

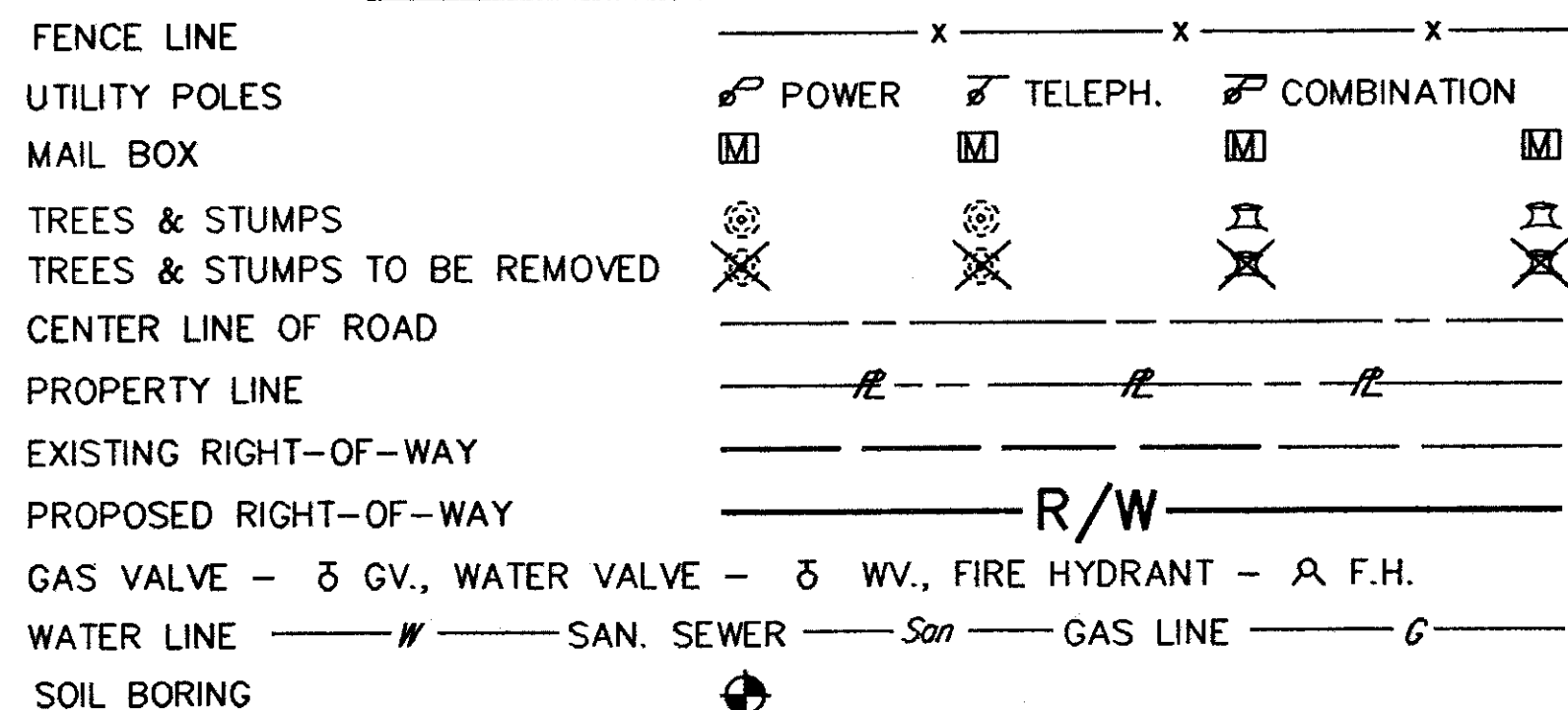
DESIGN DESIGNATION

CURRENT ADT (1993) = 3,450
 DESIGN YEAR ADT (2013) = 5,180
 DHV = 518
 D = 55%
 T = 2%
 DESIGN SPEED = 35 MPH
 LEGAL SPEED = 35 MPH
 FUNCTIONAL CLASSIFICATION = MAJOR COLLECTOR, (RURAL)

*2x3
3 cities
45pp*

DESIGN EXCEPTIONS	APPROVED
LANE WIDTH	12-1-94
BRIDGE WIDTH	12-1-94
HORIZONTAL ALIGNMENT	12-1-94

CONVENTIONAL SIGNS



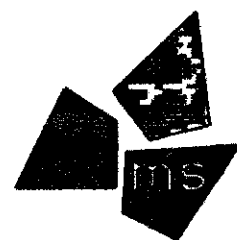
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LINE DATA

BEGIN PROJECT	STA.264+60.43
END PROJECT	STA.267+65.00
LENGTH OF PROJECT	304.57 FT. OR 0.057 MI.
BEGIN WORK	STA.263+25.00
END WORK	STA.268+13.00
LENGTH OF WORK	475 FT. OR 0.089 MI.

PREPARED AND RECOMMENDED BY
ms consultants, inc.
 CONSULTING ENGINEERS, ARCHITECTS & PLANNERS
 YOUNGSTOWN, OHIO 44503



FILE NO.	DATE OF LETTING CONTRACT NO.
	19

STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

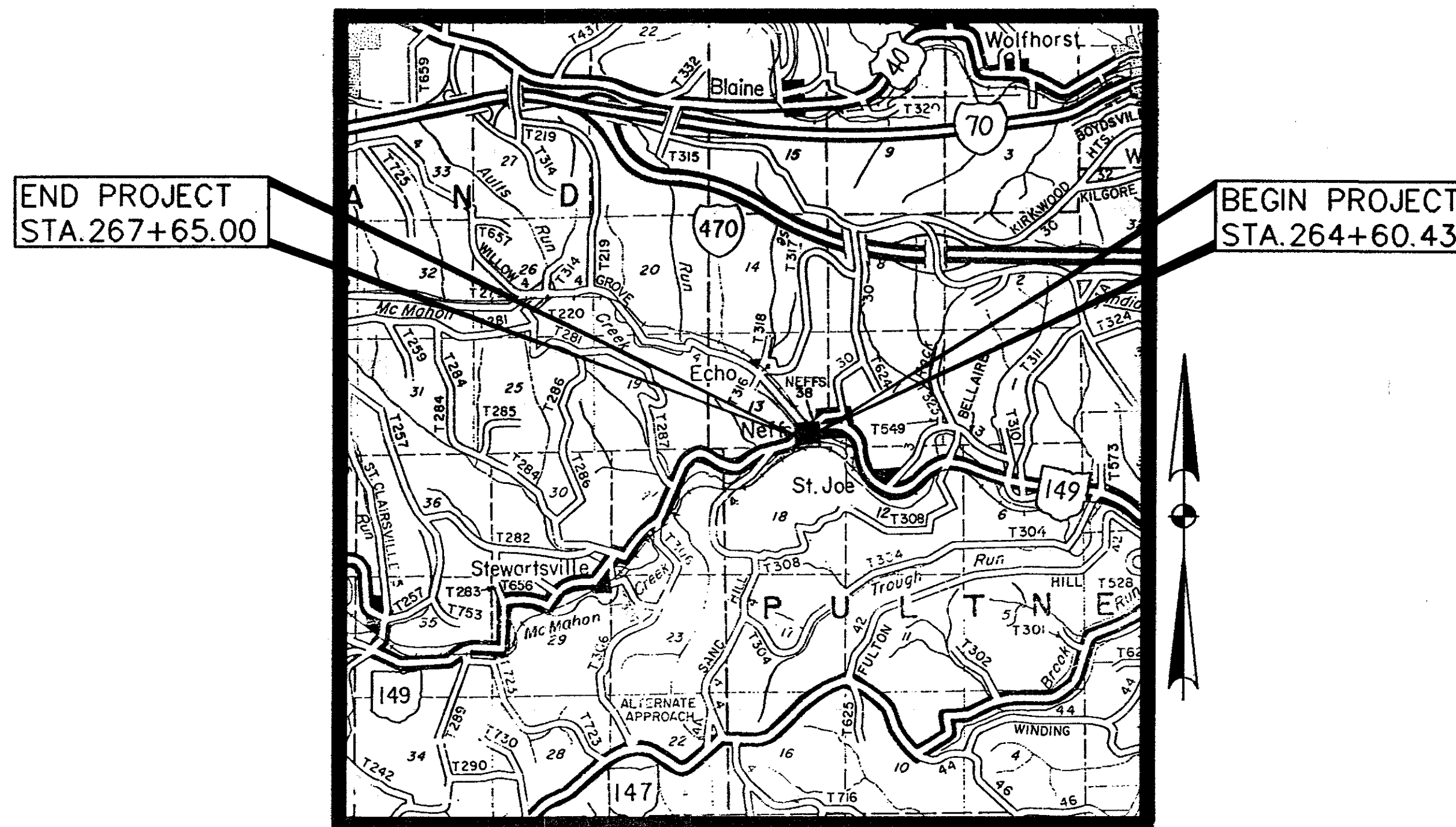
BEL-149-4.99

PULTNEY TOWNSHIP
 BELMONT COUNTY

1997 SPECIFICATIONS

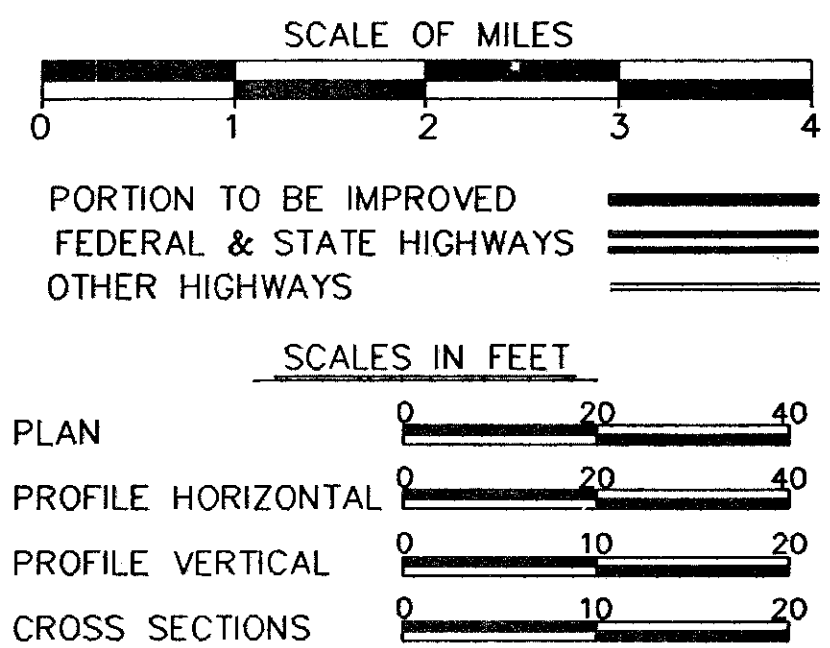
THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR MAINTENANCE AND SAFETY OF TRAFFIC WILL BE SET FORTH ON THE PLANS AND ESTIMATES.



LOCATION PLAN

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



STANDARD DRAWINGS				SUPPLEMENTAL SPECIFICATIONS	
BP-3.1	2-21-92	DM-1.1M	10-21-97	TC-41.20	6-21-94
BP-4.1	2-21-92	DM-4.3M	6-30-95	TC-42.20	3-26-79
GR-1.1M	10-21-97	RM-1.1M	4-8-97	TC-52.10	4-3-79
GR-1.2M	1-3-96	MH-1	12-18-84	TC-52.20	4-3-79
GR-2.1M	10-21-97	MH-1.2M	9-6-95		
GR-3.4M	10-21-97	RM-4.2M	10-21-97		
GR-4.1	5-6-91			DS-1-92	12-15-94
		MT-97.10	4-29-88	AS-1-81	9-15-94
CB-1.1M	7-12-95	MT-105.10	7-1-92	DBR-2-73	9-15-94
CB-2.3M	7-12-95	MT-105.11	7-1-92		
		AS-1-81	9-15-94		
HW-2.1M	7-12-95	DBR-2-73	9-15-94	PCB-91	4-24-92
HW-2.2M	7-12-95				

APPROVED *Michael D. Coxe*
 DATE 6/25/98 DISTRICT DEPUTY DIRECTOR

APPROVED *Ray J. King*
 DATE 8-6-98 DIRECTOR, DEPARTMENT OF TRANSPORTATION

DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____
 DIVISION ADMINISTRATOR

DATE _____

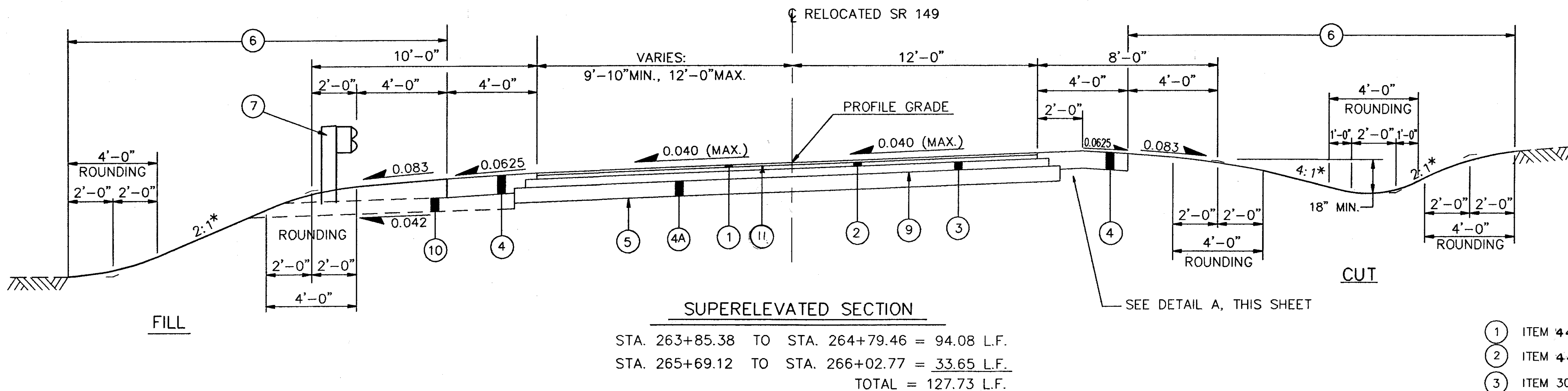
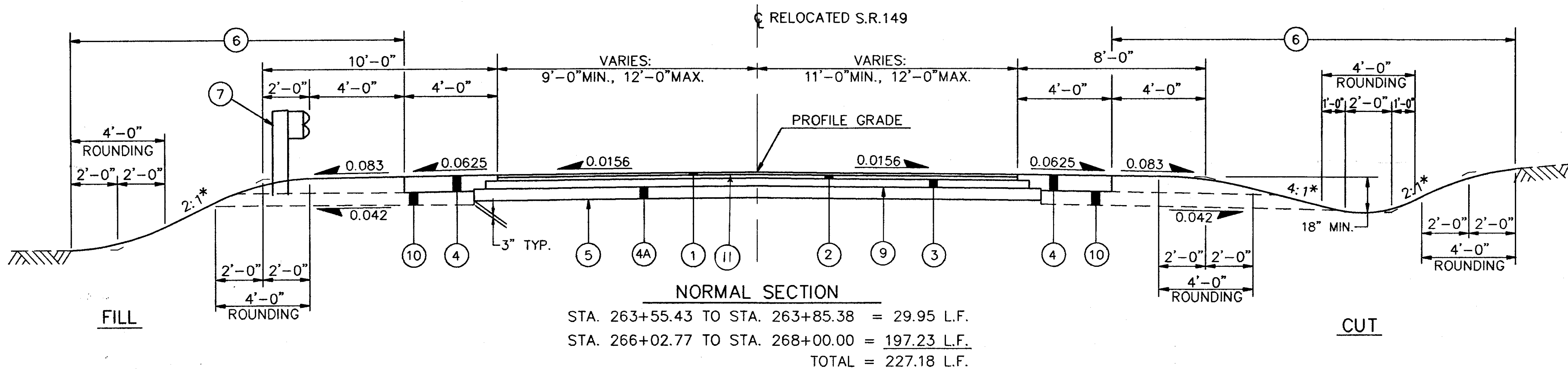
BEL-149-4.99
 980659
 PID# 5364
 DIST 10
 18.30 02/01/95
 ms inc CIVIL7 FR: C:\DRAWING\08042305\0804215H SC: 1

TYPICAL SECTIONS

NOTES

* UNLESS OTHERWISE SHOWN ON CROSS SECTIONS

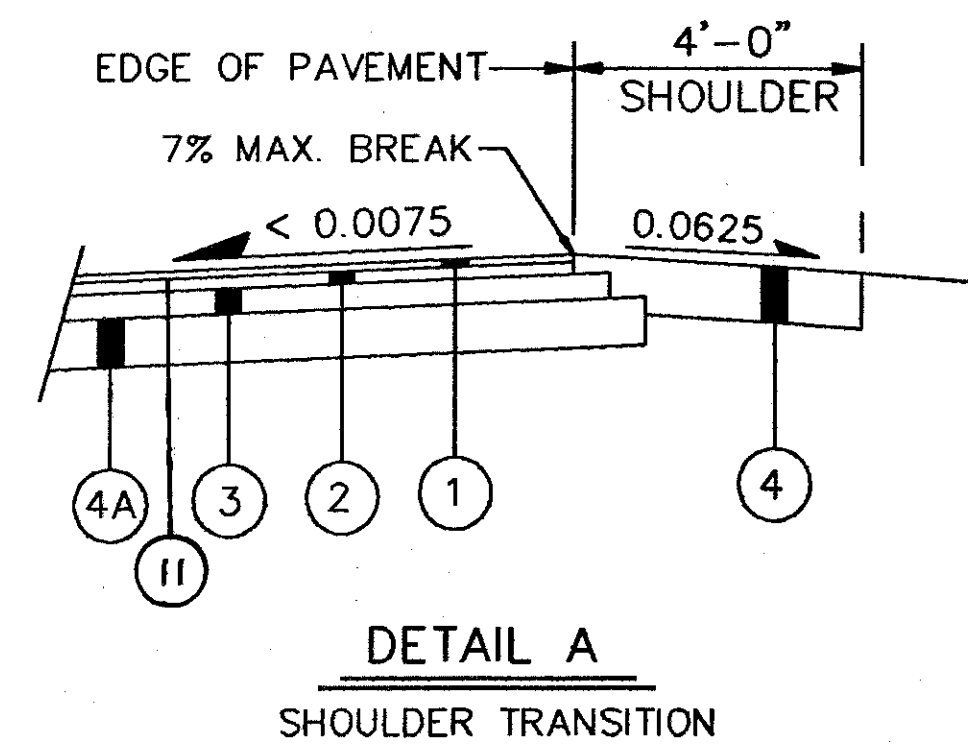
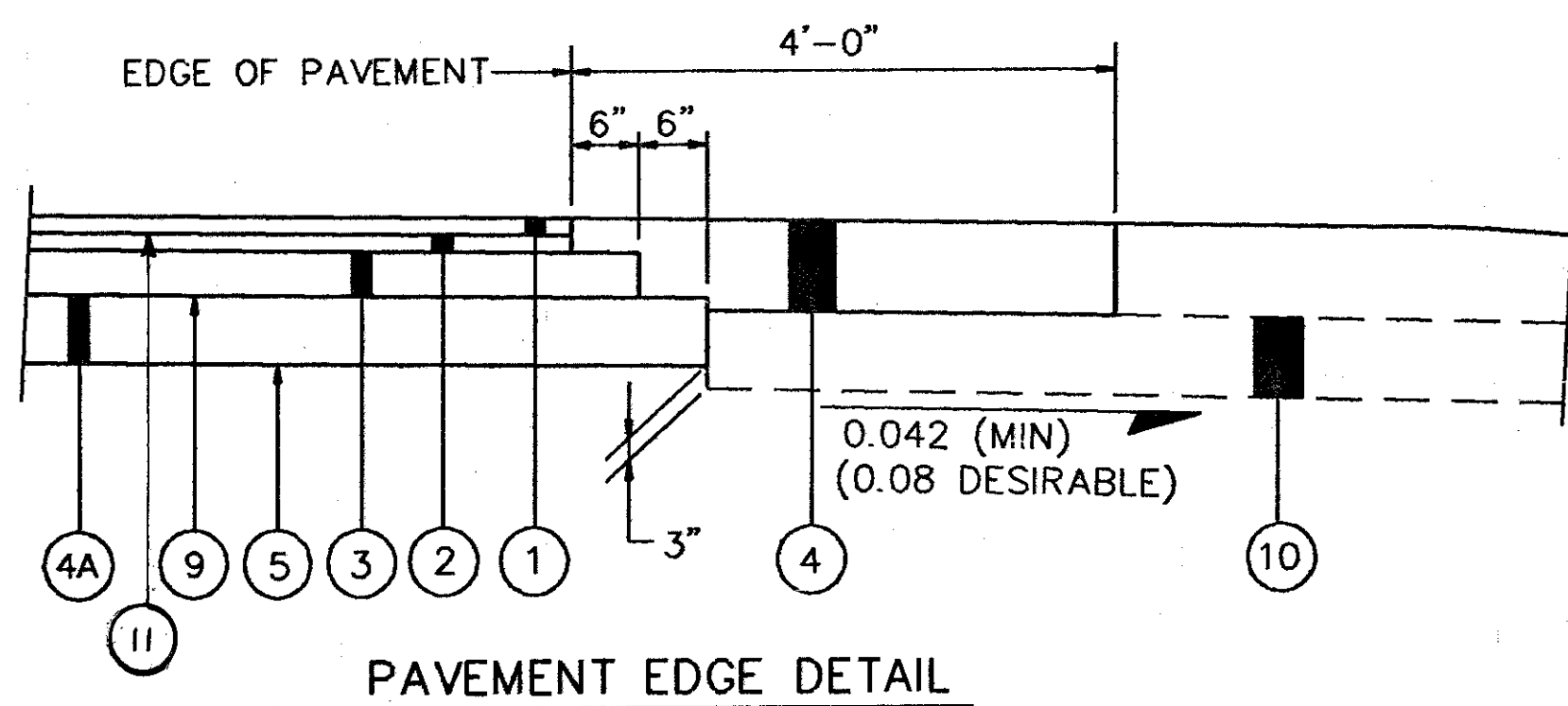
CALC. BY: JAL DATE: 1-95 CHKD. BY: GRT DATE: 1-95 FEDERAL PROJECT	BELMONT COUNTY BEL-149-4.99 STATE PROJECT	OHIO FHWA 5 REGION	2 42
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NOTE: SEE SHEET NO. 22 FOR SUPERELEVATION TABLE.

LEGEND

- ① ITEM 448 1 1/4" ASPHALT CONCRETE, SURFACE COURSE, TYPE 1, PG 64-22
- ② ITEM 448 1 3/4" ASPHALT CONCRETE, INTERMEDIATE COURSE, TYPE 2, PG 64-22
- ③ ITEM 301 4" BITUMINOUS AGGREGATE BASE, PG 64-22
- ④ ITEM 304 8" AGGREGATE BASE
- ④A ITEM 304 6" AGGREGATE BASE
- ⑤ ITEM 203 SUBGRADE COMPACTION
- ⑥ ITEM 659 SEEDING AND MULCHING
- ⑦ ITEM 606 GUARDRAIL, TYPE 5
- ⑧ ITEM 611 REINFORCED CONCRETE APPROACH SLAB, T=12", AS PER PLAN
- ⑨ ITEM 408 BITUMINOUS PRIME COAT @ 0.40 GAL./S.Y.
- ⑩ ITEM 605 AGGREGATE DRAINS
- (A) EXISTING ASPHALT WEARING SURFACE
- (B) EXISTING PLAIN CONCRETE BASE
- (C) EXISTING FLEXIBLE BASE
- (II) TACK COAT FOR INTERMEDIATE COURSE



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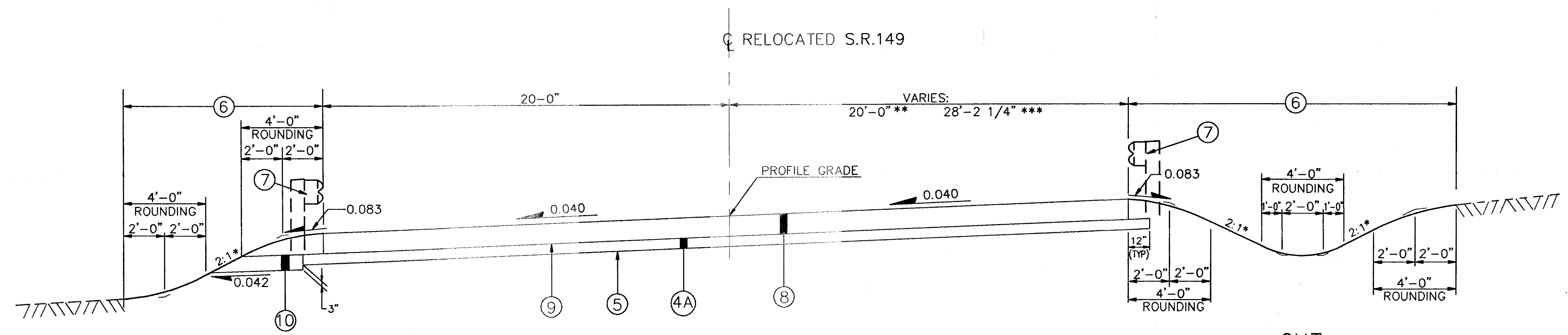
TYPICAL SECTIONS

NOTES:

* UNLESS OTHERWISE SHOWN ON CROSS SECTIONS.
FOR LEGEND SEE SHEET NO. 2

CALC. BY: JAL	BELMONT COUNTY	OHIO
DATE: 1-95	BEL-149-4.99	FHWA 5
CHKD BY: GRT		REGION
DATE: 1-95		
FEDERAL PROJECT	STATE PROJECT	

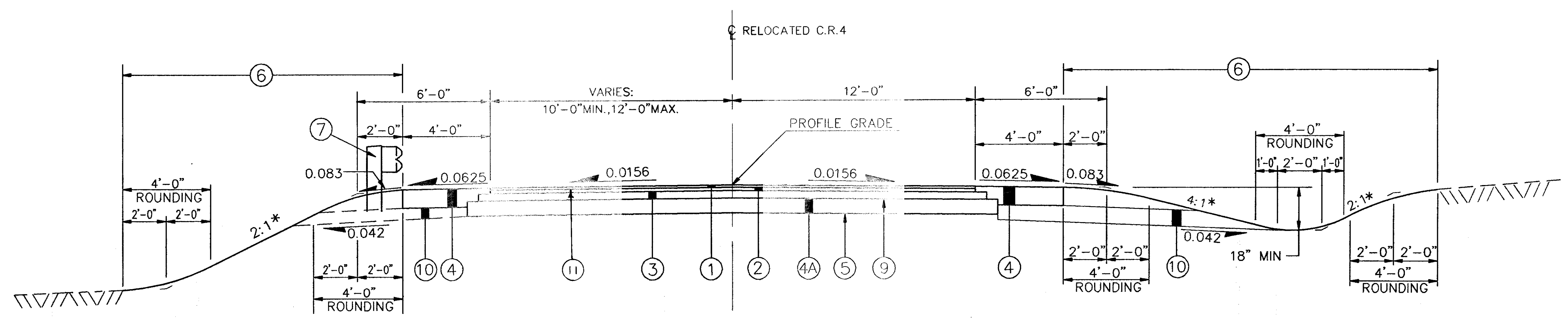
3
42



APPROACH SLAB SECTION
RELOCATED SR 149

BRIDGE LIMITS
STA. 264+94.46 TO STA. 265+54.12

*** STA. 264+79.46 TO STA. 264+94.46 = 15.00 L.F.
** STA. 265+54.12 TO STA. 265+69.12 = 15.00 L.F.
TOTAL = 30.00 L.F.



NORMAL SECTION
RELOCATED CR 4

STA. 9+86.00 TO STA. 11+50.00 = 164.00 L.F.

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TYPICAL SECTIONS

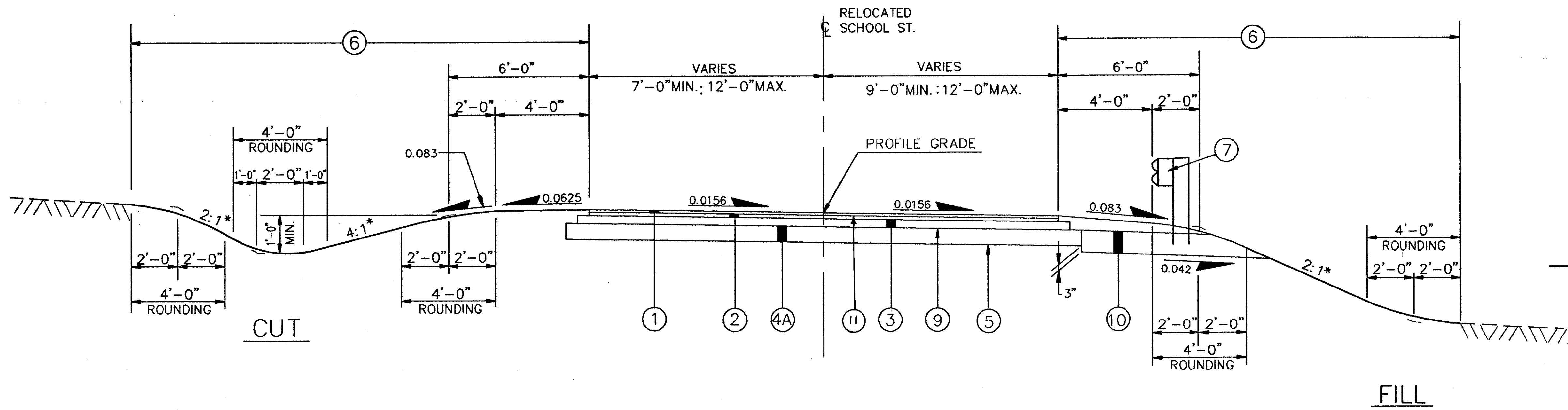
NOTES:

* UNLESS OTHERWISE SHOWN ON CROSS SECTIONS

** SEE CROSS SECTIONS.

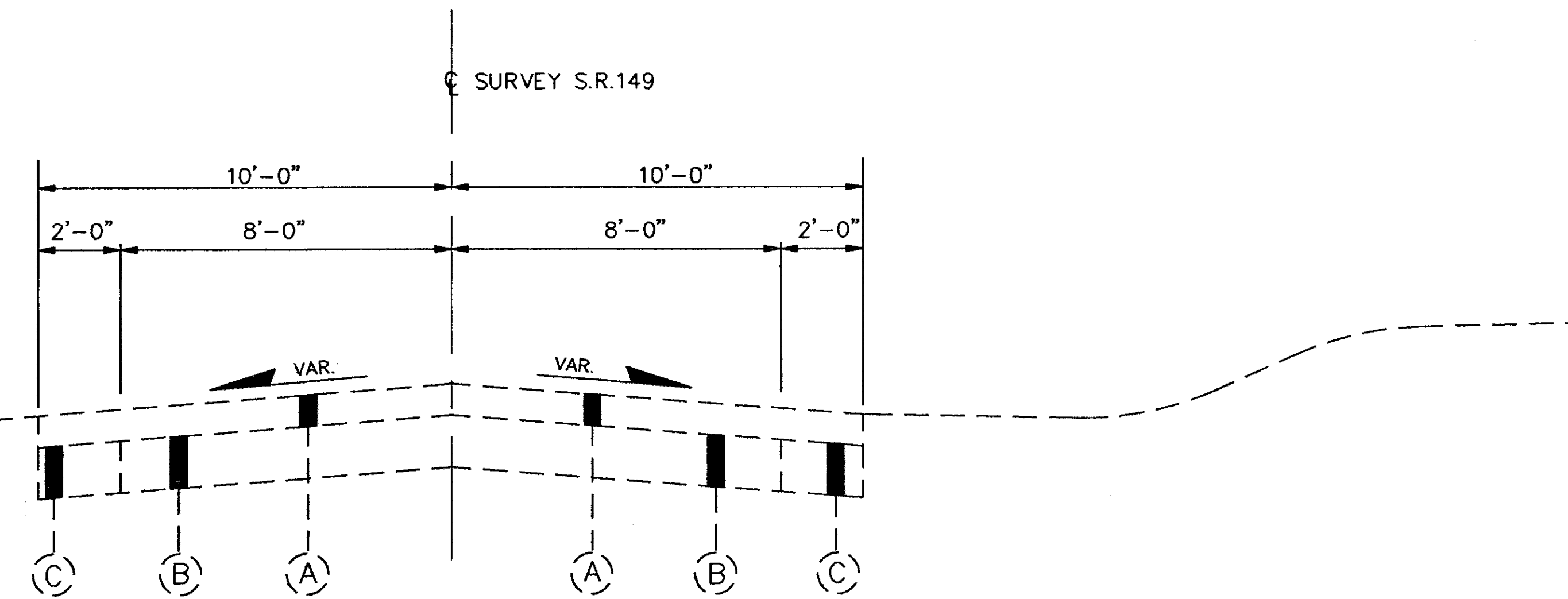
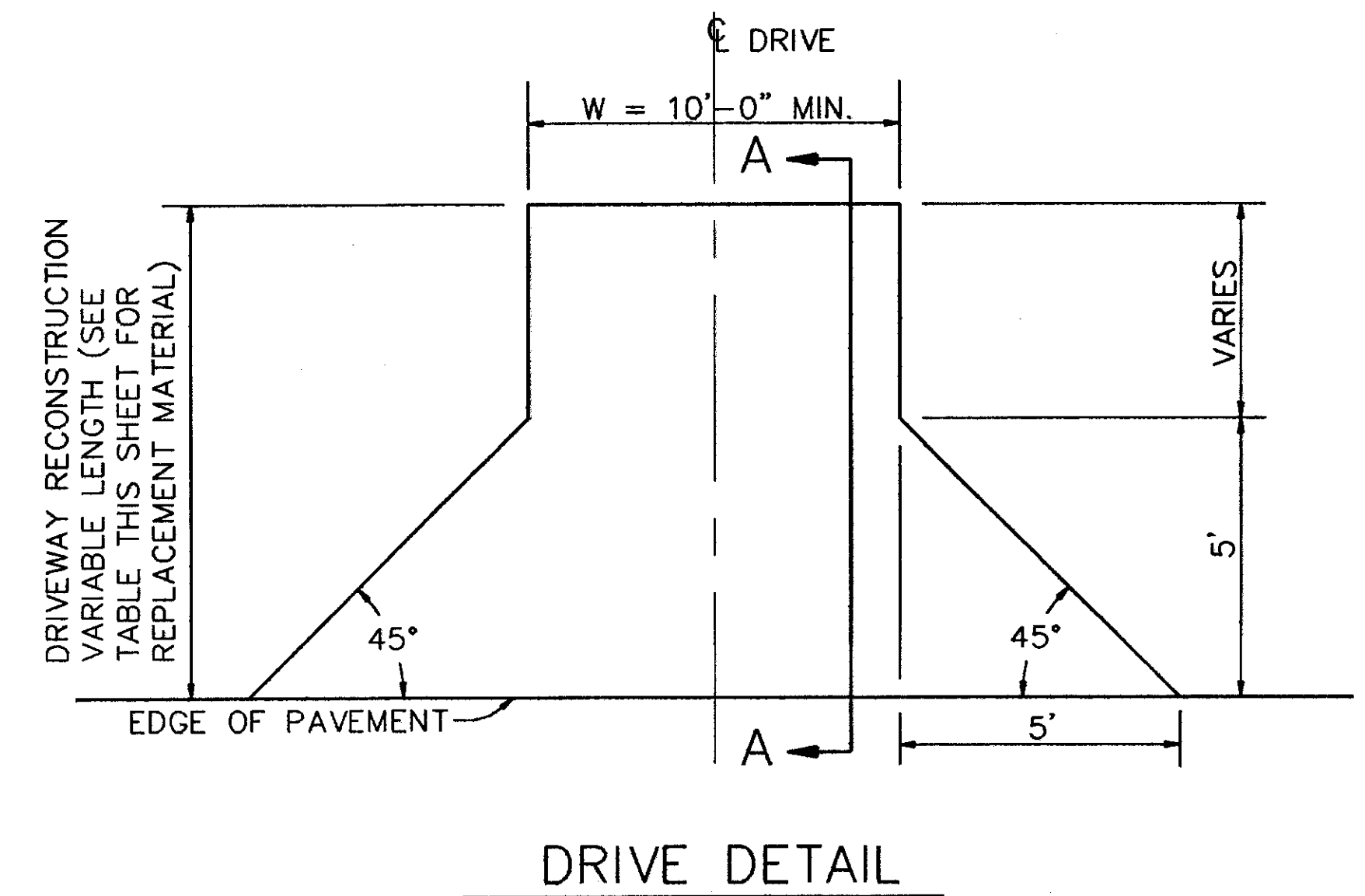
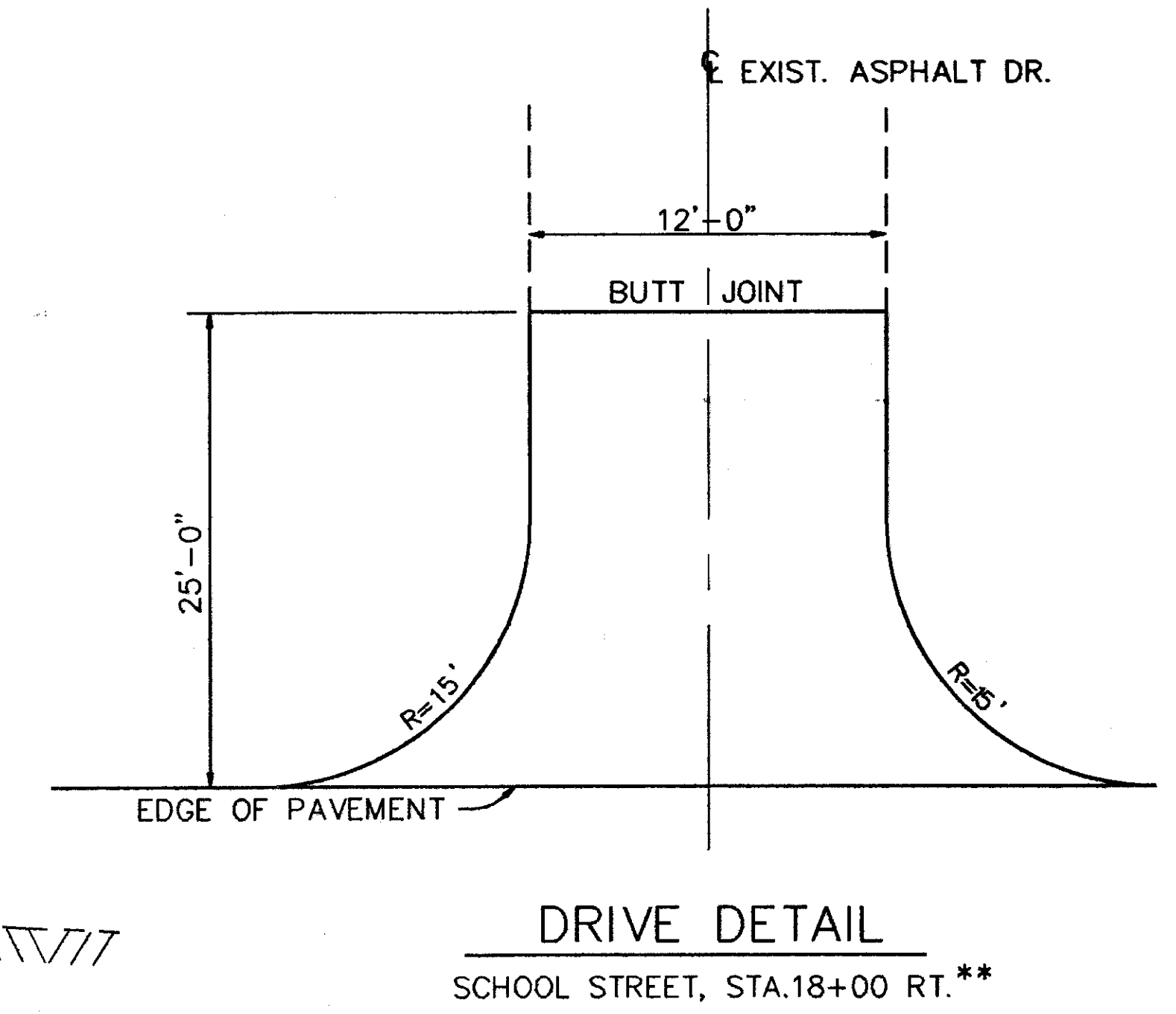
FOR LEGEND SEE SHEET NO. 2

CALC. BY: JAL DATE: 1-95	BELMONT COUNTY BEL-149-4.99	OHIO FHWA REGION 5	4 42
CHKD. BY: GRT DATE: 1-95	FEDERAL PROJECT	STATE PROJECT	



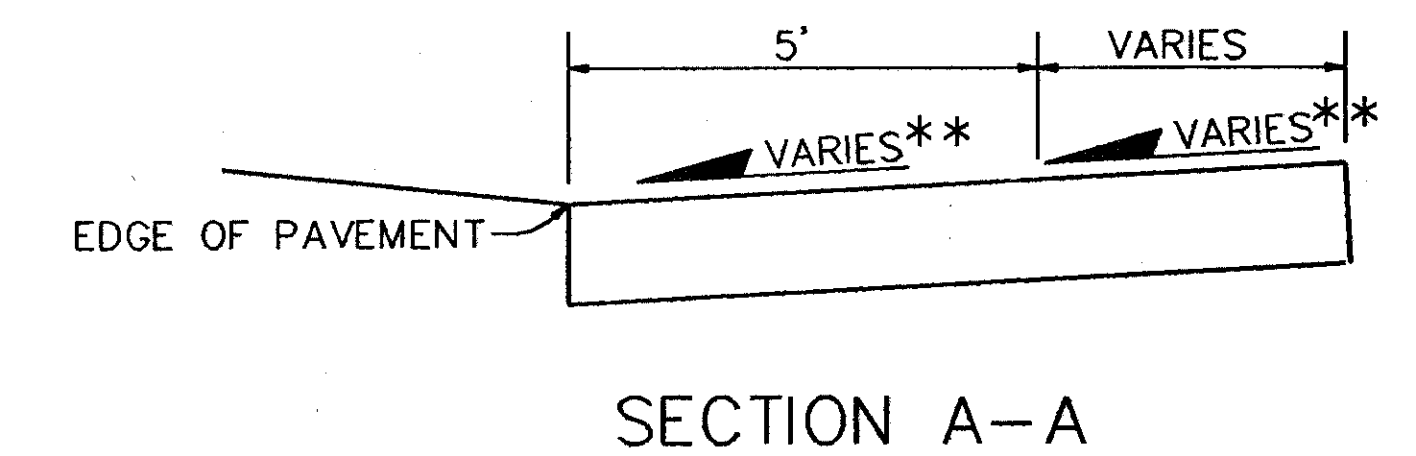
TYPICAL SECTION
RELOCATED SCHOOL STREET

STA.17+60.00 TO STA.19+40.61 = 180.61 L.F.



EXISTING TYPICAL SECTION - SR 149

REPLACEMENT MATERIAL		
EXISTING DRIVE	RESIDENTIAL	COMMERCIAL
CONCRETE	6" ITEM 452~PLAIN CONCRETE PAVEMENT	8" ITEM 452~PLAIN CONCRETE PAVEMENT
ASPHALT	1" ITEM 448 ASPH. CONC. W/4" ITEM 301	1" ITEM 448 ASPH. CONC. W/5" ITEM 301
AGGREGATE	8" ITEM 304 AGGREGATE BASE	10" ITEM 304 AGGREGATE BASE



GENERAL NOTES

CALC. BY: JAL	BELMONT COUNTY	OHIO	5 42
DATE: 1-95	BEL-149-4.99	FHWA REGION 5	
CHKD. BY: GRT			
DATE: 1-95			
FEDERAL PROJECT	STATE PROJECT		

BENCH MARK DATUM

ELEVATIONS SHOWN IN THE PLANS ARE BASED ON U.S.G.S. DATUM. (SEE SHEET NO. 13)

U.S.G.S. STAMPED 733 STEUBENVILLE

THE CONTRACTOR WILL BE REQUIRED TO NOTIFY DISTRICT 11 OF O.D.O.T. 5 (FIVE) WORKING DAYS PRIOR TO ANY ACTIVITY THAT WOULD DISTURB THE LOCATION OR ELEVATION OF THE BENCH MARK MONUMENT.

THE DISTRICT OFFICE WILL FURNISH THE CONTRACTOR WITH A REPLACEMENT DISC MONUMENT, WHICH THE CONTRACTOR WILL PLACE IN AN ACCESSIBLE AND PREFERABLY HORIZONTAL LOCATION ON THE STRUCTURE, AS DIRECTED BY THE ENGINEER, AT THE TIME OF CONSTRUCTION. THE EXISTING DISC MONUMENT SHALL BE SALVAGED AND RETURNED TO DISTRICT 11 OFFICE.

PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 623 CONSTRUCTION LAYOUT STAKES.

MONUMENTS

MONUMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS AS SHOWN ON THE STANDARD CONSTRUCTION DRAWINGS AND AT THE LOCATIONS SHOWN ON SHEET NO. 39.

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.

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS

THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS-SECTIONS EVEN THOUGH OTHERWISE SHOWN.

TACK COAT

THE RATE OF APPLICATION OF ITEM 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. PLAN QUANTITIES INDICATE AVERAGE APPLICATION RATES OF 0.075 GALLONS PER SQUARE YARD OF TACK COAT FOR ESTIMATING PURPOSES ONLY.

CLEARING AND GRUBBING

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

ITEM 659 SEEDING AND MULCHING

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR ITEM 659, SEEDING AND MULCHING, ARE BASED ON THESE LIMITS.

WORK LIMITS

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

WATER FOR DUST CONTROL

WATER USED AS A DUST PALLIATIVE SHALL BE FURNISHED AND APPLIED BY THE CONTRACTOR IN ACCORDANCE WITH THE PROVISIONS OF ITEM 616.

THE WORK IS TO BE DONE AT THE ITEM, LOCATION AND THE AMOUNT AS DIRECTED BY THE ENGINEER. IF THE CONTRACTOR OBTAINS WATER FROM A HYDRANT, THE WATER WILL BE METERED BY THE SUPPLIER, AND CHARGED TO THE CONTRACTOR AT THE PREVAILING RATE.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE.

ITEM 616 WATER 5 M. GAL
ITEM 616 CALCIUM CHLORIDE 1 TON

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:

ITEM 207 STRAW OR HAY BALES 100 EACH
ITEM 207 FILTER FABRIC FENCE 500 LIN. FT.

BENCHING OF FOUNDATION SLOPES

ALTHOUGH CROSS-SECTIONS INDICATE SPECIFIC DIMENSIONS FOR PROPOSED BENCHING OF THE EMBANKMENT FOUNDATION IN CERTAIN AREAS, NO WAIVER OF THE SPECIFICATIONS IS INTENDED. ALL OTHER SLOPED EMBANKMENT AREAS SHALL BE BENCHED AS SET FORTH IN 203.09. NO ADDITIONAL PAYMENT WILL BE MADE FOR BENCHING REQUIRED UNDER THE PROVISIONS OF 203.09.

WATERING AND MOWING PERMANENT SEEDED AREAS

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

659, WATER 3 M. GAL

EROSION CONTROL

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

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 UTILITIES 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 PLAN 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 PERTINENT 603 CONDUIT ITEM.

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.

UTILITY OWNERSHIP

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

AEP OHIO POWER COMPANY
301 CLEVELAND AVE. S.W.
P.O. BOX 24630
CANTON, OHIO 44701-4630
PH. 330-438-7721
ATTN: MIKE THOMAS
FAX-330-438-7383

AMERITECH
160N. SIXTH ST.
ZANESVILLE, OH 43701
(740) 454-3513

BELMONT COUNTY
SANITARY SEWER DIST.
P.O. BOX 457
ST. CLAIRSVILLE, OHIO 43950
(740) 695-3144

COLUMBIA GAS OF OHIO.
P.O. BOX 250
CAMBRIDGE, OHIO 43725
(740) 432-8226

TCI CABLEVISION OF OHIO, INC.
908 NATIONAL ROAD
BRIDGEPORT, OHIO 43912
(740) 633-2112

ITEM 611 REINFORCED CONCRETE APPROACH SLAB (T=12"), 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.

MATERIALS, LABOR AND INSTALLATION SHALL BE INCLUDED FOR PAYMENT IN THIS ITEM 611 REINFORCED CONCRETE APPROACH SLAB (T=12"), AS PER PLAN.

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 COURSE. LONGITUDINAL JOINTS SHALL BE LAPPED AS SHOWN ON STANDARD CONSTRUCTION DRAWING BP-3.1.

RESIDENTIAL AND COMMERCIAL DRAINAGE CONNECTIONS

EXISTING ROOF DRAINS, FOOTER DRAINS OR YARD DRAINS, DISTURBED BY THE WORK, SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS BY CONNECTING A CONDUIT THROUGH THE CURB OR INTO A DRAINAGE STRUCTURE. THE LOCATION, TYPE, SIZE AND GRADE OF THE NEW CONDUIT REQUIRED TO REPLACE OR EXTEND THE EXISTING DRAIN WILL BE DETERMINED BY THE ENGINEER.

THE FOLLOWING CONDUIT TYPES MAY BE USED: 707.19 PS46 MIN, 707.17 NON-PERFORATED, SS931 OR SS944.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR THE WORK NOTED ABOVE:

603, 4" CONDUIT, TYPE E, 50 L.F.

603, 4" CONDUIT, TYPE F, 50 L.F.

UNTREATED SEPTIC CONNECTIONS

THIS PLAN MAKES NO PROVISION FOR CONNECTING, NOR SHALL THE ENGINEER OR CONTRACTOR CONNECT, ANY UNTREATED SEPTIC DRAINAGE INTO THE HIGHWAY DRAINAGE SYSTEM. ANY PIPE CARRYING UNTREATED SEPTIC FLOW SHALL BE PLUGGED WITH CLASS C CONCRETE AT THE RIGHT-OF-WAY LINE. PAYMENT FOR PLUGGING SHALL BE INCLUDED IN THE CONTRACT PRICE FOR ITEM 203 EXCAVATION.

TREATED SEPTIC CONNECTIONS

TREATED SEPTIC FLOW MAY BE DISCHARGED INTO THE HIGHWAY DRAINAGE SYSTEM PROVIDED THE OWNER HAS ACQUIRED AN OFFICIAL PERMIT FROM BELMONT COUNTY.

IN EACH CASE WHERE A PERMIT HAS BEEN ISSUED FOR MAKING A TREATED SEPTIC CONNECTION INTO A HIGHWAY DRAINAGE CONDUIT, AN INSPECTION WELL SHALL BE PROVIDED IN ACCORDANCE WITH STANDARD CONSTRUCTION DRAWING DM-3.1M

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER IN MAKING THE ABOVE CONNECTIONS:

603, 4" CONDUIT, TYPE C, 100 L.F.
604, INSPECTION WELL, 2 EACH

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.

DEMOLITION DEBRIS

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

STREAM CHANNEL EXCAVATION

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT ANY INCIDENTAL DISCHARGES ASSOCIATED WITH THE EXCAVATION AND HAULING OF MATERIAL FROM THE STREAM CHANNEL. THIS PERTAINS TO ANY EXCAVATION OPERATIONS SUCH AS, FOUNDATION PIER OR ABUTMENT EXCAVATION, CHANNEL CLEAN OUT, EXCAVATION FOR ROCK CHANNEL PROTECTION AND REMOVAL OF ANY TEMPORARY FILL ASSOCIATED WITH CONSTRUCTION OPERATIONS.

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 CONSTRUCTION DRAWINGS REFERRED TO IN THIS PLAN AS CB-2-2A&B, CB-6, GR-1.1, GR-1.2, GR-2.1, GR-3.4, HW-4A, HW-4B, MH-3, MC-1, MC-4, MC-9.2, AND MC-11, SHALL BE CONSIDERED TO READ AS STANDARD CONSTRUCTION DRAWINGS CB-1.1M, CB-2.3M, GR-1.1M, GR-1.2M, GR-2.1M, GR-3.4M, HW-2.1M, HW-2.2M, MH-1.2M, RM-1.1M, DM-1.1M, RM-4.2M AND DM-4.3M RESPECTIVELY.

MAINTAINING TRAFFIC

CALC. BY: R.A.K. DATE: 6/94 CHKD. BY: D.R.B. DATE: 1/95	BEL-149-4.99	OHIO FHWA REGION 5
FEDERAL PROJECT	STATE PROJECT	

614 MAINTAINING TRAFFIC

THE CONTRACTOR SHALL MAINTAIN TRAFFIC AT ALL TIMES IN ACCORDANCE WITH ITEM 614 MAINTAINING TRAFFIC, AS SHOWN ON SHEETS 7-10 AND AS DESCRIBED BELOW.

ALL SIGNS, PAVEMENT MARKINGS, SIGN SUPPORTS, DRUMS, PORTABLE CONCRETE BARRIER, LIGHTS, FLAGGERS, AND INCIDENTALS SHALL BE FURNISHED, ERECTED, MAINTAINED, AND REMOVED BY THE CONTRACTOR IN CONFORMANCE WITH THE MOST RECENT REVISION, CURRENT EDITION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (OMUTCD). ALL SIGNS USED FOR THE MAINTENANCE OF TRAFFIC SHALL BE NEW OR LIKE NEW CONDITION WITH TYPE G (HIGH INTENSITY) SHEETING SUBJECT TO THE APPROVAL OF THE ENGINEER. DEVICES USED TO MAINTAIN TRAFFIC SHALL BE ERECTED IMMEDIATELY PRIOR TO THE BEGINNING OF WORK AND SHALL BE REMOVED IMMEDIATELY AFTER THE TERMINATION OF SAID WORK.

A MINIMUM OF ONE LANE OPERATION IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES ON S.R. 149 AND C.R. 4 BY USE OF THE EXISTING ROADWAY AND STRUCTURE, PROPOSED ROADWAY AND STRUCTURE, 615 TEMPORARY PAVEMENT, AND TEMPORARY SURFACES USING 404, 410, AND 616. THE CONTRACTOR SHALL BE PERMITTED TO CLOSE ONE LANE OF TRAFFIC DURING RELOCATION OF TEMPORARY TRAFFIC CONTROL DEVICES BETWEEN CONSTRUCTION STAGES AND DURING PART WIDTH CONSTRUCTION IN STAGES 4 AND 5. IF IT IS NECESSARY TO REDUCE TRAFFIC FLOW ON SR 149 TO A SINGLE LANE, FLAGGERS SHALL BE USED PER STANDARD DRAWING MT-97.10 TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS THE SINGLE LANE OPERATION IS IN EFFECT, SUBJECT TO THE APPROVAL OF THE ENGINEER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE SERVICES AND SCHEDULING OF SAID FLAGGERS.

INGRESS AND EGRESS TO THE ADJACENT COMMERCIAL AND RESIDENTIAL PROPERTIES MUST BE MAINTAINED AT ALL TIMES. FOR PARCELS WITH TWO OR MORE DRIVES, AT LEAST ONE DRIVE SHALL BE OPEN AT ALL TIMES. IF A PARCEL HAS ONLY ONE DRIVE, THE CONTRACTOR SHALL MAINTAIN TRAFFIC ON AT LEAST ONE-HALF OF THE DRIVE AT ALL TIMES.

WHEN WORK IS BEING PERFORMED ON SHOULDER AREAS, REFER TO OMUTCD FIG. C-12.

UPON COMPLETION OF STAGE 5, THE CONTRACTOR SHALL PLACE THE WEARING COURSE FOR THE ENTIRE PROJECT ONE LANE AT A TIME WITH SR 149 TRAFFIC MAINTAINED IN THE REMAINING LANE.

PORTIONS OF THE NEW ROADWAY THAT ARE OPENED TO TRAFFIC DURING THE CONSTRUCTION OF THIS PROJECT, AND EXISTING OR INTERIM PAVEMENTS THAT ARE USED TO MAINTAIN TRAFFIC DURING THE CONSTRUCTION OF THIS PROJECT, SHALL BE PROVIDED WITH TEMPORARY PAVEMENT MARKINGS AS SHOWN ON SHEETS 7-10 OR AS DIRECTED BY THE ENGINEER. PRIOR TO THE APPLICATION OF THE FINAL PAVEMENT MARKINGS, TEMPORARY PAVEMENT MARKINGS SHALL BE PLACED AT THE SAME LOCATIONS AS SHOWN FOR THE FINAL MARKINGS (SEE TRAFFIC CONTROL SIGNING AND PAVEMENT MARKING PLAN SHEET).

THE CONTRACTOR SHALL FOLLOW THE CONSTRUCTION SEQUENCE AND MAINTAINING TRAFFIC PROCEDURES LISTED BELOW:

STAGE 1 - THE CONTRACTOR SHALL INSTALL THE TRAFFIC CONTROL FOR STAGE 1 AS SHOWN ON SHEET 7. TRAFFIC SHALL BE MAINTAINED ON EXISTING ROADWAYS DURING CONSTRUCTION OF THE NEW STRUCTURE ON RELOCATED SR 149 AND A PORTION OF RELOCATED SCHOOL STREET. THE WORK ON RELOCATED SCHOOL STREET WILL CONSIST OF CONSTRUCTION OF THE ROADWAY EMBANKMENT AND PLACEMENT OF THE 304 AND 301 PAVEMENT COURSES.

STAGE 2 - UPON COMPLETION OF THE PORTION OF RELOCATED SCHOOL STREET CONSTRUCTED DURING STAGE 1, THE CONTRACTOR SHALL SET UP THE STAGE 2 TRAFFIC CONTROL AS SHOWN ON SHEET 8. THE CONTRACTOR SHALL THEN CONSTRUCT THE TEMPORARY SCHOOL STREET CONNECTOR WHILE CONTINUING WORK ON THE STRUCTURE.

STAGE 3 - UPON COMPLETION OF THE TEMPORARY SCHOOL STREET CONNECTOR, THE CONTRACTOR SHALL SET UP THE STAGE 3 TRAFFIC CONTROL AS SHOWN ON SHEET 9. THE CONTRACTOR SHALL CONSTRUCT THE 304 AND 301 PAVEMENT COURSES FOR RELOCATED SR 149 FROM THE NEW BRIDGE TO STA. 266+35(±). THE CONTRACTOR MAY ALSO CONSTRUCT AT HIS OPTION THE 402 COURSE AT THIS TIME. WORK SHALL CONTINUE ON THE STRUCTURE.

STAGE 4 - UPON COMPLETION OF THE PAVEMENT WORK ON RELOCATED SR 149 IN STAGE 3, THE CONTRACTOR SHALL SET UP THE STAGE 4 TRAFFIC CONTROL AS SHOWN ON SHEET 9. THE CONTRACTOR SHALL UTILIZE PART WIDTH CONSTRUCTION ON RELOCATED SR 149 FROM STA. 266+35(±) TO THE END OF THE PROJECT. THE CONTRACTOR SHALL ALSO UTILIZE PART WIDTH CONSTRUCTION ON THE REMAINING PORTION OF SCHOOL STREET AS SHOWN ON SHEET 9. REMOVE THE TEMPORARY SCHOOL STREET CONNECTOR AND CONTINUE WORK ON THE STRUCTURE.

STAGE 5 - THE CONTRACTOR SHALL INSTALL THE TRAFFIC CONTROL FOR STAGE 5 AS SHOWN ON SHEET 10. TRAFFIC SHALL BE MAINTAINED ON COMPLETED PORTIONS OF THE RELOCATED SR 149 PAVEMENT AND NEW STRUCTURE DURING REMOVAL OF THE EXISTING STRUCTURE AND THE EXISTING SR 149 PAVEMENT. CONSTRUCTION OF THE REMAINDER OF RELOCATED SR 149 AND CR 4 SHALL BE ACCOMPLISHED BY MEANS OF PART WIDTH CONSTRUCTION. TRAFFIC SHALL BE MAINTAINED ON THE NEW STRUCTURE DURING CONSTRUCTION OF THE REMAINING PORTIONS OF THE NEW BRIDGE. COMPLETE ALL REMAINING CONSTRUCTION.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER FOR THE MAINTENANCE OF TRAFFIC:

ITEM 614	BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC	25 C.Y.
ITEM 410	TRAFFIC COMPACTED SURFACE, TYPE A OR B	100 C.Y.
ITEM 614	OBJECT MARKER	38 EACH
ITEM 615	TEMPORARY PAVEMENT, CLASS B, AS PER PLAN	75 S.Y.
ITEM 615	TEMPORARY ROADS	LUMP SUM
ITEM 616	CALCIUM CHLORIDE	2 TON
ITEM 616	WATER	2 M-GALS.

SEPARATE PAYMENT SHALL BE MADE FOR ITEMS 614, 410, 614, 615, AND 616 NOTED ABOVE. ALL OTHER WORK REQUIRED FOR TRAFFIC MAINTENANCE, UNLESS PAID FOR SEPARATELY ELSEWHERE SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC.

614 BARRIER REFLECTOR

ITEM 614 BARRIER REFLECTOR, TYPE B SHALL CONFORM TO ITEM 626 EXCEPT THAT SPACING SHALL BE AS SHOWN BELOW.

BARRIER REFLECTORS (see Roadway Plan for permanent Item 626 Barrier Reflector Quantities)						
Stage	Station	Side	Spacing	Type		Comment
				A	B	
1	264+30 - 264+90 (S.R. 149)	LT	25'		3	On PCB
	265+90± (S.R. 149) - 18+00± (RELOC. SCHOOL ST.)	RT	25'		9	On PCB
2	265+90± (S.R. 149) - 19+10± (RELOC. SCHOOL ST.)	RT	25'		4	On PCB
3	265+90± (S.R. 149) - 19+00± (TEMP. SCHOOL ST.)	LT	25'		5	On PCB
	18+10± (RELOC. SCHOOL ST.)	LT-RT	25'		2	On PCB
4	265+90± (S.R. 149) - 19+15± (RELOC. SCHOOL ST.)	RT	25'		4	On PCB
5	9+90± - 11+00± (C.R. 4)	RT	25'		5	On PCB
	264+80± - 266+30± (S.R. 149)	RT	25'		6	On PCB
TOTAL					38	

615 TEMPORARY PAVEMENT, CLASS B, AS PER PLAN

THIS ITEM SHALL CONFORM TO ITEM 615 EXCEPT THAT THE TEMPORARY PAVEMENT SHALL BE LEFT IN PLACE.

615 TEMPORARY ROADS

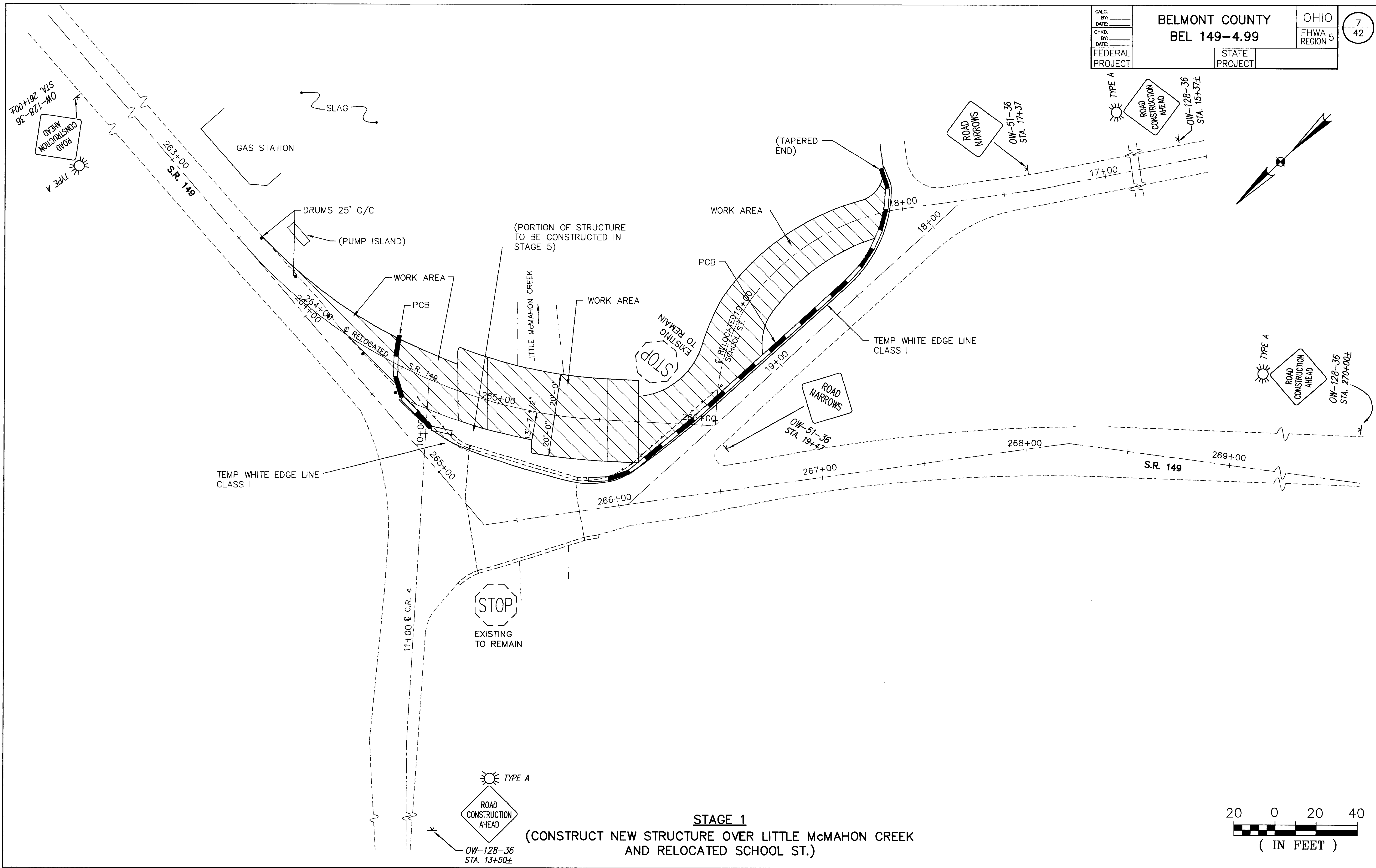
PAVEMENT COMPOSITION OF TEMPORARY ROAD SHALL BE CLASS B PAVEMENT-FLEXIBLE.

622 PORTABLE CONCRETE BARRIER

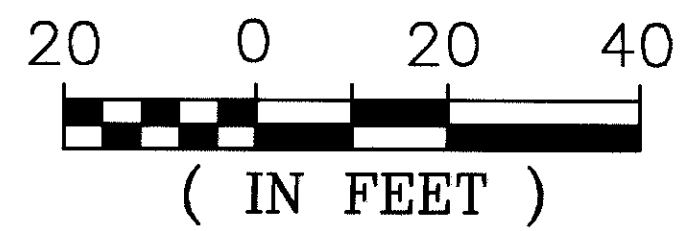
IT IS ANTICIPATED THAT THE SAME BARRIER WILL BE USED IN VARIOUS PHASES OF CONSTRUCTION. MOVEMENT OF THE CONCRETE BARRIER BETWEEN PHASES SHALL BE ACCOMPLISHED IN ONE WORKING DAY. FLAGGERS SHALL BE UTILIZED FOR PROTECTION OF VEHICULAR TRAFFIC UNTIL MOVEMENT OF THE BARRIER IS COMPLETE.

AN ESTIMATED QUANTITY OF 900 LIN. FT. OF ITEM 622 PORTABLE CONCRETE BARRIER, 32", AND 90 LIN. FT. OF ITEM 622 PORTABLE CONCRETE BARRIER, 32", BRIDGE MOUNTED, SHALL BE FURNISHED, INSTALLED, MAINTAINED AND SUBSEQUENTLY REMOVED BY THE CONTRACTOR. SEE SHEETS 7-10 FOR ADDITIONAL DETAILS. THE PORTABLE CONCRETE BARRIER, BRIDGE MOUNTED, SHALL NOT BE PINNED TO THE DECK.

THIS ITEM SHALL BE PAID FOR BY THE ACTUAL LINEAL FEET OF ITEM 622 PORTABLE CONCRETE BARRIER (PCB) INSTALLED AT A PARTICULAR LOCATION.

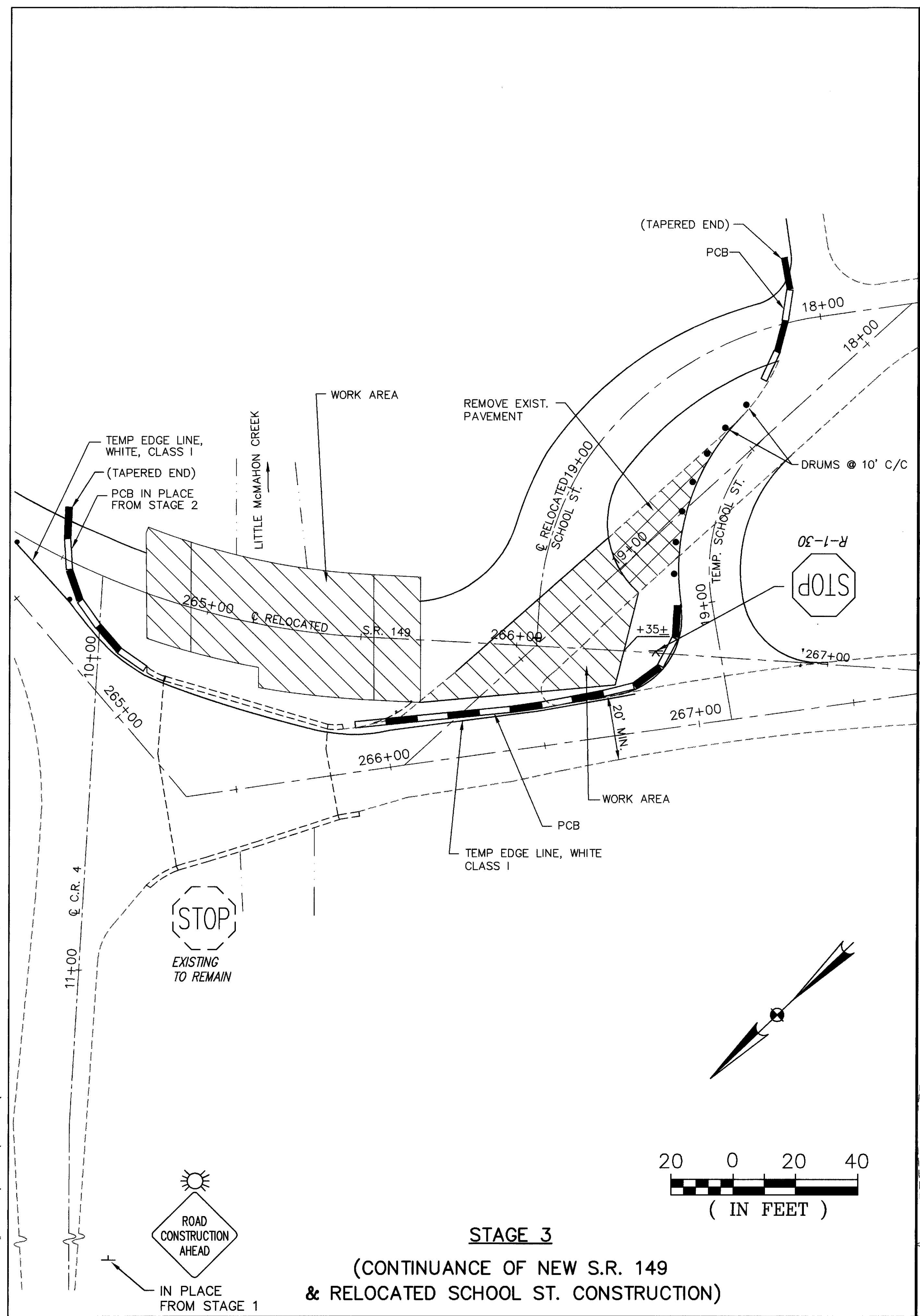


STAGE 1
 (CONSTRUCT NEW STRUCTURE OVER LITTLE McMAHON CREEK AND RELOCATED SCHOOL ST.)

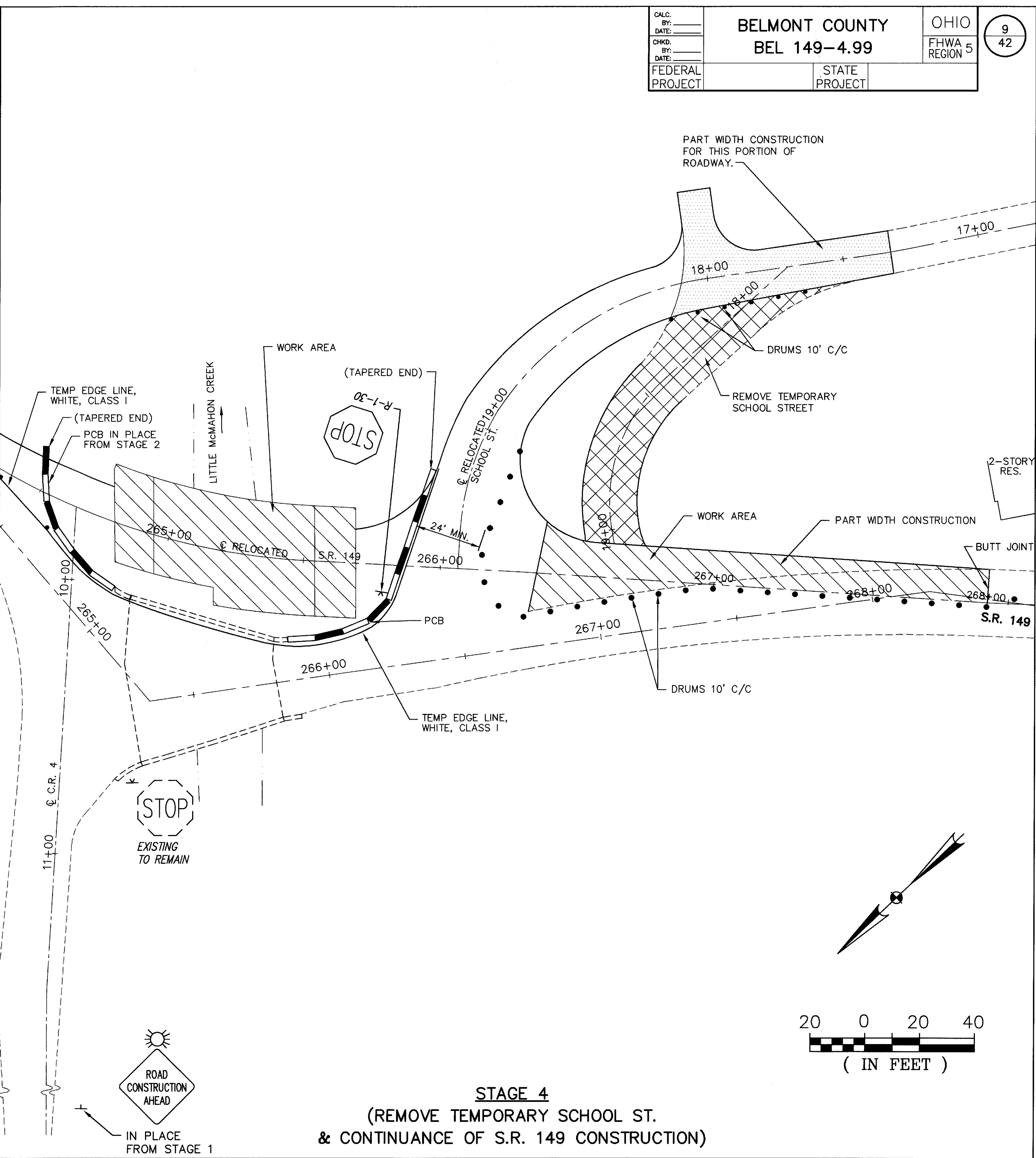


MAINTAINING TRAFFIC

COL #23 C:\DRAWING\05042305\050423MT.DWG JANUARY-31-1995



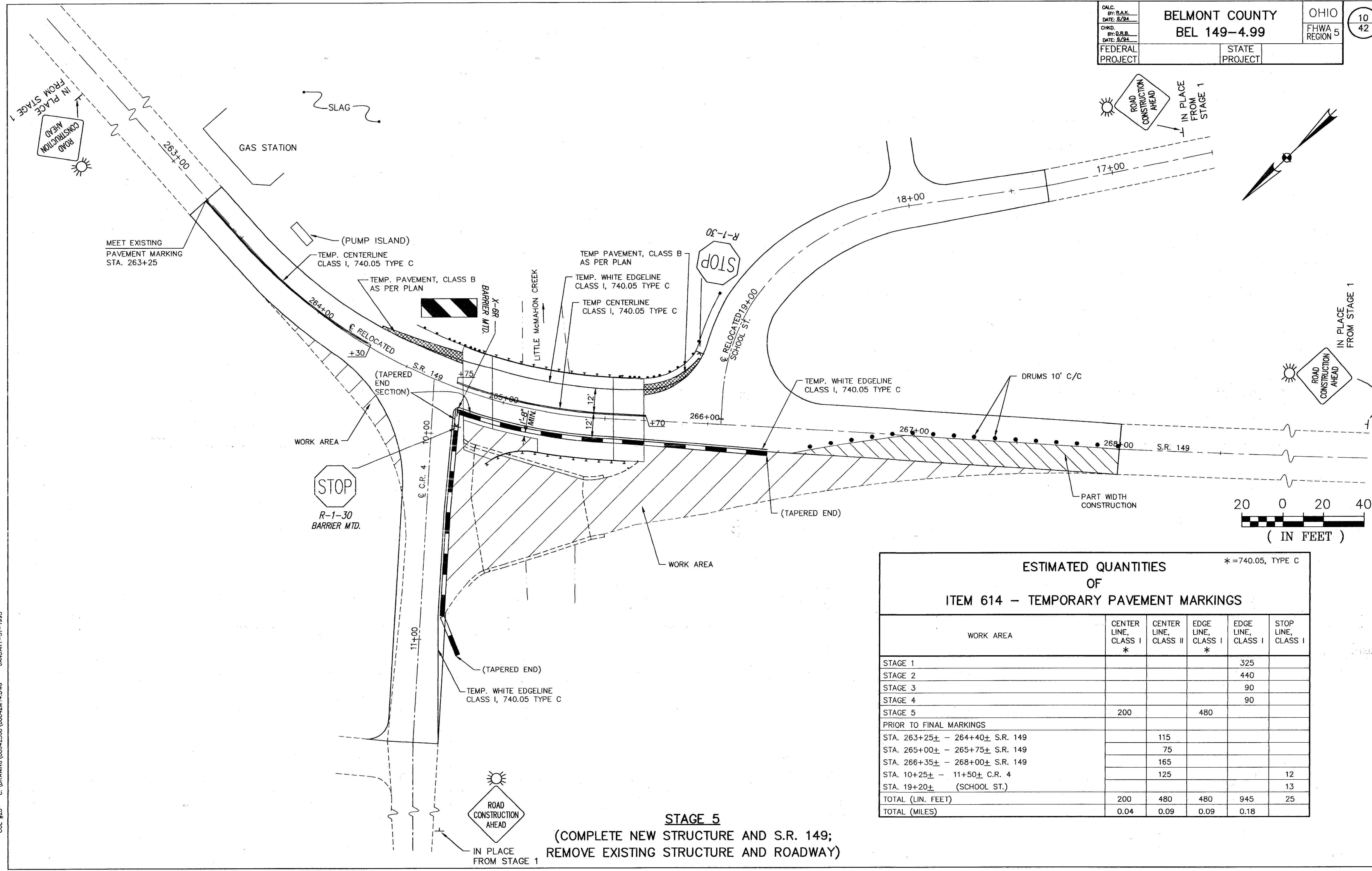
STAGE 3
 (CONTINUANCE OF NEW S.R. 149
 & RELOCATED SCHOOL ST. CONSTRUCTION)



STAGE 4
 (REMOVE TEMPORARY SCHOOL ST.
 & CONTINUANCE OF S.R. 149 CONSTRUCTION)

MAINTAINING TRAFFIC

COL #23 C:\DRAWING\08042306\08042306.DWG JANUARY-31-1995



* = 740.05, TYPE C

ESTIMATED QUANTITIES OF ITEM 614 - TEMPORARY PAVEMENT MARKINGS					
WORK AREA	CENTER LINE, CLASS I *	CENTER LINE, CLASS II	EDGE LINE, CLASS I *	EDGE LINE, CLASS I	STOP LINE, CLASS I
STAGE 1				325	
STAGE 2				440	
STAGE 3				90	
STAGE 4				90	
STAGE 5	200		480		
PRIOR TO FINAL MARKINGS					
STA. 263+25± - 264+40± S.R. 149		115			
STA. 265+00± - 265+75± S.R. 149		75			
STA. 266+35± - 268+00± S.R. 149		165			
STA. 10+25± - 11+50± C.R. 4		125			12
STA. 19+20± (SCHOOL ST.)					13
TOTAL (LIN. FEET)	200	480	480	945	25
TOTAL (MILES)	0.04	0.09	0.09	0.18	

STAGE 5
 (COMPLETE NEW STRUCTURE AND S.R. 149;
 REMOVE EXISTING STRUCTURE AND ROADWAY)

MAINTAINING TRAFFIC

COL #23 C:\DRAWING\08042306\08042306\08042306.DWG JANUARY-31-1995

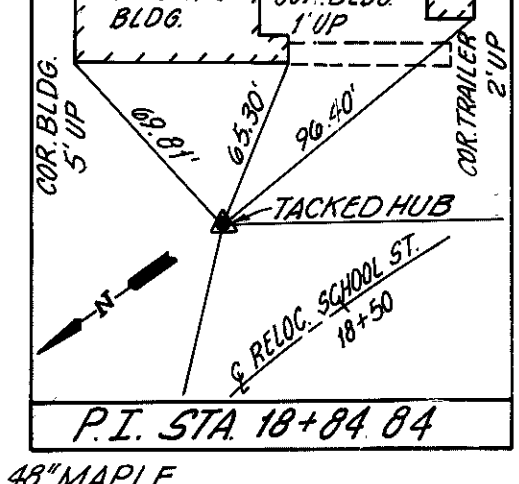
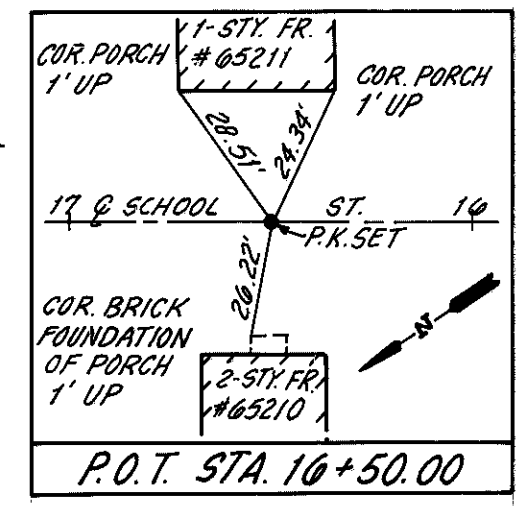
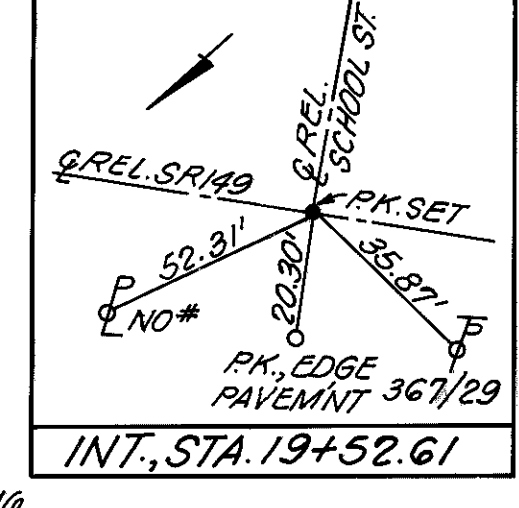
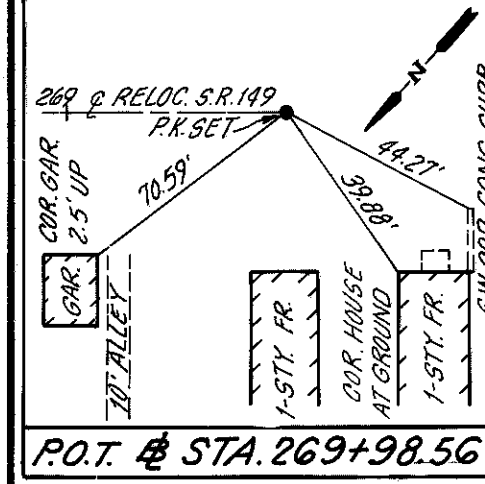
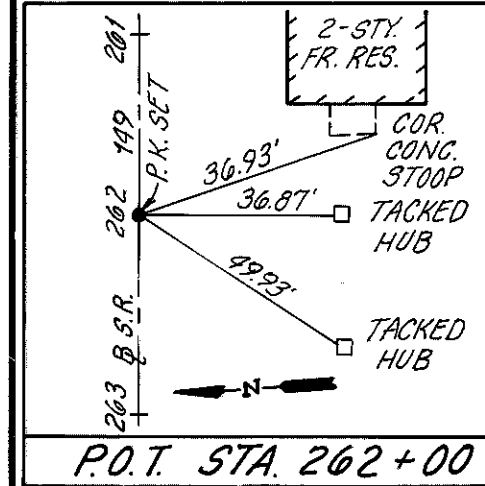
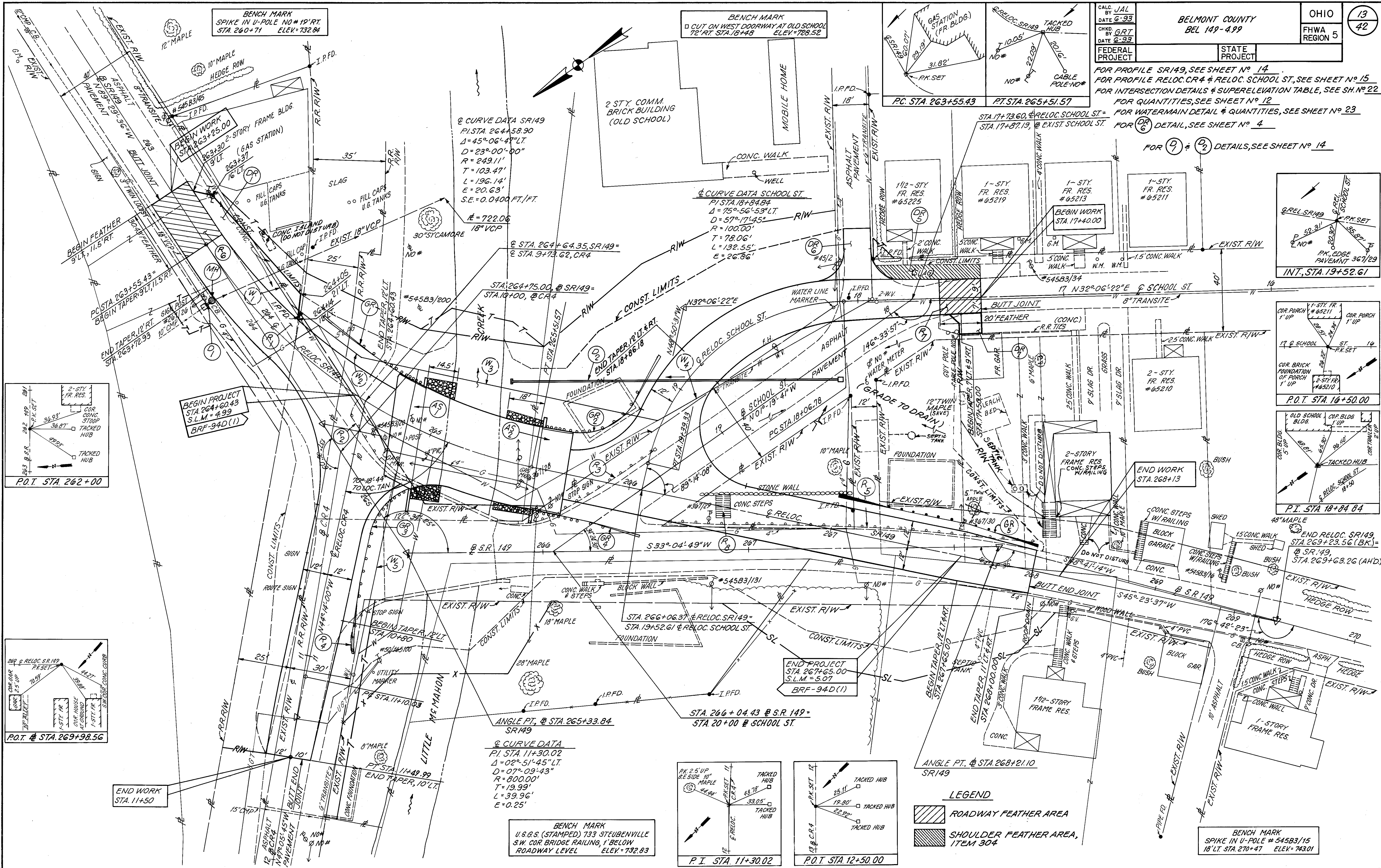
GENERAL SUMMARY

CALC. BY: JAL DATE: 1-95	BELMONT COUNTY BEL-149-4.99	OHIO FHWA REGION 5	11 42
CHD. BY: GRT DATE: 1-95			
FEDERAL PROJECT	STATE PROJECT		

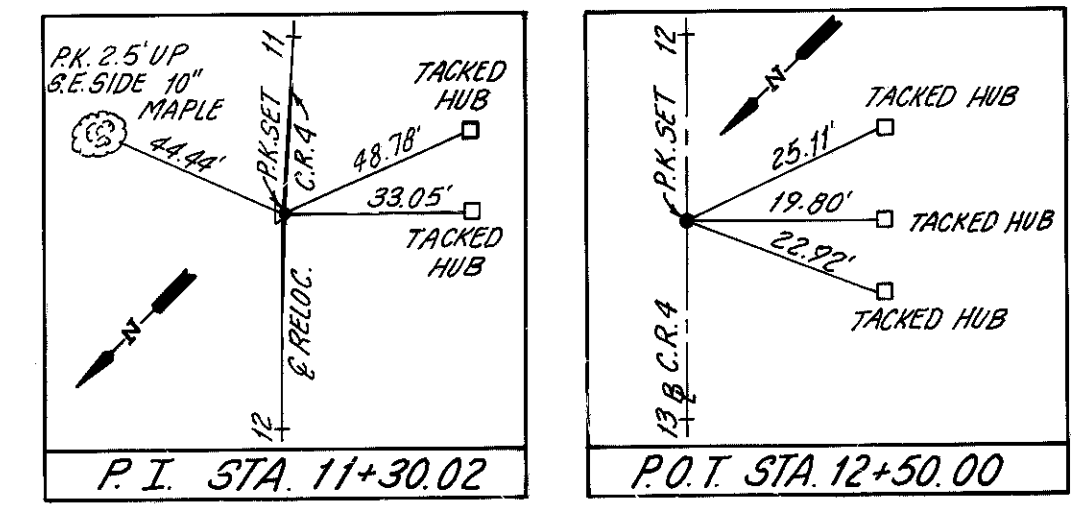
TOTAL FROM SHEET NO.						ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	TOTAL FROM SHEET NO.				ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
ITEM	5	12	23	39	42						ITEM	6	12	23					
ROADWAY																			
201		LUMP				201	11000	LUMP		CLEARING AND GRUBBING	301				301	46000	228	CU. YD.	BITUMINOUS AGGREGATE BASE, PG 64-22
202			LUMP			202	11200	LUMP		PORTIONS OF STRUCTURE REMOVED	304				304	20000	451	CU. YD.	AGGREGATE BASE
202			953			202	23000	953	SQ. YD.	PAVEMENT REMOVED									
202			LUMP			202	30204	LUMP		STEPS REMOVED									
202				363		202	35100	363	LIN. FT.	PIPE REMOVED, 24" AND UNDER									
202			300			202	38000	300	LIN. FT.	GUARDRAIL REMOVED	407				407	10000	18	GAL.	TACK COAT
203			1,683			203	12000	1,683	CU. YD.	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	407				407	14000	146	GAL.	TACK COAT FOR INTERMEDIATE COURSE
203			3,123			203	20000	3,123	CU. YD.	EMBANKMENT	408				408	10000	805	GAL.	BITUMINOUS PRIME COAT
203			2,089			203	50000	2,089	SQ. YD.	SUBGRADE COMPACTION	448				448	46050	95	CU. YD.	ASPHALT CONCRETE, INTERMEDIATE COURSE, TYPE 2, PG 64-22
604					14	604	40500	14	EACH	REFERENCE MONUMENT	448				448	47020	67	CU. YD.	ASPHALT CONCRETE, SURFACE COURSE, TYPE 1, PG 64-22
606			225			606	13000	225	LIN. FT.	GUARDRAIL, TYPE 5	448				448	48020	2	CU. YD.	ASPHALT CONCRETE, SURFACE COURSE, TYPE 1, PG 64-22 (DRIVEWAYS)
606			6			606	25000	6	EACH	ANCHOR ASSEMBLY, TYPE A	452				452	12000	85	SQ. YD.	8" PLAIN CONCRETE PAVEMENT
606			4			606	35140	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 4	611				611	10001	146	SQ. YD.	REINFORCED CONCRETE APPROACH SLAB (T-12"), AS PER PLAN (SEE SHEET NO. 5)
616			5			616	10000	5	M GAL	WATER	WATER WORK								
616			1			616	20000	1	TON	CALCIUM CHLORIDE	511				511	51100	3	CU. YD.	CLASS C CONCRETE, MISC., ENCASEMENT
626			8			626	00100	8	EACH	BARRIER REFLECTOR, TYPE A	638				638	01304	445	LIN. FT.	8" WATER MAIN DUCTILE IRON PIPE ANSI CLASS 53, MECHANICAL JOINTS AND FITTINGS WITH RETAINER GLANDS
SPECIAL					10	SPECIAL	69011500	10	EACH	IRON PIN	MAINTENANCE OF TRAFFIC								
EROSION CONTROL																			
207			500			207	30000	500	LIN. FT.	FILTER FABRIC FENCE	410	100			410	12000	100	CU. YD.	TRAFFIC COMPACTED SURFACE, TYPE A OR B
207			100			207	70000	100	EACH	STRAW OR HAY BALES	614	25			614	13000	25	CU. YD.	BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC
601				162		601	32100	162	CU. YD.	ROCK CHANNEL PROTECTION, TYPE B WITH FILTER	614	38			614	13300	38	EACH	BARRIER REFLECTOR, TYPE B
659				2335		659	10000	2335	SQ. YD.	SEEDING AND MULCHING	614	40			614	13350	40	EACH	OBJECT MARKER
659				0.5		659	20000	0.5	TON	COMMERCIAL FERTILIZER	615	LUMP			615	10000	LUMP		TEMPORARY ROAD
659				1.5		659	30000	1.5	TON	AGRICULTURAL LIMING	615	75			615	25001	75	SQ. YD.	TEMPORARY PAVEMENT, CLASS B, AS PER PLAN (SEE SHEET NO. 6)
659			3	3		659	35000	6	M GAL	WATER	616	2			616	10000	2	M GAL.	WATER
DRAINAGE																			
602			0.25			602	20000	0.25	CU. YD.	CONCRETE MASONRY	616	2			616	20000	2	TON	CALCIUM CHLORIDE
603			100			603	00200	100	LIN. FT.	4" CONDUIT, TYPE C	622	900			622	40020	900	LIN. FT.	PORTABLE CONCRETE BARRIER, 32"
603			50			603	00400	50	LIN. FT.	4" CONDUIT, TYPE E	622	90			622	40040	90	LIN. FT.	PORTABLE CONCRETE BARRIER, 32", BRIDGE MOUNTED
603			50			603	00406	50	LIN. FT.	4" CONDUIT, TYPE F	FOR TRAFFIC CONTROL GENERAL SUMMARY SEE SHEET NO. 24.								
603				5		603	04400	5	LIN. FT.	12" CONDUIT, TYPE B	FOR STRUCTURES OVER 20' GENERAL SUMMARY SEE SHEET NO. 26.								
603			40			603	05900	40	LIN. FT.	15" CONDUIT, TYPE B	614	LUMP			614	11000	LUMP		MAINTAINING TRAFFIC
603			120			603	06100	120	LIN. FT.	15" CONDUIT, TYPE C	623				623	10000	LUMP		CONSTRUCTION LAYOUT STAKES
604			1			604	02000	1	EACH	CATCH BASIN, No. 6	624				624	10000	LUMP		MOBILIZATION
604			1			604	04500	1	EACH	CATCH BASIN, No. 2-2B	806				806	16010	9	MONTH	FIELD OFFICE, TYPE B
604			1			604	31500	1	EACH	MANHOLE, NO. 3	806				806	26000	9	MONTH	COMPUTER EQUIPMENT FOR FIELD OFFICE
604			2			604	37000	2	EACH	INSPECTION WELL									
605				99		605	31100	99	LIN. FT.	AGGREGATE DRAIN									

NS 814 CIVIL, 7 PM DRAWING NUMBER 2006080405 SC. -1, 1304 05/09/95

FOR PROFILE SRI149, SEE SHEET NO. 14
 FOR PROFILE RELOC. CR4 & RELOC. SCHOOL ST., SEE SHEET NO. 15
 FOR INTERSECTION DETAILS & SUPERELEVATION TABLE, SEE SH. NO. 22
 FOR QUANTITIES, SEE SHEET NO. 12
 FOR WATERMAIN DETAIL & QUANTITIES, SEE SHEET NO. 23
 FOR (D) & (E) DETAILS, SEE SHEET NO. 4



BENCH MARK
 U.S.G.S. (STAMPED) 733 STEUBENVILLE
 S.W. COR. BRIDGE RAILING, 1' BELOW
 ROADWAY LEVEL ELEV. 732.83

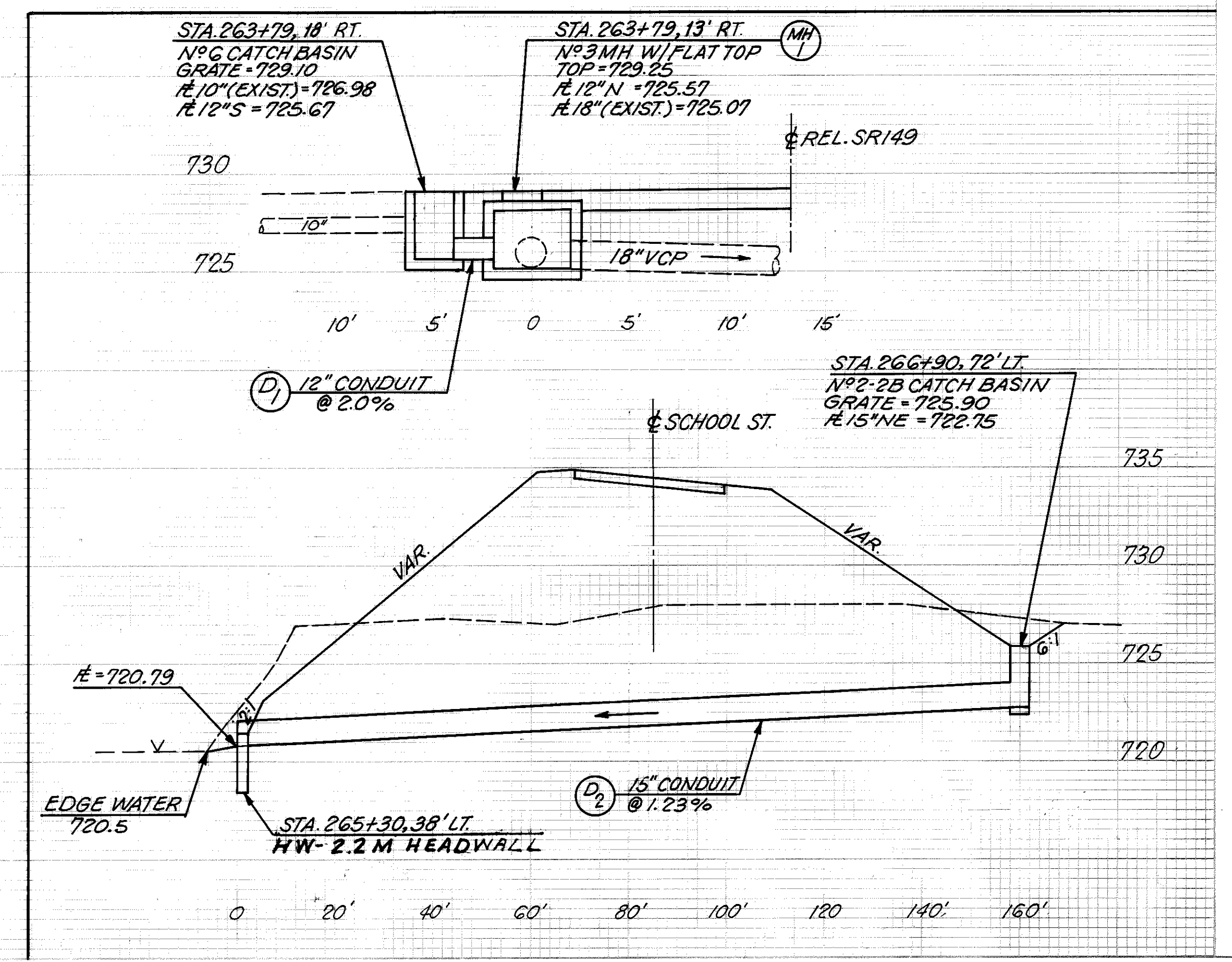
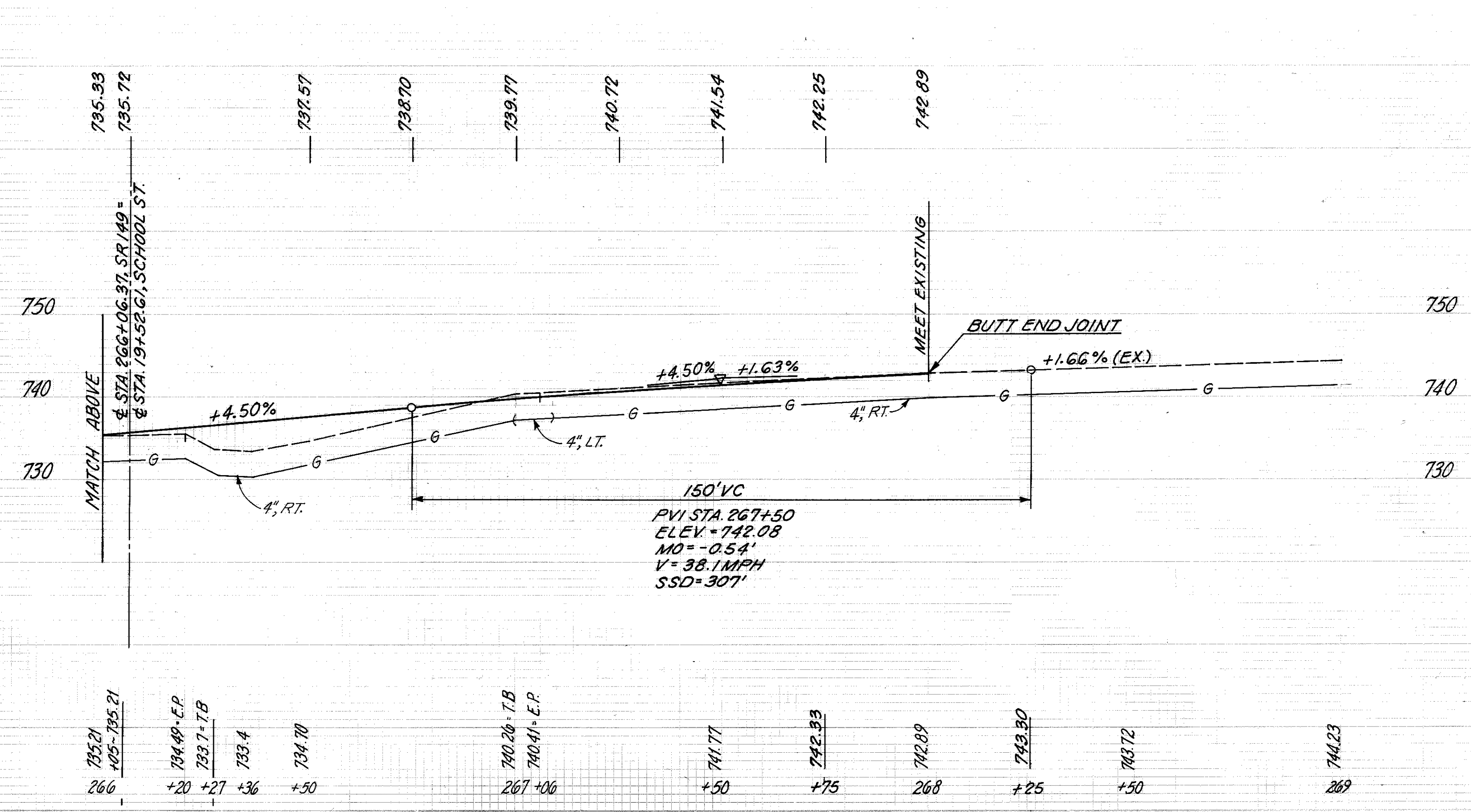
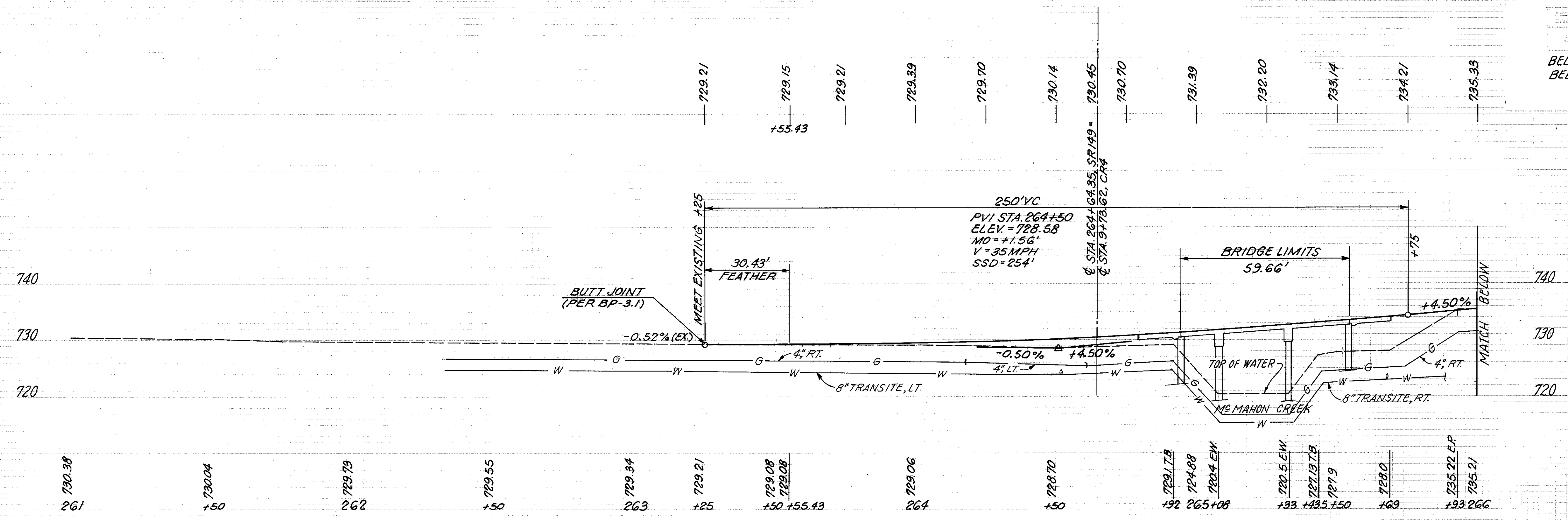


LEGEND

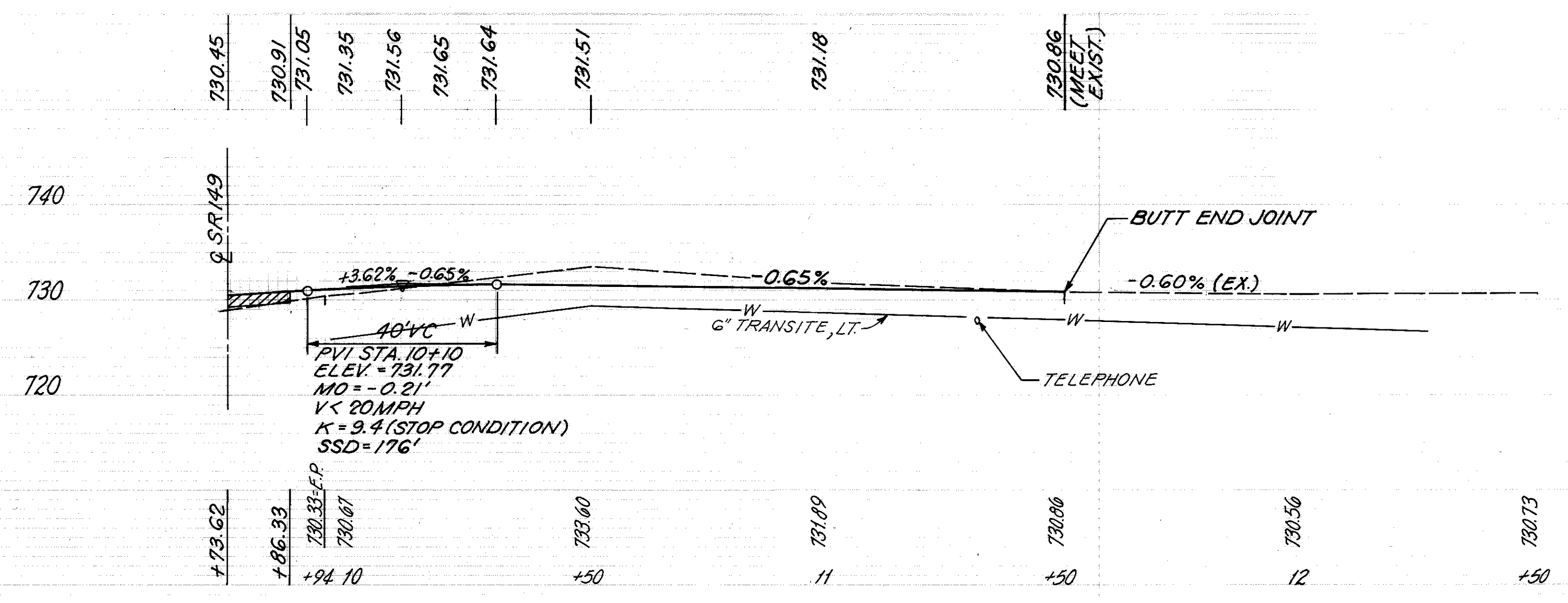
- ROADWAY FEATHER AREA
- SHOULDER FEATHER AREA, ITEM 304

BENCH MARK
 SPIKE IN U-POLE # 545B3/15
 18' LT. STA. 270+47 ELEV. 743.01

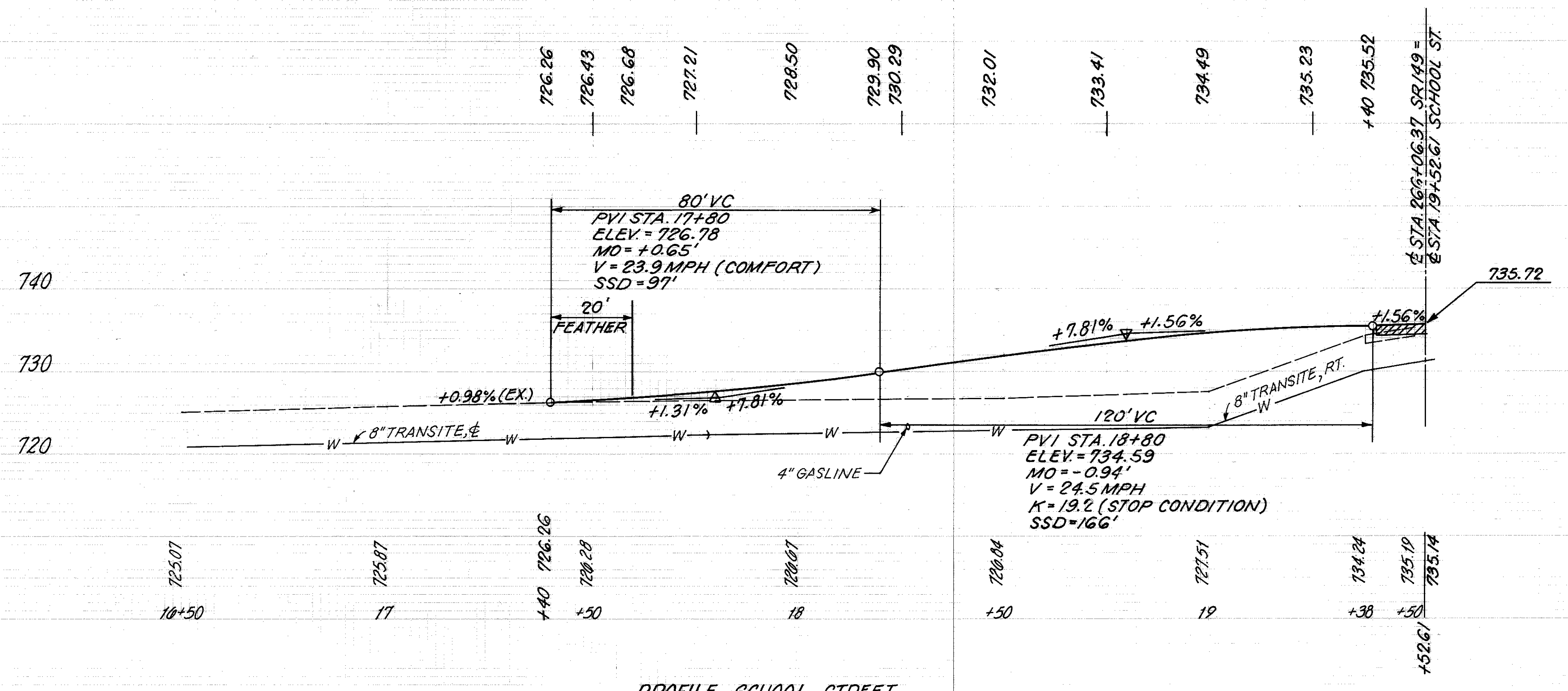
BELMONT COUNTY
BEL 149-4.99



PROFILE S.R. 149 - STA. 261+00 TO STA. 269+00



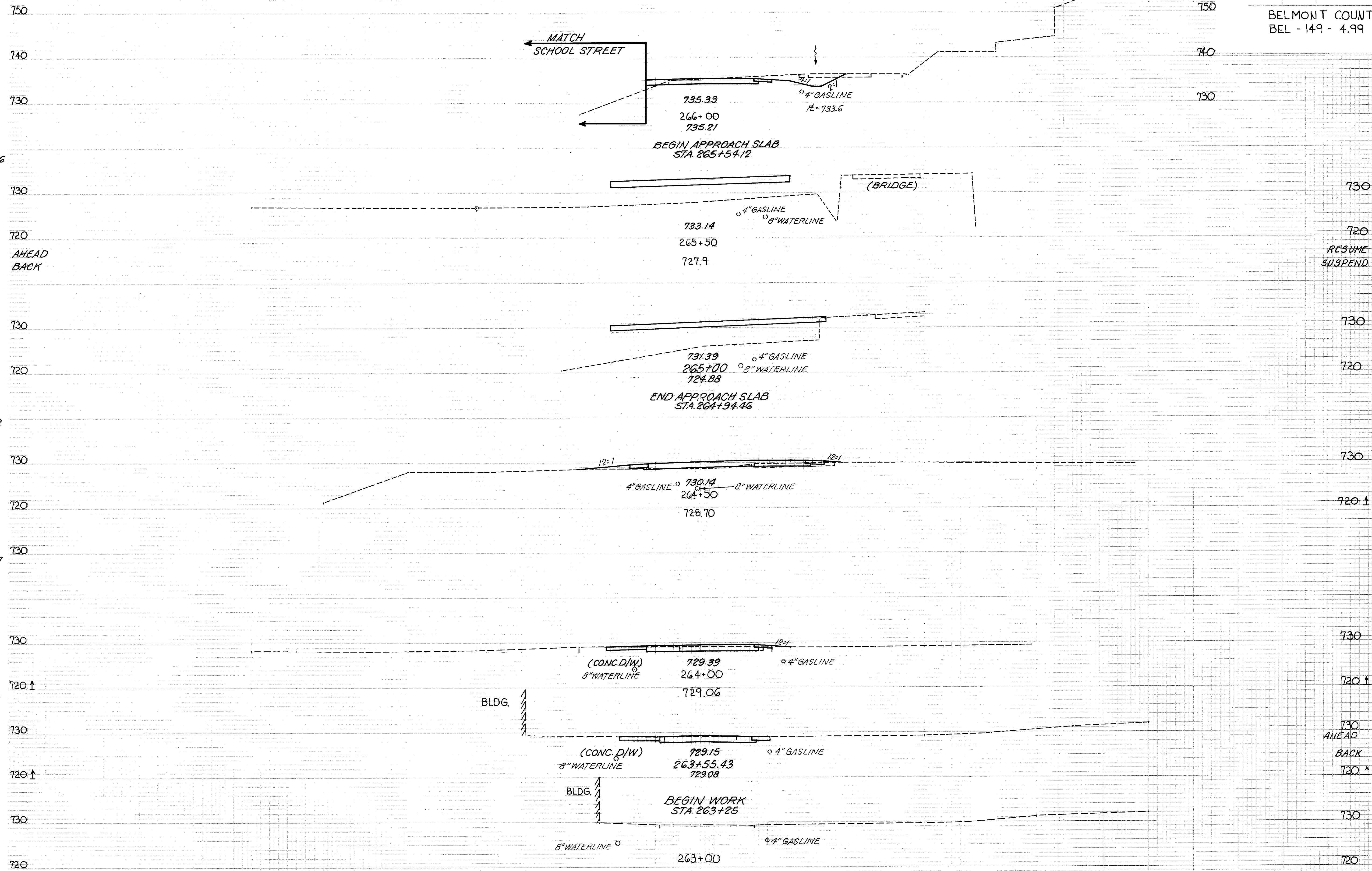
PROFILE C.R. 4



PROFILE SCHOOL STREET

BELMONT COUNTY
BEL - 149 - 4.99

17
146
40
0
0
32
13
47
4
11
0



END AREA	VOLUME	
	OUT	FILL
40	2	
		34 110
	RESUME 0	128
	SUSPEND 0	216
		1 190
		1 15
		19 17
20	3	
		28 2
	730 AHEAD 14	0
	BACK 6	0
		4 0
		0 0
		730 0
		720 0
TOTAL THIS SHEET		86 319

236 TOTAL THIS SHEET

TOTAL THIS SHEET

1,405 TOTAL SEEDING, SR 149

750
740

4' CONC. STEPS & WALK 268+18
743.22

4" GASLINE

TOTAL EARTHWORK, SR 149

END AREA		VOLUME	
CUT	FILL	CUT	FILL
		1063	1,777

0 268+13

END WORK STA. 268+13

268+13 0 0

760 7 0

9 750

AHEAD 27 0

BACK 36 0

13 740

HSE.

742.89

4" GASLINE
E=742.3

740 245 319

244 730

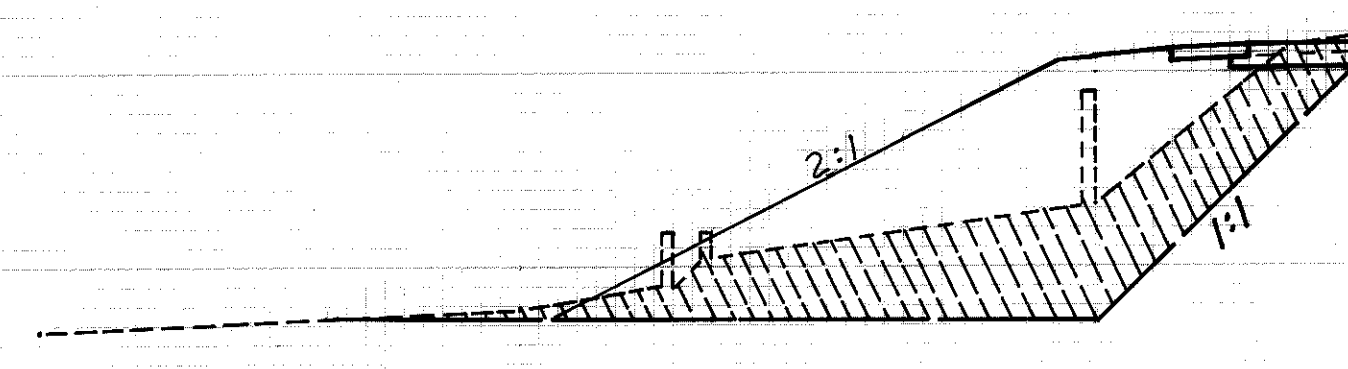
END SPECIAL BENCHING STA. 268+00

268+00

742.89

730 229 345

75 750



741.54

267+50

741.77

4" GASLINE
E=739.8

740 419 535

433 730

SPECIAL BENCHING AREA. SEE GENERAL NOTES SHEET N° 5 (TYPICAL)

739.77

267+00

740.26

E=738.0

760 224 233

81 740

BEGIN SPECIAL BENCHING STA. 266+50

737.57

266+50

734.70

4" GASLINE
E=735.8

740 238 420

38 730

1,169 TOTAL THIS SHEET

TOTAL THIS SHEET

730 68 184

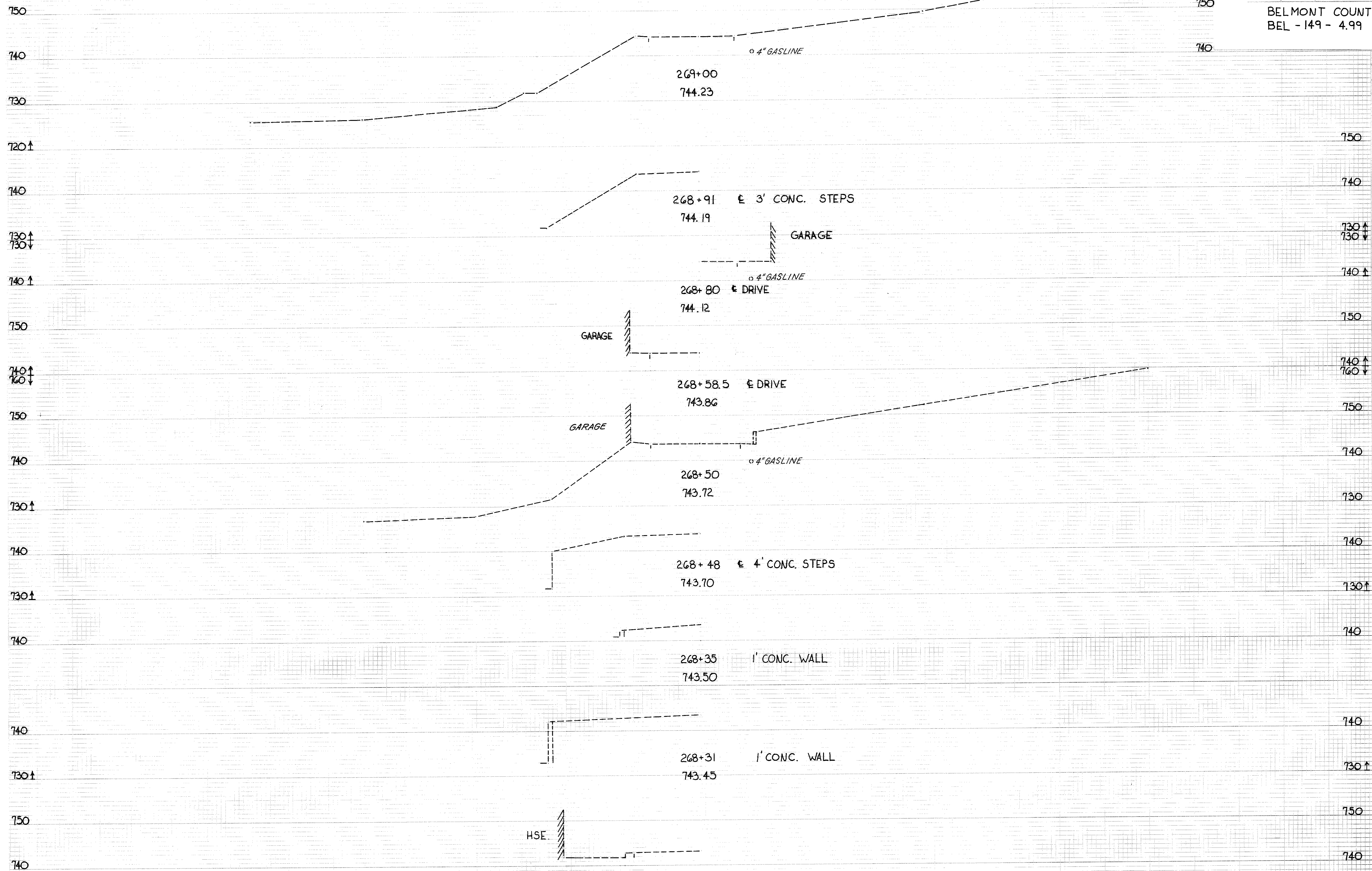
977 1,458

100 90 80 70 60 50 40 30 20 10 E 10 20 30 40 50 60 70 80 90 100

FED. RD. DIVISION	STATE	PROJECT
	OHIO	

18
42

BELMONT COUNTY
BEL - 149 - 4.99



END AREA		VOLUME	
OUT	FILL	OUT	FILL

750			
740			
730			
720			
740			
730			
740			
750			
740			
750			
740			
730			
740			
750			
740			
730			
740			
750			
740			

100 90 80 70 60 50 40 30 20 10 E 10 20 30 40 50 60 70 80 90 100

CROSS SECTIONS ~ SR 149 STA. 268+20 TO STA. 269+00

90 TOTAL SEEDING, CR 4

740

730

BELMONT COUNTY
BEL - 149 - 4.99

12+50
730.73

TOTAL EARTHWORK, CR 4 418 82

12+00
730.56

740

730

END WORK
STA. 11+50

740

AHEAD 0 0

BACK 30 5

730

6" WATERLINE 730.86
11+50
730.86

71 5

TELEPHONE 6" WATERLINE 731.18
11+00
731.89

47 0

194 3

MATCH
CREEK CROSS SECTIONS

12:1 731.51
10+50
733.60 6:1

162 3

152 51

MATCH
CREEK CROSS SECTIONS

731.35
10+00
730.67
PROP. ABUT.

740

730

2 52

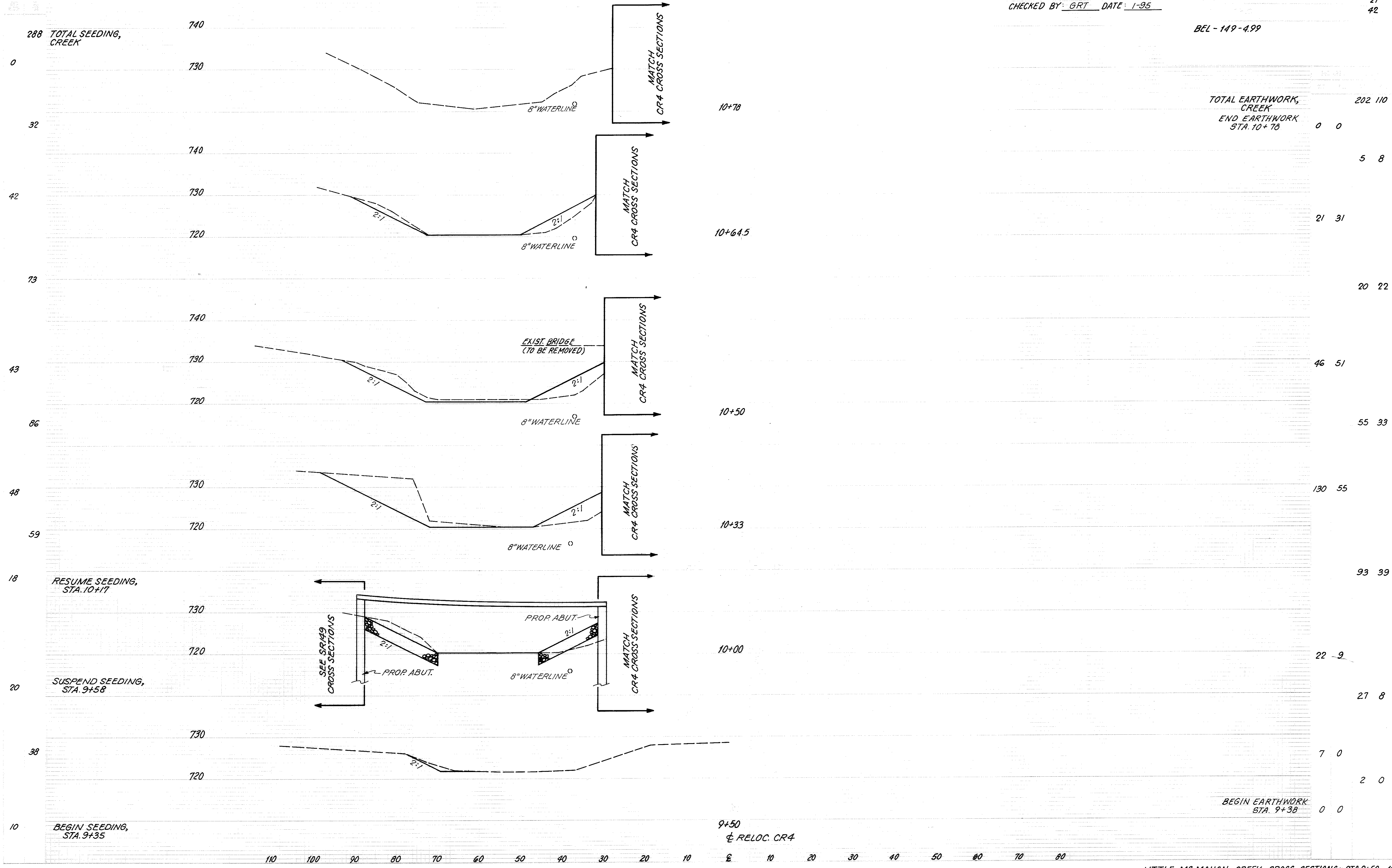
1 23

BEGIN WORK
STA. 9+88

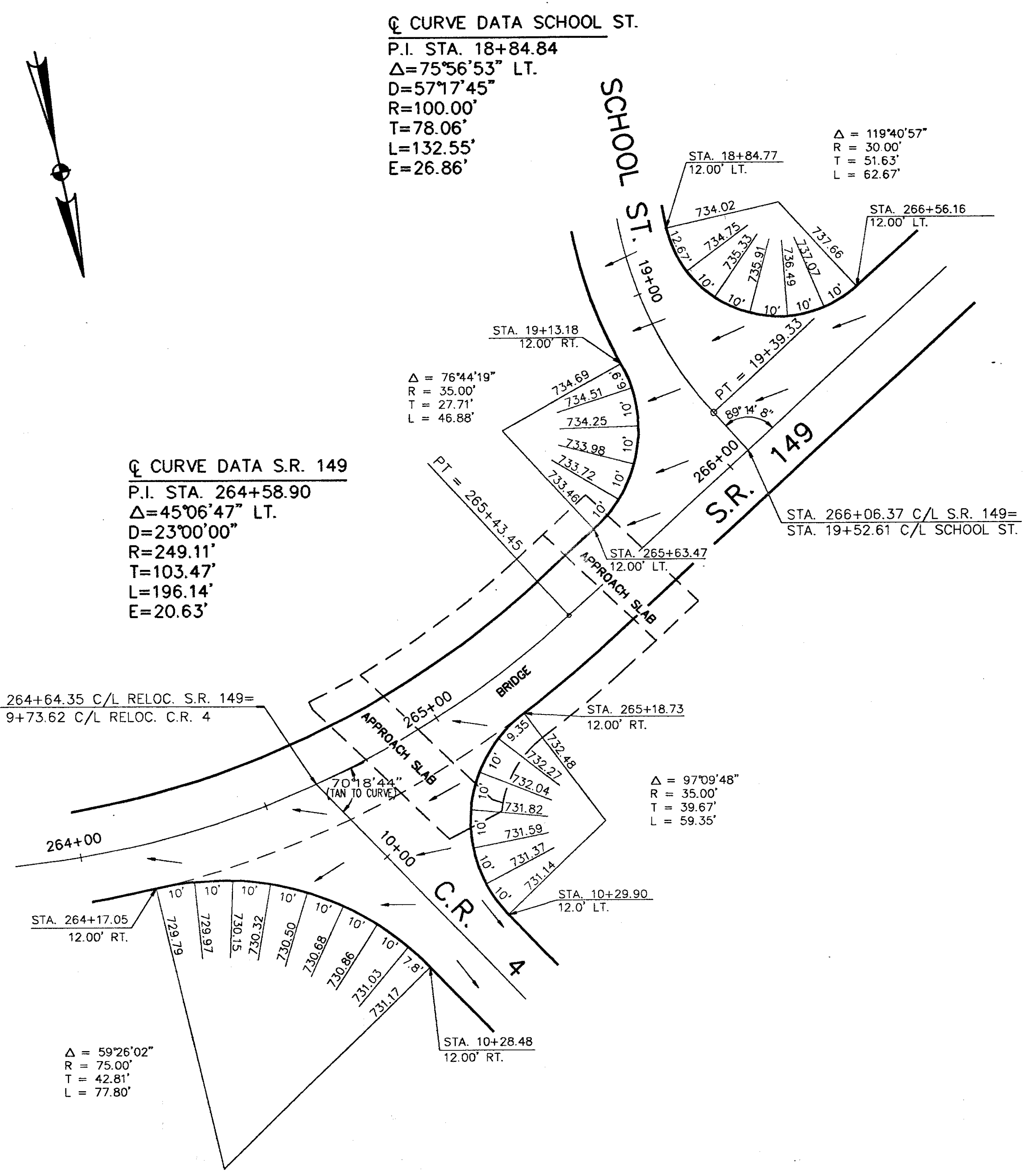
AHEAD 2 52

BACK 0 0

BEL - 149-499



LITTLE Mc MAHON CREEK CROSS SECTIONS - STA. 9+50 - 10+78



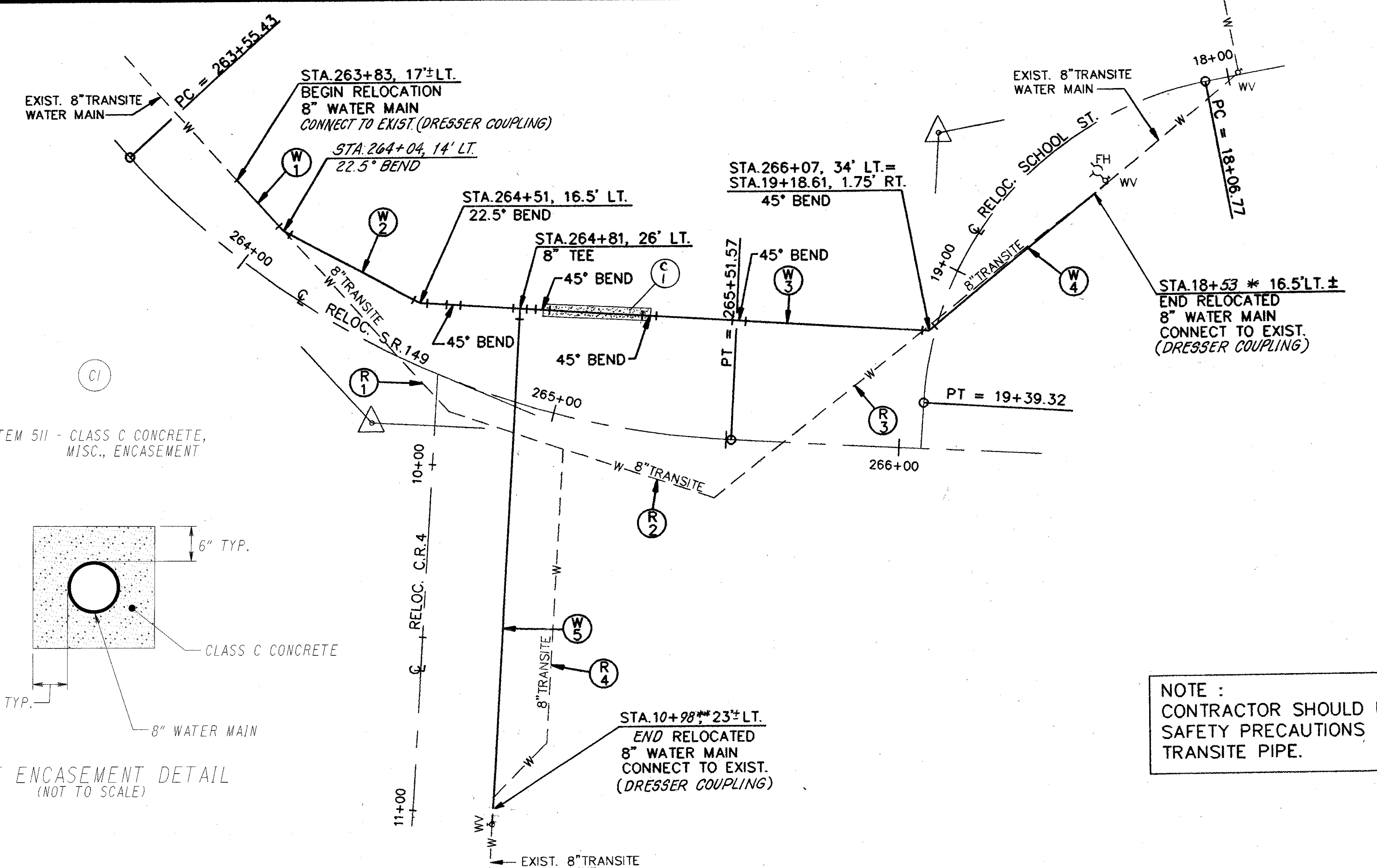
INTERSECTION DETAILS

SUPERELEVATION TABLE

PC STA. 263+55.43				PI STA. 264+58.90			PT STA. 265+51.57				REMARKS
LEFT							RIGHT				
EDGE OF PAVEMENT	DIFF.	RATE	WIDTH	PROFILE GRADE	☉ STATION	☉ ELEVATION	WIDTH	RATE	DIFF.	EDGE OF PAVEMENT	
729.01	-0.14	-0.0156	9.00	729.15	263 +55.43	729.15	11.50	-0.0156	-0.18	728.97	NC/PC
729.05	-0.15	-0.0156	9.50	729.20	263 +72.93	729.20	12.00	-0.0065	-0.08	729.12	
729.06	-0.15	-0.0156	9.56	729.21	263 +75.00	729.21	12.00	-0.0054	-0.06	729.15	
729.12	-0.15	-0.0156	9.86	729.27	263 +85.38	729.27	12.00	0.0000	0.00	729.27	FLAT
729.24	-0.16	-0.0156	10.28	729.40	264 +00.00	729.40	12.00	0.0076	0.09	729.49	
729.40	-0.17	-0.0156	10.72	729.57	264 +15.33	729.57	12.00	0.0156	0.19	729.76	PL
729.48	-0.23	-0.0206	11.00	729.71	264 +25.00	729.71	12.00	0.0206	0.25	729.96	
729.76	-0.39	-0.0336	11.71	730.15	264 +50.00	730.15	12.00	0.0336	0.40	730.55	
729.90	-0.47	-0.0390	12.00	730.37	264 +60.43	730.37	12.00	0.0390	0.47	730.84	
729.94	-0.48	-0.0400	12.00	730.42	264 +62.63	730.42	12.00	0.0400	0.48	730.90	FS
729.91**	-0.80	-0.0400	20.00	730.71	264 +75.00	730.71	12.00	0.0400	0.48	731.19	
730.60*	-0.80	-0.0400	20.00	731.40	265 +00.00	731.40	28.07	0.0400	1.12	732.52**	
731.41*	-0.80	-0.0400	20.00	732.21	265 +25.00	732.21	20.00	0.0400	0.80	733.01*	
731.44*	-0.80	-0.0400	20.00	732.24	265 +25.97	732.24	20.00	0.0400	0.80	733.04*	FS
732.60*	-0.55	-0.0275	20.00	733.15	265 +50.00	733.15	20.00	0.0275	0.33	733.76*	
732.68*	-0.53	-0.0267	20.00	733.21	265 +51.57	733.21	12.00	0.0267	0.32	733.53*	PT
733.90	-0.19	-0.0156	12.00	734.09	265 +72.37	734.09	12.00	0.0156	0.19	734.28	PL
734.02	-0.19	-0.0156	12.00	734.21	265 +75.00	734.21	12.00	0.0142	0.17	734.38	
735.13	-0.19	-0.0156	12.00	735.32	266 +00.00	735.32	12.00	0.0008	0.01	735.33	
735.25	-0.19	-0.0156	12.00	735.44	266 +02.77	735.44	12.00	0.0000	0.00	735.44	FLAT
735.42	-0.19	-0.0156	12.00	735.61	266 +06.37	735.61	12.00	0.0000	0.00	735.61	
736.26	-0.19	-0.0156	12.00	736.45	266 +25.00	736.45	12.00	-0.0117	-0.14	736.31	
736.62	-0.19	-0.0156	12.00	736.81	266 +33.17	736.81	12.00	-0.0156	-0.19	736.62	NC

*EDGE OF BRIDGE
**EDGE OF APPROACH SLAB

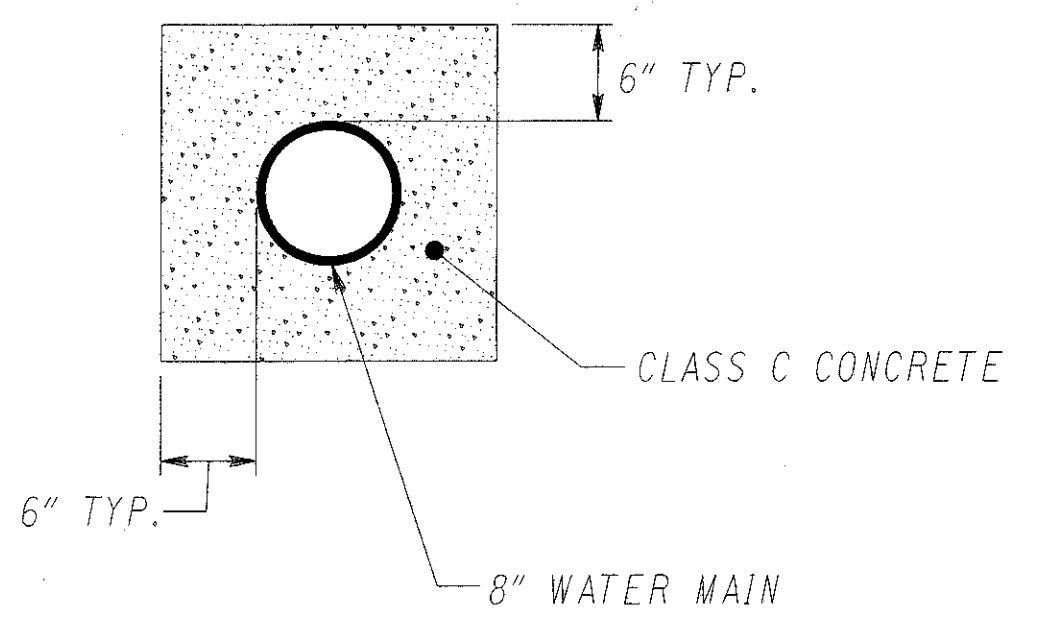
ms 916 DWL.7 FR. C:\DRAWING\0804209\0804209.DWG SC. 1-20 13.34 01/21/95



* SCHOOL ST. STATIONING
 ** C.R.4 STATIONING

REFERENCE NO.	STATION TO STATION	SIDE	①		
			PIPE REMOVED 24" AND UNDER	CLASS C CONCRETE, MISC., ENCASEMENT	8" WATER MAIN, DUCTILE IRON PIPE, ANSI CLASS 53 MECHANICAL JOINTS & FITTINGS
			L.F.	C.Y.	L.F.
R1	263+83 - 264+71	L/R	90		
R2	264+71 - 265+48	RT.	80		
R3	265+48 - 19+19*	RT.	78		
R4	9+93** - 11+03**	LT.	115		
W1	263+83 - 264+04	LT.			21
W2	264+04 - 264+51	LT.			47
W3	264+51 - 266+07	LT.			170
W4	266+07 - 18+53*	L/R			62
W5	264+81 - 10+98**	LT.			145
C1	264+95 - 265+26	LT.		3	
TOTALS			363	3	445

ITEM 511 - CLASS C CONCRETE, MISC., ENCASEMENT

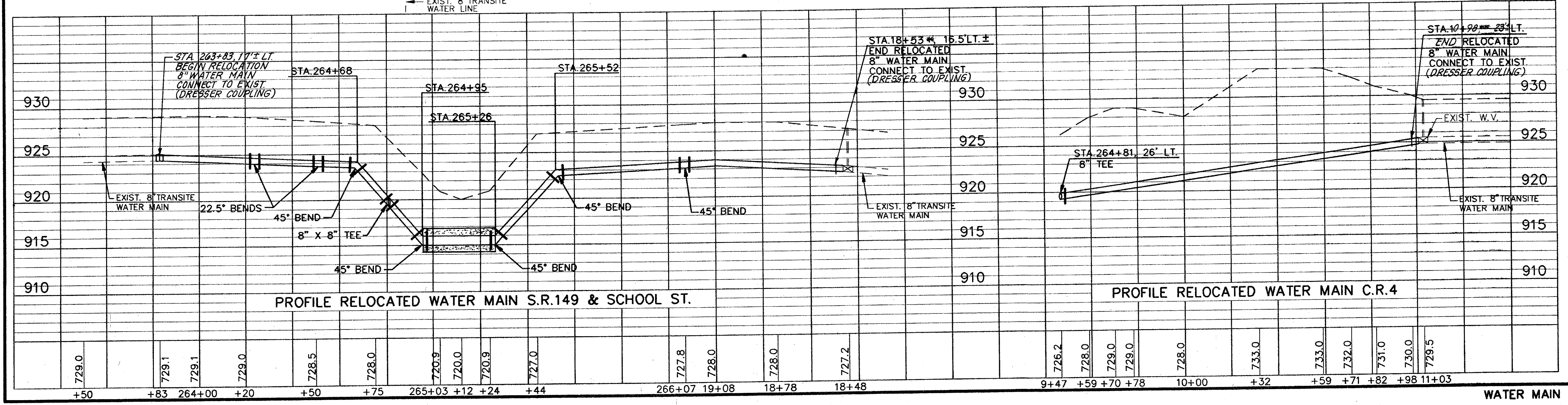


PIPE ENCASEMENT DETAIL (NOT TO SCALE)

NOTE: CONTRACTOR SHOULD USE ALL CURRENT SAFETY PRECAUTIONS WHEN SAWING TRANSITE PIPE.

① WITH RETAINER GLANDS

NOTE: - ALL BENDS AND JOINTS SHALL BE COMPLETE WITH RETAINER GLANDS.

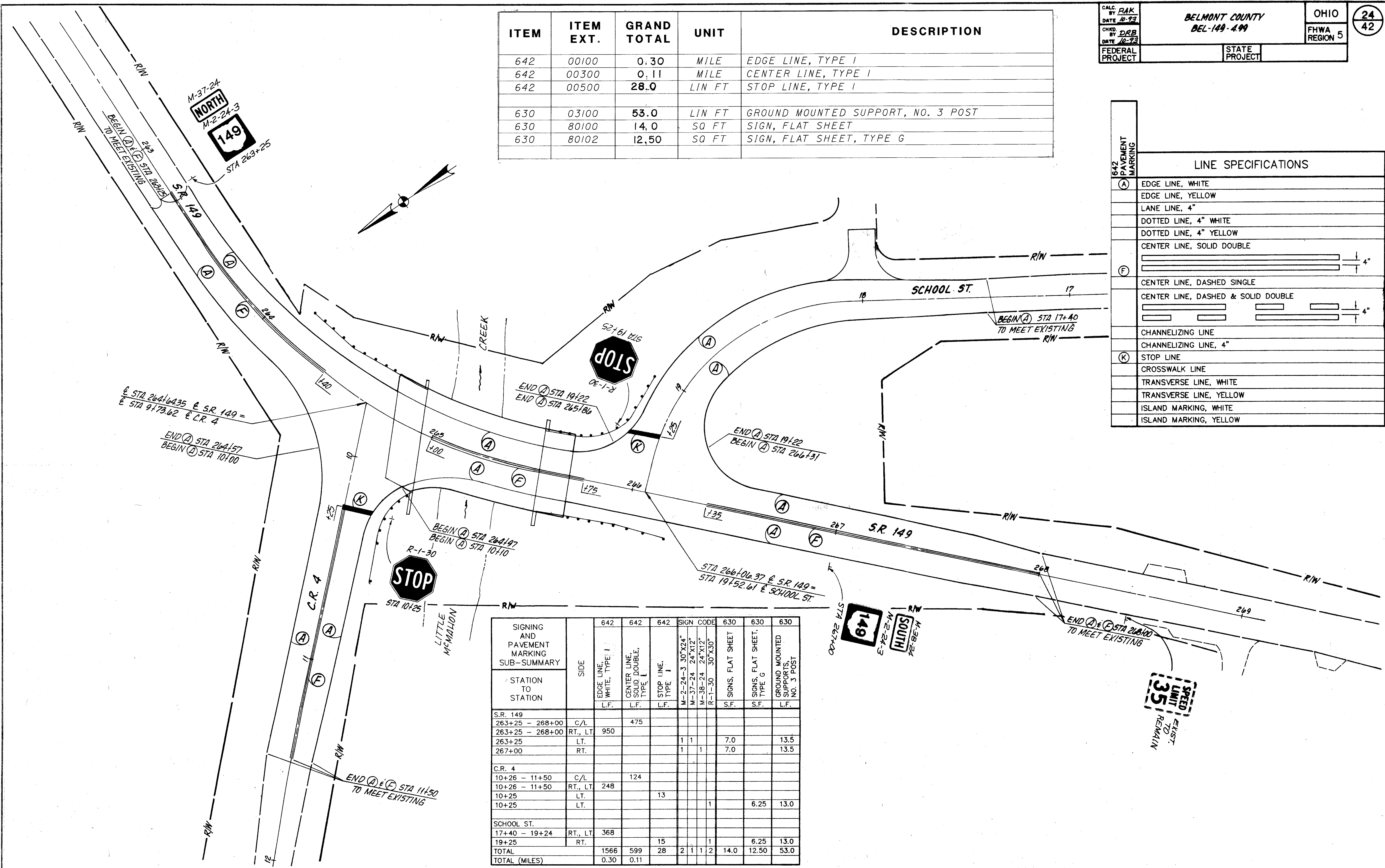


1515 02/01/95
 1515 02/01/95
 1515 02/01/95

WATER MAIN

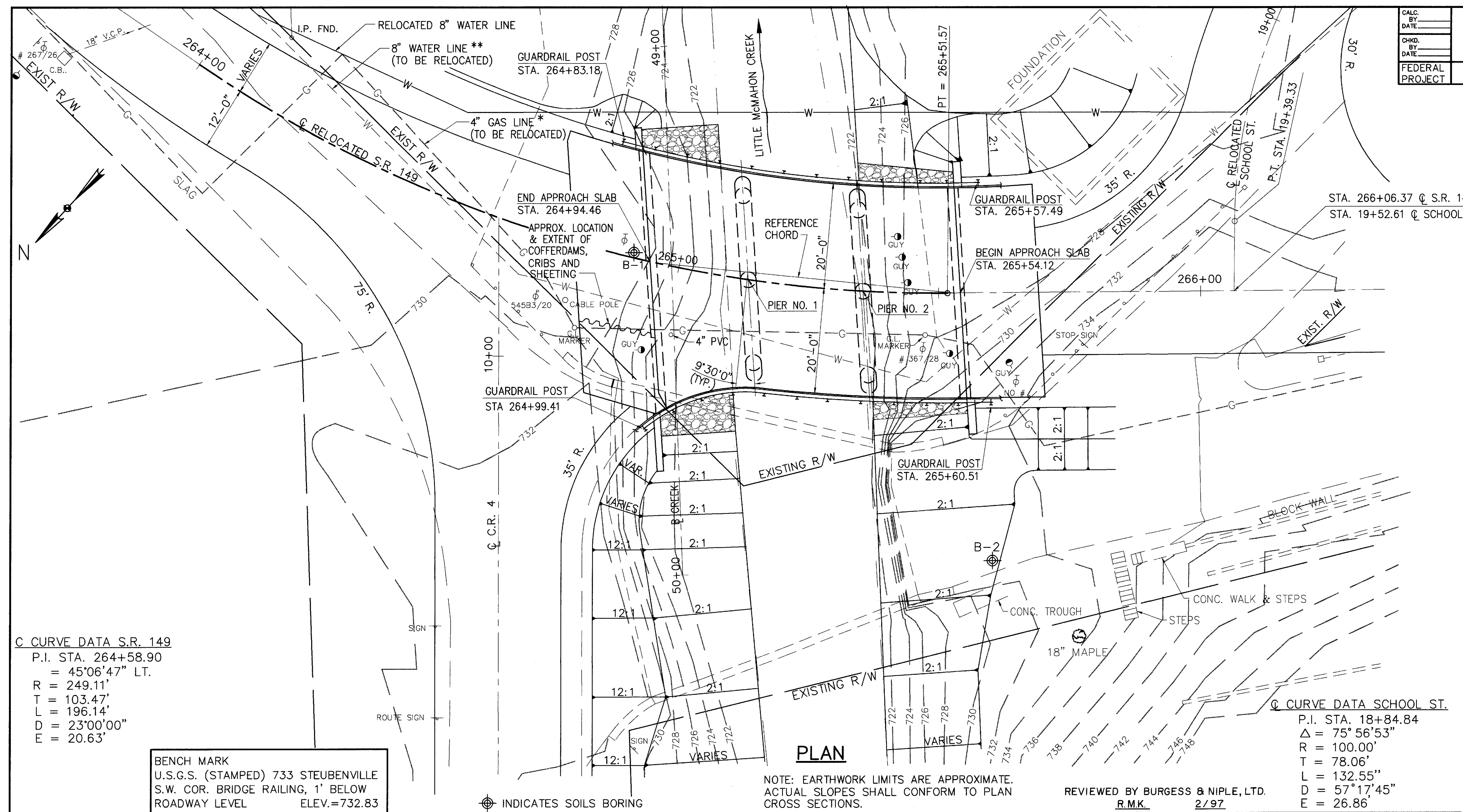
ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
642	00100	0.30	MILE	EDGE LINE, TYPE I
642	00300	0.11	MILE	CENTER LINE, TYPE I
642	00500	28.0	LIN FT	STOP LINE, TYPE I
630	03100	53.0	LIN FT	GROUND MOUNTED SUPPORT, NO. 3 POST
630	80100	14.0	SQ FT	SIGN, FLAT SHEET
630	80102	12.50	SQ FT	SIGN, FLAT SHEET, TYPE G

642 PAVEMENT MARKING	LINE SPECIFICATIONS
(A)	EDGE LINE, WHITE
	EDGE LINE, YELLOW
	LANE LINE, 4"
	DOTTED LINE, 4" WHITE
	DOTTED LINE, 4" YELLOW
	CENTER LINE, SOLID DOUBLE
(F)	CENTER LINE, DASHED SINGLE
	CENTER LINE, DASHED & SOLID DOUBLE
	CHANNELIZING LINE
	CHANNELIZING LINE, 4"
(K)	STOP LINE
	CROSSWALK LINE
	TRANSVERSE LINE, WHITE
	TRANSVERSE LINE, YELLOW
	ISLAND MARKING, WHITE
	ISLAND MARKING, YELLOW



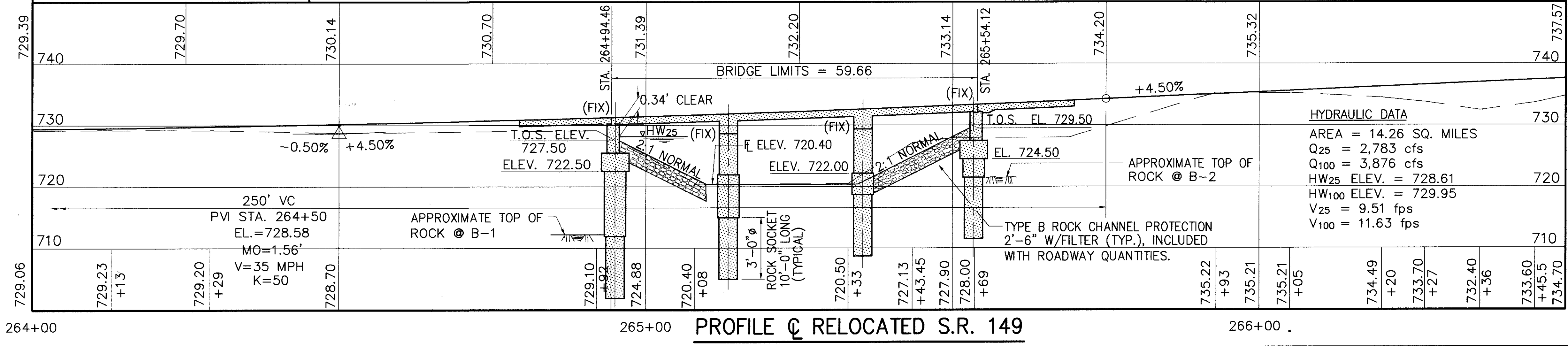
SIGNING AND PAVEMENT MARKING SUB-SUMMARY	SIDE	642		642		642		SIGN CODE		630		630	
		EDGE LINE, WHITE, TYPE I	CENTER LINE, SOLID DOUBLE, TYPE I	STOP LINE, TYPE I	M-2-24-3 30"x24"	M-37-24 24"x12"	M-38-24 24"x12"	R-1-30 30"x30"	S.F.	S.F.	S.F.	S.F.	
S.R. 149	C/L		475										
263+25 - 268+00	RT., LT	950											
263+25	LT.				1	1			7.0			13.5	
267+00	RT.				1	1			7.0			13.5	
C.R. 4	C/L		124										
10+26 - 11+50	RT., LT	248											
10+25	LT.			13									
10+25	LT.					1			6.25			13.0	
SCHOOL ST.	RT., LT	368											
17+40 - 19+24	RT.			15					6.25			13.0	
TOTAL		1566	599	28	2	1	1	2	14.0	12.50		53.0	
TOTAL (MILES)		0.30	0.11										

SIGNING AND PAVEMENT MARKING PLAN S.R. 149 STA 263+00 TO STA. 269+00



C CURVE DATA S.R. 149
 P.I. STA. 264+58.90
 = 45°06'47" LT.
 R = 249.11'
 T = 103.47'
 L = 196.14'
 D = 23°00'00"
 E = 20.63'

BENCH MARK
 U.S.G.S. (STAMPED) 733 STEUBENVILLE
 S.W. COR. BRIDGE RAILING, 1' BELOW
 ROADWAY LEVEL ELEV.=732.83



* COLUMBIA GAS OF OHIO
 ** BELMONT COUNTY SANITARY SEWER DISTRICT

EXISTING STRUCTURE

TYPE: FILLED CONCRETE SPANDREL ARCH
 SPANS: 55' CLEAR AT SPRING LINE
 ROADWAY: VARIES 28'-6" TO 60'-0"
 DESIGN LOADING: UNKNOWN
 SKEW: NONE
 WEARING SURFACE: ASPHALT CONCRETE
 ALIGNMENT: TANGENT
 APPROACH SLABS: NONE
 CONDITION: FUNCTIONALLY OBSOLETE
 DISPOSITION: TO BE REMOVED
 STRUCTURE FILE NO.: 0704822

PROPOSED STRUCTURE

TYPE: CONTINUOUS CONCRETE SLAB W/STUB
 ABUTMENTS AND CAP & COLUMN PIERS
 SPANS: 17'-6", 22'-0", 17'-6" = 57'-0"
 F/F ABUTMENTS (ALONG REF. CHORD)
 ROADWAY: 40'-0" F/F GUARDRAIL (MIN.)
 DESIGN LOADING: HS20-44 & ALTERNATE
 MILITARY LOADING
 SKEW: 9°30'0" RIGHT FORWARD (TO REF. CHORD)
 WEARING SURFACE: MONOLITHIC CONCRETE
 ALIGNMENT: CURVED (23°00'00" LT)
 APPROACH SLABS: 15'-0" LONG (AS-1-81)
 SUPERELEVATION: VARIES (0.040 FT./FT. MAX.)
 AVERAGE DAILY TRAFFIC: 5,180 (2010)
 AVERAGE DAILY TRUCK TRAFFIC: 104 (2010)

1/14

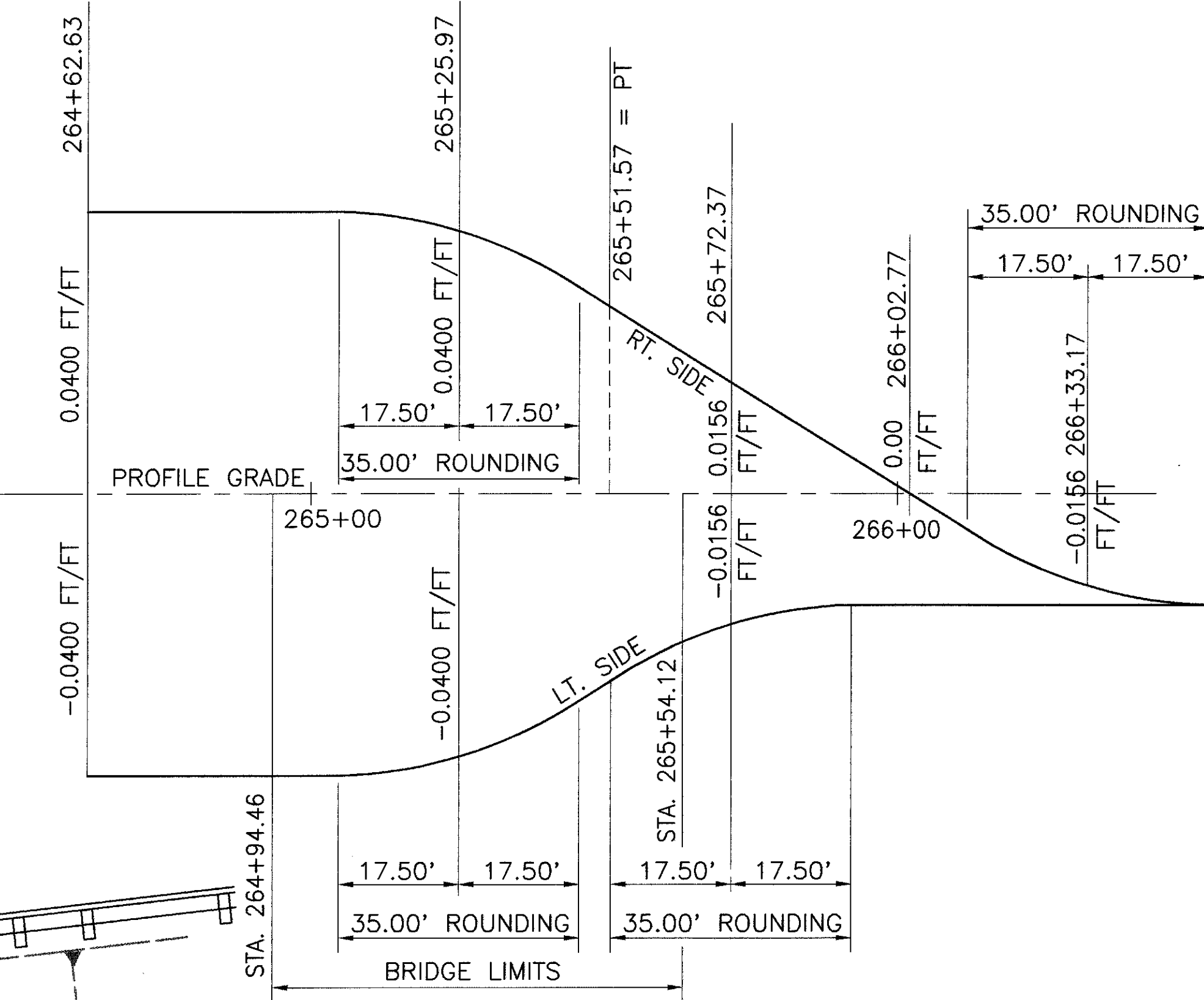
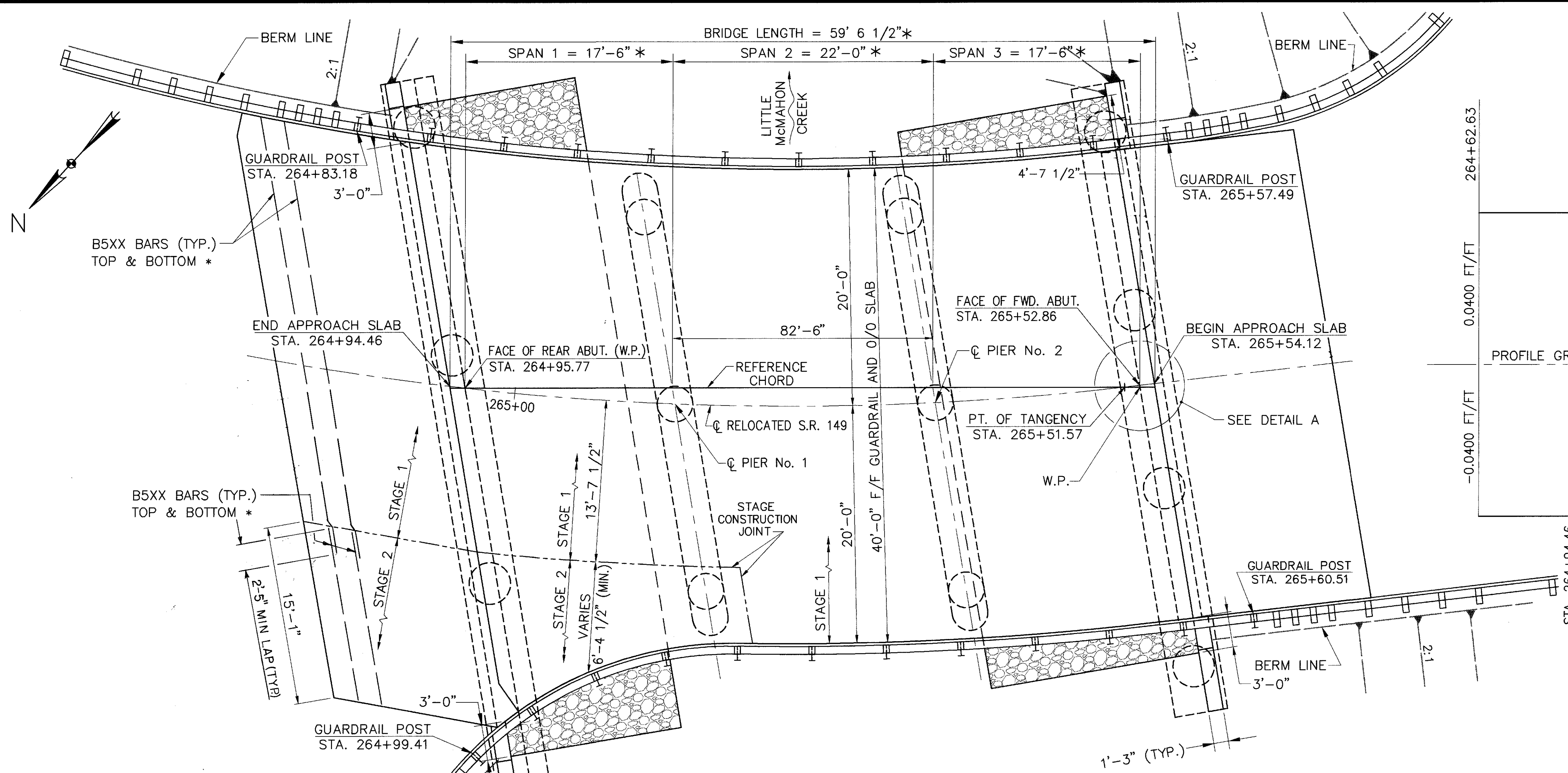
ms consultants
 YOUNGSTOWN, OHIO

SITE PLAN
 BRIDGE No. BEL-149-0502
 OVER
 LITTLE McMAHON CREEK

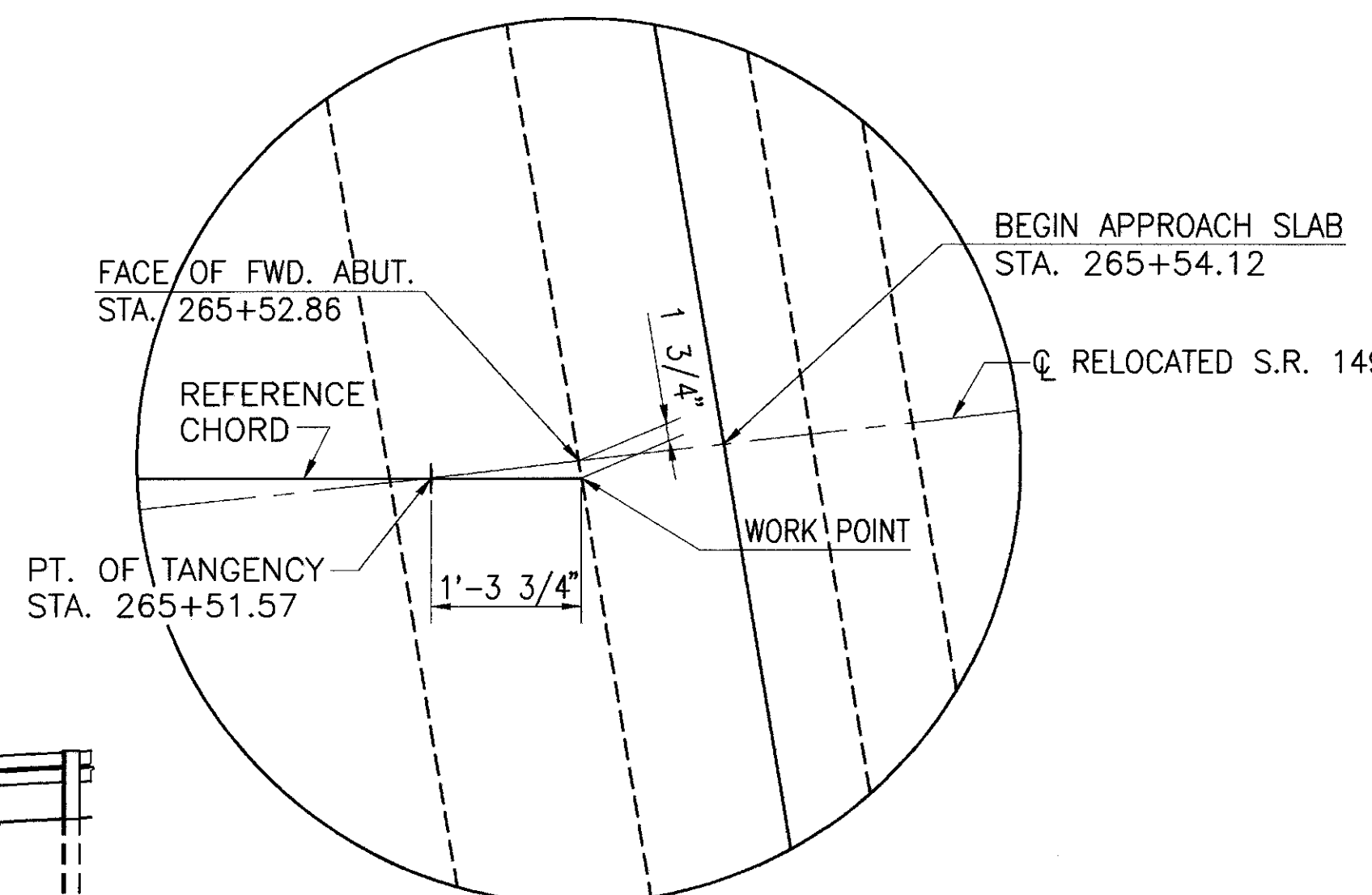
BELMONT COUNTY, OHIO STA. 264+94.46
 STA. 265+54.12

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
W.H. 10-91	E.K. 10-91	W.H. 10-91	G.K. 8-93	D.S. 8-93

STY #2 ERK C:\DRAWING\08042308\08042391 1=10 18.47 07/26/96



PAVEMENT TRANSITION DIAGRAM



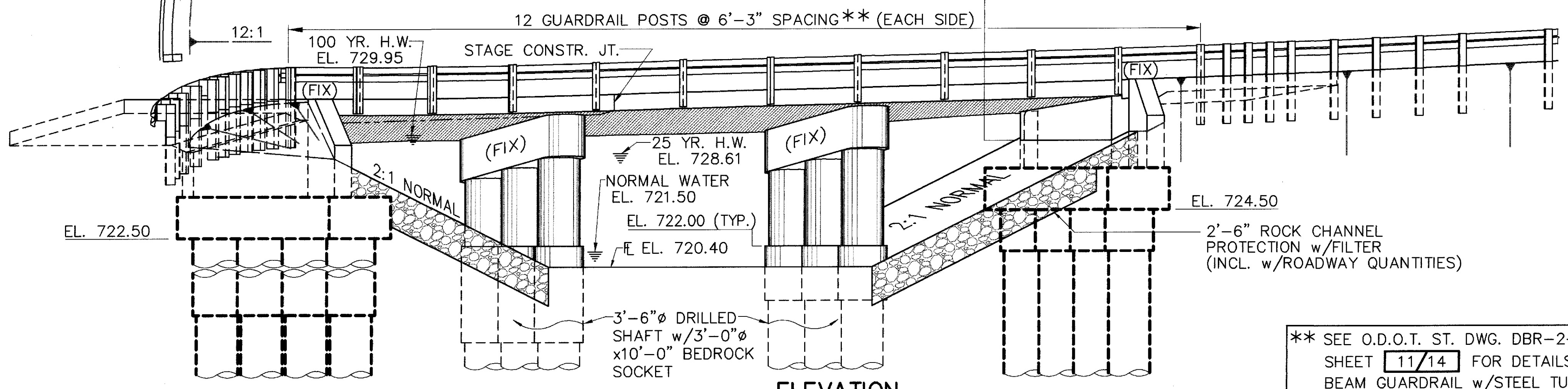
DETAIL A

* SEE STD. DWG. AS-1-81 FOR LAYOUT OF #5 TRANSVERSE BARS IN APPROACH SLAB.

* ALONG REFERENCE CHORD
W.P. = WORK POINT

GENERAL PLAN

EL. 729.50 (FWD. ABUT.)
EL. 727.50 (REAR ABUT.)



ELEVATION

** SEE O.D.O.T. ST. DWG. DBR-2-73 AND SHEET 11/14 FOR DETAILS OF DEEP BEAM GUARDRAIL w/STEEL TUBULAR BACKUP

2 / 14

ms consultants, inc.
 YOUNGSTOWN, OHIO
GENERAL PLAN
 BRIDGE No. BEL-149-0502
 OVER
 LITTLE McMAHON CREEK
 BELMONT COUNTY, OHIO

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
D.S.	W.R.H.	D.S.	W.H.	D.S.
7-93	7-93	7-93	8-93	8-93

STA 264+94.46
 STA 265+54.12

STR. #2 ERK C:\DRAWING\06042008\06042008P 1=64 12:44 01/16/97

GENERAL NOTES

CALC. BY DATE CHKD. BY DATE FEDERAL PROJECT	BEL-149-4.99 BELMONT COUNTY	OHIO FHWA REGION 5 STATE PROJECT	27 42
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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

AS-1-81	DATED	9/15/94	SS 844	DATED	5-5-98
DBR-2-73	DATED	9/15/94			
PCB-91	DATED	4/24/92			
DS-1-92	DATED	12-15-94			

DESIGN SPECIFICATIONS

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

DESIGN LOADING

DESIGN LOADING - HS20-44 AND THE ALTERNATE MILITARY LOADING.

DESIGN STRESSES

ALL SUBSTRUCTURES AND SUPERSTRUCTURES SHALL BE HIGH PERFORMANCE CONCRETE.

ASSUMED UNIT STRESSES:

- SUBSTRUCTURES - 1333 PSI
- SUPERSTRUCTURES - 1500 PSI

REINFORCING STEEL ASTM A615, A616, OR A617.
GRADE 60 - UNIT STRENGTH 24,000 PSI.

DECK PROTECTION METHOD

EPOXY COATED REINFORCING STEEL, TOP AND BOTTOM MAT, AND SEALING OF CONCRETE SURFACES.

SEALING OF CONCRETE SURFACES

CONCRETE SEALANT SHALL BE APPLIED TO SURFACE AREAS AS INDICATED IN SUPERSTRUCTURE AND PIER DETAILS SHEETS 9/14 & 11/14.

THE EXPOSED PORTIONS OF THE ABUTMENTS ABOVE THE GROUNDLINE SHALL RECEIVE A PROTECTIVE COATING OF EPOXY SEALER, AS INDICATED IN ABUTMENT DETAILS SHEETS 7/14 & 8/14.

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

MONOLITHIC WEARING SURFACE

MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 1" THICK.

EXISTING STRUCTURE REMOVED

WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC, THE EXISTING STRUCTURE SHALL BE REMOVED AS PER 202.03. SUITABLE WASTE MASONRY MAY BE USED AS BANK PROTECTION AS DIRECTED BY THE ENGINEER.

POROUS BACKFILL

POROUS BACKFILL WITH FILTER FABRIC, 2 FEET THICK SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO ONE FOOT BELOW THE EMBANKMENT SURFACE, AND LATERALLY TO THE ENDS OF THE WINGWALLS.

MECHANICAL CONNECTORS (FOR DECK)

A POSITION COUPLER TYPE OF MECHANICAL CONNECTOR FOR REINFORCING BARS SHALL BE PROVIDED. THE POSITION COUPLER WILL PROPERLY JOIN CURVED, BENT, OR STRAIGHT BARS THAT ARE TO BE IN A FIXED POSITION DURING THE SPLICING PROCESS WHEN NEITHER BAR IS ABLE TO ROTATE. INSTALLATION OF CONNECTORS SHALL CONFORM WITH MANUFACTURER'S RECOMMENDED PROCEDURES. A DOWEL BAR SPLICE TYPE OF CONNECTOR IS PROHIBITED.

CONNECTORS 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 REPLACE WITH MATERIAL WHICH MEETS THE SPECIFICATIONS.

CONNECTORS SHALL CONFORM WITH ITEM 509 AND BE INCLUDED IN ITEM 511.

MECHANICAL CONNECTORS (FOR ABUTMENTS)

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 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

ESTIMATED QUANTITIES

CALC. GK DATE 8-93 CHK W.H. DATE 5-96

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	SUPERST.	ABUT.	PIER	GENERAL
202	11002	LUMP		STRUCTURE REMOVED, OVER 20 FOOT SPAN				LUMP
503	11101	LUMP		COFFERDAMS, CRIBS AND SHEETING, AS PER PLAN				LUMP
503	21100	159	CU. YD.	UNCLASSIFIED EXCAVATION		159		
524	94704	140	LIN. FT.	DRILLED SHAFTS, 36" DIAMETER, INTO BEDROCK		80	60	
524	94802	88	LIN. FT.	DRILLED SHAFTS, 42" DIAMETER, ABOVE BEDROCK		56	32	
					29,645	11,275	3,194	
844	48000	109	CU. YD.	HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE (DECK)	109			
844	48040	132	CU. YD.	HIGH PERFORMANCE CONCRETE, SUBSTRUCTURE		97	35	
844	49000	LUMP		HIGH PERFORMANCE CONCRETE, TRIAL MIX				LUMP
844	49010	LUMP		HIGH PERFORMANCE CONCRETE, TESTING				LUMP
512	44400	2	SQ. YD.	TYPE B WATERPROOFING		2		
SPECIAL	51267510	108	SQ. YD.	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	34	59	15	
517	72300	137.5	LIN. FT.	RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS & ANCHOR BOLTS), (SEE PROP. NOTE)	137.5			
518	21200	42	CU. YD.	POROUS BACKFILL WITH FILTER FABRIC		42		
SPECIAL	51822300	140	LIN. FT.	STEEL DRIP STRIP				
518	41100	123	LIN. FT.	6" PERFORATED HELICAL CORRUGATED STEEL PIPE - 707.01		123		
518	41200	32	LIN. FT.	6" NON-PERFORATED HELICAL CORRUGATED STEEL PIPE, INCLUDING SPECIALS, 707.01		32		

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.

CONNECTORS AND DOWEL BAR EXTENSIONS SHALL CONFORM WITH ITEM 509 AND BE INCLUDED IN ITEM 511.

CONCRETE DECK SLAB

AFTER DECK SLAB CONCRETE HAS BEEN AIR CURED FOR NOT LESS THAN 7 DAYS, AND IMMEDIATELY AFTER A MINIMUM 48 HOUR PERIOD WITHOUT PRECIPITATION, VERTICAL CONSTRUCTION JOINTS IN THE DECK SLAB, HORIZONTAL JOINTS AT AND ADJACENT TO THE ROADWAY SURFACE (AT THE BASE OF SIDEWALKS, CURBS, BARRIERS, ETC.), AND CRACKS IN THE ROADWAY SURFACE THAT ARE VISIBLE TO THE UNAIDED EYE, SHALL BE SEALED WITH A HIGH MOLECULAR WEIGHT METHA-CRYLATE (HMWM) RESIN. SEALANT SHALL BE APPLIED BY BRUSH, SPRAY, OR OTHER SUITABLE APPLICATOR ALONG THE SURFACE OF JOINTS AND CRACKS. IF NECESSARY, MULTIPLE APPLICATIONS SHALL BE MADE UNTIL COMPLETE PENETRATION HAS BEEN ACHIEVED. AFTER SEALANT HAS BEEN CURED, IT SHALL BE ABRASIVELY BLASTED TO ROUGHEN THE SEALANT SURFACE AND RESTORE ITS SUITABILITY FOR VEHICULAR TRAFFIC AND FOR OVERCOATING WITH A CONCRETE SURFACE SEALANT. SEALING CONSTRUCTION JOINTS AND CRACKS, AS DESCRIBED ABOVE, SHALL BE INCLUDED WITH THE DECK SLAB CONCRETE FOR PAYMENT.

COFFERDAMS, CRIBS AND SHEETING, AS PER PLAN

TEMPORARY SHORING SHALL BE USED TO ACCOMPLISH THE PROPOSED CONSTRUCTION IN STAGES. THE DESIGN OF THE TEMPORARY SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER, AND CONFORM WITH 501.05. FOR APPROVAL, FIVE COPIES OF THE DRAWINGS SHALL BE SUBMITTED TO THE DIRECTOR AND CONCURRENTLY, ONE COPY TO THE BUREAU OF BRIDGES AND STRUCTURAL DESIGN. CONSTRUCTION OF THE SHORING SHALL NOT BEGIN UNTIL AFTER WRITTEN APPROVAL HAS BEEN RECEIVED FROM THE DIRECTOR. PORTIONS OF THE TEMPORARY SHORING COMPOSED OF STEEL OR CONCRETE MAY BE LEFT IN PLACE AT THE DISCRETION OF THE ENGINEER. PORTIONS COMPOSED OF OTHER MATERIALS SHALL BE REMOVED PRIOR TO COMPLETION OF THE WORK.

HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE

THIS ITEM SHALL BE IN ACCORDANCE WITH THE ITEM 844 EXCEPT THAT THE CONCRETE SHALL CONSIST OF MIX 3.

UTILITY LINES

ALL EXPENSE INVOLVED IN RELOCATION (INSTALLING) THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE UTILITY(IES). THE CONTRACTOR AND UTILITY(IES) ARE TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

PROPOSED WORK:

1. TRAFFIC SHALL BE MAINTAINED AS DESCRIBED IN THE ROADWAY GENERAL NOTES. STREAM FLOW SHALL BE MAINTAINED AT ALL TIMES.
2. INSTALL STAGE 1 PORTABLE CONCRETE BARRIERS AS SHOWN IN THE ROADWAY MAINTENANCE OF TRAFFIC SHEETS.
3. ROUTE TRAFFIC OVER THE STAGE 1 TEMPORARY TRAFFIC LANES.
4. COMPLETE STAGE 1 CONSTRUCTION UP TO STAGE 1 CONSTRUCTION JOINT INCLUDING COFFERDAMS, CRIBS AND SHEETING, EXCAVATION, DRILLED SHAFTS, ABUTMENTS, WINGWALLS, PIER CAPS, CONCRETE SUPERSTRUCTURE, BACKFILL, APPROACH SLABS, BRIDGE RAILING ON SOUTH FACE OF SLAB, ABUTMENT DRAINAGE ITEMS, ROCK CHANNEL PROTECTION, AND SEALING OF CONCRETE SURFACES.
5. INSTALL STAGE 1A PORTABLE CONCRETE BARRIERS AS SHOWN IN THE ROADWAY MAINTENANCE OF TRAFFIC SHEETS.
6. ROUTE TRAFFIC OVER THE STAGE 1A TEMPORARY TRAFFIC LANES.
7. REMOVE STAGE 1 PORTABLE CONCRETE BARRIERS AS SHOWN IN THE ROADWAY MAINTENANCE OF TRAFFIC SHEETS. THE DECK FORMWORK AND SUPPORTS OF STAGE 1 CONSTRUCTION SHALL REMAIN IN PLACE UNTIL STAGE 2 PLACEMENT HAS REACHED 75% OF ITS STRENGTH AND AS DIRECTED BY THE ENGINEER.
8. COMPLETE STAGE 1A CONSTRUCTION.
9. INSTALL STAGE 2 PORTABLE CONCRETE BARRIERS AS SHOWN IN THE ROADWAY MAINTENANCE OF TRAFFIC SHEETS.
10. ROUTE TRAFFIC OVER STAGE 2 TEMPORARY TRAFFIC LANES.
11. REMOVE EXISTING STRUCTURE AS PER ITEM 202.
12. COMPLETE STAGE 2 CONSTRUCTION INCLUDING STAGE 2 REAR ABUTMENT EXCAVATION, DRILLED SHAFT, ABUTMENT, WINGWALL, CONCRETE SUPERSTRUCTURE, BACKFILL, APPROACH SLAB, ABUTMENT DRAINAGE ITEMS, ROCK CHANNEL PROTECTION, SEALING OF CONCRETE SURFACES, AND BRIDGE RAILING ON NORTH FACE OF SLAB.
13. REMOVE STAGE 2 PORTABLE CONCRETE BARRIERS.
14. REOPEN THE STRUCTURE TO TWO LANES OF TRAFFIC.
15. CHANGES IN THE SEQUENCE OF THE WORK DESIRED BY THE CONTRACTOR WHICH DO NOT HAVE AN ADVERSE EFFECT ON THE MAINTENANCE OF TRAFFIC WILL BE CONSIDERED BY THE ENGINEER FOR APPROVAL.

3/14

ms consultants, inc. YOUNGSTOWN, OHIO				
GENERAL NOTES & ESTIMATED QUANTITIES BRIDGE No. BEL-149-0502 OVER LITTLE McMAHON CREEK BELMONT COUNTY, OHIO				
STA. 264+94.46 STA. 265+54.12				
DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
G.K.	W.H.	G.K.	W.H.	D.S.
7-93	7-93	7-93	8-93	8-93

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FHWA REGION	STATE	PROJECT	
5	OHIO		

28
42

BEL-149- 4.99

BRIDGE No. BEL-149-0502

DESIGN PARAMETERS

THE DESIGN LOAD TO BE SUPPORTED BY EACH DRILLED SHAFT IS 146 TONS AT THE PIER AND 119 TONS AT EACH ABUTMENT, WHICH IS ASSUMED TO BE RESISTED BY SHAFT ADHESION WITHIN A PORTION OF THE BEDROCK SOCKET AND ALSO BY SHAFT END BEARING PRESSURE. THE ALLOWABLE BEDROCK SOCKET ADHESION IS ONE TON PER SQUARE FOOT WHICH IS ASSUMED TO ACT ALONG THE BOTTOM 8 FEET OF THE BEDROCK SOCKET. THE ALLOWABLE DESIGN END BEARING PRESSURE IS 10 TONS PER SQUARE FOOT.

GENERAL NOTES

INSPECTION RECORD FOR DRILLED SHAFTS

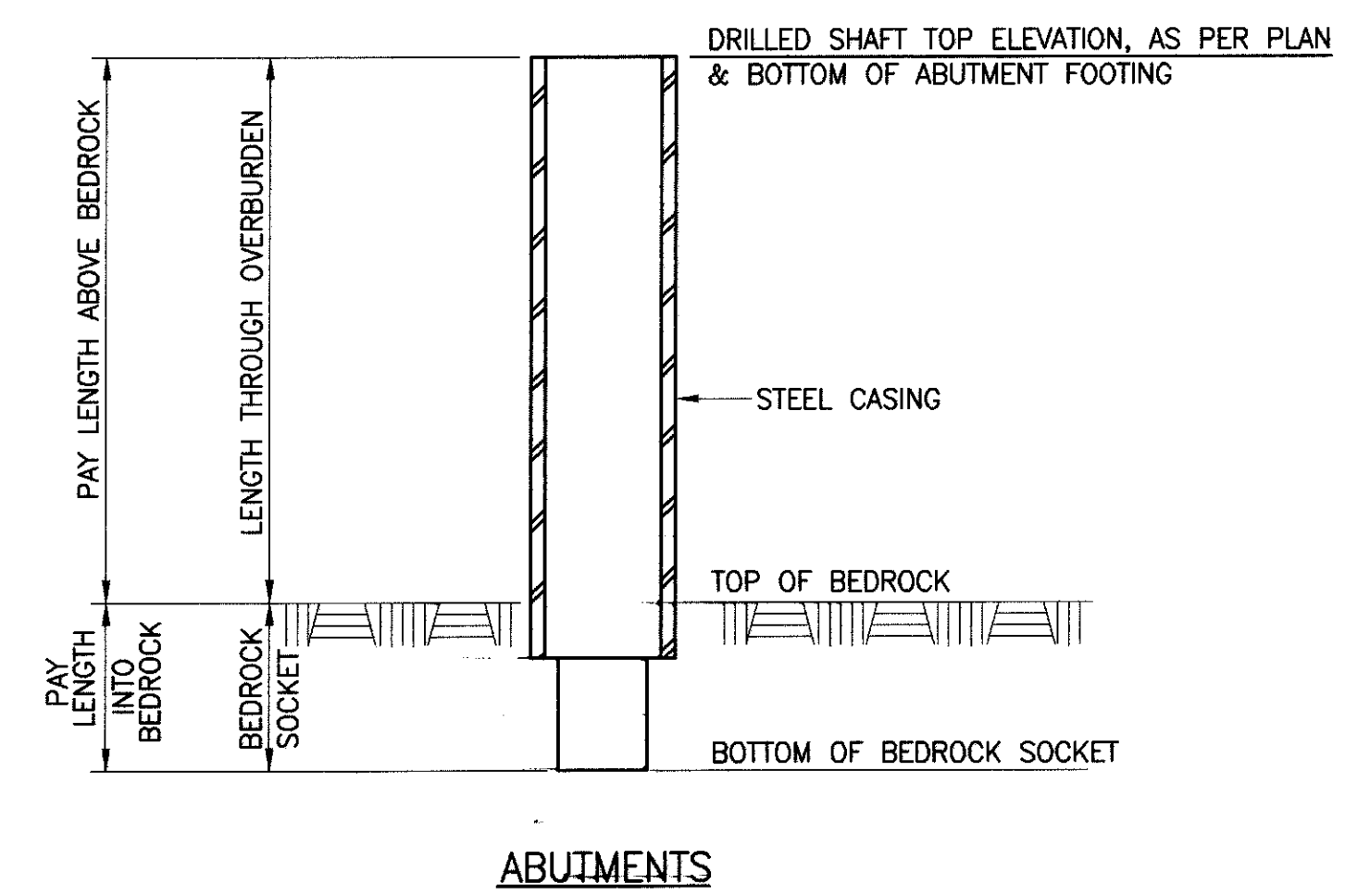
CALC. BY: _____	OHIO FHWA REGION 5	29 42
CHKD. BY: _____		
BEL-149-4.99 BELMONT COUNTY		
FEDERAL PROJECT: _____	STATE PROJECT: _____	

PROJECT NO. _____	GENERAL CONTRACTOR _____	TYPE & MODEL OF DRILLING MACHINERY _____	TYPE OF CONCRETE PUMP _____	COST PER LINEAL FOOT _____
	DRILLING CONTRACTOR _____	MAX. CONTINUOUS TORQUE _____ FT.-LB.	HOSE DIAMETER _____ INCHES	ABOVE THE BEDROCK SOCKET _____
	PROJECT ENGINEER _____	CROWD (MAX. CONTINUOUS DOWNWARD FORCE) _____ LBS.	CAPACITY _____ CU. FT./MIN.	IN BEDROCK SOCKET _____
				TYPE OF ROCK _____

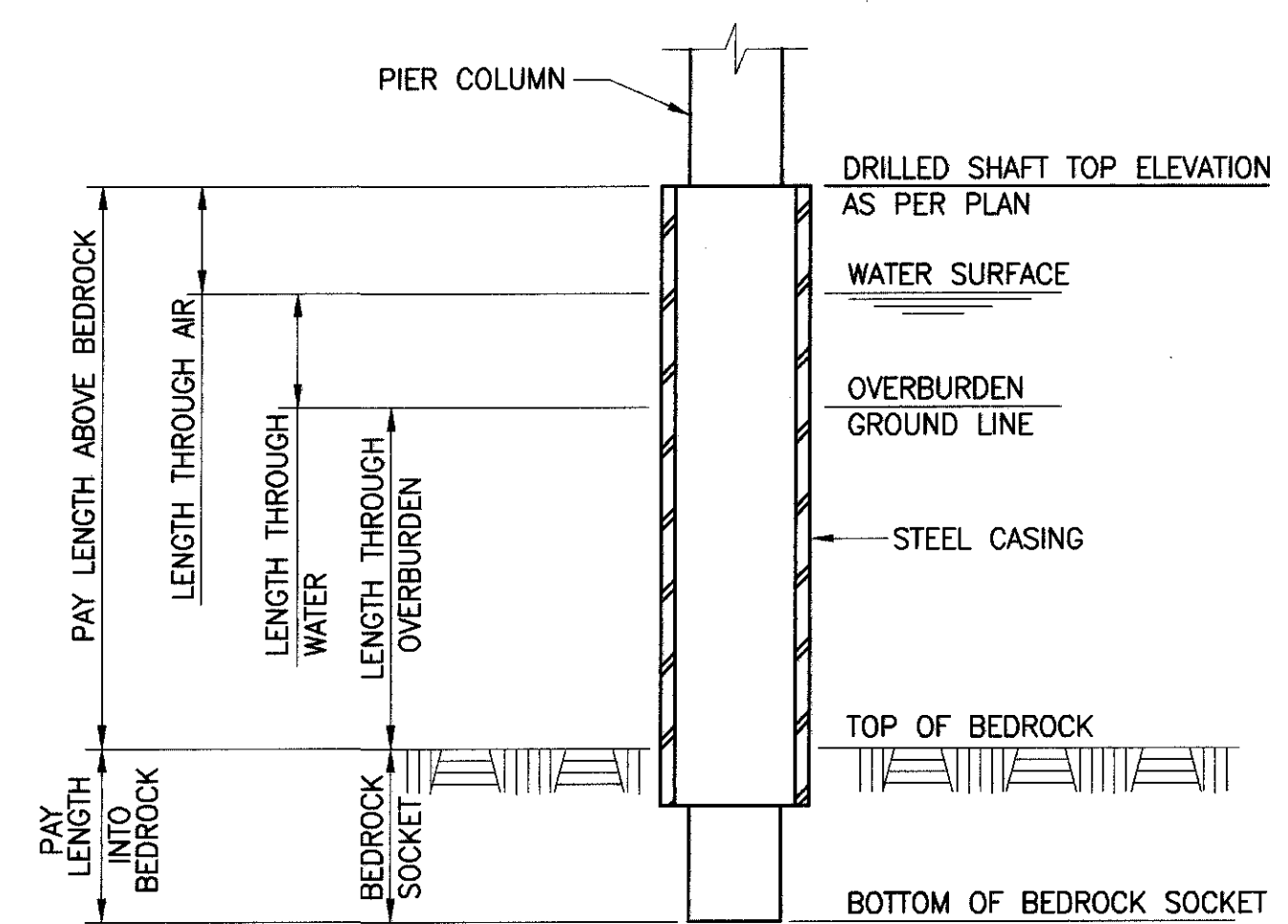
SUBSTRUCTURE UNITS		DATE AND TIME OF DRILLING		APPROX. ELEVATION OF TOP OF OVER BURDEN	LENGTH OF DRILLED SHAFTS ABOVE THE BEDROCK SOCKET				OBSTRUCTIONS ENCOUNTERED			LENGTH OF DRILLED SHAFTS IN BEDROCK SOCKET			STEEL CASING			REINFORCING STEEL				CONCRETE					TOLERANCES		PLAN SHAFT DIAMETER (INCH)	CONSTRUCTED SHAFT DIAMETER (INCH)				
PIER OR ABUT.	SHAFT NO.	STARTED			FINISHED		THROUGH AIR (FEET)	THROUGH WATER (FEET)	THROUGH OVER BURDEN (FEET)	PAY LENGTH (FEET)	NUMBER	SIZE (INCH)	ELAPSED TIME FOR REMOVAL (HR.)	APPROX. ELEVATION OF TOP OF BEDROCK	ELEV. OF BOT. OF BEDROCK SOCKET	LENGTH OF BEDROCK SOCKET (FEET)	LENGTH (FEET)	CASING GAUGE	WAS CASING LEFT IN PLACE?	VERTICAL		SPIRAL		SLUMP TEST RESULT (INCH)	CYLINDER STRENGTH f _c (P.S.I.)	AIR TEMP. (F)	TIME NEEDED TO PLACE CONCRETE (HR.)	QUANTITY (CU. YD.)			DEVIATION FROM PLUMB		DEVIATION OF COLUMN TOP CENTER FROM PLAN LOCATION HORIZONTALLY (INCH)	
		BAR SIZE NO.	NO. OF REBARS		BAR SIZE NO.	PITCH (INCH)														N-S (INCH)	E-W (INCH)													

PROJECT ENGINEER COMMENTS

- LOCATION AND EXTENT OF CAVITIES
- PROCEDURES FOR CONTROLLING WATER
- WERE UNEXPECTED SUBSURFACE CONDITIONS ENCOUNTERED?
- ANY SUGGESTIONS FOR IMPROVING THE PLANS



ABUTMENTS



PIERS

WHEN INSPECTION RECORD IS COMPLETED
SUBMIT A COPY TO BUREAU OF BRIDGES
ATTN: FOUNDATION ENGINEER

THIS SHEET IS TO BE USED ONLY FOR
RECORDING "AS-BUILT" INFORMATION

5 / 14

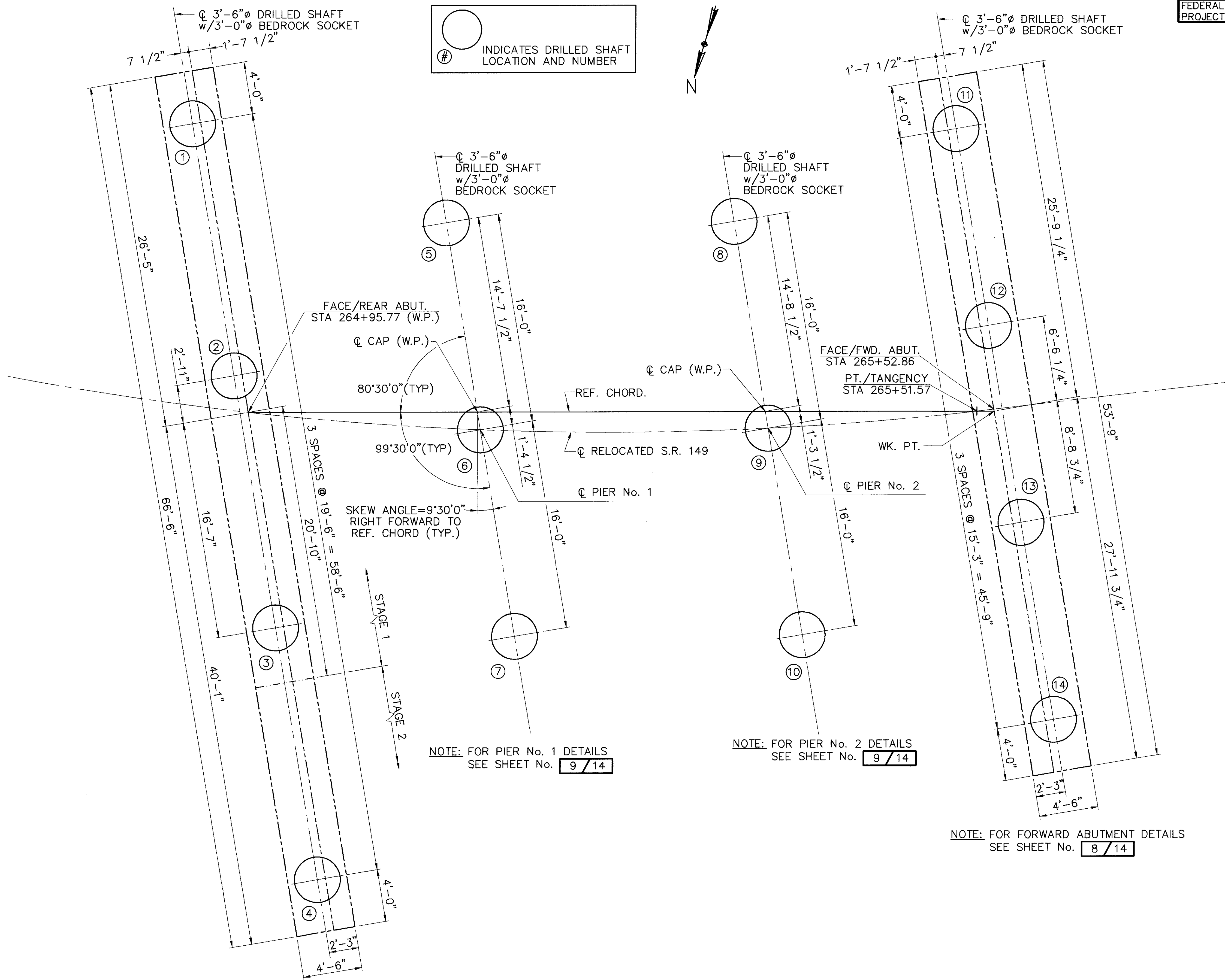
ms consultants, inc.
YOUNGSTOWN, OHIO

**DRILLED SHAFTS
INSPECTION RECORD**
BRIDGE No. BEL-149-0502
OVER
LITTLE McMAHON CREEK
BELMONT COUNTY, OHIO

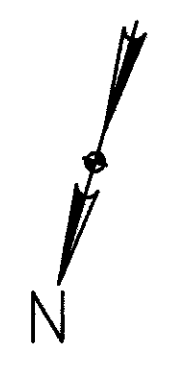
STA. 264+94.46
STA. 265+54.12

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
G.K.	R.M.	G.K.	W.H.	D.S.
8-93	8-93	8-93	8-93	8-93

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⊕ INDICATES DRILLED SHAFT LOCATION AND NUMBER



NOTE: FOR REAR ABUTMENT DETAILS SEE SHEET No. **7/14**

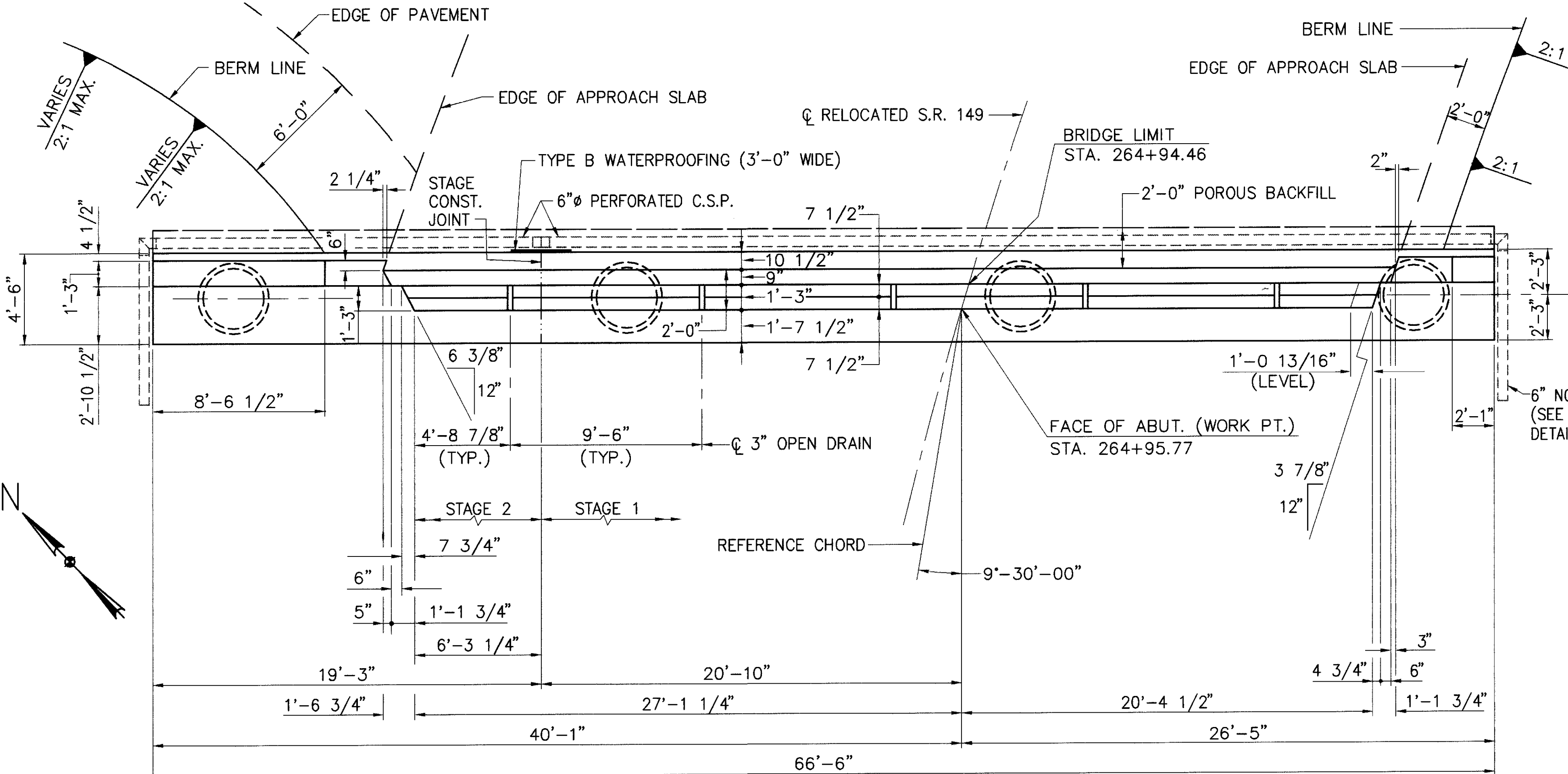
NOTE: FOR PIER No. 1 DETAILS SEE SHEET No. **9/14**

NOTE: FOR PIER No. 2 DETAILS SEE SHEET No. **9/14**

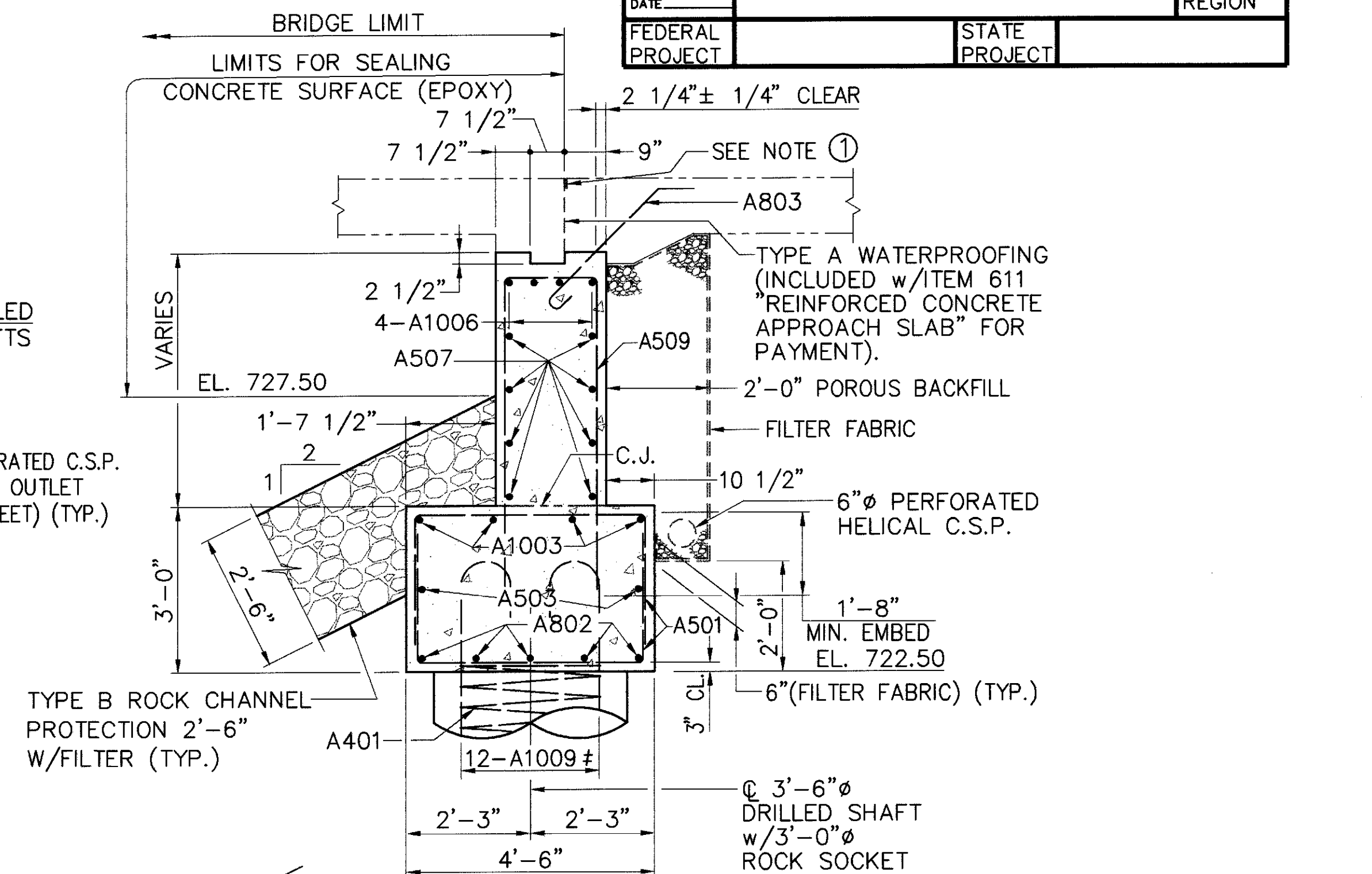
NOTE: FOR FORWARD ABUTMENT DETAILS SEE SHEET No. **8/14**

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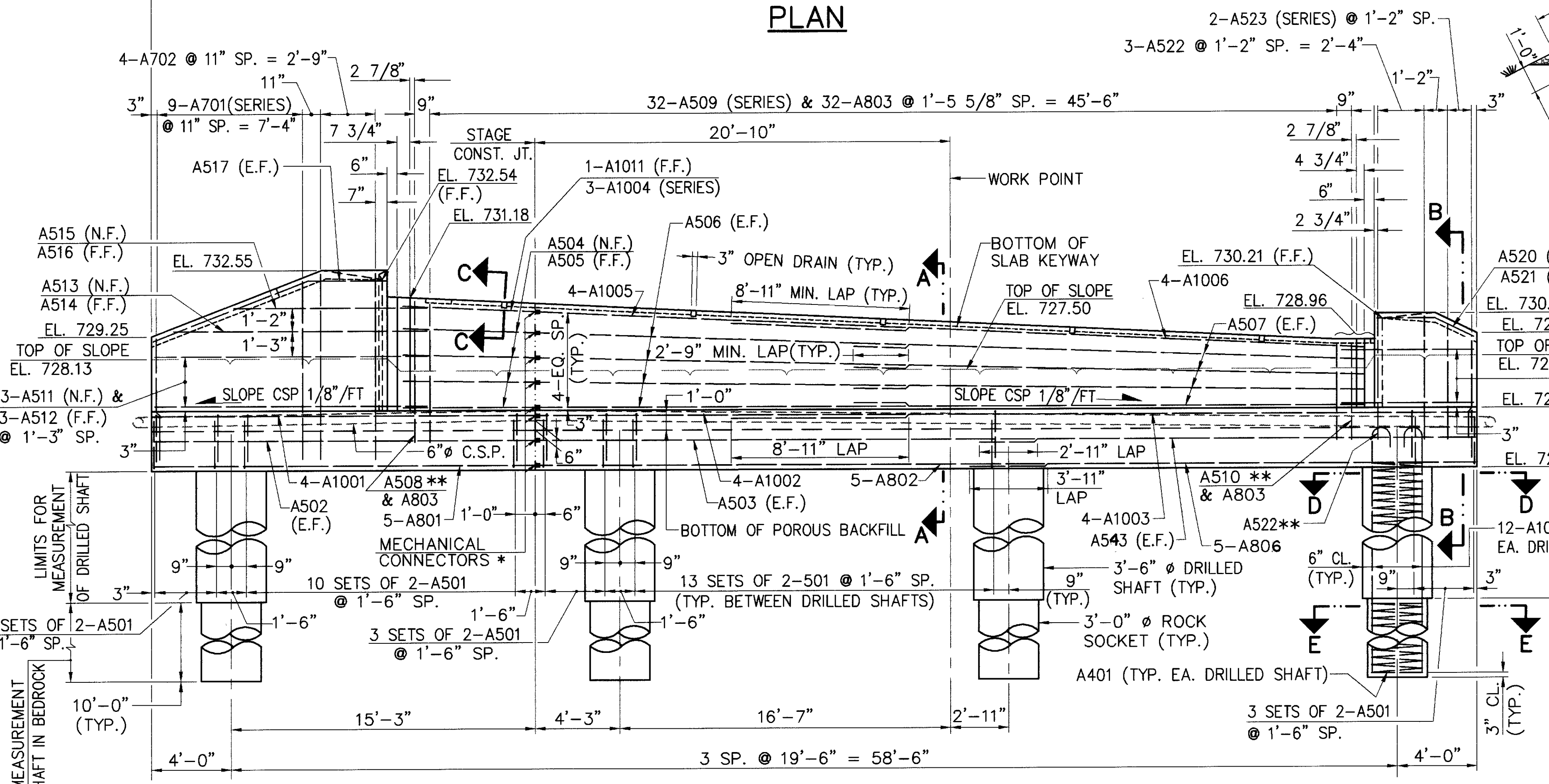
ms consultants, inc. YOUNGSTOWN, OHIO				
FOUNDATION PLAN				
BRIDGE No. BEL-149-4.99 OVER LITTLE McMAHON CREEK				
BELMONT COUNTY, OHIO			STA. 264+94.46 STA. 265+54.12	
DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
<i>B.C.</i>	W.R.H.	<i>B.C.</i>	W.H.	D.S.
7-93	7-93	7-93	8-93	8-93



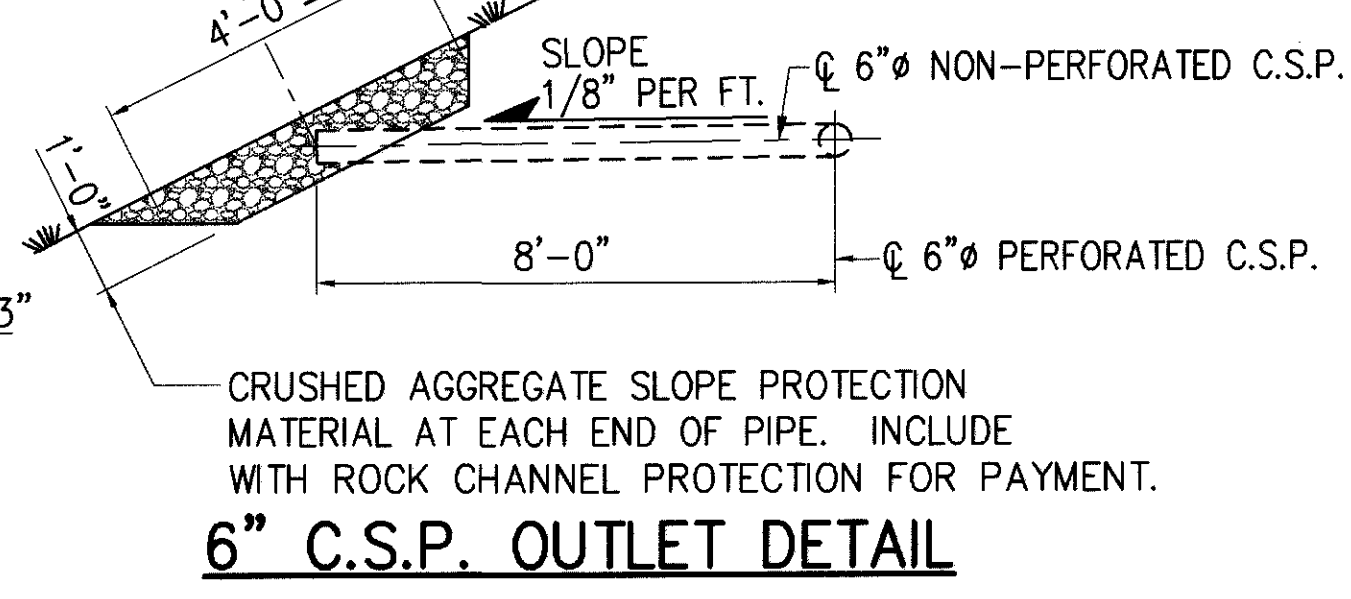
PLAN



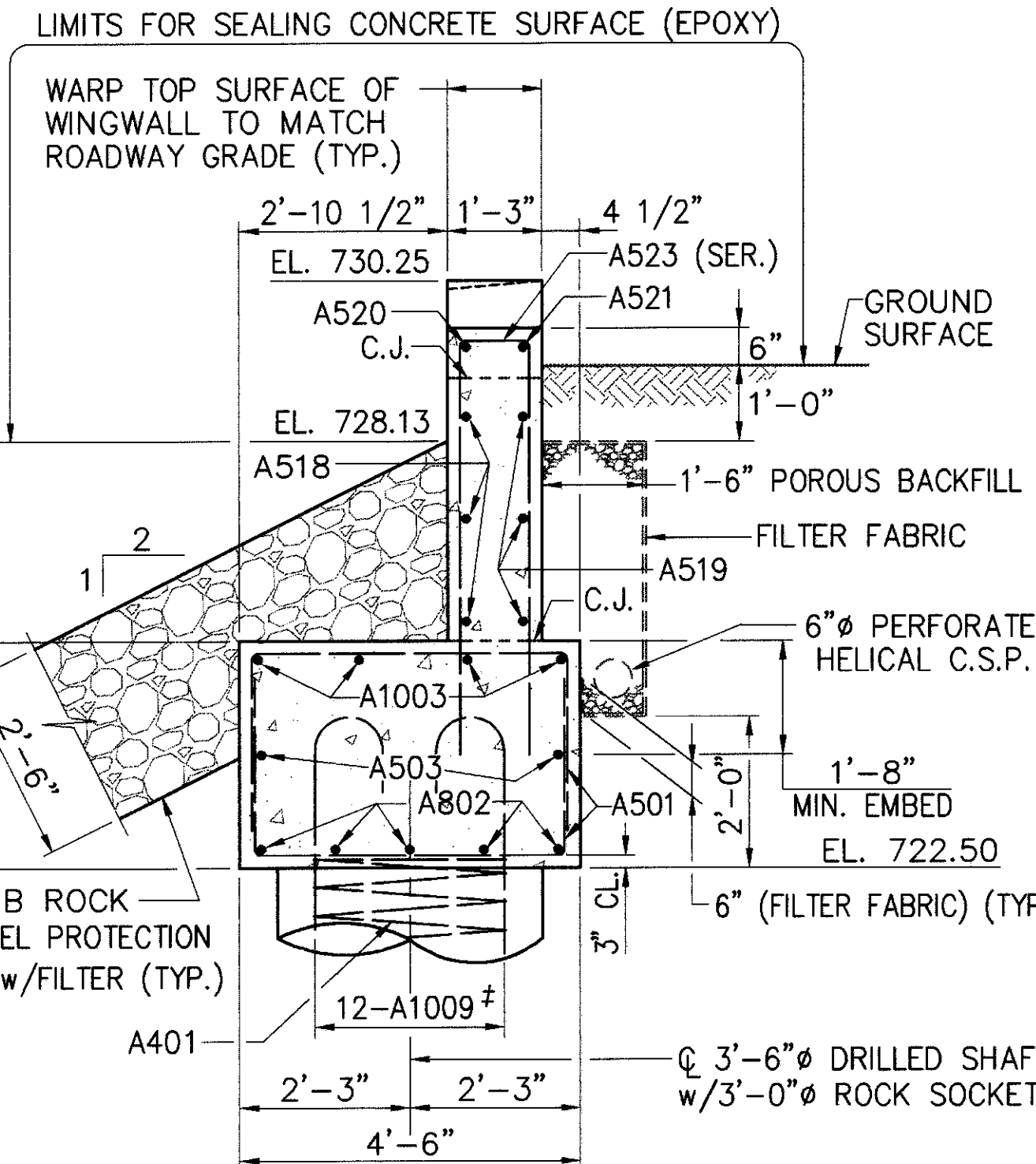
SECTION A-A



ELEVATION



6" C.S.P. OUTLET DETAIL



SECTION B-B

LEGEND

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE
W.P. = WORK POINT
C.J. = CONSTRUCTION JOINT
EA. = EACH

- NOTES**
- PREFORMED ELASTOMERIC JOINT SEAL, ITEM 705.11, (1 1/4" FOR 1/2" JOINT) DEPRESSED 1/8" BELOW ROADWAY, PLACED IN 1/2"x2 1/4" GROOVE.
 - FOR SECTIONS C-C, D-D & E-E SEE SHT. 8/14
 - TOP OF COLUMN SPIRAL REINFORCING TO BE EMBEDDED A MINIMUM OF 2" INTO THE ABUTMENT FOOTING.
- ** ORIENT PARALLEL TO END FACE.
ORIENT HOOKS RADIALLY TO CENTER OF DRILLED SHAFT.

ms consultants, inc.
YOUNGSTOWN, OHIO

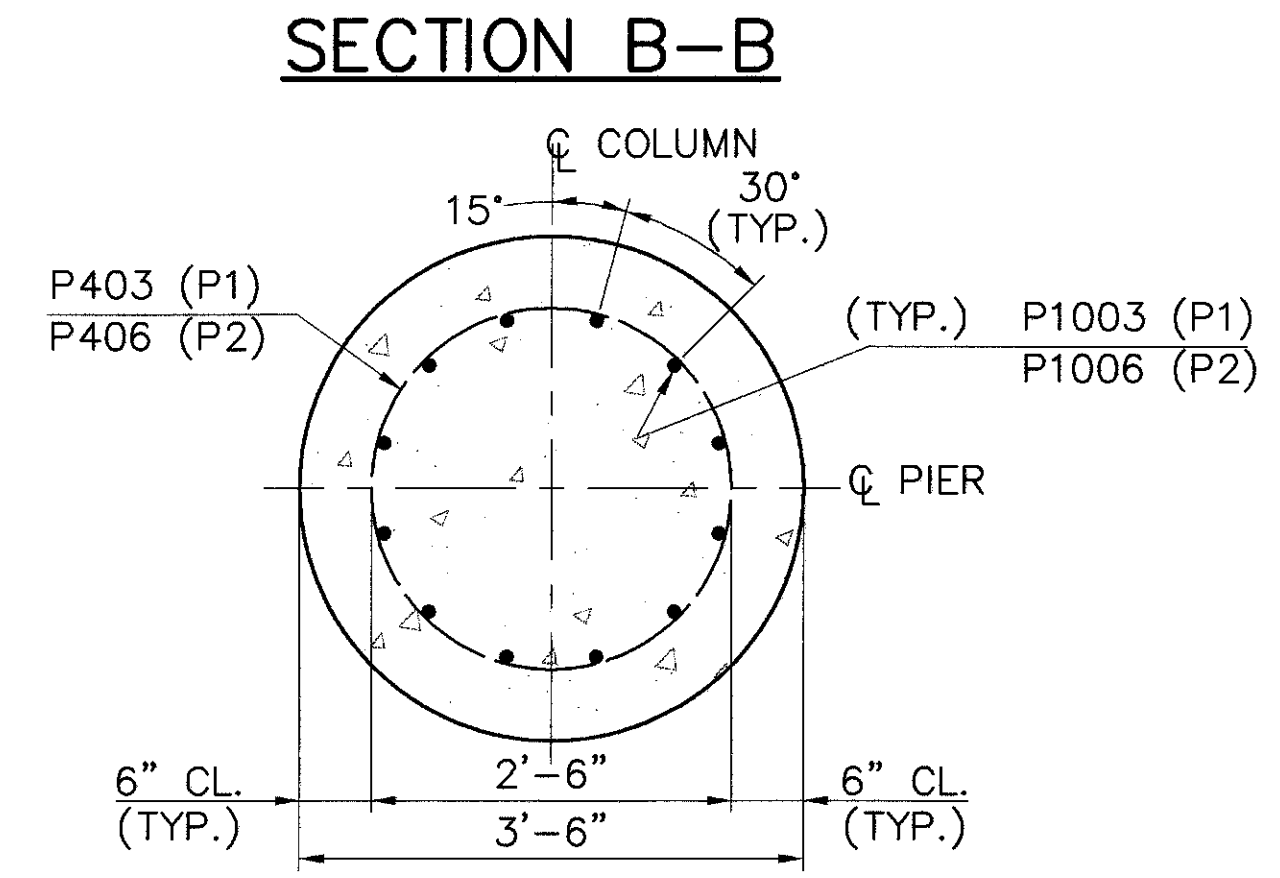
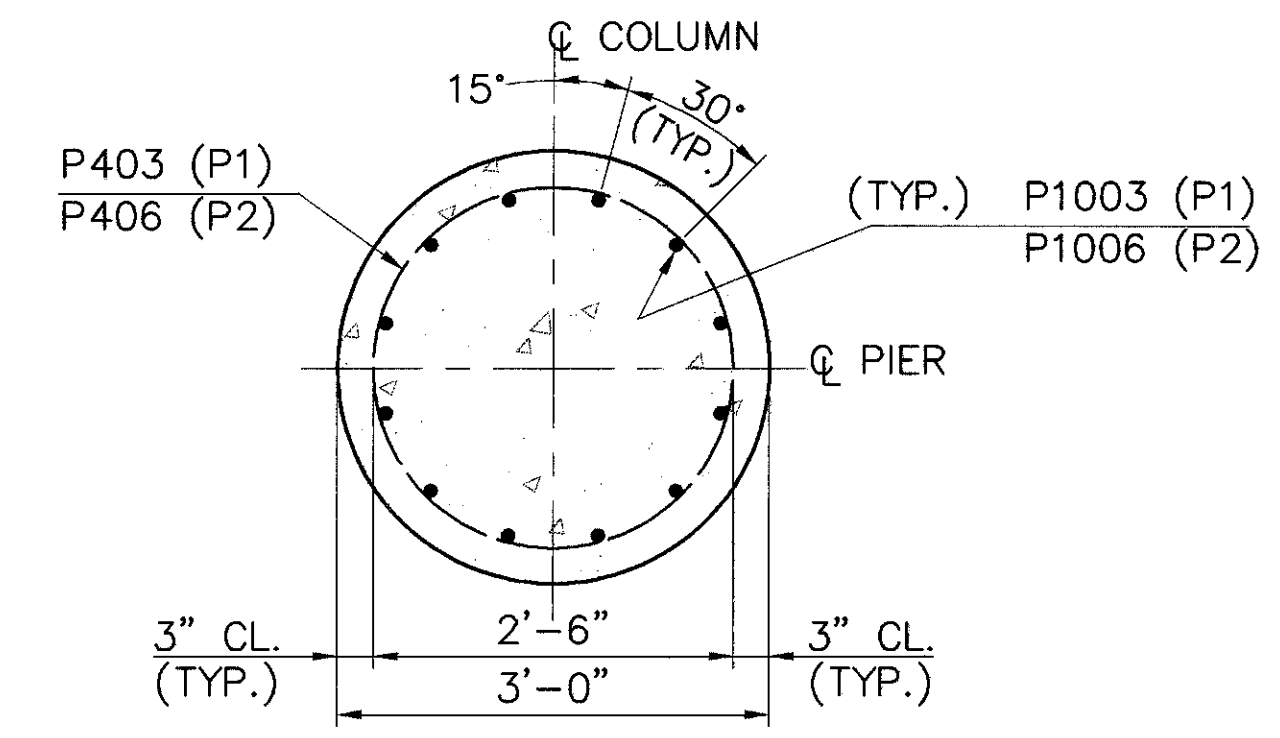
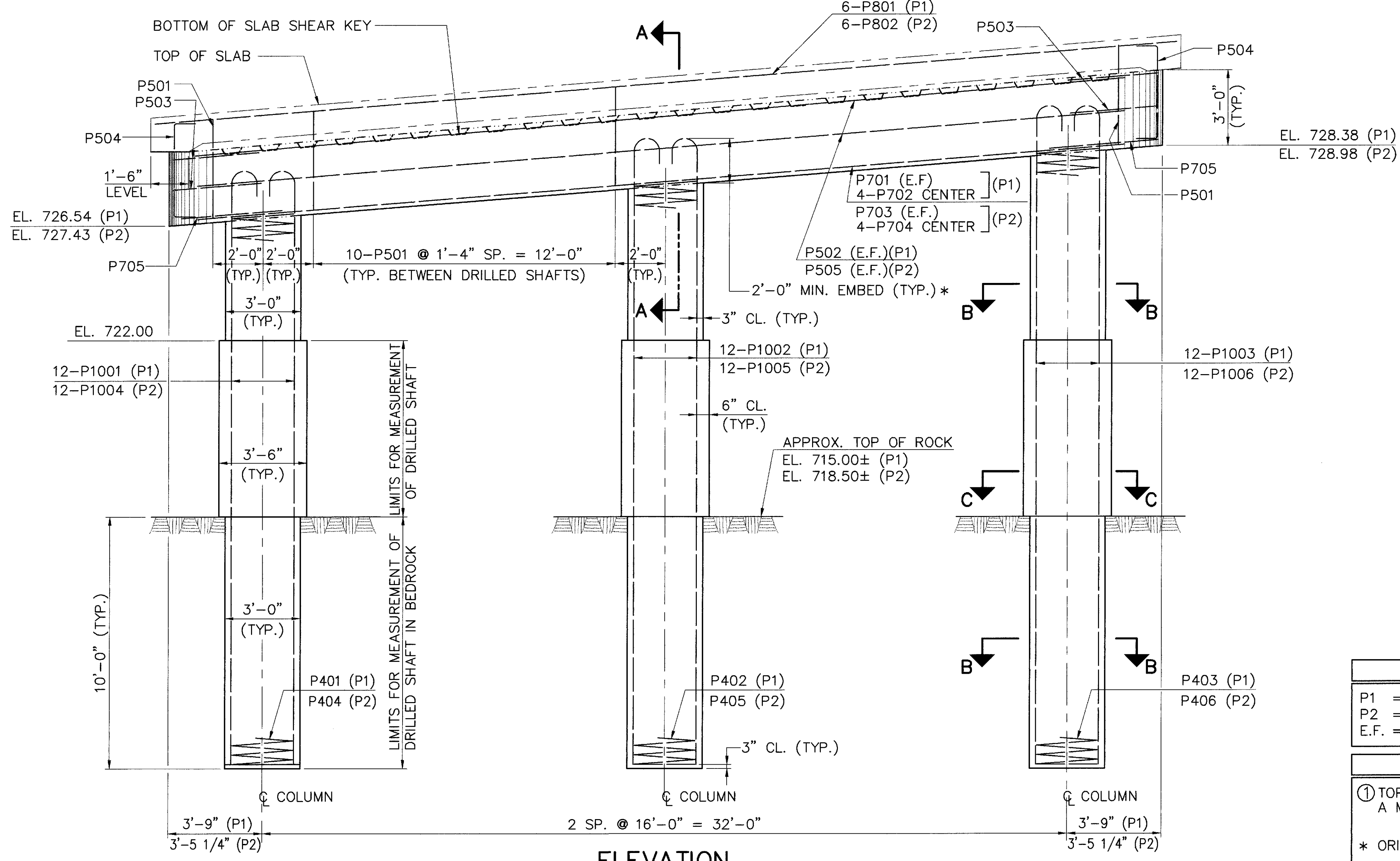
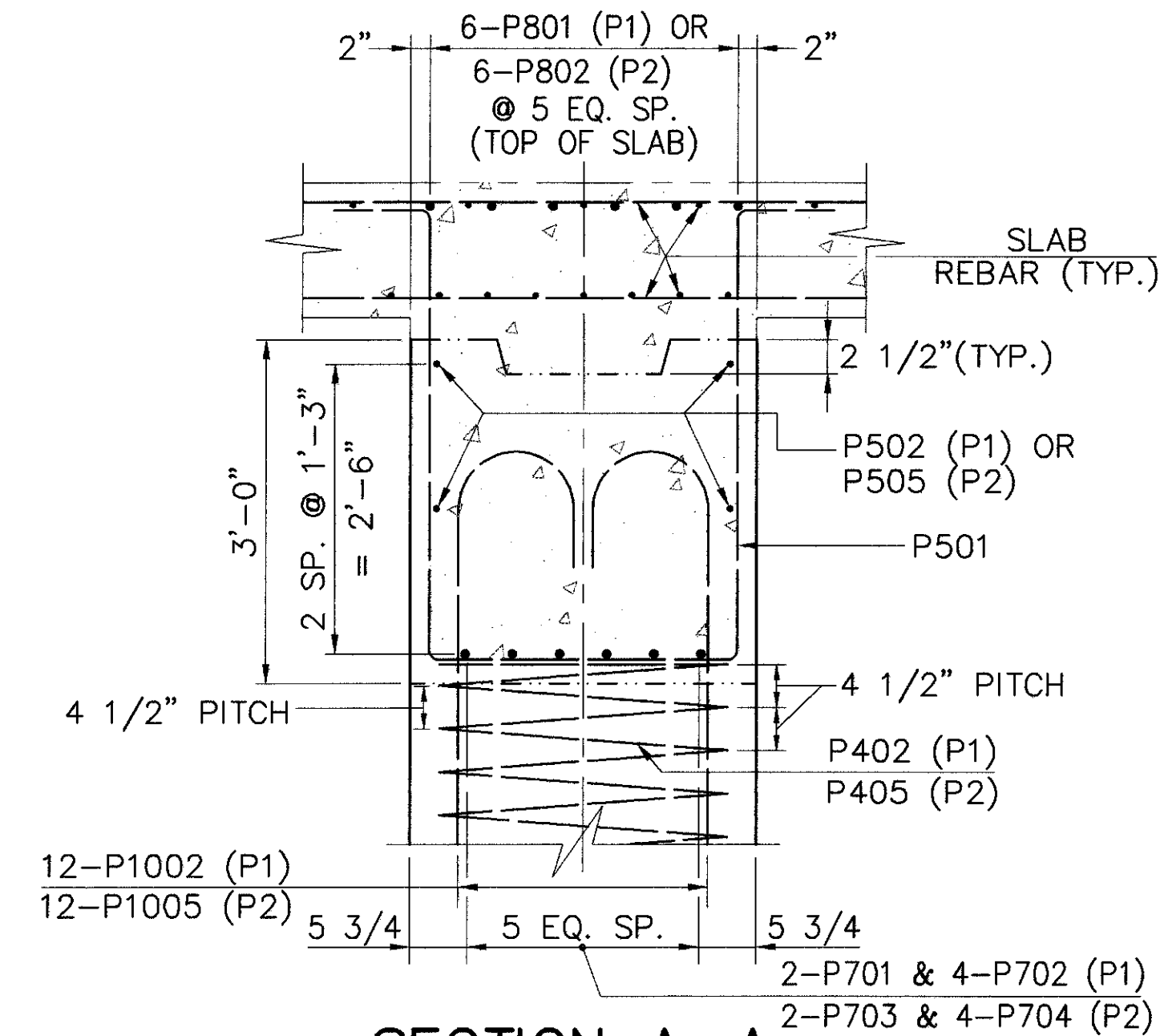
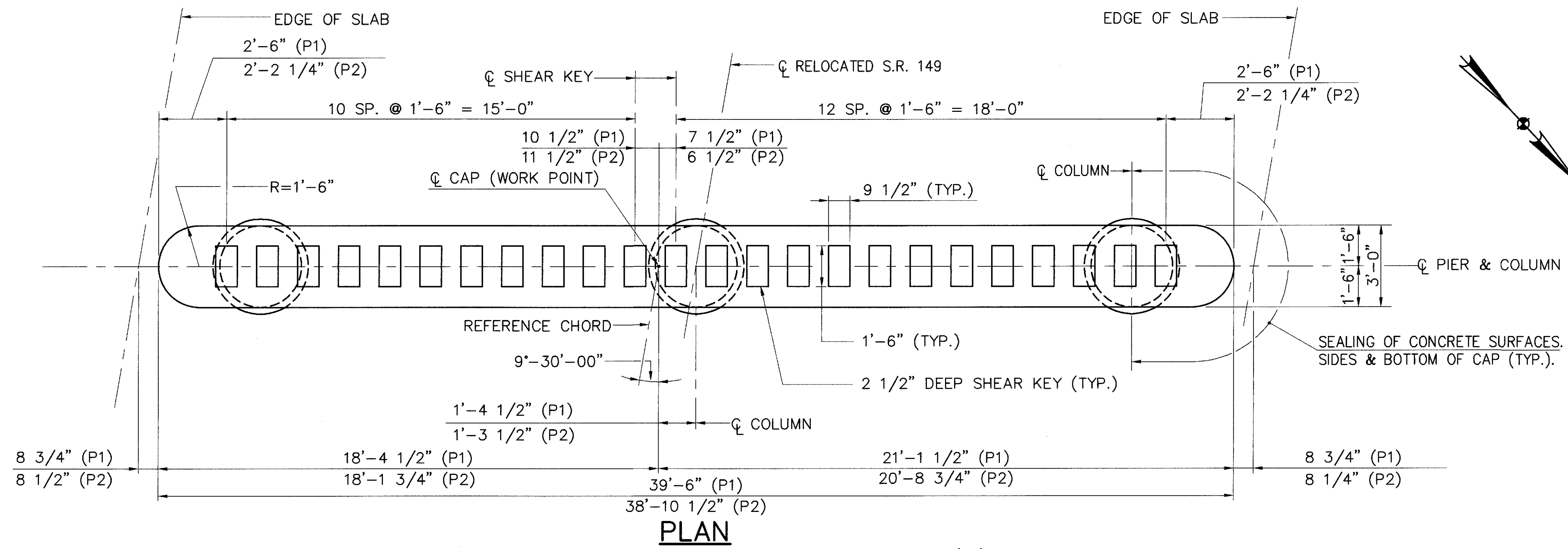
REAR ABUTMENT PLAN & ELEVATION
BRIDGE No. BEL-149-0502
OVER
LITTLE McMAHON CREEK

BELMONT COUNTY, OHIO STA 264+94.46
STA 265+54.12

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
G.K.	W.R.H.	G.K.	W.H.	D.S.
6-93	6-93	6-93	8-93	8-93

* L = 8'-11" (NO. 10)
L = 3'-11" (NO. 8)
L = 2'-9" (NO. 5)
SEE MECHANICAL CONNECTOR NOTE, SHT. 3/14

STR. # ERK C:\VIRAMING\BRIDGE\REARABUT 1-48 12:04 01/16/97



LEGEND

P1 = PIER 1
P2 = PIER 2
E.F. = EACH FACE

NOTES

① TOP OF COLUMN SPIRAL REINFORCING TO BE EMBEDDED A MINIMUM OF 2" INTO THE PIER CAP CONCRETE.

* ORIENT HOOKS RADIALLY TO CENTER OF DRILLED SHAFT

ms consultants, inc.
YOUNGSTOWN, OHIO

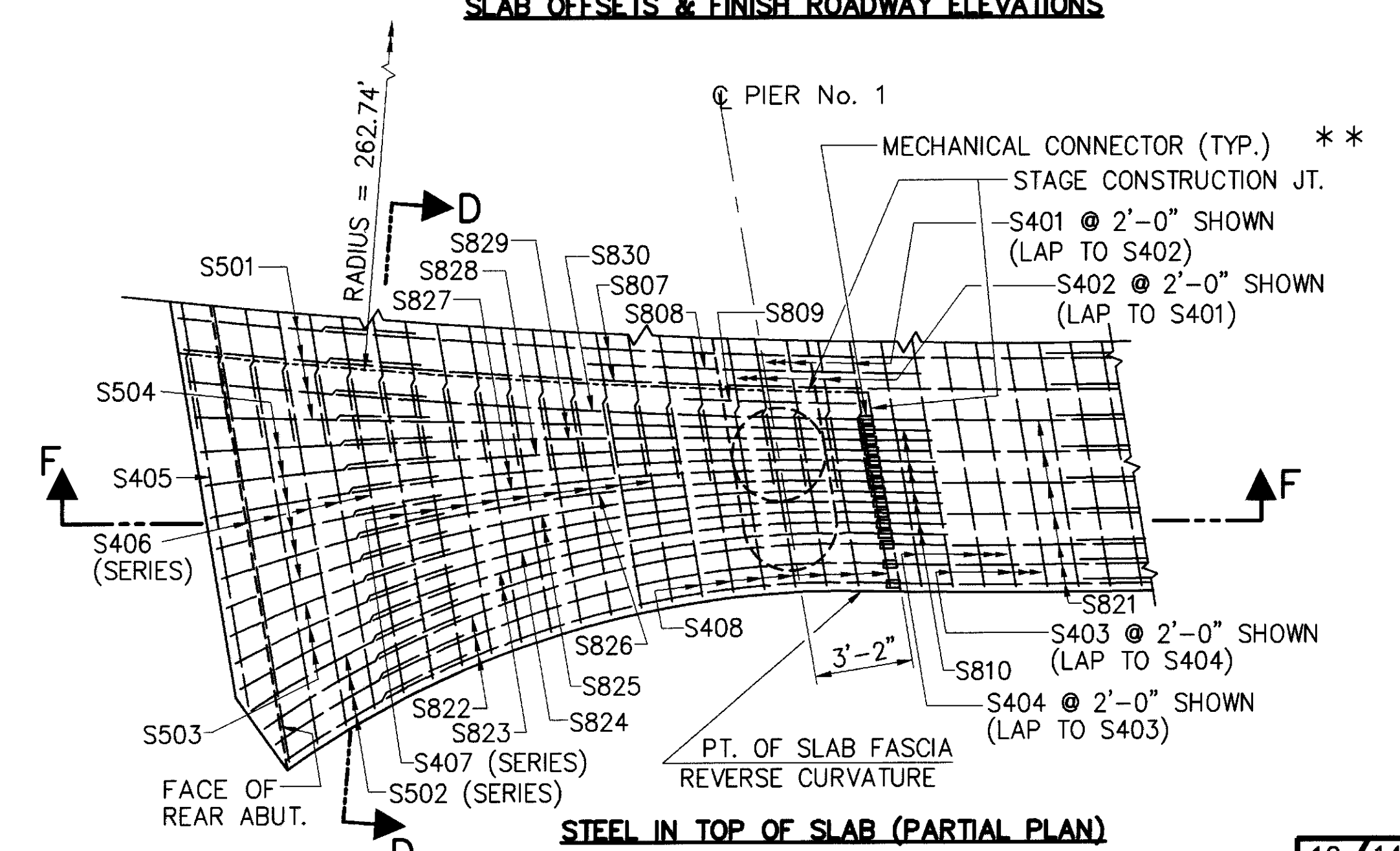
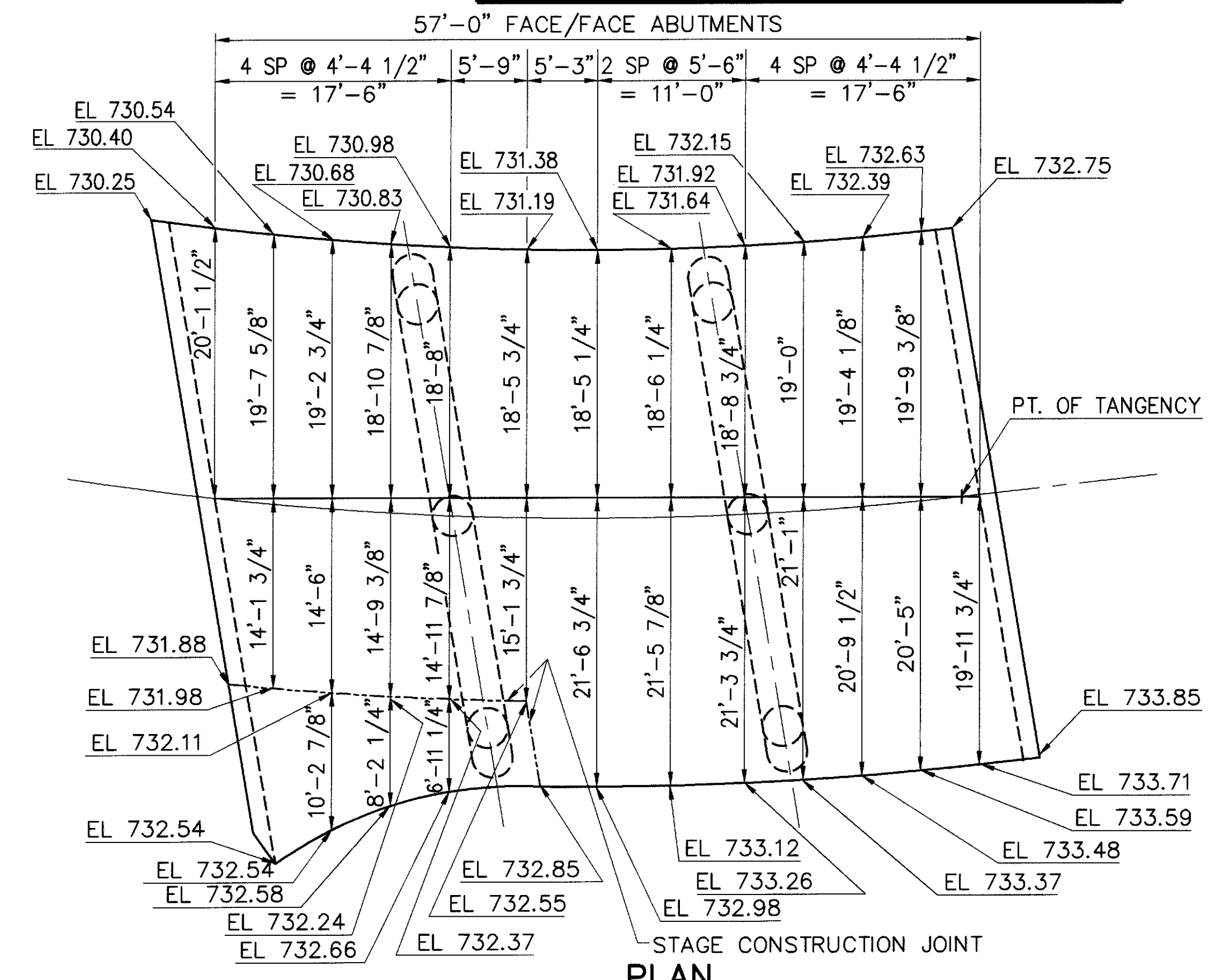
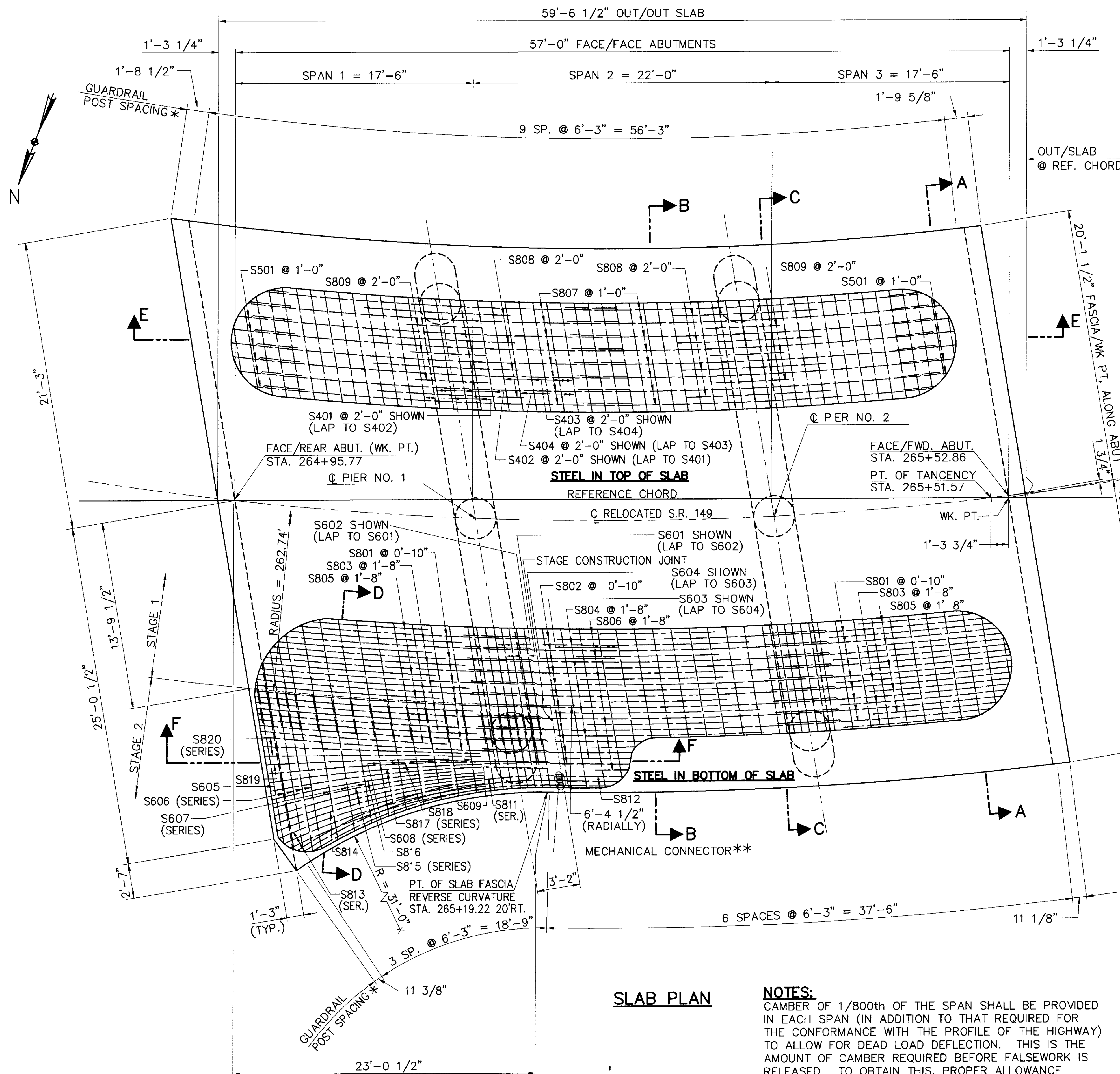
PIER DETAILS
BRIDGE No. BEL-149-0502
OVER
LITTLE McMAHON CREEK

BELMONT COUNTY, OHIO

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
G.K.	E.K.	G.K.	W.H.	D.S.
6-93	6-93	6-93	8-93	8-93

STA. 264+94.46
STA. 265+54.12

SHEET #2 E.K. C:\DRAWING\08042308\PIER 1-32 11:02 03/08/96



NOTES:
CAMBER OF 1/800th OF THE SPAN SHALL BE PROVIDED IN EACH SPAN (IN ADDITION TO THAT REQUIRED FOR THE CONFORMANCE WITH THE PROFILE OF THE HIGHWAY) TO ALLOW FOR DEAD LOAD DEFLECTION. THIS IS THE AMOUNT OF CAMBER REQUIRED BEFORE FALSEWORK IS RELEASED. TO OBTAIN THIS, PROPER ALLOWANCE SHALL BE MADE FOR THE DEFLECTION OF FALSEWORK MEMBERS.

* MEASURED ALONG SLAB FASCIA
** SEE MECHANICAL CONNECTOR NOTE SHEET 3/14

FOR SECTIONS A-A, B-B, C-C & D-D
SEE SHEET 11/14

FOR SECTIONS E-E & F-F SEE SHEET 12/14

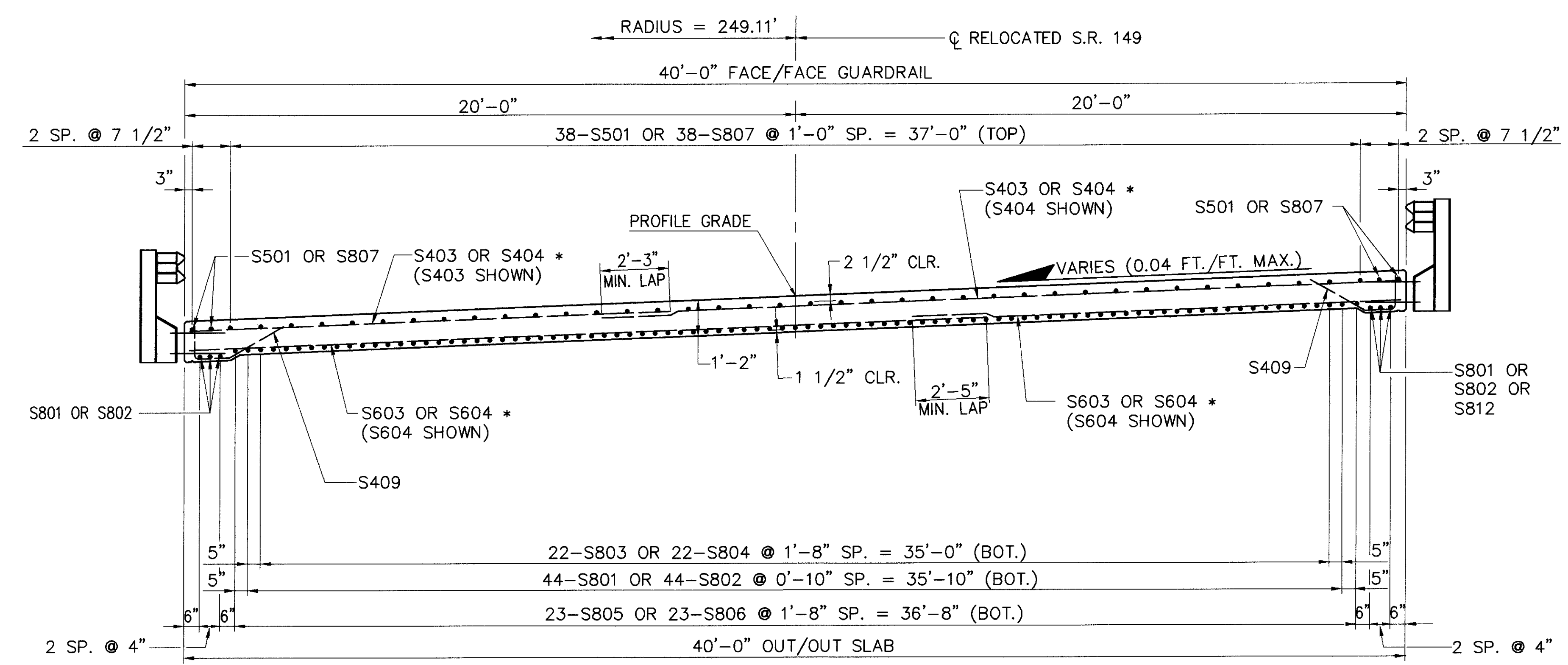
ms consultants, inc.
YOUNGSTOWN, OHIO

SLAB PLAN
BRIDGE No. BEL-149-0502
OVER
LITTLE McMAHON CREEK

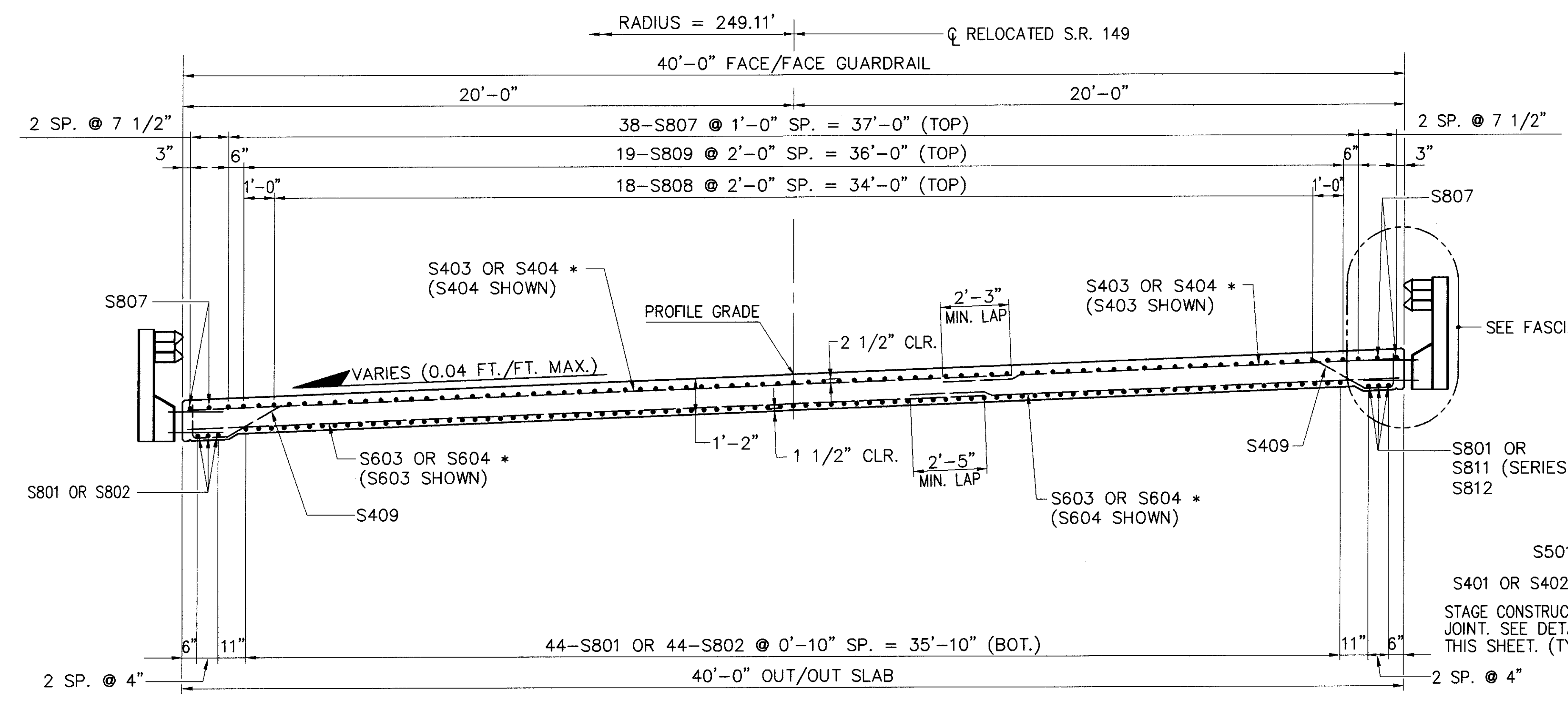
STA. 264+94.46
STA. 265+54.12

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
J.C.	W.R.H.	J.C.	W.H.	D.S.
5-93	5-93	5-93	8-93	8-93

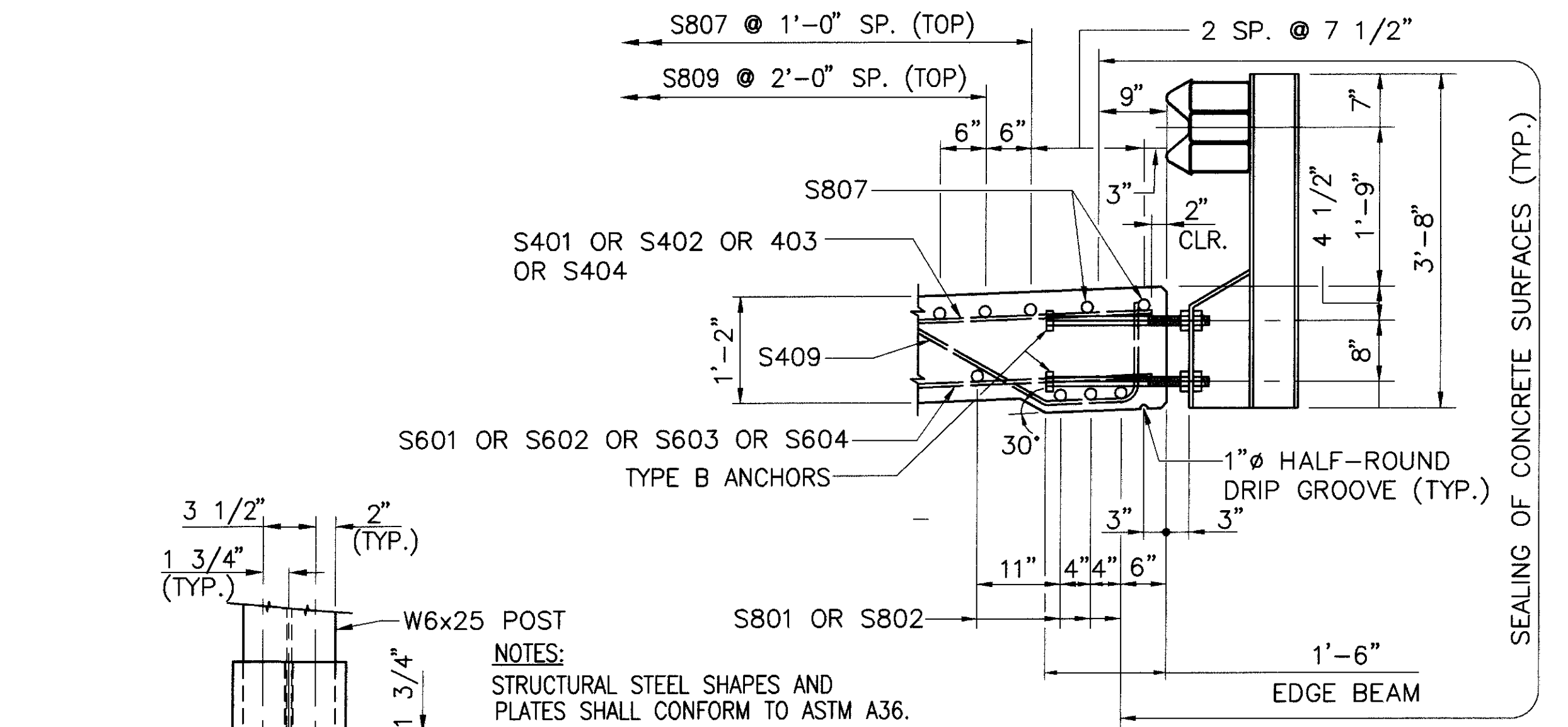
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RADIAL SECTION A-A & B-B (MIDSPAN)



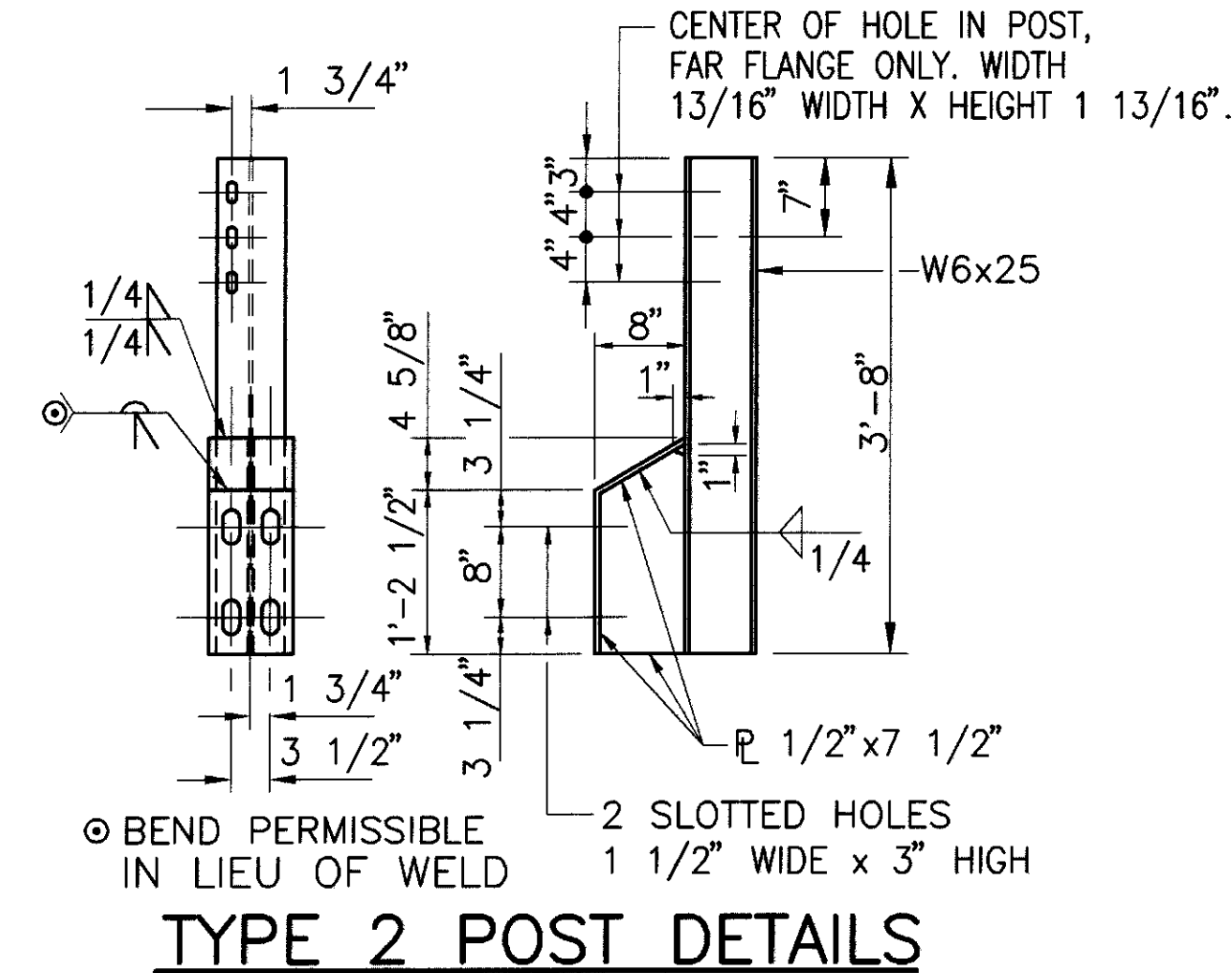
RADIAL SECTION C-C (NEAR PIER)



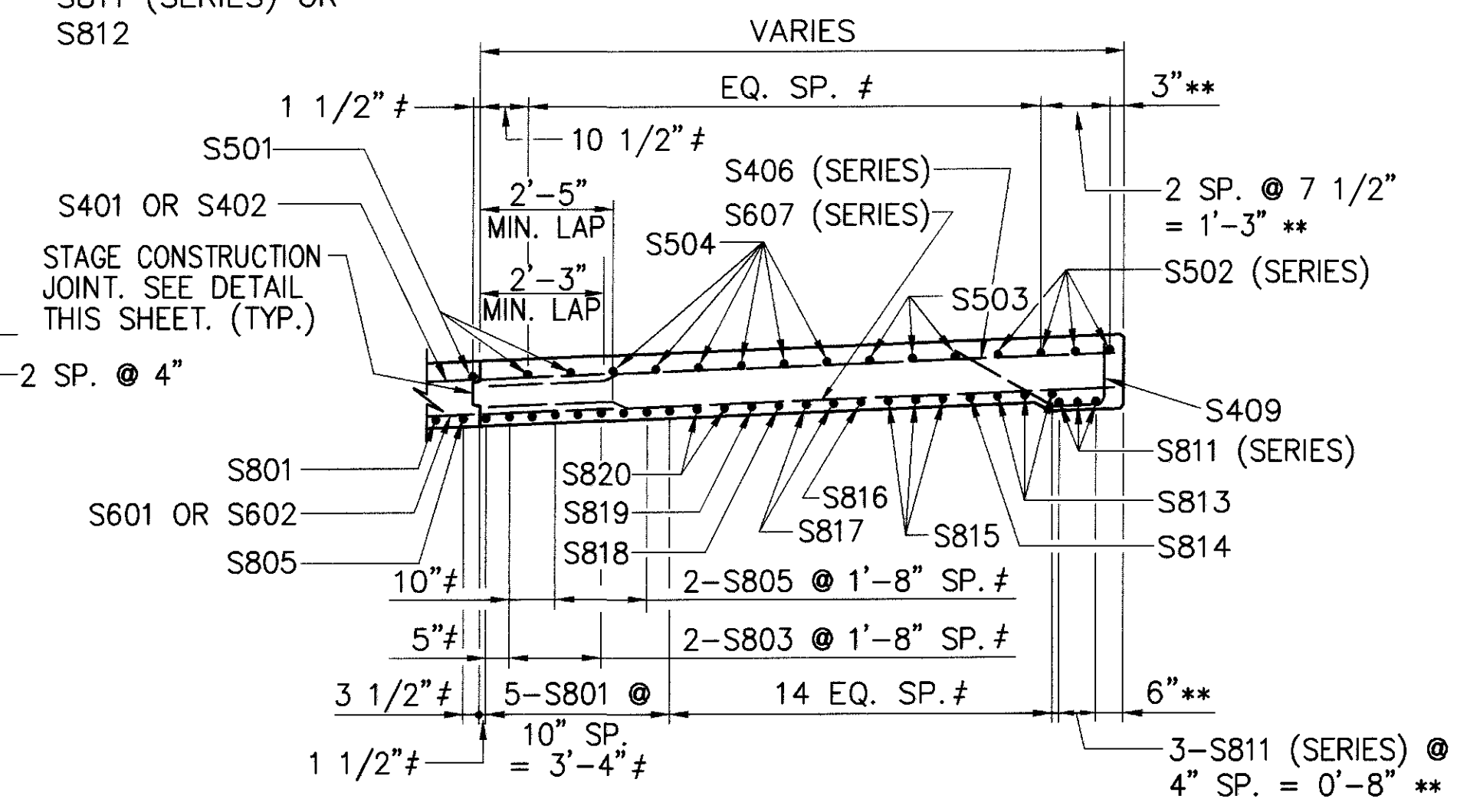
FASCIA DETAIL
(REFER TO TYPE 2 POST DETAILS THIS SHEET AND STD. DWG. DBR-2-73 FOR ANCHOR DETAILS)

GUARDRAIL POST MOUNTING PLATE DETAIL

NOTES
 * REINFORCEMENT SHOWN AS IF CROSS SECTION IS PARALLEL WITH SKEW
 ** MEASURED NORMAL TO SLAB FASCIA
 # ALONG ϕ ROADWAY RADIUS



TYPE 2 POST DETAILS



PARTIAL SECTION D-D

STAGE CONSTRUCTION JOINT DETAIL

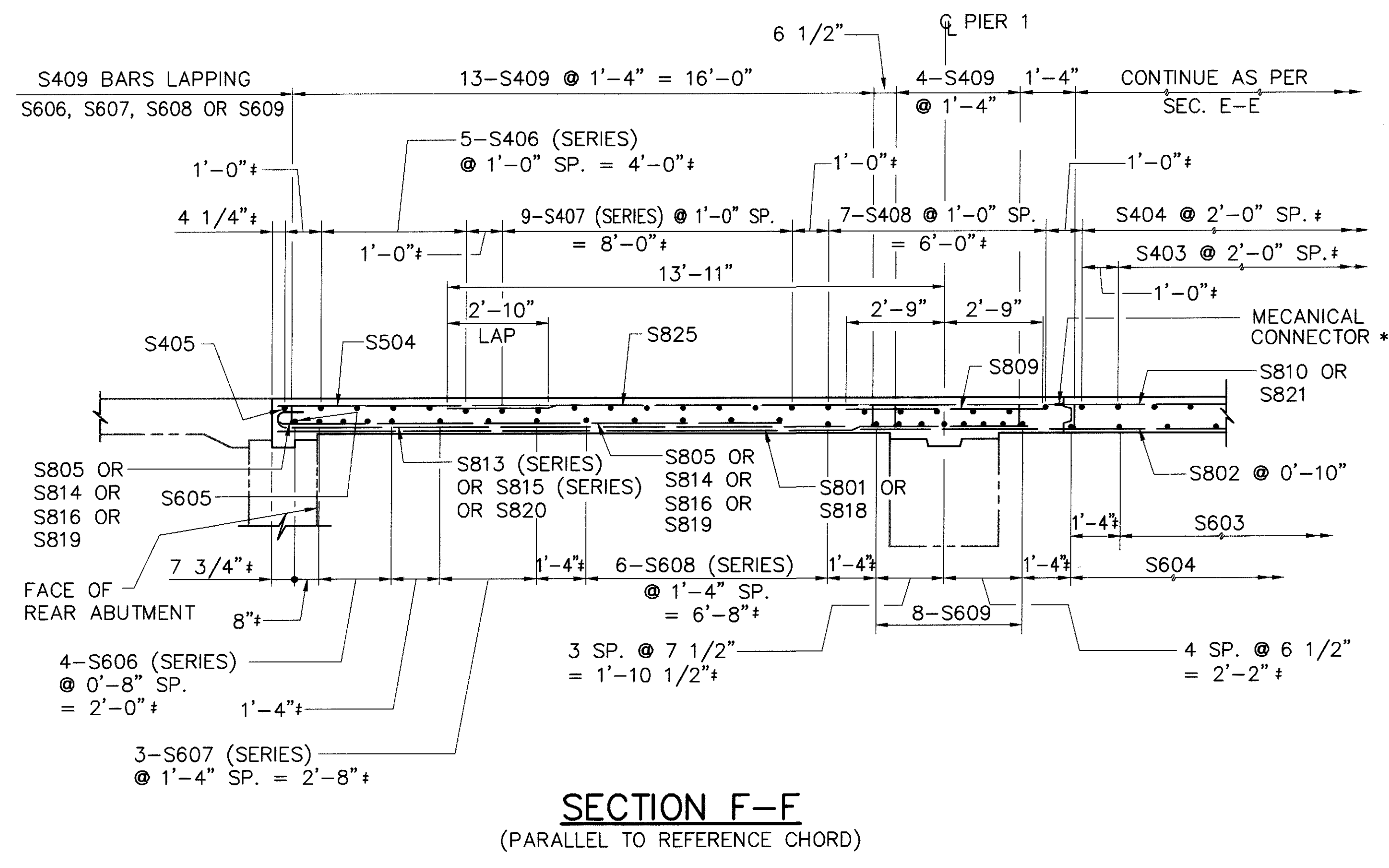
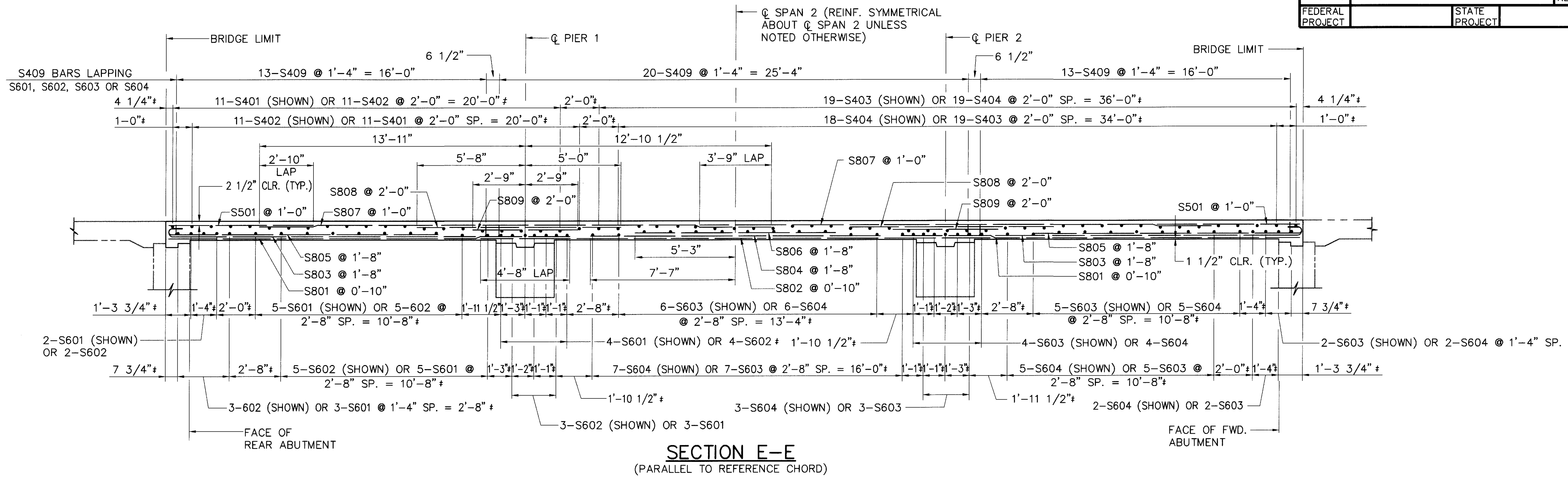
ms consultants, inc.
 YOUNGSTOWN, OHIO

TRANSVERSE SECTIONS
 BRIDGE No. BEL-149-0502
 OVER
 LITTLE McMAHON CREEK

BELMONT COUNTY, OHIO STA. 264+94.46
 STA. 265+54.12

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
G.K.	E.K.	G.K.	W.H.	D.S.
5-93	5-93	5-93	8-93	8-93

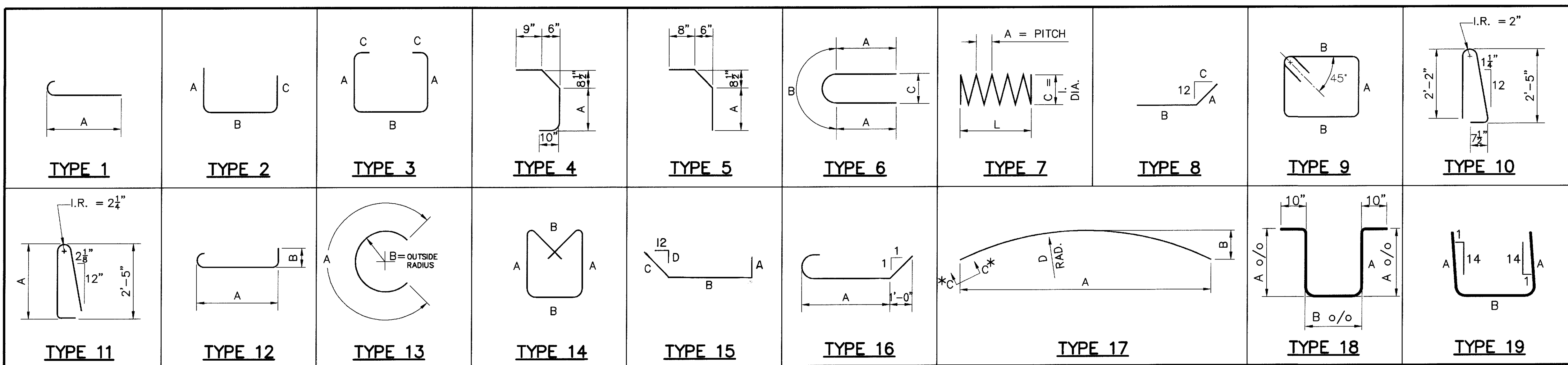
STA. #2 E.R.K. C:\DRAWING\08042308\TRANSV 1=32 12:12 07/16/97



† MEASURED NORMAL TO SKEW
* SEE MECHANICAL CONNECTOR NOTE SHT. 3/14

ms consultants, inc. YOUNGSTOWN, OHIO				
SLAB DETAILS BRIDGE No. BEL-149-0502 OVER LITTLE McMAHON CREEK				
BELMONT COUNTY, OHIO			STA 264+94.46 STA 255+54.12	
DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
G.K.	E.K.	G.K.	W.H.	D.S.
6-93	6-93	6-93	6-93	6-93

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NOTES:
 EPOXY COATING; All reinforcing steel bars are to be epoxy coated.
 BAR SIZE; The bar size is indicated in the bar mark. The first digit where three digits are used, and the first two digits where four are used, indicate the bar size number. For example: A506 is a No. 5 size bar and P1101 is a No. 11 size bar.

SPIRAL REINFORCING BARS; The "LENGTH" shown in the steel list for the spiral bars is the length of the spiral along the axis of the spiral. One and one-half closed-coil turns shall be provided at ends of each spiral unit. Four steel channel, tee or angle spacers, weighing approximately 0.80 lb per linear feet of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coils. The number of pounds of these spacers, based on 3.20 lbs. per linear foot, will be paid for as reinforcing steel and is included in the tabulated quantities of spiral bars.

REINFORCING STEEL SAMPLES: refer to cms sections 106.03, 700, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel, spliced in accordance with 509.08.

ABUTMENTS ABUTMENTS (CONT.) PIERS (CONT.)

ABUTMENTS										ABUTMENTS (CONT.)										PIERS (CONT.)										
MARK	NO.	LENGTH	TYPE	A	B	C	D	INC.	WEIGHT	MARK	NO.	LENGTH	TYPE	A	B	C	D	INC.	WEIGHT	MARK	NO.	LENGTH	TYPE	A	B	C	D	INC.	WEIGHT	
A1001	4	19'-1"	S						328	A524	2	35'-9"	S						75	P401	1	21'-8"	7	4 1/2"		2'-5"			**	
A1002	4	18'-6"	S						318	A525	2	20'-5"	S						43	P402	1	22'-5"	7	4 1/2"		2'-5"			**	
A1003	4	37'-6"	S						645	A526	6	17'-8"	S						111	P403	1	23'-2"	7	4 1/2"		2'-5"			**	
A1004	1 SET OF 3	6'-3" TO 6'-9"	S					3"	84	A527	6	24'-10"	S						155	P404	1	19'-0"	7	4 1/2"		2'-5"			**	
A1005	4	18'-9"	S						323	A528	1	11'-6"	2	5'-0 1/2"	1'-8"	5'-0 1/2"			12	P405	1	19'-8"	7	4 1/2"		2'-5"			**	
A1006	4	32'-3"	S						555	A529	1 SET OF 26	11'-9"	2	5'-2"	1'-8"	5'-2"		1/2"	347	P406	1	20'-3"	7	4 1/2"		2'-5"			**	
A1007	12	31'-2"	S						1,609	A530	1	13'-10"	2	6'-2 1/2"	1'-8"	6'-2 1/2"			43											
A1008	4	17'-8"	S						304	A531	3	7'-6"	S						23											
A1009	48	24'-2"	1	22'-9"					**	A532	2	5'-4"	S						11											
A1010	48	16'-2"	1	14'-9"					**	A533	2	4'-2"	S						9											
A1011	1	7'-6"	S						32	A534	2	5'-5"	8	2'-5"	3'-4"	24.0			11											
A801	5	19'-1"	S						255	A535	1 SET OF 3	11'-4"	2	5'-4"	0'-11"	5'-4"		8"	40											
A802	5	25'-6"	S						341	A536	2	14'-2"	2	6'-8"	0'-11"	6'-8"			30											
A803	62	5'-1"	16	2'-8 1/2"					841	A537	3	9'-11"	S						31											
A804	5	36'-3"	S						484	A538	3	7'-8"	S						24											
A805	5	20'-11"	S						279	A539	1	9'-5"	S						10											
A806	5	25'-6"	S						340	A540	1	7'-2"	S						7											
A701	1 SET OF 9	12'-7"	2	6'-0"	0'-11"	6'-0"		4 1/2"	287	A541	2	4'-5"	S						9											
A702	4	19'-0"	2	9'-2 1/2"	0'-11"	9'-2 1/2"			155	A542	2	8'-4"	8	2'-6"	5'-10"	24.0			17											
A703	3	17'-7"	2	8'-6"	0'-11"	8'-6"			108	A543	2	25'-1"	S						52											
A704	1 SET OF 6	12'-8"	2	6'-0 1/2"	0'-11"	6'-0 1/2"		5 1/2"	182	A401	4	20'-10"	7	4 1/2"		2'-5"			**											
										A402	4	12'-11"	7	4 1/2"		2'-5"			**											
																			TOTAL	11,275										

** DRILLED SHAFT REBAR INCLUDED WITH DRILLED SHAFT PAY ITEM

▲ Reinforcing bar utilizes a mechanical connector. Bar length for payment is measured to the construction joint. Extra bar length and/or bar end preparation may be necessary depending upon the type of mechanical connector furnished.

PIERS									
MARK	NO.	LENGTH	TYPE	A	B	C	D	INC.	WEIGHT
A501	168	8'-7"	2	2'-4"	4'-2"	2'-4"			1,504
A502	2	19'-1"	S						40
A503	2	24'-11"	S						52
A504	4	6'-3"	S						26
A505	4	7'-6"	S						31
A506	8	18'-9"	S						156
A507	8	26'-2"	S						218
A508	1	15'-6"	2	6'-11"	1'-11"	6'-11"			16
A509	1 SET OF 32	10'-9"	2	4'-8"	1'-8"	4'-8"		7/8"	434
A510	1	10'-10"	2	4'-8"	1'-9"	4'-8"			11
A511	3	13'-8"	S						43
A512	3	11'-2"	S						35
A513	1	12'-9"	S						13
A514	1	10'-2"	S						11
A515	1	9'-9"	S						10
A516	1	7'-3"	S						8
A517	2	11'-7"	8	2'-9"	8'-10"	31.0			24
A518	3	7'-0"	S						22
A519	3	4'-6"	S						14
A520	1	4'-10"	8	2'-1"	2'-9"	25.0			5
A521	1	4'-7"	8	2'-1"	2'-6"	25.0			5
A522	3	13'-2"	2	6'-3"	0'-11"	6'-3"			41
A523	1 SET OF 2	11'-10"	2	5'-7"	0'-11"	5'-7"		7"	26

REPLACEMENT BARS										
MARK	NO.	LENGTH	TYPE	A	B	C	D	INC.	WEIGHT	
P801	6	40'-7"	S						650	
P802	6	40'-0"	S						641	
P701	2	36'-6"	S						149	
P702	4	37'-8"	S						308	
P703	2	35'-11"	S						147	
P704	4	37'-1"	S						303	
P705	4	9'-3"	6	3'-0"	3'-3"	2'-0"			76	
P501	44	11'-6"	18	3'-10"	2'-8"				528	
P502	4	36'-6"	S						152	
P503	8	8'-3"	6	2'-2"	3'-11"	2'-6"			69	
P504	4	5'-1"	2	10"	3'-8"	10"			21	
P505	4	35'-11"	S						150	
									TOTAL	

13/14

ms consultants, inc.
 YOUNGSTOWN, OHIO

REINFORCING STEEL LIST
 BRIDGE No. BEL-149-0502
 OVER
 LITTLE McMAHON CREEK
 BELMONT COUNTY, OHIO STA. 264+94.46
 STA. 265+54.12

DESIGNED	DRAWN	CALC.	CHECKED	REVIEWED
G.K.	E.K.	G.K.	W.H.	D.S.
6-93	6-93	6-93	6-93	6-93

STR. # ERK C:\DRAWING\BRIDGE\REBAR 1=1 12:17 01/16/97

CENTERLINE SURVEY PLAT

BEL 149-4.99

BELMONT COUNTY, PULTNEY TOWNSHIP

S.E. QTR. SECTION 13, T-6, R-3

CALC. BY <u>L.R.B.</u> DATE <u>2-22</u> CHKO BY <u>R.D.M.</u> DATE <u>2-22</u> FEDERAL PROJECT <u>BRF-94D(1)</u>	BELMONT COUNTY BEL 149-4.99	OHIO FHWA REGION 5 11032(0)	39 42 1 4
--	--------------------------------	-----------------------------------	--------------------

BASIS OF BEARING
 N 57° 52' 00" W TAKEN FROM EXIST. R/W OF A 12' ALLEY AS SHOWN ON THE UNRECORDED PLAT OF NORTH NEFF 1903 AND THE EXTENSION OF SCHOOL ST. ROAD RECORD VOL. 12, AUGUST 1960

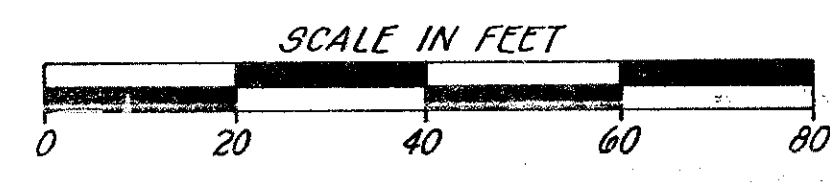
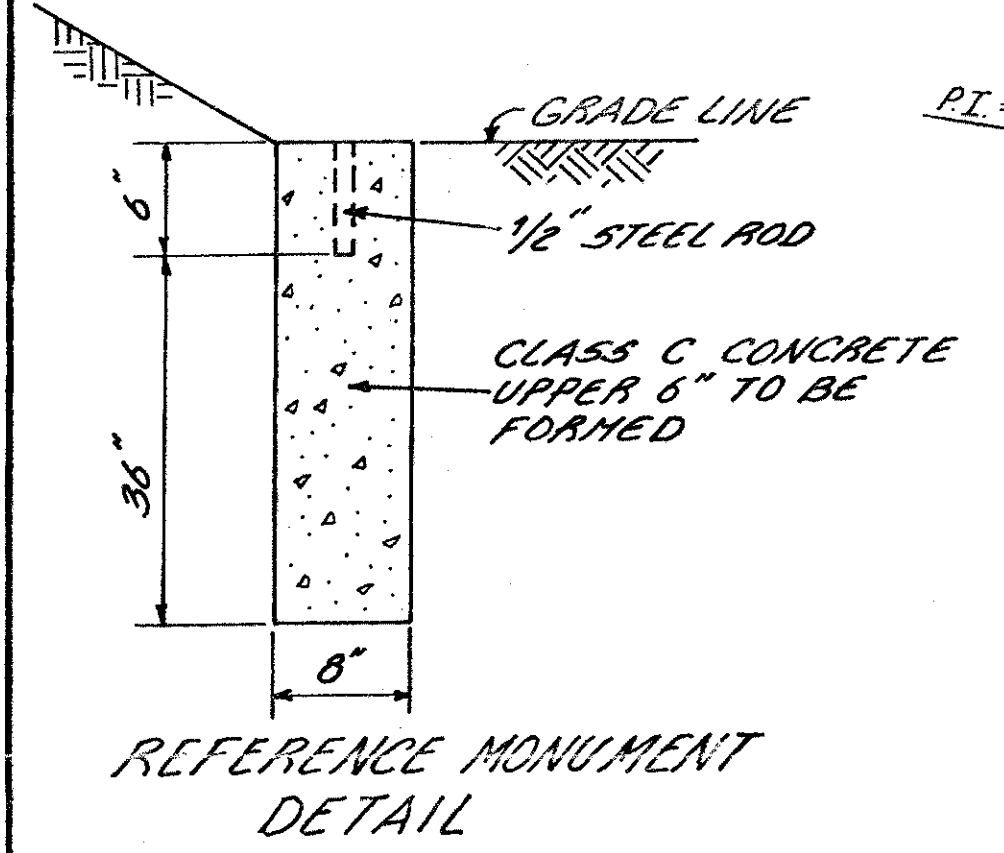
CENTERLINE REFERENCE MONUMENTS WILL BE SET UNDER THE DIRECTION OF A REGISTERED SURVEYOR AT THE FOLLOWING LOCATIONS:

- RELOCATED S.R. 149
 PC STA. 263+55.43 14.00' LT. & RT.
 PT STA. 265+51.57 40.00' LT. & RT.
 STA. 267+75.00 20.00' LT. & RT.
- RELOCATED SCHOOL ST.
 PC STA. 18+06.78 25.00' LT. & RT.
 STA. 17+00.00 20.00' LT. & RT.
- RELOCATED C.R. 4
 STA. 10+50.00 18.00' LT. & RT.
 PC STA. 11+10.04 14.00' LT. & RT.

MONUMENT SYMBOLS
 ● REFERENCE MONUMENTS

CURVE DATA

- ① S.R. 149
 PI = STA 264+58.90
 Δ = 45° 06' 47" LT.
 D = 23° 00' 00"
 R = 249.11'
 T = 103.47'
 L = 196.14'
 E = 20.63'
- ② RELOC. SCHOOL ST.
 PI = STA. 18+84.84
 Δ = 75° 56' 53" LT.
 D = 57° 17' 45"
 R = 100.00'
 T = 78.06'
 L = 132.55'
 E = 26.86'
- ③ RELOC. C.R. 4
 PI = STA 11+30.02
 Δ = 02° 51' 45" LT.
 D = 07° 09' 43"
 R = 800.00'
 T = 19.99'
 L = 39.96'
 E = 0.25'



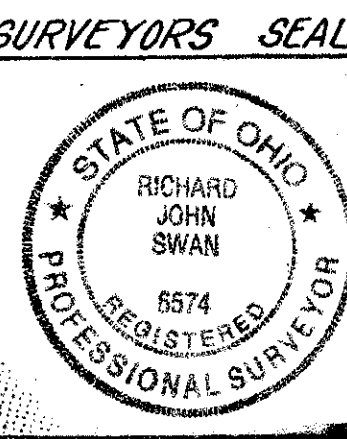
DETAIL "A"

CERTIFICATE OF APPROVAL

APPROVED _____ DATE _____
 BELMONT COUNTY ENGINEER

NO. _____
 RECEIVED FOR RECORD _____, 19____
 TIME RECEIVED _____ O'CLOCK _____ M
 RECORDED _____, 19____
 PLAT BOOK _____ PAGE _____
 BELMONT COUNTY RECORDER OF PLATS
 FEE _____ COUNTY RECORDER

I HEREBY CERTIFY THAT THIS PLAT IS A DELINEATION OF A SURVEY MADE FOR THE DEPARTMENT OF TRANSPORTATION, STATE OF OHIO
 DATE 3/3/96
 RICHARD JOHN SWAN
 REGISTERED SURVEYOR # 6574



PARCEL NO.	NAME
1	MITCHELL E. BARNES & PAMELA S. BARNES
2	CSX TRANSPORTATION, INC., A VIRGINIA CORPORATION
3	MITCHELL E. BARNES & PAMELA S. BARNES
4	LONNIE OTTO
5	LONNIE OTTO
6	CHARLES HOWARD MEHL AND CAROLYN SUE MEHL
7	ROSE MARIE MELLOTT, SINGLE AND NATHAN MARK RUHLMAN, SINGLE
8	LARRY L. TAYLOR AND TAMARA R. TAYLOR
9	WILLIAM J. SCHMITT AND MARIE K. SCHMITT
10	BOARD OF COUNTY COMMISSIONERS OF BELMONT COUNTY, OHIO
11	JAMES E. USENICK AND ROSEANN USENICK
12	LAWRENCE R. McCOOL AND MARY A. McCOOL

PROPERTY MAP BEL-149-4.99

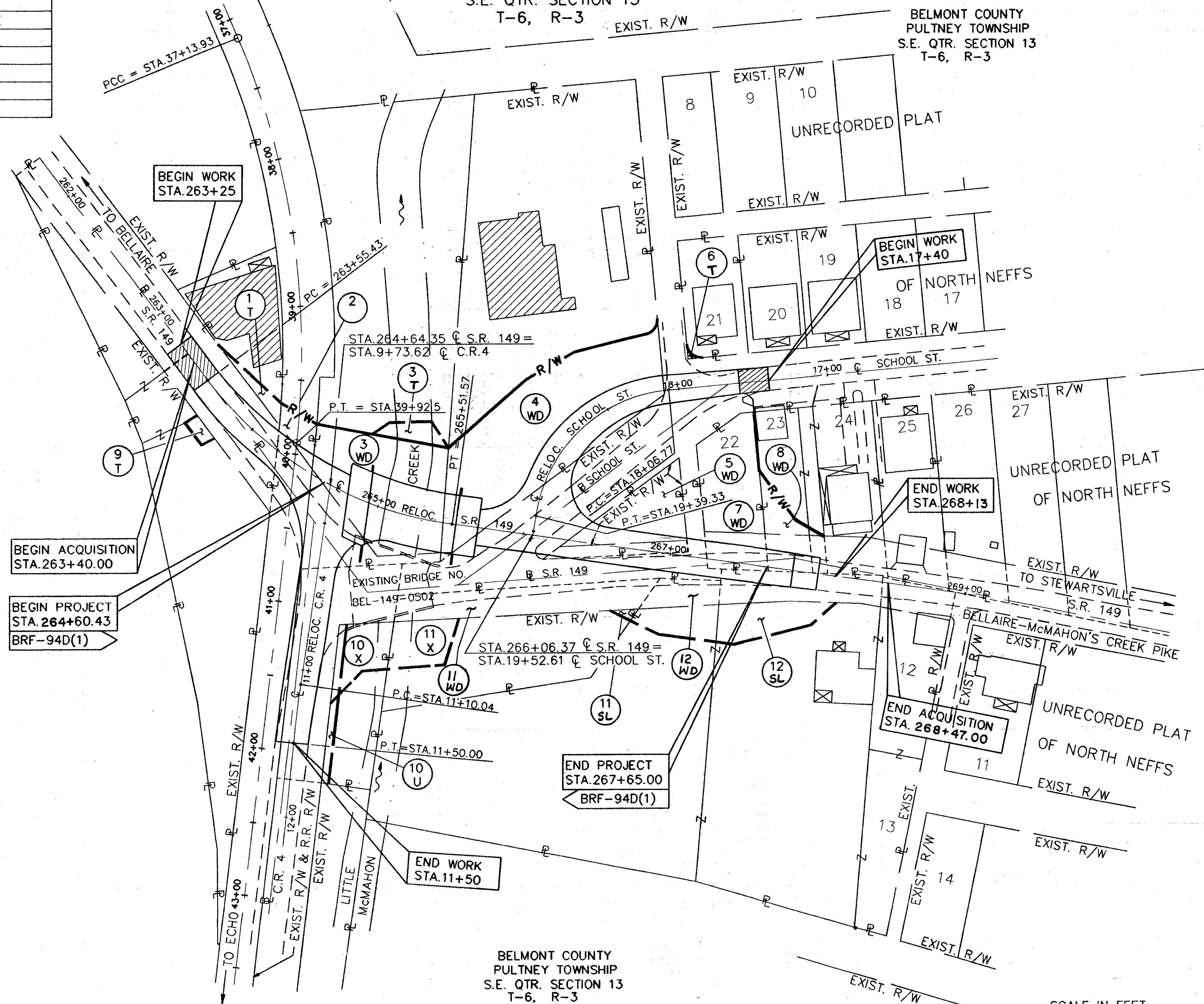
BELMONT COUNTY
PULTNEY TOWNSHIP
UNINCORPORATED VILLAGE OF NEFFS
S.E. QTR. SECTION 13
T-6, R-3

CALC BY: JRB DATE: 5-95	BELMONT COUNTY	OHIO	40
CHKD BY: RDW DATE: 5-95	BEL-149-4.99	FHWA REGION 5	42
FEDERAL PROJECT	BRF-94D(1)	STATE PROJECT	11032(0)

40
42
2
4

STRUCTURES KEY

-  RESIDENTIAL BUILDING
-  COMMERCIAL BUILDING

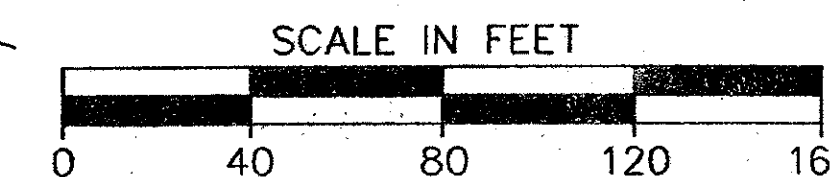


NOTE:
THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 O.R.C.

AFFECTED UTILITIES

- | | |
|---|---|
| P PUBLIC PROJECTS COORDINATOR
AEP OHIO POWER
1 RIVERSIDE PLAZA-METAL FORGE
COLUMBUS, OHIO 43215-2373
PH 614-223-1579 | G COLUMBIA GAS OF OHIO
216 HIGHLAND AVE.
CAMBRIDGE, OHIO 43725
PH 614-432-8226 |
| T NETWORK SERVICES-AMERITECH
150 EAST GAY STREET
ROOM 6C
COLUMBUS, OHIO 43215
PH 614-223-5241 | S BELMONT COUNTY SANITARY SEWER DISTRICT
P.O. BOX 457
ST. CLAIRSVILLE, OHIO 43950
PH 614-695-3144 |
| TV TCI
908 NATIONAL ROAD
P.O. BOX 469
BRIDGEPORT, OHIO 43912
PH 614-633-2464 | BTV BELLAIRE T.V. CABLE
64421 HILLTOP AVE.
C.R. 214
BELLAIRE, OHIO 43906
PH 614-676-6377 |

BELMONT COUNTY
PULTNEY TOWNSHIP
S.E. QTR. SECTION 13
T-6, R-3



REV	DATE	DESCRIPTION	DATE OF COMPLETION
Dist #1	7-16-96	Revised Parcel Identifiers to agree with Summary of R/W and R/W Detail Sheets for Parcels 3, 6, 11 & 12	
Dist #2	6-24-96	Par. 2 - Added "A Virginia Corporation" to Owner's Name	
Dist #3	6-20-96	Revised Parcel B-WD	
	4/17/96		

PROPERTY MAP

TOTAL NUMBER OF _____
 12 OWNERSHIPS
 2 TOTAL TAKES
 0 OWNERSHIPS WITH STRUCTURES INVOLVED
 0 OWNERSHIPS WITH "P" ITEMS

SUMMARY OF ADDITIONAL RIGHT OF WAY

PID NO. 5364

CALC. BY: JRB DATE: 5-95	BELMONT COUNTY		OHIO
CHKD. BY: RDW DATE: 5-95	BEL-149-4.99		FHWA REGION 5
FEDERAL PROJECT	BRF-94D(1)	STATE PROJECT	11032(0)

41
42
3
4

PARCEL	OWNER	SHEET NO.	PERM. PCL. NO.	OWNERS RECORD		AUDITOR AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUC-TURE	NET RESIDUE		TYPE FUND	REMARKS AND PERSONALTY	AS ACQUIRED			
				BOOK	PAGE							LEFT	RIGHT			BOOK	PAGE		
1-T	MITCHELL E. BARNES & PAMELA S. BARNES	4 & 4A	26-01922	699	818	0.1558	---	0.011	---	0.011	---	0.1558	---	STATE	TRACT I RECONSTRUCT DRIVE (0.058 AC. EXCEPTED FOR SR149 R/W)				
2	CSX TRANSPORTATION, INC., A VIRGINIA CORPORATION, FKA THE BALTIMORE AND OHIO RAILROAD COMPANY, FKA BELLAIRE AND ST. CLAIRSVILLE RAILWAY COMPANY	4 & 4A	26-90027.000	147	15	UNKNOWN	UNKNOWN	0.131	0.033	0.098	---	UNKNOWN	UNKNOWN	STATE					
				166	465	UNKNOWN	UNKNOWN	---	---	---	---	---	UNKNOWN	UNKNOWN	STATE				
				201	27	---	---	---	---	---	---	---	---	---	---	STATE	MERGER		
3WD	MITCHELL E. BARNES & PAMELA S. BARNES	4 & 4A	26-00021	699	818	0.732	0.049	0.206	0.049	0.157	---	0.526	---	STATE	TRACT II				
3-T		4 & 4A						0.010	---	0.010	---	---	---	STATE	REGRADE CHANNEL				
4WD	LONNIE OTTO	4 & 4A	26-01486	703	761	0.8208	0.001	0.246	0.001	0.245	---	0.5748	---	STATE					
5WD	LONNIE OTTO	4 & 4A	26-01486	703	761	0.069	0.016	0.069	0.016	0.053	---	---	---	STATE	TOTAL TAKE				
6T	CHARLES HOWARD MEHL AND CAROLYN SUE MEHL	4 & 4A	26-00802	512	722	0.073	---	0.001	---	0.001	---	0.073	---	STATE	SUB LOT 21 UNRECORDED PLAT NORTH NEFFS WORK AREA				
7WD	ROSE MARIE MELLOTT, SINGLE AND NATHAN MARK RUHLAND, SINGLE	4 & 4A	26-01172	660	476	0.0899	0.023	0.0899	0.023	0.0669	---	---	---	STATE	TOTAL TAKE SUB LOT 22 UNRECORDED PLAT NORTH NEFFS				
8WD	LARRY L. TAYLOR AND TAMARA R. TAYLOR	4 & 4A	26-00817	669	754	0.075	0.017	0.033	0.017	0.016	---	0.042	---	STATE	THIRD TRACT PT. SUBLOT 23 UNRECORDED PLAT NORTH NEFFS				
							0.025	0.006	0.007	0.006	0.001	---	0.018	---	STATE	SECOND TRACT PT. SUBLOT 23 UNRECORDED PLAT NORTH NEFFS			
							0.106	0.023	0.023	0.023	---	---	---	0.083	---	STATE	FIRST TRACT SUBLOT 24 UNRECORDED PLAT NORTH NEFFS		
							TOTAL		0.206	0.046	0.063	0.046	0.017	---	0.143	---	STATE		
9-T	WILLIAM J. SCHMITT AND MARIE K. SCHMITT	4 & 4A	26-00015	670	187	0.048	0.018	0.004	---	0.004	---	---	0.030	STATE	TRACT II REGRADE AREA				
							0.123	0.076	---	---	---	---	0.047	STATE	TRACT III				
							0.297	0.031	---	---	---	---	0.266	STATE	TRACT I				
							TOTAL		0.468	0.125	---	---	---	---	0.343	STATE			
10-X	BOARD OF COUNTY COMMISSIONERS OF BELMONT COUNTY, OHIO	4 & 4A	26-03723.000	463	435	0.309	0.133	0.036	---	0.036	---	0.176	STATE	REBUILD AND MAINTAIN CHANNEL 0.080 AC. WITHIN R.R.					
10-U		4 & 4A						0.012	---	0.012	---	---	---	---	(ACQUIRE IN NAME OF BELMONT COUNTY SANITARY SEWER DISTRICT)				
11WD	JAMES E. USENICK AND ROSEANN USENICK	4 & 4A	26-00997	626	43	0.250	0.073	0.073	0.073	---	---	0.172	STATE	P.R.O. ONLY					
11-X		4 & 4A						0.038	---	0.038	---	---	---	STATE	REBUILD AND MAINTAIN CHANNEL				
11SL		4 & 4A						0.005	---	0.005	---	---	---	STATE					
12WD	LAWRENCE R. McCOOL AND MARY A. McCOOL	4 & 4A	26-02592	629	506	0.656	0.020	0.020	0.020	---	---	0.599	STATE	P.R.O. ONLY					
12SL		4 & 4A		565	742	---	---	0.037	---	0.037	---	---	---	STATE					
12WD		4 & 4A	26-00881	629	504	0.568	0.052	0.052	0.052	---	---	0.468	STATE	TRACT I P.R.O. ONLY					
12SL		4 & 4A		408	207	---	---	0.048	---	0.048	---	---	---	STATE					
		4 & 4A	26-00880	629	504	0.207	0.022	---	---	---	---	0.185	STATE	TRACT II SUB LOT 12 P.R.O. ONLY & SUB LOT 13					
				408	207	---	---	---	---	---	---	---	---	---					
TOTAL FOR PARCELS 12-WD & 12-SL					TOTAL	1.431	0.094	0.157	0.072	0.085	---	---	1.252	STATE					

NOTE:

- ALL AREAS SHOWN ARE IN ACRES.
- ALL TEMPORARY PARCELS TO HAVE ONE YEAR DURATION.

(AUDITOR AREA AFTER OUTSALES) MINUS (TOTAL P.R.O.) MINUS (NET TAKE) = NET RESIDUE

Dist. II	7-25-96	Rev Auditor's Parcel Numbers for Par. 8
Dist. II	6-24-96	Par. 2 - Added "A Virginia Corporation" to Owner's Name
Dist. II	6-20-96	Revised Parcel 8-WD SHEET COMPLETED
4/17/96	COMP. DATE	REV. DATE
		DESCRIPTION

MS 515 CIVIL 7 FN C:\DRAWING\B4E306\B4E306.DWG SC: 1:1 31 02/29/96

BELMONT COUNTY
BEL 149-499

STATE PROJECT 11032 (0)

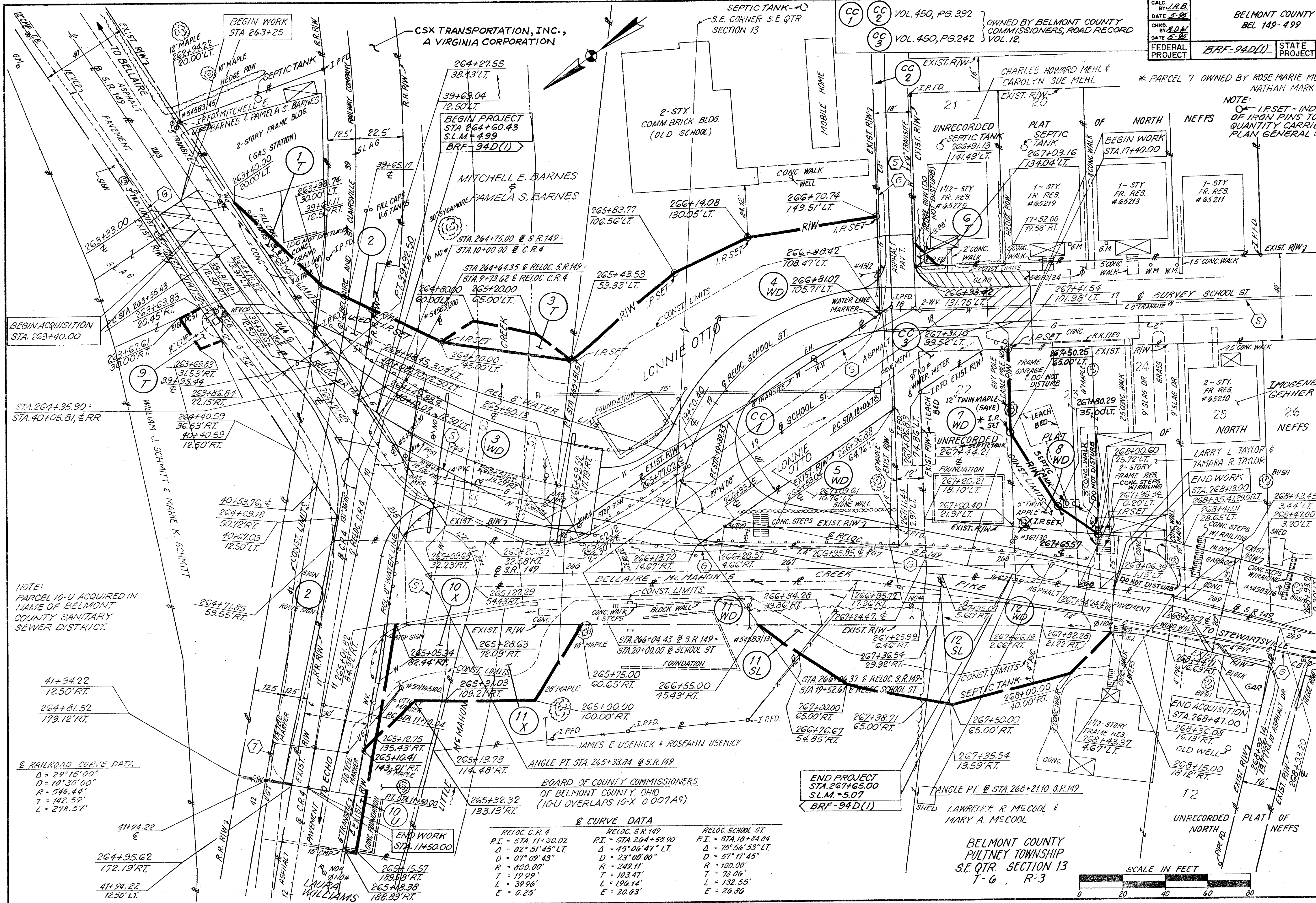
CALC. BY: L.R.B.
DATE: 2-82
CHKD. BY: B.D.W.
DATE: 2-82
FEDERAL PROJECT: BRF-94D(1)

OWNED BY BELMONT COUNTY COMMISSIONERS, ROAD RECORD VOL. 12.

CC 1 VOL. 450, PG. 392
CC 2 VOL. 450, PG. 242
CC 3

* PARCEL 7 OWNED BY ROSE MARIE MELLOTT, SINGLE & NATHAN MARK RUHLAND, SINGLE

NOTE: I.P.SET - INDICATES THE LOCATION OF IRON PINS TO BE SET, TOTAL OF 10. QUANTITY CARRIED TO THE CONSTRUCTION PLAN GENERAL SUMMARY, SH. N° 11.



NOTE: PARCEL 10-U ACQUIRED IN NAME OF BELMONT COUNTY SANITARY SEWER DISTRICT.

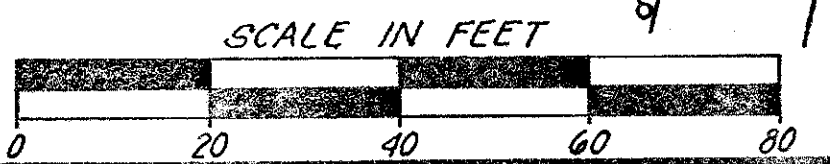
& RAILROAD CURVE DATA
 $\Delta = 29^{\circ}15'00''$
 $D = 10^{\circ}30'00''$
 $R = 546.44'$
 $T = 142.59'$
 $L = 278.57'$

& CURVE DATA

RELOC. C.R. 4	RELOC. S.R. 149	RELOC. SCHOOL ST
PI. = STA 11+30.02	PI. = STA 264+58.90	PI. = STA 18+84.84
$\Delta = 02^{\circ}51'45''$ LT.	$\Delta = 45^{\circ}06'47''$ LT.	$\Delta = 75^{\circ}56'53''$ LT.
$D = 01^{\circ}09'43''$	$D = 23^{\circ}00'00''$	$D = 51^{\circ}11'45''$
$R = 800.00'$	$R = 249.11'$	$R = 100.00'$
$T = 19.99'$	$T = 103.41'$	$T = 78.06'$
$L = 39.96'$	$L = 196.14'$	$L = 132.55'$
$E = 0.25'$	$E = 20.63'$	$E = 26.86'$

END PROJECT
STA 267+65.00
S.L.M. = 5.07
BRF-94D(1)

BELMONT COUNTY
PULTNEY TOWNSHIP
S.E. QTR. SECTION 13
T-6, R-3

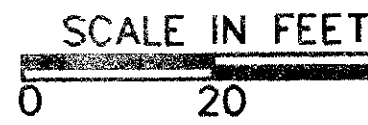


6-24-96 ~ Dist. 11
Par. 2 ~ Added "A Virginia Corporation" to Owner's Name

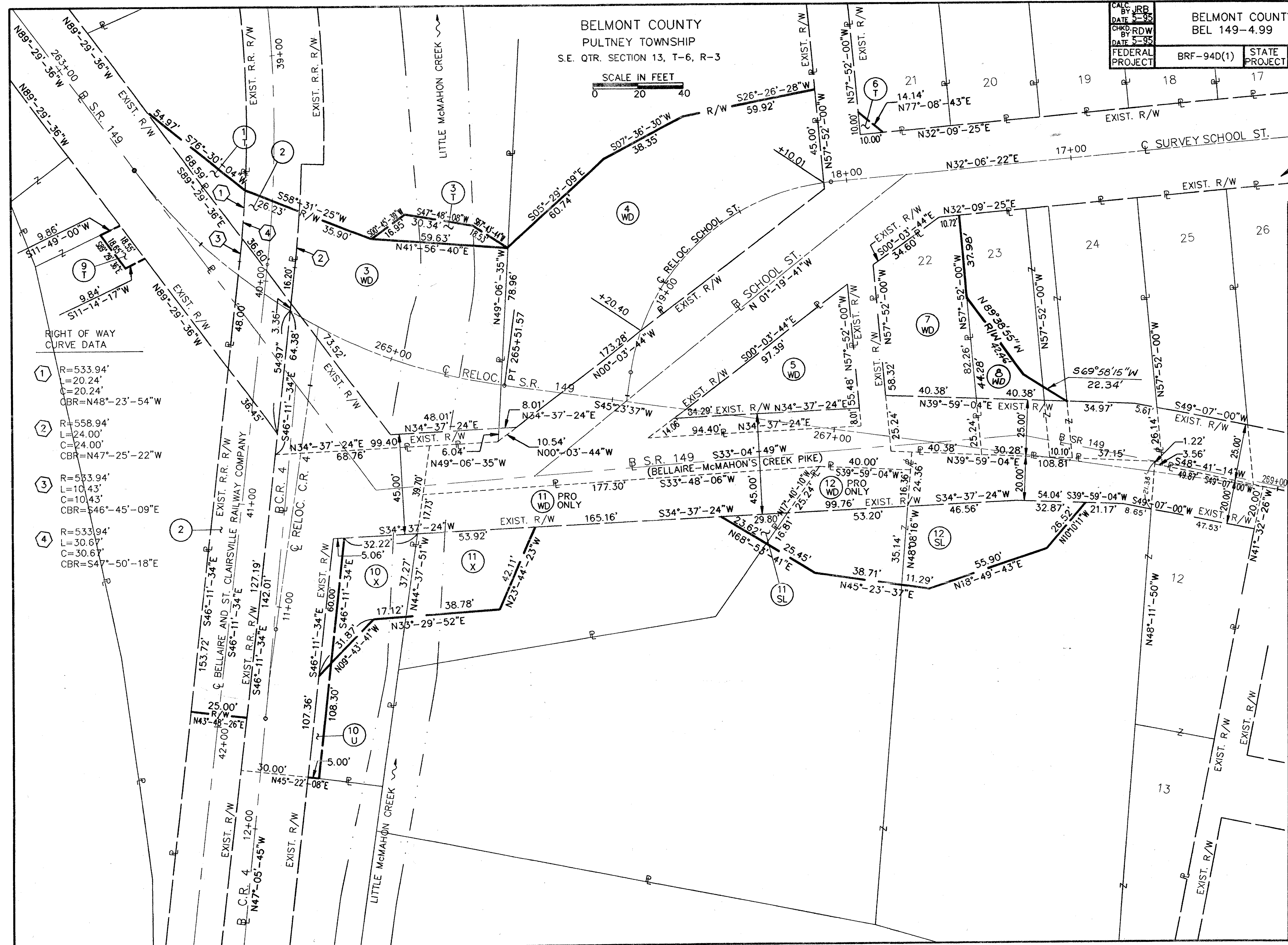
6-20-69 ~ Dist. 11
Revised Par. 8-WD and added Septic Tank & Leach Bed Location on Parcels 7 & 8.

Revised
Sheet Completed
Date: 4/17/96
R/W STA. 263+00 TO STA. 269+00

BELMONT COUNTY
PULTNEY TOWNSHIP
S.E. QTR. SECTION 13, T-6, R-3



DATE 5-95	BELMONT COUNTY	OHIO	42A
CHKD BY RDW	BEL 149-4.99	FHWA	42
DATE 5-95		REGION 5	4A
FEDERAL PROJECT	BRF-94D(1)	STATE PROJECT	11032(0)



- RIGHT OF WAY CURVE DATA
- ① R=533.94'
L=20.24'
C=20.24'
CBR=N48°-23'-54"W
 - ② R=558.94'
L=24.00'
C=24.00'
CBR=N47°-25'-22"W
 - ③ R=533.94'
L=10.43'
C=10.43'
CBR=S46°-45'-09"E
 - ④ R=533.94'
L=30.67'
C=30.67'
CBR=S47°-50'-18"E

6-20-96 ~ Dist. 11
Revised Parcel B-WD
REVISED
SHEET COMPLETED
DATE: 4/17/96
PROPERTY DETAILS

NS 816 CIVIL 7 PM C:\DRAWING\NS\62305.DWG (PLOT) SC: 1:40 0918 02/29/96

GEOLOGY OF THE SITE

THE STRUCTURE SITE IS LOCATED IN THE HIGHLY DISSECTED UNGLACIATED PORTION OF THE FLUSHING ESCARPMENT ON THE NARROW FLOODPLAIN OF AND OVER LITTLE McMAHON CREEK IN AN AREA WHERE SHALLOW VALLEY FILL AND ALLUVIAL DEPOSITS OVERLIE SHALE AND LIMESTONE BEDROCK OF PENNSYLVANIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE CORE-BORINGS MADE BY MEANS OF A MECHANICALLY-POWERED HOLLOW STEM ROTARY EARTH AUGER MOUNTED ON A MOBILE PLATFORM, PERFORMED ON MARCH 21 AND 22, 1989.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE BORINGS DISCLOSED THAT RELATIVELY LOOSE SILTS AND STIFF CLAYS AND GRAVELS CONTAINING VARIOUS AMOUNTS OF SAND OVERLIE GENTLY SLOPING BEDROCK SURFACE. BORING B-1 (LOCATED IN THE GENERAL VICINITY OF THE REAR ABUTMENT) ENCOUNTERED BEDROCK SURFACE AT APPROXIMATE 18.0 FEET BELOW GROUND SURFACE, ELEVATION 711.6 FEET AND WAS DISCONTINUED AFTER PENETRATING 13.0 FEET BELOW BEDROCK SURFACE AT 30.0 FOOT DEPTH, ELEVATION 698.7 FEET. BORING B-2 (LOCATED IN THE GENERAL VICINITY OF THE FORWARD ABUTMENT) ENCOUNTERED BEDROCK SURFACE AT 15.0 FOOT DEPTH, ELEVATION 719.6 FEET AND CONTINUED TO A DEPTH OF 20.0 FEET, ELEVATION 714.6 FEET WHERE IT WAS TERMINATED AFTER PENETRATING 5.0 FEET BELOW BEDROCK SURFACE.

FREE WATER WAS ENCOUNTERED IN TEST BORING B-1 AT ELEVATION 721.1 FEET.

- Auger Boring Location - Plan View.
- Press and/or Drive Sample and/or Core Boring Location - Plan View.
- Drive Rod Penetration Resistance Sounding Location - Plan View.
- Capped Pile
- Footing
- Footing on Pile
- Top of Rock

- Coal
- Weathered Mudstone or Claystone
- Mudstone or Claystone
- Weathered Shale
- Shale
- Weathered Siltstone
- Siltstone

LEGEND

- Horizontal Bar on Boring Log Indicates the Depth the Sample Was Taken.
- Figures Beside the Boring Log in Profile Indicate the Number of Blows for Standard Penetration Test.
X = Number of Blows for First 6 inches.
Y = Number of Blows for Second 6 inches.
Z = Number of Blows for Third 6 inches.
- Drive Rod Penetration Resistance Sounding Log - Profile
- Resistance "R" < 10,000 lbs.
- Resistance "R" > 10,000 lbs.
- Z Indicates Final Measurement of Penetration, in Inches.
- W Indicates Free Water Elevation.
- Indicates Static Water Elevation.

SYMBOLS OF ROCK TYPES

- Weathered Sandstone
- Sandstone
- Leached Dolomite
- Dolomite
- Leached Limestone
- Limestone
- Boulders or Cobbles

GENERAL INFORMATION

Drive Rod Penetration Sounding Tests

Drive rod penetration resistance tests constitute driving a 1.315-inch diameter steel rod, with a 45° cone point, into the ground, using a 122-pound drop-hammer with a free fall of five feet. At one or two-foot depth intervals, a measurement is taken to determine the amount of penetration achieved in three hammer drops. This reading is converted to an empirical value for capacity "R", in thousands of pounds (which is a measure of both the point resistance and frictional resistance on the rod), by using charts prepared by the Ohio Department of Highways, Bureau of Bridges, on the basis of correlation study of rod penetration with past performance of pile driving. For interpretation, a graph is prepared by plotting the value "R" against the depth at which the reading was taken, and connecting the plotted points. The curve obtained reflects the density of subsurface materials in a manner that can be readily compared with data from similar tests at other locations on the structure site. From this comparison, the overall uniformity of subsurface condition may be evaluated.

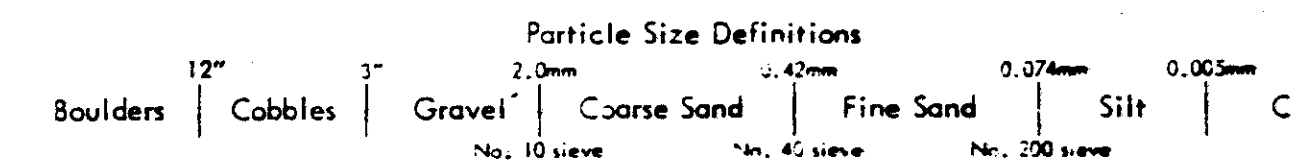
Drive Sample Borings - Drive-Press Sample Borings

Drive sample borings are made by means of a rotary-type drill rig, employing a 2" O.D. 1-3/8" I.D. sampler, at 2-1.2 and/or 5-foot depth intervals, driven by means of a 140-pound drop-hammer with a free fall of 30 inches. The number of blows required to drive the sampler 18 inches is considered the standard penetration test.

Drive-press sample borings are made by means of a rotary-type drill rig, employing a 2" O.D. 1-3/8" I.D. drive sampler, and 3" O.D. thin-wall press sampler. The press sampler is advanced by continuous uniform pressure, applied by the drill rig.

The boring log sheets show a graphic plot of the information obtained, including depth of elevation of the sample, number of blows for the standard penetration tests in three 6-inch increments, depth of press samples, field sample number, sample description - based on laboratory tests and the Casagrande AC classification system - and gradation, plasticity, and moisture content determinations. Results of strength and consolidation testing, if performed, appear on separate enclosures.

At depths where materials are bouldery or gravelly to the extent that the sampler can not be driven, a wash sample is procured for visual classification, in order to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.



LOG OF BORING

Date Started 3/21/89 Date Completed 3/22/89 Boring No. B-1
 Sampler Type SS Dia. 1 3/8" Casing Length Dia. Station & Offset 264+91, 1' LT. (REAR ABUTMENT)
 Water Elev. 721.1' Surface Elev. 729.1'

Elev.	Depth	Std. Pen. (N)	Rec. Loss ft.	Description	Sample No.	Physical Characteristics							SHTL Class.	
						% Agg.	% C.S.	% F.S.	% Silt	% Clay	LL	PI		W.C.
729.1	0			TOPSOIL										VISUAL
728.6	2	AUGERED		BROWN SANDY SILT AND CLAY W/GRAVEL (DRILLER'S DESCRIPTION)										VISUAL
724.1	6	3/4/3		BROWN GRAVELLY SANDY SILT	5	15	4	24	40	17	29	9	28	A-4
721.6	8	8/10/50(0.3)		BROWN CLAYEY SANDY GRAVEL W/BRICK BATS	6	50	15	12	12	11	32	11	26	A-2-6
719.1	10	5/6/11		BROWN CLAYEY SANDY GRAVEL	7	56	13	12	9	10	30	111	18	A-2-6
716.6	14	56/21/50		BROWN SILTY SANDY GRAVEL	8	48	17	16	10	9	NP	NP	14	A-1-B
714.1	16	65(0.5)		GRAY SILTY SANDY GRAVEL	9	54	14	14	11	7	NP	NP	9	A-1-B
711.6	18	38/50(0.3)		TOP OF ROCK										
709.1	20	60(0.4)		GRAY WEATHERED CLAY SHALE	10									7 VISUAL
708.7	22		1.7	CLAY SHALE, DARK-GRAY, FIRM, SLIGHTLY CARBONACEOUS, FISSILE WITH SCATTERED THIN CLAY SEAMS, BROKEN AND JOINTED. CORE LOSS 38%.	11									7 VISUAL
698.7	30		4.5											
	32													

BOTTOM OF BORING

LOG OF BORING

Date Started 3/21/89 Date Completed 3/21/89 Boring No. B-2
 Sampler Type SS Dia. 1 3/8" Casing Length Dia. Station & Offset 265+60, 51' RT. (FORWARD ABUT.)
 Water Elev. 734.6' Surface Elev. 734.6'

Elev.	Depth	Std. Pen. (N)	Rec. Loss ft.	Description	Sample No.	Physical Characteristics							SHTL Class.	
						% Agg.	% C.S.	% F.S.	% Silt	% Clay	LL	PI		W.C.
734.6	0			ASPHALT & CONCRETE										VISUAL
733.6	2	AUGERED		BROWN SILT AND CLAY (DRILLER'S DESCRIPTION)										VISUAL
729.6	6	4/7/10		BROWN CLAY	1	5	4	6	42	43	48	24	22	A-7-6
727.1	8	10/14/20		BROWN SANDY GRAVELLY CLAY	2	32	9	15	30	14	42	17	21	A-7-6
724.6	10	26/35/50(0.2)		BROWN SILTY SANDY GRAVEL	3	64	10	9	11	6	29	9	7	A-2-4
722.1	14	13/9/50		TOP OF ROCK										
719.6	16	25/50(0.3)		NO RECOVERY - BROWN GRAVELLY SANDY CLAY (DRILLER'S DESCRIPTION)										VISUAL
718.8	18			GRAY WEATHERED CLAY SHALE	4									8 VISUAL
714.6	20		3.4	LIMESTONE, GRAY, HARD, DENSE WITH SCATTERED MEDIUM-FIRM THIN CLAY SHALE INTERVALS, BROKEN AND JOINTED. CORE LOSS 19%.										

BOTTOM OF BORING

NOTE - ALL AVAILABLE SOIL AND INFORMATION WHICH CAN BE COMPILED FROM THE STRUCTURE FOUNDATION GATTION SHEETS HAS BEEN SO REPORTED. COPIES OF THIS INFORMATION MAY BE INSPECTED IN THE DISTRICT DIRECTOR'S OFFICE, THE BUREAU OF SOILS SECTION OF THE BUREAU OF REPAIRS AND DESIGN OR IN THE BRIDGE DIVISION, 25 SOUTH FRONT STREET.

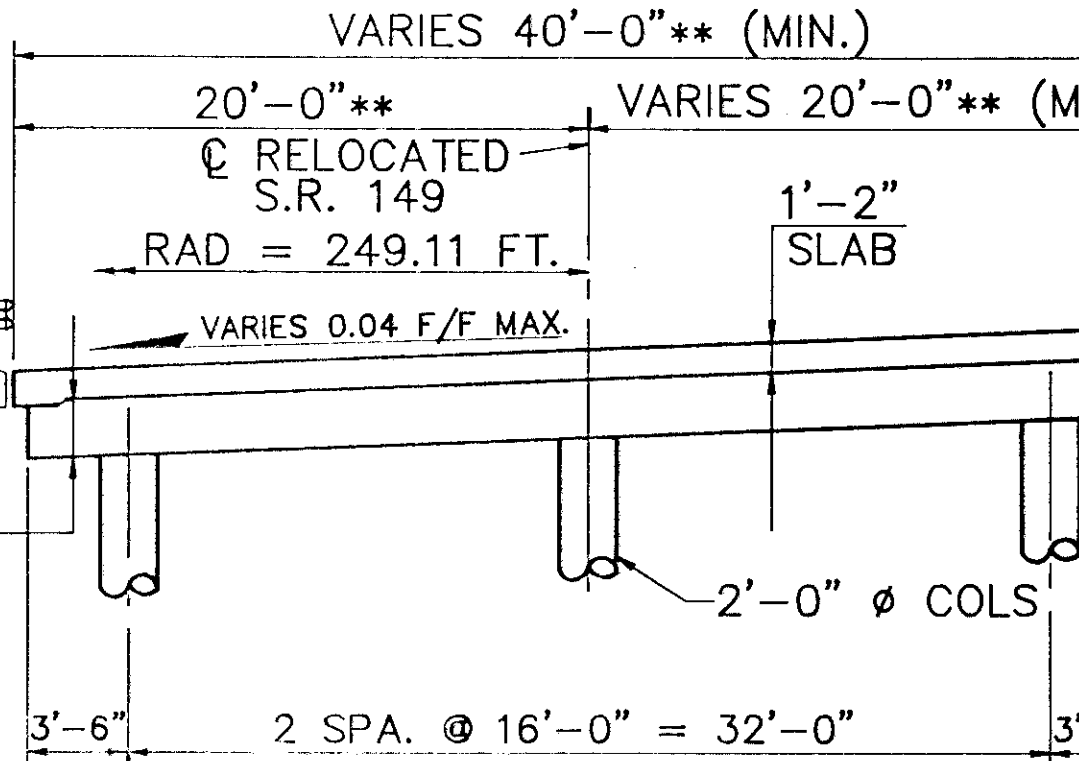
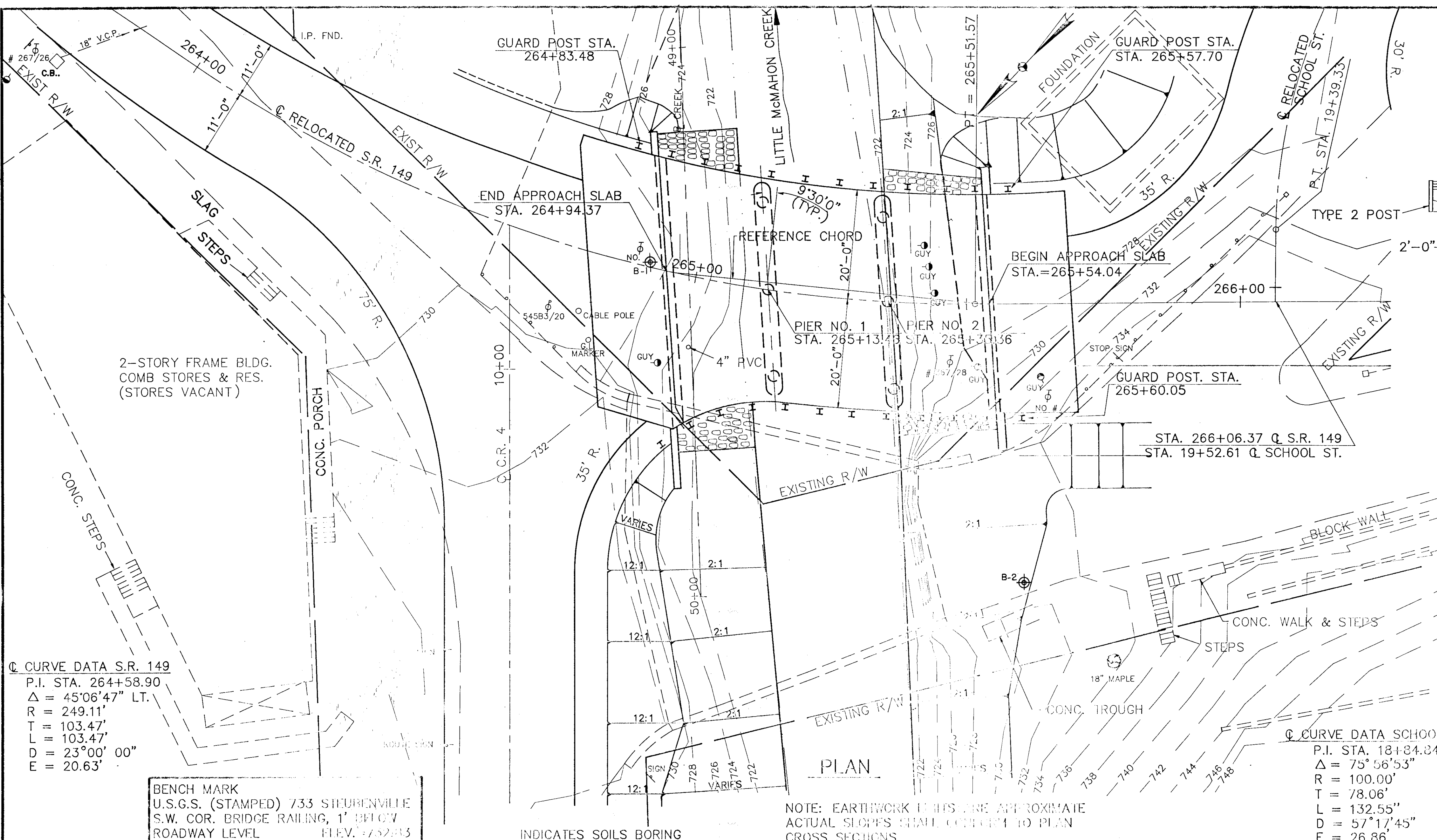
REVISED 8/14
REVISED 1/14

NOTE: Information shown by this subsurface investigation is for the use in establishing design controls for the project. The Ohio Department of Transportation does not guarantee the accuracy of this data and it is not to be used for any purpose other than that for which it was prepared.

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - TESTS
1600 WEST BROAD STREET, COLUMBUS, OHIO 43260

STRUCTURE FOUNDATION
BRIDGE NO. BEL-149-0502
OVER LITTLE McMAHON CREEK
SEC. BEL-149-4.99

CHECKED BY A.F. REVIEWED BY M.R.S.



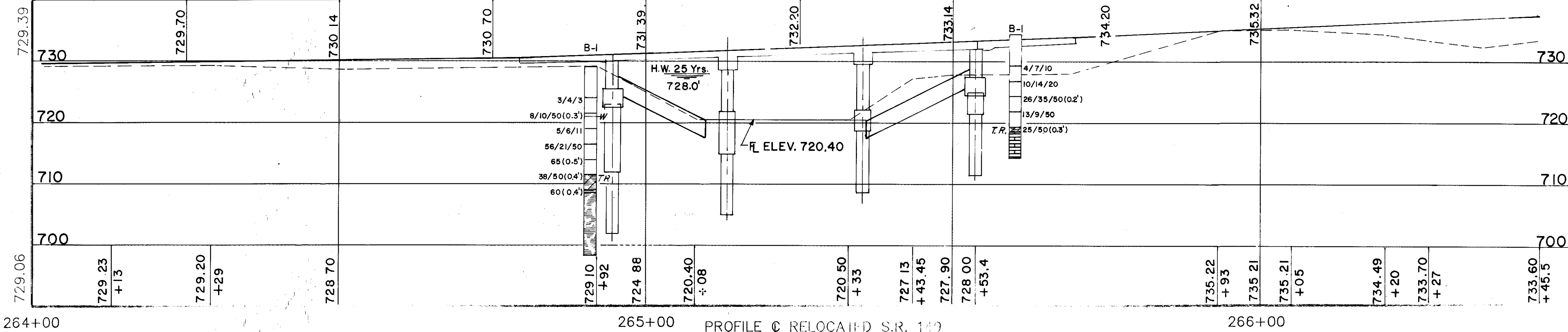
TRANSVERSE SECTION
 * REFERENCE CHORD IS A LINE BETWEEN THE POINTS OF INTERSECTION OF THE CENTERLINE OF RELOCATED S.R. 149 AND THE FACES OF THE ABUTMENTS
 ** MEASURED RADIALLY

Q CURVE DATA S.R. 149
 P.I. STA. 264+58.90
 $\Delta = 45^{\circ}06'47''$ LT.
 R = 249.11'
 T = 103.47'
 L = 103.47'
 D = $23^{\circ}00'00''$
 E = 20.63'

Q CURVE DATA SCHOOL ST.
 P.I. STA. 18+84.84
 $\Delta = 75^{\circ}56'53''$
 R = 100.00'
 T = 78.06'
 L = 132.55'
 D = $57^{\circ}17'45''$
 E = 26.86'

BENCH MARK
 U.S.G.S. (STAMPED) 733 STEUBENVILLE
 S.W. COR. BRIDGE RAILING, 1' BELOW
 ROADWAY LEVEL ELEV. 732.83

NOTE: EARTHWORK FIGURES ARE APPROXIMATE
 ACTUAL SLOPES SHALL CORRECT TO PLAN
 CROSS SECTIONS.



EXISTING STRUCTURE
 TYPE: FILLED CONCRETE SPANDREL
 SPANS: 55' CLEAR AT SPRING LINE
 ROADWAY: VARIES 28'-6" TO 60'
 F/F RAILING
 DESIGN LOADING: UNKNOWN
 SKEW: NONE
 WEARING SURFACE: ASPHALT CONCRETE
 ALIGNMENT: TANGENT
 APPROACH SLABS: NONE
 CONDITION: FUNCTIONALLY OBSOLETE
 DISPOSITION: TO BE REMOVED
 STRUCTURE FILE NO.: 0704822

PROPOSED STRUCTURE
 TYPE: CONTINUOUS CONCRETE SLAB
 ABUTMENTS AND CAP & COL
 SPANS: 17'-6", 22'-0", 17'-6" = 57'
 F/F ABUTMENTS (ALONG R/W)
 ROADWAY: 40'-0" F/F GUARDRAIL
 DESIGN LOADING: HS20-44 & A
 MILITARY LOAD
 SKEW: 930'0" RIGHT FORWARD (TO
 WEARING SURFACE: MONOLITHIC
 ALIGNMENT: CURVED ($23^{\circ}00'00''$ L
 APPROACH SLABS: 15'-0" LONG
 SUPER ELEVATION: 0.040 FT./FT.
 AVERAGE DAILY TRAFFIC: 5,180
 AVERAGE DAILY TRUCK TRAFFIC

REVISED 8/14/92
 REVISED 1/14/91
 OHIO DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS-TESTING LABORATORY
 1600 WEST BROAD STREET COLUMBUS, OHIO 43261
 STRUCTURE FOUNDATION INVESTIGATION
 BRIDGE NO. BEL-149-0502
 OVER LITTLE MCMAHON CREEK
 SEC. BEL-149-4.99

PLAN AND PROFILE
 DRAWN BY: J.B.H. CHECKED BY: A.F. REVIEWED BY: M.R.S.

264+00 265+00 266+00 PROFILE Q RELOCATED S.R. 149

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 806**

**FIELD OFFICE
September 9, 1997**

806.01 Description

806.02 General

806.03 Computer Equipment for Field Office

806.04 Basis of Payment

806.01 Description. This item shall consist of providing, maintaining and subsequently removing a field office for the exclusive use of the Department for the duration of the contract at a location approved by the Engineer. The field office will be designated as Type A, B or C.

806.02 General. The field office shall be available and completely functional at a time directed by the Engineer. The office shall have a minimum ceiling height of 2.1 m (7 feet) and have provisions for maintaining room temperature between 20 and 27 C (68 and 80 F). The Type C field office shall have a separate enclosed room for the Engineer. The Contractor shall provide and maintain telephone and electric service. One phone shall be connected to a recorded answering device. One speaker phone shall be required for Type B or Type C facilities. All field office types shall have one copying machine ;the copier shall be provided with all necessary maintenance and paper supplies, and be capable of producing multiple copies of documents up to 216 by 356 mm (8 1/2 by 14-inch) in size. The Type B and Type C field offices shall have a facsimile machine.

The office shall be provided with potable hot and cold water. The office shall also have neat, sanitary, enclosed toilet accommodations; associated lavatory and sanitary supplies shall be furnished. Portable facilities may be provided with the approval of the Engineer.

On all projects requiring moisture and density control of construction materials, the field office shall contain a storage box for a nuclear density gauge in accordance with drawings on file with the Director.

Additional requirements for field office and office equipment are as specified in the following table:

FIELD OFFICE

Item	Type A	Type B	Type C
Floor Space, m ² (sq. ft.).....	14 (150)	46 (500)	93 (1000)
Telephone	2	4	4
Base Radio & 4-Hand Held Units ¹	--	--	1
10 Column Electronic Calculator with Tape	1	2	3
Desk and Chair Set	1	3	5
Work Tables, 750 by 1800 mm (30 by 72-inch)	1	2	3
4 Drawer, Legal Size, Lockable Metal File Cabinet	--	1	2
2 Drawer, Metal File Cabinet ...	1	2	2
Portable Fire Extinguishers - Type 2A10BC-5#	1	1	2
All Weather Parking Spaces ...	4	8	10
Plan Rack ²	1	1	2

1. Units shall be capable of transmitting and receiving voice communication between office and any area on the project site.

2. Capable of handling the breakdown of 559x864 mm (22x34 inch) sized plans in to 10 sections.

The preceding requirements for the field office may be modified only upon written approval of the Engineer.

806.03 Computer Equipment for Field Office. Where required, the Contractor shall furnish, install, and maintain the following computer hardware and software in the field office required by this item for the life of the contract. All computer hardware and software furnished shall be for the exclusive use of the Engineer and staff and shall be operable at the same time as the field office.

This system shall not experience down time exceeding 48 hours from notification by the Engineer. The Contractor shall replace stolen, vandalized, or units otherwise inoperable within 48 hours after notification by the Engineer. Upon completion of the contract, the hardware and software furnished by the Contractor shall remain the property of the Contractor.

Computer Hardware

- (1) One IBM PC compatible computer with an Intel Pentium processor (or equal) operating at a minimum 200 MHz. The computer shall be provided with the following **minimum** requirements:
 - a. 2.1 Gigabyte hard disk
 - b. 32 Megabytes RAM

- c. one 3.5 inch., 1.44 MB floppy drive
- d. one 8x CD-ROM drive
- e. 101 key keyboard
- f. 15 inch Hi-Res Super VGA Color Monitor 1024 X 768 resolution with .28 dot pitch and Hi-Res Super VGA Card with 2 Megabytes of Video RAM.
- g. 2 Button Microsoft compatible mouse with appropriate software, compatible with required software.
- h. At least 1 parallel port and 1 serial interface port and 1 mouse port.
- i. one 56K firmware upgradeable 3Com compatible modem

(2) Hewlett Packard LaserJet compatible (PCL3 emulation) 6 page per minute printer or approved equal and parallel printer cable.

(3) Surge Protector. 15 amp six outlet with circuit breaker control, phone line circuit surge protection and a surge indicator light.

Computer Software

The Contractor shall furnish, load, and maintain the following software on the computers provided in the field offices: Microsoft Windows 95 (with games removed) and the Corel Professional Edition Office Suite Version 8.

All computer hardware and software shall be maintained by the Contractor during the life of the contract. Information for proposed "equal" equipment shall be submitted to the Engineer and be approved prior to use.

Along with the furniture under 806.02, the Contractor shall also provide the necessary stands, tables, etc. to accommodate the computer system.

806.04 Basis of Payment. The field office will be paid for at the contract price bid, which price shall be full compensation for furnishing, maintaining and subsequently removing the field office and all incidentals necessary to complete this item. The field office and any required computer equipment shall be paid on a monthly basis. The contract bid price shall be full compensation for furnishing, setting up, maintaining, and subsequently removing the specified computer hardware and software from the field office.

Item	Unit	Description
806	Month	Field office, Type _____
806	Month	Computer equipment for field office

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 844

HIGH PERFORMANCE CONCRETE FOR STRUCTURES

May 5, 1998

- 844.01 Description
- 844.02 Material
- 844.03 Proportioning
- 844.031 Proportioning, Slipforming
- 844.04 Mix Options
- 844.05 Provisions
- 844.06 Placement Limitations
- 844.07 Equipment for Bridge Decks
- 844.08 Superstructure Deck Curing and Texturing
- 844.09 Curing and Loading
- 844.10 Sealing Joints and Cracks
- 844.11 Chloride Resistance, Drying Shrinkage, and Heat of Hydration Testing
- 844.12 Method of Measurement
- 844.13 Basis of Payment

844.01 DESCRIPTION. This item consists of supplying and placing a high performance concrete that is workable, finishable, and when necessary, pumpable.

The probability of higher than normal dosage rates of Type F or G admixtures is likely. The need for chemical admixtures or aggregates or both, different from the Contractor's normal sources is a distinct possibility.

All provisions of Item 511-Class S concrete will remain in effect, except as modified herein.

844.02 MATERIAL. The maximum sodium sulfate soundness loss for coarse aggregate will be 10 percent.

Fly ash will meet 705.13 Class C.

Ground granulated blast furnace (GGBF) slag will meet ASTM C 989, grade 100 minimum (manufacturer's certification is required). The one day cube strength results of ASTM C 1073 may be used in lieu of the 7 and 28 day cube strengths required by ASTM C 989.

Only one source of fly ash or GGBF slag will be used in any one structure, unless otherwise authorized by the Engineer. Bulk fly ash or GGBF slag will be stored in waterproof bins.

Micro-silica admixture will meet ASTM C 1240 and be from a source approved by the Office of Materials Management, 1600 W. Broad Street, Columbus, Ohio.

Cement will be Type 1 only (701.04); only one brand, grade or kind shall be used in any given superstructure except upon permission of the Engineer.

High molecular weight methacrylate resin sealer shall meet the requirements of Supplemental Specification 954.

The Contractor will obtain a written statement from the manufacturers of the chemical admixtures verifying the compatibility of the combination of materials and the sequence in which they are combined. The manufacturers will further designate a technical representative from its company or the ready-mix supplier to be in charge of the dispensing of the admixture products. The technical representatives will act in an advisory capacity and will report to the Contractor and the Engineer any operations and procedures which are considered by the representative as being detrimental to the integrity of the placement. The manufacturer's technical representative will be present during concrete placement unless his presence is waived by the Engineer.

844.03 PROPORTIONING. The proportioning options of 499.031 will not be permitted.

At least 3 days prior to placing the test slab, the Contractor will submit in writing the specific mix design and batching sequence for the project. This design is for the Engineer's information and review and only subject to approval for meeting the specification proportions.

If any proportioning or batching sequence modifications are needed, the Contractor will submit a revised mix design or batching sequence to the Engineer and perform another test slab at no additional cost to the State. A successful test slab pour, as determined by the Engineer, must be completed before any concrete is placed.

844.031 PROPORTIONING, SLIPFORMING. The Contractor is allowed the option of slipforming bridge parapets. A mix will be developed and a 6m (20 foot) section of parapet will be slipformed as a test section. Up to two thirds of the No. 8 Size coarse aggregate may be replaced with No. 57 Size coarse aggregate. The Engineer will approve the test section before any additional parapet concrete is allowed to be slipformed. The approved slipform concrete mix design will be submitted to The Office of Materials Management for record purposes.

Dimensional Tolerances and Acceptance Criteria.

Dimensions will not be in excess of the construction tolerances listed below:

Reinforcing steel cover -13 (- ½ inch) + 13 mm (+ ½ inch)

Top width dimension	-0 + 6 mm (+ 1/4 inch)
Bottom width dimension	-0 + 13 mm (+ 1/2 inch)
Surface flatness	6 mm in 3 meters(1/4 inch in 10 feet)
Vertical alignment	13 mm in 6 meters
(Deviation from a line parallel to the grade line)	(1/2 inch in 20 feet)

All reinforcing steel joints and/or splices in the bridge railing steel shall be tied. A dry run to check for reinforcing clearance and rigidity of the reinforcing cages shall be required before any concrete is placed. The Contractor shall verify reinforcing clearances and make any adjustments to the cage to establish the required clearances during the dry run. Reinforcing steel cages are to be rigid (defined as no movement during the slipforming dryrun). If the Engineer determines the cages are not rigid, the Contractor must stabilize the cages before any slipforming is performed. The Contractor may add any additional diagonal reinforcing steel between the front and rear vertical reinforcing faces to establish the required rigidity. Any additional reinforcing steel required to adequately stabilize the cages shall be the Contractor's expense.

Honeycombing, cracking, tearing and other defects shall be repaired or patched immediately upon exit from the slipform equipment. Defects shall be completely filled with concrete.

Control Joints shall be constructed by sawing 32 mm (1 1/4 inches) deep the perimeter of the parapet, after the concrete has taken its initial set but before any shrinkage cracks develop. Generally initial set is within 6 hours of batching of the concrete. All joints shall be sawed within 24 hours of placement. Joints shall be sawed by using an edge guide, fence or jig to insure that the joint is straight, true and aligned on all faces of the parapet. The joint width shall be the width of the saw blade, a nominal 6 mm (1/4 inch).

Slip formed concrete will require different slumps than those listed in 499 or other plan specified concrete. The consistency of the concrete should be such that the concrete exiting the slipform does not pull but is stiff enough to prevent waviness and sags in the finished surfaces. Method A, Water Curing, 511.14 is required. As slipformed concrete has a low water-cement ratio, timely application of the water cure is critical in helping control shrinkage cracks.

No water shall be added or applied to the concrete after it has left the truck.

The Contractor shall furnish all necessary platforms to protect against falling debris during the slipforming operation, to allow access for completing the finishing operation and to allow the inspector access.

Concrete control joints will be sawed 35mm (1½ inch) into the concrete by use of an edge guide, fence or jig to assure the cut joint is straight, true and aligned on all faces of the parapet. the Joint will be a saw blade wide, (nominal 6mm (¼ inch)). The perimeter of the control joint will be caulked with a polyurethane or polymeric material meeting Federal Specification TT-S-00227E.

844.04 MIX OPTIONS. Unless specific concrete mixes are specified in the pay item descriptions, the following provisions will apply:

All superstructure concrete except for parapet concrete will consist of mix 3 or mix 4. If mix 3 is used for the deck, then all other concrete will be mix 1 or mix 3 concrete. If mix 4 is used for the deck, then all other concrete will be mix 2 or mix 4 concrete.

Any 499 calendar time restrictions regarding the use of fly ash will be waived for this concrete.

The following proportions will used as a starting mix design.

CONCRETE TABLE
Quantities Per Cubic Meter
Aggregates (SSD)

Aggregate Type				Mix 1 (Fly Ash)			Max Air Content +/-2%	
	Fine Aggregate (kg)	#8 Course Aggregate (kg)	Total (kg)	Cement Content (kg)	Fly Ash (kg)	Water to Cementitious Ratio		
Gravel	783	878	1661	314	101	0.38	7	
Limestone	783	887	1670	314	101	0.38	7	
Slag	783	771	1554	314	101	0.38	7	
Aggregate Type				Mix 2 (GGBF Slag)			Max Air Content +/-2%	
	Fine Aggregate (kg)	#8 Course Aggregate (kg)	Total (kg)	Cement Content (kg)	GGBF Slag (kg)	Water to Cementitious Ratio		
Gravel	792	878	1670	291	125	0.38	7	
Limestone	792	887	1679	291	125	0.38	7	
Slag	792	768	1560	291	125	0.38	7	
Aggregate Type				Mix 3 (Fly Ash + Microsilica)			Max Air Content +/-2%	
	Fine Aggregate (kg)	#8 Course Aggregate (kg)	Total (kg)	Cement Content (kg)	Fly Ash (kg)	Micro-Silica (kg)		Water to Cementitious Ratio
Gravel	804	875	1679	285	89	18	0.40	7
Limestone	804	884	1688	285	89	18	0.40	7
Slag	804	768	1572	285	89	18	0.40	7
Aggregate Type				Mix 4 (GGBF Slag + Microsilica)			Max Air Content +/-2%	
	Fine Aggregate (kg)	#8 Course Aggregate (kg)	Total (kg)	Cement Content (kg)	GGBF Slag (kg)	Micro-Silica (kg)		Water to Cementitious Ratio
Gravel	813	875	1688	261	113	18	0.40	7
Limestone	813	884	1697	261	113	18	0.40	7
Slag	813	768	1581	261	113	18	0.40	7

200mm maximum slump at placement for all mixes.

CONCRETE TABLE
Quantities Per Cubic Yard
Aggregates (SSD)

Aggregate Type				Mix 1 (Fly Ash)			Max Air Content +/-2%	
	Fine Aggregate (lb)	#8 Course Aggregate (lb)	Total (lb)	Cement Content (lb)	Fly Ash (lb)	Water to Cementitious Ratio		
Gravel	1320	1480	2800	530	170	0.38	7	
Limestone	1320	1495	2815	530	170	0.38	7	
Slag	1320	1300	2620	530	170	0.38	7	
Aggregate Type				Mix 2 (GGBF Slag)			Max Air Content +/-2%	
	Fine Aggregate (lb)	#8 Course Aggregate (lb)	Total (lb)	Cement Content (lb)	GGBF Slag (lb)	Water to Cementitious Ratio		
Gravel	1335	1480	2815	490	210	0.38	7	
Limestone	1335	1495	2830	490	210	0.38	7	
Slag	1335	1295	2630	490	210	0.38	7	
Aggregate Type				Mix 3 (Fly Ash + Microsilica)			Max Air Content +/-2%	
	Fine Aggregate (lb)	#8 Course Aggregate (lb)	Total (lb)	Cement Content (lb)	Fly Ash (lb)	Micro-Silica (lb)		Water to Cementitious Ratio
Gravel	1355	1475	2830	480	150	30	0.40	7
Limestone	1355	1490	2845	480	150	30	0.40	7
Slag	1355	1295	2650	480	150	30	0.40	7
Aggregate Type				Mix 4 (GGBF Slag + Microsilica)			Max Air Content +/-2%	
	Fine Aggregate (lb)	#8 Course Aggregate (lb)	Total (lb)	Cement Content (lb)	GGBF Slag (lb)	Micro-Silica (lb)		Water to Cementitious Ratio
Gravel	1370	1475	2845	440	190	30	0.40	7
Limestone	1370	1490	2860	440	190	30	0.40	7
Slag	1370	1295	2665	440	190	30	0.40	7

8 inch maximum slump at placement for all mixes.

The weights specified in the concrete table were calculated for materials of the following bulk specific gravities (SSD): natural sand and gravel 2.62, limestone sand 2.68, limestone 2.65, slag 2.30, fly ash 2.65, GGBF slag 2.90, Microsilica solids 2.20, and Portland cement 3.15. For aggregates of specific gravities differing more than plus or minus 0.02 from these, the weights in the table will be corrected.

If, during the progress of work, the specific gravity of one or both of the aggregates changes, the batch weight will be adjusted to conform to the new specific gravity.

The water cement ratio will be calculated based upon the total cementitious material. Cementitious material will include Portland cement, fly ash, GGBF slag and Microsilica (solids).

The proportions of coarse and fine aggregate will be adjusted to provide the maximum amount of coarse aggregate possible and still provide a workable and +finishable mix. The Contractor may modify the mixes shown by adjusting the coarse and fine aggregates up to 50.0 kg.(100 pounds) each, unless otherwise approved by the Engineer.

844.05 PROVISIONS. An approved high range water reducer (Type F or G) will be used to achieve the desired workability level at the specified water cementitious ratio. These chemical admixtures will conform to 705.12 (ASTM C 494) Type F or G and be approved by the Office of Materials Management. The majority of these admixtures will be added at the plant.

Type A or D chemical admixture conforming to 705.12 (ASTM C494) will be added to the concrete at the plant. The addition of these admixtures will supersede the concrete temperature requirements under items 499.03 and 511.06. The trial batch, as specified below, will be repeated until the mix exhibits the necessary finishability characteristics.

The moisture content of the coarse aggregate will be above the saturated surface dry (SSD) condition immediately prior to being incorporated into the mix.

The cementitious content will be maintained and the maximum water cementitious ratio will not be exceeded. The Type F or G admixture will be added and mixed in accordance with the manufacturer's recommendations. The Contractor will furnish a volumetric dispenser for the Type F or G or have a gage on each truck-mounted Type F or G dispensing tank. After discharging concrete and prior to reloading, all wash water will be removed, by reversing each truck drum at the plant.

If Type F or G admixture is added at the job site, the load will be mixed a minimum of 5 minutes at mixing speed.

If during discharge any mechanical balling or microsilica balling whatsoever is

observed, the load shall be rejected and the mixing process revised to prevent further balling.

If slump loss occurs before placement of the concrete, the concrete may be "replasticized" with the admixture to restore plasticity. The slump range and air content will be rechecked to ensure conformance to the specifications. If the consistency of the load after "replasticizing" is such as to cause segregation of the components, this will be cause for rejection of the load. Discharge will be complete within 90 minutes after the combining of the water and the cementitious material.

The Contractor will perform sufficient advance testing to ensure conformance with these specifications prior to placement of the concrete.

Sampling and testing for entrained air content and slump will be measured at the point of placement. For deck pours, this will be at the point of placement on the deck.

The Contractor will make one or more trial batches of concrete meeting these specifications, of the size to be hauled, at least four days before the deck concrete is to be placed. The Contractor will cast one or more test slabs, 2.4m (8 feet) x 1.2m (4 feet) x 0.1m (4 inches), finished and textured in accordance with these requirements. The Contractor will not be required to saw the texture unless the deck texture is required to be sawn. If the workability of the trial batch is not acceptable, the Contractor will modify the mix design or batching sequence and retest as per 844.03. Payment for the trial batch or batches and test slabs will be at the lump sum price bid for High Performance Concrete Trial Mix.

844.06 PLACEMENT LIMITATION. Concrete deck pours will begin only when favorable atmospheric conditions exist and are predicted to stay favorable for the duration of the pour.

Favorable atmospheric conditions exist when the surface evaporation rate, as affected by the ambient air temperature, concrete temperature, relative humidity, and wind velocity is 0.49 kg per square meter per hour (0.1 pounds per square foot per hour) or less. Figure 1 ACI 308 (see Item 511.08) will be used to determine graphically the surface evaporation rate.

To meet favorable atmospheric conditions, the Contractor may be required to place concrete at night. Actual measurement of data required in Figure 1 will be within 3m (10 ft.) of the area where the concrete is to be placed. For piers, abutments, and poured parapets, Figure 1 will not apply. Figure 1 will apply for slip formed parapets.

If placement is to be made at night, the Contractor will submit a plan which provides adequate lighting for the work area at least 15 calendar days in advance, and

receive written approval from the Engineer before placing the concrete. The lights will be so directed that they do not affect or distract approaching traffic.

The Contractor will insure that concrete pumping lines do not displace reinforcing steel during placement.

844.07 EQUIPMENT FOR BRIDGE DECKS. Concrete will be mixed in a central mixing plant or by a ready-mixed truck capable of discharging concrete having a maximum water cementitious ratio of 0.38. Mixing equipment will meet the requirements of 499.04(b). Admixtures will be introduced into the concrete in such a manner as to facilitate dispersion throughout entire load. Batch plants will meet the requirements of 499.04(a) and will be located such that the maximum time required from start of mixing to completion of discharge of the concrete at the site will not exceed 90 minutes.

An approved self-propelled finishing machine will be used. The finishing machine will be equipped with forward and reverse drive mechanisms that enable precise velocity control of the machine while it is moving in either direction. It will be equipped with two or more rotating rollers. It will be equipped with augers and either a vibrating pan or vibrating rollers. Vibrating frequency for pan or rollers will vary from 1500 to 5000 pulses per minute. The Contractor will furnish the necessary verification of these vibration frequencies. Screeds will have provisions for raising above the finished concrete surface. Roller tampers attached to finishing machines to mechanically depress aggregate are not allowed.

The placing and finishing equipment will be designed so that the elapsed time between depositing concrete and final finishing will not exceed 10 minutes.

Standard hand vibration equipment shall be used. Because high performance concretes are more cohesive, more vibration is required for proper consolidation than for Class C and S mixes. Vibration, often between each rebar, will be required to adequately consolidate a bridge deck even though the surface appears well consolidated.

Finishing machines will be supported by rail and supports made of steel. Rail will be furnished in sections not less than 3m (10 feet) in length and be sufficient cross-section so that the weight of the finishing machine causes zero vertical deflection while in motion. Rail will be straight with no sections exceeding a tolerance of 3mm (1/8 inch) in 3.05m (10 feet) in any direction. Rail supports will be screw-type adjustable saddles and will be of sufficient number under the rail so that zero vertical deflection occurs under the weight of the finishing machine.

A flexible blue steel blade with rounded edges is recommended for finishing.

844.08 SUPERSTRUCTURE DECK CURING AND TEXTURING. Within 3m (10

feet) of the completed tining operation, the finished surface will be covered with a single layer of clean wet burlap. The burlap will be kept wet by a continuous flow of water through soaker hoses and covered with a 100 μ m (4 mils) white opaque polyethylene film or a wet burlap - white opaque polyethylene sheet for 7 days. At the end of 7 days, the deck will be allowed to surface dry (joints and cracks sealed as per 844.10 below). Within 12 hours, membrane cure as per 511.14 method(b).

When pouring under provision of 511.12 methods which retard evaporation may be used, but the deck will be kept continuously wet with hoses and the curing will be 7 days with the surface being maintained between 10 °C (50 °F) and 38 °C (100 °F) as specified. At the end of 7 days, the deck will be allowed to surface dry (joints and cracks sealed as per 844.10). Within 12 hours, membrane cure as per 511.14 method(b).

At the Contractor's option, the Contractor may saw texture the deck instead of texturing as per 511. If the texture as required by 511 is not met, the Contractor will saw texture the deck at no cost to the State.

The texture operation will follow as closely as possible behind the placement.

Immediately after finishing, the Contractor will spray an evaporation retardant on the fresh concrete as per manufacturer's written recommendations. Only products specifically marketed for such usage will be utilized. This material will not be finished into the plastic concrete at any time. Application in a stream will not be allowed. The Contractor is not limited in spraying additional evaporation retardant to concrete surfaces.

844.09 CURING AND LOADING. Curing and loading will be per 511.14, except that the deck will not be opened to traffic until the 7 day water cure is completed and the membrane curing compound has been applied and allowed to dry for the minimum time recommended by the manufacturer. Superstructure deck concrete placed between October 15 and March 15 will not be opened to traffic for a minimum of 30 days after placement.

844.10 SEALING JOINTS AND CRACKS. After the water curing period has been completed and prior to the application of the membrane cure, the following areas will be sealed with a high molecular weight methacrylate (HMWM) sealer meeting SS 954: transverse joints in the deck; joints between the concrete deck and steel end dams; longitudinal joints in the deck; and longitudinal joints between the deck and safety curb, barriers, and parapets, etc. Payment for the material and placement of the HMWM sealer will be included in this item.

Prior to opening the deck to traffic, the deck will be checked on the top and bottom surfaces. Any cracking will be sealed from above with same HMWM product, in

accordance with the manufacturer's recommendations.

All costs for sealing in accordance with above, will be included with the appropriate concrete item. No separate payment for sealing will be made.

844.11 CHLORIDE RESISTANCE, DRYING SHRINKAGE, AND HEAT OF HYDRATION TESTING. When included as a separate pay item, the Contractor will perform rapid chloride permeability tests (AASHTO T 227) for every bridge deck placed using this concrete. A minimum of 3 tests will be made for decks containing less than 75 cubic meters (100 cubic yards) of superstructure concrete. For all other decks, 6 tests will be required. These tests will be made on the deck superstructure concrete samples obtained from the actual concrete used. The same number of drying shrinkage tests will be performed as per ASTM C 157.

Results of rapid chloride permeability tests will be shown at 28, 56 and 90 days. Results of drying shrinkage tests will be shown at 4, 7, 14, 28, 56 and 90 days.

Concrete heat of hydration testing will be performed to determine the potential for length change due to thermal expansion and contraction. Starting immediately after the placement of the deck, concrete temperatures will be taken and tabulated. A location will be chosen on the deck which is accessible for hourly readings and representative of the overall deck pour. The temperatures will be taken by installing three thermometers into the fresh concrete. The bulb of the thermometers will be located at 25mm (1 inch) below the surface of the concrete, at approximately mid-slab and at 25mm (1 inch) above the bottom deck form. The thermometers will be left in place throughout the testing time. Thermometers may be lubricated and placed in a thin plastic sheath to facilitate eventual removal. After removal, the holes remaining will be drilled out and filled as approved by the Engineer.

The following temperature intervals will be used:

Test Intervals	Time
2 hour	first 12 hours
3 hours	second 12 hours
4 hours	second day
8 hours	third thru fifth day

Ambient air temperatures will also be noted when each concrete temperature is taken. All testing will be performed by a testing laboratory regularly inspected by the "Cement and Concrete Reference Laboratories" (CCRL). A copy of the last CCRL inspection report will be furnished to the Engineer prior to the test slab pour.

If the Contractor uses mix 1 or mix 2 concrete for the parapets or substructures, the Contractor will make an additional 3 chloride permeability and drying shrinkage tests for that concrete. If used for the parapets, the Contractor will also test for heat of hydration as described above with one thermometer located at 25mm (1 inch) below

the top of the parapet and second thermometer located 500mm (19 inches) below the top of the parapet, approximately midway between the front and back faces of the parapet. For units constructed with the same concrete mix option as the deck, no additional testing will be required.

The results of all tests shall be tabulated on the attached form and forwarded to the following address no later than 10 days following the completion of the tests:

The Office of Structural Engineering
Ohio Department of Transportation, Room 516
25 South Front Street
Columbus, Ohio 43215

All costs of testing as outlined above will be paid for under the lump sum bid price for High Performance Concrete Testing.

844.12 METHOD OF MEASUREMENT. The quantity will be measured as per 511.18 and will include all labor, material, equipment and incidentals necessary to complete this item of work.

Payment for High Performance Concrete Testing will not be made until the Office of Structural Engineering has received the results of all tests.

844.13 BASIS OF PAYMENT. Payment for the above completed and accepted quantities will be made at the contract bid price for:

Item	Units	Description
844	Cubic meter (cubic yard)	High performance concrete superstructure (deck)
844	Square meter (square yard)	High performance concrete superstructure (deck)
844	Cubic meter (cubic yard)	High performance concrete superstructure (parapet)
844	Cubic meter (cubic yard)	High performance concrete substructure
844	Lump sum	High performance concrete trial mix
844	Lump sum	High performance concrete testing

SPECIAL PROVISIONS

WATERWAY PERMITS

FOR

CRS: BEL-149-4.99

U.S. ARMY CORPS OF ENGINEERS

PERMIT NUMBER: NWP # 14

OHIO EPA

PERMIT NUMBER: _____

DATE: 6/4/97

NATIONWIDE PERMIT

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

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

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

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

OHIO STATE CERTIFICATION GENERAL CONDITIONS FOR NATIONWIDE PERMITS.

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

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

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

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

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

OH-Cond: 1/1

NATIONWIDE PERMIT CONDITIONS

GENERAL CONDITIONS:

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

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

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

11. Endangered Species.

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

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

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

13. Notification.

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

NWP-Cond: 2/7

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

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

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

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

NWP-Cond: 3/7

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

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

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

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

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

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

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

NWP-Cond: 6/7

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

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

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

NWP-Cond: 5/7

(I) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided that the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site.

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

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

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

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

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

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

NWP-Cond: 4/7

SECTION 404 ONLY CONDITIONS:

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

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

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

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

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

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

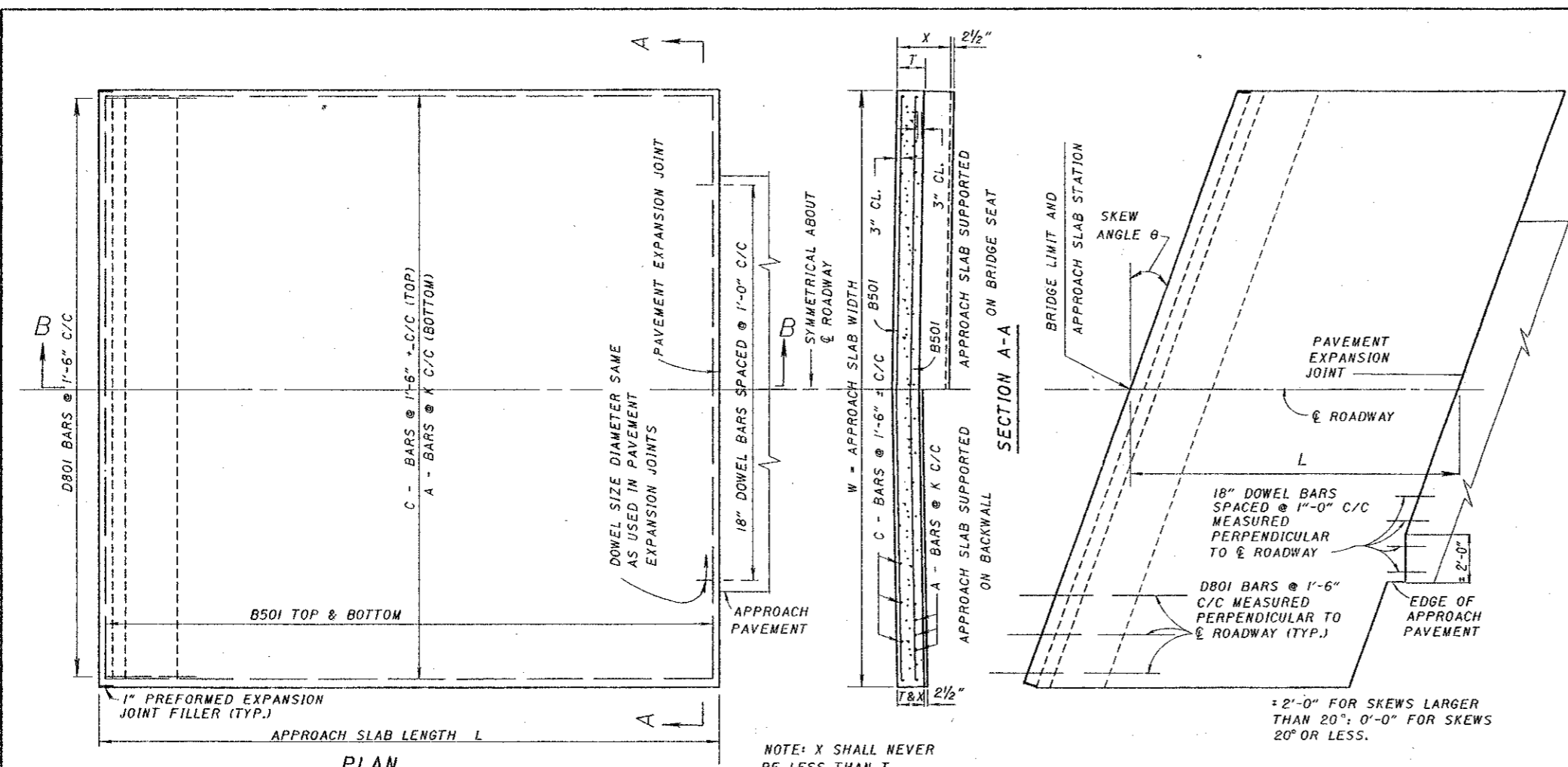
6. Obstruction of high flows. To the maximum extent practicable, discharges must not permanently restrict or impede the passage of normal or expected high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).

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

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

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

NWP-Cond: 7/7



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 S11.09.

CURBS, BRIDGES WITH SIDEWALKS : FOR BRIDGES CONSTRUCTED WITH RAISED SIDEWALKS, DEFLECTOR PARAPETS OR OTHER TYPES OF CONSTRUCTION WHICH RETAIN ROADWAY SURFACE DRAINAGE, THE APPROACH SLABS SHALL EITHER INCLUDE INTEGRAL CURBS OR BE CONSTRUCTED IN CONJUNCTION WITH BRIDGE CURBS. CURB HEIGHT SHALL BE TRANSITIONED UNIFORMLY BETWEEN BRIDGE CURB HEIGHT AND APPROACH CURB HEIGHT IN A LENGTH AS FOLLOWS: WHERE WINGWALL EXTENDS BEYOND END OF APPROACH SLAB, USE A MINIMUM LENGTH OF 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.

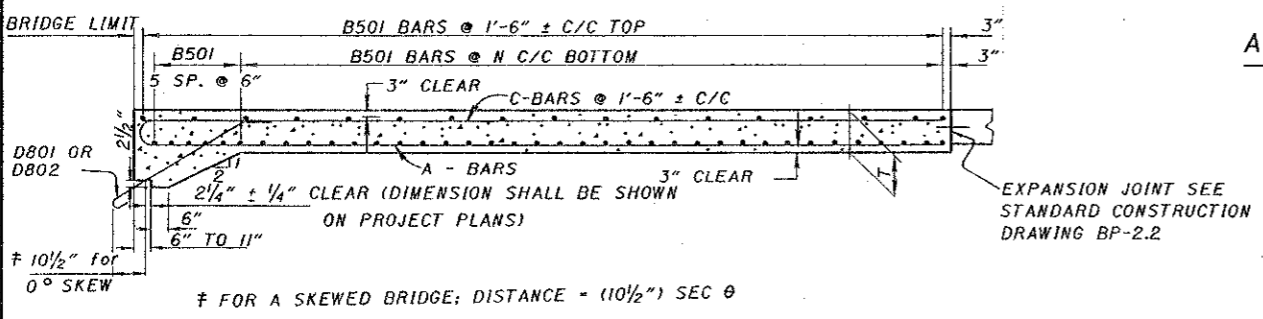
EXPANSION JOINT DETAILS AT THE APPROACH PAVEMENT END OF THE APPROACH SLAB ARE USED ONLY IN CONJUNCTION WITH CONCRETE PAVEMENT OR CONCRETE BASE COURSE. PAYMENT FOR THE EXPANSION JOINT, INCLUDING DOWEL BARS, PREFORMED EXPANSION JOINT FILLER AND JOINT SEALER, IS INCLUDED IN THE PRICE BID PER SQ. YD. FOR THE APPROACH SLAB.

APPROACH SLAB FOR SKEWED STRUCTURE

GENERAL: THIS DRAWING PROVIDES DESIGN AND GENERAL CONSTRUCTION DETAILS. THE PROJECT PLANS WILL SHOW LENGTH, SKEW, CURBS (IF ANY), ESTIMATED QUANTITY (SQUARE 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.

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.

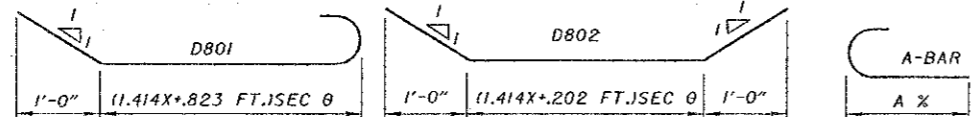


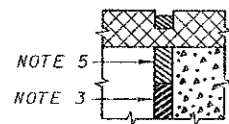
SECTION B-B

REINFORCING STEEL (FOR ONE APPROACH SLAB)

LENGTH L	THICK- NESS T	SP'C'G K	MARK	A-BARS		B501 (BOTTOM)		B501 (TOP)		C-BARS		D801 OR D802 NO. REQ'D.
				LENGTH	DIMENSION A	NO. REQ'D.	SP'C'G N	NO. REQ'D.	LENGTH	NO. REQ'D.	MARK	
15'-0"	12"	10"	A1001	15'-11"	14'-6"	* (W-0.5)sec θ	9"	22	* (W-0.5)sec θ	11	C501	14'-6"
20'-0"	13"	7 1/2"	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"	6 1/2"	A1004	30'-11"	29'-6"		8 1/2"	44		21	C504	29'-6"

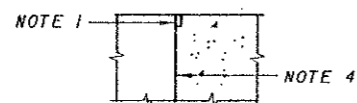
W - APPROACH SLAB WIDTH, OUT TO OUT, IN FEET
θ - ANGLE OF SKEW
K - A-BAR SPACING IN INCHES
N - B-BAR SPACING IN INCHES
X - APPROACH SLAB THICKNESS AT ABUTMENT END IN FEET
% - OUT TO OUT





DETAIL A

CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

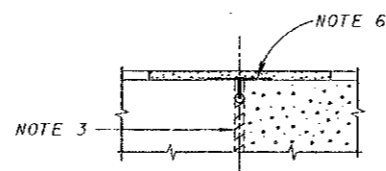


DETAIL B

CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

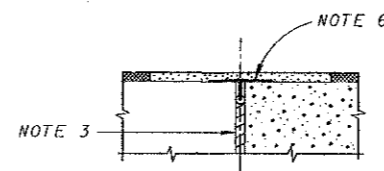


DETAIL C

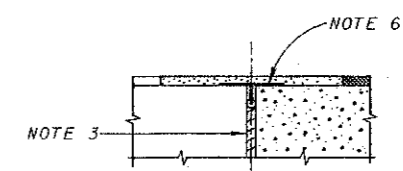


DETAIL D

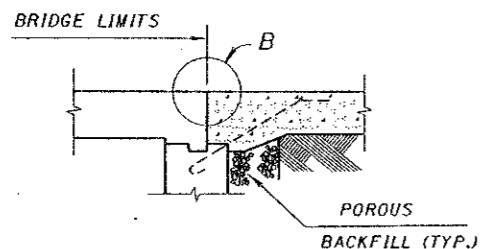
CONCRETE WEARING SURFACE ON BRIDGE DECK ONLY



DETAIL E

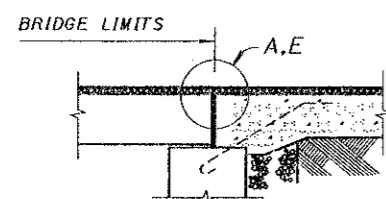


DETAIL F

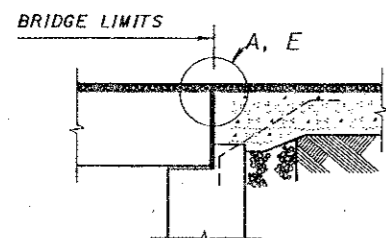


ON SLAB BRIDGES

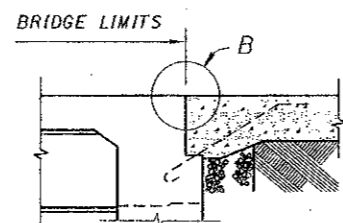
ASPHALT CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB



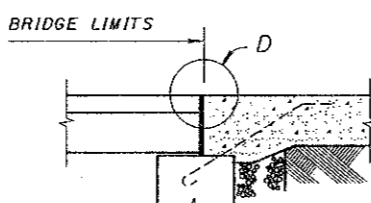
ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



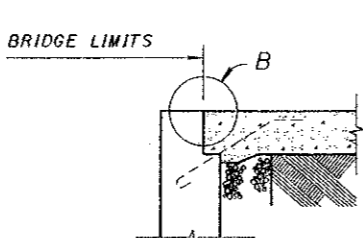
APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL



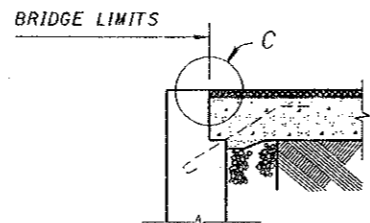
ON BRIDGES WITH INTEGRAL CONSTRUCTION



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 (1 1/4" FOR 1/2" JOINT) DEPRESSED 1/8" BELOW ROADWAY, PLACED IN 1/2" x 2 1/4" GROOVE.

NOTE 2: PREFORMED ELASTOMERIC JOINT SEALER 705.11 (1 1/4" FOR 1/2" JOINT) PLACED IN 1/2" x 2 1/8" GROOVE.

NOTE 3: 1" PREFORMED EXPANSION JOINT FILLER 705.03

NOTE 4: TYPE "A" WATERPROOFING.

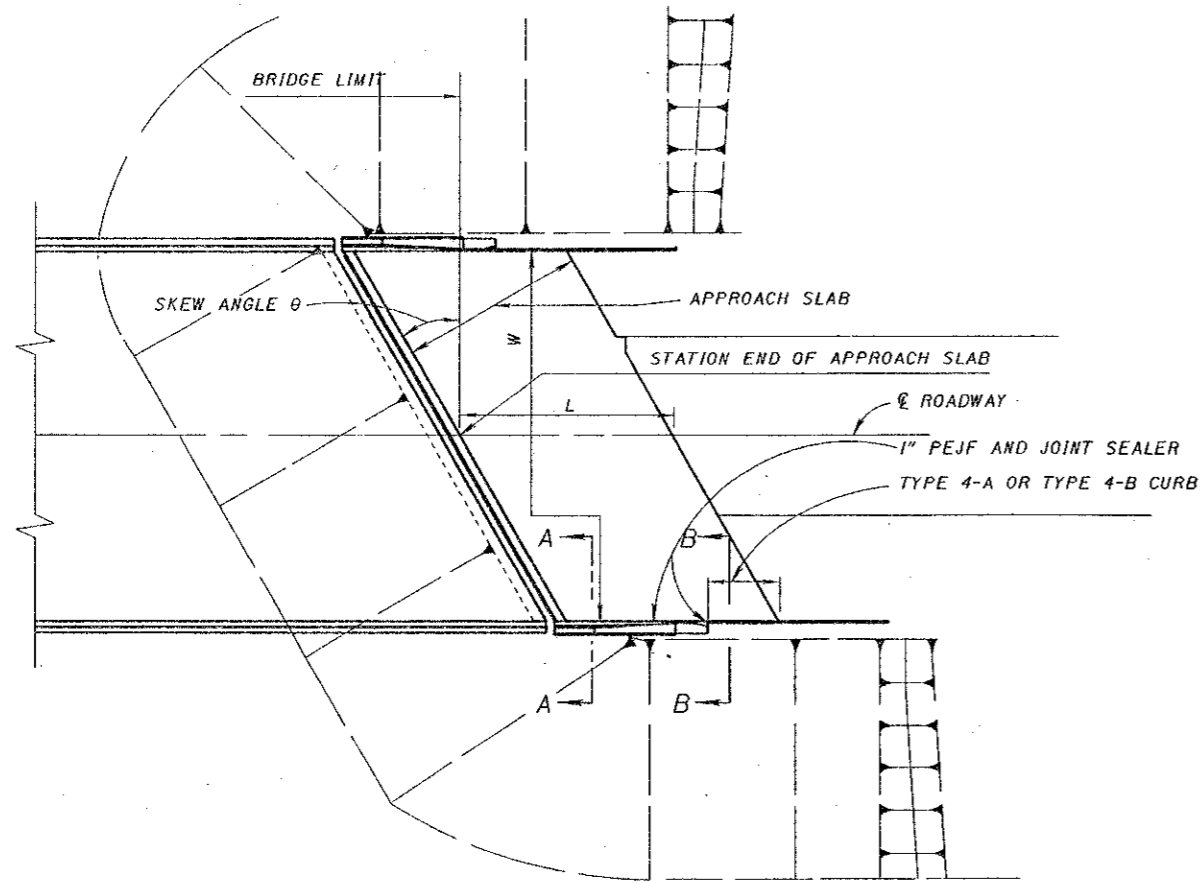
NOTE 5: SEE PLAN INSERT SHEET, ABUTMENT JOINTS IN BITUMINOUS CONCRETE BOX BEAM BRIDGES.

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

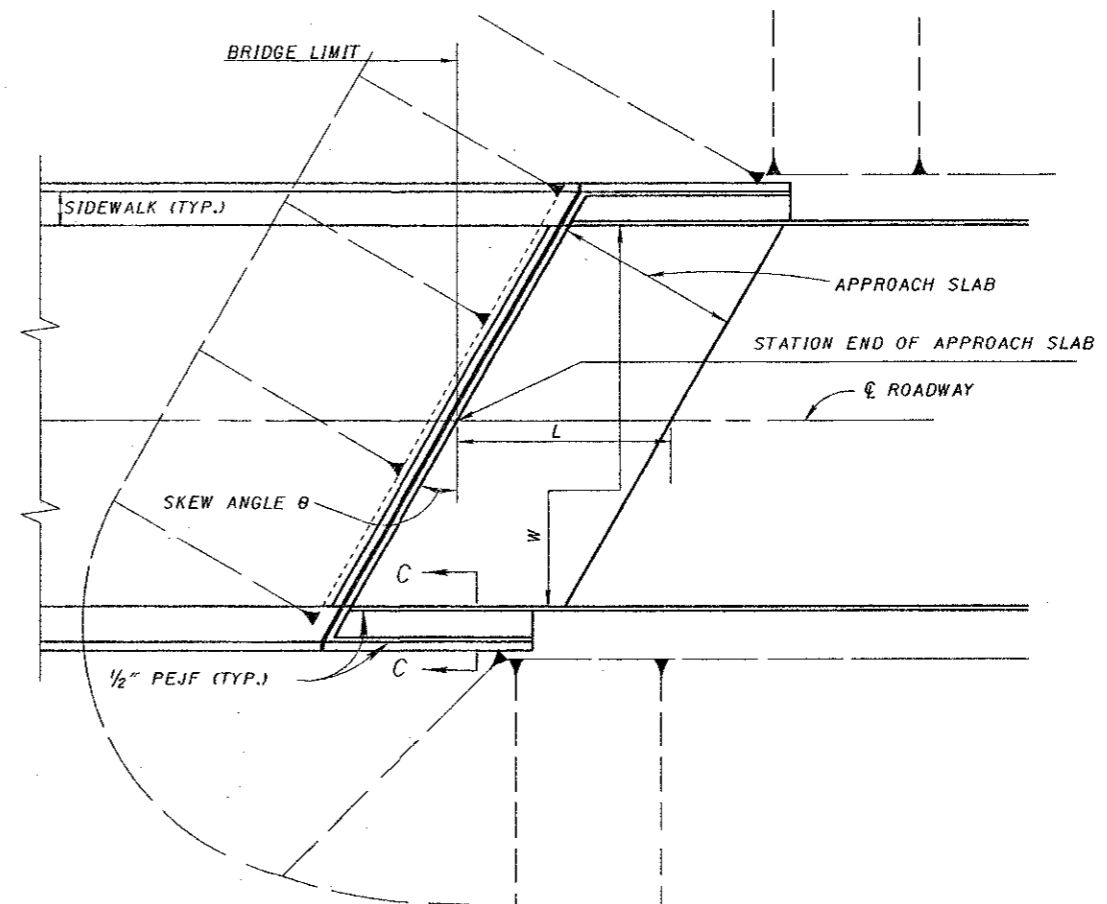
TYPE "A" WATERPROOFING SHALL NOT EXTEND ABOVE THE BOTTOM OF THE GROOVE INTO WHICH THE PREFORMED ELASTOMERIC JOINT SEALER IS TO BE PLACED. IT SHALL BE APPLIED TO THE ENTIRE AREA OF THE ABUTMENT OR SUPERSTRUCTURE WHICH COMES INTO CONTACT WITH THE APPROACH SLAB.

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.

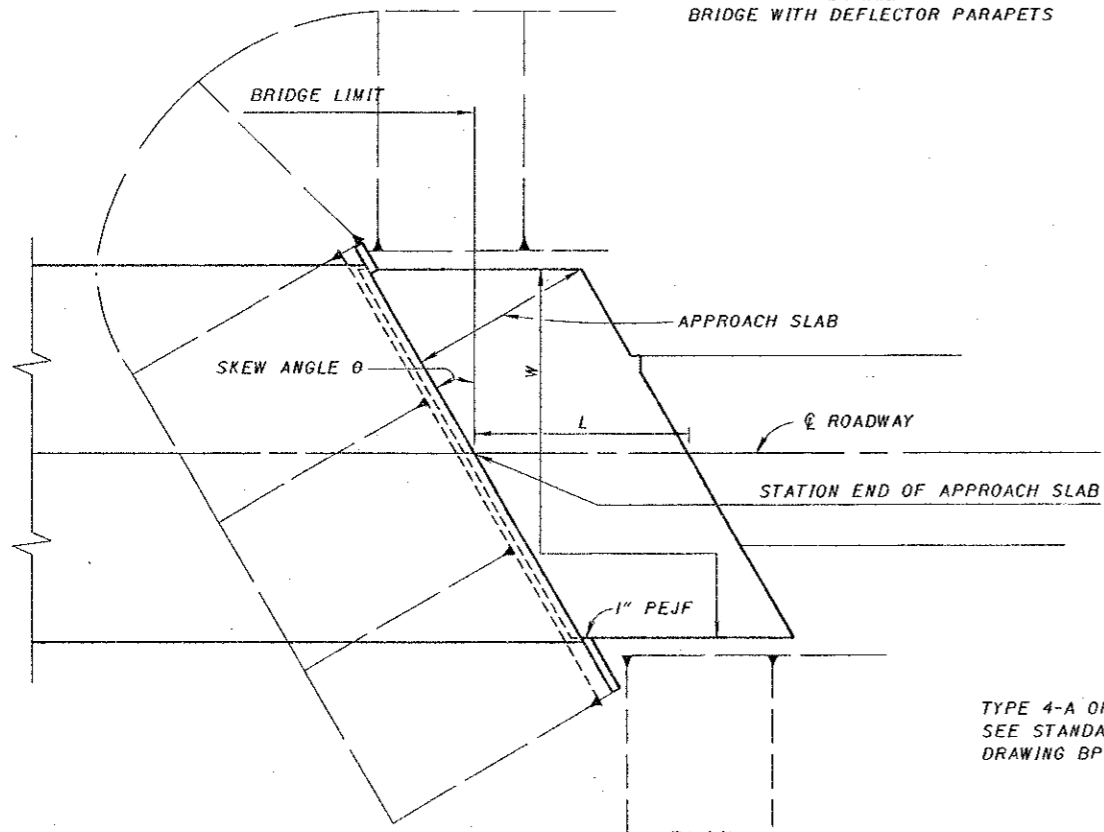
FOR STRUCTURES HAVING ASPHALT CONCRETE WEARING SURFACE ON BOTH BRIDGE DECK AND APPROACH SLABS AND WHERE NO DECK EXPANSION DEVICES ARE PROVIDED, THE DECK MEMBRANE WATERPROOFING SHALL EXTEND BEYOND THE BRIDGE LIMITS A DISTANCE OF 2'-0".



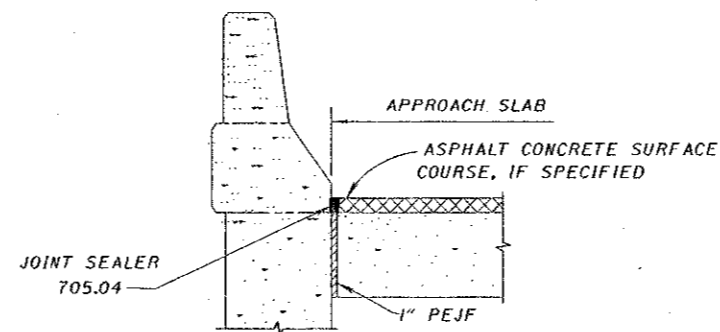
PLAN
BRIDGE WITH DEFLECTOR PARAPETS



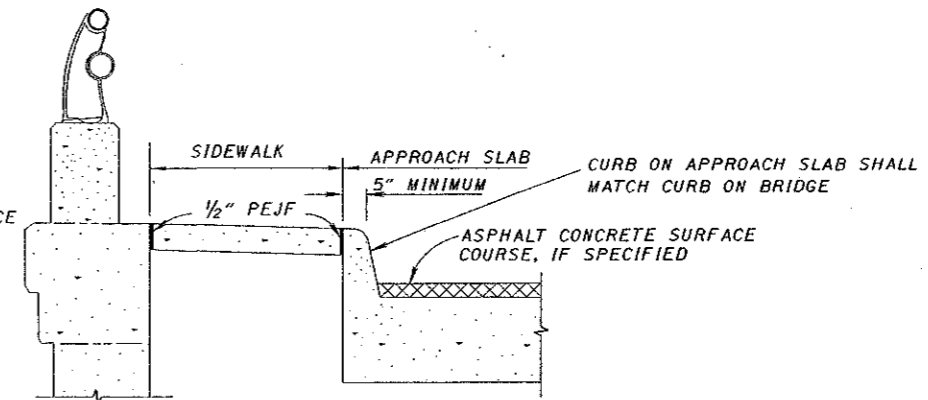
PLAN
BRIDGE WITH SIDEWALKS



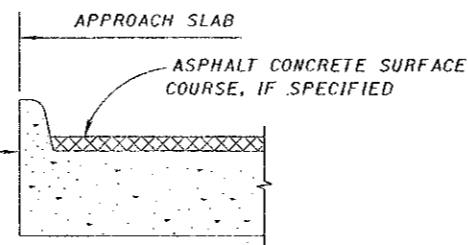
PLAN
BRIDGE WITHOUT CURBS



SECTION A-A



SECTION C-C



SECTION B-B

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

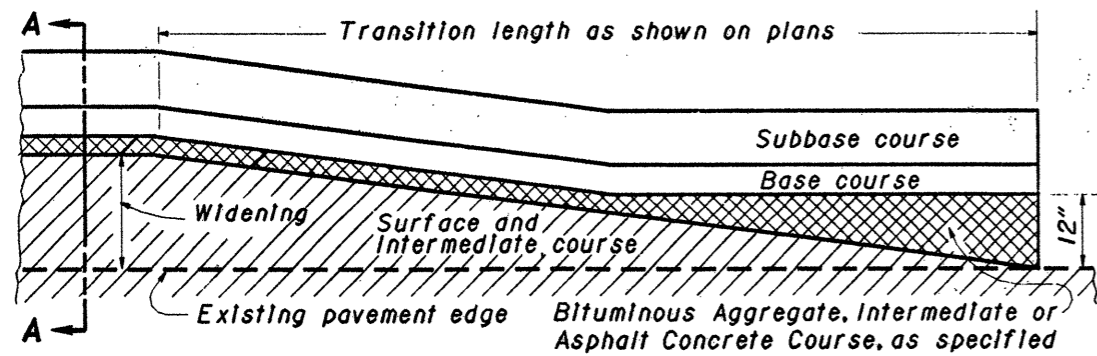
DESIGN AGENCY
BUREAU OF BRIDGES
AND
STRUCTURAL DESIGN

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
Robert B. Pyle
ENGINEER OF BRIDGES
DATE 11-27-81

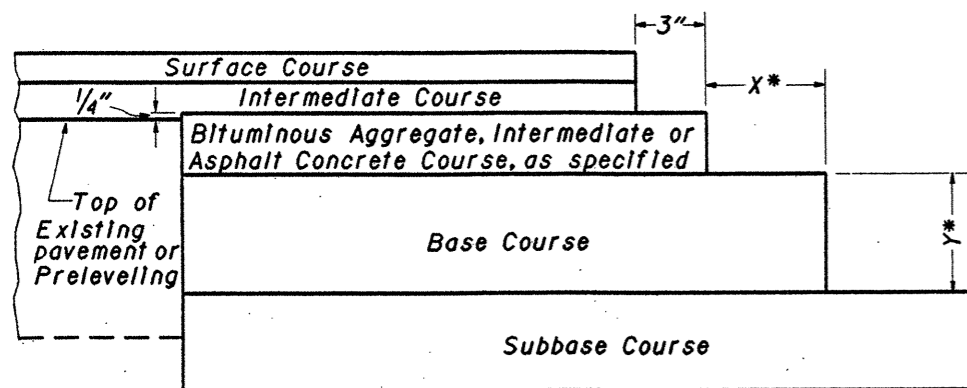
DESIGNED	REVIEWED
JFF	LHW
DRAWN	AS-1-81
JFF	

REVISIONS
9-15-94

STANDARD
REINFORCED CONCRETE
APPROACH SLAB



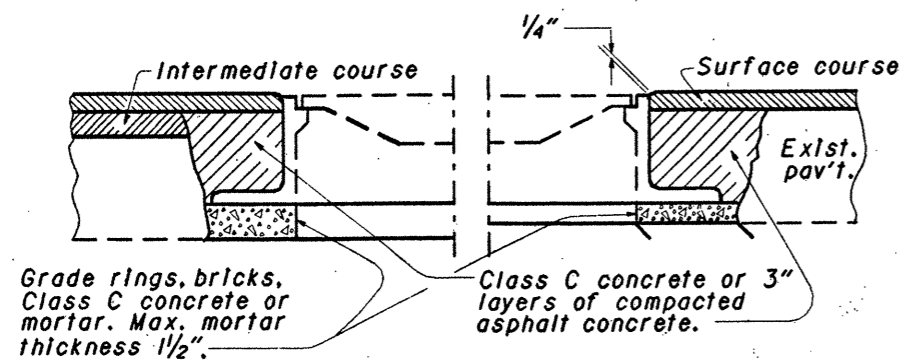
PLAN
MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



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.

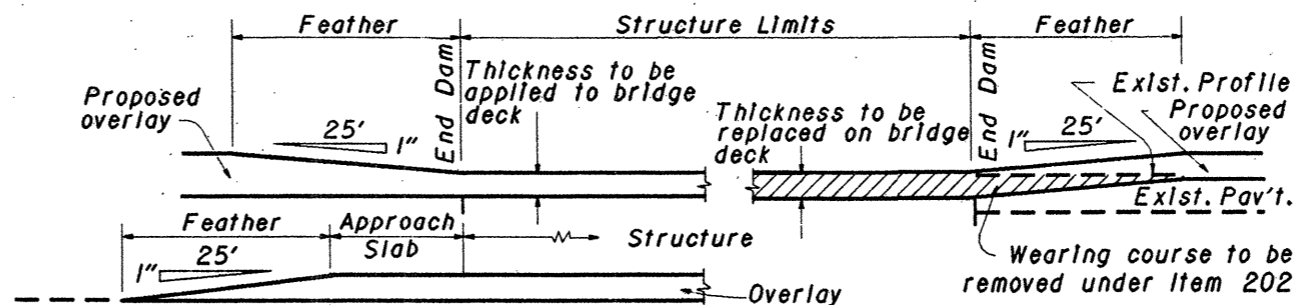
SECTION A-A
COURSE DETAIL FOR WIDENING



USING CONCRETE OR MORTAR

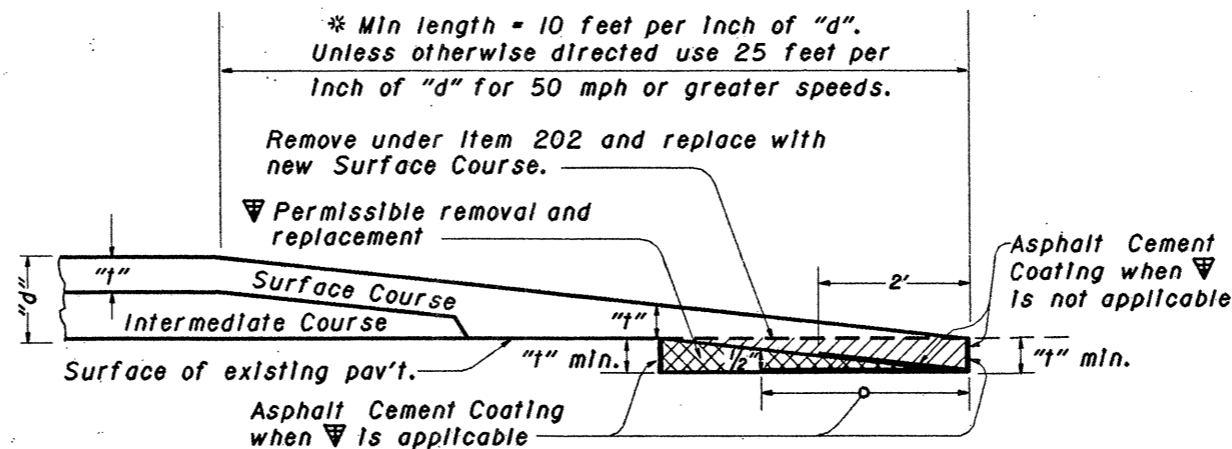
Metal adjusting rings shall: (a) attach securely to the existing frame by welding or mechanical devices; (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and (c) provide an even seat for the manhole cover. In addition,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

MANHOLES ADJUSTED TO GRADE

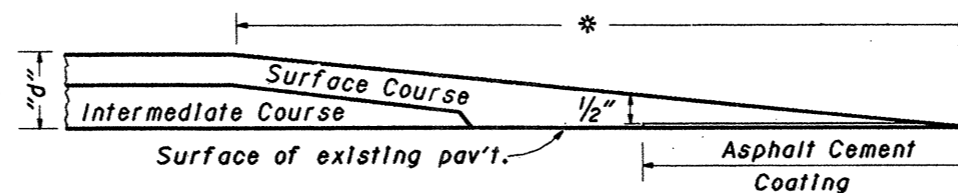


Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES



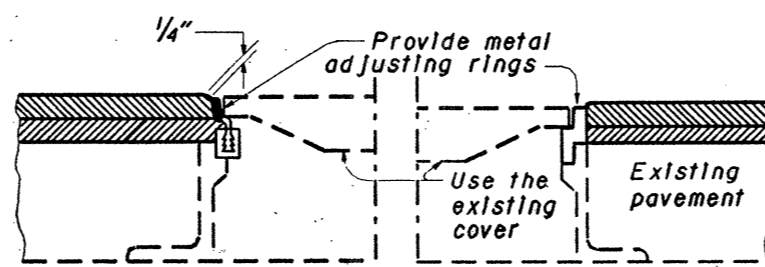
BUTT JOINT TYPE



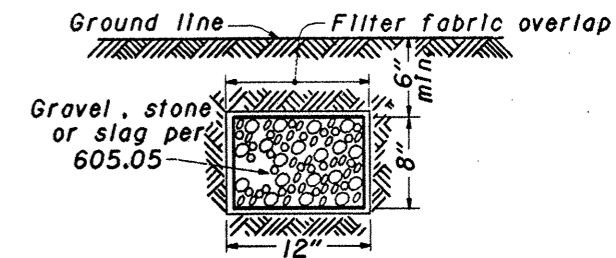
TAPER EDGE TYPE

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

PLACING FEATHERED AREAS

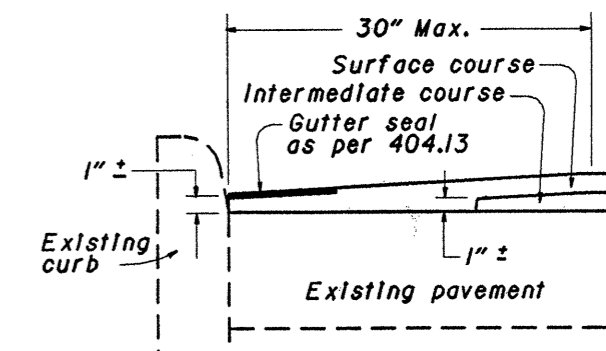


USING METAL ADJUSTING RINGS



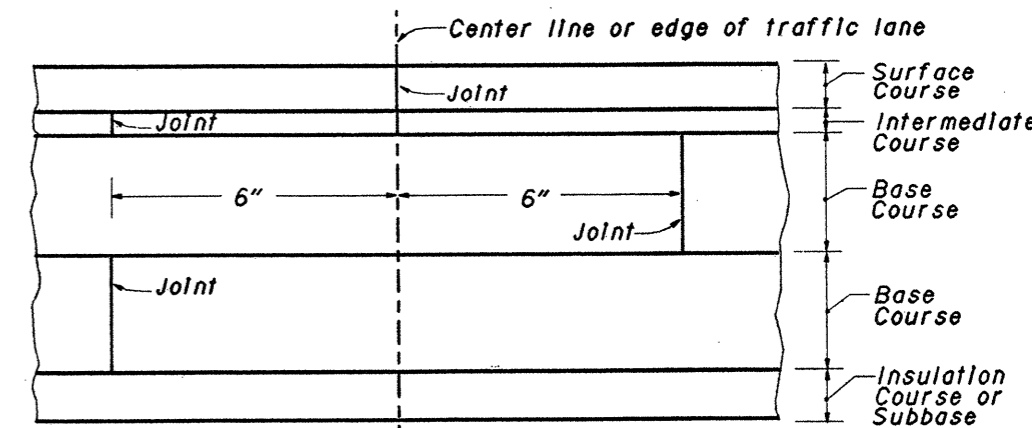
Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item.

AGGREGATE DRAIN



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

GUTTER FINISH



LAPPING LONGITUDINAL JOINTS

BUREAU OF LOCATION AND DESIGN
 OHIO DEPARTMENT OF TRANSPORTATION

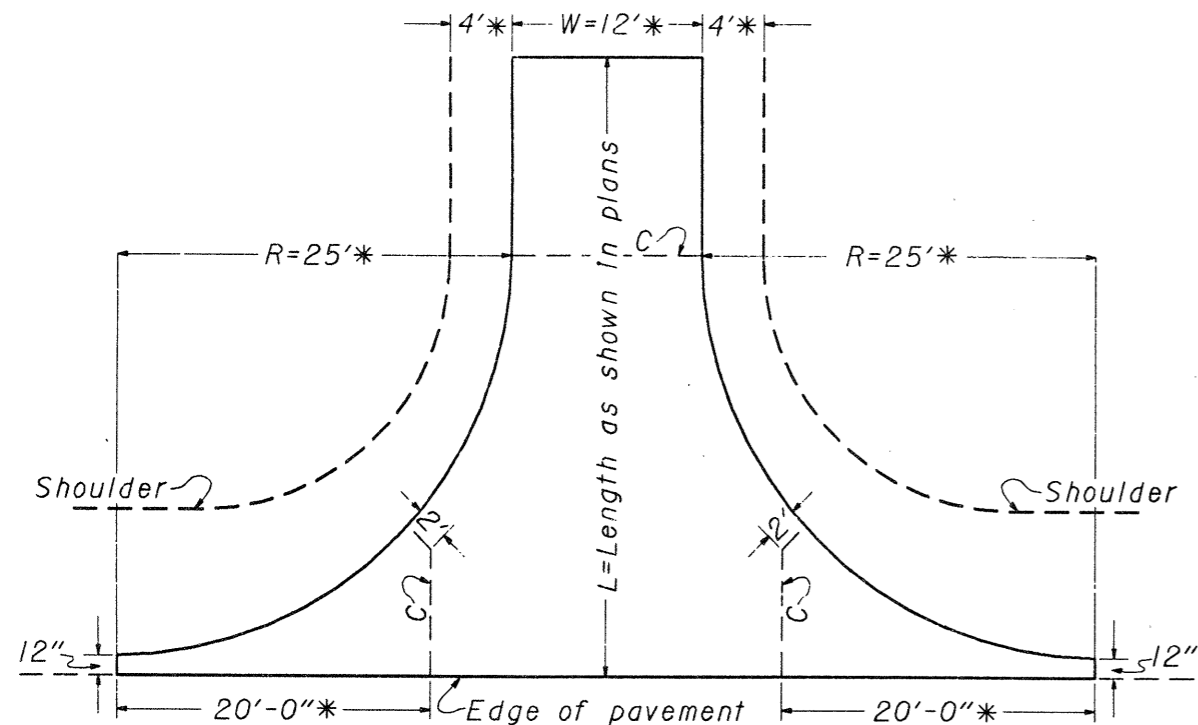
RESURFACING

STANDARD
 CONSTRUCTION
 DRAWING

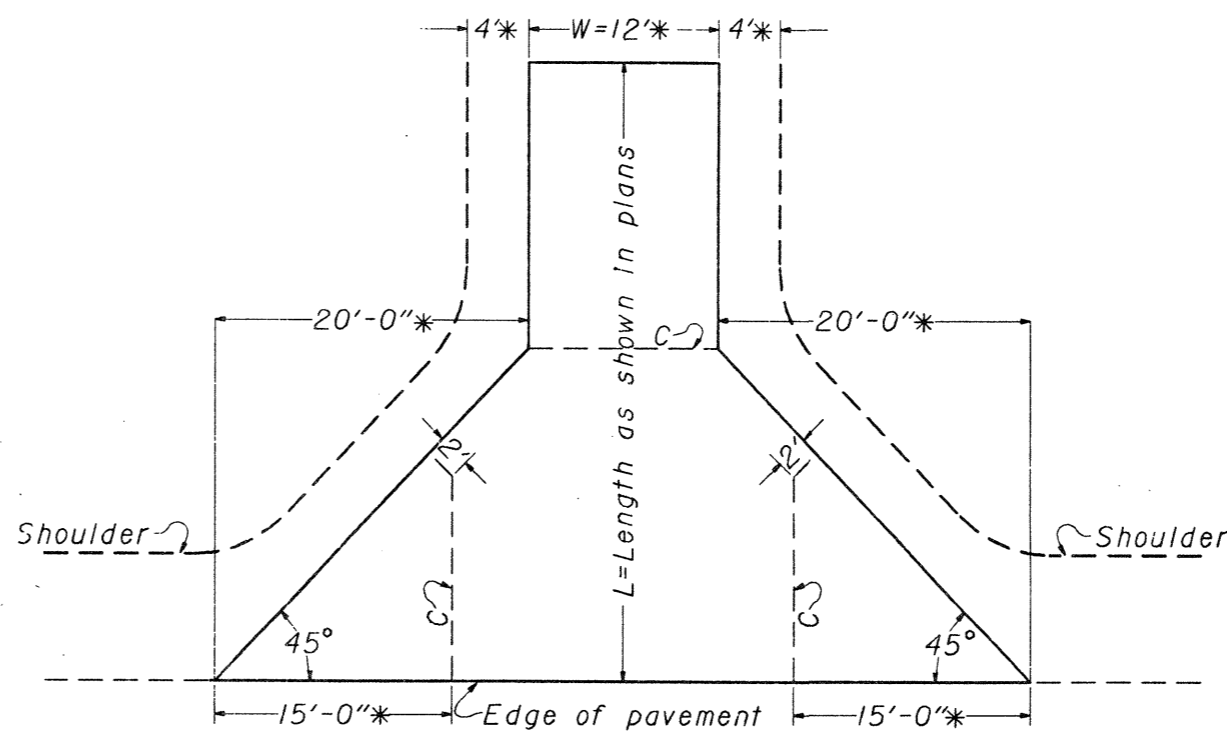
BP-3.1

APPROVED *D.K. Hubman* ENGR., L & D

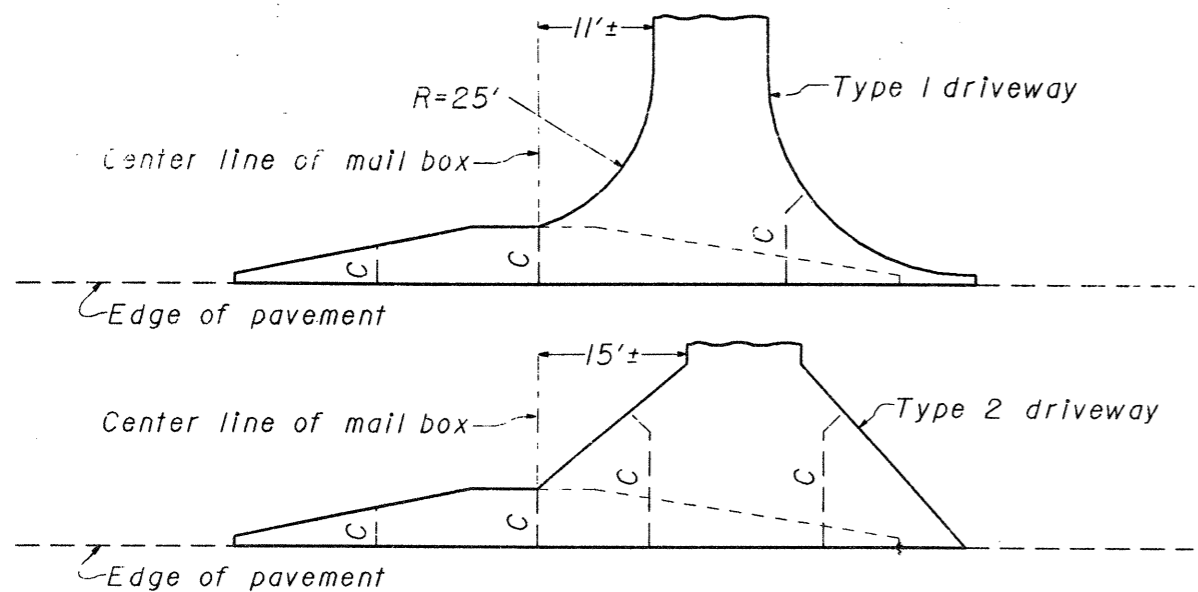
DATE
 2-21-92



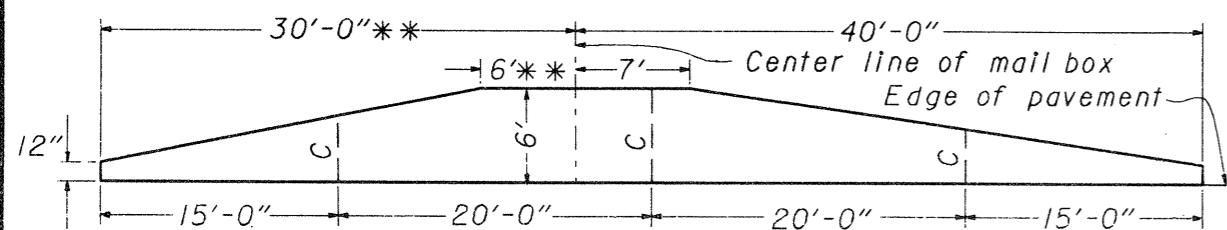
TYPE 1 DRIVEWAY



TYPE 2 DRIVEWAY



COMBINED DRIVEWAY & MAIL BOX APPROACH



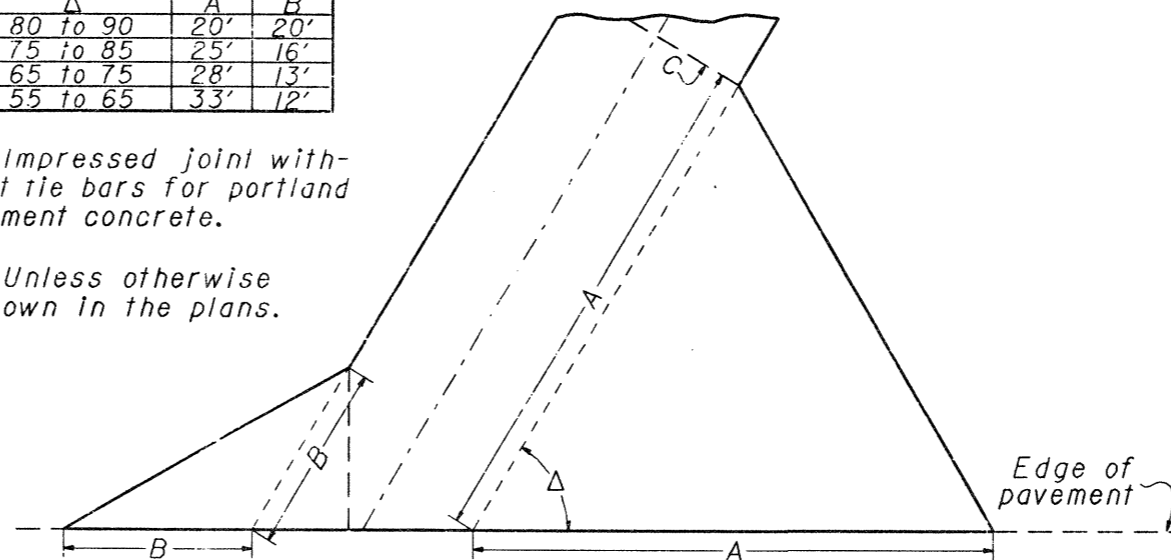
** Add 3 feet for each additional mail box

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'

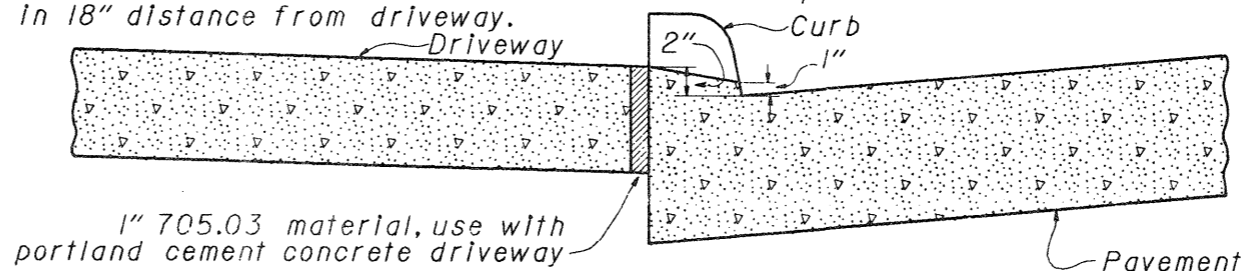
C=Impressed joint without tie bars for portland cement concrete.

* 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.



1" 705.03 material, use with portland cement concrete driveway

DROP CURB DETAILS AT DRIVEWAYS

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.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

DATE
2-21-92

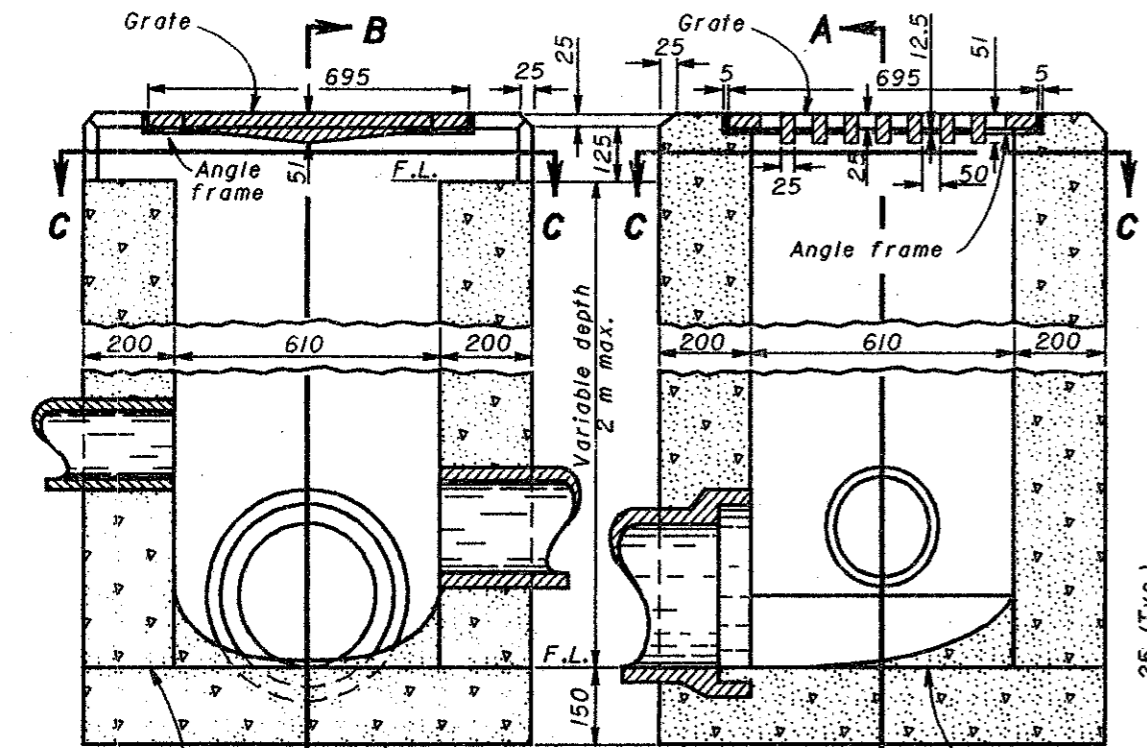
DRIVEWAYS

STANDARD
CONSTRUCTION
DRAWING

BP-4.1

APPROVED *D.K. Hulman* ENGR., L & D

CATCH BASIN No. 2-2A



Permissible const. joint

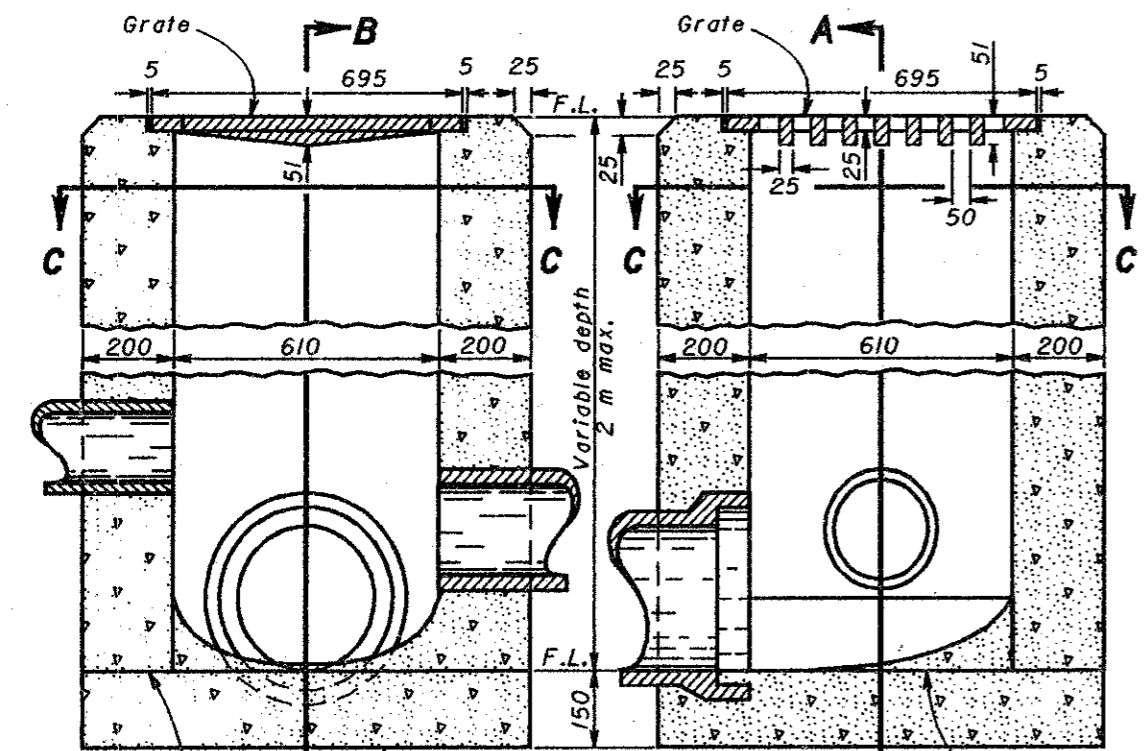
Bottom slab may be precast separately and the outlet pipe placed on top of it with the bottom shaped to drain

Permissible const. joint

SECTION A-A

SECTION B-B

CATCH BASIN No. 2-2B



Permissible const. joint

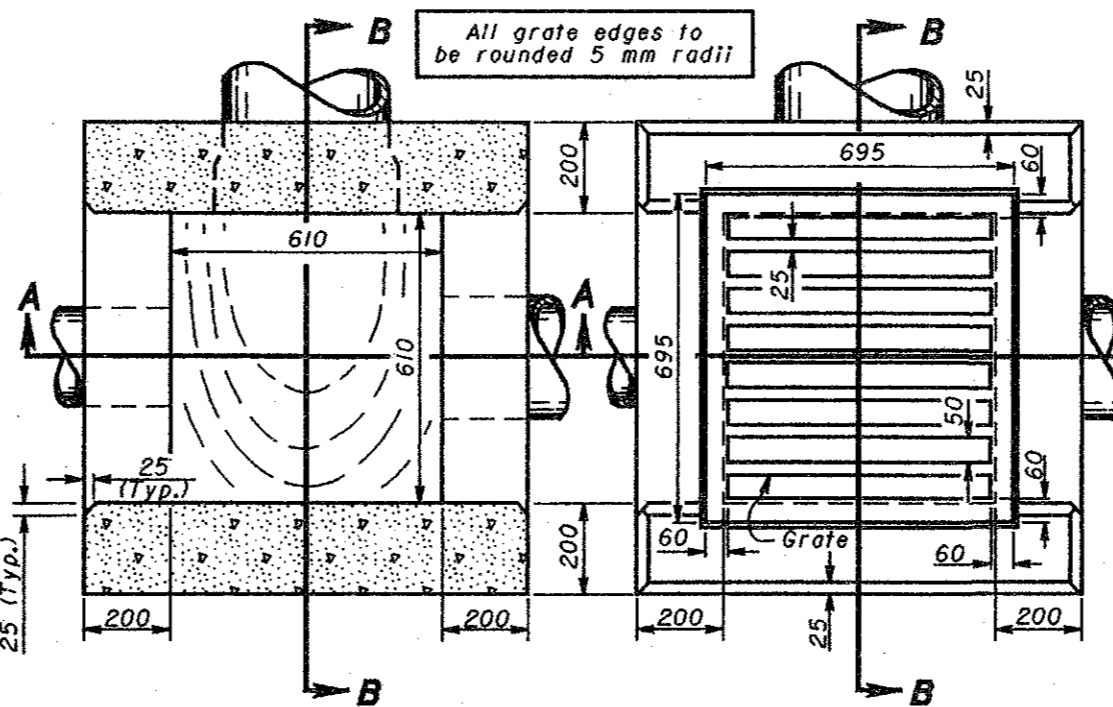
Bottom slab may be precast separately and the outlet pipe placed on top of it with the bottom shaped to drain

Permissible const. joint

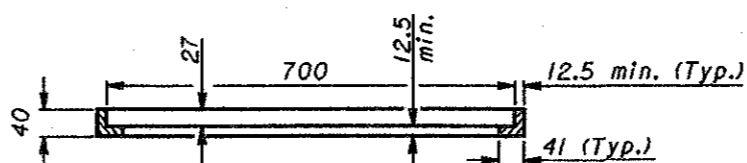
SECTION A-A

SECTION B-B

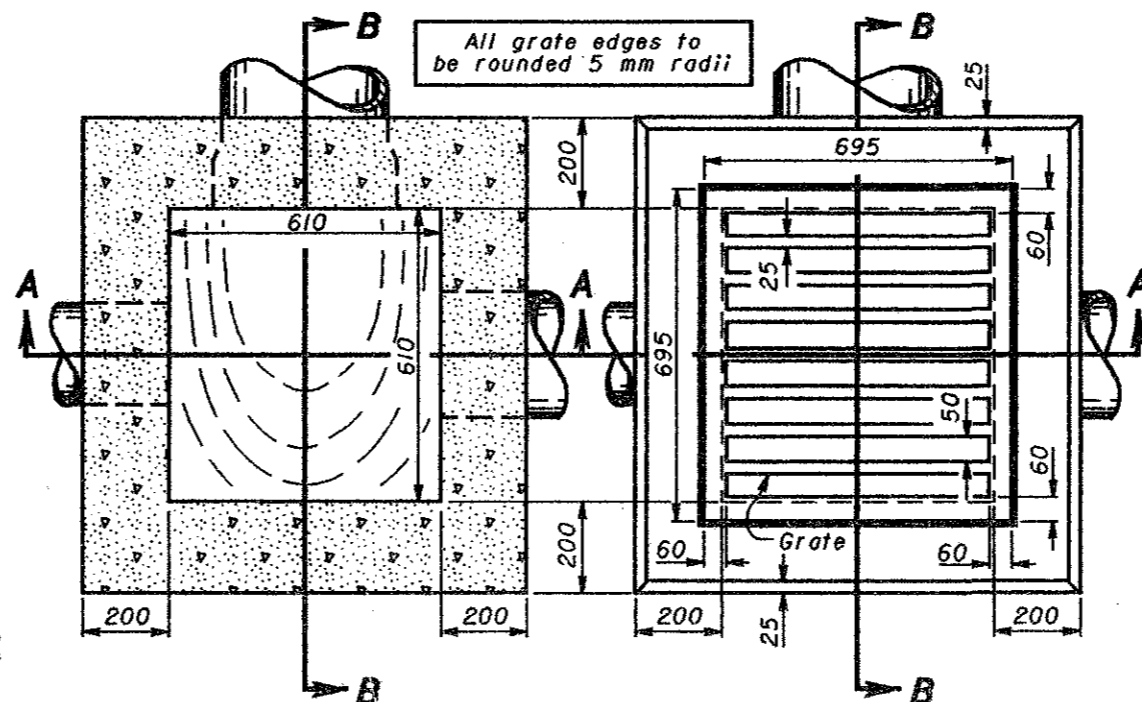
SECTION C-C



PLAN



SECTION THRU ANGLE FRAME FOR STANDARD No. 2-2A CATCH BASIN



SECTION C-C

PLAN

NOTES

GRATE AND FRAME: The design shall be essentially the same and equally as strong as the one shown herein.

WALLS: Brick or cast-in-place walls have a nominal thickness of 200 mm. Precast walls shall have a minimum thickness of 150 mm and be reinforced sufficiently to permit shipping and handling without damage. Brick shall not be used above the flow line of the side opening for Type 2-2A.

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 in the hardened concrete and be marked with the catch basin number.

PRECAST BASE: If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.

LOCATION AND ELEVATION: When given on the plans, location and elevation are at the top center of the grate. When side openings are provided, the elevation shall be at the flow line of the side inlet.

MINIMUM DEPTH: The minimum depth of CB No. 2-2A shall be the outside diameter (O.D.) of the outlet pipe plus 180 mm. The minimum depth for CB No. 2-2B shall be the O.D. of the outlet pipe plus 105 mm.

2-2B GRATE ELEVATION: Grate elevation is to be placed 100 to 150 mm below normal ditch, returning to normal 3 to 5 m each side of inlet.

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.

2-2A SIDE INLETS: Inlets shall be provided on both sides of the No. 2-2A catch basin in sags and on upstream side only where the ditch has a continuous down grade past the catch basin. Side inlets shall not be used within the Clear Zone. The flow line should be 100 to 150 mm below the normal elevation of the ditch flow line, returning to normal within 3 to 5 m of the basin.

CONSTRUCTION INFORMATION

Minimum mass of grate, 54 kg
Minimum mass of frame, 18 kg

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces CB-2-2 A & B.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

CATCH BASINS
No's 2-2A & B

DATE
7-12-95

STANDARD
CONSTRUCTION
DRAWING

APPROVED *W. K. Hulman*
ENGR., L & D

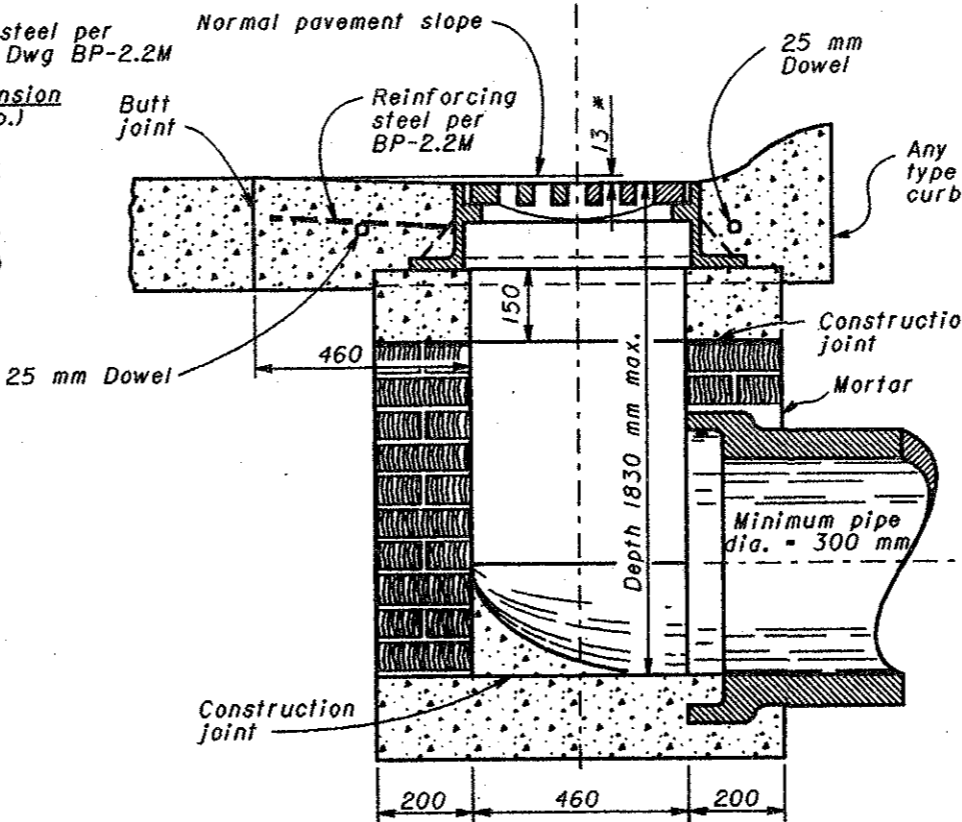
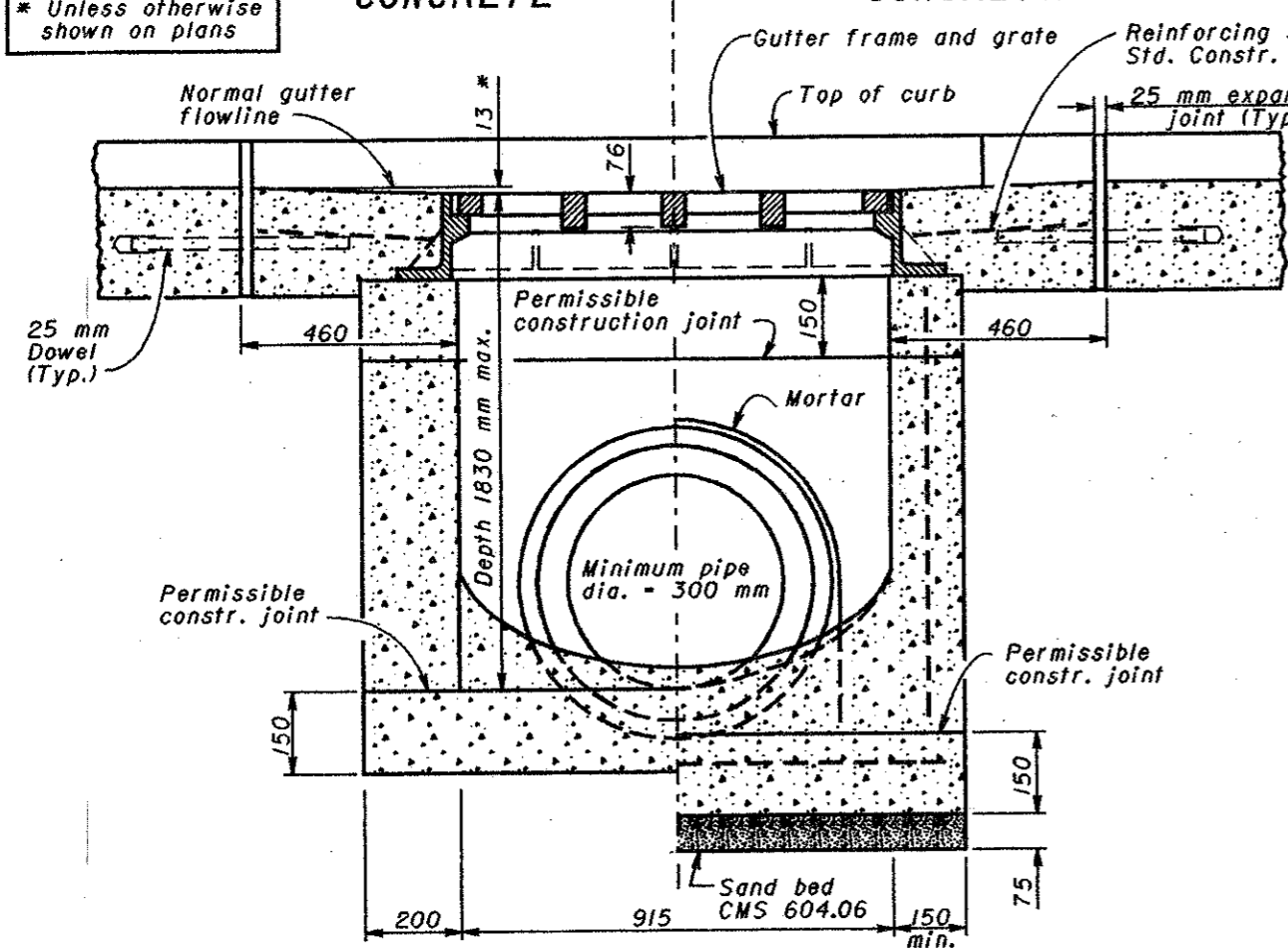
CAST-IN-PLACE CONCRETE

REINFORCED PRECAST CONCRETE

BRICK WALLS

NOTES

* Unless otherwise shown on plans



GRATE AND FRAME: The design shall be essentially the same and equally as strong as those shown hereon.

BEARING AREAS: of frame and grate shall be so fitted and finished as to provide a firm and even seat for all portions of the grate in the frame. No projections shall exist on bearing areas of either casting and the grate shall seat in its frame without rocking. Frame and grate shall be fitted, matched and marked before delivery to the project.

WALLS: Brick or cast-in-place walls shall have a nominal thickness of 200 mm. Precast walls shall have a minimum thickness of 150 mm and be reinforced sufficiently to permit shipping and handling without damage.

CONCRETE: Cast-in-place concrete shall be Class C. Precast concrete shall meet the requirements of CMS 706.13 with a minimum of 4% entrained air in the hardened concrete and be marked with the catch basin number.

MINIMUM DEPTH: The minimum depth shall be the outside diameter (O.D.) of the outlet pipe plus 385 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 and curb. See Std. Constr. Dwg. BP-2.2M for dowel detail.

BLOCKOUT APRONS: Shall be Class C concrete. Cost of apron shall not be included in catch basin bid price when located in PCC pavement, and no deduction in normal pavement quantities shall be made because of the blockout. When adjacent paving is asphalt, the dowels shall be omitted and the cost of the concrete apron shall be included in the catch basin bid price. Cost of curb, if any, shall be included in CMS 609. For basins without curb, the grate elevation shall be 25 mm below the normal pavement slope measured at the center of the grate.

CONSTRUCTION INFORMATION

Minimum mass of grate, 95 kg
Minimum mass of frame, 120 kg

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces CB-6.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

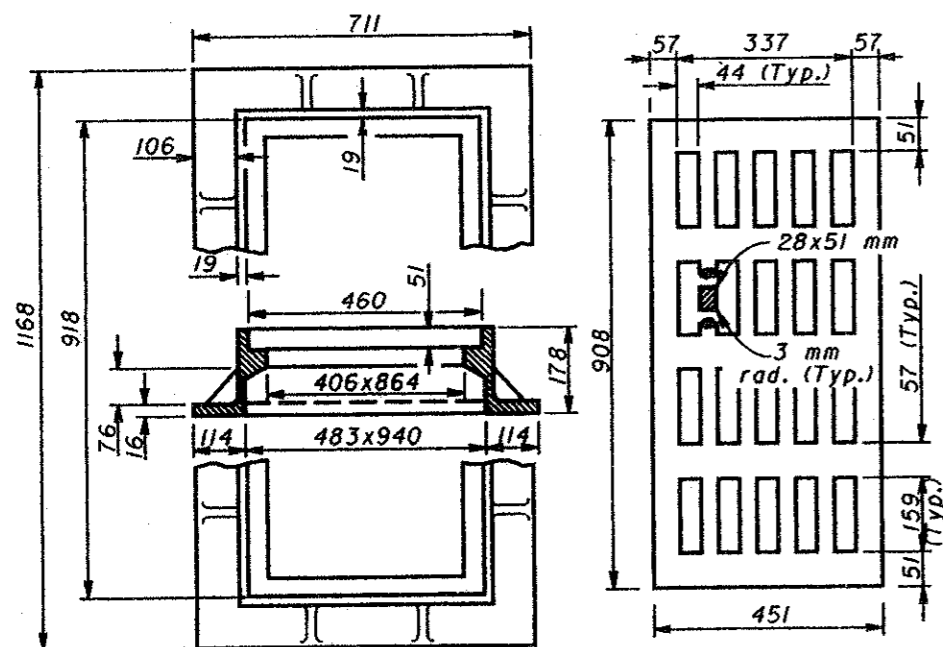
CATCH BASIN No. 6

DATE
7-12-95

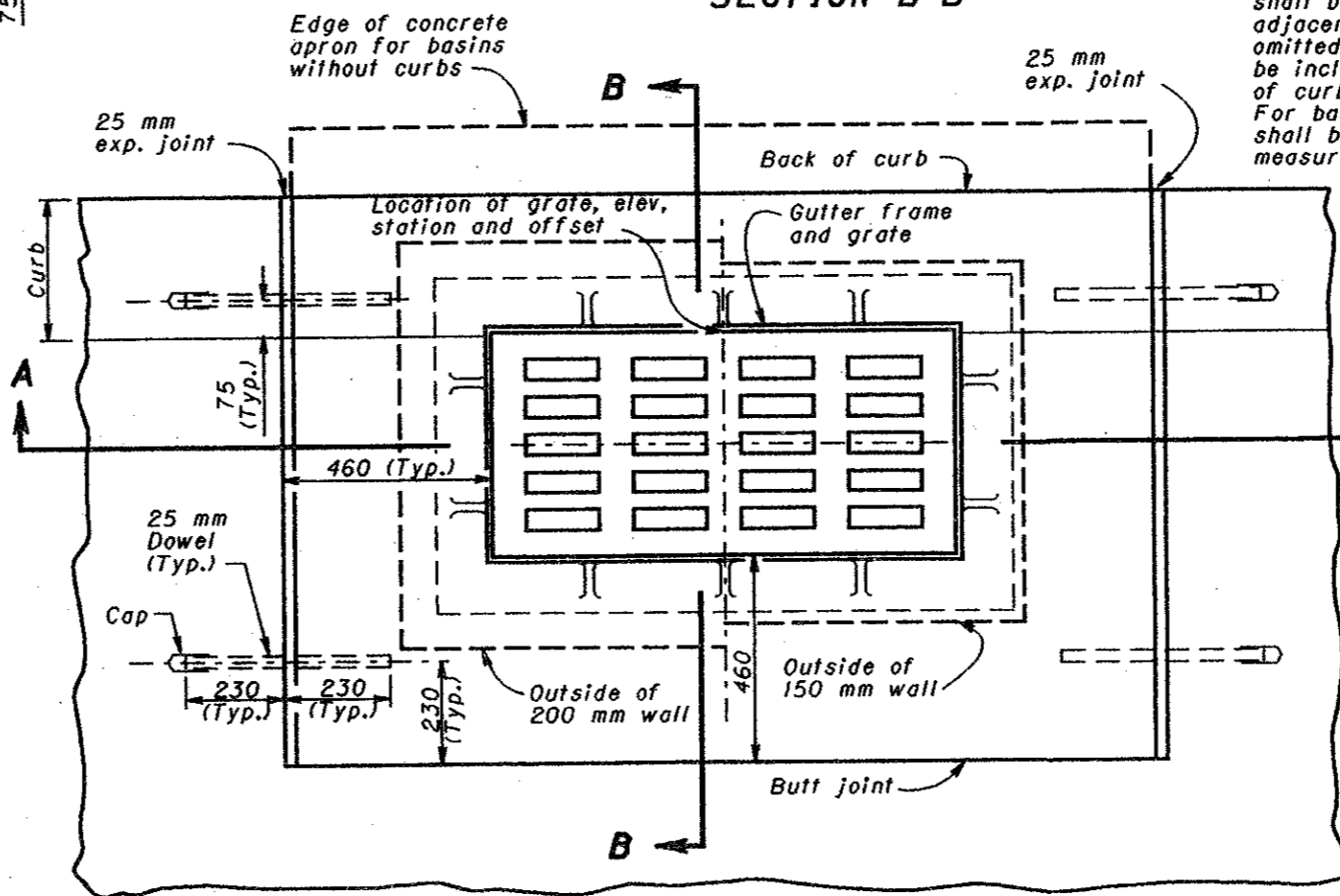
STANDARD CONSTRUCTION DRAWING
CB-2.3M

APPROVED *D. K. Hulman*
ENGR., L & D

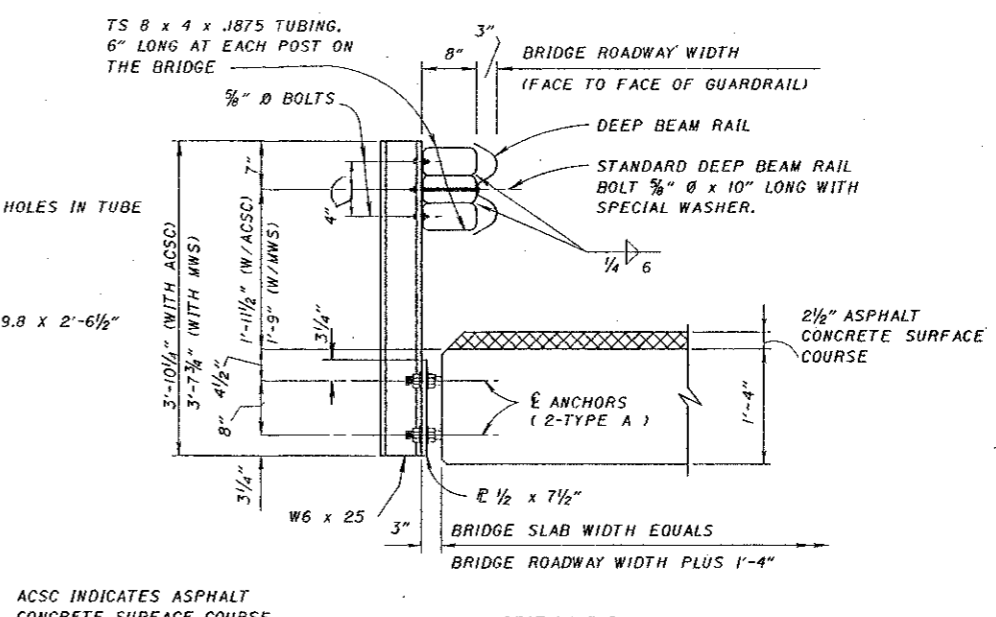
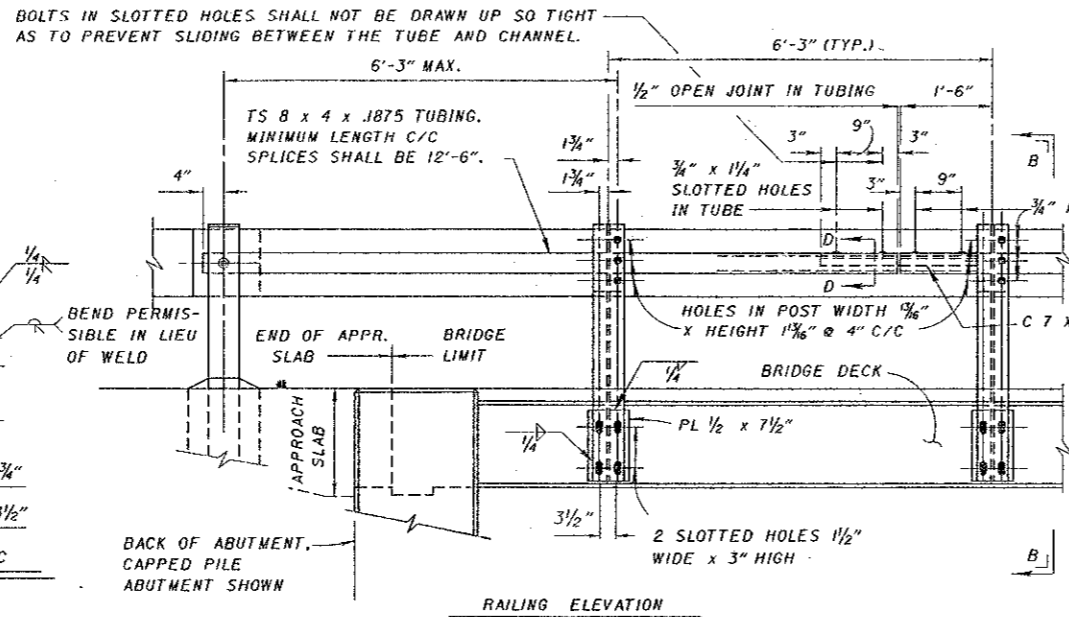
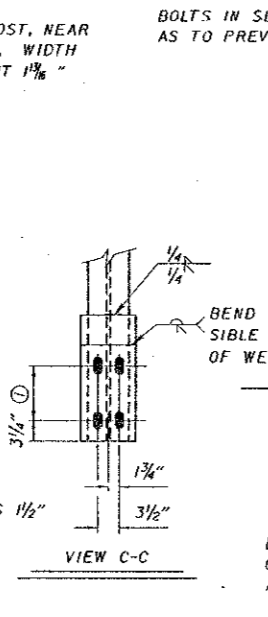
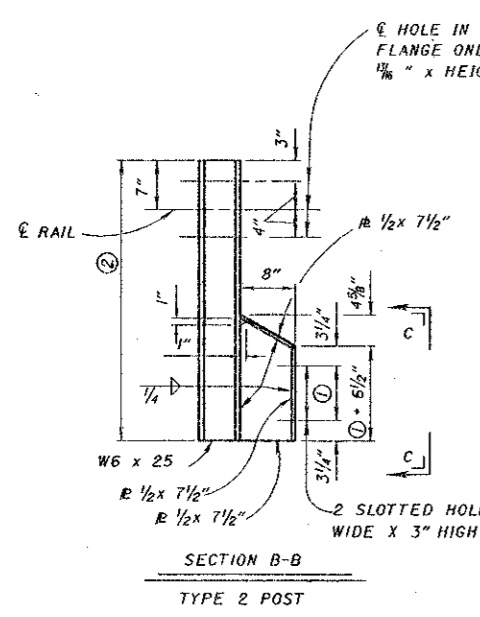
SECTION A-A



SECTION B-B

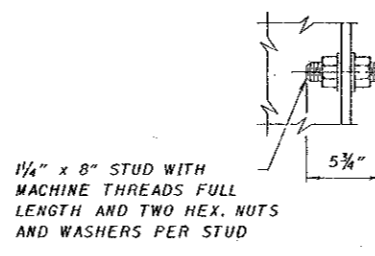
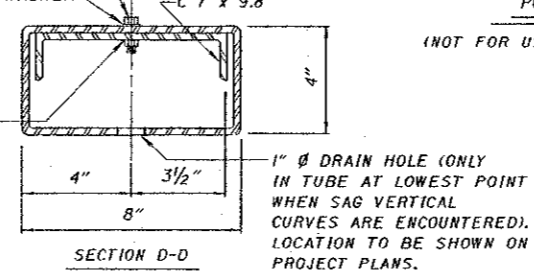
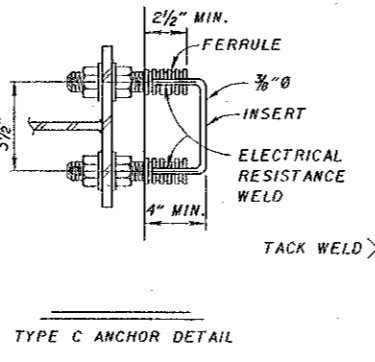
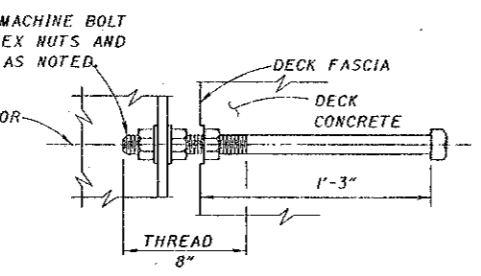
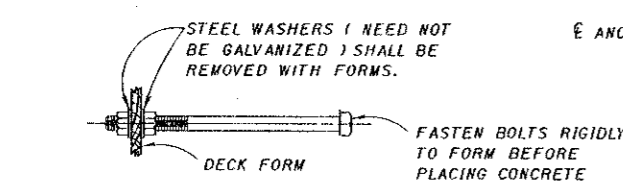
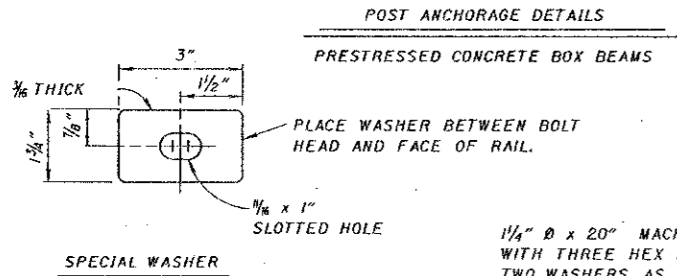
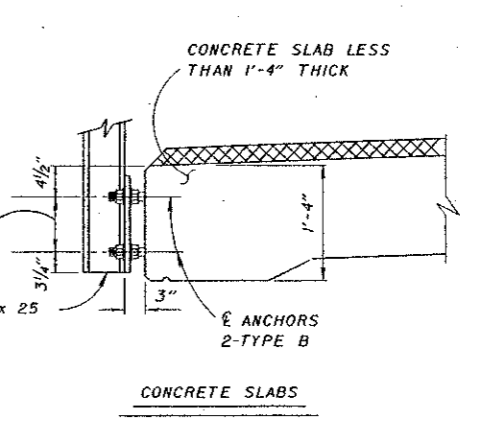
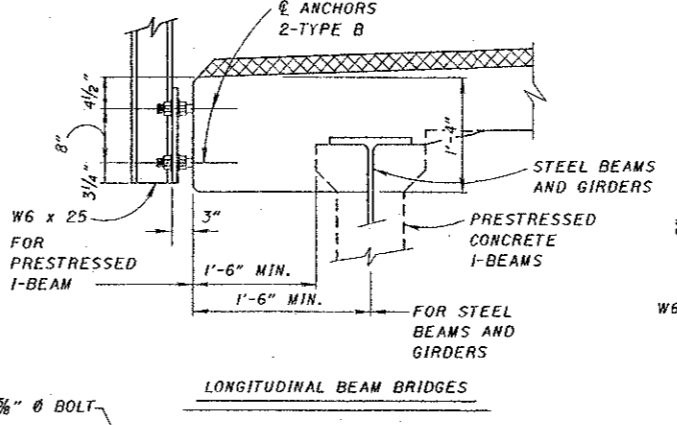
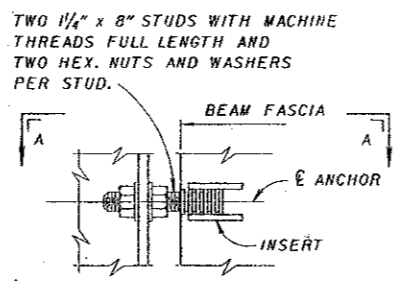
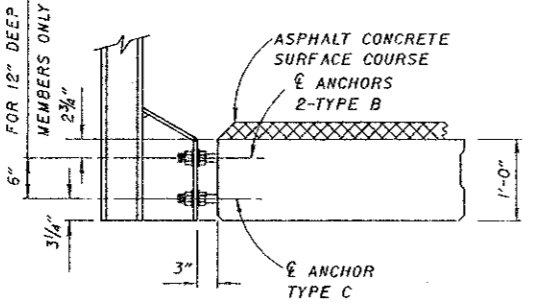
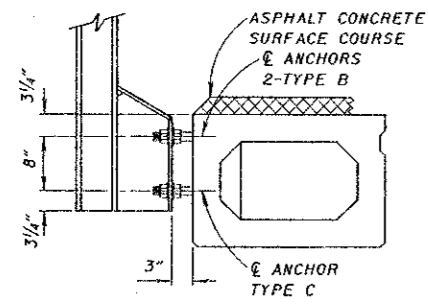


PLAN OF CATCH BASINS AND PAVEMENT JOINTS



DIMENSION ① IS 6" OR 8" DEPENDING ON BOX BEAM DEPTH. SEE PROJECT PLANS AND POST ANCHORAGE DETAILS. PRESTRESSED CONCRETE BOX BEAMS. FOR DIMENSION ② SEE PROJECT PLANS.

(FOR USE WITH PRESTRESSED CONCRETE BOX BEAMS)



MATERIAL: ALL ANCHOR BOLTS, NUTS AND STUDS SHALL CONFORM TO THE PHYSICAL PROPERTIES OF ASTM-A325 EXCEPT THAT THE ELONGATION SHALL BE 10%. THE CHEMICAL PROPERTIES ARE WAIVED.

STEEL TUBING SHALL BE AS PER ITEM T07.10. ALL GUARDRAIL POSTS SHALL BE ASTM A36

GALVANIZING: ALL GUARDRAIL POSTS, TUBES, HARDWARE AND ACCESSORIES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 OR ASTM A153, EXCEPT AS OTHERWISE NOTED.

TYPE C ANCHOR INSERTS OF A DIFFERENT TYPE MAY BE PROVIDED IF APPROVED BY THE DIRECTOR.

TYPE A ANCHORS SHOULD ONLY BE USED ON PROJECTS WHERE THE ORIGINAL ANCHORS WERE TYPE A AND ALL ANCHORS ON ANY SINGLE STRUCTURE ARE NOT BEING REMOVED OR REPLACED

DESIGN AGENCY BUREAU OF BRIDGES AND STRUCTURAL DESIGN
STATE OF OHIO DEPARTMENT OF TRANSPORTATION Robert B. Phelps ENGINEER OF BRIDGES
DATE 4-10-73
REVISED LHW
CHECKED JAM
DESIGNED JFF
REVISIONS 9-15-94
STANDARD DEEP BEAM BRIDGE GUARDRAIL
DBR-2-73
1/1

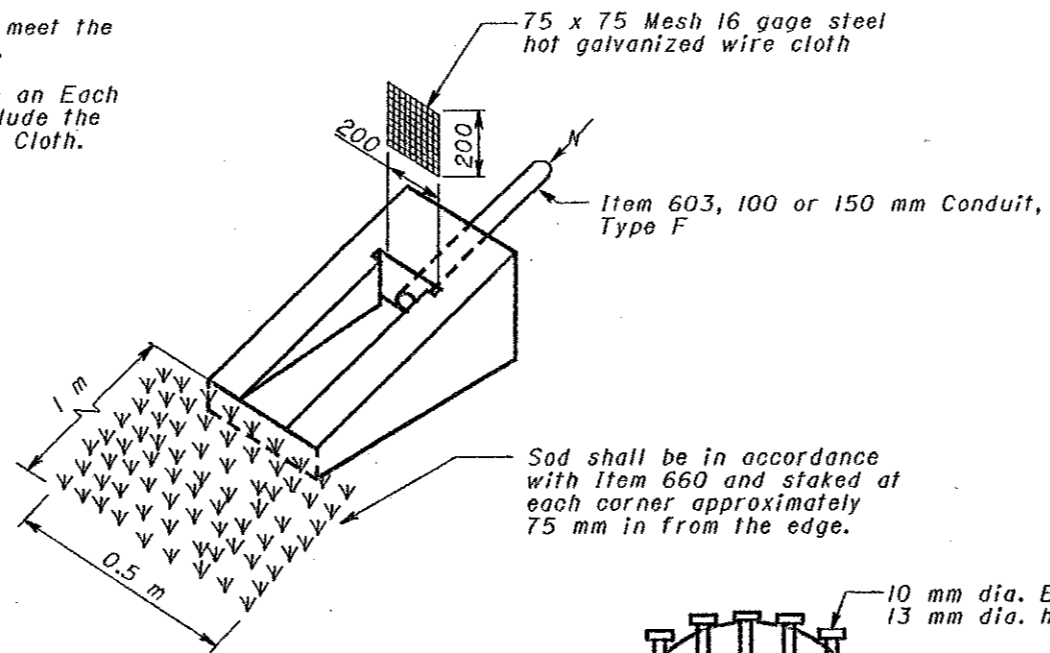
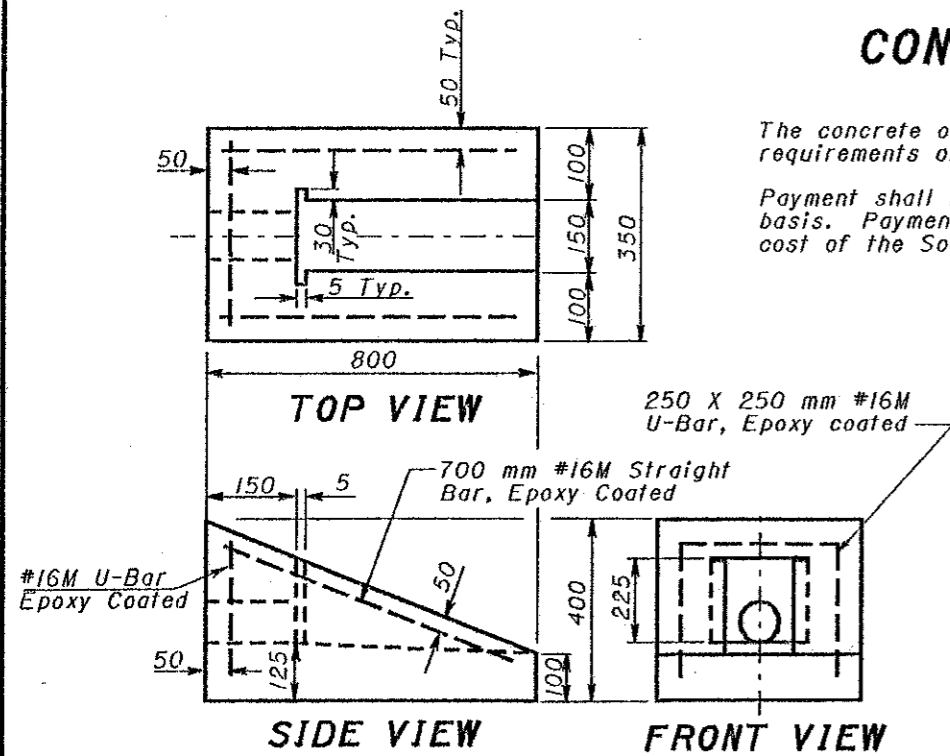
CONSTRUCTION METHODS

NOTES

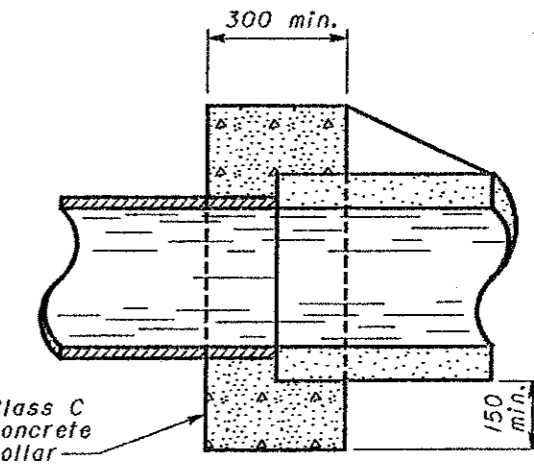
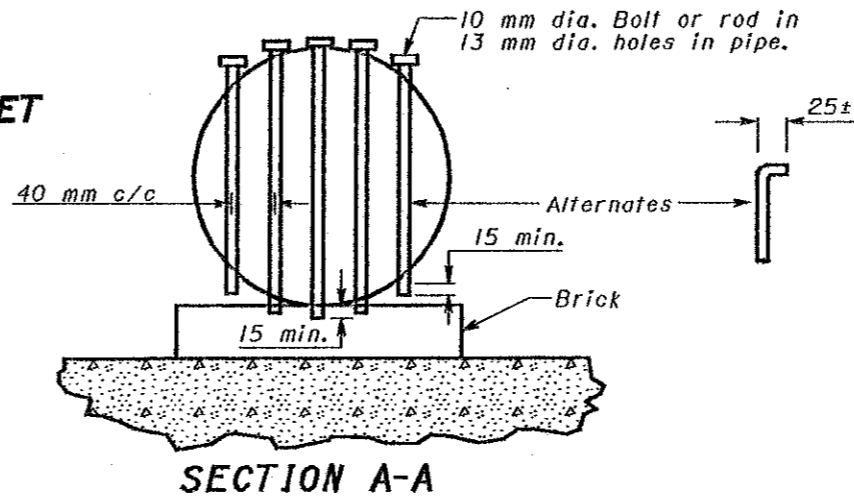
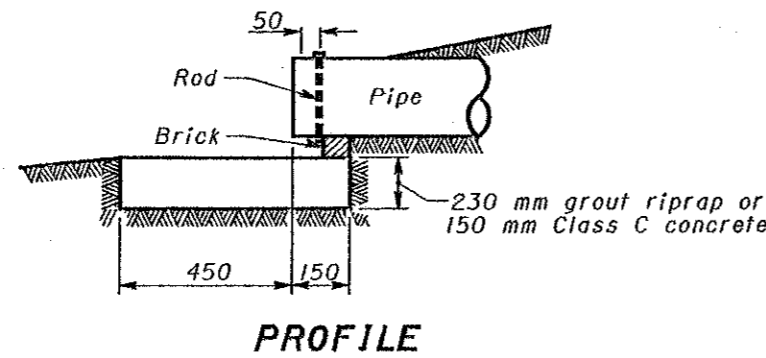
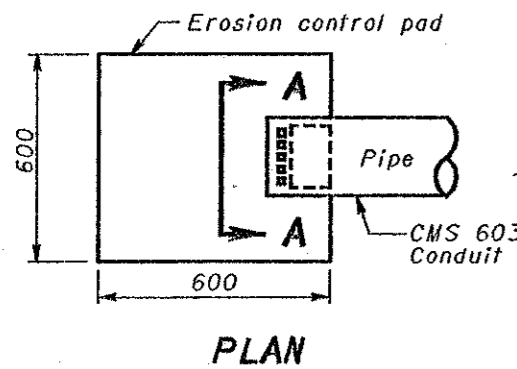
The concrete outlet shall meet the requirements of CMS 604.
 Payment shall be made on an Each basis. Payment shall include the cost of the Sod and Wire Cloth.

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 — .



PRECAST REINFORCED CONCRETE OUTLET



MASONRY COLLAR

EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE

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

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces MC-4.

OHIO DEPARTMENT OF TRANSPORTATION

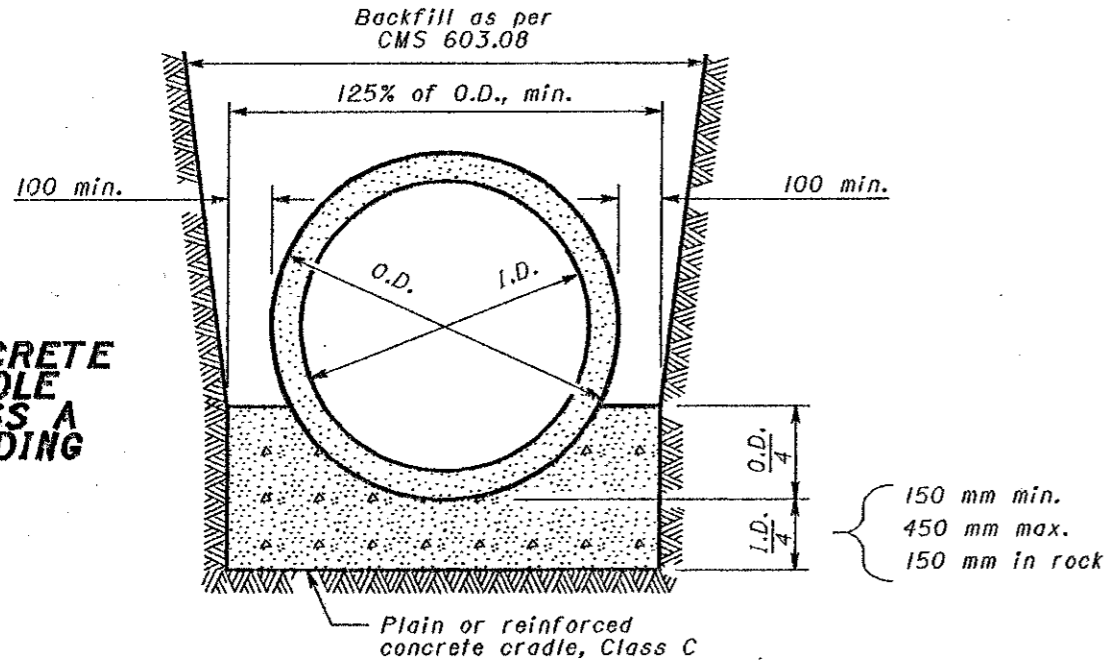
OUTLETS, DRAINS AND SEWERS

DATE: 6-30-95, 10-21-97

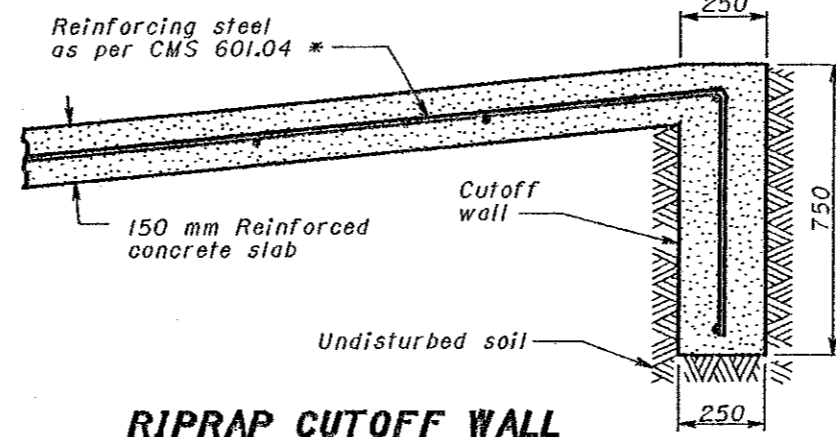
STANDARD CONSTRUCTION **DM-1.1M** DRAWING

APPROVED: *Ray F. Sutherland*

CONCRETE CRADLE CLASS A BEDDING



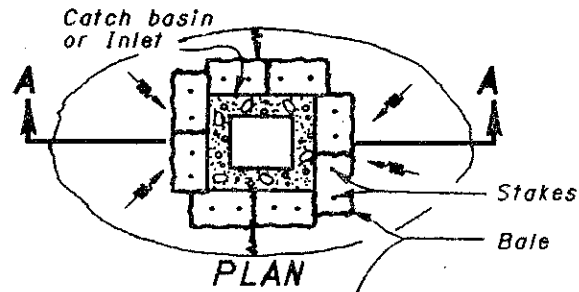
* If wire fabric is used in the slab, #10M bars at 600 mm overlapping the fabric. 300 mm, or wire fabric in accordance with SCD BP-1.1M may be used.



RIPRAP CUTOFF WALL

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

STRAW OR HAY BALES



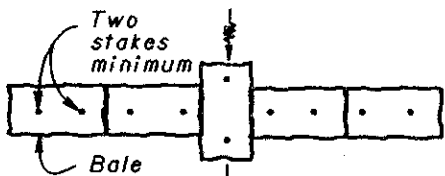
BALE PLACEMENT: Bales shall be tightly placed adjacently and entrenched 50 mm to 75 mm before staking; or a small amount of loose soil shall be lightly compacted along the upstream edge of the bales.

Each bale shall be firmly staked with a minimum of two stakes at least 1 m in length.

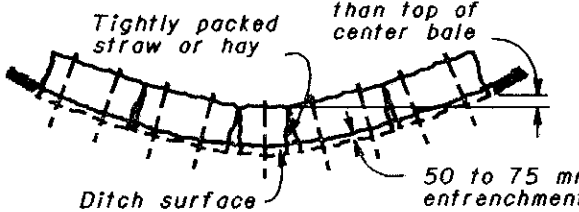
Stakes shall be wooden 50 x 50 mm, reinforcing bars or fence posts, as approved by the Engineer.

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.

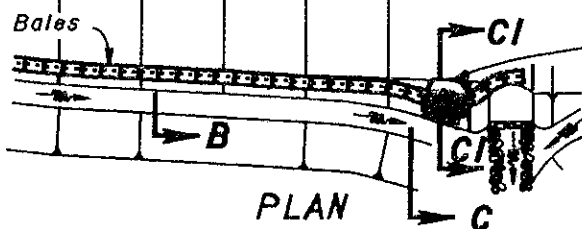
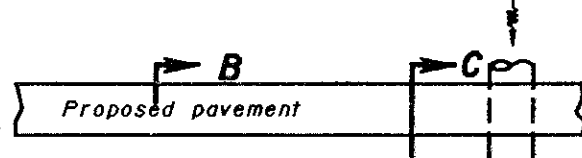
SECTION A-A
BALE INLET FILTER



PLAN

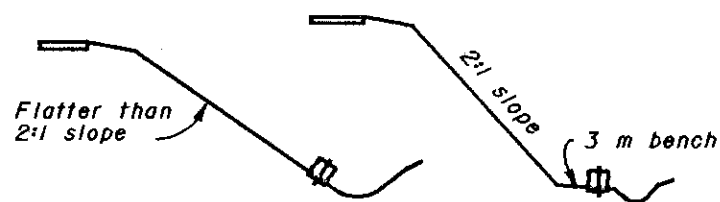


ELEVATION
BALE DITCH CHECK



PLAN

Sediment pit, 0.5 m max. depth with sand and gravel outlet filter, 0.3 m min. height



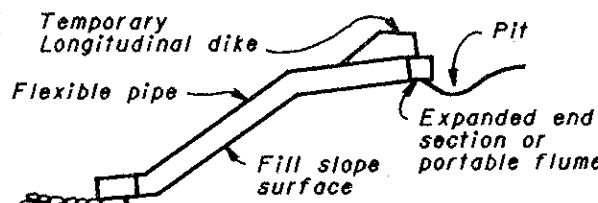
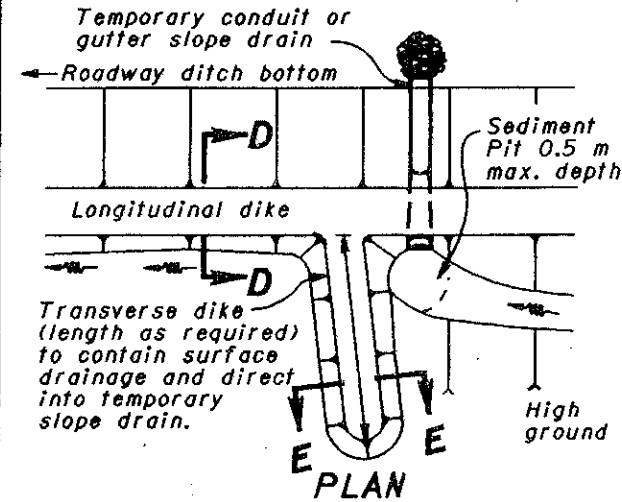
SECTION B-B

SECTION C-C

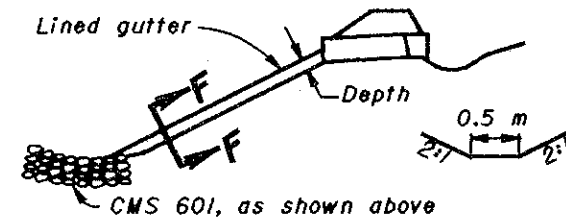
SECTION CI-CI

BALE FILTER DIKE

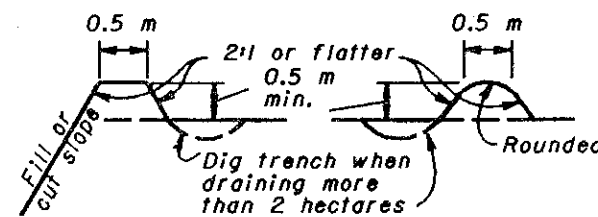
DIKES AND SLOPE PROTECTION



CONDUIT SLOPE DRAIN



SECTION F-F
GUTTER SLOPE DRAIN



SECTION D-D

SECTION E-E

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.

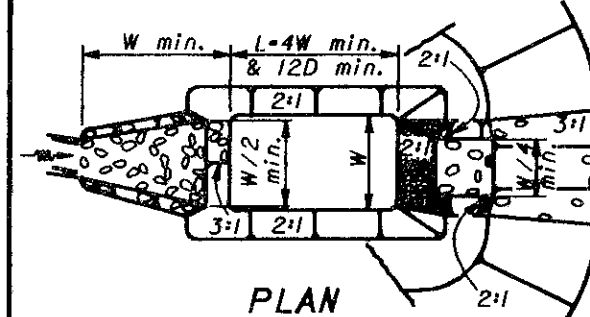
GUTTERS: Gutters for slope drains shall be lined with Type C rock channel protection, crushed aggregate slope protection, portland cement concrete, bituminous concrete, plastic sheeting (on slopes 4:1 max.), partial pipe sections or approved equal.

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

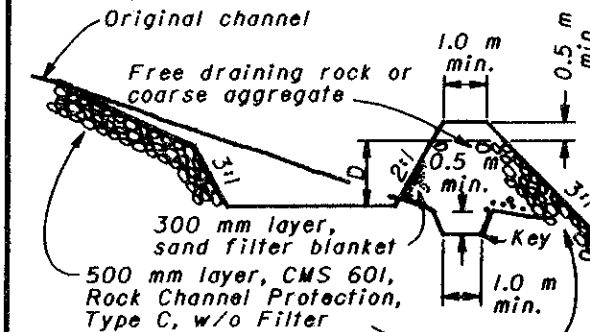
BASIS OF PAYMENT: Temporary dikes shall be paid for under Item 207, Temporary Dikes. Temporary slope drains shall be paid for under Item 207, Temporary Slope Drains. Rock required shall be paid for under Item 601, Rock Channel Protection, Type C, w/o Filter.

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

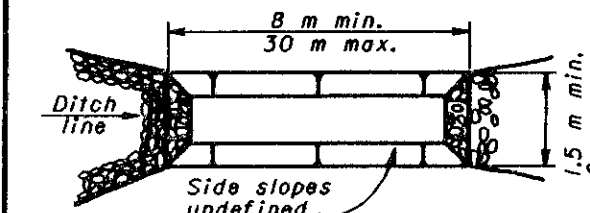
SEDIMENT BASINS & DAMS



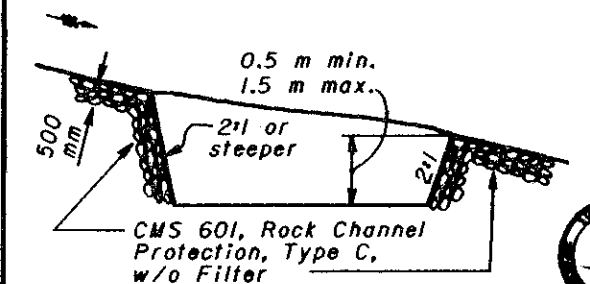
PLAN



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 actual number of cubic meters of excavation and embankment required to construct the basin or dam. Rock required shall be paid for under Item 601, Rock Channel Protection, Type C, w/o Filter.



This Drawing Replaces MC-II.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TEMPORARY
EROSION
CONTROL

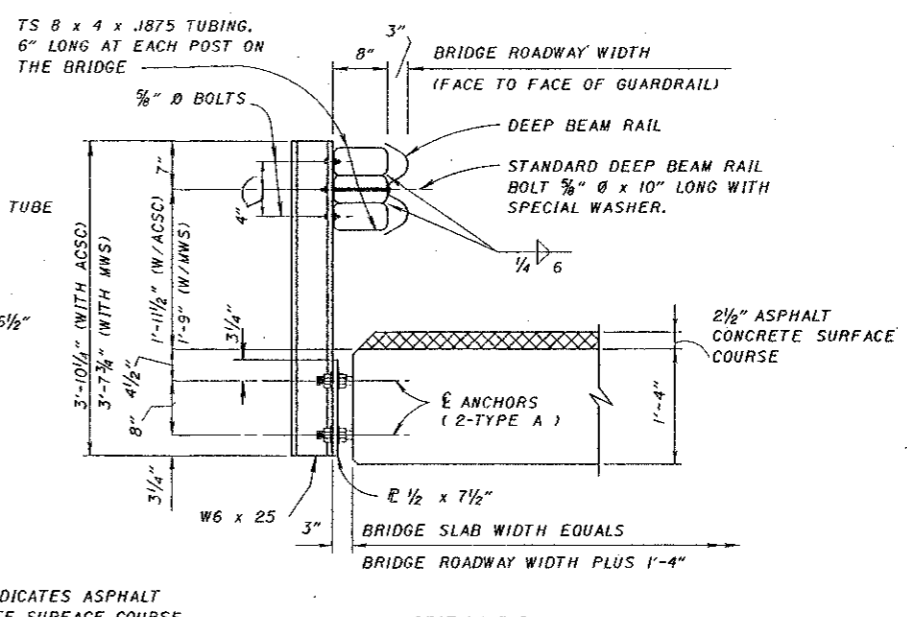
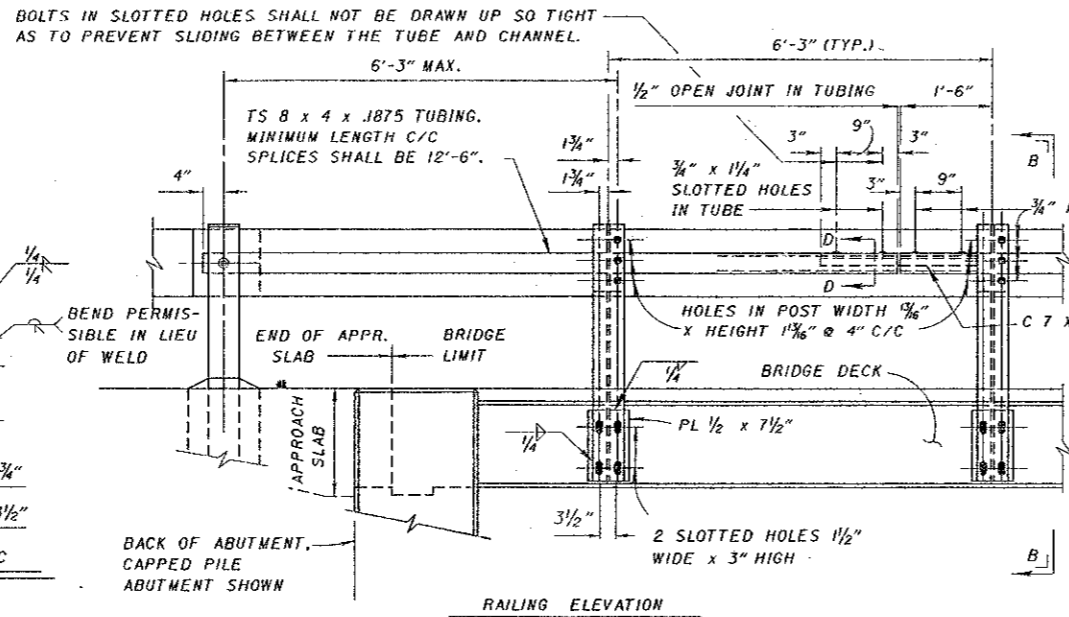
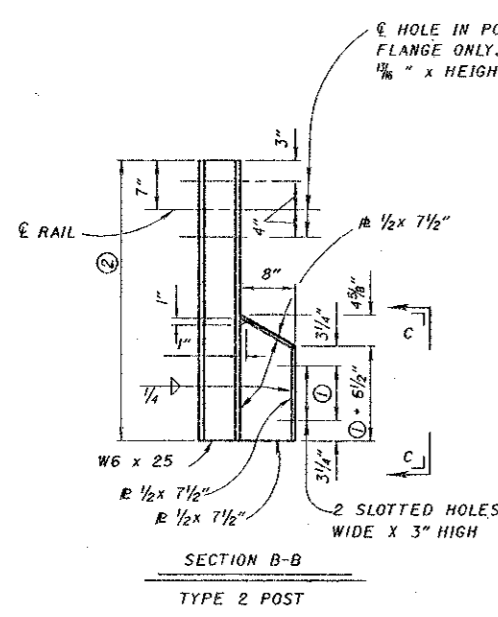
DATE
6-30-95

STANDARD
CONSTRUCTION
DRAWING

DM-4.3M

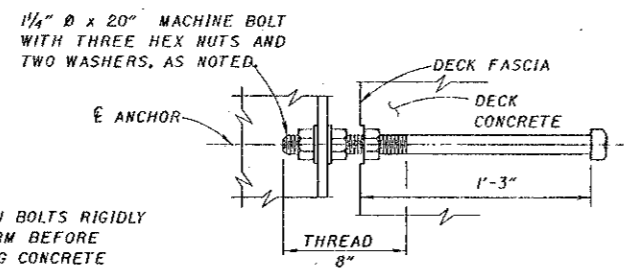
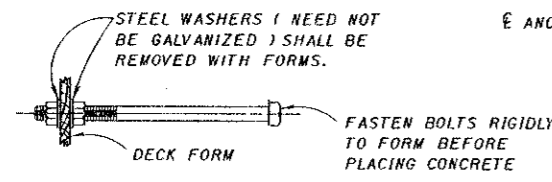
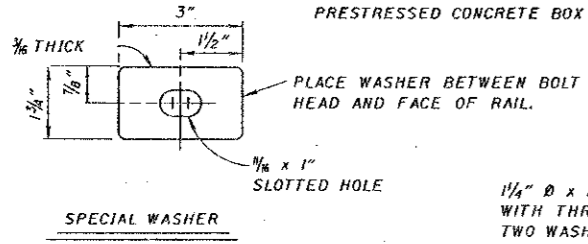
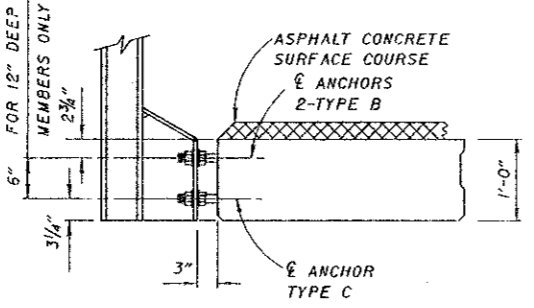
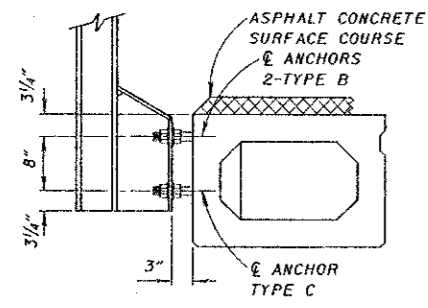
APPROVED: W.K. Hubman

ENGR. L & D



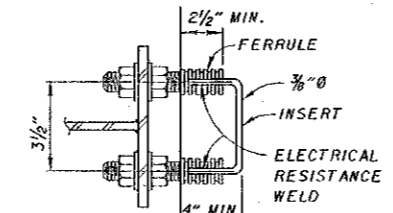
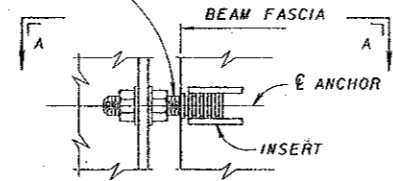
DIMENSION ① IS 6" OR 8" DEPENDING ON BOX BEAM DEPTH. SEE PROJECT PLANS AND POST ANCHORAGE DETAILS. PRESTRESSED CONCRETE BOX BEAMS. FOR DIMENSION ② SEE PROJECT PLANS.

(FOR USE WITH PRESTRESSED CONCRETE BOX BEAMS)

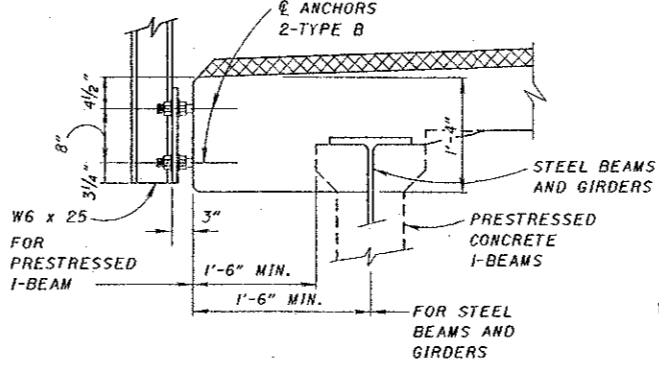


TYPE A ANCHORS SHOULD ONLY BE USED ON PROJECTS WHERE THE ORIGINAL ANCHORS WERE TYPE A AND ALL ANCHORS ON ANY SINGLE STRUCTURE ARE NOT BEING REMOVED OR REPLACED

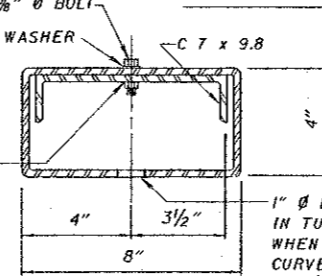
TWO 1/4" x 8" STUDS WITH MACHINE THREADS FULL LENGTH AND TWO HEX. NUTS AND WASHERS PER STUD.



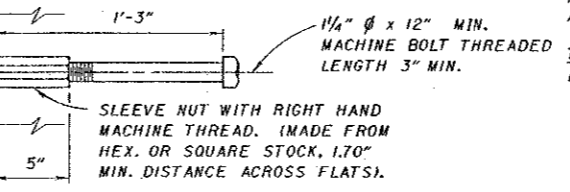
TYPE C ANCHOR DETAIL



LONGITUDINAL BEAM BRIDGES



POST ANCHORAGE DETAILS (NOT FOR USE WITH PRESTRESSED BOX BEAMS)



TYPE B ANCHOR DETAIL

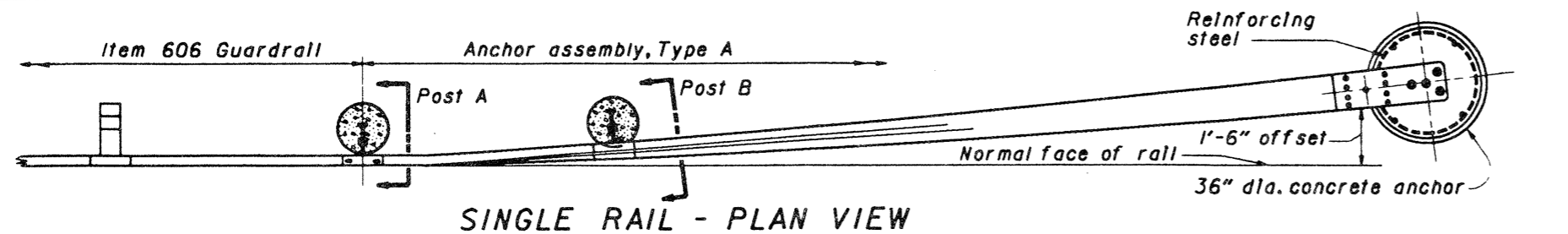
MATERIAL: ALL ANCHOR BOLTS, NUTS AND STUDS SHALL CONFORM TO THE PHYSICAL PROPERTIES OF ASTM-A325 EXCEPT THAT THE ELONGATION SHALL BE 10 %. THE CHEMICAL PROPERTIES ARE WAIVED.

STEEL TUBING SHALL BE AS PER ITEM T07.10. ALL GUARDRAIL POSTS SHALL BE ASTM A36

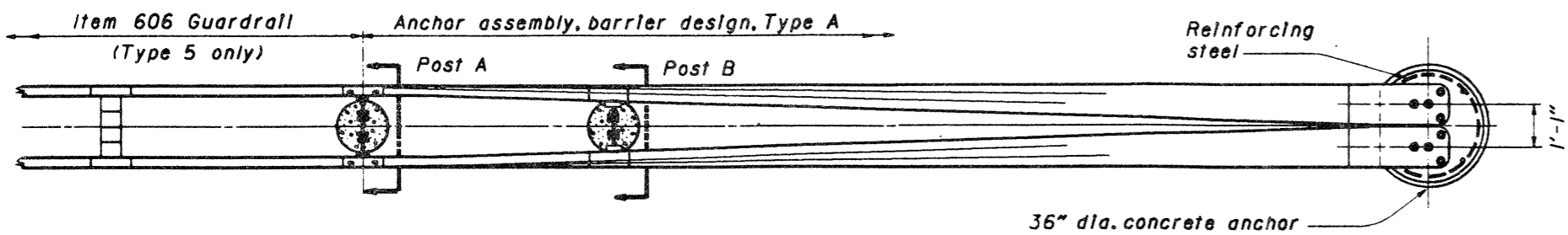
GALVANIZING: ALL GUARDRAIL POSTS, TUBES, HARDWARE AND ACCESSORIES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 OR ASTM A153, EXCEPT AS OTHERWISE NOTED.

TYPE C ANCHOR INSERTS OF A DIFFERENT TYPE MAY BE PROVIDED IF APPROVED BY THE DIRECTOR.

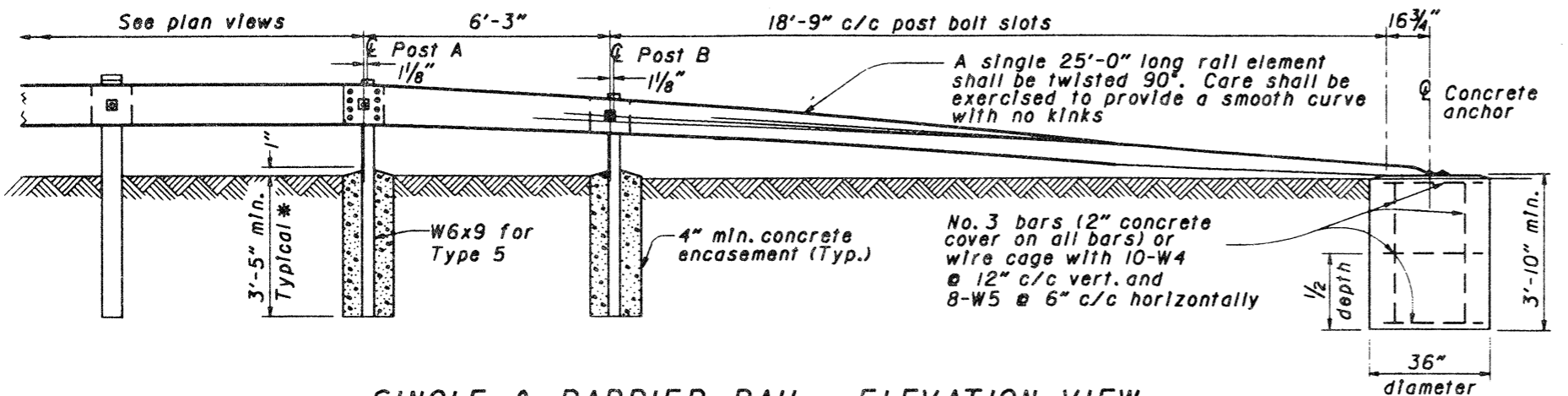
DESIGN AGENCY	BUREAU OF BRIDGES AND STRUCTURAL DESIGN
STATE OF OHIO DEPARTMENT OF TRANSPORTATION	DATE 4-10-73
ENGINEER OF BRIDGES	Robert B. Pfeiffer
REVISIONS	9-15-94
DESIGNED	JFF REF
CHECKED	JAM
REVISED	LHW
STANDARD	DBR-2-73
DEEP BEAM BRIDGE GUARDRAIL	
1 / 1	



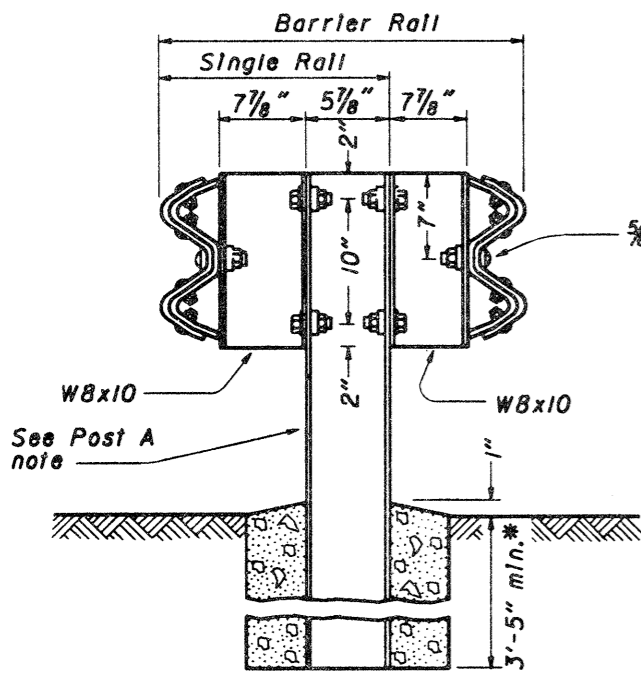
SINGLE RAIL - PLAN VIEW



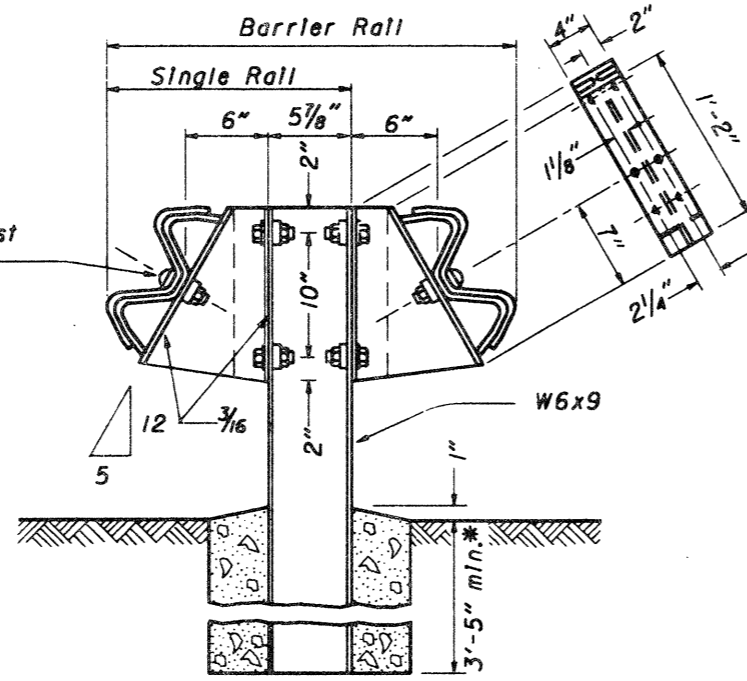
BARRIER RAIL - PLAN VIEW



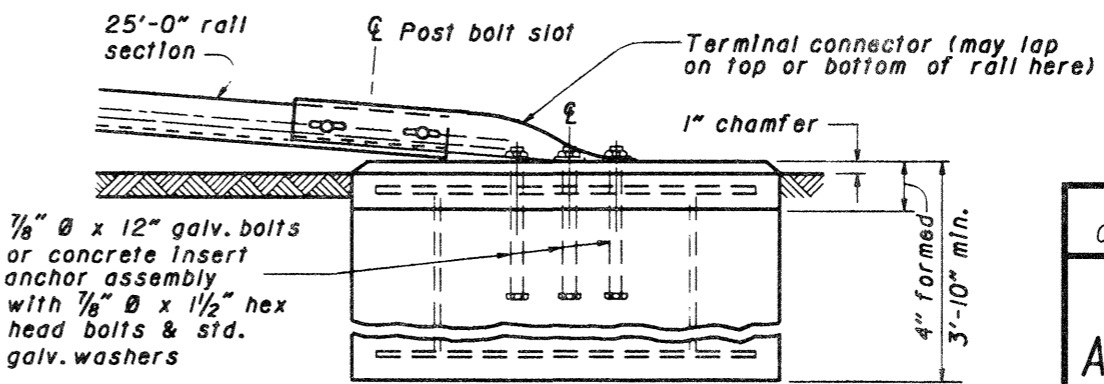
SINGLE & BARRIER RAIL - ELEVATION VIEW



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 5/8" hexhead bolts and nuts with standard washers on both sides.

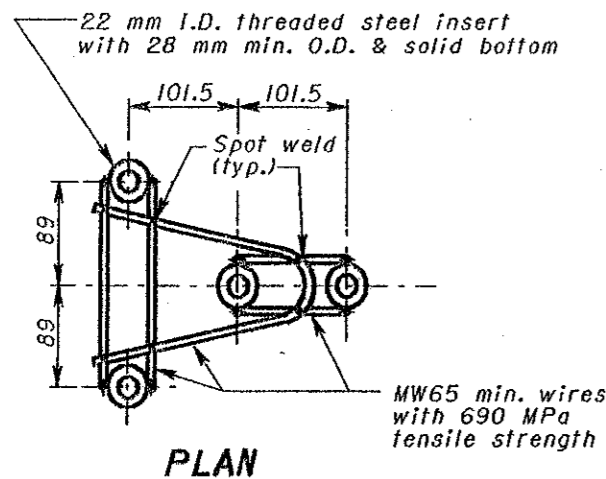
ALL WASHERS INDICATED on this drawing are standard galvanized steel of the appropriate size.

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.

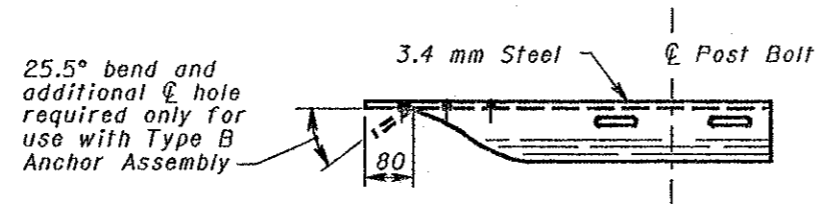
POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 guardrail, Post A shall be a standard Type 4 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 5/8" diameter.

* **FOR SINGLE RAIL INSTALLATIONS,** see Standard Construction Drawing GR-1.2 for additional post embedment details.

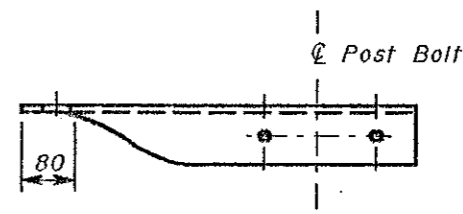
BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION		DATE 5-6-91
TYPE A ANCHOR ASSEMBLY		
STANDARD CONSTRUCTION DRAWING	GR-4.1	
APPROVED <i>D.K. Hulman</i> ENGR., L. & D.		



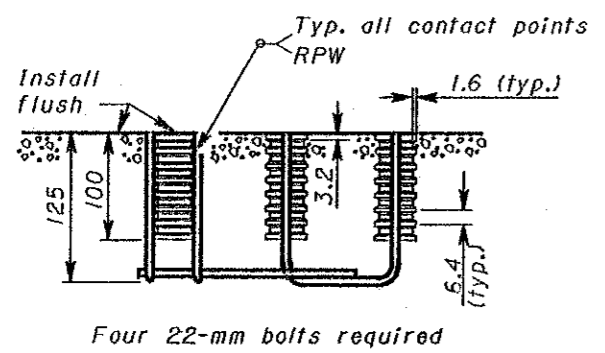
PLAN



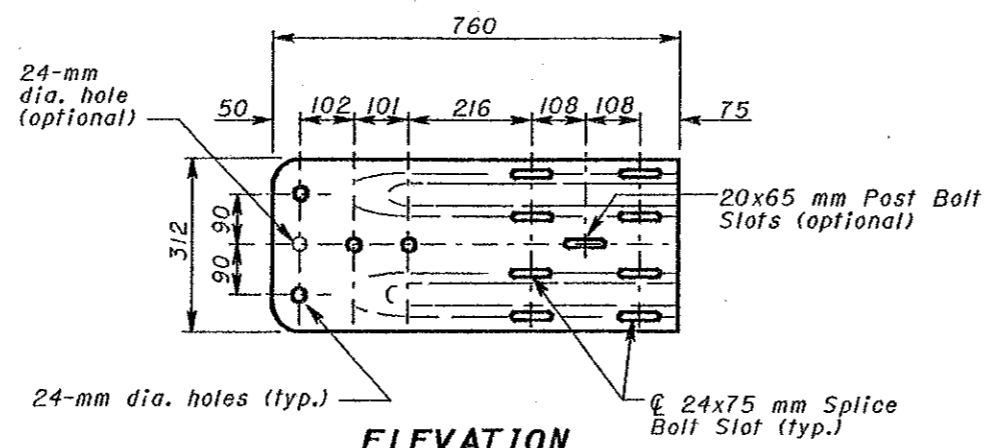
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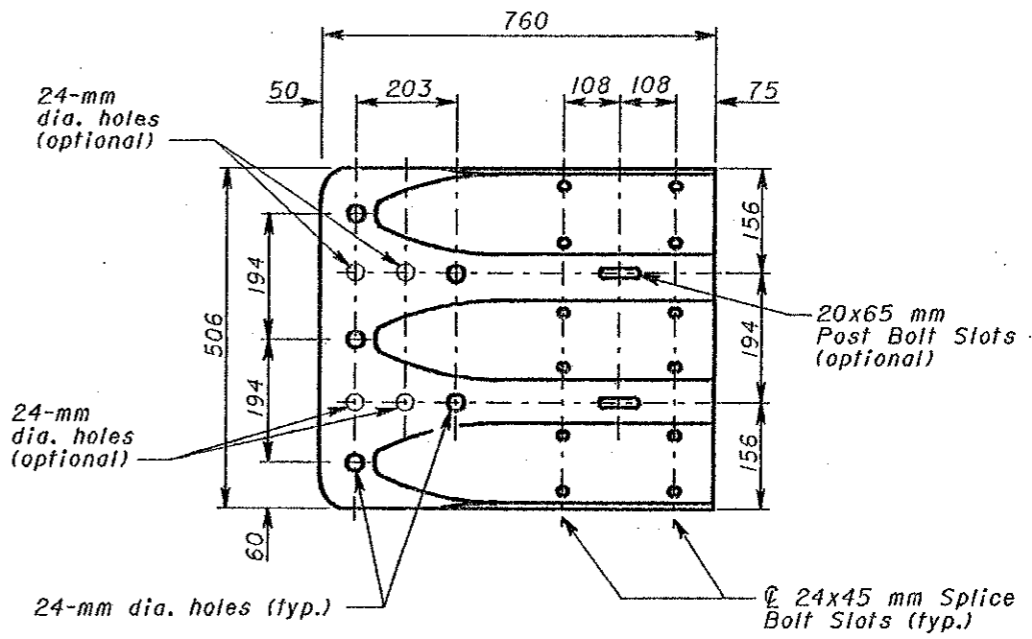
PLAN



ELEVATION



ELEVATION



ELEVATION

CONCRETE INSERT ANCHOR ASSEMBLY (W-BEAM ONLY)

W-BEAM TERMINAL CONNECTOR

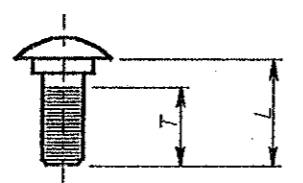
THRIE-BEAM TERMINAL CONNECTOR

All dimensions are in millimeters unless otherwise noted.



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.



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

BUTTON HEAD BOLT
 (For post and splice bolts)

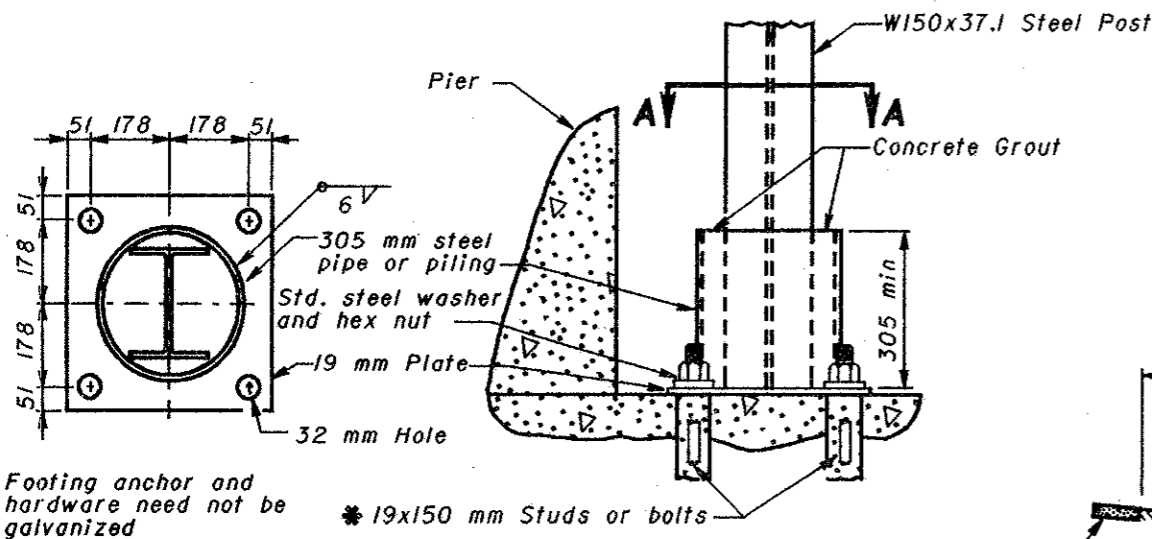
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

STANDARD CONSTRUCTION DRAWING **GR-1.1M**

APPROVED *Randy T. Sutherland*

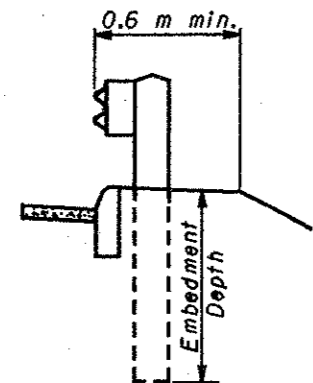
DATE
 11-30-94
 10-21-97



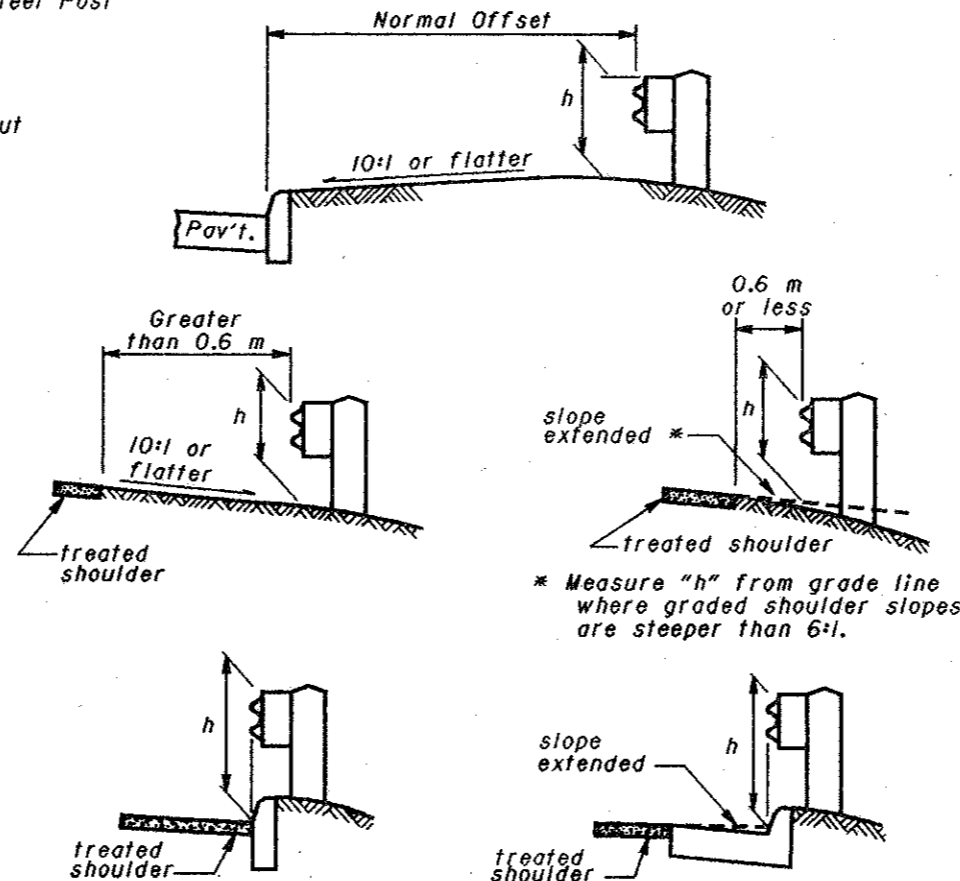
SECTION A-A

ELEVATION

FOOTING ANCHOR

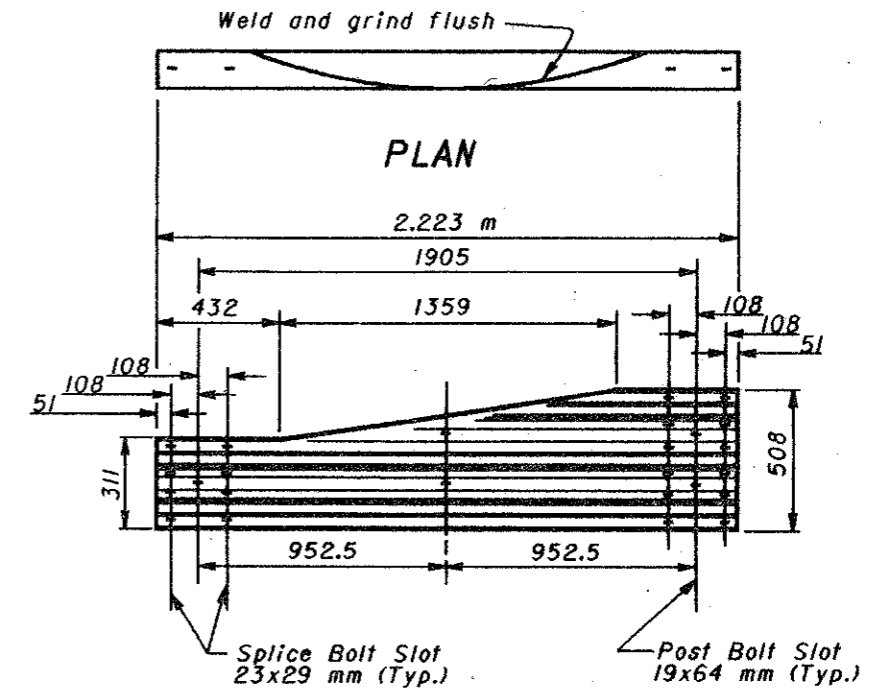


DETAIL A



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.



This Drawing Replaces GR-1.2.

OFFICE OF ROADWAY ENGINEERING
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL
DETAILS

DATE
1-3-96

STANDARD
CONSTRUCTION DRAWING
GR-1.2M

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

NOTES

POSTS: Posts may be round (standard single rail only) or 150x200 mm square-sawn pressure-treated wood or W150x13.5 galvanized steel. The same type post shall be used throughout the length of the project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 200 mm ± 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.

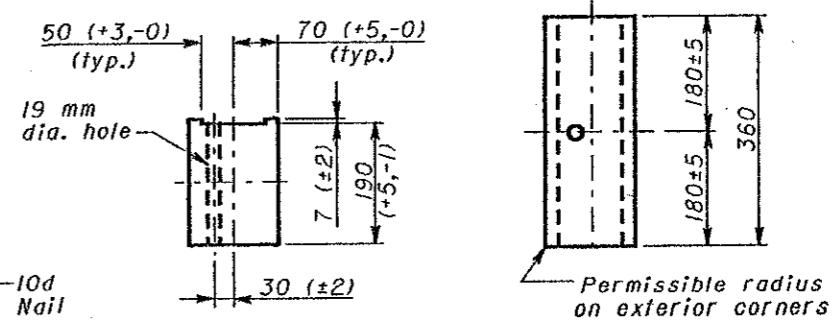
WELDED BEAMS: Welded beam guardrail posts and blockouts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A 769M, Class 1 using Grade 36 steel (250 MPa yield point) with the following exceptions:

- Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.
- Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

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

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

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



PLAN NOTCHED BLOCKOUTS FOR STEEL POSTS

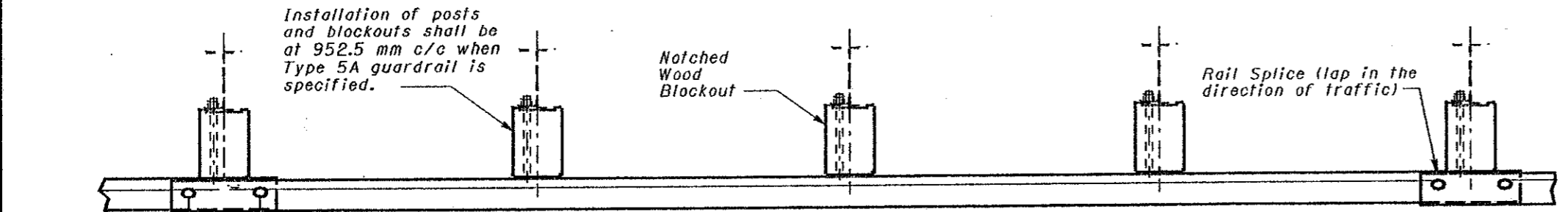
ELEVATION NOTCHED BLOCKOUTS FOR STEEL POSTS

OHIO DEPARTMENT OF TRANSPORTATION

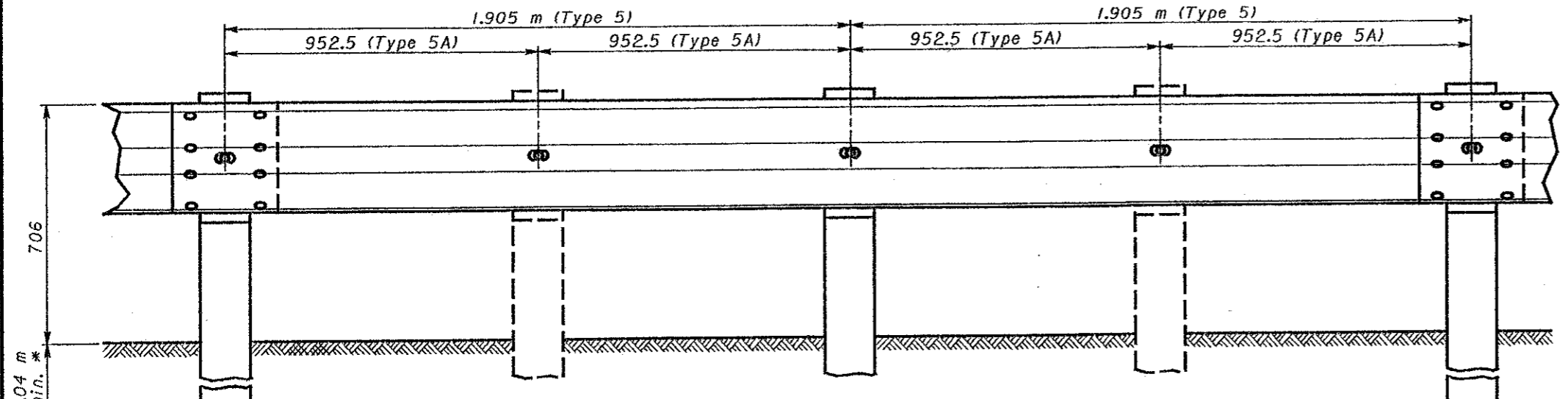
GUARDRAIL TYPE 5 & 5A

DATE
11-30-94
10-21-97

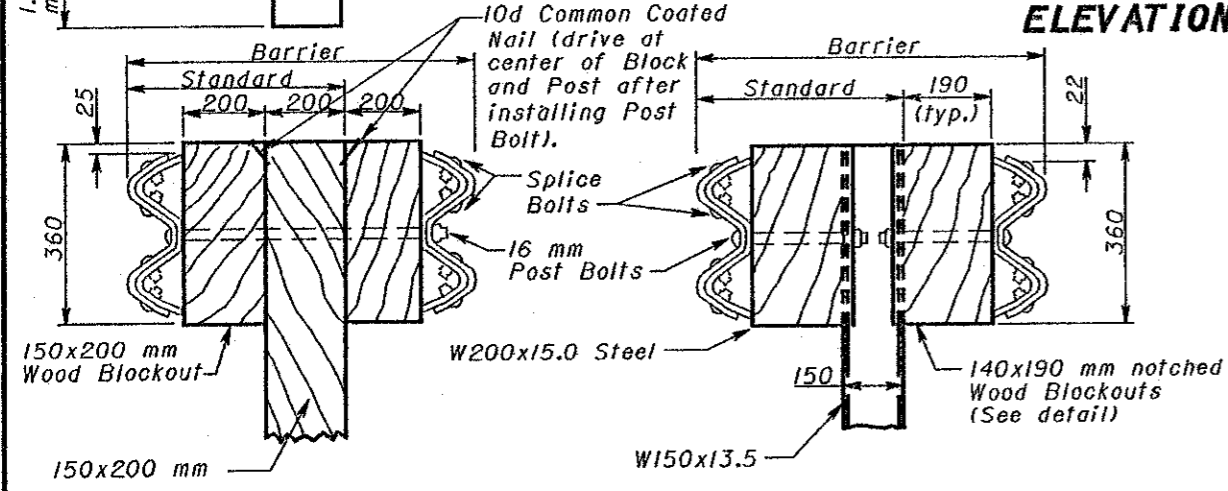
STANDARD CONSTRUCTION DRAWING
GR-2.1M
APPROVED *[Signature]*



PLAN VIEW (Steel Posts shown)

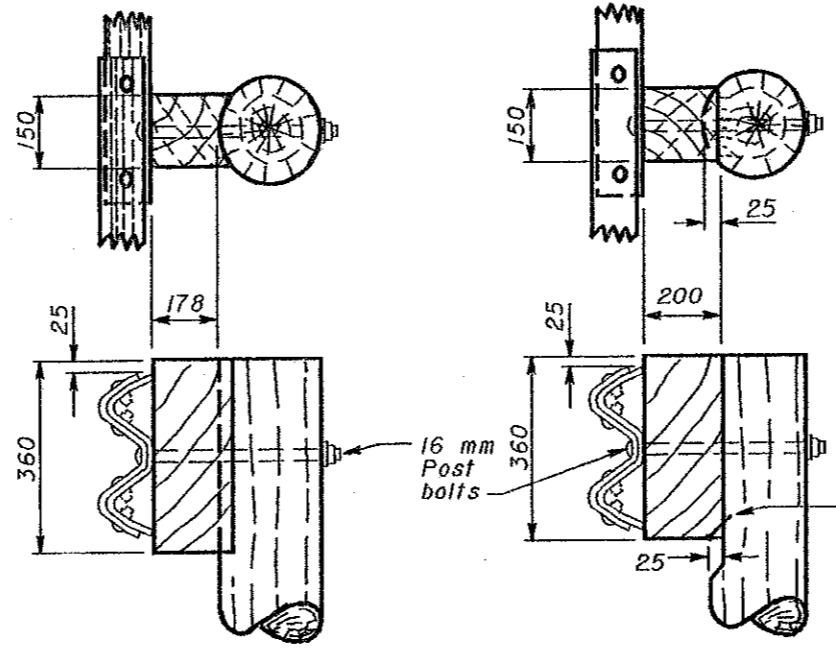


ELEVATION (Wood Posts shown)



SQUARE WOOD POST

STEEL POST



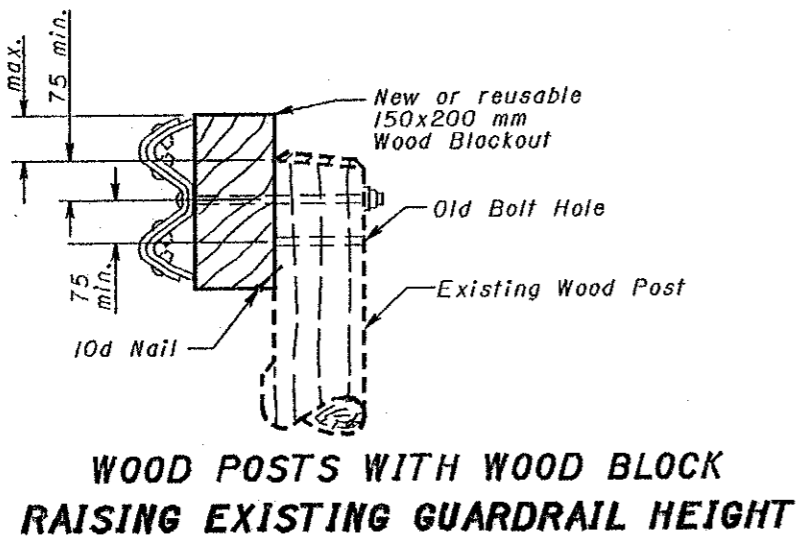
METHOD 1

METHOD 2

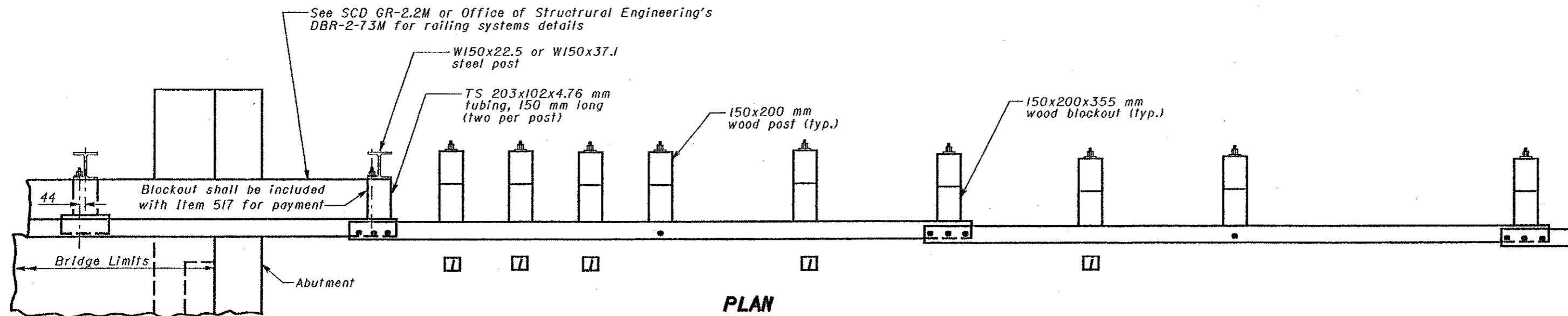
Alternate methods of placing the blockouts on round posts may be submitted for consideration and approved by the Engineer.

ROUND WOOD POSTS

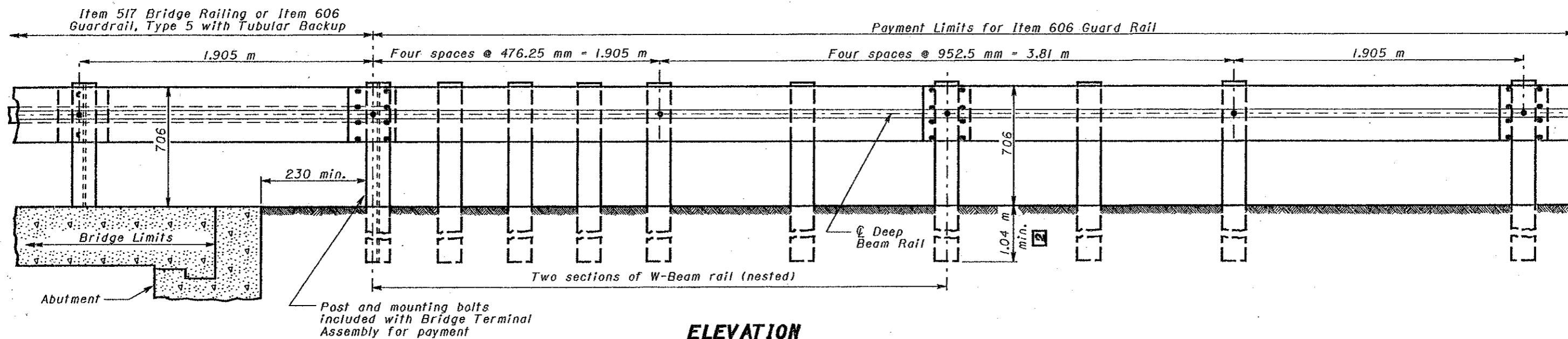
All dimensions are in millimeters unless otherwise noted.



WOOD POSTS WITH WOOD BLOCK RAISING EXISTING GUARDRAIL HEIGHT



PLAN



ELEVATION

All dimensions are in millimeters unless otherwise noted.

- 1 Guardrail not attached to posts. Blockout fastened to post with standard post bolt.
- 2 See SCD GR-1.2M for additional post embedment details.

NOTES

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

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

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

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

Wood Posts shall be square-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.

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

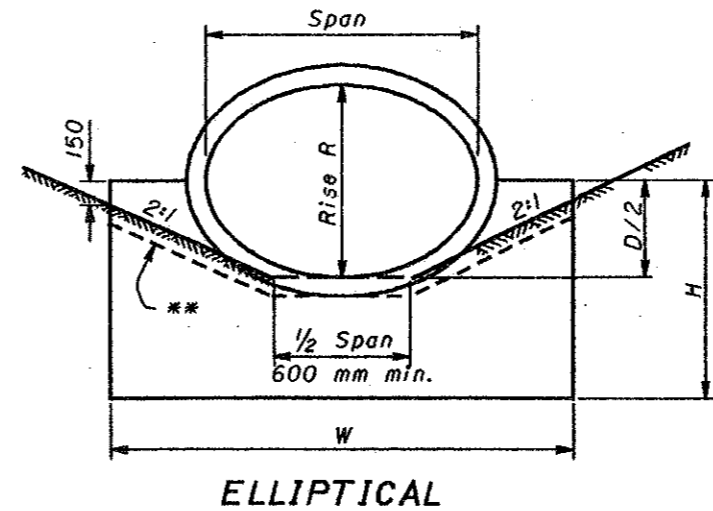
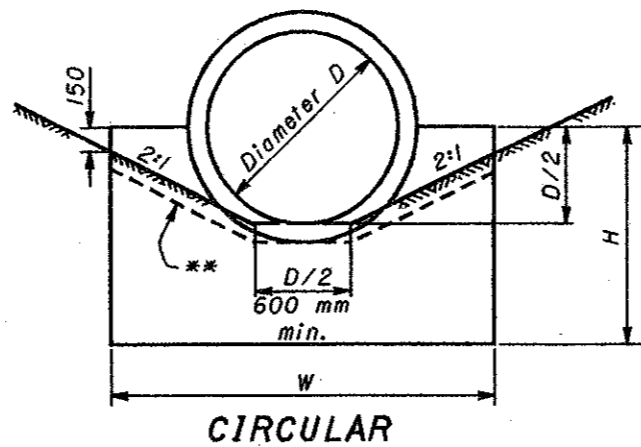
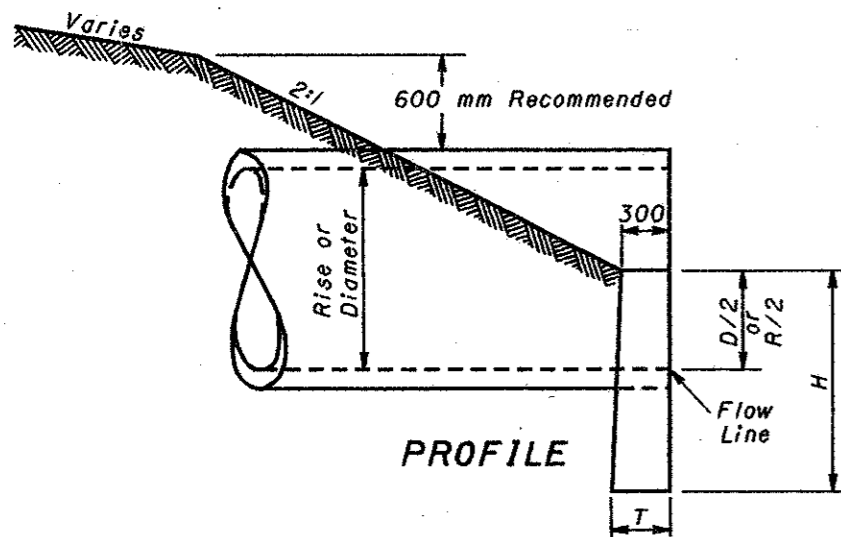
PAYMENT: Payment for Item 606 - Each, Bridge Terminal Assembly, Type 4, shall include the extra cost, in excess of normal guardrail costs, for additional posts and other hardware. The TS 203x102 mm spacers and tubular backup rail extending to the first post off the bridge shall be included with Item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



This Drawing Replaces GR-3.4.

OHIO DEPARTMENT OF TRANSPORTATION	
BRIDGE TERMINAL ASSEMBLY, TYPE 4	DATE 1-3-96 10-21-97
STANDARD CONSTRUCTION DRAWING GR-3.4M	APPROVED <i>[Signature]</i>

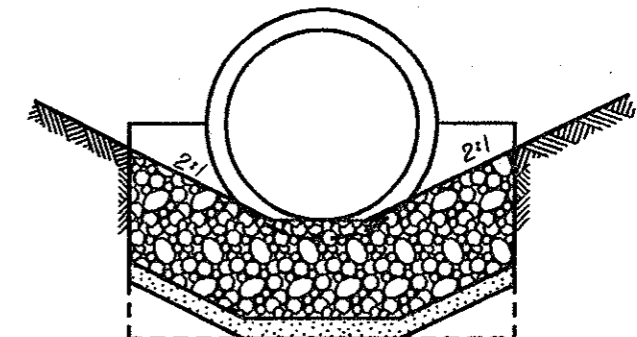
** Top surface of 150 mm inlet headwall extension



CONCRETE PIPE

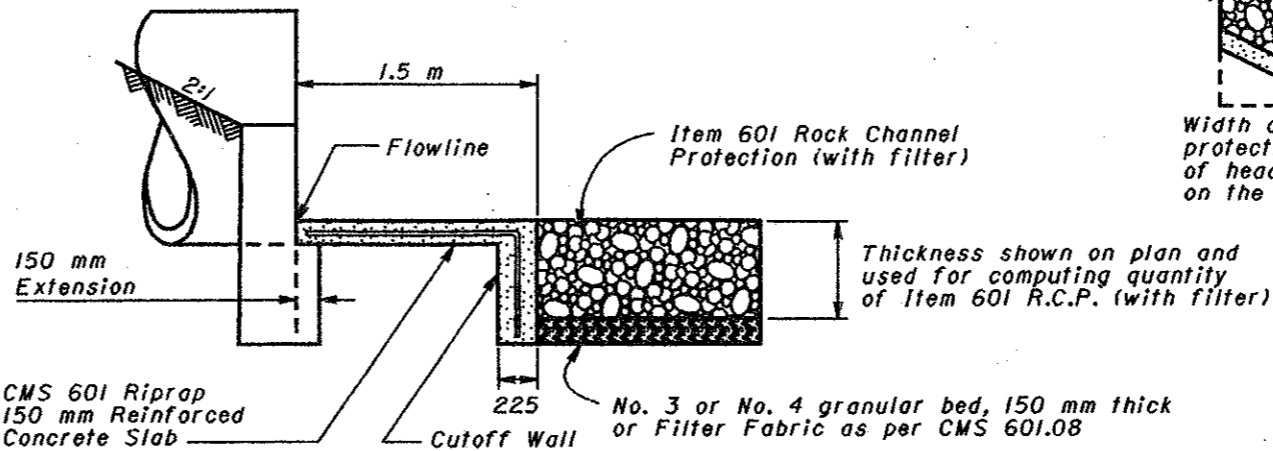
NOTE

CONCRETE: Concrete for headwalls shall be Class C. Concrete quantities are based on headwalls without the 150 mm extension under the channel protection.



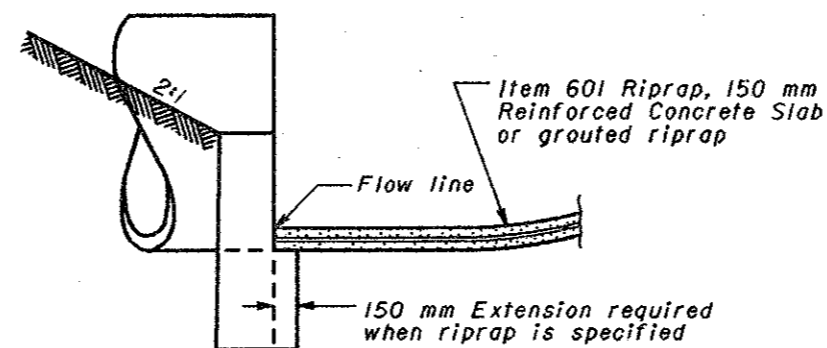
Width of riprap and rock channel protection shall be equal to the width of headwall unless otherwise shown on the plans. (Minimum width 1.2 m.)

HEADWALL FOR CONCRETE PIPE										
CIRCULAR					ELLIPTICAL					
D	W	H	T	Conc. (m ³)	Span	Rise	W	H	T	Conc. (m ³)
300	600	925	300	0.17	575	350	925	975	300	0.27
375	750	975	300	0.22	750	475	1100	1025	300	0.34
450	900	1000	300	0.27	850	550	1200	1050	300	0.38
525	1050	1025	300	0.32	950	600	1375	1075	300	0.44
600	1200	1075	300	0.39	1050	675	1425	1100	300	0.47
675	1350	1125	300	0.46	1125	725	1575	1125	300	0.53
750	1500	1150	300	0.52	1225	800	1650	1175	300	0.58
825	1650	1175	300	0.58	1325	850	1800	1225	375	0.74
900	1800	1225	300	0.66	1500	950	2075	1275	375	0.89
975	1950	1275	300	0.75	1700	1075	2450	1325	400	1.14
1050	2100	1300	300	0.82	1900	1200	2800	1525	400	1.49
1200	2400	1375	350	1.07	2075	1325	3150	1575	450	1.86
1350	2775	1450	350	1.31	2275	1450	3500	1650	450	2.16
1500	3150	1675	400	1.85	2450	1575	3825	1700	500	2.60
1650	3525	1750	450	2.31	2650	1700	4200	1775	500	2.98
1800	3900	1825	450	2.67	2825	1800	4500	1825	550	3.49
1950	4275	1900	500	3.25	3025	1925	4850	1900	550	3.91
2100	4650	1975	550	3.90	3200	2050	5175	1950	600	4.54
2250	5025	2050	550	4.38	3400	2175	5525	2025	600	5.03
2400	5400	2125	600	5.16	3575	2300	5900	2075	650	5.81
2550	5775	2200	650	6.03	3775	2425	6250	2150	650	6.38
2700	6150	2275	650	6.64	4150	2650	6875	2250	700	7.73
2850	6525	2350	700	7.66	4500	2900	7575	2400	750	9.54
3000	6900	2450	750	8.87						
3150	7275	2525	750	9.64						
3300	7650	2600	825	11.18						
3600	8400	2750	875	13.57						



OUTLET CHANNEL PROTECTION DETAIL

The depth of the riprap cutoff wall (750 mm min.) shall match the thickness of the rock channel protection shown on the plan plus 150 mm.



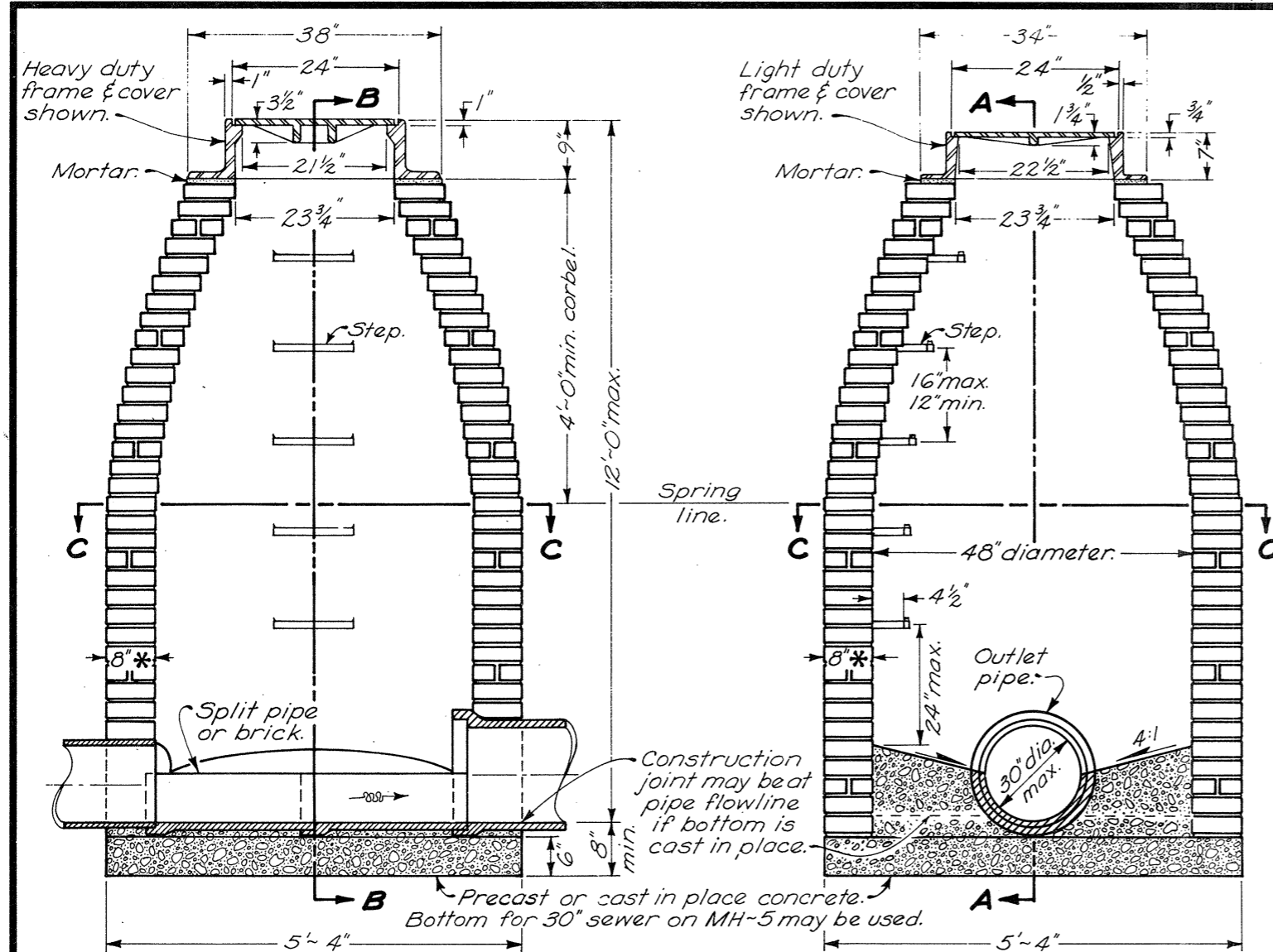
INLET CHANNEL PROTECTION DETAIL

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces HW-4B.

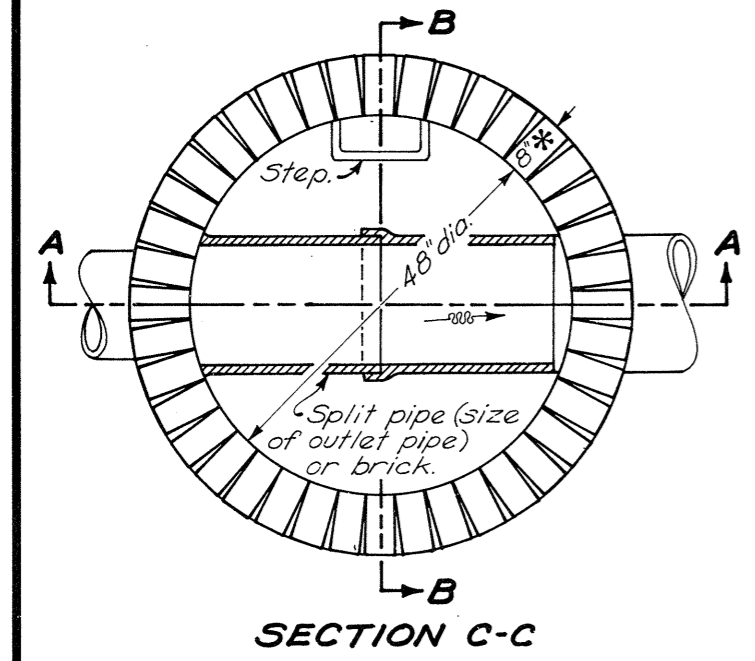
BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION		DATE 7-12-95
HALF-HEIGHT HEADWALLS FOR CONCRETE PIPE		
STANDARD CONSTRUCTION DRAWING HW-2.2M		
APPROVED <i>D.K. Hulman</i> ENGR., L & D		



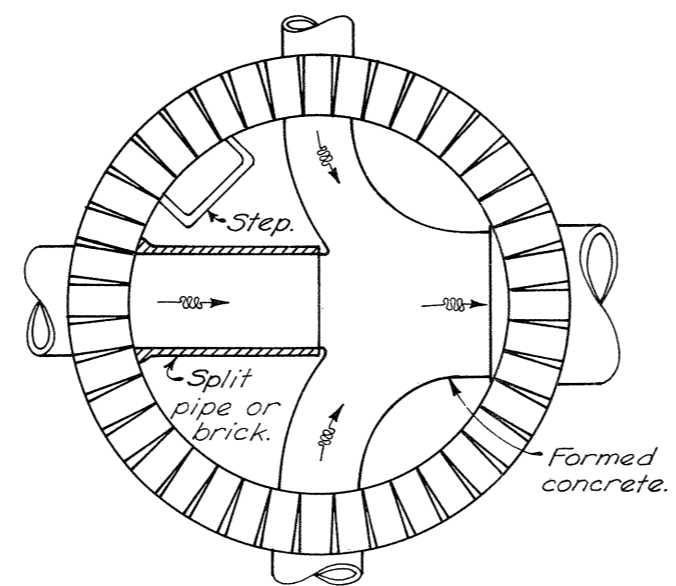
SECTION A-A

SECTION B-B

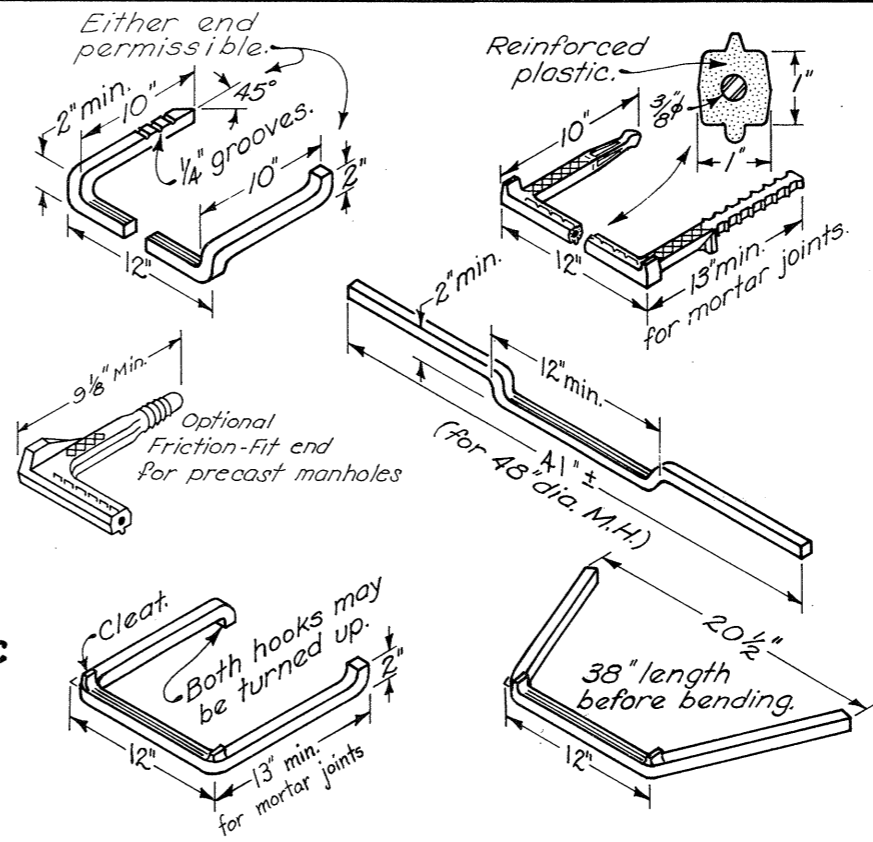
* Nominal thickness.



SECTION C-C

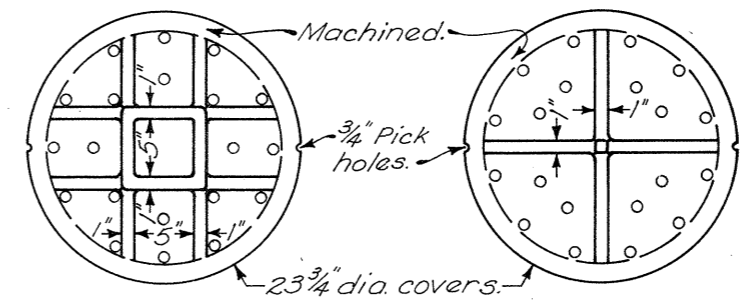


SECTION BELOW SPRING LINE SHOWING METHOD OF TURNING SIDE DRAINS

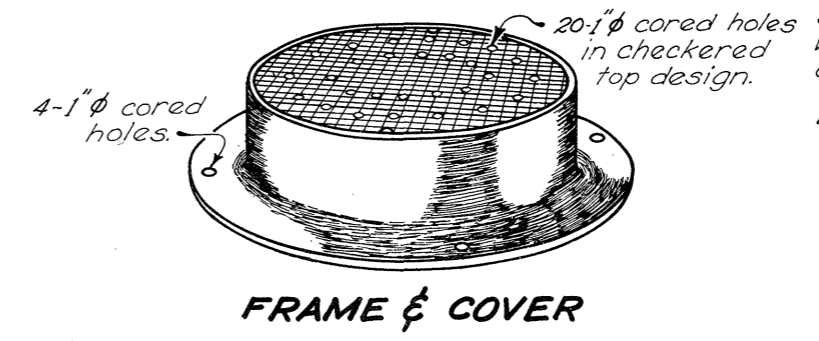


STEP DETAILS

Steps shall have a minimum cross sectional dimension of one inch for ferrous metal and 3/4 inch for aluminum.



HEAVY DUTY COVERS ~ BOTTOM VIEW **LIGHT DUTY COVERS ~ BOTTOM VIEW**



FRAME & COVER

NOTES

CONSTRUCTION: Number 1 manhole is for sewers 30" diameter or less. The design shown is for brick construction with every sixth course a stretcher course. The 6" bottom may be precast or cast in place concrete. The bottom channel sections shall be built with concrete and lined with split pipe or brick except curved channels may be formed in the concrete.

Precast solid concrete radial blocks or cast in place concrete reinforced with No.4 bars on 12" centers both vertically and horizontally, may be used with a wall thickness of 6" or greater. Precast manholes detailed on MH-3 or MH-5 may be used in lieu of the design shown hereon unless otherwise required by the plans.

FRAME AND COVER shall be of heavy design (475 lbs. min. total weight) when the manhole is placed within the limits of the pavement or shoulder, otherwise the light design (275 lbs. min.) may be used. Bearing areas shall be finished smooth and fitted so as to provide a firm and even seat for all portions of the cover in the frame. Each cover shall seat in its frame without rocking and shall be marked as a matched frame and cover before delivery to the project. The base of the frame shall be set in a full bed of Portland cement mortar, and so adjusted to conform to the finished pavement or shoulder elevation and slope. Castings meeting Item 604 requirements and designed essentially the same and equally as strong as those shown hereon shall be provided.

STEPS shall conform to the material requirements of specification 604. All steps shall have a depressed tread or a 1/2" minimum cleat height at the ends.

Steps installed in fresh concrete shall be embedded to minimum depth of 4". Steps installed in mortar joints shall be embedded to a minimum depth of 7".

Friction-fit steps meeting the requirements of 711.31 with a 1/2" diameter rebar may be used in precast manholes. The receiving holes for friction-fit steps shall not penetrate the manhole wall.

The Engineer may require the contractor to test load a maximum of one step per manhole to a proof load of 400 lbs. in direct pull. The equipment and method used shall meet the approval of the Engineer.

If the selected step fails the pullout test, the remaining steps in that manhole shall also be tested. All steps not passing the pullout test shall be removed and a new step installed and tested to the satisfaction of the Engineer. Cost of testing shall be incidental to the unit price bid for the manhole.

DROP PIPE, when specified on the plans, shall be constructed as shown on MH-2.

SANITARY SEWER COVERS shall be without the pick and vent holes shown hereon and shall include a sealing gasket affixed to the bearing surface. Bolt-down covers shall not be used unless specified in the plans.

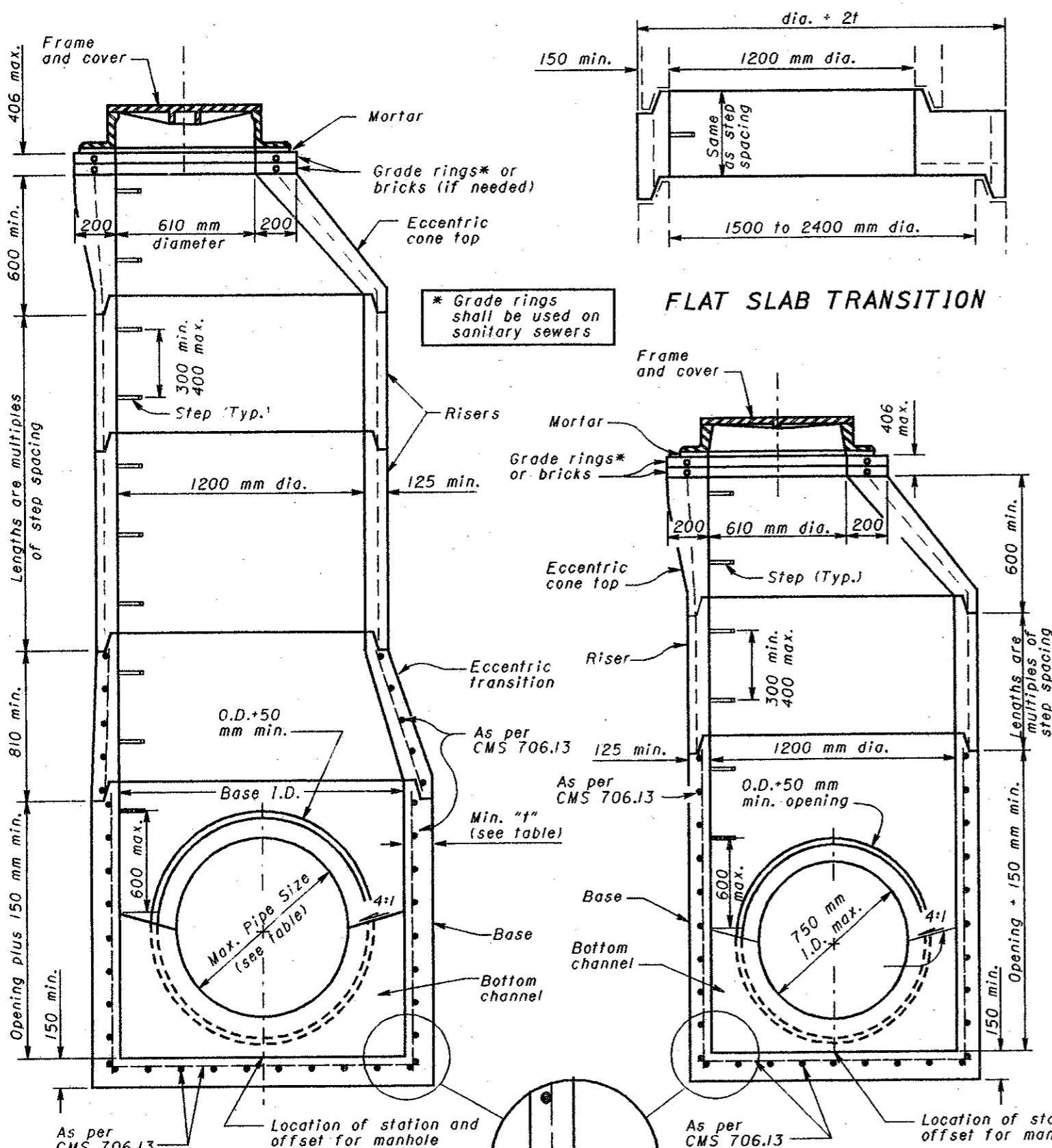
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

No. 1 MANHOLE

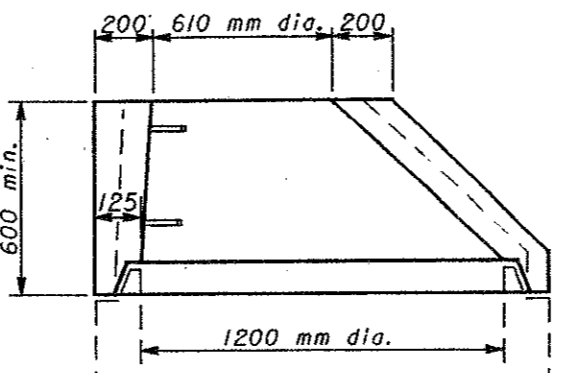
STANDARD CONSTRUCTION DRAWING MH-1

APPROVED *[Signature]* ENGR., L.S.D.

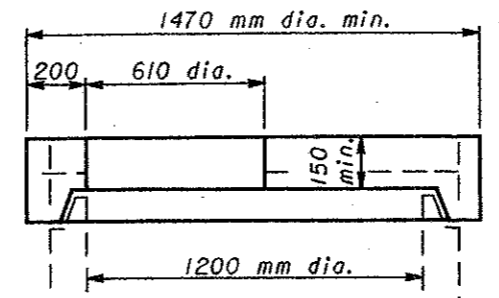
DATE
6-1-65
6-12-65
12-18-84



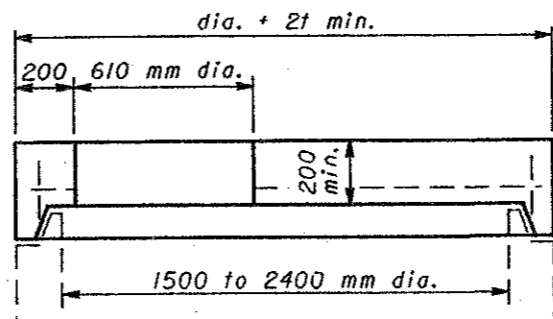
FLAT SLAB TRANSITION



ALTERNATE ECCENTRIC CONE TOP



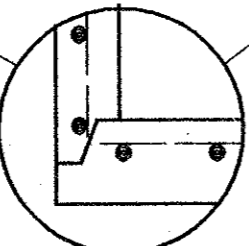
FLAT SLAB TOP



FLAT SLAB TOP

1500 to 2400 mm PRECAST BASE
SEE TABLE FOR MAXIMUM PIPE SIZES

1200 mm PRECAST BASE
FOR 750 mm AND SMALLER PIPE



ALTERNATE

SECTION VIEWS OF REINFORCED PRECAST MANHOLES

NOTES

GENERAL: With normal soil and site conditions this standard precast manhole may be used for any required manhole depth.
Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.

TOP AND TRANSITION (OR REDUCER): This section shall be a flat slab unless an eccentric cone is specified.

BASE: Manhole No. 3 is shown with a monolithic floor and riser which may be cast in one or two operations. A permissible alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipes shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete, precast in the base or field constructed as shown on Std. Constr. Dwgs. MH-1.1M and MH-3.1M.

RISER SECTIONS: Openings for 450 mm and smaller inlet pipes may be either prefabricated, or cut in the field provided the sides of the pipe at the springline do not project into the manhole.

CONNECTIONS: Connections between precast manhole sections and pipes on sanitary sewers may be sealed with resilient connectors conforming to ASTM C 923.

JOINT SEAL: Seal between precast manhole sections on sanitary sewers shall be resilient and flexible gasket joints per CMS 706.11.

MATERIALS: Materials for bases and other precast sections, including reinforcement not specified hereon, shall comply with the requirements of CMS 706.13.

DROP PIPE: When specified on the plans, drop pipe shall be constructed as shown on MH-3.1M.

STEPS, FRAMES AND COVERS: Shall comply with the requirements set forth on MH-1.1M.

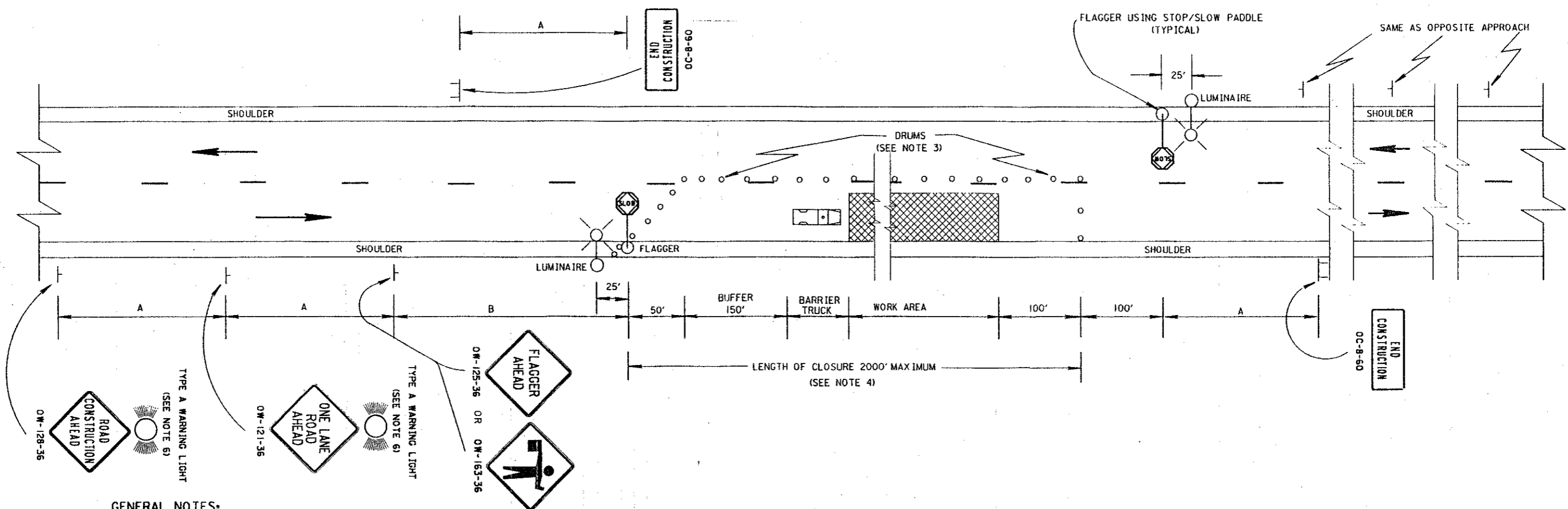
All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces MH-3.

OFFICE OF ROADWAY ENGINEERING OHIO DEPARTMENT OF TRANSPORTATION		DATE
MANHOLE No. 3		9-6-95
STANDARD CONSTRUCTION DRAWING MH-1.2M		
APPROVED <i>D.K. Hukman, P.E.</i> ADMINISTRATOR		

Base I.D. (mm)	Min. "t" (mm)	Max. Pipe Size (mm)
1500	125	900
1950	150	1200
2100	175	1350
2250	190	1500
2400	200	1500



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: [Signature] ENGR. OF DESIGN SERVICES	

TEMPORARY SIGN SUPPORT REQUIREMENTS

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

- 1) LATERAL PLACEMENT TO NEAREST EDGE OF SIGNS SHALL BE AS FOLLOWS:
 - a) ON THE RIGHT SIDE OF THE ROAD FOR APPROACHING TRAFFIC (EXCEPT FOR DUAL MOUNTED SIGNS AND SIGNS DESIGNATED IN THE PLANS FOR LEFT SIDE MOUNTING).
 - b) CURBED ROADWAY - MINIMUM 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

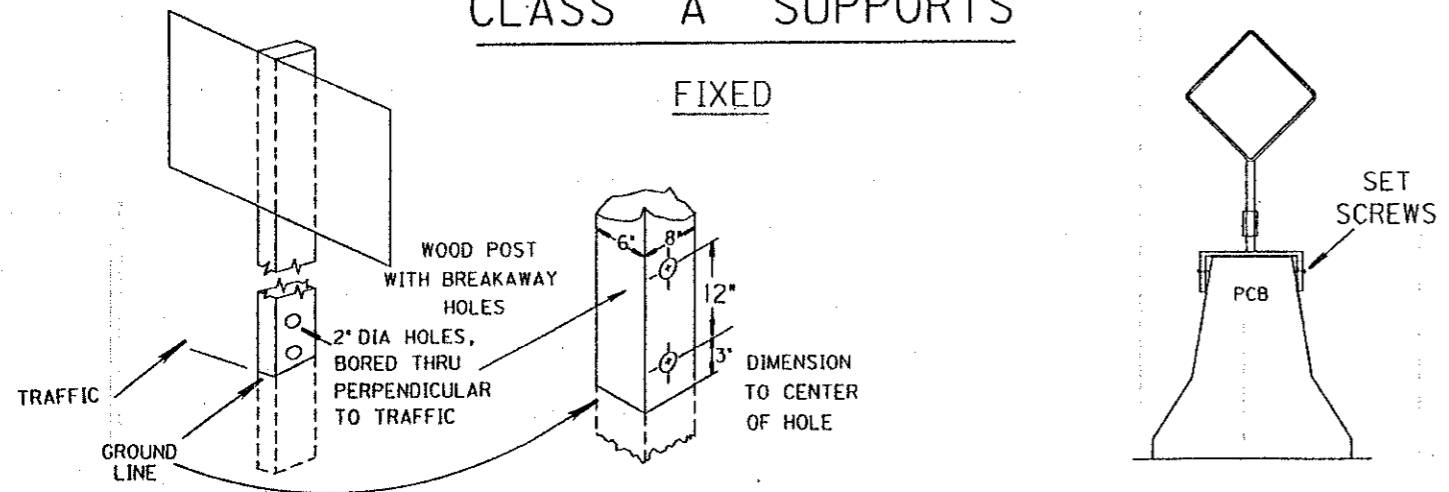
- 1) ALL #2 AND #3 POSTS WHEN INSTALLED SINGLY OR IN PAIRS (SIDE BY SIDE) ACCORDING TO THE DETAILS OF TC-41.20. THE NUMBER OF SUPPORTS SHALL BE AS SHOWN ON TC-52.10 AND TC-52.20.
- 2) THE FOLLOWING POST TYPES, WHEN INSTALLED SINGLY, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 42 INCHES:
 - 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)

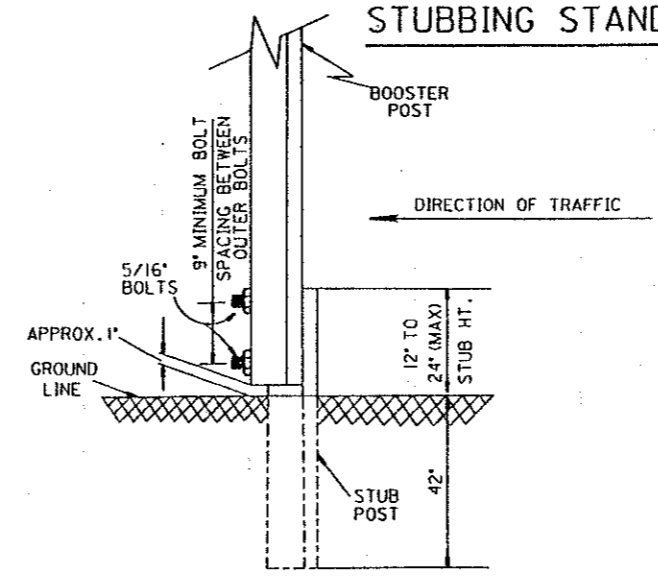
ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM 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
TEMPORARY SIGN SUPPORT	05/07/90 07/01/92
STANDARD CONSTRUCTION DRAWING	MT-105.10
APPROVED <i>J. R. [Signature]</i>	ENGR. OF DESIGN SERVICES

CLASS A SUPPORTS



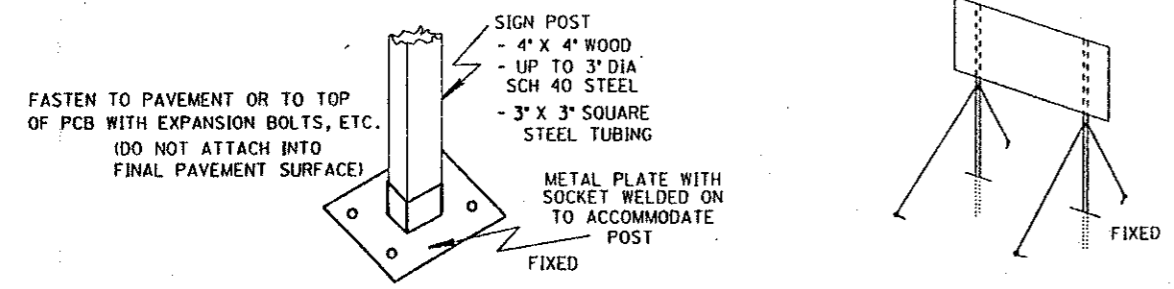
CLASS A SUPPORTS STUBBING STANDARD



NOTES

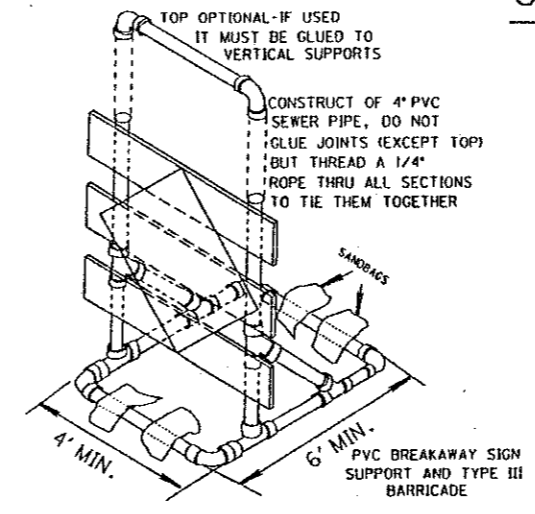
1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1 LB./FT. LESS THAN STUB POST

CLASS B SUPPORTS

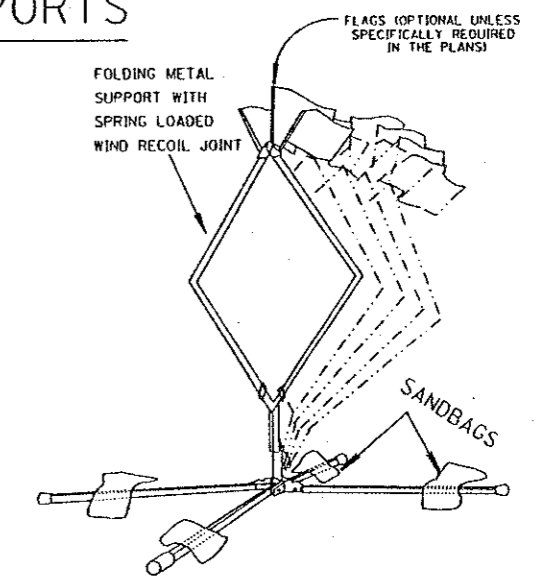
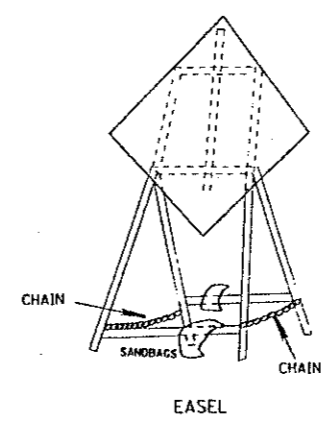


ANY CLASS A SIGN POST WITH GUY WIRES ADDED TO INCREASE SIGN CARRYING ABILITY. (GUY WIRES SHALL NOT BE HEAVIER THAN 1/8" DIA. BRAIDED CABLE; GUY ANCHORS SHALL NOT EXTEND MORE THAN 6" ABOVE GROUND SURFACE).

CLASS A SUPPORTS



PORTABLE



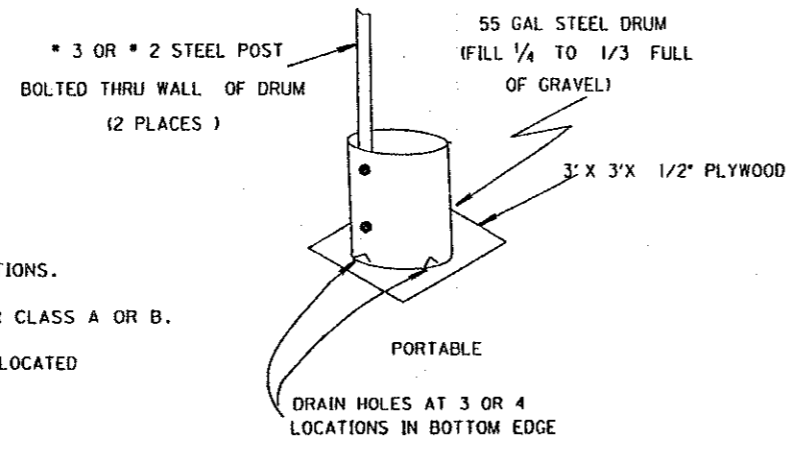
NOTES

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 SUFFICIENT 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.

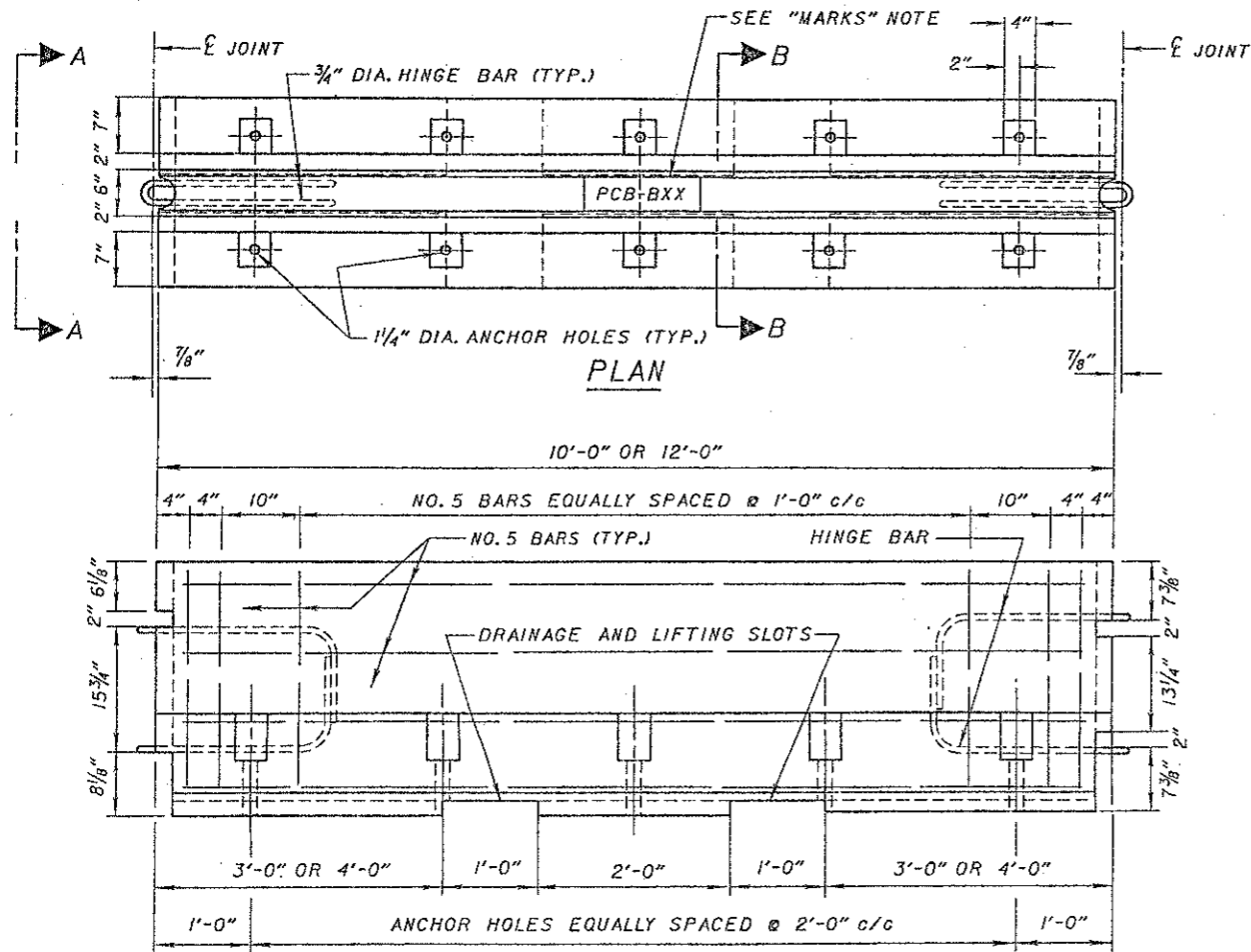
ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM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

CLASS C SUPPORTS

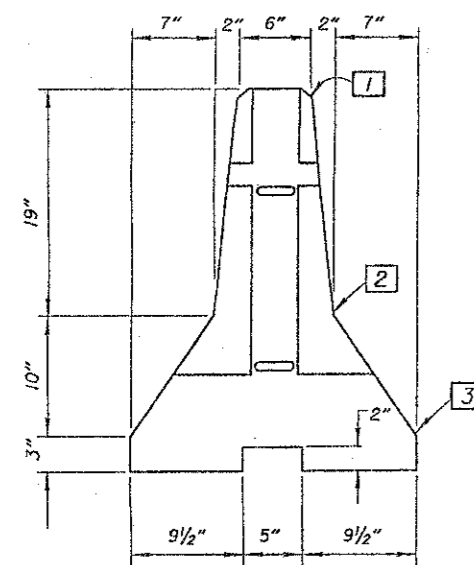


1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

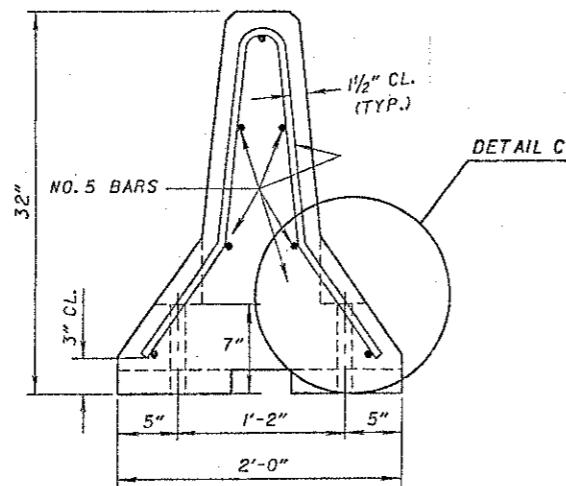
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 05/07/90 07/01/92
TEMPORARY SIGN SUPPORT	
STANDARD CONSTRUCTION DRAWING	MT-105.11
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	



ELEVATION

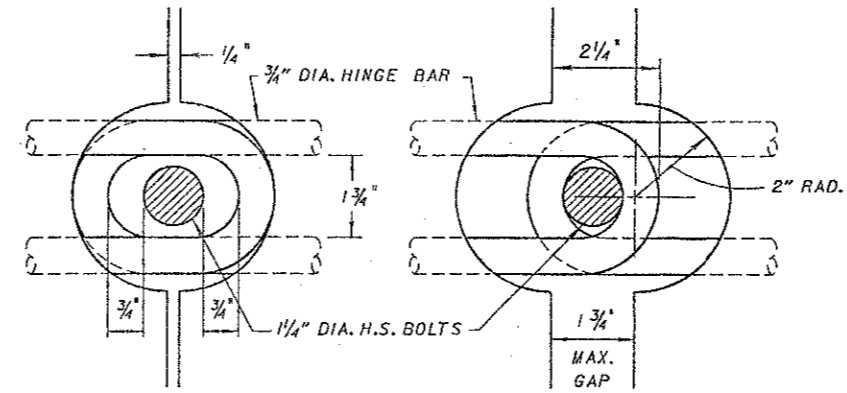


VIEW A-A



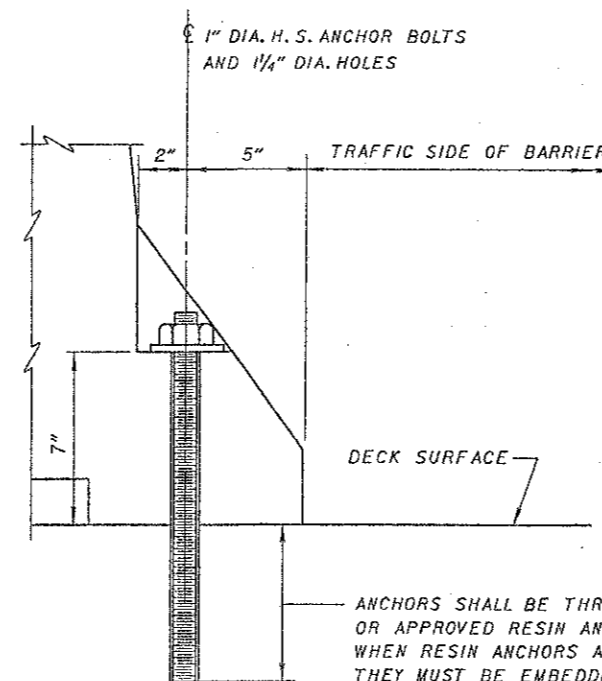
SECTION B-B

- 1 1" RADIUS OR 3/4" CHAMFER ALL TOP AND END CORNERS
- 2 PERMISSIBLE 10" RADIUS
- 3 PERMISSIBLE 1" RADIUS



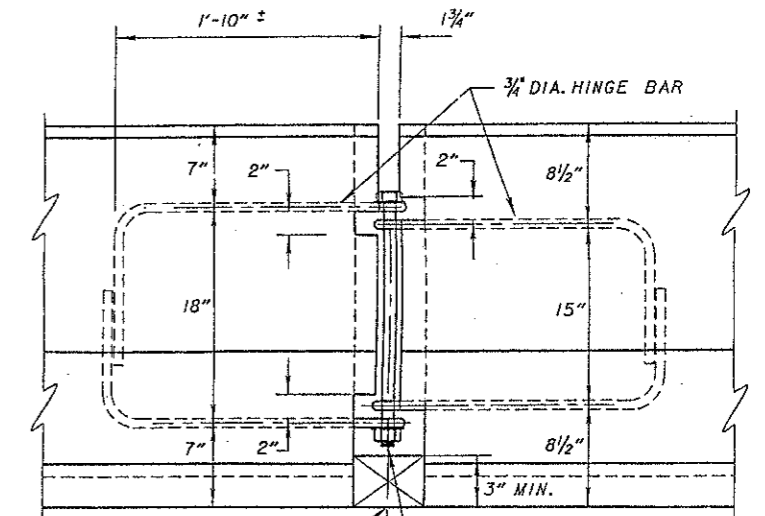
① CLOSED JOINT ② OPEN JOINT
JOINT CONNECTION DETAILS

- ① BARRIERS SHALL INITIALLY BE PLACED CLOSER TOGETHER SO BOLTS CAN BE EASILY INSERT-THROUGH HINGE BAR LOOPS.
- ② BARRIER JOINTS SHALL BE FULLY OPEN BEFORE NUT IS TIGHTENED ONTO BOLT AND OPENING IS SNUGLY BLOCKED.



DETAIL C

ANCHORS SHALL BE THRU BOLTS OR APPROVED RESIN ANCHORS. WHEN RESIN ANCHORS ARE USED, THEY MUST BE EMBEDDED A MINIMUM OF 6 1/2" INTO FIRM CONCRETE. WHEN NO LONGER NEEDED, ANCHORS SHALL BE REMOVED AS DIRECTED BY THE ENGINEER. WHERE DECK IS TO REMAIN, HOLES SHALL BE FILLED WITH AN EPOXY NON-SHRINK GROUT.



DETAIL AT HINGED CONNECTION

HARDWOOD OR CONCRETE BLOCKING FULL WIDTH OF BARRIER.

GENERAL NOTES

HARDWARE
BOLTS, DECK ANCHORING BOLTS AND ALL NUTS AND WASHERS SHALL CONFORM TO ASTM A325. THEY SHALL BE GALVANIZED IN ACCORDANCE WITH CMS 711.02.

REINFORCING STEEL - ALL REINFORCING STEEL (INCLUDING THE 3/4" DIA. HINGE BARS) SHALL MEET THE REQUIREMENTS OF CMS 509.02. HINGE BARS SHALL BE GALVANIZED AFTER FABRICATION.

CONCRETE - PORTABLE CONCRETE BARRIER SEGMENTS SHALL BE CONSTRUCTED OF CLASS C CONCRETE WITH A MINIMUM COMPRESSIVE STRESS OF 4,000 PSI.

BRIDGE DECK SURFACE PREPARATION:
THE SURFACE AREA ON WHICH THE PORTABLE CONCRETE BARRIERS WILL REST SHALL BE CLEAR OF ALL LOOSE SAND, GRAVEL, DIRT AND DEBRIS.

ANY IRREGULARITIES IN THE BRIDGE DECK AREAS, UNLESS JUDGED BY THE ENGINEER TO BE INCONSEQUENTIAL, SHALL BE LEVELED WITH GROUT AND/OR ASPHALT.

ASPHALT ROLL ROOFING SHALL BE PLACED ON THOSE BRIDGE DECK AREAS, AS JUDGED BY THE ENGINEER, TO HAVE A SURFACE ROUGHNESS WHICH WOULD INHIBIT FRICTION CONTACT BETWEEN BARRIER SEGMENTS AND DECK.

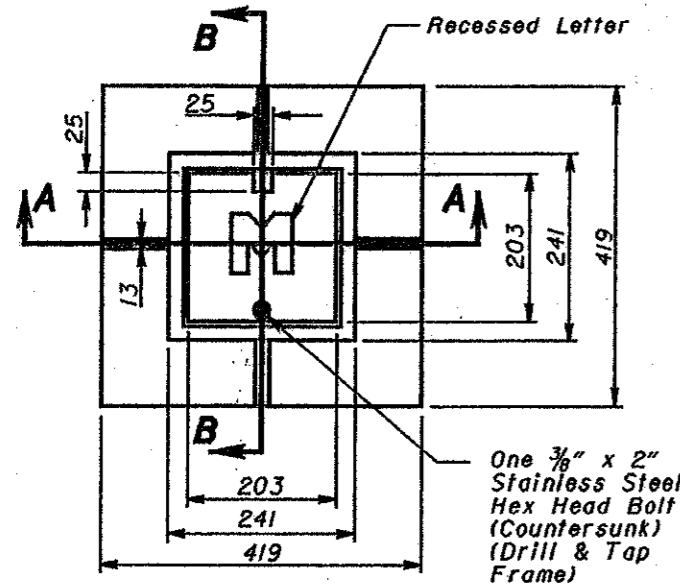
MARKS - ALL BARRIER SEGMENTS SHALL BE CLEARLY MARKED. WHERE "XX" IS THE YEAR IN WHICH THE BARRIER WAS CAST. EACH SEGMENT SHALL ALSO HAVE, ON ITS TOP SURFACE, A UNIQUE IDENTIFICATION OF THE MANUFACTURER AND, SOMEWHERE ON THE BARRIER, THE DAY AND MONTH THE BARRIER WAS CAST.

ALL MARKINGS SHALL BE PERMANENTLY IMPRINTED ON THE BARRIER USING A MINIMUM OF 2" HIGH LETTERING.

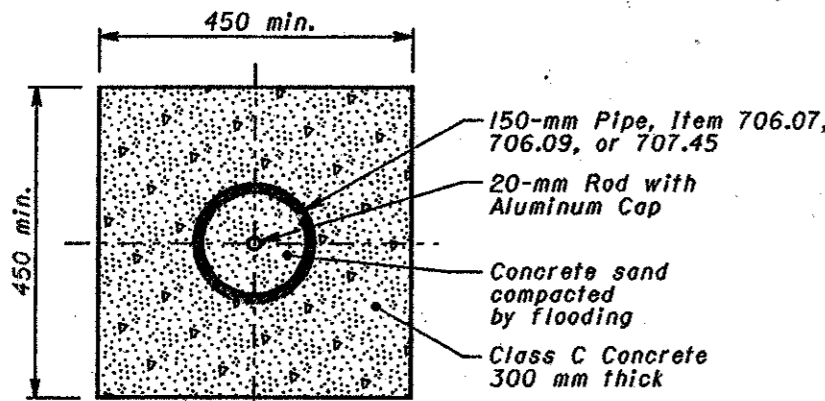
HANDLING DEVICES MAY BE USED IN LIEU OF THE LIFTING SLOTS FOR MOVING THE BARRIER. THEY MAY BE OF ANY DESIGN SUFFICIENT TO HANDLE THE WEIGHT OF THE SECTION BEING LIFTED. NO REMAINING HANDLING DEVICES SHALL PROTRUDE ABOVE THE BARRIER SURFACE.

THE PROJECT PLANS SHALL INDICATE THE NUMBER OF ANCHORS PER SEGMENT, AS WELL AS THE BARRIER LOCATION ON THE BRIDGE DECK, AND ANY SPECIAL ANCHORAGE REQUIREMENTS.

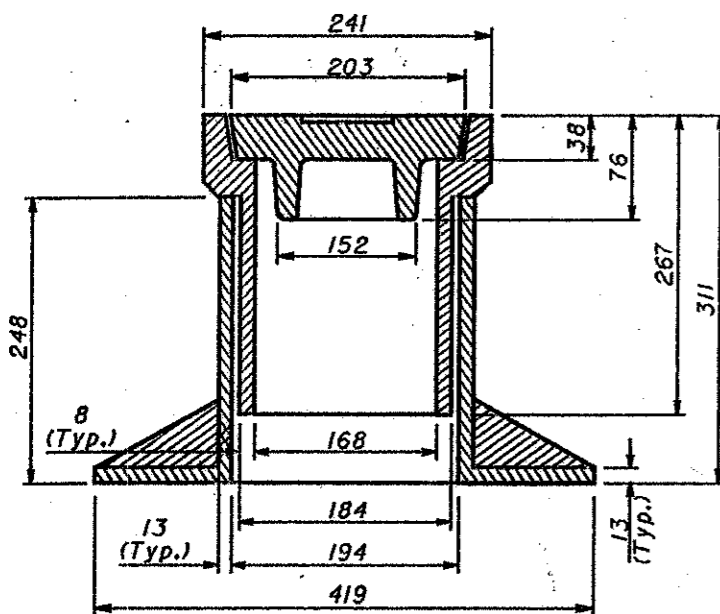
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN				DRAWING NO. PCB-91
	STANDARD PORTABLE CONCRETE BARRIER DETAILS				
	APPROVED:	DATE: 4-24-92		ENGINEER OF BRIDGES	
	PREPARED	DRAWN	CHECKED	REVIEWED	
	AJM	GFJ	WTF	LMW	



TOP VIEW

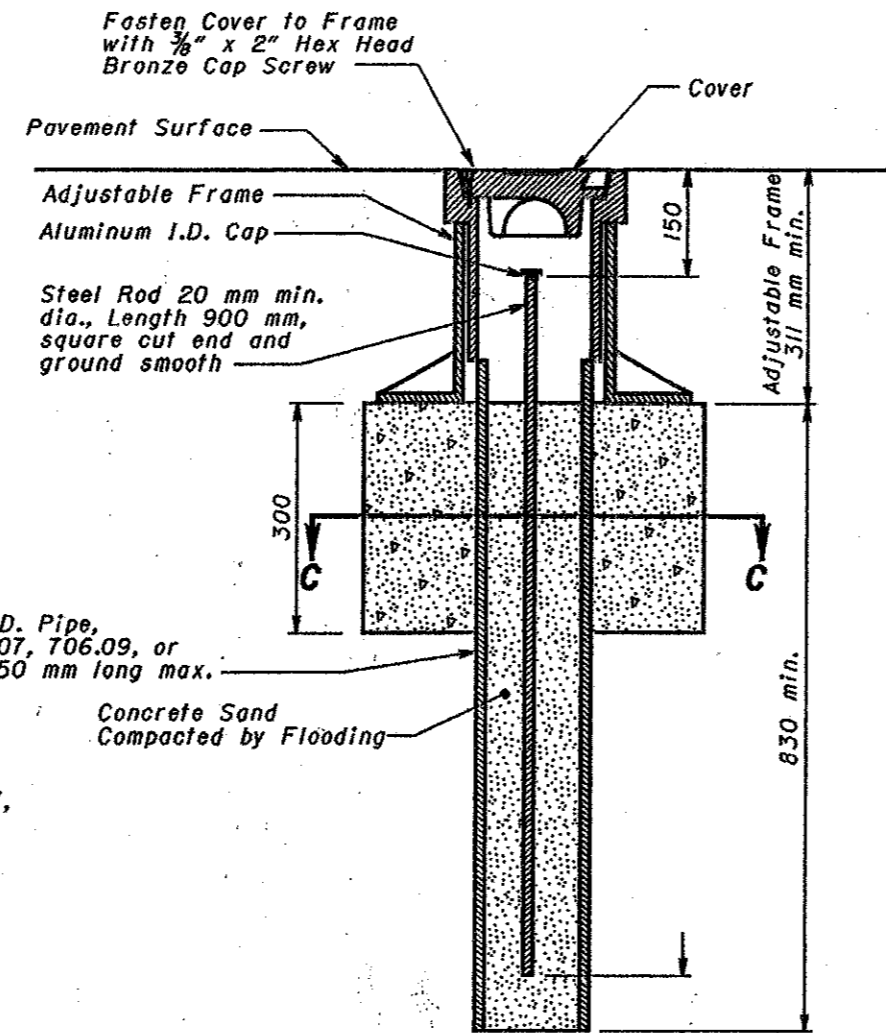


SECTION C-C



SECTION A-A

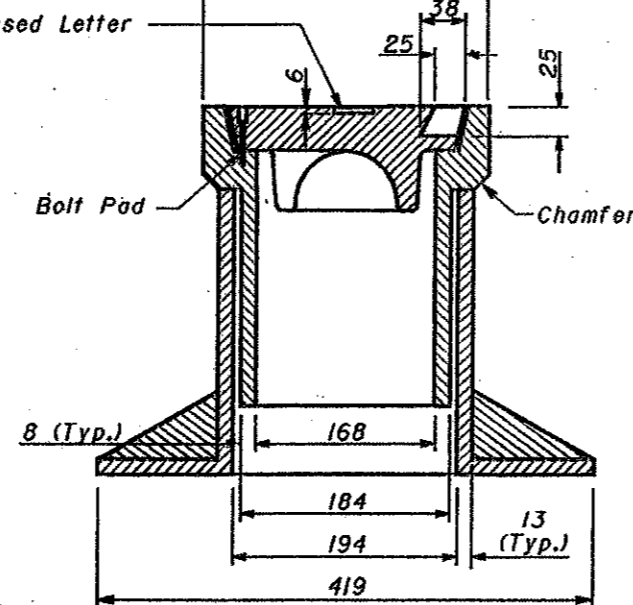
ADJUSTABLE CENTERLINE MONUMENT DETAILS



SIDE VIEW

150-mm I.D. Pipe, Item 706.07, 706.09, or 707.45, 850 mm long max.

Concrete Sand Compacted by Flooding



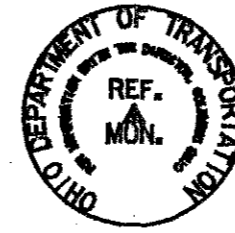
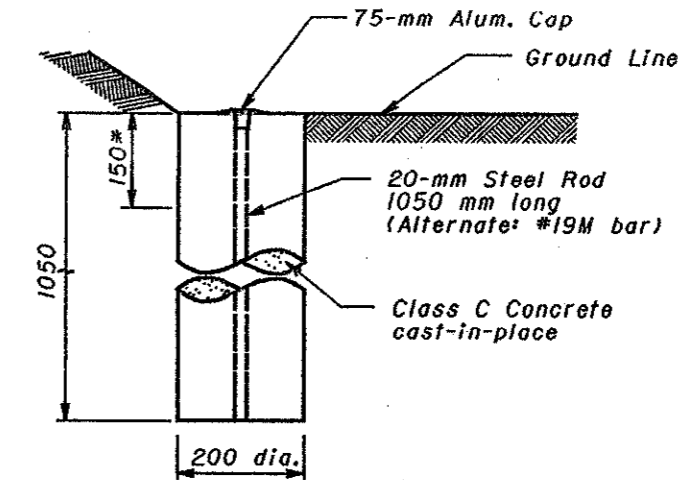
SECTION B-B



ALUMINUM CAP PLAN VIEW

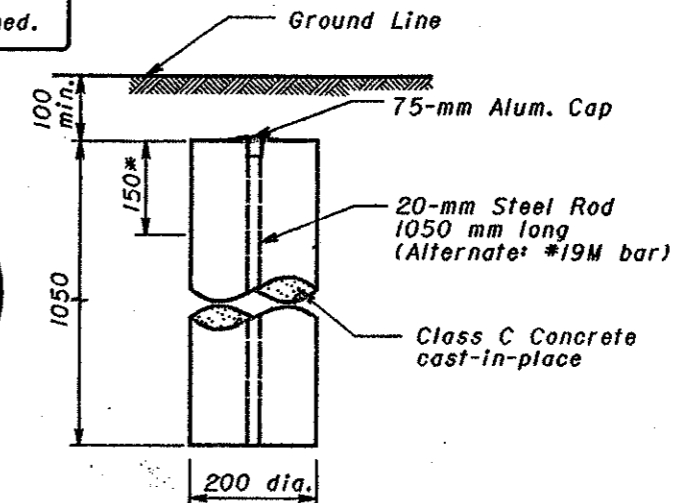
RIGHT OF WAY MONUMENT DETAILS

* The upper 150 mm of the 1050 mm cast-in-place monument shall be formed.



ALUMINUM CAP PLAN VIEW

REFERENCE MONUMENT DETAILS



NOTES

The details and dimensions shown on the Monument Assembly drawing represent a direct conversion of the English dimensions to metric units. Existing products are currently manufactured solely in English units; therefore, the dimensions for the 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.



OFFICE OF PLANNING OHIO DEPARTMENT OF TRANSPORTATION	
ROADWAY ITEMS	DATE 6-30-95 4-8-97
STANDARD CONSTRUCTION DRAWING RM-1.1M	
APPROVED <i>[Signature]</i> ADMINISTRATOR	

NOTES

PORTABLE CONCRETE BARRIER (PCB) PCB, as shown, shall not be used on bridge deck edges. PCB, Bridge Mounted, shall be used at such locations in accordance with the Office of Structural Engineering's Standard Drawing PCB-91M.

WIRE FABRIC Shall meet the requirements of CMS 709.10.

CONNECTING HARDWARE Bolts, washers and hex nuts shall be galvanized after fabrication as per CMS 711.02 and shall meet the requirements of CMS 711.09 except that the Rotational Capacity test specified in ASTM A 325M shall be waived.

In lieu of the pin and loop connections detailed on this Standard Construction Drawing, barrier sections with "J-J Hooks" end connections may be utilized.

Transition barrier sections with pin and loop connections on one end and "J-J Hooks" on the other shall be used to connect runs of "J-J Hooks" barrier to other permitted barrier types. The heights of the transition sections shall be the same as the barrier runs being connected. "J-J Hooks" is a trademark of Easi-Set Industries, P.O. Box 300, Midland, VA 22728, (540) 439-8911 or (800) 547-4045.

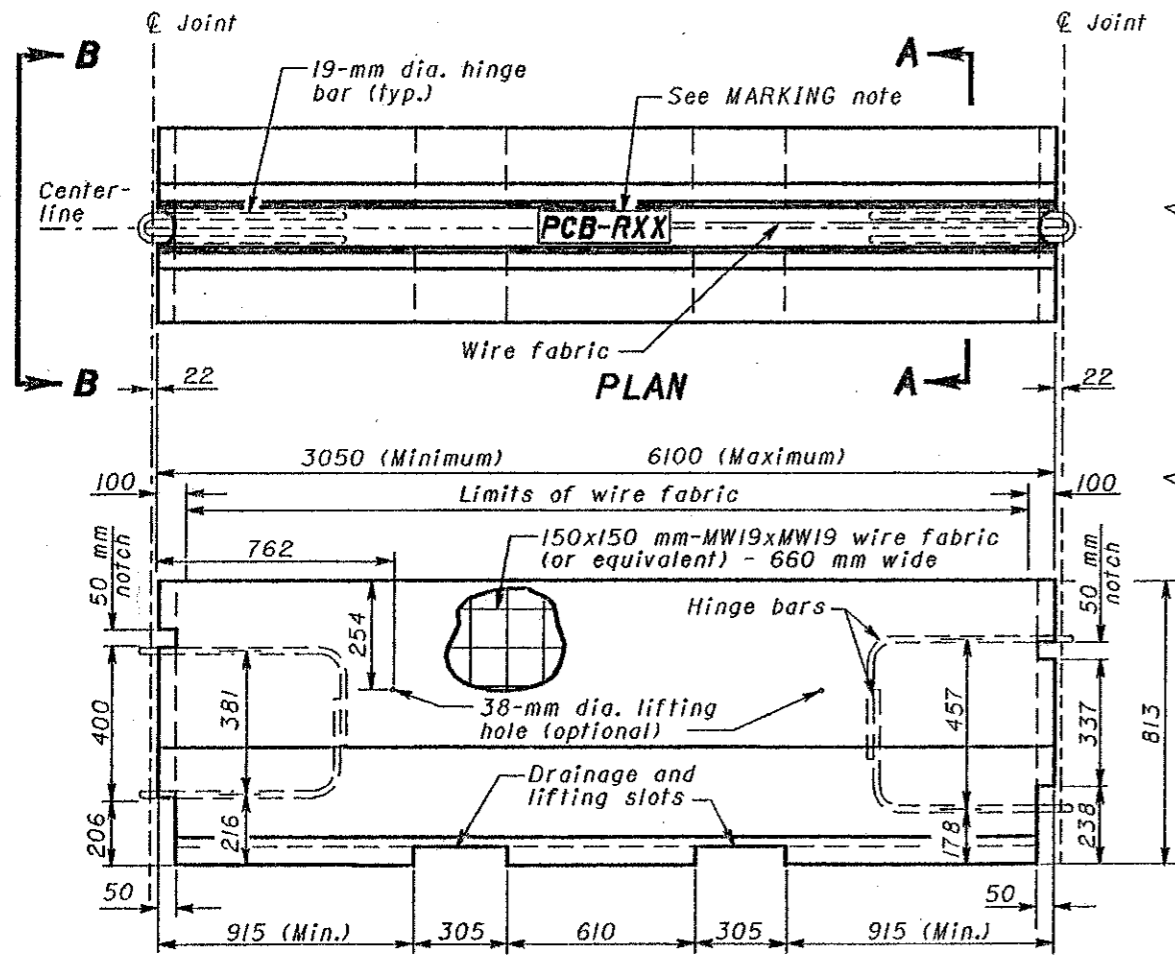
HINGE AND REINFORCING BARS The 19-mm hinge bars and #16M reinforcing bars shall meet the requirements of CMS 509.

HANDLING DEVICES Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

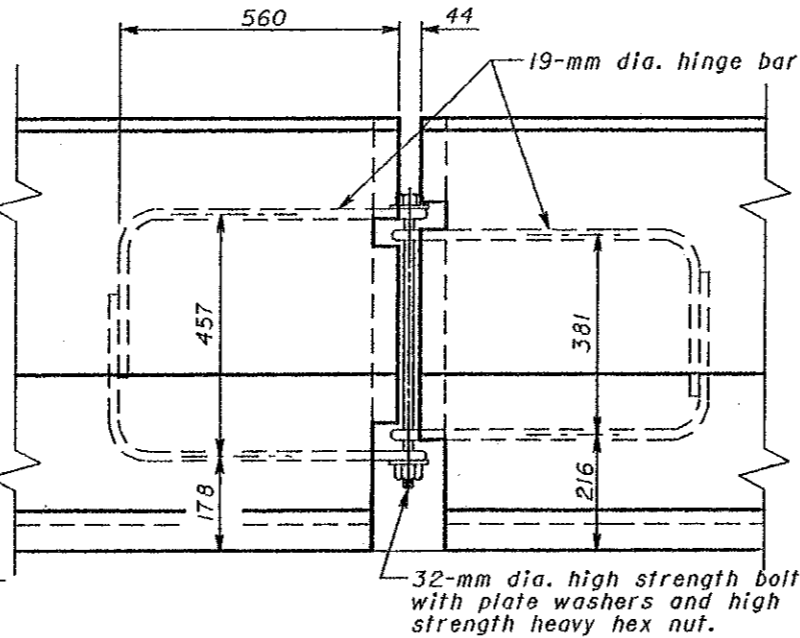
MARKING All barrier segments shall be marked as shown, where XX indicates the year cast. These markings shall be permanently impressed in the barrier using a minimum of 50-mm high lettering.

Each segment shall have, on its top, a unique identification as to its manufacturer and, somewhere on the barrier, the day and month that the barrier was manufactured.

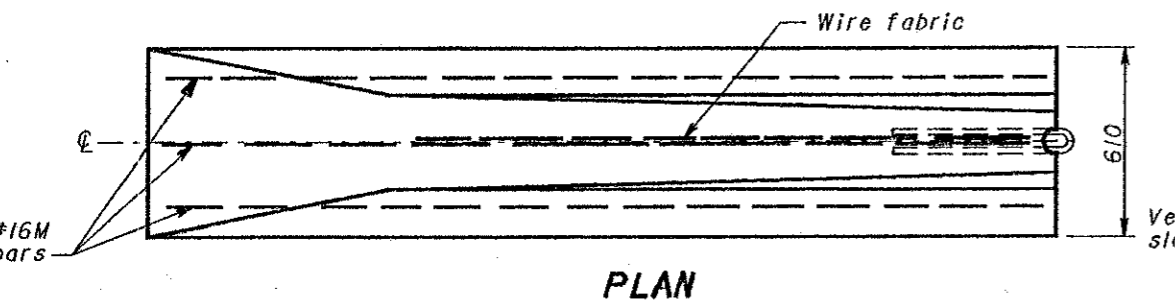
See CMS 622 for additional information.



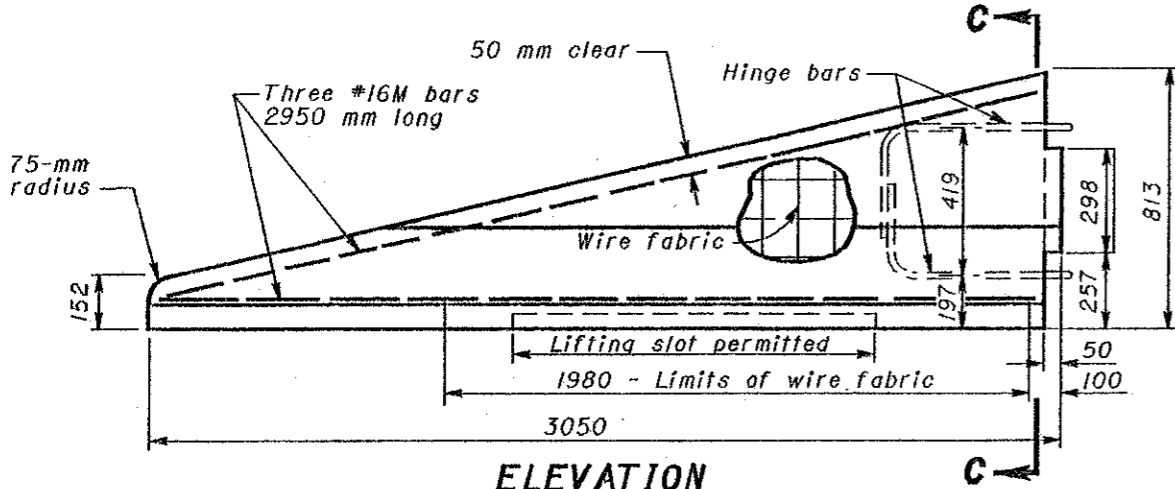
**ELEVATION
BARRIER DETAILS**



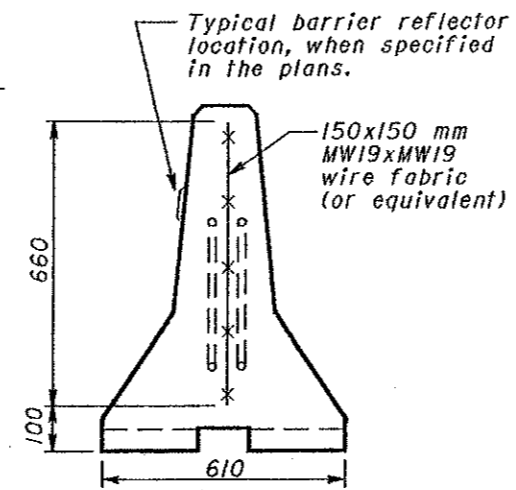
DETAIL AT HINGED CONNECTION



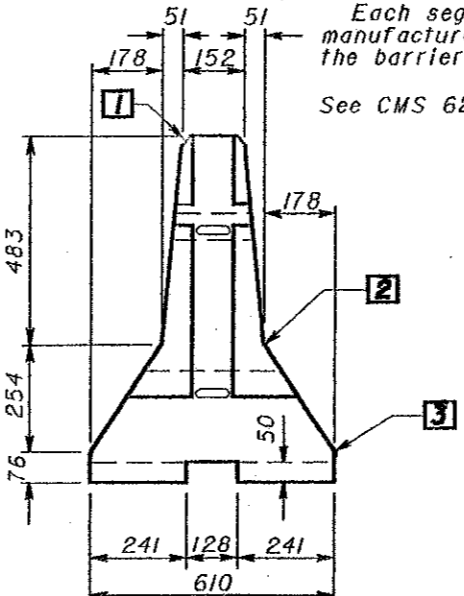
PLAN



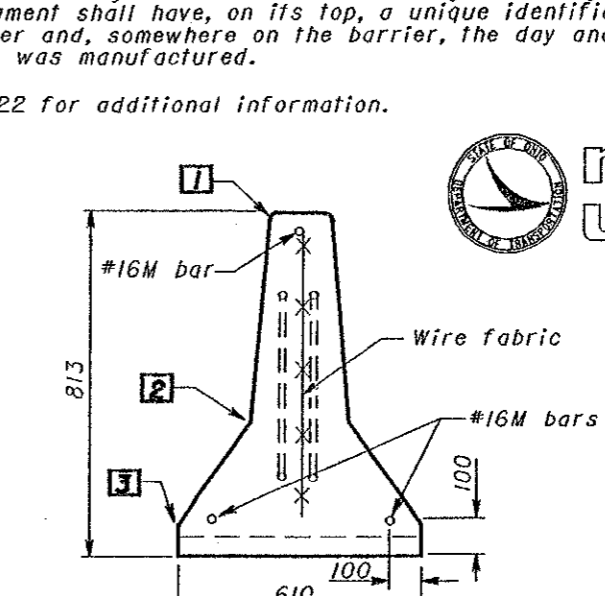
**ELEVATION
TAPERED END SECTION DETAILS**



SECTION A-A

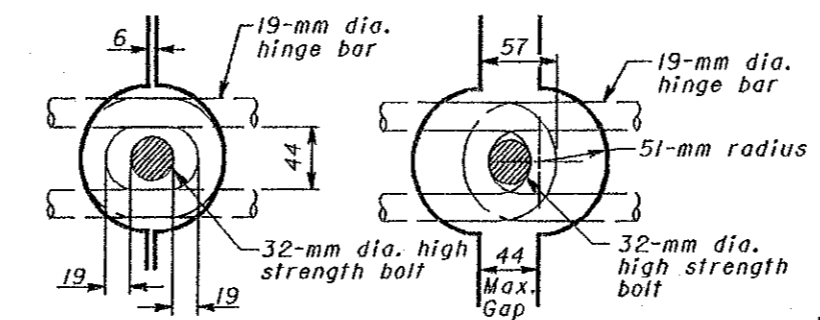


VIEW B-B



SECTION C-C

Vertical edges on keyway and drainage slots may be battered. Depth 50±6 mm.



CLOSED JOINT

Barriers shall initially be placed close together so that bolts can be easily inserted through hinge bar loop.

OPEN JOINT

Barrier joints shall be fully open before the nut is tightened onto bolt.

JOINT CONNECTION DETAILS

All dimensions are in millimeters unless otherwise noted.

LEGEND

- 1 25-mm radius or 19-mm chamfer, all top and end corners.
- 2 Permissible 250-mm radius.
- 3 Permissible 25-mm radius.

This Drawing Replaces MC-9.2.

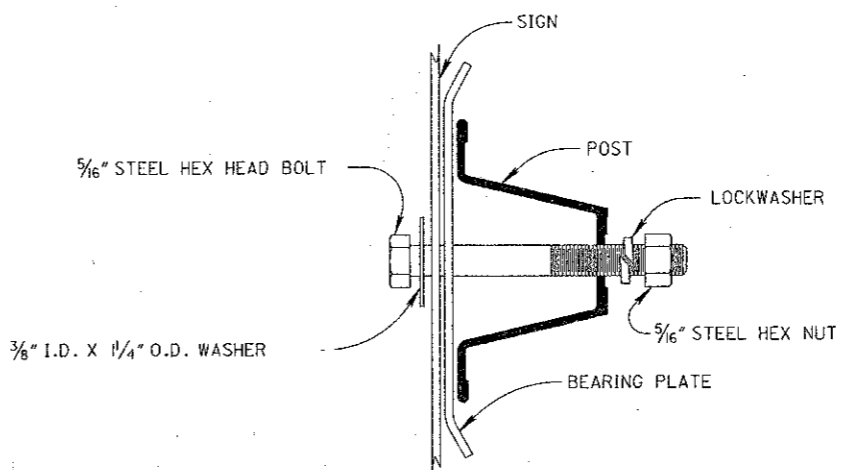
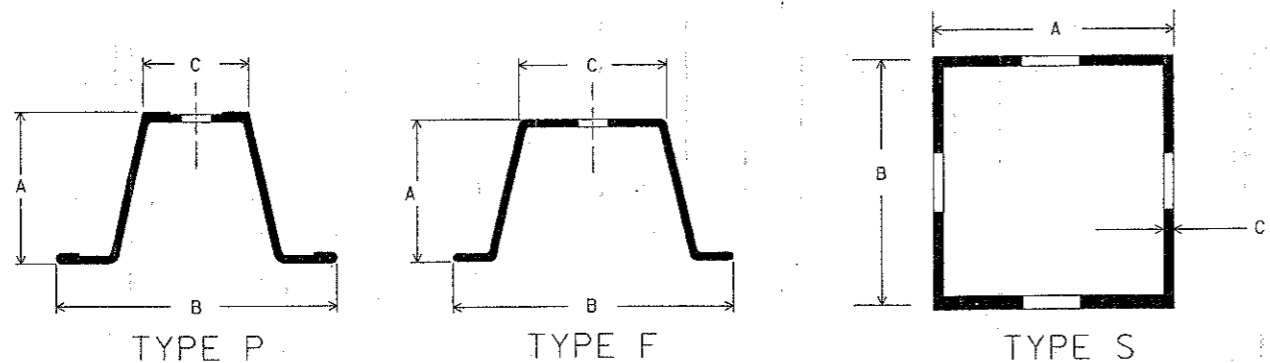
OHIO DEPARTMENT OF TRANSPORTATION

813-mm PORTABLE CONCRETE BARRIER

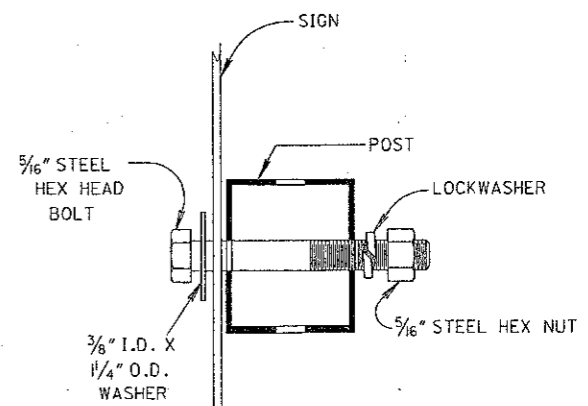
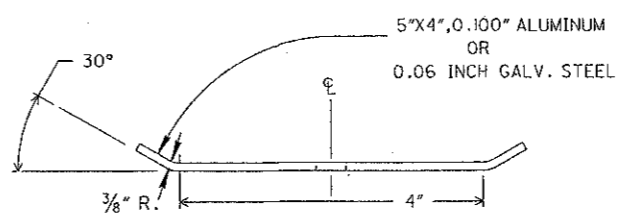
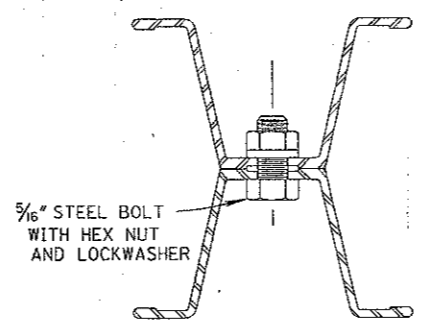
STANDARD CONSTRUCTION DRAWING **RM-4.2M**

APPROVED *[Signature]*

DATE
6-30-95
10-21-97

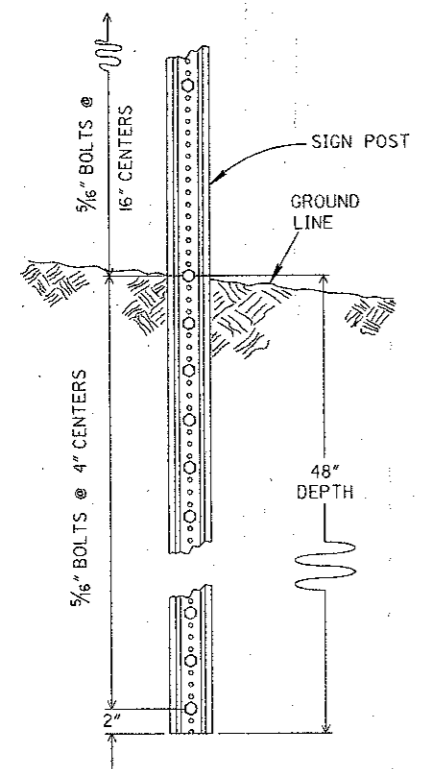


U - CHANNEL
SIGN ATTACHMENT DETAIL

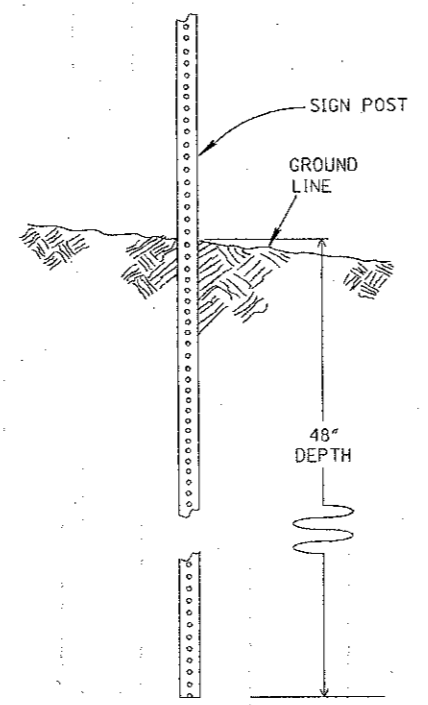


SQUARE POST
SIGN ATTACHMENT DETAIL

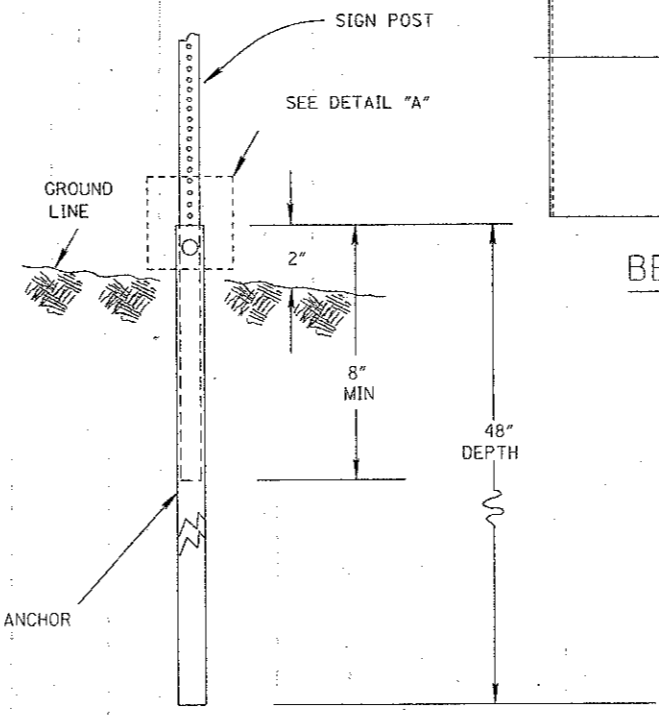
POST NO.	TYPE	LB/FT	POST DIMENSIONS (INCHES)			ANCHOR DIMENSIONS			NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
			A	B	C	A	B	C	
1	F	1.12	0.875	2.063	0.813				2
	P	2.00	1.469	3.063	1.281				
2	F	2.00	1.516	3.125	1.250				2
	S		2.000	2.000	0.083	2.250	2.250	0.105	
3	P	3.00	1.875	3.500	1.313				2
	F	3.00	1.750	3.500	1.625				
4	S		2.000	2.000	0.083	2.250	2.250	0.105	2
	P	4.00	TWO NO.2 POST						
5	F	4.00	TWO NO.2 POST						0
	S		2.500	2.500	0.105	3.00	3.00	0.188	
6	P	6.00	TWO NO.3 POST						0
	F	6.00	TWO NO.3 POST						



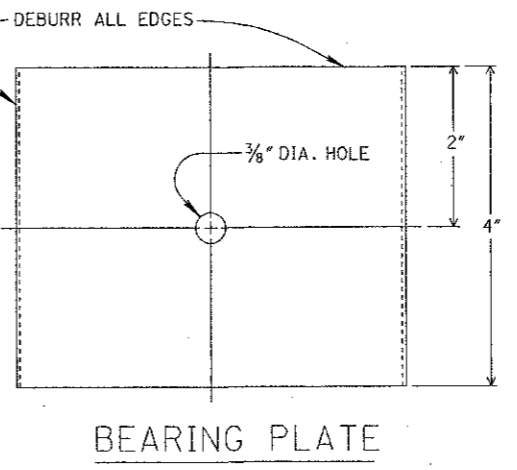
TYPICAL U - CHANNEL
DRIVEN INSTALLATION



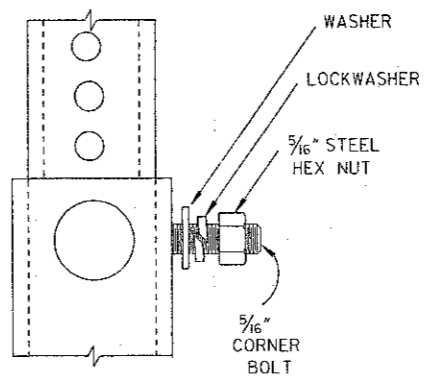
TYPICAL SQUARE POST
DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR
BASE INSTALLATION



BEARING PLATE

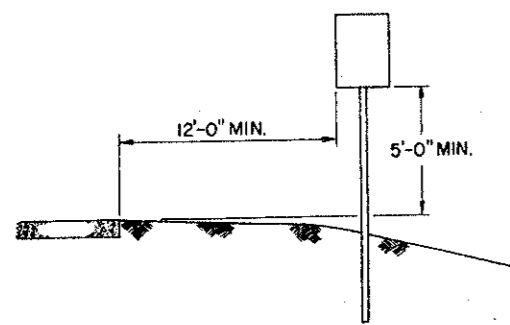


DETAIL "A"

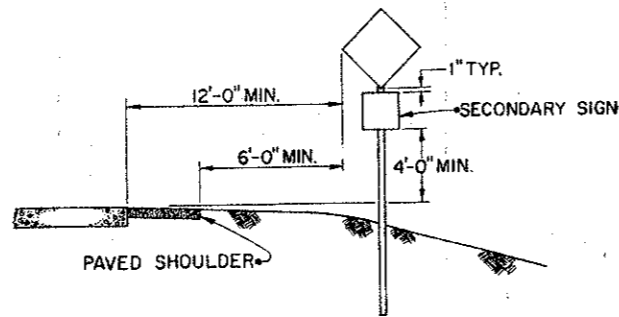
NOTES

- 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.
- USE OF ANCHOR BASE WITH SQUARE POST IS OPTIONAL.
- SQUARE POST MAY HAVE DIE-CUT KNOCKOUTS OR OPEN HOLES.

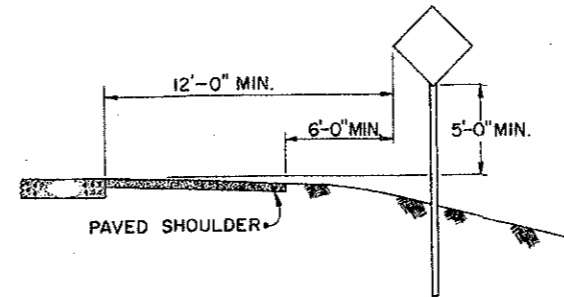
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 04/01/77 03/26/79 06/21/94
YIELDING POST	
STANDARD CONSTRUCTION DRAWING APPROVED: <i>[Signature]</i>	TC-41.20 ENGR. OF DESIGN SERVICES



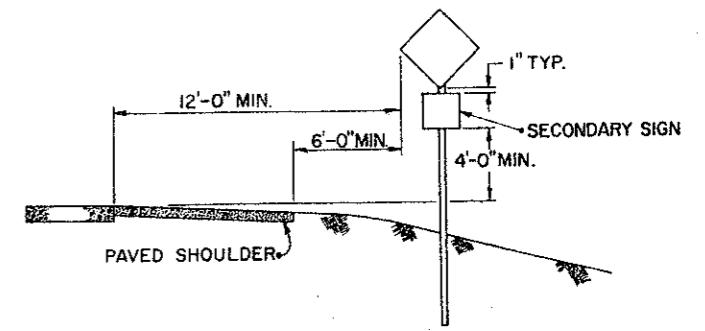
RURAL UNDIVIDED



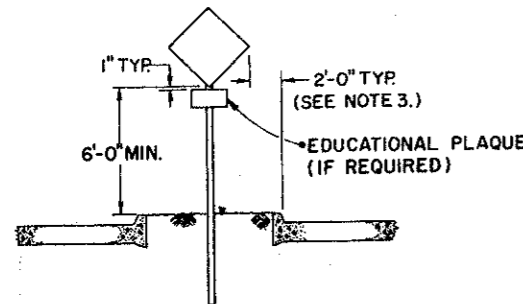
RURAL UNDIVIDED
(W / SECONDARY SIGN)



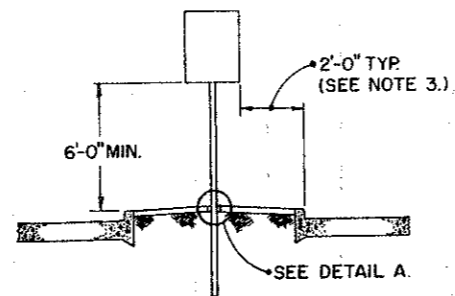
RURAL DIVIDED



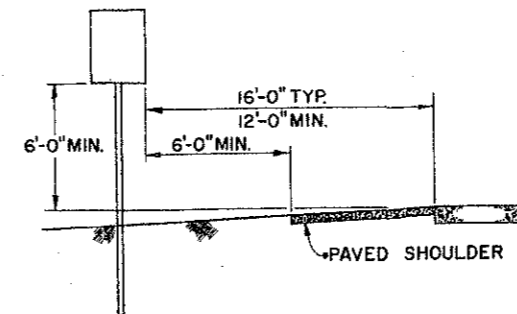
RURAL DIVIDED
(W / SECONDARY SIGN)



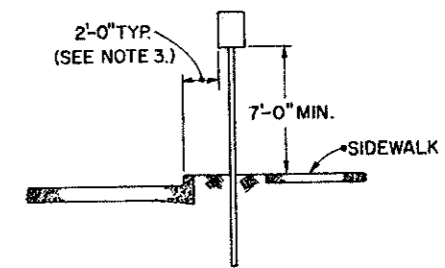
MEDIAN



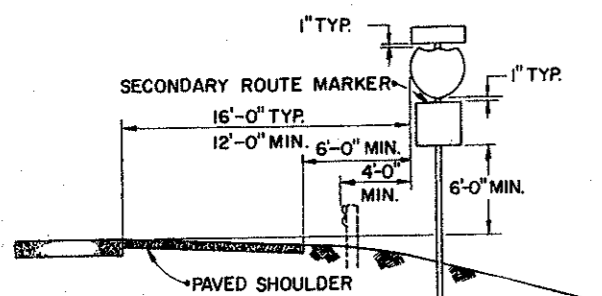
PAVED MEDIAN



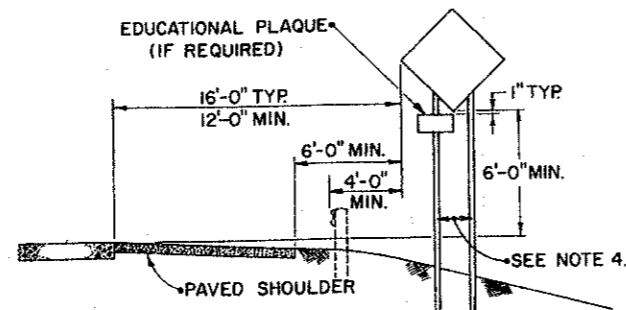
MEDIAN-EXPRESSWAY OR FREEWAY



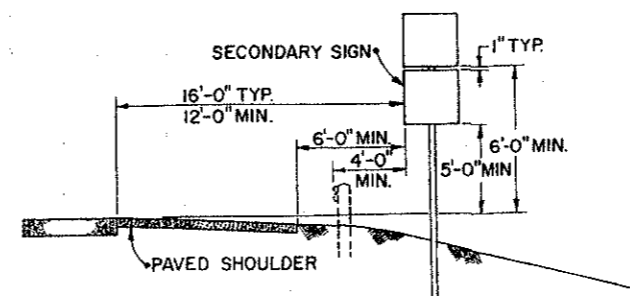
URBAN-RESIDENTIAL AND BUSINESS



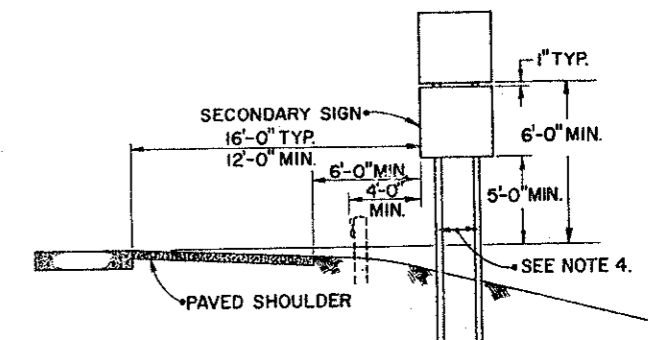
EXPRESSWAY OR FREEWAY
(W / SECONDARY SIGN)



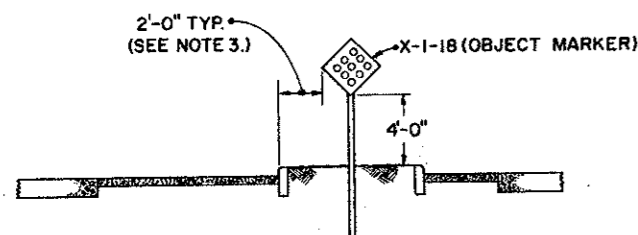
EXPRESSWAY OR FREEWAY



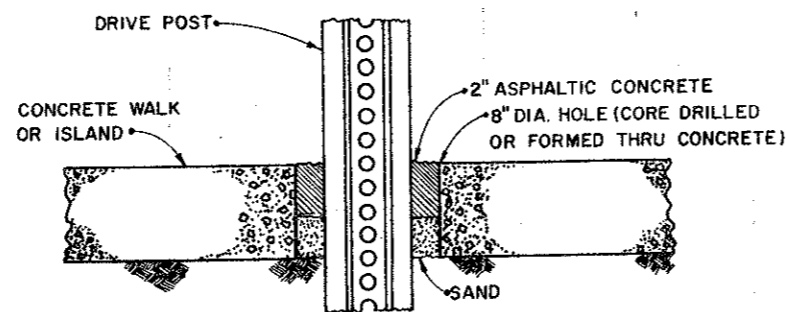
EXPRESSWAY OR FREEWAY
(W / SECONDARY SIGN)



EXPRESSWAY OR FREEWAY
(W / SECONDARY SIGN)



EXPRESSWAY OR FREEWAY



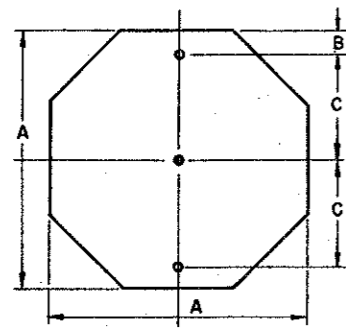
DETAIL A.

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.

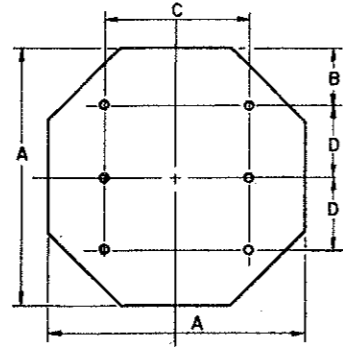
ALL ITEMS SHALL CONFORM TO SUPPLEMENTAL SPECIFICATIONS 857 AND 957, UNLESS OTHERWISE SPECIFIED

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 4/1/77 3/26/79
TYPICAL SIGN PLACEMENT REGULATORY, WARNING AND ROUTE MARKER SIGNS	
STANDARD CONSTRUCTION TC-42.20	
APPROVED: <i>[Signature]</i> Engineer of Design Services	



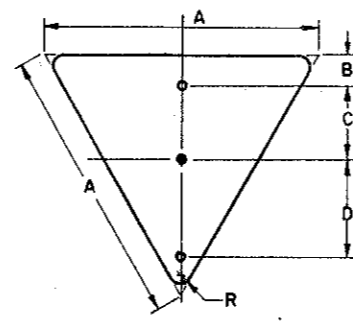
OCTA-1-3

A	B	C	GAUGE	SQ. FT.
30	3	12	.080	6.25
36	6	12	.080	9.00



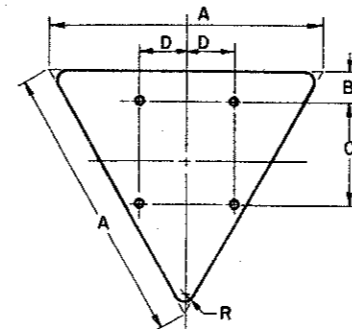
OCTA-2-6

A	B	C	D	GAUGE	SQ. FT.
48	12	24	12	.100	16.00



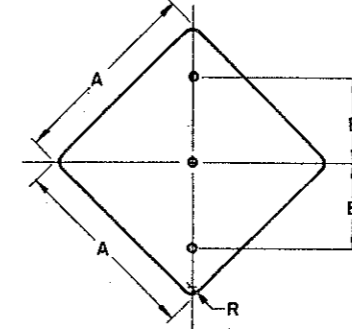
TRI-1-3

A	B	C	D	R	GAUGE	SQ. FT.
36	3	10	11	2.00	.100	3.90



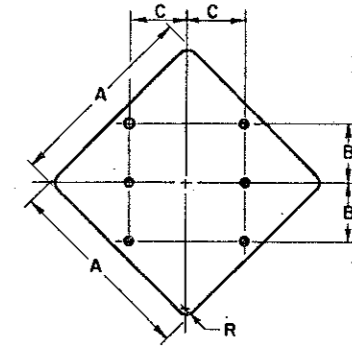
TRI-2-4

A	B	C	D	R	GAUGE	SQ. FT.
48	3	12	12	3	.100	6.93
60	3	18	15	4	.100	10.83



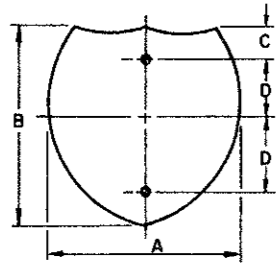
DIA-1-3

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



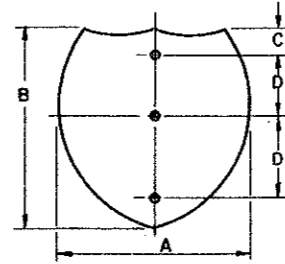
DIA-2-6

A	B	C	R	GAUGE	SQ. FT.
48	15	15	3	.100	16.00
60	18	18	3.75	.100	25.00



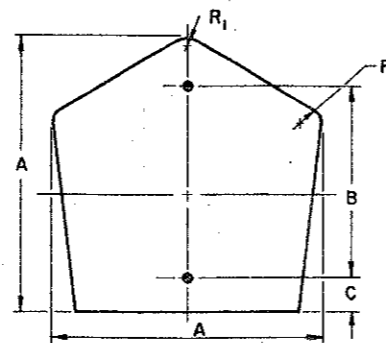
I.S.-1-2

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



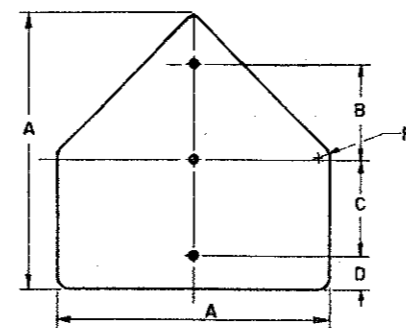
I.S.-1-3

A	B	C	D	GAUGE	SQ. FT.
36	36	6	12	.080	9.00
48	36	6	12	.100	12.00



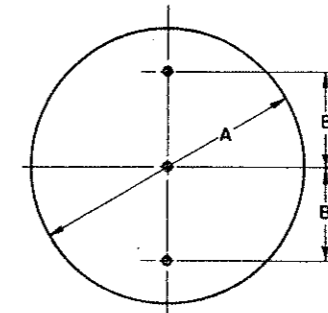
CO-1-2

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



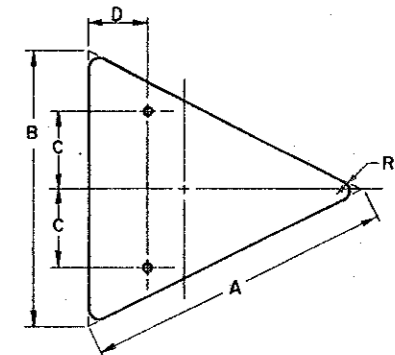
PENT-1-3

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

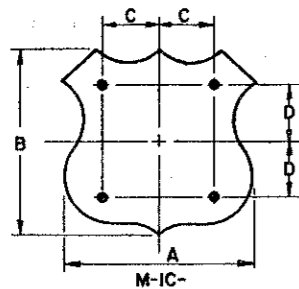


ISOS-1-2

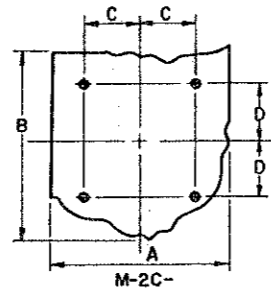
A	B	C	D	R	GAUGE	SQ. FT.
40	30	7.50	12	1.88	.080	3.86
48	36	9	15	2.25	.100	5.56

ROUTE SHIELDS

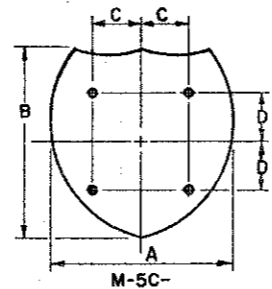
(FOR GUIDE SIGNS ONLY)



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



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

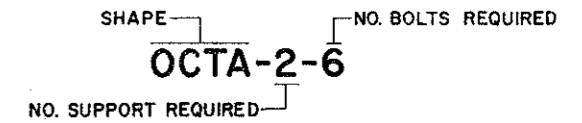


A	B	C	D
24	24	7	7
30	24	8	8
30	30	9	9
40	30	9	9
36	36	10	10
48	36	15	10

ALL SHIELDS SHALL BE .063 GAUGE

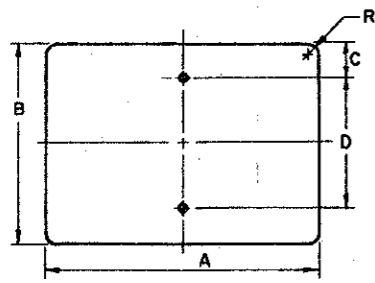
NOTES

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.



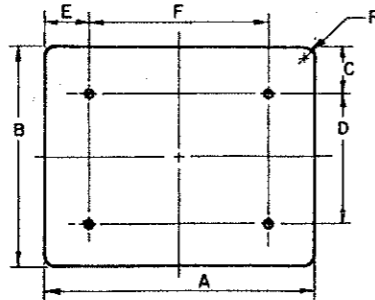
ALL ITEMS SHALL CONFORM TO SUPPLEMENTAL SPECIFICATIONS 857 AND 957, UNLESS OTHERWISE SPECIFIED.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE
SIGN BLANK DETAILS I	4/1/77 4/3/79
STANDARD CONSTRUCTION DRAWING	TC-52.10
APPROVED: <i>E. J. Lohmeyer</i> Engineer of Design Services	



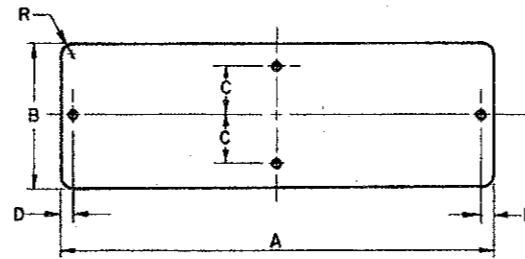
H-REC-1-2

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	15	1.50	12	1.50	.080	4.38
48	20	3	14	1.50	.080	6.67



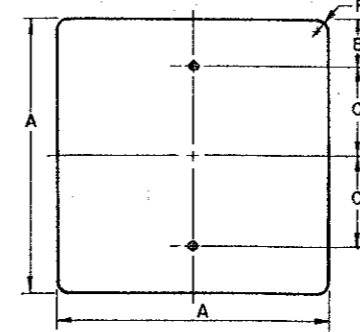
H-REC-2-4

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



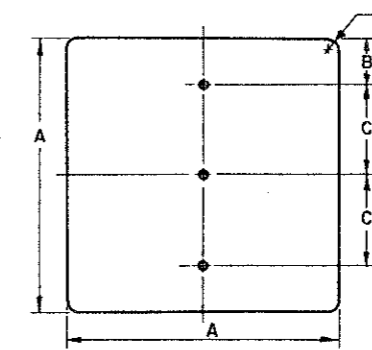
H-REC-1-4 (ONE WAY)

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



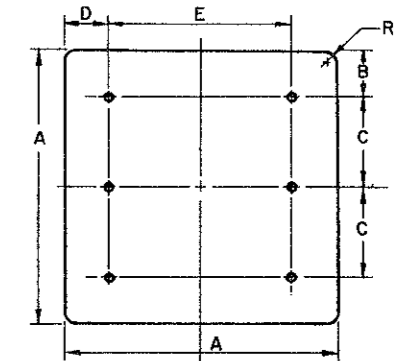
SQ-1-2

A	B	C	R	GAUGE	SQ. FT.
15	3	4 1/2	1.50	.063	1.56
18	3	6	1.50	.063	2.25
24	3	9	1.50	.063	4.00



SQ-1-3

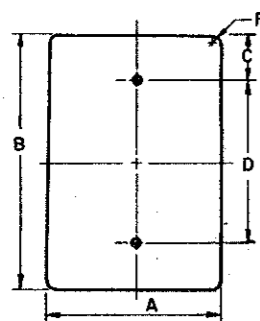
A	B	C	R	GAUGE	SQ. FT.
30	3	12	1.88	.080	6.25
36	6	12	2.25	.080	9.00



SQ-2-6

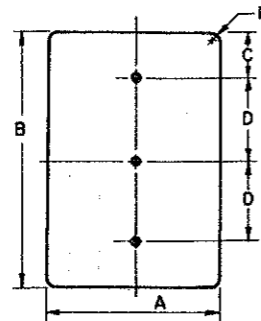
A	B	C	D	E	R	GAUGE	SQ. FT.
36	6	12	6	24	2.25	.080	9.00
48	6	18	9	30	3.00	.100	16.00

* "DO NOT ENTER" SIGN.



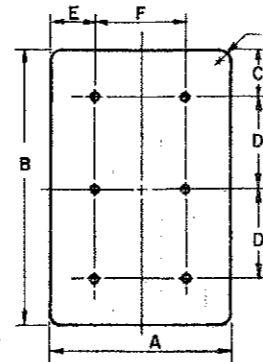
V-REC-1-2

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

- ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.
- ALL BOLT HOLES SHALL BE 3/8" DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
- DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF ± 1/32 INCH.
- FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

SHAPE H-REC-2-4 NO. BOLTS REQUIRED
 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	DATE 4/1/77
SIGN BLANK DETAILS II	
DATE 4/3/79	
STANDARD CONSTRUCTION DRAWING TC-52.20	
APPROVED: <i>E. J. [Signature]</i> Engineer of Design Services	

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