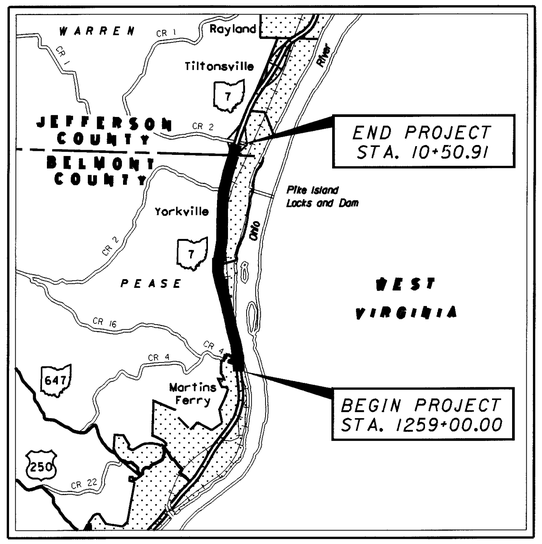
BEL-7-23.76
980618
94PGS

PID# 10443
09-23-98
DIST. 11



LOCATION MAP

LATITUDE: 40°08'20" LONGITUDE: 80°42'50"

SCALE IN MILES
0 1 2 3 4

PORTION TO BE IMPROVED
STATE & FEDERAL ROUTES
OTHER ROADS

DESIGN DESIGNATION

CURRENT ADT (1998)	14,650
DESIGN YEAR ADT (2008)	18,310
DESIGN HOURLY VOLUME (2008)	1831
DIRECTIONAL DISTRIBUTION	55%
TRUCKS (24 HOUR B&C)	14.7%
DESIGN SPEED	55 MPH
LEGAL SPEED	55 MPH

DESIGN FUNCTIONAL CLASSIFICATION - RURAL EXPRESSWAY

DESIGN EXCEPTIONS

DESIGN FEATURE	APPROVAL DATE	SHEET NO.
Bridge Width	8/11/94	77, 80 & 81
Graded Shoulder	8/11/94	5-7
Stopping Sight Distance (Horizontal)	8/11/94	59

UNDERGROUND UTILITIES

TWO WORKING DAYS
BEFORE YOU DIG
CALL 1-800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

Plan Prepared By:
STICKLEN-BELSHEIM
COLUMBUS, OHIO

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
BEL/JEF-7-23.76/0.00

CITY OF MARTINS FERRY
VILLAGE OF YORKVILLE
PEASE TOWNSHIP
WARREN TOWNSHIP

BELMONT COUNTY
JEFFERSON COUNTY

ENGINEERS SEAL:
STATE OF OHIO
George Edward Downing #E-39543 REGISTERED PROFESSIONAL ENGINEER
SIGNED: George E. Downing
DATE: 6-1-98

ENGINEERS SEAL:
For Design Changes on Sheet No's. 1, 4, 5, 6, 7, 8, 9, 15, 16, 17, 18, 26, 29, 31, 38A, 38B, 38C, 42, 43, 44, 45, 50A, 50B, 53, 70, 82, & 83.
STATE OF OHIO
SCOTT HARLEN GANYARD 52767 REGISTERED PROFESSIONAL ENGINEER
SIGNED: Scott H. Ganyard
DATE: 5-21-98

INDEX OF SHEETS

TITLE SHEET	1
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TYPICAL SECTIONS	4-7
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PLAN SHEETS	42-48
MISCELLANEOUS DETAILS	49-50, 50A & 50B
APPROACH SLAB DETAILS	51-52
TRAFFIC CONTROL	53-68
LIGHTING	69-76
CAST-IN-PLACE STRUCTURES	77-94

PROJECT DESCRIPTION

Rehabilitation of 3.13 miles of the existing pavement and shoulders by resurfacing, including new traffic control signs, guardrail, right-of-way fence, lighting and pavement markings; rehabilitation of the existing structures by overlaying the bridge decks.

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 THE PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

UNDER AUTHORITY OF SECTION 4511.21, DIVISION (I) 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.

STANDARD CONSTRUCTION DRAWINGS

BP-2.1M	4-8-97	F-1.1M	4-8-97	GR-4.4	2-21-92	HL-10.13	5-1-87	TC-41.50	6-21-94	MT-96.20	9-9-88
BP-2.2M	10-21-97	F-2.1M	4-8-97	GR-5.1	10-30-92	HL-20.11	5-1-87	TC-42.10	8-19-77	MT-96.25	9-9-88
BP-2.3M	10-28-94	F-3	5-1-76	GR-5.2	10-30-92	HL-30.11	5-1-87	TC-42.20	3-26-79	MT-97.10	4-29-88
BP-2.5M	4-8-97	F-3.4M	4-8-97	GR-5.3	10-30-92	HL-30.21	5-1-87	TC-51.11	9-30-94	MT-98.12	6-24-93
BP-3.1	2-21-92	F-5	5-1-76	GR-6.1M	1-3-96	HL-30.22	5-1-87	TC-51.12	1-3-94	MT-98.13	6-24-93
BP-5.1	10-28-94					HL-30.31	5-1-87	TC-52.10	4-3-97	MT-98.14	6-24-93
		GR-1.1M	10-21-97	I-1.1M	9-6-95	HL-30.32	5-1-87	TC-52.20	4-3-97	MT-98.15	6-24-93
		GR-1.2M	1-3-96	I-1.2M	9-6-95	HL-30.33	5-1-87	TC-61.10	4-5-82	MT-98.16	6-24-93
CB-2.1M	7-12-95	GR-1.3	2-21-92	I-2.1M	10-21-97	HL-40.10	5-1-87	TC-65.10	7-7-95	MT-99.20	4-29-88
CB-3.1M	7-12-95	GR-2.1M	10-21-97	I-2.2M	9-6-95	HL-50.11	5-1-87	TC-65.11	7-7-95	MT-105.10	7-1-92
CB-3.2M	7-12-95	GR-3.1M	10-21-97			HL-50.21	5-1-87	TC-65.12	7-7-95	MT-105.11	7-1-92
CB-3.4M	7-12-95	GR-3.2M	10-21-97	RM-1.1M	4-8-97	HL-60.11	5-1-87	TC-71.10	9-10-91		
		GR-3.5M	10-21-97	RM-3.1M	10-21-97	HL-60.12	5-1-87	TC-72.20	2-26-82	AS-1-81	9-15-94
DM-1.1M	10-21-97	GR-3.7M	10-21-97	RM-4.5M	10-21-97	HL-60.31	5-1-87			EXJ-3-82	2-14-97
DM-4.3M	6-30-95	GR-4.1	5-6-91					MT-95.30	10-10-88	EXJ-4-87	2-14-97
DM-4.4M	6-30-95	GR-4.2M	10-21-97	HL-10.11	5-1-87	TC-41.10	8-29-84	MT-95.40	10-1-92	GSD-1-96	2-12-97
		GR-4.3M	10-21-97	HL-10.12	5-1-87	TC-41.20	6-21-94	MT-96.10	9-9-88	SD-1-69	6-12-69

SUPPLEMENTAL SPECIFICATIONS

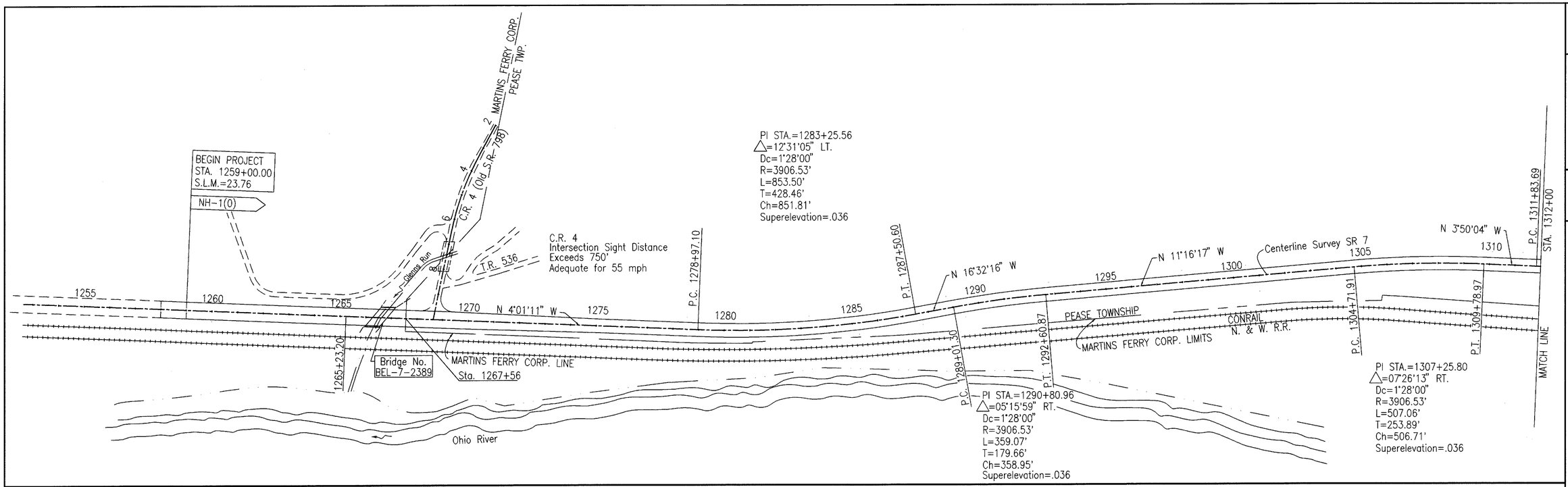
815	5-30-96
846	9-9-97
849	6-14-97
863	9-9-97
910	4-21-97
949	6-14-95
954	9-9-97

SPECIAL PROVISIONS

APPROVED John T. Gram
DATE 5-28-98 DISTRICT DEPUTY DIRECTOR

APPROVED Jerry Sharp
DATE 6-9-98 DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO. NH-1(212)
PID NO. 10443
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
BEL/JEF-7-23.76/0.00
1/94



STICKLEN – BELSHEIM & ASSOCIATES

0' 200' 400'
HORIZONTAL SCALE IN FEET

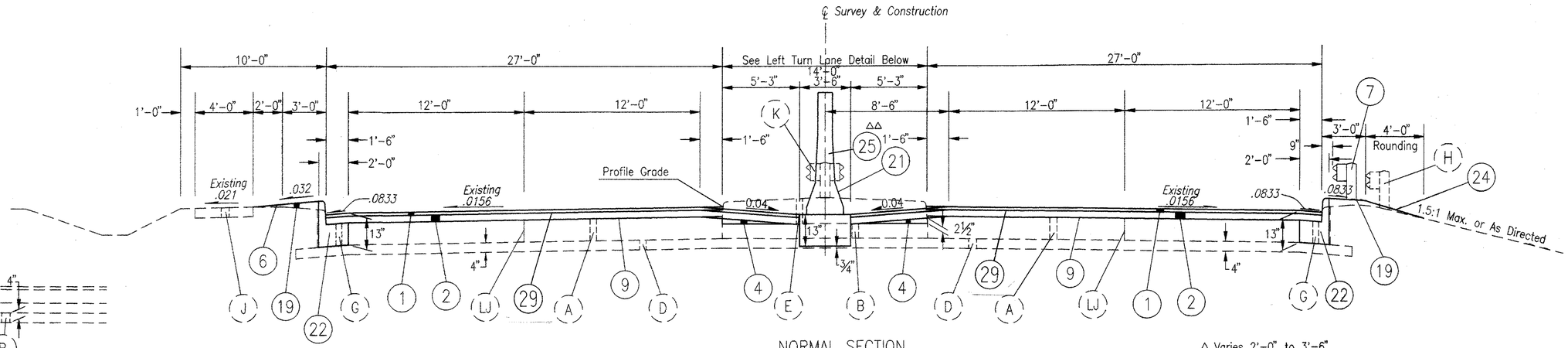
CALC. BY: CAM DATE: 10/94
CHKD. BY: HEC DATE: 2/95

SCHEMATIC PLAN

BEL/JEF-7-23.76/0.00

3/94

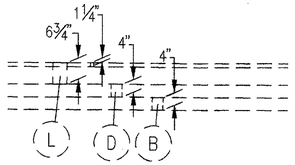
STICKLEN – BELSHEIM & ASSOCIATES



NORMAL SECTION

LIMITING STATIONS

Sta. 1257+76 to Sta. 1269+25△ = 1149 Lin. Ft. △

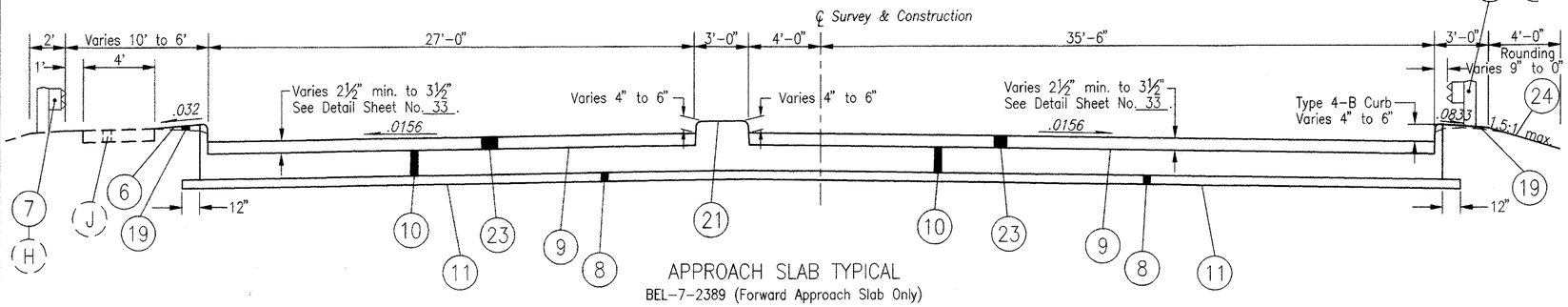


TYPICAL SECTION ADJOINING PAVEMENT

Sta. 1258+00

△ Varies 2'-0" to 3'-6"
From Sta. 1264+89.15 to Sta. 1265+71.65
From Sta. 1267+10.30 to Sta. 1267+92.80

△△ Concrete Barrier replaced by G.R.E.A.T. Impact Attenuator Sta. 1262+75.75 to Sta. 1263+07.50
See Details Sheet Nos. 36-38 .



APPROACH SLAB TYPICAL

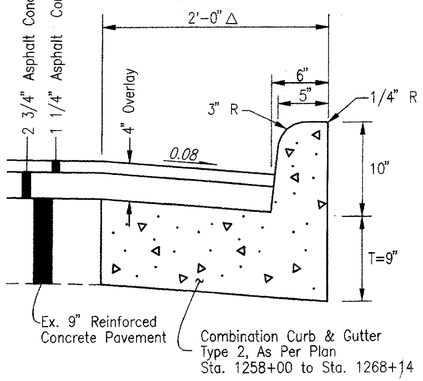
BEL-7-2389 (Forward Approach Slab Only)

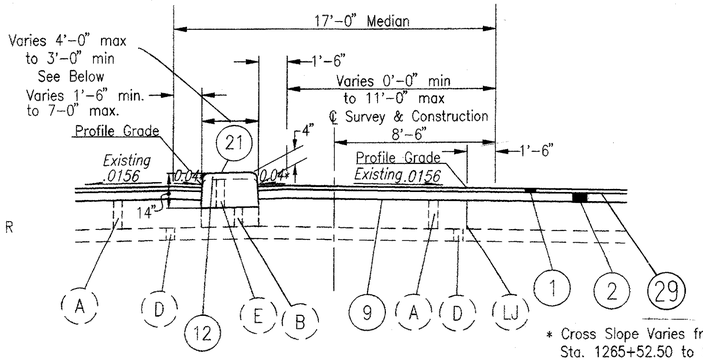
LIMITING STATIONS

Sta. 1266+83.55 to Sta. 1267+13.55 = 30 Lin. Ft.

DETAIL

Item 202 Combination Curb and Gutter Type 2, As Per Plan





* Cross Slope Varies from −0.04 to 0.0156
Sta. 1265+52.50 to Sta. 1265+62.50

LEFT TURN LANE DETAIL (See Detail Sheet No. 36 .)

Sta. 1263+07.50 to Sta. 1263+12.50 (4" Concrete Median Tapers from 4'-0" to 3'-0" Wide)
Sta. 1263+12.50 to Sta. 1268+14 (4" Concrete Median 3'-0" Wide)
Sta. 1268+14 to Sta. 1269+25 (Median Opening)

(See Normal Section above for Additional Details)

LEGEND

(1)	ITEM 446	1 1/4" Asphalt Concrete Surface Course, Type 1H, As Per Plan
(2)	ITEM 446	2 3/4" Asphalt Concrete Intermediate Course, Type 2, PG 64-28
(4)	ITEM 446	Asphalt Concrete Intermediate Course, Type 2, PG 64-28, Thickness As Shown
(5)	ITEM 606	Guardrail, Barrier Design, Type 5
(6)	ITEM 659	Seeding and Mulching
(7)	ITEM 606	Guardrail, Type 5
(8)	ITEM 304	6" Aggregate Base (See Proposal Note)
(9)	ITEM 407	Tack Coat
(10)	ITEM 611	Reinforced Concrete Approach Slab, T=17", As Per Plan
(11)	ITEM 203	Subgrade Compaction
(12)	ITEM 612	Concrete Median, As Per Plan
(15)	ITEM 304	Aggregate Base, Thickness as Shown
(17)	ITEM 203	Linear Grading Method B
(19)	ITEM 203	Linear Grading Method C
(21)	ITEM SPECIAL	Sealing of Concrete Surfaces (Epoxy)
(22)	ITEM 609	Combination Curb and Gutter, Type 2, As Per Plan
(23)	ITEM 446	Asphalt Concrete Surface Course, Type 1, PG 64-28, As Per Plan Thickness As Shown
(24)	ITEM 670	Slope Erosion Protection
(25)	ITEM 622	Concrete Barrier, Type B50, As Per Plan
(29)	ITEM 407	Tack Coat for Intermediate Course
(A)		Existing 9" Reinforced Concrete Pavement
(B)		Existing 6" Subbase
(D)		Existing Bituminous Aggregate Base
(E)		Existing Concrete Divider
(G)		Existing Curb & Gutter
(H)		Existing Guardrail
(LJ)		Existing Longitudinal joint
(J)		Existing 4" Concrete Walk
(K)		Existing Barrier Guardrail
(L)		Existing Asphalt Concrete

CALC. GFD DATE: 5/94
CHKD. CAM BY: DATE: 10/94

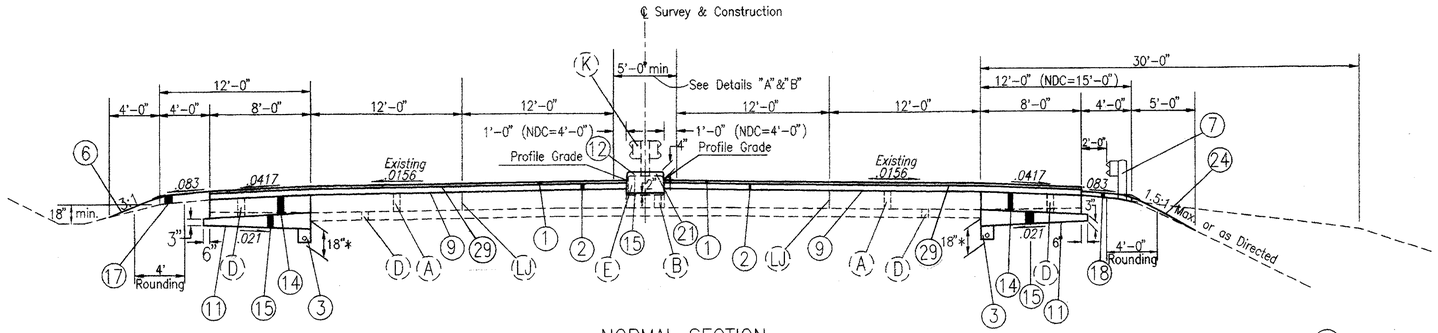
TYPICAL SECTION

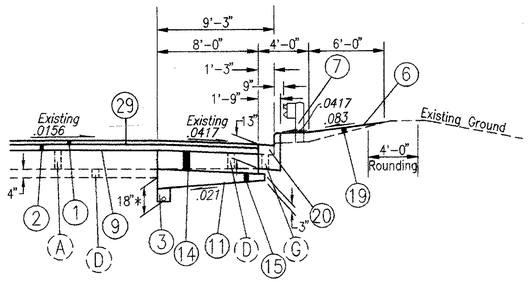
BEL/JEF-7-23.76/0.00

4
94

2/24/97 JCH 1983TP1 FINAL

STICKLEN – BELSHEIM & ASSOCIATES





CURB SECTION DETAIL

Sta. 1401+25 ℄ to Sta. 1415+79.82(Sta. 0+00, Ramp D)

NORMAL SECTION

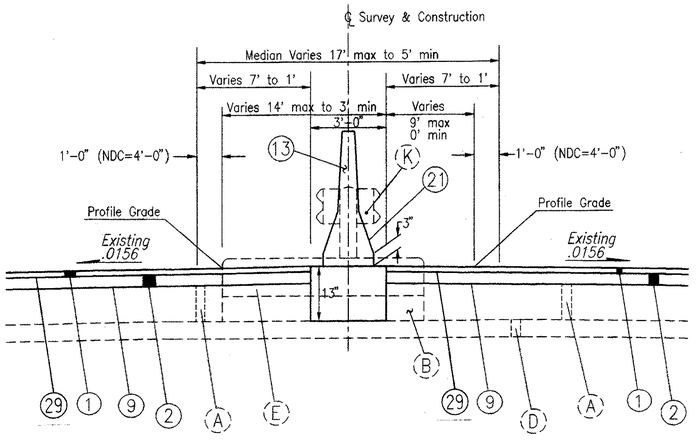
LIMITING STATIONS

See Detail "A"	Sta. 1269+25 to Sta. 1269+75	=	50 Lin. Ft.
	Sta. 1269+75 to Sta. 1275+31.25	=	556.25 Lin. Ft.
See Detail "B"	Sta. 1275+31.25 to Sta. 1276+50	=	118.75 Lin. Ft.
	Sta. 1295+00 to Sta. 1302+25	=	725 Lin. Ft.
	Sta. 1322+50 to Sta. 1328+25	=	575 Lin. Ft.
	Sta. 1342+25 to Sta. 1348+75	=	650 Lin. Ft.
	Sta. 1362+25 to Sta. 1380+25	=	1800 Lin. Ft.
	Sta. 1395+50 to Sta. 10+50.91	=	3065.22 Lin. Ft. †
	Deduct for Structure & Approach Slab (Jef-7-0016) Sta. 8+24.89 to Sta. 10+50.91	=	-226.02 Lin. Ft.
	TOTAL	=	7314.20 Lin. Ft.

1268+14 BEGIN SHOULDER (RT.)

† Sta. Equaton 1415+64.31 Back =0+00.00 Ahead, See Curb Section Detail (This Sheet) Structure & Approach Slab JEF-7-0016 Sta. 8+24.89 to Sta. 10+50.91 (226.02 Lin. Ft.)

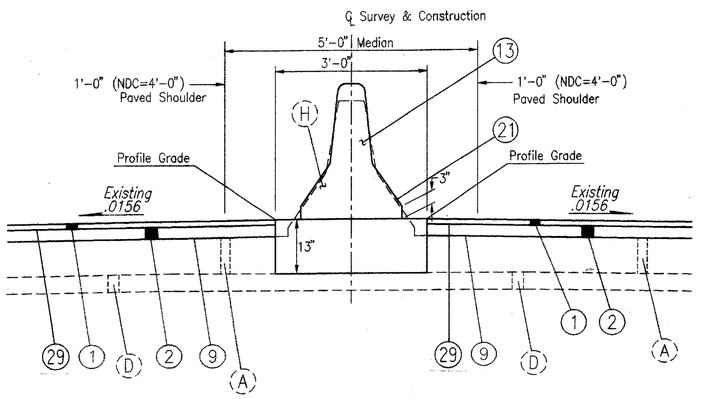
* 12" Min., See Underdrain Quantities Sheet No. 30 .



DETAIL "A" (See Normal Section above for Additional Details)

LIMITING STATIONS

Sta. 1269+25 to Sta. 1269+75 (Median Tapers 17' to 16', Existing Divider Tapers 6' to 14')(No Existing Barrier Guardrail)
Sta. 1269+75 to Sta. 1275+25 (Median Tapers 16' to 5', Existing Divider Tapers 14' to 3')(1270+08 Begin Concrete Barrier)
Sta. 1275+25 to Sta. 1275+31.25 Median Width= 5'



DETAIL "B" (See Normal Section above for Additional Details)

MEDIAN SHOULDER OVERLAY

LIMITING STATIONS

Sta. 1275+31.25 to Sta. 1276+50
Sta. 1295+00 to Sta. 1302+25
Sta. 1322+50 to Sta. 1328+25
Sta. 1342+25 to Sta. 1348+75
Sta. 1362+25 to Sta. 1380+25
Sta. 1395+50 to Sta. 1415+64.31
Sta. 0+00 to Sta. 8+24.89

LEGEND

- (A) Existing 9" Reinforced Concrete Pavement
- (B) Existing 6" Subbase
- (D) Existing Bituminous Aggregate Base
- (E) Existing Concrete Divider
- (G) Existing Curb & Gutter
- (H) Existing Concrete Barrier
- (K) Existing Barrier Guardrail
- (LJ) Existing Standard Longitudinal joint

(1) ITEM 446 1 1/4" Asphalt Concrete Surface Course, Type 1**H, As Per Plan**

(2) ITEM 446 2 3/4" Asphalt Concrete Intermediate Course, Type 2, **PG 64-28**

(3) ITEM 605 4" Shallow Pipe Underdrains, 707.15, As Per Plan (See Sheet No. 49 .)

(6) ITEM 659 Seeding and Mulching

(7) ITEM 606 Guardrail, Type 5

(9) ITEM 407 Tack Coat

(11) ITEM 203 Subgrade Compaction

(12) ITEM 612 Concrete Median, As Per Plan (See Sheet No. 8 .)

(13) ITEM 622 Concrete Barrier, Type A, As Per Plan (See Sheet No. 8 .)

(14) ITEM **301** **9" Bituminous Aggregate Base, PG 64-28**

(15) ITEM 304 Aggregate Base, Thickness as shown (See Proposal Note)

(16) ITEM 203 Linear Grading Method A

(17) ITEM 203 Linear Grading Method B

(18) ITEM 448 2" Asphalt Concrete Intermediate Course, Type 1 (under Guardrail), **PG 64-22, As Per Plan**

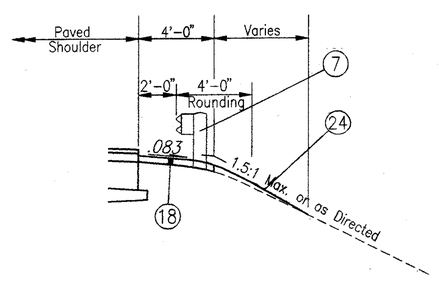
(19) ITEM 203 Linear Grading Method C

(20) ITEM 609 Combination Curb and Gutter, Type 2

(21) ITEM Special Sealing of Concrete Surfaces (Epoxy)

(24) ITEM 670 Slope Erosion Protection

(29) ITEM 407 Tack Coat for Intermediate Course



ASPHALT PAVING & ROUNDING DETAIL

CALC. GED BY: DATE: 5/94
CHKD. CAM BY: DATE: 10/94

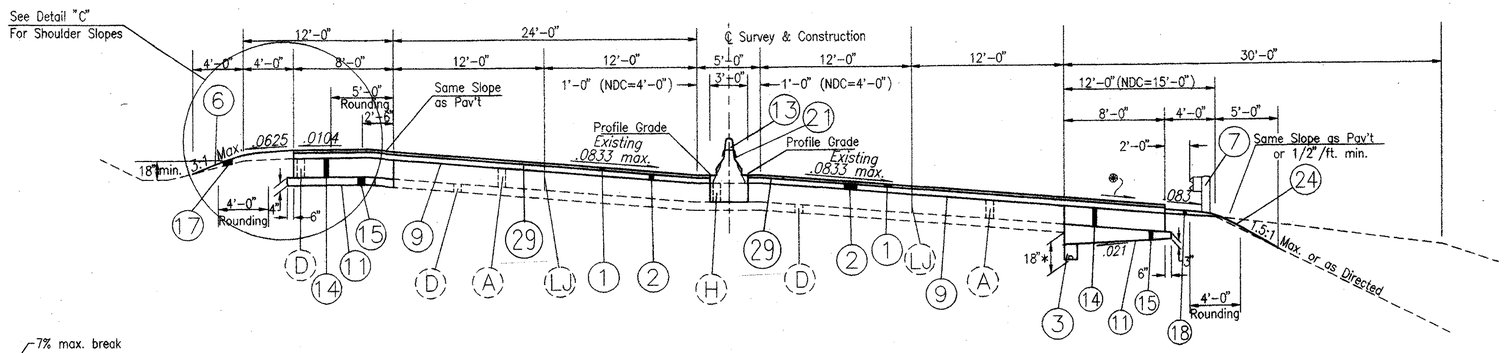
TYPICAL SECTION

BEL/JEF-7-23.76/0.00

5/94

2/24/97 ATH 1403TYP2 FINAL

STICKLEN – BELSHEIM & ASSOCIATES

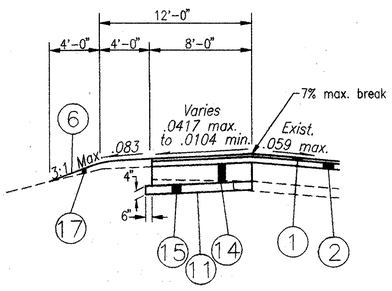


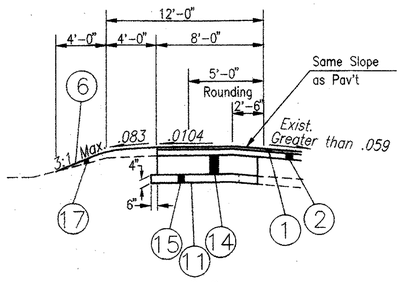
NOTES:

● .0417 or Rate of Superelevation Whichever is Greater

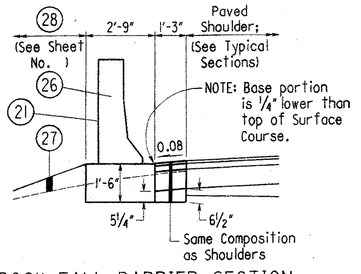
SUPERELEVATED SECTION

Sta. 1328+25 to Sta. 1342+25 = 1400.00 Lin. Ft.
Add For Sta. Equation 1342+10.64 Back = 1342+00.00 Ahead = 10.64 Lin. Ft.
Deduct For Structure & Approach Slab BEL-7-2526 Sta. 1338+09.09 to Sta. 1340+16.95 = −207.86 Lin. Ft.
TOTAL = 1202.78 Lin. Ft.





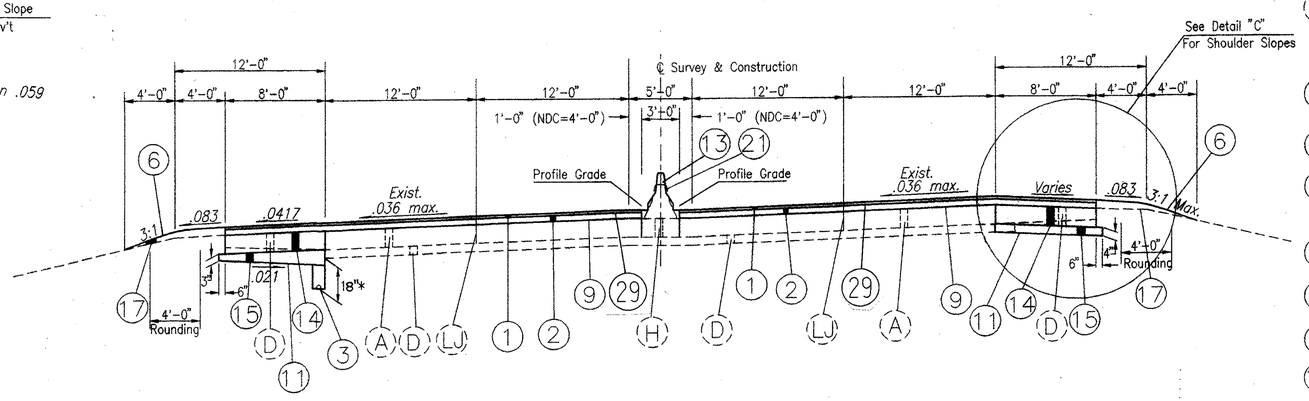
DETAIL "C"



ROCK FALL BARRIER SECTION

LIMITING STATIONS

Sta. 1272+00 to 1337+00 = 6,500 Lin. Ft.



SUPERELEVATED SECTION

Sta. 1276+50 to Sta. 1288+25 = 1175 Lin. Ft. Se = .036 Max.
Sta. 1288+25 to Sta. 1295+00 = 675 Lin. Ft. (Superelevation is Reversed) Se = .036 Max.
Sta. 1302+25 to Sta. 1310+75 = 850 Lin. Ft. (Superelevation is Reversed) Se = .036 Max.
Sta. 1310+75 to Sta. 1322+50 = 1175 Lin. Ft. Se = .036 Max.
Sta. 1348+75 to Sta. 1362+25 = 1350 Lin. Ft. Se = .024 Max.
Sta. 1380+25 to Sta. 1395+50 = 1525 Lin. Ft. (Superelevation is Reversed) Se = .036 Max.
Deduct For Structure & Approach Slab BEL-7-2619 Sta. 1387+05.25 to Sta. 1388+91.75 = −186.50 Lin. Ft.
TOTAL = 6563.50 Lin. Ft.

LEGEND

(A) Existing 9" Reinforced Concrete Pavement
(D) Existing Bituminous Aggregate Base
(H) Existing Concrete Barrier
(LJ) Existing Standard Longitudinal joint

LEGEND (Cont'd.)

(26) ITEM 622 Concrete Barrier, Type D-50, As Per Plan
(27) ITEM 203 Embankment, As Per Plan
(28) ITEM 203 Linear Grading (Ditch Cleanout)
(29) ITEM 407 Tack Coat for Intermediate Course

(1) ITEM 446 1 1/4" Asphalt Concrete Surface Course, Type 1H, As Per Plan
(2) ITEM 446 2 3/4" Asphalt Concrete Intermediate Course, Type 2, PG 64-28
(3) ITEM 605 4" Shallow Pipe Underdrains, 707.15, As Per Plan
(6) ITEM 659 Seeding and Mulching
(7) ITEM 606 Guardrail, Type 5
(9) ITEM 407 Tack Coat
(11) ITEM 203 Subgrade Compaction
(13) ITEM 622 Concrete Barrier, Type A, As Per Plan
(14) ITEM 301 9" Bituminous Aggregate Base, PG64-28
(15) ITEM 304 Aggregate Base, Thickness as Shown
(16) ITEM 203 Linear Grading Method A
(17) ITEM 203 Linear Grading Method B
(18) ITEM 448 2" Asphalt Concrete Intermediate Course, Type 1 (under Guardrail), PG 64-22, As Per Plan
(21) ITEM SPECIAL Sealing of Concrete Surfaces (Epoxy)
(24) ITEM 670 Slope Erosion Protection

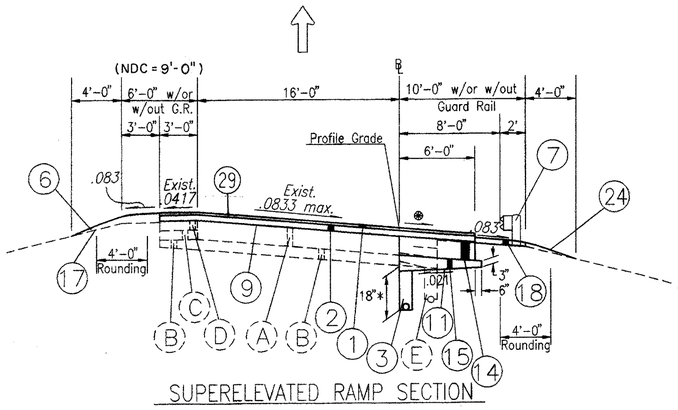
CALC. BY: GED DATE: 5/94
CHKD. BY: CAM DATE: 10/94

TYPICAL SECTION

BEL/JEF-7-23.76/0.00

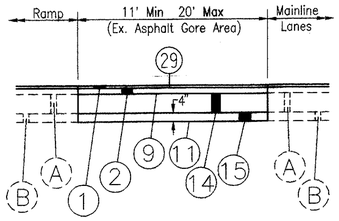
6/94

STICKLEN – BELSHEIM & ASSOCIATES



SUPERELEVATED RAMP SECTION

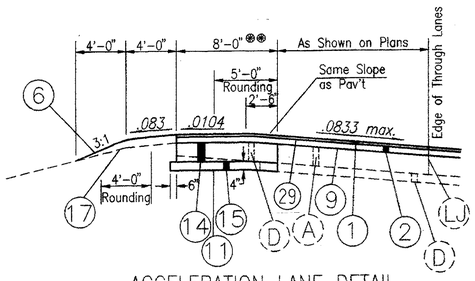
T.R. 469 Inter. Ramp "A" Sta. 1342+75 to Sta. 1348+00, Se = .032 max.
T.R. 469 Inter. Ramp "A" Sta. 1348+00 to Sta. 1351+40.14, Se = .040 max. (Superelevation reverse of that shown)
T.R. 469 Inter. Ramp "B" Sta. 1353+50 to Sta. 1359+01.98, Se = .032 max.
T.R. 469 Inter. Ramp "C" Sta. 1347+51.36 to Sta. 1353+25, Se = .042 max.
T.R. 469 Inter. Ramp "D" Sta. 1345+00 to Sta. 1348+85.93, Se = .050 max.
Public Rd. Inter. Ramp "A" Sta. 0+84.00 to Sta. 7+61.00, Se = .026 max



GORE AREA REPLACEMENT

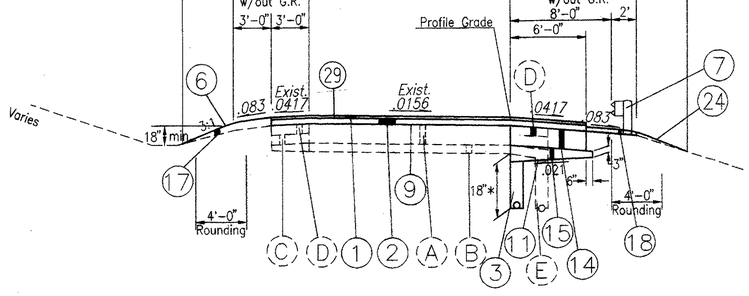
ACCELERATION LANES ONLY

Sta. 1340+89.33 to Sta. 1344+00.00 Rt.(SB) = 310.67 LIN. FT.
Sta. 1357+67.00 to Sta. 1360+00.00 (NB) = 233.00 LIN. FT.
Sta. 0+84.00 to Sta. 2+55.00 (SB) = 171.00 LIN. FT.
TOTAL = 714.67 LIN. FT.



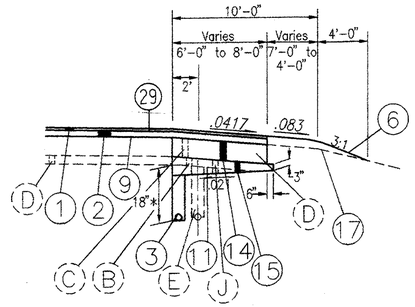
ACCELERATION LANE DETAIL

Sta. 1331+00 to Sta. 1340+89.33 Lt.(Acceleration Lane) Se = .083 max.



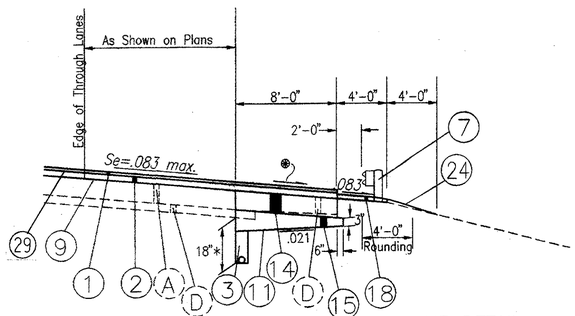
NORMAL RAMP SECTION

T.R. 469 Inter. Ramp "A" Sta. 1340+89.33 to Sta. 1342+75, Se = .0156 max.
T.R. 469 Inter. Ramp "B" Sta. 1351+58.56 to Sta. 1353+50, Se = .0156 max.
T.R. 469 Inter. Ramp "C" Sta. 1353+25.00 to Sta. 1360+00, Se = .0156 max.
T.R. 469 Inter. Ramp "D" Sta. 1341+91.50 to Sta. 1345+00, Se = .0156 max.
Public Rd. Inter. Ramp "D" Sta. 0+59.00 to Sta. 8+59.50, Se = .0156 max.
Public Rd. Inter. Ramp "A" Sta. 7+61.00 to Sta. 8+18.00, Se = .0145 max



SHOULDER TRANSITION DETAIL

Paved Shoulder Width Transitions 8' to 6' in 50'.



ACCELERATION & DECELERATION LANE DETAIL

Mainline Stations

Sta. 1334+00.00 to Sta. 1341+91.50 Rt.(Decel. Lane), Se = .083 max.
Sta. 1359+00.00 to Sta. 1367+00.00 Lt.(Decel. Lane), Se = .024 max.
Sta. 1360+00.00 to Sta. 1370+00.00 Rt.(Accel. Lane), Se = .0156 max.
Sta. 1406+43.31 to Sta. 0+84.00 Lt.(Accel. Lane), Se = .0192 max.
Sta. 1407+03.56 to Sta. 0+75.00 Rt.(Decel. Lane), Se = .0156 max.(See Curb Section Detail Sheet 5)

LEGEND

- (A) Existing 9" Reinforced Concrete Pavement
- (B) Existing Subbase
- (C) Existing Aggregate Base
- (D) Existing Bituminous Aggregate Base
- (E) Existing 6" Pipe Underdrains
- (F) Existing 8" Concrete Pavement
- (G) Existing Curb & Gutter
- (J) Existing Aggregate
- (LJ) Existing Standard Longitudinal joint

- (LJ) Type D Drilled Tied Longitudinal Joint Per Standard Drawing BP-2.1
- (1) ITEM 446 1 1/4" Asphalt Concrete Surface Course, Type 1H, As Per Plan
- (2) ITEM 446 2 3/4" Asphalt Concrete Intermediate Course, Type 2, PG 64-28
- (3) ITEM 605 4" Shallow Pipe Underdrains, 707.15, As Per Plan (See Sheet No. 49 .)
- (6) ITEM 659 Seeding & Mulching
- (7) ITEM 606 Guardrail, Type 5
- (9) ITEM 407 Tack Coat
- (11) ITEM 203 Subgrade Compaction
- (14) ITEM 301 9" Bituminous Aggregate Base, PG64-28
- (15) ITEM 304 Aggregate Base, Thickness as Shown (See Proposal Note)
- (16) ITEM 203 Linear Grading, Method A
- (17) ITEM 203 Linear Grading, Method B
- (18) ITEM 448 2" Asphalt Concrete Intermediate Course, Type 1 (under Guardrail), PG 64-22, As Per Plan
- (24) ITEM 670 Slope Erosion Protection
- (29) ITEM 407 Tack Coat for Intermediate Course

NOTES:

- ⊕ .0417 or Rate of Superelevation Whichever is Greater
- ⊕⊕ See Detail C, Sheet No. 6 for Shoulder Slopes
- * 12" Min.
- Direction of Travel

Left and Right side configuration on ramps is referenced to direction of travel.

CALC. BY: GED DATE: 5/94
CHKD. BY: CAM DATE: 10/94

TYPICAL SECTION

BEL/JEF-7-23.76/0.00

7/94

STICKLEN – BELSHEIM & ASSOCIATES

ELEVATION DATUM

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM. (NGVD 1929)

WORK LIMITS

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATIONS 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.

UNDERGROUND UTILITIES

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

UTILITIES

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

GAS

COLUMBIA GAS OF OHIO, INC.
216 HIGHLAND AVE.
P.O. BOX 250
CAMBRIDGE, OH 43725-0250

CABLE

TCI CABLE
908 NATIONAL RD.
P.O. BOX 469
BRIDGEPORT, OH 43912

ELECTRIC

AEP POWER CO.
215 N. FRONT ST.
COLUMBUS, OH 43215-2291

TELEPHONE

AMERITECH
150 E. GAY ST. - 6C
COLUMBUS, OH 43215

WATER

CITY OF MARTINS FERRY DIVISION OF WATER
MARTINS FERRY CITY BUILDING
5TH & WALNUT ST.
MARTINS FERRY, OH 43935

VILLAGE OF YORKVILLE WATER
139 MARKET STREET
YORKVILLE, OH 43971

SEWER

CITY OF MARTINS FERRY SANITARY SEWER
MARTINS FERRY CITY BUILDING
5TH & WALNUT ST.
MARTINS FERRY, OH 43935

CONTINGENCY QUANTITIES

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

PROFILE AND ALIGNMENT FOR RESURFACING PROJECTS

THE PROPOSED PAVEMENT RESURFACING SHALL FOLLOW THE ALIGNMENT AND PROFILE OF THE EXISTING PAVEMENT. THE PROPOSED ASPHALT CONCRETE OVERLAY SHALL HAVE A UNIFORM THICKNESS OF 4 INCHES.

CONSTRUCTION PLANS, SHOWING THE ORIGINAL ALIGNMENT AND PROFILE, ARE AVAILABLE FOR INSPECTION AT THE DISTRICT 11 OFFICE:

BEL-7-23.74, JEF-7-0.00, ORIGINAL CONSTRUCTION PLANS, 1974

ITEM 201 - CLEARING AND GRUBBING, AS PER PLAN

WORK UNDER THIS ITEM SHALL BE WITHIN THE AREAS TWO (2) FEET ON EACH SIDE OF THE NEW FENCE LIMITS WITHIN THE LIMITS OF THE RIGHT OF WAY AND SHALL CONSIST OF THE FOLLOWING:

1. THE REMOVAL OF ALL TREES, STUMPS, AND BRUSH TO GROUND LEVEL.
2. THE REMOVAL OF ALL LITTER.
3. MOWING OF ALL VEGETATION TO A HEIGHT OF BETWEEN 3" AND 5".
4. TREATMENT OF THE REMOVAL AREA WITH THE FOLLOWING HERBICIDES WITHIN 24 HOURS AFTER VEGETATION IS CUT: 1 GALLON DOW "TORDON RTU" COMBINED WITH 2 QUARTS 2, 4 D-AMINE OR AN APPROVED EQUAL IN SUFFICIENT WATER TO MAKE 50 GALLONS OF TOTAL SPRAY MIX PER ACRE. AN ESTIMATED AREA OF 0.51 ACRES IS TO BE TREATED WITH THE HERBICIDE.

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

THE FOLLOWING IS AN ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED:

SIZE	TREES	STUMPS
18"	0	0
30"	0	0
48"	0	0
60"	0	0

PAYMENT FOR THE ABOVE WORK WILL BE MADE AT THE LUMP SUM CONTRACT PRICE FOR ITEM 201, CLEARING AND GRUBBING, AS PER PLAN, AND SHALL INCLUDE THE COST OF ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS AS NECESSARY TO COMPLETE THE WORK.

ITEM 203, LINEAR GRADING, METHODS B AND C

THIS WORK SHALL INCLUDE THE EXCAVATION AND EMBANKMENT REQUIRED TO GRADE BEYOND THE PAVED SHOULDERS. VEGETATION, MATERIAL BUILDUP, AND COLLECTED DEBRIS ON THE SHOULDER OR WITHIN THE LINEAR GRADING LIMITS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. THE DISPOSAL SHALL BE AS PER 203.05, OR WASTED OVER FILL SLOPES AT THE DIRECTION OF THE ENGINEER.

METHOD B APPLIES TO AREAS WITHOUT GUARDRAIL. THE EXCAVATED MATERIAL SHALL BE REPLACED WITH COMPACTABLE GRANULAR MATERIAL CONFORMING TO 203.02, PLACED TO GRADE AS SHOWN ON THE TYPICAL SECTIONS. THE GRADED AREA SHALL BE SEEDED AS PER 659.

METHOD C APPLIES TO AREAS BEHIND PROPOSED TYPE 6 CURB. THE EXCAVATED MATERIAL SHALL BE REPLACED WITH COMPACTIBLE GRANULAR MATERIAL CONFORMING TO 203.02., PLACED TO GRADE AS SHOWN ON THE TYPICAL SECTIONS. THE GRADED AREA SHALL BE SEEDED AS PER 659.

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 CONSIDERED AS ONE STATION PER 100 LINEAR FEET MEASURED SEPARATELY FOR THE OUTSIDE SHOULDERS ON MAINLINE, AND SEPARATELY FOR THE LEFT AND RIGHT SHOULDERS ON EACH RAMP.

A QUANTITY 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 BORROW 100 CU YD

PAYMENT FOR THE ABOVE WORK, EXCEPT FOR ITEM 659, WILL BE MADE AT THE RESPECTIVE CONTRACT PRICE FOR ITEM 203, STATION, LINEAR GRADING, METHOD B, METHOD B, AND ITEM 203, STATION, LINEAR GRADING, METHOD C, AND SHALL INCLUDE THE COST OF ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS AS NECESSARY TO COMPLETE THE WORK.

PAVING UNDER GUARDRAIL AND ITEM 203 LINEAR GRADING, METHOD A

THIS OPERATION SHALL INCLUDE PREPARATION OF THE GRADED SHOULDER USING ITEM 203, LINEAR GRADING, METHOD A, AND PAVING UNDER THE GUARDRAIL USING ITEM 448, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER GUARDRAIL), **PG 64-22, AS PER PLAN.**

ITEM 203, LINEAR GRADING, METHOD A, SHALL CONSIST OF EXCAVATING TOPSOIL, PLACING GRANULAR MATERIAL, AND APPLYING HERBICIDE.

ALL EXCAVATED 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 SHOWN ON THE ASPHALT PAVING & ROUNDING DETAIL ON SHEET NO. 5, 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 THAT WILL BE PAVED WITH ASPHALT CONCRETE 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 PER 100 FOOT STATION FOR ONE SIDE OF THE PAVEMENT UNDER ITEM 203, LINEAR GRADING, METHOD A.

PAVING UNDER GUARDRAIL SHALL CONSIST OF PLACING A 2" 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 OF THE PATCH SHALL BE SMOOTH AND SLOPED TO DRAIN AWAY FROM THE POSTS.

ALL EQUIPMENT, MATERIALS, AND LABOR REQUIRED TO PAVE UNDER GUARDRAIL, BORE THE ASPHALT, AND PATCH AROUND THE POST WITH THE EXCEPTION OF SETTING GUARDRAIL POSTS, SHALL BE INCLUDED IN PAYMENT UNDER ITEM 448, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER GUARDRAIL) **PG 64-22, AS PER PLAN. A SEPARATE PAY WILL BE MADE TO** PROTECT GRADED AREA BEYOND GUARDRAIL PAVING USING ITEM 670 SLOPE EROSION PROTECTION.

ITEM 203, LINEAR GRADING (DITCH CLEANOUT)

THIS ITEM SHALL CONSIST OF RECONSTRUCTING THE ROADWAY DITCH IN CUT SECTIONS IN ACCORDANCE WITH THE DIMENSIONS SHOWN ON SHEET NO. 28 .

PAYMENT FOR THIS WORK WILL BE AS FOLLOWS:

1. ITEM 203 - LINEAR GRADING (DITCH CLEANOUT), METHOD 1 - THIS ITEM SHALL APPLY TO NORMAL DITCH SECTIONS.
2. ITEM 203 - LINEAR GRADING (DITCH CLEANOUT), METHOD 2 - THIS ITEM SHALL APPLY TO DITCH SECTIONS WITH A 10' ROCK FALL BENCH.

THE ENGINEER SHALL DETERMINE THE NEED FOR THIS ITEM AT EACH LOCATION DURING CONSTUCTION AND SHALL NON-PERFORM THIS WORK IN ANY AREAS WHERE IT IS NOT NECESSARY.

THE METHOD OF MEASUREMENT SHALL BE CONSIDERED AS ONE STATION PER 100 LINEAR FEET MEASURED SEPARATELY FOR EACH DIRECTIONAL ROADWAY.

PAYMENT FOR THE ABOVE WORK, INCLUDING EXCAVATION AND EMBANKMENT, SHALL BE INCLUDED IN THE UNIT PRICE BID OF STATION FOR THE APPROPRIATE LINEAR GRADING (DITCH CLEANOUT) ITEM.

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 0.075 GALLONS PER SQUARE YARD OF TACK COAT FOR ESTIMATING PURPOSES ONLY.

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 DRAWINGS GR-1.1 AND GR-2.2. PAYMENT SHALL BE INCLUDED IN THE CONTRACR PRICE FOR THE RESPECTIVE GUARDRAIL ITEMS.

SEEDING

QUANTITIES FOR SEEDING ARE CALCULATED FOR THE SOIL AREAS FROM LINEAR GRADING, METHODS A, B, AND C AND LINEAR GRADING (DITCH CLEANOUT), METHODS 1 AND 2.

WATERING PERMANENT SEEDED AREAS

THE FOLLOWING ESTIMATED QUANTITY FROM SHEET NO. 28 IS TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH AND TO CARE FOR PERMANENT SEEDED AREAS PER 659.09:

659, WATER 192 M. GAL

REVIEW OF DRAINAGE FACILITIES

BEFORE ANY WORK IS STARTED ON THE PROJECT AND AGAIN BEFORE FINAL ACCEPTANCE BY THE STATE, REPRESENTATIVES OF THE STATE AND THE CONTRACTOR, ALONG WITH LOCAL REPRESENTATIVES, SHALL MAKE AN INSPECTION OF ALL EXISTING SEWERS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCES SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTION SHALL BE KEPT IN WRITING BY THE STATE.

ALL NEW CONDUITS, INLETS, CATCH BASINS, AND MANHOLES CONSTRUCTED AS A PART OF THE PROJECT SHALL BE FREE OF ALL FOREIGN MATTER AND IN A CLEAN CONDITION BEFORE THE PROJECT WILL BE ACCEPTED BY THE STATE.

ALL EXISTING SEWERS INSPECTED INITIALLY BY THE ABOVE MENTIONED PARTIES SHALL BE MAINTAINED AND LEFT IN A CONDITION REASONABLY COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. ANY CHANGE IN THE CONDITION RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 603 CONDUIT ITEMS.

ITEM 622, CONCRETE BARRIER, TYPE A AND TYPE B50, AS PER PLAN

THIS WORK WILL INVOLVE CONSTUCTING A CONCRETE BARRIER IN THE EXISTING LOCATION. THE NEW CONCRETE BARRIER WILL ADHERE TO STANDARD DRAWING MC-9.3 EXCEPT THAT THE VERTICAL DIMENSION OF THE CONCRETE BASE WILL BE 13 INCHES IN LIEU OF THE 9 INCHES SHOWN ON MC-9.3.

ITEM 612, CONCRETE MEDIAN, AS PER PLAN

THIS WORK WILL INVOLVE CONSTUCTING A NEW CONCRETE MEDIAN AS PER STANDARD DRAWING MC-6 WITH THE FOLLOWING EXCEPTION: 4" HEIGHT ABOVE THE PROPOSED OVERLAY INSTEAD OF 6" AND A TOTAL THICKNESS OF 14 INCHES. SEE SHEET NO. 5 FOR DETAILS.

ITEM SPECIAL, SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

AN EPOXY CONCRETE SEALER SHALL BE APPLIED TO THE EXPOSED SURFACE OF THE CONCRETE MEDIAN AND CONCRETE MEDIAN BARRIER FOR THE FULL LENGTH OF THE PROJECT PRIOR TO ANY RESURFACING OPERATIONS. SEALER SHALL BE APPLIED PRIOR TO INSTALLATION OF BARRIER REFLECTORS.

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

THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY FOR THE PURPOSE OF SEALING THE CONCRETE MEDIAN AND CONCRETE MEDIAN BARRIER:

ITEM SPECIAL- **SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)- 11,261 S.Y.**

WORK LIMITS

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATIONS 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.

PART-WIDTH CONSTRUCTION

BECAUSE OF THE NECESSITY TO BUILD THIS PROJECT UNDER TRAFFIC AND CONSTRUCTING 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-3.1.

CALC. ATH BY: ATH DATE: 6/95
CHKD. CAM BY: CAM DATE: 10/95

GENERAL NOTES

BEL/JEF-7-23.76/0.00

FINAL 10/9/95 ATH 2/24/97

RAISED PAVEMENT MARKERS REMOVED FOR STORAGE, AS PER PLAN

THE REQUIREMENT TO FILL THE DEPRESSIONS (SEE SECTION 202.071) HAS BEEN WAIVED.

THE FOLLOWING QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE PURPOSE OF REMOVING EXISTING RAISED PAVEMENT MARKERS AS PER SECTION 202.071:

ITEM 202 – RAISED PAVEMENT MARKERS REMOVED FOR STORAGE – 541 EA.

CROSSINGS AND CONNECTIONS TO EXISTING PIPES AND UTILITIES

WHERE PLANS PROVIDE FOR A PROPOSED CONDUIT TO BE CONNECTED TO, OR CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UITLITIES BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.

IF IT IS DETERMINED THAT THE ELEVATION OF THE EXISTING CONDUIT, OR EXISTING APPURTENANCE TO BE CONNECTED, DIFFERS FROM THE PLAN ELEVATION OR RESULTS IN A CHANGE IN THE PALN CONDUIT SLOPE, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WILL BE AFFECTED BY THE VARIANCE IN THE EXISTING ELEVATIONS.

IF IT IS DETERMINED THAT THE PROPOSED CONDUIT WILL INTERSECT AN EXISTING SEWER OR UNDERGROUND UTILITY IF CONSTRUCTED AS SHOWN ON THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WOULD BE AFFECTED BY THE INTERFERENCE WITH AN EXISTING FACILITY.

PAYMENT FOR ALL THE OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTIENT 603 CONDUIT ITEM.

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 ANY OF 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 REQUIREMENTS OF 108.04.

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

207, TEMPORARY SEEDING AND MULCHING	14572	SQ.YD.
207, STRAW OR HAY BALES	517	EACH
207, FILTER FABRIC FENCE	5386	LIN.FT.
659, REPAIR SEEDING AND MULCHING	3643	SQ.YD.
659, WATER	4	M GAL.

SAME SEASON COMPLETION OF SURFACE COURSE

ANY LENGTH OF RESURFACING WORK STARTED IN A CONSTRUCTION SEASON SHALL HAVE THE SURFACE COURSE PLACED THAT SAME SEASON.

FENCE GROUNDING

ANY RIGHT OF WAY FENCE CROSSING UNDER OVERHEAD ELECTRIC POWER LINES OR TRANSMISSION LINES SHALL BE GROUNDED IN ACCORDANCE WITH STANDARD DRAWING HL-50.11.

GROUND RODS SHALL BE USED AS DIRECTED BY THE ENGINEER. FOR LOCATIONS AND QUANTITIES SEE SHEET NO. 31 .

ITEM 604 REFERENCE MONUMENTS, AS PER PLAN

A QUANTITY OF CENTERLINE REFERENCE MONUMENTS IS INCLUDED FOR USE AS DIRECTED BY THE ENGINEER TO REPLACE ANY EXISTING MONUMENTS DISTURBED BY CONSTRUCTION.

PRIOR TO WORKING IN THE AREA OF AN EXISTING MONUMENT, THE CONTRACTOR IS TO HAVE A SURVEYOR REFERENCE THE EXISTING MONUMENT. AFTER CONSTRUCTION IS COMPLETE THE NEW REFERENCE MONUMENT IS TO BE PLACED IN THE EXACT LOCATION OF THE EXISTING MONUMENT, AS CONFIRMED BY A SURVEYOR. THE SURVEYOR IS TO BE A PROFESSIONAL SURVEYOR REGISTERED IN THE STATE OF OHIO.

THIS ITEM INCLUDES REMOVAL AND DISPOSAL OF THE EXISTING REFERENCE MONUMENT AND PROVIDING A NEW CENTERLINE REFERENCE MONUMENT IN PLACE.

THE COST OF ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TC LOCATE, REFERENCE, REMOVE AND RE-ESTABLISH THE REFERENCE MONUMENTS IS INCLUDED IN THE UNIT PRICE BID FOR ITEM 604 REFERENCE MONUMENTS, AS PER PLAN. FOR LOCATIONS AND QUANTITIES, SEE SHEET NO. 31 .

ITEM SPECIAL, PIPE CLEANOUT

EXISTING CONDUITS SHALL BE CLEANED OUT AT THE LOCATIONS AND AS DIRECTED BY THE ENGINEER.

THIS WORK SHALL CONSIST OF THE REMOVAL OF ALL FOREIGN MATTER FROM THE INSIDE OF THE EXISTING CONDUIT IN A MANNER ACCEPTABLE TO THE ENGINEER. THE REMOVED MATERIAL SHALL BE DISPOSED OF IN ACCORDANCE WITH SECTION 203.05.

PAYMENT TO PERFORM THIS WORK WILL BE MADE AT THE UNIT PRICE BID OF LINEAR FEET OF EXISTING CONDUIT CLEANED OUT, AND SHALL INCLUDE THE COST OF ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

THE FOLLOWING QUANTITY, TO BE USED AS DIRECTED BY THE ENGINEER, HAS BEEN CARRIED TO THE GENERAL SUMMARY FOR PIPE CLEANOUT:

ITEM SPECIAL – PIPE CLEANOUT 1000 LIN. FT.

STATION MARKING

STATION MARKING SHALL BE PROVIDED ON EACH SIDE OF THE CONCRETE BARRIER AND ON TOP OF THE CONCRETE MEDIAN AT 100 FOOT INTERVALS AS PER STANDARD DRAWING MC-9.

CATCH BASIN REPLACEMENT

THE EXISTING NO. 5, 5A AND NO. 4 CATCH BASINS LISTED IN THE TABLE ON SHEET NO. 26 EXHIBIT SIDE WALL FAILURE AND MISSING MORTAR FROM AROUND BRICK AND SHALL BE REMOVED AND REPLACED WITH NEW NO. 5, NO. 5A AND NO. 4 CATCH BASINS.

THE PROPOSED GRATE AND INVERT ELEVATIONS AT EACH LOCATION SHALL MATCH THE EXISTING GRATE AND INVERT ELEVATIONS.

THE DEPTH OF THE NEW BASINS HAVE BEEN OBTAINED FROM THE ORIGINAL CONSTUCTION PLANS AND SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE NEW CATCH BASIN DEPTHS SHALL BE BASED ON ACTUAL DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

A QUANTITY OF 4 LIN. FT. OF CONDUIT, TO BE USED AS DIRECTED BY THE ENGINEER, HAS BEEN PROVIDED AT EACH CATCH BASIN LOCATION TO CONNECT THE NEW BASIN WITH THE EXISTING PIPE. A MASONRY COLLAR AS PER STANDARD DRAWING MC-4 SHALL BE USED TO JOIN TOGETHER THE NEW AND EXISTING PIPE.

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

MATERIALS FURNISHED FOR FINE AND COUSE AGGREGATES USED IN THESE ITEMS SHALL EXCLUDE ALL STONE AND CRUSHED CARBONATE STONE.

INLET NO. 3C, AS PER PLAN

THIS WORK WILL INVOLVE REMOVING THE EXISTING MEDIAN INLET, CONSTRUCTING A NEW I-3C BARRIER MEDIAN INLET AND CONNECTING ALL PIPES THROUGH TO THE OUTLET PIPE.

THE EXISTING MEDIAN INLET SHALL BE REMOVED AS PER ODOT 202.09, EXCEPT AS FOLLOWS:

THE MINIMUM REQUIRED REMOVAL WILL BE LIMITED TO THE REMOVAL OF THE EXISTING INLET TOP, TROUGH, AND THE UPPER 1'-6" OF THE SUMP.

ALL EXISTING AND/OR PROPOSED PIPE INLETS SHALL BE CONNECTED THROUGH THE EXISTING INLET BASE TO THE OUTLET PIPE. AFTER ALL PIPES HAVE BEEN CONNECTED THROUGH, THE EXISTING INLET BASE SHALL BE BACKFILLED WITH SAND, GRAVEL OR CRUSHED STONE MEETING GRADATION REQUIREMENTS OF NO. 57 SIZE AGGREGATE OR ODOT CMS 310.02. BACKFILL MATERIAL SHALL BE COMPACTED UNDER AND AROUND THE CONDUITS IN LAYERS NOT TO EXCEED 8 INCHES.

THE PROPOSED MEDIAN BARRIER INLETS SHALL BE CONSTUCTED AS PER STANDARD DRAWING I-3C.

ALL EQUIPMENT, MATERIAL AND LABOR REQUIRED TO PERFORM THE WORK DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR ITEM 604, INLET NO. 3C, AS PER PLAN.

SEE SHEET NO. 50 FOR DETAILS.

ITEM 606, ANCHOR ASSEMBLY, TYPE E

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING AN ET-2000, OPTION "B", GUARDRAIL END TERMINAL AS MANUFACTURER BY SYRO STEEL COMPANY, 1170 NO. STATE STREET, GIRARD, OHIO 44420 (TELEPHONE: 216-545-4373).

THE LENGTH OF THE ET-2000 SYSTEM IS CONSIDERED TO BE 50' INCLUSIVE OF TWO 25' LONG RAIL ELEMENTS. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND AT THE LOCATIONS SHOWN IN THE PLANS.

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

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.

ITEM 611, REINFORCED CONCRETE APPROACH SLAB (T=17"), AS PER PLAN

THE REINFORCING STEEL FOR THE APPROACH SLABS OF THIS STRUCTURE SHALL BE EPOXY COATED IN CONFORMANCE WITH 509.

TWO SEPARATE THICKNESSES OF CLEAR OR OPAQUE POLYETHYLENE FILM, 705.06, SHALL BE PLACED ON THE PREPARED SUBBASE AND WHERE THE APPROACH SLAB IS TO BE CONSTRUCTED. THE POLYETHYLENE FILMS SHALL COMPLETELY COVER THE FULL LENGTH AND WIDTH OF THE SUBBASE BETWEEN THE SIDEWALL FORMS FOR THE APPROACH SLAB.
PAYMENT FOR ITEM 517 RAILING (DEFLECTOR PARAPET TYPE), INTEGRAL CONCRETE MEDIAN AND INTEGRAL CURB PLACED WITHIN THE LIMITS OF THE APPROACH SLAB SHALL BE INCLUDED WITH ITEM 611.
FOR APPROACH SLAB DETAILS, SEE SHEET NOS. 51 & 52 .
MATERIALS, LABOR AND INSTALLATION SHALL BE INCLUDED FOR PAYMENT IN THIS ITEM 611 REINFORCED CONCRETE APPROACH SLAB (T=17"), AS PER PLAN.

ITEM SPECIAL, IMPACT ATTENUATOR, QUADGUARD TYPE

This item shall consist of furnishing and installing an impact attenuator 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 QuadGuard impact attenuator system.

The attenuator shall be placed in accordance with the manufacturer's specifications, and at the locations shown in the 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 concrete median barrier shall be transitioned to a rectangular shape for use as a monolithic concrete backup for the attenuator. The manufacturer shall provide all of the necessary details for the backup system that are not shown in the plan. All costs associated with constructing the concrete backup shall be considered incidental to, and included with the cost of the impact attenuator.

The nose cover of the attenuator shall be yellow, and marked with three evenly spaced four inch wide horizontal stripes of white reflective material meeting the requirements of 730.19 for a permanent installation.

The Contractor shall be responsible for inspecting, maintaining, repairing, and otherwise restoring the impact attenuator in accordance with 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 prior to acceptance by the State, it shall be replaced within 24 hours of the incident which caused damage to the attenuator. In addition to any extra units supplied for this project, the Contractor shall be responsible for supplying all necessary labor, materials, hardware, equipment, and incidentals required to perform the above described replacement of the attenuator.

The estimated quantity below shall be used as directed by the Engineer for use in the above mentioned replacement only when the Engineer decides that minor or major repairs cannot be performed within the 24 hour time limitation:

Item Special, Replacement Impact Attenuator, QuadGuard Type -------- 1 Each

The permanently installed impact attenuators shall be bid as Item Special, Each, Impact Attenuator, QuadGuard Type.
The model number of the permanent unit and the replacement unit shall be QS2408Y, Bi-directional.

For locations and quantities of the permanently installed attenuators, see sheet no's. 29, 37 & 38.

Payment for the above work, including furnishing, installing, maintaining, and restoring the attenuator after each vehicular impact, will be made at the contract price for Item Special, Each, Impact Attenuator, QuadGuard Type, and shall include the cost of all labor, materials, hardware, equipment, and incidentals necessary to complete the work.

CONVERSION OF METRIC STANDARD DRAWINGS

The metric standard drawings referenced in this plan shall be converted to English units using the SI (Metric) to English Conversion Factors provided in Section 109.011 of the 1997 Construction and Materials Specifications. The appendix of ASTM E 380 shall be utilized for any additional conversion factors required. Conversions shall be appropriately precise, and shall reflect standard industry English values where suitable.

Standard Drawing in this plan:	Shall be considered to read as:	Standard Drawing in this plan:	Shall be considered to read as:	Standard Drawing in this plan:	Shall be considered to read as:
BP-2.1	BP-2.1M	GR-1.1	GR-1.1M	I-2	I-1.1M
BP-2.2	BP-2.2M	GR-1.2	GR-1.2M	I-2A	I-1.2M
BP-2.3	BP-2.3M	GR-2.1	GR-2.1M	I-3A & 3B	I-2.1M
BP-2.5	BP-2.5M	GR-3.1	GR-3.1M	I-3C & 3D	I-2.2M
CB-3	CB-2.1M	GR-3.2	GR-3.2M	MC-1	RM-1.1M
CB-4	CB-3.1M	GR-3.5	GR-3.5M	MC-4	DM-1.1M
CB-5	CB-3.2M	GR-3B	GR-3.7M	MC-6	RM-3.1M
CB-458A	CB-3.4M	GR-4.2	GR-4.2M	MC-11	DM-4.3M
F-1	F-1.1M	GR-4.3	GR-4.3M		
F-2	F-2.1M	GR-6	GR-6.1M		
F-6	F-3.4M	GR-8.1	RM-4.5M		

CALC. BY: ATH DATE: 9/95
CHKD. BY: CAM DATE: 10/95

GENERAL NOTES

BEL/JEF-7-23.76/0.00

CONSTRUCTION PHASING

PHASE I

REMOVE EXISTING CURB AND GUTTER FROM STATION 1258+00 TO STATION 1268+14 AND FROM STATION 1401+25 TO STATION 1415+79.82. REMOVE EXISTING OUTSIDE SHOULDERS FROM STATION 1268+14 TO STATION 8+25 ON THE MAINLINE, RAMPS AND SPEED CHANGE LANES.

PERFORM CONCRETE JOINT REPAIR IN THE TRAVEL LANES, SPEED CHANGE LANES AND RAMPS.

CONSTRUCT NEW PIPE UNDERDRAINS, THE 305 CONCRETE BASE COURSE FOR NEW SHOULDERS AND NEW CURB AND GUTTER. THE NEW SHOULDER BASE COURSE SHALL BE CONSTRUCTED TO THE SAME ELEVATION AS THE EXISTING EDGE OF PAVEMENT, AS SHOWN ON THE TYPICAL SECTIONS.

ONE LANE OF TRAFFIC SHALL BE MAINTAINED IN EACH DIRECTION AS PER STANDARD CONSTRUCTION DRAWINGS MT-95.30, MT-98.13, MT-98.14, MT-98.15 AND SHEET NO. 14 BY USING THE EXISTING PAVEMENT. SEE DETAILS "A" AND "B" THIS SHEET.

PHASE II

REMOVE EXISTING CONCRETE MEDIAN, BARRIER MEDIAN, AND BARRIER GUARDRAIL.

PERFORM CONCRETE JOINT REPAIR IN THE PASSING LANES.

CONSTRUCT NEW CONCRETE MEDIAN, CONCRETE BARRIER MEDIAN AND REPLACE MEDIAN INLETS.

THE PAVEMENT REPAIR, CONCRETE MEDIAN REMOVAL AND REPLACEMENT FOR THE TURNING LANE AND PASSING LANES OF STATE ROUTE 7 AT STATE ROUTE 798 SHALL BE COMPLETED IMMEDIATELY AFTER COMMENCING PHASE II CONSTRUCTION FOR A MINIMUM DISTANCE OF 300' APPROACHING THE INTERSECTION OF COUNTY ROAD NO. 4 WITH STATE ROUTE 7.

ONE LANE OF TRAFFIC SHALL BE MAINTAINED IN EACH DIRECTION AS PER STANDARD CONSTRUCTION DRAWING MT-95.30 BY USING PORTIONS OF THE EXISTING PAVEMENT, NEW CONCRETE SHOULDERS, AND NEW GUTTERS. SEE DETAILS "C" AND "D" THIS SHEET.

PHASE III

PLACE THE 2-3/4" ASHPALT CONCRETE INTERMEDIATE COURSE AND THE 1-1/4" ASPHALT CONCRETE SURFACE COURSE. PERFORM PAVEMENT MARKING AND INSTALLATION OF RAISED PAVEMENT MARKERS. COMPLETE ALL REMAINING PROJECT CONSTRUCTION.

ONE LANE TRAFFIC SHALL BE MAINTAINED IN EACH DIRECTION BY USING THE RESURFACED PAVEMENT AND SHOULDERS. SEE STANDARD DRAWING MT-99.20 AND MT-95.30.

BRIDGE CONSTRUCTION PHASING

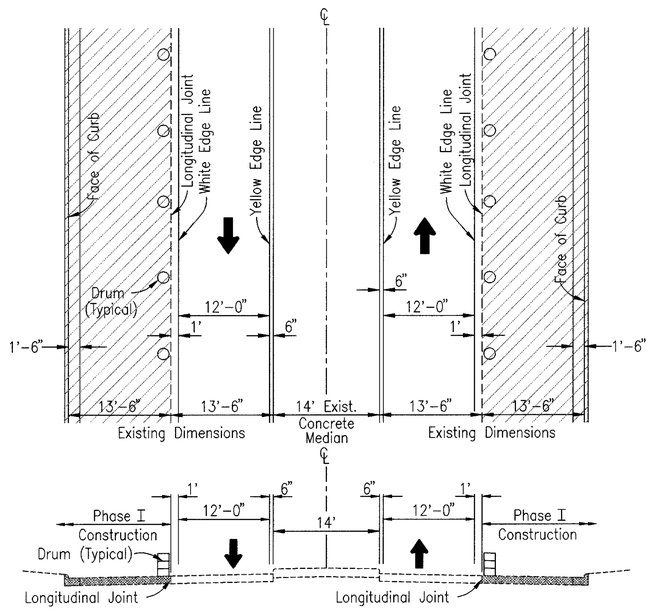
FOR BRIDGE PHASE CONSTRUCTION DETAILS, SEE SHEET NUMBERS 77 THROUGH 81.

WORK ZONE PAVEMENT MARKINGS

ITEM	DESCRIPTION	PHASE I	PHASE II	PHASE III	TOTAL	UNITS
614	TEMPORARY LANE LINE, CLASS I, 642 PAINT			7.05	7.05	MILE
614	TEMPORARY EDGE LINE, CLASS I, 642 PAINT	12.74	12.74	15.40	40.88	MILE
614	TEMPORARY CHANNELIZING LINE, CLASS I, 642 PAINT			3586	3586	LIN. FT.
614	TEMPORARY CHANNELIZING LINE, CLASS I, 740.05, TYPE C	250	4345		4595	LIN. FT.
614	TEMPORARY GORE MARKING, CLASS II, 740.05, TYPE C		918		918	LIN. FT.
614	TEMPORARY TRANSVERSE LINE, CLASS I, 642 PAINT			2568	2568	LIN. FT.
614	TEMPORARY STOP LINE, CLASS I, 642 PAINT			95	95	LIN. FT.
614	TEMPORARY CENTER LINE, CLASS I, 642 PAINT			0.10	0.10	MILE
614	TEMPORARY WORK ZONE MARKING SIGNS				100	EACH

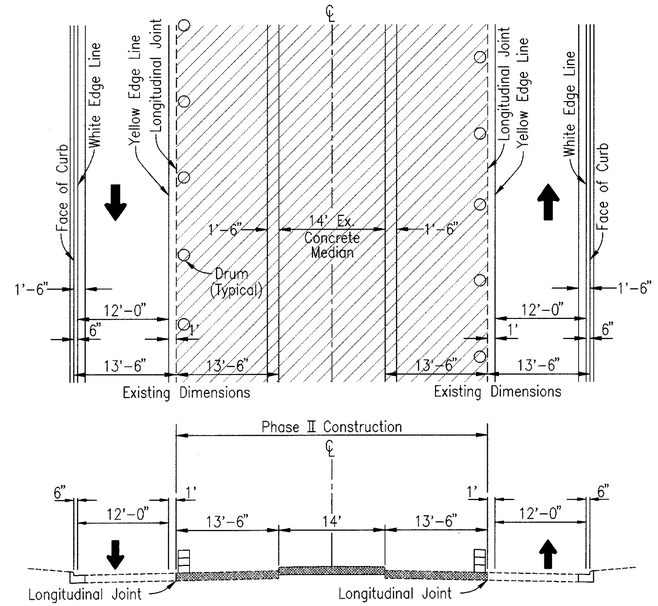
THE ABOVE ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR TEMPORARY WORK ZONE PAVEMENT MARKINGS AND SIGNS PER THE REQUIREMENTS OF THE STANDARD CONSTRUCTION DRAWINGS.

Phase I
STA. 1258+00 to STA. 1268+14



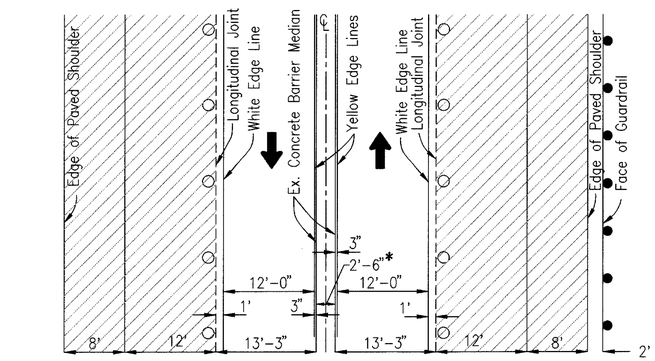
DETAIL "A"

Phase II
Station 1258+00 to Station 1268+14

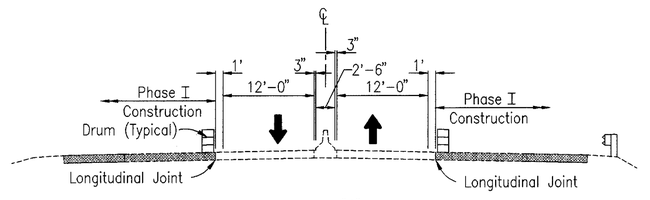


DETAIL "C"

Phase I
STA. 1268+14 to STA. 8+50

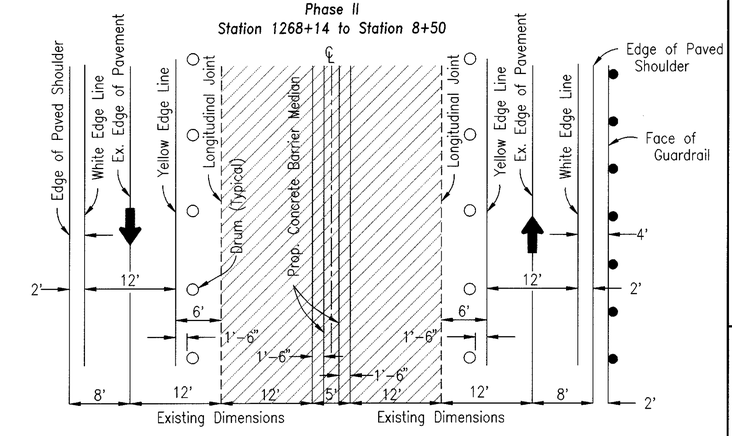


*3' ON BRIDGE NO. BEL-7-2526



DETAIL "B"

Phase II
Station 1268+14 to Station 8+50



DETAIL "D"

CALC. BY: CAM DATE: 09/94
CHKD. BY: GED DATE: 09/94

MAINTENANCE OF TRAFFIC

MAINTAINING TRAFFIC

GENERAL

BEFORE WORK IS STARTED ON THIS PROJECT THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF OPERATIONS, IN WRITING, TO THE DIRECTOR OF TRANSPORTATION FOR HIS APPROVAL.

A WORKSITE TRAFFIC SUPERVISOR SHALL BE AVAILABLE TWENTY-FOUR (24) HOURS PER DAY DURING THE TIME RESTRICTED TRAFFIC IS BEING MAINTAINED TO INSURE PROPER FUNCTIONING OF THE VARIOUS TRAFFIC CONTROL DEVICES, EXCEPT WHEN THE CONTRACTOR IS PERFORMING WORK IN THESE AREAS.

BEFORE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAME(S) AND TELEPHONE NUMBER(S) OF A WORKSITE TRAFFIC SUPERVISOR WHO CAN BE CONTACTED 24 HOURS A DAY BY THE OHIO DEPARTMENT OF TRANSPORTATION AND ALL INTERESTED POLICE AGENCIES. THIS WORKSITE TRAFFIC SUPERVISOR SHALL INSPECT ALL TRAFFIC CONTROL DEVICES AT THE START OF EACH DAY AND SHALL BE RESPONSIBLE FOR REPLACING NECESSARY TRAFFIC CONTROL DEVICES.

WHEN TRAFFIC IS MAINTAINED IN THE ADJACENT LANE, THE CONTRACTOR SHALL SCHEDULE THE WORK SUCH THAT ALL PAVEMENT REMOVED SHALL BE REPLACED WITH NEW MATERIAL EACH DAY AS PER SECTION 255.08.

ANY OPEN PAVEMENT OR SHOULDER TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH BARRICADES, DRUMS, OR PORTABLE CONCRETE BARRIER AS SHOWN ON SHEET NO. 14 .

DRUMS SHALL BE USED ON ALL TAPERS AND LANE CLOSURES. SIGNS NOT IN USE SHALL BE ADEQUATELY COVERED OR REMOVED.

IN ADDITION TO LOCATIONS ON THE MAINLINE OW-128-48 "ROAD CONSTRUCTION AHEAD" SIGNS ARE TO BE PLACED ON ALL ENTRANCE RAMPS AND ON THE APPROACHES TO SR 7 ON THE INTERSECTING ROADS. THE EXACT LOCATION TO BE DETERMINED BY THE ENGINEER. THE SIGNS SHALL BE EQUIPPED WITH TYPE A FLASHING WARNING LIGHTS.

THE CONTRACTOR WILL BE REQUIRED TO PROVIDE, ERECT, MAINTAIN (IN PROPER POSITION, CLEAN, LEGIBLE, AND GOOD WORKING CONDITION) AND REMOVE ALL LIGHTS, SIGNS, BARRICADES, PORTABLE CONCRETE BARRIERS, DRUMS, AND ALL OTHER TRAFFIC CONTROL DEVICES NECESSARY FOR THE MAINTENANCE OF TRAFFIC, INCLUDING REGULATORY SIGNS AND PAVEMENT MARKINGS.

ALL EXISTING LANES SHALL BE OPEN TO TRAFFIC BETWEEN NOVEMBER 15th AND AND APRIL 15th. NOVEMBER 15th SHALL BE CONSIDERED TO CONSTITUTE AN INTERIM COMPLETION DATE AND LIQUIDATED DAMAGES SHALL BE ASSESSED IN ACCORDANCE WITH 108.07 FOR EACH CALENDAR DAY THAT ALL LANES ARE NOT OPEN AND AVAILABLE TO TRAFFIC.

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 THE PLAN.

CONTRACTOR'S OPERATION AND EQUIPMENT

THE CONTRACTOR'S EQUIPMENT SHALL BE OPERATED IN THE SAME DIRECTION AS THE TRAFFIC. FLAGGERS SHALL BE USED WHEN CONSTRUCTION EQUIPMENT MUST MERGE WITH TRAFFIC STREAM. ALL OF THE CONTRACTOR'S EQUIPMENT WHICH IS CAPABLE OF DRIVING IN TRAFFIC SHALL HAVE AT LEAST ONE (1) OPERATIONAL AMBER FLASHING LIGHT OR STROBE LIGHT.

WHEN THE CONTRACTOR'S EQUIPMENT SHALL BE USED ON THE NEXT WORKING DAY, THE EQUIPMENT MAY BE PARKED WITHIN THE HIGHWAY RIGHT-OF-WAY AS PER SECTION 614.03, OTHERWISE THE EQUIPMENT SHALL BE STORED AT A PRE-APPROVED STORAGE AREA. ALL PRIVATE VEHICLES SHALL BE PARKED AT THE PRE-APPROVED STORAGE AREA.

ITEM 622 - PORTABLE CONCRETE BARRIERS

UTILIZE PORTABLE CONCRETE BARRIER TO PROTECT FULL DEPTH PAVEMENT REPAIR AREAS AS PER GENERAL NOTE NO. 10 ON SHEET NO. 14 . POSITION THE PORTABLE CONCRETE BARRIER AS SHOWN ON STANDARD DRAWING MT-95.40. SEE SHEET NUMBERS 20 THROUGH 25 FOR SPECIFIC LOCATIONS WHICH ARE GREATER THAN 60 FEET IN LENGTH.

THE FOLLOWING QUANTITY IS INCLUDED IN THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY FOR THIS ITEM:

ITEM 622 - PORTABLE CONCRETE BARRIER, 32" 380 LIN. FT.

CONCRETE MEDIAN BARRIER REPLACEMENT

THE EXSITING BARRIER SHALL BE REMOVED AND REPLACED IN A CONTINUOUS OPERATION, AND THIS WORK SHALL BE LIMITED TO A LENGTH SUBJECT TO THE APPROVAL OF THE ENGINEER. THE ENGINEER SHALL BE SATISFIED THAT ALL INSTALLATIONS WILL AFFORD MAXIMUM PROTECTION FOR TRAFFIC.

GUARDRAIL REPLACEMENT

NO HAZARD SHALL BE LEFT UNPROTECTED EXCEPT FOR THE ACTUAL TIME NECESSARY TO REMOVE THE EXISTING GUARDRAIL, PREPARE THE SITE, AND INSTALL NEW 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 UNTIL SUCH TIME AS THE ENGINEER IS ASSURED OF COMPLIANCE.

ITEM 614, BARRIER REFLECTORS

REFLECTORS AND THEIR MOUNTING SHALL CONFORM TO ITEM 626 EXCEPT THAT SPACING SHALL BE AS SHOWN IN THE CALCULATION. THE FOLLOWING QUANTITY HAS BEEN INCLUDED IN THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:

(380/50) + 1 = 9
ITEM 614 - BARRIER REFLECTOR, TYPE B 9 EACH

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 FACE IS STRICTLY PROHIBITED.

ITEM SPECIAL, REPLACEMENT SIGN

FLAT SHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT SIGNS SHALL BE NEW. OTHER MATERIALS MAY BE IN USED BUT GOOD CONDITION SUBJECT TO APPROVAL BY THE ENGINEER.

PAYMENT FOR THE NEW SIGNS SHALL BE MADE AT THE CONTRACT PRICE PER SQUARE FOOT FOR ITEM SPECIAL, REPLACEMENT SIGN, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF DAMAGED SIGNS, HARDWARE AND SUPPORTS, AND PROVIDING THE NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ETC.

AN ESTIMATED QUANTITY OF 200 SQUARE FEET HAS BEEN PROVIDED IN THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY.

ITEM SPECIAL, REPLACEMENT DRUM

DRUMS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT DRUMS SHALL BE NEW.

PAYMENT FOR THE NEW DRUMS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM SPECIAL, REPLACEMENT DRUM, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED DRUM, AND PROVIDING AND MAINTAINING THE REPLACEMENT DRUM IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS FOR THE ORIGINAL DRUM.

AN ESTIMATED QUANTITY OF 10 EACH HAS BEEN PROVIDED IN THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY.

ITEM 614, WORK ZONE SPEED LIMIT SIGN

THE CONTRACTOR SHALL FURNISH, INSTALL, 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, 500 FEET IN ADVANCE OF THE LANE REDUCTION TAPER. THE SIGN SHALL BE MOUNTED ON THE RIGHT SIDE, 250 FEET IN ADVANCE OF THE LANE REDUCTION TAPER ON UNDIVIDED HIGHWAYS. THE SIGN SHALL BE REPEATED, ON THE SIDE NEAREST TRAFFIC, EVERY 1 MILE FOR 55 MPH ZONES AND EVERY 1/2 MILE 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.

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 WITHIN 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 33 EACH

ITEM SPECIAL-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 TASKS:

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, OR AS DIRECTED BY THE ENGINEER TO ENSURE SAFE TRAFFIC OPERATION.

LAW ENFORCEMENT OFFICERS (L.E.O.'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 APPROPRIATE LAW ENFORCEMENT AGENCY THAT HAS JURISDICTION:

THE OHIO HIGHWAY PATROL, ST. CLAIRSVILLE POST: TELEPHONE (614) 695-0915
THE OHIO HIGHWAY PATROL, STEUBENVILLE POST: TELEPHONE (614) 264-1641

LAW ENFORCEMENT OFFICERS WITH PATROL CAR REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM SPECIAL-LAW ENFORCEMENT OFFICER WITH PATROL CAR. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY:

ITEM SPECIAL, 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 FOR 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.

MAINLINE

A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES AS PER STANDARD DRAWING MT-95.30.

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.

CONSTRUCTION WORK SHALL BE PERMITTED ON ONLY ONE SIDE OF THE DIRECTIONAL ROADWAY AT A TIME. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR BE PERMITTED TO HAVE WORK ZONES THAT ALTERNATELY CLOSE BOTH THE PASSING LANE AND THE TRAVEL LANE UNLESS THE DISTANCE BETWEEN THE LANE RESTRICTIONS EXCEEDS TWO (2) MILES.

TRAFFIC SHALL BE MAINTAINED BY USE OF THE EXISTING PAVEMENT AND THE SHOULDERS OR THE RESURFACED PAVEMENT AND SHOULDERS.

CLASS C CONCRETE SHALL BE USED FOR ALL MAINLINE PAVEMENT REPAIRS.

BRIDGES

ALTERNATING ONE-WAY TRAFFIC ON BEL-7-2549 SHALL BE MAINTAINED BY USE OF TEMPORARY TRAFFIC SIGNALS AS PER STANDARD DRAWINGS MT-96.10, MT-96.20, MT96.25 AND MT-97.10 AND DETAIL "E" ON SHEET NO. 12 .

ON ALL OTHER BRIDGES, A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES AS PER STANDARD DRAWING MT-95.30.

TWO LANES OF TRAFFIC SHALL NOT BE PERMITTED ACROSS ANY BRIDGE ON WHICH ONLY ONE LANE OF REHABILITATION HAS BEEN COMPLETED.

BRIDGE No. BEL-7-2389 BACKWALL REMOVAL AND RECONSTRUCTION

WHEN TRAFFIC IS MAINTAINED IN ADJACENT LANES, THE OPENING CREATED BY THE REMOVAL OF THE EXISTING BRIDGE BACKWALL SHALL BE COVERED WITH A STEEL PLATE WHEN WORK IS NOT BEING PERFORMED ON THE PROPOSED BRIDGE BACKWALL.

RAMPS AND SPEED CHANGE LANES

RAMP TRAFFIC SHALL BE MAINTAINED BY USING PORTIONS OF THE EXISTING PAVEMENT, THE EXISTING OR WIDENED SHOULDERS, OR BOTH.

THE CONTRACTOR MAY USE A FLAGGER OR FLAGGERS TO STOP TRAFFIC, AS DIRECTED BY THE ENGINEER FOR PERIODS NOT TO EXCEED TEN MINUTES.

SPEED CHANGE LANE TRAFFIC SHALL BE MAINTAINED AS PER STANDARD DRAWINGS MT-98.12, MT-98.13, MT-98.14, MT-98.15 AND MT-98.16, BY USING PORTIONS OF THE EXISTING PAVEMENT, THE EXISTING OR REBUILT SHOULDERS, OR BOTH.

CLASS FS CONCRETE SHALL BE USED FOR ALL RAMP AND SPEED CHANGE LANE PAVEMENT REPAIRS.

ALTERNATE METHODS

IF THE CONTRACTOR SO ELECTS, HE MAY SUBMIT ALTERNATE METHODS FOR THE MAINTENANCE OF TRAFFIC, PROVIDED THE INTENT OF THIS PLAN IS FOLLOWED AND NO ADDITIONAL INCONVENIENCE TO THE TRAVELLING PUBLIC RESULTS THEREFROM. NO ALTERNATE PLAN SHALL BE PLACED INTO EFFECT UNTIL APPROVAL HAS BEEN GRANTED, IN WRITING BY THE DIRECTOR.

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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.

NOTIFICATION OF WORK ZONE LANE RESTRICTIONS

THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST EIGHTEEN (18) DAYS PRIOR TO IMPLEMENTING ANY WORK ZONE RESTRICTIONS THAT 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.

FOR DETAILS NOT SHOWN, SEE STANDARD DRAWINGS MT-96.10, MT-96.20 AND MT-96.25.

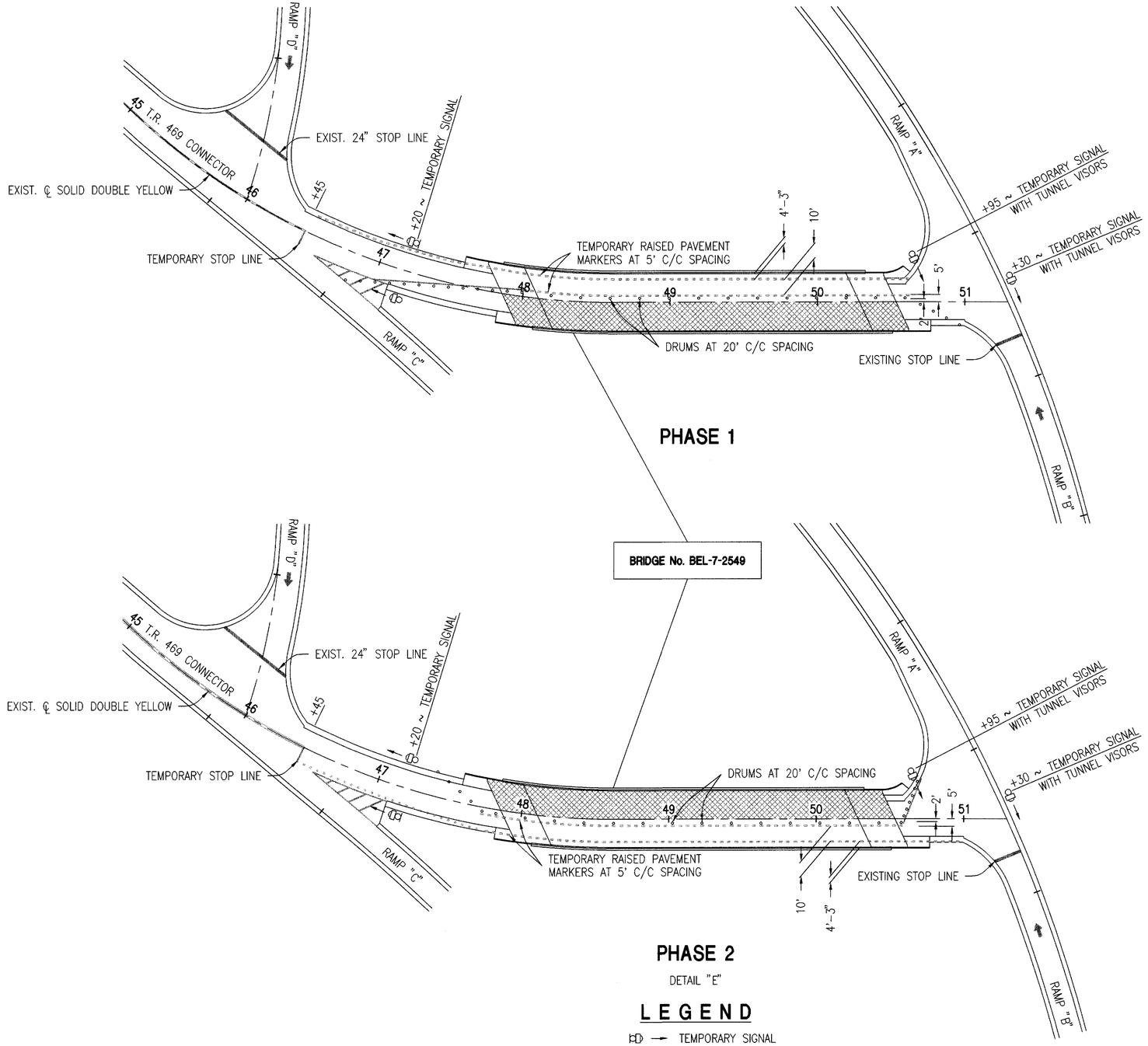
SIGNAL PHASING

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, SIGNAL PHASING FOR THIS PROJECT SHALL BE:

INTERVAL	1	2	3	4	5	6	TOTAL
WESTBOUND	R	R	R	R	G	Y	
EASTBOUND	R	G	Y	R	R	R	
SECONDS	17	20	3	17	20	3	80
MOVEMENT	⊢	→	⊢	⊢	←	⊢	

THE FOLLOWING ESTIMATED QUANTITIES ARE INCLUDED IN THE MAINTENANCE OF TRAFFIC GENERAL SUMMARY FOR THE PURPOSE OF MAINTAINING TRAFFIC ON BRIDGE No. BEL-7-2549:

ITEM 614, TEMPORARY EDGE LINE, CLASS I, 740.05, TYPE C 0.03 MILES
ITEM 614, TEMPORARY RAISED PAVEMENT MARKERS, TYPE A 549 EACH



PHASE 1

PHASE 2

DETAIL "E"

LEGEND

- TEMPORARY SIGNAL
- SINGLE TRPM
- DOUBLE TRPM
- TRAFFIC DRUM
- WORK AREA

HORIZONTAL SCALE IN FEET
0' 40' 80'

CALC. BY: CAM DATE: 09/94
DRWD. BY: GED DATE: 09/94

MAINTENANCE OF TRAFFIC

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STICKLEN – BELSHEIM & ASSOCIATES

GENERAL

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING, INSTALLING, MAINTAINING, AND SUBSEQUENTLY REMOVING TEMPORARY RAISED PAVEMENT MARKERS (TRPM'S). THE MARKERS SHALL BE YELLOW OR WHITE, AS DESCRIBED IN THE PLAN.

MATERIAL

ALL MARKERS SHALL BE OF SUFFICIENT STRENGTH AND PROPERLY SHAPED SO AS NOT TO BE DISLODGED OR BROKEN, OR THE REFLECTOR DISLODGED OR BROKEN, OR THE REFLECTOR DISLODGED OR DAMAGED BY IMPACTS FROM VEHICLES TIRES, INCLUDING THOSE OF HIGH PRESSURE TRUCK TIRES LOADED TO 4500 POUNDS.

RETROREFLECTORS SHALL BE PROVIDED IN ONE OR TWO DIRECTIONS ON EACH MARKER AS REQUIRED BY THE USAGE AND SHALL RETURN WHITE OR YELLOW LIGHT AS IS APPROPRIATE FOR THE APPLICATION.

THE REFLECTOR SHALL HAVE AN EFFECTIVE AREA OF 0.35 SQUARE INCHES FOR TYPE A OR 3.0 SQUARE INCHES FOR TYPE B. ITS BRIGHTNESS OR SPECIFIC INTENSITY (WHEN TESTED AT 0.2 DEGREE ANGLE OF OBSERVATION AND THE FOLLOWING ANGLES OF INCIDENCE; SHALL MEET OR EXCEED THE FOLLOWING:

SPECIFIC INTENSITY

TYPE A

INCIDENCE ANGLE (DEGREES)	WHITE	YELLOW
0	1.0	0.6
20	0.4	0.24
45	—	—

TYPE B

	WHITE	YELLOW
0	3.0	1.8
20	1.2	0.72
45	0.3	0.2

ANGLE OF INCIDENCE FORMED BY A RAY FROM LIGHT SOURCE TO THE MARKER AND THE NORMAL TO THE LEADING EDGE OF THE MARKER FACE (ALSO HORIZONTAL ENTRANCE ANGLE).

ANGLE OF OBSERVATION FORMED BY A RAY FROM LIGHT SOURCE TO THE MARKER AND THE RETURNED RAY FROM THE MARKER TO THE MEASURING RECEPTOR.

SPECIFIC INTENSITY IS THE MEAN CANDLEPOWER OF THE REFLECTED LIGHT (AT GIVEN INCIDENCE AND DIVERGENCE ANGLES) FOR EACH FOOT-CANDLE AT THE REFLECTOR (ON A PLANE PERPENDICULAR TO THE INCIDENT LIGHT).

TYPE A MARKERS ARE INTENDED TO PROVIDE HIGH VISIBILITY BOTH DAY AND NIGHT. THEIR DAY TIME VISIBILITY SHALL BE ASSURED BY SIZE, SHAPE AND COLOR AS FOLLOWS:

1) THE MARKERS SHALL BE A HIGH VISIBILITY YELLOW OR WHITE COLOR WHICH WILL NOT DEGRADE SUBSTANTIALLY DUE TO TRAFFIC WEAR AND WHICH WILL MATCH THE COLOR OF THE REFLECTOR.

2) WHEN VIEWED FROM ABOVE, THE MARKERS SHALL HAVE A VISIBLE AREA OF NOT LESS THAN 14 SQUARE INCHES.

3) WHEN VIEWED FROM THE FRONT, PARALLEL TO THE PAVEMENT, AS FROM APPROACHING TRAFFIC, THE MARKER SHALL HAVE A WIDTH OF APPROXIMATELY 4 INCHES AND A VISIBLE AREA OF NOT LESS THAN 1.5 SQUARE INCHES.

TYPE B MARKERS ARE INTENDED TO PROVIDE HIGH VISIBILITY AT NIGHT BY RETROREFLECTING AUTOMOTIVE HEADLIGHT BACK TO DRIVER.

INSTALLATION

TEMPORARY RAISED PAVEMENT MARKERS SHALL BE ATTACHED TO CLEAN, DRY PAVEMENT BY A BUTYL ADHESIVE PAD, A BITUMINOUS ADHESIVE OR OTHER CONSTRUCTION GRADE ADHESIVES (SUCH AS FRANKLIN PANEL AND METAL ADHESIVE) SUITABLE TO ANCHOR THE MARKER UNDER THE ABOVE CONDITIONS. WHEN IT IS NECESSARY TO ATTACH MARKERS TO NEW CONCRETE PAVEMENT WITH CURING COMPOUND REMAINING, THE CURING COMPOUND MEMBRANE SHALL BE REMOVED BY SANDBLASTING OR OTHER MECHANICAL CLEANING METHOD. MARKERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR SHALL IMMEDIATELY REPLACE, AT HIS EXPENSE, ANY MARKERS WHICH FAIL (BROKEN HOUSING, HOUSING WORN TO THE EXTENT THAT DAYTIME VISIBILITY IS SIGNIFICANTLY DIMINISHED OR OF AN UNACCEPTABLE COLOR, DETACHED OR BROKEN REFLECTOR, HOUSING DETACHED FROM ADHESIVE).

MARKERS ARE LIKELY TO BE REMOVED BY SNOW PLOWING OPERATIONS, THUS THEY ARE NOT CONSIDERED SUITABLE FOR USE DURING THE PERIOD FROM OCTOBER 15 UNTIL APRIL 30. THE CONTRACTOR IS ADVISED TO SCHEDULE HIS WORK AND/OR THE USE OF THESE DEVICES TO AVOID THIS PERIOD. SHOULD THE CONTRACTOR CHOOSE TO USE TRPM'S DURING THIS PERIOD AND THEY ARE SUBSEQUENTLY REMOVED OR DESTROYED BY SNOW AND ICE CONTROL ACTIVITIES. THE CONTRACTOR SHALL IMMEDIATELY, AT HIS EXPENSE, PROVIDE A SUBSTITUTE TRAFFIC GUIDANCE SYSTEM EFFECTIVE DURING DAY AND NIGHT AND WHICH IS ACCEPTABLE TO THE ENGINEER.

THE MARKERS SHALL BE PLACED ACCURATELY TO DEPICT STRAIGHT OR UNIFORMLY CURVING LINES. WHEN USED TO SUPPLEMENT TEMPORARY PAVEMENT MARKINGS, THEY SHALL BE PLACED ON OR IMMEDIATELY ADJACENT TO THE PAVEMENT MARKING. LOCATIONS SHALL BE ADJUSTED UP TO ONE FOOT LONGITUDINALLY OR SIX INCHES LATERALLY TO AVOID PLACEMENT ON JOINTS, OR ON CRACKED OR DETERIORATED PAVEMENT. MARKERS SHALL NOT BE PLACED DIRECTLY ON PAVEMENT MARKINGS IF THIS DISTRACTS FROM THEIR ABILITY TO REMAIN ATTACHED TO THE PAVEMENT.

APPLICATION

1) WHEN REQUIRED TO SUPPLEMENT PAVEMENT MARKING, TEMPORARY RAISED PAVEMENT MARKERS SHALL BE PLACED AS FOLLOWS:

LINE	TYPE	SPACING
EDGE LINE	A OR B	20'C/C
LANE LINE	A OR B	40'C/C*
CENTER LINE (SINGLE/BROKEN	A OR B	40'C/C*
CENTER LINE (DOUBLE/SOLID)	A OR B	2 UNITS SIDE BY SIDE 4 INCHES APART 20'C/C
CHANNELIZING LINE (INCLUDES EXIT GORE NOSE)	A OR B	10'C/C

* CENTERED IN GAP

2) WHEN USED TO SIMULATE (REPLACE) PAVEMENT MARKING, TEMPORARY RAISED PAVEMENT MARKERS SHALL BE PLACED AS FOLLOWS:

LINE	TYPE	SPACING
EDGE LINE	A	5'C/C
LANE LINE	A	4 @ 3.33'C/C 30'GAP (40'CYCLE)
CENTER LINE (DOUBLE/SOLID)	A	2 UNITS SIDE BY SIDE 5'C/C
CENTER LINE (SINGLE/BROKEN)	A	4 @ 3.33'C/C 30'GAP (40'CYCLE)
CHANNELIZING LINE (INCLUDES EXIT GORE NOSE)	A	5'C/C
EDGE LINE (TWO COLOR) (WHITE/YELLOW)	A	BACK TO BACK 5'C/C

YELLOW MARKERS USED TO SEPARATE OPPOSITE FLOWS OF TRAFFIC (CENTER LINES) SHALL INCLUDE REFLECTIONS FOR BOTH DIRECTIONS. ALL OTHER YELLOW AND WHITE MARKERS SHALL PROVIDE RETROREFLECTIVITY FOR ONE DIRECTION ONLY.

REMOVAL

REMOVAL SHALL BE ACCOMPLISHED IN A MANNER THAT LITTLE OR NONE OF THE ADHESIVE REMAINS ON THE PAVEMENT. PERMANENT PAVEMENT SURFACES SHALL NOT BE SCARRED, BROKEN OR ROUGHENED SIGNIFICANTLY.

PAYMENT

BASIS OF PAYMENT SHALL BE AT THE CONTRACT UNIT PRICE PER EACH MARKER AND SHALL INCLUDE ALL LABOR, EQUIPMENT, HARDWARE AND INCIDENTALS REQUIRED TO PERFORM THE WORK. IT SHALL ALSO INCLUDE REPLACEMENT AT NO ADDITIONAL COST OF ALL TEMPORARY RAISED PAVEMENT MARKERS WHICH, IN THE JUDGEMENT OF THE ENGINEER, FAIL FOR ANY REASON, EXCEPT DUE TO FAILURE OF THE PAVEMENT TO WHICH THEY ARE ATTACHED.

STATIONING FROM	STATIONING TO	SIDE	SPACING (FT.)	TYPE A W	TYPE A Y	TYPE A Y/Y		TYPE B OR A W	TYPE B OR A Y	TYPE B OR A Y/Y		REMARKS (LINE TYPE)
PHASE 1												
46+45	50+60	LEFT	5' c/c	84	84							EDGE
48+00	50+60	LEFT	5' c/c	53	53							EDGE
PHASE 2												
46+45	47+75	RIGHT	5' c/c	27								EDGE
47+75	51+00	RIGHT	5' c/c	66	66							EDGE
47+75	50+60	RIGHT	5' c/c	58	58							EDGE
TOTALS				288	261							
				549								

REVISED BY: CAM DATE: 9/28/95

210120	DATE
614 TEMPORARY RAISED PAVEMENT MARKERS	03/30/88 03/23/90 03/28/90 07/03/90

CALC. CAM BY: DATE: 07/94

CHKD. GED BY: DATE: 07/94

TEMPORARY RAISED PAVEMENT MARKERS PLAN INSERT SHEET

BEL/JEF-7-23.76/0.00

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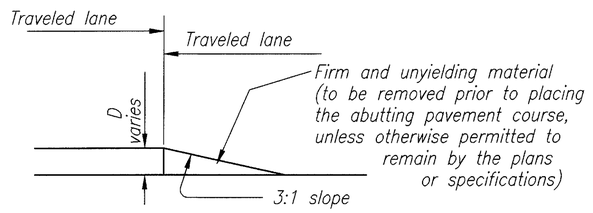
GENERAL NOTES

1. It is intended that this drawing be used for treatment of drop-offs that develop during construction operations, and that are not otherwise provided for in the construction plans. Where the plans do not provide specific items for labor, equipment, or materials to implement the drop-off treatments specified hereon, they shall be included for payment in the lump sum bid for Item 614 – Maintaining Traffic.
2. While the need for certain advisory signing is noted hereon, it is not intended that this be indicative of all signing that may be required to advise or warn motorists, and all requirements of the Ohio Manual of Uniform Traffic Control Devices (OMUTCD) must be fulfilled.
3. In urban or otherwise heavily developed areas where pedestrians and/or bicyclists may be present in significant numbers, additional signing and protective measures other than those shown hereon may be required.
4. The drop-off treatment selected for use at any given location shall be as appropriate for the prevailing conditions at the site.
5. Where concrete barrier is specified, it shall be in accordance with Standard Construction Drawing MC-9.2 and Item 622.
6. When drums are specified for a dropoff condition, a minimum number of four drums shall be used. Spacing shall be as indicated in the plans or as specified in the OMUTCD.
7. When OW-151 (Low Shoulder) signs or OW-171 (Uneven Lanes) and OWP-171 signs are required, they shall be placed 750' in advance of the condition, on all intersecting entrance ramps within the limits of the condition and immediately beyond all intersecting roadways within the limits of the condition. When the dropoff condition extends more than one-half mile, additional signs should be erected at intervals of one mile or less.
8. For locations, such as at lane shifts, lane closures, etc., where traffic is required to negotiate any difference in elevation between pavements, a 3:1 slope treatment similar to the Optional Wedge Treatment shall be provided.
9. Portable concrete barrier shall be placed on the same level as the traffic surface and shall not encroach on lane width(s) designated as the minimum required for traffic use. Where drums are used, and their presence would reduce traveled lane widths to less than 10', drums may be placed on the opposite level from that of traffic provided the dropoff depth does not exceed 5" and approval is granted by the Project Engineer.
10. Pavement Repairs (or similar work):
    a. Lengths greater than 60 feet – utilize appropriate treatment from Condition I.
    b. Lengths of 60 feet or less – repairs shall be effected in accordance with 255.08. Drums may be used as a separator adjacent to the traveled lane.

OPTIONAL WEDGE TREATMENT
(MILLING OR RESURFACING)

1. This treatment may be used when permitted for Condition I only.
2. OW-171 and OWP-171 signs required.

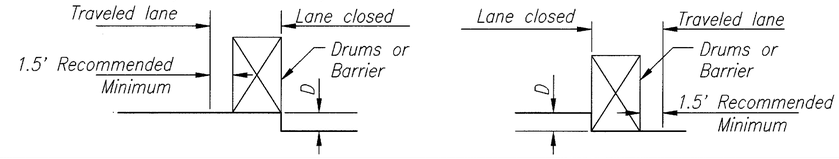


CONDITION I
DROPOFFS BETWEEN TRAVELED LANES

1. These treatments are to be used for resurfacing, pavement planing, excavation, etc. between or within traveled lanes.

D (In.)	Treatment
≤1½	Erect OW-171 and OWP-171 signs.
>1½-3	1) Lane closure utilizing drums* as shown below OR 2) Optional Wedge Treatment
>3-5	Lane closure utilizing drums as shown below.
>5	Lane closure utilizing portable concrete barrier as shown below.

*Cones may be used for daytime only conditions.

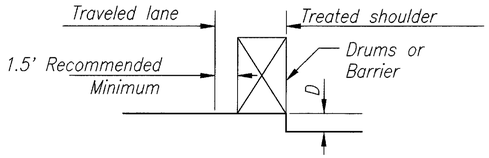


CONDITION II
DROPOFFS WITHIN GRADED SHOULDER AREA

1. The treatments indicated below are for use in conjunction with resurfacing, planing, or excavations within the graded shoulder area.
2. The graded shoulder area is that flat or gradually sloping area between the edge of a normally traveled lane and the more steeply sloping ditch foreslope or embankment slope. Its surface may be soil or turf, and/or it may be inclusive of a "treated" area (improved with aggregates, asphaltic materials, or concrete). For the purposes herein, its maximum width shall be considered to be twelve (12) feet.

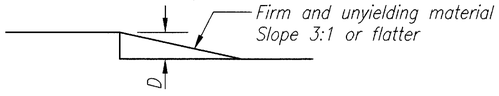
D (In.)	Treatment
≤1½	1) If edgelines are present, no treatment necessary OR 2) Erect OW-171 and OWP-171 signs.
>1½-5	1) If min. lane width* requirements can be met, maintain lanes utilizing drums as shown below OR 2) If min. lane width* requirements cannot be met, close adjacent lane utilizing drums OR 3) Optional Shoulder Treatment.
>5-12 Daylight only	If min. lane width* requirements can be met, maintain lanes utilizing drums as shown below.
>5-24	1) If min. lane width* requirements can be met, maintain lanes utilizing portable concrete barrier as shown below. OR 2) If min. lane width* requirements cannot be met, close adjacent lane utilizing drums.
>24	Lane closure utilizing portable concrete barrier as shown below.

* Minimum lane widths shall be 10' unless otherwise specified in the plans.



OPTIONAL SHOULDER TREATMENT

1. This treatment may not be used within a bituminous shoulder where a hot longitudinal joint per 401.15 is required.
2. OW-151 signs required.

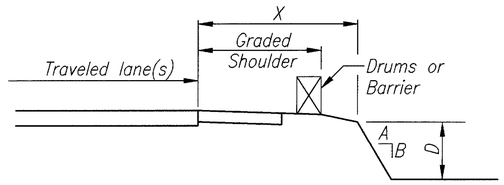


CONDITION III
DROPOFFS BEYOND GRADED SHOULDER OR BACK OF CURB

1. See Note 2 under Condition II.
2. Use Chart A or B below, as applicable.

CHART A

USE FOR:
1. Uncurbed Facilities.
2. Curbed Facilities, where:
   a. Curbs are less than 6" in height.
   b. Curbs are 6" or greater in height and the legal speed is greater than 40 mph.

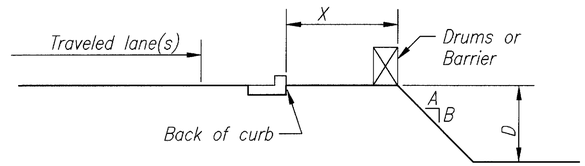


X (Ft.)	D (In.)	A/B	TREATMENT REQUIRED Day	Night
0-4	Any	Any	(a)	(a)
4-30	Any	3:1 or Flatter	None	None
4-12	≤3	Steeper than 3:1	None	None
4-12	>3-≤12	Steeper than 3:1	Drums	Drums
4-12	>12	Steeper than 3:1	Drums	Barrier
>12-20	≤12	Steeper than 3:1	None	None
>12-20	>12-≤24	Steeper than 3:1	Drums	Drums
>12-20	>24	Steeper than 3:1	Drums	Barrier
>20-30	≤24	Steeper than 3:1	None	Drums
>20-30	>24	Steeper than 3:1	Drums	Barrier
>30	Any	Any	None	None

(a) Use treatment specified under Condition II.

CHART B

USE FOR: Curbed facilities, where the curb is 6" or greater in height and the legal speed is 40 mph or less.



X (Ft.)	D (In.)	A/B	TREATMENT REQUIRED Day	Night
0-10	<12	Any	None	Drums
0-10	>12	Any	Drums	Drums
>10	Any	Any	None	None

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
BUREAU OF LOCATION AND DESIGN

DROPOFFS IN WORK ZONES

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED

DROPOFFS IN WORK ZONES (MAINLINE ONLY) PLAN INSERT SHEET

CALC. 7/94 BY: DAM DATE:
CHKD. GED BY: DATE: 7/94

BEL/JEF-7-23.76/0.00

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9/5/96 RRB 1993DWZ FINAL

STICKLEN – BELSHEIM & ASSOCIATES

SHEET NUMBER													ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET
8	9	17	18	19	25	26	28	29	31	38A	41							
																	ROADWAY	
LUMP													201	11001	LUMP		CLEARING AND GRUBBING, AS PER PLAN	8
					121								202	23000	121	SQ YD	PAVEMENT REMOVED	
		1627											202	30600	1627	SQ YD	CONCRETE MEDIAN REMOVED	
		14623											202	30700	14623	LIN FT	CONCRETE BARRIER REMOVED	
		1070											202	32500	1070	LIN FT	CURB AND GUTTER REMOVED	
								18692					202	38000	18692	LIN FT	GUARDRAIL REMOVED	
								413					202	38300	413	LIN FT	GUARDRAIL REMOVED, BARRIER DESIGN	
	541												202	54101	541	EACH	RAISED PAVEMENT MARKER REMOVED FOR STORAGE, AS PER PLAN	9
						2							202	58500	2	EACH	CATCH BASIN ABANDONED	
	1000												SPECIAL	20270100	1000	LIN FT	PIPE CLEANOUT	9
									27163				202	75000	27163	LIN FT	FENCE REMOVED	
		8646	3354	228									203	12000	12228	CU YD	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	
100													203	40000	100	CU YD	BORROW	
		26128	9057										203	50000	35185	SQ YD	SUBGRADE COMPACTION	
							161						203	60200	161	STATION	LINEAR GRADING, METHOD A	8
							234						203	60204	234	STATION	LINEAR GRADING, METHOD B	8
							34						203	60300	34	STATION	LINEAR GRADING, METHOD C	8
							258						203	60408	258	STATION	LINEAR GRADING (DITCH CLEANOUT)	8
11261													SPECIAL	5126751O	11261	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	8
									74				604	40501	74	EACH	REFERENCE MONUMENT, AS PER PLAN	9
								16843.75					606	13000	16843.75	LIN FT	GUARDRAIL, TYPE 5	
								2					606	26000	2	EACH	ANCHOR ASSEMBLY, TYPE B	
								11					606	26100	11	EACH	ANCHOR ASSEMBLY, TYPE E	9
								13					606	26500	13	EACH	ANCHOR ASSEMBLY, TYPE T	
								14					606	35000	14	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1	
								7					606	35100	7	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 2	
									15682				607	15000	15682	LIN FT	FENCE, TYPE 47	
									4940				607	23000	4940	LIN FT	FENCE, TYPE CLT	
		15122											622	23301	15122	LIN FT	CONCRETE BARRIER, TYPE A, AS PER PLAN	8
		505											622	23405	505	LIN FT	CONCRETE BARRIER, TYPE B50, AS PER PLAN	8
								120					622	24000	120	LIN FT	CONCRETE BARRIER, TYPE D	
										6226			622	24005	6226	LIN FT	CONCRETE BARRIER, TYPE D-50, AS PER PLAN	38A
									2				625	32000	2	EACH	GROUND ROD	
								2					SPECIAL	69010384	2	EACH	IMPACT ATTENUATOR, QUADGUARD TYPE, BI-DIRECTIONAL	9
																	EROSION CONTROL	
	14572												207	10000	14572	SQ YD	TEMPORARY SEEDING AND MULCHING	
	5386										6634		207	30000	12020	LIN FT	FILTER FABRIC FENCE	
	517										517		207	70000	1034	EACH	STRAW OR HAY BALES	
											52		601	32200	52	CU YD	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER	
							88953						659	10000	88953	SQ YD	SEEDING AND MULCHING	
	3643												659	14000	3643	SQ YD	REPAIR SEEDING AND MULCHING	
							8.00						659	20000	8.00	TON	COMMERCIAL FERTILIZER	
							40.51						659	30000	40.51	TON	AGRICULTURAL LIMING	
192	4												659	35000	196	M GALLON	WATER	
							16093						670	41000	16093	SQ YD	SLOPE EROSION PROTECTION	

CALC. ATH DATE: 11/95
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GENERAL SUMMARY

BEL/JEF-7-23.76/0.00

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2/24/97 ATH 199505 FINAL

STICKLEN – BELSHEIM & ASSOCIATES

11	17	18	19	25	26	27	28	30		50B		ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET
																DRAINAGE	
					8							603	00900	8	LIN FT	6" CONDUIT, TYPE B	
								1349				603	01500	1349	LIN FT	6" CONDUIT, TYPE F, 707.31, 707.33, OR 707.42	
					94	66				16		603	04400	176	LIN FT	12" CONDUIT, TYPE B	
					8							603	05900	8	LIN FT	15" CONDUIT, TYPE B	
					20					146		603	07400	166	LIN FT	18" CONDUIT, TYPE B	
					4					18		603	08900	22	LIN FT	21" CONDUIT, TYPE B	
					44	8						603	10400	52	LIN FT	24" CONDUIT, TYPE B	
					12							603	11900	12	LIN FT	27" CONDUIT, TYPE B	
					8					34		603	13400	42	LIN FT	30" CONDUIT, TYPE B	
					8							603	16400	8	LIN FT	36" CONDUIT, TYPE B	
					12							603	19400	12	LIN FT	42" CONDUIT, TYPE B	
					36							603	20900	36	LIN FT	48" CONDUIT, TYPE B	
					8							604	00400	8	EACH	CATCH BASIN, NO. 3	
					7							604	01200	7	EACH	CATCH BASIN, NO. 4	
					24							604	01600	24	EACH	CATCH BASIN, NO. 5	
					6							604	01800	6	EACH	CATCH BASIN, NO. 5A	
						2						604	10900	2	EACH	INLET, NO. 2-6	
										14		604	14603	14	EACH	INLET, NO. 3B50, AS PER PLAN	50A
						1						604	15000	1	EACH	INLET, NO. 3C	
						16						604	15001	16	EACH	INLET, NO. 3C, AS PER PLAN	9 & 50
					3							604	17500	3	EACH	INLET, NO. 2-A-6	
					1							604	34500	1	EACH	MANHOLE ADJUSTED TO GRADE	
								36				604	36600	36	EACH	PRECAST REINFORCED CONCRETE OUTLET	
								26659				605	05101	26659	LIN FT	4" SHALLOW PIPE UNDERDRAIN, 707.31, AS PER PLAN	49
				176								605	13400	176	LIN FT	6" UNCLASSIFIED PIPE UNDERDRAIN, 707.01 TYPE III OR 707.21 TYPE III	
						16						SPECIAL	69098000	16	EACH	MISC.: INLET CLEANOUT	
																PAVEMENT	
			13605									251	01000	13605	SQ YD	PARTIAL DEPTH PAVEMENT REPAIR	
	271											254	01000	271	SQ YD	PAVEMENT PLANING, BITUMINOUS	
			15300	7830								255	10000	23130	SQ YD	FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS C	
			2880	2460								255	10100	5340	SQ YD	FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS FS	
			60900	22540								255	20000	83440	LIN FT	FULL DEPTH PAVEMENT SAWING	
	5451	2280										301	46010	7731	CU YD	BITUMINOUS AGGREGATE BASE, PG64-28	
	2659	1070	231									304	20000	3960	CU YD	AGGREGATE BASE	
	6561	1362										407	10000	7923	GALLON	TACK COAT	
	8591	2157										407	14000	10,748	GALLON	TACK COAT FOR INTERMEDIATE COURSE	8
			66623	26300								413	14000	92923	LIN FT	SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	
	8640	2046										446	46040	10686	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG 64-28	
	4136	999										446	50001	5135	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN	9
							397					448	46061	397	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, UNDER GUARDRAIL, PG 64-22, AS PER PLAN	8
			26380									SPECIAL	45012600	26380	LIN FT	LONGITUDINAL JOINT CLEANING AND SEALING, CLASS V, 705.04	
			4660									SPECIAL	45012800	4660	LIN FT	LONGITUDINAL JOINT CLEANING AND SEALING, CLASS VI, 705.04	
				136								SPECIAL	45130000	136	LIN FT	PRESSURE RELIEF JOINT, TYPE A	
	668	786										609	12000	1454	LIN FT	COMBINATION CURB AND GUTTER, TYPE 2	
	1070											609	12001	1070	LIN FT	COMBINATION CURB AND GUTTER, TYPE 2, AS PER PLAN	4
		242										611	30001	242	SQ YD	REINFORCED CONCRETE APPROACH SLAB (T=17"), AS PER PLAN	9, 51 & 52
	305											612	42001	305	SQ YD	CONCRETE MEDIAN, AS PER PLAN	8
																FOR LIGHTING GENERAL SUMMARY	70
																FOR TRAFFIC CONTROL GENERAL SUMMARY	53
																FOR CAST-IN-PLACE STRUCTURES GENERAL SUMMARY	83
																FOR MAINTENANCE OF TRAFFIC GENERAL SUMMARY	53
LUMP												614	11000	LUMP		MAINTAINING TRAFFIC	
												623	10000	LUMP		CONSTRUCTION LAYOUT STAKES	
												624	10000	LUMP		MOBILIZATION	
												806	16020	24	MONTH	FIELD OFFICE, TYPE C	
												806	26000	24	MONTH	COMPUTER EQUIPMENT FOR FIELD OFFICE	

CALC. ATH BY: DATE: 11/95
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GENERAL SUMMARY

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16/94

FINAL 1993052 ATH 2/24/97

STICKLEN – BELSHEIM & ASSOCIATES

** NOT INCLUDING EMBANKMENT CONSTRUCTION

LOCATION	STATION		LENGTH	WIDTH	AREA	254	407		446		446		202	609	609	203	203	301	304		202	612	202	622		626	COMMENTS	SEE SHEET
						PAV'T. PLANING BITUM.	TACK COAT FOR I.C.	TACK COAT	AVERAGE THICKNESS	2 3/4" ASPHALT INTERMEDIATE COURSE, TYPE 2, PG 64-28	AVERAGE THICKNESS	1 1/4" ASPHALT SURFACE COURSE, TYPE I, PG 64-28 AS PER PLAN	CURB AND GUTTER REMOVED	COMB. CURB & GUTTER, TYPE 2, AS PER PLAN	COMB. CURB & GUTTER, TYPE 2	EXCAVATION ** (1.1' AVG. DEPTH)	SUBGRADE COMPACTION	9" BITUMINOUS AGGREGATE BASE PG64-28	AVERAGE END AREA	AGGREGATE BASE	CONCRETE MEDIAN REMOVED	CONCRETE MEDIAN, AS PER PLAN	CONCRETE BARRIER REMOVED	CONCRETE BARRIER, AS PER PLAN TYPE A	CONCRETE BARRIER, AS PER PLAN TYPE B50	BARRIER, REFLECTOR, TYPE B		
	FROM	TO	LIN. FT.	LIN. FT.	SQ. YD.	SQ. YD.	GAL.	GAL.	INCH	CU. YD.	INCH	CU. YD.	LIN. FT.	LIN. FT.	LIN. FT.	CU. YD.	SQ. YD.	CU. YD.	SQ. FT.	CU. YD.	SQ. YD.	SQ. YD.	SQ. YD.	LIN. FT.	LIN. FT.	LIN. FT.	EACH		
MAINLINE PAVEMENT RESURFACING																												
FEATHER (NB&SB)	1258+00.00	1259+00.00	100.00	48	533.3	160	40	40	2.00	11.1	1.64	24.3															BEGIN PROJECT	
NB & SB	1259+00.00	1265+10.70	610.70	48	3257.1		244	244		248.8		113.1																
SB ONLY	1265+10.70	1265+42.96	32.26	24	86.0		6	6		6.6		3.0																
FEATHER (NB @ BRIDGE)	1265+10.70	1266+10.70	100.00	38	422.2		16	16	2.00	8.8	2.39	23.5																
FEATHER (SB @ BRIDGE)	1265+42.96	1266+42.96	100.00	27	300.0		19	19	2.00	6.3	2.39	16.7																
BRIDGE NO. BEL-7-2389																												
FEATHER (NB @ BRIDGE)	1266+67.42	1267+67.42	100.00	39.5	438.9		33	33	2.00	24.4	2.39	29.1				78	122			20.3							REPLACE APPROACH SLAB	
FEATHER (SB @ BRIDGE)	1266+99.68	1267+99.68	100.00	27	300.0		23	23	2.00	16.7	2.39	19.9				75	117			19.4							REPLACE APPROACH SLAB	
NB ONLY	1267+67.42	1267+99.68	32.26	24	86.0		6	6		6.6		3.0																
CR-4 FEATHER	9+66.42	9+26.42			232.8	111	17	17	2.00	7.1	1.25	8.1															SEE DETAIL SHEET NO. 32	
NB & SB	1267+99.68	1337+28.16	6928.48	48	36951.9		2771	2771		2822.7		1283.1																
NB ONLY	1337+28.16	1337+40.02	11.86	24	31.6		2	2		2.4		1.1																
FEATHER (SB @ BRIDGE)	1337+28.16	1338+28.16	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
FEATHER (NB @ BRIDGE)	1337+40.02	1338+40.02	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
BRIDGE NO. BEL-7-2526																												
FEATHER (SB @ BRIDGE)	1339+86.02	1340+86.02	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
FEATHER (NB @ BRIDGE)	1339+97.88	1340+97.88	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
SB ONLY	1340+86.02	1340+97.88	11.86	24	31.6		2	2		2.4		1.1																
NB & SB	1340+97.88	1342+10.64	112.76	48	601.4		45	45		45.9		20.9															STATION EQUATION	
NB & SB	1342+00.00	1386+35.25	4435.25	48	23654.7		1774	1774		1807.0		821.3															1342+10.64(BACK)=1342+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	1386+35.25	1387+35.25	100.00	48	533.3		40	40	2.00	29.6	2.39	35.4																
BRIDGE NO. BEL-7-2619																												
FEATHER (NB & SB @ BRIDGE)	1388+71.75	1389+71.75	100.00	48	533.3		40	40	2.00	29.6	2.14	31.7																
NB & SB	1389+71.75	1415+64.31	2592.56	48	13827.0		1037	1037		1056.2		480.1															STATION EQUATION	
NB & SB	0+00.00	7+49.89	749.89	48	3999.4		300	300		305.5		138.9															1415+64.31(BACK)=0+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	7+49.89	8+49.89	100.00	48	533.3		40	40	2.00	29.6	2.26	33.5																
BRIDGE NO. JEF-7-0016																												
OUTSIDE SHOULDER REPLACEMENT & RESURFACING																												
NB & SB	1258+00.00	1265+10.70	711	3	236.9		18	18		18.1		8.2	711	711													BEGIN CURB 1258+00	36
SB ONLY	1265+10.70	1265+42.96	32	1.5	5.4		0	0		0.4		0.2	32	32														
FEATHER (NB @ BRIDGE)	1265+10.70	1266+00.08	89	1.5	14.9		1	1	2.00	0.8	2.39	1.0	59	59													END CURB 1265+70.08	36
FEATHER (SB @ BRIDGE)	1265+42.96	1266+53.58	111	1.5	18.4		1	1	2.00	1.0	2.39	1.2	81	81													END CURB 1266+23.58	36
BRIDGE NO. BEL-7-2389																												
FEATHER (NB @ BRIDGE)	1266+56.80	1267+67.42	111	1.5	18.4		1	1	2.00	1.0	2.39	1.2	81	81													BEGIN CURB 1266+86.80	36
FEATHER (SB @ BRIDGE)	1267+10.30	1267+99.68	89	1.5	14.9		1	1	2.00	0.8	2.39	1.0	59	59													BEGIN CURB 1267+40.30	36
NB ONLY	1267+67.42	1267+99.68	32	1.5	5.4		0	0		0.4		0.2	32	32														
NB & SB	1267+99.68	1268+14.00	14	3	4.8		0	0		0.4		0.2	14	14													END CURB 1268+14	36
NB ONLY	1268+14.00	1269+25.00	111	8	98.7		7			7.5		3.4				38	117	25	2.88	11.9							BEGIN CONC. SHOULDER 1268+14	
NB & SB	1269+25.00	1331+00.00	6175	16	10977.8		823			838.6		381.2				4277	13036	2745	5.77	1319.0								
NB ONLY	1331+00.00	1334+00.00	300	8	266.7		20			20.4		9.3				104	317	67	2.88	32.0								
BRIDGE NO. BEL-7-2526																												
NB ONLY	1342+00.00	1342+10.64	11	8	9.5		1			0.7		0.3				4	11	2	2.88	1.1							STATION EQUATION	
NB ONLY	1342+00.00	1344+00.00	200	8	177.8		13			13.6		6.2				69	211	45	2.88	21.4							1342+10.64(BACK)=1342+00.00(AHEAD)	
NB & SB	1344+00.00	1357+67.00	1367	16	2430.2		182			185.6		84.4				947	2886	608	5.77	292.0								
SB ONLY	1357+67.00	1359+00.00	133	8	118.2		9			9.0		4.1				46	140	30	2.88	14.2								
SB ONLY	1367+00.00	1370+00.00	300	8	266.7		20			20.4		9.3				104	317	67	2.88	32.0								
NB & SB	1370+00.00	1386+35.25	1635	16	2907.1		218			222.1		100.9				1133	3452	727	5.77	349.3								
FEATHER (NB & SB @ BRIDGE)	1386+35.25	1387+35.25	100	16	177.8		13		2.00	9.9	2.39	11.8				48	148	31	5.77	15.0							END CONC. SHOULDER 1387+05.25	
BRIDGE NO. BEL-7-2619																												
FEATHER (NB & SB @ BRIDGE)	1388+71.75	1389+71.75	100.0	16	177.8		13		2.00	9.9	2.14	10.6				55	169	36	5.77	17.1							BEGIN CONC. SHOULDER 1388+91.75	
NB & SB	1389+71.75	1406+48.31	1676.6	16	2980.6		224			227.7		103.5			523	1161	3539	745	5.77	358.1							BEGIN CURB 1401+25	
NB ONLY	1406+48.61	1407+93.56	144.95	8	128.8		10			9.8		4.5			145	50	153	32	2.88	15.5							END CURB CALC. 1407+93.56	
NB ONLY	0+75.00	2+55.00	180	8	160.0		12			12.2		5.6				62	190	40	2.88	19.2							1415+64.31(BACK)=0+00.00(AHEAD)	
NB & SB	2+55.00	7+49.89	494.89	16	879.8		66			67.2		30.5				343	1045	220	5.77	105.7								
FEATHER (NB & SB @ BRIDGE)	7+49.89	8+49.89	100	16	177.8		13		2.00	9.9	2.26	11.2				52	158	33	5.77	16.0							END CONC. SHOULDER 8+24.89	
BRIDGE NO. JEF-7-0016																												
MEDIAN REPLACEMENT & MEDIAN SHOULDER RESURFACING																												
NB & SB	1257+76.00	1258+00.00	24	14	37.333					4.1		1.0										24		24	2			
NB & SB	1258+00.00	1262+80.75	480.75	14	747.83		42			81.8		19.5									748			481	12		BEGIN CONC. MEDIAN 1258+00	
NB & SB	1263+07.50	1263+12.50	5	3 & 4	1.9444		0.44			0.85		0.2									8	2					BEGIN LEFT TURN LANE 1263+12.5	
NB & SB	1263+12.50	1265+26.83	214.33	7.7 & 9.3	221.47		14			14.0		6.4									221	221					BEGIN LEFT TURN LANE 1263+12.5	
FEATHER (NB & SB @ BRIDGE)	1265+26.83	1266+26.83	100	13.6 & 3.4	37.778		11		2.00	8.4	2.39	10.0									38	38						
BRIDGE NO. BEL-7-2389																												
FEATHER (NB & SB @ BRIDGE)	1266+83.55	1267+83.55	100	14 & 3	33.333		12		2.00	8.6	2.39	10.3									33	33						
NB & SB	1267+83.55	1268+14.00	30.45	14 & 3	10.15		4			3.6		1.6									10	10					END CONC. MEDIAN 1268+14	
NB & SB	1268+14.00	1269+25.00	111	17	209.67		16			16.0		7.3															CR-4 INTERSECTION	
NB & SB	1269+25.00	1270+08.00	83	14 & 3	97.346		7			7.4		3.4									97							
NB & SB	1270+08.00	1275+31.25	523.25	13.3 & 3	471.4		35			36.0		16.4									471			523		12	IMPACT ATTENUATOR 1269+81.25	
NB & SB	1275+31.25	1337+34.09	6202.8	2 & 3	2067.6		103			105.3		47.9											6203	6203		126	BEGIN CONC. BARRIER 1270+08	
FEATHER (NB & SB @ BRIDGE)	1337+34.09	1338+34.09	100	2 & 3	33.333		2		2.00	1.2	2.26	1.4											100	100		4		
BRIDGE NO. BEL-7-2526																												
FEATHER (NB & SB @ BRIDGE)	1339+91.95	1340+91.95	100	2 & 3	33.333		2		2.00	1.2	2.26	1.4											100	100		4		
NB & SB	1340+91.95	1342+10.64	118.69	2 & 3	39.563		2			2.0		0.9											119	119		4	STATION EQUATION	
NB & SB	1342+00.00	1386+35.25	4435.3	2 & 3	1478.4		74			75.3		34.2											4435	4435		90	1342+10.64(BACK)=1342+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	1386+35.25	1387+35.25	100	2 & 3	33.333		2		2.00	1.2	2.39	1.5											100	100		4		
BRIDGE NO. BEL-7-2619																												
FEATHER (NB & SB @ BRIDGE)	1388+71.75	1389+71.75	100	2 & 3	33.333		2		2.00	1.2	2.14	1.3											100	100		4		
NB & SB	1389+71.75	1415+64.31	2592.6	2 & 3	864.19		43			44.0		20.0											2593	2593		54	STATION EQUATION	
NB & SB	0+00.00	7+49.89	749.89	2 & 3	249.96		12			12.7		5.8											750	750		18	1415+64.31(BACK)=0+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	7+49.89	8+49.89	100	2 & 3	33.333		2		2.00	1.2	2.26	1.4											100	100		4		
BRIDGE NO. JEF-7-0016					SUBTOTALS	271	8591	6561		8640.4		4136.3	1070	1070	668	8646	26128	5451		2659.2	1627	305	14623	15122	505	338		
QUANTITIES CARRIED TO THE GENERAL SUMMARY					GRAND TOTAL	271	8591	6561		8640		4136	1070	1070	668	8646	26128	5451		2659	1627	305	14623	15122	505	338 *		

* 626, BARRIER REFLECTOR, TYPE B CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY

CALC. ATH DATE: 1/95
CHKD. DGK BY: DATE: 10/95

PAVEMENT CALCULATIONS
MAINLINE / OUTSIDE SHOULDER / MEDIAN

BEL/JEF-7-23.76/0.00

FINAL 1900PW RRB 1/13/94

** NOT INCLUDING EMBANKMENT CONSTRUCTION

LOCATION	STATION FROM	STATION TO	LENGTH	AVERAGE WIDTH RAMP	AVERAGE WIDTH SHOULDER	AREA RAMP	AREA SHOULDER	203 SUBGRADE COMPACTION	407 TACK COAT FOR I.C.	407 TACK COAT	446 THICKNESS	446 2 3/4" ASPHALT INTERMEDIATE COURSE TYPE 2, PG 64-28	446 THICKNESS	446 1 1/4" ASPHALT SURFACE COURSE, TYPE I, PG 64-28 AS PER PLAN	203 EXCAVATION ** (1.1' AVG. DEPTH)	301 9" BITUMINOUS AGGREGATE BASE PG64-28	304 AVERAGE END AREA	304 AGGREGATE BASE	609 COMB. CURB & GUTTER, TYPE 2	COMMENTS	SEE SHEET
RAMPS TO TR-469																					
	1334+00.00	1335+00.00	100.00	6.00	8.00	66.7	88.9	89	12	5		11.9		5.4	33	22	2.88	10.7		100' DECELERATION LANE TAPER	
DECELERATION LANE FOR RAMP D	1335+00.00	1336+18.50	118.50	12.00	8.00	158.0	105.3	105	20	12		20.1		9.1	39	26	2.88	12.7			
	1336+18.50	1338+46.57	228.07	14.00	8.00	354.8	202.7	181	42	27	2.00	31.0		19.4	66	45	2.88	21.7		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
	1340+04.43	1341+91.50	187.07	31.50	8.00	654.7	166.3	144	62	49	2.00	45.6		28.5	53	36	2.88	17.3		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
	1341+91.50	1342+41.50	50.00	16.00	10.00	88.9	55.6	39	11	7		11.0		5.0	14	10	2.47	4.6		TRANSITION SHOULDER WIDTH (8' TO 6')	
RAMP D	1342+41.50	1347+92.00	550.50	16.00	9.00	978.7	550.5	367	115	73		116.8		53.1	135	92	2.07	42.2			
	1347+92.00	1348+43.26	51.26			134.2	50.3	31	14	10		14.1		6.4	11	8		3.7		BEGIN WIDENING FOR INTERSECTION	
	1348+43.26	1348+85.93	42.67			357.1	69.8	37	32	27	2.00	5.3	1.25	14.8	23	16		7.7		RAMP FEATHERING @ INTERSECTION	32
ACCELERATION LANE FOR RAMP A	1331+00.00	1338+21.61	721.61	8.75	8.00	677.3	619.2	619	97	51	2.00	72.0		45.0	227	155	2.88	74.4		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
	1339+79.47	1341+00.00	120.53	23.44	8.00	248.8	84.9	85	25	19	2.00	18.5		11.6	31	21	2.88	10.2		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
STATION EQUATION STA 1341+00 = STA 1340+89.33 'A'																					
	1340+89.33	1341+39.33	50.00	14.62	18.00	81.2	100.0	100	14	6		13.8		6.3	37	25	6.13	11.4		TRANSITION SHOULDER WIDTH (8' TO 6')	
	1341+39.33	1341+89.33	50.00	15.87	17.00	88.2	94.4	94	14	7		13.9		6.3	35	24	5.74	10.6			
	1341+89.33	1342+89.33	100.00	15.25	19.50	169.4	216.7	217	29	13		29.5		13.4	81	54	6.57	24.3		REPLACE GORE AREA (1340+89.33 TO 1344+00)	
RAMP A	1342+89.33	1344+00.00	110.67	16.00	23.00	196.7	282.8	283	36	15		36.6		16.7	104	71	7.74	31.7			
	1344+00.00	1348+00.00	400.00	16.00	9.00	711.1	400.0	267	83	53		84.9		38.6	98	67	2.07	30.6			
	1348+00.00	1350+19.52	219.52	16.00	9.00	390.3	219.5	146	46	29		46.6		21.2	54	37	2.07	16.8			
	1350+19.52	1350+94.11	74.59			148.3	71.3	51	16	11		16.8		7.6	20	13		6.2		BEGIN WIDENING FOR INTERSECTION	
	1350+94.11	1351+40.14	46.03			190.6	45.0	30	18	14	2.00	3.9	1.25	8.2	12	8		3.6		RAMP FEATHERING @ INTERSECTION	32
	1347+51.36	1349+35.00				235.3	109.7	73	26	18			1.25	12.0	44	28		13.3		RAMP FEATHERING @ INTERSECTION	32
	1349+35.00	1349+50.00				26.7	15.0	10	3	2	2.00	2.3	1.25	1.4	4	3		1.2		RAMP FEATHERING @ INTERSECTION	32
RAMP C	1349+50.00	1357+67.00	817.00	16.00	9.00	1452.4	817.0	545	170	109		173.4		78.8	200	136	2.07	62.6			
	1357+67.00	1358+00.00	33.00	16.00	24.75	58.7	90.8	91	11	4		11.4		5.2	33	23	8.32	10.2			
	1358+00.00	1359+00.00	100.00	15.00	21.75	166.7	241.7	242	31	13		31.2		14.2	89	61	7.32	27.1		REPLACE GORE AREA (1357+67 TO 1360+00)	
	1359+00.00	1359+50.00	50.00	15.50	17.75	86.1	98.6	99	14	6		14.1		6.4	36	25	5.99	11.1			
	1359+50.00	1360+00.00	50.00	14.50	18.25	80.6	101.4	101	14	6		13.9		6.3	37	25	6.22	11.5		TRANSITION SHOULDER WIDTH (6' TO 8')	
ACCELERATION LANE FOR RAMP C	1360+00.00	1370+00.00	1000.00	12.50	8.00	1388.9	888.9	889	171	104		174.0		79.1	326	222	2.88	106.8			
	1351+58.56	1352+05.13				106.0	49.3	29	12	8	2.00	3.2	1.25	5.4	11	7		3.5		RAMP FEATHERING @ INTERSECTION	32
RAMP B	1352+05.13	1358+50.00	644.87	16.00	9.00	1146.4	644.9	430	134	86		136.8		62.2	158	108	2.07	49.4			
	1358+50.00	1359+00.00	50.00	16.00	10.00	88.9	55.6	39	11	7		11.0		5.0	14	10	2.47	4.6		TRANSITION SHOULDER WIDTH (6' TO 8')	
	1359+00.00	1362+25.00	325.00	27.50	8.00	993.1	288.9	289	96	74		97.9		44.5	106	72	2.88	34.7			
DECELERATION LANE FOR RAMP B	1362+25.00	1363+68.84	143.84	14.00	8.00	223.8	127.9	128	26	17		26.9		12.2	47	32	2.88	15.4			
	1363+68.84	1366+00.00	231.16	12.00	8.00	308.2	205.5	205	39	23		39.2		17.8	75	51	2.88	24.7			
	1366+00.00	1367+00.00	100.00	6.00	8.00	66.7	88.9	89	12	5		11.9		5.4	33	22	2.88	10.7		100' DECELERATION LANE TAPER	
RAMPS TO PUBLIC RD.																					
ACCELERATION LANE FOR RAMP A	1406+48.31	1415+64.31	916.00	11.45	8.00	1165.4	814.2	814	148	87		151.2		68.7	299	204	2.88	97.8		1415+64.31(BACK)=0+00.00(AHEAD)	
	0+00.00	0+84.00	84.00	23.95	8.00	223.5	74.7	75	22	17		22.8		10.4	27	19	2.88	9.0		1415+64.31(BACK)=0+00.00(AHEAD)	
	0+84.00	1+34.00	50.00	14.50	18.38	80.6	102.1	102	14	6		14.0		6.3	37	26	6.26	11.6		TRANSITION SHOULDER WIDTH (8' TO 6')	
	1+34.00	1+84.00	50.00	15.50	18.63	86.1	103.5	103	14	6		14.5		6.6	38	26	6.28	11.6		REPLACE GORE AREA (0+84 TO 2+55)	
RAMP A	1+84.00	2+55.00	71.00	14.71	22.75	116.0	179.5	179	22	9		22.6		10.3	66	45	7.65	20.1			
	2+55.00	2+84.00	29.00	15.71	9.00	50.6	29.0	19	6	4		6.1		2.8	7	5	2.07	2.2			
	2+84.00	7+43.00	459.00	16.00	9.00	816.0	459.0	306	96	61		97.4		44.3	112	77	2.07	35.2			
	7+43.00	7+78.00	35.00	16.00	8.30	62.2	32.3	20	7	5		7.2		3.3	8	5	1.80	2.3		TRANSITION SHOULDER WIDTH (6' TO 4.6')	
	7+78.00	8+18.00	40.00	16.00	6.80	71.1	30.2	17	8	5	2.00	2.1	1.25	3.5	6	4	1.27	1.9		RAMP FEATHERING @ INTERSECTION (SHLDR. 4.6' TO 3')	33
	1407+93.56	1408+93.56	100.00	6.00	8.00	66.7	88.9	89	12	5		11.9		5.4	33	22	2.88	10.7	100	100' DECELERATION LANE TAPER	
DECELERATION LANE FOR RAMP D	1408+93.56	1410+00.00	106.44	12.00	8.00	141.9	94.6	95	18	11		18.1		8.2	35	24	2.88	11.4	106	CURB & GUTTER, TYPE 2 (1407+93.56 TO 1415+79.82)	
	1410+00.00	1415+79.82	579.82	23.00	8.00	1481.8	515.4	515	150	111		152.6		69.3	189	129	2.88	61.9	580	1415+79.82(BACK)=0+00.00(AHEAD)	
	0+00.00	0+60.00	60.00	36.50	8.00	243.3	53.3	53	22	18		22.7		10.3	20	13	2.88	6.4		1415+79.82(BACK)=0+00.00(AHEAD)	
	0+60.00	1+10.00	50.00	16.00	10.00	88.9	55.6	39	11	7		11.0		5.0	14	10	2.47	4.6		TRANSITION SHOULDER WIDTH (8' TO 6')	
RAMP D	1+10.00	7+84.50	674.50	16.00	9.00	1199.1	674.5	450	141	90		143.1		65.1	165	113	2.07	51.7			
	7+84.50	8+19.50	35.00	16.00	8.30	62.2	32.3	20	7	5		7.2		3.3	8	5	1.80	2.3		TRANSITION SHOULDER WIDTH (6' TO 4.6')	
	8+19.50	8+59.50	40.00	16.00	6.80	71.1	30.2	17	8	5	2.00	2.1	1.25	3.5	6	4	1.27	1.9		RAMP FEATHERING @ INTERSECTION (SHLDR. 4.6' TO 3')	33
							SUBTOTALS	9057	2157	1362		2046.2		998.8	3354	2280		1069.6	786		
QUANTITIES CARRIED TO THE GENERAL SUMMARY							GRAND TOTAL	9057	2157	1362		2046		999	3354	2280		1070	786		

ITEM 611 - REINFORCED CONCRETE APPROACH SLAB (T=17"), AS PER PLAN

FROM STATION 1266+83.55 TO STATION 1267+13.55 = 30.00 LIN. FT.

30.00 x	70.50 x	1 / 9 =	235.00	S.Y.
(1.5 x 1.5)+(2.5 x 1.5)		1 / 9 =	6.67	S.Y.
TOTAL CARRIED TO GENERAL SUMMARY =			242	S.Y.

CALC. ATH BY: DATE: 1/95
CHKD. DGK BY: DATE: 10/95

PAVEMENT CALCULATIONS
RAMP / RAMP SHOULDERS / SPEED CHANGE LANES

BEL/JEF-7-23.76/0.00

18/94

STICKLEN - BELSHEIM & ASSOCIATES

EXISTING TRANSVERSE JOINT CALCULATIONS:

MAINLINE

25.5' WIDTH (EACH SIDE, NB & SB)

STA. 1258+00 TO 1263+12.50 (NB & SB)x 2	=	1025.00 LF
STA. 1263+12.50 TO STA. 1268+14 (SB)	=	501.50 LF
DEDUCT FOR BRIDGE AND APPROACH SLABS:		
BRIDGE NO. BEL-7-2389 (SB): [56.72'+(30'+30')]	=	-116.72 LF
TOTAL LENGTH	=	1409.78 LF
NORMAL JOINT SPACING: [1409.78' x 1JT/40']	=	36 JOINTS
ADDITIONAL JOINTS: [1409.78' x 1JT/3000']	=	1 JOINTS
TOTAL JOINTS	=	37 JOINTS

31' AVG. WIDTH (LEFT TURN LANE TAPER)

STA. 1263+12.5 TO STA. 1265+62.5 (NB):	=	250.00 LF
TOTAL LENGTH	=	250.00 LF
NORMAL JOINT SPACING: [250.00' x 1JT/40']	=	6 JOINTS
ADDITIONAL JOINTS: [250.00' x 1JT/3000']	=	1 JOINTS
TOTAL JOINTS	=	7 JOINTS

36.5' WIDTH (LEFT TURN LANE)

STA. 1265+62.5 TO STA. 1268+14 (NB):	=	251.50 LF
DEDUCT FOR BRIDGE AND APPROACH SLABS:		
BRIDGE NO. BEL-7-2389 (NB): [56.72'+(30'+30')]	=	-116.72 LF
TOTAL LENGTH	=	134.78 LF
NORMAL JOINT SPACING: [134.78' x 1JT/40']	=	3 JOINTS
ADDITIONAL JOINTS: [134.78' x 1JT/3000']	=	1 JOINTS
TOTAL JOINTS	=	4 JOINTS

64' WIDTH (INTERSECTION WITH CR-4)

STA. 1268+14 TO STA. 1269+25 (NB & SB)x 2	=	222.00 LF
TOTAL LENGTH	=	222.00 LF
NORMAL JOINT SPACING: [222.00' x 1JT/40']	=	6 JOINTS
ADDITIONAL JOINTS: [222.00' x 1JT/3000']	=	1 JOINTS
TOTAL JOINTS	=	7 JOINTS

25' WIDTH (EACH SIDE, NB & SB)

STA. 1269+25 TO STA. 1415+64.31 (NB & SB)x 2	=	29278.62 LF
STA. 0+00 TO STA. 8+49.89 (NB & SB)x 2	=	1699.78 LF
DEDUCT FOR BRIDGES AND APPROACH SLABS:		
BRIDGE NO. BEL-7-2526 (NB & SB): 2x[157.86' + (25'+25')]	=	-415.72 LF
BRIDGE NO. BEL-7-2619 (NB & SB): 2x[136.50' + (20'+30')]	=	-373.00 LF
BRIDGE NO. JEF-7-0016 (NB & SB): 2x[25']	=	-50.00 LF
TOTAL LENGTH	=	30139.68 LF
NORMAL JOINT SPACING: [30139.68' x 1JT/40']	=	754 JOINTS
ADDITIONAL JOINTS: [30139.68' x 1JT/3000']	=	10 JOINTS
TOTAL JOINTS	=	764 JOINTS

SPEED CHANGE LANES

ACCELERATION (12.5' AVG WIDTH)

FOR RAMP 'A', TR-469:		
STA. 1331+00.00 TO STA. 1340+89.33 (SB)	=	989.33 LF
FOR RAMP 'C', TR-469:		
STA. 1360+00.00 TO STA. 1370+00.00 (NB)	=	1000.00 LF
FOR RAMP 'A', PUBLIC RD:		
STA. 1406+48.31 TO STA. 1415+64.31 (SB)	=	916.00 LF
STA. 0+00.00 TO STA. 0+84.00 (SB)	=	84.00 LF
DEDUCT FOR BRIDGE AND APPROACH SLABS:		
BRIDGE NO. BEL-7-2526 (SB): [157.86'+(25'+25')]	=	-207.86 LF
TOTAL LENGTH	=	2781.47 LF
NORMAL JOINT SPACING: [2781.47' x 1JT/40']	=	70 JOINTS
ADDITIONAL JOINTS: [2781.47' x 1JT/3000']	=	1 JOINTS
TOTAL JOINTS	=	71 JOINTS

DECELERATION (15.5' AVG WIDTH)

FOR RAMP 'D', TR-469:		
STA. 1334+00.00 TO STA. 1341+91.50 (NB)	=	791.50 LF
FOR RAMP 'B', TR-469:		
STA. 1359+00.00 TO STA. 1367+00.00 (SB)	=	800.00 LF
FOR RAMP 'D', PUBLIC RD:		
STA. 1407+93.56 TO STA. 1415+79.82 (NB)	=	786.26 LF
STA. 0+00.00 TO STA. 0+60.00 (NB)	=	60.00 LF
DEDUCT FOR BRIDGE AND APPROACH SLABS:		
BRIDGE NO. BEL-7-2526 (NB): [157.86'+(25'+25')]	=	-207.86 LF
TOTAL LENGTH	=	2229.90 LF
NORMAL JOINT SPACING: [2229.90' x 1JT/40']	=	56 JOINTS
ADDITIONAL JOINTS: [2229.90' x 1JT/3000']	=	1 JOINTS
TOTAL JOINTS	=	57 JOINTS

EXISTING TRANSVERSE JOINT CALCULATIONS: (CONT.)

RAMPS (15.5' AVG. WIDTH)

RAMP 'A', TR-469:		
STA. 1340+89.33 TO STA. 1344+00.00 (SB)	=	310.67 LF
RAMP 'C', TR-469:		
STA. 1357+67.00 TO STA. 1360+00.00 (NB)	=	233.00 LF
RAMP 'C', PUBLIC RD:		
STA. 0+84.00 TO STA. 2+84.00 (SB)	=	200.00 LF
TOTAL LENGTH	=	743.67 LF
NORMAL JOINT SPACING: [743.67' x 1JT/40']	=	19 JOINTS
ADDITIONAL JOINTS: [743.67' x 1JT/3000']	=	1 JOINTS
TOTAL JOINTS	=	20 JOINTS

RAMPS (16' WIDTH)

RAMP 'A', TR-469:		
STA. 1344+00.00 TO STA. 1351+38.96	=	738.96 LF
RAMP 'B', TR-469:		
STA. 1351+59.68 TO STA. 1359+00.00	=	740.32 LF
RAMP 'C', TR-469:		
STA. 1347+51.36 TO STA. 1357+67.00	=	1015.64 LF
RAMP 'D', TR-469:		
STA. 1341+91.50 TO STA. 1348+85.93	=	694.43 LF
RAMP 'A', PUBLIC RD:		
STA. 2+84.00 TO STA. 8+18.00	=	534.00 LF
RAMP 'D', PUBLIC RD:		
STA. 0+60.00 TO STA. 8+59.50	=	799.50 LF
TOTAL LENGTH	=	4522.85 LF
NORMAL JOINT SPACING: [4522.85' x 1JT/40']	=	113 JOINTS
ADDITIONAL JOINTS: [4522.85' x 1JT/3000']	=	2 JOINTS
TOTAL JOINTS	=	115 JOINTS

ESTIMATED QUANTITIES

THE FOLLOWING ESTIMATED QUANTITIES FOR ITEMS 251, 203, & 304 ARE INCLUDED FOR USE "AS DIRECTED BY THE ENGINEER":

ITEM 251 PARTIAL DEPTH PAVEMENT REPAIR (3" AVG. THICKNESS)
USE 15% OF TOTAL MAINLINE PAVEMENT AREA FOR ESTIMATE.
TOTAL MAINLINE PAVEMENT AREA =
[25.5'x1409.78' + 31'x250' + 36.5'x134.78' + 64'x222 + 25'x30139.68']/9 = 90702 SY
15% OF TOTAL = 90702 x 0.15 = 13605 SY USE 13605 SY

SUBBBASE/SUBGRADE FAILURE ('PUMPING'):
USE 10% OF TOTAL MAINLINE JOINTS FOR ESTIMATE.
TOTAL MAINLINE JOINTS = 37 + 7 + 4 + 7 + 764 = 819 JOINTS
TOTAL PUMPING MAINLINE JOINTS = 819 x 0.10 = 82 JOINTS

ITEM 203 EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION
16.67SY/JOINT x 6"DEEP/36 = 2.78 CY/JOINT
2.78 CY/JOINT x 82 JOINTS = 227.96 CY USE 228 CY

ITEM 304 AGGREGATE BASE
16.67SY/JOINT x 6"DEEP/36 = 2.78 CY/JOINT
2.78 CY/JOINT x 83 JOINTS = 230.74 CY USE 231 CY

ESTIMATED QUANTITIES

ITEM 255 FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS C
MAINLINE PAVEMENT: (SEE LEFT FOR JOINT CALCULATIONS)

25.5' WIDTH x 6'(EACH SIDE, NB & SB):		
17.00 SY/JOINT x 6' x 37 JOINTS	=	629 SY
31' AVG. WIDTH x 6'(LEFT TURN LANE TAPER):		
20.67 SY/JOINT x 6' x 7 JOINTS	=	145 SY
36.5' WIDTH x 6'(LEFT TURN LANE):		
24.33 SY/JOINT x 6' x 4 JOINTS	=	98 SY
64' WIDTH x 6'(INTERSECTION WITH CR-4):		
42.67 SY/JOINT x 7 JOINTS	=	299 SY
25' WIDTH x 6'(EACH SIDE, NB & SB):		
16.67 SY/JOINT x 764 JOINTS	=	12736 SY
TOTAL	=	13907 SY

INCREASE TOTAL BY 10% = 13907 SY x 1.10 = 15298 SY USE 15300 SY

ITEM 255 FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS FS
SPEED CHANGE LANES: (SEE LEFT FOR JOINT CALCULATIONS)

ACCELERATION LANES: (12.5' AVG. WIDTH x 6')		
8.33 SY/JOINT x 71 JOINTS	=	592 SY
DECELERATION LANES: (15.5' AVG. WIDTH x 6')		
10.33 SY/JOINT x 57 JOINTS	=	589 SY
RAMPS (15.5' AVG. WIDTH x 6'):		
10.33 SY/JOINT x 20 JOINTS	=	207 SY
RAMPS (16' WIDTH x 6'):		
10.67 SY/JOINT x 115 JOINTS	=	1227 SY
TOTAL	=	2615 SY

INCREASE TOTAL BY 10% = 2615 SY x 1.10 = 2877 SY USE 2880 SY

ITEM 255 FULL DEPTH PAVEMENT SAWING
MAINLINE PAVEMENT: (SEE LEFT FOR JOINT CALCULATIONS)

25.5' WIDTH (EACH SIDE, NB & SB):		
57 LF/JOINT x 37 JOINTS	=	2109 LF
31' AVG. WIDTH (LEFT TURN LANE TAPER):		
68 LF/JOINT x 7 JOINTS	=	476 LF
36.5' WIDTH (LEFT TURN LANE):		
79 LF/JOINT x 4 JOINTS	=	316 LF
64' WIDTH (INTERSECTION WITH CR-4):		
152 LF/JOINT x 7 JOINTS	=	1064 LF
25' WIDTH (EACH SIDE, NB & SB):		
56 LF/JOINT x 764 JOINTS	=	42784 LF
SPEED CHANGE LANES: (SEE LEFT FOR JOINT CALCULATIONS)		
ACCELERATION LANES: (12.5' AVG. WIDTH)		
31 LF/JOINT x 71 JOINTS	=	2201 LF
DECELERATION LANES: (15.5' AVG. WIDTH)		
37 LF/JOINT x 57 JOINTS	=	2109 LF
RAMPS (15.5' AVG. WIDTH):		
31 LF/JOINT x 20 JOINTS	=	620 LF
RAMPS (16' WIDTH):		
32 LF/JOINT x 115 JOINTS	=	3680 LF
TOTAL	=	55359 LF

INCREASE TOTAL BY 10% = 55359 LF x 1.10 = 60895 LF USE 60900 LF

WIRE FABRIC REINFORCED AS PER BP-2.5
TO BE USED WITH CLASS FS PAVEMENT REPLACEMENT
INFORMATION ONLY
2880 SY COST INCLUDED IN ITEM 255

ITEM 413 SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS
MAINLINE PAVEMENT AND SHOULDERS: (SEE LEFT FOR JOINT CALCULATIONS)

25.5' WIDTH + 1.5' SHOULDER (EACH SIDE, NB & SB):		
54 LF/JOINT x 37 JOINTS	=	1998 LF
31' AVG. WIDTH + 1.5' SHOULDER (LEFT TURN LANE TAPER):		
65 LF/JOINT x 7 JOINTS	=	455 LF
36.5' WIDTH + 1.5' SHOULDER (LEFT TURN LANE):		
76 LF/JOINT x 4 JOINTS	=	304 LF
64' WIDTH + (2) 8' SHOULDERS (INTERSECTION WITH CR-4):		
160 LF/JOINT x 7 JOINTS	=	1120 LF
25' WIDTH + 8' SHOULDER (EACH SIDE, NB & SB):		
66 LF/JOINT x 764 JOINTS	=	50424 LF
SPEED CHANGE LANES: (SEE LEFT FOR JOINT CALCULATIONS)		
ACCELERATION LANES: (12.5' AVG. WIDTH + 8' SHOULDER)		
41 LF/JOINT x 71 JOINTS	=	2912 LF
DECELERATION LANES: (15.5' AVG. WIDTH + 8' SHOULDER)		
47 LF/JOINT x 57 JOINTS	=	2680 LF
RAMPS (15.5' AVG. WIDTH + 6' & 3' SHOULDERS):		
49 LF/JOINT x 20 JOINTS	=	980 LF
RAMPS (16' WIDTH + 6' & 3' SHOULDERS):		
50 LF/JOINT x 115 JOINTS	=	5750 LF
TOTAL	=	66623 LF

EXISTING LONGITUDINAL JOINT CLEANING AND SEALING CALCULATION
TOTAL LENGTH OF EXISTING LONGITUDINAL JOINTS:

MAINLINE LANES: (SEE LEFT FOR JOINT CALCULATIONS)		
25.5' WIDTH (EACH SIDE, NB & SB):	=	1509.78 LF
31' AVG. WIDTH (LEFT TURN LANE TAPER):	=	250.00 LF
36.5' WIDTH (LEFT TURN LANE):	=	134.78 LF
64' WIDTH (INTERSECTION WITH CR-4):	=	222.00 LF
25' WIDTH (EACH SIDE, NB & SB):	=	30139.68 LF
SPEED CHANGE LANES: (SEE LEFT FOR JOINT CALCULATIONS)		
ACCELERATION LANES: (12.5' AVG. WIDTH)	=	2781.47 LF
DECELERATION LANES: (15.5' AVG. WIDTH)	=	2229.90 LF
ADDITIONAL LONGITUDINAL JOINTS @ GORES:		
FOR RAMP 'A', TR-469 (ACCEL. LANE):	=	73.00 LF
FOR RAMP 'B', TR-469 (DECEL. LANE):	=	359.00 LF
FOR RAMP 'C', TR-469 (ACCEL. LANE):	=	277.00 LF
FOR RAMP 'D', TR-469 (DECEL. LANE):	=	255.00 LF
FOR RAMP 'A', PUBLIC RD (ACCEL. LANE):	=	278.00 LF
FOR RAMP 'D', PUBLIC RD (DECEL. LANE):	=	460.00 LF
RAMPS - ADDITIONAL LONGITUDINAL JOINTS @ INTERSECTIONS		
FOR RAMP 'A', TR-469:	=	144.00 LF
FOR RAMP 'B', TR-469:	=	30.00 LF
FOR RAMP 'C', TR-469:	=	52.00 LF
FOR RAMP 'D', TR-469:	=	225.00 LF
TOTAL	=	39420.61 LF
		USE 39421 LF

DEDUCT LENGTH OF LONGITUDINAL JOINTS SEALED AS PART OF FULL DEPTH JOINT AND CRACK REPAIRS:

MAINLINE: [37 + 7 + 4 + 7 + 764] x 6'	=	-4914.00 LF
ACCELERATION LANES: [71] x 6'	=	-426.00 LF
DECELERATION LANES: [57] x 6'	=	-342.00 LF
'CRACK REPAIR' (MAINLINE) SEE SHEET NOS. 20-25.	=	-2242.00 LF
'CRACK REPAIR' (ACCEL/DECEL) SEE SHEET NOS. 20-25.	=	-461.00 LF
TOTAL	=	-8385.00 LF

GRAND TOTAL = 39421' - 8385' = 31036 LF

ITEM SPECIAL LONGITUDINAL JOINT CLEANING AND SEALING, CLASS V, 705.04
USE 85% OF GRAND TOTAL FOR ESTIMATE: (SEE ABOVE)
31036' x 0.85 = 26380 LF USE 26380 LF

ITEM SPECIAL LONGITUDINAL JOINT CLEANING AND SEALING, CLASS VI, 705.04
USE 15% OF GRAND TOTAL FOR ESTIMATE: (SEE ABOVE)
31036' x 0.15 = 4655 LF USE 4660 LF

FOR JOINT DETAILS SEE SHEET NOS. 34 & 35.

CALC. BY: ATH DATE: 1/95
CHKD. BY: DGK DATE: 10/95

PAVEMENT JOINT REPAIR CALCULATIONS

BEL/JEF-7-23.76/0.00

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255										* WIRE FABRIC REINF., AS PER BP-2.5	413	SPECIAL	202	605	COMMENTS	
		FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C						FULL DEPTH PAVEMENT SAWING	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS				SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	PRESSURE RELIEF JOINT, TYPE A	PAVEMENT REMOVED	6" UNCLASSIFIED PIPE UNDERDRAIN 707.01 OR 707.21	SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
		TYPE Y/Y		TYPE Y/N/Y		TYPE Y/PRJ/Y			TYPE Y/Y	TYPE Y/N/Y								
		PASSING LANE	TRAVEL LANE	PASSING LANE	TRAVEL LANE	PASSING LANE	TRAVEL LANE		SPEED CHANGE LANE	SPEED CHANGE LANE								
		SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	LIN. FT.	SQ. YD.	SQ. YD.		SQ. YD.	LIN. FT.	LIN. FT.	SQ. YD.	LIN. FT.		
S.R. 7 NORTHBOUND																		
1269+99 / 1270+13		28.9	8.0					70				*28.9	66.0				SEE 'JOINT/CRACK REPAIR' DETAIL	34
1265+56 (NB & SB)						36.4	21.3	152					152.0	68.0	60.4	88.0	SEE O.D.O.T. STD. DWG. BP-2.3	
1267+54 (NB & SB)						36.4	21.3	152					152.0	68.0	60.4	88.0	SEE O.D.O.T. STD. DWG. BP-2.3	
1270+35			8.0					30					40.0					
1288+76		8.7	8.0					56					66.0					
1290+91 / 1291+54				99.7	64.0			119				*163.7	145.0				SEE 'DETAIL 1'	34
1292+76		8.7	8.0					56					66.0					
1305+84			8.0					30					40.0					
1308+67		8.7	8.0					56					66.0					
1310+61		8.7	8.0					56					66.0					
1311+83		8.7						32					26.0					
1320+33		8.7						32					26.0					
1321+90		8.7						32					26.0					
1322+73		8.7	8.0					56					66.0					
1323+46		8.7	8.0					56					66.0					
1324+73		8.7	8.0					56					66.0					
1325+00	N	8.7	8.0					56					66.0					
1326+27		8.7	8.0					56					66.0					
1329+43		8.7						32					26.0					
1331+03		8.7	8.0					56					66.0					
1331+78	O	8.7						32					26.0					
1332+61		8.7	8.0					56					66.0					
1333+40		8.7						32					26.0					
1334+17		8.7						42	1.3			*1.3	46.0					
1334+60	R	8.7						32					26.0					
1336+10								30	8.0			*8.0	40.0					
1336+46		8.7						64	8.7			*8.7	68.0					
1336+90		8.7	8.0					90	9.3			*9.3	94.0					
1337+22	T	8.7	8.0					102	13.3			*13.3	106.0					
1337+65		8.7	8.0					62					72.0					
1341+79								38	10.7			*10.7	48.0					
1349+30			8.0					30					40.0					
1350+05	H		8.0					30					40.0					
1360+79								38	10.7			*10.7	48.0					
1362+47								38	10.7			*10.7	48.0					
1362+85								38	10.7			*10.7	48.0					
1363+71	B							38	10.7			*10.7	48.0					
1364+44								32	8.7			*8.7	42.0					
1365+21								30	8.0			*8.0	40.0					
1365+67								28	7.3			*7.3	38.0					
1366+09	O							26	6.7			*6.7	36.0					
1366+45			8.0					54	6.0			*6.0	58.0					
1366+86								22	5.3			*5.3	32.0					
1367+26			8.0					50	4.7			*4.7	44.0					
1367+69	U							18	4.0			*4.0	28.0					
1368+07								16	3.3			*3.3	26.0					
1368+42								14	2.7			*2.7	24.0					
1368+84								12	2.0			*2.0	22.0					
1370+03	N		8.0					30					40.0					
1382+79 / 1382+86		18.8	17.3					63				*36.1	66.0					
1383+26			8.0					30					40.0					
1383+60			8.0					30					40.0					
1386+05	D	8.7	8.0					56					66.0					
1386+39		8.7	8.0					56					66.0					
1386+97 / 1387+00		13.0	12.0					59					66.0				SEE 'JOINT/CRACK REPAIR' DETAIL	34
1389+87			8.0					30					40.0					
1391+46		8.7	8.0					56					66.0					
1391+88			8.0					30					40.0					
1392+28			8.0					30					40.0					
1394+23			8.0					30					40.0					
1395+03 / 1395+09			16.0					36				*16.0	40.0					
1401+50			8.0					30					40.0					
1408+27			8.0					38	2.7			*2.7	42.0					
1408+63			8.0					36					46.0					
1408+70								24	6.0			*6.0	34.0					
1409+09								30	8.0			*8.0	40.0					
1409+46								30	8.0			*8.0	40.0					
1411+90								30	8.0			*8.0	40.0					
1412+66								38	10.7			*10.7	48.0					
1413+13								46	13.3			*13.3	56.0					
1414+25								54	16.0			*16.0	64.0					
1415+47								38	10.7			*10.7	48.0					
1+26			8.0					30					40.0					
2+00 / 2+09			20.0					39				*20.0	40.0					
3+97 / 4+03			16.0					36				*16.0	40.0					
4+79		8.7	8.0					56					66.0					
6+02		8.7	8.0					56					66.0					
6+38 / 6+47		21.7	20.0					65				*41.7	66.0					
SUBTOTALS		325.0	397.3	99.7	64.0	72.9	42.7	3547.0	236.0	0.0		*558.3	4105.0	136.0	120.9	176.0	QUANTITIES CARRIED TO SHEET NO. 25	

CALC. BY: ATH DATE: 1/95
CHKD. BY: DGK DATE: 10/95

CALCULATIONS
FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

BEL/JEF-7-23.76/0.00

20
94

FINAL 1995(?) ATH 2/28/97

STICKLEN – BELSHEIM & ASSOCIATES

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255								* 413	COMMENTS	
		FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C				FULL DEPTH PAVEMENT SAWING	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS			* WIRE FABRIC REINF., AS PER BP-2.5	SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
		TYPE Y/Y		TYPE Y/N/Y			TYPE Y/Y	TYPE Y/N/Y					
		PASSING LANE SQ. YD.	TRAVEL LANE SQ. YD.	PASSING LANE SQ. YD.	TRAVEL LANE SQ. YD.	LIN. FT.	SPEED CHANGE LANE SQ. YD.	SPEED CHANGE LANE SQ. YD.		SQ. YD.	LIN. FT.		
6+77 / 6+88		8.7	22.7			67				*22.7	66.0		
7+17 / 7+26		21.7	20.0			65				*41.7	66.0		
7+67		8.7	8.0			56					66.0		
S.R. 7 SOUTHBOUND													
1258+00 / 1263+13		741.0	684.0			563				*1425.0	50.0	REPLACE PAVEMENT	
1258+52			8.0			30					40.0		
1259+05		8.7	8.0			56					66.0		
1260+22			8.0			30					40.0		
1262+27			8.0			30					40.0	1 FT. DIAMETER HOLE	
1262+41 / 1262+58		33.2	30.7			73				*63.9	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1262+99		8.7	8.0			56					66.0		
1263+61 / 1268+30		498.3			633.3	525				*1131.7	196.0	SEE 'DETAIL 8'	35
1268+43			8.0			30					24.0		
1268+52						14	2.7			2.7	8.0		
1268+55			8.0			30					24.0		
1269+12			8.0			30					24.0		
1269+46		8.7	8.0			56					66.0		
1269+87 / 1269+93		17.3	16.0			62				*33.3	66.0		
1270+77			8.0			30					40.0		
1271+92			8.0			30					40.0		
1272+41		8.7	8.0			56					66.0		
1273+15			8.0			30					40.0		
1273+51			8.0			30					40.0		
1274+00			8.0			30					40.0		
1274+37	S		8.0			30					40.0		
1274+67			8.0			30					40.0		
1275+10 / 1275+18		20.2	18.7			64				*38.9	66.0		
1275+56 / 1275+59		8.7	12.0			59					66.0		
1275+76 / 1275+87	O	24.6	22.7			67				*47.3	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1276+37		8.7	8.0			56					66.0		
1276+73			8.0			30					40.0		
1276+95 / 1277+19		17.3			40.0	106				*57.3	92.0	SEE 'DETAIL 2'	35
1277+51	U	8.7				32					26.0		
1278+01			8.0			30					40.0		
1278+33 / 1278+46			25.3			43				*25.3	40.0		
1278+73		8.7	8.0			56					66.0		
1279+20	T		8.0			30					40.0		
1279+52 / 1279+61		8.7	20.0			65				*20.0	66.0		
1279+92			8.0			30					40.0		
1280+33			8.0			30					40.0		
1280+71	H	8.7	8.0			56					66.0		
1281+21		8.7	8.0			56					66.0		
1281+98 / 1282+08			21.3			40				*21.3	40.0		
1282+85			8.0			30					40.0		
1283+20	B		8.0			30					40.0		
1283+48			8.0			30					40.0		
1283+95 / 1284+03		8.7	18.7			64				*18.7	66.0		
1284+16 / 1284+21		15.9	8.0			61				*15.9	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1284+41	O	8.7	8.0			56					66.0		
1284+84			8.0			30					40.0		
1285+16		8.7	8.0			56					66.0		
1285+65			8.0			30					40.0		
1285+99	U	8.7	8.0			56					66.0		
1286+42			8.0			30					40.0		
1286+74			8.0			30					40.0		
1287+53 / 1287+58			14.7			35				*14.7	40.0		
1288+74	N	8.7	8.0			56					66.0		
1289+06 / 1289+22					29.3	46				*29.3	40.0		
1289+57			8.0			30					40.0		
1289+93			8.0			30					40.0		
1290+47 / 1290+57	D	8.7	21.3			66				*21.3	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1290+73		8.7				32					26.0		
1290+82			8.0			30					40.0		
1291+95 / 1292+03			18.7			38				*18.7	40.0		
1292+70 / 1292+77		18.8	17.3			63				*36.1	66.0		
1293+11			8.0			30					40.0		
1294+66		8.7	8.0			56					66.0		
1295+26 / 1295+36		23.1	21.3			66				*44.4	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1296+35			8.0			30					40.0		
1296+72 / 1296+83			22.7			41				*22.7	40.0		
1297+92 / 1298+13				39.0	36.0	77				*75.0	66.0	SEE 'DETAIL 3'	35
1298+69			8.0			30					40.0		
1299+18			8.0			30					40.0		
1299+51			8.0			30					40.0		
1299+88		8.7	8.0			56					66.0		
1300+00			8.0			30					40.0		
1300+32 / 1300+56		17.3			40.0	106				*40.0	92.0	SEE 'DETAIL 4'	35
SUBTOTALS		**1639.5**	**1428.0**	**39.0**	**778.7**	**4400.0**	**2.7**	**0.0**		***3245.1**	**3890.0**	QUANTITIES CARRIED TO SHEET NO. 25 .	

CALC. ATH DATE: 1/95
CHKD. DGK DATE: 10/95

CALCULATIONS

FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

BEL/JEF-7-23.76/0.00

FINAL 1993UTS PRR 9/3/94

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255								* WIRE FABRIC REINF., AS PER BP-2.5	413 SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	COMMENTS SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
		FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C				FULL DEPTH PAVEMENT SAWING	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS						
		TYPE Y/Y		TYPE Y/N/Y			TYPE Y/Y	TYPE Y/N/Y					
		PASSING LANE	TRAVEL LANE	PASSING LANE	TRAVEL LANE		SPEED CHANGE LANE	SPEED CHANGE LANE					
		SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	LIN. FT.	SQ. YD.	SQ. YD.		SQ. YD.	LIN. FT.		
1300+67			8.0			30					40.0		
1300+80 / 1300+94		8.7	26.7			70				*26.7	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1301+12		8.7	8.0			56					66.0		
1301+58			8.0			30					40.0		
1302+31		8.7	8.0			56					66.0		
1303+48			8.0			30					40.0		
1305+92			8.0			30					40.0		
1307+70			8.0			30					40.0		
1308+25			8.0			30					40.0		
1309+89			8.0			30					40.0		
1310+29		8.7	8.0			56					66.0		
1311+50		8.7	8.0			56					66.0		
1311+90		8.7	8.0			56					66.0		
1312+36		8.7	8.0			56					66.0		
1312+73	S	8.7				32					26.0		
1313+23			8.0			30					40.0		
1313+96			8.0			30					40.0		
1314+37		8.7	8.0			56					66.0		
1314+71	O		8.0			30					40.0		
1315+08		8.7				32					26.0		
1315+17			8.0			30					40.0		
1315+49 / 1315+56		8.7	17.3			63				*17.3	66.0		
1315+90	U		8.0			30					40.0		
1316+53			8.0			30					40.0		
1316+69		8.7	8.0			56					66.0		
1317+07		8.7	8.0			56					66.0		
1317+48	T	8.7	8.0			56					66.0		
1317+95 / 1318+09		28.9	26.7			70				*55.6	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1318+33			8.0			30					40.0		
1319+08			8.0			30					40.0		
1319+49	H	8.7	8.0			56					66.0		
1319+89		8.7	8.0			56					66.0		
1320+27			8.0			30					40.0		
1320+73			8.0			30					40.0		
1321+49	B	8.7	8.0			56					66.0		
1322+71		8.7	8.0			56					66.0		
1323+04		8.7	8.0			56					66.0		
1323+40			8.0			30					40.0		
1323+83 / 1323+87	O	8.7	13.3			60					66.0		
1324+25			8.0			30					40.0		
1324+63 / 1324+68			14.7			35				*14.7	40.0		
1325+04			8.0			30					40.0		
1325+86	U		8.0			30					40.0		
1326+24		8.7	8.0			56					66.0		
1326+65		8.7	8.0			56					66.0		
1327+05		8.7	8.0			56					66.0		
1327+47	N	8.7	8.0			56					66.0		
1327+87			8.0			30					40.0		
1328+23			8.0			30					40.0		
1328+65		8.7	8.0			56					66.0		
1329+06	D		8.0			30					40.0		
1329+47			8.0			30					40.0		
1329+80 / 1329+88			18.7			38				*18.7	40.0		
1330+27			8.0			30					40.0		
1331+79			8.0			40	1.3			*1.3	44.0		
1333+00			8.0			46	3.3			*3.3	50.0		
1333+34			8.0			48	4.0			*4.0	52.0		
1333+78						20	4.7			*4.7	30.0		
1334+55			8.0			54	6.0			*6.0	58.0		
1334+96			8.0			56	6.7			*6.7	60.0		
1335+32			8.0			58	7.3			*7.3	62.0		
1335+80						30	8.0			*8.0	40.0		
1336+11						32	8.7			*8.7	42.0		
1336+84		8.7	8.0			92	10.0			*10.0	96.0		
1337+27 / 1337+37		23.1	8.0			110	10.7			*33.8	114.0	SEE 'DETAIL 5'	35
1340+50		8.7	8.0			110		16.0		*16.0	114.0		
1341+14			8..0			30					40.0		
1342+47		8.7	8.0			56					66.0		
1342+87		8.7	8.0			56					66.0		
1343+62			8.0			30					40.0		
1344+06			8.0			30					40.0		
1344+53			8.0			30					40.0		
1346+42			8.0			30					40.0		
1346+94			8.0			30					40.0		
1349+61 / 1349+66			14.7			35				*14.7	40.0		
1350+41			8.0			30					40.0		
1351+21		8.7	8.0			56					66.0		
1351+60			8.0			30					40.0		
SUBTOTALS		312.0	652.1	0.0	0.0	3439.0	70.7	16.0		*257.4	4076.0	QUANTITIES CARRIED TO SHEET NO. 25 .	

CALC. ATH DATE: 1/95
CHKD. DGK DATE: 10/95

CALCULATIONS
FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

BEL/JEF-7-23.76/0.00

22
94

FINAL 1/31/96

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255								* WIRE FABRIC REINF., AS PER BP-2.5	413	COMMENTS	
		FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C				FULL DEPTH PAVEMENT SAWING	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS				SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
		TYPE Y/Y		TYPE Y/N/Y			TYPE Y/Y	TYPE Y/N/Y					
		PASSING LANE	TRAVEL LANE	PASSING LANE	TRAVEL LANE		SPEED CHANGE LANE	SPEED CHANGE LANE					
		SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	LIN. FT.	SQ. YD.	SQ. YD.		SQ. YD.	LIN. FT.		
1352+79			8.0			30					40.0		
1354+00			8.0			30					40.0		
1354+88		8.7	8.0			56					66.0		
1356+49		8.7	8.0			56					66.0		
1356+85			8.0			30					40.0		
1357+26			8.0			30					40.0		
1358+00			8.0			30					40.0		
1358+43			8.0			30					40.0		
1361+61						42	12.0			*12.0	52.0		
1362+00	S		8.0			68	10.7			*10.7	72.0		
1362+52						34	9.3			*9.3	44.0		
1363+72						30	8.0			*8.0	40.0		
1364+00						30	8.0			*8.0	40.0		
1364+88	0	8.7	8.0			86	8.0			*8.0	90.0		
1365+27						30	8.0			*8.0	40.0		
1365+65						30	8.0			*8.0	40.0		
1366+06						20	4.7			*4.7	30.0		
1366+50	U	8.7	8.0			74	4.0			*4.0	78.0		
1369+20 / 1369+30			21.3			40				*21.3	40.0		
1369+68			8.0			30					40.0		
1370+84			8.0			30					40.0		
1372+07	T	8.7	8.0			56					66.0		
1372+46			8.0			30					40.0		
1373+62			8.0			30					40.0		
1374+03 / 1374+08			14.7			35				*14.7	40.0		
1375+69	H		8.0			30					40.0		
1376+02			8.0			30					40.0		
1376+41			8.0			30					40.0		
1377+28		8.7	8.0			56					66.0		
1378+06	B		8.0			30					40.0		
1378+46			8.0			30					40.0		
1378+81		8.7	8.0			56					66.0		
1379+26			8.0			30					40.0		
1379+64	0		8.0			30					40.0		
1380+05		8.7	8.0			56					66.0		
1380+44			8.0			30					40.0		
1381+24			8.0			30					40.0		
1381+67	U	8.7	8.0			56					66.0		
1382+00 / 1382+06			16.0			36				*16.0	40.0		
1382+38 / 1382+48			21.3			40				*21.3	40.0		
1383+20 / 1383+28			18.7			38				*18.7	40.0		
1383+57 / 1383+64	N		17.3			37				*17.3	40.0		
1384+48			8.0			30					40.0		
1385+89		8.7	8.0			56					66.0		
1386+31		8.7	8.0			56					66.0		
1388+97		8.7	8.0			56					66.0		
1390+20		8.7	8.0			56					66.0		
1391+43			8.0			30					40.0		
1391+86			8.0			30					40.0		
1392+21			8.0			30					40.0		
1392+61 / 1392+70		8.7	20.0			65				*20.0	66.0		
1393+04			8.0			30					40.0		
1393+12			8.0			30					40.0		
1393+88			8.0			30					40.0		
1394+27		8.7	8.0			56					66.0		
1395+42		8.7	8.0			56					66.0		
1397+88		8.7	8.0			56					66.0		
1398+29			8.0			30					40.0		
1398+72		8.7	8.0			56					66.0		
1399+53			8.0			30					40.0		
1400+72			8.0			30					40.0		
1401+13			8.0			30					40.0		
1401+52		8.7	8.0			56					66.0		
1401+87			8.0			30					40.0		
1402+27			8.0			30					40.0		
1402+67 / 1402+75			18.7			38				*18.7	40.0		
1403+12		8.7	8.0			56					66.0		
1403+54			8.0			30					40.0		
1403+86		8.7	8.0			56					66.0		
1404+27			8.0			30					40.0		
1404+66			8.0			30					40.0		
1405+06		8.7	8.0			56					66.0		
1405+47 / 1405+51		14.4	13.3			60					66.0		
1407+02			8.0			38	0.7			*0.7	42.0		
1407+52			8.0			40	1.3			*1.3	44.0		
1407+90			8.0			42	2.0			*2.0	46.0		
SUBTOTALS		**205.1**	**641.3**	**0.0**	**0.0**	**3067.0**	**84.7**	**0.0**		***232.7**	**3724.0**	QUANTITIES CARRIED TO SHEET NO. 25 .	

CALCULATIONS
FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

CALC. ATH. BY: DATE: 1/95
CHKD. DGK. BY: DATE: 10/95

BEL/JEF-7-23.76/0.00

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255								* 413	COMMENTS	
		FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C				FULL DEPTH PAVEMENT SAWING	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS			* WIRE FABRIC REINF., AS PER BP-2.5	SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
		TYPE Y/Y		TYPE Y/N/Y			TYPE Y/Y	TYPE Y/N/Y					
		PASSING LANE SQ. YD.	TRAVEL LANE SQ. YD.	PASSING LANE SQ. YD.	TRAVEL LANE SQ. YD.	LIN. FT.	SPEED CHANGE LANE SQ. YD.	SPEED CHANGE LANE SQ. YD.		SQ. YD.	LIN. FT.		
1408+32			8.0			44	2.7			*2.7	48.0		
1408+64	S		8.0			46	3.3			*3.3	50.0		
1408+87 / 1409+43		8.7			44.0	128		22.0		*66.0	78.0	SEE 'DETAIL 6'	35
1410+24	O		8.0			54	6.0			*6.0	58.0		
1410+66						26	6.7			*6.7	36.0		
1411+12	U		8.0			60	8.0			*8.0	64.0		
1411+50 / 1411+90				36.1	48.0	158		39.0		*123.1	92.0	SEE 'DETAIL 7'	35
1412+28	T					36	10.0			*10.0	46.0		
1412+71						38	10.7			*10.7	48.0		
1413+12	H					40	11.3			*11.3	50.0		
1413+52						42	12.0			*12.0	52.0		
1414+25	B					38	10.7			*10.7	48.0		
0+17						38	10.7			*10.7	48.0		
0+63	O					38	10.7			*10.7	48.0		
1+24		8.7	8.0			56					66.0		
2+44	U	8.7				32					26.0		
4+46			8.0			30					40.0		
4+81	N		8.0			30					40.0		
5+19		8.7	8.0			56					66.0		
5+58	D	8.7	8.0			56					66.0		
5+99		8.7	8.0			56					66.0		
6+37 / 6+47		23.1	21.3			66				*44.4	66.0		
6+85		8.7	8.0			56					66.0		
7+17 / 7+29		26.0	24.0			68				*50.0	66.0		
7+57 / 7+66		21.7	20.0			65				*41.7	66.0		
RAMP 'A', TR 469													
1340+97						34	9.5			*9.5	49.8		
1341+08						35	9.6			*9.6	49.4		
1341+36						36	10.1			*10.1	48.6		
1341+65						38	10.6			*10.6	49.8		
1342+53						37	10.3			*10.3	54.9		
1342+95						38	10.6			*10.6	55.9		
1343+71 / 1343+82						49	30.2			*30.2	67.0		
1344+18						38	10.7			*10.7	56.0		
1345+69						38	10.7			*10.7	56.0		
1346+13 / 1346+21						46	24.9			*24.9	64.0		
1346+96						38	10.7			*10.7	56.0		
1347+32						38	10.7			*10.7	56.0		
1347+70						38	10.7			*10.7	56.0		
1348+53						38	10.7			*10.7	56.0		
1349+35						38	10.7			*10.7	56.0		
1349+69						38	10.7			*10.7	56.0		
1350+14						38	10.7			*10.7	56.0		
1350+45						38	10.7			*10.7	56.0		
1350+55						38	10.7			*10.7	56.0		
1350+94						38	10.7			*10.7	56.0		
1351+25						38	10.7			*10.7	56.0		
RAMP 'B', TR 469													
1351+60 / 1351+67						45	23.1			*23.1	63.0		
1352+02						38	10.7			*10.7	56.0		
1352+47						38	10.7			*10.7	56.0		
1352+86						38	10.7			*10.7	56.0		
1353+25						38	10.7			*10.7	56.0		
1353+66 / 1353+69						41	16.0			*16.0	59.0		
1354+02						38	10.7			*10.7	56.0		
1354+48						38	10.7			*10.7	56.0		
1354+87						38	10.7			*10.7	56.0		
1355+26						38	10.7			*10.7	56.0		
1355+64						38	10.7			*10.7	56.0		
1355+99						38	10.7			*10.7	56.0		
1356+47						38	10.7			*10.7	56.0		
1356+85						38	10.7			*10.7	56.0		
1357+25						38	10.7			*10.7	56.0		
1357+66						38	10.7			*10.7	56.0		
1358+09						38	10.7			*10.7	56.0		
1358+46						38	10.7			*10.7	56.0		
1358+84						38	10.7			*10.7	51.4		
RAMP 'C', TR 469													
1348+43						23	5.7			*5.7	35.0		
1348+74						37	10.3			*10.3	49.0		
1349+55						38	10.7			*10.7	56.0		
1349+92						38	10.7			*10.7	56.0		
1350+27						38	10.7			*10.7	56.0		
1350+67						38	10.7			*10.7	56.0		
1351+08						38	10.7			*10.7	56.0		
1351+41 / 1351+51						48	28.4			*28.4	66.0		
1351+86						38	10.7			*10.7	56.0		
SUBTOTALS		**131.4**	**153.3**	**36.1**	**92.0**	**3232.3**	**686.1**	**61.0**		***1011.3**	**4122.9**	QUANTITIES CARRIED TO SHEET NO. 25 .	

CALC. ATH DATE: 1/95
CHKD. DGK DATE: 10/95

CALCULATIONS
FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

BEL/JEF-7-23.76/0.00

24/94

FINAL 1995/JTS ATH 9/5/94

STICKLEN – BELSHEIM & ASSOCIATES

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255											* WIRE FABRIC REINF., AS PER BP-2.5	413	SPECIAL	202	605	COMMENTS	
		FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C						FULL DEPTH PAVEMENT SAWING	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS					SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	PRESSURE RELIEF JOINT, TYPE A	PAVEMENT REMOVED	6" UNCLASSIFIED PIPE UNDERDRAIN 707.01 OR 707.21	SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
		TYPE Y/Y		TYPE Y/N/Y		TYPE Y/PRJ/Y			TYPE Y/Y	TYPE Y/N/Y									
		PASSING LANE	TRAVEL LANE	PASSING LANE	TRAVEL LANE	PASSING LANE	TRAVEL LANE		SPEED CHANGE LANE	SPEED CHANGE LANE									
		SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	LIN. FT.	SQ. YD.	SQ. YD.			SQ. YD.	LIN. FT.	LIN. FT.	SQ. YD.	LIN. FT.		
1352+28								38	10.7				*10.7	56.0					
1353+06								38	10.7				*10.7	56.0					
1353+50								38	10.7				*10.7	56.0					
1353+83								38	10.7				*10.7	56.0					
1354+27								38	10.7				*10.7	56.0					
1354+66								38	10.7				*10.7	56.0					
1355+07								38	10.7				*10.7	56.0					
1355+85								38	10.7				*10.7	56.0					
1357+06								38	10.7				*10.7	56.0					
1357+86 / 1357+93								48	28.4				*28.4	66.0					
1358+35								37	10.2				*10.2	54.6					
1358+64								35	9.8				*9.8	53.4					
1359+20								37	10.4				*10.4	55.2					
1359+59								36	9.9				*9.9	48.4					
RAMP 'D', TR 469																			
1342+16								38	10.7				*10.7	58.0					
1342+48								38	10.7				*10.7	56.0					
1342+92								38	10.7				*10.7	56.0					
1343+33								38	10.7				*10.7	56.0					
1343+69								38	10.7				*10.7	56.0					
1344+10								38	10.7				*10.7	56.0					
1344+45 / 1344+53								46	24.9				*24.9	64.0					
1344+85								38	10.7				*10.7	56.0					
1345+25 / 1345+32								45	23.1				*23.1	63.0					
1345+72								38	10.7				*10.7	56.0					
1346+08								38	10.7				*10.7	56.0					
1346+52								38	10.7				*10.7	56.0					
1346+92								38	10.7				*10.7	56.0					
1347+62								38	10.7				*10.7	56.0					
1348+04								38	10.7				*10.7	56.0					
1348+38								38	10.7				*10.7	56.0					
RAMP 'A', PUBLIC RD.																			
1+01								35	9.6				*9.6	49.3					
1+29								36	9.9				*9.9	48.2					
1+61								37	10.4				*10.4	49.1					
1+70								37	10.5				*10.5	49.4					
2+03								35	9.6				*9.6	52.8					
2+76								38	10.6				*10.6	55.7					
3+21								38	10.7				*10.7	56.0					
3+55 / 3+65								48	28.4				*28.4	66.0					
3+97								38	10.7				*10.7	56.0					
4+29 / 4+41								50	32.0				*32.0	68.0					
4+74 / 4+80								44	21.3				*21.3	62.0					
5+15 / 5+24								47	26.7				*26.7	65.0					
5+62								38	10.7				*10.7	56.0					
5+95								38	10.7				*10.7	56.0					
6+34 / 6+40								44	21.3				*21.3	62.0					
6+77								38	10.7				*10.7	56.0					
7+15 / 7+26								49	30.2				*30.2	67.0					
7+50 / 7+59								47	26.7				*26.7	65.0					
7+94 / 8+02								46	24.9				*24.9	64.0					
8+17 / 8+47								68		64.0			*64.0	68.0					
8+77 / 8+94								68		64.0			*64.0	68.0					
RAMP ' D', PUBLIC RD.																			
0+74 / 0+85								49	30.2				*30.2	69.8					
1+16 / 1+24								46	24.9				*24.9	64.0					
1+57								38	10.7				*10.7	56.0					
2+01								38	10.7				*10.7	56.0					
2+41								38	10.7				*10.7	56.0					
2+84								38	10.7				*10.7	56.0					
3+16								38	10.7				*10.7	56.0					
3+60								38	10.7				*10.7	56.0					
3+99								38	10.7				*10.7	56.0					
4+37								38	10.7				*10.7	56.0					
4+72 / 4+82								48	28.4				*28.4	66.0					
5+22								38	10.7				*10.7	56.0					
6+03								38	10.7				*10.7	56.0					
6+36								38	10.7				*10.7	56.0					
6+79								38	10.7				*10.7	56.0					
7+13 / 7+24								49	30.2				*30.2	67.0					
7+55								38	10.7				*10.7	56.0					
7+95								38	10.7				*10.7	56.0					
SUBTOTALS (THIS SHEET)		0.0	0.0	0.0	0.0			2800	950.6	128.0			*1078.6	3985					
SUBTOTALS (SHEET NO. 20)		325.0	397.3	99.7	64.0	72.9	42.7	3547.0	236.0	0.0			*558.3	4105.0	136.0	120.9	176.0		
SUBTOTALS (SHEET NO. 21)		1639.5	1428.0	39.0	778.7			4400.0	2.7	0.0			*3245.1	3890.0					
SUBTOTALS (SHEET NO. 22)		312.0	652.1	0.0	0.0			3439.0	70.7	16.0			*257.4	4076.0					
SUBTOTALS (SHEET NO. 23)		205.1	641.3	0.0	0.0			3067	84.7	0.0			*232.7	3724					
SUBTOTALS (SHEET NO. 24)		131.4	153.3	36.1	92.0			3232.3	686.1	61.0			*1011.3	4122.9					
TOTAL		2613.0	3272.0	174.8	934.7	72.9	42.7	20486	2030.6	205.0			*6383.4	23903	136	121	176		
INCREASE BY 10%		261.3	327.2	17.5	93.5	7.3	4.3	2048.6	203.1	20.5				2390.3				NOTE: ALL ESTIMATED QUANTITIES	
GRAND TOTAL		7830						22540	2460				* SEE NOTE	26300	136	121	176	CARRIED TO THE GENERAL SUMMARY	

CALC. ATH BY: ATH DATE: 1/95
CHKD. DGK BY: DGK DATE: 10/95

CALCULATIONS
FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

BEL/JEF-7-23.76/0.00

FINAL 1993078 ATH 2/28/97

DRAINAGE QUANTITIES

REF. NO.	PLAN SHEET NO.	LOCATION	SIDE	603 CONDUIT, TYPE B 6" Lin. Ft.	12" Lin. Ft.	15" Lin. Ft.	18" Lin. Ft.	21" Lin. Ft.	24" Lin. Ft.	27" Lin. Ft.	30" Lin. Ft.	36" Lin. Ft.	42" Lin. Ft.	48" Lin. Ft.	604 CATCH BASIN NO. 3 EA.	NO. 4 EA.	NO. 5 EA.	NO. 5A EA.	604 INLET NO. 2-A-6* EACH	604 MANHOLE ADJUSTED TO GRADE EACH	202 CATCH BASIN ABANDONED EACH	WINDOW OR GRATE ELEVATION	INVERT ELEVATION	DEPTH	EXISTING PIPE CONNECTIONS
1D	42	1258+75.0	Lt.		4														1			664.27	661.02	3.25	12" E
2D	42	1258+75.0	Rt.		4	4													1	1 +		664.21	659.79	4.42	12" W, 15" N
3D	42	1262+50.0	Lt.						8								1		1			662.08	656.59	5.49	24" E&W
4D	42	1262+40.0	Rt.		4										1							661.94	658.59	3.35	12" N
5D	42	1263+75.0	Lt.		4										1							661.49	657.76	3.73	12" E
6D	42	1263+75.0	Rt.		8										1							661.48	655.51	5.97	12" E&W
7D	42	1264+50.0	Lt.		4										1							661.68	658.05	3.63	12" E
8D	42	1264+50.0	Rt.		8										1							661.73	656.11	5.62	12" E&W
9D	42	1269+30.0	Lt.					4									1					657.38	654.06	3.32	21" S
10D	43	1278+54.0	Lt.														1					668.41	662.97	5.44	18" E
11D	43	1283+34.0	Lt.														1					675.22	671.77	3.45	18" E
12D	43	1288+78.0	Lt.														1					683.70	680.26	3.44	18" E
13D	43	1292+78.0	Lt.														1					689.6	686.30	3.30	18" E
14D	43	1295+27.0	Lt.														1					691.65	688.40	3.25	18" E
15D	43	1298+00.0	Lt.														1					693.96	691.04	2.92	18" E
16D	43	1300+50.0	Lt.														1					695.18	691.47	3.71	18" E
17D	44	1304+30.0	Lt.													1						697.00	693.50	3.50	21" E
18D	44	1310+10.0	Lt.						4							1						699.85	695.89	3.96	24" N
19D	44	1311+30.0	Lt.						4							1						698.59	694.54	4.05	24" S, 30" E
20D	44	1314+50.0	Lt.														1					699.92	696.54	3.38	18" E
21D	44	1318+00.0	Lt.														1					701.37	697.88	3.49	18"E
22D	44	1321+00.0	Lt.								4						1					703.34	697.43	5.91	30" N&E
23D	44	1324+50.0	Lt.						4		4						1					704.67	699.42	5.25	24" N, 30" S
24D	44	1327+50.0	Lt.						4								1					705.79	702.26	3.53	24" S
25D	45	1345+50.0	Lt.	4			4										1					680.95	677.95	3.00	6" E, 18" N
26D	45	1346+50.0	Lt.				4		4							1						682.24	676.22	6.02	18" S, 24" E
27D	45	1347+00.0	Rt.						8								1					671.56	668.47	3.09	24" E&W
28D	46	1355+00.0	Lt.						4								1					662.27	658.74	3.53	24" E
29D	46	1355+00.0	Rt.						4	4								1				663.28	657.56	5.72	24" W, 27" E
30D	46	1361+73.0	Lt.									4						1				659.32	654.61	4.71	42" E
31D	47	1388+32.0	Lt.										8					1				661.81	655.48	6.33	48" N & S
32D	47	1389+00.0	Lt.		4								8					1				680.67	672.14	8.53	12" E, 48" N&S
33D	47	1388+30.0	Rt.				4										1					657.80	654.55	3.25	18" S
34D	47	1394+50.0	Lt.										8					1				684.19	676.13	8.06	48" N&S
35D	47	1398+50.0	Lt.										8					1				685.9	678.76	7.14	48" N&S
36D	47	1402+50.0	Lt.		4							4	4			1						687.43	679.94	7.49	12"E,42"N,48"S
37D	47	1402+50.0	Rt.		4									1								689.43	685.68	3.75	12" W
38D	48	1405+50.0	Lt.		4							4	4			1						688.43	681.71	6.72	12"E,36"N,42"S
39D	48	1405+50.0	Rt.		4									1								690.54	687.05	3.49	12" W
40D	48	1410+50.0	Lt.		4					4		4				1						690.01	684.24	5.77	12"E,27"N,36"S
41D	48	1410+50.0	Rt.		4									1								692.01	688.10	3.91	12" W
42D	48	1413+50.0	Lt.				4			4							1					691.05	686.45	4.60	18" N, 27" S
43D	48	0+84.0	Lt.	4	4		4										1					694.85	689.53	5.32	6"E,12"E,18"S
44D	48	0+86.0	Lt.		10															1 **		697.42	693.69	3.73	12" N&S
45D	48	1+36.0	Lt.																	1 ***		698.53	693.87	4.66	12" S
46D	48	0+50.0	Rt.			4											1					667.12	665.12	2.00	15" SE
47D	48	8+70.0	Rt.		4												1					685.40	682.40	3.00	12" N
48D	48	8+66.0	Lt.		8												1					693.00	689.09	3.91	12" N & W
49D	48	8+59.0	Lt.		4												1					694.50	691.00	3.50	12" N
TOTALS–Carried To General Summary				8	94	8	20	4	44	12	8	8	12	36	8	7	24	6	3	1	2	-------	-------	-------	-------

* Apron as Per Standard Drawing I-2

** Connect Pipes Thru

*** Plug Existing Pipe

+ See Sheet No. 36.

For Inlet, No. 3B50, As Per Plan details, see sheet no. 50A.

CALC. ATH BY:- DATE:- 8/95
CHKD. BPS BY:- DATE:- 11/95

DRAINAGE QUANTITIES

BEL/JEF-7-23.76/0.00

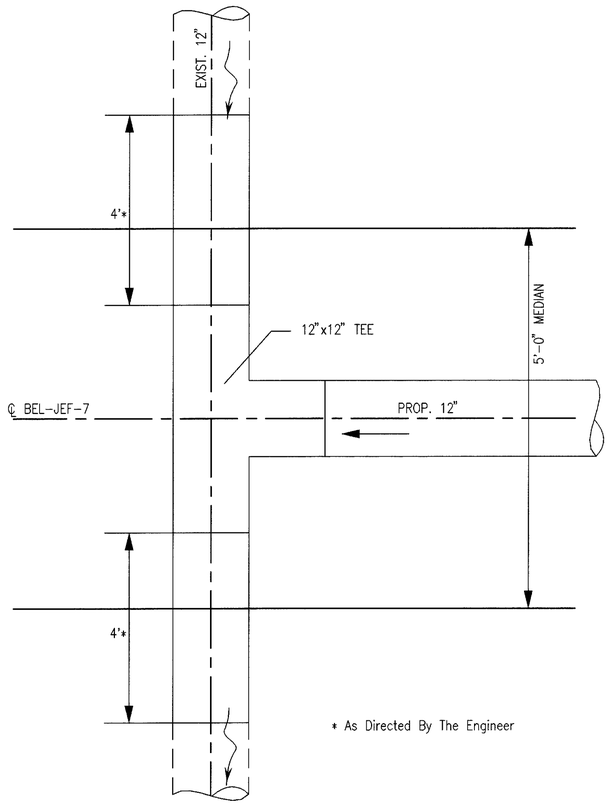
2/26/97 ATH 1803R01 FINAL

MEDIAN DRAINAGE QUANTITIES

REF. NO.	PLAN SHEET NO.	LOCATION	SIDE	603 CONDUIT, TYPE B 12" LIN. FT.	603 CONDUIT, TYPE B 24" LIN. FT.	604 INLET, NO. 3C, AS PER PLAN * EACH	604 INLET, NO. 3C EACH	604 INLET NO. 2-6 EACH	SPECIAL INLET CLEANOUT EACH	WINDOW ELEVATION	INVERT ELEVATION	DEPTH	EXISTING PIPE CONNECTIONS
1MD	43	1278+54	C/L			1			1	671.13	662.07	9.06	18" E&W
2MD	43	1280+53	C/L			1			1	674.07	669.74	4.33	12" E
3MD	43	1288+78	C/L			1			1	685.94	679.32	6.62	12"N, 18" E&W
4MD	43	1290+53	C/L			1			1	688.66	684.97	3.69	12"S
5MD	44	1304+29.5	C/L			1			1	699.25	693.03	6.22	12" N, 21" E&W
6MD	44	1305+65	C/L			1			1	699.9	696.05	3.85	12" S
7MD	44	1311+29.5	C/L			1			1	701.78	697.57	4.21	12" N, 30" E&W
8MD	44	1312+65	C/L			1			1	702.35	698.22	4.13	12" S
9MD	45	1337+90	C/L			1			1	703.63	700.21	3.42	12" W
10MD	45	1340+52	C/L			1			1	697.09	693.46	3.63	12" W
11MD	46	1354+00	C/L			1			1	665.61	662.56	3.05	12" N
12MD	46	1355+00	C/L			1			1	665.27	658.38	6.89	12" N&S, 24" E&W
13MD	46	1355+75	C/L			1			1	665.50	662.68	2.82	12" S
14MD	47	1382+78	C/L			1			1	673.78	669.45	4.33	12" N&E
15MD	47	1383+53	C/L			1			1	674.21	670.43	3.78	12" S
16MD	47	1389+03	C/L			1			1	683.44	679.42	4.02	12" W
17MD	44	FROM 1314+50 TO 1315+00	C/L	58			1 **			703.32	695.95	7.37	12" S
18MD	42	1263+65	LT.	8				1		661.91	657.25	4.66	12" N
19MD	42	1263+73	RT.		8			1		661.94	657.17	4.77	12" E&W
TOTALS THIS SHEET				66	8	16	1	2	16	-------	-------	-------	-------
TOTALS–Carried To General Summary				**66**	**8**	**16**	**1**	**2**	**16**	-------	-------	-------	-------

* See Detail Sheet No. 50

** Connect to existing pipe using 12" x 12" TEE connection at station 1314+50.00



* As Directed By The Engineer

12" x 12" TEE CONNECTION
STA. 1314+50

CALC: ATH DATE: 8/95
CHKD: BPS DATE: 11/95

MEDIAN INLET DRAINAGE QUANTITIES

BEL/JEF-7-23.76/0.00

27
94

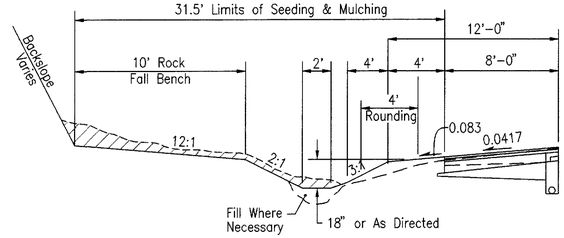
5/29/97 ATH 1993R02 FINAL

ITEM 670
SLOPE EROSION PROTECTION
From Linear Grading, Method A
160.93 Sta. x 100 x 9' Avg. Width / 9 = 16093 Sq. Yd.

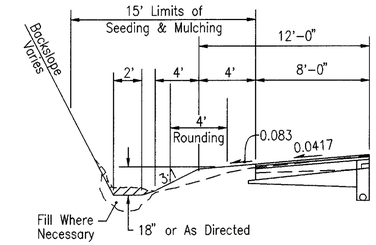
ITEM 659
SEEDING & MULCHING
From Linear Grading, Method B
233.22 Sta. x 100 x 8' Avg. Width / 9 = 20730.67 Sq. Yd.
From Linear Grading, Method C
33.71 Sta. x 100 x 7' Avg. Width / 9 = 2621.89 Sq. Yd.
From Linear Grading (Ditch Cleanout) As Per Plan (Method 1)
35.64 x 100 x 31.5' Avg. Width / 9 = 12474.00 Sq.Yd.
From Linear Grading (Ditch Cleanout) as Per Plan (Method 2)
222.20 x 100 x 15' Avg. Width / 9 = 37033.33 Sq.Yd.
SUBTOTAL 72859.89
TOTAL 88952.89 **Use 88953 Sq. Yd.**
COMMERCIAL FERTILIZER
88953 x 9 x 20 / 1000 / 2000 = **8.00 Ton**
AGRICULTURAL LIMING
88953 X 9 X 46 / 1000 / 2000 x 2.2 = **40.51 Ton**
WATER
88953 X 9 X 120 / 1000 / 1000 X 2 = 192.14 M Gal
Use 192 M Gal (Quantity Carried to General Notes)
Unless indicated otherwise, Quantities Carried To General Summary

ITEM 203, LINEAR GRADING, METHOD C				
STATION		SIDE	LENGTH	203 LINEAR GRADING, METHOD C
FROM	TO		LIN. FT.	STA.
1258+00	1265+98.63	RT.	798.63	7.99
1258+00.0	1266+59.22	LT.	859.22	8.59
1266+54.3	1268+14.0	RT.	159.70	1.60
1267+14.89	1268+14.0	LT.	99.11	0.99
1401+25.0	1415+79.82	RT.	1454.82	14.55
TOTAL				33.71
Total – Carried To General Summary				34

ITEM 203, LINEAR GRADING (DITCH CLEANOUT), AS PER PLAN					
STATION		LANE	LENGTH	LINEAR GRADING (DITCH CLEANOUT), METHOD 1	LINEAR GRADING (DITCH CLEANOUT), METHOD 2
FROM	TO		LIN. FT.	STA.	STA.
1298+00	1338+50	NORTH BOUND	4050.00		40.50
1352+00	1387+00		3500.00		35.00
1389+00	1415+00		2600.00		26.00
1269+30	1338+00	SOUTH BOUND	6870.00		68.70
1340+00	1387+00		4700.00		47.00
1389+00	9+00		3564.31	35.64	
4+00	9+00		500.00		5.00
TOTAL				35.64	222.20
Total – Carried To General Summary				258	



METHOD 1



METHOD 2

DITCH CLEANOUT DETAILS

ITEM 203, LINEAR GRADING, METHOD A & ASPHALT PAVING UNDER GUARDRAIL					
GUARDRAIL REF. NO.	STATION OF PAVING		LANE OR RAMP	LENGTH	203 LINEAR GRADING, METHOD A
	FROM	TO		LIN. FT.	STA.
5GR	1268+14.00	1322+77.30		5463.30	54.63
6GR	1331+01.28	1338+45.03	N B	743.75	7.44
11GR	1349+39.07	1349+95.32	O O	56.25	0.56
21GR	1385+71.97	1387+28.22	R U	156.25	1.56
23GR	1388+81.88	1415+79.82	T N	2697.94	26.98
23GR	0+00.00	7+89.6 D	H D	789.56	7.90
25GR	1+61.44	8+42.69		681.25	6.81
4GR	1268+14.00	9+03.47		92.54	0.93
7GR	1337+41.96	1338+04.46	S B	62.50	0.63
9GR	1339+76.35	1341+21.93 A	O O	156.25	1.56
12GR	1351+04.68	1351+60.93	U U	56.25	0.56
20GR	1384+04.36	1387+29.36	T N	325.00	3.25
22GR	1388+80.54	1390+36.79	H D	156.25	1.56
24GR	3+98.86	8+36.36		437.50	4.38
8GR	1340+27.87	1348+04.73	D	787.50	7.88
10GR	46+62.36	47+87.36	TR 469 L	125.00	1.25
13GR	50+30.45	1350+90.35	TR 469 L	43.75	0.44
14GR	50+49.40	50+93.15	TR 469 R	43.75	0.44
15GR	47+28.40	48+09.65	TR 469 R	81.25	0.81
16GR	43+00.00	1355+04.00	C	987.5	9.88
17GR	1349+46.00	1355+46.00	C	600.00	6.00
18GR	1353+75.00	1357+75.00	B	400.00	4.00
19GR	1357+50.00	1369+00.00	C	1150.00	11.50
TOTAL					160.93
Totals – Carried to General Summary					161.00

ITEM 203, LINEAR GRADING, METHOD A & ASPHALT PAVING UNDER GUARDRAIL	
448 2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER G.R.), PG 64-22, AS PER PLAN	
CU. YD.	
134.9	
18.4	
1.4	
3.9	
66.6	
19.5	
16.8	
2.3	
1.5	
3.9	
1.4	
8.0	
3.9	
10.8	
19.4	
3.1	
1.1	
1.1	
2.0	
24.4	
14.8	
9.9	
28.4	
397.4	
397.0	

ITEM 203, LINEAR GRADING, METHOD B				
STATION		LANE	LENGTH	203 LINEAR GRADING, METHOD B
FROM	TO		LIN. FT.	STA.
1322+71.4	1330+02.1	N B	730.70	7.31
1341+91.5	1348+53.10	O O	661.60	6.62
1350+55.0	1357+67.0	R U	712.00	7.12
1369+00.0	1385+77.10	T N	1677.10	16.77
0+60.0	1+55.1	H D	95.10	0.95
1269+25.0	1337+42.10	S B	6817.10	68.17
1344+00.0	1350+50.0	O O	650.00	6.50
1352+51.9	1359+00.0	U U	648.10	6.48
1359+00.0	1384+06.10	T N	2506.10	25.06
1390+28.90	2+55.0	H D	2790.41	27.90
2+55.0	3+98.6		143.60	1.44
1341+30.60	1351+40.14	A Lt.	1009.54	10.10
1344+00.0	1351+40.14	A Rt.	740.14	7.40
1341+91.5	1348+85.93	D Lt.	694.43	6.94
1355+04.0	1357+50.0	C Rt.	246.00	2.46
1356+46.0	1357+67.0	C Lt.	121.00	1.21
1351+58.56	1359+00.0	B Lt.	741.44	7.41
1351+58.56	1353+75.0	B Rt.	216.44	2.16
1357+72.0	1359+00.0	B Rt.	128.00	1.28
2+55.0	8+18.0	A Lt. Pub.	563.00	5.63
2+55.0	8+18.0	A Rt. Pub.	563.00	5.63
0+60.0	8+59.5	D Lt. Pub.	799.50	8.00
7+91.9	8+59.5	D Rt. Pub.	67.60	0.68
TOTAL				233.22
Total – Carried To General Summary				234

Excavation Where Necessary. The details for Method 1 & 2 are intended to show the proposed ground line only. The hatched areas do not represent actual field conditions and shall not be used to calculate excavation volume.

CALC. ATH BY: DATE: 8/95
CHKD. BPS BY: DATE: 11/95

LINEAR GRADING

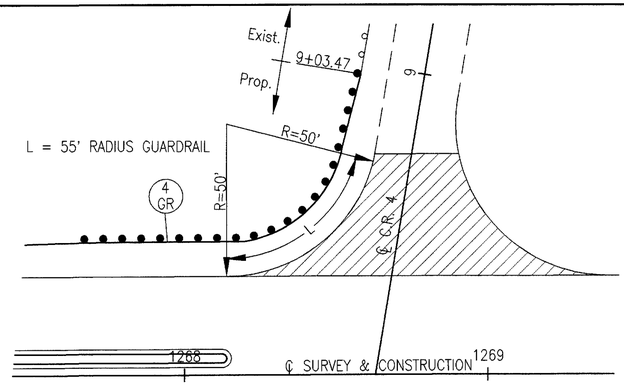
BEL/JEF-7-23.76/0.00

28/94

FINAL 1993eng RBB 5/5/98

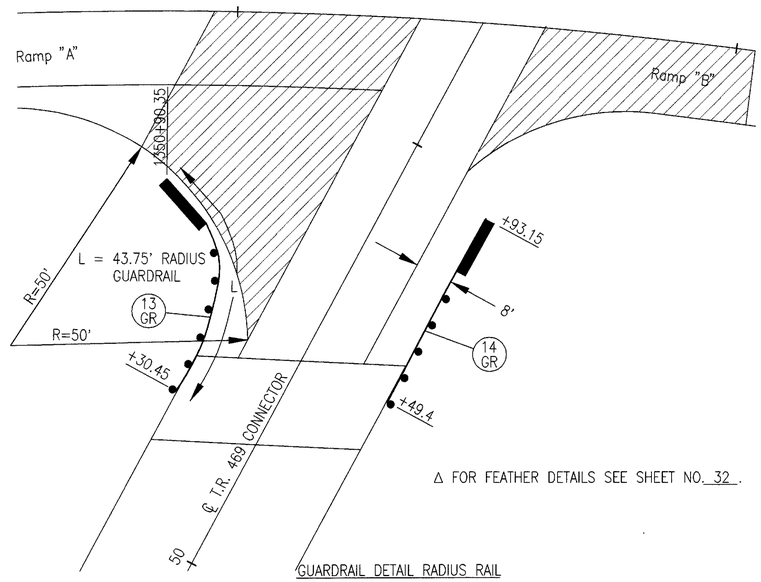
GUARDRAIL & BARRIER REFLECTOR QUANTITIES

REF. NO.	PLAN SHEET NO.	STATION FROM	STATION TO	SIDE	202 GUARDRAIL REMOVED	202 GUARDRAIL REMOVED, BARRIER DESIGN	606 GUARDRAIL, TYPE 5	606 ANCHOR ASSEMBLY TYPE B	606 ANCHOR ASSEMBLY TYPE E	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	SPECIAL IMPACT ATTENUATOR, QUADGUARD TYPE	622 CONCRETE BARRIER, TYPE	622 CONCRETE BARRIER, TYPE D	COMMENTS
					LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EACH	LIN. FT.		
1GR	42	1258+00.0	1263+12.5	CL	200	412.5									1			
		1262+80.75	1263+07.50															
2GR	42	1257+94.48	1265+98.63	Rt.	804.15		806.25				1		18	2				MATCH EXISTING G.R. @ 1257+94.48
		1257+94.48	1266+00.73															
3GR	42	1265+59.22	1266+59.22	Lt.	100		87.50			1		1	3					
		1265+61.22	1266+61.22															
4GR	42	1267+14.89	8+35.55 CR4	Lt.	250		181.25			1	1		3					SEE DETAIL RIGHT INCLUDES 55' RADIUS RAIL
		1267+12.79	9+03.47 CR4															
5GR	42-44	1266+54.3	1322+73.5	Rt.	5625		5612.5			1		1	57					
		1266+52.30	1322+77.30															
6GR	45	1330+00.0	1338+42.93	Rt.	825		731.25	1			1		9					
		1331+01.28	1338+45.03															
7GR	45	1337+40.0	1338+02.46	Lt.	62.5		**106.25**				1	1	3					
		1336+97.90	1338+04.46															
8GR	45	1340+29.87	44+70.0 TR469	Rt.	887.5		775			1		1	9					STATION EQUATION 1342+10.64(BACK)=1342+00(AHEAD)
		1340+27.87	1348+04.73 D															
9GR	45	1339+78.45	1341+28.5 A	Lt.	150		143.75	1			1		3					RAMP "A" STATION EQUATION 1341+00(BACK)=1340+89.33(AHEAD)
		1339+76.35	1341+21.93 A															
10GR	45	46+56.0 TR469	47+85.26 TR469	Lt.	125		100		1		1		3					
		46+62.36 TR469	47+87.36 TR469															
11GR	45	1348+75.0	1351+00.0	Rt.	225		31.25		1		1		2	2			60	SEE STANDARD CONSTRUCTION DWG. GR-8.1
		1349+39.07	1349+95.32															
12GR	45	1350+00.0	1352+25.0	Lt.	225		31.25		1		1		2	2			60	SEE STANDARD CONSTRUCTION DWG. GR-8.1
		1351+04.68	1351+60.93															
13GR	45	50+32.55 TR469	1350+82 A	Lt.	50		31.25			1	1		2					SEE DETAIL RIGHT INCLUDES 43.75' RADIUS RAIL
		50+30.45 TR469	1350+90.35 A															
14GR	45	50+51.5 TR469	51+01.5 TR469	Rt.	50		31.25			1	1		2					SEE DETAIL RIGHT
		50+49.4 TR469	50+93.15 TR469															
15GR	45	47+24.0 TR469	48+07.55 TR469	Rt.	87.5		56.25		1		1		2					
		47+28.4 TR469	48+09.65 TR469															
16GR	45,46	43+00.0 TR469	1355+04.0 C	Rt.	987.5		950		1	1			11					
		43+00.0 TR469	1355+04.0 C															
17GR	454,46	1349+46.0 C	1356+46.0 C	Lt.	700		562.5		1	1			7					
		1349+46.0 C	1355+46.0 C															
18GR	46	1353+75.0 B	1357+72.0 B	Rt.	400		362.5		1	1			5					
		1353+75.0 B	1357+75.0 B															
19GR	46	1357+50.0 C	1369+00.0	Rt.	1150		1112.5		1	1			13					
		1357+50.0 C	1369+00.0															
20GR	47	1384+04.0	1387+27.36	Lt.	325		312.5			1		1	5					
		1384+04.36	1387+29.36															
21GR	47	1385+75.0	1387+26.12	Rt.	150		131.25		1		1		3					
		1385+71.97	1387+28.22															
22GR	47	1388+82.64	1390+31.0	Lt.	150		131.25		1		1		3					
		1388+80.54	1390+36.79															
23GR	47,48	1388+83.88	7+94.0 D	Rt.	3487.5		3475			1		1	36					RAMP "D" STATION EQUATION 1415+79.82(BACK)=0+00(AHEAD)
		1388+81.88	7+89.56 D															
24GR	48	3+96.5	8+34.36	Lt.	437.5		425			1		1	6					
		3+98.86	8+36.36															
25GR	48	1+53.0	8+40.59	Rt.	687.5		656.25		1		1		8					
		1+61.44	8+42.69															
26GR	42	1269+81.25	1275+31.25	CL	550										1			
		1269+81.25	1270+08															
TOTALS – Carried To Traffic Control General Summary													215	6				
TOTALS – Carried To General Summary					18692	413	**16843.75**	2	11	**13**	**14**	7			2		120	



GUARDRAIL DETAIL RADIUS RAIL

* FACE OF RAIL VARIES 11.0' TO 11.44' FROM EDGE OF PAVEMENT
STA. 1267+12.79 TO STA. 9+03.47



Δ FOR FEATHER DETAILS SEE SHEET NO. 32 .

GUARDRAIL DETAIL RADIUS RAIL

STA. 50+30.45 TR 469 TO STA 1350+90.35 RAMP 'A' *
STA. 50+49.40 TR 469 TO STA 50+93.15 TR 469 **
* FACE OF RAIL VARIES 2' TO 8.87' FROM EDGE OF PAVEMENT
** FACE OF RAIL 8' FROM EDGE OF PAVEMENT

ITEM SPECIAL SEALING OF CONCRETE SURFACES (EPOXY)

CONCRETE MEDIAN

Sta. 1263+07.50 to Sta. 1263+12.50 =	5	
Sta. 1263+12.50 to Sta. 1266+26.83 =	314.33	
Sta. 1266+83.55 to Sta. 1268+14.00 =	130.45	
	449.78	LIN FT

CONCRETE BARRIER

Sta. 1257+76 to Sta. 1262+80.75 =	504.75	
Sta. 1270+08 to Sta. 1342+10.64 BK =	7202.64	
Sta. 1342+00 AHD to Sta. 1415+64.31 BK =	7364.31	
Sta. 0+00.00 AHD to Sta. 8+49.89 =	849.89	
	15416.84	LIN FT
Deduct Bridge BEL – 7 – 2526	-157.86	
Deduct Bridge BEL – 7 – 2619	-136.50	
Total Concrete Barrier, Type A =	15122.48	LIN FT
Total Concrete Barrier, Type B =	504.75	LIN FT
Total Concrete Barrier, Type D =	120.00	LIN FT

SURFACE AREA

Concrete Median ((5 x 50"/12) + (444.78' x 44"/12)) x 1/9 =	183.52	
Concrete Barrier, Type A 15122.48' x 74.62"/12 x 1/9 =	10,448.51	
Concrete Barrier, Type B 504.75' x 116.62"/12 x 1/9 =	545.04	
Concrete Barrier, Type D 120.00' x 75.31"/12 x 1/9 =	83.68	
	11,260.75	S.Y.
Total Carried to Sheet No. 8 =	11,261	S.Y.

CALC. ATH DATE: 11/95
CHKD. BPS DATE: 11/95

CALCULATIONS - GUARDRAIL & BARRIER MEDIAN

BEL/JEF-7-23.76/0.00

29/94

FINAL ATH 1995042 2/28/97

* 707.31, 707.33 OR 707.42

UNDERDRAIN QUANTITIES

Station		Lane	605 4" Shallow Pipe Under-Drain, 707.31 As Per Plan	604 Precast Reinforced Concrete Outlet	603 6" Conduit Type F, *	Bends & Branches		Outlet Station	Plug Station	Comments
						Tee	90			
From	To		Lin. Ft.	Each	Lin. Ft.	Each	Each			
1269+25	1276+50	Rt.	725						1276+50	Make UD 18" Deep
				1	40	1		1273+00		
				1	40		1	1269+25		
1269+25	1288+25	Lt.	1900						1288+25	
					19	1		1283+34		Outlet to CB
					18	1		1278+54		Outlet to CB
				1	36		1	1269+30		Outlet to CB
1288+25	1310+75	Rt.	2250						1310+75	
				1	18	1		1305+75		
				1	18	1		1300+75		
				1	38	1		1295+75		
				1	38	1		1290+75		
				1	24		1	1288+25		
1295+25	1302+25	Lt.	725						1302+25	
					19	1		1300+50		Outlet to CB
					18	1		1298+00		Outlet to CB
					18		1	1295+27		Outlet to CB
1310+10	1328+50	Lt.	1840						1328+50	
					18	1		1327+50		Outlet to CB
					18	1		1324+50		Outlet to CB
					19	1		1321+00		Outlet to CB
					21	1		1318+00		Outlet to CB
					21	1		1314+50		Outlet to CB
					22	1		1311+30		Outlet to CB
					22		1	1310+10		Outlet to CB
1322+50	1338+25	Rt.	1575	1	22	1		1327+00		
				1	24	1		1322+50		
				1	30	1		1337+00		
				1	30	1		1338+25		
1342+25	1348+75	Rt.	650						1342+25	Make UD 12" Deep
				1	16		1	1348+75		
1340+40	D1347+16	Rt.	676	1	15		1	D1347+16		
1342+25	1359+00	Lt.	1675						1342+25	Make UD 12" Deep
				1	20	1		1352+25		
					20	1		1355+00		Sag, Outlet to CB
1359+00	1380+25	Lt.	2125						1359+00	
				1	30	1		1368+75		
				1	33	1		1363+75		
				1	22	1		1378+75		Make UD 18" Deep
				1	22		1	1380+25		
A1340+89.33	A1348+00	Rt.	711						A1348+00	
					20	1		A1345+50		Sag, Outlet to CB
B1353+50	B1359+00	Lt.	550	1	20	1		B1349+00		
C1349+00	C1360+00	Rt.	1100	1	20		1	C1349+00		
				1	22	1		C1354+00		
				1	23	1		C1357+25		
1360+00	1387+05	Rt.	2705	1	17	1		1363+75		
				1	30	1		1368+75		
				1	33	1		1378+75		
				1	32	1		1382+75		
				1	32	1		1383+50		
1388+90	0+59	Rt.	2733						1387+05	
				1	18		1	1388+90		
				1	20	1		1392+50		
				1	18	1		1397+50		
					10	1		1402+50		Outlet to CB
					10	1		1405+50		Outlet to CB
					20	1		1410+50		Outlet to CB
2+50	8+25	Rt.	575	1	22		1	2+50		
				1	20	1		4+25		
D0+59	D8+55	Rt.	796						8+25	
							1	D8+55		Connect to Exist UD
				1	20	1		D0+59		
1395+50	0+84	Lt.	2098	1	18		1	1395+50		Make UD 18" Deep
									1398+47	
					23	1		1398+50		Outlet to CB
					23	1		1402+50		Outlet to CB
					23	1		1405+50		Outlet to CB
					22	1		1410+50		Outlet to CB
					22	1		1413+50		Outlet to CB
A0+84	A8+58.5	Lt.	775				1	A8+58.5		Outlet to CB
					20	1		A0+84		Outlet to CB
3+50	8+25	Lt.	475						8+25	
				1	22		1	3+50		
SubTotals						46	15			
Totals			26659	36	1349	--------	--------			

For Underdrain Details See Sheet 49.

CALC. BY: ATH DATE: 7/95
CHKD. BY: BPS DATE: 11/95

UNDERDRAIN QUANTITIES

BEL/JEF-7-23.76/0.00

9/5/96 RPR 1995CAD FINAL

REF. NO.	PLAN SHEET NO.	202			607												625
		FENCE, REMOVED	FENCE, TYPE CLT	FENCE, TYPE 47	POST ASSEMBLY			LINE POST	FENCE TERMINAL				STREAM CROSSING					GROUND ROD
					(C)	(E)	(I)	(L)	(TE)	(TD)	(A)		(X1)	(X2)	(X3)	(X4)		
		LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	EACH	EACH	EACH	EACH		EACH	EACH	EACH	EACH		EACH
1-F	42	760																1
2-F	42	34	784		4	2												
3-F	42	66	66		1	2												
4-F	42,43	1035		1035	2	1	2		1									
5-F	42-45	6531																
8-F	44-45	3475		3475	4	1	7				1				2			
10-F	45	294		294	2				1		1				1			
11-F	45	1112		1112	3	1	2	1			1							
12-F	45-47	4953		4953	2		9		1		1				2			
13-F	45-47	4550		4550	3	1	19	2			1			2				
14-F	47	263		263	2				1		1							
15-F	47,48	3732	3732		8	1	11				1							1
16-F	48	358	358		2	1			1									
SUB-TOTAL		27163	4940	15682	33	10	50	3	5	0	7			2	5			2
TOTAL:		27163	4940	15682														2

QUANTITIES CARRIED TO THE GENERAL SUMMARY.

FENCE LEGEND

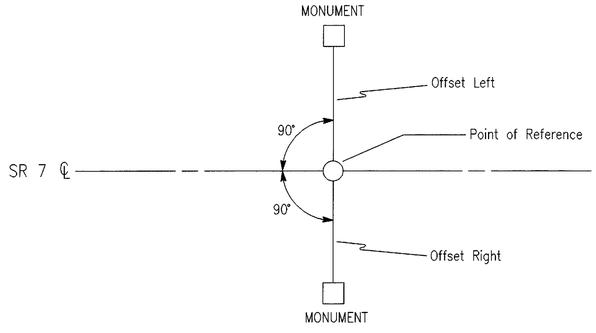
- (C) — CORNER POST ASSEMBLY
- (E) — END POST ASSEMBLY
- (I) — INTERMEDIATE ANCHOR POST ASSEMBLY
- (L) — WOOD POST OR CONCRETE ENCASED STEEL LINE POST
- (TE) — FENCE TERMINAL ASSEMBLY, TYPE E
- (TD) — FENCE TERMINAL ASSEMBLY, TYPE D
- (A) — ABUTMENT CONNECTION
- (X2) — CROSSING, TYPE 2
- (X3) — CROSSING, TYPE 3
- ⏚ — GROUND ROD

FOR DETAILS, SEE STANDARD DRAWINGS F-1, F-2, F-3, F-5, AND F-6.

CENTERLINE REFERENCE MONUMENTS

(See Note on Sheet No. 9)

POINT OF REFERENCE		OFFSET FROM ℄ S.R. 7		604 REFERENCE MONUMENT, AS PER PLAN
		LT.	RT.	EACH
P.O.T.	1260+00.00	44'	40'	2
P.O.T.	1265+00.00	44'	40'	2
P.O.T.	1270+00.00	43'	44.75'	2
P.O.T.	1275+00.00	38'	39.75'	2
P.C.	1278+97.10	37.5'	39.5'	2
P.O.C.	1283+00.00	37.5'	39.5'	2
P.T.	1287+50.61	37.5'	39.5'	2
P.C.	1289+01.30	37.5'	39.5'	2
P.T.	1292+60.37	37.5'	39.5'	2
P.O.T.	1299+00.00	37.5'	39.5'	2
P.C.	1304+71.91	37.5'	39.5'	2
P.O.C.	1307+06.81	37.5'	39.5'	2
P.T.	1309+78.97	37.5'	39.5'	2
P.C.	1311+83.69	37.5'	39.5'	2
P.O.C.	1316+00.00	37.5'	39.5'	2
P.T.	1320+12.15	37.5'	39.5'	2
P.O.T.	1325+00.00	37.5'	39.5'	2
T.S.	1329+81.07	37.5'	39.5'	2
S.C.	1333+81.07	44.5'	39.5'	2
C.S.	1336+80.84	52'	52.5'	2
S.T.	1340+80.84	62'	67'	2
P.O.T.	1346+00.00	39.5'	39.5'	2
P.C.	1350+66.60	47'	39.5'	2
P.O.C.	1356+00.00	37.5'	37.5'	2
P.T.	1360+36.61	64'	63.5'	2
P.O.T.	1362+10.49	52.5'	59'	2
P.O.T.	1367+00.00	37.5'	47'	2
P.O.T.	1372+00.00	37.5'	39.5'	2
P.O.T.	1377+00.00	37.5'	39.5'	2
P.C.	1382+71.56	37.5'	39.5'	2
P.O.C.	1387+00.00	39.5'	37.5'	2
P.T.	1392+90.20	37.5'	39.5'	2
P.O.T.	1399+00.00	37.5'	39.5'	2
P.O.T.	1405+00.00	37.5'	39.5'	2
P.O.T.	1410+00.00	46'	51.5'	2
P.O.T.	1415+64.31	60.5'	72.5'	2
P.O.T.	5+00.00	39.5'	39.5'	2
TOTAL – Carried to General Summary				74



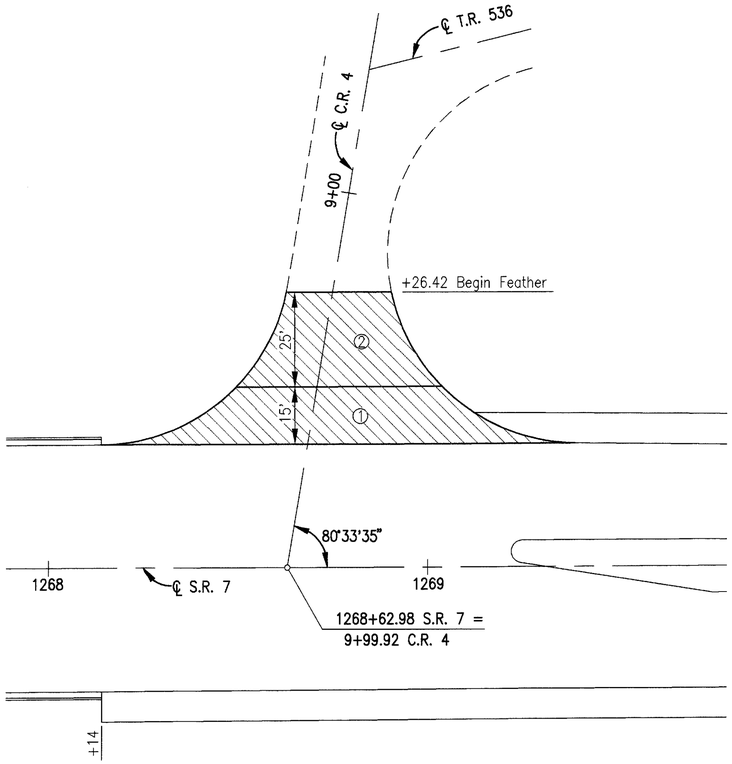
CALC. ATH BY: DATE: 8/95
CHKD. BPS BY: DATE: 11/95

CENTERLINE REFERENCE MONUMENTS AND FENCE SUB SUMMARY

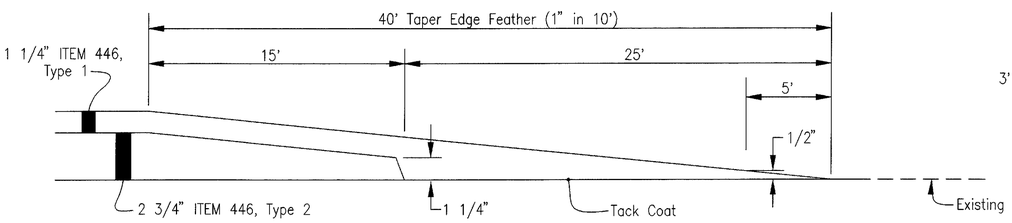
BEL/JEF-7-23.76/0.00

31/94

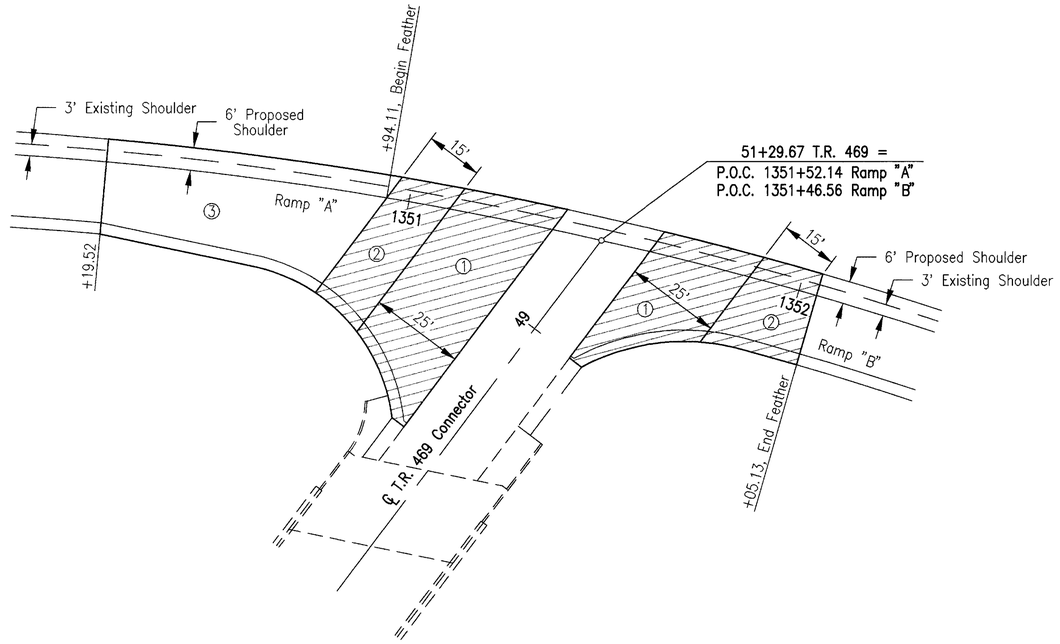
2/28/97 ATH 1993STDC FINAL



S.R. 7 AT C.R. 4 INTERSECTION



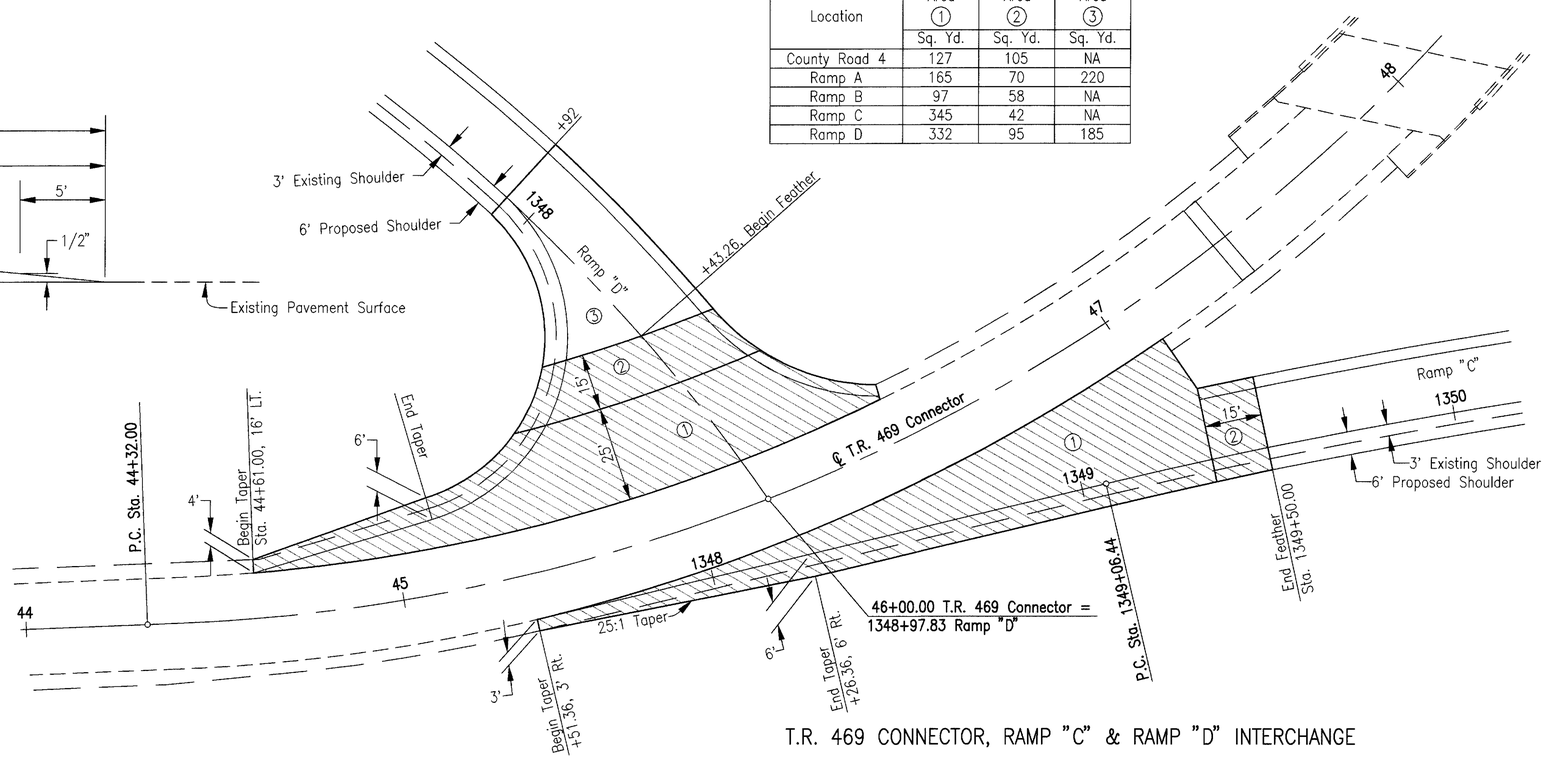
FEATHER DETAIL AT SIDE ROADS & RAMPS



T.R. 469 CONNECTOR, RAMP "A" & RAMP "B" INTERCHANGE

Areas used in Resurfacing Calculations
(See Sheet Nos. 17 & 18)

Location	Area ① Sq. Yd.	Area ② Sq. Yd.	Area ③ Sq. Yd.
County Road 4	127	105	NA
Ramp A	165	70	220
Ramp B	97	58	NA
Ramp C	345	42	NA
Ramp D	332	95	185



T.R. 469 CONNECTOR, RAMP "C" & RAMP "D" INTERCHANGE

NO SCALE

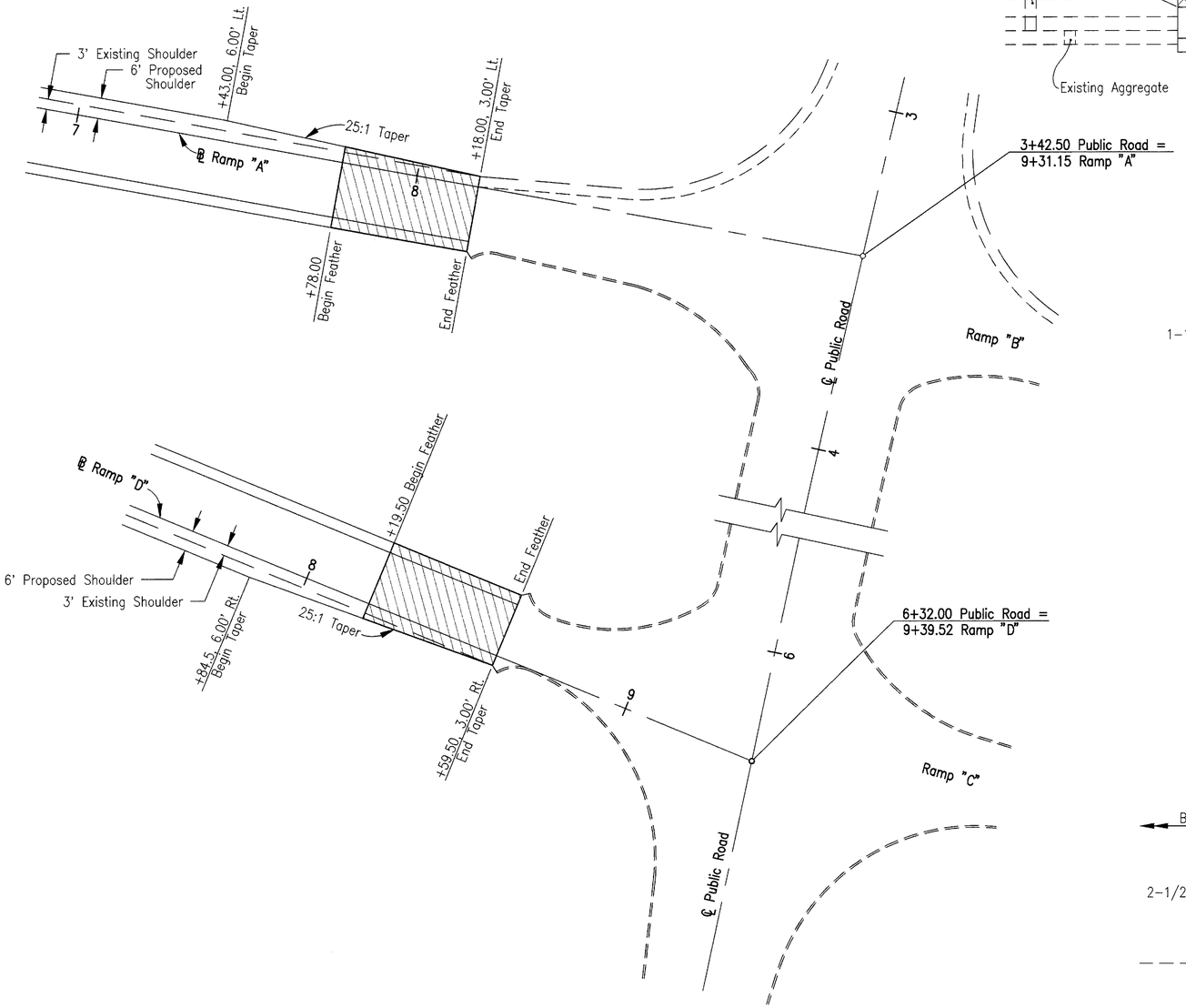
CALC. BY: CAM DATE: 1/95
CHKD. BY: GED DATE: 4/95

FEATHER DETAILS

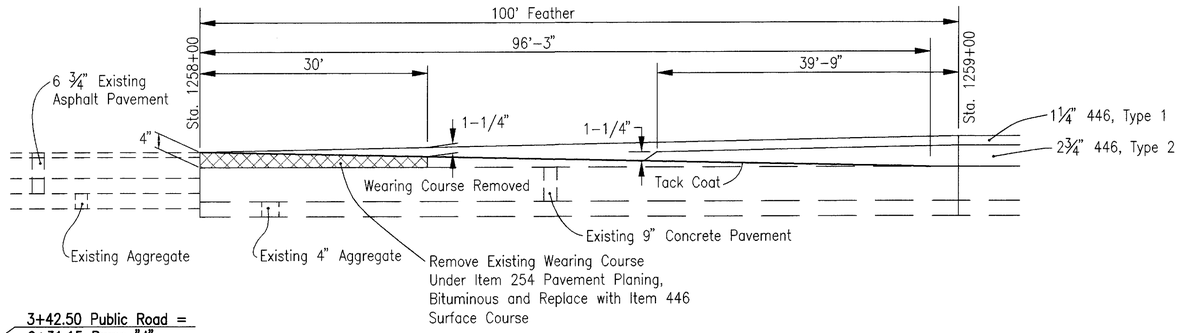
BEL/JEF-7-23.76/0.000

32/94

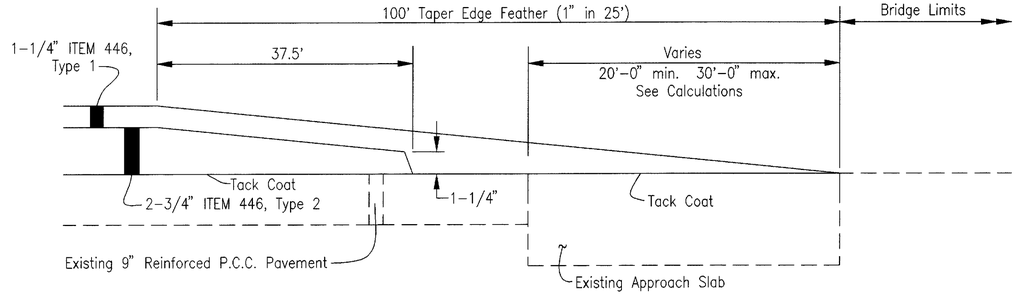
2/26/97 ATH 1993TH1 FINAL



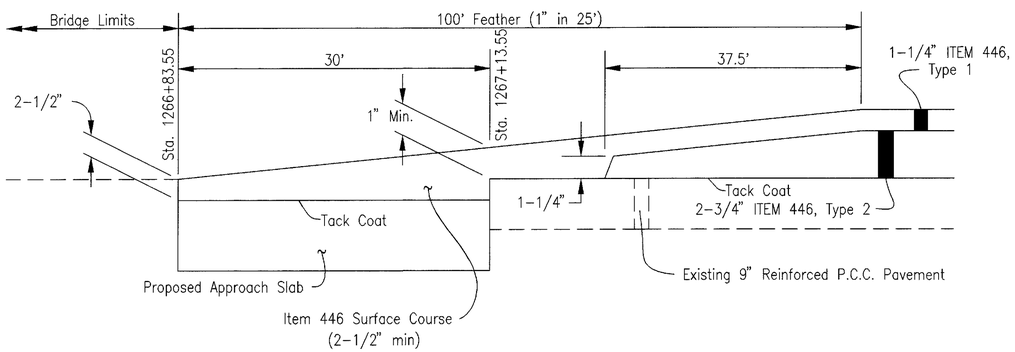
PUBLIC ROAD INTERCHANGE, RAMP "A" & RAMP "D"



FEATHER DETAIL AT BEGIN PROJECT
Station 1258+00.00 to Station 1259+00.00



FEATHER DETAIL FOR AT GRADE STRUCTURES
BEL-7-2389 (Rear Approach Slab Only)
BEL-7-2526
BEL-7-2619
JEF-7-0016 (Rear Approach Slab Only)



FEATHER DETAIL FOR BEL-7-2389 (Forward Approach Slab Only)

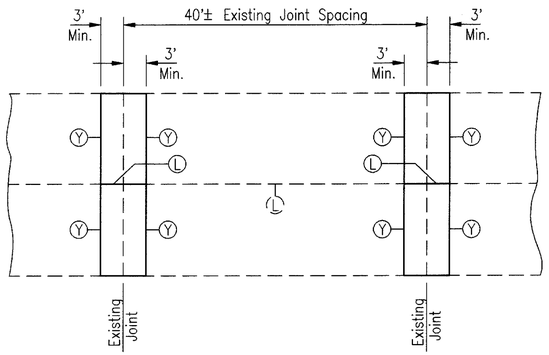
NO SCALE

CALC. BY: CAM DATE: 1/95
CHKD. BY: GED DATE: 4/96

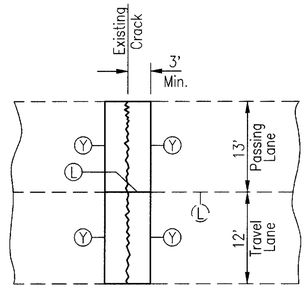
FEATHER DETAILS

BEL/JEF-7-23.76/0.000

FINAL
ATH 1993715
2/28/97

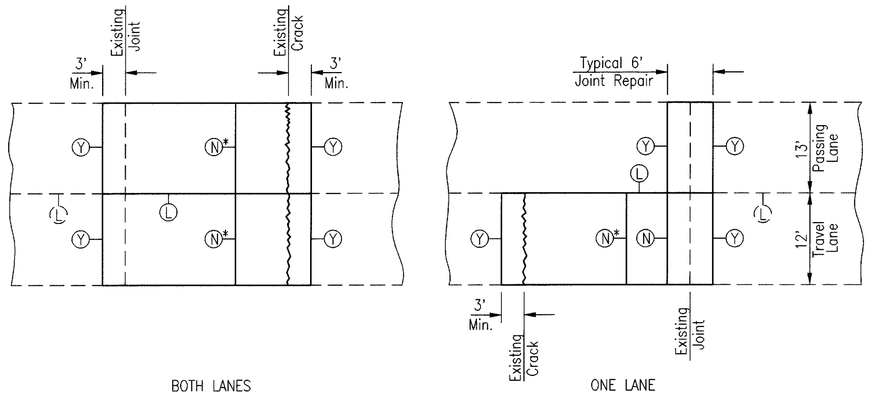


TYPICAL MAINLINE JOINT REPAIR



TYPICAL MAINLINE CRACK REPAIR

Note: Crack may be in one lane or both lanes.

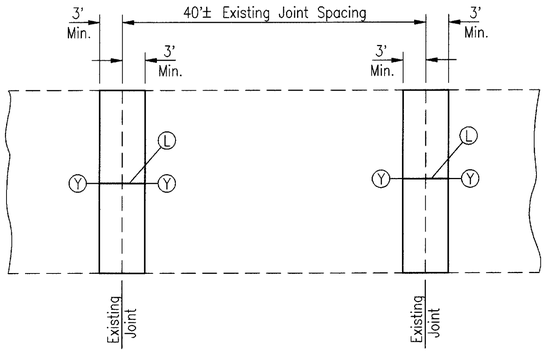


BOTH LANES

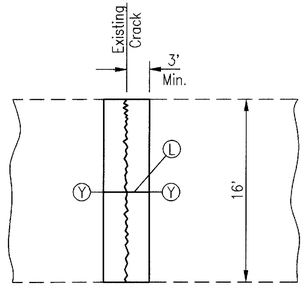
ONE LANE

NOTE: Crack may be in either lane.

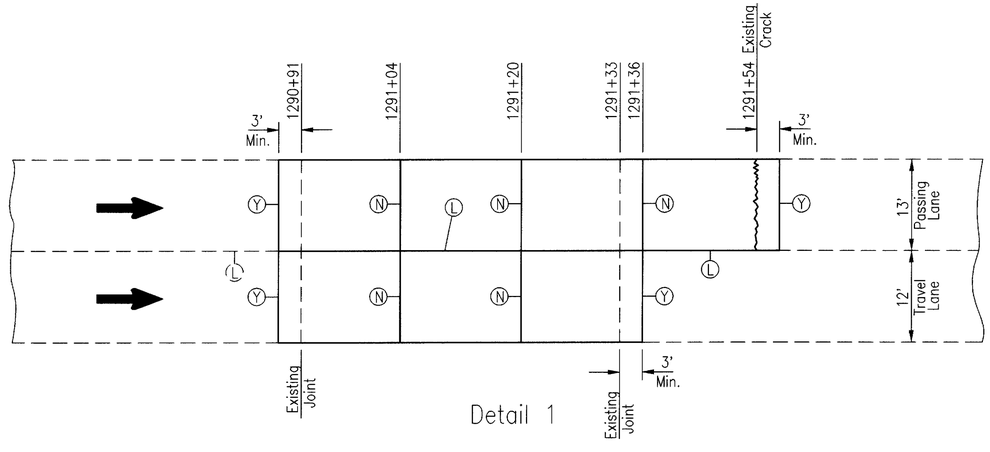
TYPICAL JOINT/CRACK REPAIR



TYPICAL RAMP JOINT REPAIR



TYPICAL RAMP CRACK REPAIR



Detail 1

S.R. 7 NORTHBOUND LANES

NOTE: Actual crack configuration may be different from that shown.

* When the (Y) joint spacing is between 22' and 42', place an additional (N) joint at the midpoint of the slab. if the (Y) joint spacing exceeds 42', (N) joints with a minimum spacing of 11' and a maximum spacing of 21' shall be equally spaced between the (Y) joints.

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

For Details not shown see Standard Drawing BP-2.5 .

HORIZONTAL SCALE IN FEET
0' 10' 20'

CALC. BY: ATH DATE: 1/95
CHKD. BY: CAM DATE: 10/95

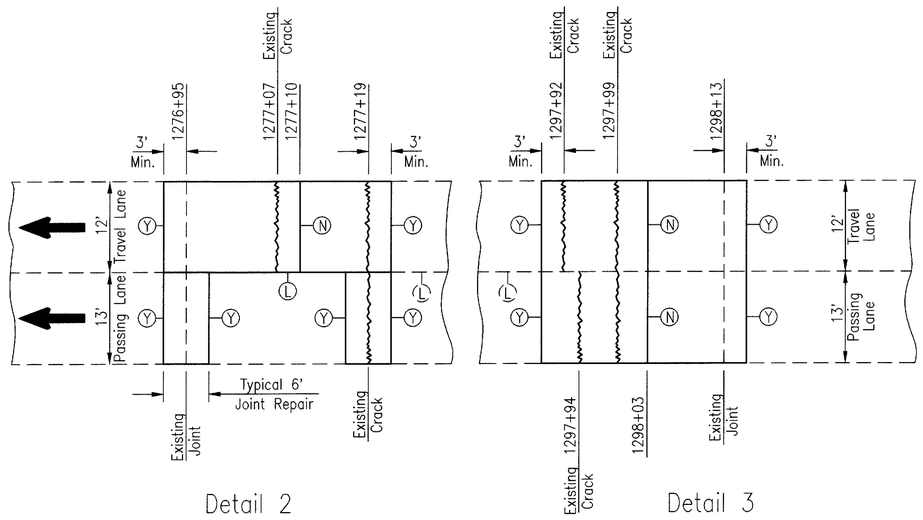
PAVEMENT REPAIR DETAILS

BEL/JEF-7-23.76/0.00

34/94

9/5/96 RRR 10:03PM FINAL

STICKLEN – BELSHEIM & ASSOCIATES

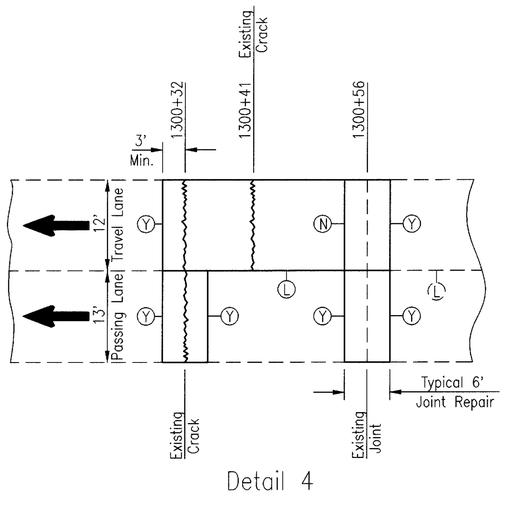


Detail 2

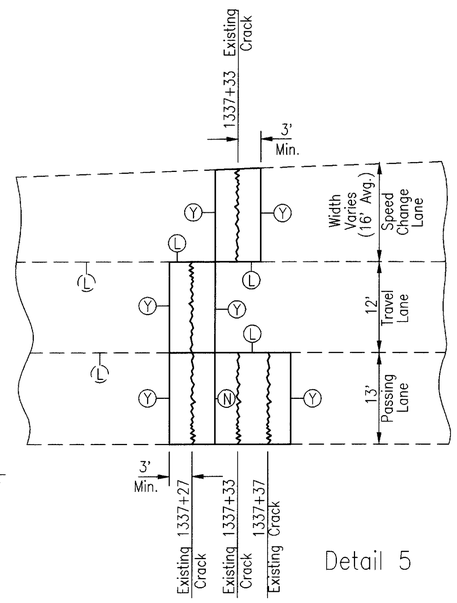
Detail 3

S.R. 7 SOUTHBOUND LANES

NOTE: Actual crack configuration may be different from that shown.



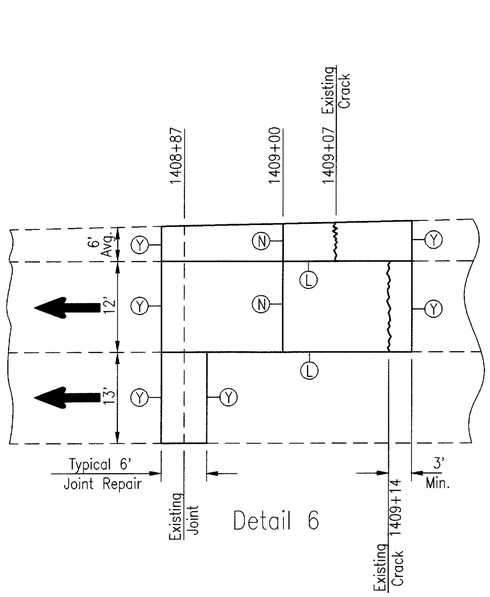
Detail 4



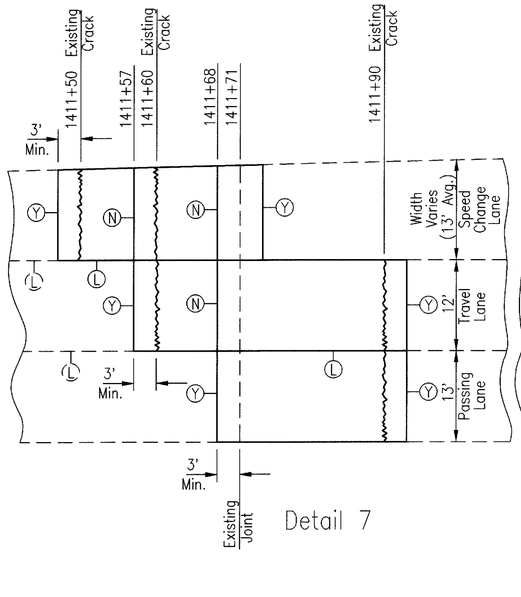
Detail 5

S.R. 7 SOUTHBOUND LANES

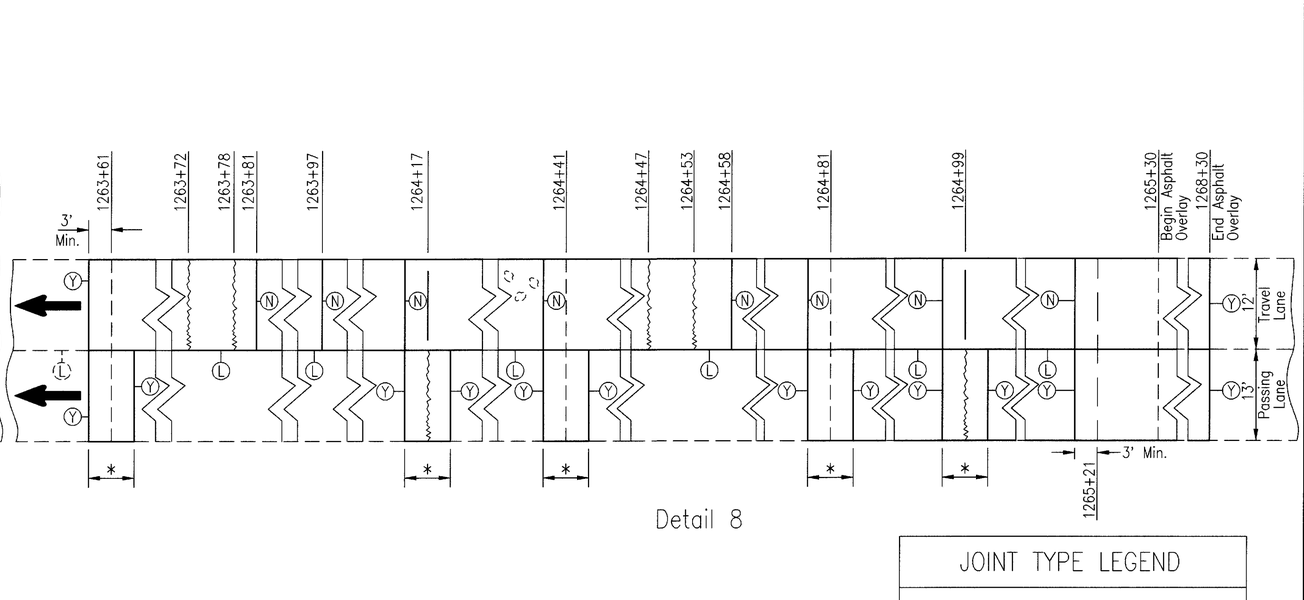
NOTE: Actual crack configuration may be different from that shown.



Detail 6



Detail 7



Detail 8

S.R. 7 SOUTHBOUND LANES

NOTE: Actual crack configuration may be different from that shown.

* – Typical 6' Joint/Crack Repair

JOINT TYPE LEGEND

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

For Details not shown see Standard Drawing BP–2.5 .

PAVEMENT REPAIR DETAILS

CALC. BY: ATH DATE: 1/95
CHKD. BY: CAM DATE: 10/95

HORIZONTAL SCALE IN FEET
0' 10' 20'

BEL/JEF-7-23.76/0.00

35/94

STICKLEN – BELSHEIM & ASSOCIATES

9/5/99 FINAL

STA. 1257+66
EXIST. BARRIER
INLET

+76 BEGIN WORK

+00 BEGIN FEATHER

BEGIN PROJECT
STA. 1259+00
S.L.M.= 23.76

NH-1(0)

1.5'
12'
12'
1.5'
3.5'
14' Existing Conc. Median
12'
1.5'
12'
12'
1.5'

1255 1256 1257 1258 1259 1260

STA. 1261+00
MATCH LINE

STA. 1261+00

EX. G.R.

+76
MATCH EXISTING

PROP. G.R.

STA. 1258+75
EXIST. NO. 3 MH

STA. 1261+00
MATCH LINE

FOR BARRIER TRANSITION
DETAILS SEE SHEET NO. 37 & 38.

END TYPE B50 CONCRETE BARRIER

STA. 1263+65, 2.6' LT.
INLET 2-6
WINDOW = 661.91

+23.58
END CURB

1.5'
12'
12'
1.5'
3'
5.25'
5.0'
5.5'
1.5'
12'
12'
12'
12'
1.5'
12'
12'
1.5'
3'
1.5'
11"
12'
12'
1.5'

14' Existing Conc. Median 1262 1263 1264 1265 1266

BRIDGE NO.
BEL-7-2389

STA. 1263+73, 0.17' RT.
INLET 2-6
WINDOW = 661.94

+45.75
+75.75
+80.75
+07.50
+12.50

M.H.
+62.5
+70.08
END CURB
+86.80
BEGIN CURB

STA. 1267+00
MATCH LINE

STA. 1267+00

+40.30
BEGIN CURB

+14 END CURB

STA. 1268+62.98
MATCH LINE

1268

STA. 1267+56
MARTINS FERRY CORP. LIMIT

8'

+14 END CURB

STICKLEN - BELSHEIM & ASSOCIATES

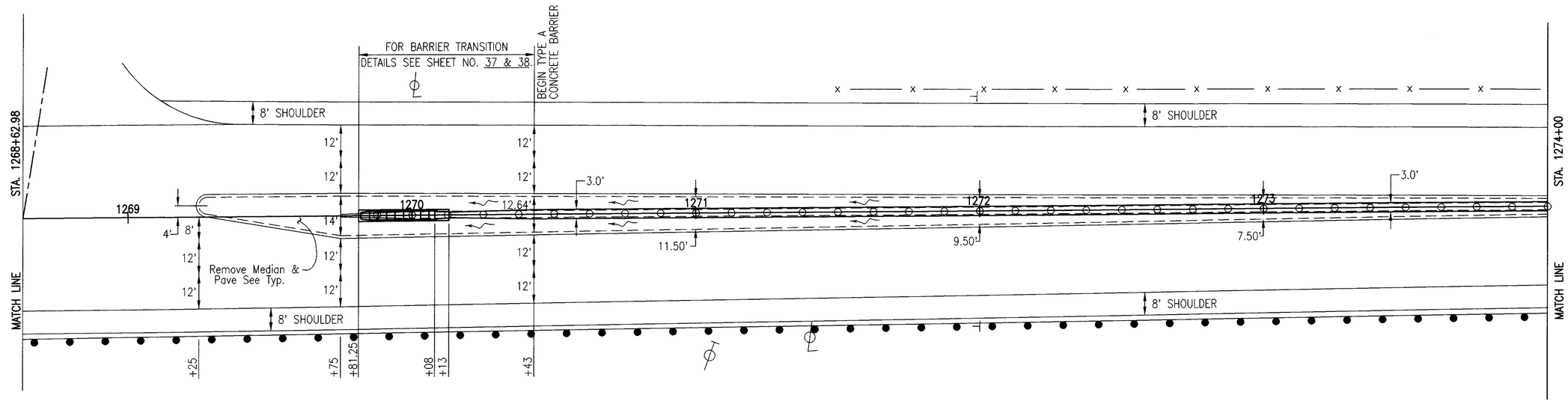
HORIZONTAL SCALE IN FEET
0' 20' 40'

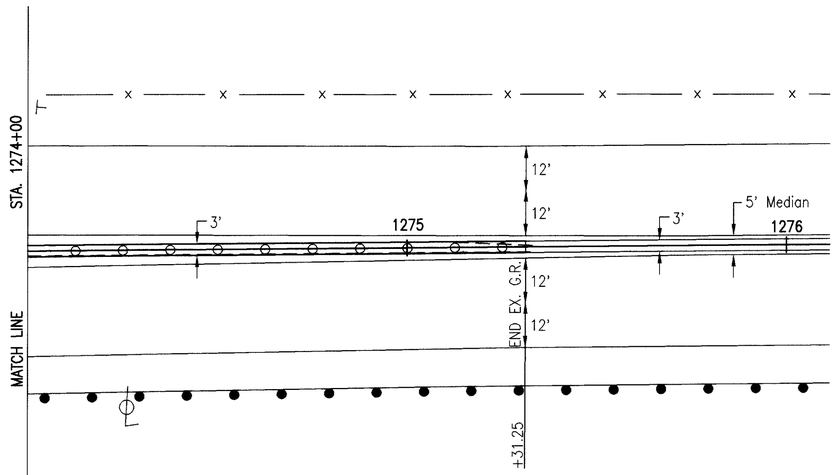
CALC. ATH BY: DATE: 6/96
CHKD. GED BY: DATE: 6/96

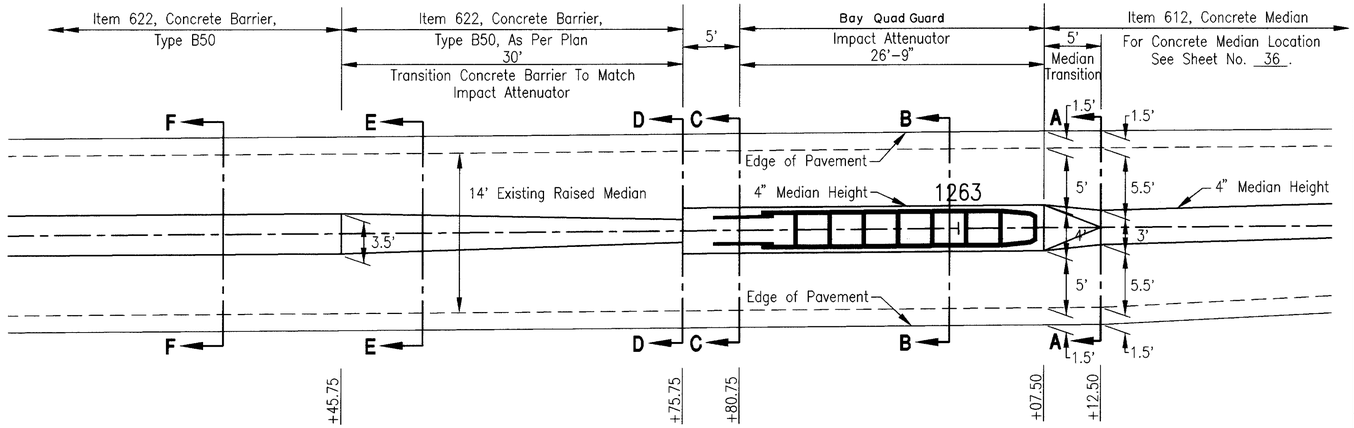
PAVEMENT DETAIL
STA. 1255+00 TO STA. 1268+62.98

BEL/JEF-7-23.76/0.00

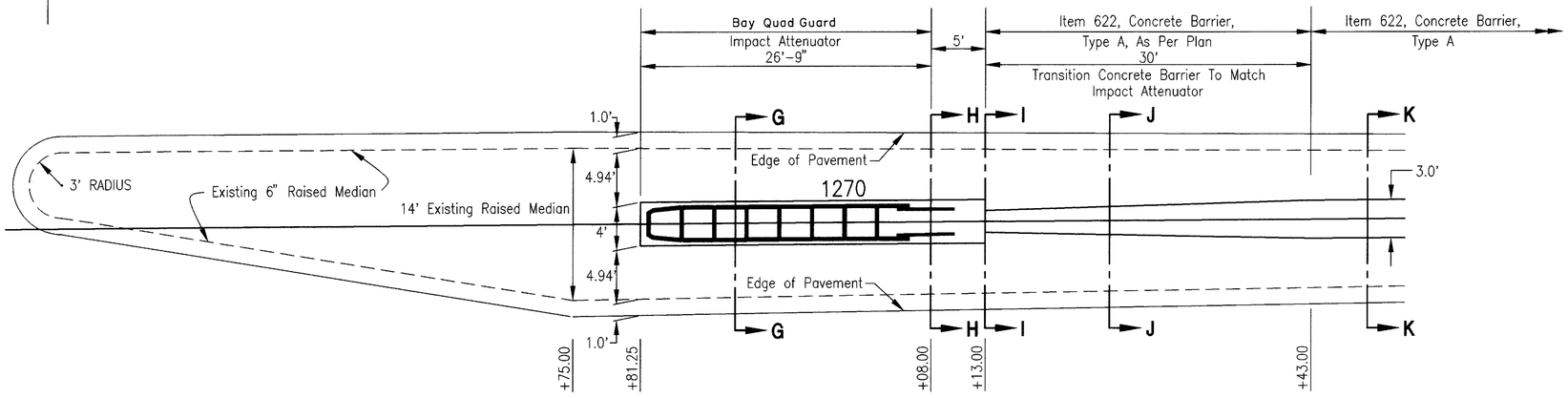
36
94







TRANSITION DETAIL
STA. 1262+45.75 TO STA. 1263+07.50



TRANSITION DETAIL
STA. 1269+81.25 TO STA. 1270+43.00

HORIZONTAL SCALE IN FEET
0' 20' 40'

CALC. BY: ATH DATE: 6/96
CHKD. BY: GED DATE: 6/96

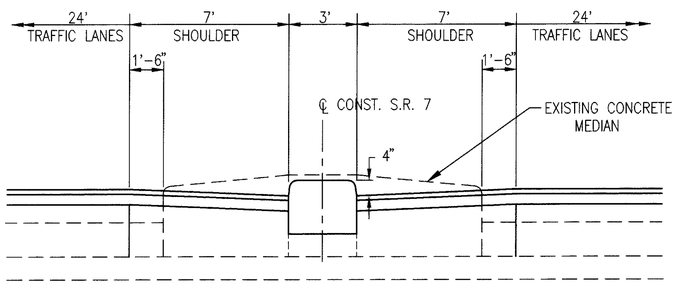
PAVEMENT DETAIL & CONCRETE BARRIER TRANSITION DETAILS STA. 1268+62.98 TO STA. 1276+00

BEL/JEF-7-23.76/0.00

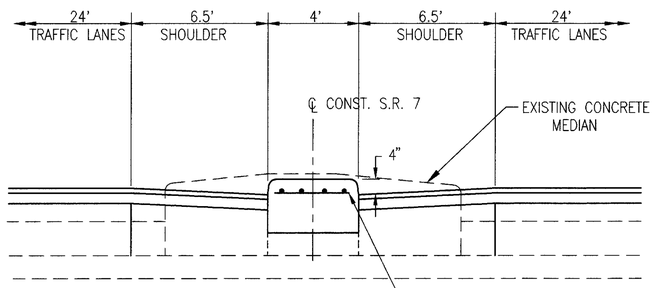
37/94

FINAL 1997/1998 5/8/98

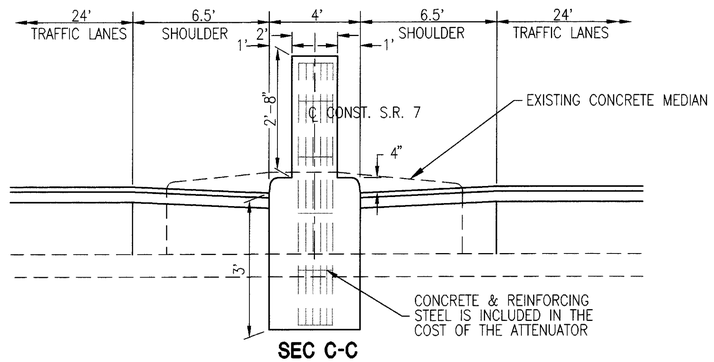
STICKLEN – BELSHEIM & ASSOCIATES



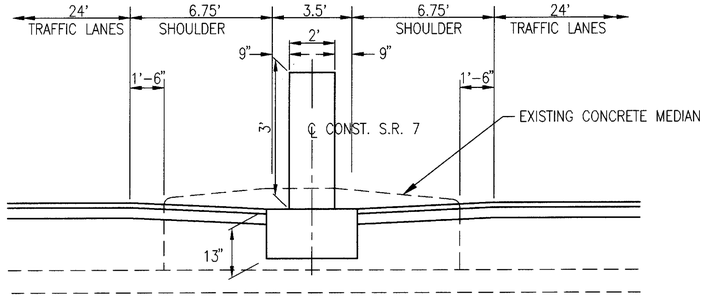
SEC A-A



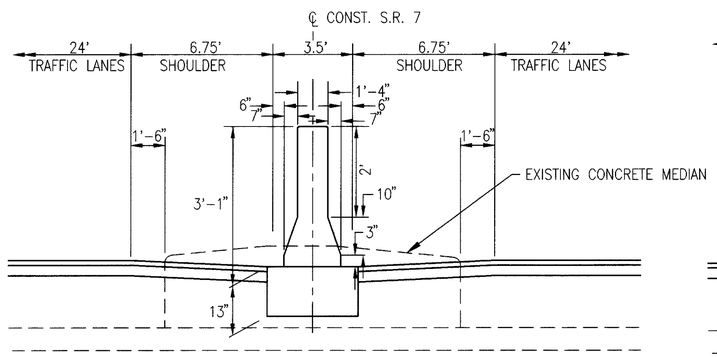
SEC B-B



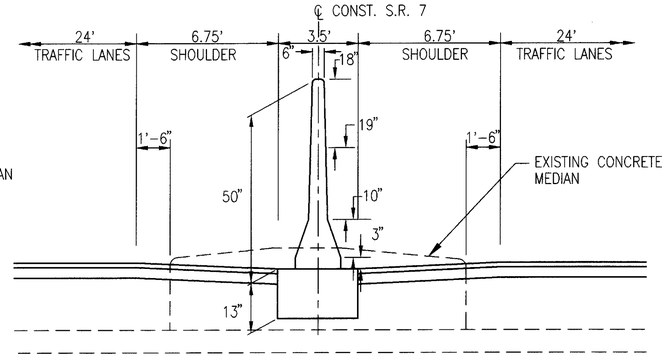
SEC C-C



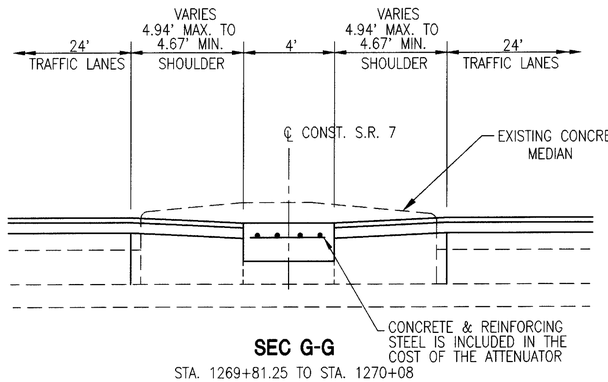
SEC D-D



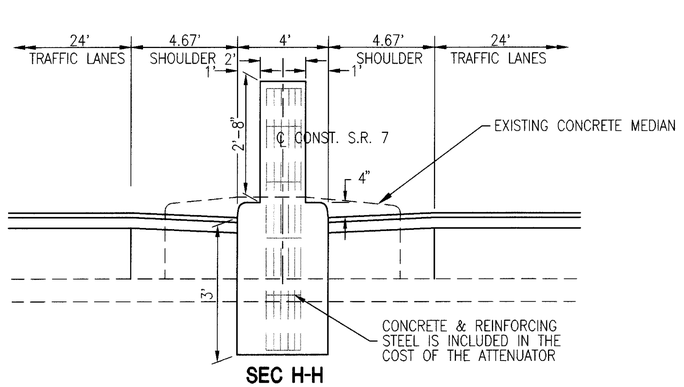
SEC E-E



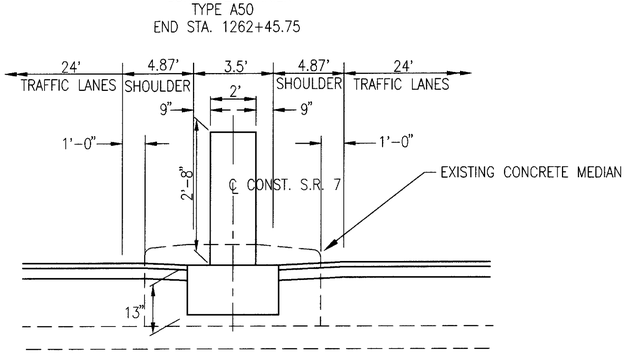
SEC F-F
CONCRETE BARRIER
TYPE A50
END STA. 1262+45.75



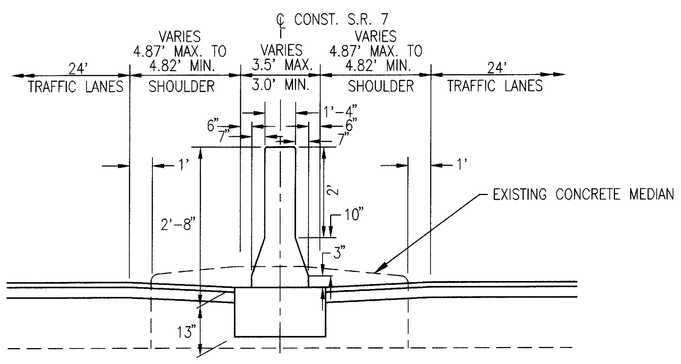
SEC G-G
STA. 1269+81.25 TO STA. 1270+08



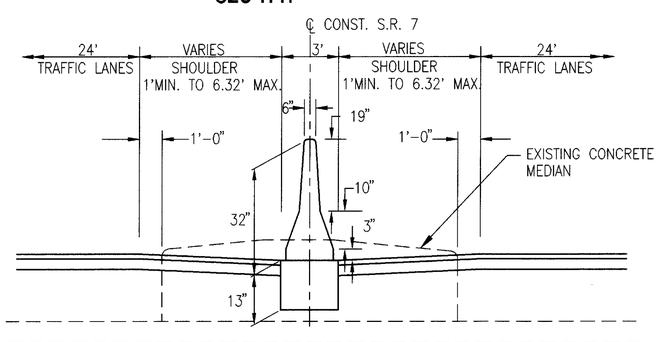
SEC H-H



SEC I-I



SEC J-J
STA. 1270+13 TO STA. 1270+43



SEC K-K
CONCRETE BARRIER
TYPE A
BEGINING STA. 1270+43

STICKLEN – BELSHEIM & ASSOCIATES

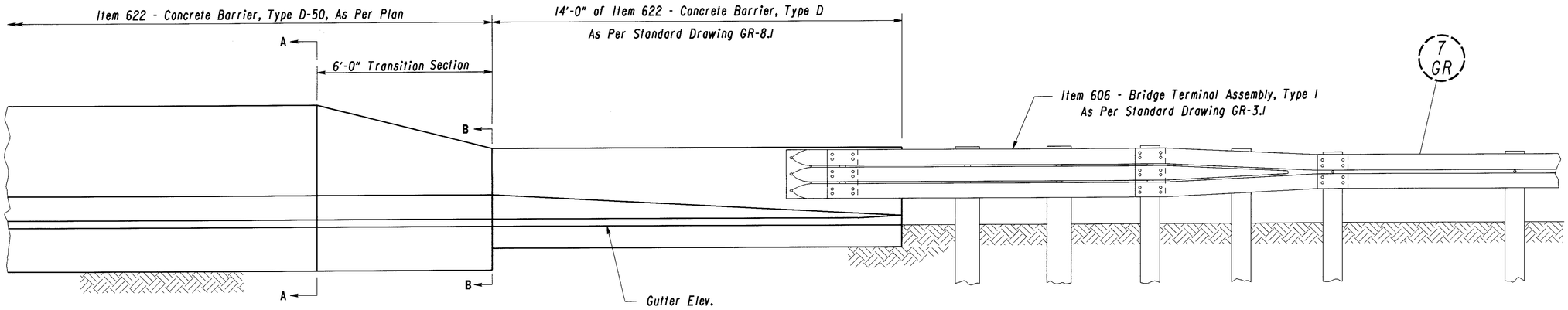
NO SCALE

CALC. BY: ATH DATE: 6/96
CHKD. BY: GED DATE: 6/96

CONCRETE BARRIER TRANSITION DETAILS

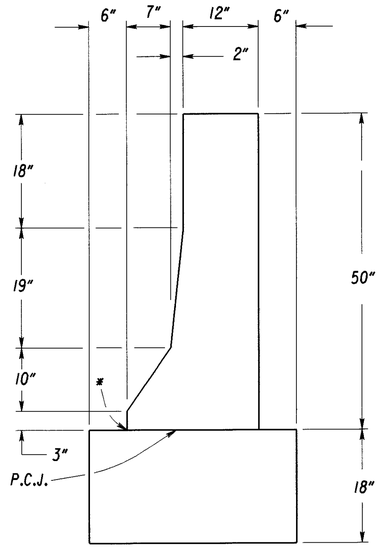
BEL/JEF-7-23.76/0.00

38
94

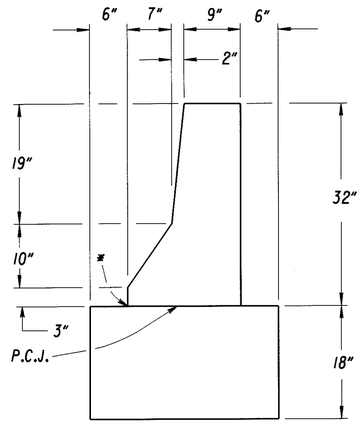


ELEVATION

1
RFB



SEC. A-A



SEC. B-B

ITEM 622, CONCRETE BARRIER, TYPE D-50, AS PER PLAN

This item shall consist of constructing 50 inch high reinforced Type D concrete barrier as detailed on sheet no's. 38A, 38B, and 38C. All other notes shown in Standard Construction Drawing MC-9.3 shall apply. The upper 18 inches shall be constructed integral with the 32 inch bottom.

The lift-out sections may be constructed separately from the permanent sections, and set into place after the base portion of the permanent section has attained a modulus of rupture of 400 psi, or be constructed on-site if a suitable bond breaker, as approved by the Engineer, is placed on top of the base portion.

Payment for the above work, including the reinforcing steel, connecting bars, U-bolts, nuts, washers, galvanized pipe, and setting the lift-out sections in place and connecting them to the permanent sections, will be made at the contract price for Item 622, Linear Feet, Concrete Barrier, Type D-50, As Per Plan, and shall include the cost of all labor, materials, equipment, and incidentals as necessary to complete the work.

The following quantity has been carried to the General Summary for the purpose of constructing Type D-50 concrete barrier as specified above:

Item 622, Concrete Barrier, Type D-50, As Per Plan - - - 6,225.77 Lin. Ft.

* Gutter Elevation
P.C.J. = Permissible Construction Joint
For Lift-Out Section Details, See Sheet No. 38C.

CALCULATED JPB DISTRICT II
CHECKED SHG DISTRICT II

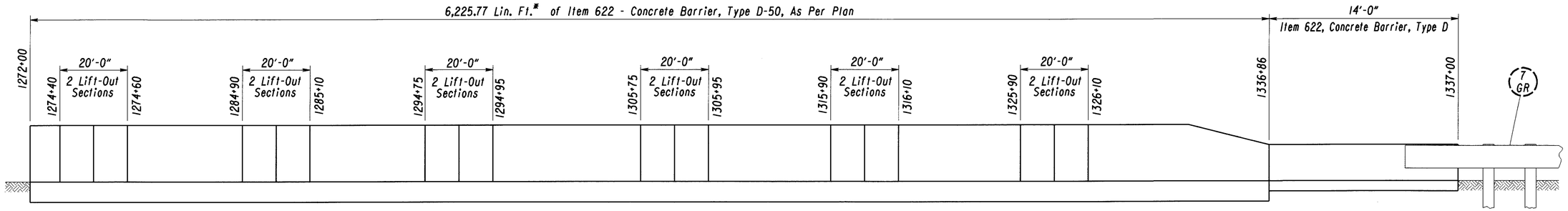
ROCK FALL BARRIER PERMANENT SECTION DETAILS

BEL/JEF-7-23.76/0.00

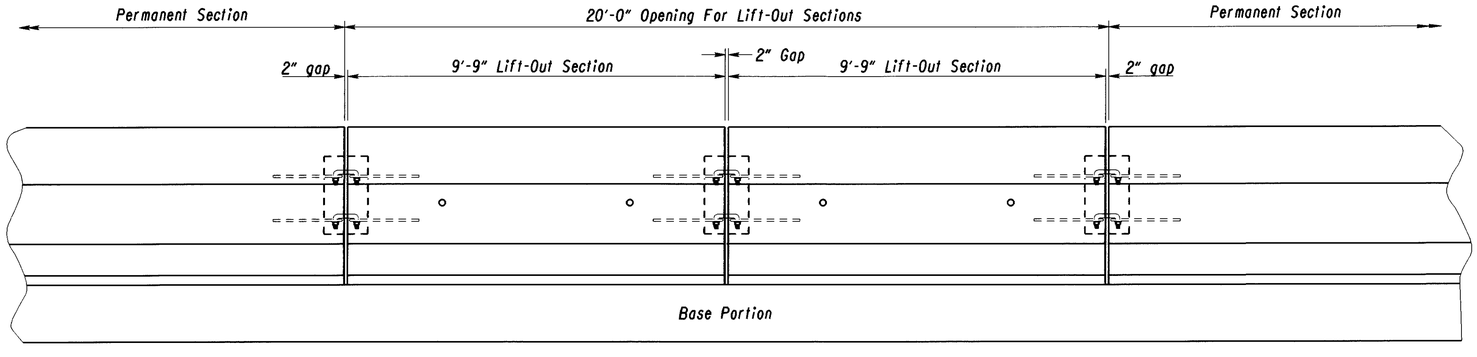
38A
94

* Adjusted for arc length; deductions made for No. 3B50 inlets.
For Permanent Section Details, See Sheet No. 38A.
For Lift-Out Section Details, See Sheet No. 38C.

NOT TO SCALE



1/RFB ELEVATION



TYPICAL PLACEMENT OF LIFT-OUT SECTIONS

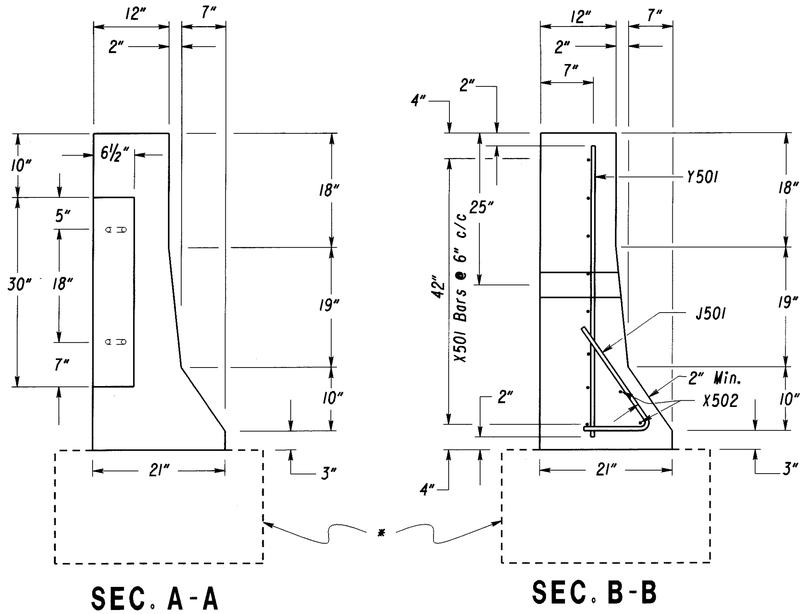
CALCULATED JPB
CHECKED SHG

ROCK FALL BARRIER
LIFT-OUT SECTION LOCATIONS

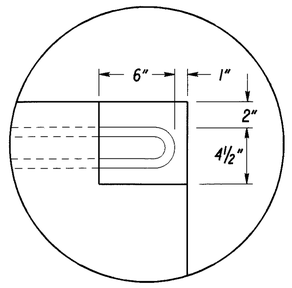
BEL/JEF-7-23.76/0.00

38B
94

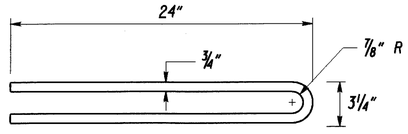
NOTE: Connecting bars, u-bolts, flat and lock washers, and hex nuts shall meet the requirements of 711.09, and be galvanized after fabrication per 711.02.



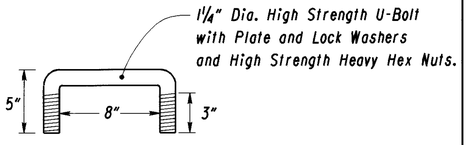
* Base portion to be constructed with permanent section. Omit Y601 and Y606 bars and welded wire fabric from the base portion within the limits of the lift-out sections.



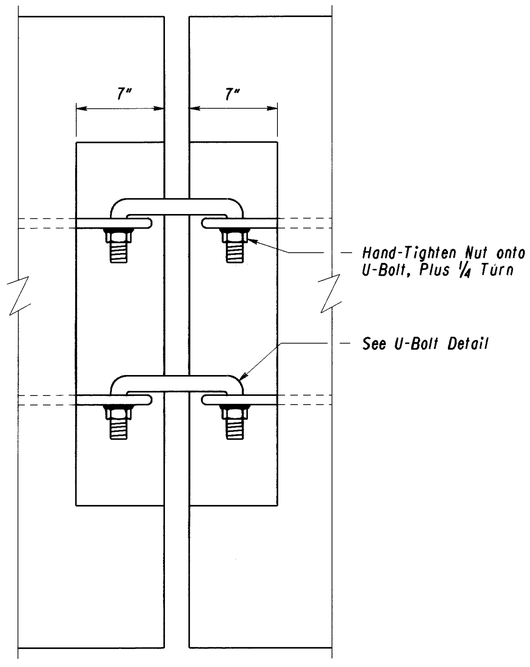
CONNECTING BAR PLACEMENT



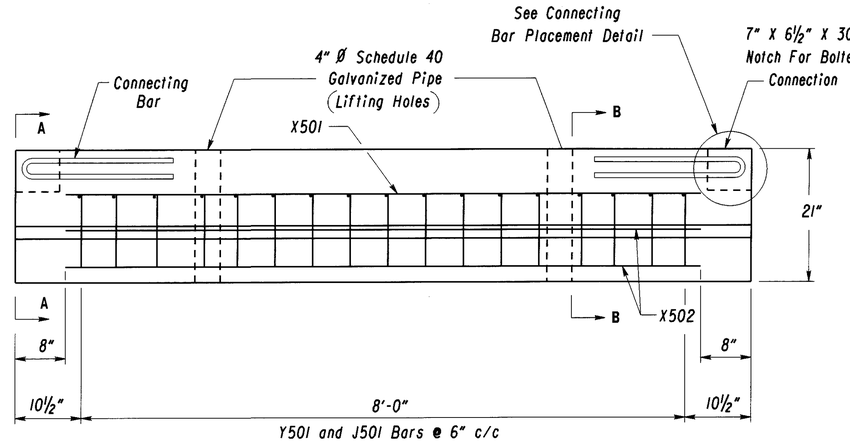
CONNECTING BAR DETAIL
(12 Required at Each Location)



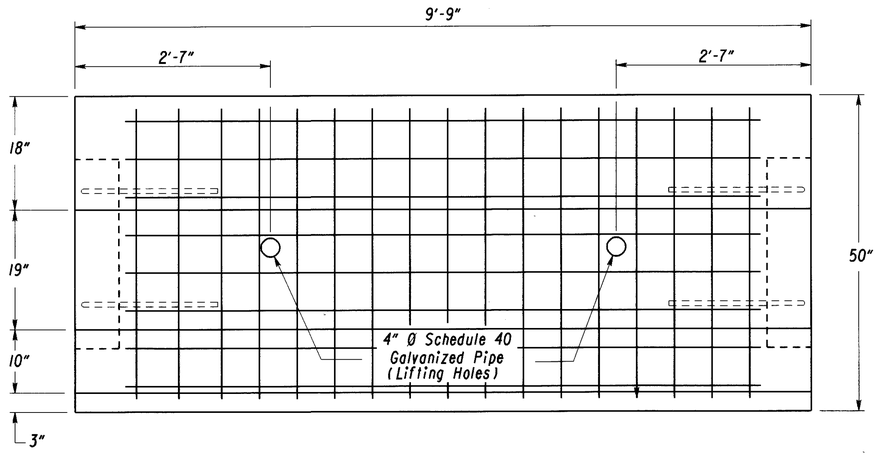
U-BOLT DETAIL
(6 Required at Each Location)



DETAIL AT BOLTED CONNECTION
(Back View)



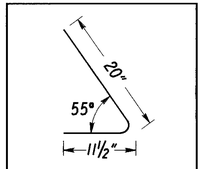
TOP



ELEVATION

STEEL REINFORCING LIST					
MARK	LENGTH	SHAPE	QTY.	SUM LENGTH	WEIGHT (LBS.)
Y501	3'-10"	Straight	17	65'-2"	68
X501	8'-5"	Straight	8	67'-4"	70
X502	8'-5"	Straight	2	16'-10"	18
J501	2'-7"	Bent	17	43'-11"	46
TOTAL	(For Information Only)				202

All reinforcing steel shall be epoxy coated.



BENDING DIAGRAM

CALCULATED JPB DISTRICT II
CHECKED SHG DISTRICT II

ROCK FALL BARRIER
LIFT-OUT SECTION DETAILS

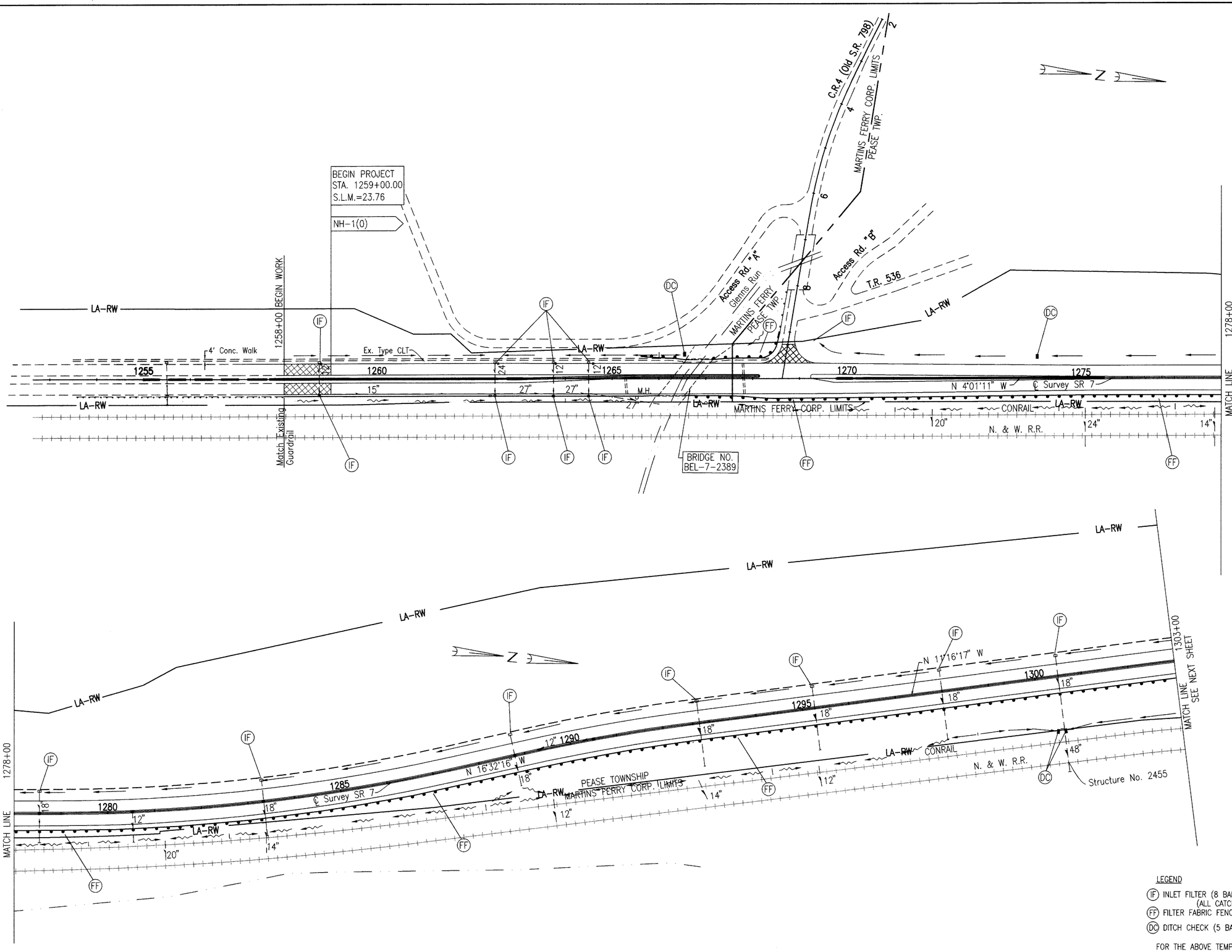
BEL/JEF-7-23.76/0.00

38C
94

CALC. BY: ATH DATE: 12/94
CHKD. BY: CAM DATE: 10/95

0' 100' 200'
HORIZONTAL SCALE IN FEET

STORM WATER POLLUTION PREVENTION PLAN
STA 1252+00 TO STA 1278+00



LEGEND

(IF) INLET FILTER (8 BALES EACH) (ALL CATCH BASINS)

(FF) FILTER FABRIC FENCE

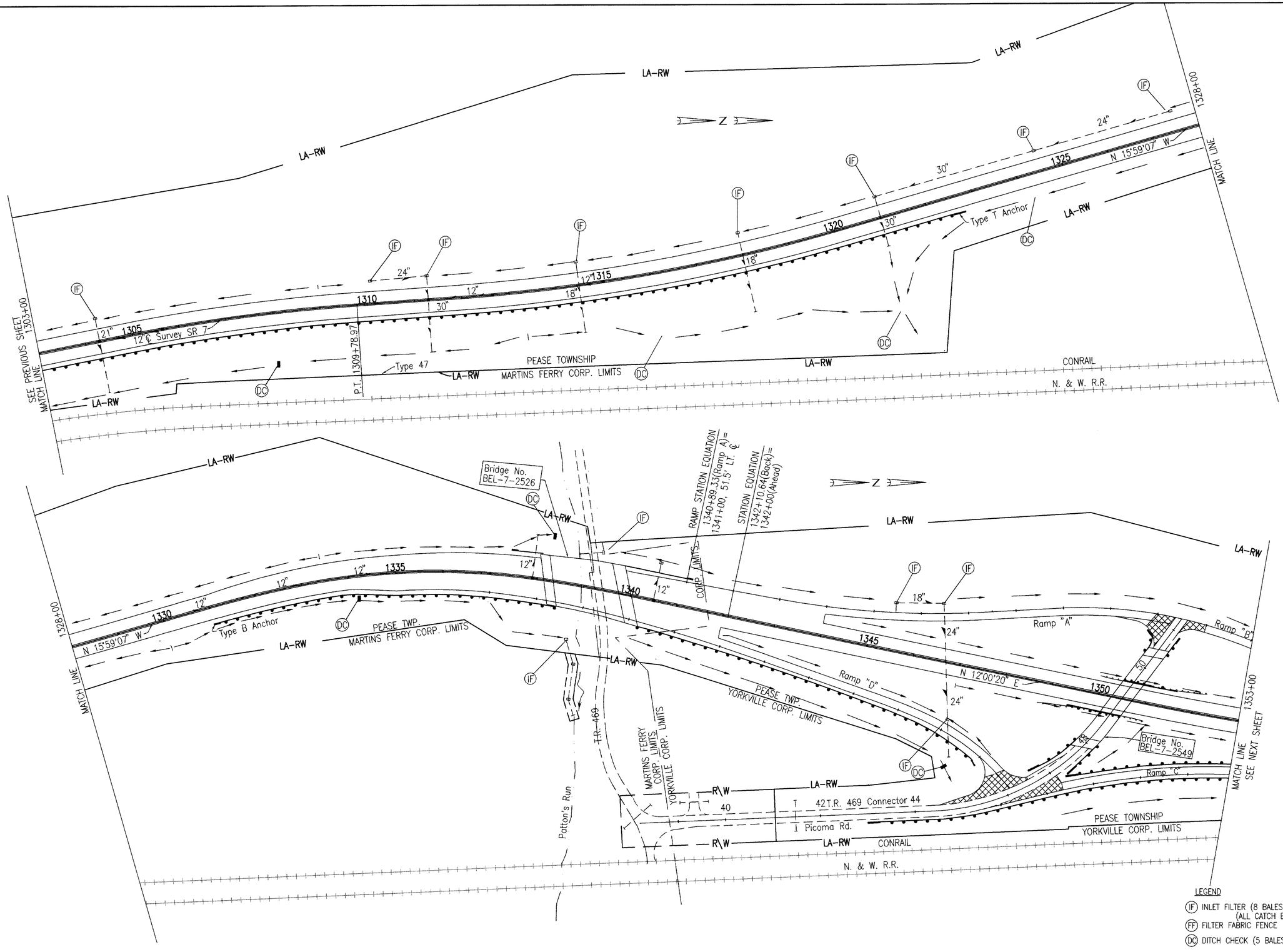
(DC) DITCH CHECK (5 BALES EACH)

FOR THE ABOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, SEE STANDARD DRAWING MC-11.

BEL/JEF-7-23.76/0.00

FINAL
RRB 1993SHT1
9/5/96

STICKLEN - BELSHEIM & ASSOCIATES



LEGEND

(IF) INLET FILTER (8 BALES EACH) (ALL CATCH BASINS)

(FF) FILTER FABRIC FENCE — — —

(DC) DITCH CHECK (5 BALES EACH) ▮

FOR THE ABOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, SEE STANDARD DRAWING MC-11.

CALC. ATH DATE: 12/94

CHKD. CAM BY: DATE: 10/95

0' 100' 200'

HORIZONTAL SCALE IN FEET

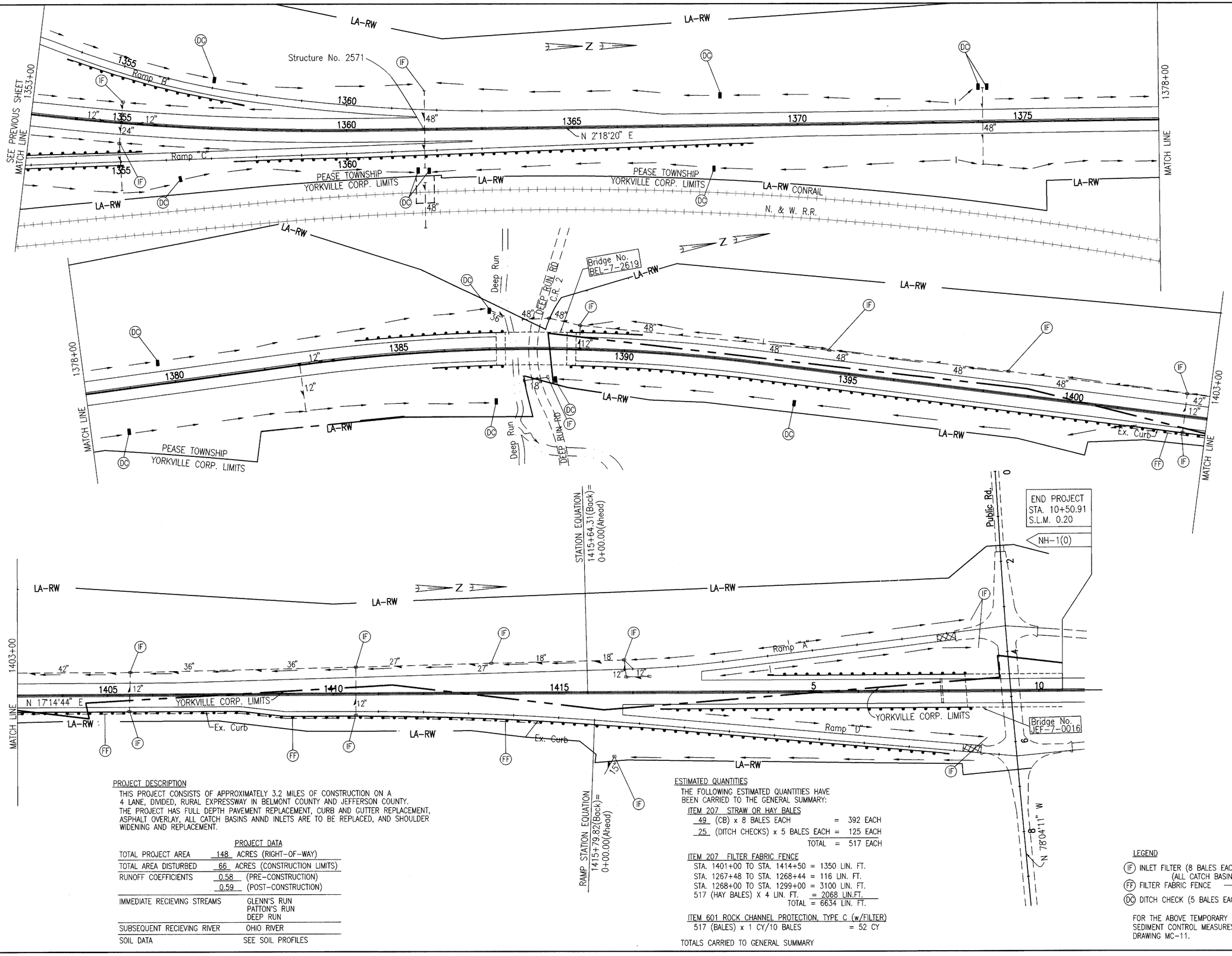
STORM WATER POLLUTION PREVENTION PLAN
STA 1303+00 TO STA 1353+00

BEL/JEF-7-23.76/0.00

40/94

9/5/96 RRB 1933BP2 FINAL

STICKLEN – BELSHEIM & ASSOCIATES



PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF APPROXIMATELY 3.2 MILES OF CONSTRUCTION ON A 4 LANE, DIVIDED, RURAL EXPRESSWAY IN BELMONT COUNTY AND JEFFERSON COUNTY. THE PROJECT HAS FULL DEPTH PAVEMENT REPLACEMENT, CURB AND GUTTER REPLACEMENT, ASPHALT OVERLAY, ALL CATCH BASINS ANND INLETS ARE TO BE REPLACED, AND SHOULDER WIDENING AND REPLACEMENT.

PROJECT DATA

TOTAL PROJECT AREA	148	ACRES (RIGHT-OF-WAY)
TOTAL AREA DISTURBED	66	ACRES (CONSTRUCTION LIMITS)
RUNOFF COEFFICIENTS	0.58	(PRE-CONSTRUCTION)
	0.59	(POST-CONSTRUCTION)
IMMEDIATE RECIEVING STREAMS		GLENN'S RUN PATTON'S RUN DEEP RUN
SUBSEQUENT RECIEVING RIVER		OHIO RIVER
SOIL DATA		SEE SOIL PROFILES

ESTIMATED QUANTITIES

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 207 STRAW OR HAY BALES

49 (CB) x 8 BALES EACH = 392 EACH

25 (DITCH CHECKS) x 5 BALES EACH = 125 EACH

TOTAL = 517 EACH

ITEM 207 FILTER FABRIC FENCE

STA. 1401+00 TO STA. 1414+50 = 1350 LIN. FT.
STA. 1267+48 TO STA. 1268+44 = 116 LIN. FT.
STA. 1268+00 TO STA. 1299+00 = 3100 LIN. FT.
517 (HAY BALES) X 4 LIN. FT. = 2068 LIN.FT.
TOTAL = 6634 LIN. FT.

ITEM 601 ROCK CHANNEL PROTECTION, TYPE C (w/FILTER)

517 (BALES) x 1 CY/10 BALES = 52 CY

TOTALS CARRIED TO GENERAL SUMMARY

LEGEND

(IF) INLET FILTER (8 BALES EACH) (ALL CATCH BASINS)
(FF) FILTER FABRIC FENCE
(DC) DITCH CHECK (5 BALES EACH)

FOR THE ABOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, SEE STANDARD DRAWING MC-11.

CALC. ATH BY: DATE: 12/94
CHKD. CAM BY: DATE: 10/95

0' 100' 200'
HORIZONTAL SCALE IN FEET

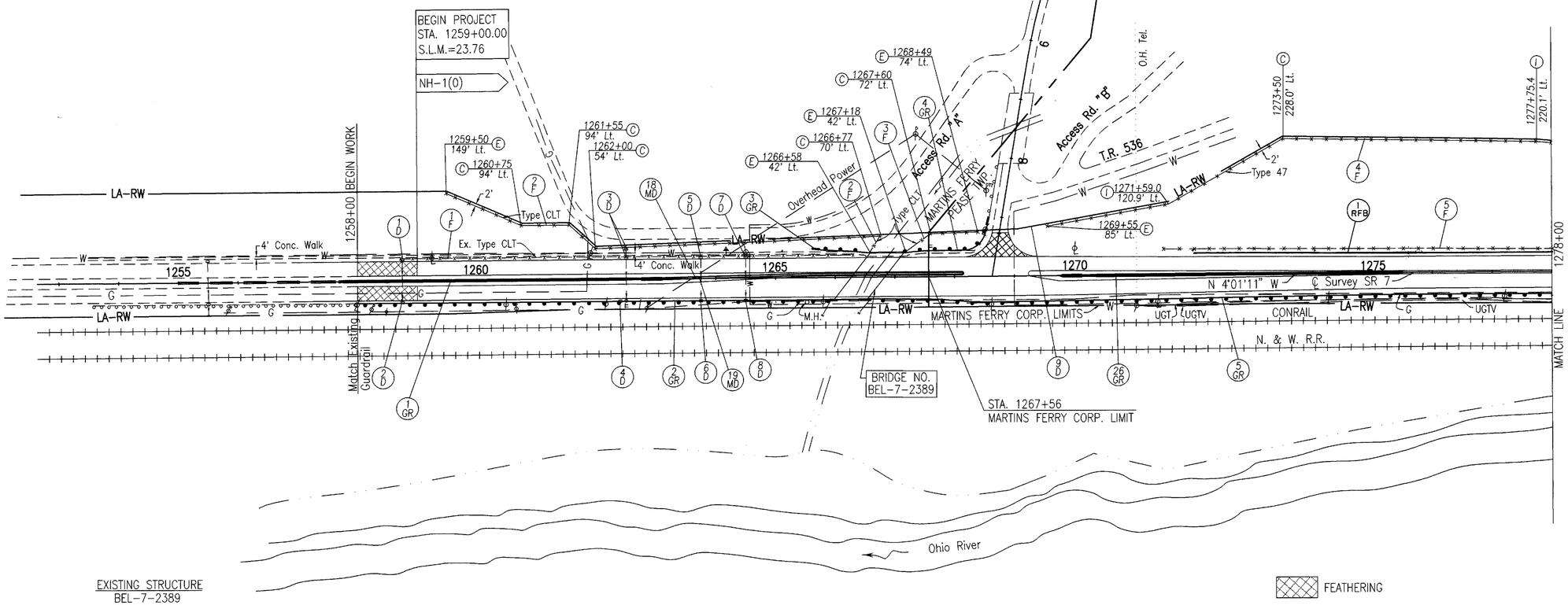
STORM WATER POLLUTION PREVENTION PLAN
STA 1353+00 TO STA 10+50.91

BEL/JEF-7-23.76/0.00

41
94

STICKLEN – BELSHEIM & ASSOCIATES

BENCH MARKS
BM #103 Top of Rebar in Concrete Reference Monument Station 1275+00, 39.75' Rt. Elevation 665.51 feet (NGVD 1929)
BM #102 Top of NW Wingwall of Bridge No. Bel-7-2389 Station 1267+27.19, 48.34' Lt. Elevation 663.645 feet (NGVD 1929)



EXISTING STRUCTURE
BEL-7-2389

TYPE: Simple span steel beam with reinforced concrete slab and substructure
SPAN: 51'-0" c/c brg.
ROADWAY: 68'-0" f/f curb with 3'-0" raised median, 6'-0" sidewalk and 2'-0" saftey curb with concrete parapets and Bridge Sidewalk Railing
LOADING: HS 20-44
WEARING SURFACE: 2 1/2" Asphalt concrete
SKEW: 38°11'55" Left forward
ALIGNMENT: Tangent
APPROACH SLABS: AS-1-72, 30'-0" Long
SUPERELEVATION: None

FEATHERING

CROSS REFERENCES	
26	Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
32	Approach Road Intersection Details
17	Concrete Median Quantities
30	Underdrain Quantities
32&33	Feather Detail
36&37	Pavement Detail

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. BY: JCM DATE: 11/94
CHKD. BY: CAM DATE: 11/94

PLAN
STA 1252+00 TO STA 1278+00

BEL./JEF-7-23.76/0.00

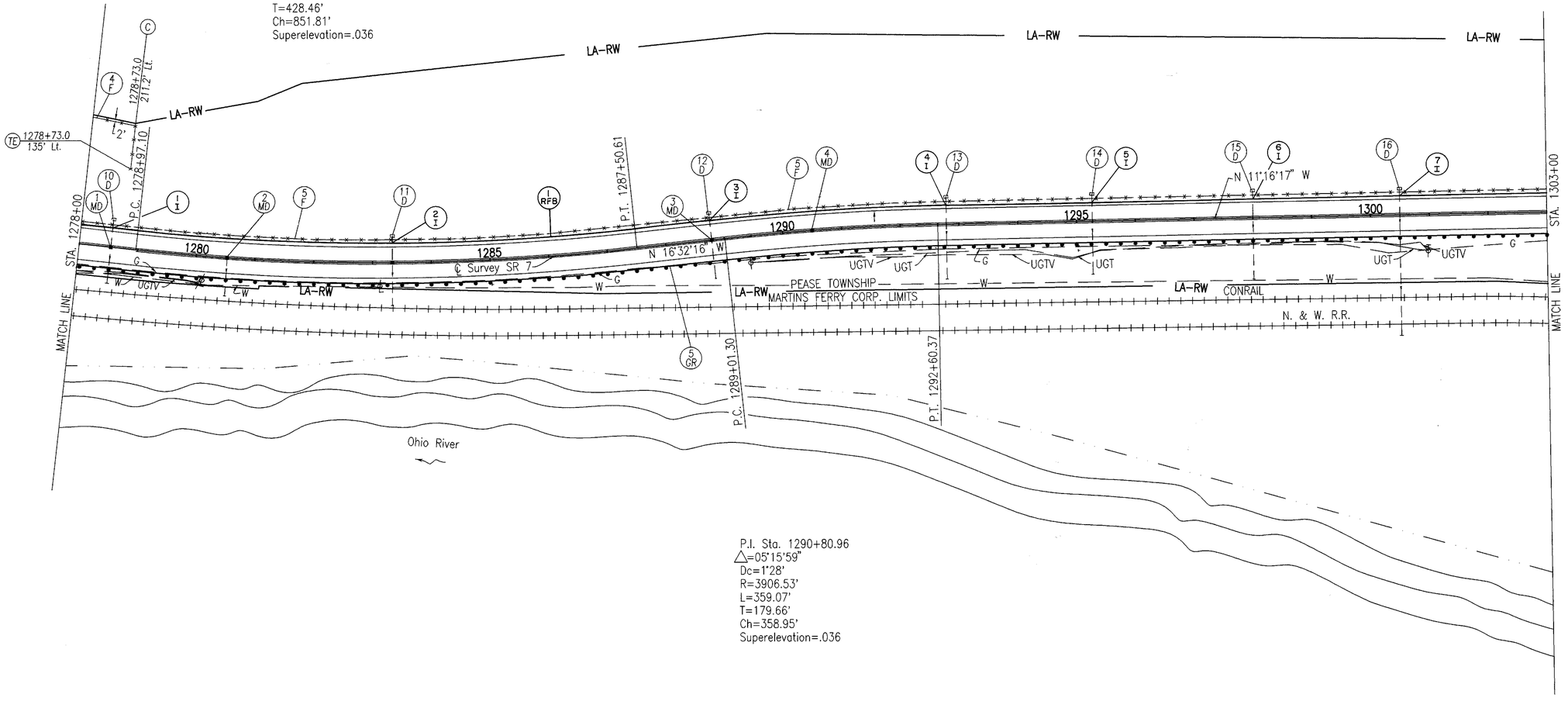
42
94

FINAL 1993/1 ASH 5/27/97

STICKLEN - BELSHEIM & ASSOCIATES

BENCH MARKS
Reference Bench Mark A Spike Found in Telephone Pole From Highway Plans, BEL-7-23.74 JEF-7-0.00 Dated 1974 Station 1285+57.50, 112' Rt. Elevation 663.350 feet (NGVD 1929)
BM #104 Top of Rebar in Concrete Reference Monument Station 1283+00, 39.50' Rt. Elevation 677.755 feet (NGVD 1929)
BM #105 Top of Rebar in Concrete Reference Monument Station 1292+60.37, 39.5' Rt. Elevation 689.790 feet (NGVD 1929)

P.I. Sta.=1283+25.56
△=12°31'05"
Dc=1°28'
R=3906.53'
L=853.50'
T=428.46'
Ch=851.81'
Superelevation=.036



P.I. Sta. 1290+80.96
△=05°15'59"
Dc=1°28'
R=3906.53'
L=359.07'
T=179.66'
Ch=358.95'
Superelevation=.036

CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
30	Underdrain Quantities
38A,B,C	ROCK FALL BARRIER

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. BY: JCM DATE: 1/94
CHKD. BY: CAM DATE: 10/94

PLAN
STA 1278+00 TO STA 1303+00

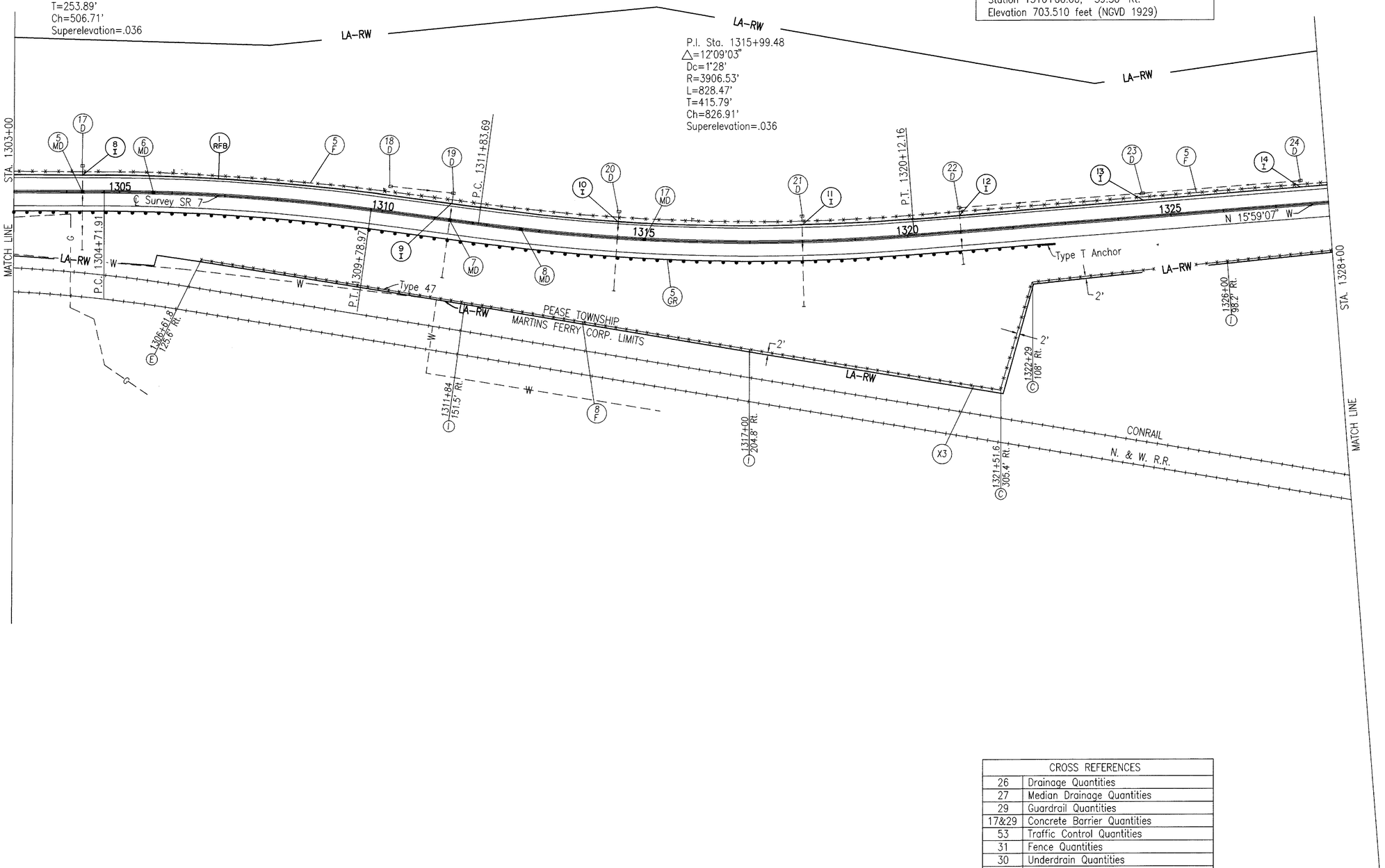
BEL/JEF-7-23.76/0.00

43
94

FINAL
ATH 1993P3
2/25/97

STICKLEN – BELSHEIM & ASSOCIATES

BENCH MARKS
BM #106 Top of Rebar in Concrete Reference Monument Station 1304+71.91, 39.50' Rt. Elevation 697.771 feet (NGVD 1929)
BM #107 Top of Rebar in Concrete Reference Monument Station 1309+78.97, 39.50' Rt. Elevation 699.706 feet (NGVD 1929)
BM #108 Top of Rebar in Concrete Reference Monument Station 1316+00.00, 39.50' Rt. Elevation 703.510 feet (NGVD 1929)



CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
30	Underdrain Quantities
38A,B,C	**ROCK FALL BARRIER**

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. BY: JCM DATE: 1/94
CHKD. BY: CAM DATE: 10/94

PLAN
STA 1303+00 TO STA 1328+00

BEL/JEF-7-23.76/0.00

44
94

FINAL
ATH 1993
2/28/97

STICKLEN – BELSHEIM & ASSOCIATES

BENCH MARKS
BM #109 Top of Rebar in Concrete Reference Monument Station 1329+81.07, 39.50' Rt. Elevation 707.948 feet (NGVD 1929)
BM #110 Top of Rebar in Concrete Reference Monument Station 1336+80.84, 52' Lt. Elevation 707.926 feet (NGVD 1929)
BM #111 Top of Rebar in Concrete Reference Monument Station 1340+80.84, 67' Rt. Elevation 694.306 feet (NGVD 1929)
BM #112 Chiseled Square on East End of Concrete Curb Station 1267+27.19, 48.34' Lt. Elevation 683.930 feet (NGVD 1929)

PI Sta. 1335+39.12
△=27°59'27"
Dc=4°
R=1432.39'
Lc=299.77'
θs=8°
Ls=400.00'
Ts=558.05'
LT=266.94'
ST=133.58'
Es=48.62'
Superelevation=.083

STA. 1328+00

N 15°59'07" W

Bridge No. BEL-7-2526

Bridge No. BEL-7-2549

Ramp "A"

Ramp "B"

Ramp "C"

Ramp "D"

N 12°00'20" E

P.C. 1350+66.60

STA. 1353+00

PEASE TWP.
MARTINS FERRY CORP. LIMITS

PEASE TWP.
YORKVILLE CORP. LIMITS

MARTINS FERRY CORP. LIMITS
YORKVILLE CORP. LIMITS

T.R. 469

42 T.R. 469 Connector 44

Picoma Rd.

CONRAIL

N. & W. R.R.

Patton's Run

MATCH LINE

MATCH LINE

LA-RW

R\W

Type 47

Type B Anchor

Ex.CB

UGT

CURVE DATA
P.I. Sta. 1335+39.12
△=27°59'27"
Dc=4°00'00"
R=1432.39'
Lc=299.77'
Ls=400.00'
Ts=558.05'
θs=8°00'00"
Es=48.62'

EXISTING STRUCTURE
BEL-7-2526

TYPE: Continuous steel beam with reinforced concrete deck and substructure
SPANS: 31'-6", 45'-0", 31'-6" c/c brgs. along ℄ S.R. 7
ROADWAY: 110'-7" average width f/f concrete barrier type parapet with 3'-0" concrete barrier median
LOADING: HS 20-44
WEARING SURFACE: 2 1/2" Asphalt concrete
SKEW: 22°15'00" Right forward with respect to ref. chord
ALIGNMENT: Spiral Right
APPROACH SLABS: 25'-0" Long
SUPERELEVATION: Varies

EXISTING STRUCTURE
BEL-7-2549

TYPE: Continuous steel beam with reinforced concrete deck and substructure
SPANS: 62'-0", 88'-6", 62'-0" c/c brgs. along ℄ T.R. 469 Connector
ROADWAY: 40'-0" f/f concrete barrier type parapet
LOADING: HS 20-44
WEARING SURFACE: 1 1/2" Asphalt concrete
SKEW: 25°00 Right forward with respect to ref. tan.
ALIGNMENT: Curve left and tangent
APPROACH SLABS: AS-1-72, 25'-0" Long
SUPERELEVATION: 0.016

FEATHERING

CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
32	Approach Road Intersection Details
30	Underdrain Quantities
32&33	Feather Detail
38A,B,C	ROCK FALL BARRIER

FINAL 1983M ATI 2/28/97

STICKLEN - BELSHEIM & ASSOCIATES

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. BT DATE: 1/94
CHKD. BT DATE: 10/94
CAM DATE: 10/94

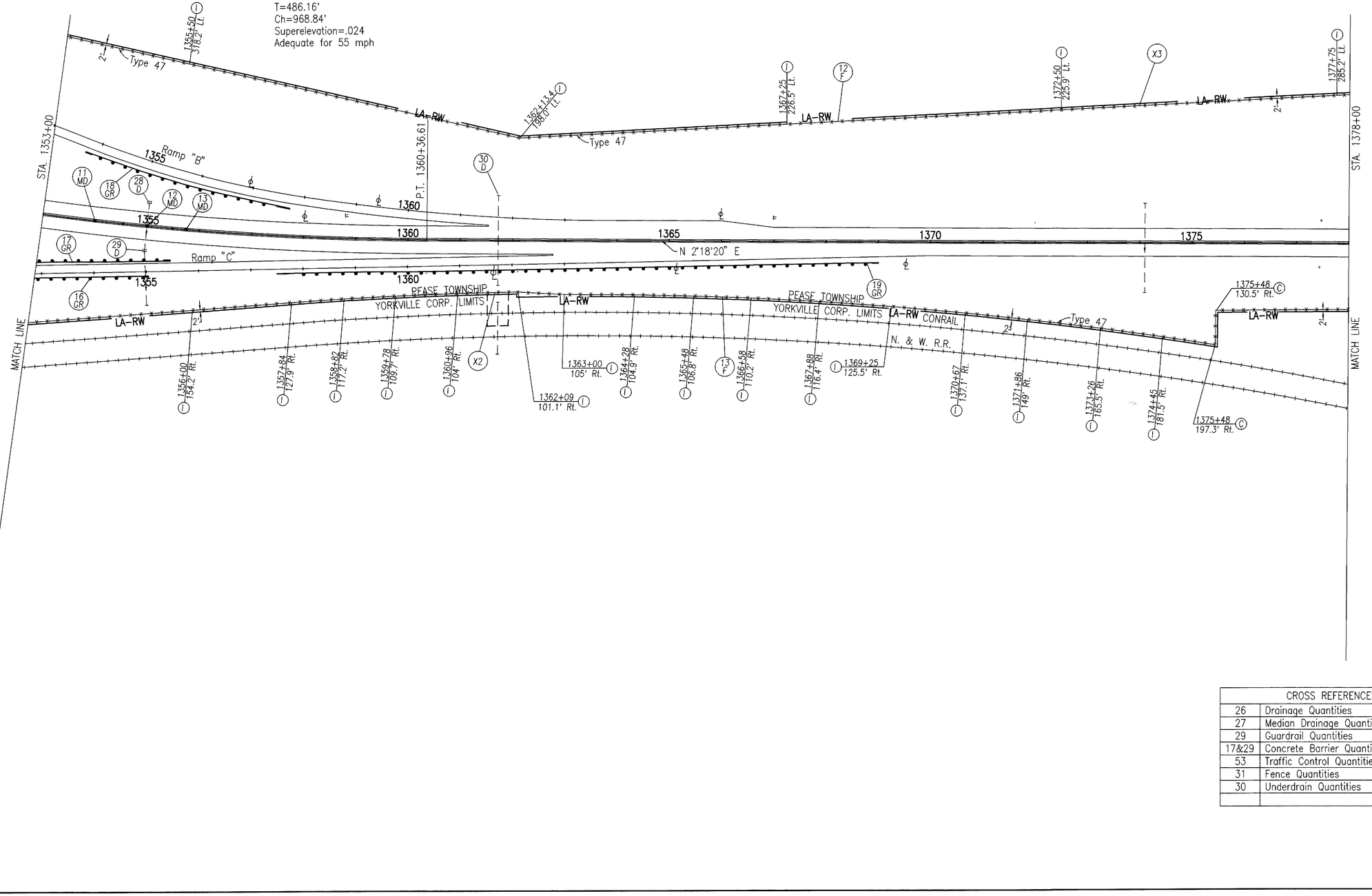
PLAN
STA 1328+00 TO STA 1353+00

BEL/JEF-7-23.76/0.00

45
94

BENCH MARKS
BM #113 Top of Rebar in Concrete Reference Monument Station 1360+36.61, 63.50' Rt. Elevation 667.014 feet (NGVD 1929)
BM #114 Top of Rebar in Concrete Reference Monument Station 1372+00.00, 37.50' Lt. Elevation 674.661 feet (NGVD 1929)

P.I. Sta. 1355+52.77
△=09°42'00"
Dc=1°00'00"
R=5729.58'
L=970.01'
T=486.16'
Ch=968.84'
Superelevation=.024
Adequate for 55 mph



CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
30	Underdrain Quantities

N

0' 100' 200'
HORIZONTAL SCALE IN FEET

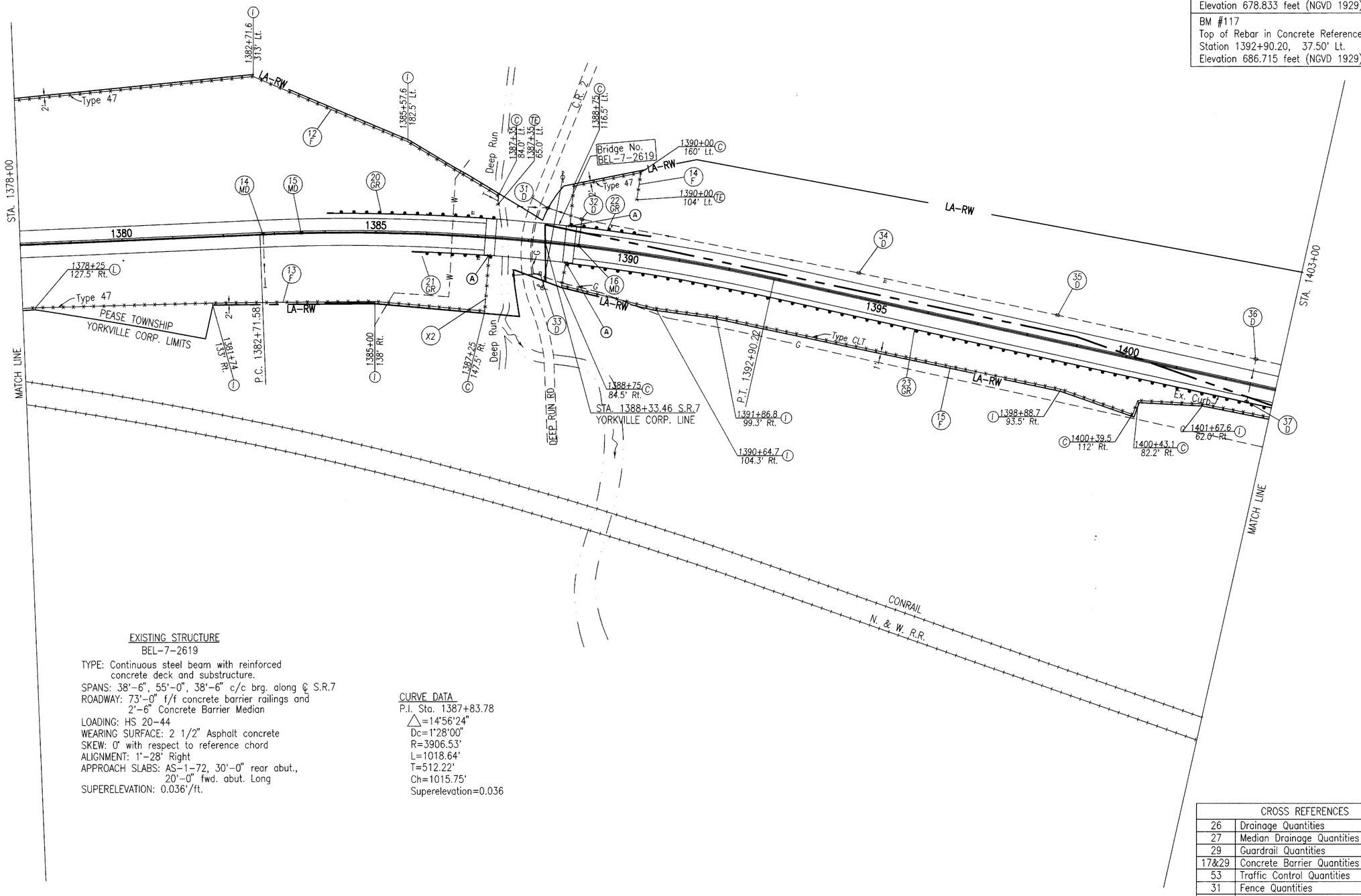
CALC. BY: JCM DATE: 1/94
CHKD. BY: CAM DATE: 10/94

PLAN
STA 1353+00 TO STA 1378+00

BEL/JEF-7-23.76/0.00

FINAL
10/95
ATH
2/26/97

BENCH MARKS
BM #115 Top of Rebar in Concrete Reference Monument Station 1382+71.56, 37.50' Lt. Elevation 673.711 feet (NGVD 1929)
BM #116 Top of Rebar in Concrete Reference Monument Station 1387+00.00, 37.50' Rt. Elevation 678.833 feet (NGVD 1929)
BM #117 Top of Rebar in Concrete Reference Monument Station 1392+90.20, 37.50' Lt. Elevation 686.715 feet (NGVD 1929)



EXISTING STRUCTURE
BEL-7-2619

TYPE: Continuous steel beam with reinforced concrete deck and substructure.
SPANS: 38'-6", 55'-0", 38'-6" c/c brg. along ℄ S.R.7
ROADWAY: 73'-0" f/f concrete barrier railings and 2'-6" Concrete Barrier Median
LOADING: HS 20-44
WEARING SURFACE: 2 1/2" Asphalt concrete
SKEW: 0° with respect to reference chord
ALIGNMENT: 1°-28' Right
APPROACH SLABS: AS-1-72, 30'-0" rear abut., 20'-0" fwd. abut. Long
SUPERELEVATION: 0.036'/ft.

CURVE DATA
P.I. Sta. 1387+83.78
△=14°56'24"
Dc=1°28'00"
R=3906.53'
L=1018.64'
T=512.22'
Ch=1015.75'
Superelevation=0.036

CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
30	Underdrain Quantities

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. BY: JCM DATE: 1/94
CHKD. BY: CAM DATE: 10/94

PLAN
STA 1378+00 TO STA 1403+00

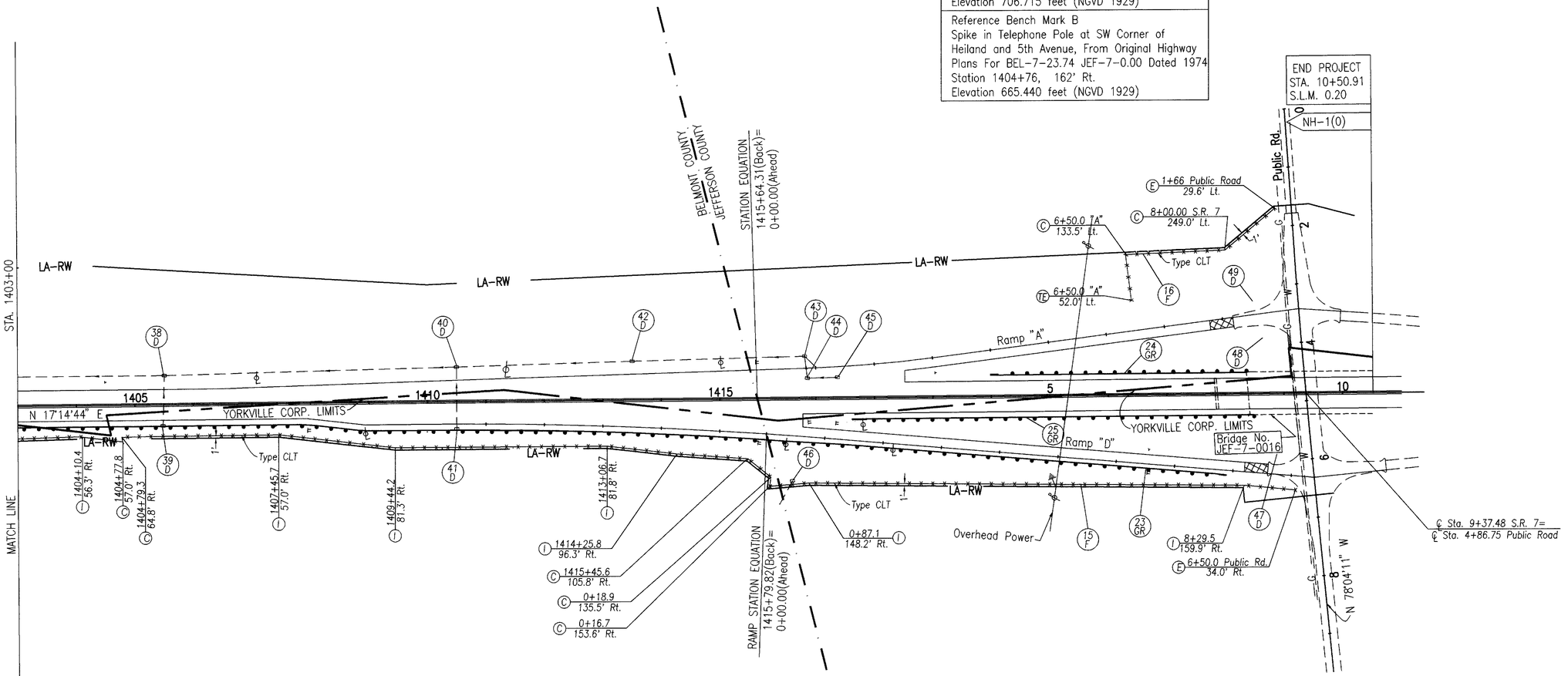
BEL/JEF-7-23.76/0.00

47
94

FINAL 9/2/98 RDB 1998P9

STICKLEN – BELSHEIM & ASSOCIATES

BENCH MARKS
BM #118 Top of Rebar in Concrete Reference Monument Station 1405+00.00, 37.50' Lt. Elevation 690.542 feet (NGVD 1929)
BM #119 Top of Rebar in Concrete Reference Monument Station 5+00.00, 39.50' Rt. Elevation 706.715 feet (NGVD 1929)
Reference Bench Mark B Spike in Telephone Pole at SW Corner of Heiland and 5th Avenue, From Original Highway Plans For BEL-7-23.74 JEF-7-0.00 Dated 1974 Station 1404+76, 162' Rt. Elevation 665.440 feet (NGVD 1929)



FEATHERING

CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
33	Approach Road Intersection Details
30	Underdrain Quantities
32&33	Feather Detail

EXISTING STRUCTURE
JEF-7-0016

TYPE: Continuous steel beam with reinforced concrete deck and substructure.
SPANS: 50'-0", 71'-6", 50'-0" c/c brg. along ℄ S.R.7
ROADWAY: 73'-0" f/f concrete barrier railings and 2'-6" Concrete Barrier Median
LOADING: HS 20-44
WEARING SURFACE: 1 1/2" Asphalt concrete
SKEW: 4°58'37" Right forward
ALIGNMENT: Tangent
APPROACH SLABS: AS-1-72, 25'-0" Long

N

0' 100' 200'
HORIZONTAL SCALE IN FEET

CALC. BY: JCM DATE: 1/94
CHKD. BY: CAM DATE: 10/94

PLAN
STA 1403+00 TO STA 11+00

BEL/JEF-7-23.76/0.00

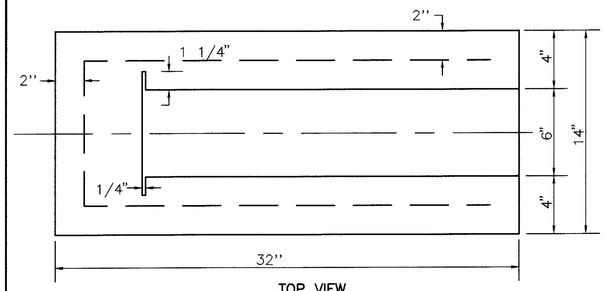
48
94

9/6/96 RBB 19097 FINAL

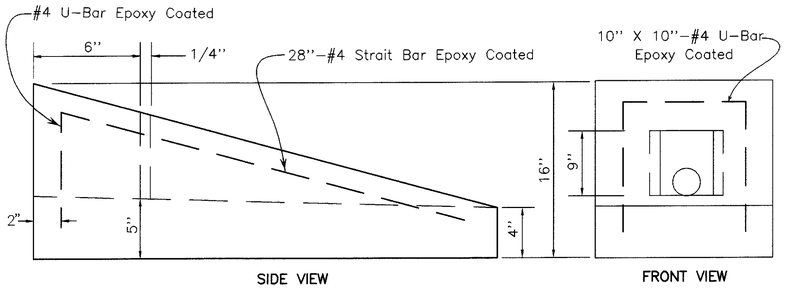
STICKLEN - BELSHEIM & ASSOCIATES

ITEM 604 – PRECAST REINFORCED CONCRETE OUTLET

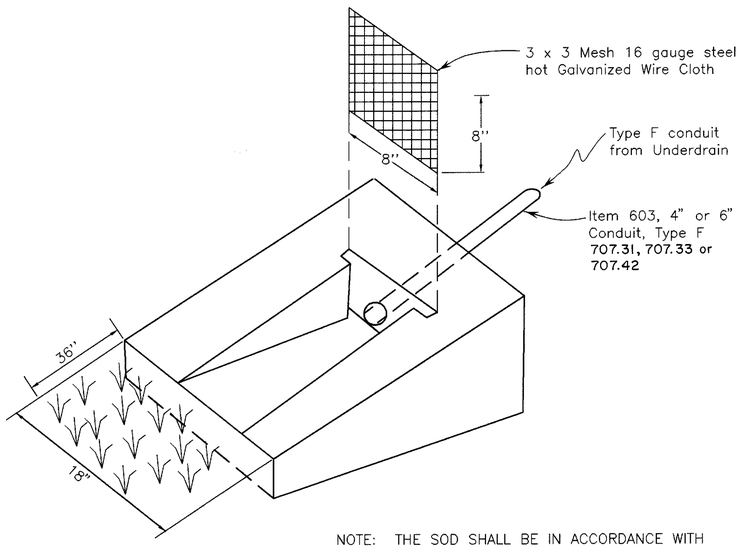
THE CONCRETE OUTLET SHALL MEET THE REQUIREMENTS OF **706.15** IN THE CONSTRUCTION & MATERIALS SPECIFICATIONS. PAYMENT SHALL BE MADE ON AN EACH BASIS. PAYMENT SHALL INCLUDE THE COST OF THE SOD & WIRE CLOTH.



TOP VIEW

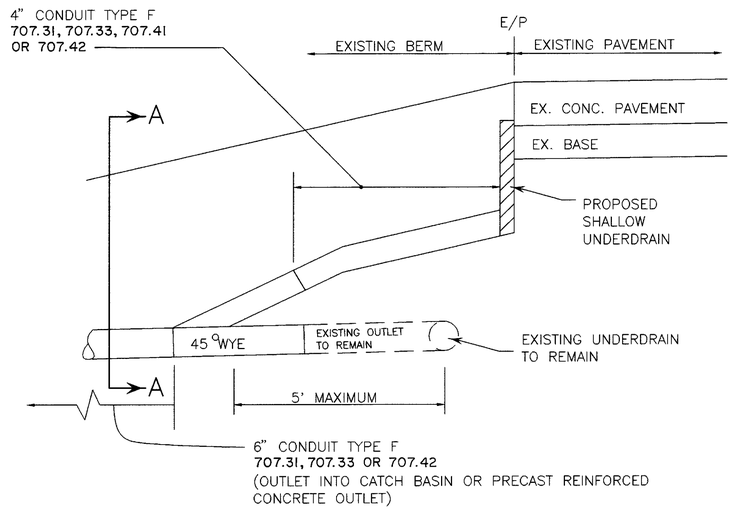


SIDE VIEW FRONT VIEW

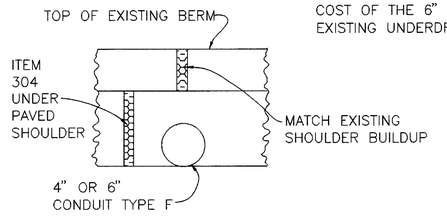


NOTE: THE SOD SHALL BE IN ACCORDANCE WITH ITEM 660 AND STAKED AT EACH CORNER APPROXIMATELY 3 INCHES IN FROM THE EDGE.

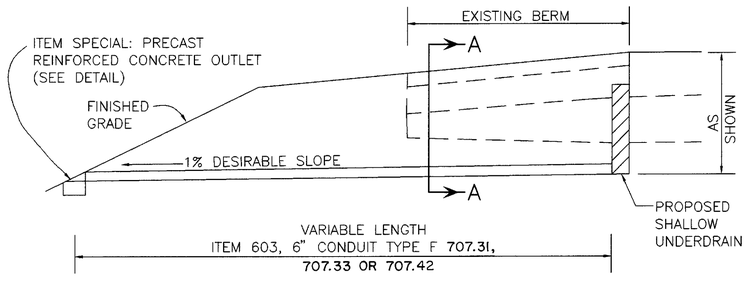
OUTLET DETAILS



NOTE: THE COST OF THE 4" 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 6" CONDUIT TYPE F BEYOND THE EXISTING UNDERDRAIN.

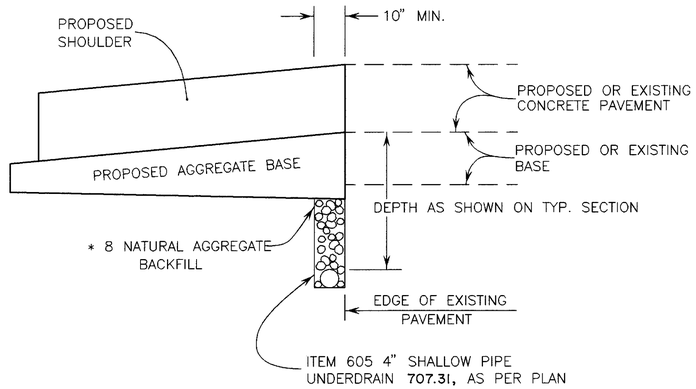


SECTION A–A



NOTE: FOR UNDERDRAIN OUTLETS INTO CATCH BASINS THE ABOVE TYPE F CONDUIT SHALL BE USED ENTIRELY BETWEEN THE UNDERDRAIN & CATCH BASIN.

PIPE UNDERDRAIN DETAIL



DESCRIPTION: This item shall consist of furnishing and installing a pipe underdrain system in accordance with the specifications, details as shown on the plans, and as directed by the Engineer.

MATERIALS: This underdrain shall be a pipe underdrain system per Item 605.

The outlets for the underdrain system shall be constructed as soon as possible after placement of the underdrain to drain the subbase & subgrade. All pipe bends & branches needed to connect the proposed underdrain to the proposed outlet or to an existing underdrain shall be manufactured fittings.

METHOD OF MEASUREMENT: Completed and accepted underdrains will be measured by the linear foot in place.

BASIS OF PAYMENT: Work completed and accepted under this item and measured will be paid for at the contract unit price bid per linear foot for Item 605 4" Shallow Pipe Underdrain **707.31,** as per plan. The price shall be full compensation for excavation and backfill; for furnishing materials, including material for outlet fittings, for all labor, tools, equipment, and incidentals necessary to complete the work.

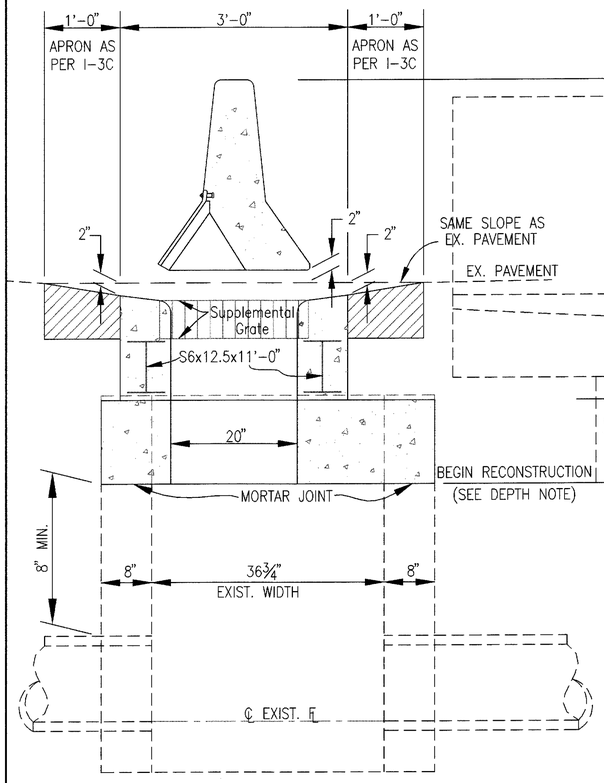
PLAN INSERT SHEET

BEL/JEF-7-23.76/0.00

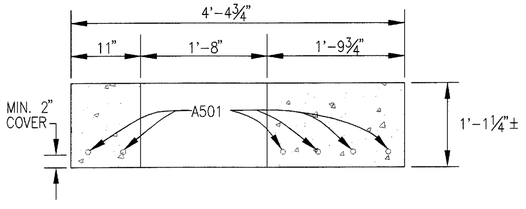
ITEM 605 4" SHALLOW PIPE UNDERDRAIN **707.31,** AS PER PLAN

DATE 2–5–93

FINAL 1993051 RRB 9/6/94



SECTION E-E



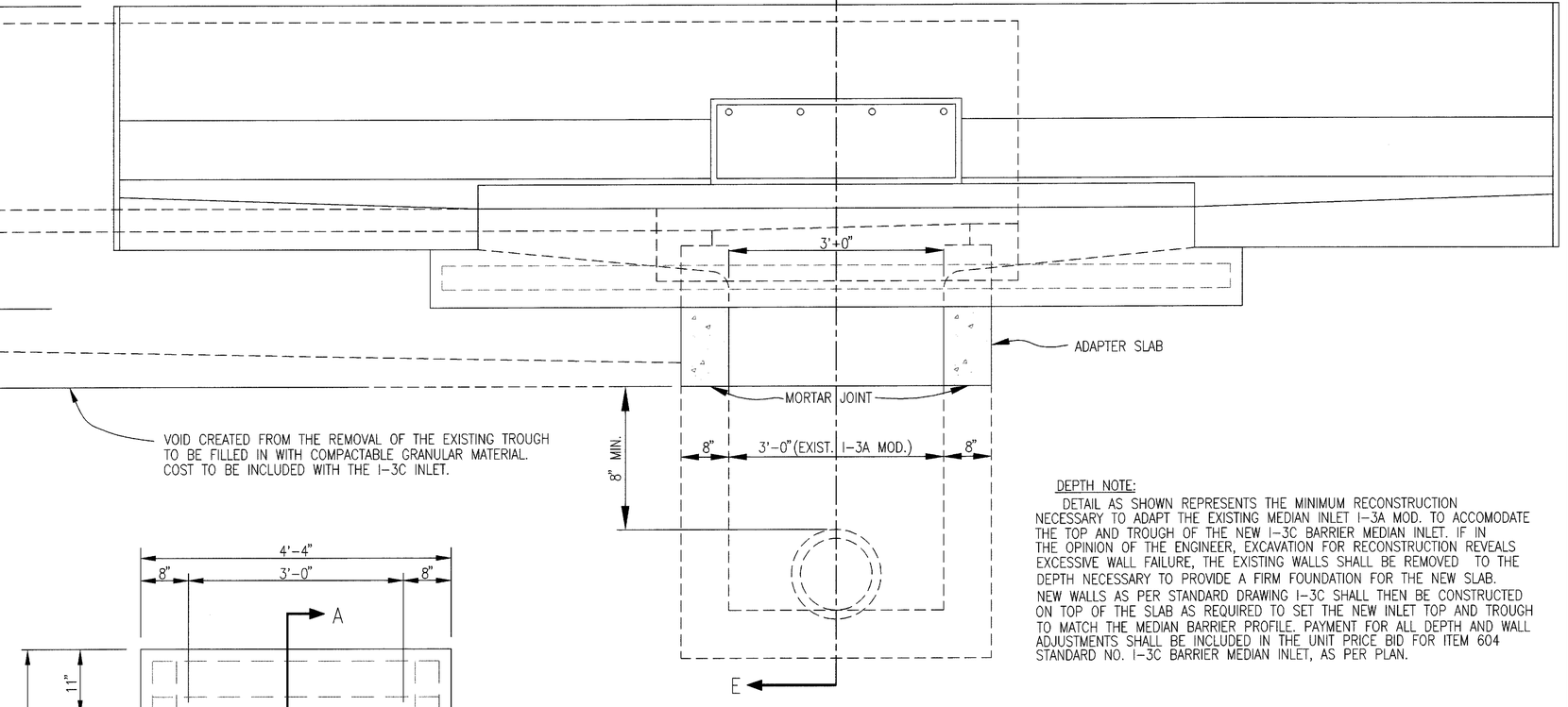
SECTION A-A

DETAIL FOR:

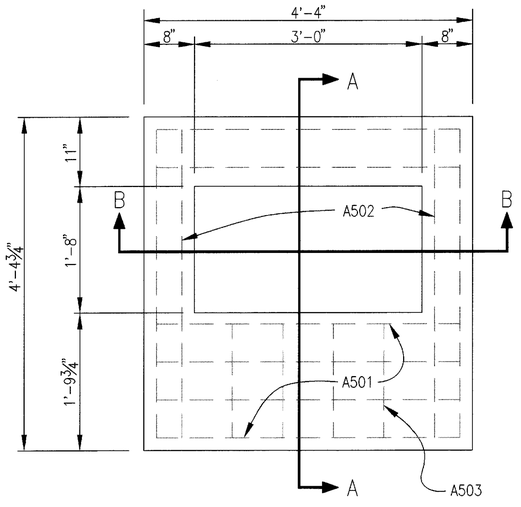
REF NO.	STA.	REF NO.	STA.
1-MD	1278+54	9-MD	1337+90
2-MD	1280+53	10-MD	1340+52
3-MD	1288+78	11-MD	1354+00
4-MD	1290+53	12-MD	1355+00
5-MD	1304+29.5	13-MD	1355+75
6-MD	1305+65	14-MD	1382+78
7-MD	1311+29.5	15-MD	1383+53
8-MD	1312+65	16-MD	1389+03

STEEL LIST (DETAIL A-1)

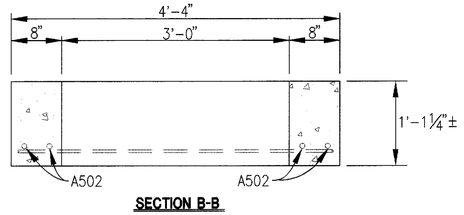
MARK	NO.	LENGTH	WEIGHT	TYPE
A501	6	4'-1"	26LBS.	ST.
A502	4	4'-1¾"	18LBS.	ST.
A503	4	1'-6¾"	7LBS.	ST.



ELEVATION



ADAPTOR SLAB DETAIL
ALL BARS ARE NO. 5



SECTION B-B

DEPTH NOTE:

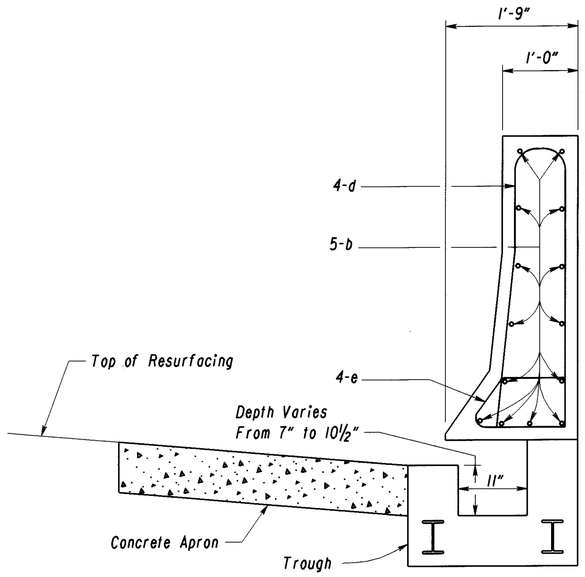
DETAIL AS SHOWN REPRESENTS THE MINIMUM RECONSTRUCTION NECESSARY TO ADAPT THE EXISTING MEDIAN INLET I-3A MOD. TO ACCOMODATE THE TOP AND TROUGH OF THE NEW I-3C BARRIER MEDIAN INLET. IF IN THE OPINION OF THE ENGINEER, EXCAVATION FOR RECONSTRUCTION REVEALS EXCESSIVE WALL FAILURE, THE EXISTING WALLS SHALL BE REMOVED TO THE DEPTH NECESSARY TO PROVIDE A FIRM FOUNDATION FOR THE NEW SLAB. NEW WALLS AS PER STANDARD DRAWING I-3C SHALL THEN BE CONSTRUCTED ON TOP OF THE SLAB AS REQUIRED TO SET THE NEW INLET TOP AND TROUGH TO MATCH THE MEDIAN BARRIER PROFILE. PAYMENT FOR ALL DEPTH AND WALL ADJUSTMENTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 604 STANDARD NO. I-3C BARRIER MEDIAN INLET, AS PER PLAN.

INLET NO. 3C, AS PER PLAN

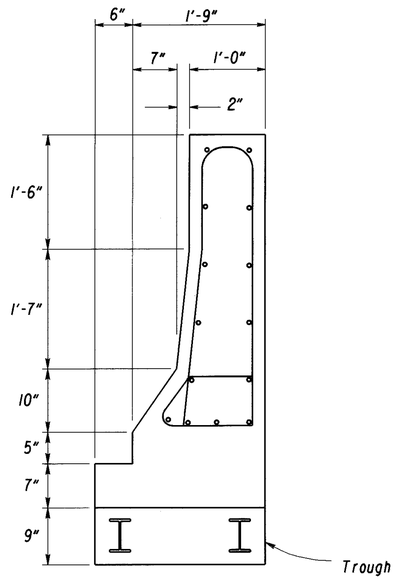
BEL/JEF-7-23.76/0.000

FINAL
193JOB7
AH
5/26/97

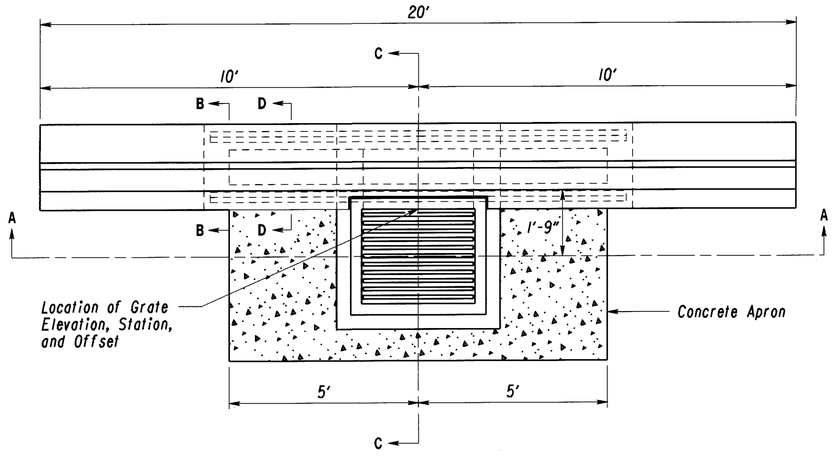
STICKLEN - BELSHEIM & ASSOCIATES



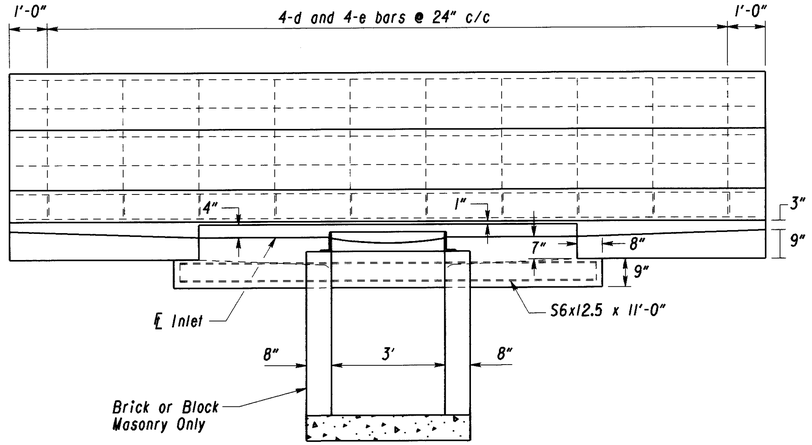
SEC. D-D



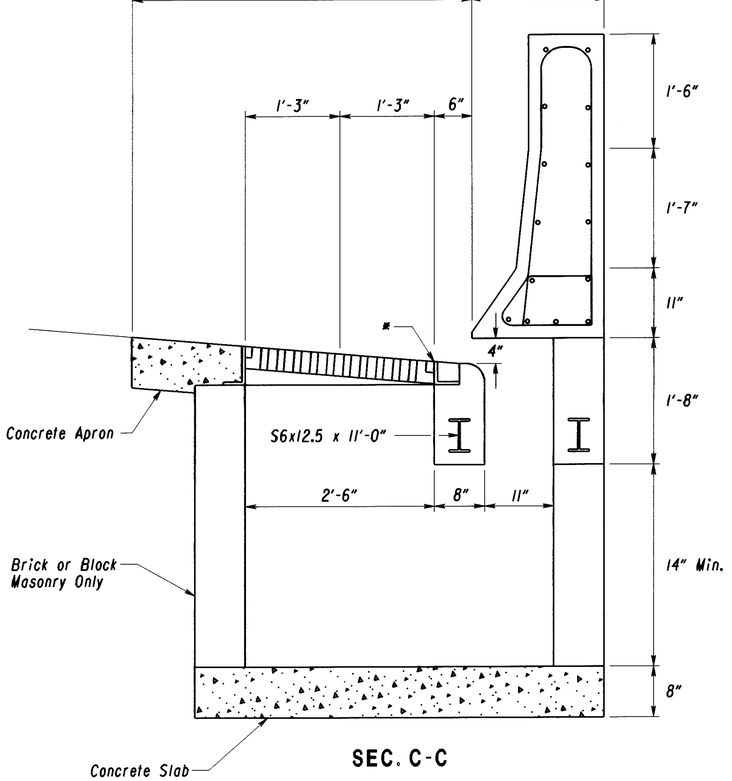
SEC. B-B



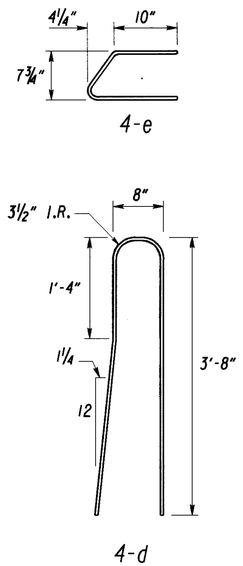
PLAN



ELEVATION A-A



SEC. C-C



BENDING DIAGRAMS

STEEL LIST				
MARK	LENGTH	SHAPE	QTY.	WEIGHT (LBS)
4-d	7'-8"	Bent	10	51
4-e	2'-8"	Bent	10	18
5-b	19'-8"	Str.	14	287
S6x12.5	11'-0"	Str.	2	275
TOTAL (For Info. Only)				631

ITEM 604, INLET, NO. 3B50, AS PER PLAN

This item shall consist of constructing an I-3B50 inlet as detailed herein. All other notes shown in Standard Construction Drawing I-3A & B shall apply.

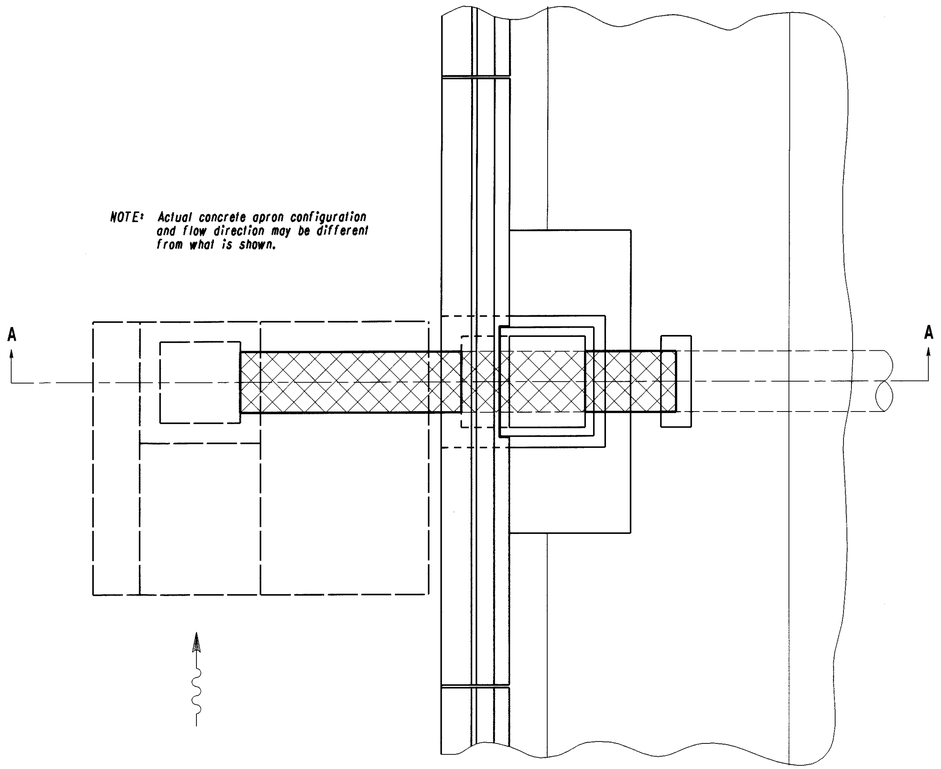
Payment for the above work will be made at the contract price for Item 604, Each, Inlet, No. 3B50, As Per Plan, and shall include the cost of all labor, materials, equipment, and incidentals necessary to complete the work.

* Location of Grate Elevation, Station, and Offset
For Details Not Shown, See Std. Dwg. I-3A & B.
For Quantities See Sheet No. 50B.

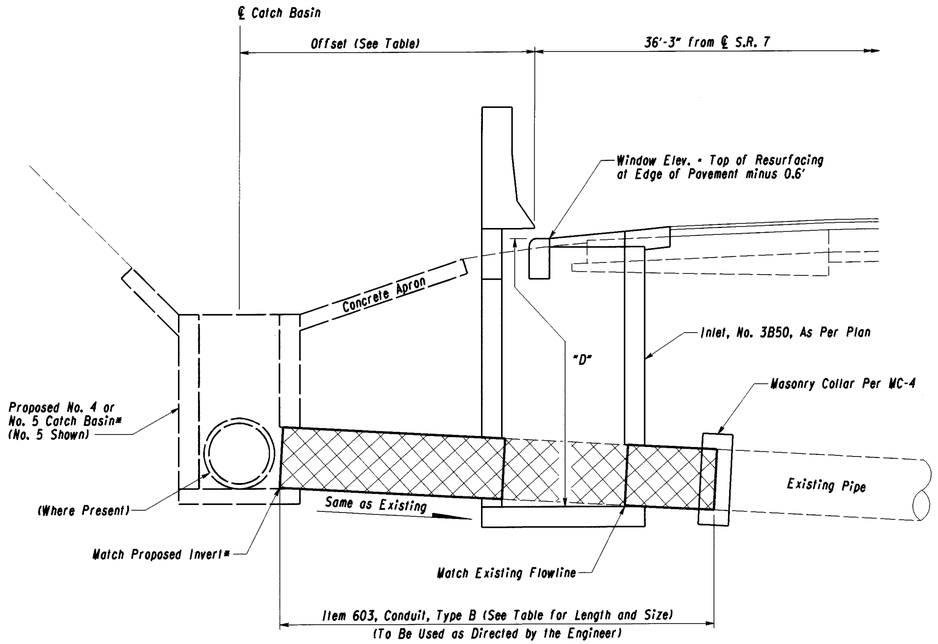
CALCULATED JPB DISTRICT II
CHECKED SHG DISTRICT II

INLET, NO. 3B50, AS PER PLAN

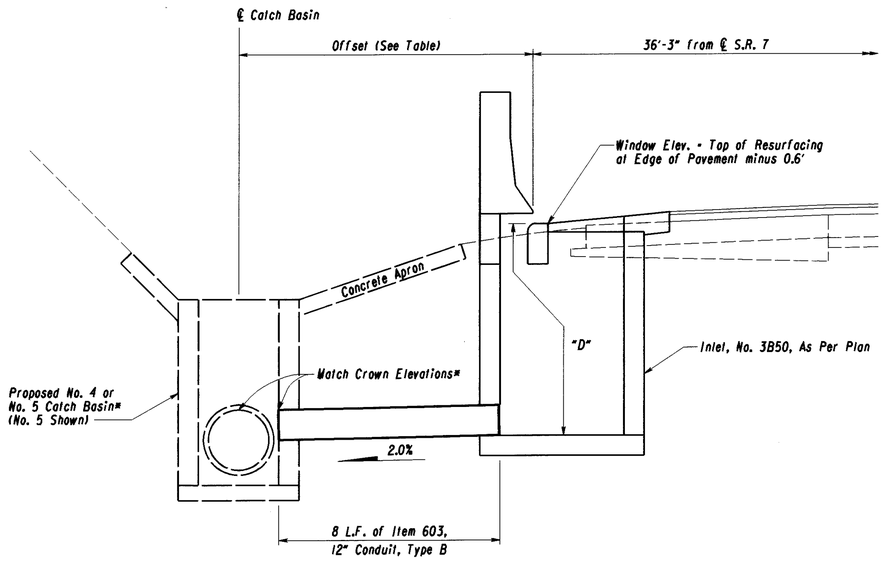
BEL/JEF-7-23.76/0.00



PLAN



SEC. A-A



SEC. A-A
(13-1 & 14-1 Only)

Reference Number	Station	Offset	Dimension "D" (±)	603 Conduit, Type B 12"	603 Conduit, Type B 18"	603 Conduit, Type B 21"	603 Conduit, Type B 30"	604 Inlet, No. 3B50, As Per Plan	
		Feet	Feet	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	
1-1	1278+54	9.75	7.4		16			1	
2-1	1283+34	9.75	5.5		16			1	
3-1	1288+78	9.75	4.6		16			1	
4-1	1292+78	9.75	4.8		16			1	
5-1	1295+27	9.75	5.5		16			1	
6-1	1298+00	9.75	5.2		16			1	
7-1	1300+50	8.75	5.2		14			1	
8-1	1304+30	12.75	4.7			18		1	
9-1	1311+30	12.75	7.1				18	1	
10-1	1314+50	11.75	5.9		18			1	
11-1	1318+00	11.75	5.9		18			1	
12-1	1321+00	9.75	7.5				16	1	
13-1	1324+50	8.75	4.8	8				1	
14-1	1327+50	8.75	4.3	8				1	
TOTALS - Carried to General Summary				16	146	18	34	14	

NOTE: Dimension "D" is shown as an approximation only, and was calculated from original construction plan details. The actual dimension may be adjusted to satisfy field conditions.

For 1-3B50 inlet details, see sheet no. 50A.

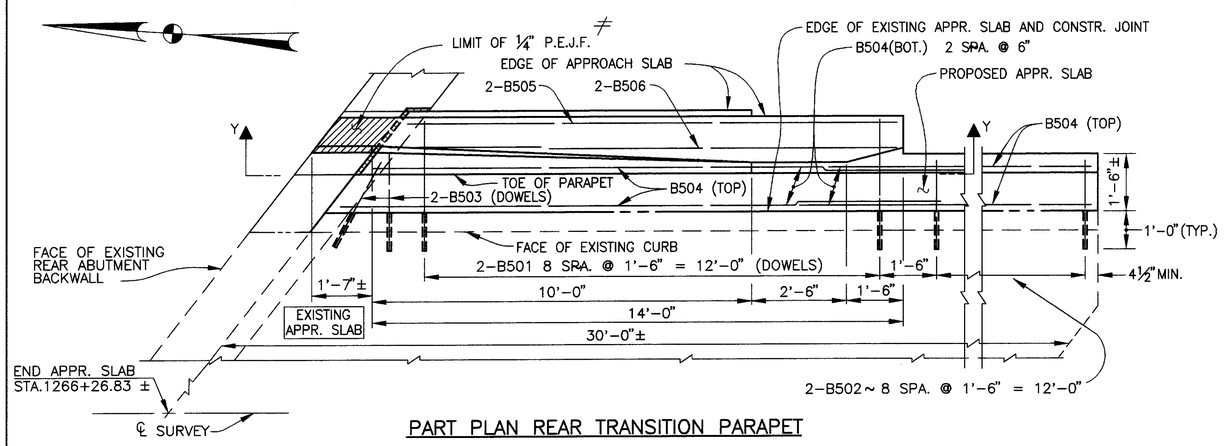
* For catch basin flowlines and quantities, see sheet no. 26.

Portion of existing pipe to be removed. Payment included with 603 Conduit.

CALCULATED JPB DISTRICT 11
CHECKED SHG DISTRICT 11

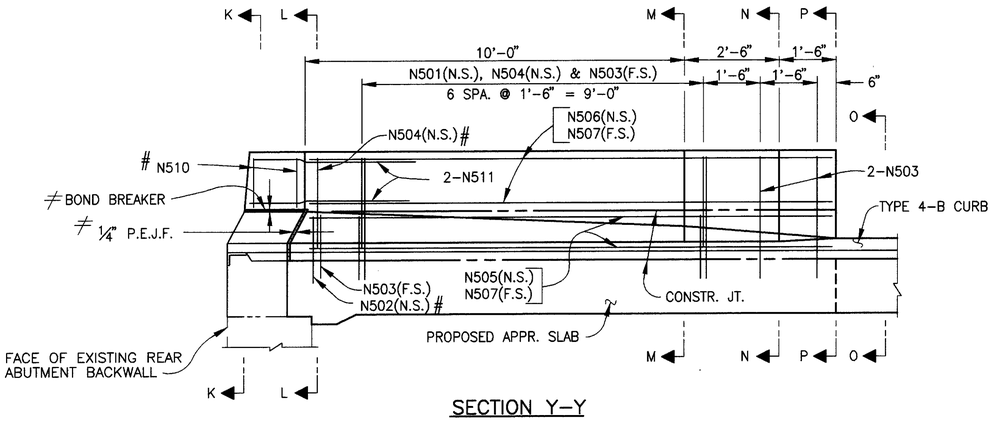
DRAINAGE DETAILS

BEL/JEF-7-23.76/0.00

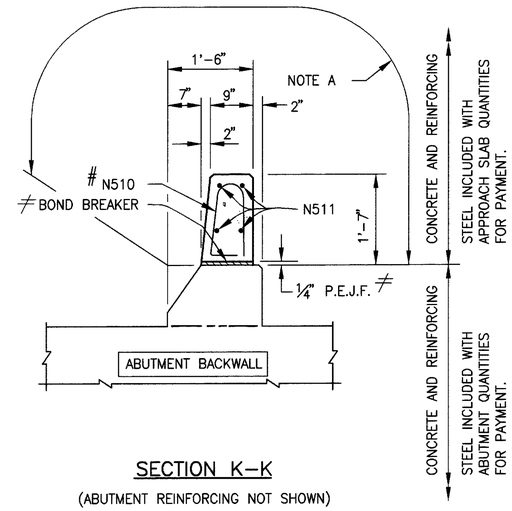


PART PLAN REAR TRANSITION PARAPET

(ASPHALT CONCRETE OVERLAY NOT SHOWN)

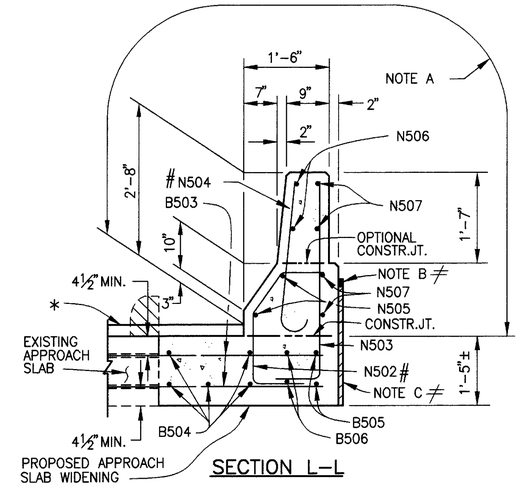


SECTION Y–Y

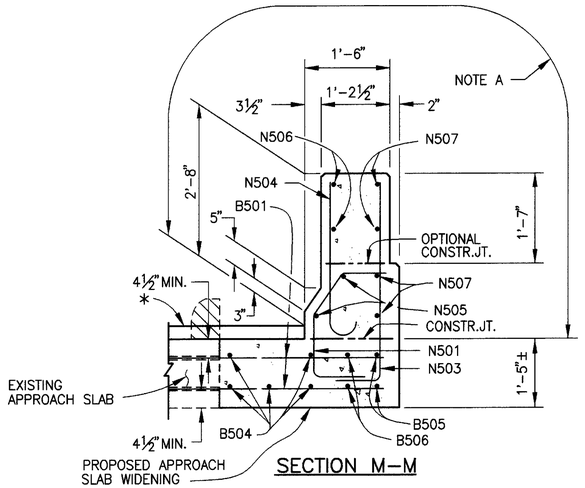


SECTION K–K

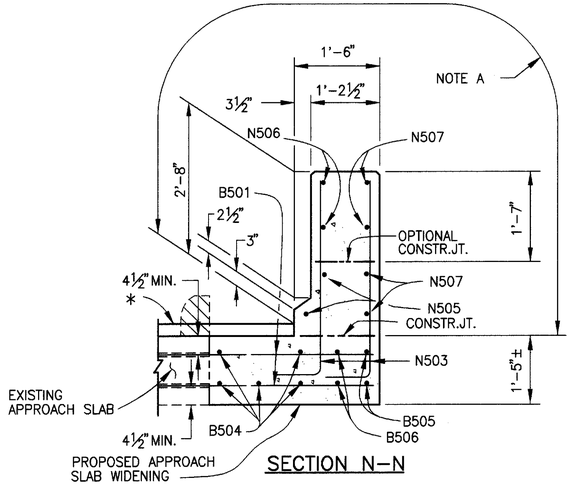
(ABUTMENT REINFORCING NOT SHOWN)



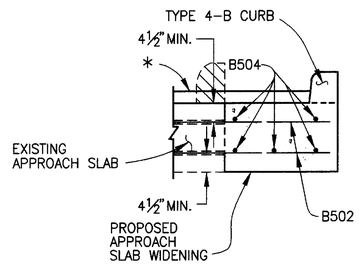
SECTION L–L



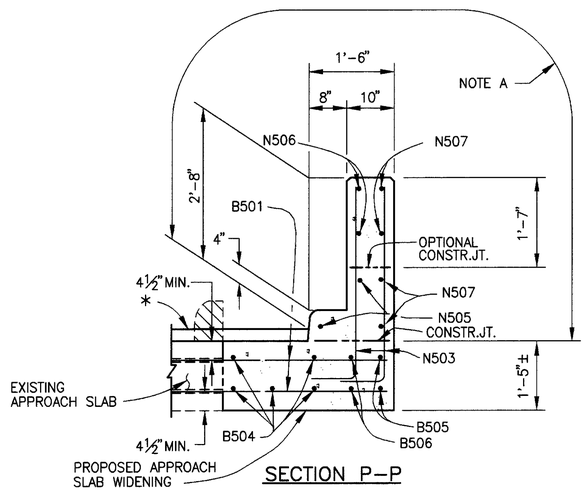
SECTION M–M



SECTION N–N



SECTION O–O



SECTION P–P

LEGEND

* = 2½" (MIN.) VARIABLE THICKNESS ASPHALT CONCRETE

F.S. = FAR SIDE

N.S. = NEAR SIDE

≠ = INCLUDE WITH APPROACH SLAB FOR PAYMENT.

\# = PLACE PARALLEL TO FACE OF ABUTMENT BACKWALL.

= LIMITS OF CONCRETE CURB REMOVAL.

FOR ADDITIONAL DETAILS AND NOTES SEE SHEET 52/94.

REFERENCE: FOR ADDITIONAL NOTES AND DETAILS SEE STD. DRAWINGS AS-1-81, BP-5.1, GR-1.1, GR-1.2, AND GR-3.1.

MINIMUM REINFORCING BAR SPLICE LAP LENGTH
NO. 5 BAR = 3'-5"

NOTE A: LIMITS OF SEALING CONCRETE SURFACES (EPOXY). A CONCRETE SEALER SHALL BE APPLIED TO THE CONCRETE SURFACES INDICATED. SEE PROPOSAL FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS AND APPLICATION PROCEDURES.

NOTE B: 2" DEEP JOINT SEALER (705.04)

NOTE C: 1" PREFORMED EXPANSION JOINT FILLER

NOTE: FOR REINFORCING STEEL LIST, SEE SHEET 52/94.

PAYMENT: CONCRETE, REINFORCING STEEL AND DOWEL HOLES FOR PARAPETS ATTACHED TO THE APPROACH SLAB, INCLUDING REINFORCING STEEL EXTENDING FROM APPROACH SLAB INTO PARAPET, AND SEALING OF CONCRETE SURFACES (EPOXY) SHALL BE INCLUDED WITH APPROACH SLAB QUANTITIES FOR PAYMENT.

REAR APPROACH SLAB DETAILS

BRIDGE NO. BEL-7-2389
S.R. 7 OVER GLENNS RUN

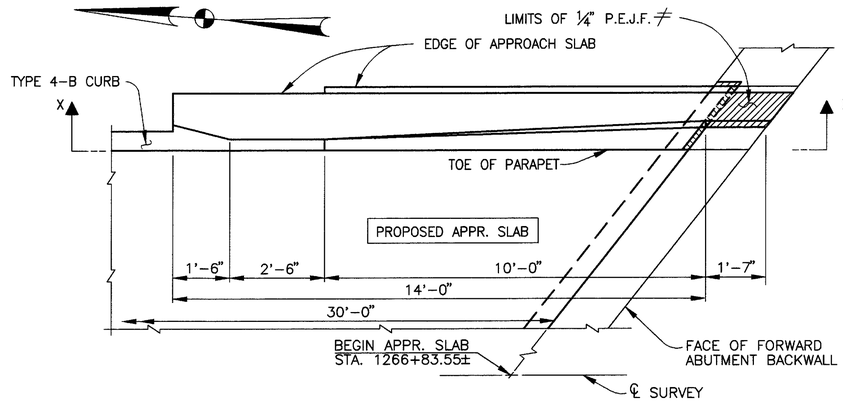
STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED	DRAWN	REVIEWED	DATE
REW	REW	T.R.O.	5/11/95
CHECKED	REVISED	STRUCTURE FILE NUMBER	
G.T.		0700770	

BEL/JEF-7-23.76/0.00

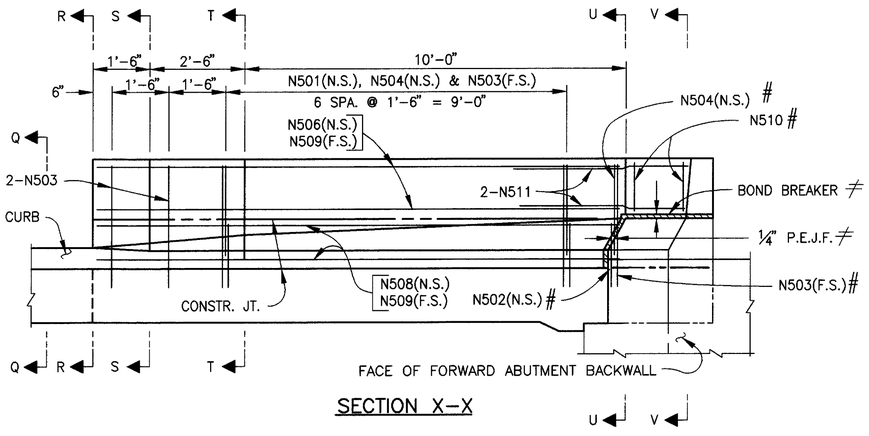
51/94

2389PARR.DWG SEPTEMBER 06, 1996

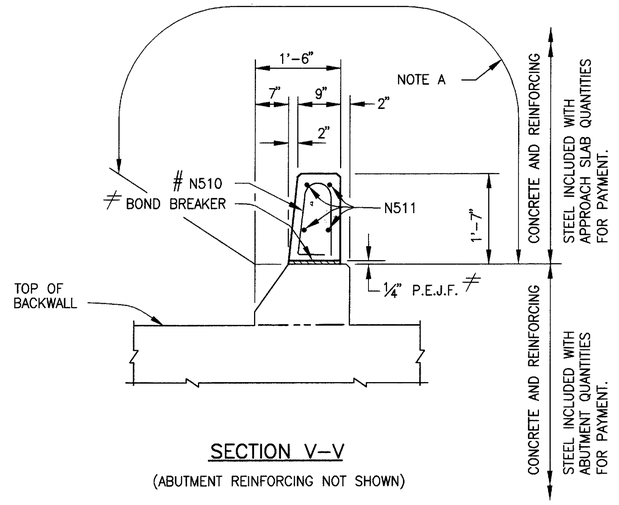


PART PLAN FORWARD TRANSITION PARAPET

(ASPHALT CONCRETE OVERLAY NOT SHOWN)

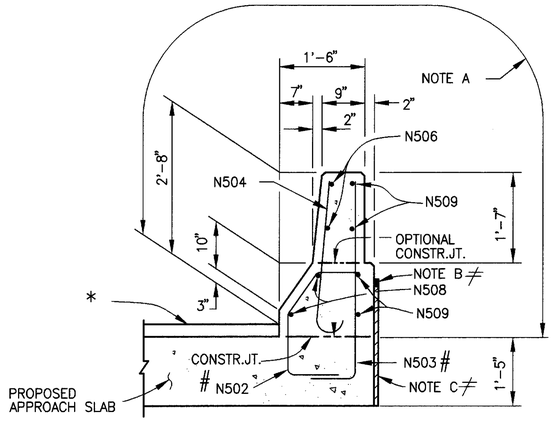


SECTION X–X

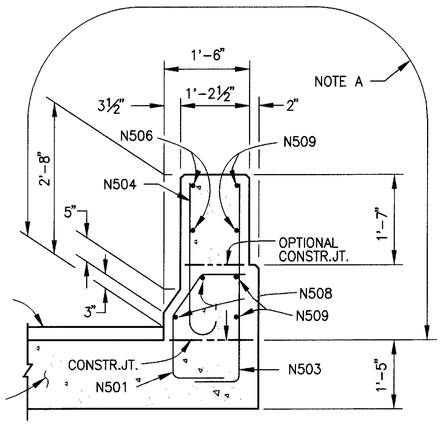


SECTION V–V

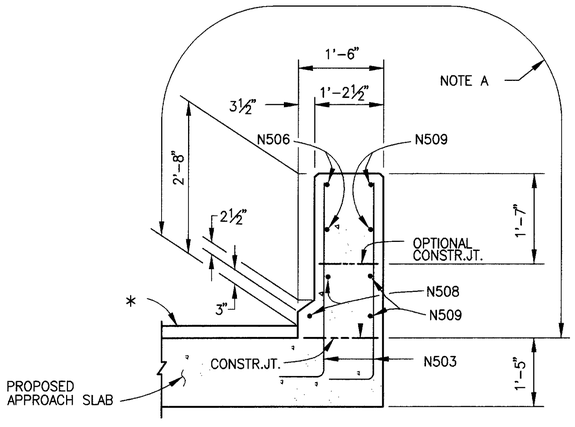
(ABUTMENT REINFORCING NOT SHOWN)



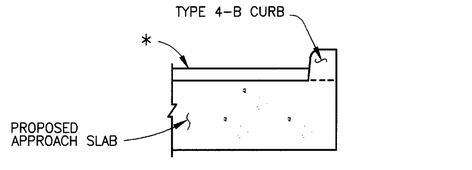
SECTION U–U



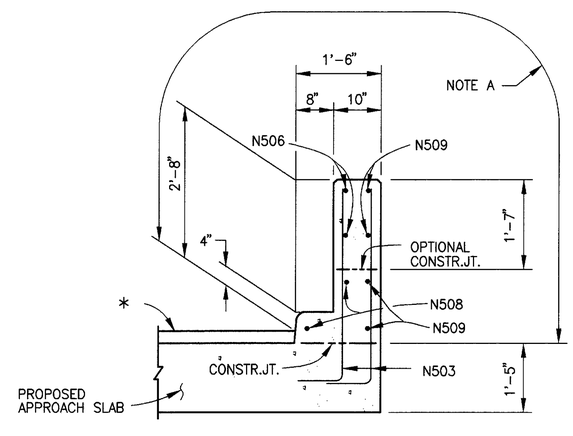
SECTION T–T



SECTION S–S



SECTION Q–Q

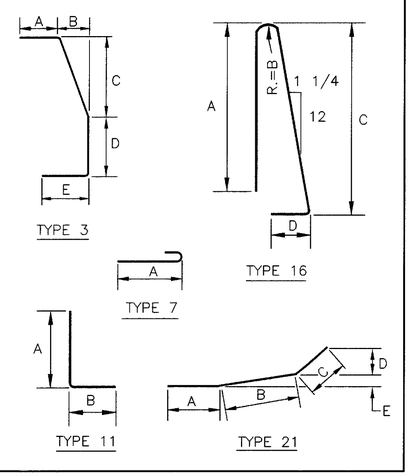


SECTION R–R

PARTIAL APPROACH SLAB REINFORCING STEEL LIST

MARK	NO.	LENGTH	WEIGHT	TYPE	DIMENSION A	B	C	D	E
N501	14	3'–5"	50	3	0'–8"	0'–6"	0'–8½"	1'–2"	1'–0"
N502	2	3"–8"	8	3	0'–10"	0'–7½"	0'–8½"	1'–2"	1'–0"
N503	24	4'–3"	106	11	3'–4"	1'–0"			
N504	16	3'–2"	53	7	2'–7"				
N505	2	13'–3"	28	ST					
N506	4	13'–8"	57	21	9'–11"	2'–4"	1'–5"	0'–5"	0'–1½"
N507	4	12'–11"	54	ST					
N508	2	13'–3"	28	ST					
N509	4	14'–2"	59	ST					
N510	4	2'–10"	12	16	1'–2"	0'–2"	1'–3"	0'–4½"	
N511	8	5'–0"	42	ST					
		TOTAL=	497						
B501	18	3'–4"	63	ST					
B502	18	2'–4"	44	ST					
B503	4	2'–6"	10	ST					
B504	10	15'–9"	164	ST					
B505	2	12'–11"	27	ST					
B506	2	13'–5"	28	ST					
		TOTAL=	336						

BENDING DIAGRAM



SEE STD. DWG. AS–1–81 FOR ADDITIONAL FORWARD APPROACH SLAB REINFORCING STEEL REQUIRED.

FOR ADDITIONAL NOTES, DETAILS AND LEGEND SEE SHEET 51/94.

BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. R INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "ST" WRITTEN IN THE TYPE COLUMN INDICATES A STRAIGHT BAR.

ALL REINFORCING STEEL TO BE EPOXY COATED.

STICKLEN – BELSHEIM & ASSOCIATES
ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN REW | CHECKED G.T. | REVIEWED T.R.O. | DATE 5/11/95 | REVISED | STRUCTURE FILE NUMBER 0700770

FORWARD APPROACH SLAB DETAILS

BRIDGE NO. BEL–7–2389
S.R. 7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

52/94

2389PARF.DWG SEPTEMBER 06, 1996

SHEET NUMBER								ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
10	11	12	17	29	55	63	64					
												MAINTENANCE OF TRAFFIC
	300							614	11100	300	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR
		549						614	12800	549	EACH	TEMPORARY RAISED PAVEMENT MARKER
7.05								614	20100	7.05	MILE	TEMPORARY LANE LINE, CLASS I, 642 PAINT
0.10								614	21100	0.10	MILE	TEMPORARY CENTER LINE, CLASS I, 642 PAINT
40.88								614	22100	40.88	MILE	TEMPORARY EDGE LINE, CLASS I, 642 PAINT
		0.03						614	22300	0.03	MILE	TEMPORARY EDGE LINE, CLASS I, 740.06, TYPE II
3586								614	23200	3586	LIN FT	TEMPORARY CHANNELIZING LINE, CLASS I, 642 PAINT
4595								614	23600	4595	LIN FT	TEMPORARY CHANNELIZING LINE, CLASS I, 740.06, TYPE II
2568								614	25200	2568	LIN FT	TEMPORARY TRANSVERSE LINE, CLASS I, 642 PAINT
95								614	26200	95	LIN FT	TEMPORARY STOP LINE, CLASS I, 642 PAINT
918								614	28600	918	LIN FT	TEMPORARY GORE MARKING, CLASS II, 740.06, TYPE II
100								614	12460	100	EACH	WORK ZONE MARKING SIGN
	33							614	12470	33	EACH	WORK ZONE SPEED LIMIT SIGN
	9							614	13300	9	EACH	BARRIER REFLECTOR, TYPE B
	380							622	40020	380	LIN FT	PORTABLE CONCRETE BARRIER, 32"
	200							SPECIAL	61412500	200	SQ FT	REPLACEMENT SIGN
	10							SPECIAL	61412600	10	EACH	REPLACEMENT DRUM
												TRAFFIC CONTROL
							69	620	10300	69	EACH	DELINEATOR, TYPE C, POST MOUNTED
							2	620	11000	2	EACH	DELINEATOR, TYPE C, BRACKET MOUNTED
							18	620	15300	18	EACH	DELINEATOR, TYPE D, POST MOUNTED
							266	620	31200	266	EACH	DELINEATOR REMOVED FOR DISPOSAL
							413	621	00100	413	EACH	RAISED PAVEMENT MARKER
				215				626	00100	215	EACH	BARRIER REFLECTOR, TYPE A
			338	6				626	00200	344	EACH	BARRIER REFLECTOR, TYPE B
					85			630	02100	85	LIN FT	GROUND MOUNTED SUPPORT, No. 2 POST
					688			630	03100	688	LIN FT	GROUND MOUNTED SUPPORT, No. 3 POST
					26			630	04100	26	LIN FT	GROUND MOUNTED SUPPORT, No. 4 POST
					236			630	06400	236	LIN FT	GROUND MOUNTED SUPPORT, S4 x 7.7 BEAM
					133			630	07000	133	LIN FT	GROUND MOUNTED SUPPORT, W8 x 18 BEAM
					157			630	07500	157	LIN FT	GROUND MOUNTED SUPPORT, W10 x 22 BEAM
					409			630	07600	409	LIN FT	GROUND MOUNTED SUPPORT, W10 x 12 BEAM
					30			630	08004	30	LIN FT	ONE WAY SUPPORT, No. 3 POST
					18			630	09000	18	EACH	BREAKAWAY BEAM CONNECTION
					237			630	80100	237	SQ FT	SIGN, FLAT SHEET
					144			630	80102	144	SQ FT	SIGN, FLAT SHEET, TYPE G
					1462			630	80204	1462	SQ FT	SIGN, EXTRUSHEET, TYPE G
					46			630	84500	46	EACH	GROUND MOUNTED BEAM SUPPORT FOUNDATION
					70			630	84900	70	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL
					1			630	85100	1	EACH	REMOVAL OF GROUND MOUNTED SIGN AND REERECTION
					8			630	85400	8	EACH	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL
					68			630	86002	68	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL
					14			630	86102	14	EACH	REMOVAL OF GROUND MOUNTED BEAM SUPPORT AND DISPOSAL
						14.93		642	00100	14.93	MILE	EDGE LINE, TYPE I
						6.64		642	00200	6.64	MILE	LANE LINE, TYPE I
						0.06		642	00300	0.06	MILE	CENTER LINE, TYPE I
						2980		642	00400	2980	LIN FT	CHANNELIZING LINE, TYPE I
						138		642	00500	138	LIN FT	STOP LINE, TYPE I
						1965		642	00700	1965	LIN FT	TRANSVERSE LINE, TYPE I
						1		642	01300	1	EACH	LANE ARROW, TYPE I
						1		642	01400	1	EACH	WORD ON PAVEMENT, 72", TYPE I

CALC. BY: BPS DATE: 10/95
CHKD. BY: VDK DATE: 3/96

TRAFFIC AND TRAFFIC CONTROL GENERAL SUMMARY

MAINTENANCE OF TRAFFIC

BEL/JEF-7-23.76/0.00

9/6/96 RRB 1993TCGS FINAL

						630																					
REF. NO.	SHEET NO.	STATION EXISTING/NEW	SIDE	SIGN CODE	SIZE	REMOVAL OF GROUND MOUNTED SIGN & DISPOSAL	REMOVAL OF GROUND MOUNTED SIGN & REERECTION	REMOVAL OF GROUND MOUNTED MAJOR SIGN & DISPOSAL	REMOVAL OF GROUND MOUNTED POST SUPPORT & DISPOSAL	REMOVAL OF GROUND MOUNTED BEAM SUPPORT & DISPOSAL	SIGN, FLAT SHEET	SIGN, FLAT SHEET, TYPE G	SIGN, EXTRUSHEET, TYPE G	GROUND MOUNTED SUPPORTS, NO. 2 POST	GROUND MOUNTED SUPPORTS, NO. 3 POST	GROUND MOUNTED SUPPORTS, NO. 4 POST		GROUND MOUNTED SUPPORTS, S4x7.7 BEAM	GROUND MOUNTED SUPPORTS, W10x12 BEAM	GROUND MOUNTED SUPPORTS, W8x18 BEAM	GROUND MOUNTED SUPPORTS, W10x22 BEAM	ONE WAY SIGN SUPPORT NO. 4 POST	ONE WAY SIGN SUPPORT NO. 3 POST	BREAKAWAY BEAM CONNECTION	GROUND MOUNTED BEAM SUPPORT FOUNDATION
						EACH	EACH	EACH	EACH		SQ. FT.	SQ. FT.	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.		LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH
1	56	1256+10	Rt.	NO WORK																					
2	56	1262+50/1262+53	Rt.	GM-1	132" x 36"	1			2				33					15.1/16.4							2
3	56	1265+12/1260+00	Lt.	IM-26-21	21" x 15"	3			1		2.19				13										
				N-29-24	24" x 24"						4														
4	56	1266+31/1264+25	Lt.	M-2-30-2	30" x 30"	2			1		6.25				15										
				M-38-30	30" x 15"						3.13														
5	56	1267+56	Lt.	GN	144" x 36"	1	1		2				36						18.2/22.2						2
6	56	1268+42	Lt.	R-1-36	36" x 36"	1			1			9			14										
7	56	1269+96/1270+01	Rt.	M-2-30-2	30" x 30"	2			1		6.25				15										
				M-37-30	30" x 15"						3.13														
8	56	1272+00/1271+73	Lt.	N-45-12	12" x 13"	1			1		1.1			12											
9	56	1272+00/1271+73	Rt.	N-45-12	12" x 13"	1			1		1.1			12											
10	56	1274+03/1266+25	Lt.	R-10-36	36" x 48"	2			1		12				14.5/15										
11	56	1277+99/1267+56	Rt.	R-10-36	36" x 48"	1			1		12				14.5/15										
12	56,57	1279+99/1272+65	Lt.	R-11A-36	36" x 48"	1			1		12				14.5/15										
13	57	1285+02/1285+00	Rt.	GJ	180" x 48"			1	2				60						20.5/24.9						2
14	57	1295+02/1288+00	Rt.	GB	168" x 84"			1		2			98						21.8/24.6						2
15	58	1306+01/1306+00	Lt.	GJ	132" x 48"			1	2				44						23.8/17.5					2	2
16	58	1309+97/1310+02	Lt.	W-139F-48	48" x 48"	1			2		16				14.5/15										
17	58	1315+88/1316+00	Lt.	R-10-36	36" x 48"	1			2		12				14.5/15										
18	58	1314+50	Rt.	GB	168" x 84"								98								24/28.4				2
19	58	1324+72/1324+53	Rt.	N-45-12	12" x 13"	1			1		1.1			12											
20	58	1324+72/1324+53	Lt.	N-45-12	12" x 13"	1			1		1.1			12											
21	58	1325+93/1326+00	Lt.	M-38-30	30" x 15"	2			1		3.13				15										
				M-2-30-2	30" x 30"						6.25														
22	59	1334+00/1334+05	Rt.	GE	168" x 84"			1		2			98							22.5/22					2
23	59	1342+21/1342+50	Rt.	GF	72" x 60"	1				2			30					17.7/18.2						2	2
24	59	1345+08	Lt.	W-49R-48	48" x 48"	1			1		16				14.5/15										
25	59	1345+95/1346+00	Rt.	R-41A-36	36" x 24"	2			2			6				12.5/13.5									
				D-4A-24	132" x 24"								22												
26	59	1346+12/1346+15	Rt.	R-41A-36	36" x 24"	1			1			6			14										
27	59	1348+42	Rt.	R-1-48	48" x 48"	1			1			16			15/15										
				R-41B-36	36" x 36"							9													
28	59	1348+66	Rt.	R-1-48	48" x 48"	4			1			16			15								15		
				R-41B-36	36" x 36"							9													
				R-43L-48	48" x 18"							6													
				R-43R-48	48" x 18"							6													
29	59	1349+79	Rt.	M-52A-108	108" x 30"	1			2				22.5					15.7/14.9							2
30	59	1350+12/1349+75	Rt.	GB	168" x 84"			1		2			98							22.2/21.9					2
31	59	1351+50	Lt.	M-45-42	42" x 60"	1			2				17.5		16.5/16.5										
32	59	1351+70	Rt.	R-41B-36	36" x 36"	3			1			9			15								15		
				R-43L-48	48" x 18"							6													
				R-2-60	60"x60"x60"							10.83													
33	59	1351+70/1351+75	Lt.	R-2-60	60"x60"x60"	1			1			10.83			15/15										
34	60	1354+11/1354+15	Lt.	R-41A-36	36" x 24"	1			1			6			14										
35	60	1354+19/1354+24	Lt.	R-41A-36	36" x 24"	2			2			6			14.5/15										
				D-4A-24	132" x 24"								22												
TOTAL THIS SHEET						41	1	5	39	8	118.73	131.66	679.00	48	429.5	26		98.0	173.5	88.6	52.4	0	30	4	20

TOTALS CARRIED TO SHEET NO. 55.

CALC. ATH DATE: 10/95
CHKD. VDK DATE: 3/96

SIGN INVENTORY

BEL/JEF-7-23.76/0.00

FINAL 1993SIGN1 RRB 9/3/96

						630																										
REF. NO.	SHEET NO.	STATION EXISTING/NEW	SIDE	SIGN CODE	SIZE	REMOVAL OF GROUND MOUNTED SIGN & DISPOSAL	REMOVAL OF GROUND MOUNTED SIGN & REERECTION	REMOVAL OF GROUND MOUNTED MAJOR SIGN & DISPOSAL	REMOVAL OF GROUND MOUNTED POST SUPPORT & DISPOSAL	REMOVAL OF GROUND MOUNTED BEAM SUPPORT & DISPOSAL	SIGN, FLAT SHEET	SIGN, FLAT SHEET, TYPE G	SIGN, EXTRUSHEET, TYPE G	GROUND MOUNTED SUPPORTS, NO. 2 POST	GROUND MOUNTED SUPPORTS, NO. 3 POST	GROUND MOUNTED SUPPORTS, NO. 4 POST		GROUND MOUNTED SUPPORTS, SAx7.7 BEAM		GROUND MOUNTED SUPPORTS, W10x12 BEAM	GROUND MOUNTED SUPPORTS, W8x18 BEAM	GROUND MOUNTED SUPPORTS, W10x22 BEAM		ONE WAY SIGN SUPPORT NO. 3 POST	BREAKAWAY BEAM CONNECTION	GROUND MOUNTED BEAM SUPPORT FOUNDATION
						EACH	EACH	EACH	EACH	EACH	SQ. FT.	SQ. FT.	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.		LIN. FT.		LIN. FT.	LIN. FT.	LIN. FT.		LIN. FT.	EACH	EACH
36	60	1356+11/1356+15	Rt.	W-49R-48	48" x 48"	1			1		16				14.5/15											
37	60	1358+90/1358+50	Lt.	GF	72" x 60"	1			2				30					17.7/17.8							2	2
38	60	1367+09/1367+15	Lt.	GE	168" x 84"			1		2			98								21.5/22.6				2	2
39	60	1377+54/1377+22	Rt.	N-45-12	12" x 13"	1			1		1.1			12												
40	60	1377+54/1377+22	Lt.	N-45-12	12" x 13"	1			1		1.1			12												
41	61	1380+11/1375+00	Rt.	M-37-30	30" x 15"	2			1		3.13				15											
				M-2-30-2	30" x 30"						6.25															
42	61	1384+50/1384+55	Lt.	GJ	132" x 48"	1			2				44							18.7/20.2						2
43	61	1386+09/1386+15	Lt.	W-139F-48	48" x 48"	1			1		16				14.5/15											
44	61	1386+96/1387+00	Lt.	GB	168" x 84"			1		2			98									24/28.3				2
45	61	1387+13/1387+18	Rt.	GN	108" x 36"	1			2				27					16.0/17.7								2
46	61	1389+69/1389+75	Lt.	W-76D-36	36" x 36"	1			1		9				15											
47	61	1390+40	Rt.	GB	156" x 84"								91									23.8/28.1			2	2
48	61	1395+13/1392+00	Lt.	R-10-36	36" x 48"	1			2		12				14.5/15											
49	61	1400+20	Lt.	GB	168" x 84"								98							20.9/18.8					2	2
50	62	1404+59/1402+00	Lt.	M-38-30	30" x 15"	2			1		3.13				15											
				M-2-30-2	30" x 30"						6.25															
51	62	1407+50	Rt.			2			1																	
52	62	1408+06/1408+10	Rt.	GE	156" x 84"			1		2			91							19.5/18.2						2
53	62	1415+72/1415+64	Rt.	GP	96" x 48"	2			2				32					16.6/15.4								2
54	62	1415+76/0+00	Lt.	GP	108" x 48"	2			2				36							19.0/21.7						2
55	62	0+85/1+30	Rt.	GF	72" x 60"	1			2				30					17.5/18.4							2	2
56	62	1+40	Rt.	NO WORK																						
57	62	3+05/3+10	Lt.	W-49R-48	48" x 48"	1			1		16				14.5/15											
58	62	6+65/6+70	Rt.	D-4A-24	120" x 24"	2			2				20		14/15											
				R-41A-36	36" x 24"							6														
59	62	6+65	Lt.			1			1																	
60	62	6+68/6+67	Rt.	R-41A-36	36" x 24"	3			1			6		13												
61	62	7+65	Lt.			1			1																	
63	62	8+40	Rt.			1			1																	
64	56	1274+65	Lt.	GM-1	132" x 36"								33							22.9/16.7					2	2
65	57	1282+65	Lt.	W-26-48	48" x 48"						16				17.7/18.3											
66	57	1295+00	Lt.	GM	132" x 60"								55							24.8/18.8					2	2
67	61	1384+00	Rt.	R-10-36	36" x 48"						12				15.2/15.5											
TOTAL THIS SHEET						29	0	3	29	6	117.96	12	783	37	258.7	0		137.1		235.1	44.1	104.2		0	14	26
TOTAL PREVIOUS SHEET						41	1	5	39	8	118.73	131.66	679	48	429.5	26		98		173.5	88.6	52.4		30	4	20
Totals Carried to Traffic Control General Summary						**70**	**1**	**8**	**68**	**14**	**237**	**144**	**1462**	**85**	**688**	**26**		**236**		**409**	**133**	**157**		**30**	**18**	**46**

CALC. ATH BY: DATE: 10/95
CHKD. VDK BY: DATE: 3/95

SIGN INVENTORY

BEL./JEF-7-23.76/0.00

9/8/98 RBB 1993SIGN2 FINAL

For Signing Details, See Sheet No. 65-68 .
For Quantities, See Sheet No. 54 & 55 .

LEGEND

- ~ Existing Sign – No Work
- ~ Existing Sign and Support – To Be Removed
- ~ Existing Sign – To Be Removed and Reerected
- ~ New Sign on New Supports

STICKLEN – BELSHEIM & ASSOCIATES

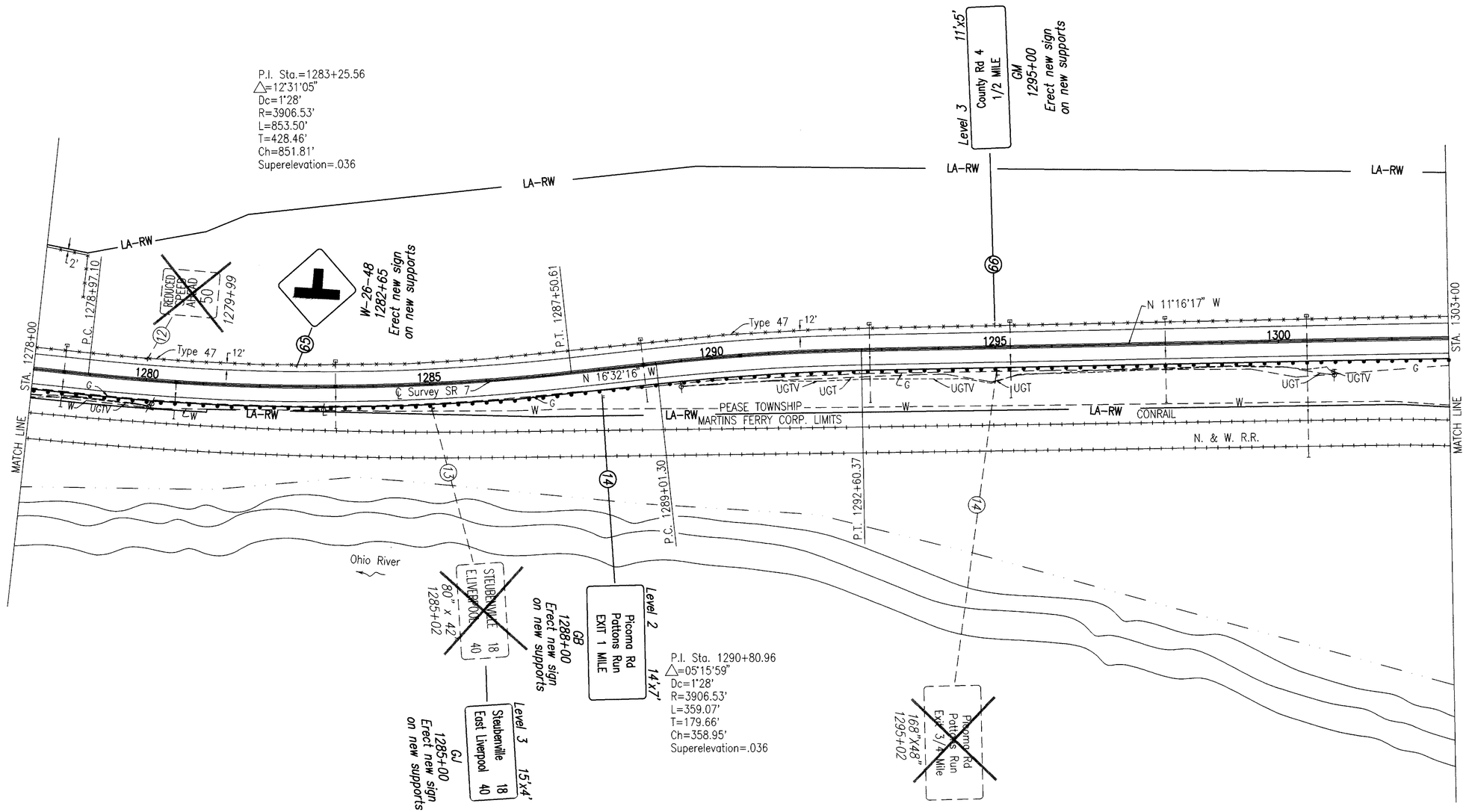
CALC. DAM DATE: 5/96
BY: DRWD. VDK DATE: 3/96

HORIZONTAL SCALE IN FEET
0' 100' 200'

SIGNING PLAN
STA 1252+00 TO STA 1278+00

BEL/JEF-7-23.76/0.00

56/94



For Legend, See Sheet No. 56 .
For Quantities, See Sheet No. 54 & 55 .
For Signing Details, See Sheet No. 65-68 .

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. BY: DAM DATE: 5/96
CHKD. BY: VDK DATE: 3/96

SIGNING PLAN
STA 1278+00 TO STA 1303+00

BEL/JEF-7-23.76/0.00

57
94

STICKLEN – BELSHEIM & ASSOCIATES

P.I. Sta. 1307+25.80
△=07°26'13"
Dc=1°28'
R=3906.53'
L=507.06'
T=253.89'
Ch=506.71'
Superelevation=.036

Level 3 11'x4'
Bridgeport 3
Marietta 82
GJ
1306+00
Erect new sign on new supports

FALLING ROCK
W-139F-48
1310+02
Erect new sign on new supports

P.I. Sta. 1315+99.48
△=12°09'03"
Dc=1°28'
R=3906.53'
L=828.47'
T=415.79'
Ch=826.91'
Superelevation=.036

SPEED LIMIT 55
R-10-36
1316+00
Erect new sign on new supports

BEL-7 25
N-45-12
1324+53
Erect new sign & support

M-38-30
SOUTH
7
M-2-30-2
1326+00
Erect new sign on new support

BRIDGEPORT 3 MARIETTA 82
1306+01

FALLING ROCK
1309+97

SPEED LIMIT 55
1315+88

SOUTH 7
1325+93

1324+72

Type 47

Type T Anchor

LA-RW

12'

2'

1305

1310

1315

1320

1325

℄ Survey SR 7

N 15°59'07" W

STA. 1303+00

STA. 1328+00

P.C. 1304+71.91

P.T. 1309+78.97

P.C. 1311+83.69

P.T. 1320+12.16

PEASE TOWNSHIP
MARTINS FERRY CORP. LIMITS

CONRAIL
N. & W. R.R.

MATCH LINE

Level 2 14'x7'
Pattons Run
Picoma Rd
EXIT 1/2 MILE

GB
1314+50
Erect new sign on new supports

BEL-7 25
N-45-12
1324+53
Erect new sign on new support

For Legend, See Sheet No. 56 .
For Quantities, See Sheet No. 54 & 55 .
For Signing Details, See Sheet No. 65-68 .

STICKLEN – BELSHEIM & ASSOCIATES

CALC. DAM DATE: 5/96
CHKD. VDK DATE: 3/96

HORIZONTAL SCALE IN FEET
0' 100' 200'

SIGNING PLAN
STA 1303+00 TO STA 1328+00

BEL/JEF-7-23.76/0.00

58/94

PI Sta. 1335+39.12
△=27°59'27"
Dc=4°
R=1432.39'
Lc=299.77'
Θs=8°
Ls=400.00'
Ts=558.05'
LT=266.94'
ST=133.58'
Es=48.62'
Superelevation=.083

CURVE DATA
P.I. Sta. 1335+39.12
△=27°59'27"
Dc=4°00'00"
R=1432.39'
Lc=299.77'
Ls=400.00'
Ts=558.05'
Θs=8°00'00"
Es=48.62'
SSD = 308' (NDC = 450')

For Legend, See Sheet No. 56 .
For Quantities, See Sheet No. 54 & 55 .
For Signing Details, See Sheet No. 65–68 .

STICKLEN – BELSHEIM & ASSOCIATES

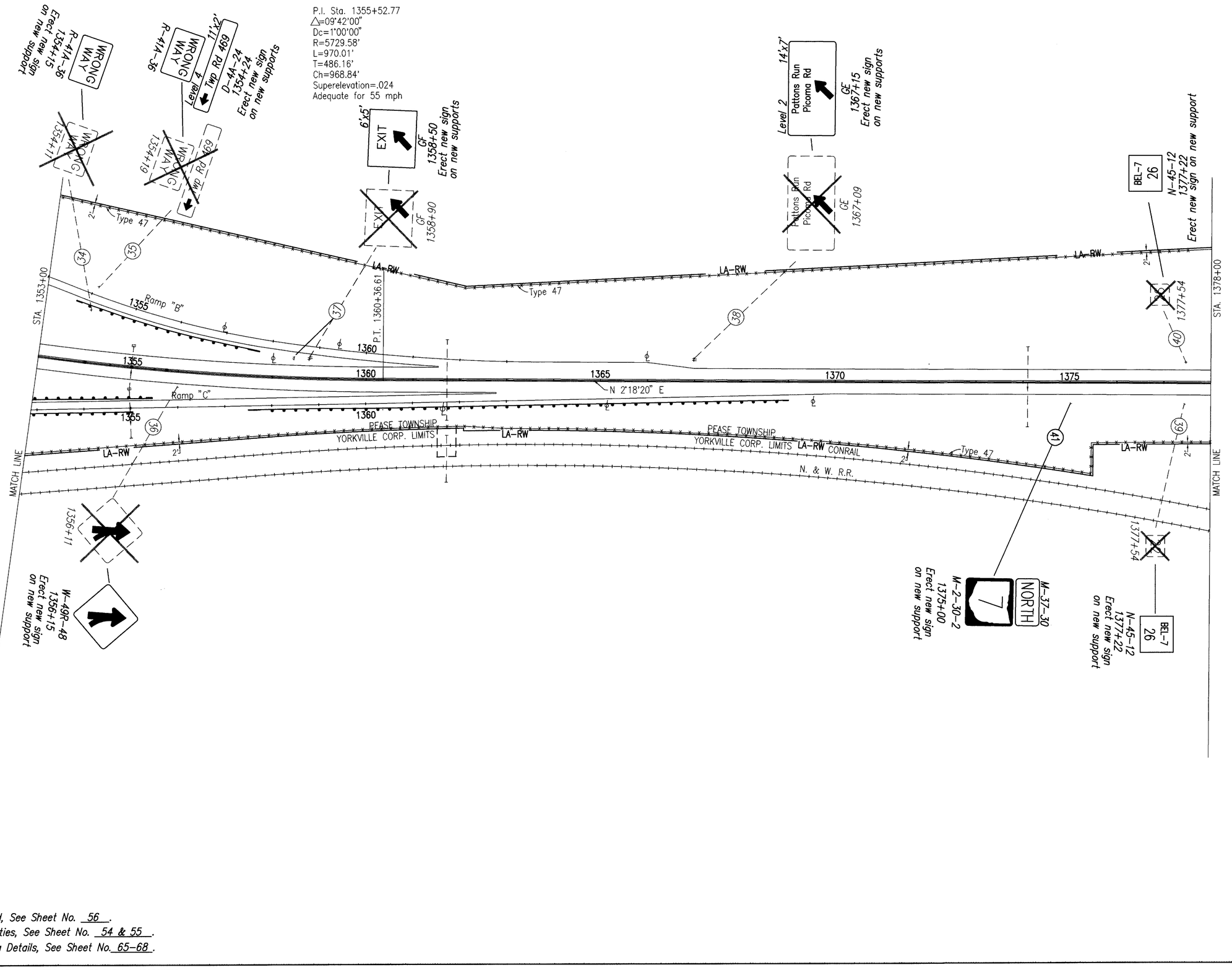
CALC. DAM 5/96
BY:
DATE:
CHKD. VDK 3/96
BY:
DATE:

HORIZONTAL SCALE IN FEET
0' 100' 200'

SIGNING PLAN
STA 1328+00 TO STA 1353+00

BEL/JEF-7-23.76/0.00

59
94



For Legend, See Sheet No. 56 .
For Quantities, See Sheet No. 54 & 55 .
For Signing Details, See Sheet No. 65–68 .

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. JCM DATE: 1/94
CHKD. VDK DATE: 3/96

SIGNING PLAN
STA 1353+00 TO STA 1378+00

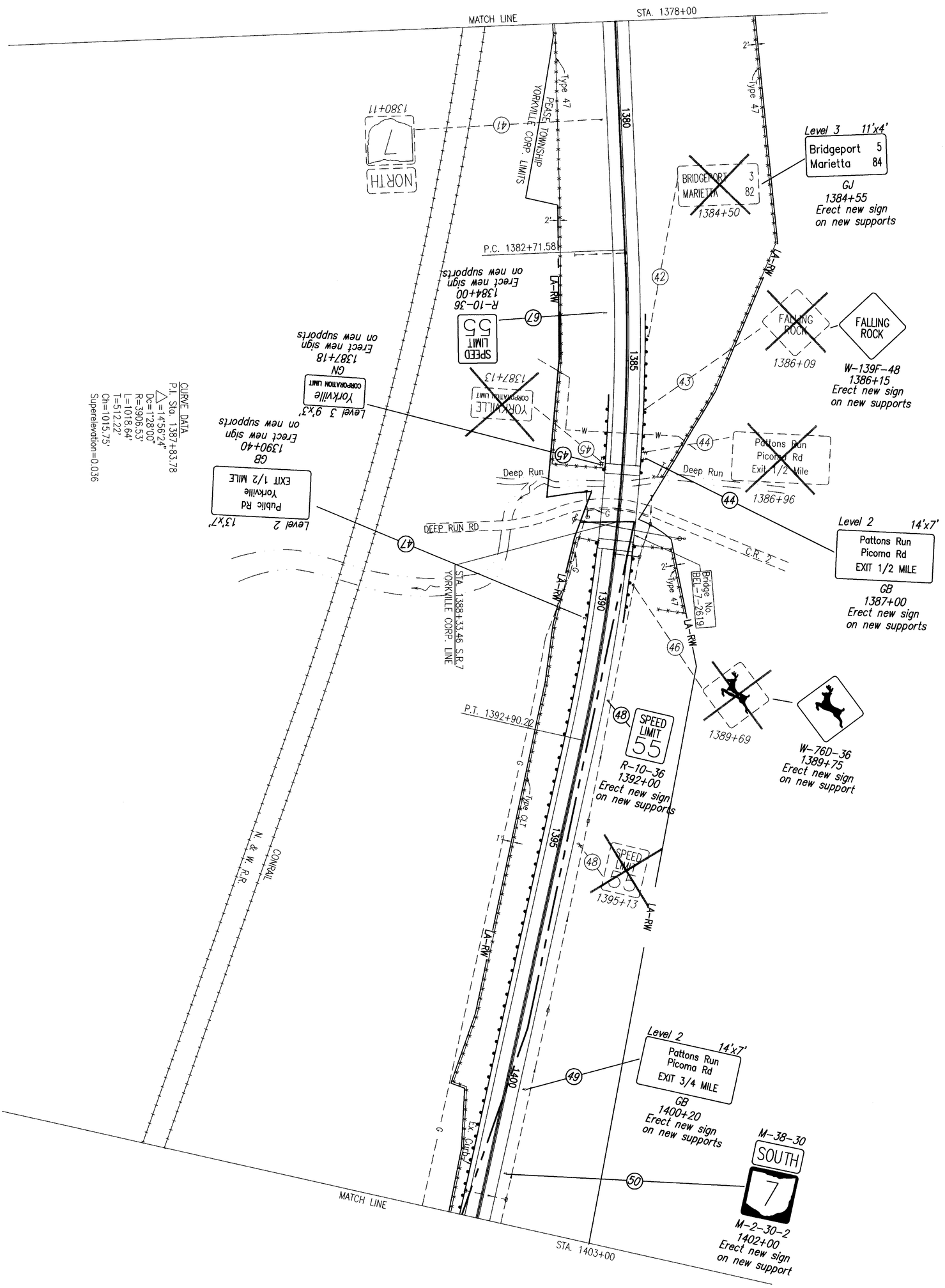
BEL./JEF-7-23.76/0.00

60
94

9/8/96 RRB 1993SP6 FINAL

STICKLEN - BELSHEIM & ASSOCIATES

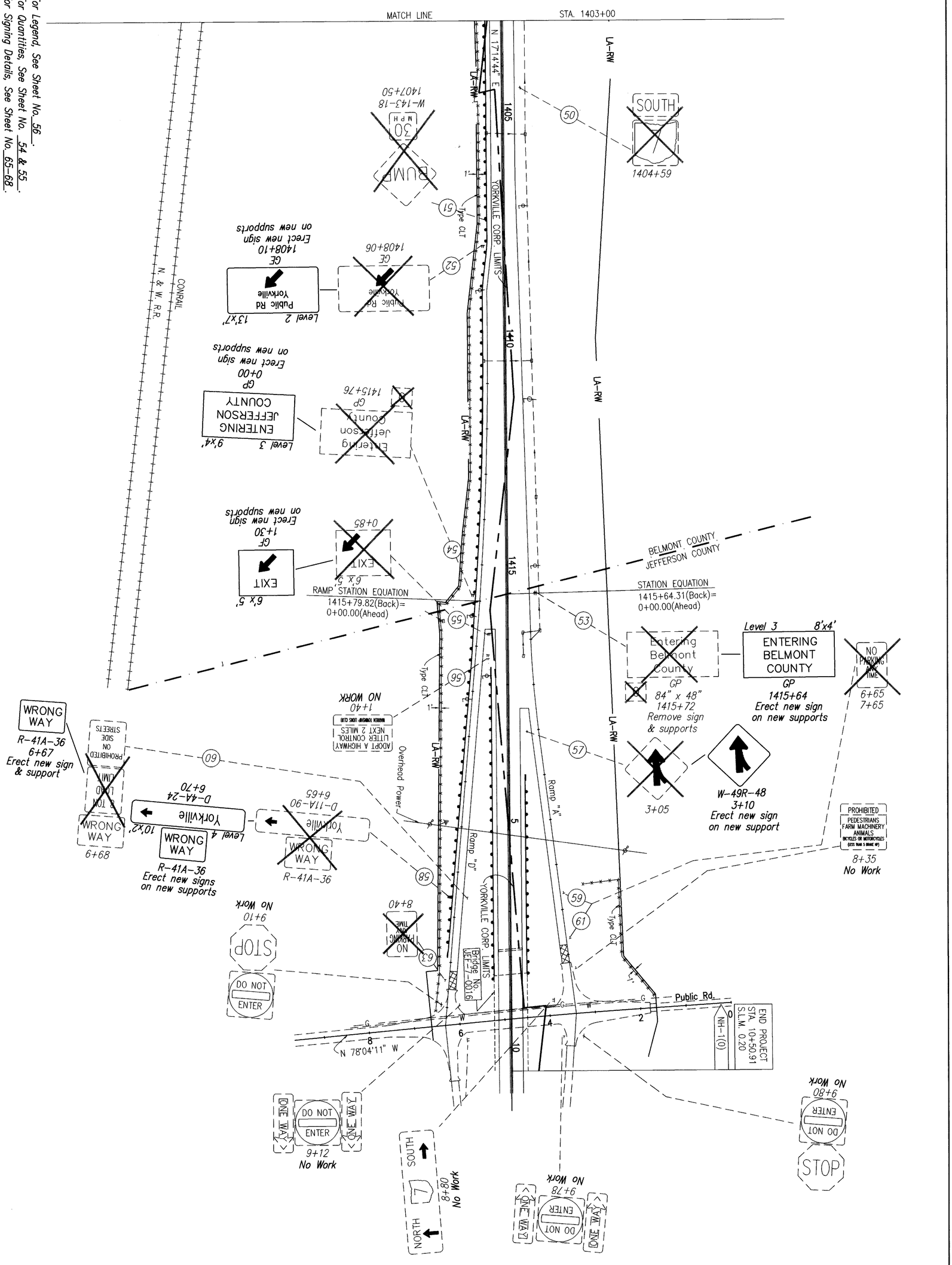
For Legend, See Sheet No. 56.
For Quantities, See Sheet No. 54 & 55.
For Signing Details, See Sheet No. 65-68.



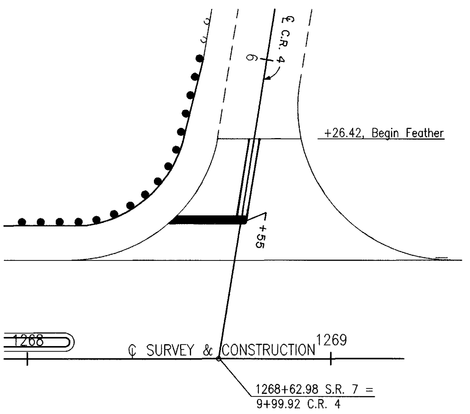
61/94	BEL/JEF-7-23.76/0.00	SIGNING PLAN STA 1378+00 TO STA 1403+00	CALC. BY: DAM DATE: 5/95 CHKD. BY: VDK DATE: 3/96	0' 100' 200' HORIZONTAL SCALE IN FEET

For Legend, See Sheet No. 56.
For Quantities, See Sheet No. 54 & 55.
For Signing Details, See Sheet No. 65-68.

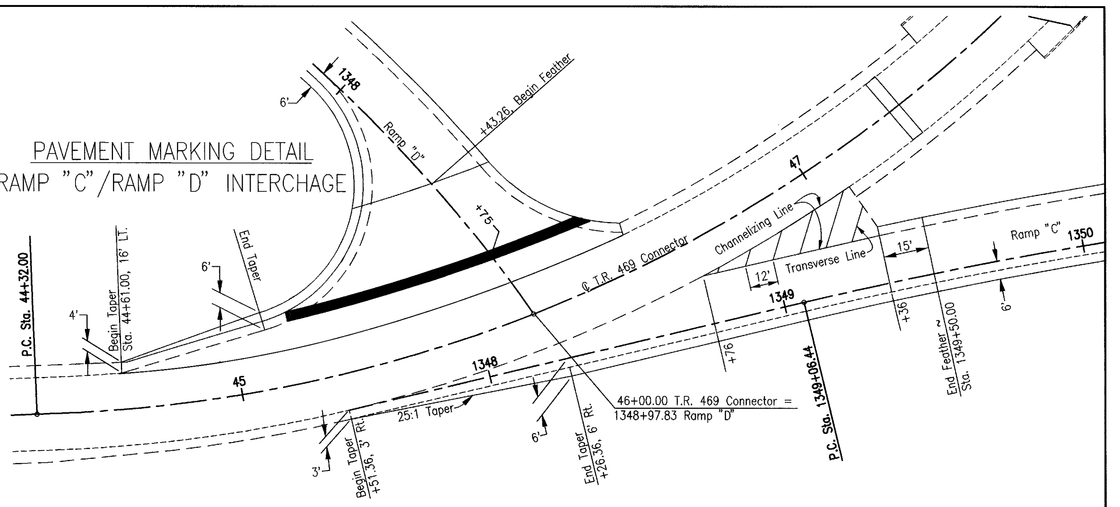
STICKLEN - BELSHEIM & ASSOCIATES



62/94	BEL/JEF-7-23.76/0.00	SIGNING PLAN STA 1403+00 TO STA 11+00	CALC. BY: DAM DATE: 5/95 CHKD. BY: VDK DATE: 5/96	0' 100' 200' HORIZONTAL SCALE IN FEET



PAVEMENT MARKING DETAIL
C.R. 4 INTERSECTION



STATION		LANE OR RAMP	SIDE	ITEM 642 – PAVEMENT MARKING, TYPE I								
				EDGE LINE		LANE LINE	CHANNEL–IZING LINE	TRANS–VERSE LINE W–WHITE Y–YELLOW	STOP LINE	LANE ARROW	WORD ON PAVEMENT 72"	CENTERLINE DOUBLE SOLID YELLOW
FROM	TO			WHITE	YELLOW							
				LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH	EACH	LIN FT
1257+00.00	1334+00.00		RT.	7700.00								
1257+00.00	1268+14.00		LT.		1114.00							
1265+62.00	1268+12.00	N	LT.				250.00			1	1	
1257+00.00	1342+10.64	O	CTR.			8510.64						
1269+25.00	1342+10.64	R	LT.		7285.64							
1342+00.0	1342+10.64	T	RT.	10.64								
1342+10.64 (BACK) = 1342+00.0		H										
1342+00.00	1362+00.00	B	RT.	2000								
1342+00.00	1415+64.31	O	LT.		7364.31							
1342+00.00	1415+64.31	U	CTR.			7364.31						
1370+00.00	1407+93.59	N	RT.	3793.59								
1415+64.31 (BACK) = 0+00.0		D										
0+00.0	10+25.91		LT.		1025.91							
0+00.0	10+25.91		CTR.			1025.91						
0+75.00	10+25.91		RT.	950.91								
1257+00.00	1268+14.00		LT.	1114.00								
1257+00.00	1268+14.00		RT.		1114.00							
1257+00.00	1342+10.64	S	CTR.			8510.64						
1269+40.00	1331+00.00	O	LT.	6160.00								
1269+25.00	1342+10.64	U	RT.		7285.64							
1339+00.00	1342+10.64	T	LT.	310.64								
1342+00.00	1415+64.31	H	RT.		7364.31							
1342+00.00	1415+64.31	B	CTR.			7364.31						
1342+00.00	1359+00.00	O	LT.	1700.00								
1367+00.00	1406+48.31	U	LT.	3948.31								
1414+48.31	1415+64.31	N	LT.	116.00								
0+00.0	10+25.91	D	LT.	1025.91								
0+00.0	10+25.91		CTR.			1025.91						
0+00.0	10+25.91		RT.		1025.91							
1336+60.00	1339+00.00	R T	RT.			240.00						
1339+00.00	1341+00.00	A R	RT.				200.00					
A – 1340+89.33	A – 1351+09.0	M 4	RT.		1019.67							
1331+00.00	1341+00.00	P 6	LT.	1000.00								
A – 1340+89.33	A – 1351+52.14	9	LT.	1062.89								
		A .										
B – 1351+46.56	B –1363+68.84		LT.	1222.28								
1363+68.84	1367+00.00	R T	LT.	331.16								
B – 1351+46.56	B – 1359+00.0	A R	RT.		753.44							
B – 1359+00.0	B – 1362+00.0	M 4	RT.				600.00					
		P 6										
1362+00.00	1364+00.00	. 9	RT.			200.00						
B – 1359+00.0	B – 1362+00.00	B .	RT.					515.0 – W				
B – 1351+70.0			RT.						19.00			
C – 1347+51.36	C – 1360+00.0	R T	RT.	1248.64								
1360+00.00	1370+00.00	A R	RT.	1000.00								
C – 1349+36.0	C – 1360+00.0	M 4	LT.		1064.00							
1360+00.00	1362+00.00	P 6	LT.				200.00					
1362+00.00	1364+40.00	9	LT.			240.00						
C – 1348+76.0	C – 1349+36.0	C .	LT.				120.00					
C – 1348+76.0	C – 1349+36.0		LT.					100 – W				
1334+00.00	1336+18.50		RT.	218.50								
D – 1336+18.5	D – 1348+50.0	R T	RT.	1329.14								
		A R										
D – 1337+20.00	D – 1338+70.0	M 4	LT.			150.00						
D – 1338+70.0	D – 1341+91.54	P 6	LT.				635.00					
D – 1338+70.0	D – 1341+91.54	9	LT.					615.00 – W				
D – 1341+91.54	D – 1348+85.0	D .	LT.		713.46							
D – 1348+75.0									98.00			
1406+48.31	1415+64.31	R P	LT.	916.00								
1415+64.31 (BACK) = 0+00.0		A U										
0+00.0	0+84.0	M B	LT.	84.00								
A – 0+84.0	A – 8+18.0	P L	LT.	734.00								
1412+08.31	1414+48.31	. I	RT.			240.00						
1414+48.31	0+84.0	A C	RT.				200.00					
A – 0+84.0	A – 8+18.0		RT.		734.00							
1407+93.56	1410+00.30		RT.	206.74								
D – 1410+00.30	D – 1415+79.82		RT.	579.52								
D–1415+79.82 (BACK) = D–0+00.0		R P										
D – 0+00.0	D – 8+60.0	A U	RT.	860.00								
1412+50.00	1415+64.31	M B	LT.				625.00					
0+00.0	0+75.0	P L	LT.				150.00					
1412+50.00	0+75.0	. I	LT.					735.00 – W				
1410+71.78	1412+50.00	D C	LT.			178.22						
D – 0+60.0	D – 8+60.0		LT.		800.00							
9+25.00	9+55.00	C	CTR.									30.00
9+55.00		R 4	RT.						21.00			
47+85.79	50+53.40	T 4	RT.	267.61								
47+85.79	50+53.40	R 6	LT.	267.61								
47+85.79	50+53.40	9	CTR.									267.61
			EACH:							1	1	
TOTALS			LIN FT:	40158.09	38664.29	35049.94	2980.00	1965.00	138.00			297.61
			MILES:	7.61	7.32	6.64						0.06
TOTALS CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY:				14.93		6.64	2980	1965	138	1	1	0.06

STICKLEN – BELSHEIM & ASSOCIATES

ITEM 620 – DELINEATORS

STATION FROM	STATION TO	LANE OR RAMP	SIDE	TYPE C POST MOUNTED	TYPE C BRACKET MOUNTED	TYPE D POST MOUNTED	SPACING	STATION FROM	STATION TO	DELINEATOR REMOVED FOR DISPOSAL
				EACH	EACH	EACH	FEET			EACH
								1257+00.00	1332+00.00	38
								1342+00.00	1358+00.00	9
								1370+00.00	1406+00.00	19
								1+00.00	10+00.00	6
								1257+00.00	1330+00.00	37
								1344+00.00	1358+00.00	8
								1368+00.00	1406+00.00	20
								3+00.00	10+00.00	5
1331+00.00	1341+00.00		LT.	5	1 @ 1339+00		200	1330+60.00	1337+00.00	9
1341+00 (BACK) = A–1340+89.33								1338+00.00	1341+00.00	4
A – 1343+00.0		RAMP A	LT.	1			200	A – 1342+00.0	A – 1344+00.0	3
A – 1344+00.0	A – 1347+00.0	TR 469	RT.			4	100	A – 1344+00.0	A – 1347+00.0	4
A – 1347+00.0	A – 1349+00.0		LT.	3			100	A – 1347+00.0	A – 1349+00.0	3
A – 1350+00.0	A – 1351+00.0		LT.	2			100	A – 1349+60.0	1351+40.0	4
B – 1351+95.0	B – 1353+95.0		LT.	3			100	B – 1351+80.0	B – 1353+00.0	3
B – 1354+00.0	B – 1358+00.0	RAMP B	RT.			5	100	B – 1354+00.0		1
B – 1358+00.0	B – 1363+00.0	TR 469	LT.	6			100	B – 1354+00.0	B – 1358+00.0	5
B–1363+68.84 (BACK) = 1363+68.84								B – 1358+00.0	B – 1367+00.0	10
1363+68.84	1367+00.00		LT.	2			200			
C – 1350+00.0	C – 1353+00.0		LT.			4	100	C – 1349+80.0	C – 1353+00.0	5
C – 1353+00.0	C – 1360+00.0	RAMP C	RT.	8			100	C – 1353+00.0	C – 1360+00.0	8
C–1360+00.0 (BACK) = 1360+00.0		TR 469								
1362+00.00	1370+00.00		RT.	5			200	C – 1361+00.0	C – 1369+00.0	9
1334+00.00	1336+00.00		RT.	2			200	1334+00.00	1336+18.50	3
1336+18.50 (BACK) = D–1336+18.50								D – 1336+18.5	D – 1337+50.0	3
D – 1338+00.0	D – 1340+00.0	RAMP D	RT.	1	1		200	D – 1338+50.0	D – 1339+50.0	2
D – 1341+00.0	D – 1346+00.0	TR 469	RT.	6			100	D – 1340+50.0	D – 1345+50.0	6
D – 1346+00.0	D – 1347+00.0		LT.			2	100	D – 1345+50.0	D – 1346+50.0	2
D – 1347+50.0	D – 1348+50.0		LT.			3	50	D – 1347+10.0		1
								D – 1347+50.0	D – 1348+70.0	4
1408+00.00	1414+00.00		LT.	4			200	1406+50.00	1415+50.00	10
1415+64.31 (BACK) = 0+00.0		RAMP A								
0+35.0		PUBLIC RD	LT.	1			200			
0+84.0 (BACK) = A – 0+84.0								A – 0+86.0	A – 7+86.0	8
A – 1+35.0	A – 8+18.0		LT.	7			100			
1408+00.00	1410+00.00		RT.	2			200	1407+94.00	1410+94.00	8
1410+00.30 (BACK) = D–1410+00.30		RAMP D								
D – 1410+00.30	D – 1414+00.0	PUBLIC RD	RT.	2			200			
D–1415+79.82 (BACK) = D–0+00.0										
D – 0+20.0	D – 8+20.0		RT.	9			100	D – 0+14.0	D – 8+14.0	9
TOTALS – CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY				69	2	18	------			266

ITEM 621 – RAISED PAVEMENT MARKER

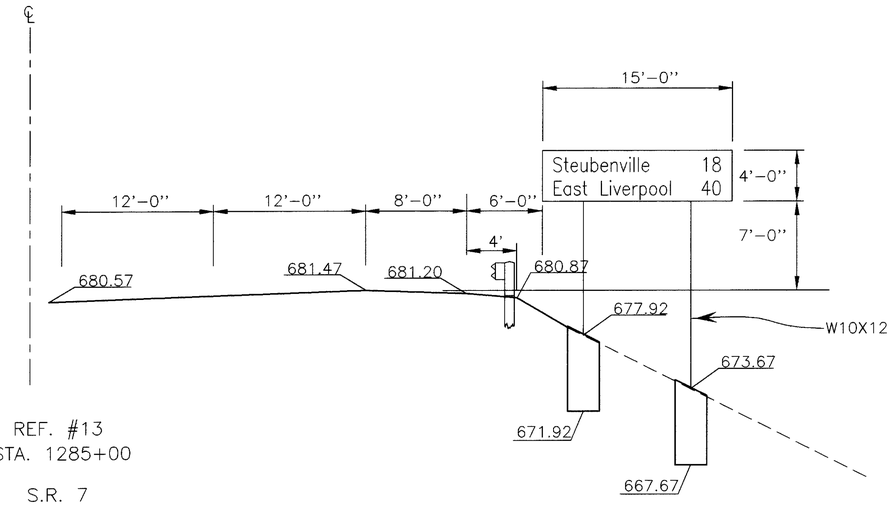
STATION FROM	STATION TO	LANE OR RAMP	LENGTH	SPACING	2–WAY WHITE/ RED	2–WAY YELLOW/ RED	1–WAY WHITE	REMARKS
FROM	TO		LIN. FT.	FEET	EACH	EACH	EACH	
1257+00.00	1268+14.00		1114.00	80	15			LANE LINE
1268+14.00	1342+10.64		7396.64	120			62	LANE LINE
1342+10.64 (BACK) = 1342+00.00								
1342+00.00	1415+64.31		7364.31	120			62	LANE LINE
1265+62.00	1268+12.00	NORTH BOUND	250	40		7		CHANNELIZING LINE
1415+64.31 (BACK) = 0+00.0								
0+00.0	10+25.91		1025.91	120			10	LANE LINE
1257+00.00	1268+14.00		1114.00	80	15			LANE LINE
1269+25.00	1285+25.00		1600.00	80	20			LANE LINE
1285+25.00	1342+10.64		5685.64	120			48	LANE LINE
1342+00.00	1415+64.31		7364.31	120			62	LANE LINE
		SOUTH BOUND						
1415+64.31 (BACK) = 0+00.0								
0+00.0	10+25.91		1025.91	120			10	LANE LINE
1339+00.00	1341+00.00	RAMP A	200.00	40	6			CHANNELIZING LINE
A – 1341+00.0	A – 1345+00.0	TR 469	400.00	80		6		YELLOW EDGE LINE
B – 1358+20.0	B – 1359+00.0	RAMP B	80.00	80		2		YELLOW EDGE LINE
1359+00.00	1362+00.00	TR 469	600.00	40	16			CHANNELIZING LINE
C – 1348+76.0	C – 1349+36.0		120.00	20	8			CHANNELIZING LINE
C – 1349+36.0	C – 1350+16.0	TR 469	80.00	80		2		YELLOW EDGE LINE
C – 1356+00.0	C – 1360+00.0	RAMP C	400.00	80		6		YELLOW EDGE LINE
1360+00.00	1362+00.00		200.00	40	6			CHANNELIZING LINE
D – 1338+70.0	D – 1341+91.54	RAMP D	635.00	40	16			CHANNELIZING LINE
D – 1341+91.54	D – 1342+75.0	TR 469	80.00	80		2		YELLOW EDGE LINE
1414+48.31	1415+64.31		116.00	40	3			CHANNELIZING LINE
1415+64.31 (BACK) = 0+00.0		RAMP A						
0+00.0	0+84.0	PUBLIC RD	84.00	40	2			CHANNELIZING LINE
A – 0+84.0	A – 4+84.0		400.00	80		5		YELLOW EDGE LINE
1413+39.31	1415+64.31		625.00	40	16			CHANNELIZING LINE
1415+64.31 (BACK) = 0+00.0		RAMP D						
0+00.0	0+75.0	PUBLIC RD	150.00	40	4			CHANNELIZING LINE
D – 0+60.0	D – 1+40.0		80.00	80		2		YELLOW EDGE LINE
TOTALS – CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY:			EACH:		127	32	254	
			TOTAL:		413			

CALC. ATH DATE: 1/95
CHKD. VDK DATE: 3/96

TRAFFIC CONTROL

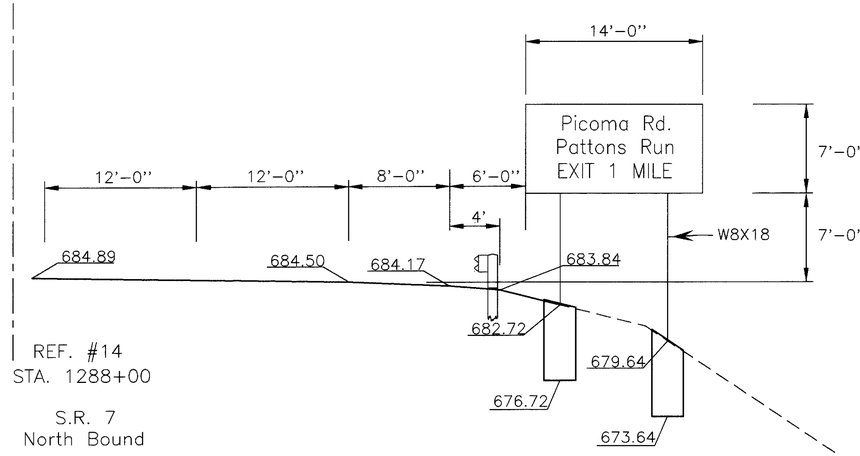
BEL/JEF-7-23.76/0.00

5/5/98 RBB 1903PMAX FINAL



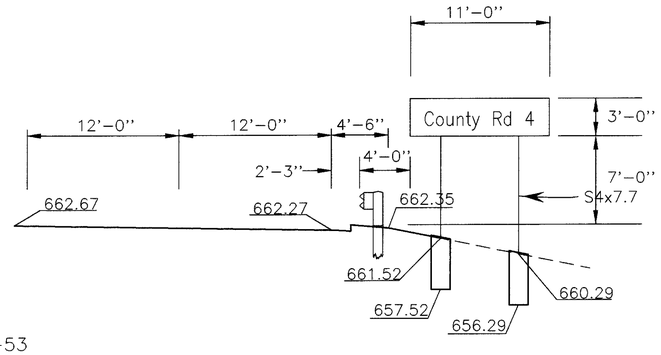
REF. #13
STA. 1285+00

S.R. 7
North Bound



REF. #14
STA. 1288+00

S.R. 7
North Bound

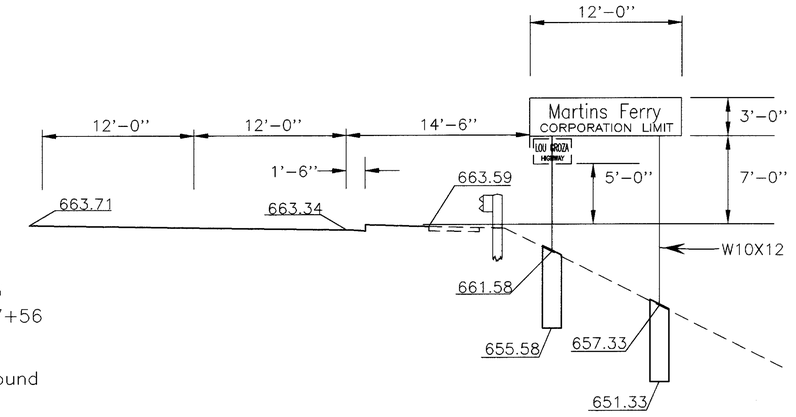


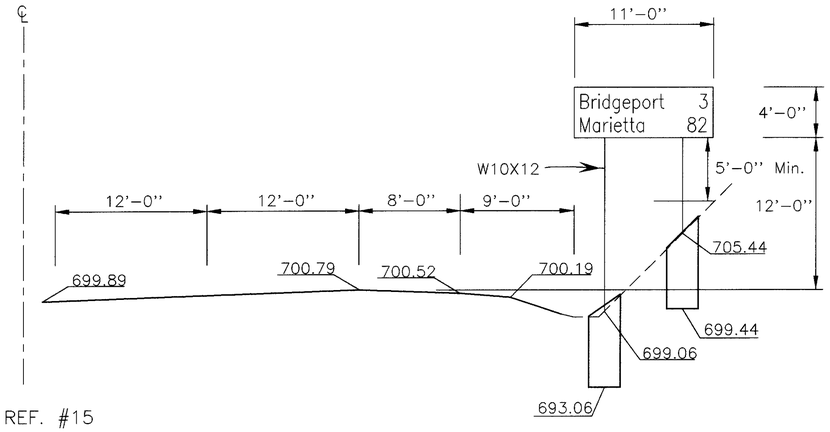
REF. #2
STA. 1262+53

S.R. 7
North Bound

REF. #5
STA. 1267+56

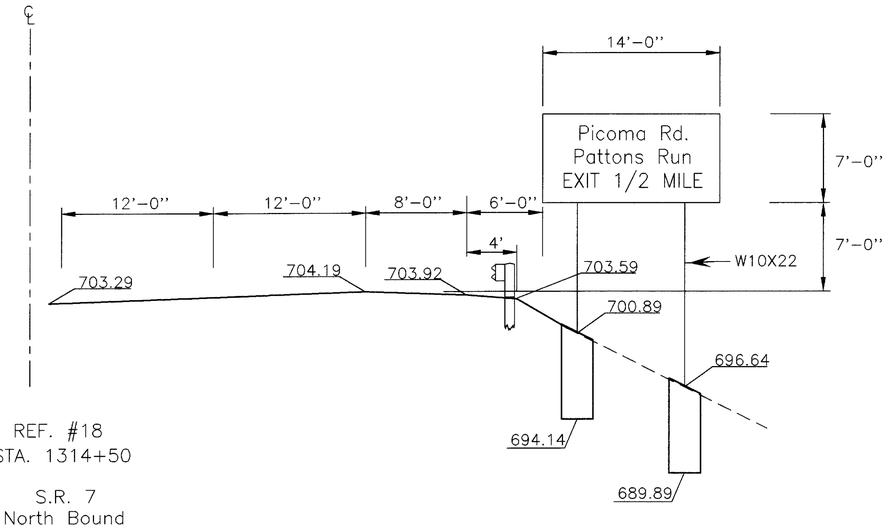
S.R. 7
South Bound





REF. #15
STA. 1306+00

S.R. 7
South Bound



REF. #18
STA. 1314+50

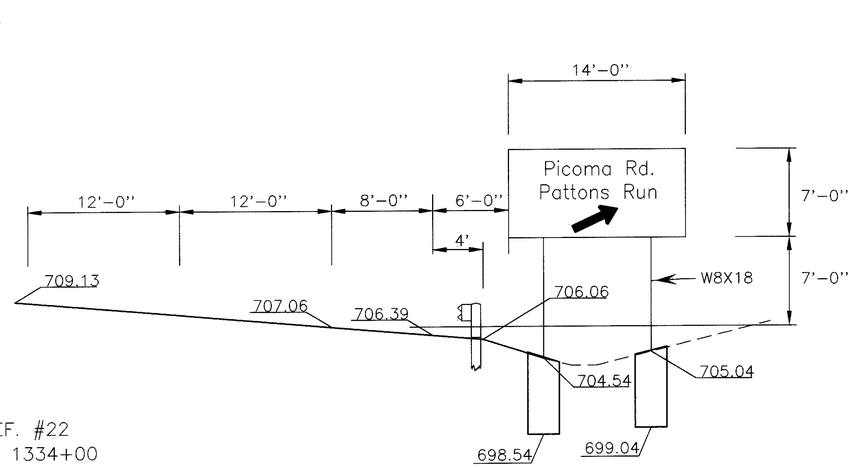
S.R. 7
North Bound

CALC. ATH
BY: 10/95
DATE:
CHKD. VDK
BY:
DATE: 3/96

SIGNING DETAILS

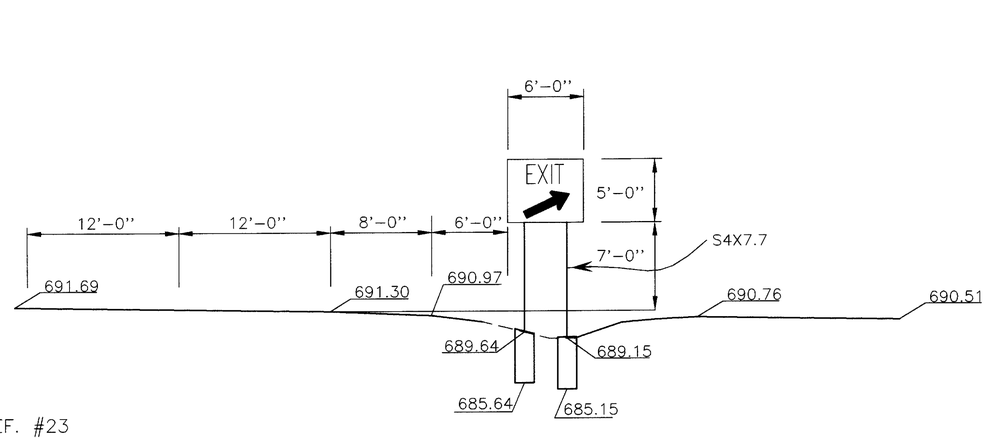
BEL/JEF-7-23.76/0.00

FINAL
1993011
PRB
9/9/96



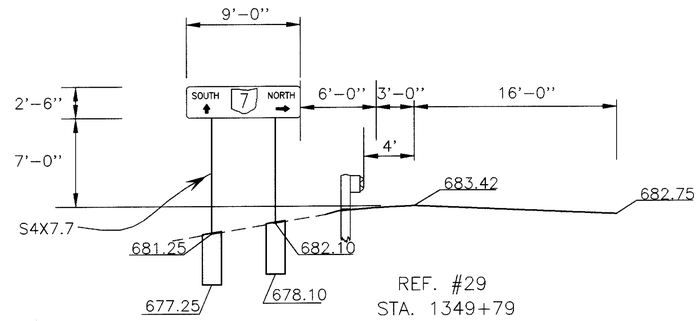
REF. #22
STA. 1334+00

S.R. 7
North Bound



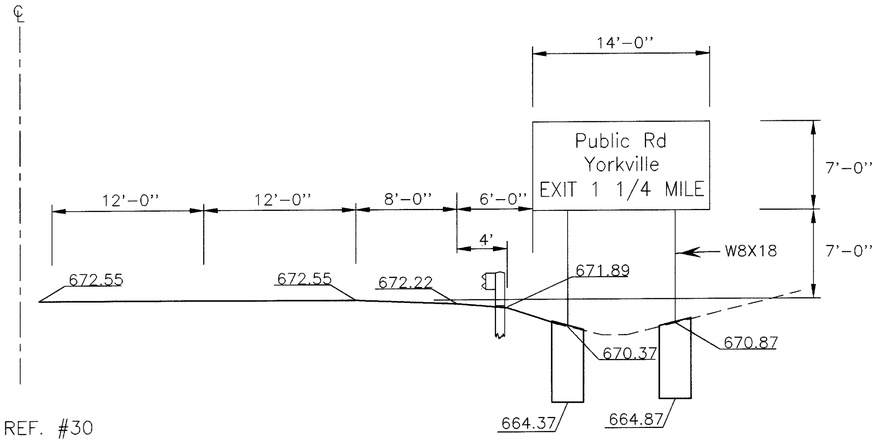
REF. #23
STA. 1342+50

S.R. 7
North Bound



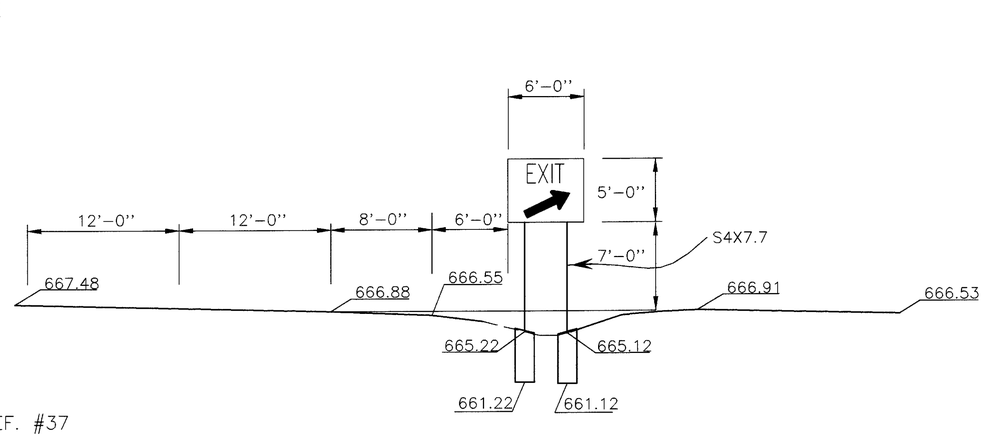
REF. #29
STA. 1349+79

S.R. 7
North Bound (Ramp "C")



REF. #30
STA. 1349+75

S.R. 7
North Bound



REF. #37
STA. 1358+50

S.R. 7
South Bound

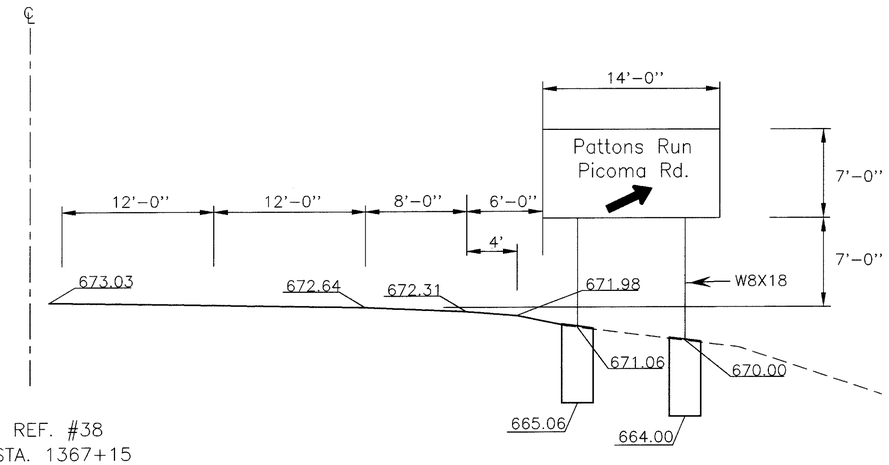
CALC. ATH
BY:
DATE: 10/95
CHKD. VDK
BY:
DATE: 3/96

SIGNING DETAILS

BEL/JEF-7-23.76/0.00

66
94

FINAL
RRB
10/03/072
9/8/94



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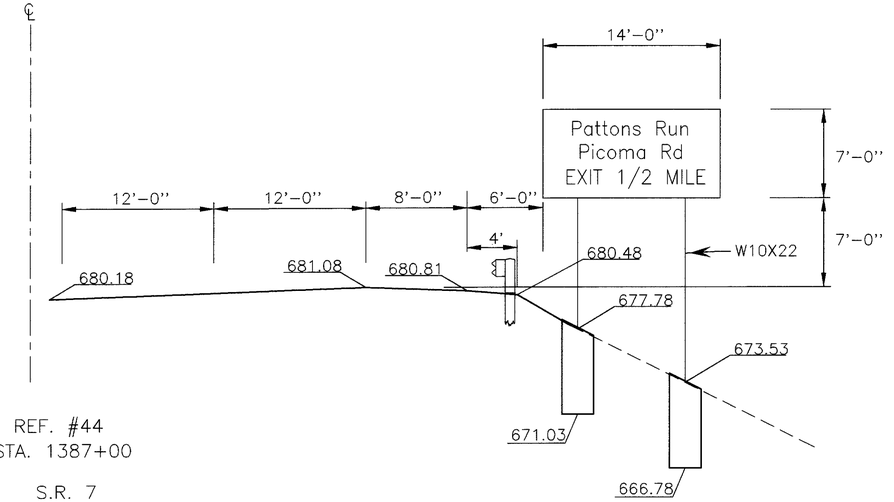
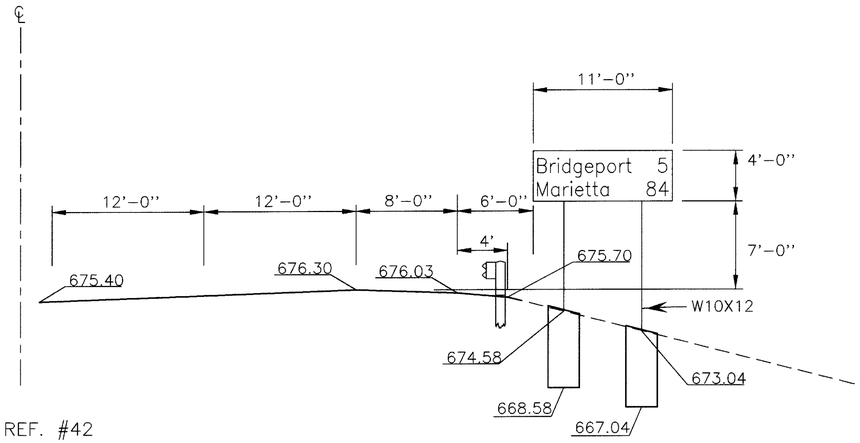
STA. 1367+15

S.R. 7
South Bound



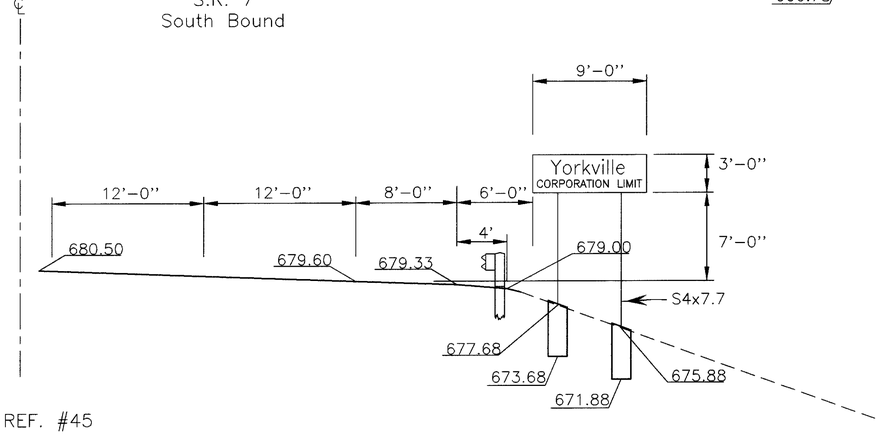
REF. #44
STA. 1387+00

S.R. 7
South Bound



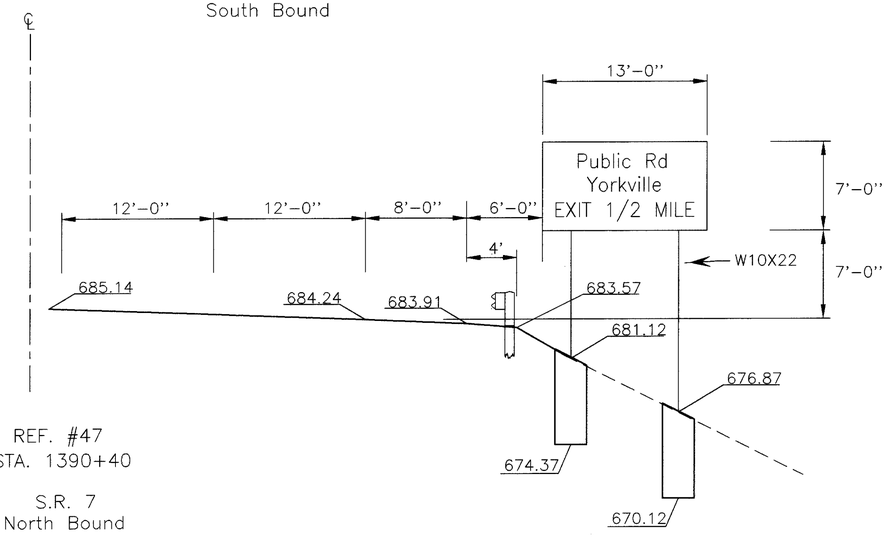
REF. #42
STA. 1384+55

S.R. 7
South Bound



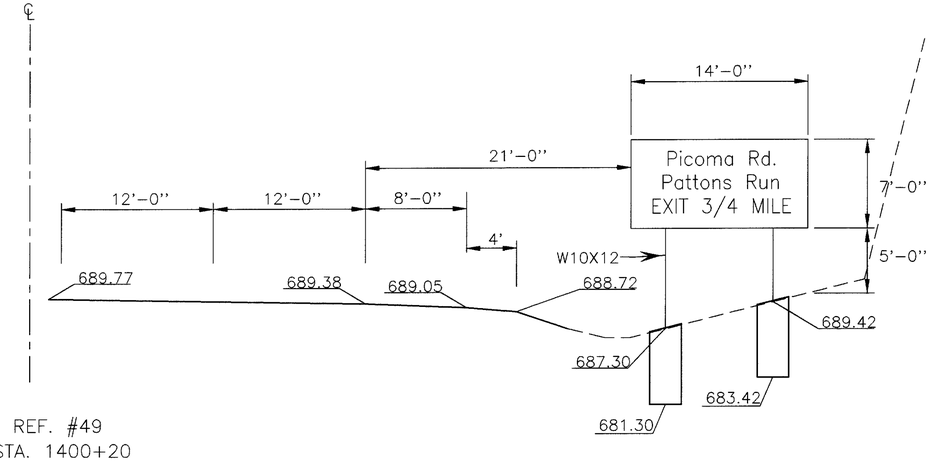
REF. #45
STA. 1387+18

S.R. 7
North Bound



REF. #47
STA. 1390+40

S.R. 7
North Bound



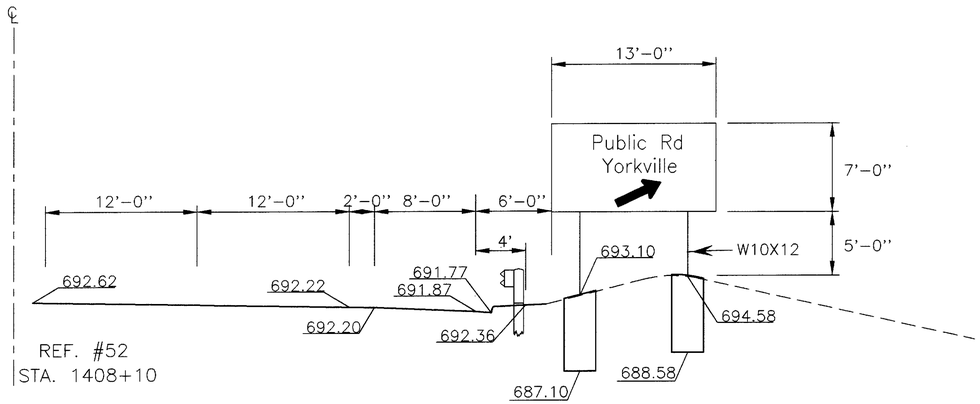
REF. #49
STA. 1400+20

S.R. 7
South Bound

CALC. ATH
BY: ATH
DATE: 10/95
CHKD. VDK
BY:
DATE: 3/96

SIGNING DETAILS

BEL/JEF-7-23.76/0.00



REF. #52
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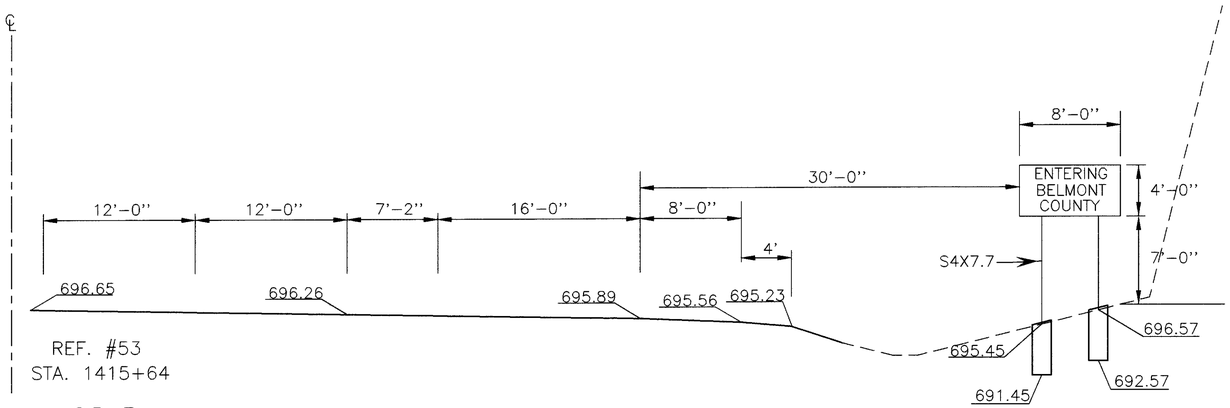
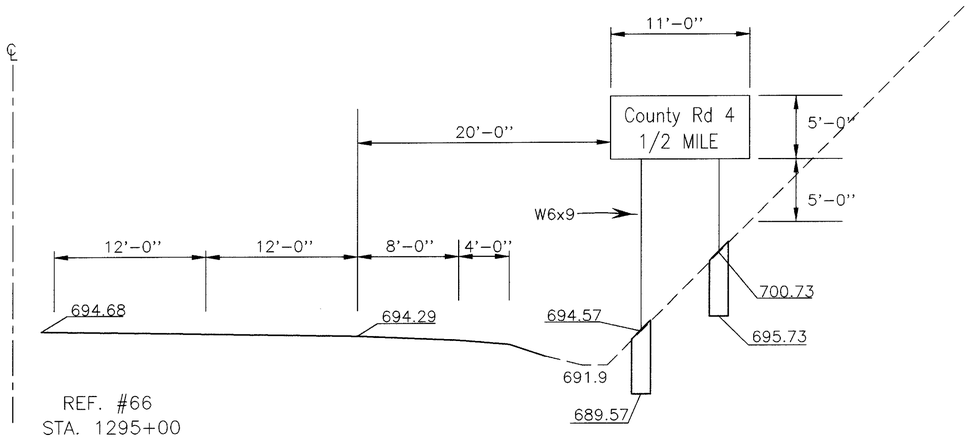
S.R. 7
North Bound



REF. #53
STA. 1415+64

S.R. 7
South Bound



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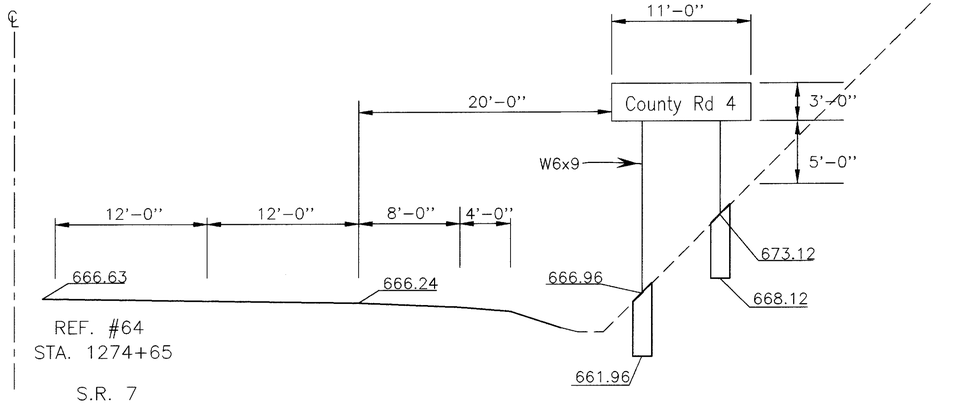
STA. 1295+00

S.R. 7
South Bound



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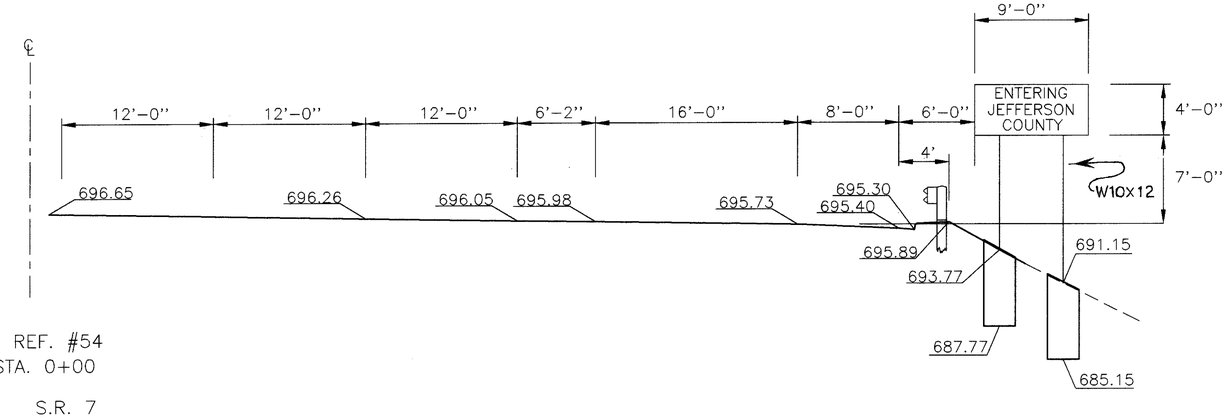
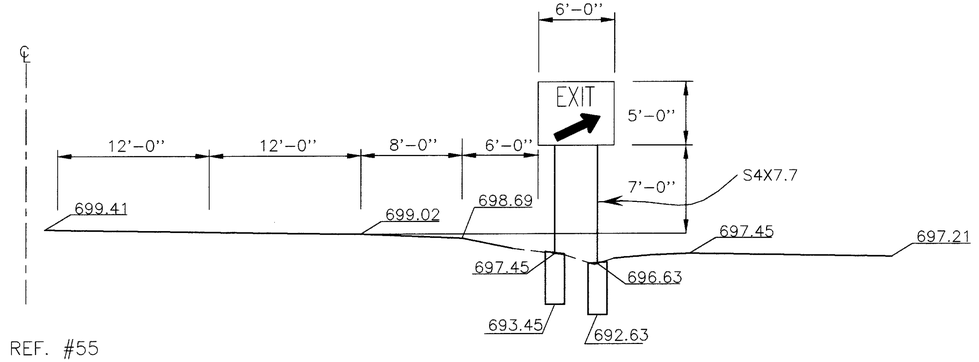
STA. 1274+65

S.R. 7
South Bound



REF. #54
STA. 0+00

S.R. 7
North Bound



REF. #55
STA. 1+30

S.R. 7
North Bound

CALC. ATH
BY:
DATE: 10/95
CHKD. VDK
BY:
DATE: 3/96

SIGNING DETAILS

BEL/JEF-7-23.76/0.00

68
94

FINAL
RW
1/9/2014
9/9/96

ITEM 625 SPECIAL–MAINTAIN EXISTING LIGHTING
THE CONTRACTOR SHALL CONSTRUCT THE NEW LIGHTING SYSTEMS IN SUCH A MANNER THAT THE ROADWAY WILL BE WITHOUT LIGHTING FOR A MINIMUM AMOUNT OF TIME AS APPROVED BY THE ENGINEER. THE CONTRACTOR WILL BE EXPECTED TO SUBMIT HIS PLANS TO THE ENGINEER FOR CONSTRUCTING THE LIGHTING SYSTEMS SO ONLY PORTIONS OF AN INTERCHANGE WILL BE WITHOUT LIGHTING FOR NOT LONGER THAN 15 CALENDAR DAYS. THE ENGINEER SHALL APPROVE THE METHOD OF CONSTRUCTING THE NEW LIGHTING SYSTEM PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL PROVIDE ANY TEMPORARY CONNECTIONS TO MAINTAIN THE LIGHTING INCLUDING ALL LABOR, MATERIAL AND EQUIPMENT NECESSARY.

THE CONTRACTOR SHALL HAVE EITHER EXISTING OR NEW HIGHWAY LIGHTING OPERATIONAL DURING THE HOLIDAY WEEKENDS, NEW YEARS DAY, (JAN. 1), MOTHERS DAY, EASTER, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, THANKSGIVING, AND CHRISTMAS (DEC 25).

PAYMENT FOR ALL OF THE ABOVE WORK WILL BE AS A LUMP SUM BID FOR ITEM 625 SPECIAL MAINTENANCE OF EXISTING LIGHTING.

CABLE SPLICES FOR CONTRACTOR'S CONVENIENCE
THE ROADWAY LIGHTING PLANS ARE DESIGNED TO HAVE ALL CABLES FOR THE LIGHTING CIRCUITS RUN IN CONTINUOUS LINESO BETWEEN SPECIFIED TERMINATION POINTS AS SHOWN IN THE PLANS. NO DIRECT BURIED IN–LINE SPLICES SHALL BE ALLOWED TO FACILITATE THE INSTALLATION OF THE CABLE, AND IN NO CASE SHALL SPLICES BE ALLOWED MERELY TO UTILIZE THE SHORT PIECES OF CABLE RATHER THAN THE CONTINUOUS PIECE CALLED OUT IN THE PLANS.

PADLOCKS AND KEYS
PADLOCKS FURNISHED SHALL BE EITHER BRASS OR BRONZE, EQUAL TO THE MASTER NO. 4BKA OR WILSON BOHANNAN 660A, AND SHALL BE KEYED IN ACCORDANCE WITH SPECIFICATION 631.08, PARAGRAPH 3. PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE BID FOR THE ITEM(S) BEING LOCKED.

625 POWER SERVICE
THE POWER SUPPLYING AGENCY FOR THIS PROJECT IS:
PUBLIC PROJECTS COORDINATOR
AMERICAN ELECTRIC POWER
215 N. FRONT ST.
COLUMBUS, OHIO 43215–2291
TELEPHONE: (614) 464–7911

ELECTRIC ENERGY FROM EXISTING POWER SERVICES SHALL CONTINUE TO BE CHARGED TO THE MAINTAINING AGENCY. THE CONTRACTOR SHALL PAY ELECTRICAL ENERGY CHARGES FOR NEW POWER SERVICE ESTABLISHED BY THIS PROJECT. UPON ACCEPTANCE OF HIGHWAY LIGHTING, THE POWER SERVICE ELECTRICAL ENERGY ACCOUNT SHALL BE TRANSFERRED TO THE MAINTAINING AGENCY. THE STATE OF OHIO SERVES AS THE MAINTAINING AGENCY FOR CONTROL CENTERS 1, 4, AND 5. THE CITY OF MARTINS FERRY WILL SERVE AS THE MAINTAINING AGENCY FOR CONTROL CENTERS 2 AND 3.

THE CONTRACTOR SHALL CONTACT AMERICAN ELECTRIC POWER TO ASCERTAIN HOOK–UP FEES HE MUST PAY FOR THE PROPOSED SERVICE. PAYMENT FOR THIS ITEM SHALL BE AT THE UNIT PRICE BID FOR THIS ITEM.

ITEM 625 POWER SERVICE, AS PER PLAN
IN ADDITION TO ITEMS 625 AND 713, THIS ITEM SHALL ALSO INCLUDE THE FOLLOWING ITEMS.

THIS ITEM SHALL CONSIST OF FURNISHING ALL EQUIPMENT AND MATERIALS NECESSARY TO PROVIDE ELECTRICAL SERVICE FOR CIRCUIT "F" AT THE PUBLIC ROAD INTERCHANGE AND INSTALLING THE CIRCUIT ON THE EXISTING 240 VOLT POWER SERVICE AT STATION 8+39 (RAMP "D").

PAYMENT FOR ALL OF THE ABOVE WORK WILL BE INCLUDED IN THE UNIT PRICE BID FOR EACH ITEM 625 POWER SERVICE, AS PER PLAN.

POLE IDENTIFICATION
ALL EXISTING LIGHT POLES THAT ARE DESIGNATED FOR RE–USE SHALL BE RELABELLED TO CORRESPOND TO THE POLE NUMBER SHOWN IN THE PLANS IF THE EXISTING POLE NUMBER DOES NOT MATCH THE PROPOSED NUMBER. RELABELING SHALL CONFORM TO ITEM 625.23. THE COST OF THIS WORK WILL BE INCIDENTAL TO AND INCLUDED IN THE VARIOUS ITEMS BID IN THIS PROJECT.

ITEM 202 POWER SERVICE REMOVED, AS PER PLAN
THIS ITEM OF WORK SHALL CONSIST OF REMOVING THE COMPLETE POWER SERVICE AND RESTORATION OF THE DISTURBED AREA. ALL ITEMS REMOVED SHALL BE THE PROPERTY OF THE CONTRACTOR EXCEPT THE DISCONNECT SWITCH ENCLOSURE AND CONTENTS, METER AND METER BASE WHICH WILL BE STORED ON THE PROJECT. THE STORED ITEMS SHALL BE CAREFULLY REMOVED AS NOT TO DAMAGE THEM. THE DISCONNECT SWITCH ENCLOSURE AND CONTENTS WILL BE PICKED UP BY THE STATE FORCES. THE METER AND METER BASE WILL BE PICKED UP BY AMERICAN ELECTRIC POWER.

THE EXISTING WOOD POLE SHALL BE REMOVED TO A MINIMUM DEPTH OF ONE FOOT BELOW EXISTING GROUND AND THE RESULTANT OPENING SHALL BE BACKFILLED TO GRADE WITH SUITABLE COMPACTED SOIL AND RESTORED TO MATCH THE SURROUNDING AREA.

PAYMENT FOR ALL OF THE ABOVE WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH ITEM 202 POWER SERVICE REMOVED, AS PER PLAN.

ITEM 625 LUMINAIRE, CONVENTIONAL: STYLE B, TYPE II, 150 WATT HPS, AS PER PLAN
ITEM 625 LUMINAIRE, CONVENTIONAL: STYLE B, TYPE III, 200 WATT HPS, AS PER PLAN
ITEM 625 LUMINAIRE, CONVENTIONAL: STYLE B, TYPE III, 250 WATT HPS, AS PER PLAN

IN ADDITION TO ITEMS 625 AND 713, STYLE B LUMINAIRES SHALL HAVE SINGLE RATED 240 VOLT, INTEGRAL REGULATOR BALLASTS FOR USE WITH HIGH PRESSURE SODIUM LAMPS AT THE WATTAGE INDICATED ON THE PLANS, AND SHALL BE GENERAL ELECTRIC M400, CROUSE HINDS OVM, AMERICAN 25/26 OR EQUAL APPROVED BY THE ENGINEER.

THE HIGH PRESSURE SODIUM LAMPS SHALL BE SYLVANIA "LUMALOX", PHILIPS "CERAMALUX", OR EQUAL APPROVED BY THE ENGINEER PAYMENT SHALL BE AT THE UNIT PRICE BID FOR THIS ITEM, COMPLETE AND IN PLACE, ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 625 LOW MAST LIGHT POLE, DESIGN ATON51.7, AS PER PLAN
IN ADDITION TO ODOT SPECIFICATIONS 625 AND 713, THE DETAILS SHOWN ON SHEET 75 SHALL APPLY.

PAYMENT FOR THIS ITEM SHALL BE AT THE UNIT PRICE BID PER EACH, COMPLETE AND IN PLACE, ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 625 LUMINAIRE, LOW MAST: STYLE B, TYPE V, 400 WATT HPS, AS PER PLAN
IN ADDITION TO ODOT SPECIFICATIONS 625 AND 713, THE DEATILS SHOWN ON SHEET 75 SHALL APPLY:

THE LUMINAIRES SHALL BE AS SPECIFIED FOR HIGH MAST LUMINAIRES IN SECTION 713.21 OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS, EXCEPT THAT THE LUMINAIRE ARRAYS AND ASSOCIATED ILLUMINATION TEST AREAS ARE HEREBY WAIVED.

THE LUMINAIRES SHALL BE SYMMETRIC, TYPE V LUMINAIRES FOR LOW MAST TOWER LIGHTING, AND MAY BE HOLOPHANE "HMST" TEST # 3683, OR GENERAL ELECTRIC "HM" TEST # 6312, OR COOPER "HAL" TEST # 48381.

PAYMENT FOR THIS ITEM SHALL BE AT THE UNIT PRICE BID PER EACH, COMPLETE AND IN PLACE, ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 625 STRUCTURE GROUNDING SYSTEM, AS PER PLAN
IT IS THE INTENT OF THIS ITEM THAT THE EXISTING STRUCTURE GROUND AT EACH OVERPASS AND UNDERPASS SHALL BE REPLACED. THIS ITEM SHALL INCLUDE THE REMOVAL AND DISPOSAL OF THE EXISTING STRUCTURE GROUNDING SYSTEM BY THE CONTRACTOR.

PAYMENT FOR THIS ITEM SHALL BE AT THE UNIT PRICE BID PER EACH, COMPLETE AND IN PLACE, ALL CONNECTIONS TESTED AND ACCEPTED.

ITEM 625 1 1/2" DUCT CABLE WITH TWO NO. 4 AWG 5000 VOLT CABLES, AS PER PLAN
IN ADDITION TO ODOT SPECIFICATIONS 625 AND 713, IT IS THE INTENT OF THESE PLANS THAT THE CABLE BE PLACED AT THE SAME OFFSET FROM THE EDGE OF PAVEMENT AS CONNECTING PULLBOXES AND LIGHT FOUNDATIONS. PLACEMENT OF THE CABLE MORE THAN 1 FOOT FROM THIS ALIGNMENT SHALL FIRST BE APPROVED BY THE ENGINEER. IN ADDITION, WARNING TAPE SHALL BE PLACED IN THE TRENCH APPROXIMATELY 1 FOOT ABOVE THE CABLE.

NO ADDITIONAL PAYMENT SHALL BE MADE FOR THE WARNING TAPE, THE COST OF WHICH SHALL BE INCLUDED IN THE INSTALLATION OF THE CABLE.

ITEM 625 CONDUIT CLEANED AND CABLES REMOVED, AS PER PLAN
EXISTING CABLE SHALL BE REMOVED FROM THE EXISTING CONDUIT DESIGNATED FOR RE–USE, AND THE CONDUIT CLEANED OF ALL FOREIGN MATERIALS FOR REUSE WITH NEW DUCT CABLE.

ALL LABOR, MATERIAL AND EQUIPMENT NEEDED FOR THIS ITEM SHALL BE PAID FOR EACH LINEAR FOOT FOR ITEM 625 CONDUIT CLEARED AND CABLES REMOVED, AS PER PLAN.

ITEM 603 4" CONDUIT, TYPE E, AS PER PLAN
REFERENCE IS MADE TO STANDARD DRAWING HL–30.11 FOR DETAILS OF DRAINING PULLBOXES. UNDERDRAINS FOR PULLBOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED APPROXIMATELY 20 FEET. THESE PLANS ASSUME A TOTAL QUANTITY OF 480 LINEAR FEET OF ITEM 603, 4" CONDUIT, TYPE E, AS PER PLAN, AND IS BASED UPON PROVIDING 15 LINEAR FEET PER PULLBOX (EITHER NEW OR REPLACED).

ITEM 625 LIGHTING, MISC: REFURBISH EXISTING LIGHT POLE, AS PER PLAN
IT IS THE INTENT OF THIS ITEM THAT FOR EXISTING LIGHT POLES DESIGNATED FOR RE–USE THAT ALL EXISTING WIRING AND CONNECTOR KITS INSIDE THE LIGHT SUPPORT, FOUNDATION, AND BRACKET ARM SHALL BE REMOVED SO THAT NEW WIRING AND NEW CONNECTOR KITS MAY BE INSTALLED. THIS ITEM SHALL ALSO INCLUDE ALL LINEAR GRADING PROXIMATE TO THE EXISTING LIGHT SUPPORT FOUNDATIONS IN ORDER THAT THE FINAL GRADE SHALL CONFORM TO THE ODOT SPECIFICATIONS AND STANDARD DRAWING HL–20.11 FOR THE LIGHT SUPPORTS AND FOUNDATIONS. ALL MATERIAL, EQUIPMENT AND LABOR REQUIRED FOR GRADING AT THE VICINITY OF THE LIGHT POLE SHALL BE PROVIDED BY THE CONTRACTOR AS PART OF THIS ITEM. LASTLY, THIS ITEM SHALL ALSO INCLUDE REPLACEMENT OF DAMAGED/MISSING MISCELLANEOUS HARDWARE (EG, REPLACE MISSING HANDHOLE COVERS).

THE EXISTING WIRING AND CONNECTOR KITS REMOVED BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE CONTRACTOR. PAYMENT FOR ALL OF THE ABOVE WORK WILL BE INCLUDED IN THE UNIT PRICE BID PER EACH OF ITEM 625 LIGHTING, MISC: REFURBISH EXISTING LIGHT POLE, AS PER PLAN.

ITEM 202 PULL BOX REMOVED, AS PER PLAN
THIS ITEM OF WORK SHALL CONSIST OF THE REMOVAL OF EXISTING PULLBOXES AND CONTENTS AND THE RESTORATION OF THE DISTURBED AREAS. AT THOSE LOCATIONS WHERE A PULLBOX WILL BE REMOVED THE RESULTANT OPENING SHALL BE BACKFILLED TO GRADE WITH SUITABLE COMPACTED SOIL AND RESTORED TO MATCH THE SURROUNDING AREA.
PAYMENT FOR ALL OF THE ABOVE WORK WILL BE INCLUDED IN THE UNIT PRICE BID FOR EACH ITEM 202 PULL BOX REMOVED, AS PER PLAN.
ITEM 202 LIGHT POLE FOUNDATION REMOVED, AS PER PLAN
THIS ITEM OF WORK SHALL CONSIST OF REMOVING THE EXISTING LIGHT POLE FOUNDATION TO A MINIMUM OF ONE FOOT BELOW GRADE AND THE RESTORATION OF THE DISTURBED AREA. ALL MATERIAL REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND ANY MATERIAL REQUIRED TO RESTORE THE DISTURBED AREA SHALL BE PROVIDED BY THE CONTRACTOR AS PART OF THIS ITEM.

PAYMENT FOR ALL OF THE ABOVE WORK WILL BE INCLUDED IN THE UNIT PRICE BID FOR EACH LIGHT POLE FOUNDATION REMOVED, AS PER PLAN.

ITEM 202 LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN
THIS ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING LIGHT POLE INCLUDING THE BRACKET ARM, TRANSFORMER BASE (IF USED), AND POLE AND BRACKET CABLE AND STORED ON THE PROJECT TO BE PICKED UP BY STATE FORCES. THE CONTRACTOR SHALL TAKE CARE AS TO NOT DAMAGE THE LIGHT POLE AS IT IS BEING REMOVED.
THE CONTRACTOR SHALL REMOVE THE POLE AND BRACKET CABLE, TRANSFORMER BASE AND BRACKET ARM FROM THE POLE. THE POLE, BRACKET ARM, AND TRANSFORMER BASE SHALL BE SORTED AND STORED IN INDIVIDUAL PILES ON THE PROJECT. THE POLE AND BRACKET CABLE AND MISCELLANEOUS HARDWARE SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF PROPERLY OFF THE PROJECT SITE. PAYMENT FOR ALL OF THE ABOVE WORK WILL BE INCLUDED IN THE UNIT PRICE BID FOR EACH LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN.

ITEM 202 LUMINAIRE REMOVED, AS PER PLAN
THE ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING LUMINAIRE. THE CONTRACTOR SHALL TAKE POSSESSION OF THE LUMINAIRE AND DISPOSE OF IT PROPERLY OFF THE PROJECT SITE.

PAYMENT FOR THIS ITEM SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH FOR ITEM 202 LUMINAIRE REMOVED, AS PER PLAN.

CALC. BY: D.S. DATE: 12/06
CHKD. BY: AM DATE: 12/06

LIGHTING GENERAL NOTES

BEL/JEF-7-23.76/0.00

File Name: [10102195][12:22] < D:\CADDS\PROJECTS\BEL-JEF\94276N1 >

LIGHTING GENERAL SUMMARY

SHEET NO.				ITEM NO.	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
69	71	72	73					LIGHTING	
	6	13	11	202	75301	30	EACH	PULLBOX REMOVED, AS PER PLAN	69
	8	4	2	202	75403	14	EACH	LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN	69
	8	4	2	202	75501	14	EACH	LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	69
	13	13	16	202	75507	42	EACH	LUMINAIRE REMOVED, AS PER PLAN	69
	1	1	1	202	75511	3	EACH	POWER SERVICE REMOVED, AS PER PLAN	69
	90	240	150	603	00401	480	LF	4" CONDUIT, TYPE E, AS PER PLAN	69
	14	22	32	625	00500	68	EACH	CONNECTOR KIT, TYPE II	
	6	12	14	625	01500	32	EACH	CABLE SPLICING KIT	
	2			625	04400	2	EACH	LIGHT POLE, DESIGN AT15B34.2	
		2	2	625	10471	4	EACH	LOW MAST LIGHT POLE, DESIGN ATON 51.7, AS PER PLAN	69
	2			625	14000	2	EACH	LIGHT POLE FOUNDATION, 24" X 6' DEEP	
		2	2	625	14200	4	EACH	LIGHT POLE FOUNDATION, 24" X 10' DEEP	
	216	1576	576	625	23300	2368	LF	NO. 2 AWG 5000 VOLT DISTRIBUTION CABLE	
	693	1133	1620	625	23400	3446	LF	NO. 10 AWG POLE AND BRACKET CABLE	
	1042	3347	4828	625	24101	9217	LF	1 1/2" DUCT CABLE WITH TWO NO. 4 AWG 5000 VOLT CABLES, AS PER PLAN	69
	20	22		625	25500	42	LF	CONDUIT, 3", 713.04	
	132	231	331	625	25900	694	LF	CONDUIT, JACKED OR DRILLED, SIZE: 3"	
		773		625	25911	773	LF	CONDUIT CLEANED AND CABLES REMOVED, AS PER PLAN	69
	2	2		625	26250	4	EACH	LUMINAIRE, CONVENTIONAL: STYLE B, TYPE II, 250 WATT HIGH PRESSURE SODIUM, AS PER PLAN	69
		7	14	625	26250	21	EACH	LUMINAIRE, CONVENTIONAL: STYLE B, TYPE III, 200 WATT HIGH PRESSURE SODIUM, AS PER PLAN	69
	5			625	26250	5	EACH	LUMINAIRE, CONVENTIONAL: STYLE B, TYPE III, 250 WATT HIGH PRESSURE SODIUM, AS PER PLAN	69
		2	2	625	26270	4	EACH	LUMINAIRE, LOWMAST: STYLE B, TYPE V, 400 WATT HIGH PRESSURE SODIUM, AS PER PLAN	69
	888	2511	4535	625	29000	7934	LF	TRENCH	
	2	9	3	625	30700	14	EACH	PULLBOX, 713.08, 18"	
	4	7	7	625	30706	18	EACH	PULLBOX, 713.08, 24"	
	4	4	2	625	32000	10	EACH	GROUND ROD	
		3		625	33001	3	EACH	STRUCTURE GROUNDING SYSTEM, AS PER PLAN	69
	2	2		625	34000	4	EACH	POWER SERVICE	
			1	625	34001	1	EACH	POWER SERVICE, AS PER PLAN	69
	LUMP	LUMP	LUMP	625	38000	LUMP		HIGH VOLTAGE TEST	
LUMP				SPECIAL	62540000	LUMP		MAINTAIN EXISTING LIGHTING	
	5	9	14	625	98000	28	EACH	LIGHTING, MISC: REFURBISH EXISTING LIGHT POLE, AS PER PLAN	69
				SPECIAL	62536000	7934	LF	PLASTIC CAUTION TAPE	

ITEM SPECIAL, PLASTIC CAUTION TAPE

The location of underground conduit and buried electrical cables shall be marked by using a continuous identifying tape buried in the trench above the conduit and cables. The identifying tape shall be an inert material, approximately 6" wide, composed of polyethylene plastic that is highly resistant to alkalis, acids, or other chemical components likely to be encountered in soils.

The tape shall be bright safety red with identifying printing "ELECTRIC" in black letters, one side only. The tape shall be supplied in continuous rolls with the identifying lettering repeated continuously the full length of the tape.

The Contractor shall bury the identifying tape above the conduit and cables at an approximate depth of 6" to 10" below the final finished grade. The tape shall be placed with the printed side up, and shall be essentially parallel with the finished surface.

The Contractor shall take necessary precautions to not pull, distort, or otherwise misplace the tape when completing the backfill. The tape shall be paid for per Linear Feet of Item Special, Plastic Caution Tape, complete in place.

CALC. BY: DLS DATE: 12/96
CHKD. BY: AHL DATE: 12/96

LIGHTING GENERAL SUMMARY

BEL/JEF-7-23.76/0.00

File Name: [08104185[10.34] < F:\PROJ\94-217\BEL-JEF\94217LNS >

LIGHTING SUB-SUMMARY

				ITEM 625																														202					603
SHEET NO.	FROM STATION	TO STATION	SIDE	CONNECTOR KIT, TYPE II	CABLE SPLICING KIT		LIGHT POLE, DES. AT15B34.2				LIGHT POLE FOUNDATION, 24"X6'		NO. 10 AWG POLE AND BRACKET CABLE		1-1/2" DUCT CABLE W/TWO-NO. 4 AWG 5000 VOLT CABLES, AS PER PLAN	NO. 2 AWG 5000 VOLT DISTRIBUTION CABLE	CONDUIT, JACKED OR DRILLED, SIZE: 3"	CONDUIT, 3", 713.04		LUMINAIRE, CONV.: STYLE B, TYPE II, 250 WATT HPS, AS PER PLAN		LUMINAIRE, CONV.: STYLE B, TYPE III, 250 WATT HPS, AS PER PLAN		TRENCH	PULLBOX, 713.08, 18"	PULLBOX, 713.08, 24"	GROUND ROD		POWER SERVICE		LIGHTING, MISC: REFURBISH EXISTING LIGHT POLE, AS PER PLAN		PULLBOX REMOVED, AS PER PLAN	LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN	LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	LUMINAIRE REMOVED, AS PER PLAN	POWER SERVICE REMOVED, AS PER PLAN	4"CONDUIT, TYPE E, AS PER PLAN
				EACH	EACH		EACH				EACH		LIN FT		LIN FT	LIN FT	LIN FT	LIN FT		EACH		EACH		LIN FT	EACH	EACH	EACH		EACH		EACH		EACH	EACH	EACH	EACH	EACH	LIN FT
	-SR7-																																						
74	1265+80		RT																															1	1	1		
74	1266+70		RT																														1					
74	1268+50		RT	2									99								1									1					1		
74	1268+50	1269+95	RT												155								145														
74	1269+95		RT		2																				1												15
74	1269+95	1271+35	RT												150								140														
74	1269+95		RT/LT													216	98																				
74	1271+35		RT	2									99								1									1					1		
74	1271+35	1283+10	RT																															4	4	4		
74	1267+40		LT																															1	1	1		
74	1267+51		LT	2			1				1		99								1					1											
74	1267+51	9+00	LT												133								123														
74	1269+95		LT		2																				1												15
74	1269+95	1270+05	LT												20								10										1				
74	1270+05		LT	2									99								1									1					1		
74	1270+05	1271+80	LT												185								175														
74	1271+80		LT	2			1				1		99								1					1											
	-C.R.4-																																						
74	5+00		LT																							1		1										
74	5+00	5+10	LT												20			10					10														
74	5+10		LT																					1													15
74	5+10	5+40	LT												40								30														
74	5+40		LT	2									99								1									1					1		
74	5+40	6+45	LT												115								105														
74	6+45		LT	2									99								1									1					1		
74	8+12		LT																														1					
74	8+50		RT																															1	1	1		
74	8+60		RT																							1							1					15
74	8+60	8+55	RT												20			10					10														
74	8+55		RT																							1		1										
74	8+60	9+00	RT												50								40														
74	9+00		RT		2																				1								1					15
74	9+00		RT/LT												44		34																					
74	9+00		LT																					1								1					15
74		9+25	RT																															1	1	1		
74	9+00	1269+95	RT												110								100														
TOTAL THIS SHEET				14	6		2				2		693		1042	216	132	20		2		5	888	2	4	4		2		5		6	8	8	13	1	90

CALC. BY: DLS DATE: 12/96
CHKD. BY: AAH DATE: 12/96

LIGHTING SUB-SUMMARY

BEL/JEF-7-23.76/0.00

File Name: [12/04/96] < d:\cadd5\PROJ\94-217\BEL-JEF\94217SS1 >

LIGHTING SUB-SUMMARY

				ITEM 625																																202						603
SHEET NO.	FROM STATION	TO STATION	SIDE	CONNECTOR KIT, TYPE II	CABLE SPLICING KIT					LOW MAST LIGHT POLE, DESIGN ATION 51.7, AS PER PLAN		LIGHT POLE FOUNDATION, 24"X10'	NO. 10 AWG POLE AND BRACKET CABLE		1-1/2" DUCT CABLE W/TWO-NO. 4 AWG 5000 VOLT CABLES AS PER PLAN	NO. 2 AWG 5000 VOLT DISTRIBUTION CABLE	CONDUIT, JACKED OR DRILLED, SIZE: 3"	CONDUIT, 3", 713.04	CONDUIT CLEANED AND CABLES REMOVED, AS PER PLAN	LUMINAIRE, CONV.; STYLE B, TYPE II, 250 WATT HPS AS PER PLAN	LUMINAIRE, CONV.; STYLE B, TYPE III, 200 WATT HPS, AS PER PLAN		LUMINAIRE, LOW MAST: STYLE B, TYPE V, 400 WATT HPS, AS PER PLAN	TRENCH	PULLBOX, 713.08 18"	PULLBOX, 713.08, 24"	GROUND ROD	STRUCTURE GROUNDING SYSTEM, AS PER PLAN	POWER SERVICE		LIGHTING, MISC: REFURBISH EXISTING LIGHT POLE, AS PER PLAN	PULLBOX REMOVED, AS PER PLAN	LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN	LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	LUMINAIRE REMOVED, AS PER PLAN	POWER SERVICE REMOVED, AS PER PLAN	4"CONDUIT, TYPE E, AS PER PLAN
				EACH	EACH					EACH		LIN FT	LIN FT		LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH	EACH		EACH	LIN FT	EACH	EACH	EACH	EACH	EACH		EACH	EACH	EACH	EACH	EACH	EACH	LIN FT
	-SR 7-																																								
75	1333+75		LT	2									99							1												1			1			
75	1333+75	1337+60	LT												395									385							1						
75	1337+60		LT	2									99							1												1			1			
75	1337+60	1337+95	LT												45									35														
75	1337+95		LT																						1							1						15
75	1337+95	1339+85	LT													400			190									1									
75	1339+85		LT																						1							1						15
75	1339+85	1340+35	LT												60									50														
75	1340+35		LT		2																						1					1						15
75	1340+35	1341+00	LT												75									65														
75	1341+00		LT	2									119							1												1			1			
75	1340+35		LT/RT												145				135																			
75	1335+00		RT	2									99							1												1			1			
75	1335+00	1338+40	RT												350									340														
75	1338+40		RT																						1							1						15
75	1338+40	1340+35	RT													410			195										1								
75	1340+35		RT		2																						1					1						15
75	1340+35	1341+55	RT												130									120														
75	1341+55		RT	2									99							1												1			1			
75	1341+55	1342+97	RT												152									142									1					
75	1342+92		RT	2									99							1												1			1			
75	1342+92	1342+97	RT												60		35							15														
75	1342+97		RT		2																					1												15
75	1342+97	1343+50	RT												63									53														
75	1343+50		RT	2									93							1												1			1			
	-RAMP D-																																								
75	1343+50	1348+00	RT												460									450														
75	1348+00		RT	2						1		1	120										1				1										
75	1348+00	44+70(TR469)	RT/LT												70									60														
	-TR 469-																																								
75	38+27		LT																										1		1						
75	38+27	38+16	LT												22			12						12													1	
75	38+16		LT																						1							1						15
75	38+16	38+20	LT												15									5														
75	38+20		LT	2									93							1												1			1			
75	38+20	38+65	LT												75									65														
75	38+65		LT																						1													15
75	38+65	38+75	LT/RT												58		48																				
75	38+75		RT																						1													15
75	38+75	38+63	RT												22									12														
75	38+63		RT	2									93							1												1			1			
75	39+05		LT/RT																													2						
75	41+20		LT																										1		1						
75	41+20	41+30	LT													40		10						10														
75	41+30		LT																								1										15
75	41+30		LT/RT													200	40																					
75	41+30		RT		4																						1										15
75	41+30	44+70	RT												700									340									1	1	1	1		
75	44+70		RT																								1										15
75	44+70		RT/LT												56		46																					
75	44+70	1349+80 (C)	RT												290									280										1	1	1		
75	44+70		LT																						1												15
75	44+65		LT																													1						
75	1349+80		RT		2																						1										15
75	1349+80	1350+15	RT												45									35									1	1	1	1		
75	1350+15		RT	2						1		1	120										1				1										
75	1349+80	47+65	RT/LT												72		62																					
75	47+65		RT																						1												15
75	47+65	48+02	RT												47									37										1	1	1		
75	48+02		RT																						1							1						15
75	48+02	50+55	RT													526			253										1									
TOTAL THIS SHEET				22	12					2		2	1133		3347	1576	231	22	773	2	7		2	2511	9	7	4	3	2		9	13	4	4	13	1	240

CALC. DJS BY: DATE: 10/96
CHKD. AAH BY: DATE: 10/96

LIGHTING SUB-SUMMARY

BEL/JEF-7-23.76/0.00

File Name: 12(0486) < d:\PROJ\94-21?\BEL-JEF\94217SS2 >

LIGHTING SUB-SUMMARY

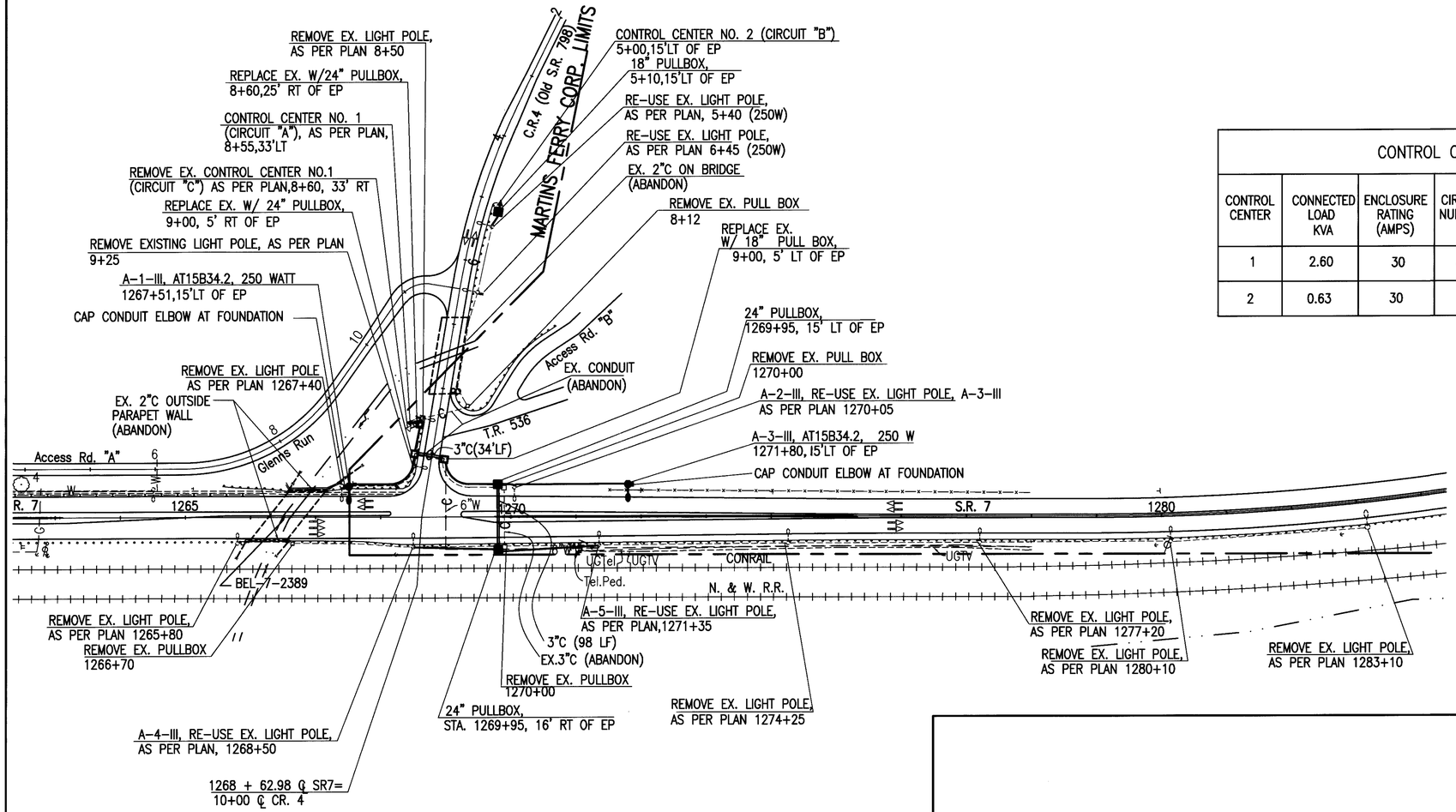
				ITEM 625																								202					603
SHEET NO.	FROM STATION	TO STATION	SIDE	CONNECTOR KIT, TYPE II	CABLE SPLICING KIT				LOW MAST LIGHT POLE, DES ATON51.7, AS PER PLAN		LIGHT POLE FOUNDATION, 24"X10'	NO. 10 AWG POLE AND BRACKET CABLE	1-1/2" DUCT CABLE W/TWO-NO. 4 AWG 5000 VOLT CABLES	NO. 2 AWG 5000 VOLT DISTRIBUTION CABLE	CONDUIT, JACKED OR DRILLED, SIZE: 3"			LUMINAIRE, CONV.: STYLE B, TYPE III, 200 WATT HPS, AS PER PLAN	LUMINAIRE, LOW MAST: STYLE B, TYPE V, 400 WATT HPS, AS PER PLAN	TRENCH	PULLBOX, 713.08, 18"	PULLBOX, 713.08, 24"	GROUND ROD			POWER SERVICE, AS PER PLAN	LIGHTING, MISC: REFURBISH EXISTING LIGHT POLE, AS PER PLAN	PULLBOX REMOVED, AS PER PLAN	LIGHT POLE REMOVED, FOR STORAGE, AS PER PLAN	LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	LUMINAIRE REMOVED, AS PER PLAN	POWER SERVICE REMOVED, AS PER PLAN	4"CONDUIT, TYPE E, AS PER PLAN
				EACH	EACH				EACH		EACH	LIN FT	LIN FT	LIN FT	LIN FT			EACH	EACH	LIN FT	EACH	EACH	EACH			EACH	EACH	EACH	EACH	EACH	EACH	EACH	LIN FT.
	-TR 469-																																
75	50+55		RT																		1							1					15
75	50+55	51+05	RT										60							50								1	1	1			
75	51+00		RT																									1					
75	51+05		RT																		1												15
75	51+05	1351+60(B)	RT										58		48																		
	-RAMP B-																																
75	1350+51		LT	2					1		1	120							1				1										
75	1350+51	1351+60	LT										119							109									1	1	1		
75	1351+60		LT		2																	1						1					15
75	1351+60	1352+12	LT										62							52													
75	1352+12		LT	2					1		1	120							1				1										
75	1352+12	1356+91	LT										489							479													
75	1356+91		LT	2								93						1									1				1		
75	1356+91	1357+95	LT										114							104													
75	1357+95		LT		2																		1										15
75	1357+95	1358+00	LT/RT										55		25					20													
75	1358+00		RT	2								99						1									1				1		
75	1357+95	1359+40	LT										155							145													
75	1359+40		LT	2								99						1									1				1		
75	1359+40	1363+05	LT										375							365								1					
75	1363+05		LT		2																		1										15
	-SR 7-																																
75	1363+05	1365+00	LT										205							195													
75	1365+00		LT	2								99						1									1				1		
75	1363+05		LT/RT											240	110																		
75	1361+60		RT	2								99						1									1				1		
75	1361+60	1363+05	RT										155							145									1				
75	1363+05		RT		2																		1										15
75	1363+05	1365+15	RT										220							210													
75	1365+15		RT	2								99						1									1				1		
75	1365+15	1369+50	RT										445							435													
75	1369+50		RT	2								99						1									1				1		
	-SR 7-																																
76	1407+10		LT	2								99						1									1				1		
76	1407+10	1411+35	LT										435							425													
76	1411+35		LT	2								99						1									1				1		
76	1411+35	1411+70	LT										45							35									1				
76	1411+70		LT		2																		1										15
76	1411+70	1415+05	LT										345							335													
76	1415+05		LT	2								99						1									1				1		
76	1411+70		LT/RT											232	106																		
76	1409+94		RT	2								99						1									1				1		
76	1409+94	1411+70	RT										186							176									1				
76	1411+70		RT		2																		1										15
76	1411+70	0+35	RT										455							445									1				
76	0+35		RT	2								99						1									1				1		
76	0+35	1+65	RT										140							130													
76	1+65		RT		2																		1						1				15
76	1+65	1+80	RT											104	42																		
76	1+80		LT	2								99						1									1				1		
76	1+65	2+35	RT										80							70													
76	2+35		RT	2								99						1									1				1		
76	2+35	5+00	RT										275							265													
76	5+00		RT																		1												15
76	5+00	8+39	RT										355							345						1		2				1	
	TOTALS THIS SHEET			32	14				2		2	1620	4828	576	331			14	2	4535	3	7	2			1	14	11	2	2	16	1	150

CALC. BY: DJS DATE: 12/96
CHKD. BY: AAH DATE: 12/96

LIGHTING SUB-SUMMARY

BEL/JEF-7-23.76/0.00

File Name: [12]04196]< D:\CADDS\PROJ\94-217\BEL-JEF\94217L2A >



CONTROL CENTER DATA							
CONTROL CENTER	CONNECTED LOAD KVA	ENCLOSURE RATING (AMPS)	CIRCUIT NUMBER	CIRCUIT LOAD (AMPS)	CIRCUIT FUSE SIZE (AMPS)	MAINTAINING AGENCY	VOLTAGE
1	2.60	30	A	5.20	30	ODOT	240
2	0.63	30	B	1.26	30	CITY OF MARTINS FERRY	240

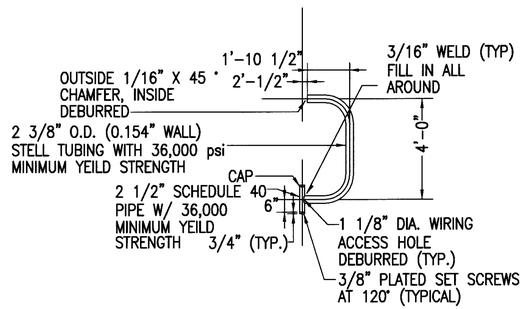
FOR QUANTITIES, SEE SHEET NO. 71

LEGEND

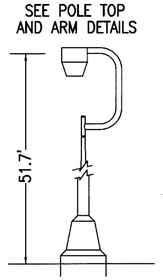
- △ EXISTING SERVICE POLE & CONTROL CENTER
- ▫ EXISTING PULL BOX
- ○— EXISTING LIGHT POLE & LUMINAIRE
- ▯ EXISTING UNDERPASS LUMINAIRE
- --℄- EXISTING METAL CONDUIT
- ---- EXISTING DUCT CABLE
- ●— PROPOSED MAST ARM POLE WITH ALUMINUM TRANSFORMER BASE, HIGH PRESSURE SODIUM, 34.2 FOOT NOMINAL EFFECTIVE MOUNTING HEIGHT.
- ● PROPOSED LOW MAST POLE WITH ALUMINUM TRANSFORMER BASE, 51.7' NOMINAL EFFECTIVE MOUNTING HEIGHT
- ▲ PROPOSED SERVICE POLE & CONTROL CENTER, 240 VOLT
- ■ PROPOSED PULL BOX, 713.08
- ▫ REPLACE EXISTING PULL BOX W/ 18", 713.08
- —— PROPOSED 1 1/2" DUCT CABLE WITH 2-NO.4 AWG CABLES OR NO. 2 AWG 5000 VOLT DISTRIBUTION CABLES.
- ═══ PROPOSED CONDUIT TO BE JACKED UNDER PAVEMENT (3"C,713.04,EXCEPT AS NOTED)

NOTE:

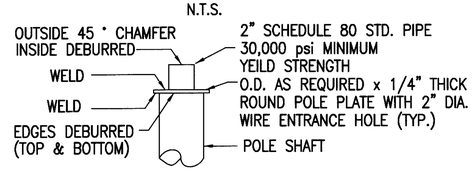
1. RE-USE OF LIGHT POLES SHALL INCLUDE REPLACEMENT OF LUMINAIRE WITH 250 WATT HPS.
2. 3"C, 713.04 FROM CONTROL CENTER TO NEAREST PULLBOX



(HOT DIP GALVANIZED AFTER FABERICATION)
ARM DETAIL – LOW MAST LIGHT POLE
N.T.S.



LOW MAST LIGHT POLE
POLE DETAIL
N.T.S.



(HOT DIP GALVANIZED AFTER FABERICATION)
POLE TOP DETAIL – LOW MAST LIGHT POLE
N.T.S.

HORIZONTAL SCALE IN FEET
0' 100' 200'

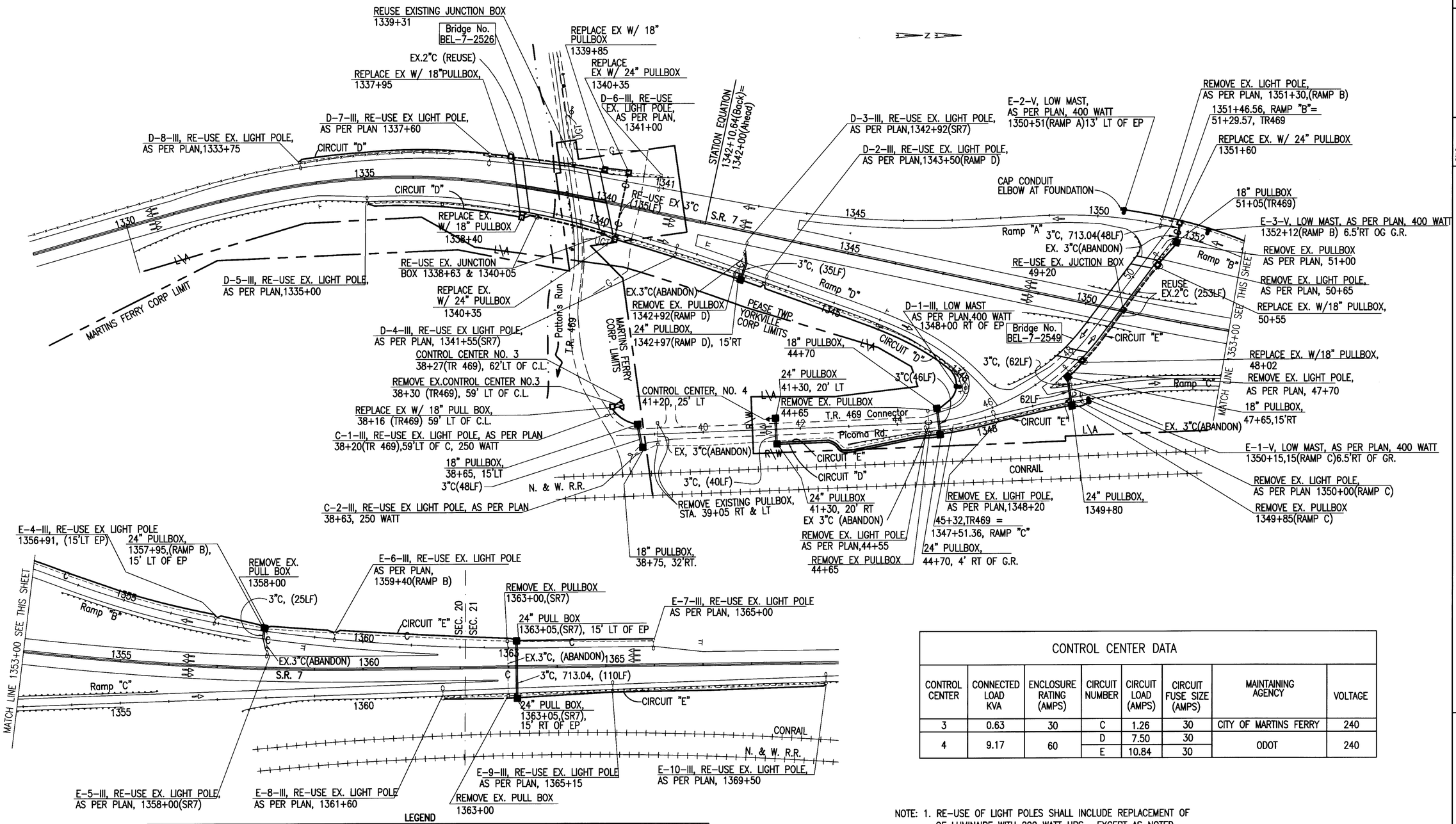
CALC. BY: DLS DATE: 12/96
CHKD. BY: AAH DATE: 12/96

LIGHTING PLAN
STA 1258+00 TO STA 1286+00

BEL/JEF-7-23.76/0.00

74
94

File Name: [12498]< D:\CADDS\PROJECTS\94-217\BEL-JEF\94217LP1 >



CONTROL CENTER DATA							
CONTROL CENTER	CONNECTED LOAD KVA	ENCLOSURE RATING (AMPS)	CIRCUIT NUMBER	CIRCUIT LOAD (AMPS)	CIRCUIT FUSE SIZE (AMPS)	MAINTAINING AGENCY	VOLTAGE
3	0.63	30	C	1.26	30	CITY OF MARTINS FERRY	240
4	9.17	60	D	7.50	30	ODOT	240
			E	10.84	30		

NOTE: 1. RE-USE OF LIGHT POLES SHALL INCLUDE REPLACEMENT OF OF LUMINAIRE WITH 200 WATT HPS, EXCEPT AS NOTED
2. 3"C, 713.04 FROM CONTROL CENTER TO NEAREST PULLBOX

LEGEND

- EXISTING SERVICE POLE & CONTROL CENTER
- EXISTING PULL BOX
- EXISTING LIGHT POLE & LUMINAIRE
- EXISTING UNDERPASS LUMINAIRE
- EXISTING DUCT CABLE
- EXISTING METAL CONDUIT
- PROPOSED MAST ARM POLE WITH ALUMINUM TRANSFORMER BASE, HIGH PRESSURE SODIUM 34.2 FOOT NOMINAL EFFECTIVE MOUNTING HEIGHT.
- PROPOSED LOW MAST POLE WITH ALUMINUM TRANSFORMER BASE, 51.7' NOMINAL EFFECTIVE MOUNTING HEIGHT SEE SHEET 74 FOR DETAILS
- PROPOSED SERVICE POLE & CONTROL CENTER, 240 VOLT
- PROPOSED PULL BOX,713.08
- REPLACE EXISTING PULL BOX W/ TYPE 713.08, 18"
- PROPOSED 1 1/2" DUCT CABLE WITH 2-NO.4 AWG CABLES OR NO. 2AWG 5000 VOLT DISTRIBUTION CABLES.
- PROPOSED CONDUIT TO BE JACKED UNDER PAVEMENT (3"C, 713.04, EXCEPT AS NOTED)

FOR QUANTITIES, SEE SHEET NO. 72 & 73

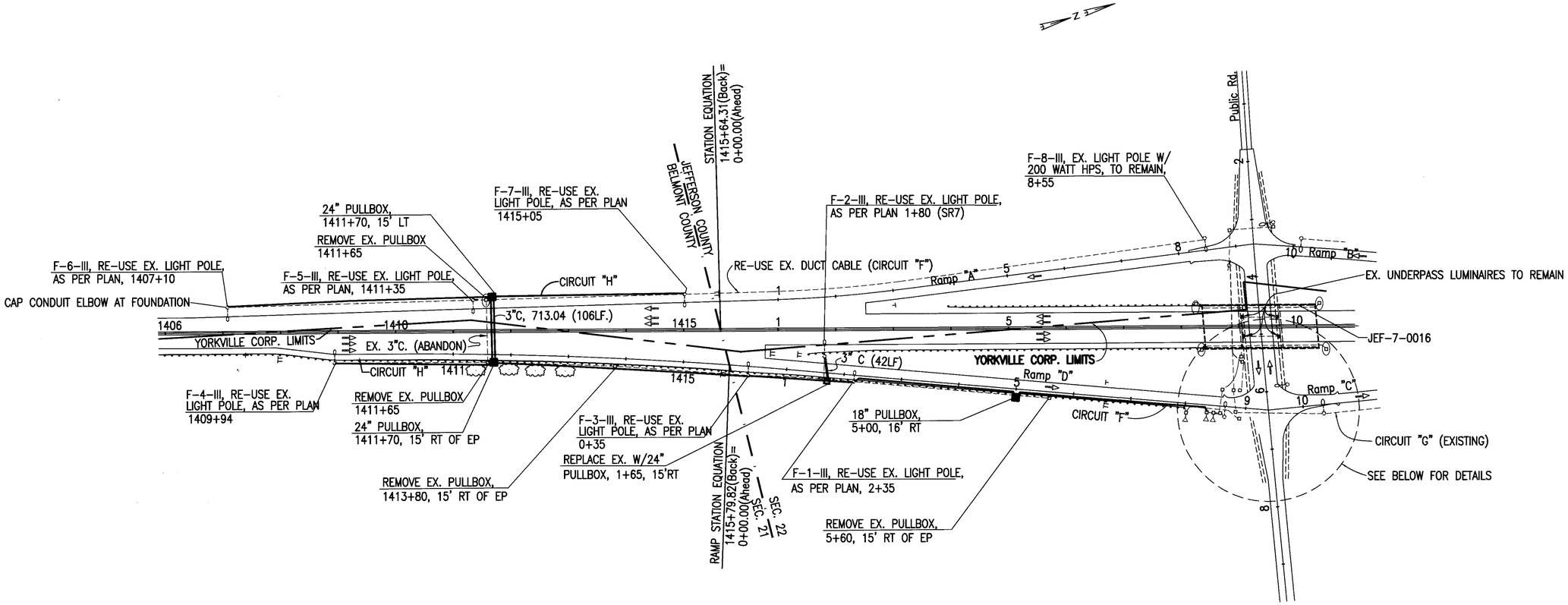
HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. BY: D.S. DATE: 12/06
CHKD. BY: ANH DATE: 12/06

LIGHTING PLAN STA 1330+00 TO STA 1372+00

BEL/JEF-7-23.76/0.00

File Name: [101496][4:17] < D:\CADDS\PROJECTS\BEL-JEF\94217LP2 >



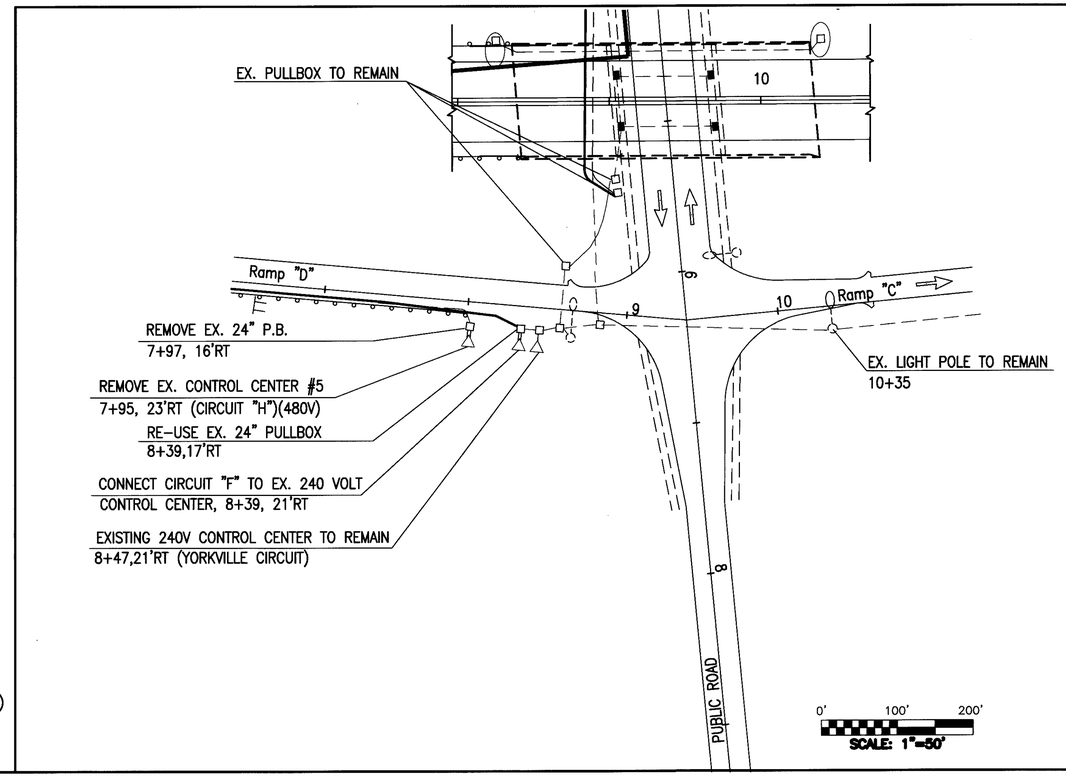
FOR QUANTITIES, SEE SHEET NO. 73

CONTROL CENTER DATA							
CONTROL CENTER	CONNECTED LOAD KVA	ENCLOSURE RATING (AMPS)	CIRCUIT NUMBER	CIRCUIT LOAD (AMPS)	CIRCUIT FUSE SIZE (AMPS)	MAINTAINING AGENCY	VOLTAGE
5	EX. +3.33	EX.	F	6.66	30	ODOT	240
			G(EX.)	EX.	EX.	ODOT	240

LEGEND

- △ EXISTING SERVICE POLE & CONTROL CENTER
- ▫ EXISTING PULL BOX
- ⊶⊷ EXISTING LIGHT POLE & LUMINAIRE
- ▯ EXISTING UNDERPASS LUMINAIRE
- —C— EXISTING METAL CONDUIT
- — — EXISTING DUCT CABLE
- ●— PROPOSED MAST ARM POLE WITH ALUMINUM TRANSFORMER BASE, HIGH PRESSURE SODIUM 34.2 FOOT NOMINAL EFFECTIVE MOUNTING HEIGHT.
- ● PROPOSED LOW MAST POLE WITH ALUMINUM TRANSFORMER BASE, 51.7' NOMINAL EFFECTIVE MOUNTING HEIGHT
- ▲ PROPOSED SERVICE POLE & CONTROL CENTER, 240 VOLT
- ■ PROPOSED PULLBOX, 18", EXCEPT WHERE NOTED, 713.08
- ▫ REPLACE EXISTING PULLBOX, WITH 713.08, 18"
- ——— PROPOSED 1 1/2" DUCT CABLE WITH 2-NO.4 AWG CABLES OR NO. 2 AWG 5000 VOLT DISTRIBUTION CABLES.
- ═══ PROPOSED CONDUIT TO BE JACKED UNDER PAVEMENT (3"C, 713.04 EXCEPT AS NOTED)

NOTE: ALL LUMINAIRES 200 WATT, EXCEPT AS NOTED



HORIZONTAL SCALE IN FEET
0' 100' 200'

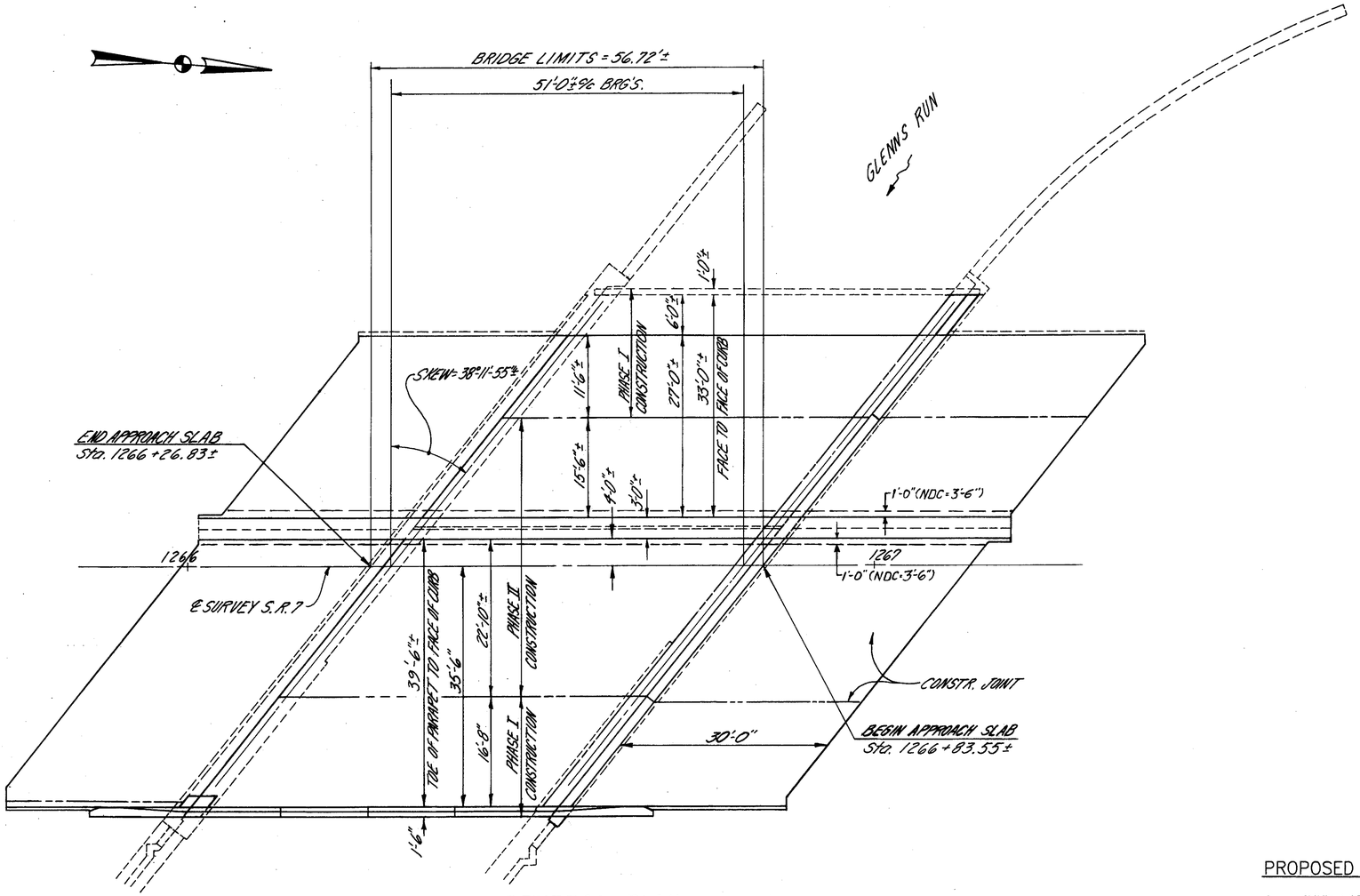
CALC. BY: DLS DATE: 12/08
CHKD. BY: AWJ DATE: 12/08

LIGHTING PLAN
STA 1403+00 TO STA 10+50.91

BEL/JEF-7-23.76/0.00

76
94

File Name: [12/4/08]< D:\CADDS\PROJECTS\94-217\BEL-JEF\94217LP3 >



GENERAL PLAN

PROPOSED WORK

1 – REPLACE THE FORWARD APPROACH SLAB AND ABUTMENT BACKWALL, PROVIDE 3" STRIP SEAL EXPANSION JOINT.
2 – EXTEND EXISTING REAR EAST COMPRESSION SEAL EXPANSION JOINT.
3 – WIDEN REAR EAST APPROACH SLAB AND REPLACE THE EAST BRIDGE PARAPET AND TRANSITION PARAPETS.
4 – REPLACE THE ASPHALT CONCRETE WEARING SURFACE WITH 2¾" THICKNESS OF MICRO-SILICA MODIFIED CONCRETE OVERLAY.
5 – EPOXY SEAL SUPERSTRUCTURE AND SUBSTRUCTURE CONCRETE SURFACES.
6 – CLEAN AND PAINT STRUCTURAL STEEL.

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN RDY | REVIEWED TKD | DATE 10/18/94
CHECKED G.T. | REVISED | STRUCTURE FILE NUMBER 0700770

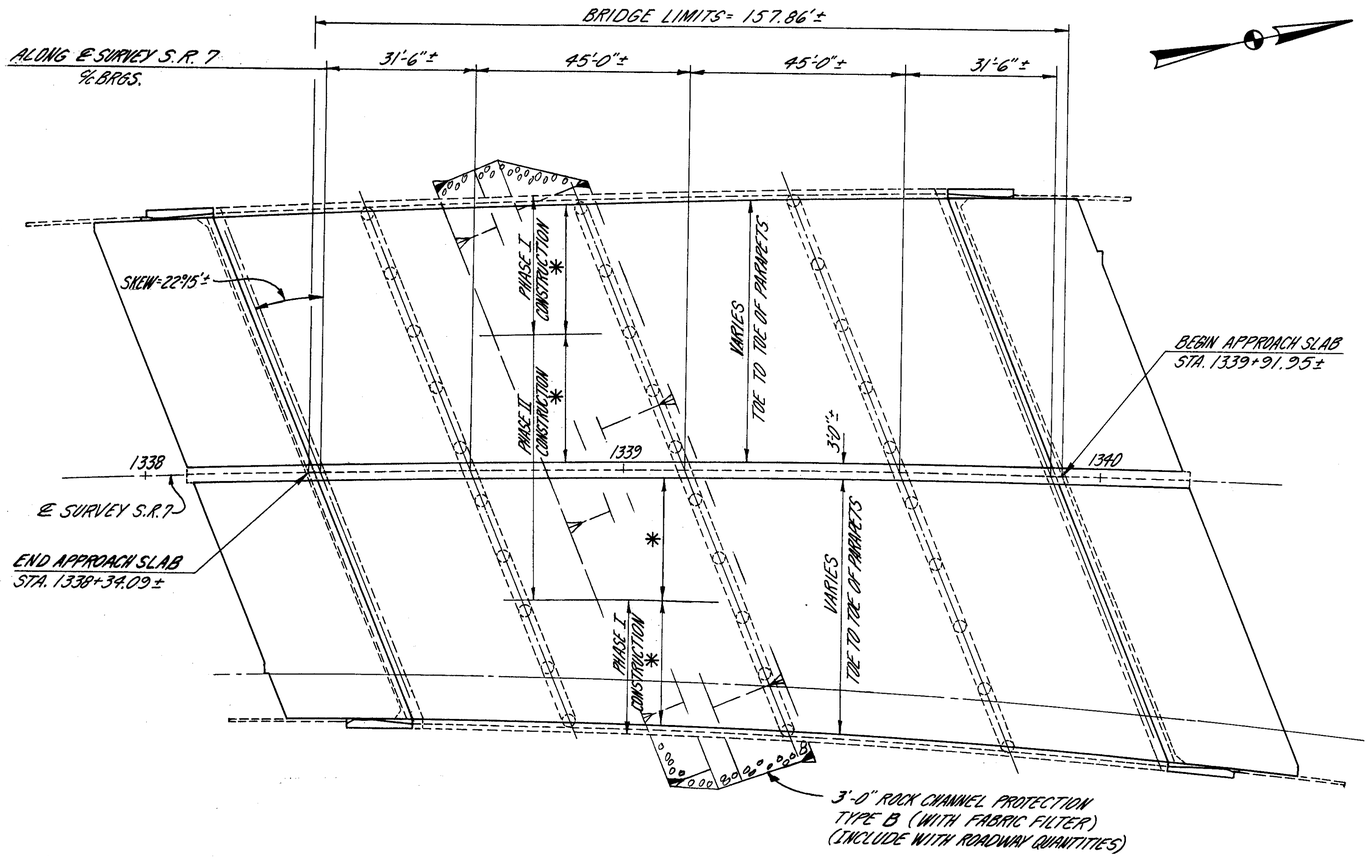
BELMONT COUNTY
STA. 1266+26.83
STA. 1266+83.55

GENERAL PLAN
BRIDGE NO. BEL-7-2389
S.R.7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

1/18

77
94



GENERAL PLAN

PROPOSED WORK

1 – REPLACE TRANSITION PARAPETS.
2 – REPAIR SPALLED CONCRETE AREAS WITH TROWELABLE MORTAR.
3 – REPLACE CORRODED END CROSS FRAMES.
4 – REPLACE ASPHALT CONCRETE WEARING SURFACE WITH 2¾" THICKNESS OF MICRO–SILICA MODIFIED CONCRETE OVERLAY.
5 – EPOXY SEAL SUPERSTRUCTURE AND SUBSTRUCTURE CONCRETE SURFACES.
6 – CLEAN AND PAINT STRUCTURAL STEEL.
7 – ADD ROCK CHANNEL PROTECTION.

LEGEND

– MAINTAIN 10'–0" MINIMUM LANE WIDTH. SEE MAINTENANCE OF TRAFFIC SHEET (10/94) TO (14/94) FOR DETAILS.

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED R E W
DRAWN RDY
CHECKED G.T.
REVISED
REVIEWED 7-20
DATE 10/18/94

STRUCTURE FILE NUMBER 0700797

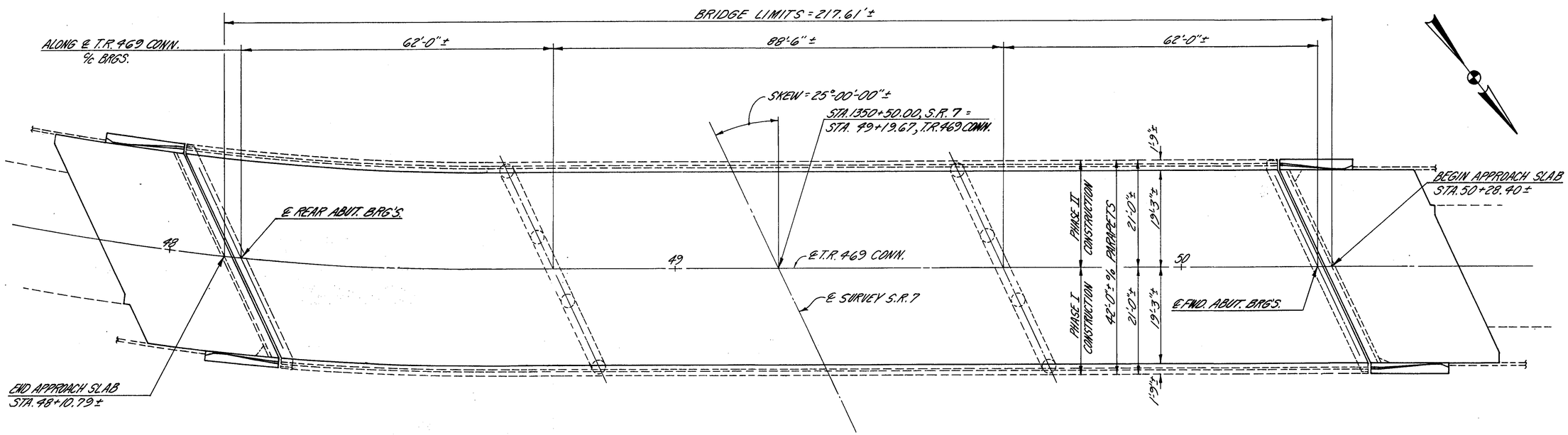
BELMONT COUNTY
STA. 1338+34.09
STA. 1339+91.95

GENERAL PLAN
BRIDGE NO. BEL-7-2526
S.R.7 OVER PATTON RUN AND T.R.469

BEL/JEF-7-23.76/000

2/18

(78/94)



GENERAL PLAN

PROPOSED WORK

1 – REPLACE TRANSITION PARAPETS.
2 – REPLACE ASPHALT CONCRETE WEARING SURFACE WITH 1¾" THICKNESS OF MICRO-SILICA MODIFIED CONCRETE OVERLAY.
3 – EPOXY SEAL SUPERSTRUCTURE AND SUBSTRUCTURE CONCRETE SURFACES.
4 – CLEAN AND PAINT STRUCTURAL STEEL.

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN RDY | REVIEWED TRO | DATE 10/19/94
CHECKED G.T. | REVISED | STRUCTURE FILE NUMBER 0700800

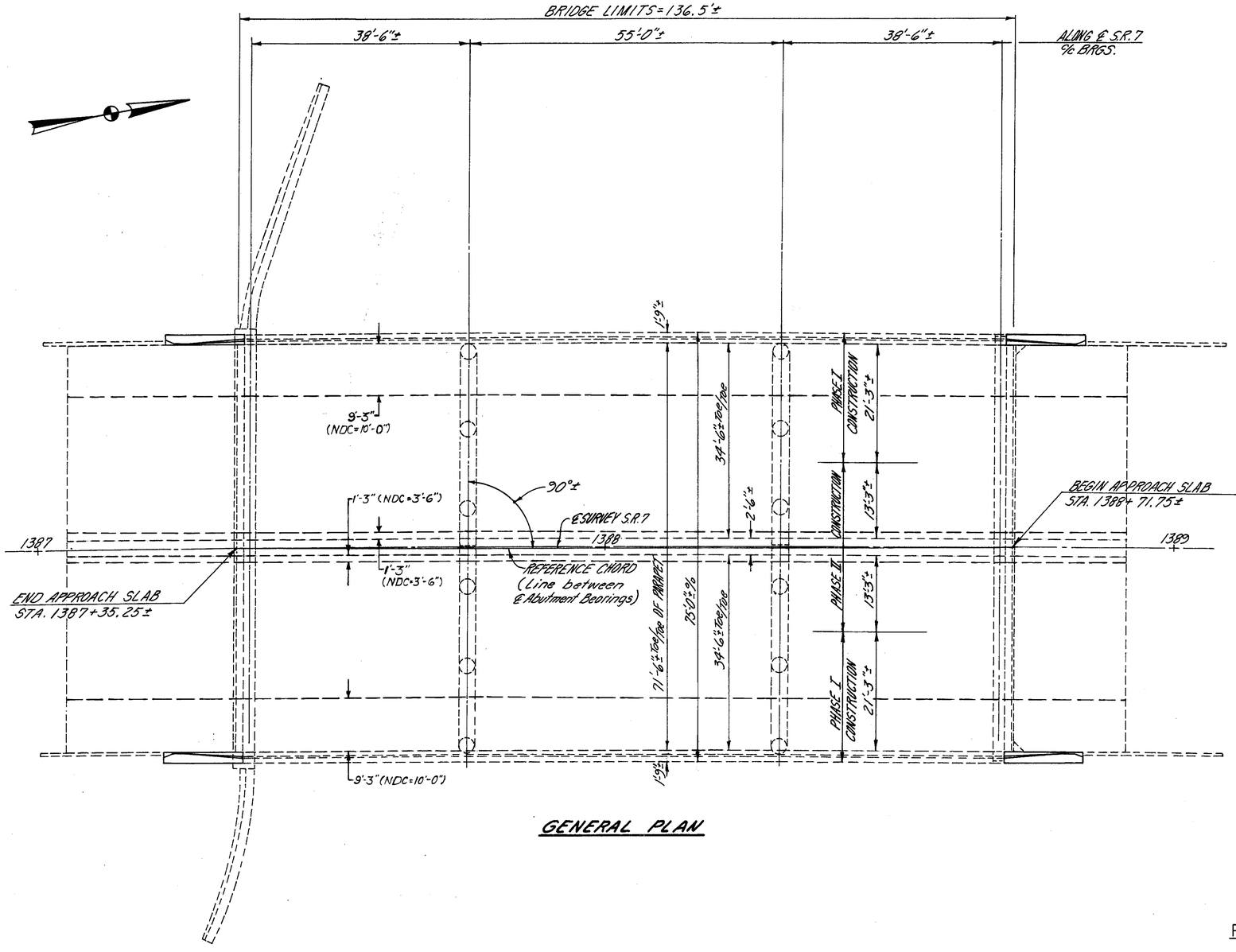
BELMONT COUNTY
STA. 48+10.79
STA. 50+28.40

GENERAL PLAN
BRIDGE NO. BEL-7-2549
S.R.7 UNDER T.R.469 CONNECTOR

BEL/JEF-7-23.76/0.00

3/18

79/94



GENERAL PLAN

PROPOSED WORK

1 – REPLACE TRANSITION PARAPETS.
2 – SOUND AND PATCH PORTIONS OF DELAMINATED MICRO-SILICA MODIFIED CONCRETE OVERLAY, AS PER PROPOSAL NOTE.
3 – TREAT BRIDGE DECK WITH GRAVITY FED RESIN.
4 – EPOXY SEAL REMAINING SUPERSTRUCTURE AND SUBSTRUCTURE CONCRETE SURFACES.
5 – CLEAN AND PAINT STRUCTURAL STEEL.

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN RDY | REVIEWED JRD | DATE 10/18/94
CHECKED G.T. | REVISED | STRUCTURE FILE NUMBER 0700827

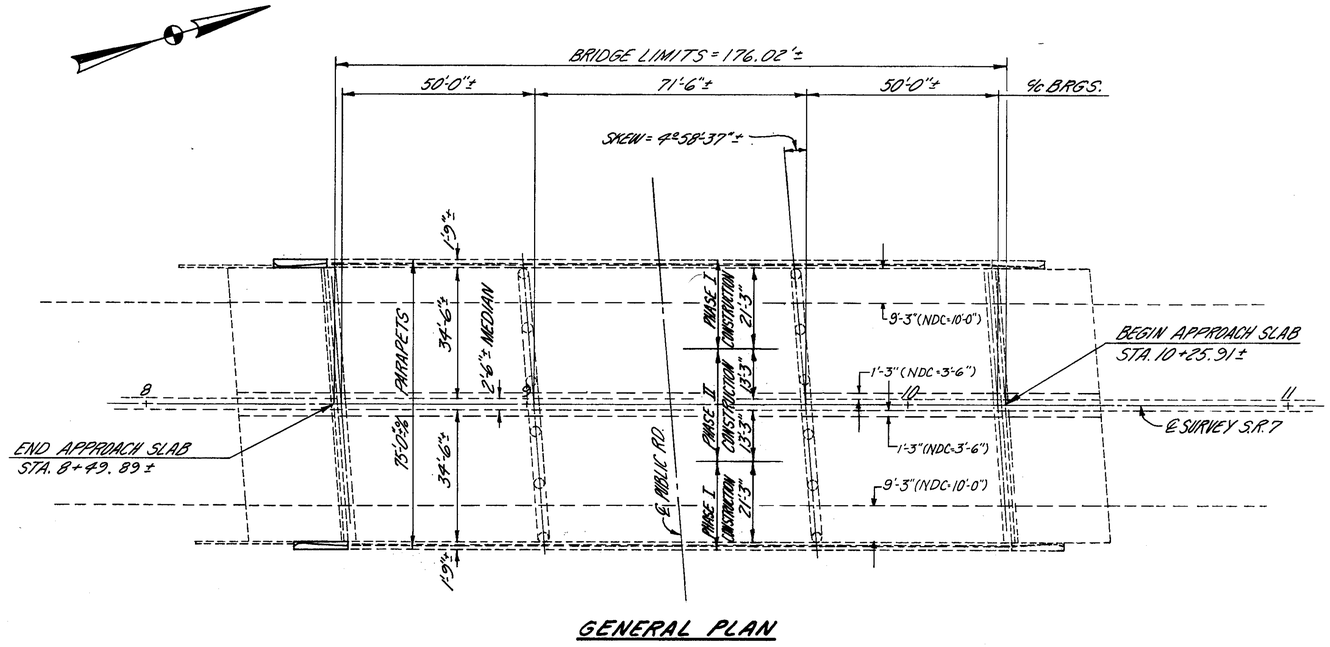
BELMONT COUNTY
STA. 1387+35.25
STA. 1388+71.75

GENERAL PLAN
BRIDGE NO. BEL-7-2619
S.R. 7 OVER DEEP RUN AND C.R. 2

BEL/JEF-7-23.76/0.00

4/18

80/94



GENERAL PLAN

PROPOSED WORK

1 – REPLACE REAR TRANSITION PARAPETS.
2 – SOUND AND PATCH PORTIONS OF DELAMINATED MICRO-SILICA MODIFIED CONCRETE OVERLAY, AS PER PROPOSAL NOTE.
3 – TREAT BRIDGE DECK WITH GRAVITY FED RESIN.
4 – EPOXY SEAL REMAINING SUPERSTRUCTURE AND SUBSTRUCTURE CONCRETE SURFACES.
5 – CLEAN AND PAINT STRUCTURAL STEEL.

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

REVIEWED 7/20 DATE 10/18/94
STRUCTURE FILE NUMBER 4100018

DESIGNED REW DRAWN RDY
CHECKED G.T. REVISED

JEFFERSON COUNTY
STA. 8+49.89
STA. 10+25.91

GENERAL PLAN
BRIDGE NO. JEF-7-0016
S.R. 7 OVER PUBLIC ROAD

BEL/JEF-7-23.76/000

5/18

81/94

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

AS-1-81	REVISED	9-15-94
EXJ-3-82	REVISED	2-14-97
EXJ-4-87	REVISED	2-14-97
GR-1.1M	DATED	10-21-97
GR-1.2M	DATED	1-3-96
GR-3.1M	DATED	10-21-97
HL-30.31	DATED	5-01-87
SD-1-69	DATED	6-12-69
GSD-1-96	DATED	2-12-97

AND TO SUPPLEMENTAL SPECIFICATIONS

849	DATED	6-14-95
910	DATED	4-21-97
949	DATED	6-14-95
815	DATED	5-30-96

DESIGN SPECIFICATIONS: THE NEW CONSTRUCTION TO THE STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1992 INCLUDING THE 1993, 1994 AND 1995 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL.

DESIGN DATA: (NEW CONSTRUCTION ONLY)
CONCRETE CLASS S – COMPRESSIVE STRENGTH 4500 P.S.I.(SUPERSTRUCTURE)
CONCRETE CLASS C – COMPRESSIVE STRENGTH 4000 P.S.I.(SUBSTRUCTURE)
REINFORCING STEEL – ASTM A615, A616 OR A617
GRADE 60 MINIMUM YIELD STRENGTH 60,000 P.S.I.
STRUCTURAL STEEL – ASTM A36 YIELD STRENGTH 36,000 P.S.I.

DECK PROTECTION METHOD: MICRO-SILICA MODIFIED CONCRETE OVERLAY, EPOXY COATED REINFORCING STEEL IN NEW CONCRETE AND SEALING OF CONCRETE SURFACES (EPOXY-URETHANE).

EXISTING STRUCTURE PLANS: PLANS PERTAINING TO THE EXISTING STRUCTURE MAY BE OBTAINED OR VIEWED BY INTERESTED PARTIES AT THE OHIO DEPARTMENT OF TRANSPORTATION, DISTRICT 11 OFFICE IN NEW PHILADELPHIA, OHIO.

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, 105.02 AND 513.02.

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.

REMOVAL OF PORTIONS OF THE EXISTING STRUCTURE: WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC, PORTIONS OF THE EXISTING STRUCTURE SHALL BE REMOVED AS PER 202 OF THE CMS, AND AS DIRECTED BY THE PLANS. SUITABLE WASTE MASONRY MAY BE PLACED AS BANK PROTECTION AS DIRECTED BY THE ENGINEER.

PLAN OF OPERATIONS: IN ADVANCE OF ANY WORK, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, A PLAN OF OPERATIONS, INCLUDING DETAILED MODIFICATIONS OF THE EXISTING STRUCTURE, FOR ALL PHASES OF CONSTRUCTION.

EXISTING DECK REMOVAL: PORTIONS OF THE EXISTING DECK SHALL BE REMOVED IN PHASE. A NEAT JOINT SHALL BE CUT ALONG THE LONGITUDINAL PHASE CONSTRUCTION JOINT AND THE TRANSVERSE DECK CONSTRUCTION JOINT BY MEANS OF A PARTIAL DEPTH SAW CUT.

CLEANING REQUIREMENTS FOR ITEM SPECIAL, PATCHING CONCRETE STRUCTURE WITH TROWELABLE MORTAR AND ITEM SPECIAL, PATCHING CONCRETE BRIDGE DECK OVERLAYS WITH MICRO-SILICA MODIFIED CONCRETE SHALL BE SUPPLEMENTED WITH THE FOLLOWING: ALL SURFACES TO BE PATCHED AND THE EXPOSED REINFORCING STEEL WITHIN SHALL BE THOROUGHLY CLEANED BY ABRASIVE BLASTING PRIOR TO THE CLEANING SPECIFIED BY 519.04 AND 520.05. CLEANING SHALL PRECEDE APPLICATION OF THE PATCHING MATERIAL OR ERECTION OF THE FORMS BY NOT MORE THAN 24 HOURS.

PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

DESCRIPTION: THIS WORK SHALL CONSIST OF THE REMOVAL OF PORTIONS OF CONCRETE DECKS INCLUDING PARAPETS, RAILING, DECK JOINTS AND OTHER APPURTENANCES FROM STEEL SUPPORTING SYSTEMS WHICH ARE TO REMAIN (BEAMS, CROSS FRAMES, ETC.). CARE SHALL BE TAKEN DURING REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND 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 CLEARANCE 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 2 INCHES OUTSIDE THESE LINES TO CONFIRM THE LOCATION OF FLANGE EDGES. DECK CUTS OVER OR WITHIN 2 INCHES OF FLANGE EDGES SHALL NOT EXTEND LOWER THAN THE BOTTOM LAYER OF DECK SLAB REINFORCING STEEL. CUTS MADE OUTSIDE 2 INCHES 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 35 POUNDS BUT NOT TO EXCEED 90 POUNDS MAY BE USED AT THE APPROVAL OF THE ENGINEER, TO ENSURE ADEQUATE DEPTH CONTROL TO PREVENT NICKING OR GOUGING THE PRIMARY STEEL MEMBERS.

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 PROJECT, BE REPLACED OR REPAIRED. PROPOSED REPAIRS, DEVELOPED BY A REGISTERED PROFESSIONAL ENGINEER, SHALL BE SUBMITTED IN WRITING FOR REVIEW AND APPROVAL BY THE DIRECTOR.

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 1" 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. THEN, 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 RESULTS SATISFACTORY TO THE ENGINEER. 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 35 POUNDS FOR REMOVAL WITHIN 18-INCHES OF PORTIONS TO BE PRESERVED. OUTSIDE THE 18 INCH LIMIT, A HAMMER HEAVIER THAN 35 POUNDS, BUT NOT TO EXCEED 90 POUNDS, 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.

REPLACEMENT OF EXISTING REINFORCING STEEL: ANY EXISTING REINFORCING BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH ARE MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED WITH NEW STEEL AT THEIR COST. ANY EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION SHALL BE REPLACED WITH NEW STEEL. AN ALLOWANCE OF 480 POUNDS IS INCLUDED IN ITEM 511 FOR THIS PURPOSE, ITEMIZED IN THE "GENERAL" COLUMNS OF THE ESTIMATED QUANTITIES TABLE.

STRUCTURE EXCAVATION IN ADDITION TO THAT NECESSARY TO REMOVE PORTIONS OF THE EXISTING STRUCTURE, AND ALL NECESSARY BACKFILL IS INCLUDED IN THE BID ITEM, "UNCLASSIFIED EXCAVATION", FOR PAYMENT.

ITEM 863, STRUCTURAL STEEL MEMBERS, MISCELLANEOUS FABRICATION, AS PER PLAN, (STRUCTURAL

STEEL FOR REHABILITATION OF DETERIORATED END CROSSFRAME, AS PER PLAN): STEEL MEMBERS TO BE FABRICATED UNDER THIS ITEM WILL NOT REQUIRE SHOP DRAWINGS PRIOR TO FABRICATION. THE CONTRACTOR SHALL MAKE NECESSARY MEASUREMENTS AND PREPARED SKETCHES, DRAWINGS, TABLES, ETC. THE ENGINEER SHALL HAVE AUTHORITY AND RESPONSIBILITY FOR ENSURING THAT THE FABRICATED STEEL IS ACCEPTABLE. TECHNICAL ASSISTANCE WILL BE PROVIDED ON REQUEST BY THE OFFICE OF STRUCTURAL ENGINEERING (OSE). MILL TEST REPORTS AND SHIPPING DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INCORPORATING STEEL ITEMS INTO THE WORK, AS REQUIRED BY 501.07. AFTER FABRICATION, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL TO ENSURE THAT THE DRAWINGS DEPICT THE STEEL AS ACTUALLY INCORPORATED INTO THE WORK. THE ENGINEER WILL THEN SEND ONE APPROVED SET TO THE OSE FOR INFORMATION. PAY WEIGHTS SHALL BE COMPUTED IN COMPLIANCE WITH 863 SUPPLEMENTAL SPECIFICATION AND SUBMITTED TO THE ENGINEER FOR HIS REVIEW AND APPROVAL. THE FABRICATOR SHALL FURNISH A 35 MILLIMETER MICROFILM COPY OF EACH SHOP DRAWING, WHICH SHALL BE MOUNTED ON AN APERTURE CARD AS SPECIFIED IN 501.05. STEEL MEMBERS INCLUDED IN THIS ITEM INCLUDE END CROSSFRAMES.

PAINTING OF STRUCTURAL STEEL : NEW STEEL SHALL BE PROVIDED BARE FOR PREPARATION AND PAINTING IN THE FIELD. FOR PURPOSES OF FIELD PAINTING, NEWLY ERECTED STEEL SHALL BE CONSIDERED EXISTING STEEL AND SHALL BE PREPARED AND PAINTED WITH A PRIME, INTERMEDIATE, AND FINISH COAT OF PAINT IN CONFORMANCE WITH S.S. 815 "FIELD PAINTING OF EXISTING STEEL, SYSTEM OZEU". COST OF CLEANING AND PAINTING OF NEW AND EXISTING STEEL WITH THE OZEU PAINT SYSTEM SHALL BE INCLUDED IN THE SEVERAL OZEU ITEMS. THE SURFACE AREA PAY QUANTITIES ARE BASED ON THE SURFACE AREA OF MAIN MEMBERS INCREASED BY A PERCENT TO ACCOUNT FOR THE AREA OF CROSSFRAMES, BEARINGS, AND OTHER STEEL INCIDENTALS BEING CLEANED AND PAINTED. SEE TABLE A BELOW FOR PERCENT INCREASE FOR EACH BRIDGE.

TABLE A

BRIDGE NO.	PERCENT INCREASE OF MAIN MEMBER SURFACE AREA
BEL-7-2389	33%
BEL-7-2526	37%
BEL-7-2549	23%
BEL-7-2619	22%
JEF-7-0016	24%

CONCRETE PARAPETS: WITHIN 48 HOURS AFTER PLACEMENT OF PARAPET CONCRETE SAW CUT 1 INCH DEEP JOINTS INTO THE CONCRETE PARAPET AT LOCATIONS AS DETAILED ON SHEET 15/18. THE SAW CUT SHALL BE MADE IN THE COMPLETE CIRCUMFERENCE OF THE PARAPET, STARTING AND ENDING AT THE ELEVATION OF THE CONCRETE DECK, AND THE COMPLETED SAW CUT SHALL BE FILLED WITH A CAULKING MATERIAL CONFORMING TO FEDERAL SPECIFICATION TT-S-00227E. THE BOTTOM HALF INCH OF THE ONE INCH DEEP SAWED JOINT IN BOTH THE INSIDE AND OUTSIDE FACES OF THE PARAPET SHOULD BE LEFT UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE. ALL LABOR, TOOLS, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK ARE INCLUDED UNDER ITEM 511, CLASS S CONCRETE, SUPERSTRUCTURE.

ITEM SPECIAL 846 CONCRETE BRIDGE DECKS WITH HMWM RESIN: A HMWM RESIN SHALL BE APPLIED ALONG THE LONGITUDINAL PHASE CONSTRUCTION JOINTS OF THE MICRO-SILICA MODIFIED CONCRETE OVERLAY, SEE SHEET 8/18, 9/18 AND SHEET 10/18.

ITEM 202-WEARING COURSE REMOVED, AS PER PLAN
INCLUDED IN THIS ITEM SHALL BE THE COST OF REMOVING ANY WATERPROOFING MATERIAL FROM BETWEEN THE CONCRETE DECK AND ASPHALT WEARING COURSE. ASPHALT REMOVAL SHALL BE A SEPARATE OPERATION FROM REMOVING ANY WATERPROOFING MATERIAL AND SEPARATE FROM THE SCARIFICATION OF THE DECK. THE COST OF ALL LABOR, EQUIPMENT, INCIDENTAL AND MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM 202-SQ.YD.-WEARING COURSE REMOVED, AS PER PLAN.

REINFORCING STEEL: NEW REINFORCING STEEL MAY REQUIRE FIELD CUTTING OR BENDING TO BE PROPERLY FITTED. PAYMENT SHALL BE INCLUDED IN 511.

ITEM SPECIAL-PATCHING CONCRETE BRIDGE OVERLAYS WITH MICRO-SILICA MODIFIED CONCRETE:
AN ENGINEER'S CONTINGENCY QUANTITY OF 10 SQ.YD. EACH HAS BEEN INCLUDED IN THE ESTIMATED QUANTITIES FOR BEL-7-2619 AND JEF-7-0016. THESE QUANTITIES SHALL BE USED AT THE ENGINEER'S DISCRETION AND MAY BE NON-PERFORMED.

MAINTENANCE OF TRAFFIC: FOR DETAILS SEE PLAN SHEET 10/94 TO SHEET 14/94. IN THE ROADWAY PLANS.

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED	DRAWN	REVIEWED	DATE
REW	REW	T.R.O.	5/11/95
CHECKED	REVISED	STRUCTURE FILE NUMBER	
G.T.			

GENERAL NOTES

BEL/JEF-7-23.76/0.00

6/18

82/94

1993NOTE.DWG SEPTEMBER 06, 1996

QUANTITIES CALCULATED BY REW – JAN. 12, 1995

ESTIMATED QUANTITIES

QUANTITIES CHECKED BY G.T. – MARCH 27, 1995

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	BEL-7-2389			BEL-7-2526				BEL-7-2549				BEL-7-2619				JEF-7-0016			
					ABUTMENT	SUPERSTR.	GENERAL	ABUTMENT	PIER	SUPERSTR.	GENERAL	ABUTMENT	PIER	SUPERSTR.	GENERAL	ABUTMENT	PIER	SUPERSTR.	GENERAL	ABUTMENT	PIER	SUPERSTR.	GENERAL
202	11201	LUMP		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN			LUMP				LUMP				LUMP				LUMP				LUMP
202	23501	3137	SQ YD	WEARING COURSE REMOVED, AS PER PLAN		379				1850				908									
503	21100	12	CU YD	UNCLASSIFIED EXCAVATION				4								6				2			
511	34400	7	CU YD	CLASS S CONCRETE, SUPERSTRUCTURE		7																	
511	45700	43	CU YD	CLASS C CONCRETE, ABUTMENT	9			9				9				11				5			
SPECIAL	51267510	3403	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)**	200	223		225	489	593		161	179	428		48	282	131		24	253	167	
846	73000	139	SQ YD	TREATING CONCRETE BRIDGE DECKS WITH HMWM RESIN		23				68				48									
SPECIAL	51273500	2345	SQ YD	TREATING CONCRETE BRIDGE DECKS WITH GRAVITY FED RESIN **														1021				1324	
863	10200	82	POUND	STRUCTURAL STEEL MEMBERS, MISCELLANEOUS LEVEL FABRICATION						82													
815	00050	71710	SQ FT	SURFACE PREPARATION OF EXISTING STEEL, SYSTEM OZEU		6780				21390				11950				13110				18480	
815	00056	71710	SQ FT	FIELD PAINTING OF EXISTING STEEL, PRIME COAT, SYSTEM OZEU		6780				21390				11950				13110				18480	
815	00060	71710	SQ FT	FIELD PAINTING OF EXISTING STEEL, INTERMEDIATE COAT, SYSTEM OZEU		6780				21390				11950				13110				18480	
815	00066	71710	SQ FT	FIELD PAINTING OF EXISTING STEEL, FINISH COAT, SYSTEM OZEU		6780				21390				11950				13110				18480	
516	11210	96	LIN FT	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL		96																	
516	11900	2	LIN FT	HORIZONTAL EXTENSION OF STRUCTURAL EXPANSION JOINT		2																	
SPECIAL	51911502	7	SQ FT	PATCHING CONCRETE STRUCTURE WITH TROWELABLE MORTAR **				7															
SPECIAL	51911600	180	SQ YD	PATCHING CONCRETE STRUCTURE, MISC.:																			
				PATCHING CONCRETE BRIDGE DECK OVERLAYS WITH MICRO-SILICA MODIFIED CONCRETE **														90				90	
SPECIAL	51922006	908	SQ YD	MICRO-SILICA MODIFIED CONCRETE OVERLAY (1.75" THICK)**										908									
SPECIAL	51922006	2229	SQ YD	MICRO-SILICA MODIFIED CONCRETE OVERLAY (2.75" THICK)**		379				1850													
SPECIAL	51922100	105	CU YD	MICRO-SILICA MODIFIED CONCRETE OVERLAY (VARIABLE THICKNESS)**		13				62				30									
SPECIAL	51922300	LUMP		TEST SLAB **		LUMP				LUMP				LUMP									

** SEE PROPOSAL NOTE

BEL-7-2389 REINFORCING STEEL LIST (FOR INFORMATION ONLY)

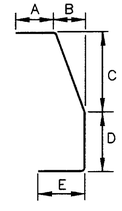
ABUTMENTS

MARK	NO.	LENGTH	WEIGHT	TYPE	ABUTMENT REAR	ABUTMENT FWD.	DIMENSION A	B	C	D	E
PHASE I											
A801	3	4'-0"	32	3	3		1'-7"	1'-2"	1'-2"	1'-0"	0'-0"
A502	39	3'-3"	132	5		40	0'-9"	1'-5"	1'-5"		
A503	3	24'-0"	75	ST		3					
A507	1	21'-4"	22	ST		1					
A508	2	18'-1"	38	ST		2					
A509	2	6'-3"	13	98		2	1'-5"	1'-7"	1'-11"	1'-7"	0'-4"
A510	4	7'-1"	30	ST		4					
A511	6	5'-8"	35	98		6	1'-5"	1'-3"	1'-11"	1'-3"	0'-4"
A512	8	1'-0"	8	ST	4	4					
A514	2	1'-10"	4	ST		2					
A515	4	2'-6"	10	11	2	2	1'-7"	1'-0"			
A516	4	3'-7"	15	3	2	2	0'-10"	0'-7½"	0'-8½"	1'-3"	1'-0"
A517	2	3'-3"	7	5	2		1'-2"	1'-2"	1'-2"		
A518	3	3'-0"	9	5	3		0'-11"	1'-2"	1'-2"		
		TOTAL =	430								
PHASE II											
A501	47	3'-7"	176	5		46	0'-9"	1'-7"	1'-7"		
A502	7	3'-3"	24	5		7	0'-9"	1'-5"	1'-5"		
A504	3	6'-8"	21	ST		3					
A505	3	19'-5"	61	ST		3					
A506	3	26'-1"	82	ST		3					
A512	2	1'-0"	2	ST		2					
A513	2	6'-10"	14	5		2	3'-2"	2'-0"	2'-0"		
A519	1	3'-8"	4	98		1	0'-0"	0'-9"	2'-3"	0'-9"	0'-4"
		TOTAL =	384								

SUPERSTRUCTURE

MARK	NO.	LENGTH	WEIGHT	TYPE	DIMENSION A	B	C	D	E
PHASE I									
S503	41	2'-4"	100	3	0'-8"	0'-6"	0'-8½"	0'-11"	0'-0"
S504	45	5'-7"	262	16	2'-4"	0'-2"	2'-7"	0'-7½"	
S505	6	2'-6"	16	11	1'-7"	1'-0"			
S506	2	3'-4"	7	3	0'-10"	0'-7½"	0'-8½"	0'-11"	0'-10"
S507	2	5'-10"	12	16	2'-4"	0'-2½"	2'-7"	0'-9½"	
S508	16	28'-5"	474	ST					
S509	4	2'-10"	12	3	0'-8"	0'-6"	0'-8½"	0'-11"	0'-8"
S510	6	2'-5"	15	5	0'-8"	1'-4"	0'-8"		
S511	3	7'-2"	22	ST					
		TOTAL =	920						
PHASE II									
S501	3	2'-10"	9	18	0'-0"	1'-1"	0'-11½"	0'-3"	1'-0"
S502	3	2'-9"	9	18	0'-0"	1'-0"	0'-11½"	0'-2"	1'-0"
		TOTAL =	18						

BENDING DIAGRAMS



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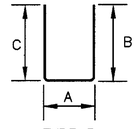

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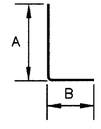

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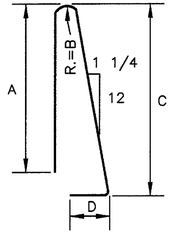

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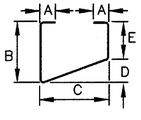

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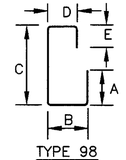


TYPE 98

BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. R. INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "ST" WRITTEN IN THE TYPE COLUMN INDICATES A STRAIGHT BAR.

ALL REINFORCING STEEL TO BE EPOXY COATED.

SEE SHEET 18/18 FOR TRANSITION PARAPET REINFORCING LIST.

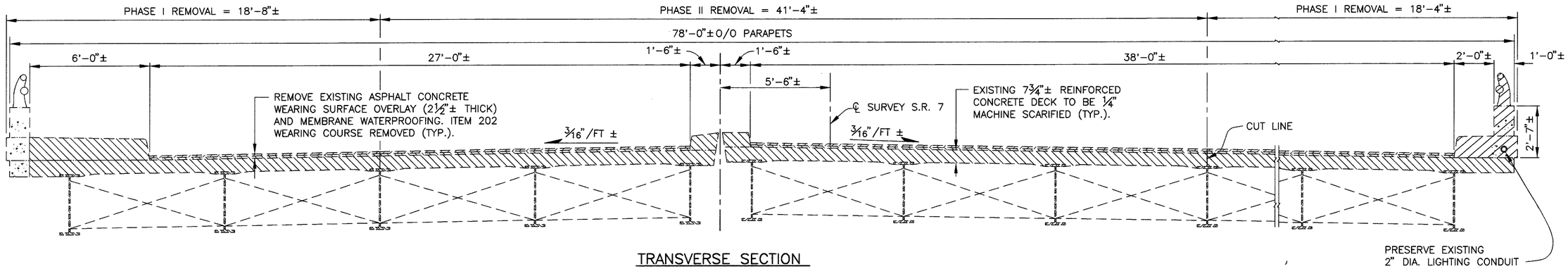
STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN REW | REVIEWED T.R.O. | DATE 5/11/95 | STRUCTURE FILE NUMBER
CHECKED G.T. | REVISED

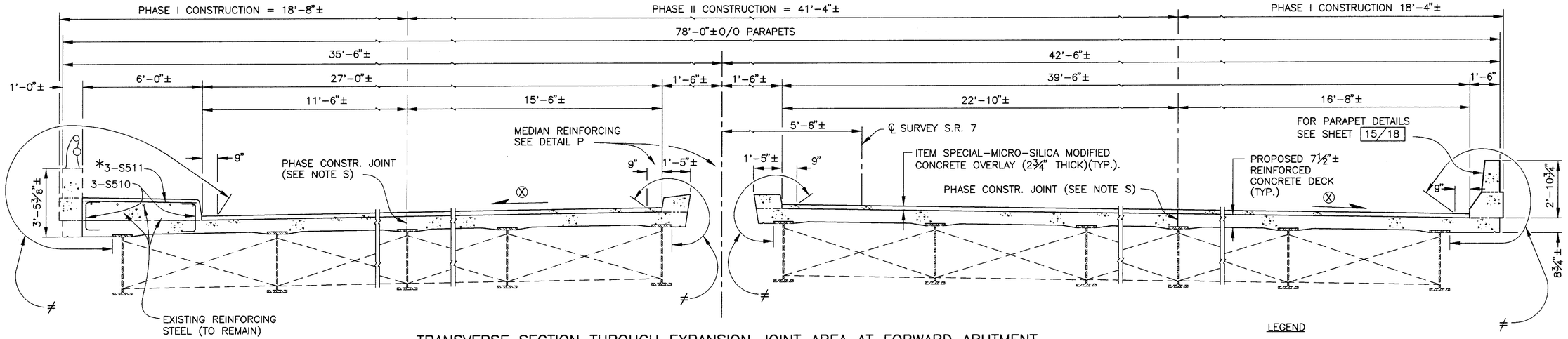
ESTIMATED QUANTITIES & REINFORCING STEEL LIST

BEL/JEF-7-23.76/0.00

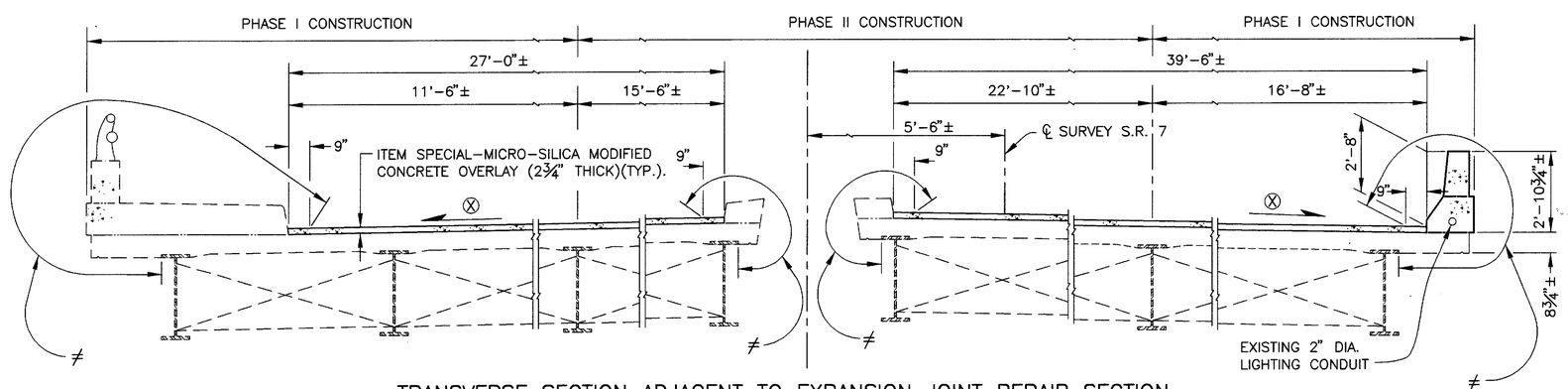
ESTQUANT.DWG SEPTEMBER 06, 1996



TRANSVERSE SECTION



TRANSVERSE SECTION THROUGH EXPANSION JOINT AREA AT FORWARD ABUTMENT



TRANSVERSE SECTION ADJACENT TO EXPANSION JOINT REPAIR SECTION

LEGEND

≠ – LIMITS OF SEALING OF CONCRETE SURFACES (EPOXY) FULL LENGTH OF DECK.

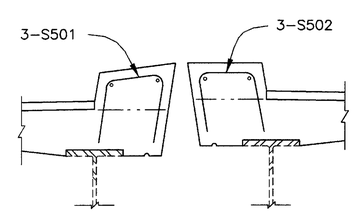
Ⓧ – MATCH EXISTING

* – PLACE PARALLEL TO FACE OF ABUTMENT.

– LIMITS OF CONCRETE PARAPET REMOVAL. (FULL LENGTH OF DECK)

– LIMITS OF CONCRETE SLAB REMOVAL (ADJACENT TO FORWARD ABUTMENT ONLY.) SEE SECTION A-A, SHEET 14/18.

NOTE S:
TREAT TOP OF MICRO-SILICA MODIFIED CONCRETE OVERLAY SURFACE, ALONG A 2 FOOT WIDE STRIP CENTERED ABOUT THE LONGITUDINAL PHASE CONSTRUCTION JOINT WITH HMWM RESIN THE FULL LENGTH OF THE DECK.



DETAIL P

(SLAB REINFORCING NOT SHOWN)

STICKLEN - BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW
DRAWN RDY/REW
CHECKED G.T.
REVISED
REVIEWED T.R.O. 5/11/95
DATE
STRUCTURE FILE NUMBER 0700770

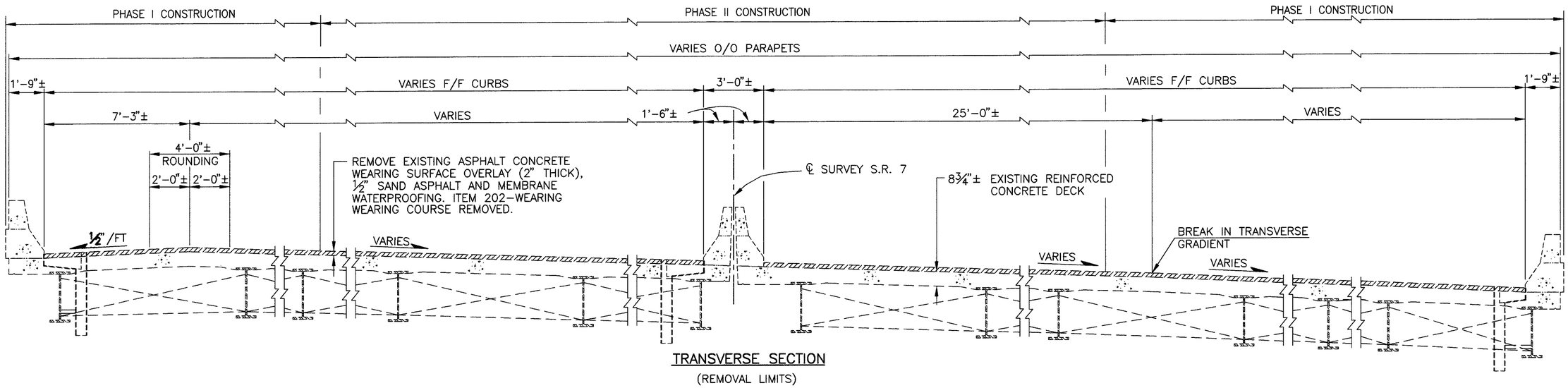
SUPERSTRUCTURE DETAILS
BRIDGE NO. BEL-7-2389
S.R. 7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

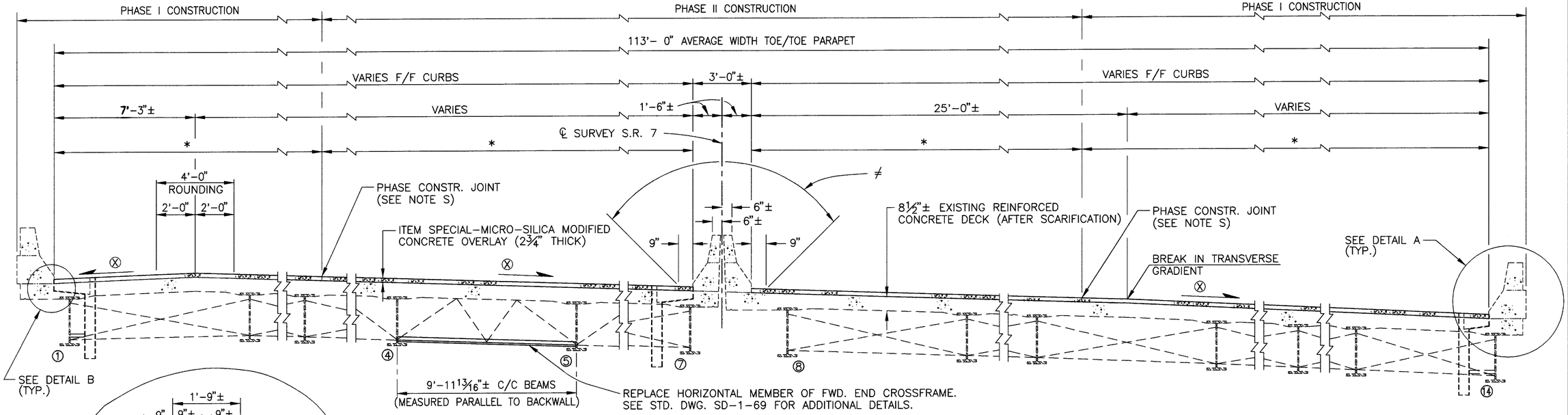
8/18

84/94

2389SUP1.DWG SEPTEMBER 06, 1996



TRANSVERSE SECTION
(REMOVAL LIMITS)



TRANSVERSE SECTION

LEGEND

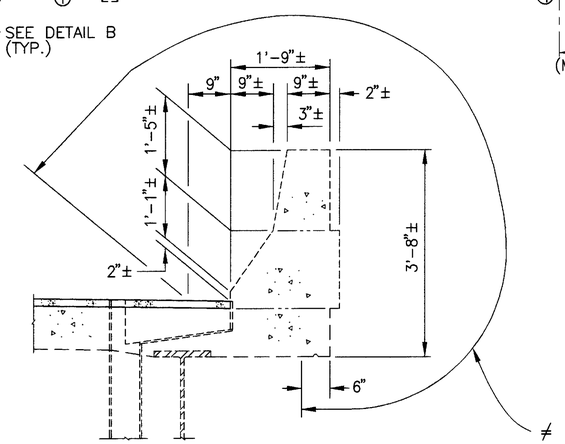
① — INDICATES BEAM NUMBER

Ⓧ — MATCH EXISTING

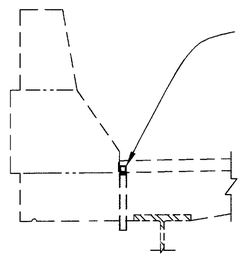
≠ — LIMITS OF EPOXY SEALING OF CONCRETE SURFACES.

* — MAINTAIN 10'-0" MINIMUM LANE WIDTH. SEE MAINTENANCE OF TRAFFIC SHEET (10/94) TO (14/94) FOR DETAILS.

NOTE S:
TREAT TOP OF MICRO-SILICA MODIFIED CONCRETE OVERLAY SURFACE, ALONG A 2 FOOT WIDE STRIP CENTERED ABOUT THE LONGITUDINAL PHASE CONSTRUCTION JOINT WITH HMWM RESIN THE FULL LENGTH OF THE DECK.



DETAIL A



EXISTING 1¼" X 1¼" PERFORATED STRUCTURAL STEEL TUBE TO BE REMOVED. INCLUDE WITH ITEM 202 WEARING COURSE REMOVED FOR PAYMENT. EXISTING 1" DIA. PVC DRAIN PIPES AT 6 FT± SPACING SHALL BE PLUGGED WITH CLASS C CONCRETE. BOTH ITEMS TO BE PERFORMED PRIOR TO PLACEMENT OF MICRO-SILICA MODIFIED CONCRETE OVERLAY.

DETAIL B

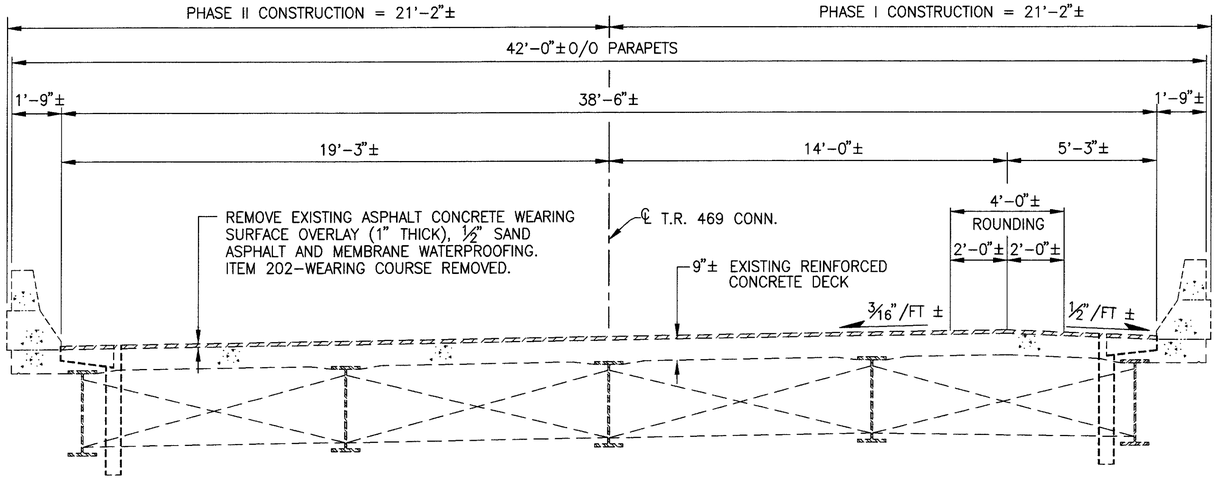
STICKLEN - BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43228

DESIGNED REW | DRAWN RDY/REW | CHECKED G.T. | REVISED | REVIEWED T.R.O. | DATE 5/11/95 | STRUCTURE FILE NUMBER 0700797

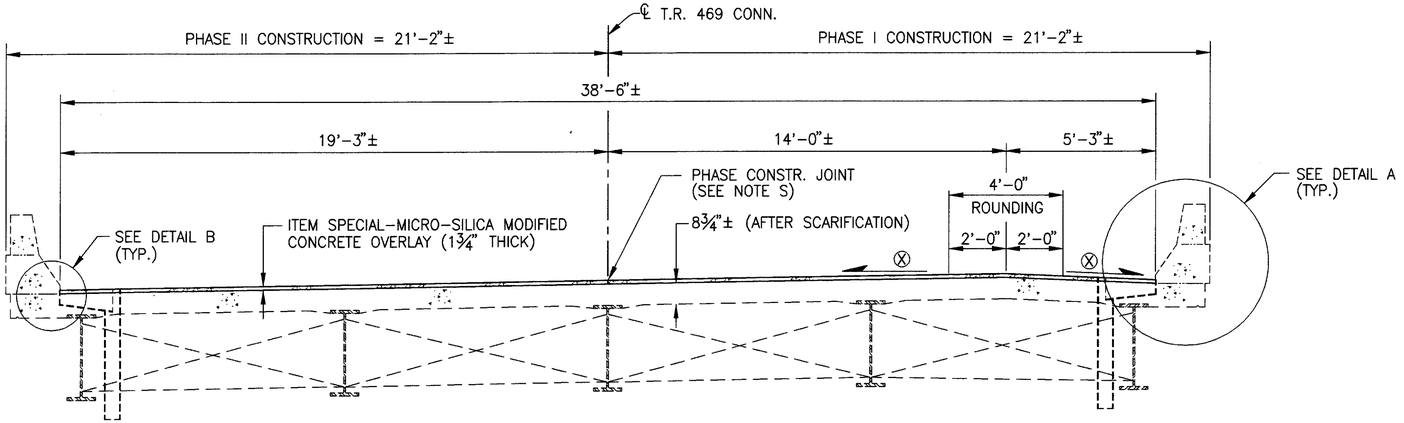
SUPERSTRUCTURE DETAILS
BRIDGE NO. BEL-7-2526
S.R. 7 OVER PATTON RUN AND T.R. 469

BEL/JEF-7-23.76/0.00

2526SUP1.DWG SEPTEMBER 06, 1996



TRANSVERSE SECTION
(REMOVAL LIMITS)

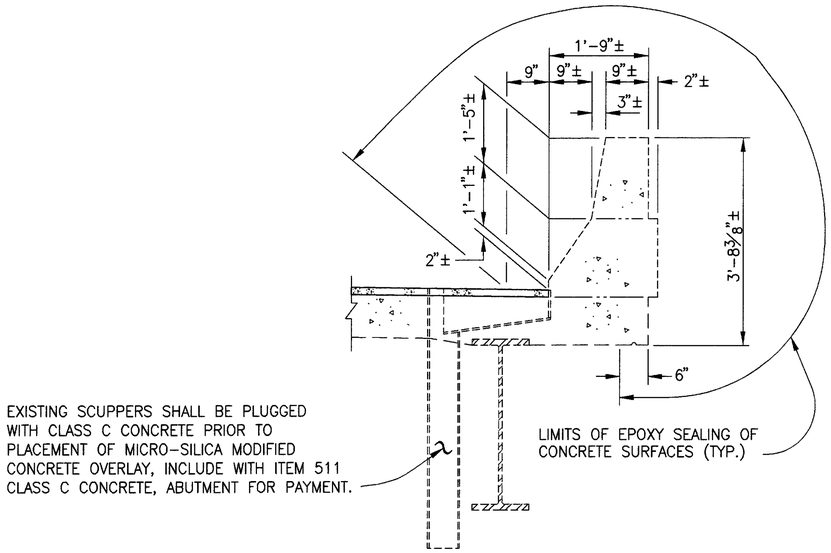


TRANSVERSE SECTION

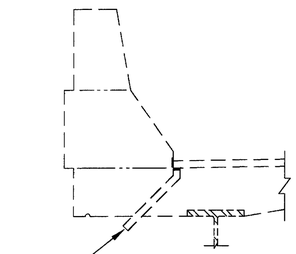
LEGEND

Ⓧ — MATCH EXISTING

NOTE S:
TREAT TOP OF MICRO-SILICA MODIFIED CONCRETE OVERLAY SURFACE, ALONG A 2 FOOT WIDE STRIP CENTERED ABOUT THE LONGITUDINAL PHASE CONSTRUCTION JOINT WITH HMWM RESIN THE FULL LENGTH OF THE DECK.



DETAIL A



DETAIL B

EXISTING 1" DIA. SUBDRAINAGE TUBES AT 6 FT± SPACING SHALL BE PLUGGED WITH CLASS C CONCRETE PRIOR TO PLACEMENT OF MICRO-SILICA MODIFIED CONCRETE OVERLAY, INCLUDE WITH ITEM 511 CLASS C CONCRETE, ABUTMENT FOR PAYMENT.

STICKLEN - BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED	DRAWN	REVIEWED	DATE
REW	RDY/REW	T.R.O.	5/11/95
CHECKED	REVISED	STRUCTURE FILE NUMBER	
G.T.		0700800	

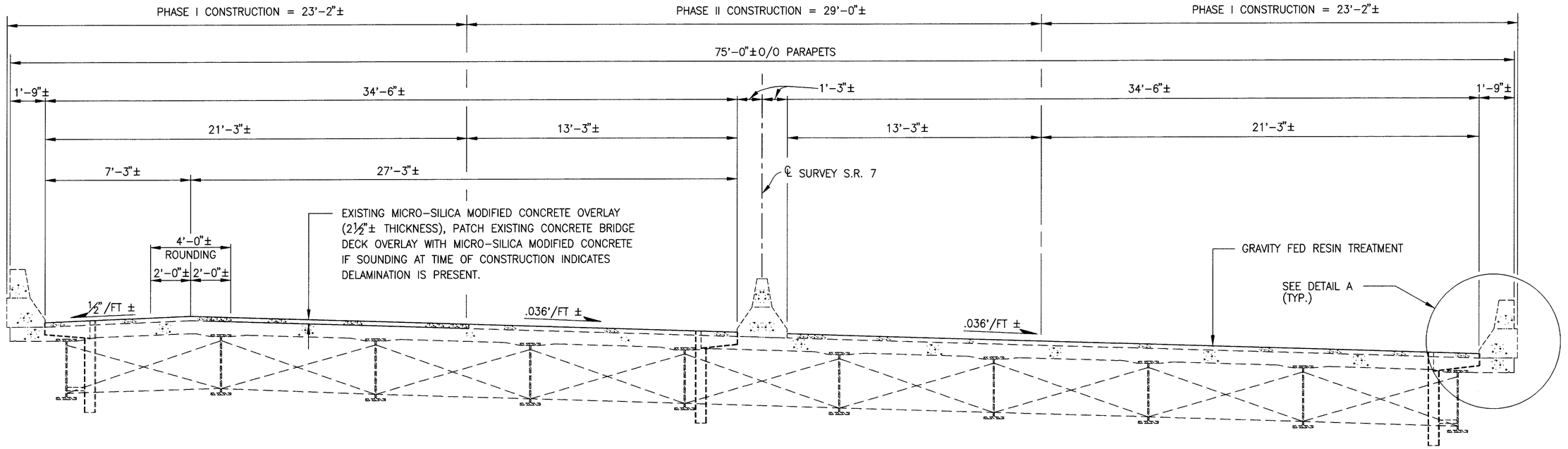
SUPERSTRUCTURE DETAILS
BRIDGE NO. BEL-7-2549
S.R. 7 UNDER T.R. 469 CONNECTOR

BEL/JEF-7-23.76/0.00

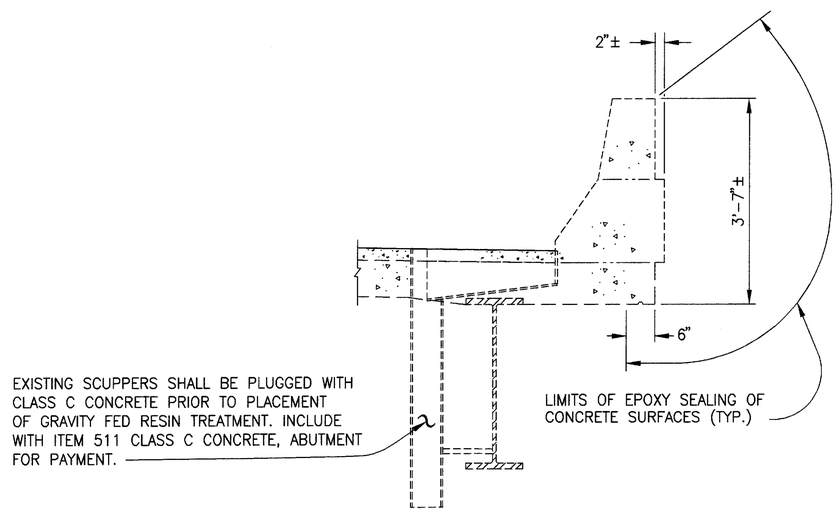
10/18

86
94

2549SUP1.DWG SEPTEMBER 06, 1996



TRANSVERSE SECTION



DETAIL A

STICKLEN - BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN RDY/REW | REVIEWED T.R.O | DATE 5/10/95
CHECKED G.T. | REVISED | STRUCTURE FILE NUMBER 0700827

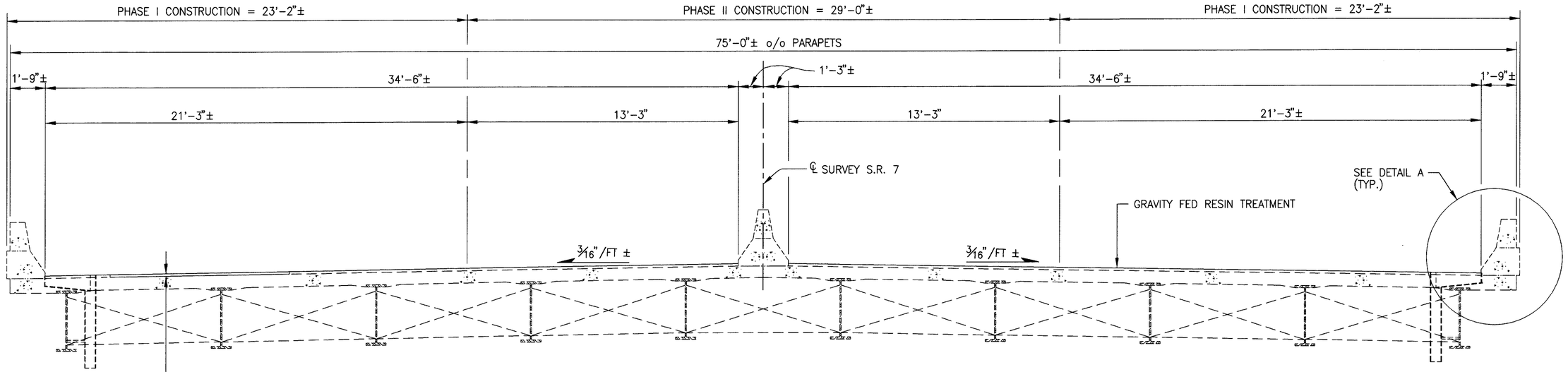
SUPERSTRUCTURE DETAILS
BRIDGE NO. BEL-7-2619
S.R. 7 OVER DEEP RUN AND C.R. 2

BEL/JEF-7-23.76/0.00

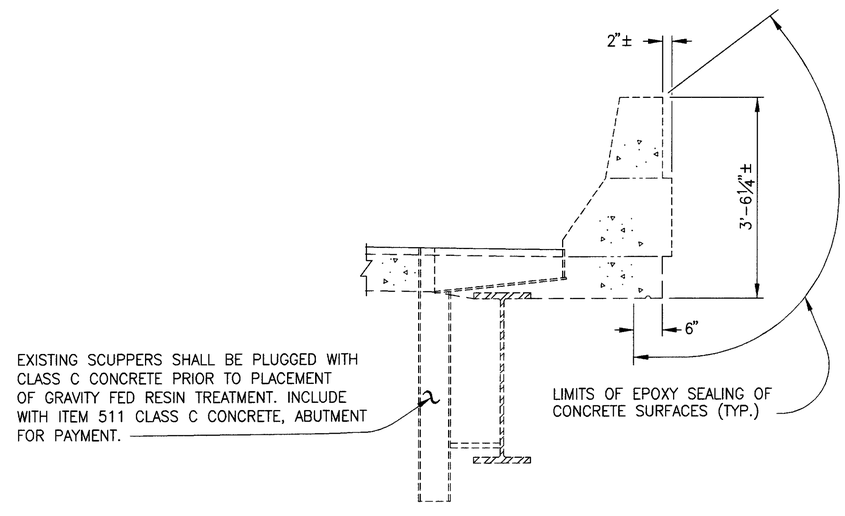
11/18

87/94

2619SUP1.DWG SEPTEMBER 06, 1996



TRANSVERSE SECTION



DETAIL A

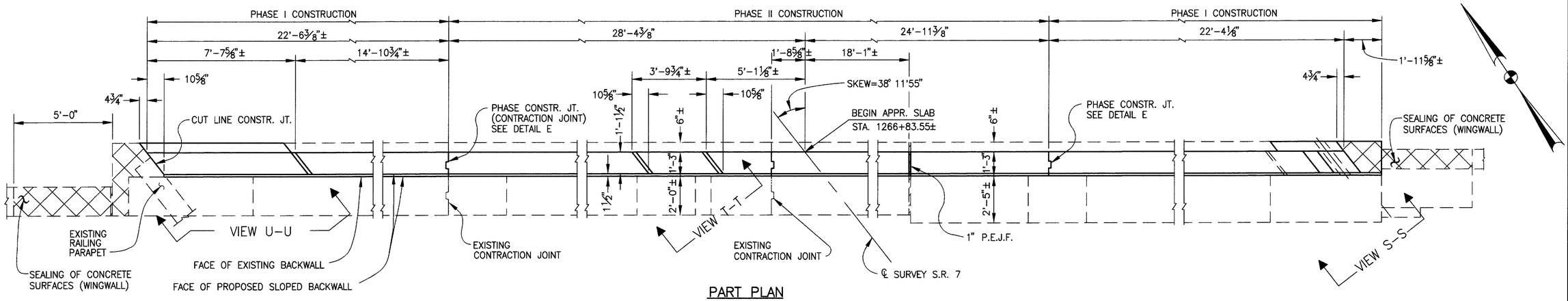
STICKLEN - BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN RDY/REW | REVIEWED T.R.O. | DATE 5/10/95
CHECKED G.T. | REVISED | STRUCTURE FILE NUMBER 4100018

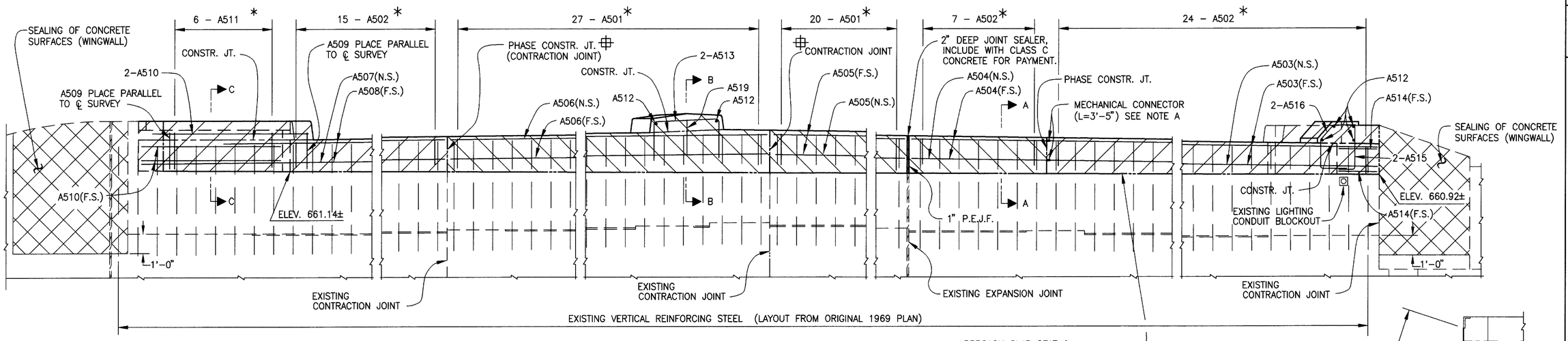
SUPERSTRUCTURE DETAILS
BRIDGE NO. JEF-7-0016
S.R. 7 OVER PUBLIC ROAD

BEL/JEF-7-23.76/0.00

0016SUP1.DWG SEPTEMBER 06, 1996

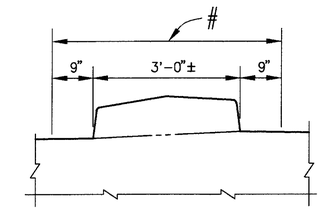


PART PLAN

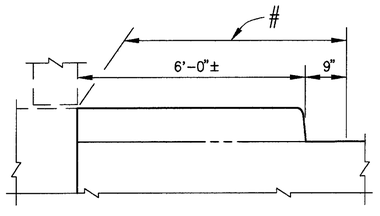


PART ELEVATION

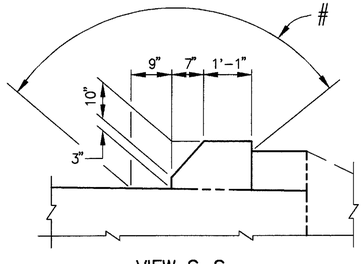
(EXISTING HORIZONTAL REINFORCING NOT SHOWN)



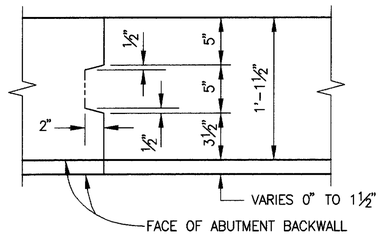
VIEW T-T



VIEW U-U



VIEW S-S



DETAIL E

NOTE A:
MECHANICAL CONNECTORS: AN APPROVED TYPE OF MECHANICAL CONNECTOR FOR REINFORCING BARS SHALL BE PROVIDED. INSTALLATION OF CONNECTORS SHALL CONFORM WITH MANUFACTURER'S RECOMMENDED PROCEDURES. IF A DOWEL BAR SPLICE TYPE OF CONNECTOR IS FURNISHED, THE MINIMUM DOWEL BAR LENGTH TO BE INCLUDED WITH THE CONNECTOR SHALL BE AS GIVEN BY THE DIMENSION "L" SHOWN ON THE PLANS.

CONNECTORS AND DOWEL BARS USED WITH EPOXY COATED BARS SHALL BE EPOXY COATED. COATING FOR BOTH CONNECTORS AND BARS SHALL CONFORM TO THE SAME SPECIFICATIONS. COATINGS WHICH HAVE BEEN DAMAGED OR WHICH OTHERWISE DO NOT MEET SPECIFICATIONS WITH RESPECT TO COLOR, CONTINUITY AND UNIFORMITY MAY BE REPAIRED AS DIRECTED BY THE ENGINEER OR THEY SHALL BE REPLACED WITH MATERIAL WHICH MEETS THE SPECIFICATIONS.

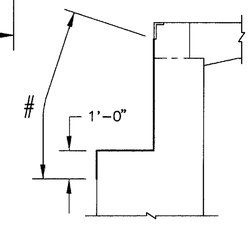
REINFORCING BAR LENGTHS SHOWN IN THE "REINFORCING STEEL LIST" ARE BASED ON A THREADED, NON-PROTRUDING TYPE OF MECHANICAL CONNECTOR.

CONNECTORS AND DOWEL BAR EXTENSIONS SHALL CONFORM WITH ITEM 509 AND BE INCLUDED IN THE BID PRICE PER POUND FOR ITEM 509, GRADE 60.

BACKWALL CONCRETE: IN ADDITION TO THE PROVISIONS OF 511.08, PROPOSED ABUTMENT BACKWALL AND WINGWALL CONCRETE ABOVE THE CUT LINE CONSTRUCTION JOINT SHALL NOT BE PLACED UNTIL AFTER THE SUPERSTRUCTURE CONCRETE IN THE SPAN ADJACENT TO THE ABUTMENT HAS BEEN PLACED. THE PROPOSED ABUTMENT BACKWALL ELEVATIONS SHALL MATCH THE ADJACENT SUPERSTRUCTURE ELEVATIONS.

A CONCRETE EPOXY SEALER SHALL BE APPLIED TO THE FRONT FACE OF BOTH FORWARD AND REAR ABUTMENT BACKWALLS FROM TOP TO BRIDGE SEAT AND BRIDGE SEAT, AND PORTIONS OF FRONT FACE AND TOPS OF WINGWALLS, AS SHOWN. PAYMENT SHALL BE INCLUDED IN THE ITEM SPECIAL, SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

MINIMUM REINFORCING BAR SPLICE LAP LENGTH:
NO. 5 BAR = 3'-5"



TYPICAL BACKWALL SECTION
(SEE CONCRETE SEALING NOTE)

LEGEND

- F.S. – FAR SIDE
- N.S. – NEAR SIDE
- P.E.J.F. – PREFORMED EXPANSION JOINT FILLER, INCLUDE WITH CLASS C CONCRETE FOR PAYMENT.
- # – LIMITS OF SEALING OF ITEM SPECIAL, SEALING OF EXISTING AND PROPOSED CONCRETE SURFACES (EPOXY-URETHANE).
- * – LAP EXISTING REINFORCING BARS SPACED AT 1'-0"±.
- ⌗ – REINFORCING STEEL AND EXPANSION JOINT ARMOR SHALL NOT EXTEND THROUGH JOINT. ENDS OF EXPANSION JOINT ARMOR ARE TO BE BUTTED CLOSE TOGETHER BUT NOT ATTACHED.
- – PORTION OF CONCRETE TO BE REMOVED UNDER PHASE I.
- – PORTION OF CONCRETE TO BE REMOVED UNDER PHASE II.
- – LIMITS OF SEALING OF ITEM SPECIAL, SEALING OF CONCRETE SURFACES

FOR SECTIONS AND ADDITIONAL NOTES AND DETAILS, SEE SHEET 14/18.

STICKLEN - BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

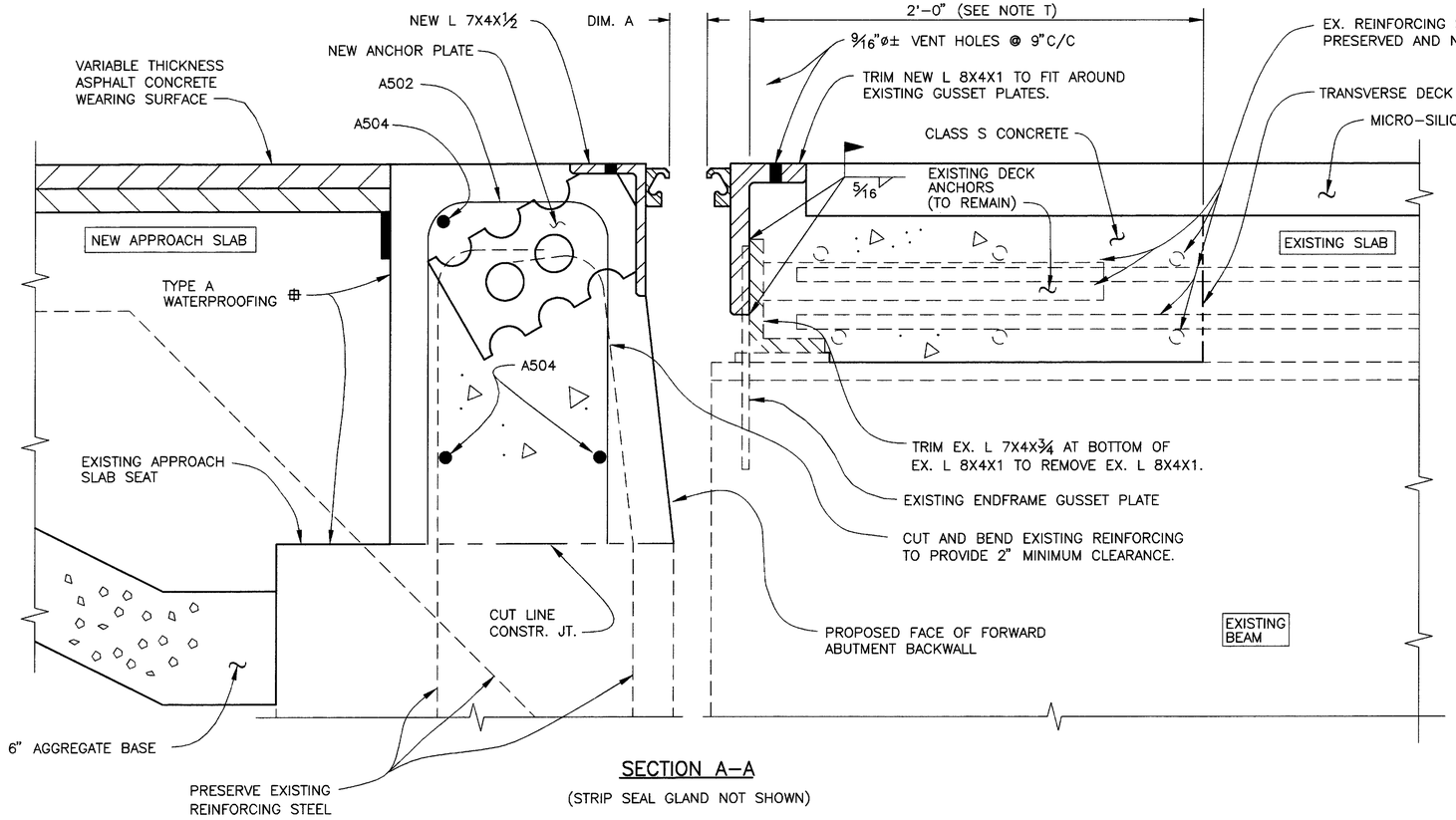
DESIGNED REW | DRAWN RDY/REW | CHECKED G.T. | REVISED | REVIEWED T.R.O. | DATE 5/10/95 | STRUCTURE FILE NUMBER 0700770

FORWARD ABUTMENT DETAILS

BRIDGE NO. BEL-7-2389
S.R. 7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

2389AB1.DWG SEPTEMBER 06, 1996



SECTION A–A

(STRIP SEAL GLAND NOT SHOWN)

LEGEND

# = INCLUDE WITH APPROACH SLAB FOR PAYMENT
N.S. = NEAR SIDE
F.S. = FAR SIDE
∗ = PLACE PARALLEL TO FACE OF ABUTMENT.

= PORTIONS TO BE REMOVED UNDER PHASE I

= PORTIONS TO BE REMOVED UNDER PHASE II

MINIMUM REINFORCING BAR SPLICE LAP LENGTH
NO. 5 BAR = 3'–5" (HORIZONTAL)

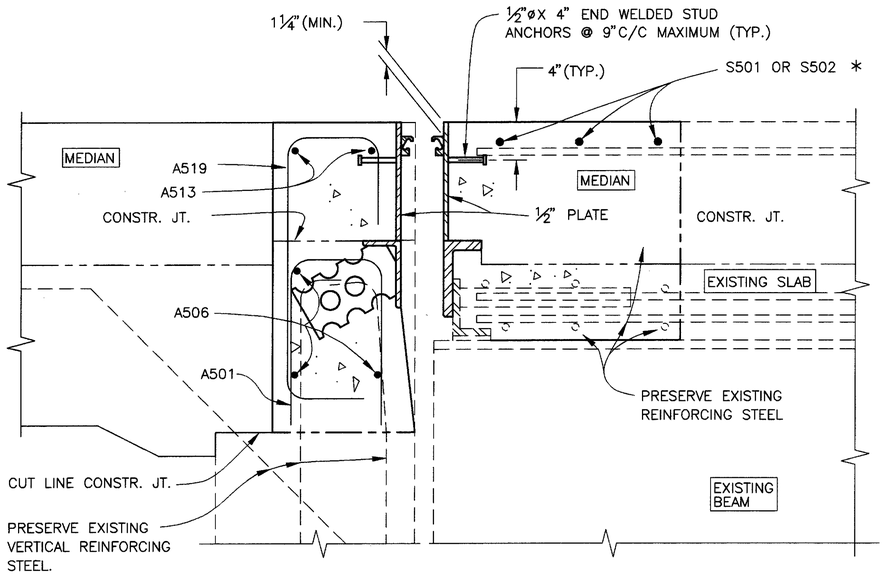
FOR PHASE CONSTRUCTION NOTES AND DETAILS, SEE MAINTENANCE OF TRAFFIC PLAN, SHEET 10/94 TO 14/94.

EXPANSION JOINT DETAILS

NOTE: FOR ADDITIONAL NOTES AND DETAILS PERTAINING TO THE STRIP SEAL EXPANSION JOINT NOT SHOWN HEREON, SEE STD. DWG. EXJ–4–87.

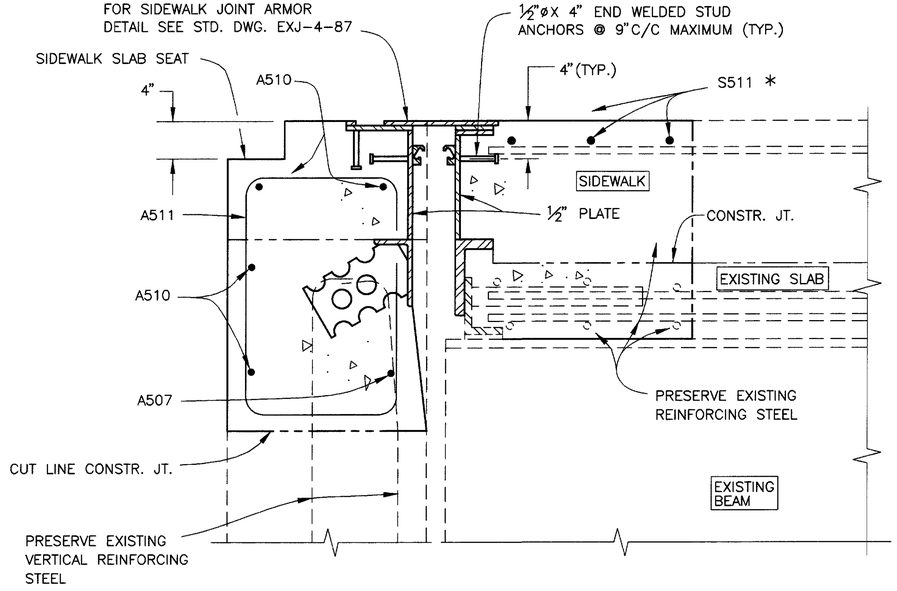
1. A STRIP SEAL GLAND WITH A 3 INCH MINIMUM MOVEMENT IS RECOMMENDED.
2. THE STRIP SEAL GLAND SHALL BE FURNISHED IN ONE CONTINUOUS PIECE.
3. DIMENSION A SHALL BE 1¾ INCHES AT ALL TEMPERATURES.

NOTE T:
THE TRANSVERSE DECK CONSTRUCTION JOINT SHALL BE LOCATED AT A DISTANCE LESS THAN THE 2'–0" DIMENSION SHOWN IN THE VICINITY OF THE 2" DIA. LIGHTING CONDUIT IN ORDER TO AVOID THE CONDUIT BY 3"±. THE CONDUIT IS LOCATED IN THE RIGHT (EAST) PARAPET AND EXITS THROUGH THE BOTTOM OF THE DECK AND PASSES THROUGH THE ABUTMENT BACKWALL.



SECTION B–B

(STRIP SEAL GLAND NOT SHOWN)



SECTION C–C

(STRIP SEAL GLAND NOT SHOWN)

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN RDY/REW | REVIEWED T.R.O. | DATE 5/11/95
CHECKED G.T. | REVISED | STRUCTURE FILE NUMBER 0700770

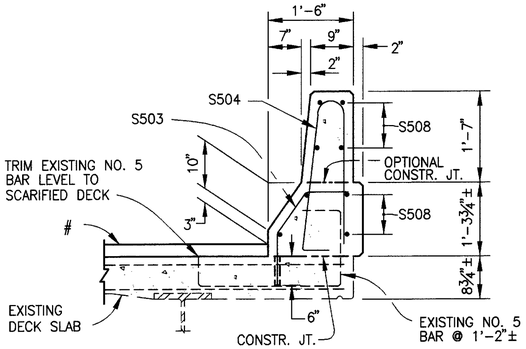
SUPERSTRUCTURE DETAILS
BRIDGE NO. BEL-7-2389
S.R. 7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

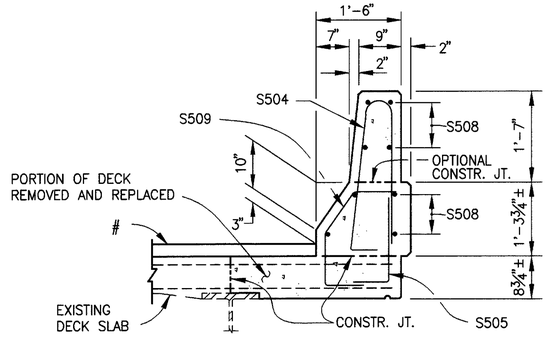
14/18

90/94

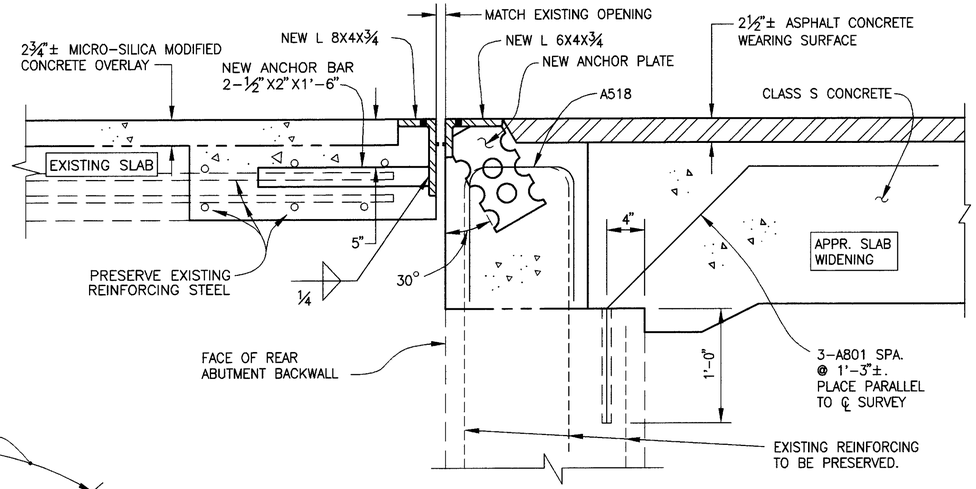
2389&NTS.DWG SEPTEMBER 06, 1996



SECTION Z–Z

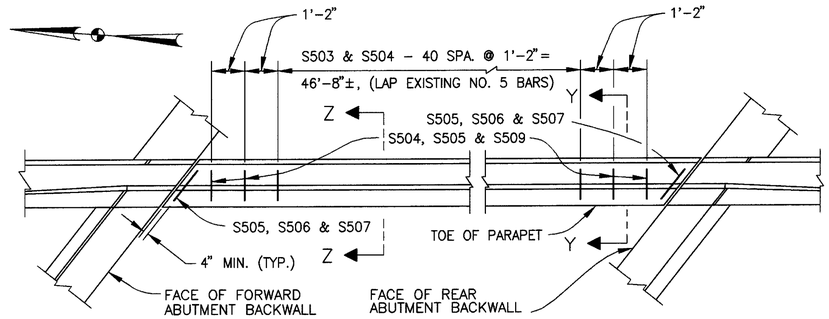


SECTION Y–Y

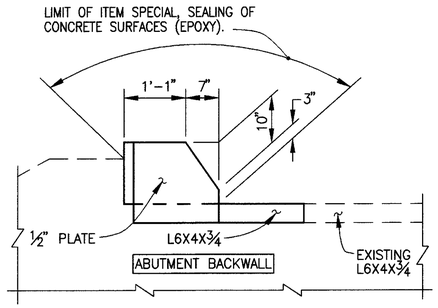


SECTION X–X

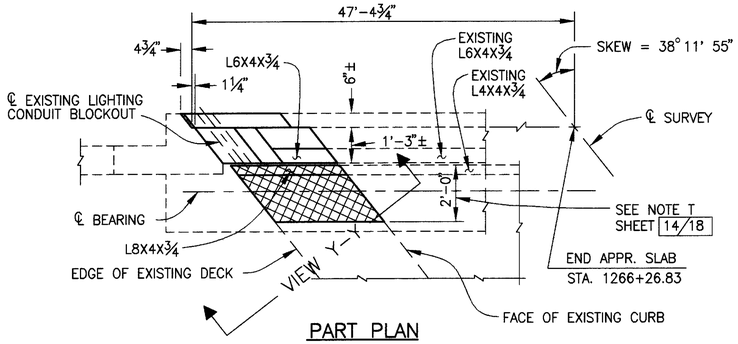
NOTE: EXISTING COMPRESSION SEAL NOT SHOWN. EXISTING COMPRESSION SEAL IN THE REMOVAL AREA IS TO BE PRESERVED IN ONE PIECE AND INCORPORATED INTO THE MODIFIED SECTION.



PLAN OF RIGHT PARAPET REINFORCING LAYOUT



VIEW Y–Y



PART PLAN

LEGEND

* = PLACE PARALLEL TO ℄ SURVEY

\# = 2¾" MICRO-SILICA MODIFIED CONCRETE OVERLAY

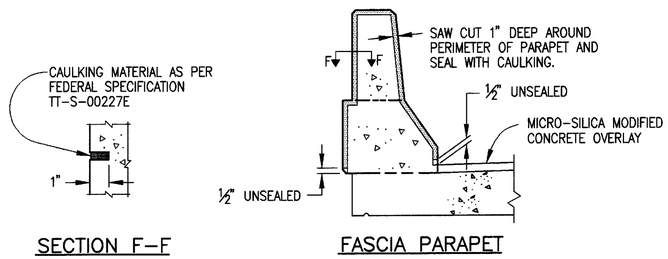
= PORTION OF DECK CONCRETE REMOVED FOR COMPRESSION SEAL JOINT EXTENSION.

= PORTION OF BACKWALL CONCRETE REMOVED.

MINIMUM REINFORCING BAR SPLICE LAP LENGTH

NO. 5 BAR = 3'-5"

FOR ADDITIONAL NOTES AND DETAILS SEE STD. DWG. EXJ-3-82.	
DETAIL	SHEET
TRANSVERSE JOINTS	1 OF 4
JOINT ARMOR ADJUSTMENT DETAIL	1 OF 4
DETAIL B	1 OF 4
CONSTRUCTION PROCEDURE PART PLAN AT ABUTMENT	1 OF 4
SECTION B–B	3 OF 4
SECTION C–C	3 OF 4
SECTION X–X	3 OF 4

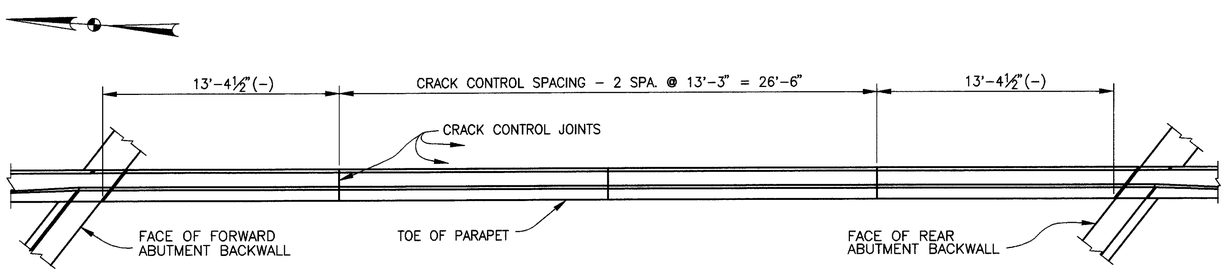


SECTION F–F

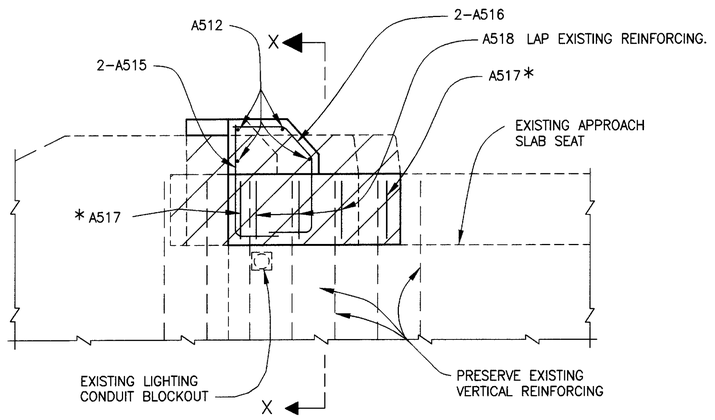
FASCIA PARAPET

CRACK CONTROL JOINT

SEE CONCRETE PARAPETS NOTE ON SHEET 6/18.



PLAN OF RIGHT PARAPET LAYOUT



PART ELEVATION

REAR ABUTMENT DETAIL

(DECK NOT SHOWN)

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN RDY | CHECKED G.T. | REVISED | REVIEWED T.R.O. | DATE 5/11/95 | STRUCTURE FILE NUMBER 0700770

SUPERSTRUCTURE DETAILS

BRIDGE NO. BEL-7-2389

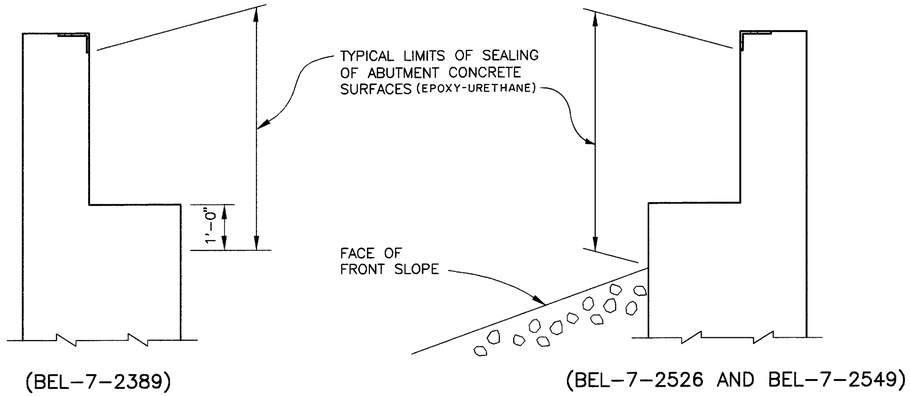
S.R. 7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

15/18

91/94

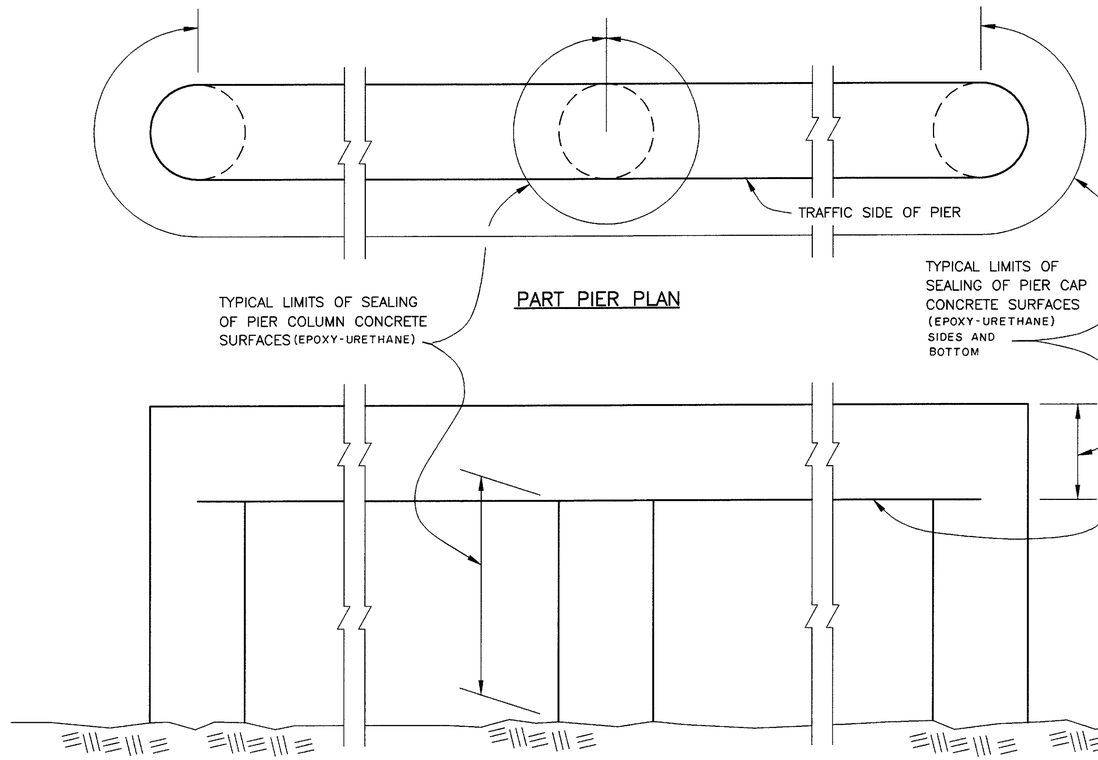
2389SUP2.DWG SEPTEMBER 06, 1996



(BEL-7-2389) (BEL-7-2526 AND BEL-7-2549)

TYPICAL SEALING OF ABUTMENTS

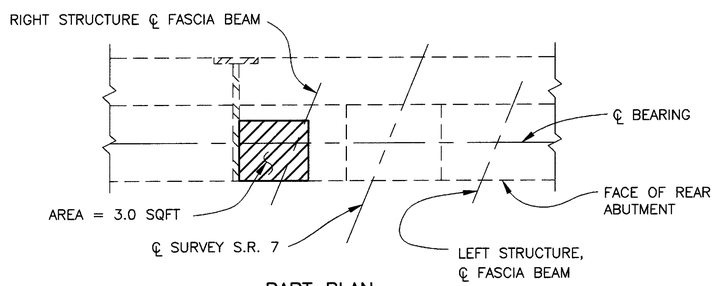
(FOR SEALING OF WINGWALLS SEE SHEET 18/18)



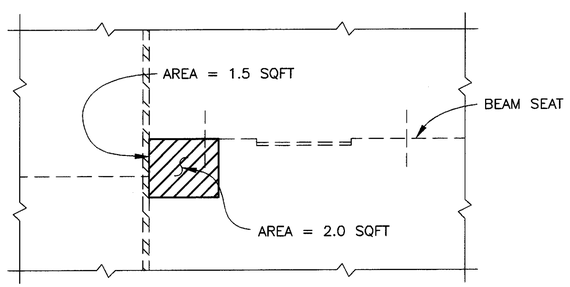
PART PIER PLAN

PART PIER ELEVATION

TYPICAL SEALING OF PIERS ADJACENT TO TRAFFIC
(BEL-7-2526, BEL-7-2549, BEL-7-2619 AND JEF-7-0016)



PART PLAN



PART ELEVATION

BEL-7-2526 REAR ABUTMENT
ITEM SPECIAL - PATCHING CONCRETE STRUCTURES WITH TROWELABLE MORTAR

STICKLEN - BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN REW | REVIEWED T.R.O. | DATE 5/11/95
CHECKED G.T. | REVISED | STRUCTURE FILE NUMBER

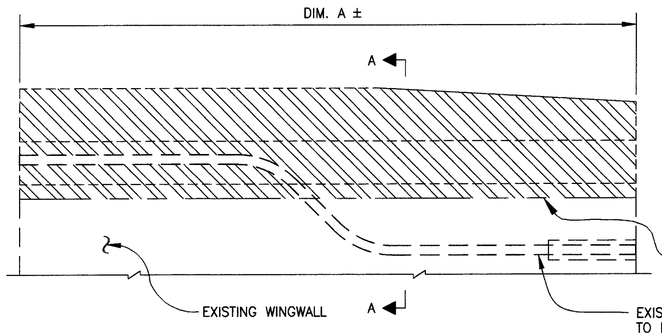
SUBSTRUCTURE DETAILS

BEL/JEF-7-23.76/0.00

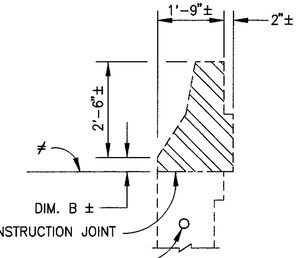
16/18

92/94

SUP_ABUT.DWG SEPTEMBER 06, 1996



EXISTING PARAPET



SECTION A-A

LEGEND

N.S. – NEAR SIDE
F.S. – FAR SIDE
NEP – NORTHEAST PARAPET
SWP – SOUTHWEST PARAPET
NWP – NORTHWEST PARAPET
SEP – SOUTHEAST PARAPET
▨ – PORTIONS OF CONCRETE REMOVAL
≠ – TOP OF CONCRETE APPROACH SLAB.

TABLE "W"					
BRIDGE NO.		DIM. A	DIM. B	DIM. C	ASPHALT CONCRETE OVERLAY THICKNESS
JEF-7-0016		13'-3"	3½"	1'-4½"	1½" MINIMUM
BEL-7-2526	NEP,SWP	13'-6"	4½"	1'-5½"	2½" MINIMUM
	NWP,SEP	12'-6"			
BEL-7-2549	NEP,SWP	14'-6"	3½"	1'-4½"	1½" MINIMUM
	NWP,SEP	15'-6"			
BEL-7-2619	SWP,SEP	9'-9"	4½"	1'-5½"	2½" MINIMUM
	NWP,NEP	12'-9"			

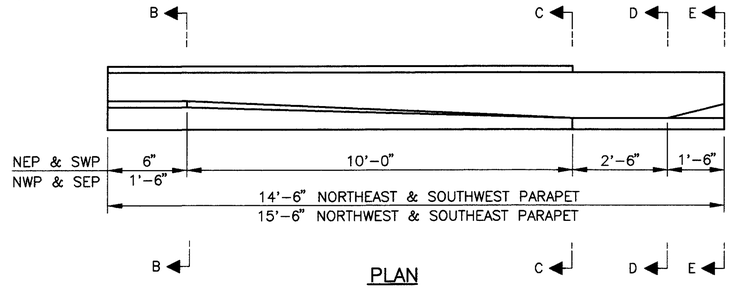
EXISTING MICRO-SILICA MODIFIED CONCRETE OVERLAYS ARE NOT TO BE DISTURBED.

NOTE
EXISTING LIGHTING CONDUITS ENCASED IN EXISTING TRANSITION PARAPETS ARE TO BE PRESERVED AND INCORPORATED INTO THE NEW WORK, COST INCLUDED WITH PARAPET CONCRETE. CONDUIT MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATION SHALL BE REPLACED WITH NEW CONDUIT AT CONTRACTOR'S COST. SEE STD. DWG. HL-30.31 FOR ADDITIONAL DETAILS.

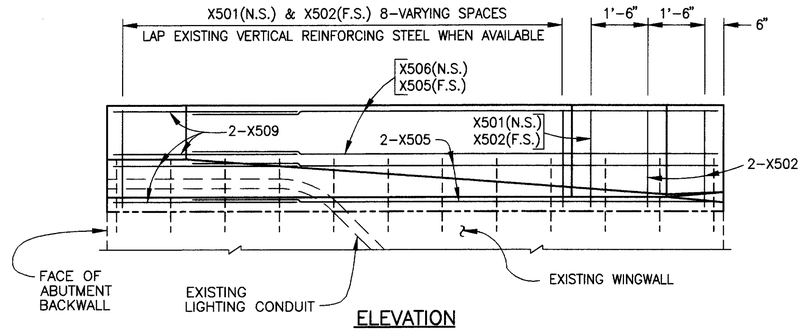
FOR ADDITIONAL SECTIONS AND USE OF DIM. C SEE SHEET 18/18 .

PRESERVE EXISTING CURB PLATE AND ANCHORS. SEE STD. DWG. SD-1-69 FOR CURB PLATE DETAILS.

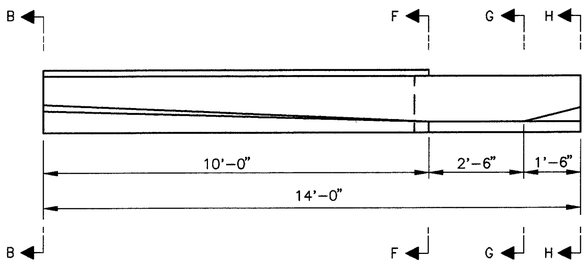
MINIMUM REINFORCING BAR SPLICE LAP LENGTH
NO. 5 BAR = 3'-5" (HORIZONTAL)



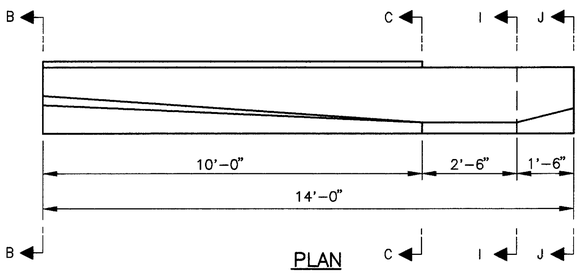
PLAN



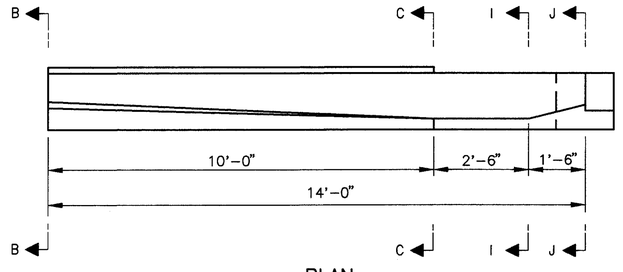
ELEVATION
APPROACH TRANSITION PARAPET
BEL-7-2549



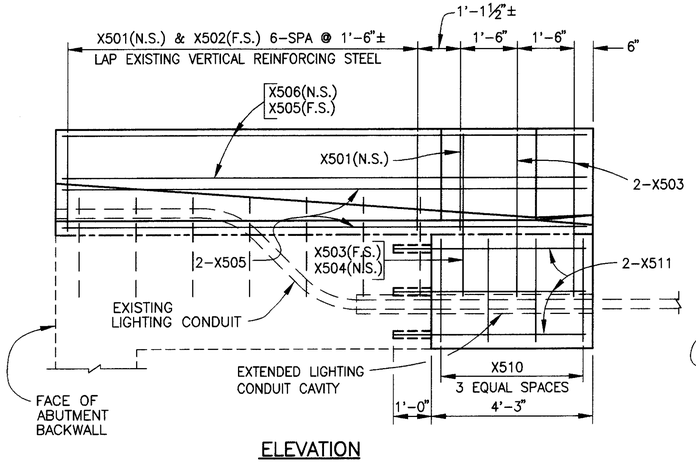
PLAN



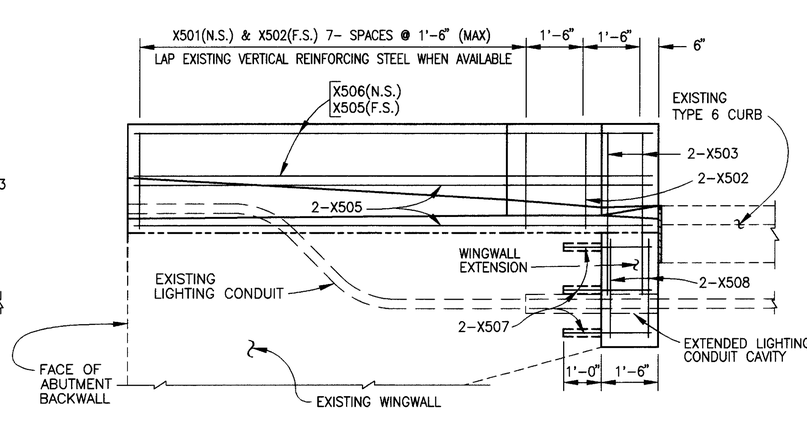
PLAN



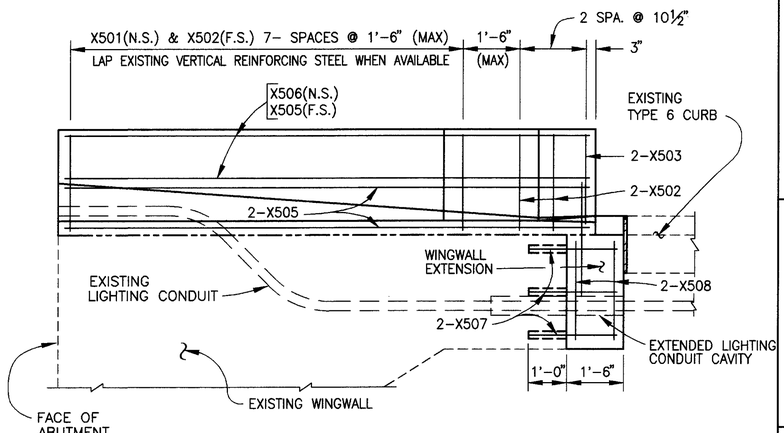
PLAN



ELEVATION
APPROACH TRANSITION PARAPET
BEL-7-2619 (SOUTH PARAPETS)



ELEVATION
APPROACH TRANSITION PARAPET
BEL-7-2526 (NWP & SEP)



ELEVATION
APPROACH TRANSITION PARAPET
BEL-7-2619 (NORTH PARAPETS), JEF-7-0016 (SOUTH PARAPETS) & BEL-7-2526 (NEP & SWP)

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW
DRAWN LH/REW
CHECKED G.T.
REVIEWED T.R.O.
DATE 5/11/95
STRUCTURE FILE NUMBER
REVISED

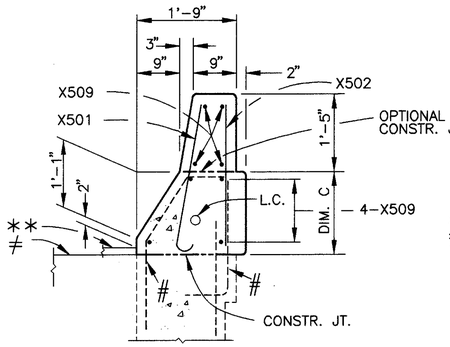
PARAPET DETAILS

BEL/JEF-7-23.76/0.00

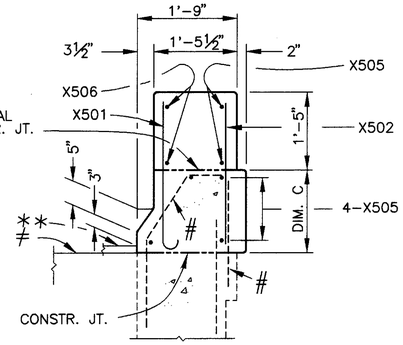
17/18

93/94

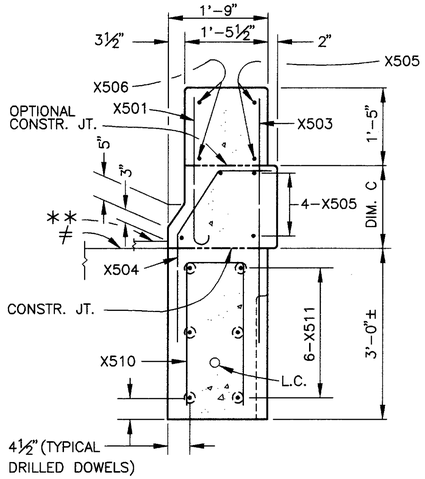
PAR17.DWG SEPTEMBER 06, 1996



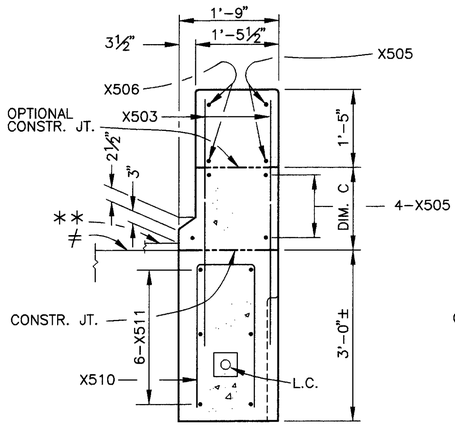
SECTION B–B



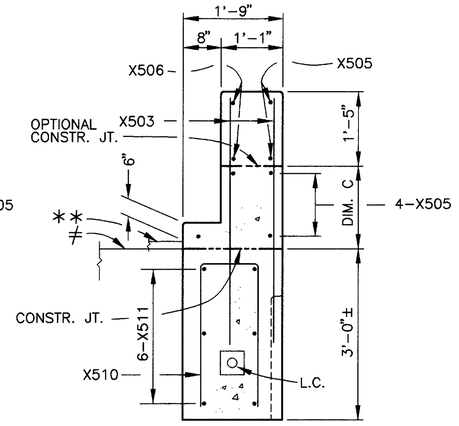
SECTION C–C



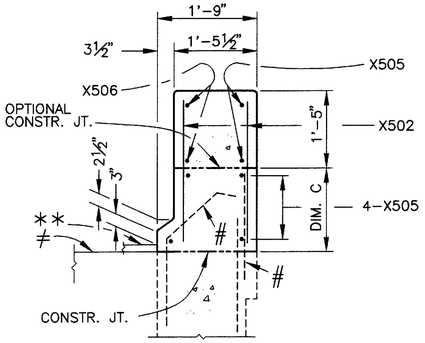
SECTION F–F



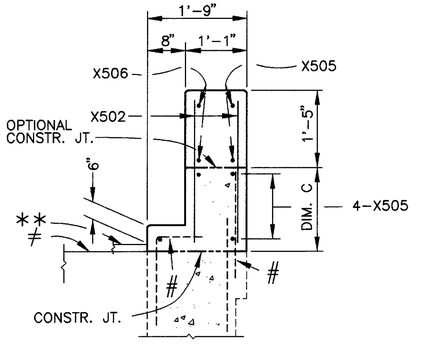
SECTION G–G



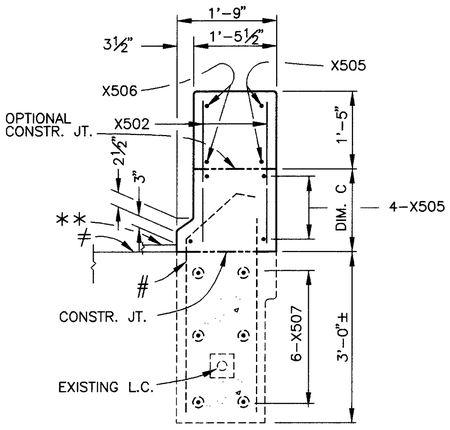
SECTION H–H



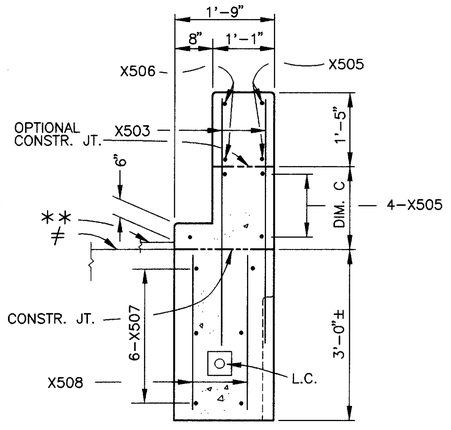
SECTION D–D



SECTION E–E



SECTION I–I

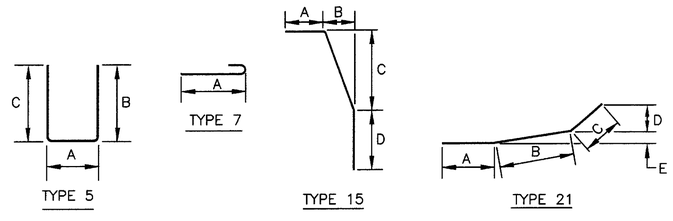


SECTION J–J

TRANSITION PARAPET REINFORCING STEEL LIST

MARK	NO.	LENGTH	WEIGHT BEL-7 2526	WEIGHT BEL-7 2549	WEIGHT BEL-7 2619	WEIGHT JEF-7 0016	TYPE	NO. BEL-7 2526	NO. BEL-7 2549	NO. BEL-7 2619	NO. JEF-7 0016	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION E
X501	120	3'-0"	100	125	100	50	7	32	40	32	16	2'-6"				
X502	162	2"-6"	115	146	99	63	ST	44	56	38	24					
X503	30	4'-3"	53		62	18	ST	12		14	4					
X504	2	3'-8"			8		15			2		0'-11"	0'-6"	0'-8½"	2'-0"	
X505	84	13'-8"	342	342	342	171	ST	24	24	24	12					
X506	28	13'-8"	114	114	114	114	21	8	8	8	4	9'-10"	2'-5"	1'-5"	0'-5"	0'-2"
X507	48	2'-4"	58		29	29	ST	24		12	12					
X508	32	2'-8"	45		22	22	ST	16		8	8					
X509	32	5'-0"		167			ST		32							
X510	8	6'-2"			51		5			8		1'-1"	2'-8"	2'-8"		
X511	12	5'-1"			64		ST			12						
		TOTAL=	827	894	891	410										

BENDING DIAGRAM



BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. "ST" WRITTEN IN THE TYPE COLUMN INDICATES A STRAIGHT BAR.

ALL REINFORCING STEEL TO BE EPOXY COATED.

LEGEND

≠ – TOP OF CONCRETE APPROACH SLAB

** – VARIABLE THICKNESS ASPHALT CONCRETE OVERLAY, SEE TABLE "W" ON SHEET 17/18 FOR MINIMUM THICKNESS.

– BEND AND/OR TRIM EXISTING REINFORCING STEEL TO PROVIDE PROPER CLEARANCE.

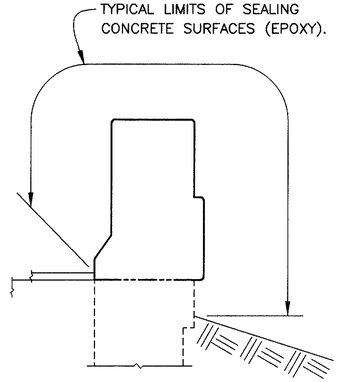
⊙ – DRILLED DOWEL

L.C. – LIGHTING CONDUIT

NOTE: – SEE SHEET 17/18 FOR DIM. C.

FOR ADDITIONAL DETAILS, SEE THE STANDARD CONSTRUCTION DRAWINGS:

GR-1.1	DATED 05-06-91
GR-1.2	DATED 10-30-92
GR-3.1	DATED 05-06-91
HL-30.31	DATED 05-01-87



STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW
DRAWN LH/REW
CHECKED G.T.
REVISED
REVIEWED T.R.O.
DATE 5/11/95
STRUCTURE FILE NUMBER

PARAPET DETAILS

BEL/JEF-7-23.76/0.00

18/18

94/94

PAR18.DWG SEPTEMBER 06, 1996

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 815

FIELD PAINTING OF EXISTING STEEL, SYSTEM OZEU

May 30, 1996

815.01 Description
815.02 Materials
815.03 Quality Control
815.04 Surface Preparation
815.05 Test Equipment
815.06 Handling
815.07 Mixing and Thinning
815.08 Coating Application
815.09 Caulking
815.10 Safety Requirements and Precautions
815.11 Inspection Access
815.12 Protection of Persons and Property
815.13 Pollution Control
815.14 Work Limitations
815.15 Method of Measurement
815.16 Basis of Payment

815.01 DESCRIPTION. This item shall consist of furnishing all necessary labor, materials, and equipment to clean and paint all existing steel surfaces as specified herein.

815.02 MATERIALS. A three coat paint system consisting of: Organic Zinc Prime Coat, Epoxy Intermediate Coat and a Urethane Finish Coat. The Contractor shall select a coating system meeting the requirements of Supplemental Specification 910 entitled OZEU Structural Steel Paint. The approved list of coatings meeting this specification is on file at the Office of Materials Management and District Office.

815.03 QUALITY CONTROL Quality control will consist of the following items:

A. Contractor Quality Control Specialist. Before any work begins, the Contractor shall designate one individual on each project as a Quality Control Specialist (only one person per project will be necessary unless the Contractor is working at more than 3 sites simultaneously). In which case, it will be necessary to provide an additional Quality Control Specialist for each additional three (or portion of three) sites being painted simultaneously. This person will not be a Foreman or member of the Contractor's production staff (ie. he will not abrasive blast, paint, recover spent abrasives, etc.). He will not be involved in any other miscellaneous tasks (ie. mixing paint, running errands, running or working on equipment, etc.) while any production work is taking place. Documentation that personnel performing quality control related functions are qualified shall be submitted to the Engineer prior to allowing the Quality Control Specialist (QCS) to begin work. Documentation/verification shall be provided to the Engineer that the QCS has received formal training from one of the following: KTA Tator, S. G. Pinney, or Corrosion Control Consultants. He shall be equipped with material safety data sheets, product data sheets, tools and equipment to provide quality control on all facets of the work and shall have a thorough understanding of the plans and specifications pertaining to this project. He shall be responsible for inspecting the equipment at the specified intervals, the abrasives, and the work, at all quality control points. He shall also be responsible for verifying that all work is done within the specified work limitations. He shall cooperate with the Inspector and compare and document quality control readings. He shall have the authority to stop work and the responsibility to inform the Contractor's Foreman of nonconforming work.

B. Quality Control Points. Quality control points (QCP) are points in time when one phase of the work is complete and ready for inspection by both the Contractor and the Engineer prior to continuing with the next operational step. At these points: The Contractor shall afford access to inspect all affected surfaces. If inspection indicates a deficiency, that phase of the work shall be corrected in accordance with these specifications prior to beginning the next phase of work. Discovery of defective work or material after a Quality Control Point is past or failure of the final product before final acceptance, shall not in any way prevent rejection or obligate the State of Ohio to final acceptance.

Quality Control Points (QCP)	PURPOSE
1. Solvent Cleaning	Remove asphaltic cement, oil, grease, salt, dirt, etc. followed by washdown
2. Grinding Flange Edges	Remove sharp corners, as detailed on plans
3. Containment/Waste Disposal	Contain, collect & dispose of abrasive blasting debris
4. Abrasive Blasting	Blasted surface to receive paint
5. Prime Coat Application	Check surface cleanliness; apply prime coat; check coating thickness
6. Removing Fins, Tears, slivers	Remove surface defects and slivers
7. Caulking	Caulk areas detailed on plans
8. Intermediate Coat Application	Check surface cleanliness; apply intermediate coat, check coating thickness
9. Finish Coat Application	Check surface cleanliness, apply finish coat, check coating thickness
10. Final Review	Visual inspection of system for Acceptance and check total system thickness.

815.04 SURFACE PREPARATION. This item shall also consist of solvent cleaning (if required), abrasive blasting, and providing a wash facility for the Engineer and Inspectors.

A. Solvent Cleaning (QCP #1) If specifically required by plan note, the bridge shall be solvent cleaned to remove all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants, (QCP #1) (see SSPC-SP 1 Solvent Cleaning for recommended practices). Under no circumstances shall any abrasive blasting be done to areas with asphaltic cement, oil, grease, or diesel fuel deposits. All solvent cleaned areas shall be subsequently washed before abrasive blasting as detailed below.

Washing shall be accomplished with potable water having a nozzle pressure of at least 7 MPa(1,000 PSI)and a delivery rate of not less than 15 L (4 gallon) per minute. The Contractor, shall provide equipment specifications to verify the above. The equipment shall also be equipped with gauges to verify the pressure. The nozzle shall be held at a maximum of 300 mm (12 inches) from the surface being washed.

B. Grinding Flange Edges (QCP #2) . If a pay item for this work is shown on the plans, all exposed bottom flange edges of longitudinal rolled and welded beams in areas designated on the plans shall be rounded to a radius of 3 mm plus or minus 1.5 mm (1/8 inch plus or minus 1/16 inch) before abrasive blasting. This work may be done without weather and temperature restrictions.

C. Containment/Waste Disposal (QCP #3). Waste material generated by abrasive blasting operations is a solid waste and shall be handled as follows: (1) Contained, (2) Collected, (3) Stored, (4) Evaluated, (5) Properly disposed.

All equipment shall be parked on ground covers free of cuts, tears or holes to prevent contamination of pavement or soil and to protect area under and around equipment.

The Contractor shall erect an enclosure to completely surround (around and under) the blasting operations. The ground cannot be used as the bottom of the enclosure unless completely covered with plastic or tarps.

The enclosure shall be constructed of flexible materials such as tarpaulins or containment screens (specifically designed for this purpose), or of rigid materials such as plywood. All materials shall be maintained free of tears, cuts or holes; however, flexible material used for the sides of the enclosure only may be weaved to contain a maximum of 15 percent holes and a minimum of 85 percent material. All seams shall be overlapped a minimum of 150 mm (6 inches) and fastened together at 300 mm (12 inch) centers, or fastened and overlapped in a manner that insures a seal which does not allow openings between the screens in the containment. The vertical sides of the enclosure shall extend completely up to the bottom of the deck on a steel beam bridge. All blasting operations on a truss type bridge shall be completely enclosed, including top side. Bulkheads shall be used between beams to enclose the blasting area.

Vacuum blasting may be used in lieu of containment, providing that the vacuum blasting equipment is manufactured and marketed for this purpose and is equipped with controls which automatically shut down the blasting operation if the blast head brushes are not held in contact with the surface being cleaned.

All debris collected by these operations, removed from equipment or filters, or that has fallen to the ground, shall be collected and stored at the bridge site, if practical, for testing, evaluation and disposal. If not practical, an alternate location shall be mutually agreed upon by the Engineer and Contractor. Additionally, centralized cleaning stations for recyclable steel, ferric oxide, or aluminum oxide grit (if used) shall be set up at a location mutually agreed upon by the Contractor and Engineer. Storage shall be in steel containers and shall have lids which shall be locked at the end of each workday.

The Contractor shall obtain the services of a testing laboratory to obtain directly from the project site and evaluate a composite representative sample of the abrasive blasting debris for each bridge site. The person taking the sample will be an employee of the testing laboratory.

The composite sample shall consist of individual samples taken from all containers which are on the site at the time of the sampling. These individual samples shall be blended together to comprise one composite sample. The individual samples shall be of equal size. There shall be one individual sample taken from each drum and four randomly spaced individual samples taken from each container other than drums.

The individual samples shall be taken with stainless steel tools and placed into either clean glass or plastic containers.

All sampling shall be done in the presence of the Engineer. In addition to the above mentioned requirements, the sampling shall also comply with the requirements of U.S. EPA Publication SW 846.

A Chain of Custody must also accompany all composite samples. Included in this document shall be in the name of the person taking the sample, the Company for which he works, the date and time which the sample was taken, the bridge from which it was taken, the Township and Municipality where the bridge is located and signatures of all persons involved in the Chain of Custody, including dates of possession.

The sampling shall be done within the first week of production blasting at each bridge. If the sampling is not done within the time allotted above, all blasting and painting operations on the bridge from which waste was generated, shall promptly cease.

The composite sample shall be tested for lead and chromium in accordance with U.S. EPA Publication SW 846. The test results and Chain of Custody records shall immediately be forwarded to the Director. If the material is hazardous, the Contractor shall also forward the names of the hauler and treatment facility to the Director. Any additional testing required by the hauler, treatment facility, or landfill will be paid for by Contractor.

All federal, state and local environmental protection laws, regulations and ordinances including, but not limited to, air quality, waste containment and waste removal must be observed during the performance of this contract.

In respect to enforcement of the above mentioned laws, bidders are advised that various governmental bodies have this responsibility. It is the responsibility of the bidders to comply with those laws as enforced by those various governmental bodies.

The existing paint being removed from these bridges may contain lead or chromium. The Contractor is responsible to assure that workers take proper safety precautions when working in this environment (see bid proposal note entitled "Safety").

Hazardous Waste: If the tests reveal that the maximum concentration of either lead or chromium exceeds 5.0 milligrams per liter, the waste shall be treated as a hazardous waste and the steel containers shall be labeled as a hazardous waste. The Director will then obtain a generator number assigned to the State.

All containers of waste material which have been classified as hazardous shall be stored in a secured location until proper disposal. The storage site shall be surrounded with 1.5 m (5 foot) high chain link fence fabric supported by traffic sign drive posts at 3 m (10 foot) center to center. Drive posts shall be embedded into the ground at least 0.6 m (2 feet) deep. The fencing shall be secured with padlocks at the end of each day. Signs shall be posted in obvious locations on the enclosure warning of the hazardous material.

The Contractor shall then arrange for hauling, treating and disposal of all hazardous waste. All hazardous waste shall be disposed of after the Director has obtained a generator number. In every case, any and all hazardous waste shall be disposed of within 60 days after it is generated. Failure to comply with the 60 day disposal requirement shall be considered by the Department as a breach of contract by the Contractor and all abrasive blasting and painting of structural steel on the project shall immediately cease until the hazardous waste is properly disposed. Upon such breach, the Department shall cease processing all pay estimates and notification of the breach shall be sent to the Contractor's surety. Further, any fines or liens assessed by any governmental agency which has jurisdiction over the disposal of this material shall be the responsibility of the Contractor. The hauling and disposal shall be by a firm licensed by U.S. EPA and who shall also be responsible for providing the Uniform Hazardous Waste Manifest (EPA Form 8700-22A).

The Contractor shall decontaminate or dispose of all collection/ containment equipment in accordance with EPA guidelines.

Non-Hazardous Solid Waste: If the waste is determined to be non- hazardous as verified by test results which have been reviewed by the Director, it shall be hauled and disposed of at a facility which is licensed to accept non-hazardous solid waste. Prior to disposal of any material, the Contractor shall submit the test results and documentation that the disposal facility is licensed by the EPA to accept non-hazardous solid waste, to the Engineer. The Contractor shall obtain and provide the Engineer with a receipt documenting disposal of waste material at the approved landfill.

D. Abrasive Blasting (QCP #4). Prior to any abrasive blasting, all dirt, sand, bird nestings, bird droppings and other debris shall be completely removed from the scuppers, bulb angles, pier and abutment seats.

All steel to be painted shall be blast cleaned according to SSPC-SP10 and as shown SSPC-Vis 1-89 (pictorial surface preparation standards for painting steel surfaces). Steel shall be maintained in a blast cleaned condition until it has received a prime coat of paint.

The back side of end cross frame assemblies which are 75 mm (3 inches) or closer to backwalls may be commercial blast cleaned according to SSPC-SP6.

Galvanized steel (including corrugated steel bridge flooring), adjacent concrete which has been coated or sealed, and other surfaces not intended to be painted, shall be covered and protected to prevent damage from blasting and painting operations. Any adjacent coatings damaged during the blasting operation shall be repaired at the Contractor's expense.

The abrasive shall be a recyclable steel, ferric oxide, or aluminum oxide grit. After each use and prior to reuse, the grit shall be cleaned of paint chips, rust, mill scale and other foreign material by equipment specifically designed for such cleaning. The Contractor is responsible for assuring recycling and cleaning equipment is capable of operating with the chosen blasting media.

Abrasives shall also be checked for oil contamination before use. A small sample of abrasives shall be added to ordinary tap water. Any detection of a oil film on the surface of the water shall be cause for rejection. This test shall be conducted on each load of abrasives delivered to the job site.

The resultant surface profile shall be a minimum of 40 µm (1.5 mils) and a maximum of 90 µm (3.5 mils). Abrasives of a size suitable to develop the required surface profile shall be used. Any abrasive blasting which is done when the steel temperature is less than 3° C(5° F) above the dew point shall be reblasted when the steel temperature is at least 3° C(5° F) above the dew point. Dew point shall be defined as the temperature at which moisture condenses on the steel surfaces.

All abrasives and residue shall be removed from all surfaces to be painted. All steel blast cleaned in any one day shall be kept dust free and prime coated the same day. Failure to prime coat the same day will require reblasting before prime coating. No dust or abrasives from adjacent work shall be left on the finish coat. The Quality Control Specialist shall perform the following test (and the Inspector will verify) to insure that the air is not contaminated: blow air from the nozzle for 30 seconds onto a white cloth or blotter held in a rigid frame. If any oil or other contaminants are present on the cloth or blotter, abrasive blasting shall be suspended until the problem is corrected and the operation is verified by another test. This test shall be done at the start of each shift and at 4 hour intervals. The abrasive shall be tested for oil contamination at the same time.

Abrasive blasting and painting may take place simultaneously on any one bridge as long as abrasive blasting debris and/or dust by the blowing operation does not come in contact with freshly painted surfaces.

The Material Safety Data Sheet (MSDS) shall be provided at the preconstruction meeting for all abrasives to be used on this project. No work shall start until the MSDS has been submitted.

The Contractor shall provide the Engineer and Inspectors a wash facility with running water to permit washing of face and hands during the surface

preparation operation. It shall at all times contain an adequate supply of potable water, soap and towels. The Contractor shall be responsible to properly contain, test and dispose of the waste water. The wash facility shall be located at each bridge site in an area that will not be contaminated by the blasting debris.

E.Prime, Intermediate and Finish Coat Application (QCP #5, #8, & #9). Each coat of paint shall be in a proper state of cure or dryness before the application of succeeding coats. Paint shall be considered ready for overcoating when an additional coat can be applied without the development of any detrimental film irregularities, such as lifting, wrinkling or loss of adhesion of the undercoat. The time interval between coating applications shall be in compliance with manufacturer's written instructions and no more than 30 days between the prime and intermediate coats and 13 days between the intermediate and finish coats. These maximum recoat times include weather related days. No additional time for weather delays will be allowed. Any coat which has cured more than the above allotted time without overcoating shall be removed and the steel reblasted to SP 10.

The completion date (month and year) of the finish coat and the letters OZEU shall be stenciled on the steel in 100 mm (4 inch) letters with a black urethane paint. This date shall be applied at four locations near the end of each outside beam on the outside web visible from the road or as directed by the Engineer.

F. Removing Fins, Tears, Slivers (QCP #6). All fins, tears, slivers or any other burred or sharp edges that become evident after priming, shall be removed by grinding. All ground surfaces shall be retextured to produce a profile of 40 to 90 µm (1.5 to 3.5 mils) and reprimed prior to application of the intermediate coat. The Contractor may also begin removing fins, tears and slivers after blasting and prior to priming.

Temperature and weather restrictions do not apply to this item. Reapplying primer shall comply with weather restrictions.

G. Caulking (QCP #7). Caulking (if a pay item) will be performed in areas of the bridge where depicted/described in the plans.

H. Job Site Visual Standards. Job site visual standards include preparation of test section, subsequent test section, and photographs of approved test section. Job site visual standards shall be used in addition to the SSPC-Vis-1-89 standard for blasting. Before any abrasive blasting is started, the Contractor will prepare a test section on the first bridge to be painted. The test section will be a representative area to be blast cleaned [approximately 2 - 3 m^2 (20-30 square feet)]. The test section area shall be photographed and the steel surface checked for the proper profile after the Engineer and the Contractor agree that the area has been blast cleaned according to plan requirements. Only after a test section area has been approved and documented by photographs and replica tape, may the Contractor proceed with his blast cleaning operations. The job site visual standards (photographs) shall be used in addition to plan specifications to determine acceptance of blast cleaning procedures, but in all cases of dispute, the SSPC-Vis-1-89 standard shall govern. If, in the opinion of the Contractor or Engineer, a subsequent bridge is not indicative of the bridge on which the test section was performed, he may request another test section.

815.05 TESTING EQUIPMENT. The Contractor shall provide the Engineer the following testing equipment in good working order, for the duration of the project. When the Contractor's people are working at different locations simultaneously, additional test equipment shall be provided for each crew for the type of work being performed. When no test equipment is available, no work shall be performed.

1. A camera with the following features and 5 (unless otherwise specified on plans) rolls of color film: A) Uses self developing color print film, B) Lens with auto focus system, C) Focuses from 0.6 m (2 feet) to infinity, D) Built-in fill flash.
2. One Spring micrometer and 3 rolls of extra-coarse replica tape.
3. One Positector 2000 or 6000, Quanix 2200, or Elcometer A345FBI1; and the calibration plates, 38-200 µm and 250-625 µm (1.5 -8 mils and 10-25 mils) as per the NBS calibration standards in accordance with ASTM D 1186.
4. One Sling Psychrometer including Psychometric tables - Used to relative humidity and dew point temperature.
5. Two steel surface thermometers accurate within 1° C(2° F) or One portable infrared thermometer available from:

   Model: Raynger ST Series (-18° C to 400°C)
   Manufacturer: Raytek Inc.
   Santa Cruz, Ca.
   (800)227-8074

   or approved equal to the portable infrared thermometer
6. Flashlight 2-D cell
7. SSPC Visual Standard for Abrasive Blast Cleaned Steel SSPC-Vis 1-89
8. One Recorder Thermometer capable of recording the date, time, and temperature over a period of at least 12 hours.

815.06 HANDLING. All paint and thinner shall be delivered to the project site in original, unopened containers with labels intact. Minor damage to containers is acceptable provided the container has not been punctured. Thinner containers shall be a maximum of 19 L (5 gallons).

Paint shall be stored at the temperature recommended by the manufacturer to prevent paint deterioration.

Each container of paint and thinner shall be clearly marked or labeled to show paint identification, component, color, lot number, stock number, date of manufacture, and information and warnings as may be required by Federal and State laws.

All containers of paint and thinner shall remain unopened until required for use. The label information shall be legible and shall be checked at the time of use. Solvent used for cleaning equipment is exempt from the above requirements.

Paint which has livered, gelled or otherwise deteriorated during storage shall not be used: However, thixotropic materials which can be stirred to attain normal consistency may be used. The oldest paint of each kind shall be used first. No paint shall be used which has surpassed its shelf life.

Paint may be considered as eligible for payment for material on hand as specified in 109.07. However, only paint which the Contractor can prove to the Engineer will be used during the construction season shall be eligible for payment. The Contractor shall provide the Engineer calculations indicating

the total m^2 (square feet) of steel to be painted during the construction season. He shall also provide calculations showing the total number of liters (gallons) required. The Contractor shall be responsible to store the paint on the project in such manner to prevent theft and adverse temperatures. He shall provide thermometers capable of monitoring the maximum high and low temperatures within the storage facility. The Contractor is responsible for properly disposing of all unused paint and paint containers.

The Contractor shall furnish shipping invoices for all materials used on the project to the Engineer, prior to use.

815.07 MIXING AND THINNING. All ingredients in any container of paint shall be thoroughly mixed immediately before use and shall be agitated often enough during application to maintain a uniform composition; however, the primer shall be continuously mixed by an automated agitation system (hand held mixers not allowed). Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. The paint shall be mixed with a high shear mixer (such as a Jiffy Mixer). Paddle mixers or paint shakers are not allowed. Paint shall not be mixed or kept in suspension by means of an air stream bubbling under the paint surface.

All paint shall be strained after mixing. Strainers shall be of a type to remove only skins and undesirable matter, but not pigment.

No thinner shall be added to the paint without the Engineer's approval, and only if necessary for proper application as recommended by the manufacturer. When the use of thinner is permissible, thinner shall be added slowly to the paint during the mixing process. All thinning shall be done under supervision of the Engineer. In no case shall more thinner be added than that recommended by the manufacturer's printed instructions. Only thinners recommended and supplied by the paint manufacturer may be added to the paint. No other additives shall be added to the paint.

Catalysts, curing agents, or hardeners which are in separate packages shall be added to the base paint only after the base paint has been thoroughly mixed. The proper volume of catalyst shall then be slowly poured into the required volume of base with constant agitation. Liquid which has separated from the pigment shall not be poured off prior to mixing. The mixture shall be used within the pot life specified by the manufacturer. Therefore only enough paint shall be catalyzed for prompt use. Most mixed, catalyzed paints cannot be stored, and unused portions of these shall be discarded at the end of each working day.

815.08 COATING APPLICATION. Coating application will be as follows.

A. General All structural steel, scuppers, expansion joints (except top surface), steel railing, exposed steel piling, drain troughs and other areas as indicated in the plans shall be painted. Galvanized surfaces shall not be painted unless otherwise noted on plans.

The following methods of application are permitted for use by this specification, as long as they are compatible with the paint being used: brush, spray, or any combination of these methods unless specified differently in the plans. Daubers, small diameter rollers or sheepskins may be used for places of difficult access when no other method is practical and in all cases shall be used where cross-frame angles are located within 50 mm (2 inches) of the bottom flange and where end cross frames are within 150 mm (6 inches) of the backwall and bottom of bottom flanges around bearings less than 150 mm (6 inches) in height.

If the surface is degraded or contaminated after surface preparation and before painting, the surface shall be restored before painting application. In order to prevent degradation or contamination of cleaned surface, the prime coat of paint shall be applied the same day of blast cleaning as required in surface preparation above.

Cleaning and painting shall be so programmed that dust or other contaminants do not fall on wet, newly-painted surfaces. Surfaces not intended to be painted shall be suitably protected from the effects of cleaning and painting operations. Overspray and pigeon droppings shall be removed with a stiff bristle brush, wire screen, or a water wash with sufficient pressure to remove overspray without damaging the paint. The overspray must be removed before applying the next coat. All abrasives and residue shall be removed from painted surfaces, before recoating, with a vacuum system equipped with a brush type cleaning tool.

No visible abrasives from adjacent work shall be left on the finish coat. Abrasives on the finish coat shall be removed.

If brush application of the coating is used, it shall produce a smooth coat. Care shall be taken to work the paint into all crevices, corners, and around all bolt and rivet heads.

B. Spray Application (General). All spray application of paint shall be in accordance with the following:

Primer ingredients shall be kept uniformly mixed in the spray pot or container during application by continuous, automated mechanical agitation (hand held mixers not allowed).

Spray equipment shall be kept clean so that dirt, dried paint and other foreign materials are not deposited in the paint film. Any solvent left in the equipment shall be completely removed before using.

Paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern. The border of the spray pattern shall be painted first; with the painting of the interior of the spray pattern to follow, before moving to the next spray pattern area. A spray pattern area is such that the gun shall be held perpendicular to the surface and at a distance which will ensure that a wet layer of paint is deposited on the surface. The trigger of the gun should be released at the end of each stroke. All bolts and rivet heads shall be sprayed from at least 2 directions or brushed to assure coverage.

Each spray operator shall demonstrate to the Engineer his ability to apply the paint as specified. Any operator who does not demonstrate this ability shall not spray.

If mud cracking occurs, the affected area shall be cleaned to bare metal in accordance with surface preparation above and repainted.

All gaps and crevices 3 mm (1/8 inch) or less shall be filled with primer.

All spray equipment used shall be suitable for use with the specified paint. Paint manufacturer's equipment recommendations shall be followed to avoid paint application problems.

If air spray is used, traps or separators shall be provided to remove oil and condensed water from the air. The traps or separators must be of adequate size and must be drained periodically during operations. The following test shall be made by the Contractor and verified by the Engineer to insure that the traps or separators are working properly.

Air shall be blown from the spray gun for 30 seconds onto a white cloth or blotter held in a rigid frame. If any oil, water or other contaminants are present on the cloth or blotter, painting shall be suspended until the problem is corrected and the operation is verified by repeating this test.

This test shall be made at the start of each shift and at 4 hour intervals. This is not required for an airless sprayer.

Spray application of all coats shall not be used unless the operation is totally enclosed to prevent overspray damage to the ground, public and private property, any and all vegetation, streams, lakes, etc. This containment shall be accomplished with tarps, plywood or other shields. If brush is used, more than one coat may be necessary to produce the required thickness.

C. Application Approval. The beginning of the application of each of the three different coats shall be subject to inspection and approval to detect any defects which might result from the Contractor's methods. If defects are discovered, the Contractor shall make all necessary adjustments to his method of application to eliminate them before proceeding with coat application.

D. Temperature. Paint shall not be applied when the temperature of the air, steel, or paint is below 10° C (50° F). Paint shall not be applied when the steel surface temperature is expected to drop below 10^0 C (50° F) before the paint has cured for the minimum times specified below:

	10° C (50° F)	16° C (60° F)	21° C (70° F)
Primer	4 hrs.	3 hrs.	2 hrs.
Intermediate	6 hrs.	5 hrs.	4 hrs.
Finish	8 hrs.	6 hrs.	4 hrs.

The above temperatures and times shall be monitored with the recording thermometer.

A heated enclosure may be used. The heat within the enclosure may be supplied by any means which will maintain the required temperature continuously and uniformly in all parts of the enclosure. The heat will be supplied as required to maintain the required minimum temperature until the coating has cured.

If combustion type heating units are used, they will be vented away from the enclosure, and exhaust fumes will not be permitted to enter the enclosure. No open combustion of any kind will be permitted in the enclosure.

E. Moisture. Paint shall not be applied when the steel surface temperature is less than 3° C (5° F) above the dew point. Paint shall not be applied to wet or damp surfaces or on frosted or ice-coated surfaces. Paint shall not be applied when the relative humidity is greater than 85%. Paint shall not be applied during rain, fog or mist unless the above moisture criteria is met.

F. Repair Procedures. Damaged areas, and areas which do not comply with the requirements of this specification, shall have the paint removed and all defects corrected. The steel should then be retextured to a near white condition to produce a profile of between 40 to 90 µm (1.5 to 3.5 mils). This profile should be measured immediately prior to the application of the prime coat to insure that the profile is not destroyed during the feathering procedure.

The existing paint should be feathered to expose a minimum of 13 mm (½ inch) of each coat.

During the reapplication of the paint, care shall be used to insure that each paint coat is applied only within the following areas. The prime coat shall only be applied to the surface of the bare steel and the existing prime coat which has been exposed by feathering. The prime coat shall not be applied to the adjacent intermediate coat. The intermediate coat shall only be applied to the new prime coat and the existing feathered intermediate coat. The intermediate coat shall not be applied to the adjacent finish coat. The finish coat shall only be applied to the new intermediate coat and the existing finish coat which has been feathered or lightly sanded. The finish coat shall not extend beyond the areas which have been feathered or lightly sanded.

At the perimeter of the repair area, the first two coats shall be applied by brush. The finish coat shall be applied by either brush or spray.

It may be necessary to make several applications in order to achieve the proper thickness for each coat.

During the application of the prime coat, the paint shall be continuously mixed.

All surface preparation and painting shall still be done in accordance with the specifications. In lieu of abrasive blasting, alternate methods of surface preparation may be allowed.

All repairs shall be made in a manner to blend the patched area with the adjacent coating. The finished surface of the patched area shall have a smooth, even profile with the adjacent surface.

The Contractor shall submit his method of correcting runs in writing to the Director for approval.

G. Continuity. Each coat of paint shall be applied as a continuous film of uniform thickness free of all defects such as holidays, runs, sags, etc. All thin spots or areas missed shall be repainted and permitted to dry before the next coat of paint is applied.

H. Dry Film Thickness. Prime thickness, cumulative prime and intermediate thickness, and cumulative prime, intermediate and finish thickness shall be determined by use of Type 2 magnetic gage in accordance with the following:

Five separate spot measurements shall be made, spaced evenly over each 9 m^2 (100 square feet)of area to be measured. These measurements shall be taken on flanges, webs, cross bracing, stiffeners, etc. Three gage readings shall be made for each spot measurement of either the substrate or the paint. The probe shall be moved a distance of 25 to 75 mm (1 to 3 inches) for each new gage reading. Any unusually high or low gage reading that cannot be repeated consistently shall be discarded. The average (mean) of the 3 gage readings shall be used as the spot measurement. The average of five spot measurements for each such 9 m^2 (100 square foot) area shall not be less that the specified thickness. No single spot measurement in any 9 m^2 (100 square foot) area shall be less than 80% of the specified minimum thickness nor greater than 150% of the maximum specified thickness. Any one of 3 readings which are averaged to produce each spot measurement, may under run or overrun by a greater amount. The 5 spot measurements shall be made for each 9 m^2 (100 square feet) of area as follows:

1. For structures not exceeding 27 m^2 (300 square feet) in area, each 9 m^2 (100 square foot) area shall be measured.
2. For structures not exceeding 90 m^2 (1,000 square feet) in area, three 9 m^2 (100 square foot) areas shall be randomly selected and measured.
3. For structures exceeding 90 m^2 (1,000 square feet) in area, the first 90 m^2 (1,000 square feet) shall be measured as stated in section 2 and for each additional 90 m^2 (1,000 square feet), or increment thereof, one 9 m^2 (100 square foot) area shall be randomly selected and measured.
4. If the dry film thickness for any 9 m^2 (100 square foot) area (sections 2 & 3) is not in compliance with the requirements of paragraph 1 of this section, then each 9 m^2 (100 square foot) area shall be measured.

5. Other size areas or number of spot measurements as specified in the contract plans shall be measured.
Each coat of paint shall have the following thickness measured above the peaks:

	Min. Spec. Thickness	Max. Spec. Thickness	Min. Spot	Max. Spot
Prime	75 µm (3.0 mil)	125 µm (5.0 mil)	60 µm (2.4mil)	188 µm (7.5mil)
Intermediate	125 µm (5.0 mil)	175 µm (7.0 mil)	100 µm (4.0 mil)	263 µm (10.5 mil)
Sub Total	200 µm (8.0 mil)	300 µm (12.0 mil)	160 µm (6.4 mil)	450 µm (18.0 mil)
Finish	50 µm (2.0 mil)	100 µm (4.0 mil)	40 µm (1.6 mil)	150 µm (6.0 mil)
Total	250 µm (10.0 mil)	400 µm (16.0 mil)	200 µm (8.0 mil)	600 µm (24.0 mil)

Film thicknesses greater than the maximum specified thicknesses that do not exhibit defects (such as runs, sags, bubbles, mudcracking, etc.) and for which the Contractor has received a written statement from the coating manufacturer stating that this excessive thickness is not detrimental, may remain in place at the discretion of the Director.

For any spot or maximum average thickness over 600 µm (24 mils) it will be necessary for the Contractor to prove to the Department that the excess thickness will not be detrimental to the coating system. This shall be accomplished by providing the Director, for approval, certified test data proving that the excessive thickness will adequately bond to the steel when subjected to thermal expansion and contraction. This thermal expansion and contraction test shall take place over five 5 cycles of a temperature ranges from -29° C to 49 ° C (-20 ° F to 120 ° F). After the thermal contraction and expansion cycles have taken place, the tested system shall be subjected to pull off tests and the results compared to the results of pull off tests which have been performed on a paint system with the proper thicknesses. In addition to the certified test results, it will also be necessary for the Contractor to provide the Director a written statement from the paint manufacturer stating that this excessive thickness is not detrimental.

If the Director does not approve the excessive coating thicknesses or the Contractor elects not to provide the required written statement from the paint manufacturer and the certified test results when required, the Contractor, at his own expense, shall remove and replace the coating. The removal and replacement of the coating shall be done as specified in 815.08 F Repair Procedures.

815.09 CAULKING QCP #7. The material shall be a two component, 100% solids epoxy and shall be one of the following:

MANUFACTURER	
Mark 270 Poly-Carb Solon, OH 216-248-1223	KOP-COAT A-788 Splash Zone Compound Carboline Company Hamilton, OH 513-896-1919
Sikadur Injection Gel Sika Chemical Corp. Lyndhurst, N.J. 201-933-8801	OR Other Commercially Available, 100% Solid, Non-Sag, Non-Shrink Epoxy Based System Capable Of Filling Voids Up To 25 mm (1 inch) Wide

815.10 SAFETY REQUIREMENTS AND PRECAUTIONS. The Contractor shall meet the applicable safety requirements of the Ohio Industrial Commission and the Occupational Safety and Health Administration (OSHA), in addition to the scaffolding requirements specified below.

The Material Safety Data Sheets (MSDS) shall be provided at the preconstruction meeting for all paints, thinners and abrasives used on this project. No work shall start until the MSDS has been submitted.

815.11 INSPECTION ACCESS. In addition to the requirements of 105.11, the Contractor shall furnish, erect, and move scaffolding and other appropriate equipment, to permit the Inspector the opportunity to closely observe all affected surfaces. This opportunity shall be provided to the Inspector during all phases of the work and continue for a period of at least 10 working days after each structure has been completely painted.

When scaffolding, or the hangers attached to the scaffolding are supported by horizontal wire ropes, or when scaffolding is placed directly under the surface to be painted, the following requirements shall be complied with:

A. When scaffolding is suspended 1092 mm (43 inches) or more below the surface to be painted, two guardrails shall be placed on all sides of the scaffolding. One guardrail shall be placed at 1067 mm (42 inches) above the scaffolding and the other guardrail at 508 mm (20 inches) above the scaffolding.

B. When the scaffolding is suspended at least 533 mm (21 inches) but less than 1092 mm (43 inches) below the surface to be painted, one guardrail shall be placed on all sides of the scaffolding at 508 mm (20 inches) above the scaffolding.

C. Two guardrails shall be placed on all sides of scaffolding not previously mentioned. The guardrails shall be placed at 1067 mm (42 inches) and 508 mm (20 inches) above scaffolding, as previously mentioned.

D. All scaffolding must be at least 610 mm (24 inches) wide when guardrail is used and 711 mm (28 inches) wide when the scaffolding is suspended less than 533 mm (21 inches) below the surface to be painted and guardrail is not used. If 2 or more scaffolding are laid parallel to achieve the proper width, they must be rigidly attached to each other to preclude any differential movement.

E. All guardrail shall be constructed as a substantial barrier which is securely fastened in place and is free from protruding objects such as nails, screws and bolts. There shall be an opening in the guardrail, properly located, to allow the Inspector access onto the scaffolding.

F. The rails and uprights shall be either metal or wood. If pipe railing is used, the railing shall have a nominal diameter of no less than 38 mm (1.5 inches). If structural steel railing is used, the rails shall be 50x50x9 mm (2x2x3/8 inch) steel angles or other metal shapes of equal or greater strength. If wood railing is used, the railing shall be 50x100 mm (2x4 inches) (nominal) stock. All uprights shall be spaced at no more than 2.4 m (8 feet) on center. If wood uprights are used, the uprights shall be 50x100 mm (2x4 inches) (nominal) stock.

G. When the surface to be inspected is more than 4.57 m (15 feet) above the ground or water, and the scaffolding is supported from the structure being painted, the Contractor shall provide the Inspector with a safety harness (not a safety belt) and lifeline. The lifeline shall not allow a fall greater than 1.8 m (6 feet). The Contractor shall provide a method of attaching the lifeline to the structure independent of the scaffolding, cables, or brackets supporting the scaffolding.

H. When scaffolding is more than 762 mm (2.5 feet) above the ground, the Contractor shall provide a ladder for access onto the scaffolding. The ladder and any equipment used to attach the ladder to the structure shall be capable of supporting 113 kg (250 pounds) with a safety factor of at least four. All rungs, steps, cleats, or treads shall have uniform spacing and shall not exceed 305 mm (12 inches) on center. At least one side rail shall extend at least 914 mm (36 inches) above the landing near the top of the ladder.

I. An additional landing shall be required when the distance from the ladder to the point where the scaffolding may be accessed, exceeds 305 mm (12 inches). The landing shall be a minimum of at least 610 mm (24 inches) wide and 610 mm (24 inches) long. It shall also be of adequate size and shape so that the distance from the landing to the point where the scaffolding is accessed does not exceed 305 mm (12 inches). The landing shall be rigid and firmly attached to the ladder; however, it shall not be supported by the ladder. The scaffolding shall be capable of supporting a minimum of 454 kg (1000 pounds).

J. In addition to the aforementioned requirements, the Contractor shall be responsible to observe and comply with all Federal, State and local laws, ordinances, regulations, orders and decrees.

K. The Contractor shall furnish all necessary traffic control to permit inspection during and after all phases of the project.

815.12 PROTECTION OF PERSONS AND PROPERTY. The Contractor shall collect, remove and dispose of all buckets, rags or other discarded materials and shall leave the job site in a clean condition.

The Contractor shall protect all portions of the structure, which are not to be painted, against damage or disfigurement by splashes, spatters, and smirches of paint. Deck bottoms and backwalls are exempt from this requirement.

When or where any direct or indirect damage or injury is done to public or private property, the Contractor shall restore, at his own expense, such property, to a condition similar or equal to that existing before such damage or injury was done.

815.13 POLLUTION CONTROL The Contractor shall take all necessary precautions to comply with pollution control laws, rules or regulations of Federal, State or local agencies and as required in this specification.

815.14 WORK LIMITATIONS. Abrasive blasting and painting shall be done between April 1 and October 31. Even though the Contractor is permitted to work prior to May 1, April is considered a winter month and no extension due to adverse weather conditions will be granted for this period. Additional work limitations on specific bridges/projects may be required by plan note.

815.15 METHOD OF MEASUREMENT. Field painting of structural steel is based on a square meter (square foot) pay item. All field painting will include 3 coats of paint; prime coat, intermediate coat, and finish coat.

On steel beam and steel girder bridges, the surface area is based on a nominal measurement of the beams; ie. 2 times the beam depth plus 3 times the flange width. In addition to this nominal measurement, a percentage is added to account for incidentals such as cross frames, bearing assemblies, stiffeners, expansion joints, scuppers, etc. Thus, it is not necessary for the Inspector to field measure every detail of the bridge to verify quantities. Some extremely complex bridges, such as trusses, will be paid for as lump sum. In the case of a quantity dispute, exact field measurements of all painted surfaces and/or calculations will govern.

Grinding fins, tears, slivers is based on the manhours expended only by the workmen who are actually doing the grinding and will include all the time when the workmen are performing grinding and repairing prime coat and not limited to the actual grinding duration (ie. all hours of the workmen when assigned to grinding regardless of actual grinding time).

Grinding of flange edges: This pay item includes all labor and equipment to grind the bottom flange edges denoted in the plans. Each meter (one linear foot) of beam represents 4 m (4 linear feet) of edge grinding.

Caulking: Includes all labor, materials and equipment to caulk areas described in the plans. Each meter (linear foot) of caulk (regardless of width or thickness) shall be measured for payment.

Surface Preparation: This lump sum or m^2 (square feet) item includes all labor, materials and equipment necessary to: contain, collect, store, evaluate, ship, treat and dispose of all waste materials generated by this project and to prepare the surface as required by these specifications, prior to applying

the prime coat.

515.16 BASIS OF PAYMENT. Payment for field painting will be made at the contract prices for:

Item	Unit	Description
815	Square meter (square foot), lump sum	Surface preparation of existing steel, System OZEU
815	Square meter (square foot), lump sum	Field painting of existing steel, prime coat, System OZEU
815	Square mete, (square foot), Lump sum	Field Painting of existing steel, Intermediate coat, System OZEU
815	Square meter (square foot), Lump sum	Field Painting of existing steel, Finish coat, System OZEU
815	Man Hour	Grinding Fins, Tears, Slivers
815	Meter (Linear foot)	Grinding Flange Edges
815	Meter (Linear foot)	Caulking

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 910
OZEU STRUCTURAL STEEL PAINT

July 17, 1995

910.01 Description
910.02 Materials
910.03 Performance Requirements
910.04 Prequalification
910.05 Sampling

910.01 Description. This specification covers the formulation and testing of a three coat structural steel paint system consisting of an organic zinc prime coat, an epoxy intermediate coat and a urethane finish coat (OZEU).

910.02 Materials.

Organic Zinc Prime Coat

This coating shall consist of a zinc dust filled, two or three component epoxy polyamide, and selected additives as required:

A. Physical Requirements	Minimum
1. Total Solids, % by weight of paint	70
2. Pigment, % by weight of total solids	83
3. Total zinc dust, % by weight of pigment	93
4. Total zinc, % by weight, of total solids	77
5. Total solids, % by volume, ASTM D2697	45
6. Color, greenish gray, approximating FS-595A-34159	
7. Pot Life at 25° C (77° F) and 50% Relative Humidity (R.H.), hours	6

B. Qualitative Requirements

1. Mixing shall conform to Section 5.2, SSPC-Paint 20 using only a high shear (Jiffy) mixer.

2. Storage life - Section 5.4, SSPC-Paint 20

3. Mudcracking - Section 5.7, SSPC-Paint 20

C. Material Quality Assurrance

1. Hardener Component	Variance*
a. Nonvolatiles, % by weight	± 2
b. Density	± 0.02g/mL (± 0.2 lb. per gal.)
c. Viscosity	± 5 KU or ± 5 sec., Ford Cup
2. Zinc/Resin Component	
a. Total Zinc metal, % by weight	± 2
b. Density	± .05g/mL (± 0.4 lb. per gal.)
c. Viscosity	± 5 KU or ± 5 sec., Ford Cup
d. Nonvolatiles, % by weight	± 2

*Variance within the mean of the tests of the previously submitted sample for qualification.

Epoxy Intermediate Coat

This coating shall be a two-part product composed of a base component and a curing agent suitable for application over the epoxy-polyamide zinc rich primer.

The base component shall contain an epoxy resin together with color pigments, mineral fillers, gellant, leveling agent, and volatile solvents. The curing agent component shall contain a liquid polyamide resin and volatile solvent. The coating shall also meet the following:

A. Physical Requirements

1. Color: White, meeting or exceeding, FS-595A-37875 as per ASTM E1347
2. Components: Two, mixed prior to application
3. Volume Solids: 50.0% minimum
4. Potlife: 6 hours, minimum @ 25° C (77°F)
5. Curing Time:
   a. Set-to-touch: 4 hours minimum @ 25°C (77°F)
   b. To Recoat: 24 hours minimum @ 25°C (77°F)
   c. Fully cured: 7 days @ 10°C (50°F)
6. Fineness of Grind, Hegman 3 minimum

7. V.O.C. maximum , 0.419 g/mL (3.5 lbs./gal.), as applied

B. Material Quality Assurance

	Test	Variance*
1.	Density	+ 0.02 g/mL (± 0.2 lbs. per gal.)
2.	Viscosity, Kreb Units	± 5
	Ford Seconds	± 5
3.	Total Solids, % by weight	± 2
4.	Pigment, % by weight	± 2
5.	Nonvolatile Vehicle, % by weight	± 2

*Variance shall be within the noted range based upon the test average of the previously submitted sample.

Urethane Finish Coat

This coating shall be a two component polyester and/or acrylic aliphatic urethane and shall be suitable for use as a finish coat over the white epoxy polyamide intermediate coat.

A. Physical Requirements

1. Finish: Specular Gloss, 60 degree: 85% minimum; 70% minimum after 3000 hours weathering resistance
2. Volume Solids: 42% minimum
3. Cure (Dry) Time at 25°C (77°F) and 50% RH
   To Touch: 30 Minutes, minimum
   Full Cure: 2 Hours, maximum
4. Pot Life: 4 hours minimum at 25°C (77°F)
5. V.O.C. maximum, 0.419 g/mL (3.5 lbs./gal.), as applied
6. Colors**
   a. Gray FS-595A - 16440
   b. Green FS-595A - 14260
   c. Blue FS-595A - 15450

**Contractor's choice unless specified on plans.

B. Material Quality Assurance

1. Analysis (for each component)

	Test	Variance*
a.	Density	+ 0.02 g/mL (± 0.2 lbs. per gal.)
b.	Viscosity, Kreb Units	± 5
	Ford Seconds	± 5
c.	Total Solids, by Weight	± 2%
d.	Pigment, by Weight	± 2%
e.	Nonvolatile Vehicle, by weight	± 2%

*Variance shall be within the noted range based upon the test average of the previously submitted sample.

910.03 Performance Requirements. The coating system, which consists of the organic zinc prime coat, the epoxy intermediate coat, and the urethane topcoat, shall be tested prior to use.

Three panels for each of the specified tests shall be prepared to the requirements of the ASTM D 609 except that the thickness shall be 3 mm (1/8 inch) minimum and the steel shall be ASTM A 36/A 36 M hot rolled steel. The surface shall be blast cleaned (using coal slag abrasive) to equal, as nearly as is practical, the standard Sa 2-1/2 of ASTM D 2200 (Steel Structures Painting Council SSPC-SP10 meets this requirement), and the surface shall have a nominal height of profile of 25 to 88 µm (1 to 3.5) mils verified by using appropriate replica tape. The panels shall be coated and permitted to cure in accordance with the manufacturer's printed instructions. The dry film coating thickness in the system to be tested shall be as follows:

Organic Zinc:	75 - 125 µm (3.0 - 5.0 Mils)
Epoxy:	125 - 175 µm (5.0 - 7.0 Mils)
Urethane:	50 - 100 µm (2.0 - 4.0 Mils)

The coating system shall pass each of the following tests:

(A) Fresh water resistance (ASTM D 870). The panels shall be scribed as per ASTM D 1654 to the depth of the base metal in the form of an "X" having at least 50 mm (2-inch) legs and then immersed in fresh tap water at 25 ± 3ºC (75 ± 5ºF). After 30 days of immersion, the panels shall show no rusting nor shall the coating show any blistering, softening or discoloration. Blistering shall be rated by ASTM D 714.

(B) Salt water resistance (ASTM D 870). The panel shall be scribed as specified in "A" above and then immersed in a water solution of 5 percent sodium chloride at 25 ± 3ºC (75 ± 5ºF). The panels shall show no rust nor shall the coating exhibit any blistering or softening after 7, 14, and 30 days. Blistering shall be rated by ASTM D 714. The sodium chloride solution shall be replaced with a fresh solution after examination at 7 and 14 days.

(C) Weathering resistance. The panels shall be tested in accordance with ASTM D 4587 Method D, utilizing UV A 340 bulbs. The panels shall be placed on test at the beginning of a wet cycle. After 3000 hours continuous exposure, the coating shall show no blistering or loss of adhesion, nor shall the panels show any rusting. The 60 degree specular gloss measurements shall be performed on the sprayed panels utilized for this test. The three initial measurements (one per panel) will be average together. The three final measurements also will be averaged together.

(D) Salt fog resistance. The panels shall be scribed as specified in "A" above, and then tested in accordance with ASTM B 117. After 3000 hours of continuous exposure the coating shall show no loss of bond nor shall it show rusting or blistering beyond 2 mm (1/16 inch) form the center of the scribe mark. Blistering shall be rated by ASTM D 714.

(E) Elcometer adhesion test, ASTM D 4541. The panels shall be tested in accordance with the following: lightly sand the coating surface and aluminum dolly and applied a quick set adhesive. Allow adhesive to cure overnight. Scribe the coating and adhesive around the dolly prior to testing. Make a minimum of four trials to failure and report the four trials. No trial shall be less than 400 psi. Fracture at the primer-blast interface shall be caused for rejection.

910.04 Prequalification. Prior to approval, copies of the manufacturer's's certified test data showing that the coating system complies with the performance requirements of this specification shall be submitted to the Engineer of Tests, 1600 W. Broad St., Columbus, Ohio 44223. The certified test data shall also state the following physical properties for each coating:

1) Density, g/mL (lbs. per gal.)
2) Solids, % by weight
3) Solids, % by volume
4) Viscosity
5) Drying time
6) V.O.C. content, g/mL (lb. per gallon)

The test data shall be developed by an independent testing laboratory approved by the Director and shall include the brand name of the paint, name of manufacturer, number of lots tested, and date of manufacture.

The following items shall also be submitted to the Director prior to approval:

1) Manufacturer's technical data sheet for each coating.
2) Material Safety Data Sheet for each coating.
3) Enough components to produce a 4 liter (one gallon) sample of each coating.
4) A one liter (one quart) sample of the thinner to be used with each coating.

When the coating has been approved by the Director, further performance testing by the manufacturer will not be required unless the formulation or manufacturing process has been changed, in which case new certified test results will be required.

910.05 Sampling. Acceptance variances shall be established by the Laboratory.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 933
QUICK SETTING CONCRETE MORTAR

July 17, 1995

933.01 Description. The mortar shall be a prepackaged material which requires the addition of water only. This material shall contain not more than 5 ppm of chloride nor shall any admixture containing more than 5 ppm of chloride be used in conjunction with these materials. The mortars shall be one of the following:

Type 1. This concrete mortar shall be comprised of a cementitous material and used when high strength, high bonding, and rapid setting characteristics are desired.

Type 2. This concrete mortar shall consist of materials that when used will provide high strength, high bonding, and rapid setting characteristics.

933.02 Packaging. Quick setting concrete mortar shall be packaged in strong moisture resistant paper bags or other suitable containers capable of withstanding shipping, normal handling and storage without breakage. The package shall protect the material from deterioration when stored in a dry condition for a period of one year. Each package or container must display information regarding the minimum nominal yield and instructions for mixing. Volumetric yield determinations shall be calculated using the manufacturers' recommended water content.

933.03 Application Requirements. These materials shall be mixed, placed, and cured in accordance with all of the manufacturers' recommended application procedures. These materials shall be capable of being extended 50 percent by dry mortar weight with aggregate. The aggregate shall meet the following requirements.

1. Aggregate shall meet the grading requirements of Table 703-1 of the CMS for No. 8, 89, 9 or a combination thereof.

2. Maximum Passing 75 µm (No. 200) sieve - Not to exceed 0.2%

3. Absorption - Not more than 2%

4. Soundness Loss - Not more than 2%

933.04 Physical Requirements. The test for time of set will be made in accordance with ASTM C 266 (modified). The mortar shall be tested as received with only the addition of water. The amount of water to be used shall be as designated on the manufacturers' shipping container.

Compressive strength tests shall be made in accordance with ASTM C 109 (modified). The mortar shall be tested as received with the addition of water only. The amount of water shall be designated on the packing container by the manufacturer.

Additional compressive strength test specimens shall be made in accordance with ASTM C 192. These specimens shall be 75 mm (3 inches) in diameter and 150 mm (6 inches) in length.

Flexural strength tests shall be in accordance with ASTM C 78.

Freeze thaw tests shall be in accordance with ASTM C 666.

933.05 Prequalification. The material shall be one that has been in place and evaluated as part of the Department's Research and Development Field Evaluation of Bridge Deck Patching Materials. The material shall have been in place on the Department's selected bridge deck for at least three (3) years and have attained an average rating of 7.5 or higher at the end of the three-year period. In addition, the manufacturer of the material shall furnish the Bureau of Tests with a certified copy of test results from a recognized laboratory showing compliance with the requirements of this specification. A recognized laboratory is one which is regularly inspected by the Cement and Concrete Reference Laboratory of the National Bureau of Standards.

933.06 Prequalified List. Upon compliance with 933.05 the manufacturer will be placed on the prequalified list. Each shipment shall include a certification from the manufacturer stating the material is of the same formulation that was prequalified. Each lot or shipment shall be sampled, tested and approved before use.

933.07 Standard Physical Requirements.

INITIAL SETTING TIME ASTM C 266 (GILMORE) (MODIFIED)

	Type-1	Type-2
Minimum	5 Min	10 Min

COMPRESSIVE STRENGTH ASTM C 109 (MODIFIED)

	Type-1		Type-2	
	MPa	Psi	MPa	Psi
1 Hour, Minimum	0.7	100	14	2000
3 Hour, Minimum	1.7	250	----	------
24 Hour, Minimum	14	2000	34	5000
7 Day, Minimum	----	-------	48	7000

COMPRESSIVE STRENGTH ASTM C 39 (MODIFIED) *

	Type-1		Type-2	
	MPa	Psi	MPa	Psi
1 Hour, Minimum	0.7	100	14	2000
3 Hour, Minimum	1.0	150	----	-------
24 Hour, Minimum	10	1500	24	3500
7 Day, Minimum	----	-------	41	6000

FLEXURAL STRENGTH ASTM C 78*

	Type-1		Type-2	
	MPa	Psi	MPa	Psi
4 Hour, Minimum	-----	-----	1.4	200
3 Day, Minimum	4.5	650	3.4	500

FREEZE AND THAW ASTM C 666 PROCEDURE

Procedure B (@ 350 Cycles)*	Type-1
Minimum Durability Factor	80%
Procedure A (@ 300 Cycles)	Type-2
Minimum Durability Factor	79%

*The test specimens shall be extended 50 percent by dry mortar weight with aggregate.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 846

TREATING CONCRETE BRIDGE DECKS WITH HMWM RESIN
September 9, 1997

846.01 Description
846.02 Material
846.03 Limitations
846.04 Surface Preparation
846.05 Installation
846.06 Method of Measurement
846.07 Basis of Payment

846.01 DESCRIPTION. This work shall consist of preparing and treating the concrete wearing surfaces of bridge deck with a penetrating sealer in accordance with these specifications, in reasonably close conformity with the plans and the manufacturer's recommendation and as directed by the Engineer.

846.02 MATERIAL. The material used for treating the concrete shall meet Supplemental Specification 954, High Molecular Weight Methacrylate (HMWM) Resin.

846.03 LIMITATIONS. This work item shall not be performed during the period beginning November 1st and ending March 31st.

846.04 SURFACE PREPARATION. Roadway dirt and debris shall first be removed from the area of the deck to be treated. Surfaces to which the sealer is to be applied shall be swept, sandblasted then manual or power broom swept and blown with compressed air so that they shall be dry and free of dust and dirt. High pressure compressed air shall be used to blow all loose material from visible cracks. The cleaning equipment shall be fined with suitable traps, filters, drip pans, driers and other devices to prevent oil and other foreign material from being deposited on the surface. Traffic shall not be allowed on the clean surface prior to application of the sealer. Existing pavement markings shall be removed according to Section 641.10 of the Specifications. All traces of asphalt or petroleum products and concrete curing seals shall be removed by the abrasive blasting prior to air sweeping.

846.05 INSTALLATION. A compatible promoter/initiator system capable of providing the same physical qualities of the hardened resin as if promoted/initiated with 2% cobalt naphthanate (6%) and 2% cumene hydroperoxide shall also be provided. Materials shall be stored at 18-27 ºC (65-80ºF). The system shall provide a resin gel time of not less than 40 minutes to not more than 1½ hours at the time and temperature of application.

The gel time shall be adjusted to compensate for the change in temperature throughout the day. The temperature of the surfaces to be treated may range from 10 ºC (50ºF) to 49ºC (120 ºF). The Contractor shall arrange to have a technical representative on site to provide mixing proportions equipment suitability, and safety advice to the Contractor and Engineer. Any conflict these provisions and representative's advice shall be resolved at the job site. The technical representative shall remain at the job site until such time as he and the Engineer agree that the Contractor is qualified in all aspects of the application of the sealer.

The promoter and initiator, if supplied separate from the resin, shall not contact each other directly. Containers of promoter or initiators shall not be stored together in a manner that will allow leakage or spillage from one to contact the containers or materials of the other.

Machine application of the resin may be performed by using a two-part resin system utilizing a promoted resin for one part and an initiated resin for the other part. This two-part resin system may be combined at a spray bar through positive displacement atomization of the resin. Compressed air shall not be used to produce the spray.

Cleaning and flushing of equipment, tools, etc., shall be done with an appropriate solvent, as approved by the Engineer, in such a manner to minimize personal and environmental hazards. Workman should be advised the resin will soften gum rubber soles, and a face-mask should be used to protect from accidental splashes. Clothing and leather saturated with resin will harden and become useless.

The surface to be treated shall be visibly dry and its temperature between 10 ºC (120ºF) prior to resin application. The resin may not be applied within 24 hours after a rain or when rain is forecast within 12 hours or when the ambient air temperature is below 10 ºC (50 ºF). The deck shall be pre-marked to control mixed material usage and to provide a rate of application of approximately 2.45m^2/l (100 square feet per gallon). The exact rate shall be determined by the Engineer prior to commencing full-scale deck treatment operations.

Before using the material the Contractor shall submit to the Director copies of the manufacturer certified test data showing that material complies with the qualitative and qualitative requirements of this specification. The test data shall be developed by an independent approved testing laboratory, and shall include the brand name of the material, name of manufacturer, number of the lot tested and date of manufacture. When the material has been approved by the Director, further testing by the manufacturer will not be required unless the formulation of manufacturing process has been changed, in which case new certified test results will be required. The manufacturer shall certify that the formulation is the same as that for which data has been submitted. The state reserves the right to sample and test delivered lots for compliance.

The deck surfaces shall be flooded with resin, allowing penetration into the concrete and filling of all cracks. The initiated mix of promoted resin shall be limited to 19l (5 gallons) at a time for manual application. A significant increase in viscosity shall be cause for rejection. The treatment shall be applied within 5 minutes after complete mixing. Excess material shall be redistributed by squeegee or brooms within 10 minutes after application.

The Contractor shall take all steps necessary to prevent the resin from flowing into lanes open to traffic. The entire treated area of the bridge deck shall have sand broadcast by mechanical means to effect a uniform coverage of 0.43 kg/m^2 to 0.65 kg/m^2 (0.80 to 1.2 pounds per square yard). The sand shall be uniformly graded aggregate conforming to the quality requirements of 703 and shall conform to the following limits for grading:

Sieve Size%	Passing Max.
4.75mm (No. 4)	100
2.36mm (No. 8)	90-100
850 μm (No. 20)	5-15
300 μm (No. 50)	0-5

It is the intention of the specification to allow the use of commercially available blast sands applied by a common lawn broadcast type seeder/spreader. Sand shall be placed between 10 to 15 minutes behind the resin spreading front and before any jelling of the resin occurs. If the surface contains large deep cracks, the low-viscosity liquid could run completely through the concrete slab. In these areas, a second coat will be required after the first coat has started to cure.

Before the monomer hardens, imperfections or spalls with standing liquid shall be filled with commercial quality concrete or sandblast sand, and finished to a uniform surface. The sand shall have a maximum moisture content of 0.5 of the percent of absorption when tested in accordance to a California Test 226.

Traffic and equipment shall not be permitted on the tested deck until it is tack free and a minimum of 6 hours have elapsed since treatment and the sand cover adheres sufficiently to resist brushing by hand. The treatment shall be protected from moisture for not less than 4 hours after placement.

846.06 METHOD OF MEASUREMENT. The area under this item will be the number of square meter (square yards) of concrete bridge deck which are prepared, treated with high molecular weight methacrylate resin and are complete in place and accepted.

The accepted quantities of deck treatment will be paid for at the contract unit price per square meter (square yard), which price and payment shall be full compensation for furnishing all labor, materials including catalysts, tools, equipment and incidentals, and for performing all the work involved in preparing and treating the concrete surfaces

according to specifications.

846.07 BASIS OF PAYMENT. Payment for the above completed and accepted quantities will be made at the contract bid price for:

Item	Units	Description
846	Square meter (square yard)	Treating concrete bridge decks with HMWM resin

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 849
ELASTOMERIC COMPRESSION SEALS FOR STRUCTURAL STEEL JOINTS

June 14, 1995

849.01 **Description**
849.02 **Materials**
849.03 **Preparation for Installation**
849.04 **Installation**
849.05 **Method of Measurement**
849.06 **Basis of Payment**

849.01 Description. This item shall consist of furnishing and installing elastomeric compression seals for bridge deck joints either armored with or composed of structural steel.

849.02 Materials. Elastomeric compression seals shall conform to Supplemental Specification 949.

849.03 Preparation for Installation. Prior to installing compression seals in structural steel joints, steel and seal surfaces which are to be bonded together shall be thoroughly cleaned and kept dry until the adhesive has been applied.

The preparation of steel surfaces shall be accomplished not more than 24 hours prior to adhesive bonding. Bare steel surfaces shall be prepared to Grade SA 3, ASTM D 2200. Galvanized steel surfaces shall be lightly sanded. Immediately after mechanical preparation, the fresh surfaces shall be wiped with methylethyl ketone, toluene or other approved solvents to remove contaminant traces.

Prior to use, all exterior elastomeric surfaces shall be cleaned with methylethyl ketone, toluene or other approved solvent using clean disposable cloths. Then, not more than 7 days prior to seal installation, a thin coating of approved cyclizing paste shall be applied to the elastomeric bonding surfaces only. After from 25 to 40 minutes, the paste shall be washed from the surface with clean water.

849.04 Installation. Substrate surfaces shall be clean, dry and maintained above 7°C (45°F) during seal installation and adhesive curing. Supplemental heating will be permitted. Adhesive shall be applied liberally to both the steel and elastomeric bonding surfaces using a serrated spatula if necessary to achieve a complete and relatively uniform coating. The elastomeric seal shall then be compressed sufficiently so that it can be inserted and allowed to expand within the joint.

Adhesive shall then be removed from the exposed joint and seal surfaces after which a small bead of adhesive, approximately 6 mm (1/4 - inch) in diameter, shall be applied to fillet the corners formed by the top edges of the seal and the sides of the joint.

Seals shall be installed with equipment designed or specifically adapted for the installation of elastomeric compression joint seals. This equipment shall not elongate the seal or cause structural damage to the completed installation.

849.05 Method of Measurement. The quantity of elastomeric compression joint seals shall be the actual number of meters (linear feet) measured horizontally along joint centerlines.

849.06 Basis of Payment. Payment for furnishing and installing compression seals will be made at the contract price for:

Item	Unit	Description
516	Meter (Linear foot)	Structural Expansion Joints including elastomeric compression seals, _____ mm (inch) width.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 863

STRUCTURAL STEEL MEMBERS

SEPTEMBER 9, 1997

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863.01 Description. This item shall consist of preparing shop drawings, furnishing, fabricating, nondestructive testing, fabricator performed quality control(QC), documentation, cleaning, shop painting, and erecting of all structural steel, and other structural metals, as specified. It shall also include any work required to move existing steel structures to the plan location, to make necessary repairs and alterations, and to connect or join new with old construction.

863.02 Fabricator Approval Procedure: Fabricators performing work under this specification shall be Pre-qualified by the Office of Structural Engineering (OSE). Requests for such Prequalification shall be made by the fabricator in writing. The Prequalification process and its requirements are listed in this specification. The Contractor shall select a fabricator from the Prequalified Fabricator List in effect the date of Contract Letting. The Contractor shall inform the District Construction Engineer and the Office of Structural Engineering of the selected fabricator.

863.03 Fabricator Pre-qualification: OSE will perform facilities inspections for prequalification evaluation of a fabricator. Fabricators meeting all qualification requirements will be assigned a fabrication level and will be included on the Prequalified Fabricator List. The Prequalified Fabricator list will be updated as necessary by the OSE.

Fabricators shall perform all fabrication in plants located within the continental limits of the United States.

Final conformance of fabrication to contract requirements is the responsibility of the Contractor. A pre-qualified fabricator does not guarantee the Contractor that work performed will meet quality and conformance requirements of the contract.

863.04 Levels of Fabrication Qualification: There are seven(7) levels of fabricator qualification. Each fabricator shall be listed at the highest level of fabrication they are qualified to perform.

Level	Description of Capabilities
Misc.	Miscellaneous products not designed to carry tension live load but requiring , shop drawings, material test reports, and inspection quality assurance by the Department such as; curb plates, bearings, expansion joints, railings, catwalk, inspection access, drainage or other products not covered by ODOT standard bridge drawings. Also retrofit cross frames, retrofit gusset plates or retro fit lateral bracing or other misc. structural members not included below
ONE	Single span, straight, rolled beam bridges without stiffeners, secondary and detail materials such as retrofit moment plates.
TWO	Multiple span, straight, rolled beam bridges without stiffeners

THREE	Single or multiple span, straight, dog legged or curved, rolled beam bridges including stiffeners.
FOUR	Straight or dog legged welded plate girder bridges
FIVE	Straight, curved, haunched or tapered welded plate girder bridges
SIX	Truss bridges, fracture critical bridges or bridges with fracture critical members

863.05 Fabricators Evaluation and Required Qualifications. Fabricators requesting pre-qualification shall have a facilities inspection performed by OSE. A facilities inspection check list is included in this specification (Appendix I). During the inspection the fabricator will furnish OSE's representative with documentation to validate the fabricator meets the criteria listed below:

AISC Certification

Misc. - No AISC category required
Level 1 - Category SBr with P endorsement
Level 2 thru 5 - Category MBr with P endorsement
Level 6 - Category MBr with P and F endorsements

Welding procedure qualifications in conformance with 863.23

Qualified welders in conformance with 863.23

Inspection personnel meeting requirements of 863.052

863.051 Miscellaneous Level required qualifications. Fabricators requesting qualification for the Miscellaneous Level shall meet requirements listed in all sections of 863 except as follows: Sections 863.052, 863.06 ,863.061 and 863.081 shall not apply. Where quality control inspection is required by the QCFS or QCPS per section 863.052 the documentation and quality control shall be the reponsibility of one employee designated by the Miscellaneous Level fabricator.

863.052 Personnel Qualifications. The fabricator shall designate at least one individual as Quality Control Fabrication Specialist (QCFS). The QCFS shall be a AWS Certified Welding Inspector qualified and certified in accordance with the provisions of AWS QC-1, Standard for Qualification and Certification of Welding Inspectors. The QCFS shall have a thorough understanding of the plans and specifications pertaining to the project. The QCFS shall be responsible for inspecting the work at all quality control (QC) points described in this specification and appendices. The QCFS is also responsible for assuring all equipment is in working order and inspected at the required intervals. The QCFS shall have the direct authority to stop work and report non-conforming work to the Contractor and OSE. The fabricator shall furnish the QCFS with all

tools and equipment necessary to perform quality control (QC) on all facets of the work. The person assigned as QCFS shall be designated the duties full time during the duration of the fabrication work specified in this supplemental specification. No other duties shall be assigned the QCFS that are not quality control inspection.

The fabricator shall designate one individual as Quality Control Paint Specialist (QCPS). The QCPS and the QCFS may be the same person. The QCPS shall have received formal training on paint inspection from one of the following firms: KTA Tator, S. G. Pinney, or Corrosion Control Consultants. The QCPS shall be responsible for all quality control points (QCP) listed in sections 863.29 and 863.30. The QCPS shall have a thorough understanding of the plans and specifications pertaining to this project. The QCPS shall be responsible for inspecting the coating application equipment at required intervals. The QCPS shall have the direct authority to stop work and report non-conforming work to the QCFS, the Contractor and OSE. The person assigned as a QCPS shall be designated the duties full time during the duration of the coating work. The fabricator shall furnish the QCPS with tools and equipment to provide (QC) on all facets of the coating application

Personnel performing nondestructive testing of weldments shall be qualified in accordance with the American Society for Nondestructive Testings (ASNT) ANSI/ASNT CP-189-1995, Standard for Qualification and Certification of Nondestructive Testing Personnel. Only individuals qualified for NDT Level II may perform nondestructive testing. All nondestructive testing shall be under the authority of the QCFS or can be performed by the QCFS if qualified.

The fabricator shall have a minimum QC staff level of one QCFS and one QCPS or one person qualified to perform both the QCFS and QCPS functions and the required NDT technicians to perform the non-destructive testing functions. The QCFS and QCPS shall be full time employees of the fabricator, except level one (1) and two (2) fabricators may choose to use outside personnel who meet the qualifications for the QCFS and/or QCPS. The use of outside QC personnel does not eliminate the requirements for the QCFS and QCPS being full-time during the project.

The qualifications of the QCFS, the QCPS, NDT personnel or outside agency personnel shall be approved prior to the fabricator being pre-qualified. Each QC specialist, NDT personnel or agency shall provide a resume listing, qualifications and work experience. QC specialists or NDT staff shall not be modified without the approval of OSE.

The QCFS and QCPS shall be responsible for documenting all inspection points (Appendix II) for each main material piece to show conformance with the requirements of this specification and contract documents. The fabricator is responsible for providing supervisory and any additional QC inspection personnel to control the work properly and to assure satisfactory materials and workmanship. The use of production staff or additional QC staff for specific quality control functions does not eliminate the QCFS's and/or QCPS's responsibility for documentation, QC and final acceptance of fabricated components at all required points.

863.06 Rating System. OSE shall evaluate the fabricator's level of quality during the fabrication

process. This evaluation will include quality assurance reviews of shop drawings, material test reports, QC documentation, and shop QA inspection. The fabricator may also be evaluated by the District construction personnel on fit-up quality during field erection. If field evaluations are performed the results will be incorporated into OSE's final rating.

OSE shall perform random and/or specific QA inspections. OSE may choose to waive any or all parts of the QA inspection. OSE will also perform QA reviews of Contractor approved shop drawings and fabricators material test reports and documentation. The rating forms associated with each process are in the Appendix II of this specification.

The Fabricator shall perform QC and provide documentation for each main material member at specified check, hold or witness points (Appendix II).

Check points require QC inspection and documentation by the fabricator before the fabrication process continues.
Hold points require QC inspection and documentation by the fabricator before QA inspection can be performed by OSE. The fabrication process can continue after QA inspection.
Witness points require concurrent QC inspection by the fabricator and QA inspection by OSE to physically witness the welding or nondestructive testing .

The results of OSE and field construction QA evaluations shall be the fabricator's rating. This rating shall be reported to the fabricator and shall effect the future qualification of the fabricator as follows:

A Rated Fabricators: Fabricators that perform fabrication resulting in ratings of 90% and above, based upon the average of five(5) consecutive reference numbers, within the last 36 months and with no individual rating less than 80% will be defined as an A rated fabricator. These fabricators shall have the A rating hold points and random QA inspection performed. The A rating hold point is a final shop inspection, prior to shipping or storage, for levels one thru five and all hold and witness points concerning level six. A single rating below 80%, or the average of five(5) consecutive ratings dropping below 90%, will result in the fabricator's pre-qualification being lowered to a B rating.

B Rated Fabricators: Fabricators that perform fabrication with ratings 89% to 80%, based upon the average of five(5)consecutive reference numbers, within the last 36 months and with no individual rating less than 70% will be defined as a B rated fabricator. These fabricators shall have all B rating hold points and random QA inspection performed. The B rating hold points are: Radiographic film review, Ultrasonic Inspection witnessing, and final shop inspection prior, to shipping or storage, for levels one thru five and all hold and witness points concerning level six. A single rating below 70%, or the average of five(5) consecutive ratings dropping below 80%, will result in the fabricator's pre-qualification being lowered to a C rating.

C Rated Fabricators: The C rating is an interim level for fabricators, newly approved, to validate their QC performance and upgrade to the Department's B and/or A rating level. These fabricators shall have all C rating hold points and random QA inspection performed. The C rating hold or witness points are: Radiographic film review, Ultrasonic Inspection witnessing, Magnetic Particle Inspection witnessing, prime painting inspection and final shop inspection prior to shipping or storage for levels one thru five and all hold or witness points concerning level six .

The C rating is not a permanent qualification level for fabricators. Fabricators who fail to achieve an average rating above 79% but average between 70% to 79% based on five(5) consecutive reference numbers within the last 36 months, with no individual rating less than 60%, will be reduced one level on the pre-qualification list. The reduced level fabricator shall then have three(3) additional consecutive reference numbers to be averaged with the previous five(5) to achieve a B rating. Fabricators that still do not achieve a B rating will result in removal from the pre-qualified fabricator list. Any time the average of three(3) consecutive ratings drops below 70%, the fabricator shall be removed from the Pre-qualified Fabricator List. The fabricator can request pre-qualification, 863.03, 36 months after removal.

Any rated fabricator that receives a single rating below 60% shall be removed from the Pre-qualified Fabricator List. The fabricator can request pre-qualification, 863.03, 36 months after removal.

863.061 Fabricator Rating Review Process. Fabricator may request in writing a reconsideration of the performance rating by a board created by the Department. The board shall be comprised of the Deputy Director, Division of Engineering Policy or his representative, the Administrator of the Office of Structural Engineering or his representative and the Chief Structural Steel Inspector from the Office of Structural Engineering. The board shall hear appeals concerning the Fabricator's performance rating on a specific bridge reference number. The board has no authority to hear appeals for revocation or suspension of a fabricator from the prequalification list.

Within ten days upon receipt of the Department's performance rating the Fabricator may write to the Office of Structural Engineering requesting that the board evaluate the rating. The Fabricator shall also submit additional documentation or evidence bearing on the performance of the work.

The Office of Structural Engineering shall schedule an informal hearing where the Fabricator shall have an opportunity to present Its case. The Department may have representatives at the hearing offering evidence in rebuttal. The board shall consider the evidence and issue its decision within fifteen days of the hearing.

863.07 General. All steel fabrication including the shop application of paint shall be performed in a Pre-qualified structural steel fabricating shop having permanent buildings of adequate size

with equipment, heating and lighting facilities and experienced personnel to satisfactorily perform all necessary operations. Areas where flame cutting, air carbon-arc gouging, welding, cleaning and painting are performed shall be inside permanent buildings. The required air temperature levels shall be maintained while these operations are in progress. Shop assembly of large pieces for fit-up of field connections may be performed outdoors. These provisions will not apply to steel requiring fabrication at the bridge site in the repair, alteration or extension of an existing structure.

Where work consists of repairing and extending or altering existing structures the Contractor shall make such measurements of the original construction as may be required to join accurately old and new work. Shop drawings shall include these measurements. Measurements which may appear upon contract plans to indicate the extent and nature of such repair or extension shall not relieve the Contractor of this responsibility.

Shop inspection or acceptance of shop drawings by the Department shall not relieve the Contractor of responsibility for erroneous or inconsistent dimensions, notations, omissions or other errors. All parts forming a structure shall be built in accordance with the contract. The Contractor will not be responsible for any contract plan errors.

The Fabricator shall notify OSE at least two weeks in advance of the beginning of shop fabrication, and furnish a proposed fabrication schedule for the work.

The Fabricator shall cooperate fully with the QA inspector, in his inspection of the work in progress. This shall include the storage of members completed during the QA inspector's absence, in such a manner, that he can completely and safely inspect the finished work, unless such hold or witness point inspections have received a written waiver.

Fabricated material shall not be shipped from the shop without prior hold point QA inspections unless such QA inspection is waived by OSE. Failure to conform to this requirement will result in a rating for the reference of 60% and reduction of the fabricator's rating to C or loss of pre-qualification if the fabricator's rating is currently a C.

Miscellaneous level structural steel members shall have final inspection performed at the fabrication shop. Micellaneous structural steel members that are not complete at the scheduled inspection, have been shipped to the job site without shop inspection or do not conform to the shop drawings supplied to the QA inspector will be cause for removal of the fabricator from the pre-qualification list. The miscellaneous level fabricator will be given two written warnings 12 months prior to the third occurance which causes removal. The fabricator may be reinstated to the prequalified list after 12 months with a request for prequalification from the fabricator and performance of facilities evaluation by the Office of Structural Engineering.

The Fabricator shall provide office accommodations having a minimum floor area of 11 m^2 (120 square feet) and a minimum ceiling height of 2.1 m (7 feet). This office shall be equipped with adequate working and storage facilities, lighting and electrical outlets. It shall also contain a

telephone with direct access to an outside trunk line which shall be for the exclusive use of the QA inspector.

In this specification where the terms "Main," "Secondary" or "Detail" are used, it shall be understood that reference has been made as follows: "Main," refers to material, members and fasteners that are primarily stressed by live load and structure weight; "Secondary," refers to material, members and fasteners that do not directly support live load or main members; "Detail," refers to material, members and fasteners that are essentially non stressed.

Where steel stamps are used for identification purposes, they shall be of the "mini-stress" or "stressless" type.

863.071 Fabricator Documentation Responsibility. The fabricator shall keep and maintain documentation records for each project reference number concerning;

1. Fabricator approval
2. Shop drawing approval
3. Material test reports
4 Welding qualifications
5. Quality control inspection
6. Non Destructive Testing of weldments

This documentation shall be made available for auditing, inspection and copying upon the Department's request. The documentation shall be archived for at least a five (5) year period from the date of final shipment from the fabrication shop.

Documentation systems are the fabricator's responsibility to establish. Quality control documentation shall include all material quality checks, dimensional checks, weld quality inspection, coating inspection checks, etc. to document both to the fabricator and to the Department that all fabrication has been thoroughly inspected and meets the specification requirements. Evaluation of the fabricator's performance by Departmental personnel, using forms defined in Appendix II, will include validation of the fabricator's actual records of inspection. This validation is intended to assure that rating of an individual component will reflect the overall quality of all components.

When establishing documentation records, processes and procedures it is recommended the fabricator review the QA rating forms (appendix II) which define the Department's QA requirements. The fabricator must establish sufficient QC requirements to perform quality fabrication.

863.08 Shop Drawing and Submittal Process. Structural steel and other metal structural elements which are to be assembled, main and secondary bridge structural steel or main bridge rehabilitation steel, finger joints, modular joints and non-standard joint sealing devices, pot bearings, spherical bearings and non-standard bearing devises and other similar items requiring either shop

or field fabrication shall be detailed on shop drawings by the Contractor or Fabricator in accordance with AASHTO "Standard Specifications for Highway Bridges" and the Ohio "Supplement" to the AASHTO specifications in effect with the contract.

The Contractor shall submit to OSE, 14 days before the pre-fabrication meeting, 863.081, written acceptance and four copies of these drawings, unless additional copies are requested. The written acceptance from the Contractor shall document review and acceptance of the shop drawings. All shop drawings shall be stamped and dated as accepted by a registered professional engineer representing the Contractor. All drawings shall incorporate the engineer's stamp and acceptance date. All drawings shall show detailer's initials. The Contractor shall furnish the fabricator's QCFS with one(1) record set of the checked and Contractor accepted shop drawings. This set will be furnished the QCFS on or before the pre-fabrication meeting.

By submission of shop drawings, the Contractor represents to ODOT that all materials, field measurements, construction requirements, contract requirements, performance criteria and similar data have been verified. By submission, the Contractor further represents that the shop drawings have been coordinated and verified with the details of the work to be performed by other fabricators and entities on the project. No allowance for additional cost or delays will be made to the Contractor for incorrect fabrication as a result of failure to coordinate or perform these verifications.

The prints shall be made from tracings, neatly and accurately drawn on sheets 559 mm x 864 mm (22 x 34 inches).

Shop drawings shall show details, dimensions, size of materials, match mark diagrams for field connections, and other information necessary for the complete fabrication and erection of the metal work. These drawings shall also show a diagram identifying, by some unique mark, each area of a welded splice to be covered by a single radiograph.

The shop drawings for all multiple span beam and girder bridges shall include an overall layout with dimensions showing the relative unloaded vertical and horizontal position of beam or girder segments with respect to a full length base or work line; camber and horizontal curvature of the beams or girders and the effect of deck surface profile shall be accounted for in this relationship. Required offsets for horizontal curvature shall be shown for each 3.0 m (10 feet) of length. Required offsets for vertical curvature shall be shown for each 1/4 of span length, at field splices and bearing points.

Shop drawings shall specifically identify each piece of steel as to grade(ASTM designation), CVN, Fracture Critical or any special testing requirements. Pieces made of different grades of steel shall not be given the same assembling or erecting mark, even though they may be of identical dimensions and detail.

When changes on submitted drawings are requested by the Department, or the Contractor makes changes in addition to those expressly requested, the shop drawings shall be submitted to identify the changes with revision marks, stamped for Contractor acceptance and dated.

Deviation from the contract plans or accepted shop drawings will not be permitted without the written order or consent of the Engineer. Requests for such deviation or change shall be submitted in writing to the Engineer. For changes in location, addition or elimination of splices, acceptance shall be obtained prior to acceptance of shop drawings. After acceptance by the Engineer, such plans shall be taken as supplemental to, but in no sense a substitute for, the contract. The QCFS shall be responsible for having documentation of any revised drawings or changes listed above

The shop drawings shall indicate the welding procedure(WPS number) to be used for each joint. Locations and identification numbers of all radiographs taken shall be detailed on the shop drawings.

After all fabrication is completed, the Contractor shall have the Fabricator furnish a 35-millimeter microfilm copy of each shop drawing mounted on an aperture card in accordance with Supplement 1002 on file in the Department. If the details shown on a drawing apply to more than one bridge, an aperture card for that drawing shall be furnished for each bridge to which it applies, each card bearing the applicable bridge number. For structures carrying railroad traffic, an additional set of aperture card-mounted films or, at the option of the railroad, a set of full-size drawings on mylar shall be furnished for each railway company involved.

863.081 Pre-Fabrication Meeting. A pre-fabrication meeting shall be held at the fabricator's facilities, or another location agreeable to all parties, for review of any fabrication issues, including information on shop drawings, inspection, hold or witness points, unique fabrication items, special processes, etc. for the project. Attendance at the meeting shall include the fabricator, the QCFS, the QCPS, the Contractor, or designated representative, and OSE's QA inspector. The meeting will be conducted by the QCFS, who will also be responsible for distribution of minutes of the meeting documenting all issues discussed.

The time of the meeting shall be agreeable to all parties but no earlier than 14 days after submittal of Contractor approved shop drawings, 863.08. OSE can waive the Pre-fabrication meeting if accepted by the Fabricator and the Contractor.

863.09 Material. Structural steel and other structure metals shall conform to CMS section 711 except that steel bar stock utilized for end dams and scuppers may be any weldable grade of low or mild carbon steel commercially available. Welded stud shear connectors shall conform to the AASHTO/AWS Bridge Welding Code, as amended by Supplement 1011. Steel plates for main and secondary members shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile or compressive stresses.

The Contractor shall submit to OSE, at least 14 days prior to member shipment, written acceptance that test data for all structural steel, except bar stock enumerated above , cast steel,

aluminum, bronze and sheet lead to be supplied complies with the requirements of CMS section 711. The Contractor's submission shall be accompanied by copies of *certified test data*, mill shipping notices and invoices showing the quantity and size of material being supplied. Materials will not be accepted for shipment from the fabrication shop until the Contractors submission has been received by the OSE. Structures that carry railway traffic require that one additional copy be submitted for each railway company involved. The QCFS shall be responsible for checking and recording that the material submissions have been performed per specification.

Additionally, one copy of main material mill test data shall be made available to the QA shop inspector prior to material passing check point one(1).

When electrodes to be used are not included in the Laboratory's list of approved electrodes and combinations of shielding, certified test data showing compliance with CMS section 711.08 shall be submitted to the Office of Materials Management.

863.10 Material Control. Each piece of steel to be fabricated shall be properly identified for the Engineer or QA Inspector.

The issuance of cutting instructions by the Fabricator to the shop shall be by cross-referencing of the assembly marks shown on the shop drawings with the corresponding item covered on the mill purchase order. The Fabricator's system of assembly-marking individual pieces of steel and the aforementioned issuance of cutting instructions shall be such as to provide a direct reference to the appropriate mill test report.

The Fabricator may furnish from stock, material that he can identify by heat number and mill test report. Any excess material placed in stock for later use shall be marked with the mill test report number and the ASTM A 6 specification identification color code, if any, when separated from the full-size piece furnished by the supplier.

During fabrication, each piece of steel shall show clearly and legibly its specification identification color code and heat number. Individually marked pieces of steel which are used in furnished size, or reduced from furnished size only by end or edge trim, that does not disturb the heat number or color code or leave any usable piece, may be used without further color coding provided that the heat number and color code remains legible.

Pieces of steel which are to be cut to smaller size pieces shall, before cutting, be legibly marked with the ASTM A 6 specification identification color code and heat number.

Individual pieces of steel which are furnished in tagged lifts or bundles shall be marked with the ASTM A 6 specification identification color code and heat number immediately upon being removed from the bundle or lift. Pieces of steel which will be subject to fabricating operations such as blast cleaning, galvanizing, heating for forming, or other operations which might obliterate paint color code and heat number marking, shall be marked with steel stamps or by a substantial tag firmly

attached or shall be approved by the QA Inspector for obliteration of material identify markings. Main material tested for CVN shall have heat numbers steel stamped into the material. The QCFS shall document that material control is performed per specification.

863.11 Care of Material. Structural material shall be stored at the shop or field above the ground, upon platforms, skids or other supports. It shall be straight and have clean and dry surfaces before being worked in the shop. Any rusted or corroded material shall be cleaned prior to use and shall meet ASTM A 6 thickness tolerances after cleaning. The QCFS shall document that care of material is performed per specification.

863.12 Workmanship and Straightening. If straightening of rolled material is necessary, it shall be done by methods that will not damage the member. When carefully planned and supervised, the application of localized heat is permitted for straightening. The temperature of the heated area shall not exceed 620 C (1150 F) as controlled by pyrometric stick or thermometers. Quenching to accelerate cooling is prohibited.

Fabricated structural steel shall be within the dimensional tolerances specified by Arts. 3.5 and 9.19 of the AASHTO/AWS Bridge Welding Code except where indicated otherwise in these specifications, and with the following additions: Waviness, the deviation of the top or bottom surface of a flange from a straight line or plan curvature, shall not exceed 3 mm (1/8 inch) when the number of waves in a 3.0 m (10 foot) length is four or less, or 1.6 mm (1/16 inch) when more than four, but sharp kinks or bends shall be cause for rejection. For the measurement of camber during laydown, the bearing points shall be relatively positioned both horizontally and vertically to plan dimensions ± 3 mm (± 1/8 inch). Rolled beams shall be cambered as called for on the plans in the pre-qualified fabricating shop by use of heat or hydraulic jacks. Heating shall be controlled as specified above and follow a formal shop heating procedure. Plate girders shall be cambered by trimming web plates prior to assembly.

Camber shall be measured as the vertical offset between the steel and the common base line extending from abutment bearing to abutment bearing. The maximum camber tolerance at midspan shall be - 0 mm (in.) and the greater of + 19 mm (3/4") or the designed haunch height. The maximum camber tolerance at midspan shall be prorated between the center of the span and each adjacent bearing to provide a smooth unbroken curve. The camber tolerances in Art. 3.5.1.3 of the AASHTO/ AWS Bridge Welding Code shall not apply.

During fabrication, shipping and erection, members shall be so supported and handled that camber is maintained. The QCFS shall document that workmanship and straightness are performed per specification.

863.13 Finish. Sheared edges of all main material shall be planed to a minimum depth of 6 mm (1/4 inch) except for ASTM A709 grade 36 material having a thickness of 16 mm (5/8 inch) or less. Burrs shall be removed. All fins, tears, slivers and burred or sharp edges that are present on any steel

member shall be removed by grinding. If these conditions appear during the blasting operation, they shall be removed by grinding and the area re-blasted to the required surface profile.

Structural steel permitted by these specifications may be flame cut, provided a smooth surface free from cracks and notches is secured and provided that an accurate profile is secured by the use of a mechanical guide. Rolled and flame cut surfaces shall meet the requirements of the AASHTO/AWS Bridge Welding Code, as amended by Supplement 1011. The surface finish of bearing and base plates and other bearing surfaces that are to come in contact with each other or with concrete shall meet the ANSI surface roughness requirements as defined in ANSI B46.1, Surface Roughness, Waviness and Lay, Part I:

ANSI

Steel slabs	50.0a μm (2000)
Heavy plates in contact in shoes to be welded	25.0a μm (1000)
Milled ends of compression members, milled or ground ends of stiffeners and fillers	12.5a μm (500)
Bridge rollers and rockers	6.4a μm (250)
Pins and pin holes	3.2a μm (125)
Sliding bearings	3.2a μm (125)

The QCFS shall document that material finish is performed per specification.

863.14 Stiffeners. The bearing ends of bearing stiffeners shall be flush and square with the web and shall have at least 75 percent of this area in contact with the inner surface of the flange. The other end of the stiffener shall have a tight fit as defined below. Bearing stiffeners shall be positioned to be vertical after erection. Intermediate stiffeners which are not used in pairs shall be welded to the compression flange. Intermediate stiffeners to which crossframe angles are connected shall be welded to the top and bottom flange. A tight fit is defined as one in which the stiffener and flange are in physical contact over some portion of the end of the stiffener and having no gap in excess of 1.6 mm (1/16 inch). Welds attaching stiffeners to the web plate shall not extend into the clip area. All stiffeners shall be clipped to clear flange-web welds and fillet or rolled shapes. The clip shall be 65 mm (2 ½ inches) along the web and 25 mm (1 inch) along the flange. The QCFS shall document that stiffener details are performed per specification.

863.15 Fillers. Fills shown on the shop drawings shall be dimensioned to the nearest 1.6 mm (1/16 inch) in thickness, but not less than 3 mm (1/8 inch) thick, based on the dimensions for detailing and intended relative position of the abutting elements to be spliced. However, in the final shop assembly, fills shall be furnished with thicknesses sufficient to compensate for any misalignment of abutting elements due to standard rolling mill tolerances or differences in thicknesses of flanges and webs at the splice location. The actual fills used shall be such as to compensate for differences in total thickness or relative positions of more than 1.6 mm (1/16 inch).

Fill plates in bolted joints shall be made flush with the perimeter of the splice plates and not be tack welded. The QCFS shall document that fills are performed per specification.

863.16 Horizontally Curved Beams and Girders. Beams and girders shall be heat curved as specified by AASHTO Standard Specifications for Highway Bridges, except that flanges for girders may be cut to shape. When members are to be heat curved, the detailed procedure including necessary calculations shall be submitted with the shop drawings for acceptance prior to starting work. The QCFS shall document heat curving procedures are submitted and performed per specification.

863.17 Joints and Splices. In bolted construction where tension or flexural members are spliced, not more than 6 mm (1/4 inch) clearance will be allowed between the abutting surfaces of spliced members. For spliced compression members, the abutting surfaces shall be truly faced so as to have a uniform bearing when properly aligned and completely bolted.

In welded construction, all abutting surfaces shall receive the proper joint preparation as shown on approved shop drawings. The preparation for field welded butt joints in main members shall be verified by a complete shop assembly as specified in 863.26. The opening in any joint, which is located in the finished structure so as to permit the entrance of water, shall be filled as directed by the Engineer with an approved caulking before paint is applied.

The QCFS shall document that joints and splices are performed per specification.

863.18 Pin Holes. Pin holes shall be bored true to size, at right angles to the axis of the member and parallel to each other. The boring shall be done after the member is completely fabricated. Pin holes for up to 127 mm (5 inch) diameter pins shall not exceed the pin diameter by more than 0.51 mm (0.020 inches); holes for larger pins shall not exceed the pin diameter by more than 0.79 mm (0.031 inches).The QCFS shall document that pin holes are performed per specification.

863.19 Pins and Rollers. Pins and rollers shall be of cold rolled steel and accurately turned to size; they shall be straight and smooth and entirely free from flaws. Pins over 230 mm (9 inches) in diameter shall be annealed. In pins larger than 230 mm (9 inches) in diameter, a hole not less than 50 mm (2 inches) in diameter shall be bored full length along the axis. One pilot and one driving nut shall be furnished for each size of pin. The QCFS shall document that pins and rollers are performed per specification.

863.20 Holes for High-Strength and Bearing Bolts. Holes shall be cylindrical, perpendicular to the member, clean cut, and free of ragged edges. All burrs shall be removed by countersinking not more than 1.6 mm (1/16 inch) or by grinding. The finished size of the holes for high-strength bolts shall be not larger than nominal diameter of the bolt plus 1.6 mm (1/16 inch), and for bearing type bolts, the holes shall provide a driving fit. The diameter shall not vary by more than 0.8 mm

(1/32 inch) from a true circle for 85 percent of the holes in a contiguous group, and not more than 1.6 mm (1/16 inch) for the remainder.

Punched holes shall be made with a die whose diameter does not exceed that of the punch by more than 1.6 mm (1/16 inch). Reaming and drilling shall be done with twist drills and, wherever possible, the reamer shall be directed by mechanical means. Holes for shop bolts shall be subpunched or subdrilled 5 mm (3/16 inch) less in diameter than the nominal diameter of the bolt, and shall be reamed to size with the parts assembled, except:

1. A709 grade 36 material thicker than 19 mm (3/4 inch) and grade 50 or 50W steel thicker than 16mm (5/8 inch) shall not be punched.
2. Materials assembled and adequately clamped together may be drilled full size.
3. Secondary and detail material of A709 Grade 36 steel not thicker than 19 mm (3/4 inch) and grade 50 or 50W steel not thicker than 16 mm (5/8 inch) fastened with high strength bolts may be punched full size.

Holes for field bolts shall be made in the same manner as holes for shop bolts except:

1. Field splices in and connections to main material shall be reamed or drilled assembled. See 863.26.
2. Assemblies such as floor beams to girders and rolled beam spans connected by diaphragms may be made through steel templates.

All holes punched full size, subpunched, or subdrilled shall be located with sufficient accuracy such that after assembling (before subpunched or subdrilled holes are reamed) a cylindrical pin 3 mm (1/8 inch) less in diameter than the nominal size of the punched hole may be entered perpendicular to the face of the member without drifting in not less than 75 percent of the contiguous holes in the same plane. All holes shall permit a pin 5 mm (3/16 inch) smaller than the nominal size of the punched holes to be inserted in the above manner. After holes are reamed or drilled full size, 85 percent of the holes in any contiguous groups shall have no offset greater than 0.8 mm (1/32 inch) between adjacent plies. The remainder of the holes shall not be offset more than 1.6 mm (1/16 inch) between adjacent plies. Plugging of improperly located holes is not permitted unless written approval has been obtained from The OSE. Steel templates shall have hardened bushings in holes accurately located in relation to the centerline of the connection as inscribed on the template. Where holes are made using a roto-broach, shell drill or other similar tool, hardened bushings need not be used in the template. The template shall be accurately positioned and bolted or clamped firmly in place prior to its use in reaming or drilling full size holes.

Templates used for reaming matching members or the opposite faces of a single member shall be exact duplicates. Templates used for connections on like parts or members shall be located with sufficient accuracy that the parts or members are duplicates and require no individual match marking.

Holes through multiple piles shall be reamed or drilled full size only when the plies of the joint are held tightly together with bolts or clamps. The joint shall also be pinned if the holes have been subpunched or subdrilled. The plies shall be disassembled and cleaned of burrs and shavings prior to final assembly. Other methods of preparing holes for high strength bolts may be given consideration upon written request to the OSE. The QCFS shall document that holes have been performed per specification.

863.21 High-Strength Steel Bolts, Nuts and Washers. High strength steel bolts, nuts and washers shall meet the provisions of 711.09.

1. General. The Engineer shall be furnished the necessary access to the work in order to observe the installation, tightening and checking of the bolts.

Based on the experience gained by the Engineer and Contractor during the use of the below described installation and inspection procedures for a particular bridge, the Engineer may elect to modify the amount of testing specified in order to expedite the work while still accomplishing properly compacted joints and tightened bolts. Consideration will be given to the use of other fastening systems or assemblies and bolt tightening procedures, if a written request is submitted to the Office of Structural Engineering in accordance with 108.05. The required bolt length shall be determined by adding to the grip the value shown in Table 1. The table values are generalized, with an allowance for manufacturing tolerances, to provide for the nut and positive "stick-through" at the end of the bolt. For each hardened flat washer that is used, add 4 mm (5/32 inch); and for each beveled washer, add 8 mm (5/16 inch). The length determined by the use of Table 1 should be adjusted to the next longer 6 mm (1/4 inch); when installed, the end of the bolt shall be flush with or project several thread lengths outside the face of the nut.

TABLE 1

Bolt Size	To determine required bolt length, add to grip*
mm	mm
M16	24
M20	28
M22	31
M24	35
M27	38
M30	41
M36	47

TABLE 1

Bolt Size	To determine required bolt length, add to grip*
inches	inches
½	11/16
5/8	7/8
3/4	1
7/8	1-1/8
1	1-1/4
1-1/8	1-1/2
1-1/4	1-5/8
1-3/8	1-3/4
1-1/2	1-7/8

*Total thickness of all connected material exclusive of washers.

Washers may, when necessary, be clipped at one location not closer than 7/8 of the bolt diameter from the center of the washer.

2. Preparation. Joint surfaces, including those adjacent to the bolt heads, nuts or washers, shall be free of paint (except for inorganic zinc primers), lacquer, dirt, oil, loose scale, rust, burrs, pits and other substances or defects which would prevent solid seating of the parts or would interfere with the development of complete frictional contact. No gaskets or other yielding material shall be interposed.

Bolts, nuts and washers will have a residual coating of lubricant when received. Bolts, nuts and washers without their original lubrication shall not be used.

3. Installation. In the final assembly of the parts to be bolted, drift pins shall be placed in a sufficient number of holes (preferably not less than 25 percent for field erection) to provide and maintain accurate alignment of holes and parts, and sufficient bolts shall be installed and brought to a snug tight condition to bring all parts of the joint into complete contact..However, in each flange and web of each beam or girder a minimum of two drift pins shall be used. Snug tight shall be defined as the tightness attained when an impact wrench begins to impact or when the full effort of a man using an ordinary spud wrench is applied. Bolts shall then be installed in any remaining open holes and tightened to a snug tight fit, after which all bolts shall be tightened completely by the turn-of-nut method. Where difficulty is experienced with the fit of the connection and the bolts are used to draw the elements into contact, the bolts in the affected portion of the connection shall be checked for sustained snug tightness after all the bolts are installed. Drift pins shall then be replaced

with bolts tightened in the same manner. Field Reaming of full sized shop holes shall not be allowed.

After the bolts are snug tight, the outer face of the nut shall be match-marked with the protruding portion of the bolt to provide the Engineer visual means of determining the relative rotation occurring between the bolt and nut during the process of final tightening. Such marks shall be made by the wrench operator with crayon or paint.

Each bolt shall have a hardened washer under the element (nut or bolt head) turned in tightening. Where an outer face of the bolted parts has a slope of more than 1:20 with respect to a plane normal to the bolt axis, a smooth beveled washer shall be used to compensate for the lack of parallelism. Galvanized A 325M (A 325) bolts shall not be reused. Re-tightening previously tightened bolts, which have become loose by tightening adjacent bolts, is not considered a reuse.

4. Tightening. Tightening of the bolts in a joint should commence at the most rigidly fixed or stiffest point, and progress toward the free edges, both in the initial snugging up and in the final tightening. If required because of bolt entering and wrench operation clearances, tightening may be done by turning the bolt. Impact wrenches, if used, shall be of adequate capacity to perform the required tightening of each bolt in approximately ten seconds.

5. Bolt Tension. Each bolt shall be tightened to provide, when all bolts in the joint are tight, at least the minimum bolt tension shown on Table 2 for the size of bolt used.

TABLE 2

Bolt Size mm	Bolt Tension* kN, minimum A 325 M
M16	91
M20	142
M22	176
M24	206
M27	267
M30	327
M36	475

TABLE 2

Bolt Size inches	Bolt Tension* kips, minimum A 325
½	12
5/8	19
3/4	28
7/8	39
1	51
1-1/8	56
1-1/4	71
1-3/8	85
1-1/2	103

*Equal to 70 percent of specified minimum tensile strengths of bolts, rounded off to the nearest kN (kip).

The bolt tension specified in Table 2 shall be attained by tightening all bolts in the joint the applicable amount of nut rotation specified in Table 3 by the turn-of-nut method.

TABLE 3
NUT ROTATION FROM SNUG TIGHT CONDITION

Bolt Length (as measured from underside of head to extreme end of point)	Disposition of Outer Faces of Bolted Parts		
	Both faces normal to bolt axis	One face Normal to bolt axis and other face sloped not more than 1:20 (bevel washer not used)	Both faces sloped not more than 1:20 from normal to bolt axis (bevel washer not used)
Up to and including 4 diameters	1/3 turn	½ turn	2/3 turn
Over 4 diameters but not exceeding 8 diameters	½ turn	2/3 turn	5/6 turn
Over 8 diameters but not exceeding 12 diameters	2/3 turn	5/6 turn	1 turn

Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by ½ turn and less, a tolerance of plus or minus 30 is permitted. For bolts installed by 2/3 turn and more, a tolerance of plus or minus 45 is permitted.

6. Inspection. (a) The first completed connection of each bridge on the project and as many subsequent connections as are deemed necessary by the Engineer shall be inspected as per paragraph (b) below. Thereafter, where the Engineer has approved the joint compactness and snug-tight condition of bolts prior to bolt tightening by the turn-of-nut method, the bolt tension as required in Table 2 shall be considered as attained if the amount of nut rotation specified by Table 3 is verified by the required match-marking.

(b) Bolts shall be inspected by the use of manual torque wrenches furnished by the Contractor. This testing shall be witnessed by the Engineer and shall be performed to his satisfaction. The inspection wrenches shall be calibrated at least once each working day in a device capable of indicating bolt tension. In this device, which shall have been approved by the Engineer, three bolts representative of the grade, size, length and condition used in the structure shall be placed and tensioned individually. A washer shall be used under the part being turned.

(c) Each of the three bolts shall be tightened in any convenient manner to the tension shown in Table 2. Then, the inspection wrench shall be applied by a slow steady pull to the tightened bolt and

the torque required to turn the nut or head 5 degrees, approximately 25 mm (1 inch) at a 300 mm (12 inch) radius, in the tightening direction shall be determined. The average torque measured in the tensioning of the three bolts shall be taken as the job inspection torque.

(d) Bolts represented by the sample described in paragraph (b) which have been tightened in the structure, shall be inspected by applying, in the tightening direction, the inspection wrench and its job inspection torque to 10 percent of the bolts, but not less than two bolts, selected at random in each connection. If no nut or bolt head is turned by this application of the job inspection torque, the connection will be accepted as properly tightened. If any nut or bolt head is turned by the application of the job inspection torque, this torque shall be applied to all the bolts in the connection, and all bolts whose nut or head is turned by the job inspection torque shall be tightened with the inspection wrench to the job inspection torque. The connection shall then be reinspected in the original manner.

7. Calibration Devices. Each calibration device shall be periodically examined by a manufacturer of such devices or by a qualified testing laboratory. Such examination shall be made at least once each year or more often if requested by the Engineer. The testing agency shall certify that each calibration device furnishes, after re-calibration if necessary, an accurate indication of actual bolt tension. The QCFS shall document that any shop applied bolts have been performed per specification.

863.22 Bearing Bolts. Turned, ribbed or other approved bearing type bolts shall meet the provisions of CMS 711.10. The bolts shall be of sufficient length to project at least 6 mm (1/4 inch) beyond the nut when tightened, and the threads on the projecting end shall be burred. The thread shall not extend into the shear planes of the contact surfaces between the connected parts. In determining whether the bolt threads are excluded from the shear planes, thread length of bolts shall be calculated as two thread lengths greater than the specified thread length as an allowance for thread run out. A washer not thicker than 6 mm (1/4 inch) may be used under the nut. The QCFS shall document that any shop applied bolts have been performed per specification.

863.23 Welding. All welding shall be performed by the shielded metal-arc, submerged arc, flux cored arc, or stud welding process. Consideration will be given to other methods of metal-arc welding if a written request is submitted to the OSE in accordance with CMS 108.05.

In other respects, the AASHTO/AWS Bridge Welding Code, as amended by Supplement 1011 shall govern the work. Welding performed on main members requires procedure testing (PQR) and an approved welding procedure (WPS). The shielded metal arc welding(SMAW) process is considered pre-qualified , and does not requires procedure testing(PQR) but requires an approved welding procedure(WPS). The fabricator shall have an approved PQR, WPS and Welder Qualifications prior to Fabricator Pre-qualification.

If after two repairs to the same area of a weld requiring radiographic quality, there is any part of the original defect remaining or there is a new rejectable indication the OSE shall have the right to

have the total joint cut apart, all deposited weld metal removed, joint preparation made and the total joint rewelded.

863.24 Stud Shear Connectors. Stud welding shall conform to the requirements of 863.23 , to the AASHTO/AWS Bridge Welding Code, as amended by Supplement 1011, and the following. Stud shear connectors that are to be welded to the top flanges of beams or girders shall be placed after the steel has been erected and suitable scaffolding or deck forming has been provided. Studs that are to be welded to beam or girder webs, end dams, bearing plates, or to other secondary members and detail material may be placed in the shop. In addition to the stud bend tests of Article 7.6.6.1 of the AASHTO/AWS Bridge Welding Code, bend tests of stud shear connectors shall also be made at the start of each work day, when welding has been interrupted for an hour or more, when changing grounds, when changing weld settings or when changing cable loop due to arc blow. In any case, no more than 500 studs shall be welded to a beam or girder without the welds being field bend tested in accordance with the specified procedure. All tested studs that show no sign of failure as determined by the Engineer shall be left in the bent position.

863.25 Threads for Bolts and Pins. Threads for bolts and pins shall conform to the Unified Standard Series ANSI B1.13M (ANSI B1.1-UNC) Class 6g (2A) for external threads and Class 6H (2B) for internal threads, except that pin ends having a diameter of 35 mm (1 3/8 inches) or more shall be threaded 4.23 mm/thread (6 threads to the inch). The QCFS shall document that threading for bolts has been performed per specification.

863.26 Shop Assembly. All contact surfaces shall be free of paint, grease, oil, rust, loose mill scale and protruding edges or burrs. The flanges and webs shall not be assembled and welded to form girders or other similar members, nor shall any fabrication or assembly which would interfere with the repair of a butt weld be accomplished until radiographs of all butt welds in the component parts are examined and approved by the QCFS for the A rated fabricators or the QA inspector for B and C rated fabricators unless waived by the OSE.

All fit-up work shall be done with the members assembled in their unloaded position as shown on the shop drawing layout required by 863.08. While assembled in the shop, members shall be adequately supported to prevent misalignment or deflection, especially at joints. Supports shall be designated to prevent settlement during the fit-up, reaming or drilling of connections. The QCFS shall maintain records of the actual dimensions and relative positions of each assembly for each offset required by 863.08 and furnish a copy to the QA inspector, upon request. This provision shall apply to both horizontal and vertical dimensions. Members that become a part of two assemblies shall be repositioned for the second assembly to the dimensions recorded for the first assembly. All connecting parts assembled in the shop for the purpose of reaming or drilling of holes for field connections or for fit-up of field welded connections shall be match-marked with steel stamps prior to disassembly.

Continuous beam and plate girders including sections adjacent to hinged, pin connected, sliding or rocker bearing joints shall have at least three adjacent segments assembled and holes reamed or drilled while assembled.

The fit-up of field welded connections shall be checked by similar shop assembly.

Longitudinal or transverse beams and girders to which diaphragms and floor beams frame or connect shall be shop assembled to check fit-up of connections to be field welded or to ream or drill holes for bolted connections. Trusses shall be assembled in lengths not less than three abutting panels before field connections are drilled or reamed while assembled.

Deck expansion devices shall be shop assembled after fabrication to check fit-up, straightness and roadway cross slope changes. Where a phased construction sequence is a mandatory part of the contract plans, part-width deck segments may be fabricated without the required shop assembly if shop drawings have incorporated a laydown, similar to 863.08, defining vertical offset dimensions from a full length common baseline to all roadway changes including sidewalks, roundings, crowns and field splice points of the expansion device.

Parts not completely assembled in the shop shall be secured by bolts, as far as practicable, to prevent damage in handling and shipping. Field splice plates shall be bolted in their final position in the shop or shifted laterally with respect to their final position so that the ends of the plates are flush with the ends of the member. Welding or tacking will not be permitted on bolted assemblies unless by written acceptance from OSE. Welding authorized shall be performed according to 863.23. The QCFS shall document that shop assembly has been performed per specification.

863.27 Nondestructive Testing. Nondestructive testing (NDT) shall conform to the AASHTO/AWS Bridge Welding Code, as amended by Supplement 1011, and this item. Welded repairs in main members for thick scabs, deep kerfs or nicks and similar gross flaws shall be subject to ultrasonic or radiographic inspection as directed by OSE or Engineer (field repairs). All examined welds and base metal adjacent to a welded joint shall be subject to the quality requirements specified in 863.23. Welds requiring nondestructive testing shall be allowed to cool before they are tested.

Where controversy may arise, regarding the interpretation of radiographs, magnetic particle indications or the acceptability of welds, OSE shall have the final authority to approve the welds. Field radiographic inspection shall be accepted by OSE prior to subsequent construction activities that would make weld repair inaccessible.

1. Radiographic Inspection of Welds. Radiographic inspection shall be made of the following welds:

(a) The full length of all butt welds in flange material of plate girders or rolled beams.

(b) The top and bottom one-third of transverse web splices in plate girders or rolled beams including the cope holes, if any.

(c) Butt welds in longitudinal stiffeners attached to tension areas of webs.

(d) Twenty-five percent of each longitudinal web splice as selected by the inspector.

(e) Full length of field flange cut repairs.

(f) Any other weld specified by the plans.

The radiograph identification mark shown on the shop drawing layout shall be steel stamped in the area marked "Weld Identification" of Figures 6.1A thru 6.1D of the AASHTO/AWS Bridge Welding Code in a manner to make it visible in the radiograph of the area without resorting to superimposed like markings. Steel Stamped identification marks on flange plates shall be placed so that after assembly of girders, they will be on the inside of flange, but out of the area to which the web will fasten. Films of repaired welds shall also be identified by the letter "R". Steel Stamped identification numbers shall not be placed within the weld area. Other required markings shall be made by using superimposed characters. Where areas being radiographed are adjacent to the edge of the plate, the film shall be located and a technique employed which will include the top and bottom images of the plate edge. Films 114 by 432 mm (4 ½ by 17 inches) shall be used where practicable. The minimum film size shall be 114 by 254 mm (4 ½ by 10 inches).

Whenever an unacceptable weld occurs in the web sections enumerated, an adjoining 300 mm (12 inch) length of weld not previously examined shall be radiographed. If unacceptable flaws are found in this adjoining segment, the remainder of the weld (if any) shall be examined.

Radiographs shall be submitted to OSE for acceptance and shall be accompanied by certification from the Contractor or Fabricator that the radiographic examination was performed in conformance to these specifications, field sketches and by two copies of the radiographic technician's analysis report listing unacceptable defects and causes for rejection. The technician's report shall include identification and energy level or source strength in becquerels of the radiation source, film to source distance, film type, and exposure time for each radiograph as well as the signature of the technician and his NDT level. The contact films shall become the property of the Department. Field main material repairs shall have sketches which clearly show specific locations, lengths and depths of field cuts or damages repaired by field welding.

2. Magnetic Particle Inspection of Welds. All welding required in the fabrication of each beam or girder shall be completed and all visual defects shall be corrected prior to the examination by magnetic particle inspection. Dry powder magnetic particle inspection shall be made of at least 0.3 m (1 foot) of each 3.0 m (10 feet) or fraction thereof for each size of weld in the following:

(a) Flange-to-web welds
(b) Moment plate to flange welds
(c) Bearing stiffener welds
(d) Other welds designated by the plans.

Test sections shall be random locations selected by the QA inspector and/or the QCFS, and the examination shall be conducted with the QA inspector observing for C rated fabricators, unless waived by OSE. The Contractor or Fabricator shall notify the Department at least 48 hours in advance of such inspection. Requests for an inspector to observe the examination shall be limited to not less than 150 m (500 feet) of weld unless a lesser amount constitutes the entire project.

The Fabricator shall position the welds as necessary for the inspection with consideration of safety and convenience to the inspecting personnel.

Welds shall be inspected after they have been cleaned. Test equipment shall be provided with a functioning ammeter. The magnetizing current shall be 100 amperes per 25 mm (inch) of prod spacing but not less than 400 amperes. Only aluminum prods shall be permitted.

When unacceptable defects are found in a section, both adjacent 1.5 m (5 foot) segments or the full length of the weld if it is a lesser amount shall be tested. Welds requiring repair shall be retested after repairs are completed.

Not all of the enumerated surface defects of Article 9.21 of the AASHTO/AWS Bridge Welding Code will be located by an inspection of this type. Welds shall be considered unacceptable if they produce such indications that are in the QA inspector's opinion in excess of the above quality standards.

The Fabricator shall record for each structural member the location of inspected areas, the location and description of any defects found, and repairs made.

3. Ultrasonic Testing of Welds. Ultrasonic inspection shall be made of the following:

(a) At least 0.3 m (1 foot) in each 3.0 m (10 feet) or fraction thereof at locations selected by the Inspector of all complete joint penetration flange-to-web welds.

(b) Fracture Critical Welds per AWS Bridge Welding Code

(c) Other welds designated by the plans

The QCFS shall document that all shop NDT has been performed per specification.

863.28 Shipping, Storage and Erection. Members damaged by improper handling, storing, transportation or erection shall be repaired or replaced, at the discretion of OSE, at no expense to the Department.

During transport, adequate blocking shall be in place between members to prevent movement and facilitate unloading. Field connection holes shall not be used for tie-down unless they are reinforced

by additional plates, angles or other material bolted in place. Bearing components shall be banded together.

Material to be stored either in the fabricating shop or in the field shall be placed on skids or blocks to prevent the metal from coming in contact with the ground. Girders and beams shall be placed and shored in an upright position for shipment and both field and shop storage. Field splice plates shall be bolted in their final position or shifted laterally with respect to their final position. All material shall be kept clean and properly drained. Bearing devices and anchorages shall be installed according to 516. Bearing surfaces and surfaces to be in permanent contact shall be thoroughly cleaned before the members are assembled.

During erection, drifting will be permitted to draw the parts into position, but the holes shall not be enlarged nor the metal distorted. Erection (drift) pins shall be cylindrical and not more than 0.8 mm (1/32 inch) smaller than the diameter of the hole. Field splices and connections shall have not less than one-half of the holes filled with pins and snug tight bolts (preferably half bolts and half pins) before the member is released from the hoisting equipment. Field splices and connections commenced prior to erection of the connected parts shall be completed before erection. Splices and connections subject to construction loads during erection shall have not less than three-fourths of the holes so filled. Permanent fastening of steel truss tension chord members shall be completed before the falsework is removed, but compression chord members shall not be permanently fastened until the span is released sufficiently from the falsework to bring the compression chord joints into full bearing. Elevations of panel points and ends of floor beams shall be properly regulated and maintained until the falsework is removed.

Enlarging by any method the holes of splices and/or connections between segments or elements of main members is prohibited without approval by OSE.

Structures shall be adjusted to correct alignment and camber before permanent fastening is begun. Cross frames and lateral bracing in continuous beam or girder spans shall not be permanently fastened in any span until all main connections in adjacent spans have been completed; however, sufficient bracing shall be installed to meet the requirements of 501.06. Where erection bolts are used, they shall be not less than 16 mm (5/8-inch) diameter. Bolts for unpainted applications of A709 Grade 50W (A588) steel shall be A 325, Type 3. Erection bolts shall be A 307 bolts with lock washers or nuts tack welded to the bolt, or A 325 bolts tightened to a snug tight condition as described in 863.21 and having nuts tack welded to the bolt. End crossframes and end dams shall be erected in a manner that assures all bearing parts will remain in bearing contact. The QCFS shall document all shipping from the shop and shop storage has been performed per specification.

863.29 Shop Painting. This section contains requirements for the application and inspection of the shop prime coat as specified in the contract plans. The payment for the shop prime coat is included in the price bid for structural steel.

The QCPS shall be responsible for being familiar with the applicable paint specifications called for in the contract plans. Where specific shop Quality Control Points (QCP) are established in the specification, the QCPS shall comply with those requirements. If no shop prime coat QCPs are defined in the applicable paint specification, the QCPs in this section shall be the responsibility of the QCPS to assure that all QCPs meet specifications .

Shop Prime coat shall be as specified in the contract documents.

Quality Control Points

Quality control points (QCP) are points in time when one phase of the work is complete and ready for inspection by the fabricator and QA Inspector. The next operational step shall not proceed unless the QCP has been accepted or QA inspection waived by the QA Inspector. At these points the Fabricator shall afford access to inspect all affected surfaces. If QA Inspection indicates a deficiency, that phase of the work shall be corrected in accordance with these specifications prior to beginning the next phase of work. Discovery of defective work or material after a Quality Control Point is past or failure of the final product before final acceptance, shall not in any way prevent rejection or obligate the Department to final acceptance.

Quality Control Points (QCP)	(PURPOSE)
1.) Shop Solvent Cleaning	Remove asphaltic cement, oil, grease salt, dirt, etc.
2.) Shop Grinding Flange Edges	Remove sharp corners, per AWS
3.) Shop Abrasive Blasting	Blasted surface to receive paint, including repair of fins, tears, slivers or sharp edges
4.) Shop Prime Coat Application	Check surface cleanliness apply prime coat check coating thickness

Shop Solvent Cleaning (QCP # 1)

The steel shall be solvent cleaned to remove all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants per SSPC-SP 1 Solvent Cleaning. Under no circumstances shall any abrasive blasting be done to areas with asphaltic cement, oil, grease, or diesel fuel deposits. Steel shall be allowed to dry before blast cleaning begins.

Shop Grinding Edges (QCP # 2)

All corners of thermally cut or sheared edges shall have a 1/16 inch radius or equivalent flat surface at a suitable angle. Thermally cut material thicker than 1 ½ inch shall have the sides ground to remove the heat effected zone.

Shop Abrasive Blasting (QCP #3)

All steel to be painted shall be blast cleaned according to SSPC-SP10. Steel shall be maintained in a blast cleaned condition until it has received a prime coat of paint.

Metallized or Galvanized steel, and other surfaces not intended to be painted, shall be covered and protected to prevent damage from blasting and painting operations. Any adjacent coatings damaged during the blasting operation shall be repaired at the fabricators expense.

The abrasive shall be a mix of recyclable steel grit and shot that produces an angular profile. After each use and prior to reuse, the steel grit shall be cleaned of paint chips, rust, mill scale and other foreign material by equipment specifically designed for such cleaning.

Abrasives shall also be checked for oil contamination before use. A small sample of abrasives shall be added to ordinary tap water. Any detection of a oil film on the surface of the water shall be cause for rejection. The QCPS shall perform and record this test prior to abrasive blasting and at the start of each shift. The resultant surface profile shall be a minimum of 40 mm (1.5 mils) and a maximum of 90 mm (3.5 mils). The QCPS shall record by the use of replica tape ASTM D4417-93 method C, the profile supplied. Five random readings shall be made for each beam or girder piece. 10% of all secondary material shall have one(1) recorded reading Abrasives of a size suitable to develop the required surface profile shall be used. Any abrasive blasting which is done when the steel temperature is less than 3° C(5° F) above the dew point shall be re-blasted when the steel temperature is at least 3° C(5° F) above the dew point. The QCPS shall record temperature by the use of a recording Thermometer and Dew point shall be recorded prior to blasting and at the start of each shift.

All abrasives and residue shall be removed from all surfaces to be painted with a vacuum cleaner equipped with a brush-type cleaning tool, or by double blowing. All blast cleaned steel shall be kept dust free, dry and shall be prime coated within 24 hours. The QCPS shall perform and record the following test to ensure that the compressed air is not contaminated: blow air from the nozzle for 30 seconds onto a white cloth or blotter held in a rigid frame. If any oil or other contaminants are present on the cloth or blotter, abrasive blasting shall be suspended until the problem is corrected and the operation is verified by a repeated test. This test shall be done prior to blowing and at the start of each shift.

Abrasive blasting and painting may take place simultaneously as long as abrasive blasting debris and/or dust by the blowing operation does not come in contact with freshly painted surfaces. Work areas for blasting and painting shall be physically separated to eliminate contamination of the priming operation.

All fins, tears, slivers and burred or sharp edges that are present on any steel member or that appear after the blasting operation shall be conditioned per ASTM A6 and the area reblasted to provide the specified surface profile.

Shop Prime Coat Application(QCP # 4)

The surfaces to be painted shall be clean and dry. Paint shall not be applied in rain, snow, fog or mist, or to frosted or ice-coated surfaces.. After QCP #3 has been accepted prime painting shall be completed before the cleaned surfaces have degraded from the prescribed standards, but in every case within 24 hours. The QCPS shall record the time between blasting and priming. Failure to prime coat the within 24 hours will require reblasting before prime coating. The QCPS shall record that the paint is applied when the ambient temperature and humidity are as specified. Primer shall be applied by spray methods. The paint may be thinned for spraying. The type of thinner and the amount used shall be as recommended by the printed instructions of the manufacturer.

Before the paint is applied, it shall be mixed to a uniform consistency and maintained during its application. Primer shall be spray applied and continuously agitated by a automated agitation system(hand held mixers are not allowed) during application. The paint shall be mixed with a high shear mixer. Paddle mixers or paint shakers shall not be used. Paint shall also not be mixed or kept in suspension by means of an air stream bubbling under the surface.

The primer shall be applied in a neat workmanlike manner as a continuous film of uniform thickness which is free of holidays, pores, runs or sags. Spray application shall produce a wet coat at all times; the deposition of semidry particles on the surface shall be avoided. The Fabricator shall take precaution to prevent contamination of surfaces that have been prepared for painting and surfaces freshly painted. The prime coat shall be applied within the shop and the steel shall not be handled unnecessarily or removed from the shop until paint has dried sufficiently to allow thickness gaging and to resist being marred in handling and shipping.

A prime coat shall coat all surfaces including insides of holes, behind stiffener clips and contact surfaces of connection or splice material which are to be fastened with shop or field bolts. Surfaces which are to be imbedded in concrete and surfaces within 50 mm (2 inches) of field welds other than those attaching intermediate or end Cross frames to beams or girders shall only receive a mist coat not less that .5 mils(12.5 um) nor more than 1.5 mils(37.5 um). Pins, pin holes and contact surfaces of bearing assemblies, except those containing self-lubricating bronze inserts, shall be painted with one coat of prime paint. Erection marks shall be applied after the prime coat is dry, using a thinned paint of a type and color which will be completely concealed by and compatible with the second coat.

The QCPS shall record the actual dry film thickness for the prime coat as specified. Thick films shall be reduced by screening, sanding, or sweep blasting. Any re-coating of prime paint that has cured longer than 24 hours with prime paint shall be done as recommended by the paint manufacturer's printed instructions. If "mud cracking" occurs, the affected area shall be scraped to soundly bonded paint and the area re-coated. Uncured paint damaged by rain, snow or condensation shall be permitted to dry; the damaged paint shall then be removed and the surface repainted. The primed coat shall be adequately cured before the intermediate coat is applied. This curing time shall be not less than that recommended by the paint manufacturer's printed instructions.

TESTING EQUIPMENT

The Fabricator shall provide the QCSP inspector the following testing equipment in good working order, for the duration of the project. When the Fabricator's people are working at different locations simultaneously, additional test equipment shall be provided for each crew for the type of work being performed. When no test equipment is available, no work shall be performed.

1. One Spring micrometer and 3 (unless otherwise specified on plans) rolls of extra-coarse replica tape.

2. One (Positector 2000 or 6000, Quanix 2200, or Elcometer A345FBI1) and the calibration plates, 38-200 mm and 250-625 mm (1.5 -8 mils and 10-25 mils) as per the NBS calibration standards in accordance with ASTM D-1186.

3. One Sling Psychrometer including Psychometric tables - Used to calculate relative humidity and dew point temperature.

4. Two steel surface thermometers accurate within 1° C(2° F) or One portable infrared thermometer available from:

   Model: Raynger ST Series (-18° C to 400°C)
   Manufacturer: Raytek Inc.
   Santa Cruz, Ca.
   (800)227-8074

   or approved equal to the portable infrared thermometer

5. Flashlight 2-D cell

6. SSPC Visual Standard for Abrasive Blast Cleaned Steel SSPC-Vis 1-89

7. One Recorder Thermometer capable of recording the date, time, and temperature over a period of at least 12 hours.

HANDLING

All paint and thinner shall be delivered to the fabricator in original, unopened containers with labels intact. Minor damage to containers is acceptable provided the container has not been punctured. Thinner containers shall be a maximum of 19 L (5 gallons).

Paint shall be stored at the temperature recommended by the manufacturer to prevent paint deterioration. The QCPS shall record storage temperatures.

Each container of paint and thinner shall be clearly marked or labeled to show paint identification, component, color, lot number, stock number, date of manufacture, and information and warnings as may be required by Federal and State laws. The QCPS shall record the lot number, stock number and date of manufacture.

All containers of paint and thinner shall remain unopened until required for use. The label information shall be legible and checked at the time of use. Solvent used for cleaning equipment is exempt from the above requirements.

Paint which has livered, gelled or otherwise deteriorated during storage shall not be used. However, thixotropic materials which can be stirred to attain normal consistency may be used. The oldest paint of each kind shall be used first. No paint shall be used which has surpassed its shelf life.

The Fabricator shall provide thermometers capable of monitoring the maximum high and low temperatures within the storage facility. The Fabricator is responsible for properly disposing of all unused paint and paint containers.

The Fabricator shall furnish TE-24 and the QCPS records for all materials used on the project to the QA Inspector.

MIXING AND THINNING

All ingredients in any container of paint shall be thoroughly mixed immediately before use and the primer shall be continuously mixed by an automated agitation system (hand held mixers not allowed). Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. The paint shall be mixed with a high shear mixer (such as a Jiffy Mixer). Paddle mixers or paint shakers are not allowed. Paint shall not be mixed or kept in suspension by means of an air stream bubbling under the paint surface. The QCPS shall record that all equipment is working correctly.

All paint shall be strained after mixing. Strainers shall be of a type to remove only skins and undesirable matter, but not pigment.

No thinner shall be added to the paint without the QCPS's approval, and only if necessary for proper application as recommended by the manufacturer. When the use of thinner is permissible, thinner shall be added slowly to the paint during the mixing process. All thinning shall be done under supervision of the QCPS. In no case shall more thinner be added than that recommended by the manufacturer's printed instructions. Only thinners recommended and supplied by the paint manufacturer may be added to the paint. No other additives shall be added to the paint.

Catalysts, curing agents, or hardeners which are in separate packages shall be added to the base paint only after the base paint has been thoroughly mixed. The proper volume of catalyst shall then

be slowly poured into the required volume of base with constant agitation. Liquid which has separated from the pigment shall not be poured off prior to mixing. The mixture shall be used within the pot life specified by the manufacturer. Therefore only enough paint shall be catalyzed for prompt use. Most mixed, catalyzed paints cannot be stored, and unused portions of these shall be discarded at the end of each working day.

COATING APPLICATION

General

Galvanized or metallized surfaces shall not be painted. All new structural steel shall be painted. The following methods of application are permitted for use by this specification, as long as they are compatible with the paint being used: Air-less or Conventional spray. Brushes Daubers, small diameter rollers or sheepskins may be used for places of difficult access when no other method is practical.

Cleaning and painting shall be so programmed that dust or other contaminants do not fall on wet, newly-painted surfaces. Surfaces not intended to be painted shall be suitably protected from the effects of cleaning and painting operations. Over spray shall be removed with a stiff bristle brush or wire screen. Remove overspray without damaging the paint. The Over spray must be removed. No visible abrasives from adjacent work shall be left on the prime. Abrasives on the prime coat shall be removed.

Spray Application (General)

All spray application of paint shall be in accordance with the following:

Spray equipment shall be kept clean so dirt, dried paint and other foreign materials are not deposited in the paint film. Any solvent left in the equipment shall be completely removed before using.

Paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern. The border of the spray pattern shall be painted first; with the painting of the interior of the spray pattern to follow, before moving to the next spray pattern area. A spray pattern area is such that the gun shall be held perpendicular to the surface and at a distance which will ensure that a wet layer of paint is deposited on the surface. The trigger of the gun should be released at the end of each stroke. The QCPS shall record that each spray operator demonstrated to the QCPS the ability to apply the paint as specified. Any operator who does not demonstrate this ability shall not spray.

The QCPS shall document that all spray equipment used follows the paint manufacturer's equipment recommendations . Equipment shall be suitable for use with the specified paint. to avoid paint application problems.

If air spray is used, traps or separators shall be provided to remove oil and condensed water from the air. The traps or separators must be of adequate size and must be drained periodically during operations. The following test shall be made by the Fabricator and verified by the QCPS to insure that the traps or separators are working properly.

The QCPS shall perform and record that air is blown from the spray gun for 30 seconds onto a white cloth or blotter held in a rigid frame. If any oil, water or other contaminants are present on the cloth or blotter: painting shall be suspended until the problem is corrected and the operation is verified by repeating this test. This test shall be made at the start of each shift and at 4 hour intervals. This is not required for an airless sprayer.

Application Approval

The end of the application of primer for each beam or girder shall be subject to QCPS inspection and approval to detect any defects which might result from the fabricator's methods. If defects are discovered, the fabricator shall make all necessary adjustments to the method of application to eliminate defects before proceeding with additional prime coat application.

Temperature

Paint shall not be applied when the temperature of the air, steel, or paint is below 10° C (50° F). Paint shall not be applied when the steel surface temperature is expected to drop below 10° C (50° F) before the paint has cured for the minimum times specified below:

	10° C (50° F)	16° C (60° F)	21° C (70° F)
Primer	4 hrs.	3 hrs.	2 hrs.

The QCPS shall record and monitor the above temperatures and times with the recording thermometer.

Moisture

Paint shall not be applied when the steel surface temperature is less than 3° C (5° F) above the dew point. Paint shall not be applied to wet or damp surfaces or on frosted or ice-coated surfaces. Paint shall not be applied when the relative humidity is greater than 85%. Paint shall not be applied outdoors. The QCPS shall record the relative humidity prior to painting, at every shift and 4 hour intervals

Repair Procedures

Damaged areas, and areas which do not comply with the requirements of this specification, shall be repaired in a manner to blend the patched area with the adjacent coating. The finished surface of the patched area shall have a smooth, even profile with the adjacent surface.

The QCPS shall submit his method of conducting repairs, correcting runs, sags , mud cracking and un-workman like conditions in writing to the OSE.

Dry Film Thickness

Prime thickness, shall be determined by use of Type 2 magnetic gage in accordance with the following:

Five separate spot measurements shall be made, spaced evenly over each 9 square meters (100 square feet) of new steel surface area to be measured. These measurements shall be taken on flanges, webs, cross bracing, stiffeners, etc. Three gage readings shall be made for each spot measurement of either the substrate or the paint. The probe shall be moved a distance of 25 to 75 mm (1 to 3 inches) for each new gage reading. Any unusually high or low gage reading that cannot be repeated consistently shall be discarded. The average (mean) of the 3 gage readings shall be used as the spot measurement. The average of five spot measurements for each such 9 square meter (100 square foot) area shall not be less that the specified thickness. No single spot measurement in any 9 square meter (100 square foot) area shall be less than 80% of the specified minimum thickness nor greater than 150% of the maximum specified thickness. Any one of 3 readings which are averaged to produce each spot measurement, may under-run or over-run by a greater amount. The 5 spot measurements shall be made for each 9 square meter (100 square feet) of area.

Coating thickness shall meet the requirements of the applicable paint specification.

SAFETY REQUIREMENTS AND PRECAUTIONS

The fabricator shall meet the applicable safety requirements of the Ohio Industrial Commission and the Occupational Safety and Health Administration (OSHA).

INSPECTION ACCESS

In addition to the requirements of CMS 105.11, the fabricator shall furnish, erect, and move scaffolding and other appropriate equipment, to permit the QA Inspector the opportunity to closely observe all affected surfaces. Material shall be separated and braced safely This opportunity shall be provided to the Inspector during all phases of the work.

863.30 Cleaning A709 Grade 50W Steel (ASTM A 588) Before the new steel is shipped All the exposed surfaces of A 709 Grade 50W (A588) steel that are to be left unpainted shall be solvent cleaned to remove all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants per SSPC-SP 1 Solvent Cleaning. QCP #1 and QCP #2 shall apply per 863.29.

Fascia beams (girders) shall be shop blast cleaned to SSPC- SP6 commercial blast. QCP#3 shall apply per 863.29.

After the placement of the superstructure concrete All the exposed surfaces of A 709 Grade 50W (A588) steel that are to be left unpainted shall be solvent cleaned to remove all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants per SSPC-SP 1 Solvent Cleaning.

The use of acid for cleaning will not be permitted.

863.31 Method of Measurement. Structural steel shall be measured by either lump sum or the plan weight of steel, whichever is stipulated in the contract.

If the quantity of structural steel to be paid is the plan weight of steel, the actual number of kilograms (pounds) shall be computed from the approved shop drawing by using a unit weight of 7850 kg/m^3 (490 pounds per cubic foot). Waste material, such as is removed by burning, cutting, machining, etc., shall not be considered as pay weight except for that material removed in the edge preparation for groove welds. Material removed to form bolt holes shall be included in the pay quantity provided that only those portions of the bolts projecting beyond the holes are included for payment. Only bolts and materials that remain in place shall be included. Any thickness and weight of members in excess of that called for on the plans (due to overweight or other cause) shall not be included in determining the weight to be paid for, unless an increase in size of a member has been requested by the Director.

Pay weight for steel castings shall be based on scale weights of the finished pieces prior to painting. Castings shall be weighed by the Fabricator, in the presence of the inspector, and weights recorded on shop bills.

The weight of paint coat, galvanized coat, run-off bars, and weld metal in all field welds and shop butt welds shall not be included. Fillet welds may be included if completely itemized.

The weight of other metals and preformed bearing pads not separately itemized is to be included with the structural steel. The following unit weights in kg/m^3 (pounds per cubic foot) shall be used: Cast steel and deposited weld metal 7850 (490), cast iron 7210 (450), phosphor or leaded bronze 8810 (550), lead 11370 (710). The weight of preformed bearing pads shall be calculated as an equivalent volume of lead.

The number of welded stud shear connectors to be paid for shall be the actual number installed and accepted.

863.32 Basis of Payment. Payment will be made at contract prices for:

Item	Unit	Description
863	Lump Sum	Structural Steel Members, Miscellaneous Level Fabrication
863	Lump Sum	Structural Steel Members, Level One(1) Fabrication
863	Lump Sum	Structural Steel Members, Level Two(2) Fabrication
863	Lump Sum	Structural Steel Members, Level Three(3) Fabrication
863	Lump Sum	Structural Steel Members, Level Four(4) Fabrication
863	Lump Sum	Structural Steel Members, Level Five(5) Fabrication
863	Lump Sum	Structural Steel Members, Fracture Critical, Level (6) Fabrication
863	Kilogram (pound)	Structural Steel Members, Miscellaneous Level Fabrication
863	Kilogram (pound)	Structural Steel Members, Level One(1) Fabrication
863	Kilogram (pound)	Structural Steel Members, Level Two(2) Fabrication
863	Kilogram (pound)	Structural Steel Members, Level Three(3) Fabrication
863	Kilogram (pound)	Structural Steel Members, Level Four(4) Fabrication
863	Kilogram (pound)	Structural Steel Members, Level Five(5) Fabrication
863	Kilogram (pound)	Structural Steel Members, Fracture Critical, Level (6) Fabrication
863	Each	Welded Stud Shear Connectors

Appendix I

OHIO DEPARTMENT OF TRANSPORTATION
P.O. Box 899
25 South Front Street
Columbus, OH 43215-0899
614-466-4082 / 614-752-4824 fax / jrandall@ODOT.DOT.Ohio.Gov

Facilities inspection has been performed by _____ From the Office of Structural Engineering (OSE)__/__/__ Based upon this report your facility will be evaluated for acceptance into the Prequalified Fabricator List as specified by Ssxxx.02

Facilities Evaluation Check List

1. Company Name: _____
2. Address: _____
3. Phone:_____ Fax:_____ E Mail_____
4. AISC Certification, enclose copy of certification:_____
   a. Level 1 Fabricator: S Br category with P endorsement
   b. Level 2 thru 5 Fabricator: M Br category with P endorsement
   c. Level 6 Fabricator: M Br category with P and F endorsements
5. Company Representative
   a. President: _____
   b. Chief Engineer: _____
   c. Shop Superintendent: _____
   d. QCFS, enclose certifications: _____
   e. QCPS, enclose certifications: _____
   f. NDT Staff or Agency, enclose certifications: _____
6. Building Facilities:
   a. Indoor heated fabrication area, length and width (ft): _____
   b. Indoor heated paint area, length and width (ft): _____
   c. Laydown assembly area, length and width (ft): _____
   d. QA Inspection Office area meets specification 863.07

7A. Lifting Equipment:
   1. Overhead equipment maximum piece lifting capacity (Lbs.) _____
   2. Mobile equipment maximum piece lifting capacity (Lbs.)_____

7B. Material Preparation:

Appendix I

1. Shearing and planed edges, comments: _____
2. Cutting, manual guided methods required for levels 1 thru 3
3. Cutting Automated guided methods required for levels 4 thru 6, maximum length:_____
4. Bending processes available, comments: _____
5. Reentrant corners and rounding edges, comments: _____

7C. Welding Processes

1. Levels 1 and 2 must have SMAW, check for calibration paperwork: _____
2. Level 3 must have SMAW and FCAW, check for calibration paperwork: _____
3. Level 4 thru 6 must have SMAW, FCAW and SAW, check for calibration paperwork: _____
4. Electrode oven, check operation and calibration paperwork: _____
5. Level 6, flux hoppers check for calibration paperwork: _____
6. Current approved PQR, separate submission required.
7. Complete package of WPS, separate submission required.
8. Qualified welders, separate submission required.

7D. NDT Technicians or Agency:

1. Level 3 fabrication requirements:
   a. Magnetic Particle Inspection(MPI): Dry powder with aluminum prods check machine calibration per ASTM E709 each 6 month: _____
   b. MPI ANSI/ASNT CP-189-1995 Level I, enclose certifications
2. Level 4 thru 6 fabrication requirements:
   a. MPI as per level 3 above
   b. Ultrasonic Testing (UT) Equipment: AWS D1.5-95 section 6.15 and qualification 6.17: _____
   c. UT ANSI/ASNT CP-189-1995 Level II , enclose certifications
   d. Radiographic Testing (RT) Equipment: AWS D1.5-95 section 6.12 viewer: _____
   e. Evaluation of production sample RT film and report per AWS D1.5-95 section 6.10: _____
   f. RT ANSI/ASNT CP-189-1995 Level II, enclose certifications

7E. Drilling and Punching Processes, check work in process meets SSxxx.20 and 26: _____

7F. Shop Bolting:

1. Skidmore Tension Devise, calibrated yearly: _____
2. Inspection Torque Wrench: _____

7G. Coating:

1. Methods available for blast cleaning: _____
2. Grit and shot mixture, examine sample work for profile: _____
3. Methods available for painting: _____

Appendix II

4. Check for operation of painting and paint inspection equipment see 863.29: _____
5. Metallizing methods available: 85% Zinc, 15% Aluminum wire method: _____
6. Galvanizing methods available: _____

FABRICATOR _____RATING FOR SHOP DRAWINGS

County:_____Project:_____Reference:_____Date:_____Bridge:_____

Y	N	NA

Contractor Coordination (15%)

1. The Contractor's has provided a certification cover letter (1 point)
2. All shop drawings were approved and stamped by the Contractor's PE (1 point)
3. Drawing notes show that the Contractor performed field verification of existing structure as per contract (1 point)
4. Approved shop drawings were received fifteen (15) working days prior to start of fabrication (1 point)
5. Letter from the Contractor addressing any contract changes due to field conditions, plan errors, fabrication substitutions (2 points)

Title Block (1%)

1. The project number is shown (1 point)
2. The item number is shown (1 point)
3. The reference number(s) are shown and separated (1 point)
4. The county, route and section of the structure is shown (1 point)
5. The initials of the checker/reviewer are shown (1 point)
6. The sheets are numbered sequentially (1 point)

General Notes (5%)

1. Correct design specifications are shown, AASHTO, interims and CMS (1 point)
2. The correct type and grade of steel is shown (15 points)
3. Charpy V Notch (CVN) specifications are noted per contract (15 points)
4. Shop and field bolts are specified per contract (10 points)
5. Welding specifications are noted per contract (1 point)
6. The system for producing holes for high strength bolts is specified (1 points)
7. The match marking system is specified (1 point)

8. Non destructive testing is specified (5 points)
9. Surface preparation is specified (1 point)
10. The rounding of all corners of sheared or flame cut edges is specified (1 point)
11. The paint or coating system is specified (1 point)

Framing Plan (10%)

1. The center/center of bearings is dimensioned along the full length base line (1 point)
2. The skew of substructures is shown. (1 point)
3. A north arrow is shown (1 point)
4. The cross frame spacing is shown (10 points)
5. The transverse or radial center/center of main members is shown (1 point)
6. Center/center member spacing is shown along the skew at the abutments (1 point)
7. The substructures are labeled (1 point)
8. The field splices are shown and dimensioned along the full length base line (1 point)
9. Main member piece marks are shown and correlate to detail drawings (15 points)
10. The field welding details are shown per contract and AWS (5 points)

Laydown Assemblies (30%)

Vertical Laydown Assemblies

1. The full length base line is from abutment to abutment (15 points)
2. The substructures are dimensioned vertically from the baseline (10 points)
3. 1/4 pts, ½ pts and field splices are dimensioned vertically from the baseline (5 points)
4. The center/center of bearings are dimensioned (5 points)
5. The splices are dimensioned from the center line of bearings (1 point)
6. Vertical offsets are dimensioned to a consistent location on each member (top of bottom flange or bottom of bottom flange) (1 point)
7. Transverse and longitudinal main members that frame together are developed for vertical offsets (15 points)

Horizontal Laydown Assemblies

1. The full length base line is from abutment to abutment (15 points)
2. The substructures are dimensioned horizontally from the baseline (10 points)
3. Points at 10'-0" center/center and field splices are dimensioned horizontally from the baseline (1 point)
4. The center/center of bearings are dimensioned (5 points)
5. The splices are dimensioned from center line of bearings (1 point)
6. Transverse and longitudinal main members that frame together are developed for horizontal offsets (15 points)

Main Member Details (30%)

1. The cross frame and intermediate stiffeners are spaced per the framing plan (1 point)
2. There are section views for the different stiffener conditions (1 point)
3. The stiffeners have proper end fit conditions (10 points)
4. Weld termination details are correct (5 points)
5. Stiffener clips are correct (1 point)
6. Re-entrant corners are provided with a 1" radius (5 points)
7. Rolled beam cross sections have been dimensioned (1 point)
8. Individual member camber diagrams are supplied with offsets at 1/4 points (1 point)
9. Individual member sweep diagrams are supplied with offsets at 10'-0" c/c (1 point)
10. All material sizes, type or grade are per contract; shapes, member plates, splice plates, fills and stiffeners. (20 points)
11. WPS procedure numbers are identified for each weld (1 point)
12. Flange and web transitions are detailed per contract and AWS (10 points)
13. Member weld sizes and details are per contract and AWS (10 points)
14. The splice pattern, edge distance, and 1/4" maximum gap per contract (10 points)
15. The bolt diameters and types are correct per contract (20 points)
16. Piece marks match the framing plan and each piece is unique (1 point)
17. End condition such as integral abutment, flange clips, distances between end of member and center line of bearing or special fit-up are per contract (10 points)
18. Fracture Critical plates are identified per AWS and contract (25 points)

19. Fracture Critical welds are identified by WPS number and FC designation per AWS and contract (15 points)
20. Paint and no paint areas are detailed per contract (1 point)

Secondary Member Details (9%)

1. Material sizes are shown per contract (15 points)
2. Secondary member work points are dimensioned (1 point)
3. Weld sizes, lengths and locations are depicted according to AWS and contract (10 points)
4. Strut and transverse diagonals are shown with legs properly oriented (1 point)
5. There is a piece mark system (1 point)
6. Bolts and hole sizes are correct (1 point)
7. Cross slope and or superelevation has been acknowledged (15 point)

Y= yes, N= no, NA = not applicable

No partial points are available for a Y, N or NA selection

Sum of { Y / (Y + N) } x Section Factor = Fabricator Rating

Timeliness _____ (Y) / _____(Y + N)* X 15 = _____
Title Block_____(Y) / _____(Y + N) X 1 = _____
General Notes_____ (Y) / _____(Y + N) X 5 = _____
Framing Plan_____(Y) / _____(Y + N) X 10 = _____
Laydown _____(Y) / _____(Y + N)* X 30 = _____
Main Member_____(Y) / _____(Y + N)* X 30 = _____
Secondary Member_____(Y) / _____(Y + N) X 9 = _____

Summation Fabricator rating for performance of shop drawings (%) = _____

* Y / (Y + N) x 1.0 for Timeliness, Laydown or Main Members sections. If any of these individual ratings are lower than the summation fabricator rating, the Fabricator rating shall then be based upon the lowest individual section rating.

Fabricator_____Rating for Performance of Shop Drawings_____%
FABRICATOR _____RATING FOR TEST REPORTS

County:_____Project:_____Reference:_____ Date:_____

Appendix II

I. General Project Information	Y	N	NA
1. County is identified (1 point)			
2. Project number is shown (1 point)			
3. Reference number is called out (1 point)			
4. Bridge number is specified (1 point)			
5. Name of fabricator is identified (1 point)			
6 Reference numbers are separated (1 point)			
7. Test reports are cross referenced to drawing piece marking system (2 point)			

II. Complete Mill Test			
1. All materials shown on the shop drawings have test reports and shippers (30 points)			
2. The producing mill is domestic (10 points)			
3. Test reports meet all contract requirements; CMS, ASTM, CVN or Fracture Critical. (25 points)			
4. Material quantity is shown on the Test Reports (2 points)			
5. Test reports show material size, shape, & length (3 points)			
6. Test reports show mill's name (2 points)			
7. Test reports show grade of steel (3 points)			
8. Test reports show purchaser of material (2 points)			

IV. Timeliness			
Test report submission was 14 working days prior to release for shipping (15 points)			

TEST REPORTS RATING TOTAL			

Y = yes, N = no, NA = not applicable
No partial points are available for a yes, no or not applicable section.

V. FOLLOW-UP SEQUENCE FOR INCOMPLETE MILL TEST	DATE Performed	DATE DUE	RESULT
1. Fax to the fabricator requesting incomplete information.			
2. Non-compliance letter and phone call after 30 days from sending fax.			
3. IOC to District after 10 days from sending non-compliance letter.			
4. District action performed.			

Appendix II

Appendix II

FABRICATOR_____ RATING FOR SHOP FABRICATION

County:_____Project: _____ Reference:_____Shop ID:_____

Office of Structural Engineering QA Inspector: _____			
Check, Hold or Witness Point Descriptions for Levels of Fabrication 1 thru 5	**Y**	**N**	**NA**
ASTM A709, Grade, Physical & Chemical Requirements, CVN : Check point 1			
Record Heat number and member description (1 point)			
Record Yield Strength, Fy (psi) (3 points)			
Record Tensile Strength, Fu (psi) (1 point)			
Record Elongation% and gage length (2 point)			
Record CVN minimum average energy(ft lb.) (1 point)			
Check Chemical Requirements (1 point)			
Heat No. Steel Stamped and matched to Mill Test Report (1 point)			
ASTM A6 Quality and permissible Variations: Check Point 2			
ASTM A6, Permissible variations in cross-section (1 point)			
ASTM A6, Permissible variations in Straightness & Storage (1 point)			
ASTM A6 and 863.11, Surface indications, Pitting due to rusting (1 point)			
ASTM A6, Laminar indications (1 point)			
Material Preparation per AWS D1.5, AASHTO and 863: Check Point 3			
Cutting beyond (inside) the prescribed lines AWS 3.2.2 (1 point)			
Cutting roughness AWS 3.2.2 (1 point)			
Occasional notches AWS 3.2.2 (document separately) (1 point)			
Cut Edge Discontinuities AWS 3.2.3 (document separately) (1 point)			
Reentrant corners AWS 3.2.4 and Radii of Beam copes 3.2.5 (1 point)			
Rounding of edges AWS 3.2.9 (1 point)			
Shearing distortion 863.13 (1 point)			
Bending , 90 degrees to rolling direction, visual inspection (document any cracking NDT required) AASHTO (1 point)			

Cambering and Sweep per 863, AWS and AASHTO: Check Point 4			
Cambering or Straightening, AASHTO shop procedure posted (1 point)			
1200 degrees F pyrometric sticks (follow shop procedure) (5 point)			
location and shape of heats (follow shop procedure) (1 point)			
location and number of support blocks (follow shop procedure) (1 point)			
Natural Cooling (follow shop procedure) (5 point)			
Fitting per AWS, 863 and AASHTO: Check Point 5			
Check size, grade , piece mark and locations of parts to be fitted (1 point)			
Remove all scale, moisture, grease & foreign material AWS 3.2.1 (1 point)			
Standard fillet weld fit up tolerance, 1/16" AWS 3.3 (1 point)			
Groove weld fit up tolerance, AWS 3.3 (1 point)			
Bearing Stiffener, mill fit @ bearing, tight fit @ other end, 863.14 (1 point)			
Intermediate Stiffener without cross frames, tight fit at compression flange, 863.14 (1 point)			
Clearance between clipped stiffener corners and fillets on rolled beams (1 point)			
Flange and Web Butt Splice Welding per AWS, 863 and AASHTO: Check Point 6			
Record Welding Type: SMAW, SAW, FCAW (1 point)			
Record Shop Welding Procedure (WPS) identification and ODOT approval date. (1 point)			
Record Tackers Name and SS#, ODOT Qualified, procedure (1 point)			
Record Welders Name and SS#, ODOT Qualified, procedure (1 point)			
Record Location of Splices (1 point)			
Record Flux and Wire combination, does it match WPS (1 point)			
Check joint geometry tolerances per AWS figure 2.4 (2 point)			
Record Preheat Temperature (F) Shop Temperature(F) (1 point)			
Record Amperage (Amps) (1 point)			
Record Voltage (Volts) (1 point)			
Record Travel Speed (IPM) (1 point)			

Check backgouge and cleaning per AWS 3.2.6 (5 point)			
Record Second side Amperage (Amps) (1 point)			
Record Second side Voltage (Volts) (1 point)			
Record Second side Travel Speed (IPM) (1 point)			
Visual inspection width, thickness AWS 3.6.3 (5 point)			
Visual inspection surface finish AWS 3.6.4 125 uin. (5 point)			
Flange to Web Fillet Welds per AWS, 863 and AASHTO: Check Point 7			
Record Welding Type: SMAW, SAW, FCAW (1 point)			
Record Welding Procedure (WPS) identification and ODOT approval date (1 point)			
Record Tackers Name and SS#, ODOT Qualified, procedure (1 point)			
Record Welder Name and SS#, ODOT Qualified, procedure (1 point)			
Record Flux and Wire combination, does it match WPS (1 point)			
Check fit- up flange to weld, AWS 3.3.1 (2 point)			
Check surface cleaning, remove all scale, AWS 3.2.1 (2 point)			
Record Preheat Temperature (F) Shop Temperature(F) (1 point)			
Record Amperage (Amps) (1 point)			
Record Voltage (Volts) (1 point)			
Record Travel Speed (IMP) (1 point)			
Visual inspection weld size and profile, AWS 3.6 (5 point)			
Stiffener Fillet Welds per AWS, 863 and AASHTO: Check Point 8			
Record Welding Type: SMAW, SAW, FCAW (1 point)			
Record Welding Procedure (WPS) identification and ODOT approval date (1 point)			
Record Tackers Name and SS#, ODOT Qualified, procedure (1 point)			
Record Welder Name and SS#, ODOT Qualified, procedure (1 point)			
Record Flux and Wire combination, does it match WPS (1 point)			
Check fit- up, 863.14 and AWS 3.3.1 (2 point)			
Check surface cleaning, AWS 3.2.1 (2 point)			

Record Preheat Temperature(F) Shop Temperature(F) (1 point)			
Record Amperage (Amps) (1 point)			
Record Voltage(Volts) (1 point)			
Record Travel Speed (IMP) (1 point)			
Visual inspection weld size and profile, AWS 3.6 (5 point)			
Shop Laydown per AWS, 863, and AASHTO: Check Point 9			
check hole patterns, size, spacing, gage, accuracy, 863.20 (2 point)			
Check hole deburring, 863.20 (1 point)			
Check blocking horizontal& vertical dimensions @ bearings, after all welding is complete. (document) 1/8" + or - 863.26 (document separately) (5 point)			
Check blocking camber dimensions @ points specified, after all welding is complete SS xxx.12 (document separately) (5 point)			
Check sweep or horizontal curvature, after all welding is complete 1/8"/10'-0" AWS 3.5 (document separately) (2 point)			
Check fitup at bolted splice, 1/4" max gap SS xxx.11 (2 point)			
Check center to center of field splices matches plan dimensions (1 point)			
Check flatness at bearing seats, after all welding is complete AWS 3.5.1.9 (2 point)			
Radiographic Inspection per AWS, 863.27 and AASHTO: Check Point 10, Hold Point for B & C Rated fabricators			
Radiographic inspection flange butt welds , 100%(ODOT review required, Critical process, Document separately) (5 point)			
Radiographic inspection web butt welds, top & bottom 1/3 (ODOT review required, Critical process ,Document separately) (5 point)			
Radiographic inspection longitudinal stiffeners butt welds, 100% (ODOT review required, Critical process, Document separately) (5 point)			
Radiographic inspection longitudinal web splice, 25% (ODOT review required, Critical process, Document separately) (5 point)			
Radiographic identification marked steel stamped and visible in radiographic film, correct image quality indicator (1 point)			
Top and bottom of plate edges visible in the radiographic film (5 point)			
Removal of weld reinforcement (1 point)			

Radiographic technician's signed analysis report (1 point)			
Ultrasonic Inspection per AWS, 863.27 and AASHTO: Check Point 11, Hold and Witness Point for B & C Rated Fabricators			
Ultrasonic inspection 10% of complete penetration flange to web weld (ODOT review required, Critical Process, Document separately) 100% QA witness with B and C rated fabricators (2 point)			
Ultrasonic technician's signed analysis report (1 point)			
Ultrasonic equipment qualification per AWS 6.17 (1 point)			
Magnetic Particle Inspection per AWS, 863.27 and AASHTO: Check Point 12, Hold and Witness point for C Rated Fabricators.			
Magnetic Particle Inspection 10% of flange to web welds (ODOT review required, Critical Process, Document separately) Dry powder prod method. 100% QA witness with C rated fabricators. (2 point)			
Magnetic Particle Inspection 10% of Bearing Stiffener Welds (ODOT review required, Critical process, Document separately) Dry powder prod method. !00% QA witness with C rated fabricators. (2 point)			
Magnetic Particle technician's signed analysis report (1 point)			
Calibration of Magnetic Particle Equipment every 6 months (1 point)			
Cleaning per 863.27, SSPC and ASTM: Check Point 13			
Shop solvent cleaning per SSPC-SP1 (5 point)			
Shop grinding edges 1/16", material thicker than 1 ½" shall be checked for removal of the heat effected zone. (1 point)			
Shop blast cleaned SSPC-SP10, Automated process: Five(5) each recorded readings at random locations for each beam and One(1) recorded reading for 10% of all secondary material with replica tape ASTM D4417 method C, 1.5 to 3.5 mil profile (10 point)			
Shop blast cleaned SSPC-SP10, Manual process: Twenty(20) each recorded readings at random locations for each beam and Ten(10) recorded reading for 10% of all secondary material with replica tape ASTM D4417 method C, 1.5 to 3.5 mil profile (10 point)			
Steel ,Ambient (Dry bulb) and Wet bulb Temperatures, Humidity and Dew Point recorded prior to blasting and at the start of each shift (5 degree F above dew point). (2 point)			
Document abrasive mix (shot % & grit %) and sizes (1 point)			

Check abrasive mix for oil contamination start of each shift (1 point)			
Removal of abrasives & residue by vacuum or double blowing (5 point)			
Test blow air for oil or other contaminants. Blotter test for 30 seconds at the start of each shift. Not required with vacuum (1 point)			
Conditioning all fins slivers and burred or sharp edges ASTM A6 then reblast to 1.5 to 3.5 mil profile. (1 point)			
Painting per 863.29, SSPC and ASTM: Check Point 14, Hold Point for C Rated Fabricators			
Record time and dates between blasting and painting (1 point)			
Record ambient temperature & humidity (minimum 50 deg.F and 5 deg F above dew point) (1 point)			
Record temperature of paint storage location (max/ min) (1 point)			
Record Paint TE-24, manufactures name and lot numbers (1 point)			
Mix paint (high shear mixer) and strain (5 point)			
Check operation of automated agitation system every 30 min. (5 point)			
Check prime inside of bolt holes, behind stiffener clips (5 point)			
Record prime thickness 3 to 5 mils: 3 gage readings for each spot measurement with 5 spot measurements in each 100 square foot (see additional instructions with paint system notes) (10 point)			
Check of workman like finish; mudcracking, holidays, pores, runs or sags. (5 point)			
Check prime has dried sufficiently prior to handling (1 point)			
Final Shop, Shipping or Storage, QA Inspection: Hold Point 15, Required for all Fabricators			

Y = Yes, N = No, NA = Not Applicable, No partial points are available for a Y, N or NA answer

Sum of {Y/(Y + N) x Section %}

Check Point 1 _____(Y) / _____(Y + N)* X 7 = _____
Check Point 2 _____(Y) / _____(Y + N) X 2 = _____
Check Point 3 _____(Y) / _____(Y + N) X 5 = _____
Check Point 4 _____(Y) / _____(Y + N) X 2 = _____
Check Point 5 _____(Y) / _____(Y + N)* X 7 = _____
Check Point 6 _____(Y) / _____(Y + N)* X 7 = _____

Check Point 7 _____(Y) / _____(Y + N)* X 7 = _____
Check Point 8 _____(Y) / _____(Y + N) X 2 = _____
Check Point 9 _____(Y) / _____(Y + N)* X 2 = _____
Check Point 10_____(Y) / _____(Y + N)* X 15 = _____
Check Point 11_____(Y) / _____(Y + N)* X 15 = _____
Check Point 12_____(Y) / _____(Y + N) X 15 = _____
Check Point 13_____(Y) / _____(Y + N) X 7 = _____
Check Point 14_____(Y) / _____(Y + N) X 7 = _____

Summation Fabricator rating for performance of QA Inspection = _____

* Y /(Y + N) x 1.0 for 1, 5, 6, 7, 9, 10, 11 and 12. If any of these individual ratings are lower then the summation fabricator rating. Then the Fabricator rating shall be based upon the lowest individual section rating.

Required Hold or Witness points
A Rating hold points = 15
B Rating hold points = 10, 11 and 15
C Rating hold or witness points = 10,11, 12, 14 and 15

FABRICATOR_____ RATING FOR SHOP FABRICATION(FCM)

County:_____Project: _____ Reference:_____Shop ID:_____

Office of Structural Engineering QA Inspector: _____			
Check, Hold or Witness Point Descriptions for Level of Fabrication 6 , Fracture Critical Members (FCM)	**Y**	**N**	**NA**
ASTM A709, Grade, Physical & Chemical Requirements, CVN : Check point 1			
Record Heat number and member description (1 point)			
Material meet physical requirements of A709 (3 points)			
Material killed fine-grain practice (AWS 12.4.2) (5 point)			
Record Zone 2 CVN minimum average energy (A709 Table S1.3) (2 point)			
CVN impact testing "P" plate frequency (5 point)			
Check Chemical Requirements (1 point)			
Heat No. Steel Stamped and matched to Mill Test Report (1 point)			
ASTM A6 Quality and permissible Variations: Check Point 2			
ASTM A6, Permissible variations in cross-section (1 point)			
ASTM A6, Permissible variations in Straightness & Storage (1 point)			
ASTM A6 and 863.11, Surface indications, Pitting due to rusting (1 point)			
ASTM A6, Laminar indications (1 point)			
Material Preparation per AWS D1.5, AASHTO and 863: Check Point 3			
Cutting beyond (inside) the prescribed lines AWS 3.2.2 (1 point)			
Cutting roughness AWS 3.2.2 (1 point)			
Occasional notches AWS 3.2.2 (document separately) (1 point)			
Cut Edge Discontinuities AWS 3.2.3 (document separately) (1 point)			
Reentrant corners AWS 3.2.4 and Radii of Beam copes 3.2.5 (1 point)			
Rounding of edges AWS 3.2.9 (1 point)			
Shearing distortion 863.13 (1 point)			
Heat Bending , 90 degrees to rolling direction, visual inspection (document any cracking NDT required) AASHTO and AWS 12.12 (5 point)			

Cambering and Sweep per 863, AWS and AASHTO: Check Point 4			
Cambering or Straightening, AASHTO and AWS 12.12 shop procedure posted (2 points)			
1200 degrees F pyrometric sticks (follow shop procedure) (5 points)			
location and shape of heats (follow shop procedure) (1 point)			
location and number of support blocks (follow shop procedure) (1 point)			
Natural Cooling (follow shop procedure) (5 point)			
Fitting per AWS, 863 and AASHTO: Check Point 5			
Check size, grade , piece mark and locations of parts to be fitted (1 point)			
Remove all scale, moisture, grease & foreign material AWS 3.2.1 (1 point)			
Standard fillet weld fit up tolerance, 1/16" AWS 3.3 (1 point)			
Groove weld fit up tolerance, AWS 3.3 (1 point)			
Bearing Stiffener, mill fit @ bearing, tight fit @ other end, 863.14 (1 point)			
Intermediate Stiffener without cross frames, tight fit at compression flange, 863.14 (1 point)			
Clearance between clipped stiffener corners and fillets on rolled beams (1 point)			
Flange and Web Butt Splice, Web-to-Flange CJP Welding per AWS, 863 and AASHTO: Hold and Witness Point 6			
Record Welding Type: SMAW, SAW, FCAW (1 point)			
Record Shop Welding Procedure (WPS) identification and ODOT approval date. (1 point)			
Record Tackers Name, ODOT Qualified? (1 point)			
Record Welders Name, ODOT Qualified? (1 point)			
Record Location of Splices (1 point)			
Record Flux and Wire combination, does it match WPS (1 point) Are Flux and Wire lot tested Check Temperature of Flux oven			
Check joint geometry tolerances per AWS figure 2.4 (2 point) witness			
Record Preheat Temperature (F) (1 point) witness			
Record Amperage (Amps) (1 point) witness			

Record Voltage (Volts) (1 point) witness			
Record Travel Speed (IPM) (1 point) witness			
Check backgouge and cleaning per AWS 3.2.6 (5 point) witness			
Record Second side Amperage (Amps) (1 point) witness			
Record Second side Voltage (Volts) (1 point) witness			
Record Second side Travel Speed (IPM) (1 point) witness			
Visual inspection width, thickness AWS 3.6.3 (5 point) witness			
Visual inspection surface finish AWS 3.6.4 125 uin. (5 point) witness			
Flange to Web Fillet Welds per AWS, 863 and AASHTO: Hold and witness Point 7			
Record Welding Type: SMAW, SAW, FCAW (1 point)			
Record Welding Procedure (WPS) identification and ODOT approval date (1 point)			
Record Tackers Name, ODOT Qualified? (1 point)			
Record Welder Name, ODOT Qualified? (1 point)			
Record Flux and Wire combination, does it match WPS Are Flux and Wire lot tested Check temperature of flux oven			
Check fit- up flange to weld, AWS 3.3.1 (2 point) witness			
Check surface cleaning, remove all scale, AWS 3.2.1 (2 point) witness			
Record Preheat Temperature (F) (1 point) witness			
Record Amperage (Amps) (1 point) witness			
Record Voltage (Volts) (1 point) witness			
Record Travel Speed (IMP) (1 point) witness			
Visual inspection weld size and profile, AWS 3.6 (5 point) witness			
Stiffener Fillet Welds per AWS, 863 and AASHTO: Hold and witness Point 8			
Record Welding Type: SMAW, SAW, FCAW (1 point)			
Record Welding Procedure (WPS) identification and ODOT approval date (1 point)			
Record Tackers Name, ODOT Qualified? (1 point)			

Record Welder Name, ODOT Qualified? (1 point)			
Record Flux and Wire combination, does it match WPS (1 point) Are Flux and Wire lot tested Check temperature of flux oven			
Check fit- up, 863.14 and AWS 3.3.1 (2 point) witness			
Check surface cleaning, AWS 3.2.1 (2 point) witness			
Record Preheat Temperature(F) (1 point) witness			
Record Amperage (Amps) (1 point) witness			
Record Voltage(Volts) (1 point) witness			
Record Travel Speed (IMP) (1 point) witness			
Visual inspection weld size and profile, AWS 3.6 (5 point) witness			
Repair procedure per AWS 12.17 hold and witness point 9			
Sketch of discontinuity with member piece mark and location on member (1 point)			
QA witness of discontinuity for determination of critical or non critical repairs (2 point)			
Noncritical repair, WPS and repair procedure pre approved (1 point)			
Critical repair, WPS and repair procedure approved for each repair by OSE (2 point)			
Record Welding Type: SMAW, SAW, FCAW (1 point)			
Record Welders Name, ODOT Qualified? (1 point)			
Record preheat temperature prior to air carbon arc (1 point) * witness			
grind surfaces to be welded smooth and bright (1 point) * witness			
Record Flux and Wire combination, does it match WPS (1 point) Are Flux and Wire lot tested Check Temperature of Flux oven			
Check joint geometry tolerances per AWS figure 2.4 (2 point) *witness			
Record Preheat Temperature (F) (1 point) * witness			
Record Amperage (Amps) (1 point) * witness			
Record Voltage (Volts) (1 point) * witness			
Record Travel Speed (IPM) (1 point) * witness			
Visual inspection width, thickness AWS 3.6.3 (2 point) * witness			
Visual inspection surface finish AWS 3.6.4 125 uin. (2 point) *witness			

Visual inspection weld size and profile, AWS 3.6 (2 point) * witness			
* witness required for critical repairs not required for non critical repairs			
Radiographic Inspection per AWS, 863 and AASHTO: Hold Point 10			
Radiographic inspection flange butt welds , 100%(ODOT review required, Critical process, Document separately) (5 point)			
Radiographic inspection 100% tension web butt welds, compression web butt welds, top & bottom 1/3 (ODOT review required, Critical process ,Document separately) (5 point)			
Radiographic inspection longitudinal stiffeners butt welds, 100% (ODOT review required, Critical process, Document separately) (5 point)			
Radiographic inspection longitudinal web splice, 25% (ODOT review required, Critical process, Document separately) (5 point)			
Radiographic identification marked steel stamped and visible in radiographic film, Hole-type image quality indicator (1 point)			
Top and bottom of plate edges visible in the radiographic film (5 point)			
Removal of weld reinforcement (1 point)			
Radiographic technician's signed analysis report (1 point)			
Ultrasonic Inspection per AWS, 863 and AASHTO: Hold and witness point 11			
Ultrasonic inspection 100% of complete penetration flange to web tension weld, 10% compression weld (ODOT review required, Critical Process, Document separately) (2 point) Ultrasonic inspection 100% tension butt welds, 100% QA witness required			
Ultrasonic technician's signed analysis report (1 point)			
Ultrasonic equipment qualification per AWS 6.17 (1 point)			
Magnetic Particle Inspection per AWS, 863 and AASHTO: Check Point 12, Hold and witness for C rated fabricators.			
Magnetic Particle Inspection 10% of flange to web welds (ODOT review required, Critical Process, Document separately) Dry powder prod method (2 point) 100% QA witness with C rated fabricators.			
Magnetic Particle Inspection 10% of Bearing Stiffener Welds (ODOT review required, Critical process, Document separately) Dry powder prod method (2 point) 100% QA with C rated fabricators.			
Magnetic Particle technician's signed analysis report (1 point)			

Calibration of Magnetic Particle Equipment every 6 months (1 point)			
Shop Laydown per AWS, 863, and AASHTO: Check Point 13			
check hole patterns, size, spacing, gage, accuracy, 863.20 (2 point)			
Check hole deburring, 863.20 (1 point)			
Check blocking horizontal& vertical dimensions @ bearings, after all welding is complete. (document) 1/8" + or - 863.12 (document separately) (5 point)			
Check blocking camber dimensions @ points specified, after all welding is complete 863.12 (document separately) (5 point)			
Check sweep or horizontal curvature, after all welding is complete 1/8"/10'-0" AWS 3.5 (document separately) (2 point)			
Check fitup at bolted splice, 1/4" max gap 863.17 (2 point)			
Check center to center of bearings matches plan dimensions (1 point)			
Check flatness at bearing seats, after all welding is complete AWS 3.5.1.9 (2 point)			
Cleaning per 863, SSPC and ASTM: Check Point 14			
Shop solvent cleaning per SSPC-SP1 (5 point)			
Shop grinding edges 1/16", material thicker than 1 ½" shall be checked for removal of the heat hardened zone. (1 point)			
Shop blast cleaned SSPC-SP10, Automated process: Five(5) each recorded readings at random locations for each beam and One(1) recorded reading for 10% of all secondary material with replica tape ASTM D4417 method C, 1.5 to 3.5 mil profile (10 point)			
Shop blast cleaned SSPC-SP10, Manual process: Twenty(20) each recorded readings at random locations for each beam and Ten(10) recorded reading for 10% of all secondary material with replica tape ASTM D4417 method C, 1.5 to 3.5 mil profile (10 point)			
Steel ,Ambient (Dry bulb) and Wet bulb Temperatures, Humidity and Dew Point recorded prior to blasting and at the start of each shift (5 degree F above dew point). (2 point)			
Document abrasive mix (shot % & grit %) and sizes (1 point)			
Check abrasive mix for oil contamination start of each shift (1 point)			
Removal of abrasives & residue by vacuum or double blowing (5 point)			

Test blow air for oil or other contaminants. Blotter test for 30 seconds at the start of each shift. Not required with vacuum (1 point)			
Conditioning all fins slivers and burred or sharp edges ASTM A6 then reblast to 1.5 to 3.5 mil profile. (1 point)			
Painting per 863, SSPC and ASTM: Hold or Check Point 15			
Record time and dates between blasting and painting (1 point)			
Record ambient temperature & humidity (minimum 50 deg.F and 5 deg F above dew point) (1 point)			
Record temperature of paint storage location (max/ min) (1 point)			
Record Paint TE-24, manufactures name and lot numbers (1 point)			
Mix paint (high shear mixer) and strain (5 point)			
Check operation of automated agitation system every 30 min. (5 point)			
Check prime inside of bolt holes, behind stiffener clips (5 point)			
Record prime thickness 3 to 5 mils: 3 gage readings for each spot measurement with 5 spot measurements in each 100 square foot (see additional instructions with paint system notes) (10 point)			
Check of workman like finish; mudcracking, holidays, pores, runs or sags. (5 point)			
Check prime has dried sufficiently prior to handling (1 point)			
Final Shop, Shipping or Storage, QA Inspection: Hold Point 16			

Y = Yes, N = No, NA = Not Applicable, No partial points are available for a Y, N or NA answer

Sum of {Y/(Y + N) x Section %}

Check Point 1 _____(Y) / _____(Y + N)* X 7 = _____
Check Point 2 _____(Y) / _____(Y + N) X 2 = _____
Check Point 3 _____(Y) / _____(Y + N) X 5 = _____
Check Point 4 _____(Y) / _____(Y + N) X 2 = _____
Check Point 5 _____(Y) / _____(Y + N)* X 7 = _____
Check Point 6 _____(Y) / _____(Y + N)* X 7 = _____
Check Point 7 _____(Y) / _____(Y + N)* X 7 = _____
Check Point 8 _____(Y) / _____(Y + N) X 2 = _____
Check Point 9 _____(Y) / _____(Y + N)* X 2 = _____
Check Point 10_____(Y) / _____(Y + N)* X 15 = _____
Check Point 11_____(Y) / _____(Y + N)* X 15 = _____
Check Point 12_____(Y) / _____(Y + N) X 15 = _____

Appendix II

Check Point 13_____(Y) / _____(Y + N) X 7 = _____
Check Point 14_____(Y) / _____(Y + N) X 7 = _____
Check Point 15_____(Y) / _____(Y + N) X 7 = _____
Check Point 16_____(Y) / _____(Y + N) X 7 = _____

Summation Fabricator rating for performance of QA Inspection = _____

* Y /(Y + N) x 1.0 for 1,5, 6, 7, 8,9, 10, 11 and 12. If any of these individual ratings are lower then the summation fabricator rating. Then the Fabricator rating shall be based upon the lowest individual section rating.

Required Hold or witness points
A Rating hold or witness points = 6, 7, 8, 9, 10, 11 and 16, witness points require QC / QA inspection for 10 % of the work in progress.

B Rating hold or witness points = 6, 7, 8, 9, 10, 11 and 16 witness points require QC / QA inspection for 20 % of the work in progress.

C Rating hold or witness points = 6, 7, 8, 9, 10, 11, 12, 15 and 16 witness points require QC/ QA inspection for 40 % of the work in progress

Appendix III

Fabricator Rating: Summation of Appendix II check lists

Fabricator Rating For Performance Of Shop Drawings _____ x 20% = _____

Fabricator Rating For Performance Of Test Reports _____ x 10% = _____

Fabricator Rating For Performance Of Shop Fabrication _____ x 70% = _____

Fabricator Rating = _____

Fabricator Rating District's Construction Comments

Designer's Note

The selected bid item for 513 should be based on a comparison of the type of structure to be built versus the capability of the level of fabricator as defined in section 863.04. As example a continuous rolled beam bridge with no stiffeners would require a level 2 fabricator. If the rolled beam bridge had stiffeners required to attach crossframes then a level 3 fabricator would be specified.

A supplemental description should be added defining the type of steel

i.e.

863	Lump Sum	Structural Steel Members, Level Four (4), A 709, grade 36

For bridges with fracture critical members or fracture critical bridges a level 6 is required (See Section 863.04)

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 910
OZEU STRUCTURAL STEEL PAINT

July 17, 1995

910.01 Description
910.02 Materials
910.03 Performance Requirements
910.04 Prequalification
910.05 Sampling

910.01 Description. This specification covers the formulation and testing of a three coat structural steel paint system consisting of an organic zinc prime coat, an epoxy intermediate coat and a urethane finish coat (OZEU).

910.02 Materials.

Organic Zinc Prime Coat

This coating shall consist of a zinc dust filled, two or three component epoxy polyamide, and selected additives as required:

A. Physical Requirements	Minimum
1. Total Solids, % by weight of paint	70
2. Pigment, % by weight of total solids	83
3. Total zinc dust, % by weight of pigment	93
4. Total zinc, % by weight, of total solids	77
5. Total solids, % by volume, ASTM D2697	45
6. Color, greenish gray, approximating FS-595A-34159	
7. Pot Life at 25° C (77° F) and 50% Relative Humidity (R.H.), hours	6

B. Qualitative Requirements

1. Mixing shall conform to Section 5.2, SSPC-Paint 20 using only a high shear (Jiffy) mixer.

2. Storage life - Section 5.4, SSPC-Paint 20

3. Mudcracking - Section 5.7, SSPC-Paint 20

C. Material Quality Assurrance

1. Hardener Component	Variance*
a. Nonvolatiles, % by weight	± 2
b. Density	± 0.02g/mL (± 0.2 lb. per gal.)
c. Viscosity	± 5 KU or ± 5 sec., Ford Cup
2. Zinc/Resin Component	
a. Total Zinc metal, % by weight	± 2
b. Density	± .05g/mL (± 0.4 lb. per gal.)
c. Viscosity	± 5 KU or ± 5 sec., Ford Cup
d. Nonvolatiles, % by weight	± 2

*Variance within the mean of the tests of the previously submitted sample for qualification.

Epoxy Intermediate Coat

This coating shall be a two-part product composed of a base component and a curing agent suitable for application over the epoxy-polyamide zinc rich primer.

The base component shall contain an epoxy resin together with color pigments, mineral fillers, gellant, leveling agent, and volatile solvents. The curing agent component shall contain a liquid polyamide resin and volatile solvent. The coating shall also meet the following:

A. Physical Requirements

1. Color: White, meeting or exceeding, FS-595A-37875 as per ASTM E1347
2. Components: Two, mixed prior to application
3. Volume Solids: 50.0% minimum
4. Potlife: 6 hours, minimum @ 25° C (77°F)
5. Curing Time:
   a. Set-to-touch: 4 hours minimum @ 25°C (77°F)
   b. To Recoat: 24 hours minimum @ 25°C (77°F)
   c. Fully cured: 7 days @ 10°C (50°F)
6. Fineness of Grind, Hegman 3 minimum

7. V.O.C. maximum , 0.419 g/mL (3.5 lbs./gal.), as applied

B. Material Quality Assurance

	Test	Variance*
1.	Density	+ 0.02 g/mL (± 0.2 lbs. per gal.)
2.	Viscosity, Kreb Units	± 5
	Ford Seconds	± 5
3.	Total Solids, % by weight	± 2
4.	Pigment, % by weight	± 2
5.	Nonvolatile Vehicle, % by weight	± 2

*Variance shall be within the noted range based upon the test average of the previously submitted sample.

Urethane Finish Coat

This coating shall be a two component polyester and/or acrylic aliphatic urethane and shall be suitable for use as a finish coat over the white epoxy polyamide intermediate coat.

A. Physical Requirements

1. Finish: Specular Gloss, 60 degree: 85% minimum; 70% minimum after 3000 hours weathering resistance
2. Volume Solids: 42% minimum
3. Cure (Dry) Time at 25°C (77°F) and 50% RH
   To Touch: 30 Minutes, minimum
   Full Cure: 2 Hours, maximum
4. Pot Life: 4 hours minimum at 25°C (77°F)
5. V.O.C. maximum, 0.419 g/mL (3.5 lbs./gal.), as applied
6. Colors**
   a. Gray FS-595A - 16440
   b. Green FS-595A - 14260
   c. Blue FS-595A - 15450

**Contractor's choice unless specified on plans.

B. Material Quality Assurance

1. Analysis (for each component)

	Test	Variance*
a.	Density	+ 0.02 g/mL (± 0.2 lbs. per gal.)
b.	Viscosity, Kreb Units	± 5
	Ford Seconds	± 5
c.	Total Solids, by Weight	± 2%
d.	Pigment, by Weight	± 2%
e.	Nonvolatile Vehicle, by weight	± 2%

*Variance shall be within the noted range based upon the test average of the previously submitted sample.

910.03 Performance Requirements. The coating system, which consists of the organic zinc prime coat, the epoxy intermediate coat, and the urethane topcoat, shall be tested prior to use.

Three panels for each of the specified tests shall be prepared to the requirements of the ASTM D 609 except that the thickness shall be 3 mm (1/8 inch) minimum and the steel shall be ASTM A 36/A 36 M hot rolled steel. The surface shall be blast cleaned (using coal slag abrasive) to equal, as nearly as is practical, the standard Sa 2-1/2 of ASTM D 2200 (Steel Structures Painting Council SSPC-SP10 meets this requirement), and the surface shall have a nominal height of profile of 25 to 88 µm (1 to 3.5) mils verified by using appropriate replica tape. The panels shall be coated and permitted to cure in accordance with the manufacturer's printed instructions. The dry film coating thickness in the system to be tested shall be as follows:

Organic Zinc:	75 - 125 µm (3.0 - 5.0 Mils)
Epoxy:	125 - 175 µm (5.0 - 7.0 Mils)
Urethane:	50 - 100 µm (2.0 - 4.0 Mils)

The coating system shall pass each of the following tests:

(A) Fresh water resistance (ASTM D 870). The panels shall be scribed as per ASTM D 1654 to the depth of the base metal in the form of an "X" having at least 50 mm (2-inch) legs and then immersed in fresh tap water at 25 ± 3ºC (75 ± 5ºF). After 30 days of immersion, the panels shall show no rusting nor shall the coating show any blistering, softening or discoloration. Blistering shall be rated by ASTM D 714.

(B) Salt water resistance (ASTM D 870). The panel shall be scribed as specified in "A" above and then immersed in a water solution of 5 percent sodium chloride at 25 ± 3ºC (75 ± 5ºF). The panels shall show no rust nor shall the coating exhibit any blistering or softening after 7, 14, and 30 days. Blistering shall be rated by ASTM D 714. The sodium chloride solution shall be replaced with a fresh solution after examination at 7 and 14 days.

(C) Weathering resistance. The panels shall be tested in accordance with ASTM D 4587 Method D, utilizing UV A 340 bulbs. The panels shall be placed on test at the beginning of a wet cycle. After 3000 hours continuous exposure, the coating shall show no blistering or loss of adhesion, nor shall the panels show any rusting. The 60 degree specular gloss measurements shall be performed on the sprayed panels utilized for this test. The three initial measurements (one per panel) will be average together. The three final measurements also will be averaged together.

(D) Salt fog resistance. The panels shall be scribed as specified in "A" above, and then tested in accordance with ASTM B 117. After 3000 hours of continuous exposure the coating shall show no loss of bond nor shall it show rusting or blistering beyond 2 mm (1/16 inch) form the center of the scribe mark. Blistering shall be rated by ASTM D 714.

(E) Elcometer adhesion test, ASTM D 4541. The panels shall be tested in accordance with the following: lightly sand the coating surface and aluminum dolly and applied a quick set adhesive. Allow adhesive to cure overnight. Scribe the coating and adhesive around the dolly prior to testing. Make a minimum of four trials to failure and report the four trials. No trial shall be less than 400 psi. Fracture at the primer-blast interface shall be caused for rejection.

910.04 Prequalification. Prior to approval, copies of the manufacturer's's certified test data showing that the coating system complies with the performance requirements of this specification shall be submitted to the Engineer of Tests, 1600 W. Broad St., Columbus, Ohio 44223. The certified test data shall also state the following physical properties for each coating:

1) Density, g/mL (lbs. per gal.)
2) Solids, % by weight
3) Solids, % by volume
4) Viscosity
5) Drying time
6) V.O.C. content, g/mL (lb. per gallon)

The test data shall be developed by an independent testing laboratory approved by the Director and shall include the brand name of the paint, name of manufacturer, number of lots tested, and date of manufacture.

The following items shall also be submitted to the Director prior to approval:

1) Manufacturer's technical data sheet for each coating.
2) Material Safety Data Sheet for each coating.
3) Enough components to produce a 4 liter (one gallon) sample of each coating.
4) A one liter (one quart) sample of the thinner to be used with each coating.

When the coating has been approved by the Director, further performance testing by the manufacturer will not be required unless the formulation or manufacturing process has been changed, in which case new certified test results will be required.

910.05 Sampling. Acceptance variances shall be established by the Laboratory.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 949
PREFORMED POLYCHLOROPRENE ELASTOMERIC JOINT SEALS FOR STRUCTURAL STEEL JOINTS

June 14, 1995

949.01 Description. This specification covers the materials for elastomeric compression seals for bridge deck joints either armored with or composed of structural steel.

949.02 Materials. Compression seals shall be composed of an extruded vulcanized elastomeric virgin polychloroprene material and shall conform to the pertinent provisions of ASTM D 3542 except that specimens for the low temperature recovery test shall be lightly dusted with talc on the outside surfaces only. Adhesive shall be Sikastix 323 by the Sika Chemical Corporation of Lyndhurst, New Jersey; Fel-Poxy FP-101 by the Felt Products Manufacturing Company of Skokie, Illinois; Mark-184 by Poly-Carb of Solon, Ohio; or an approved equivalent.

949.03 General Requirements. Seals shall be high compression type elastomeric compression seals with internal webbing and a single 'V' notch in the bottom. The Contractor shall indicate on the shop drawing the manufacturer and part number of the seal to be furnished.

Seals for bridge deck joints shall be furnished in one continuous piece unless a shop fabricated splice, field splice, or field butt joint is indicated on the plans or approved by the Director.

The seal fabricator shall furnish closure devices vulcanized to the ends of all deck joint seals. These devices shall be designed to prevent the entrance of precipitation, surface drainage and roadway debris into the seals. Such devices shall not be detrimental to the compressive behavior of the seals. The closure devices shall be designed to ventilate all seal compartments.

When required, the adequacy of closure devices shall be established by a simulation test. A sample compression seal with a closure device attached to each end shall be capable of withstanding 500 cycles of compression at 21°C ± 6°C (70 ± 10°F), within a 24-hour period, without visible distress to the seal, closure devices or the bond between them. In each cycle, the sample shall be compressed from 20 to 60 percent of the nominal seal width.

Compression seals for deck joints having sharp changes in alignment shall be made by mitering and splicing. However, subject to the approval of the Director, sharp changes in the vertical alignment may be made by a combination of cutting and hole drilling the seal. Where seals are miter-spliced to fit deck joints, seal dimensions shall be verified by templates which match the dimensions of the steel portions of the joint or by shop assembly of the seals with the steel portions of the joints.

At each seal miter splice, a sufficient length of internal webbing on each side of the splice shall be removed and replaced with a single snug fitting piece of closed cell foam reinforcement. Foam inserts and the adhesive used for bonding the inserts and seal elements together shall be as recommended by the seal manufacturer. The splicing adhesive and the closed cell foam shall be compatible with the other materials specified herein, and they shall be compounded to furnish similar compressive resistance and durability characteristics.

Completed splices shall have no offsets on exterior surface. After installation there shall be no evidence of bond failure at the splices.

Seals other than straight seals without intermediate splices shall be shop fabricated in accordance with approved shop drawings. Shop drawing dimensions for existing joints, or for joints which are being modified, shall be based on field measurements provided by the Contractor.

949.04 Sampling and Testing. Each lot of compression seals shall be tested by an independent laboratory to ensure compliance with these provisions. Two certified copies of the qualification test data indicating that the tested materials comply with these provisions shall be submitted to the Laboratory. Sampling, when requested, shall be in accordance with 106.03 except that where compression seals are to be fabricated according to plan requirements, seal samples shall be made available prior to fabrication. The sample from each lot and for each project shall be one piece, one meter (three feet) long.

Material acceptance will be based upon Laboratory evaluation of certified test data, Laboratory test of sampled material, or the evaluation of both certified test data and tested samples.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 954
HIGH MOLECULAR WEIGHT METHACRYLATE (HMWM) RESIN

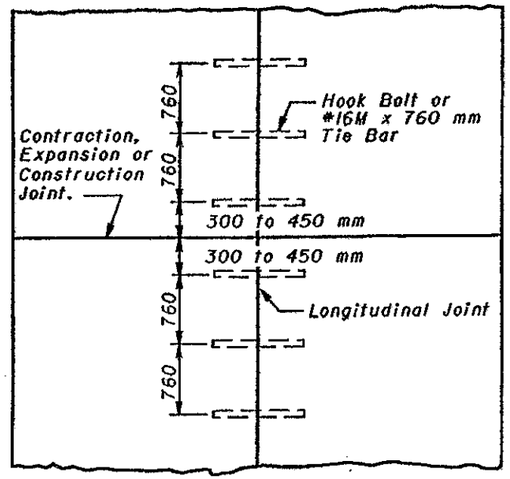
September 9, 1997

The high molecular weight methacrylate (HMWM) resin shall be low viscosity, non-fuming, conforming to the following:

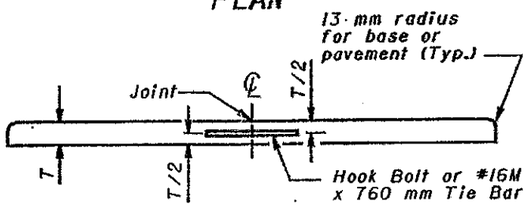
Viscosity	Less than 25 cps (brookfield viscometer, Model RVT with UL adaptor or Model LVF, # spindle and UL adaptor C@ 25 ºC (77 ºF) (ASTM D 2849)
Density	Greater than 8.4 lbs/gal Ca 25 ºC (77 ºF) (ASTM D 2849)
Flash Point	Greater than 93 ºC (200 ºF) (PenskyMartens CC) (ASTM D 93)
Vapor Pressure	Less than 1.0 mm Hg C@ 25 ºC (77 ºF) (ASTM D 323)
TG (DSC)	Greater than 58 ºC (135 º F) (ASTM D3418)
Shelf Life	Must be 1 year minimum at manufacturers recommended environmental considerations.
Gel Time	Greater than 40 min - 100 g mass (ASTM D 2471) (thin film)
Percent Solids	Greater than 90% by weight
Bond Strength	Greater than 10.5MPa (1500 psi) (ASTM C 882)

The resin shall be from the approved list in the Office of Materials Management.

TIE BAR OR HOOK BOLT SPACING

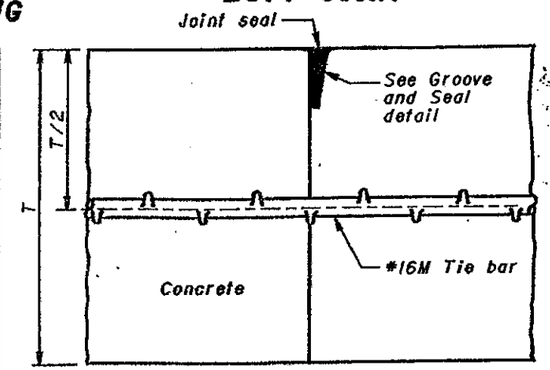


PLAN



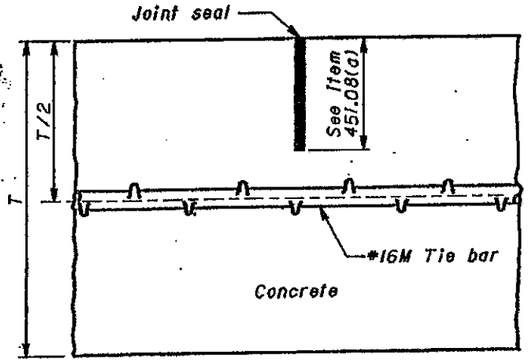
CROSS SECTION

BUTT JOINT



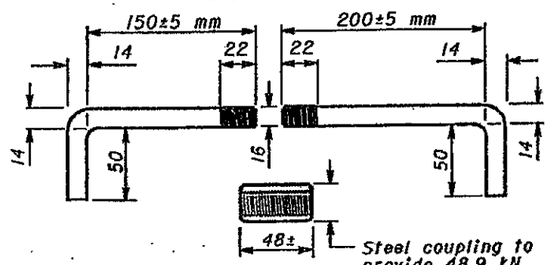
DETAIL OF JOINT

SAWED JOINT



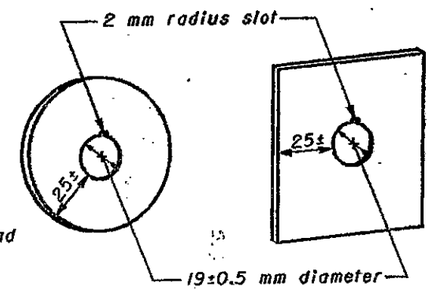
DETAIL OF JOINT

HOOK BOLT



NYLON OR PLASTIC GROUT RETENTION DISCS FOR DOWEL/TIE BARS

(1.6 mm min. thickness)



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.

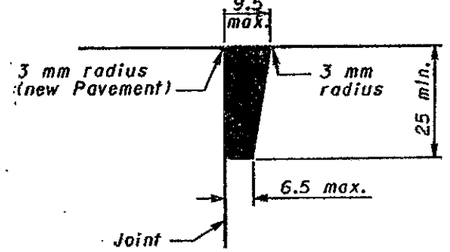
SEALING JOINTS: Sawed or hand-formed joints may be sealed with Item 705.04 or 705.11 joint sealer.

HOOK BOLTS: Hook bolt inserts shall be turned to a tight fit when installed in threaded hook bolts or couplings.

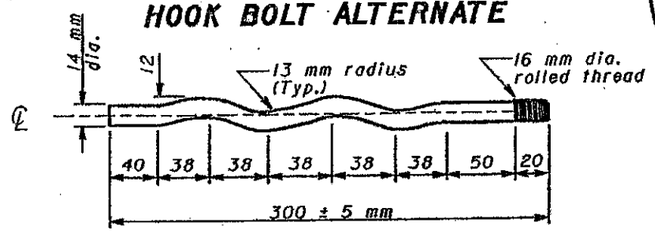
METAL STRENGTH: Tie bars, hook bolt assemblies and the hook bolt alternate shall have a minimum strength of 48.9 kN.

All dimensions are in millimeters unless otherwise noted.

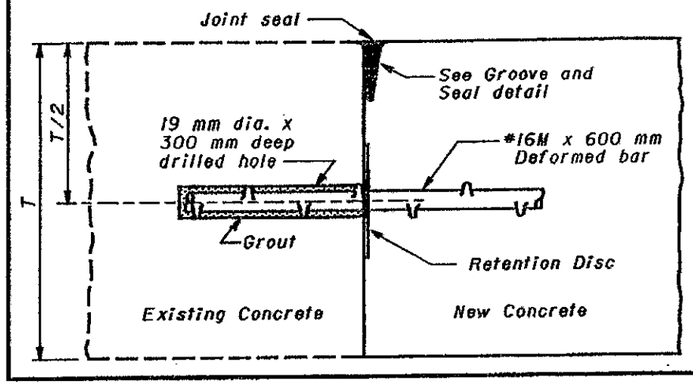
GROOVE AND SEAL DETAIL



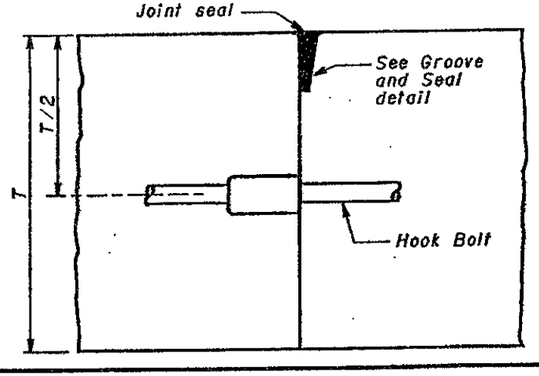
HOOK BOLT ALTERNATE



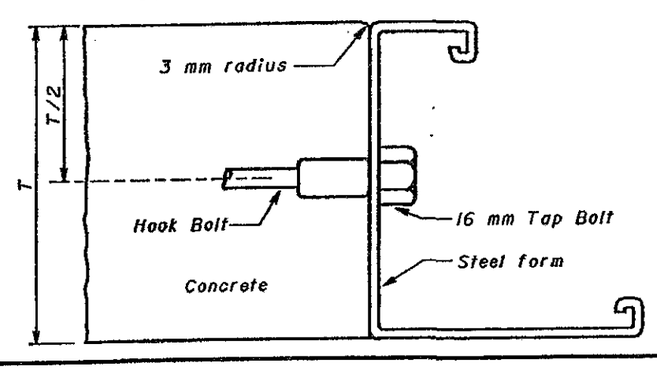
TYPE D (DRILLED TIED LONGITUDINAL) JOINT



BUTT JOINT



ACCEPTABLE METHOD OF FORMING JOINT



metric units

This Drawing Replaces BP-2.1.

OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

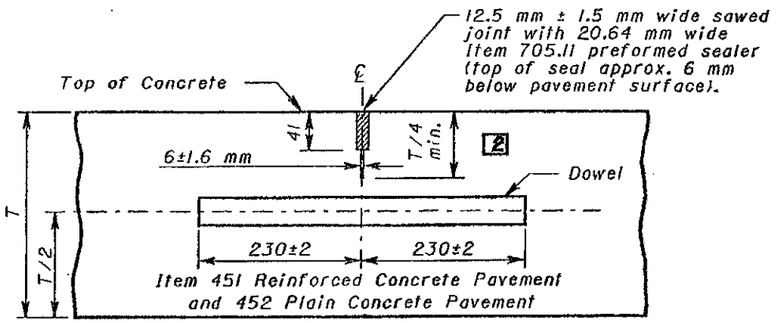
LONGITUDINAL PAVEMENT JOINTS

DATE: 10-28-94, 4-8-97

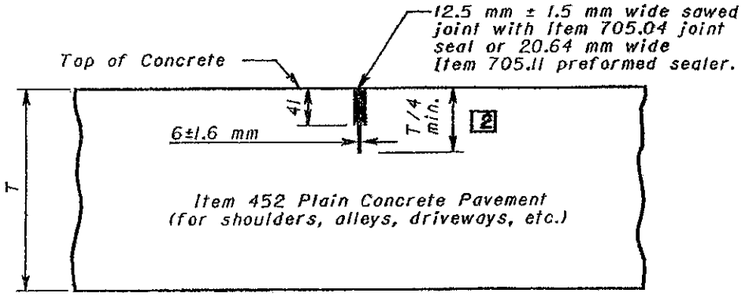
STANDARD CONSTRUCTION DRAWING **BP-2.1M**

APPROVED Larry F. Southerland
ADMINISTRATOR

CONTRACTION JOINTS

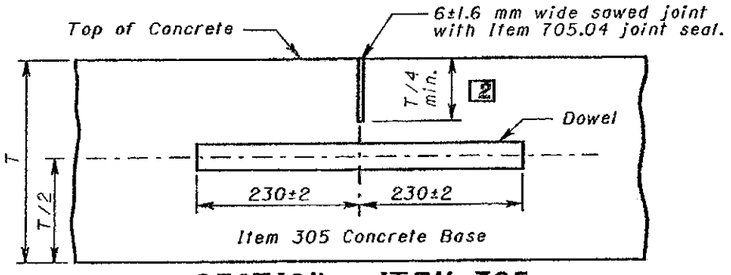


SECTION - ITEM 451 & 452

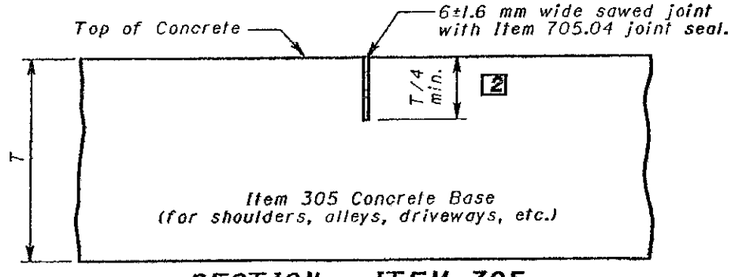


SECTION - ITEM 452

2 Where T > 255 mm, the sawcut depth shall be T/3.



SECTION - ITEM 305



SECTION - ITEM 305

NOTES

GENERAL: Notes and details shown on this drawing shall be considered in conjunction with and supplemental to the pertinent specifications for portland cement concrete pavement and bases, and related incidentals.

JOINT COMPONENTS: This drawing is intended for use with a uniform depth pavement. When the project involves the placing of variable depth pavement, the joint components shall be held in place in accordance with the method shown in the plans or as approved by the Engineer.

CONTRACTION JOINTS: All contraction joints in Item 451 Reinforced Concrete Pavement shall be dowelled. Contraction joints in Item 452 Plain Concrete Pavement and Item 305 Concrete Base shall be dowelled where they are located in mainline pavement, ramps, acceleration/deceleration lanes, or collector/distributor lanes, or in shoulders within 150 m of a pressure relief joint.

Contraction joints in Item 305 Concrete Base and in Item 452 Plain Concrete Pavement shall not be dowelled in alleys, private drives, or commercial drives.

Contraction joints of the type specified shall be spaced in accordance with the Contraction Joint Spacing table:

CONTRACTION JOINT SPACING	
TYPES OF PAVEMENT OR BASE	MAXIMUM SPACING BETWEEN JOINTS
Item 451 Reinforced Concrete Pavement	6.5 m
Item 452 Plain Concrete Pavement [1]	5.0 m
Item 305 Concrete Base	6.0 m

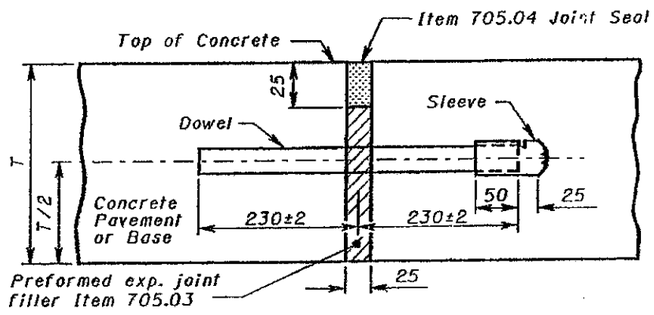
[1] Where Item 452 Plain Concrete Pavement (for shoulders, etc.) is being placed and tied longitudinally to Item 451, Reinforced Concrete Pavement, or Item 305, Concrete Base the joints in Item 452 shall match the spacing alignment, sawing, and sealing requirements of the joints in Item 451 or 305.

CONSTRUCTION JOINTS: In plain concrete pavement or concrete base a construction joint shall not be located closer than 1.8 m to another parallel joint.

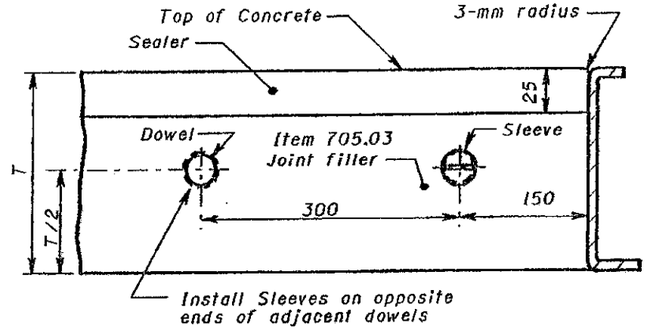
Kerf and seal conforming in all respects to details shown for contraction joints shall be provided at each construction joint in concrete pavement and base.

SEALING BASE CONTRACTION JOINTS: All contraction joints for concrete base shall be sealed as detailed on this drawing and the cost included in the unit price bid for Item 305.

EXPANSION JOINT

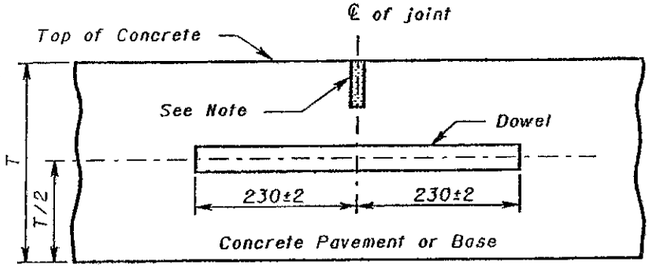


SECTION THROUGH EXP. JOINT



SIDE ELEVATION OF EXP. JOINT
(through Concrete Pavement or Base)

CONSTRUCTION JOINT



SECTION THROUGH CONSTRUCTION JOINT

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces BP-2.2.

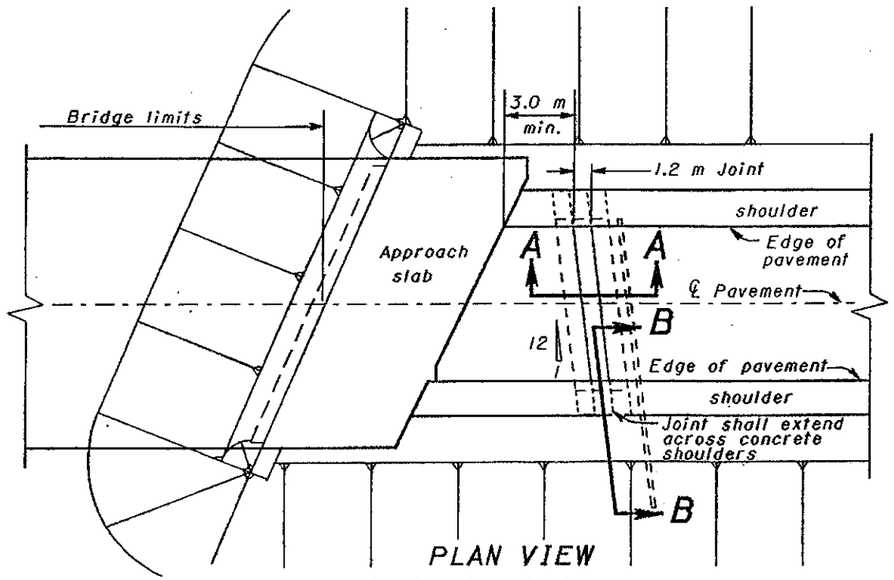
OHIO DEPARTMENT OF TRANSPORTATION

TRANSVERSE PAVEMENT JOINTS

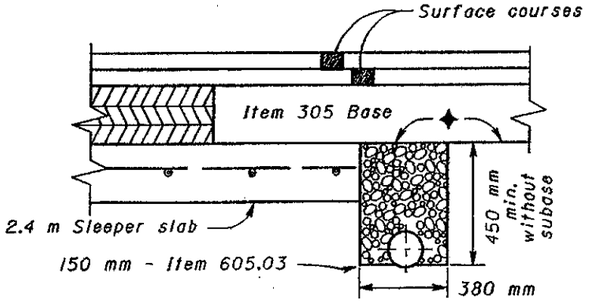
DATE: 10-28-94, 4-8-97, 10-21-97

STANDARD CONSTRUCTION DRAWING **BP-2.2M**

APPROVED Larry F. Sutherland



PRESSURE RELIEF JOINT - TYPE A



ALTERNATE PAVEMENT DETAIL

For details not shown, see Section A-A

REINFORCING STEEL LIST #15M rebar				
Mark	**Shape**	**No.**	**Length**	**Bending Diagram**
R1501	St.	8	S-0.15 m	483 mm, 230 mm, 483 mm; 230 mm; R1503
R1502	St.	⊛ S	2.2 m	
R1503	Bt.	⊛ S-2	1.3 m	

⊛ S = Length of sleeper slab (in meters) divided by 0.3.

R1501 bars may be furnished in segments with a 485 mm bar lap between segments.

NOTES

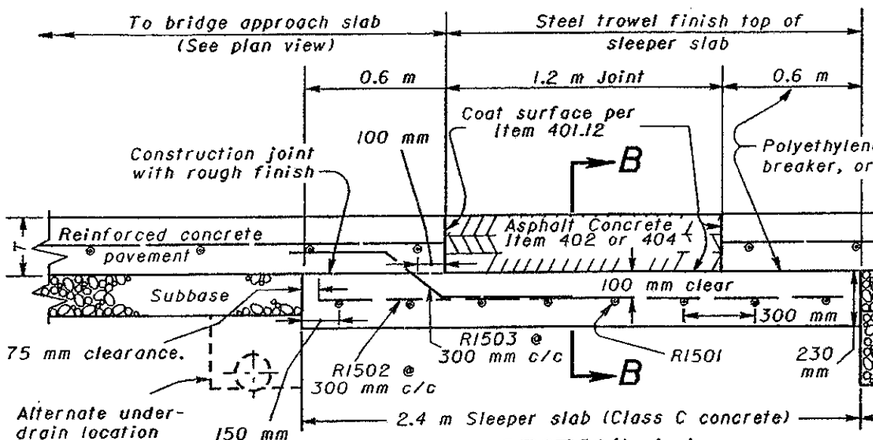
ASPHALT CONCRETE: Item 402 or 404, shall be compacted in three equal courses with compaction equipment as approved by the Engineer. Surface of the asphalt concrete shall be flush to 6 mm above the concrete pavement surface.

MEASUREMENT: Measurement of the pressure relief joint 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 A, 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 under Item 605.

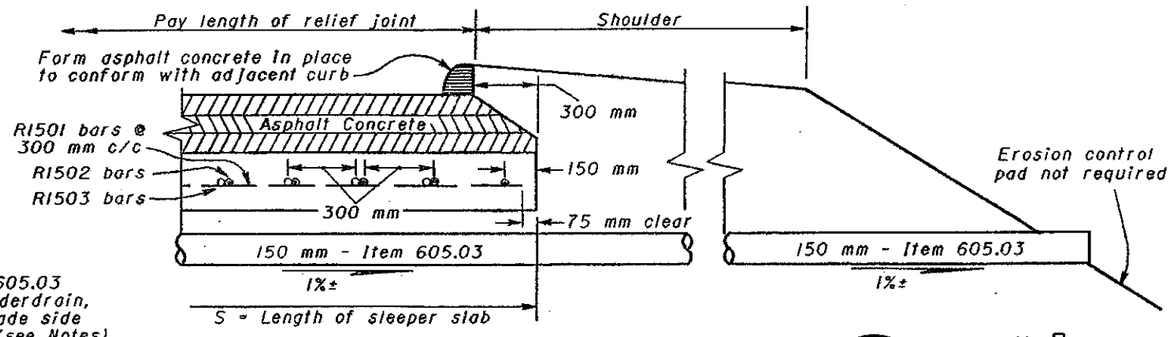
UNDERDRAIN: A perforated metal pipe underdrain, Item 707.01 or 707.21 shall be placed along the upgrade side of the sleeper slab. It shall extend from edge to edge of the sleeper slab and shall be outletted as shown on the plan, either to a longitudinal underdrain, a catch basin, or through the embankment or ditch inslope. These drains shall be paid for per meter of Item 605, 150 mm Shallow pipe underdrain, Item 707.01 or 707.21.

EXPANSION JOINTS: normally required in the bridge approach pavement per Item 451.08(c) will not be required.

CONCRETE BASE AND PLAIN CONCRETE PAVEMENT: placed between the approach slab and the pressure relief joint shall be reinforced with steel mesh and load transfer devices provided in transverse joints as per the requirements of Std. Const. Dwgs. BP-1.1M, BP-2.2M and Item 451. The cost of the mesh and dowels shall be considered incidental to the appropriate pavement

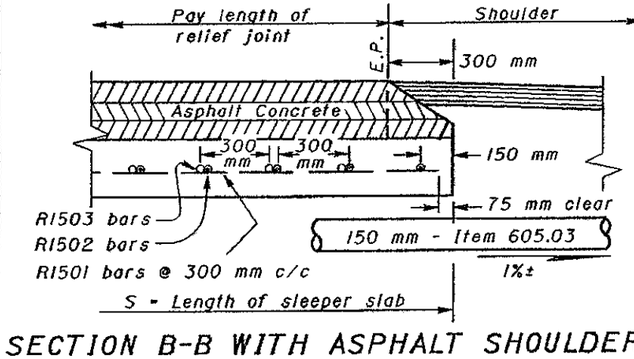


SECTION A-A

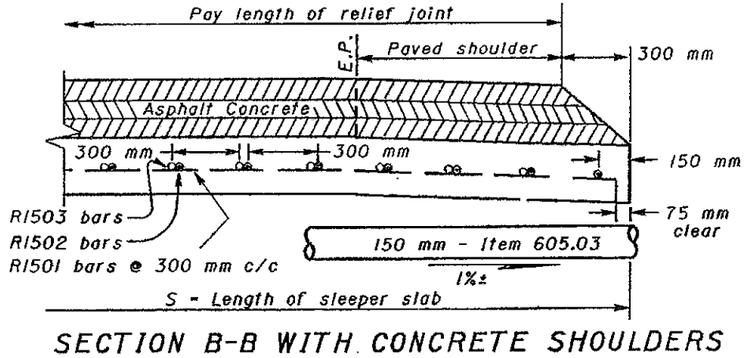


SECTION B-B WITH CURB

(showing on underdrain outlet "through the embankment")



SECTION B-B WITH ASPHALT SHOULDERS



SECTION B-B WITH CONCRETE SHOULDERS

✦ Care shall be taken in the area within 1.2 m from the end of the sleeper slab to be sure the surface of the subbase or subgrade is finished smooth and is flush with or slightly higher than the surface of the sleeper slab.

T = thickness as shown on plan

metric units

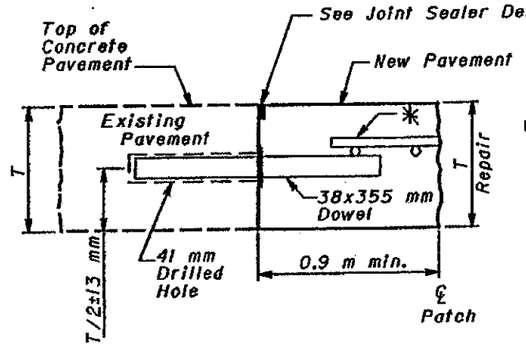
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

PRESSURE RELIEF JOINT TYPE A

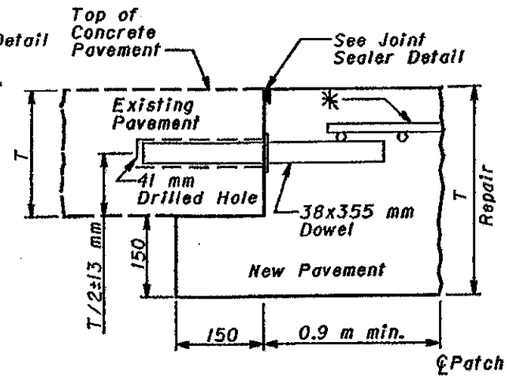
DATE 10-28-94

STANDARD CONSTRUCTION DRAWING **BP-2.3M**

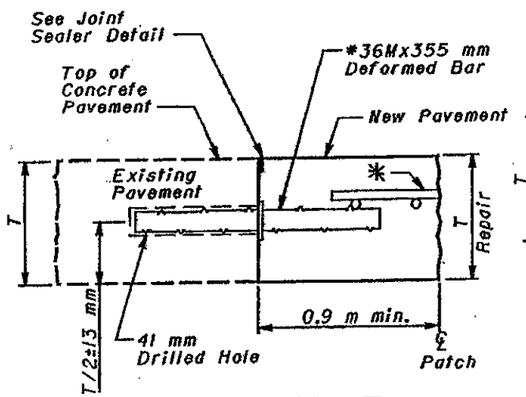
APPROVED W. K. Hulman
ENGR., L & D



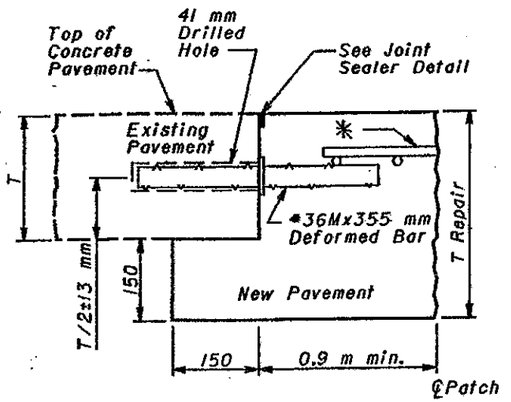
SECTION - TYPE Y
(Contraction)



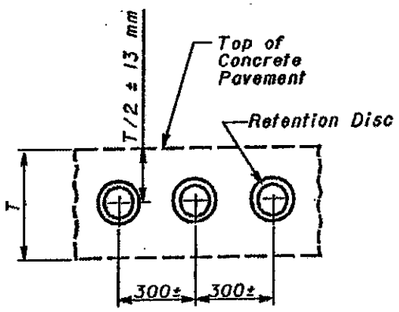
SECTION - TYPE YU
(Undercut + Contraction)



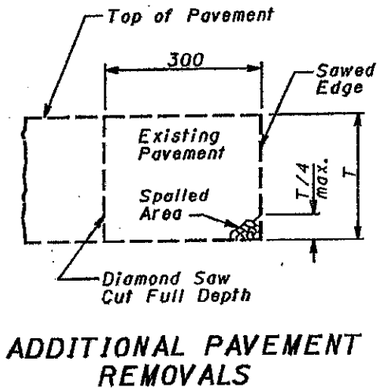
SECTION - TYPE T
(Tied)



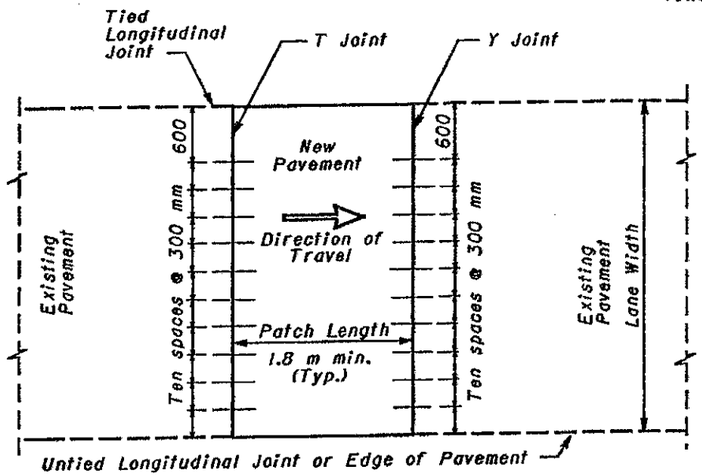
SECTION - TYPE TU
(Undercut + Tied)



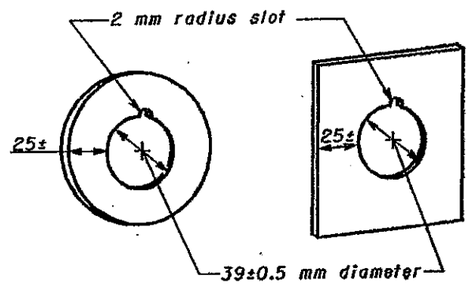
HOLE DRILLING DETAIL



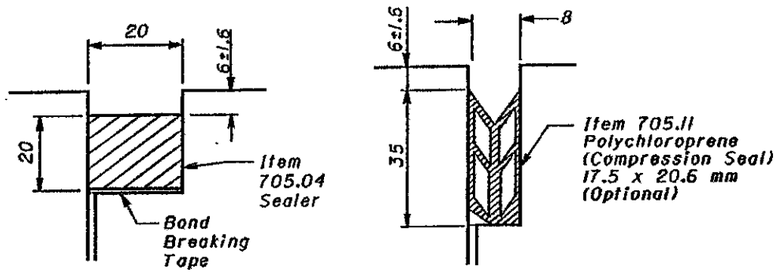
ADDITIONAL PAVEMENT REMOVALS



TIE / DOWEL BAR PLACEMENT DETAIL
(See Note ✦ for Bar Placement)



NYLON OR PLASTIC GROUT RETENSION DISCS FOR DOWEL/TIE BARS ⊛
(1.6 mm min. thickness)



JOINT SEALER DETAIL

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.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces BP-2.5.

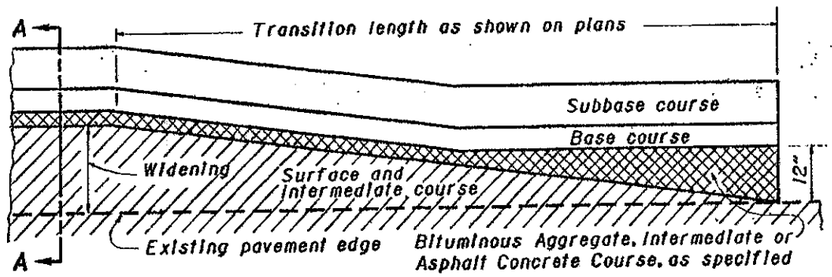
OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

RIGID REPLACEMENT

DATE
10-28-94
4-8-97

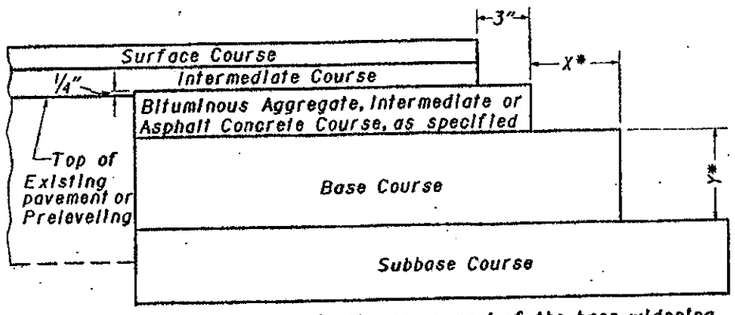
STANDARD CONSTRUCTION DRAWING **BP-2.5M**

APPROVED Larry F. Sutherland
ADMINISTRATOR



PLAN

MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT

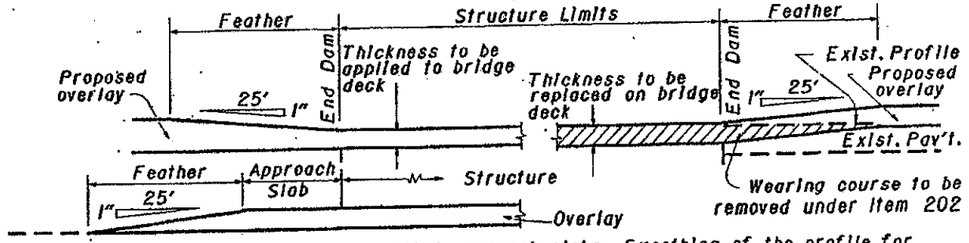


The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" 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.

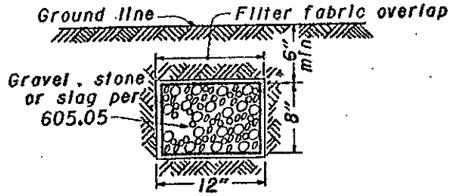
SECTION A-A

COURSE DETAIL FOR WIDENING



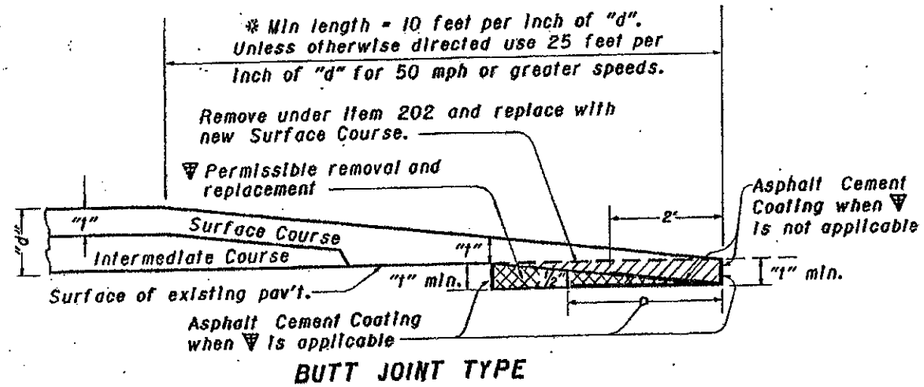
Details assume non-settled approach slabs.. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES

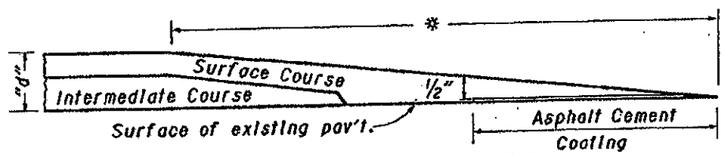


Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item.

AGGREGATE DRAIN



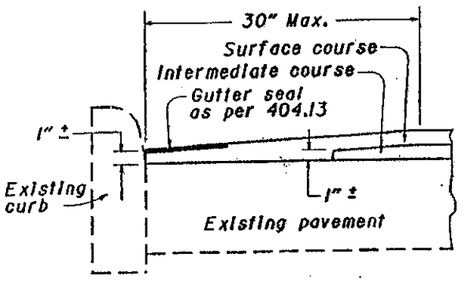
BUTT JOINT TYPE



TAPER EDGE TYPE

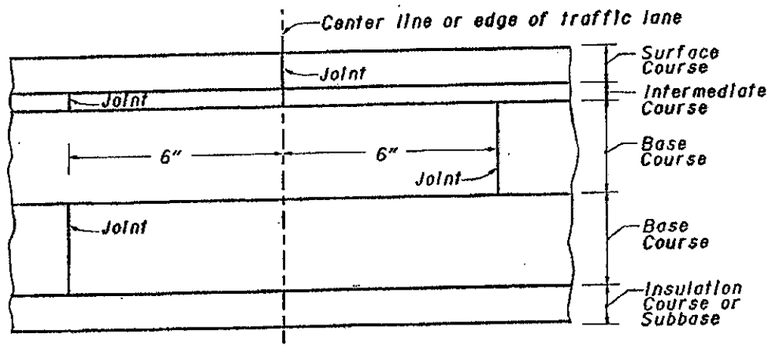
NOTE: Either butt or taper type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS

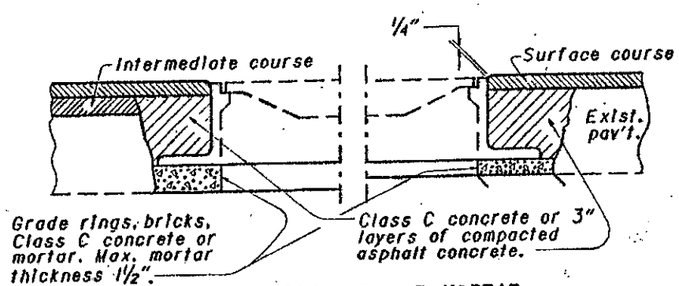


Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

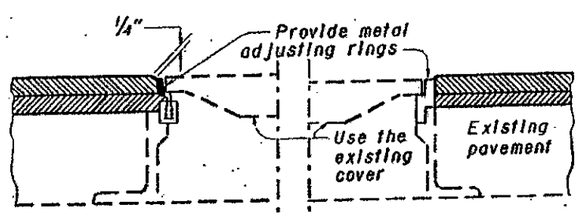
GUTTER FINISH



LAPPING LONGITUDINAL JOINTS



USING CONCRETE OR MORTAR



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

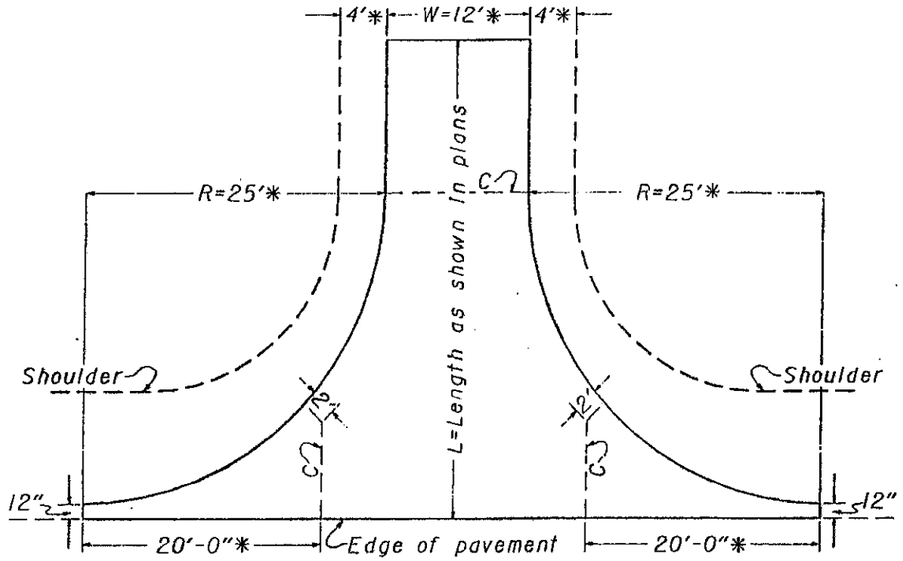
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

DATE 2-21-92

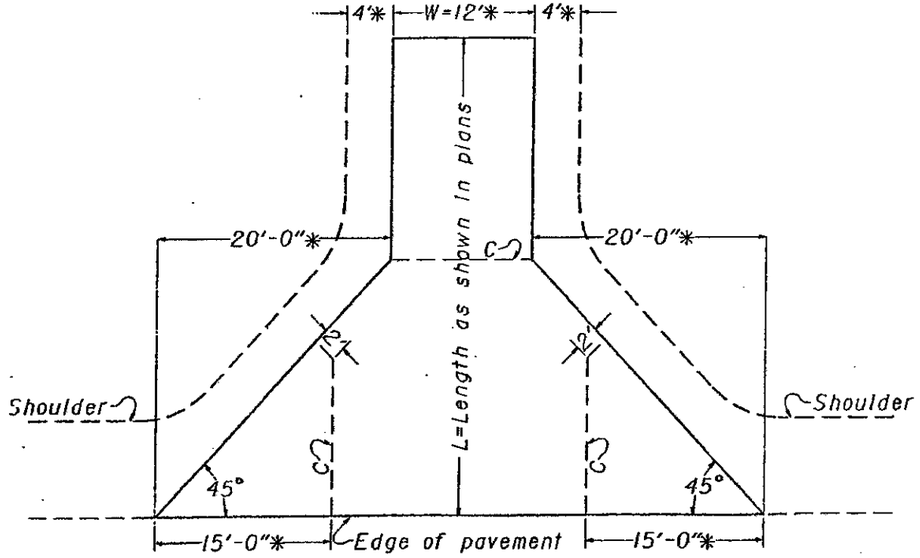
RESURFACING

STANDARD CONSTRUCTION DRAWING **BP-3.1**

APPROVED D.K. Hulman ENGR., L & D



TYPE 1 DRIVEWAY



TYPE 2 DRIVEWAY

NOTES

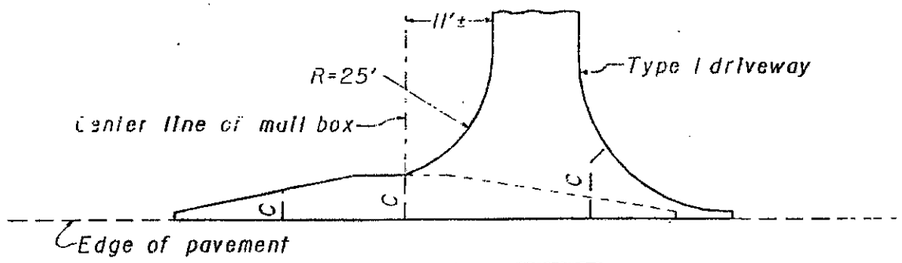
GENERAL: The design details shown hereon shall govern the construction of driveways unless otherwise shown in the project plans.

The pavement type and thickness shall be specified in the project plans.

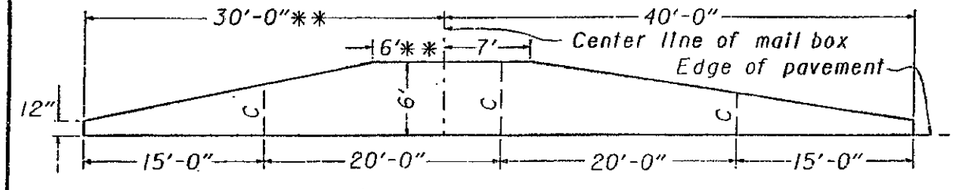
Driveway and mail box approaches shall be combined when feasible.

JOINTS: Impressed joints for portland cement concrete driveways shall be 1/4" minimum width by 3" ± depth and shall be sealed with 705.04 or ASTM D 1850.

In addition to the joints shown hereon, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed seventeen feet in the portion of the driveway back of the flare.



COMBINED DRIVEWAY & MAIL BOX APPROACH



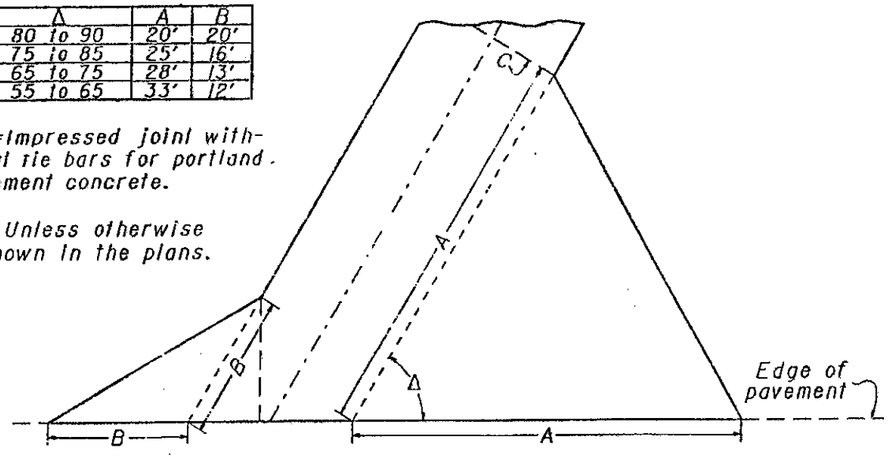
** Add 3 feet for each additional mail box

TYPICAL MAIL BOX APPROACH

A	A	B
80 to 90	20'	20'
75 to 85	25'	16'
65 to 75	28'	13'
55 to 65	33'	12'

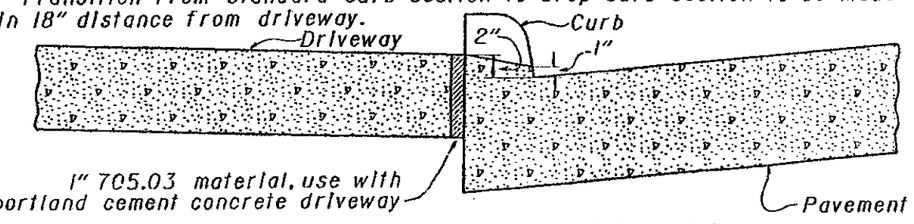
C=Impressed joint without tie bars for portland cement concrete.

* Unless otherwise shown in the plans.



TYPE 2 SKEWED DRIVEWAY

Transition from standard curb section to drop curb section to be made in 18" distance from driveway.



DROP CURB DETAILS AT DRIVEWAYS

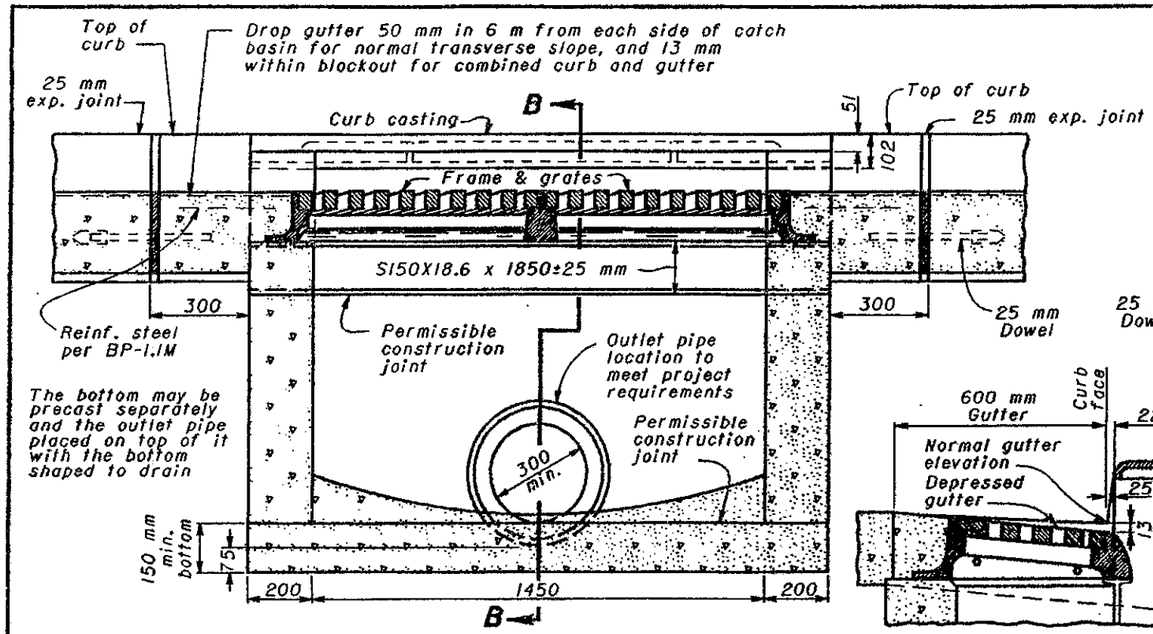
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

DATE 2-21-92

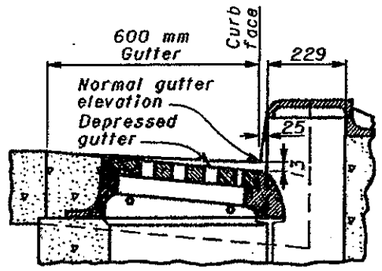
DRIVEWAYS

STANDARD CONSTRUCTION DRAWING **BP-4.1**

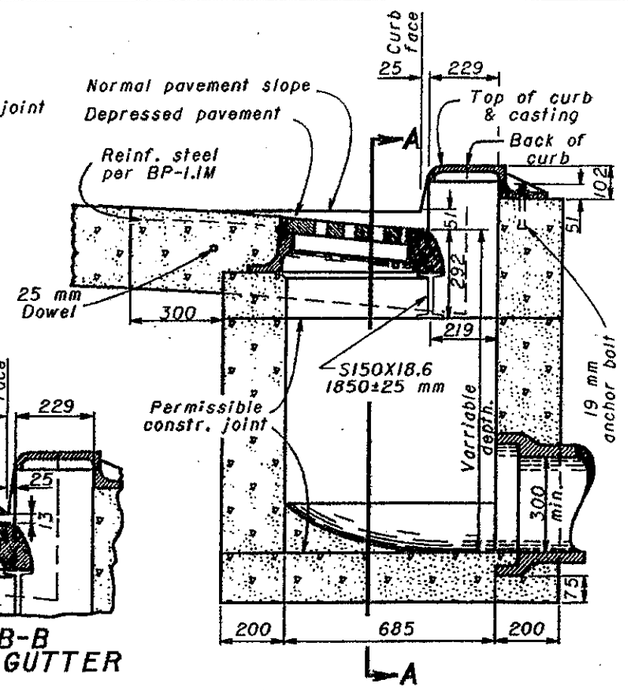
APPROVED D.K. Hulman ENGR., L & D



SECTION A-A



SECTION B-B
WITH CURB & GUTTER



SECTION B-B

NOTES

GRATES: Two required. **For details, see Std. Constr. Dwg. CB-2.2M.** Grate "V" shall be provided unless the plans specifically require the diagonal grate. If the diagonal grate is specified, it shall be placed so that the diagonal bars direct drainage flow toward the curb.

CASTINGS: The design shall be essentially the same and equally as strong as those shown. Minimum mass: Curb Casting 138 kg, two Grates 115 kg, Frame 267 kg, and two Grates "V" 95 kg.

BEARING AREAS: The frame and grate shall be so fitted and finished as to provide a firm and even seat. No projections shall exist on bearing areas and the grate shall seat in its frame **without** rocking.

WALLS: When used in place of concrete, brick side walls shall be 200 mm nominal thickness.

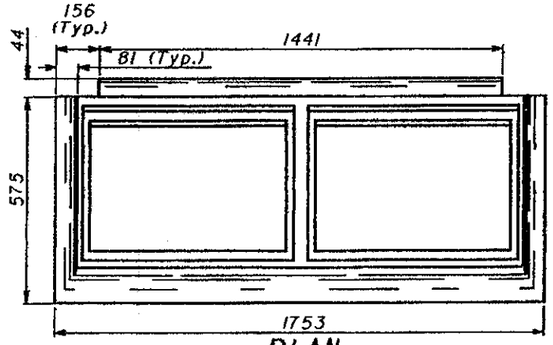
PRECAST CONSTRUCTION: Permitted, except for the apron. Concrete shall meet requirements of CMS 706.13 with a minimum of 4% entrained air in the hardened concrete. Precast walls shall have a minimum thickness of 150 mm and reinforcing shall be sufficient to permit shipping and placement without damage.

MINIMUM DEPTH: The minimum depth shall be the outside diameter (O.D.) of the outlet pipe plus 360 mm.

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 50 mm when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

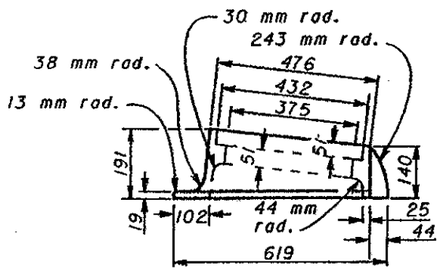
DOWELS: Four 25x460 mm dowels are required for concrete pavement or gutter blockout. See BP-2.2M for dowel details.

BLOCKOUT: Blockouts shall be paved with Class C concrete in PCC pavement or gutter and paid for as part of the pavement or gutter with no deduction in pavement, curb or gutter quantities because of castings. A Class C concrete apron the size of the 600 mm gutter blockout shall be cast-in-place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction to be made in curb quantities.

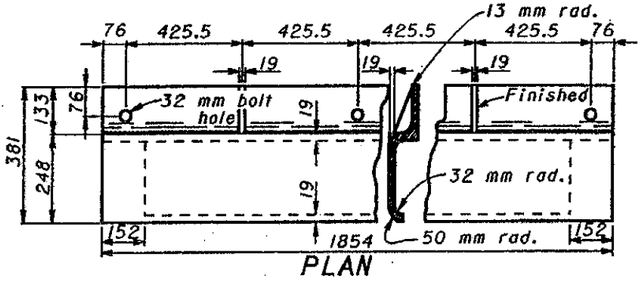


PLAN

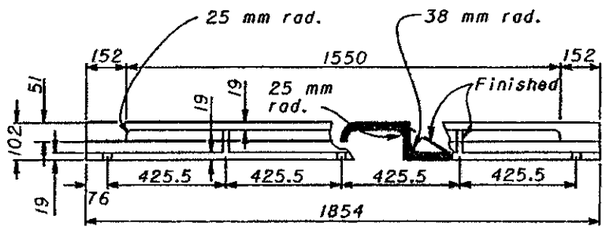
CATCH BASIN



END VIEW FRAME

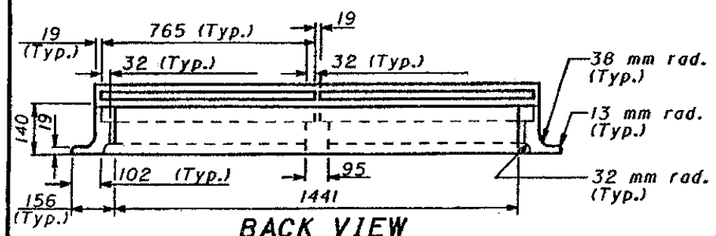


PLAN

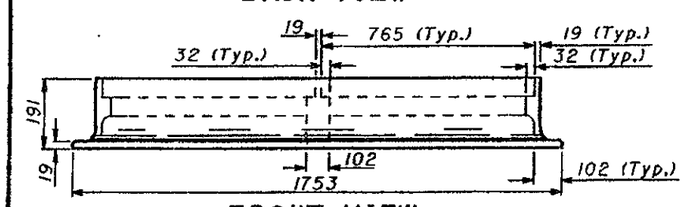


FRONT VIEW

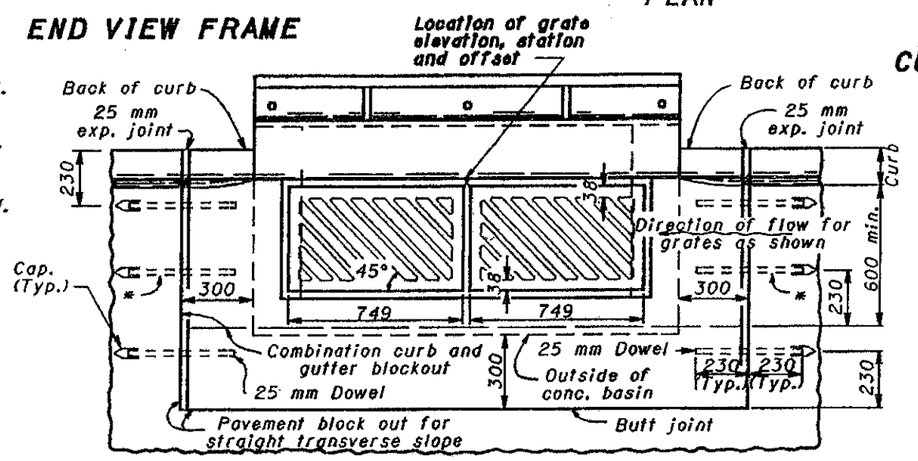
CURB CASTING



BACK VIEW



FRONT VIEW
FRAME



PLAN OF CATCH BASIN AND PAVEMENT JOINTS

*Dowel location for curb & gutter

metric units

All dimensions are in millimeters unless otherwise noted.

This Drawing Replaces CB-3.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

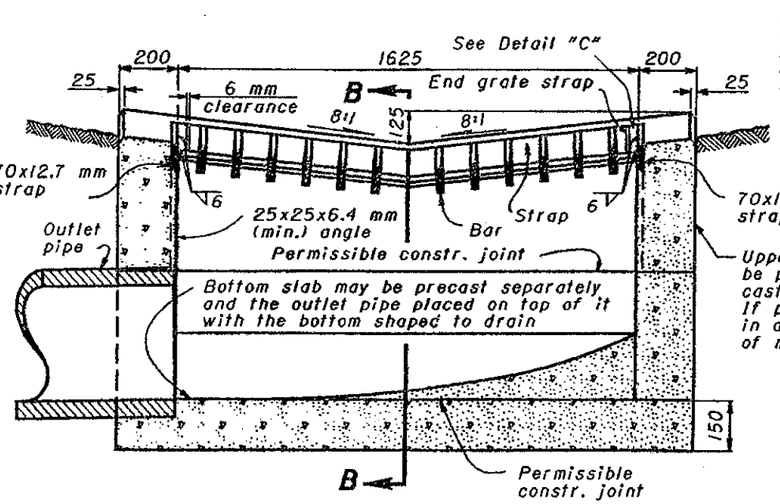
CATCH BASIN No. 3

DATE 7-12-95

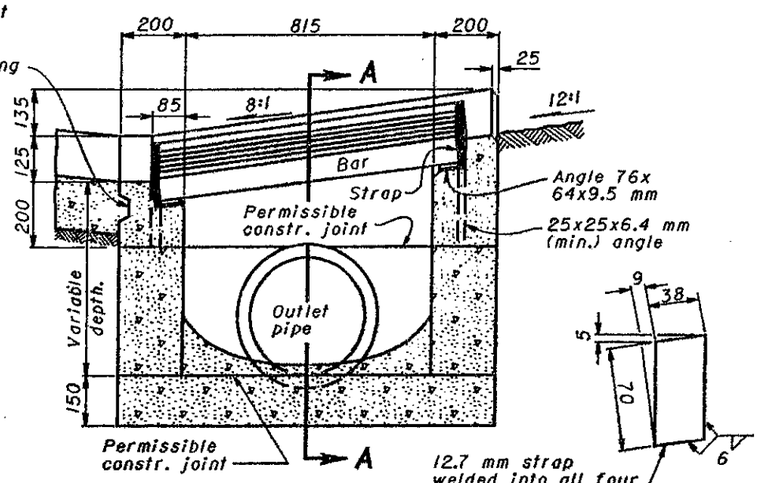
STANDARD CONSTRUCTION DRAWING **CB-2.1M**

APPROVED D.K. Hulmes
ENGR., L & D

CATCH BASIN No. 4

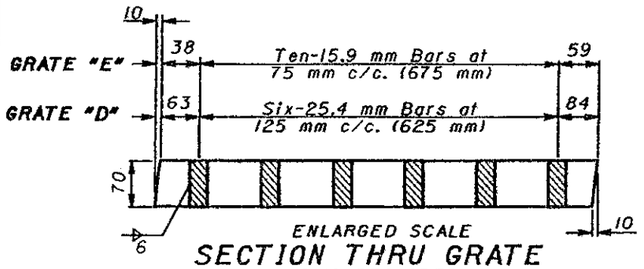


SECTION A-A

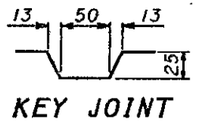


SECTION B-B

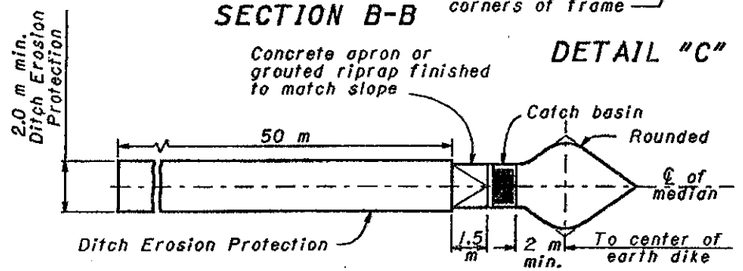
DETAIL "C"



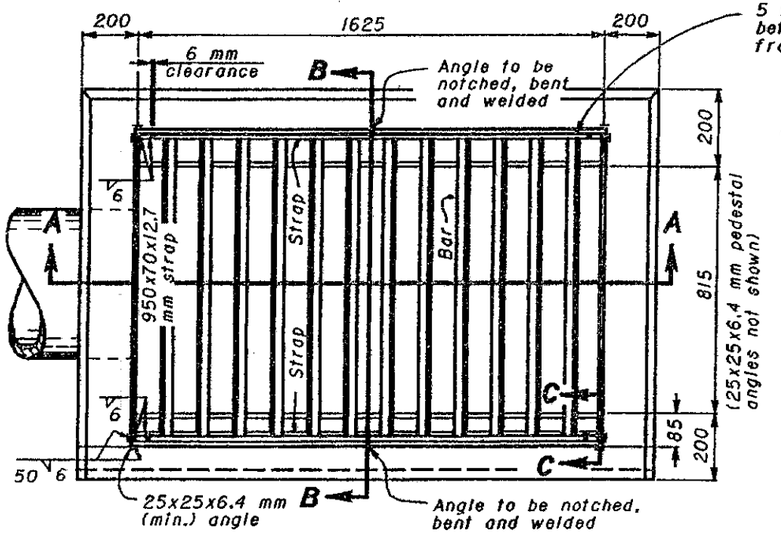
SECTION THRU GRATE
(TWO REQUIRED)



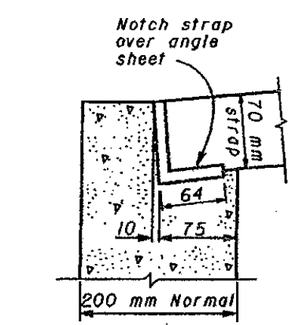
KEY JOINT



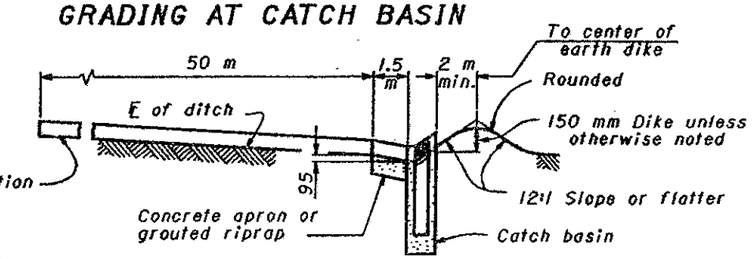
PLAN OF MEDIAN
GRADING AT CATCH BASIN



PLAN OF CATCH BASIN

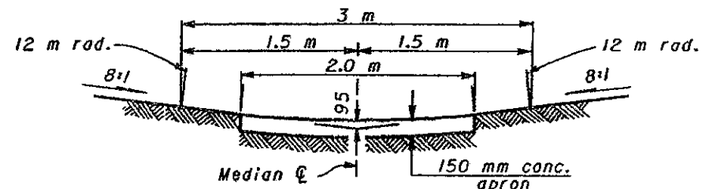


SECTION C-C



VERTICAL SCALE DISTORTED

PROFILE OF MEDIAN
GRADING AT CATCH BASIN



UPSTREAM END VIEW
OF CONCRETE APRON
OR GROUTED RIPRAP

NOTES

GRATE AND FRAME: Shall be of structural steel in accordance with CMS 711.01 and 513. The design shall be essentially the same and equally as strong as the on shown hereon.

GRATE: Shall be depressed 95 mm below the upstream end of the concrete apron at the centerline of the ditch. Unless Grate "E" is specifically required by the plans, Grate "D" shall be furnished and installed.

WALLS: Brick or cast-in-place walls shall have a nominal thickness of 200 mm from the bottom slab to the upper box. Precast walls shall have a minimum thickness of 150 mm and be reinforced sufficiently to permit shipping and handling without damage.

STEPS: Steps meeting the requirements of Std. Constr Dwg. MH-1.1M shall be provided where the depth exceeds 1.8 m.

BASINS OVER 3.5 m IN DEPTH: Shall be precast or cast-in-place concrete; reinforced with #15M bars on 300 mm centers both vertically and horizontally with 50 mm clearance form inside wall face.

LOCATION AND ELEVATION: When given on the plans, location is the center of the grate. Elevation is the lowest point on the grate.

OPENINGS: Pipe openings shall be the outside diameter of the pipe being supplied plus 50 mm when prefabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

CONCRETE APRONS: Aprons are to be constructed in such a manner that the outside edges are at equal elevation.

DITCH PROTECTION: Provide a 50 m length of ditch erosion protection as shown. Installation and payment for the ditch erosion protection shall comply with CMS 670.

BASINS IN SAG: When in a sag, omit the earth dike and longitudinal slope of the grate, and provide concrete apron and ditch protection on each side of the basin.

COST: The concrete apron or grouted riprap and downstream dike shall be considered incidental to Item 604, Catch Basins. However, the apron is not required when Item 604, Catch Basins, Without Apron is specified.

CONSTRUCTION INFORMATION
Typical mass of grate - 170 kg
Typical mass of frame - 45 kg

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces CB-4.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

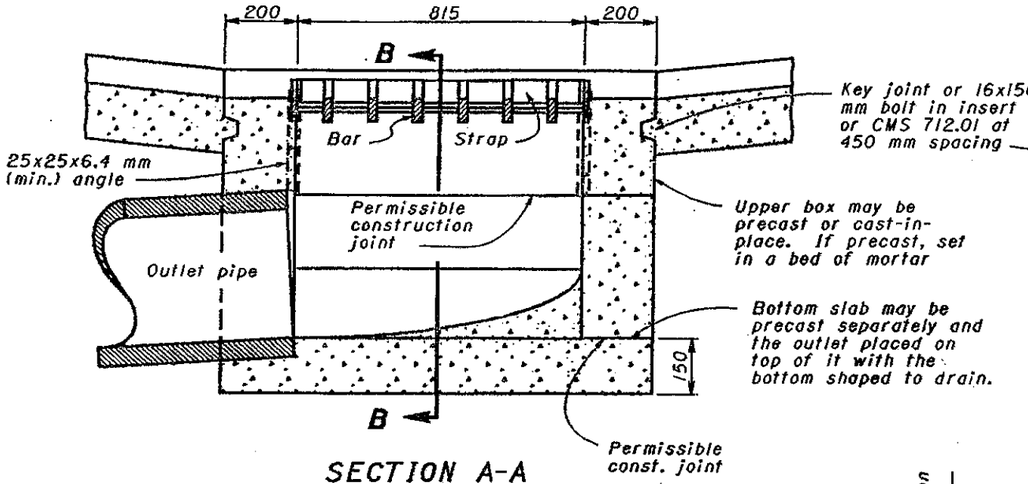
CATCH BASIN No. 4

DATE 7-12-95

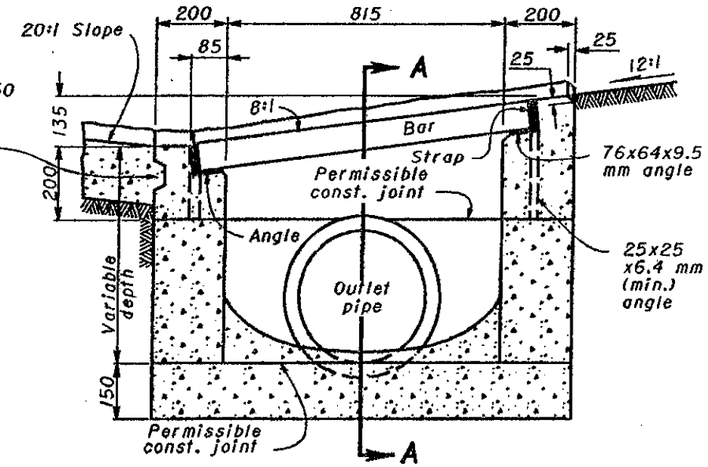
STANDARD CONSTRUCTION DRAWING **CB-3.1M**

APPROVED D. K. Hickman
ENGR., L. & D

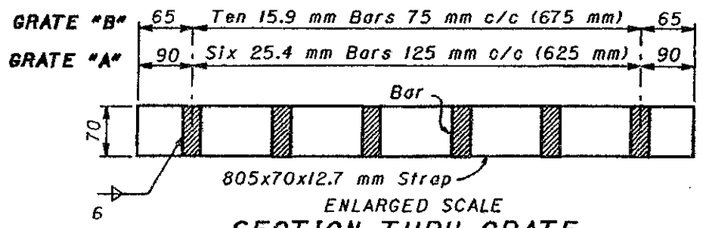
CATCH BASIN No. 5



SECTION A-A

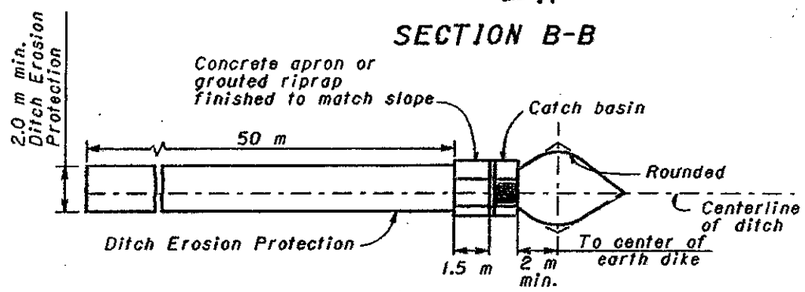


SECTION B-B

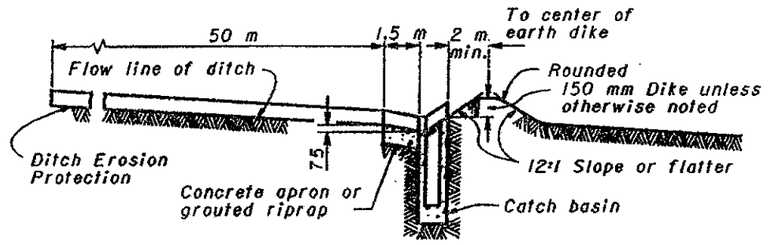


ENLARGED SCALE

SECTION THRU GRATE

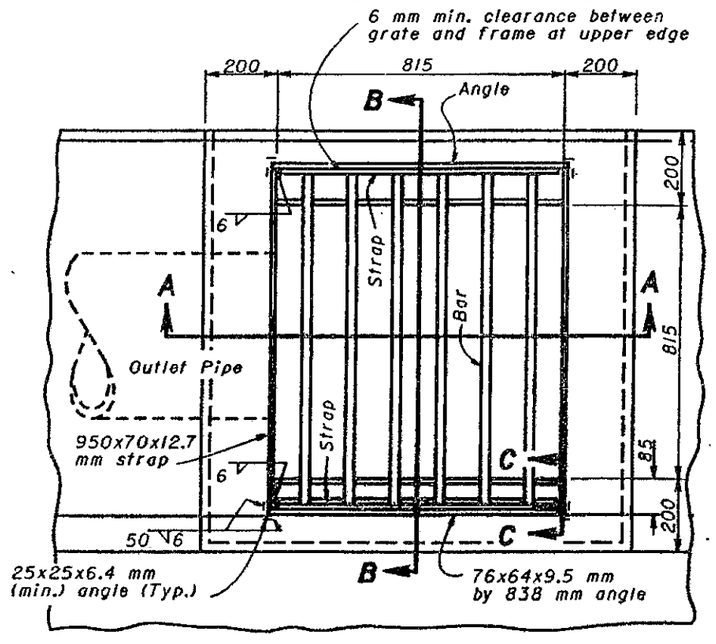


PLAN OF ROADSIDE DITCH GRADING AT CATCH BASIN

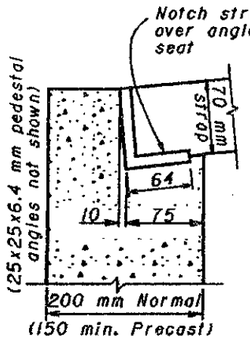


VERTICAL SCALE DISTORTED

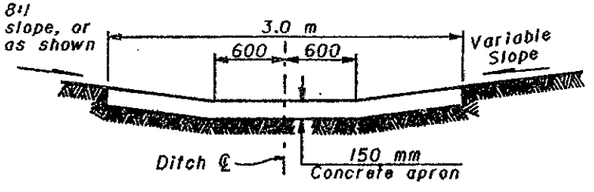
PROFILE OF ROADSIDE DITCH GRADING AT CATCH BASIN



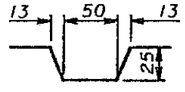
PLAN OF CATCH BASIN



SECTION C-C



UPSTREAM END VIEW OF CONCRETE APRON OR GROUTED RIPRAP



KEY JOINT

NOTES

GRATE AND FRAME: Shall be of structural steel in accordance with CMS 711.01 and 513. The design shall be essentially the same and equally as strong as the one shown hereon.

GRATE: Shall be depressed 75 mm below the upstream end of the concrete apron at the centerline of the ditch. Unless Grate "B" is specifically required by the plans, Grate "A" shall be furnished and installed.

WALLS: Brick or cast-in-place walls shall have a nominal thickness of 200 mm from the bottom slab to the upper box. Precast walls shall have a minimum thickness of 150 mm and be reinforced sufficiently to permit shipping and handling without damage.

STEPS: Steps meeting the requirements of Std. Constr. Dwg. MH-1.1M shall be provided where the depth exceeds 1.8 m.

BASINS OVER 3.5 m IN DEPTH: 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 inside wall face.

LOCATION AND ELEVATION: When given on the plans, the location is the center of the grate. The elevation is the lowest point on the grate.

OPENINGS: Pipe openings shall be the outside diameter of the pipe being supplied plus 50 mm when prefabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

CONCRETE APRONS: Aprons are to be constructed in such a manner that the outside edges are at equal elevation.

DITCH PROTECTION: Provide a 50 m length of ditch erosion protection as shown. Installation and payment for ditch erosion protection shall comply with CMS 670.

BASINS IN SAG: When in a sag, omit the earth dike and longitudinal slope of the grate, and provide concrete and ditch protection on each side of the basin.

COST: The concrete apron or grouted riprap and dike shall be considered incidental to Item 604, Catch Basins. However, the apron is not required when Item 604, Catch Basins, Without Apron is specified.

CONSTRUCTION INFORMATION
Typical mass of grate - 84 kg
Typical mass of frame - 27 kg

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces CB-5.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

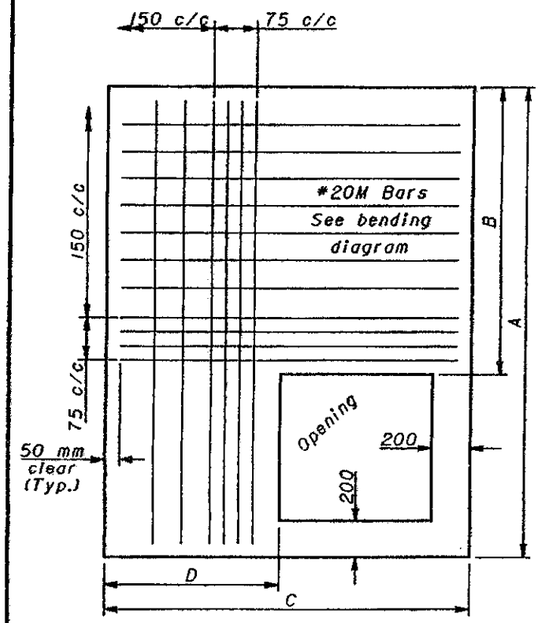
CATCH BASIN No. 5

DATE 7-12-95

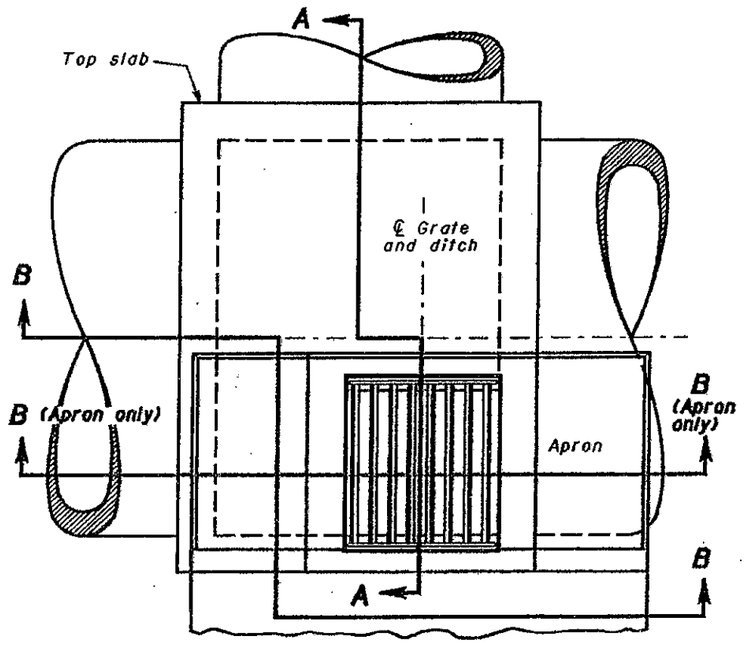
STANDARD CONSTRUCTION DRAWING **CB-3.2M**

APPROVED W. K. Hulman
ENGR., L & D

CATCH BASINS No. 4A, No. 5A, and No. 8A



TOP SLAB DETAIL



PLAN

NOTES

DESIGN: The lower box, shown hereon, is designed for use with the upper boxes of Std. Constr. Dwgs. CB-3.1M, CB-3.2M, and CB-3.3M (shown). See the appropriate Drawing for specific details.

WALLS: Brick or cast-in-place walls shall have a nominal thickness of 200 mm from the bottom slab to the upper box. Precast walls shall have a minimum thickness of 150 mm and be reinforced sufficiently to permit shipping and handling without damage.

STEPS: Steps meeting the requirements of Std. Constr. Dwg. MH-1.1M shall be provided where the depth exceeds 1.8 m.

BASINS OVER 3.5 m IN DEPTH: 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 inside wall face.

LOCATION AND ELEVATION: When given on the plans, the location is the center of the grate. The elevation is the lowest point on the grate.

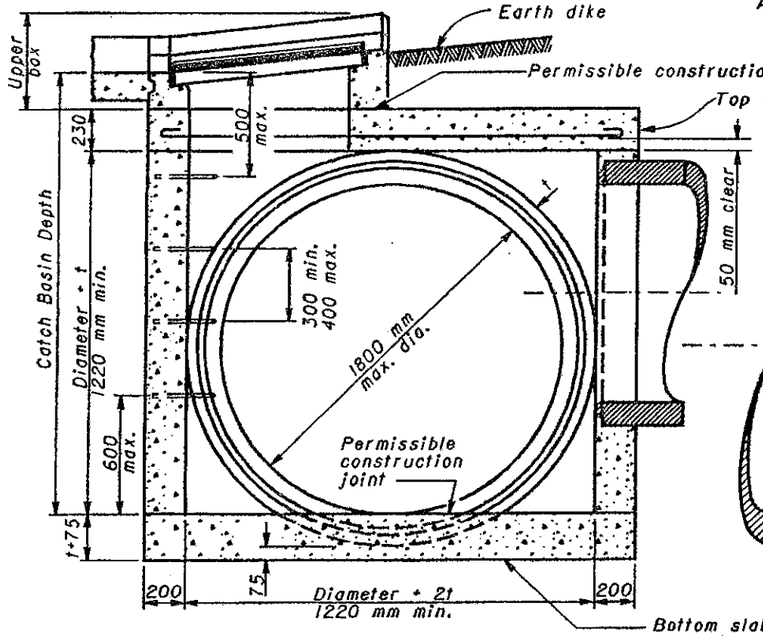
OPENINGS: Pipe openings shall be the outside diameter of the pipe being supplied plus 50 mm when prefabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

CONCRETE APRONS: Aprons are to be constructed in such a manner that the outside edges are at equal elevation.

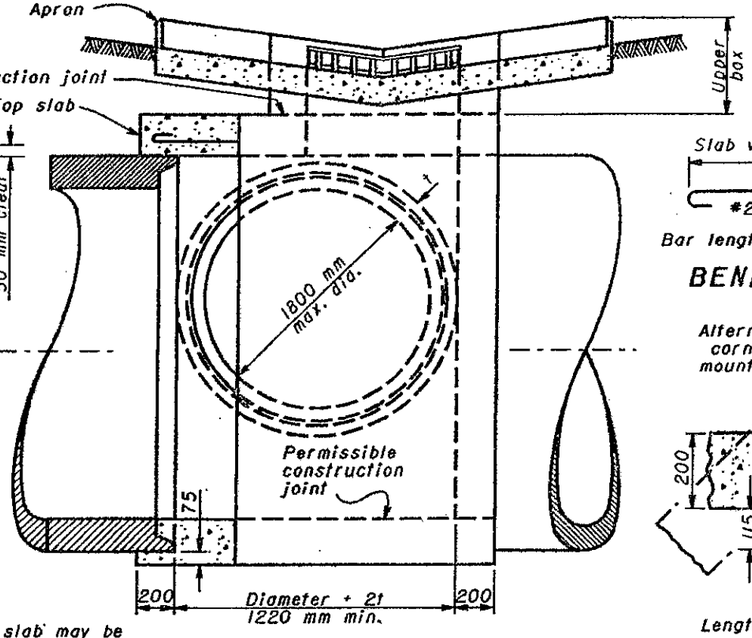
DITCH PROTECTION: Provide a 50 m length of ditch erosion protection as shown. Installation and payment for ditch erosion protection shall comply with CMS 670.

BASINS IN SAG: When in a sag, omit the earth dike and longitudinal slope of the grate, and provide concrete and ditch protection on each side of the basin.

COST: The concrete apron or grouted riprap and dike shall be considered incidental to Item 604, Catch Basins. However, the apron is not required when Item 604, Catch Basins, Without Apron is specified.

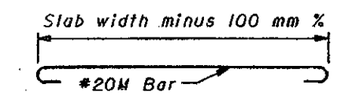


SECTION A-A



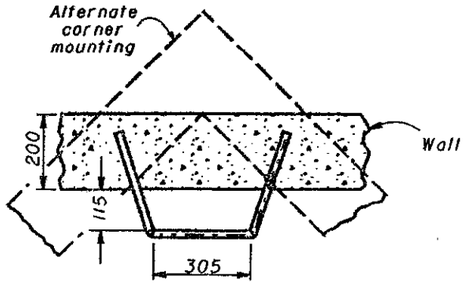
Bottom slab may be precast separately and the outlet pipe placed on top of it with the bottom shaped to drain.

SECTION B-B



Bar length = % dimension + 405 mm

BENDING DIAGRAM



Length before bending: 965 mm

STEP DETAIL

TOP SLAB DIMENSIONS (in millimeters)						
PIPE DIAMETER	CB-5A & 8A		CB-4A			
	A or C	B or D	A	B	C	D
Under 1050	1625	600	1625	600	2025	200
1050	1700	675	1700	675	2025	200
1200	1875	875	1875	875	2025	200
1350	2050	1050	2050	1050	2050	225
1500	2250	1225	2250	1225	2225	400
1650	2425	1400	2425	1400	2425	575
1800	2600	1575	2600	1575	2600	750

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces CB-458A.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

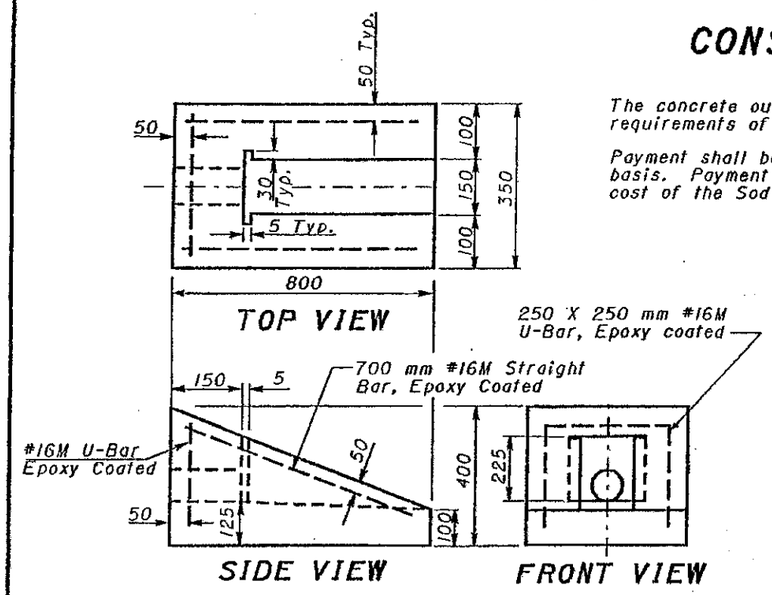
CATCH BASINS No's 4A, 5A, 8A

DATE 7-12-95

STANDARD CONSTRUCTION DRAWING **CB-3.4M**

APPROVED D. K. Hubman
ENGR., L & D

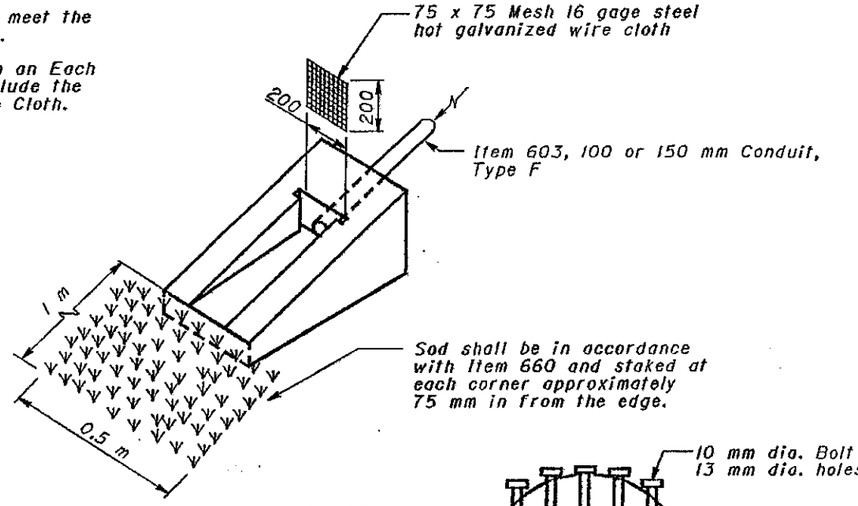
CONSTRUCTION METHODS



PRECAST REINFORCED CONCRETE OUTLET

The concrete outlet shall meet the requirements of CMS 604.

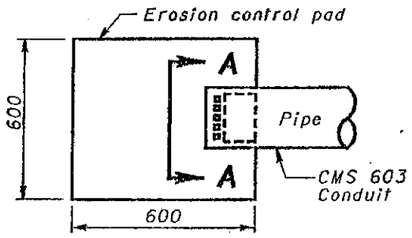
Payment shall be made on an Each basis. Payment shall include the cost of the Sod and Wire Cloth.

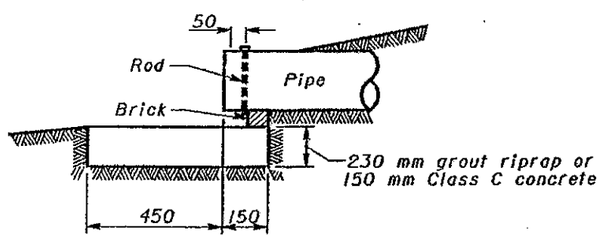


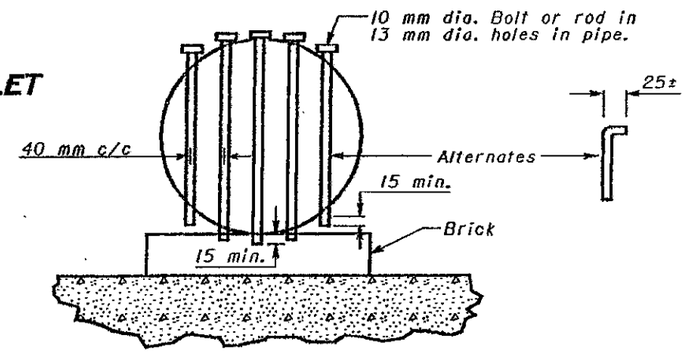
NOTES

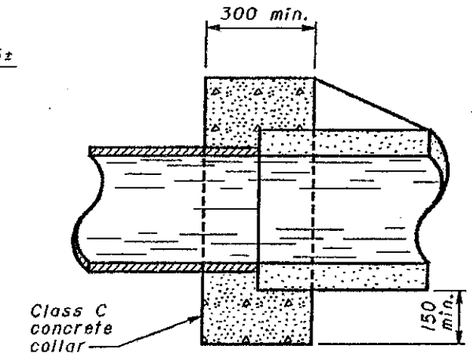
MASONRY COLLARS: A masonry collar shall be provide where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint. The cost shall be included in the unit price bid for the new conduit.

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 __ .





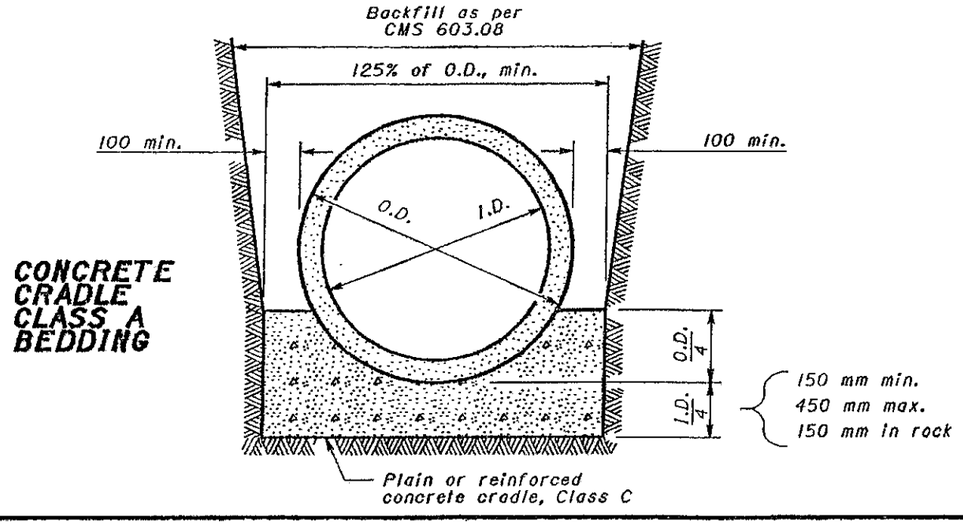




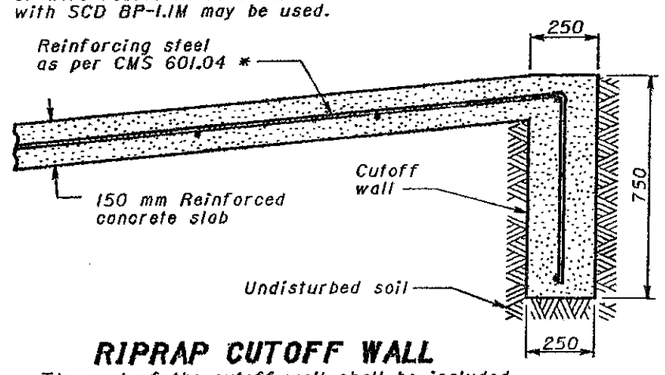
MASONRY COLLAR

EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE

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



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



RIPRAP CUTOFF WALL

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

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces MC-4.

OHIO DEPARTMENT OF TRANSPORTATION

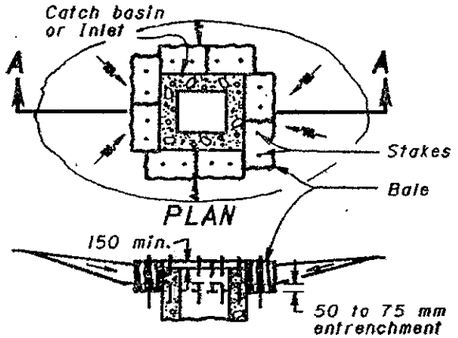
OUTLETS, DRAINS AND SEWERS

DATE: 6-30-95, 10-21-97

STANDARD CONSTRUCTION DRAWING DM-1.1M

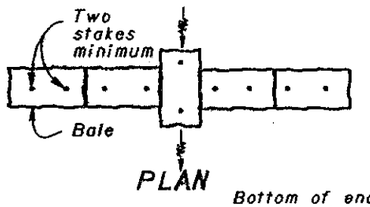
APPROVED Craig F. Sutherland

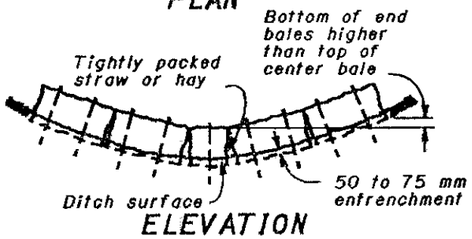
STRAW OR HAY BALES



SECTION A-A

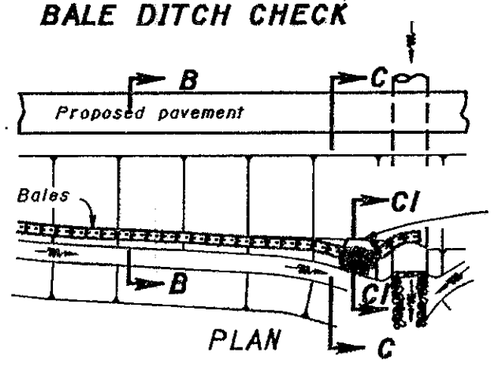
BALE INLET FILTER



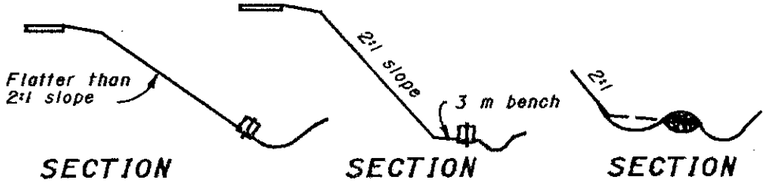


ELEVATION

BALE DITCH CHECK



Sediment pit, 0.5 m max. depth with sand and gravel outlet filter, 0.3 m min. height



SECTION B-B | SECTION C-C | SECTION C1-C1

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.

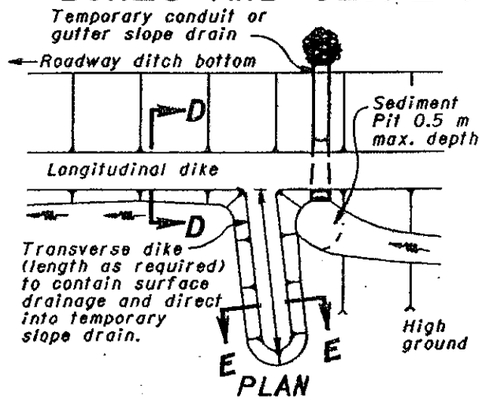
Loose straw or hay shall be scattered for a distance of 3 m on the upstream side of each ditch check, and shall be wedged between and under staked bales.

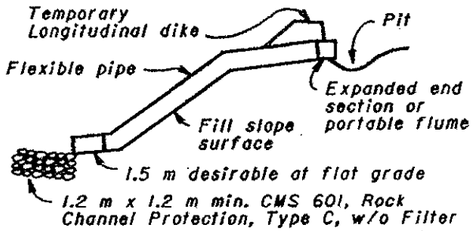
PITS: Sediment pits shall be provided where directed by the Engineer, and their cost included in the unit price bid for the adjacent CMS 207 items.

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

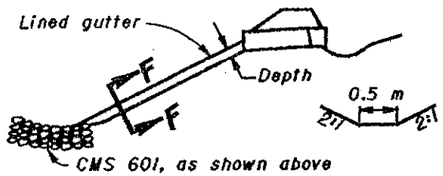
BASIS OF PAYMENT: Straw or hay bale installation shall be paid for under Item 207, Straw or Hay Bales.
Cost will include placing, staking, maintaining and removing.

DIKES AND SLOPE PROTECTION



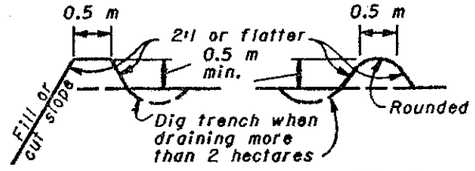


CONDUIT SLOPE DRAIN



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.

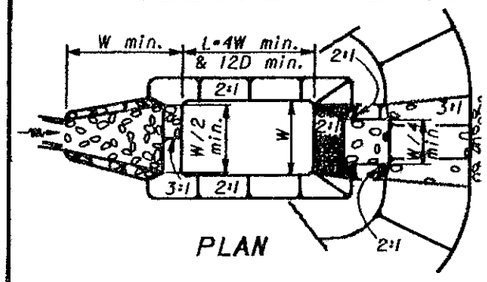
CONDUITS: Conduits for slope drains shall be corrugated steel pipe, corrugated or smooth plastic pipe, rubber conduit, or an approved equal.

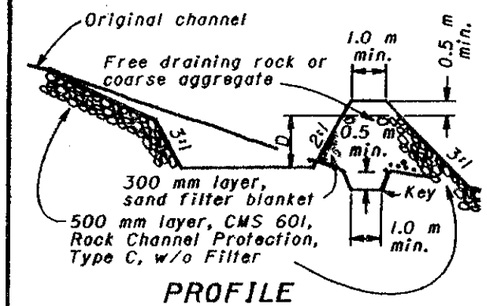
GUTTERS: Gutters for slope drains shall be lined with Type C rock channel protection, crushed aggregate slope protection, portland cement concrete, bituminous concrete, plastic sheeting (on slopes 4:1 max.), partial pipe sections or approved equal.

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.

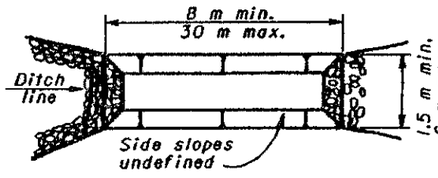
SEDIMENT BASINS & DAMS



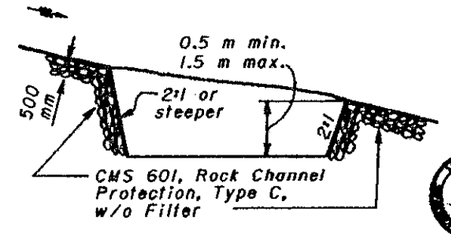


PROFILE

SEDIMENT DAM



PLAN



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.

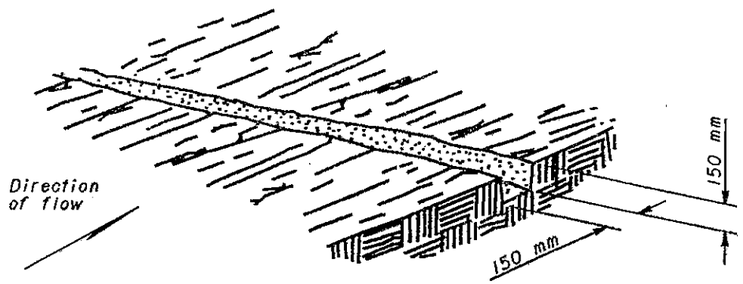
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION CONTROL

DATE 6-30-95

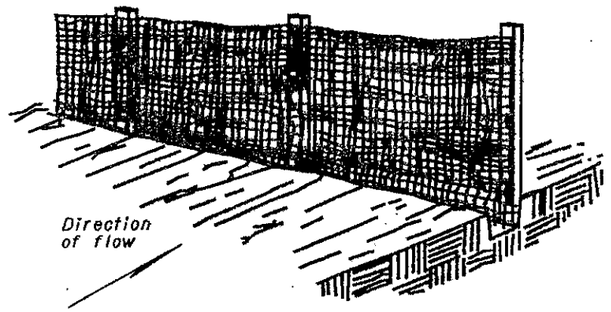
STANDARD CONSTRUCTION DRAWING **DM-4.3M**

APPROVED W. K. Hedman
ENGR. L & D



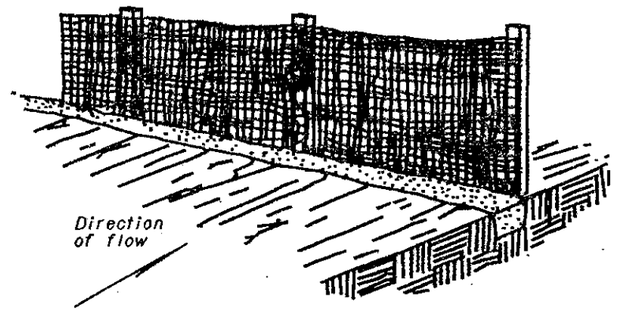
Excavate a 150 mm by 150 mm trench along the proposed fence line.

STEP 1



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

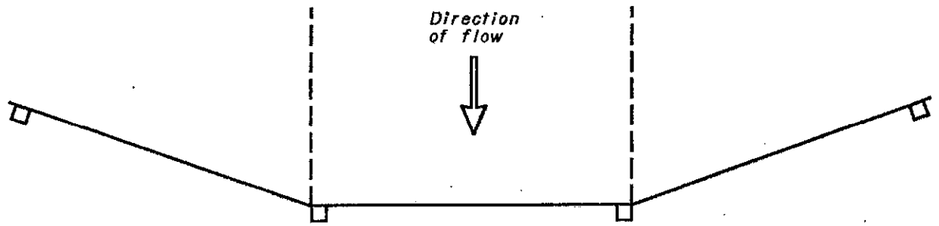
STEP 2



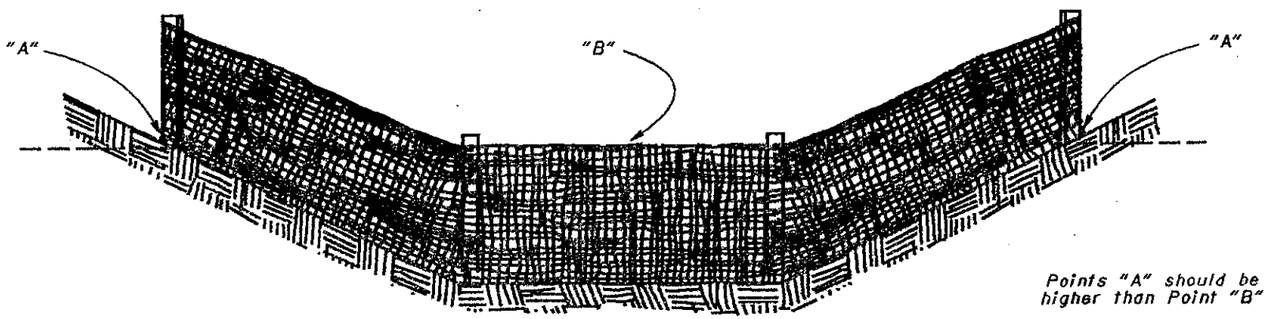
Backfill and compact the excavated soil.

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

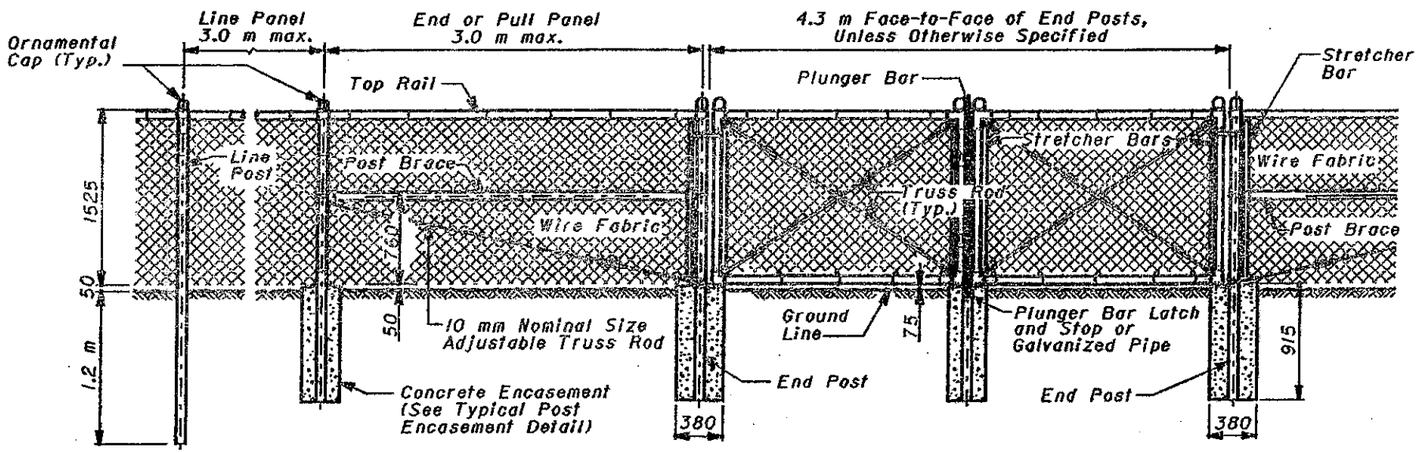
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION CONTROL

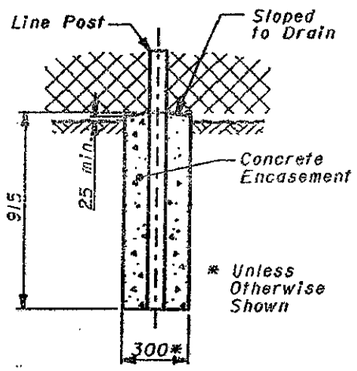
DATE 6-30-95

STANDARD CONSTRUCTION DRAWING **DM-4.4M**

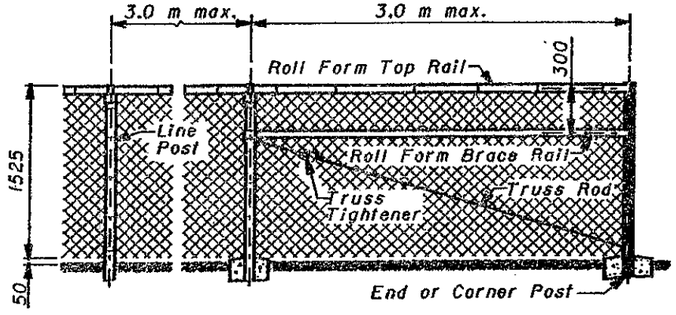
APPROVED W. K. Hulman
ENGR., L & D



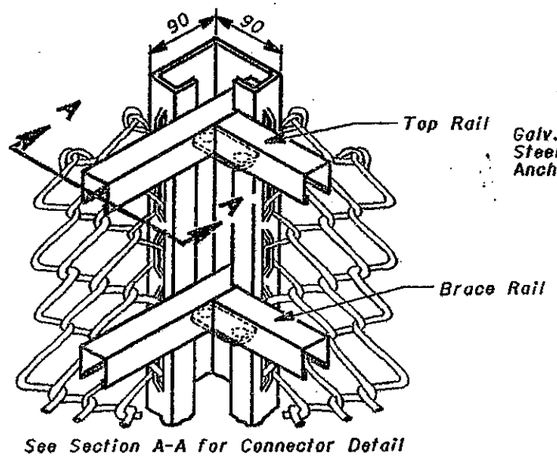
TYPE CL FENCE



TYPICAL POST ENCASEMENT



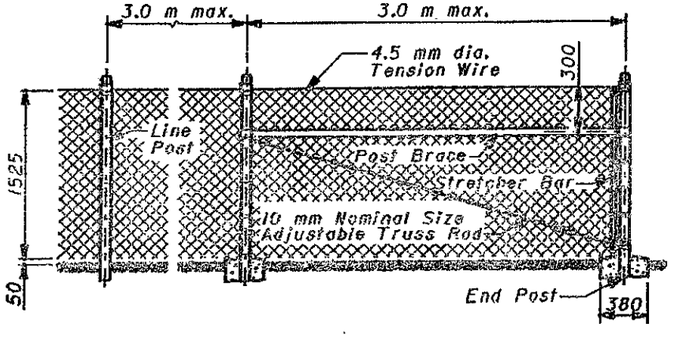
ROLL FORM ALTERNATE



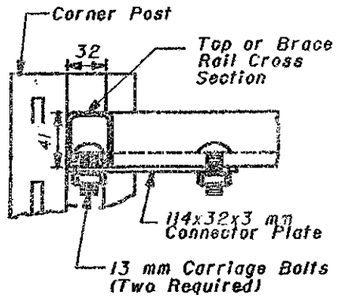
See Section A-A for Connector Detail

ROLL FORM ALTERNATE CORNER POST

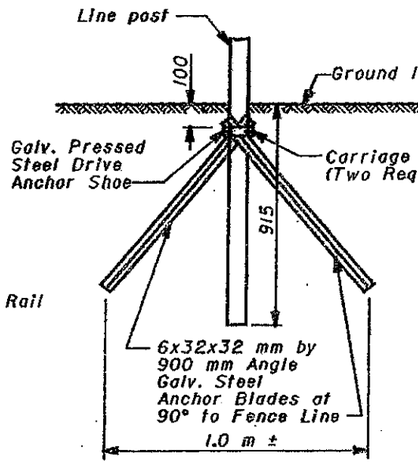
Fabric Outside



TYPE CLT FENCE

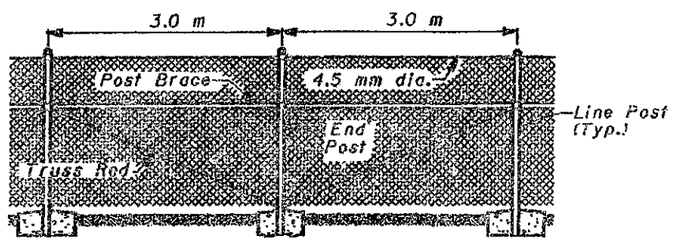


SECTION A - A



DRIVE ANCHOR DETAIL

For Line Post Alternate



INTERMEDIATE ANCHOR POST ASSEMBLY

For Type CLT Fence

NOTES

STREAM CROSSINGS: *Where chain link fence is to be constructed continuously across streams, and stream crossing closures are required by the plans, the closure shall be constructed in accordance with the details shown on Std. Constr. Dwg. F-3.4M, modified as necessary to conform with chain link fence dimensions and details.*

TENSION WIRE: *Wire shall be used instead of the top rail when specified on the plans as Item 607, Fence, Type CLT. The wire shall be stretched taut and fastened to or passed through the top fitting. The fence shall be fastened to the tension wire with fabric ties consisting of hog rings every 600 mm or less.*

GATES: *Each gate shall be equipped with an approved padlock with a double locking bolt, a five-pin tumbler, a laminated steel case, and a brass cylinder, and shall be rust-proof. Where companion gates are installed on opposite sides of the highway tumblers shall be identically set in each lock so that the same key will open each lock. Two keys shall be furnished with each padlock. The cost of the padlock and keys shall be included in the cost of the gate.*

POST ENCASEMENT: *Line posts shall normally be driven to an embedment depth of 1.2 meters. Where soil or other conditions do not permit driving to this depth, post holes shall be dug or bored and the posts encased in concrete. Posts located in unconsolidated fills or other loose soils, in dips or other depressions in the ground surface, or installed with fabric exceeding 1525 mm in height shall also be encased in concrete.*

Steel drive anchors may be used as an alternate to concrete encasement of line posts. All end, corner and pull panel posts shall be encased in concrete.

FRAMEWORK AND FABRIC: *Materials may be any type permitted by CMS 710.03.*

FENCE GROUNDING: *When needed for overhead electrical lines, grounding is to be in accordance with Std. Constr. Dwg. HL-50.11M.*

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces F-1.

OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

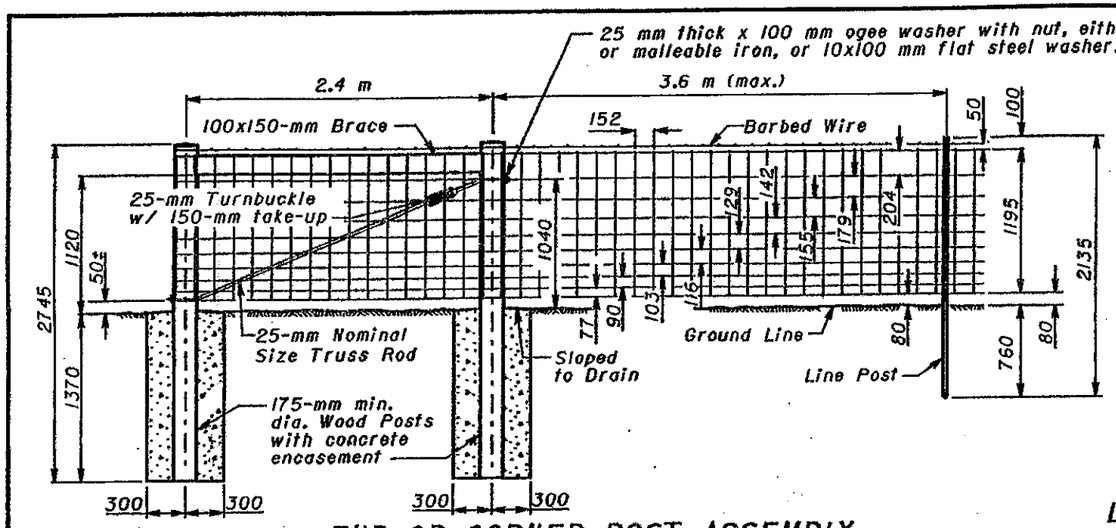
CHAIN LINK FENCE

DATE
4-21-95
4-8-97

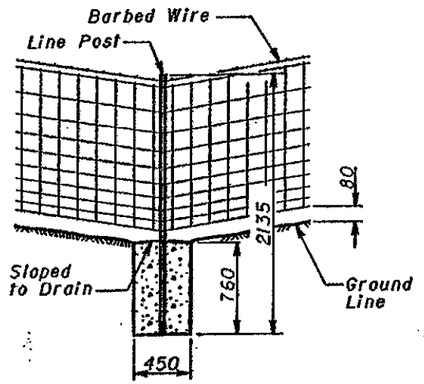
STANDARD CONSTRUCTION DRAWING **F-1.1M**

APPROVED Randy F. Cumberland
ADMINISTRATOR

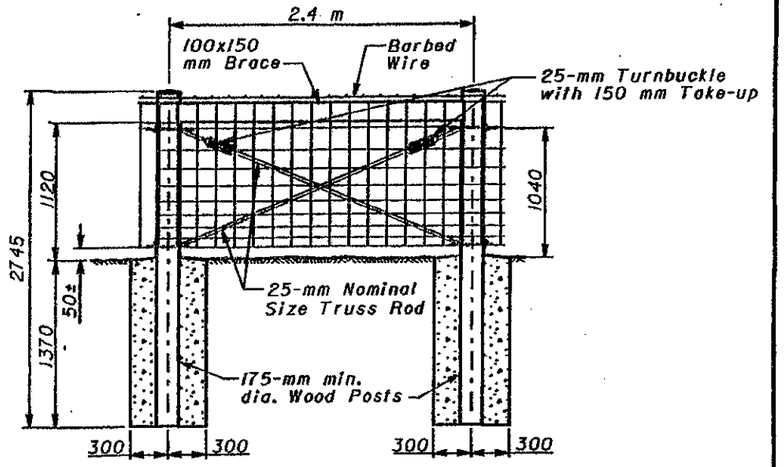
TYPE 47 FENCE



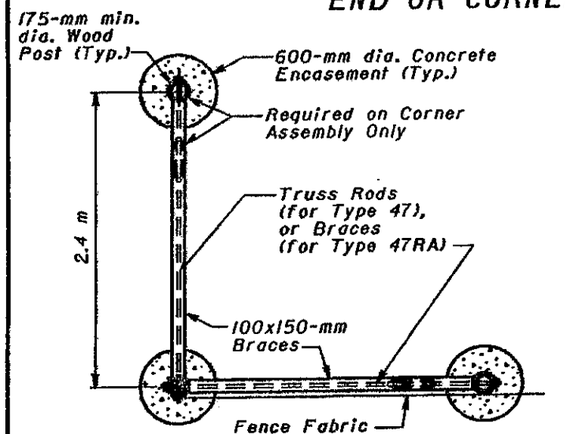
END OR CORNER POST ASSEMBLY



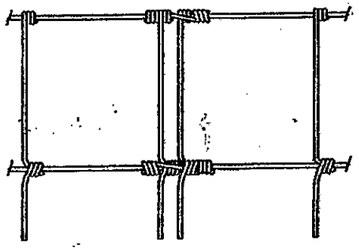
LINE POST IN A DIP SECTION



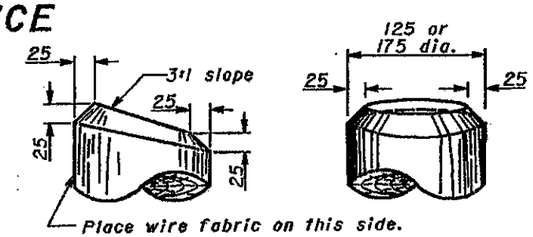
INTERMEDIATE ANCHOR POST ASSEMBLY



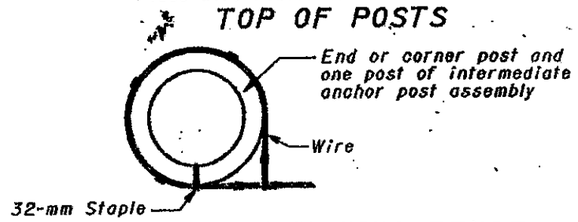
END OR CORNER POST ASSEMBLY PLAN VIEW



WIRE FENCE SPLICE



TOP OF POSTS



METHOD OF FASTENING FENCE

NOTES

BRACES: Wood braces shall be set in notches in the posts and fastened with 16d nails.

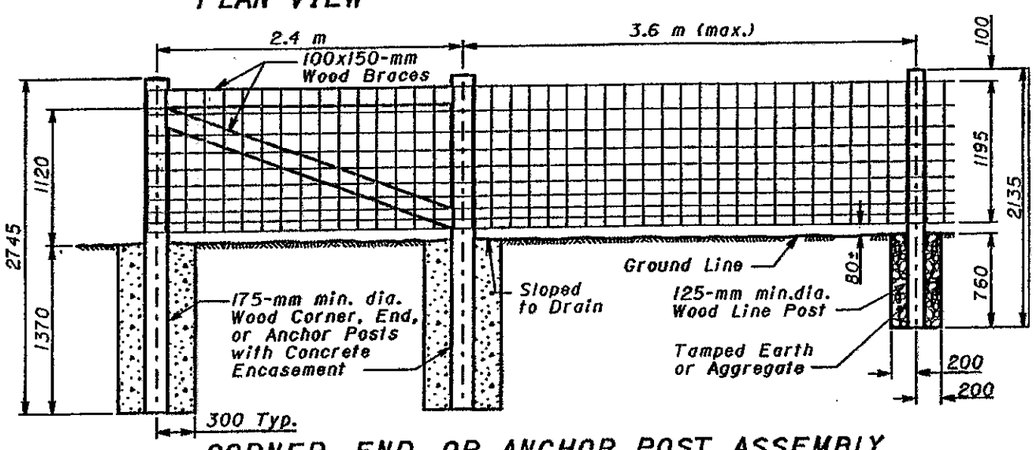
POSTS: Concrete encasement and tamped earth or aggregate shall be omitted when wood posts are driven to grade, except for line posts in a dop section.

Posts set or driven to within 25 mm of grade need not be trimmed.

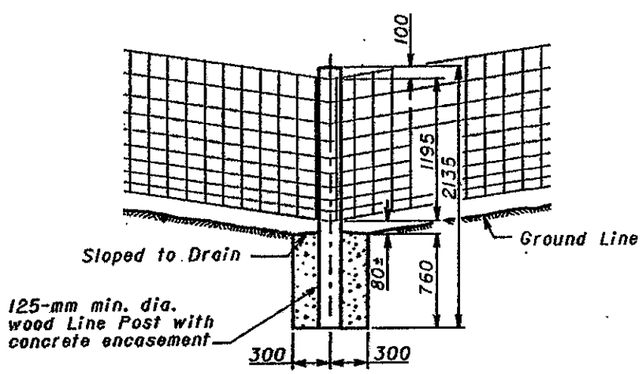
FABRIC: Other methods for splicing wire fence may be used in lieu of the method shown, when approved by the Engineer.

TYPE 47RA FENCE: Type 47RA shall be used to fence rest areas. Where Types 47 and 47RA intersect at a corner, the corner assembly shall have all wood braces. Fence shall be paid for as Item 607 - Fence, Type 47RA.

TYPE 47RA FENCE



CORNER, END, OR ANCHOR POST ASSEMBLY



LINE POST IN A DIP SECTION

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces F-2.

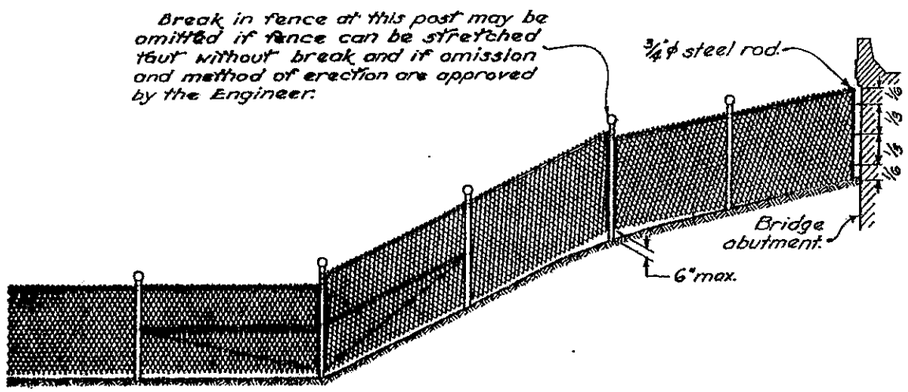
OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

WOVEN WIRE FENCE

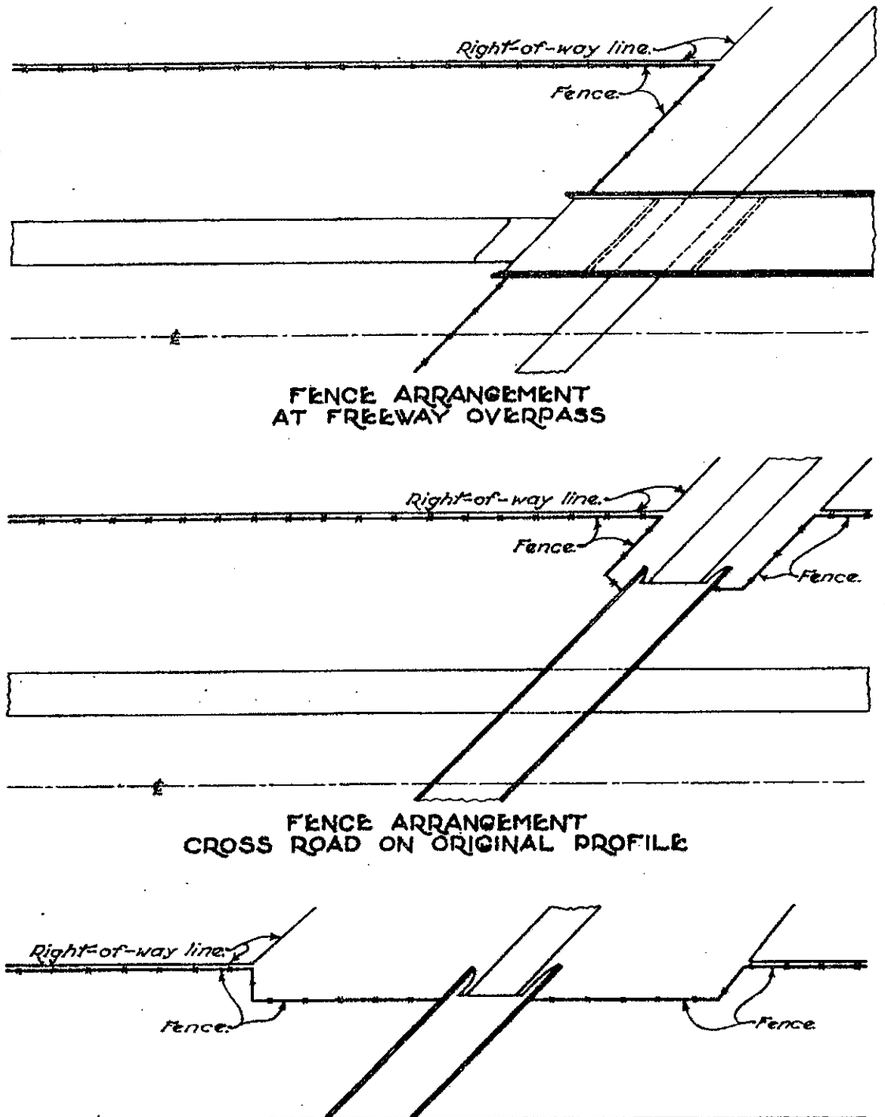
DATE: 4-21-95, 4-8-97

STANDARD CONSTRUCTION DRAWING **F-2.1M**

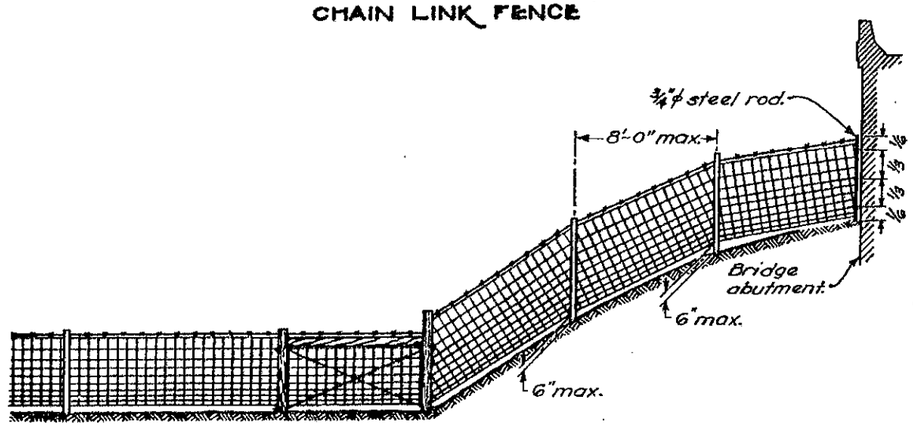
APPROVED Larry F. Sutherland
ADMINISTRATOR



CHAIN LINK FENCE

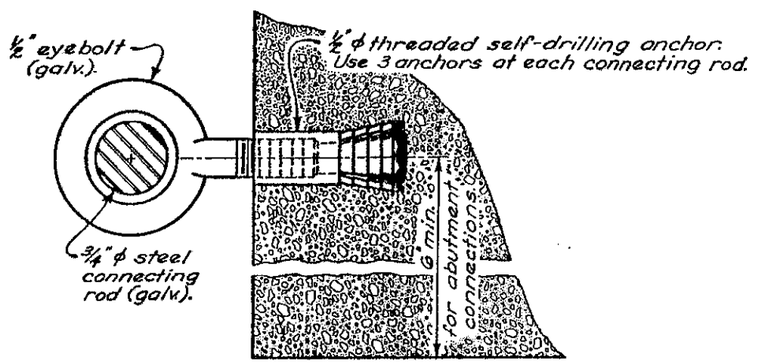


FENCE ARRANGEMENT
AT FREEWAY OVERPASS

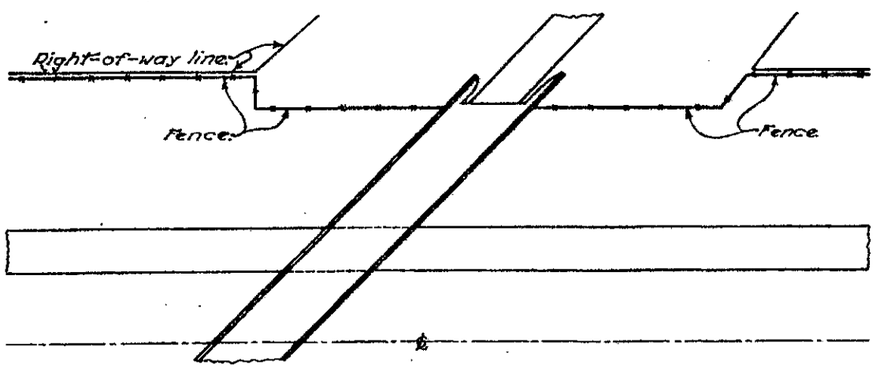


WOVEN WIRE FENCE

FENCE ARRANGEMENT
CROSS ROAD ON ORIGINAL PROFILE



ABUTMENT CONNECTION



FENCE ARRANGEMENT
CROSS ROAD ON HIGH FILL

NOTES

GENERAL: Details shown hereon shall be used in conjunction with standard drawings F-1 and F-2.

ABUTMENT CONNECTION: Cost of furnishing and installing connecting rods, eyebolts and anchors shall be included in the unit price bid per linear foot of fence. Where needed to clear deck projections or other irregularities the shaft length of the eyebolt may vary.

ANCHORS: Self-drilling anchors shall conform to 712.01. Threaded steel inserts may be placed in the wet concrete when the structure is constructed instead of using self-drilling anchors.

EYEBOLTS shall conform with ASTM A 489, except that the bend test is waived and finish shall be hot-dipped galvanized in accordance with ASTM A 153.

CLEARANCE of the lower wires on embankments approaching bridge connections may vary from 0 inches to 6 inches.

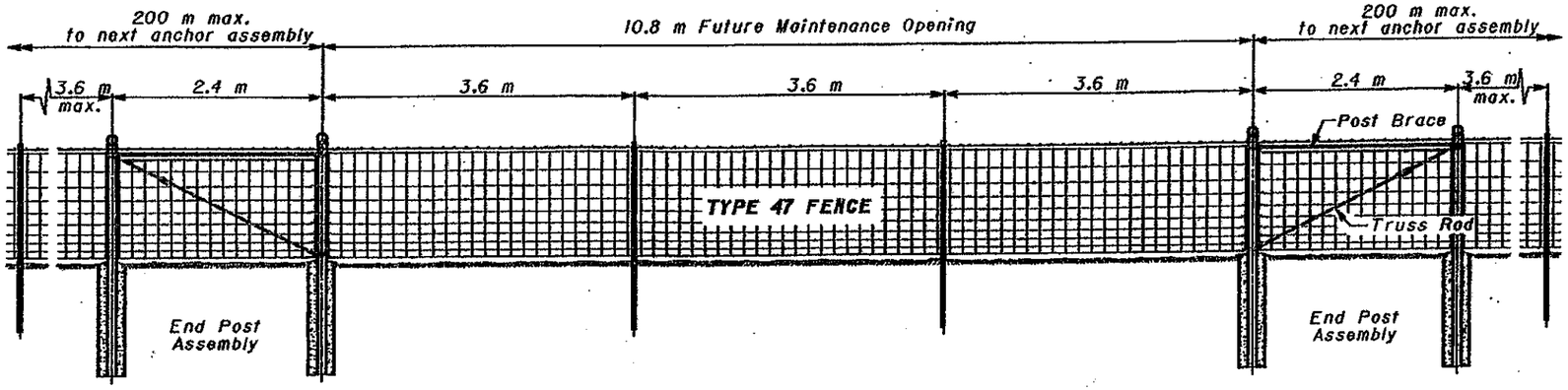
BUREAU OF ROADWAY DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

FENCE DETAILS AT BRIDGES

STANDARD CONSTRUCTION DRAWING F-3

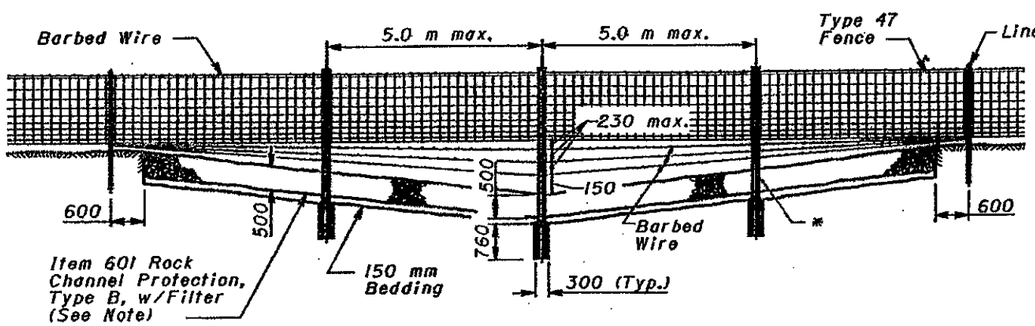
APPROVED _____ ENGR. R.D.

DATE
2-1-63
6-1-66
10-1-68
2-20-69
5-10-69
5-1-76

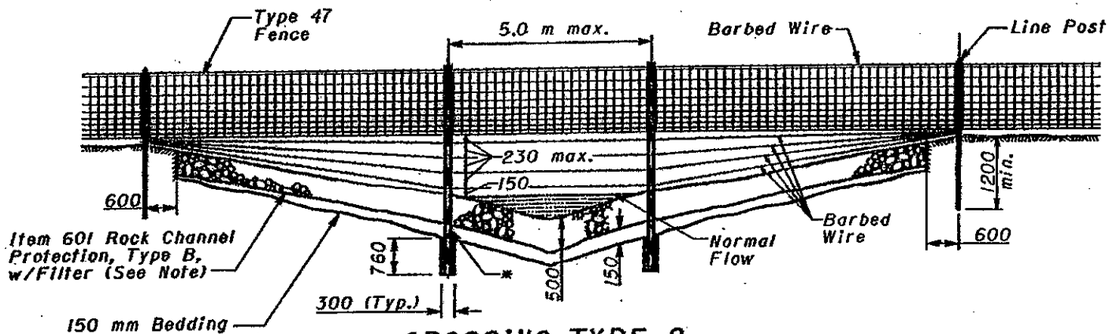


FUTURE MAINTENANCE OPENING

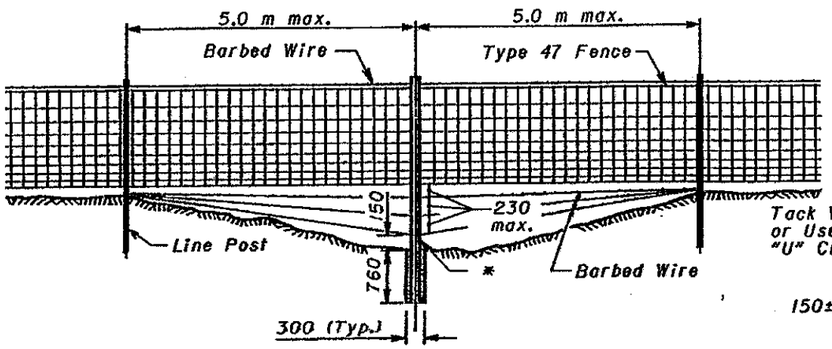
* Extra length posts shall be 63 mm dia. steel pipe or 75x75x6.4 mm angle, galvanized and set in concrete.



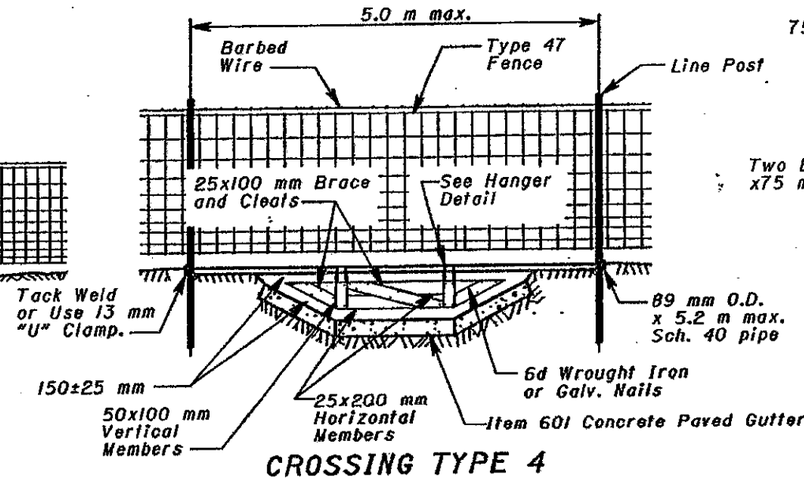
CROSSING TYPE 1



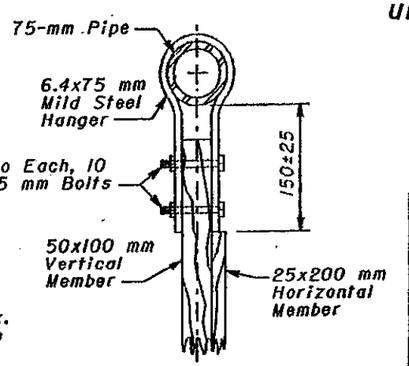
CROSSING TYPE 2



CROSSING TYPE 3



CROSSING TYPE 4



HANGER DETAIL

NOTES

FENCE DETAILS: Details shown on this drawing apply to standard Type 47 fence as detailed; however, the same designs may be used in the construction of all type of fence if modified for differences in basic design, such as anchor assembly, height of fence, length of panel, or other variances which would affect the design.

CROSSINGS: Types 1, 2, or 3, shall be provided at earth side ditches and streams served by culverts smaller than 1200 mm rise. A Type 4 crossing shall be provided where fence crosses a paved channel that is over 0.5 m deep.

TYPE 2 CROSSING: This Type is shown crossing a live stream, but it may also be used for intermittent flow channels. For a live stream crossing, the barbed wire may be deleted or its spacing varied, when directed by the Engineer, to prevent or reduce the collection of debris.

ROCK CHANNEL PROTECTION: Rock shall consist of 0.5 m of Rock Channel Protection, Type B, with Filter, unless otherwise shown on the plans or determined by the Engineer. It shall be placed 1.8 m wide (0.6 m outside the fence and 1.2 m inside the fence), and shall be paid for as Item 601 - Rock Channel Protection, Type ___ , w/Filter.

CONCRETE ENCASEMENT: When no rock channel protection is required, the 760 mm depth of concrete encasement shall be measured from the bottom of the channel.

MAINTENANCE OPENING: Barbed wire and fence fabric in the opening shall be separate from the approach wire fabric, and shall be installed after the wire and fabric has been streched and fastened on both approaches.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces F-6.

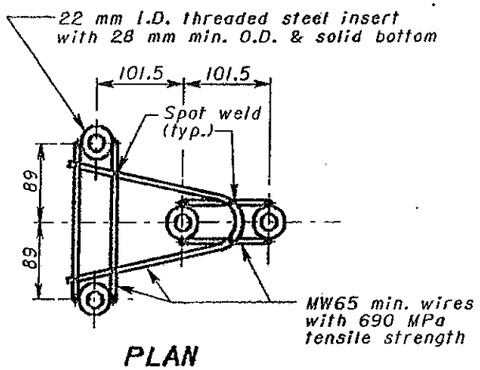
OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

FENCE DETAILS

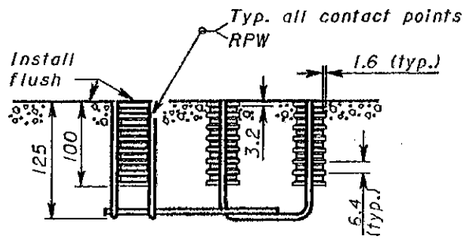
DATE
4-21-95
4-8-97

STANDARD CONSTRUCTION DRAWING F-3.4M

APPROVED Roger T. Sutherland
ADMINISTRATOR



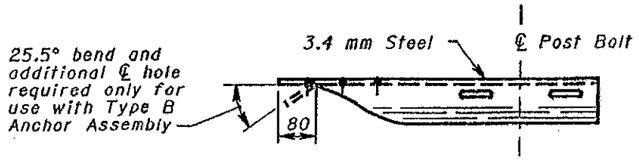
PLAN



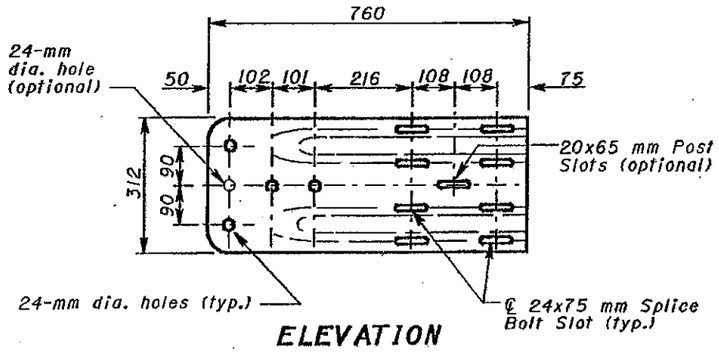
Four 22-mm bolts required

ELEVATION

CONCRETE INSERT ANCHOR ASSEMBLY (W-BEAM ONLY)

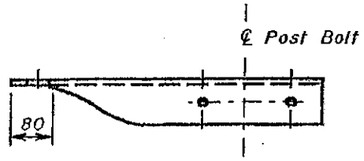


PLAN

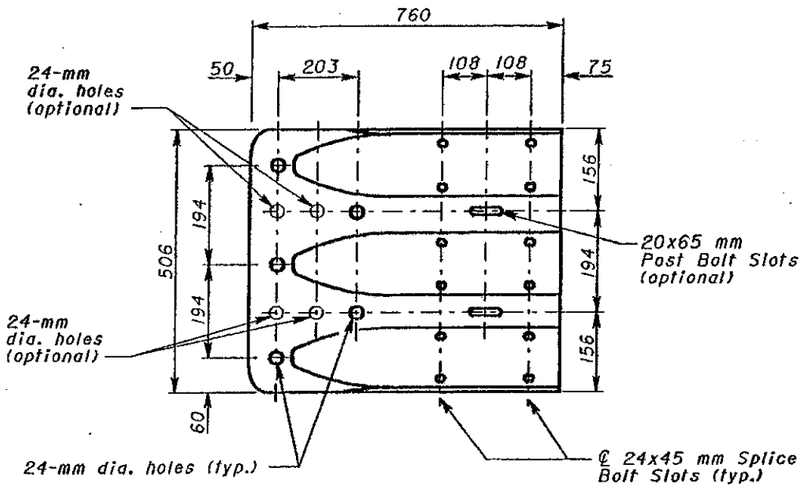


ELEVATION

W-BEAM TERMINAL CONNECTOR

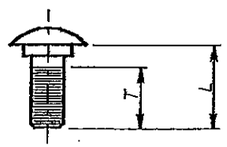


PLAN



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

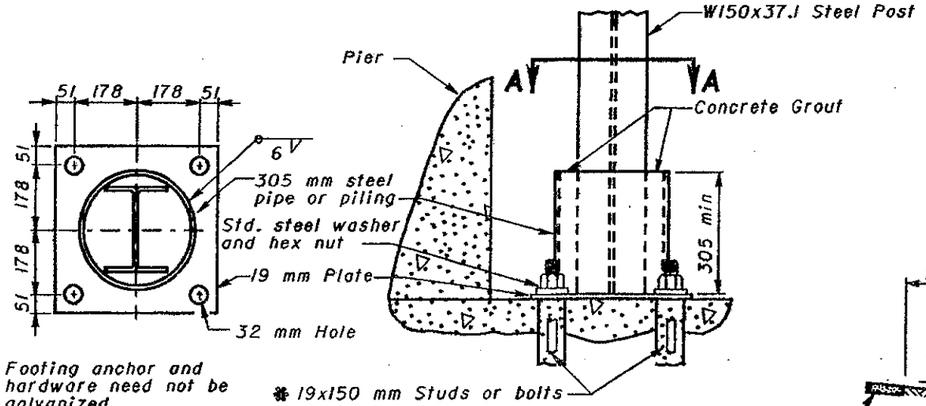
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

DATE
11-30-94
10-21-97

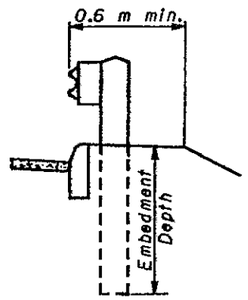
STANDARD CONSTRUCTION DRAWING GR-1.1M

APPROVED Gary F. Sutherland

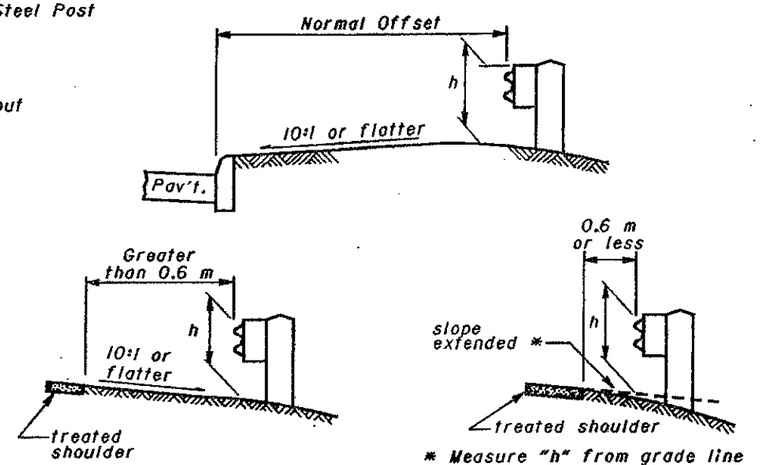


SECTION A-A ELEVATION

FOOTING ANCHOR

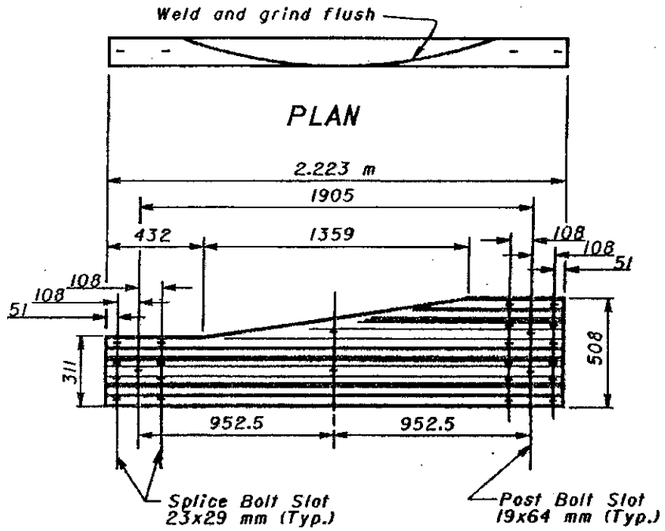


DETAIL A



h = Standard height (Tolerance ±25 mm)

MEASURING GUARDRAIL HEIGHT



ELEVATION

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.

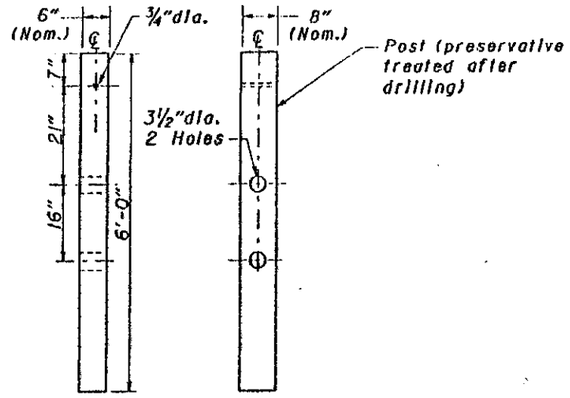
OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

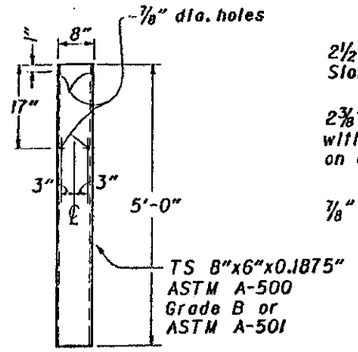
DATE 1-3-96

STANDARD CONSTRUCTION DRAWING **GR-1.2M**

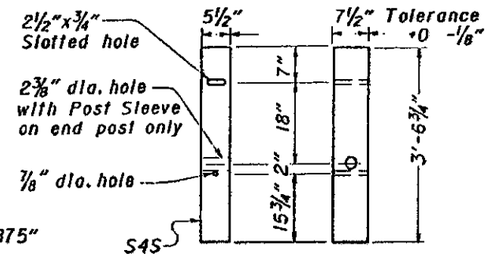
APPROVED R.K. Hellman, P.E.
ADMINISTRATOR



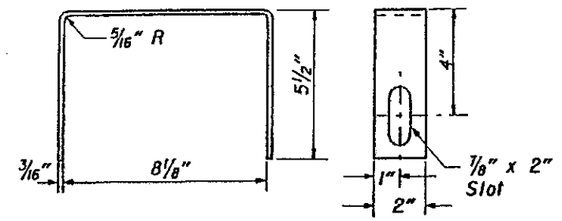
TYPE 1 BREAKAWAY POST



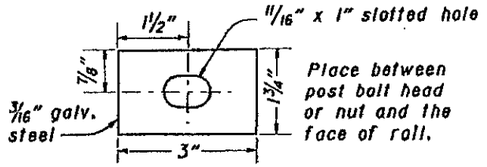
STEEL TUBE



TYPE 2 BREAKAWAY POST

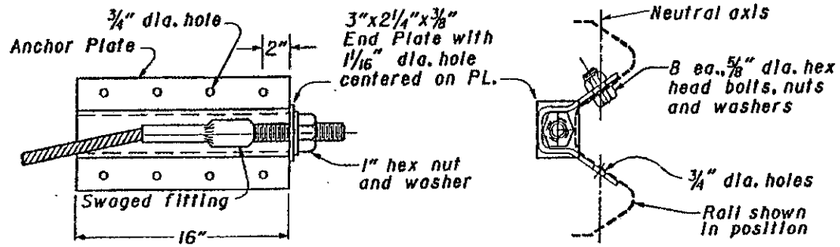


YOKE DETAILS

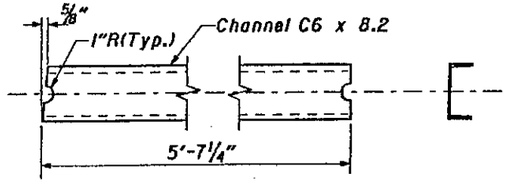


RECTANGULAR WASHER

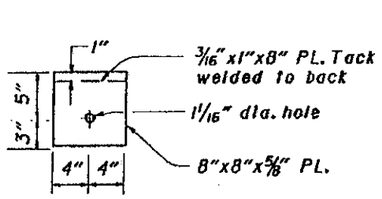
(Not to be used in typical Type 4, 5 or 5A guardrail installations. Use only where specified.)



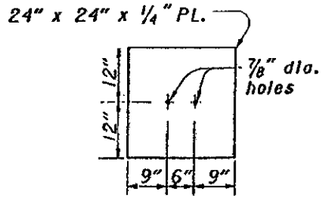
ANCHOR PLATE ASSEMBLY DETAILS



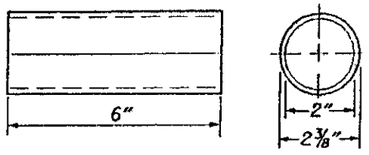
STRUT DETAILS



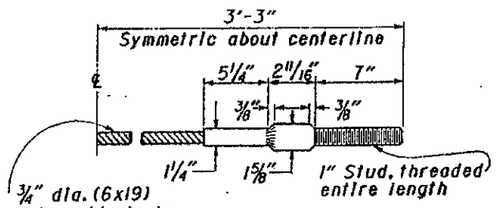
BEARING PLATE



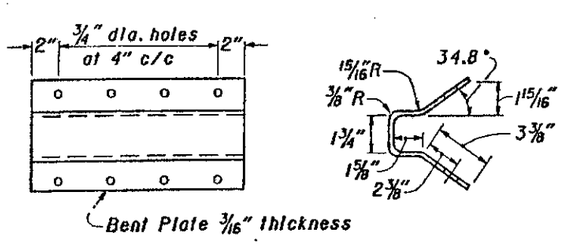
SOIL PLATE



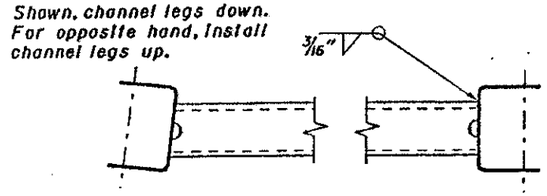
POST SLEEVE



STANDARD SWAGED FITTING AND STUD CABLE ASSEMBLY



ANCHOR PLATE



STRUT AND YOKE ASSEMBLY

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

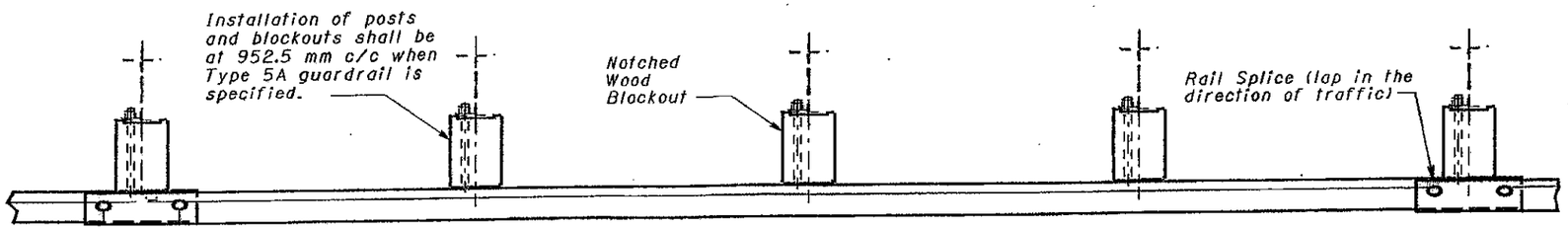
GUARDRAIL DETAILS

DATE 2-21-92

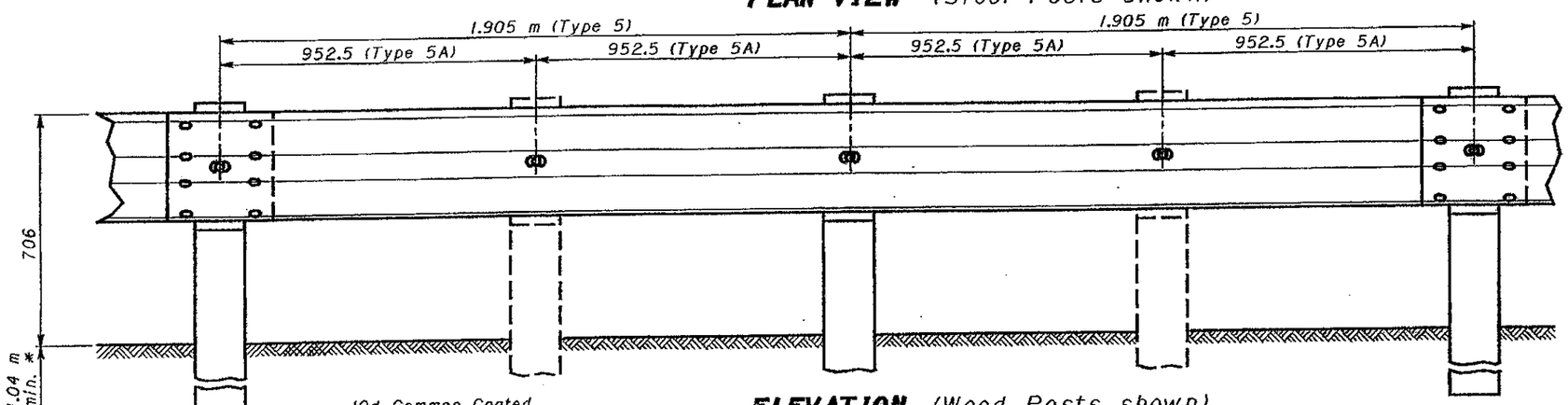
STANDARD CONSTRUCTION DRAWING

GR-1.3

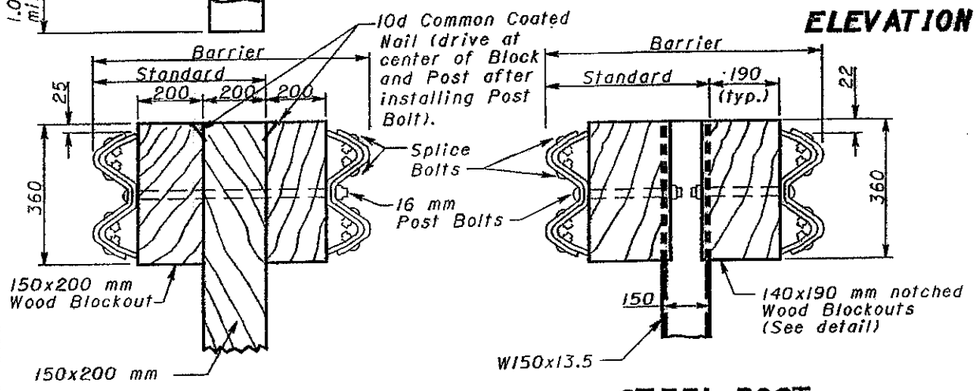
APPROVED A.K. Hulman ENGR., L & D



PLAN VIEW (Steel Posts shown)

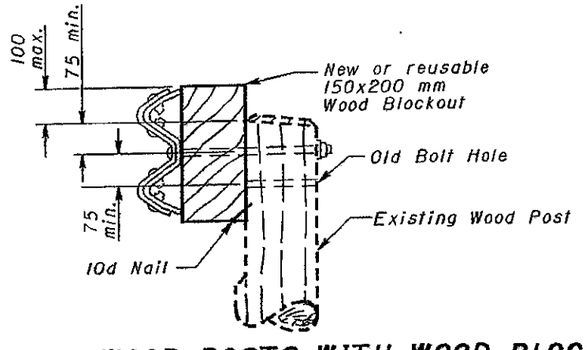


ELEVATION (Wood Posts shown)

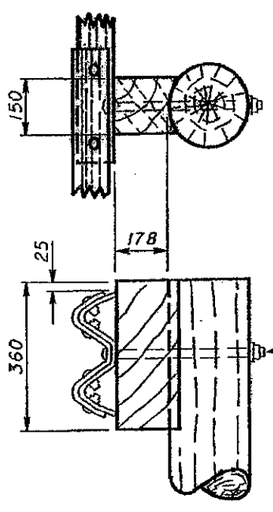


SQUARE WOOD POST

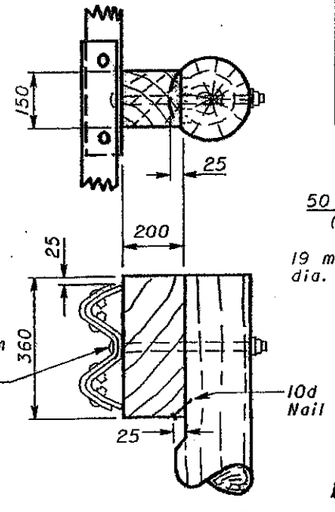
STEEL POST



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

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.

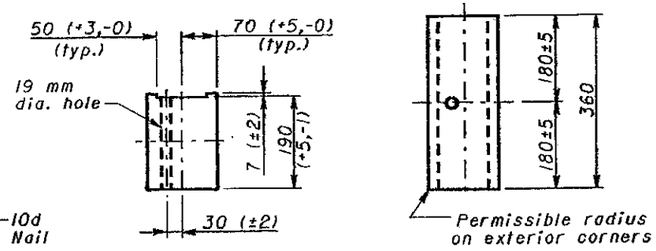
Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.

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

All dimensions are in millimeters unless otherwise noted.

metric units

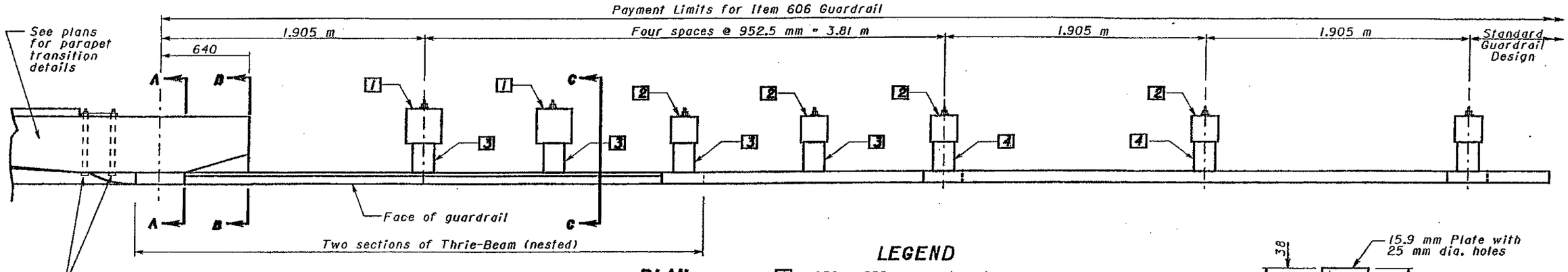
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL TYPE 5 & 5A

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

STANDARD CONSTRUCTION DRAWING **GR-2.1M**

APPROVED Lange E. Sutherland

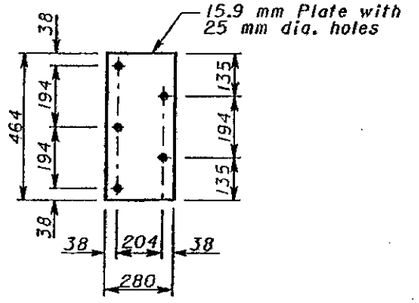


PLAN

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)

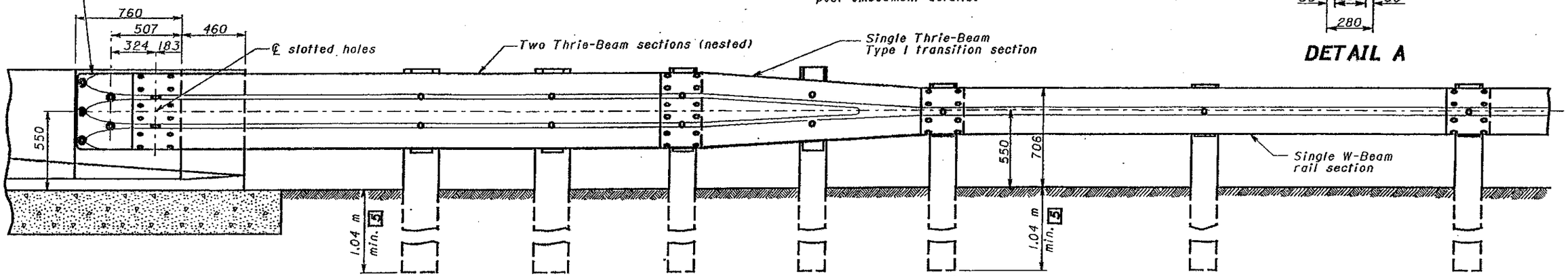
LEGEND

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.

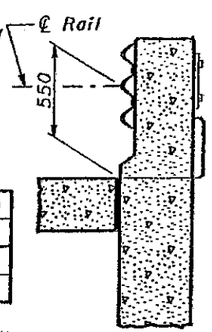
POSTS:
GENERAL - Posts may be set in drilled holes or driven to grade.

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.

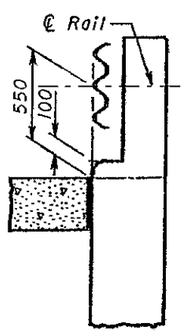
ALTERNATE POSTS AND BLOCKOUTS for Type I Bridge Terminal Assemblies may be furnished according to the following chart. Plastic blockouts shall not be permitted for Type I Bridge Terminal Assemblies.

Wood Posts & Blockouts	250x250 mm	200x200 mm
Steel Posts	W200x35.9	W150x37.1
Wood Blockouts	150x200 mm	
Steel Blockouts	W150x13.5	

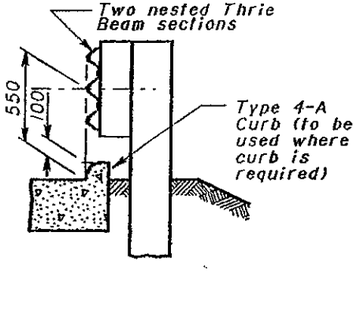
PAYMENT:
Payment for Item 606 - Each, Bridge Terminal Assembly, Type I, shall include the extra cost, in excess of normal guardrail cost, for additional and different type posts and blockouts, nested Thrie-Beam sections, terminal connector, Thrie-Beam transition section, steel plate, bolts, hex nuts, 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

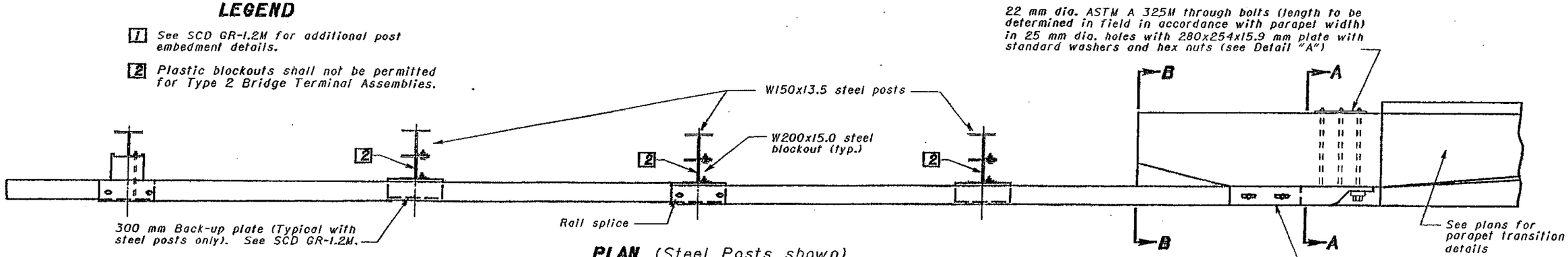
STANDARD CONSTRUCTION DRAWING **GR-3.1M**

APPROVED Gary F. Eberhardt

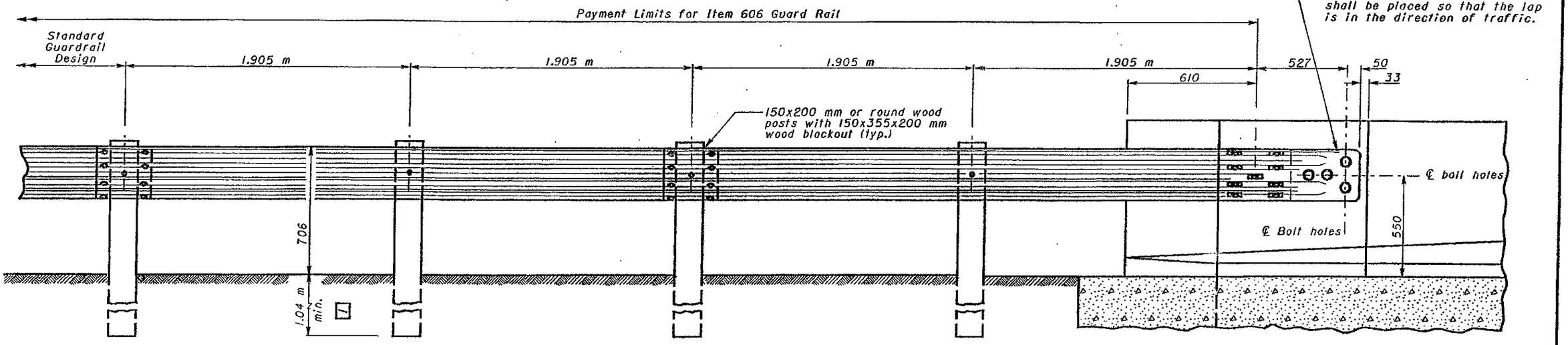
LEGEND

[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)

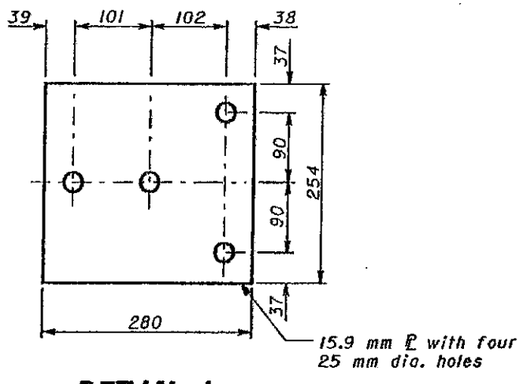
NOTES

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

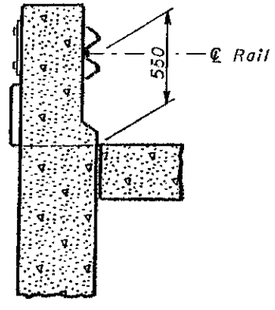
APPLICATION:
The Type 2 Bridge Terminal Assembly shall be used to connect guardrail runs to the trailing end of bridge parapets or other concrete barrier installations on one-direction roadways.

POSTS:
Posts shall be of standard size and material specified for the appropriate type of guardrail to be installed leaving the bridge or barrier.

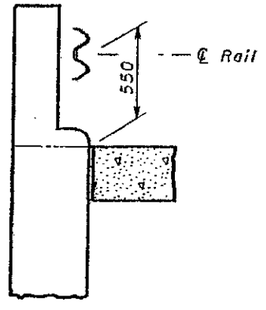
PAYMENT:
Payment for Item 606 - Each, Bridge Terminal Assembly, Type 2 shall include the extra cost, in excess of normal guardrail cost, for the terminal connector, steel blockouts, plates, bolts, hex nuts, washers and other hardware.



DETAIL A



SECTION A - A



SECTION B - B

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces GR-3.2.

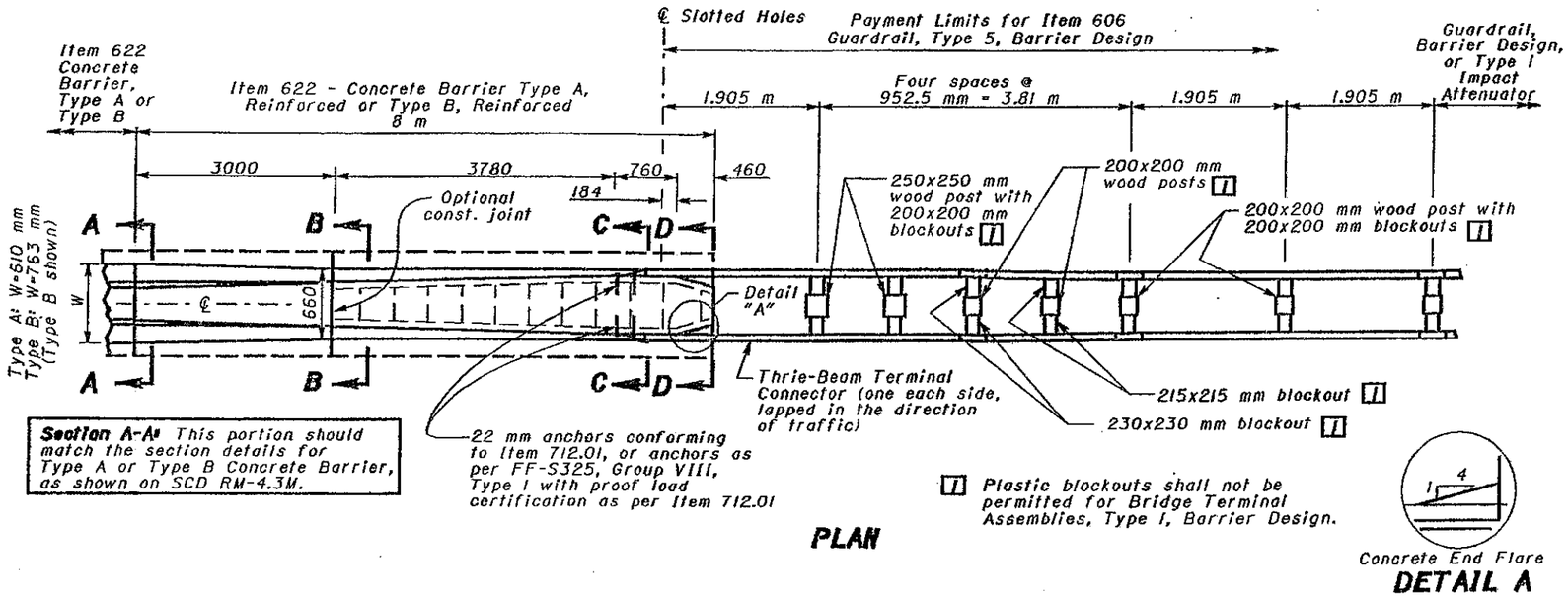
OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE TERMINAL ASSEMBLY, TYPE 2

DATE
11-30-94
10-21-97

STANDARD CONSTRUCTION DRAWING GR-3.2M

APPROVED Gary L. Sutherland

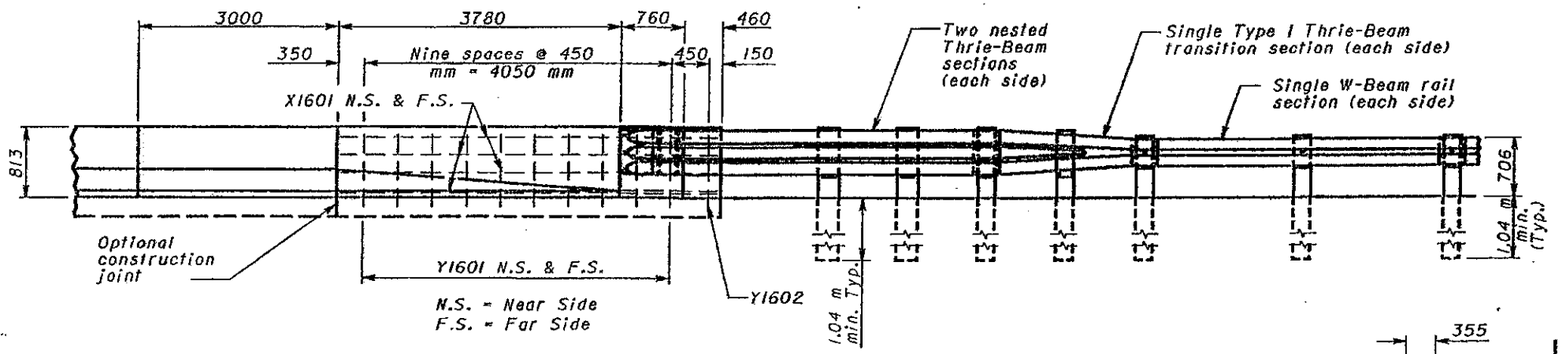


Section A-A: This portion should match the section details for Type A or Type B Concrete Barrier, as shown on SCD RM-4.3M.

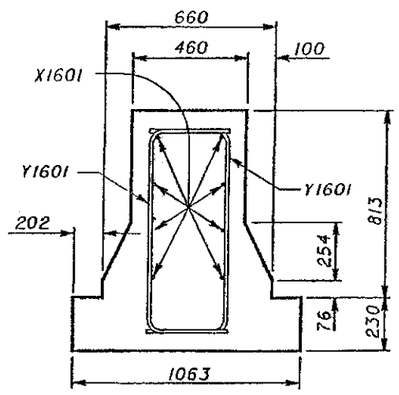
PLAN

Concrete End Flare

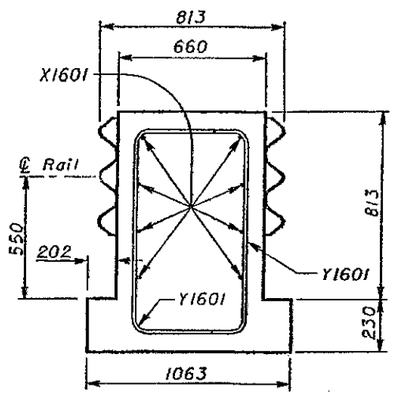
DETAIL A



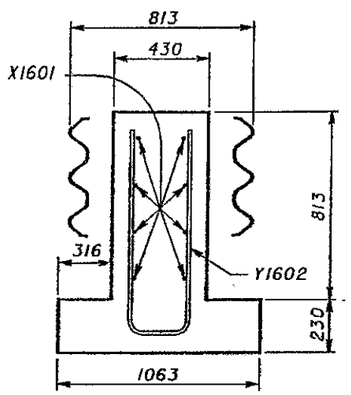
ELEVATION



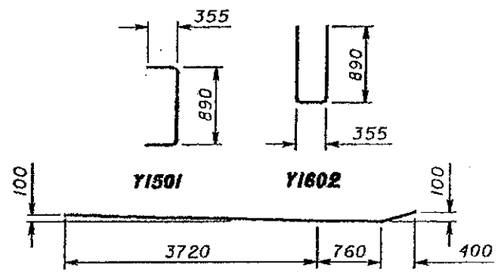
SECTION B-B



SECTION C-C



VIEW D-D



BENDING DIAGRAMS

REINFORCING BAR LIST

MARK	LENGTH (mm)	SHAPE	QUANITY	MASS (kg)
X1601	4880	Bent	8 Each	61
Y1601	1530	Bent	20 Each	48
Y1602	2060	Bent	1 Each	4
Total Mass (for information only):				113

NOTES

GENERAL: For additional details, see SCD's GR-1.1M, GR-1.2M and other Drawings pertaining to design of specific guardrail types. See SCD RM-4.3M for concrete barrier details.

APPLICATION: The Bridge Terminal Assembly, Type 1, Barrier Design, shall be used to connect Type 5 barrier design guardrail or Type 1 Impact Attenuators to concrete median barriers.

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

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

Steel Posts and Blockouts may be furnished as an alternate. The steel alternates for wood posts are listed below.

Wood Posts	250x250 mm	200x200 mm
Steel Posts	W200x35.9	W150x37.1

REINFORCING: All reinforcing bars shall be epoxy coated and included in the cost of Item 622.

PAYMENT: Payment for the guardrail transition section will be made at the unit price bid per Each for Item 606 - Bridge Terminal Assembly, Type 1, Barrier Design and shall include the extra cost, in excess of normal guardrail costs, for additional and different type posts and blockouts, nested thrie beam sections, terminal connectors, thrie beam transitions sections, bolts, anchors, washers, and other hardware.

Payment for the concrete transition section will be made at the unit price bid per Meter for Item 622 - Concrete Barrier, Type ____ (A, Reinforced or B, Reinforced) and shall include all materials, labor, and reinforcing steel required to construct the barrier as shown within the limits defined. (See Plan view.)

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces GR-3.5.

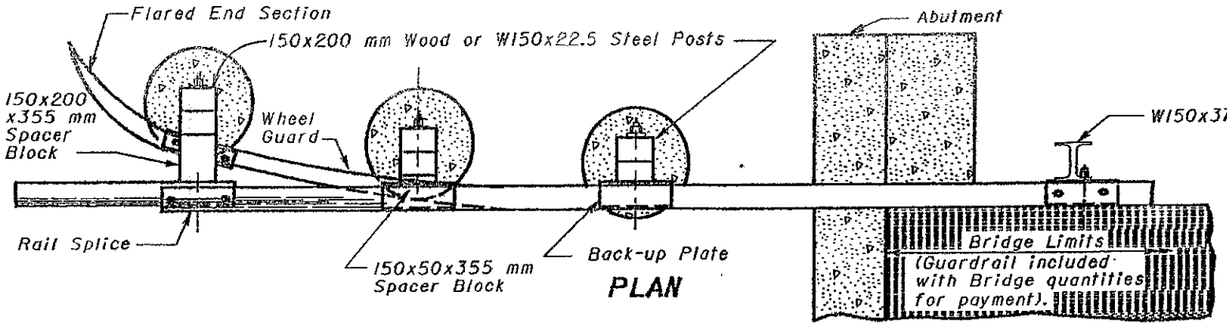
OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE TERMINAL ASSEMBLY, TYPE 1, BARRIER DESIGN

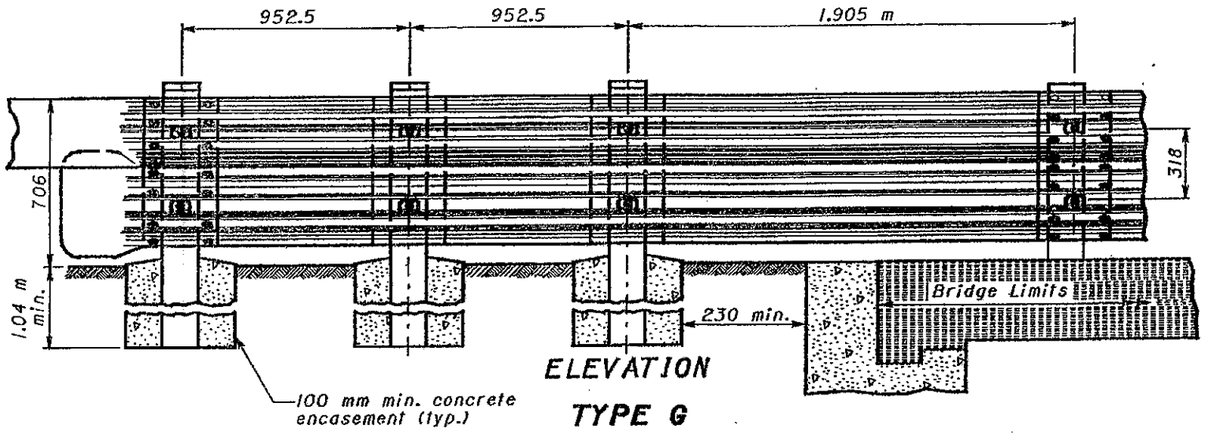
STANDARD CONSTRUCTION DRAWING **GR-3.5M**

APPROVED Lawrence F. Sutherland

DATE
1-3-96
10-21-97



PLAN



ELEVATION

TYPE G

NOTES

PAYMENT: Item 606, Each, Bridge Terminal Assembly, Type ____, shall include the additional cost in excess of normal guardrail cost, such as additional or heavier posts, concrete, encasement, wheelguard beyond bridge limits, extra rail, terminal connector, anchors and other hardware, etc.

FOR DETAILS NOT SHOWN: See SCD's GR-1.1M, GR-1.2M, GR-1.3M, GR-4.1M and other drawings pertaining to design of specific guardrail Type.

GUARDRAIL TERMINATION: Terminate as directed by the Engineer. The 3.81 m normal rail section may vary as shown to facilitate connection or reconstruction of existing approach guardrail. The 527 mm terminal connector or 356 mm Post A location dimensions may be increased to avoid existing parapet steel.

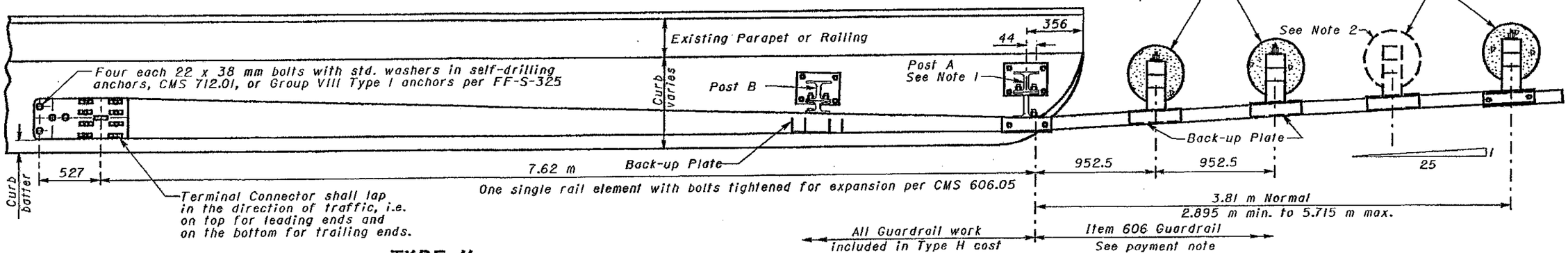
SPACER BLOCK: Size may be increased if necessary to locate posts beyond wide approach slab.

POSTS: Posts shall be 150x200 mm wood or W150x 22.5 steel (except posts A and B of Type H) of the same material type as used on approach guardrail, with 100 mm minimum concrete encasement.

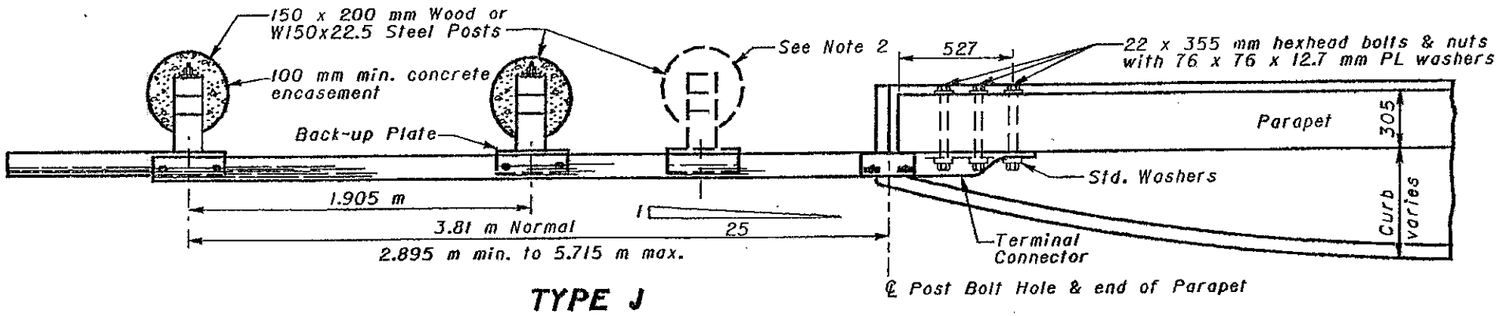
NOTE 1: These posts correspond with posts A and B as detailed on SCD GR-4.1M, except that they are mounted on plates as detailed on GR-1.2M. Top of rail at post A shall be 706 mm above bridge deck.

NOTE 2: Place one additional encased post halfway between 2nd and 3rd posts (Type H) or 1st post and bridge parapet (Type J) when panel length exceeds 3.81 m.

All dimensions are in millimeters unless otherwise noted.



TYPE H



TYPE J

(Trailing end, one-way traffic only)

metric units

This Drawing Replaces GR-3B.

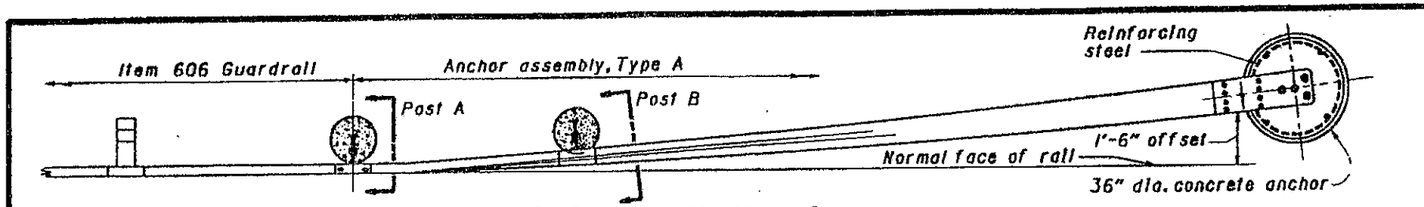
OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE TERMINAL ASSEMBLIES

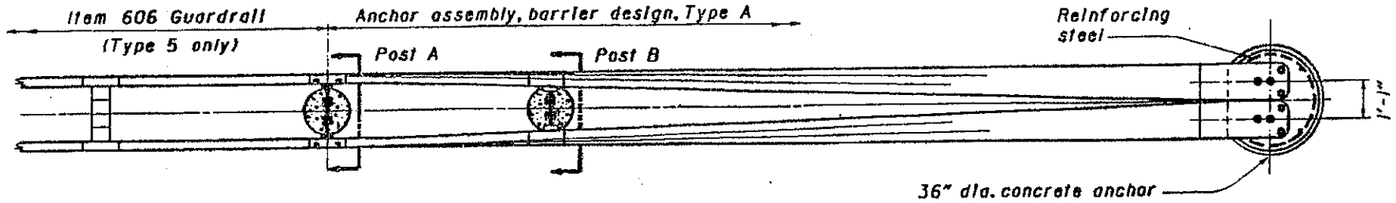
DATE: 11-30-94, 10-21-97

STANDARD CONSTRUCTION DRAWING **GR-3.7M**

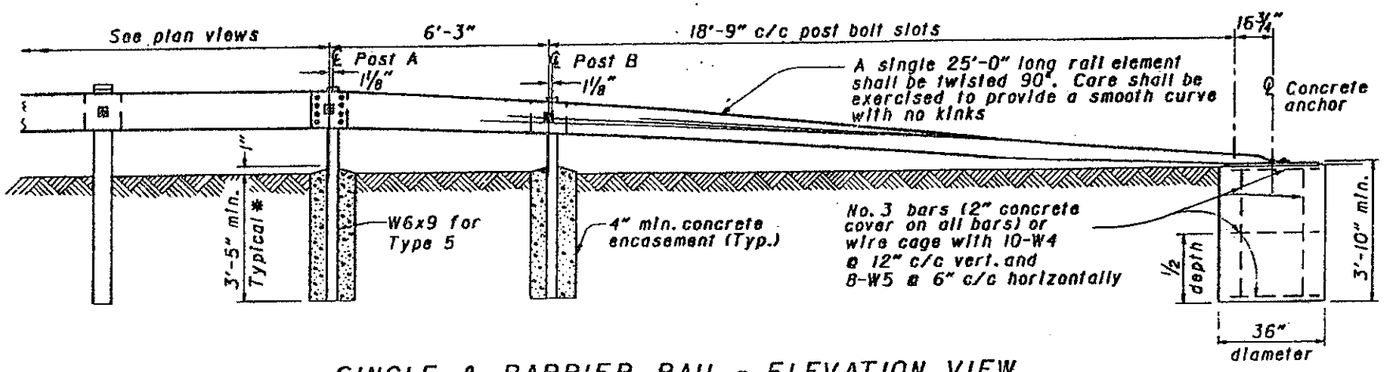
APPROVED Lanyt T. Leuffland



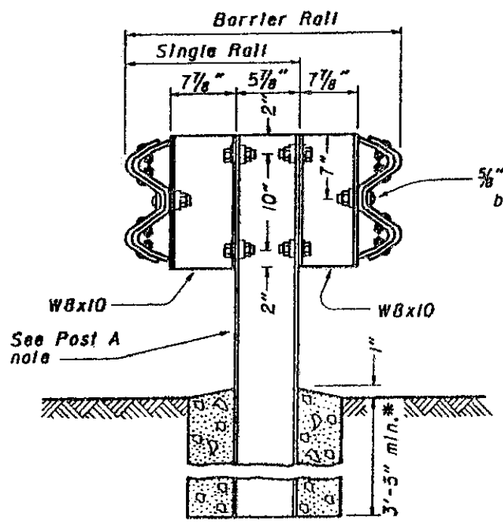
SINGLE RAIL - PLAN VIEW



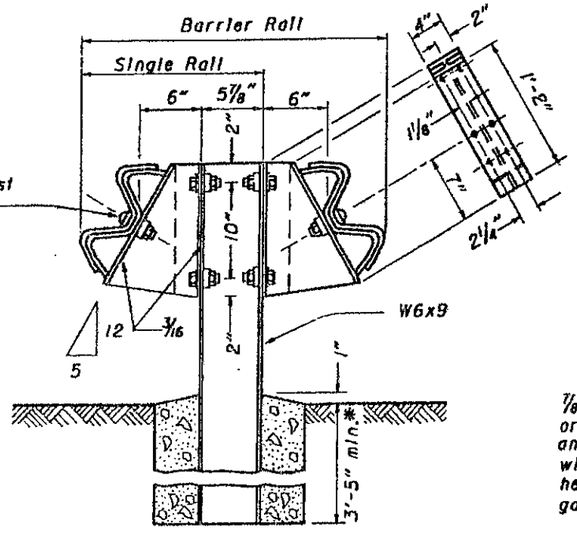
BARRIER RAIL - PLAN VIEW



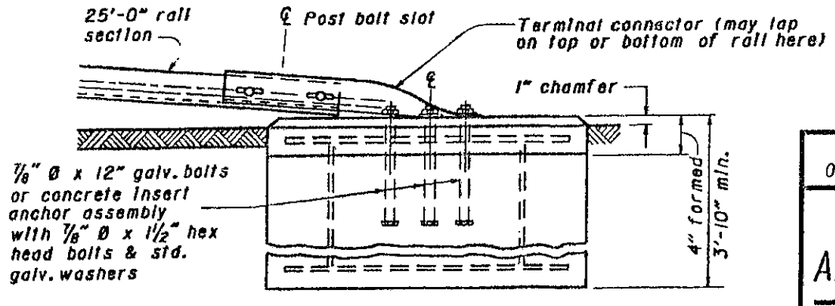
SINGLE & BARRIER RAIL - ELEVATION VIEW



POST A



POST B



CONCRETE ANCHOR

NOTES

GENERAL: For details not shown, see Std. Const. Dwgs. GR-1.1, GR-1.2 and other Standard Construction Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

The 1'-6" 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 for Post B shall be made of 3/16" steel plate as per 710.15, or two sections of W6 x 9 or W8 x 10 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 ⅝" hexhead bolts and nuts with standard washers on both sides.

ALL WASHERS INDICATED on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" 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 ⅝" diameter.

* **FOR SINGLE RAIL INSTALLATIONS,** see Standard Construction Drawing GR-1.2 for additional post embedment details.

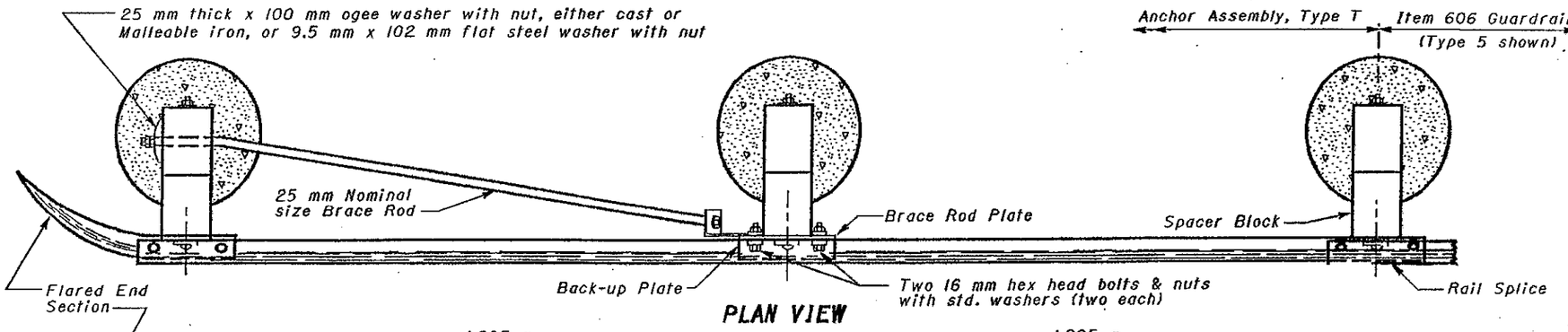
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TYPE A ANCHOR ASSEMBLY

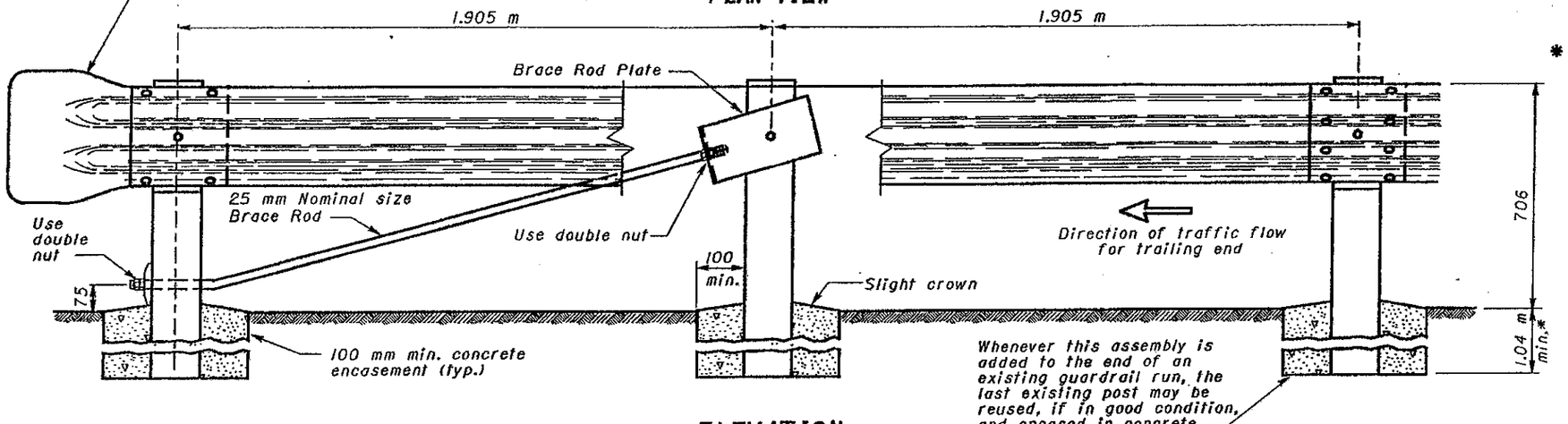
DATE 5-6-91

STANDARD CONSTRUCTION DRAWING GR-4.1

APPROVED D. K. Hulman ENGR., L. & D.

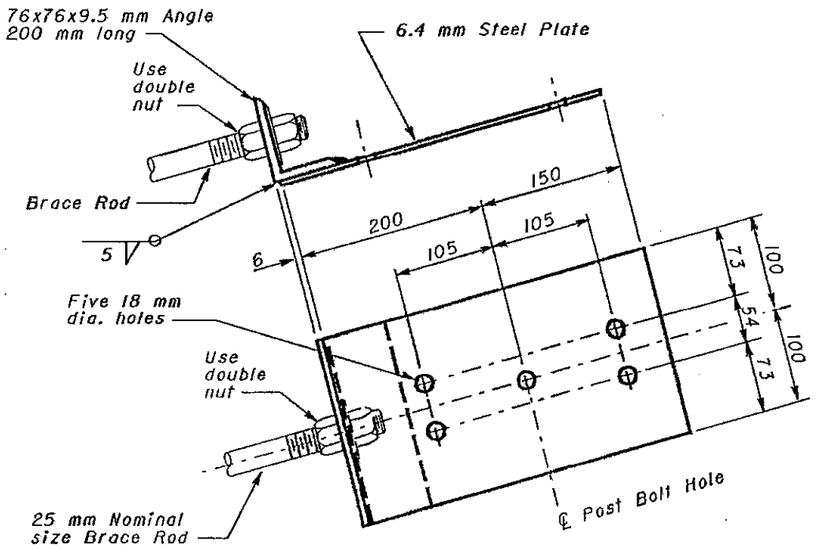


PLAN VIEW

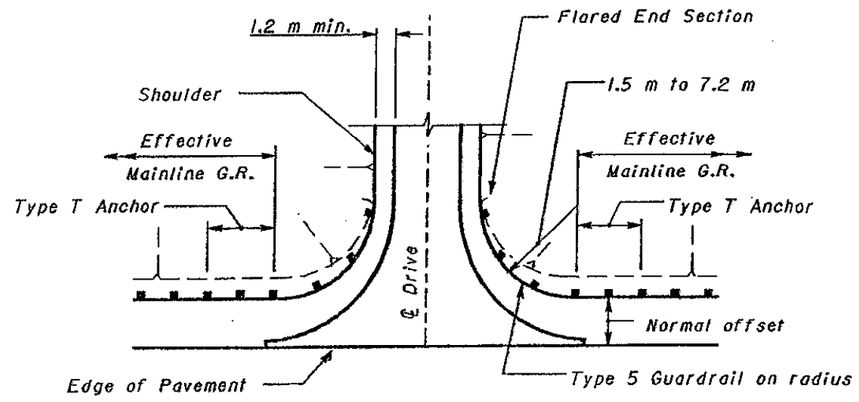


ELEVATION

TYPE T



BRACE ROD PLATE



DRIVEWAY OPENING

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.

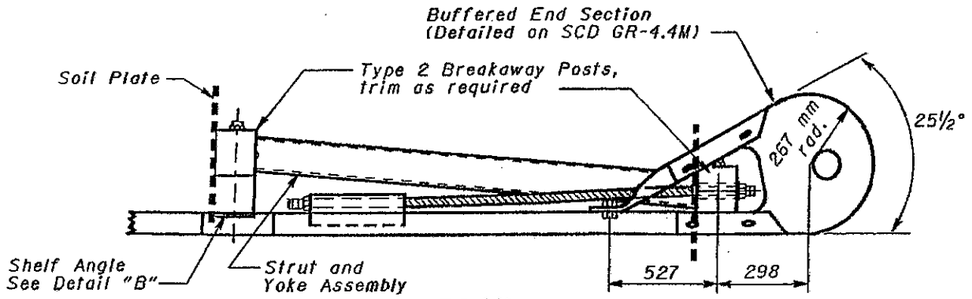
* **FOR SPECIFIC POST EMBEDMENT:** See SCD GR-1.2M for depth requirements.

All dimensions are in millimeters unless otherwise noted.

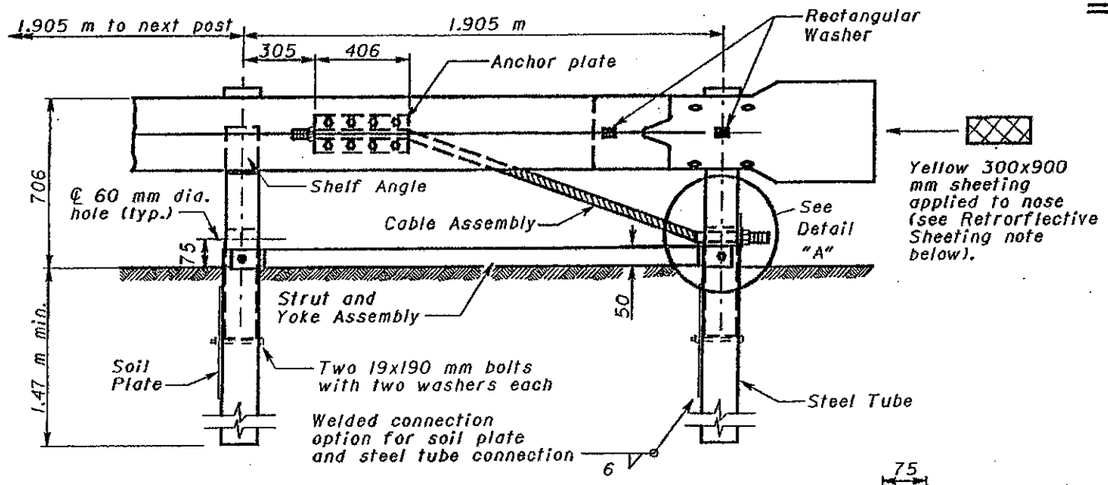
metric units

OHIO DEPARTMENT OF TRANSPORTATION

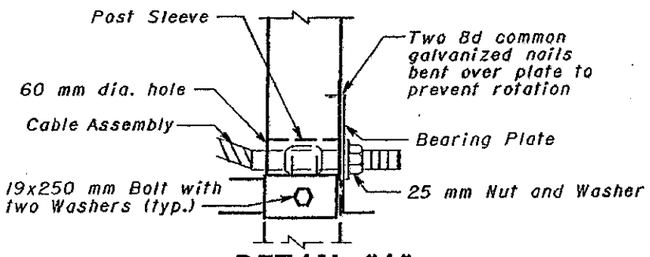
TYPE T ANCHOR ASSEMBLY	DATE: 4-21-95, 10-21-97
STANDARD CONSTRUCTION DRAWING GR-4.2M	
APPROVED: Gary T. Sutherland	



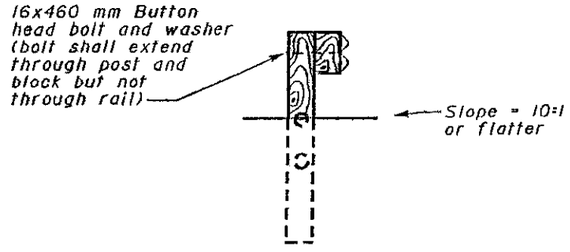
PLAN



ELEVATION

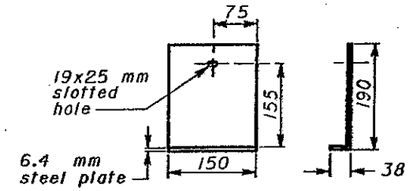


DETAIL "A"

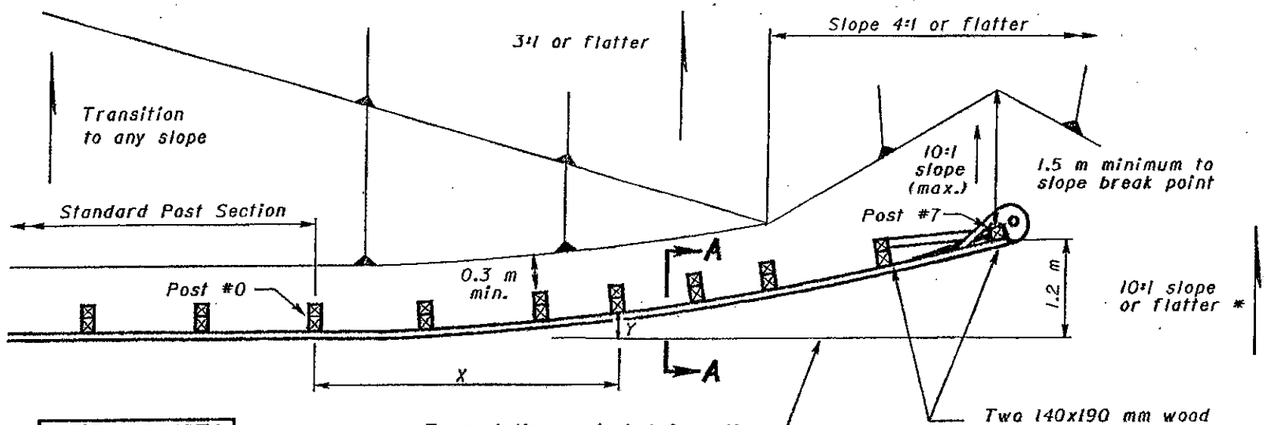


SECTION A-A

Type 1 Breakaway Post and Block

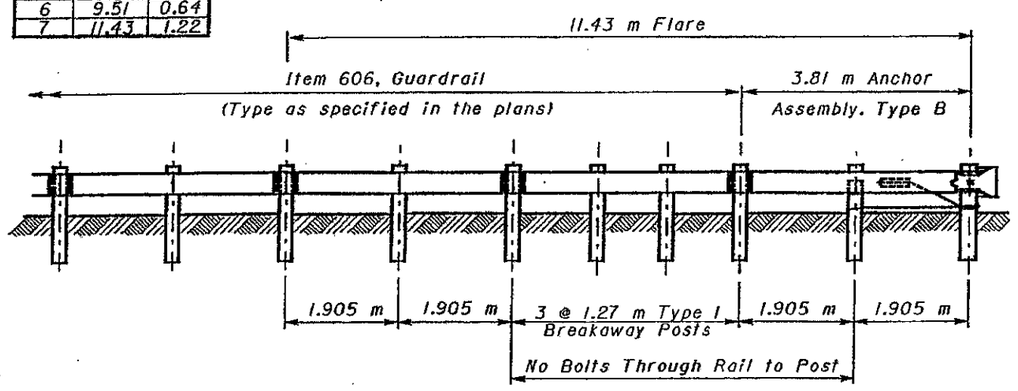


DETAIL "B"
SHELF ANGLE



PLAN

FLARE OFFSETS (in meters)		
Post	X	Y
0	0.0	0.0
1	1.89	0.03
2	3.81	0.06
3	5.09	0.09
4	6.34	0.21
5	7.62	0.37
6	9.51	0.64
7	11.43	1.22



ELEVATION

All dimensions are in millimeters unless otherwise noted.

NOTES

GENERAL: For details not shown, see SCD's GR-1.1M, GR-1.2M, GR-1.3M, GR-4.4M and other Drawings pertaining to design of specific guardrail types. All angles, channels and plates shall conform to CMS 711.01. Structural tubing shall conform to CMS 707.10. All structural steel shall be galvanized as per CMS 711.02.

POST OFFSET: Dimensions are given to the center of the face of the blockouts, except at Post #7, where the dimension is to the center of the face of the post.

GRADING OF SLOPES AND TRANSITIONS: Grading must be provided as shown for the Type B Anchor Assembly to function correctly.

* **10:1 SLOPE:** This slope shall extend a minimum of 15 m approaching the Assembly where it shall be smoothly transitioned to the graded shoulder slopes shown on the Typical Sections.

SHEETING: Retroreflective sheeting shall not be required when the offset distance to the face of the Buffer End Section from the near edge of the adjacent pavement is 6 m, or greater.

The sheeting shall be Standard, Type G, meeting the requirements of CMS 730.19, and shall be applied as per manufacturers' recommended procedure. Sheeting shall not be applied when the ambient temperature is below 4 °C.

PAYMENT: All materials and labor for the 3.81 m Type B Anchor Assembly shown, including any extra cost for using Breakaway Line Posts, shall be included in the unit price bid for Item 606, Each, Anchor Assembly, Type B. Payment for grading requirements shown herein shall be made under Item 203 as specified in the plans.

metric units

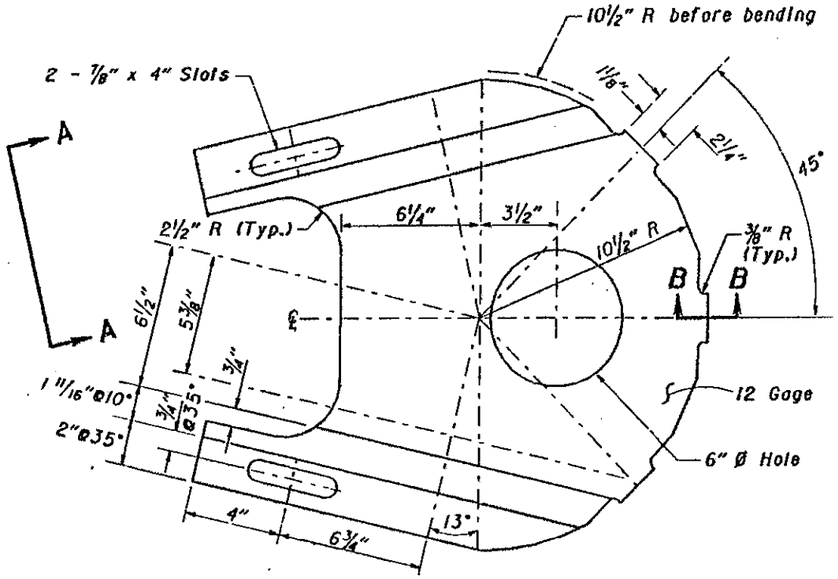
OHIO DEPARTMENT OF TRANSPORTATION

TYPE B ANCHOR ASSEMBLY

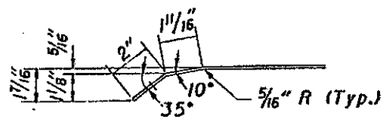
DATE: 11-30-94, 10-21-97

STANDARD CONSTRUCTION DRAWING **GR-4.3M**

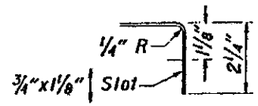
APPROVED: Larry T. Sutherland



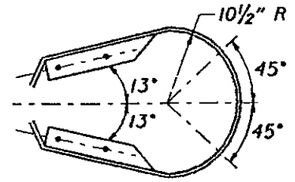
DIAPHRAGM PLATE DETAIL
(2 Required each Terminal)



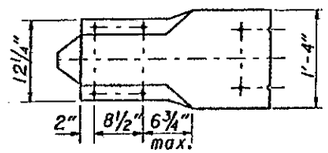
DIAPHRAGM PLATE DETAIL
VIEW A-A



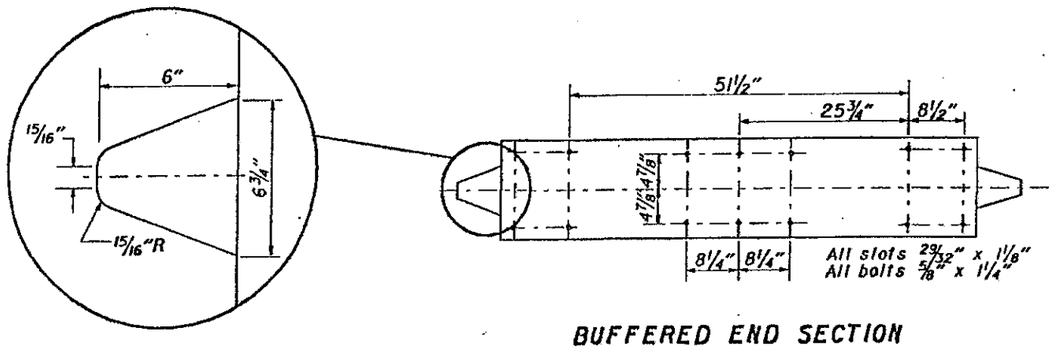
DIAPHRAGM PLATE DETAIL
VIEW B-B



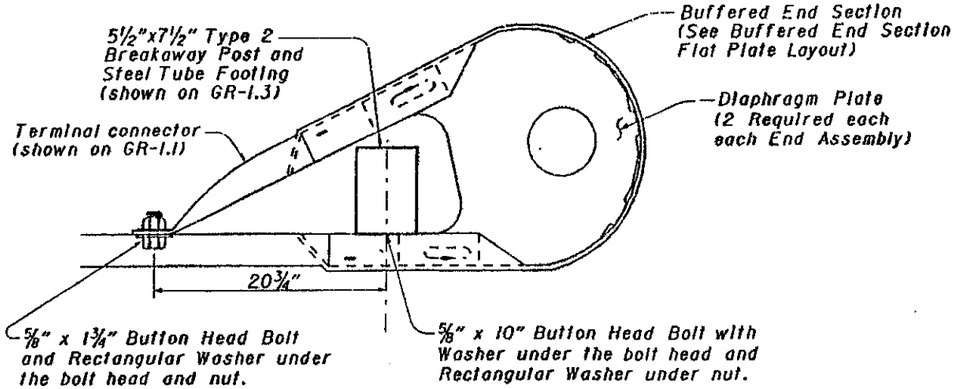
BUFFERED END SECTION
PLAN



BUFFERED END SECTION
ELEVATION



BUFFERED END SECTION
FLAT PLATE LAYOUT



BUFFERED END ASSEMBLY

NOTES

FOR COMPLETE Installation and assembly details, see Std. Const. Dwg. GR-4.3.

ALL STRUCTURAL STEEL shall be galvanized as per 711.02.

FOR ADDITIONAL DETAILS, see Standard Construction Drawings GR-1.1, 1.2 and 1.3.

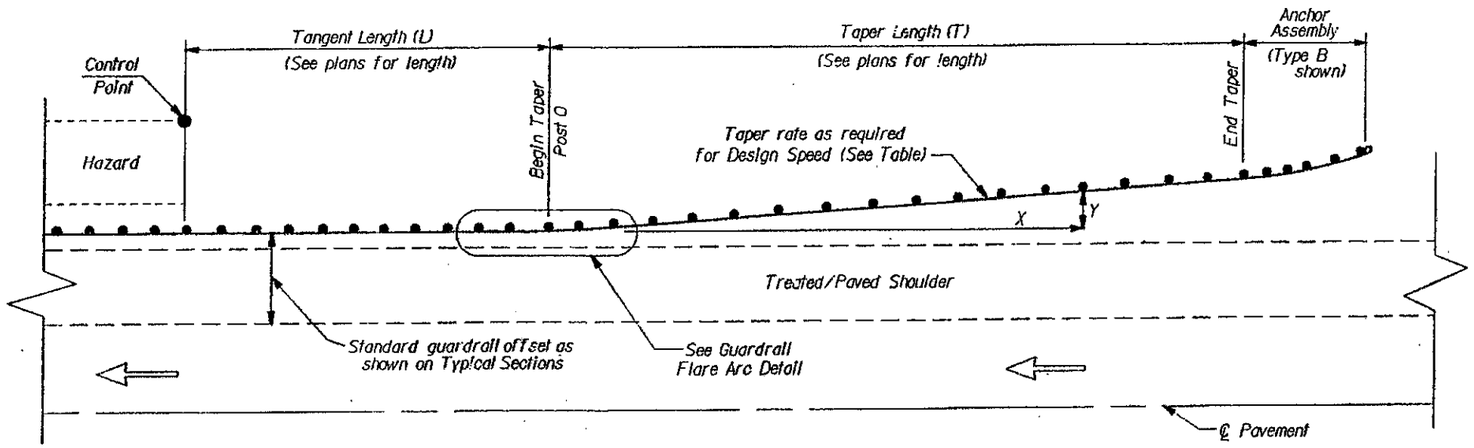
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TYPE B ANCHOR ASSEMBLY DETAILS

DATE 2-21-92

STANDARD CONSTRUCTION DRAWING GR-4.4

APPROVED D. K. Hedrman ENGR., L & D



STANDARD GUARDRAIL FLARE
(Plan View)

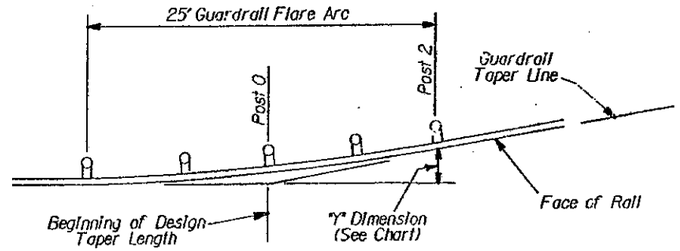
NOTES

THE STANDARD GUARDRAIL FLARE shown herein shall be constructed when indicated in the construction plans and in conjunction with Standard Construction Drawing GR-5.2. The Tangent Length and Taper Length used to construct each flare shall be as specified in the plans.

SPEEDS used to determine taper rates and offsets shall be the design speed indicated in the plan. Where a design speed is not shown or available, the legal posted speed limit shall be used. For design speeds below 45 mph, the tapered guardrail offsets shown for 45 mph may be used.

AN ANCHOR ASSEMBLY, Type B shall be used with standard guardrail flares unless otherwise specified.

THE CONTROL POINT shown designates the extent of the hazard being shielded and is shown for design use only.



GUARDRAIL FLARE ARC DETAIL

TAPERED GUARDRAIL OFFSETS (In feet)

		45 MPH 10:1 Taper		50 MPH 11:1 Taper		55 MPH 12:1 Taper		60 MPH 13:1 Taper		65 MPH 14:1 Taper		70 MPH 15:1 Taper	
	Post	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	0	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.2	0.0	0.2	0.0	0.2
	2	12.4	1.3	12.5	1.1	12.5	1.0	12.5	1.0	12.5	0.9	12.5	0.8
25' Taper Length	4	24.9	2.5	24.9	2.3	24.9	2.1	24.9	1.9	24.9	1.8	24.9	1.7
	6	37.3	3.7	37.3	3.4	37.4	3.1	37.4	2.9	37.4	2.7	37.4	2.5
50' Taper Length	8	49.8	5.0	49.8	4.5	49.8	4.1	49.9	3.8	49.9	3.6	49.9	3.3
	10	62.2	6.2	62.2	5.7	62.3	5.2	62.3	4.8	62.3	4.5	62.4	4.2
75' Taper Length	12	74.6	7.5	74.7	6.8	74.7	6.2	74.8	5.7	74.8	5.3	74.8	5.0
	14	87.1	8.7	87.1	7.9	87.2	7.3	87.2	6.7	87.3	6.2	87.3	5.8
100' Taper Length	16	99.5	9.9	99.6	9.1	99.7	8.3	99.7	7.7	99.7	7.1	99.8	6.7
	18	111.9	11.2	112.0	10.2	112.1	9.3	112.2	8.6	112.2	8.0	112.3	7.5
125' Taper Length	20	124.4	12.4	124.5	11.3	124.6	10.4	124.7	9.5	124.7	8.9	124.7	8.3
	22	136.8	13.7	136.9	12.5	137.0	11.4	137.1	10.5	137.1	9.8	137.2	9.1
150' Taper Length	24	149.3	14.9	149.4	13.6	149.5	12.5	149.6	11.5	149.6	10.7	149.7	10.0
	26	161.7	16.2	161.8	14.7	161.9	13.5	162.0	12.5	162.1	11.6	162.1	10.8
175' Taper Length	28	174.1	17.4	174.3	15.8	174.4	14.5	174.5	13.4	174.6	12.5	174.6	11.6
	30	186.6	18.7	186.7	17.0	186.9	15.6	186.9	14.4	187.0	13.4	187.1	12.5
200' Taper Length	32	199.0	19.9	199.2	18.1	199.3	16.6	199.4	15.3	199.5	14.3	199.6	13.3

All "X" dimensions shown are from the centerline of Post 0 to the centerline of the indicated post along the standard guardrail offset line extended.
All "Y" dimensions shown are from the standard guardrail offset line extended to the face of rail at the post indicated.

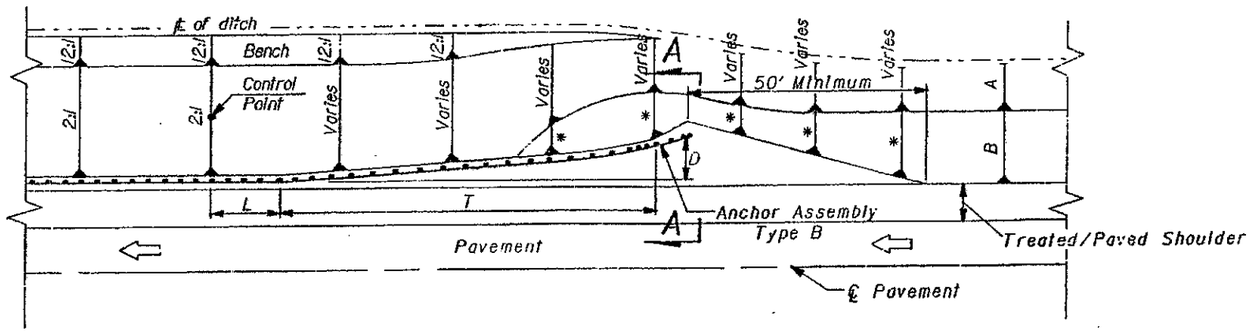
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL FLARE DETAILS

DATE 10-30-92

STANDARD CONSTRUCTION DRAWING **GR - 5.1**

APPROVED R.K. Hubman ENGR., L & D



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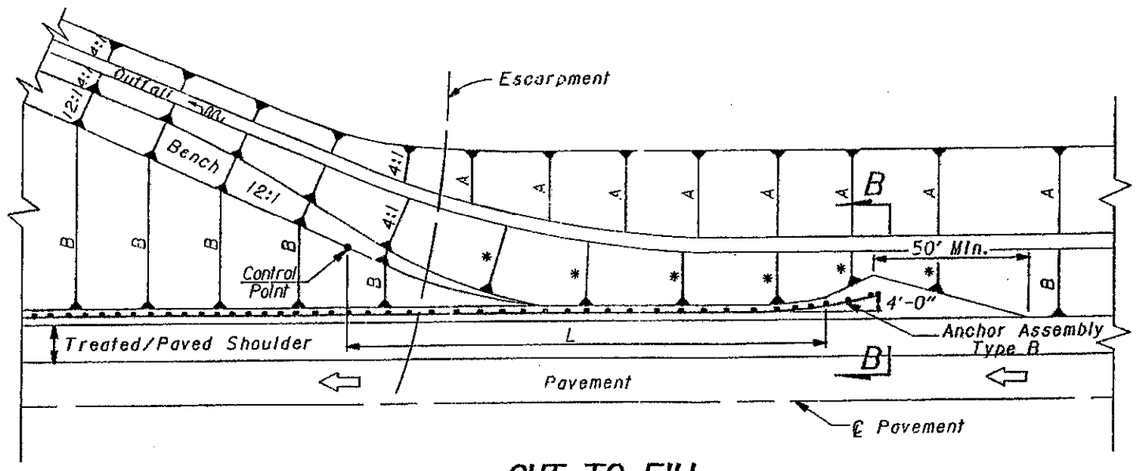
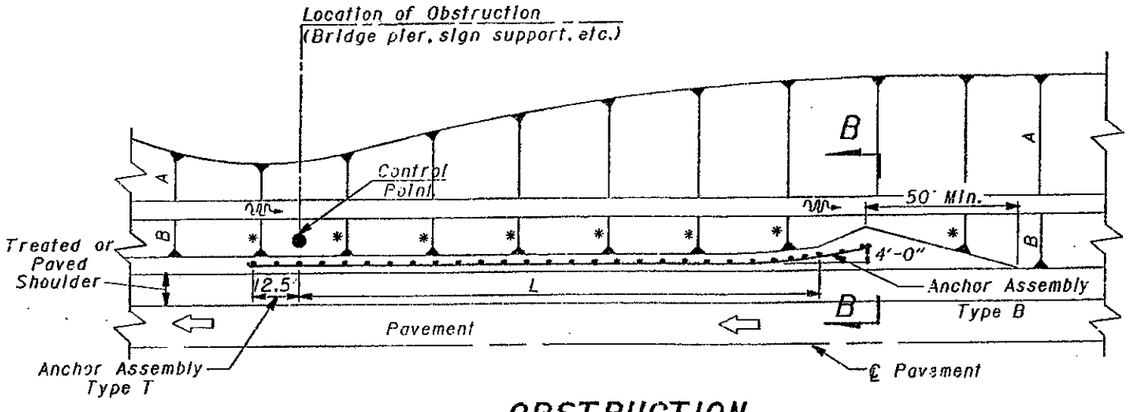


CUT TO FILL



OBSTRUCTION

NOTES

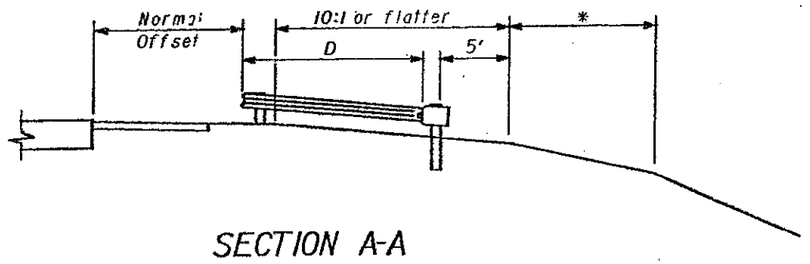
THE APPLICATION of details shown herein shall only be utilized where approach foreslopes are 6:1 or flatter.

SLOPES designated by * shall be 4:1 or flatter. Slopes labeled A or B shall be constructed as specified in the plans.

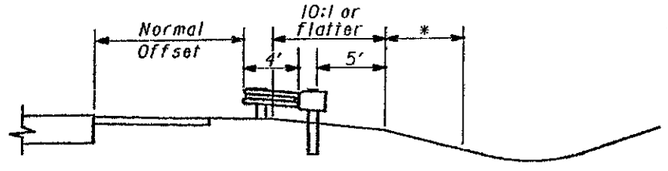
DISTANCES shown as L, T and D shall be constructed as specified in the plans. Distance L is the length of guardrail extending beyond the control point parallel to the roadway centerline. Distance T is the length the guardrail is tapered and distance D is the corresponding offset distance of the taper. See Standard Construction Drawing GR-5.1 for additional details on guardrail flares, T and D. The control points shown designate the extent of the hazard being shielded and is shown for design use only.

THE TYPE B ANCHOR ASSEMBLY shall be installed in accordance with Standard Construction Drawing GR-4.3.

THE OBSTRUCTION INSTALLATION shown is applicable for one-directional roadways only.



SECTION A-A



SECTION B-B

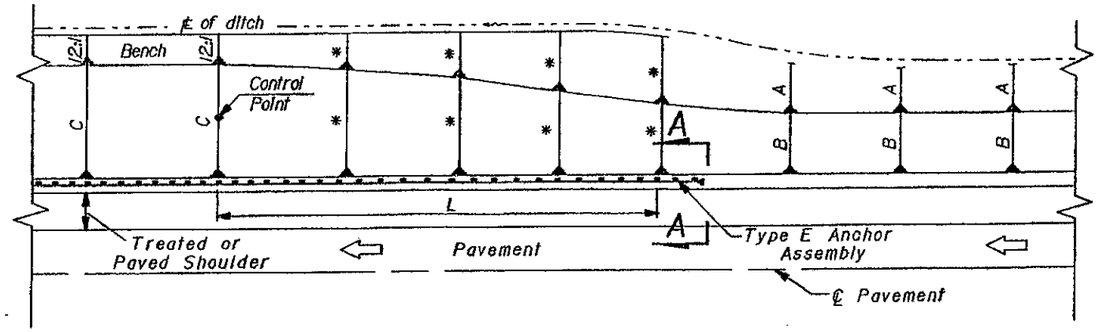
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

INTRODUCTION OF GUARDRAIL RUNS Foreslope 6:1 or flatter

DATE 10-30-92

STANDARD CONSTRUCTION DRAWING **GR-5.2**

APPROVED D.K. Hulmon ENGR., L & D



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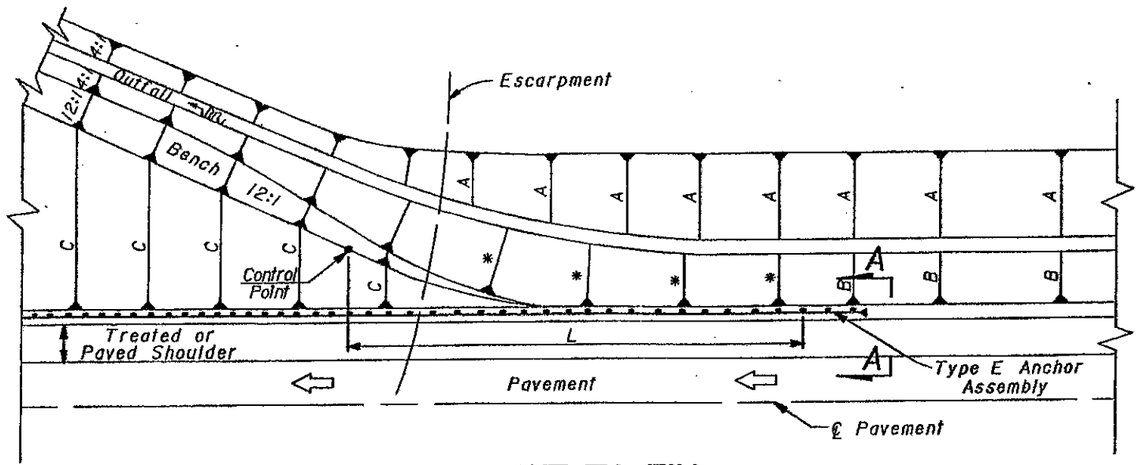
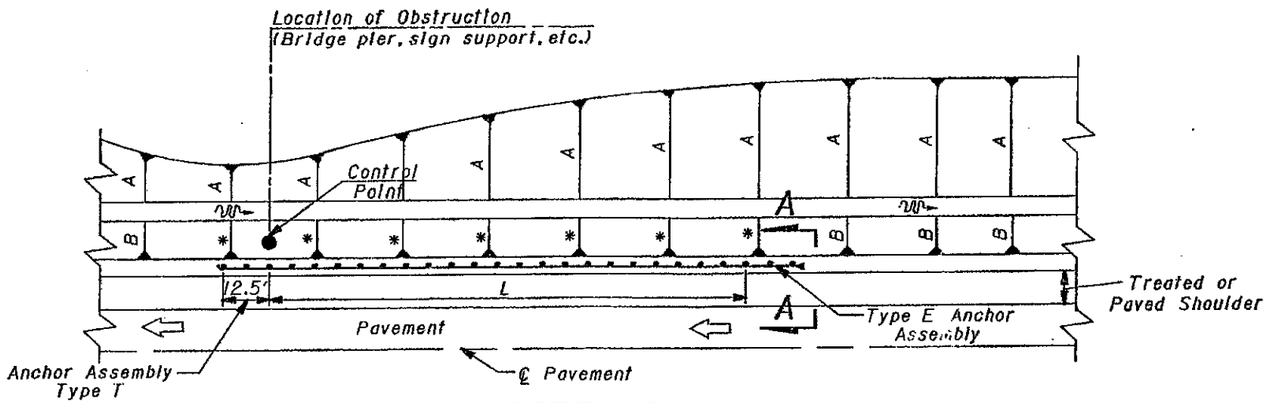


CUT TO FILL



OBSTRUCTION

NOTES

THE APPLICATION *of details shown herein shall only be utilized where approach foreslopes are steeper than 6:1, but not steeper than 3:1.*

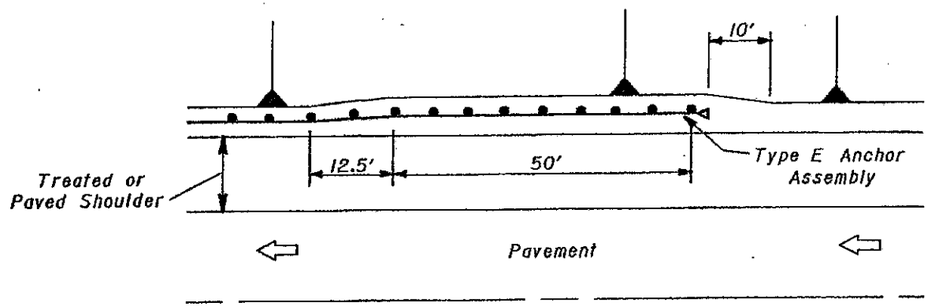
SLOPES *designated by * shall be 3:1 or flatter. Slopes labeled A, B or C shall be constructed as specified in the plans.*

DISTANCES *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.*

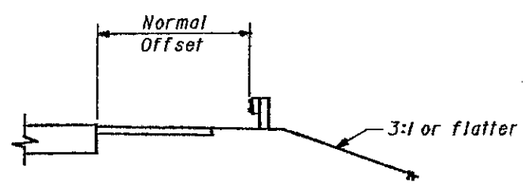
GUARDRAIL END TERMINALS *utilized for the situations shown herein shall be Type E Anchor Assemblies unless otherwise specified in the plans.*

THE OBSTRUCTION INSTALLATION *shown is applicable for one-directional roadways only.*

THE OFFSET 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 50' of guardrail is to be offset an additional 9" from the normal guardail offset by tapering within the 12.5' shown below. The graded shoulder width shall be increased 9" also and tapered back to the normal width in 10' as shown.*



OFFSET DESIGN
(Plan View)



SECTION A-A

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

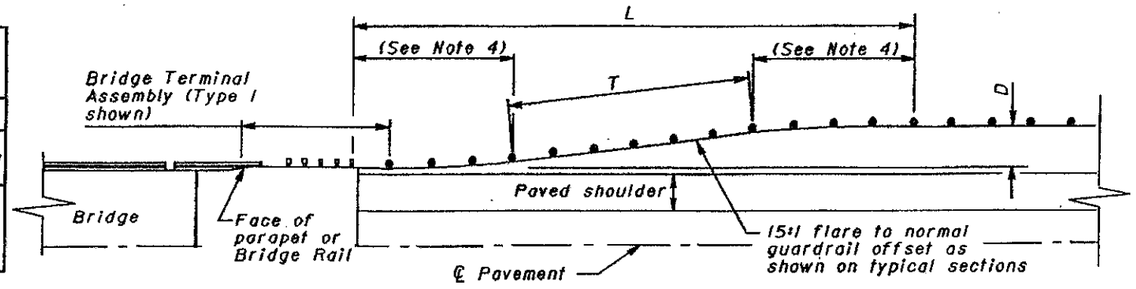
INTRODUCTION OF GUARDRAIL RUNS
Foreslope steeper than 6:1

DATE 10-30-92

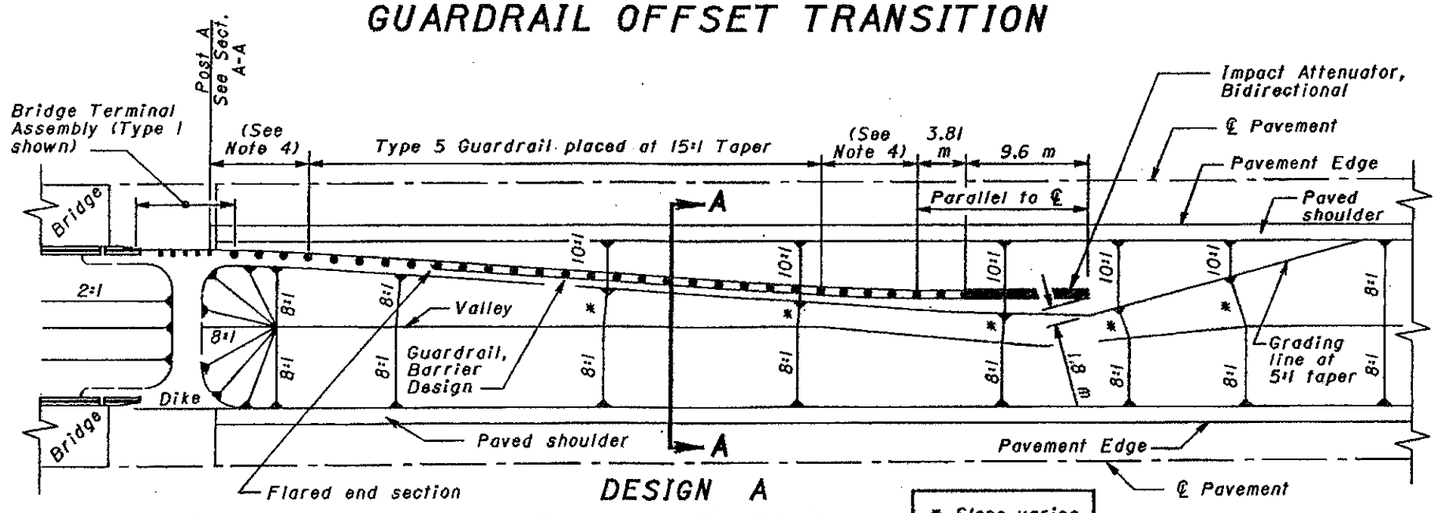
STANDARD CONSTRUCTION DRAWING **GR-5.3**

APPROVED R.K. Hulman ENGR., L & D

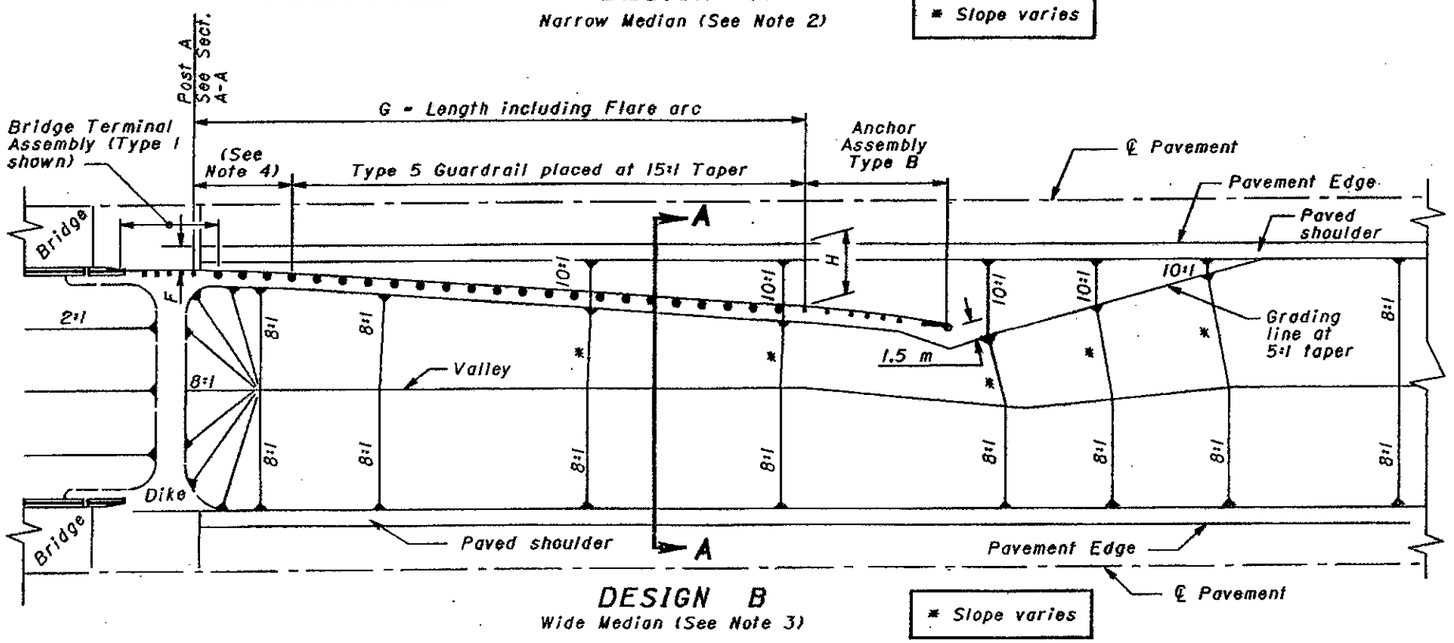
Recommended Lengths for Guardrail Offset Transitions		
D	L	T
Difference in Offset	Total Length	Tangent Length on Flares
0.6	19.05	3.81
1.2	26.67	11.43
1.8	38.10	22.86
2.4	45.72	30.48
3.0	53.34	38.10



GUARDRAIL OFFSET TRANSITION



DESIGN A
Narrow Median (See Note 2)



DESIGN B
Wide Median (See Note 3)

INTRODUCED GUARDRAIL APPROACH INSTALLATIONS

NOTES

1) The length of guardrail needed shall be determined according to methods contained in Section 601 of the Location and Design Manual. Quantities shown on this sheet are based on these methods, using a lateral offset of 9 m for the hazard, a runout length of 144m, and a guardrail taper rate of 15:1.

2) **Design "A"** shall be used in narrow medians where the end of the guardrail run extends into the clear zone of the opposite side traffic. In medians where the guardrail run would otherwise extend beyond the centerline of the median, the guardrail run should be turned to follow the centerline using a standard flare arc. The plans shall clearly indicate what portion of the flared guardrail run is to be constructed using barrier guardrail.

3) **Design "B"** shall be used where the guardrail run lies outside the clear zone of the opposite side traffic. In this case, the design of the guardrail flare in the median would be similar to that of the guardrail approach on the outside shoulder. Estimated quantities are provided in the box below.

4) Use a 7.62 m Standard Flare Arc as per Std. Constr. Dwg. GR-5.1M.

5) Cross-slopes in front of guardrail must be 10:1 or flatter. The 8:1 slopes shown in the median at other locations are the recommended practice, although other slopes may be designated in the plans.

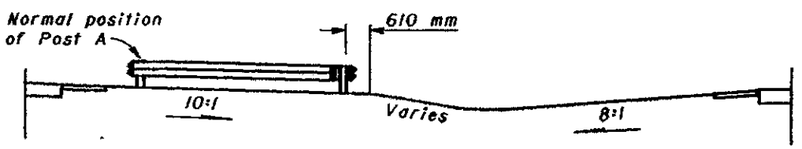
Recommended Lengths (1) For Guardrail Flares at Bridge Approaches (2)		
F	G	H
Guardrail Offset at Bridge	Length of Need (3)	Offset at End of Run
1.2	64.77	5.26
1.8	60.96	5.61
2.4	53.34	5.70
3.0	49.53	6.05
3.6	45.72	6.39
4.2	41.91	6.74
4.8	38.10	7.09

Table Notes

1 Including the 7.62 m flare arc coming off the bridge, but excluding the anchor assembly/attenuator device.

2 For use with a Design "B" median or on the outside shoulder approach to the bridge.

3 Lengths are based on using whole numbers of guardrail panels (3.81 m long).



SECTION A-A

This Drawing Replaces GR-6.

OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL AT BRIDGES

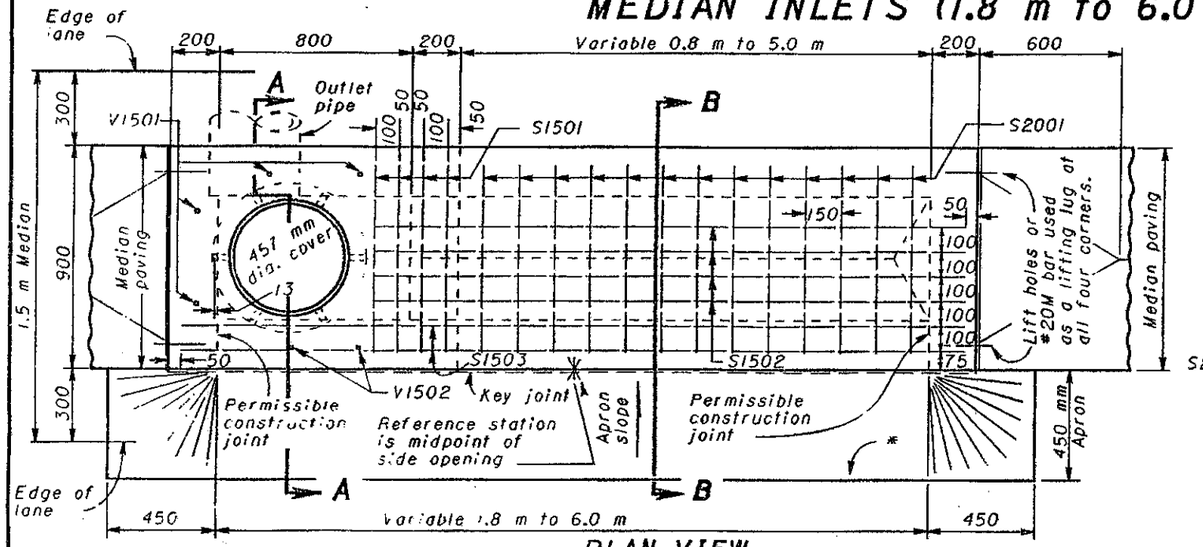
DATE 1-3-96

STANDARD CONSTRUCTION DRAWING **GR-6.1M**

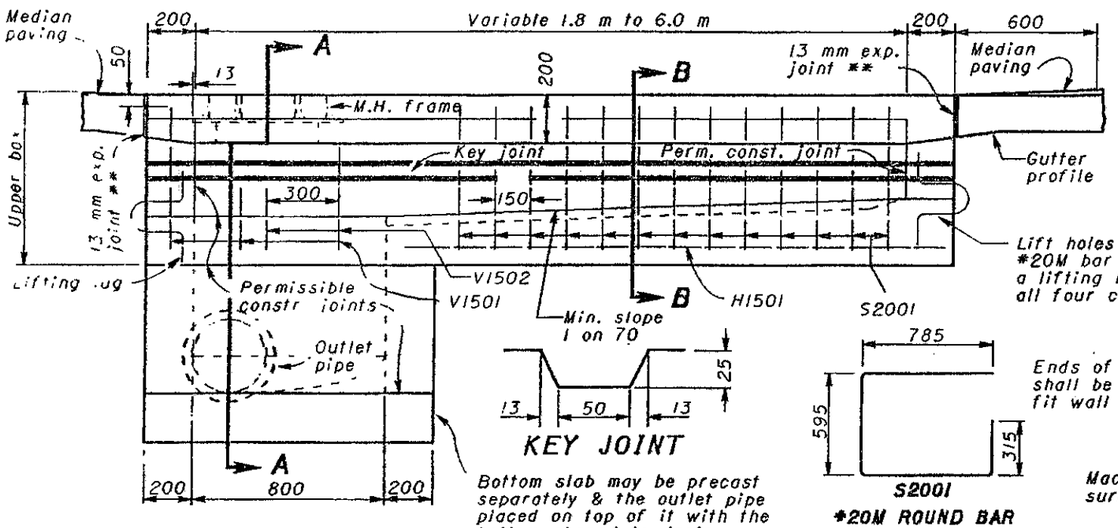
APPROVED R.K. Hulman, P.E.
ADMINISTRATOR

metric units

MEDIAN INLETS (1.8 m to 6.0 m)



PLAN VIEW

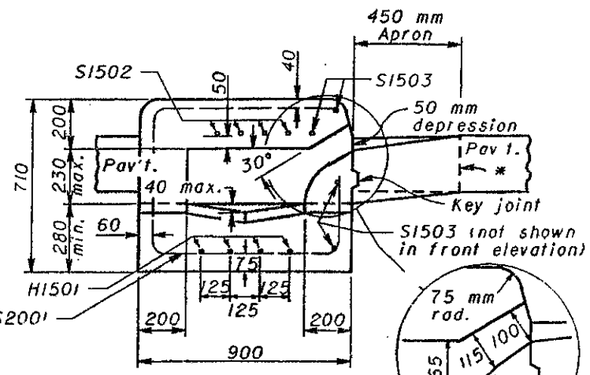


FRONT ELEVATION

KEY JOINT

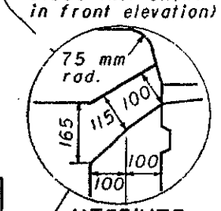
S2001
*20M ROUND BAR
BENDING DIAGRAM

** A 25 mm minimum expansion joint shall be provided in concete pavements or concrete shoulders.

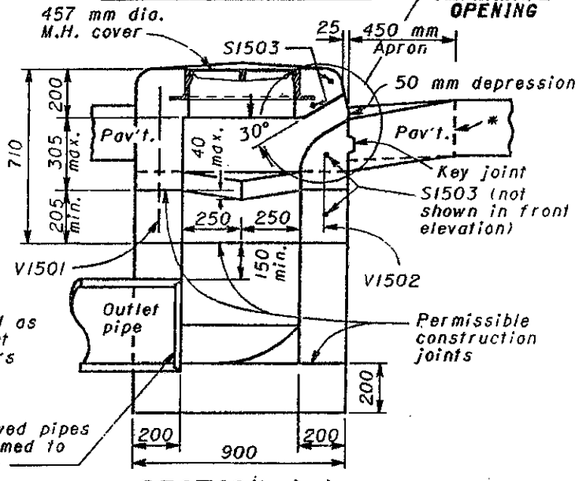


SECTION B-B

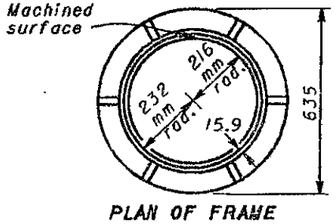
* Butt joint when used in flexible pavement



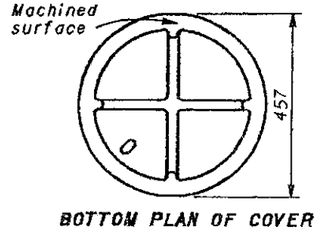
ALTERNATE OPENING



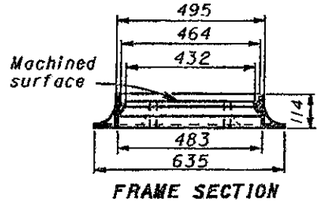
SECTION A-A



PLAN OF FRAME

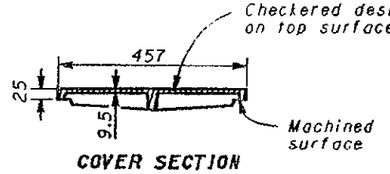


BOTTOM PLAN OF COVER



FRAME SECTION

MANHOLE FRAME



COVER SECTION

MANHOLE COVER

CONCRETE AND REINFORCING QUANTITIES

Inlet Length (m)	Concrete (m3)	Reinforcing S2001 No.	S2001 Length (mm)	S1501 No.	S1501 Length (mm)	S1502 No.	S1502 Length (mm)	S1503 No.	S1503 Length (mm)	H1501 No.	H1501 Length (mm)	V1501 No.	V1501 Length (mm)	V1502 No.	V1502 Length (mm)	Mass (kg)
1.8	1.7	5	2480	4	775	4	1300	4	2100	4	1100	4	610	2	300	67
2.4	2.0	9	2480	4	775	4	1900	4	2700	4	1700	4	610	2	300	102
3.0	2.3	13	2480	4	775	4	2500	4	3300	4	2300	4	610	2	300	136
3.6	2.6	17	2480	4	775	4	3100	4	3900	4	2900	4	610	2	300	171
4.2	2.9	21	2480	4	775	4	3700	4	4500	4	3500	4	610	2	300	206
4.8	3.2	25	2480	4	775	4	4300	4	5100	4	4100	4	610	2	300	240
5.4	3.5	29	2480	4	775	4	4900	4	5700	4	4700	4	610	2	300	275
6.0	3.8	33	2480	4	775	4	5500	4	6300	4	5300	4	610	2	300	310

Note: The above table of quantities is included with this drawing for estimating purposes only. The cost of furnishing and placing all concrete, reinforcing steel, casting, etc., shall be included in Item 604 for payment. All straight bars are *15M.

NOTES

CASTINGS: The design shall be essentially the same and equally as strong as those shown hereon.
Bearing areas of frame and cover shall be so fitted and finished as to provide a firm and even seat for the entire cover in the frame. No projections shall exist on bearing areas of either casting and the cover shall seat in its frame without rocking.
Minimum mass of frame and cover: 59 kg.

SUMP WALLS: The walls between the upper box and bottom slab may be brick, concrete block, cast-in-place or pre-cast concrete construction. Precast walls may have a minimum thickness of 150 mm and shall be reinforced sufficiently to permit shipping and handling without damage.

DEPRESSED APRON: The 450 mm depressed apron shall be an integral part of concrete pavements, with the hand finishing required for the 50 mm depression being performed before the initial set. When the inlets are used with flexible pavements, the depressed apron shall be of 230 mm thick Class C concrete. Payment for all labor and material required to construct the depressed apron construct the depressed apron shall be included in the cost of the inlet. The subgrade shall be adjusted to receive the depressed apron.

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 inlet shall be sealed with an approved sealer.

REINFORCING STEEL: All reinforcing steel shall be epoxy coated in accordance with CMS 509.10.

QUANTITIES: Quantities of median pavement within the limits of the inlet shall be deducted from the project quantities.

SIDE OPENING: Details shown for the right side of the inlet shall also apply to left side openings where needed for drainage of the left median shoulder as shown in the plans. The sump shall be located at the downgrade end of the inlet for both right and left side openings.

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.

UPPER BOX: May be precast, or cast-in-place. If precast it shall be set in a bed of mortar at the sump walls and in a bed of compacted sand at other points. Reinforcing steel for precast upper boxes shall be equivalent to the design shown hereon. Construction joints other than those shown are permitted in the endwalls to facilitate the removal of precasting forms. The interior trough may have a flat bottom.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces I-2.

OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

MEDIAN INLETS

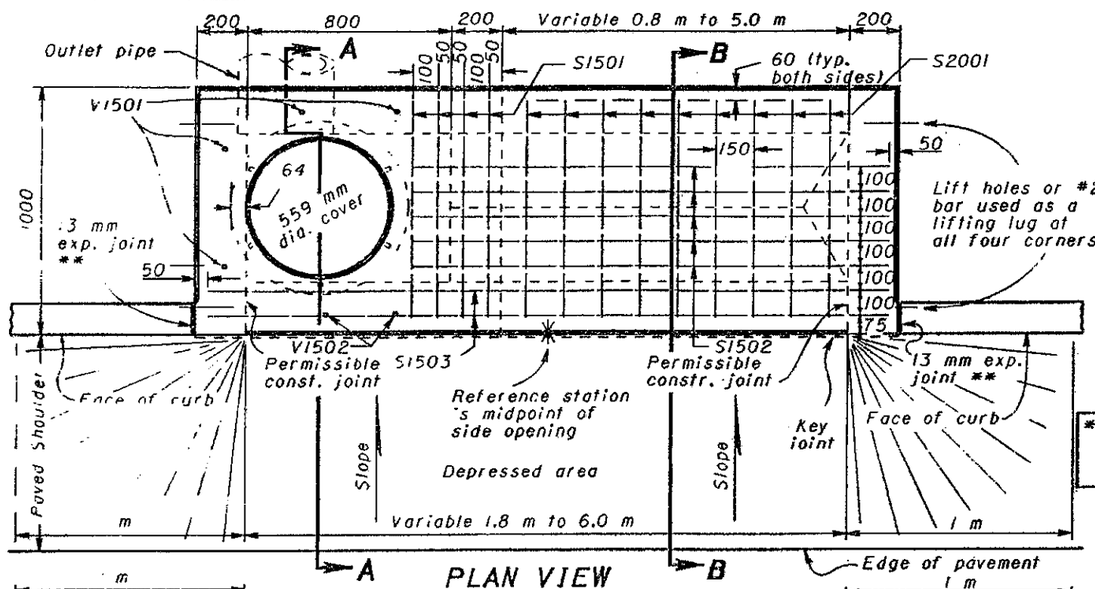
DATE 9-6-95

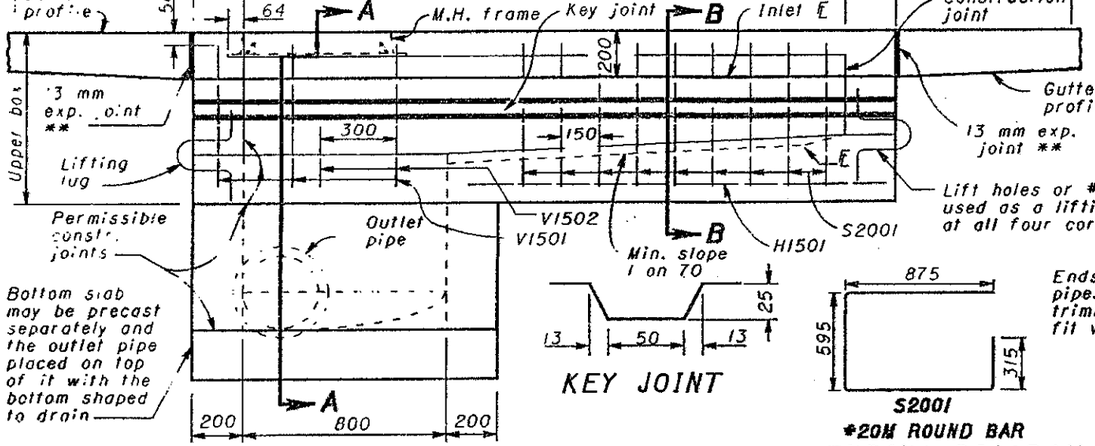
STANDARD CONSTRUCTION DRAWING **I-1.1M**

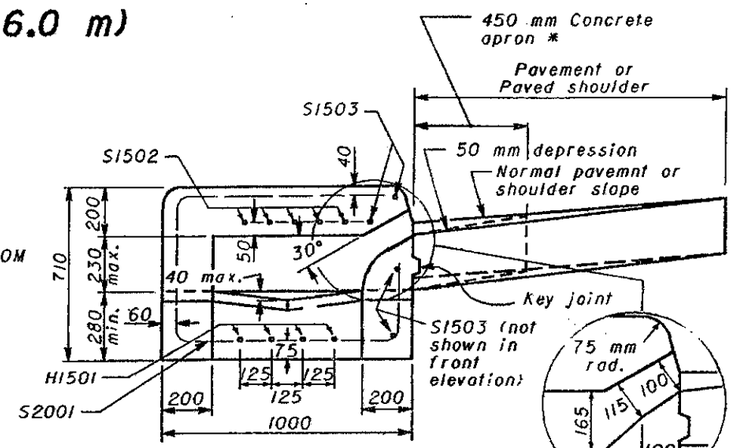
APPROVED D.K. Hudman, P.E.
ADMINISTRATOR

PAVEMENT INLETS (1.8 m to 6.0 m)

** A 25 mm minimum expansion joint shall be provided in concrete pavement or concrete shoulders.

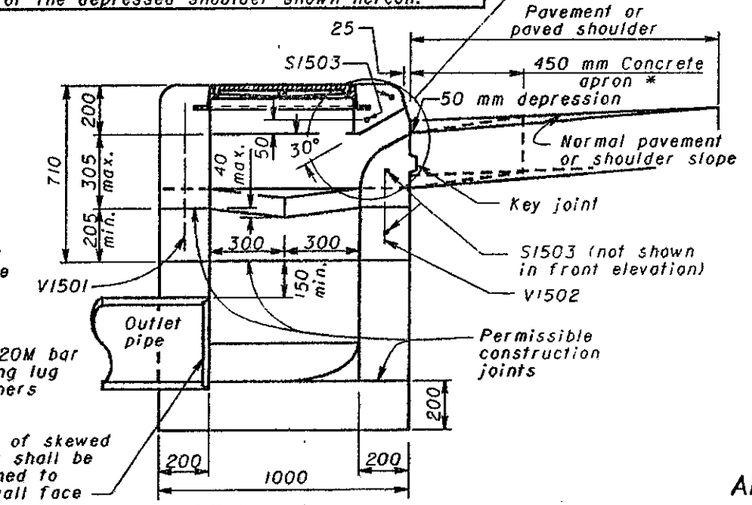




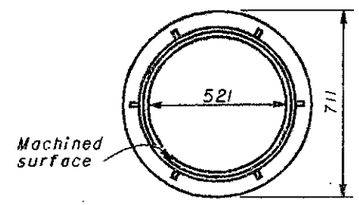


SECTION B-B

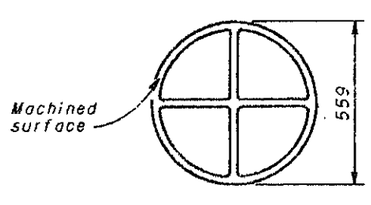
* When the inlet is placed at the edge of pavement, a concrete apron, as shown on Std. Constr. Dwg. I-1.1M, shall be provided in lieu of the depressed shoulder shown hereon.



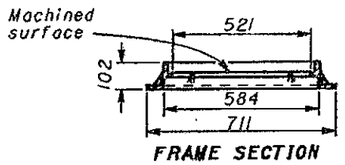
SECTION A-A



PLAN OF FRAME

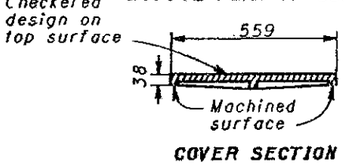


BOTTOM PLAN OF COVER



FRAME SECTION

MANHOLE FRAME



COVER SECTION

MANHOLE COVER

CONCRETE AND REINFORCING QUANTITIES

Inlet Length (m)	Concrete (m3)	Reinforcing S2001 No.	S2001 Length (mm)	S1501 No.	S1501 Length (mm)	S1502 No.	S1502 Length (mm)	S1503 No.	S1503 Length (mm)	H1501 No.	H1501 Length (mm)	V1501 No.	V1501 Length (mm)	V1502 No.	V1502 Length (mm)	Mass (kg)
1.8	1.8	5	2660	4	865	5	1300	4	2100	4	1100	4	610	2	300	72
2.4	2.1	9	2660	4	865	5	1900	4	2700	4	1700	4	610	2	300	109
3.0	2.4	13	2660	4	865	5	2500	4	3300	4	2300	4	610	2	300	146
3.6	2.8	17	2660	4	865	5	3100	4	3900	4	2900	4	610	2	300	184
4.2	3.1	21	2660	4	865	5	3700	4	4500	4	3500	4	610	2	300	221
4.8	3.4	25	2660	4	865	5	4300	4	5100	4	4100	4	610	2	300	258
5.4	3.7	29	2660	4	865	5	4900	4	5700	4	4700	4	610	2	300	296
6.0	4.0	33	2660	4	865	5	5500	4	6300	4	5300	4	610	2	300	333

Note: The above table of quantities is included with this drawing for estimating purposes only. The cost of furnishing and placing all concrete, reinforcing steel, casting, etc., shall be included in Item 604 for payment. All straight bars are #15M.

NOTES

CASTINGS: The design shall be essentially the same and equally as strong as those shown hereon.
Bearing areas of frame and cover shall be so fitted and finished as to provide a firm and even seat for the entire cover in the frame. No projections shall exist on bearing areas of either casting and the cover shall seat in its frame without rocking.

Minimum mass of frame and cover: 88 kg.

SUMP WALLS: Walls between the upper box and bottom slab may be brick, concrete block, cast-in-place or precast concrete construction. Precast walls may have a minimum thickness of 150 mm and shall be reinforced sufficiently to permit shipping and handling without damage.

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 inlet shall be sealed with an approved sealer.

REINFORCING STEEL: All reinforcing steel shall be epoxy coated in accordance wiht CMS 509.10.

QUANTITIES: Curb quantities within the limits of the inlet shall be deducted from the project quantities.

SIDE OPENING: Details shown for the right side of the inlet shall also apply to left side openings where needed for drainage of the opposite outside shoulder as shown in the plans. The sump shall be located at the downgrade end of the inlet for both right and left side openings.

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.

UPPER BOX: May be precast, or cast-in-place. If precast, it shall be set in a bed of mortar at the sump walls and in a bed of compacted sand at all other points. Reinforcing steel for precast upper boxes shall be equivalent to the design shown hereon. Construction joints other than those shown are permitted in the endwalls to facilitate the removal of precasting forms. The interior trough may have a flat bottom.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces I-2A.

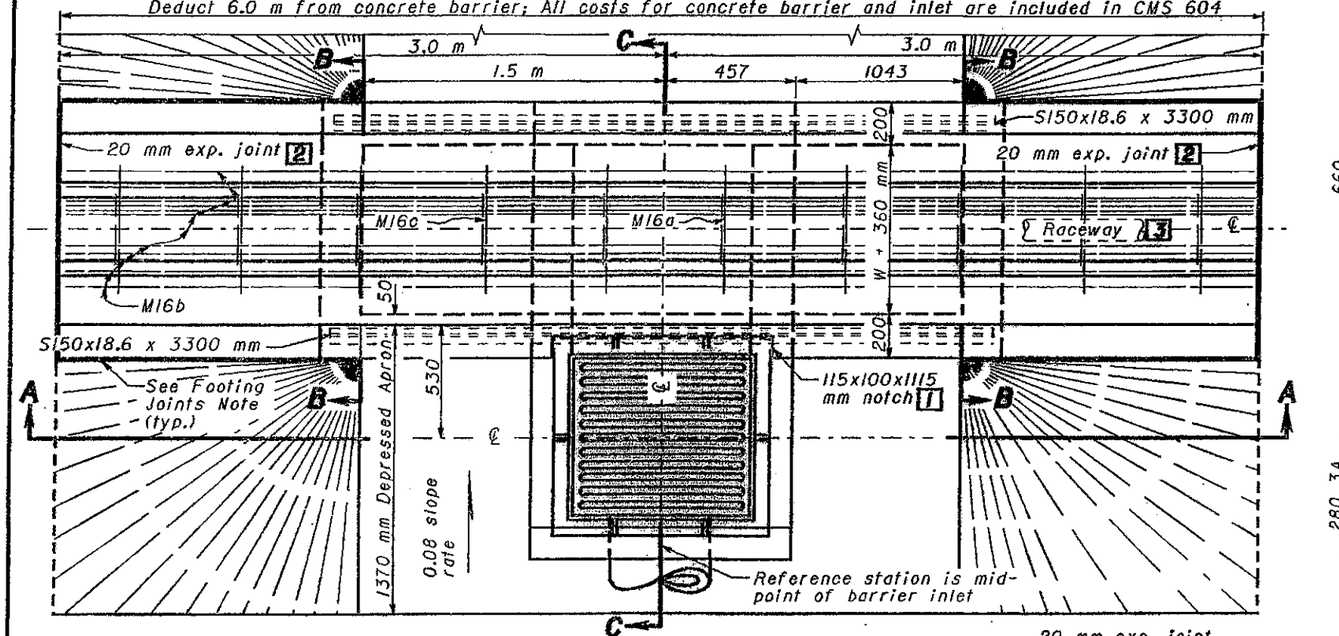
OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

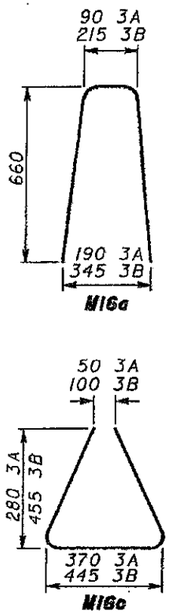
PAVEMENT INLETS

DATE 9-6-95

STANDARD CONSTRUCTION DRAWING **I-1.2M**

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





BENDING DIAGRAM #16M BARS

NOTES

GENERAL: For details of concrete barriers, see SCD RM-4.3M. Minimum mass of frame and cover shall be 245 kg.

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. The unit above the upper permissible construction joint may be precast or cast-in-place.

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.

FOOTING JOINTS: The vertical walls between the barrier footing and a concrete pavement or concrete base shall be provided with a sealed joint as detailed on SCD RM-4.3M.

STEPS: Steps shall be in accordance with SCD MH-1.1M.

GRATE LOCATION: In superelevated curves or at other locations where there is unequal discharge from the directional roadways, the inlet grating shall be located in the roadway which discharges the major flow.

INLETS OVER 3.5 m IN DEPTH: Such inlets shall be precast or cast-in-place concrete; reinforced with #16M 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.

STEEL LIST

INLET NO.	W	M16a		M16b		M16c		S150x18.6	
		No.	Length	No.	Length	No.	Length	No.	Length
I-3A	152	10	1370	13	5900	10	940	2	3300
I-3B	305	10	1525	13	5900	10	1370	2	3300

Included for estimating purposes only. The cost of furnishing and placing all reinforcing steel shall be included in Item 604 for payment.

LEGEND

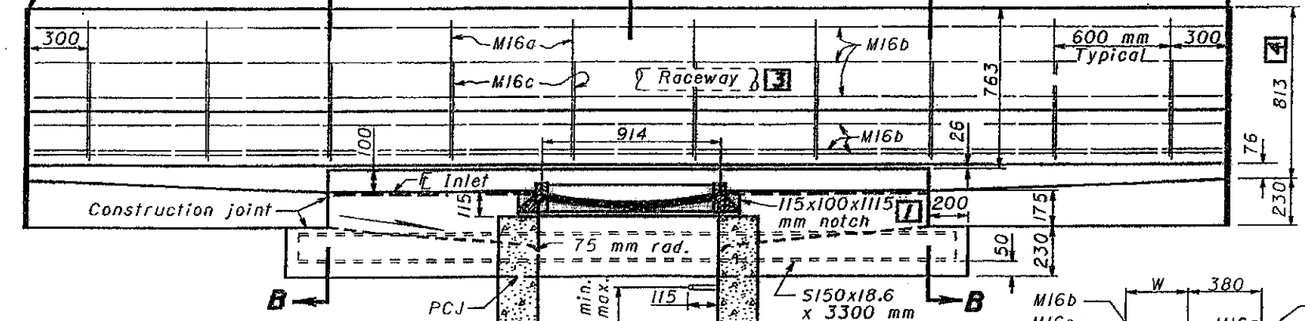
1 After casting is placed, fill notch with Class C concrete

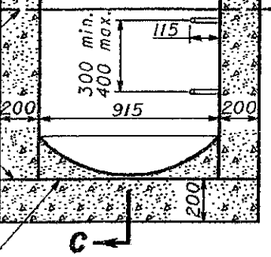
2 A 37 mm minimum exp. joint shall be provided in concrete pavement or concrete shoulders.

3 100 mm Lighting raceway, if required elsewhere by the plans

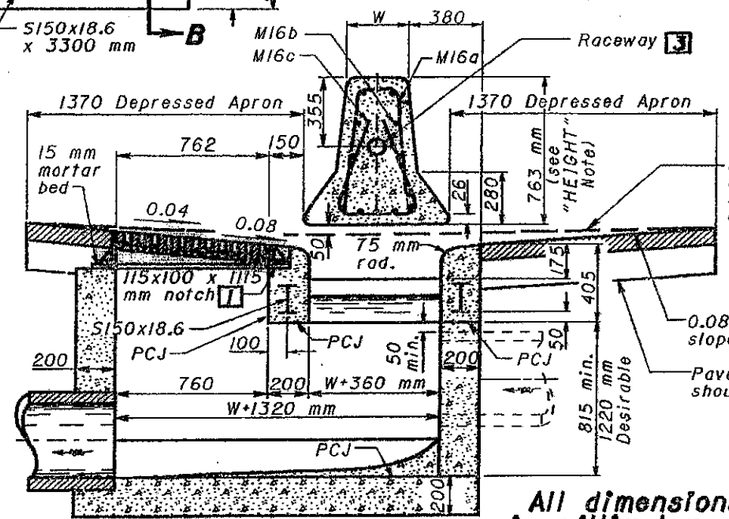
4 Barrier height equals either 813 mm or 1270 mm.

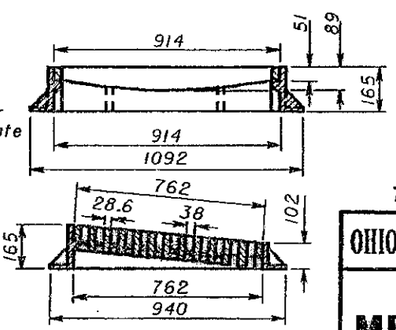
PCJ - Permissible construction joint





ALTERNATE SPILLWAY SHAPE





CASTING DETAILS

STANDARD INLET NO.

Barrier	W-152 mm	W-305 mm
813 mm	I-3A	I-3B
1270 mm	I-3A 1270	I-3B 1270

This Drawing Replaces I-3A & B.

All dimensions are in millimeters unless otherwise noted.

metric units

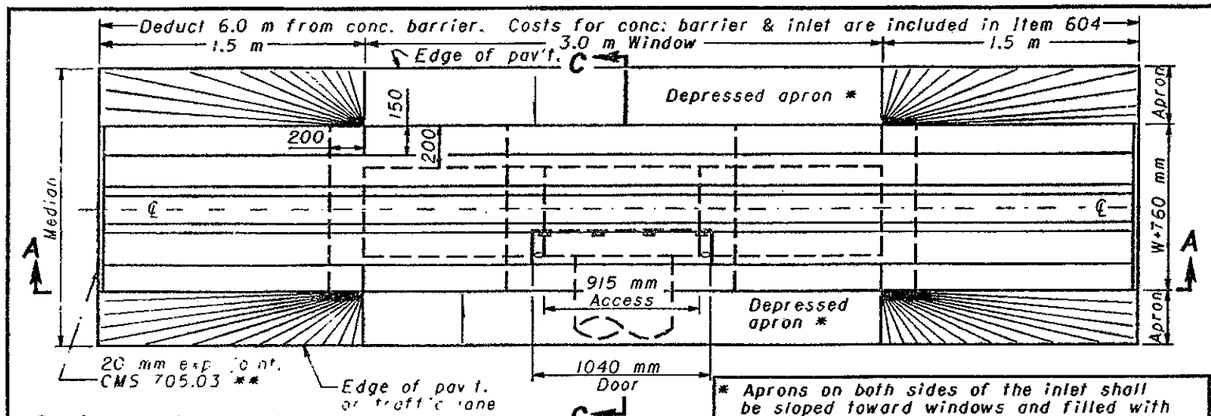
OHIO DEPARTMENT OF TRANSPORTATION

BARRIER MEDIAN INLETS 3A & 3B

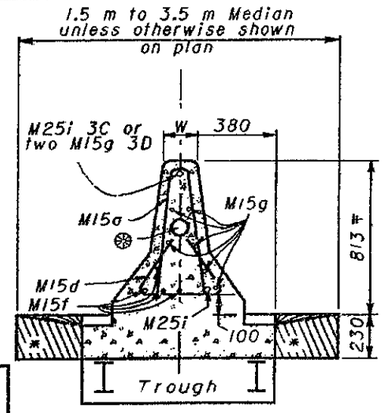
STANDARD CONSTRUCTION DRAWING **I-2.1M**

APPROVED: Gary F. Sutherland

DATE: 9-6-95, 4-8-97, 10-21-97, 4-14-98

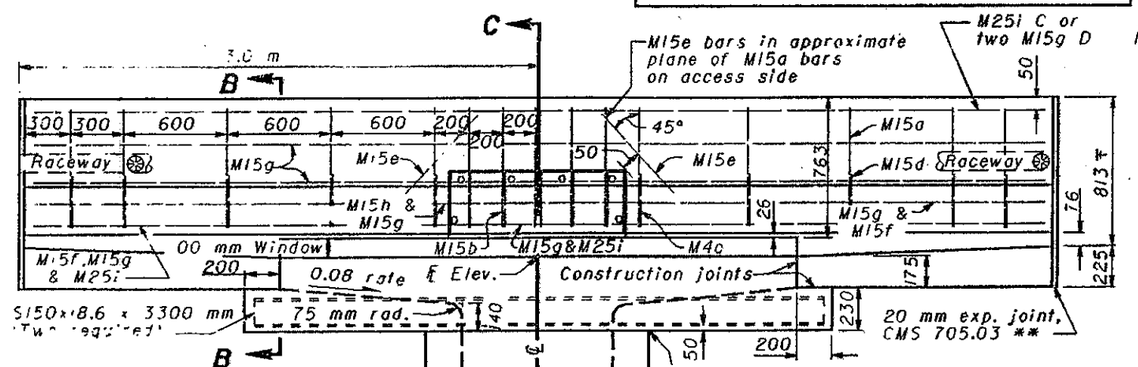


* Aprons on both sides of the inlet shall be sloped toward windows and filled with Class C concrete. On superelevated sections, the aprons shall be sloped as shown in Section C-C. Cost of any pavement removal and material is included in CMS 604.



SECTION B-B

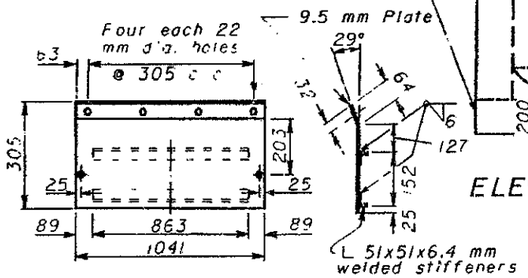
∓ Barrier height equals either 813 mm or 1270 mm.



Bottom slab may be precast separately and the outlet pipe placed on top of it with the bottom shaped to drain

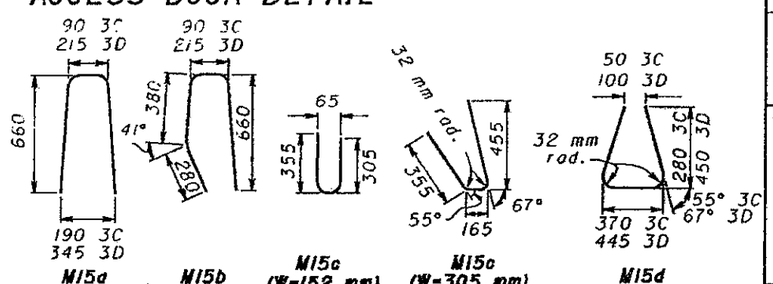
◆ Inlet top profile shall match the adjacent concrete median barrier profile by constructing the top surface of the base to match the median barrier profile.

** A 37 mm minimum exp. joint shall be provided in concrete pavement or concrete shoulders.



ACCESS DOOR DETAIL

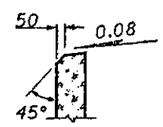
STANDARD INLET NUMBERS
I-3C Type A (813 mm Barrier with W=152 mm)
I-3C Type A1 (1270 mm Barrier with W=152 mm)
I-3D Type B (813 mm Barrier with W=305 mm)
I-3D Type B1 (1270 mm Barrier with W=305 mm)



BENDING DIAGRAMS - #15M BARS

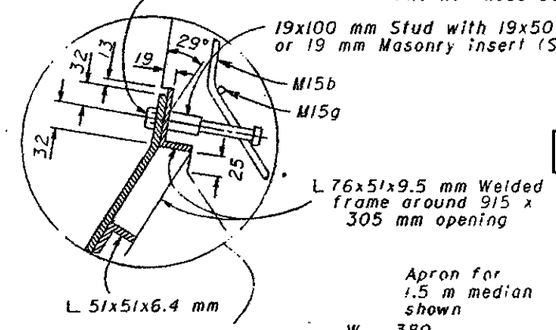
STEEL LIST ⊕					
		I-3C (W-152)		I-3D (W-305)	
Size	Bar	Ea.	Length (mm)	Ea.	Length (mm)
#15M	M15a	10	1370	10	1525
	M15b	5	1370	5	1525
	M15c	5	710	5	965
	M15d	10	940	10	1370
	M15e	2	610	2	610
	M15f	8	2490	8	2490
	M15g	6	5995	8	5995
	M15h	1	1525	1	1525
S150x18.6		2	3300	2	3300
#25M	M25i	2	5995	1	5995

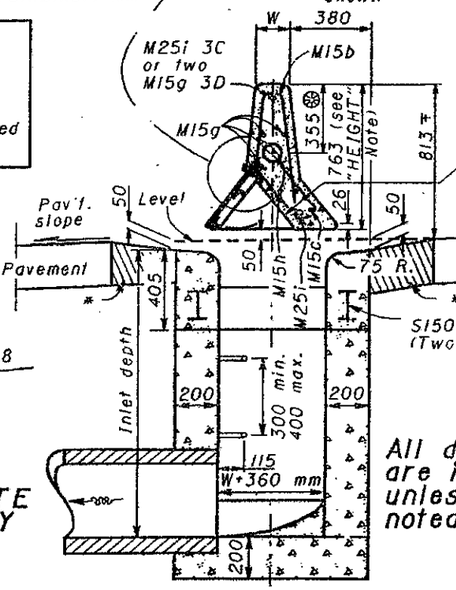
⊕ Included for estimating purposes only. The cost of furnishing and placing all reinforcing steel shall be included in Item 604 for payment.



ALTERNATE SPILLWAY SHAPE

19 mm dia. x 50 mm hex head bolt



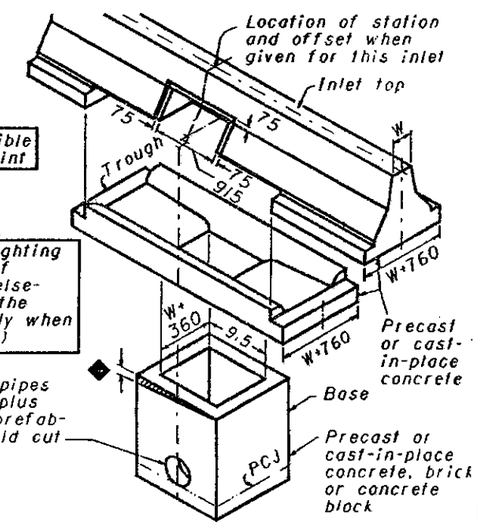


SECTION C-C

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)



Openings for pipes shall be O.D. plus 50 mm when prefabricated or field cut

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.

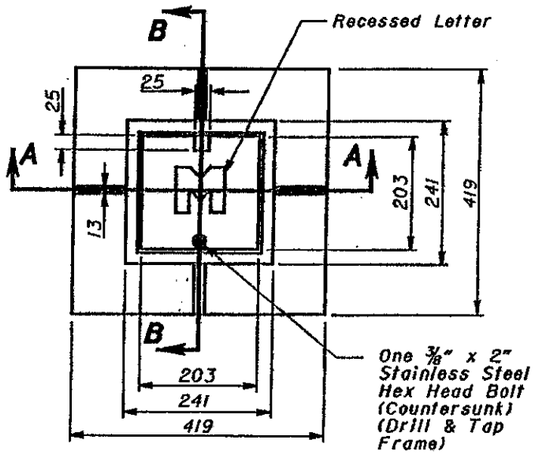
OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

BARRIER MEDIAN INLETS 3C & 3D

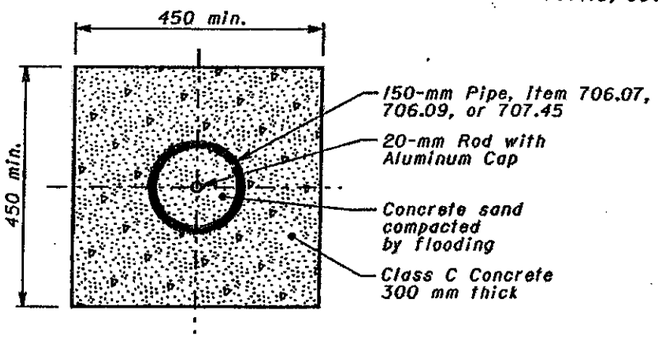
DATE 9-6-95

STANDARD CONSTRUCTION DRAWING **I-2.2M**

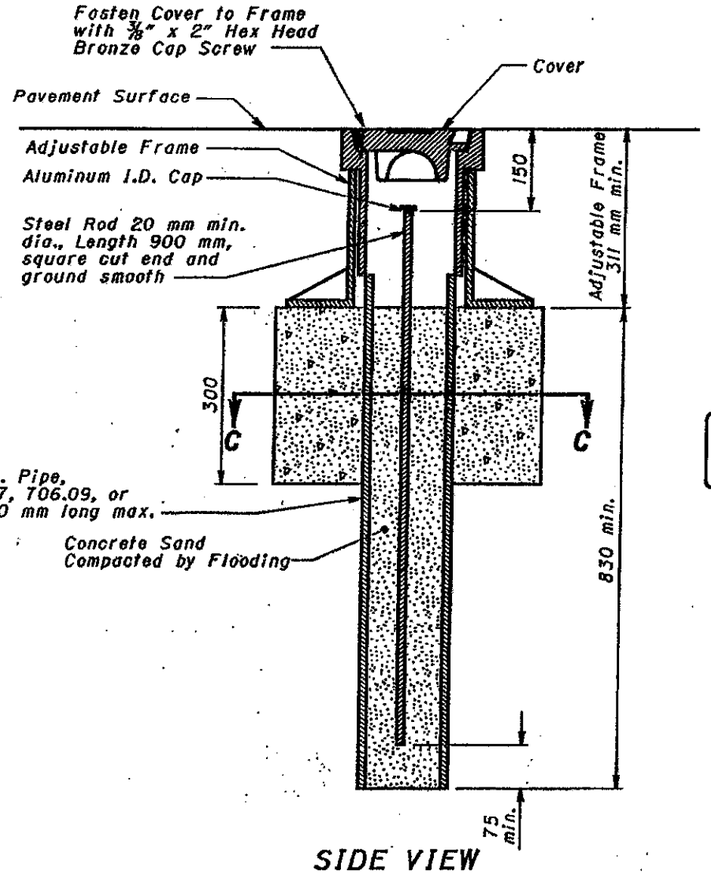
APPROVED R. K. Nuhman, P.E.
ADMINISTRATOR



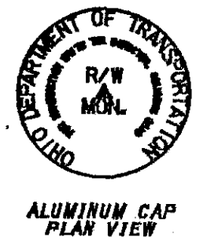
TOP VIEW



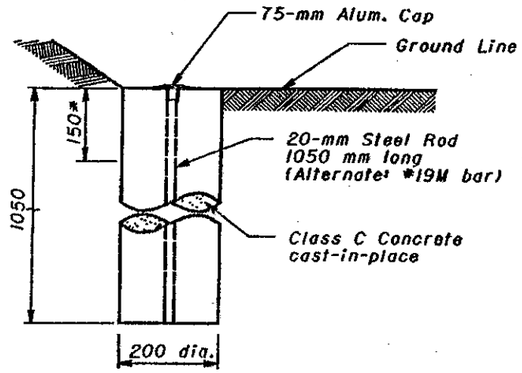
SECTION C-C



SIDE VIEW



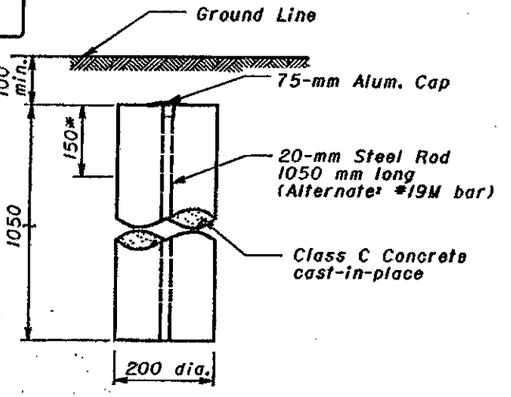
ALUMINUM CAP PLAN VIEW



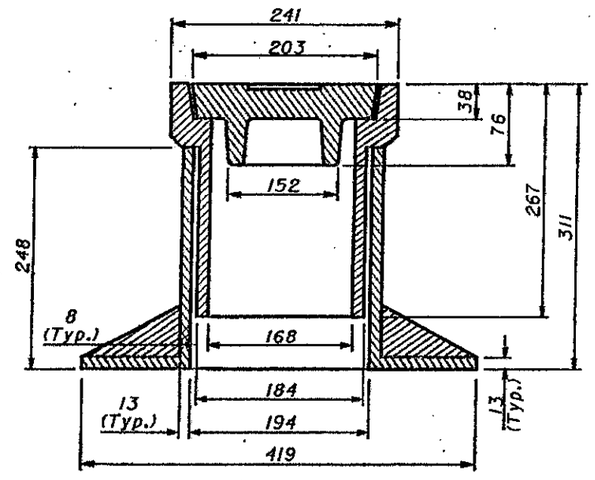
RIGHT OF WAY MONUMENT DETAILS

* The upper 150 mm of the 1050 mm cast-in-place monument shall be formed.

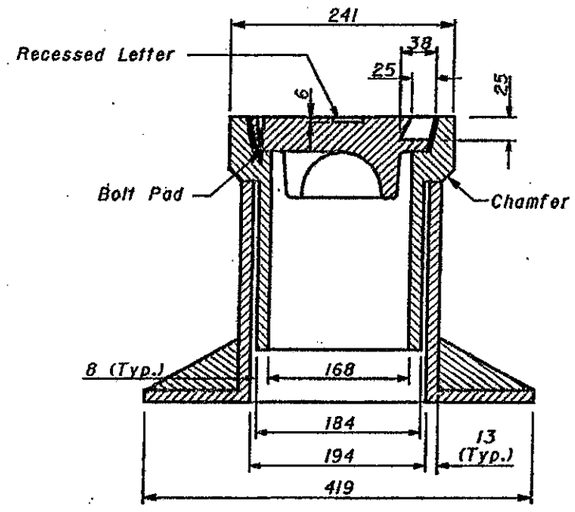
ALUMINUM CAP PLAN VIEW



REFERENCE MONUMENT DETAILS



SECTION A-A



SECTION B-B

ADJUSTABLE CENTERLINE 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 3/8" 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

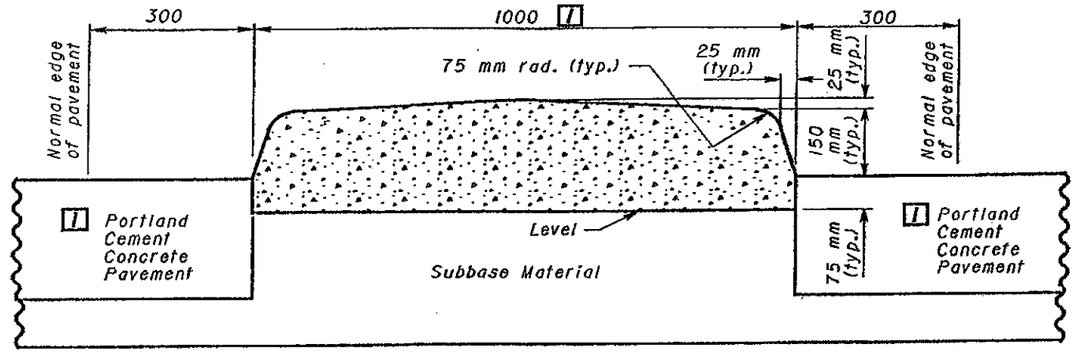
ROADWAY ITEMS

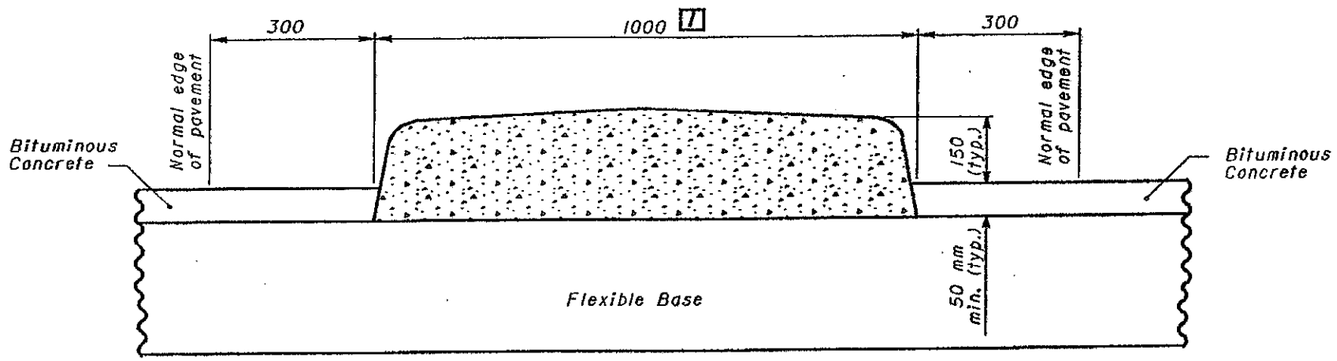
DATE
6-30-95
4-8-97

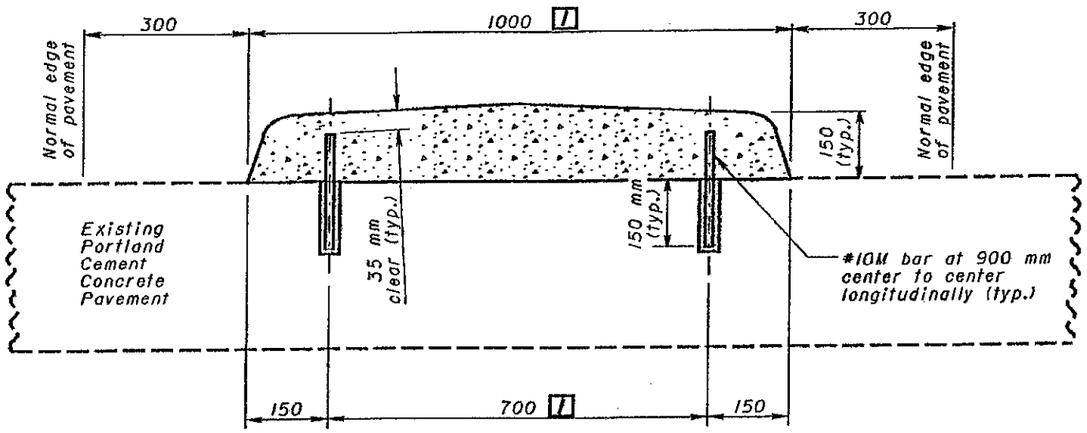
STANDARD CONSTRUCTION DRAWING **RM-1.1M**

APPROVED Gary F. Sutherland
ADMINISTRATOR

STANDARD TRAFFIC DIVIDERS







CONCRETE MEDIANS

NOTES

CONCRETE MEDIAN PAVEMENT

JOINTS: 6-mm contraction joints shall be constructed at 3 m intervals in accordance with pertinent provisions of CMS 609.04. For additional specifications see CMS 612.

METHOD OF INSTALLATION: When traffic dividers are to be installed on existing Portland Cement Concrete Pavement the surface shall be clean, dry and free of any loose material.

ANCHORS AND GROUT: For median widths of 450 mm or less use one #10M rebar spaced at 900 mm center to center.

For additional specifications see CMS 510.

LEGEND

[1] Unless otherwise shown in the plans.

All dimensions are in millimeters unless otherwise noted.

metric units

This Drawing Replaces MC-6.

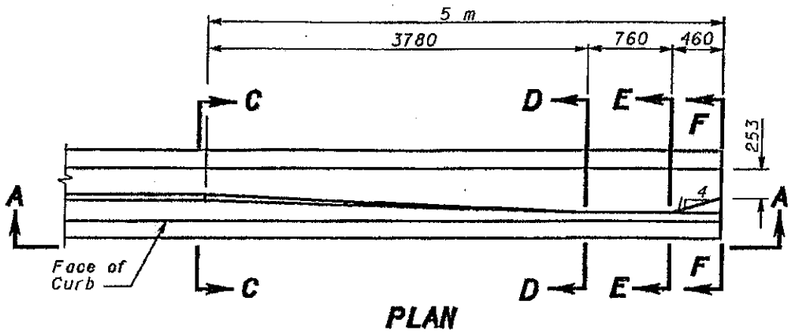
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC DIVIDERS

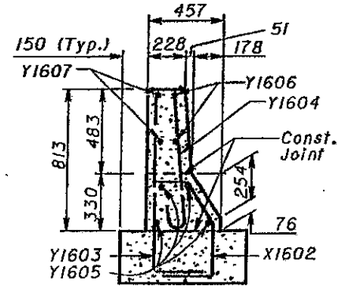
DATE
6-30-95
10-21-97

STANDARD CONSTRUCTION DRAWING **RM-3.1M**

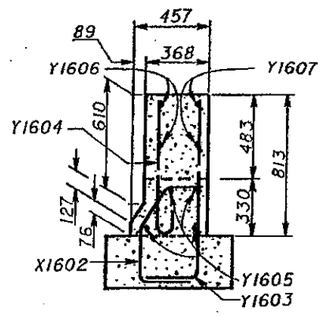
APPROVED Lauryl F. Sutherland



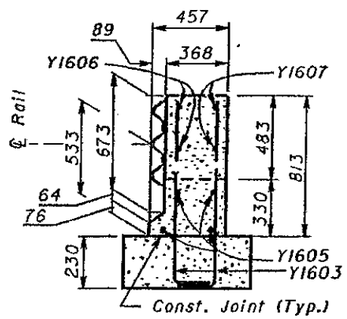
PLAN



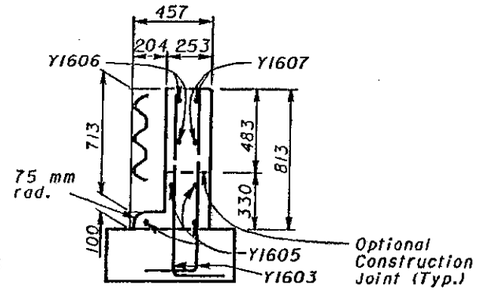
SECTION C-C



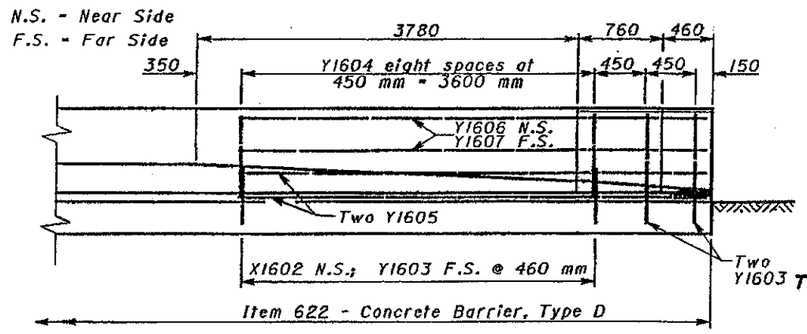
SECTION D-D



SECTION E-E



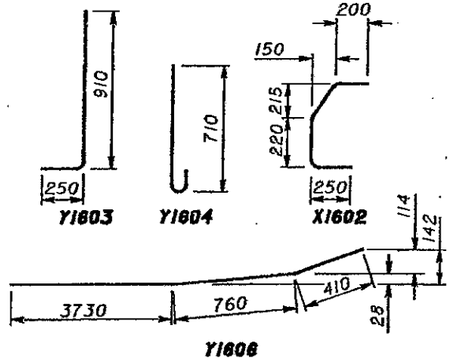
SECTION F-F



SECTION A-A

REINFORCING BAR LIST

MARK	LENGTH (mm)	SHAPE	NO.	MASS (kg)
X1602	850	Bent	9	12
Y1603	1120	Bent	13	23
Y1604	880	Bent	9	13
Y1605	4900	Str.	4	31
Y1606	4900	Bent	2	15
Y1607	4900	Str.	2	15
TOTAL MASS (For info. only)				109



BENDING DIAGRAMS

NOTES

LOCATION: Concrete barrier at obstructions shall be constructed with the toe of the barrier slope at the normal guardrail offset from the roadway. Installations within continuous runs shall be constructed so that no approach or trailing guardrail tapers are required to connect to the barrier.

Installations that cannot be constructed at the normal guardrail offset and are to be connected to approach or trailing guardrail runs shall have a 25:1 guardrail taper to meet the existing or normal guardrail offset.

Installations that are not to be connected to approach or trailing guardrail runs shall include the standard guardrail flare as per SCD GR-5.1M.

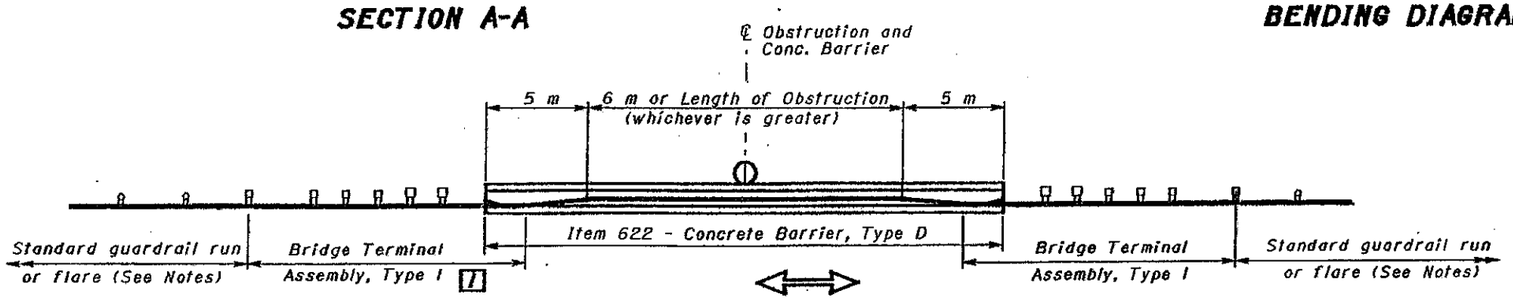
INCORPORATED INSTALLATIONS: For barrier installations that cannot be constructed at the normal guardrail offset, the incorporated installations shown may be installed at vertical walls. piers or other similar obstructions. For pier-incorporated installations the contractor may use the optional treatment, forming the back face of the Type D Concrete Barrier to the location shown (between piers only), with any additional cost being included in the cost of Item 622.

REINFORCING: All reinforcing bars shall be epoxy coated and shall meet the requirements of CMS 509.

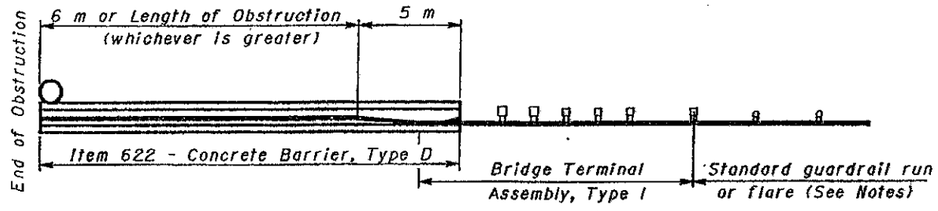
MISCELLANEOUS: For Bridge Terminal Assembly, Type 1 and Type 2 details and connections, see SCD's GR-3.1M and GR-3.2M, respectively. For Type D Concrete Barrier details see SCD RM-4.3M.

PAYMENT: Payment for Item 622, Concrete Barrier, Type D shall include all materials, labor and reinforcing steel required to construct the barrier as shown.

All dimensions are in millimeters unless otherwise noted.



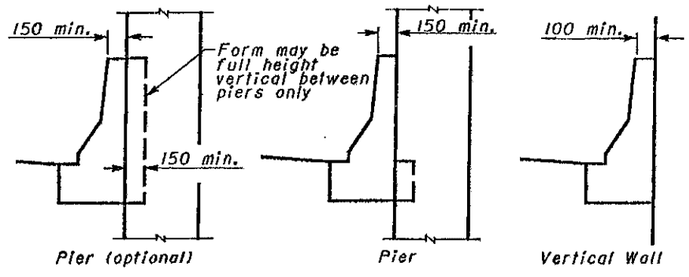
Bi-directional Travel or Directional Travel where trailing guardrail is used.



Directional Travel where no trailing guardrail is used.

TYPICAL INSTALLATIONS

[1] Bridge Terminal Assembly, Type 2 shall be used for directional roadways where trailing guardrail is used and is out of the clear zone of opposite direction traffic.



INCORPORATED INSTALLATIONS

metric units

This Drawing Replaces GR-8.1.

OHIO DEPARTMENT OF TRANSPORTATION

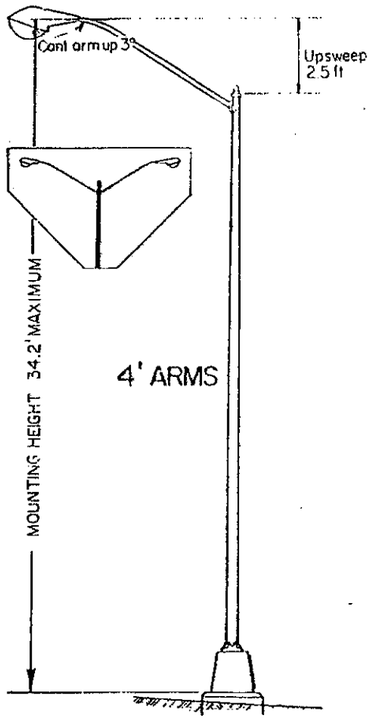
CONCRETE BARRIER AT OBSTRUCTIONS

DATE: 6-30-95, 10-21-97

STANDARD CONSTRUCTION DRAWING **RM-4.5M**

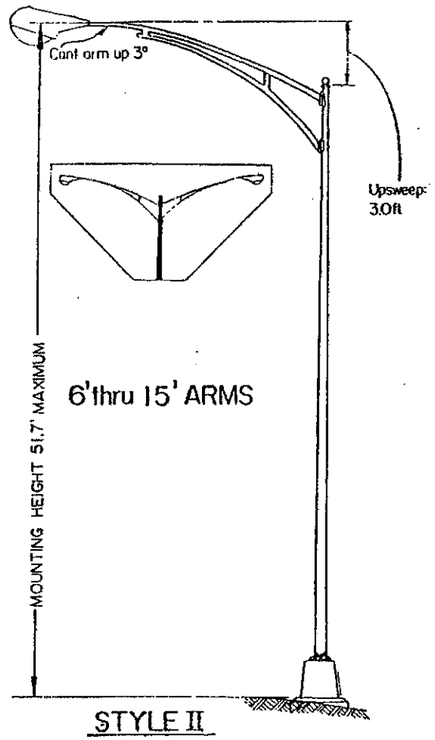
APPROVED: David T. Gutknecht

LIGHT POLE STYLES



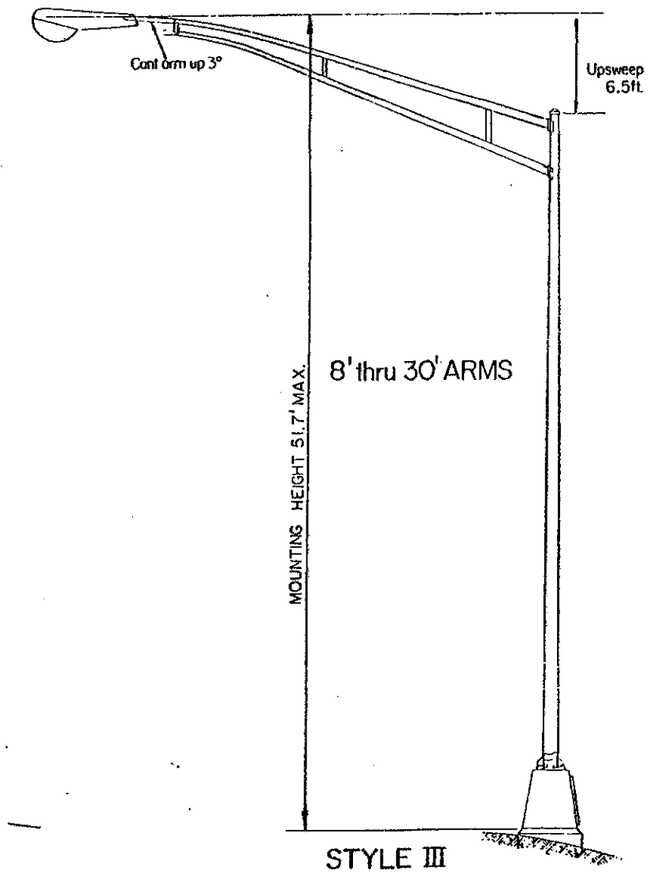
4' ARMS

STYLE I



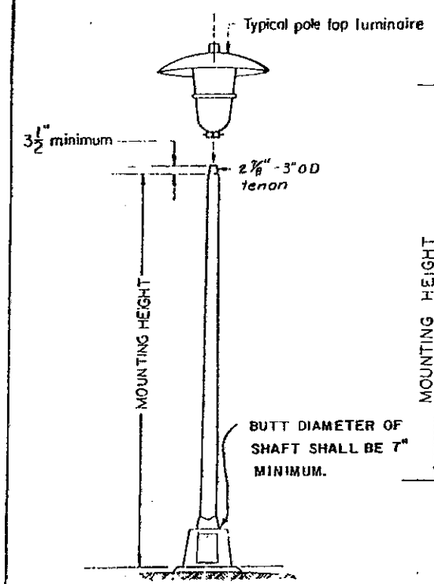
6' thru 15' ARMS

STYLE II

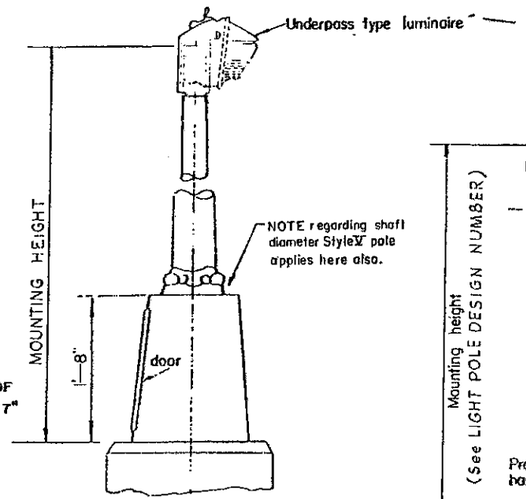


8' thru 30' ARMS

STYLE III

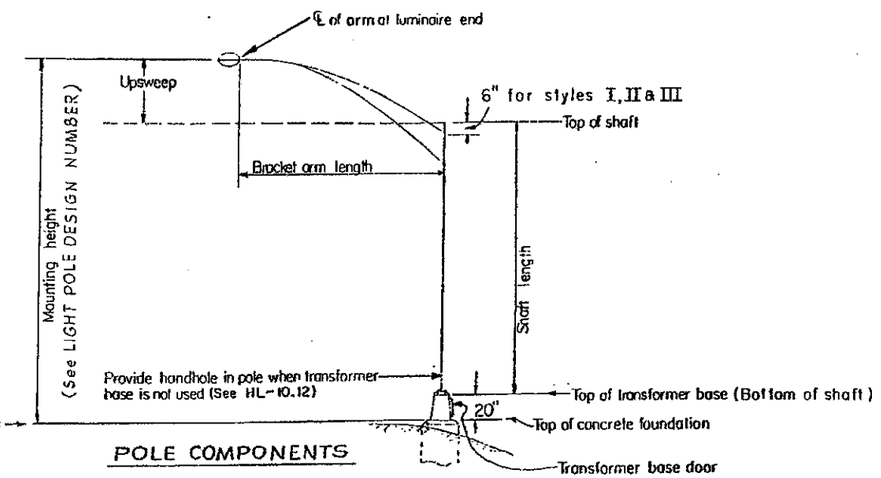


STYLE V

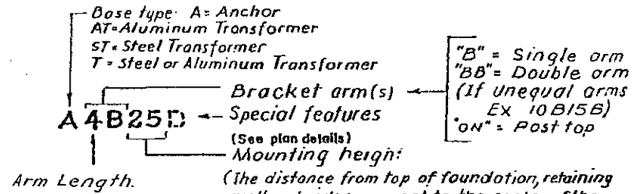


STYLE VI

NOTE: Subject to the approval of the Engineer, modification of the ratio of bracket upsweep to arm length is permissible provided the basic pole proportions are maintained as shown.



POLE COMPONENTS



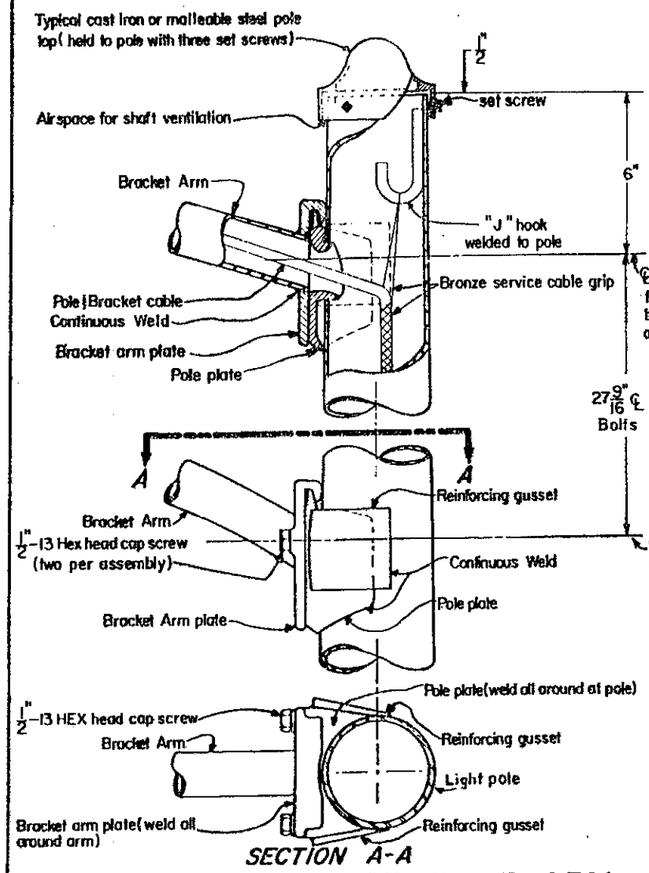
LIGHT POLE DESIGN NUMBER

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING	DATE 5-1-87
LIGHT POLE STYLES	
STANDARD CONSTRUCTION DRAWING HL-10.11	

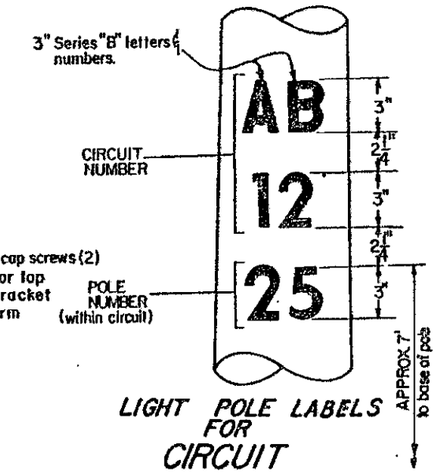
APPROVED: _____ Engineer of Design Services

LIGHT POLE DETAILS

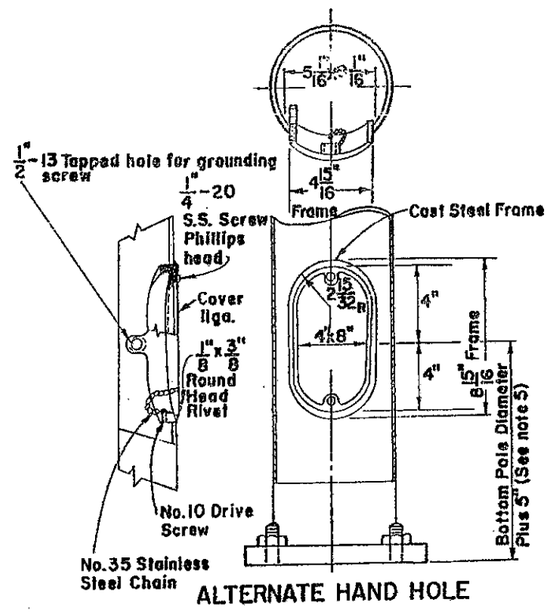


SECTION A-A

POLE TOP and BRACKET ARM ASSEMBLIES



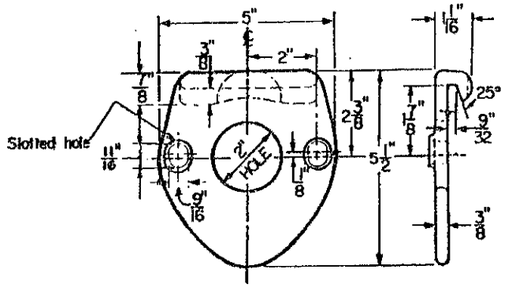
LIGHT POLE LABELS FOR CIRCUIT IDENTIFICATION (See note 4)



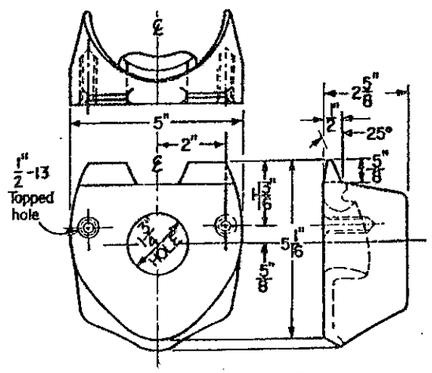
ALTERNATE HAND HOLE

NOTES

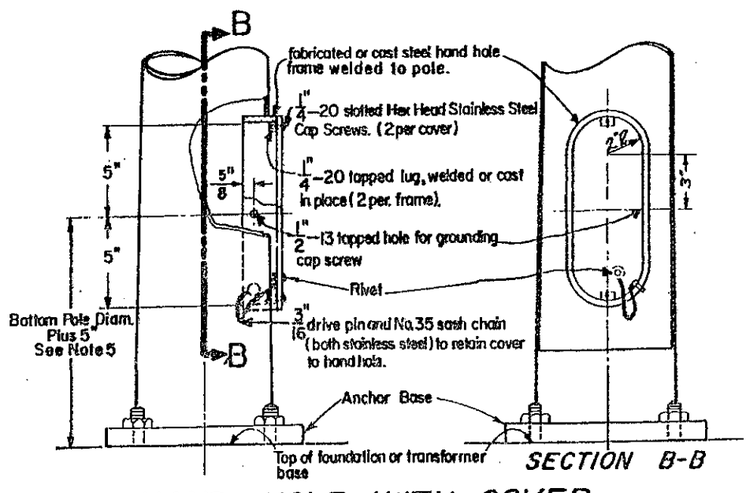
1. Hand holes are not required on poles with transformer bases.
2. Hand holes shall be opposite the roadway unless such location renders them inaccessible. (See NOTE 6)
3. Use of Reinforcing gussets is optional.
4. Circuit and light pole numbers shall be as scheduled on light plan sheets. Labels shall meet the requirements of 713.18 and shall contain 3" series "B" letters and numbers as per the "Standard Alphabets for Highway Signs" published by the Federal Highway Adminstration.
5. Hand holes for bridge poles shall be on roadway side and 17" from center of hand hole to bottom of base.
6. All light poles mounted on raised concrete median barriers shall be equipped with handholes. Handholes shall be located beneath the bracket arm extending over the Northbound or Westbound traffic lanes.
7. Details shown hereon are essentially for galvanized steel pole designs meeting 713.01 requirements. For aluminum designs, or other permitted steel material designs, variations from these details will be acceptable, as approved by the Engineer.
8. Circuit identification details are applicable to all pole designs.
9. See HL-60.11 For details of termination for ground cable.



BRACKET ARM PLATE (CAST STEEL)



POLE PLATE (CAST STEEL)



HAND HOLE WITH COVER
See Notes 1 & 2

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING	DATE 5-1-87
LIGHT POLE DETAILS	
STANDARD CONSTRUCTION DRAWING HL-10.12	

APPROVED _____ Engineer of Design Services

POLE BASE DETAILS

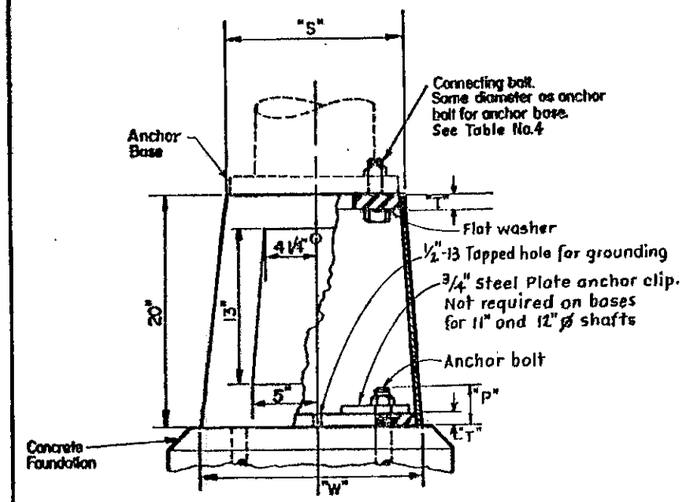
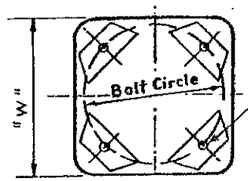


TABLE NO.1 STEEL TRANSFORMER BASES					
SHAFT SIZE	"T"	"S"	"W"	BOLT CIRCLE	"P"
6.0" thru 9.2"	3/4" min.	13" sq.	16" sq.	15"	4 1/2"
8.5" thru 10"	1 1/4" min.	15" sq.	18" sq.	17 1/4"	4 1/2"
11" and 12"	1 1/4"	17" sq.	25" sq.	22"	4 1/2"



BASE FRAME

STEEL TRANSFORMER BASES

NOTES (continued)

7. The AT-X base shall be used with anchor base poles having diameters of 7.5" thru 9.5" and having bolt circles 10 1/2" thru 13". For poles whose bottom shaft diameter is 9.5" and bolt circle 13", the top-slots of the AT-X base will require special machining for fit.

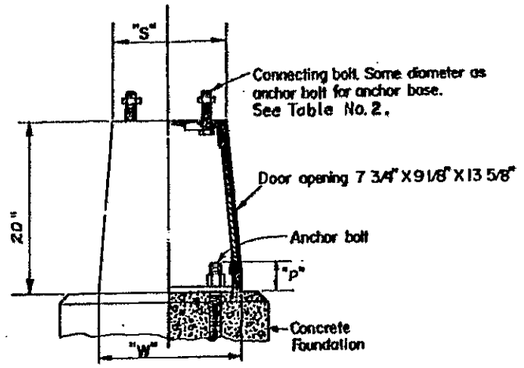
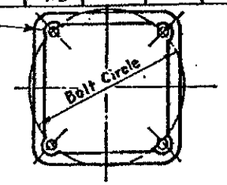


TABLE NO.2 TRANSFORMER BASE ANCHOR BOLTS			
SHAFT SIZE	STEEL POLE GUAGE NO. 11	7	
6.5"	1" ø X 40"	1" ø X 40"	1 1/4" ø X 48"
7"			
7.5"			
8"			
8.5"		1" ø X 48"	1 1/2" ø X 60"
9"			
9.5			
10"	1 1/4" ø X 48"		
11"			
12"			

40" bolts include 4" bend
48" and 60" bolts include 6" bend

TABLE NO. 3 ALUMINUM TRANSFORMER BASES					
TYPE	"P"	"S"	"W"	BOLT CIRCLE	SHAFT SIZE
AT-A	4 1/2"	13"	16 3/8"	15"	SEE NOTE 2
AT-C	4 1/2"	14 5/8"	17 1/4"	17 1/4"	SEE NOTE 3
AT-X	4 1/2"	13	14	12 1/2"	SEE NOTE 7



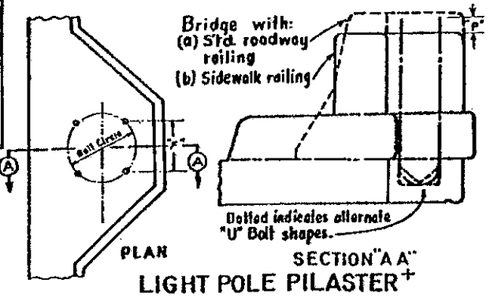
BASE FRAME

CAST ALUMINUM TRANSFORMER BASES

SHALL NOT BE USED WHERE OVERHEAD WIRING IS REQUIRED

TABLE NO. 5			
SHAFT SIZE	"F"	U-BOLT LENGTH ‡ SIDEWALK	STD. RDWY
6.5"	6 3/4"	75"	82"
7.0"	7 1/16"	75"	82"
7.5"	7 7/16"	76 1/2"	83 1/2"
8.0"	7 3/4"	76 1/2"	83 1/2"
8.5"	8 1/8"	76 1/2"	83 1/2"
9.0"	8 7/8"	78"	85"
9.5"	9 3/16"	78"	85"
10.0"	9 9/16"	79 1/2"	86 1/2"
11.0"	10 5/8"	79 1/2"	86 1/2"
12.0"	11 5/16"	81"	88"

‡ See NOTE 4



LIGHT POLE PILASTER+

BRIDGE MOUNTED POLES

+ For pilaster dimensional details, See HL-20.14

NOTES

1. For pole grounding details see HL-60.11
2. Type AT-A base shall normally be used with anchor base poles having diameters of 6 inches through 9.2, inches inclusive, and mounting heights through 41.7 feet.
3. Type AT-C base must be used for anchor base poles having diameters of 9.5 inches and 10 inches and mounting heights through 51.7 except for exclusions listed below:
   - a All double-arm poles with mounting heights of 50 feet.
   - b All single-arm poles with mounting heights of 50 feet and arm lengths of 25 feet and 30 feet.
   - c All double-arm poles with mounting heights of 45 feet and arm lengths of 25 feet and 30 feet.
   - d All single-arm poles with mounting heights of 45 feet and arm length of 30 feet.

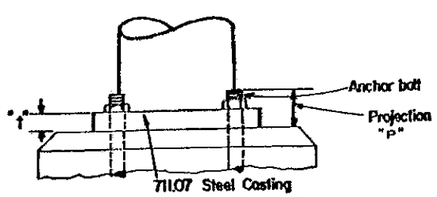
   On excepted poles above, transformer bases of material other than cast aluminum shall be used.
4. U-bolt lengths shown in TABLE NO.5 are developed lengths and may vary ±1/2". Lengths are for 1", 1 1/4", 1 1/2" and 1 3/4" diam. bolts. Lengths shown are for bridges with sidewalk railing and for bridges having a standard roadway railing.
5. For anchor bolt data when transformer bases are to be mounted on bridge pilasters see TABLE NO.1 and TABLE NO.2.
6. For median-mounted pole base details See HL-20.13

TABLE NO. 4 ANCHOR BOLTS FOR STEEL ANCHOR BASES						
SHAFT SIZE	BOLT CIRCLE	BOLT* PROJ "P"	"t"	POLE GUAGE NO.11	NO. 7	NO.3
6.5"	9 1/2"	2 1/8"	7/8"	1" x 40"	1 1/4" x 48"	1 1/4" x 48"
7"	10"	2 1/4"	1"			
7.5"	10 1/2"	2 5/8"	1 1/8"			
8"	11"	2 5/8"	1 3/16"			
8.5"	11 1/2"	2 3/4"	1 1/4"			1 1/2" x 60"
9"	12 1/2"	3"	1 5/16"			
9.5	13"	3 1/8"	1 3/8"	1 1/4" x 48"		
10"	13 1/2"	3 3/8"	1 7/16"		1 1/2" x 60"	1 3/4" x 90"
11"	15"	3 5/8"	1 5/8"			
12"	16"	4	1 11/16"			

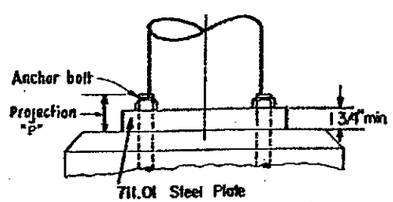
* Based on cast steel anchor bases only. For plate bases the projection shall be increased by the amount the plate thickness exceeds the "t" dimension shown.

STEEL ANCHOR BASES

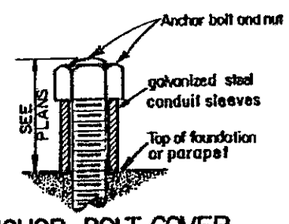
(See optional base plate details on either side)



OPTIONAL **CAST STEEL** BASE
(See TABLE NO.4)



OPTIONAL **STEEL PLATE** BASE
(See TABLE NO4)



ANCHOR BOLT COVER

Note: To be placed on all light pole anchor bolts provided for future lighting installations.

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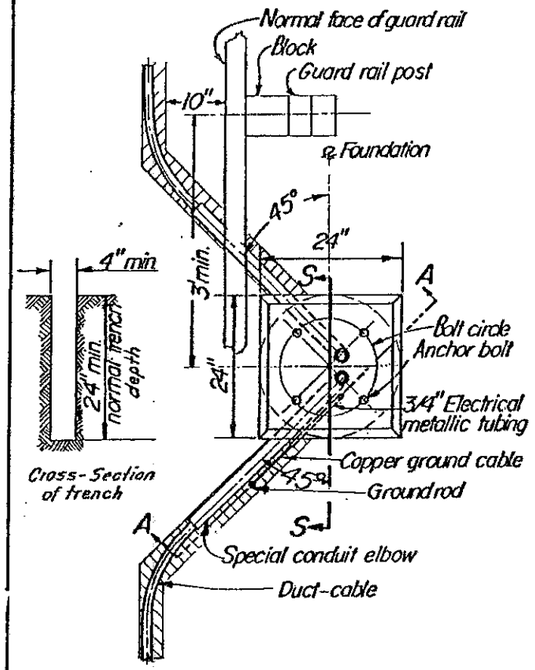
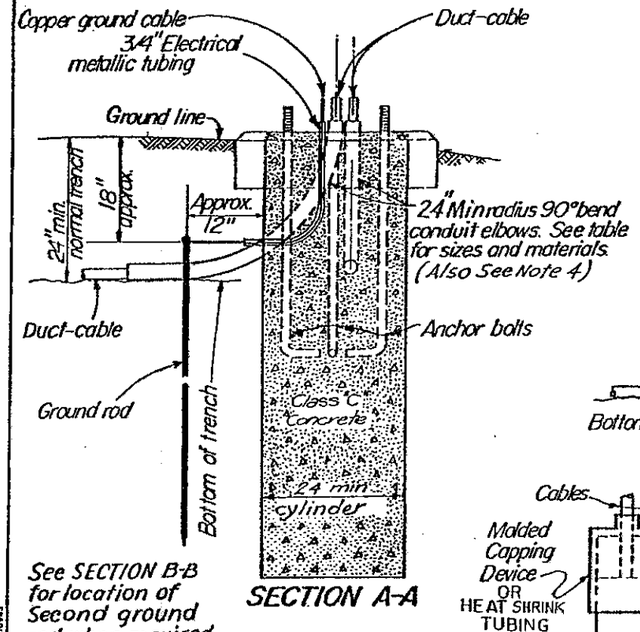
HIGHWAY LIGHTING	DATE 5-1-87
POLE BASE DETAILS	
STANDARD CONSTRUCTION DRAWING HL-10.13	

APPROVED: _____ Engineer of Design Services

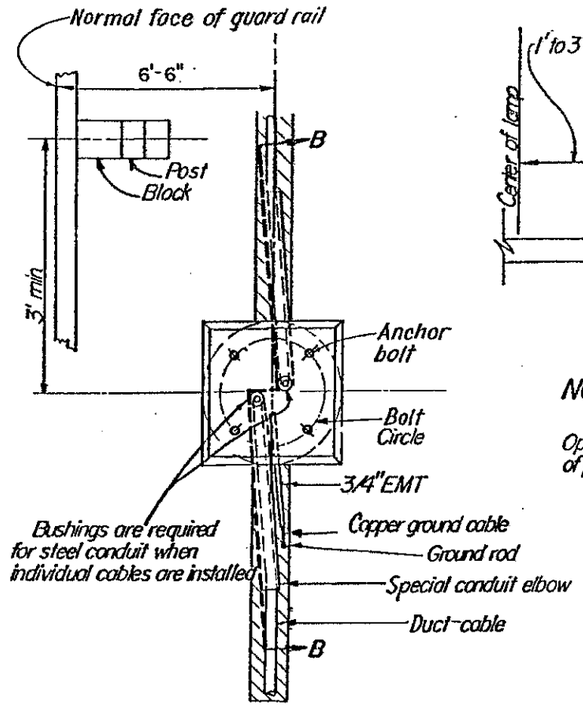
FOUNDATION AND TRENCH DETAILS



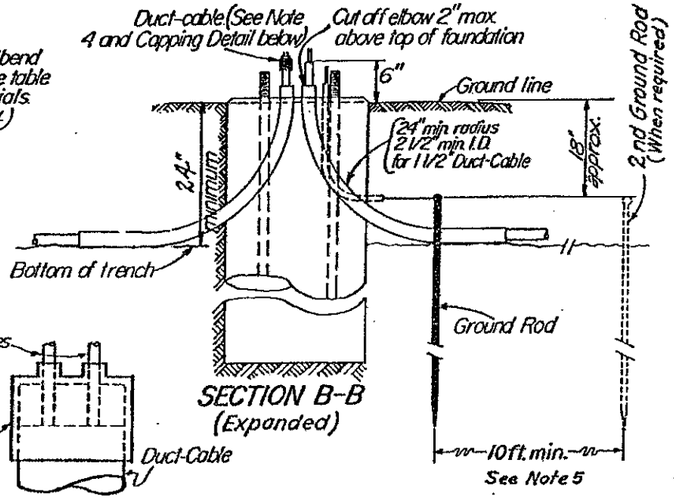
ALTERNATE **TRENCH ALIGNMENT**
(Use as directed by the Engineer)



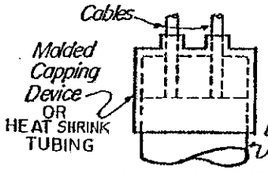
SECTION A-A



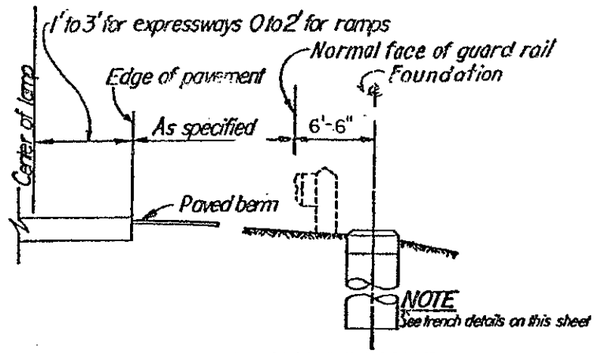
NORMAL TRENCH ALIGNMENT



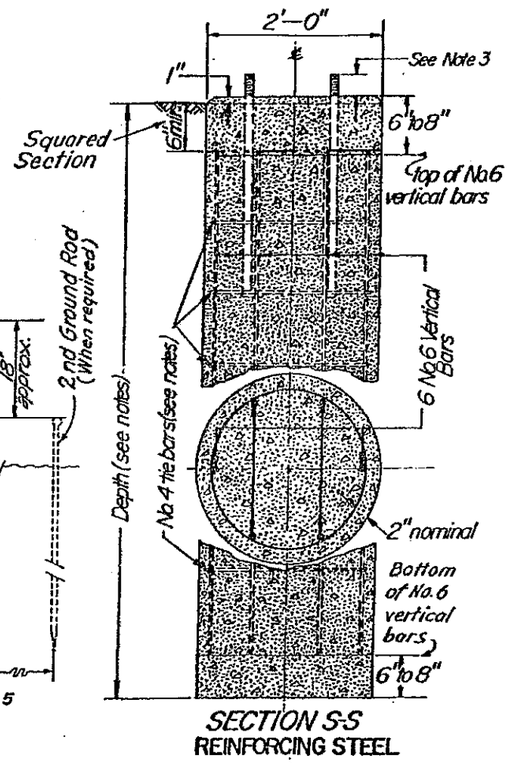
SECTION B-B
(Expanded)



CAPPING DETAIL



NORMAL LOCATION OF LIGHT POLE FOUNDATION
Opposite hand for poles mounted on left side of pavement.



SECTION S-S
REINFORCING STEEL

NOTES

1. FOUNDATION
   Minimum depths to be as follows:
   6 feet for poles having a mounting height less than 40 ft.
   8 feet for poles having a mounting height 40 ft. thru 44 ft.
   9 feet for poles having a mounting height 45 ft. thru 49 ft.
   10 feet for poles having a mounting height of 50 ft. thru 55 ft.
   No. 4 Tie bars required as follows:
   4 No. 4 tie bars for 6 ft depth
   5 No. 4 tie bars for 8 and 9 ft. depth
   6 No. 4 tie bars for 10 ft. depth
   Rotate bars to clear conduits.

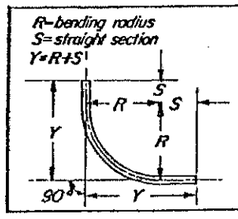
2. COPPER GROUND CABLE:
   No. 4 AWG, stranded insulated copper ground cable shall be used. Exothermically weld cable to ground rod, run free end through 3/4" EMT and connect as shown on HL-60.11.
   Use two coats of insulating varnish over exothermic weld and exposed conductor.

3. ANCHOR BOLT DATA:
   For anchor bolt data see HL-10.13, POLE BASE DETAILS

4. CONDUIT:
   Where 2" or 3" diameter conduit terminates in a foundation the conduit elbows in the foundation shall be the same size as the conduit. The ends of conduit elbows containing distribution cable shall be closed as described in 625.13
   When the terminating conduit is steel the conduit elbows in the pole foundation shall also be steel.
   At the last light pole on a circuit the vacant conduit elbow in the light pole foundation shall be stubbed out and capped.

5. GROUND RODS:
   When a second ground rod is required it shall be installed in the cable trench as shown in SECTION B-B.

6. REINFORCING STEEL:
   Reinforcing steel may be assembled in cages by approved welding of bars.
   Subject to approval of the Engineer cages may be assembled in a spiral conformation.



SPECIAL CONDUIT ELBOWS
90° BENDS

2", 2 1/2" & 3" 7130A			3" 7130T		
R	S	Y	R	S	Y
24"	11"	35"	24"	8"	32"
30"	11"	41"			
36"	11"	47"	36"	2"	38"
42"	12"	54"			
48"	12"	60"			

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING

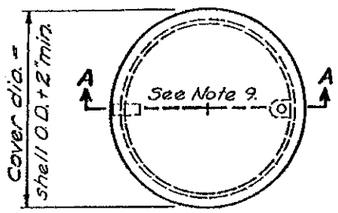
DATE 5-1-87

FOUNDATION AND TRENCH DETAILS

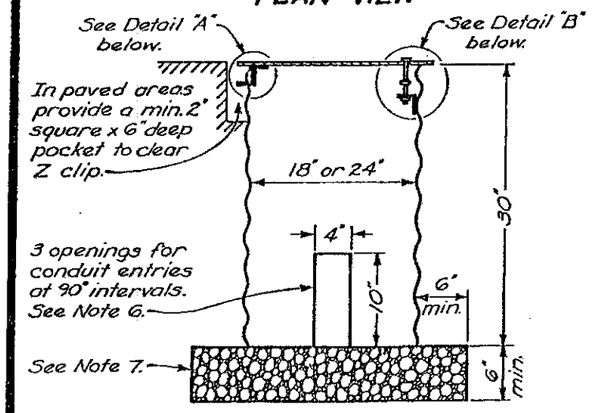
STANDARD CONSTRUCTION DRAWING HL-20.11

APPROVED _____ Engineer of Design Services

BRUHNS 44150 10143

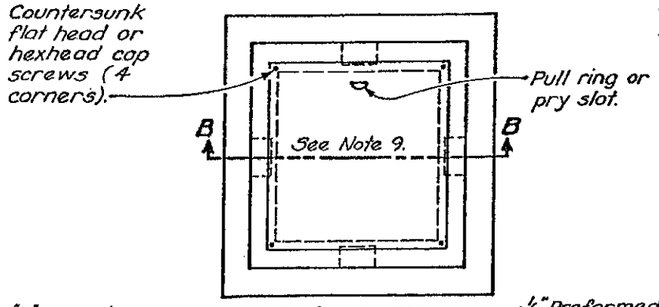


PLAN VIEW

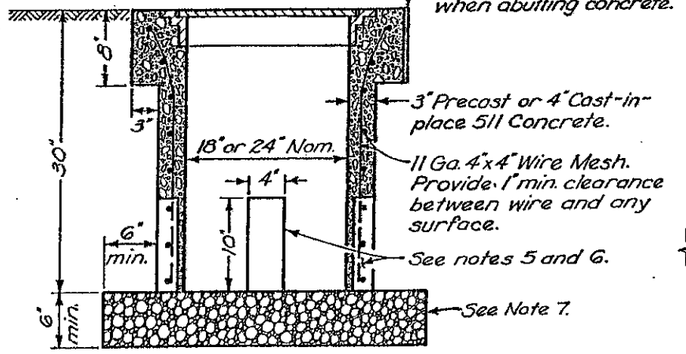


SECTION A-A

CORRUGATED STEEL PULL BOX

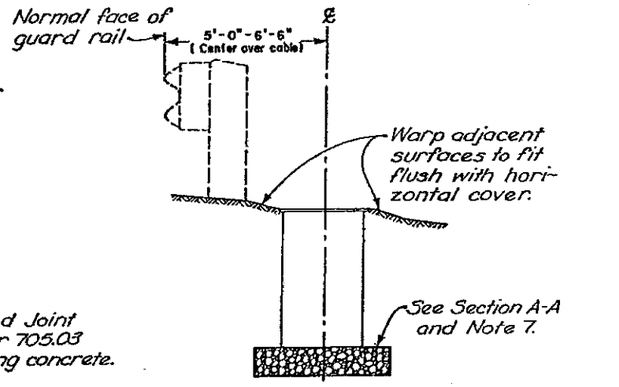


PLAN VIEW

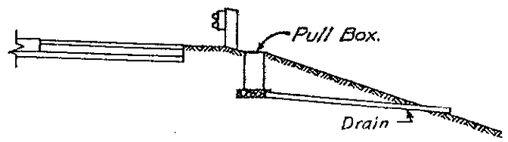


SECTION B-B

CONCRETE PULL BOX



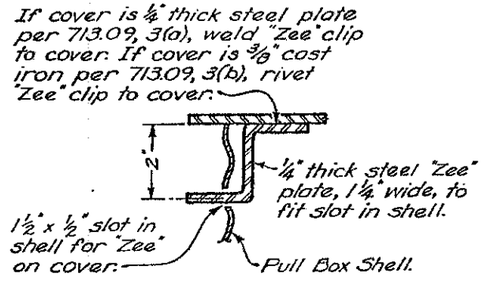
NORMAL INSTALLATION



INSTALLATION IN ROADWAY FILL SECTION

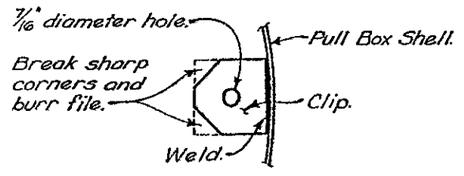
NOTES

1. Pull boxes shall conform with 625.11, 713.08, 713.081 and 713.09
2. Concrete pull boxes shall have ferrous metal covers and matching frames by Neenah, Josam or Zurn Foundries, or approved equal. Covers may be ½" minimum galvanized plate steel or cast iron with reinforcing ribs.
3. Tapered thickness concrete pull box walls may be used; however, minimum wall thickness shall be as indicated.
4. Lifting rings or wire pulling rings may be incorporated into precast concrete pull box walls.
5. Conduit entries for cast-in-place concrete pull boxes shall be cast as required. Precast pull boxes may have blocked out sections of the wall as knockouts in the quantity of one per wall.
6. Unused opening areas surrounding conduits shall be blocked after conduit installation.
7. Aggregate used for pull boxes shall be No. 7 or 8, at least 6" deep. Costs for aggregate shall be included with the unit price bid for each pull box.
8. Pull box drains in accordance with 603 shall be installed when specified, or as directed by the Engineer. Alternate drain location may be used when normal run would exceed 20 feet.
9. See 713.09 for cover marking requirements.

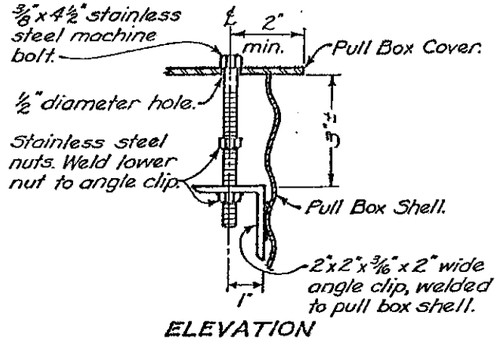


ELEVATION

DETAIL A

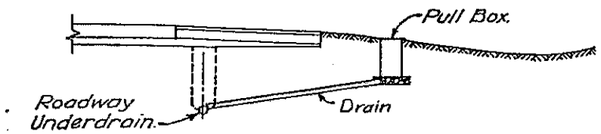


PLAN VIEW

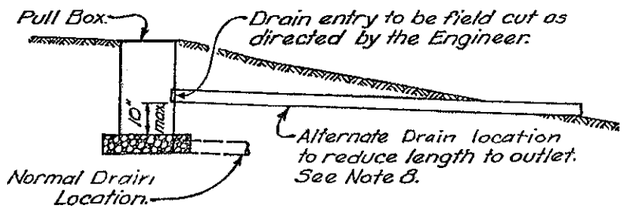


ELEVATION

DETAIL B



INSTALLATION IN ROADWAY CUT SECTION



ALTERNATE UNDERDRAIN LOCATION

UNDERDRAINS FOR PULL BOXES

BUREAU OF DESIGN SERVICES
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OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING

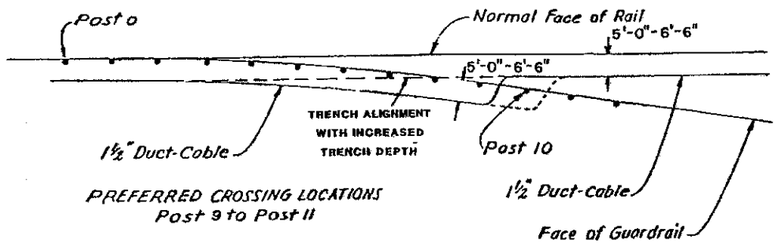
PULL BOX DETAILS I

DATE 5-1-87

STANDARD CONSTRUCTION DRAWING HL-30.11

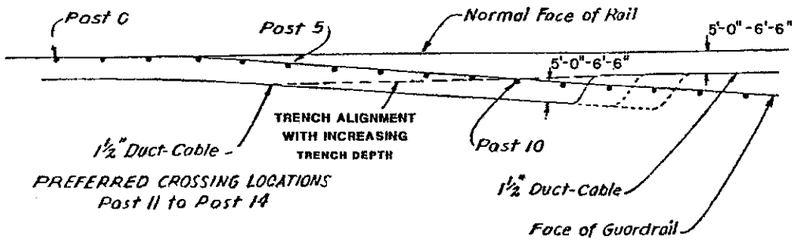
APPROVED _____ Engineer of Design Services

STANDARD GUARDRAIL FLARE
FOR CUT TO FILL AND FILL TO FILL AREAS
1"=10'



PREFERRED CROSSING LOCATIONS
Post 9 to Post 11

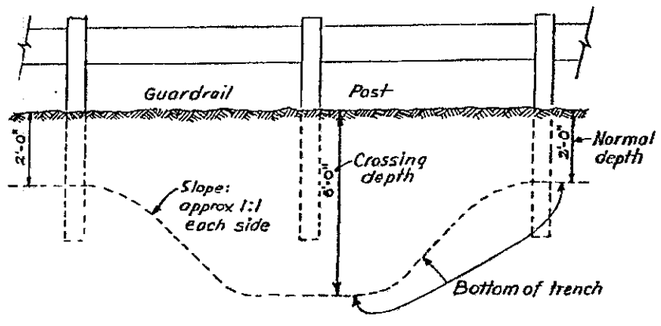
INTRODUCED GUARDRAIL FLARE
BECAUSE OF OBSTRUCTION
1"=10'



PREFERRED CROSSING LOCATIONS
Post 11 to Post 14

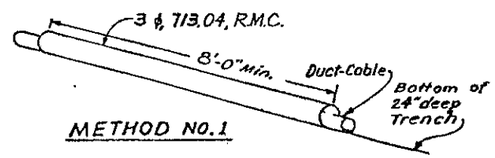
METHOD for PROTECTING DUCT-CABLE UNDER GUARD RAIL

Increased depth of cable trench at point of crossing.
To be used whenever trench alignment is within 1'-6" of posts.

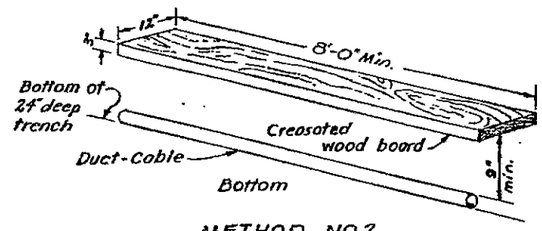


METHODS OF PROTECTING DUCT-CABLE

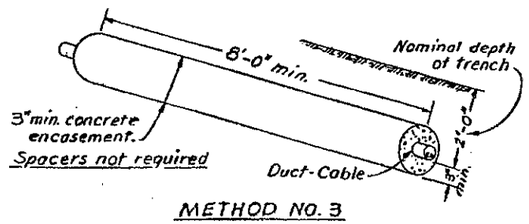
(See NOTE No.1)



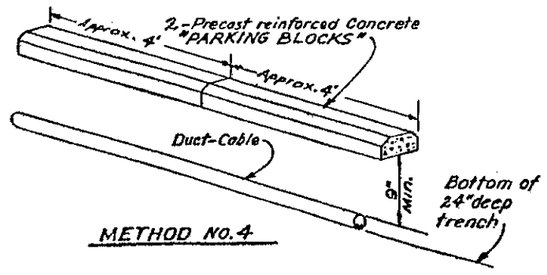
METHOD NO.1



METHOD NO.2



METHOD NO. 3



METHOD NO.4

NOTES

1. Payment for protection of duct-cable and distribution cable under guard rail, as detailed in Methods 1 thru 4, shall be included in the unit prices bid for the affected cable and trench items.

BUREAU OF DESIGN SERVICES
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OHIO DEPARTMENT OF TRANSPORTATION

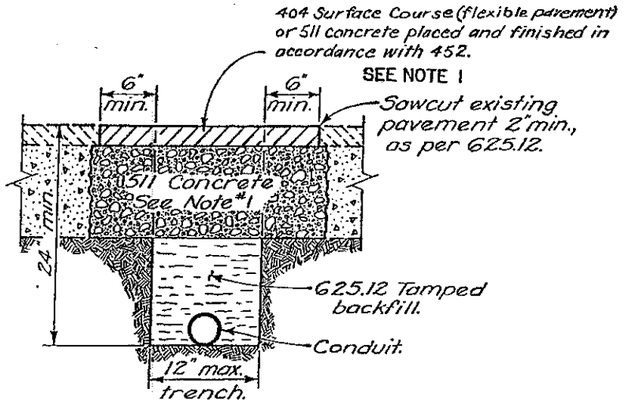
HIGHWAY LIGHTING

DATE 5-1-87

ROADWAY CONDUIT DETAILS I

STANDARD CONSTRUCTION DRAWING **HL-30.21**

APPROVED _____ Engr. of Design Services

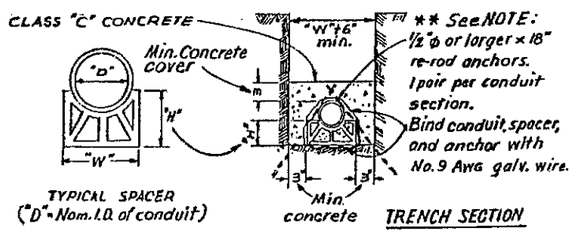


TRENCH IN PAVED AREAS

CONCRETE ENCASED CONDUIT

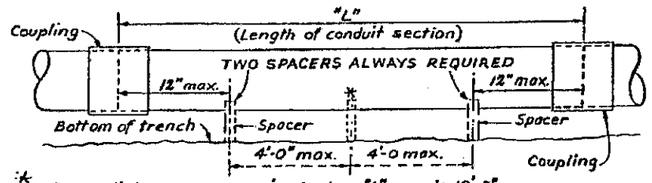
"D"	"H"	"W"
2"	3 1/8"	5 1/2"
3"	3 7/8"	6 1/2"
4"	4 5/8"	7 5/8"
5"	4 1/2"	8 5/8"

Nominal spacer dimensions



TYPICAL SPACER ("D" = Nom. I.D. of conduit)

TRENCH SECTION



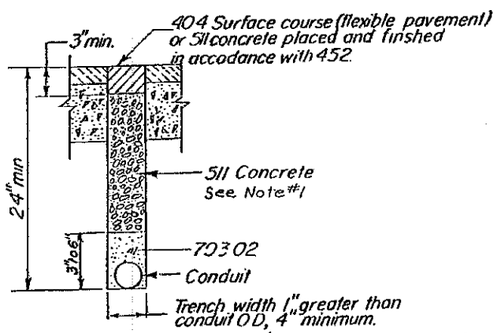
*Intermediate spacer required when "L" equals 10'-0"
Additional spacers shall be required when "L" exceeds 10'-0"

SIDE ELEVATION

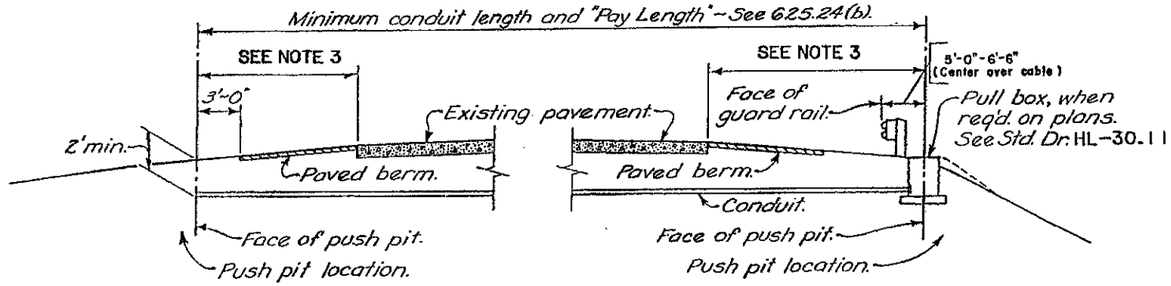
** NOTE: DELETE ANCHORS AND BINDING WIRE WHEN USING STEEL CONDUIT.

NOTES

1. At trench locations in paved areas, replacement of disturbed flexible pavement shall consist of 511 Concrete placed to within 2" of the surface and a 404 Surface course matching the existing surface. Replacement of disturbed rigid pavement shall consist of 511. Concrete with surface placed and finished in accordance with 452.
2. Site clearing and restoration shall be in accordance with 603.09.
3. When undermining shoulder areas that do not have paved berms provide 3/4" thick steel surface plates, corrugated pipe sleeves, shoring or other approved means to prevent cave-in.
4. When conduit is jacked or drilled under divided pavements cable may be installed in a trench through the median area when specified in the plans.



NARROW SLIT TYPE TRENCH



CONDUIT JACKED UNDER PAVEMENT

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

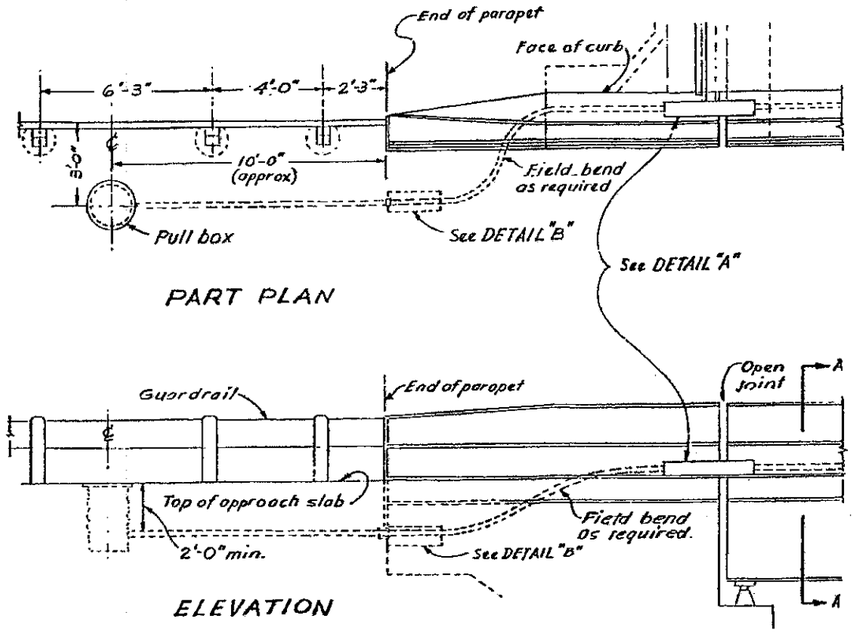
HIGHWAY LIGHTING

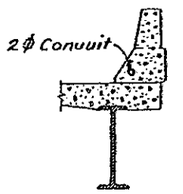
DATE 5-1-87

ROADWAY CONDUIT DETAILS II

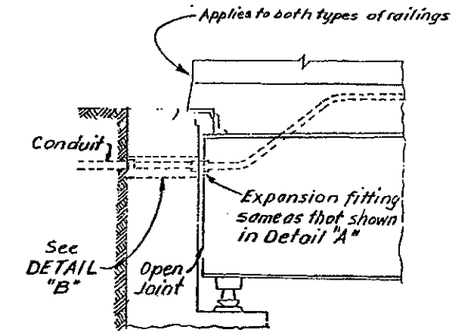
STANDARD CONSTRUCTION DRAWING **HL-30.22**

APPROVED _____ Engr. of Design Services





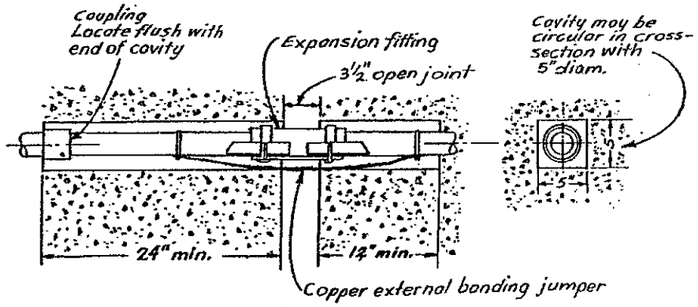
CONDUIT DETAILS FOR BRIDGE WITH STANDARD ROADWAY RAILING



STRAIGHT WING WALL

NOTES

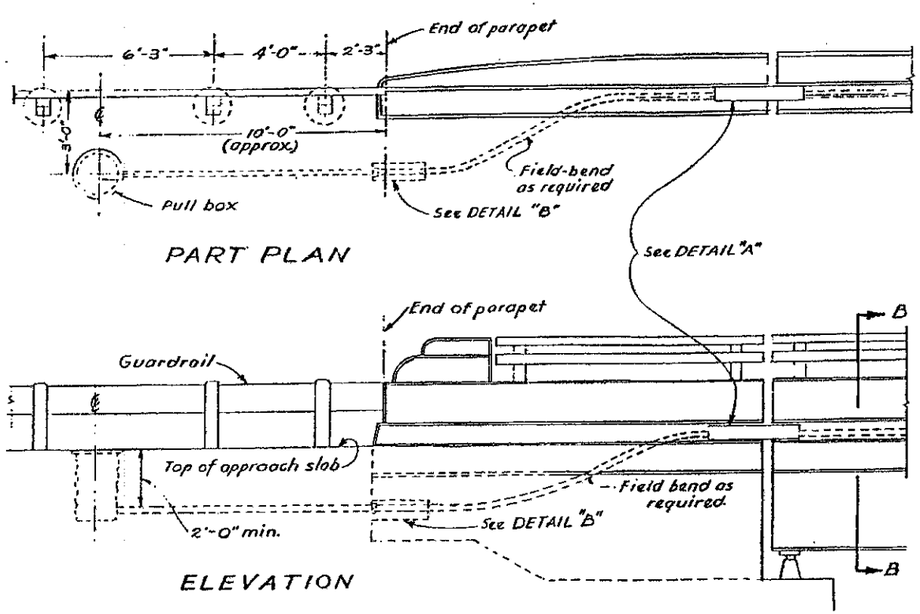
1. Fill space around the conduit and/or fittings within the cavity with a polyurethane foam or other approved cold applied joint sealer.

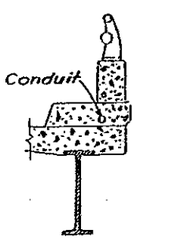


Locate conduit and fittings as near to top of cavity as possible.

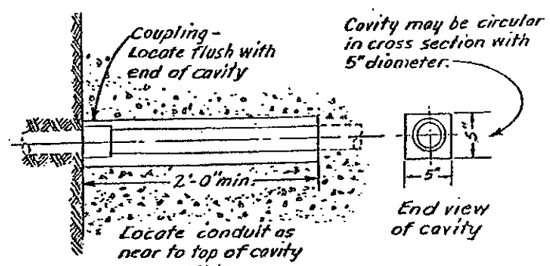
DETAIL "A"

CAVITY FOR CONDUIT EXPANSION FITTING
Dimensions may be altered to fit abutment design.





CONDUIT DETAILS FOR BRIDGE WITH SIDEWALK RAILING



DETAIL "B"

CAVITY FOR CONDUIT CONNECTION AT BRIDGE ABUTMENTS
Dimensions may be altered to fit abutment design

BUREAU OF DESIGN SERVICES
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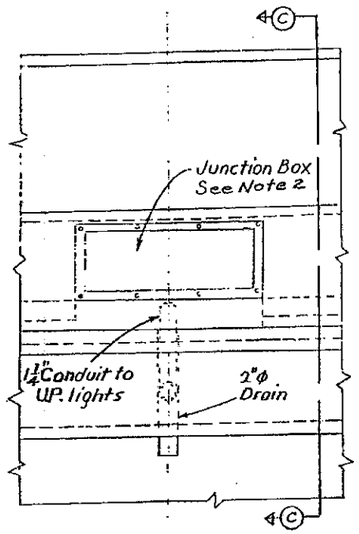
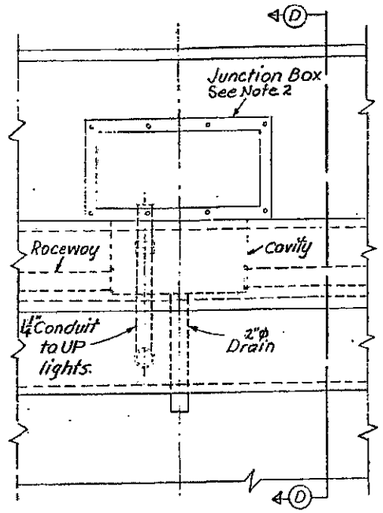
HIGHWAY LIGHTING	DATE
STRUCTURE CONDUIT DETAILS I	5-1-87
STANDARD CONSTRUCTION DRAWING HL-30.31	

APPROVED _____ Engr. of Design Services



ELEVATION



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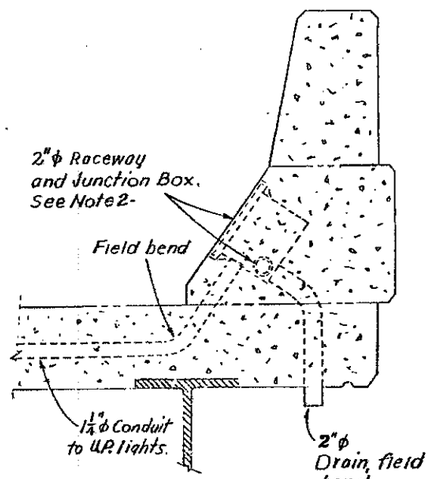
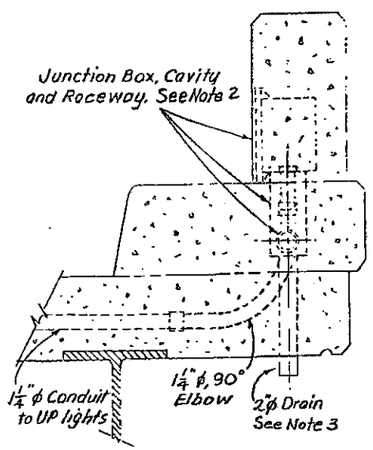


SECTION "C-C"



SECTION "D-D"

RACEWAY WITH SERVICE TO U.P. LIGHTS SEE NOTE 1

BRIDGE WITH ROADWAY RAILING BRIDGE WITH SIDEWALK RAILING

NOTES

1. U.P. = Underpass
2. For location and details of the 2"ϕ conduit raceway, Junction Boxes, conduit drain and box openings for service to underpass lights see HL-20.14, STRUCTURE LIGHTING I
3. Install 2" conduit drains at low point(s) in raceway between light pole pilasters. Exposed drain openings shall be provided with an approved, corrosion resistant metal screen or perforated plastic cap with ⅛" openings.
4. For grounding details see HL-50.21, STRUCTURE GROUNDING
5. All conduit shall conform to 713.04.

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HIGHWAY LIGHTING

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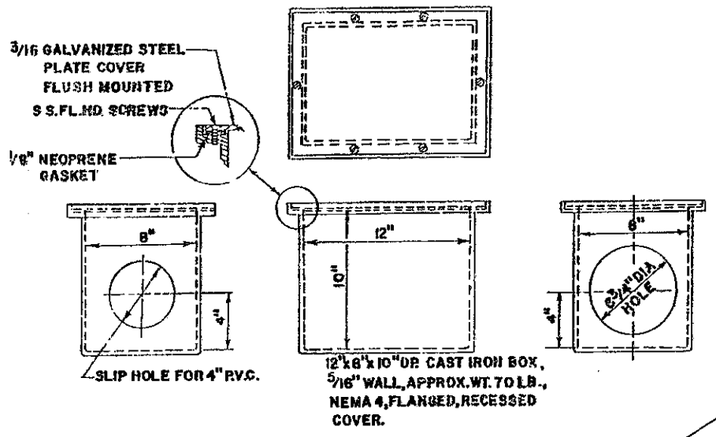
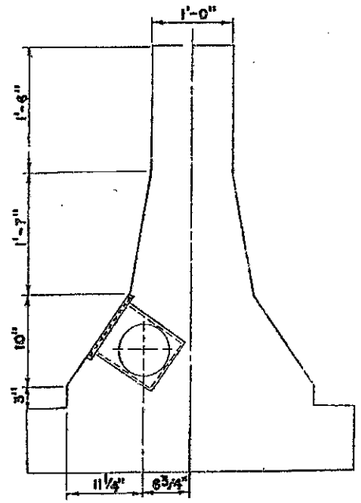
STRUCTURE CONDUIT DETAILS II

STANDARD CONSTRUCTION DRAWING HL-30.32

APPROVED _____ Engr. of Design Services



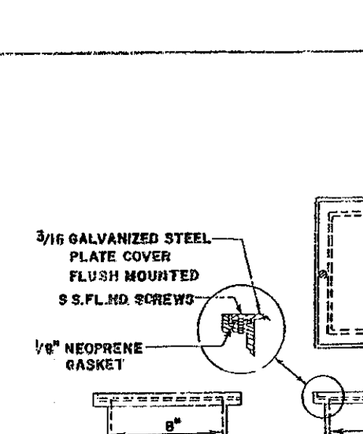
TRANSITION JUNCTION BOX DETAILS



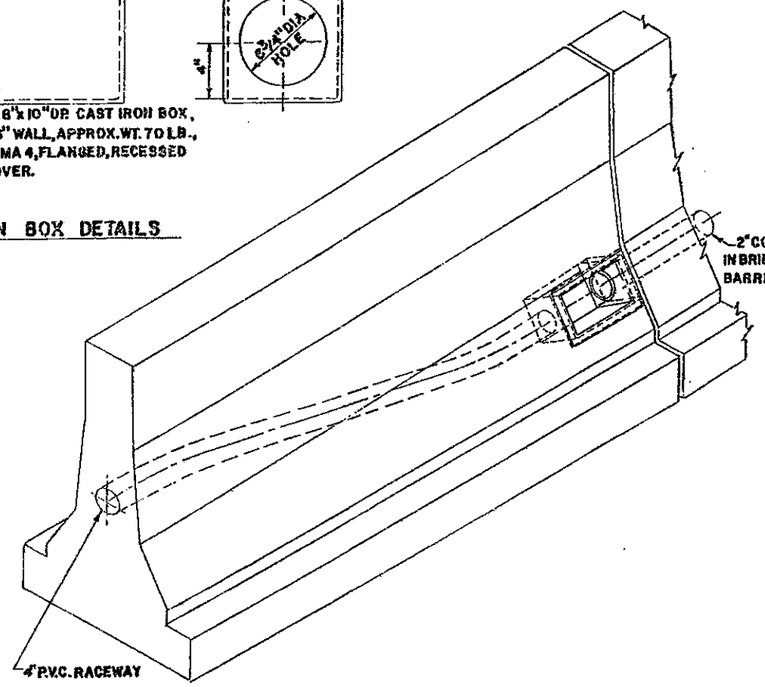
END ELEV. B-B

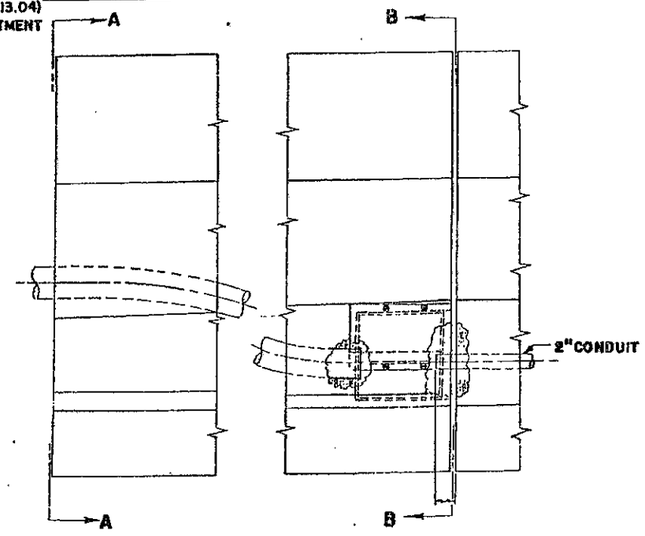
NOTES

1) JUNCTION BOX SHALL CONFORM TO 713.10, EXCEPT THAT THE GALVAIZED STEEL PLATE COVER SHALL CONFORM TO ASTM A-242 OR A-36.



END ELEV. A-A





SIDE ELEVATION, TRANSITION BARRIER FROM ROADWAY TO BRIDGE CONFGURATION

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DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING

STRUCTURE CONDUIT DETAILS III

DATE 5-1-87

STANDARD CONSTRUCTION DRAWING HL-30.33

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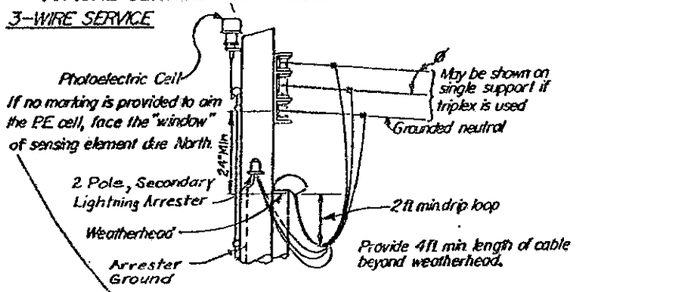
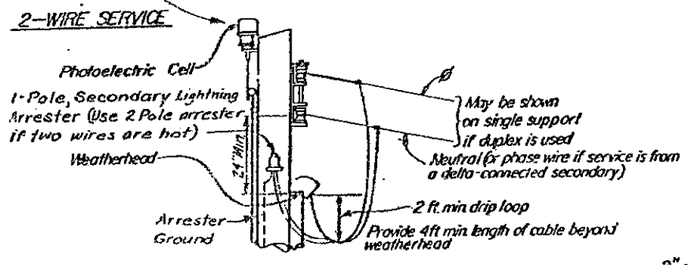
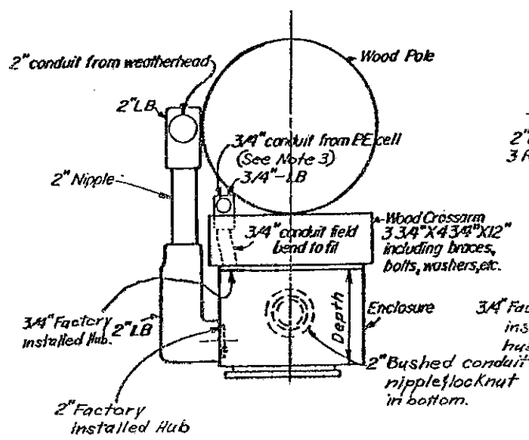
SERVICE POLES AND CONTROL CENTERS

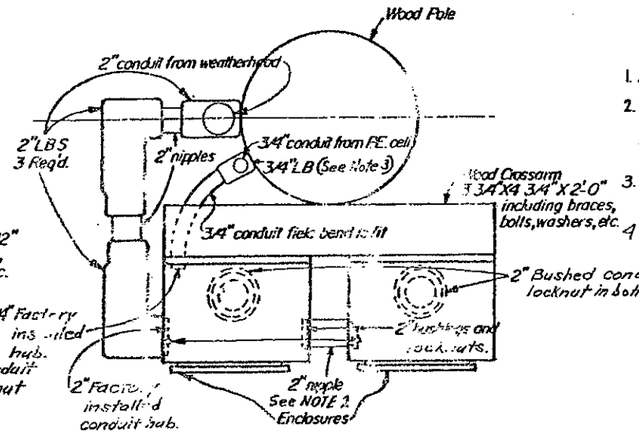
TYPICAL SERVICE POLE HEADS







PLAN
SINGLE ENCLOSURE



PLAN
DOUBLE ENCLOSURES

NOTES

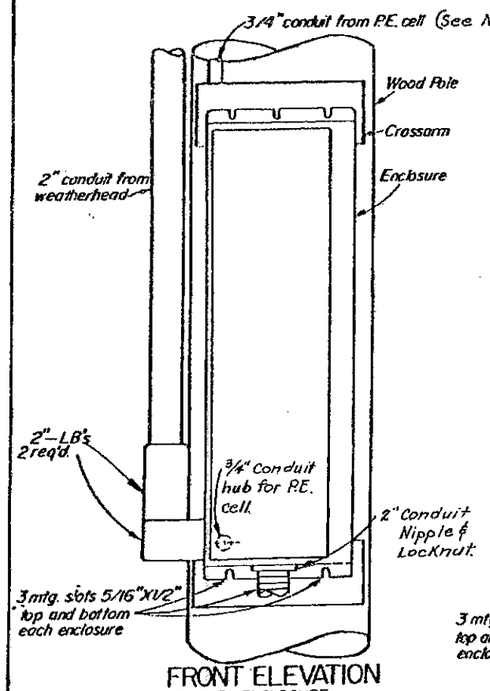
1. All openings in enclosures shall be made by fabricator.
2. Two or more enclosures may be mounted with sides abutting. The 2" nipple shown shall then be replaced by the installation of 2" insulated bushings in the openings for cables.
3. The 3/4" conduit for control wiring between P.E. Cell and contactor enters the back of the enclosure at the bottom.
4. All conduit shall conform to 713.04

ENCLOSURE TYPES

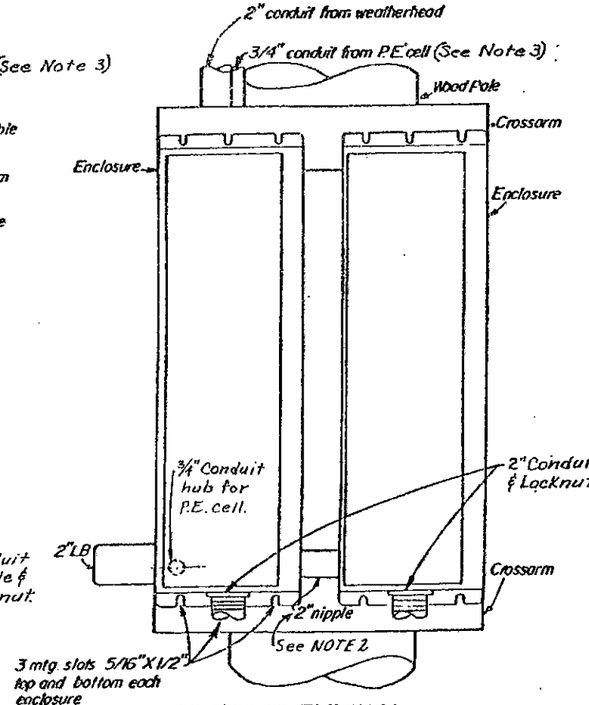
MINIMUM INTERIOR DIMENSIONS

TYPE NO.	PRINCIPLE CONTENTS	WIDTH	HEIGHT	DEPTH*
S-60	60 ampere fused switch.	10½"	18"	6 9/16"
S-100	100 ampere fused switch.	14"	24"	8.81"
SC-60	60 ampere combination fused switch & contactor.	14"	34"	7 5/8"
SC-100	100 ampere combination fused switch & contactor.	14½"	42"	8.81"

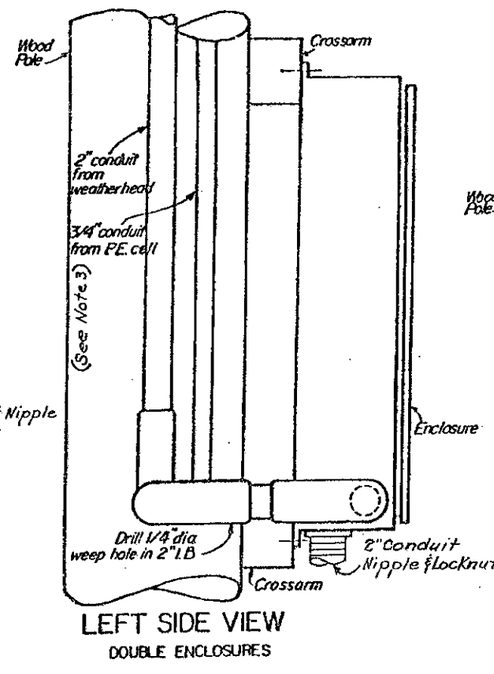
*See "PLAN" view of Single Enclosure. The interior depth dimension shall not include any part of the enclosure door which may protrude into the interior of the enclosure.



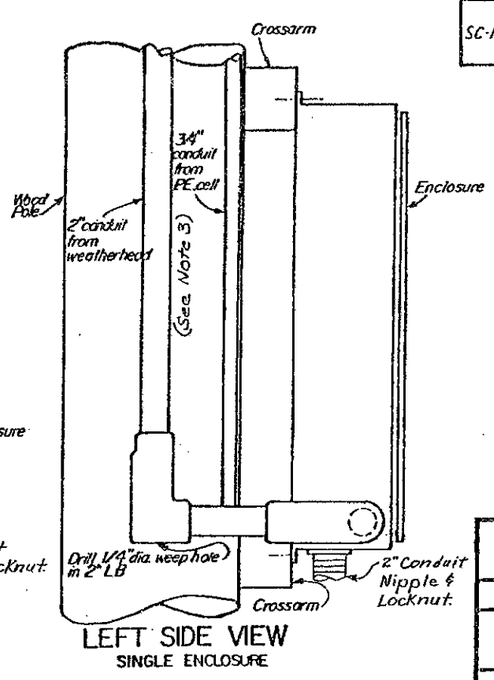
FRONT ELEVATION
SINGLE ENCLOSURE



FRONT ELEVATION
DOUBLE ENCLOSURES



LEFT SIDE VIEW
DOUBLE ENCLOSURES



LEFT SIDE VIEW
SINGLE ENCLOSURE

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DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

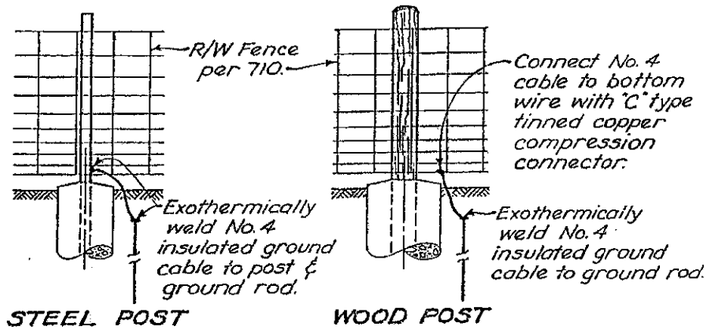
HIGHWAY LIGHTING

CONTROL CENTERS

DATE 5-1-87

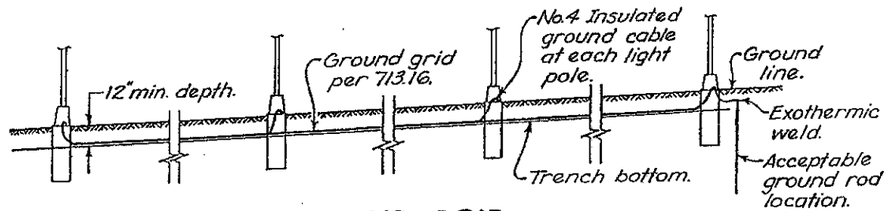
STANDARD CONSTRUCTION DRAWING **HL-40.10**

APPROVED: _____ Engineer of Design Services

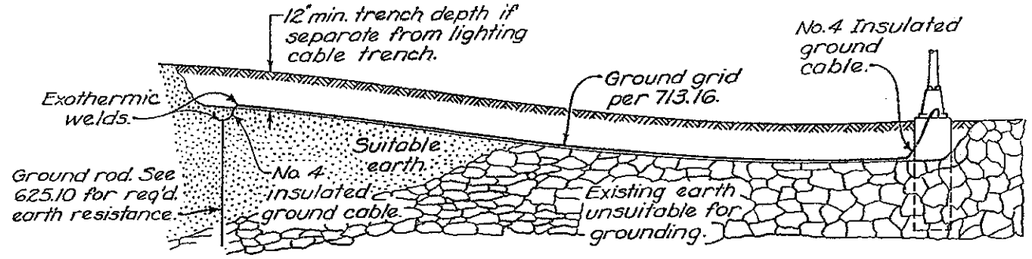


R/W FENCE GROUND

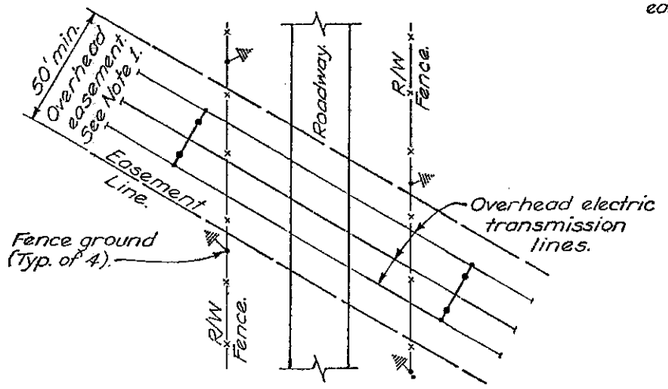
When specifically noted on the plans, and in Notes 1, 2 & 3, R/W Fences shall be grounded as shown above. See also Note 4.



GROUND GRID



MODIFIED GROUND GRID - INDIVIDUAL POLE



FENCE GROUNDS AT TRANSMISSION LINE CROSSING

NOTES

1. Where overhead transmission line easements 50 feet or more in width cross a fenced roadway right-of-way, each fence shall be grounded as shown hereon.
2. Where overhead electric power line easements less than 50 feet in width cross a fenced roadway right-of-way, each fence shall be grounded directly below the centerline of the power line crossing.
3. Where overhead transmission lines rated 110KV or higher are parallel to roadway fences and the transmission line easement is contiguous to the roadway right-of-way the roadway fences shall be grounded at least every 300 ft.
4. Fence grounds will be paid for at the unit price bid for 625 Ground rod.
5. Apply two coats of insulating varnish over all exothermic welds and exposed cable.

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HIGHWAY LIGHTING

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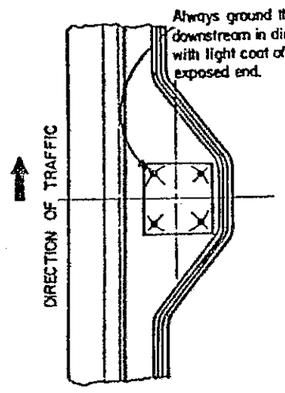
GROUNDING DETAILS

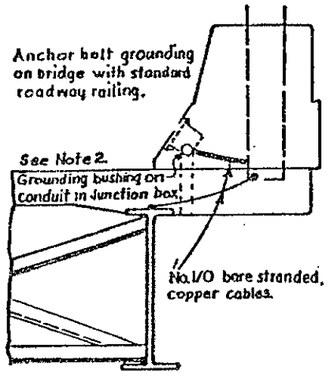
STANDARD CONSTRUCTION DRAWING **HL-50.11**

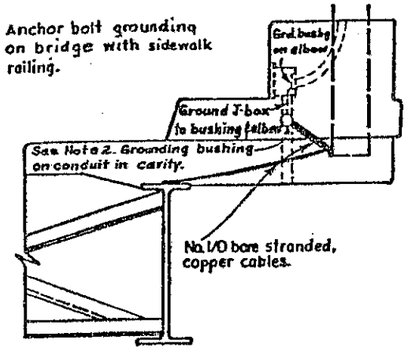
APPROVED _____ Engineer of Design Services

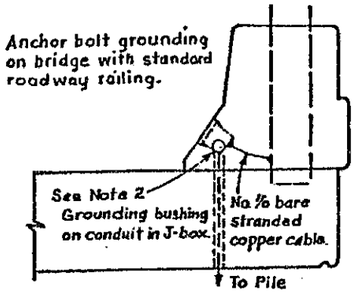
STRUCTURE GROUNDING

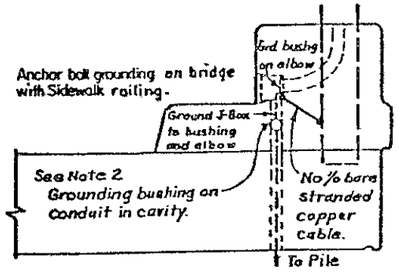


LIGHT POLE PARAPET PLAN





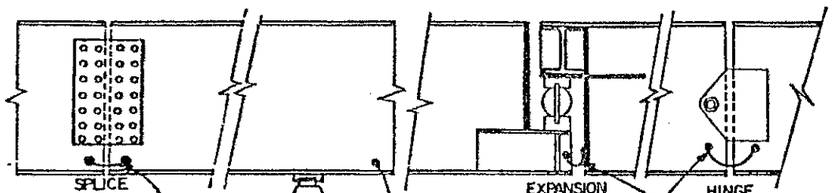


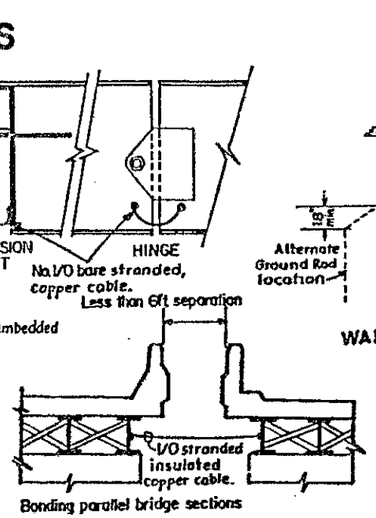


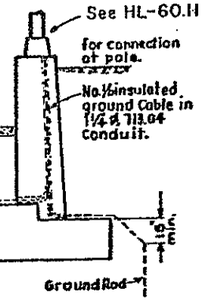
NOTES

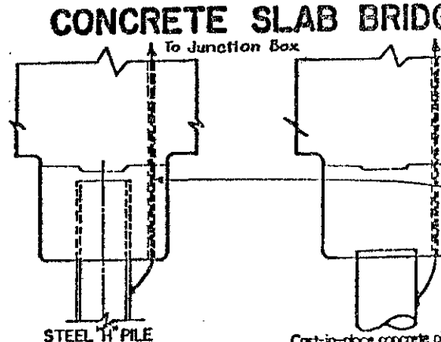
1. Copper grounding cable shall be connected to structural steel, pile encasement, piling, ground rods, junction boxes and anchor bolts by means of exothermic welding. Two coats of insulating varnish shall be applied over the exothermic weld and exposed cable.
2. Structure grounding system shall be connected to structure conduit system by the use of conduit grounding bushings as shown on HL-20.14 and this drawing.

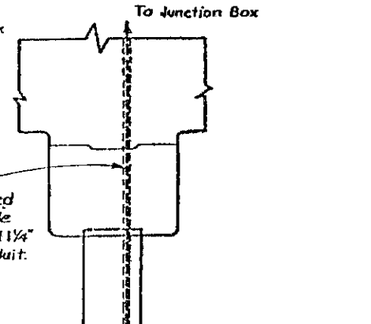
STEEL BEAM BRIDGES

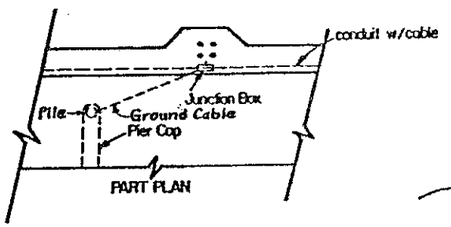


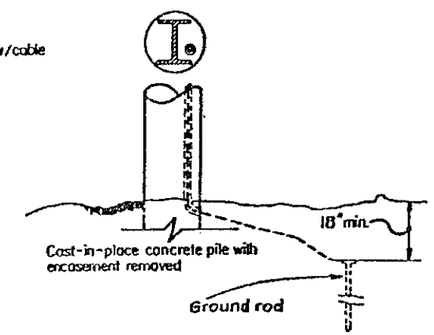


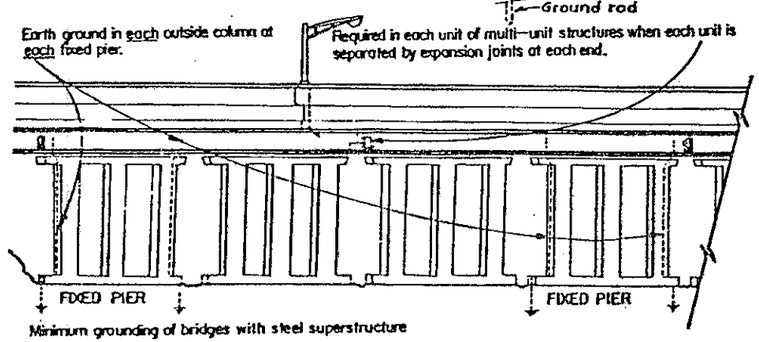




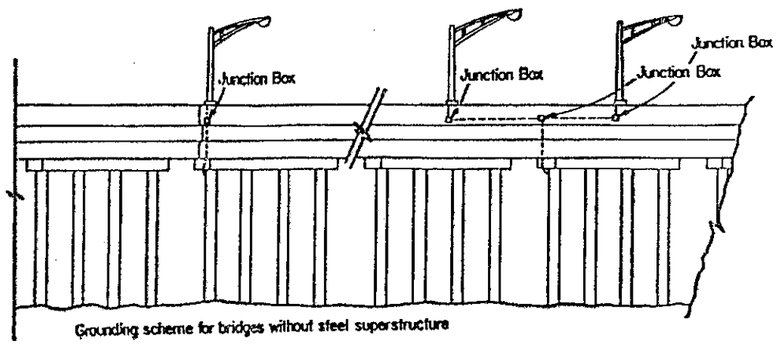








Minimum grounding of bridges with steel superstructure



Grounding scheme for bridges without steel superstructure

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OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING

STRUCTURE GROUNDING

STANDARD CONSTRUCTION DRAWING HL-50.21

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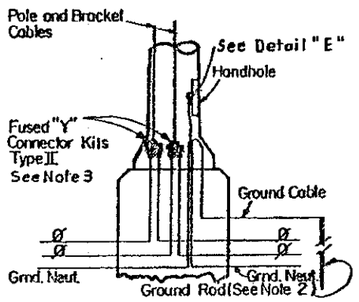
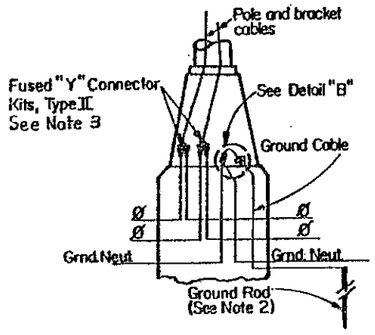
DATE 5-1-87

BRUNING 4230 10/65

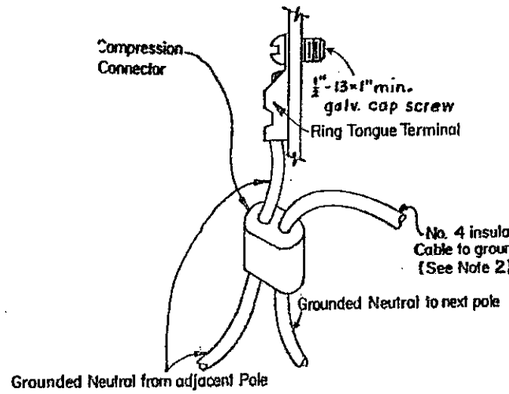


ANCHOR BASE POLE



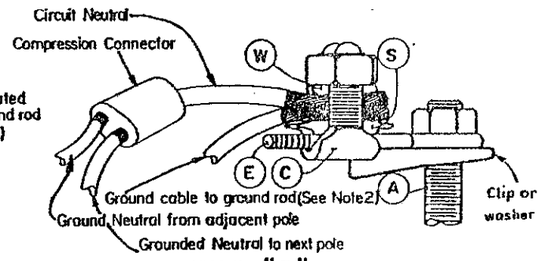
TRANSFORMER BASE POLE

120/240 VOLTS, THREE WIRE, GROUNDED NEUTRAL



DETAIL "E"

3-Wire, Grounded Neutral
Anchor Base Pole

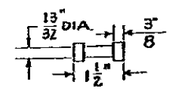


DETAIL "B"

3-WIRE, GROUNDED NEUTRAL
Transformer Base Pole

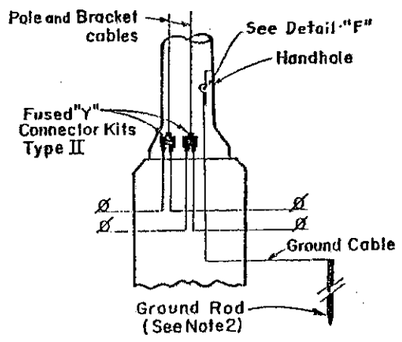
NOTES

1. Provide sufficient slack in all cables to permit bringing Kits outside of pole base through handhole of anchor base poles or door in transformer base poles.
2. For structure-mounted poles substitute "Structure grounding system" for "ground rod."
3. Fuses for connector Kits shall be as follows:

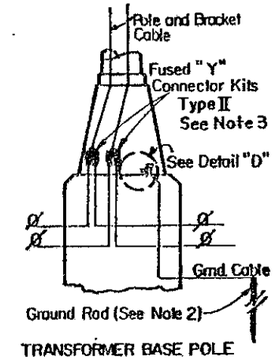


Any standard Midget Ferrule type fuse, (except glass tube) may be used in this connection.

Fuses rated 600 volts and 10 amperes, minimum shall be used unless otherwise specified.

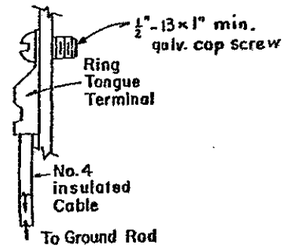


Anchor Base Pole



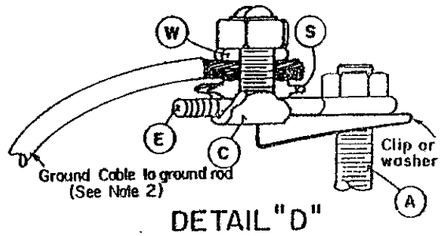
TRANSFORMER BASE POLE

240 or 480 VOLTS, TWO-WIRE, UNGROUNDED



DETAIL "F"

2-WIRE UNGROUNDED

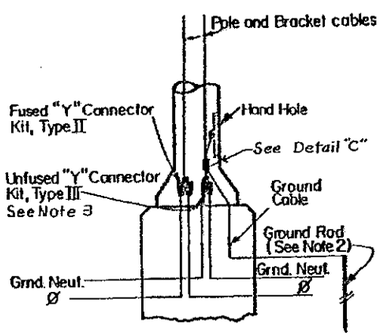


DETAIL "D"

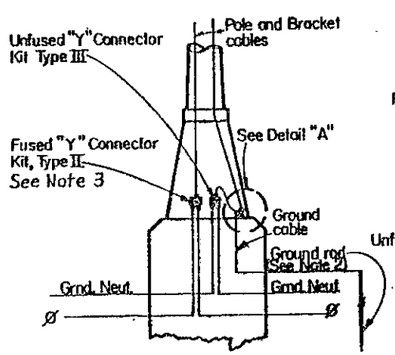
2-Wire, Ungrounded Circuit
Transformer Base Pole

LEGEND of ITEMS COMMON TO DETAILS "A", "B", & "D"

- (A) Anchor Bolt
- (C) Tin Plated Copper Split Bolt Connector with the following components:
  - (S) Spacer (Tin plated)
  - (W) Washer
  - (E) 3/8"X4" Galv. Steel eyebolt

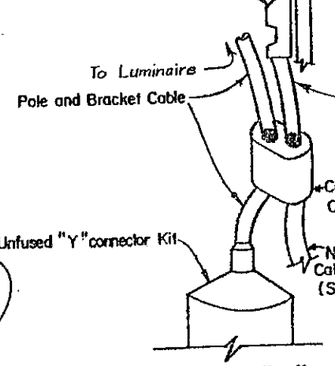


ANCHOR BASE POLE



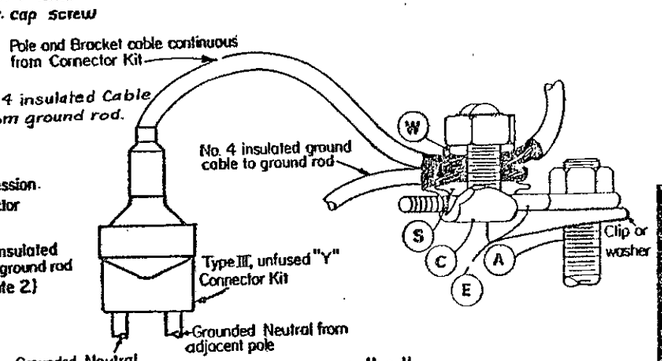
TRANSFORMER BASE POLE

480 VOLT, TWO-WIRE, GROUNDED NEUTRAL



DETAIL "C"

2-Wire, Grounded Neutral
Anchor Base Pole



DETAIL "A"

2-Wire Grounded Neutral
Transformer Base Pole

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

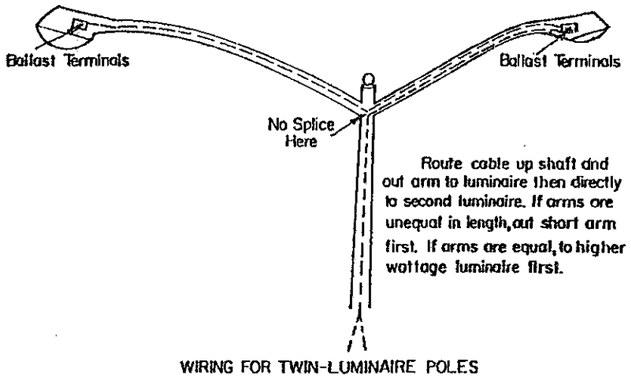
HIGHWAY LIGHTING

POLE WIRING I

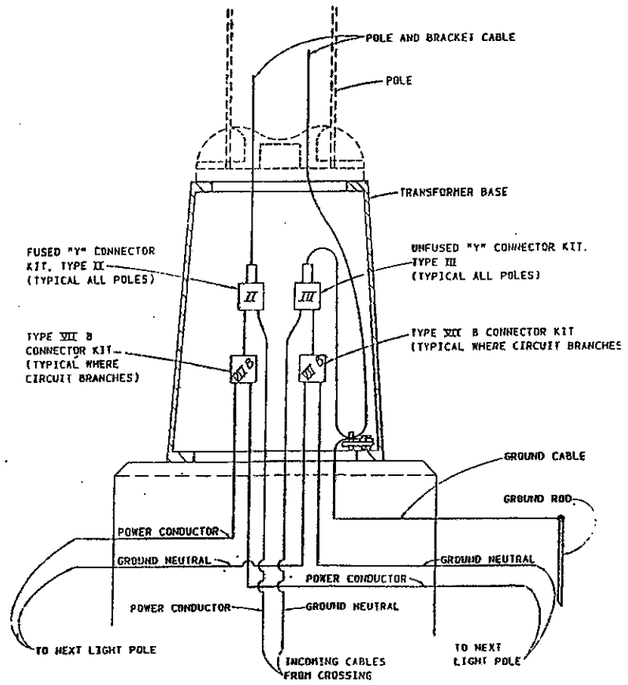
STANDARD CONSTRUCTION DRAWING **HL-60.11**

DATE 5-1-87

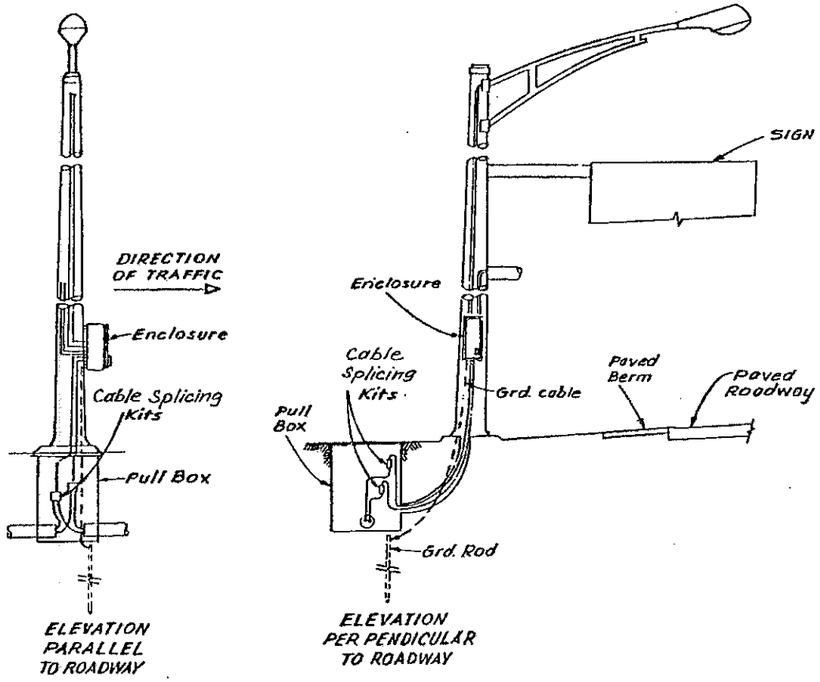
APPROVED _____ Engr. of Design Services



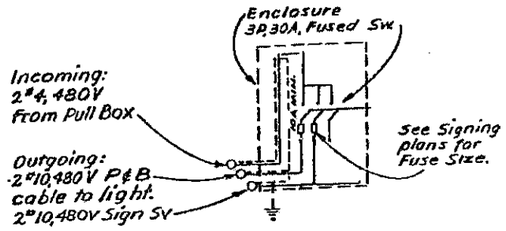
WIRING FOR TWIN-LUMINAIRE POLES



POLE BASE WIRING
FOR CIRCUIT BRANCH



WIRING FOR COMBINATION LIGHT AND SIGN POLE



WIRING DIAGRAM
COMBINATION LIGHT AND SIGN POLE

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

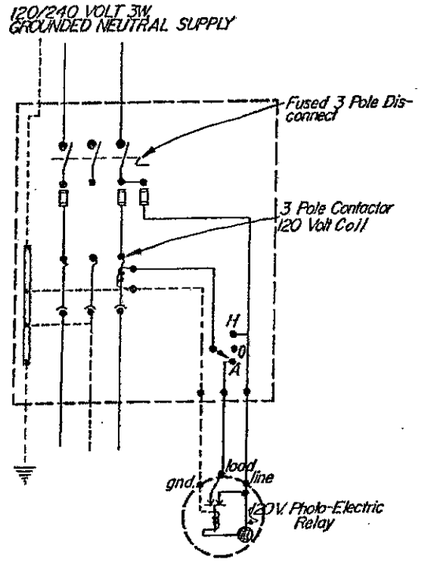
HIGHWAY LIGHTING

POLE WIRING II

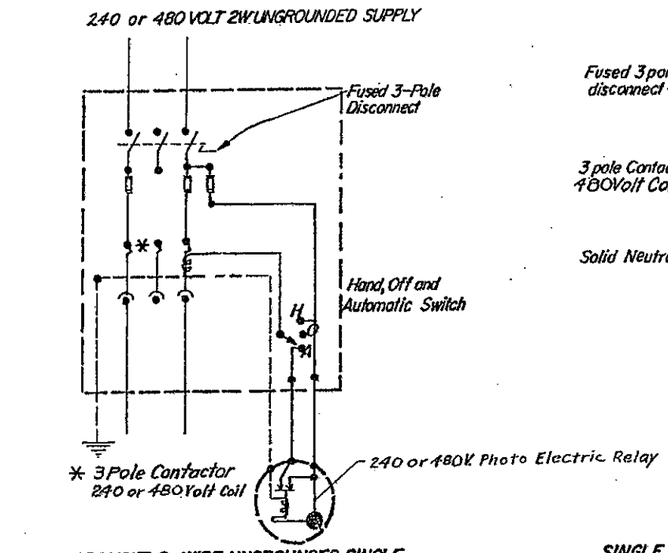
DATE 5-1-87

STANDARD CONSTRUCTION DRAWING **HL-60.12**

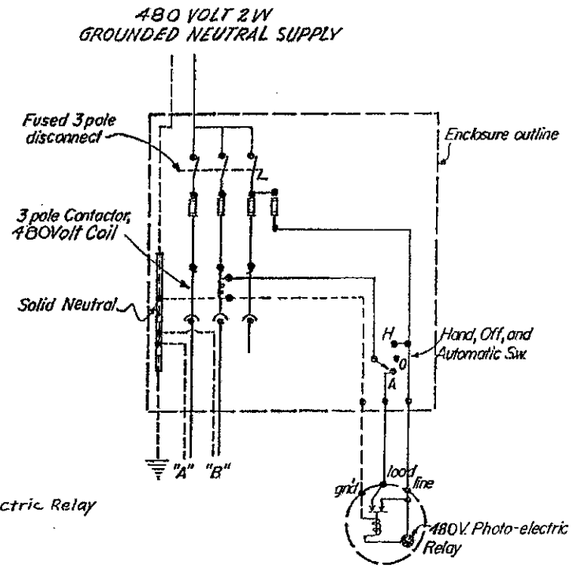
APPROVED _____ Engr. of Design Services



120/240 VOLT, 3-WIRE, GROUNDED NEUTRAL SINGLE CIRCUIT

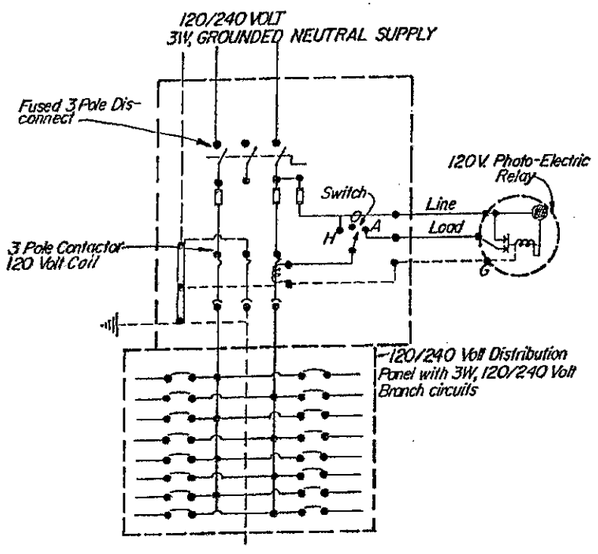


240 or 480 VOLT, 2-WIRE UNGROUNDED SINGLE CIRCUIT

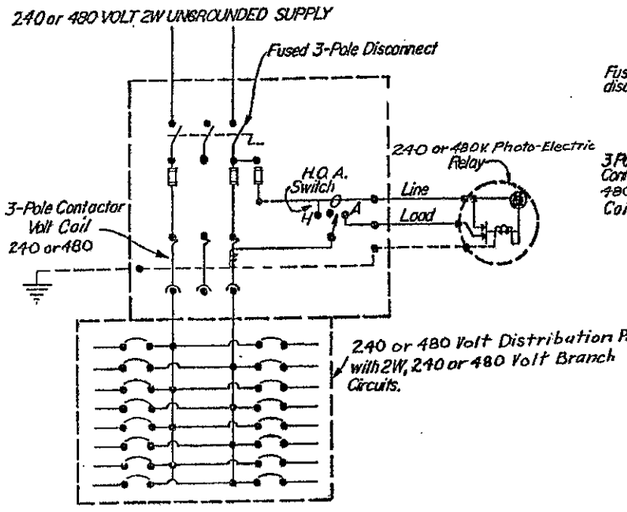


SINGLE UNIT 480 VOLT, 2-WIRE GROUNDED NEUTRAL

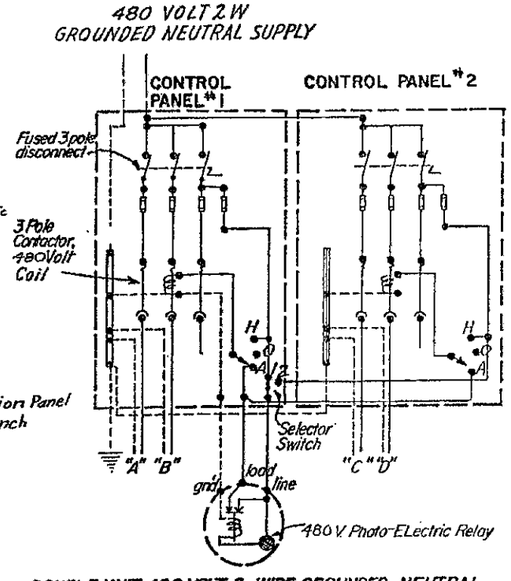
NOTES



120/240 VOLT, 3-WIRE, GROUNDED NEUTRAL MULTIPLE CIRCUIT



240 or 480 VOLT, 2-WIRE UNGROUNDED MULTIPLE CIRCUIT



DOUBLE UNIT 480 VOLT, 2-WIRE GROUNDED NEUTRAL

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

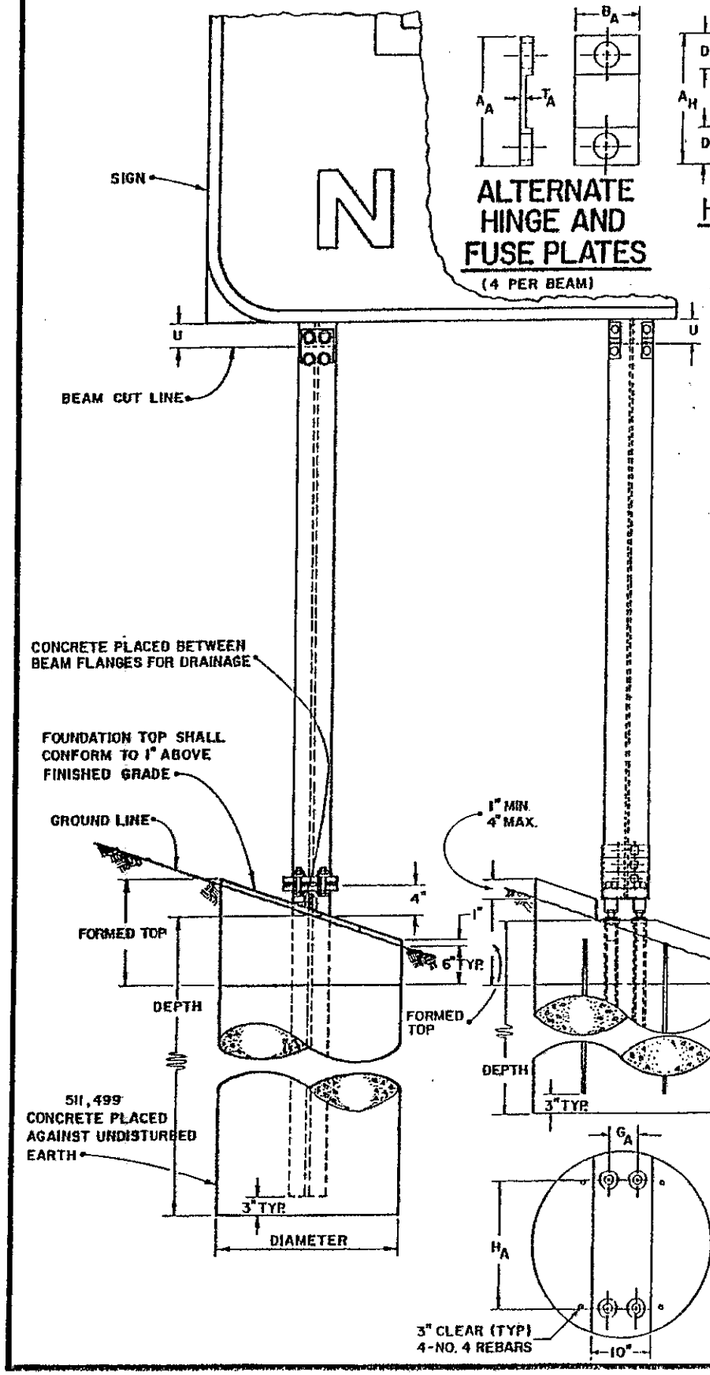
HIGHWAY LIGHTING

DATE 5-1-87

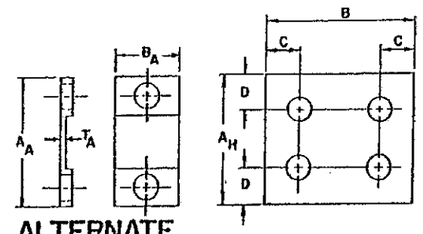
CONTROL CENTER WIRING

STANDARD CONSTRUCTION DRAWING **HL-60.31**

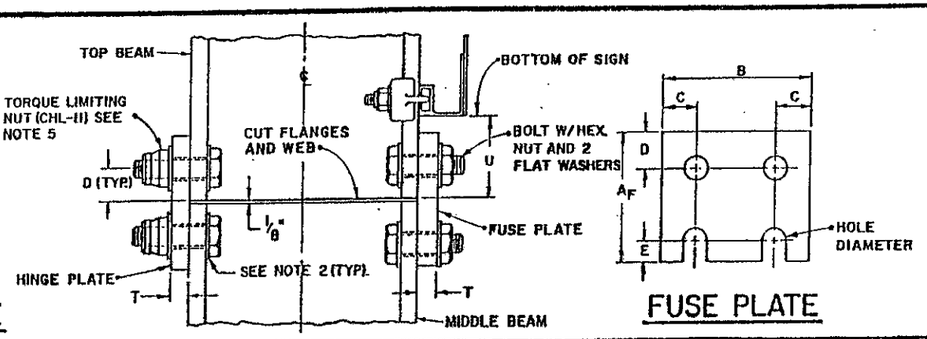
APPROVED _____ Engr. of Design Services



ALTERNATE HINGE AND FUSE PLATES
(4 PER BEAM)



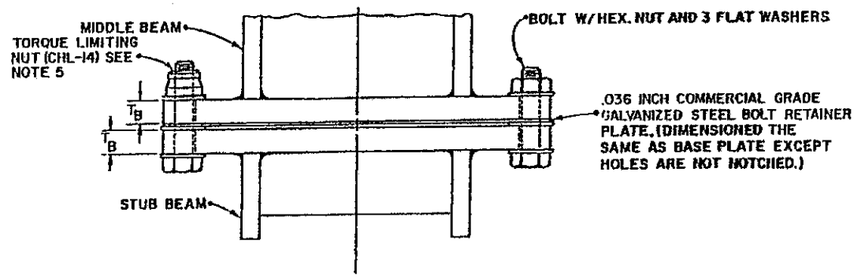
HINGE PLATE
SEE NOTE 6

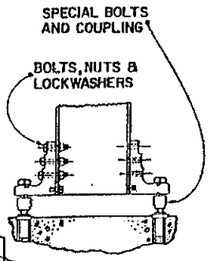


FUSE PLATE

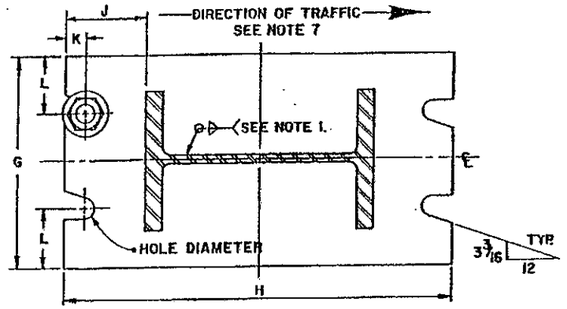
BEAM TYPE	BEAM SIZE	A_H	A_F	B	C	D	E	T	U	HOLE DIA.	BOLT SIZE	MIN. PRELOAD(lbs.)	ALT. A_A	ALT. B_A	ALT. BOLT SIZE	ALT. T_A
S4X7.7	4 X2 5/8	4 1/8	3 5/8	2 5/8	9/16	1	1/2	3/16	2 1/2	9/16	1/2	10,000	3 3/4	1	1/2	.071
W6X9	5 7/8X 4	4 1/8	3 5/8	4	7/8	1	1/2	3/16	2 1/2	9/16	1/2	10,000	3 3/4	1	1/2	.071
W10X12	9 7/8X 4	6 1/8	5 3/8	4	7/8	1 1/2	3/4	3/16	3 1/2	13/16	3/4	25,000	3 3/4	1	1/2	.071
W8X18	8 5/8X5 1/4	7 1/8	6 1/4	5 1/4	1 1/4	1 3/4	7/8	1/4	4	15/16	7/8	35,000	4 3/4	1 1/2	3/4	.113
W10X22	10 1/8 X5 3/4	8 1/8	7 1/8	5 3/4	1 1/2	2	1	5/16	4 1/2	1 1/16	1	46,000	4 3/4	1 1/2	3/4	.113
W12X30	12 3/8X6 1/2	8 1/8	7 1/8	6 1/2	1 1/2	2	1	5/16	4 1/2	1 1/16	1	46,000	4 3/4	1 1/2	3/4	.113

HINGE AND FUSE PLATE DIMENSIONS, INCHES — ALTERNATE DESIGN SEE NOTE 8





SIDE VIEW



BASE PLATE

BEAM TYPE	BEAM SIZE	FOUNDATIONS DIA. (feet)	DEPTH (feet)	CONCRETE cu.yd/ea.	BASE PLATE DIMENSIONS, INCHES G	H	J	K	L	T_B	HOLE DIA.	BOLT SIZE	MAX. TORQUE in./lbs.	ALT. G_A	ALT. H_A	ALT. BOLT SIZE
S4X7.7	4 X2 5/8	1.5	4	.27	4	8	2	1/2	1	3/4	9/16	1/2	200	4 1/4	7 11/16	1/2
W6X9	5 7/8X4	1.5	5	.33	5 1/2	10	2 1/16	1/2	1	3/4	9/16	1/2	200	4 1/4	9 9/16	1/2
W10X12	9 7/8X4	2.5	6	1.10	8	14 1/2	2 5/16	3/4	1 1/2	3/4	13/16	3/4	750	4 1/4	13 5/8	1/2
W8X18	8 1/8X5 1/4	2.5	6	1.10	8	14 1/2	3 1/4	3/4	1 1/2	1	13/16	3/4	750	3	16 1/4	1/2
W10X22	10 1/8 X5 3/4	2.5	6.75	1.23	8	14 1/2	2 5/16	15/16	2	1	1 1/16	1	1325	4	18 5/16	5/8
W12X30	12 3/8X6 1/2	2.5	8.25	1.50	10	17	2 7/16	15/16	2	1 1/4	1 1/16	1	1325	4	20 7/16	5/8

FOUNDATIONS — BASE PLATE DIMENSIONS, INCHES — ALTERNATE DESIGN SEE NOTE 8

NOTES

1. BASE PLATE WELD SIZE SHALL BE EQUAL TO THE BEAM FLANGE AND WEB THICKNESS RESPECTIVELY, BUT NO LESS THAN 1/4" INCH IN EITHER INSTANCE.
2. BEVELED WASHERS SHALL BE USED WITH THE S4X7.7 BEAM AND SHALL BE MALLEABLE IRON CONFORMING WITH ASTM A47 GRADE 35018.
3. FUSE AND HINGE PLATE CONNECTIONS SHALL BE TIGHTENED IN THE SHOP FOLLOWING A METHOD APPROVED BY THE ENGINEER TO PRODUCE THE MINIMUM BOLT PRELOAD SPECIFIED.
4. THE FOLLOWING PROCEDURE SHALL BE USED IN ASSEMBLING THE BREAKAWAY BASE PLATE:
   AFTER ALL BOLTS, WASHERS, STANDARD NUTS AND BOLT RETAINER PLATE ARE IN PLACE, TIGHTEN ALL STANDARD NUTS SNUGLY WITH A 12" WRENCH. LOOSEN EACH BOLT IN TURN AND RETIGHTEN IN A SYSTEMATIC MANNER TO THE SPECIFIED MAXIMUM TORQUE. WRENCHES SHALL BE CALIBRATED AT LEAST ONCE EACH WORKING DAY FOR EACH BOLT DIAMETER BEING TORQUED. BURR THREADS AT JUNCTION WITH NUT USING A CENTER PUNCH.
5. IN LIEU OF THE STANDARD NUTS AND PROCEDURES OUTLINED IN 3 AND 4 ABOVE, THE SUPPORTS MAY BE ASSEMBLED USING TORQUE LIMITING NUTS.
   EACH NUT SHALL BE TIGHTENED WITH SUFFICIENT TORQUE APPLIED UNTIL THE UPPER WRENCHING SURFACE HAS SHEARED AWAY FROM THE STRUCTURAL BODY OF THE NUT. FUSE AND HINGE PLATES SHALL BE SHOP ASSEMBLED FOLLOWING THIS PROCEDURE.
   THE NUTS USED SHALL BE AS MANUFACTURED BY HI-SHEAR CORP., TORRANCE CALIFORNIA; VOI SHAN INDUSTRIES - CULVER CITY, CALIFORNIA; STANDARD PRESSED STEEL - JENKINTOWN, PENNSYLVANIA OR APPROVED EQUAL.
   THE TORQUE LIMITING NUT PART NUMBER CHL-14 SHALL BE USED FOR THE BASE PLATE, CHL-11 FOR THE FUSE AND HINGE PLATES.
6. FOR BEAMS SUBJECT TO IMPACT FROM OPPOSITE DIRECTIONS (SUCH AS IN FREEWAY MEDIANS) PROVIDE FUSE PLATES ON BOTH SIDES.
7. NOTCHES SHOWN FOR INSTALLATION TO THE RIGHT OF TRAFFIC. FOR INSTALLATIONS TO THE LEFT OF TRAFFIC, FABRICATE WITH SKEWED EDGE OF NOTCHES REVERSED FROM THAT SHOWN.
8. DIMENSIONS SHOWN FOR ALTERNATE DESIGNS ARE APPROXIMATE. SPECIFIC DIMENSIONS FOR ALTERNATE DESIGNS REQUIRE PREQUALIFICATION. AN APPROVED LIST OF SUPPLIERS IS MAINTAINED BY O.D.O.T., PAYMENT FOR ALTERNATE DESIGNS WILL BE BASED ON THE PLAN QUANTITIES FOR EMBEDDED BEAMS.

ALL ITEMS SHALL CONFORM TO C & M SPECIFICATIONS 630 AND 730, UNLESS OTHERWISE SPECIFIED.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

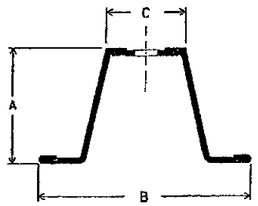
TRAFFIC CONTROL

STRUCTURAL BEAM SIGN SUPPORTS

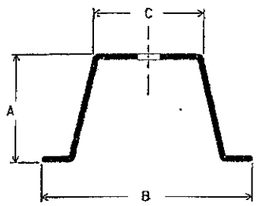
STANDARD CONSTRUCTION DRAWING TC-41.10

APPROVED _____ Engineer of Design Services

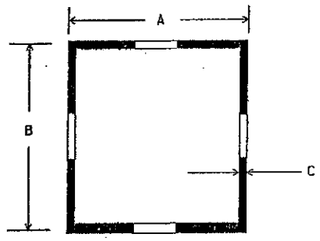
DATE: 8/19/77, 3/26/79, 12/23/81, 8/29/84



TYPE P

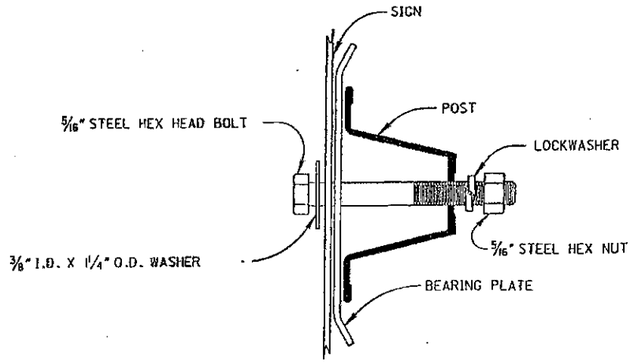


TYPE F



TYPE S

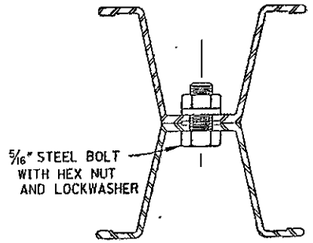
POST NO.	TYPE	LB/FT	POST DIMENSIONS (INCHES) A	B	C	ANCHOR DIMENSIONS A	B	C	NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
1	F	1.12	0.875	2.063	0.813				
2	P	2.00	1.469	3.063	1.281				2
	F	2.00	1.516	3.125	1.250				2
	S		2.000	2.000	0.083	2.250	2.250	0.105	2
3	P	3.00	1.875	3.500	1.313				2
	F	3.00	1.750	3.500	1.625				2
	S		2.000	2.000	0.083	2.250	2.250	0.105	2
4	P	4.00	TWO NO.2 POST						0
	F	4.00	TWO NO.2 POST						0
	S		2.500	2.500	0.105	3.00	3.00	0.188	1
6	P	6.00	TWO NO.3 POST						0
	F	6.00	TWO NO.3 POST						0

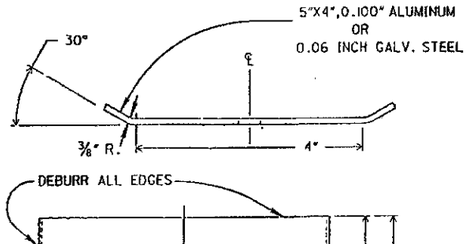


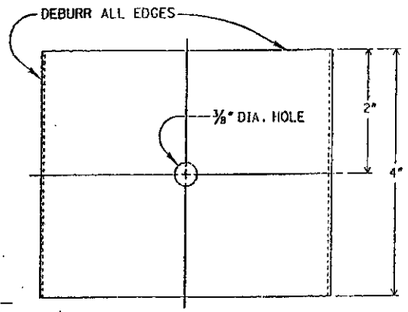
U - CHANNEL
SIGN ATTACHMENT DETAIL

NOTES

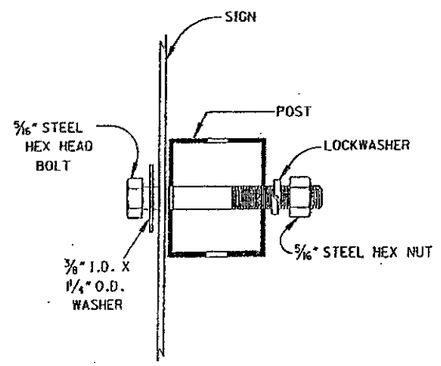
1. NUMBER 4 TYPE P AND F POST, AND NUMBER 6 TYPE P AND F POST, SHALL ONLY BE INSTALLED IN PROTECTED LOCATIONS (e.g. BEHIND GUARDRAIL). TWO POST INSTALLATIONS OF NUMBER 4 TYPE S POST SHALL BE INSTALLED IN PROTECTED LOCATIONS.
2. USE OF ANCHOR BASE WITH SQUARE POST IS OPTIONAL.
3. SQUARE POST MAY HAVE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



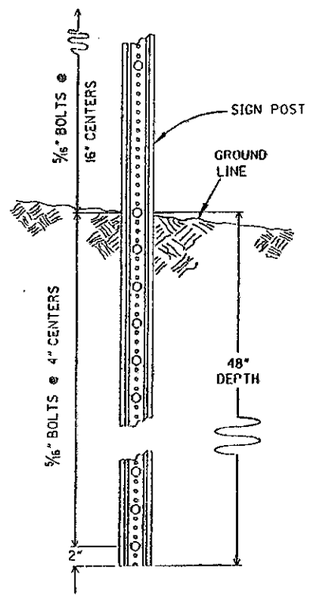




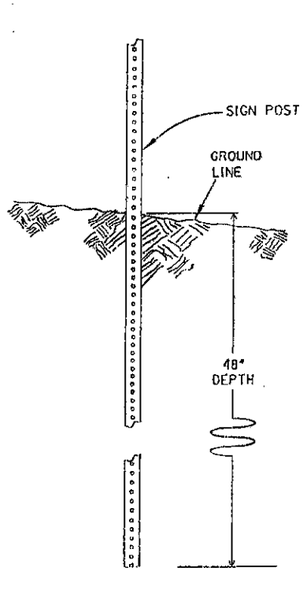
BEARING PLATE



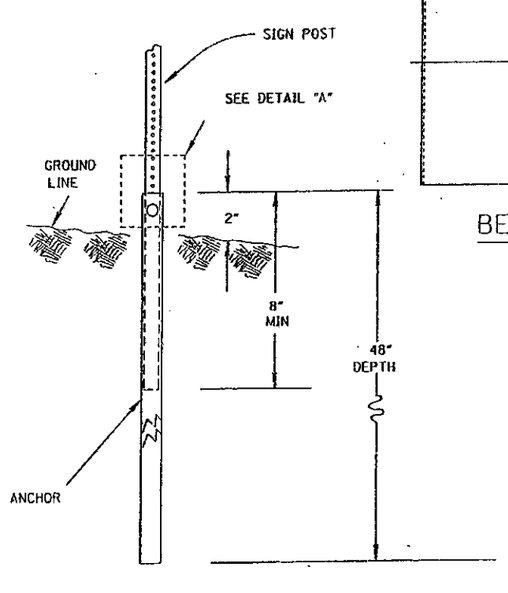
SQUARE POST
SIGN ATTACHMENT DETAIL



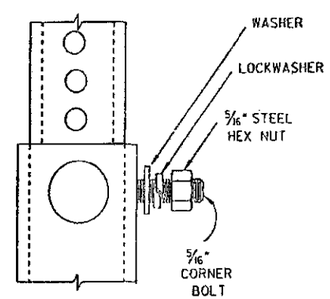
TYPICAL U - CHANNEL
DRIVEN INSTALLATION



TYPICAL SQUARE POST
DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR
BASE INSTALLATION



DETAIL "A"

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

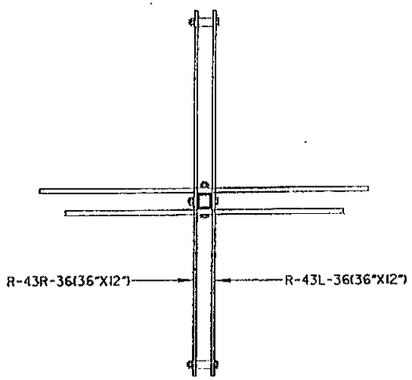
YIELDING POST

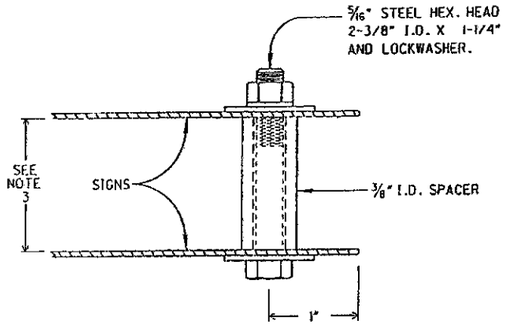
DATE
04/01/77
03/26/79
06/21/94

STANDARD CONSTRUCTION DRAWING TC-41.20

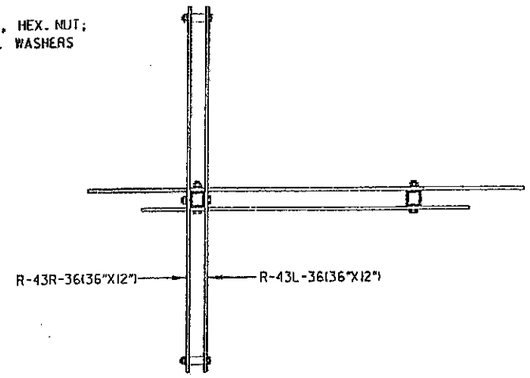
APPROVED _____ ENGR. OF DESIGN SERVICES

WCC



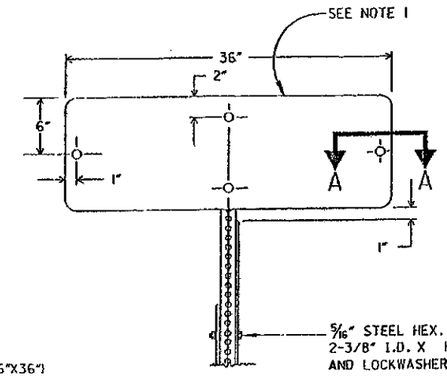


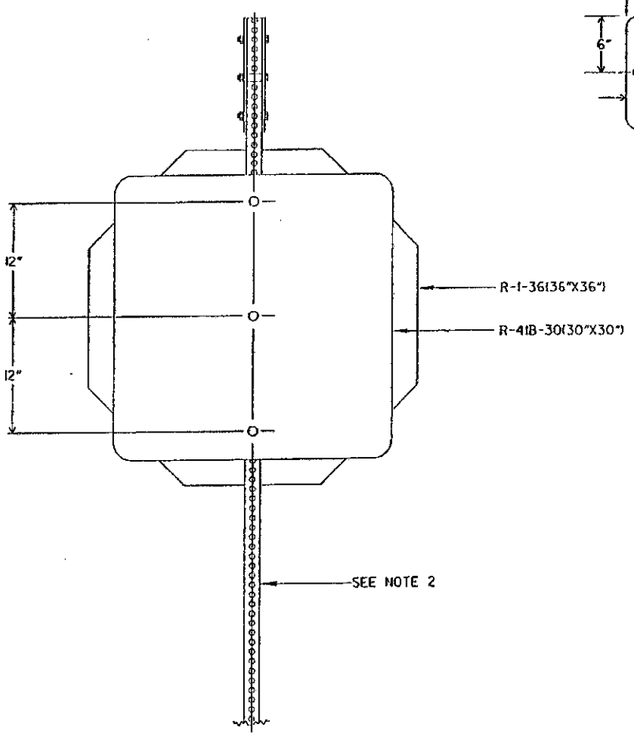
SECTION A-A



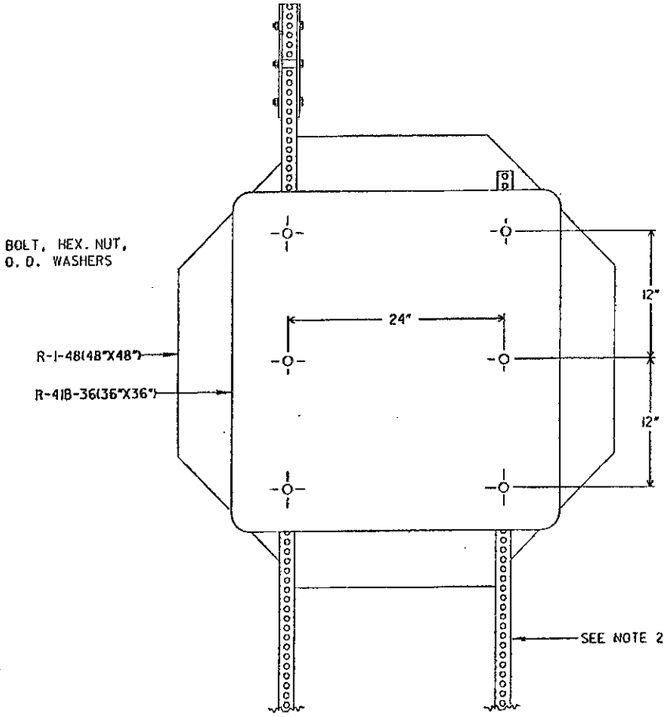
NOTES

1. IN SPECIAL SITUATIONS A R-43L (R)-48 SIGN MAY BE USED IN LIEU OF THE R-43L (R) - 36 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-41.20.





SINGLE POST

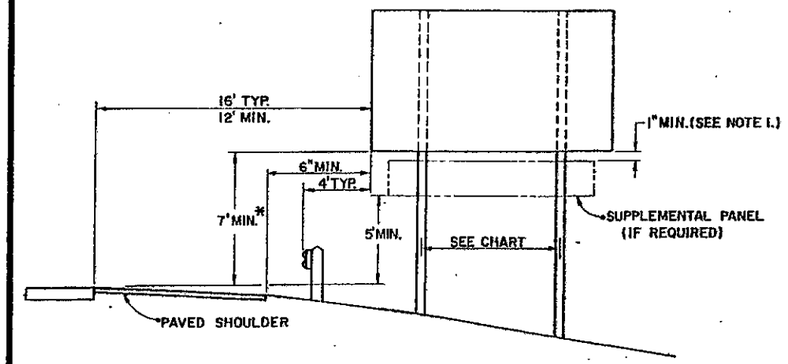


TWO POST

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 04/01/77 03/26/79 06/21/94
"ONE WAY" SIGN SUPPORT DETAILS	
STANDARD CONSTRUCTION DRAWING TC-41.50 APPROVED _____ ENGR. OF DESIGN SERVICES	

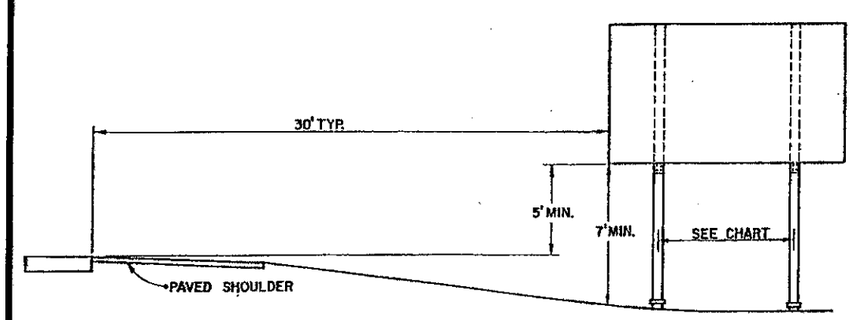
WCC

FREEWAYS AND EXPRESSWAYS

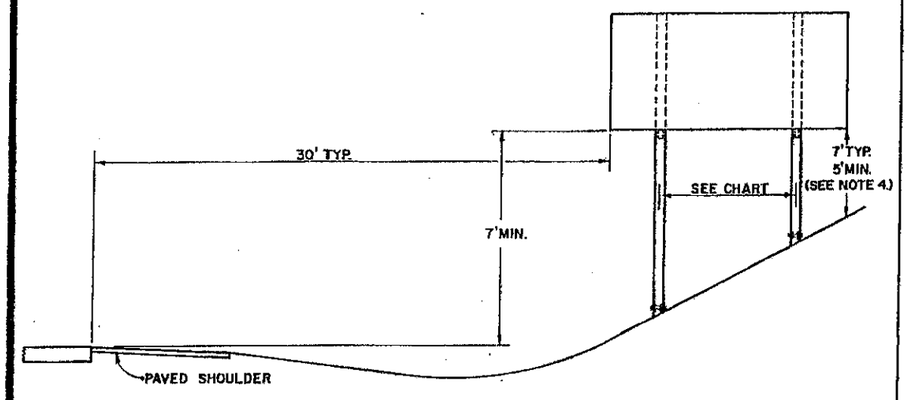


TYPICAL INSTALLATION WITH GUARDRAIL

* 8' MIN. WITH SUPPLEMENTAL PANEL.

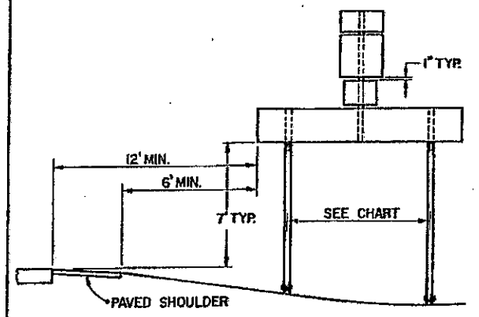


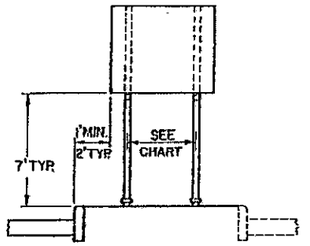
TYPICAL INSTALLATION, FILL SECTION, 30' OFFSET



TYPICAL INSTALLATION, CUT SECTION, 30' OFFSET

STREETS-RAMPS-HIGHWAYS

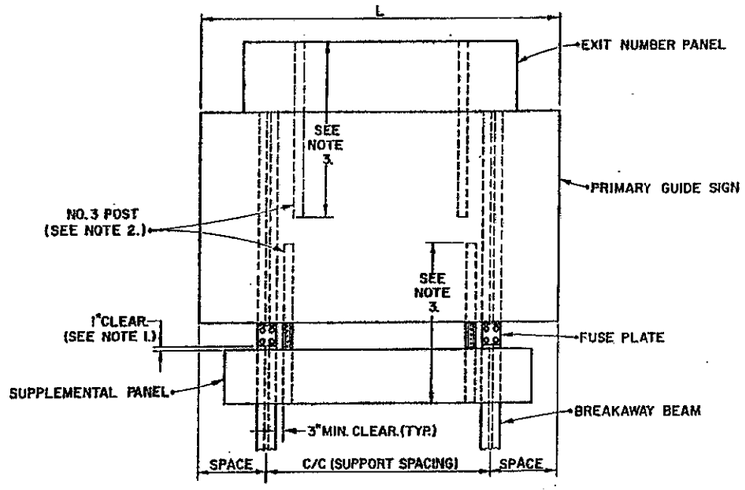




CURB SECTION

NOTES

1. SUPPLEMENTAL PANELS SHALL BE MOUNTED ONE (1) INCH BELOW THE FUSE PLATE ON BREAKAWAY BEAM INSTALLATIONS AND ONE (1) INCH 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 ATERNATELY 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 5'-0" MINIMUM IF BACK SLOPES ARE GREATER THAN 3:1.



SUPPLEMENTAL PANEL ATTACHMENT

SUPPORT SPACING CHART

2 SUPPORTS				3 SUPPORTS				
L (feet)	SPACING (feet) SPACE	C/C	SPACE	L (feet)	SPACING (feet) SPACE	C/C	C/C	SPACE
5	1.10	2.80	1.10	20	1.50	8.50	8.50	1.50
6	1.32	3.36	1.32	21	2.00	8.50	8.50	2.00
7	1.54	3.92	1.54	22	2.50	8.50	8.50	2.50
8	1.76	4.48	1.76	23	3.00	8.50	8.50	3.00
9	1.98	5.04	1.98	24	3.36	8.64	8.64	3.36
10	2.20	5.60	2.20	25	3.50	9.00	9.00	3.50
11	2.42	6.16	2.42	26	3.64	9.36	9.36	3.64
12	1.75	8.50	1.75	27	3.78	9.72	9.72	3.78
13	2.25	8.50	2.25	28	3.92	10.08	10.08	3.92
14	2.75	8.50	2.75					
15	3.25	8.50	3.25					
16	3.52	8.96	3.52					
17	3.74	9.52	3.74					
18	3.96	10.08	3.96					
19	4.18	10.64	4.18					

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

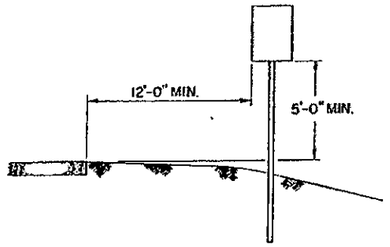
TRAFFIC CONTROL

DATE 8/19/77

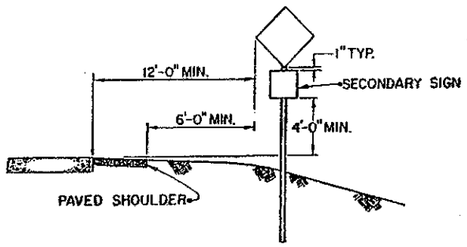
TYPICAL SIGN PLACEMENT
GUIDE SIGNS

STANDARD CONSTRUCTION DRAWING TC-42.10

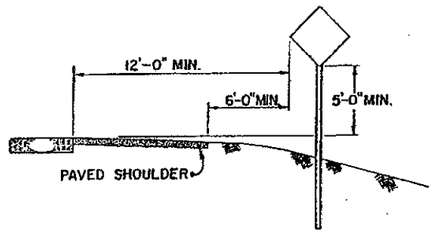
APPROVED: Engineer of Design Services



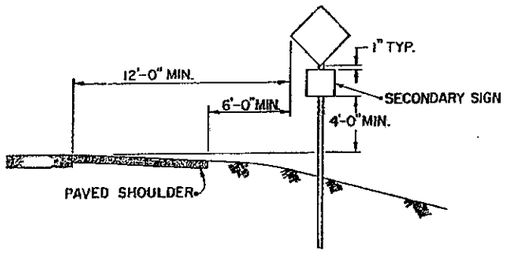
RURAL UNDIVIDED



RURAL UNDIVIDED
(W/ SECONDARY SIGN)



RURAL DIVIDED



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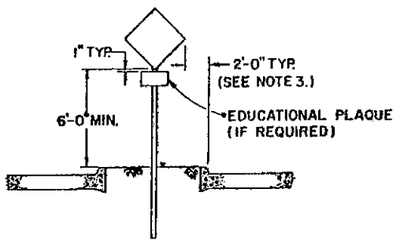
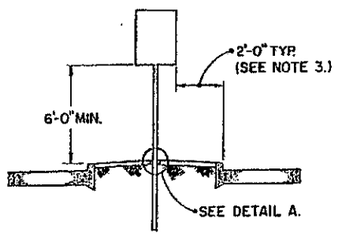
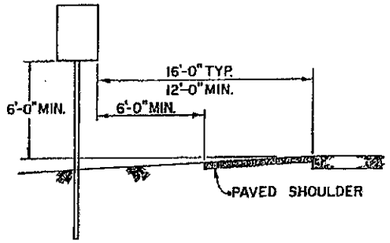
(W/ SECONDARY SIGN)



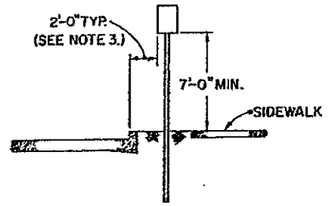
MEDIAN



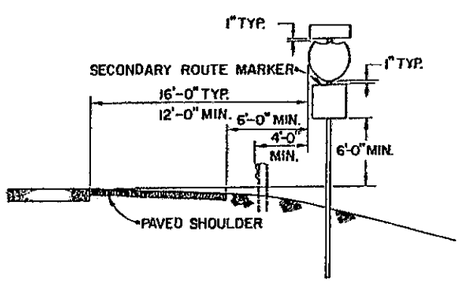
PAVED MEDIAN



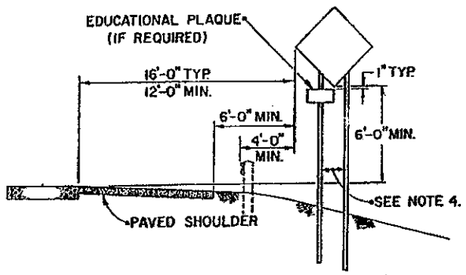
MEDIAN-EXPRESSWAY OR FREEWAY



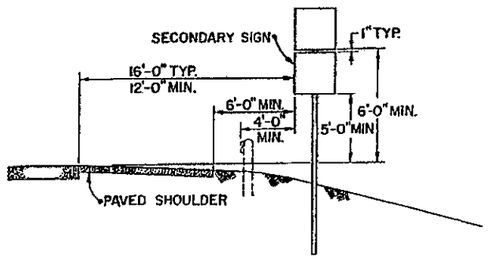
URBAN-RESIDENTAL AND BUSINESS



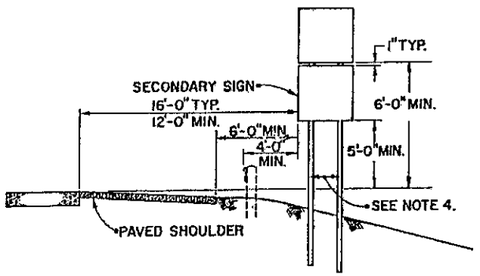
EXPRESSWAY OR FREEWAY
(W/ SECONDARY SIGN)



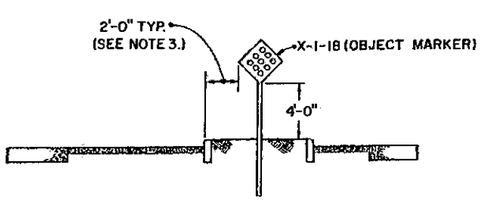
EXPRESSWAY OR FREEWAY



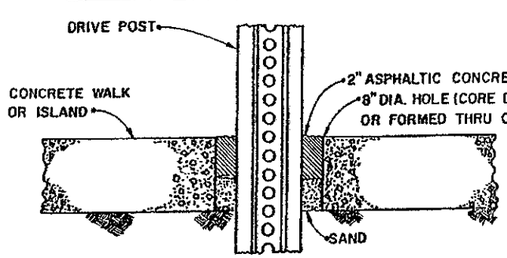
EXPRESSWAY OR FREEWAY
(W/ SECONDARY SIGN)



EXPRESSWAY OR FREEWAY
(W/ SECONDARY SIGN)



EXPRESSWAY OR FREEWAY



DETAIL A.

NOTES

1. SEE STANDARD CONSTRUCTION DRAWING TC-41.20 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 ONE FOOT IS PERMISSIBLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
4. SEE STANDARD CONSTRUCTION DRAWINGS TC-52.10 AND TC-52.20 FOR DIMENSIONS BETWEEN SUPPORTS.

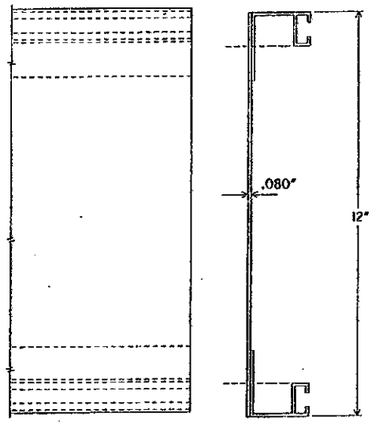
ALL ITEMS SHALL CONFORM TO SUPPLEMENTAL SPECIFICATIONS 857 AND 957, UNLESS OTHERWISE SPECIFIED

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE
TYPICAL SIGN PLACEMENT REGULATORY, WARNING AND ROUTE MARKER SIGNS	4/1/77 3/26/79
STANDARD CONSTRUCTION DRAWING TC-42.20	

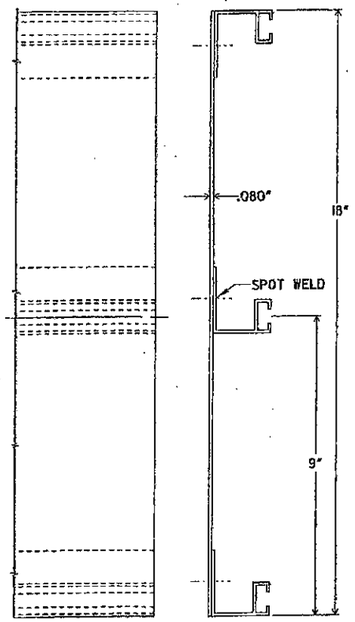
APPROVED: _____ Engineer of Design Services

12" BOLTED EXTRUSHEET PANEL



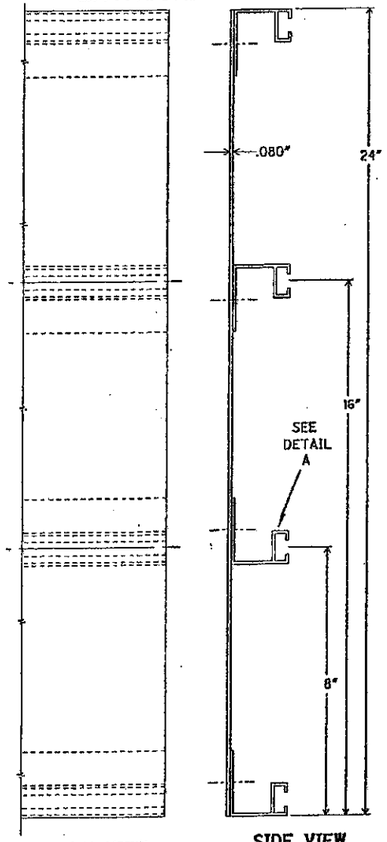
FRONT VIEW SIDE VIEW

18" BOLTED EXTRUSHEET PANEL

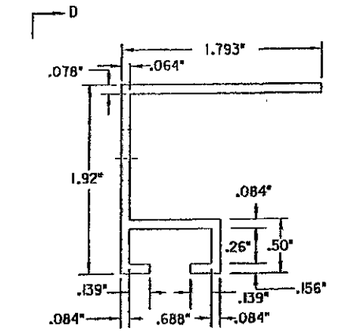


FRONT VIEW SIDE VIEW

24" BOLTED EXTRUSHEET PANEL

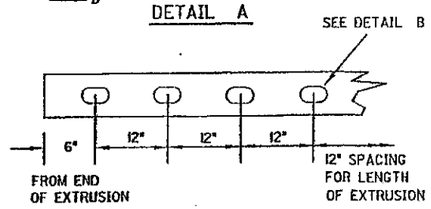


FRONT VIEW SIDE VIEW

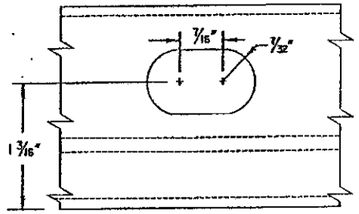


D

DETAIL A



SECTION D-D

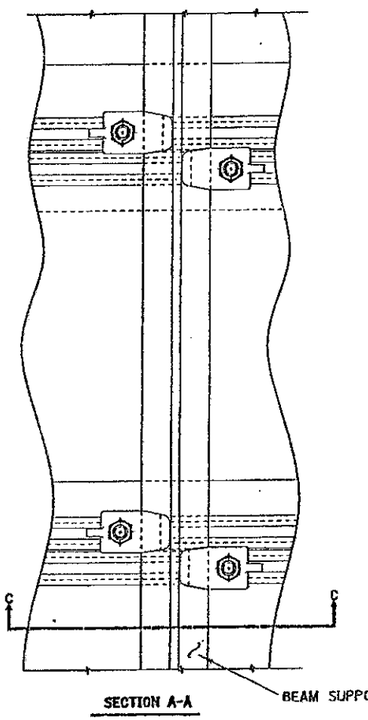


DETAIL B

NOTES

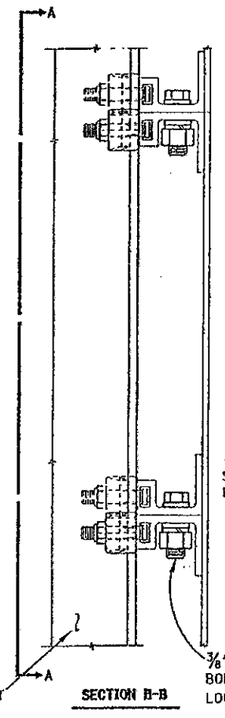
1. COMBINATIONS OF 12", 18" AND 24" PANELS SHOULD BE USED TO ATTAIN REQUIRED SIGN HEIGHT. 30", 36", 42" AND 48" PANEL HEIGHTS ARE ALLOWED, BUT THEIR USE IS NOT REQUIRED.
2. THE PANELS SHALL BE ERECTED HORIZONTALLY AND BOLTED ON 24" CENTERS.
3. THE PANELS SHALL BE FASTENED TO EACH VERTICAL SUPPORT MEMBER 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 6" GLARE SHIELD EXTRUSHEET PANEL, CHANGE THE 12" DIMENSION IN THE 12" BOLTED EXTRUSHEET PANEL DETAIL TO 6". ALL OTHER DETAILS ARE THE SAME.
5. SPOT WELDS SHALL BE SPACED AT A MAXIMUM OF 4" CENTER TO CENTER.

PANEL HEIGHT (INCHES)	NO. OF STIFFENERS
6	2
12	2
18	3
24	4
30	4
36	5
42	6
48	7

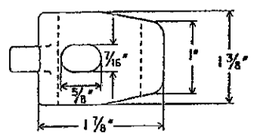


SECTION A-A

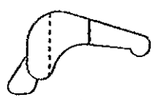
BEAM SUPPORT

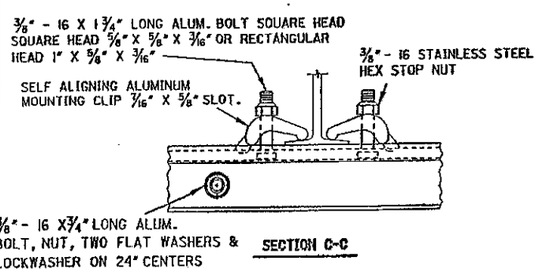


SECTION B-B

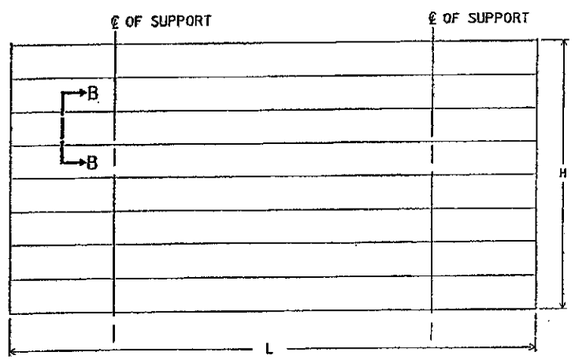


CLIP DETAIL





SECTION C-C



GENERAL ARRANGEMENT

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

ALUMINUM BOLTED-EXTRUSHEET PANEL SIGN

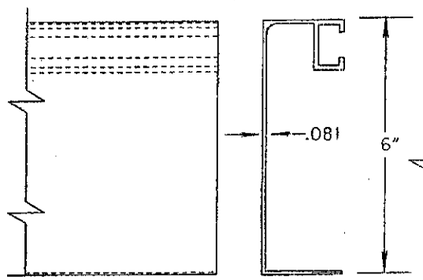
STANDARD CONSTRUCTION DRAWING TC-51.11

APPROVED Daryl Creager ENGR. OF DESIGN SERVICES

DATE
06/02/75
04/03/79
01/20/84
09/30/94

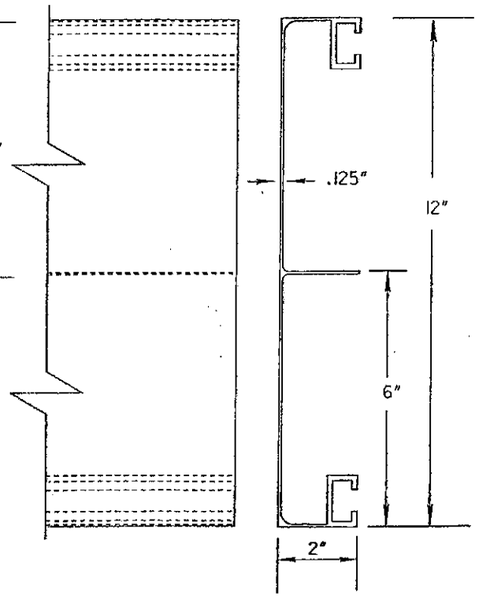
WCC

6" BOLTED EXTRUSION PANEL



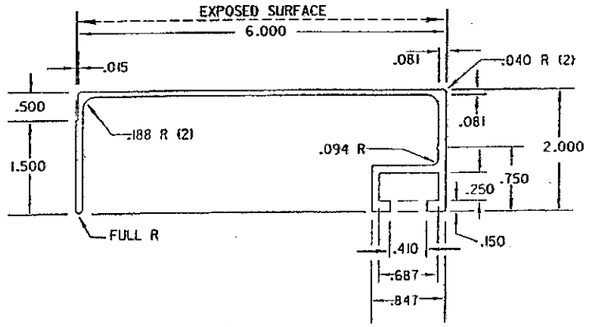
FRONT VIEW SIDE VIEW

12" BOLTED EXTRUSION PANEL

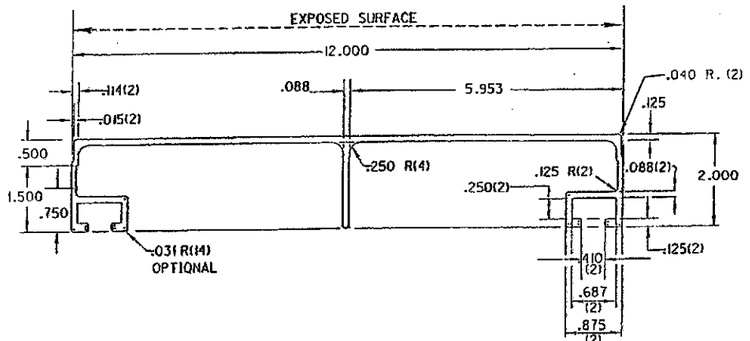


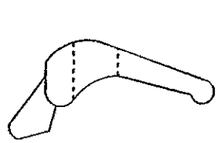
FRONT VIEW SIDE VIEW

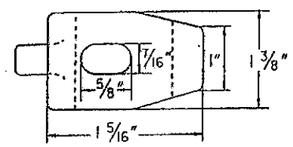
6" SIGN EXTRUSION



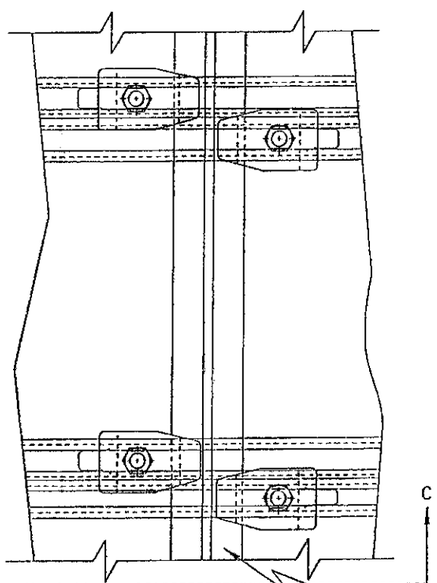
12" SIGN EXTRUSION





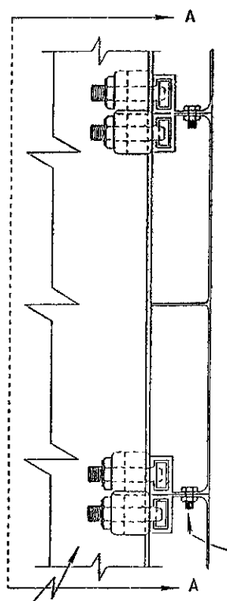


CLIP DETAIL

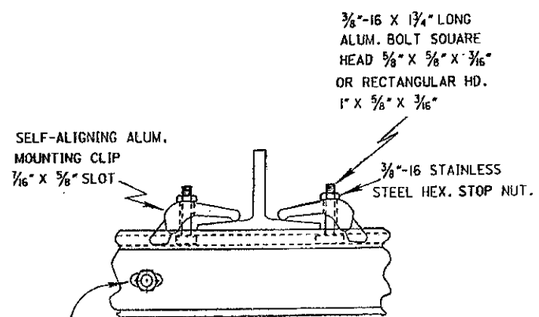


SECTION A-A

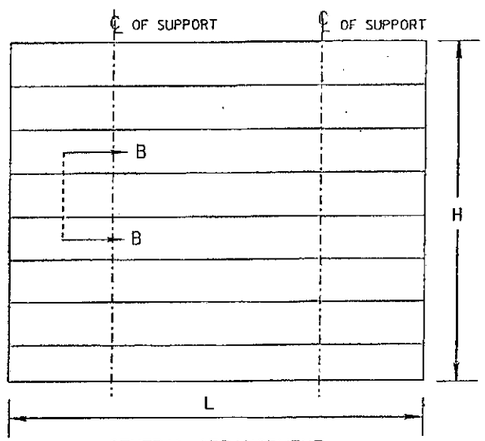
BEAM SUPPORT



SECTION B-B



SECTION C-C



GENERAL ARRANGEMENT

NOTES

1. COMBINATIONS OF 6" AND 12" PANELS ARE TO BE USED TO ATTAIN REQUIRED SIGN HEIGHT.
2. THE PANELS SHALL BE ERECTED HORIZONTALLY AND BOLTED TOGETHER ON 24" CENTERS.
3. THE PANELS SHALL BE FASTENED TO EACH VERTICAL MEMBER WITH MOUNTING CLIPS.
4. ALL DIMENSIONS ARE IN INCHES. STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED SHAPES APPLY.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

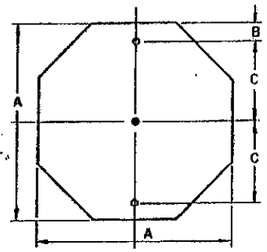
DATE 01/03/94

ALUMINUM BOLTED-EXTRUSION PANEL SIGN

STANDARD CONSTRUCTION DRAWING TC-51.12

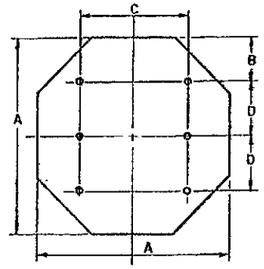
APPROVED Doug A Craig ENGR. OF DESIGN SERVICES

WCC



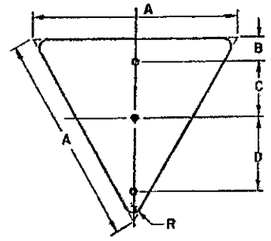
OCTA-1-3

A	B	C	GAUGE	SQ. FT.
30	3	12	.080	6.25
36	6	12	.080	9.00



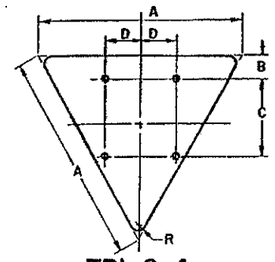
OCTA-2-6

A	B	C	D	GAUGE	SQ. FT.
48	12	24	12	.100	16.00



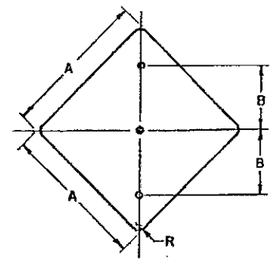
TRI-1-3

A	B	C	D	R	GAUGE	SQ. FT.
36	3	10	11	2.00	.100	3.90



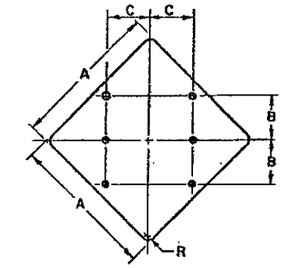
TRI-2-4

A	B	C	D	R	GAUGE	SQ. FT.
48	3	12	12	3	.100	6.93
60	3	18	15	4	.100	10.83



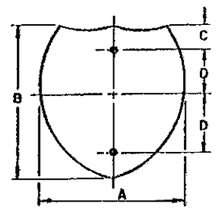
DIA-1-3

A	B	R	GAUGE	SQ. FT.
24	12	1.50	.063	4.00
30	15	1.88	.080	6.25
36	18	2.25	.080	9.00



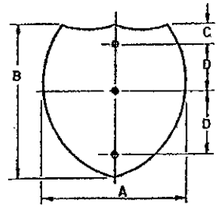
DIA-2-6

A	B	C	R	GAUGE	SQ. FT.
48	15	15	3	.100	16.00
60	18	18	3.75	.100	25.00



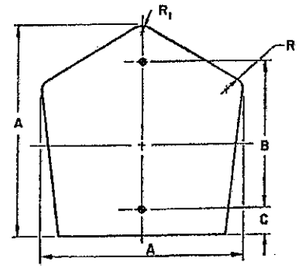
I.S.-1-2

A	B	C	D	GAUGE	SQ. FT.
24	24	3	9	.063	4.00
30	24	3	9	.080	5.00
30	30	3	12	.080	6.25
40	30	3	12	.080	8.33



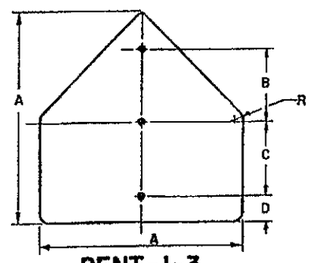
I.S.-1-3

A	B	C	D	GAUGE	SQ. FT.
36	36	6	12	.080	9.00
48	36	6	12	.100	12.00



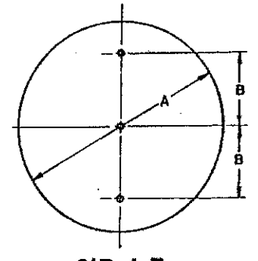
CO-1-2

A	B	C	R_1	R	GAUGE	SQ. FT.
18	15	1	5	2	.063	2.25
24	18	2	5.31	2.69	.063	4.00
30	24	2	6.63	3.38	.080	6.25



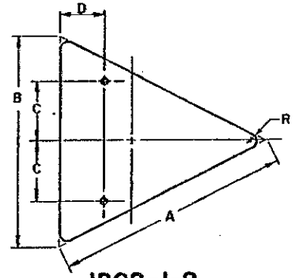
PENT-1-3

A	B	C	D	R	GAUGE	SQ. FT.
30	10	11	3	1.88	.080	6.25
36	12	12	3	2.25	.080	9.00
42	14	13	4	2.50	.100	12.25



CIR-1-3

A	B	GAUGE	SQ.FT.
30	12	.063	6.25
36	15	.080	9.00

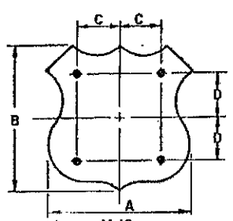


ISOS-1-2

A	B	C	D	R	GAUGE	SQ. FT.
40	30	7.50	12	1.88	.080	3.86
48	36	9	15	2.25	.100	5.56

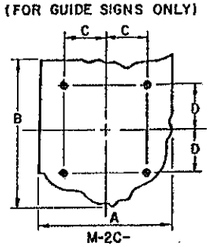
ROUTE SHIELDS

(FOR GUIDE SIGNS ONLY)



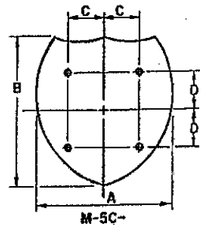
M-1C-

A	B	C	D
24	24	7	7
30	24	8	8
30	30	9	9
37.5	30	9	9
36	36	10	10
45	36	15	10



M-2C-

A	B	C	D
24	24	7	7
30	24	8	8
30	30	9	9
37.5	30	9	9
36	36	10	10
45	36	15	10



M-5C-

A	B	C	D
24	24	7	7
30	24	8	8
30	30	9	9
40	30	9	9
36	36	10	10
48	36	15	10

ALL SHIELDS SHALL BE .063 GAUGE

NOTES

1. ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE $\frac{3}{8}$" DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF $\pm\frac{1}{32}$ INCH.
4. FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

SHAPE — NO. BOLTS REQUIRED

OCTA-2-6

NO. SUPPORT REQUIRED

ALL ITEMS SHALL CONFORM TO SUPPLEMENTAL SPECIFICATIONS 857 AND 957, UNLESS OTHERWISE SPECIFIED.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

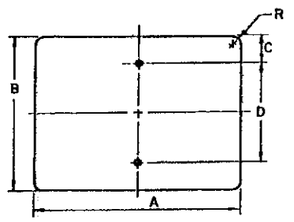
TRAFFIC CONTROL

DATE: 4/1/77, 4/3/79

SIGN BLANK DETAILS I

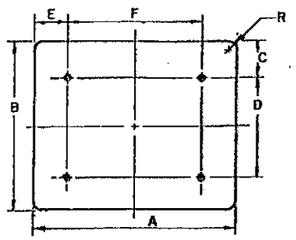
STANDARD CONSTRUCTION DRAWING TC-52.10

APPROVED: _____ Engineer of Design Services



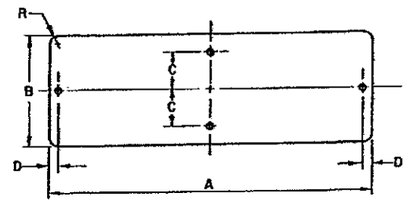
H-REC-1-2

A	B	C	D	R	GAUGE	SQ.FT.
12	6	1.50	3	1.50	.063	.50
18	6	1.50	3	1.50	.063	.75
18	12	1.50	9	1.50	.063	1.50
21	15	1.50	12	1.50	.063	2.19
21	18	3	12	1.50	.063	2.63
24	6	1.50	3	1.50	.063	1.00
24	8	1.50	5	1.50	.063	1.33
24	10	1.50	7	1.50	.063	1.67
24	12	1.50	9	1.50	.063	2.00
24	18	3	12	1.50	.063	3.00
30	8	1.50	5	1.50	.063	1.67
30	10	1.50	7	1.50	.063	2.08
30	12	1.50	9	1.50	.080	2.50
30	15	1.50	12	1.50	.080	3.13
30	16	1.50	13	1.50	.080	3.33
30	18	3	12	1.50	.080	3.75
30	24	3	18	1.50	.080	5.00
36	6	1.50	3	1.50	.080	1.50
36	12	1.50	9	1.50	.080	3.00
36	15	1.50	12	1.50	.080	3.75
36	18	3	12	1.50	.080	4.50
36	24	3	18	1.50	.080	6.00
37.5	30	3	24	1.50	.080	7.81
42	16	1.50	12	1.50	.080	4.38
48	20	3	14	1.50	.080	6.67



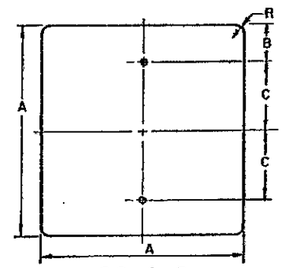
H-REC-2-4

A	B	C	D	E	F	R	GAUGE	SQ.FT.
36	24	3	18	6	24	1.50	.080	6.00
36	30	3	24	6	24	1.88	.080	7.50
40	20	3	14	6	28	1.50	.080	5.56
42	36	6	24	9	24	2.25	.100	10.50
45	36	6	24	9	27	2.25	.100	11.25
48	8	1.50	5	9	30	1.50	.080	2.67
48	8.50	1.50	5.50	9	30	1.50	.080	2.83
48	14	1.50	11	9	30	1.50	.080	4.67
48	16	1.50	13	9	30	1.50	.080	5.33
48	18	3	12	9	30	1.50	.080	6.00
48	24	3	18	9	30	1.88	.100	8.00
48	30	3	24	9	30	1.88	.100	10.00
48	36	6	24	9	30	2.25	.100	12.00
48	42	6	30	9	30	2.25	.100	14.00
56	8	1.50	5	12	32	1.50	.100	3.11
60	12	1.50	9	12	36	1.50	.080	5.00
60	24	3	18	12	36	1.50	.100	10.00
60	30	3	24	12	36	1.88	.100	12.50
60	36	6	24	12	36	2.25	.100	15.00
60	40	6	28	12	36	2.25	.100	16.67
64	8	1.50	5	12	40	1.50	.100	3.56
66	24	3	18	12	42	1.50	.100	11.00
66	36	6	24	12	42	2.25	.100	16.50
72	12	1.50	9	12	48	1.50	.100	6.00
72	18	3	12	12	48	1.50	.100	9.00
72	24	3	18	12	48	1.50	.100	12.00
72	36	6	24	12	48	1.50	.100	18.00



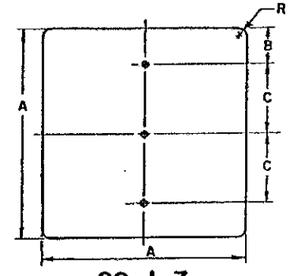
H-REC-1-4 (ONE WAY)

A	B	C	D	R	GAUGE	SQ.FT.
36	12	4	1	1.50	.080	3.00
48	18	6	1.50	1.50	.100	6.00



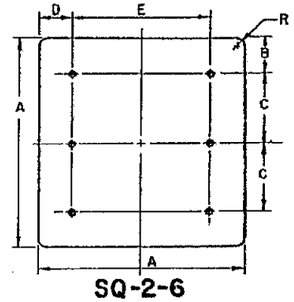
SQ-1-2

A	B	C	R	GAUGE	SQ.FT.
15	3	4½	1.50	.063	1.56
18	3	6	1.50	.063	2.25
24	3	9	1.50	.063	4.00



SQ-1-3

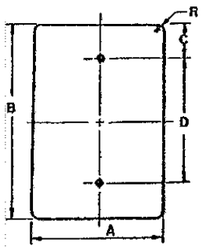
A	B	C	R	GAUGE	SQ.FT.
30	3	12	1.88	.080	6.25
36	6	12	2.25	.080	9.00



SQ-2-6

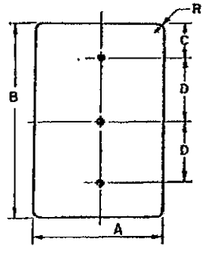
A	B	C	D	E	R	GAUGE	SQ.FT.
* 36	6	12	6	24	2.25	.080	9.00
48	6	18	9	30	3.00	.100	16.00

* "DO NOT ENTER" SIGN.



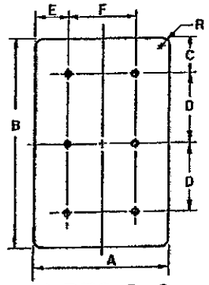
V-REC-1-2

A	B	C	D	R	GAUGE	SQ.FT.
8	26	5	16	1.50	.063	1.44
9	12	1.50	9	1.50	.063	.75
12	18	1.50	15	1.50	.063	1.50
12	24	3	18	1.50	.063	2.00
18	24	3	18	1.50	.063	3.00



V-REC-1-3

A	B	C	D	R	GAUGE	SQ.FT.
6	54	9	18	1.50	.080	2.25
12	36	3	15	1.50	.063	3.00
12	48	6	18	1.50	.080	4.00
24	30	3	12	1.50	.080	5.00
24	36	3	15	1.50	.080	6.00
24	48	9	15	1.50	.100	8.00
30	36	3	15	1.88	.080	7.50
30	38	3	16	1.50	.080	7.92
30	42	9	12	1.50	.080	8.75
36	42	9	12	2.25	.100	10.50



V-REC-2-6

A	B	C	D	E	F	R	GAUGE	SQ.FT.
36	48	6	18	6	24	2.25	.080	12.00
36	54	6	21	6	24	2.25	.100	13.50
36	60	6	24	6	24	2.25	.100	15.00
36	72	9	27	6	24	2.25	.100	18.00
48	54	6	21	9	30	3.00	.100	18.00
48	60	6	24	9	30	3.00	.100	20.00
48	96	12	36	9	30	3.00	.100	32.00

NOTES

1. ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE $\frac{3}{8}$" DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF $\pm\frac{1}{32}$ INCH.
4. FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

SHAPE — NO. BOLTS REQUIRED

H-REC-2-4

NO. SUPPORTS REQUIRED

ALL ITEMS SHALL CONFORM TO SUPPLEMENTAL SPECIFICATIONS 857 AND 957, UNLESS OTHERWISE SPECIFIED.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

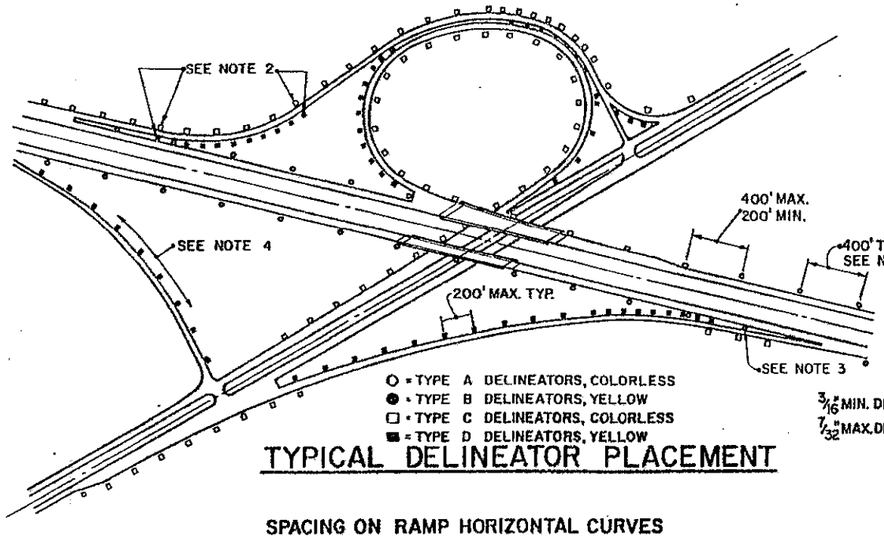
TRAFFIC CONTROL

SIGN BLANK DETAILS II

DATE: 4/1/77, 4/3/79

STANDARD CONSTRUCTION DRAWING TC-52.20

APPROVED: Engineer of Design Services



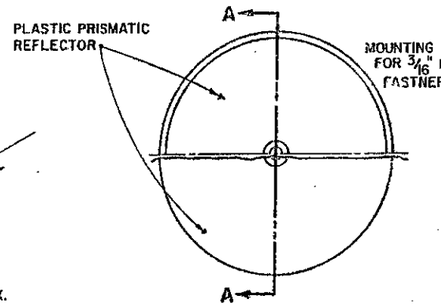
TYPICAL DELINEATOR PLACEMENT

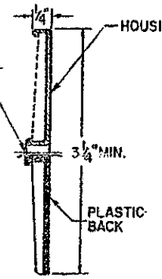
SPACING ON RAMP HORIZONTAL CURVES

RADII (feet) FROM	RADII (feet) TO	DEGREE OF CURVE (MAX)	SPACING ON CURVE	*TRANSITION SPACING
TANGENT	1201	5	200'	200'
1200	1001	6	100'	200'
1000	801	7	90'	200'
800	601	9	80'	160'
600	476	12	70'	140'
475	301	19	60'	120'
300	—	—	50'	100'

* FROM TANGENT TO 12° CURVE, TRANSITION SPACING = 200' TO 140' TO 70'
FROM 19° CURVE TO TANGENT, TRANSITION SPACING = 60' TO 120' TO 200'

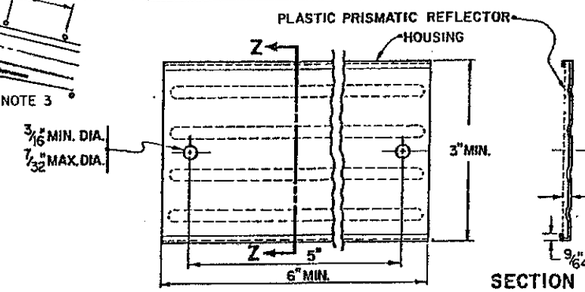
12





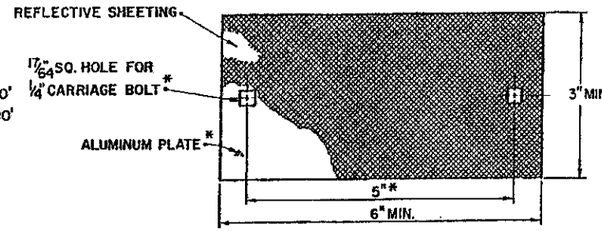
SECTION A-A

TYPE "A" & "B" DELINEATOR

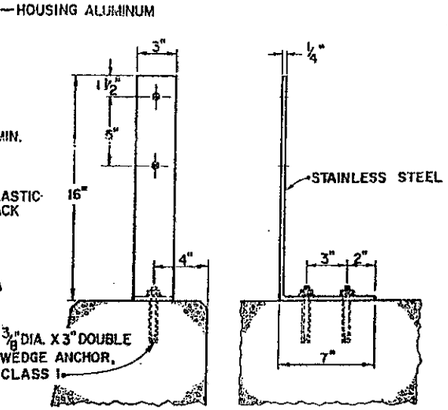


SECTION Z-Z

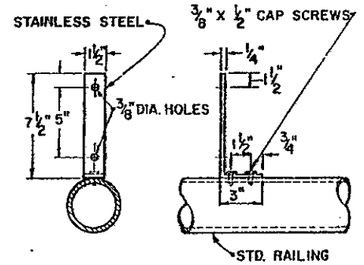
TYPE "C" & "D" DELINEATOR



TYPE "C" & "D" DELINEATOR



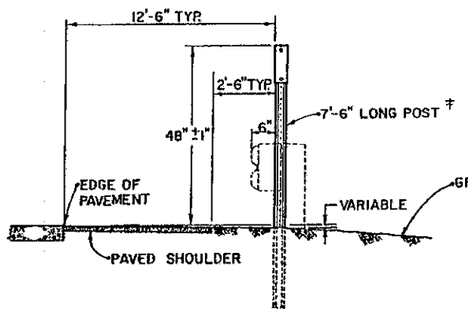
BRIDGE PARAPET BRACKET



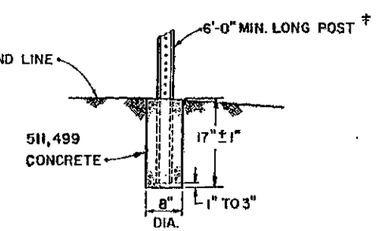
BRIDGE RAIL BRACKET

NOTES:

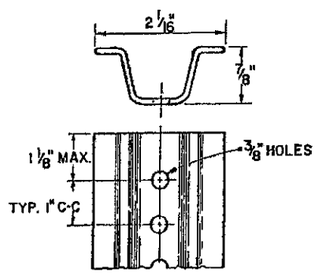
1. TYPE "A" DELINEATORS SHALL BE SPACED ON THE RIGHT OF THE THROUGH ROADWAY AT 400-FOOT INTERVALS WITHOUT REGARD TO CURVES. TYPE "B" DELINEATORS, IF USED, SHALL BE LOCATED ON THE LEFT OF THE THROUGH ROADWAY.
2. DELINEATORS SHALL BE PROVIDED ON AT LEAST ONE SIDE OF INTERCHANGE RAMPS AND SHALL CONFORM TO THE RESPECTIVE EDGE LINE COLOR.
3. NO DELINEATORS SHALL BE PLACED IN A PAVED BERM.
4. WHEN THE DEGREE OF CURVATURE ON RAMPS REQUIRE LESS THAN 200-FOOT 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 DRIVE POSTS OR BRACKETS.
6. OMIT DELINEATORS IF WITHIN 50 FEET OF A MILE MARKER.



LATERAL PLACEMENT



ALTERNATE CONCRETE EMBEDMENT



NO. 1 STEEL DRIVE POST ‡

* DIMENSIONS GIVEN APPLY ONLY TO REMOVABLE REFLECTOR PLATES AS USED WITH STEEL POST AND BRIDGE BRACKETS.

‡ DIMENSIONS GIVEN APPLY ONLY TO DELINEATORS UTILIZING A STEEL DRIVE POST.

DELINEATORS SHALL CONFORM WITH C & M SPECIFICATION 620.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

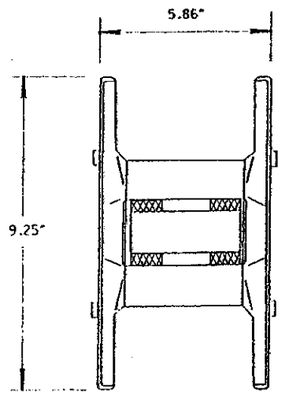
DELINEATOR DETAILS

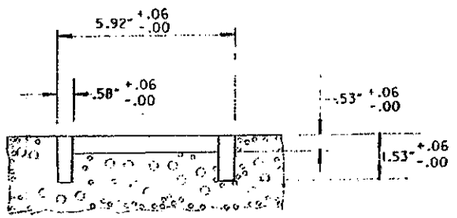
STANDARD CONSTRUCTION DRAWING TC-61.10

APPROVED: E. J. Lesniak Engineer of Design Services

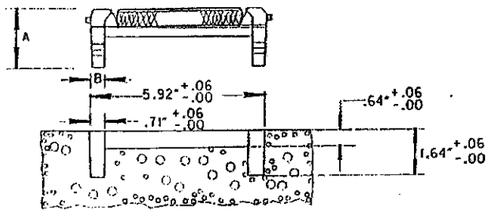
DATE
12/1/75
8/19/77
3/29/79
2/26/82
4/5/82

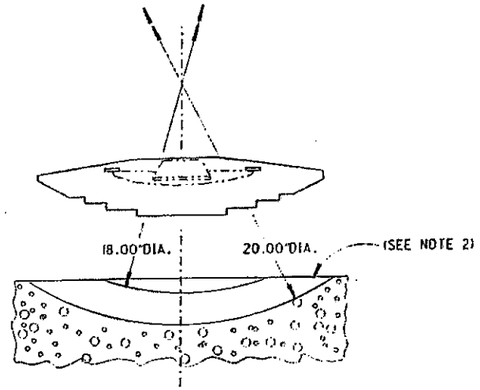
	CONVENTIONAL TYPE	LOW PROFILE TYPE
A	1.74"	1.69"
B	.46"	.59"





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 1" 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 CURVES OF 5° OR GREATER, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 40 FEET BETWEEN P.C. OR T.S. AND P.T. OR S.T.
4. FOR HORIZONTAL CURVES OF 10° OR GREATER, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 20 FEET BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 20 FOOT SPACING, 12 RAISED PAVEMENT MARKERS AT 40 FOOT SPACING SHALL BE INSTALLED ON EACH END OF THE 20 FOOT SPACING.
5. WHEN A CHANNELIZING LINE IS LESS THAN 80 FEET 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 120 FEET. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 80 FEET.

CASTING AND SAW CUT DETAILS

EDGE LINE

ONE WAY (WHITE) WITH RIGHT EDGE LINE OR
ONE WAY (YELLOW) WITH LEFT EDGE LINE OR
TWO WAY (YELLOW/RED) WITH LEFT EDGE LINE ON RAMPS
YELLOW SIDE FACING TRAFFIC

CHANNELIZING LINE

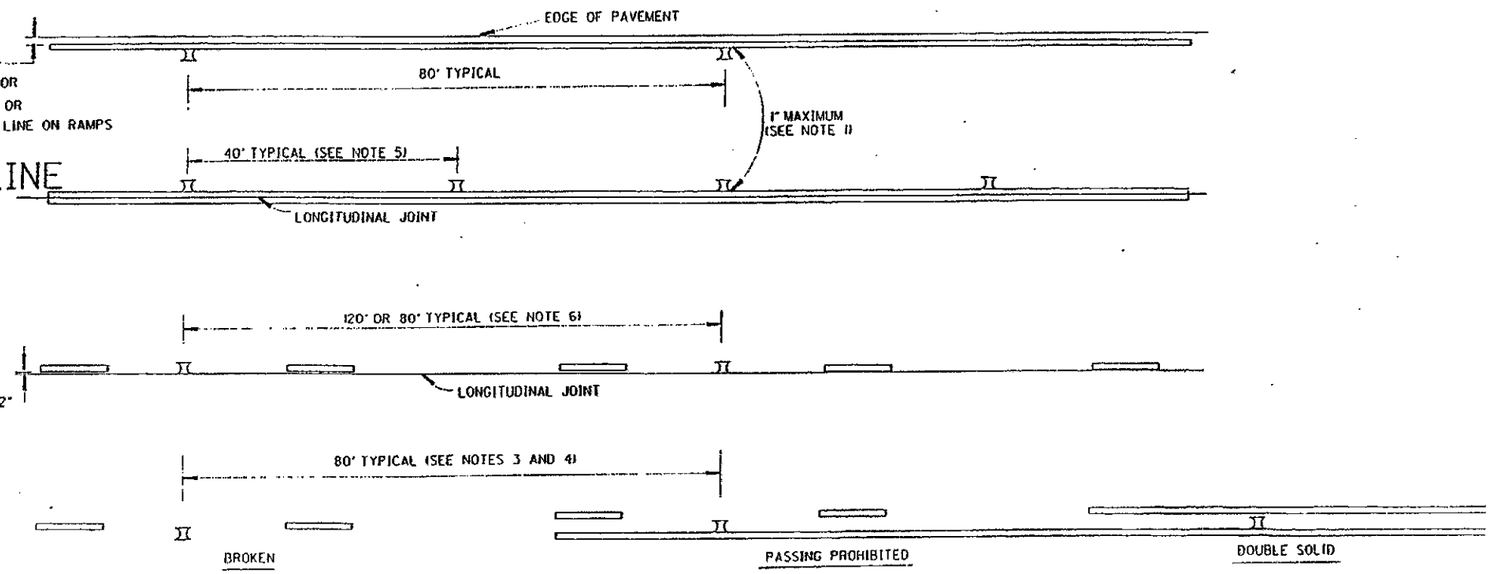
TWO WAY (WHITE/RED)
WHITE SIDE FACING TRAFFIC

LANE LINE

ONE WAY (WHITE) OR
TWO WAY (WHITE/RED)
WHITE SIDE FACING TRAFFIC

CENTER LINE

TWO WAY (YELLOW/YELLOW)



TYPICAL RAISED PAVEMENT MARKER PLACEMENT WITH LONGITUDINAL PAVEMENT MARKINGS

OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

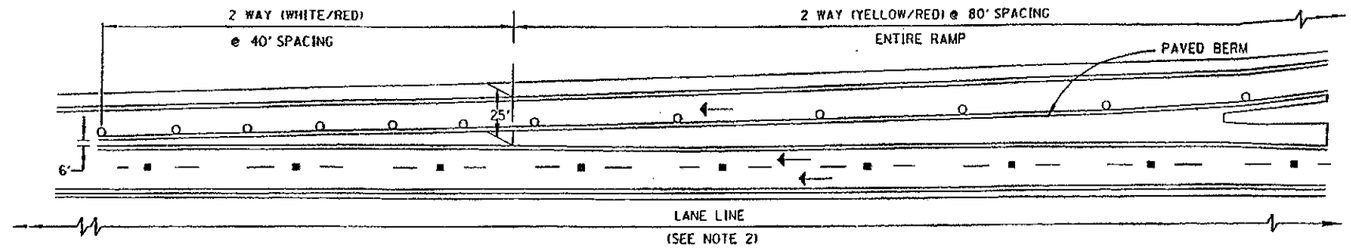
RAISED PAVEMENT MARKER INSTALLATION DETAILS

STANDARD CONSTRUCTION DRAWING TC-65.10

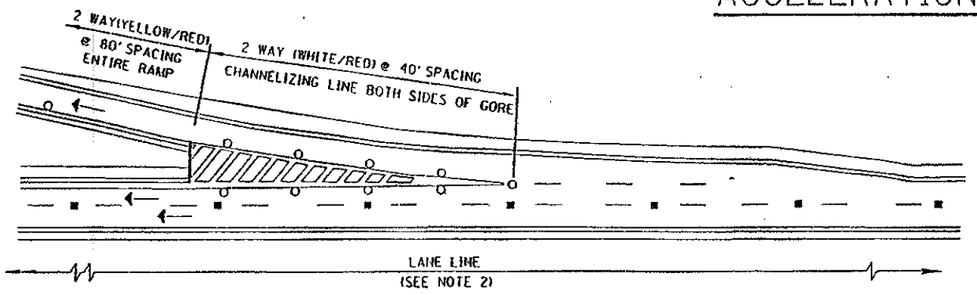
APPROVED _____ ADMINISTRATOR

DATE
05/21/81
02/26/82
02/01/90
01/07/95

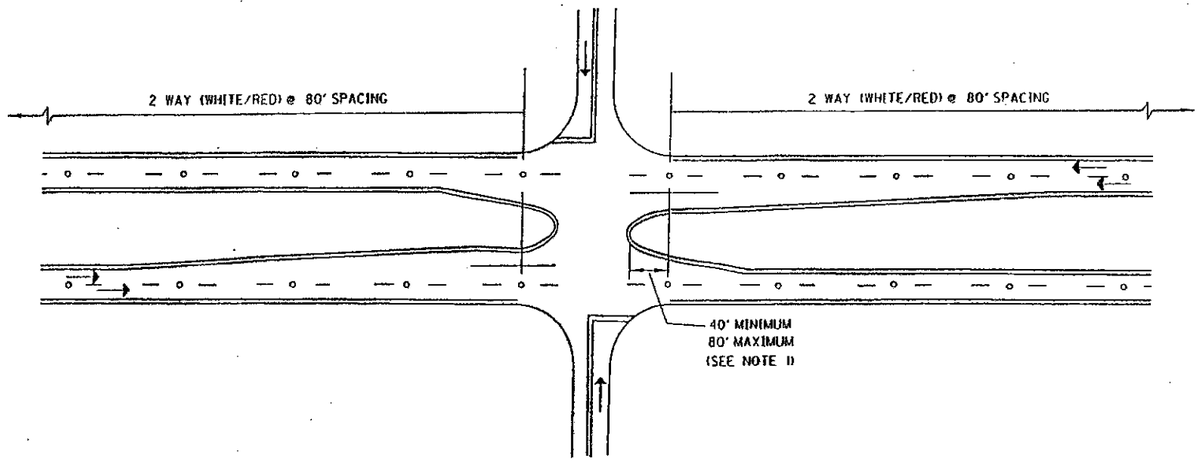
WCC



ACCELERATION LANE

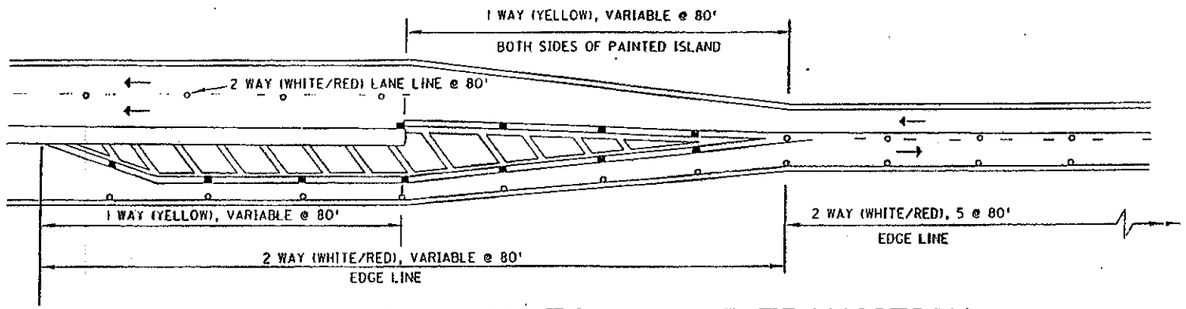


DECELERATION LANE

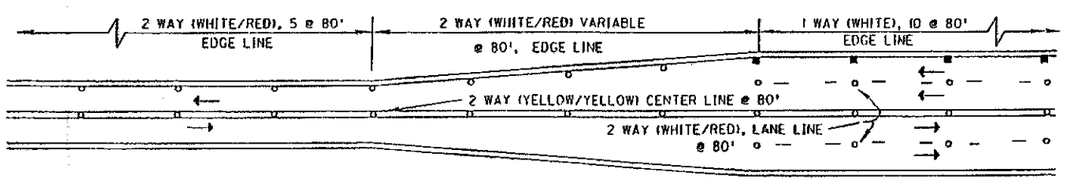


MULTILANE DIVIDED-CONTROLLED ACCESS

(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 120 FEET. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 80 FEET.

LEGEND

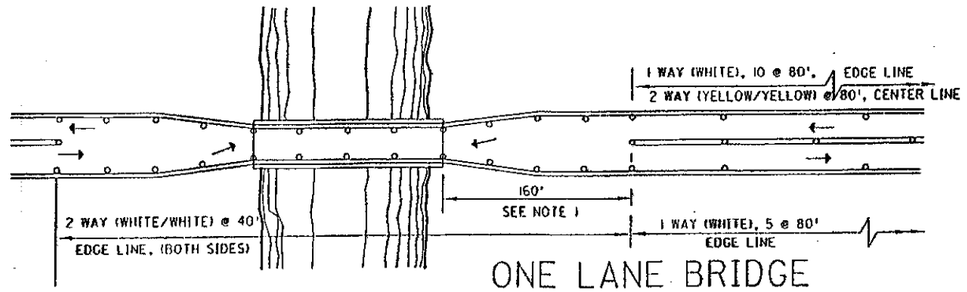
- ■ 1 WAY REFLECTORS
- o 2 WAY REFLECTORS

OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

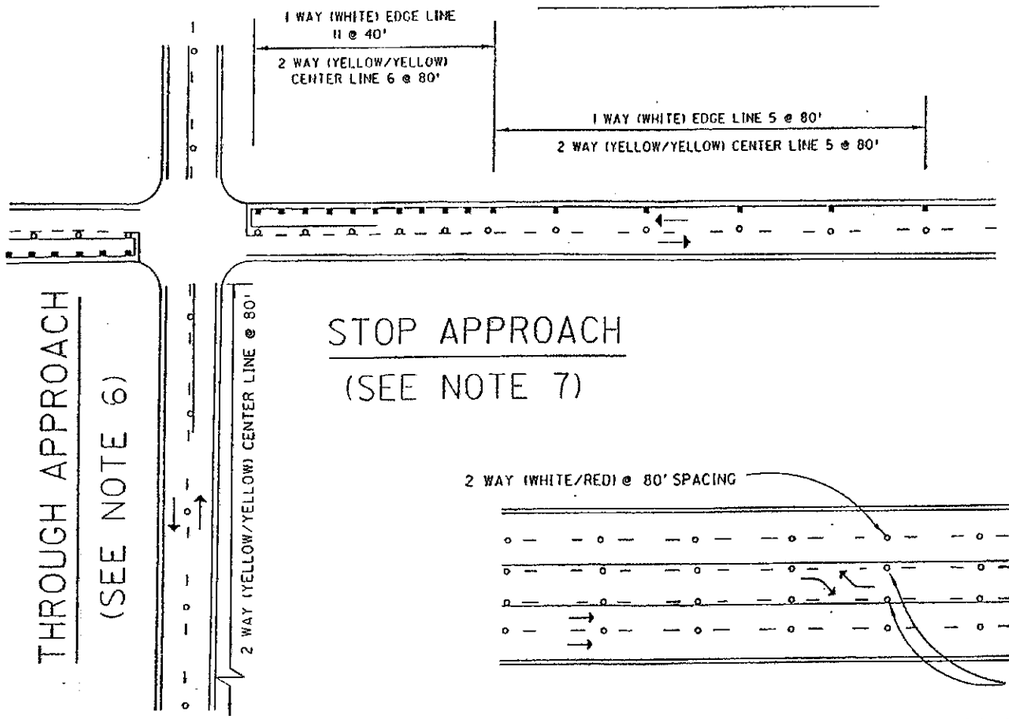
TRAFFIC CONTROL	DATE
RAISED PAVEMENT MARKER DETAILS I	05/21/81 02/26/82 04/05/82 02/01/90 07/07/95

STANDARD CONSTRUCTION DRAWING TC-65.11

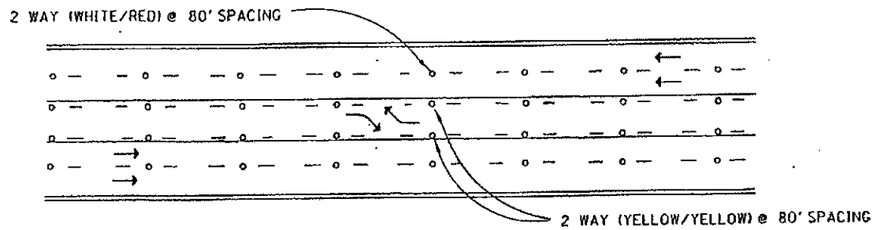
APPROVED _____ ADMINISTRATOR



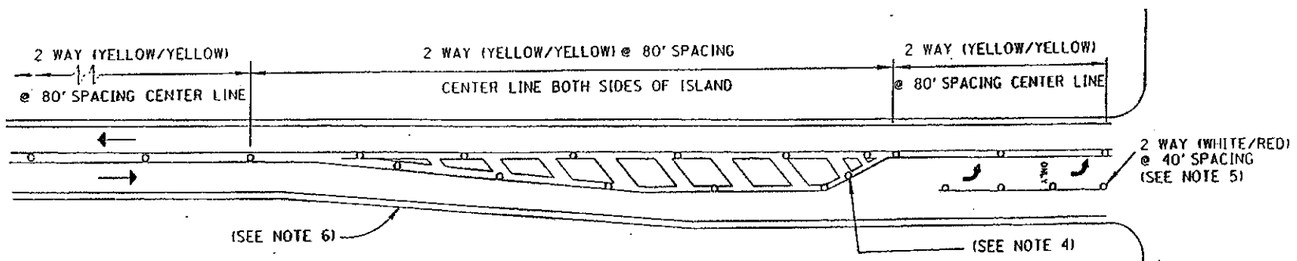
ONE LANE BRIDGE



STOP APPROACH
(SEE NOTE 7)



TWO WAY LEFT TURN LANE



APPROACH W/LEFT TURN LANE

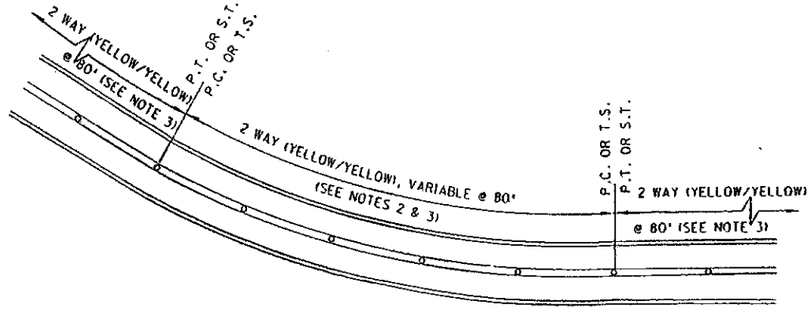
LEGEND

■ 1 WAY REFLECTORS

○ 2 WAY REFLECTORS

NOTES

1. FOR ONE LANE BRIDGES, PAINTED CENTER LINE AND CENTER LINE MARKERS SHALL BE OMITTED 160 FEET ON EACH SIDE AND ACROSS THE BRIDGE.
2. FOR HORIZONTAL CURVES OF 5° OR GREATER, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 40 FEET BETWEEN P.C. OR T.S. AND P.T. OR S.T.
3. FOR HORIZONTAL CURVES OF 10° OR GREATER, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 20 FEET BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 20 FOOT SPACING, 12 RAISED PAVEMENT MARKERS AT 40 FOOT SPACING SHALL BE INSTALLED ON EACH END OF THE 20 FOOT 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 80 FEET 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.



HORIZONTAL CURVE

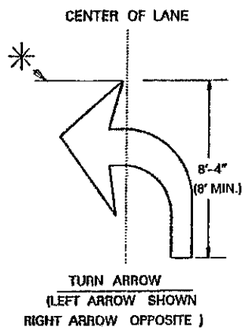
OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE
RAISED PAVEMENT MARKER DETAILS II	05/21/81 06/08/89 02/01/90 07/07/95

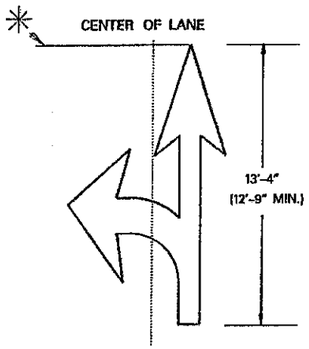
STANDARD CONSTRUCTION DRAWING TC-65.12

APPROVED _____ ADMINISTRATOR

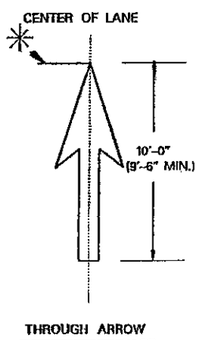
WCC



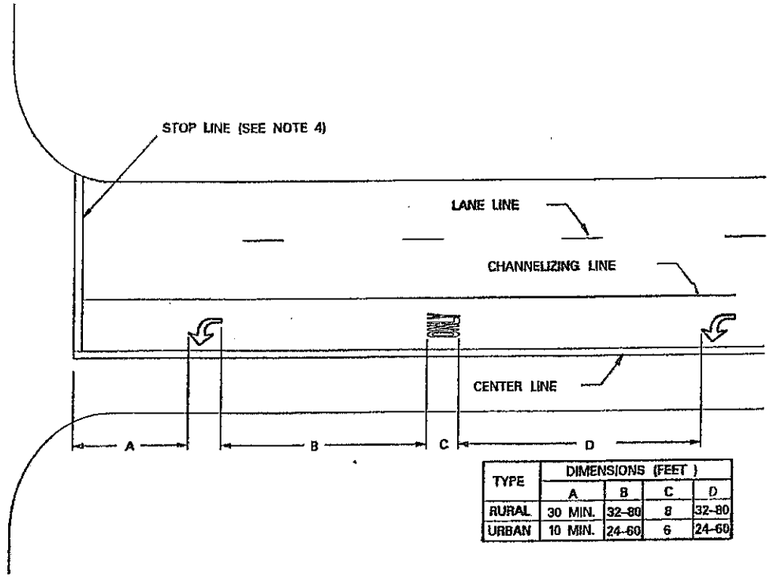
TURN ARROW
(LEFT ARROW SHOWN
RIGHT ARROW OPPOSITE)



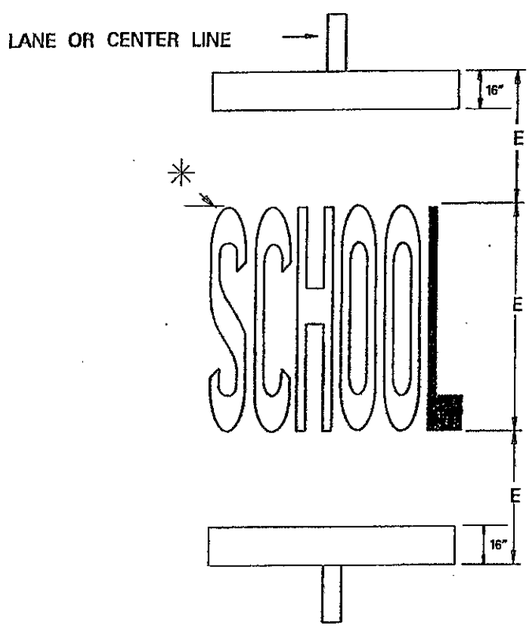
COMBINED ARROW
(THREE HEAD DIRECTIONAL ARROWS CAN BE ACHIEVED BY THE COMBINATION OF TURN ARROWS.)



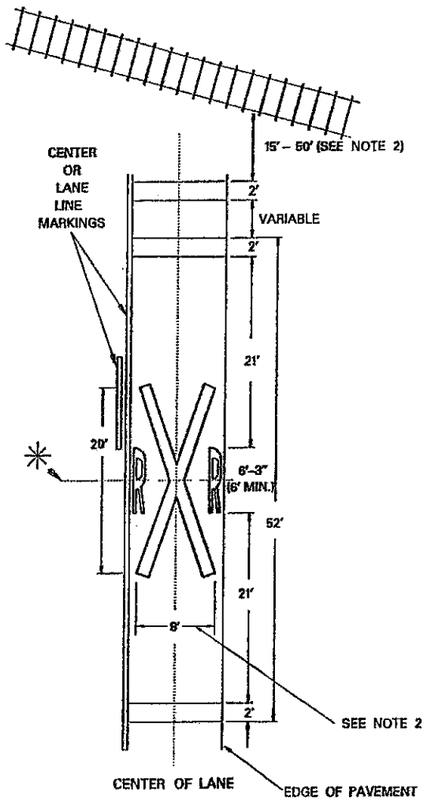
THROUGH ARROW



TYPE	DIMENSIONS (FEET)			
	A	B	C	D
RURAL	30 MIN.	32-80	8	32-80
URBAN	10 MIN.	24-60	6	24-60



TYPE	E (INCHES)	
	STANDARD	OPTIONAL
RURAL	96	100
URBAN	72	75



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 15 FEET TO 50 FEET OF THE NEAR EDGE OF THE TRACKS. WIDTH OF "X" MAY VARY ACCORDING TO LANE WIDTH.

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 30 FEET OR LESS THAN 4 FEET FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY. FOR NORMAL INTERSECTIONS A MAXIMUM DISTANCE OF 10 FEET IS RECOMMENDED.

   IF A MARKED CROSSWALK IS PRESENT, THE STOP LINE SHOULD BE PLACED 4 FEET 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

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

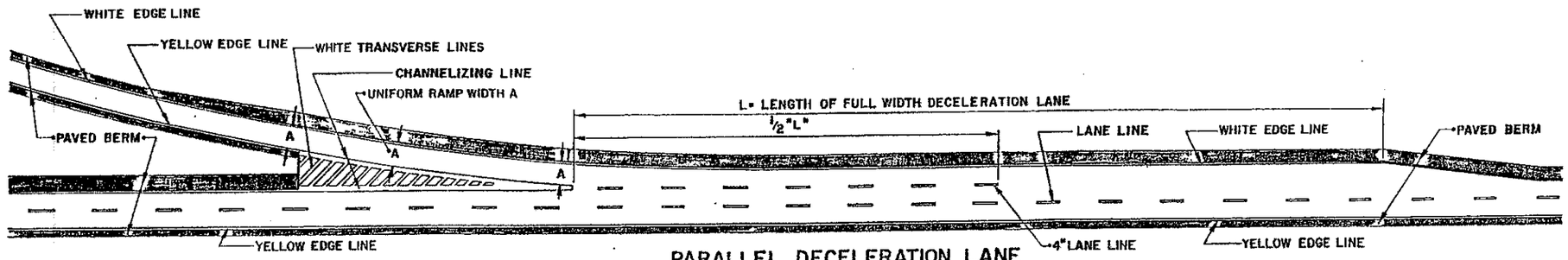
WORDS, SYMBOLS AND ARROWS

DATE 09/10/91

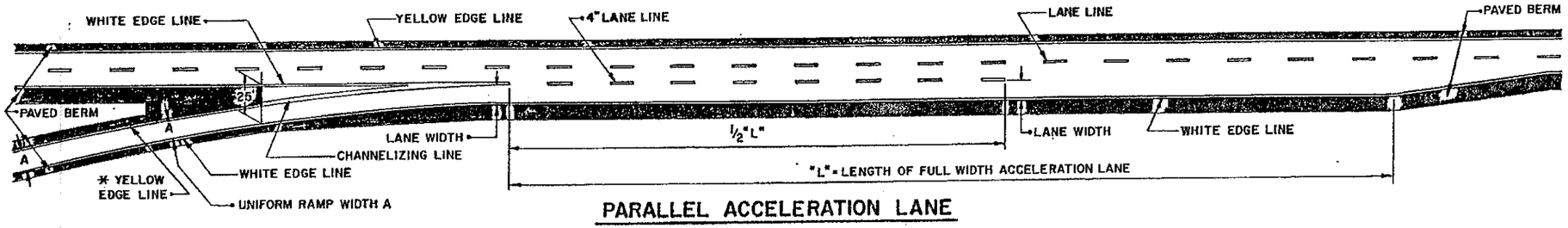
STANDARD CONSTRUCTION DRAWING TC – 71.10

APPROVED Ray J Krieger ENGR. OF DESIGN SERVICES

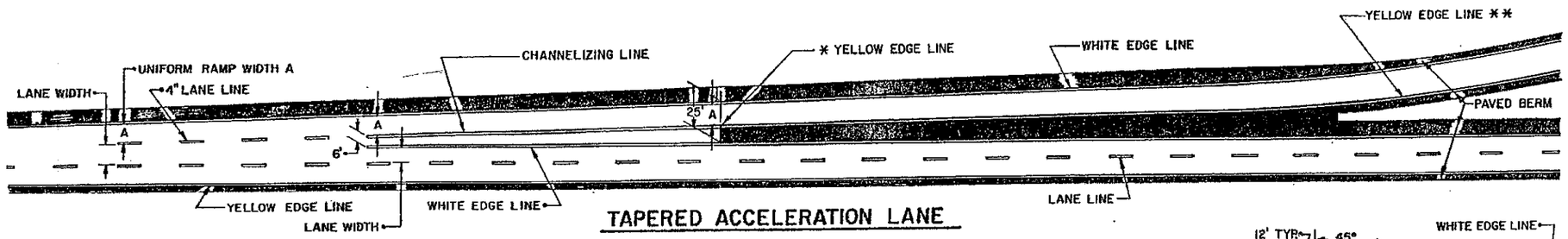
WCC



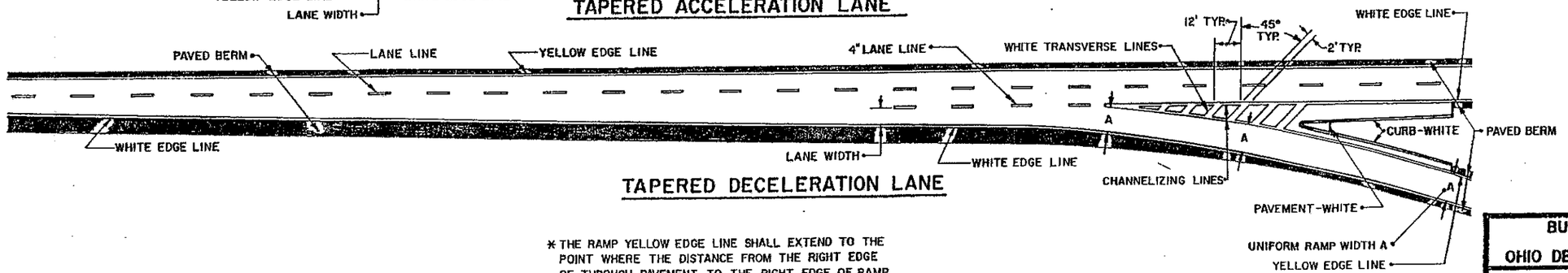
PARALLEL DECELERATION LANE



PARALLEL ACCELERATION LANE



TAPERED ACCELERATION LANE



TAPERED DECELERATION LANE

* THE RAMP YELLOW EDGE LINE SHALL EXTEND TO THE POINT WHERE THE DISTANCE FROM THE RIGHT EDGE OF THROUGH PAVEMENT TO THE RIGHT EDGE OF RAMP IS 25 FEET OR WHERE THE PAVED BERM ENDS.

** ANY EXISTING CURB SHALL BE PAINTED WHITE.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

FREEWAY ENTRANCE AND EXIT MARKINGS

STANDARD CONSTRUCTION DRAWING TC-72.20

APPROVED: Engineer of Design Services

DATE
6-29-77
4/3/79
10/26/81
2/26/82

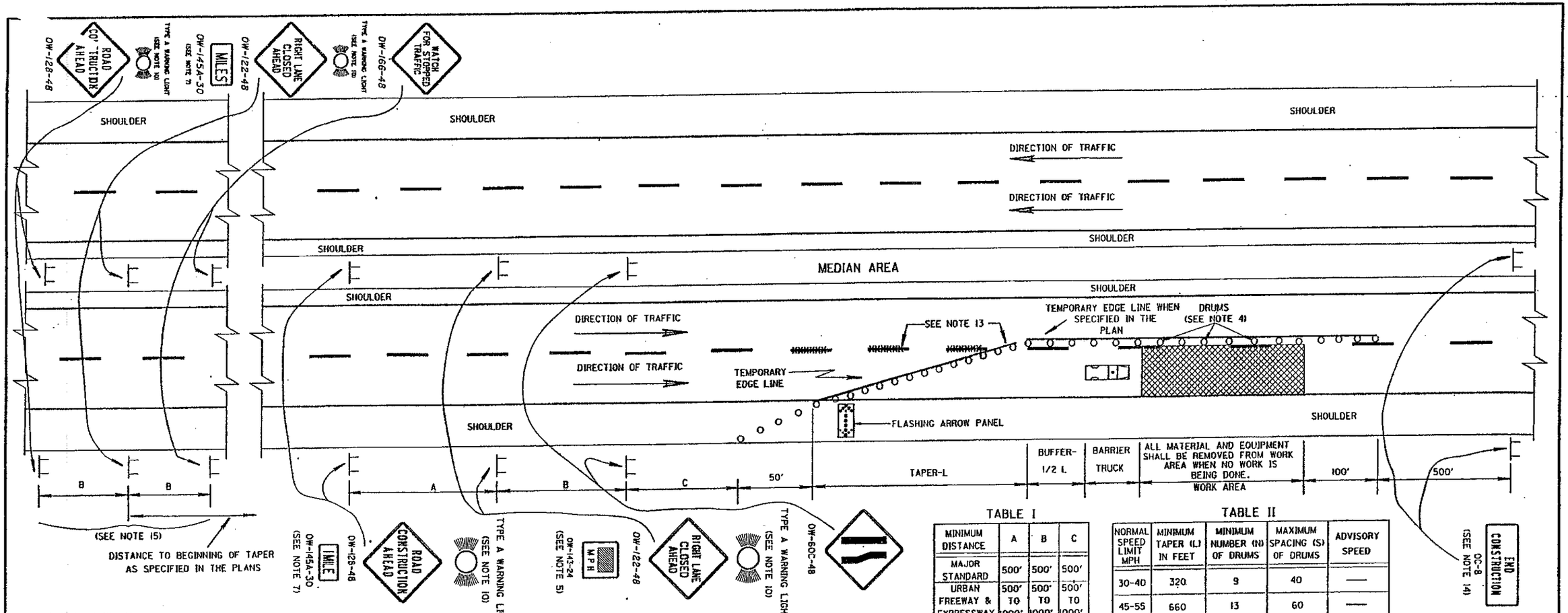


TABLE I

MINIMUM DISTANCE	A	B	C
MAJOR STANDARD	500'	500'	500'
URBAN FREEWAY & EXPRESSWAY	500' TO 3000'	500' TO 1000'	500' TO 1000'
RURAL FREEWAY & EXPRESSWAY	2600'	1600'	1000'

TABLE II

NORMAL SPEED LIMIT MPH	MINIMUM TAPER (L) IN FEET	MINIMUM NUMBER (N) OF DRUMS	MAXIMUM SPACING (S) OF DRUMS	ADVISORY SPEED
30-40	320	9	40	—
45-55	660	13	60	—
60-65	780	13	60	55

GENERAL NOTES:

1. THE LOCATION OF THE TRANSITION 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 200 FEET CLEARANCE TO EXISTING SIGNS.

3. THE TAPER LENGTH (L), NUMBER (N), AND SPACING (S) OF DRUMS SHALL CONFORM TO TABLE II. DRUM SPACING (S) SHALL BE USED FOR THE PAVEMENT TAPER, THE BUFFER AREA AND FOR THE FIRST 1000 FEET 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 IN THE SHOULDER TAPER.

4. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES 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-143-24 SHALL BE USED WHEN SPECIFIED IN THE PLAN OR AS DIRECTED BY THE ENGINEER. THE ADVISORY SPEED SHALL BE AS SPECIFIED IN THE PLAN, AS SHOWN IN TABLE II OR AS DIRECTED BY THE ENGINEER.

6. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.

7. THE DISTANCE PLATE OW-145A-30 SHALL INDICATE THE DISTANCE TO THE BEGINNING OF THE PAVEMENT TAPER (L). DISTANCES LESS THAN ONE MILE MAY BE IF EXPRESSED IN FEET. THE PLAQUE MAY BE OMITTED IF EXTRA ADVANCE SIGN GROUPS ARE NOT USED.

8. THE BARRIER TRUCK SHOWN AT THE BEGINNING OF 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. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE BARRIER TRUCK SHOWN WHEN APPROVED BY THE ENGINEER. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 1/4 MILE.

9. THE FLASHING ARROW PANEL SHALL MEET REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING TC-35.10.

10. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" AND "RIGHT (OR LEFT) LANE CLOSED AHEAD" SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

11. 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-122-48 SIGNS AND OW-60D-48 SIGNS SHALL BE SUBSTITUTED FOR THE OW-60C-48 SIGNS.

12. 36" WARNING SIGN SIZES MAY BE USED ON DIVIDED ROADWAYS THAT ARE NOT CLASSIFIED AS FREEWAYS OR EXPRESSWAYS.

13. 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 (947.03 TYPE-C) TAPE OR TEMPORARY RPM'S UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE AFTER COMPLETION OF THE WORK. TEMPORARY MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 621.134 AND THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED.

14. 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.

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.

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 INCIDENTAL TO 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

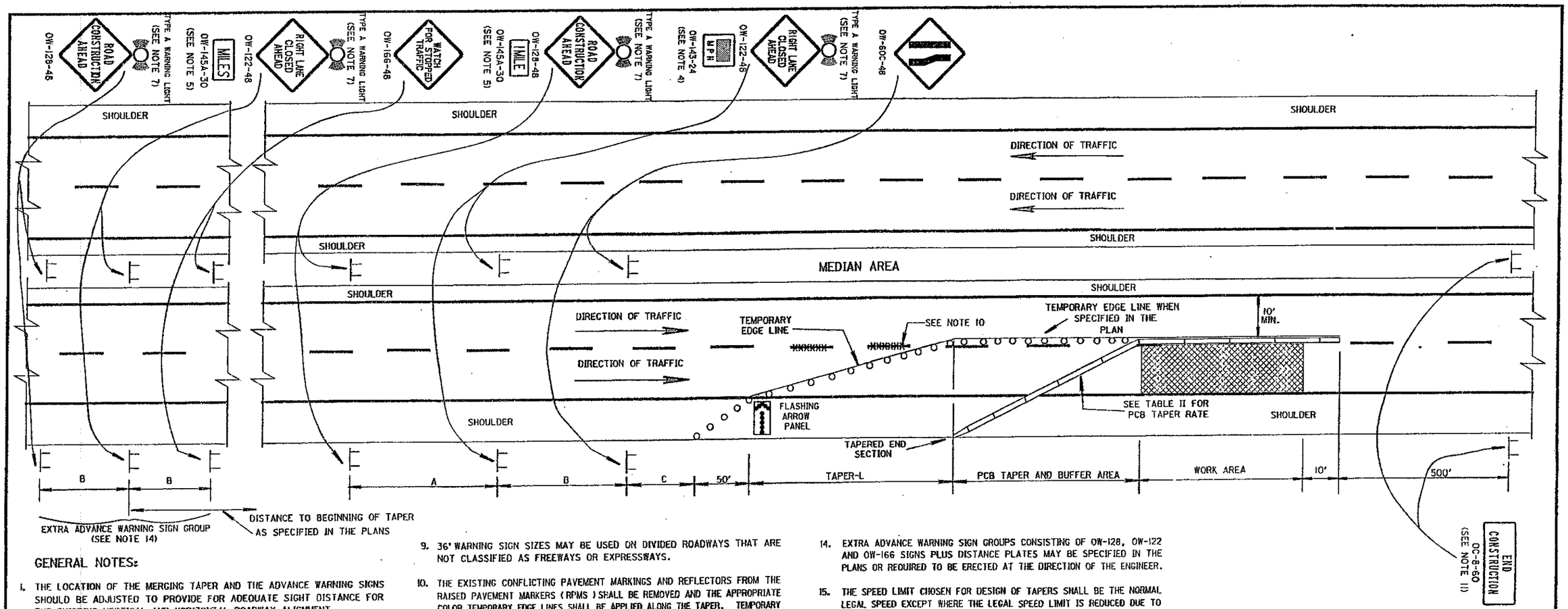
CLOSING RIGHT OR LEFT LANE OF A MULTI-LANE DIVIDED HIGHWAY WITH DRUMS

DATE 10/10/88

STANDARD CONSTRUCTION DRAWING MT-95.30

APPROVED _____ ENGR. OF DESIGN SERVICES

WC



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 200 FEET 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 AND THE BUFFER AREA. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER.

4. THE ADVISORY SPEED SIGN OW-143-24 SHALL BE USED WHEN SPECIFIED IN THE PLAN.

5. THE DISTANCE PLATE OW-145A-30 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.

6. THE FLASHING ARROW PANEL SHALL MEET REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING TC-35.10.

7. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" AND "RIGHT (OR LEFT) LANE CLOSED AHEAD" SIGNS ARE REQUIRED.

8. WHEN WORK IS BEING PERFORMED IN THE LANE ADJACENT TO THE MEDIAN ON A DIVIDED HIGHWAY, OW-123-48 SIGNS SHALL BE SUBSTITUTED FOR THE OW-122-48 SIGNS AND OW-60D-48 SIGNS SHALL BE SUBSTITUTED FOR THE OW-60C-48 SIGNS.

9. 36" WARNING SIGN SIZES MAY BE USED ON DIVIDED ROADWAYS THAT ARE NOT CLASSIFIED AS FREEWAYS OR EXPRESSWAYS.

10. 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.

11. THE OC-8-60 SIGNS MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

12. PCB SHALL BE DELINEATED AS FOLLOWS:

PCB TYPE	DELINEATION
32" HIGH WITHOUT GLARE SCREEN	BARRIER REFLECTORS @ 25' C-C (MAX.) TOP MOUNTED OBJECT MARKERS (9" X 15") @ 25' C-C (MAX.)
32" HIGH WITH GLARE SCREEN	BARRIER REFLECTORS @ 25' C-C VERTICAL STRIPES ON PADDLES (2" X 12") @ 12½' C-C (MAX.)
50" HIGH	BARRIER REFLECTORS @ 12½' C-C (MAX.)
TAPERED END SECTION AND EXPOSED END	OBJECT MARKERS (9" X 15") TOP MOUNTED @ EACH END

13. OW-128-36 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 ACROSS THE CLOSED LANE AT EACH INTERSECTION AND DRIVEWAY.

14. 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.

15. THE SPEED LIMIT CHOSEN FOR DESIGN OF TAPERS SHALL BE THE NORMAL LEGAL SPEED EXCEPT WHERE THE LEGAL SPEED LIMIT IS REDUCED DUE TO THE CONSTRUCTION AND THE SUBJECT LANE CLOSURE IS NOT THE FIRST ACTIVE CONSTRUCTION AREA ENCOUNTERED BY TRAFFIC WITHIN THE PROJECT.

16. NO EQUIPMENT OR MATERIAL SHALL BE LOCATED OTHER THAN BEHIND THE PCB.

LEGEND

DRUMS	○○○○○○
PORTABLE CONCRETE BARRIER (PCB)	
REMOVE EXISTING MARKINGS	XXXXXXXXX

TABLE I

MINIMUM DISTANCE	A	B	C
MAJOR STANDARD	500'	500'	500'
URBAN FREEWAY & EXPRESSWAY	500' TO 1000'	500' TO 1000'	500' TO 1000'
RURAL FREEWAY & EXPRESSWAY	2600'	1500'	1000'

TABLE II

SPEED LIMIT MPH*	MINIMUM DRUM TAPER (L) IN FEET	MAXIMUM SPACING (S) OF DRUMS	PCB TAPER RATE
30-40	320	40	11 : 1
45-55	660	50	16 : 1
60-65	780	60	19 : 1

* SEE NOTE (15)

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

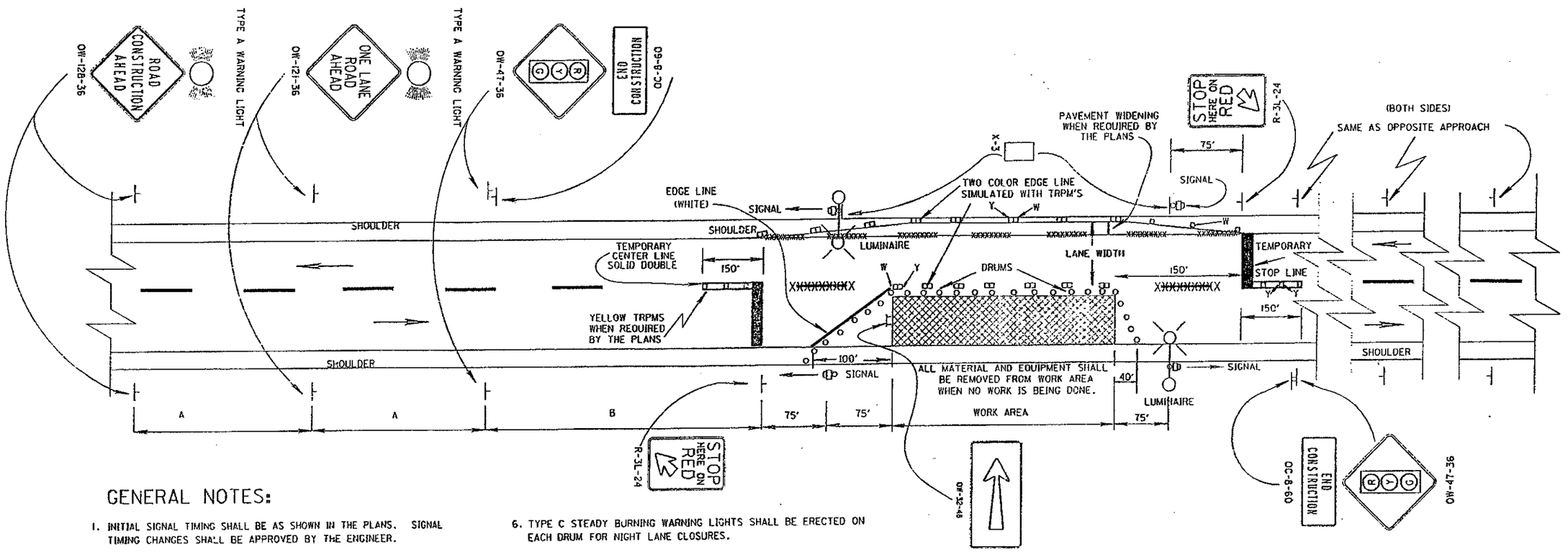
CLOSING RIGHT OR LEFT LANE OF A MULTI-LANE DIVIDED HIGHWAY WITH PORTABLE CONCRETE BARRIER

DATE 10/01/92

STANDARD CONSTRUCTION DRAWING MT-95.40

APPROVED Doug Craig ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES:

1. INITIAL SIGNAL TIMING SHALL BE AS SHOWN IN THE PLANS. SIGNAL TIMING CHANGES SHALL BE APPROVED BY THE ENGINEER.

2. SIGNALS SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE REQUIREMENTS OF PART 6 OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

3. DRUMS SHALL BE SPACED AT 50' CENTER TO CENTER WITHIN THE WORK AREA. DRUMS ON THE ADVANCE AND RETURN TAPERS SHALL BE SPACED AT 10' CENTER TO CENTER.

4. ADEQUATE AREA ILLUMINATION TO CLEARLY IDENTIFY BOTH ENDS OF THE WORK AREA AT NIGHT SHALL BE PROVIDED BY USING 150 WATT MINIMUM HIGH PRESSURE SODIUM LUMINAIRES OR 250 WATT MINIMUM MERCURY LUMINAIRES. LUMINAIRES SHALL BE LOCATED ADJACENT TO THE SIGNAL LOCATIONS AS SHOWN ABOVE. THE MOUNTING HEIGHT FOR LUMINAIRES SHALL BE A MINIMUM OF 27 FEET ABOVE THE PAVEMENT BUT IN NO CASE LESS THAN 15 FEET ABOVE THE TOP OF THE SIGNAL AND MOUNTED ON A SUPPORT OF ADEQUATE STRENGTH TO PROVIDE A SATISFACTORY INSTALLATION. THE OVERHEAD CONDUCTOR CLEARANCE SHALL BE A MINIMUM OF 18 FEET ABOVE THE PAVEMENT. THE LUMINAIRE ARM SHALL BE OF SUFFICIENT LENGTH TO EXTEND TO THE EDGE OF THE PAVEMENT. POLES SHALL BE ERECTED A MINIMUM OF 5.5 FEET BEHIND FACE OF GUARDRAIL WHERE EXISTING, OR 12 FEET FROM THE EDGE OF PAVEMENT. WHERE POSSIBLE LOCATE BEHIND DITCH.

5. TEMPORARY CENTER LINE: SOLID, DOUBLE, AS SHOWN, SHALL BE INSTALLED AND MAINTAINED WHERE NO PASSING LINES ARE NOT ALREADY IN PLACE. 12" STOP LINES SHALL ALSO BE INSTALLED. TEMPORARY RAISED PAVEMENT MARKERS, (TRPM'S) TO SIMULATE A TWO COLOR EDGE LINE SHALL BE PROVIDED. EXISTING CONFLICTING PAVEMENT MARKINGS OR RAISED PAVEMENT MARKER REFLECTORS BETWEEN THE WORK AREA AND THE STOP LINES OR WITHIN THE ONE WAY LANE WIDTH SHALL BE REMOVED. AFTER COMPLETION OF THE WORK. TEMPORARY MARKINGS AND TRPM'S SHALL BE REMOVED IN ACCORDANCE WITH 621.134 AND THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESTORED.

6. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.

7. THE HORIZONTAL OR VERTICAL ALIGNMENT OF THE ROADWAY MAY REQUIRE ADJUSTMENTS IN THE LOCATION OF THE ADVANCE WARNING SIGNS OR THE SIGNAL HEADS. TREE OR BRUSH TRIMMING TO PROVIDE ADEQUATE SIGHT DISTANCE TO SIGN AND SIGNALS SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER. THE DISTANCES SHOWN FOR ADVANCE WARNING SIGN SPACINGS ARE MINIMUM.

8. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS.

9. ALL TRAFFIC SIGNAL AND LIGHTING EQUIPMENT USED IN THIS INSTALLATION, SUCH AS SIGNAL OR LIGHTING CABLE, SIGNAL HEADS, LUMINAIRES OR SIGNAL CONTROLLER SHALL BE IN CONFORMANCE WITH SPECIFICATION ITEMS 625, 632, 633, 713, 732 AND 733. HOWEVER, THE PERFORMANCE TESTS OF 625.22E AND 632.27(6). THE WORKING DRAWING REQUIREMENTS OF 625.04, 632.03 AND 633.03. THE WIRING DIAGRAM AND SERVICE MANUAL REQUIREMENT OF 633.04 AND THE TESTING AND PREQUALIFICATION REQUIREMENT OF 633.05 ARE WAIVED. ALSO THE REQUIREMENTS OF 733.01 CONCERNING EXPANSIBLE 3-DIAL UNITS AND TWELVE SIGNAL CIRCUITS ARE WAIVED. USED EQUIPMENT IS ACCEPTABLE. CONFLICT MONITORS SHALL BE USED EXCEPT WITH ELECTROMECHANICAL PRETIMED CONTROLLERS WITH CAM SHAFT.

10. IF THE SIGNAL IS CHANGED TO FLASHING OPERATION. RED SHALL BE FLASHED TO BOTH APPROACHES ON ALL SIGNAL HEADS.

DISTANCE	A	B
URBAN	200'	350'
RURAL	500'	750'

XXXXXXXX—— EXISTING MARKINGS REMOVED

W —— TRPM, WHITE, 1-WAY

Y —— TRPM, YELLOW, 1-WAY

Y—Y —— TRPM, YELLOW, 2-WAY

Y—W —— TWO TRPM'S BACK TO BACK

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 INCIDENTAL TO 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

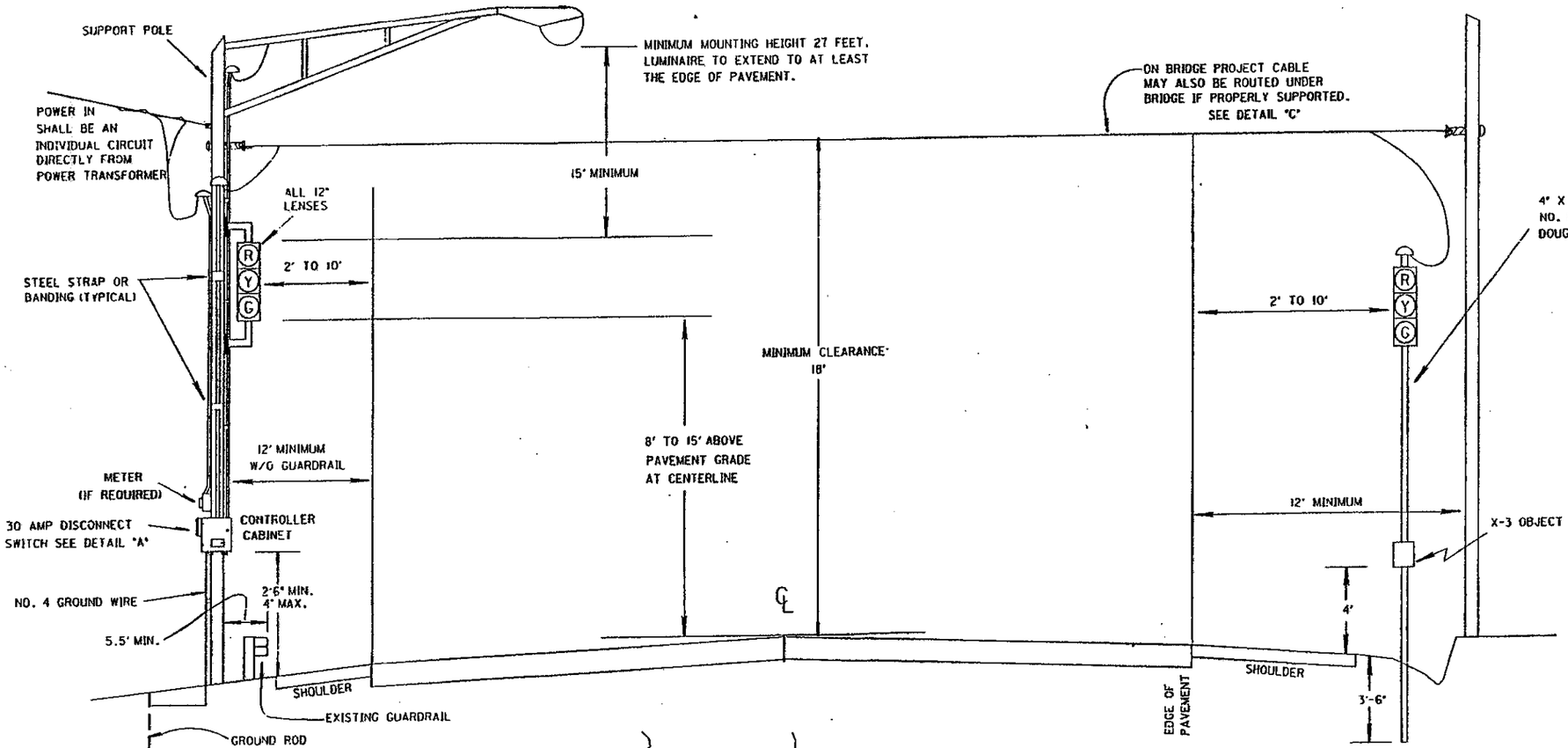
DATE 09/09/88

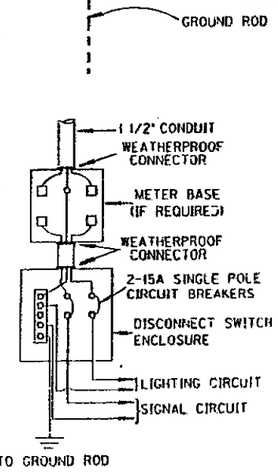
SIGNALIZED CLOSING
1 LANE OF A 2 LANE
HIGHWAY WITH DRUMS

STANDARD CONSTRUCTION DRAWING MT-96.10

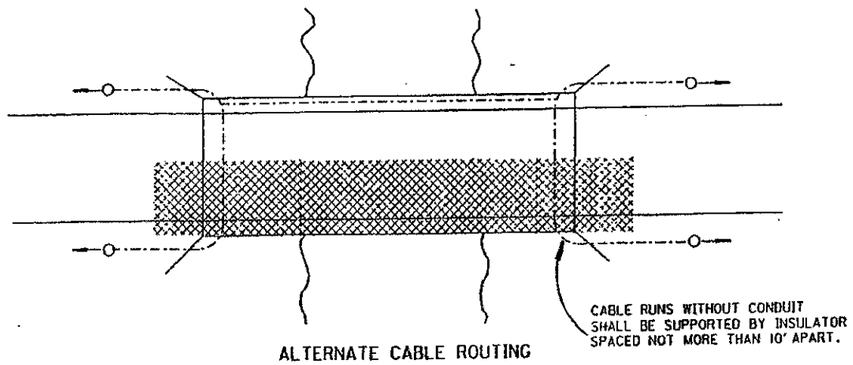
APPROVED _____ ENGR. OF DESIGN SERVICES

296.10 WC



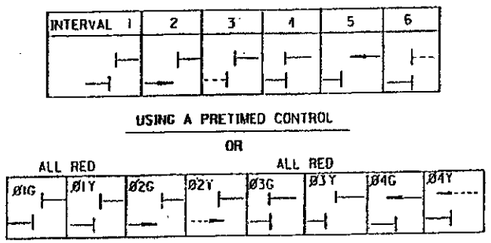


DETAIL "A"



ALTERNATE CABLE ROUTING

DETAIL "C"



USING A PRETIMED CONTROL

OR

WHEN CALLED FOR IN THE PLANS, Ø2 GREEN AND Ø4 GREEN SHALL BE ACTUATED BY DETECTORS AT APPROACH TO THE WORK ZONE. Ø1 & Ø3 ARE DUMMY PHASES TO TIME ALL RED INTERVAL. TIMING INITIALIZES ON PHASE ONE.

USING A 4 PHASE ACTUATED CONTROL

DETAIL "B"
SIGNAL PHASING

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DETAILS FOR SIGNALIZED CLOSING 1 LANE OF A 2 LANE HIGHWAY

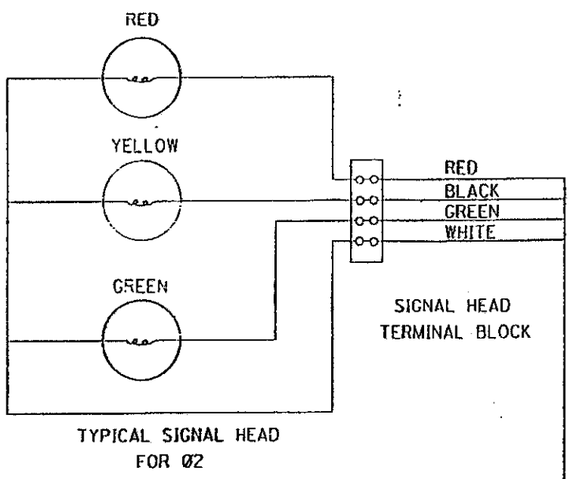
DATE 09/09/88

STANDARD CONSTRUCTION DRAWING MT-96.20

APPROVED _____ ENGR. OF DESIGN SERVICES

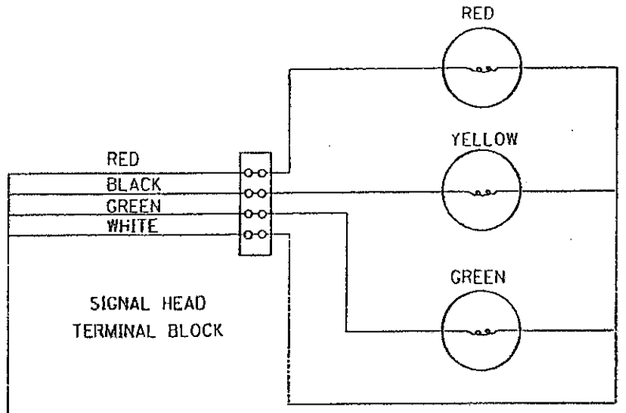
296.20 WC

CABLE SHALL BE 4-CONDUCTOR NO. 14 COPPER SIGNAL CABLE, COLOR CODED AND STRANDED. ALL ELECTRICAL CONNECTIONS TO BE MADE AT TERMINAL BLOCKS USING LOCK FORK TERMINALS. SPLICES IN SIGNAL CABLE SHOULD BE AVOIDED BUT IF NECESSARY SPLICE KITS SHALL BE USED. ALL CONNECTIONS AT SPLICE POINTS SHALL BE SOLDERED.

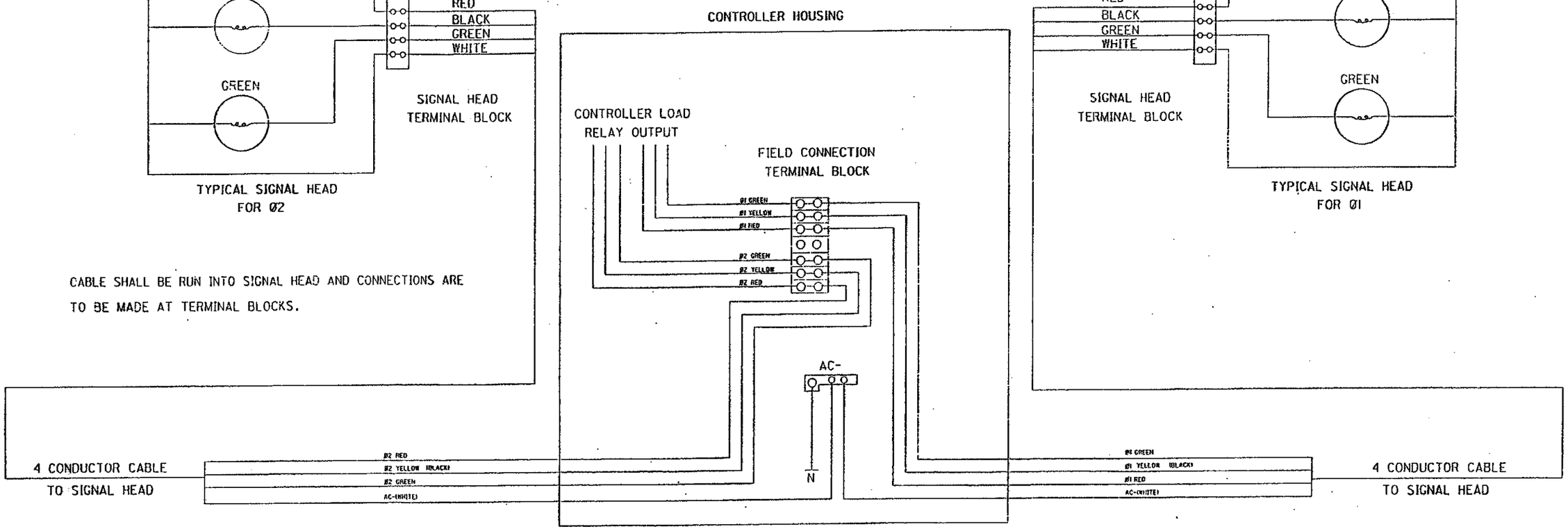


TYPICAL SIGNAL HEAD
FOR Ø2

CABLE SHALL BE RUN INTO SIGNAL HEAD AND CONNECTIONS ARE TO BE MADE AT TERMINAL BLOCKS.



TYPICAL SIGNAL HEAD
FOR Ø1



TYPICAL SIGNAL HEAD HOOK-UP

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE 09/09/88

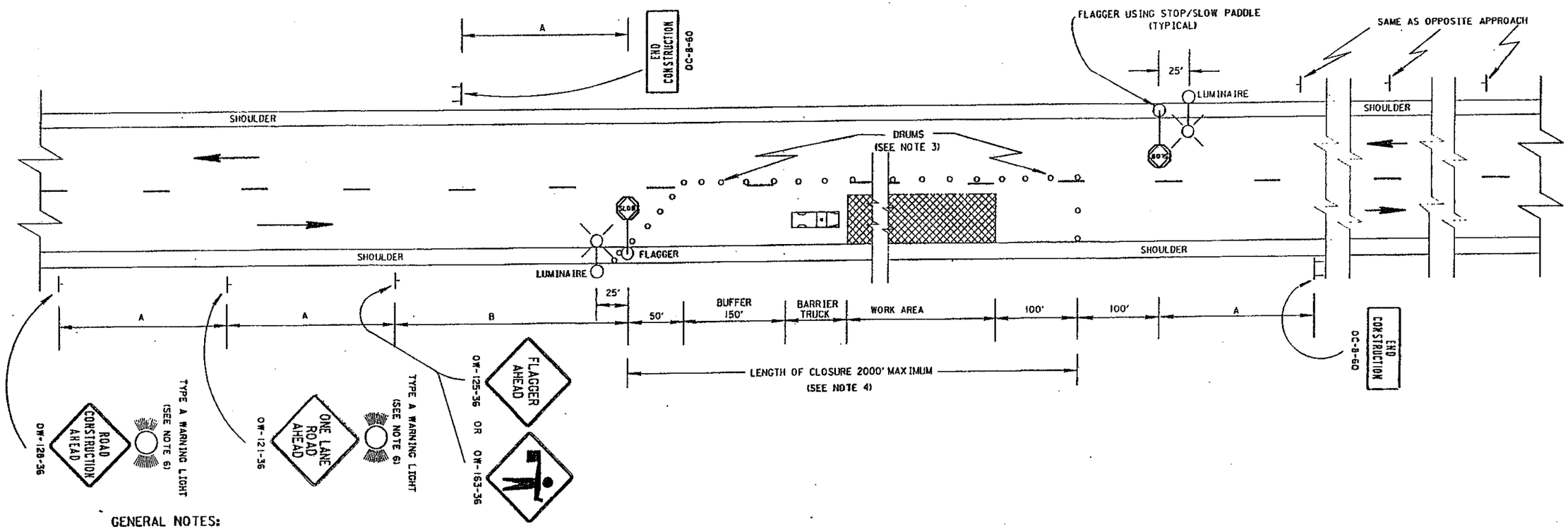
WIRING DIAGRAM FOR SIGNALIZED CLOSING I LANE OF A 2 LANE HIGHWAY

STANDARD CONSTRUCTION DRAWING MT-96.25

APPROVED: ENGR. OF DESIGN SERVICES

295.25

WC



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. THE DISTANCES SHOWN ARE MINIMUMS. DISTANCE B MAY ALSO BE INCREASED, PRIOR TO IMPLEMENTATION OF THE CLOSURE OR AFTER IT IS IN EFFECT, AS DIRECTED BY THE ENGINEER FOR SUCH OCCURENCES AS LONG TRAFFIC BACKUPS.

2. FLAGGERS. ONE FOR EACH DIRECTION SHALL BE USED TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS A ONE LANE OPERATION IS IN EFFECT. THE FLAGGERS SHALL BE ABLE TO COMMUNICATE WITH EACH OTHER AT ALL TIMES.

3. DRUMS SHALL BE SPACED AT 50' CENTER TO CENTER ALONG THE CLOSURE. DRUMS ON THE ADVANCE TAPER SHALL BE SPACED AT 10' CENTER TO CENTER. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES MAY BE SUBSTITUTED FOR DRUMS FOR DAY-TIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER.

4. SEVERAL SMALL WORK AREAS CLOSE TOGETHER SHALL BE COMBINED INTO ONE WORK ZONE. HOWEVER, THE CLOSURE SHALL NOT BE MORE THAN 2000 FEET LONG UNLESS APPROVED BY THE ENGINEER. THE MINIMUM LENGTH BETWEEN CLOSURES SHALL BE 2000 FEET. ONLY ONE SIDE OF THE ROAD SHALL BE CLOSED IN ANY ONE WORK ZONE.

5. THE BARRIER TRUCK SHOWN AT THE BEGINNING OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS BARRIER TRUCK SHALL BE REMOVED FROM THE PAVEMENT WHEN WORKERS ARE NOT IN THE WORK AREA. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE BARRIER TRUCK SHOWN WHEN APPROVED BY THE ENGINEER. THE VEHICLE SHALL BE EQUIPPED WITH A 360° ROTATION OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF ONE-QUARTER MILE.

6. THE TYPE A FLASHING WARNING LIGHTS SHOWN ON THE 'ROAD CONSTRUCTION AHEAD ' (OW-128) AND THE 'ONE LANE ROAD AHEAD ' (OW-121) SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

7. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.

8. ADEQUATE AREA ILLUMINATION OF EACH FLAGGER STATION SHALL BE PROVIDED AT NIGHT BY USING 150 WATT MINIMUM HIGH PRESSURE SODIUM LUMINAIRES OR 250 WATT MINIMUM MERCURY LUMINAIRES. LUMINAIRES SHALL BE LOCATED ADJACENT TO ONE FLAGGER STATION FOR EACH DIRECTION OF TRAFFIC AS SHOWN ABOVE. THE MOUNTING HEIGHT FOR LUMINAIRES SHALL BE A MINIMUM OF 27 FEET ABOVE THE PAVEMENT AND MOUNTED ON A SUPPORT OF ADEQUATE STRENGTH TO PROVIDE A SATISFACTORY INSTALLATION. THE OVERHEAD CONDUCTOR CLEARANCE SHALL BE A MINIMUM OF 18 FEET ABOVE THE PAVEMENT. THE LUMINAIRE ARM SHALL BE OF SUFFICIENT LENGTH TO EXTEND TO THE EDGE OF THE PAVEMENT. POLES SHALL BE ERECTED A MINIMUM OF 5.5' BEHIND FACE OF GUARDRAIL WHERE EXISTING, OR 12' FROM THE EDGE OF PAVEMENT. WHERE POSSIBLE LOCATE BEHIND DITCH. LIGHTING MATERIAL SHALL COMPLY WITH SPECIFICATION 713.

9. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND MAJOR DRIVES AS NECESSARY TO PREVENT WRONG WAY MOVEMENTS AND TO KEEP VEHICLES OFF OF NEW PAVEMENT NOT READY FOR TRAFFIC. THE METHOD OF CONTROL SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

MINIMUM DISTANCE	A	B
URBAN	200	200
RURAL	500	500

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 INCIDENTAL TO THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE 04/29/88

FLAGGERS CLOSING
1 LANE OF A 2 LANE HIGHWAY
STATIONARY OPERATION

STANDARD CONSTRUCTION DRAWING MT-97.10

APPROVED: ENGR. OF DESIGN SERVICES

TG-1

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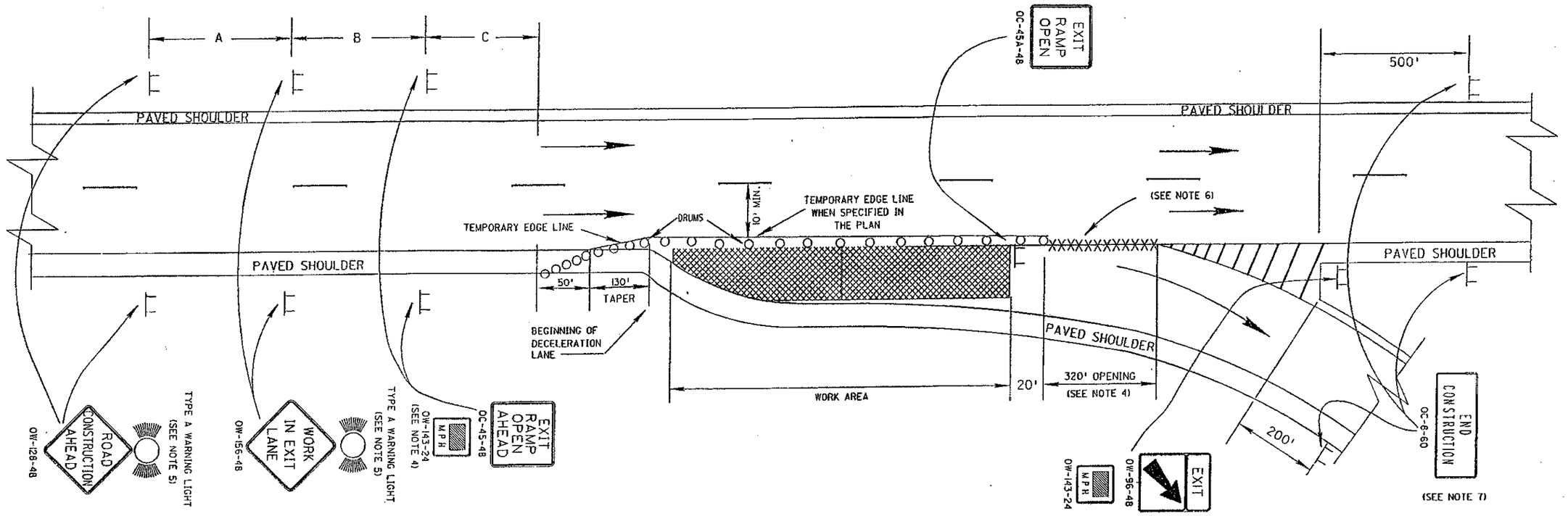

GENERAL NOTES:

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 200 FEET CLEARANCE TO EXISTING SIGNS, EXCEPT THE OW-96-48 SIGN WHICH MAY BE ADJACENT TO THE OF SIGN IN THE GORE.

3. ALONG THE CLOSURE DRUMS SHALL BE SPACED AT 20 FT. CENTER TO CENTER. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES 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 320 FT. 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
290 FT. -	50 MPH
260 FT. -	45 MPH
230 FT. -	40 MPH
200 FT. -	35 MPH

IF A 200 FT. 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 10 MPH 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 (FEET)	A	B	C
URBAN FREEWAY & EXPRESSWAY	500 TO 1000	500 TO 1000	500 TO 1000
RURAL FREEWAY & EXPRESSWAY	2600	1600	1000

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: 08/25/89, 10/20/92, 06/24/93

STANDARD CONSTRUCTION DRAWING MT-98.12

APPROVED [signature] ENGR. OF DESIGN SERVICES

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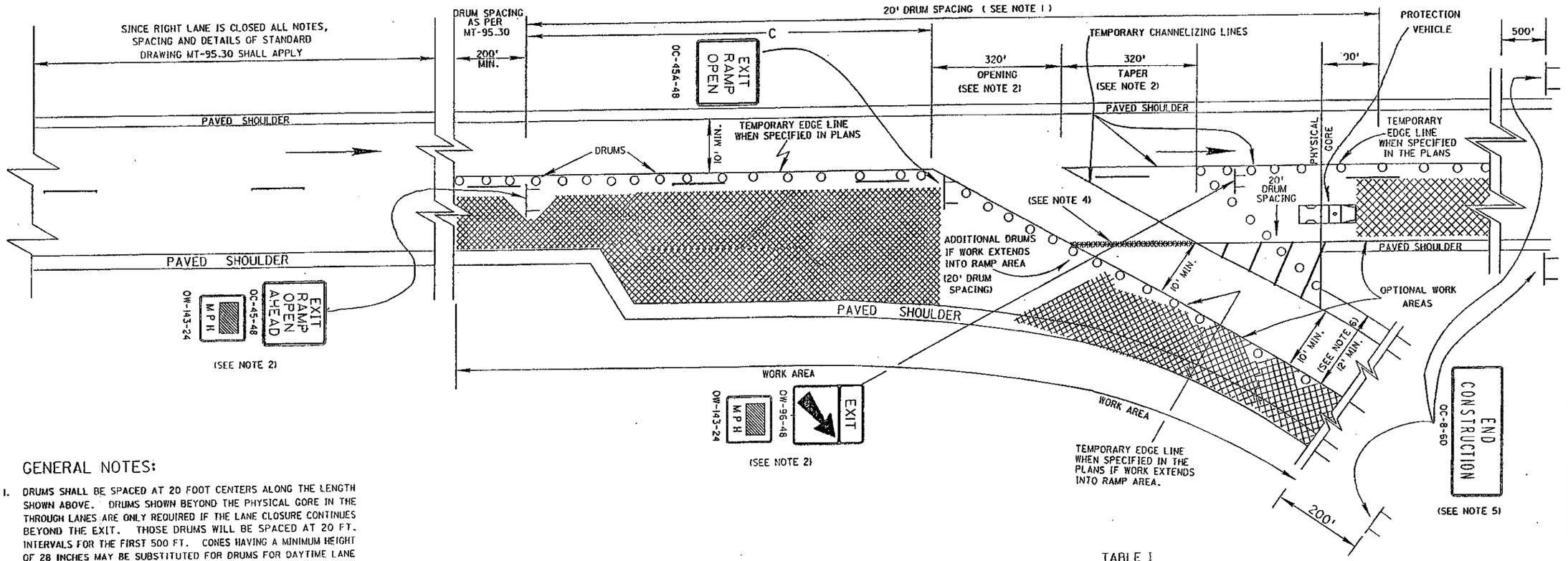

GENERAL NOTES:

1. DRUMS SHALL BE SPACED AT 20 FOOT 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 20 FT. INTERVALS FOR THE FIRST 500 FT. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES 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 320 FT. 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
290 FT.	50 MPH
260 FT.	45 MPH
230 FT.	40 MPH
200 FT.	35 MPH

IF 200 FT. 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 10 MPH 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 ONE QUARTER MILE. 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 10 FT. MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 12 FT. 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 (FEET)	
	C
URBAN FREEWAY & EXPRESSWAY	500 TO 1000
RURAL FREEWAY & EXPRESSWAY	1000

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
LANE CLOSURE BEFORE EXIT GORE	08/25/89 10/20/92 06/24/93
STANDARD CONSTRUCTION DRAWING MT-98.13	
APPROVED Doug Krieger ENGR. OF DESIGN SERVICES	

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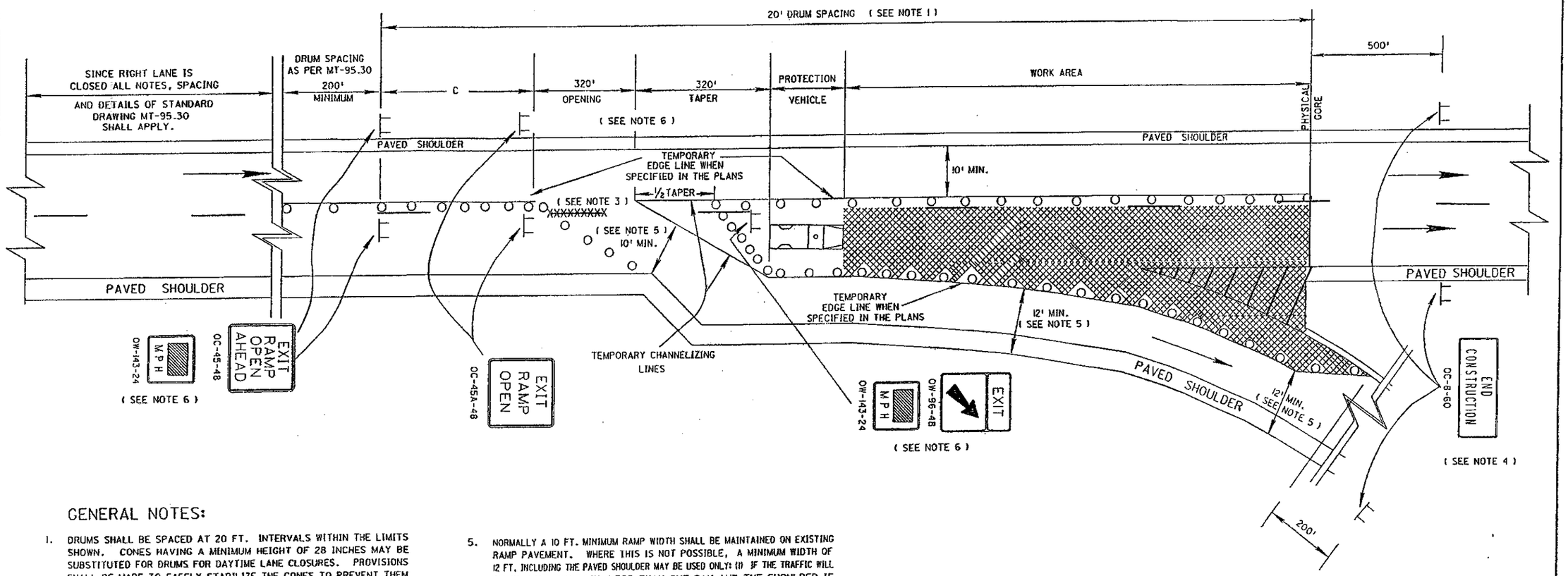

GENERAL NOTES:

1. DRUMS SHALL BE SPACED AT 20 FT. INTERVALS WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES 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 ONE QUARTER MILE. 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 10 FT. MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 12 FT. 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 320 FT. 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
290 FT.	50 MPH
260 FT.	45 MPH
230 FT.	40 MPH
200 FT.	35 MPH

IF 200 FT. 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 10 MPH 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 (FEET)	
	C
URBAN FREEWAY & EXPRESSWAY	500 TO 1000
RURAL FREEWAY & EXPRESSWAY	1000

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 EXIT GORE

DATE: 08/25/89, 10/20/92, 06/24/93

STANDARD CONSTRUCTION DRAWING MT-98.14

APPROVED Doug Berger ENGR. OF DESIGN SERVICES

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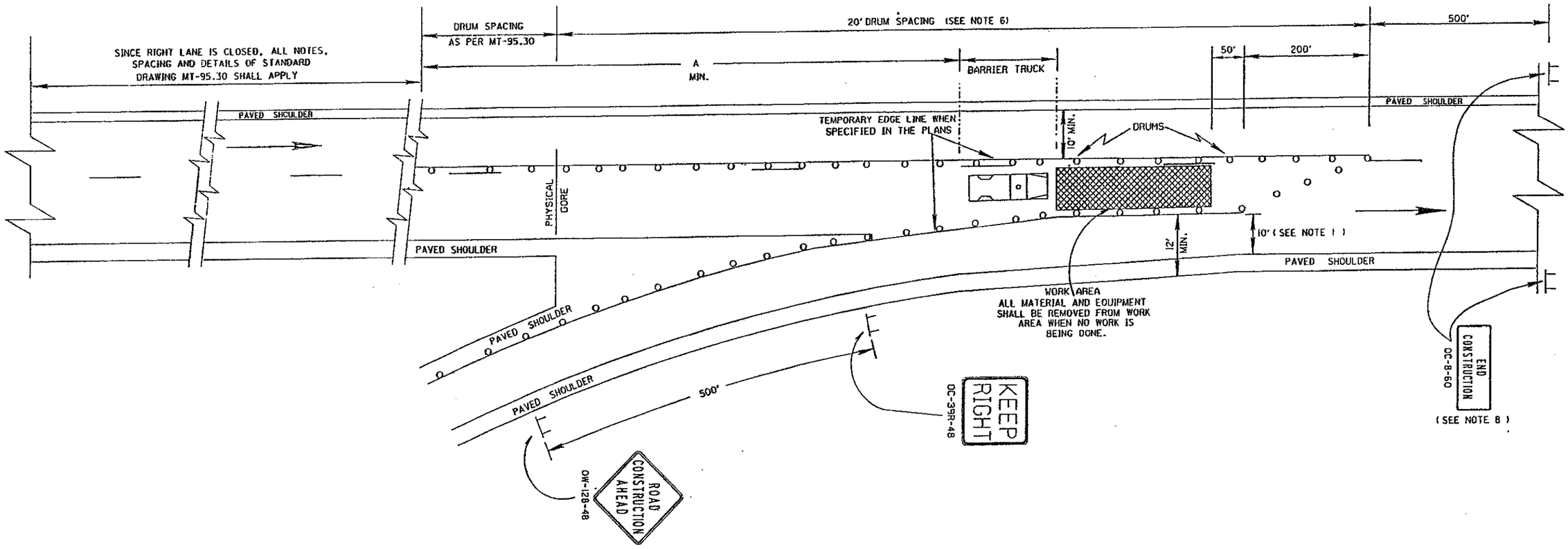

GENERAL NOTES

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 10 FEET OR MORE. WHEN THE CLEARANCE IS LESS THAN 10' FEET: (1) THE TRAFFIC CONTROL ON "LANE CLOSURE AT ENTRANCE RAMP: PLAN 'B', MT-98.16 SHOULD BE USED, OR (2) THE RAMP MAY BE CLOSED ONLY IF PERMITTED BY THE PLANS, OR (3) ALLOWING RAMP TRAFFIC TO USE THE PAVED SHOULDER SHOULDER SHOULD BE CONSIDERED ONLY IF TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD. WHEN THE RAMP IS CLOSED APPROPRIATE DETOUR SIGNS SHALL BE PROVIDED.

2. RAMP SIGNS SHALL BE DUAL MOUNTED ON MULTILANE RAMPS. WHEN THE RAMP IS NOT LONG ENOUGH TO ALLOW PLACEMENT AS SPECIFIED ABOVE, THE SIGNS MAY BE SPACED PROPORTIONATELY WITHIN THE SPACE AVAILABLE AS DETERMINED BY THE ENGINEER (A 200 FOOT MINIMUM SPACING MUST BE MAINTAINED).

3. THE BARRIER TRUCK SHOWN AT THE BEGINNING OF 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. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE BARRIER TRUCK SHOWN WHEN APPROVED BY THE ENGINEER. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF ¼ MILE.

4. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.

5. THE APPROPRIATE COLOR TEMPORARY EDGE LINE SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (947.03 TYPE-C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE AFTER COMPLETION OF THE WORK. TEMPORARY MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 621.134 AND THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED.

6. DRUMS SHALL BE SPACED AT 20' INTERVALS ON BOTH SIDES OF THE WORK AREA WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES 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.

7. 36" CONSTRUCTION SIGN SIZES MAY BE USED ON DIVIDED ROADWAYS THAT ARE NOT CLASSIFIED AS FREEWAYS OR EXPRESSWAYS.

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.

TABLE I

SPEED	A
20 - 25	60
30 - 40	160
45 - 55	330
60 - 65	390

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 08/25/89

LANE CLOSURE AT ENTRANCE RAMP: PLAN A

STANDARD CONSTRUCTION DRAWING MT-98.15

APPROVED _____ ENGR. OF DESIGN SERVICES

WC

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 IN ACCORDANCE WITH ITEM 104.02.

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 400' TO 600'.

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 ONE-QUARTER MILE.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-3IR-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 5' 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 ONE-QUARTER MILE.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. ✱ A FLASHING ARROW PANEL 54" X 30" (TYPE B) VISIBLE TO THE REAR MOUNTED A MINIMUM OF 7' 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 ONE-QUARTER MILE MOUNTED A MINIMUM OF 7' 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 54" X 30" (TYPE B) DISPLAYED TO THE REAR MOUNTED A MINIMUM OF 7' 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 7' 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 1' ABOVE THE ROAD SURFACE.
4. A KEEP RIGHT SIGN (OC-3IR-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 5' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN, AND 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 16" 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 ONE-QUARTER MILE.
2. ✱ (A) A FLASHING ARROW PANEL 54" X 30" (TYPE B) VISIBLE TO THE REAR MOUNTED AT A MINIMUM HEIGHT OF 7' 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 7' 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 4'6" ABOVE THE ROAD SURFACE AND OC-51-48 SHALL BE MOUNTED A MINIMUM OF 5'0" 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 18". THEY SHALL BE SPACED TO PROTECT THE WET LINE, NORMALLY BETWEEN 120' AND 200'. IN AREAS OF TRAFFIC CONGESTION, ON CURVES AND AT OTHER LOCATIONS WHERE TRACKING OF THE WET LINE IS EXPECTED SPACINGS AS CLOSE AS 20' 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 ONE MILE.

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 ONE-QUARTER MILE.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-3IR-48) MOUNTED A MINIMUM OF 5' 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 1000'.

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 REQUIRMENTS.

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 (28" 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 200 FEET OR LESS SHALL BE CONSIDERED AUXILIARY MARKINGS, EXCEPT 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

BUREAU OF DESIGN SERVICES
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OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE 11/14/86 04/29/88
TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS	
STANDARD CONSTRUCTION DRAWING MT-99.20	
APPROVED ENGR. OF DESIGN SERVICES	

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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 2 FT. BEHIND FACE OF CURB.

   c) UNCURBED ROADWAY-12 FT. FROM EDGE OF TRAFFIC LANE OR 6 FT. FROM EDGE OF PAVED OR USEABLE SHOULDER, WHICHEVER IS GREATER.

   d) BEHIND GUARDRAIL OR BARRIER - PREFERABLY 2 FT. BEHIND FACE OF GUARDRAIL (MINIMUM 1 FT.) FOR SIGNS ON CLASS A SUPPORTS: 4 FT. FOR CLASS B OR C SUPPORTS: 1 FT. 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 - 5 FT. WHEN PARKED CARS, CONSTRUCTION EQUIPMENT, ETC WILL NOT OBSCURE SIGN VISIBILITY.

   b) RURAL AREAS WITH PARKED CARS OR CONSTRUCTION EQUIPMENT - 7 FT.

   c) URBAN - 7 FT.

   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 400 TO 600 FT. 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 1 FT. 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 30' FROM EDGE OF PAVEMENT	WITHIN 30' 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 5.5' BEHIND FACE OF RAIL OR IF SIGN IS NOT 1' BEHIND FACE OF CONCRETE BARRIER.

** 30' CRITERION IS BASED UPON STRAIGHT ROADWAY AND A SLOPE OF 6:1 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 1 FT. 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 1 FT. DEEP BY 12" 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 POSTS WHEN INSTALLED SINGLY OR IN PAIRS (SIDE BY SIDE) ACCORDING TO THE DETAILS OF TC-41.20. THE NUMBER OF SUPPORTS SHALL BE AS SHOWN ON TC-52.10 AND TC-52.20.

2) THE FOLLOWING POST TYPES, WHEN INSTALLED SINGLY, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 42 INCHES:

   a) - UP TO 4" X 4" WOOD

   b) - UP TO 2 INCH DIAMETER SCHEDULE 40 STEEL PIPE

   c) - UP TO 3 INCH DIAMETER SCHEDULE 40 ALUMINUM PIPE

   d) - UP TO 2 1/4 INCH SQUARE, 12 GAUGE WALL, PUNCHED STEEL POST

   e) - UP TO 6" X 8" WOOD WITH BREAKAWAY HOLES SHOWN BELOW

3) THE FOLLOWING POST TYPES WHEN INSTALLED IN PAIRS (SIDE BY SIDE) WITH LESS THAN 7 FT. BETWEEN POSTS, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 42 INCHES:

   a) - UP TO 4" X 4" WOOD

   b) - UP TO 2 INCH DIAMETER SCHEDULE 40 STEEL PIPE

   c) - UP TO 3 INCH DIAMETER SCHEDULE 40 ALUMINUM PIPE

   d) - UP TO 2 INCH 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-41.10 WITH A MINIMUM CLEAR DISTANCE BETWEEN SUPPORTS OF 7 FT. 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-105.11)

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
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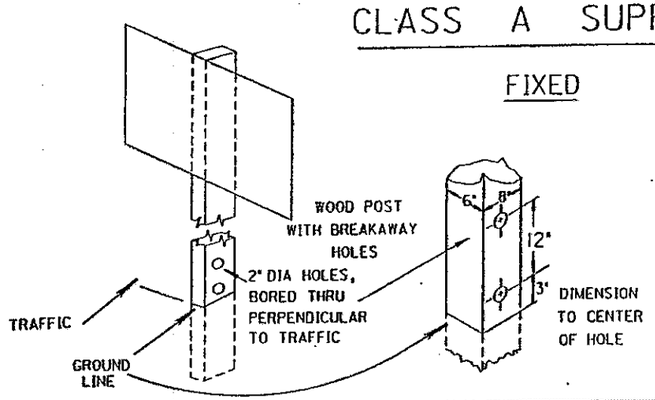
OHIO DEPARTMENT OF TRANSPORTATION

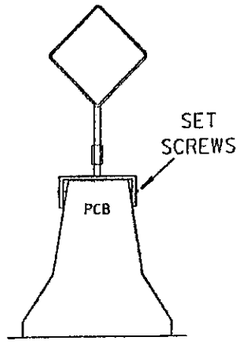
MAINTENANCE OF TRAFFIC	DATE 05/01/90 07/01/92
TEMPORARY SIGN SUPPORT	
STANDARD CONSTRUCTION DRAWING MT-105.10	
APPROVED [signature] ENGR. OF DESIGN SERVICES	

WCC

CLASS A SUPPORTS

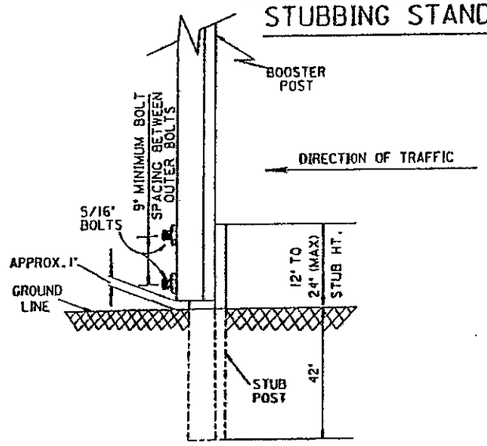
FIXED





CLASS A SUPPORTS

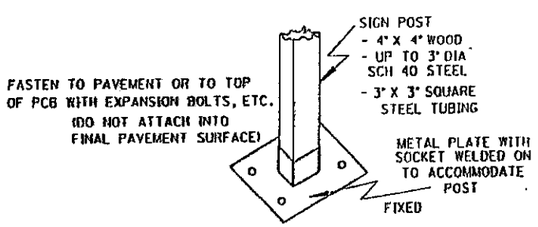
STUBBING STANDARD

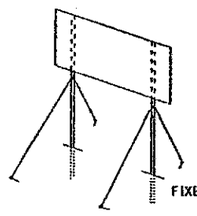


NOTES

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 LB./FT. LESS THAN STUB POST

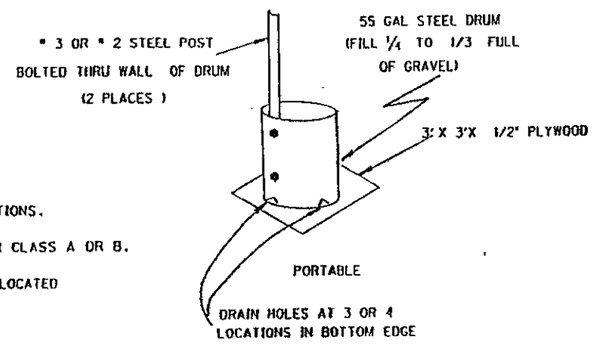
CLASS B SUPPORTS





ANY CLASS A SIGN POST WITH GUY WIRES ADDED TO INCREASE SIGN CARRYING ABILITY. (GUY WIRES SHALL NOT BE HEAVIER THAN 1/8" DIA. BRAIDED CABLE. GUY ANCHORS SHALL NOT EXTEND MORE THAN 6" ABOVE GROUND SURFACE).

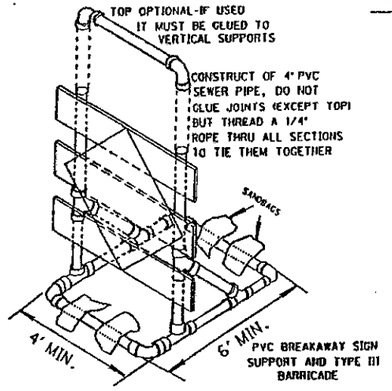
CLASS C SUPPORTS

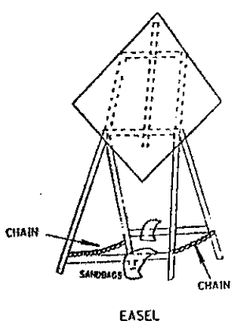


1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

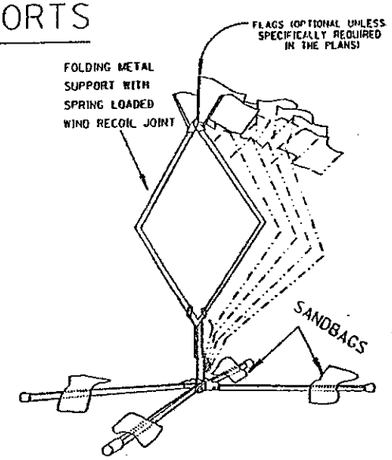
CLASS A SUPPORTS

PORTABLE





EASEL



NOTES

RAIL MATERIALS:
1" X 8" OR 2" X 8" COMMON LUMBER
8" X (5/8" TO 1") THICK EXTERIOR PLYWOOD
EXTRUDED PLASTIC OR FORMED SHEET METAL WITH AN 8" WIDE SURFACE AND OF SUFFICENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 30 POUNDS PER SQUARE FOOT, BUT HAVING A WEIGHT OF NOT MORE THAN 5.0 POUNDS PER FOOT.

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BUREAU OF DESIGN SERVICES
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MAINTENANCE OF TRAFFIC	DATE 05/07/90 07/01/92
TEMPORARY SIGN SUPPORT	
STANDARD CONSTRUCTION DRAWING MT-105.11	

APPROVED Troy Mungo ENGR. OF DESIGN SERVICES

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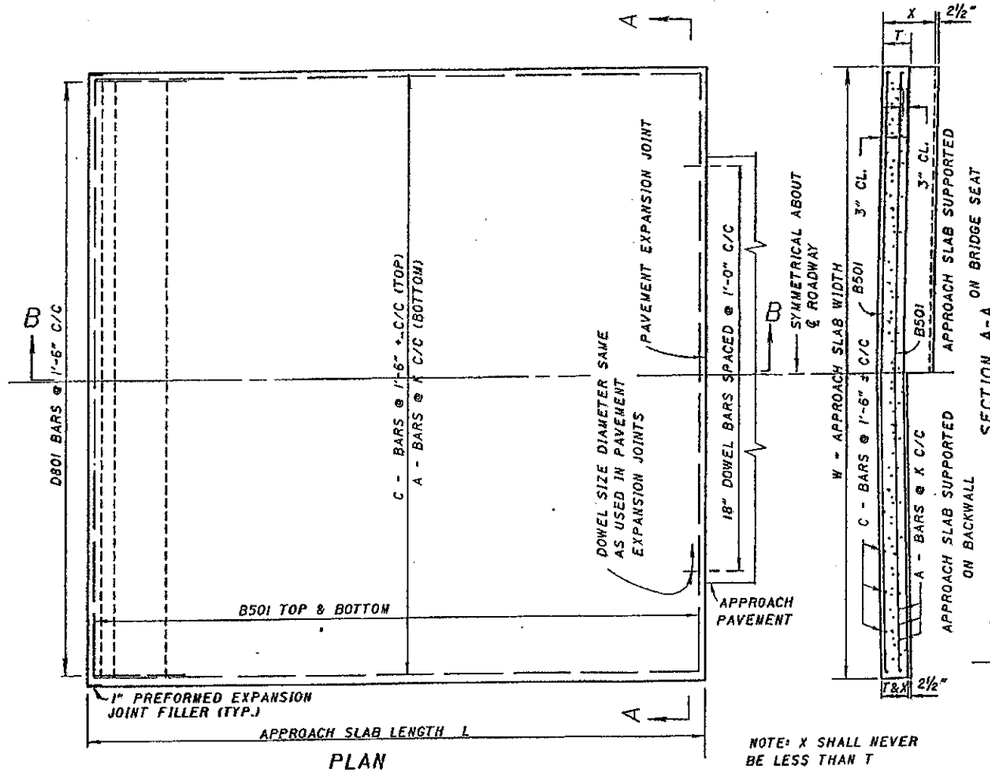
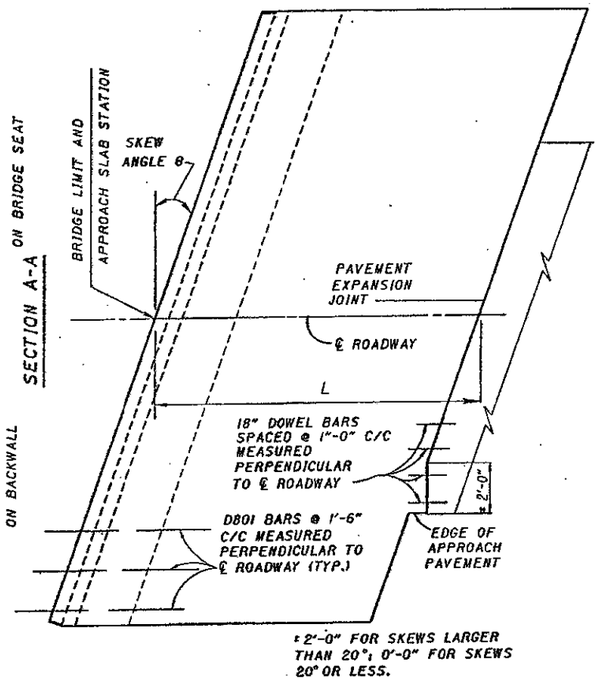


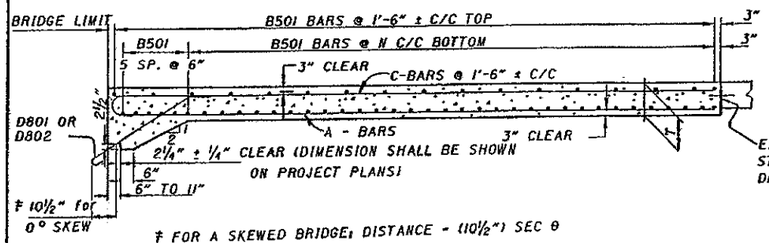
PLAN

SECTION A-A

NOTE: X SHALL NEVER BE LESS THAN T



≠ 2'-0" FOR SKEWS LARGER THAN 20°; 0'-0" FOR SKEWS 20° OR LESS.



≠ FOR A SKEWED BRIDGE: DISTANCE = (10½") SEC θ

SECTION B-B

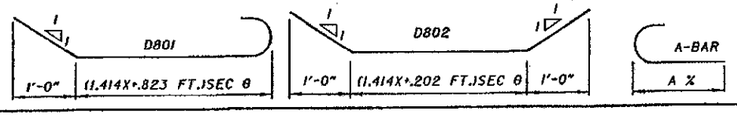
APPROACH SLAB FOR SKEWED STRUCTURE

REINFORCING STEEL (FOR ONE APPROACH SLAB)

LENGTH L	THICKNESS T	A-BARS SP'C'G K	A-BARS MARK	A-BARS LENGTH	A-BARS DIMENSION A	A-BARS NO. REQ'D.	B501 (BOTTOM) * LENGTH	B501 (BOTTOM) SP'C'G N	B501 (BOTTOM) NO. REQ'D.	B501 (TOP) * LENGTH	B501 (TOP) NO. REQ'D.	C-BARS MARK	C-BARS LENGTH	C-BARS NO. REQ'D.	D801 OR D802 NO. REQ'D.
15'-0"	12"	10"	A1001	15'-11"	14'-6"	1 + (W-0.5)/K/12	(W-0.5)sec θ	9"	22	(W-0.5)sec θ	11	C501	14'-6"	1 + (W-0.5)/18/12	1 + (W-0.5)/18/12
20'-0"	13"	7½"	A1002	20'-11"	19'-6"			8"	31		14	C502	19'-6"		
25'-0"	15"	7"	A1003	25'-11"	24'-6"			8"	39		18	C503	24'-6"		
30'-0"	17"	6½"	A1004	30'-11"	29'-6"			8½"	44		21	C504	29'-6"		

* AT THE OPTION OF THE CONTRACTOR, B501 BARS MAY BE LAPPED 20 INCHES MINIMUM AT THE CENTERLINE OF ROADWAY, OR WHERE REQUIRED FOR LONGITUDINAL CONSTRUCTION JOINTS.

W = APPROACH SLAB WIDTH, OUT TO OUT, IN FEET
θ = ANGLE OF SKEW
K = A-BAR SPACING IN INCHES
N = B-BAR SPACING IN INCHES
X = APPROACH SLAB THICKNESS AT ABUTMENT END IN FEET
℄ = OUT TO OUT



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: HS-20-44 AND THE ALTERNATE MILITARY LOADING.

CONCRETE CLASS C : COMPRESSIVE STRENGTH 4000 P.S.I

REINFORCING STEEL: ASTM A615, A616 OR A617-GRADE 60; MINIMUM YIELD STRENGTH OF 6000 P.S.I. 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 YARDS 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 YARDS 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 UNIFORMILY 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 10 FEET 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 10 FEET 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. YD. FOR THE APPROACH SLAB.

GENERAL: THIS DRAWING PROVIDES DESIGN AND GENERAL CONSTRUCTION DETAILS. THE PROJECT PLANS WILL SHOW LENGTH, SKEW, CURBS (IF ANY), ESTIMATED QUANTITY (SQUARE YARDS), 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 D801 OR D802 SHALL BE DETAILED FOR A SPECIFIC BRIDGE AND SHALL BE INCLUDED WITH ITEM 509 UNDER ABUTMENTS OR SUPERSTRUCTURE FOR PAYMENT. D801 BARS CANNOT BE USED AS SHOWN WHERE APPROACH SLABS ARE SUPPORTED ON BACKWALLS LESS THAN 14 INCHES THICK. D802 BARS SHALL BE USED ON PRESTRESSED CONCRETE BOX BEAM BRIDGES WHERE THE APPROACH SLAB IS SUPPORTED ON AN 11 INCHES THICK BACKWALL.

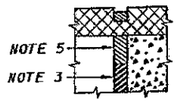
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Robert B. Pavlin
ENGINEER OF BRIDGES
11-22-91
DATE

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

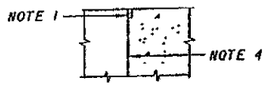
REVISED LWW
CHECKED JAM
DESIGNED JFF
DRAWN JFF
REVISIONS 9-15-94
AS-1-81

STANDARD
REINFORCED CONCRETE APPROACH SLAB

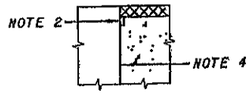
1 / 3



DETAIL A



DETAIL B



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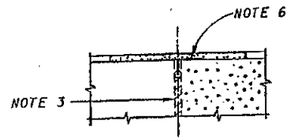
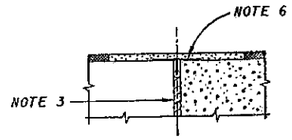
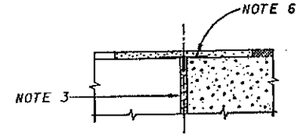


DETAIL D

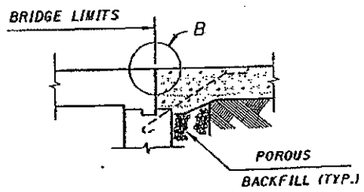


DETAIL E



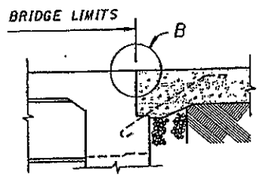
DETAIL F

CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB



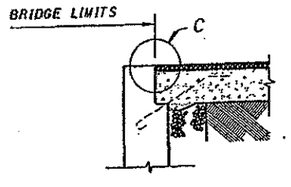
ON SLAB BRIDGES

CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB



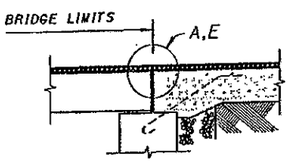
ON BRIDGES WITH INTEGRAL CONSTRUCTION

CONCRETE WEARING SURFACE ON BRIDGE DECK ONLY

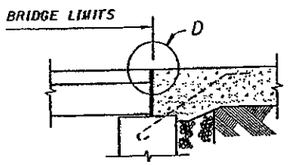


APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

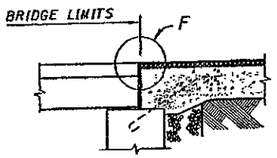
ASPHALT CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB



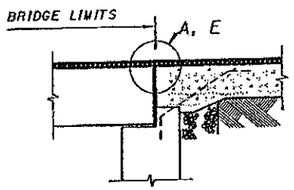
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



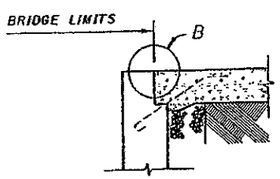
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



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 (1¼" FOR ½" JOINT) DEPRESSED ⅛" BELOW ROADWAY, PLACED IN ½" x 2¼" GROOVE.

NOTE 2 : PREFORMED ELASTOMERIC JOINT SEALER 705.11 (1¼" FOR ½" JOINT) PLACED IN ½" x 2⅛" GROOVE.

NOTE 3 : 1" 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.

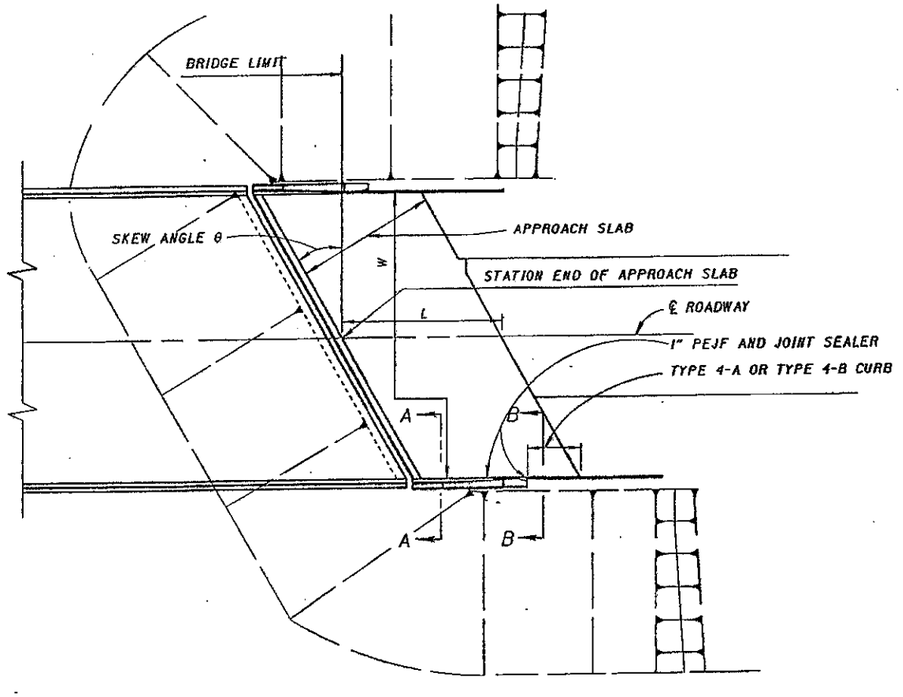
FOR STRUCTURES HAVING ASPHALT CONCRETE WEARING SURFACE ON BOTH BRIDGE DECK AND APPROACH SLABS AND WHERE NO DECK EXPANSION DEVICES ARE PROVIDED, THE DECK MEMBRANE WATERPROOFING SHALL EXTEND BEYOND THE BRIDGE LIMITS A DISTANCE OF 2'-0".

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Robert B. Pfahler
ENGINEER OF BRIDGES
11-27-81
DATE

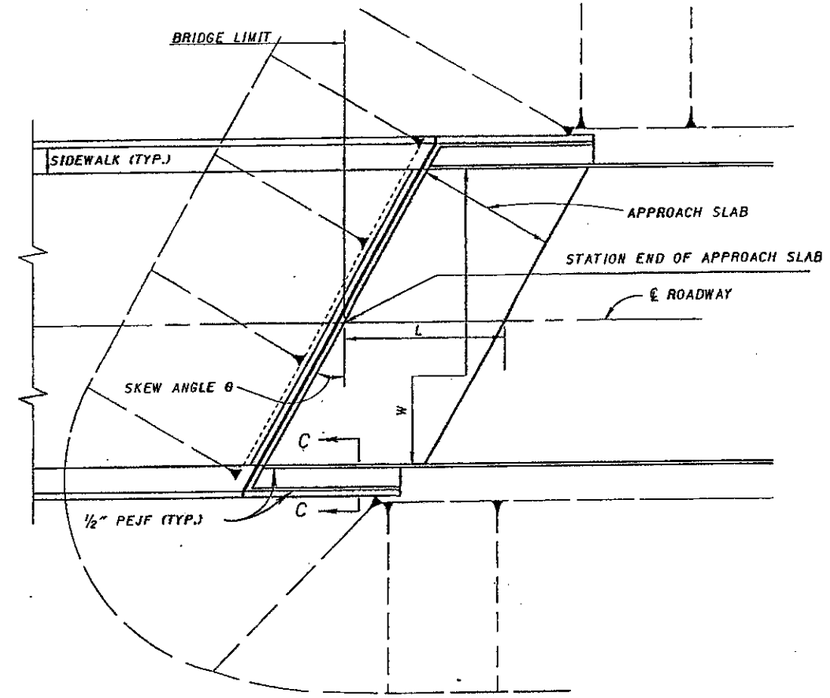
REVISIONS	DESIGNED	CHECKED	REVIEWED
9-15-94	JFF	JAM	LHW
	DRAWN JFF	AS-1-81	

STANDARD
REINFORCED CONCRETE
APPROACH SLAB



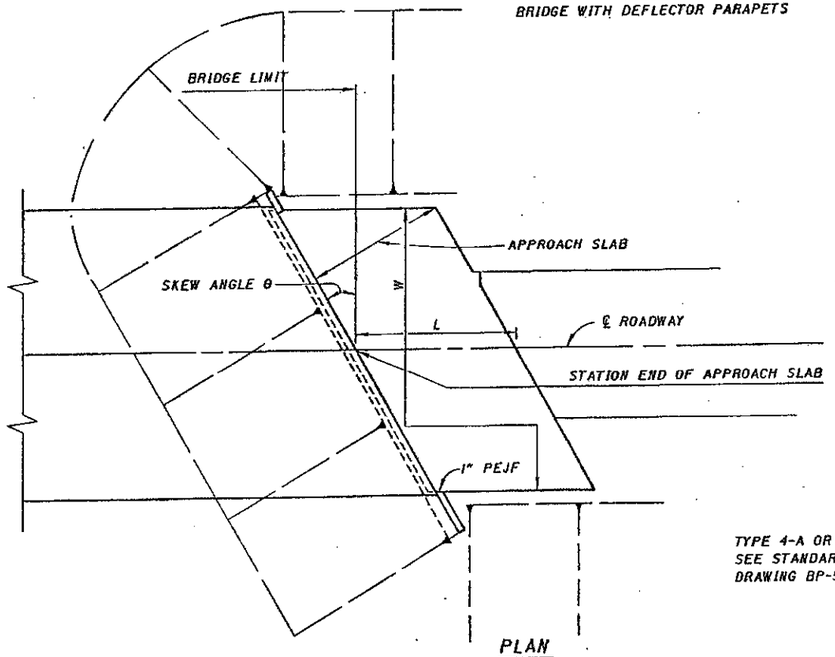
PLAN

BRIDGE WITH DEFLECTOR PARAPETS



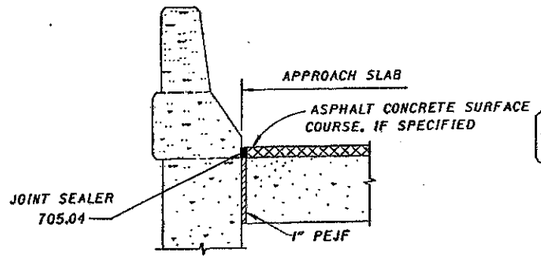
PLAN

BRIDGE WITH SIDEWALKS

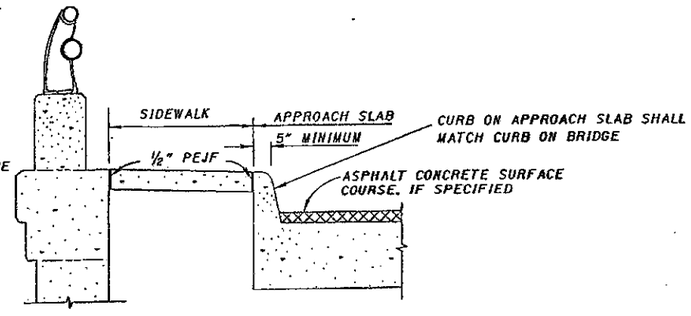


PLAN

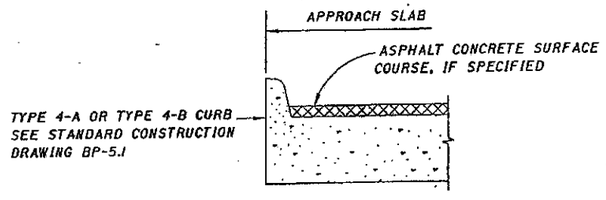
BRIDGE WITHOUT CURBS



SECTION A-A



SECTION C-C



SECTION B-B

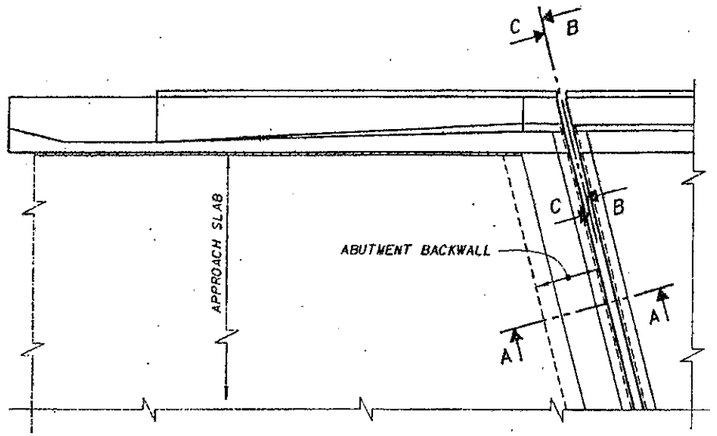
DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Robert L Phillis
ENGINEER OF BRIDGES
11-22-81
DATE

REVISED LMW
CHECKED JAM
DESIGNED JFF
DRAWN JFF
AS-1-81
REVISIONS 9-15-94

STANDARD
REINFORCED CONCRETE APPROACH SLAB

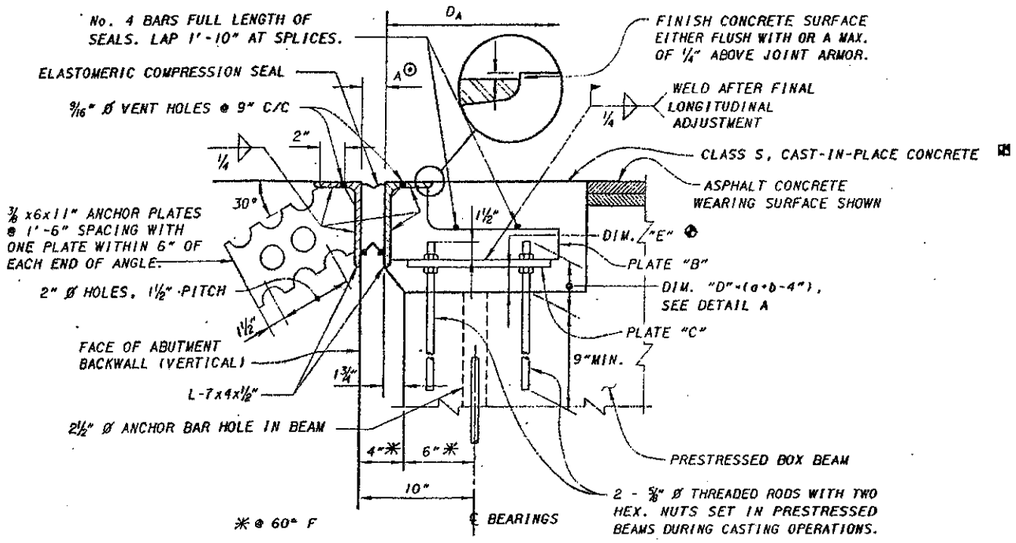
3 / 3



PART PLAN AT ABUTMENT

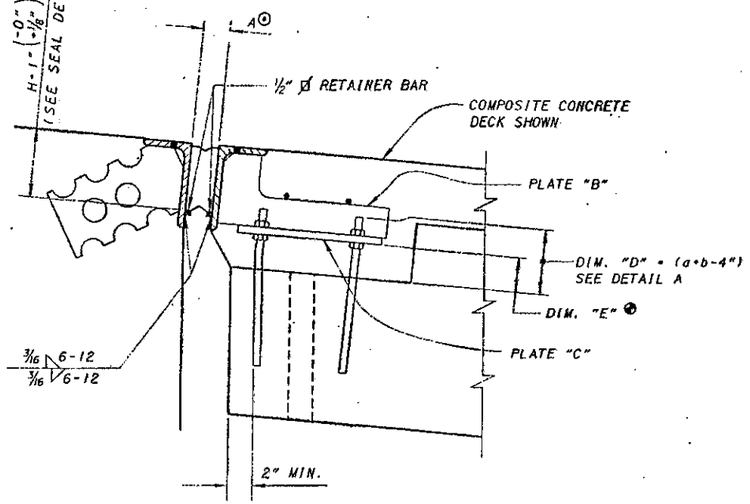
FOR BRIDGES WITH DEFLECTOR PARAPET RAILING

SEE SHEET 3/4 FOR SECTIONS B-B AND C-C, GENERAL NOTES AND NOTES TO THE DESIGNER.



SECTION A-A

WITH ROADWAY GRADIENT OF 2% OR LESS SHOWN



SECTION A-A

WITH ROADWAY GRADIENT GREATER THAN 2%

TRANSVERSE JOINTS IN ABUTMENT ARMOR ANGLES SHALL BE CLOSELY BUTTED WITH A MINIMUM OF 6'-0" BETWEEN JOINTS. SUPERSTRUCTURE ARMOR ANGLES SHALL BE CONTINUOUS FULL LENGTH OF JOINT WITH A FULL PENETRATION BUTT WELD AT EACH ARMOR ANGLE SPLICE. BUTT WELD METAL IN CONTACT WITH COMPRESSION SEAL AND RETAINER BAR SHALL BE GROUND FLUSH.

❷ IF DIM. "E" IS LESS THAN 3" A BED OF NON-SHRINKING GROUT SHALL BE PLACED AND COMPACTED UNDER EACH PLATE "C" AFTER FINAL VERTICAL ADJUSTMENT.

CONSTRUCTION PROCEDURE

1. PLACE BACKWALL CONCRETE DURING STABLE OR RISING AMBIENT TEMPERATURES AND CONCLUDE PLACEMENT AT OR IMMEDIATELY BEFORE THE DAY'S PEAK AMBIENT TEMPERATURE.

⊙ 2. NOT MORE THAN FOUR HOURS PRIOR TO THE DAY'S PEAK AMBIENT TEMPERATURE, SET ABUTMENT EXPANSION JOINT WIDTH TO DIMENSION "A" WHICH SHALL BE DETERMINED AS FOLLOWS:

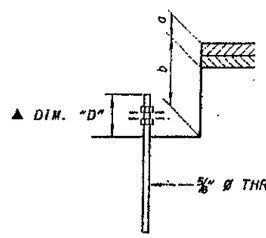
$A = 2\frac{1}{4}" + D_{TA}$, WHERE

A = JOINT WIDTH (INCHES) MEASURED NORMAL TO JOINT.

D_{TA} = AJUSTMENT (INCHES) FOR A PEAK AMBIENT TEMPERATURE OTHER THAN 60° F (SEE CHART).

3. LOOSEN ANY TEMPORARY END DAM BOLTS AFTER INITIAL SET OF CONCRETE, PREFERABLY NOT LATER THAN TWO HOURS AFTER CONCLUSION OF CONCRETE PLACEMENT.

⊠ 4. SURFACE TEXTURE ON DECK JOINTS MAY BE PARALLEL WITH THE JOINT FOR SKEWED BRIDGES WITH ASPHALT CONCRETE WEARING SURFACE.

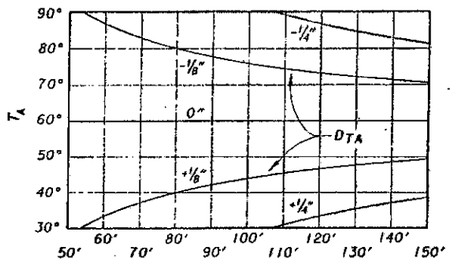


DETAIL A

a = ASPHALT CONCRETE WEARING SURFACE THICKNESS (OR COMPOSITE SLAB THICKNESS) AT NOTCH

b = 5" NOTCH FOR 17" BEAMS OR 7" NOTCH FOR 21" THRU 42" BEAMS.

▲ DIMENSION "D" SHALL BE SHOWN ON PROJECT PLANS.



$D_M = D_A \cos \Theta$

T_A = ANTICIPATED PEAK AMBIENT TEMPERATURE (°F).

D_A = ACTUAL DISTANCE TO THE THERMAL NEUTRAL EXPANSION POINT OF SUPERSTRUCTURE ALONG CENTER LINE OF ROADWAY. SEE SECTION A-A ON THIS SHEET. THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE IS THAT POINT WHICH HAS ZERO HORIZONTAL MOVEMENT DURING TEMPERATURE CHANGES (INCHES).

D_M = MODIFIED DISTANCE FOR DETERMINING JOINT ADJUSTMENT (FEET).

Θ = SKEW ANGLE OF EXPANSION JOINT.

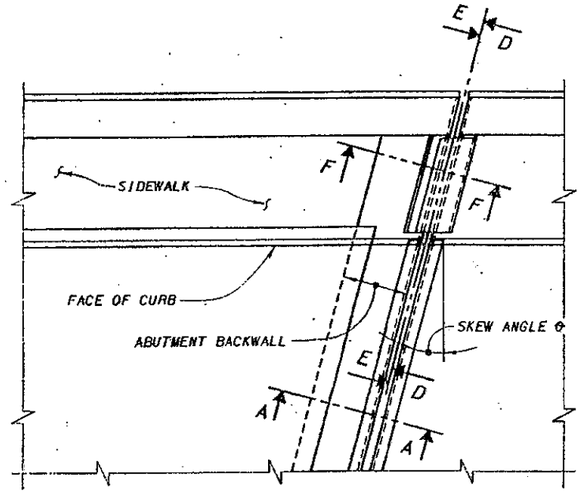
DIMENSION "A" ADJUSTMENT D_{TA}

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES — DATE 11-15-82

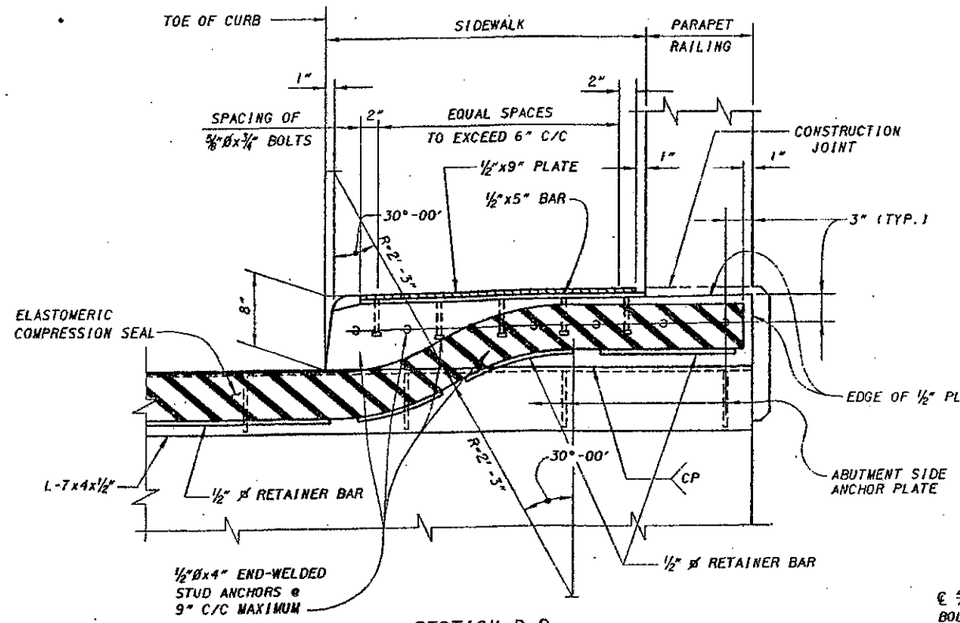
REVISIONS	DESIGNED	CHECKED	REVISED
8-1-84	RLD/AJH	JS/NPB	WTL/RLD
2-14-97	DRAWN AJH		EXJ-3-82

STANDARD
COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES



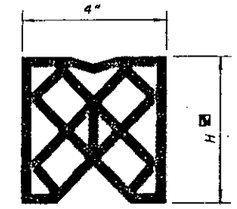
PART PLAN AT ABUTMENT

FOR BRIDGES WITH SIDEWALK PARAPET RAILING



SECTION D-D

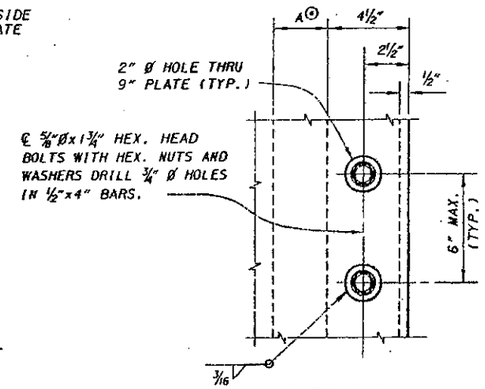
SEE SECTION E-E FOR OTHER DETAILS NOT SHOWN



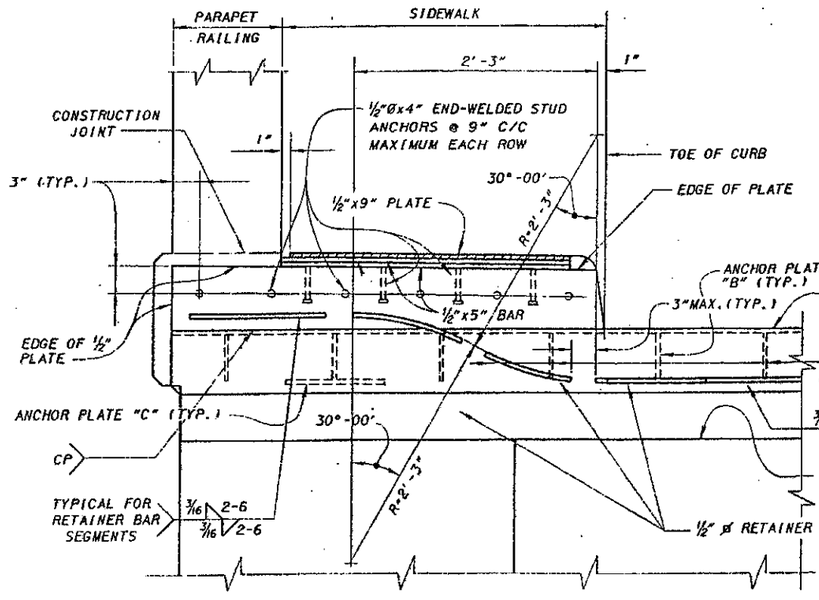
COMPRESSION SEAL DETAIL

D. S. BROWN'S CV4000, WATSON-BOWMAN, ACME'S WJ400, OR AN APPROVED ALTERNATE.

☒ SEE THE MANUFACTURER'S CATALOGUE FOR THE SEAL ACTUALLY CHOSEN FOR USE.



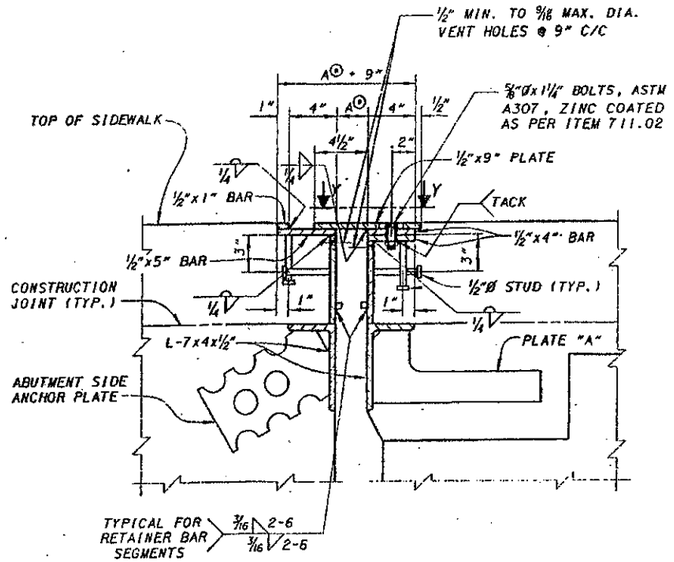
VIEW Y-Y



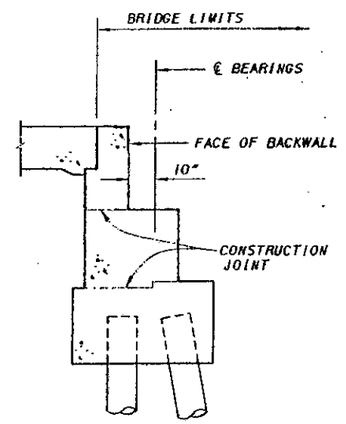
SECTION E-E

SEAL NOT SHOWN

LEGEND:
R = RADIUS



SECTION F-F



ABUTMENT TYPICAL SECTION

SEE SHEET 1 / 4 FOR CONSTRUCTION PROCEDURE, SECTION A-A AND ADDITIONAL DETAILS.

SEE SHEET 3 / 4 FOR GENERAL NOTES AND NOTES TO DESIGNER.

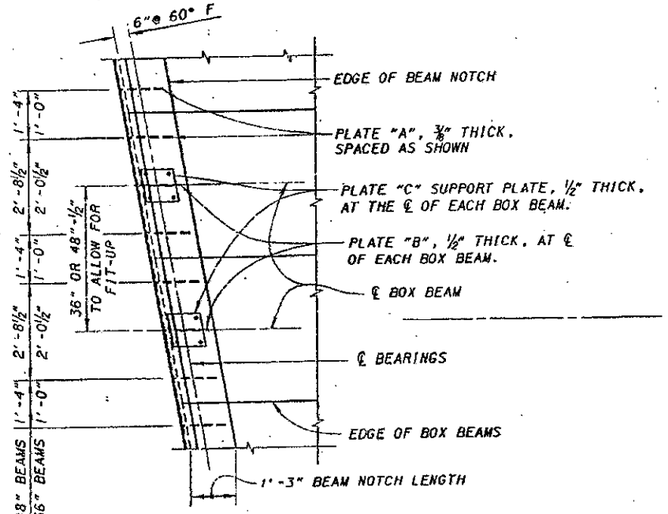
DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Michael T. Fuller
ENGINEER OF BRIDGES
11-15-82
DATE

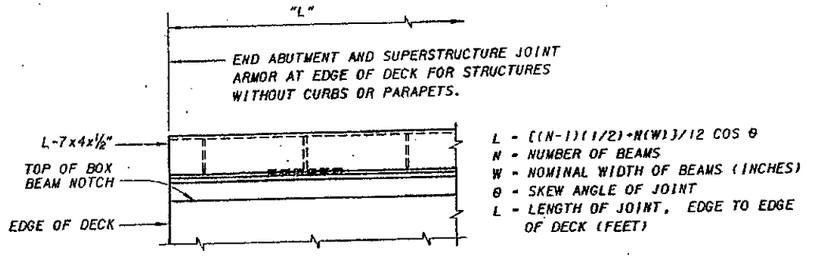
REVISIONS	DESIGNED	CHECKED	REVISED
8-1-84	RLD/AJM	JS/WPB	WTL/RLD
2-14-97	DRAWN AJM		EXJ-3-82

STANDARD
COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES

2 / 4



JOINT PLAN - SUPERSTRUCTURE SIDE



PART ELEVATION FOR FULL WIDTH STRUCTURES

NOTE: WHERE THE TOTAL WIDTH OUT TO OUT OF BOX BEAMS IS EQUAL TO THE BRIDGE ROADWAY WIDTH, JOINT ARMOR SHALL BE OF SUFFICIENT LENGHT TO ALLOW FIT-UP OF BEAMS. SEE FORMULA FOR LENGTH "L".

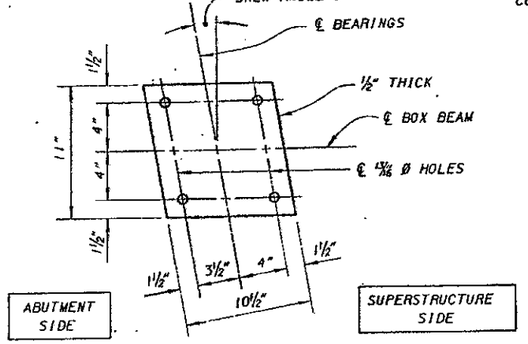
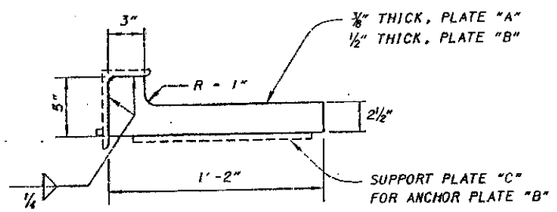
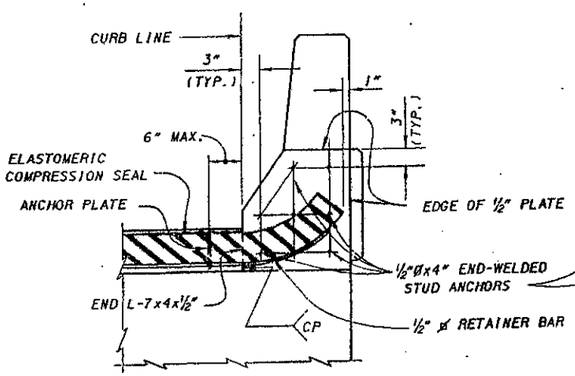


PLATE "C" PLAN



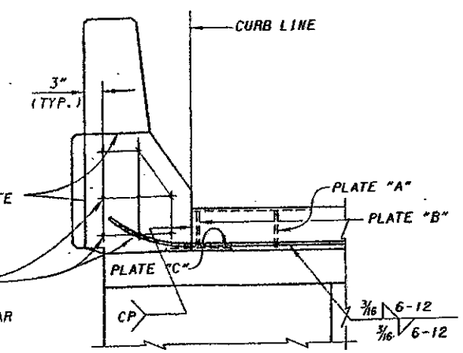
ARMOR ANCHOR PLATES

NOTE: FOR JOINT ARMOR ANCHOR SPACING, A FIT-UP ALLOWANCE OF ½" PER BOX BEAM SHALL BE MADE.



SECTION B-B

(FOR LOCATION SEE SHEET 1/4).



SECTION C-C

SEE SECTION B-B FOR ADDITIONAL DETAILS
(FOR LOCATION SEE SHEET 1/4).

NOTES TO DESIGNER

DESIGN LIMITS: GENERALLY, θ NOT GREATER THAN 15°; D_W (SEE CHART ON SHEET 1/4). NOT LONGER THAN 120 FEET. THIS DESIGN IS INTENDED FOR STRUCTURES WITH A FREE STANDING ABUTMENT SIMILAR TO THE ABUTMENT DETAIL SHOWN ON SHEET 2/4.

ANCHOR BAR HOLES IN ABUTMENT SEATS SHALL BE 2½ INCH DIA. UNLESS OTHERWISE SHOWN ON PROJECT PLANS.

BEAM ENDS FOR STRUCTURES ON GRADES OVER 2% SHALL BE MADE VERTICAL.

COMPRESSION SEAL AT THE FIXED ABUTMENT SHALL BE AS SHOWN WHERE DIM. "A" = 2¼" AT ANY AMBIENT TEMPERATURE.

GENERAL NOTES

COMPRESSION SEAL: MATERIAL REQUIREMENTS FOR THE COMPRESSION SEAL SHALL CONFORM TO ITEM 705.11. INSTALLATION SHALL FOLLOW THE MANUFACTURER'S RECOMMENDATIONS AND SHALL BE SUPERVISED BY HIM OR HIS DESIGNATED REPRESENTATIVE. THE LUBRICANT ADHESIVE USED SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

ARMOR STEEL COATING: ALL STEEL PARTS OF THE JOINT ASSEMBLY SHALL BE ASTM A709, GRADE 36. THE FINISHED STEEL ASSEMBLY SHALL BE METALIZED. THE THICKNESS OF THE COATING SHALL BE 6 TO 8 MILS. THE WIRE USED FOR THE METALIZING SHALL CONSIST OF 85% ZINC AND 15% ALUMINUM. SURFACE PREPARATION AND APPLICATION SHALL CONFORM TO SSPC COATING SYSTEM GUIDE NO. 23.00, "GUIDE FOR THERMAL SPRAY METALLIC COATING SYSTEMS". AN OPAQUE SEAL COAT MEETING SECTION 7.2, SEALERS AND TOPCOATS; SHALL BE APPLIED TO METALIZED SURFACES THAT WILL BE IN CONTACT WITH THE CONCRETE.

REPAIRS SHALL BE MADE PRIOR TO THE INSTALLATION OF THE SEAL. METALIZED SURFACES DAMAGED DURING FABRICATION SHALL BE REPAIRED BY REBLASTING AND METALIZING AS PER SSPC GUIDE 23.00. METALIZED SURFACES DAMAGED DURING SHIPMENT OR FIELD WELDING SHALL BE REPAIRED AS PER ASTM A 780-93a, ANNEX A1, REPAIR USING ZINC BASED ALLOYS. THIS FIELD PROCESS REQUIRES REMOVAL OF CONTAMINATES FROM THE SURFACE, PREHEATING THE SURFACE TO 600° F AND APPLICATION OF ZINC COATING BY EITHER RUBBING A PURE ZINC STICK OR SPRINKLING ZINC POWDER ON THE PREHEATED SURFACE. THE ZINC COATING THICKNESS SHALL BE THE SAME AS THAT SPECIFIED FOR THE METALIZING.

NON-SHRINKING MORTAR OR GROUT SHALL CONFORM WITH CORPS OF ENGINEERS SPECIFICATION CRD-C621-89A AND BE APPROVED BY THE ODOT LABORATORY.

BATCH SIZE SHALL BE LIMITED SO PLACEMENT CAN BE COMPLETED WITHIN 30 MINUTES. WATER SHALL NOT BE ADDED TO INCREASE FLOWABILITY WHICH HAS BEEN DECREASED BY DELAYED USE OF MORTAR.

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.

SPLICE OR JOINT IN COMPRESSION SEAL: COMPRESSION SEALS FOR BRIDGE DECK JOINTS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE UNLESS A SHOP FABRICATED SPLICE OR FIELD SPLICE IS APPROVED BY THE DIRECTOR.

MEASUREMENT FOR PAY PURPOSES SHALL BE BASED ON LINEAR FEET OF SEALED JOINT SYSTEM, MEASURED HORIZONTALLY ALONG THE JOINT CENTERLINE AND BETWEEN THE OUTER LIMITS OF THE FABRICATED JOINT, FURNISHED AND PLACED. THIS PAY ITEM SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE JOINT IN PLACE, WHICH INCLUDES: THE JOINT ARMOR, ELASTOMERIC COMPRESSION SEAL, RETAINERS, ANCHORING DEVICES AND TEMPORARY SUPPORTS. THE ⅝" THREADED RODS CAST INTO BEAMS, ALONG WITH NUTS SHALL BE INCLUDED WITH BOX BEAMS FOR PAYMENT. PAYMENT WILL BE MADE PER LINEAR FOOT FOR ITEM 516, "STRUCTURAL EXPANSION JOINTS, INCLUDING ELASTOMERIC COMPRESSION SEAL".

PRESTRESSED CONCRETE BOX BEAMS SHALL BE MODIFIED AS FOLLOWS COMPRESSION SEAL INSTALLATION:

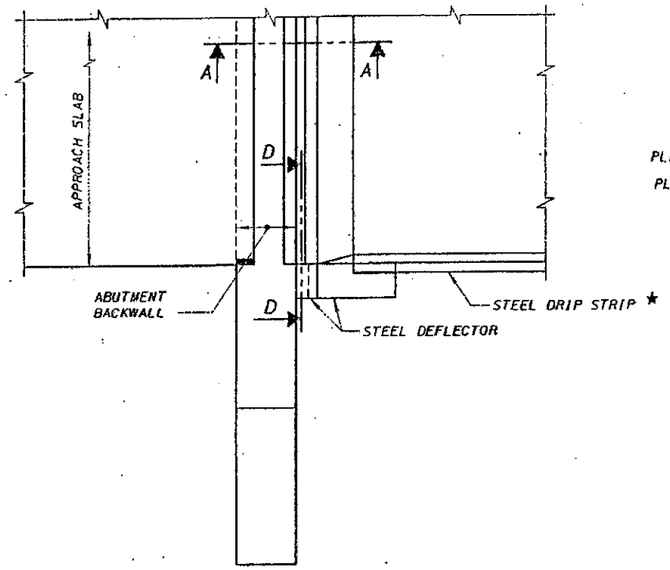
1. STIRRUP REINFORCING STEEL IN NOTCHED AREAS AT ENDS OF COMPOSITE BEAMS SHALL NOT PROJECT ABOVE THE TOP OF CONCRETE.
2. ENDS OF FASCIA BEAMS SHALL BE NOTCHED FULL WIDTH OF BEAMS.
3. 12 INCH DEEP BEAMS REQUIRE A SPECIAL DESIGN.
4. HOLES FOR ANCHOR BARS SHALL BE 2½" DIAMETER.

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Michael P. Hayden 11-15-82
ENGINEER OF BRIDGES DATE

REVISIONS	DESIGNED	CHECKED	REVIEWED
8-1-84	ALD/AJM	JS/MPB	WTL/RLD
2-14-97	DRAWN AJM		EXJ-3-82

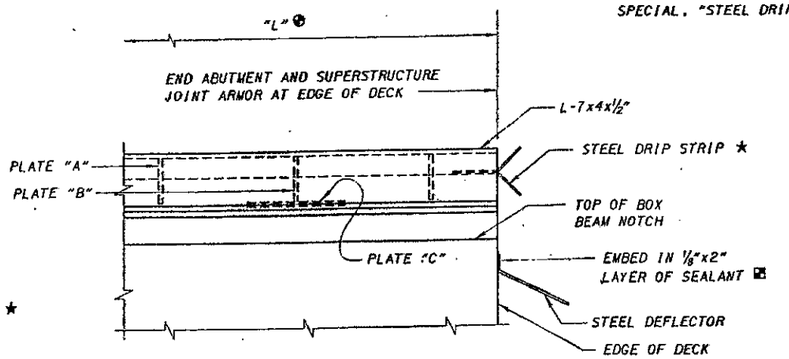
STANDARD
COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES



PART PLAN AT ABUTMENT
FOR FULL WIDTH STRUCTURES

(SEE SHEET 1 / 4 FOR SECTION A-A)

★ THE STEEL DRIP STRIP ON THE EDGE OF THE FASCIA BEAM SHALL BE PAID FOR UNDER A SEPARATE PAY ITEM, ITEM SPECIAL, "STEEL DRIP STRIP".



SECTION D-D

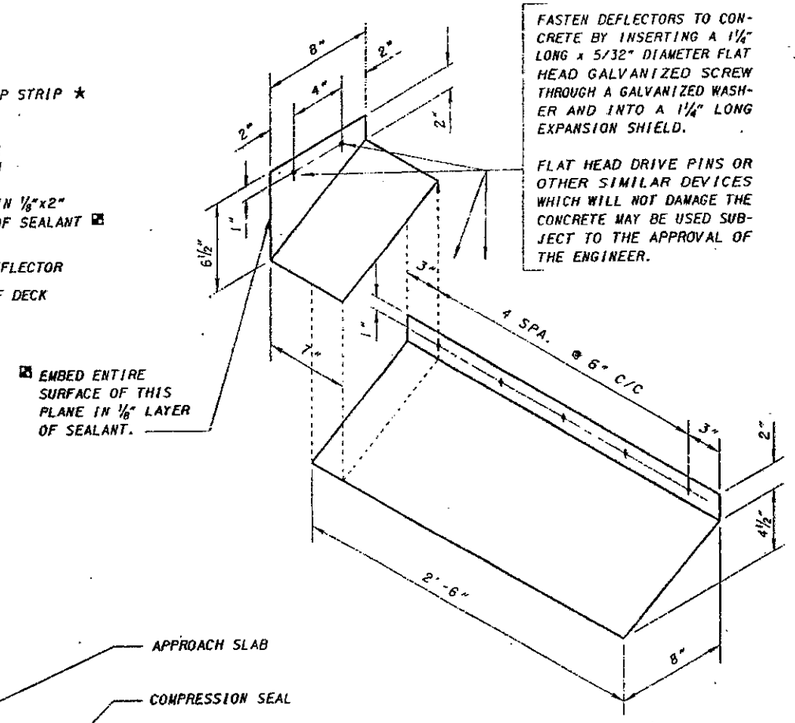
NOTES:

❶ JOINT ARMOR SHALL BE OF SUFFICIENT LENGTH TO ALLOW FOR FIT-UP OF BEAMS. SEE FORMULA FOR LENGTH "L".

⊠ SEALANT SHALL MEET FEDERAL GOVERNMENT SPECIFICATION TT-S-0027E.

FASTEN DEFLECTORS TO CONCRETE BY INSERTING A 1¼" LONG x 5/32" DIAMETER FLAT HEAD GALVANIZED SCREW THROUGH A GALVANIZED WASHER AND INTO A 1¼" LONG EXPANSION SHIELD.

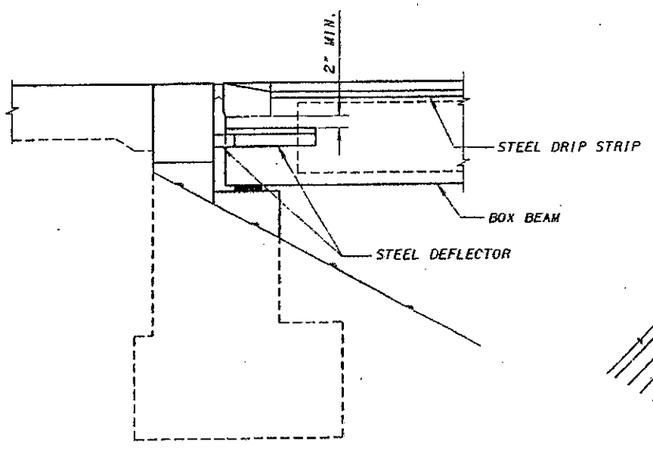
FLAT HEAD DRIVE PINS OR OTHER SIMILAR DEVICES WHICH WILL NOT DAMAGE THE CONCRETE MAY BE USED SUBJECT TO THE APPROVAL OF THE ENGINEER.



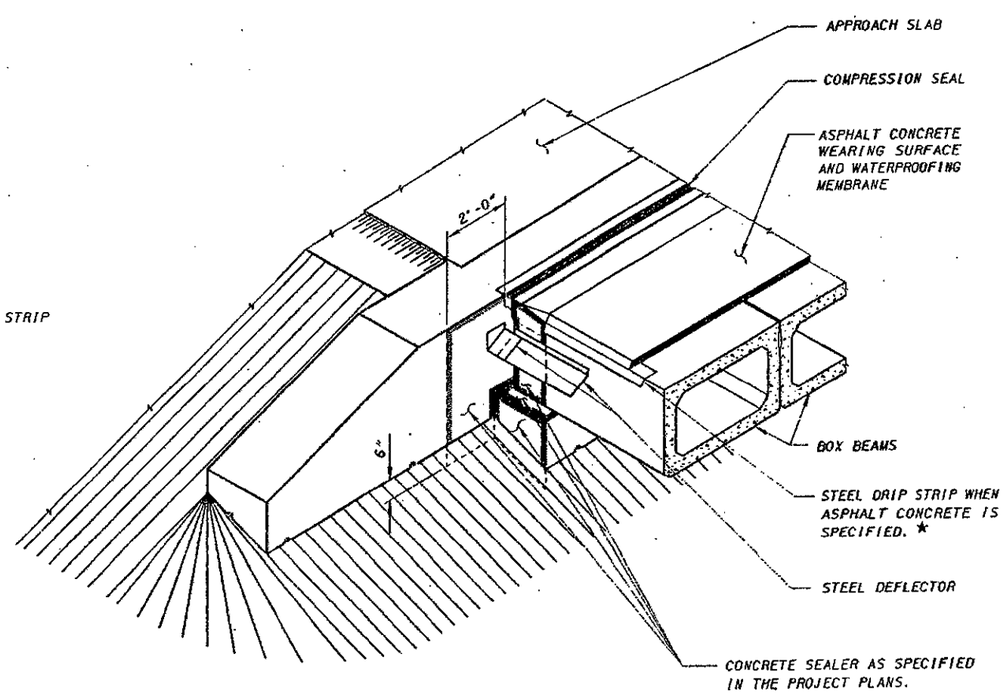
⊠ EMBED ENTIRE SURFACE OF THIS PLANE IN ⅛" LAYER OF SEALANT.

DEFLECTOR DETAILS

DEFLECTORS SHALL BE MADE FROM MINIMUM 22 GAGE STAINLESS STEEL MEETING THE REQUIREMENTS OF ASTM 167, TYPE 304, WITH A MILL FINISH.



ELEVATION



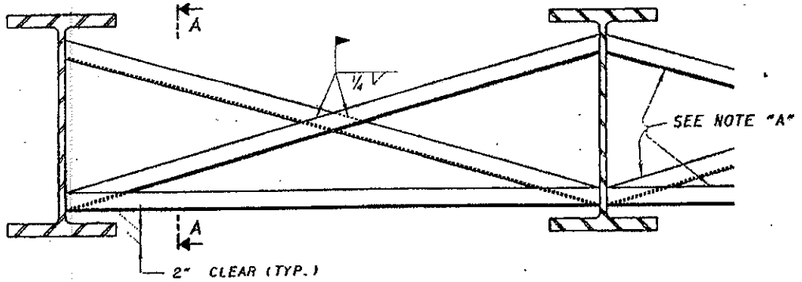
CONCRETE PROTECTION AS DETAILED ON THIS SHEET (STAINLESS STEEL DEFLECTORS AT ABUTMENTS AND CONCRETE SEALER ON DESIGNATED SURFACES) SHALL BE PROVIDED IF CALLED FOR ON THE PROJECT PLANS AND SHALL BE INCLUDED WITH ITEM 516 FOR PAYMENT. IN THIS CASE THE PAY ITEM SHALL BE "STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS AND CONCRETE PROTECTION".

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES — 11-15-82 DATE

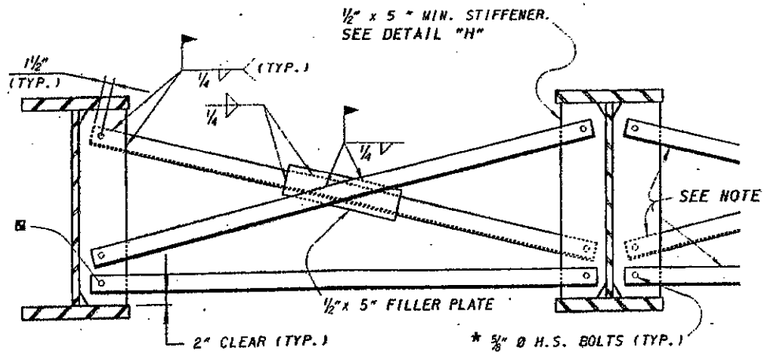
REVISIONS	DESIGNED	CHECKED	DRAWN	REVIEWED
8-1-84	RLD/AJM	JS/MPB	AJM	WTL/RLD
2-14-97				EXJ-5-82

STANDARD
COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES



TYPE 1: INTERMEDIATE WELDED CROSSFRAME DETAILS

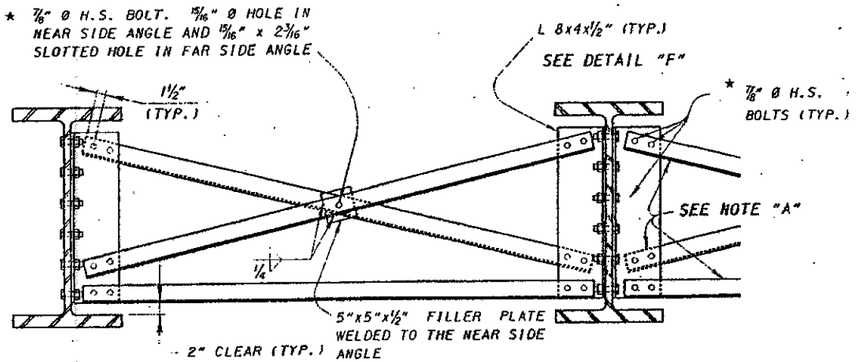
FOR ROLLED BEAM BRIDGES
AASHTO CASE II



TYPE 3 INTERMEDIATE WELDED CROSSFRAME DETAILS

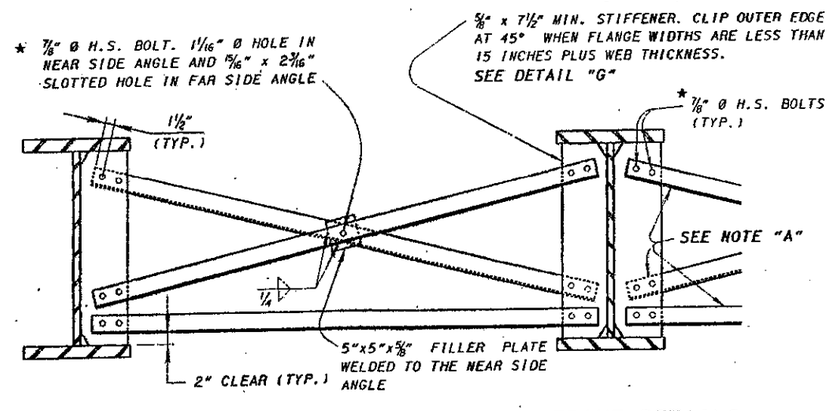
FOR GIRDER BRIDGES AND AASHTO CASE I ROLLED BEAM BRIDGES

CROSSFRAME ANGLE SIZE	
DEPTH OF BEAM/GIRDER	MINIMUM SIZE ANGLE
D < 48 INCH	3 x 3 x 5/16"
48 INCH < D < 52 INCH	3 1/2 x 3 1/2 x 3/8"
52 INCH < D < 60 INCH	4 x 4 x 3/8"



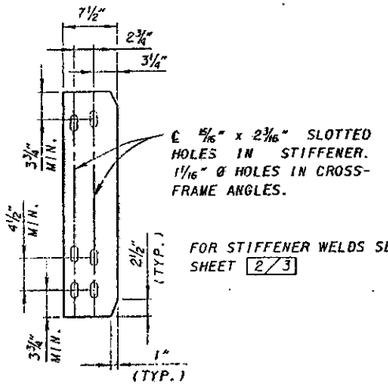
TYPE 2: INTERMEDIATE BOLTED CROSSFRAME DETAILS

FOR ROLLED BEAM BRIDGES
AASHTO CASE I OR CASE II

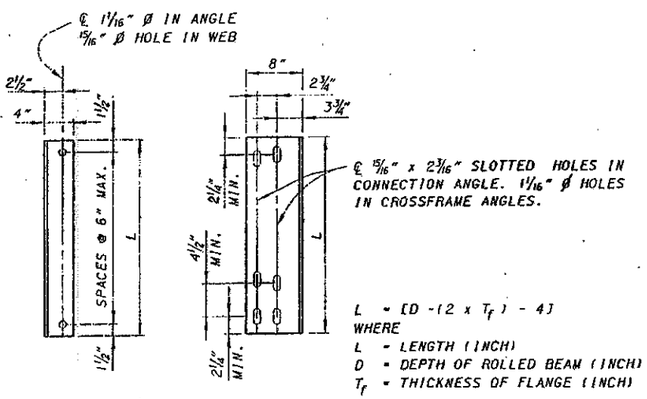


TYPE 4 INTERMEDIATE BOLTED CROSSFRAME DETAILS

FOR GIRDER BRIDGES AND AASHTO CASE I ROLLED BEAM BRIDGES



DETAIL "G"



DETAIL "F"

★ ALL BOLTS ARE A325 TYPE 1 GALVANIZED FOR A GALVANIZED OR PAINTED BRIDGE AND A325 TYPE 3 FOR A588 WEATHERING STEEL BRIDGE. EACH ANCHOR ASSEMBLY SHALL INCLUDE A BOLT, NUT AND TWO (2) WASHERS, TIGHTENED PER CMS SECTION 513.15.

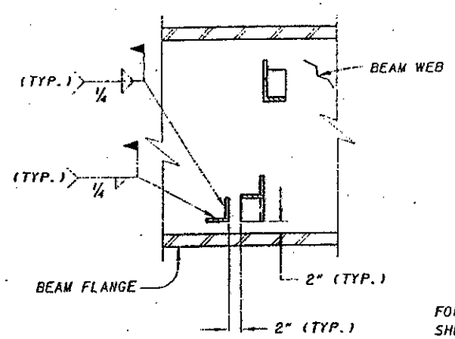
THE FABRICATOR SHALL CHECK LONGITUDINAL CROSSFRAME SPACING SO THAT INTERFERENCE WITH BOLTED SPLICES, ANCHOR BOLTS, COMPLETE PENETRATION WEB OR FLANGE WELDED SPLICES AND BEARING STIFFENERS CAN BE AVOIDED. SPACING SHALL BE ADJUSTED TO PROVIDE AT LEAST SIX INCHES OF LONGITUDINAL CLEARANCE. THE FABRICATOR MAY ADJUST CROSS-FRAME SPACES UP TO A MAXIMUM OF 15'-0" CENTER TO CENTER UNLESS THE CONTRACT DRAWINGS PROVIDE A NOTED MAXIMUM.

FOR COMPLETELY SHOP PAINTED OR GALVANIZED SYSTEMS, A TYPE 2 OR TYPE 4 CROSSFRAME SHALL BE USED.

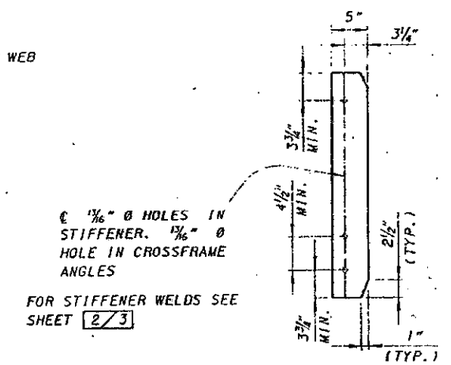
AT THE OPTION OF THE CONTRACTOR, TYPE 2 CROSSFRAME CAN BE USED IN LIEU OF TYPE 1 CROSSFRAME AND TYPE 4 CROSSFRAME CAN BE USED INSTEAD OF TYPE 3 CROSSFRAME.

⊠ AT SKEWED STRUCTURES THE NEED OF SLOTTED HOLES AT EACH CROSS FRAME LOCATION SHALL BE INVESTIGATED AND SPECIFIED ON THE PLANS AS REQUIRED.

NOTE "A"
MATCH CROSSFRAME LEGS TO EACH SIDE OF THE WEB, SEE CROSSFRAME ANGLE SIZE GUIDE TABLE FOR SIZES



SECTION A-A



DETAIL "H"

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Brad Fogwell
ADMINISTRATOR
2-12-97
DATE

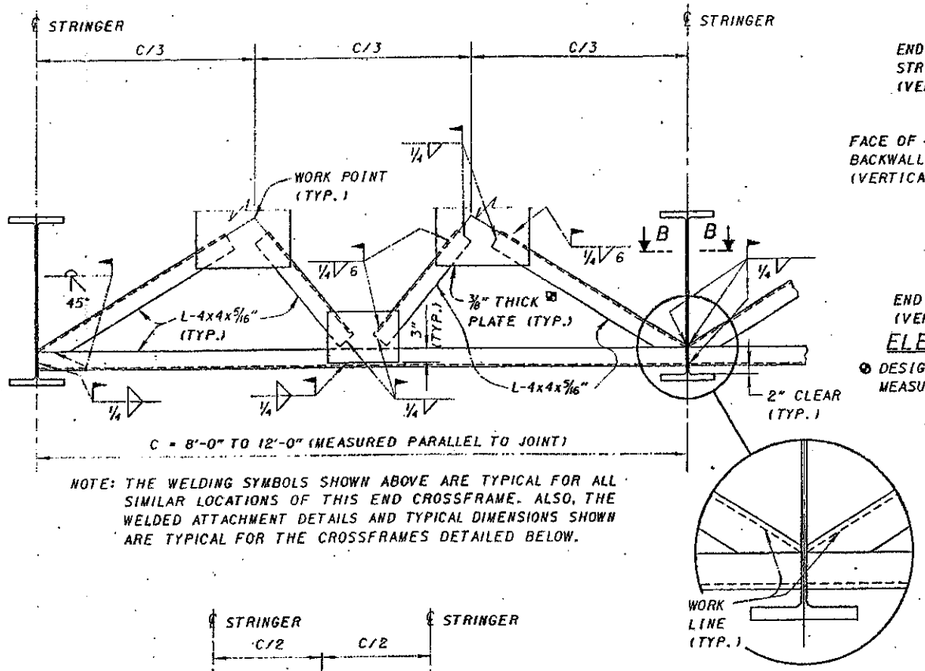
DESIGN AGENCY
OFFICE OF STRUCTURAL ENGINEERING

REVISIONS	DESIGNED	DRAWN	CHECKED	REVIEWED
	JCR	BOB/FO	JS	WTL

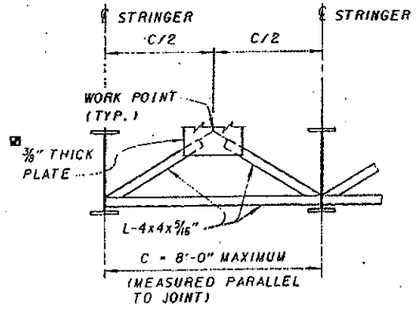
GSD-1-96

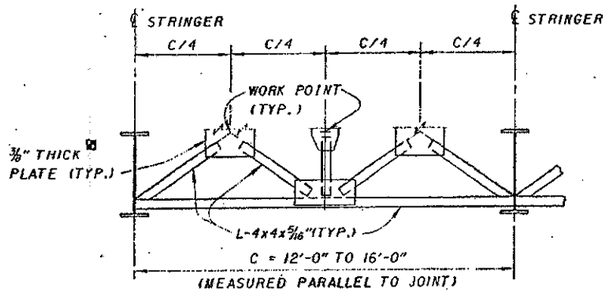
STANDARD
GENERAL STEEL DETAILS

1/3

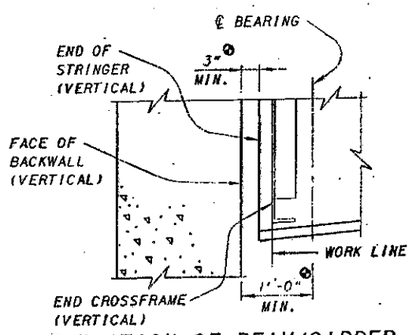


NOTE: THE WELDING SYMBOLS SHOWN ABOVE ARE TYPICAL FOR ALL SIMILAR LOCATIONS OF THIS END CROSSFRAME. ALSO, THE WELDED ATTACHMENT DETAILS AND TYPICAL DIMENSIONS SHOWN ARE TYPICAL FOR THE CROSSFRAMES DETAILED BELOW.





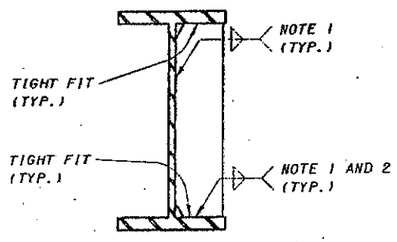
END CROSSFRAME DETAILS



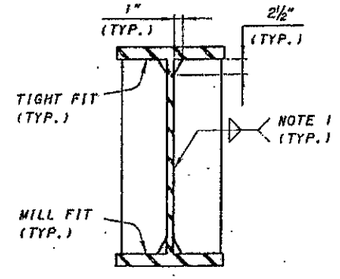
ELEVATION OF BEAM/GIRDER

⊘ DESIGNER TO ESTABLISH DIMENSION REQUIRED, MEASURED NORMAL TO BACKWALL.

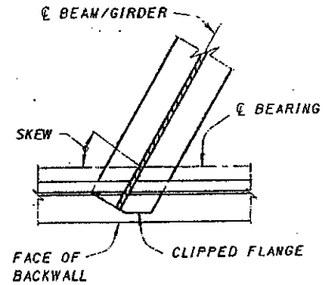
⊠ 3/8" THICK PLATE IS A PART OF THE EXPANSION JOINT SYSTEM. SEE EXPANSION JOINT STANDARD DRAWINGS FOR DETAILS.



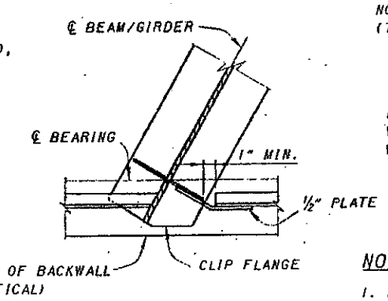
INTERMEDIATE STIFFENER



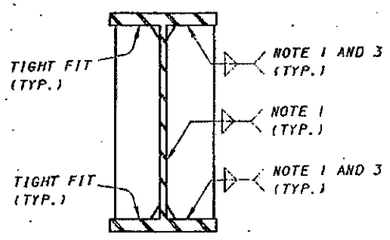
BEARING STIFFENER



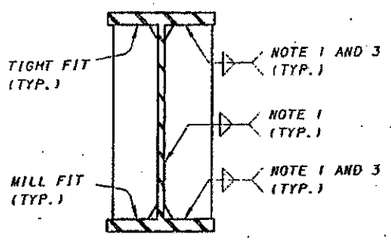
SECTION B-B



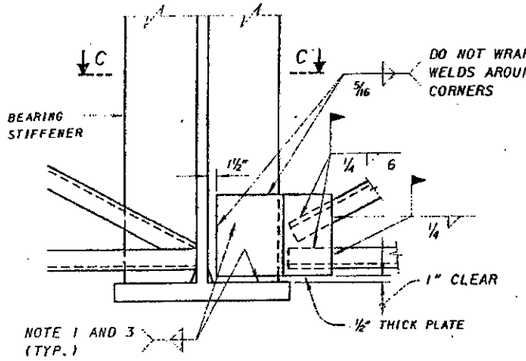
SECTION C-C



INTERMEDIATE STIFFENER WITH CROSSFRAMES



BEARING STIFFENER WITH CROSSFRAMES



BEAM/GIRDER END

END CROSSFRAME FOR SKEWED BRIDGES WHERE BEARING STIFFENERS INTERFERE WITH END CROSSFRAMES.

NOTES:

1. PROVIDE 1/4" WELD WHEN THE THICKER PLATE IS 3/8" OR LESS OR 5/16" WELD WHEN THE THICKER PLATE IS GREATER THAN 3/4", UNLESS DESIGN REQUIRES LARGER WELDS (SEE CMS 513.17).
2. INTERMEDIATE STIFFENERS REQUIRE FILLET WELDS TO THE COMPRESSION FLANGE ONLY PER CMS 513.08.
3. STIFFENERS TO WHICH CROSS FRAMES CONNECT REQUIRE FILLET WELDS TO BOTH FLANGES PER CMS 513.08

BEARING STIFFENER: BEARING STIFFENER SHALL BE VERTICAL AFTER ERECTION.

WELDS: STIFFENER TO STRINGER WELDS SHALL BE TERMINATED AS GIVEN BELOW:

A. STIFFENER TO STRINGER FLANGE WELDS 1/4" ± 1/8" AT BOTH ENDS OF THE STIFFENER.
B. STIFFENER TO STRINGER WEB WELDS 1/2" ± 1/4" AT BOTH ENDS OF THE STIFFENER.

MILL FIT: THE BEARING ENDS OF THE BEARING STIFFENER SHALL BE FLUSH AND SQUARE WITH THE WEB AND SHALL HAVE AT LEAST 75 PERCENT OF THIS AREA IN CONTACT WITH THE INNER SURFACE OF THE FLANGE.

TIGHT FIT: A TIGHT FIT IS DEFINED AS ONE IN WHICH THE STIFFENER AND FLANGE ARE IN PHYSICAL CONTACT OVER SOME PORTION OF THE END OF THE STIFFENER AND HAVING NO GAP IN EXCESS OF 1/16 INCH.

BEAM OR GIRDER ENDS: FOR STRUCTURES ON GRADE THE BEAM OR GIRDER ENDS SHALL BE CUT IN A MANNER THAT THEY ARE VERTICAL AFTER ERECTION. A THREE (3) INCH MINIMUM CLEARANCE AT 60 F SHALL BE MAINTAINED BETWEEN THE VERTICAL ENDS OF THE BEAMS OR GIRDERS AND THE VERTICAL FACE OF THE BACKWALL.

WORK POINTS: WORK POINTS SHALL BE COORDINATED BETWEEN EXPANSION JOINT AND STRUCTURAL STEEL SUPPLIERS TO ASSURE FIT UP AT ALL DESIGN LOCATIONS.

TRANSITION OF THICKNESS OR WIDTH AT BUTT JOINTS: REFER TO SECTION 9.20 OF THE AMERICAN WELDING SOCIETY (AWS) BRIDGE WELDING CODE AS AMENDED BY SUPPLEMENTAL SPECIFICATION 1011 WHICH PROVIDES TRANSITION DETAILS OF THICKNESSES AND WIDTHS AT COMPLETE PENETRATION BUTT JOINTS.

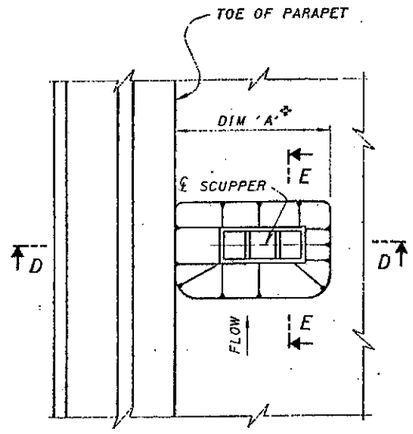
DESIGN AGENCY: OFFICE OF STRUCTURAL ENGINEERING

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Brad Fogo — ADMINISTRATOR
2-12-97 — DATE

REVISIONS	DESIGNED JCR	DRAWN BDB/FO	CHECKED JS	REVIEWED WTL	GSD-1-96

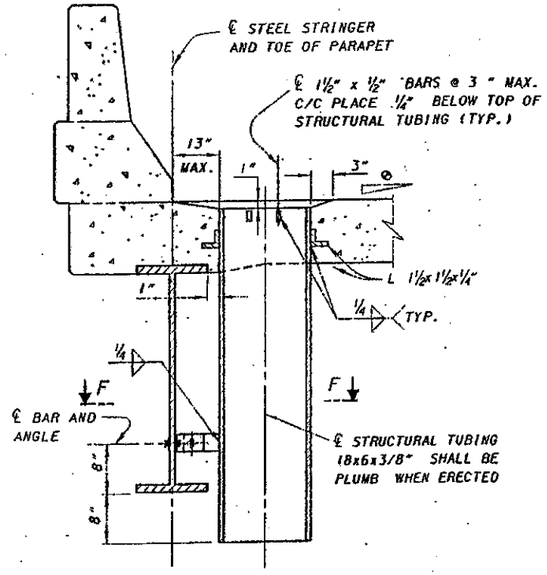
STANDARD

GENERAL STEEL DETAILS



PLAN

✣ DIMENSION 'A' SHALL NOT EXTEND BEYOND THE LIMITS OF THE SHOULDER (SHALL NOT FALL IN THE TRAFFIC LANE)



SECTION D-D

THE SCUPPERS SHALL BE LOCATED ON THE BRIDGE DECK BASED ON BRIDGE GEOMETRY AND THE CONTRIBUTING DECK DRAINAGE.

THE CONCRETE DECK, AT THE TWO SCUPPER CORNERS AWAY FROM THE CURB LINE, SHALL BE REINFORCED BY 3'-0" LONG #4 BAR, ONE BAR AT EACH CORNER, ORIENTED AT 45° TO THE SCUPPER.

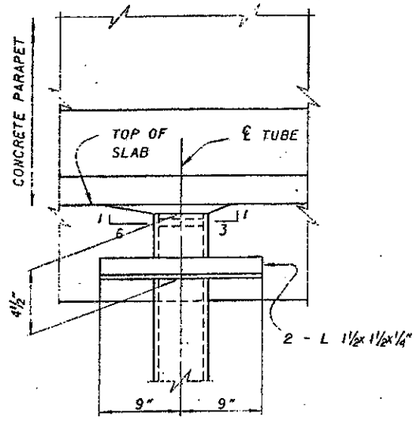
◈ SQUARE CUT TOP OF TUBE UNLESS DESIGNER SPECIFIES CROSS SLOPE GREATER THAN ½" PER FOOT IN WHICH CASE THE TOP IS TO BE CUT PARALLEL TO THE CROSS SLOPE.

⊠ SLOTTED HOLES SHALL BE 11/16" x 1 9/16". THE SLOT SHALL BE HORIZONTAL IN THE 3 x 3/8" BAR AND VERTICAL IN THE ANGLE. USE A ⅝" Ø A325 HIGH STRENGTH HEX HEAD BOLT WITH HEX NUT AND WASHERS, TIGHTEN AS PER CMS 513.15.

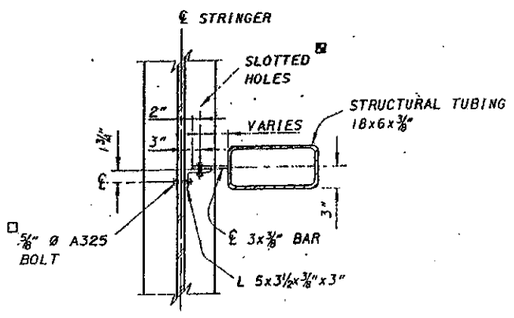
□ ⅝" Ø A325 TYPE 1 GALVANIZED FOR A GALVANIZED OR PAINTED BRIDGE AND A325 TYPE 3 FOR A588 WEATHERING STEEL BRIDGE. EACH ASSEMBLY SHALL INCLUDE A BOLT, NUT AND TWO (2) WASHERS, TIGHTENED PER CMS SECTION 513.15. FOR A GALVANIZED BRIDGE SYSTEM PROVIDED A 3.5" x 3.5" x ⅛" PREFORMED BEARING PAD WITH A 13/16" Ø HOLE AS PER CMS 711.21 BETWEEN THE BEAM WEB AND THE ANGLE. FIELD DRILL 13/16" DIAMETER HOLE IN THE WEB AFTER THE DECK CONCRETE HAS BEEN POURED.

THE SUPPORT ANGLES, BARS, SUPPORT BOLTS AND RELATED HARDWARE ARE INCLUDED WITH SCUPPERS FOR PAYMENT.

SCUPPERS INCLUDING SUPPORT ANGLES, BARS, BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH CMS 711.02.



SECTION E-E



SECTION F-F

DESIGN AGENCY
OFFICE OF STRUCTURAL ENGINEERING

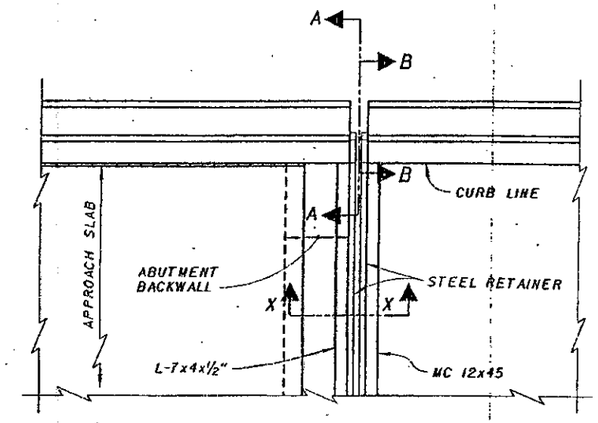
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Brad Fravell — ADMINISTRATOR
2-12-97 — DATE

REVISIONS	DESIGNED JCR	CHECKED JS	REVIEWED WTL
	DRAWN JFF/FO		

STANDARD GSD-1-96

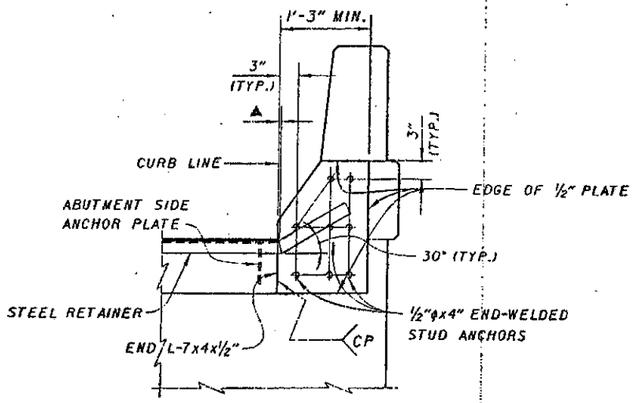
GENERAL STEEL DETAILS

3 / 3

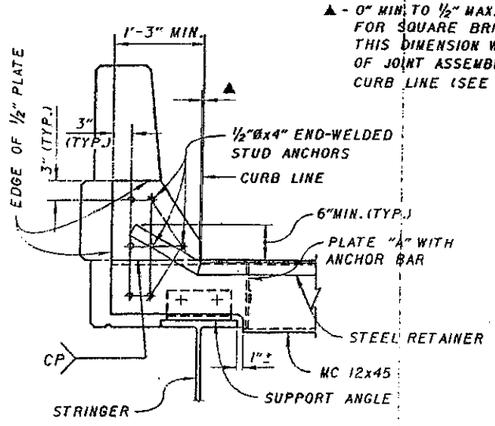


PART PLAN AT ABUTMENT

FOR SQUARE OR LOW SKEWED (15° OR LESS) BRIDGES WITH DEFLECTOR PARAPET RAILING

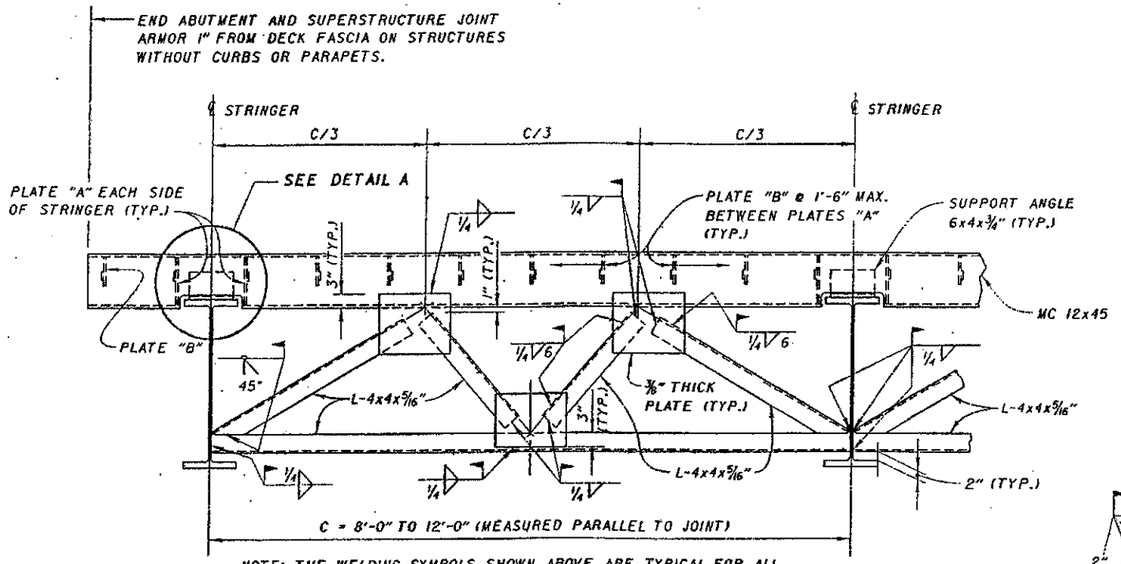


SECTION A-A

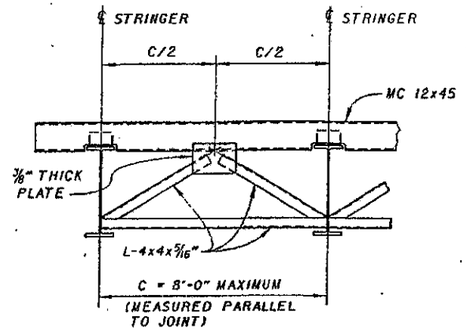


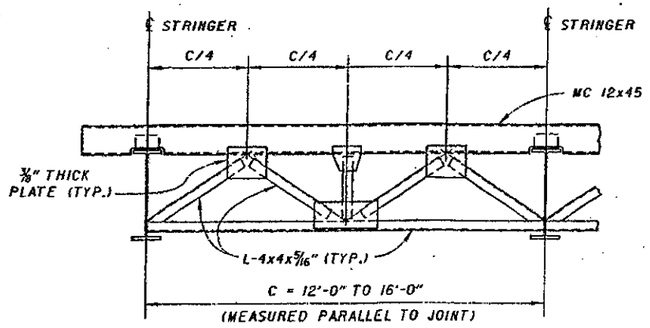
SECTION B-B

▲ - 0" MIN. TO ½" 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).



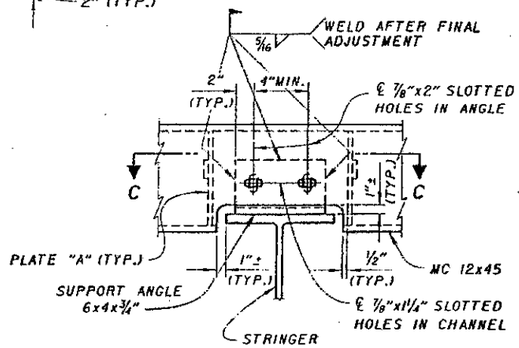
NOTE: THE WELDING SYMBOLS SHOWN ABOVE ARE TYPICAL FOR ALL SIMILAR LOCATIONS OF THIS END CROSSFRAME. ALSO, THE WELDED ATTACHMENT DETAILS AND TYPICAL DIMENSIONS SHOWN ARE TYPICAL FOR THE CROSSFRAMES DETAILED BELOW.



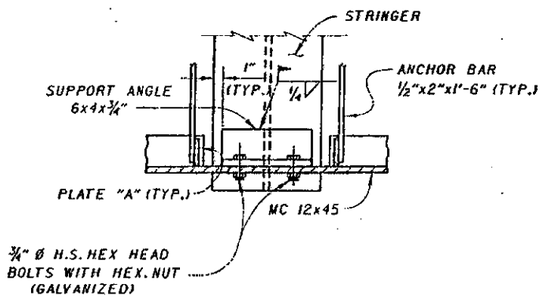


END CROSSFRAME DETAILS

STEEL RETAINERS ARE NOT SHOWN



DETAIL A



SECTION C-C

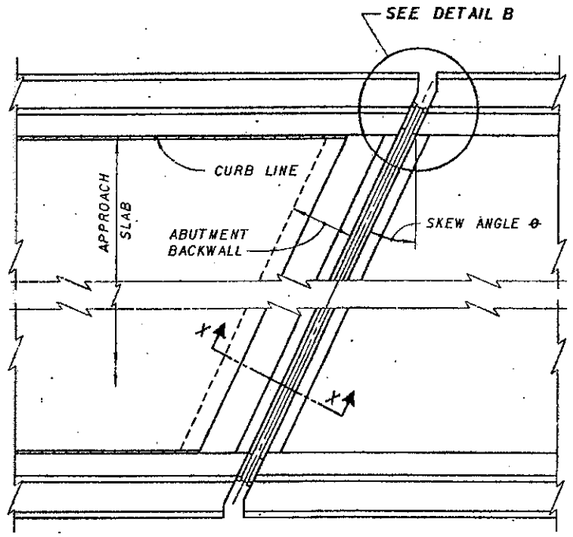
NOTE:
THE JOINT ARMOR SHOULD NOT BE PAINTED, EXCEPT FOR THE METALIZED SURFACES DAMAGED DURING CROSSFRAME INSTALLATION. THESE AREAS SHALL BE CLEANED AND PAINTED IN CONFORMANCE WITH THE STRUCTURE'S PAINT SYSTEM REQUIREMENTS. OVERSPRAY FROM PAINTING NEED NOT BE REMOVED. FOR REPAIR OF ALL OTHER METALIZED SURFACES SEE THE JOINT INSTALLATION NOTES ON SHEET 5/5.

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

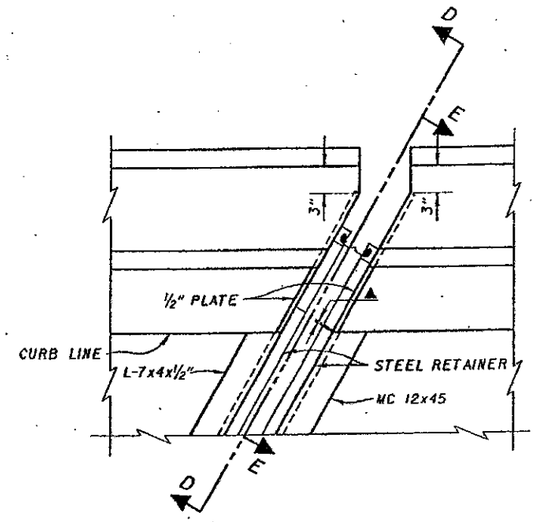
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
01-20-94
ENGINEER OF BRIDGES — DATE

REVISIONS	DESIGNED	CHECKED	REVIEWED
11-12-93 2-14-97	AJM DRAWN GFJ/AJM	JS	WTL/LWW EXI-4-87

STANDARD
STRIP SEAL EXPANSION JOINTS
STEEL STRINGER STRUCTURES



PLAN AT ABUTMENT
FOR SKEWED BRIDGES (OVER 15°) WITH DEFLECTOR PARAPET RAILING



DETAIL B

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.

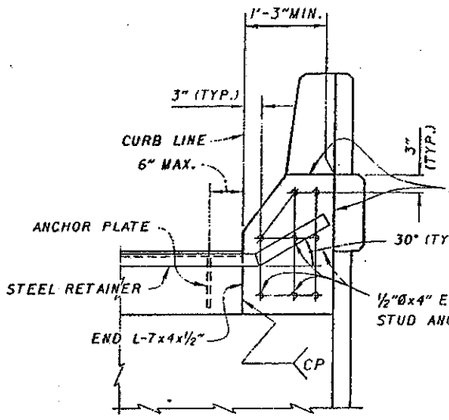
THE MINIMUM LENGTH OF RETAINER SHALL BE 6'-0" BETWEEN JOINTS UNLESS OTHERWISE SHOWN.

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 SHALL BE GROUND SMOOTH.

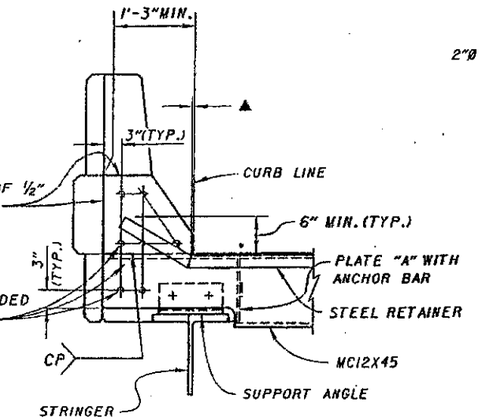
PROJECT PLANS SHALL LIST DIMENSION "A" FOR TEMPERATURES BETWEEN 30°F AND 90°F IN 10 DEGREE INCREMENTS.

JOINT SEAL GLANDS AT FIXED BEARINGS SHALL BE THE SAME SIZE AS AT THE EXPANSION BEARINGS WITH A DIMENSION "A" OF 2" AT ANY AMBIENT TEMPERATURE.

CONCRETE UNDER JOINT ARMOR SHALL BE HAND PLACED AND VIBRATED TO ACHIEVE SOLID FILLING.

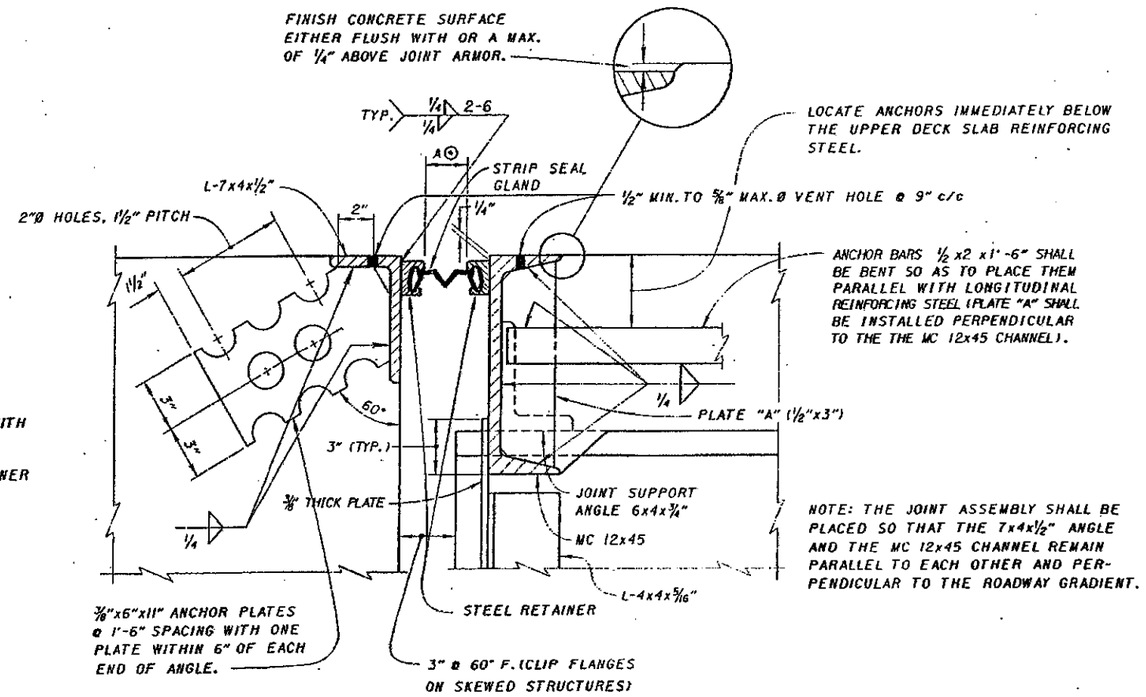


SECTION D-D



SECTION E-E

▲ - 0" MIN. TO ½" 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.

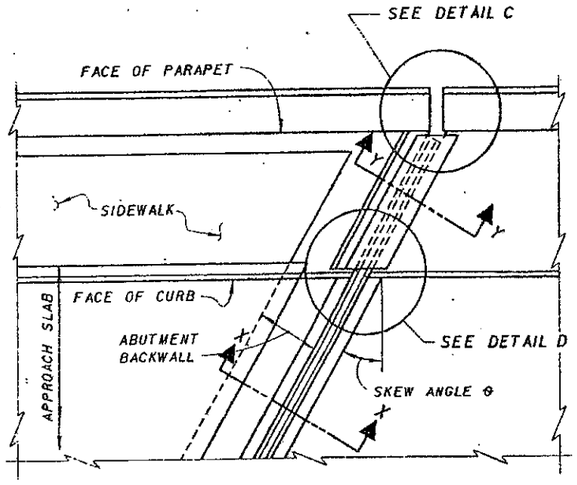
DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES — 01-20-94 DATE

REVISIONS	DESIGNED	CHECKED	REVIEWED	EXJ-4-87
11-12-93 2-14-97	AJM	JS	WTL/LMW	
	DRAWN GFJ/AJM			

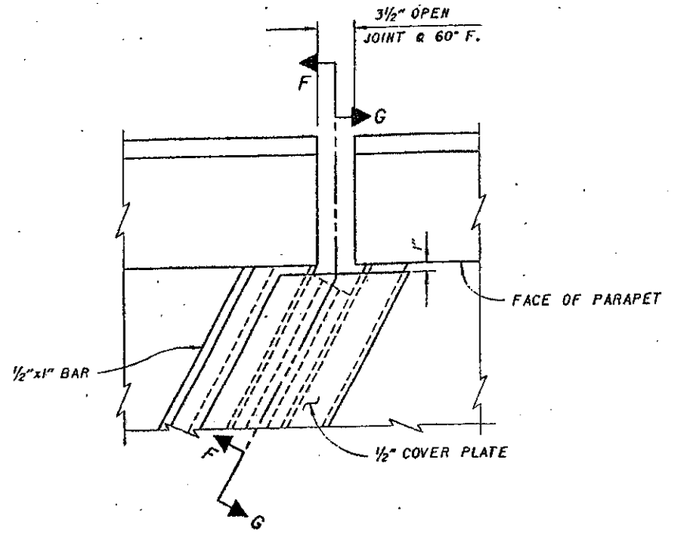
STANDARD
STRIP SEAL EXPANSION JOINTS
STEEL STRINGER STRUCTURES

2/5

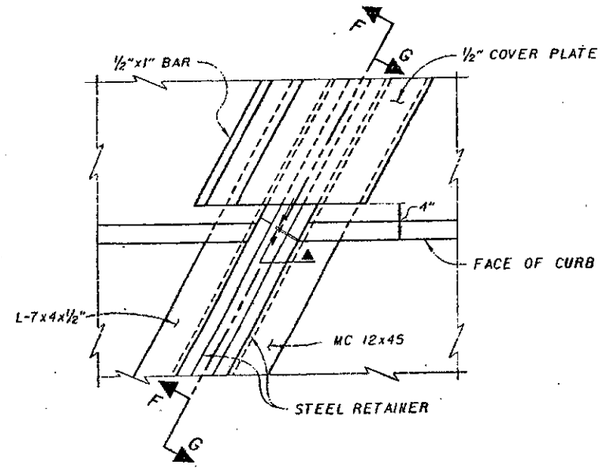


PART PLAN AT ABUTMENT

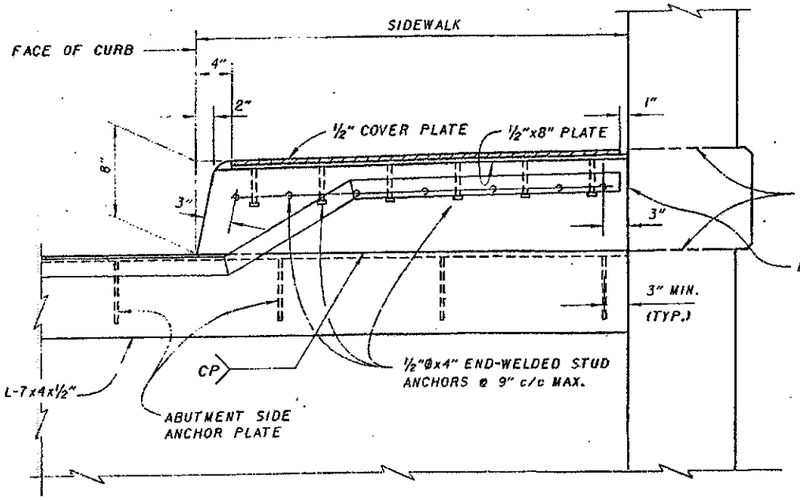
FOR BRIDGES WITH SIDEWALK PARAPET RAILING



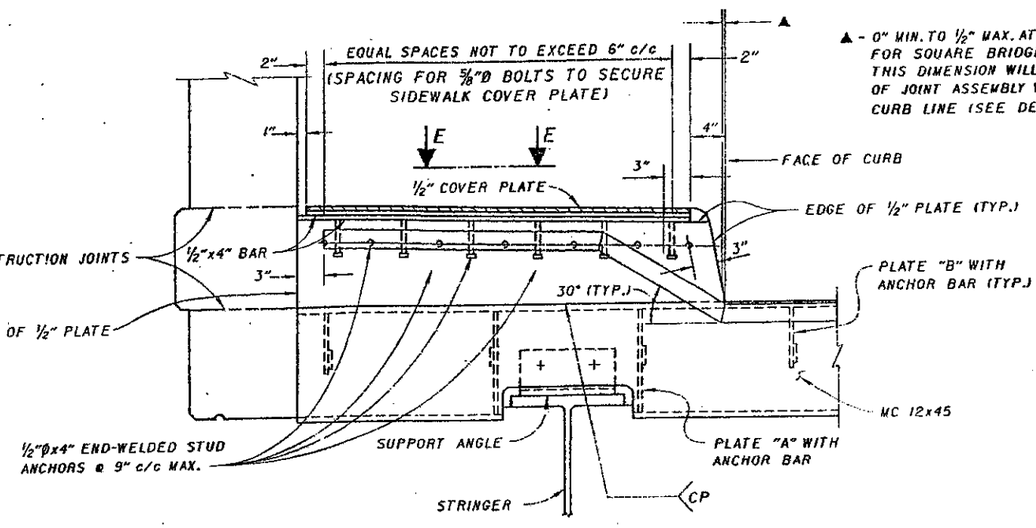
DETAIL C



DETAIL D



SECTION F-F



▲ - 0" MIN. TO ½" 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).

SECTION G-G

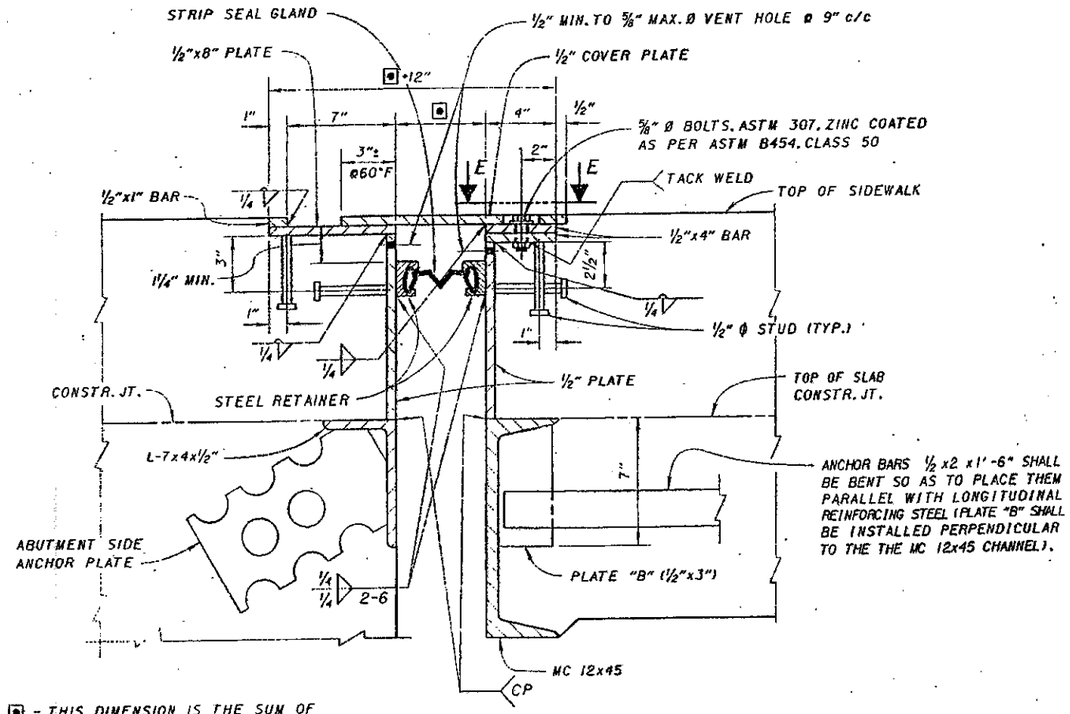
FOR VIEW E-E SEE SHEET 4/5.
FOR SECTION X-X SEE SHEET 2/5.
FOR SECTION Y-Y SEE SHEET 4/5.

DESIGN AGENCY
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
01-20-94
DATE
ENGINEER OF BRIDGES

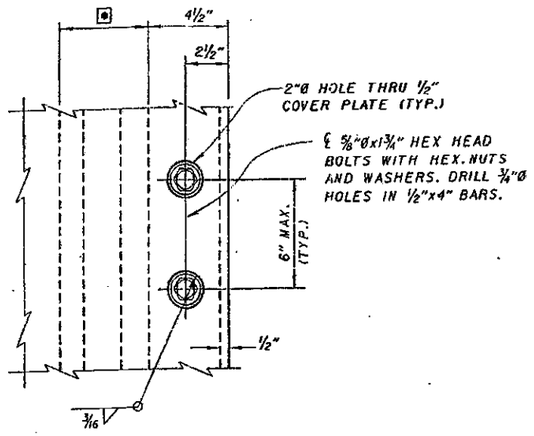
STANDARD
STRIP SEAL EXPANSION JOINTS
STEEL STRINGER STRUCTURES

REVISIONS	DESIGNED	CHECKED	REVISED
11-12-93	AJM	JS	WTL/LMW
2-14-97	DRAWN GFJ/AJM		EXJ-4-87

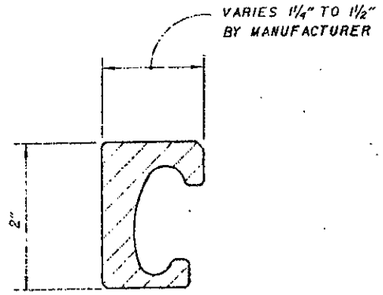


▣ - THIS DIMENSION IS THE SUM OF 12 X STEEL RETAINER WIDTH + DIM. "A").

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
01-20-94 DATE
ENGINEER OF BRIDGES

REVISIONS
11-12-93
2-14-97

DESIGNED AJH
DRAWN GFJ/AJH
CHECKED JS
REVIEWED WTL/LHW

STANDARD
STRIP SEAL EXPANSION JOINTS
STEEL STRINGER STRUCTURES

EXJ-4-87

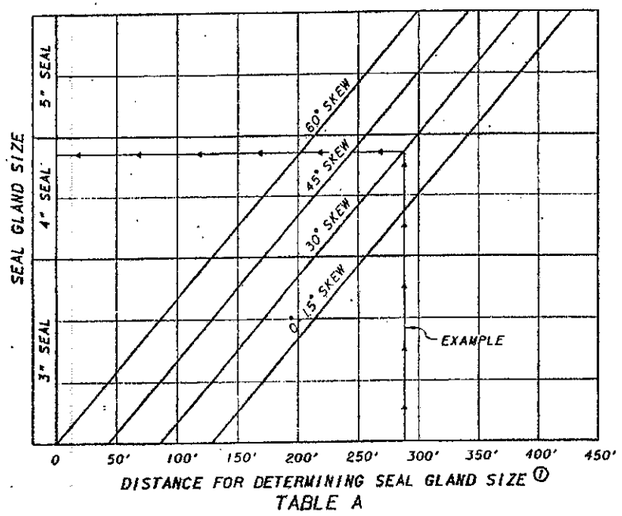


TABLE A

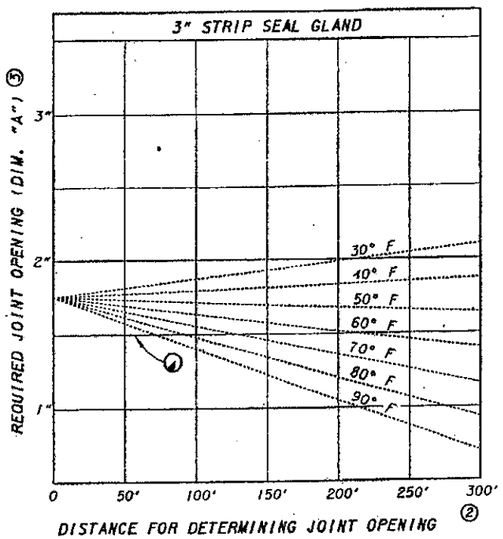


TABLE B

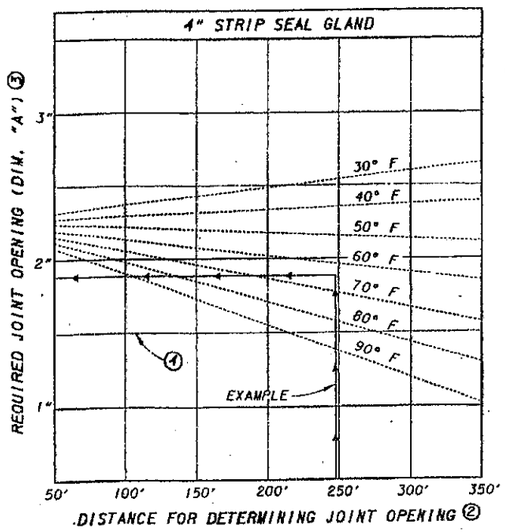


TABLE C

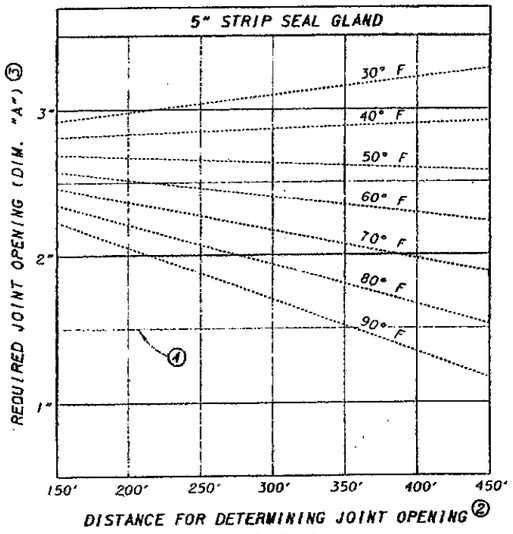


TABLE D

GENERAL NOTES:

MATERIALS: ALL STEEL PARTS OF THE JOINT ASSEMBLY SHALL BE ASTM A709, GRADE 36. THE FINISHED STEEL ASSEMBLY SHALL BE METALIZED. THE THICKNESS OF THE COATING SHALL BE 6-8 MILS. THE WIRE USED FOR THE METALLIZING SHALL CONSIST OF 85% ZINC AND 15% ALUMINUM. SURFACE PREPARATION AND APPLICATION SHALL CONFORM TO SSPC COATING SYSTEM GUIDE NO. 2300, "GUIDE FOR THERMAL SPRAY METALLIC COATING SYSTEMS". A SEALER AS PER SSPC PAINT SPECIFICATION NO. 27, SHALL BE APPLIED TO METALLIZED SURFACES THAT WILL BE IN CONTACT WITH CONCRETE. THERE IS NO NEED TO METALIZE THE SURFACES OF THE RETAINERS TO WHICH THE GLANDS WILL BE BONDED. THESE SURFACES MAY BE MASKED TO PREVENT THE BUILDUP OF OVERSPRAY WITHIN THE RETAINER GROOVE.

THE PREFORMED STRIP SEAL GLAND SHALL BE EXTRUDED POLYCHLOROPRENE MATERIAL MEETING THE REQUIREMENTS OF ASTM D2628. DUE TO THE CONFIGURATION OF THE STRIP SEAL, THE RECOVERY TEST IS NOT APPLICABLE. PHYSICAL PROPERITIES SHALL MEET THE REQUIREMENTS SPECIFIED IN TABLE "E" ON THIS SHEET.

EACH LOT OF STRIP SEAL GLANDS SHALL BE TESTED BY THE MANUFACTURER OR AN ACCREDITED LABORATORY TO ENSURE COMPLIANCE WITH THESE PROVISIONS. TWO CERTIFIED COPIES OF THE QUALIFICATION TEST DATA INDICATING THAT THE TESTED MATERIALS COMPLY WITH THESE PROVISIONS SHALL BE SUBMITTED TO THE ODOT TESTING LABORATORY.

THE STEEL RETAINER AND POLYCHLOROPRENE GLAND SHALL BE SUPPLIED BY THE SAME MANUFACTURER AND SHALL BE DESIGNED TO FUNCTION AS AN INTEGRAL UNIT.

TABLE E
(PHYSICAL PROPERTIES OF SEAL ELEMENT)

PROPERTY	REQUIREMENT	ASTM METHOD
TENSILE STRENGTH, MIN. PSI	2000	D412
ELONGATION @ BREAK, MIN. PERCENT	250	D412
HARDNESS, TYPE A DUROMETER, POINTS	60 ± 5	D2240 (MODIFIED)
OVEN AGING, 70 HR @ 212° F TENSILE STRENGTH, LOSS, MAX. ELONGATION, LOSS, MAX. HARDNESS, TYPE A DUROMETER, POINTS CHANGE	 20 PERCENT 20 PERCENT 0 TO +10	D573 D2240 (MODIFIED)
OIL SWELL, ASTM OIL 3 70 HR @ 212° F, WEIGHT CHANGE MAX	45 PERCENT	D471
OZONE RESISTANCE 20 PERCENT STRAIN, 300 PPHM IN AIR, 70 HR @ 104° F (WIPED WITH TOLUENE TO REMOVE SURFACE CONTAMINATION)	NO CRACKS	D1149
LOW TEMPERTURE STIFFENING 7 DAYS @ 14° F HARDNESS, TYPE A DUROMETER, POINTS CHANGE COMPRESSION SET, 70 HR @ 212° F MAX.	 0 TO +15 40 PERCENT	D2240 D2240 (MODIFIED) D395 METHOD B

LUBRICANT-ADHESIVE USED TO INSTALL THE PREFORMED STRIP SEALS SHALL BE A ONE PART MOISTURE CURING POLYURETHANE COMPOUND, MEETING THE REQUIREMENTS OF ASTM D4070, AND AS SPECIFIED BY THE SEAL GLAND MANUFACTURER. IT SHALL HAVE A SUITABLE CONSISTENCY AT THE TEMPERATURE AT WHICH THE SEALS ARE INSTALLED AND SHALL BE COMPATIBLE WITH THE SEALS AND THE STEEL RETAINERS.

SPLICE OR JOINT IN SEAL GLAND: SEAL GLANDS FOR BRIDGE DECK JOINTS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE UNLESS SHOP FABRICATED SPLICES ARE SHOWN ON THE PLANS OR APPROVED BY THE DIRECTOR. FIELD SPLICING SHALL NOT BE PERMITTED.

COMPLETED SPLICES SHALL HAVE NO OFFSETS ON EXTERIOR SURFACES, AND AFTER INSTALLATION, THERE SHALL BE NO EVIDENCE OF BOND FAILURE AT THE SPLICES.

FOR OTHER THAN STRAIGHT SEALS WITHOUT INTERMEDIATE SPLICES, SEAL GLANDS SHALL BE SHOP FABRICATED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS, SHOP DRAWING DIMENSIONS FOR EXISTING JOINTS OR FOR JOINTS WHICH ARE BEING MODIFIED SHALL BE BASED ON FIELD MEASUREMENTS PROVIDED BY THE CONTRACTOR.

PREPARATION FOR INSTALLATION: TO AVOID THE SUBSEQUENT CONTAMINATION OF THE PREPARED SURFACES, ALL SURFACES OF ELASTOMERIC STRIP SEAL GLANDS SHALL BE CLEANED WITH METHYL ETHYL KETONE (MEK), TOLUENE (T) OR ANOTHER APPROVED SOLVENT USING CLEAN DISPOSABLE CLOTHS.

NO MORE THAN 24 HOURS BEFORE APPLICATION OF THE LUBRICANT ADHESIVE, ONLY THE SURFACES OF THE STEEL RETAINER TO WHICH ADHESIVE IS APPLIED SHALL BE CLEANED TO SSPC VISUAL STANDARD SP-6.

INSTALLATION: IMMEDIATELY PRIOR TO APPLICATION OF LUBRICANT-ADHESIVE, BONDING SURFACES SHALL BE CLEAN, DRY AND WARMER THAN 45 DEGREES F. AND THEY SHALL BE MAINTAINED AT OR ABOVE THIS TEMPERATURE UNTIL THE ADHESIVE HAS CURED. LUBRICANT-ADHESIVE SHALL BE APPLIED LIBERALLY TO BOTH STEEL AND ELASTOMERIC BONDING SURFACES USING A STIFF BRUSH IF NECESSARY TO ACHIEVE A COMPLETE AND RELATIVELY UNIFORM COATING. THE BULBED EDGES OF THE ELASTOMERIC SEAL SHALL BE INSERTED INTO THE RETAINER GROOVES. AFTER INSTALLATION, EXCESS LUBRICANT-ADHESIVE SHALL BE REMOVED FROM THE EXPOSED SEAL SURFACES.

SEAL GLANDS SHALL BE INSTALLED WITH EQUIPMENT DESIGNED OR SPECIFICALLY ADAPTED FOR THE INSTALLATION OF ELASTOMERIC JOINT SEAL GLANDS. THIS EQUIPMENT SHALL NOT ELONGATE THE SEAL GLAND OR CAUSE STRUCTURAL DAMAGE TO THE COMPLETED INSTALLATION.

REPAIRS SHALL BE MADE PRIOR TO THE INSTALLATION OF THE SEAL. METALIZED SURFACES DAMAGED DURING FABRICATION SHALL BE REPAIRED BY REBLASTING AND METALIZING AS PER SSPC GUIDE 23.00. METALIZED SURFACES DAMAGED DURING SHIPMENT OR FIELD WELDING SHALL BE REPAIRED AS PER ASTM A 780-93a, ANNEX A1, REPAIR USING ZINC BASED ALLOYS. THIS FIELD PROCESS REQUIRES REMOVAL OF CONTAMINATES FROM THE SURFACE, PREHEATING THE SURFACE TO 600° F AND APPLICATION OF ZINC COATING BY EITHER RUBBING A PURE ZINC STICK OR SPRINKLING ZINC POWDER ON THE PREHEATED SURFACE. THE ZINC COATING THICKNESS SHALL BE THE SAME AS THAT SPECIFIED FOR THE METALIZING.

MEASUREMENT FOR PAY PURPOSES SHALL BE BASED ON THE LINEAR FEET OF SEALED JOINT SYSTEM, MEASURED HORIZONTALLY ALONG THE JOINT CENTERLINE AND BETWEEN THE OUTER LIMITS OF THE FABRICATED JOINT. THIS PAY ITEM SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE JOINT IN PLACE, WHICH INCLUDES: THE JOINT ARMOR, RETAINERS, GLAND, ANCHORING DEVICES, PLATE "A", PLATE "B", TEMPORARY SUPPORTS AND THE END CROSSFRAME TOP GUSSET PLATES. PAYMENT WILL BE MADE PER LINEAR METER FOR ITEM 516, "STRUCTURAL EXPANSION JOINTS, NCLUDING ELASTOMERIC STRIP SEALS".

THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE IS THAT POINT WHICH HAS ZERO HORIZONTAL MOVEMENT DURING TEMPERATURE CHANGES.

LEGEND

① - THIS IS THE ACTUAL DISTANCE FROM THE CENTERLINE OF JOINT TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE MEASURED ALONG THE CENTERLINE OF ROADWAY. THIS DIMENSION SHALL BE A MAXIMUM OF 299' FOR 60° SKEWS, 342' FOR 45° SKEWS, 385' FOR 30° SKEWS AND 427' FOR 0° THRU 15° SKEWS.

② - THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OF 15° OR LESS IS THE ACTUAL DISTANCE TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE ALONG CENTERLINE OF ROADWAY. THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OVER 15° BUT NOT GREATER THAN 60° IS ARRIVED AT BY MULTIPLYING THE ABOVE DEFINED DISTANCE ALONG THE CENTERLINE OF ROADWAY BY THE COSINE OF THE EXPANSION JOINT SKEW ANGLE.

③ - THIS IS THE JOINT OPENING (DIMENSION "A") REQUIRED AT THE TIME OF ABUTMENT BACKWALL CONCRETE PLACEMENT, BASED ON THE DAY'S ANTICIPATED PEAK AMBIENT TEMPERATURE.

④ - MINIMUM JOINT OPENING (DIMENSION "A") AT TIME OF SEAL GLAND INSTALLATION SHALL NOT BE LESS THAN 1½". IF THE JOINT OPENING IS LESS, INSTALLATION SHALL BE POSTPONED UNTIL THE TEMPERATURE DROPS A SUFFICIENT AMOUNT TO ALLOW THE MINIMUM 1½" OPENING.

EXAMPLE

GIVEN - DISTANCE FROM THE CENTERLINE OF JOINT TO THERMAL NEUTRAL POINT OF SUPERSTRUCTURE ALONG CENTERLINE OF ROADWAY IS 287.5'; SKEW ANGLE OF THE EXPANSION JOINT IS 30°; ANTICIPATED AMBIENT TEMPERATURE AT TIME OF JOINT INSTALLATION IS 65° F.

FIND - REQUIRED STRIP SEAL GLAND SIZE AND JOINT OPENING (DIMENSION "A") AT TIME OF JOINT ARMOR INSTALLATION.

SOLUTION -

(A) ENTER TABLE "A" AT ① WITH 287.5' AND FIND THAT THE REQUIRED STRIP SEAL GLAND SIZE IS 4 INCHES.

(B) ENTER TABLE "C" AT ② WITH 287.5' x COSINE OF 30°=248.98' AND FIND REQUIRED JOINT OPENING AT 65° F. IS 1.86".

NOTE: STEP (B) REQUIRED ONLY AT TIME OF CONSTRUCTION.

DESIGN AGENCY
BUREAU OF BRIDGES
AND STRUCTURAL DESIGN

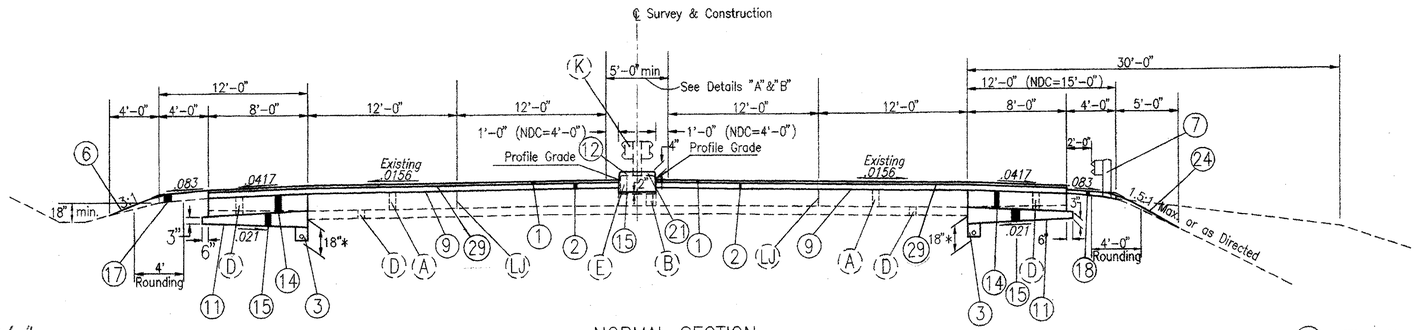
STATE OF OHIO DEPARTMENT OF TRANSPORTATION
01-20-94
DATE
ENGINEER OF BRIDGES

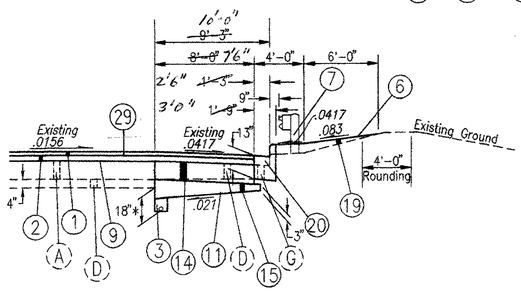
REVISIONS
11-12-93
2-14-97

DESIGNED AJM
DRAWN GFJ/AJM
CHECKED JS
REVIEWED WTL/LWW

STANDARD
STRIP SEAL EXPANSION JOINTS
STEEL STRINGER STRUCTURES
EXJ-4-87

5 / 5





CURB SECTION DETAIL

Sta. 1401+25 ℄ to Sta. 1415+79.82(Sta. 0+00, Ramp D)

NORMAL SECTION

LIMITING STATIONS

See Detail "A"
- Sta. 1269+25 to Sta. 1269+75 = 50 Lin. Ft.
- Sta. 1269+75 to Sta. 1275+31.25 = 556.25 Lin. Ft.

See Detail "B"
- Sta. 1275+31.25 to Sta. 1276+50 = 118.75 Lin. Ft.
- Sta. 1295+00 to Sta. 1302+25 = 725 Lin. Ft.
- Sta. 1322+50 to Sta. 1328+25 = 575 Lin. Ft.
- Sta. 1342+25 to Sta. 1348+75 = 650 Lin. Ft.
- Sta. 1362+25 to Sta. 1380+25 = 1800 Lin. Ft.
- Sta. 1395+50 to Sta. 10+50.91 = 3065.22 Lin. Ft. †
- Deduct for Structure & Approach Slab (Jef-7-0016) Sta. 8+24.89 to Sta. 10+50.91 = -226.02 Lin. Ft.

TOTAL = 7314.20 Lin. Ft.

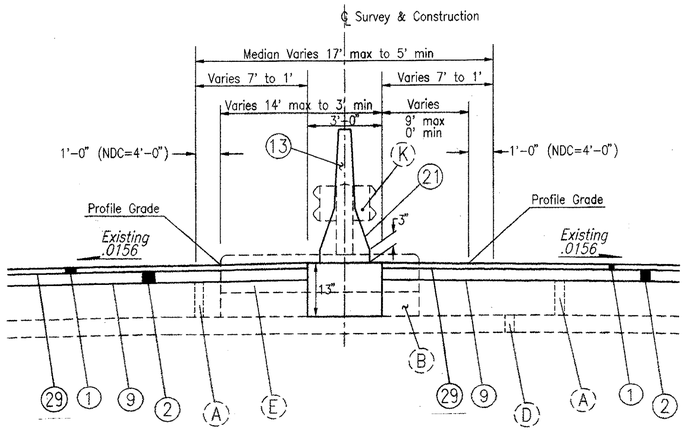
† Sta. Equaton 1415+64.31 Back =0+00.00 Ahead, See Curb Section Detail (This Sheet) Structure & Approach Slab JEF-7-0016 Sta. 8+24.89 to Sta. 10+50.91 (226.02 Lin. Ft.)

∗ 12" Min., See Underdrain Quantities Sheet No. 30 .

LEGEND

- (A) Existing 9" Reinforced Concrete Pavement
- (B) Existing 6" Subbase
- (D) Existing Bituminous Aggregate Base
- (E) Existing Concrete Divider
- (G) Existing Curb & Gutter
- (H) Existing Concrete Barrier
- (K) Existing Barrier Guardrail
- (LJ) Existing Standard Longitudinal joint

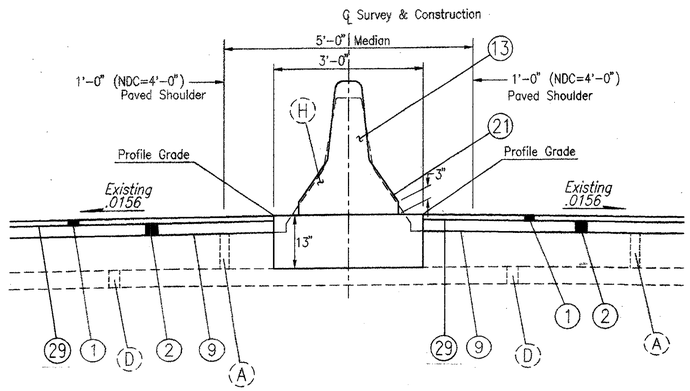
(1) ITEM 446 1 1/4" Asphalt Concrete Surface Course, Type 1H, As Per Plan
(2) ITEM 446 2 3/4" Asphalt Concrete Intermediate Course, Type 2, PG 64-28
(3) ITEM 605 4" Shallow Pipe Underdrains, 707.15, As Per Plan (See Sheet No. 49 .)
(6) ITEM 659 Seeding and Mulching
(7) ITEM 606 Guardrail, Type 5
(9) ITEM 407 Tack Coat
(11) ITEM 203 Subgrade Compaction
(12) ITEM 612 Concrete Median, As Per Plan (See Sheet No. 8 .)
(13) ITEM 622 Concrete Barrier, Type A, As Per Plan (See Sheet No. 8 .)
(14) ITEM 301 9" Bituminous Aggregate Base, PG 64-28
(15) ITEM 304 Aggregate Base, Thickness as shown (See Proposal Note)
(16) ITEM 203 Linear Grading Method A
(17) ITEM 203 Linear Grading Method B
(18) ITEM 448 2" Asphalt Concrete Intermediate Course, Type 1 (under Guardrail), PG 64-22, As Per Plan
(19) ITEM 203 Linear Grading Method C
(20) ITEM 609 Combination Curb and Gutter, Type 2
(21) ITEM Special Sealing of Concrete Surfaces (Epoxy)
(24) ITEM 670 Slope Erosion Protection
(29) ITEM 407 Tack Coat for Intermediate Course



DETAIL "A" (See Normal Section above for Additional Details)

LIMITING STATIONS

Sta. 1269+25 to Sta. 1269+75 (Median Tapers 17' to 16', Existing Divider Tapers 6' to 14')(No Existing Barrier Guardrail)
Sta. 1269+75 to Sta. 1275+25 (Median Tapers 16' to 5', Existing Divider Tapers 14' to 3')(1270+08 Begin Concrete Barrier)
Sta. 1275+25 to Sta. 1275+31.25 Median Width= 5'

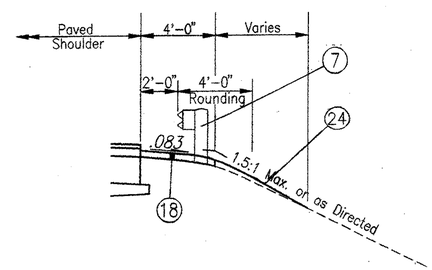


DETAIL "B" (See Normal Section above for Additional Details)

MEDIAN SHOULDER OVERLAY

LIMITING STATIONS

Sta. 1275+31.25 to Sta. 1276+50
Sta. 1295+00 to Sta. 1302+25
Sta. 1322+50 to Sta. 1328+25
Sta. 1342+25 to Sta. 1348+75
Sta. 1362+25 to Sta. 1380+25
Sta. 1395+50 to Sta. 1415+64.31
Sta. 0+00 to Sta. 8+24.89



ASPHALT PAVING & ROUNDING DETAIL

CALC. BY: GFD DATE: 5/94
CHKD. BY: CAM DATE: 10/94

TYPICAL SECTION

BEL/JEF-7-23.76/0.00

5
94

2/24/97 ATH 1403DP2 FINAL

CALC. BY: ATH DATE: 7/95
CHKD. BY: DGK DATE: 10/95

** NOT INCLUDING EMBANKMENT CONSTRUCTION

LOCATION	STATION		LENGTH	WIDTH	AREA	254	407		446		446		202	609	609	203	203	301	304		202	612	202	622		626	COMMENTS	SEE SHEET
						PAVT. PLANING BITUM.	TACK COAT FOR I.C.	TACK COAT	AVERAGE THICKNESS	2 3/4" ASPHALT INTERMEDIATE COURSE, TYPE 2, PG 64-28	AVERAGE THICKNESS	1 1/4" ASPHALT SURFACE COURSE, TYPE I, PG 64-28 AS PER PLAN	CURB AND GUTTER REMOVED	COMB. CURB & GUTTER, TYPE 2, AS PER PLAN	COMB. CURB & GUTTER, TYPE 2	EXCAVATION ** (1.1' AVG. DEPTH)	SUBGRADE COMPACTION	9" BITUMINOUS AGGREGATE BASE PG64-28	AVERAGE END AREA	AGGREGATE BASE	CONCRETE MEDIAN REMOVED	CONCRETE MEDIAN, AS PER PLAN	CONCRETE BARRIER REMOVED	CONCRETE BARRIER, AS PER PLAN TYPE A	CONCRETE BARRIER, AS PER PLAN TYPE B50	BARRIER, REFLECTOR, TYPE B		
	FROM	TO	LIN. FT.	LIN. FT.	SQ. YD.	SQ. YD.	GAL.	GAL.	INCH	CU. YD.	INCH	CU. YD.	LIN. FT.	LIN. FT.	LIN. FT.	CU. YD.	SQ. YD.	CU.YD.	SQ. FT.	CU. YD.	SQ. YD.	SQ. YD.	LIN. FT.	LIN. FT.	LIN. FT.	EACH		
MAINLINE PAVEMENT RESURFACING																												
FEATHER (NB&SB)	1258+00.00	1259+00.00	100.00	48	533.3	160	40	40	2.00	11.1	1.64	24.3															BEGIN PROJECT	
NB & SB	1259+00.00	1265+10.70	610.70	48	3257.1		244	244		248.8		113.1																
SB ONLY	1265+10.70	1265+42.96	32.26	24	86.0		6	6		6.6		3.0																
FEATHER (NB @ BRIDGE)	1265+10.70	1266+10.70	100.00	38	422.2		16	16	2.00	8.8	2.39	23.5																
FEATHER (SB @ BRIDGE)	1265+42.96	1266+42.96	100.00	27	300.0		19	19	2.00	6.3	2.39	16.7																
BRIDGE NO. BEL-7-2389																												
FEATHER (NB @ BRIDGE)	1266+67.42	1267+67.42	100.00	39.5	438.9		33	33	2.00	24.4	2.39	29.1				78	122			20.3							REPLACE APPROACH SLAB	
FEATHER (SB @ BRIDGE)	1266+99.68	1267+99.68	100.00	27	300.0		23	23	2.00	16.7	2.39	19.9				75	117			19.4							REPLACE APPROACH SLAB	
NB ONLY	1267+67.42	1267+99.68	32.26	24	86.0		6	6		6.6		3.0															SEE DETAIL SHEET NO. 32	
CR-4 FEATHER	9+66.42	9+26.42			232.8	111	17	17	2.00	7.1	1.25	8.1																
NB & SB	1267+99.68	1337+28.16	6928.48	48	36951.9		2771	2771		2822.7		1283.1																
NB ONLY	1337+28.16	1337+40.02	11.86	24	31.6		2	2		2.4		1.1																
FEATHER (SB @ BRIDGE)	1337+28.16	1338+28.16	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
FEATHER (NB @ BRIDGE)	1337+40.02	1338+40.02	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
BRIDGE NO. BEL-7-2526																												
FEATHER (SB @ BRIDGE)	1339+86.02	1340+86.02	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
FEATHER (NB @ BRIDGE)	1339+97.88	1340+97.88	100.00	24	266.7		20	20	2.00	14.8	2.26	16.7																
SB ONLY	1340+86.02	1340+97.88	11.86	24	31.6		2	2		2.4		1.1																
NB & SB	1340+97.88	1342+10.64	112.76	48	601.4		45	45		45.9		20.9															STATION EQUATION	
NB & SB	1342+00.00	1386+35.25	4435.25	48	23654.7		1774	1774		1807.0		821.3															1342+10.64(BACK)=1342+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	1386+35.25	1387+35.25	100.00	48	533.3		40	40	2.00	29.6	2.39	35.4																
BRIDGE NO. BEL-7-2619																												
FEATHER (NB & SB @ BRIDGE)	1388+71.75	1389+71.75	100.00	48	533.3		40	40	2.00	29.6	2.14	31.7																
NB & SB	1389+71.75	1415+64.31	2592.56	48	13827.0		1037	1037		1056.2		480.1															STATION EQUATION	
NB & SB	0+00.00	7+49.89	749.89	48	3999.4		300	300		305.5		138.9															1415+64.31(BACK)=0+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	7+49.89	8+49.89	100.00	48	533.3		40	40	2.00	29.6	2.26	33.5																
BRIDGE NO. JEF-7-0016																												
OUTSIDE SHOULDER REPLACEMENT & RESURFACING													1922	1922														
NB & SB	1258+00.00	1265+10.70	711	3	236.9		18	18		18.1		8.2	711	711													BEGIN CURB 1258+00	36
SB ONLY	1265+10.70	1265+42.96	32	1.5	5.4		0	0		0.4		0.2	32	32														
FEATHER (NB @ BRIDGE)	1265+10.70	1266+00.08	89	1.5	14.9		1	1	2.00	0.8	2.39	1.0	59	59													END CURB 1265+70.08	36
FEATHER (SB @ BRIDGE)	1265+42.96	1266+53.58	111	1.5	18.4		1	1	2.00	1.0	2.39	1.2	81	81													END CURB 1266+23.58	36
BRIDGE NO. BEL-7-2389																												
FEATHER (NB @ BRIDGE)	1266+56.80	1267+67.42	111	1.5	18.4		1	1	2.00	1.0	2.39	1.2	81	81													BEGIN CURB 1266+86.80	36
FEATHER (SB @ BRIDGE)	1267+10.30	1267+99.68	89	1.5	14.9		1	1	2.00	0.8	2.39	1.0	59	59													BEGIN CURB 1267+40.30	36
NB ONLY	1267+67.42	1267+99.68	32	1.5	5.4		0	0		0.4		0.2	32	32														
NB & SB	1267+99.68	1268+14.00	14	3	4.8		0	0		0.4		0.2	14	14													END CURB 1268+14	36
NB ONLY	1268+14.00	1269+25.00	111	8	98.7		7			7.5		3.4				38	117	25	2.88	11.9							BEGIN CONC. SHOULDER 1268+14	
NB & SB	1269+25.00	1331+00.00	6175	16	10977.8		823			838.6		381.2				4277	13036	2745	5.77	1319.0								
NB ONLY	1331+00.00	1334+00.00	300	8	266.7		20			20.4		9.3				104	317	67	2.88	32.0								
BRIDGE NO. BEL-7-2526																												
NB ONLY	1342+00.00	1342+10.64	11	8	9.5		1			0.7		0.3				4	11	2	2.88	1.1							STATION EQUATION	
NB ONLY	1342+00.00	1344+00.00	200	8	177.8		13			13.6		6.2				69	211	45	2.88	21.4							1342+10.64(BACK)=1342+00.00(AHEAD)	
NB & SB	1344+00.00	1357+67.00	1367	16	2430.2		182			185.6		84.4				947	2886	608	5.77	292.0								
SB ONLY	1357+67.00	1359+00.00	133	8	118.2		9			9.0		4.1				46	140	30	2.88	14.2								
SB ONLY	1367+00.00	1370+00.00	300	8	266.7		20			20.4		9.3				104	317	67	2.88	32.0								
NB & SB	1370+00.00	1386+35.25	1635	16	2907.1		218			222.1		100.9				1133	3452	727	5.77	349.3								
FEATHER (NB & SB @ BRIDGE)	1386+35.25	1387+35.25	100	16	177.8		13		2.00	9.9	2.39	11.8				48	148	31	5.77	15.0							END CONC. SHOULDER 1387+05.25	
BRIDGE NO. BEL-7-2619																												
FEATHER (NB & SB @ BRIDGE)	1388+71.75	1389+71.75	100.0	16	177.8		13		2.00	9.9	2.14	10.6				55	169	36	5.77	17.1							BEGIN CONC. SHOULDER 1388+91.75	
NB & SB	1389+71.75	1406+48.31	1676.6	16	2980.6		224			227.7		103.5				523	1161	3539	745	5.77	358.1						BEGIN CURB 1401+25	
NB ONLY	1406+48.61	1407+93.56	144.95	8	128.8		10			9.8		4.5				145	50	153	32	2.88	15.5						END CURB CALC. 1407+93.56	
NB ONLY	0+75.00	2+55.00	180	8	160.0		12			12.2		5.6					62	190	40	2.88	19.2						1415+64.31(BACK)=0+00.00(AHEAD)	
NB & SB	2+55.00	7+49.89	494.89	16	879.8		66			67.2		30.5					343	1045	220	5.77	105.7							
FEATHER (NB & SB @ BRIDGE)	7+49.89	8+49.89	100	16	177.8		13		2.00	9.9	2.26	11.2					52	158	33	5.77	16.0						END CONC. SHOULDER 8+24.89	
BRIDGE NO. JEF-7-0016																												
MEDIAN REPLACEMENT & MEDIAN SHOULDER RESURFACING																												
NB & SB	1257+76.00	1258+00.00	24	14	37.333					4.1		1.0											24		24	2		
NB & SB	1258+00.00	1262+80.75	480.75	14	747.83		42			81.8		19.5									748				481	12	BEGIN CONC. MEDIAN 1258+00	
NB & SB	1263+07.50	1263+12.50	5	3 & 4	1.9444		0.44			0.85		0.2									8	2					BEGIN LEFT TURN LANE 1263+12.5	
NB & SB	1263+12.50	1265+26.83	214.33	7.7 & 9.3	221.47		14			14.0		6.4									221	221					BEGIN LEFT TURN LANE 1263+12.5	
FEATHER (NB & SB @ BRIDGE)	1265+26.83	1266+26.83	100	13.6 & 3.4	37.778		11		2.00	8.4	2.39	10.0									38	38 /261						
BRIDGE NO. BEL-7-2389																					23	23						
FEATHER (NB & SB @ BRIDGE)	1266+83.55	1267+83.55	100	14 & 3	33.333		12		2.00	8.6	2.39	10.3									33 7618	33						
NB & SB	1267+83.55	1268+14.00	30.45	14 & 3	10.15		4			3.6		1.6									10	(10)					END CONC. MEDIAN 1268+14	
NB & SB	1268+14.00	1269+25.00	111	17	209.67		16			16.0		7.3															CR-4 INTERSECTION	
NB & SB	1269+25.00	1270+08.00	83	14 & 3	97.346		7			7.4		3.4									97							
NB & SB	1270+08.00	1275+31.25	523.25	13.3 & 3	471.4		35			36.0		16.4									471						IMPACT ATTENUATOR 1269+81.25	
NB & SB	1275+31.25	1337+34.09	6202.8	2 & 3	2067.6		103			105.3		47.9											6203	6203	523	12	BEGIN CONC. BARRIER 1270+08	
FEATHER (NB & SB @ BRIDGE)	1337+34.09	1338+34.09	100	2 & 3	33.333		2		2.00	1.2	2.26	1.4											100	100		4		
BRIDGE NO. BEL-7-2526																												
FEATHER (NB & SB @ BRIDGE)	1339+91.95	1340+91.95	100	2 & 3	33.333		2		2.00	1.2	2.26	1.4											100	100		4		
NB & SB	1340+91.95	1342+10.64	118.69	2 & 3	39.563		2			2.0		0.9											119	119		4	STATION EQUATION	
NB & SB	1342+00.00	1386+35.25	4435.3	2 & 3	1478.4		74			75.3		34.2											4435	4435	523	90	1342+10.64(BACK)=1342+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	1386+35.25	1387+35.25	100	2 & 3	33.333		2		2.00	1.2	2.39	1.5											100	100		4		
BRIDGE NO. BEL-7-2619																												
FEATHER (NB & SB @ BRIDGE)	1388+71.75	1389+71.75	100	2 & 3	33.333		2		2.00	1.2	2.14	1.3											100	100		4		
NB & SB	1389+71.75	1415+64.31	2592.6	2 & 3	864.19		43			44.0		20.0											2593	2593		54	STATION EQUATION	
NB & SB	0+00.00	7+49.89	749.89	2 & 3	249.96		12			12.7		5.8											750	750		18	1415+64.31(BACK)=0+00.00(AHEAD)	
FEATHER (NB & SB @ BRIDGE)	7+49.89	8+49.89	100	2 & 3	33.333		2		2.00	1.2	2.26	1.4											100	100		4		
BRIDGE NO. JEF-7-0016																												
				SUBTOTALS		271	8591	6561		8640.4		4136.3	1070	1070	668	8646	26128	5451		2659.2	1627	305	14623	15122	505	338		
QUANTITIES CARRIED TO THE GENERAL SUMMARY				GRAND TOTAL		271	8591	6561		8640		4136	1070	1070	668	8646	26128	5451		2659	1627	305	14623	15122	505	338 *		

* 626, BARRIER REFLECTOR, TYPE B CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY

PAVEMENT CALCULATIONS
MAINLINE / OUTSIDE SHOULDER / MEDIAN

BEL/JEF-7-23.76/0.00

17/94

STICKLEN – BELSHEIM & ASSOCIATES

** NOT INCLUDING EMBANKMENT CONSTRUCTION

LOCATION	STATION FROM	STATION TO	LENGTH	AVERAGE WIDTH RAMP	AVERAGE WIDTH SHOULDER	AREA RAMP	AREA SHOULDER	203 SUBGRADE COMPACTION	407 TACK COAT FOR I.C.	407 TACK COAT	446 THICKNESS	446 2 3/4" ASPHALT INTERMEDIATE COURSE TYPE 2, PG 64-28	446 THICKNESS	446 1 1/4" ASPHALT SURFACE COURSE, TYPE 1, PG 64-28 AS PER PLAN	203 EXCAVATION ** (1.1' AVG. DEPTH)	301 9" BITUMINOUS AGGREGATE BASE PG64-28	304 AVERAGE END AREA	304 AGGREGATE BASE	609 COMB. CURB & GUTTER, TYPE 2	COMMENTS	SEE SHEET
	FROM	TO	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YD.	SQ. YD.	SQ. YD.	GAL.	GAL.		CU. YD.		CU. YD.	CU. YD.	CU.YD.	SQ. FT.	CU. YD.	LIN. FT.		
RAMPS TO TR-469																					
	1334+00.00	1335+00.00	100.00	6.00	8.00	66.7	88.9	89	12	5		11.9		5.4	33	22	2.88	10.7		100' DECELERATION LANE TAPER	
DECELERATION LANE FOR RAMP D	1335+00.00	1336+18.50	118.50	12.00	8.00	158.0	105.3	105	20	12		20.1		9.1	39	26	2.88	12.7			
	1336+18.50	1338+46.57	228.07	14.00	8.00	354.8	202.7	181	42	27	2.00	31.0		19.4	66	45	2.88	21.7		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
	1340+04.43	1341+91.50	187.07	31.50	8.00	654.7	166.3	144	62	49	2.00	45.6		28.5	53	36	2.88	17.3		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
	1341+91.50	1342+41.50	50.00	16.00	10.00	88.9	55.6	39	11	7		11.0		5.0	14	10	2.47	4.6		TRANSITION SHOULDER WIDTH (8' TO 6')	
RAMP D	1342+41.50	1347+92.00	550.50	16.00	9.00	978.7	550.5	367	115	73		116.8		53.1	135	92	2.07	42.2			
	1347+92.00	1348+43.26	51.26			134.2	50.3	31	14	10		14.1		6.4	11	8		3.7		BEGIN WIDENING FOR INTERSECTION	
	1348+43.26	1348+85.93	42.67			357.1	69.8	37	32	27	2.00	5.3	1.25	14.8	23	16		7.7		RAMP FEATHERING @ INTERSECTION	32
ACCELERATION LANE FOR RAMP A	1331+00.00	1338+21.61	721.61	8.75	8.00	677.3	619.2	619	97	51	2.00	72.0		45.0	227	155	2.88	74.4		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
	1339+79.47	1341+00.00	120.53	23.44	8.00	248.8	84.9	85	25	19	2.00	18.5		11.6	31	21	2.88	10.2		DEDUCT APPROACH SLABS (BR. NO. BEL-7-2526) & FEATHER	
STATION EQUATION STA 1341+00 = STA 1340+89.33 'A'																					
	1340+89.33	1341+39.33	50.00	14.62	18.00	81.2	100.0	100	14	6		13.8		6.3	37	25	6.13	11.4		TRANSITION SHOULDER WIDTH (8' TO 6')	
	1341+39.33	1341+89.33	50.00	15.87	17.00	88.2	94.4	94	14	7		13.9		6.3	35	24	5.74	10.6			
	1341+89.33	1342+89.33	100.00	15.25	19.50	169.4	216.7	217	29	13		29.5		13.4	81	54	6.57	24.3		REPLACE GORE AREA (1340+89.33 TO 1344+00)	
RAMP A	1342+89.33	1344+00.00	110.67	16.00	23.00	196.7	282.8	283	36	15		36.6		16.7	104	71	7.74	31.7			
	1344+00.00	1348+00.00	400.00	16.00	9.00	711.1	400.0	267	83	53		84.9		38.6	98	67	2.07	30.6			
	1348+00.00	1350+19.52	219.52	16.00	9.00	390.3	219.5	146	46	29		46.6		21.2	54	37	2.07	16.8			
	1350+19.52	1350+94.11	74.59			148.3	71.3	51	16	11		16.8		7.6	20	13		6.2		BEGIN WIDENING FOR INTERSECTION	
	1350+94.11	1351+40.14	46.03			190.6	45.0	30	18	14	2.00	3.9	1.25	8.2	12	8		3.6		RAMP FEATHERING @ INTERSECTION	32
	1347+51.36	1349+35.00				235.3	109.7	73	26	18			1.25	12.0	44	28		13.3		RAMP FEATHERING @ INTERSECTION	32
	1349+35.00	1349+50.00				26.7	15.0	10	3	2	2.00	2.3	1.25	1.4	4	3		1.2		RAMP FEATHERING @ INTERSECTION	32
RAMP C	1349+50.00	1357+67.00	817.00	16.00	9.00	1452.4	817.0	545	170	109		173.4		78.8	200	136	2.07	62.6			
	1357+67.00	1358+00.00	33.00	16.00	24.75	58.7	90.8	91	11	4		11.4		5.2	33	23	8.32	10.2			
	1358+00.00	1359+00.00	100.00	15.00	21.75	166.7	241.7	242	31	13		31.2		14.2	89	61	7.32	27.1		REPLACE GORE AREA (1357+67 TO 1360+00)	
	1359+00.00	1359+50.00	50.00	15.50	17.75	86.1	98.6	99	14	6		14.1		6.4	36	25	5.99	11.1			
	1359+50.00	1360+00.00	50.00	14.50	18.25	80.6	101.4	101	14	6		13.9		6.3	37	25	6.22	11.5		TRANSITION SHOULDER WIDTH (6' TO 8')	
ACCELERATION LANE FOR RAMP C	1360+00.00	1370+00.00	1000.00	12.50	8.00	1388.9	888.9	889	171	104		174.0		79.1	326	222	2.88	106.8			
	1351+58.56	1352+05.13				106.0	49.3	29	12	8	2.00	3.2	1.25	5.4	11	7		3.5		RAMP FEATHERING @ INTERSECTION	32
RAMP B	1352+05.13	1358+50.00	644.87	16.00	9.00	1146.4	644.9	430	134	86		136.8		62.2	158	108	2.07	49.4			
	1358+50.00	1359+00.00	50.00	16.00	10.00	88.9	55.6	39	11	7		11.0		5.0	14	10	2.47	4.6		TRANSITION SHOULDER WIDTH (6' TO 8')	
	1359+00.00	1362+25.00	325.00	27.50	8.00	993.1	288.9	289	96	74		97.9		44.5	106	72	2.88	34.7			
DECELERATION LANE FOR RAMP B	1362+25.00	1363+68.84	143.84	14.00	8.00	223.8	127.9	128	26	17		26.9		12.2	47	32	2.88	15.4			
	1363+68.84	1366+00.00	231.16	12.00	8.00	308.2	205.5	205	39	23		39.2		17.8	75	51	2.88	24.7			
	1366+00.00	1367+00.00	100.00	6.00	8.00	66.7	88.9	89	12	5		11.9		5.4	33	22	2.88	10.7		100' DECELERATION LANE TAPER	
RAMPS TO PUBLIC RD.																					
ACCELERATION LANE FOR RAMP A	1406+48.31	1415+64.31	916.00	11.45	8.00	1165.4	814.2	814	148	87		151.2		68.7	299	204	2.88	97.8		1415+64.31(BACK)=0+00.00(AHEAD)	
	0+00.00	0+84.00	84.00	23.95	8.00	223.5	74.7	75	22	17		22.8		10.4	27	19	2.88	9.0		1415+64.31(BACK)=0+00.00(AHEAD)	
	0+84.00	1+34.00	50.00	14.50	18.38	80.6	102.1	102	14	6		14.0		6.3	37	26	6.26	11.6		TRANSITION SHOULDER WIDTH (8' TO 6')	
	1+34.00	1+84.00	50.00	15.50	18.63	86.1	103.5	103	14	6		14.5		6.6	38	26	6.28	11.6		REPLACE GORE AREA (0+84 TO 2+55)	
RAMP A	1+84.00	2+55.00	71.00	14.71	22.75	116.0	179.5	179	22	9		22.6		10.3	66	45	7.65	20.1			
	2+55.00	2+84.00	29.00	15.71	9.00	50.6	29.0	19	6	4		6.1		2.8	7	5	2.07	2.2			
	2+84.00	7+43.00	459.00	16.00	9.00	816.0	459.0	306	96	61		97.4		44.3	112	77	2.07	35.2			
	7+43.00	7+78.00	35.00	16.00	8.30	62.2	32.3	20	7	5		7.2		3.3	8	5	1.80	2.3		TRANSITION SHOULDER WIDTH (6' TO 4.6')	
	7+78.00	8+18.00	40.00	16.00	6.80	71.1	30.2	17	8	5	2.00	2.1	1.25	3.5	6	4	1.27	1.9		RAMP FEATHERING @ INTERSECTION (SHLDR. 4.6' TO 3')	33
	1407+93.56	1408+93.56	100.00	6.00	8.00	66.7	88.9	89	12	5		11.9		5.4	33	22	2.88	10.7	100	100' DECELERATION LANE TAPER	
DECELERATION LANE FOR RAMP D	1408+93.56	1410+00.00	106.44	12.00	8.00	141.9	94.6	95	18	11		18.1		8.2	35	24	2.88	11.4	~~106~~ 288.36	CURB & GUTTER, TYPE 2 (1407+93.56 TO 1415+79.82)	
	1410+00.00	1415+79.82	579.82	23.00	8.00	1481.8	515.4	515	150	111		152.6		69.3	189	129	2.88	61.9	580	1415+79.82(BACK)=0+00.00(AHEAD)	
	0+00.00	0+60.00	60.00	36.50	8.00	243.3	53.3	53	22	18		22.7		10.3	20	13	2.88	6.4		1415+79.82(BACK)=0+00.00(AHEAD)	
	0+60.00	1+10.00	50.00	16.00	10.00	88.9	55.6	39	11	7		11.0		5.0	14	10	2.47	4.6		TRANSITION SHOULDER WIDTH (8' TO 6')	
RAMP D	1+10.00	7+84.50	674.50	16.00	9.00	1199.1	674.5	450	141	90		143.1		65.1	165	113	2.07	51.7			
	7+84.50	8+19.50	35.00	16.00	8.30	62.2	32.3	20	7	5		7.2		3.3	8	5	1.80	2.3		TRANSITION SHOULDER WIDTH (6' TO 4.6')	
	8+19.50	8+59.50	40.00	16.00	6.80	71.1	30.2	17	8	5	2.00	2.1	1.25	3.5	6	4	1.27	1.9		RAMP FEATHERING @ INTERSECTION (SHLDR. 4.6' TO 3')	33
							SUBTOTALS	9057	2157	1362		2046.2		998.8	3354	2280		1069.6	~~786~~	~~1468.36~~	
QUANTITIES CARRIED TO THE GENERAL SUMMARY							GRAND TOTAL	9057	2157	1362		2046		999	3354	2280		1070	~~786~~		

ITEM 611 - REINFORCED CONCRETE APPROACH SLAB (T=17"), AS PER PLAN

FROM STATION 1266+83.55 TO STATION 1267+13.55 = 30.00 LIN. FT.

30.00 x	70.50 x	1 / 9 =	235.00 S.Y.
(1.5 x 1.5)+(2.5 x 1.5)	1 / 9 =		6.67 S.Y.
TOTAL CARRIED TO GENERAL SUMMARY =			**242 S.Y.**

CALC. BY: ATH DATE: 1/95
CHKD. BY: DGK DATE: 10/95

PAVEMENT CALCULATIONS
RAMP / RAMP SHOULDERS / SPEED CHANGE LANES

BEL/JEF-7-23.76/0.00

18
94

STICKLEN - BELSHEIM & ASSOCIATES

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255 FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C — TYPE Y/Y PASSING LANE SQ. YD.	TYPE Y/Y TRAVEL LANE SQ. YD.	TYPE Y/N/Y PASSING LANE SQ. YD.	TYPE Y/N/Y TRAVEL LANE SQ. YD.	TYPE Y/PRJ/Y PASSING LANE SQ. YD.	TYPE Y/PRJ/Y TRAVEL LANE SQ. YD.	FULL DEPTH PAVEMENT SAWING LIN. FT.	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS — TYPE Y/Y SPEED CHANGE LANE SQ. YD.	TYPE Y/N/Y SPEED CHANGE LANE SQ. YD.	* WIRE FABRIC REINF., AS PER BP-2.5 SQ. YD.	413 SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS LIN. FT.	SPECIAL PRESSURE RELIEF JOINT, TYPE A LIN. FT.	202 PAVEMENT REMOVED SQ. YD.	605 6" UNCLASSIFIED PIPE UNDERDRAIN 707.01 OR 707.21 LIN. FT.	COMMENTS SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
S.R. 7 NORTHBOUND																	
1269+99 / 1270+13		28.9	8.0					70			*28.9	66.0				SEE 'JOINT/CRACK REPAIR' DETAIL	34
1265+56 (NB & SB)						36.4	21.3	152 177.3				155.3 152.0	69.65 68.0 ✓	60.4 ✓	88.0	SEE O.D.O.T. STD. DWG. BP-2.3	
1267+54 (NB & SB)						36.4	21.3	152 177.3				152.0	69.65 68.0 ✓	60.4 ✓	88.0	SEE O.D.O.T. STD. DWG. BP-2.3	
1270+35			8.0					30				40.0					
1288+76		8.7	8.0					56				66.0					
1290+91 / 1291+54				99.7	64.0			119			*163.7	145.0				SEE 'DETAIL 1'	34
1292+76		8.7	8.0					56				66.0					
1305+84			8.0					30				40.0					
1308+67		8.7	8.0					56				66.0					
1310+61		8.7	8.0					56				66.0					
1311+83		8.7						32				26.0					
1320+33		8.7						32				26.0					
1321+90		8.7						32				26.0					
1322+73		8.7	8.0					56				66.0					
1323+46		8.7	8.0					56				66.0					
1324+73		8.7	8.0					56				66.0					
1325+00	N	8.7	8.0					56				66.0					
1326+27		8.7	8.0					56				66.0					
1329+43		8.7						32				26.0					
1331+03		8.7	8.0					56				66.0					
1331+78	O	8.7						32				26.0					
1332+61		8.7	8.0					56				66.0					
1333+40		8.7						32				26.0					
1334+17		8.7						42	1.3		*1.3	46.0					
1334+60	R	8.7						32				26.0					
1336+10								30	8.0		*8.0	40.0					
1336+46		8.7						64	8.7		*8.7	68.0					
1336+90		8.7	8.0					90	9.3		*9.3	94.0					
1337+22	T	8.7	8.0					102	13.3		*13.3	106.0					
1337+65		8.7	8.0					62				72.0					
1341+79								38	10.7		*10.7	48.0					
1349+30			8.0					30				40.0					
1350+05	H		8.0					30				40.0					
1360+79								38	10.7		*10.7	48.0					
1362+47								38	10.7		*10.7	48.0					
1362+85								38	10.7		*10.7	48.0					
1363+71	B							38	10.7		*10.7	48.0					
1364+44								32	8.7		*8.7	42.0					
1365+21								30	8.0		*8.0	40.0					
1365+67								28	7.3		*7.3	38.0					
1366+09	O							26	6.7		*6.7	36.0					
1366+45			8.0					54	6.0		*6.0	58.0					
1366+86								22	5.3		*5.3	32.0					
1367+26			8.0					50	4.7		*4.7	44.0					
1367+69	U							18	4.0		*4.0	28.0					
1368+07								16	3.3		*3.3	26.0					
1368+42								14	2.7		*2.7	24.0					
1368+84								12	2.0		*2.0	22.0					
1370+03	N		8.0					30				40.0					
1382+79 / 1382+86		18.8	17.3					63			*36.1	66.0					
1383+26			8.0					30				40.0					
1383+60			8.0					30				40.0					
1386+05	D	8.7	8.0					56				66.0					
1386+39		8.7	8.0					56				66.0					
1386+97 / 1387+00		13.0	12.0					59				66.0				SEE 'JOINT/CRACK REPAIR' DETAIL	34
1389+87			8.0					30				40.0					
1391+46		8.7	8.0					56				66.0					
1391+88			8.0					30				40.0					
1392+28			8.0					30				40.0					
1394+23			8.0					30				40.0					
1395+03 / 1395+09			16.0					36			*16.0	40.0					
1401+50			8.0					30				40.0					
1408+27			8.0					38	2.7		*2.7	42.0					
1408+63			8.0					36				46.0					
1408+70								24	6.0		*6.0	34.0					
1409+09								30	8.0		*8.0	40.0					
1409+46								30	8.0		*8.0	40.0					
1411+90								30	8.0		*8.0	40.0					
1412+66								38	10.7		*10.7	48.0					
1413+13								46	13.3		*13.3	56.0					
1414+25								54	16.0		*16.0	64.0					
1415+47								38	10.7		*10.7	48.0					
1+26			8.0					30				40.0					
2+00 / 2+09			20.0					39			*20.0	40.0					
3+97 / 4+03			16.0					36			*16.0	40.0					
4+79		8.7	8.0					56				66.0					
6+02		8.7	8.0					56				66.0					
6+38 / 6+47		21.7	20.0					65			*41.7	66.0					
SUBTOTALS		**325.0**	**397.3**	**99.7**	**64.0**	**72.9**	**42.7**	**3547.0**	**236.0**	**0.0**	***558.3**	**4105.0**	**136.0**	**120.9**	**176.0**	QUANTITIES CARRIED TO SHEET NO. 25	

CALC. ATH DATE: 1/95
CHKD. DCK BY: DATE: 10/95

CALCULATIONS
FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

BEL/JEF-7-23.76/0.00

FINAL 1995/11 ATH 5/29/97

* FOR INFORMATION ONLY, COST INCLUDED IN ITEM 255.

EXISTING CRACK STATION	LANE	255								413	COMMENTS	
		FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS C				FULL DEPTH PAVEMENT SAWING	FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID PAVEMENT REPLACEMENT, CLASS FS			* WIRE FABRIC REINF., AS PER BP-2.5	SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	SEE 'CRACK REPAIR' DETAILS (UNLESS OTHERWISE SHOWN BELOW)	SEE SHEET
		TYPE Y/Y		TYPE Y/N/Y			TYPE Y/Y	TYPE Y/N/Y					
		PASSING LANE	TRAVEL LANE	PASSING LANE	TRAVEL LANE		SPEED CHANGE LANE	SPEED CHANGE LANE					
		SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	LIN. FT.	SQ. YD.	SQ. YD.		SQ. YD.	LIN. FT.		
6+77 / 6+88		8.7	22.7			67				*22.7	66.0		
7+17 / 7+26		21.7	20.0			65				*41.7	66.0		
7+67		8.7	8.0			56					66.0		
S.R. 7 SOUTHBOUND													
1258+00 / 1263+13		741.0	684.0			563				*1425.0	50.0	REPLACE PAVEMENT	
1258+52			8.0			30					40.0		
1259+05		8.7	8.0			56					66.0		
1260+22			8.0			30					40.0		
1262+27			8.0			30					40.0	1 FT. DIAMETER HOLE	
1262+41 / 1262+58		33.2	30.7			73				*63.9	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1262+99		8.7	8.0			56					66.0		
1263+61 / 1268+30		498.3			633.3	525				*1131.7	196.0	SEE 'DETAIL 8'	35
1268+43			8.0			30					24.0		
1268+52						14	2.7			2.7	8.0		
1268+55			8.0			30					24.0		
1269+12			8.0			30					24.0		
1269+46		8.7	8.0			56					66.0		
1269+87 / 1269+93		17.3	16.0			62				*33.3	66.0		
1270+77			8.0			30					40.0		
1271+92			8.0			30					40.0		
1272+41		8.7	8.0			56					66.0		
1273+15			8.0			30					40.0		
1273+51			8.0			30					40.0		
1274+00			8.0			30					40.0		
1274+37	S		8.0			30					40.0		
1274+67			8.0			30					40.0		
1275+10 / 1275+18		20.2	18.7			64				*38.9	66.0		
1275+56 / 1275+59		8.7	12.0			59					66.0		
1275+76 / 1275+87	O	24.6	22.7			67				*47.3	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1276+37		8.7	8.0			56					66.0		
1276+73			8.0			30					40.0		
1276+95 / 1277+19		17.3			40.0	106				*57.3	92.0	SEE 'DETAIL 2'	35
1277+51	U	8.7				32					26.0		
1278+01			8.0			30					40.0		
1278+33 / 1278+46			25.3			43				*25.3	40.0		
1278+73		8.7	8.0			56					66.0		
1279+20	T		8.0			30					40.0		
1279+52 / 1279+61		8.7	20.0			65				*20.0	66.0		
1279+92			8.0			30					40.0		
1280+33			8.0			30					40.0		
1280+71	H	8.7	8.0			56					66.0		
1281+21		8.7	8.0			56					66.0		
1281+98 / 1282+08			21.3			40				*21.3	40.0		
1282+85			8.0			30					40.0		
1283+20	B		8.0			30					40.0		
1283+48			8.0			30					40.0		
1283+95 / 1284+03		8.7	18.7			64				*18.7	66.0		
1284+16 / 1284+21		15.9	8.0			61				*15.9	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1284+41	O	8.7	8.0			56					66.0		
1284+84			8.0			30					40.0		
1285+16		8.7	8.0			56					66.0		
1285+65			8.0			30					40.0		
1285+99	U	8.7	8.0			56					66.0		
1286+42			8.0			30					40.0		
1286+74			8.0			30					40.0		
1287+53 / 1287+58			14.7			35				*14.7	40.0		
1288+74	N	8.7	8.0			56					66.0		
1289+06 / 1289+22					29.3	46				*29.3	40.0		
1289+57			8.0			30					40.0		
1289+93			8.0			30					40.0		
1290+47 / 1290+57	D	8.7	21.3			66				*21.3	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1290+73		8.7				32					26.0		
1290+82			8.0			30					40.0		
1291+95 / 1292+03			18.7			38				*18.7	40.0		
1292+70 / 1292+77		18.8	17.3			63				*36.1	66.0		
1293+11			8.0			30					40.0		
1294+66		8.7	8.0			56					66.0		
1295+26 / 1295+36		23.1	21.3			66				*44.4	66.0	SEE 'JOINT/CRACK REPAIR' DETAIL	34
1296+35			8.0			30					40.0		
1296+72 / 1296+83			22.7			41				*22.7	40.0		
1297+92 / 1298+13				39.0	36.0	77				*75.0	66.0	SEE 'DETAIL 3'	35
1298+69			8.0			30					40.0		
1299+18			8.0			30					40.0		
1299+51			8.0			30					40.0		
1299+88		8.7	8.0			56					66.0		
1300+00			8.0			30					40.0		
1300+32 / 1300+56		17.3			40.0	106				*40.0	92.0	SEE 'DETAIL 4'	35
SUBTOTALS		1639.5	1428.0	39.0	778.7	4400.0	2.7	0.0		*3245.1	3890.0	QUANTITIES CARRIED TO SHEET NO. 25	

Grand Total off 661

CALCULATIONS

FULL DEPTH RIGID PAVEMENT REMOVAL AND REPLACEMENT

BEL/JEF-7-23.76/0.00

CALC. BY: ATH DATE: 1/95

CHKD. BY: DGK DATE: 10/95

21
94

FINAL
RRS 1/95/22
9/6/94

STICKLEN – BELSHEIM & ASSOCIATES

DRAINAGE QUANTITIES

REF. NO.	PLAN SHEET NO.	LOCATION	SIDE	603 CONDUIT, TYPE B (Lin. Ft.) 6"	12"	15"	18"	21"	24"	27"	30"	36"	42"	48"	604 CATCH BASIN NO. 3 EA.	NO. 4 EA.	NO. 5 EA.	NO. 5A EA.	604 INLET NO. 2-A-6* EACH	604 MANHOLE ADJUSTED TO GRADE EACH	202 CATCH BASIN ABANDONED EACH	WINDOW OR GRATE ELEVATION	INVERT ELEVATION	DEPTH	EXISTING PIPE CONNECTIONS
1D	42	1258+75.0	Lt.		4														1			664.27	661.02	3.25	12" E
2D	42	1258+75.0	Rt.		4	4													1	1 +		664.21	659.79	4.42	12" W, 15" N
3D	42	1262+50.0	Lt.						(8)								(1)		(1)			662.08	656.59	5.49	24" E&W
4D	42	1262+40.0	Rt.		4										1							661.94	658.59	3.35	12" N
5D	42	1263+75.0	Lt.		4										1							661.49	657.76	3.73	12" E
6D	42	1263+75.0	Rt.		8										1							661.48	655.51	5.97	12" E&W
7D	42	1264+50.0	Lt.		4										1							661.68	658.05	3.63	12" E
8D	42	1264+50.0	Rt.		8										1							661.73	656.11	5.62	12" E&W
9D	42	1269+30.0	Lt.					4									1					657.38	654.06	3.32	21" S
10D	43	1278+54.0	Lt.														1					668.41	662.97	5.44	18" E
11D	43	1283+34.0	Lt.														1					675.22	671.77	3.45	18" E
12D	43	1288+78.0	Lt.														1					683.70	680.26	3.44	18" E
13D	43	1292+78.0	Lt.														1					689.6	686.30	3.30	18" E
14D	43	1295+27.0	Lt.														1					691.65	688.40	3.25	18" E
15D	43	1298+00.0	Lt.														1					693.96	691.04	2.92	18" E
16D	43	1300+50.0	Lt.														1					695.18	691.47	3.71	18" E
17D	44	1304+30.0	Lt.													1						697.00	693.50	3.50	21" E
18D	44	1310+10.0	Lt.						4							1						699.85	695.89	3.96	24" N
19D	44	1311+30.0	Lt.						4							1						698.59	694.54	4.05	24" S, 30" E
20D	44	1314+50.0	Lt.														1					699.92	696.54	3.38	18" E
21D	44	1318+00.0	Lt.														1					701.37	697.88	3.49	18"E
22D	44	1321+00.0	Lt.								4						X	1 ← changed				703.34	697.43	5.91	30" N&E
23D	44	1324+50.0	Lt.						4		4						1					704.67	699.42	5.25	24" N, 30" S
24D	44	1327+50.0	Lt.						4								1					705.79	702.26	3.53	24" S
25D	45	1345+50.0	Lt.	4			4										1					680.95	677.95	3.00	6" E, 18" N
26D	45	1346+50.0	Lt.				4		4							1						682.24	676.22	6.02	18" S, 24" E
27D	45	1347+00.0	Rt.						8								1					671.56	668.47	3.09	24" E&W
28D	46	1355+00.0	Lt.						4								1					662.27	658.74	3.53	24" E
29D	46	1355+00.0	Rt.						4	4							1	1				663.28	657.56	5.72	24" W, 27" E
30D	46	1361+73.0	Lt.										4				1	1				659.32	654.61	4.71	42" E
31D	47	1388+32.0	Lt.											8				1				661.81	655.48	6.33	48" N & S
32D	47	1389+00.0	Lt.		4									8				1				680.67	672.14	8.53	12" E, 48" N&S
33D	47	1388+30.0	Rt.				4										1					657.80	654.55	3.25	18" S
34D	47	1394+50.0	Lt.											8				1				684.19	676.13	8.06	48" N&S
35D	47	1398+50.0	Lt.											8				1				685.9	678.76	7.14	48" N&S
36D	47	1402+50.0	Lt.		4								4	4		1						687.43	679.94	7.49	12"E,42"N,48"S
37D	47	1402+50.0	Rt.		4										1							689.43	685.68	3.75	12" W
38D	48	1405+50.0	Lt.		4							4	4			1						688.43	681.71	6.72	12"E,36"N,42"S
39D	48	1405+50.0	Rt.		4										1							690.54	687.05	3.49	12" W
40D	48	1410+50.0	Lt.		4					4		4				1						690.01	684.24	5.77	12"E,27"N,36"S
41D	48	1410+50.0	Rt.		4										1							692.01	688.10	3.91	12" W
42D	48	1413+50.0	Lt.				4			4							1					691.05	686.45	4.60	18" N, 27" S
43D	48	0+84.0	Lt.	4	4		4										1					694.85	689.53	5.32	6"E,12"E,18"S
44D	48	0+86.0	Lt.		10															1 **		697.42	693.69	3.73	12" N&S
45D	48	1+36.0	Lt.																	1 ***		698.53	693.87	4.66	12" S
46D	48	0+50.0	Rt.			4											1					667.12	665.12	2.00	15" SE
47D	48	8+70.0	Rt.		4												1					685.40	682.40	3.00	12" N
48D	48	8+66.0	Lt.		8												1					693.00	689.09	3.91	12" N & W
49D	48	8+59.0	Lt.		4												1					694.50	691.00	3.50	12" N
TOTALS—Carried To General Summary				8	94	8	20	4	44	12	8	8	12	36	8	7	24	6	3	1	2	--------	--------	--------	--------

Extra #5 at 1359+00 Lt. →

* Apron as Per Standard Drawing I-2 ** Connect Pipes Thru *** Plug Existing Pipe + See Sheet No. 36.

For Inlet, No. 3B50, As Per Plan details, see sheet no. 50A.

CALC. BY: ATH DATE: 8/95
CHKD. BY: BPS DATE: 11/95

DRAINAGE QUANTITIES

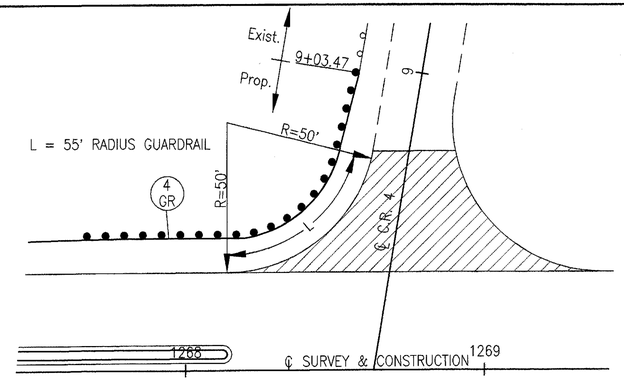
BEL/JEF-7-23.76/0.00

26/94

2/26/97 ATH 1993091 FINAL

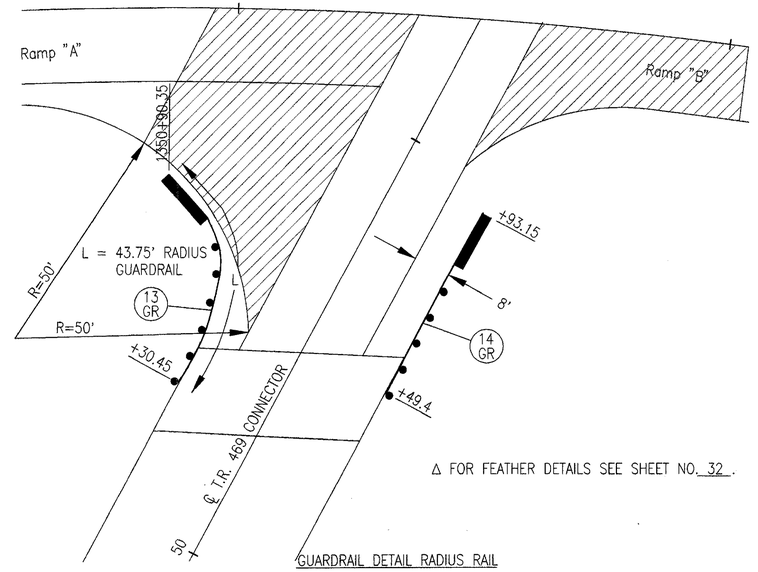
GUARDRAIL & BARRIER REFLECTOR QUANTITIES

REF. NO.	PLAN SHEET NO.	STATION FROM	STATION TO	SIDE	202 GUARDRAIL REMOVED LIN. FT.	202 GUARDRAIL REMOVED, BARRIER DESIGN LIN. FT.	606 GUARDRAIL, TYPE 5 LIN. FT.	606 ANCHOR ASSEMBLY TYPE B EA.	606 ANCHOR ASSEMBLY TYPE E EA.	606 ANCHOR ASSEMBLY TYPE T EA.	606 BRIDGE TERMINAL ASSEMBLY TYPE 1 EA.	606 BRIDGE TERMINAL ASSEMBLY TYPE 2 EA.	626 BARRIER REFLECTOR, TYPE A EA.	626 BARRIER REFLECTOR, TYPE B EA.	SPECIAL IMPACT ATTENUATOR, QUADGUARD TYPE EACH	622 CONCRETE BARRIER, TYPE LIN. FT.	622 CONCRETE BARRIER, TYPE D LIN. FT.	COMMENTS
1GR	42	1258+00.0	1263+12.5	CL	200	412.5									1			
		1262+80.75	1263+07.50			312.5?												
2GR	42	1257+94.48	1265+98.63	Rt.	804.15		806.25				1		18	2				MATCH EXISTING G.R. @ 1257+94.48
		1257+94.48	1266+00.73															
3GR	42	1265+59.22	1266+59.22	Lt.	100		87.50		1		1		3					
		1265+61.22	1266+61.22															
4GR	42	1267+14.89	8+35.55 CR4	Lt.	250		181.25		1		1		3					SEE DETAIL RIGHT INCLUDES 55' RADIUS RAIL
		1267+12.79	9+03.47 CR4															
5GR	42–44	1266+54.3	1322+73.5	Rt.	5625		5612.5		1		1		57					
		1266+52.30	1322+77.30															
6GR	45	1330+00.0	1338+42.93	Rt.	825		731.25	1			1		9					
		1331+01.28	1338+45.03															
7GR	45	1337+40.0	1338+02.46	Lt.	62.5		106.25				1	1	3				(14)	
		1336+97.90	1338+04.46															
8GR	45	1340+29.87	44+70.0 TR469	Rt.	887.5		775		1			1	9					STATION EQUATION 1342+10.64(BACK)=1342+00(AHEAD)
		1340+27.87	1348+04.73 D															
9GR	45	1339+78.45	1341+28.5 A	Lt.	150		143.75	1			1		3					RAMP "A" STATION EQUATION 1341+00(BACK)=1340+89.33(AHEAD)
		1339+76.35	1341+21.93 A															
10GR	45	46+56.0 TR469	47+85.26 TR469	Lt.	125		100		1		1		3					
		46+62.36 TR469	47+87.36 TR469															
11GR	45	1348+75.0	1351+00.0	Rt.	225		31.25		1		1		2	2			60	SEE STANDARD CONSTRUCTION DWG. GR–8.1
		1349+39.07	1349+95.32															
12GR	45	1350+00.0	1352+25.0	Lt.	225		31.25		1		1		2	2			60	SEE STANDARD CONSTRUCTION DWG. GR–8.1
		1351+04.68	1351+60.93															
13GR	45	50+32.55 TR469	1350+82 A	Lt.	50		31.25			1	1		2					SEE DETAIL RIGHT INCLUDES 43.75' RADIUS RAIL
		50+30.45 TR469	1350+90.35 A															
14GR	45	50+51.5 TR469	51+01.5 TR469	Rt.	50		31.25			1	1		2					SEE DETAIL RIGHT
		50+49.4 TR469	50+93.15 TR469															
15GR	45	47+24.0 TR469	48+07.55 TR469	Rt.	87.5		56.25		1		1		2					
		47+28.4 TR469	48+09.65 TR469															
16GR	45,46	43+00.0 TR469	1355+04.0 C	Rt.	987.5		950		1	1			11					
		1349+46.0 C	1356+46.0 C															
17GR	454,46	1349+46.0 C	1355+46.0 C	Lt.	700		562.5		1	1			7					
		1353+75.0 B	1357+72.0 B															
18GR	46	1353+75.0 B	1357+75.0 B	Rt.	400		362.5		1	1			5					
		1357+50.0 C	1369+00.0															
19GR	46	1357+50.0 C	1369+00.0	Rt.	1150		1112.5		1	1			13					
		1384+04.0	1387+27.36															
20GR	47	1384+04.36	1387+29.36	Lt.	325		312.5			1		1	5					
		1385+75.0	1387+26.12															
21GR	47	1385+71.97	1387+28.22	Rt.	150		131.25		1		1		3					
		1388+82.64	1390+31.0															
22GR	47	1388+80.54	1390+36.79	Lt.	150		131.25		1		1		3					
		1388+83.88	7+94.0 D															
23GR	47,48	1388+81.88	7+89.56 D	Rt.	3487.5		3475			1		1	36					RAMP "D" STATION EQUATION 1415+79.82(BACK)=0+00(AHEAD)
		3+96.5	8+34.36															
24GR	48	3+98.86	8+36.36	Lt.	437.5		425			1		1	6					
		1+53.0	8+40.59															
25GR	48	1+61.44	8+42.69	Rt.	687.5		656.25		1		1		8					
		1269+81.25	1275+31.25															
26GR	42	1269+81.25	1270+08	CL	~~550~~ WRONG → 550										1			
TOTALS – Carried To Traffic Control General Summary													215	6				
TOTALS – Carried To General Summary					18692	413	16843.75	2	11	13	14	7			2		120	



GUARDRAIL DETAIL RADIUS RAIL

* FACE OF RAIL VARIES 11.0' TO 11.44' FROM EDGE OF PAVEMENT STA. 1267+12.79 TO STA. 9+03.47



Δ FOR FEATHER DETAILS SEE SHEET NO. 32 .

GUARDRAIL DETAIL RADIUS RAIL

STA. 50+30.45 TR 469 TO STA 1350+90.35 RAMP 'A' *
STA. 50+49.40 TR 469 TO STA 50+93.15 TR 469 **
* FACE OF RAIL VARIES 2' TO 8.87' FROM EDGE OF PAVEMENT
** FACE OF RAIL 8' FROM EDGE OF PAVEMENT

ITEM SPECIAL SEALING OF CONCRETE SURFACES (EPOXY)

CONCRETE MEDIAN

Sta. 1263+07.50 to Sta. 1263+12.50 =	5	
Sta. 1263+12.50 to Sta. 1266+26.83 =	314.33	
Sta. 1266+83.55 to Sta. 1268+14.00 =	130.45	
	449.78	LIN FT

CONCRETE BARRIER

Sta. 1257+76 to Sta. 1262+80.75 =	504.75	
Sta. 1270+08 to Sta. 1342+10.64 BK =	7202.64	
Sta. 1342+00 AHD to Sta. 1415+64.31 BK =	7364.31	
Sta. 0+00.00 AHD to Sta. 8+49.89 =	849.89	
	15416.84	LIN FT
Deduct Bridge BEL – 7 – 2526	–157.86	
Deduct Bridge BEL – 7 – 2619	–136.50	
Total Concrete Barrier, Type A =	15122.48	LIN FT
Total Concrete Barrier, Type B =	504.75	LIN FT
Total Concrete Barrier, Type D =	120.00	LIN FT

SURFACE AREA

Concrete Median ((5 x 50"/12) + (444.78' x 44"/12)) x 1/9 =	183.52	
Concrete Barrier, Type A 15122.48' x 74.62"/12 x 1/9 =	10,448.51	
Concrete Barrier, Type B 504.75' x 116.62"/12 x 1/9 =	545.04	
Concrete Barrier, Type D 120.00' x 75.31"/12 x 1/9 =	83.68	
	11,260.75	S.Y.
Total Carried to Sheet No. 8 =	11,261	S.Y.

CALC. BY: ATH DATE: 1/95
CHKD. BY: BPS DATE: 1/95

CALCULATIONS - GUARDRAIL & BARRIER MEDIAN

BEL/JEF-7-23.76/0.00

29/94

FINAL 1993CALS ATH 2/28/97

* 707.31, 707.33 OR 707.42

UNDERDRAIN QUANTITIES

Station From	Station To	Lane	605 4" Shallow Pipe Under-Drain, 707.31 As Per Plan Lin. Ft.	604 Precast Reinforced Concrete Outlet Each	603 6" Conduit Type F, * Lin. Ft.	Bends & Branches Tee Each	Bends & Branches 90 Each	Outlet Station	Plug Station	Comments
									1276+50	Make
1269+25	1276+50	Rt.	725	1	40	1		1273+00		UD
				1	40		1	1269+25		18" Deep
									1288+25	
					19	1		1283+34		Outlet to CB
1269+25	1288+25	Lt.	1900		18	1		1278+54		Outlet to CB
				1	36		1	1269+30		Outlet to CB
									1310+75	
				1	18	1		1305+75		
1288+25	1310+75	Rt.	2250	1	18	1		1300+75		
				1	38	1		1295+75		
				1	38	1		1290+75		
				1	24		1	1288+25		
									1302+25	
					19	1		1300+50		Outlet to CB
1295+25	1302+25	Lt.	725		18	1		1298+00		Outlet to CB
					18		1	1295+27		Outlet to CB
									1328+50	
					18	1		1327+50		Outlet to CB
					18	1		1324+50		Outlet to CB
					19	1		1321+00		Outlet to CB
1310+10	1328+50	Lt.	1840		21	1		1318+00		Outlet to CB
					21	1		1314+50		Outlet to CB
					22	1		1311+30		Outlet to CB
					22		1	1310+10		Outlet to CB
				1	22	1		1327+00		
				1	24	1		1322+50		
1322+50	1338+25	Rt.	1575	1	30	1		1337+00		
				1	30	1		1338+25		
									1342+25	Make UD
1342+25	1348+75	Rt.	650	1	16		1	1348+75		12" Deep
1340+40	D1347+16	Rt.	676	1	15		1	D1347+16		
								~~1350+00~~	1342+25	Make UD
1342+25	1359+00	Lt.	1675	1	20	1		~~1352+25~~		12" Deep
					20	1		1355+00		Sag, Outlet to CB
									1359+00	
				1	30	1		1368+75		
				1	33	1		1363+75		
1359+00	1380+25	Lt.	2125	1	22	1		1378+75		Make UD
				1	22		1	1380+25		18" Deep
									A1348+00	
A1340+89.33	A1348+00	Rt.	711		20	1		A1345+50		Sag, Outlet to CB
~~B1353+50~~	B1359+00	Lt.	550	~~X~~	20	1		~~B1349+00~~	outlet to CB ~~5~~ 6 1354+00	
				1	20		1	C1349+00		
C1349+00	C1360+00	Rt.	1100	1	22	1		C1354+00		
				1	23	1		C1357+25		
				1	17	1		1363+75		
				1	30	1		1368+75		
1360+00	1387+05	Rt.	2705	1	33	1		1378+75		
				1	32	1		1382+75		
				1	32	1		1383+50		
									1387+05	
				1	18		1	1388+90		
				1	20	1		1392+50		
				1	18	1		1397+50		
1388+90	0+59	Rt.	2733		10	1		~~1402+50~~		Outlet to CB
					10	1		~~1406+50~~		Outlet to CB
					20	1		~~1410+50~~		Outlet to CB
				1	22		1	2+50		
2+50	8+25	Rt.	575	1	20	1		4+25		
									8+25	
							1	~~D0+55~~		Connect to Exist UD
D0+59	D8+55	Rt.	796	1	20	1		D0+59		
				~~X~~	18		1	~~1395+50~~ 1394+50		Make UD
									1398+47	18" Deep
1395+50	0+84	Lt.	2098		23	1		1398+50		Outlet to CB
					23	1		1402+50		Outlet to CB
					23	1		1405+50		Outlet to CB
					22	1		1410+50		Outlet to CB
					22	1		1413+50		Outlet to CB
							1	A8+58.5		Outlet to CB
A0+84	A8+58.5	Lt.	775		20	1		A0+84		Outlet to CB
									8+25	
~~3+50~~ 3+80	8+25	Lt.	~~495~~ 475	1	22		1	~~3+50~~ 3+80		
SubTotals						46	15			
Totals			26659	36	1349	-------	-------			

34/31

Extra CB #5
1354+00 Lt
25 L.F. 12"

For Underdrain Details See Sheet 49.

CALC. BY: ATH DATE: 1/95
CHKD. BY: BPS DATE: 11/95

UNDERDRAIN QUANTITIES

BEL/JEF-7-23.76/0.00

30/94

FINAL 1993CALC 9/5/96

REF. NO.	PLAN SHEET NO.	202 FENCE, REMOVED	FENCE, TYPE CLT	FENCE, TYPE 47	607 POST ASSEMBLY Ⓒ	POST ASSEMBLY Ⓔ	POST ASSEMBLY Ⓘ	LINE POST Ⓛ	FENCE TERMINAL TE	FENCE TERMINAL TD	FENCE TERMINAL Ⓐ		STREAM CROSSING X1	STREAM CROSSING X2	STREAM CROSSING X3	STREAM CROSSING X4		625 GROUND ROD
		LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	EACH	EACH	EACH	EACH		EACH	EACH	EACH	EACH		EACH
1-F	42	760																1
2-F	42	34	784		4	2												
3-F	42	66	66		1	2												
4-F	42,43	1035		1035	2	1	2		1									
5-F	42-45	6531																
8-F	44-45	3475		3475	4	1	7				1				2			
10-F	45	294		294	2				1		1				1			
11-F	45	1112		1112	3	1	2	1			1							
12-F	45-47	4953		4953	2		9		1		1				2			
13-F	45-47	4550		4550	3	1	19	2			1			2				
14-F	47	263		263	2				1		1							
15-F	47,48	3732	3732		8	1	11				1							1
XTRA'S	27'+28'=	SS	SS															
16-F	48	358	358		2	1			1									
SUB-TOTAL		27163	4940	15682	33	10	50	3	5	0	7			2	5			2
TOTAL:		27163	4940	15682														2

QUANTITIES CARRIED TO THE GENERAL SUMMARY.

FENCE LEGEND

- Ⓒ — CORNER POST ASSEMBLY
- Ⓔ — END POST ASSEMBLY
- Ⓘ — INTERMEDIATE ANCHOR POST ASSEMBLY
- Ⓛ — WOOD POST OR CONCRETE ENCASED STEEL LINE POST
- TE — FENCE TERMINAL ASSEMBLY, TYPE E
- TD — FENCE TERMINAL ASSEMBLY, TYPE D
- Ⓐ — ABUTMENT CONNECTION
- X2 — CROSSING, TYPE 2
- X3 — CROSSING, TYPE 3
- ⏚ — GROUND ROD

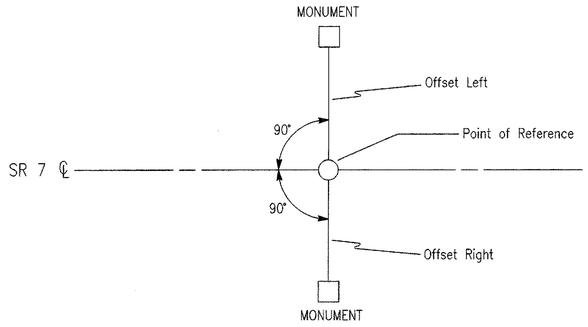
FOR DETAILS, SEE STANDARD DRAWINGS F-1, F-2, F-3, F-5, AND F-6.

CENTERLINE REFERENCE MONUMENTS

(See Note on Sheet No. 9)

Reason: 52"W x 11" Conflict

POINT OF REFERENCE		AS Built offsets	OFFSET FROM ℄ S.R. 7 LT.	OFFSET FROM ℄ S.R. 7 RT.	604 REFERENCE MONUMENT, AS PER PLAN EACH
P.O.T.	1260+00.00		44'	40'	2
P.O.T.	1265+00.00	35'	44'	40'	2
P.O.T.	1270+00.00	31'	43'	44.75'	2
P.O.T.	1275+00.00	31'	38'	39.75'	2
P.C.	1278+97.10	31'	37.5'	39.5'	2
P.O.C.	1283+00.00	31'	37.5'	39.5'	2
P.T.	1287+50.61	31'	37.5'	39.5'	2
P.C.	1289+01.30	31'	37.5'	39.5'	2
P.T.	1292+60.37	31'	37.5'	39.5'	2
P.O.T.	1299+00.00	31'	37.5'	39.5'	2
P.C.	1304+71.91	31'	37.5'	39.5'	2
P.O.C.	1307+06.81	31'	37.5'	39.5'	2
P.T.	1309+78.97	31'	37.5'	39.5'	2
P.C.	1311+83.69	31'	37.5'	39.5'	2
P.O.C.	1316+00.00	31'	37.5'	39.5'	2
P.T.	1320+12.15	31'	37.5'	39.5'	2
P.O.T.	1325+00.00	31'	37.5'	39.5'	2
T.S.	1329+81.07	31'	37.5'	39.5'	2
S.C.	1333+81.07	42'	44.5'	39.5'	2
C.S.	1336+80.84	49.5'	62'	52.5'	2
S.T.	1340+80.84		62'	67'	2
P.O.T.	1346+00.00		39.5'	39.5'	2
P.C.	1350+66.60		47'	39.5'	2
P.O.C.	1356+00.00		37.5'	37.5'	2
P.T.	1360+36.61		64'	63.5'	2
P.O.T.	1362+10.49		52.5'	59'	2
P.O.T.	1367+00.00		37.5'	47'	2
P.O.T.	1372+00.00		37.5'	39.5'	2
P.O.T.	1377+00.00		37.5'	39.5'	2
P.C.	1382+71.56		37.5'	39.5'	2
P.O.C.	1387+00.00		39.5'	37.5'	2
P.T.	1392+90.20		37.5'	39.5'	2
P.O.T.	1399+00.00		37.5'	39.5'	2
P.O.T.	1405+00.00		37.5'	39.5'	2
P.O.T.	1410+00.00		46'	51.5'	2
P.O.T.	1415+64.31		60.5'	72.5'	2
P.O.T.	5+00.00		39.5'	39.5'	2
TOTAL – Carried to General Summary					74



CENTERLINE REFERENCE MONUMENTS AND FENCE SUB SUMMARY

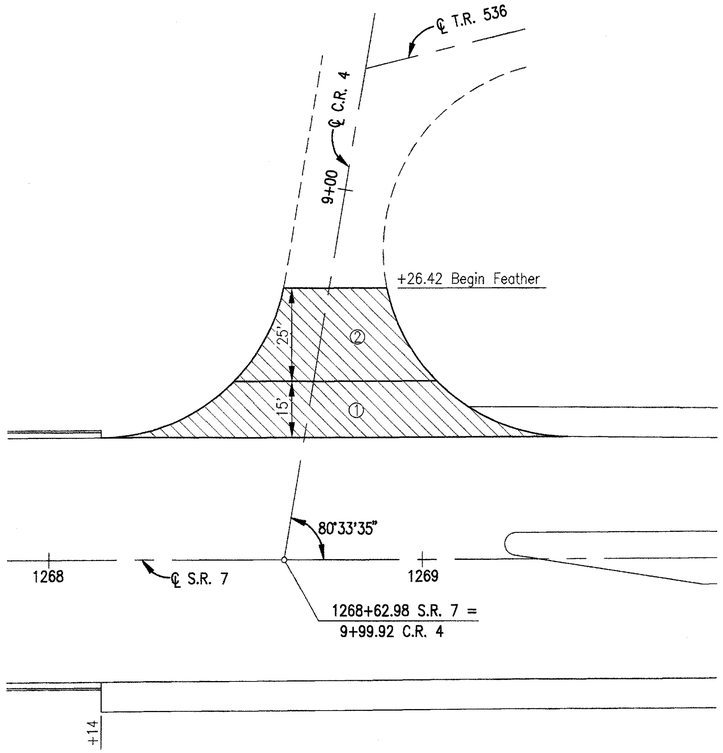
CHK'D. BY: ATH DATE: 8/95
CHK'D. BY: BPS DATE: 11/95

BEL/JEF-7-23.76/0.00

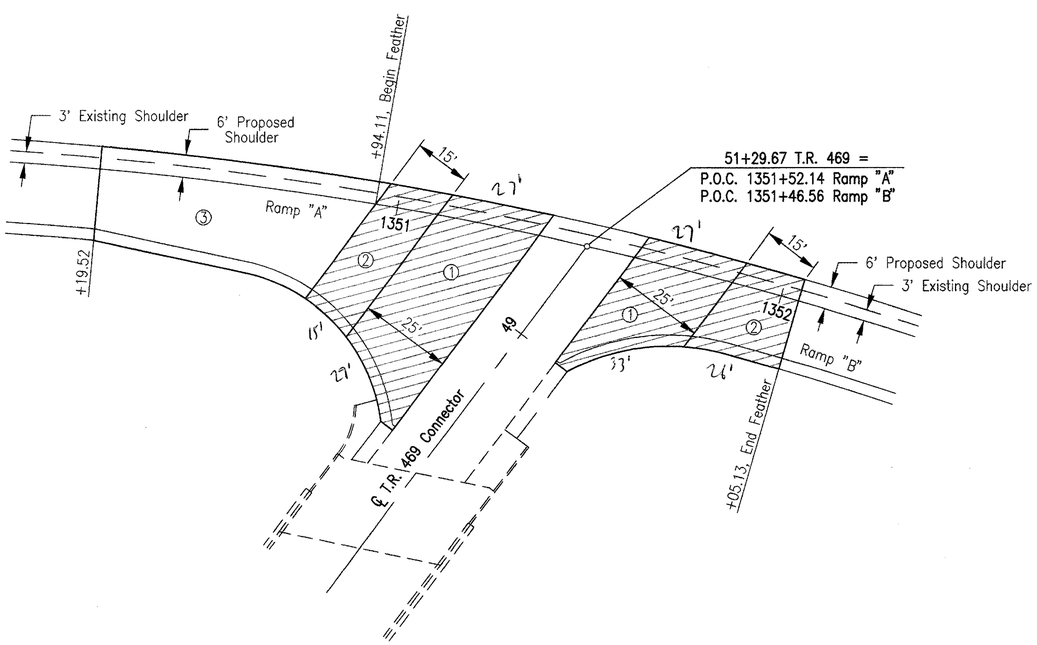
31/94

FINAL 1/8/97 ATH

STICKLEN – BELSHEIM & ASSOCIATES

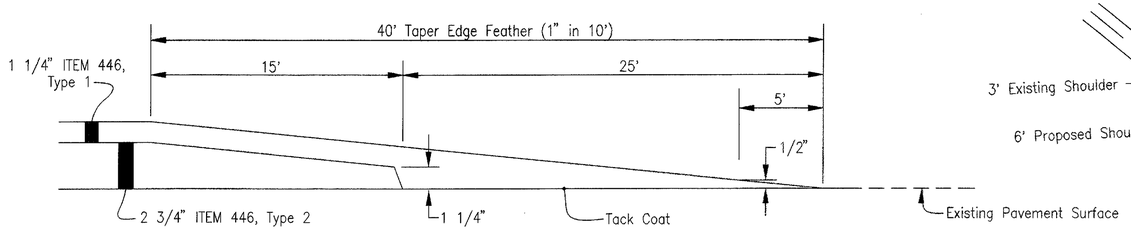


S.R. 7 AT C.R. 4 INTERSECTION

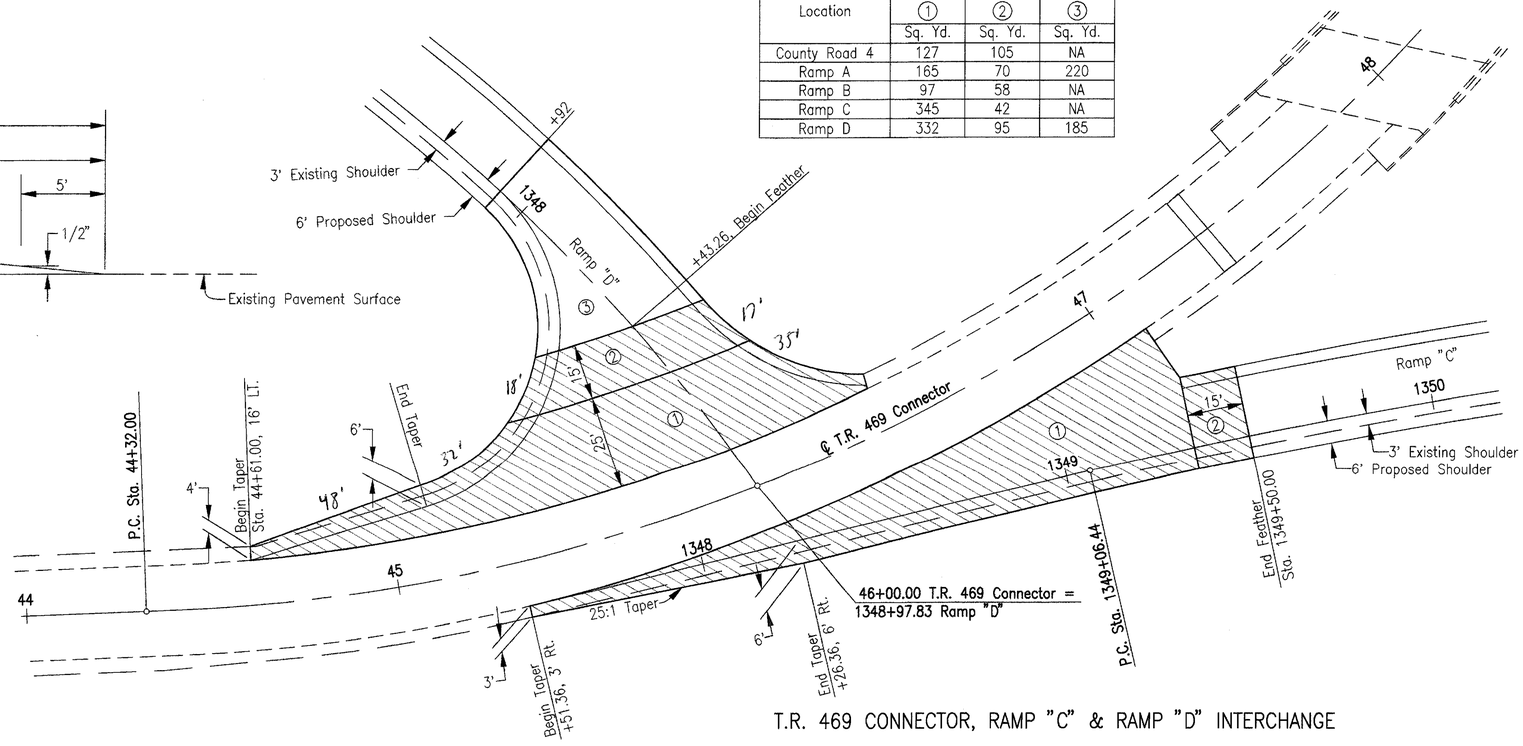


T.R. 469 CONNECTOR, RAMP "A" & RAMP "B" INTERCHANGE

Areas used in Resurfacing Calculations (See Sheet Nos. 17 & 18)			
Location	Area ① Sq. Yd.	Area ② Sq. Yd.	Area ③ Sq. Yd.
County Road 4	127	105	NA
Ramp A	165	70	220
Ramp B	97	58	NA
Ramp C	345	42	NA
Ramp D	332	95	185



FEATHER DETAIL AT SIDE ROADS & RAMPS



T.R. 469 CONNECTOR, RAMP "C" & RAMP "D" INTERCHANGE

NO SCALE

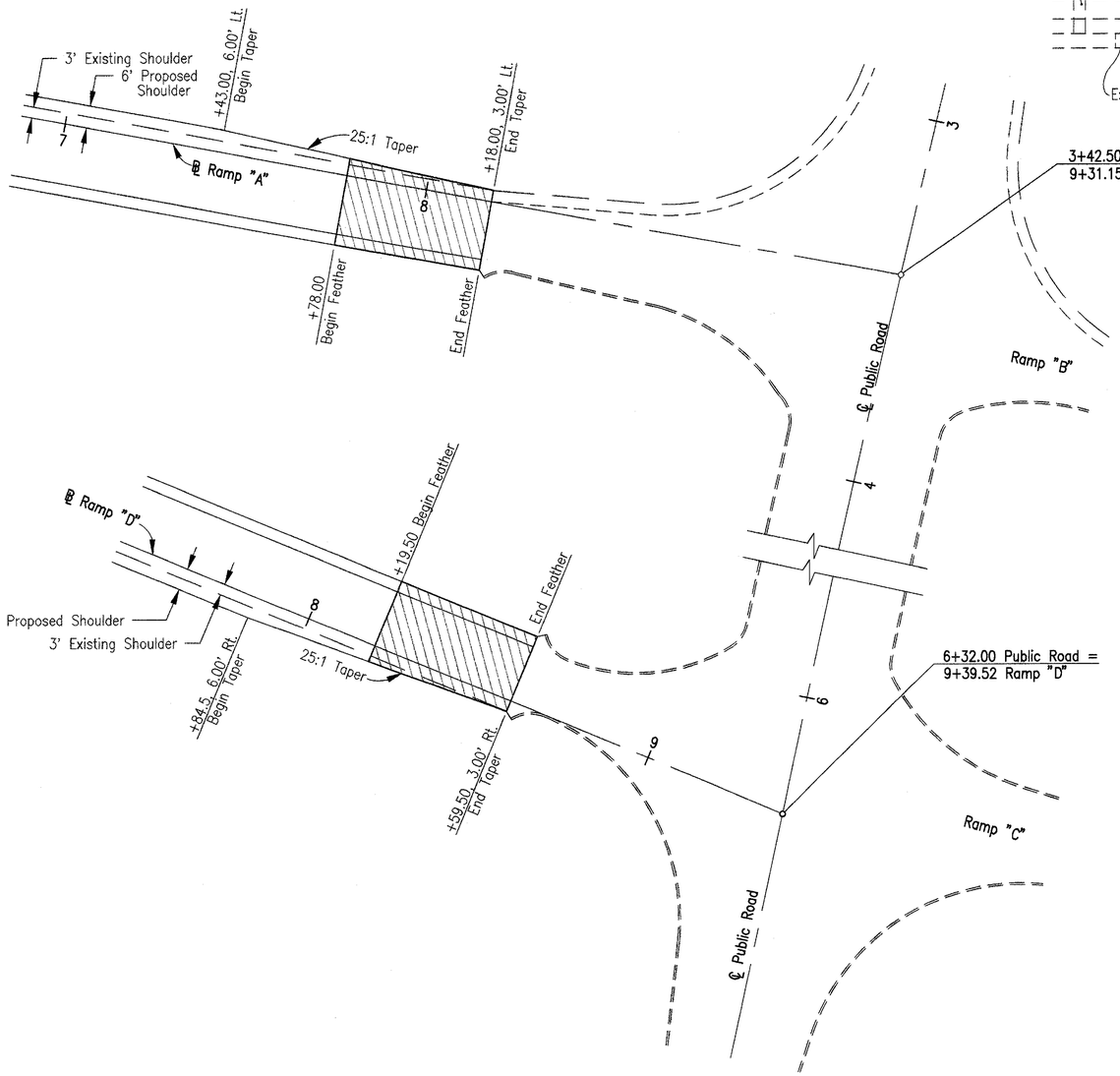
CALC. BY: CAM DATE: 1/95
CHKD. BY: GED DATE: 4/96

FEATHER DETAILS

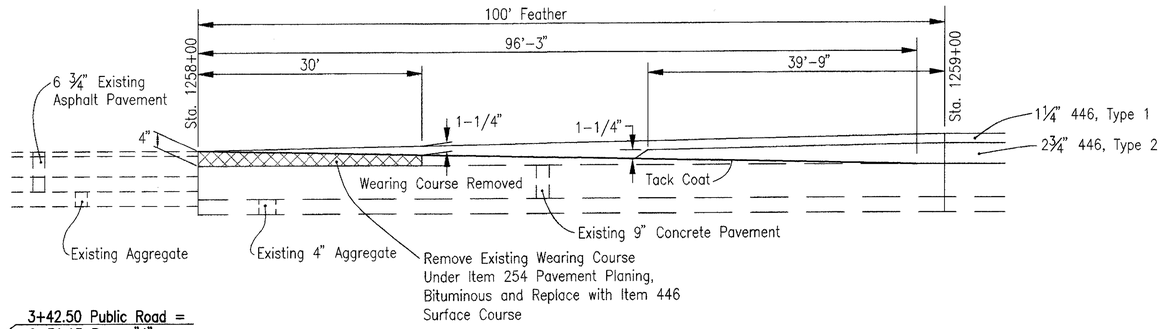
BEL/JEF-7-23.76/0.000

32/94

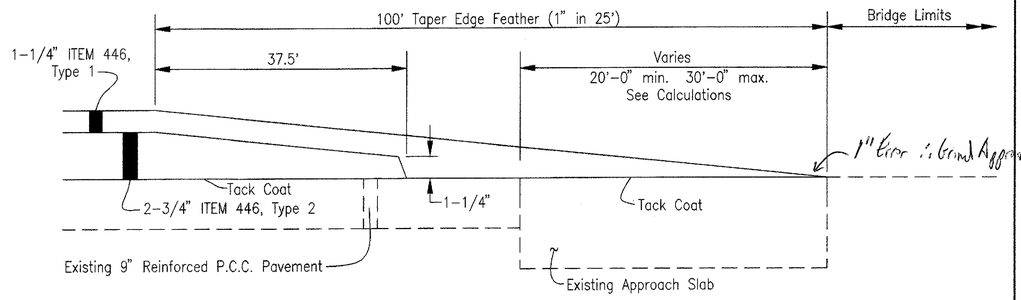
2/25/97 KCH 1982P1H1 FINAL



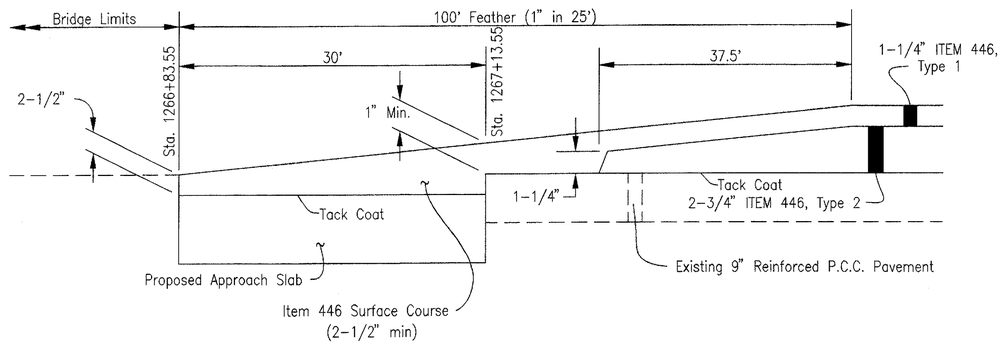
PUBLIC ROAD INTERCHANGE, RAMP "A" & RAMP "D"



FEATHER DETAIL AT BEGIN PROJECT
Station 1258+00.00 to Station 1259+00.00



FEATHER DETAIL FOR AT GRADE STRUCTURES
BEL-7-2389 (Rear Approach Slab Only)
BEL-7-2526
BEL-7-2619
JEF-7-0016 (Rear Approach Slab Only)



FEATHER DETAIL FOR BEL-7-2389 (Forward Approach Slab Only)

NO SCALE

CALC. BY: CAM DATE: 1/95
CHKD. BY: GED DATE: 4/96

FEATHER DETAILS

BEL/JEF-7-23.76/0.000

FINAL
1993TH2
ASH
5/28/97

STA. 1257+66
EXIST. BARRIER
INLET

+76 BEGIN WORK

+00 BEGIN FEATHER

Transition altered previous job

BEGIN PROJECT
STA. 1259+00
S.L.M.= 23.76

NH-1(0)

3.5' WIDE

12' wide

1255 1256 1257 1258 1259 1260

3.5'

14' Existing Conc. Median

Conc. Barrier-WMH Transition

72.72 L.F.

1258+87.7

STA. 1261+00

MATCH LINE

EX. G.R.

+76 MATCH EXISTING

PROP. G.R.

STA. 1258+75
EXIST. NO. 3 MH

FOR BARRIER TRANSITION
DETAILS SEE SHEET NO. 37 & 38.

END TYPE B50 CONCRETE BARRIER

STA. 1263+65, 2.6' LT.
INLET 2-6
WINDOW = 661.91

+23.58
END CURB

STA. 1261+00

MATCH LINE

14' Existing Conc. Median

1262 1263 1264 1265 1266

5.25' 5.0' 5.25' 5.0'

manhole

BRIDGE NO.
BEL-7-2389

25° approach slab

1266+83.13

1266+26.83

STA. 1263+73, 0.17' RT.
INLET 2-6
WINDOW = 661.94

M.H.

+45.75 +75.75 +80.75 +07.50 +12.50 +62.5 +70.08 +86.80

END CURB

BEGIN CURB

STA. 1267+00

MATCH LINE

+40.30
BEGIN CURB

+14 END CURB

Appr. Slab
1267+13.13

145'

1268

STA. 1267+56
MARTINS FERRY CORP. LIMIT

STA. 1268+62.98

MATCH LINE

8'

+14 END CURB

STICKLEN – BELSHEIM & ASSOCIATES

N

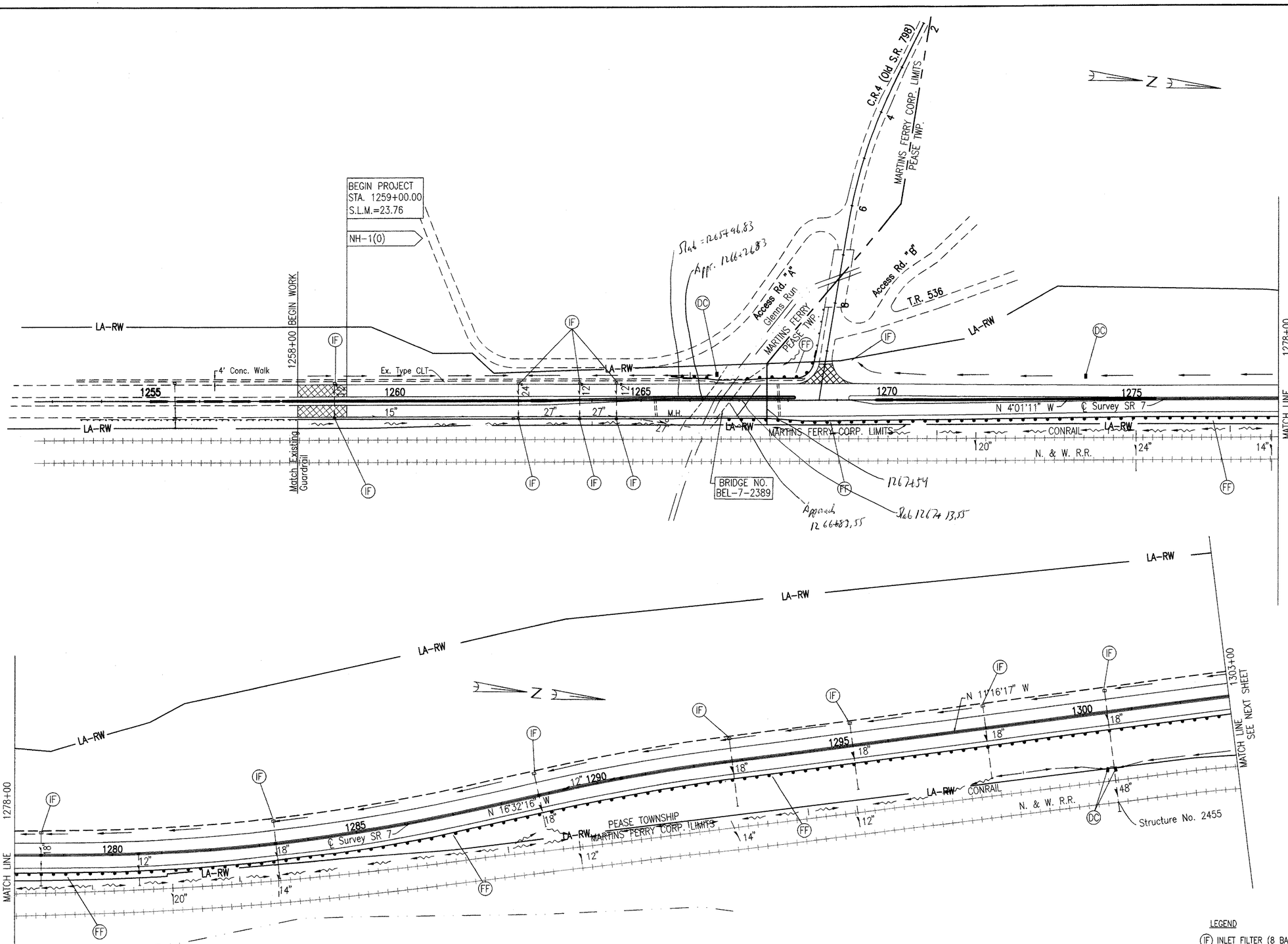
HORIZONTAL SCALE IN FEET
0' 20' 40'

CALC. BY: ATH DATE: 6/96
CHKD. BY: GED DATE: 6/96

PAVEMENT DETAIL
STA. 1255+00 TO STA. 1268+62.98

BEL/JEF-7-23.76/0.00

36
94



LEGEND

(IF) INLET FILTER (8 BALES EACH) (ALL CATCH BASINS)

(FF) FILTER FABRIC FENCE — — —

(DC) DITCH CHECK (5 BALES EACH) ▮

FOR THE ABOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, SEE STANDARD DRAWING MC-11.

CALC. BY: ATH DATE: 12/94
CHKD. BY: CAM DATE: 10/95

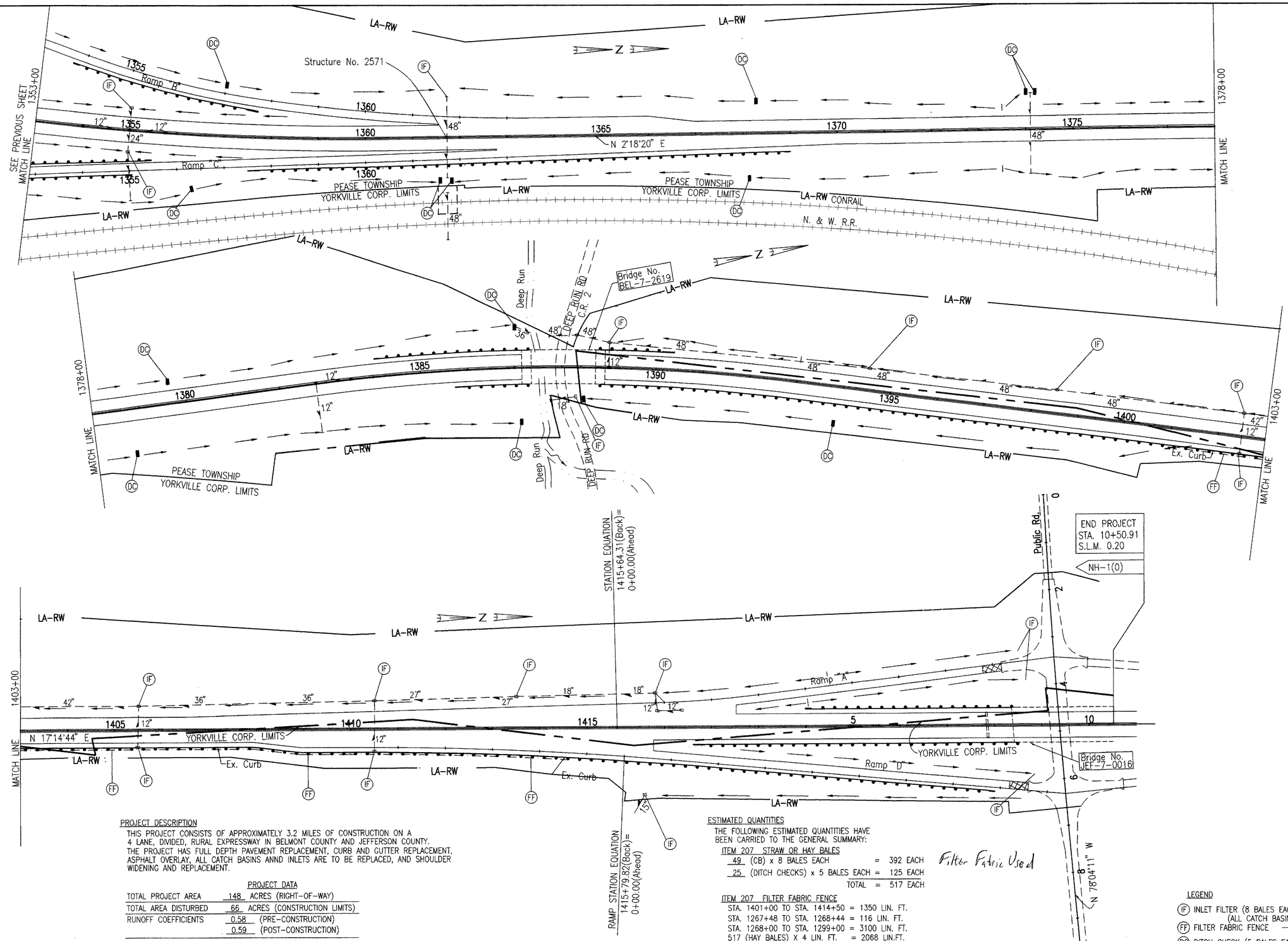
0' 100' 200'
HORIZONTAL SCALE IN FEET

STORM WATER POLLUTION PREVENTION PLAN
STA 1252+00 TO STA 1278+00

BEL/JEF-7-23.76/0.00

39
94

STICKLEN – BELSHEIM & ASSOCIATES



PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF APPROXIMATELY 3.2 MILES OF CONSTRUCTION ON A 4 LANE, DIVIDED, RURAL EXPRESSWAY IN BELMONT COUNTY AND JEFFERSON COUNTY. THE PROJECT HAS FULL DEPTH PAVEMENT REPLACEMENT, CURB AND GUTTER REPLACEMENT, ASPHALT OVERLAY, ALL CATCH BASINS ANND INLETS ARE TO BE REPLACED, AND SHOULDER WIDENING AND REPLACEMENT.

PROJECT DATA		
TOTAL PROJECT AREA	148	ACRES (RIGHT-OF-WAY)
TOTAL AREA DISTURBED	66	ACRES (CONSTRUCTION LIMITS)
RUNOFF COEFFICIENTS	0.58	(PRE-CONSTRUCTION)
	0.59	(POST-CONSTRUCTION)
IMMEDIATE RECIEVING STREAMS	GLENN'S RUN PATTON'S RUN DEEP RUN	
SUBSEQUENT RECIEVING RIVER	OHIO RIVER	
SOIL DATA	SEE SOIL PROFILES	

ESTIMATED QUANTITIES

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 207 STRAW OR HAY BALES

49 (CB) x 8 BALES EACH = 392 EACH

25 (DITCH CHECKS) x 5 BALES EACH = 125 EACH

TOTAL = 517 EACH

Filter Fabric Used

ITEM 207 FILTER FABRIC FENCE

STA. 1401+00 TO STA. 1414+50 = 1350 LIN. FT.

STA. 1267+48 TO STA. 1268+44 = 116 LIN. FT.

STA. 1268+00 TO STA. 1299+00 = 3100 LIN. FT.

517 (HAY BALES) X 4 LIN. FT. = 2068 LIN.FT.

TOTAL = 6634 LIN. FT.

ITEM 601 ROCK CHANNEL PROTECTION, TYPE C (w/FILTER)

517 (BALES) x 1 CY/10 BALES = 52 CY

TOTALS CARRIED TO GENERAL SUMMARY

LEGEND

(IF) INLET FILTER (8 BALES EACH) (ALL CATCH BASINS)

(FF) FILTER FABRIC FENCE

(DC) DITCH CHECK (5 BALES EACH)

FOR THE ABOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, SEE STANDARD DRAWING MC-11.

CALC. BY: ATH DATE: 12/94
CHKD. BY: CAM DATE: 10/95

0' 100' 200' HORIZONTAL SCALE IN FEET

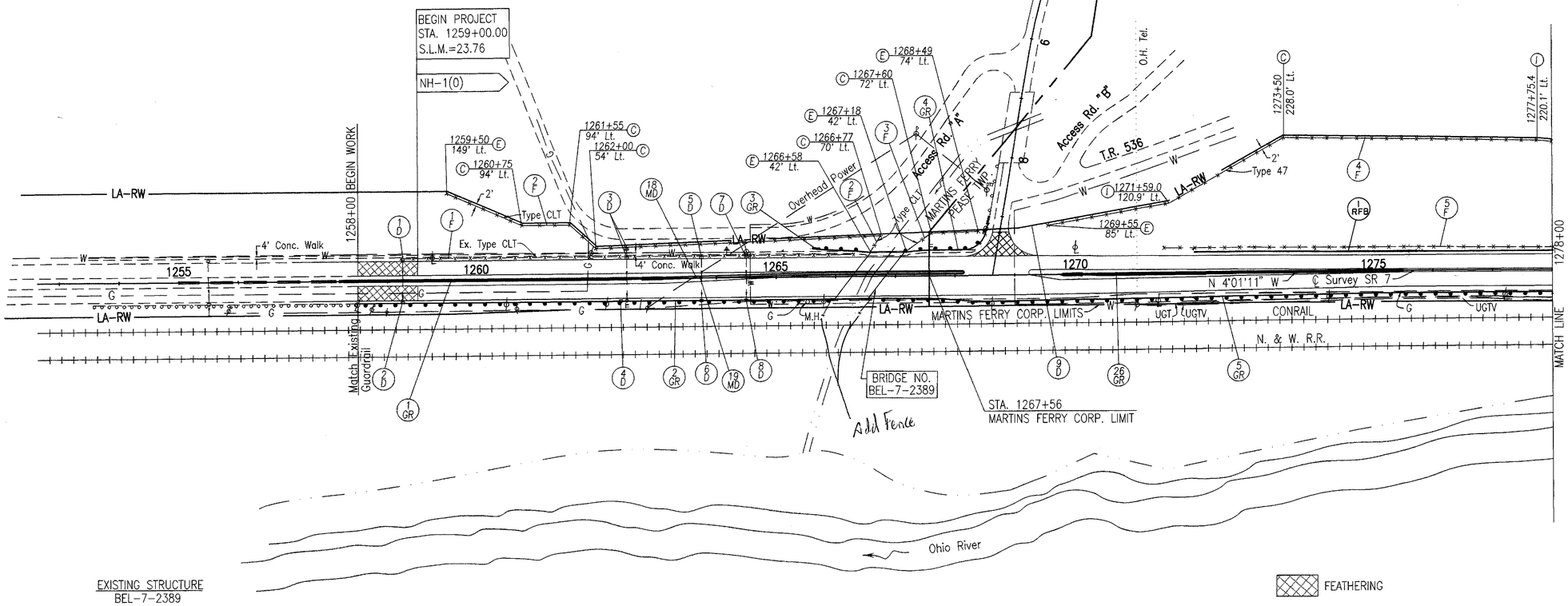
STORM WATER POLLUTION PREVENTION PLAN
STA 1353+00 TO STA 10+50.91

BEL/JEF-7-23.76/0.00

41/94

STICKLEN - BELSHEIM & ASSOCIATES

BENCH MARKS
BM #103 Top of Rebar in Concrete Reference Monument Station 1275+00, 39.75' Rt. Elevation 665.51 feet (NGVD 1929)
BM #102 Top of NW Wingwall of Bridge No. Bel-7-2389 Station 1267+27.19, 48.34' Lt. Elevation 663.645 feet (NGVD 1929)



EXISTING STRUCTURE
BEL-7-2389

TYPE: Simple span steel beam with reinforced concrete slab and substructure
SPAN: 51'-0" c/c brg.
ROADWAY: 68'-0" f/f curb with 3'-0" raised median, 6'-0" sidewalk and 2'-0" saftey curb with concrete parapets and Bridge Sidewalk Railing
LOADING: HS 20-44
WEARING SURFACE: 2 1/2" Asphalt concrete
SKEW: 38°11'55" Left forward
ALIGNMENT: Tangent
APPROACH SLABS: AS-1-72, 30'-0" Long
SUPERELEVATION: None

FEATHERING

CROSS REFERENCES	
26	Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
32	Approach Road Intersection Details
17	Concrete Median Quantities
30	Underdrain Quantities
32&33	Feather Detail
36&37	Pavement Detail

N

0' 100' 200'
HORIZONTAL SCALE IN FEET

CALC. BY: JCM DATE: 11/94
CHKD. BY: CAM DATE: 11/94

PLAN
STA 1252+00 TO STA 1278+00

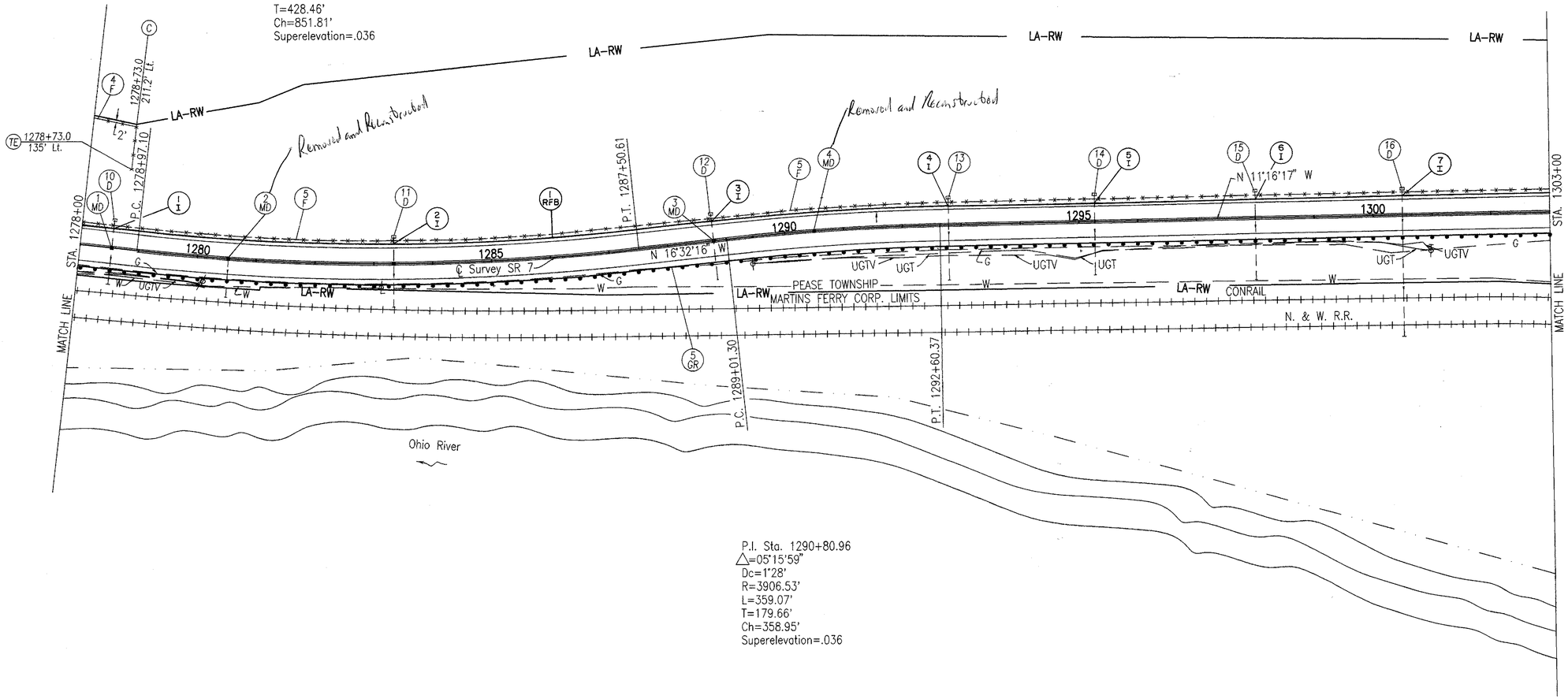
BEL/JEF-7-23.76/0.00

42
94

FINAL 1993P1 ASH 2/27/97

BENCH MARKS
Reference Bench Mark A Spike Found in Telephone Pole From Highway Plans, BEL-7-23.74 JEF-7-0.00 Dated 1974 Station 1285+57.50, 112' Rt. Elevation 663.350 feet (NGVD 1929)
BM #104 Top of Rebar in Concrete Reference Monument Station 1283+00, 39.50' Rt. Elevation 677.755 feet (NGVD 1929)
BM #105 Top of Rebar in Concrete Reference Monument Station 1292+60.37, 39.5' Rt. Elevation 689.790 feet (NGVD 1929)

P.I. Sta.=1283+25.56
△=12°31'05"
Dc=1°28'
R=3906.53'
L=853.50'
T=428.46'
Ch=851.81'
Superelevation=.036



P.I. Sta. 1290+80.96
△=05°15'59"
Dc=1°28'
R=3906.53'
L=359.07'
T=179.66'
Ch=358.95'
Superelevation=.036

CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
30	Underdrain Quantities
38A,B,C	ROCK FALL BARRIER

0' 100' 200'
HORIZONTAL SCALE IN FEET

CALC. BY: JCM DATE: 1/94
CHKD. BY: CAM DATE: 10/94

PLAN
STA 1278+00 TO STA 1303+00

BEL/JEF-7-23.76/0.00

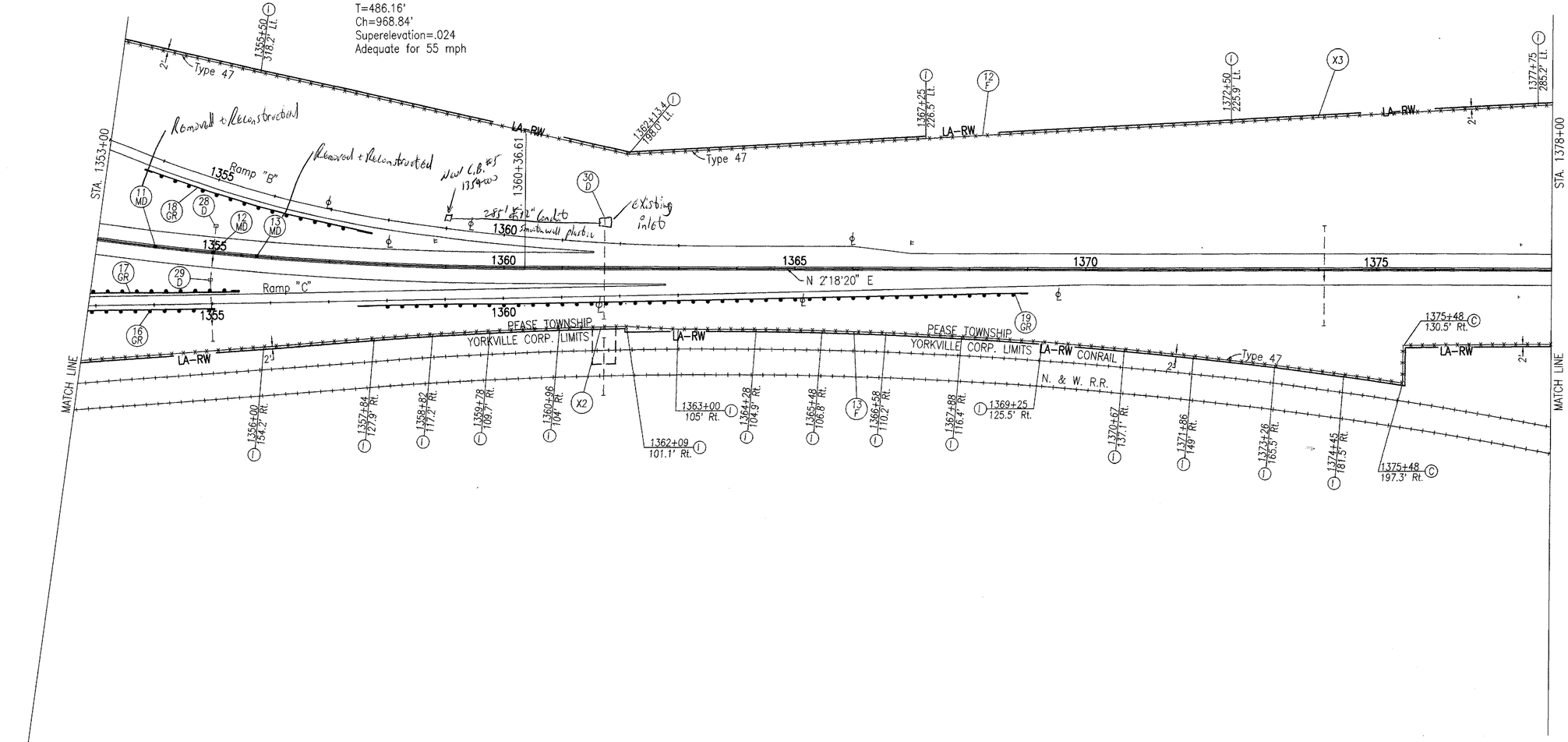
43
94

FINAL 1999P2 ATH 2/22/99

STICKLEN – BELSHEIM & ASSOCIATES

BENCH MARKS
BM #113 Top of Rebar in Concrete Reference Monument Station 1360+36.61, 63.50' Rt. Elevation 667.014 feet (NGVD 1929)
BM #114 Top of Rebar in Concrete Reference Monument Station 1372+00.00, 37.50' Lt. Elevation 674.661 feet (NGVD 1929)

P.I. Sta. 1355+52.77
△=09°42'00"
Dc=1°00'00"
R=5729.58'
L=970.01'
T=486.16'
Ch=968.84'
Superelevation=.024
Adequate for 55 mph



CROSS REFERENCES	
26	Drainage Quantities
27	Median Drainage Quantities
29	Guardrail Quantities
17&29	Concrete Barrier Quantities
53	Traffic Control Quantities
31	Fence Quantities
30	Underdrain Quantities

HORIZONTAL SCALE IN FEET
0' 100' 200'

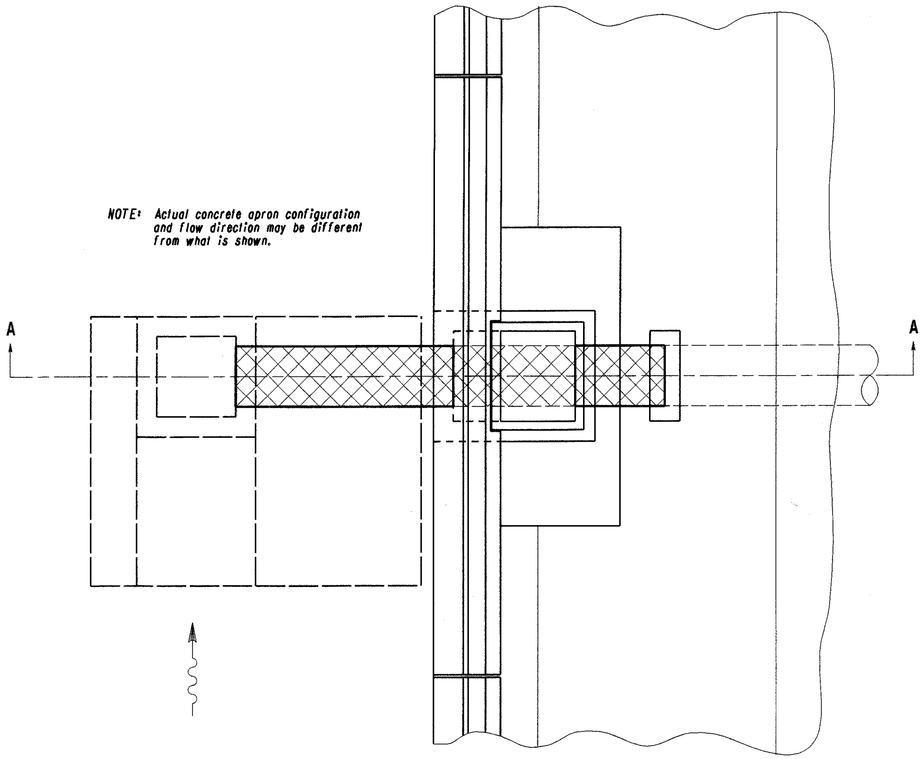
CALC. BY: JCM DATE: 1/94
CHK'D. BY: CAM DATE: 10/94

PLAN
STA 1353+00 TO STA 1378+00

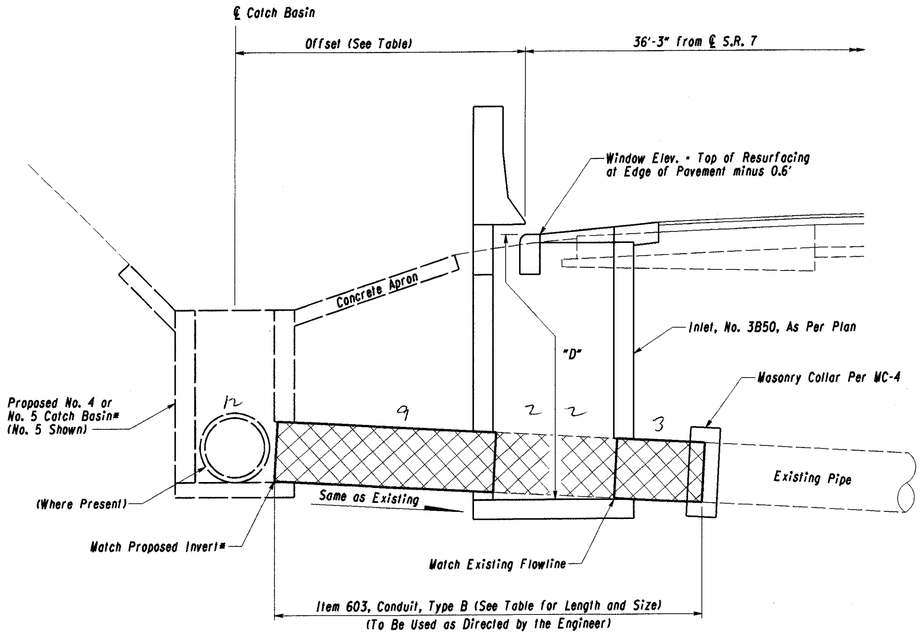
BEL/JEF-7-23.76/0.00

46
94

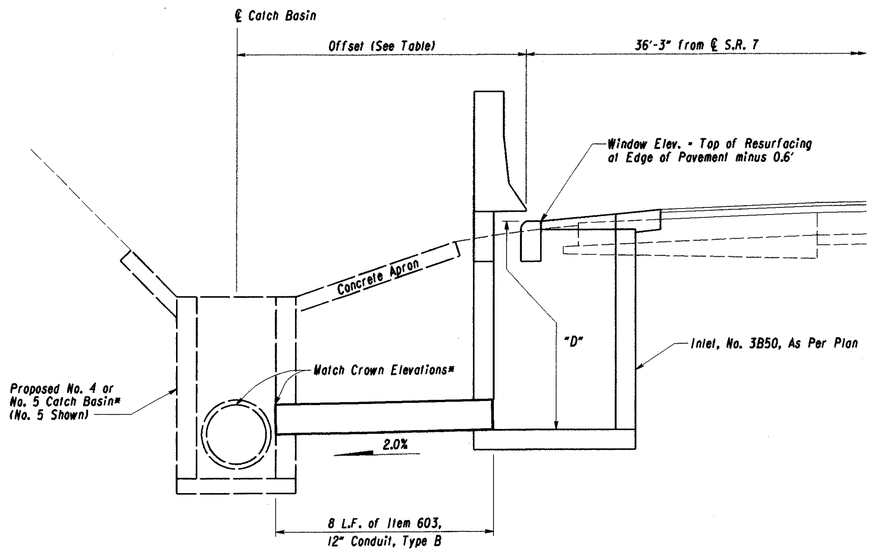
STICKLEN – BELSHEIM & ASSOCIATES



PLAN



SEC. A-A



SEC. A-A
(13-1 & 14-1 Only)

Reference Number	Station	Offset	Dimension "D" (±)	603 Conduit, Type B 12"	603 Conduit, Type B 18"	603 Conduit, Type B 21"	603 Conduit, Type B 30"	604 Inlet, No. 3B50, As Per Plan	
		Feet	Feet	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	
1-1	1278+54	9.75	7.4		16			1	
2-1	1283+34	9.75	5.5		16			1	
3-1	1288+78	9.75	4.6		16			1	
4-1	1292+78	9.75	4.8		16			1	
5-1	1295+27	9.75	5.5		16			1	
6-1	1298+00	9.75	5.2		16			1	
7-1	1300+50	8.75	5.2		14			1	
8-1	1304+30	12.75	4.7			18		1	
9-1	1311+30	12.75	7.1				18	1	
10-1	1314+50	11.75	5.9		18			1	
11-1	1318+00	11.75	5.9		18			1	
12-1	1321+00	9.75	7.5				16	1	
13-1	1324+50	8.75	4.8	8				1	
14-1	1327+50	8.75	4.3	8				1	
TOTALS - Carried to General Summary				16	146	18	34	14	

NOTE: Dimension "D" is shown as an approximation only, and was calculated from original construction plan details. The actual dimension may be adjusted to satisfy field conditions.

For 1-3B50 inlet details, see sheet no. 50A.

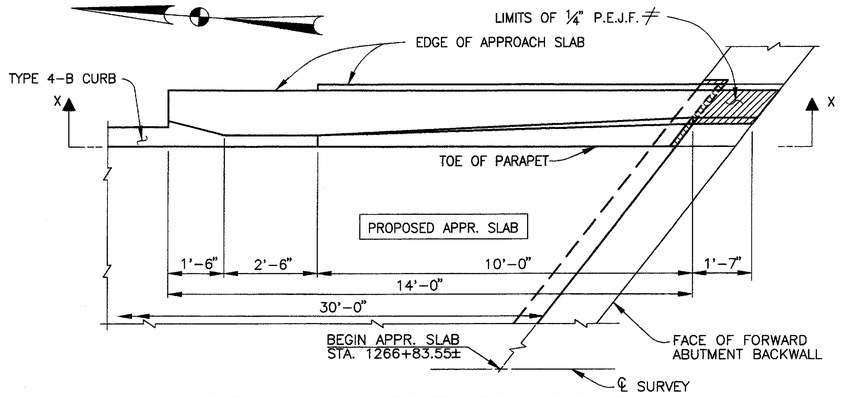
* For catch basin flowlines and quantities, see sheet no. 26.

Portion of existing pipe to be removed. Payment included with 603 Conduit.

CALCULATED JAB DISTRICT 11
CHECKED SHG DISTRICT 11

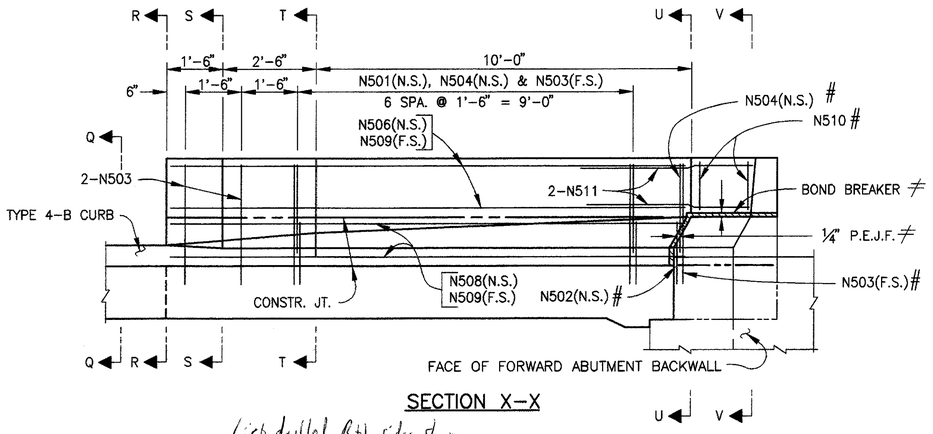
DRAINAGE DETAILS

BEL/JEF-7-23.76/0.00



PART PLAN FORWARD TRANSITION PARAPET

(ASPHALT CONCRETE OVERLAY NOT SHOWN)



SECTION X–X

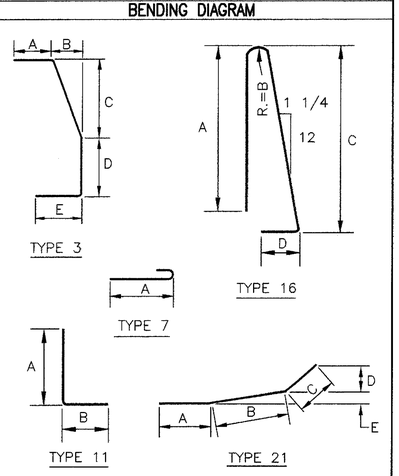
List doubled. Both sides shown.

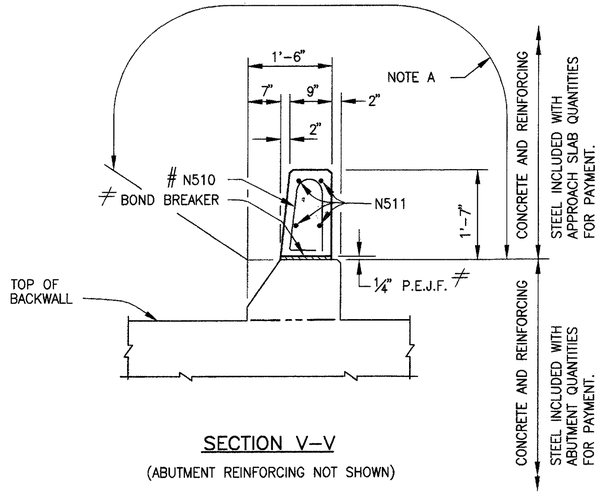
PARTIAL APPROACH SLAB REINFORCING STEEL LIST

MARK	NO.	LENGTH	WEIGHT	TYPE	DIMENSION A	B	C	D	E
N501	14	3'–5"	50	3	0'–8"	0'–6"	0'–8½"	1'–2"	1'–0"
N502	2	3"–8"	8	3	0'–10"	0'–7½"	0'–8½"	1'–2"	1'–0"
N503	24	4'–3"	106	11	3'–4"	1'–0"			
N504	16	3'–2"	53	7	2'–7"				
N505	2	13'–3"	28	ST					
N506	4	13'–8"	57	21	9'–11"	2'–4"	1'–5"	0'–5"	0'–1½"
N507	4	12'–11"	54	ST					
N508	2	13'–3"	28	ST					
N509	4	14'–2"	59	ST					
N510	4	2'–10"	12	16	1'–2"	0'–2"	1'–3"	0'–4½"	
N511	8	5'–0"	42	ST					
		TOTAL=	497						
B501	18	3'–4"	63	ST					
B502	18	2'–4"	44	ST					
B503	4	2'–6"	10	ST					
B504	10	15'–9"	164	ST					
B505	2	12'–11"	27	ST					
B506	2	13'–5"	28	ST					
		TOTAL=	336						

½ per side.

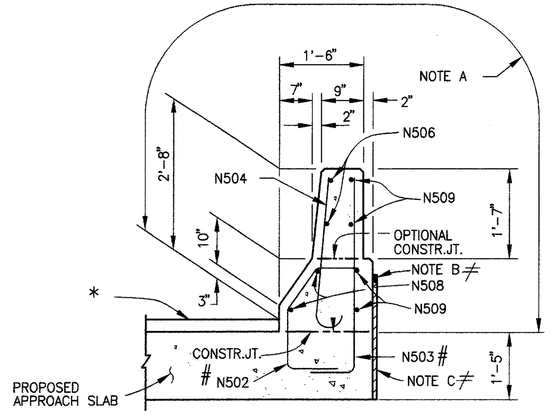
BENDING DIAGRAM



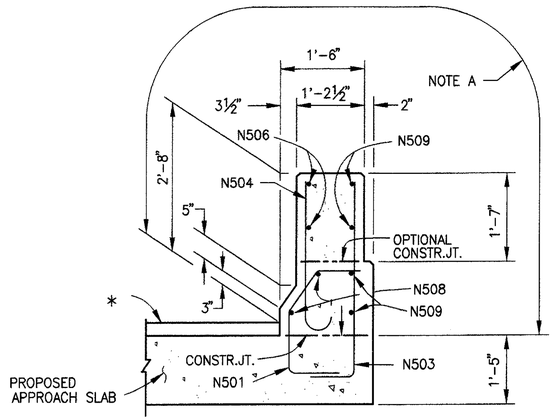


SECTION V–V

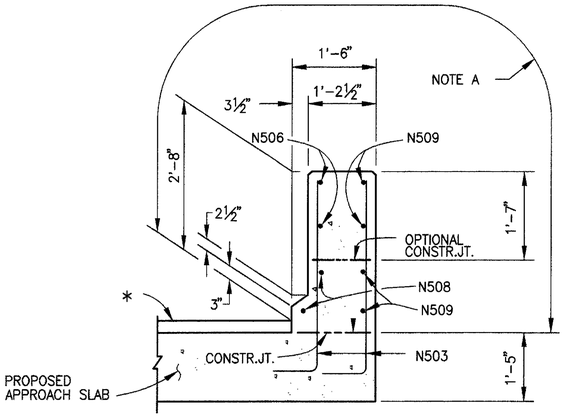
(ABUTMENT REINFORCING NOT SHOWN)



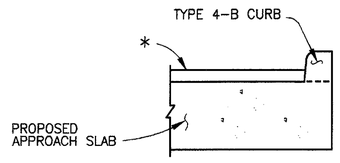
SECTION U–U



SECTION T–T



SECTION S–S



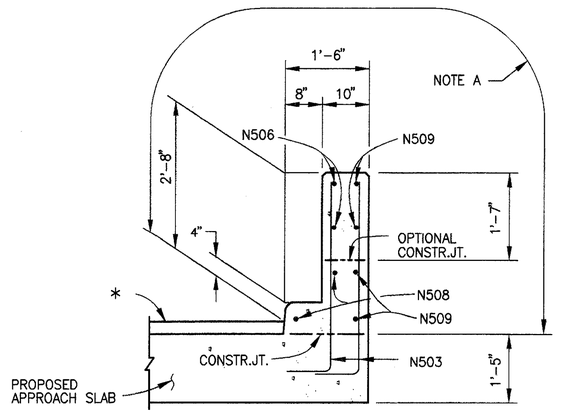
SECTION Q–Q

SEE STD. DWG. AS–1–81 FOR ADDITIONAL FORWARD APPROACH SLAB REINFORCING STEEL REQUIRED.

FOR ADDITIONAL NOTES, DETAILS AND LEGEND SEE SHEET 51/94.

BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. R INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "ST" WRITTEN IN THE TYPE COLUMN INDICATES A STRAIGHT BAR.

ALL REINFORCING STEEL TO BE EPOXY COATED.



SECTION R–R

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW | DRAWN REW | CHECKED G.T. | REVISED

REVIEWED T.R.O. DATE 5/11/95

STRUCTURE FILE NUMBER 0700770

FORWARD APPROACH SLAB DETAILS

BRIDGE NO. BEL–7–2389
S.R. 7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

52/94

2389PARF.DWG SEPTEMBER 06, 1996

630

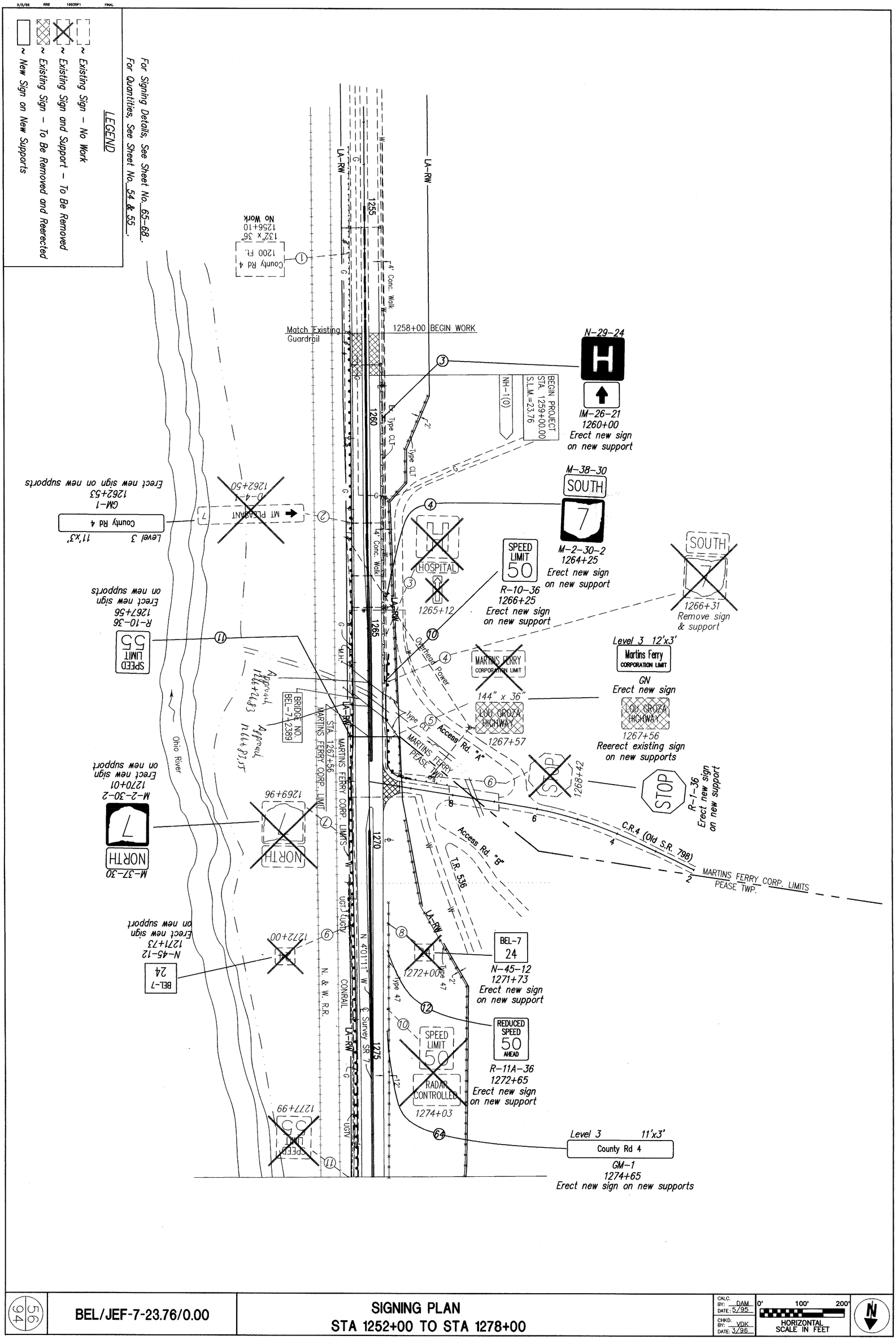
REF. NO.	SHEET NO.	STATION EXISTING/NEW	SIDE	SIGN CODE	SIZE	REMOVAL OF GROUND MOUNTED SIGN & DISPOSAL	REMOVAL OF GROUND MOUNTED SIGN & REERECTION	REMOVAL OF GROUND MOUNTED MAJOR SIGN & DISPOSAL	REMOVAL OF GROUND MOUNTED POST SUPPORT & DISPOSAL	REMOVAL OF GROUND MOUNTED BEAM SUPPORT & DISPOSAL	SIGN, FLAT SHEET	SIGN, FLAT SHEET, TYPE G	SIGN, EXTRUSHEET, TYPE G	GROUND MOUNTED SUPPORTS, NO. 2 POST	GROUND MOUNTED SUPPORTS, NO. 3 POST	GROUND MOUNTED SUPPORTS, NO. 4 POST		GROUND MOUNTED SUPPORTS, S4x7.7 BEAM		GROUND MOUNTED SUPPORTS, W10x12 BEAM	GROUND MOUNTED SUPPORTS, W8x18 BEAM	GROUND MOUNTED SUPPORTS, W10x22 BEAM		ONE WAY SIGN SUPPORT NO. 3 POST	BREAKAWAY BEAM CONNECTION	GROUND MOUNTED BEAM SUPPORT FOUNDATION
						EACH	EACH	EACH	EACH	EACH	SQ. FT.	SQ. FT.	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.		LIN. FT.		LIN. FT.	LIN. FT.	LIN. FT.		LIN. FT.	EACH	EACH
36	60	1356+11/1356+15	Rt.	W-49R-48	48" x 48"	1			1		16				14.5/15											
37	60	1358+90/1358+50	Lt.	GF	72" x 60"	1			2				30					17.7/17.8							2	2
38	60	1367+09/1367+15	Lt.	GE	168" x 84"			1		2			98								21.5/22.6				2	2
39	60	1377+54/1377+22	Rt.	N-45-12	12" x 13"	1			1		1.1			12												
40	60	1377+54/1377+22	Lt.	N-45-12	12" x 13"	1			1		1.1			12												
41	61	1380+11/1375+00	Rt.	M-37-30	30" x 15"	2			1		3.13				15											
				M-2-30-2	30" x 30"						6.25															
42	61	1384+50/1384+55	Lt.	GJ	132" x 48"	1			2				44							18.7/20.2						2
43	61	1386+09/1386+15	Lt.	W-139F-48	48" x 48"	1			1		16				14.5/15											
44	61	1386+96/1387+00	Lt.	GB	168" x 84"			1		2			98									24/28.3				2
45	61	1387+13/1387+18	Rt.	GN	108" x 36"	1			2				27					16.0/17.7								2
46	61	1389+69/1389+75	Lt.	W-76D-36	36" x 36"	1			1		9				15											
47	61	1390+40	Rt.	GB	156" x 84"								91									23.8/28.1			2	2
48	61	1395+13/1392+00	Lt.	R-10-36	36" x 48"	1			2		12				14.5/15											
49	61	1400+20	Lt.	GB	168" x 84"								98							20.9/18.8					2	2
50	62	1404+59/1402+00	Lt.	M-38-30	30" x 15"	2			1		3.13				15											
				M-2-30-2	30" x 30"						6.25															
51	62	1407+50	Rt.			2			1																	
52	62	1408+06/1408+10	Rt.	GE	156" x 84"			1		2			91							19.5/18.2						2
53	62	1415+72/1415+64	Rt.	GP	96" x 48"	2			2				32					16.6/15.4							(2)	2
54	62	1415+76/0+00	Lt.	GP	108" x 48"	2			2				36							19.0/21.7						2
55	62	0+85/1+30	Rt.	GF	72" x 60"	1			2				30					17.5/18.4							2	2
56	62	1+40	Rt.	NO WORK																						
57	62	3+05/3+10	Lt.	W-49R-48	48" x 48"	1			1		16				14.5/15											
58	62	6+65/6+70	Rt.	D-4A-24	120" x 24"	2			2				20		14/15											
				R-41A-36	36" x 24"							6														
59	62	6+65	Lt.			1			1																	
60	62	6+68/6+67	Rt.	R-41A-36	36" x 24"	3			1			6		13												
61	62	7+65	Lt.			1			1																	
63	62	8+40	Rt.			1			1																	
64	56	1274+65	Lt.	GM-1	132" x 36"								33							22.9/16.7					2	2
65	57	1282+65	Lt.	W-26-48	48" x 48"						16				17.7/18.3											
66	57	1295+00	Lt.	GM	132" x 60"								55							24.8/18.8					2	2
67	61	1384+00	Rt.	R-10-36	36" x 48"						12				15.2/15.5											
TOTAL THIS SHEET						29	0	3	29	6	117.96	12	783	37	258.7	0		137.1		235.1	44.1	104.2		0	14	26
TOTAL PREVIOUS SHEET						41	1	5	39	8	118.73	131.66	679	48	429.5	26		98		173.5	88.6	52.4		30	4	20
Totals Carried to Traffic Control General Summary						**70**	**1**	**8**	**68**	**14**	**237**	**144**	**1462**	**85**	**688**	**26**		**236**		**409**	**133**	**157**		**30**	**18**	**46**

CALC. ATH BY: DATE: 10/95
CHKD. VDK BY: DATE: 3/95

SIGN INVENTORY

BEL/JEF-7-23.76/0.00

55
94



STICKLEN - BELSHEIM & ASSOCIATES

56 / 94	BEL/JEF-7-23.76/0.00	SIGNING PLAN STA 1252+00 TO STA 1278+00	CALC. BY: DAM DATE: 5/95 CHKD. BY: VDK DATE: 3/96	0' 100' 200' HORIZONTAL SCALE IN FEET

Level 3 11'x4'
Bridgeport 5
Marietta 84
GJ
1384+55
Erect new sign on new supports

FALLING ROCK
W-139F-48
1386+15
Erect new sign on new supports

Level 2 14'x7'
Pattons Run
Picoma Rd
EXIT 1/2 MILE
GB
1387+00
Erect new sign on new supports

W-76D-36
1389+75
Erect new sign on new support

M-38-30
SOUTH
7
M-2-30-2
1402+00
Erect new sign on new support

Level 2 14'x7'
Pattons Run
Picoma Rd
EXIT 3/4 MILE
GB
1400+20
Erect new sign on new supports

SPEED LIMIT 55
R-10-36
1392+00
Erect new sign on new supports

SPEED LIMIT 55
1395+13

SPEED LIMIT 55
R-10-36
1384+00
Erect new sign on new supports

YORKVILLE CORPORATION LIMIT
1387+37

Level 3 9'x3'
Yorkville
CORPORATION LIMIT
GN
1387+18
Erect new sign on new supports

Level 2 13'x7'
Public Rd
Yorkville
EXIT 1/2 MILE
GB
1390+40
Erect new sign on new supports

BRIDGEPORT 3
MARIETTA 82
1384+50

Pattons Run Rd
Picoma Rd
Exit 1/2 Mile
1386+96

1386+09

1389+69

Bridge No. BEL-7-2619

Deep Run

C.R. 2

STA. 1378+00

STA. 1403+00

1380

1385

1390

1395

1400

Type 47

Type CLT

2'

PEASE TOWNSHIP
YORKVILLE CORP. LIMITS

P.C. 1382+71.58

P.I. 1392+90.22

MATCH LINE

LA-RW

G

W

Ex. Curb

3741 L.F.
New Fence

DEEP RUN RD

STA. 1388+33.46 S.R.7
YORKVILLE CORP. LINE

NORTH
7
1380+11

CONRAIL
N. & W. R.R.

CURVE DATA
P.I. Sta. 1387+83.78
△=14°56'24"
Dc=1°28'00"
R=3906.53'
L=1018.64'
T=512.22'
Ch=1015.75'
Superelevation=0.036

For Legend, See Sheet No. 56 .
For Quantities, See Sheet No. 54 & 55 .
For Signing Details, See Sheet No. 65-68 .

HORIZONTAL SCALE IN FEET
0' 100' 200'

CALC. DAM BY: DATE: 5/95
CHKD. YDK BY: DATE: 3/96

SIGNING PLAN
STA 1378+00 TO STA 1403+00

BEL/JEF-7-23.76/0.00

61/94

ITEM 620 – DELINEATORS

STATION FROM	STATION TO	LANE OR RAMP	SIDE	TYPE C POST MOUNTED	TYPE C BRACKET MOUNTED	TYPE D POST MOUNTED	SPACING	STATION FROM	STATION TO	DELINEATOR REMOVED FOR DISPOSAL
				EACH	EACH	EACH	FEET			EACH
								1257+00.00	1332+00.00	38
								1342+00.00	1358+00.00	9
								1370+00.00	1406+00.00	19
								1+00.00	10+00.00	6
								1257+00.00	1330+00.00	37
								1344+00.00	1358+00.00	8
								1368+00.00	1406+00.00	20
								3+00.00	10+00.00	5
1331+00.00	1341+00.00		LT.	5	1 @ 1339+00		200	1330+60.00	1337+00.00	9
1341+00 (BACK) = A–1340+89.33								1338+00.00	1341+00.00	4
A – 1343+00.0		RAMP A TR 469	LT.	1			200	A – 1342+00.0	A – 1344+00.0	3
A – 1344+00.0	A – 1347+00.0		RT.			4	100	A – 1344+00.0	A – 1347+00.0	4
A – 1347+00.0	A – 1349+00.0		LT.	3			100	A – 1347+00.0	A – 1349+00.0	3
A – 1350+00.0	A – 1351+00.0		LT.	2			100	A – 1349+60.0	1351+40.0	4
B – 1351+95.0	B – 1353+95.0		LT.	3			100	B – 1351+80.0	B – 1353+00.0	3
B – 1354+00.0	B – 1358+00.0	RAMP B TR 469	RT.			5	100	B – 1354+00.0		1
B – 1358+00.0	B – 1363+00.0		LT.	6			100	B – 1354+00.0	B – 1358+00.0	5
B–1363+68.84 (BACK) = 1363+68.84								B – 1358+00.0	B – 1367+00.0	10
1363+68.84	1367+00.00		LT.	2			200			
C – 1350+00.0	C – 1353+00.0		LT.			4	100	C – 1349+80.0	C – 1353+00.0	5
C – 1353+00.0	C – 1360+00.0	RAMP C TR 469	RT.	8			100	C – 1353+00.0	C – 1360+00.0	8
C–1360+00.0 (BACK) = 1360+00.0										
1362+00.00	1370+00.00		RT.	5			200	C – 1361+00.0	C – 1369+00.0	9
1334+00.00	1336+00.00		RT.	2			200	1334+00.00	1336+18.50	3
1336+18.50 (BACK) = D–1336+18.50								D – 1336+18.5	D – 1337+50.0	3
D – 1338+00.0	D – 1340+00.0	RAMP D TR 469	RT.	1	1		200	D – 1338+50.0	D – 1339+50.0	2
D – 1341+00.0	D – 1346+00.0		RT.	6			100	D – 1340+50.0	D – 1345+50.0	6
D – 1346+00.0	D – 1347+00.0		LT.			2	100	D – 1345+50.0	D – 1346+50.0	2
D – 1347+50.0	D – 1348+50.0		LT.			3	50	D – 1347+10.0		1
								D – 1347+50.0	D – 1348+70.0	4
1408+00.00	1414+00.00		LT.	4			200	1406+50.00	1415+50.00	10
1415+64.31 (BACK) = 0+00.0		RAMP A PUBLIC RD								
0+35.0			LT.	1			200			
0+84.0 (BACK) = A – 0+84.0								A – 0+86.0	A – 7+86.0	8
A – 1+35.0	A – 8+18.0		LT.	7			100			
1408+00.00	1410+00.00		RT.	2			200	1407+94.00	1410+94.00	8
1410+00.30 (BACK) = D–1410+00.30		RAMP D PUBLIC RD								
D – 1410+00.30	D – 1414+00.0		RT.	2			200			
D–1415+79.82 (BACK) = D–0+00.0										
D – 0+20.0	D – 8+20.0		RT.	9			100	D – 0+14.0	D – 8+14.0	9
TOTALS – CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY				69	2	18	------			266

ITEM 621 – RAISED PAVEMENT MARKER

STATION FROM	STATION TO	LANE OR RAMP	LENGTH	SPACING	2–WAY WHITE/ RED	2–WAY YELLOW/ RED	1–WAY WHITE	REMARKS
			LIN. FT.	FEET	EACH	EACH	EACH	
1257+00.00	1268+14.00	NORTH BOUND	1114.00	80	15			LANE LINE
1268+14.00	1342+10.64		7396.64	120			62	LANE LINE
1342+10.64 (BACK) = 1342+00.00								
1342+00.00	1415+64.31		7364.31	120			62	LANE LINE
1265+62.00	1268+12.00		250	40	7			CHANNELIZING LINE
1415+64.31 (BACK) = 0+00.0								
0+00.0	10+25.91		1025.91	120			10	LANE LINE
1257+00.00	1268+14.00	SOUTH BOUND	1114.00	80	15			LANE LINE
1269+25.00	1285+25.00		1600.00	80	20			LANE LINE
1285+25.00	1342+10.64		5685.64	120			48	LANE LINE
1342+00.00	1415+64.31		7364.31	120			62	LANE LINE
1415+64.31 (BACK) = 0+00.0								
0+00.0	10+25.91		1025.91	120			10	LANE LINE
1339+00.00	1341+00.00	RAMP A TR 469	200.00	40	6			CHANNELIZING LINE
A – 1341+00.0	A – 1345+00.0		400.00	80		6		YELLOW EDGE LINE
B – 1358+20.0	B – 1359+00.0	RAMP B TR 469	80.00	80		2		YELLOW EDGE LINE
1359+00.00	1362+00.00		600.00	40	16			CHANNELIZING LINE
C – 1348+76.0	C – 1349+36.0	TR 469 RAMP C	120.00	20	8			CHANNELIZING LINE
C – 1349+36.0	C – 1350+16.0		80.00	80		2		YELLOW EDGE LINE
C – 1356+00.0	C – 1360+00.0		400.00	80		6		YELLOW EDGE LINE
1360+00.00	1362+00.00		200.00	40	6			CHANNELIZING LINE
D – 1338+70.0	D – 1341+91.54	RAMP D TR 469	635.00	40	16			CHANNELIZING LINE
D – 1341+91.54	D – 1342+75.0		80.00	80		2		YELLOW EDGE LINE
1414+48.31	1415+64.31	RAMP A PUBLIC RD	116.00	40	3			CHANNELIZING LINE
1415+64.31 (BACK) = 0+00.0								
0+00.0	0+84.0		84.00	40	2			CHANNELIZING LINE
A – 0+84.0	A – 4+84.0		400.00	80		5		YELLOW EDGE LINE
1413+39.31	1415+64.31	RAMP D PUBLIC RD	625.00	40	16			CHANNELIZING LINE
1415+64.31 (BACK) = 0+00.0								
0+00.0	0+75.0		150.00	40	4			CHANNELIZING LINE
D – 0+60.0	D – 1+40.0		80.00	80		2		YELLOW EDGE LINE
TOTALS – CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY:				EACH:	127	32	254	
				TOTAL:	413			

CALC. BY: ATH DATE: 1/95
CHKD. BY: VDK DATE: 2/95

TRAFFIC CONTROL

BEL/JEF-7-23.76/0.00

64
94

FINAL
RIB 1953PMX
9/8/95

LIGHTING SUB-SUMMARY

				ITEM 625																								202					603
SHEET NO.	FROM STATION	TO STATION	SIDE	CONNECTOR KIT, TYPE II	CABLE SPLICING KIT				LOW MAST LIGHT POLE, DES ATON51.7, AS PER PLAN		LIGHT POLE FOUNDATION, 24"X10'	NO. 10 AWG POLE AND BRACKET CABLE	1-1/2" DUCT CABLE W/TWO-NO. 4 AWG 5000 VOLT CABLES	NO. 2 AWG 5000 VOLT DISTRIBUTION CABLE	CONDUIT, JACKED OR DRILLED, SIZE: 3"			LUMINAIRE, CONV.: STYLE B, TYPE III, 200 WATT HPS, AS PER PLAN	LUMINAIRE, LOW MAST: STYLE B, TYPE V, 400 WATT HPS, AS PER PLAN	TRENCH	PULLBOX, 713.08, 18"	PULLBOX, 713.08, 24"	GROUND ROD			POWER SERVICE, AS PER PLAN	LIGHTING, MISC: REFURBISH EXISTING LIGHT POLE, AS PER PLAN	PULLBOX REMOVED, AS PER PLAN	LIGHT POLE REMOVED, FOR STORAGE, AS PER PLAN	LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	LUMINAIRE REMOVED, AS PER PLAN	POWER SERVICE REMOVED, AS PER PLAN	4"CONDUIT,TYPE E, AS PER PLAN
				EACH	EACH				EACH		EACH	LIN FT	LIN FT	LIN FT	LIN FT			EACH	EACH	LIN FT	EACH	EACH	EACH			EACH	EACH	EACH	EACH	EACH	EACH	EACH	LIN FT.
	-TR 469-																																
75	50+55		RT																		1							1					15
75	50+55	51+05	RT										60							50								1	1	1			
75	51+00		RT																									1					
75	51+05		RT																		1												15
75	51+05	1351+60(B)	RT										58		48																		
	-RAMP B-																																
75	1350+51		LT	2					1		1	120							1				1										
75	1350+51	1351+60	LT										119							109									1	1	1			
75	1351+60		LT		2																	1						1					15
75	1351+60	1352+12	LT										62							52													
75	1352+12		LT	2					1		1	120							1				1										
75	1352+12	1356+91	LT										489							479													
75	1356+91		LT	2								93						1								1					1		
75	1356+91	1357+95	LT										114							104													
75	1357+95		LT		2																	1											15
75	1357+95	1358+00	LT/RT										55		25					20													
75	1358+00		RT	2								99						1								1					1		
75	1357+95	1359+40	LT										155							145													
75	1359+40		LT	2								99						1								1					1		
75	1359+40	1363+05	LT										375							365								1					
75	1363+05		LT		2																	1											15
	-SR 7-																																
75	1363+05	1365+00	LT										205							195													
75	1365+00		LT	2								99						1								1					1		
														Used dico																			
75	1363+05		LT/RT											240	110																		
75	1361+60		RT	2								99						1								1					1		
75	1361+60	1363+05	RT										155							145								1					
75	1363+05		RT		2																	1											15
75	1363+05	1365+15	RT										220							210													
75	1365+15		RT	2								99						1								1					1		
75	1365+15	1369+50	RT										445							435													
75	1369+50		RT	2								99						1								1					1		
	-SR 7-																																
76	1407+10		LT	2								99						1								1					1		
76	1407+10	1411+35	LT										435							425													
76	1411+35		LT	2								99						1								1					1		
76	1411+35	1411+70	LT										45							35								1					
76	1411+70		LT		2																	1											15
76	1411+70	1415+05	LT										345							335													
76	1415+05		LT	2								99						1								1					1		
76	1411+70		LT/RT											232	106																		
76	1409+94		RT	2								99						1								1					1		
76	1409+94	1411+70	RT										186							176								1					
76	1411+70		RT		2																	1											15
76	1411+70	0+35	RT										455							445								1					
76	0+35		RT	2								99						1								1					1		
76	0+35	1+65	RT										140							130													
76	1+65		RT		2																	1						1					15
76	1+65	1+80	RT											104	42																		
76	1+80		LT	2								99						1								1					1		
76	1+65	2+35	RT										80							70													
76	2+35		RT	2								99						1								1					1		
76	2+35	5+00	RT										275							265													
76	5+00		RT																		1											15
76	5+00	8+39	RT										355							345						1		2				1	
	TOTALS THIS SHEET			32	14				2		2	1620	4828	576	331			14	2	4535	3	7	2			1	14	11	2	2	16	1	150

CALC. BY: DLS DATE: 12/96
CHKD. BY: AAH DATE: 12/96

LIGHTING SUB-SUMMARY

BEL/JEF-7-23.76/0.00

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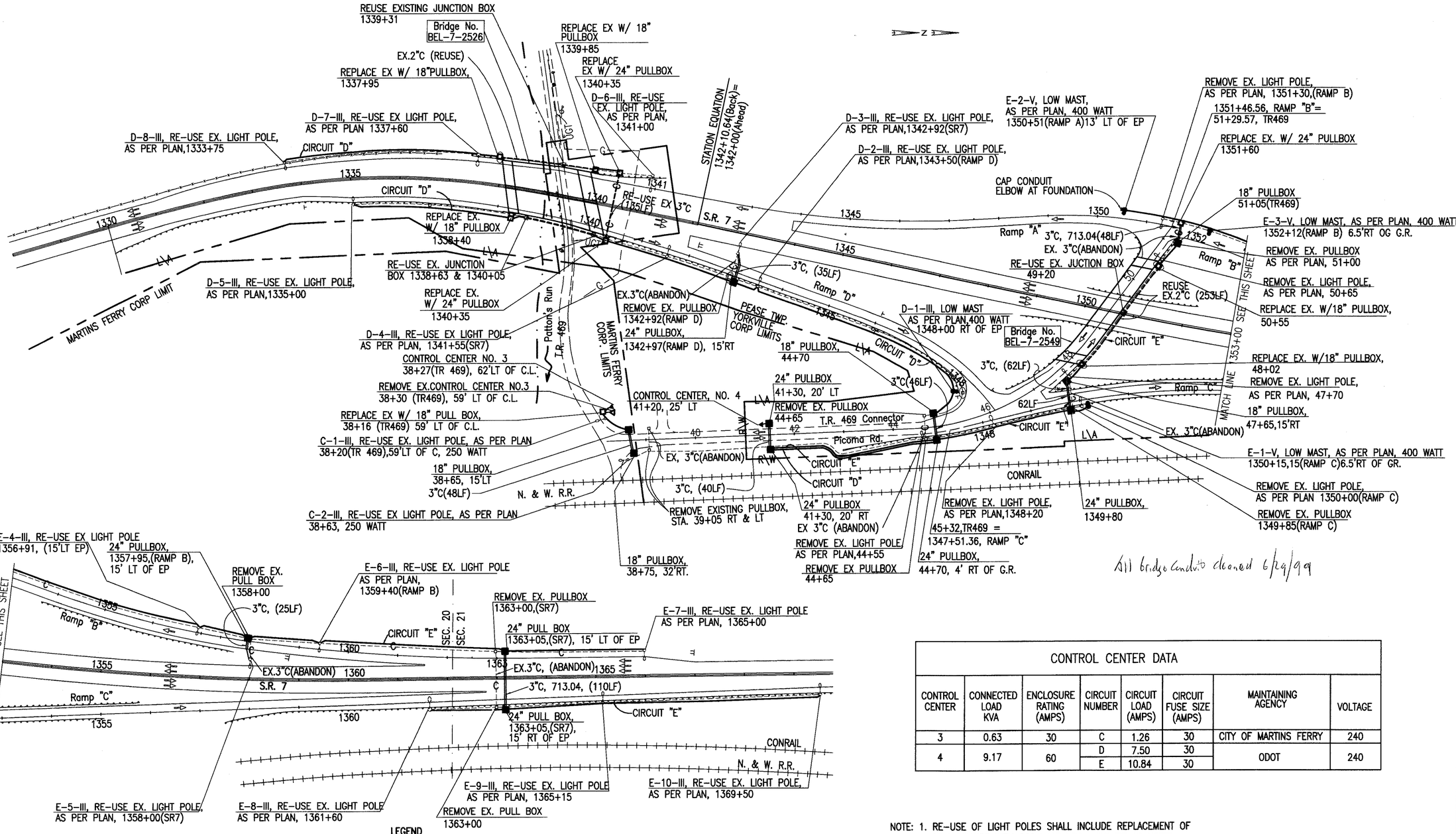

CONTROL CENTER DATA							
CONTROL CENTER	CONNECTED LOAD KVA	ENCLOSURE RATING (AMPS)	CIRCUIT NUMBER	CIRCUIT LOAD (AMPS)	CIRCUIT FUSE SIZE (AMPS)	MAINTAINING AGENCY	VOLTAGE
3	0.63	30	C	1.26	30	CITY OF MARTINS FERRY	240
4	9.17	60	D	7.50	30	ODOT	240
			E	10.84	30		

LEGEND

- EXISTING SERVICE POLE & CONTROL CENTER
- EXISTING PULL BOX
- EXISTING LIGHT POLE & LUMINAIRE
- EXISTING UNDERPASS LUMINAIRE
- EXISTING DUCT CABLE
- EXISTING METAL CONDUIT
- PROPOSED MAST ARM POLE WITH ALUMINUM TRANSFORMER BASE, HIGH PRESSURE SODIUM 34.2 FOOT NOMINAL EFFECTIVE MOUNTING HEIGHT.
- PROPOSED LOW MAST POLE WITH ALUMINUM TRANSFORMER BASE, 51.7' NOMINAL EFFECTIVE MOUNTING HEIGHT SEE SHEET 74 FOR DETAILS
- PROPOSED SERVICE POLE & CONTROL CENTER, 240 VOLT
- PROPOSED PULL BOX,713.08
- REPLACE EXISTING PULL BOX W/ TYPE 713.08, 18"
- PROPOSED 1 1/2" DUCT CABLE WITH 2-NO.4 AWG CABLES OR NO. 2AWG 5000 VOLT DISTRIBUTION CABLES.
- PROPOSED CONDUIT TO BE JACKED UNDER PAVEMENT (3"C, 713.04, EXCEPT AS NOTED)

NOTE: 1. RE-USE OF LIGHT POLES SHALL INCLUDE REPLACEMENT OF OF LUMINAIRE WITH 200 WATT HPS, EXCEPT AS NOTED
2. 3"C, 713.04 FROM CONTROL CENTER TO NEAREST PULLBOX

FOR QUANTITIES, SEE SHEET NO. 72 & 73

HORIZONTAL SCALE IN FEET 0' 100' 200'

CALC. BY: DAS DATE: 12/98
CHKD. BY: AW DATE: 12/98

LIGHTING PLAN STA 1330+00 TO STA 1372+00

BEL/JEF-7-23.76/0.00

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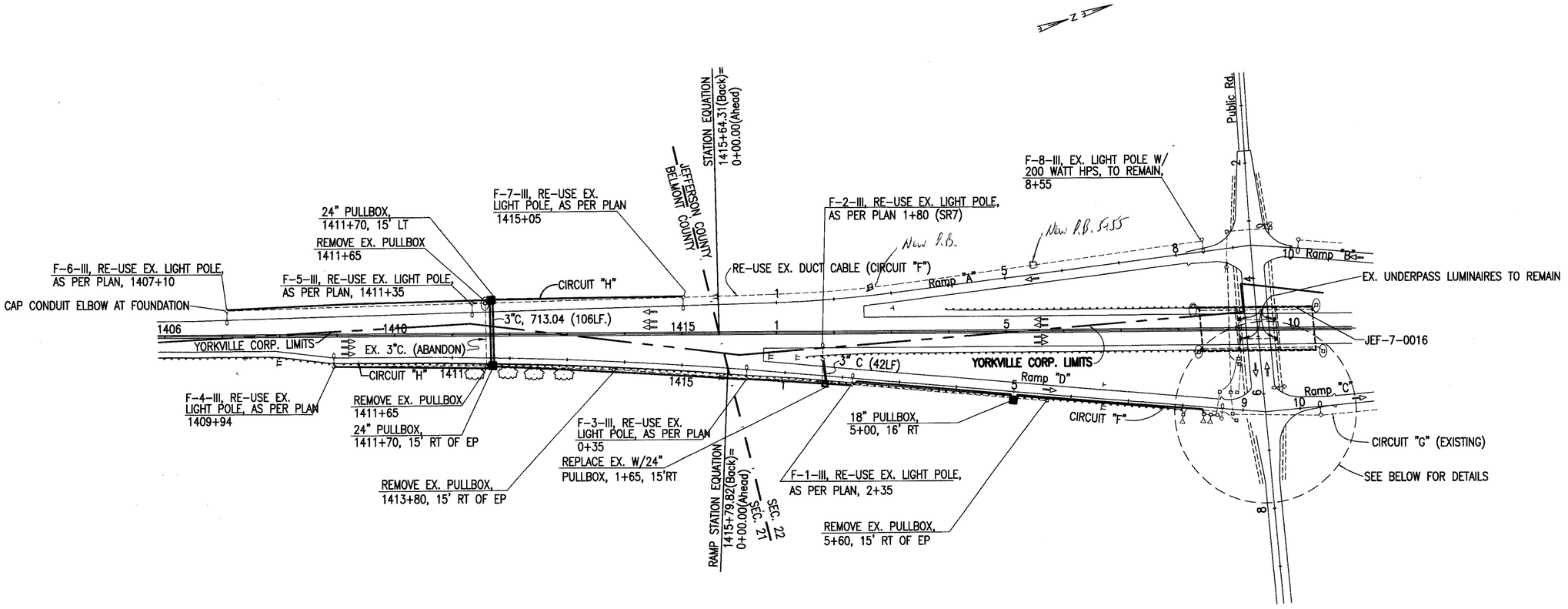


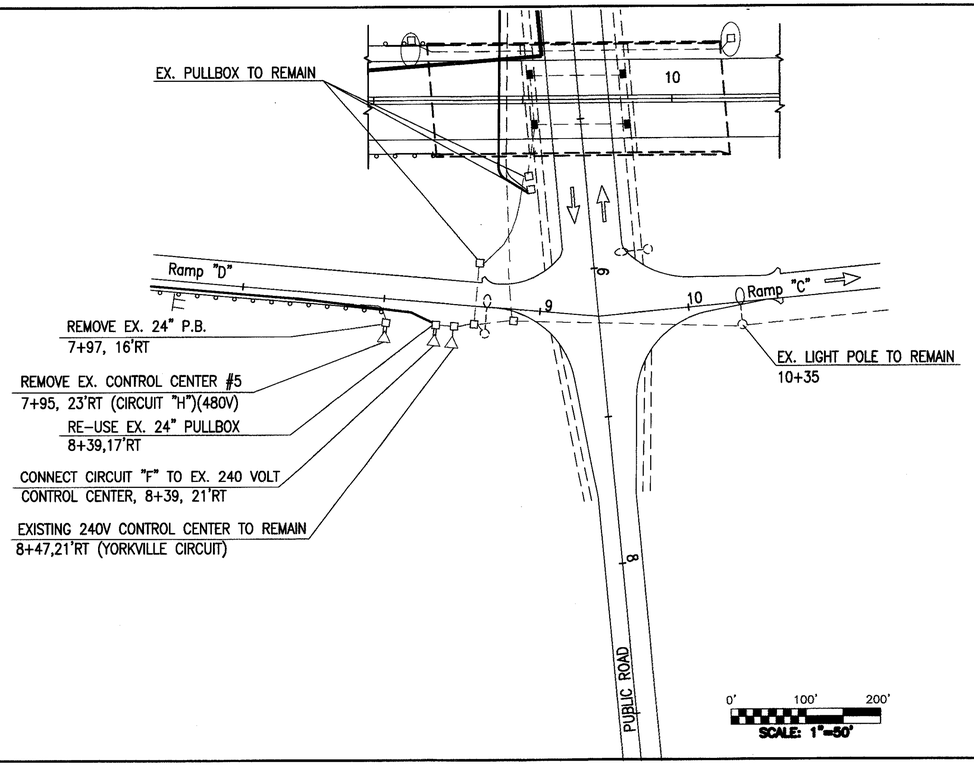
FOR QUANTITIES, SEE SHEET NO. 73

CONTROL CENTER DATA							
CONTROL CENTER	CONNECTED LOAD KVA	ENCLOSURE RATING (AMPS)	CIRCUIT NUMBER	CIRCUIT LOAD (AMPS)	CIRCUIT FUSE SIZE (AMPS)	MAINTAINING AGENCY	VOLTAGE
5	EX. +3.33	EX.	F	6.66	30	ODOT	240
			G(EX.)	EX.	EX.	ODOT	240

LEGEND

- △ EXISTING SERVICE POLE & CONTROL CENTER
- □ EXISTING PULL BOX
- EXISTING LIGHT POLE & LUMINAIRE
- ▯ EXISTING UNDERPASS LUMINAIRE
- —C— EXISTING METAL CONDUIT
- --- EXISTING DUCT CABLE
- PROPOSED MAST ARM POLE WITH ALUMINUM TRANSFORMER BASE, HIGH PRESSURE SODIUM 34.2 FOOT NOMINAL EFFECTIVE MOUNTING HEIGHT.
- PROPOSED LOW MAST POLE WITH ALUMINUM TRANSFORMER BASE, 51.7' NOMINAL EFFECTIVE MOUNTING HEIGHT
- ▲ PROPOSED SERVICE POLE & CONTROL CENTER, 240 VOLT
- ■ PROPOSED PULLBOX, 18", EXCEPT WHERE NOTED, 713.08
- □ REPLACE EXISTING PULLBOX, WITH 713.08, 18"
- PROPOSED 1 1/2" DUCT CABLE WITH 2-NO.4 AWG CABLES OR NO. 2 AWG 5000 VOLT DISTRIBUTION CABLES.
- PROPOSED CONDUIT TO BE JACKED UNDER PAVEMENT (3"C, 713.04 EXCEPT AS NOTED)

NOTE: ALL LUMINAIRES 200 WATT, EXCEPT AS NOTED



HORIZONTAL SCALE IN FEET
0' 100' 200'

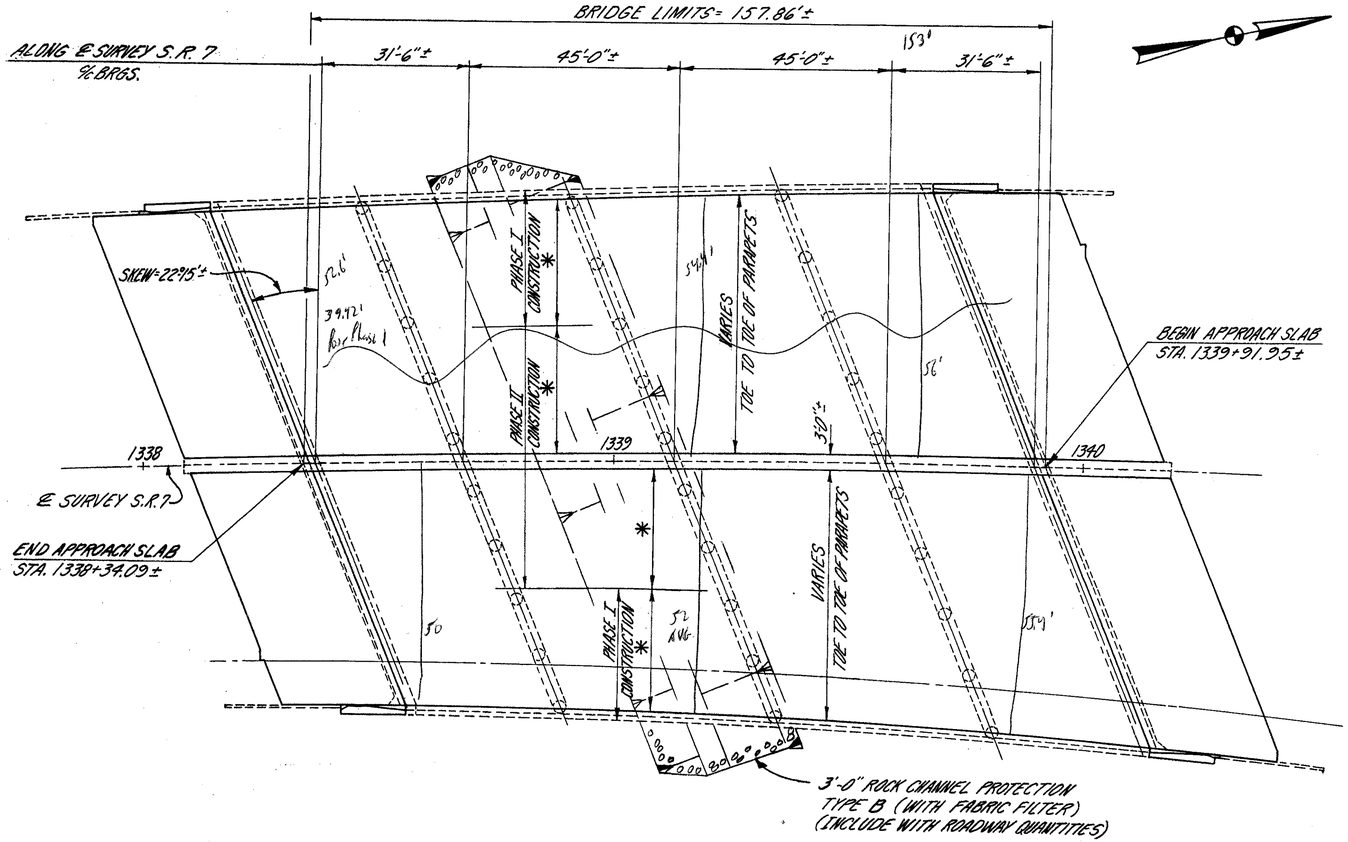
CALC. BY: DLS DATE: 12/98
CHKD. BY: AW DATE: 12/98

LIGHTING PLAN
STA 1403+00 TO STA 1050.91

BEL/JEF-7-23.76/0.00

76
94

File Name: [12/4/98]< D:\CADD5\PROJECTS\94-217\BEL-JEF\94217LP3 >



GENERAL PLAN

Decks $\left(\frac{52+52.5}{2}\right) \times 153.83/9 = 925.75$ S.Y.

Deck N $56 \times 153.83/9 = 853.72$ S.Y.

$\ell\,(54.4 + 113.14/9) = 96.02$ S.Y.

PROPOSED WORK

1 – REPLACE TRANSITION PARAPETS.
2 – REPAIR SPALLED CONCRETE AREAS WITH TROWELABLE MORTAR.
3 – REPLACE CORRODED END CROSS FRAMES.
4 – REPLACE ASPHALT CONCRETE WEARING SURFACE WITH $2\frac{3}{4}$" THICKNESS OF MICRO–SILICA MODIFIED CONCRETE OVERLAY.
5 – EPOXY SEAL SUPERSTRUCTURE AND SUBSTRUCTURE CONCRETE SURFACES.
6 – CLEAN AND PAINT STRUCTURAL STEEL.
7 – ADD ROCK CHANNEL PROTECTION.

LEGEND

– MAINTAIN 10'–0" MINIMUM LANE WIDTH. SEE MAINTENANCE OF TRAFFIC SHEET (10/94) TO (14/94) FOR DETAILS.

STICKLEN – BELSHEIM & ASSOCIATES
ENGINEERS
1550 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED R.E.W
DRAWN R.D.Y
CHECKED G.T.
REVISED
REVISED 7-26
DATE 10/18/94
STRUCTURE FILE NUMBER 0700797

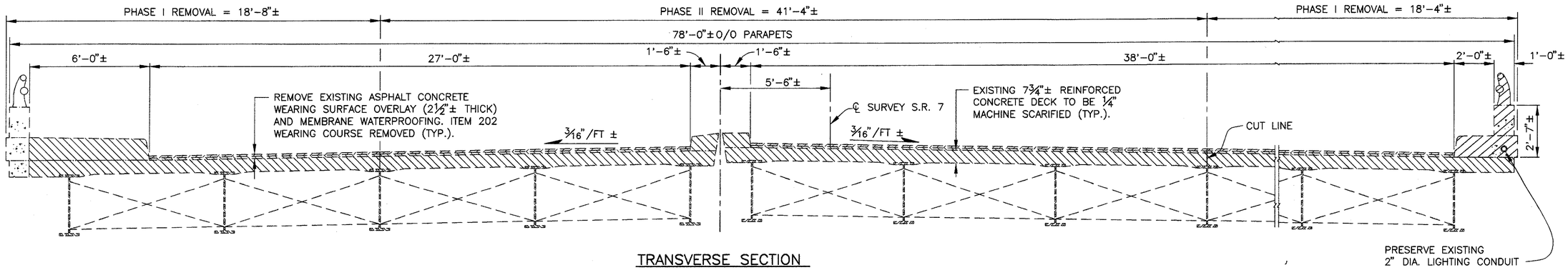
BELMONT COUNTY
STA. 1338+34.09
STA. 1339+91.95

GENERAL PLAN
BRIDGE NO. BEL-7-2526
S.R.7 OVER PATTON RUN AND T.R.469

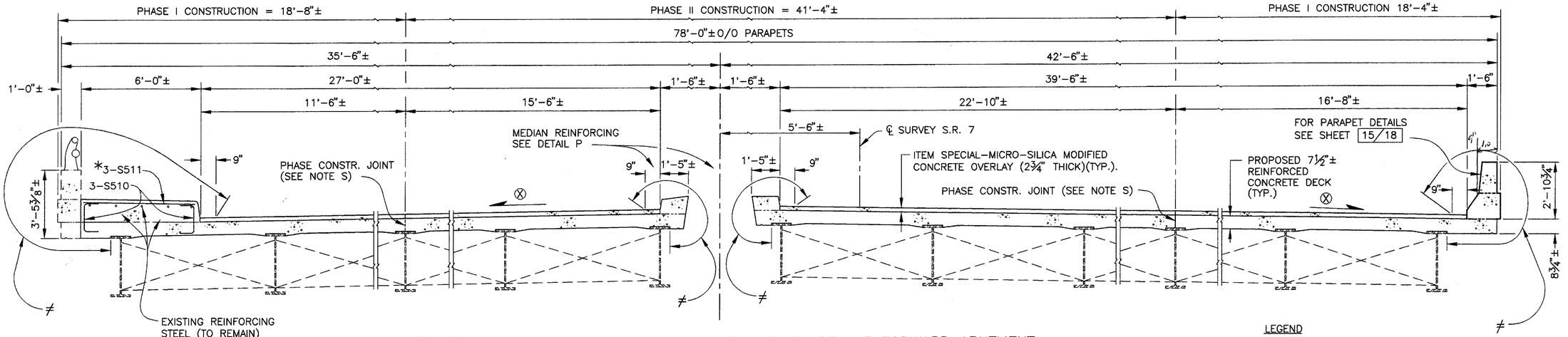
BEL/JEF-7-23.76/0.00

2/18

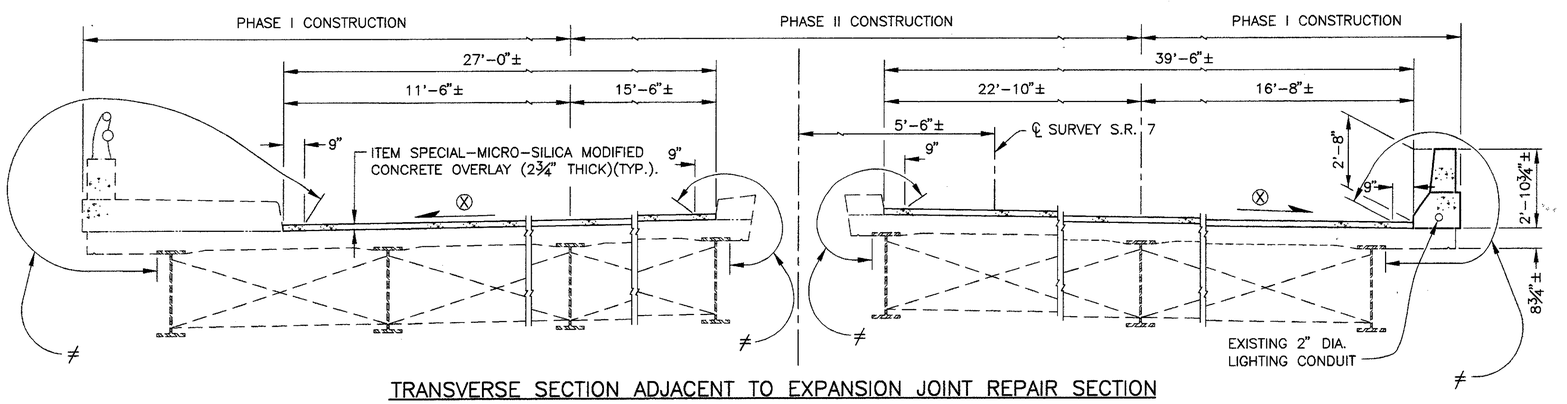
(78/94)



TRANSVERSE SECTION



TRANSVERSE SECTION THROUGH EXPANSION JOINT AREA AT FORWARD ABUTMENT



TRANSVERSE SECTION ADJACENT TO EXPANSION JOINT REPAIR SECTION

LEGEND

≠ – LIMITS OF SEALING OF CONCRETE SURFACES (EPOXY) FULL LENGTH OF DECK.

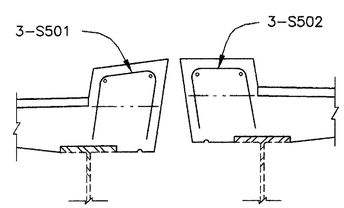
Ⓧ – MATCH EXISTING

* – PLACE PARALLEL TO FACE OF ABUTMENT.

– LIMITS OF CONCRETE PARAPET REMOVAL. (FULL LENGTH OF DECK)

– LIMITS OF CONCRETE SLAB REMOVAL (ADJACENT TO FORWARD ABUTMENT ONLY.) SEE SECTION A–A, SHEET 14/18.

NOTE S:
TREAT TOP OF MICRO–SILICA MODIFIED CONCRETE OVERLAY SURFACE, ALONG A 2 FOOT WIDE STRIP CENTERED ABOUT THE LONGITUDINAL PHASE CONSTRUCTION JOINT WITH HMWM RESIN THE FULL LENGTH OF THE DECK.



DETAIL P

(SLAB REINFORCING NOT SHOWN)

STICKLEN – BELSHEIM & ASSOCIATES ENGINEERS
1050 KINGSMILL PARKWAY COLUMBUS, OHIO 43229

DESIGNED REW
DRAWN RDY/REW
CHECKED G.T.
REVIEWED T.R.O. 5/11/95
REVISED
DATE
STRUCTURE FILE NUMBER 0700770

SUPERSTRUCTURE DETAILS
BRIDGE NO. BEL-7-2389
S.R. 7 OVER GLENNS RUN

BEL/JEF-7-23.76/0.00

8/18

84/94

2389SUP1.DWG SEPTEMBER 06, 1996