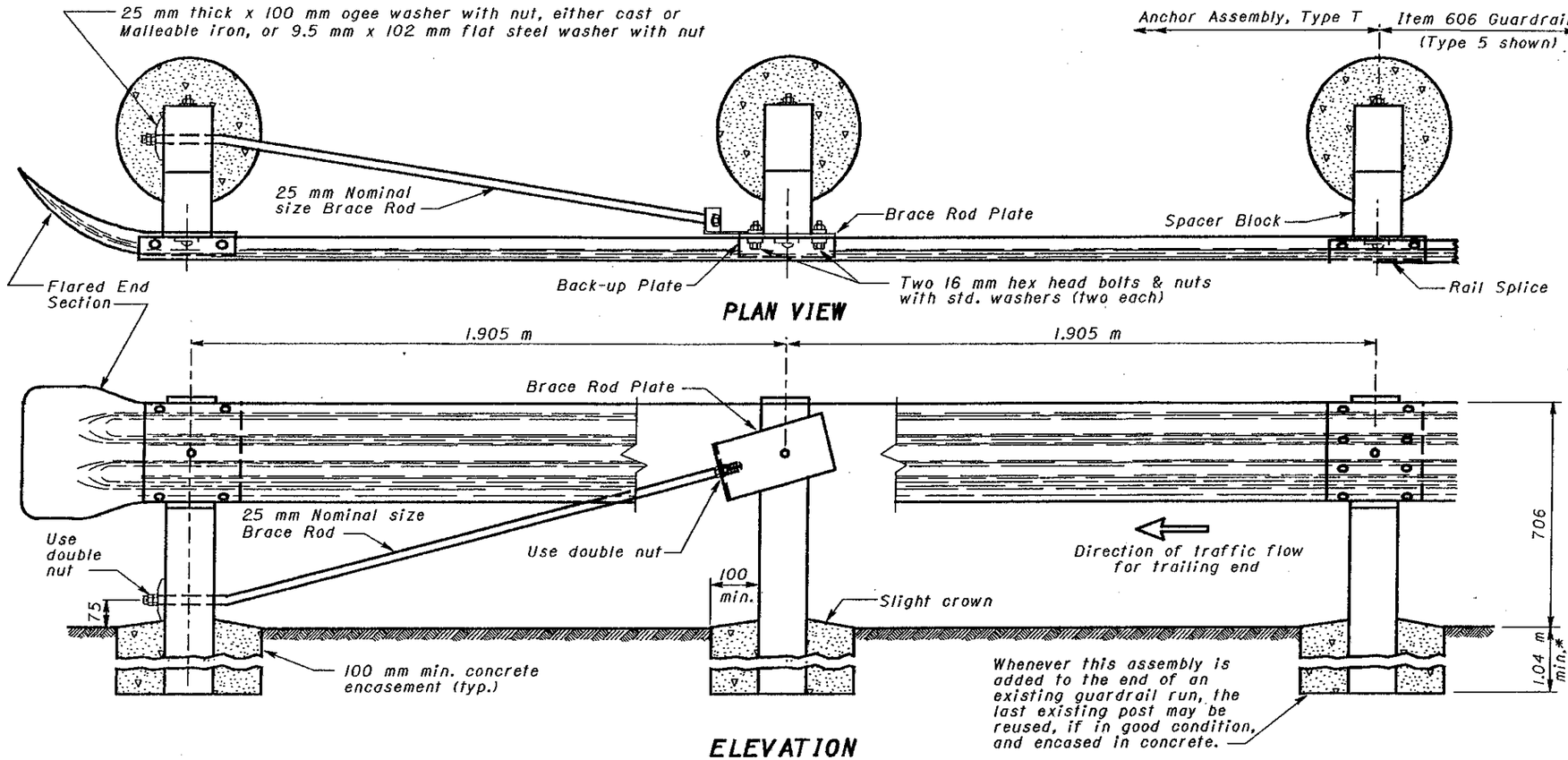
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TYPE A ANCHOR ASSEMBLY

DATE 11-30-94

STANDARD CONSTRUCTION DRAWING **GR-4.1M**

APPROVED D.K. Hulman
ENGR., L & D



NOTES

FOR DETAILS NOT SHOWN: See SCD's GR-1.1M, GR-1.2M and other Drawings pertaining to design of specific guardrail types.

WASHERS: All washers indicated are standard galvanized steel of the appropriate size.

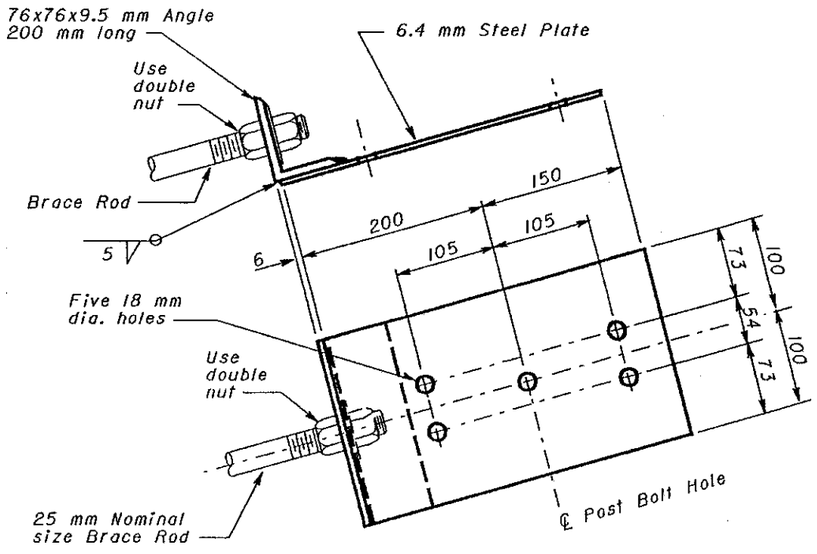
POSTS: Posts shall be the same as used on the adjacent guardrail, with 100 mm minimim concrete encasement.

SPACER BLOCKS: Blocks may be notched in the field, in a manner satisfactory to the Engineer, to accommodate the installation of the brace rod plate 16 mm attachment bolts.

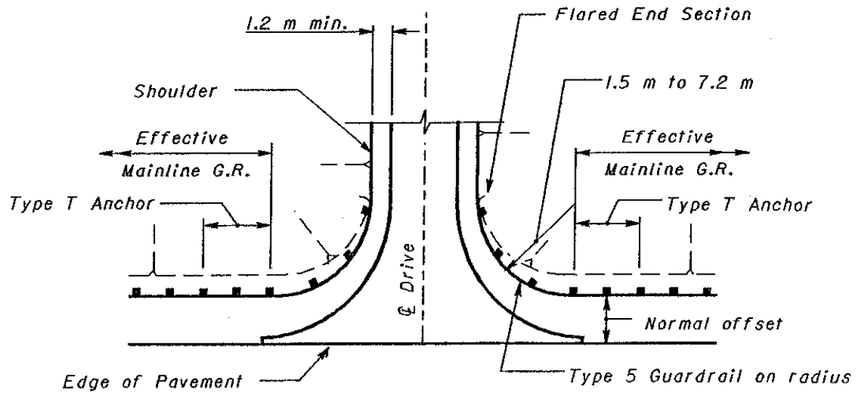
BRACE ROD ASSEMBLY: Rods shall be galvanized and develop a tensile strength of at least 178 kN.

* **FOR SPECIFIC POST EMBEDMENT:** See SCD GR-1.2M for depth requirements.

TYPE T



BRACE ROD PLATE

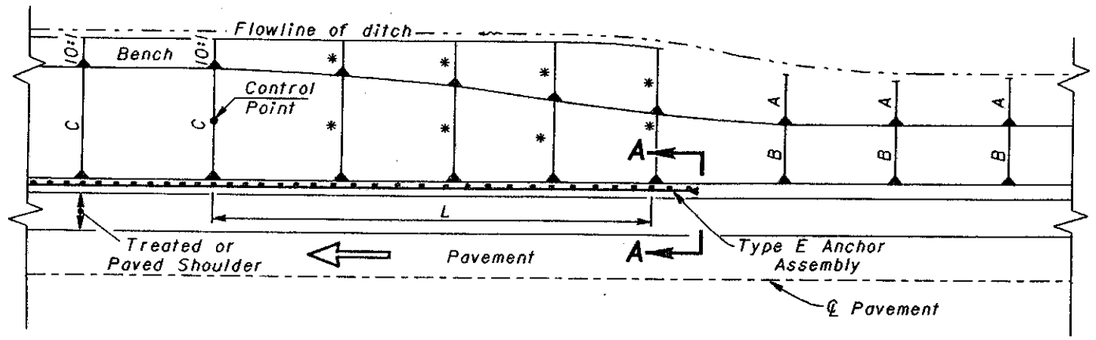


DRIVEWAY OPENING

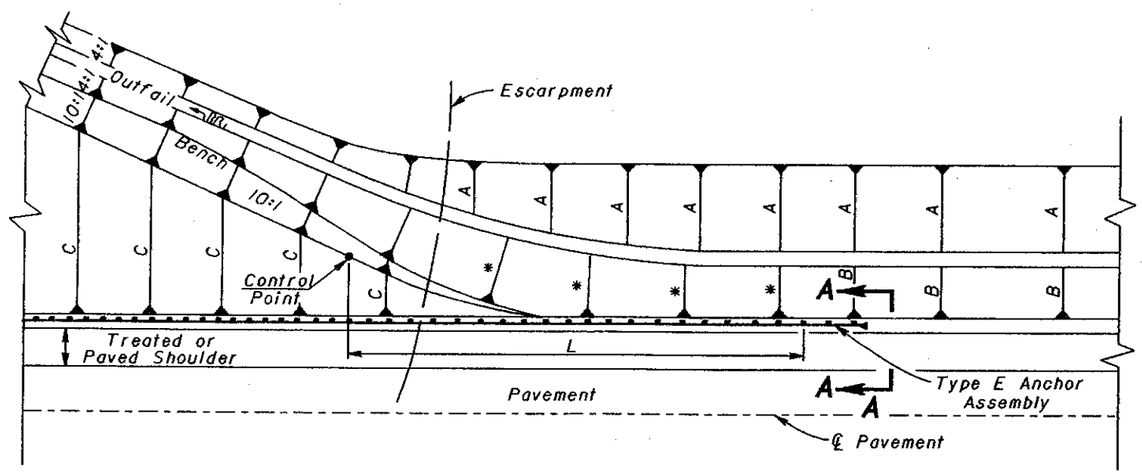
All dimensions are in millimeters unless otherwise noted.

metric units

OHIO DEPARTMENT OF TRANSPORTATION	
TYPE T ANCHOR ASSEMBLY	DATE 4-21-95 10-21-97
STANDARD CONSTRUCTION DRAWING GR-4.2M	
APPROVED Larry T. Sutherland	



FILL TO FILL



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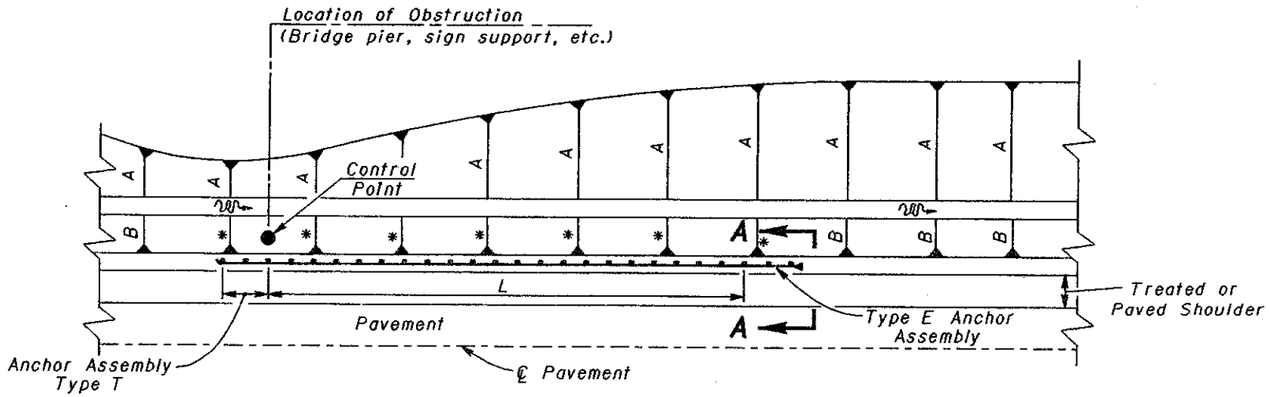


OBSTRUCTION

NOTES

APPLICATION: The application of details shown herein shall only be utilized where approach foreslopes are steeper than 6:1, but not steeper than 3:1.

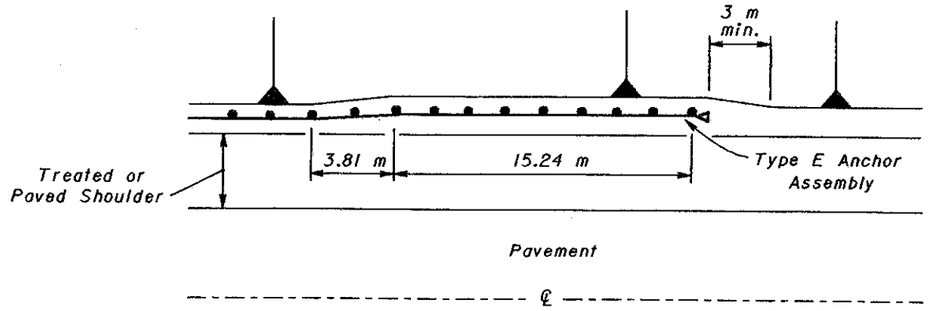
SLOPES: Slopes designated by * shall be 3:1 or flatter. Slopes labeled A, B or C shall be constructed as specified in the plans.

"L" DISTANCE: Dimensions shown as L shall be constructed as specified in the plans. Distance L is the length of guardrail extending beyond the control point parallel to the centerline. The control points shown designate the extent of the hazard being shielded and is shown for design use only.

GUARDRAIL END TERMINALS: Terminals utilized for the situations shown herein shall be Type E Anchor Assemblies unless otherwise specified in the plans.

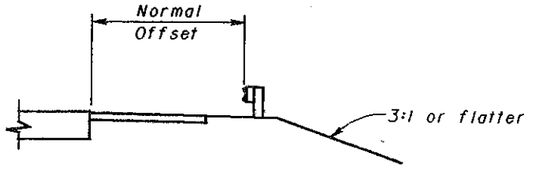
OBSTRUCTION INSTALLATION: The installation shown is applicable for one-directional roadways only.

OFFSET DESIGN: The design shown may be specified and/or constructed where it is deemed detrimental to lose effective shoulder width due to the dimensions of the Type E Anchor Assembly. The final 15.24 m of guardrail is to be offset an additional 230 mm from the normal guardail offset by tapering within the 3.81 m shown below. The graded shoulder width shall be increased 230 mm also and tapered back to the normal width in 3 m as shown.



OFFSET DESIGN
(Plan View)

metric units



SECTION A-A

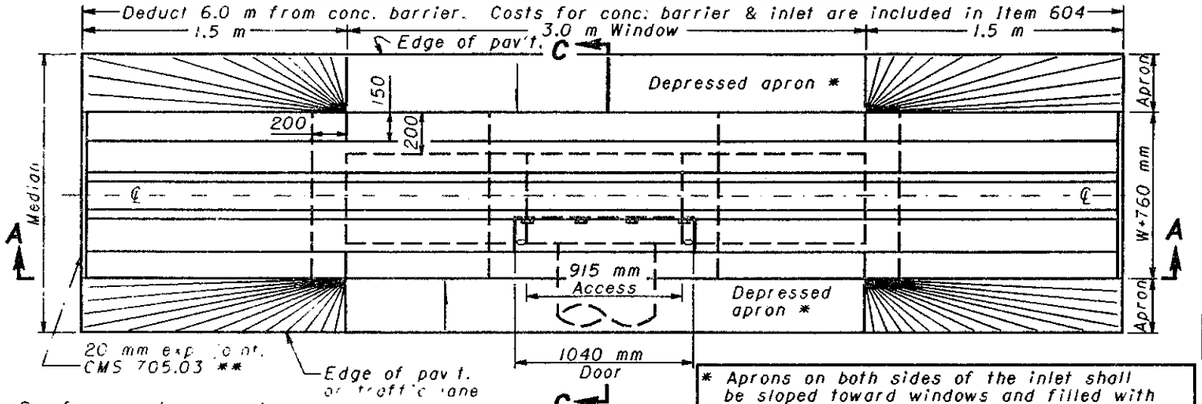
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

INTRODUCTION OF GUARDRAIL RUNS Foreslope steeper than 6:1

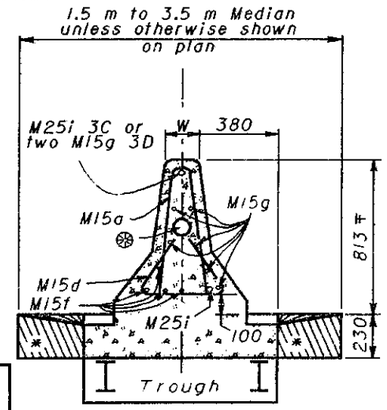
DATE 11-30-94

STANDARD CONSTRUCTION DRAWING **GR-5.3M**

APPROVED W. K. Hukman
ENGR., L & D

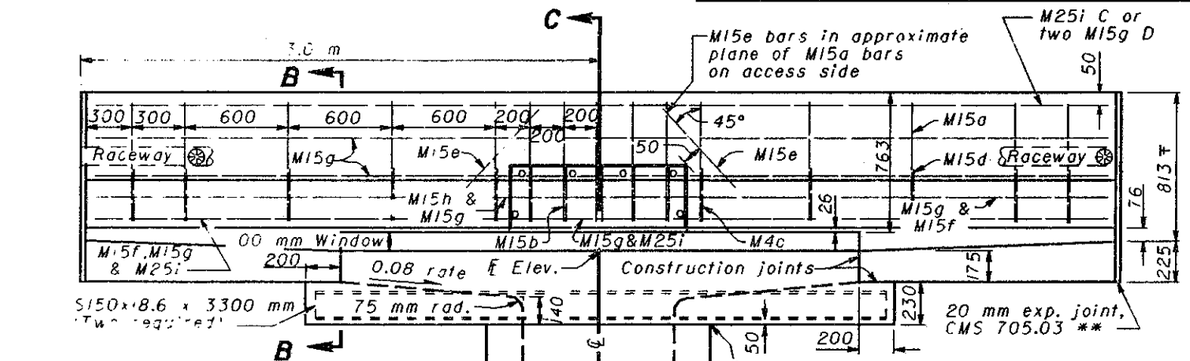


* Aprons on both sides of the inlet shall be sloped toward windows and filled with Class C concrete. On superelevated sections, the aprons shall be sloped as shown in Section C-C. Cost of any pavement removal and material is included in CMS 604.



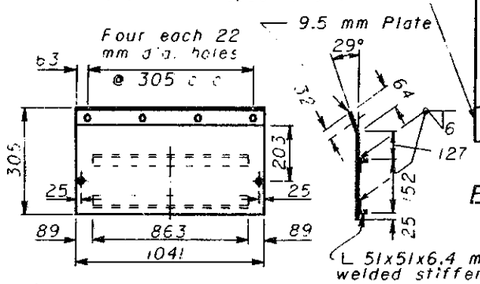
SECTION B-B

∓ Barrier height equals either 813 mm or 1270 mm.



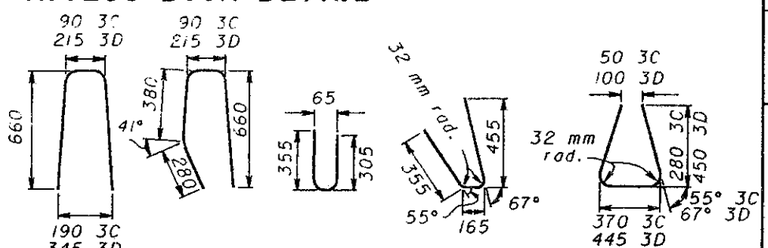
◆ Inlet top profile shall match the adjacent concrete median barrier profile by constructing the top surface of the base to match the median barrier profile.

** A 37 mm minimum exp. joint shall be provided in concrete pavement or concrete shoulders.



ACCESS DOOR DETAIL

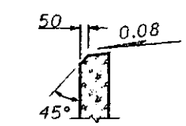
STANDARD INLET NUMBERS	
I-3C Type A	(813 mm Barrier with W-152 mm)
I-3C Type A1	(1270 mm Barrier with W-152 mm)
I-3D Type B	(813 mm Barrier with W-305 mm)
I-3D Type B1	(1270 mm Barrier with W-305 mm)



BENDING DIAGRAMS - #15M BARS

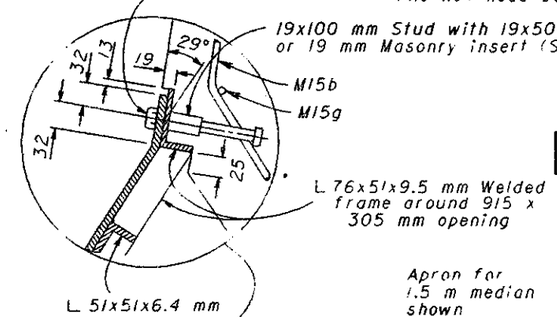
STEEL LIST ◆					
		I-3C (W-152)		I-3D (W-305)	
Size	Bar	Ea.	Length (mm)	Ea.	Length (mm)
#15M	M15a	10	1370	10	1525
	M15b	5	1370	5	1525
	M15c	5	710	5	965
	M15d	10	940	10	1370
	M15e	2	610	2	610
	M15f	8	2490	8	2490
	M15g	6	5995	8	5995
	M15h	1	1525	1	1525
S150x18.6		2	3300	2	3300
#25M	M25i	2	5995	1	5995

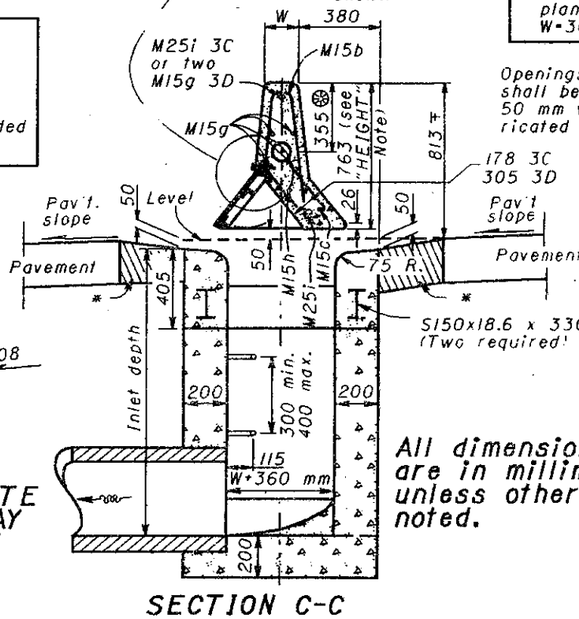
◆ Included for estimating purposes only. The cost of furnishing and placing all reinforcing steel shall be included in Item 604 for payment.



ALTERNATE SPILLWAY SHAPE

19 mm dia. x 50 mm hex head bolt



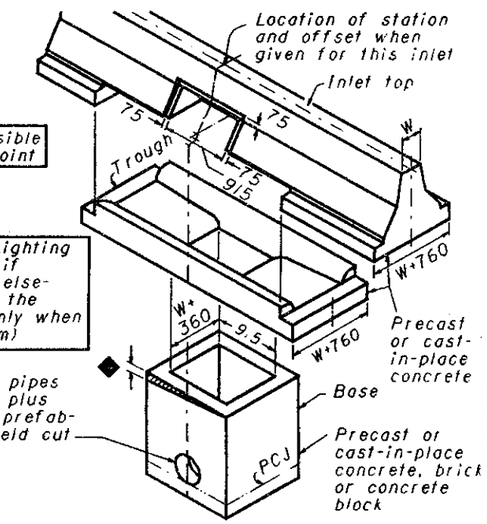


SECTION C-C

All dimensions are in millimeters unless otherwise noted.

PCJ = Permissible construction joint

⊗ 100 mm Lighting raceway, if required elsewhere by the plans. (Only when W=305 mm)



PICTORIAL VIEW

NOTES

GENERAL: For details of concrete barriers, see Std. Constr. Dwg. RM-4.3M.

WALLS: The walls between the bottom slab and the upper permissible construction joint may be built of brick, concrete block or cast-in-place concrete, 200 mm nominal thickness for depths of 3.5 m or less. Precast walls shall have a minimum thickness of 150 mm and be reinforced sufficiently to permit shipping and handling without damage.

HEIGHT: When placed in 1270 mm high barrier the 763 mm height shall be made 1220 mm.

CONCRETE: Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 with a minimum of 4% entrained air content in the hardened concrete. Required markings shall include the inlet number. Exposed concrete surfaces of the barrier shall be sealed with an approved sealer.

REINFORCING STEEL: Reinforcing steel shall be epoxy coated in accordance with CMS 509.10.

STEPS: Steps shall be in accordance with MH-1.1M.

INLETS OVER 3.5 m IN DEPTH: Such inlets shall be precast or cast-in-place concrete; reinforced with #15M bars on 300 mm centers both vertically and horizontally with 50 mm clearance from the inside wall face.

OPENINGS: Pipe openings shall be the outside diameter of the pipe being supplied plus 50 mm when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

ACCESS DOOR: The steel door, frame and all inserts, shall be galvanized. The hex head bolts shall be stainless steel.

metric units

This Drawing Replaces I-3C & D.

OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

BARRIER MEDIAN INLETS 3C & 3D

DATE 9-6-95

STANDARD CONSTRUCTION DRAWING **I-2.2M**

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

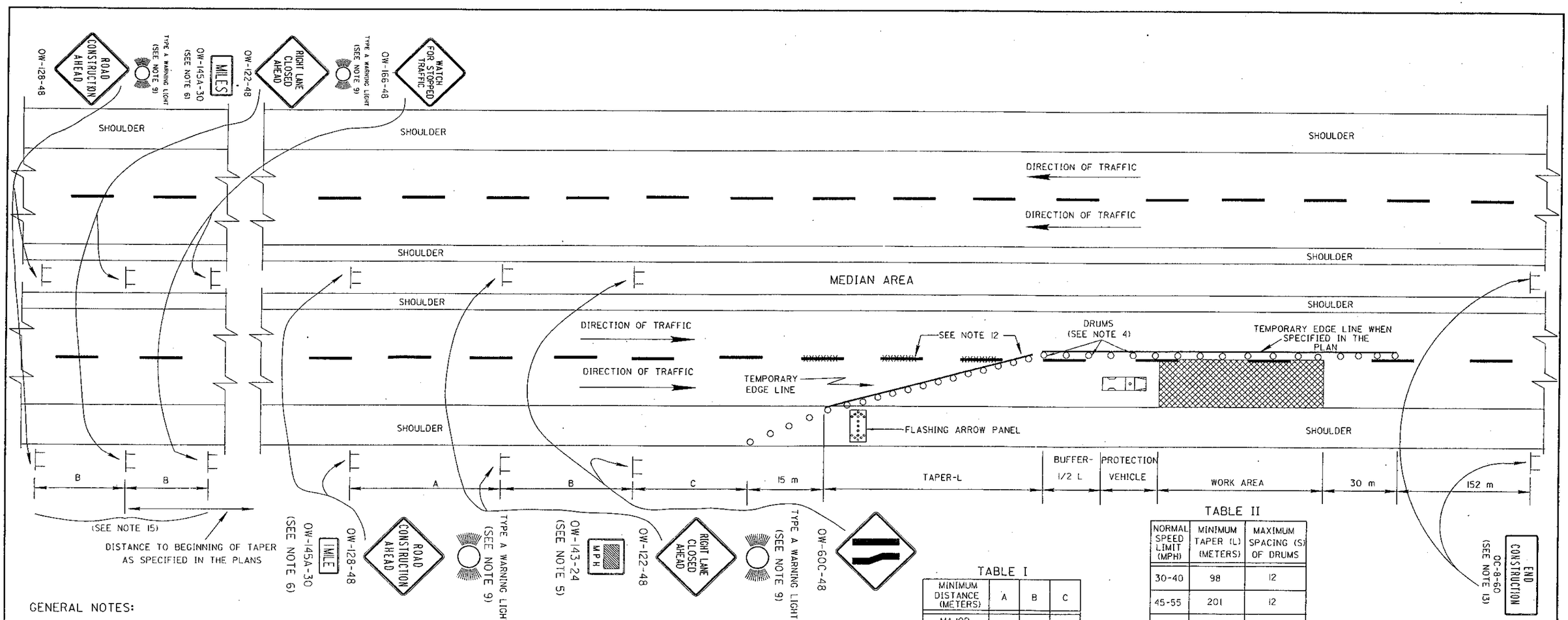


TABLE I

MINIMUM DISTANCE (METERS)	A	B	C
MAJOR STANDARD	152	152	152
URBAN FREEWAY & EXPRESSWAY	152 TO 305	152 TO 305	152 TO 305
RURAL FREEWAY & EXPRESSWAY	792	488	305

TABLE II

NORMAL SPEED LIMIT (MPH)	MINIMUM TAPER (L) (METERS)	MAXIMUM SPACING (S) OF DRUMS
30-40	98	12
45-55	201	12
60-65	238	18

GENERAL NOTES:

1. THE LOCATION OF THE MERGING TAPER AND THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.

2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61 m CLEARANCE TO EXISTING SIGNS.

3. THE TAPER LENGTH (L) AND SPACING (S) OF DRUMS SHALL CONFORM TO TABLE II. DRUM SPACING (S) SHALL BE USED FOR THE MERGING TAPER, THE BUFFER AREA AND FOR THE FIRST 305 m OF THE WORK AREA AND AT OTHER HAZARDOUS LOCATIONS AS DIRECTED BY THE ENGINEER. THE MAXIMUM DRUM SPACING FOR THE BALANCE OF THE WORK AREA IS TO BE TWO TIMES THE SPACING (S) IN TABLE II. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER.

4. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

5. THE ADVISORY SPEED SIGN OW-143 SHALL BE USED WHEN SPECIFIED IN THE PLAN.

6. THE DISTANCE PLATE OW-145A SHALL INDICATE THE DISTANCE TO THE BEGINNING OF THE MERGING TAPER (L). DISTANCES LESS THAN ONE MILE MAY BE EXPRESSED IN FEET. THE PLAQUE MAY BE OMITTED IF EXTRA ADVANCE SIGN GROUPS ARE NOT USED.

7. THE PROTECTION VEHICLE, LOCATED CLOSE TO THE WORK, SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

8. THE FLASHING ARROW PANEL SHALL MEET REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING TC-35.10M.

9. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE OW-128 AND OW-122 - (123) SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY

10. WHEN WORK IS BEING PERFORMED IN THE LANE ADJACENT TO THE MEDIAN ON A DIVIDED HIGHWAY, OW-123 SIGNS SHALL BE SUBSTITUTED FOR THE OW-122 SIGNS AND OW-60D SIGNS SHALL BE SUBSTITUTED FOR THE OW-60C SIGNS.

11. 36 INCH WARNING SIGN SIZES MAY BE USED ON DIVIDED ROADWAYS THAT ARE NOT CLASSIFIED AS FREEWAYS OR EXPRESSWAYS.

12. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS

12. CONT. THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

13. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

14. OW-128 SIGNS SHALL BE PROVIDED ON ENTRANCE RAMPS AND/OR SIDE ROADS LOCATED WITHIN THE WORK LIMITS OR THE ADVANCE WARNING SIGN GROUP. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND DRIVEWAYS. THREE DRUMS SHALL BE PLACED ON EACH SIDE ACROSS THE CLOSED LANE AT EACH INTERSECTION AND DRIVEWAY.

15. EXTRA ADVANCE WARNING SIGN GROUPS CONSISTING OF OW-128, OW-122 AND OW-166 SIGNS PLUS DISTANCE PLATES MAY BE SPECIFIED IN THE PLANS OR REQUIRED TO BE ERECTED AT THE DIRECTION OF THE ENGINEER.

16. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

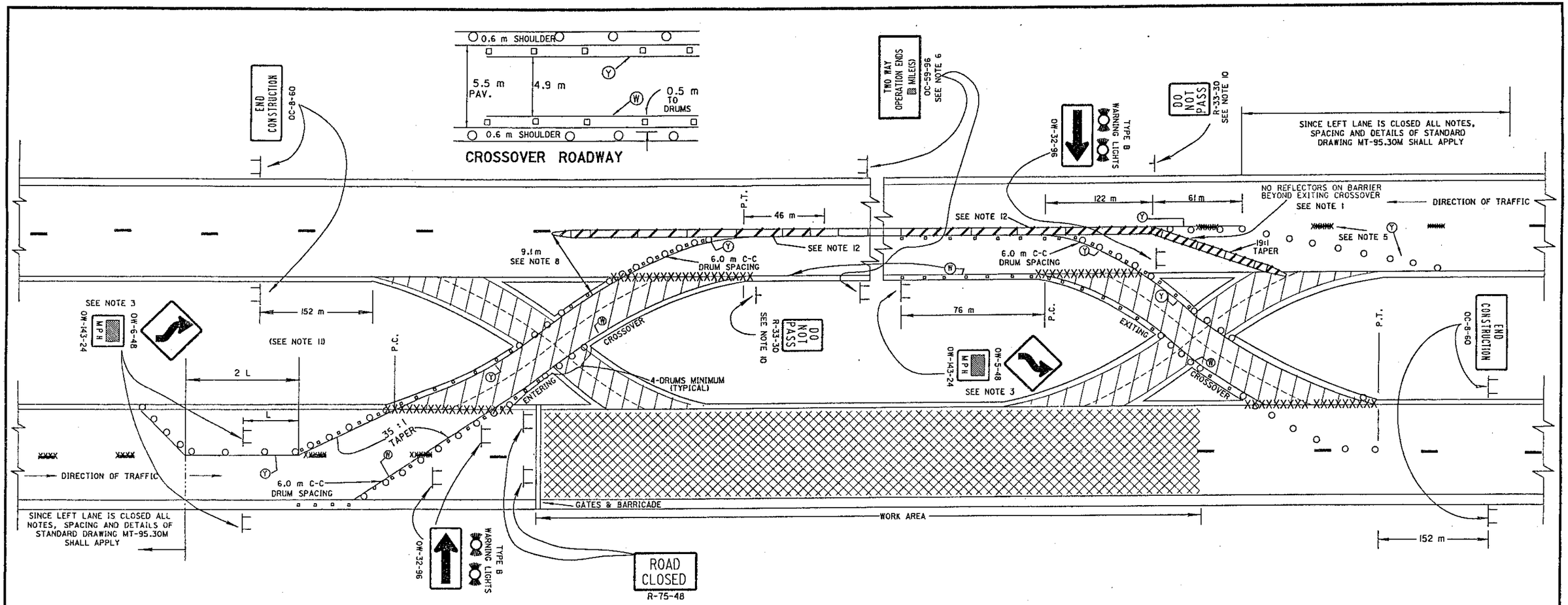
METRIC

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 MAINTAININC TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE
CLOSING RIGHT OR LEFT LANE OF A MULTI-LANE DIVIDED HIGHWAY WITH DRUMS	04/25/94
STANDARD CONSTRUCTION DRAWING MT-95.30M	

APPROVED _____ ENGR. OF DESIGN SERVICES



GENERAL NOTES:

1. NO REFLECTORS OR OTHER CHANNELIZING DEVICES SHALL BE PERMITTED ON THE FACE OF THE PCB FACING THE EXISTING CROSSOVER, FROM PC TO END OF BARRIER. PCB SHALL BE DELINEATED AS FOLLOWS:

PCB TYPE	DELINEATION
813 mm HIGH WITHOUT GLARE SCREEN	BARRIER REFLECTORS AT 7.6 m C-C (MAX.) ALTERNATED WITH TOP MOUNTED OBJECT MARKERS (229 X 381 mm) AT 7.6 m C-C (MAX.)
813 mm HIGH WITH GLARE SCREEN	BARRIER REFLECTORS AT 7.6 m C-C VERTICAL ORANGE REFLECTORIZED STRIPES ON PADDLES (51 X 305 mm) AT 3.8 m C-C (MAX.)
1270 mm HIGH	BARRIER REFLECTORS AT 3.8 m C-C (MAX.)
TAPERED END SECTION AND EXPOSED END	OBJECT MARKERS (229 X 381 mm) TOP MOUNTED AT EACH END

2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED NOT TO CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61 m CLEARANCE TO EXISTING SIGNS. IF SHOULDER IS USED AS A LANE, SET BACK ALL SIGNS TO 1.8 m BEYOND THE SHOULDER.

3. THE ADVISORY SPEED SIGN (OW-143) SHALL BE USED WHEN SPECIFIED. THE ADVISORY SPEED SHALL BE AS CALLED FOR IN THE PLANS.

4. DRUMS SHALL BE SPACED AT 12 m C-C UNLESS OTHERWISE SHOWN.

5. THE EDGE LINES ADJACENT TO THE BARRIER MAY BE PAINT ONLY IF THEY WILL BE DESTROYED OR SURFACED OVER IN THE NEXT STAGE OF WORK. THEY SHALL BE INSTALLED WITH REMOVABLE TAPE IF ON THE FINAL SURFACE. IN ORDER TO CHANGE THE COLOR OF THE EDGE LINE NEXT TO THE MEDIAN, IT MAY BE HEAVILY PAINTED OVER (WITH SUBSEQUENT OVER PAINTING IF NECESSARY DURING THE LIFE OF THE WORK STAGE TO MAINTAIN DAY AND NIGHT COLOR) EXCEPT THAT THIS PROCEDURE WILL NOT BE PERMITTED FOR A LINE ON THE FINAL SURFACE.

   THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED. THE RIGHT EDGE LINE IN THE TWO WAY TRAFFIC SECTION SHALL BE WHITE. ALL PAVEMENT MARKINGS WHICH WILL CROSS NORMAL TRAFFIC LANES SHALL BE INSTALLED USING REMOVABLE (740.05, TYPE C) TAPE, UNLESS THE AREA WILL BE RESURFACED PRIOR TO IMPLEMENTING THE NEXT TRAFFIC STAGE. AFTER COMPLETION OF THE WORK, TEMPORARY MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 641.10 AND THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

6. THE OC-59 SIGNS SHALL BE PLACED APPROXIMATELY 1.6 km APART ON WORK AREAS OVER 4.8 km.

7. THE PORTABLE CONCRETE BARRIER (PCB) NEAR THE EXITING CROSSOVER, SHALL EXTEND STRAIGHT ON THE PERMANENT ROADWAY TO 122 m BEYOND THE PC OF THE CROSSOVER AND THEN TAPER AT 19:1 ACROSS THE TRAFFIC LANE AND PAVED SHOULDER ENDING WITH A TAPERED END SECTION AT THE EDGE OF SHOULDER.

8. PCB NEAR THE ENTERING CROSSOVER SHALL EXTEND TO A POINT 9.1 m FROM THE EDGE OF THE CROSSOVER ROADWAY.

9. PCB SHALL BE 1270 mm HIGH OR FITTED WITH GLARE SHIELDS WITHIN THE FOLLOWING LIMITS: (1) NEAR THE ENTERING CROSSOVER FROM THE BEGINNING OF BARRIER TO 91 m BEYOND THE P.T. AND (2) FROM 61 m IN ADVANCE OF P.C. TO THE END OF BARRIER NEAR THE EXITING CROSSOVER.

10. "DO NOT PASS" (R-33) SIGNS ARE TO BE INSTALLED AT 460 m INTERVALS IN BOTH DIRECTIONS BEGINNING AT THE LOCATION SHOWN FOR THE FIRST SIGN TO THE END OF PCB.

11. DISTANCE L SHALL BE BASED UPON THE SPEED LIMIT IMPOSED THROUGH THE REMAINDER OF THE WORK ZONE (SEE DRAWING MT-95.30M FOR VALUES OF L).

12. NO TEMPORARY YELLOW EDGE LINE SHALL BE PLACED ADJACENT TO PCB BETWEEN THE P.T. AND P.C. UNLESS SPECIFIED IN THE PLANS.

LEGEND

- XXXXX — PAVEMENT MARKING REMOVED
- ○ — DRUM
- (W) — WHITE EDGE LINE
- (Y) — YELLOW EDGE LINE
- ▫ — TEMP. RAISED PAVT. MARKER (TRPM)
- — PCB
- — PCB (1270 mm HIGH OR WITH GLARESHIELD)

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

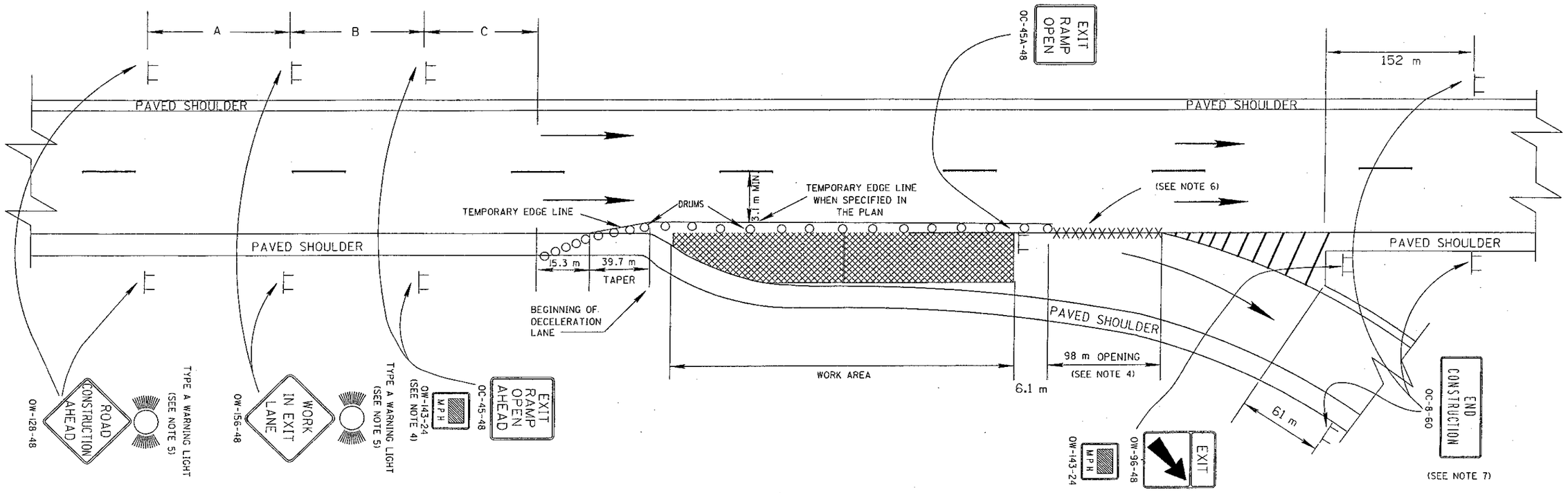
DATE 01/30/95

TWO-LANE, TWO-WAY OPERATION FOR USE ON FOUR LANE DIVIDED ROADWAYS (PORTABLE CONCRETE BARRIER - PCB)

STANDARD CONSTRUCTION DRAWING MT-95.70M

APPROVED ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES:

1. THE LOCATION OF THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.

2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61 m CLEARANCE TO EXISTING SIGNS, EXCEPT THE OW-96-48 SIGN WHICH MAY BE ADJACENT TO THE GF SIGN IN THE GORE.

3. ALONG THE CLOSURE DRUMS SHALL BE SPACED AT 6.1 m CENTER TO CENTER. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

4. THE OPENING TO THE RAMP SHALL BE 98 m OR MORE, WHENEVER POSSIBLE. A LESSER OPENING MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. WHEN A LESSER OPENING IS PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
35 m	56 km/h - 35 MPH

IF A 61 m OPENING CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

4. CONT. THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

5. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" AND "WORK IN EXIT LANE" SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

6. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

7. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

MINIMUM DISTANCE (METERS)	A	B	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305	152 TO 305	152 TO 305
RURAL FREEWAY & EXPRESSWAY	792	488	305

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

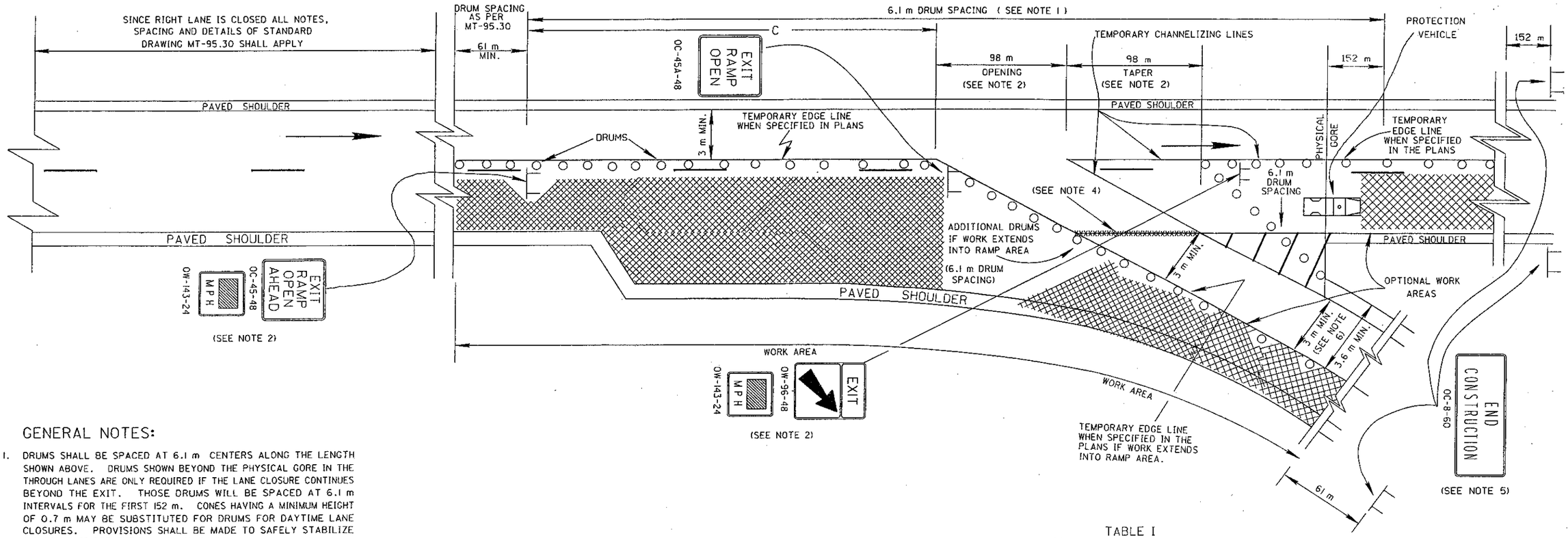
LANE CLOSURE IN DECELERATION LANE

DATE 06/24/93

STANDARD CONSTRUCTION DRAWING MT-98.12M

APPROVED Doyl Cooper ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES:

1. DRUMS SHALL BE SPACED AT 6.1 m CENTERS ALONG THE LENGTH SHOWN ABOVE. DRUMS SHOWN BEYOND THE PHYSICAL GORE IN THE THROUGH LANES ARE ONLY REQUIRED IF THE LANE CLOSURE CONTINUES BEYOND THE EXIT. THOSE DRUMS WILL BE SPACED AT 6.1 m INTERVALS FOR THE FIRST 152 m. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

2. THE OPENING TO THE RAMP AND THE TAPER ACROSS THE CLOSED LANE SHOULD EACH BE 98 m OR MORE WHENEVER POSSIBLE. A LESSER OPENING AND/OR TAPER MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. THE OPENING SHALL NEVER BE LESS THAN THE TAPER, BUT MAY BE MORE. WHEN LESSER OPENING AND/OR TAPER LENGTHS ARE PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING/TAPER	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
61 m	56 km/h - 35 MPH

IF 61 m MINIMUM DIMENSIONS CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16.1 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

3. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

4. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND a) TEMPORARY CHANNELIZING LINES SHALL BE APPLIED AND b) THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY CHANNELIZING LINES AND EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

5. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

6. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD.

7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

MINIMUM DISTANCE (METERS)	
	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305
RURAL FREEWAY & EXPRESSWAY	305

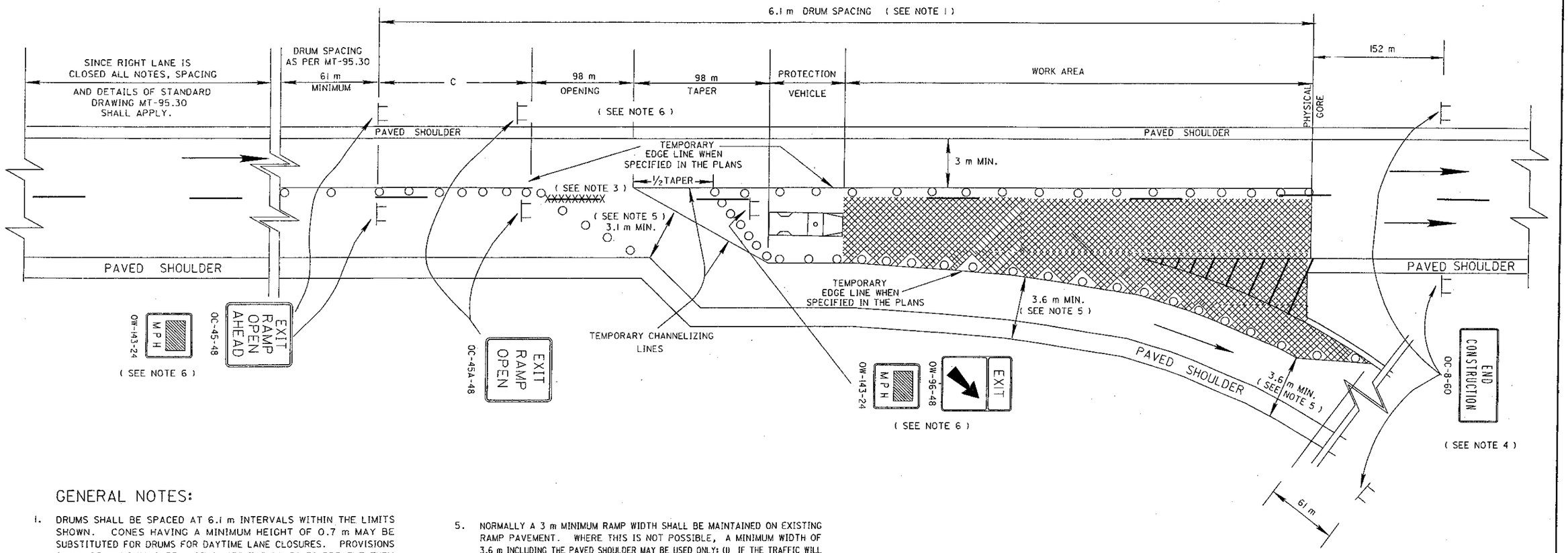
METRIC

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 06/24/93
LANE CLOSURE BEFORE EXIT GORE	
STANDARD CONSTRUCTION DRAWING MT-98.13M	
APPROVED Amy L Creager ENGR. OF DESIGN SERVICES	

WCC



GENERAL NOTES:

1. DRUMS SHALL BE SPACED AT 6.1 m INTERVALS WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

2. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

3. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND a) TEMPORARY CHANNELIZING LINES SHALL BE APPLIED AND b) THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY CHANNELIZING LINES AND EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

4. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

5. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD.

6. THE OPENING TO THE RAMP AND THE TAPER IN ADVANCE OF THE CLOSED LANE SHOULD EACH BE 98 m OR MORE WHENEVER POSSIBLE. A LESSER OPENING AND/OR TAPER LENGTH MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. THE OPENING SHALL NEVER BE LESS THAN THE TAPER, BUT MAY BE MORE. WHEN LESSER OPENING AND/OR TAPER LENGTHS ARE PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING/TAPER	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
61 m	56 km/h - 35 MPH

IF 61 m MINIMUM DIMENSION CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16.1 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

MINIMUM DISTANCE (METERS)	
	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305
RURAL FREEWAY & EXPRESSWAY	305

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

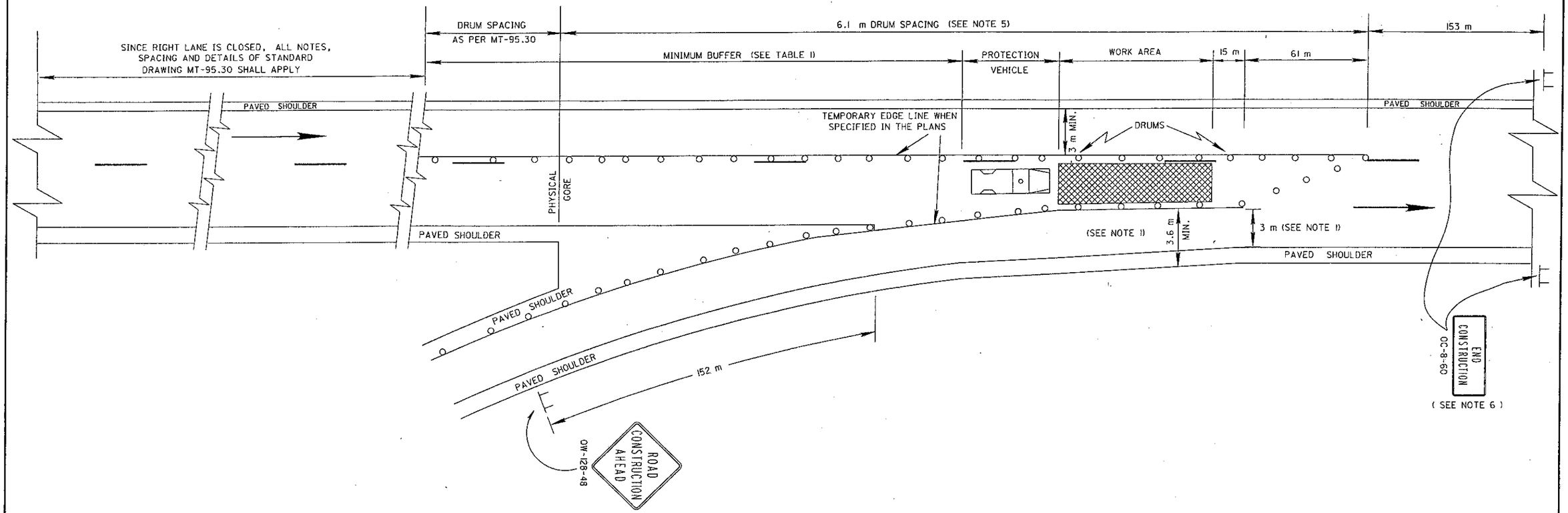
DATE 06/24/93

LANE CLOSURE
AT EXIT GORE

STANDARD CONSTRUCTION DRAWING MT-98.14M

APPROVED Doyle Craig ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES:

1. THIS WORK AREA TRAFFIC CONTROL APPLICATION SHALL BE EMPLOYED ONLY WHEN THE LATERAL CLEARANCE BETWEEN THE CHANNELIZING DEVICES AT THE RIGHT EDGE OF THE WORK AREA AND THE EDGE OF THE RAMP PAVEMENT IS 3 m OR MORE. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD. WHEN THE RAMP IS CLOSED APPROPRIATE DETOUR SIGNS SHALL BE PROVIDED.

2. WHEN THE RAMP IS NOT LONG ENOUGH TO ALLOW SIGN PLACEMENT AS SPECIFIED ABOVE, THEY MAY BE SPACED PROPORTIONATELY WITHIN THE SPACE AVAILABLE AS DETERMINED BY THE ENGINEER (A 61 m MINIMUM SPACING MUST BE MAINTAINED).

3. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

4. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

5. DRUMS SHALL BE SPACED AT 6.1 m INTERVALS ON BOTH SIDES OF THE WORK AREA WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

6. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

NORMAL SPEED LIMIT		MINIMUM BUFFER
(MPH)	(km/h)	(METERS)
45 - 50	72 - 88	101
60 - 65	96 - 104	119

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

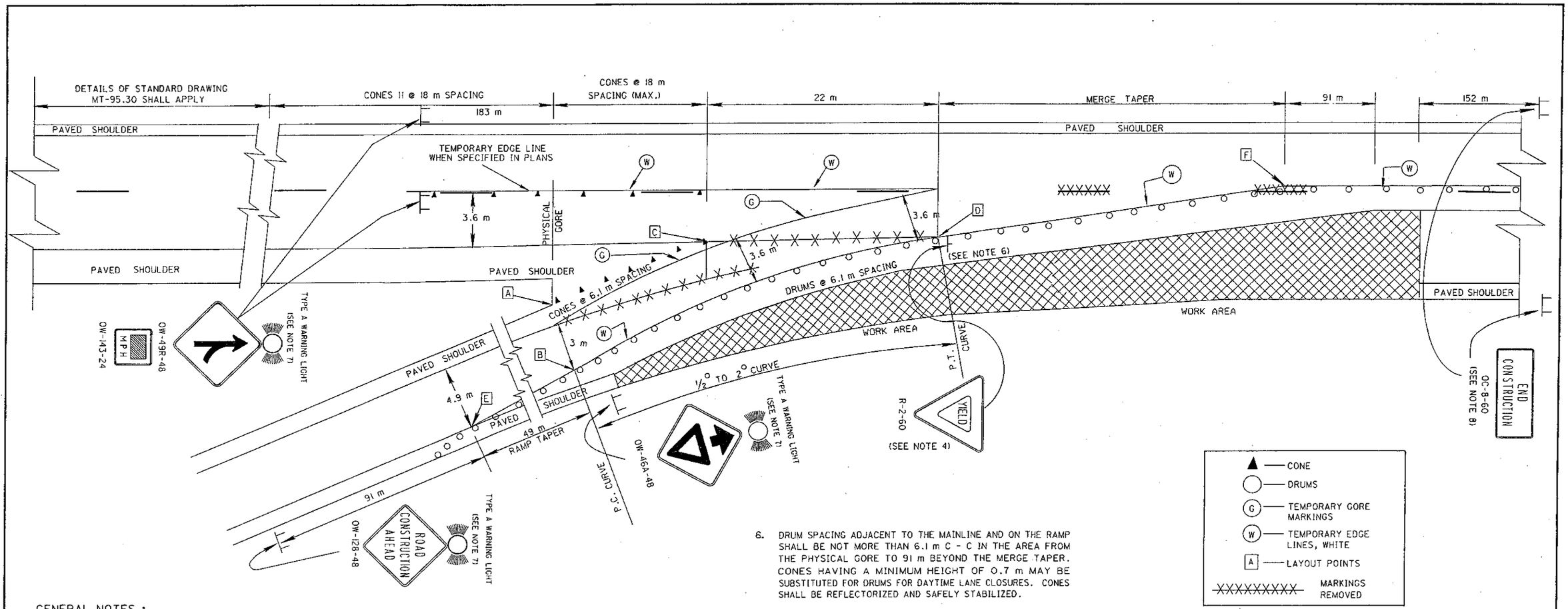
LANE CLOSURE AT
ENTRANCE RAMP: PLAN A

DATE 06/24/93

STANDARD CONSTRUCTION DRAWING MT-98.15M

APPROVED Doug Kreuger ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES :

1. THIS WORK AREA TRAFFIC CONTROL APPLICATION SHALL BE EMPLOYED WHEN: (1) THE LATERAL CLEARANCE BETWEEN CHANNELIZING DEVICES AT THE RIGHT EDGE OF THE WORK AREA AND THE EDGE OF PAVEMENT IS LESS THAN 3 m (3.6 m IF THE SHOULDER PAVEMENT IS USED) AS SHOWN ON DRAWING MT-98.15, AND (2) THE REQUIRED RAMP TAPERS AND CURVES CAN BE PROVIDED AS SHOWN EXCEPT AS DESCRIBED IN NOTE 4. IN THE EVENT THE WORK ZONE CONDITION WOULD PERMIT THE USE OF EITHER MT-98.15 OR MT-98.16, MT-98.15 SHALL BE USED. THIS TRAFFIC CONTROL MEASURE SHALL NOT BE PLACED IN EFFECT UNTIL IMMEDIATELY BEFORE THE CONTRACTOR IS FULLY PREPARED TO PERFORM THE WORK ON THE RAMP OR LANE ADJACENT TO IT. ONCE THIS MEASURE IS PLACED INTO EFFECT, THE CONTRACTOR SHALL EXPEDITIOUSLY PURSUE THE WORK (WORKING CONTINUOUSLY WITH FULL CREW IN THE RAMP AREA ON ALL NORMAL WORKING DAYS) UNTIL IT IS COMPLETED AND SHALL IMMEDIATELY OPEN THE AREA TO NORMAL TRAFFIC OR, AS A MINIMUM, REVERT TO THE METHODS SHOWN ON MT-98.15. IT IS THE INTENT THAT THE LONGEST MERGING TAPER LENGTH POSSIBLE SHALL BE CHOSEN, COMMENSURATE WITH THE REQUIREMENTS OF CONSTRUCTION.

2. THE RAMP TAPER SHALL DESIRABLY BE LOCATED TO PROVIDE A 3 m MINIMUM PATH BETWEEN DRUMS AND THE PAVED SHOULDER IN THE GORE. THE RAMP TRAFFIC MAY BE PLACED ON THE PAVED GORE AS SHOWN ABOVE ONLY IF: (1) THE TRAFFIC WILL USE THE PAVED SHOULDER PAVEMENT LESS THAN ONE DAY AND THE SHOULDER PAVEMENT IS IN GOOD CONDITION AND IS LEVEL AND SMOOTH OR (2) IF THE SHOULDER PAVEMENT IS ADEQUATELY STRENGTHENED, LEVELED AND SMOOTHED TO CARRY THE ANTICIPATED LOAD. A MINIMUM OF 3 DRUMS SHALL BE USED TO CLOSE THE RAMP SHOULDER.

3. WHEN THE RAMP IS NOT LONG ENOUGH TO ALLOW SIGN PLACEMENT AS SPECIFIED ABOVE, THEY MAY BE SPACED PROPORTIONATELY WITHIN THE SPACE AVAILABLE AS DETERMINED BY THE ENGINEER (A 61 m MINIMUM SPACING MUST BE MAINTAINED).

4. IT WILL BE NECESSARY TO MOVE THE LOCATION OF ANY EXISTING YIELD SIGN. IN THESE CASES, THE PERMANENT R-2 SIGN INSTALLATION SHALL BE REMOVED (AND SUBSEQUENTLY RESTORED) AND THE TEMPORARY INSTALLATION SHALL BE MOUNTED APPROPRIATELY. IF THE REQUIRED DISTANCES (RAMP TAPER, CURVE AND MERGE TAPER) CANNOT BE OBTAINED, THE ENGINEER MAY APPROVE SLIGHTLY LOWER VALUES FOR A SHORT TIME, IN WHICH CASE THE YIELD SIGN SHALL BE REMOVED AND A 1.2 m STOP SIGN PLACED APPROPRIATELY TO BE VIDIBLE TO RAMP TRAFFIC BUT NOT BE OBTRUSIVE TO MAINLINE TRAFFIC.

5. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AT NO ADDITIONAL COST. THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY PAVEMENT MARKINGS WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, TEMPORARY PAVEMENT MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 641.10 AND THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

6. DRUM SPACING ADJACENT TO THE MAINLINE AND ON THE RAMP SHALL BE NOT MORE THAN 6.1 m C - C IN THE AREA FROM THE PHYSICAL GORE TO 91 m BEYOND THE MERGE TAPER. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. CONES SHALL BE REFLECTORIZED AND SAFELY STABILIZED.

7. TYPE A FLASHING WARNING LIGHTS ARE REQUIRED ON THE ROAD CONSTRUCTION AHEAD (OW-128-48), MERGE (OW-49R-48) AND THE YIELD AHEAD (OW-46-48) SIGNS WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

8. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

9. FROM THE END OF THE GORE AREA GRADED SHOULDER (POINT A), LOCATE THE PC OF THE CURVE BY MEASURING PERPENDICULAR TO THE RAMP CENTERLINE 3 m OF RAMP PAVEMENT, NOT INCLUDING PAVED SHOULDER WIDTH (POINT B). FROM THE END OF THE GORE AREA PAVED SHOULDER (POINT C), LOCATE THE PT OF THE CURVE BY MEASURING 22 m FROM POINT C ALONG THE EDGE OF PAVEMENT EXTENDED (POINT D).

10. PLACEMENT OF DRUMS SHALL BEGIN AT (POINT E) 49 m UPSTREAM FROM THE PREVIOUSLY LOCATED PC (POINT B) AND AT THE RIGHT EDGE OF RAMP PAVEMENT. FROM THIS POINT A DRUM TAPER SHALL BE PLACED TO THE PC (POINT B) AND THEN ALONG A CURVE AS SHOWN TO THE PT (POINT D) WHERE A 48:1 (MIN.) MERGE TAPER SHALL MEET MAINLINE TRAFFIC CONTROL (POINT F).

11. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

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.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

LANE CLOSURE AT ENTRANCE RAMP: PLAN B

DATE 06/24/93

STANDARD CONSTRUCTION DRAWING MT-98.16M

APPROVED _____ ENGR. OF DESIGN SERVICES

WCC

GENERAL

IN ADDITION TO 614, TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE PURPOSE OF THE FOLLOWING REQUIREMENTS FOR TRAFFIC CONTROL FOR PAVEMENT MARKING OPERATIONS IS TO PROVIDE SAFETY FOR HIGHWAY USERS, WORKERS AND EQUIPMENT AND TO PROTECT THE MARKINGS FROM DAMAGE DURING APPLICATION. THESE REQUIREMENTS ARE THE REQUIRED MINIMUMS. IF AT ANY TIME DURING THE APPLICATION OF MARKINGS IT IS FOUND BY THE ENGINEER THAT THESE MINIMUM TRAFFIC CONTROL REQUIREMENTS ARE NOT ACHIEVING THE NECESSARY SAFETY AND MARKING PROTECTION. ADDITIONAL TRAFFIC CONTROL SHALL BE IMPLEMENTED AT NO ADDITIONAL COST.

THE ENGINEER MAY SUSPEND WORK IN ORDER TO RELIEVE TRAFFIC CONGESTION AT ANY TIME. NO WORK SHALL BE DONE DURING PEAK HOURS, AS DETERMINED BY THE ENGINEER.

VEHICLES TRANSPORTING FLAMMABLE PAVEMENT MARKING MATERIALS (MATERIAL SUPPLY VEHICLES) SHALL NOT BE UTILIZED FOR LEAD OR TRAIL VEHICLES OR FOR POWER BROOM EQUIPMENT. ALL PAVEMENT MARKING APPLICATION, PROTECTION AND SUPPORT EQUIPMENT FOLLOWING THE LINE MARKING MACHINE SHALL HAVE THE TRAFFIC CONTROL EQUIPMENT OF A TRAIL VEHICLE.

LINE MARKING MACHINES SHALL NOT BE USED FOR SIGN AND CONE PLACEMENT.

LEAD VEHICLE

A LEAD VEHICLE IS TO BE USED TO WARN OPPOSING TRAFFIC OF THE APPROACH OF CENTER LINE AND OTHER MARKING EQUIPMENT WHEN THIS EQUIPMENT EXTENDS INTO THE ADJACENT OPPOSING TRAFFIC LANE. THE LEAD VEHICLE SHALL PRECEDE THE "LEFT OF CENTER" MARKING EQUIPMENT A DISTANCE THAT WILL PROVIDE ADVANCE SAFE WARNING TO APPROACHING TRAFFIC. THE OPERATOR OF THIS UNIT SHALL DRIVE AHEAD OF THE CREST OF A VERTICAL CURVE OR AROUND A HORIZONTAL CURVE AND WAIT UNTIL THE "LEFT OF CENTER" MARKING EQUIPMENT NEARS AND THEN PROCEED, MAINTAINING AN ADVANCE LOCATION OF 122 m TO 183 m.

A LEAD VEHICLE SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL DEVICES:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS , AND
3. A KEEP RIGHT SIGN (OC-31R-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE MEASURED TO THE BOTTOM OF THE SIGN, AND VISIBLE TO OPPOSING TRAFFIC.

POWER BROOM EQUIPMENT

POWER BROOM EQUIPMENT SHALL BE EQUIPPED AND OPERATED DURING PAVEMENT PREPARATIONS WITH THE FOLLOWING TRAFFIC CONTROL DEVICES:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS , AND
- ✳ 3. A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) VISIBLE TO THE REAR MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS.

LINE MARKING MACHINE

ALL TRAFFIC LINE MARKING MACHINES SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL EQUIPMENT:

1. THREE 360° ROTATING OR FLASHING AMBER BEACONS CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m, MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, ONE FORWARD, ONE ON THE RIGHT REAR AND ONE ON THE LEFT REAR OF THE VEHICLE.
- ✳ 2. (A) A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) DISPLAYED TO THE REAR MOUNTED A MINIMUM OF 2 m ABOVE THE THE ROAD SURFACE, MEASURED TO BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS, OR
   (B) A DO NOT PASS SIGN (R-33A-48) VISIBLE TO THE REAR DURING CENTER LINE MARKING ON TWO-LANE, TWO-WAY ROADWAYS AND MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN. THIS SIGN MAY BE USED TO COVER THE ARROW PANEL WHICH SHALL NOT BE USED ON TWO-LANE, TWO WAY ROADWAYS.
3. A WET PAINT WITH ARROW SIGN (OC-50-24 OR OC-51-48) SHALL FACE THE REAR. THE SIGN SHALL BE POSITIONED WITH THE ARROW POINTING TO THE WET LINE. WHEN USED, OC-50-24 SHALL BE MOUNTED ON THE SIDE OF THE VEHICLE NEAREST THE WET MARKING MATERIAL. OC-50-24 AND OC-51-48 SIGNS SHALL BE MOUNTED A MINIMUM OF 0.3 m ABOVE THE ROAD SURFACE.
4. A KEEP RIGHT SIGN (OC-31R-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN FACING OPPOSING TRAFFIC WHEN THIS UNIT EXTENDS INTO THE ADJACENT OPPOSING TRAFFIC LANE.
5. THE GUIDE AND SIDE MOUNTED MARKING CARRIAGES SHALL EACH BE EQUIPPED WITH A CLEAN RED FLAG NOT LESS THAN 0.4 m SQUARE AND FASTENED TO A STAFF OF SUFFICIENT LENGTH SO AS TO PERMIT THE FLAG TO MOVE FREELY OF ANY OBSTRUCTION.

TRAIL VEHICLE

WHEN REQUIRED, A TRAIL VEHICLE SHALL BE POSITIONED AT THE TRACK FREE END OF THE WET LINE.

TRAIL VEHICLES SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL EQUIPMENT:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m,
- ✳ 2. (A) A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) VISIBLE TO THE REAR MOUNTED AT A MINIMUM HEIGHT OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS, OR
   (B) A DO NOT PASS SIGN (R-33A-48) VISIBLE TO THE REAR DURING CENTER LINE MARKING ON TWO-LANE, TWO-WAY ROADWAYS AND MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN. THIS SIGN MAY BE USED TO COVER THE ARROW PANEL, WHICH SHALL NOT BE USED ON TWO-LANE, TWO-WAY ROADWAYS.
3. A WET PAINT WITH ARROW SIGN (OC-50-24 OR OC-51-48) SHALL FACE THE REAR. THE SIGN SHALL BE POSITIONED WITH THE ARROW POINTING TO THE WET LINE. WHEN USED, OC-50.24 SHALL BE MOUNTED ON THE SIDE OF THE VEHICLE NEAREST, THE WET MARKING MATERIAL. OC-50-24 SHALL BE MOUNTED A MINIMUM OF 1.4 m ABOVE THE ROAD SURFACE AND OC-51-48 SHALL BE MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE, BOTH MEASURED TO THE BOTTOM OF THE SIGN.

✳ WHEN A VEHICLE IS OPERATING ON A TWO-LANE TWO-WAY ROADWAY THE FLASHING ARROW PANEL SHALL BE TILTED HORIZONTALLY OR COVERED.

CONES AND WET PAINT-KEEP OFF SIGNS

CONES AND WET PAINT-KEEP OFF SIGNS (R-87-24) SHALL BE PLACED TO PROTECT THE LINE WHENEVER THE TRACK FREE TIME EXCEEDS 2 MINUTES. THESE DEVICES SHALL NOT BE REMOVED UNTIL THE LINE HAS DRIED TO A TRACK FREE CONDITION. RETRIEVAL EQUIPMENT SHALL HAVE THE TRAFFIC CONTROL EQUIPMENT OF A TRAIL VEHICLE. CONES SHALL HAVE A MINIMUM HEIGHT OF 0.46 m. THEY SHALL BE SPACED TO PROTECT THE WET LINE NORMALLY BETWEEN 37 m AND 61 m. IN AREAS OF TRAFFIC CONGESTION , ON CURVES AND AT OTHER LOCATIONS WHERE TRACKING OF THE WET LINE IS EXPECTED SPACINGS AS CLOSE AS 6.1 m MAY BE REQUIRED. THE WET PAINT-KEEP OFF SIGNS (R-87-24) SHALL BE PLACED FACING TRAFFIC AT:

A. THE BEGINNING AND END OF LINE APPLICATION,
B. ALL SIDE AND CROSS ROADS, AND
C. MAXIMUM INTERVALS OF 1.6 km.

WHEN LANE LINE MARKINGS REQUIRE GREATER THAN A TWO MINUTE DRYING TIME, THE LANE FROM WHICH THE LINE MARKING MACHINE APPLIES LANE LINE MARKINGS SHALL BE CLOSED UNTIL THE LINE HAS DRIED TO A TOTALLY TRACK FREE CONDITION.

IMMOBILE OPERATIONS

WHEN LOADING MATERIAL, CLEANING OR PERFORMING OTHER OPERATIONS IN THE FIELD, EVERY EFFORT SHALL BE MADE TO HAVE ALL EQUIPMENT COMPLETELY OFF OF THE TRAVELED WAY. WHEN IT BECOMES NECESSARY TO ENTER UPON PRIVATE PROPERTY, PERMISSION SHALL BE OBTAINED IN ADVANCE. WHEN THE CONTRACTOR CANNOT REMOVE HIS EQUIPMENT FROM THE TRAVELED WAY ALL TRAFFIC CONTROL DEVICES ON THE VEHICLES SHALL BE IN OPERATION AND FLAGGERS AND VEHICLES SHALL BE STATIONED TO PROTECT THE WORK SITE AND THE TRAVELING PUBLIC.

TWO-WAY TRAFFIC SHALL BE MAINTAINED. FLAGGERS SHALL BE EQUIPPED IN ACCORDANCE WITH ITEM 614.03.

AUXILIARY MARKINGS

PAVEMENT PREPARATION AND PLACING OF AUXILIARY MARKINGS (SEE (3)) ARE CONSIDERED TO BE STATIONARY OPERATIONS AND TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH PLAN DETAILS, STANDARD CONSTRUCTION DRAWINGS AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD).

LAYOUT AND PREMARKING

THE VEHICLE USED IN LAYOUT AND PREMARKING SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING EQUIPMENT:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-31R-48) MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN, AND VISIBLE TO OPPOSING TRAFFIC.

NIGHTTIME OPERATION

NIGHTTIME OPERATION IS DEFINED TO INCLUDE THE TIME FROM ONE-HALF HOUR AFTER SUNSET TO ONE-HALF HOUR BEFORE SUNRISE , AND AT ANY OTHER TIME WHEN THERE ARE UNFAVORABLE ATMOSPHERIC CONDITIONS OR WHEN THERE IS NOT SUFFICIENT NATURAL LIGHT TO RENDER DISCERNIBLE PERSONS, VEHICLES, AND SUBSTANTIAL OBJECTS ON THE HIGHWAY AT A DISTANCE OF 305 m.

DURING NIGHTTIME CONDITIONS THE FOLLOWING TRAFFIC CONTROL SHALL BE PROVIDED:

1. CONES SHALL BE REFLECTORIZED OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY (SEE 7F-5, OMUTCD), AND
2. THE GUIDE AND SIDE-MOUNTED CARRIAGES SHALL BE ILLUMINATED.

THE PRESENCE OF HIGHWAY LIGHTING DOES NOT WAIVE THESE REQUIREMENTS.

MINIMUM PAVEMENT MARKING TRAFFIC CONTROL EQUIPMENT REQUIREMENTS

THIS TABLE INDICATES THE TRAFFIC CONTROL EQUIPMENT WHICH SHALL BE FURNISHED FOR EACH TYPE OF LONG LINE PAVEMENT MARKING OPERATION. IN ADDITION, THE TYPE OF TRAFFIC CONTROL EQUIPMENT WHICH SHALL BE FURNISHED WHEN DIRECTED BY THE ENGINEER IS INDICATED.

EQUIPMENT	PAVEMENT MARKING LINE TYPE (1)					
	CENTER LINE		EDGE LINE		LANE LINE (2) CHANNELIZING LINE (3)	
	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY
LEAD VEHICLE	A	A	C	C	C	C
POWER BROOM EQUIPMENT	B	B	A	A	B	B
LINE MARKING MACHINE	A	A	A	A	A	A
TRAIL VEHICLE	D	A	D	A	LANE CLOSURE REQUIRED (0.7 m CONES REQUIRED)	A
TRAIL VEHICLE (ADDITIONAL)	C	B	C	B		A
TRAIL VEHICLE (SIGN & CONE RETRIEVAL)	A	C	A	C		C
TRAIL VEHICLE (SHADOW FOR RETRIEVAL)	A	C	A	C		C

(1) FOR EQUIPMENT REQUIREMENTS FOR AUXILIARY MARKING OPERATIONS SEE THE PLANS AND PART 7, OMUTCD.

(2) INCLUDES BOTH DASHED AND SOLID LANE LINES.

(3) CHANNELIZING LINE SEGMENTS OF 61 m OR LESS SHALL BE CONSIDERED AUXILIARY MARKINGS, EXECPT WHEN APPLIED AS COMPONENTS OF GORE MARKINGS SPRAYED IN MOVING OPERATIONS SEPARATE FROM THE APPLICATION OF TRANSVERSE LINES.

A	REQUIRED EQUIPMENT
B	EQUIPMENT REQUIRED WHEN DIRECTED BY THE ENGINEER
C	NOT REQUIRED
D	REQUIRED EQUIPMENT FOR SIGN & CONE PLACEMENT

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

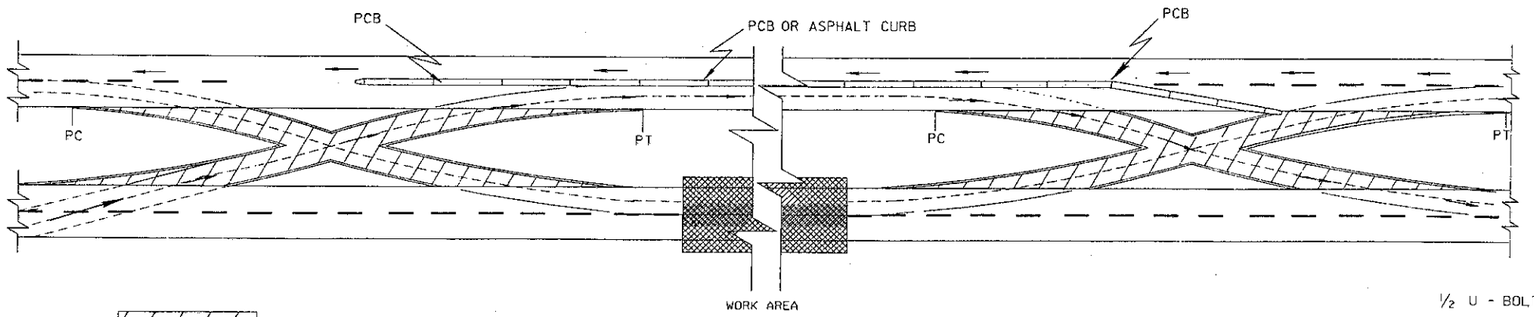
DATE 01/30/95

TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS

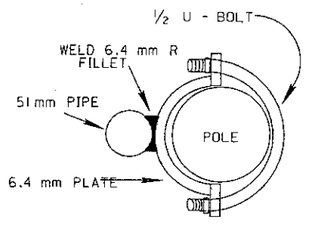
STANDARD CONSTRUCTION DRAWING MT-99.20M

APPROVED Roy J. Crump ENGR. OF DESIGN SERVICES

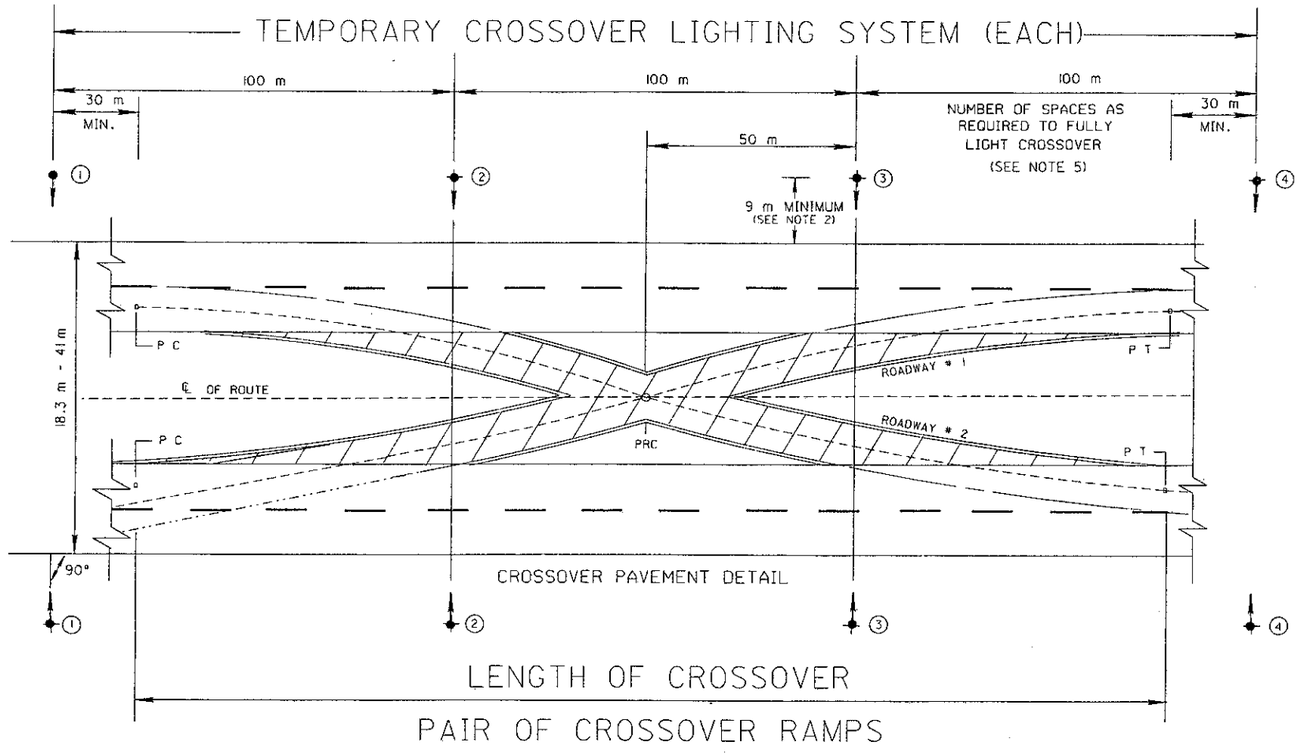
IF THE DISTANCE BETWEEN TWO ADJACENT CROSSOVER LIGHTING SYSTEMS IS LESS THAN 457 m INSTALL ADDITIONAL UNITS AS REQUIRED TO ACHIEVE FULL LIGHTING BETWEEN CROSSOVERS

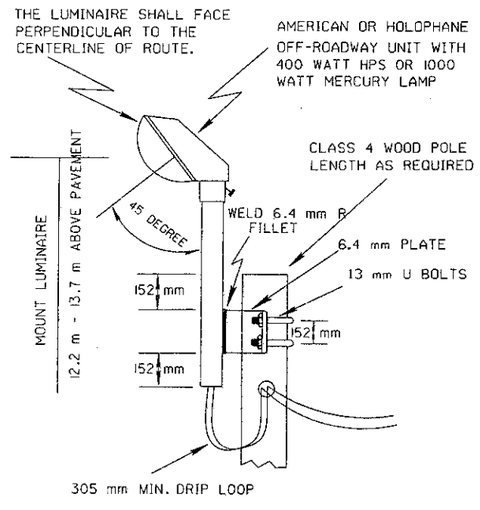


TEMPORARY PAVEMENT



TOP VIEW





SIDE VIEW
MOUNTING DETAIL

NOTES

1. ALL LIGHTING EQUIPMENT USED IN THIS INSTALLATION, SUCH AS LIGHTING CABLE, OR LUMINAIRES SHALL BE IN CONFORMANCE WITH SPECIFICATION ITEMS 625 AND 713. HOWEVER, THE PERFORMANCE TEST OF 625.22E AND THE WORKING DRAWING REQUIREMENTS OF 625.04 ARE WAIVED. USED EQUIPMENT IS ACCEPTABLE.

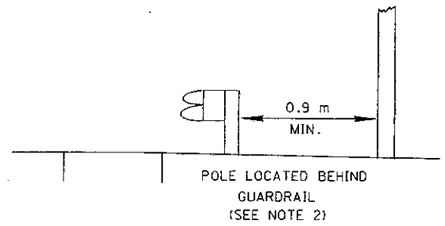
2. LIGHTING POLES NOT LOCATED BEHIND EXISTING GUARDRAIL SHALL BE SET BACK 12.2 m FROM EDGE OF THE NEAREST TRAFFIC LANE (INCLUDING ANY SHOULDER OR TEMPORARY PAVEMENT USED AS A TRAFFIC LANE). WHERE LOCAL CONDITIONS PREVENT THE 12.2 m SET BACK, IT MAY BE REDUCED TO 9 m WITH THE APPROVAL OF THE ENGINEER. WHEN LOCATED BEHIND EXISTING GUARDRAIL, LIGHT POLES SHALL BE A MINIMUM OF 0.9 m CLEAR FROM BACK OF GUARDRAIL POST TO FACE OF POLE. ANY POLES PROVIDED FOR POWER SERVICE SHALL BE SET BACK AT LEAST AS FAR AS THE LIGHTING POLES.

3. A PHOTOCELL SHALL TURN ON THE LIGHTING SYSTEM WHEN AMBIENT ILLUMINATION IS BELOW 32.3 lux.

4. ALL OVERHEAD WIRING SHALL BE #4 AWG MINIMUM. DOWN GUY ANCHORS SHALL BE PROVIDED AT BOTH ENDS OF OVERHEAD SPANS. ALL WIRING CROSSING THE ROADWAY SHALL HAVE A MINIMUM CLEARANCE OF 6.1 m.

5. LIGHTING UNITS WILL BE SPACED AT 100 m INTERVALS. THE FIRST 100 m SPACE CENTERED ON THE PRC AND ADDITIONAL 100 m SPACES AND PAIRS OF LIGHTS WILL BE ADDED IN EACH DIRECTION TO 30 m BEYOND THE PC OR PT.

6. THE WORK SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS ELECTRICAL ENERGY AND PAYMENT OF FEES NECESSARY TO ARRANGE AND INSTALL THE ELECTRICAL SERVICE, AND TO ERECT, MAINTAIN, OPERATE AND SUBSEQUENTLY REMOVE THE LIGHTING FOR EACH 614 "TEMPORARY CROSSOVER LIGHTING SYSTEM" FOR A PAIR OF CROSSOVER RAMPS. CONTINUOUS LIGHTING, IF REQUIRED, WILL BE INCLUDED IN THE ADJACENT CROSSOVER LIGHTING SYSTEMS.



METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE 04/25/94
TEMPORARY CROSSOVER LIGHTING SYSTEM	
STANDARD CONSTRUCTION DRAWING MT-100.00M	

APPROVED Greg L. Krieger 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 ERECTED. 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)

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC | DATE 04/25/94

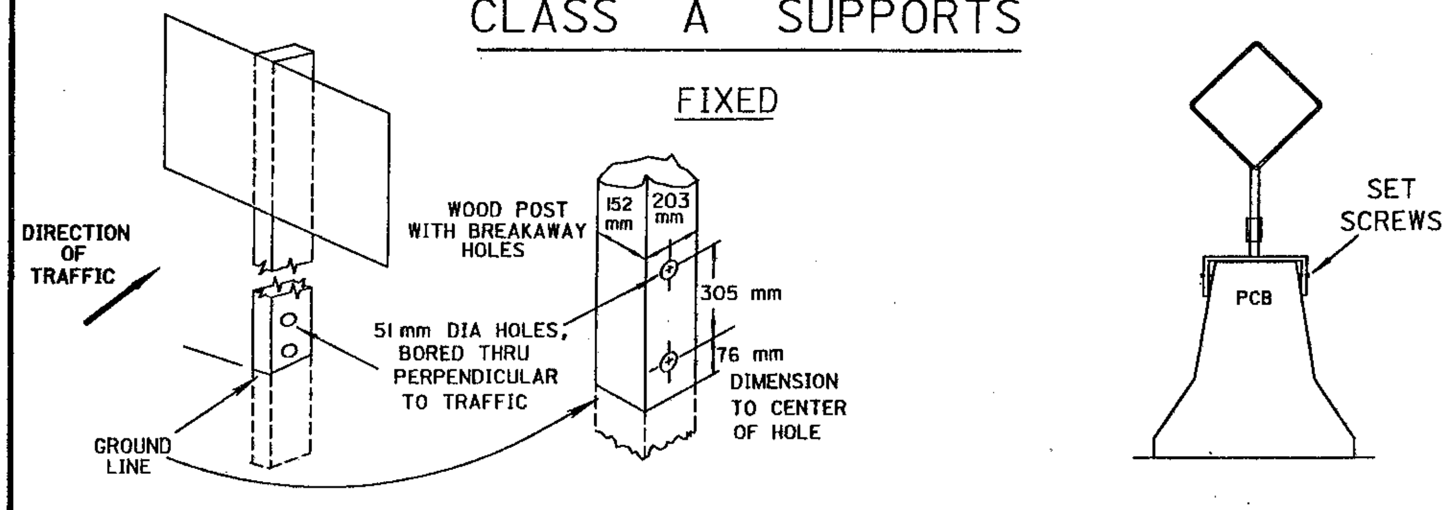
TEMPORARY SIGN SUPPORT

STANDARD CONSTRUCTION DRAWING MT-105.10M

APPROVED [signature] ENGR. OF DESIGN SERVICES

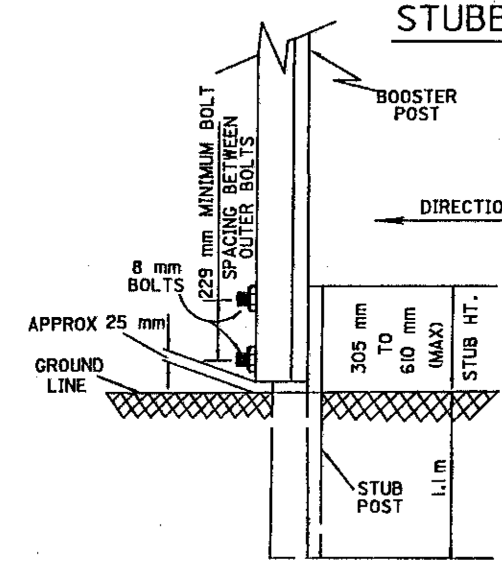
CLASS A SUPPORTS

FIXED



CLASS A SUPPORTS

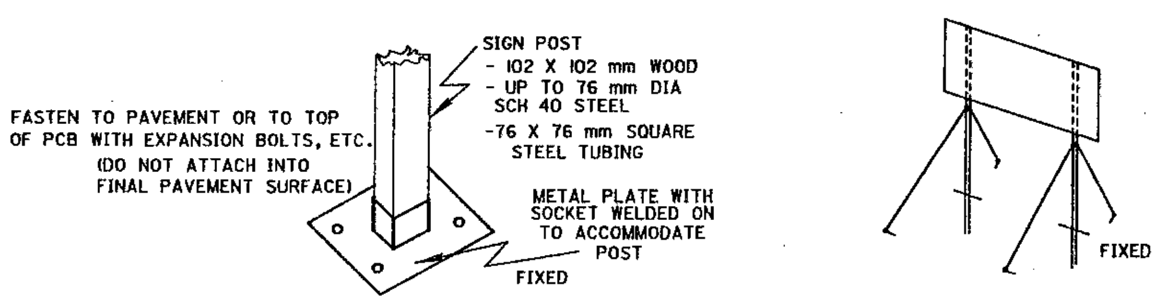
STUBBING STANDARD



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

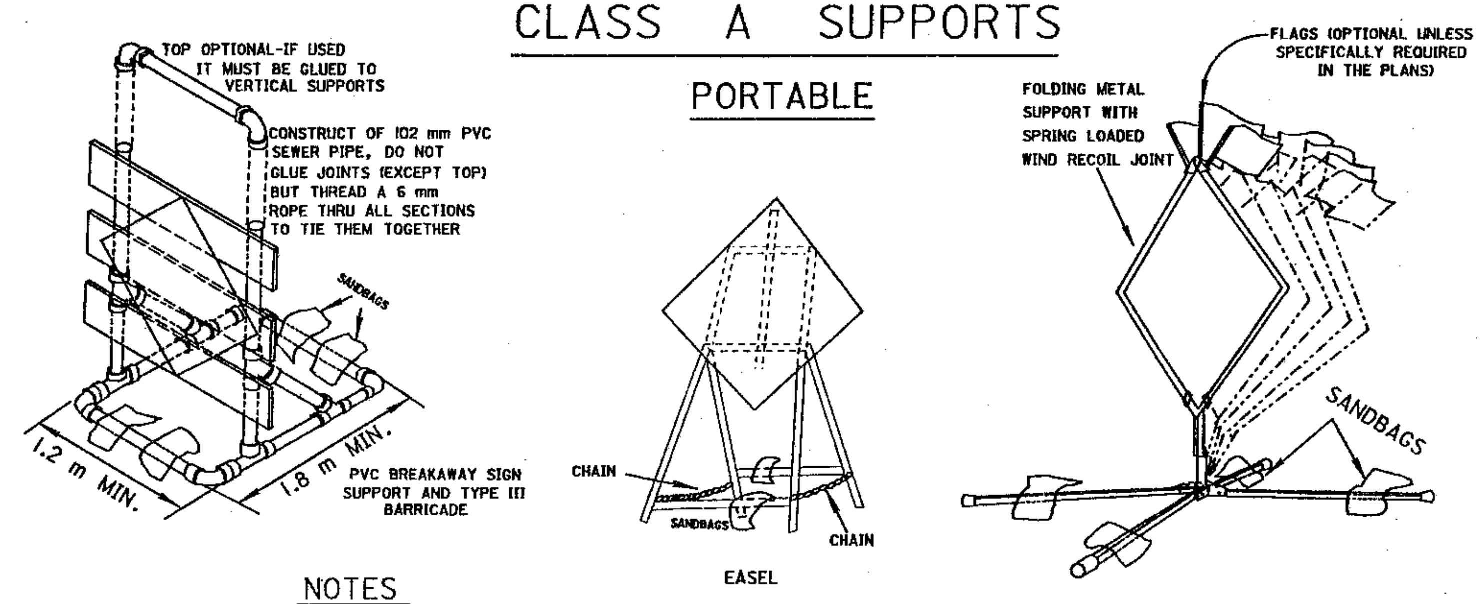
CLASS B SUPPORTS



ANY CLASS A SIGN POST WITH GUY WIRES ADDED TO INCREASE SIGN CARRYING ABILITY. (GUY WIRES SHALL NOT BE HEAVIER THAN 3.2 mm DIA. BRAIDED CABLE. GUY ANCHORS SHALL NOT EXTEND MORE THAN 152 mm ABOVE GROUND SURFACE).

CLASS A SUPPORTS

PORTABLE

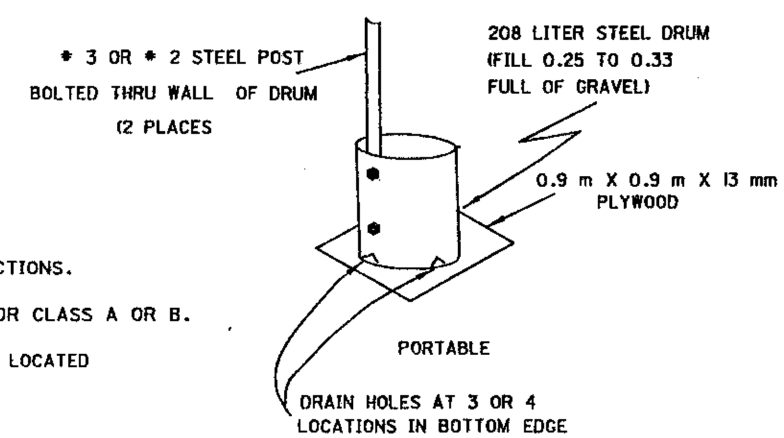


NOTES

RAL 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 SUFFICENT 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

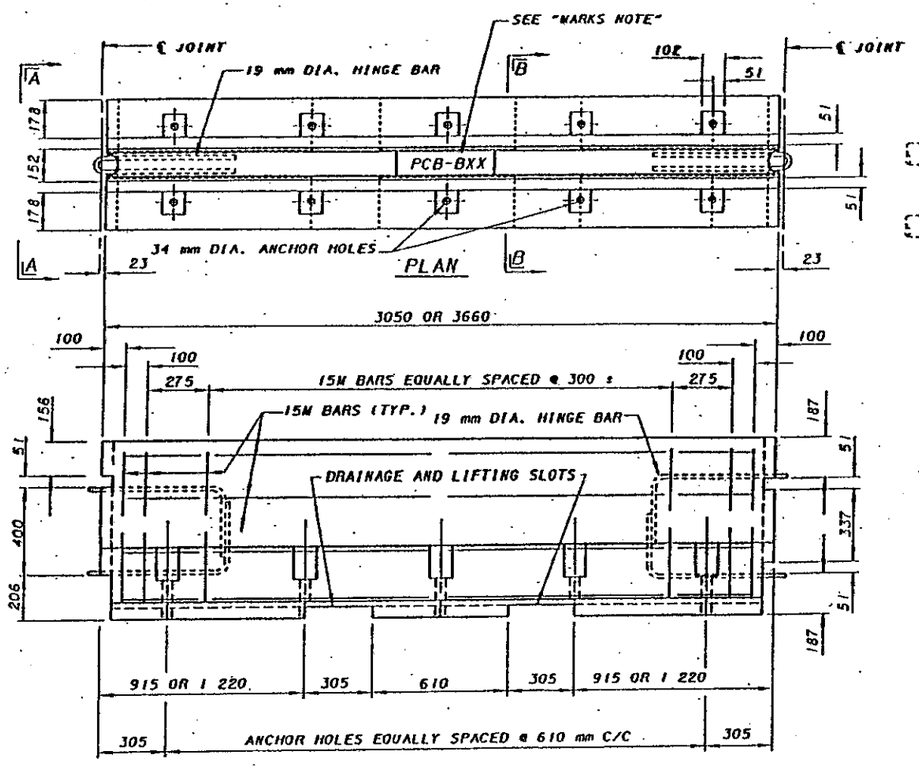


1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

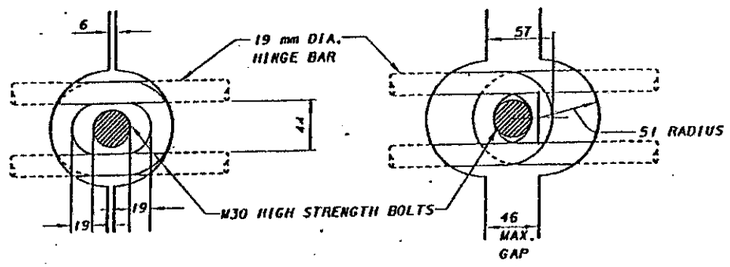
ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM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

METRIC

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 04/25/94
TEMPORARY SIGN SUPPORT	
STANDARD CONSTRUCTION DRAWING	MT-105.11M
APPROVED [signature] ENGR. OF DESIGN SERVICES	



ELEVATION



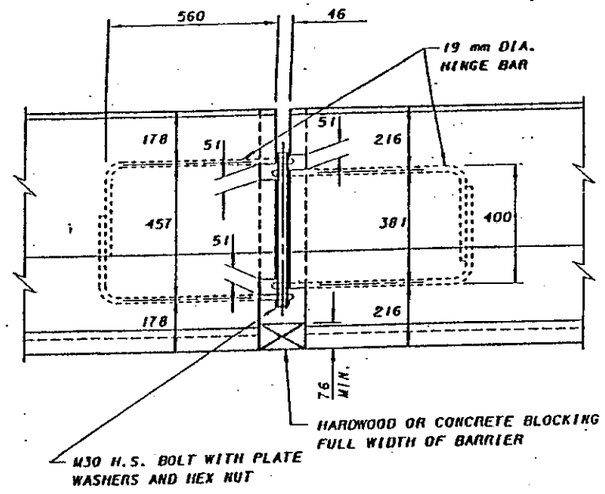
(1) CLOSED JOINT

(2) OPEN JOINT

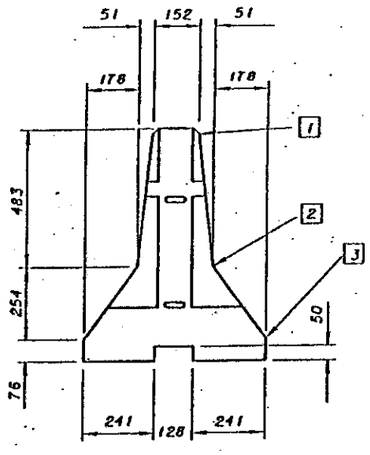
JOINT CONNECTION DETAILS

(1) BARRIER SHALL INITIALLY BE PLACED CLOSER TOGETHER SO BOLTS CAN BE EASILY INSERTED THROUGH HINGE BAR LOOPS.

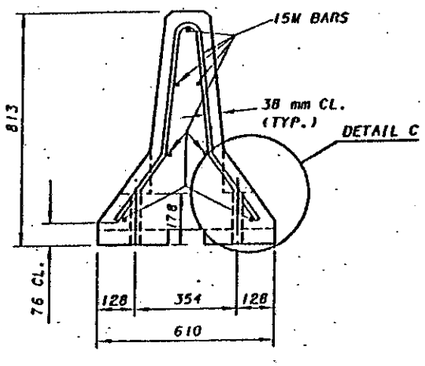
(2) BARRIER JOINTS SHALL BE FULLY OPEN BEFORE NUT IS TIGHTENED ONTO BOLT AND OPENING IS SNUGGLY BLOCKED.



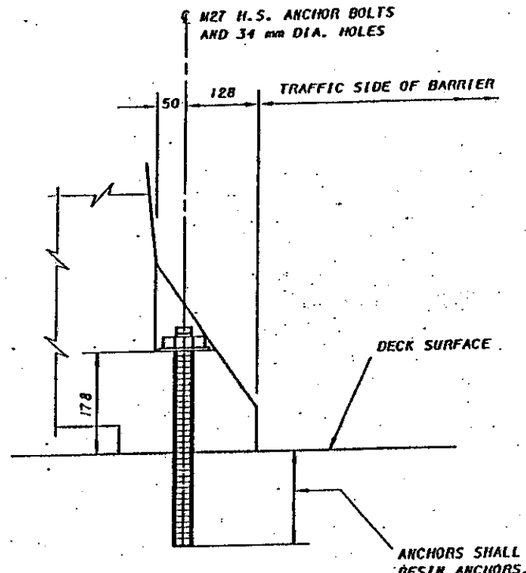
DETAIL AT HINGED CONNECTION



VIEW A-A



SECTION B-B



DETAIL C

ANCHORS SHALL BE THROUGH BOLTS OR APPROVED RESIN ANCHORS. WHEN RESIN ANCHORS ARE USED THEY MUST BE EMBEDDED A MINIMUM OF 165 mm INTO FIRM CONCRETE. WHEN NO LONGER NEEDED, ANCHORS SHALL BE REMOVED AS DIRECTED BY THE ENGINEER. WHERE DECK IS TO REMAIN, HOLES SHALL BE FILLED WITH AN EPOXY NON-SHRINK GROUT.

GENERAL NOTES

HARDWARE:
BOLTS, DECK ANCHORING BOLTS AND ALL NUTS AND WASHERS SHALL CONFORM TO ASTM A325M. THEY SHALL BE GALVANIZED IN ACCORDANCE WITH CMS 711.02.

REINFORCING STEEL:
ALL REINFORCING STEEL (INCLUDING THE 19 mm DIAMETER HINGE BARS) SHALL MEET THE REQUIREMENTS OF CMS 509.02. HINGE BARS SHALL BE GALVANIZED AFTER FABRICATION.

CONCRETE:
PORTABLE CONCRETE BARRIER SEGMENTS SHALL BE CONSTRUCTED OF CLASS C CONCRETE WITH A MINIMUM COMPRESSIVE STRESS OF 28 MPa.

BRIDGE DECK SURFACE PREPARATION:
THE SURFACE AREA ON WHICH THE PORTABLE CONCRETE BARRIER WILL REST SHALL BE CLEAR OF ALL LOOSE SAND, GRAVEL, DIRT AND DEBRIS.

ANY IRREGULARITIES IN THE BRIDGE DECK AREAS, UNLESS JUDGED BY THE ENGINEER TO BE INCONSEQUENTIAL, SHALL BE LEVELED WITH GROUT AND/OR ASPHALT.

ASPHALT ROLL ROOFING SHALL BE PLACED ON THOSE BRIDGE DECK AREAS, AS JUDGED BY THE ENGINEER, TO HAVE A SURFACE ROUGHNESS WHICH WOULD INHIBIT FRICTION CONTACT BETWEEN BARRIER SEGMENTS AND DECK.

MARKS:
ALL BARRIER SEGMENTS SHALL BE CLEARLY MARKED, WHERE "XX" IS THE YEAR IN WHICH THE BARRIER WAS CAST. EACH SHALL ALSO HAVE, ON IT'S TOP SURFACE, A UNIQUE IDENTIFICATION OF THE MANUFACTURER AND, SOMEWHERE ON THE BARRIER, THE DAY AND MONTH THE BARRIER WAS CAST.

ALL MARKINGS SHALL BE PERMANENTLY IMPRINTED ON THE BARRIER USING A MINIMUM OF 50 mm HIGH LETTERING.

HANDLING DEVICES MAY BE USED IN LIEU OF THE LIFTING SLOTS FOR MOVING THE BARRIER. THEY MAY BE OF ANY DESIGN SUFFICIENT TO HANDLE THE WEIGHT OF THE SECTION BEING LIFTED. NO REMAINING HANDLING DEVICES SHALL PROTRUDE ABOVE THE BARRIER SURFACE.

THE PROJECT PLANS SHALL INDICATE THE NUMBER OF ANCHORS PER SEGMENT, AS WELL AS THE BARRIER LOCATION ON THE BRIDGE DECK, AND ANY SPECIAL ANCHORAGE REQUIREMENTS.

[1] 25 mm RADIUS OR 19 mm CHAMFER, ALL TOP AND END CORNERS.

[2] PERMISSIBLE 250 mm RADIUS.

[3] PERMISSIBLE 25 mm RADIUS.

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

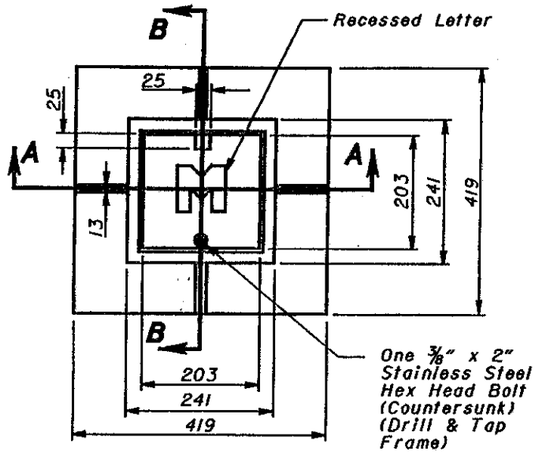
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Richard L. Engel
ENGINEER OF BRIDGES
5-28-98
DATE

DESIGNED	CHECKED	ADVISED
AJM	WTF/JS	LAW
DRAWN	PCB-91M	
GFI/TDB		

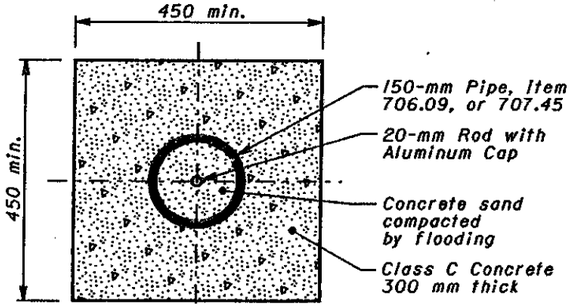
REVISIONS

STANDARD
PORTABLE CONCRETE BARRIER
DETAILS

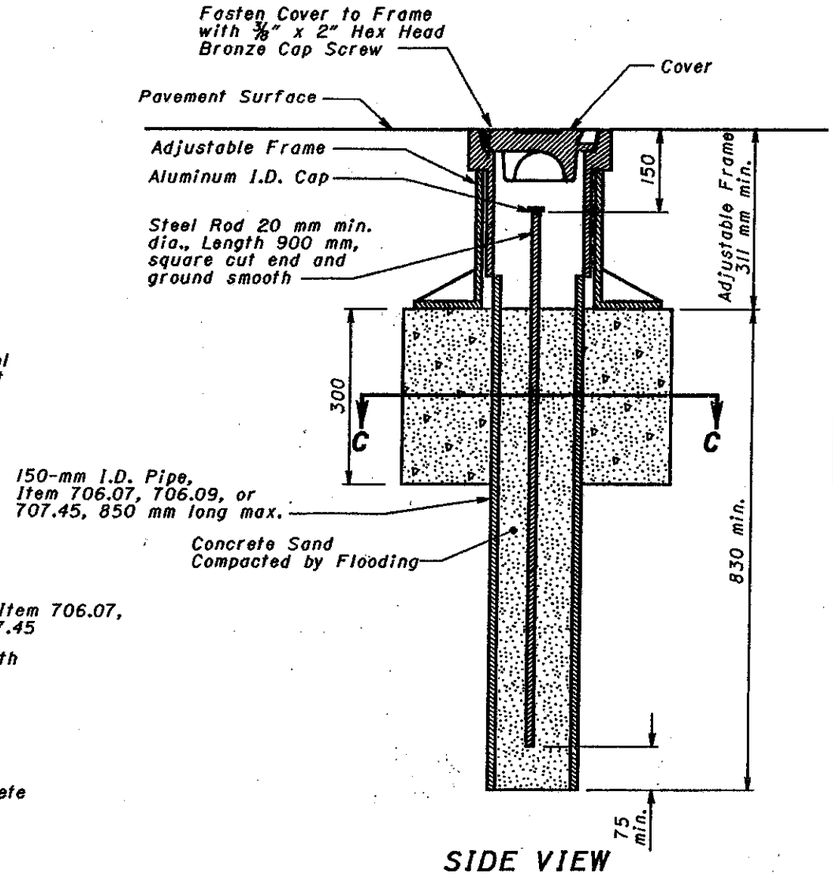
1 / 1



TOP VIEW

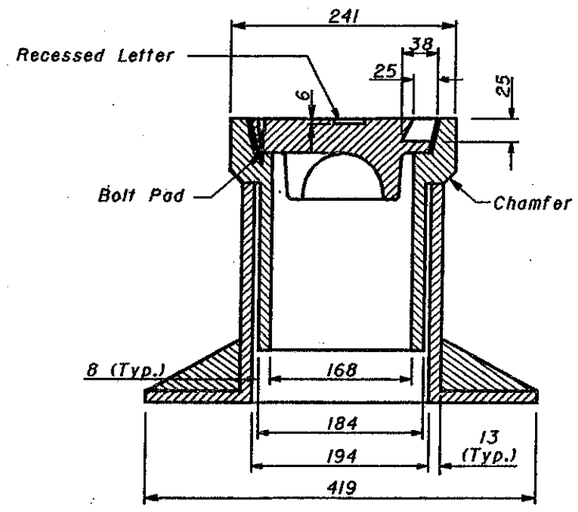


SECTION C-C



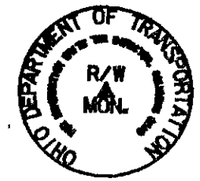
SIDE VIEW

SECTION A-A

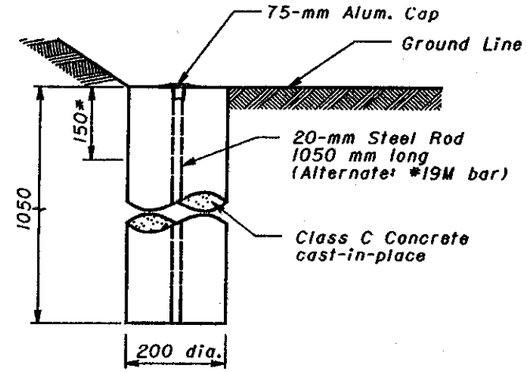


SECTION B-B

ADJUSTABLE CENTERLINE MONUMENT DETAILS



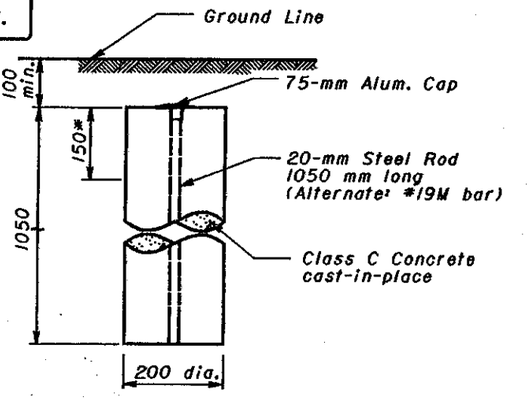
ALUMINUM CAP PLAN VIEW



RIGHT OF WAY MONUMENT DETAILS

* The upper 150 mm of the 1050 mm cast-in-place monument shall be formed.

ALUMINUM CAP PLAN VIEW



REFERENCE MONUMENT DETAILS

NOTES

The details and dimensions shown on the Monument Assembly drawing represent a direct conversion of the English dimensions to metric units. Existing products are currently manufactured solely in English units; therefore, the dimensions for the ⅜" x 2" hex head bolt were not converted to an equivalent metric size.

The aluminum identification cap shall be furnished and installed by ODOT.

The monuments shall be placed under the direction of a registered Surveyor and are to be set, as shown by the Highway Contractor at the time of construction. All alterations, with prior approval of the Ohio Department of Transportation, shall be noted and ODOT shall be notified of the new locations.

All dimensions are in millimeters unless otherwise noted.

metric units

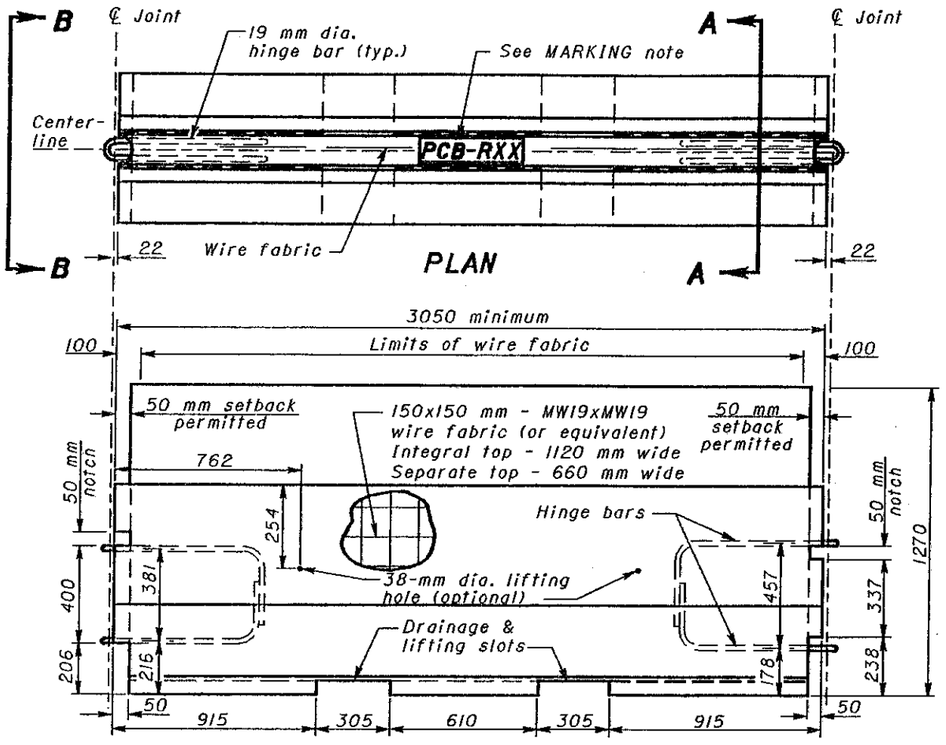
OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

ROADWAY ITEMS

DATE
6-30-95
4-8-97

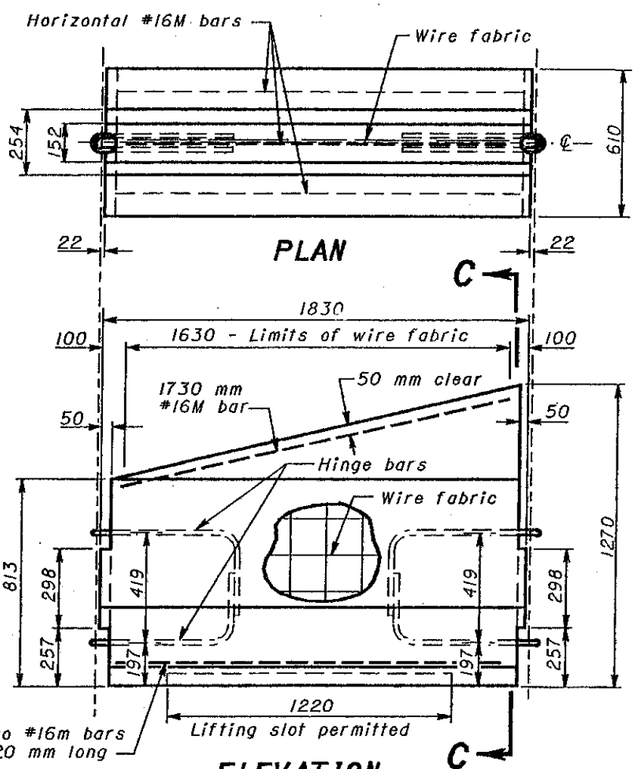
STANDARD CONSTRUCTION DRAWING **RM-1.1M**

APPROVED Gary F. Sutherland
ADMINISTRATOR



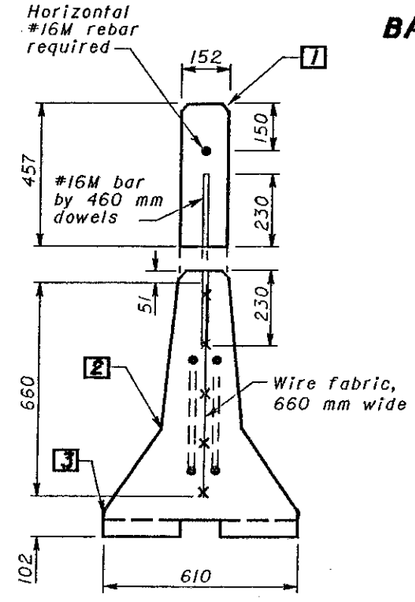
ELEVATION

BARRIER DETAILS



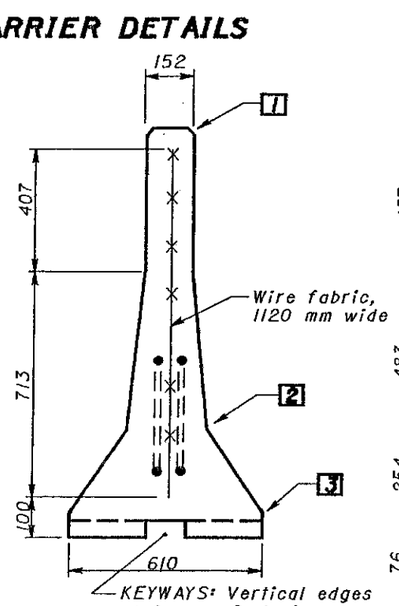
ELEVATION

1270-mm TRANSITION SECTION



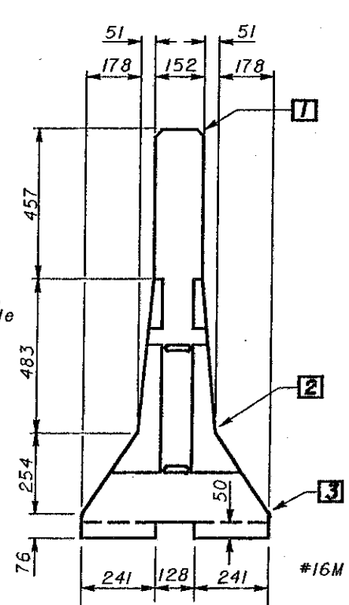
SECTION A-A

Separate Top

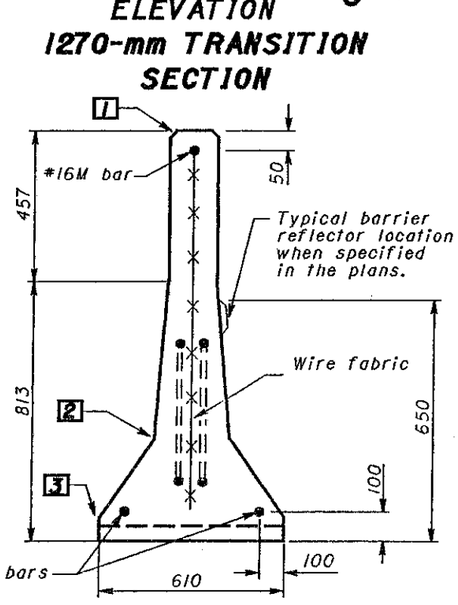


SECTION A-A

Integral Top



VIEW B-B



SECTION C-C

NOTES

PORTABLE CONCRETE BARRIER (PCB): PCB, as shown, shall not be used on bridge deck edges. PCB, Bridge Mounted, shall be used at such locations in accordance with the Office of Structural Engineering's Standard Drawing PCB-91M.

1270-mm PCB: The upper 457 mm of the barrier shall be constructed integrally with the bottom portion using wire fabric extending as shown throughout, or separately using #16M rebar dowels at maximum spacing of 915 mm. Start and end dowels 150 mm from barrier segment ends.

1270-mm TRANSITION SECTION: A 813-mm tapered end section or 813-mm PCB section (see SCD RM-4.2M) must be connected to the 813-mm end of the 1270-mm transition section.

WIRE FABRIC: Shall meet the requirements of CMS 709.10.

CONNECTING HARDWARE: Bolts, washers and hex nuts shall be galvanized after fabrication per CMS 711.02 and shall meet the requirements of CMS 711.09, except that the Rotational Capacity test specified in ASTM A 325M shall be waived.

In lieu of the pin and loop connections detailed on this SCD, barrier sections with "J-J Hooks" end connections may be utilized.

Transition barrier sections with pin and loop connections on one end and "J-J Hooks" on the other shall be used to connect runs of "J-J Hooks" barrier to other permited barrier types. The heights of the transition sections shall be the same as the barrier runs being connected.

"J-J Hooks" is a trademark of the Easi-Set Industries, P.O. box 300, Midland, VA 22728, (540) 439-8911 or (800) 547-4045.

HINGE AND REINFORCING BARS: The 19-mm hinge bars and #16M reinforcing bars shall meet the requirements of CMS 509.

HINGE BAR PLACEMENT: For placement, see "Detail at Hinged Connection" on SCD RM-4.2M. For open and closed joint connections of adjacent barriers, see "Joint Connection Details" on RM-4.2M.

HANDLING DEVICES: Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

MARKING: All barrier segments shall be marked as shown, where XX indicates the year cast. These markings shall be permanently impressed in the barrier using a minimum of 50-mm high lettering.

Each segment shall have, on its top, a unique identification as to its manufacturer and, somewhere on the barrier, the day and month that the barrier was manufactured.

See CMS 622 for additional information.

All dimensions are in millimeters unless otherwise noted.

metric units

LEGEND

1 — 25-mm Radius or 19-mm chamfer, all top and end corners.

2 — Permissible 250-mm radius.

3 — Permissible 25-mm radius.

This Drawing Replaces MC-9.1.

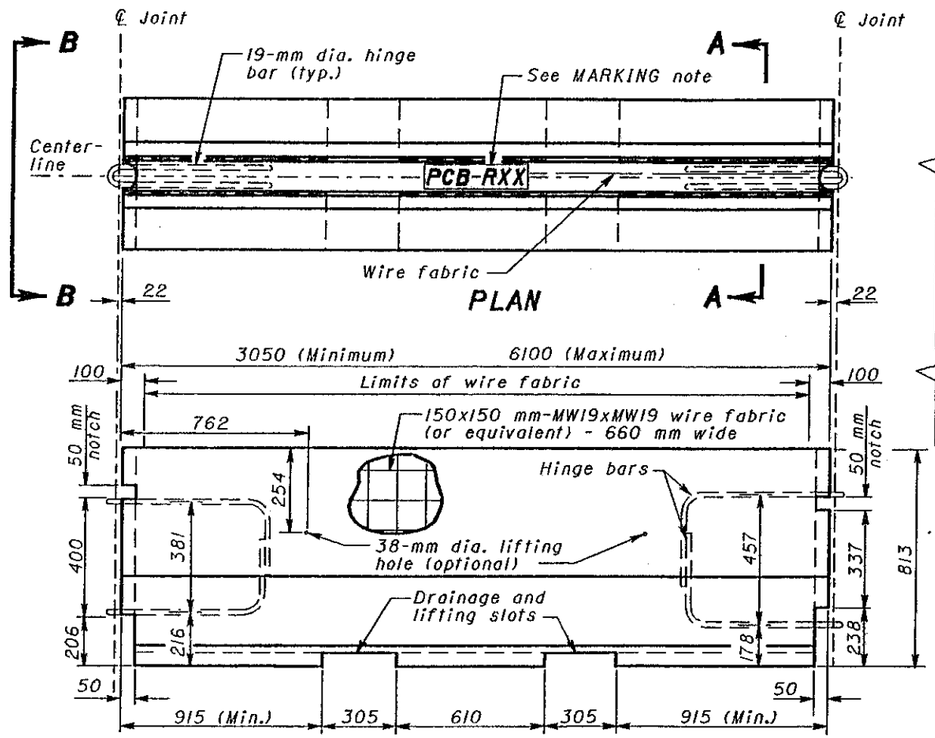
OHIO DEPARTMENT OF TRANSPORTATION

1270-mm PORTABLE CONCRETE BARRIER

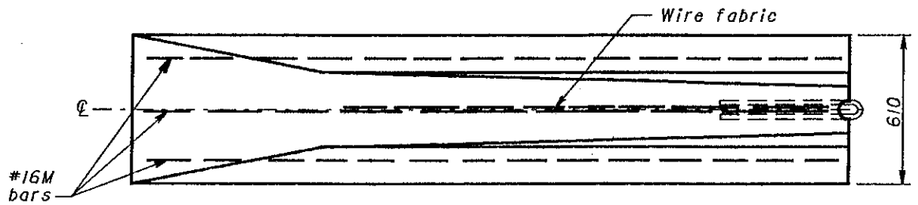
DATE: 6-30-95, 10-21-97

STANDARD CONSTRUCTION DRAWING **RM-4.1M**

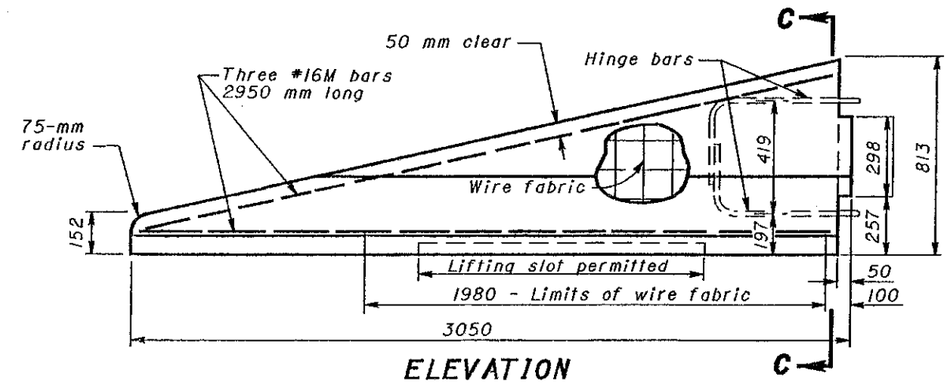
APPROVED Larry F. Sutherland



BARRIER DETAILS

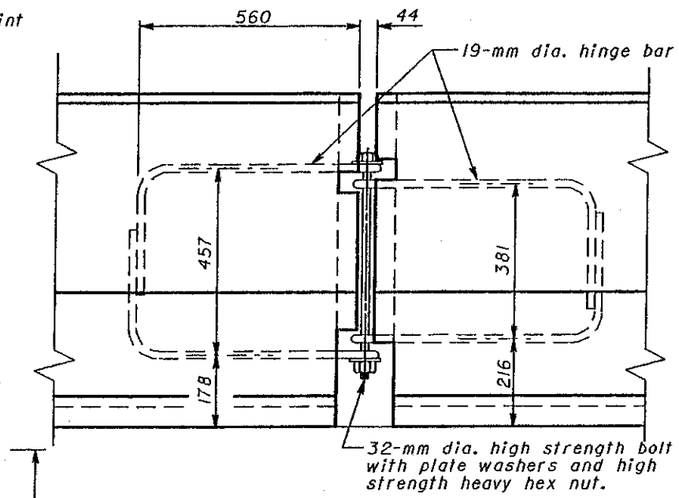


PLAN

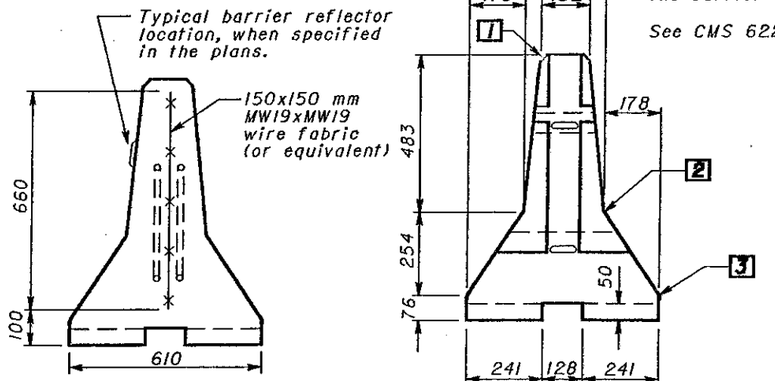


ELEVATION

TAPERED END SECTION DETAILS



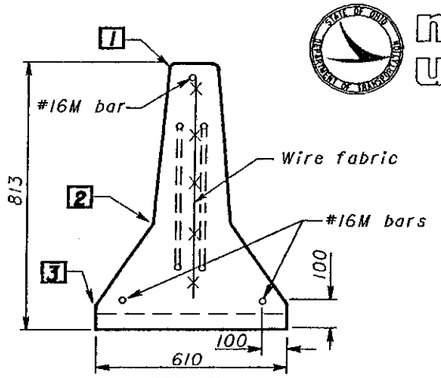
DETAIL AT HINGED CONNECTION



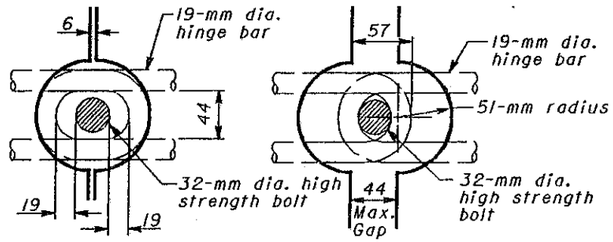
Vertical edges on keyway and drainage slots may be battered. Depth 50±6 mm.

SECTION A-A

VIEW B-B



SECTION C-C



CLOSED JOINT

Barriers shall initially be placed close together so that bolts can be easily inserted through hinge bar loop.

OPEN JOINT

Barrier joints shall be fully open before the nut is tightened onto bolt.

JOINT CONNECTION DETAILS

NOTES

PORTABLE CONCRETE BARRIER (PCB): PCB, as shown, shall not be used on bridge deck edges. PCB, Bridge Mounted, shall be used at such locations in accordance with the Office of Structural Engineering's Standard Drawing PCB-91M.

WIRE FABRIC: Shall meet the requirements of CMS 709.10.

CONNECTING HARDWARE: Bolts, washers and hex nuts shall be galvanized after fabrication as per CMS 711.02 and shall meet the requirements of CMS 711.09 except that the Rotational Capacity test specified in ASTM A 325M shall be waived.

In lieu of the pin and loop connections detailed on this Standard Construction Drawing, barrier sections with "J-J Hooks" end connections may be utilized.

Transition barrier sections with pin and loop connections on one end and "J-J Hooks" on the other shall be used to connect runs of "J-J Hooks" barrier to other permitted barrier types. The heights of the transition sections shall be the same as the barrier runs being connected.

"J-J Hooks" is a trademark of Easi-Set Industries, P.O. Box 300, Midland, VA 22728, (540) 439-8911 or (800) 547-4045.

HINGE AND REINFORCING BARS: The 19-mm hinge bars and #16M reinforcing bars shall meet the requirements of CMS 509.

HANDLING DEVICES: Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

MARKING: All barrier segments shall be marked as shown, where XX indicates the year cast. These markings shall be permanently impressed in the barrier using a minimum of 50-mm high lettering.

Each segment shall have, on its top, a unique identification as to its manufacturer and, somewhere on the barrier, the day and month that the barrier was manufactured.

See CMS 622 for additional information.

metric units

LEGEND

1. 25-mm radius or 19-mm chamfer, all top and end corners.
2. Permissible 250-mm radius.
3. Permissible 25-mm radius.

All dimensions are in millimeters unless otherwise noted.

This Drawing Replaces MC-9.2.

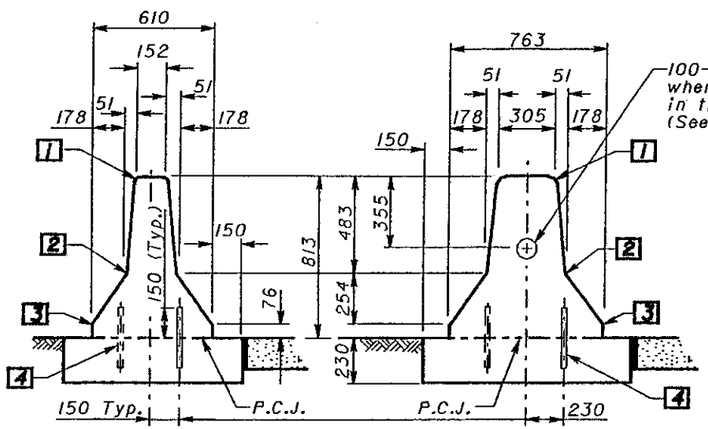
OHIO DEPARTMENT OF TRANSPORTATION

813-mm PORTABLE CONCRETE BARRIER

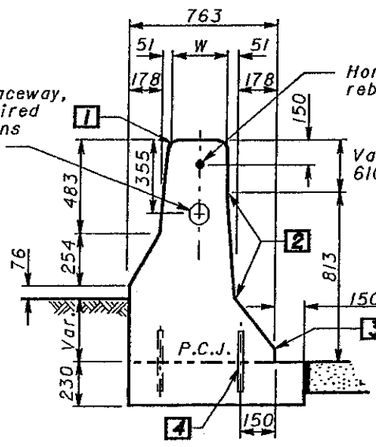
DATE: 6-30-95, 10-21-97

STANDARD CONSTRUCTION DRAWING **RM-4.2M**

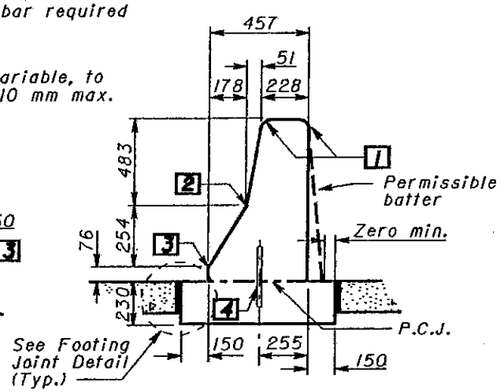
APPROVED Lanyt F. Sutherland



TYPE A TYPE B



TYPE C



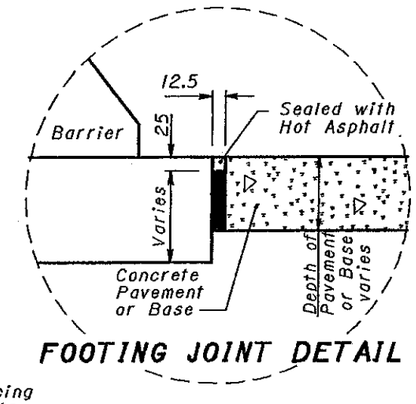
TYPE D

NORMAL SECTIONS

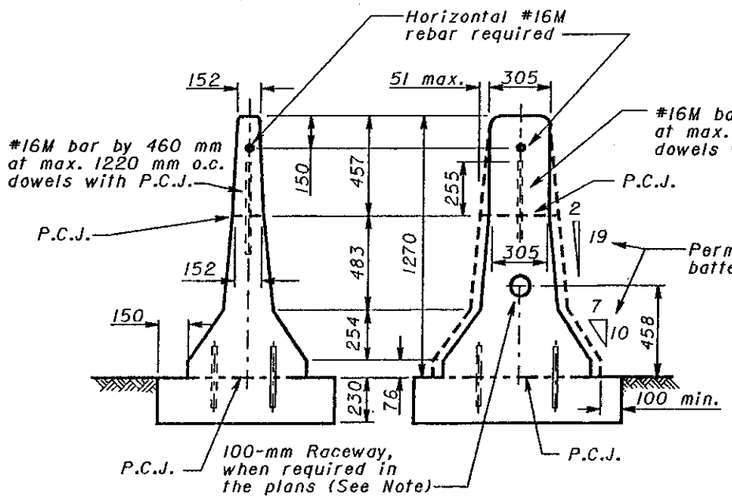
LEGEND

1. 25-mm radius or 19-mm chamfer.
2. Permissible 250-mm radius.
3. Permissible 25-mm radius.
4. #25M epoxy coated deformed steel bars, 305 mm long, spaced 1220 mm between successive bars on a staggered pattern except in Type D. Omit dowels when the top is constructed integrally with the base.

W = 152 or 305 mm barrier width, as specified in the plans.



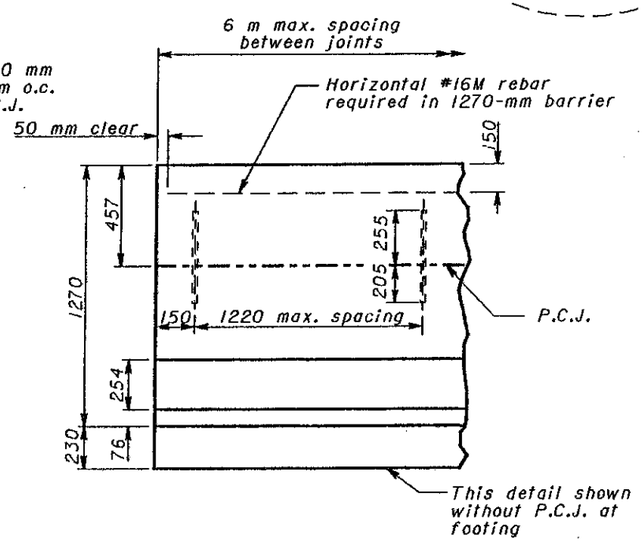
FOOTING JOINT DETAIL



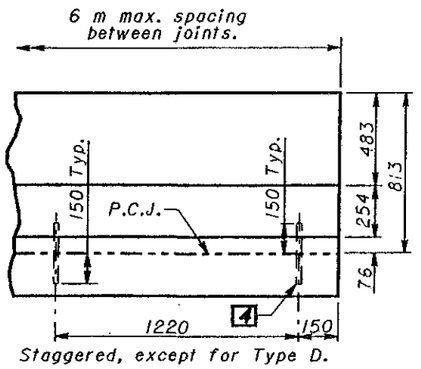
TYPE AI TYPE BI

1270-mm BARRIERS - TYPICAL SECTIONS

See Type A and Type B Normal Section Details for dimensions that are not shown.



1270-mm BARRIER



Staggered, except for Type D.

813-mm BARRIER

BARRIER ELEVATIONS

NOTES

JOINTS: Unsealed contraction joints spaced at 6 m maximum shall be constructed throughout the run of Concrete Barrier except that expansion joints shall be used at the center line of and around each bridge pier column and on either side of overhead sign supports, inlets and light pole foundations. If the inlet top is slip formed, the expansion joints adjacent to it may be omitted.

Contraction joints may be constructed with metal inserts inside the forms, preformed full width joint filler, a grooving tool, or by sawing. Inserts, tooled or sawed joints shall have a 75-mm minimum depth. All joints shall be constructed for the full height of the barrier including the footing. Sawing shall be done as soon as curing will allow, to prevent spalling.

FOOTING JOINTS: The vertical walls between the barrier footing and a concrete pavement or concrete base shall be provided with a sealed joint as shown. Sealing material shall conform to CMS 705.04.

P.C.J. - Permissible Construction Joint

MEASUREMENT: Item 622, Concrete Barrier, including transitions and pier sections detailed on SCD RM-4.4M, is paid for in meters as one of the four types (A, B, C or D) or as Type AI and BI, (for 1270 mm high barrier), with appropriate deductions for other items such as:

Item 604 I-3 Median inlet	6 meters.
Item 625 Light pole foundation or pullbox	1 meter.
Item 630 Overhead sign support foundation	3 meters.
Item 630 Barrier wall assembly	3 meters.

1270-mm BARRIER: High barrier shall be built in locations specified in the plans. Construct the lower 813 mm of the barrier base using the same dimensions as shown in the corresponding Normal Section. The upper 457 mm may be constructed integral with the bottom, or separately with #15M rebar dowels at 1220 mm maximum spacing. Start and end dowels 150 mm from barrier contraction joints.

RACEWAY: The contractor shall ensure that the electrical raceway is clear of internal obstructions. Cost of the 100 mm polyvinyl chloride raceway and No. 10 AWG copper-clad or aluminum-clad wire if needed for future installation of circuits shall be included in the unit cost per meter for Item 622, Concrete Barrier.

STATION MARKING: Marking shall be impressed in the "green" concrete on both sides at the top of the barrier if specified the plans, which cost shall be incidental to the unit cost per meter bid for Item 622, Concrete Barrier.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces MC-9.3.

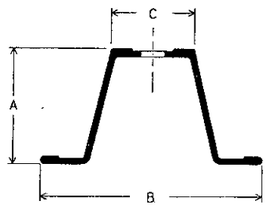
OHIO DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIERS

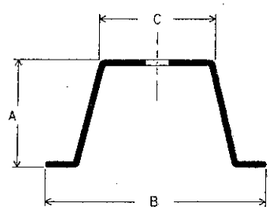
DATE 6-30-95 10-21-97

STANDARD CONSTRUCTION DRAWING **RM-4.3M**

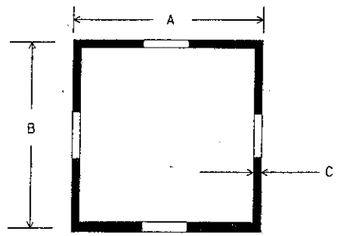
APPROVED Gary F. Sheffield



TYPE P

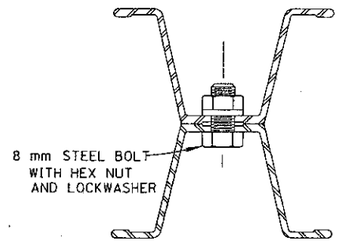


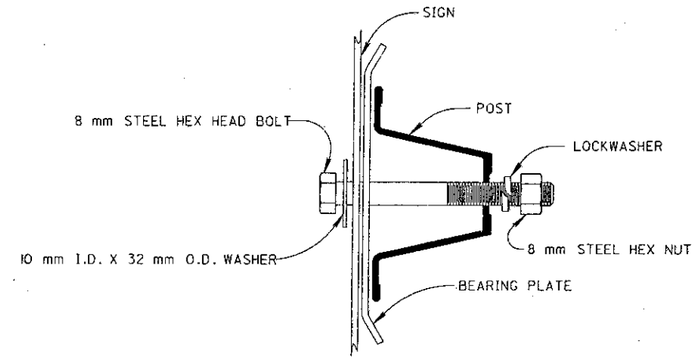
TYPE F



TYPE S

POST NO.	TYPE	Kg/m	POST DIMENSIONS MILLIMETERS A	B	C	ANCHOR DIMENSIONS A	B	C	NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
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

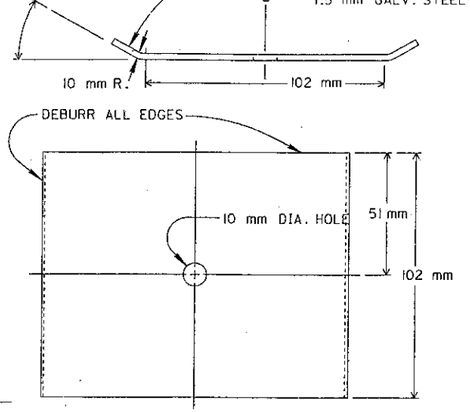




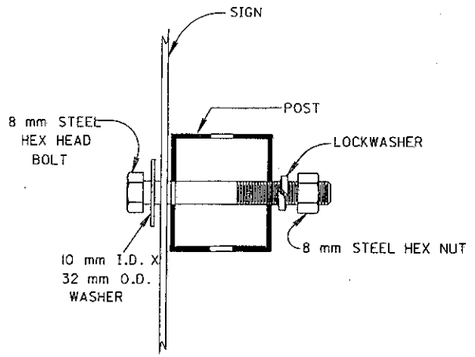
U - CHANNEL
SIGN ATTACHMENT DETAIL

NOTES

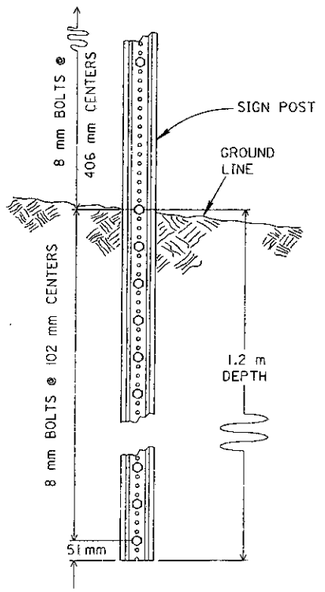
1. NUMBER 4 TYPE P AND F POST, AND NUMBER 6 TYPE P AND F POST, SHALL ONLY BE INSTALLED IN PROTECTED LOCATIONS (e.g. BEHIND GUARDRAIL). TWO POST INSTALLATIONS OF NUMBER 4 TYPE S POST SHALL BE INSTALLED IN PROTECTED LOCATIONS.
2. USE OF ANCHOR BASE WITH SQUARE POST IS OPTIONAL.
3. SQUARE POST MAY HAVE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



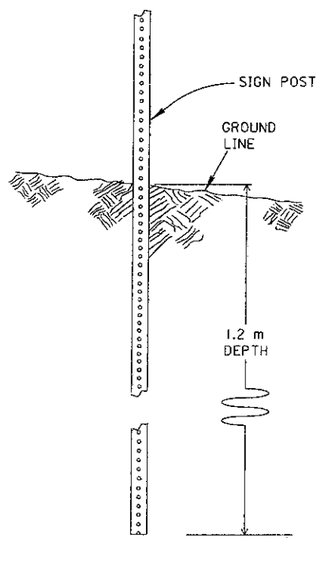
BEARING PLATE



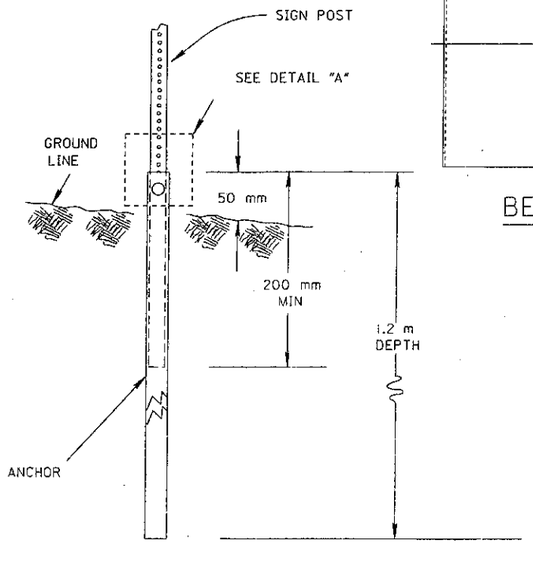
SQUARE POST
SIGN ATTACHMENT DETAIL



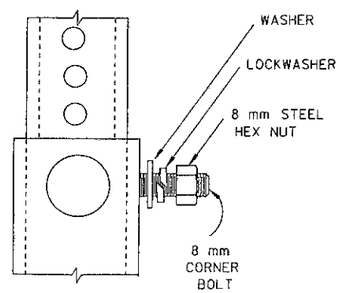
TYPICAL U - CHANNEL
DRIVEN INSTALLATION



TYPICAL SQUARE POST
DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR
BASE INSTALLATION



DETAIL "A"

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

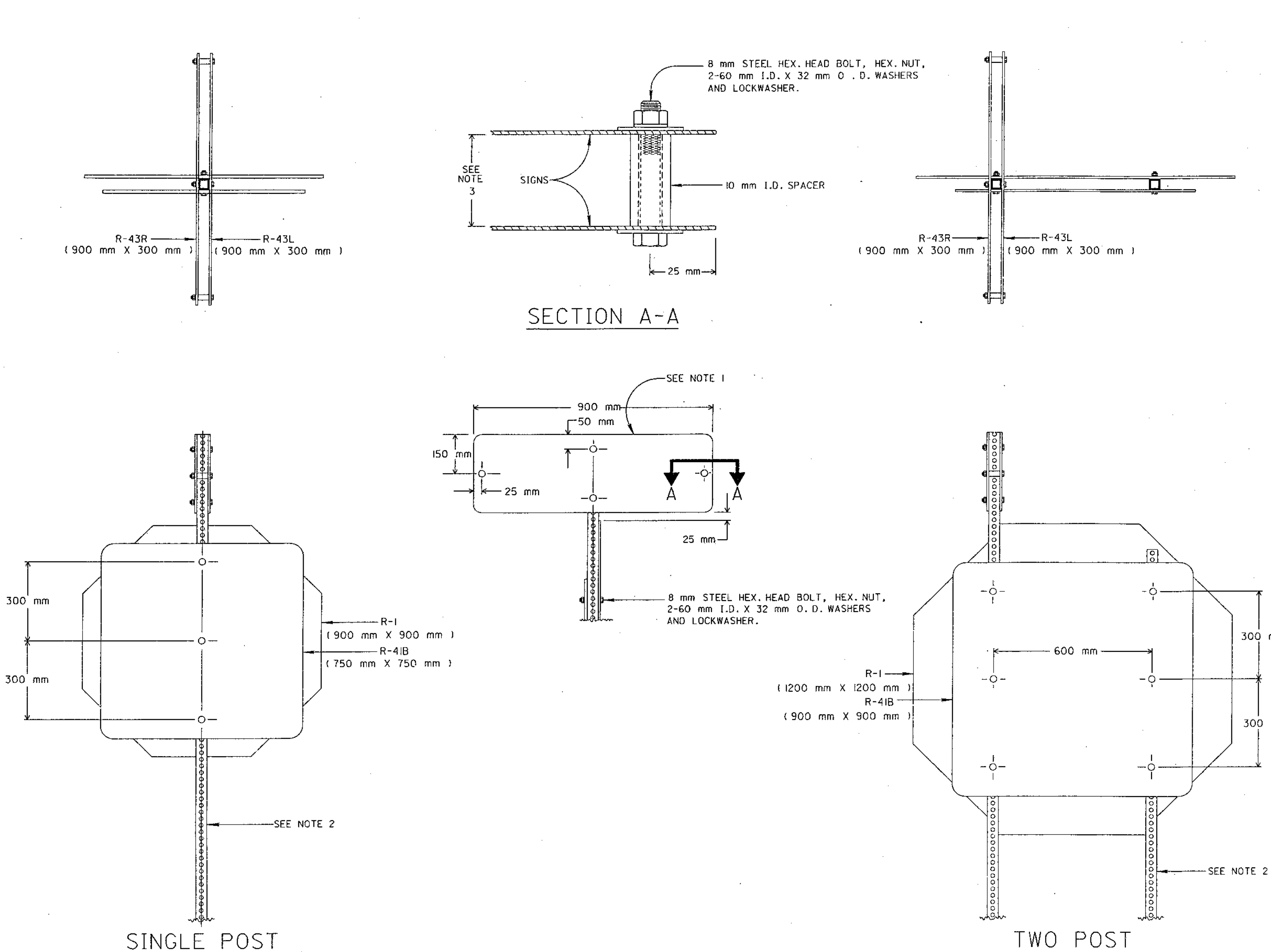
DATE 07/01/94

YIELDING POST

STANDARD CONSTRUCTION DRAWING TC-41.20M

APPROVED _____ ENGR. OF DESIGN SERVICES

WCC



NOTES

1. IN SPECIAL SITUATIONS, A 1200 mm X 450 mm R-43L(R) SIGN MAY BE USED IN LIEU OF THE 900 mm X 300 mm R-43L(R) SIGN.
2. ALL SUPPORTS SHALL BE SQUARE TUBULAR STEEL.
3. LENGTH OF SPACER SHALL BE EQUAL TO POST SIZE.
4. FOR POST(S) INSTALLATION DETAILS, SEE STANDARD DRAWING TC-41.20M.

METRIC

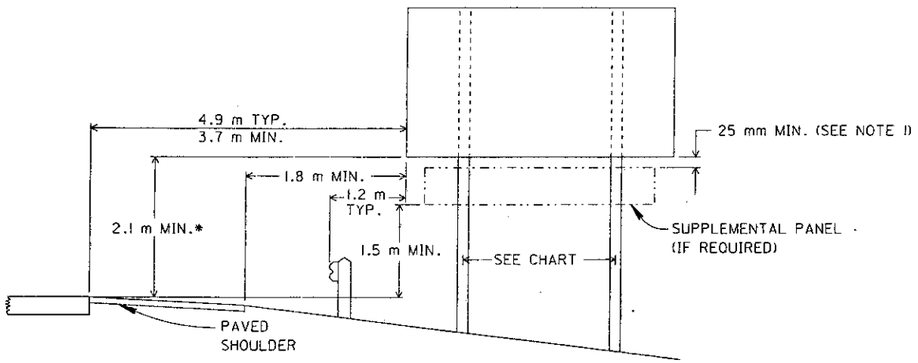
BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE 07/01/94
" ONE WAY " SIGN SUPPORT DETAILS	
STANDARD CONSTRUCTION DRAWING TC-41.50M	

APPROVED [signature] ENGR. OF DESIGN SERVICES

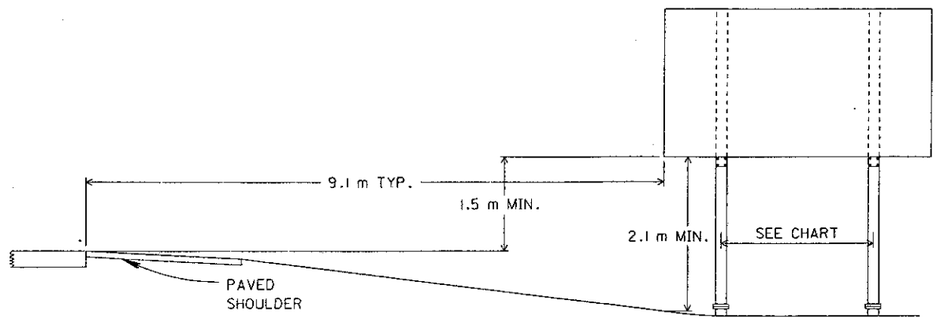
WCC

FREEWAYS AND EXPRESSWAYS

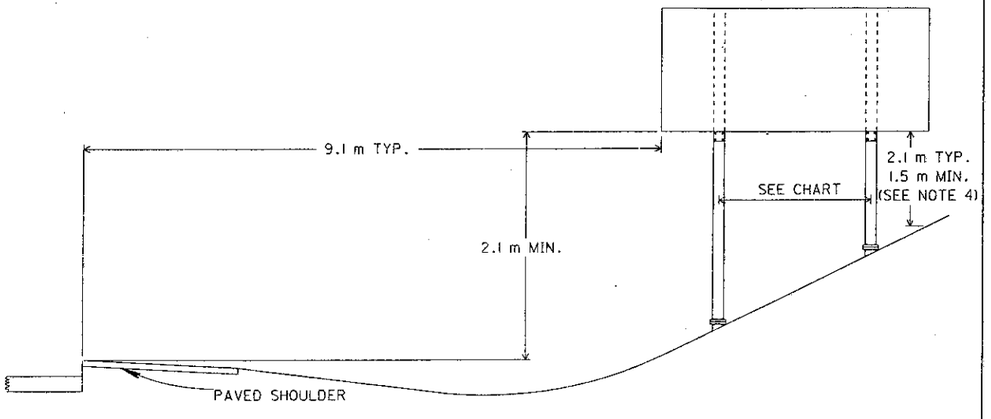


TYPICAL INSTALLATION WITH GUARDRAIL

* 2.4 m MIN. WITH SUPPLEMENTAL PANEL

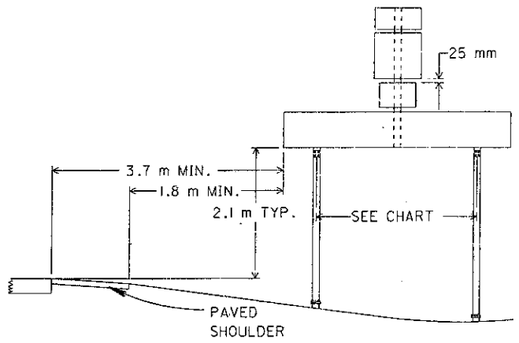


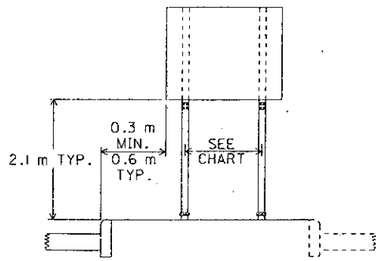
TYPICAL INSTALLATION, FILL SECTION, 9.1 m OFFSET



TYPICAL INSTALLATION, CUT SECTION, 9.1 m OFFSET

STREETS-RAMPS-HIGHWAYS

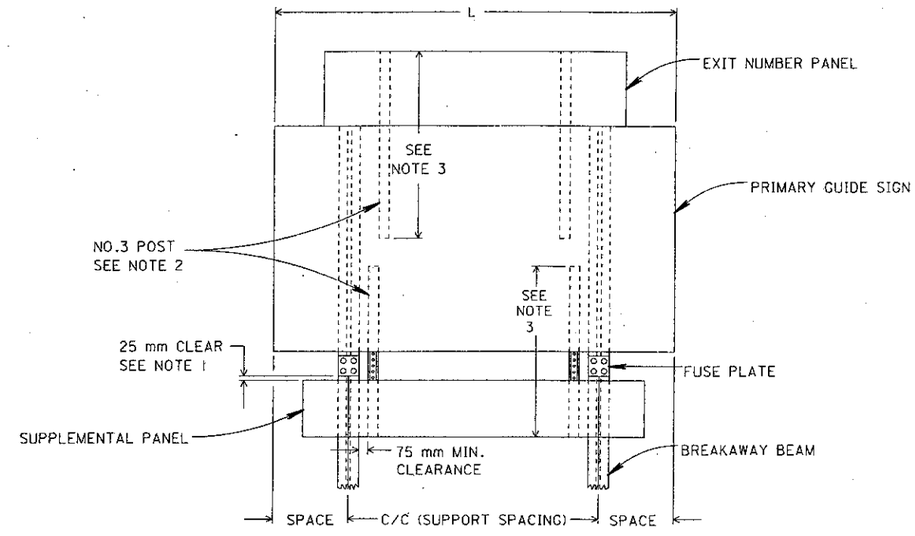




CURB SECTION

NOTES

1. SUPPLEMENTAL PANELS SHALL BE MOUNTED 25 mm BELOW THE FUSE PLATE ON BREAKAWAY BEAM INSTALLATIONS AND 25 mm MINIMUM BELOW THE GUIDE SIGN WHEN THE SIGN SUPPORTS ARE RIGID BEAMS.
2. NO. 3 POST SHALL BE ATTACHED TO BOTH THE GUIDE SIGN AND THE EXIT NUMBER OR OTHER SUPPLEMENTAL PANELS BY MOUNTING CLIPS FASTENED ALTERNATELY AT EACH HORIZONTAL EXTRUSION AND BOTH SIDES AT THE TOP AND BOTTOM OF THE POSTS. NO CONNECTIONS SHALL BE MADE BETWEEN THE SUPPLEMENTAL PANEL AND BREAKAWAY BEAMS.
3. LENGTH OF POST SHALL BE 2.5 TIMES THE HEIGHT OF THE SUPPLEMENTAL PANEL. THE POST SPACING SHALL BE AS PER THE SUPPORT SPACING CHART.
4. USE 1.5 m MINIMUM IF BACK SLOPES ARE GREATER THAN 3 TO 1.



SUPPLEMENTAL PANEL ATTACHMENT

SUPPORT SPACING CHART

2 SUPPORTS				3 SUPPORTS				
L (meters)	SPACING (meters) SPACE	C/C	SPACE	L (meters)	SPACING (meters) SPACE	C/C	C/C	SPACE
1.5	0.33	0.84	0.33	6.0	0.40	2.60	2.60	0.40
1.8	0.40	1.00	0.40	6.3	0.55	2.60	2.60	0.55
2.1	0.46	1.18	0.46	6.6	0.70	2.60	2.60	0.70
2.4	0.52	1.36	0.52	6.9	0.85	2.60	2.60	0.85
2.7	0.59	1.52	0.59	7.2	1.00	2.60	2.60	1.00
3.0	0.65	1.70	0.65	7.5	1.00	2.75	2.75	1.00
3.3	0.72	1.86	0.72	7.8	1.05	2.85	2.85	1.05
3.6	0.50	2.60	0.50	8.1	1.10	2.95	2.95	1.10
3.9	0.65	2.60	0.65	8.4	1.15	3.05	3.05	1.15
4.2	0.80	2.60	0.80					
4.5	0.95	2.60	0.95					
4.8	1.05	2.70	1.05					
5.1	1.10	2.90	1.10					
5.4	1.20	3.00	1.20					
5.7	1.23	3.24	1.23					

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

DATE 03/31/94

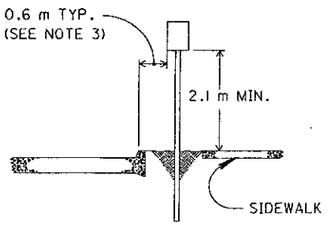
TYPICAL SIGN PLACEMENT
GUIDE SIGNS

STANDARD CONSTRUCTION DRAWING

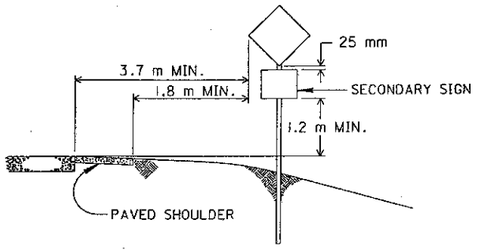
TC-42.10M

APPROVED _____ ENGR. OF DESIGN SERVICES

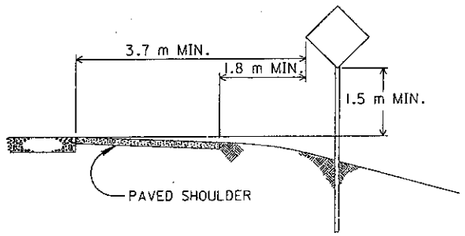
WCC



URBAN-RESIDENTIAL AND BUSINESS



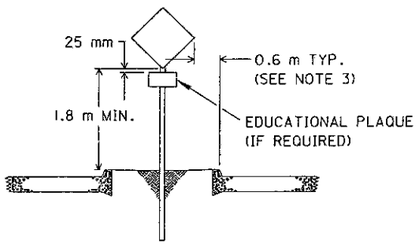
RURAL
W/SECONDARY SIGN



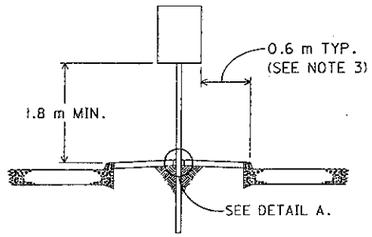
RURAL

NOTES

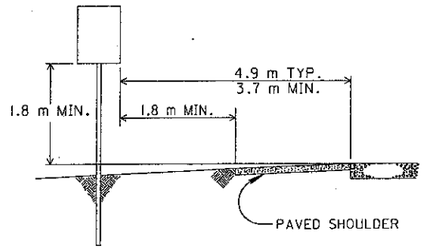
1. SEE DRAWING TC-41.20M FOR DETAILS ON YIELDING SUPPORTS.
2. ALL SIGNS SHALL BE PLACED 90° TO THE ROADWAY, EXCEPT PARKING SIGNS WITH ARROW SHALL BE SET AT AN ANGLE OF NOT LESS THAN 30° NOR MORE THAN 45° WITH A LINE PARALLEL TO THE FLOW OF TRAFFIC.
3. A CLEARANCE OF 0.3 m IS PERMISSIBLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
4. SEE DRAWINGS TC-52.10M AND TC-52.20M FOR DIMENSIONS BETWEEN SUPPORTS.



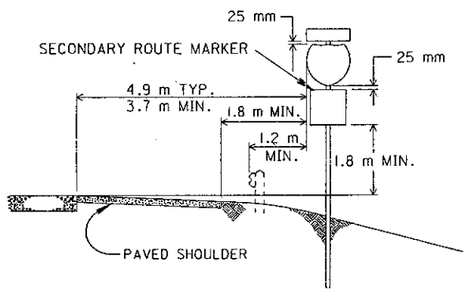
MEDIAN



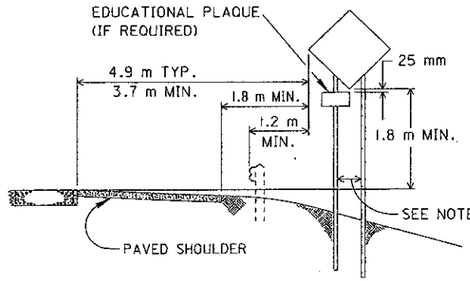
PAVED MEDIAN



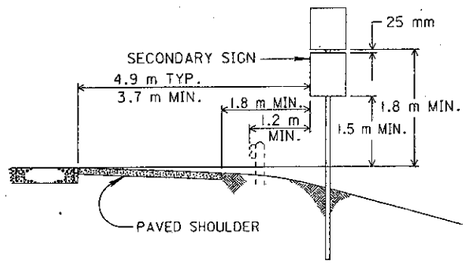
MEDIAN-EXPRESSWAY OR FREEWAY



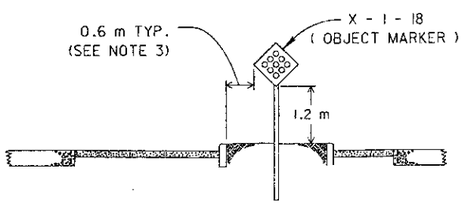
EXPRESSWAY OR FREEWAY
W/SECONDARY SIGN



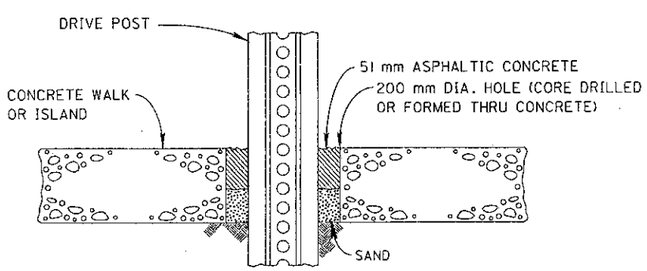
EXPRESSWAY OR FREEWAY



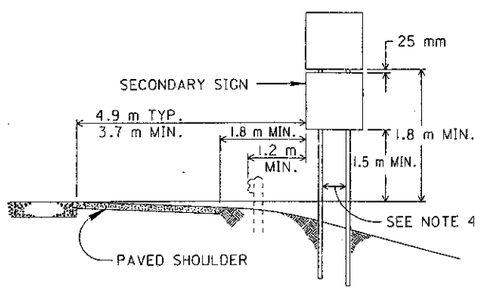
EXPRESSWAY OR FREEWAY
W/SECONDARY SIGN



EXPRESSWAY OR FREEWAY



DETAIL A.



EXPRESSWAY OR FREEWAY
W/SECONDARY SIGN

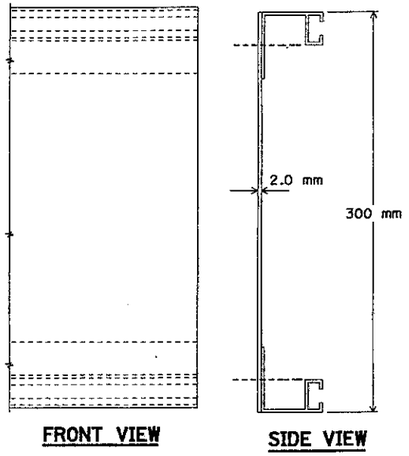
METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE 03/31/94
TYPICAL SIGN PLACEMENT REGULATORY, WARNING AND ROUTE MARKER SIGNS	
STANDARD CONSTRUCTION DRAWING TC-42.20M	
APPROVED _____ ENGR. OF DESIGN SERVICES	

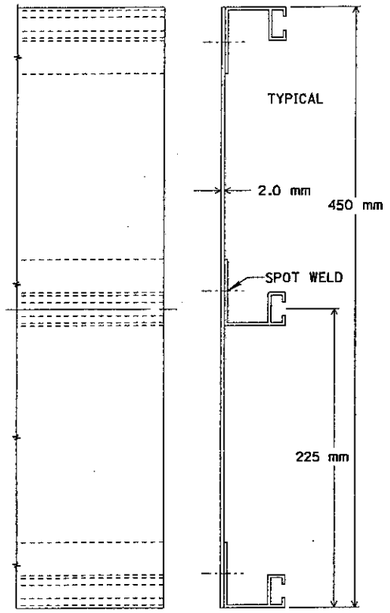
WCC

300 mm BOLTED EXTRUSHEET PANEL



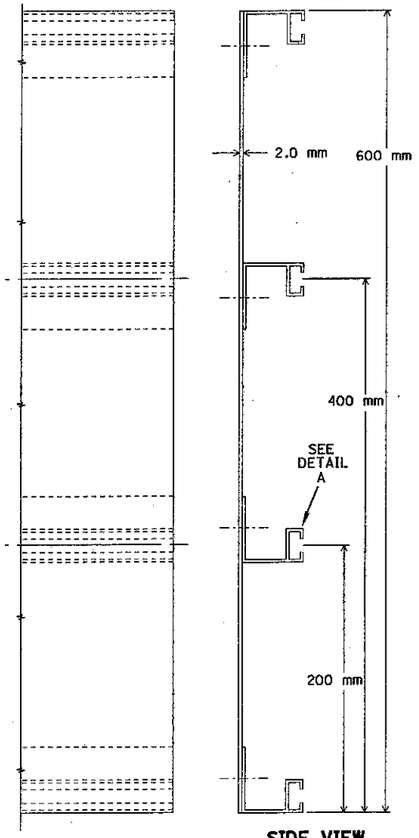
FRONT VIEW SIDE VIEW

450 mm BOLTED EXTRUSHEET PANEL

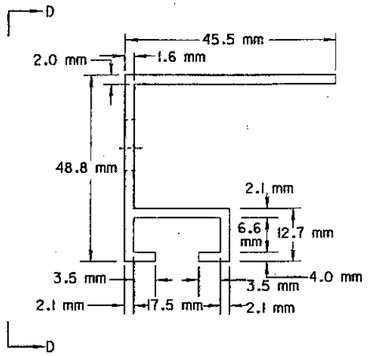


FRONT VIEW SIDE VIEW

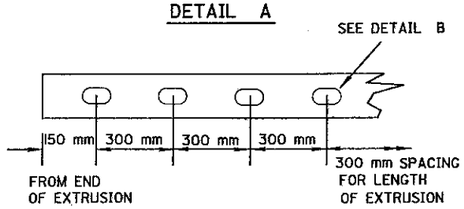
600 mm BOLTED EXTRUSHEET PANEL



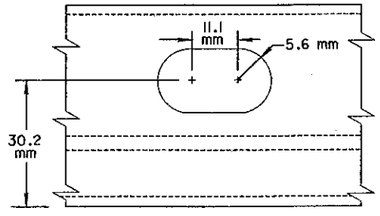
FRONT VIEW SIDE VIEW



DETAIL A



SECTION D-D

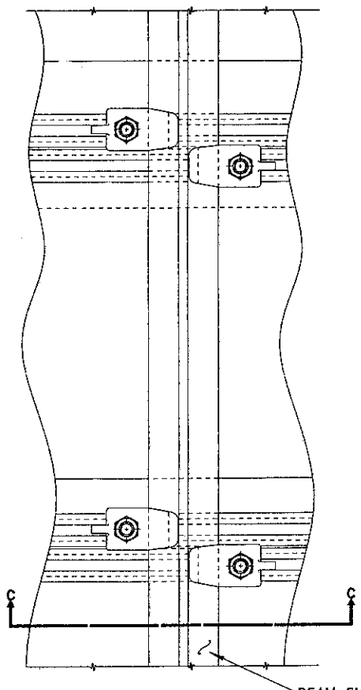


DETAIL B

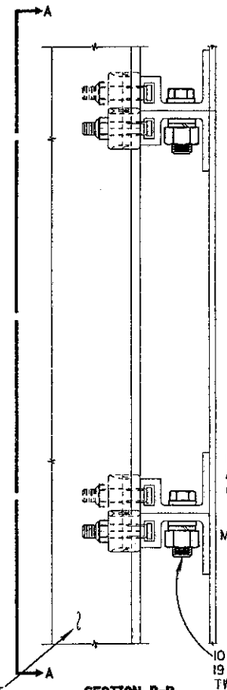
NOTES

1. COMBINATIONS OF 300 mm, 450 mm AND 600 mm PANELS SHOULD BE USED TO ATTAIN REQUIRED SIGN HEIGHT. 750 mm, 900 mm, 1050 mm, 1200 mm PANEL HEIGHTS ARE ALLOWED, BUT THEIR USE IS NOT REQUIRED.
2. THE PANELS SHALL BE ERECTED HORIZONTALLY AND BOLTED ON 600 mm CENTERS.
3. THE PANELS SHALL BE FASTENED TO EACH VERTICAL SUPPORT MEMBER WITH MOUNTING CLIPS; ALTERNATELY AT EACH HORIZONTAL EXTRUSION; BOTH SIDES AT EACH JOINT, AND BOTH SIDES AT TOP AND BOTTOM EDGES OF SIGNS.
4. FOR THE 150 mm GLARE SHIELD EXTRUSHEET PANEL, CHANGE THE 300 mm DIMENSION IN THE 300 mm BOLTED EXTRUSHEET PANEL DETAIL TO 150 mm. ALL OTHER DETAILS ARE THE SAME.
5. SPOT WELDS SHALL BE SPACED AT A MAXIMUM OF 100 mm CENTER TO CENTER.

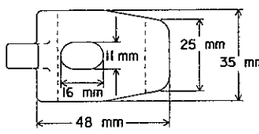
PANEL HEIGHT (MILLIMETERS)	NO. OF STIFFENERS
150	2
300	2
450	3
600	4
750	4
900	5
1050	6
1200	7



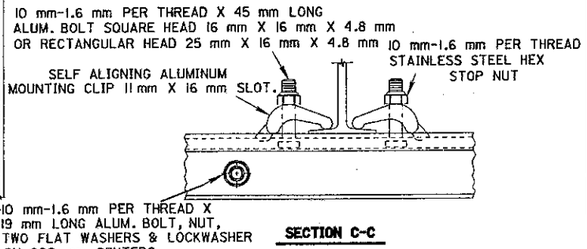
SECTION A-A



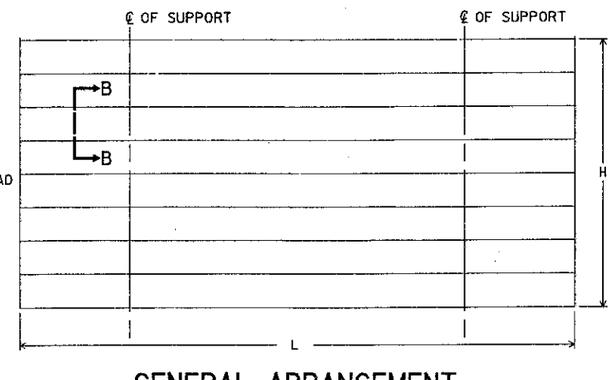
SECTION B-B



CLIP DETAIL



SECTION C-C



GENERAL ARRANGEMENT

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

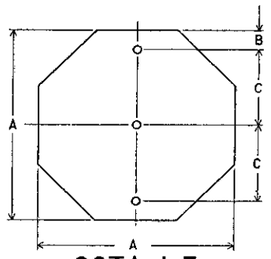
DATE 09/30/94

ALUMINUM BOLTED-EXTRUSHEET PANEL SIGN

STANDARD CONSTRUCTION DRAWING TC-51.11M

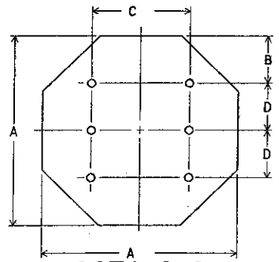
APPROVED _____ ENGR. OF DESIGN SERVICES

WCC



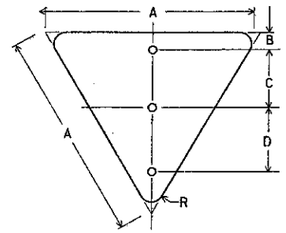
OCTA-1-3

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



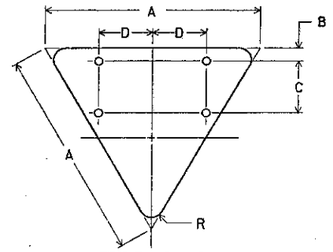
OCTA-2-6

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



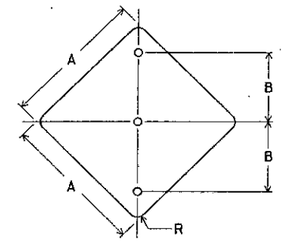
TRI-1-3

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



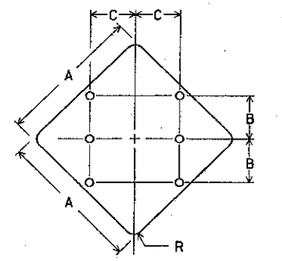
TRI-2-4

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



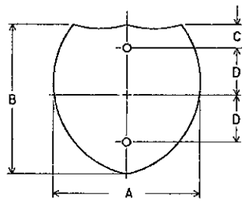
DIA-1-3

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



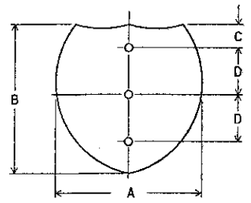
DIA-2-6

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



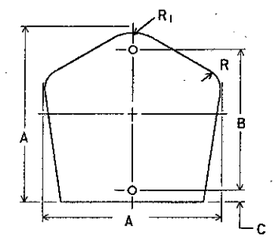
I.S.-1-2

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



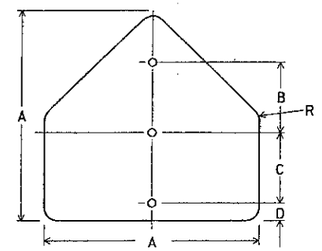
I.S.-1-3

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



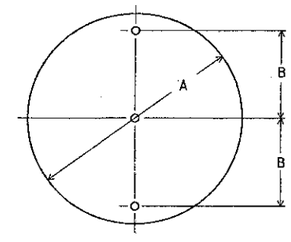
CO-1-2

A	B	C	R_1	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



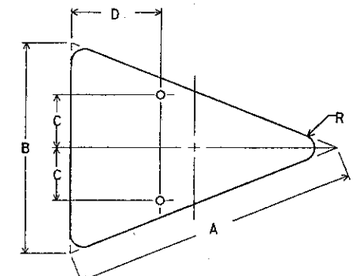
PENT-1-3

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

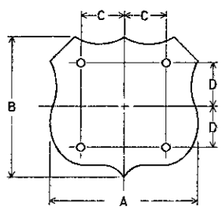


ISOS-1-2

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

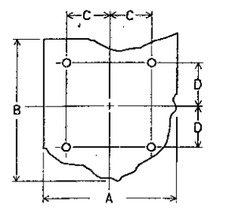
ROUTE SHIELDS

(FOR GUIDE SIGNS ONLY)



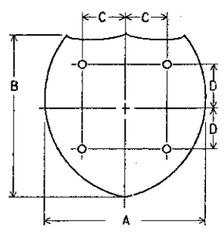
M-1C-

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

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 DRAWING.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

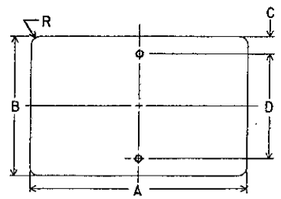
DATE 07/29/94

SIGN BLANK DETAILS I

STANDARD CONSTRUCTION DRAWING TC-52.10M

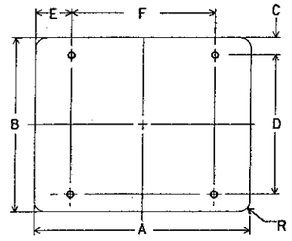
APPROVED _____ ENGR. OF DESIGN SERVICES

WCC



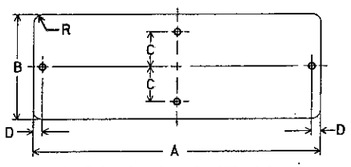
H-REC-1-2

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



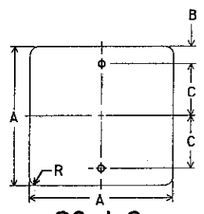
H-REC-2-4

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



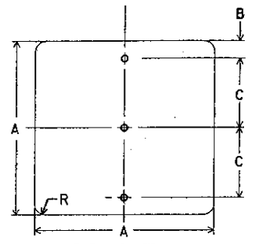
H-REC-1-4 (ONE WAY)

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



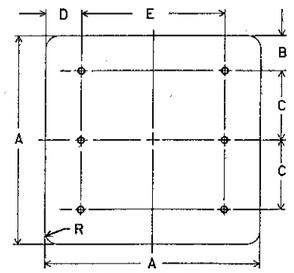
SQ-1-2

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

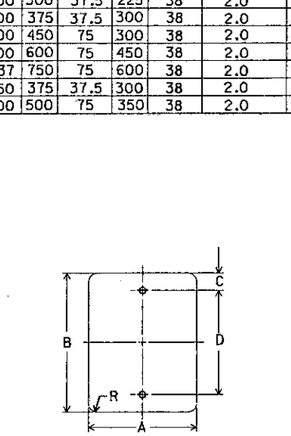
A	B	C	R	THICKNESS	m^2
750	75	300	48	2.0	0.56
900	150	300	57	2.0	0.81



SQ-2-6

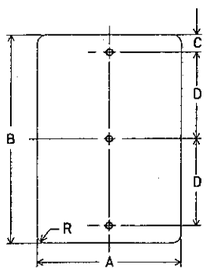
	A	B	C	D	E	R	THICKNESS	m^2
*	900	150	300	150	600	57	2.0	0.81
	1200	150	450	225	750	75	2.5	1.44

* "DO NOT ENTER" SIGN.



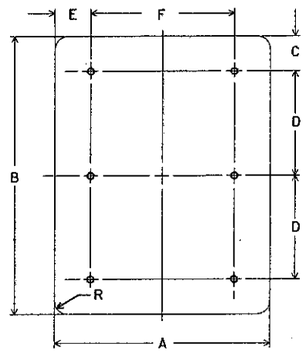
V-REC-1-2

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.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

DATE 07/29/94

SIGN BLANK DETAILS II

STANDARD CONSTRUCTION DRAWING TC-52.20M

APPROVED Dayl Craig ENGR. OF DESIGN SERVICES

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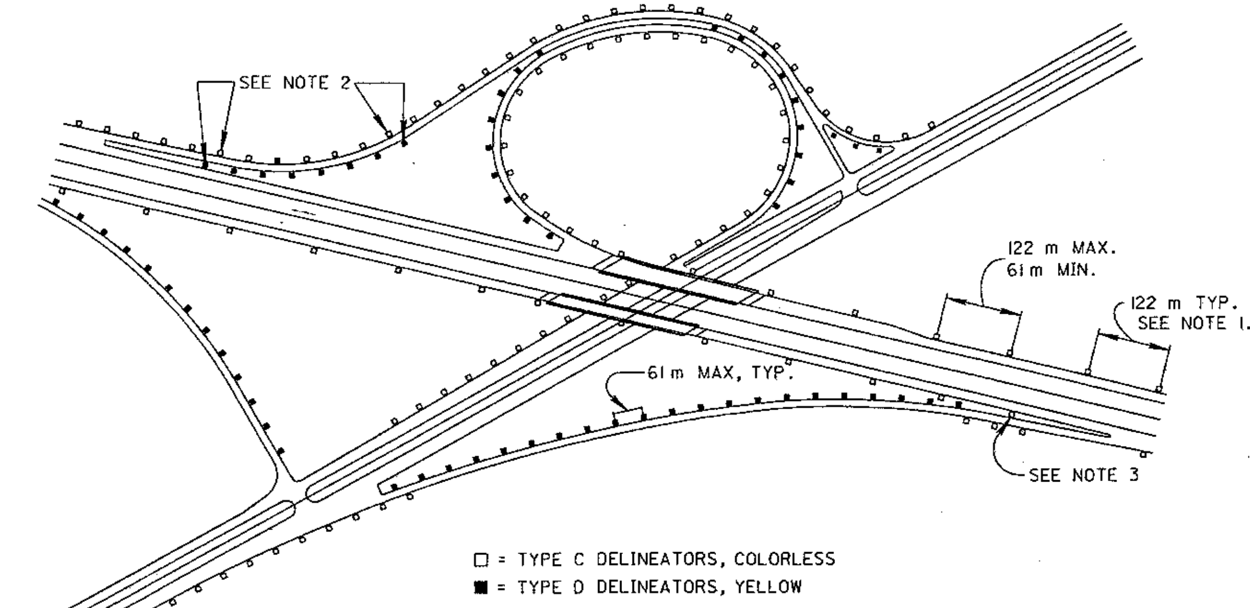
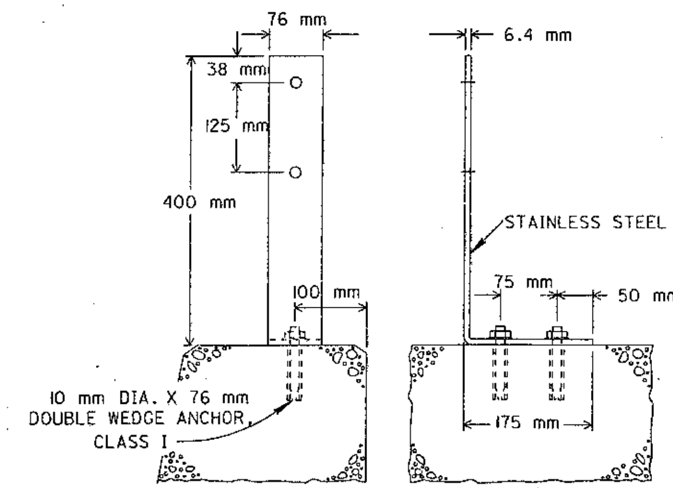


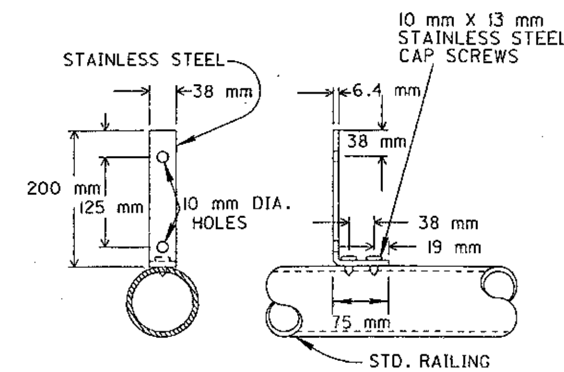
TYPICAL DELINEATOR PLACEMENT



BRIDGE PARAPET BRACKET

NOTES

1. TYPE "C" DELINEATORS SHALL BE SPACED ON THE RIGHT OF THE THROUGH ROADWAY AT 122 METER INTERVALS WITHOUT REGARD TO CURVES. TYPE "D" DELINEATORS, IF USED, SHALL BE LOCATED ON THE LEFT OF THE THROUGH ROADWAY.
2. DELINEATORS SHALL BE PROVIDED ON AT LEAST ONE SIDE OF INTERCHANGE RAMPS AND SHALL CONFORM TO THE RESPECTIVE EDGE LINE COLOR.
3. NO DELINEATORS SHALL BE PLACED IN A PAVED BERM.
4. WHEN THE CURVE RADIUS ON RAMPS REQUIRES LESS THAN 61 METER SPACING, THE DELINEATORS SHALL BE PLACED ON THE OUTSIDE OF THE CURVE IN RELATION TO THE FLOW OF TRAFFIC.
5. TAMPER RESISTANT FASTENERS SHALL BE USED TO ATTACH DELINEATORS TO BRACKETS.
6. OMIT DELINEATORS IF WITHIN 15 METERS OF A KILOMETER MARKER.

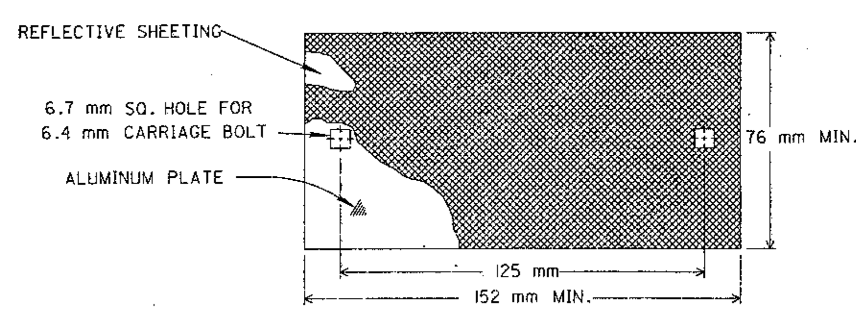


BRIDGE RAIL BRACKET

SPACING ON RAMP HORIZONTAL CURVES

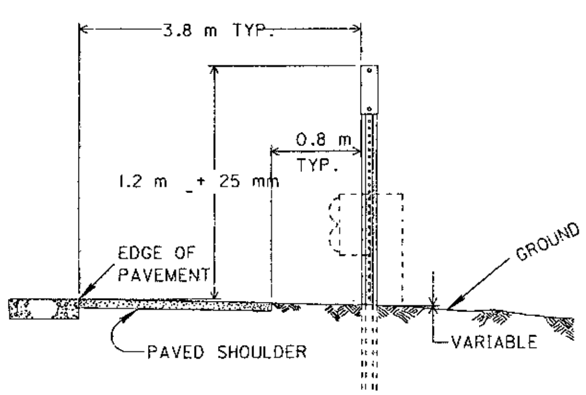
RADII (METERS)		SPACING ON CURVE (METERS)	TRANSITION * SPACING (METERS)
FROM	TO		
TANGENT	366	61	61
366	305	30.5	61
305	244	27.4	61
244	183	24.4	48.8
183	145	21.3	42.7
145	91	18.3	36.6
91	-	15.2	30.5

* FROM TANGENT TO 145 METER CURVE RADIUS, TRANSITION SPACING = 61 m TO 42.7 m TO 21.3 m
FROM 91 METER CURVE RADIUS TO TANGENT, TRANSITION SPACING = 18.3 m TO 36.6 m TO 61 m

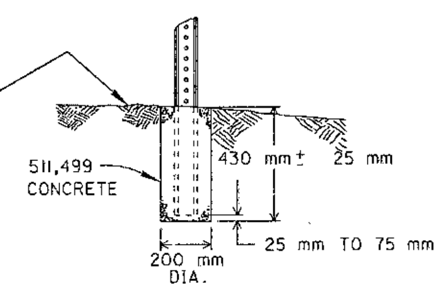


TYPE "C" & "D" DELINEATOR

DIMENSIONS GIVEN APPLY ONLY TO REMOVABLE REFLECTOR PLATES AS USED WITH BRIDGE BRACKETS.



LATERAL PLACEMENT



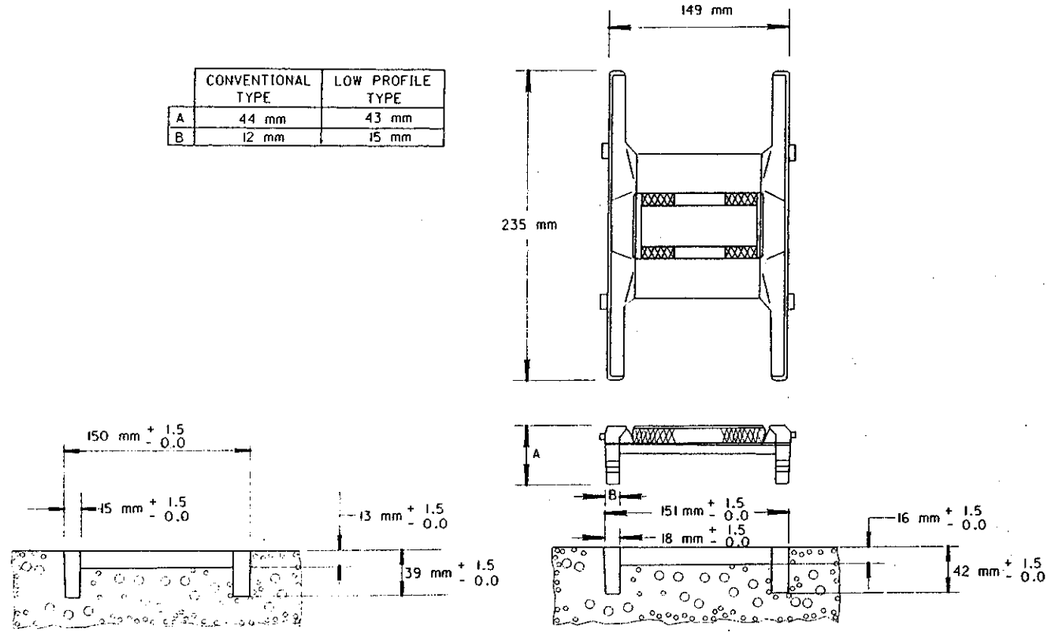
ALTERNATE CONCRETE EMBEDMENT

METRIC

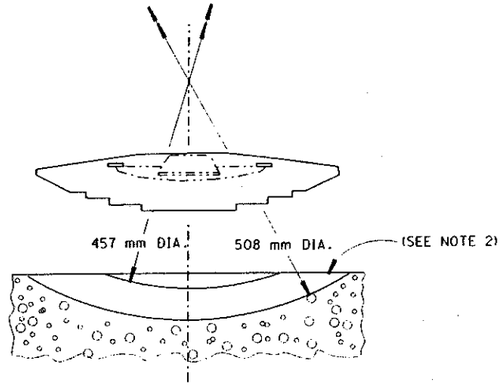
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 03/31/94
DELINEATOR DETAILS	
STANDARD CONSTRUCTION DRAWING	TC-61.10M
APPROVED [signature] ENGR. OF DESIGN SERVICES	

WCC

	CONVENTIONAL TYPE	LOW PROFILE TYPE
A	44 mm	43 mm
B	12 mm	15 mm



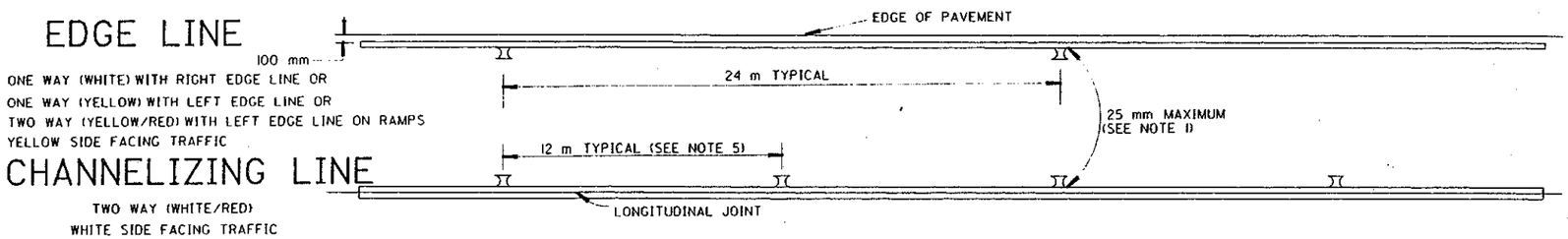
OPTIONAL FOR CONVENTIONAL TYPE

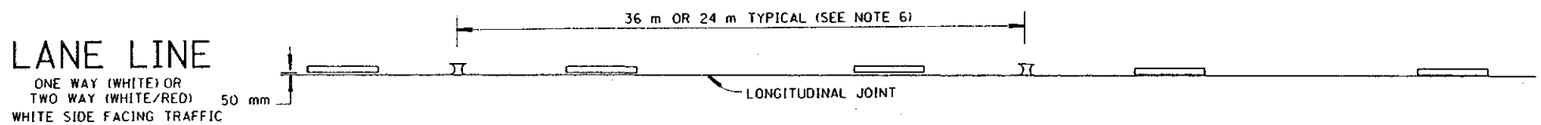


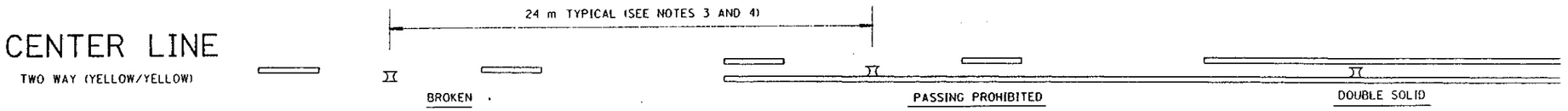
NOTES

1. CENTER LINE MARKERS SHALL BE PLACED BETWEEN THE TWO LINES. MARKERS INSTALLED ALONG AN EDGE LINE OR CHANNELIZING LINE SHALL BE PLACED SO THAT THE CASTING IS NO MORE THAN 25 mm FROM THE NEAR EDGE OF THE LINE. MARKERS INSTALLED ALONG A LANE LINE OR DASHED YELLOW CENTER LINE SHALL BE PLACED BETWEEN AND IN LINE WITH THE DASHES. MARKERS SHALL NOT BE PLACED OVER THE LINES EXCEPT WHERE THE LINES DEVIATE VISIBLY FROM THEIR CORRECT ALIGNMENT, AND THEN ONLY WITH THE APPROVAL OF THE ENGINEER.
2. TO FACILITATE THE CUTTING OF THE TWO PARALLEL SLOTS AND INTERVENING CONCAVED SURFACE SIMULTANEOUSLY, IT IS RECOMMENDED THAT AN ARBOR AND SAW BLADES ASSEMBLY BE USED. FOR ADDITIONAL DETAILS AND TOLERANCES OF THE CASTING AND ARBOR-SAW ASSEMBLY CONTACT THE CASTING MANUFACTURE.
3. FOR HORIZONTAL CURVE RADIUS OF 380 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 12 m BETWEEN P.C. OR T.S. AND P.T. OR S.T.
4. FOR HORIZONTAL CURVE RADIUS OF 250 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 6 m BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 6m SPACING, 12 RAISED PAVEMENT MARKERS AT 12 m SPACING SHALL BE INSTALLED ON EACH END OF THE 6 m SPACING.
5. WHEN A CHANNELIZING LINE IS LESS THAN 24 m IN LENGTH, ONE RAISED PAVEMENT MARKER SHALL BE PLACED AT EACH END OF THE LINE AND ONE SHALL BE PLACED IN THE CENTER OF THE LINE.
6. RAISED PAVEMENT MARKERS ON LANE LINES ON FREEWAYS SHALL BE ONE WAY WHITE SPACED AT 36 METERS. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 24 METERS.

CASTING AND SAW CUT DETAILS







TYPICAL RAISED PAVEMENT MARKER PLACEMENT WITH LONGITUDINAL PAVEMENT MARKINGS

metric Units

OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

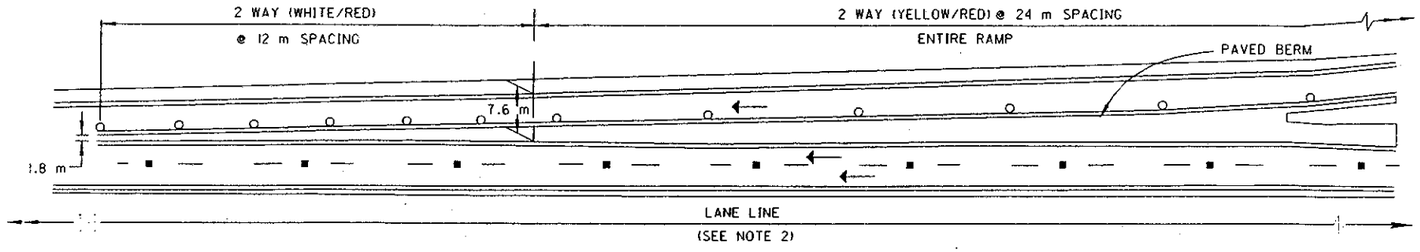
RAISED PAVEMENT MARKER INSTALLATION DETAILS

STANDARD CONSTRUCTION DRAWING TC-65.10M

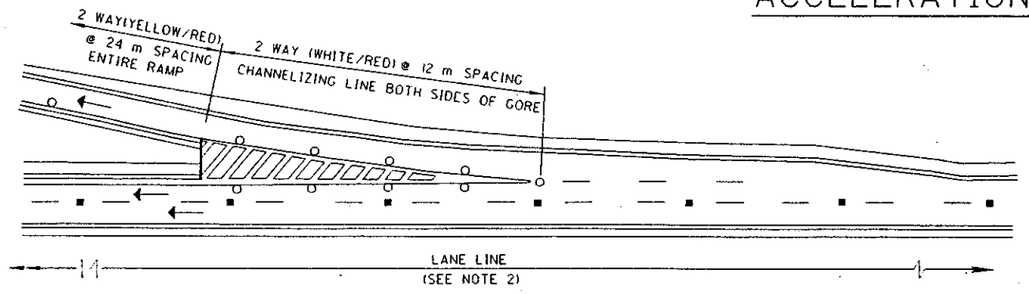
APPROVED _____ ADMINISTRATOR

DATE
11/03/93
11/01/95

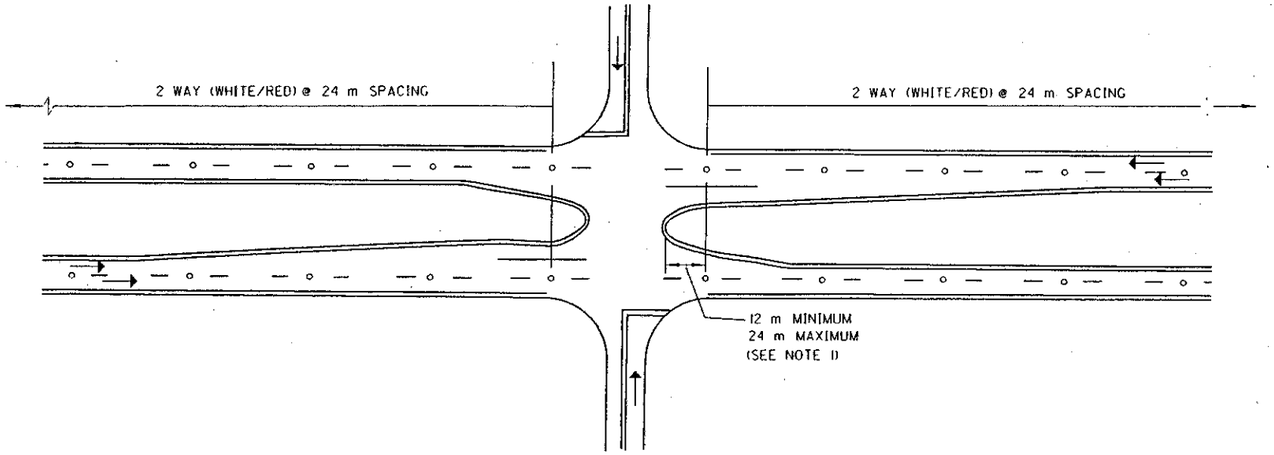
WCC



ACCELERATION LANE

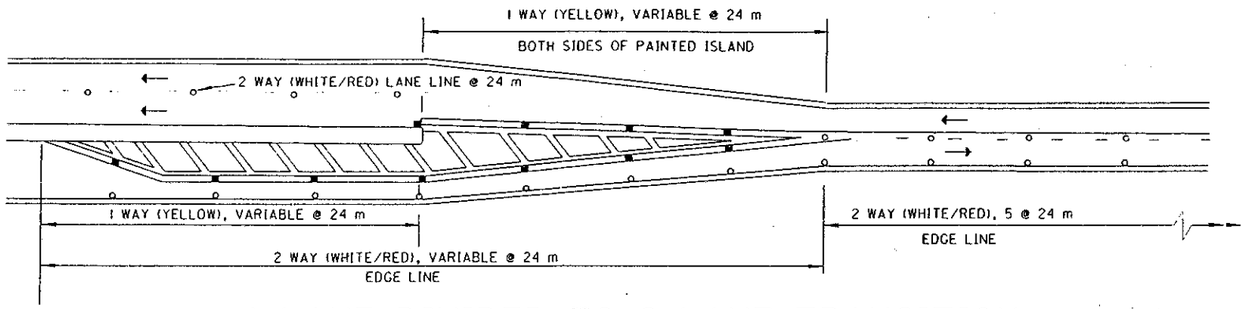


DECELERATION LANE

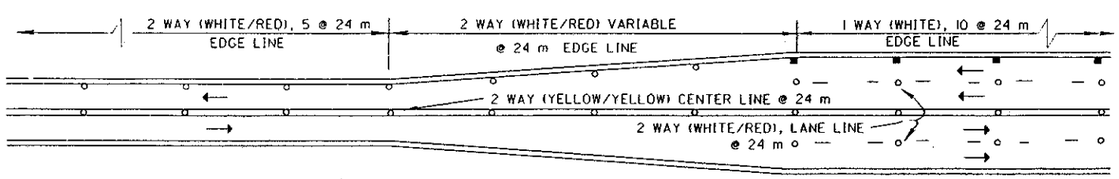


MULTILANE DIVIDED-CONTROLLED ACCESS

(SEE NOTE 2)



4 LANE DIVIDED TO 2 LANE TRANSITION



4 LANE UNDIVIDED TO 2 LANE TRANSITION

NOTES

1. RAISED PAVEMENT MARKERS SHALL NOT BE PLACED IN THE DIRECTIONAL ROADWAYS WITHIN THE INTERSECTION AREA.
2. RAISED PAVEMENT MARKERS ON LANE LINES ON FREEWAYS SHALL BE ONE WAY WHITE SPACED AT 36 METERS. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 24 METERS.

LEGEND

- ■ 1 WAY REFLECTORS
- ○ 2 WAY REFLECTORS

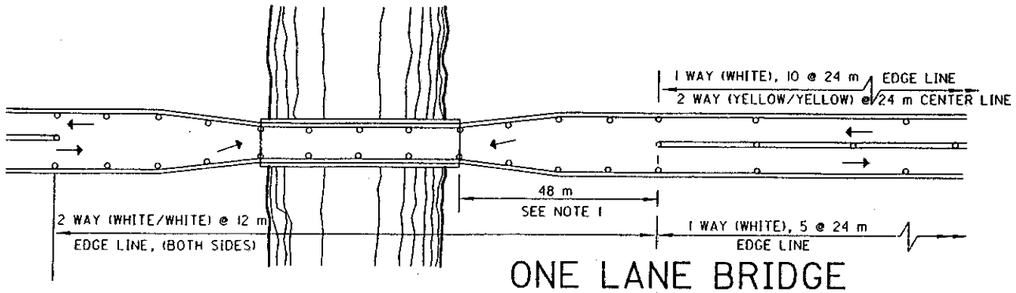
STATE OF OHIO DEPARTMENT OF TRANSPORTATION

metric units

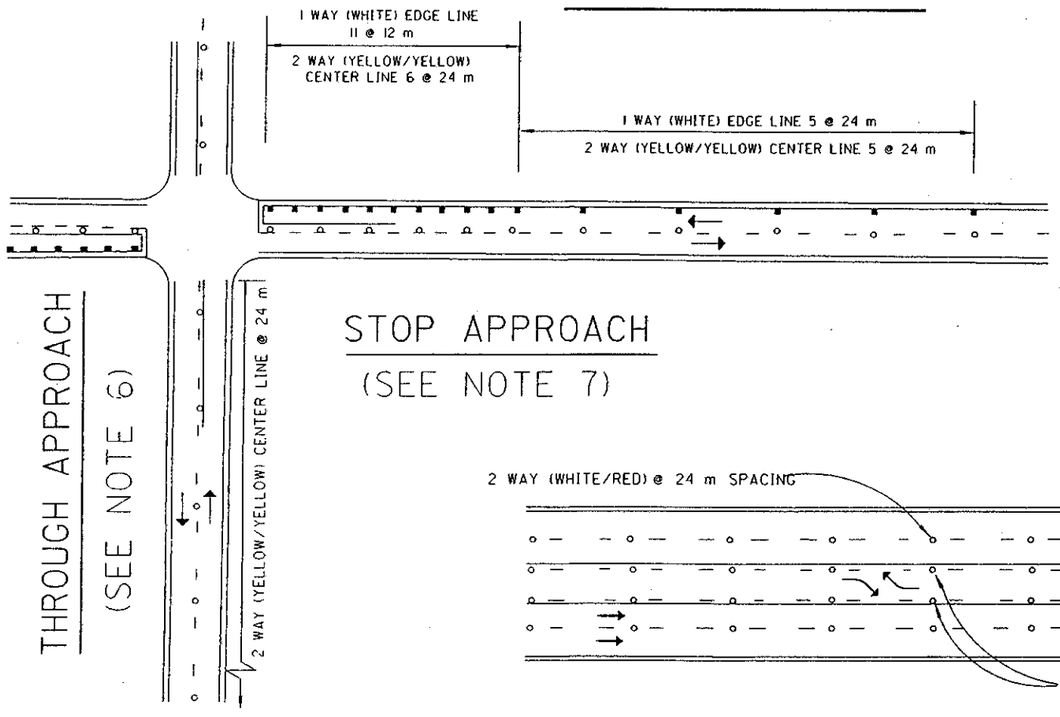
OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE 11/03/93 11/01/95
RAISED PAVEMENT MARKER DETAILS I	
STANDARD CONSTRUCTION DRAWING TC-65.11M	

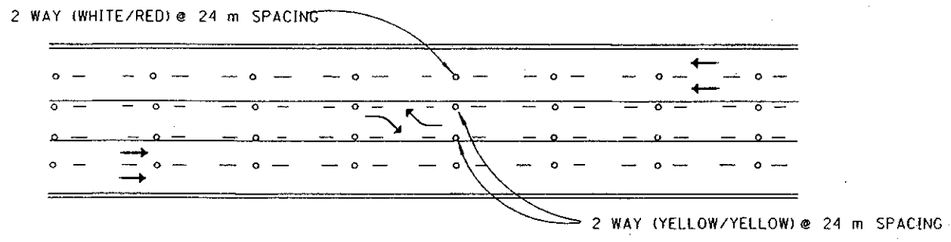
APPROVED _____ ADMINISTRATOR



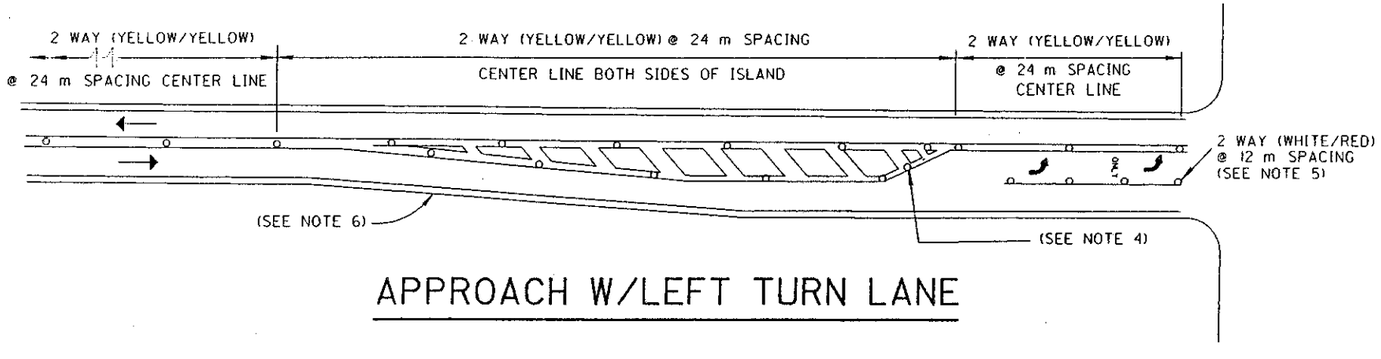
ONE LANE BRIDGE



STOP APPROACH
(SEE NOTE 7)



TWO WAY LEFT TURN LANE

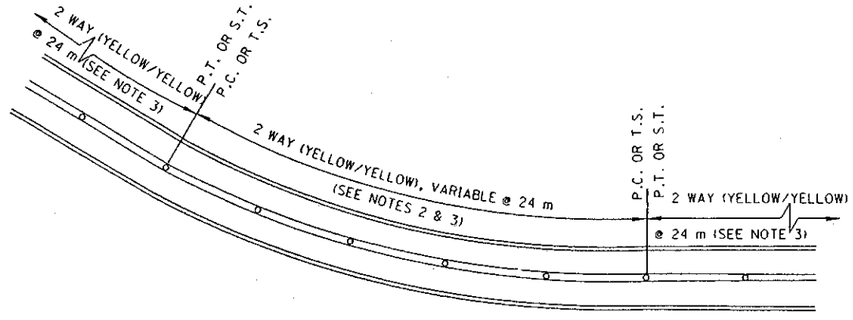


APPROACH W/LEFT TURN LANE

LEGEND

■ 1 WAY REFLECTORS

○ 2 WAY REFLECTORS



HORIZONTAL CURVE

NOTES

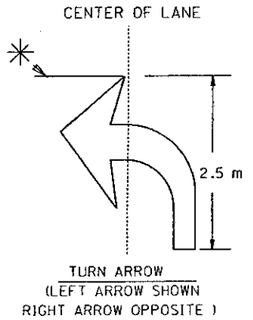
1. FOR ONE LANE BRIDGES, PAINTED CENTER LINE AND CENTER LINE MARKERS SHALL BE OMITTED 48 METERS ON EACH SIDE AND ACROSS THE BRIDGE.
2. FOR HORIZONTAL CURVE RADIUS OF 380 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 12 m BETWEEN P.C. OR T.S. AND P.T. OR S.T.
3. FOR HORIZONTAL CURVE RADIUS OF 250 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 6 m BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 6 m SPACING, 12 RAISED PAVEMENT MARKERS AT 12 m SPACING SHALL BE INSTALLED ON EACH END OF THE 6 m SPACING.
4. A MINIMUM OF 3 EQUALLY SPACED RAISED PAVEMENT MARKERS SHALL BE INSTALLED ON THE BACK TAPER.
5. WHEN A CHANNELIZING LINE IS LESS THAN 24 m LONG, ONE RAISED PAVEMENT MARKER SHALL BE PLACED AT EACH END OF THE LINE AND ONE SHALL BE PLACED IN THE CENTER OF THE LINE.
6. RAISED PAVEMENT MARKERS SHALL NOT BE PLACED ON EDGE LINES ON A THROUGH APPROACH.
7. ALL APPROACHES AT A SIGNALIZED INTERSECTION SHALL BE TREATED AS SHOWN IN THE STOP APPROACH DETAIL.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

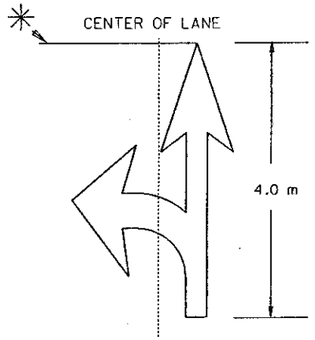
metric units

OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

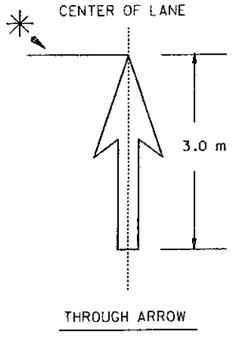
TRAFFIC CONTROL	DATE 11/03/93 11/01/95
RAISED PAVEMENT MARKER DETAILS II	
STANDARD CONSTRUCTION DRAWING TC-65.12M	
APPROVED ..... ADMINISTRATOR	



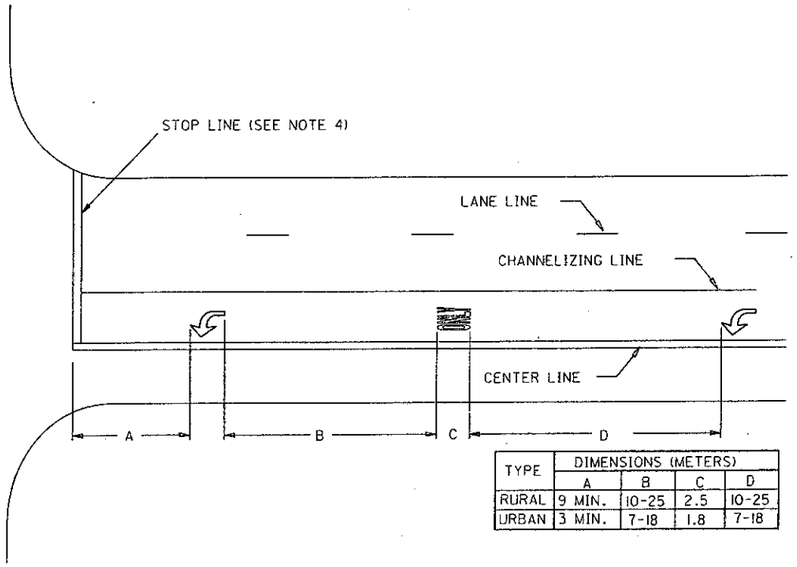
TURN ARROW
(LEFT ARROW SHOWN
RIGHT ARROW OPPOSITE)



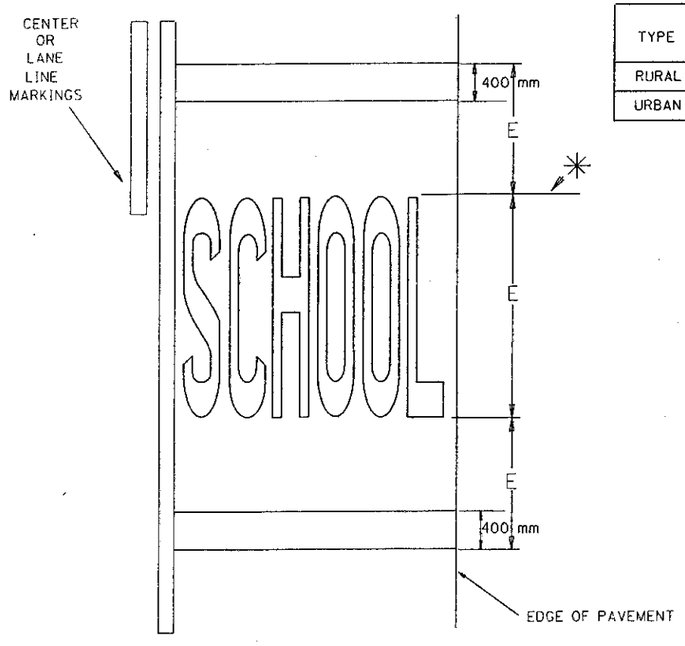
COMBINED ARROW
(THREE HEAD DIRECTIONAL ARROWS
CAN BE ACHIEVED BY THE COMBINATION
OF TURN ARROWS.)



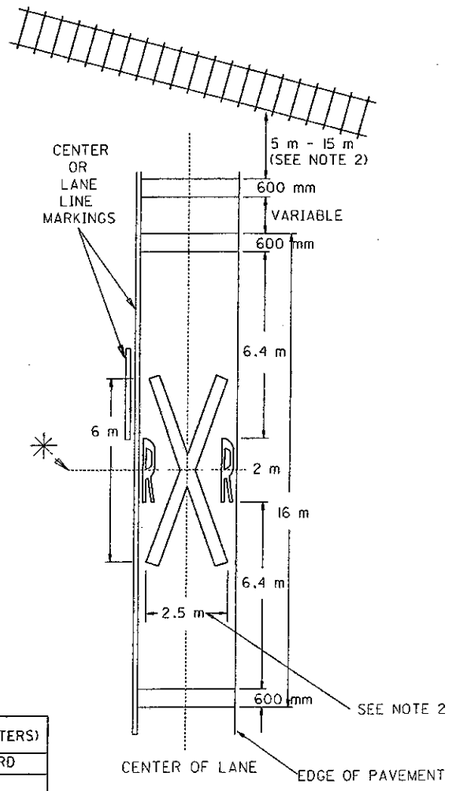
THROUGH ARROW

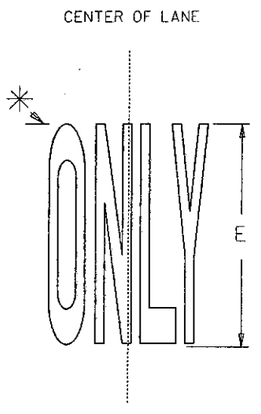


TYPE	DIMENSIONS (METERS)			
	A	B	C	D
RURAL	9 MIN.	10-25	2.5	10-25
URBAN	3 MIN.	7-18	1.8	7-18



TYPE	E (MILLIMETERS)
	STANDARD
RURAL	2500
URBAN	1800





NOTES

1. ON MULTI-LANE APPROACHES, THE TRANSVERSE LINES USED WITH THE RAILROAD SYMBOLS SHALL EXTEND ACROSS ALL APPROACH LANES AND SYMBOLS SHALL BE PLACED IN EACH APPROACH LANE.

2. THE RAILROAD SYMBOL SHALL BE LOCATED SO THAT THE W-94, "RAILROAD ADVANCE WARNING SIGN", IS WITHIN THE TWO TRANSVERSE BOUNDARY LINES OF THE RAILROAD SYMBOL. THE STOP LINE SHALL BE LOCATED FOR BEST SIGHT DISTANCE WITHIN 5 METERS TO 15 METERS OF THE NEAR EDGE OF THE TRACKS. WIDTH OF "X" MAY VARY ACCORDING TO LANE WIDTH. STOP LINES SHALL BE APPROXIMATELY 2.4 METERS FROM A GATE (IF PRESENT).

3. PREFERABLY, THE WORD "SCHOOL" SHOULD BE CONTAINED IN A SINGLE LANE. ON ONE LANE APPLICATIONS, THE TRANSVERSE LINES SHALL EXTEND ACROSS THE LANE WHICH APPROACHES THE ZONE WITH THE WORD "SCHOOL" CENTERED ACROSS THAT LANE. FOR TWO APPROACH LANES, EACH LANE SHOULD HAVE A SEPARATE WORD "SCHOOL" CENTERED ACROSS IT. ON TWO LANE, TWO WAY ROADWAYS WITH INSUFFICIENT PAVEMENT WIDTH, THE WORD AND TRANSVERSE LINES SHALL EXTEND ACROSS BOTH LANES OF TRAFFIC. ON FOUR LANE, TWO WAY ROADWAYS WITH INSUFFICIENT PAVEMENT WIDTH, THE WORD AND TRANSVERSE LINES SHALL EXTEND ACROSS BOTH LANES ENTERING THE SCHOOL ZONE. CENTER OR LANE LINES SHALL NOT PASS THROUGH THE "SCHOOL" MARKING.

4. THE STOP LINE SHOULD BE PLACED WHERE CROSS-CORNER VISION IS MAXIMUM, IN NO CASE MORE THAN 9.1 METERS OR LESS THAN 1.2 METERS FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY. FOR NORMAL INTERSECTIONS A MAXIMUM DISTANCE OF 3 METERS IS RECOMMENDED.

   IF A MARKED CROSSWALK IS PRESENT, THE STOP LINE SHOULD BE PLACED 1.2 METERS IN ADVANCE OF AND PARALLEL TO THE NEAREST CROSSWALK LINE.

5 FOR TRAFFIC PAINT AND POLYESTER APPLICATION, TEMPLATE GAPS SHALL BE FILLED WITH MARKING MATERIAL IN ACCORDANCE WITH 641.03. FOR EXTRUDED THERMOPLASTIC MATERIAL, THESE GAPS MAY REMAIN UNFILLED IN ACCORDANCE WITH 644.03.

6. USE STANDARD DIMENSIONS CONFORMING TO REQUIREMENTS OF OMUTCD SECTIONS 3B-40, 3B-41 AND 3B-43 WHICH CONFORMS TO THE 1977 METRIC EDITION STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING WITH ERRATA.

✳ - INDICATES STATION REFERENCE POINT

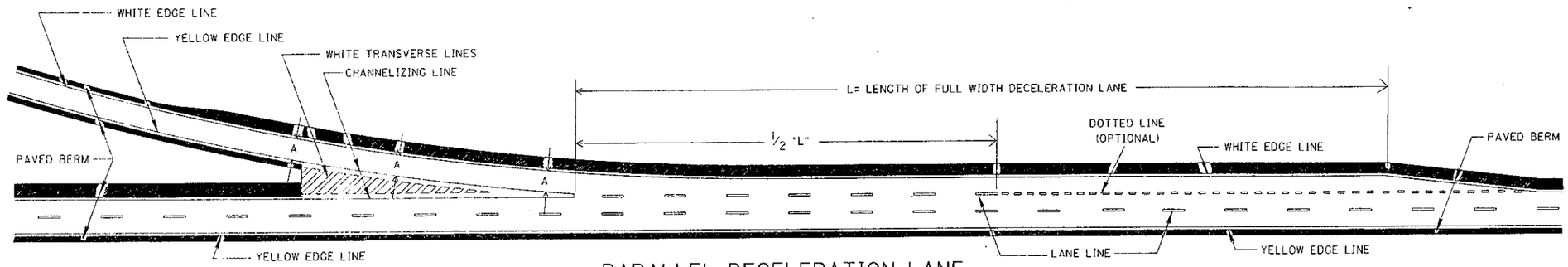
METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

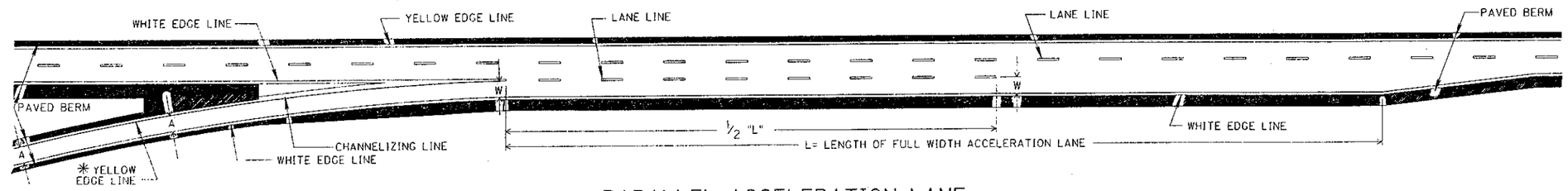
TRAFFIC CONTROL	DATE 09/01/93
WORDS , SYMBOLS AND ARROWS	
STANDARD CONSTRUCTION DRAWING TC-71.10M	

APPROVED _____ ENGR. OF DESIGN SERVICES

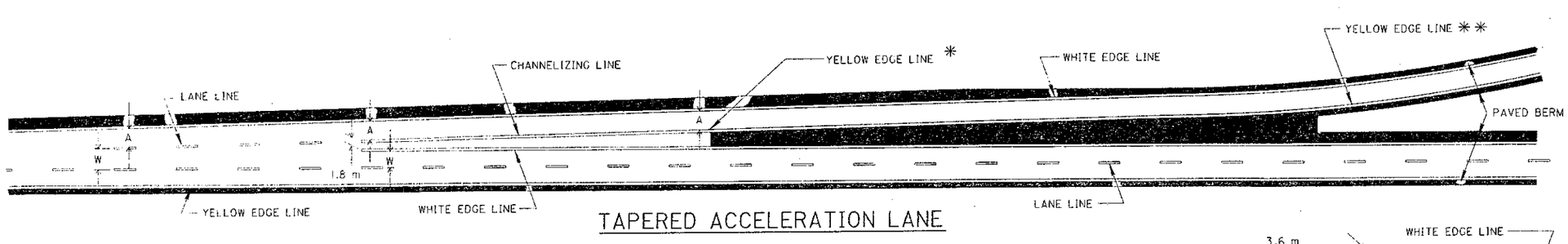
WCC



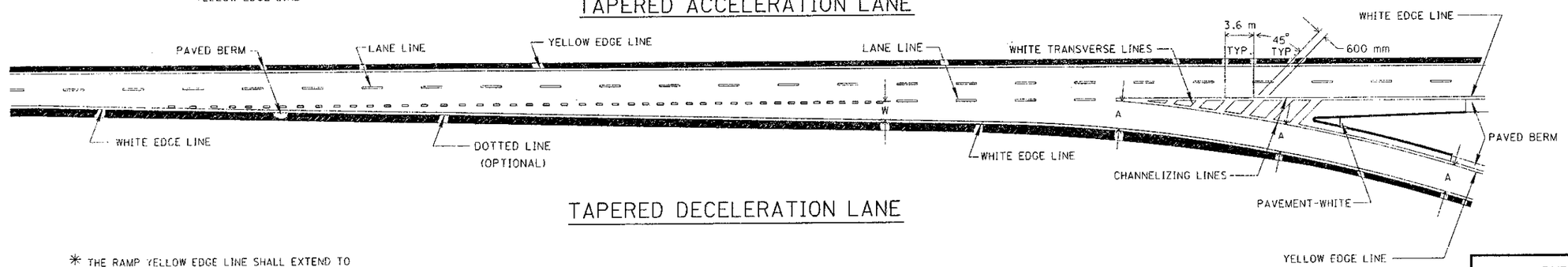
PARALLEL DECELERATION LANE



PARALLEL ACCELERATION LANE



TAPERED ACCELERATION LANE



TAPERED DECELERATION LANE

✳ THE RAMP YELLOW EDGE LINE SHALL EXTEND TO WHERE THE PAVED BERM ENDS.

✳✳ ANY EXISTING CURB SHALL BE PAINTED WHITE.

A = UNIFORM RAMP WIDTH

W = LANE WIDTH

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE 09/01/93
FREEWAY ENTRANCE AND EXIT MARKINGS	
STANDARD CONSTRUCTION DRAWING TC-72.20M	
APPROVED D. J. Mraz ENGR. OF DESIGN SERVICES	

WCC