

837 (86) Williams

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

FHW REGION	STATE	FEDERAL PROJECT	
5	OHIO		



PLAN NO. 22

837

PART	COUNTY	ROUTE	SECTIONS	PROJECT TERMINI		NET LENGTH MILES	TOWNSHIP	CITY	VILLAGE
				BEGIN	END				
1	HURON	US-224	(12.22)(17.36-18.63)	12.22	21.27	7.93			

The Standard 19 85 Specifications of the State of Ohio, Department of Transportation, including changes and Supplemental Specifications listed in the plans and proposal shall govern these improvements.

I hereby approve these plans and declare that the making of these improvements will require the closing of the highways to traffic on Parts No. None and that detours will be provided by State forces. The closing to traffic of the highways will not be required on Parts No. 1 and provisions for the maintenance and safety of traffic will be as indicated in the proposal.

Approved Date 4/15/86 Gary W. Parris
District Deputy Director of Transportation

JEM Approved Date 6-6-86 Walter J. Justin
Engineer of Bridges

Approved Date _____
Engineer of Maintenance

Approved Date 9-10-86 James C. Longenecker
Deputy Director, Operations of Operations

Approved Date _____
Assistant Deputy Director, Program Development

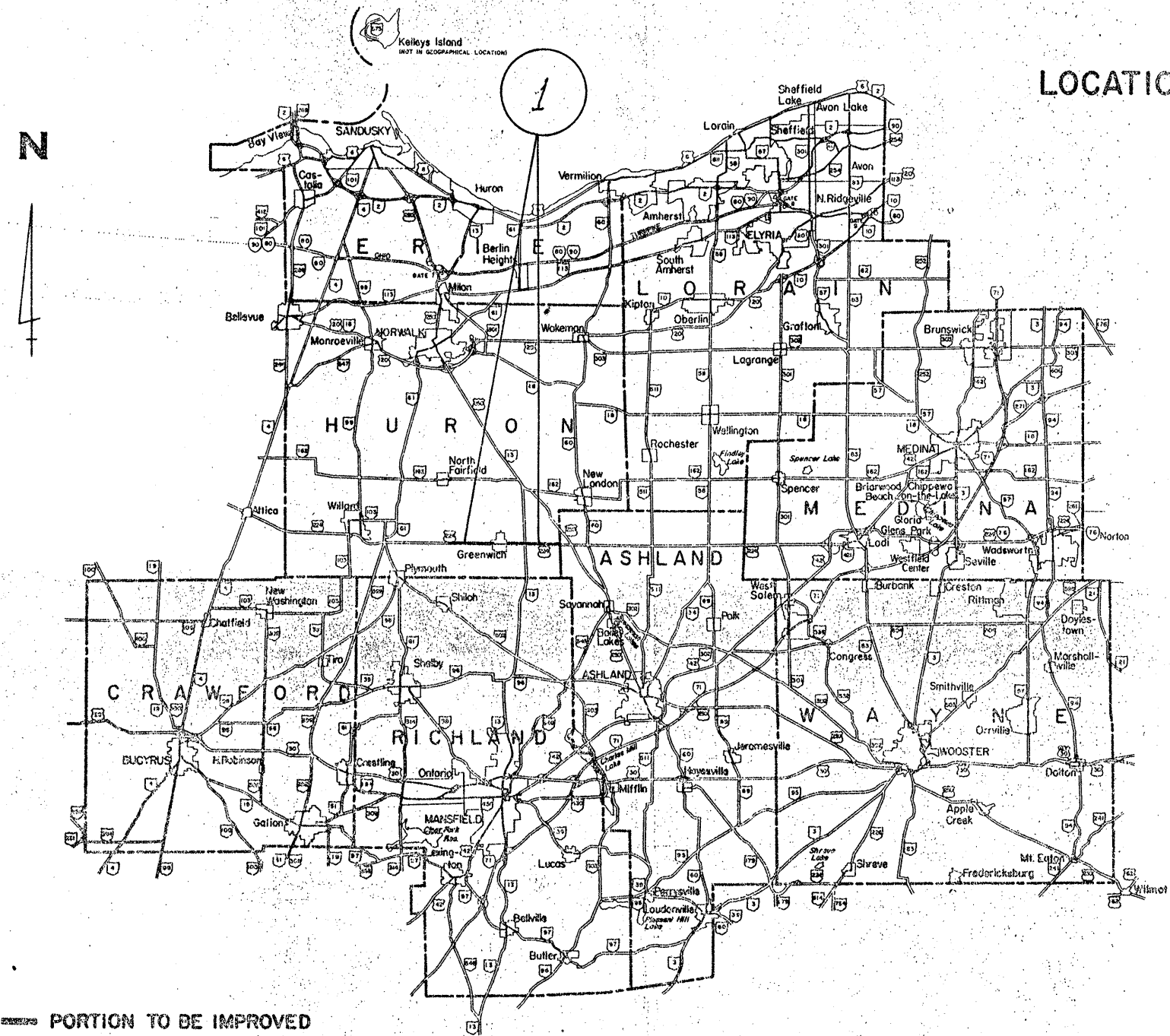
Approved Date _____
Chief Engineer, Construction

Approved Date _____
Chief Engineer, Design

Approved Date _____
Assistant Director, Department of Transportation

Approved Date 9-10-86 Warren J. Smith
Director, Department of Transportation

LOCATION MAP



PORTION TO BE IMPROVED

1-18-86

EN

STANDARD DRAWINGS		SUPPLEMENTAL SPECIFICATIONS	
BP-5	01-11-85	SS-847	10-17-83
BP-6	06-01-65	SS-947	10-17-83
TC-71.10	04-09-79	SS-850	02-25-86
OBR-2-73	04-10-73		
GR-1	01-11-85	SS-861	9-9-83
GR-2B	02-05-82	SS-961	9-9-83

GENERAL SUMMARY

ITEM	GRAND TOTAL <i>Part 1</i>	UNIT	DESCRIPTION
407	9168	Gal .	Tack Coat, <i>As per Plan.</i>
407	287	Ton	Cover Aggregate
402	4049	Cu. Yd .	Asphalt Concrete AC-20
404	3183	Cu. Yd .	Asphalt Concrete AC-20, <i>As per Plan</i>
<i>Special</i>	40000	Lb.	<i>Crack Sealing, Hot Applied, ASTM D-3405</i>
<i>Special</i>	2939	Sq. Yd.	<i>Pavement Planing, Bituminous, Without Heating</i>
203	4	Station	<i>Linear Grading</i>
847	180	Lin. Ft.	<i>Stop Lines, 947.03, Type A1, Inlaid</i>
847	2	Each	<i>Railroad Symbol on Pavement, 947.03 Type A1, Inlaid.</i>
621	7.93	Mile	<i>Center Lines</i>
621	15.86	Mile	<i>Edge Lines</i>
617	37	M. Gal.	<i>Water</i>
614	18	Each	<i>Work Zone Marking Signs.</i>
614	15.86	Mile	<i>Temporary Center Lines, Class II</i>
624	Lump	Lump	Mobilization
617	18609	Sq. Yd .	Shoulder Preparation
617	1619	Cu. Yd .	Compacted Aggregate
614	Lump	Lump	Maintaining Traffic

GENERAL NOTES

TRAFFIC:

Traffic shall be maintained at all times. The length of restricted traffic zones shall be kept to a minimum consistent with the specification requirements for protection of completed courses.

RAILROAD CROSSINGS:

The new surface course shall be feathered or butt jointed to meet the rail grades as specified.

ALIGNMENT AND PROFILE:

The work proposed by this project is for the resurfacing of the existing pavement. The alignment of the existing pavement will not be changed, and the profile of the proposed surface will be similar to that of the existing pavement except that it will be raised an amount equal to the thickness of the resurfacing course or courses specified in these plans.

INTERMEDIATE COURSE, SPOT LEVELING AND PATCHING:

This material shall be placed in a separate operation where and as directed by the engineer.

TACK COAT:

The tack coat operation shall be as determined at a pre-construction conference as per 407.05, and application rates shall not exceed 0.10 gal. per sq. yd.

COVER AGGREGATE:

Cover aggregate shall conform to 703.06.

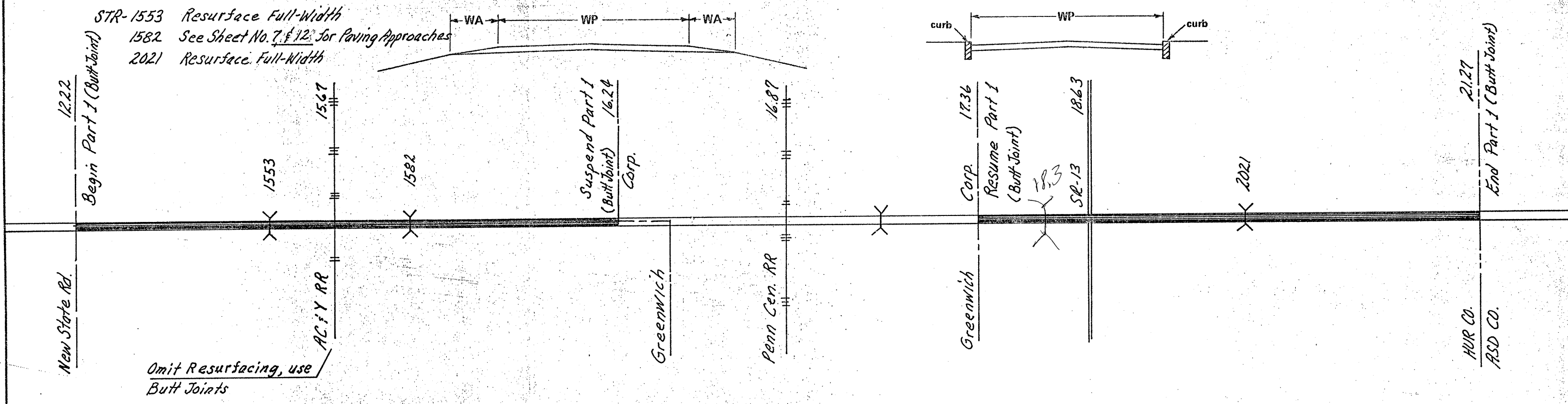
ASPHALT CONCRETE

PLAN NO.
22

4
26

TYPICAL 1

TYPICAL 2



PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH		WP FEET	TYPICAL	EXISTING TYPE PAVEMENT	PAVEMENT AREA SQ. YDS.	PROPOSED PAVEMENT						Special Crack Sealing Hot Applied ASTM D-3405 lb.	Special Pavement Placing, Bitum. without Heating Sq. Yd.
			MILES	LIN. FT.					407		ASPHALT CONCRETE					
									TACK COAT @ .02... gal./s.y. GALS.	COVER AGGR. @ .5... lbs./s.y. TONS	ITEM 402 THICK INCHES 1/4" Av.	CU. YDS.	ITEM 404 THICK INCHES	CU. YDS.		
1	US-224	12.22-16.24	4.02	21226	24	1	404	56603								
		17.36-21.27	3.91	20645	24	1	404	55053								
							EA For Inter. MB and Drives	2944								
		Total Part 1	7.93	41871				114600	9168	287	3979	1"	3183	40000	600	

ROUTINE MAINTENANCE:

Between the time that bids are taken and the start of construction, the maintaining agency may enter upon the project and perform routine maintenance such as crack sealing, patching, and berm and shoulder repair. The effects, if any, of the performance of routine maintenance shall be considered as inherent in work of the character provided for in the contract and the resulting conditions shall not be considered as differing materially from those existing at the time bids were taken.

INTERSECTIONS:

Rural-Intersections shall be paved ~~to end of radii~~ or as directed by the Engineer to provide a smooth transition between the two highways. Urban-Intersections shall be paved to ~~back of crosswalks~~ or as directed by the Engineer. Drives-Paved drives shall be resurfaced as directed by the Engineer. Care shall be taken to eliminate water pockets in curbed sections.

TACK MATERIAL:

The amount of tack material required to coat the existing pavement edges prior to 301 or 402 operations shall be included in the Unit Price Bid for Item 402, Asphalt Concrete or Item 301, Bituminous Aggregate Base.

ITEM 407, TACK COAT:

As per 407.05 the application rate shall be ~~.08~~ gallons per square yard, a complete pavement surface coverage shall be required. Areas of tack stripped by construction equipment or traffic shall be recoated prior to placing asphalt concrete. Item 407.06 shall be followed unless waived by the Engineer.

BUTT JOINTS:

Butt joints shall not be cut and left open to traffic for a time period longer than ~~three (3) days~~. If cut is not paved within three (3) days, it shall be filled in with a temporary asphalt concrete wedge, of sufficient length as directed by the Engineer.

Construction "Bump" signs (OW-62 and OW-143) shall be erected and maintained during the period that the cut for the butt joint is left open.

ITEM SPECIAL, PAVEMENT PLANING, BITUMINOUS WITHOUT HEATING:

Planing is to be performed as directed and in areas designated by the Engineer. Removal of existing pavement surface may be required to eliminate adverse surface distortion which in the judgment of the Engineer cannot be satisfactorily corrected in the paving courses.

These areas may include material displaced by rutting or shoving, asphalt surface patches, concrete patches and transverse bumps at joints or joints with structures, adjoining pavements or railroads, etc.

ITEM SPECIAL, PAVEMENT REPAIR:

This item of work shall consist of the removal of the existing pavement or paved berm which may be asphalt, brick, concrete or a combination of each, in areas exhibiting severe pavement failure.

The Engineer shall designate the locations and limits of the areas to be repaired. The repair areas shall be roughly rectangular in shape and cut or sawed to a neat line. The pavement shall be removed within the designated areas by methods which will not damage the adjacent pavement. The depth of removal, as directed by the Engineer, shall be sufficient to remove all deteriorated pavement (estimated depth may vary from 2" to maximum 12".) The materials so removed shall be disposed of in accordance with 203.05.

Replacement material shall be 402 or 301 material and shall be placed and compacted to finish flush with the adjacent pavement surface. The repair areas shall be painted with bituminous material (sides and bottom.) All compaction shall be achieved by mechanical methods to satisfaction of the Engineer, maximum lift thickness (3".)

Payment shall include all labor, equipment and materials necessary to complete the pavement repair. The following estimated quantity is provided in the Summary to be used as directed by the Engineer. Payment will be made at contract price per cubic yard, by ticket weight conversion, Item Special, Pavement Repair. 50 Cu. Yd.

MAILBOXES:

~~Existing Aggregate Mailbox approaches~~ shall be paved with ~~1 1/4"~~ of Item 402 and 1" of Item 404. They shall conform as much as practical to Standard Drawing BP-6 or as directed by the Engineer.

Grading shall be performed in these areas to obtain a base which is flush with the existing edge of pavement. A quantity of 617 Aggregate has been provided for areas where the shoulders were low prior to grading and/or low areas caused by removal of unsuitable material. Quantities to perform this work have been included in the General Summary and are estimated as follows:

Item Special Grading Mailbox Approaches: 90 Locations
Item 617 Compacted Aggregate: 68 Cu. Yds.

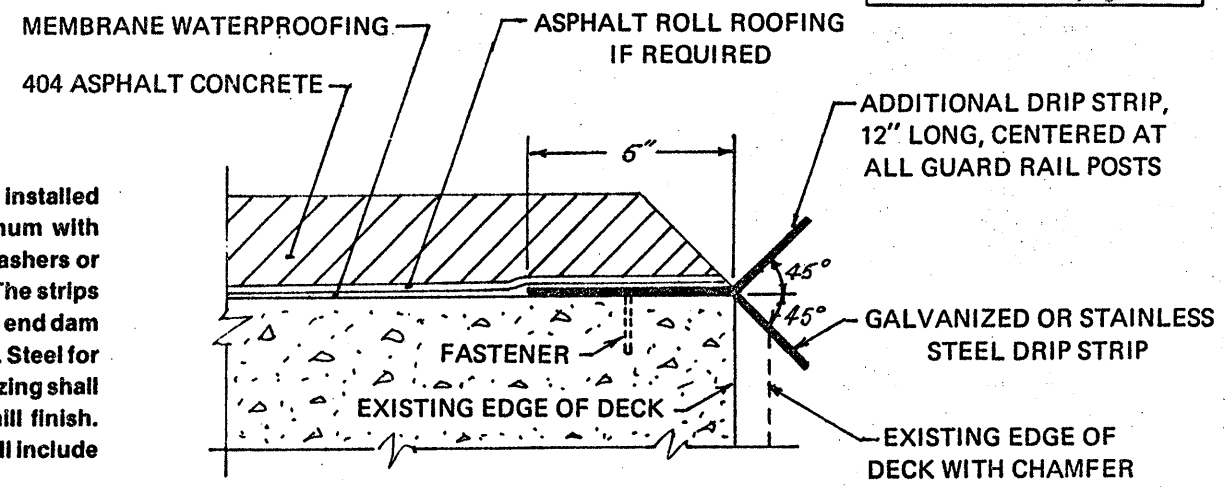
BRIDGE DECK TREATMENT

PROTECTIVE COURSE FOR MEMBRANE WATERPROOFING

MEMBRANE WATERPROOFING, Sheet Type 1: A minimum of 1-1/2 inches of 404 Asphalt Concrete shall be placed over the membrane.

MEMBRANE WATERPROOFING: A minimum of 2-1/2 inches of 404 Asphalt Concrete shall be placed over the membrane.

DRIP STRIP: Prior to applying deck membrane waterproofing, a bent drip strip shall be installed along the edges of the deck as shown. The strips shall be fastened at 1'-6" c/c maximum with 1-1/4" x 5/32" x 1/4" (Length x Shank diameter x Head diameter) flat head drive pins and washers or No. 10 galvanized screws and expansion anchors, subject to the approval of the Engineer. The strips shall be placed the full length of the deck, ending at the face of the abutment wingwall or steel end dam angle. Where splices are required a 3" (Min.) lap shall be used with a fastener through the lap. Steel for galvanized strips shall be 8" x 0.105" and shall meet the requirements of ASTM A568. Galvanizing shall be in accordance with 711.02. Stainless steel shall be 20 gauge ASTM A167, Type 304, mill finish. Payment shall be at the contract price bid for Item Special, Sq. Ft., Steel Drip Strip, which shall include all materials, labor, tools and incidentals necessary to complete item.



TYP. SEC. DRIP STRIP

BRIDGE DECK DATA

PART	COUNTY, ROUTE, BRIDGE NO.	LENGTH (BRIDGE LIMITS) L.F.	WIDTH L.F.	BRIDGE DECK AREA S.Y.	202	BRIDGE DECK REPAIR			519	SPECIAL		516	609	CONCRETE	Existing Wearing Surface	SPECIAL	Pavement Width Ft.
					WEARING COURSE REMOVED DEPTH S.Y.	Superplasticized Dense Concrete (See Proposal Note)	1 3/4" THICK OVERLAY AS PER PLAN S.Y.	VARIABLE THICKNESS OVERLAY C.Y.	FULL-DEPTH REPAIR C.Y.	PATCHING Concrete Struc. Cures, as per Plan S.F.	STEEL DRIP STRIP S.F.	Scupper Adjustment Each	Keyway Drain Each	VERT. EXT. OF STR. EXP. JOINTS L.F.		Asphalt Concrete Curb, as per Plan L.F.	
1	HUR-224-1553	24.5	30.0	82											Asphalt	* 615	24
1	HUR-224-1582	60.2	40.0	268		268	9	1					60		Asphalt	**1112	24
1	HUR-224-2021	23.6	30.0	79											Asphalt	* 612	24
						268	9	1					60				2339
2	HUR-224-1709	22.5	28.0	72		72	9	1	20	6	24				Asphalt	** 606	24

* Plane a maximum of 2" from the bridge full width and 100' on each approach the same time the bridge is planed. Remove all dirt and loose material. Resurface full width.

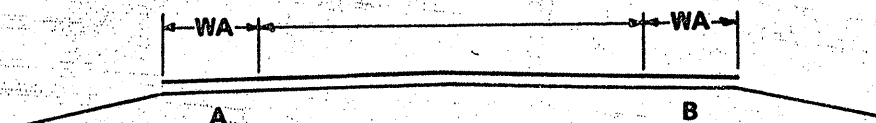
~~** Plane 100' on each approach the same time the bridge is planed.~~

See Sheet No. 13, 14 & 15 for traffic control details on HUR-224-1582 and ~~HUR-224-1709~~.

PAVED SHOULDERS

*NOTES

TYPICAL 1



TYPICAL 2



NOTE: Shoulder widening shall be in place before any bridge work is done.

ITEM 411 - STABILIZED CRUSHED AGGREGATE: Whenever 411 stabilized crushed aggregate is stipulated, the first paragraph of 411.03 is waived and subgrade compaction shall be to the satisfaction of the Engineer.

** One station equals 100 lin. ft. Stations shall be measured along each edge of pavement.

1. **ITEM 203 LINEAR GRADING:** This work shall consist of preparing a subgrade for the shoulder paving by excavating the existing shoulder material to the depth shown in the plan, or as directed by the Engineer to remove any unstable material and by shaping and compacting the subgrade. The unsound or broken edge of bituminous pavements shall first be trimmed to a line established by the Engineer. The existing shoulder then shall be excavated and the subgrade shaped and compacted. Compaction shall be carried out to the satisfaction of the Engineer by means of a trench roller, 401.11. Areas graded in excess of depths specified or directed by the Engineer shall be backfilled to desired grade using 617 Compacted Aggregate at the contractor's expense. Excavated material shall be disposed of as indicated in the plan.

- a. Used to back up shoulders where required; the balance to be disposed of as directed by the Engineer.
- b. Disposed of by the Contractor at his own responsibility outside the limits of the right-of way.
- c. Wasted adjacent to the pavement and within the right-of-way as directed by the Engineer.

2. **ITEM 402 ASPHALT CONCRETE:** Prior to placing a bituminous mixture for shoulder paving, the edge of the existing pavement, for the full depth of the trench, shall be coated with bituminous material in accordance with 401.12.

3. **ITEM 301 BITUMINOUS AGGREGATE BASE** may be used in lieu of Item 402 Asphalt Concrete.

4. **ITEM 617 COMPACTED AGGREGATE:** A quantity of Item 617 Compacted Aggregate has been provided for areas where the shoulders were low prior to grading and/or low areas caused by removal of unsuitable material.

5. **ITEM 408 BITUMINOUS PRIME COAT:** After application of the Prime Coat, no further treatment shall be performed until so directed by the Engineer.

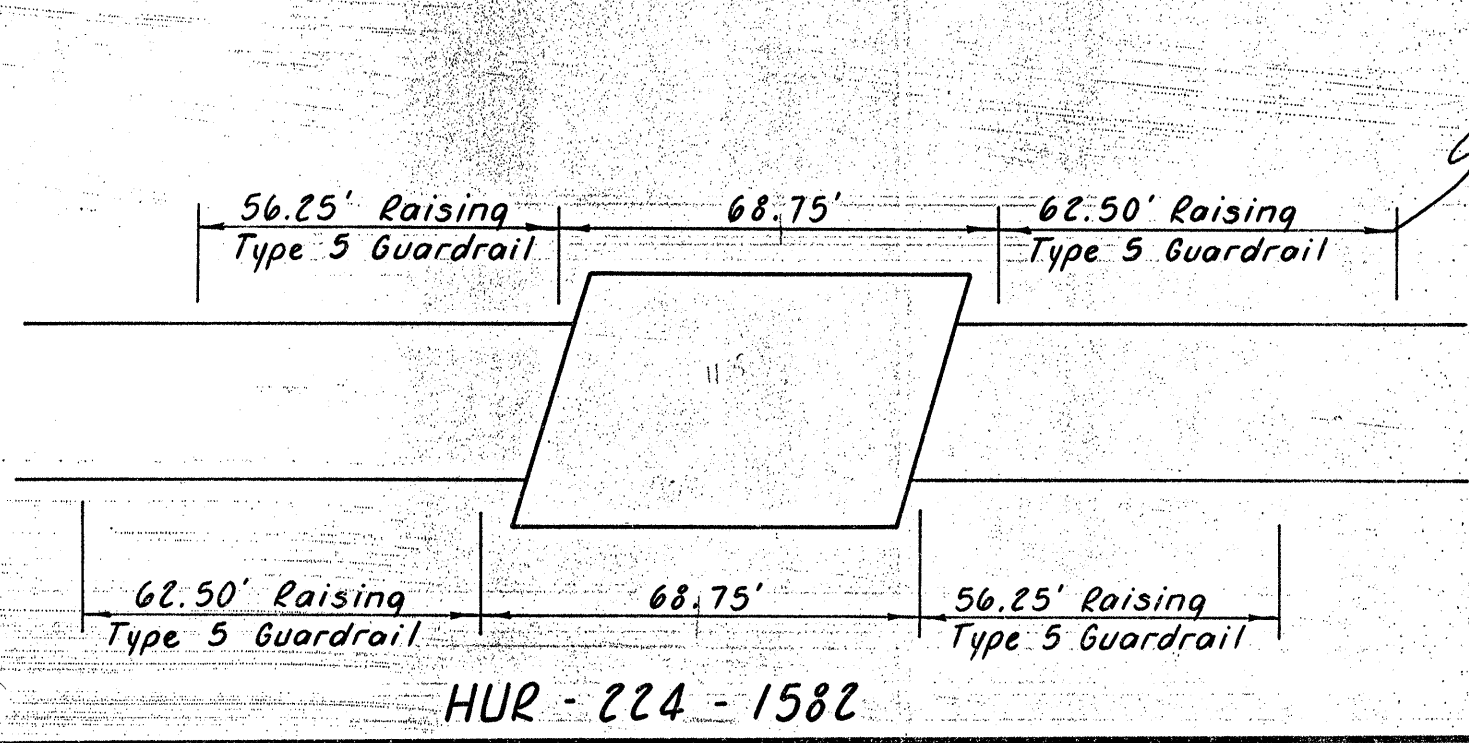
6. **SHIELD:** The contractor shall provide a shield to prevent the spraying or drifting of liquid bituminous material onto the edge of the pavement or edgelines. The attention of the contractor is directed to 107.12 of the Specifications.

PAVED SHOULDER DATA

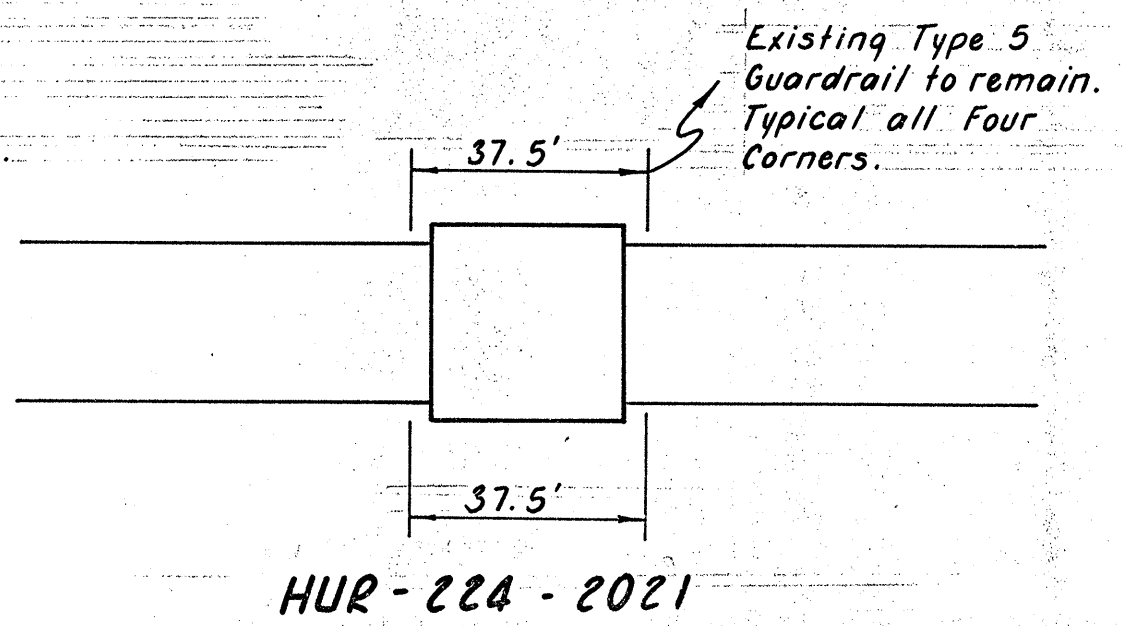
PART	ROUTE	LOG POINT TO LOG POINT	LENGTH		TYPICAL	PROPOSED WIDTH (FT.)				SHOULDER AREA SQ. YDS.	203 LINEAR GRADING		402 ASPHALT CONCRETE		411 STABILIZED CRUSHED AGGREGATE		408 PRIME	409 SEAL		617 COMPACTED AGGREGATE	605 AGGREGATE DRAINS	*NOTES	
			MILES	LIN. FT.		A	B	C	D		DEPTH INCHES	**STA.	AVG. THICK INCHES	CU. YDS.	AVG. THICK INCHES	CU. YDS.	Bit. Matl.	Bit. Matl.	Aggr.	CU. YDS.	LIN. FT.		
																	@..... gal./s.y.	@..... gal./s.y.	@..... c.y./s.y.				
1	224	15.80 - 15.82	0.02	100	1	7	7			156	8	2	8	35									
1	224	15.83 - 15.85	0.02	100	1	7	7			156	8	2	8	35									
		TOTAL										4		70									1,3

ESTIMATED QUANTITIES

Bridge Number	Side	517	517	606	202				
		Rebuilt Railing on new Type 2 Posts, As Per Plan	Rebuilt Railing on Existing Type 2 Posts, As Per Plan	Raising Type 5 Guardrail, As Per Plan	Anchor Post Removed				
		Lin. Ft.	Lin. Ft.	Lin. Ft.	Each				
HUR - 224 - 1582	L	68.75		118.75	2				
	R	68.75		118.75	2				
HUR - 224 - 2021	L		37.5						
	R		37.5						
Totals		137.5	75.0	237.5	4				

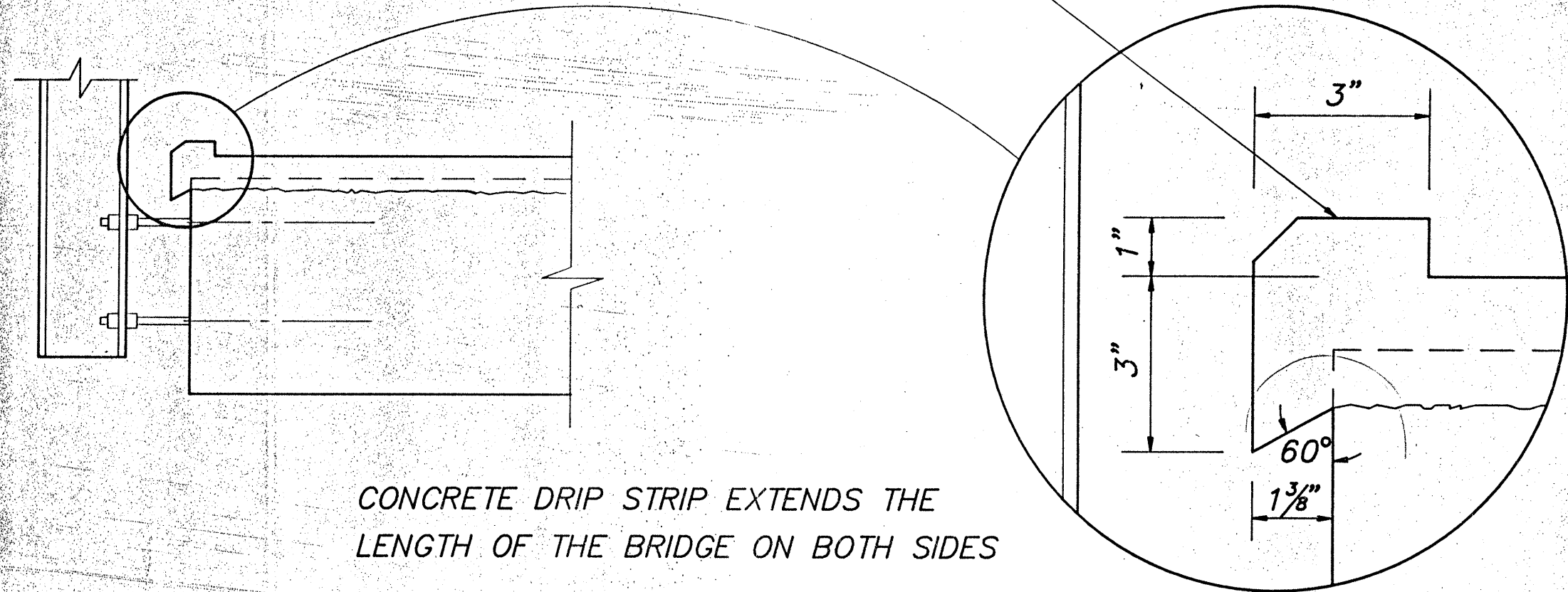


Existing Type "A" Anchor Assembly to remain. Remove Anchor Post "C" As Per General Note, Typ. all Four Corners.



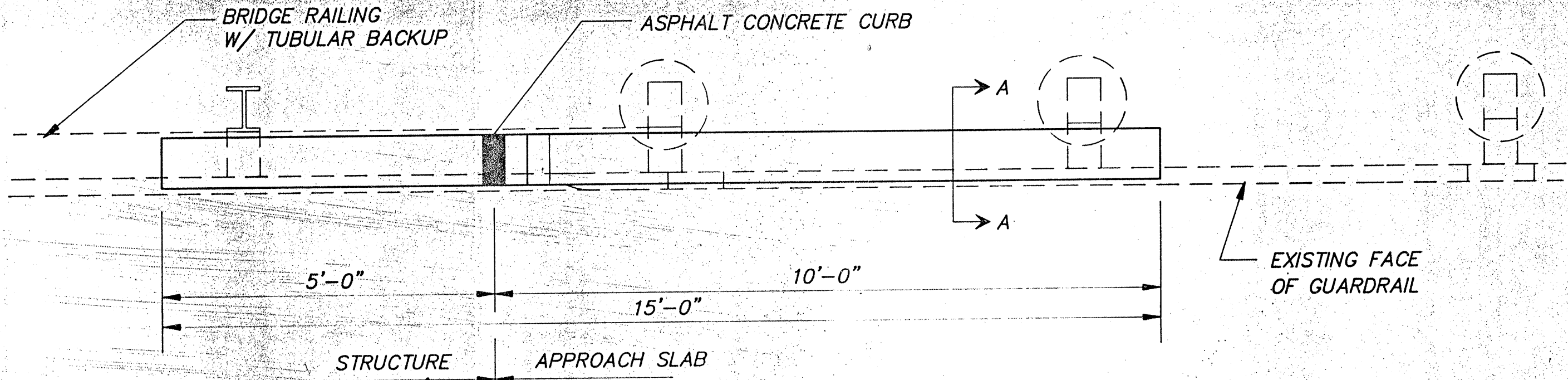
Existing Type 5 Guardrail to remain. Typical all Four Corners.

18" LONG CONCRETE HUMP TO BE
CENTERED IN FRONT OF EACH
GUARDRAIL POST

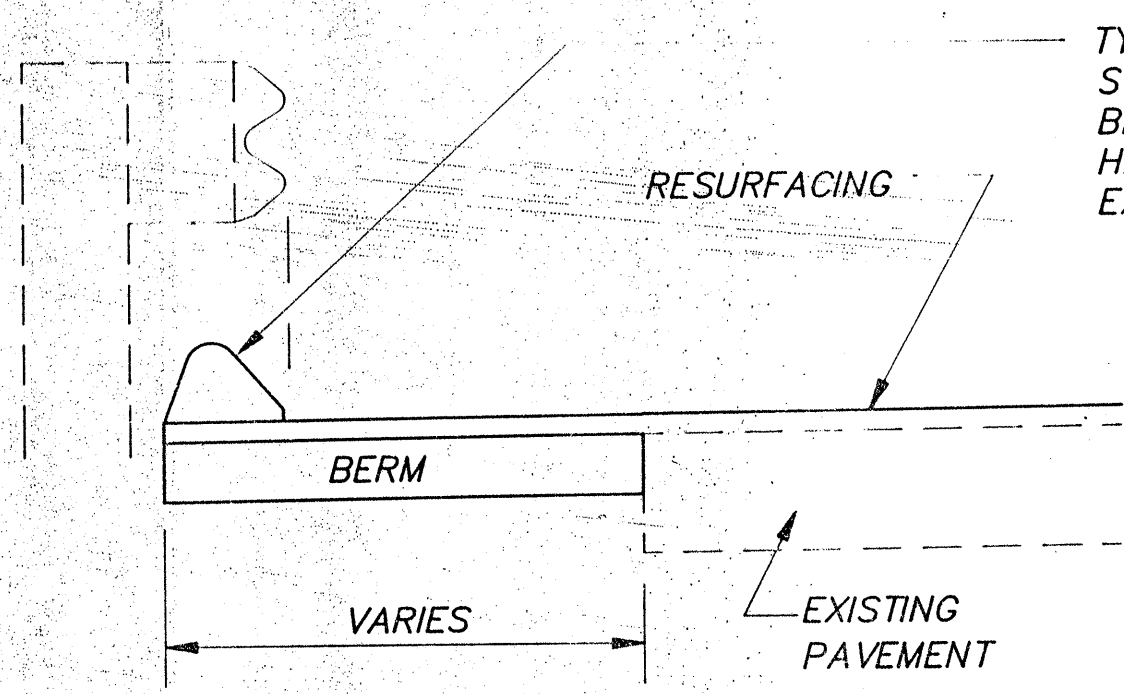


CONCRETE DRIP STRIP EXTENDS THE
LENGTH OF THE BRIDGE ON BOTH SIDES

TYPICAL EDGE DETAIL
FOR CONCRETE SLAB BRIDGE

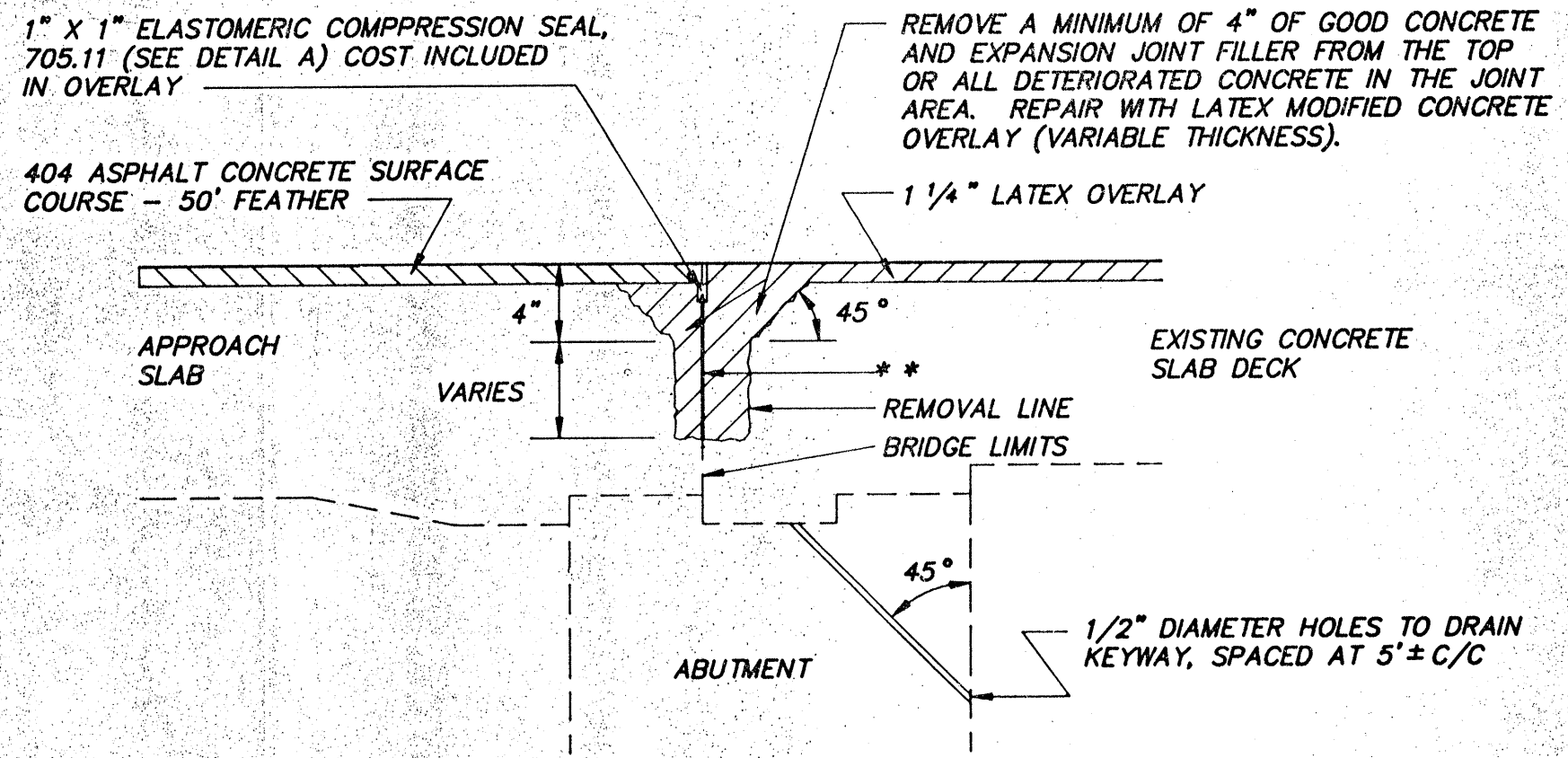


ASPHALT CURB DETAILS



TYPE 1 ASPHALT CONCRETE CURB. REFER TO STANDARD DRAWING BP-5. THE CURB SHALL BE PLACED AS PER 609.06 EXCEPT IT MAY BE HAND TAMPED. THE CURB FACE SHALL NOT EXTEND BEYOND THE GUARDRAIL FACE.

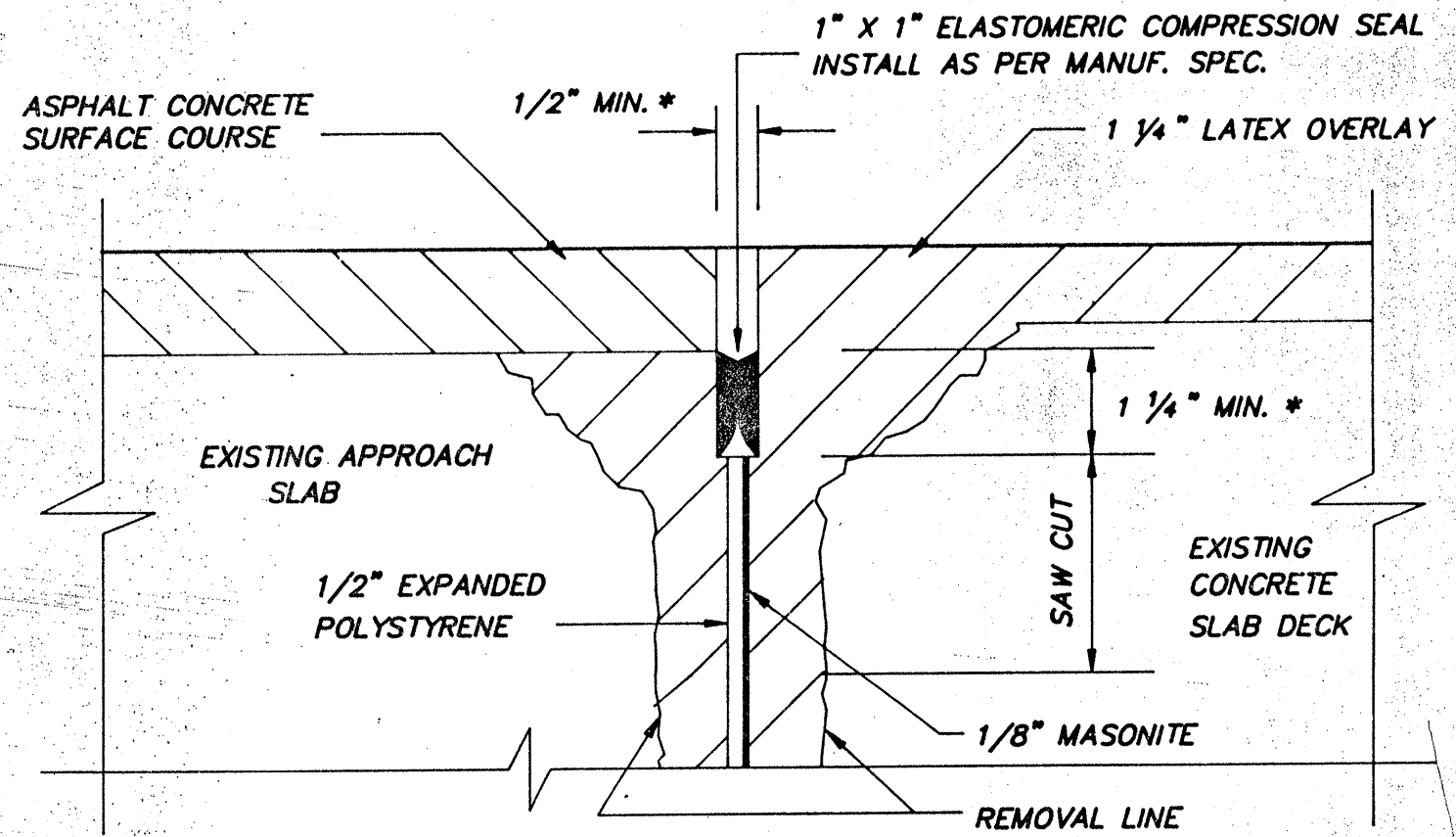
SECTION A-A



TYPICAL JOINT REPAIR DETAIL FOR CONCRETE SLAB DECK

* DIMENSIONS SHOWN ARE FOR WATSON BOWMAN WB-1000. USE WB-1000 OR APPROVED EQUAL AS PER 705.11.

** GLUE 1/2" EXPANDED POLYSTYRENE TO 1/8" MASONITE. INSTALL TOTAL DEPTH OF REPAIRED AREA. SAW CUT ENOUGH MASONITE AND POLYSTYRENE TO INSTALL THE COMPRESSION SEAL AFTER THE JOINT HAS BEEN REPAIRED.

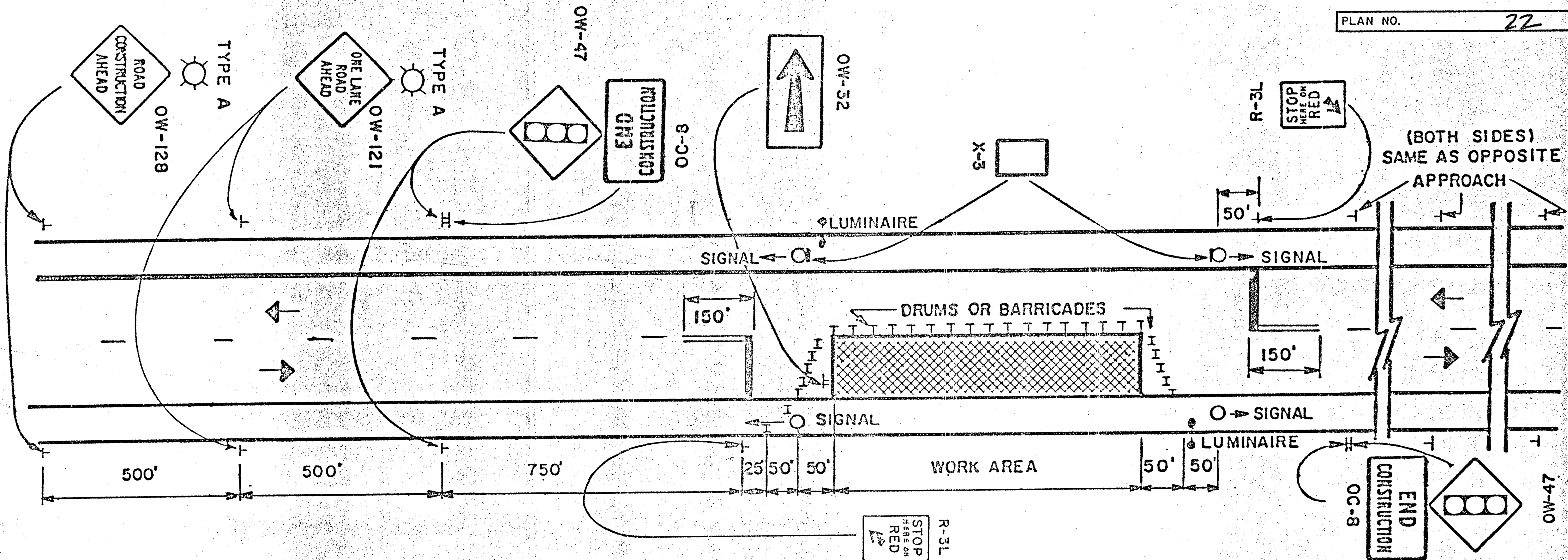


DETAIL "A"

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

13
26

PLAN NO. 22



GENERAL NOTES.

1. The maximum length of work area for one way traffic signal control is determined by the capacity required to handle the peak hour demand. Practical maximum length is 400 feet. Signal timing changes shall be approved by the Engineer.
2. Signals shall be installed and operated in accordance with the requirements of Part 6 of the Ohio Manual of Uniform Traffic Control Devices.
3. Drums or barricades shall be spaced at 50' to 60' center to center within the work area. Drums or barricades on the advance and return tapers shall be spaced at 10' center to center.
4. Adequate area illumination to clearly identify both ends of the work area at night for long term operations shall be provided by using 150 watt minimum high pressure sodium luminaires

or 250 watt minimum mercury luminaires. Luminaires shall be located adjacent to one signal for each direction of traffic. The mounting height for temporary luminaires shall be a minimum of 27 feet above the pavement and the overhead conductor clearance shall be a minimum of 15 feet above the pavement. Lighting material shall comply with Specification 625.

5. Twenty-four (24) inch stop lines shall be installed and where no passing lines are not already in place they shall be added. Removable pavement markings may be used. Existing conflicting pavement markings and raised pavement marker reflectors between the work area and the stop line shall be removed. After completion of the work the stop lines and added no passing lines shall be removed in accordance with 621.134 and the raised pavement marker reflectors shall be replaced in kind.

6. The Type A flashing barricade warning lights shown on the "Road Construction Ahead" and the "One Lane Road Ahead" signs are required whenever a night lane closure is necessary.
7. Type C steady burning barricade warning lights shall be erected on drums or barricades for night lane closures. The maximum spacing shall be identical to the channelizing device spacing requirements described in Note 3.
8. The horizontal or vertical alignment of the roadway may require adjustments in the location of the advance warning signs (the distances shown for advance warning sign spacings are minimums). The vertical alignment of the roadway may require adjustments in the height of the signal heads within the range specified in the Typical Pole Supported Signal Detail.

9. All traffic signals and equipment used in this traffic signal installation, such as a signal cable and signal heads, shall be in conformance with Specifications 632 and 732. However, the performance test provision noted in Specification 632.27, paragraph 6 and the working drawing requirements of 632.03 are waived. The controller, flashers, load switches, conflict monitor and other controller accessories shall comply with Supplemental Specifications 861 and 951, except that the requirements of 861.03 and 861.05 are waived, as well as the requirements of 951.01 for expandible three dial units and twelve circuits for pretimed controllers. Used equipment meeting current ODOT Specifications is acceptable.

Conflict monitors shall be furnished at all locations unless an electromechanical pretimed controller with cam shaft is provided.

10. When the signal is changed to a flash condition either manually or automatically, red shall be flashed to both approaches.

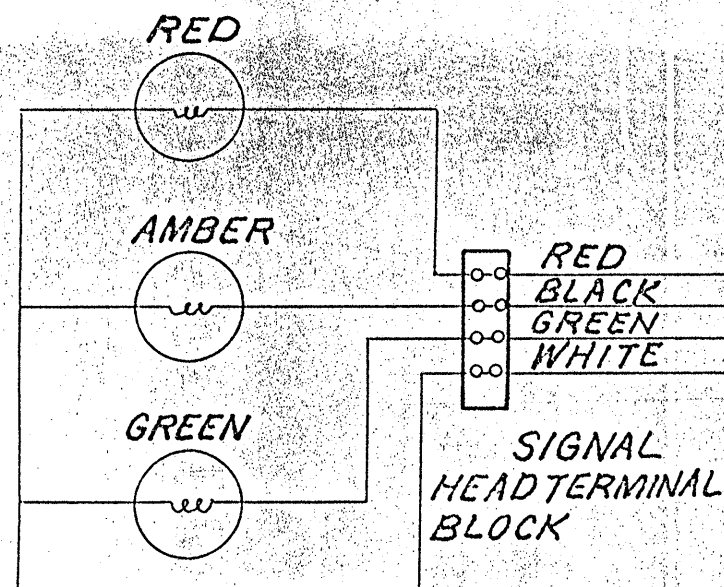
OHIO DEPARTMENT OF TRANSPORTATION

SIGNALIZED CLOSING
1 LANE OF A 2 LANE
HIGHWAY (A)

HUR-224-1582

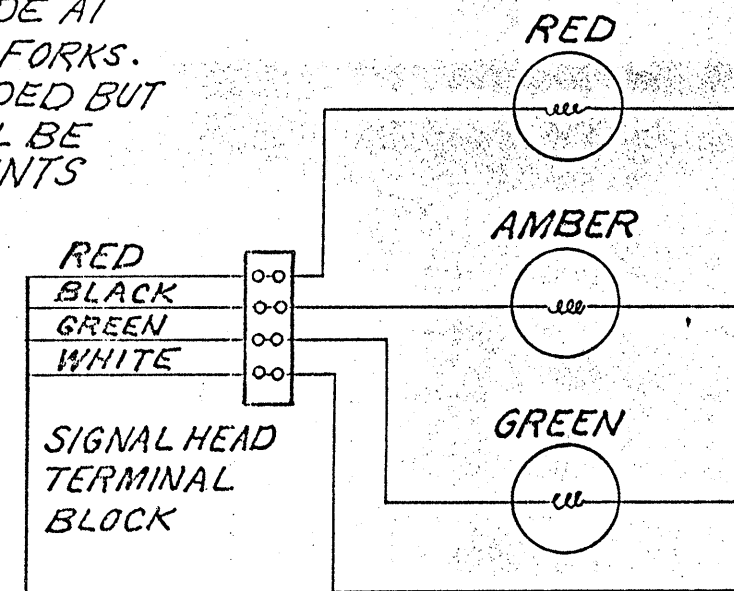
DR. CK. DATE 12/82 3/84 4/85

CABLE SHALL BE 4-CONDUCTOR No. 14 COPPER SIGNAL CABLE, COLOR CODED AND STRANDED. ALL ELECTRICAL CONNECTIONS TO BE MADE AT TERMINAL BLOCKS USING TERMINAL LOCK FORKS. SPLICES IN SIGNAL CABLE SHOULD BE AVOIDED BUT IF NECESSARY SPLICE KITS SHALL BE USED. ALL CONNECTIONS AT SPLICE POINTS SHALL BE SOLDERED.

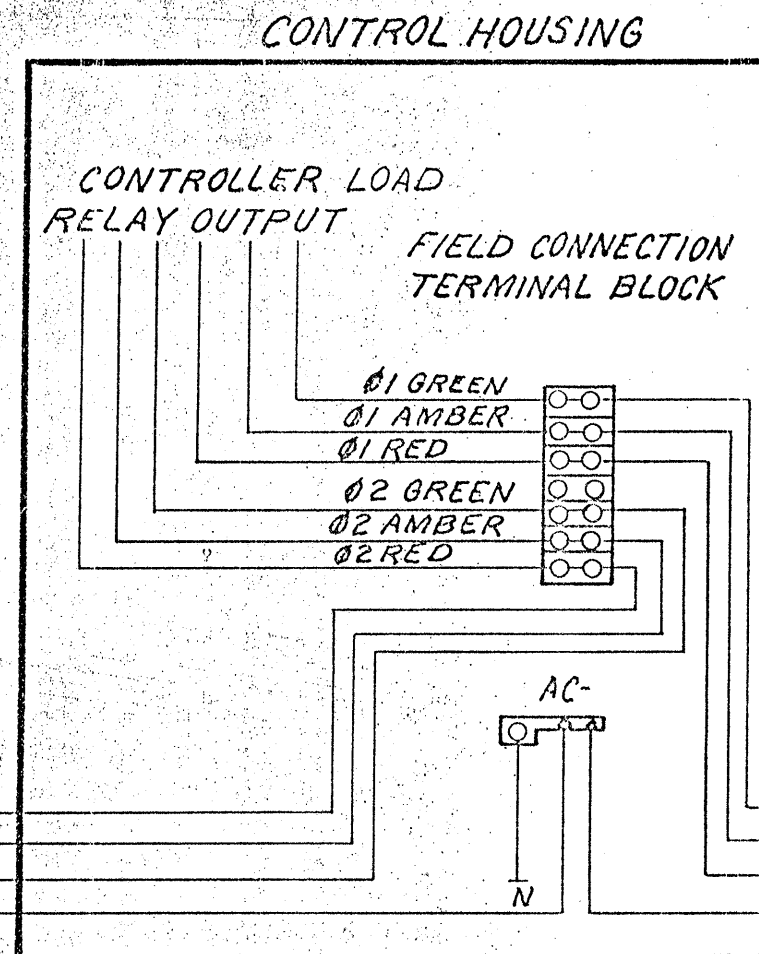


TYPICAL SIGNAL HEAD FOR Ø2

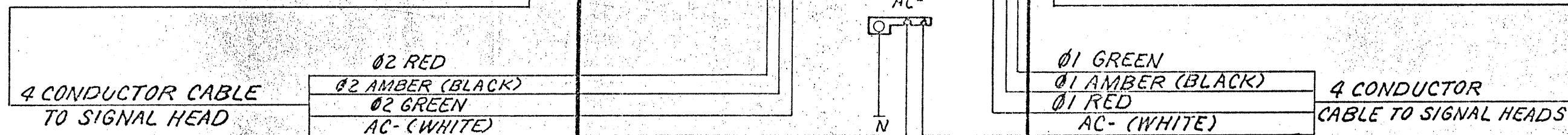
CABLE SHALL BE RUN INTO SIGNAL HEAD AND CONNECTIONS ARE TO BE MADE AT TERMINAL BLOCK. WHEN TWO 4-CONDUCTOR CABLES ARE USED AT FIRST HEAD FROM CONTROLLER BOTH CABLES SHALL BE CONNECTED AT TERMINAL BLOCK IN HEAD.



TYPICAL SIGNAL HEAD FOR Ø1



TYPICAL SIGNAL HEAD HOOK-UP

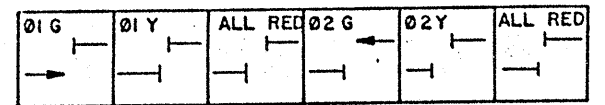
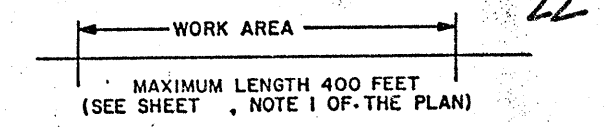
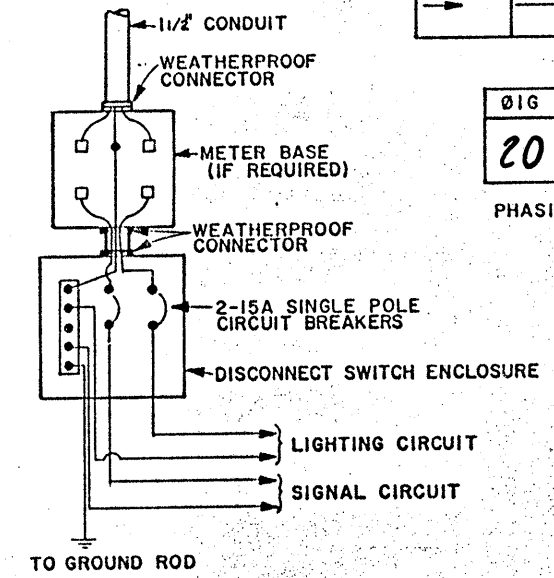
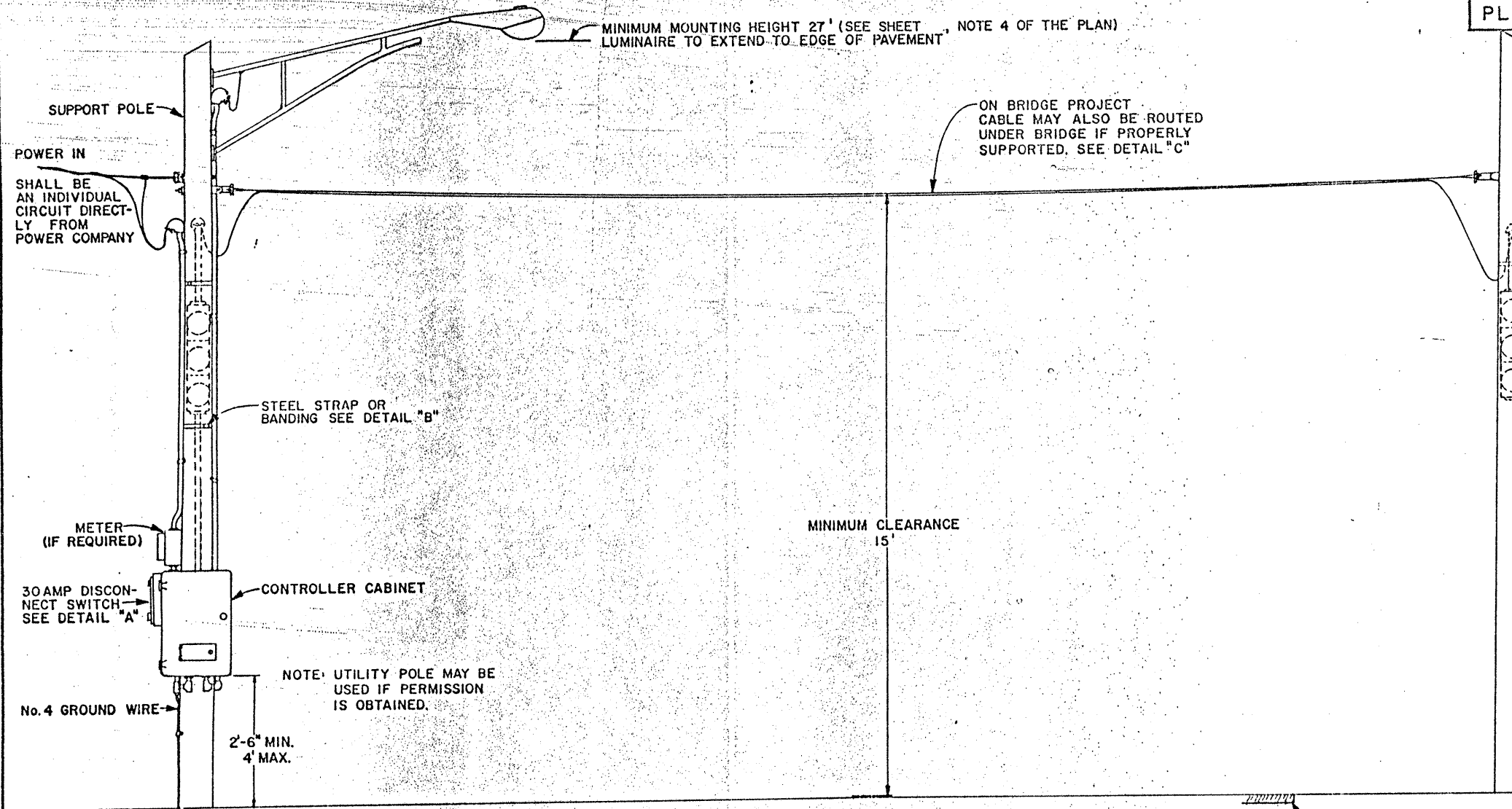


PLAN NO.

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

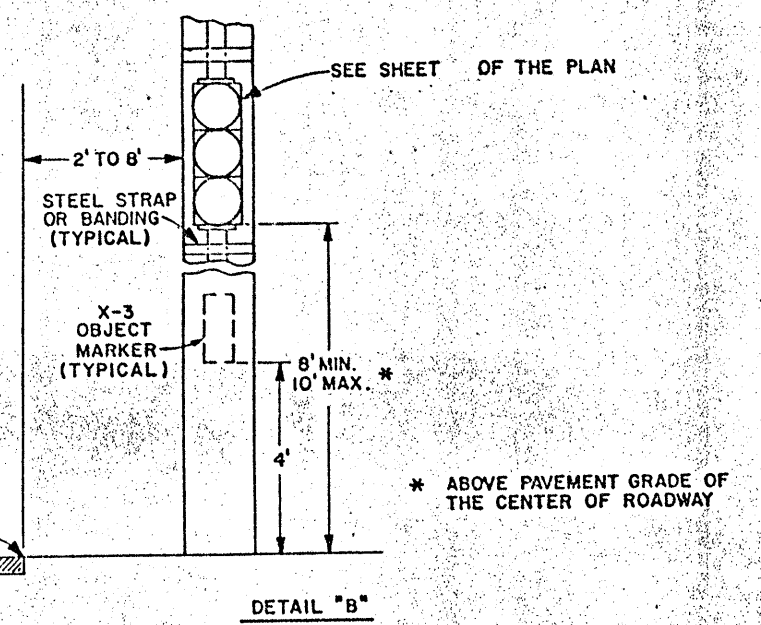
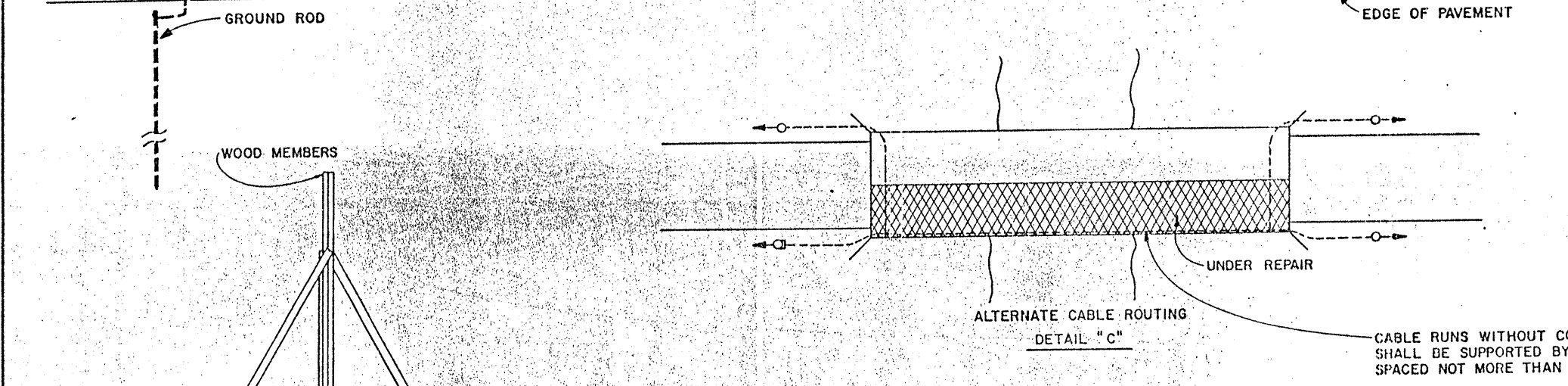
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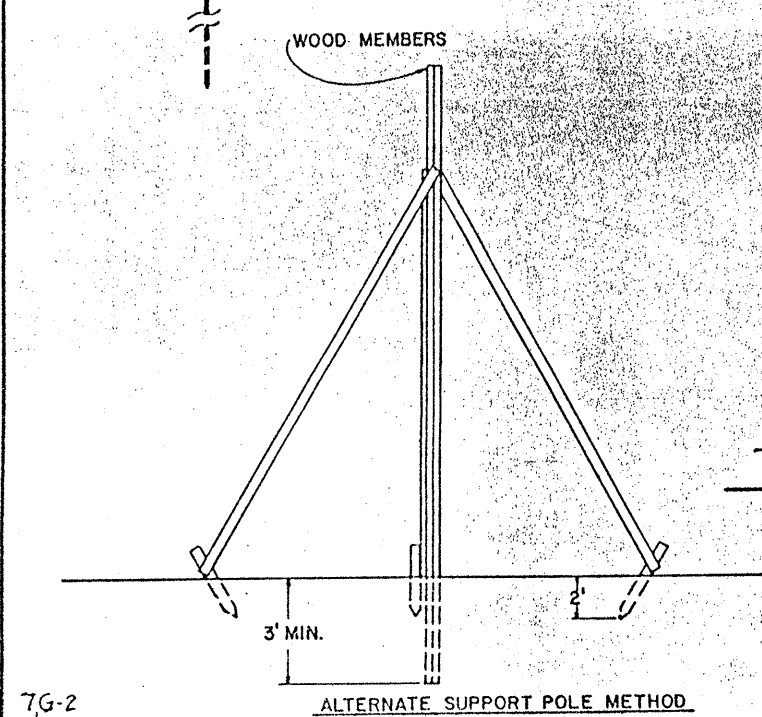
Ø1G	Ø1Y	ALL RED	Ø2G	Ø2Y	ALL RED
20	5	5	20	5	5

PHASING AND INITIAL TIMING SETTINGS



DETAIL "B"

TYPICAL SERVICE, LUMINAIRE, SIGNAL HEAD AND CONTROLLER CABINET INSTALLATION



ALTERNATE SUPPORT POLE METHOD

OHIO DEPARTMENT OF TRANSPORTATION	
SIGNALIZED CLOSING 1 LANE OF A 2 LANE HIGHWAY	DATE 4/85
HUR-224-1582	
DR.	CK.

VERIFICATION:

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND/OR FROM FIELD OBSERVATION AND MEASUREMENTS. CONSEQUENTLY, THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE ORIGINAL CONSTRUCTION PLANS OF THE EXISTING BRIDGE ARE AVAILABLE UPON REQUEST AT THE DISTRICT 3 OFFICE OF THE OHIO DEPARTMENT OF TRANSPORTATION, ASHLAND, OHIO.

CONTRACT BID PRICES SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

WORK LIMITATIONS:

NO CONCRETE DECK OVERLAYS SHALL BE PLACED BEFORE *MAY 1*

THE CONTRACTOR SHALL SCHEDULE THE WORK SO THAT ALL DECK OVERLAYS ARE PLACED BEFORE OCTOBER 15. IF FOR SOME UNFORESEEN CIRCUMSTANCES THE DECK OVERLAYS OR PORTIONS OF DECK OVERLAY ARE NOT PLACED BY OCTOBER 15, REGARDLESS OF THE WORK REMAINING, THE FULL DEPTH REPAIRS SHALL BE COMPLETED AS PER 511 AND THE UNFINISHED DECK SHALL BE RESURFACED WITH ITEM 404 ASPHALT CONCRETE AND OPENED TO TRAFFIC. THE CONTRACTOR SHALL PLACE AND MAINTAIN AT HIS EXPENSE THE ASPHALT WEARING SURFACE UNTIL REMOVED AT HIS EXPENSE THE FOLLOWING SPRING WHEN THE DECK OVERLAY CAN BE PLACED AFTER *MAY 1*

TEMPORARY WEDGE:

AFTER THE CONCRETE OVERLAY HAS BEEN PLACED AND BEFORE THE BRIDGE IS OPENED TO TRAFFIC A TEMPORARY WEDGE WILL BE INSTALLED TO MAINTAIN TRAFFIC IF THE PERMANENT ASPHALT IS NOT IN PLACE. THE TEMPORARY WEDGE WILL BE 404 ASPHALT CONCRETE BUILT AS PER STANDARD DRAWING BP-5, EXCEPT NO TACK COAT WILL BE REQUIRED. THE TEMPORARY WEDGE WILL BE FEATHERED AT ONE INCH PER TWENTY-FIVE FEET OR AS DIRECTED BY THE ENGINEER. THE TEMPORARY WEDGE WILL BE COMPLETELY REMOVED JUST BEFORE ANY NEW ROADWAY ASPHALT IS INSTALLED AND IN NO CASE SHALL TRAFFIC BE ALLOWED TO CROSS AN END DAM WITHOUT AN APPROVED TEMPORARY WEDGE.

PAYMENT FOR ALL OF THE ABOVE SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 414, MAINTAINING TRAFFIC, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTAL NECESSARY TO COMPLETE THE ABOVE WORK.

PLACING ASPHALT CONCRETE FEATHERING ON APPROACHES TO BRIDGES

SPECIAL CARE SHALL BE TAKEN, WHEN PLACING THE ASPHALT CONCRETE FEATHERING, TO EFFECT A SMOOTH TRANSITION FROM THE EXISTING APPROACH PAVEMENT TO THE BRIDGE DECK. THE CONTRACTOR'S ATTENTION IS CALLED TO SECTION 404.16 OF THE CMS TO STANDARD DRAWING BP-5 DATED 1-11-85 FOR REQUIRED TOLERANCES.

SUPERPLASTICIZED
ITEM 850 \wedge *DENSE* CONCRETE OVERLAY, AS PER PLAN

COARSE AGGREGATE SHALL BE LIMESTONE OR SLAG. PAYMENT SHALL BE INCLUDED IN THE UNIT PRICE BID PER SQUARE YARD FOR ITEM 850 *SUPERPLASTICIZED* \wedge *DENSE* CONCRETE OVERLAY, AS PER PLAN, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM SPECIAL, PAVEMENT PLANING, BITUMINOUS WITHOUT HEAT

ALL ASPHALT, SEALS, AND WATERPROOFING SHALL BE PLANED FROM THE BRIDGE BEFORE ANY DECK OVERLAY WORK MAY BEGIN. THE CONCRETE DECK SHALL NOT BE SCARIFIED AT THE SAME TIME AS THE ASPHALT IS PLANED. THE ASPHALT ON THE BRIDGE SHALL NOT BE PLANED UNTIL THE CONTRACTOR IS READY TO BEGIN DECK WORK ON THE BRIDGE WITHIN THREE (3) DAYS.

FOR ALL PAVEMENT PLANING REQUIREMENTS SEE GENERAL NOTE ON SHEET NO. 7.

PAYMENT FOR ALL OF THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID PER SQUARE YARD FOR ITEM SPECIAL, PAVEMENT PLANING, BITUMINOUS WITHOUT HEAT, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM SPECIAL KEYWAY DRAIN

HOLES SHALL BE DRILLED IN THE ABUTMENT FOR KEYWAY DRAINS AS SHOWN IN DETAIL ON SHEET NO. 12. THE HOLES SHALL BE SPACED AT APPROXIMATELY FIVE (5) FOOT CENTERS AS DIRECTED BY THE ENGINEER.

PAYMENT FOR ALL OF THE ABOVE WORK SHALL BE AT THE UNIT PRICE BID PER EACH FOR ITEM SPECIAL, KEYWAY DRAIN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 609, ASPHALT CONCRETE CURB, AS PER PLAN:

This item shall be placed as shown in details on Sheet No. 11. Payment shall be at the unit price bid per lineal foot for Item 609, Asphalt Concrete Curb, as per plan, which shall include all labor, equipment, materials and incidentals necessary to complete the above work.

ITEM 202, ANCHOR POST REMOVED:

The existing type A anchor assemblies on the guardrail on this project shall be modified to remove post "C" (post nearest to the concrete anchor), including spacer blocks and concrete encasement, to a minimum of one foot below the ground line. The resulting post hole shall be backfilled and tamped and the site restored. Special care shall be exercised so as not to damage the rail element of the anchor assembly and any damage shall be repaired as directed by the Engineer at no cost to the State. All materials removed shall be disposed of by the Contractor.

Payment for all of the above shall be at the unit price bid per each for Item 202, Anchor Post Removed, which shall include all labor, equipment, materials and incidentals necessary to complete the above work.

GUARDRAIL REPLACEMENT:

No hazard shall be left unprotected except for the actual time necessary to remove, grade and reinstall guardrail in a continuous operation. The removal of all guardrail shall at all times be as directed by the Engineer. No guardrail shall be removed until the replacement material is on the site, ready for installation. Failure to comply with this requirement shall be deemed sufficient cause to order work suspended on this project until such time that the Engineer is assured of said compliance.

ITEM 517, REBUILT RAILING ON NEW TYPE 2 POSTS, AS PER PLAN:

The existing bridge railing and posts shall be carefully dismantled and stored by the Contractor in such a manner so as not to damage the rail to be re-used.

The salvaged single deep beam rail and new tubular backup shall be reerected on new type 2 posts utilizing the existing guardrail anchor bolts in the deck fascia. Posts shall be of sufficient length to obtain a minimum of twenty-seven (27) inch guardrail height above the proposed deck surface. The Contractor shall furnish new bolts and miscellaneous hardware as necessary. For details see Standard Drawing DBR-2-73.

Payment for all of the above shall be at the unit price bid per linear foot, for Item 517, Rebuilt Railing on New Type 2 Posts, as per Plan, which shall include all labor, equipment, materials and incidentals necessary to complete the above work.

ITEM 517, REBUILT RAILING ON EXISTING TYPE 2 POSTS, AS PER PLAN:

The existing bridge railing and wood blocks shall be carefully dismantled from the existing type 2 post and stored by the Contractor in such a manner so as not to damage the rail to be re-used. The existing wood blocks shall become the property of the Contractor.

The salvaged single deep beam rail and new tubular backup shall be reerected on the existing type 2 posts. The contractor shall furnish new bolts and miscellaneous hardware as necessary. For details see Standard Drawing DBR-2-73.

Payment for all of the above shall be at the unit price bid per linear foot, for Item 517, Rebuilt Railing on Existing Type 2 Posts, as per Plan, which shall include all labor, equipment, materials and incidentals necessary to complete the above work.

G E N E R A L N O T E S

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PLAN NO.
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ITEM 606, RAISING TYPE 5 GUARDRAIL, AS PER PLAN:

Where designated on the plan, the Type 5 guardrail shall be raised on the existing wood posts as per Standard Drawing GR-2B, with new post bolts.

The rail shall be dismantled only to the extent necessary to field bore new bolt holes in the wood posts, and to reconnect the rail and blocks to the existing posts.

The existing type "A" anchor assemblies shall not be adjusted. The last rail element shall be transitioned to meet these assemblies.

Payment for all of the above shall be at the unit price bid per linear foot of Item 606, Raising Type 5 Guardrail, as per Plan, which shall include all labor, equipment, materials and incidentals necessary to complete the above work.

ITEM 519, PATCHING CONCRETE STRUCTURES, AS PER PLAN:

This item shall be used to repair the curbs and the bottom of the deck.

Within twenty-four (24) hours before placing concrete, the existing surface against which the concrete shall be placed, and existing reinforcing steel shall be thoroughly cleaned by sandblasting. Sandblasting shall be at least equal to SA2 "Thorough Blast Cleaning" as outlined in ASTM D-2200 or SSPC-SP6. All loose and deteriorated concrete and calcium carbonate deposits shall be removed with hand tools before sandblasting.

Payment for all of the above shall be at the unit price bid per square foot for Item 519, Patching Concrete Structures, as per Plan, which shall include all labor, equipment, materials, and incidentals necessary to complete the above work.

ITEM SPECIAL, SCUPPER ADJUSTMENT:

This item shall include adjusting the scuppers as per details on Sheet No. 14.

Payment for all of the above shall be at the unit price bid per each for Item Special, Scupper Adjustment, which shall include all labor, equipment, materials and incidentals necessary to complete the above work.

Sub-Summary Part 1
** Temp.Center Lines 1586

614 WORK ZONE PAVEMENT MARKINGS

GENERAL

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

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

THE CONTRACTOR SHALL, IN ADVANCE OF ANY SECTION OF ROADWAY LACKING OMTCD FULL PATTERN STANDARD DIMENSION EDGE LINE OR CENTER LINE MARKINGS, ERECT A "NO EDGE LINES" (OW-167-36) SIGN OR "UNMARKED NO PASSING ZONES" (OW-168-36) SIGN OR BOTH AS MAY BE APPROPRIATE. THESE SIGNS SHALL BE IN PLACE PRIOR TO EXPOSING THE ROADWAY TO TRAFFIC. THESE SIGNS SHALL ALSO BE ERECTED ON EACH ENTRANCE RAMP, AT INTERSECTIONS OF THROUGH ROADS TO WARN ENTERING OR TURNING TRAFFIC OF THE CONDITION AND AT LEAST ONCE EVERY TWO MILES ALONG THE ROADWAY. THESE SIGNS SHALL BE REMOVED WHEN THEY NO LONGER APPLY.

TEMPORARY PAVEMENT MARKING MATERIALS

UNLESS OTHERWISE INDICATED ON THE PLANS, TEMPORARY PAVEMENT MARKINGS MAY BE EITHER 621.02 PAINT OR 947.03 TYPE B OR C PREFORMED MATERIAL.

PAINT

PAINTED MARKINGS SHALL BE IN ACCORDANCE WITH 621 EXCEPT THAT (1) PARAGRAPH 621.14 SHALL NOT APPLY, (2) WHERE THE MARKINGS ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 621.02, AND (3) WHEN APPLIED TO NEW ASPHALT PAVEMENT SURFACES OR PLANED ASPHALT PAVEMENT SURFACES, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

WIDTH OF LINE, IN.	GALLONS PER MILE OF LINE				
SOLID LINE	4	6	8	12	24
DASHED LINE	6	9	12	18	36
DOTTED LINE	8	12	16	24	48

TYPE B AND TYPE C PREFORMED MATERIAL

PREFORMED MATERIAL SHALL COMPLY WITH 947.03 EXCEPT THAT NO PREFORMED MATERIAL CONTAINING METAL SHALL BE PLACED ON ANY SURFACE UNLESS IT WILL BE REMOVED LATER BY THE CONTRACTOR. TEMPORARY PAVEMENT MARKINGS OF 947.03 PREFORMED MATERIAL SHALL BE REMOVED PRIOR TO PLACEMENT OF 621 OR 847 SURFACE COURSE MARKINGS AT THAT LOCATION. PREFORMED MATERIAL SHALL BE APPLIED IN ACCORDANCE WITH 847 EXCEPT AS MODIFIED HEREIN.

PLACEMENT

TEMPORARY MARKINGS SHALL BE COMPLETE AND IN PLACE ON ALL PAVEMENT, INCLUDING RAMPS, PRIOR TO EXPOSING IT TO TRAFFIC. WHEN TEMPORARY MARKINGS CONFLICT WITH THE TRAFFIC PATTERN, THEY SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH 621.134.

LINE PLACEMENT TOLERANCE FOR FINAL SURFACES SHALL BE IN ACCORDANCE WITH 621.052. ON SURFACES OTHER THAN THE FINAL, THE TOLERANCE PERMITTED SHALL BE TWICE THAT IN 621.052.

LAYOUT AND PREMARKING SHALL BE IN ACCORDANCE WITH 621.051.

TEMPORARY MARKING CLASSES

CLASS I MARKINGS

CLASS I MARKINGS SHALL BE APPLIED TO THE FULL DIMENSIONS AS DEFINED IN 621 WITH THE FOLLOWING ADDITIONS OR EXCEPTIONS:

- 1) TRANSVERSE LINES SHALL BE 8-INCHES IN WIDTH.
- 2) STOP LINES SHALL BE 12-INCHES IN WIDTH.
- 3) CROSS WALK LINES SHALL BE 8-INCHES IN WIDTH.

CLASS II MARKINGS

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

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 4-INCH WIDE BY A MINIMUM OF 48-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 4-INCH WIDE BY A MINIMUM OF 48-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

GORE MARKINGS SHALL BE TWO CONTINUOUS, WHITE 4-INCH LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

THE PAINT APPLICATION RATE SHALL BE NOT LESS THAN 2.4 GALLONS PER MILE FOR LANE LINE AND CENTER LINE AND 24 GALLONS PER MILE FOR GORE MARKINGS.

CONFLICTING EXISTING MARKINGS

THE CONTRACTOR SHALL, PRIOR TO PLACING TEMPORARY MARKINGS, REMOVE ALL CONFLICTING EXISTING MARKINGS VISIBLE TO THE TRAVELING PUBLIC DURING DAYLIGHT OR NIGHTTIME HOURS IN ACCORDANCE WITH 621.134. THE COST FOR REMOVAL OF CONFLICTING MARKINGS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SPECIFICALLY ITEMIZED.

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

INTERIM MARKINGS

WITHIN 21 CALENDAR DAYS AFTER OPENING ANY LENGTH OF PAVEMENT TO TRAFFIC, THE 621 OR 847 PAVEMENT MARKINGS CALLED FOR IN THE PLANS SHALL BE APPLIED. EQUIVALENT 614 CLASS I, PAINT MARKINGS MAY BE USED IN LIEU OF FINAL MARKINGS. IN THIS EVENT, THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I PAINT MARKINGS AS PART OF THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC

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

METHOD OF MEASUREMENT

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

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

BASIS OF PAYMENT

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

ITEM	UNIT	DESCRIPTION
614	MILES	TEMPORARY LANE LINES, CLASS _____ *
* 614	MILES	TEMPORARY CENTER LINES, CLASS <u>II</u> *
614	LIN. FT.	TEMPORARY CHANNELIZING LINES, CLASS I, _____ *
614	MILES	TEMPORARY EDGE LINES, CLASS I, _____ *
614	LIN. FT.	TEMPORARY GORE MARKINGS, CLASS II, _____ *
614	LIN. FT.	TEMPORARY STOP LINES, CLASS I, _____ *
614	LIN. FT.	TEMPORARY CROSSWALK LINES, CLASS I, _____ *
614	EACH	TEMPORARY LANE ARROWS, CLASS I, _____ *
614	EACH	TEMPORARY RAILROAD SYMBOL MARKINGS, CLASS I, _____ *
614	EACH	TEMPORARY WORD "ONLY" ON PAVEMENT, 72-INCH, CLASS I, _____ *
614	LIN. FT.	TEMPORARY TRANSVERSE LINES, CLASS I, _____ *
614	LIN. FT.	TEMPORARY DOTTED LINES, CLASS I, _____ *

*TYPE MATERIAL (621 PAINT, 947.03 TYPE B OR 947.03 TYPE C OR LEFT BLANK TO PERMIT ANY OF THE THREE)

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621 EDGE LINES ON NEW ASPHALT PAVEMENTS

EDGE LINES SHALL BE IN ACCORDANCE WITH 621 EXCEPT THAT (1) ON EVERY ROADWAY AND RAMP, EDGE LINES SHALL BE IN PLACE PRIOR TO EXPOSING IT TO TRAFFIC, (2) WHERE THE EDGE LINES ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 621.02; AND (3) WHEN APPLIED TO NEW ASPHALT PAVEMENT THE SPECIFIED APPLICATION RATE SHALL BE 24 GALLONS PER MILE.

614 WORK ZONE MARKING SIGNS

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE WORK ZONE MARKING SIGNS (OW-167 AND OW-168) WITHIN THE WORK LIMITS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

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

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

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

ITEM	UNIT	DESCRIPTION
614	EACH	WORK ZONE MARKING SIGNS
A QUANTITY OF <u>18</u> EACH WORK ZONE MARKING SIGNS (<u>9</u> EACH "NO EDGE LINES" OW-167 AND <u>9</u> EACH "UNMARKED NO PASSING ZONES" OW-168) ARE CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER.		

PAVEMENT MARKING SUB-SUMMARY

PLAN NO.
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CO.	ROUTE	FROM		TO		621 QUANTITIES			PARTICIPATION	621 CENTER LINE
		S.L.M.	S.L.M.	CENTER LINES MILES			REMARKS			
				TOTAL	DASHED	SOLID				
HUR	US-224	12.22	16.24	New State Rd.	Greenwich Corp. West	4.02	3.31	2.60		Part 1
HUR	US-224	17.36	21.27	Greenwich Corp. East	HUR/ASD Co. Line	3.91	3.70	1.78		Part 1 (cont'd.)
CENTER LINE TOTAL						7.93	7.01	4.38		

CO.	ROUTE	FROM		TO		621 QUANTITIES			PARTICIPATION	621 LANE LINE
		S.L.M.	S.L.M.	4" LANE LINES MILES			REMARKS			
				TOTAL	DASHED	SOLID				
LANE LINE TOTAL										

CO.	ROUTE	FROM		TO		WHITE EDGE LINE QUANTITIES				YELLOW EDGE LINE QUANTITIES				621 EDGE LINE
		S.L.M.	S.L.M.	TOTAL MILES	HIGHWAY MILES	RAMP MILES	PART.	TOTAL MILES	HIGHWAY MILES	RAMP MILES	PART.	REMARKS		
HUR	US-224	12.22	16.24	New State Rd.	Greenwich Corp. West	8.04	4.02							Part 1
HUR	US-224	17.36	21.27	Greenwich Corp. East	HUR/ASD Co. Line	7.82	3.91							Part 1 (cont'd.)
EDGE LINE TOTAL						15.86	7.93							

CO.	ROUTE	FROM		TO		621 QUANTITIES		PARTICIPATION	621 CHANNELIZING LINE
		S.L.M.	S.L.M.	8" CHANNELIZING LINES		REMARKS			
				MILES	LIN. FT.				
CHANNELIZING LINE TOTAL									

847 AUXILIARY MARKING (947.03 TYPE A) INLAID

CO.	ROUTE	S.L.M.		24" TRANSVERSE LINES		STOP LINE	12" CROSSWALK LINES	WORD ON PAVEMENT		LANE ARROWS				RAILROAD SYMBOL ON PAVEMENT	DOTTED LINES		REMARKS
		FROM	TO	WHITE LIN. FT.	YELLOW LIN. FT.			24" LIN. FT.	WHITE LIN. FT.	ONLY	SCHOOL	TURN			COMB.	WHITE LIN. FT.	
						96"	96"			LEFT EACH	RIGHT EACH	THRU. EACH	COMB. EACH				
		EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH								
HUR	US-224	12.22	16.24			130							2			Part 1	
HUR	US-224	17.36	21.27			50										Part 1 (cont'd.)	
TOTAL						180							2				

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

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PLAN NO. 22

INITIAL PAVEMENT MARKINGS FOR RESURFACED SECTIONS
GENERAL NOTES

In addition to the requirements of 621 and 847 the following shall apply:

621 Materials

Glass beads shall be kept dry during storage and prior to use.

621 SPECIAL EQUIPMENT

The Contractor's striper shall be equipped with an odometer graduated to 1/100 of a mile. The Engineer will determine the degree of accuracy of the Contractor's odometer and establish an adjustment factor as may be required to accurately determine the pay item quantities. The Engineer will periodically check the odometer's operation to assure maintenance of accurate measurements.

Failure of the odometer to function properly shall be cause to stop the work until the odometer is made to function properly. On short projects the Engineer may approve alternate methods to accurately measure the length of the various types of markings applied. If measurement of the work has to be done by the Department, the cost of the Department labor and equipment plus 10 percent shall be deducted from payment due the Contractor for the work. When measuring lane, edge and center line marking the odometer shall be started at the first marked line and remain in operation, until the end of the section being marked, where it shall be shut off and the reading of the odometer recorded.

Electrical foot counters shall be provided and installed in the striper. The counters shall individually tabulate the amount of footage applied by each striping gun on the center line carriage and lane line carriage, whether solid or dashed. The counters shall be 6 digit type with a reset feature.

The pavement marking equipment shall be equipped with a pressure regulated air jet which shall remove all debris from the pavement in advance of the applicator gun. The air jet shall operate when marking material is being applied and shall be synchronized with marking material application or remain "on" at all times.

The Contractor shall use an accurate dashing mechanism, capable of being easily adjusted

Provision for the above special equipment by the Contractor shall be incidental to the application.

847 LAYOUT AND PREMARKING

In addition to the requirements of 847 premarking for auxiliary markings shall be located from schematic forms provided at the pre-construction conference.

621 MATERIAL QUANTITY MEASUREMENT

The quantity of marking material or glass beads per unit of measurement will be computed by the Engineer at the end of each day's work. A day's applied mileage of less than 2 miles may be included in the next day's applied markings for the purpose of computing marking material and bead application rates.

The Contractor shall provide a calibrated measuring device acceptable to the Engineer for measuring material in the striper tanks.

The quantity of marking material used shall be determined by measuring the marking material in the tanks before and after marking material is applied. The Contractor shall cooperate with the Engineer in providing measurements whenever requested. The marking material application rate shall be determined by dividing the total gallons used by the appropriate marking length as determined from the foot counter as described within the Special Equipment Section of these notes. Any determination of pay deduction resulting from shortages in marking quantities shall be based on the measurements obtained by this method. The amount of glass beads applied will be ascertained by the Engineer by observation and from information supplied by the Contractor as to quantity used.

847 AUXILIARY PAVEMENT MARKING

For this project auxiliary markings shall be defined as: stop lines, crosswalk lines, transverse lines, railroad symbol markings, lane arrows, word on pavement and dotted lines except when used to extend edge lines.

STANDARD CONSTRUCTION DRAWING TC 71.10

The dimensions shown on Standard Construction Drawing TC 71.10 are nominal. Letters, numerals and symbols conforming to the requirements of section 3B-17 of the 1978 National Manual On Uniform Traffic Control Devices may also be used. Any of the following standards for letters, numeral or symbol dimensioning may be used: A.) Standard dimensions shown on this detail or B.) Standard dimensions (either metric or their hard converted English unit equivalents) in accord with the 1977 Metric Edition Standard Alphabets For Highway Signs and Pavement Marking with Errata or C.) Standard dimensions shown in figures 3-17, 3-18, 7-2, 7-3, 8-2 or 9-6 of the 1978 National Manual On Uniform Traffic Control Devices.

TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS

GENERAL

In addition to 614, traffic shall be maintained in accordance with the following requirements.

The purpose of the following requirements for Traffic Control for Pavement Marking operations is to provide safety for highway users, workers and equipment and to protect the markings from damage during application. These requirements are the required minimums. If at any time during the application of markings it is found by the Engineer that these minimum traffic control device requirements are not achieving the necessary safety and marking protection, additional traffic control devices shall be implemented in accordance with 104.02.

The Engineer may suspend work in order to relieve traffic congestion at any time. No work shall be done during peak hours, as determined by the Engineer.

LEAD VEHICLE

A lead vehicle is to be used to warn opposing traffic of the approach of centerline and other marking equipment when this equipment extends into the adjacent opposing traffic lane. The lead vehicle shall precede the "left of center" marking equipment a distance that will provide advance safe warning to approaching traffic. The operator of this unit should drive ahead of the crest of a vertical curve or around a horizontal curve and wait until the "left of center" marking equipment nears and then proceed, maintaining an advance location of 400 feet to 600 feet.

A lead vehicle shall be equipped and operated with the following traffic control devices:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1/4 mile.
2. Lighted head lights and tail lights, and
3. A KEEP RIGHT sign (OC-31R-48) and WET PAINT sign (OC-52-48) mounted a minimum of 5' above the road surface measured to the bottom of the sign and visible to opposing traffic.

POWER BROOM EQUIPMENT

Power broom equipment shall be equipped and operated during pavement preparations (Item 621.04) with the following traffic control devices:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1/4 mile.
2. Lighted head lights and tail lights, and
3. A flashing arrow panel 54" x 30" (Type B) visible to the rear mounted a minimum of 7' above the road surface measured to the bottom of the panel and used only on multi-lane highways.

LINE MARKING MACHINE

All traffic line marking machines shall be equipped and operated with the following traffic control equipment:

1. Three 360° rotating or flashing amber beacons clearly visible a minimum of 1/4 mile mounted a minimum of 7' above the road surface; one forward, one on the right rear and one on the left rear of the vehicle.
2. (a) A flashing arrow panel 54" x 30" (Type B) displayed to the rear mounted a minimum of 7' above the road surface measured to the bottom of the panel and used only on multilane highways, or
(b) A DO NOT PASS sign (R-33A-48) visible to the rear during centerline marking on two lane, two way roadways and mounted a minimum of 7' above the road surface measured to the bottom of the sign. This sign may be

used to cover the arrow panel, which shall Not be used on two lane, two way roadways.

3. A WET PAINT with arrow sign (OC-50-24 or OC-51-48) shall face the rear. The sign shall be positioned with the arrow pointing to the wet line. When used, OC-50-24 shall be mounted on the in use carriage side of the vehicle. OC-50-24 and OC-51-48 signs shall be mounted a minimum of 1' above the road surface.
4. A KEEP RIGHT sign (OC-31R-48) and WET PAINT sign (OC-52-48) mounted a minimum of 5' above the road surface measured to the bottom of the sign and facing opposing traffic when this unit extends into the adjacent opposing traffic lane.
5. The guide and side mounted marking carriages shall each be equipped with a clean red flag not less than 16" square and fastened to staffs of sufficient length so as to permit the flags to move freely of any obstruction.

TRAIL VEHICLE

When required a trail vehicle shall be positioned at the track free end of the wet line. An additional trail vehicle shall be used when applying lane lines of fast dry material (i.e. ≤ 2 min. dry) to protect the wet line between the line marking machine and the track free end of the wet line. All pavement marking application, protection and support equipment following the line marking machine shall be equipped with the traffic control of a trail vehicle.

Trail vehicles shall be equipped and operated with the following traffic control equipment:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1/4 mile.
2. (a) A flashing arrow panel 54" x 30" (Type B) visible to the rear mounted at a minimum height of 7' above the road surface measured to the bottom of the panel and used only on multi-lane highways, or
(b) A DO NOT PASS sign ((R-33A-48) visible to the rear during centerline marking on two lane, two way roadways, and mounted a minimum of 7' above the road surface measured to the bottom of the sign. This sign may be used to cover the arrow panel, which shall Not be used on two lane, two way roadways.
3. A WET PAINT with arrow sign (OC-50-24 or OC-51-48) shall face the rear. The sign shall be positioned with the arrow pointing to the wet line. When used, OC-50-24 shall be mounted on the side of the vehicle nearest the wet marking material. When used, OC-50-24 shall be mounted a minimum of 4'6" above the road surface and OC-51-48 shall be mounted a minimum of 5'0" above the road surface, both measured to the bottom of the sign.

CONES AND WET PAINT-KEEP OFF SIGNS

Cones and WET PAINT-KEEP OFF signs (R-87-24) shall be placed to protect the line whenever the track free time exceeds two minutes. These devices shall not be removed until the line has dried to a track free condition. Retrieval equipment shall have traffic control of a trail vehicle. Cones shall have a minimum height of 18". They shall be spaced to protect the wet line, normally between 120' and 200'. In areas of traffic congestion, on curves and at other locations where tracking of the wet line is expected, spacings as close as 20' may be required. The WET PAINT-KEEP OFF signs (R-87-24) shall be placed facing traffic at:

- A. The beginning and end of line application,
- B. All side and cross roads, and
- C. Maximum intervals of one mile.

DATE
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12-6

IMMOBILE OPERATIONS

When loading material, cleaning or performing other operations in the field every effort shall be made to have all equipment completely off of the traveled roadway. When it becomes necessary to enter upon private property, permission shall be obtained in advance. When the Contractor cannot remove his equipment from the traveled roadway all traffic control devices on the vehicles shall be in operation and flaggers and vehicles shall be stationed to protect the work site and the travelling public.

Two way traffic shall be maintained. Flaggers shall be equipped in accordance with Item 614.03.

AUXILIARY MARKINGS

Pavement preparation and placing of auxiliary markings are considered to be stationary operations and traffic control shall be in accordance with plan details shown on Sheet(s) _____ and Part 7, Ohio Manual of Uniform Traffic Control Devices (OMUTCD).

LAYOUT AND PREMARKING

The vehicle used in layout and premarking (Item 621.051) shall be equipped and operated with the following equipment:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1/4 mile.
2. Lighted head lights and tail lights, and
3. A KEEP RIGHT sign (OC-31R-48) mounted a minimum of 5' above the road surface measured to the bottom of the sign and visible to opposing traffic.

NIGHTTIME OPERATION

Nighttime operation is defined to include the time from one-half hour after sunset to one-half hour before sunrise, and at any other time when there are unfavorable atmospheric conditions or when there is no sufficient natural light to render discernible persons, vehicles, and substantial objects on the highway at a distance of one thousand feet.

During nighttime conditions the following additional traffic control shall be provided:

1. Cones shall be reflectorized or equipped with lighting devices for maximum visibility (See 7F-5, OMUTCD), and
2. The guide and side mounted carriages shall be illuminated.




The presence of highway lighting does not waive these requirements.

MINIMUM PAVEMENT MARKING TRAFFIC CONTROL EQUIPMENT REQUIREMENTS

This table indicates the traffic control equipment which shall be furnished for each type of long line pavement marking operation. In addition, those types of traffic control equipment which shall be furnished when directed by the Engineer are indicated.

EQUIPMENT	PAVEMENT MARKING LINE TYPE ¹					
	CENTER LINE		EDGE LINE		LANE LINE ² CHANNELIZING LINE	
	> 2 MIN. DRY	≤ 2 MIN. DRY	> 2 MIN. DRY	≤ 2 MIN. DRY	> 2 MIN. DRY	≤ 2 MIN. DRY
LEAD VEHICLE						
POWER BROOM EQUIPMENT						
LINE MARKING MACHINE						
TRAIL VEHICLE						
TRAIL VEHICLE (ADDITIONAL)						
TRAIL VEHICLE (SIGN & CONE RETRIEVAL)						

1. For equipment requirements for auxiliary operations see plan sheet(s) _____ and Part 7, OMUTCD.
2. Includes both dashed and solid lane lines.

-  Required Equipment
-  Equipment Required When Directed by the Engineer
-  Not Required

TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS

DATE
9-02
12-02

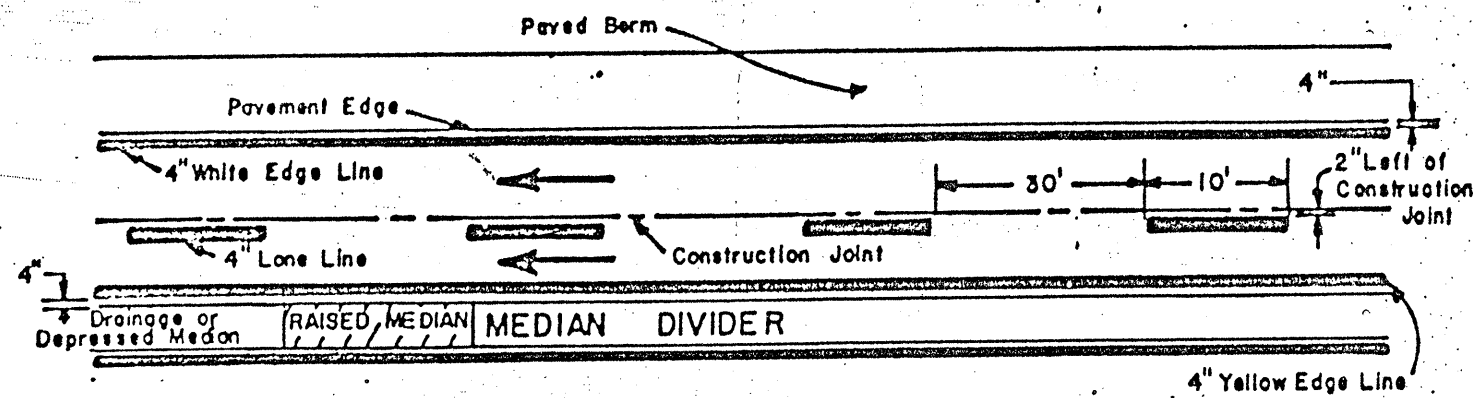
PAVEMENT MARKING TYPICAL DETAILS

FED. RD DIV.	STATE	PROJECT	
5	OHIO		

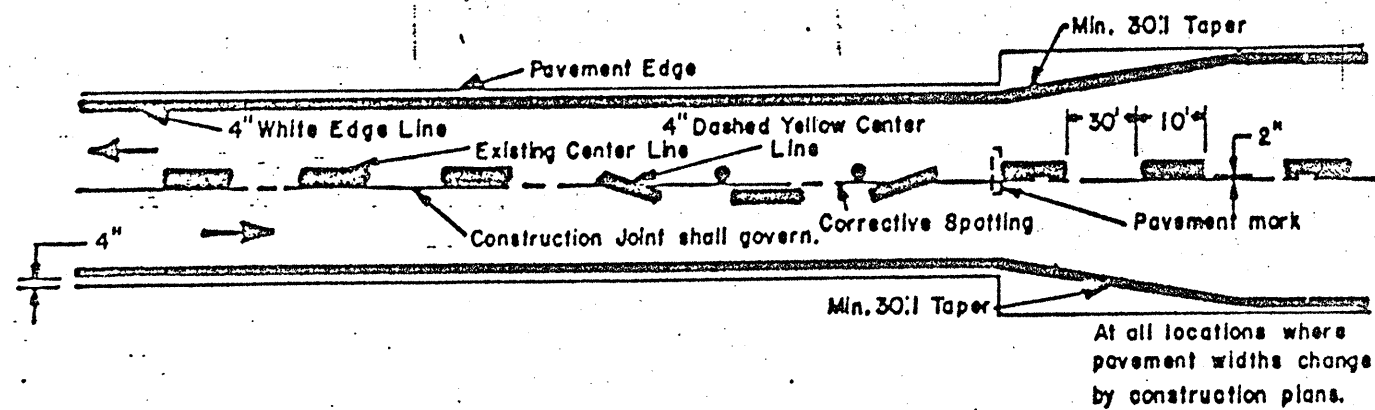
24
26

PLAN NO. 22

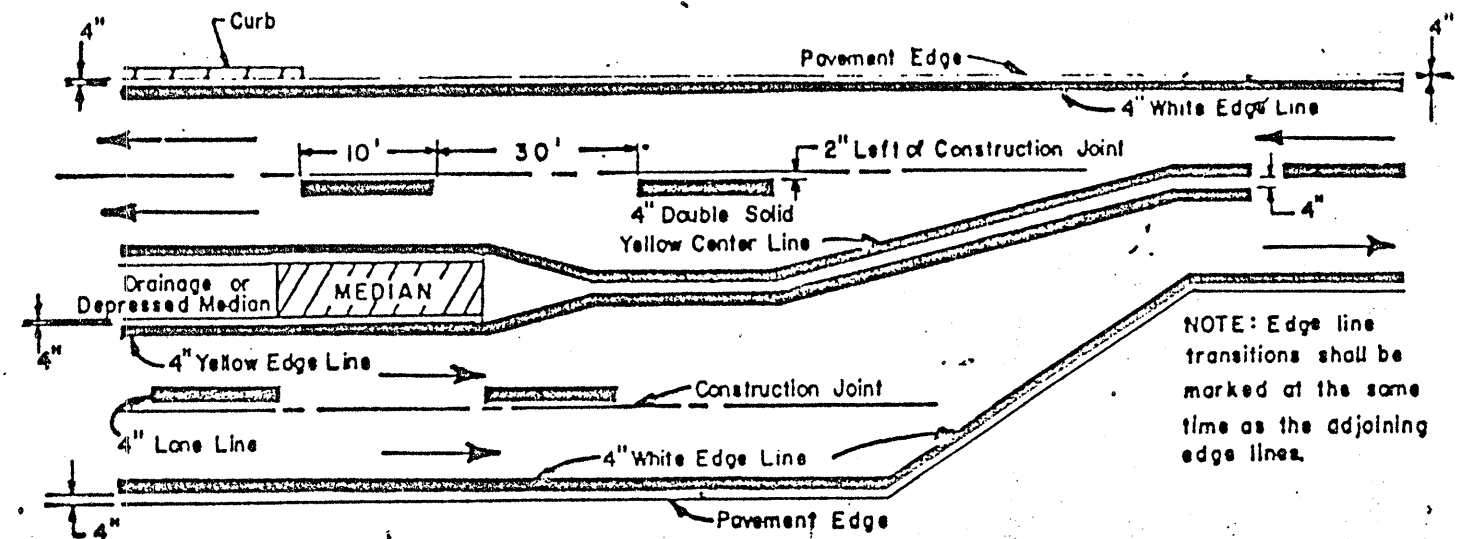
FREEWAY & EXPRESSWAY MAINLINE MARKINGS



TWO LANE MARKINGS



MULTILANE DIVIDED & UNDIVIDED HIGHWAY MARKINGS



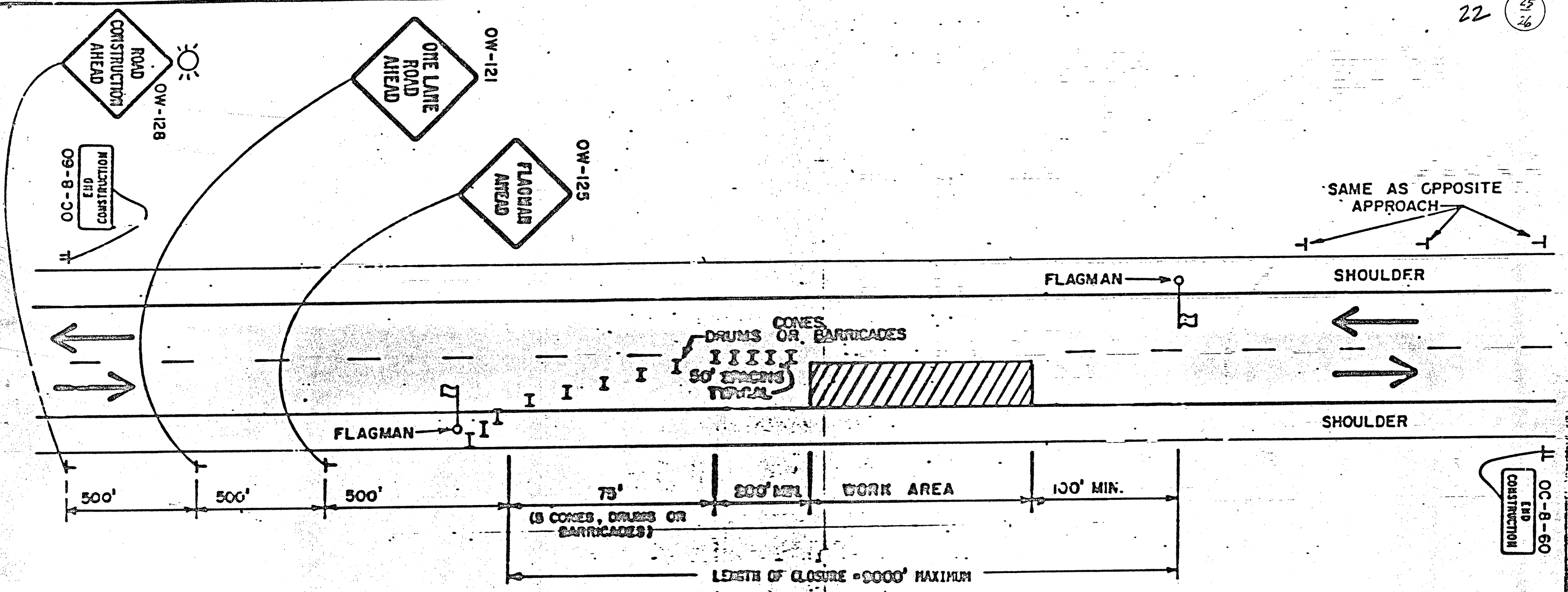
NOTE: Edge line transitions shall be marked at the same time as the adjoining edge lines.

NOTES:

1. THE DISTANCE FROM THE PAVEMENT EDGE TO THE NEAR-SIDE EDGE OF THE EDGELINE MAY BE INCREASED WITH THE APPROVAL OF THE ENGINEER IN ORDER TO MAINTAIN UNIFORM LANE WIDTH.
2. SEE TC 72.20 FOR PAVEMENT ENTRANCE AND EXIT RAMP TERMINALS.

DEPARTMENT OF TRANSPORTATION	
PAVEMENT MARKING TYPICAL DETAILS	DATE 11/80
JDL. COR.	

12/81



GENERAL NOTES

1. FLAGMEN SHALL BE USED TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS ONE LANE OPERATION IS IN EFFECT. FLAGMEN SHALL BE ABLE TO COMMUNICATE WITH EACH OTHER AT ALL TIMES EITHER VERBALLY OR BY MEANS OF RADIO OR FIELD TELEPHONES. FLAGMAN STATIONS SHALL BE ADEQUATELY ILLUMINATED FOR NIGHT TIME OPERATIONS BY USE OF A 175 WATT MINIMUM LUMINAIRE.
2. CONES MAY BE SUBSTITUTED FOR BARRICADES OR DRUMS FOR THE LANE CLOSURES DURING DAYLIGHT HOURS ONLY.
3. WHEN THE AMBIENT TEMPERATURE EXCEEDS 80 DEGREES F, THE ENGINEER MAY INCREASE THE LENGTH OF CLOSURE TO ALLOW FOR SUFFICIENT COOLING OF THE NEW PAVEMENT.

4. THE TYPE B HIGH INTENSITY BARRICADE WARNING LIGHT SHOWN ON THE ROAD CONSTRUCTION AHEAD SIGN IS REQUIRED WHENEVER NIGHT LANE CLOSURE IS NECESSARY.
5. TYPE C STEADY BURNING BARRICADE WARNING LIGHTS SHALL BE ERECTED ON DRUMS OR BARRICADES FOR NIGHT LANE CLOSURES.
6. THE ADVANCE WARNING SIGNS "OW 128" "OW-121" AND "OW-125" SHALL BE MOVED BACK AS REQUIRED BY THE QUEUING OF STOPPED VEHICLES.
7. 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 ENGINEER MAY SHORTEN THE MAXIMUM ALLOWABLE LENGTH OF CLOSURE TO RELIEVE EXCESSIVE TRAFFIC BACKUPS.

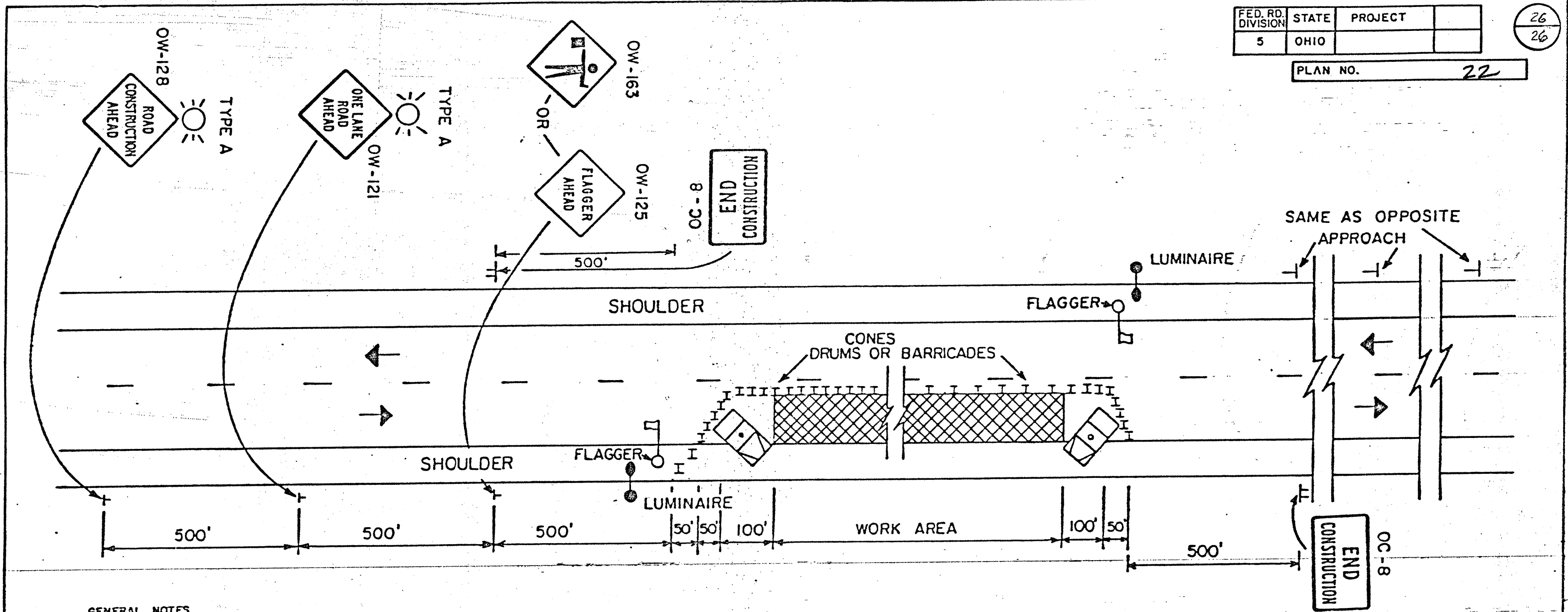
ALL TRAFFIC CONTROL SIGNS, CHANNELIZING DEVICES, AND FLAGMEN SHALL BE MOVED FORWARD BEFORE THE CLOSURE REACHES THE MAXIMUM ALLOWABLE LENGTH. ONLY ONE SIDE OF THE ROAD SHALL BE CLOSED AT ANY TIME IN A WORK AREA.

OHIO DEPARTMENT OF TRANSPORTATION	
FLAGMEN CLOSING 1 LANE OF A 2 LANE HIGHWAY	DATE 2/8/80
PAYING OPERATIONS	
CR	CX

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

26
26

PLAN NO. 22



GENERAL NOTES.

- 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.
- Flaggers shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall communicate with each other at all times as described in the Ohio Manual of Uniform Traffic Control Devices (OMUTCD) in Section 7H: Control of Traffic Through Work Areas.
- Cones drums or barricades shall be spaced at approximately 50' to 60' center to center for the first 1000 feet of the work area and at a maximum of 100' to 120' center to center for the balance of the work area. Cones, drums or barricades on the advance and return tapers shall be spaced at 10' center to center. Cones may be substituted for barricades or drums for lane closures during daylight hours only.
- Several small work sites close together shall be combined into one work area to make a closure not more than 2000 feet long including tapers. Closures of more than 2000 feet may be 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 area.
- The work vehicles shown at the beginning and end of the work area shall be in place and unoccupied whenever workers are in the work area. These work vehicles shall be removed from the pavement whenever workers are not in the work area. Other protective devices may be used in lieu of the work vehicles shown when approved by the Engineer. The vehicles shall be equipped with a 360° rotating or flashing amber beacon clearly visible a minimum of a 1/4 mile.
- The Type A flashing barricade warning lights shown on the "Road Construction Ahead" and the "One Lane Road Ahead" signs are required whenever a night lane closure is necessary.
- Type C steady burning barricade warning lights shall be erected on drums or barricades for night lane closures. The maximum spacing shall be identical to the channelizing device spacing requirements described in Note 3.
- Adequate area illumination to clearly identify the flagger station at night for long term operations shall be provided 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 temporary luminaires shall be a minimum of 27 feet above the pavement and the overhead conductor clearance shall be 20 feet above the pavement.

OHIO DEPARTMENT OF TRANSPORTATION
**FLAGGERS CLOSING
 1 LANE OF A 2 LANE
 HIGHWAY**
 DATE 12/82