KNO-13-15.93 SAFETY UPGRADING	OHIO	1 / 22
F-34(4)	FHWA REGION 5 / FEDERAL PROJECT	

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

KNO-13-15.93

F-34(4)

CALCULATED BY [illegible] DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78

MICROFILMED APR 4 1987

MIDDLEBURY, WAYNE & MORRIS TOWNSHIPS
VILLAGE OF FREDERICKTOWN
KNOX COUNTY

DESIGN DESIGNATION

1978	ADT	4774
1998	ADT	7161
DHV		716
D		60%
T		12%
V		55

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line or
Center Line 352 353

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA & RW
Existing Right of Way
Railroad or
Guardrail (existing) (proposed)

INDEX OF SHEETS

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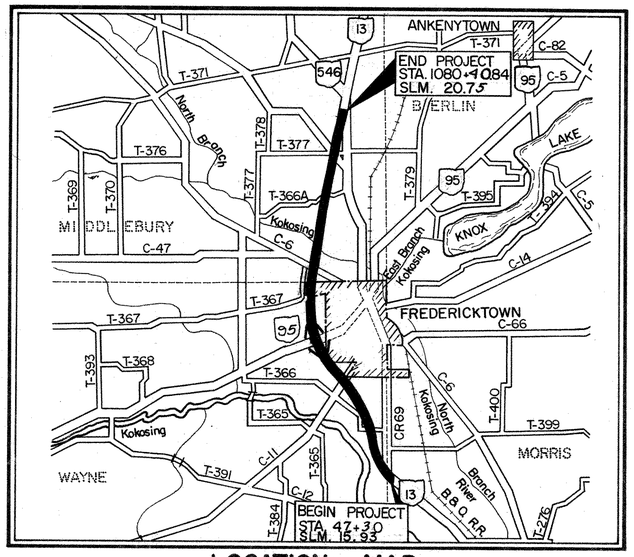


LOCATION MAP

SCALE IN MILES
1 0 1 2 3

Portion to be improved
State & Federal Routes
Other Roads

SCALES

Plan 0 50 100

LINE DATA

Begin Project Sta. 47+30.00
Station Equation Sta. 59+20.00 BK. = 838+00.00 Ahd.

End Project Sta. 1080+40.84
Net Length of Project 25130.84 Lin. Ft. or 4.816 Miles

Begin Work Sta. 43+00
Station Equations Sta. 59+20.00 BK. = 838+00.00 Ahd.
Sta. 1080+80.84 BK. = 1080+60.11 Ahd.

End Work Sta. 1083+80
Length of Work 26220.73 Lin. Ft.
ADD FOR C.R. 69 APP'R. 403 Lin. Ft.
ADD FOR S.R. 95 1167 Lin. Ft.
TOTAL LENGTH OF WORK 27,790.73 LIN. FT. OR 5.263 MILES

1977 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.

The right of way for this improvement will be provided by the State of Ohio.

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway and that provisions for the maintenance and safety of traffic will be as set forth on these plans and estimates.

I-14

SUPPLEMENTAL SPECIFICATIONS		
1001	1-3-77	
847	4-3-76	
842	8-29-74	
S625	1-11-74	
S713	1-11-74	
844	11-8-74	
848	2-23-78	
836	3-12-75	
933	7-6-73	

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS							
		TC-21.20	4-18-77	TC-52.10	4-1-77		
BP-5	8-11-75	TC-71.10	12-1-75	TC-52.20	4-1-77		
		TC-72.20	8-29-77	TC-35.10	10-5-77		
GR-1	12-6-76	TC-41.50	4-1-77	TC-51.11	6-2-75		
GR-3A	12-6-76	CB-5	9-1-69	TC-84.20	9-5-75		
GR-2B	12-6-76	HW-4	1-1-70	TC-85.20	9-5-75		
GR-3	12-6-76	TC-61.10	8-19-77				
GR-4	12-6-76	DBR 2-73	4-10-73				
GR-4A	7-26-76	TC-41.10	8-19-77				
GR-5	1-1-71	TC-41.20	4-1-77				
GR-6	1-1-71	TC-42.10	8-19-77				
MC-3	6-1-73	TC-42.20	4-1-77				
MC-4	7-26-76	TC-51.10	6-2-75				

Approved [illegible] R.E.
Date 7-21-78 District Deputy Director of Transportation

OK HAS Approved Robert B. Pfeifer
Date 8-24-78 Engineer, Bureau of Bridges, and Structural Design

Approved R. E. Gatlin
Date 10-20-78 Chief Engineer, Planning and Design

Approved David L. Weir
Date 10-20-78 Director, Department of Transportation

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

Project: KNO-13-15.93 KNOX COUNTY
Date of Letting _____ 19__, Contract No. _____
0300 Rev. 11-21-73

† THICKNESS VARIES IN FEATHER AREA

TYPICAL SECTIONS

TYPE 848

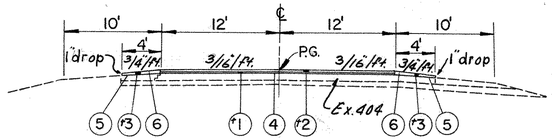
FHWA REGION	STATE	PROJECT	
5	OHIO		

KNO-13-15.93

2/22

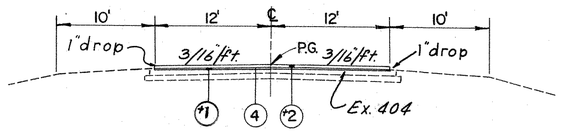
CALCULATED BY JB DATE 6/6/78

CHECKED BY JB DATE 7/20/78



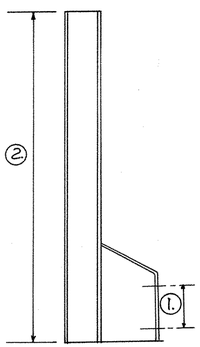
TYPICAL NORMAL SECTION S.R.13

46+90.00 - 47+08.29 = 18.29 L.F



TYPICAL SECTION - C.R.69

0+44 - 2+00 = 156 L.F



TYPE 2 BRIDGE POST

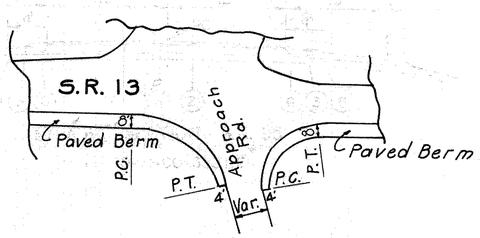
DIMENSION ① is 8"

DIMENSION ② is 3'-10"

No. Required: Bridge KNO-13-1829R = 22
Bridge KNO-13-1829L = 22
Bridge KNO-13-1910R = 60
Bridge KNO-13-1910L = 60

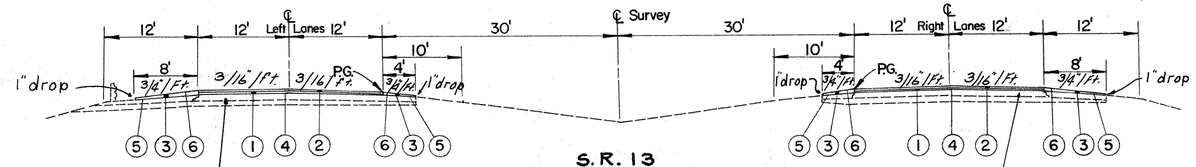
For details not shown see Standard Bridge Drawing DBR-2-73

Note: Existing Bridge Posts shall be salvaged for removal by State Forces.



TYPICAL PLAN

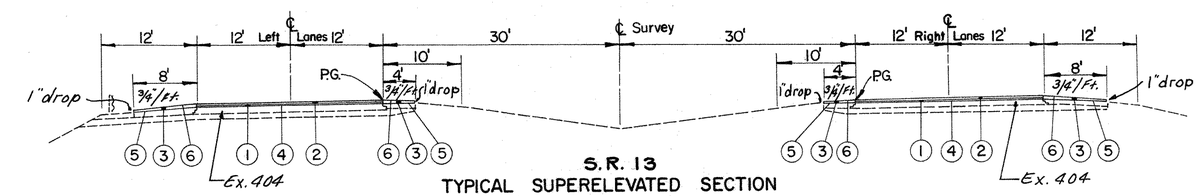
Berms Paved Around Approach Road Returns



S.R. 13

TYPICAL NORMAL SECTION

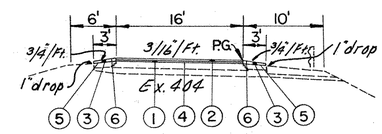
838+25 - 867+75 = 2950 L.F.
895+75 - 908+50 = 1275 L.F.
967+25 - 1067+90 = 10065.00 L.F.



S.R. 13

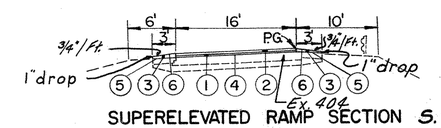
TYPICAL SUPERELEVATED SECTION

58+67.67 - 59+20.0 Bk = 52.33 L.F
838+00.0 - 838+25.0 = 25.00 L.F.
867+75.0 - 895+75.0 = 2800.00 L.F
908+50.0 - 967+25.0 = 5875.00 L.F



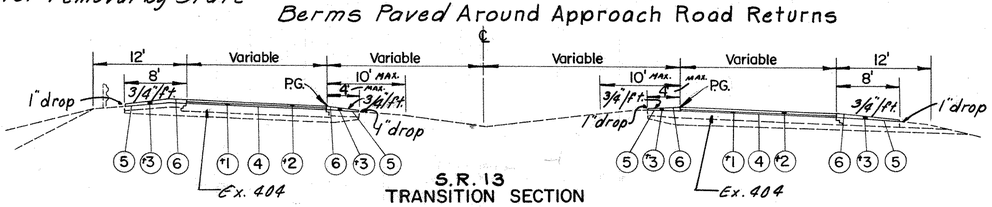
NORMAL RAMP SECTION S.R. 13

S.E. RAMP 6+76.67 - 9+00.00 = 223.33 L.F
S.W. RAMP 3+00.00 - 10+39.68 = 739.68 L.F
N.W. RAMP 0+85.64 - 8+09.97 = 724.33 L.F
N.E. RAMP 1+14.00 - 4+00.00 = 286.00 L.F



SUPERELEVATED RAMP SECTION S.R. 13

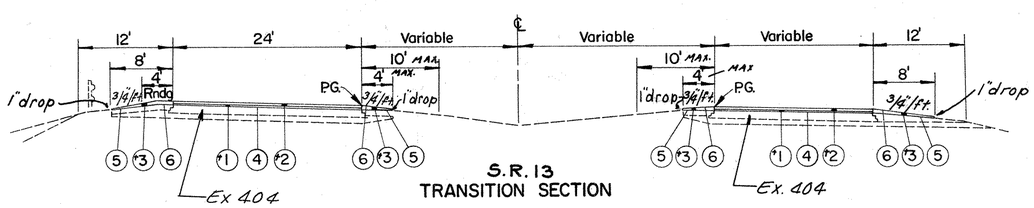
S.E. RAMP 0+00.00 - 6+76.67 = 676.67 L.F
9+00.00 - 11+86.55 = 286.55 L.F
S.W. RAMP 0+00.00 - 3+00.00 = 300.00 L.F
10+39.68 - 11+37.09 = 97.41 L.F
N.W. RAMP 0+12.77 - 0+85.64 = 72.87 L.F
8+09.97 - 11+41.89 = 331.92 L.F
N.E. RAMP 0+12.25 - 1+14.00 = 101.75 L.F
4+00.00 - 10+37.36 = 637.36 L.F



S.R. 13

TRANSITION SECTION

47+08.29 - 58+67.67 = 1159.38 L.F



S.R. 13

TRANSITION SECTION

1067+90 - 1080+80.84 = 1290.84 L.F.

Note:

Included in the General Summary is a quantity of 150 Cu. Yds. of 203 embankment to be used as directed by the Engineer for the purpose of filling low spots at the edge of the paved berm.

LEGEND

†① 848 Asphalt Concrete INTERMEDIATE COURSE, Type I T= 3/8"

†② 848 Asphalt Concrete Surface Course, Type I T= 1"

†③ 848 Asphalt Concrete Surface Course, Type I T= 1 3/8"

④ *407 Tack Coat: @ 0.1 gal./Sq. Yds.
407 Cover Aggregate @ 7 lbs./Sq. Yds.

⑤ 408 Bituminous Prime Coat: 702.09, RT-2 or RT-3; 702.02, MC-30 or MC-70; or 702.03, Primer 20 @ 0.4 gal./Sq. Yd.

⑥ 409 Seal Coat Cover Aggregate, #8 @ 0.008 C.Y./S.Y.
409 Seal Coat Bituminous Material: 702.09 RT-9 or RT-10; 702.02, MC-800 or MC-3000; 702.04, RS-1, RS-2, CRS-1 or CRS-2; or 702.03, CBAE 800 @ 0.30 gal./S.Y.

* 702.02, RC-250; 702.04, SS-1, SS-1H, MS-2 or RS-1

GENERAL NOTES

FIELD OFFICE

The Contractor shall provide a suitable field office having a minimum of 300 sq. ft. of floor space and in addition to the requirements of Item 619, he shall provide and maintain sanitary provisions as per 107.06. All the above is included in the lump sum price bid for Item 619, Field Office.

ESTIMATED QUANTITIES

Specific locations and usage of estimated quantities set up on this plan to be used "as directed by the Engineer" shall be made a matter of record by incorporation into the final change order governing completion of this project. Estimated quantities of materials shall not be ordered for delivery to the project unless authorized by the Engineer.

PROFILE

The profile of the proposed Asphalt Concrete course shall be approximately 1⅜ inches above that of the existing pavement.

LOCATIONS OF THE GUARD RAIL

The locations of guardrail runs as shown in these plans are subject to adjustment to assure that the planned installations will afford maximum protection for traffic.

FEATHERING 848

All 848 Asphalt Concrete placed on existing surfaces shall be feathered onto such surfaces according to one of the methods shown on Standard Construction Drawing BP-5.

ITEM SPECIAL MEMBRANE WATERPROOFING

For specifications on this special item see Proposal Note No. 109.

BRIDGE SURFACING

Surface on the bridge decks is computed at a thickness of 2½". Feathering from 1⅜" to 2½" is to be done on the approach slabs, as per Standard Construction Drawing BP-5. Bridge Numbers: KNO-13-1829 L&R. and KNO-13-1910 L&R. For Details See Sht. 5.

PUBLIC SAFETY

No hazard shall be left unprotected except for the actual time necessary to remove, grade and reinstall guard rail in a continuous operation. The removal of all guard rail shall at all times be as directed by the Engineer. No guard rail 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.

~~606 - GUARD RAIL TYPE 5, AS PER PLAN~~

~~Rail elements salvaged under 202 Guard Rail Removed for Reuse or Storage on this project may be used in lieu of furnishing new rail elements for 606 Guard Rail Type 5. If salvaged rail is used it must be renovated prior to installation, if renovation is necessary, and new splice bolts furnished.~~

VOID

~~Additional new posts shall be furnished and installed where needed to meet the spacing requirements of Type 5 guard rail. New posts shall be of the same general type as the existing posts, however, they shall meet the requirements of current specifications and plan details. All new spacer blocks, post bolts, splice bolts (except where rail sections are not dismantled), and miscellaneous hardware shall be furnished and installed in accordance with plan details and specifications.~~

~~If, within the run of rail to be rebuilt, some posts are found to be damaged or not satisfactory, they shall be removed and replaced under 606 Guard Rail Replacement Posts.~~

~~Rail shall be cleaned of rust, dirt or other foreign materials. Intermediate post bolt slots ¾" x 2-½" shall be field punched or drilled. Areas on which the spelter coating has been damaged and intermediate holes shall be repaired or regalvanized in accordance with AASHO Specification M 36 Section 23 or they may be repaired under the direction of the Engineer with stick-form galvanizing repair compound meeting the requirements of FSS O-G-93.~~

~~The Contractor may, at his option, remove and dispose of rails suitable for re-use and substitute, at no additional cost, new material conforming to 710.06.~~

~~The accepted quantities of rebuilt guard rail, measured in accordance with 606.07, will be paid for at the unit price bid per linear foot for 606 Guard Rail Type 5, As Per Plan.~~

VOID

GUARD RAIL REMOVED *FOR STORAGE, AS PER PLAN*

Guard rail designated for removal on this project shall be carefully dismantled and the salvageable rail elements stored for removal by State forces. All posts, blocks, bolts, damaged rail and other material not considered salvageable shall be disposed of as directed. All post holes shall be carefully filled and tamped and the site cleaned and restored.

Site restoration will include grading of the shoulder in the area of the guard rail removal to provide proper shoulder drainage and smooth shoulder slopes where traffic or weather may have built a ridge of earth and debris under the guard rail. The graded or disturbed area shall be reseeded except, where new guard rail is to be constructed, an area under the new guard rail 3' wide, measured from one foot in front of the rail (or centered under guard rail, barrier design) shall not be seeded.

Payment for all of the above shall be at the unit price bid for 202 Guard rail removed for storage *AS PER PLAN* for 202 Guard rail, barrier design, removed for storage, *AS PER PLAN* measured by the linear foot center to center of terminal posts or center of bridge connection splices. Existing bridge railing shall be included in these items.

~~GUARD RAIL REPLACEMENT POSTS~~

~~If, within runs of guard rail indicated to be rebuilt on this project, specific posts are found to be damaged or in need of replacement at the time this contract is awarded, those posts shall be removed and disposed of. New posts of similar type shall be furnished and installed, meeting current requirements of 606 and plan details.~~

VOID

~~Payment for each post replaced shall be made at the unit price bid per each for 606 Guard Rail Replacement Posts. It is not the intent of this plan that this item be used to pay for additional posts furnished to meet spacing requirements for guard rail rebuilt as Type 5.~~

~~An estimated quantity of 60 replacement posts has been set up on this plan to be used as directed by the Engineer.~~

202 CURB REMOVALS

On the S.W. Ramp and the N.E. Ramp at S.R. 95 interchange the existing Type 7 and Type 8 curbs shall be removed. The unit price bid for such removals shall include the backfilling of the holes with 404 to the existing paved berm line and any grading and seeding necessary to level the existing ground to drain properly.

ANCHOR ASSEMBLY TYPE T, AS PER PLAN

On this project where an anchor assembly Type T is added to an existing guard rail run the last post in the existing run shall be removed and set in concrete to conform with Standard Construction Drawing GR-4A.

RESTORATION OF DISTURBED AREAS

The Contractor shall replace all disturbed seeded and sodded areas and other disturbed surfaces to a condition equal to that existing before the work was started. All replacements shall be done in accordance with the pertinent specification items and as directed by the Engineer. Payment for all restoration work including materials, equipment, labor, incidentals, and disposal of all surplus materials shall be included in the unit price bid for the various items.

~~606 GUARD RAIL REBUILT TYPE 5, AS PER PLAN~~

VOID

~~On this project two runs of existing Type 4 Guard Rail shall be rebuilt as Type 5. The Contractor shall furnish all necessary posts, bolts, block outs, etc. to convert these two runs from Type 4 to Type 5. It will not be necessary to dismantle these runs as they are already galvanized and punched for Type 5 mounting.~~

ITEM 842 REMOVE AND REERECT STRAIN POLE

This item shall include: (1) Removing the messenger wire, signals and accessories from the existing strain pole (2) Removing the strain pole (3) Removing the existing foundation to one foot below the ground line and backfilling the hole (4) Resetting the strain pole on the new foundation (5) Attaching the existing signals to the new messenger wire and attaching the messenger wire to the strain pole.

Payment shall include all labor and equipment necessary to perform the above work and shall be per lump sum Item 842 Remove and Reerect Strain Pole.

SPOT LEVELING COURSE AND BERM REPLACEMENT

A quantity of Item 848 Asphalt Concrete has been included in the plans to provide a leveling course for pavement and berms. This material may also be used to repair berms damaged when used for maintaining traffic:

848 *ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1*
200 CU. YDS.

CONSTRUCTION PLAN

Reference is hereby made to the following designated plan for a former construction project which includes the areas covered by this improvement: KNO-13-15.93

Copies of this plan are on file at the District 5 Office of the Department of Transportation, Newark, Ohio, or at the office of the Administrator of Contract Sales, Columbus, Ohio.

517 RAILING, AS PER PLAN

Rail elements salvaged under removal items in the plan may be used in lieu of furnishing new rail elements for this item.

For post details see sheet 2.

ITEM SPECIAL - STEEL 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 18" % maximum with power driven pins or #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 abutment wing wall 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 .105" and shall meet the requirements of ASTM A 568.

Galvanizing shall be in accordance with 711.02.

Stainless steel shall be 20 ga. ASTM A167, Type 304, mill finish

Payment shall be at the contract price bid for Item Special, Square Feet, Steel Drip Strip, which shall include all materials, labor, tools, and incidentals necessary to complete the item.

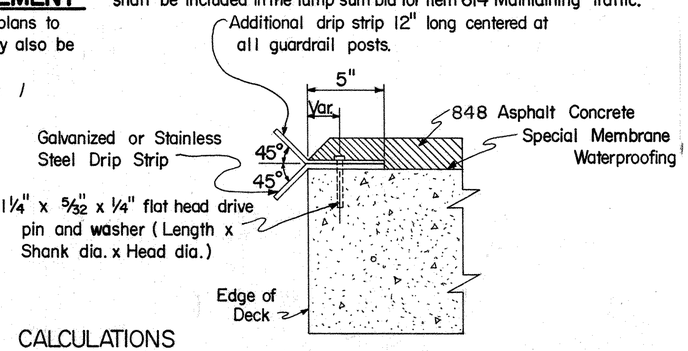
MAINTAINING TRAFFIC

Traffic control shall be maintained as per the detail sheets and specifications and as outlined in the construction and maintenance operations section of the Ohio Manual of Uniform Traffic Control Devices for Streets and Highway, current edition with latest revisions. In addition the following shall apply:

The ramps shall remain open with traffic using the berms and partial pavement.

A minimum of one lane of traffic in each direction shall be maintained at all times. Temporary pavement markings shall be furnished and placed by the Contractor at all times to provide positive lane delineation on any area where the existing lines have been obliterated due to paving operations. The delineation shall consist of reflectorized white plastic *strips 4" x 12"*. The marks shall be located on the lines of the final lane lines and spaced at approximately 40' intervals. No traffic will be permitted on new 848 material until positive lane delineation is in place. When the 848 surface course is being constructed the marks shall be placed prior to the final rolling.

The length and duration of restricted traffic zones shall be held to a minimum consistant with the specification requirements for protection of completed courses. Interruption of through traffic on S.R.13, S.R.95, C.R.11, and C.R.6 shall be held to a minimum. Payment for all the above shall be included in the lump sum bid for Item 614 Maintaining Traffic.



CALCULATIONS

Steel Drip Strip Bridge No.'s KNO-13-1829 L&R & KNO-13-1910 L&R

Total length = 2(66.60) + 2(66.60) + 2(186.5) + 2(186.5) + 164' (for G.R. posts) = 1176.4 L.F.

1176.4 (.6667) = 784 Sq. Ft.

Quantity Carried to General Summary

DRIP STRIP DETAIL

Rev. 11-14-78

FHWA REGION	STATE	PROJECT	
5	OHIO		

3-A
22

KNOX-13-15.93

CALCULATED BY [illegible] DATE 6/30/78
CHECKED BY [illegible] DATE 7/20/78
Revised by [illegible] Date 8/16/78

GENERAL NOTES

ITEM 844 REMOVAL OF GROUND MOUNTED SIGNS

Ground mounted signs shall be carefully removed where indicated on the plans. The signs shall be re-erected elsewhere on the project or stored on the project for salvage by state forces.

To assure maintenance of adequate traffic control at all times, no signs shall be removed without the approval of the Engineer.

Re-erection may require field drilling and any necessary hardware shall be furnished by the Contractor.

Payment will be at the contract unit price for each sign removed and stored or re-erected.

Item 844 Each Removal of Ground Mounted Signs for Storage.

Item 844 Each Removal of Ground Mounted Signs and Re-erection.

ITEM 844 REMOVAL OF GROUND MOUNTED SIGN SUPPORTS

Ground mounted sign supports shall be carefully removed where indicated on the plans and stored on the project for salvage by State Forces. Supports shall be removed with care to avoid damaging.

Payment will be at the contract unit price for each support removed and stored.

Item 844 Each Removal of Ground Mounted Post Support.

~~SIGNS, ERECTED~~

~~In addition to the provisions of supplemental specification 844, the following requirement shall apply. The Contractor shall submit to the Engineer a schedule of sign erection at least 120 days in advance of any erection work. The schedule shall be in writing with 2 copies and shall include erection dates, sign numbers and delivery point.~~

~~The copies will be distributed by the Engineer to the following agencies:~~

~~(a) The Traffic Engineer of the affected Field District of the Department.~~

~~(b) Bureau of Design Services, 25 South Front Street, Columbus, Ohio 43215.~~

ITEM 621 BROKEN LINE PAVEMENT MARKINGS

The requirements of 621.05 shall be modified for application of broken lines. The lines shall be applied in a 40-foot cycle consisting of a 10-foot dash and a 30-foot space between dashes. The table in 621.05 for the application rate of traffic paint for broken lines shall be revised to read 4 Gallons for a 4-inch line width and 6 gallons for a 6 inch line width per mile of line.

ITEM 844 GROUND MOUNTED SUPPORT, NO. 4 POST, AS PER PLAN

Special posts incorporating a square tubular top extension for mounting signs at right angles to other signs on the post shall be furnished, assembled and erected in accordance with TC-41.50 and the plans.

Payment will be at the contract unit price per linear foot of support overall length, furnished and in place.

844 Linear foot Ground Mounted Support, No. 4 Post, As per plan.

ITEM 620 REPLACEMENT OF DELINEATORS

A Quantity of 105 Type A & 54 Type D Delineators has been added to the general summary sheet. The Contractor shall replace broken, missing or damaged Delineator Reflectors and posts in the quantity and at the locations as determined by the Engineer. Delineators shall be replaced in accordance with TC-61.10.

FASTENING OF BRIDGE TERMINAL ASSEMBLY, TYPE F

Where bridge terminal assemblies, Type F, are to be fastened to existing concrete parapets by steel box block-outs they shall be attached by means of through bolts. Expansion anchor bolts will not be permitted.

Where self-drilling anchors are permitted and are used, the holes shall be drilled with tubular expansion shell, rather than with a bit, to insure a proper fit. The anchors shall be installed flush with the surface of concrete.

WHERE ANCHORAGE BY EXPANSION BOLTS TO A DETERIORATED CONCRETE SURFACE WOULD RESULT IN A QUESTIONABLE ATTACHMENT, THROUGH BOLTS SHALL BE USED INSTEAD, AT THE DISCRETION OF THE ENGINEER.

ITEM 848 ASPHALT CONCRETE

Subsequent to the completion of plans, the asphalt concrete used on this project has been revised from items 402, 403 and 404 to supplemental specification 848. All reference to 402, 403 and 404 appearing on the plans shall be considered to read as follows:

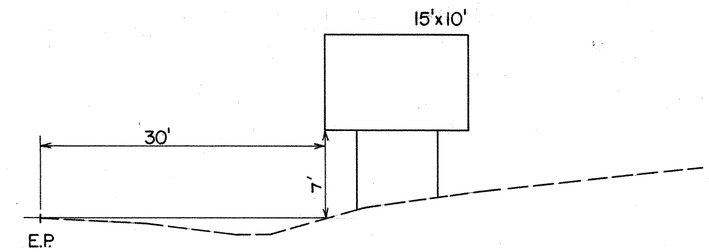
402 becomes 848 Asphalt Concrete Intermediate Course, Type 2
403 becomes 848 Asphalt Concrete Intermediate Course, Type 1
404 becomes 848 Asphalt Concrete Surface Course, Type 1

On this project, item 848, table 2-2, properties of mixtures shall be for medium traffic volumes.

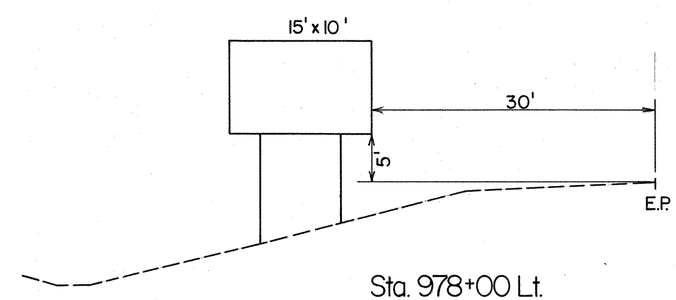
ITEM 844 SIGNS, BY TYPE

Reflective sheeting for sign faces shall be TYPE F in accordance with 844.03.

CROSS SECTIONS FOR SIGNS



Sta. 899+00 Rt.



Sta. 978+00 Lt.

GENERAL NOTES

DESCRIPTION OF WORK:

The work shall consist of the placement of plowable prismatic reflector type pavement markers in accordance with the lines, symbols, and dimensions shown on the plans or as described herein. The contractor shall furnish all material, services, labor and equipment necessary for the required pavement preparation and pavement marker installation, except as specified below.

MATERIALS:

The plowable prismatic reflector type pavement marker is an iron casting to which is attached a replaceable prismatic retro-reflector.

A two-way plowable prismatic reflector type pavement marker is a casting which can withstand snow plowing in two opposing directions. Plowable prismatic reflector type pavement markers will be furnished by the Department.

The contractor shall inform the Department of the location of his storage facility at the pre-construction conference. The marker materials furnished by the Department will be shipped directly from the vendor to the contractor's storage facility. The Department shall be responsible for all arrangements for shipment of the pavement markers from the vendor to his storage facility. The contractor shall provide to the Department receiving tickets for the marker materials received. Procedures for documenting receipt of pavement markers will be furnished to the contractor at the pre-construction conference.

The contractor shall store the pavement markers without damage or contamination with foreign matter. A deduction, in the amount of the actual cost to the State of Ohio, shall be made for materials damaged by the contractor or for markers received by the contractor which were not installed and were not returned to the Department.

The adhesive used to bond the pavement marker to the pavement shall be a two-component standard set epoxy available from the Amerace Corporation (Signal Products Division, 7542 North Natchez Avenue, Niles, Illinois), or an equivalent made with the following formulation:

Component A	Parts by Weight
Epoxy Resin (Epon 828 or equal)	100.00
Titanium Dioxide	7.68
#13 Talc	36.64

Component B	
N-Aminoethyl piperazine (Jefferson or equal)	25.10
Nonyl phenol	50.03
Talc (Fiberine C-400, Sierra or equal)	69.28
Molacco Black	0.23

The epoxy adhesive shall be furnished by the contractor. The contractor shall furnish to the Engineer a Certificate of Analysis containing the Certified Formulation and Certified Test Data to be obtained in the following manner:

The Certified Formulation shall be for each of the Component Parts, the actual percent by weight, the name of the producer and brand name of the material, and the producer's code number.
Certified Test Data for the properties of the Component Parts, Components A (Epoxy) and B (Hardener) and the Cured System shall be performed in accordance with the Methods of Test of AASHTO M237-73.

The respective properties of the Component Parts to be tested are in Sections 2.3.1 to 2.3.3 and 2.3.5 to 2.3.7. The properties of both Components A and B to be tested are noted in Section 3.1. The properties of the Cured System to be tested are listed in Table 7. Certified Test Data for the Component Parts may be performed by the respective manufacturers. Certified Test Data for Components A and B and the Cured System may be performed by either the Epoxy Adhesive producer or an independant testing laboratory.

For sampling purposes, a batch shall consist of a single charge of all Components into a mixing chamber.

A Certified Formulation will be required for each batch of Components A and B. Certified Test Data will be required for each 1000 gallons or fraction thereof of material. Batches of less than 1000 gallons shall be combined in proportion to their size in order to form a composite sample representative of no more than 1250 gallons. This composite sample shall be thoroughly mixed and shall serve to represent the material to be tested. The contractor shall also furnish to the Engineer a 1 pint sample of each component from the initial batch of epoxy adhesive to be used on the project and from any subsequent batches when required by the Engineer.

The epoxy adhesive shall be mixed by combining components A and B in a ratio of 1:1 by volume. The epoxy adhesive requires that the mixing operation and placing of the pavement markers be done rapidly. Any mixed batch that becomes so viscous that it cannot be readily extruded from under the marker under light pressure shall not be used. The adhesive shall be maintained at 60°F to 80°F before mixing. Any heating of the epoxy shall be by the application of indirect heat. The adhesive shall not be heated above 120° F.

UNLOADING STATE-FURNISHED MATERIAL:

The contractor shall be responsible for all arrangements necessary for the unloading of the state-furnished materials from the supplier's truck or common carrier at the time of delivery to the contractor's storage facility. The Department or its agent will provide the contractor advance notice of the supplier's date of shipment as soon as practicable after the shipping schedule is established.

PAVEMENT PREPARATION:

The contractor shall be responsible for cleaning and preparing the pavement to which the pavement marker is to be bonded, to the satisfaction of the Engineer, such that at the time of marker installation the pavement shall be free of dirt, dust, oil, grease, moisture, curing compound, loose or unsound layers or any other material which would interfere with proper bonding of the marker to the pavement. Sand blasting shall be used when directed.

INSTALLATION OF PLOWABLE PRISMATIC REFLECTOR TYPE PAVEMENT MARKERS:

At the time of installation, the pavement marker casting shall be free of dirt, dust, oil, grease, rust, moisture or any foreign matter which will impair adhesion to the pavement. It shall be the contractor's responsibility to clean each contaminated casting by sand blasting or other acceptable procedure to remove all such foreign matter prior to installation.

Before beginning pavement marker application, the contractor shall accurately and adequately lay out, by reference points, the location of all pavement markers, to assure their proper placement.

Pavement markers shall not be placed on pavement surfaces that show visible evidence of cracking, checking, spalling, or failure of underlying base material.

If, during the pre-installation layout operation, it is determined that a marker would be placed at a point with one of the aforementioned pavement surface defects or at a pavement construction joint or within the intersection of a driveway or public street as the result of typical marker spacing, the affected marker shall be relocated longitudinally a sufficient distance to a point approved by the Engineer. The distance the marker may be relocated shall not exceed 10% of the typical marker spacing. Where it would be necessary to relocate the marker a distance greater than 10% of the typical marker spacing, the affected marker shall be deleted.

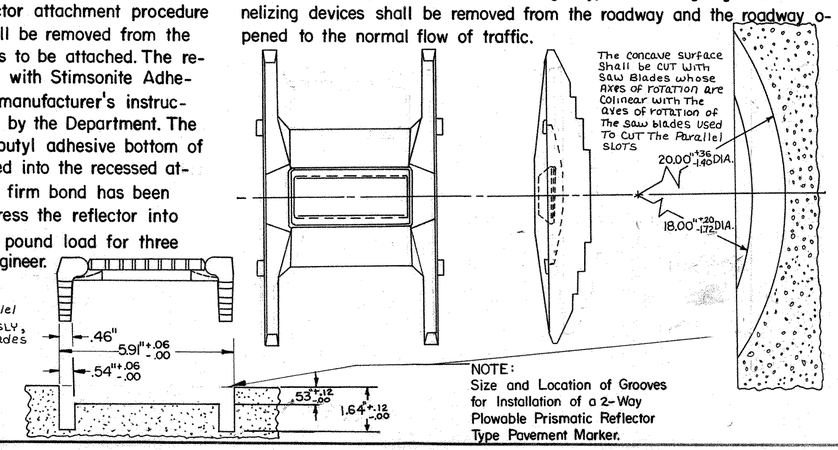
The pavement surface temperature at the time of application shall be not less than 50°F. The ambient air temperature shall be not less than 50°F. No markers shall be installed if the pavement surface is not dry.

Plowable pavement markers shall be installed by inserting the two keels on the casting into parallel slots cut into the pavement in accordance with the details on this sheet. Within 7 days after the slots are cut into the pavement, the marker castings shall be installed.

Before applying the epoxy adhesive, the slots shall be brushed or blown clean of loose material and shall be dry. The cleaned slots shall be filled with epoxy adhesive. Sufficient epoxy shall be placed in and between the slots to insure that all voids beneath and around the casting are filled so as to create a watertight seal around the casting. The keels of the pavement marker casting shall be hand placed into the slots in such a manner as to assure that the tips of the marker's snowplow deflecting surface are below the pavement surface. Also, the four lugs on the keels of the two-way plowable casting shall be in contact with the pavement.

The contractor may attach the prismatic reflector to the casting in the field or in a shop. Where the contractor performs reflector attachment in the field, the prismatic reflector shall not be attached to the casting until after the adhesive in the pavement slots has properly hardened. In either operation, the following reflector attachment procedure shall be used. Any rust or foreign matter shall be removed from the surface of the casting on which the reflector is to be attached. The recessed attachment area shall then be painted with Stimsonite Adhesive Primer or equal in accordance with the manufacturer's instructions. The adhesive primer shall be furnished by the Department. The release paper shall then be peeled from the butyl adhesive bottom of the reflector and the reflector shall be inserted into the recessed attachment area and pressed into place until a firm bond has been made with the casting. The contractor shall press the reflector into place by the application of a 1000 to 2500 pound load for three seconds by a procedure acceptable to the Engineer.

NOTE: To facilitate the cutting of the two parallel slots and intervening concave surface simultaneously, it is recommended that an arbor and saw blades assembly be used. The contractor may obtain a detail of a typical arbor and saw blades assembly at the Bureau of Traffic, 25 South Front Street, Columbus, Ohio.



NOTE:
Size and Location of Grooves for Installation of a 2-Way Plowable Prismatic Reflector Type Pavement Marker.

METHOD OF MEASUREMENT:

The number of plowable prismatic reflector type pavement markers will be the actual number, complete, in place, and accepted, in type of casting, and in the units designated. The pavement marker material will include the furnishing and application of all required epoxy adhesive. Layout and premarking of the pavement marker locations and surface preparation will be incidental to the installation of the pavement markers.

BASIS OF PAYMENT:

Payment for accepted quantities complete in place will be made at the contract unit price per each two-way plowable prismatic reflector type pavement marker installed. Payment shall be full compensation for all materials, labor, incidentals, and equipment for placement of the pavement markers.

ITEM 614 MAINTAINING TRAFFIC:

Normal directional traffic shall be maintained on the roadway at all times during the construction period in accordance with sheets 3, 20 & 21 of this contract and the Ohio Manual of Uniform Traffic Control Devices, as approved by the Engineer, except that a flashing or sequencing arrow panel shall be used in addition to the traffic control required for closing one lane of a 4-lane highway (divided or undivided).

The contractor shall provide, place and subsequently remove all necessary warning signs and channelizing devices to keep traffic off newly installed pavement markers for the minimum period specified in the following table.

Ambient Air Temperature °F	Minimum Period (Minutes) Protected from Traffic
100	15
90	20
80	25
70	30
60	35
50 (no application below 50° F)	45

During periods of high ambient relative humidity, epoxy may require slightly longer drying time than indicated above.

At the completion of each working day, all warning signs and channelizing devices shall be removed from the roadway and the roadway opened to the normal flow of traffic.

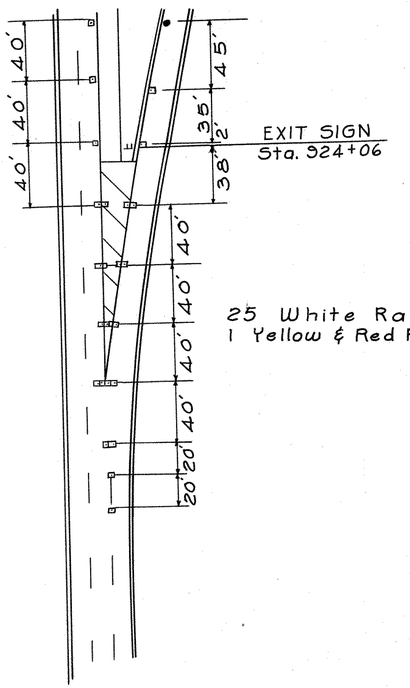
FHWA REGION	STATE	PROJECT	
5	OHIO		

3-C
22

KN 0-13-15.93

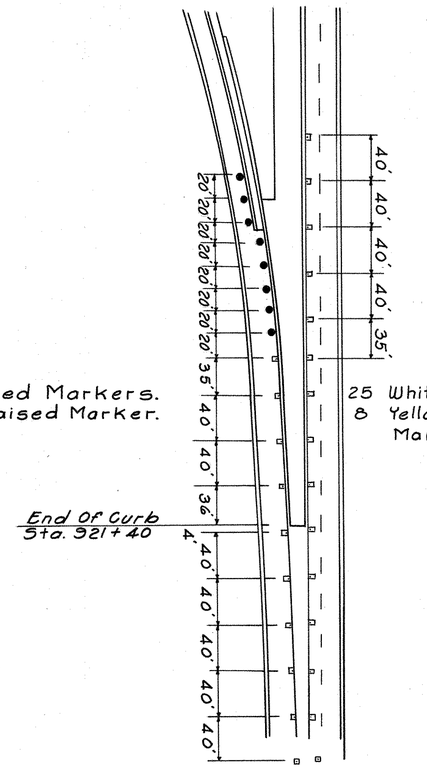
CALCULATED BY [illegible] DATE 6/30/78
CHECKED BY [illegible] DATE 7/20/78
Revised by [illegible] Date 8/16/78

PRISMATIC REFLECTORS



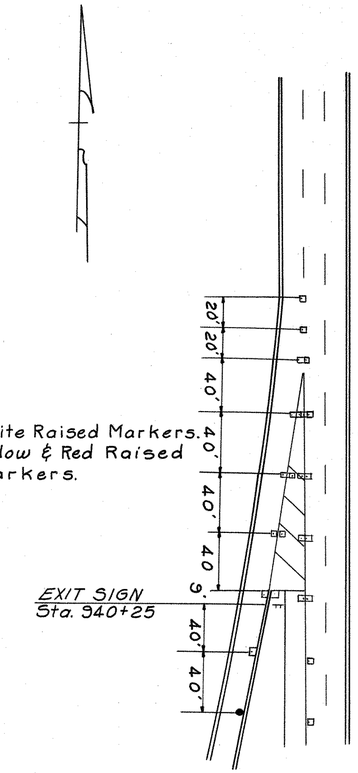
25 White Raised Markers.
1 Yellow & Red Raised Marker.

Deceleration
S.E. Ramp



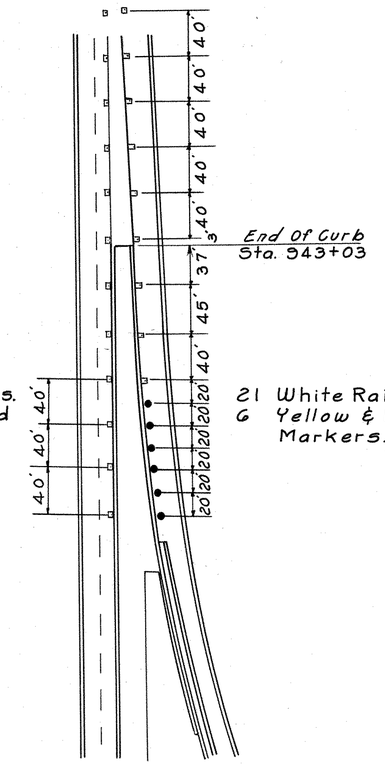
25 White Raised Markers.
8 Yellow & Red Raised Markers.

Acceleration
S.W. Ramp



23 White Raised Markers.
1 Yellow & Red Raised Markers.

Deceleration
N.W. Ramp



21 White Raised Markers.
6 Yellow & Red Raised Markers.

Acceleration
N.E. Ramp

Note :—
Markers installed along an edge, lane, or channelizing line shall be placed so the near edge of the marker casting is no more than 1/4" inch from the near edge of the painted line.
Prismatic Reflectors shall not be placed within the limits of the painted lines.

ITEM SPECIAL
Two - Way Plowable Prismatic Reflector Type Pavement Marker Installed EACH
110

Total Carried To General Summary

LEGEND

☐ TWO WAY RAISED MARKER (WHITE)

● TWO WAY RAISED MARKER (YELLOW & RED WITH YELLOW SIDE FACING TRAFFIC)

RAISED PAVEMENT MARKERS

This contract includes sections of roadway where plowable prismatic raised pavement markers are installed in the pavement. Pavement marking materials shall not be applied to the prismatic reflector unit housed in the casting of a plowable raised pavement marker. If pavement marking material is applied to more than 10% of a reflecting surface, the contractor shall, at his expense, either remove all marking material from the reflector unit by cleaning, or he shall remove and replace in kind the reflector unit, as determined by the Engineer. Line widths shall be maintained as per specification, and the Ohio Manual of Uniform Traffic Control Devices, and as indicated herein.
The contractor may interrupt the application of the painted line at each raised pavement marker where paint would otherwise be applied to the marker reflecting surface. The maximum gap in the painted line at each marker shall be 18 inches.
Annotated drawings describing a device developed by the Department to detect and interrupt painting at a plowable raised pavement marker are available from the Bureau of Traffic. This device is compatible with commercial pavement marking application equipment employing electro-pneumatic valves to control material flow. The contractor is not required to use this device, however.
This item shall be incidental to the application of the painted lines.

This Sheet Not To Scale

PRISMATIC REFLECTORS

CALCULATIONS

CALCULATED BY [illegible] DATE 6/6/78
CHECKED BY [illegible] DATE 7/20/78

FHWA REGION	STATE	PROJECT	
5	OHIO		

PAVEMENT

STA.	STA.	LENGTH	AV. WIDTH	SQ. FT.	LOCATION
MAINLINE					
46 + 90	47 + 08.29	18.29	24	438.96	N.B. & S.B.
47 + 08.29	48 + 49.83	141.54	27	3821.58	S.B. & N.B. Taper
48 + 49.83	50 + 17.00	167.17	36.43	6090.00	N.B. & S.B. Taper
50 + 17.00	50 + 68.29	51.29	23.15	1187.36	N.B. Taper
50 + 68.29	59 + 03.31 Bk.	835.02	24	20040.48	N.B.
50 + 17.00	52 + 49.83	232.83	20.79	4840.54	S.B. Taper
52 + 49.83	59 + 30.30 Bk.	680.47	24	16331.28	S.B.
838 + 00 Ahd	949 + 98.75	1119.875	48	53754.00	N.B. & S.B.
951 + 15.25	992 + 96.75	4181.50	48	200712.00	N.B. & S.B.
995 + 33.25	1067 + 98.68	7265.43	48	348740.64	N.B. & S.B.
1067 + 98.68	1068 + 67.99	69.31	24	1663.44	N.B.
1068 + 67.99	1080 + 48.38 Bk	1180.39	18	21247.02	N.B. Taper
1067 + 98.68	1080 + 80.84 Bk	1282.16	24	30771.84	S.B.
				1193425.14 ÷ 9 = 132602.79 S.Y.	
C.R. 69					
0 - 08.00	0 + 19.00 (Planimeter)			1889.00	
0 + 44.00	1 + 21.22 (Planimeter)			3563.00	
				5452.00 ÷ 9 = 605.78 S.Y.	
1 + 21.22	2 + 00.00	78.78	24	1890.72 ÷ 9 = 210.08 S.Y.*	
				* Corr. as Appr. Rd. Quantity	
C.R. 6					
48 + 59.04	49 + 41.27 (Planimeter)			2940.00	
50 + 58.73	51 + 40.96 (Planimeter)			3200.00	
49 + 67.37	50 + 32.63 (Planimeter)			9341.00	Includes 250 Taper
				15481.00 ÷ 9 = 1720.11 S.Y.	
C.R. 11					
48 + 67.46	49 + 43.07 (Planimeter)			2888.00	ML Approaches
49 + 68.37	50 + 31.63 (Planimeter)			9970.00	Includes 250' Taper
50 + 56.93	51 + 32.54 (Planimeter)			2765.00	ML Approach
				15623.00 ÷ 9 = 1735.89 S.Y.	
T.R. 377					
49 + 69.44	50 + 30.56 (Planimeter)			9068.00	Includes 250' Taper
48 + 77.45	49 + 44.99 (Planimeter)			2362.00	ML Approach
50 + 55.01	51 + 22.55 (Planimeter)			2278.00	ML Approach
				13708.00 ÷ 9 = 1523.11 S.Y.	
S.E. RAMP					
0 + 00	2 + 87.30 (Planimeter)			7346.00	Includes 100' @ ML
2 + 87.30	3 + 87.30	100.00	18.5	1850.00	Taper
3 + 87.30	11 + 23.65	736.35	16	11781.60	
11 + 23.65	11 + 84.55 (Planimeter)			2590.00	S.R. 95 Approach
				23567.60 ÷ 9 = 2618.62 S.Y.	
S.W. RAMP					
0 + 00	1 + 00	100	15	1500.00	
1 + 00	2 + 00	100	17.5	1750.00	Taper
2 + 00	2 + 84	84	19	1596.00	
2 + 84	10 + 39.68	755.68	16	12090.88	
10 + 39.68	11 + 37.09 (Planimeter)			3725.00	S.R. 95 Approach
				20661.88 ÷ 9 = 2295.76 S.Y.	
N.W. RAMP					
0 + 12.77	0 + 85.64 (Planimeter)			2830.00	S.R. 95 Approach
0 + 85.64	8 + 09.97	724.33	16	11589.26	
8 + 09.97	9 + 09.97	100.00	18.5	1850.00	Taper
9 + 09.97	11 + 41.89 (Planimeter)			6159.00	Includes 100' @ ML
				22428.26 ÷ 9 = 2492.03 S.Y.	
N.E. RAMP					
0 + 12.25	1 + 13.98 (Planimeter)			3790.00	S.R. 95 Approach
1 + 13.98	7 + 47.00	633.02	16	10128.32	
7 + 47.00	8 + 37.36	90.36	19	1716.84	
8 + 37.36	9 + 37.36	100.00	17.5	1750.00	Taper
9 + 37.36	10 + 37.36	100.00	15	1500.00	
				18885.16 ÷ 9 = 2098.35 S.Y.	

Total Pavement Area 147692.44 S.Y.

BERM

STA.	STA.	LENGTH	AV. WIDTH	SQ. FT.	LOCATION
MAINLINE					
46 + 90	52 + 30	540.00	8	4320.00	N.B. Rt.
52 + 30	53 + 95	231.00	8	1848.00	C.R. 69 Approach
53 + 95	59 + 03.31 Bk.	509.31	8	4074.48	N.B. Rt.
50 + 17	51 + 07	90.00	2.75	247.50	N.B. Lt.
51 + 07	52 + 70	163.00	4	652.00	N.B. Lt.
53 + 29	59 + 03.31 Bk.	574.31	4	2297.24	N.B. Lt.
46 + 90	59 + 30.30 Bk.	1240.30	8	9922.40	S.B. Lt.
50 + 17	51 + 07	90.00	2.75	247.50	S.B. Rt.
51 + 07	52 + 73	166.00	8	1328.00	S.B. Rt.
53 + 35	59 + 30.30 Bk.	595.30	8	4762.40	S.B. Rt.
838 + 00 Ah.	896 + 18.54	58.18.54	8	4654.832	N.B. Rt.
838 + 00 Ah.	895 + 61.27	57.61.27	8	4609.016	S.B. Lt.
896 + 18.54	897 + 62.95	200.00	8	1600.00	C.R. 11 Rt.
895 + 61.27	897 + 05.68	200.00	8	1600.00	C.R. 11 Lt.
896 + 98	949 + 98.75	53.00.75	8	424.06.00	Med. Lt. & Rt.
897 + 62.95	920 + 80	23.17.05	8	185.36.40	N.B. Rt.
897 + 05.68	921 + 38	24.32.32	8	194.58.56	S.B. Lt.
924 + 72.85	925 + 22.85	50.00	9	450.00	N.B. Rt. Taper
925 + 22.85	941 + 35	16.12.15	8	128.97.20	N.B. Rt.
941 + 35	943 + 03	168.00	14	2352.00	N.B. Rt.
921 + 38	922 + 79.50	141.50	14	1981.00	S.B. Lt.
922 + 79.50	939 + 23.58	164.40.08	8	131.52.64	S.B. Lt.
939 + 23.58	939 + 73.58	50.00	9	450.00	S.B. Lt. Taper
943 + 03	950 + 43.94	740.94	8	5927.52	N.B. Rt.
943 + 06	950 + 03.56	697.56	8	5580.48	S.B. Lt.
951 + 10.44	979 + 56.64	28.46.20	8	227.69.60	N.B. Rt.
950 + 70.06	980 + 40.32	29.70.26	8	237.62.08	S.B. Lt.
950 + 90.25	980 + 36.38	29.46.13	8	235.69.04	Med. Lt. & Rt.
979 + 56.64	980 + 99.44	172.00	8	1376.00	C.R. 6 Rt.
980 + 40.32	981 + 83.12	172.00	8	1376.00	C.R. 6 Lt.
981 + 03.38	993 + 21.75	12.18.37	8	97.46.96	Med. Lt. & Rt.
980 + 99.44	993 + 21.75	12.22.31	8	97.78.48	N.B. Rt.
980 + 83.12	993 + 21.75	12.38.63	8	99.09.04	S.B. Lt.
995 + 08.25	1064 + 55.03	69.46.78	8	555.74.24	Med. Lt. & Rt.
995 + 08.25	1064 + 32.10	69.23.85	8	553.90.80	N.B. Rt.
995 + 08.25	1064 + 01.21	68.92.96	8	551.43.68	S.B. Lt.
1064 + 32.10	1065 + 74.33	166.00	8	1328.00	T.R. 377 Rt.
1064 + 01.21	1065 + 43.44	166.00	8	1328.00	T.R. 377 Lt.
1065 + 20.51	1077 + 18	119.7.49	8	957.99.2	Med. Lt. & Rt.
1077 + 18	1077 + 93	75.00	5.5	412.50	Med. Lt. & Rt.
1065 + 74.33	1080 + 48.38 Bk.	147.40.5	8	117.92.40	N.B. Rt.
1065 + 43.44	1080 + 80.84 Bk.	153.7.40	8	122.99.20	S.B. Lt.
838 + 00 Ahd.	896 + 26	58.26.00	8	466.08.00	Med. Lt. & Rt.
				600473.74 ÷ 9 = 66719.30 S.Y.	
S.E. RAMP					
0 + 00	2 + 87.30	287.30	8	2298.40	Rt.
2 + 87.30	3 + 87.30	100.00	5.5	550.00	Taper
3 + 87.30	11 + 23.65	736.35	6	4418.10	Lt. & Rt.
11 + 23.65	11 + 84.55	193.00	3	579.00	S.R. 95 Approach
				7845.50 ÷ 9 = 871.72 S.Y.	
S.W. RAMP					
0 + 00	2 + 00	200.00	5.5	1100.00	Taper
2 + 00	2 + 84	84.00	3	252.00	Lt.
2 + 84	10 + 39.68	755.68	6	4534.08	Lt. & Rt.
10 + 39.68	11 + 37.09	262.00	3	786.00	S.R. 95 Approaach
				6672.08 ÷ 9 = 741.34 S.Y.	
N.W. RAMP					
0 + 12.77	0 + 85.74	211.00	3	633.00	S.R. 95 Approach
0 + 85.74	8 + 09.97	724.23	6	4345.38	Lt. & Rt.
8 + 09.97	9 + 09.97	100.00	5.5	550.00	Taper
9 + 09.97	11 + 41.89	231.92	8	1855.36	Lt.
				7383.74 ÷ 9 = 820.42 S.Y.	
N.E. RAMP					
0 + 12.25	1 + 13.98	266.00	3	798.00	S.R. 95 Approach
1 + 13.98	7 + 47	633.02	6	3798.12	Lt. & Rt.
7 + 47	8 + 37.36	90.36	3	271.08	Rt.
8 + 37.36	10 + 37.36	200.00	5.5	1100.00	Taper
				5967.20 ÷ 9 = 663.02 S.Y.	

BERM (Cont.)

STA.	STA.	SQ. FT.	LOCATION
C.R. 11			
48 + 67.46	49 + 43.07 (Planimeter)	2911	ML Approach
50 + 56.93	51 + 32.54 (Planimeter)	2788	ML Approach
		5699 ÷ 9 = 633.22 S.Y.	
T.R. 377			
48 + 77.45	49 + 44.99 (Planimeter)	2391	ML Approach
50 + 55.01	51 + 22.55 (Planimeter)	2297	ML Approach
		4688 ÷ 9 = 520.89 S.Y.	

Total Berm Area 70969.91 S.Y.

848 Asphalt Concrete ⊕

C.R. 69	210.08 (.0382)	=	8.03 C.Y.
ML	147692 (.0382)	=	5641.83 C.Y.
Berm	70970 (0.0452) (1 5/8" ave)	=	3207.84 C.Y.
Bridges & A.S.	(2249.24)(.0694) + (25)/9 (24) (.0538) 6		
	+ 25 ((30.70 + 28.45)/9) (.0538)	=	186.46 C.Y.
Deduction from Sheet 4			- 23.22 C.Y.
		⊕	9020.94 C.Y.

SPECIAL - MEMBRANE WATERPROOFING

KNO-13-1829 Rt.	((44.35 + 42.71)/2) (66.60)	= 2899.10	÷ 9 = 322.12 S.Y.
KNO-13-1829 Lt.	(40) (66.60)	= 2664	÷ 9 = 296 S.Y.
KNO-13-1910 Rt.	(183.5) (40)	= 7340	÷ 9 = 815.56 S.Y.
KNO-13-1910 Lt.	(183.5) (40)	= 7340	÷ 9 = 815.56 S.Y.
			2249.24 S.Y.

407 TACK COAT & COVER AGGREGATE

Pavement (147692) + A.S. (565) (0.1) = 14826 Gal.

(148257) (0.0035) = 519 Tons

408 BITUMINOUS PRIME COAT

Berm (70970) (0.4) = 28388 Gals.

409 SEAL COAT COVER AGGREGATE #8

Berm (70970) + Bridges & A.S. (2813.55)

73784 (.008) = 590 C.Y.

409 SEAL COAT BITUMINOUS MATERIAL

(73784) (0.3) = 22135 Gal.

SPECIAL - PATCHING CONCRETE BRIDGE DECKS TYPE I or II

KNO.-13-1829	L	10
KNO.-13-1829	R	10
KNO.-13-1910	L	140
KNO.-13-1910	R	30
	TOTAL	190 Sq. Yds.

202 REMOVALS

Concrete Curb Type 7

(1-C)	1 + 41	2 + 85	144 L.F	S.W. Ramp
(2-C)	7 + 32.36	8 + 69.36	137 L.F	N.E. Ramp
		Sub Total	281 Lin. Ft.	

Concrete Curb Type 8

(1-C)	0 + 00	1 + 41	141 L.F	S.W. Ramp
(2-C)	8 + 69.36	10 + 37.36	168 L.F	N.E. Ramp
		Sub Total	309 Lin. Ft.	
		Curb Removed Total	590 Lin. Ft.	

848 Asphalt Concrete Deduction for Feathering

46+90	40 (24)	=	960
CR 69	20 (24)	=	480
CR 11	2(20)(20)	=	800
SER	20 (65)	=	1300
SWR	20 (70)	=	1400
NER	20 (70)	=	1400
NWR	20 (70)	=	1400
CR 6	2(20)(24)	=	960
TR 377	2(20)(20)	=	800
1080+80	40 (36)	=	1440

10940 (.1146) ÷ 2 ÷ 27 = 23.22 C.Y.

GUARD RAIL — KNO-13-15.93

SHT.	MARK	STA.	STA.	DISPOSITION
		(Existing Stationing) See line sheet for location of work		
9	1 GR.	896 + 69 Lt.	897 + 95 Lt.	Add 25' Guard Rail and Anchor Assembly Type A
9	2 GR.	897 + 23 Rt.	897 + 75 Rt.	Remove 100' Guardrail / w/BTA TYPE F.
11	3 GR.	S.W.R. 10 + 05	S.R.95 52 + 45	Add Anchor Assembly Type T - Remove & Erect. 100'
11	4 GR.	S.R.95 52 + 47	NWR 6 + 08	Rem. & Erect. 100' with Bridge Terminal Assembly Type F
11	5 GR.	S.R.95 49 + 18	NWR 5 + 14	NO WORK
9	6 GR.	921 + 25 Lt.	922 + 47 Lt.	Remove Guard Rail and Anchor Assembly - 125'
11	7 GR.	932 + 01 Lt.	933 + 63 Lt.	Add Anchor Assembly Type T
10	8 GR.	S.E.R. 10 + 20	S.R.95 55 + 05	Rem. & Erect. 100' with Bridge Terminal Assembly Type F
10	9 GR.	S.E.R. 10 + 80	S.R.95 58 + 47	NO WORK
10	10 GR.	S.R.95 55 + 05	N.E.R. 0 + 99	Add Anchor Assembly Type T - Remove & Erect. 100'
10	11 GR.	S.R.95 58 + 47	N.E.R. 1 + 10	Add Anchor Assembly Type T \ w/BTA TYPE F.
10-11	12 GR.	931 + 25 ℄	933 + 74 ℄	No Work
10	13 GR.	931 + 27 Rt.	933 + 03 Rt.	Add Anchor Assembly Type T
12	14 GR.	946 + 31 Lt.	950 + 00 Lt.	Add Anchor Assembly Type T
12	15 GR.	947 + 84 Rt.	950 + 45 Rt.	No Work
12	16 GR.	949 + 25 Med.	950 + 30 Med.	No Work
12	17 GR.	948 + 25 Med.	949 + 25 Med.	Remove 25' Barrier Rail and Add Anchor Assembly
12	18 GR.	950 + 70 Lt.	956 + 59 Lt.	No Work \ (Barrier Design) Type A
12	19 GR.	950 + 83 Med.	951 + 88 Med.	No Work
12	20 GR.	951 + 88 Med.	952 + 88 Med.	Remove 25' Barrier Rail and Add Anchor Assembly
12	21 GR.	951 + 20 Rt.	951 + 39 Rt.	Add Anchor Assembly Type T \ (Barrier Design) Type A
12	22 GR.	961 + 97 Rt.	963 + 21 Rt.	Remove Guard Rail and Anchor Assembly
13	23 GR.	973 + 22 Rt.	CR6 52 + 20 Rt.	Add Anchor Assembly Type A & Rebuild 75' as Type 5
13	24 GR.	CR6 48 + 48	993 + 22 Lt.	Remove 12.5' Guard Rail & Add. Anch. Ass. Type A.
13	25 GR.	CR6 52 + 92	993 + 22 Rt.	Add Anchor Assembly Type A & Rebuild 200' as Type 5
12	26 GR.	951 + 05	951 + 22 Rt.	Add Anchor Assembly Type T
12	27 GR.	949 + 92	950 + 08 Rt.	Add Anchor Assembly Type T
13	28 GR.	992 + 10 Med.	993 + 22 Med.	No Work
13	29 GR.	991 + 10 Med.	992 + 76 Med.	Remove 25' Barrier Rail and Add Anchor Assembly
13	30 GR.	995 + 08 Rt.	995 + 30 Rt.	Add Anchor Assembly Type T \ (Barrier Design) Type A
13-14	31 GR.	995 + 08 Lt.	996 + 88 Lt.	No Work
13-14	32 GR.	995 + 08 Med.	996 + 21 Med.	No Work
14	33 GR.	996 + 21 Med.	997 + 21 Med.	Remove 25' Barrier Rail and Add Anchor Assembly
13	34 GR.	995 + 08 Med.	995 + 30 Med.	Add. Anchor Assembly Type T \ (Barrier Design) Type A
13	35 GR.	992 + 00 Lt.	993 + 22 Lt.	Add. Anchor Assembly Type T

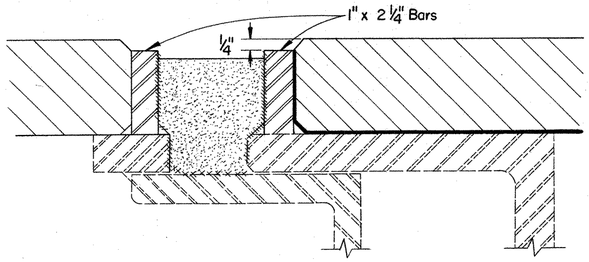
SUMMARY OF GUARD RAIL ITEMS

202	762.5	L.F	Guard Rail Removed for Reuse or Storage
202	100	L.F	Guard Rail (Barrier Design) Removed for Storage
606	4	Ea.	Anchor Assembly, Type A
606	4	Ea.	Anchor Assembly (Barrier Design), Type A
606	12	Ea.	Anchor Assembly, Type T, As Per Plan
606	425	L.F	Guard Rail, Type 5, As Per Plan
606	4	Ea.	Bridge Terminal Assembly, Type F
606	275	L.F	Guard Rail Rebuilt, Type 5, As Per Plan

⊕ 848 ASPHALT CONCRETE SPLIT:

ASPHALT CONCRETE SURFACE COURSE, TYPE 1 = 7,415 CU. YDS.

ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 = 1,606 CU. YDS.



ITEM 516 - VERTICAL EXTENSION OF STRUCTURAL EXPANSION JOINTS, AS PER PLAN
(For use at abutment expansion joints)

Surfaces indicated thus shall be sandblasted and wiped clean. Joints shall be filled before rust forms. If rust forms surfaces shall be re-sandblasted.

Bond to this surface shall be prevented by use of foil or other suitable bond-breaker barrier satisfactory to the Engineer. Care shall be taken not to displace barrier when placing joint sealer.

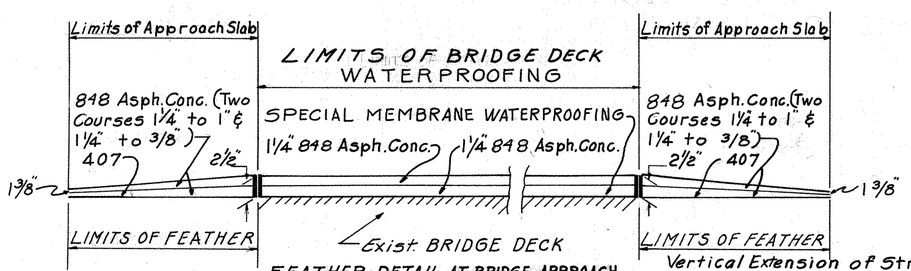
Joint Sealer Material shall be a bridge deck waterproofing membrane material which also meets the requirements of 705.01.

See Standard Drawing BP-5 and 516.04 for notes and details not shown, except that welds shall be continuous.

Cost of surface preparation and furnishing and placing the joint sealer shall be included in the unit price bid for Item 516-Vertical Extension of Structural Expansion Joints, As Per Plan. This Item shall also include the furnishing and installation of steel bars to the existing end dam plates as detailed in Standard Drawing BP-5 and elsewhere in the plans.

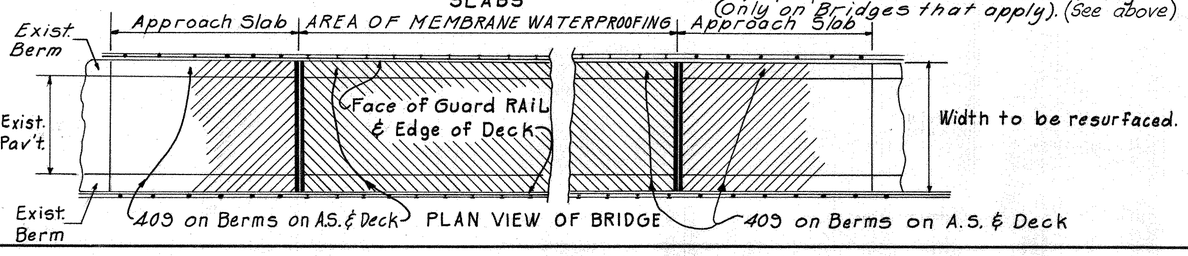
Steel bar stock utilized for the joint extensions may be any weldable grade of low or mild carbon steel available commercially. This material is to be excluded from the requirements of 501.07 for test reports Temporary ramps shall be constructed with a maximum slope of 4ft./inch.

ITEM 516 - VERTICAL EXTENSION OF STRUCTURAL EXPANSION JOINTS, AS PER PLAN (KNO-13-1895(L & R) 160 LIN. FT.



FEATHER DETAIL AT BRIDGE APPROACH SLABS

Vertical Extension of Structural Expansion Joints, as per plan. Bars are 1" wide and 2 1/4" high (Only on Bridges that apply). (See above)



GENERAL SUMMARY

Revised DEH 8/16/78

CALCULATED BY JB DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78

TYPE CODE 6203 UNLESS OTHERWISE SHOWN

SHEET NUMBER 2	3	3A	4	5	10	17	18	19	22	3G	ITEM	QUANT.	UNIT	DESCRIPTION
														ROADWAY
						12					203	12	Cu.Yds.	Excavation NOT INCLUDING EMBANKMENT CONSTRUCTION
150						174					203	324	Cu.Yds.	Embankment
					2287.5						202	2287.5	Lin. Ft.	Guard Rail Removed for Storage
					100						202	100	Lin. Ft.	Guard Rail (Barrier Design) Removed for Storage
			590								202	590	Lin. Ft.	Curb Removed
					6						606	6	Each	ANCHOR ASSEMBLY, TYPE T
					6						606	6	Each	Anchor Assembly, Type T, As Per Plan
					1023						606	1023	Lin.Ft.	Guard Rail, Type 5
					4						606	4	Each	Anchor Assembly, Type A
					4						606	4	Each	Anchor Assembly (Barrier Design), Type A
See note, Sh. 3-A →					4						606	4	Each	Bridge Terminal Assembly, Type F, as per plan
					16						606	16	Each	Bridge Terminal Assembly, Type B
														STRUCTURE REPAIR
			190								SPEC.	190	Sq.Yds.	Patching Concrete Bridge Decks, Type I or II (See Note in Proposal)
				160							516	160	Lin.Ft.	Vertical Extension of Structural Expansion Joints, As Per Plan
	784										SPEC.	784	Sq.Ft.	Steel Drip Strip
					1002						517	1002	Lin.Ft.	Railing (Deep Beam rail with steel tubular backup, Type 2 Posts) As Per Plan
			2249								SPEC	2249	Sq. Yds.	MEMBRANE WATERPROOFING (SEE PROPOSAL NOTE)
														DRAINAGE
						0.43					602	0.43	Cu.Yds.	Concrete Masonry
						9					603	9	Lin.Ft.	24" Conduit, Type A, 706.02
						1					604	1	Each	Standard No. 5 Catch Basin
														EROSION CONTROL TYPE CODE Y-005
						0.06					659	0.06	Tons	Commercial Fertilizer (12-12-12)
						0.29					659	0.29	Tons	Agricultural Liming
						641					659	641	Sq.Yds.	Seeding & Mulching
														PAVEMENT
			22135								409	22135	Gal.	Seal Coat Bituminous Material 702.09, RT-9 or RT-10; 702.02, MC-800 or MC-3000; 702.04, RS-1, RS-2, CRS-1 or CRS-2; or 702.03, C BAE 800
			590								409	590	Cu. Yds.	SEAL COAT COVER AGGREGATE, No. 8
	200		1606								848	1806	Cu. Yds.	ASPHALT CONCRET INTERMEDIATE COURSE, TYPE 1
			7415								848	7415	Cu.Yds.	Asphalt Concrete Surface Course, Type 1
			14826								407	14826	Gal.	Tack Coat; 702.04, SS-1, SS-1H, MS-2 or RS-1, or 702.02, RC-250
			519								407	519	Ton	Cover Aggregate
			28388								408	28388	Gal.	Bituminous Prime Coat; 702.09, RT-2 or RT-3; 702.02, MC-30 or MC-70; or 702.03, Primer 20
														TRAFFIC CONTROL
										110	Special	110	Each	Two-Way Plowable Prismatic Reflector Type Pavement Marker Installed
								424			844	424	Sq.Ft.	Signs Flat Sheet
								300			844	300	Sq.Ft.	Signs Extrusheet
								86			844	86	Lin. Ft.	Ground Mounted Supports, No. 3 Post Driven
								648			844	648	Lin. Ft.	Ground Mounted Supports, No. 4 Post Driven
								25			844	25	Each	Removal of Ground Mounted Signs and Reerection
								104			844	104	Lin. Ft.	Ground Mounted Supports, W10 x 21
								4			844	4	Each	Breakaway Beam Connection
								182			844	182	Lin. Ft.	Ground Mounted Support, No. 4 Post, As Per Plan
								29			844	29	Each	Removal of Ground Mounted Signs for Storage
							20.43				621	20.43	Miles	Edge Lines
							0.19				621	0.19	Miles	4" Lane Lines
							0.51				621	0.51	Miles	Center Lines
							9.04				621	9.04	Miles	6" Lane Lines
								38			844	38	Each	Removal of Ground Mounted Post Supports
							400				847	400	Lin.Ft.	24" Stop Lines 847.10 Type A
							1175				847	1175	Lin.Ft.	24" Broad Transverse Lines 847.10 Type A
							1465				847	1465	Lin.Ft.	8" Channelizing Lines 847.10 Type A
							7				847	7	Each	Word ONLY on Pavement 847.10 Type A
							9				847	9	Each	Lane Arrow 847.10 Type A
								4.90			844	4.90	Cu.Yds.	Concrete for EMBEDDED Foundation
						1					S625	1	Each	Ground Rod
		105									620	105	Each	Delineators, Type A, Post Mounted
						2.56					842	2.56	Cu.Yds.	Concrete for Anchor Base Foundation
						171					842	171	Lin.Ft.	Messenger Wire 7 Strand (3/8" Dia.) with Accessories
						Lump					842	Lump	Lump	Remove and Reerect Strain Pole
		54									620	54	Each	Delineators, Type D, Post Mounted
	Lump										614	Lump	Lump	Maintaining Traffic
	Lump										619	Lump	Lump	Field Office
											623	Lump	Lump	Construction Layout Stakes

FHWA REGION	STATE	PROJECT	
5	OHIO		

6/22

KNO-13-15.93

CALCULATED BY JB DATE 6/6/78
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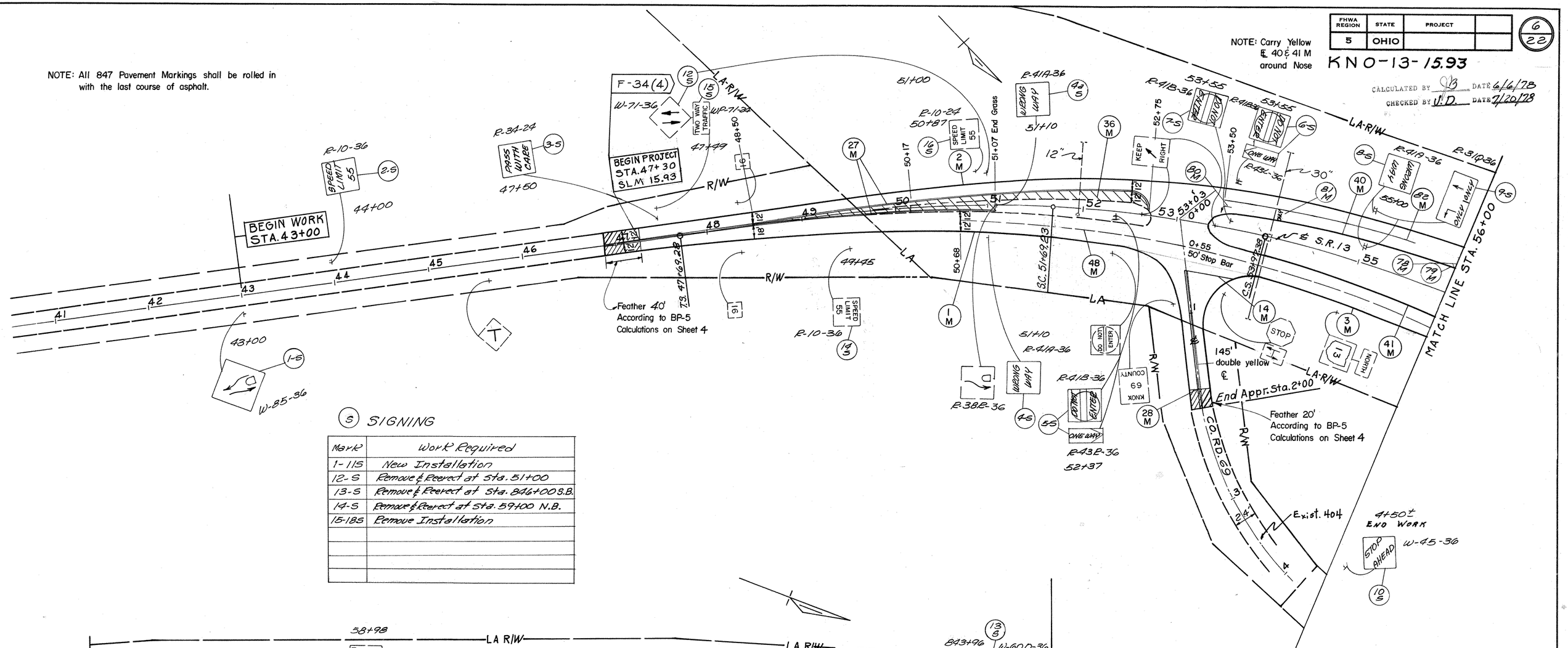
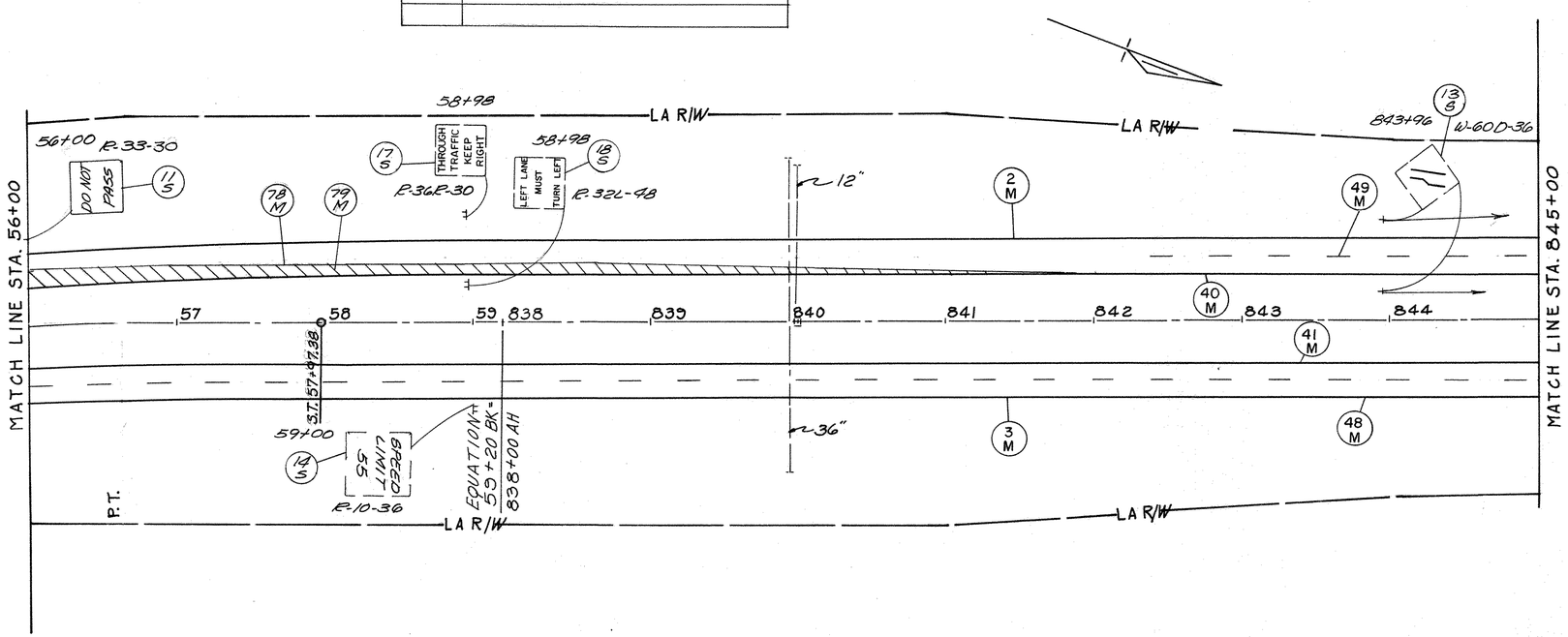
NOTE: All 847 Pavement Markings shall be rolled in with the last course of asphalt.

NOTE: Carry Yellow ℄ 40℄ 41 M around Nose



(S) SIGNING

Mark	Work Required
1-11S	New Installation
12-S	Remove & Reerect at Sta. 51+00
13-S	Remove & Reerect at Sta. 846+00 S.B.
14-S	Remove & Reerect at Sta. 59+00 N.B.
15-18S	Remove Installation



See Pavement Markings On Sheet 19
See Signing Quantities On Sheet 22

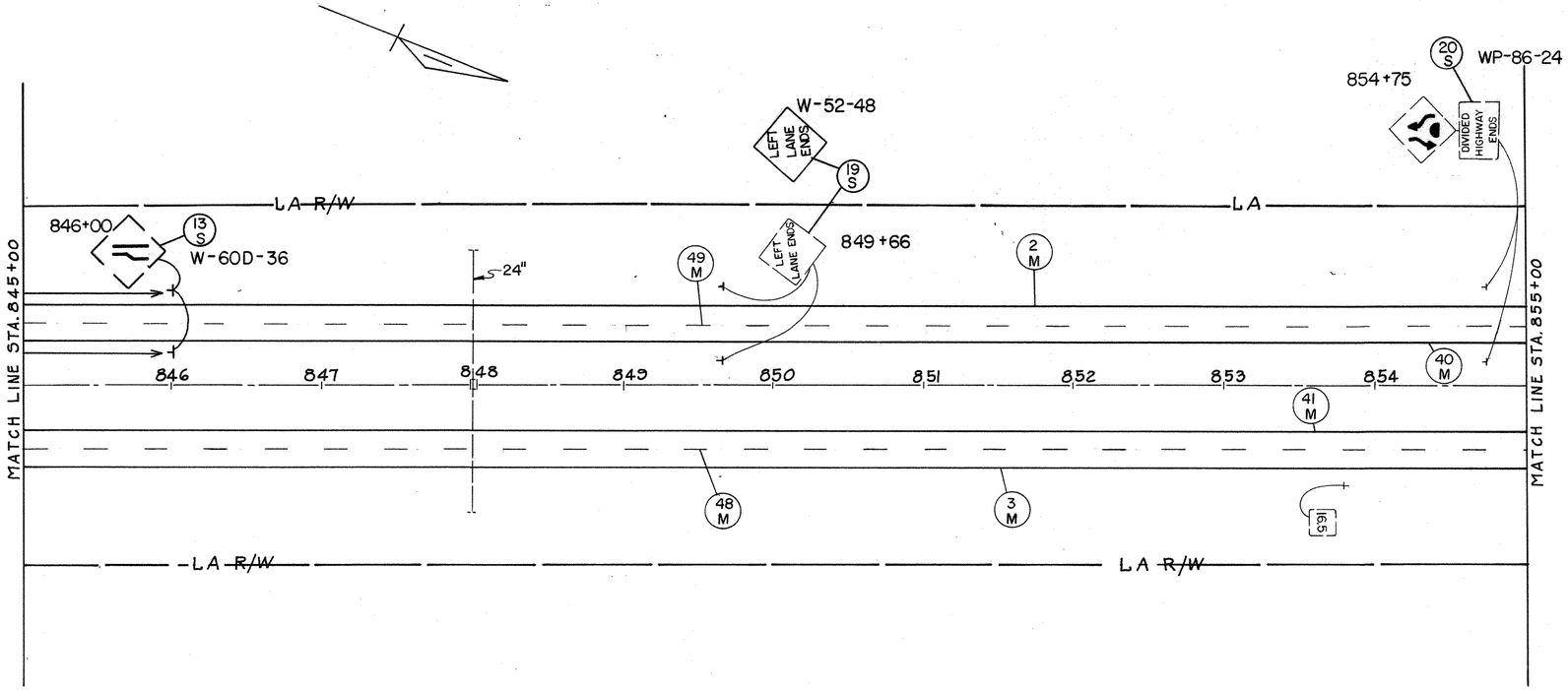
41+00 - 845+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

7
22

KNO-13-15.93

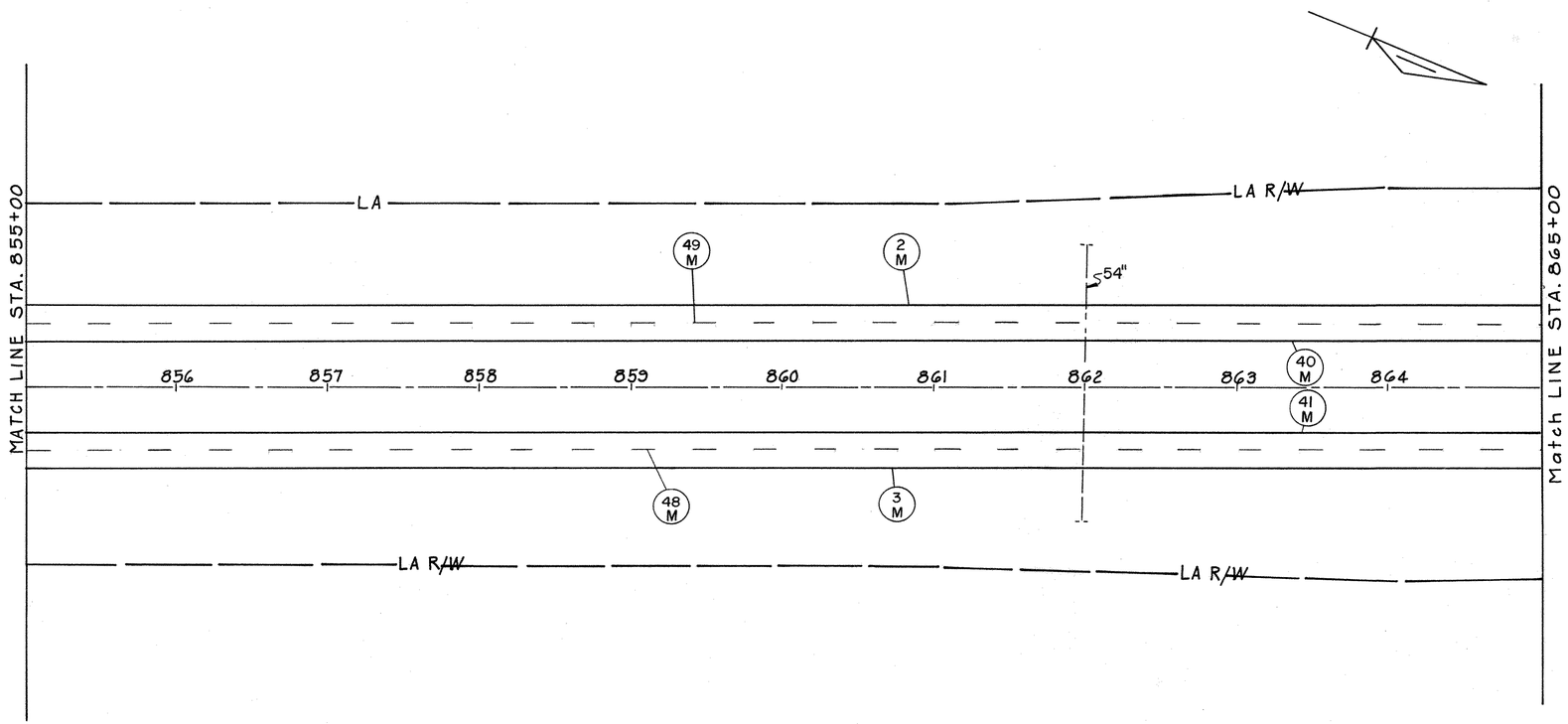
CALCULATED BY JB DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78



(S) SIGNING

Mark	Work Required
13-S	Remove & Reerect from Sta. 843+96 *
19-S	Replace Installation
20-S	Remove Signs

*See Sheet 6



See Pavement Markings On Sheet 19
See Signing Quantities On Sheet 22

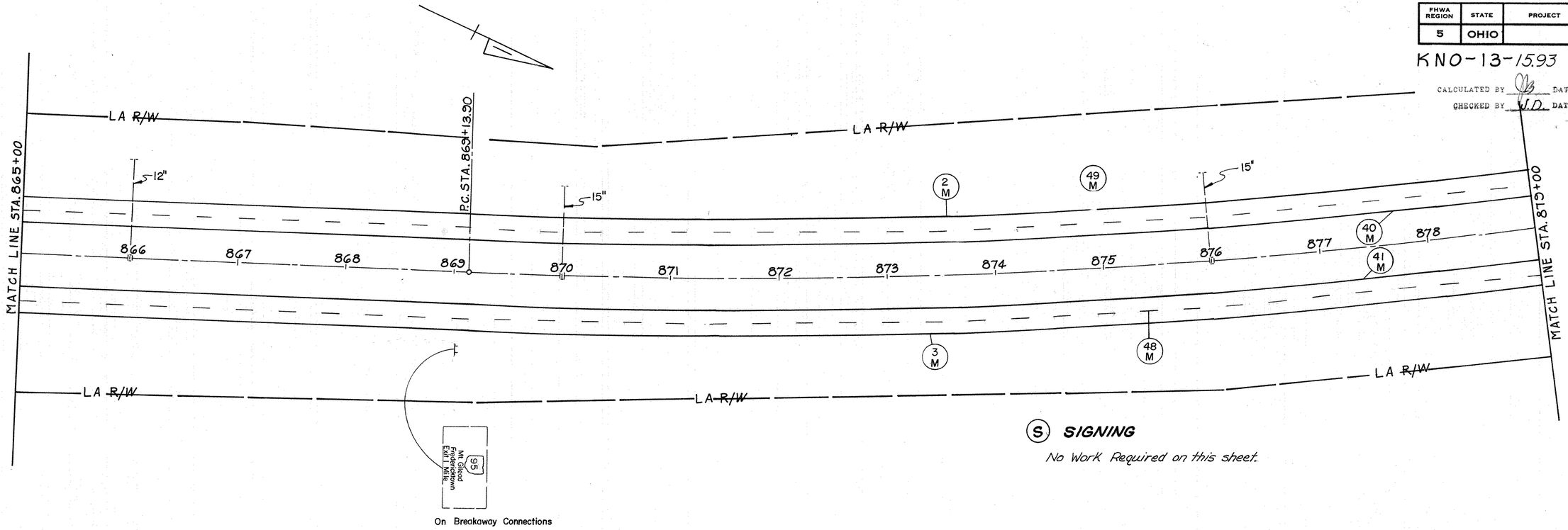
845+00 - 865+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

8
22

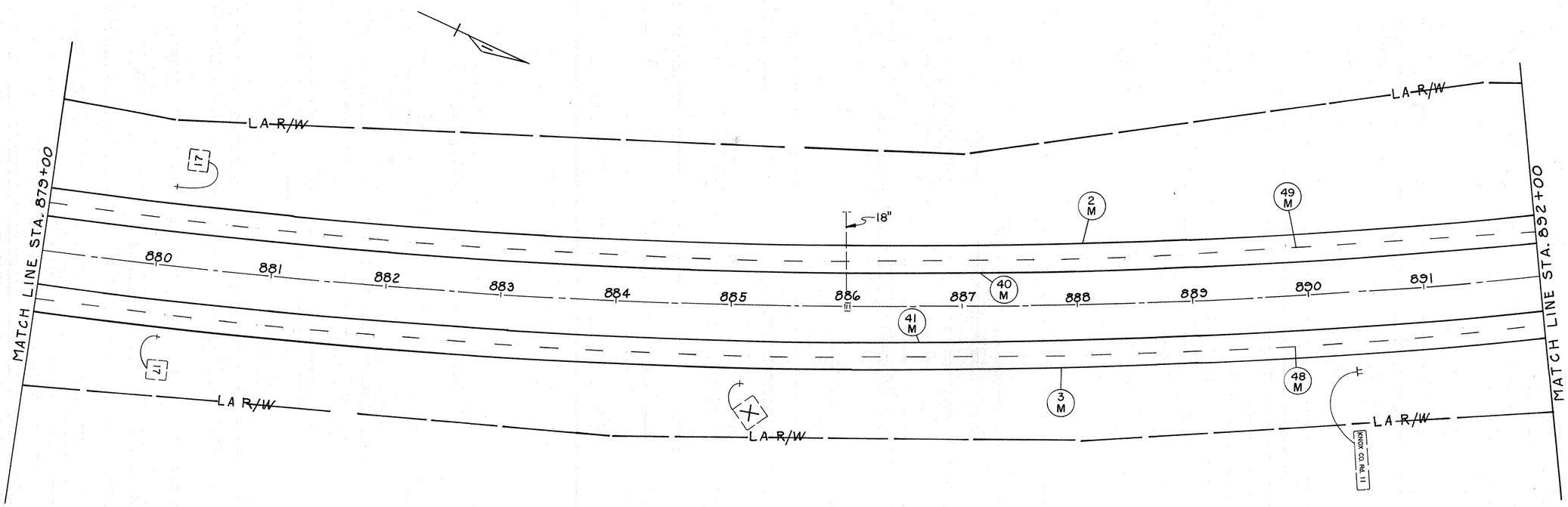
KNO-13-15.93

CALCULATED BY [illegible] DATE 6/6/78
CHECKED BY W.D. DATE 7/20/78



(S) **SIGNING**

No Work Required on this sheet.



See Pavement Markings On Sheet 19

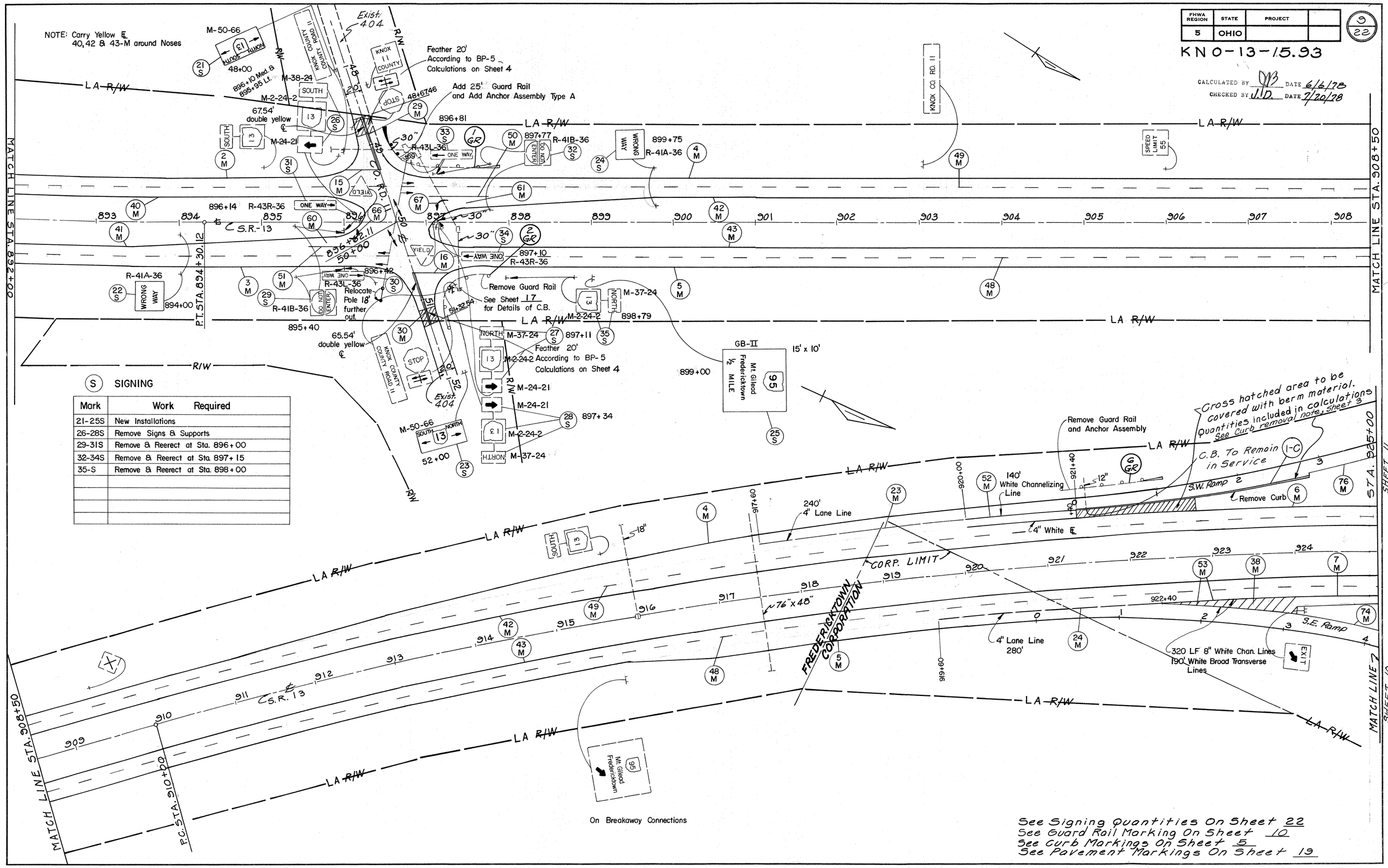
865+00 – 892+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

9/22

KNO-13-15.93

CALCULATED BY DB DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78



(S) SIGNING

Mark	Work Required
21-25S	New Installations
26-28S	Remove Signs & Supports
29-31S	Remove & Reerect at Sta. 896+00
32-34S	Remove & Reerect at Sta. 897+15
35-S	Remove & Reerect at Sta. 898+00

See Signing Quantities On Sheet 22
See Guard Rail Marking On Sheet 10
See Curb Markings On Sheet 5
See Pavement Markings On Sheet 19

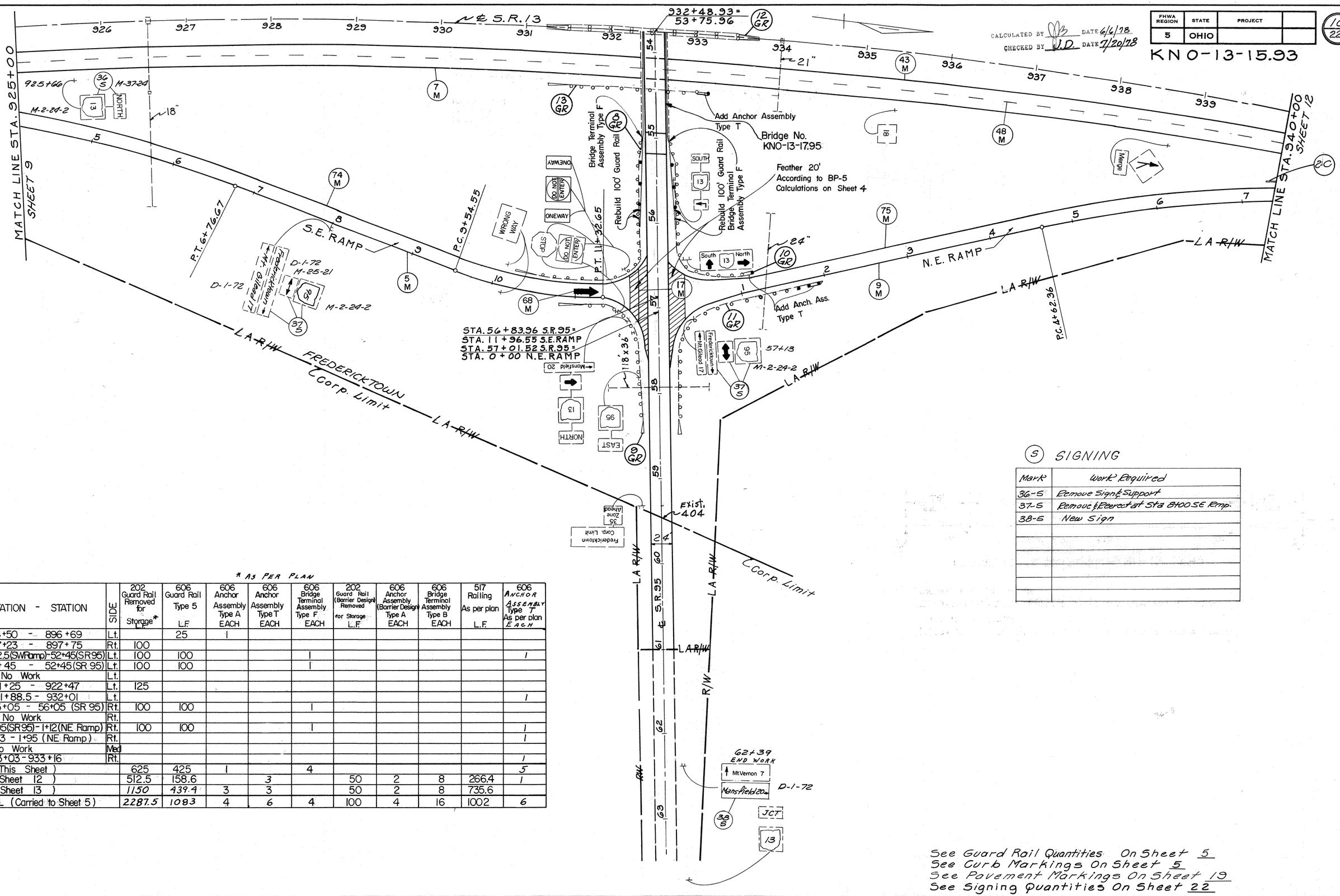
892+00 - 925+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

CALCULATED BY DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78

10/22

KNO-13-15.93



(S) SIGNING

Mark	Work Required
36-S	Remove Sign & Support
37-S	Remove & Reerect at Sta 8+00 SE Ramp
38-S	New Sign

* AS PER PLAN

SHEET	REF.	STATION - STATION	SIDE	202 Guard Rail Removed for Storage* L.F.	606 Guard Rail Type 5 L.F.	606 Anchor Assembly Type A EACH	606 Anchor Assembly Type T EACH	606 Bridge Terminal Assembly Type F EACH	202 Guard Rail (Barrier Design) Removed for Storage L.F.	606 Anchor Assembly (Barrier Design) Type A EACH	606 Bridge Terminal Assembly Type B EACH	517 Railing As per plan L.F.	606 ANCHOR ASSEMBLY Type T As per plan EACH
9	1 GR	896+50 - 896+69	Lt.		25	1							
9	2 GR	897+23 - 897+75	Rt.	100									
11	3 GR	9+92.5(SW Ramp)-52+45(SR 95)	Lt.	100	100			1					1
11	4 GR	51+45 - 52+45(SR 95)	Lt.	100	100			1					
11	5 GR	No Work	Lt.										
9	6 GR	921+25 - 922+47	Lt.	125									
11	7 GR	931+88.5 - 932+01	Lt.										1
10	8 GR	55+05 - 56+05 (SR 95)	Rt.	100	100			1					
10	9 GR	No Work	Rt.										
10	10 GR	55+05(SR 95)-1+12(NE Ramp)	Rt.	100	100			1					1
10	11 GR	1+83 - 1+95 (NE Ramp)	Rt.										1
10-11	12 GR	No Work	Med										
10	13 GR	933+03 - 933+16	Rt.										1
Totals		(This Sheet)		625	425	1		4					5
Totals		(Sheet 12)		512.5	158.6		3		50	2	8	266.4	1
Totals		(Sheet 13)		1150	439.4	3	3		50	2	8	735.6	
GRAND TOTAL (Carried to Sheet 5)				2287.5	1083	4	6	4	100	4	16	1002	6

See Guard Rail Quantities On Sheet 5
See Curb Markings On Sheet 5
See Pavement Markings On Sheet 19
See Signing Quantities On Sheet 22

925+00 RT. - 940+00 RT.

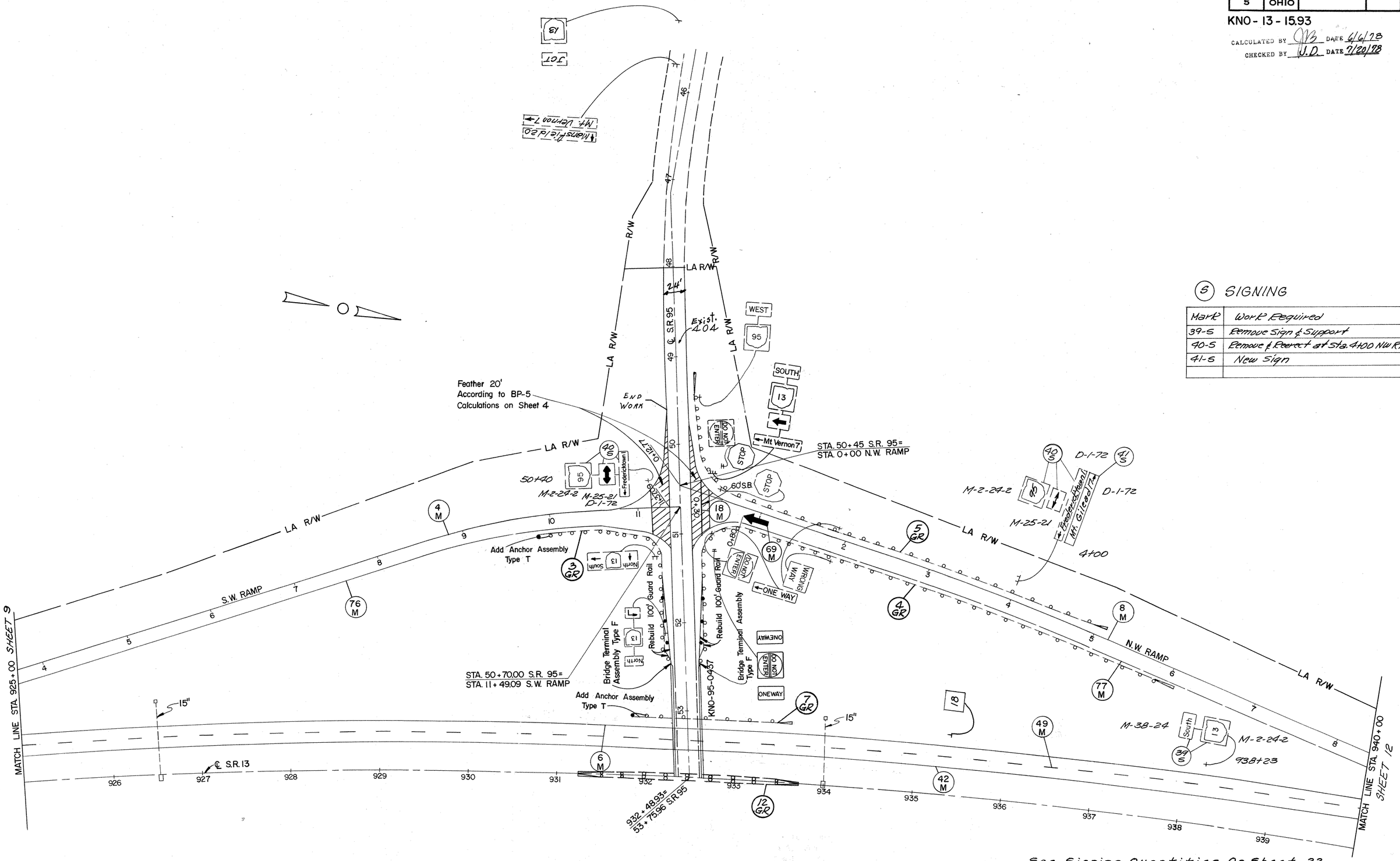
FHWA REGION	STATE	PROJECT	
5	OHIO		

11/22

KNO - 13 - 15.93

CALCULATED BY JWB DATE 6/6/78

CHECKED BY J.D. DATE 7/20/78



(5) SIGNING

Mark	Work Required
39-S	Remove Sign & Support
40-S	Remove & Reerect at Sta. 4+00 NW Ramp
41-S	New Sign

See Signing Quantities On Sheet 22
See Guard Rail Markings On Sheet 10
See Pavement Markings On Sheet 19

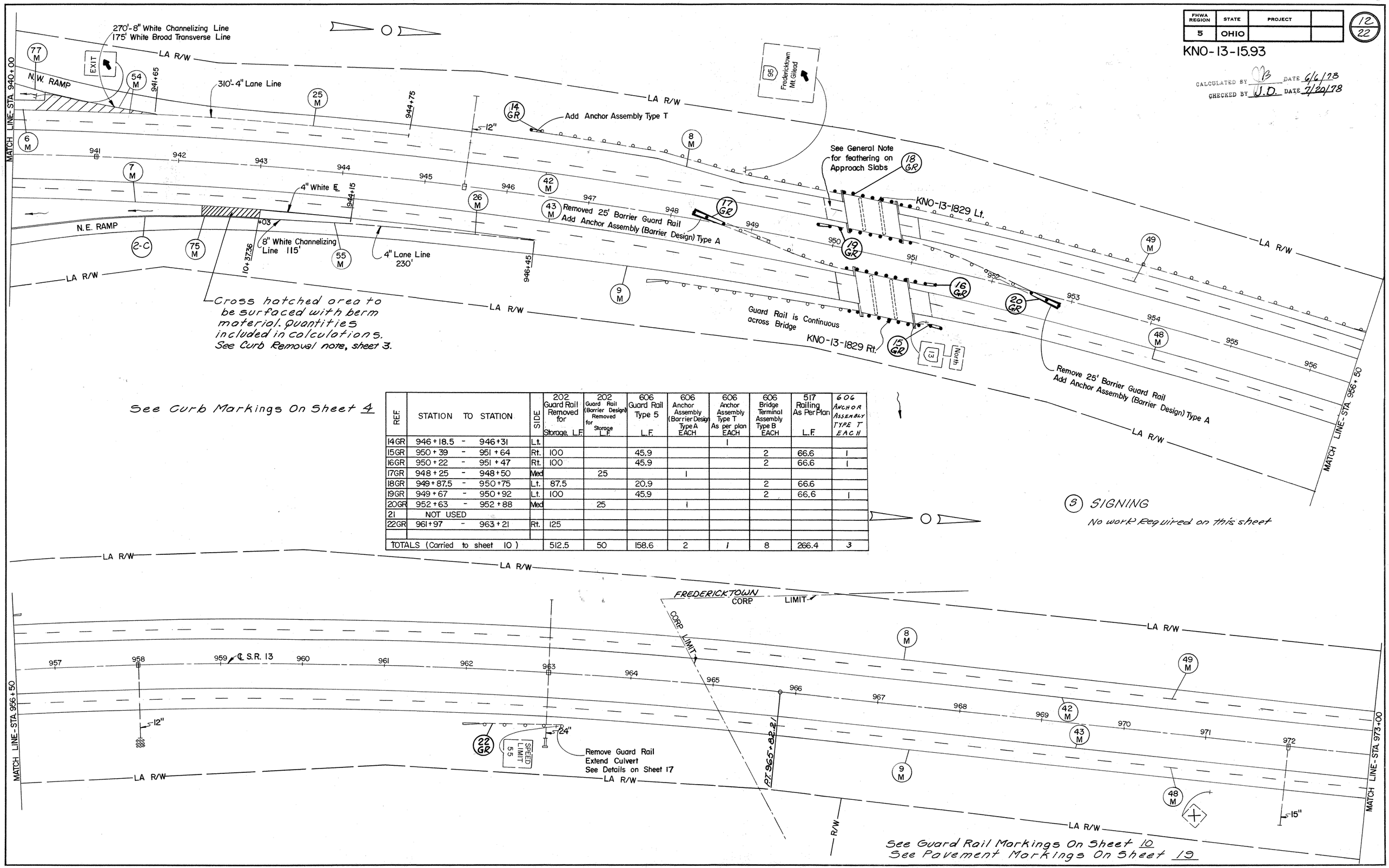
925+00 Lt. to 940+00 Lt.

FHWA REGION	STATE	PROJECT	
5	OHIO		

12/22

KNO-13-15.93

CALCULATED BY [illegible] DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78



REF.	STATION	TO	STATION	SIDE	202 Guard Rail Removed for Storage, L.F.	202 Guard Rail (Barrier Design) Removed for Storage L.F.	606 Guard Rail Type 5 L.F.	606 Anchor Assembly (Barrier Design) Type A EACH	606 Anchor Assembly Type T As per plan EACH	606 Bridge Terminal Assembly Type B EACH	517 Railing As Per Plan L.F.	606 ANCHOR ASSEMBLY TYPE T EACH
14GR	946+18.5	-	946+31	Lt.					1			
15GR	950+39	-	951+64	Rt.	100		45.9			2	66.6	1
16GR	950+22	-	951+47	Rt.	100		45.9			2	66.6	1
17GR	948+25	-	948+50	Med		25		1				
18GR	949+87.5	-	950+75	Lt.	87.5		20.9			2	66.6	
19GR	949+67	-	950+92	Lt.	100		45.9			2	66.6	1
20GR	952+63	-	952+88	Med		25		1				
21	NOT USED											
22GR	961+97	-	963+21	Rt.	125							
TOTALS (Carried to sheet 10)					512.5	50	158.6	2	1	8	266.4	3

(3) SIGNING

No work Required on this sheet

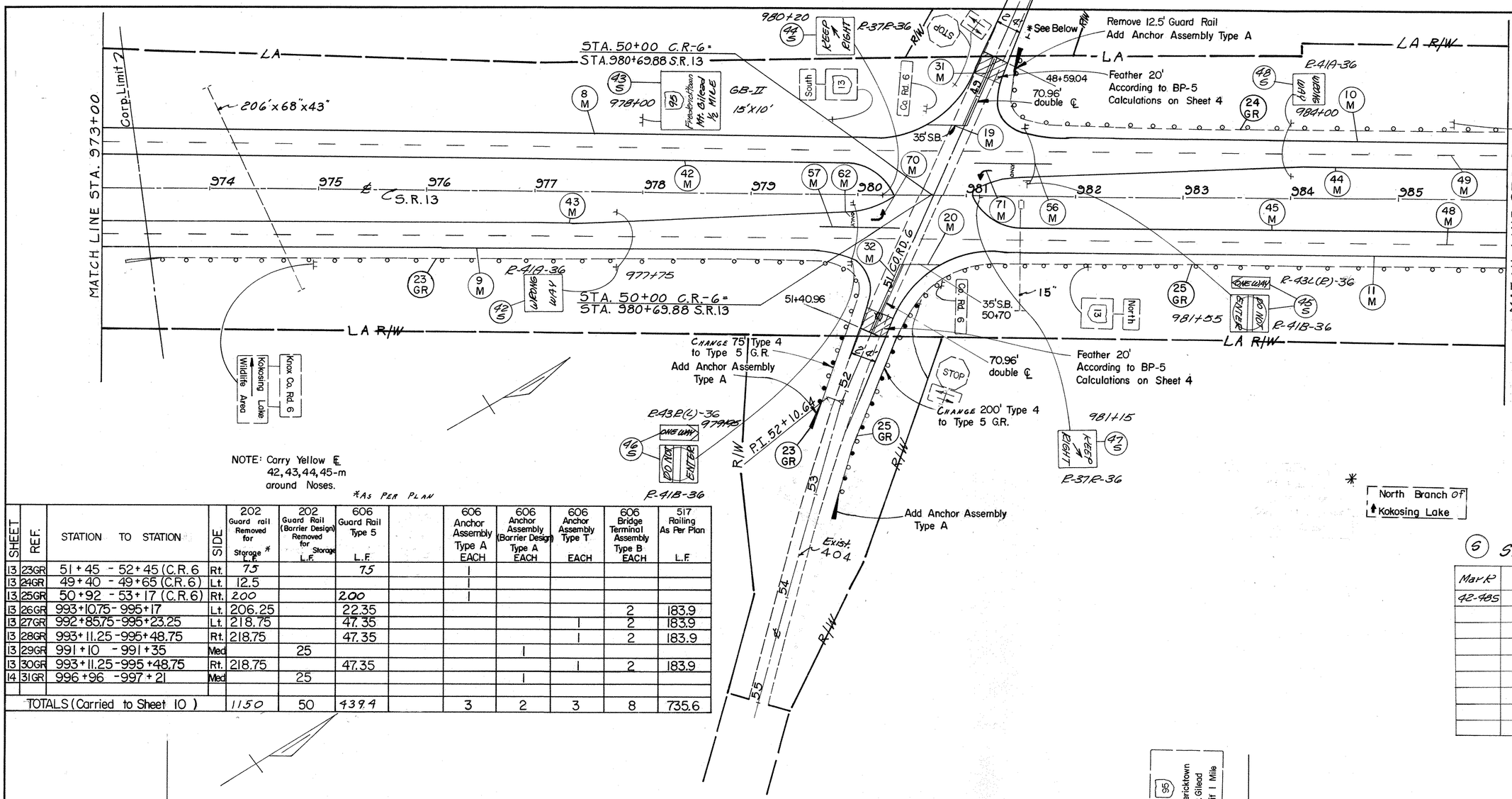
940+00 - 973+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

13/22

KNO-13-15.93

CALCULATED BY [illegible] DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78

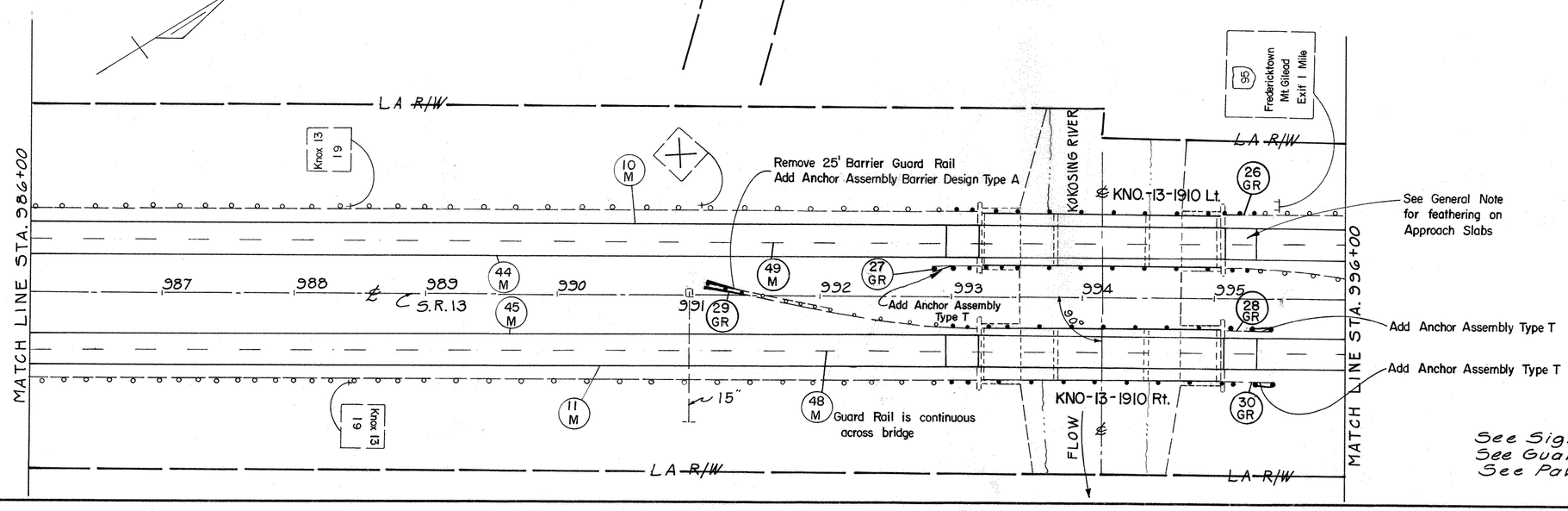


SHEET	REF.	STATION TO STATION	SIDE	202 Guard rail Removed for Storage * L.F.	202 Guard Rail (Barrier Design) Removed for Storage L.F.	606 Guard Rail Type 5 L.F.		606 Anchor Assembly Type A EACH	606 Anchor Assembly (Barrier Design) Type A EACH	606 Anchor Assembly Type T EACH	606 Bridge Terminal Assembly Type B EACH	517 Railing As Per Plan L.F.
13	23GR	51 + 45 - 52 + 45 (C.R. 6	Rt.	75		75		1				
13	24GR	49 + 40 - 49 + 65 (C.R. 6)	Lt.	12.5				1				
13	25GR	50 + 92 - 53 + 17 (C.R. 6)	Rt.	200		200		1				
13	26GR	993 + 10.75 - 995 + 17	Lt.	206.25		22.35					2	183.9
13	27GR	992 + 85.75 - 995 + 23.25	Lt.	218.75		47.35				1	2	183.9
13	28GR	993 + 11.25 - 995 + 48.75	Rt.	218.75		47.35				1	2	183.9
13	29GR	991 + 10 - 991 + 35	Med		25				1			
13	30GR	993 + 11.25 - 995 + 48.75	Rt.	218.75		47.35				1	2	183.9
14	31GR	996 + 96 - 997 + 21	Med		25				1			
TOTALS (Carried to Sheet 10)				1150	50	439.4		3	2	3	8	735.6

*As per plan

(5) SIGNING

Mark	Work Required
42-48S	New Installations



See Signing Quantities On Sheet 22
See Guard Rail Markings On Sheet 14
See Pavement Markings On Sheet 19

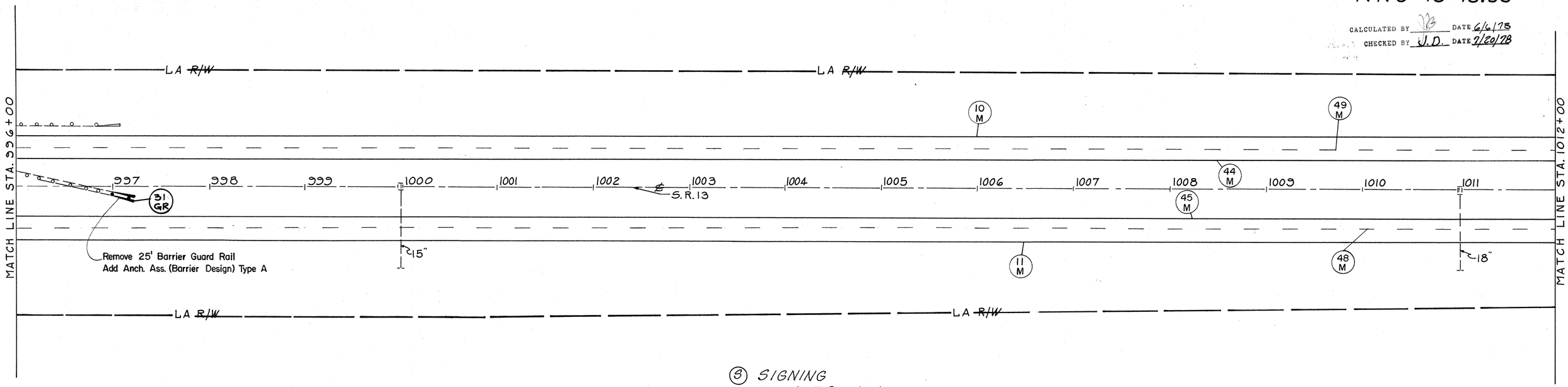
973+00-996

FHWA REGION	STATE	PROJECT	
5	OHIO		

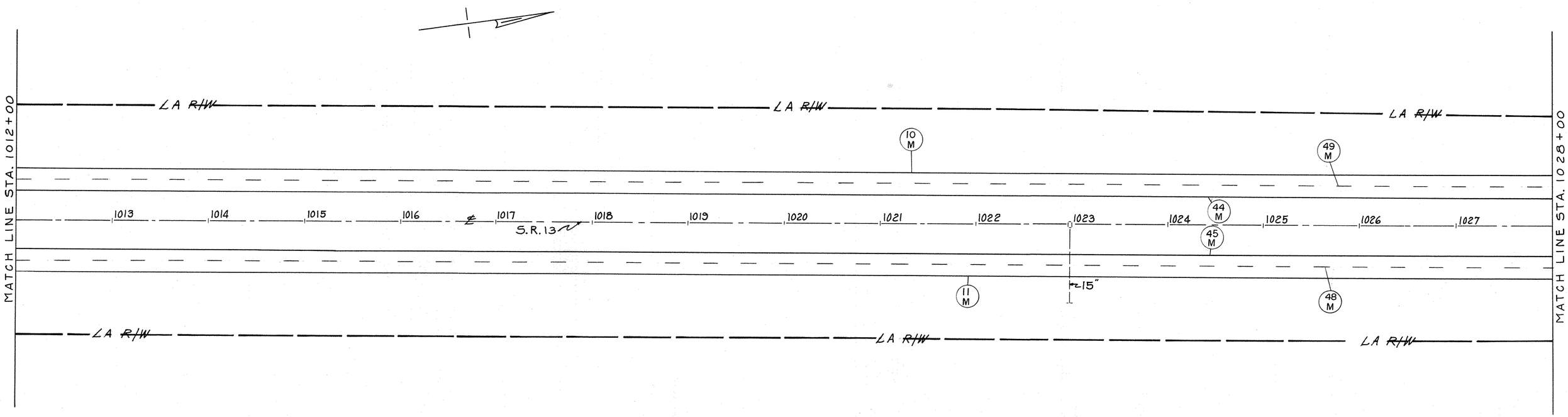
14/22

KNO-13-15.93

CALCULATED BY VB DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78



③ SIGNING
No Work Required on this sheet



See Guard Rail Markings On Sheet 13
See Pavement Markings On Sheet 19

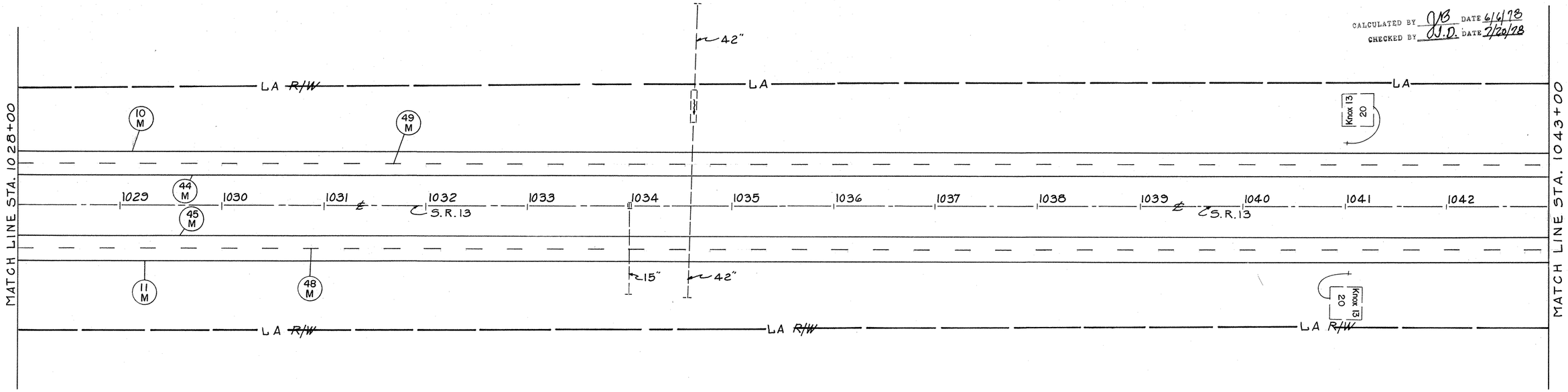
996+00 – 1028+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

KN 0-13-15.93

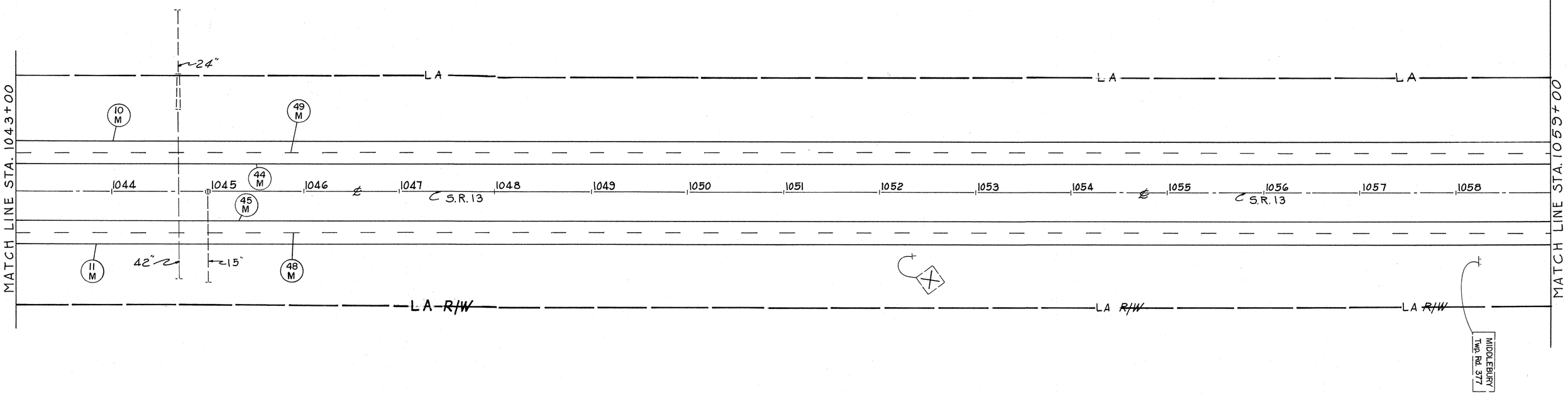
15/22

CALCULATED BY JB DATE 6/6/78
CHECKED BY J.D. DATE 2/20/78



(3) SIGNING

No Work Required on this sheet



See Pavement Markings On Sheet 19

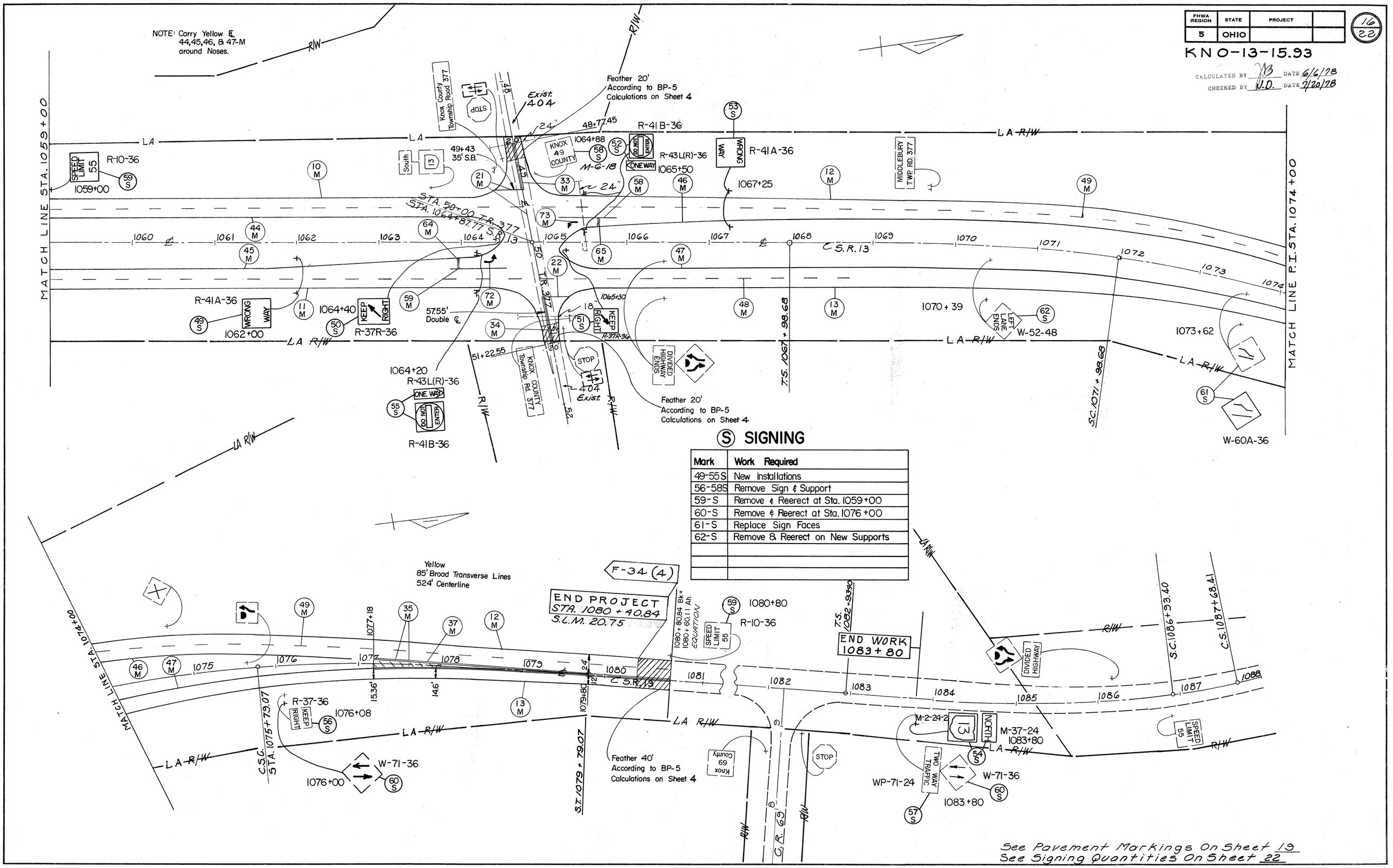
1028+00+00-1059+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

16/22

KNO-13-15.93

CALCULATED BY JB DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78



(S) SIGNING

Mark	Work Required
49-55 S	New Installations
56-58 S	Remove Sign & Support
59-S	Remove & Reerect at Sta. 1059+00
60-S	Remove & Reerect at Sta. 1076+00
61-S	Replace Sign Faces
62-S	Remove & Reerect on New Supports

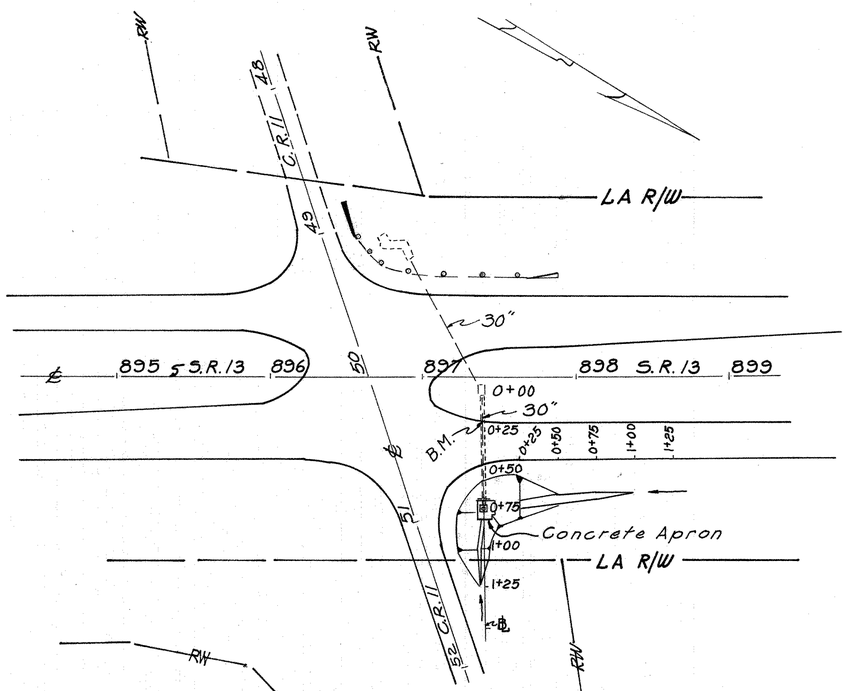
See Pavement Markings On Sheet 19
See Signing Quantities On Sheet 22

1059+00-1088+00

FED. RD. DIST. NO.	STATE	PROJECT	TYPE FUNDS
5	OHIO		

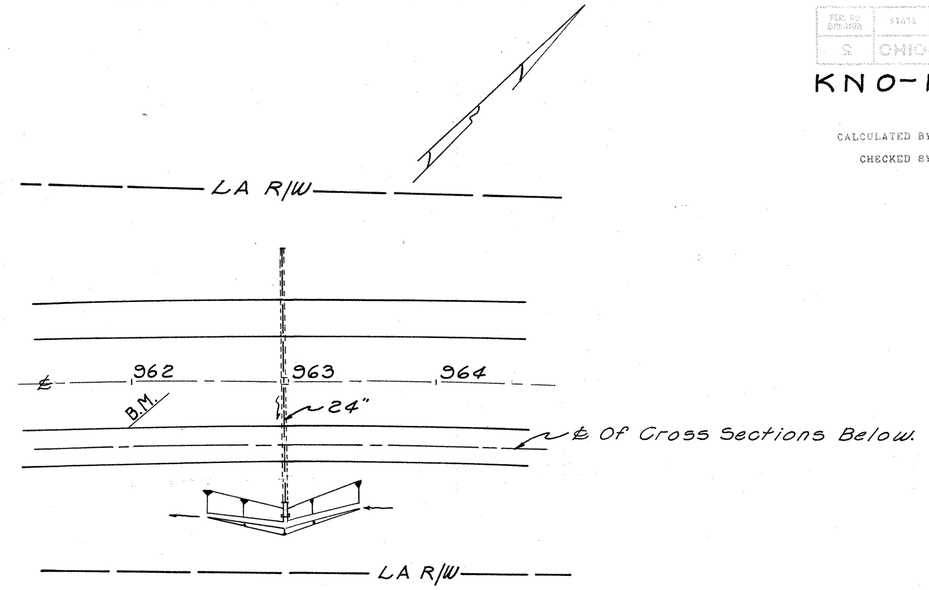
KNO-13-15.93

CALCULATED BY RB DATE 6/6/78
CHECKED BY W.D. DATE 9/20/78



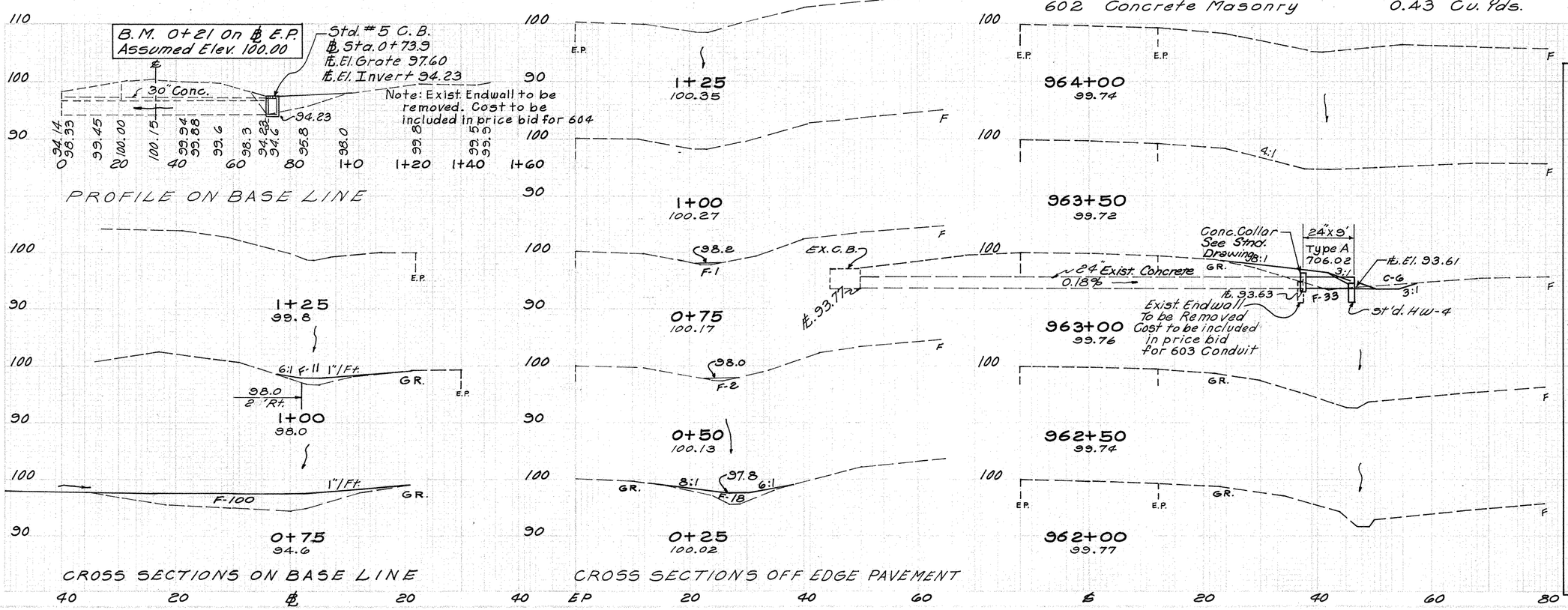
QUANTITIES

604 Std. No. 5 Catch Basin 1 Each



QUANTITIES

603 24" Conduit Type A 706.02 9 Lin. Ft.
602 Concrete Masonry 0.43 Cu. Yds.



B.M. Lt. Edge N.B. Pav't. Sta. 962+00
Assumed Elev. 100.00

EARTH WORK			SEEDING AND MULCHING Sq. Yds.	
BASE LINE EMBANKMENT				
0+50	0		0+25	28
0+75	100	46	1+75	63	253
1+00	11	51	1+00	25	122
1+25	0	5	1+25	0	35
	Total.	102		Total	410
EDGE OF PAV'T				
0+25	18	8	0+50	8	21
0+50	2	1	0+75	7	10
0+75	1	1	1+00	0	0
1+00	0		1+25	0	
	Total.	10		Total	31
MAIN LINE				
962+50	0	31	0	100
963+00	33	31	36	100
963+50	0		0	
	Total	62	Total	200

Embankment, Total. 174 Cu. Yds.
Seeding, Total 641 Sq. Yds.

EXCAVATION

962+50	0	
963+00	6	6
963+50	0	6

Total 12 Cu. Yds.

CALCULATIONS

659 Commercial Fertilizer (12-12-12) 641(00009) 0.06 Tons.
659 Agricultural Liming 641(00045) = 0.29 Tons.
659 Seeding And Mulching 641 Sq. Yds.

CULVERT DETAILS

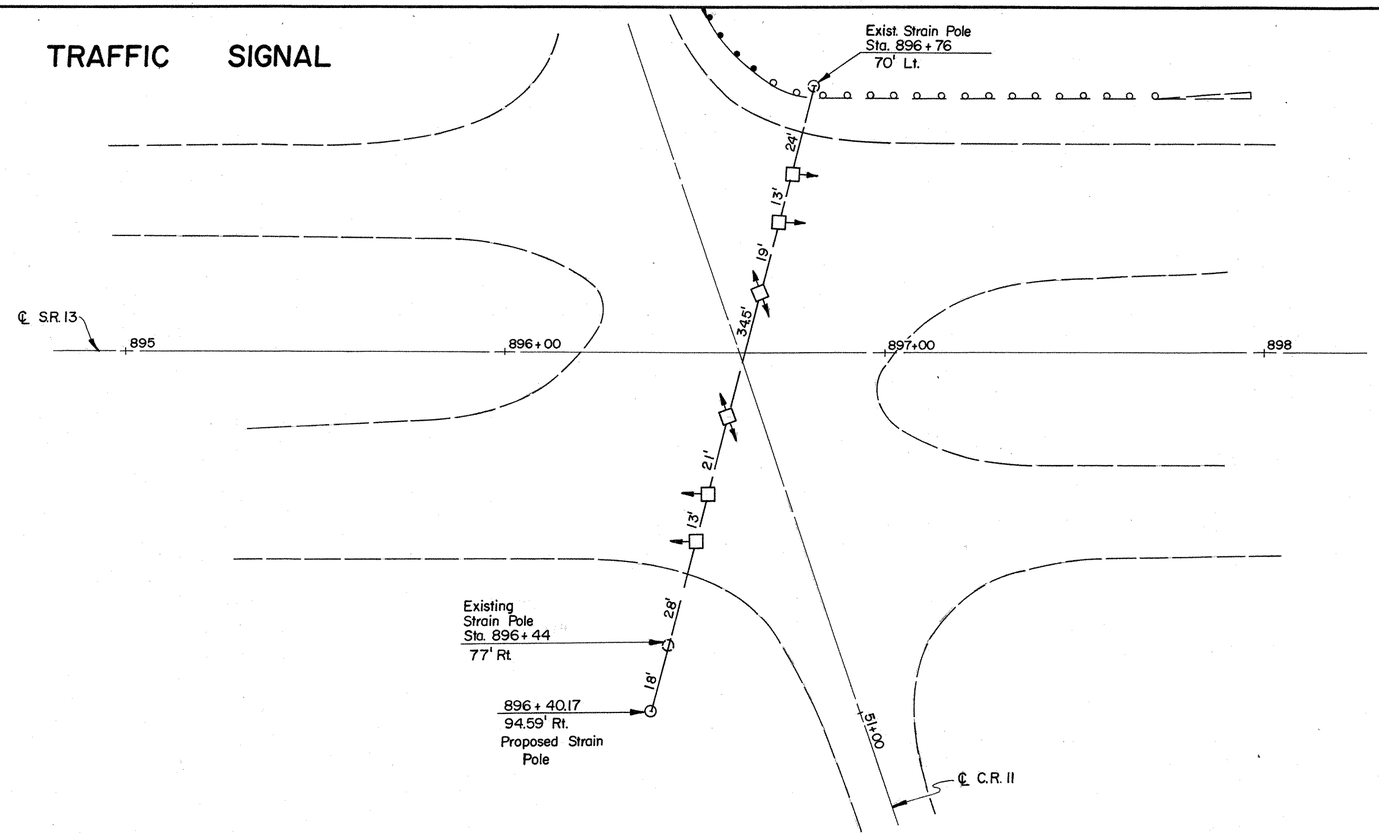
FHWA REGION	STATE	PROJECT	
5	OHIO		

18/22

KNOX-13-15.93

CALCULATED BY JB DATE 6/6/78
CHECKED BY W.D. DATE 7/20/78

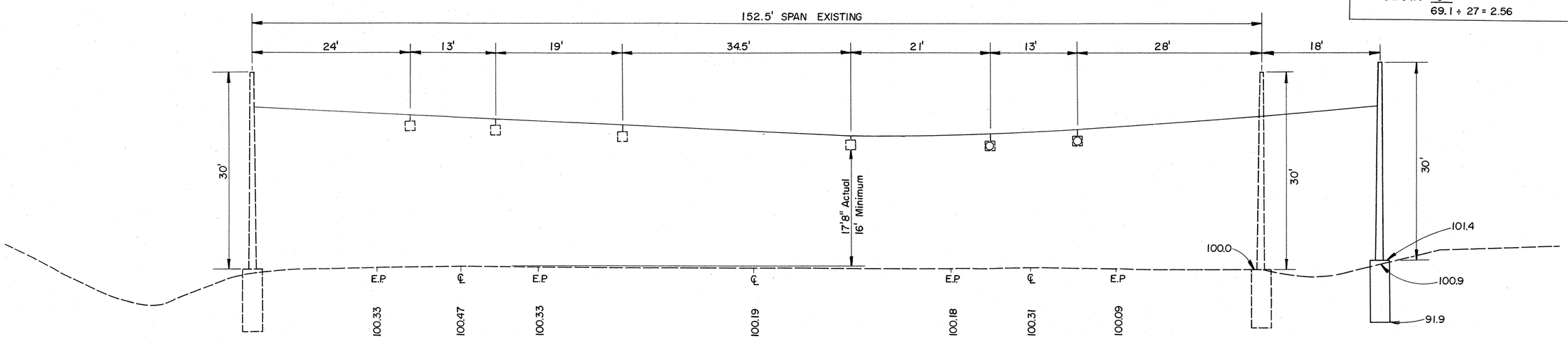
TRAFFIC SIGNAL



ITEM S625	ITEM 842		
Ground Rod	Concrete for Anchor Base Foundation	Messenger Wire 7 Strand (3/8" Dia.) with Accessories	Remove & Reerect Strain Pole
Each	Cu. Yds.	Lin. Ft.	Lump
1	2.56	170.5	Lump

Quantities Carried to General Summary Sheet 5

Calculation for Concrete for Anchor Base Foundation
$8.5' \times \pi \times 1.5^2 = 60.1$
$3 \times 3 \times 1 = 9$
$69.1 \div 27 = 2.56$



FOUNDATION DESIGN NO. 6

NOTE: A 3" capped conduit and a 3/4" EMT shall be included in the new foundation

PAVEMENT MARKINGS

CALCULATED BY D.B. DATE 6/6/78
CHECKED BY J.D. DATE 7/20/78

FHWA REGION	STATE	PROJECT	
5	OHIO		

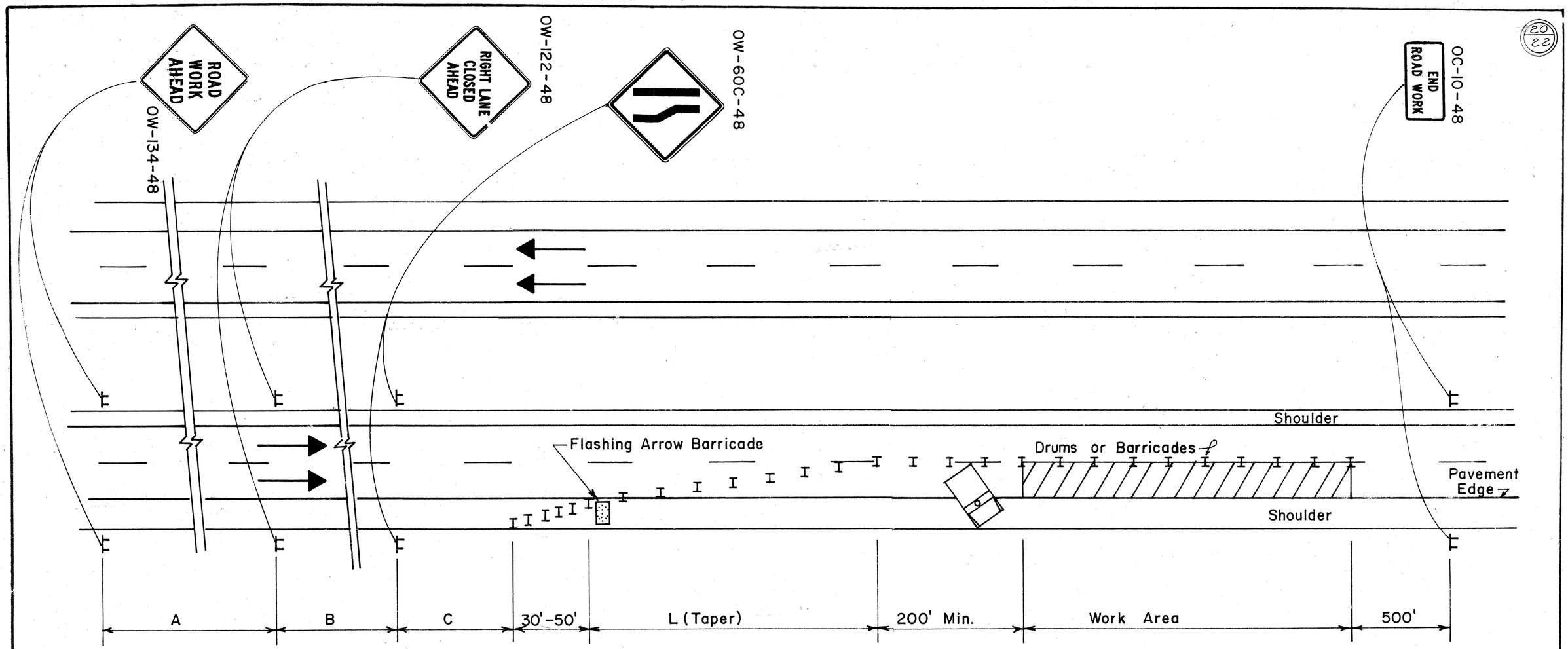
KNO-13-15.93

MARK	STATION TO STATION	ITEM 621 4" White Edge Line Miles	4" Lane Line Miles	Center Line Miles	4" Yellow Edge Line Miles	6" Lane Line Miles
1-M	46 + 90 ℳ Rt. 2 + 00 C.R. 69 Rt.	0.14				
2-M	46 + 90 ℳ Lt. 48 + 67.46 C.R. 11 Rt.	1.34				
3-M	2 + 00 C.R. 69 Lt. 51 + 32.54 C.R. 11 Rt.	1.27				
4-M	48 + 67.46 C.R. 11 Lt. 11 + 37.09 S.W. Ramp Lt.	0.71				
5-M	51 + 32.54 C.R. 11 Lt. 11 + 84.55 S.E. Ramp Rt.	0.69				
6-M	920 + 00 ℳ Lt. 940 + 30 ℳ Lt.	0.38				
7-M	924 + 00 ℳ Rt. 944 + 15 ℳ Rt.	0.38				
8-M	0 + 12.77 N.W. Ramp Lt. 48 + 59.04 C.R. 6 Rt.	0.95				
9-M	0 + 12.25 N.E. Ramp Rt. 51 + 40.96 C.R. 6 Rt	0.77				
10-M	48 + 59.04 C.R. 6 Lt. 48 + 77.45 T.R. 377 Rt.	1.60				
11-M	51 + 40.96 C.R. 6 Lt. 51 + 22.55 T.R. 377 Rt.	1.62				
12-M	48 + 77.45 T.R. 377 Lt. 1080 + 80.84 ℳ Lt.	0.31				
13-M	51 + 22.55 T.R. 377 Lt. 1080 + 80.84 ℳ Rt.	0.31				
23-M	917 + 60 ℳ Lt. 920 + 00 ℳ Lt.		0.04			
24-M	919 + 60 ℳ Rt. 922 + 40 ℳ Rt.		0.05			
25-M	941 + 65 ℳ Lt. 944 + 75 ℳ Lt.		0.06			
26-M	944 + 15 ℳ Rt. 946 + 45 ℳ Rt.		0.04			
27-M	46 + 90 ℳ Lt. 52 + 75 ℳ Lt.			0.16		
28-M	0 + 55 C.R. 69 ℄ 2 + 00 C.R. 69 ℄			0.03		
29-M	48 + 67.46 C.R. 11 ℄ 49 + 35 C.R. 11 ℄			0.01		
30-M	50 + 67 C.R. 11 ℄ 51 + 32.54 C.R. 11 ℄			0.01		
31-M	48 + 59.04 C.R. 6 ℄ 49 + 30 C.R. 6 ℄			0.01		
32-M	50 + 70 C.R. 6 ℄ 51 + 40.96 C.R. 6 ℄			0.01		
33-M	48 + 77.45 T.R. 377 ℄ 49 + 43 T.R. 377 ℄			0.01		
34-M	50 + 65 T.R. 377 ℄ 51 + 22.55 T.R. 377 ℄			0.01		
35-M	1077 + 18 ℳ Lt. & Rt. 1080 + 80.84 ℳ ℄			0.12		
40-M	53 + 35 ℳ Lt. 896 + 25 ℳ Lt.				1.21	
41-M	53 + 35 ℳ Rt. 896 + 25 ℳ Rt.				1.21	
42-M	897 + 00 ℳ Lt. 980 + 35 ℳ Lt.				1.58	
43-M	897 + 00 ℳ Rt. 980 + 35 ℳ Rt.				1.58	
44-M	981 + 05 ℳ Lt. 1064 + 55 ℳ Lt.				1.58	
45-M	981 + 05 ℳ Rt. 1064 + 55 ℳ Rt.				1.58	
46-M	1065 + 20 ℳ Lt. 1077 + 18 ℳ Lt.				0.23	
47-M	1065 + 20 ℳ Rt. 1077 + 18 ℳ Rt.				0.23	
48-M	50 + 68 ℳ Rt. 1068 + 68 ℳ Rt.					4.53
49-M	842 + 50 ℳ Lt. 1080 + 80.84 ℳ Lt.					4.51
74-M	3 + 10 S.E. Ramp Lt. 11 + 84.55 S.E. Ramp Lt.				0.17	
75-M	0 + 12.25 N.E. Ramp Lt. 10 + 37.36 N.E. Ramp Lt.				0.20	
76-M	0 + 00 S.W. Ramp Rt. 11 + 37.09 S.W. Ramp Rt.				0.23	
77-M	0 + 12.77 N.W. Ramp Rt. 8 + 65 N.W. Ramp Rt.				0.16	
78-M	55 + 90 ℳ Lt. 842 + 00 ℳ Lt.			0.14		
TOTALS		10.47	0.19	0.51	9.96	9.04

20.43

MARK	STATION TO STATION	ITEM 847 TYPE A 24" Stop Lines Linear Feet	24" Yellow Broad Transverse Lines Linear Feet	24" White Broad Transverse Lines Linear Feet	8" White Channelizing Lines Linear Feet	Word ONLY on Pavement Each	Lane Arrow Each
14-M	0 + 55 C.R. 69 Lt.	50					
15-M	49 + 35 C.R. 11 Rt.	45					
16-M	50 + 67 C.R. 11 Lt.	45					
17-M	11 + 75 S.E. Ramp Lt.	60					
18-M	0 + 30 N.W. Ramp Rt	60					
19-M	49 + 30 C.R. 6 Rt.	35					
20-M	50 + 70 C.R. 6 Lt.	35					
21-M	49 + 43 T.R. 377 Rt.	35					
22-M	50 + 65 T.R. 377 Lt.	35					
36-M	48 + 50 ℳ ℄ 52 + 75 ℳ ℄		355				
37-M	1077 + 18 ℳ ℄ 1079 + 80 ℳ ℄		85				
38-M	922 + 40 ℳ Rt. 924 + 00 ℳ Rt.			190			
39-M	940 + 30 ℳ Lt. 941 + 65 ℳ Lt.			175			
50-M	897 + 00 ℳ Lt. 897 + 70 ℳ Lt.				70		
51-M	895 + 55 ℳ Rt. 896 + 25 ℳ Rt.				70		
52-M	920 + 00 ℳ Lt. 921 + 40 ℳ Lt.				140		
53-M	922 + 40 ℳ Rt. 924 + 00 ℳ Rt.				320		
54-M	940 + 30 ℳ Lt. 941 + 65 ℳ Lt.				270		
55-M	943 + 00 ℳ Rt. 944 + 15 ℳ Rt.				115		
56-M	981 + 05 ℳ Lt. 981 + 75 ℳ Lt.				70		
57-M	979 + 65 ℳ Rt. 980 + 25 ℳ Rt.				70		
58-M	1065 + 20 ℳ Lt. 1065 + 90 ℳ Lt.				70		
59-M	1063 + 85 ℳ Rt. 1064 + 55 ℳ Rt.				70		
60-M	895 + 75 ℳ Rt.					1	
61-M	897 + 50 ℳ Lt.					1	
62-M	979 + 85 ℳ Rt.					1	
63-M	981 + 55 ℳ Lt.					1	
64-M	1064 + 05 ℳ Rt.					1	
65-M	1065 + 70 ℳ Lt.					1	
66-M	896 + 15 ℳ Rt.						1
67-M	897 + 10 ℳ Lt.						1
68-M	11 + 25 S.E. Ramp Lt.						1
69-M	0 + 80 N.W. Ramp Rt.						1
70-M	980 + 25 ℳ Rt.						1
71-M	981 + 15 ℳ Lt.						1
72-M	1064 + 45 ℳ Rt.						1
73-M	1065 + 30 ℳ Lt.						1
79-M	55 + 90 ℳ Lt. 842 + 00 ℳ Lt.		370				
80-M	53 + 50 ℳ Lt.						1
81-M	54 + 10 ℳ Lt.					1	
82-M	53 + 50 ℳ Lt. 55 + 50 ℳ Lt.				200		
TOTALS		400	810	365	1465	7	9

1175



GENERAL NOTES

1. THIRTEEN (13) DRUMS OR BARRICADES SHALL BE USED TO FORM THE LANE TRANSITION TAPER IN ADVANCE OF THE WORK AREA. FIVE (5) CHANNELIZING DEVICES SHALL BE USED TO FORM THE TAPER ON THE SHOULDER. CONES, DRUMS, OR BARRICADES SHALL BE SPACED AT 50 FOOT CENTERS FOR THE FIRST 1000 FEET OF THE WORK AREA AND AT A MAXIMUM OF 100 FEET FOR THE BALANCE OF THE WORK AREA. CONES MAY BE SUBSTITUTED FOR THE BARRICADES OR STEEL DRUMS FOR THE LANE CLOSURES DURING DAYLIGHT HOURS ONLY.

2. WHEN WORK IS BEING PERFORMED IN THE LANE ADJACENT TO THE MEDIAN ON A DIVIDED HIGHWAY, "OW-123-48" SIGNS SHALL BE SUBSTITUTED FOR "OW-122-48" SIGNS AND THE OW-60D SIGNS SHALL BE SUBSTITUTED FOR THE OW-60C SIGNS.

3. THE WORK TRUCK SHOWN AT THE BEGINNING OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER MEN ARE WORKING WITHIN THE WORK AREA. THIS TRUCK SHALL BE MOVED FROM THE PAVEMENT WHENEVER WORKMEN ARE NOT IN THE WORK AREA. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE WORK TRUCK SHOWN WHEN APPROVED BY THE ENGINEER.

5. TYPE C STEADY BURNING BARRICADE WARNING LIGHTS SHALL BE ERECTED ON DRUMS OR BARRICADES FOR NIGHT LANE CLOSURES. MAXIMUM SPACING SHALL BE 50' CENTER TO CENTER IN ADVANCE OF THE WORK AREA AND 200' CENTER TO CENTER WITHIN THE LIMITS OF THE WORK AREA.

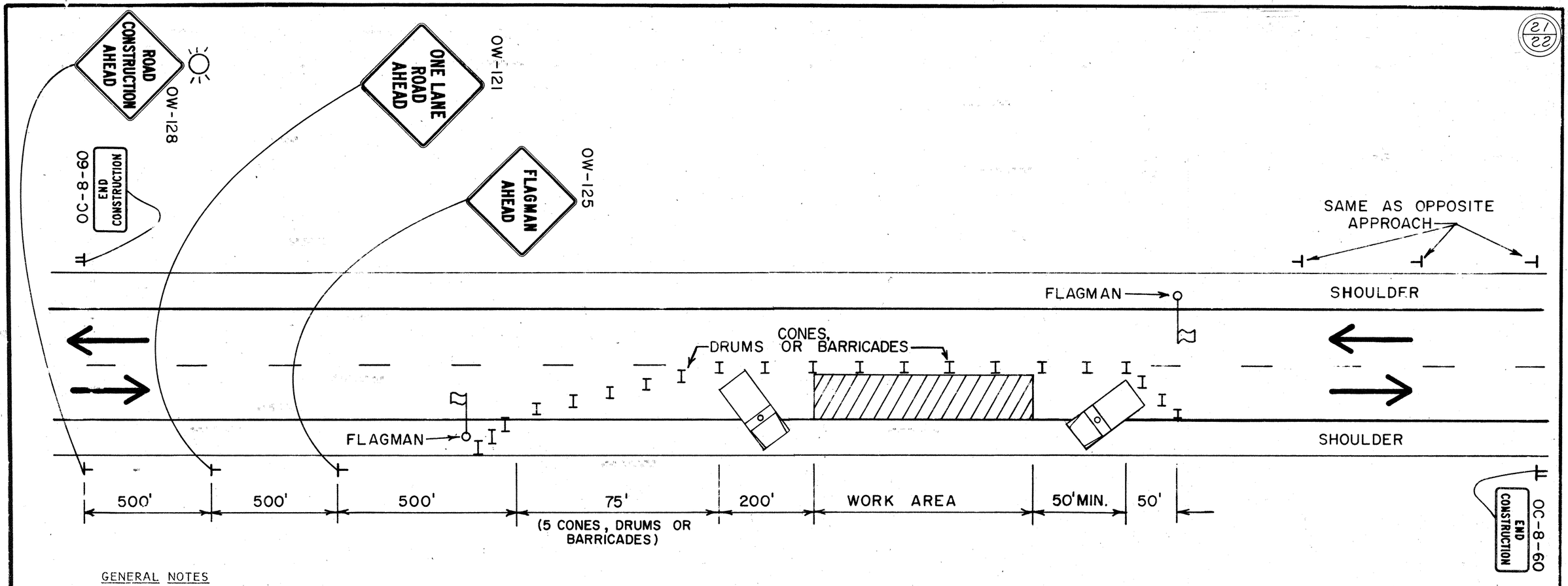
DISTANCE	A	B	C	L
URBAN	200	200	200	425
MAJOR STANDARD	500	500	500	600
FREEWAY AND EXPRESSWAY	2600	1600	1000	720

OHIO DEPARTMENT OF TRANSPORTATION

CLOSING ONE LANE OF A FOUR LANE DIVIDED HIGHWAY

DATE 4/77

DR. GRD CK. RLB.



GENERAL NOTES

1. FLAGMEN SHALL BE USED TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS ONE LANE OPERATION IS IN EFFECT. FLAGMAN SHALL COMMUNICATE WITH EACH OTHER AT ALL TIMES AS DESCRIBED IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES IN THE SECTION "FLAGMAN CONTROL". FLAGMEN STATIONS SHALL BE ADEQUATELY ILLUMINATED FOR NIGHT-TIME OPERATIONS BY USE OF A 175 WATT MINIMUM LUMINAIRE.

2. CONES, DRUMS, OR BARRICADES SHALL BE SPACED AT 50 FOOT CENTERS FOR THE FIRST 1000 FEET OF THE WORK AREA AND AT A MAXIMUM OF 100 FEET FOR THE BALANCE OF THE WORK AREA. CONES MAY BE SUBSTITUTED FOR BARRICADES OR STEEL DRUMS FOR THE LANE CLOSURES DURING DAYLIGHT HOURS ONLY.

3. 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 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.

4. THE WORK TRUCKS SHOWN AT EACH END OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER MEN ARE WORKING WITHIN THE WORK AREA. THESE TRUCKS SHALL BE MOVED FROM THE PAVEMENT WHENEVER WORKMEN ARE NOT IN THE WORK AREA. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE WORK TRUCKS SHOWN WHEN APPROVED BY THE ENGINEER.

5. THE TYPE B HIGH INTENSITY BARRICADE WARNING LIGHT SHOWN ON THE ROAD CONSTRUCTION AHEAD SIGN, IS REQUIRED WHENEVER NIGHT LANE CLOSURE IS NECESSARY.

6. TYPE C STEADY BURNING BARRICADE WARNING LIGHTS SHALL BE ERECTED ON DRUMS OR BARRICADES FOR NIGHT LANE CLOSURES. MAXIMUM SPACING SHALL BE 50' CENTER TO CENTER IN ADVANCE OF THE WORK AREA AND 200' CENTER TO CENTER WITHIN THE WORK AREA.

OHIO DEPARTMENT OF TRANSPORTATION	
FLAGMEN CLOSING I LANE OF A 2 LANE HIGHWAY	DATE 4/77
DR GBD CK. RLB	

CALCULATED BY [illegible] DATE 6/6/78
CHECKED BY N.D. DATE 7/20/78
Revised DEH 8/17/78

FHWA REGION	STATE	PROJECT	
5	OHIO		

22
22

KNO-13-15.93

SIGNING QUANTITIES

Sheet	Mark	Side	Station	Reference Number	Sign Size	ITEM 844 Signs Flat Sheet	Signs Extrusheet	Ground Mounted Supports, No. 3 Post Driven	Ground Mounted Supports, No. 4 Post Driven	Removal of Ground Mounted Signs and Reerection	Ground Mounted Supports, W10 x 21	Breakaway Beam Connection	Ground Mounted Supports No. 4 Post, As Per Plan	Concrete for EMBEDDED Foundations	Removal of Ground Mounted Signs for Storage	Removal of Ground Mounted Post Supports
					Ft. x Ft.	Sq. Ft.	Sq. Ft.	Lin. Ft.	Lin. Ft.	Each	Lin. Ft.	Each	Lin. Ft.	Cu. Yds.	Each	Each
6	1-S	Rt.	43+00	W-85-36	3 x 3	9			14							
6	2-S	Lt.	44+00	R-10-36	3 x 4	12			14-14							
6	3-S	Lt.	47+50	R-34-24	2 x 2.5	5		12								
6	4-S	Rt.	51+10	R-41A-36	3 x 2	6			12							
6	4a-S	Med.	51+10	R-41A-36	3 x 2	6	Mount on Back of Existing R-38R Sign									
6	5-S	Med.	52+37	R-41B-36	3 x 3	9							13			
				R-43R-36	3 x 1	3										
6	6-S	Lt.	53+55	R-41B-36	3 x 3	9							13			
				R-43L-36	3 x 1	3										
6	7-S	Med.	53+55	R-41B-36	3 x 3	9			13							
6	8-S	Lt.&Med	55+00	R-41A-36	3 x 2	6-6			13-13							
6	9-S	Lt.&Med	55+00	R-31Q-36	3 x 3	9-9	Mount on Back of 8-S									
6	10-S	Lt.	4+50[1]	W-45-36	3 x 3	9			14							
6	11-S	Lt.	56+00	R-33-30	2.5 x 3	7.5			13							
6	12-S	Lt.	47+49	W-71-36	3 x 3					1						1
		Lt.	to 51+00						14							
6	13-S	Lt.&Med	843+96	W-60D-36	3 x 3					2						2
			to 846+00						14-14							
6	14-S	Rt.	49+45	R-10-36	3 x 4					1						1
			to 59+00						14-14							
6	15-S	Lt.	47+49	WP-71-24	2 x 1.5										1	
6	16-S	Lt.	50+87	R-10-24	2 x 2.5										1	1
6	17-S	Lt.	58+98	R-36R-30	3 x 3.5										1	2
6	18-S	Med.	58+98	R-32L-48	4 x 4										1	2
7	19-S	Lt.&Med	849+66	W-52-48	4 x 4	16-16			15,15,15,15						2	2
7	20-S	Lt.&Med	854+75	WP-86-24	2 x 1.5										2	
9	21-S	Rt.	48+00	M-50-66	5.5 x 2	11		12-12								
9	22-S	Rt.&Med	894+00	R-41A-36	3 x 2	6-6			12-12							
9	23-S	Lt.	52+00	M-50-66	5.5 x 2	11		12-12								
9	24-S	Lt.&Med	899+75	R-41A-36	3 x 2	6-6			12-12							
9	25-S	Rt.	899+00	GB-II	15 x 10		150				25-24	2		2.45		
9	26-S	Med.	896+10 &	M-38-24	2 x 1										2	1
		Lt.	895+95	M-2-24-2	2 x 2										2	1
				M-24-21	1.75 x 1.25										2	
9	27-S	Med.	897+11	M-37-24	2 x 1										1	1
				M-2-24-2	2 x 2										1	
				M-24-21	1.75 x 1.25										1	
9	28-S	Rt.	897+34	M-37-24	2 x 1										1	1
				M-2-24-2	2 x 2										1	
				M-24-21	1.75 x 1.25										1	
9	29-S	Rt.&Med	895+40	R-41B-36	3 x 3					2						2
		Rt.&Med	to 896+00										13-13			
9	30-S	Rt.	896+42	R-43L-36	3 x 1					1		Mount on 29-S				1
		Rt.	to 896+00													
9	31-S	Med.	896+14	R-43R-36	3 x 1					1		Mount on 29-S				1
		Med.	to 896+00													
9	32-S	Lt.&Med	897+77	R-41B-36	3 x 3					2						2
		Lt.&Med	to 897+15										13-13			
9	33-S	Lt.	896+81	R-43L-36	3 x 1					1		Mount on 32-S				1
		Lt.	to 897+15													
9	34-S	Med.	897+10	R-43R-36	3 x 1					1		Mount on 32-S				1
		Med.	to 897+15													
9	35-S	Rt.	898+79	M-2-24-2	2 x 2					1						1
		Rt.	to 898+00	M-37-24	2 x 1			13		1						

SIGNING QUANTITIES (CONT.)

Sheet	Mark	Side	Station	Reference Number	Sign Size	ITEM 844 Signs Flat Sheet	Signs Extrusheet	Ground Mounted Supports, No. 3 Post Driven	Ground Mounted Supports, No. 4 Post Driven	Removal of Ground Mounted Signs and Reerection	Ground Mounted Supports, w 10 x 21	Breakaway Beam Connection	Ground Mounted Support, No. 4 Post, As Per Plan	Concrete for EMBEDDED Foundations	Removal of Ground Mounted Signs for Storage	Removal of Ground Mounted Post Supports
					Ft. x Ft.	Sq. Ft.	Sq. Ft.	Lin. Ft.	Lin. Ft.	Each	Lin. Ft.	Each	Lin. Ft.	Cu. Yds.	Each	Each
10	36-S	Rt.	925+66	M-2-24-2	2 x 2										1	1
				M-37-24	2 x 1										1	
10	37-S	Lt.	57+13	M-2-24-2	2 x 2				12-12	1						2
		Rt.	to 8+00	M-25-21	1.75 x 1.25					1						
				D-1-72	6 x 1					2						
10	38-S	Lt.	62+39	D-1-72	6 x 1	6	Mount on Existing Supports									
11	39-S	Lt.	938+23	M-2-24-2	2 x 2										1	1
				M-38-24	2 x 1										1	
11	40-S	Rt.	50+40	M-2-24-2	2 x 2				12-12	1						2
		Lt.	to 4+00	M-25-21	1.75 x 1.25					1						
				D-1-72	6 x 1					1						
11	41-S	Lt.	4+00	D-1-72	6 x 1	6	Mount Below 40-S									
13	42-S	Rt.&Med	977+75	R-41A-36	3 x 2	6-6			12-12							
13	43-S	Lt.	978+00	GB-II	15 x 10		150				29-26	2		2.45		
13	44-S	Med.	980+20	R-37R-36	3 x 4	12			13-13							
13	45-S	Lt.&Med.	981+55	R-41B-36	3 x 3	9-9							13-13			
				R-43L(R)-36	3 x 1	3-3										
13	46-S	Rt.&Med.	979+95	R-41B-36	3 x 3	9-9							13-13			
				R-43L(R)-36	3 x 1	3-3										
13	47-S	Med.	981+15	R-37R-36	3 x 4	12			13-13							
13	48-S	Lt.&Med.	984+00	R-41A-36	3 x 2	6-6			12-12							
16	49-S	Rt.&Med.	1062+00	R-41A-36	3 x 2	6-6			12-12							
16	50-S	Med.	1064+40	R-37R-36	3 x 4	12			13-13							
16	51-S	Med.	1065+30	R-37R-36	3 x 4	12			13-13							
16	52-S	Lt.&Med.	1065+50	R-41B-36	3 x 3	9-9							13-13			
				R-43L(R)-36	3 x 1	3-3										
16	53-S	Lt.&Med.	1067+25	R-41A-36	3 x 2	6-6			12-12							
16	54-S	Rt.	1083+80	M-2-24-2	2 x 2	4		13								
				M-37-24	2 x 1	2										
16	55-S	Rt.&Med.	1064+20	R-41B-36	3 x 3	9-9							13-13			
				R-43L(R)-36	3 x 1	3-3										
16	56-S	Rt.	1076+08	R-37-36	3 x 3										1	1
16	57-S	Rt.	1083+80	WP-71-24	2 x 1.5										1	1
16	58-S	Lt.	1064+88	M-6-18	1.5 x 1.5										1	1
16	59-S	Lt.	1080+80	R-10-36	3 x 4				14-14							2
		Lt.	to 1059+00							1						
16	60-S		1083+80	W-71-36	3 x 3				14							1
			to 1076+00							1						
16	61-S	Med.&Rt.	1073+62	W-60A-36	3 x 3	9-9									2	
16	62-S	Med.&Rt.	1070+39	W-52-48	4 x 4				15,15,15,15	2						2
TOTALS						423.5	300	86	648	25	104	4	182	4.9	29	38