

DESIGN DESIGNATION

CURRENT ADT (1989) = 1760 V.P.D.
DESIGN YEAR ADT (2009) = 2460 V.P.D.
DHV = 295 V.P.H.
D = 50%
T = 22%
DESIGN SPEED = 60 M.P.H.
LEGAL SPEED = 55 M.P.H.
FUNCTIONAL CLASSIFICATION Minor Collector

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**UNI-739-0.02**ALLEN TOWNSHIP
LIBERTY TOWNSHIP
UNION COUNTY

OHIO

FHWA
REGION 5FEDERAL
PROJECT1
79

UNI-739-0.02

100% STATE FUNDING

CONVENTIONAL SIGNS

County Line ————— L/A —————
Township Line ————— RW —————
Section Line ————— LA & RW —————
Corporation Line ————— or —————
Fence Line (existing) —X— (proposed) —X—
Center Line ————— or —————
Trees (to be removed) —X—
Utility Poles: Telephone —P—, Power —P—, Light —P—
Limited Access (only) ————— L/A —————
Right of Way (only) ————— RW —————
Limited Access & Right of Way ————— LA & RW —————
Existing Right of Way —————
Property Line ————— (in existing fence) —X—
Railroad ————— or —————
Guardrail (existing) ————— (proposed) —————
Topsail Replacement —————

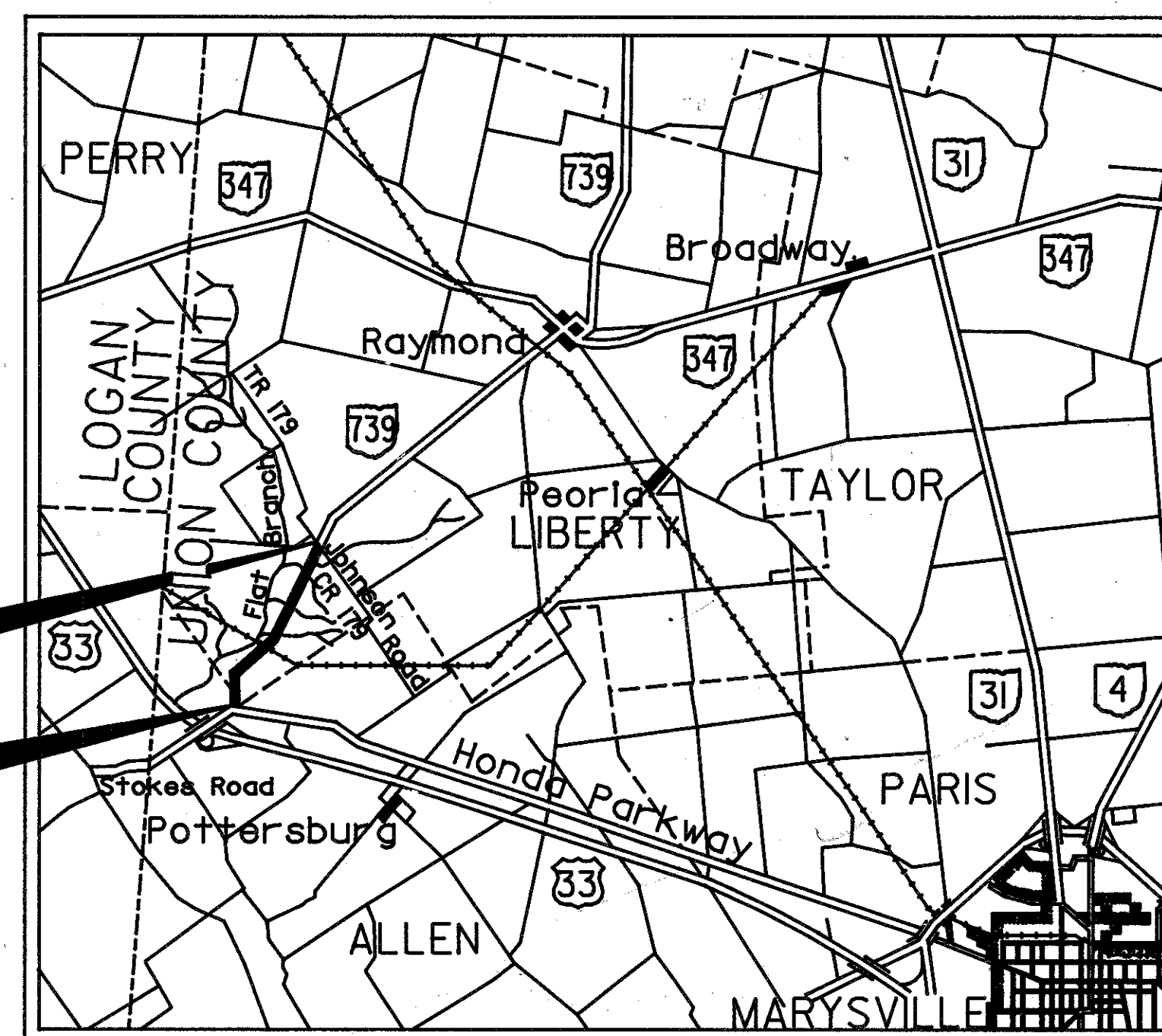
INDEX OF SHEETS

TITLE SHEET
SCHEMATIC PLAN AND DETOUR MAP
TYPICAL SECTIONS
TEMPORARY EROSION AND SEDIMENT CONTROL
GENERAL NOTES
GENERAL SUMMARY
PAVEMENT CALCULATIONS
SUPERELEVATION TABLES
SHALLOW UNDERDRAIN OUTLET DETAIL
TWIN HEADWALL DETAIL
PLAN AND PROFILE SHEETS S.R. 739
CROSS SECTIONS S.R. 739
DRIVE DETAILS
CULVERT DETAILS
PLAN AND PROFILE SHEETS T.R. 179
CROSS SECTIONS T.R. 179
INTERSECTION DETAIL T.R. 179
PLAN AND PROFILE SHEETS STOKES RD.
CROSS SECTIONS STOKES RD.
INTERSECTION DETAIL STOKES RD.
TRAFFIC CONTROL
TRAFFIC CONTROL SUMMARY
RIGHT-OF-WAY PLAN
SHEETS NO. 19, 40, 57 HAVE BEEN OMITTED
29

LINE DATA

BEGIN PROJECT = STATION 1+00
END PROJECT = STATION 106+00
DEDUCT FOR STRUCTURE UNI-739-0177 = 119'
DEDUCT FOR STA. 40+56.92 TO STA. 49+00.00 = 843.08'
NET LENGTH OF PROJECT = 9537.92' OR 1.806 MILES
BEGIN WORK STATION 1+08
END WORK STATION 107+00
TOTAL NET LENGTH OF WORK = 10808 LIN. FT.
ADD FOR STOKES RD./HONDA PKWY.
STA. 64+51 TO STA. 70+25 = 574 FT.
ADD FOR T.R. 179
STA. 254+70 TO STA. 258+03 = 340.18 FT.
TOTAL NET LENGTH OF WORK = 11722.18 LIN. FT. OR 2.22 MILES

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
Call... 800-362-2764 (Toll free)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY



LOCATION MAP

SCALE IN MILES
0 1 2 3 4

Portion to be improved —————
State & Federal Routes —————
Other Roads —————

SCALES

Plan —————
Profiles: Horizontal —————, Vertical —————
Cross Section: Horizontal —————, Vertical —————

SUPPLEMENTAL SPECIFICATIONS	
802	5-4-88
847	10-17-83
947	10-17-83
841	5-16-84
843	7-29-88
944	6-24-89
931	6-18-85

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-1	6-1-65	HW-3	6-1-65		
BP-2	1-11-85	HW-4A	4-1-80	TC-41.20	3-26-79
BP-3	12-6-76	HW-4B	4-1-80	TC-42.20	3-26-79
BP-4	10-1-87	MC-1	6-13-69	TC-52.10	4-3-79
BP-5	10-1-87	MC-4	7-26-76	TC-52.20	4-3-79
BP-6	10-1-87	MC-10	5-1-76		
BP-10	1-30-84	MC-11	8-1-78		
		GR-3	1-21-85		
GR-1	1-11-85				
GR-2B	2-5-82				
GR-4	2-5-82	LA-1	6-1-79		
GR-6	2-5-82				
DBR-2-73	4-10-73				

Plan Prepared By:
DISTRICT NO. 6
OHIO DEPARTMENT OF
TRANSPORTATION

SEAL

Project: UNI-739-0.02
Date of Letting

1989 ,Contract No.

1989 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will require the closing to traffic of the highway and that detours will be provided as indicated on the plans. (See Sheet 2 of 79)

Approved W. Howard Throck
Date 5-5-89 District Deputy Director of Transportation

Approved B. D. Haskins
Date 8/1/89 Engineer, Bureau of Bridges and Structural Design

Approved Charles J. Still
Date 9/25/89 Chief Engineer, Planning and Design

Approved Bernard G. Hurst
Date 9/25/89 Director, Department of Transportation

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR

DATE

SCHEMATIC PLAN & DETOUR MAP

F.H.W.A REGION	STATE	PROJECT	
5	OHIO		

2
79

UNI-739-0.02

BEGIN WORK
TR/CR 179
STA. 254+70.15

END WORK
TR/CR 179
STA. 258+10.33

RESUME PROJECT
STA. 92+47

END PROJECT
STA. 106+00
S.L.M. 2.01

END WORK
STA. 107+00

SUSPEND PROJECT
STA. 91+28

0 100 200 300

CURVE DATA

R = 3819.72FT
L = 1288.89FT
T = 650.63FT
Delta = 19°20'00"
Dc = 1°30'00"
External = 55.02FT
Ls = 200.00FT
THETAs = 1°30'00"
L.Tang. = 133.34FT
S.Tang. = 66.67FT

SUSPEND PROJECT
STA. 40+56.92

RESUME PROJECT
STA. 49+00

CURVE DATA
R = 1206.23FT
L = 834.12FT
T = 434.52FT
Delta = 39°37'15"
Dc = 4°45'00"
External = 75.88FT
Ls = 300.00FT
THETAs = 7°07'30"
L.Tang. = 200.16FT
S.Tang. = 100.15FT

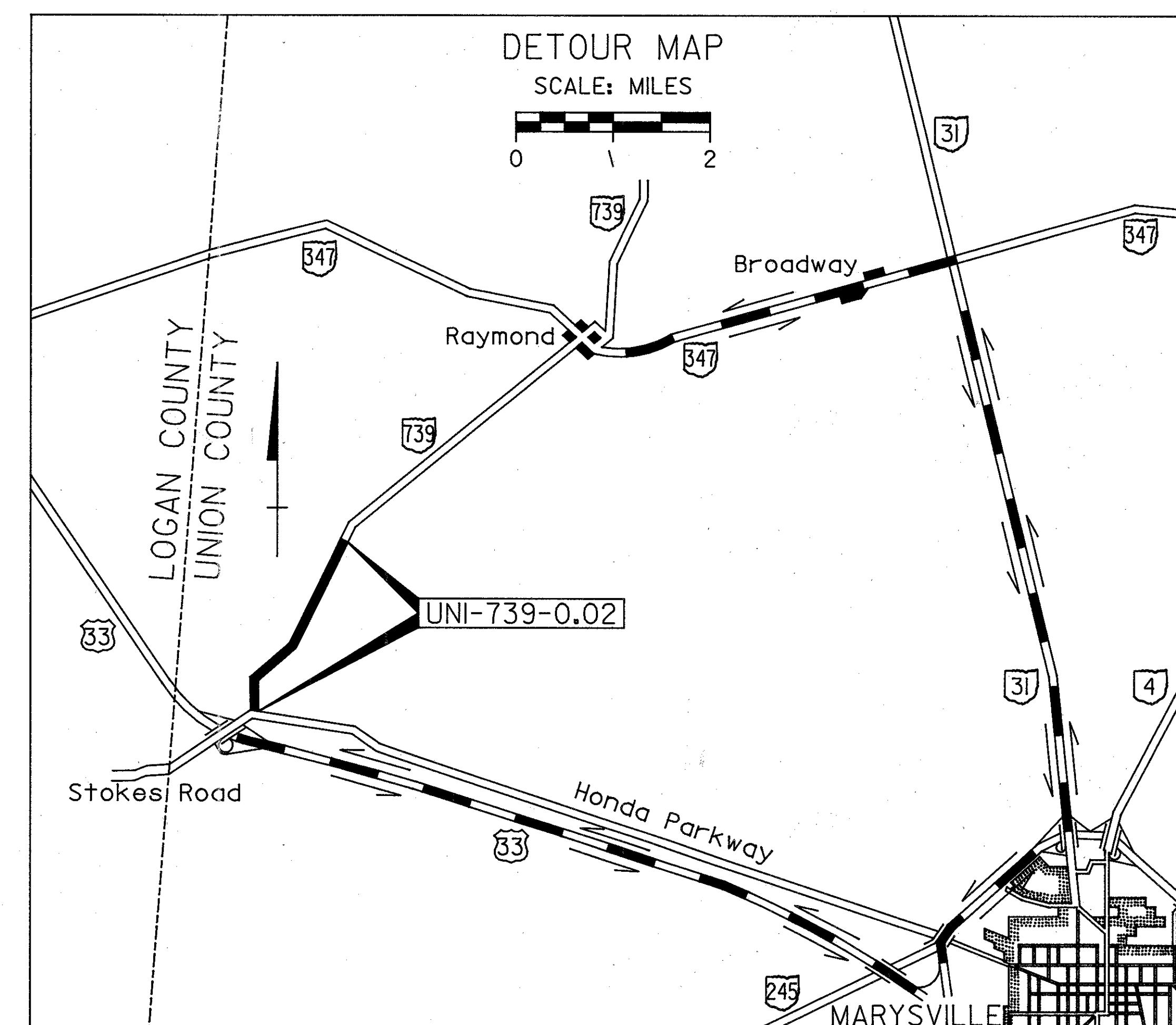
BEGIN WORK
HONDA PKWY.
STA. 64+51

BEGIN PROJECT
STA. 1+00
S.L.M. 0.02

BEGIN WORK
STA. 1+08

END WORK
HONDA PKWY.
STA. 70+25

Sta. 1+08 S.R. 739 =
Sta. 64+50.70 HON. A PARKWAY



FHWA REGION	STATE	PROJECT	
5	OHIO		

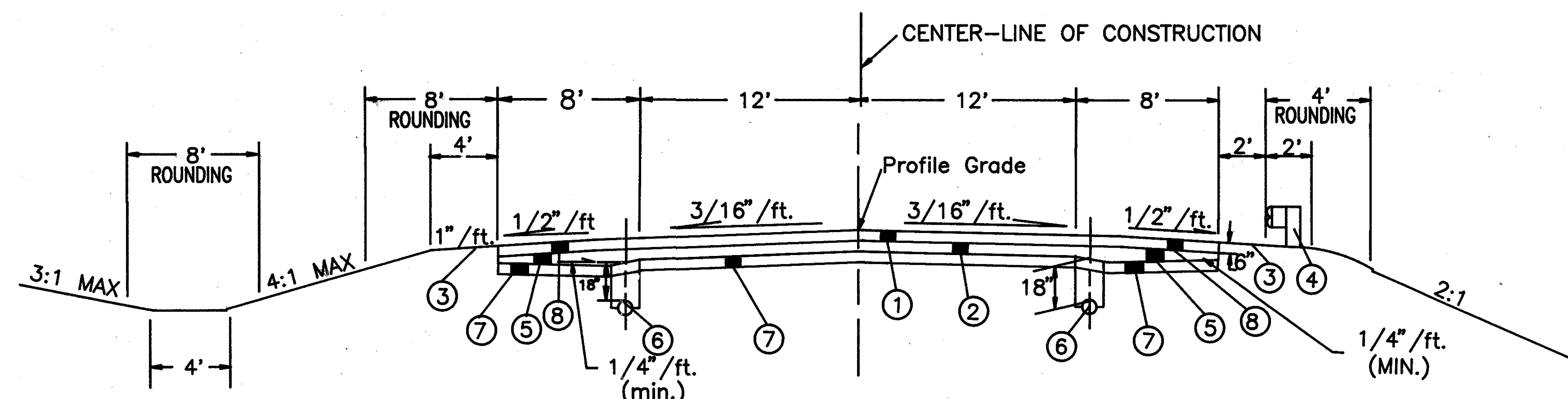
3
79

UNI-739-0.02

TYPICAL SECTION TYPE 451

LEGEND

- ① Item 451 9" Reinforced Concrete Pavement, AS PER PLAN
- ② Item 310 6" Subbase, Type II, As Per Plan
- ③ Item 659 Seeding and Mulching
- ④ Item 606 Guardrail, Type 5
- ⑤ Item 310 3" min. Subbase, Type II, As Per Plan
- ⑥ Item 605 6" Shallow Pipe Underdrain
- ⑦ Item Special 6" Lime/Soil Stabilized Subgrade
- ⑧ Item 452 6" min. Plain Concrete Pavement, As Per Plan



FULL WIDTH CONSTRUCTION - NORMAL SECTION

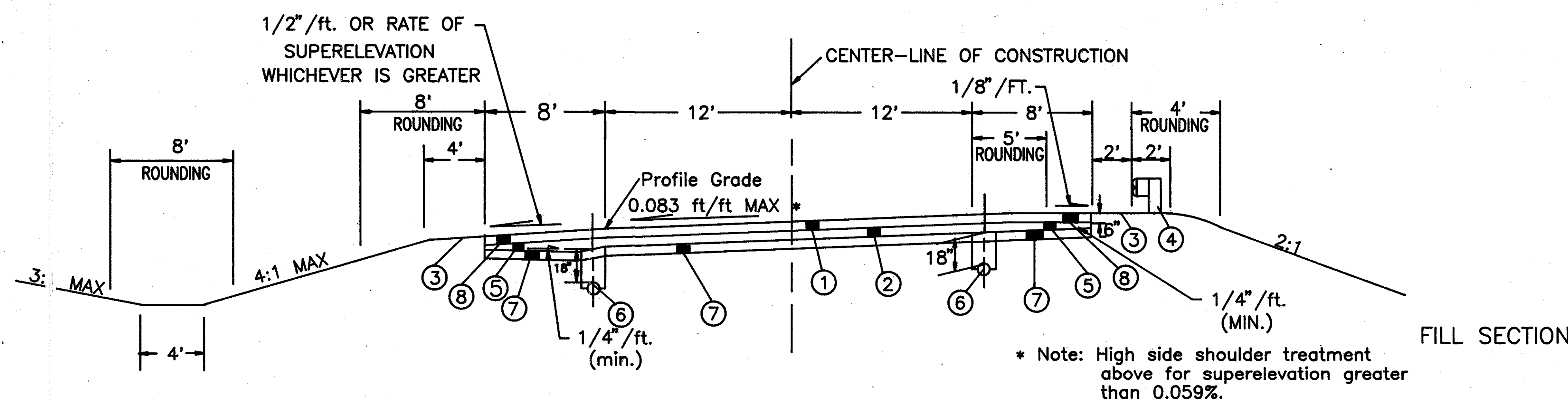
LIMITING STATIONS

Sta. 1+00.00 - Sta. 8+00.28
Sta. 23+84.68 - Sta. 27+00.00
Sta. 31+00.00 - Sta. 40+56.92 (SUSPEND PROJECT)
Sta. 58+95.82 - Sta. 63+00.00
Sta. 66+00.00 - Sta. 91+28.00 (SUSPEND PROJECT)
(RESUME PROJECT) Sta. 92+47.00 - Sta. 106+00.00
Total Lin. Ft. = 6257.70

FILL SECTION

CUT SECTION

See Sheet 53 For Drive Typicals
See Sheet 64 For Stokes Road Turn Lane Typical



FULL WIDTH CONSTRUCTION - SUPERELEVATED SECTION

SEE SUPERELEVATION TABLE, SHEET NO. 15 & 16

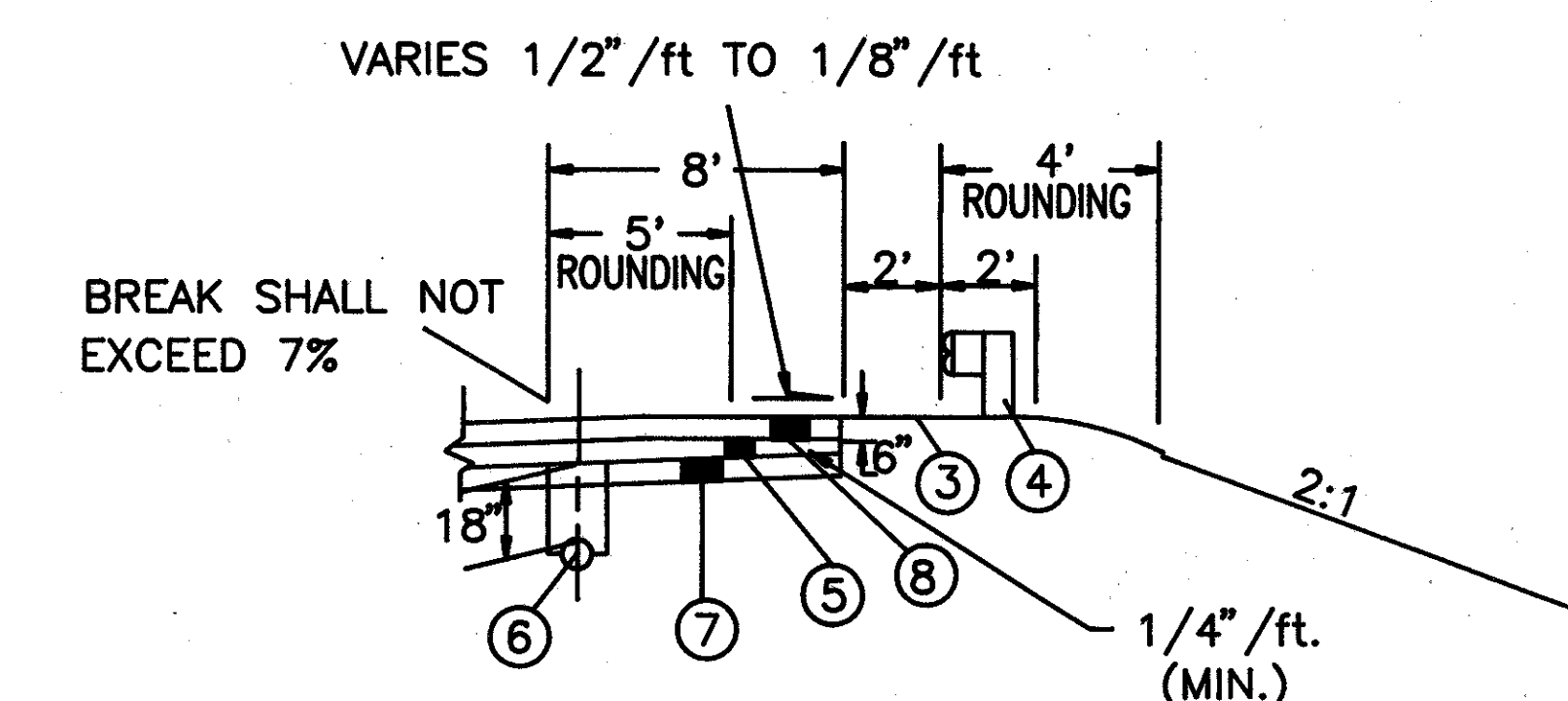
LIMITING STATIONS

Sta. 8+00.28 - Sta. 15+00.00
Sta. 18+50.00 - Sta. 23+84.68
(RESUME PROJECT) Sta. 49+00.00 - Sta. 58+95.82

Total Lin. Ft. = 2230.22

CUT SECTION

FILL SECTION



* FOR SUPERELEVATION NOT MORE THAN 0.059 ft. per ft.

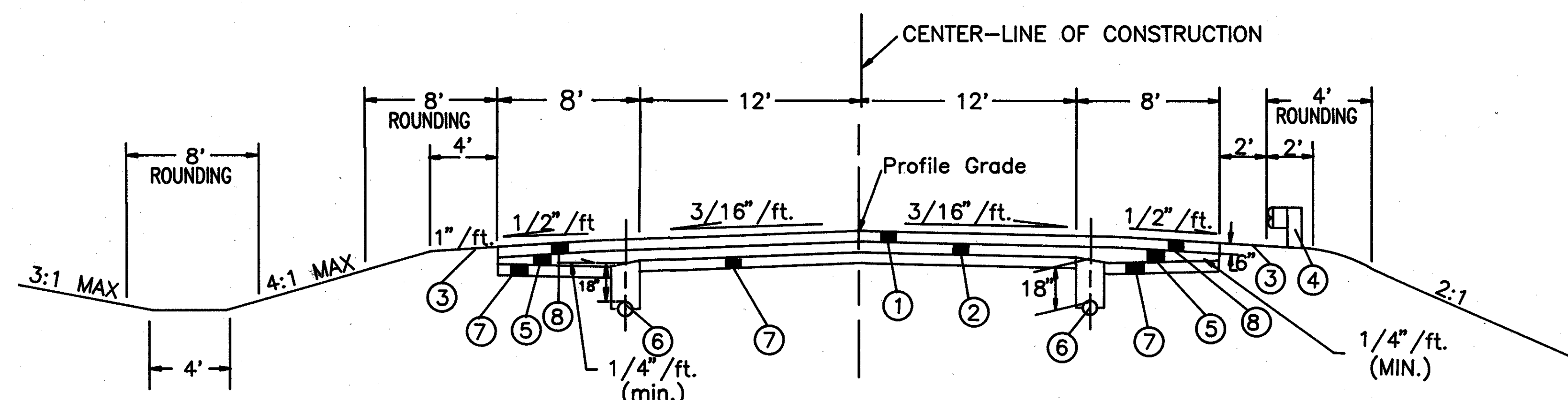
FHWA REGION	STATE	PROJECT	
5	OHIO		

UNI-739-0.02

TYPICAL SECTION TYPE 451

LEGEND

- ① Item 451 9" Reinforced Concrete Pavement, As Per Plan
- ② Item 310 6" Subbase, Type II, As Per Plan
- ③ Item 659 Seeding and Mulching
- ④ Item 606 Guardrail, Type 5
- ⑤ Item 310 3" min. Subbase, Type II, As Per Plan
- ⑥ Item 605 6" Shallow Pipe Underdrain
- ⑦ Item 203 Embankment Using Granular Material
- ⑧ Item 452 6" min. Plain Concrete Pavement, As Per Plan



FULL WIDTH CONSTRUCTION - NORMAL SECTION

LIMITING STATIONS

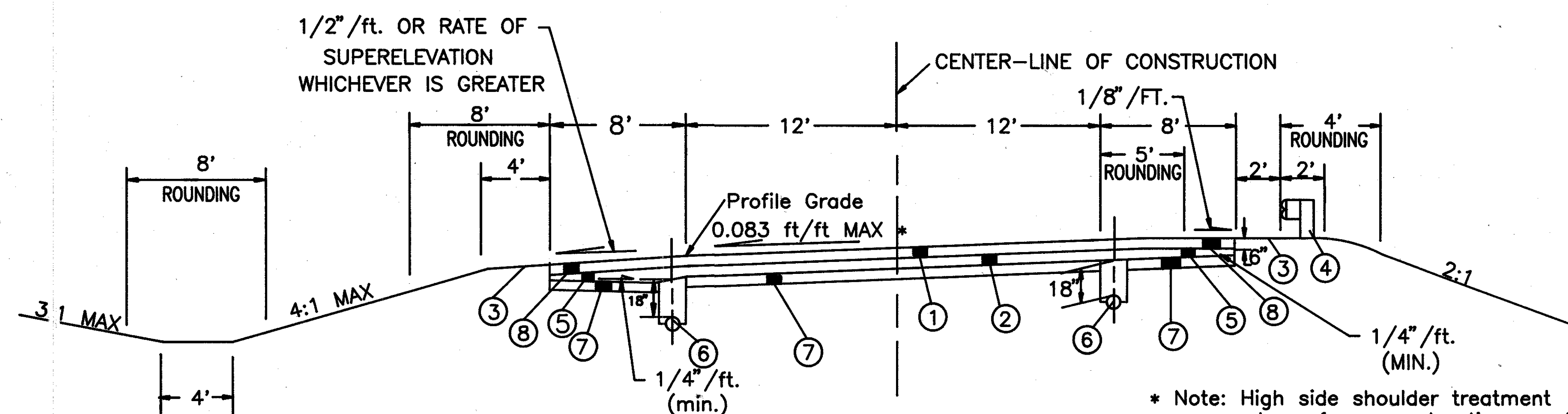
Sta. 27+00.00 - Sta. 31+00.00
Sta. 63+00.00 - Sta. 66+00.00

Total Lin. Ft. = 700.00

FILL SECTION

CUT SECTION

See Sheet 53 For Drive Typicals
See Sheet 64 For Stokes Road Turn Lane Typical



FULL WIDTH CONSTRUCTION - SUPERELEVATED SECTION

SEE SUPERELEVATION TABLE, SHEET NO. 15 & 16

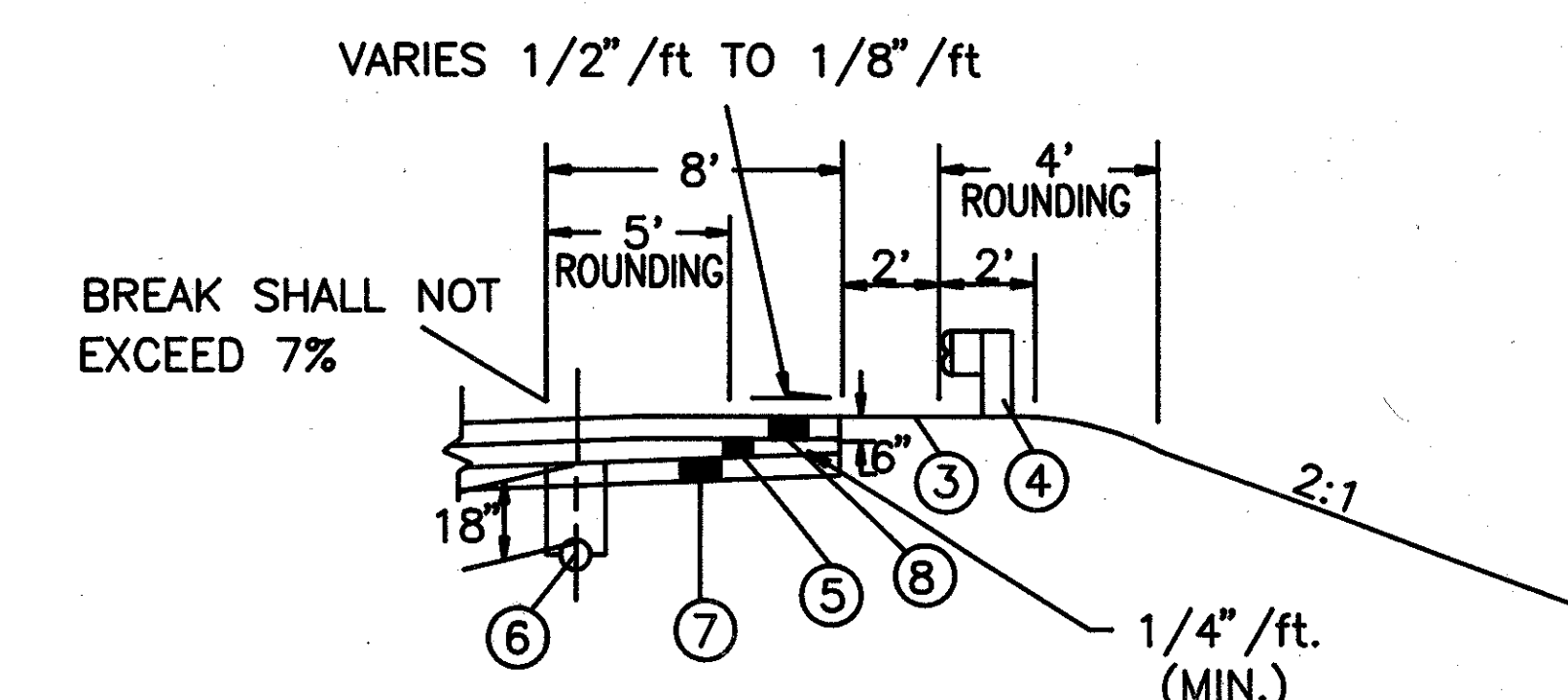
LIMITING STATIONS

Sta. 15+00.00 - Sta. 18+50.00

Total Lin. Ft. = 350.00

FILL SECTION

CUT SECTION



* FOR SUPERELEVATION NOT MORE THAN 0.059 ft. per ft.

* Note: High side shoulder treatment above for superelevation greater than 0.059%.

TYPICAL SECTIONS

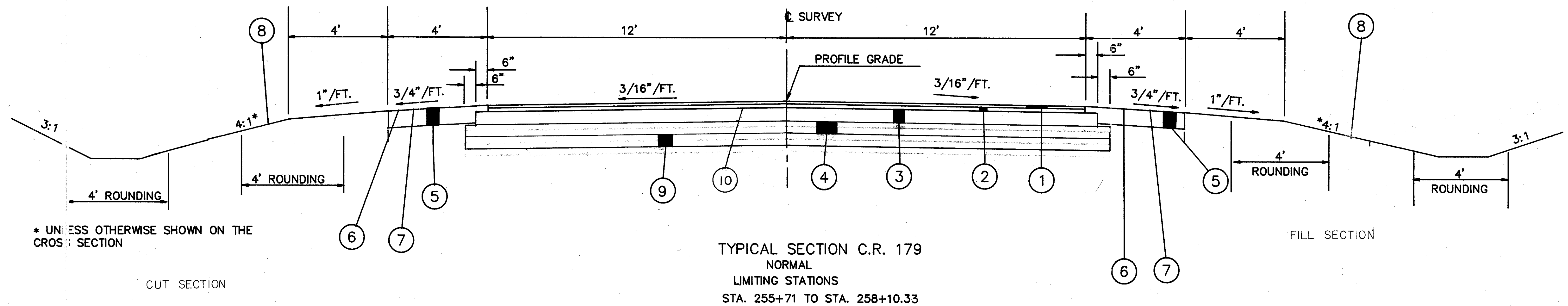
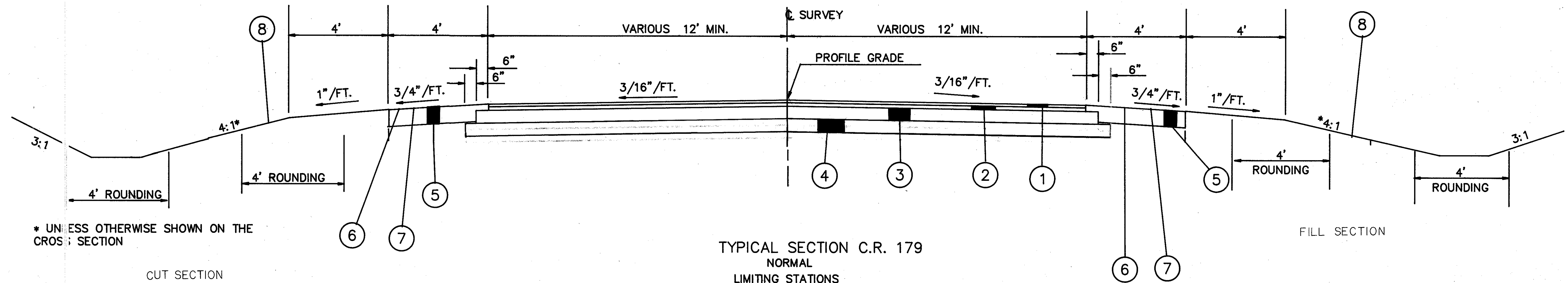
FHWA REGION	STATE	PROJECT	
5	OHIO		

5

79

UNI-739-0.02

TYPE 404 ON 301



LEGEND

- | | |
|---|--|
| ① ITEM 404-1 1/4" ASPHALT CONCRETE, AC-20 | ⑥ ITEM 408- PRIME COAT, APPLIED AT THE RATE OF 0.4 GAL./ SQ. YD. |
| ② ITEM 402- 1 3/4" ASPHALT CONCRETE, AC-20 | ⑦ ITEM 409- SEAL COAT, APPLIED AT THE RATE OF 0.3 GAL./ SQ. YD. WITH COVER AGGREGATE NO 8 APPLIED AT THE RATE OF 0.008 CU. YD. PER SQ. YD. |
| ③ ITEM 301- 6" BITUMINOUS AGGREGATE BASE, AC-20 | ⑧ ITEM 659- SEEDING AND MULCHING |
| ④ ITEM 304- 6" AGGREGATE BASE, AS PER PLAN | ⑨ ITEM SPECIAL- 6" LIME/SOIL STABILIZED SUBGRADE |
| ⑤ ITEM 304- 8" AGGREGATE BASE, AS PER PLAN | ⑩ ITEM 407- TACK COAT |

TYPICAL SECTION CR/TR 179

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

CALC. BY: DPP
CHECKED BY: N.W.K.

FHWA REGION	STATE	PROJECT
5	OHIO	

UNI-739-0.02

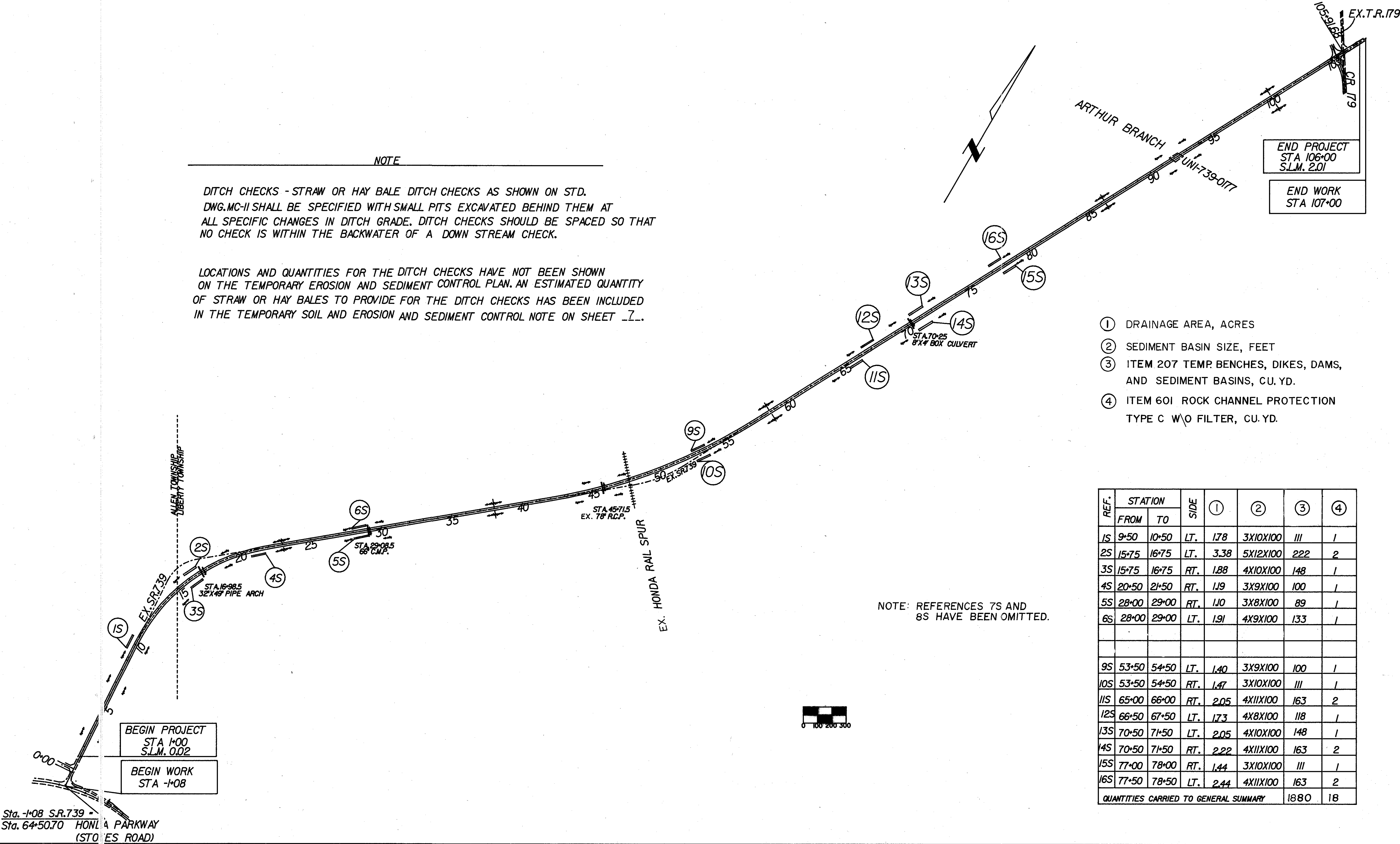
NOTE

DITCH CHECKS - STRAW OR HAY BALE DITCH CHECKS AS SHOWN ON STD. DWG.MC-II SHALL BE SPECIFIED WITH SMALL PITS EXCAVATED BEHIND THEM AT ALL SPECIFIC CHANGES IN DITCH GRADE. DITCH CHECKS SHOULD BE SPACED SO THAT NO CHECK IS WITHIN THE BACKWATER OF A DOWN STREAM CHECK.

LOCATIONS AND QUANTITIES FOR THE DITCH CHECKS HAVE NOT BEEN SHOWN ON THE TEMPORARY EROSION AND SEDIMENT CONTROL PLAN. AN ESTIMATED QUANTITY OF STRAW OR HAY BALES TO PROVIDE FOR THE DITCH CHECKS HAS BEEN INCLUDED IN THE TEMPORARY SOIL AND EROSION AND SEDIMENT CONTROL NOTE ON SHEET 7.

- ① DRAINAGE AREA, ACRES
- ② SEDIMENT BASIN SIZE, FEET
- ③ ITEM 207 TEMP. BENCHES, DIKES, DAMS, AND SEDIMENT BASINS, CU. YD.
- ④ ITEM 601 ROCK CHANNEL PROTECTION TYPE C W/O FILTER, CU. YD.

REF.	STATION		SIDE	①	②	③	④
	FROM	TO					
1S	9+50	10+50	LT.	1.78	3X10X100	III	1
2S	15+75	16+75	LT.	3.38	5X12X100	222	2
3S	15+75	16+75	RT.	1.88	4X10X100	148	1
4S	20+50	21+50	RT.	1.19	3X9X100	100	1
5S	28+00	29+00	RT.	1.10	3X8X100	89	1
6S	28+00	29+00	LT.	1.91	4X9X100	133	1
9S	53+50	54+50	LT.	1.40	3X9X100	100	1
10S	53+50	54+50	RT.	1.47	3X10X100	III	1
11S	65+00	66+00	RT.	2.05	4X11X100	163	2
12S	66+50	67+50	LT.	1.73	4X8X100	118	1
13S	70+50	71+50	LT.	2.05	4X10X100	148	1
14S	70+50	71+50	RT.	2.22	4X11X100	163	2
15S	77+00	78+00	RT.	1.44	3X10X100	III	1
16S	77+50	78+50	LT.	2.44	4X11X100	163	2
QUANTITIES CARRIED TO GENERAL SUMMARY						1880	18



NOTE: REFERENCES 7S AND 8S HAVE BEEN OMITTED.

GENERAL NOTES

Calc. By	DSP
Chk. By	N. W. K.

FHWA REGION	STATE	PROJECT
5	OHIO	

7
79

UNI-739-0.02

FIELD OFFICE, AS PER PLAN

THE CONTRACTOR SHALL PROVIDE A SUITABLE FIELD OFFICE HAVING A MINIMUM OF 400 SQ. FT. OF FLOOR SPACE. PAYMENT SHALL BE AT THE LUMP SUM PRICE BID FOR ITEM 619, FIELD OFFICE.

THE COMPLETE PROJECT CONSTRUCTION SCHEDULE IS TO BE PRINTED OUT ON 36" BY 24" PAPER, SUBMITTED, AND APPROVED BY THE ENGINEER PRIOR TO THE BEGINNING OF ANY WORK. THE SCHEDULING WILL BE DONE USING SORCIM/US "SUPER PROJECT PLUS" VERSION 2.0, A CPM BASED CONSTRUCTION SCHEDULING PROGRAM FOR IBM OR COMPATIBLE MICROCOMPUTERS. THIS SCHEDULE SHALL BE UPDATED BY THE CONTRACTOR AS THE ENGINEER REQUIRES. NO CHANGES OR REVISIONS SHALL BE MADE TO THE INITIALLY APPROVED SCHEDULE WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.

ALL DIRECT AND INCIDENTAL COSTS ASSOCIATED WITH THIS REQUIREMENT SHALL BE INCLUDED WITH ITEM 619 - FIELD OFFICE, AS PER PLAN. NO ADDITIONAL COSTS WILL BE ACCEPTED ELSEWHERE.

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS

THE ROUNDED CORNERS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS SECTIONS, EVEN THOUGH OTHERWISE SHOWN ON THESE PLANS.

UNDERGROUND UTILITIES

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

UTILITY OWNERSHIP

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

COLUMBIA GAS OF OHIO 920 WEST CRODALE BLVD. COLUMBUS, OHIO 43212 (614) 460-2222	UNION RURAL ELECTRIC COOPERATIVE 15461 STATE ROUTE 36 P.O. BOX 393 MARYSVILLE, OHIO 43040
DAYTON POWER AND LIGHT P.O. BOX 1241 COURTHOUSE PLAZA SW. DAYTON, OHIO 45401 (513) 227-2459	HONDA OF AMERICA MANUFACTURING, INC. 24000 U.S. ROUTE 33 MARYSVILLE, OHIO 43040 (513) 642-5006
UNITED TELEPHONE OF OHIO 127 NORTH MAIN ST. BELLEFONTAINE, OHIO (513) 599-4131	GENERAL TELEPHONE AND ELECTRIC 1300 COLUMBUS-SANDUSKY RD. MARION, OHIO 43302 (614) 383-0509

CONTINGENCY QUANTITIES

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK LISTED IN THE GENERAL SUMMARY FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER.

LOCATION OF GUARDRAIL

THE LOCATIONS OF GUARDRAIL RUNS, AS SHOWN ON THESE PLANS, ARE SUBJECT TO ADJUSTMENT PRIOR TO FINAL ACCEPTANCE. THE ENGINEER SHALL BE SATISFIED THAT ALL INSTALLATIONS WILL AFFORD MAXIMUM PROTECTION FOR TRAFFIC.

SEEDING

QUANTITIES FOR SEEDING ARE CALCULATED FOR THE SOIL AREAS BETWEEN 10 FEET OUTSIDE THE WORK LIMITS, AS SHOWN ON THE CROSS SECTIONS, OR TO THE RIGHT-OF-WAY LINE, IF SUCH LINE IS LESS THAN 10 FEET FROM THE WORK LIMITS.

WATERING PERMANENTLY SEEDED AREAS

THE FOLLOWING ESTIMATED QUANTITY IS TO BE USED, AS DIRECTED BY THE ENGINEER, TO PROMOTE GROWTH OF THE PERMANENTLY SEEDED AREAS, AS PER 659.09:

659 WATER	200 M-GAL
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JOINT SEALERS

ALL REFERENCES TO 705.01 OR 705.02 APPEARING ON STANDARD DRAWINGS OR ON THE PLANS, SHALL BE CONSIDERED TO READ 705.04.

REMOVAL OF TREES OR STUMPS

ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT SHALL BE REMOVED UNDER THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING, EXCEPT THAT THOSE TREES FOR WHICH PROTECTION AND PRESERVATION WORK IS INDICATED ELSEWHERE IN THESE PLANS SHALL NOT BE REMOVED.

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

SIZES	NO. TREES	NO. STUMPS	TOTAL
18"	47	96	143
30"	7	16	23
48"	0	0	0
60"	0	0	0

THE ABOVE ESTIMATE IS APPROXIMATE AND THE STATE OF OHIO RESERVES THE RIGHT TO ORDER THE REMOVAL OF ADDITIONAL TREES OR STUMPS OUTSIDE OF THE LIMITS OF CONSTRUCTION BUT WITHIN THE RIGHT-OF-WAY AND/OR EASEMENT LINES. PAYMENT FOR THE REMOVAL OF THESE ADDITIONAL TREES OR STUMPS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

FARM DRAINS

ALL FARM DRAINS ENCOUNTERED DURING CONSTRUCTION SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS UNDER THE DIRECTION OF THE ENGINEER. EXISTING COLLECTORS WHICH ARE LOCATED BELOW THE ROADWAY DITCH ELEVATIONS, AND WHICH CROSS THE ROADWAY, SHALL BE REPLACED WITHIN THE CONSTRUCTION LIMITS BY ITEM 603, CONDUIT, TYPE B, ONE COMMERCIAL SIZE LARGER THAN THE EXISTING CONDUIT.

EXISTING COLLECTORS AND ISOLATED FARM DRAINS ENCOUNTERED ABOVE THE ELEVATION OF THE ROADWAY DITCHES SHALL BE OUTLETTED INTO THE ROADWAY DITCH BY 603 TYPE F CONDUIT. THE OPTIMUM OUTLET ELEVATION SHALL BE, IF POSSIBLE, 1 FOOT ABOVE THE FLOWLINE ELEVATION OF THE DITCH. LATERAL FIELD TILES THAT CROSS THE ROADWAY SHALL BE INTERCEPTED BY 603 TYPE E CONDUIT AND CARRIED LONGITUDINALLY TO AN ADEQUATE OUTLET OR ROADWAY CROSSING.

THE LOCATION, TYPE, SIZE, AND GRADE OF REQUIRED REPLACEMENTS SHALL BE DETERMINED BY THE ENGINEER, AND PAYMENT SHALL BE MADE ON FINAL MEASUREMENTS.

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

ITEM 603	12" CONDUIT, TYPE B	50 LIN. FT.
ITEM 603	6" CONDUIT, TYPE F, 707.17	50 LIN. FT.
ITEM 603	6" CONDUIT, TYPE E	50 LIN. FT.
ITEM 601	ROCK CHANNEL PROTECTION TYPE C WITH FILTER	10 CU. YD.

NECESSARY BENDS OR BRANCHES SHALL BE INCLUDED FOR PAYMENT IN THE PERTINENT CONDUIT ITEM.

NONE OF THE ABOVE ITEMS SHALL BE ORDERED BY THE CONTRACTOR UNTIL AUTHORIZED BY THE ENGINEER.

EROSION CONTROL PADS AND ANIMAL GUARDS

EROSION CONTROL PADS AND ANIMAL GUARDS SHALL BE PROVIDED AT THE OUTLET END OF ALL FARM DRAINS, AS PER STANDARD CONSTRUCTION DRAWING MC-4, EXCEPT WHEN THEY OUTLET INTO A DRAINAGE STRUCTURE. FOR UNDERDRAIN OUTLET END TREATMENT SEE SHEET 17.

EROSION CONTROL

ANY OR ALL OF ITEMS 601, 660, 670 MAY BE PROVIDED IN THESE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE WILL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS AND TURF OF A STABLE NATURE WILL BE REMOVED ONLY IN ORDER TO PLACE ITEM 601. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES FOR THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

ITEM 605, PIPE UNDERDRAINS

UNDERDRAINS SHALL BE INSTALLED AFTER LIME STABILIZATION HAS BEEN PERFORMED.

MONUMENTS

MONUMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS SHOWN ON STANDARD CONSTRUCTION DRAWING MC-1. FOR LOCATIONS SEE SHEET NO. 73. A TOTAL OF 30 TO GENERAL SUMMARY.

CONDUIT END TREATMENT

UNLESS OTHERWISE SPECIFIED IN THE PLANS, THE CONTRACTOR SHALL, IMMEDIATELY AFTER PLACEMENT OF ANY CONDUIT, CONSTRUCT THE END TREATMENTS REQUIRED BY THE PLANS AT BOTH THE OUTLET AND INLET ENDS. THIS SHALL INCLUDE HEADWALLS, CONCRETE RIPRAP, ROCK CHANNEL PROTECTION, SODDING, ETC.

TACK COAT

THE TACK COAT AND COVER AGGREGATE OPERATION SHALL BE DETERMINED AS PER 407.05 AND 407.06 OF THE CMS. PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF 0.075 GALLONS PER SQUARE YARD OF TACK COAT FOR ESTIMATING PURPOSES ONLY.

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

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

207 TEMPORARY SEEDING AND MULCHING	18,542 SQ. YD.
207 STRAW OR HAY BALES	500 EACH
207 TEMPORARY SLOPE DRAINS	150 LIN. FT.
207 TEMPORARY BENCHES, DIKES, DAMS AND SEDIMENT BASINS	750 CU. YD.

601 TYPE C ROCK CHANNEL PROTECTION (WITHOUT FILTER)	6 CU. YD.
659 MOWING	42 M-SQ. FT.
659 COMMERCIAL FERTILIZER	1 TON
659 REPAIR SEEDING AND MULCHING	4,635 SQ. YD.
659 WATER	40 M-GAL

DETOUR LIMITATIONS AND MAINTAINING TRAFFIC

TWO WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES EXCEPT FOR A SINGLE PERIOD NOT TO EXCEED 120 CONSECUTIVE CALENDAR DAYS THROUGH TRAFFIC WILL BE DETOURED AS SHOWN ON SHEET 2.

THE CONTRACTOR SHALL NOTIFY THE DISTRICT TRAFFIC ENGINEER IN WRITING A MINIMUM OF SEVEN (7) DAYS IN ADVANCE OF THE DATE THE DETOUR IS NEEDED. THE STATE OF OHIO WILL INSTALL, MAINTAIN, AND SUBSEQUENTLY REMOVE THE DETOUR SIGNING.

THE FOLLOWING QUANTITIES HAVE BEEN PROVIDED TO BE USED AS DIRECTED TO MAINTAIN EGRESS AND INGRESS TO THE HONDA RESEARCH CENTER, AT ALL TIMES.

ITEM 410 TRAFFIC COMPACTED SURFACE COURSE TYPE A OR B	100 CY.
ITEM 616 WATER	5 M-GAL
ITEM 616 CALCIUM CHLORIDE	5 TONS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC MAINTENANCE AT ALL TIMES IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 614, MAINTAINING TRAFFIC.

EXCEPT FOR THE ABOVE ITEMS, PAYMENT FOR ALL MAINTENANCE OF TRAFFIC SHALL BE IN THE LUMP SUM BID FOR ITEM 614 MAINTAINING TRAFFIC. THE DETOUR SHALL NOT BE PLACED INTO EFFECT UNTIL STATE ROUTE 347 IS OPEN TO TRAFFIC.

COORDINATION WITH OTHER CONTRACTORS

THE CONTRACTOR SHALL COORDINATE ALL ROAD CLOSINGS, TRAFFIC MAINTENANCE, AND CONSTRUCTION OF THE RAILROAD CROSSING WITH THE CONTRACTOR(S) WHO ARE CONSTRUCTING THE HONDA RAIL SPUR AND THE LOGAN TOWNSHIP ROAD 179 PROJECT.

LIQUIDATED DAMAGES

LIQUIDATED DAMAGES SHALL BE ASSESSED IN ACCORDANCE WITH SECTION 108.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATION FOR EACH CALENDAR DAY THAT THE ROADWAY REMAINS CLOSED TO TRAFFIC BEYOND THE SPECIFIED LIMIT.

DUST CONTROL

MATERIALS FOR DUST CONTROL, TO BE USED AS DIRECTED BY THE ENGINEER, ARE PROVIDED AS FOLLOWS:

ITEM 616 WATER	50 M-GAL
ITEM 616 CALCIUM CHLORIDE	5 TONS

REVISED 12-12-89

GENERAL NOTES

GENERAL NOTES

UNI-739-0.02

ITEM SPECIAL, 6" LIME-SOIL STABILIZED SUBGRADE

DESCRIPTION - THIS ITEM SHALL CONSIST OF AN ADMIXTURE OF HYDRATED LIME WITH THE SUBGRADE SOIL CONSTRUCTED IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN CONFORMITY WITH THE LINES, GRADES AND TYPICAL CROSS-SECTIONS AS SHOWN ON THE PLANS, MIXED, SPREAD, COMPACTED AND FINISHED, READY FOR ACCEPTANCE.

THE SUBGRADE SHALL BE TREATED TO THE LINES SHOWN ON THE PLANS.

MATERIALS - HYDRATED LIME SHALL MEET THE REQUIREMENTS OF 712.04 (B). WEIGHT OF THE LIME USED SHALL BE BETWEEN 3 AND 8 PERCENT OF THE DRY WEIGHT OF THE SUBGRADE SOIL AS DIRECTED BY THE ENGINEER.

CONSTRUCTION METHODS - LIME STABILIZATION WORK SHALL BE DONE WHEN THE AIR TEMPERATURE IS 40 DEGREES F. OR ABOVE AND THE MATERIAL TO BE TREATED IS NOT FROZEN. NO WORK SHALL BE DONE DURING WET OR UNSUITABLE WEATHER. THE SUBGRADE IN THE AREAS TO BE STABILIZED WITH LIME, SHALL BE SHAPED TO THE PLAN LINES PRIOR TO ADMIXTURE OF LIME SO AS TO PERMIT CONSTRUCTION OF A UNIFORM Y COMPACTED COURSE OF LIME TREATED SOIL OF THE THICKNESS SHOWN ON THE PLANS. THE LIME SHALL THEN BE APPLIED AT THE RATE SET BY THE ENGINEER USING BULK DISTRIBUTOR, APPROVED HYDRAULIC METHODS OR BY MANUAL METHODS. CARE SHALL BE EXERCISED DURING THE SPREADING AND MIXING OPERATION TO PREVENT EXCESSIVE LOSS OF LIME BY DUSTING. IMMEDIATELY AFTER SPREADING DRY LIME, IF THE BULK DISTRIBUTOR OR MANUAL METHODS ARE USED, THE LIME SHALL BE SPRINKLED WITH WATER USING A PRESSURE DISTRIBUTOR. THE SPREADING OF THE LIME SHALL BE FOLLOWED IMMEDIATELY BY AN INITIAL MIXING OPERATION CONSISTING OF THE USE OF A SPRIG TOOTH OR DISC HARROW FOLLOWED BY AN APPROVED POWER DRIVEN ROTARY TYPE MIXER. DURING THIS INITIAL MIXING OPERATION, WATER SHALL BE ADDED IF NECESSARY TO BRING THE MIXED MATERIAL TO OPTIMUM. MIXING SHALL BE CONTINUED UNTIL THE LIME HAD BEEN THOROUGHLY INCORPORATED INTO THE MIX AND ALL SOIL CLODS HAVE BEEN REDUCED TO A MAXIMUM SIZE OF 2 INCHES.

FOLLOWING THE INITIAL MIXING, THE MATERIAL SHALL BE LIGHTLY COMPACTED WITH A STEEL WHEELED OR PNEUMATIC TIRED ROLLER TO SEAL IT AGAINST RAIN OR EXCESSIVE DRYING. THE PARTIALLY MIXED MATERIAL SHALL BE PERMITTED TO STAND FOR A PERIOD OF NOT LESS THAN 24 HOURS NOR MORE THAN 7 DAYS PRIOR TO FINAL MIXING. IF CONDITIONS DURING CONSTRUCTION ARE SUCH THAT MORE THAN 7 DAYS ELAPSE BETWEEN INITIAL MIXING AND FINAL COMPACTION AN ADDITIONAL 1/2 PERCENT OF LIME SHALL BE ADDED DURING THE FINAL MIXING.

THE ADDED LIME SHALL BE FURNISHED AT THE CONTRACTOR'S EXPENSE UNLESS THE DELAY BEYOND THE 7 DAY LIMIT IS CAUSED BY CONDITIONS BEYOND THE CONTROL OF THE CONTRACTOR. THE FINAL MIXING SHALL BE DONE WITH APPROVED POWER DRIVEN ROTARY TYPE EQUIPMENT UNTIL THE SOIL HAS BECOME COMPLETELY PULVERIZED WITH ALL CLODS REDUCED TO A MAXIMUM SIZE OF 1 INCH AND AT LEAST 60% OF THE CLODS REDUCED TO SUCH A SIZE THAT THEY WILL PASS A NO. 4 SIEVE. MIXING SHALL BE CONTINUED UNTIL THE LIME HAS BEEN UNIFORMLY DISTRIBUTED THROUGH THE PULVERIZED SOIL. THE MIXTURE SHALL AGAIN BE BROUGHT TO OPTIMUM MOISTURE CONTENT DURING THE FINAL MIXING AND THE MIXTURE SHALL THEN BE SHAPED AND COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF 203.13, EXCEPT THAT ON THIS PROJECT SOILS WITH MAXIMUM LABORATORY DRY WEIGHTS OF NOT LESS THAN 90 POUNDS WILL BE PERMITTED IN THE SUBGRADE AND SHOULD BE COMPACTED TO 100% OF LABORATORY MAXIMUM DRY WEIGHT. FINAL ROLLING SHALL BE DONE WITH A STEEL WHEELED ROLLER MEETING THE REQUIREMENTS OF 401.11. THE COMPACTED LIME SOIL MIXTURE SHALL BE SHAPED TO PLAN LINES WITHIN TOLERANCES SET UP IN 203.06 FOR SUBGRADE.

THE COMPACTED LIME STABILIZED SUBGRADE SHALL BE PERMITTED TO CURE FOR A PERIOD OF AT LEAST 5 DAYS PRIOR TO PLACEMENT OF THE OVERLYING PAVEMENT COURSE. THE SURFACE SHALL BE LIGHTLY SPRINKLED DURING HOT, DRY WEATHER THROUGH THE CURING PERIOD TO PREVENT EXCESSIVE MOISTURE LOSS, AS DIRECTED BY THE ENGINEER. DURING THE CURING PERIOD, HEAVY EQUIPMENT SHOULD BE KEPT OFF THE TREATED SUBGRADE. THE LIME STABILIZED SUBGRADE SHALL BE COVERED BY THE OVERLYING PAVEMENT COURSE WITHIN FOUR WEEKS OF THE FINAL MIXING OPERATION, OR PROTECTED BY A BITUMINOUS PRIME COAT AT NO ADDITIONAL COST TO THE STATE IF MORE THAN FOUR WEEKS ELAPSE BEFORE PLACING THE OVERLYING COURSE. THE BITUMINOUS PRIME SHALL CONSIST OF 0.2 GALLON PER SQUARE YARD OF 702.02 RC-70 OR RC-750 OR 702.04 RS-1.

MEASUREMENT AND PAYMENT - THE QUANTITIES TO BE PAID FOR SHALL BE AS FOLLOWS:

- ITEM SPECIAL, 6" LIME - SOIL STABILIZED SUBGRADE, PER SQUARE YARD -- INCLUDES SPREADING, MIXING, SHAPING AND COMPACTING LIME SOIL STABILIZED MIXTURE
- ITEM SPECIAL, HYDRATED LIME, PER TON -- DELIVERED HYDRATED LIME FOR THE LIME SOIL STABILIZATION
- ITEM 616, WATER, PER THOUSAND GALLONS (M GAL.)

PAYMENT FOR THE ABOVE ITEMS SHALL INCLUDE FULL COMPENSATION FOR FURNISHING LIME AND WATER, HAULING, SCARIFYING, BLADING, SPREADING, MIXING, SHAPING AND COMPACTING LIME WITH THE SOIL, AND FOR ALL LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM. ANY WATER REQUIRED FOR THIS ITEM SHALL BE MEASURED AND PAID FOR IN ACCORDANCE WITH THE REQUIREMENTS OF 616, EXCEPT THAT WATER USED FOR SPREADING LIME HYDRAULICALLY SHALL NOT BE MEASURED FOR PAYMENT IF IT BRINGS THE SOIL TO MORE THAN 5 PERCENT ABOVE OPTIMUM IMMEDIATELY AFTER THE APPLICATION OF THE LIME. ALL PAY QUANTITIES SHALL BE DETERMINED BY FINAL MEASUREMENT.

SEE SHEET 14 FOR QUANTITIES

TOPSOIL REPLACEMENT

ROADWAY BORINGS SHOWED 1' OF TOPSOIL OVER MOST OF THE PROJECT AREA. THE TOPSOIL SHALL BE REMOVED AND REPLACED WITH ITEM 203 - EMBANKMENT WHEREVER EXISTING GROUND SURFACE IS 3' OR LESS BELOW SUBGRADE. LATERAL LIMITS OF REMOVAL ARE 1' OUTSIDE OF THE OUTER EDGES OF THE PROPOSED PAVED SHOULDERS. THE APPROXIMATE LOCATIONS OF THESE TOPSOIL REPLACEMENTS ARE SHOWN ON THE CROSS-SECTIONS. AN ESTIMATED QUANTITY OF 4,190 CUBIC YARDS OF ITEM 203 - EXCAVATION, NOT INCLUDING EMBANKMENT CONSTRUCTION AND AN EQUAL AMOUNT OF ITEM 203 - EMBANKMENT HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THIS PURPOSE.

EXCAVATED TOPSOIL MAY BE USED IN THE TOP 12" OF THE FILL SLOPES OUTSIDE A POINT 4' BEYOND THE EDGES OF THE PROPOSED PAVED SHOULDERS. IT SHOULD BE COMPACTED BUT THE MOISTURE/DENSITY REQUIREMENTS SHOULD BE WAIVED FOR THIS UPPER 12".

THE TOPSOIL MAY ALSO BE USED FOR EMBANKMENT OUTSIDE A POINT 8' BEYOND THE PAVED SHOULDER, BUT SHOULD BE SUBJECT TO MOISTURE/DENSITY REQUIREMENTS. MAXIMUM LABORATORY DRY WEIGHT SHOULD NOT BE LESS THAN 85 POUNDS PER CUBIC FOOT AND THE MINIMUM COMPACTION REQUIREMENT SHOULD BE 90% OF THE MAXIMUM LABORATORY DRY WEIGHT. THE CONTRACTOR MAY BLEND THE TOPSOIL WITH SUITABLE EMBANKMENT MATERIALS TO MEET THE MOISTURE/DENSITY REQUIREMENTS.

PLACEMENT OF TOPSOIL AS DETAILED ABOVE WILL BE PAID FOR AS EMBANKMENT.

THE BITUMINOUS COURSES OF THE EXISTING ROADWAY MUST BE REMOVED WHERE THEY OCCUR WITHIN 3' BELOW PROPOSED SUBGRADE (BOTTOM OF THE 310 SUBBASE) AND REPLACED WITH SOIL. THE ESTIMATED QUANTITIES OF EXCAVATION, NOT INCLUDING EMBANKMENT AND EMBANKMENT PROVIDED ABOVE FOR TOPSOIL REPLACEMENT INCLUDE QUANTITIES FOR THIS PURPOSE ALSO.

SOFT SUBGRADE

HIGH SOIL MOISTURES BETWEEN STATIONS 66 AND 80 INDICATE A POSSIBLE SOFT SUBGRADE PROBLEM. TO ELIMINATE ANY SOFT SUBGRADE HERE OR IN OTHER SECTIONS AS WELL, 247 CUBIC YARDS OF ADDITIONAL EXCAVATION, NOT INCLUDING EMBANKMENT CONSTRUCTION AND EMBANKMENT ARE BEING INCLUDED IN THE GENERAL SUMMARY. AREAS OF SOFT SUBGRADE WILL BE IDENTIFIED USING ITEM 203, PROOF ROLLING, AS PER PLAN.

ITEM 203 - PROOF ROLLING, AS PER PLAN

THE SUBGRADE IN AREAS OF LIME STABILIZATION SHALL BE TEST ROLLED AFTER ROUGH GRADING AND PRIOR TO THE ADDITION OF LIME, USING A GRADER HAVING A MINIMUM WEIGHT OF 15 TONS. AREAS LACKING SUFFICIENT STABILITY IN THE OPINION OF THE ENGINEER, SHALL BE TREATED AS SOFT SUBGRADE. AN ESTIMATED QUANTITY OF 16 HOURS HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR THIS PURPOSE.

ITEM 203 - EMBANKMENT, USING GRANULAR MATERIAL

IN ORDER TO PREVENT SATURATION OF THE SUBGRADE BY FLOODING IN SOME AREAS WE ARE PROVIDING 2' OF 203.03 GRANULAR MATERIAL TO BE PLACED BELOW THE TOP OF THE SUBGRADE IN THESE AREAS. FOR THE LOCATIONS OF THE AREAS AND THE CORRESPONDING QUANTITIES SEE SHEET 14.

ITEM 310 - SUBBASE, AS PER PLAN /ITEM 304 - AGGREGATE BASE, AS PER PLAN MATERIALS FURNISHED FOR THESE ITEMS SHALL EXCLUDE ALL SLAG EXCEPT GRANULATED SLAG OR CRUSHED AIR-COOLED BLAST FURNACE SLAG.

ONCE EVERY TWO WEEKS PROGRESS MEETINGS SHALL BE ATTENDED BY THE CONTRACTOR. AT THESE MEETINGS THE CONTRACTOR SHALL PRESENT HIS PROPOSED NUMBER AND DURATION OF WORK SHIFTS, WORK CREWS, AND SPECIFIC PORTIONS OF THE WORK ANTICIPATED TO BE PERFORMED DURING THE FOLLOWING WEEKS. THESE MEETINGS SHALL ONLY BE WAIVED AT THE DISCRETION OF THE ENGINEER.

PAVEMENT REMOVAL OUTSIDE NORMAL CONSTRUCTION LIMITS

IN THE AREAS FROM STA. 14+00 TO STA. 18+00 ON S.R. 739, AND FROM STA. 159+00 TO STA. 163+50 ON EXISTING T.R. 179 THE EXISTING PAVEMENT SHALL BE REMOVED. AFTER THE PAVEMENT HAS BEEN REMOVED THE OLD ROADWAY SHALL BE GRADED, SLOPED TO DRAIN, AND SEEDED. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED FOR THIS WORK.

ITEM 203 EXCAVATION INCLUDING EMBANKMENT CONSTRUCTION	1259 C.Y.
ITEM 659 SEEDING AND MULCHING	3778 S.Y.

ITEM 451, REINFORCED CONCRETE, AS PER PLAN

REINFORCED CONCRETE PAVEMENT SHALL MEET THE REQUIREMENTS OF ITEM 451 AND STANDARD DRAWING BP-4 WITH THE FOLLOWING EXCEPTIONS:

- THE MAXIMUM SPACING BETWEEN CONTRACTION/EXPANSION JOINTS SHALL BE TWENTY (20) FEET.
- ALL JOINTS SHALL BE SKEWED 4 FEET RIGHT FORWARD FOR A 24 FOOT WIDTH. DOVEL BARS SHALL BE INSTALLED PARALLEL TO THE LONGITUDINAL JOINT. TIE BARS INSTALLED ACROSS THE LONGITUDINAL JOINT SHALL BE PARALLEL TO THE SKEWED JOINT.
- THE WIDTH OF THE CONTRACTION JOINTS SHALL BE 5/8" +/- 1/16" AND THE MINIMUM DEPTH SHALL BE 2-1/4". PREFORMED ELASTIC JOINT SEALER SHALL BE USED, SHALL MEET THE REQUIREMENTS OF 705.11, AND SHALL HAVE A MINIMUM WIDTH OF 1-1/4". DRAWINGS AND SPECIFICATIONS OF THE MATERIAL PROPOSED FOR USE SHALL BE SUBMITTED TO THE DIRECTOR FOR REVIEW AND APPROVAL.
- DOVEL INSTALLING MACHINES WILL NOT BE PERMITTED ON THIS PROJECT.
- MESH SHALL BE RECTANGULAR AND CENTERED IN EACH PANEL SO AS TO MAINTAIN A CLEARANCE OF 3 (+/- 2) INCHES FROM THE END OF THE NEAREST DOVEL. THE CLEARANCE FROM ANY DOVEL SHALL NOT EXCEED 32 INCHES. THE MESH SHALL CONSIST OF W8.5 OR D8.5 LONGITUDINAL WIRES SPACED AT 6' CENTER TO CENTER AND W4 OR D4 TRANSVERSE WIRES SPACED AT 12' CENTER TO CENTER.
- DOVELS SHALL BE EPOXY COATED AS PER 709.13. DOVEL ASSEMBLIES SHALL BE EPOXY COATED AS PER 709.00.
- REFER TO 'MAINLINE PAVEMENT SURFACE SMOOTHNESS REQUIREMENTS' IN THE PROPOSAL.

ITEM 452, PLAIN CONCRETE PAVEMENT, AS PER PLAN

PLAIN CONCRETE PAVEMENT SHALL MEET ALL THE REQUIREMENTS OF 452 AND STANDARD DRAWING BP-3 WITH THE FOLLOWING EXCEPTIONS:

- THE MAXIMUM SPACING BETWEEN CONTRACTION/EXPANSION JOINTS SHALL BE TWENTY (20) FEET AND SHALL BE ALIGNED WITH THE MAINLINE JOINTS.
- ALL JOINTS SHALL BE SKEWED 4 FEET RIGHT FORWARD FOR A 24 FOOT WIDTH.
- THE WIDTH OF THE CONTRACTION JOINTS SHALL BE 5/8" +/- 1/16" AND THE MINIMUM DEPTH SHALL BE 2-1/4". PREFORMED ELASTIC JOINT SEALER SHALL BE USED, SHALL MEET THE REQUIREMENTS OF 705.11, AND SHALL HAVE A MINIMUM WIDTH OF 1-1/4". DRAWINGS AND SPECIFICATIONS OF THE MATERIAL PROPOSED FOR USE SHALL BE SUBMITTED TO THE DIRECTOR FOR REVIEW AND APPROVAL.
- THE JOINT BETWEEN THE INSIDE AND OUTSIDE SHOULDERS AND MAINLINE PAVEMENT SHALL BE TIED AT 30 INCH SPACINGS.
- DOVEL BARS WILL NOT BE REQUIRED WITHIN 500' OF A PRESSURE RELIEF JOINT AS SPECIFIED IN BP-4.

STAGE CONSTRUCTION

THE FIRST STAGE OF CONSTRUCTION SHALL BE THE COMPLETION OF WORK REQUIRED FROM STATION 1+08 TO STATION 40+56.92.

GENERAL SUMMARY

Calc. By MMK
Chk. By DPP

F.H.W.A. REGION	STATE	PROJECT
5	OHIO	

10
79

UNI-739-0.02

ITEM	SHEET NUMBER		ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
	6	7					
							ROADWAY
201		LUMP	201		LUMP		CLEARING AND GRUBBING
202			202		40	LIN.FT.	PIPE REMOVED, 24" AND UNDER
202			202		366	LIN.FT.	GUARDRAIL REMOVED
202			202		LUMP		STRUCTURE REMOVED
203			203		1259	CU.YD.	EXCAVATION INCLUDING EMBANKMENT CONSTRUCTION
203			203		77473	CU.YD.	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION
203			203		34776	CU.YD.	EMBANKMENT
203			203		2878	CU.YD.	EMBANKMENT USING GRANULAR MATERIAL
203			203		6824	SQ.YD.	SUBGRADE COMPACTION
203			203		1	HOUR	PROOF ROLLING
203			203		16	HOUR	PROOF ROLLING, AS PER PLAN (SEE SHT. 8)
410		100	410		100	CU.YD.	TRAFFIC COMPACTED SURFACE, TYPE A OR B
604		30	604		30	EACH	REFERENCE MONUMENT
517			517		160	LIN.FT.	RAILING, DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP, TYPE 2 STEEL POSTS AND ANCHOR BOLTS
606			606		25	LIN.FT.	GUARDRAIL, TYPE 5, WITH TUBULAR BACKUP, AS DBR-2-73, AND INLET MOUNTED POST
606			606		2115	LIN.FT.	GUARDRAIL, TYPE 5
606			606		12	EACH	ANCHOR ASSEMBLY, TYPE A
606			606		4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE B
616		55	616		164	M. GAL.	WATER
616		101	616		10.	TON	CALCIUM CHLORIDE
616							
							EROSION CONTROL
207	1880	750	207		2630	CU.YD.	TEMPORARY BENCHES, DIKES, DAMS, AND SEDIMENT BASINS
207		18542	207		18542	SQ.YD.	TEMPORARY SEEDING AND MULCHING
207		150	207		150	LIN.FT.	TEMPORARY SLOPE DRAINS
207		500	207		500	EACH	STRAW OR HAY BALES
601			601		17	CU.YD.	ROCK CHANNEL PROTECTION, TYPE B, WITH FILTER
601		10	601		24	CU.YD.	ROCK CHANNEL PROTECTION, TYPE C, WITH FILTER
601	18	6	601		24	CU.YD.	ROCK CHANNEL PROTECTION, TYPE C, WITHOUT FILTER
659			659		92014	SQ.YD.	SEEDING AND MULCHING
659		1	659		12.56	TON	COMMERCIAL FERTILIZER
659		240	659		240	M. GAL.	WATER
659		4635	659		4635	SQ.YD.	REPAIR SEEDING AND MULCHING
659		42	659		42	M. SQ.FT.	MOWING
660			660		13	SQ.YD.	SODDING
670			670		1372	SQ.YD.	DITCH EROSION PROTECTION
							DRAINAGE
602			602		42.8	CU.YD.	CONCRETE MASONRY
603			603		95	LIN.FT.	34" x 53" CONDUIT, TYPE A, 706.04, CLASS HE-II
603			603		62	LIN.FT.	CONDUIT, TYPE A, 66", 706.02, OR 72", 707.02
603			603		50	LIN.FT.	8' X 4' CONDUIT, TYPE A, 706.05
603			603		144	LIN.FT.	12" CONDUIT, TYPE A, 706.02 3000 D-LOAD
603	50		603		50	LIN.FT.	12" CONDUIT, TYPE B
603			603		245	LIN.FT.	12" CONDUIT, TYPE D
603	50		603		50	LIN.FT.	6" CONDUIT, TYPE E
603	50		603		664	LIN.FT.	6" CONDUIT, TYPE F 707.17 NON PERFORATED, ASTM 3034, SDR35 OR SS931
605			605		17259	LIN.FT.	6" SHALLOW PIPE UNDERDRAINS
605			605		806	LIN.FT.	6" UNCLASSIFIED PIPE UNDERDRAINS
Spec.			Spec.		18	EACH	PRECAST REINFORCED CONCRETE OUTLET

GENERAL SUMMARY

Calc. By MWK
Chk. By DBP

F.H.W.A REGION	STATE	PROJECT
5	OHIO	



UNI-739-0.02

ITEM	6	7	SHEET NUMBER																ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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PAVEMENT CALCULATIONS

CALCS BY: DPP
CHK BY: MW

FHWA REGION	STATE	PROJECT	
5	OHIO		

11
79

UNI-739-0.02

ITEM 203 SUB GRADE COMPACTION

S.R. 739

* 1050 FT. X 40 FT. / 9

= 4666.66 S.Y.

TOKES ROAD

SHOULDER

6273.39 S.F. + 2612.16 S.F.

= 8885.55 S.F.

8885.55 S.F./9

= 987.3 S.Y.

R 179

STA. 255+71.15 TO STA. 258+50

(CARRIED FROM ITEM 408)

= 1169.54 S.Y.

ITEM 203 SUBGRADE COMPACTION CARRIED TO GENERAL SUMMARY = 6824 S.Y.

ITEM 203 PROOF ROLLING

TOKES ROAD

SHOULDER

8885.55 S.F./9/3000

= 0.33 HRS.

R 179

STA. 255+71.15 TO STA. 258+50

(CARRIED FROM ITEM 408)

= 1169.54 S.Y.

TOTAL HRS. = 1169.54 S.Y. / 3000 S.Y./HR. = 0.39 HRS.

ITEM 203 PROOF ROLLING CARRIED TO GENERAL SUMMARY = 1 HRS.

ITEM 301

7" BITUMINOUS AGGREGATE BASE

STOKES ROAD SHOULDER

NE RADIUS .5 X (97° 21' 29" / 57.295779) X (43.5 + 39) X (43.5 - 39)

= 315.42 S.F.

STA. 65+22.33 TO STA. 70+25, LT.

503.07 FT. X 4 FT.

= 2012.28 S.F.

TOTAL

= 2327.7 S.F.

2327.7 S.F. X 0.583 FT. / 27

= 50.3 C.Y.

TOTAL 7" ITEM 301

= 50 C.Y.

ITEM 301 6" BITUMINOUS AGGREGATE BASE, AC-20

CR 179

STA. 55+71.15 TO STA. 258+10.33

239.13 FT. X 24 FT. X 6/12 FT. / 27

= 106.31 C.Y.

TRANSITION

STA. 58+10.33 TO STA. 258+50

39.6 FT. X .5(24 + 20) FT. X 6/12 FT. / 27 = 16.17 C.Y.

RADIUS RETURN #2

STA. 105+86.80 TO STA. 256+11.77

((50)^2 X TAN(80/2) - PI(50)^2(80)/360) X 6/12 FT. / 27

= 6.53 C.Y.

RADIUS RETURN #3

STA. 104+60.85 TO STA. 256+33.25

((50)^2 X TAN(100/2) - PI(50)^2(100)/360) X 6/12 FT./27

= 14.78 C.Y.

TOTAL 6" ITEM 301 = 144 C.Y.

ITEM 301 10" BITUMINOUS AGGREGATE BASE

STOKES ROAD

6273.39 S.F. X 0.833 FT./27

= 193.6 C.Y.

TOTAL 10" ITEM 301 = 194 C.Y.

TOTAL ITEM 301, BITUMINOUS AGGREGATE BASE CARRIED TO GENERAL SUMMARY = 388 C.Y.

ITEM 304 6 1/2" AGGREGATE BASE, AS PER PLAN

STOKES ROAD

6273.39 S.F. X .5 FT. / 27 = 116 C.Y.

SHOULDER

NE RADIUS .5 X (97° 21' 29" / 57.295779) X (43.5+38.5) X (43.5-38.5)

= 348.34 S.F.

STA 65+22.33 TO STA 70+25

502.67 FT. X 4.5 FT

= 2263.82 S.F.

TOTAL

= 2612.34 S.F.

1/2" AGG. BASE 2612 X 1.0 FT / 27 = 96.7 C.Y.

TR 179

STA. 255+71.15 TO STA. 258+10.33

239.18 FT. X 24 FT. X 6/12 FT. / 27

= 106.31 C.Y.

TRANSITION

STA. 258+10.33 TO STA. 258+50

39.67 FT. X .5(24 + 20) FT. X 6/12 FT. / 27 = 16.17 C.Y.

RADIUS RETURN #2

STA. 105+86.80 TO STA. 256+11.77

((50)^2 X TAN(80/2) - PI(50)^2(80)/360) X 6/12 FT. / 27

= 6.53 C.Y.

RADIUS RETURN #3

STA. 104+60.85 TO STA. 256+33.25

((50)^2 X TAN(100/2) - PI(50)^2(100)/360) X 6/12 FT. / 27

= 14.78 C.Y.

TOTAL 6 1/2" ITEM 304 = 357 C.Y.

ITEM 304 8" AGGREGATE BASE, AS PER PLAN

TR 179

SHOULDER

STA. 256+11.77 TO STA. 258+50

238.23 FT. X 4 FT. X 8/12 FT. / 27

= 23.53 C.Y.

STA. 256+33.25 TO STA. 258+50

216.75 FT. X 4 FT. X 8/12 FT. / 27

= 21.41 C.Y.

RADIUS RETURN #2

SHOULDER

STA. 105+86.80 TO STA. 256+11.77

69.83 FT. X .5(4 + 8) FT. X 8/12 FT. / 27

= 10.35 C.Y.

RADIUS RETURN #3

STA. 104+60.85 TO STA. 256+33.25

87.25 FT. X .5(4 + 8) FT. X 8/12 FT. / 27

= 12.93 C.Y.

TOTAL 8" ITEM 304 = 68 C.Y.

TOTAL ITEM 304, AGGREGATE BASE, AS PER PLAN CARRIED TO GENERAL SUMMARY = 425 C.Y.

* 203 SUBGRADE COMPACTION PROVIDED FOR AREAS WHERE ITEM 203-
EMBANKMENT USING GRANULAR MATERIAL IS USED. SEE TYPICAL SECTIONS
FOR ACTUAL STATIONS.

PAVEMENT CALCULATIONS

CALC. BY	DPP
CHK BY	MMK

FHWA REGION	STATE	PROJECT
5	OHIO	

UNI-739-0.02

ITEM 310 SUBBASE, TYPE II, AS PER PLAN

3' SUBBASE, TYPE II (MIN.)

SR 739

STA. 1+00 TO STA. 40+56.92
3,957 FT. X 7 FT. X (3/12) FT./27 X 2 = 513 C.Y.
STA. 49+00 TO STA. 91+28
4,228 FT. X 7 FT. X (3/12) FT./27 X 2 = 548 C.Y.
STA. 92+47 TO STA. 106+00
1353 FT. X 7 FT. X (3/12) FT./27 X 2 = 175 C.Y.

TR 179

SHOULDER
STA. 254+70.15 TO STA. 254+84.77
14.62 FT. X .5(4 + 8) FT. X 3/12 FT. / 27 = 0.82 C.Y.
STA. 254+70.15 TO STA. 255+07.05
36.90 FT. X .5(4 + 8) FT. X 3/12 FT. / 27 = 2.05 C.Y.

RADIUS RETURN #1

STA. 254+84.77 TO STA. 106+08.56
87.25 FT. X 8.0 FT. X 3/12 FT. /27 = 6.47 C.Y.

RADIUS RETURN #4

STA. 255+07.05 TO STA. 104+82.74
69.83 FT. X 8.0 FT. X 3/12 FT. / 27 = 5.18 C.Y.
TOTAL 3' ITEM 310 SUBBASE, TYPE II, AS PER PLAN = 1251 C.Y.

6' SUBBASE, TYPE II

SR 739

STA. 1+00 TO STA. 40+56.92
3,957 FT. X 26 FT. X 0.5 FT. (AVG) / 27 = 1905 C.Y.
STA. 49+00 TO STA. 91+28
4228 FT. X 26 FT. X 0.5 FT. (AVG) / 27 = 2036 C.Y.
STA. 92+47 TO STA. 106+00.
1,353 FT. X 26 FT. X 0.5 FT. (AVG)/27 = 651 C.Y.

TR 179

STA. 254+70.15 TO STA. 255+47.15
77 FT. X 24 FT. X 6/12 FT. / 27 = 34.23 C.Y.

RADIUS RETURN #1

STA. 254+84.77 TO STA. 106+08.56
 $((50)^2 \times \tan(100/2) - \pi(50)^2(100)/360) \times 6/12 \text{ FT.}/27$
= 14.78 C.Y.

RADIUS RETURN #4

STA. 255+07.05 TO STA. 104+82.74
 $((50)^2 \times \tan(80/2) - \pi(50)^2(80)/360) \times 6/12 \text{ FT.}/27$
= 6.53 C.Y.
TOTAL 6' ITEM 310 SUBBASE, TYPE II = 4648 C.Y.

TOTAL ITEM 310 SUBBASE, TYPE II CARRIED TO GENERAL SUMMARY = 5899 C.Y.

ITEM 407 TACK COAT

STOKES ROAD

6273 S.F. X 1 S.Y./9 S.F. X 0.075 GAL./S.Y. = 52 GAL.

TR 179

7771 S.F. X 1 S.Y./9 S.F. X 0.075 GAL./S.Y. = 65 GAL.

TOTAL ITEM 407, TACK COAT, CARRIED TO GENERAL SUMMARY = 117 GAL.

ITEM 402 1-3/4" ASPHALT CONCRETE, AC-20

STOKES ROAD

6273.39 S.F. X 0.146 FT./27 = 33.9 C.Y.

TR 179

STA. 255+71.15 TO STA. 258+10.33
239.18 FT. X 24 FT. X 1.75/12 FT. / 27 = 31.01 C.Y.

TRANSITION

STA.258+10.33 TO STA. 258+50
39.67 FT. X .5(24+20) FT. X 1.75/12 FT. / 27 = 4.72 C.Y.

RADIUS RETURN #2

STA. 105+86.80 TO STA. 256+11.77
 $((50)^2 \times \tan(80/2) - \pi(50)^2(80)/360) \times 1.75/12 \text{ FT.} / 27$
= 1.91 C.Y.

RADIUS RETURN #3

STA. 104+60.85 TO STA. 256+33.25
 $((50)^2 \times \tan(100/2) - \pi(50)^2(100)/360) \times 1.75/12 \text{ FT.} / 27$
= 4.31 C.Y.

TOTAL ITEM 402, ASPHALT CONCRETE, AC-20 CARRIED TO GENERAL SUMMARY = 76 C.Y.

ITEM 404 1-1/4" ASPHALT CONCRETE, AC-20

STOKES ROAD

NE RADIUS 0.5 X (97^2(21'29"/57.295779) X (50+43.5) X (50-43.5)
= 516 S.F.

STA. 65+22.33 TO STA. 69+75, LT.
452.67 FT. X 12 FT. = 5432 S.F.

STA. 69+75 TO STA. 70+25, LT.
50 FT. X (12 + 1)/2 = 325 S.F.

TOTAL = 6273 S.F.
= 24 C.Y.

6273 X 0.104/27

TR 179

STA. 255+71.15 TO STA. 258+10.33
239.18 FT. X 24 FT. X 1.25/12 FT. / 27 = 22.17 C.Y.

TRANSITION

STA. 258+10.33 TO STA. 258+50
39.67 FT. X .5(24 +20) FT. X 1.25/12 FT. / 27 = 3.37 C.Y.

RADIUS RETURN #2

STA. 105+86.80 TO STA. 256+11.77
 $((50)^2 \times \tan(80/2) - \pi(50)^2(80)/360) \times 1.25/12 \text{ FT.} / 27$
= 1.36 C.Y.

RADIUS RETURN #3

STA. 104+60.85 TO STA. 256+33.25
 $((50)^2 \times \tan(100/2) - \pi(50)^2(100)/360) \times 1.25/12 \text{ FT.} / 27$
= 3.08 C.Y.

TOTAL ITEM 404, ASPHALT CONCRETE, AC-20 CARRIED TO GENERAL SUMMARY = 54 C.Y.

PAVEMENT CALCULATIONS

CALC. BY DPP
CHK BY MWK

FHWA REGION	STATE	PROJECT
5	OHIO	

13
79

UNI-739-0.02

ITEM 401 PRIME COAT

TR 179

STA. 255+71.15 TO STA. 258+10.33
239.18 FT. X 24 FT. / 9 = 637.82 S.Y.

SHOULDER

STA. 256+11.77 TO STA. 258+50
238.23 FT. X 4 FT. / 9 = 105.88 S.Y.

STA. 256+33.25 TO STA. 258+50
216.75 FT. X 4 FT. / 9 = 96.34 S.Y.

TRANSITION

STA. 258+10.33 TO STA. 258+50
39.67 FT. X .5(24 + 20) FT. / 9 = 96.97 S.Y.

RADIUS RETURN #2

STA. 105+86.80 TO STA. 256+11.77
 $((50)^2 \times \tan(80/2) - \pi(50)^2(80)/360) / 9 = 39.16 \text{ S.Y.}$

SHOULDER

69.83 FT. X .5(4 + 8) FT. / 9 = 46.56 S.Y.

RADIUS RETURN #3

STA. 104+60.85 TO STA. 256+33.25
 $((50)^2 \times \tan(100/2) - \pi(50)^2(100)/360) / 9 = 88.64 \text{ S.Y.}$

SHOULDER

87.25 FT. X .5(4 + 8) FT. / 9 = 58.17 S.Y.
TOTAL = 1169.54 S.Y.

TOTAL GALLONS = 1169.54 X 0.4 = 467.82 GAL.

TOTAL ITEM 408, PRIME COAT CARRIED TO GENERAL SUMMARY = 468 GAL.

ITEM 401 SEAL COAT BITUMINOUS MATERIAL

STOKES ROAD

SHOULDER

2346.1 S.F./9 X 0.30 = 78.2 GAL.

TR 179

SHOULDER

STA. 256+11.77 TO STA. 258+50
238.23 FT. X 4 FT. / 9 = 105.88 S.Y.

STA. 256+33.25 TO STA. 258+50
216.75 FT. X 4 FT. / 9 = 96.34 S.Y.

RADIUS RETURN #2

STA. 105+86.80 TO STA. 256+11.77
69.83 FT. X .5(4 + 8) FT. / 9 = 46.56 S.Y.

RADIUS RETURN #3

STA. 104+60 TO STA. 256+33.25
87.25 FT. X .5(4 + 8) FT. / 9 = 58.17 S.Y.

TOTAL = 306.95 S.Y.

TOTAL GALLONS = 306.95 X 0.3 = 92.09 GAL.

TOTAL ITEM 409, SEAL COAT CARRIED TO GENERAL SUMMARY = 170 GAL.

ITEM 401 SEAL COAT COVER AGGERGATE

STOKES ROAD

SHOULDER

2346.1 S.F./9 X 0.008 CY/SY = 2.09 C.Y.

TR 179(SHOULDER AND RADIUS RETURNS)

306.95 S.Y. X 0.0008 C.Y./S.Y. = 2.46 C.Y.

ITEM 409 CARRIED TO GENERAL SUMMARY = 5 C.Y.

ITEM 451 9" REINFORCED CONCRETE PAVEMENT,AS PER PLAN

STA. 1+00 TO STA. 40+56.92

3957 FT. X 24 FT. / 9 = 10,552 S.Y.

STA. 49+00 TO STA. 91+28

4,228 FT. X 24 FT. / 9 = 11,275 S.Y.

STA. 92+47 TO STA. 106+00

1,353 FT. X 24 FT. / 9 = 3,608 S.Y.

TR 179

STA. 254+70.15 TO STA. 255+47.15 = 77.0 FT.

77 FT. X 24 FT./ 9 = 205.34 S.Y.

RADIUS RETURN #1

STA. 254+84.77 TO STA. 106+08.56

$((50)^2 \times \tan(100/2) - \pi(50)^2(100)/360) / 9 = 88.64 \text{ S.Y.}$

RADIUS RETURN #4

STA 255+07.05 TO STA. 104+82.74

$((50)^2 \times \tan(80/2) - \pi(50)^2(80)/3600) / 9 = 39.16 \text{ S.Y.}$

TOTAL ITEM 451,REINFORCED CONCRETE PAVEMENT CARRIED TO GENERAL SUMMARY
(AS PER PLAN) = 25,768 S.Y

ITEM 452 6" PLAIN CONCRETE PAVEMENT (MIN.),AS PER PLAN

SHOULDER

STA. 1+00 TO STA. 40+56.92

3957 FT. X 8 FT. X 2/9 = 7035 S.Y.

STA. 49+00 TO STA. 91+28

4,228 FT. X 8 FT. X 2/9 = 7516 S.Y.

STA. 92+47 TO STA. 106+00

1,353 FT. X 8 FT. X 2/9 = 2405 S.Y.

TR 179

SHOULDER

STA. 254+70.15 TO STA. 254+84.77

14.62 FT. X 1/2(4 + 8) FT. /9 = 9.75 S.Y.

STA. 254+70.15 TO STA. 255+07.05

36.90 FT. X .5(4 + 8) FT. /9 = 24.60 S.Y.

RADIUS RETURN #1

STA. 254+84.77 TO STA. 106+08.56

69.83 FT. X 8.0 FT. / 9 = 62.07 S.Y.

RADIUS RETURN #4

STA 255+07.05 TO STA. 104+82.74

69.83 FT. X 8.0 FT. / 9 = 62.07 S.Y.

TOTAL 6"ITEM 452,PLAIN CONCRETE PAVEMENT CARRIED TO GENERAL SUMMARY
(AS PER PLAN) = 17,115 S.Y.

PAVEMENT CALCULATIONS

CALC. BY	DPP
CHK BY	MW

FHWA REGION	STATE	PROJECT	
5	OHIO		

UNI-739-0.02

ITEM SPECIAL 6" LIME/SOIL STABILIZED SUBGRADE

STA. 1+00 TO STA. 40+56.92
* 3,207 FT. X 13.25 FT. X 2 / 9 = 9,443 S.Y.
STA. 49+00 TO STA. 91+28
* 3,928 FT. X 13.25 FT. X 2 / 9 = 11,566 S.Y.
STA. 92+47 TO STA. 106+00
1,353 FT. X 13.25 FT. X 2 / 9 = 3,984 S.Y.

SHOULDER
STA. 1+00 TO STA. 40+56.92
* 3,207 FT. X 5.25 FT. X 2 / 9 = 3,742 S.Y.
STA. 49+00 TO STA. 91+28
3,928 FT. X 5.25 FT. X 2 / 9 = 4,583 S.Y.
STA. 92+47 TO STA. 106+00
1,353 FT. X 5.25 FT. X 2 / 9 = 1,579 S.Y.

STOKES ROAD
8885.55 S.F. / 9 = 987 S.Y.

TR 179
STA. 254+70.15 TO STA. 255+47.15
77 FT. X 24 FT. / 9 = 205 S.Y.
SHOULDER
STA. 254+70.15 TO STA. 254+84.77
14.62 FT. X .5(4 + 8) FT. / 9 = 10 S.Y.
STA. 254+70.15 TO STA. 255+07.05
36.90 FT. X .5(4 + 8) FT. / 9 = 25 S.Y.

RADIUS RETURN #1
STA. 254+84.77 TO STA. 106+08.56
 $((50)^2 \times \tan(100/2) - \pi(50)^2(100)/360) / 9$
= 89 S.Y.

SHOULDER
STA. 254+84.77 TO STA. 106+08.56
87.25 FT. X 8.0 FT. / 9 = 78 S.Y.

RADIUS RETURN #4
STA. 255+07.05 TO STA. 104+82.74
 $((50)^2 \times \tan(80/2) - \pi(50)^2(80)/360) / 9$
= 39 S.Y.

SHOULDER
STA. 255+07.05 TO STA. 104+82.74
69.83 FT. X 8.0 FT. / 9 = 62 S.Y.

TOTAL ITEM SPECIAL, LIME/SOIL STABILIZED SUBGRADE CARRIED TO GENERAL SUMMARY = 36,392 S.Y.

ITEM SPECIAL - HYDRATED LIME

36,392 S.Y. X 22 LBS./S.Y. X 1 TON /2000LBS = 400 TONS
TOTAL CARRIED TO GENERAL SUMMARY

ITEM 616 WATER - 36,392 S.Y. X 3 GAL/S.Y. X 1/1000 = 109 MGAL.
TOTAL CARRIED TO GENERAL SUMMARY

ITEM 203 - EMBANKMENT USING GRANULAR MATERIAL

STA. 15+00 - 18+50 = 350.00'
STA. 27+00 - 31+00 = 400.00'
STA. 63+00 - 66+00 = 300.00'

TOTAL = 1050'

1050 FT. X 13.25 FT. X 2 FT. X 2 / 27 = 2,061 C.Y.
SHOULDERS
1050 FT. X 5.25 FT. X 2 FT. X 2 / 27 = 817 C.Y.

TOTAL ITEM 203 - EMBANKMENT USING GRANULAR MATERIAL
CARRIED TO GENERAL SUMMARY: = 2878 C.Y.

ITEM 659 COMMERCIAL FERTILIZER

FROM SHEETS 20-30, 60,64
TOTAL SEEDING AREA = 93399 S.Y. (INCLUDES 13 S.Y. SODDING & 1372 S.Y. DITCH EROSION PROTECTION)
93399 S.Y. X 9 S.F./S.Y. X 20 LBS./1000 S.F. X 1 TON/2000 LBS. = 8.41 TONS
FOR A TWO CONSTRUCTION SEASON PROJECT
93399 S.Y. X 9 S.F./S.Y. X 7.5 LBS./1000 S.F. X 1 TON/2000 LBS. = 3.15 TONS
TOTAL CARRIED TO GENERAL SUMMARY = 11.56 TONS

* IN ORDER TO PREVENT SATURATION OF THE SOIL BY FLOODING, 2 FT. OF 203.02 GRANULAR MATERIAL HAS BEEN PROVIDED TO BE USED BELOW THE TOP OF SUBGRADE IN SOME AREAS. THE LIME/SOIL STABILIZED SUBGRADE WILL NOT BE USED IN THESE AREAS. THESE QUANTITIES REFLECT THE DEDUCTION FOR THESE AREAS. FOR LOCATIONS OF THE GRANULAR FILL SECTIONS SEE ITEM 203 - EMBANKMENT USING GRANULAR MATERIAL ON THIS SHEET.

UNI-739-0.02

SUPERELEVATION TABLE

ELEVATION LEFT	ION EDGE	WIDTH	LEFT EDGE PAVEMENT	STATION	PROFILE GRADE ELEVATION	CENTER-LINE OF PAVEMENT	CENTER-LINE ELEVATION	WIDTH	ELEVATION RIGHT EDGE
1080.80	12'		375' PAVEMENT EDGE TRANSITION	8+00.28	1080.99		1080.99	12'	1080.80
1080.57	12'			8+25.00	1080.70		1080.70	12'	1080.51
1080.34	12'			8+50.00	1080.40		1080.40	12'	1080.21
1080.09	12'			8+75.28	TS 1080.09		1080.09	12'	1079.91
1079.86	12'			9+00.00	1079.80		1079.80	12'	1079.61
1079.62	12'			9+25.00	1079.50		1079.50	12'	1079.31
1079.39	12'			9+50.28	1079.20		1079.20	12'	1079.01
1079.26	12'			9+75.00	1078.90		1078.99	12'	1078.71
1079.12	12'			10+00.00	1078.58		1078.76	12'	1078.39
1079.98	12'			10+25.00	1078.26		1078.53	12'	1078.07
1079.83	12'			10+50.00	1077.93		1078.29	12'	1077.74
1079.68	12'			10+75.00	1077.60		1078.05	12'	1077.41
1079.51	12'		11+00.00	1077.25		1077.79	12'	1077.06	
1079.34	12'		11+25.00	1076.90		1077.53	12'	1076.71	
1079.15	12'		11+50.00	1076.53		1077.25	12'	1076.34	
1079.96	12'		11+75.28	SC 1076.16		1076.97	12'	1075.97	
1079.79	12'		12+00.00	1075.78		1076.59	12'	1075.59	
1079.21	12'		12+25.00	1075.40		1076.21	12'	1075.21	
1079.81	12'		12+50.00	1075.00		1075.81	12'	1074.81	
1079.41	12'		12+75.00	1074.60		1075.41	12'	1074.41	
1079.01	12'		13+00.00	1074.20		1075.01	12'	1074.01	
1079.61	12'		13+25.00	1073.80		1074.61	12'	1073.61	
1079.21	12'		13+50.00	1073.40		1074.21	12'	1073.21	
1079.81	12'		13+75.00	1073.00		1073.81	12'	1072.81	
1079.41	12'		14+00.00	1072.60		1073.41	12'	1072.41	
1079.01	12'		14+25.00	1072.20		1073.01	12'	1072.01	
1079.61	12'		14+50.00	1071.80		1072.61	12'	1071.61	
1079.21	12'		14+75.00	1071.40		1072.21	12'	1071.21	
1079.81	12'		15+00.00	1071.00		1071.81	12'	1070.81	
1079.41	12'		15+25.00	1070.60		1071.41	12'	1070.41	
1079.03	12'		15+50.00	1070.22		1071.03	12'	1070.03	
1079.69	12'		15+75.00	1069.88		1070.69	12'	1069.69	
1079.39	12'		16+00.00	1069.58		1070.39	12'	1069.39	
1079.13	12'		16+25.00	1069.32		1070.13	12'	1069.13	
1079.91	12'		16+50.00	1069.10		1069.91	12'	1068.91	
1079.73	12'		16+75.00	1068.92		1069.73	12'	1068.73	
1079.59	12'		17+00.00	1068.78		1069.59	12'	1068.59	
1079.49	12'		17+25.00	1068.68		1069.49	12'	1068.49	
1079.43	12'		17+50.00	1068.62		1069.43	12'	1068.43	
1079.41	12'		17+75.00	1068.60		1069.41	12'	1068.41	
1079.43	12'		18+00.00	1068.62		1069.43	12'	1068.43	
1079.49	12'		18+25.00	1068.68		1069.49	12'	1068.49	
1079.57	12'		18+50.00	1068.76		1069.57	12'	1068.57	
1079.65	12'		18+75.00	1068.84		1069.65	12'	1068.65	
1079.73	12'		19+00.00	1068.92		1069.73	12'	1068.73	
1079.81	12'		19+25.00	1069.00		1069.81	12'	1068.81	
1079.89	12'		19+50.00	1069.08		1069.89	12'	1068.89	
1079.97	12'		19+75.00	1069.16		1069.97	12'	1068.97	
1079.05	12'		20+00.00	1069.24		1070.05	12'	1069.05	
1079.08	12'		20+09.68	CS 1069.27		1070.08	12'	1069.08	

[illegible]

SUPERELEVATION TABLE

UNI-739-0.02

FROM STA. 40+56.92 TO STA. 49+00 SEE PROJECT UNI-739-CONRAIL CROSSING FOR REVISIONS.

ELEVATION LEFT EDGE	WIDTH	STATION	PROFILE ELEVATION	CENTER-LINE OF PAVEMENT	CENTER-LINE ELEVATION	RIGHT EDGE PAVEMENT	WIDTH	RIGHT EDGE ELEVATION
1068.99	12'	40+56.92	1069.18	125' PAVEMENT CENTER LINE TRANSITION	1069.18	275' PAVEMENT EDGE TRANSITION	12'	1068.99
1069.40	12'	40+75.00	1069.59		1069.59		12'	1069.53
1069.31	12'	41+00.00	1069.50		1069.50		12'	1069.50
1069.22	12'	41+31.92	1069.41		1069.41		12'	1069.47
1069.13	12'	41+50.00	1069.32		1069.32		12'	1069.45
1069.04	12'	41+75.00	1069.23		1069.23		12'	1069.42
1068.95	12'	42+06.92	1069.14		1069.14		12'	1069.39
1068.86	12'	42+25.00	1069.05		1069.11		12'	1069.41
1068.78	12'	42+50.00	1068.96		1069.08		12'	1069.45
1068.68	12'	42+75.00	1068.87		1069.05		12'	1069.48
1068.59	12'	43+00.00	1068.78		1069.02		12'	1069.51
1068.46	12'	43+31.92	1068.69		1068.95		12'	1069.44
1068.38	12'	43+50.00	1068.60	1068.87	12'	1069.36		
1068.31	12'	43+75.00	1068.52	1068.80	12'	1069.29		
1068.23	12'	44+00.00	1068.42	1068.72	12'	1069.21		
1068.17	12'	44+25.00	1068.34	1068.66	12'	1069.15		
1068.10	12'	44+50.00	1068.27	1068.59	12'	1069.08		
1068.03	12'	44+75.00	1068.21	1068.52	12'	1069.01		
1067.97	12'	45+00.00	1068.16	1068.46	12'	1068.95		
1067.94	12'	45+25.00	1068.13	1068.43	12'	1068.92		
1067.92	12'	45+50.00	1068.11	1068.41	12'	1068.90		
1067.92	12'	45+75.00	1068.11	1068.41	12'	1068.90		
1067.92	12'	46+00.00	1068.11	1068.41	12'	1068.90		
1067.94	12'	46+25.00	1068.13	1068.43	12'	1068.92		
1067.98	12'	46+50.00	1068.17	1068.47	12'	1068.96		
1068.02	12'	46+75.00	1068.21	1068.51	12'	1069.00		
1068.08	12'	47+00.00	1068.27	1068.57	12'	1069.06		
1068.15	12'	47+25.00	1068.34	1068.64	12'	1069.13		
1068.21	12'	47+50.00	1068.40	1068.70	12'	1069.19		
1068.28	12'	47+75.00	1068.47	1068.77	12'	1069.26		
1068.34	12'	48+00.00	1068.53	1068.83	12'	1069.32		
1068.41	12'	48+25.00	1068.60	1068.90	12'	1069.39		
1068.47	12'	48+50.00	1068.66	1068.96	12'	1069.45		
1068.54	12'	48+75.00	1068.73	1069.03	12'	1069.52		
1068.60	12'	49+00.00	1068.79	1069.09	12'	1069.58		
1068.67	12'	49+25.00	1068.86	1069.16	12'	1069.65		
1068.73	12'	49+50.00	1068.92	1069.22	12'	1069.71		
1068.80	12'	49+75.00	1068.99	1069.29	12'	1069.78		
1068.86	12'	50+00.00	1069.05	1069.35	12'	1069.84		
1068.93	12'	50+25.00	1069.12	1069.42	12'	1069.91		
1068.99	12'	50+50.00	1069.18	1069.48	12'	1069.97		
1069.06	12'	50+75.00	1069.25	1069.55	12'	1070.04		
1069.12	12'	51+00.00	1069.31	1069.61	12'	1070.10		
1069.19	12'	51+25.00	1069.38	1069.68	12'	1070.17		
1069.25	12'	51+50.00	1069.44	1069.74	12'	1070.23		
1069.32	12'	51+75.00	1069.51	1069.81	12'	1070.30		
1069.38	12'	52+00.00	1069.57	1069.87	12'	1070.36		
1069.45	12'	52+25.00	1069.64	1069.94	12'	1070.43		
1069.51	12'	52+50.00	1069.70	1070.00	12'	1070.49		
1069.58	12'	52+75.00	1069.77	1070.07	12'	1070.56		
1069.64	12'	53+00.00	1069.83	1070.13	12'	1070.62		
1069.71	12'	53+25.00	1069.90	1070.20	12'	1070.69		
1069.77	12'	53+50.00	1069.96	1070.26	12'	1070.75		
1069.84	12'	53+75.00	1070.03	1070.33	12'	1070.82		

[illegible]

SHALLOW UNDERDRAIN OUTLET DETAILS

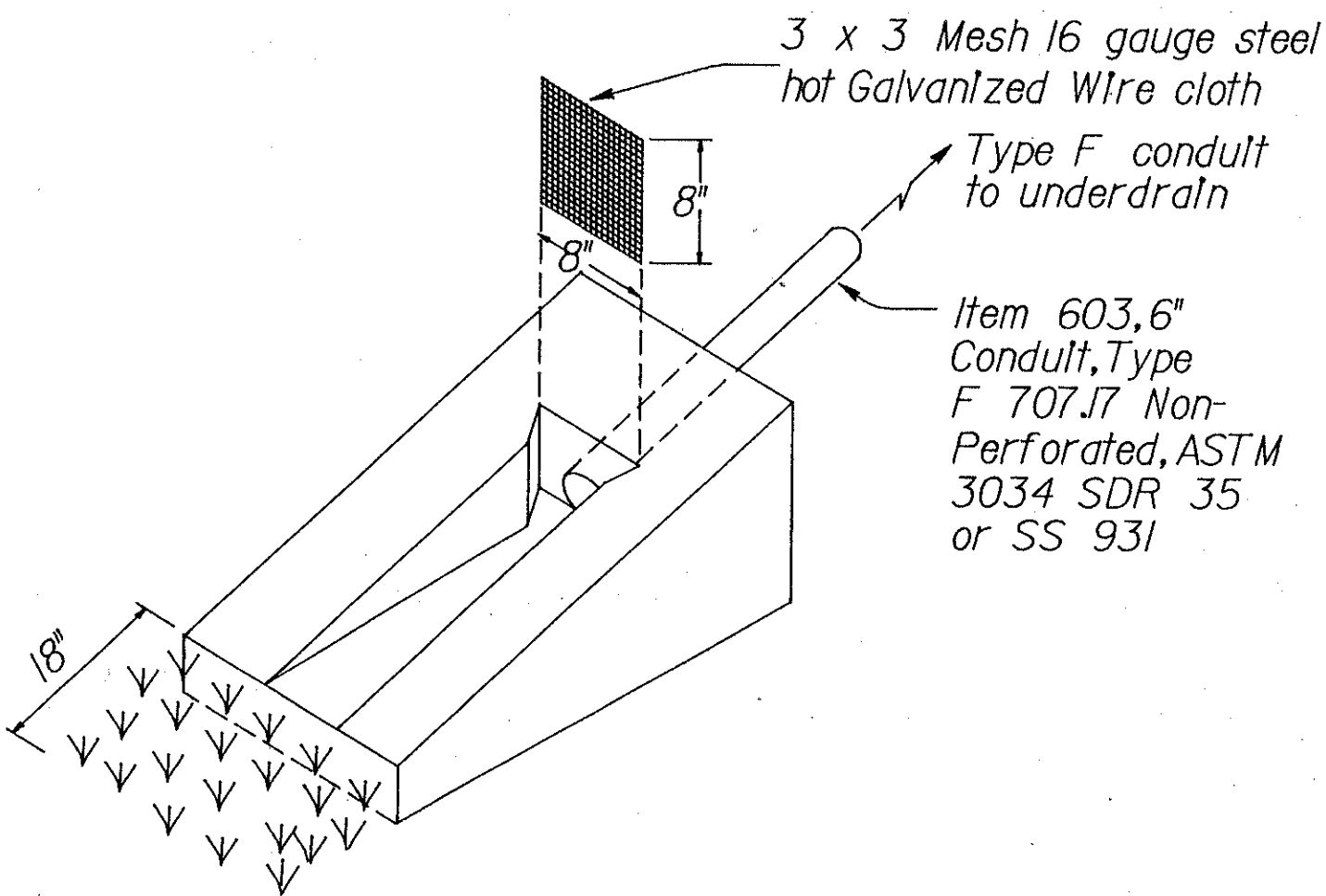
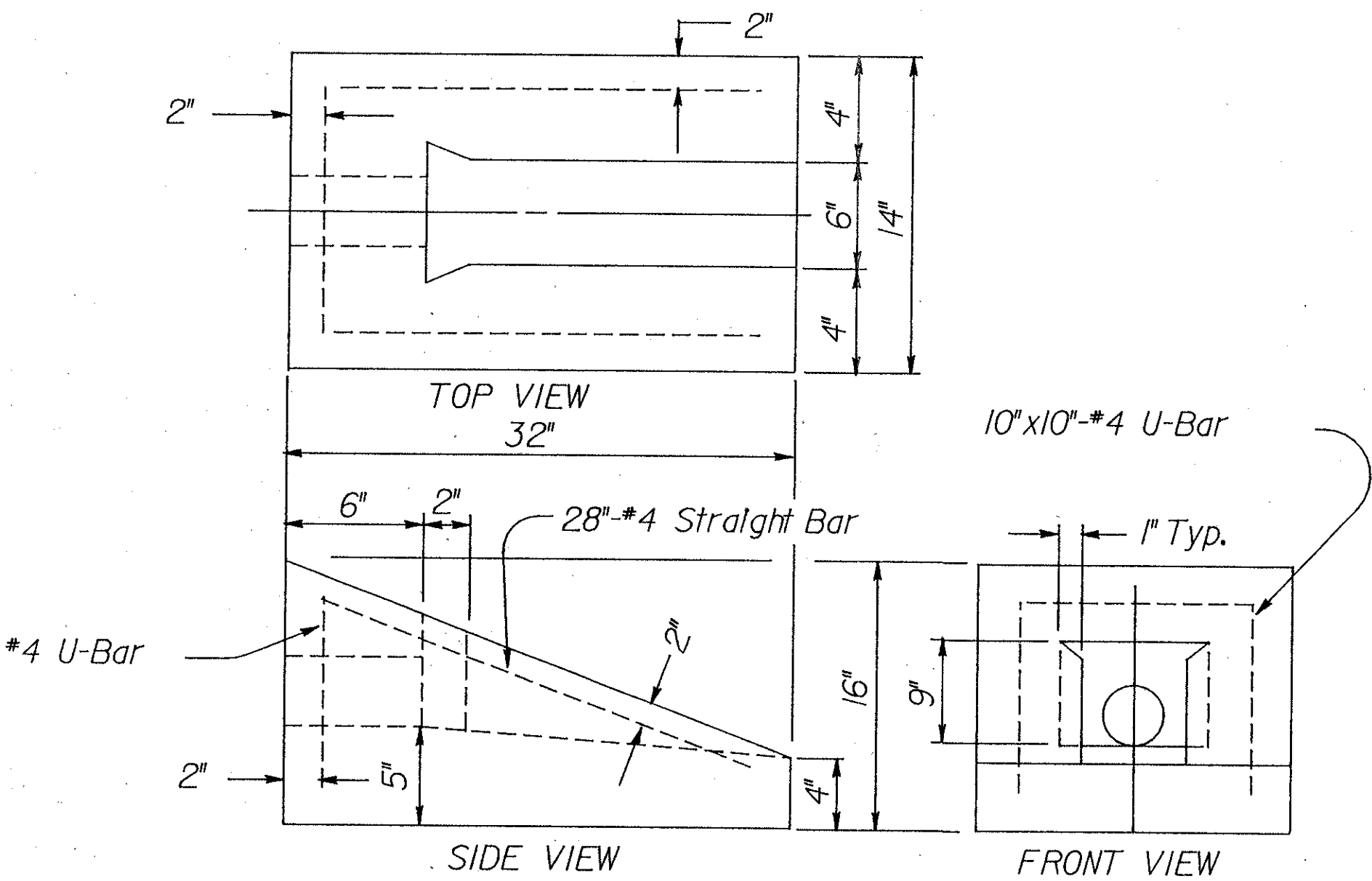
FHWA REGION	STATE	PROJECT	
5	OHIO		

17
79

UNI-739-0.02

ITEM SPECIAL - PRECAST REINFORCED
CONCRETE OUTLET

The Concrete outlet shall meet the requirements of
Item 604 In the Construction & Materials Specifications.
Payment shall be made on an Each basis. Payment shall
Include the cost of the Sod & Wire Cloth.



NOTE: The Sod shall be in accordance with
Item 660 and staked at each corner
approximately 3 inches in from the edge.

TWIN PIPE HEADWALL DETAIL

STATION 105+00

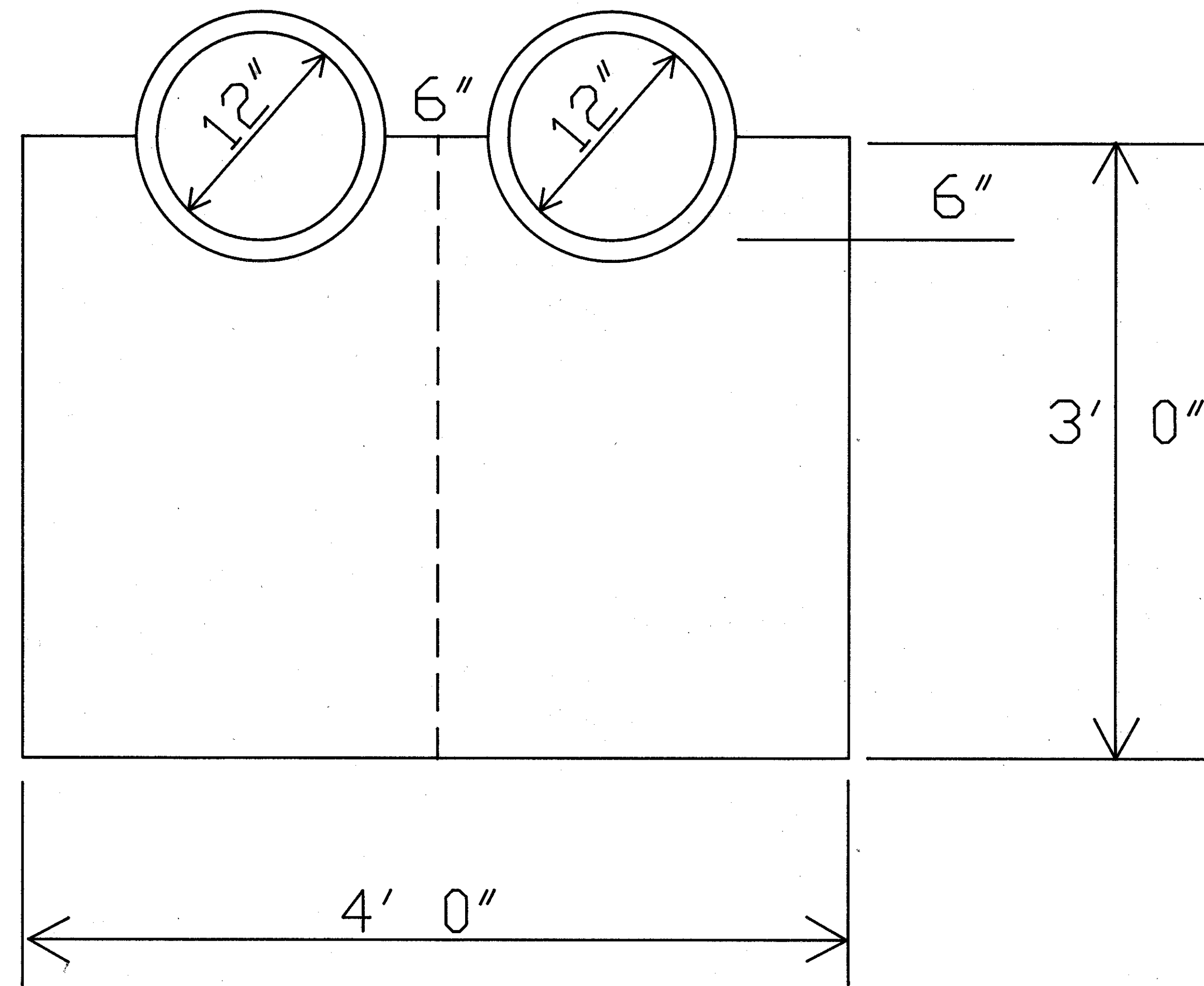
FHWA REGION	STATE	PROJECT	
5	OHIO		

18
79

UNI-739-0.02

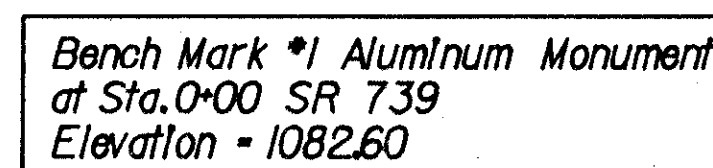
MODIFIED HW-4B HEADWALL

A HEADWALL IS TO BE PROVIDED AT BOTH ENDS OF THE PIPE
FOR ANY DETAILS NOT SHOWN SEE HW-4B



FOR ADDITIONAL DETAILS OF PIPES SEE:
PLAN AND PROFILE SHEET NO. 30
CROSS SECTION SHEET NO. 52

NOTE: FOR DRIVE DETAILS AND PROFILE SEE SHEET 53
NOTE: SEE STD DRAWING BP-6



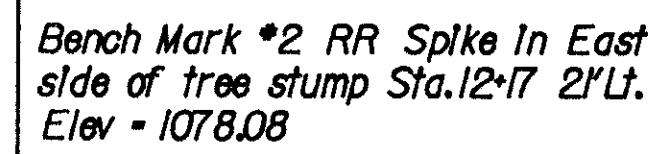
TOTALS		50	1000
NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10			

NOTE: FOR DRIVE DETAIL SEE SHEET 53.

7077 NON-PERFORATED ASTM 3034 SDR35 OR SS93/

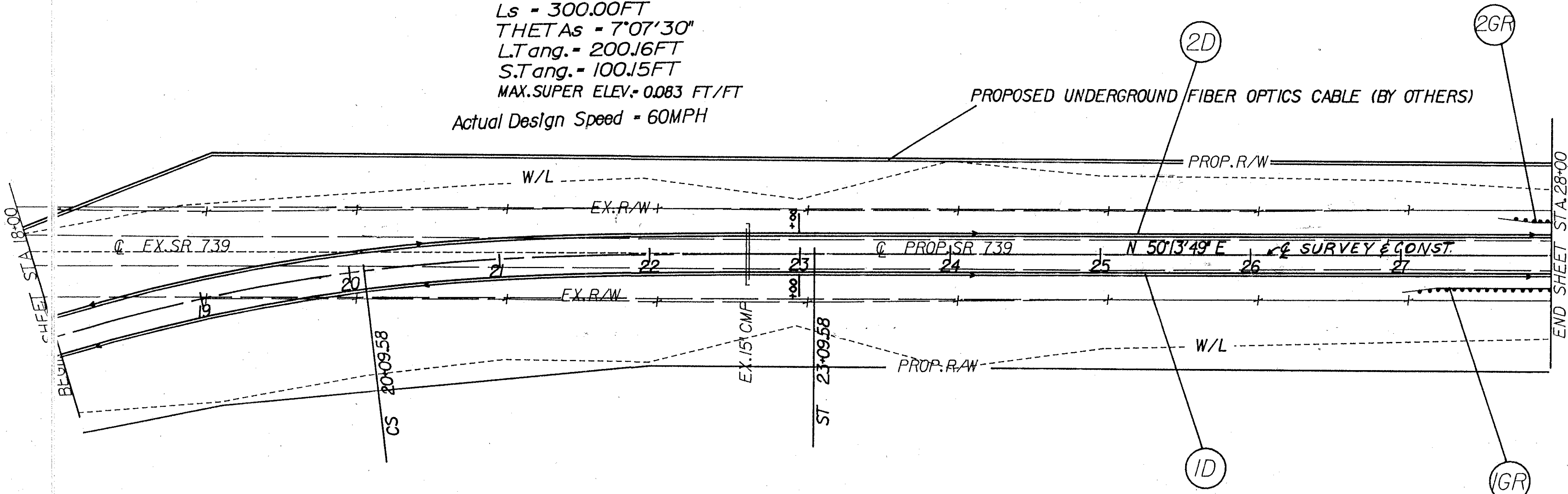
NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10

PLAN & PROFILE STA. 8+00 TO STA 18+00

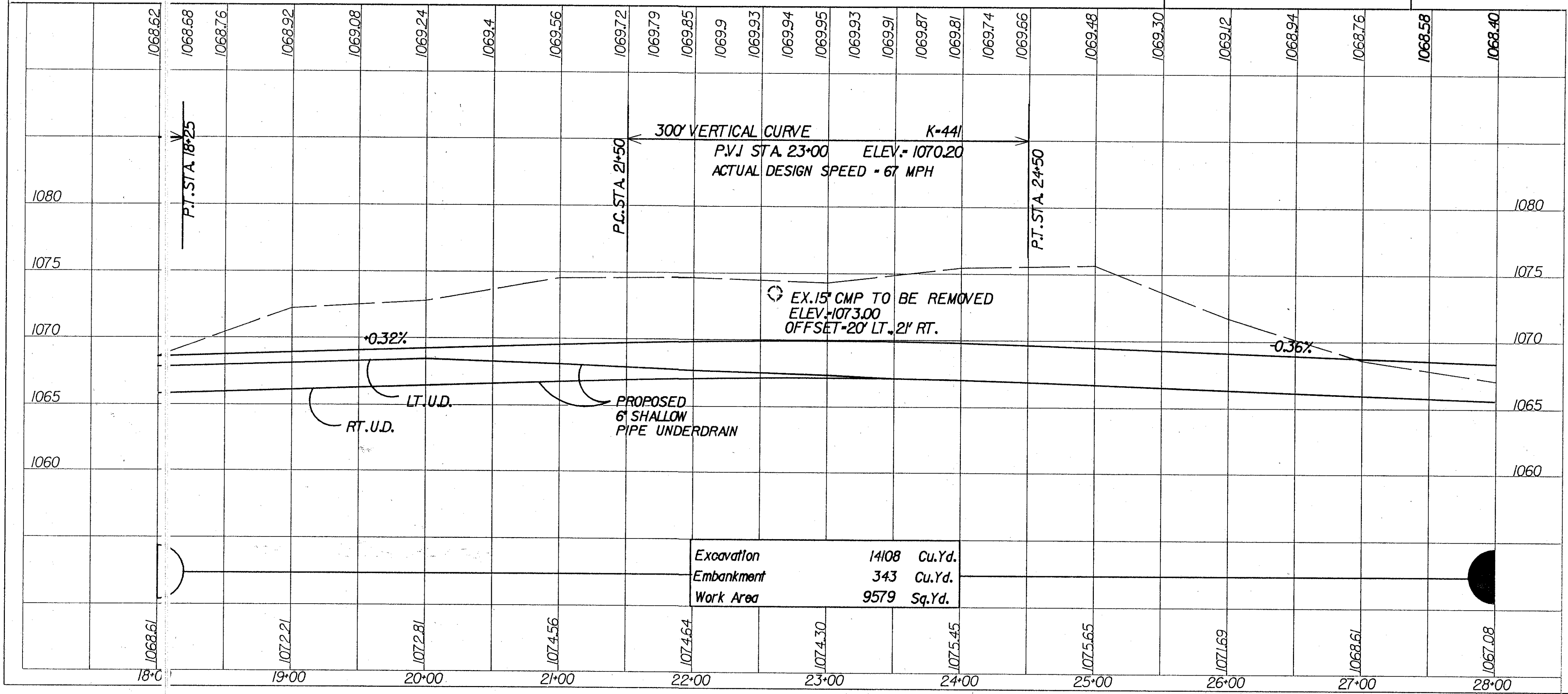


UNI-739-0.02

CURVE DATA
P.I. STA. = 16+39.85
R = 1206.23FT
L = 834.12FT
T = 434.52FT
Delta = 39°37'15"
Dc = 4°45'00"
External = 75.88FT
Ls = 300.00FT
THETAs = 7°07'30"
LTang. = 200.16FT
STang. = 100.15FT
MAX. SUPER ELEV. = 0.083 FT/FT
Actual Design Speed = 60MPH



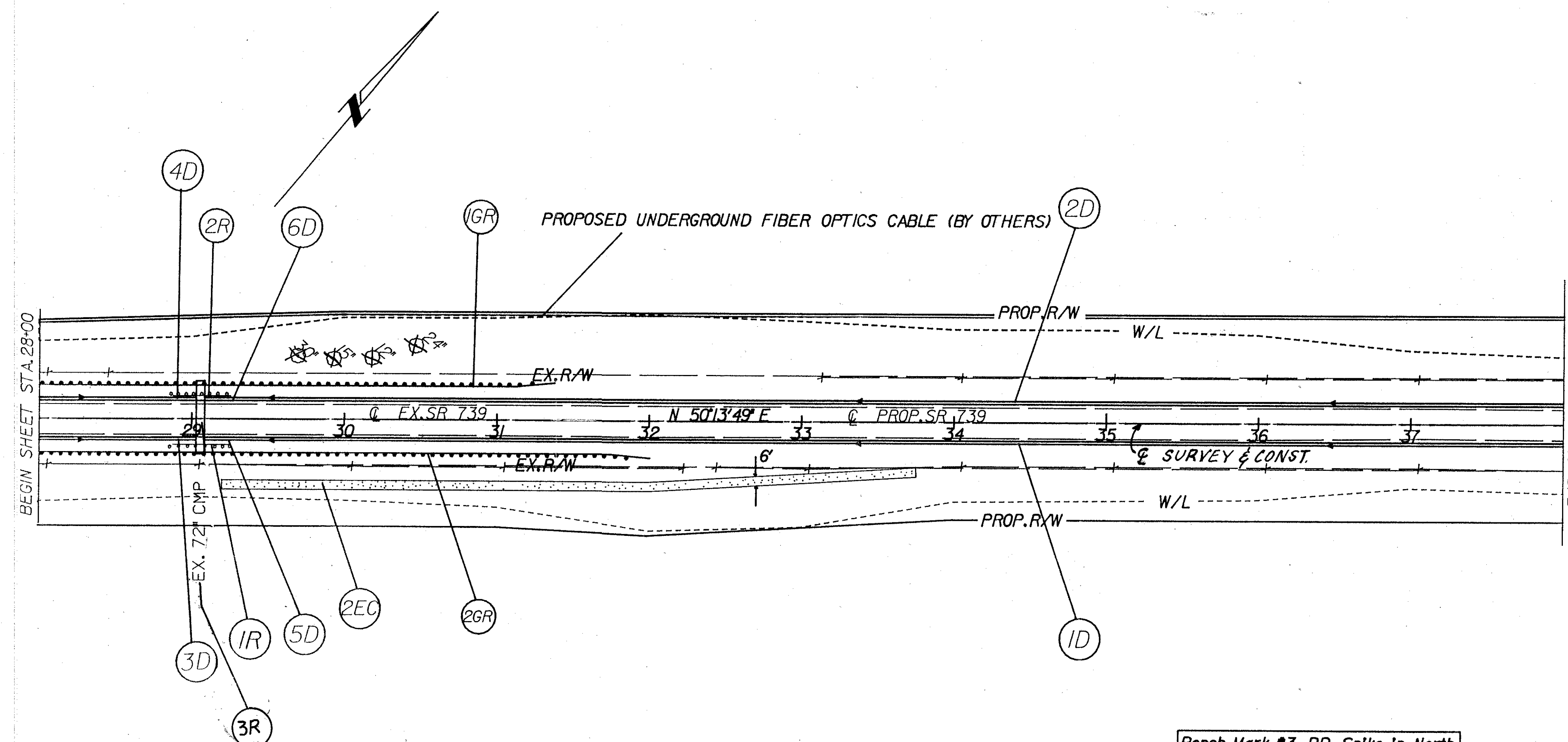
Bench Mark *3 RR Spike In North
Side of Sawed off Power Pole
Sta. 33+13 29' Lt Elev = 1072.80



Excavation	14108	Cu.Yd.
Embankment	343	Cu.Yd.
Work Area	9579	Sq.Yd.

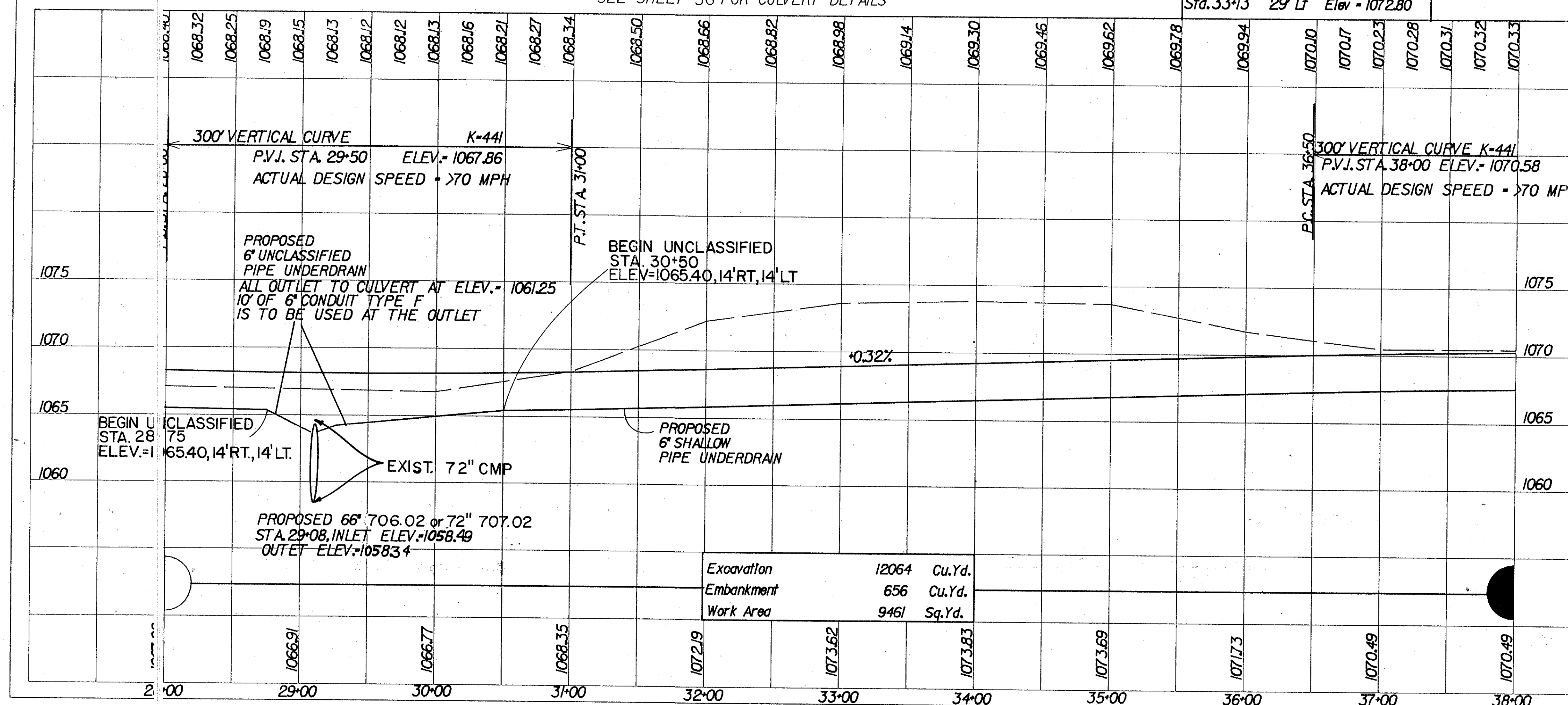
ESTIMATED QUANTITIES									
REF. NO.	STATION	SIDE	FROM	TO	LIN. FT.	EACH	TOTAL	UNIT	TOTAL
ID	18+00	R	18+00	28+00	1000				
2D	18+00	L	18+00	28+00	1000				
IGR	27+00	R	27+00	28+00					
2GR	27+52.5	L	27+52.5	28+00					
TOTALS									
NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10									

UNI-739-0.02



SEE SHEET 56 FOR CULVERT DETAILS

Bench Mark *3 RR Spike In North
Side of Sawed off Power Pole
Sta. 33+13 29' Lt Elev = 1072.80



* 7017 NON-PERFORATED ASTM 3034 SDR35 OR SS931

ESTIMATED QUANTITIES																			
REF. NO.	STATION	SIDE																	
			TO		605		603		605										
			FROM		UN.FT.	LIN.FT.	UN.FT.	LIN.FT.	UN.FT.	LIN.FT.									
1D	28+00	R	28+00	38+00															
2D	28+00	L	28+00	38+00															
3D	28+05	R	28+05	29+05															
4D	28+05	L	28+05	29+05															
5D	29+05	R	29+05	30+50															
6D	29+11	L	29+11	30+50															

FHWA REGION	STATE	PROJECT	
5	OHIO		

24
79

Delta = $19^{\circ}20'00''$
 Dc = $130'00''$
 External = 55.02FT
 Ls = 200.00FT
 THETAs = $130^{\circ}00''$
 L.Tang. = 133.34FT
 S.Tang. = 66.67FT
 MAX. SUPERELEVATION = 0.041
 Actual Design Speed = 60MPH

SUSPEND PROJECT
 STA 40+56.92

PROPOSED UNDERGROUND FIBER
 OPTICS CABLE (BY OTHERS)

PROP. R/W
 EX. R/W
 EX. SR 739
 EX. 78" R.C.P.
 W/L
 TS 43+31.92
 SC 43+31.92
 N $50^{\circ}13'49''$ E
 39 40 41 42 43 44 45 46 47
 9
 HONDA RAIL SPUR
 CIV. SHEET STA. 48+00

300' VERTICAL CURVE K=441
P.V.I. STA. 38+00 ELEV. = 1070.58
ACTUAL DESIGN SPEED MET = 67 MPH

P.T. STA. 39+50

SUSPEND PROJECT STA. 40+56.92

CONNECT TO EXISTING UNDERDRAIN STA. 40+56.92, ELEV. = 1066.80, 14" RT. STA. 40+56.92, ELEV. = 1066.82, 14" LT.

EXISTING 6" SHALLOW PIPE UNDERDRAIN

LT.U.D. RT.U.D.

EX. 300' VERTICAL CURVE K=484
P.V.I. STA. 45+50 ELEV. = 1067.88
ACTUAL DESIGN SPEED MET = 67 MPH

EXISTING 6" UNCLASSIFIED PIPE UNDERDRAIN
ALL OUTLET INTO PIPE AT ELEV. = 1059.50
10' OF 6" CONDUIT TYPE F AT OUTLET

EX. 78" R.C.P.

C/L R/R STA. 47+35

Excavation	301	Cu.Yd.
Embankment	550	Cu.Yd.
Work Area	1856	Sq.Yd.

[illegible]

TOTALS					512
NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10					

PLAN & PROFILE STA. 38+00 TO STA 48+00

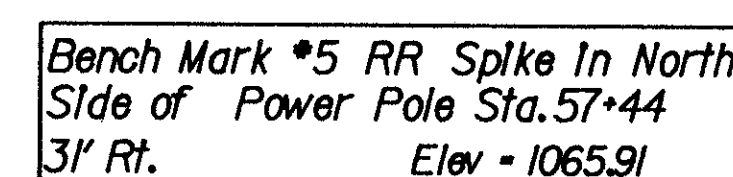
Delta = 19°20'00"
 Dc = 1°30'00"
 External = 55.02FT
 Ls = 200.00FT
 THETAs = 1°30'00"
 LTang. = 133.34FT
 S.Tang. = 66.67FT
 Actual Design Speed = 60MPH

UNDERGROUND FIBER OPTICS CABLE
 PI 49+86.02
 PROP. R/W
 PROP. SB 739
 EX. R/W
 W/L
 EX. 12' CMP
 PROP. R/W
 EX. R/W
 W/L
 CS 58+20.82
 STA 58+00
 49, 50, 51, 52, 53, 54, 55, 56, 57
 2D, 5D, 4D, 1D, 3D, 1DR
 PRESUME PROJECT STA 49+00

F.H.W.A REGION	STATE	PROJECT	
5	OHIO		

25
79

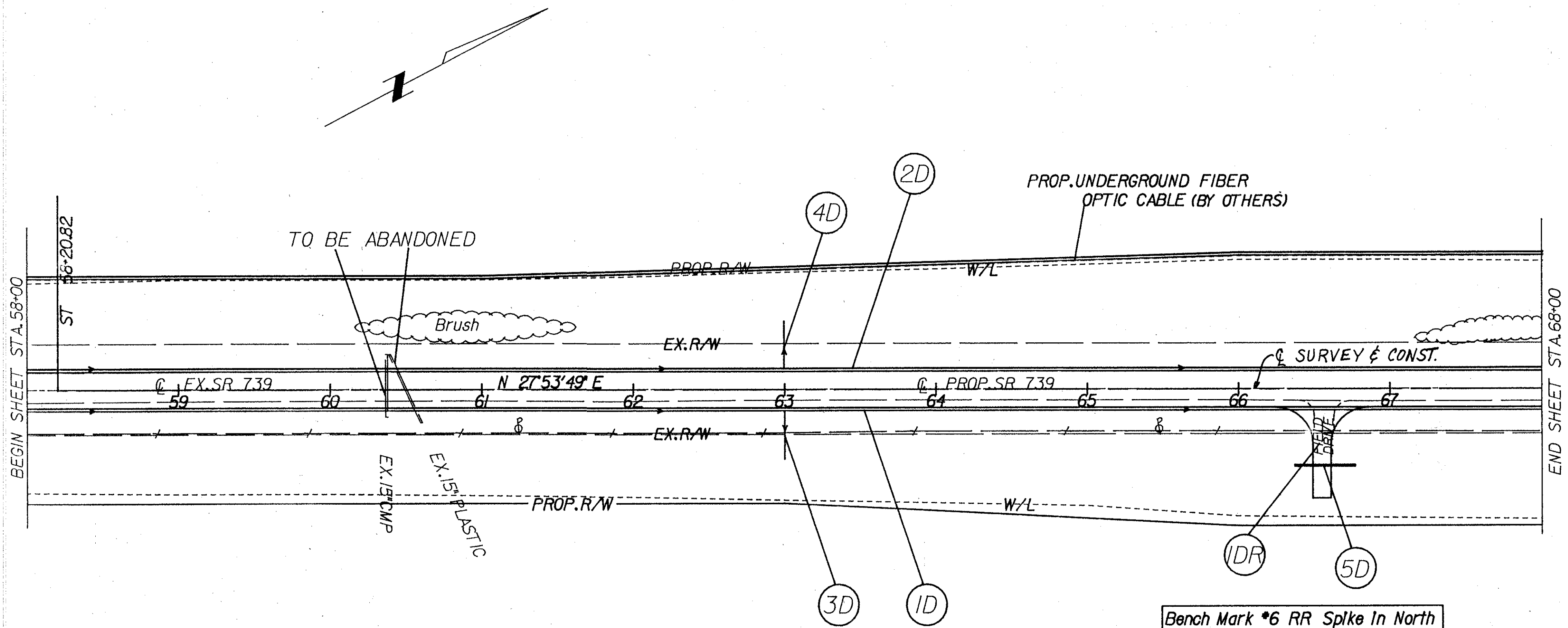
SEE SHEET 53 FOR DRIVE PROFILE



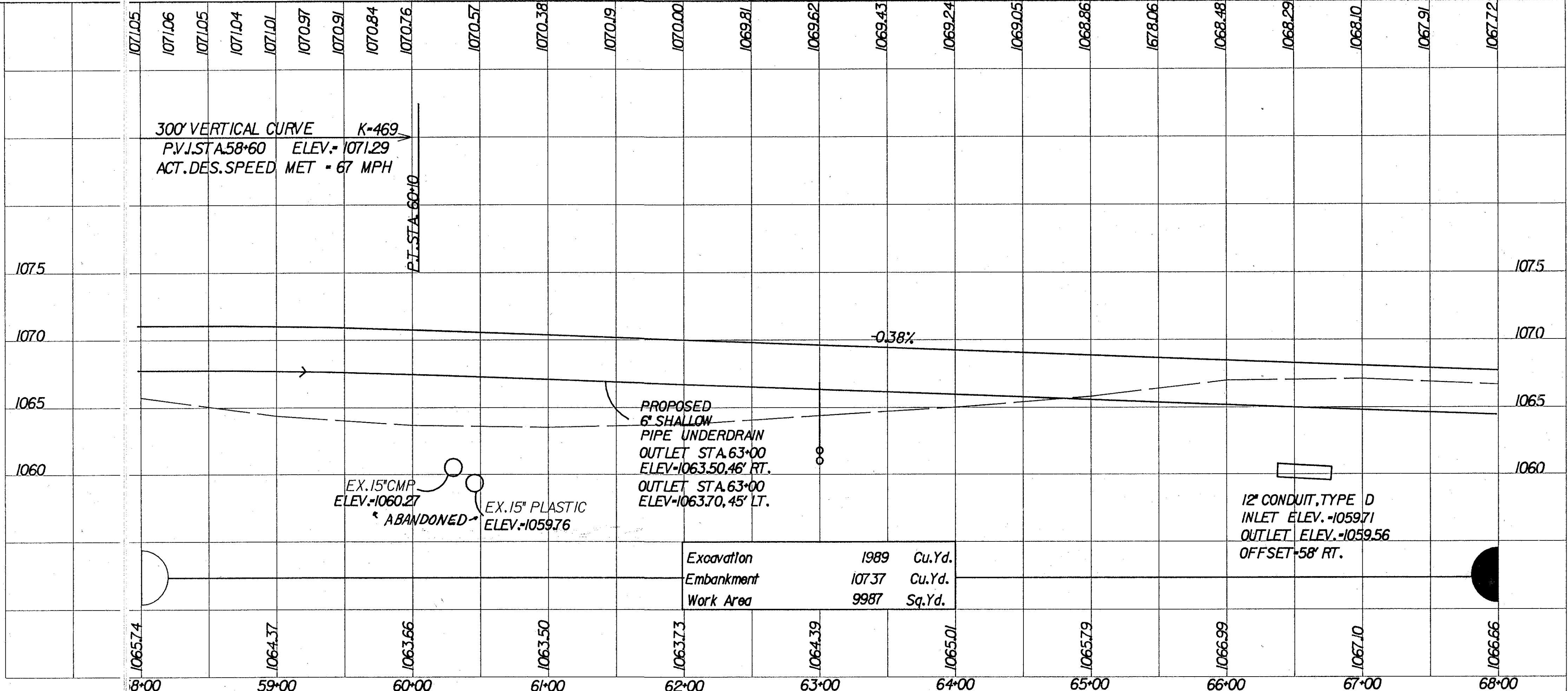
TOTALS		50	73	1800	2
NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10					

PLAN & PROFILE STA. 48+00 TO STA 58+00

UNI-739-0.02



Bench Mark *6 RR Spk In North
Side of Power Pole Sta. 65+44
30' Rt. Elev = 1066.85



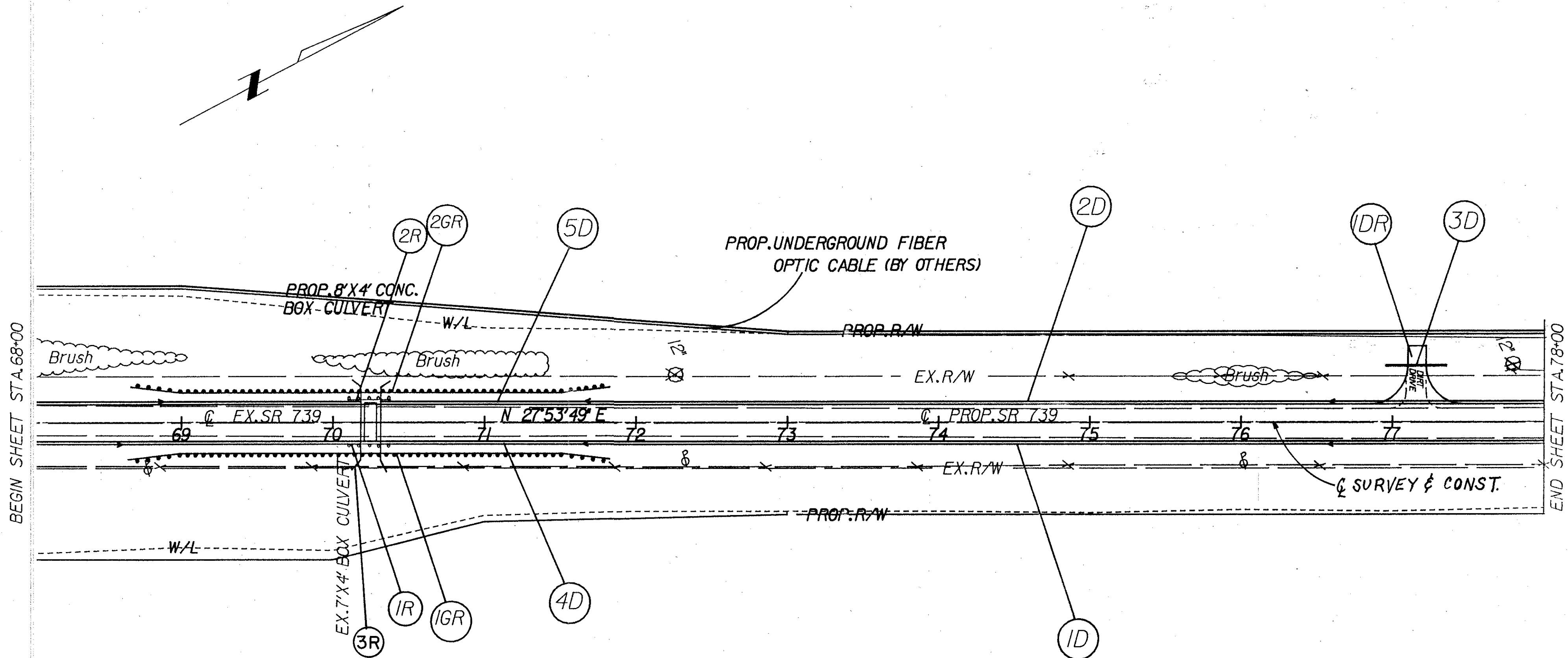
REF. NO.	STATION	SIDE	TYPE	LENGTH	WIDTH	Δ	A	B	AGGREGATE BASE AS PER PLAN	CUYD.	CUYD.	CUYD.	CUYD.	CUYD.	CUYD.
1DR	66+55	RT.	1	62'	12'	90'	20'	20'							
TOTALS										13					

SEE SHEET 54 FOR DRIVE DETAILS

ESTIMATED QUANTITIES													
REF. NO.	STATION	SIDE	FROM		TO	603	603	605	SPECIAL	BENDS AND BRANCHES	INFO ONLY		
			FROM	TO									
1D	58+00		58+00	68+00	R								
2D	58+00		58+00	68+00	L								
3D	63+00		63+00	63+00	R		34		1				
4D	63+00		63+00	63+00	L		33		1				
5D	66+35		66+35	66+75	R	40							

NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10

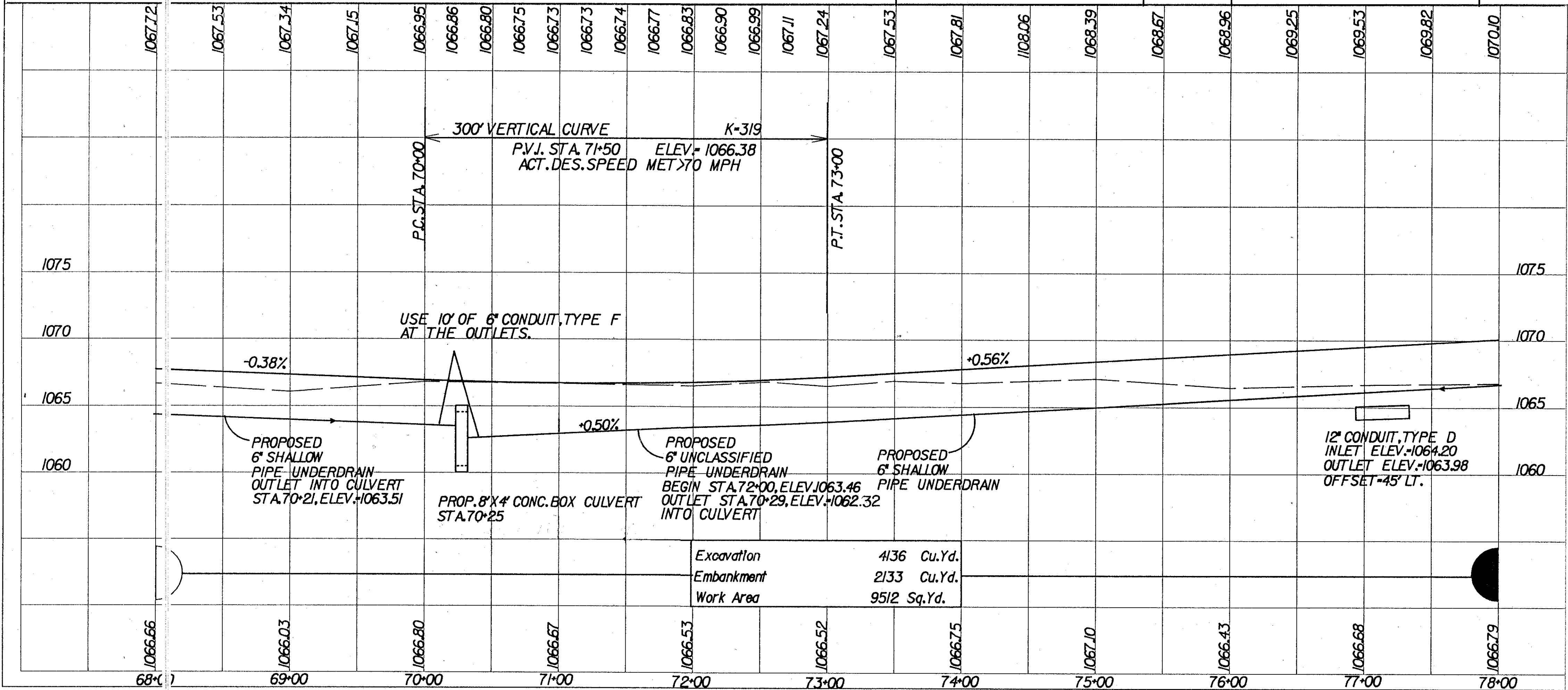
UNI-739-0.02



SEE SHEET 58.59 FOR CULVERT DETAILS

Bench Mark #7 Square Cut on
Bridge at Sta. 70+14 12' Rt.
Elev = 1067.02

Bench Mark #8 RR Spike In
North Side of Power Pole @
76+00 31' Rt. Elev = 1066.43



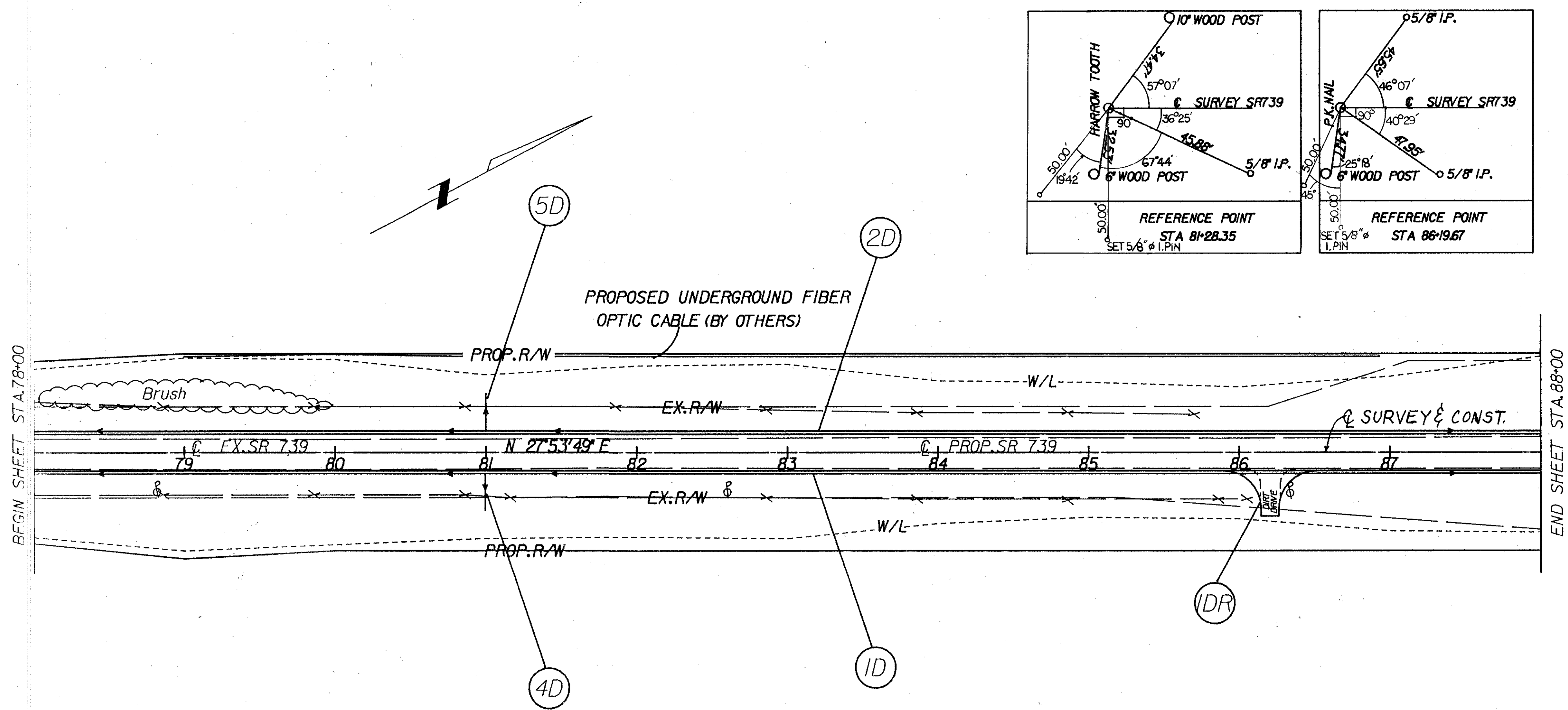
7017 NON-PERFORATED ASTM 3034 SDR35 OR SS931

DRIVES AND APPROACHES																															
REF. NO.	STATION	SIDE	TYPE	LENGTH	WIDTH	△	A	B	304		402		404																		
									CUYD.	CUYD.	CUYD.	CUYD.	CUYD.	CUYD.																	

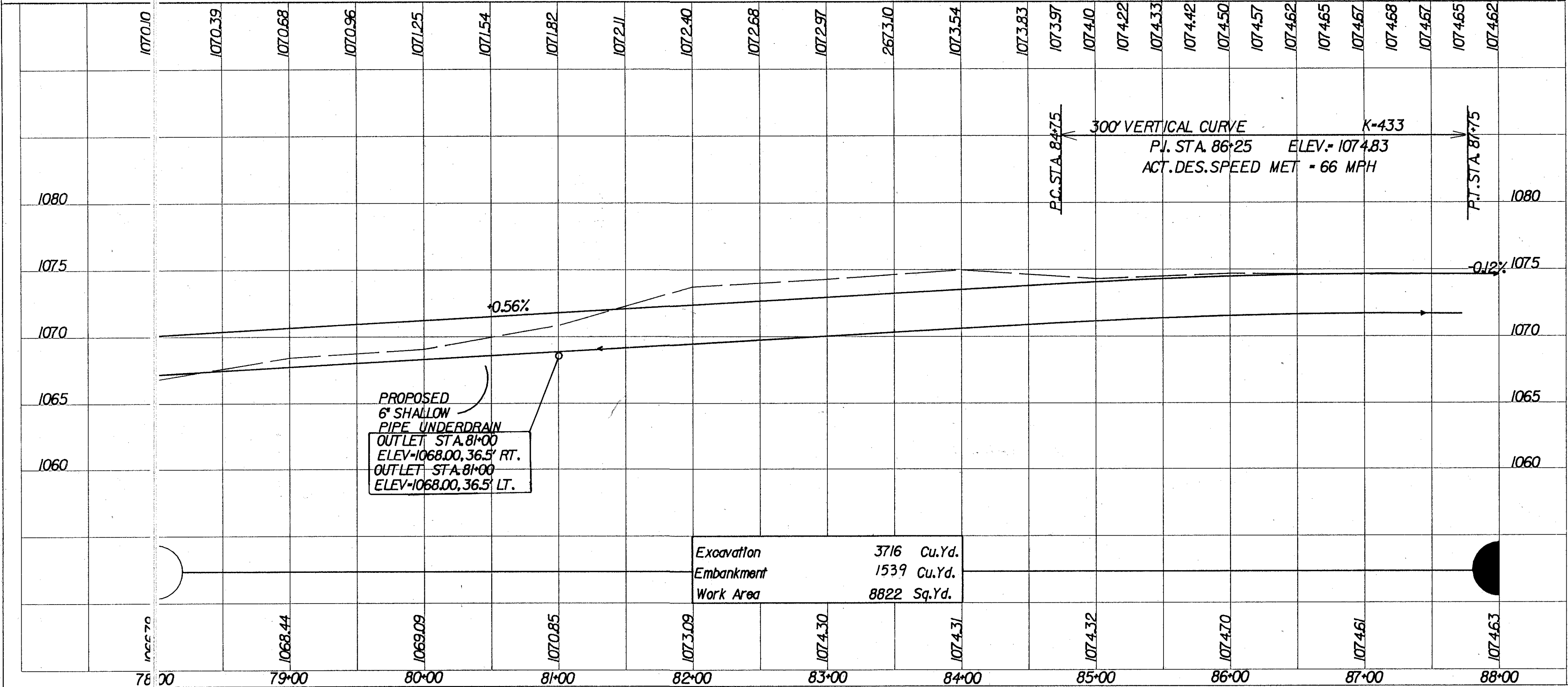
SEE SHEET 54 FOR DRIVE DETAILS

ESTIMATED QUANTITIES												
REF. NO.	STATION		SIDE	202	202	605	603	603	605	606	606	606

UNI-739-0.02



Bench Mark *9 RR Spike In North
Side of Power Pole Sta. 83+59
29' Rt. Elev = 1072.97



* 707.17 NON PERFORATED, ASTM 3034, SDR35, DR SS931

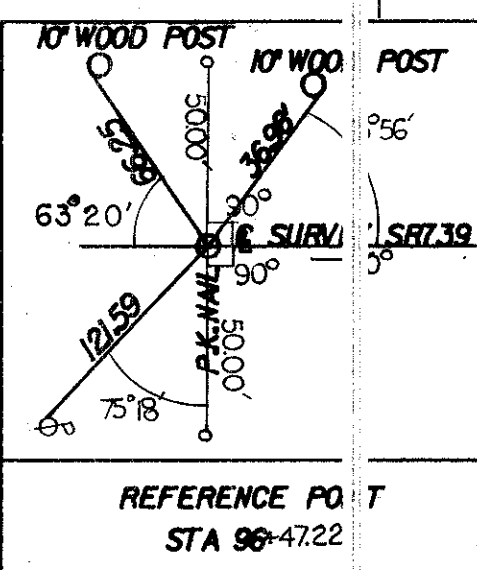
DRIVES AND APPROACHES		404	402	304	204	104	004	TOTALS
REF. NO.	ASPHALT CONCRETE							
	ASPHALT CONCRETE							
STATION	AGGREGATE BASE AS PER PLAN							
	B							
SIDE	A							
	WIDTH							
TYPE	LENGTH							
	TYPE							
STATION	RT.							
	FT.							
REF. NO.	86+20							
	1							
STATION	30' 12' 30' 20' 20'							
	6							
TOTALS	6							
	6							

NOTE: FOR DRIVE DETAIL SEE SHEET 54.

ESTIMATED QUANTITIES		603	605	SPECIAL	INFO ONLY
REF. NO.	6' CONDUIT TYPE F*				
	UN.FT.				
STATION	245				
	245				
SIDE	R				
	L				
STATION	81+00				
	81+00				
FROM	88+00				
	88+00				
TO	88+00				
	88+00				
TOTALS	49				
	2				

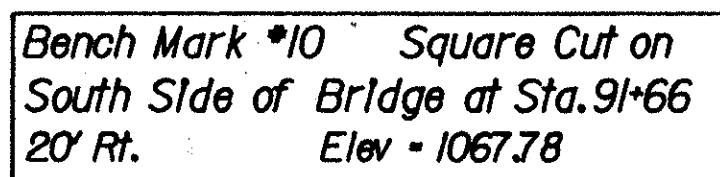
NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10

Type - Continuous Reinforced Concrete Slab
Spans - 20'-25' 20' c/c brgs.
Roadway - 36'-4' w/ f guard rails
Load Frequency - HS-18.98
Skew - 30 deg R.F.
Wearing Surface - 1" Latex
Approach Slabs - AS-1-54 (25' long)
Alignment - tangent



NOTE: FOR DRIVE DETAIL SEE SHEET 54.

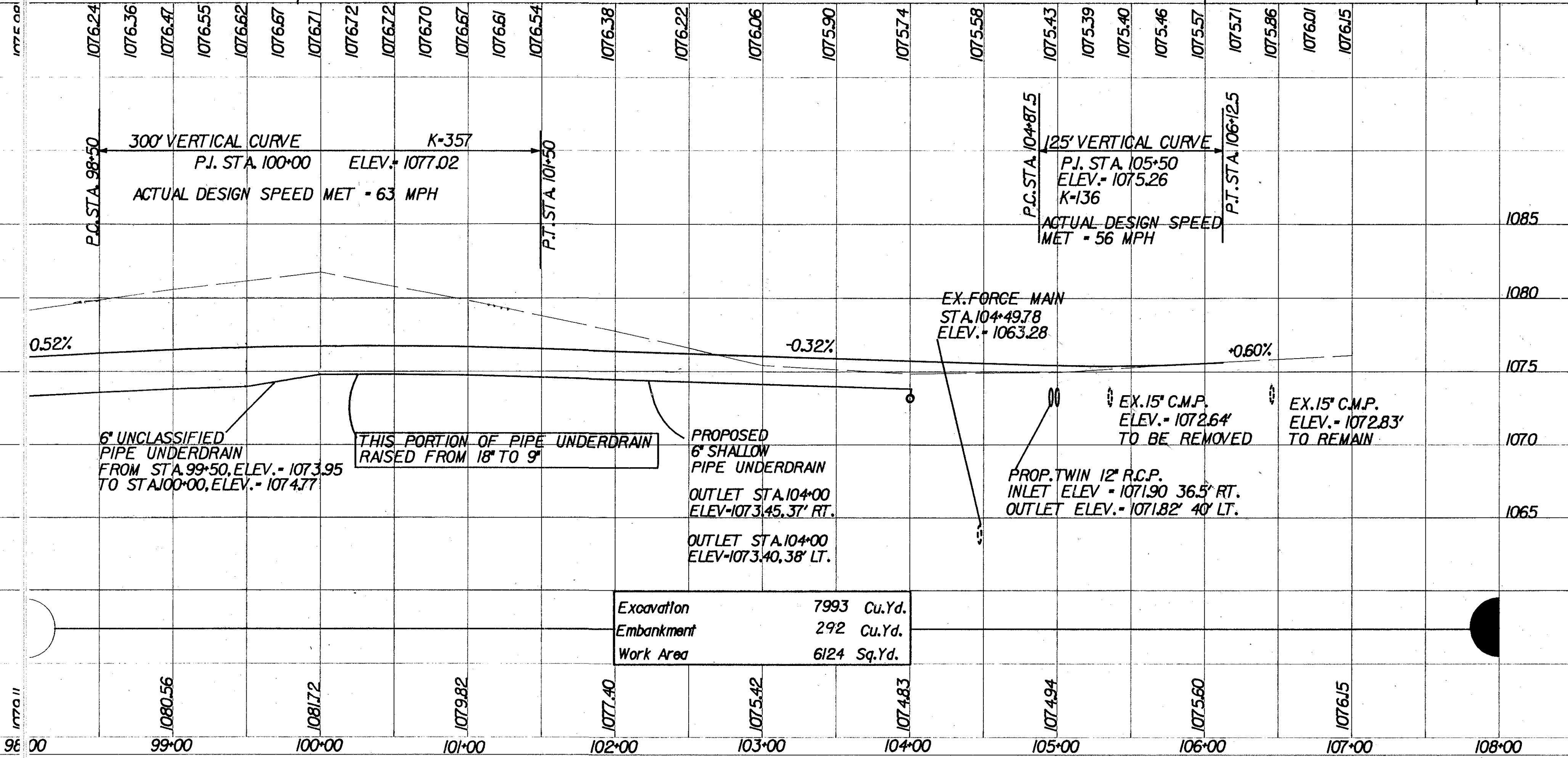
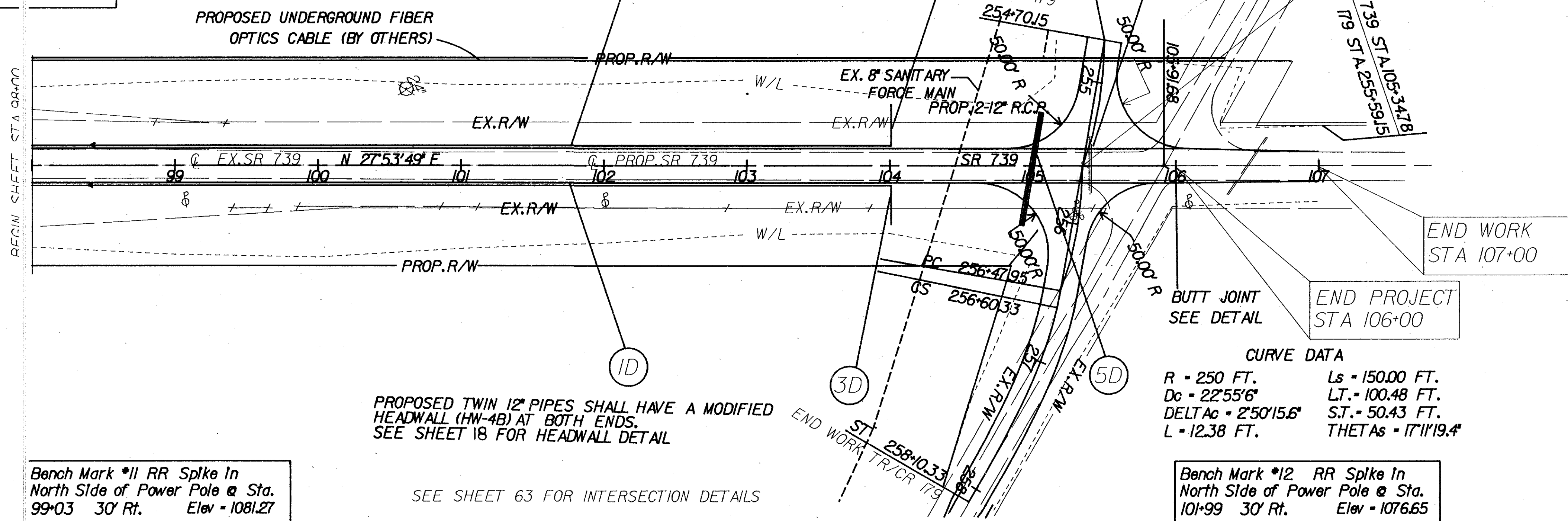
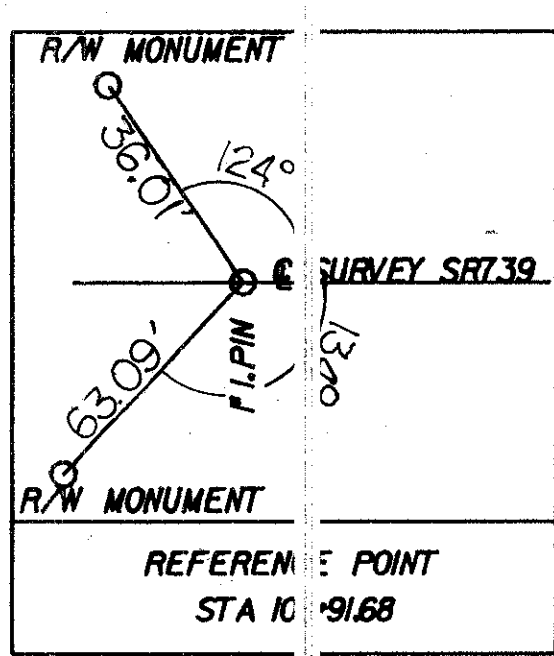
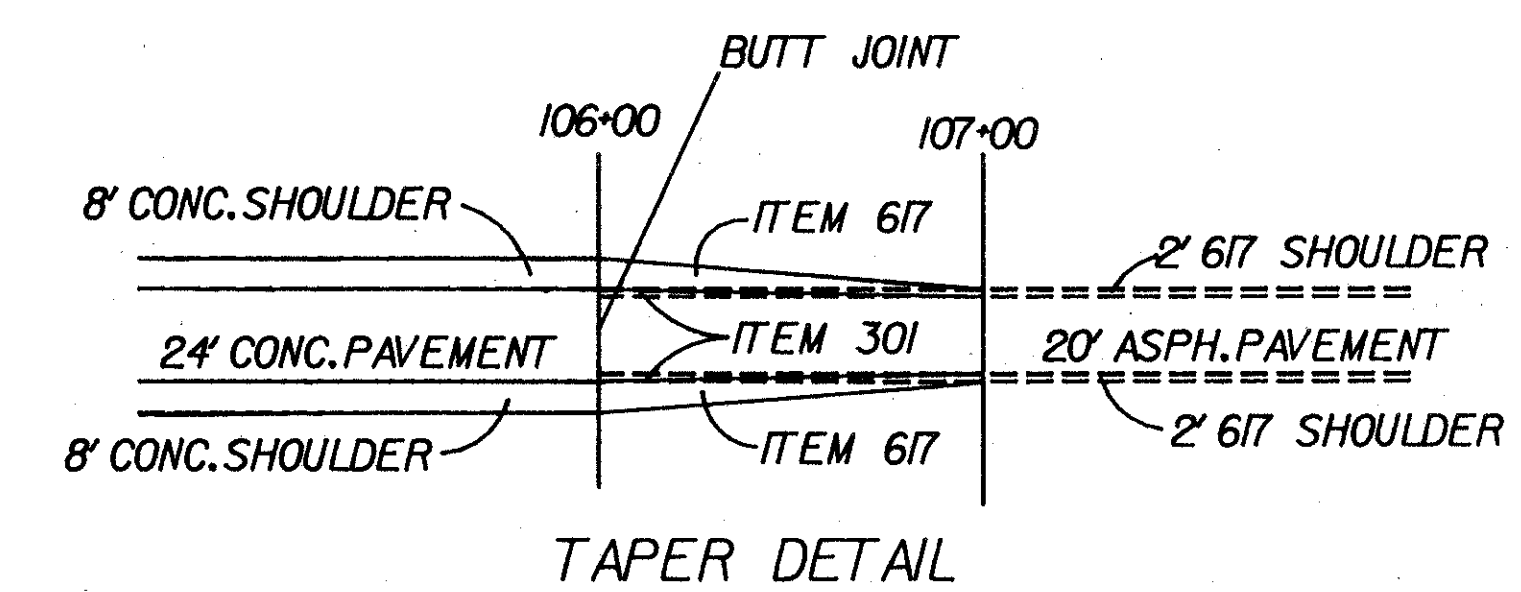
UNI-739-0.02



• 707.17 NON PERFORATED, ASTM 3034, SDR35, OR SS931
• DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP, TYPE 2 STEEL POSTS AND ANCHOR BOLTS

NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10

UNI-739-0.02



* 707 JT NON PERFORATED, ASTM 3034 SDR35, OR SS931

ESTIMATED QUANTITIES									
REF. NO.	STATION	FROM	TO	UN. FT.	CU. YD.	SPECIAL INFO	605	603	TOTALS
1D		98+00	104+00			BENDS AND BRANCHES			
2D		98+00	104+00			PRECAST REINFORCED CONCRETE OUTLET			
3D		98+00	104+00			6" UNCLASSIFIED PIPE UNDERDRAIN	50		50
4D		98+00	104+00			6" SHALLOW PIPE UNDERDRAIN	550		550
5D		98+00	104+00			CONDUIT TYPE F	25		25
IR		105+40				12" CONDUIT TYPE A 706.02 3000 D-LOAD		144	144
						CONCRETE MASONRY		175	175
						PIPE REMOVED 24" AND UNDER		40	40
TOTALS				40	175		51	144	100

NOTE: ALL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET NO. 10

© CONSTRUCTION

70



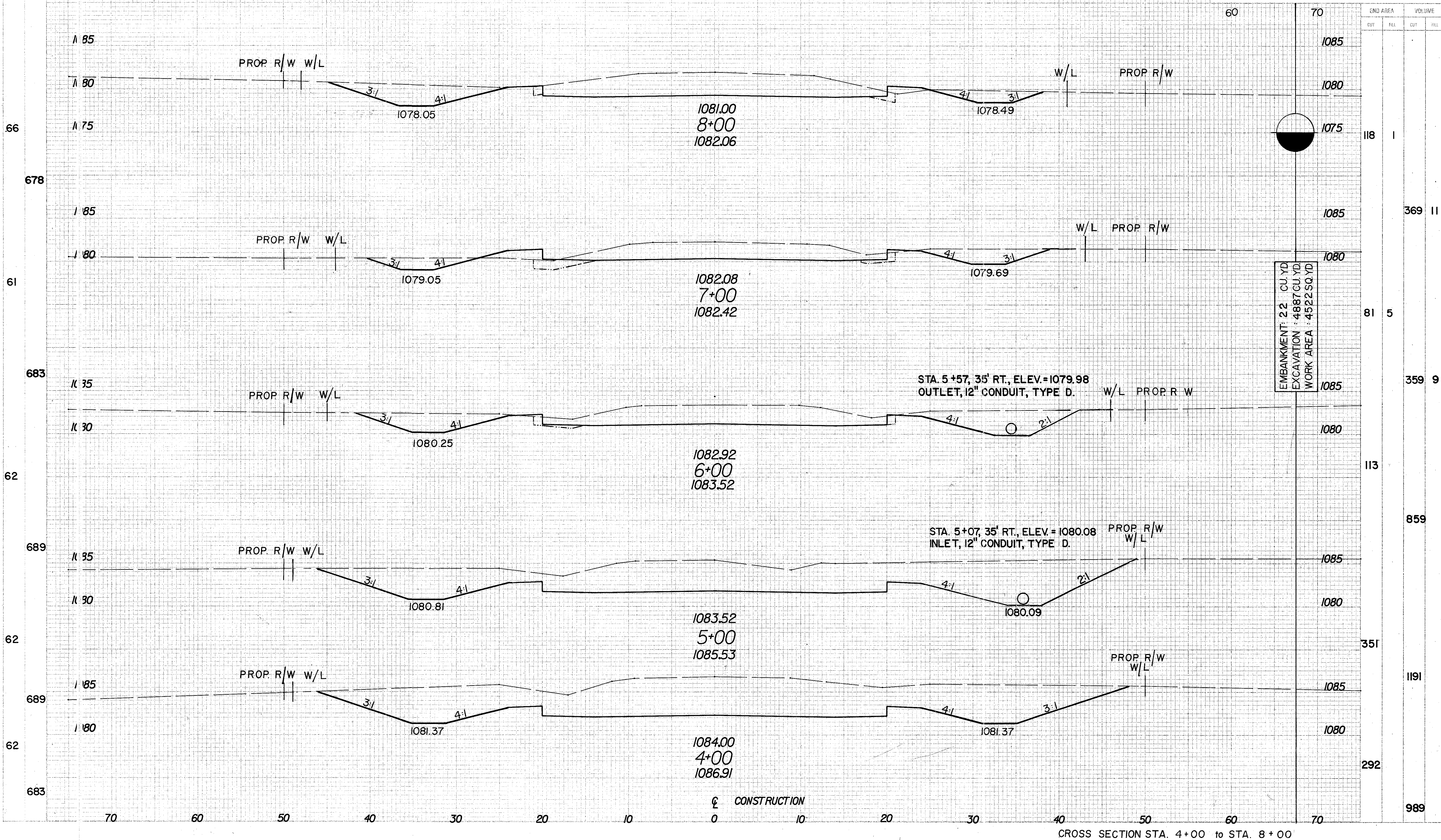
SECTION
ELEVATION
70 60 50 40 30 20 10 0 10 20 30 40 50

CONSTRUCTION

FWA REGION STATE PROJECT
5 OHIO

32
79

UNI-739-0.02

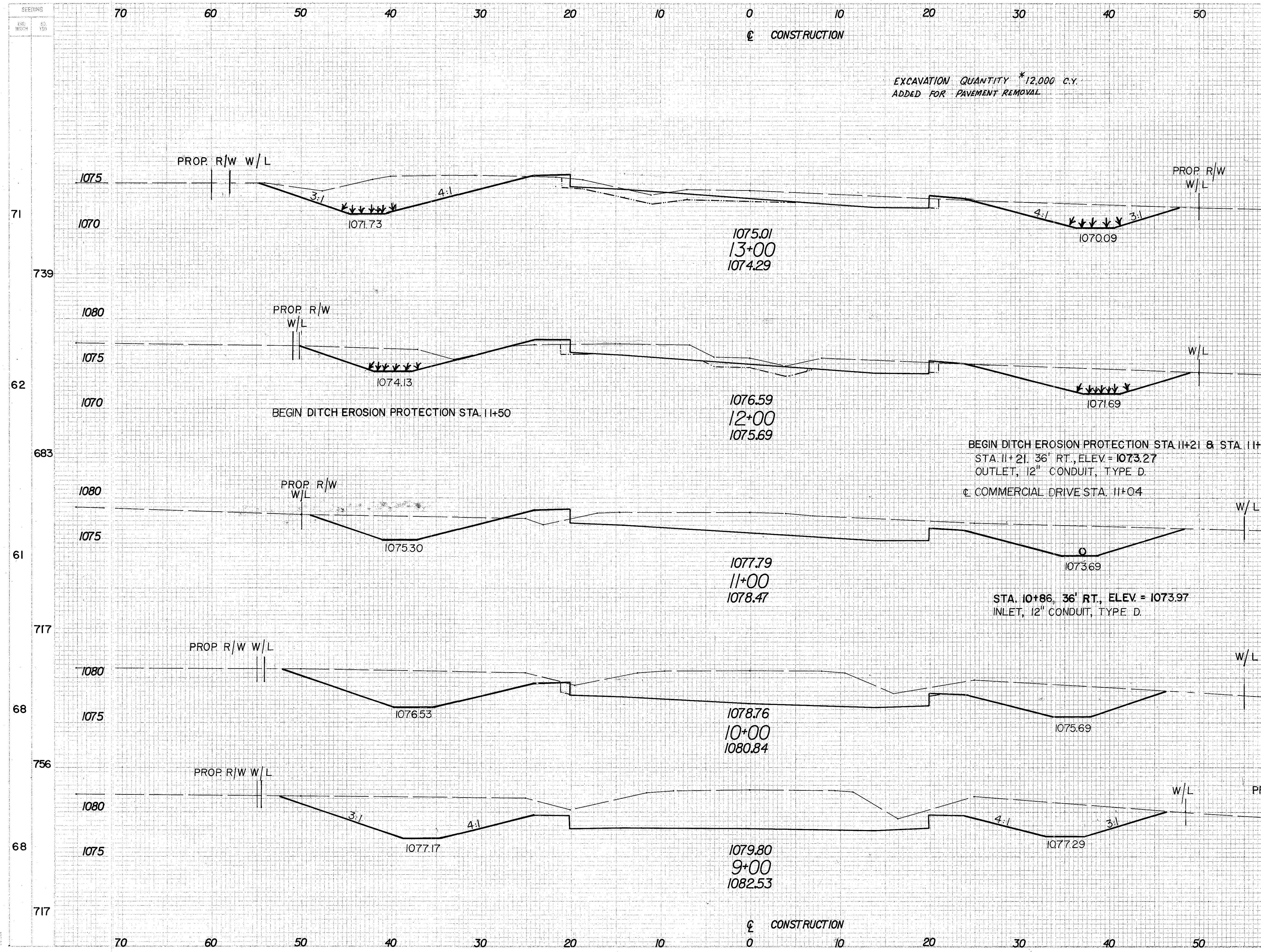


EMBANKMENT: 2.2 CU. YD.
EXCAVATION: 4887 CU. YD.
WORK AREA: 4522 SQ. YD.

STA. 5+57, 35' RT., ELEV.=1079.98
OUTLET, 12" CONDUIT, TYPE D.

STA. 5+07, 35' RT., ELEV.=1080.08
INLET, 12" CONDUIT, TYPE D.

CROSS SECTION STA. 4+00 to STA. 8+00



UNI-739-0.02

EXCAVATION QUANTITY *12,000 C.Y.
ADDED FOR PAVEMENT REMOVAL

60		70		END AREA		VOLUME	
CUT	FILL	CUT	FILL	CUT	FILL	CUT	FILL
				119	2		
						376	11
				84	4		
						261	20
				157	7		
						731	13
				238			
						994	
				299			
						772	2

EMBANKMENT: 1611 CU YD
EXCAVATION: 16815 CU YD
WORK AREA: 6718 SQ. YD.

BEGIN DITCH EROSION PROTECTION STA. 11+21 & STA. 11+27
STA. 11+21, 36" RT., ELEV. = 1073.27
OUTLET, 12" CONDUIT, TYPE D.
COMMERCIAL DRIVE STA. 11+04

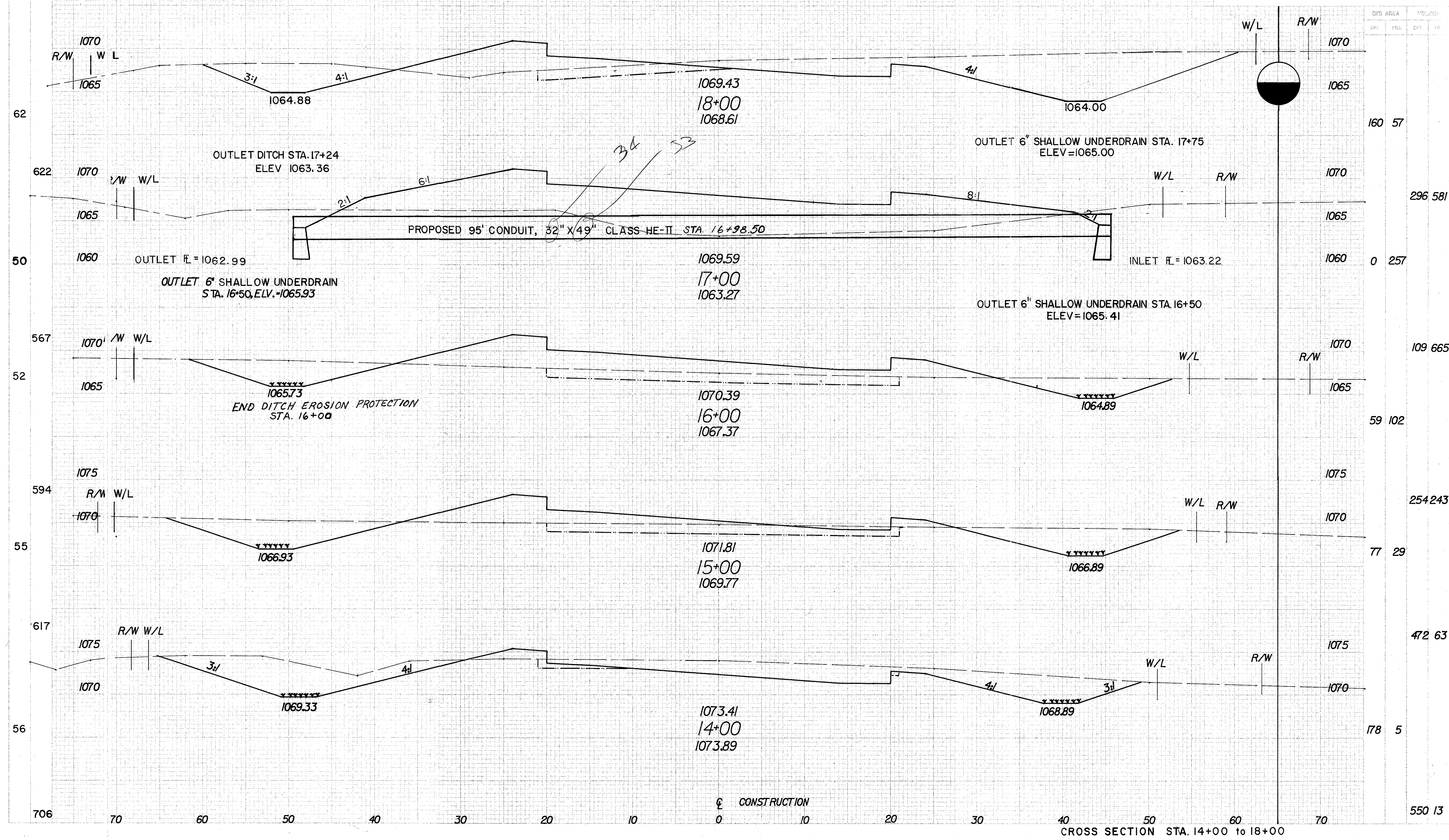
STA. 10+86, 36" RT., ELEV. = 1073.97
INLET, 12" CONDUIT, TYPE D.

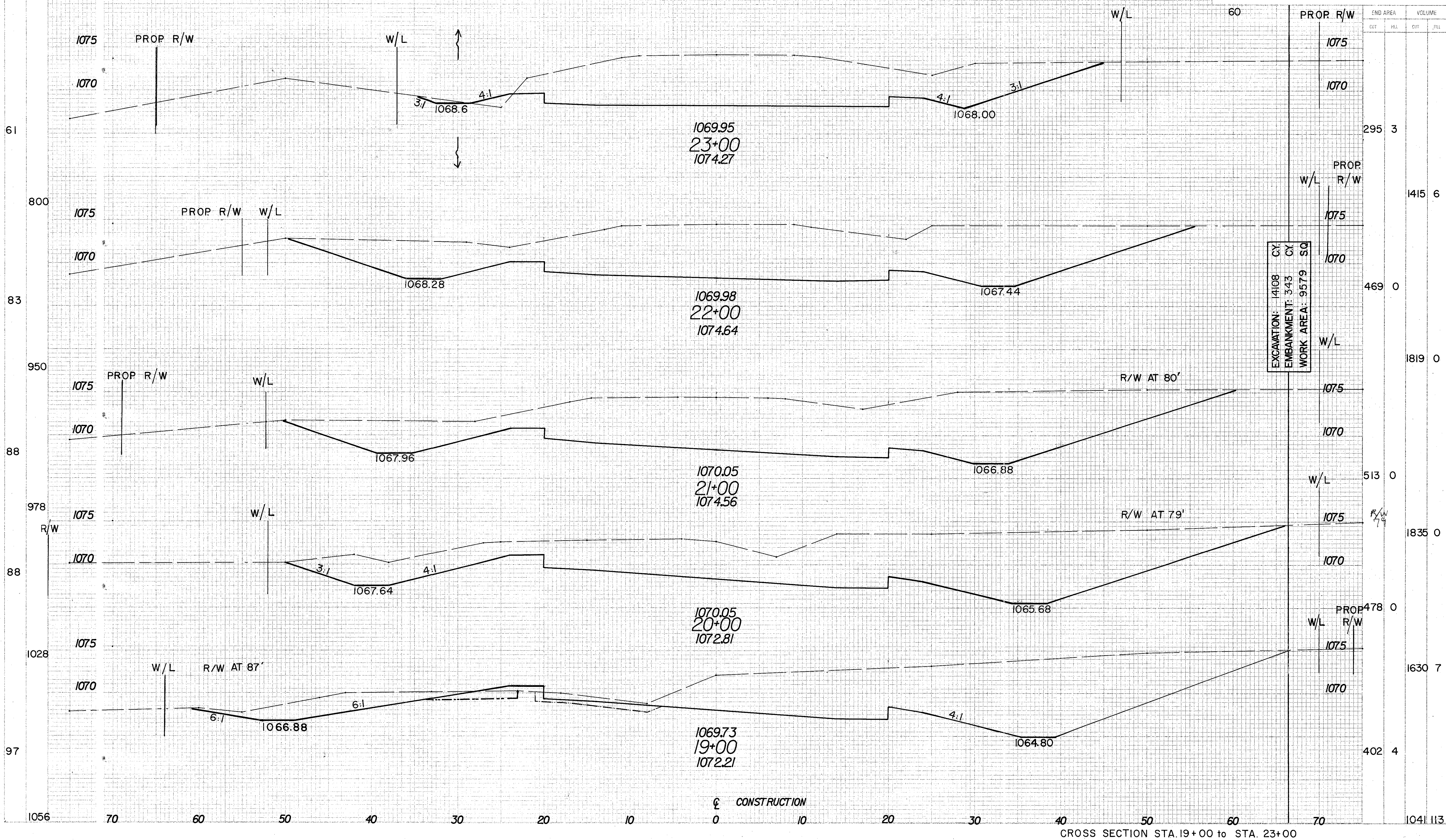
SECTION
EXP. WIDTH
CON. YRS.

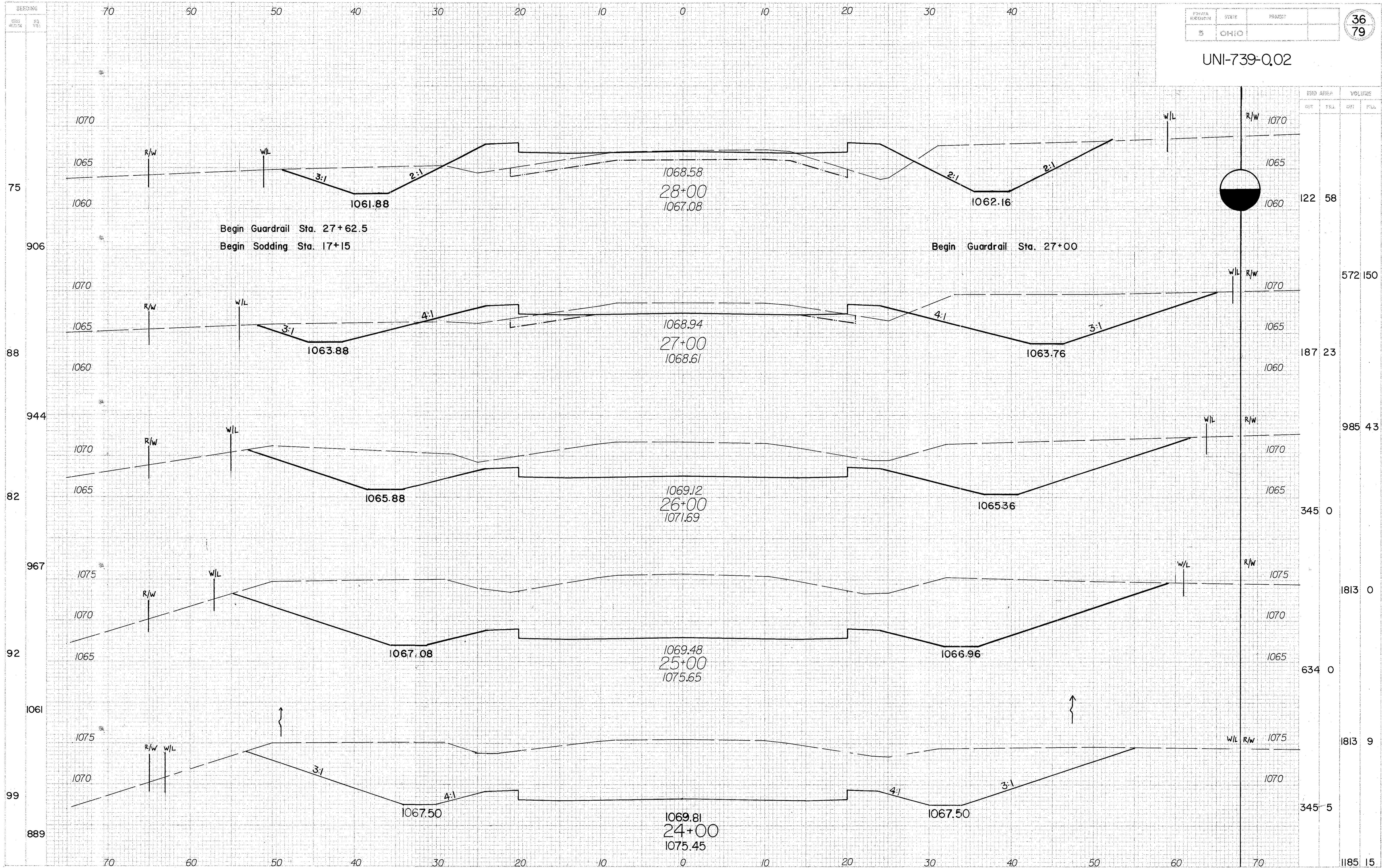
TOWNSHIP
STATE
COUNTY

34
79

UNI-739-0.02

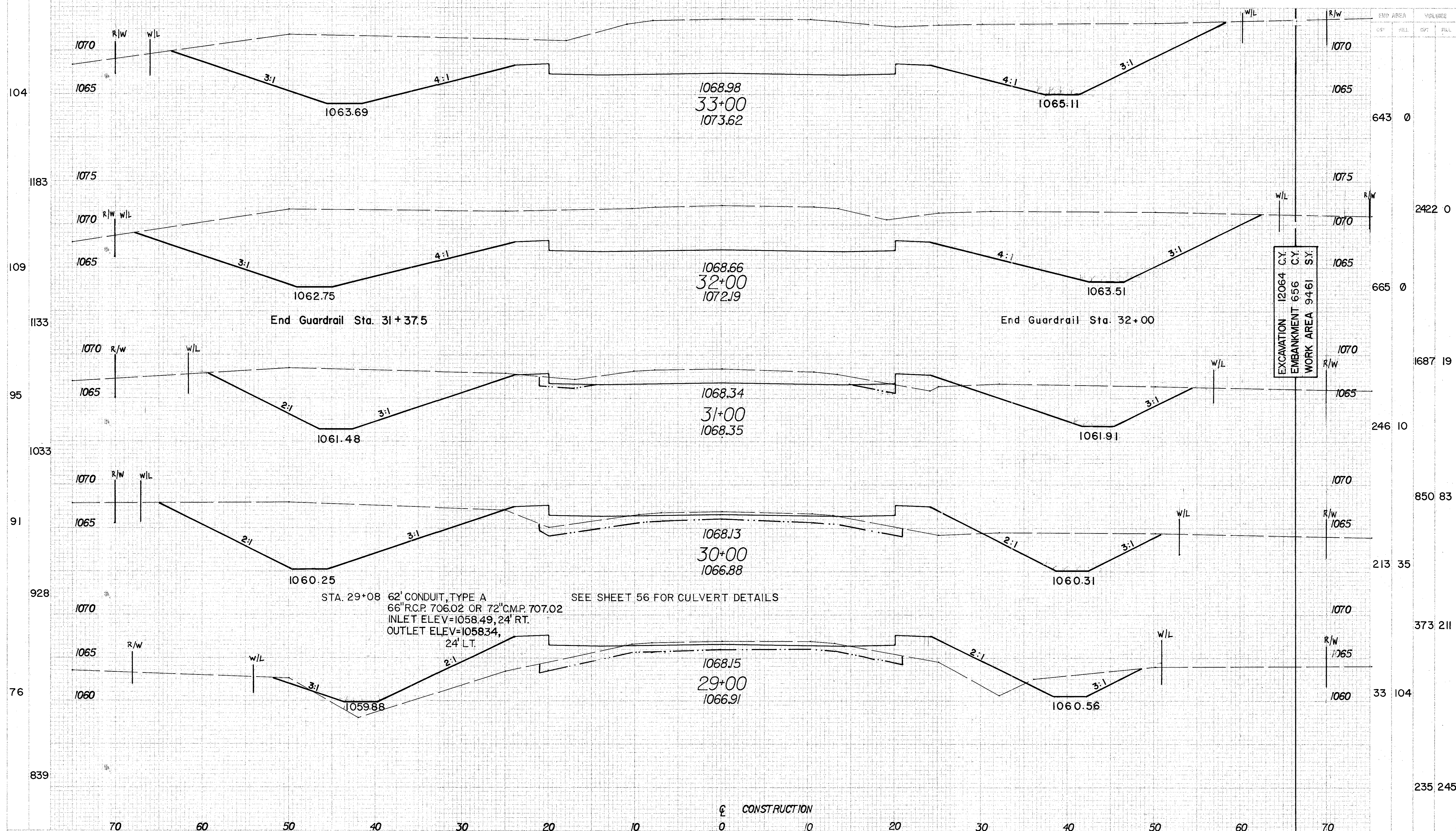




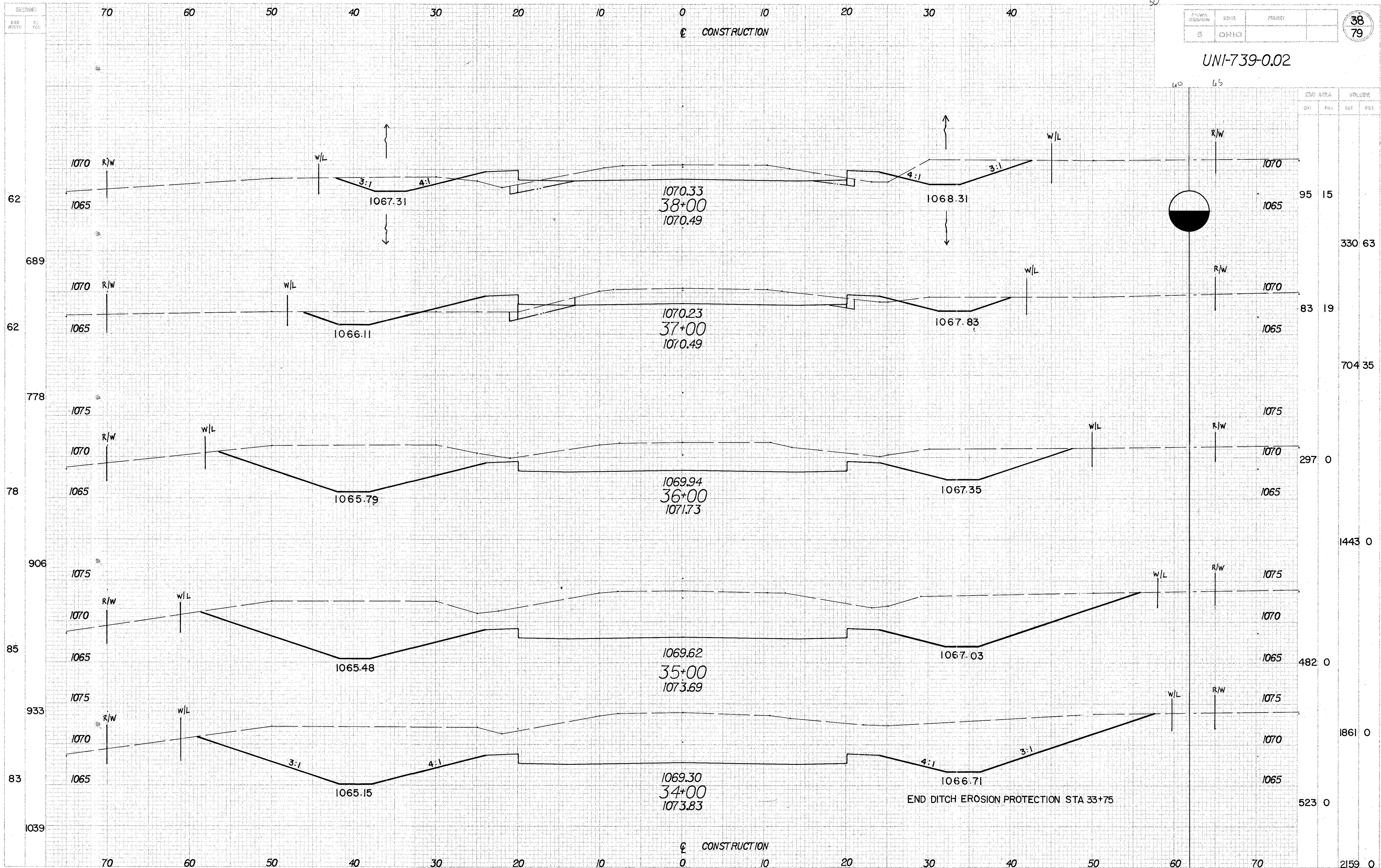


CROSS SECTION STA. 24+00 to STA. 28+00

6 CONSTRUCTION



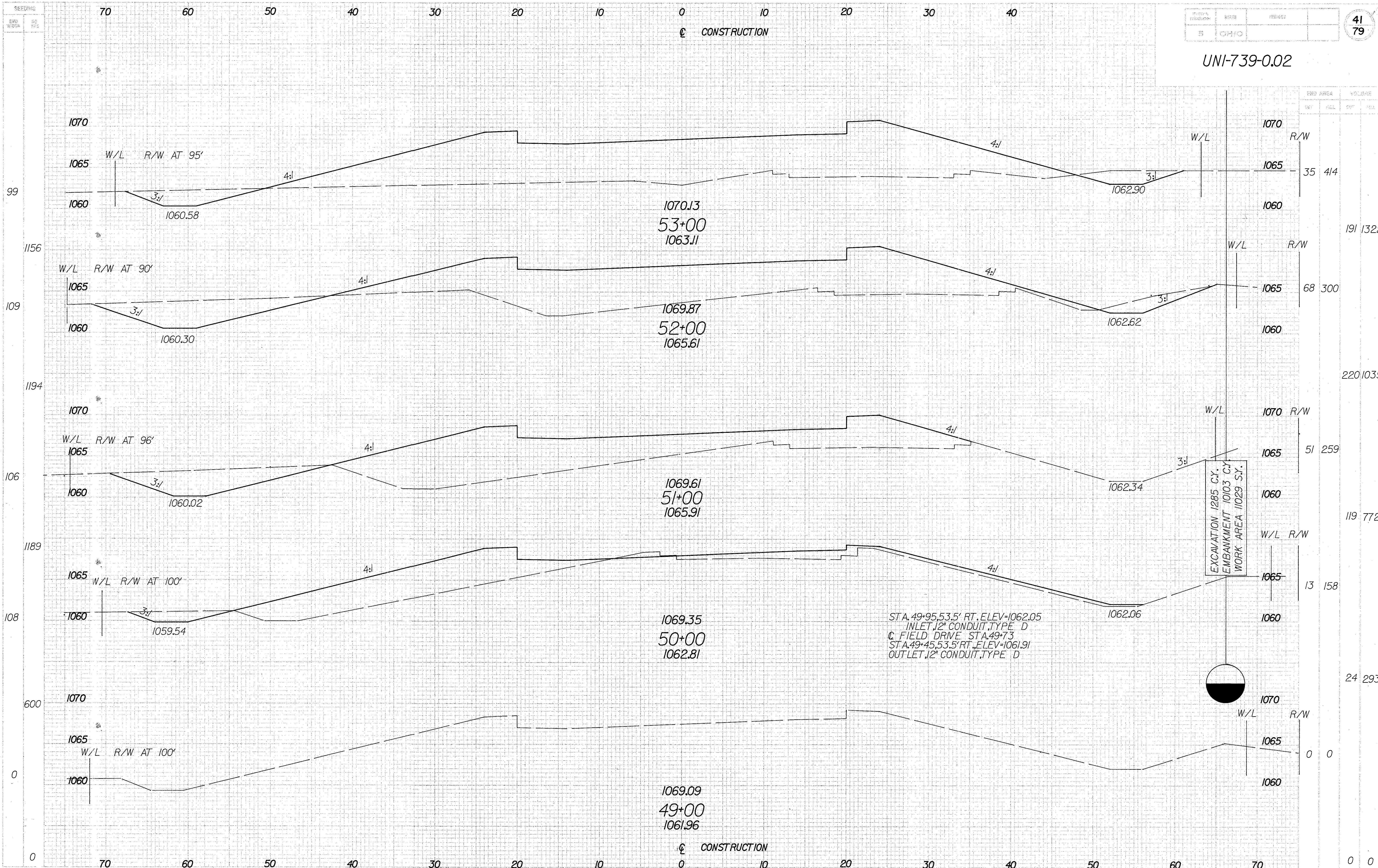
CROSS SECTION STA. 29+00 to STA. 33+00



CROSS SECTION STA. 34+00 to STA. 38+00

④ CONSTRUCTION

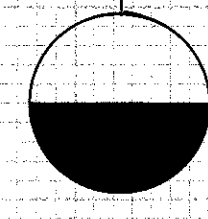


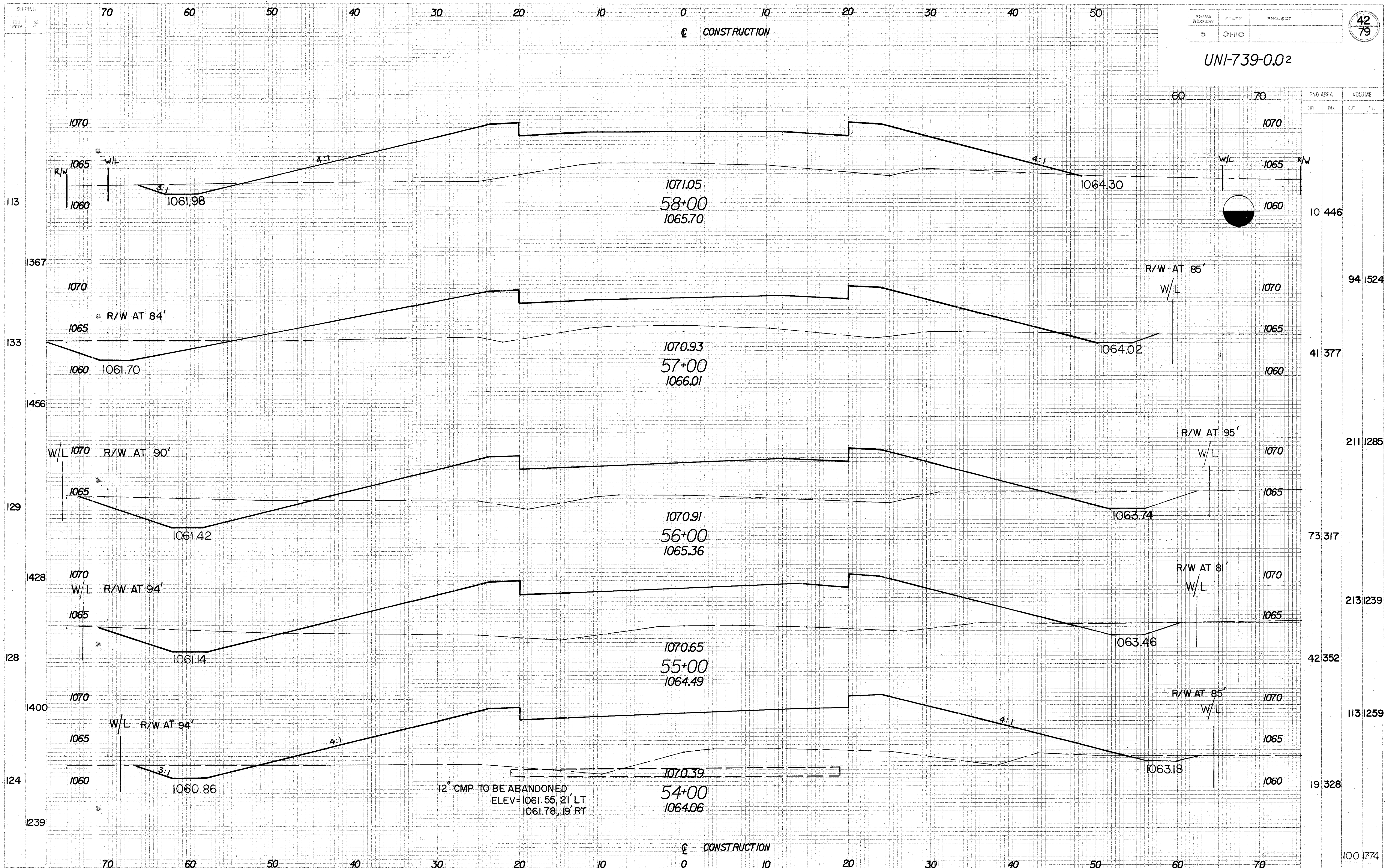


UNI-739-0.02

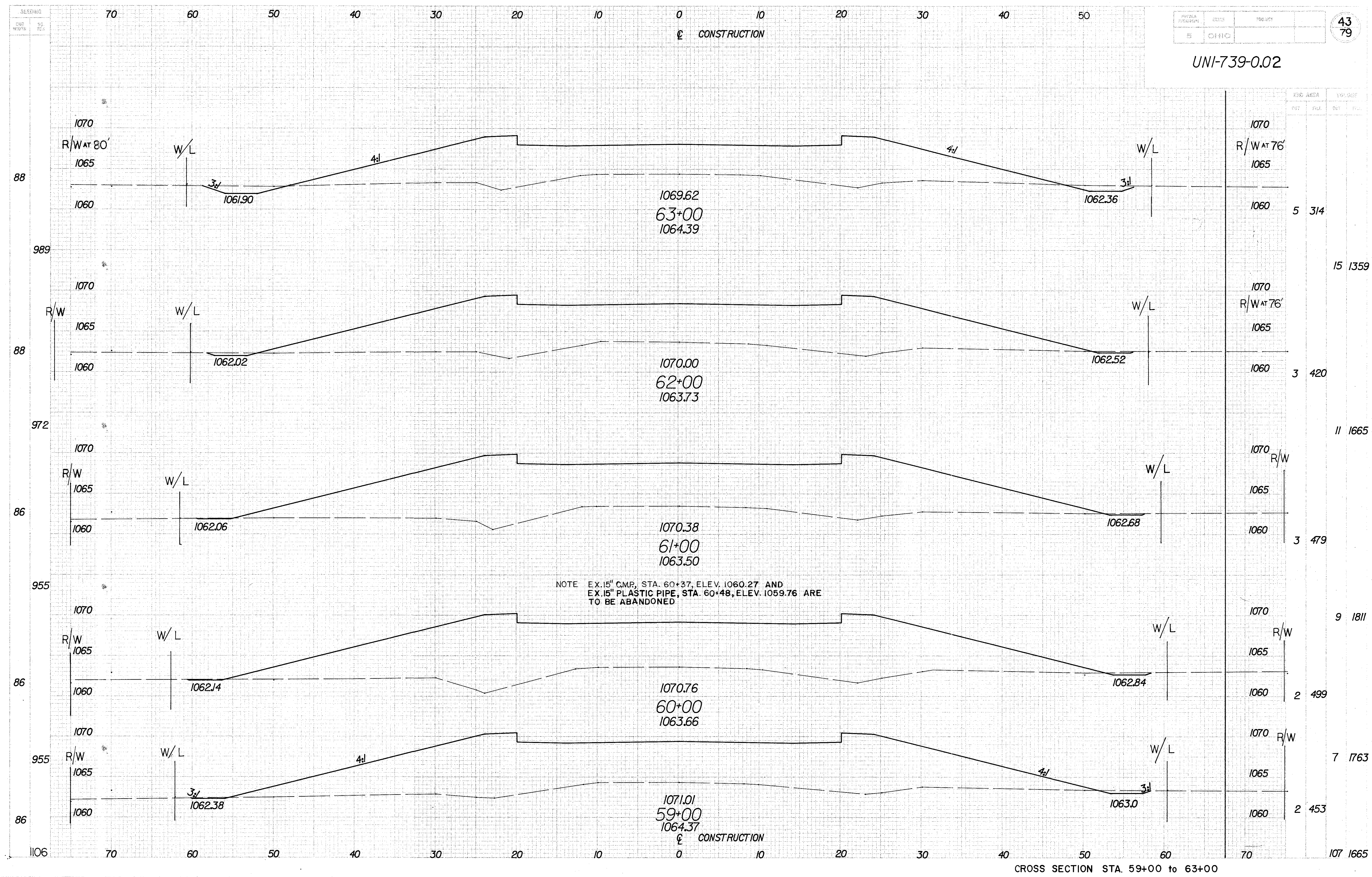
EXCAVATION 1285 C.Y.
EMBANKMENT 1003 C.Y.
WORK AREA 11029 SY.

STA. 49+95.53.5' RT. ELEV.=1062.05
INLET, 12" CONDUIT, TYPE D
CL FIELD DRIVE STA. 49+73
STA. 49+45.53.5' RT. ELEV.=1061.91
OUTLET, 12" CONDUIT, TYPE D





CROSS SECTION STA. 54+00 to STA. 58+00



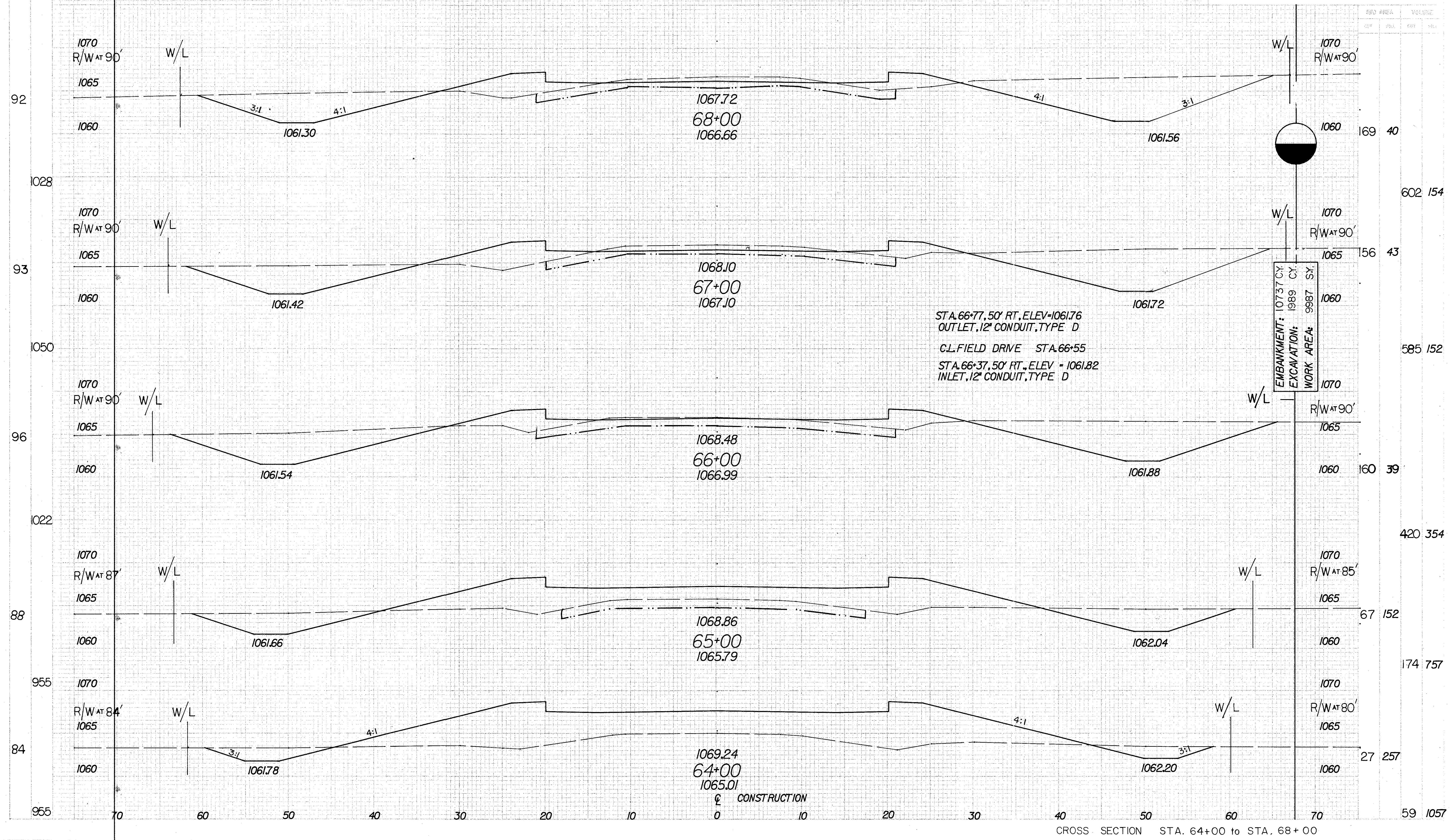
SECTION
NO.
79

SECTION
NO.
79

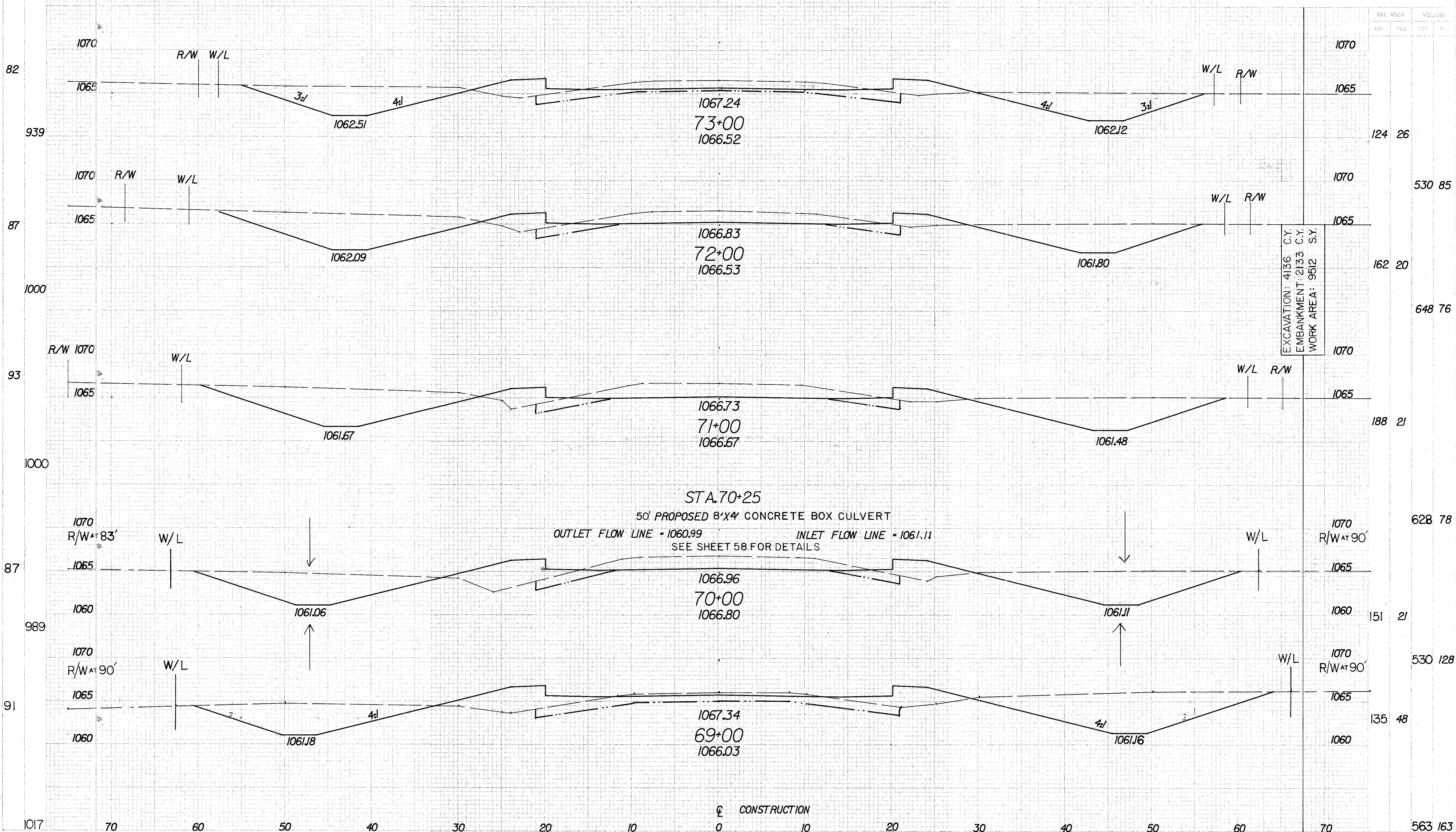
44
79

CONSTRUCTION

UNI-739-0.02

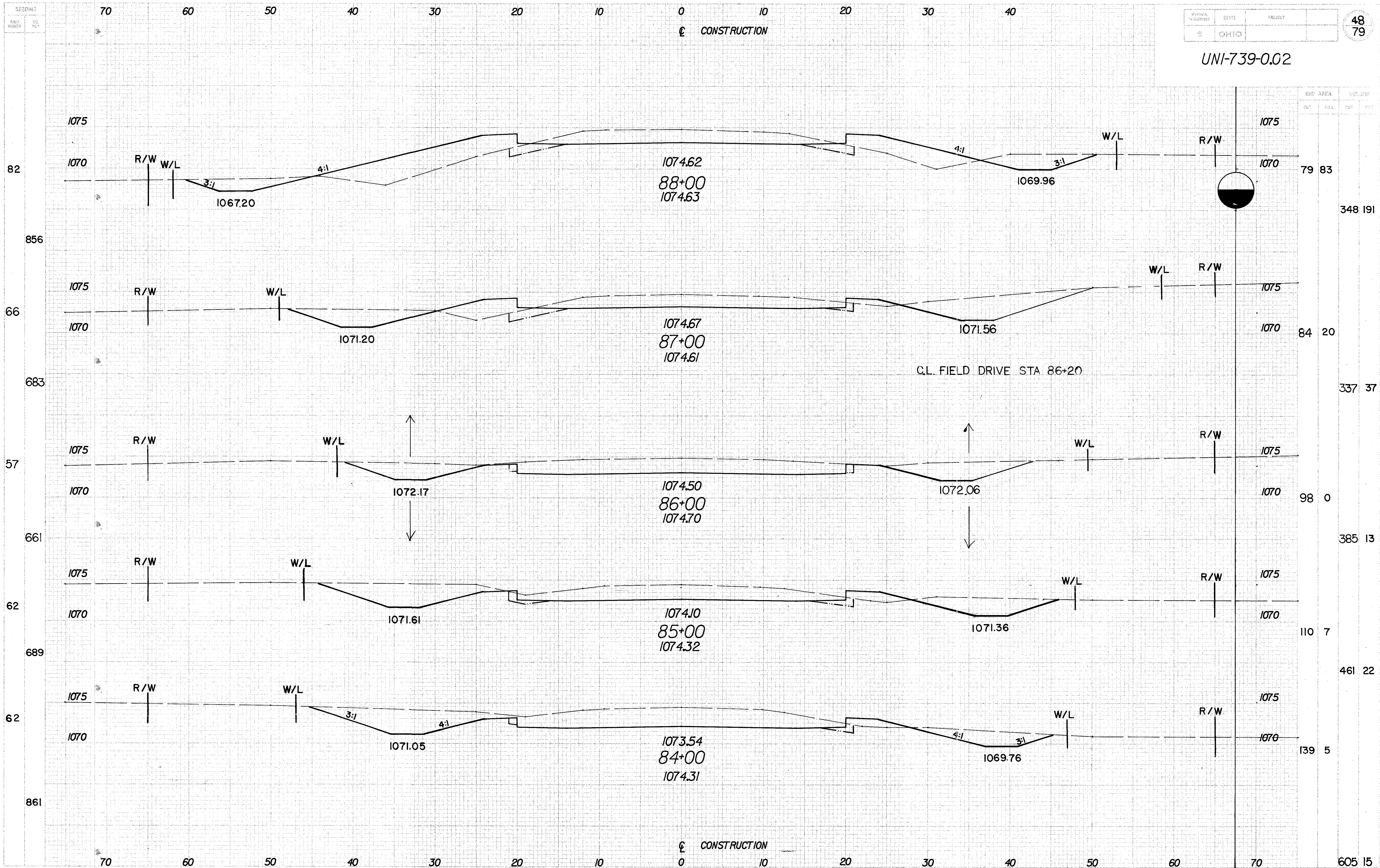


UNI-739-0.02

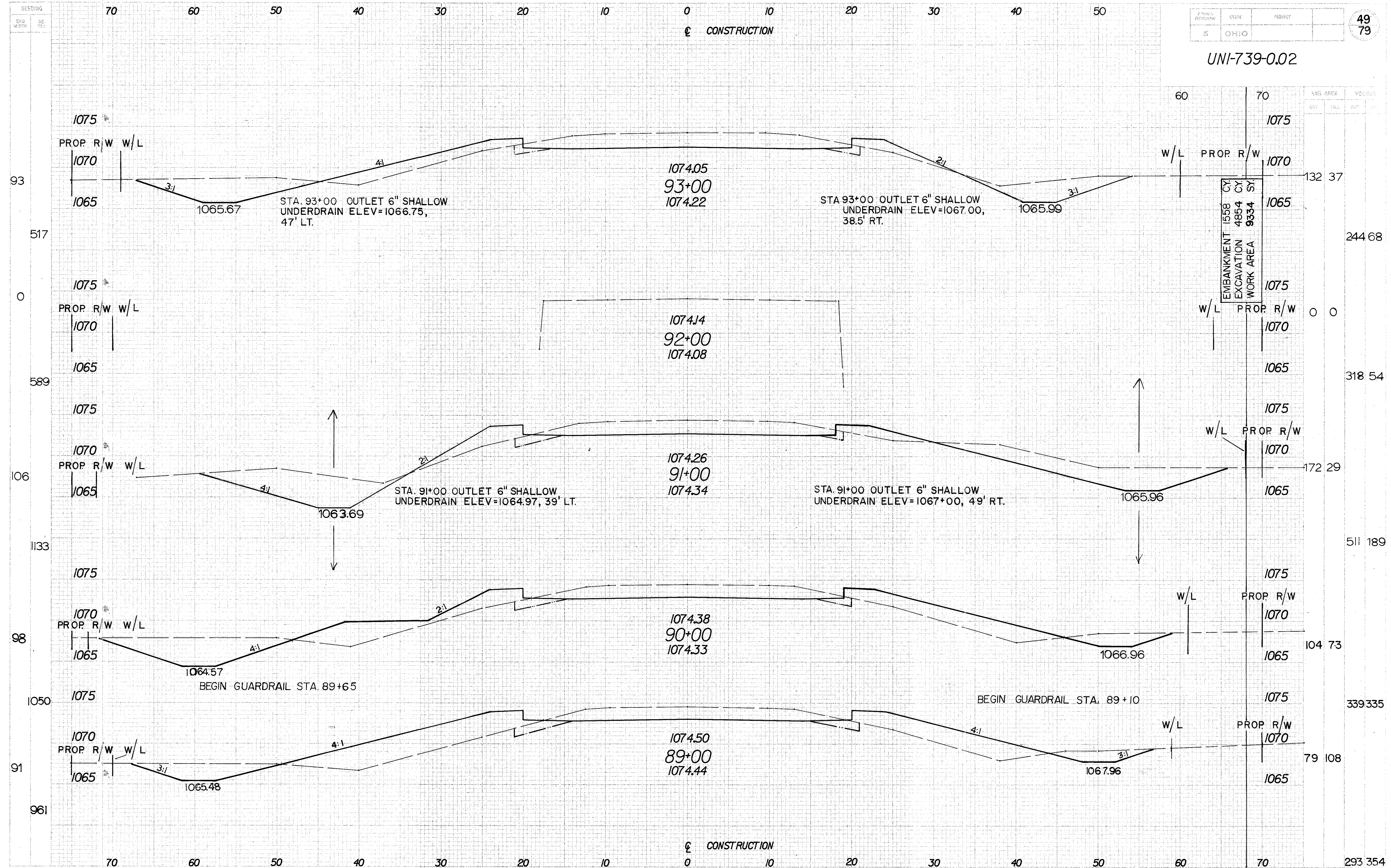


CROSS-SECTION STA. 69+00 to STA. 73+00

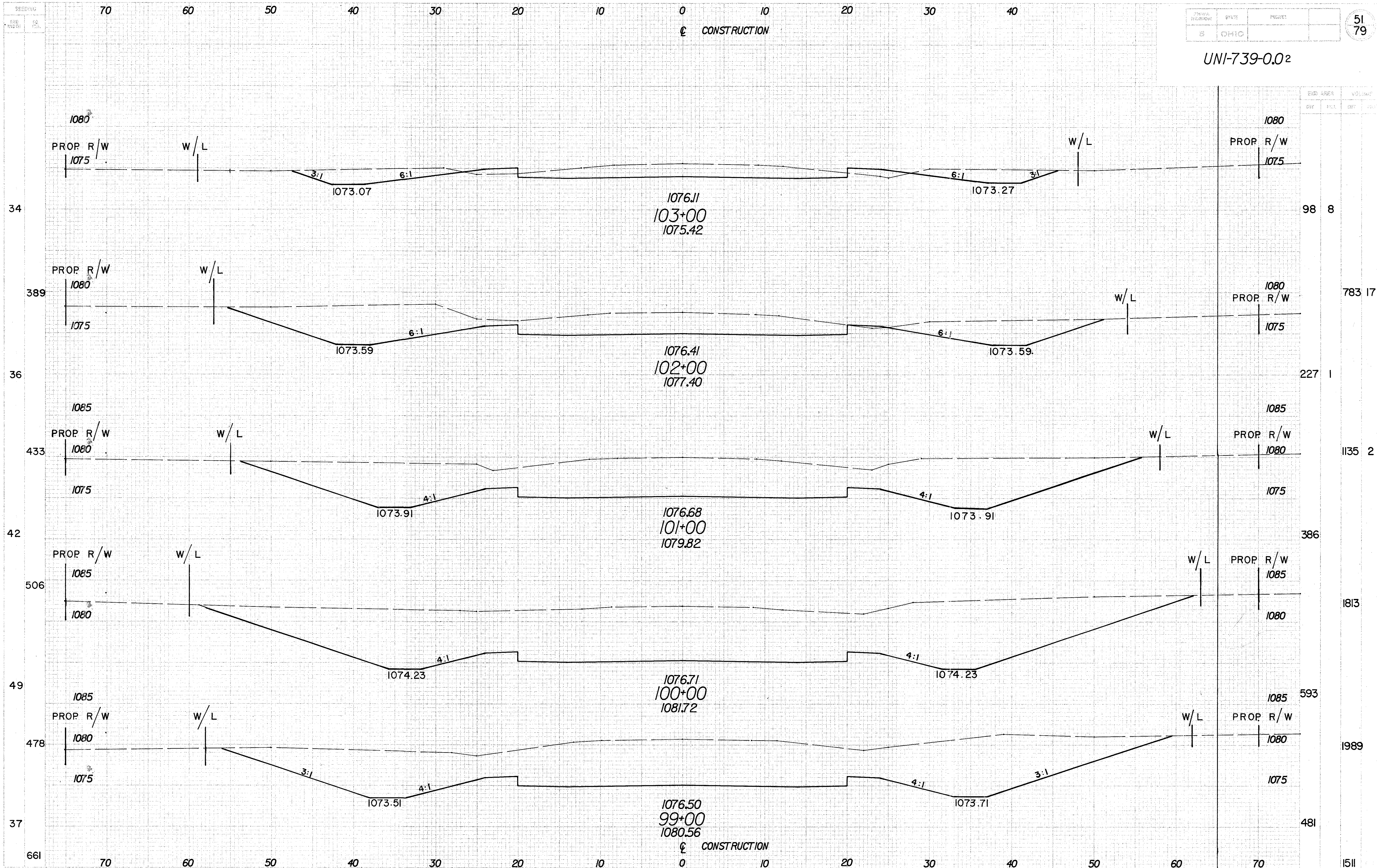
CROSS SECTION STA. 74+00 to STA. 78+00



UNI-739-0.02



CROSS SECTION STA. 89+00 to STA. 93+00



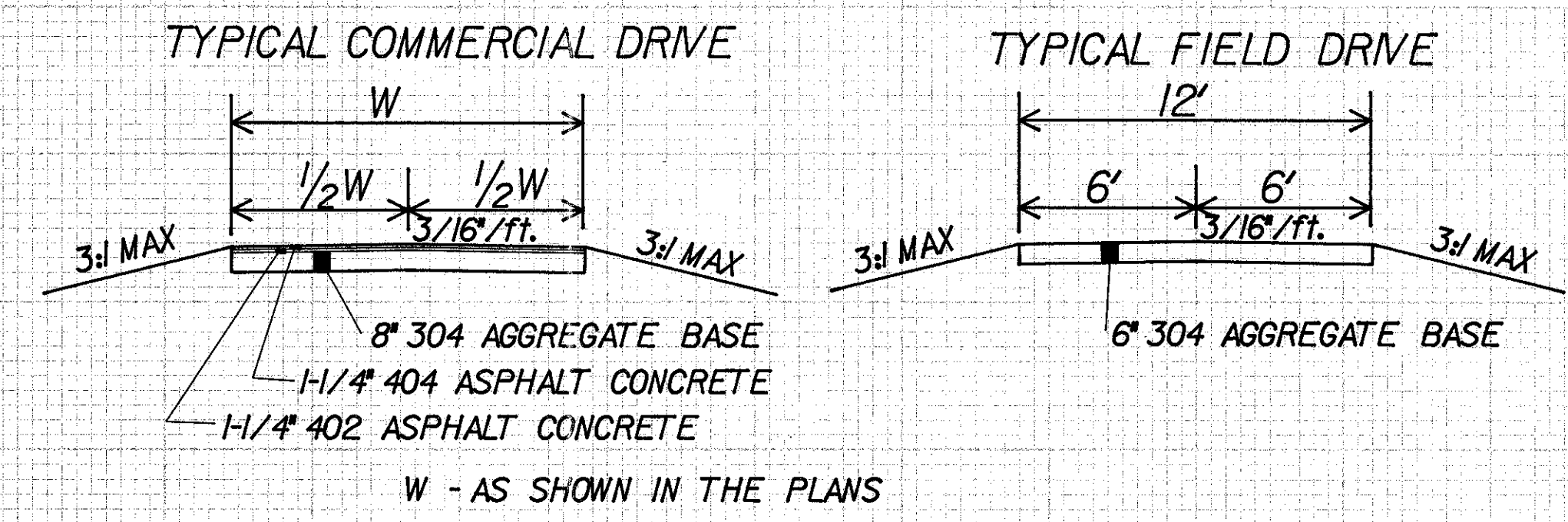
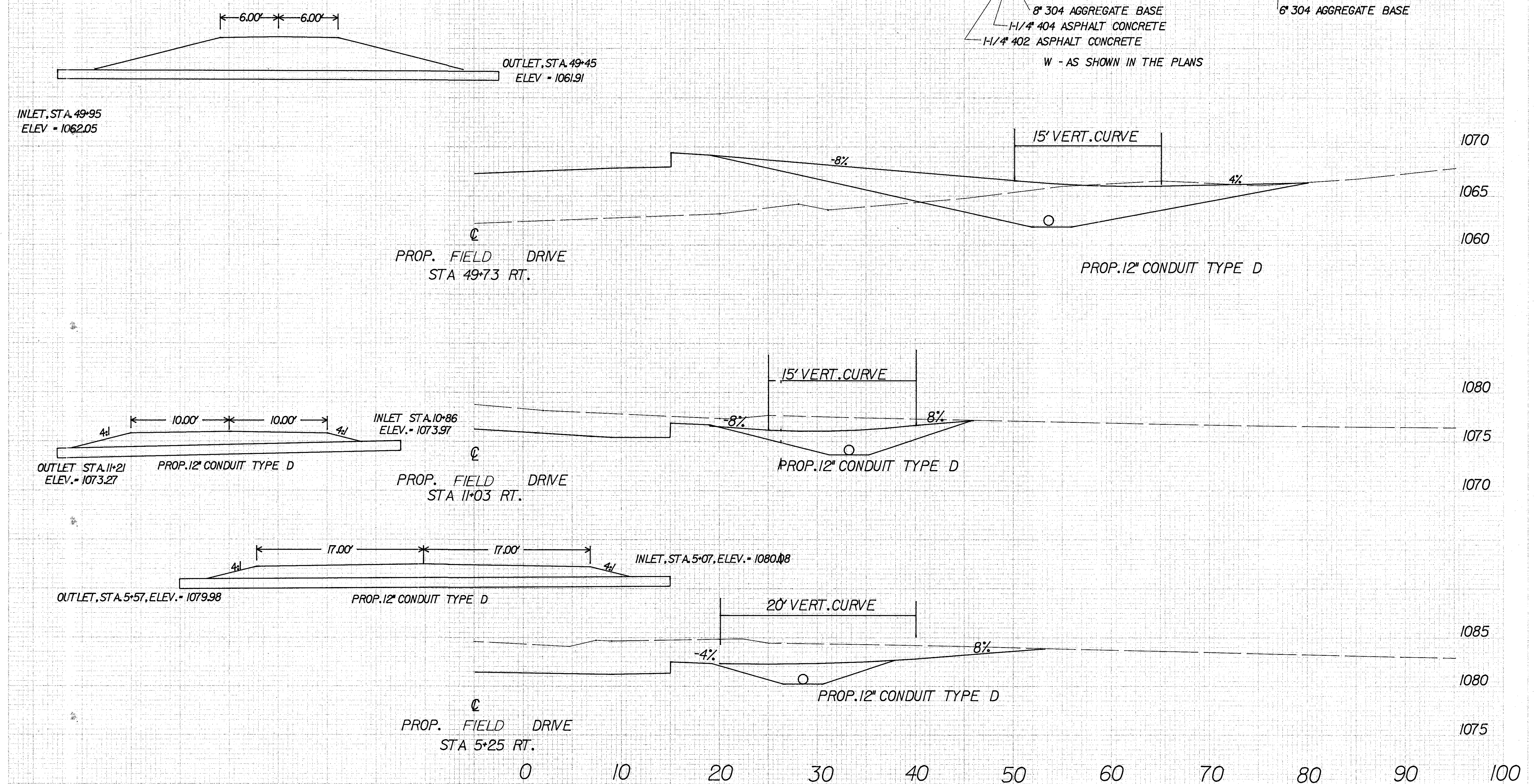
CROSS SECTION STA. 99+00 to STA. 103+00

END AREA		VOLUME	
END	AREA	END	VOL



ADDITIONAL EMBANKMENT	
STA	VOLUME (CY)
49+73 RT.	190
11+03 RT.	31
5+25 RT.	38
TOTAL	259
TOTAL CARRIED TO SHEET 54	

UNI-739-0.02



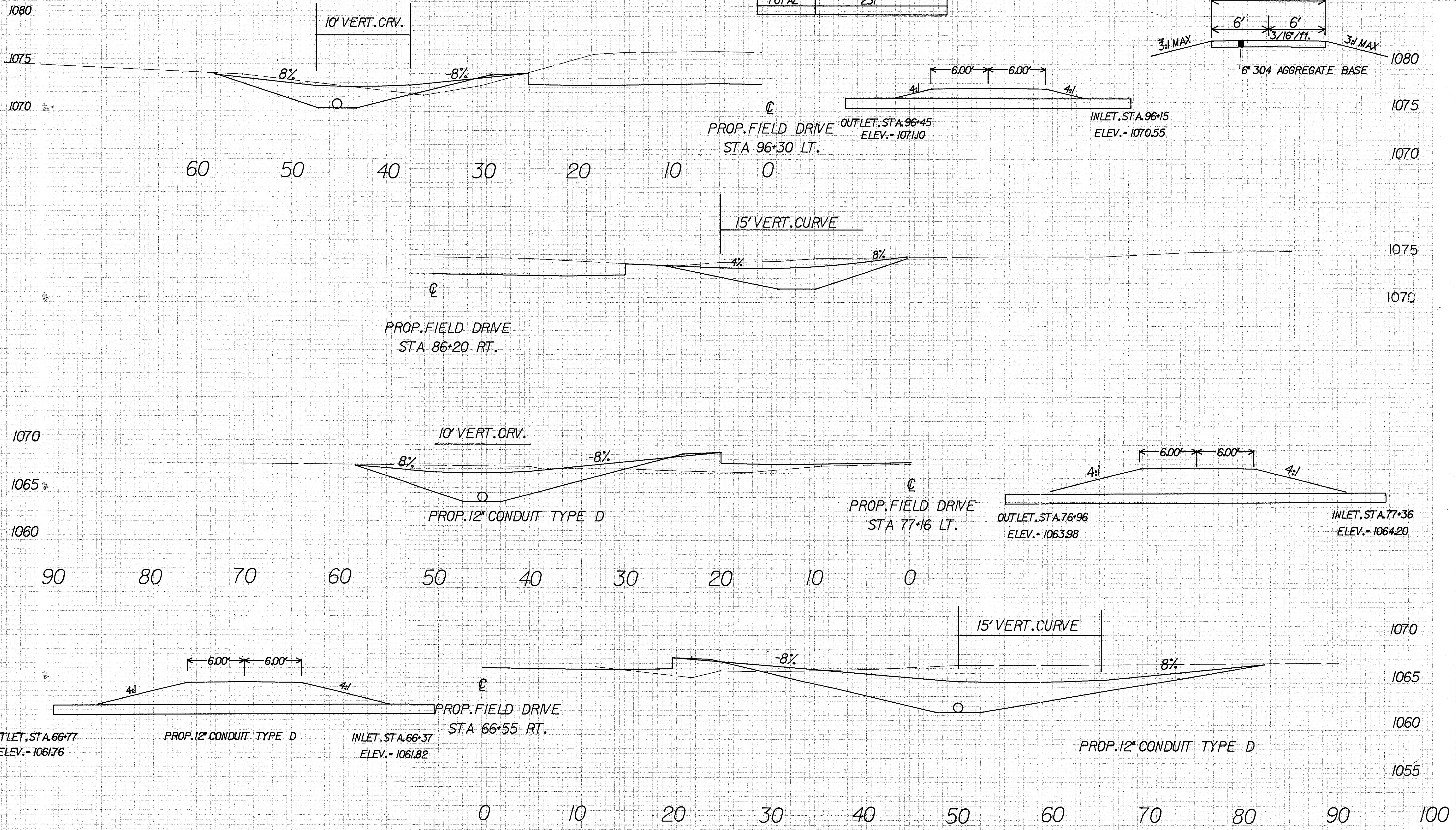
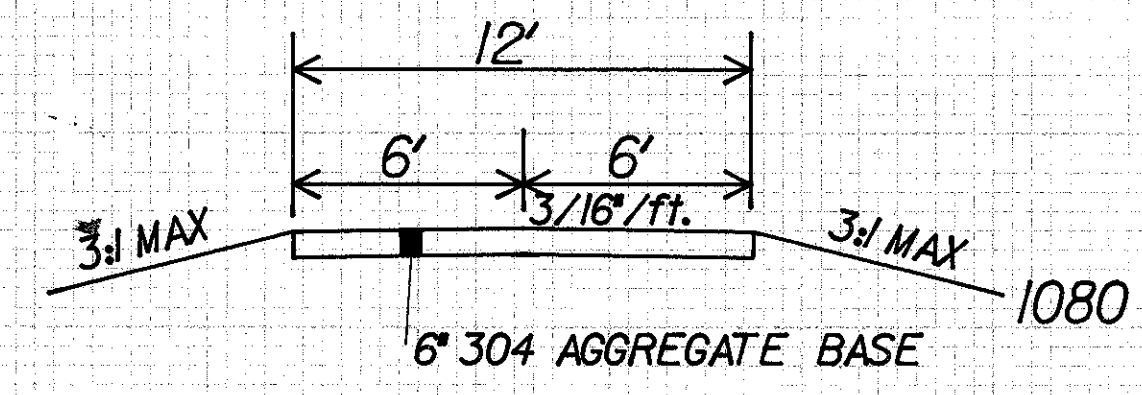
DRIVE DETAILS

UNI-739-0.02

ADDITIONAL EMBANKMENT	
STA	VOLUME (CY)
96+30 LT	25
86+20 RT	21
77+16 LT	40
66+55 RT	145
TOTAL	231

TOTAL OF 259 CY. FROM SHEET 53
TOTAL OF 490 CY. CARRIED TO GEN. SUM.

TYPICAL FIELD DRIVE



OUTLET, STA. 66+77
ELEV. = 1061.76

PROP. 12" CONDUIT TYPE D

INLET, STA. 66+37
ELEV. = 1061.82

PROP. FIELD DRIVE
STA 66+55 RT.

PROP. FIELD DRIVE
STA 77+16 LT.

OUTLET, STA. 76+96
ELEV. = 1063.98

INLET, STA. 77+36
ELEV. = 1064.20

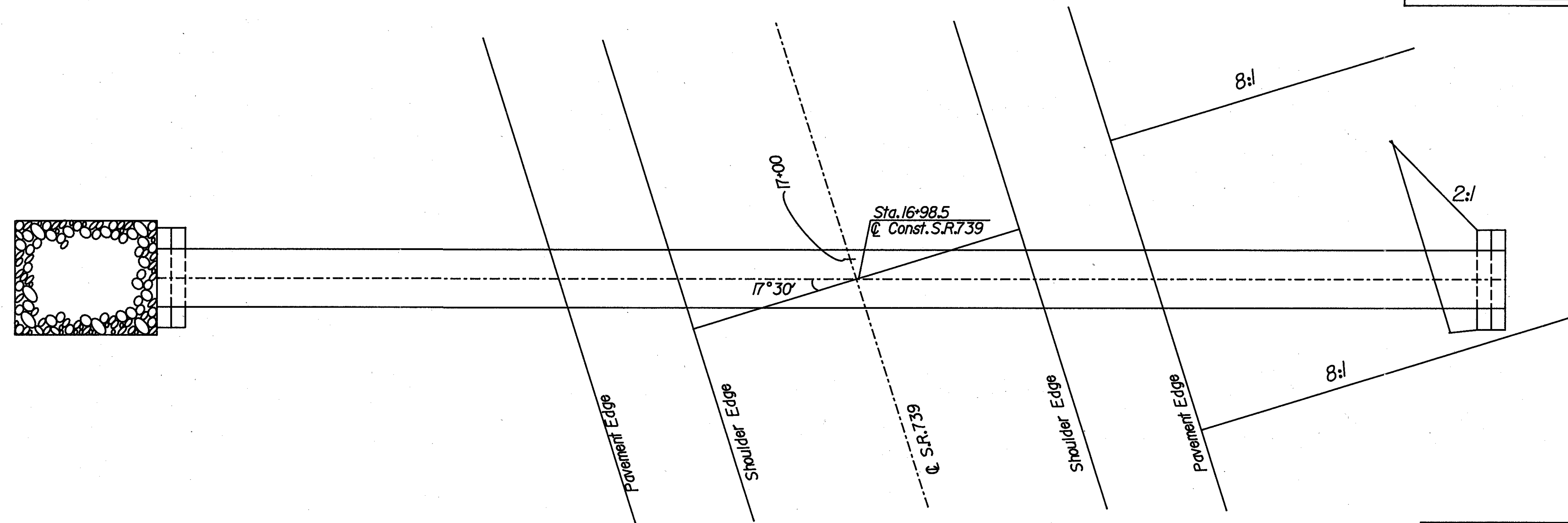
PROP. FIELD DRIVE
STA 86+20 RT.

PROP. FIELD DRIVE
STA 96+30 LT.

OUTLET, STA. 96+45
ELEV. = 1071.10

INLET, STA. 96+15
ELEV. = 1070.55

UNI-739-0.02



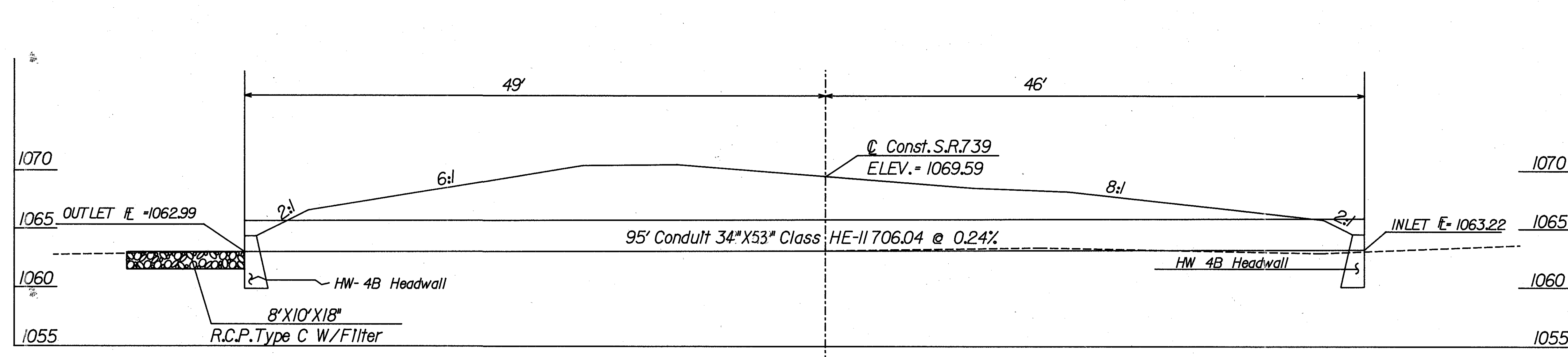
ESTIMATED QUANTITIES

ITEM	DESCRIPTION	QUANTITIES
601	Rock Channel Protection, Type C w/Filter	5 Cu.Yd.
602	Concrete Masonry	1.04 Cu.Yd.
603	Conduit, 34" X 53" 706.04 Class HE-II	95 Lin.Ft.

Quantities Carried to Gen. Sum. Sheet 10

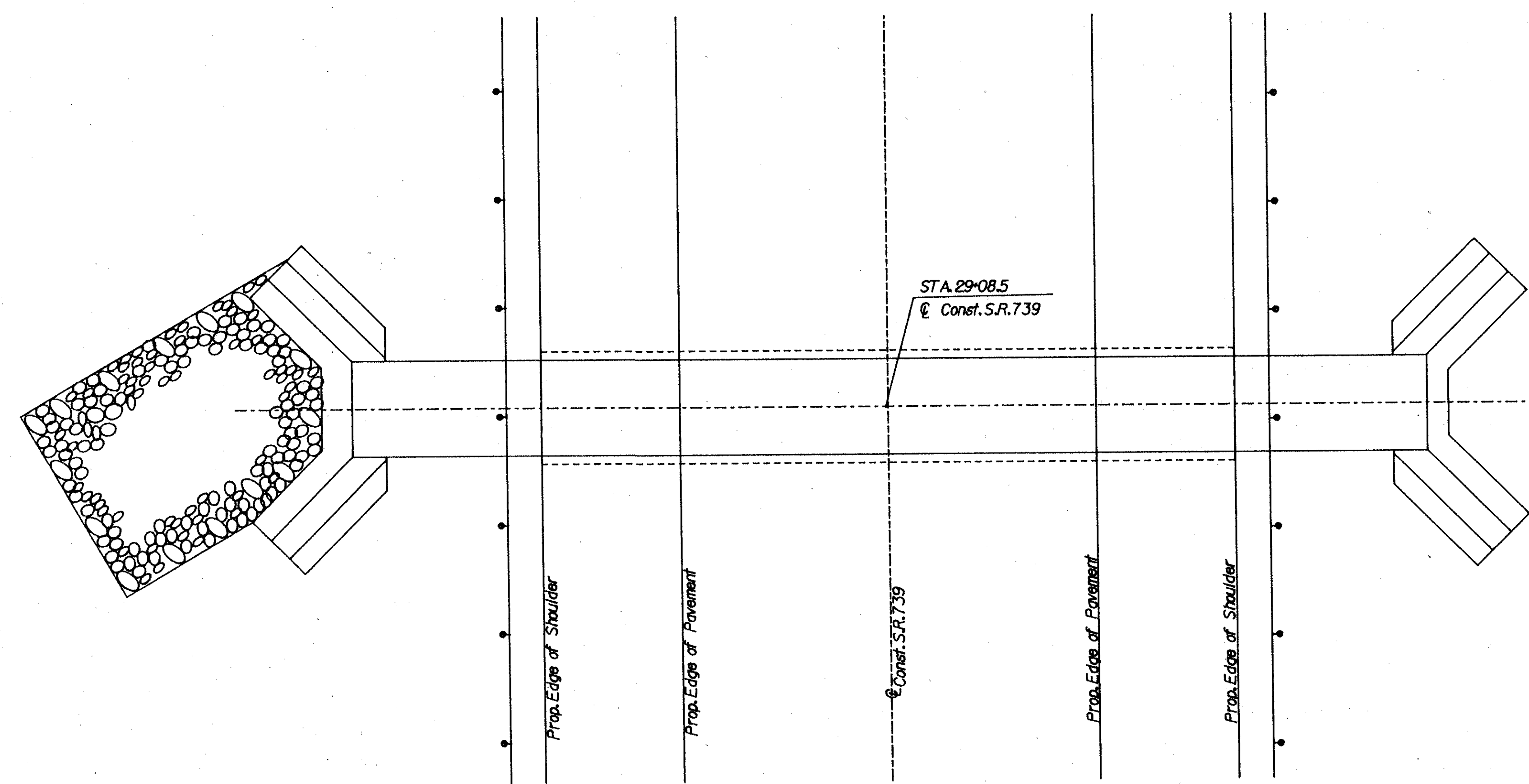
DRAINAGE QUANTITIES

Drainage Area	55 acres
Q25	66 cfs
Q100	96 cfs
HW25	1066.42
HW100	1068.69



STRUCTURE UNI-739-0032 STA. 16+98.50

UNI-739-0.02



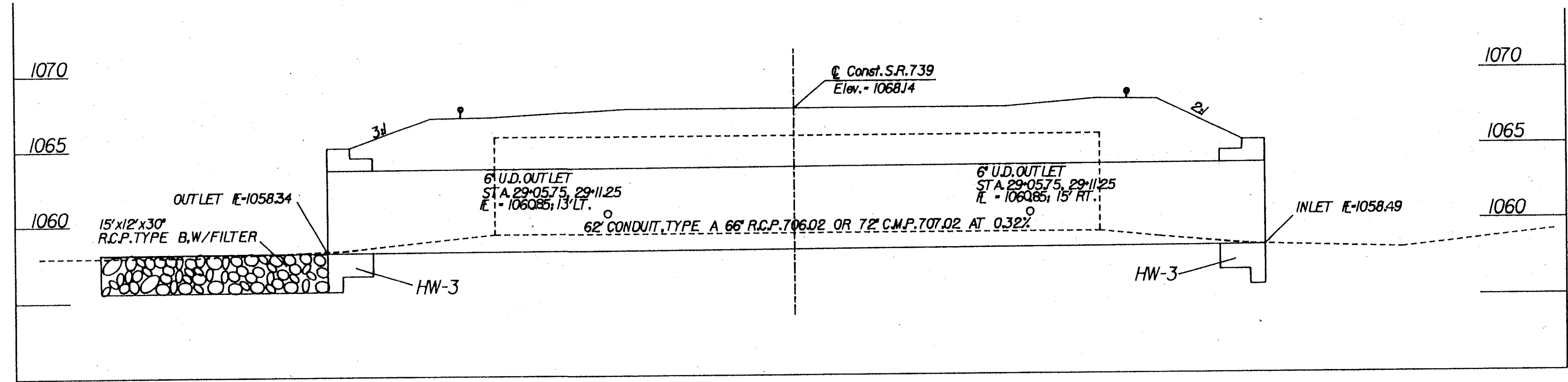
ESTIMATED QUANTITIES

ITEM	DESCRIPTION	QUANTITIES
601	Rock Channel Protection, Type B w/Filter	17 Cu.Yd.
602	Concrete Masonry	17.0 Cu.Yd.*
603	Conduit, Type A 66" R.C.P. 706.02 or 72" C.M.P. 707.02	62 Lin.Ft.

Quantities Carried to Gen. Sum. Sheet no.
 * If the 66" pipe is used the masonry will be 14.7 Cu.Yd.

DRAINAGE QUANTITIES

DESCRIPTION	QUANTITIES
Drainage Area	387 acres
Q25	199 cfs
Q100	284 cfs
HW25	1063.35
HW100	1066.35

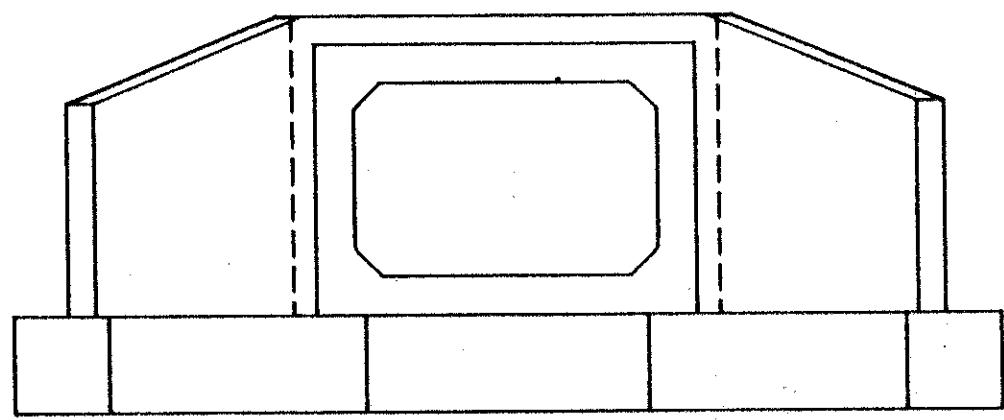
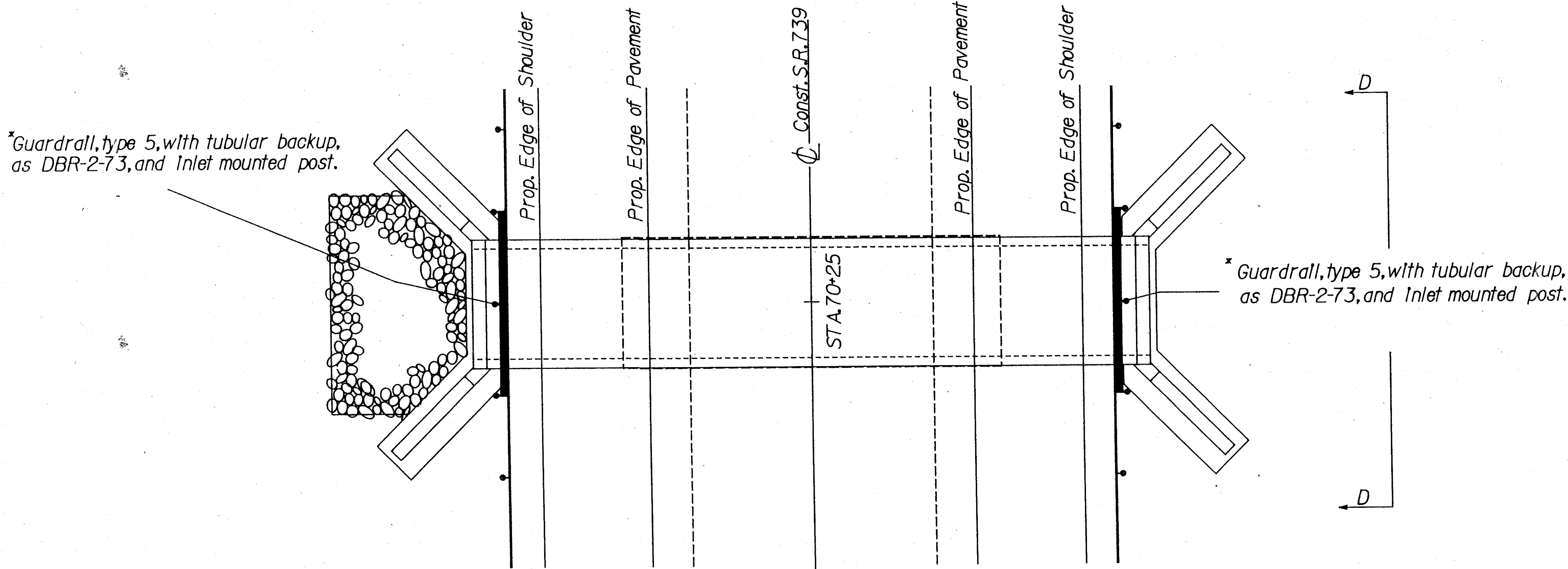


CALC. BY DPP
CHECK. BY NWK

FHWA REGION	STATE	PROJECT
5	OHIO	

58
79

UNI-739-0.02



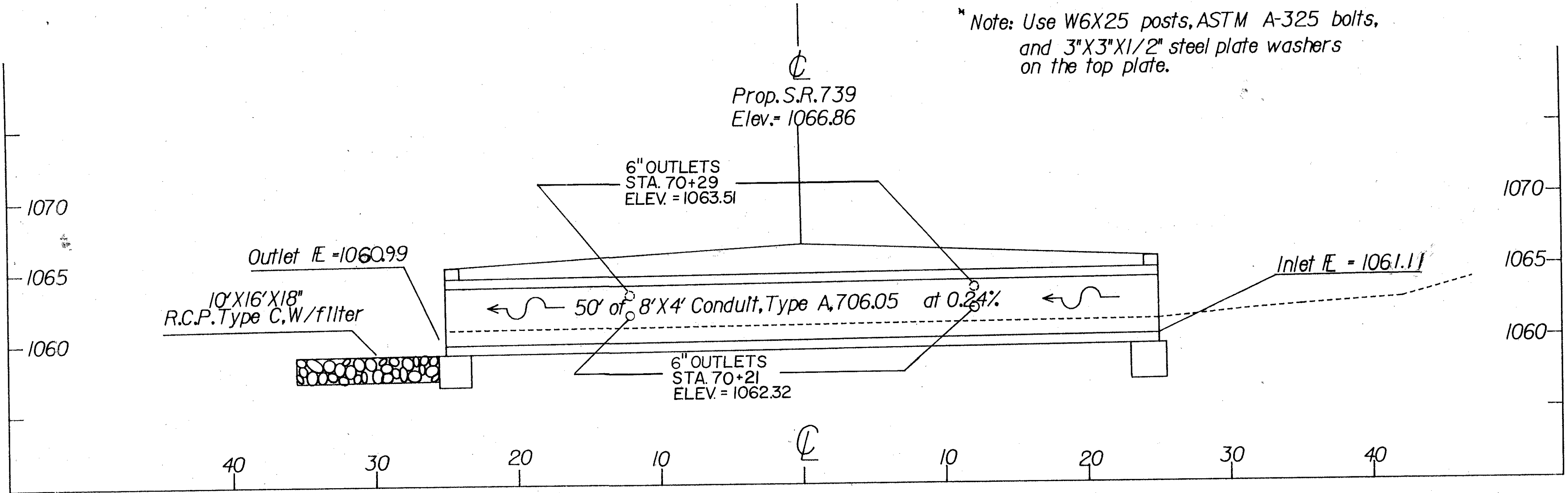
VIEW D-D

ESTIMATED QUANTITIES

ITEM	DESCRIPTION	QUANTITY
601	Rock channel protection, Type C with filter	9 Cu.Yd.
602	Concrete Masonry	23 Cu.Yd.
603	8'X4' Conduit, Type A, 706.05	50 Lin.Ft.
606	Guardrail, type 5, with tubular backup, as DBR-2-73, and Inlet mounted post.	25 Lin.Ft.

Quantities Carried to the General Summary.

DRAINAGE AREA	184 ac.
Q_{25}	145 cfs
Q_{100}	205 cfs
HW_{25}	1064.60
HW_{100}	1066.00



* Note: Use W6X25 posts, ASTM A-325 bolts,
and 3"X3"X1/2" steel plate washers
on the top plate.

WINGWALL GEOMETRY

Sta. 70+25
Const. SR739

45° (typ.)

Top of Headwall

Top of Headwall

LEFT SIDE			
NO.	STATION	OFF.	ELEV.
1	70+25	25.5	1060.32
2	70+29.5	25	1066.41
3	70+26.75	30	1063.32
4	70+20.5	25	1066.41
5	70+23.25	30	1063.32
6	70+18.83	23	1060.32
7	70+30.83	23	1060.32

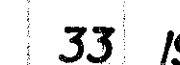
RIGHT SIDE			
NO.	STATION	OFF.	ELEV.
8	70+25	25.5	1060.44
9	70+29.5	25	1066.53
10	70+26.75	30	1063.44
11	70+20.5	25	1066.53
12	70+23.25	30	1063.44
13	70+18.83	23	1060.44
14	70+30.83	23	1060.44

0 5

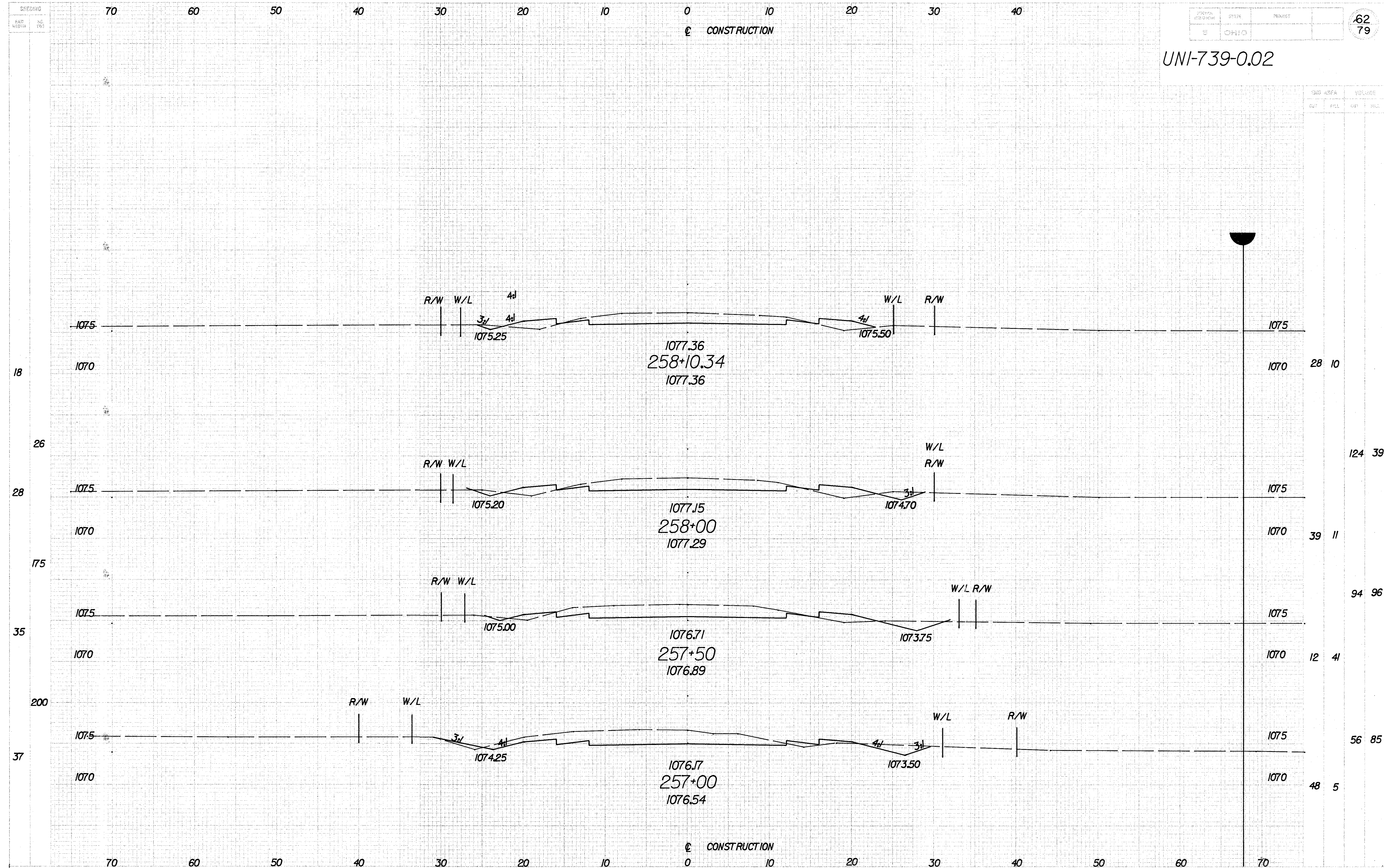
UNI-739-0.02



EMBANKMENT: 243 CY.
EXCAVATION: 335 CY.
WORK AREA: 401 SY.



CROSS SECTION CR179 STA. 254+70.15 to STA. 256+50



UNI-739-0.02

CUT AREA		FILL VOLUME	
CUT	FILL	CUT	FILL
28	10	124	39
39	11	94	96
12	41	56	85
48	5		

CROSS SECTION CR/TR 179 STA. 257+00 to STA. 258+10.34

CURVE DATA

RADIUS RETURN #1

$$\triangle = 100^{\circ}-00'-00''$$

$$R = 50'$$

$$L = 87.25'$$

$$T = 59.65'$$

$$STA 106+08.56, 1/2' LT., 1075.42$$

$$A \text{ --- } 1075.33$$

$$B \text{ --- } 1075.22$$

$$C \text{ --- } 1074.83$$

$$D \text{ --- } 1073.76$$

$$E \text{ --- } 1074.24$$

$$F \text{ --- } 1074.58$$

$$G \text{ --- } 1074.93$$

$$H \text{ --- } 1075.17$$

$$STA 254+84.77, 1/2' LT. 1075.28$$

CURVE DATA

RADIUS RETURN #4

$$\triangle = 80^{\circ}-00'-00''$$

$$R = 50'$$

$$L = 69.83'$$

$$T = 43.15'$$

$$STA 104+82.74, 1/2' LT., 1075.34$$

$$A \text{ --- } 1075.24$$

$$B \text{ --- } 1075.02$$

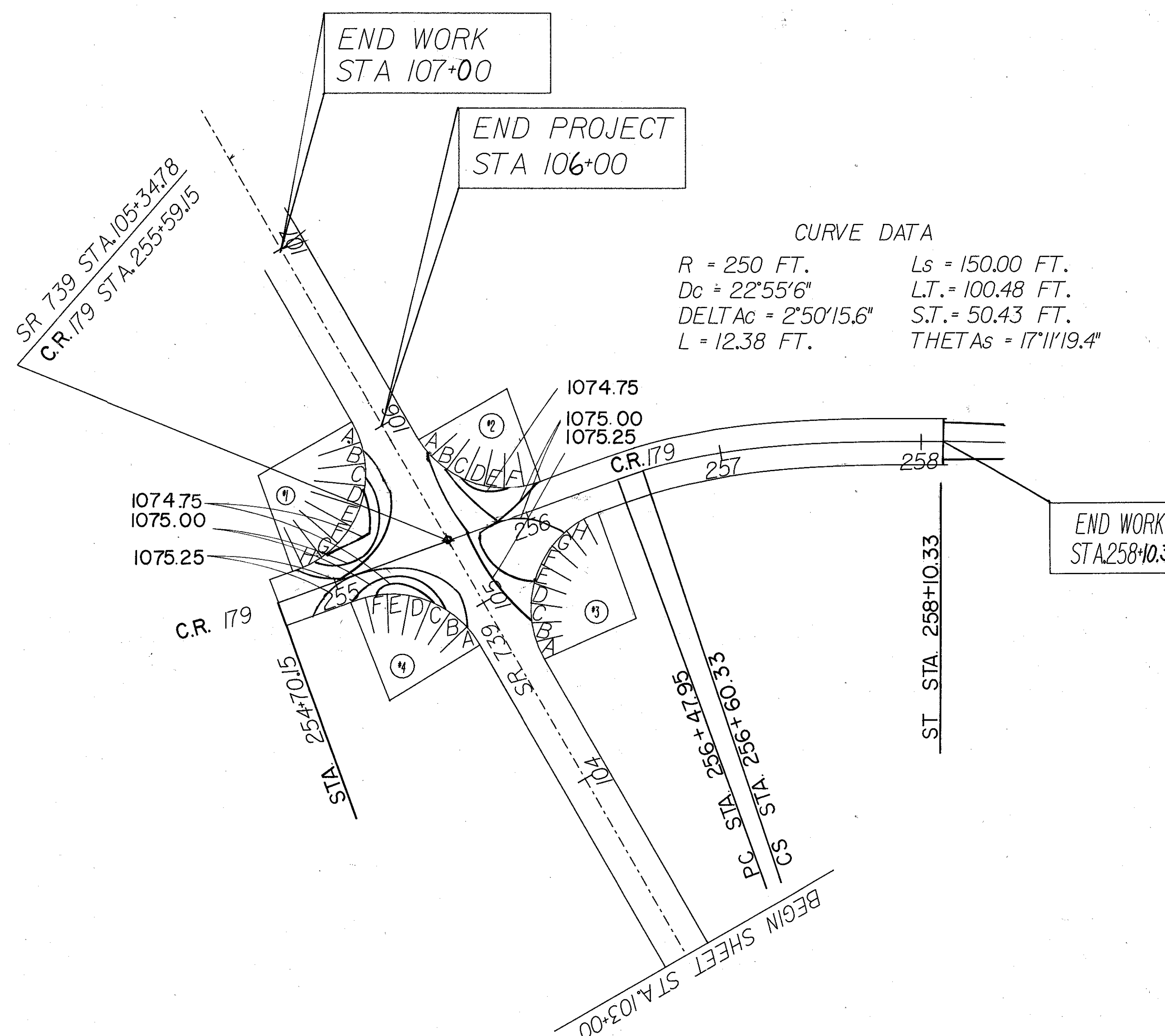
$$C \text{ --- } 1074.50$$

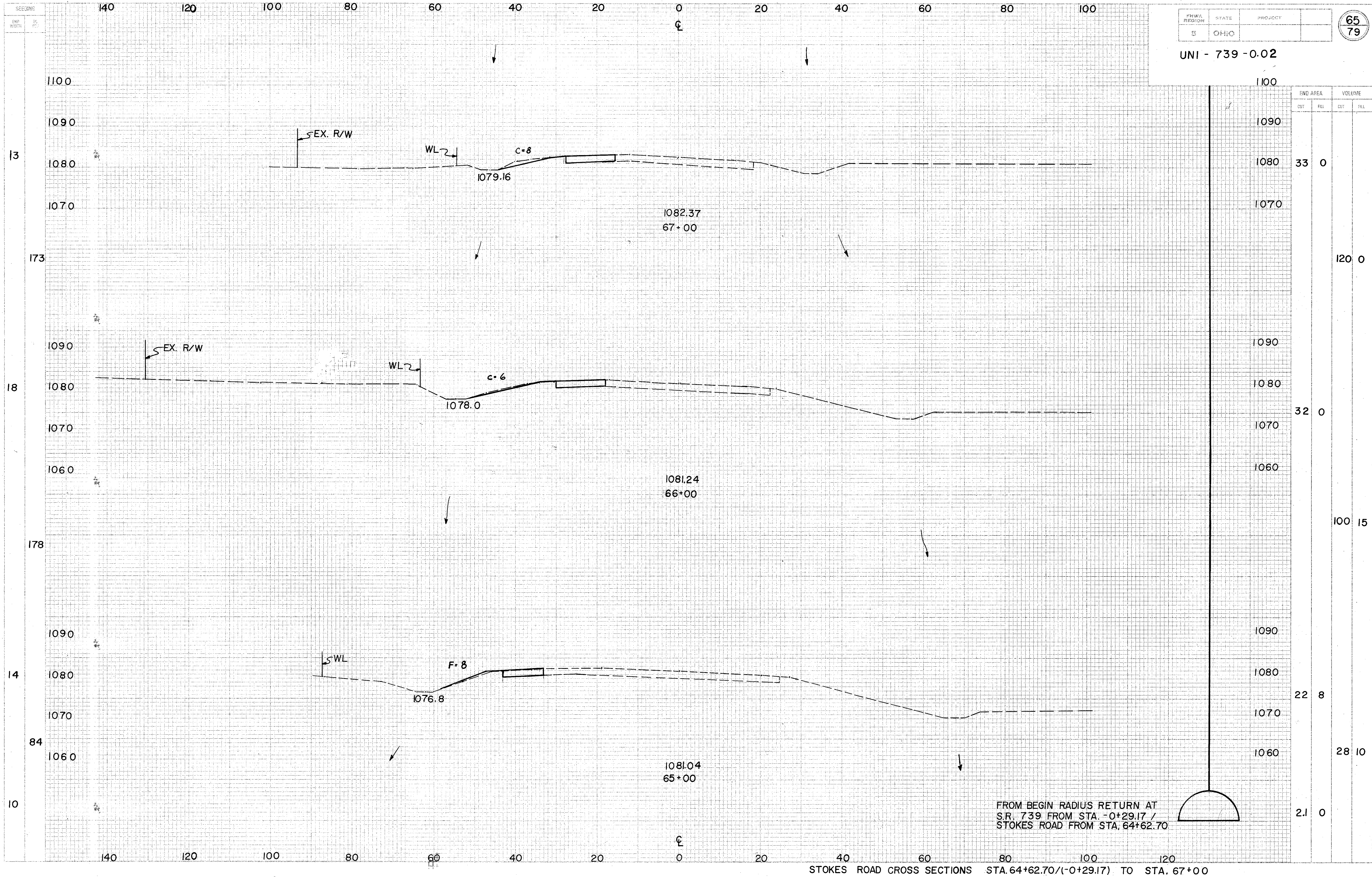
$$D \text{ --- } 1074.41$$

$$E \text{ --- } 1074.60$$

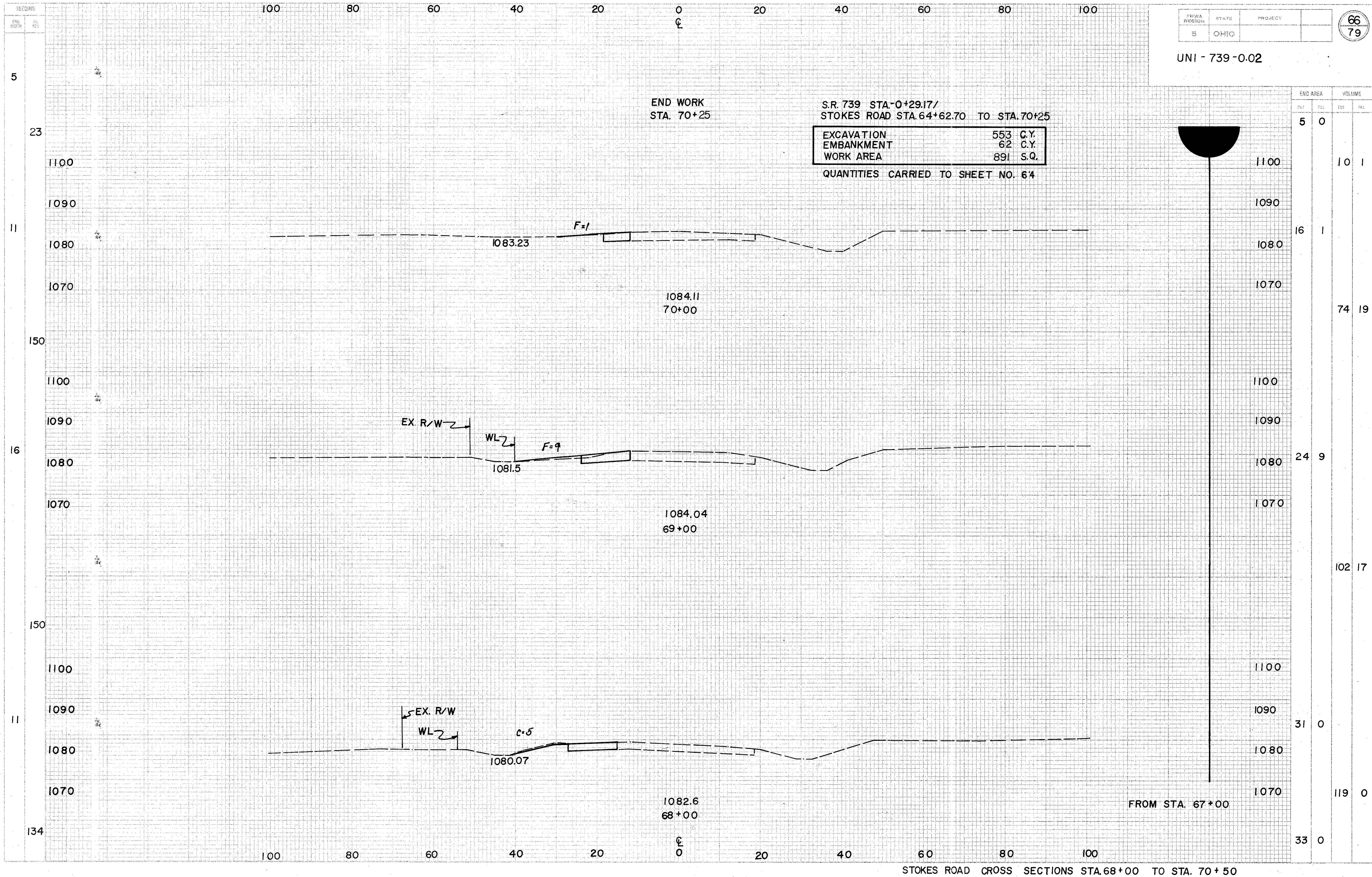
$$F \text{ --- } 1074.92$$

$$STA 255+07.05, 1/2' RT., 1075.06$$





STOKES ROAD CROSS SECTIONS STA. 64+62.70/(-0+29.17) TO STA. 67+00

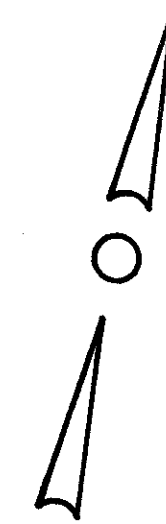


INTERSECTION DETAIL

FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

67
79

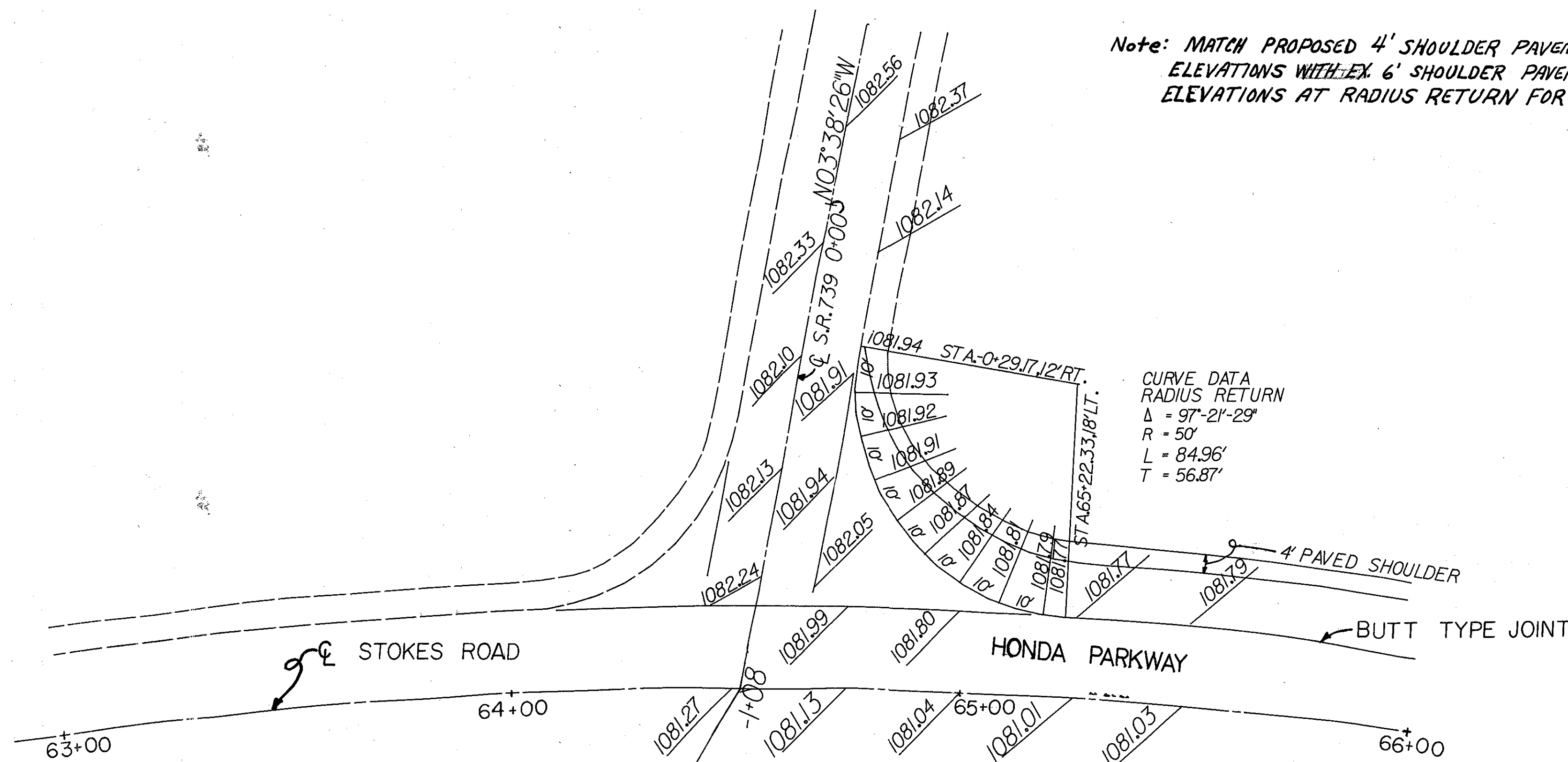
UNI-739-0.02



RIGHT TURN LANE PAVEMENT ELEVATIONS

	STATION	EXIST. ED.PAV.	TURN LANE ED.PAV.	EDGE BERM
S.R.739	-0+29.17, 12' RT.	1081.94	1081.90	1081.69
	10'	1081.93	1081.79	1081.59
	10'	1081.92	1081.70	1081.51
	10'	1081.91	1081.63	1081.53
	10'	1081.89	1081.60	1081.39
	10'	1081.87	1081.57	1081.35
	10'	1081.84	1081.56	1081.33
	10'	1081.81	1081.57	1081.33
	10'	1081.79	1081.58	1081.33
	10'	1081.77	1081.58	1081.33
STOKES ROAD	65+22.33, 18' LT.	1081.77	1081.58	1081.33
	65+25	1081.77	1081.58	1081.33
	65+50	1081.79	1081.60	1081.35
	65+75	1081.83	1081.64	1081.39
	66+00	1081.93	1081.74	1081.49
	66+25	1082.05	1081.86	1081.61
	66+50	1082.18	1081.99	1081.74
	66+75	1082.30	1082.11	1081.86
	67+00	1082.43	1082.24	1081.99
	67+25	1082.55	1082.36	1082.11
	67+50	1082.70	1082.51	1082.26
	67+75	1082.88	1082.69	1082.44
	68+00	1083.02	1082.83	1082.58
	68+25	1083.18	1082.99	1082.74
	68+50	1083.32	1083.13	1082.88
	68+75	1083.39	1083.20	1082.95
	69+00	1083.45	1083.26	1083.01
TAPER	69+25	1083.52	1083.33	1083.08
	69+50	1083.58	1083.39	1083.14
	69+75	1083.65	1083.46	1083.21
	70+00	1083.74	1083.55	1083.30
	70+25	1083.84	1083.82	1083.57

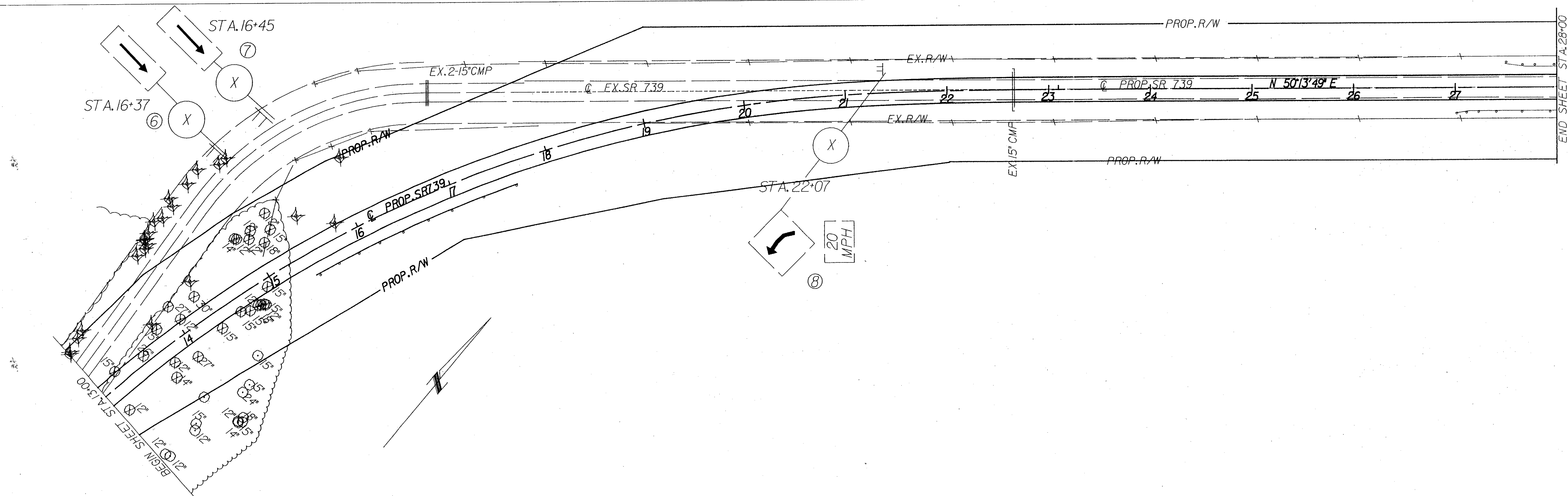
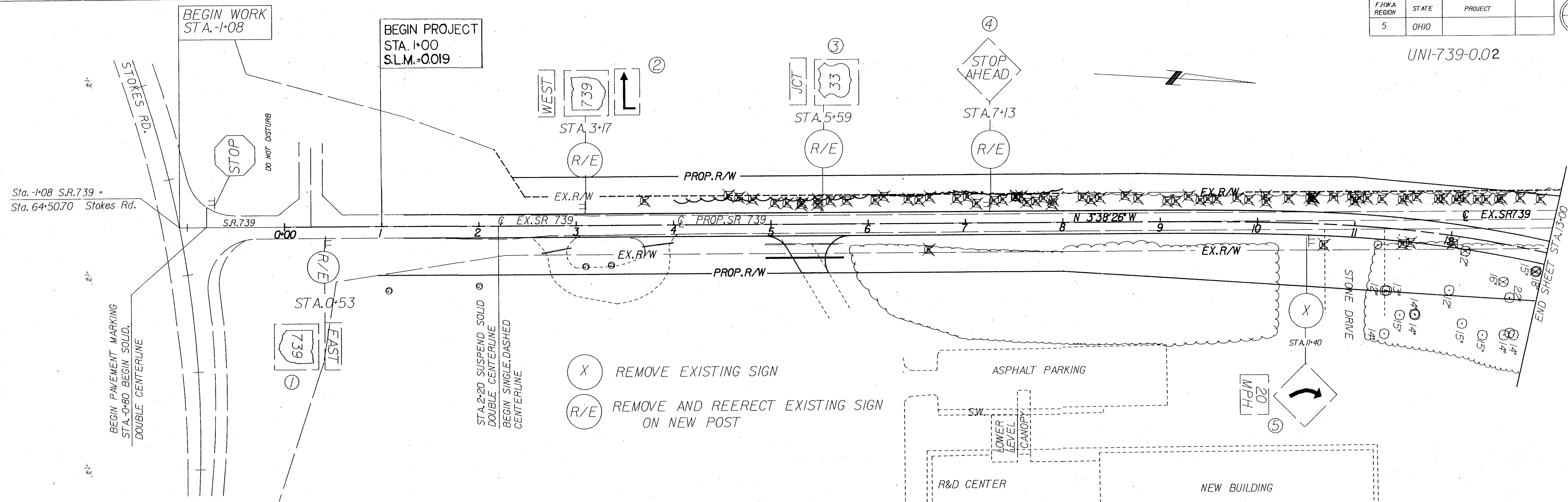
Note: MATCH PROPOSED 4' SHOULDER PAVEMENT & ELEVATIONS WITH EX. 6' SHOULDER PAVEMENT & ELEVATIONS AT RADIUS RETURN FOR S.R.739.



P.O.C. STA 64+50.70 STOKES ROAD =
P.O.T. STA -1+08 S.R.739

CURVE DATA
STOKES ROAD
P.I. STA 65+20.08
 $\Delta = 40^\circ 50' 50''$ RT.
D = 5'00'00"
R = 1,145.92'
T = 426.70'
L = 816.94'
E = 76.87'
P.C. STA 60+93.38
P.T. STA 69+10.32

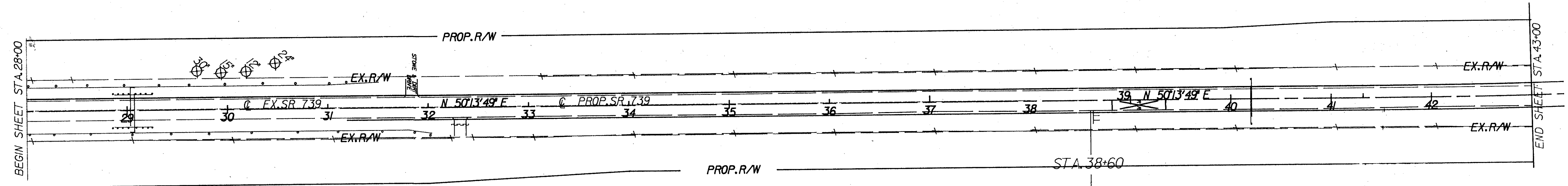
UNI-739-0.02



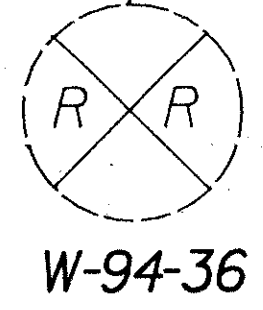
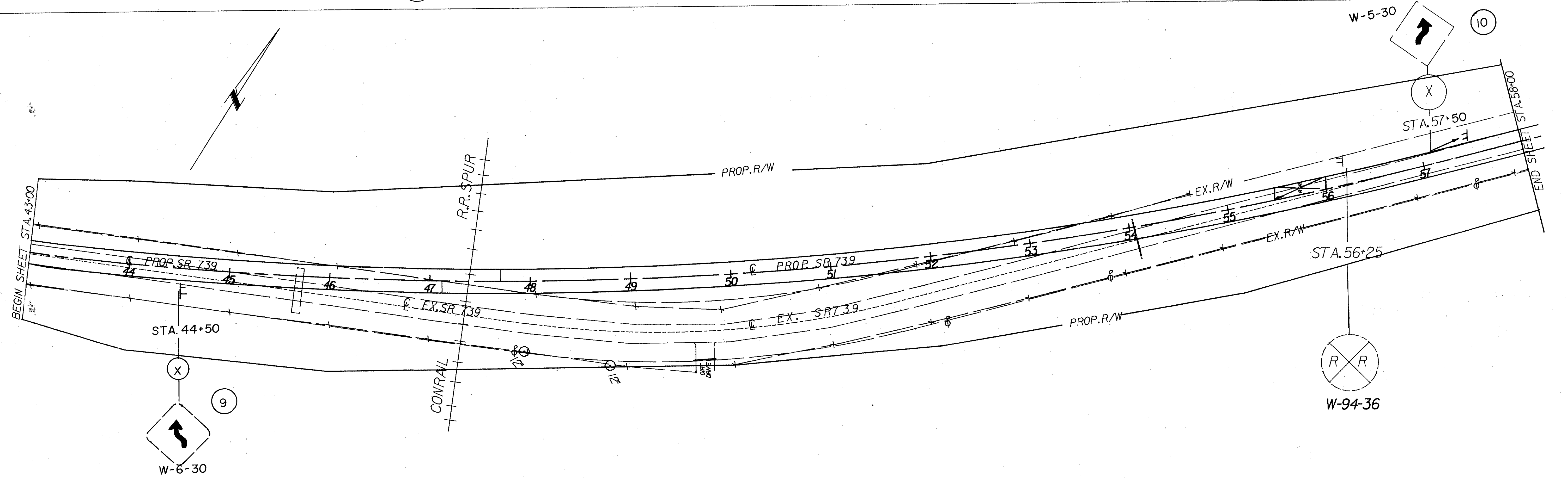
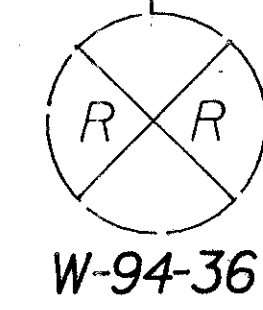
FHWA REGION	STATE	PROJECT	
5	OHIO		

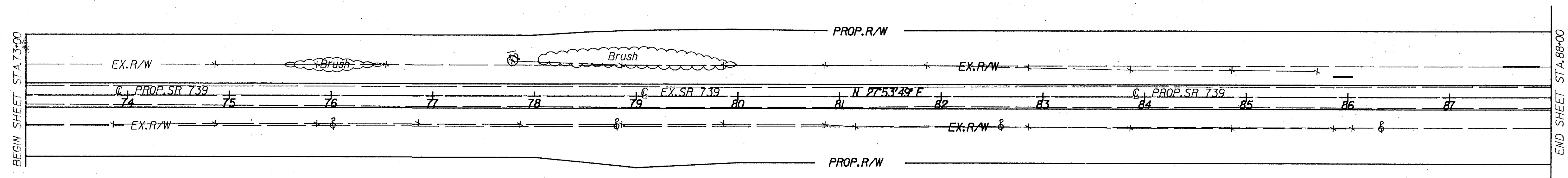
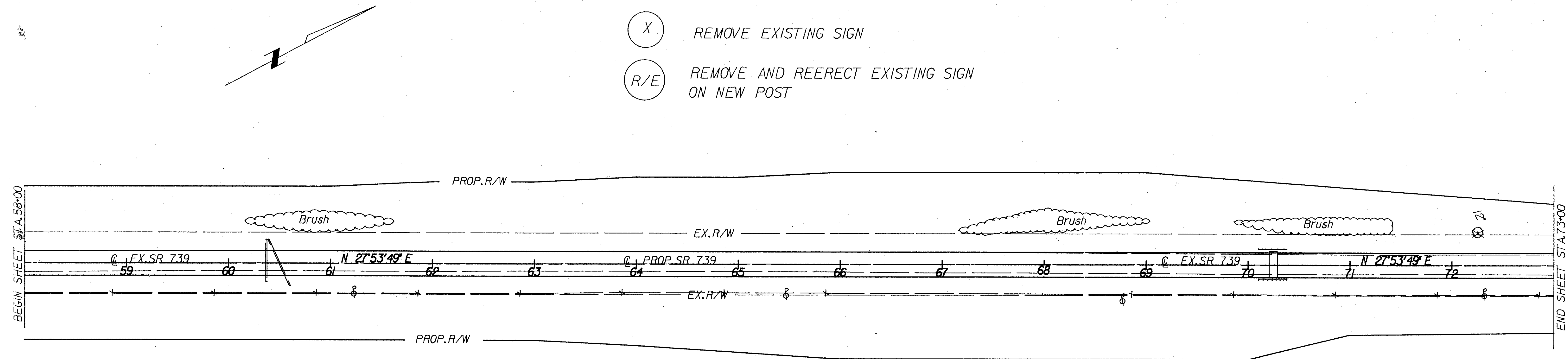
69
79

UNI-739-0.02



- (X) REMOVE EXISTING SIGN
- (R/E) REMOVE AND REERECT EXISTING SIGN ON NEW POST
- (NO.) NEW SIGN





TRAFFIC CONTROL GENERAL SUMMARY

UNI-739-0.02

SIGN LOCATION	STA 0+53	STA 3+17	STA 5+59	STA 7+13	STA 11+40	STA 16+37	STA 16+45	STA 22+07	STA 44+50	STA 57+50	STA 104+00	STA 106+25	STA 255+25 TR 179	STA 255+25 TR 179	STA 255+80 TR 179	STA 255+75 TR 179	STA 255+95 TR 179	STA 255+95 TR 179				STA 104+00	STA 106+25	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
SIGN NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	15	16				M-39-24	M-40-24					
SIGN CODE NUMBER																												

802 Barrier Reflector, Type A		
	Side	Each
27+00 TO 31+38	Rt	6
27+63 TO 32+00	Lt	6
69+00 TO 71+50	Rt	4
69+00 TO 71+50	Lt	4
89+65 TO 94+65	Rt	6
89+10 TO 94+10	Lt	6
TOTAL		32

PAVEMENT MARKING SCHEDULE		ITEM 621					
		4" CENTER LINES, SOLID, DOUBLE	EDGE LINES	STOP LINES	CHANNELIZING LINES	4" CENTER LINES, DASHED, SINGLE	RAILROAD SYMBOL MARKINGS
SHT.	LOCATION	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	EACH
	0+00 to 107+00		19,050				
	-0+80 to 2+00	308					
	2+00 to 102+40					19,040	
	102+40 to 107+00	510					
	255+25 TR179	55		15			
	255+95 TR179	215		15			
	US 33		400		225		
	TR179		800				
	STA. 39+10						1
	STA. 57+75						1
	47+10			12			
	47+70			12			
TOTALS		1,088	20,250	54	225	19,040	2

11,128 Lin.Ft
2.11 MILES

V.M.S.158,3490,5270,12282
12308,12400-12413,13271,13849

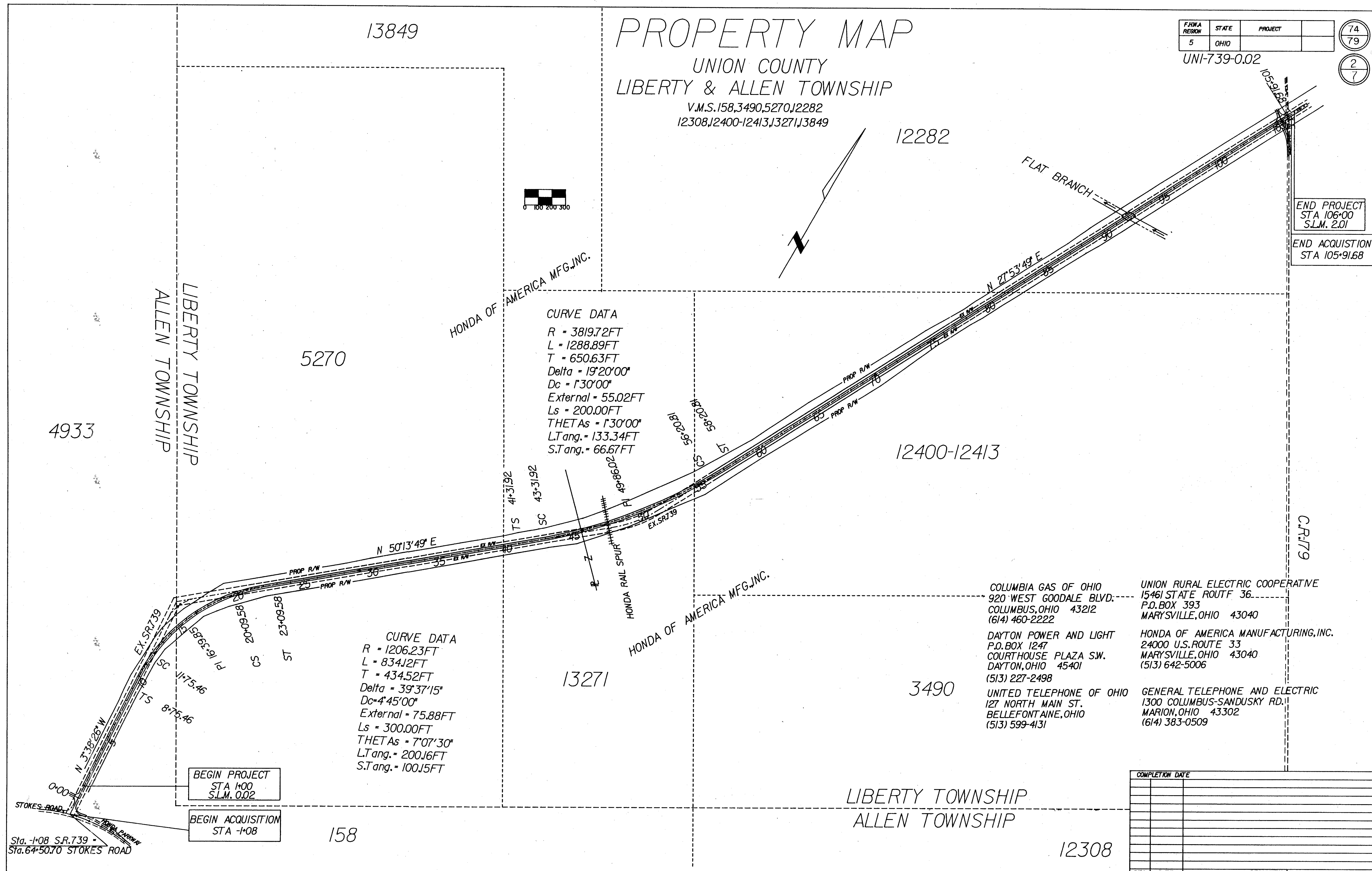
FHWA REGION	STATE	PROJECT	
5	OHIO		

UNI-739-0.02

$$\frac{74}{79}$$
$$\frac{2}{7}$$

END PROJECT
STA 106+00
S.L.M. 2.01

END ACQUISITION
STA 105+91.68

[illegible]

PROPERTY MAP

1 OWNERSHIPS
0 TOTAL TAKES ⁶ ₄
 _____ OWNERSHIPS WITH STRUCTURES INVOLVED
 _____ OWNERSHIPS WITH "P" ITEMS

CALC. BY _____ DATE _____			OHIO	75
CHKD. BY _____ DATE _____			FHWA REGION 5	79
FEDERAL PROJECT	STATE PROJECT	06552 (0)		3 7

[illegible]

COMPLETION DATE

REV.	DATE	DESCRIPTION
------	------	-------------

R/W SUMMARY SHEET

HONDA OF AMERICA MFG., INC.

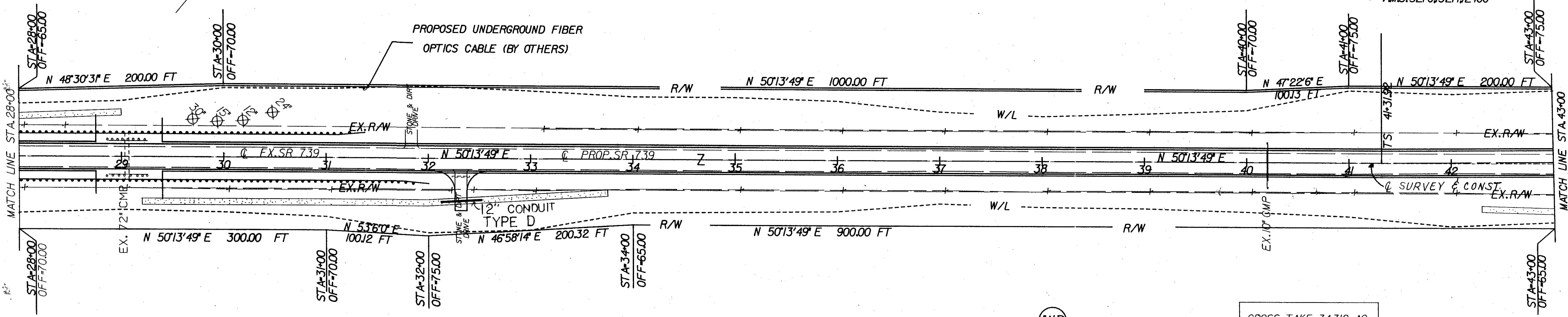
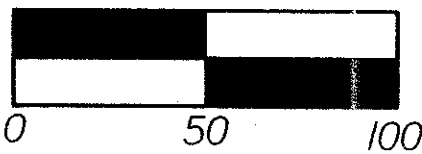
Calc. By _____
Chk. By _____

F.H.W.A. REGION	STATE	PROJECT
5	OHIO	

77
79

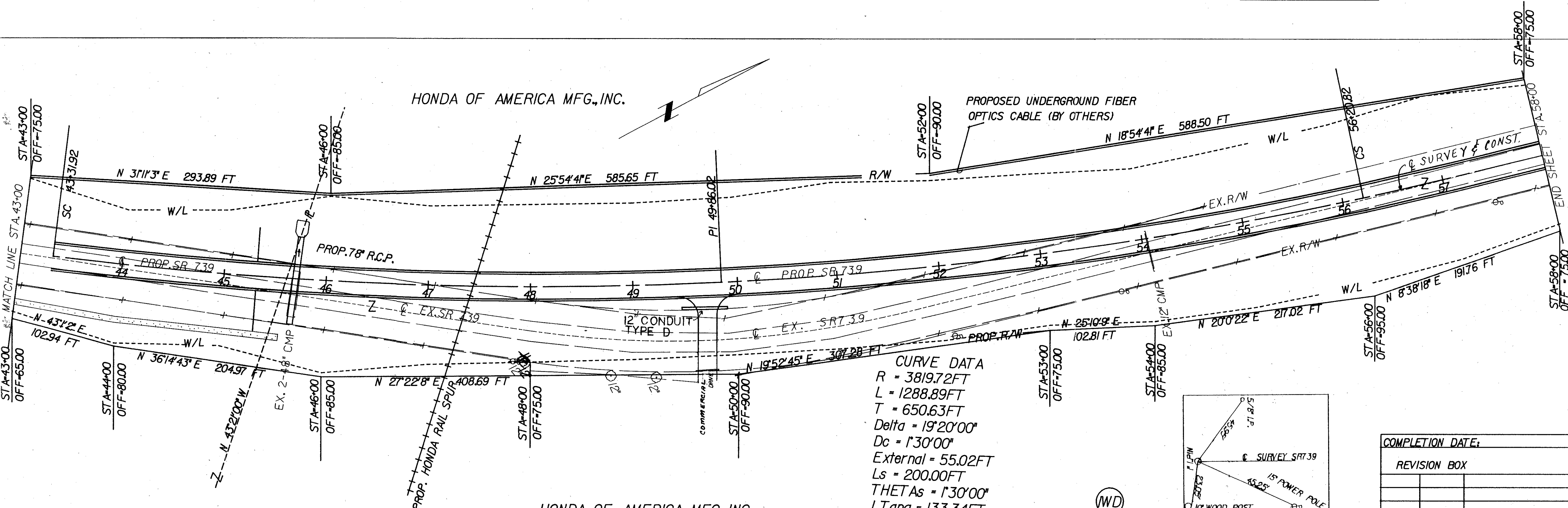
UNI-739-0.02
ALLEN TOWNSHIP
LIBERTY TOWNSHIP
UNION COUNTY
V.M.S. 5270, J3271, J2400

5
7



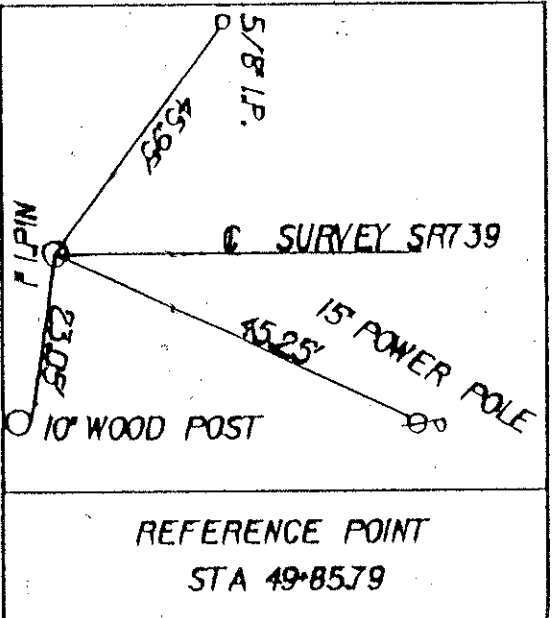
HONDA OF AMERICA MFG., INC.

GROSS TAKE 34.312 AC
P.R.O. TAKE 15.466 AC
NET TAKE 18.846 AC



HONDA OF AMERICA MFG., INC.

CURVE DATA
R = 3819.72 FT
L = 1288.89 FT
T = 650.63 FT
Delta = 19°20'00"
Dc = 1°30'00"
External = 55.02 FT
Ls = 200.00 FT
THETAs = 1°30'00"
L.Tang. = 133.34 FT
S.Tang. = 66.67 FT



COMPLETION DATE:		
REVISION BOX		
REV	DATE	DESCRIPTION

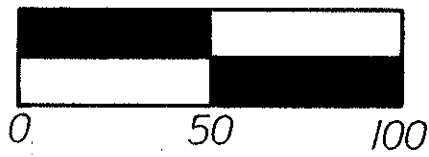
Calc. By _____
Chk. By _____

F.H.W.A. REGION	STATE	PROJECT
5	OHIO	

UNI-739-0.02

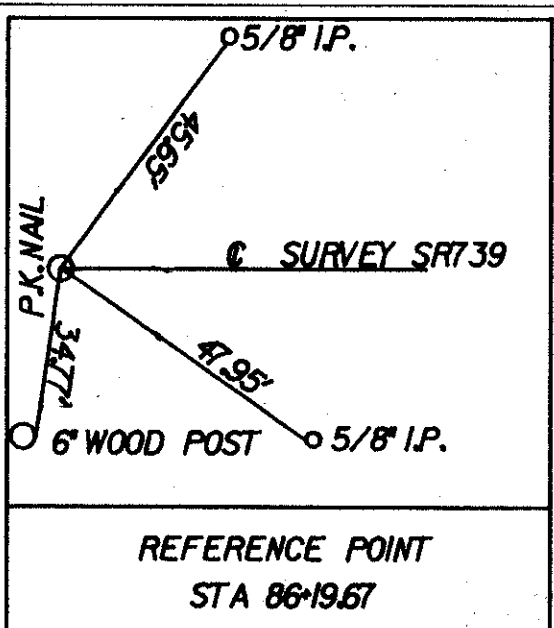
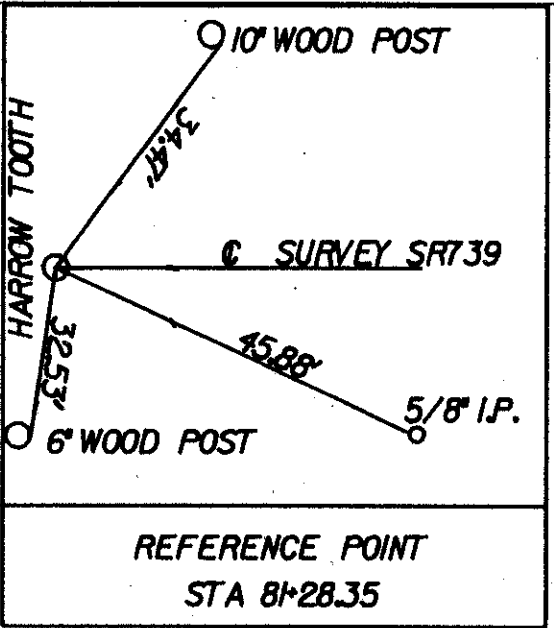
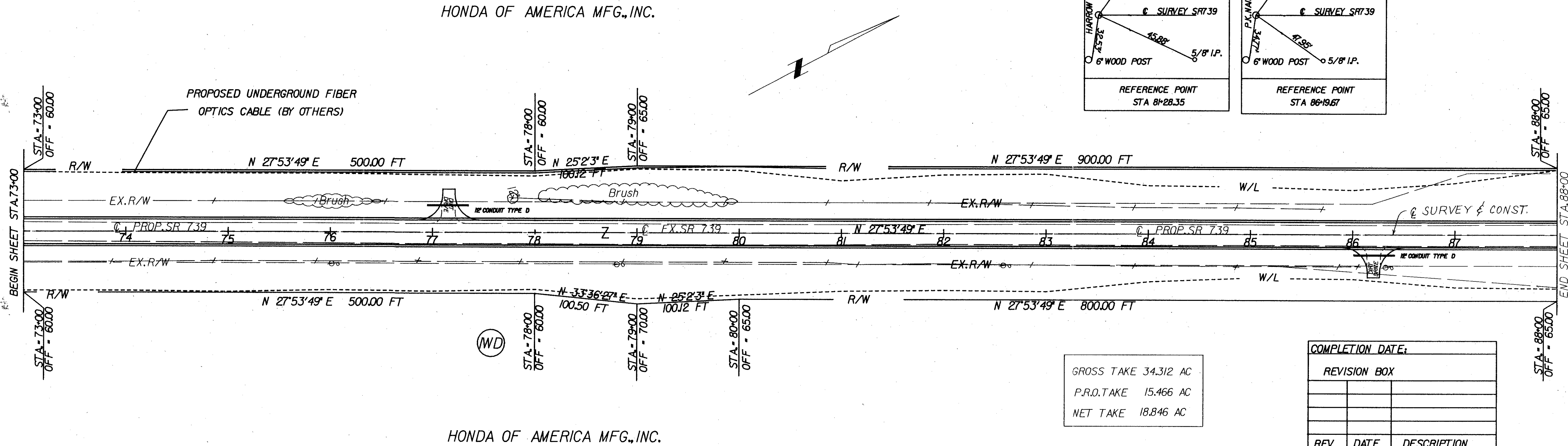
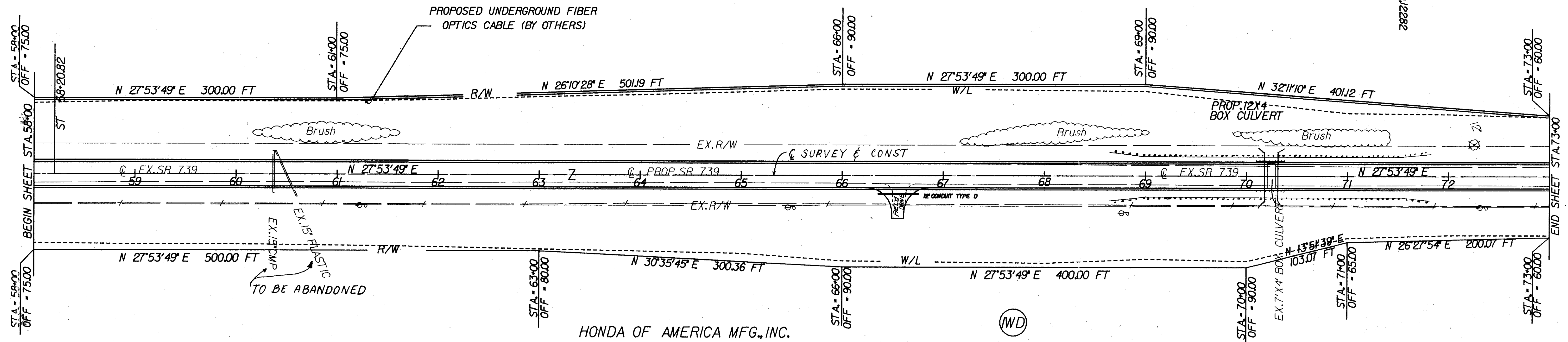
ALLEN TOWNSHIP
LIBERTY TOWNSHIP
UNION COUNTY

V.M.S./2400/2282



78
79

6
7

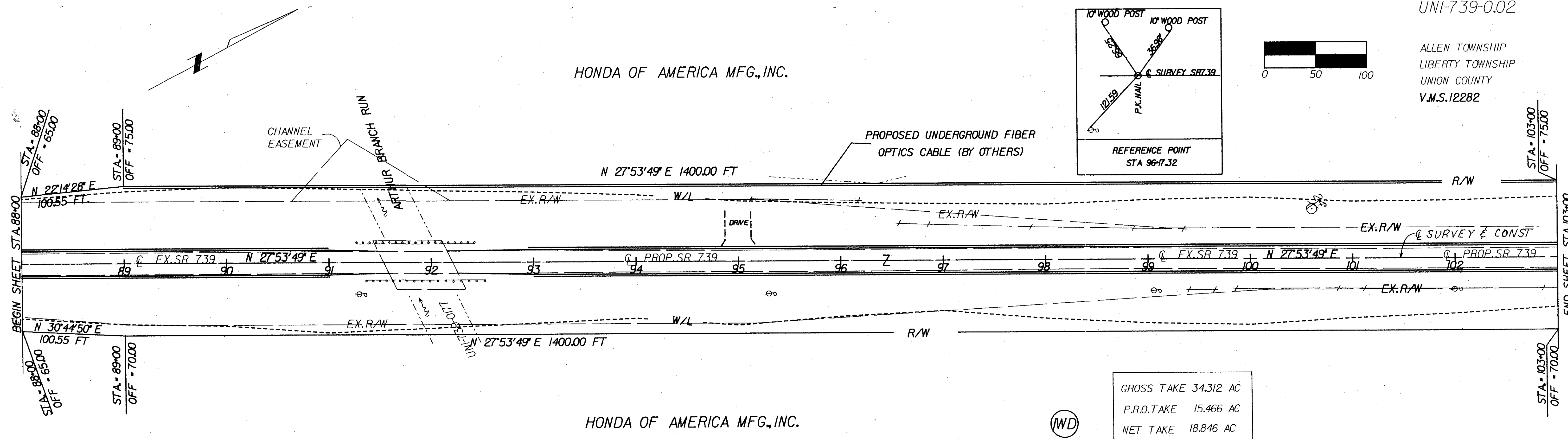
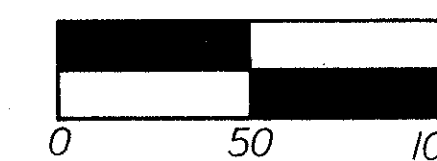
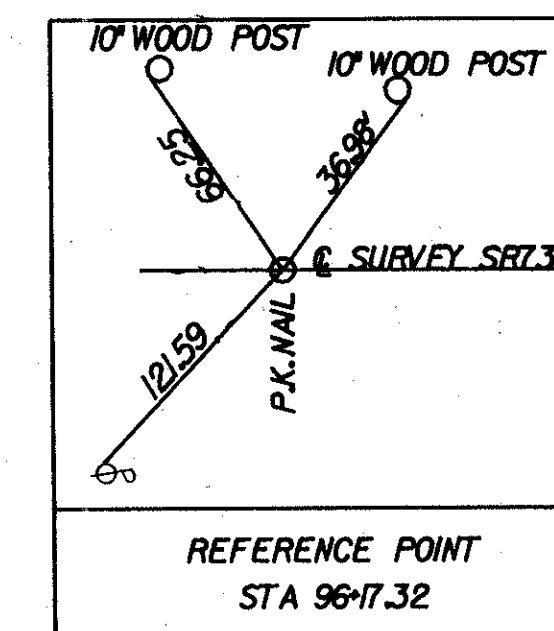


GROSS TAKE 34.312 AC
P.R.O. TAKE 15.466 AC
NET TAKE 18.846 AC

COMPLETION DATE:		
REVISION BOX		
REV	DATE	DESCRIPTION

UNI-739-0.02

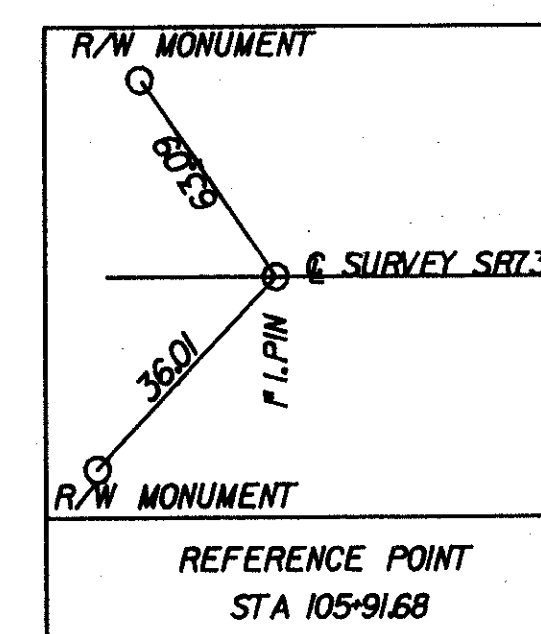
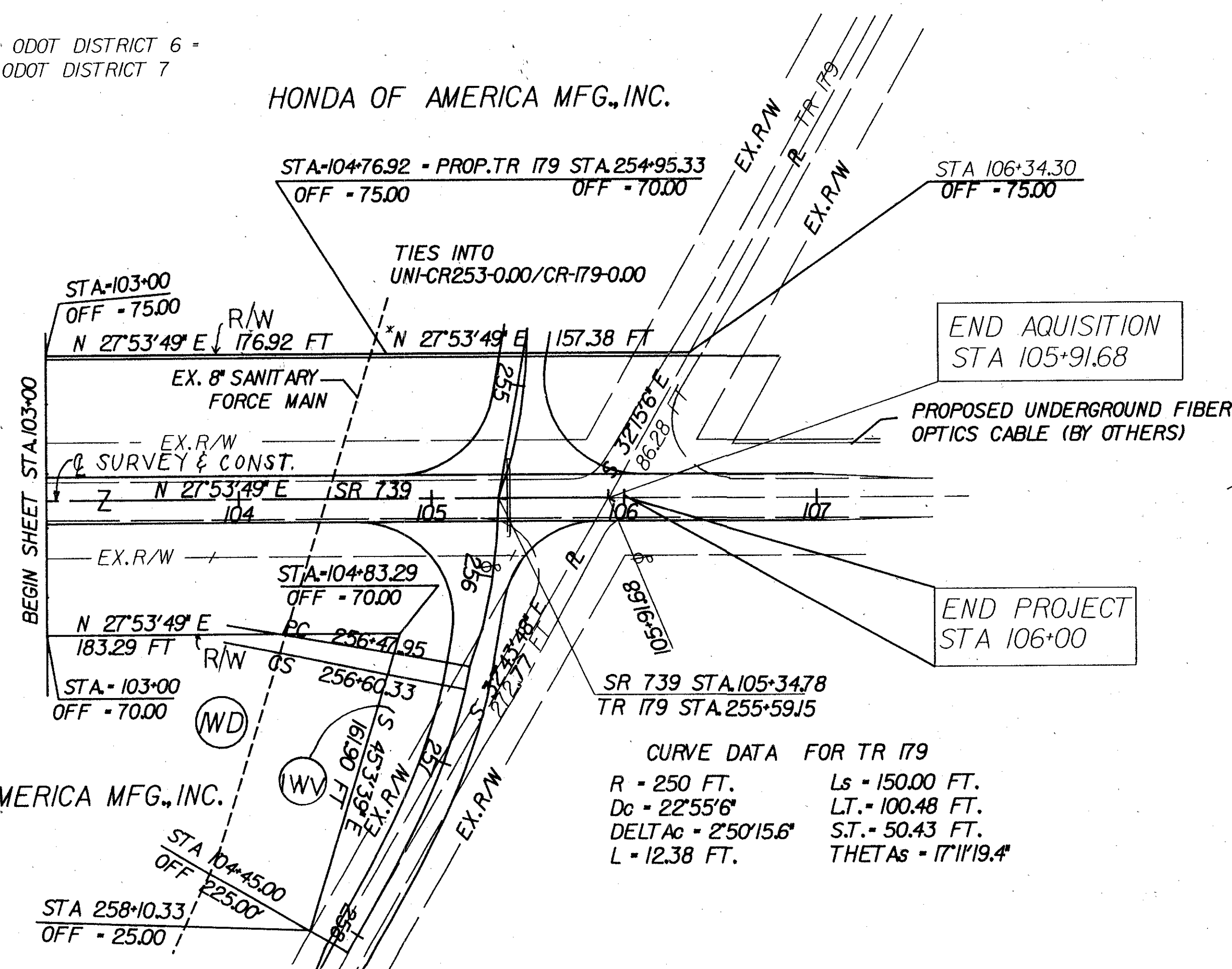
ALLEN TOWNSHIP
LIBERTY TOWNSHIP
UNION COUNTY
V.M.S.12282



GROSS TAKE 34.312 AC
P.R.O. TAKE 15.466 AC
NET TAKE 18.846 AC

* N 27°53'49" E ODOT DISTRICT 6 =
N 28°9'50" E ODOT DISTRICT 7

HONDA OF AMERICA MFG., INC.



HONDA OF AMERICA MFG., INC.

COMPLETION DATE:		
REVISION BOX		
REV	DATE	DESCRIPTION

RIGHT-OF-WAY STA. 88+00 TO STA. 107+00

GENERAL INFORMATION

INTRODUCTION

THIS REPORT CONSISTS OF THE SOILS INVESTIGATION OF 2.1 MILES OF PROPOSED USR 739, BEGINNING ON USR 33 AT EAST LIBERTY, EXTENDING NORTHWARD AND TERMINATING AT TWP. ROAD 197.

PROPOSED SR 739, MAXIMUM CUTS 6 FEET; MAXIMUM FILLS 6 FEET.

GEOLOGY OF THE PROJECT

THE PROJECT IS LOCATED ON THE GLACIATED MISSISSIPPI VALLEY PLAIN, IN AN AREA WHERE THICK GLACIAL DRIFT OVERLIES DOLOMITE BEDROCK OF THE MONROE GROUP.

EXPLORATION

EXPLORATORY BORINGS WERE MADE BY MEANS OF TRUCK-MOUNTED MECHANICAL SOIL AUGER AND DRIVE SAMPLE BORINGS, MADE BETWEEN MARCH 8 AND 10, 1988.

INVESTIGATIONAL FINDINGS

MATERIALS ENCOUNTERED ON THE PROJECT WERE PREDOMINANTLY COMPRISED OF SILT CLAYS (A-6A AND A-6B) AND CLAYS (A-7-6), WITH SOME SANDY SILTS (A-4A), GENERALLY HAVING LOW MOISTURE CONTENTS AND MOISTURE CONTENTS IN THE LOWER PORTIONS OF THE PLASTIC RANGE.

LEGEND FOR PROJECT AVERAGE RESULTS OF TESTS— 160 SAMPLES TESTED

DESCRIPTION	H.R.B. CLASS	OHIO CLASS	% AGG.	% C. SAND	% F. SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	WATER CONTENT	SAMPLES TESTED
GRAVEL	A-1-A(0)	A-1-A	55	24	9	10	2	NP	NP	10	1
GRAVEL WITH SAND	A-1-B(0)	A-1-B	27	35	15	17	6	NP	NP	13	1
SANDY SILT	A-4(5)	A-4A	19	9	14	30	28	24	7	16	19
SILT	A-4(8)	A-4B	0	4	7	56	33	23	8	22	1
SILT AND CLAY	A-6(9)	A-6A	11	3	7	33	46	33	13	18	59
SILTY CLAY	A-6(11)	A-6B	10	3	6	29	52	38	17	21	27
CLAY	A-7-6(14)	A-7-6	15	3	6	26	48	46	22	25	52

SOD AND/OR TOPSOIL-X-APPROXIMATE DEPTH
 BERM MATERIAL
 AUGER BORING-PLAN VIEW
 DRIVE SAMPLE BORING-PLAN VIEW
 AUGER BORING PLOTTED TO VERTICAL SCALE ONLY
 DRIVE SAMPLE BORING PLOTTED TO VERTICAL SCALE ONLY

WATER CONTENT NEARLY EQUAL TO OR GREATER THAN LIQUID LIMIT.
 INDICATES A NON-PLASTIC MATERIAL WITH A HIGH WATER CONTENT
 FREE WATER
 STATIC WATER LEVEL
 NUMBER OF BLOWS FOR "STANDARD PENETRATION" TEST.
 X=NUMBER OF BLOWS FOR FIRST 6 INCHES
 Y=NUMBER OF BLOWS FOR SECOND 6 INCHES
 Z=NUMBER OF BLOWS FOR THIRD 6 INCHES

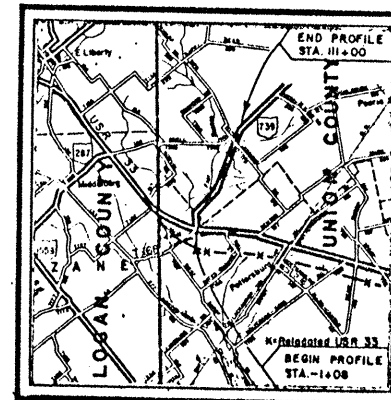
NOTE: FIGURES BESIDE BORINGS INDICATE WATER CONTENT IN PERCENT. e.g. 15

SOIL PROFILE UNION COUNTY UNI-739-0.02

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-TESTING LABORATORY
1600 WEST BROAD STREET COLUMBUS, OHIO 43223

NOTE: INFORMATION SHOWN BY THIS SUBGRADE PROFILE WAS OBTAINED SOLELY FOR USE IN ESTABLISHING DESIGN CONTROLS FOR THE PROJECT. THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THIS DATA AND IT IS NOT TO BE CONSTRUED AS A PART OF THE PLANS GOVERNING CONSTRUCTION OF THE PROJECT.

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE SOIL PROFILE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATION, SOIL TESTS, AND BEDROCK BORINGS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1600 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET



LOCATION MAP

Recon. R.D.R. 3/8/88
Drilling Auger, G.J.R. 3/8 & 9/88
Core, H.E.R. 3/8 to 10/88
Drafting: A.R. 4/27/88

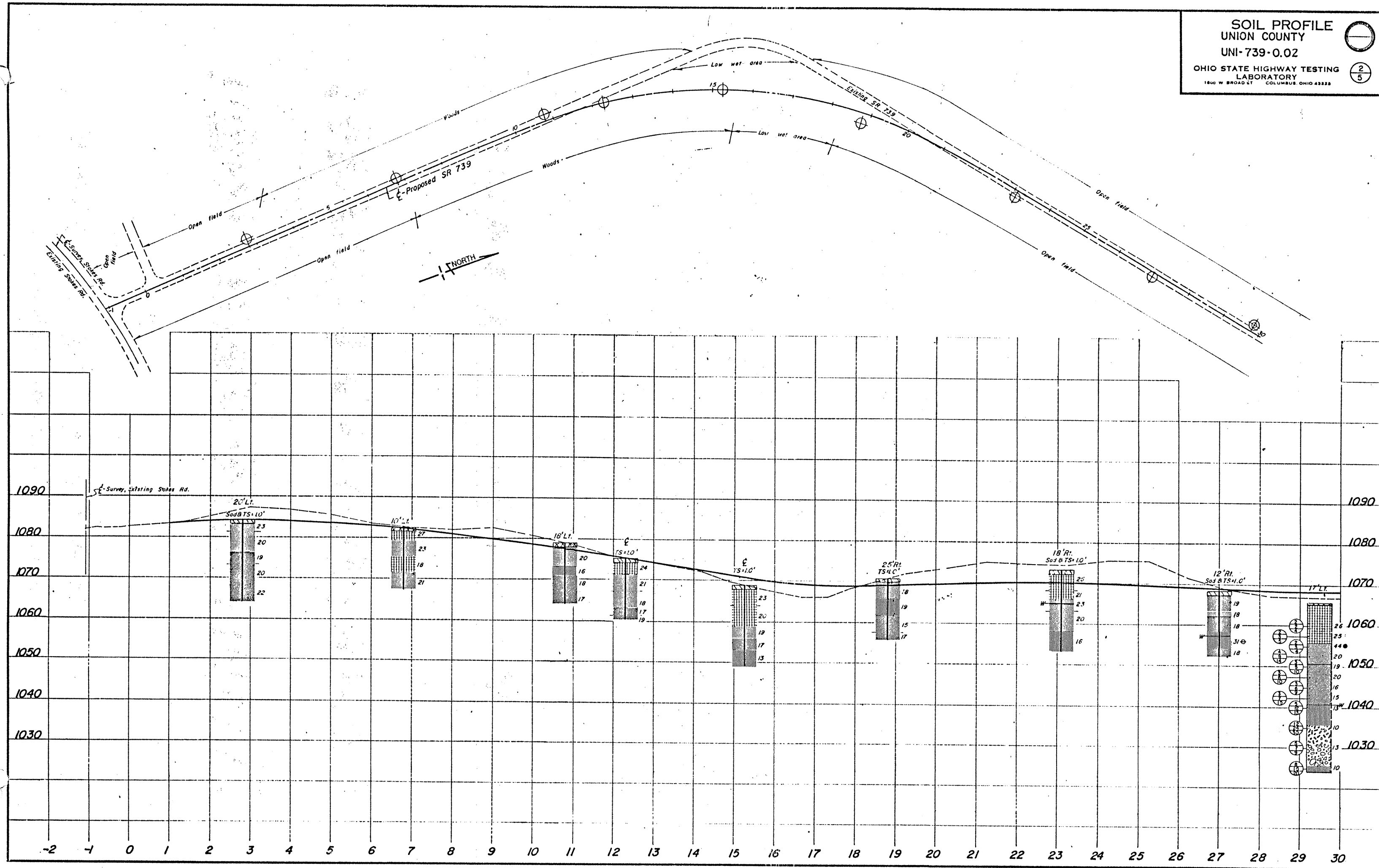
SUMMARY OF SOIL TEST DATA

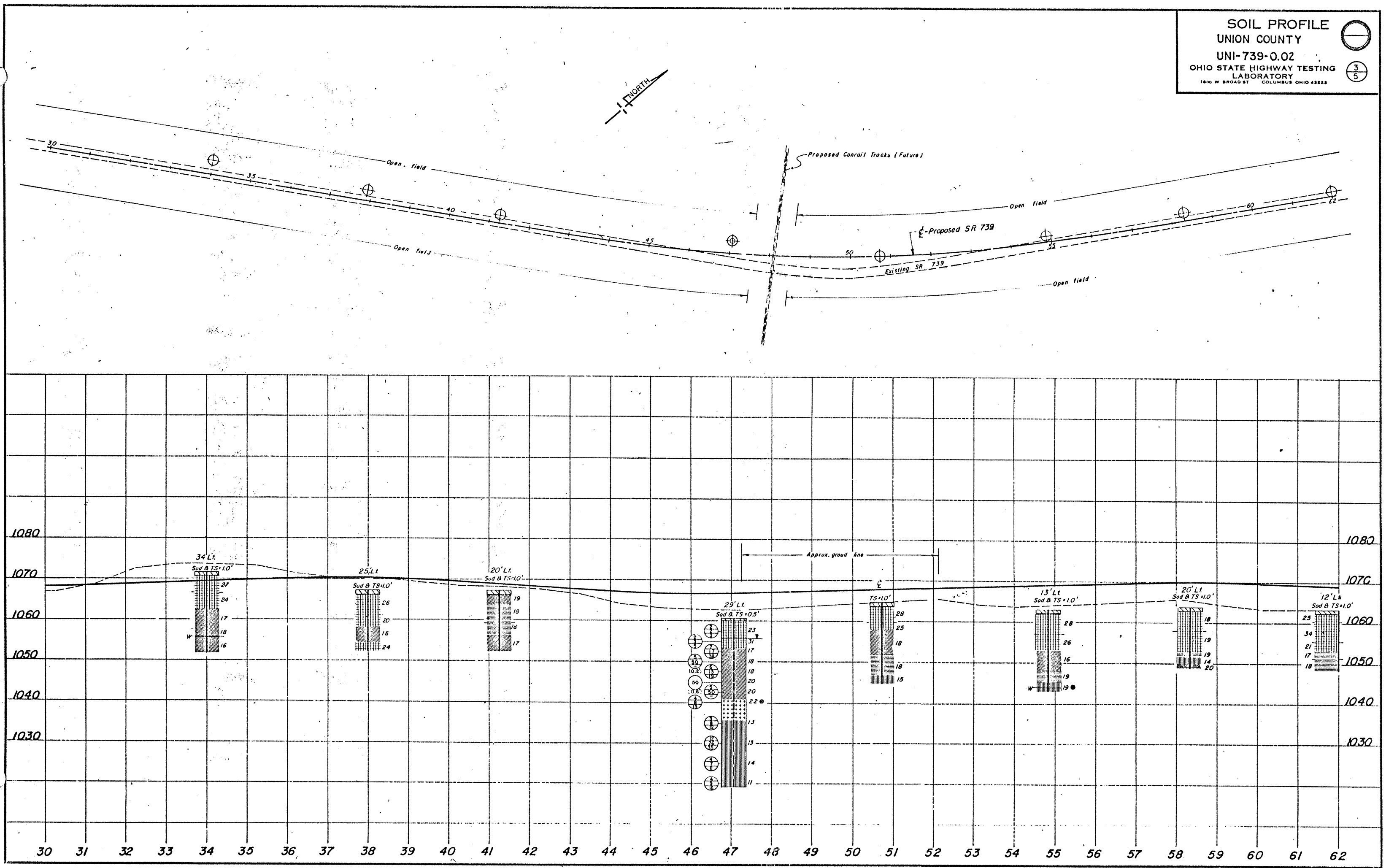
NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES THAT THE MATERIAL IS NON-PLASTIC
* DENOTES SAMPLE TAKEN AT OR NEAR GRADE

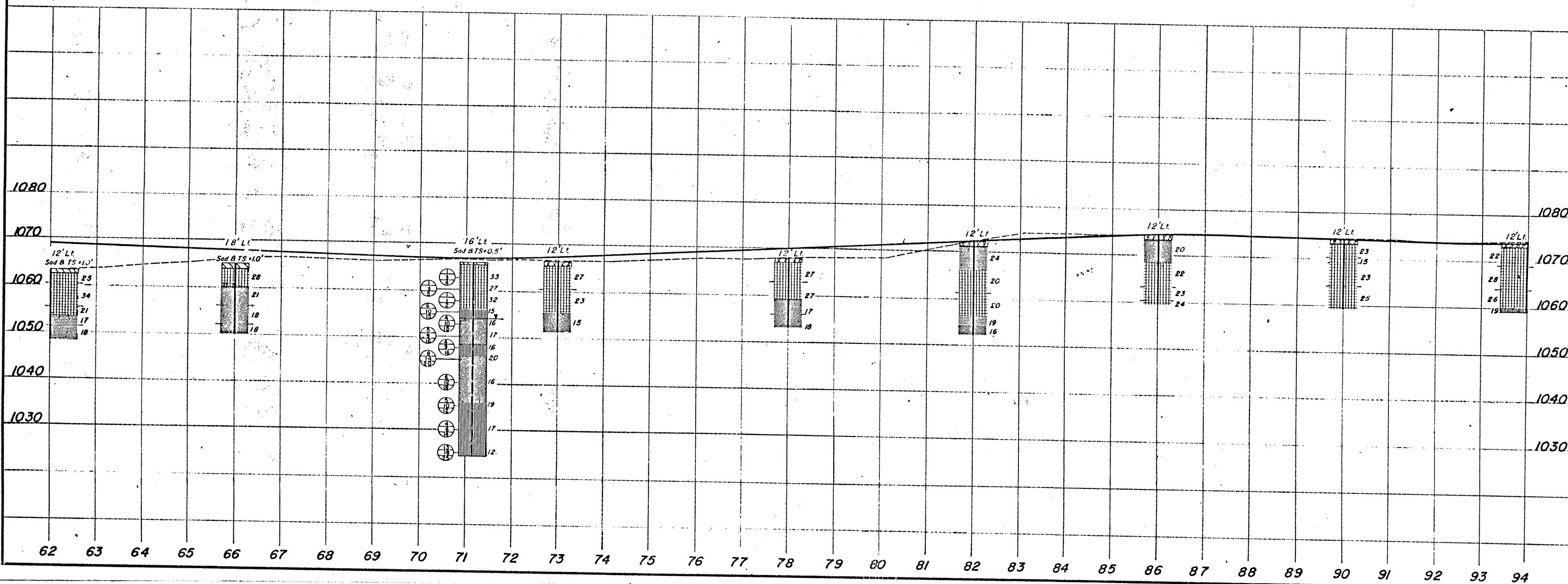
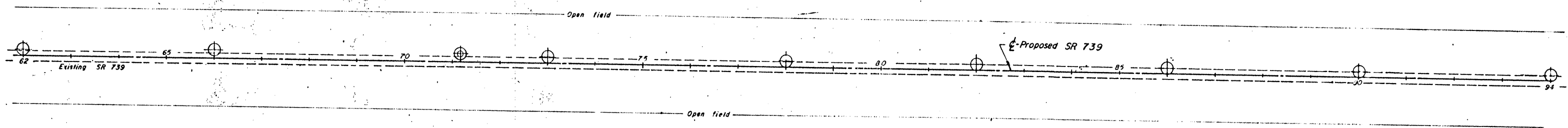
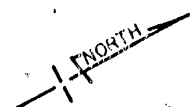
STATION & OFFSET DEPTH											STATION & OFFSET DEPTH											STATION & OFFSET DEPTH											STATION & OFFSET DEPTH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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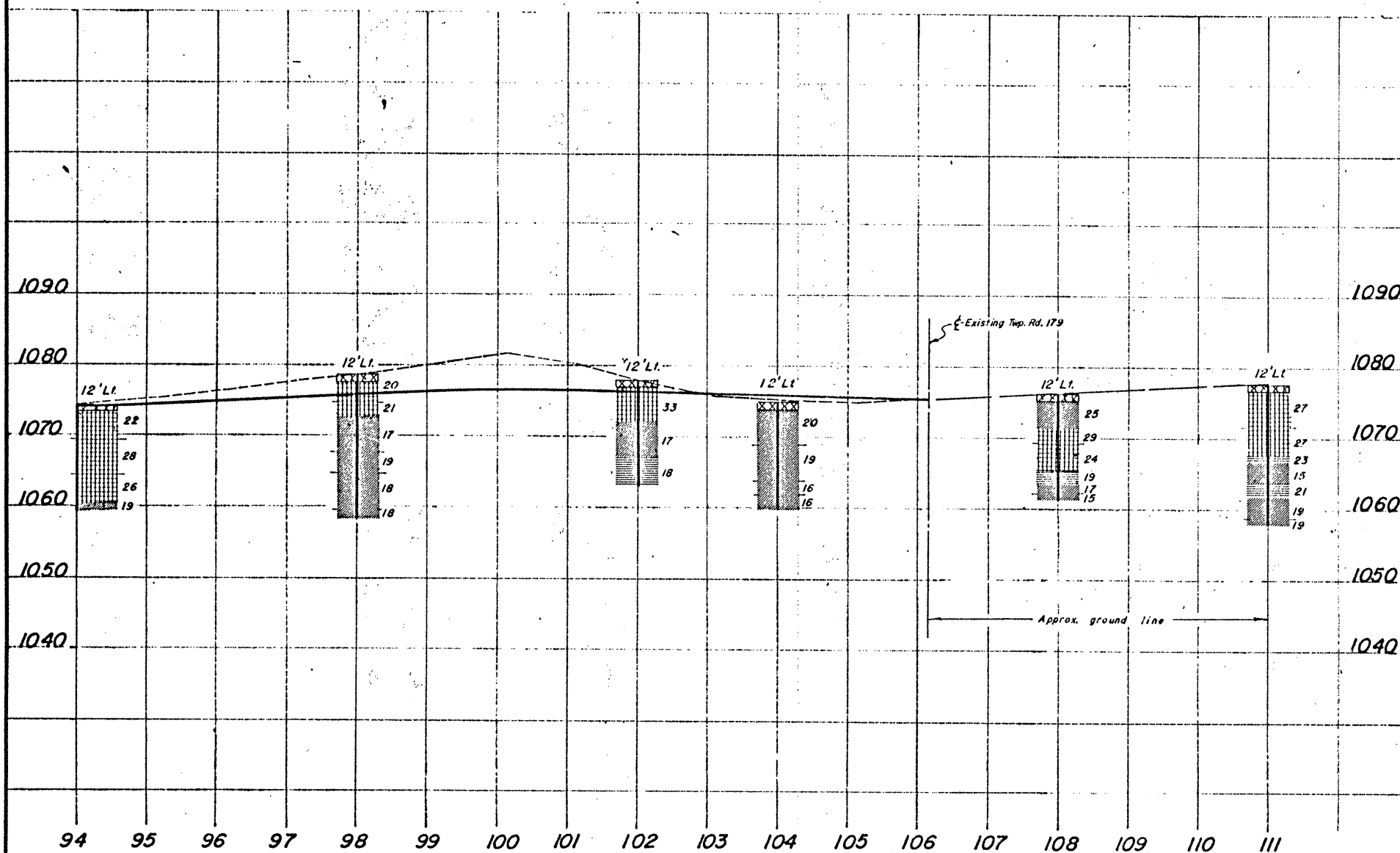
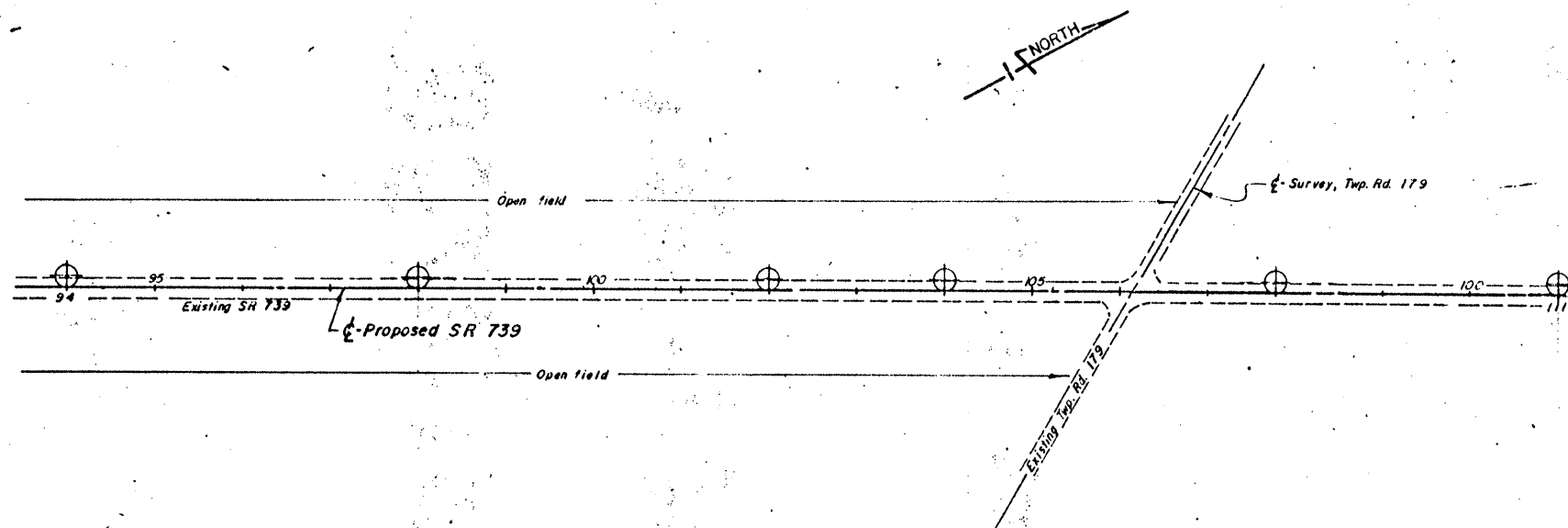


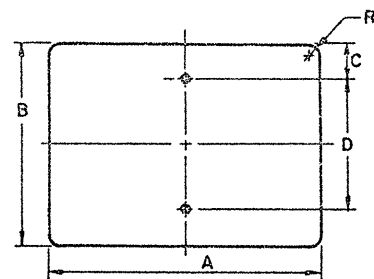
2
5





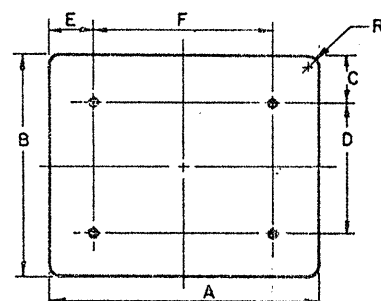






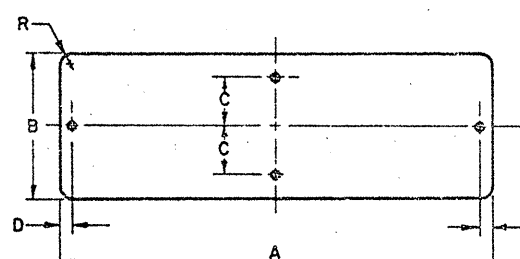
H-REC-1-2

A	B	C	D	R	GAUGE	SQ. FT.
12	6	1.50	3	1.50	.063	.50
18	6	1.50	3	1.50	.063	.75
18	12	1.50	9	1.50	.063	1.50
21	15	1.50	12	1.50	.063	2.19
21	18	3	12	1.50	.063	2.63
24	6	1.50	3	1.50	.063	1.00
24	8	1.50	5	1.50	.063	1.33
24	10	1.50	7	1.50	.063	1.67
24	12	1.50	9	1.50	.063	2.00
24	18	3	12	1.50	.063	3.00
30	8	1.50	5	1.50	.063	1.67
30	10	1.50	7	1.50	.063	2.08
30	12	1.50	9	1.50	.080	2.50
30	15	1.50	12	1.50	.080	3.13
30	16	1.50	13	1.50	.080	3.33
30	18	3	12	1.50	.080	3.75
30	24	3	18	1.50	.080	5.00
36	6	1.50	3	1.50	.080	1.50
36	12	1.50	9	1.50	.080	3.00
36	15	1.50	12	1.50	.080	3.75
36	18	3	12	1.50	.080	4.50
36	24	3	18	1.50	.080	6.00
37.5	30	3	24	1.50	.080	7.81
42	15	1.50	12	1.50	.080	4.38
48	20	3	14	1.50	.080	6.67



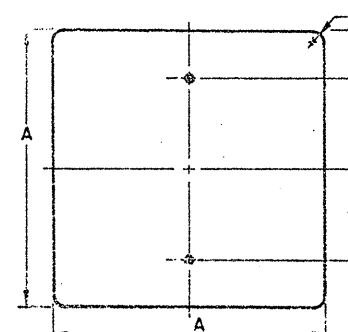
H-REC-2-4

A	B	C	D	E	F	R	GAUGE	SQ. FT.
36	24	3	18	6	24	1.50	.080	6.00
36	30	3	24	6	24	1.88	.080	7.50
40	20	3	14	6	28	1.50	.080	5.56
42	36	6	24	9	24	2.25	.100	10.50
45	36	6	24	9	27	2.25	.100	11.25
48	8	1.50	5	9	30	1.50	.080	2.67
48	8.50	1.50	5.50	9	30	1.50	.080	2.83
48	14	1.50	11	9	30	1.50	.080	4.67
48	16	1.50	13	9	30	1.50	.080	5.33
48	18	3	12	9	30	1.50	.080	6.00
48	24	3	18	9	30	1.88	.100	8.00
48	30	3	24	9	30	1.88	.100	10.00
48	36	6	24	9	30	2.25	.100	12.00
48	42	6	30	9	30	2.25	.100	14.00
56	8	1.50	5	12	32	1.50	.100	3.11
60	12	1.50	9	12	36	1.50	.080	5.00
60	24	3	18	12	36	1.50	.100	10.00
60	30	3	24	12	36	1.88	.100	12.50
60	36	6	24	12	36	2.25	.100	15.00
60	40	6	28	12	36	2.25	.100	16.67
64	8	1.50	5	12	40	1.50	.100	3.56
66	24	3	18	12	42	1.50	.100	11.00
66	36	6	24	12	42	2.25	.100	16.50
72	12	1.50	9	12	48	1.50	.100	6.00
72	18	3	12	12	48	1.50	.100	9.00
72	24	3	18	12	48	1.50	.100	12.00
72	36	6	24	12	48	1.50	.100	18.00



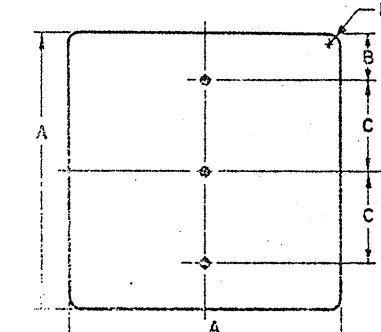
H-REC-1-4 (ONE WAY)

A	B	C	D	R	GAUGE	SQ. FT.
36	12	4	1	1.50	.080	3.00
48	18	6	1.50	1.50	.100	6.00



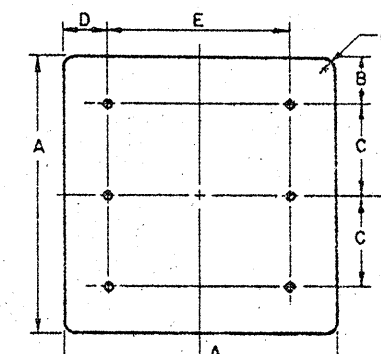
SQ-1-2

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



SQ-1-3

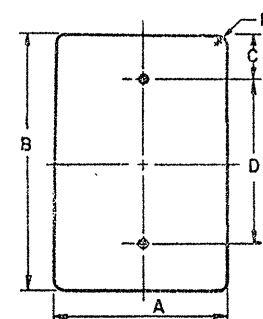
A	B	C	R	GAUGE	SQ. FT.
30	3	12	1.88	.080	6.25
36	6	12	2.25	.080	9.00



SQ-2-6

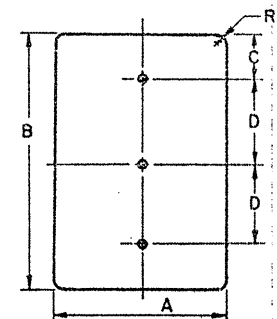
A	B	C	D	E	R	GAUGE	SQ. FT.
36	6	12	6	24	2.25	.080	9.00
48	6	18	9	30	3.00	.100	16.00

* "DO NOT ENTER" SIGN.



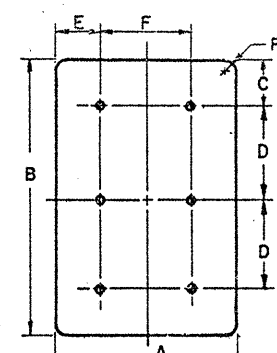
V-REC-1-2

A	B	C	D	R	GAUGE	SQ. FT.
8	26	5	16	1.50	.063	1.44
9	12	1.50	9	1.50	.063	.75
12	18	1.50	15	1.50	.063	1.50
12	24	3	18	1.50	.063	2.00
18	24	3	18	1.50	.063	3.00



V-REC-1-3

A	B	C	D	R	GAUGE	SQ. FT.
6	54	9	18	1.50	.080	2.25
12	36	3	15	1.50	.063	3.00
12	48	6	18	1.50	.080	4.00
24	30	3	12	1.50	.080	5.00
24	36	3	15	1.50	.080	6.00
24	48	9	15	1.50	.100	8.00
30	36	3	15	1.88	.080	7.50
30	38	3	16	1.50	.080	7.92
30	42	9	12	1.50	.080	8.75
36	42	9	12	2.25	.100	10.50



V-REC-2-6

A	B	C	D	E	F	R	GAUGE	SQ. FT.
36	48	6	18	6	24	2.25	.080	12.00
36	54	6	21	6	24	2.25	.100	13.50
36	60	6	24	6	24	2.25	.100	15.00
36	72	9	27	6	24	2.25	.100	18.00
48	54	6	21	9	30	3.00	.100	18.00
48	60	6	24	9	30	3.00	.100	20.00
48	96	12	36	9	30	3.00	.100	32.00

NOTES

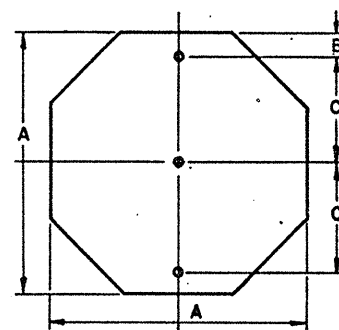
1. ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE $\frac{3}{8}$ " DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF $\pm \frac{1}{32}$ INCH.
4. FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

SHAPE H-REC-2-4 NO. BOLTS REQUIRED

NO. SUPPORTS REQUIRED

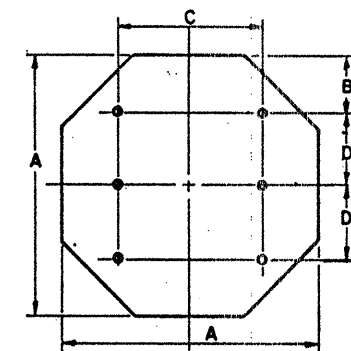
ALL ITEMS SHALL CONFORM TO SUPPLEMENTAL SPECIFICATIONS 857 AND 957, UNLESS OTHERWISE SPECIFIED.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 4/1/77 4/3/79
SIGN BLANK DETAILS II	
STANDARD CONSTRUCTION DRAWING APPROVED: <i>E. J. [Signature]</i> Engineer of Design Services	TC-52.20



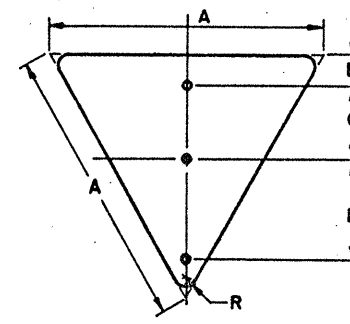
OCTA-1-3

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



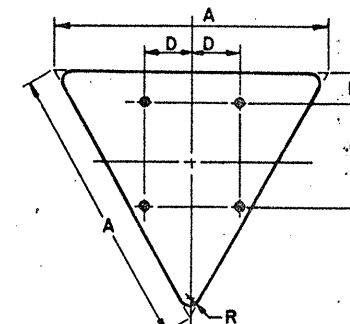
OCTA-2-6

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



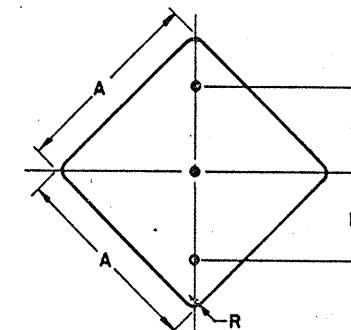
TRI-1-3

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



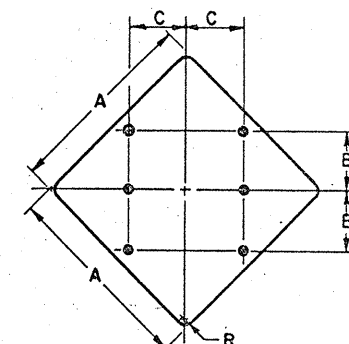
TRI-2-4

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



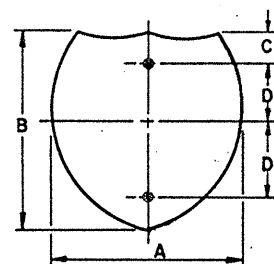
DIA-1-3

A	B	R	GAUGE	SQ. FT.
24	12	1.50	.063	4.00
30	15	1.88	.080	6.25
36	18	2.25	.080	9.00



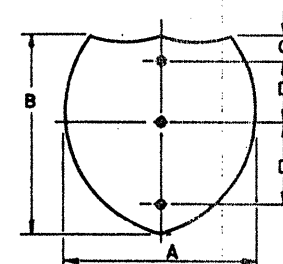
DIA-2-6

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



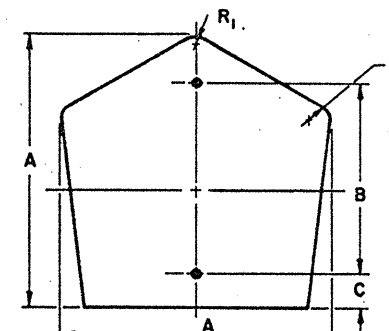
I.S.-1-2

A	B	C	D	GAUGE	SQ. FT.
24	24	3	9	.063	4.00
30	24	3	9	.080	5.00
30	30	3	12	.080	6.25
40	30	3	12	.080	8.33



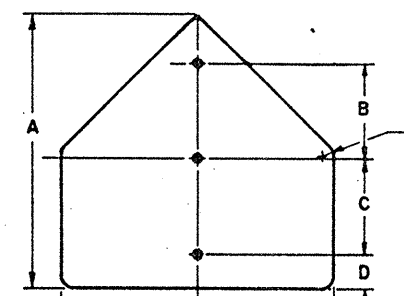
I.S.-1-3

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



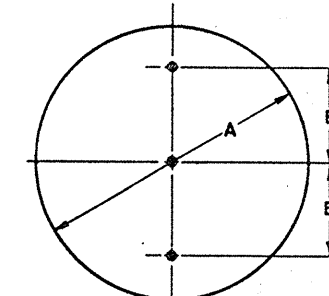
CO-1-2

A	B	C	R ₁	R	GAUGE	SQ. FT.
18	15	1	5	2	.063	2.25
24	18	2	5.31	2.69	.063	4.00
30	24	2	6.63	3.38	.080	6.25



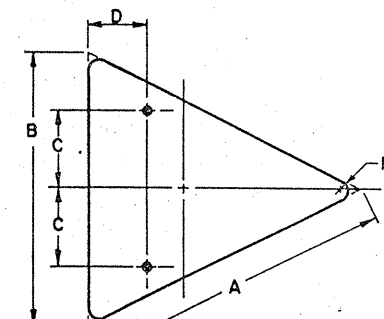
PENT-1-3

A	B	C	D	R	GAUGE	SQ. FT.
30	10	11	3	1.88	.080	6.25
36	12	12	3	2.25	.080	9.00
42	14	13	4	2.50	.100	12.25



CIR-1-3

A	B	GAUGE	SQ. FT.
30	12	.063	6.25
36	15	.080	9.00

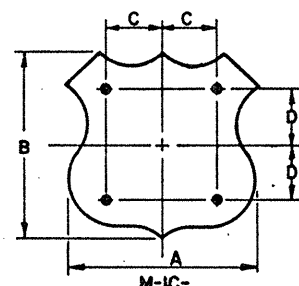


ISOS-1-2

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

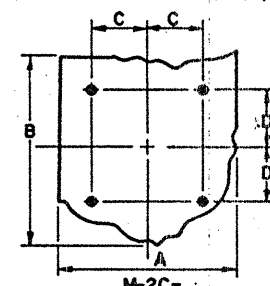
ROUTE SHIELDS

(FOR GUIDE SIGNS ONLY)



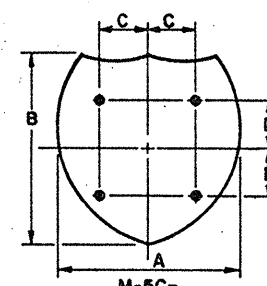
M-1C-

A	B	C	D
24	24	7	7
30	24	8	8
30	30	9	9
37.5	30	9	9
36	36	10	10
45	36	15	10



M-2C-

A	B	C	D
24	24	7	7
30	24	8	8
30	30	9	9
37.5	30	9	9
36	36	10	10
45	36	15	10



M-5C-

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

ALL SHIELDS SHALL BE .063 GAUGE

NOTES

1. ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE $\frac{3}{8}$ " DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF $\pm \frac{1}{32}$ INCH.
4. FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

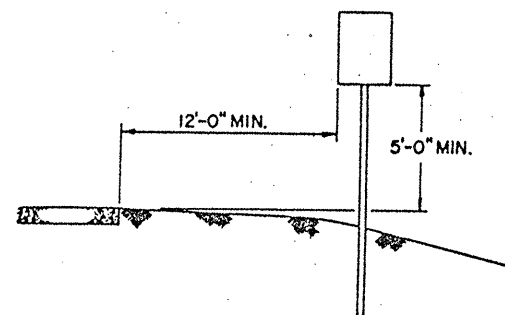
SHAPE NO. BOLTS REQUIRED

OCTA-2-6

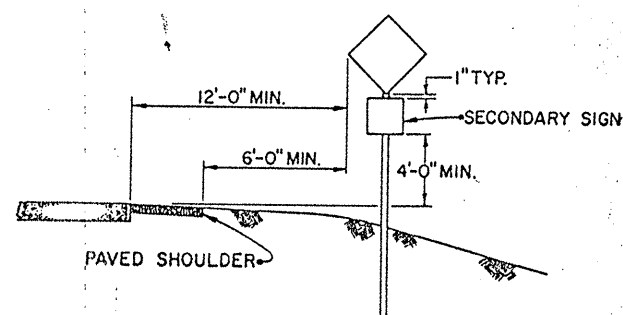
NO. SUPPORT REQUIRED

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

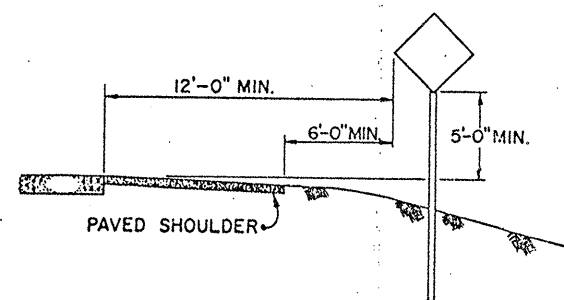
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE
SIGN BLANK DETAILS I	4/1/77 4/3/79
STANDARD CONSTRUCTION DRAWING TC-52.10	
APPROVED: <i>E. J. [Signature]</i> Engineer of Design Services	



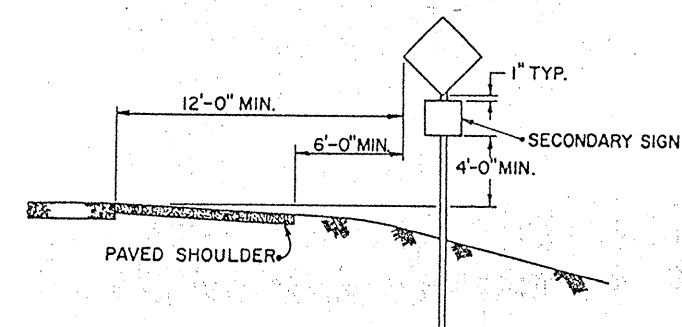
RURAL UNDIVIDED



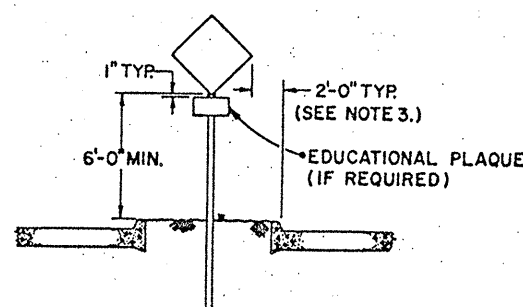
RURAL UNDIVIDED
(W / SECONDARY SIGN)



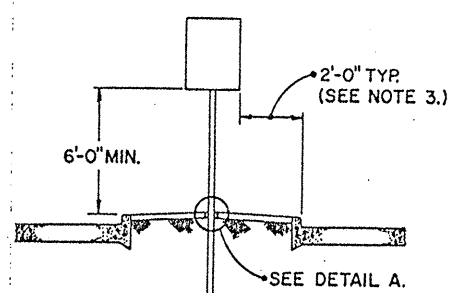
RURAL DIVIDED



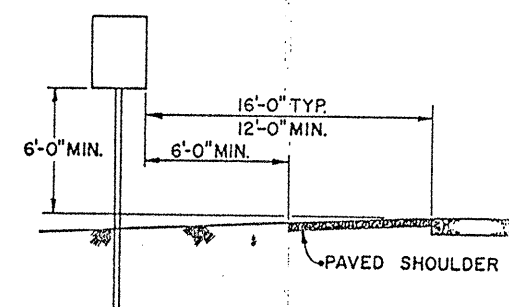
RURAL DIVIDED
(W / SECONDARY SIGN)



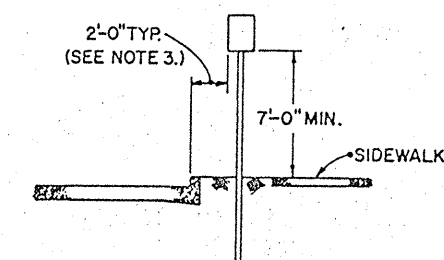
MEDIAN



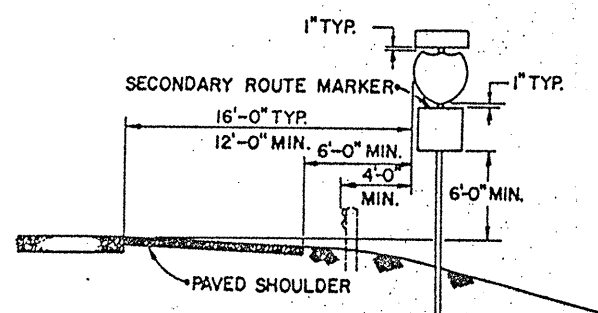
PAVED MEDIAN



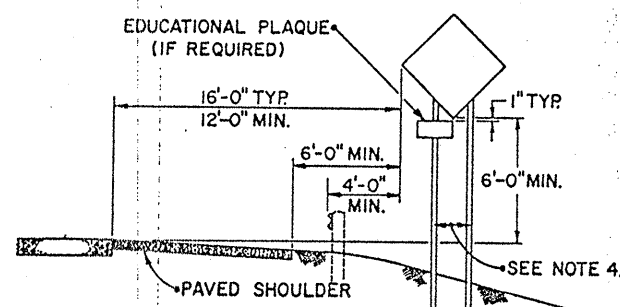
MEDIAN-EXPRESSWAY OR FREEWAY



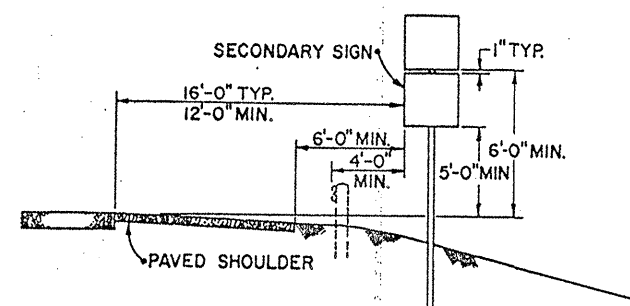
URBAN-RESIDENTIAL AND BUSINESS



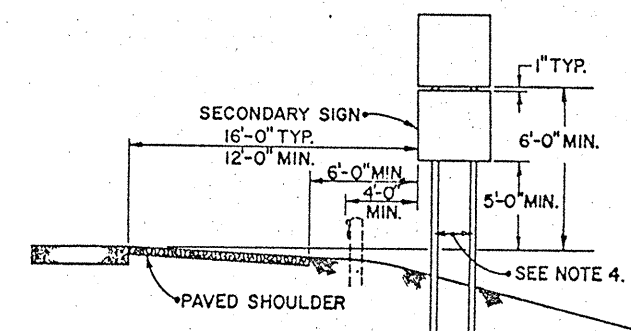
EXPRESSWAY OR FREEWAY
(W / SECONDARY SIGN)



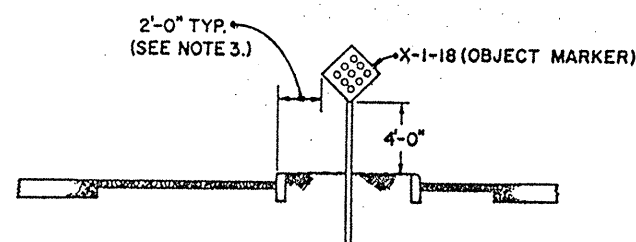
EXPRESSWAY OR FREEWAY



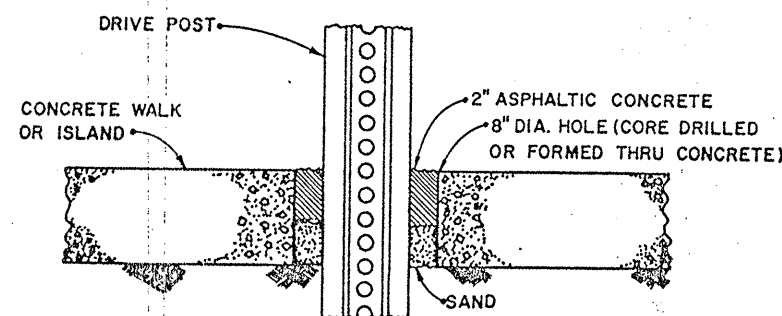
EXPRESSWAY OR FREEWAY
(W / SECONDARY SIGN)



EXPRESSWAY OR FREEWAY
(W / SECONDARY SIGN)



EXPRESSWAY OR FREEWAY



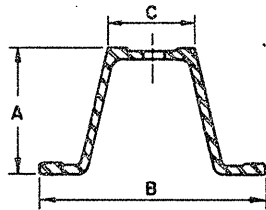
DETAIL A.

NOTES

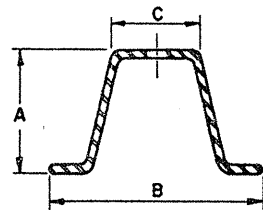
1. SEE STANDARD CONSTRUCTION DRAWING TC-41.20 FOR DETAILS ON YIELDING SUPPORTS.
2. ALL SIGNS SHALL BE PLACED 90° TO THE ROADWAY, EXCEPT PARKING SIGNS WITH ARROW SHALL BE SET AT AN ANGLE OF NOT LESS THAN 30° NOR MORE THAN 45° WITH A LINE PARALLEL TO THE FLOW OF TRAFFIC.
3. A CLEARANCE OF ONE FOOT IS PERMISSIBLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
4. SEE STANDARD CONSTRUCTION DRAWINGS TC-52.10 AND TC-52.20 FOR DIMENSIONS BETWEEN SUPPORTS.

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

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

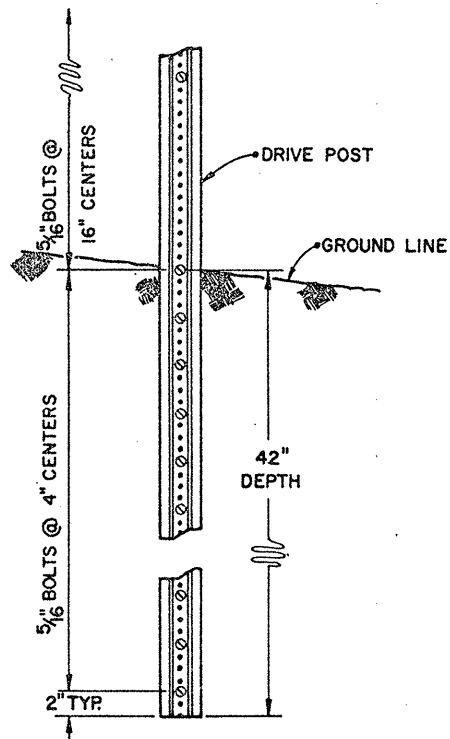


TYPE P

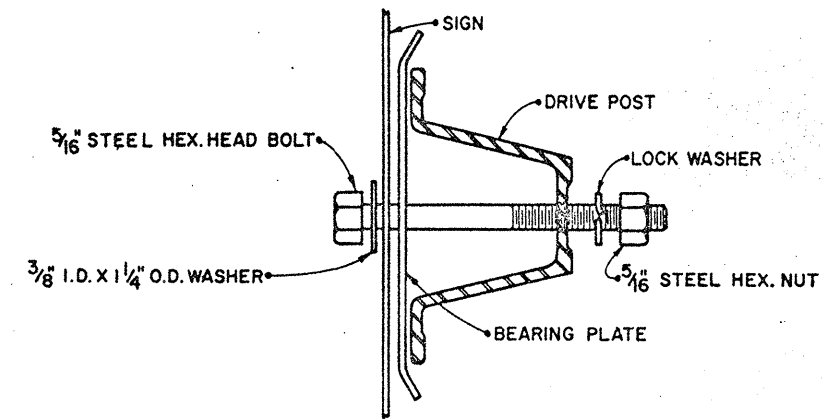


TYPE F

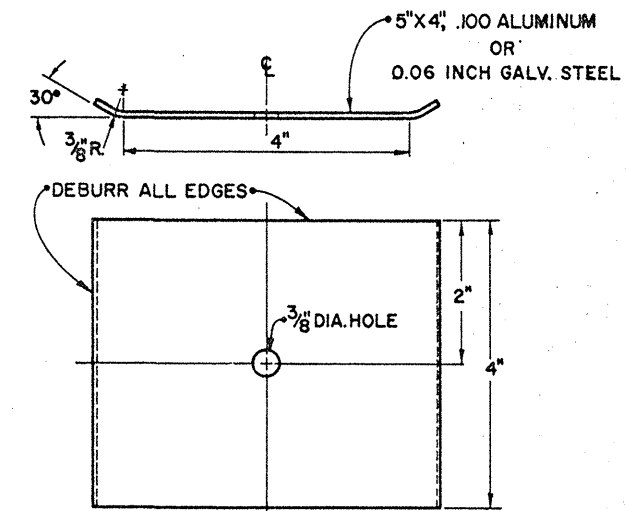
POST NO.	TYPE	LB/FT	DIMENSIONS (INCHES)		
			A	B	C
1	F	1.12	0.875	2.063	0.813
2	P	2.00	1.469	3.063	1.281
	F	2.00	1.516	3.125	1.250
3	P	3.00	1.875	3.500	1.313
	F	3.00	1.750	3.500	1.625
4	P	4.00	TWO NO. 2 POST		
	F	4.00	TWO NO. 2 POST		
6	P	6.00	TWO NO. 3 POST		
	F	6.00	TWO NO. 3 POST		



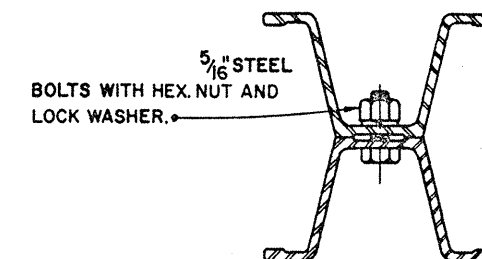
TYPICAL DRIVEN INSTALLATION



SIGN ATTACHMENT DETAIL

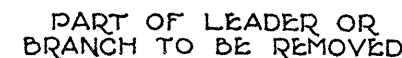
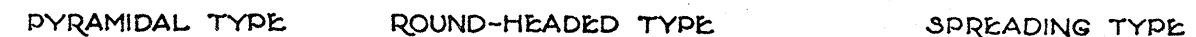
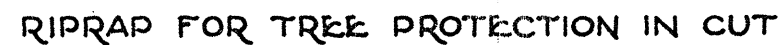
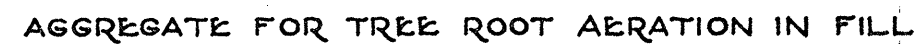
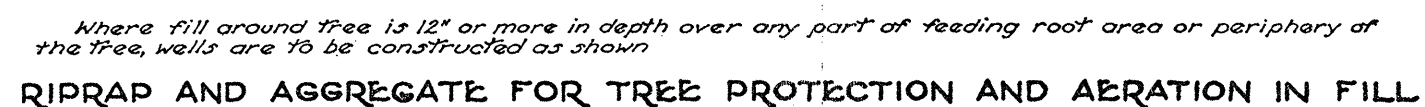


BEARING PLATE

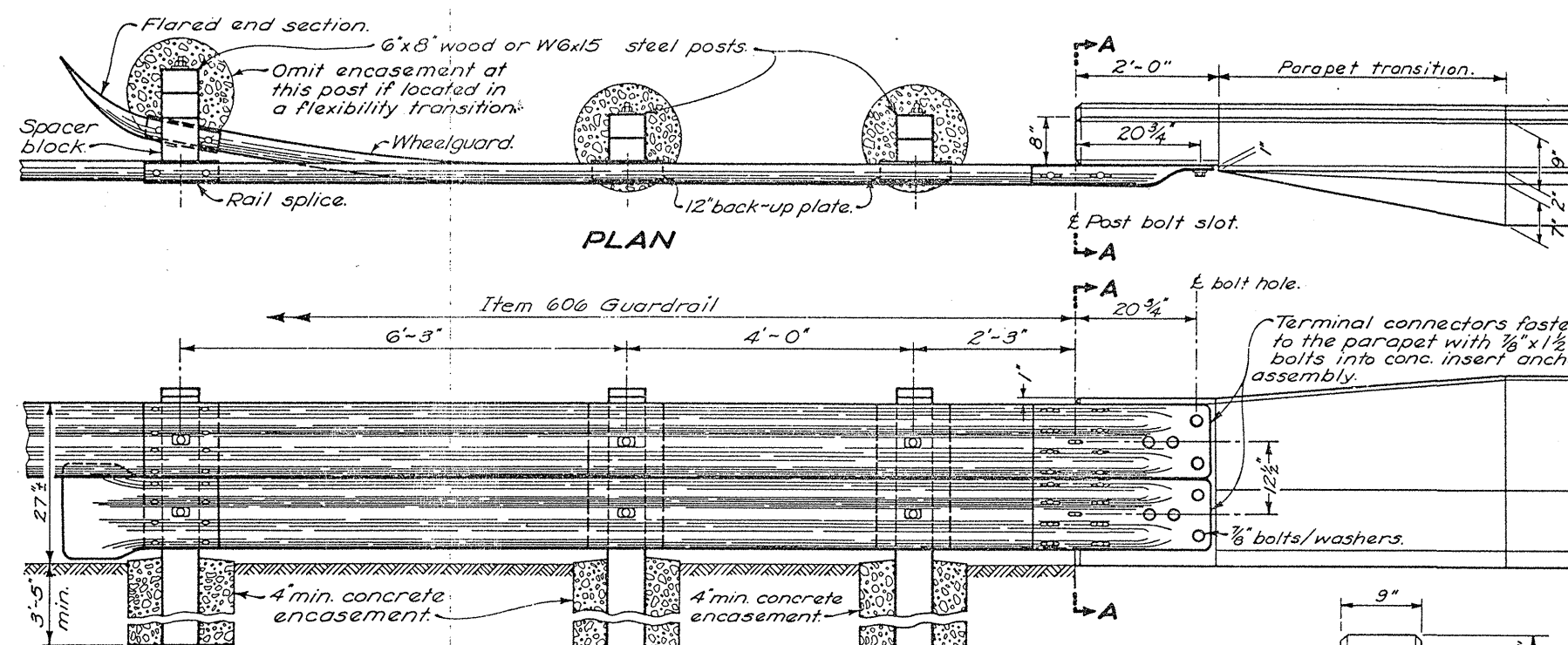


ALL ITEMS SHALL CONFORM TO C&M SPECIFICATIONS, 712.20 AND SUPPLEMENTAL SPECIFICATIONS 857 AND 957, UNLESS OTHERWISE SPECIFIED.

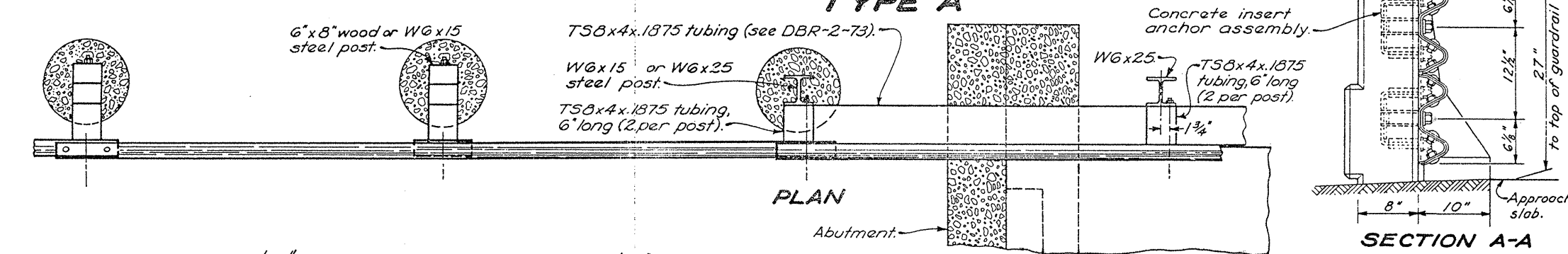
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 4/1/77 3/26/79
YIELDING POST	
STANDARD CONSTRUCTION DRAWING	TC-41.20
APPROVED: <i>E. J. Kelly</i> Engineer of Design Services	



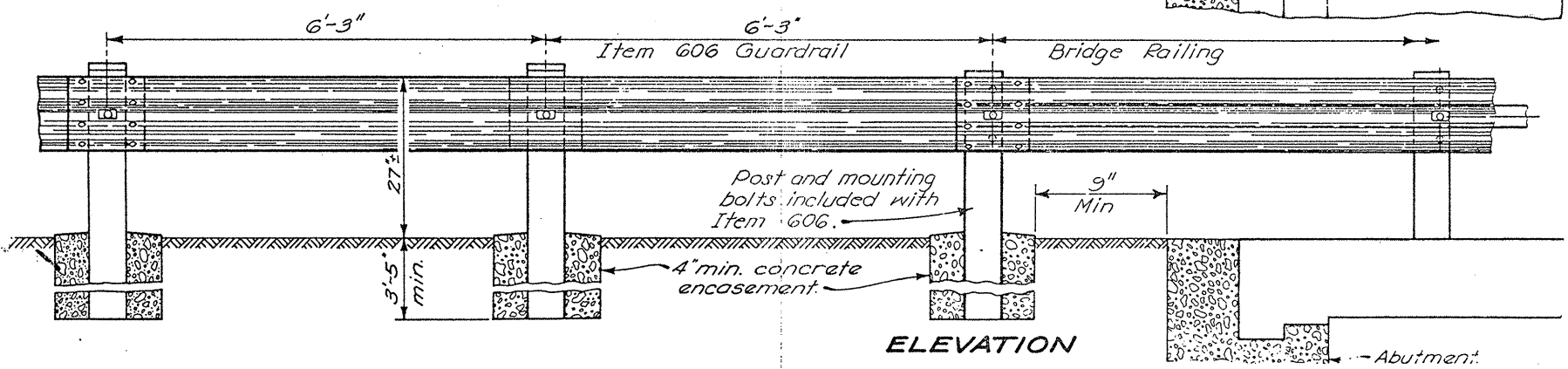
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS	
OHIO DEPARTMENT OF TRANSPORTATION	
LANDSCAPING	
DATE 6-1-79	
TREE WELLS & PRUNING	
STANDARD CONSTRUCTION DRAWING	LA-1
APPROVED <i>[Signature]</i> Engineer of Design Services	



ELEVATION
TYPE A



SECTION A-A



ELEVATION
TYPE B

NOTES

PAYMENT For item 606, each, Bridge terminal assembly Type —, shall include the additional cost in excess of normal guardrail cost, such as: additional or heavier posts, concrete encasement, wheelguard, terminal connector, and other hardware, payment for bridge railing and parapets shall include the cost of the concrete insert anchor assembly, and the TS 8x4 spacers and tubular back-up rail at and in between the first posts off the bridge.

TYPE A: The wheelguard shall be required on all uncurbed approach connections and on all uncurbed trailing connections on undivided highways. The wheelguard shall be omitted: on all curbed connections, on uncurbed trailing connections on divided or directional roadways, and all three posts shall have spacer blocks and concrete encasement.

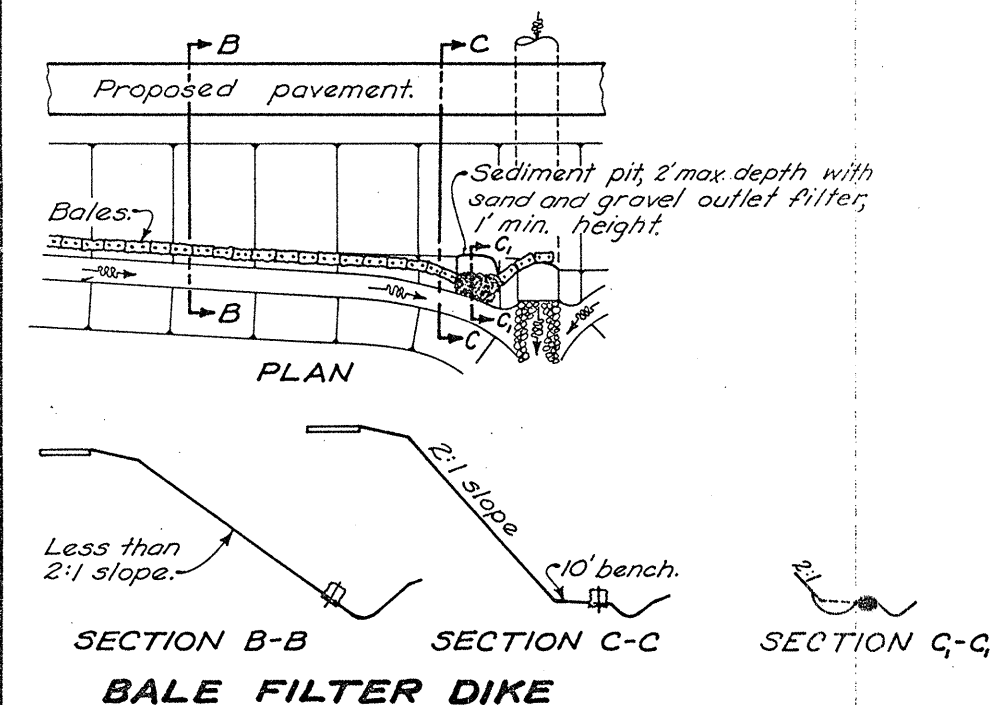
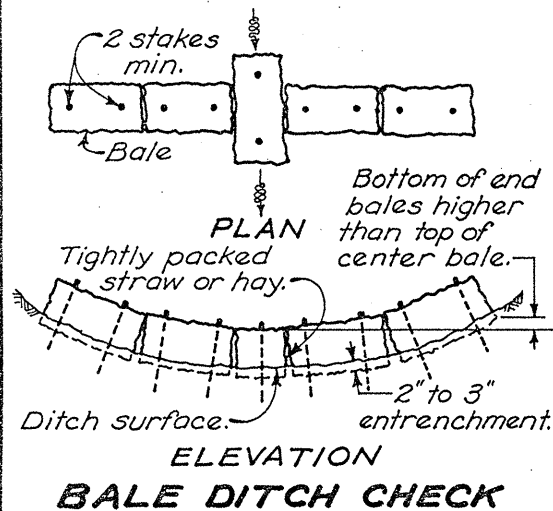
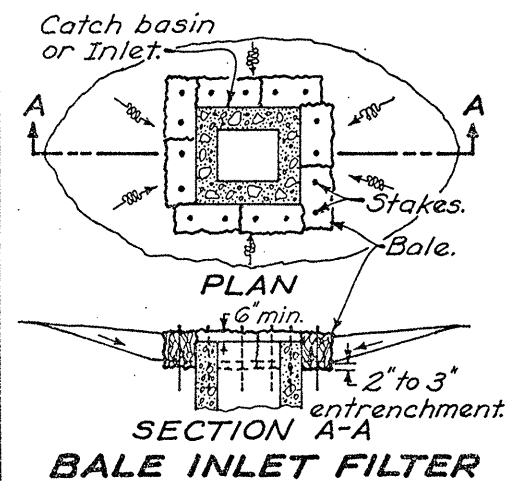
TERMINAL CONNECTORS of Type A shall be fastened to existing (safety shape) parapets, not having concrete insert anchor assemblies, with four 1/8" dia. hexhead bolts through the parapet with 3"x3"x1/2" plate washers and hex nuts on back of parapet.

POST TYPE shall be the same material type as used on approach guardrail except the first post off the bridge for Type B shall be as shown.

FOR DETAILS not shown, see GR-1 and other Standard Construction Drawings pertaining to design of specific guardrail type.

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
BRIDGE TERMINAL ASSEMBLIES	
DATE 1-1-71 11-9-71 12-6-76 2-5-82 1-21-85	GR-3
STANDARD CONSTRUCTION DRAWING	
APPROVED <i>[Signature]</i>	ENGR., L.&D.

STRAW OR HAY BALES



Not to scale.

BALE PLACEMENT: Bales shall be tightly placed, adjacently, and entrenched 2" to 3" before staking; or a small amount of loose soil shall be lightly compacted along the upstream edge of the bales.

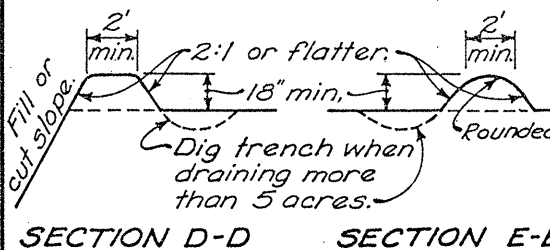
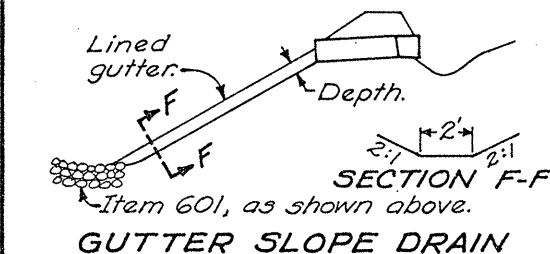
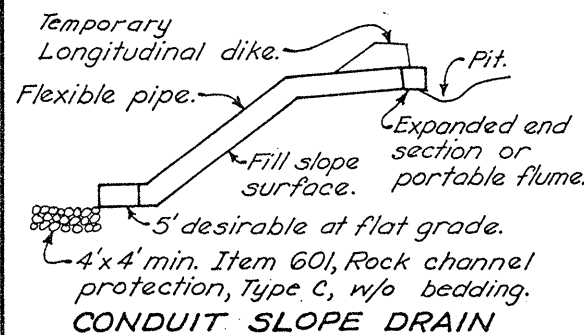
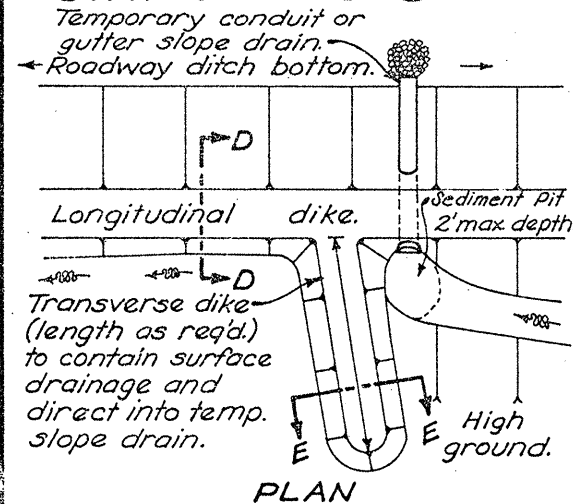
Each bale shall be firmly staked with a minimum of 2 stakes at least 3' in length. Stakes shall be wooden 2x2", reinforcing bars or fence posts, as approved by the engineer.

Loose straw or hay shall be scattered for a distance of 10' on the upstream side of each ditch check, and shall be wedged between and under staked bales.

SEDIMENT PITS shall be provided where directed by the Engineer and their cost included in the price bid for adjacent 207 Items.

BASIS OF PAYMENT: Straw or hay bale installation shall be paid for under Item 207, Each, Straw or hay bales. Cost will include placing, staking, maintaining and removing.

DIKES AND SLOPE PROTECTION



TEMPORARY SLOPE DRAINS RECOMMENDED SIZES				
Area in acres	Pipe Sizes			Gutter depth
	Smooth	Corrugated	Half-round	
0-4	6"	6"	18"	8"
4-8	8"	12"	18"	8"
8-12	10"	15"	21"	12"

Not to scale.

GENERAL: Dikes & drains shown shall be used when earthwork operations on slopes higher than 8' are suspended for three weeks or more and/or as directed by the Engineer. Smaller dikes used at the end of a day's operation shall be considered as part of the earthwork.

Temporary slope drains shall be suitably positioned and anchored to prevent movement or undermining, as directed by the Engineer.

LONGITUDINAL DIKES shall be constructed of suitable 203 material and compacted to 85% maximum density.

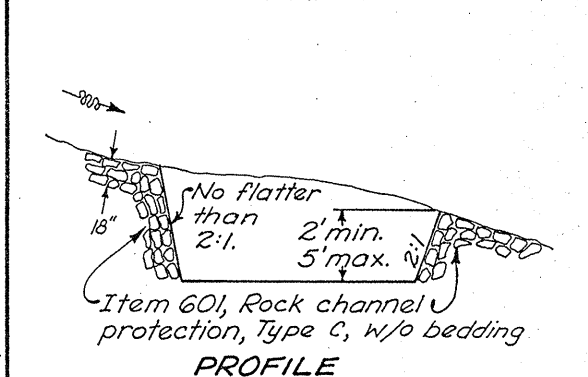
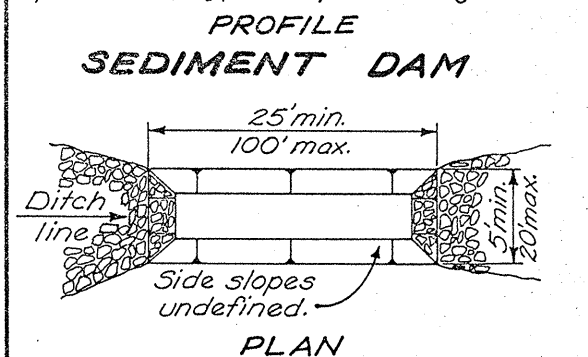
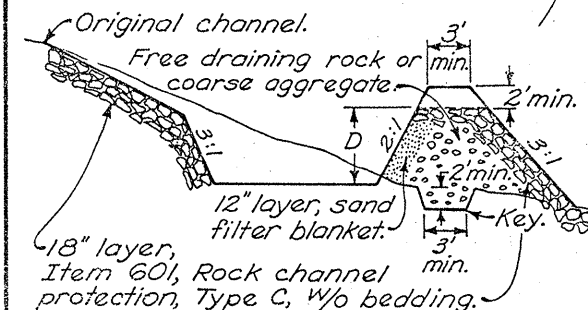
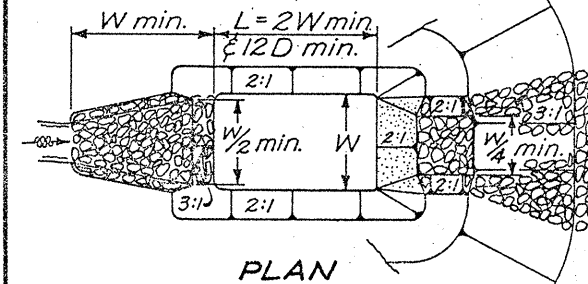
CONDUITS for slope drains shall be corrugated steel pipe, corrugated or smooth plastic pipe, rubber conduit, or an approved equal.

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

SEDIMENT PITS shall be provided where directed by the Engineer and their cost included in the price bid for adjacent 207 Items.

BASIS OF PAYMENT: Temporary dikes shall be paid for under Item 207, Cubic Yard, Temporary benches, dikes, dams and sediment basins. Temporary slope drains shall be paid for under Item 207, Linear foot, Temporary slope drains. Rock required shall be paid for under Item 601, Rock channel protection, Type C, w/o bedding.

SEDIMENT BASINS & DAMS



SEDIMENT BASIN

EMBANKMENT for sediment basin construction shall be as per 203 compacted as directed by the Engineer.

MAINTENANCE: Sediment pits, dams and basins shall be acceptably maintained. Deposited sediment shall be removed when the initial volume has been reduced one-half. The sand filter blanket on sediment basins shall be replaced when deposited sediment is removed. The cost of maintenance shall be covered by Item 207.

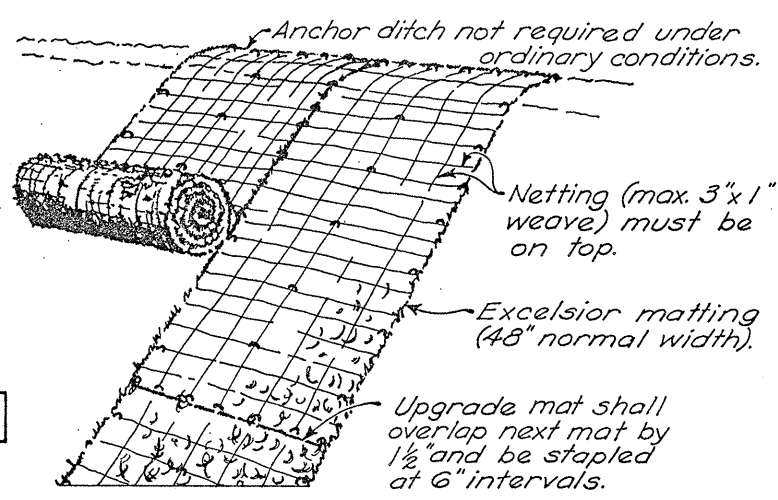
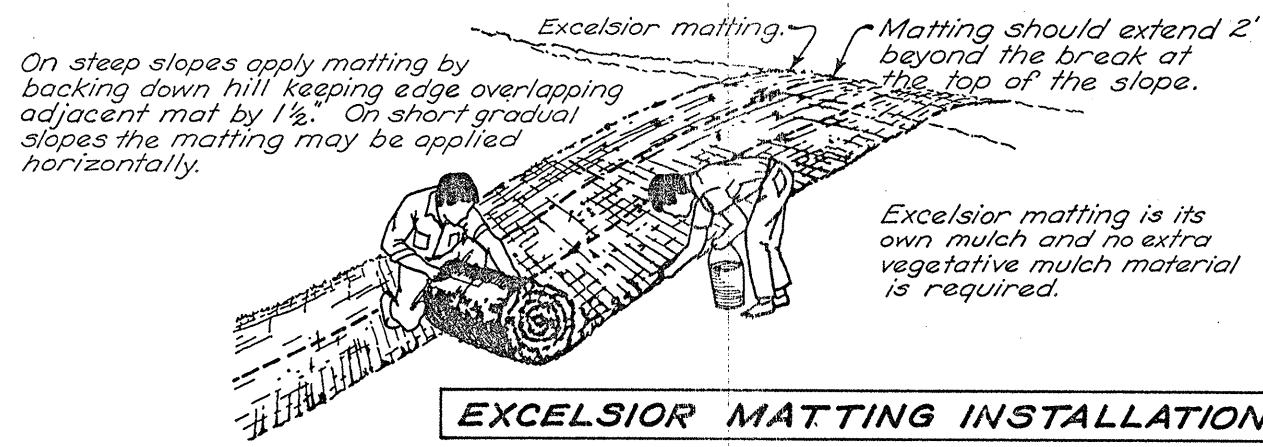
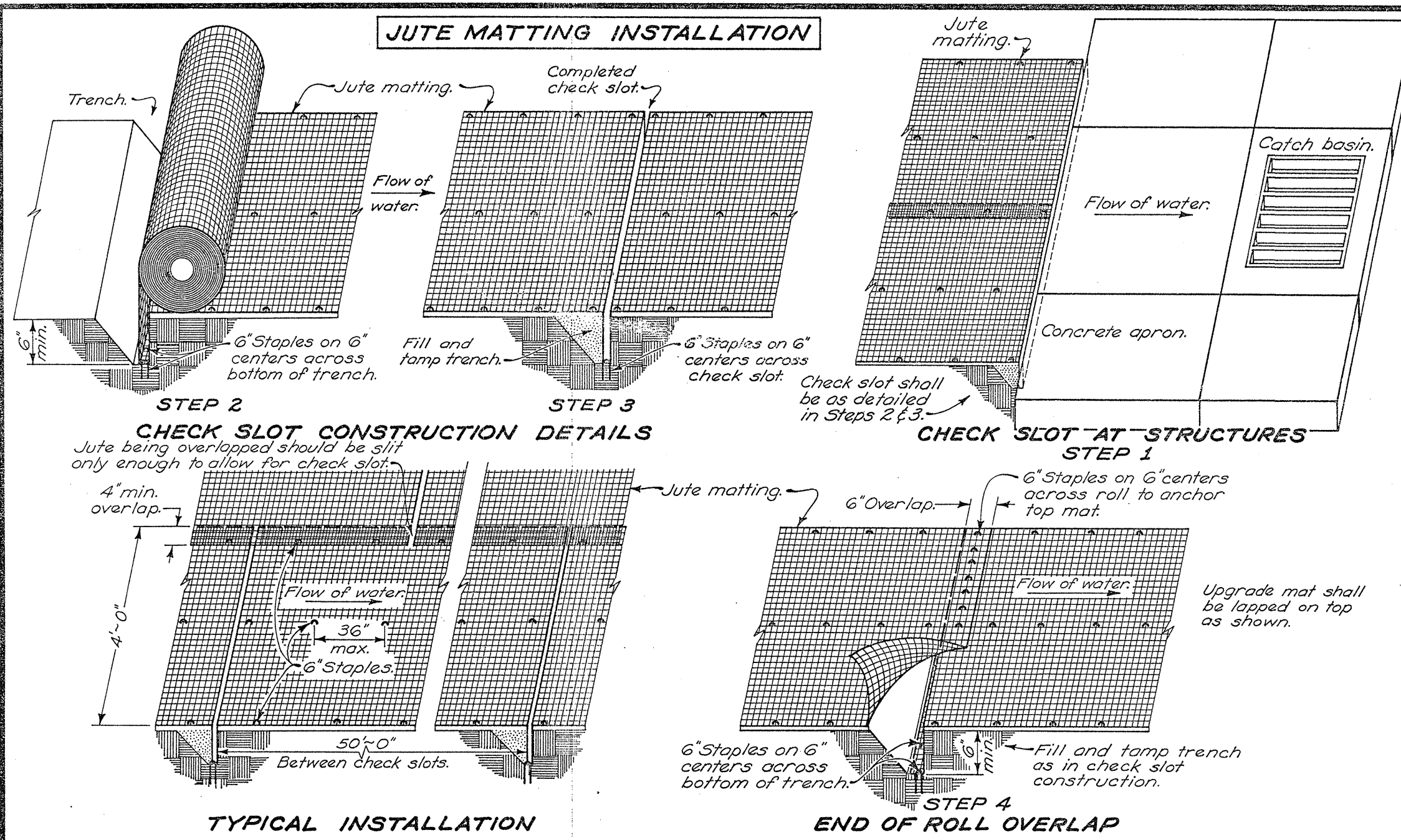
FILTERS: Plastic filter fabric, as approved by the engineer, may be substituted for the sand filter blanket on sediment dams. Such fabrics may be cleaned in lieu of replacement, when approved by the Engineer.

SIZE: A series of smaller basins or dams may be substituted for a larger basin or dam when approved by the Engineer.

BASIS OF PAYMENT: Sediment Dams and Basins shall be paid for under Item 207 Cubic Yard, Temporary benches, dikes, dams and sediment basins. Rock required shall be paid for under Item 601, Cubic Yard, Rock channel protection, Type C, w/o bedding.

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
TEMPORARY EROSION CONTROL	
STANDARD CONSTRUCTION DRAWING	MC-11
APPROVED <i>M. J. Cunningham</i> ENGR., L. & D.	
DATE 8-1-78	

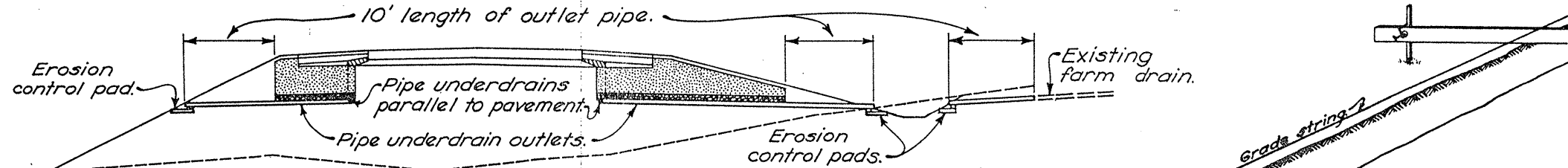
Not to scale.



BUREAU OF ROADWAY DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
JUTE & EXCELSIOR MATTING	
STANDARD CONSTRUCTION DRAWING	MC-10
APPROVED <i>E. J. Schmitt</i> ENGR., R.D.	
DATE 5-1-76	

CONSTRUCTION METHODS

NOTES



UNDERDRAIN OUTLET SECTION

GRADE STAKES shall be set at the following intervals:
For grades less than 0.70% ~ 25 ft.
For grades of 0.70% and over ~ 50 ft.

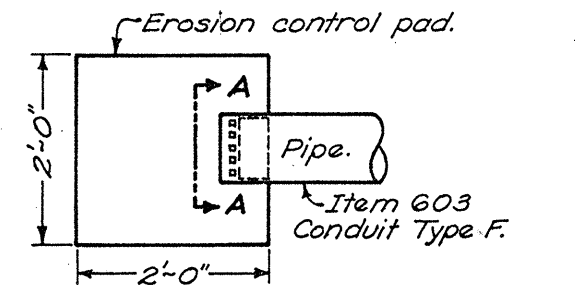
GRADE POLE shall be a straight pole dressed with corners rounded, size depending on length but approximately 1"x2". The pole shall be equipped with a metal bracket on the bottom with a projecting length of 12". Notches shall be cut on the pole for the depth of the flowline below the grade string and for the depth of trench. A spirit level shall be used on the pole to determine when the pole is vertical.

ALTERNATE METHODS: The Engineer may approve other methods of determining alignment and gradient of pipe lines if the Contractor can demonstrate that the same degree of accuracy can be obtained as can be obtained by use of the method shown on this drawing.

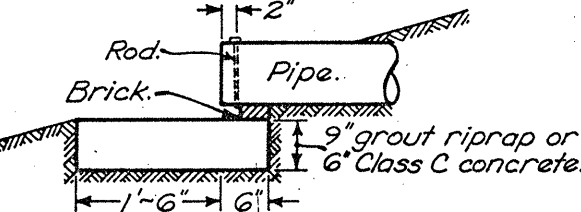
MASONRY COLLARS: Where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint, a collar shall be provided and the cost shall be included in the price bid for new conduit.

EROSION CONTROL PADS AND ANIMAL GUARDS shall be provided at the outlet end of all pipe underdrains and farm drains except when they outlet into a drainage structure.

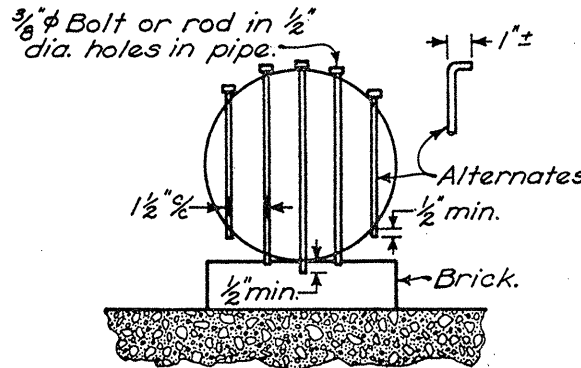
The steel bolts or rods for the animal guard shall be galvanized per 710.10. In lieu of drilling or punching the 1/2" diameter holes into the pipe, a metal collar meeting all of the above requirements, may be clamped on the end of the pipe, if approved by the Engineer. Payment for the erosion control pads and the animal guards shall be included in the price bid for Item 603 — Conduit, Type F.



PLAN



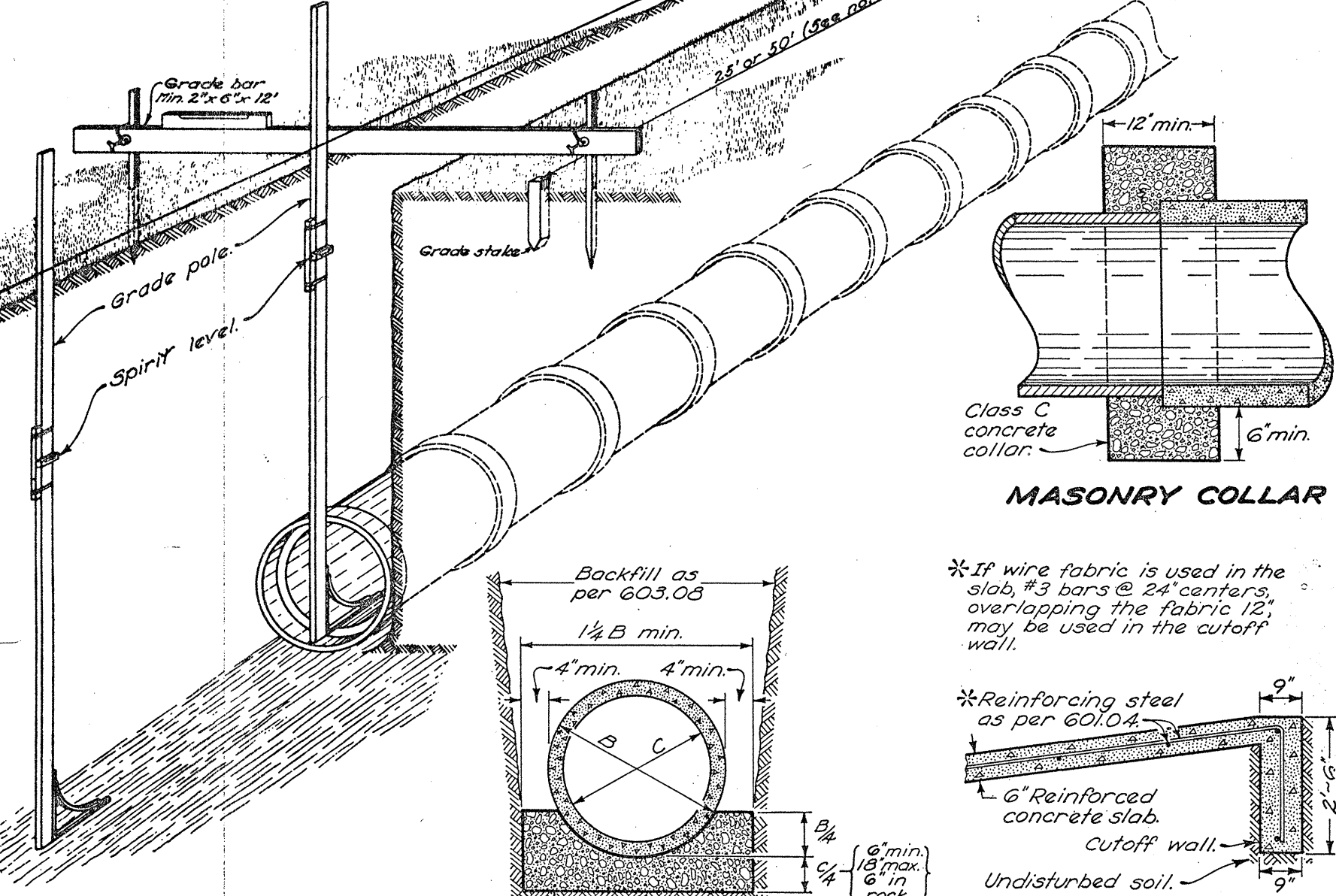
PROFILE



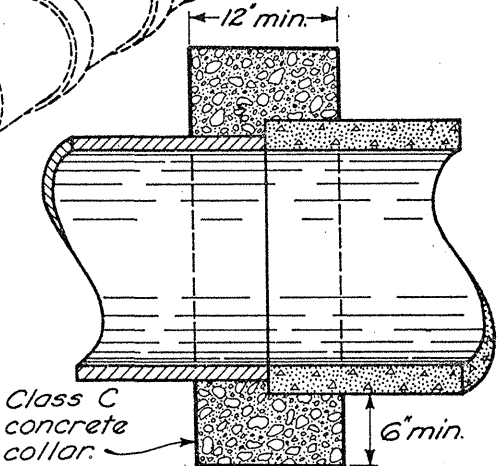
SECTION A-A

Conduit Size	4"	6"	8"	10"	12"	15"	18"
No. of Bolts	2	3	5	6	7	9	11

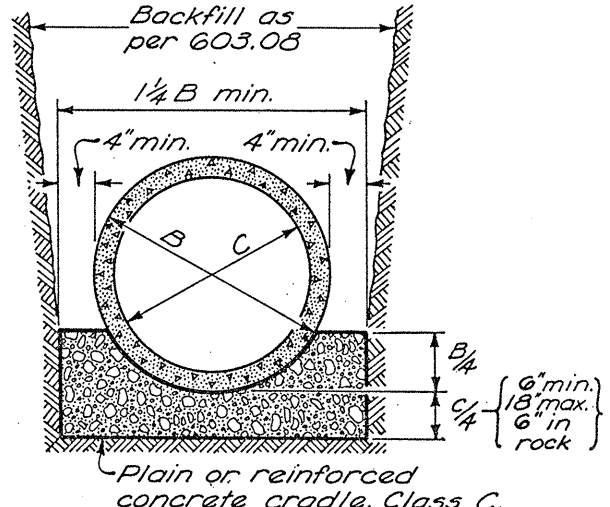
ANIMAL GUARD AND EROSION CONTROL PAD FOR OUTLET PIPE



LAYING PIPE

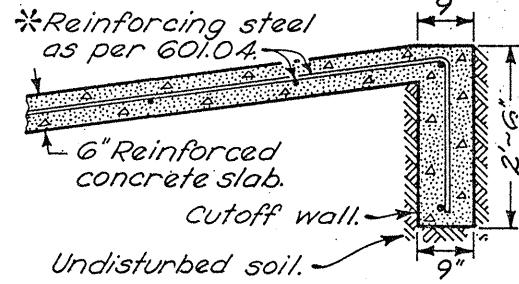


MASONRY COLLAR



CONCRETE CRADLE CLASS A BEDDING

*If wire fabric is used in the slab, #3 bars @ 24" centers, overlapping the fabric 12", may be used in the cutoff wall.



RIPRAP CUTOFF WALL
Cutoff wall shall be included in the price bid for Item 601 Riprap-6" Reinforced Concrete Slab.

BUREAU OF ROADWAY DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

DRAINS AND SEWERS

DATE
6-1-65
6-13-69
7-26-76

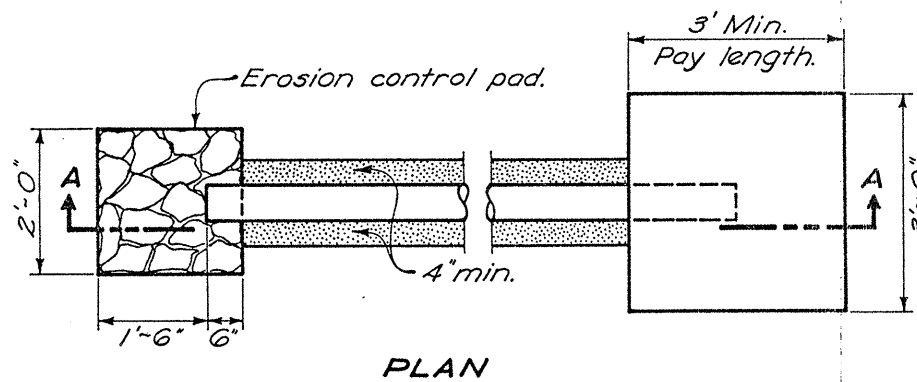
STANDARD CONSTRUCTION DRAWING
APPROVED *E. J. Schaefer* ENGR., R.D.

MC-4

ROADWAY ITEMS

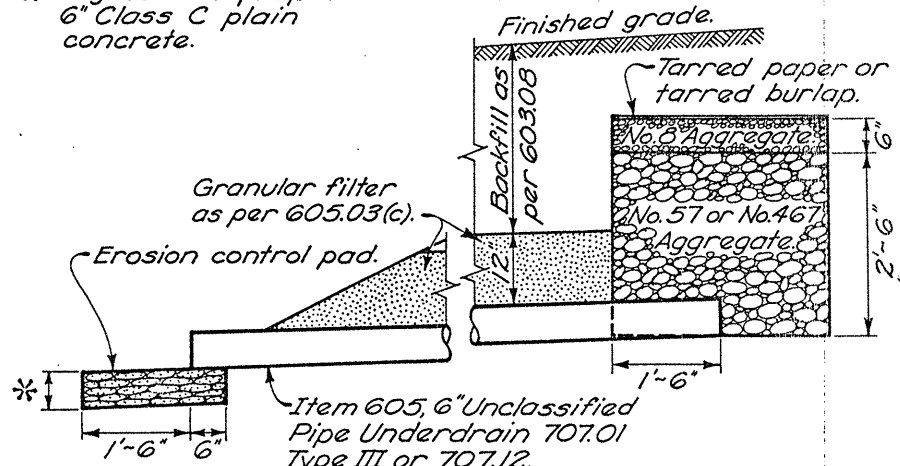
NOTES

SPRING DRAIN: Aggregates, tarred paper or tarred burlap, erosion control pad, backfill and necessary excavation for spring drains shall be included for payment in the unit price bid per linear foot for Item 605, Aggregate Drains for Springs, as per plan.

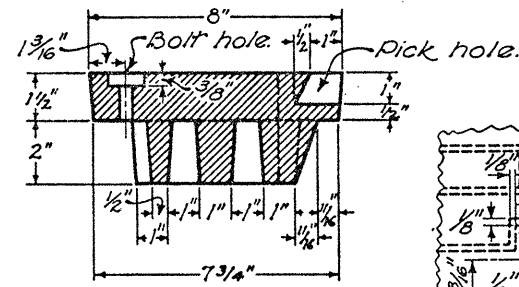


PLAN

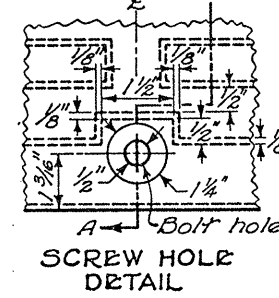
* 9" grouted riprap or 6" Class C plain concrete.



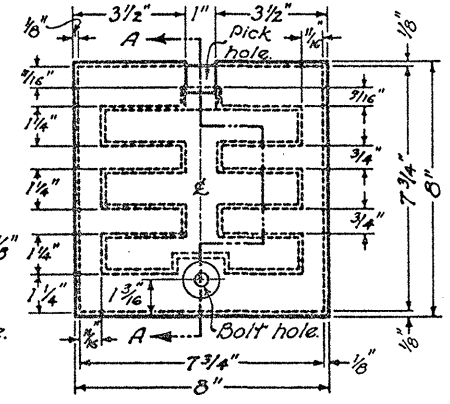
SECTION A-A
SPRING DRAIN DETAIL



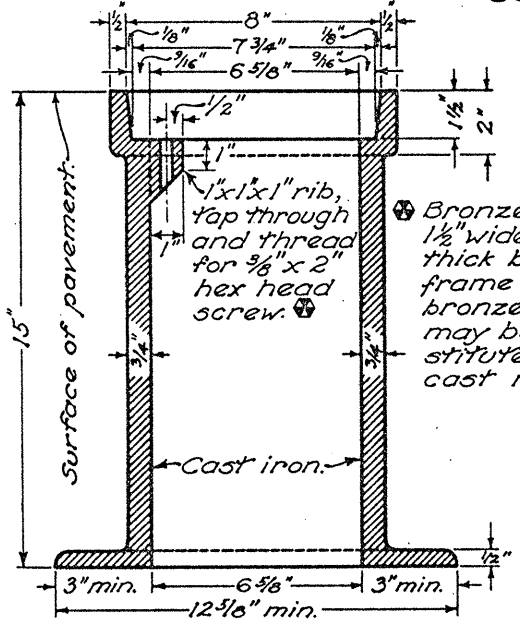
MONUMENT BOX COVER
SECTION A-A



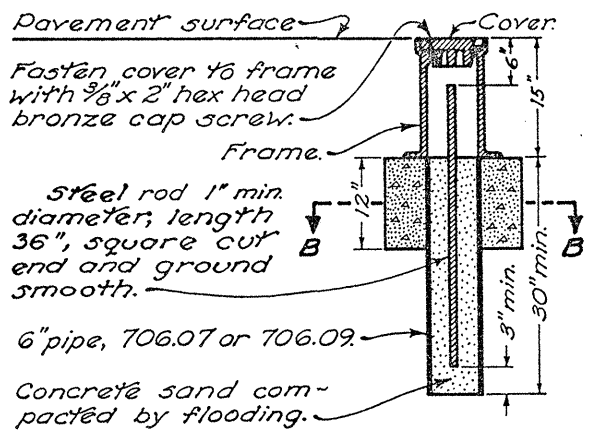
SCREW HOLE
DETAIL



MONUMENT BOX COVER PLAN



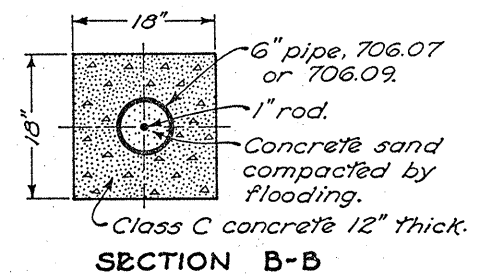
MONUMENT BOX FRAME SECTION



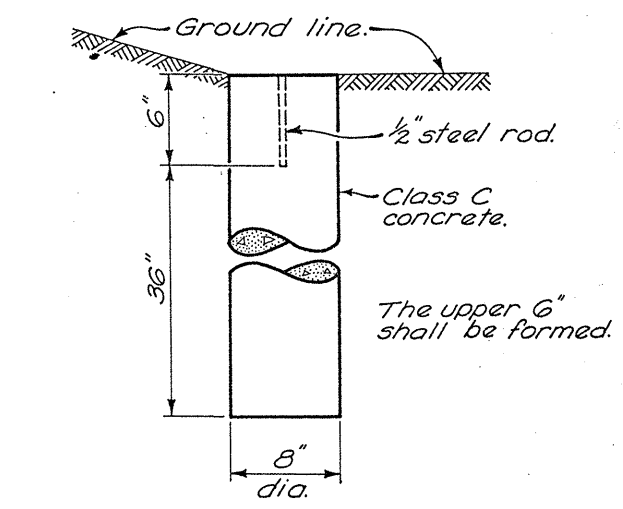
MONUMENT ASSEMBLY SECTION

Cost of furnishing and placing monument box, steel rod, class C concrete, concrete sand and pipe included in price bid for 604 Monument Assembly.

MONUMENT ASSEMBLY

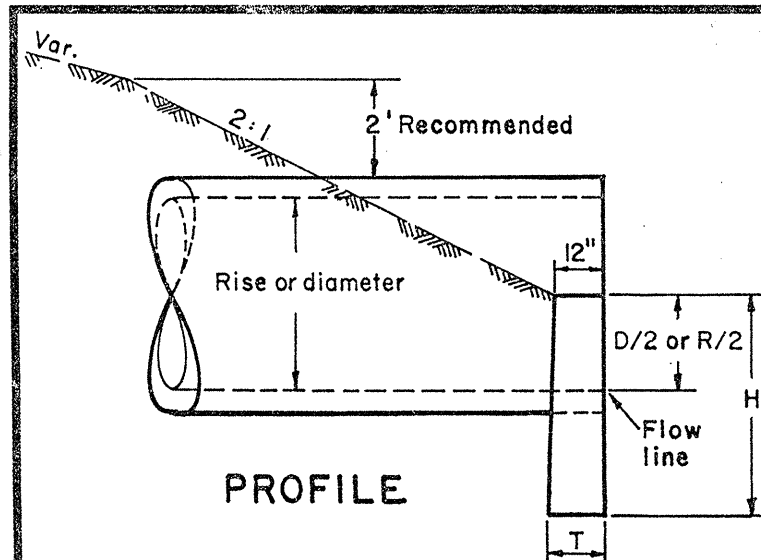


SECTION B-B

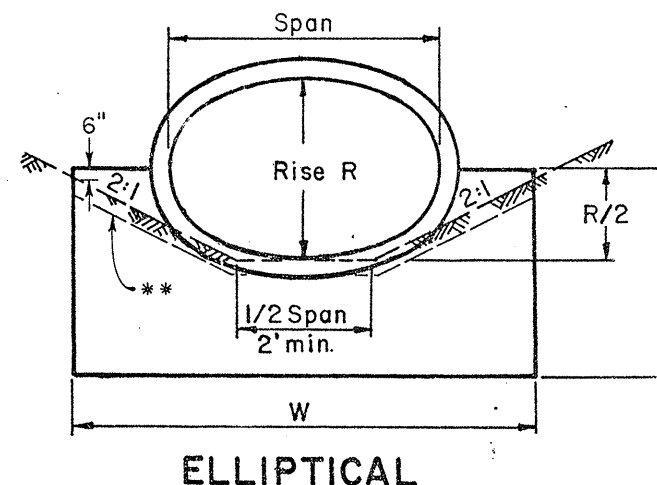
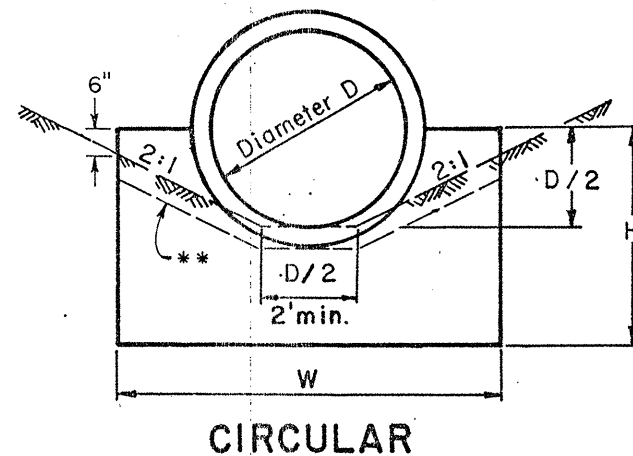


REFERENCE MONUMENT

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF HIGHWAYS	
ROADWAY ITEMS	
STANDARD CONSTRUCTION DRAWING	MC-1
APPROVED <i>K.E. Lattin</i> ENGR. L. & D.	
DATE 6-1-65 10-1-67 6-13-69	



** Top surface of 6" inlet headwall extension

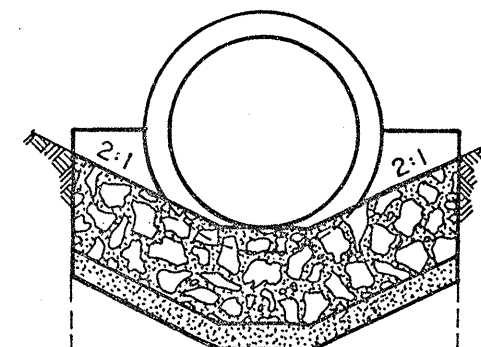
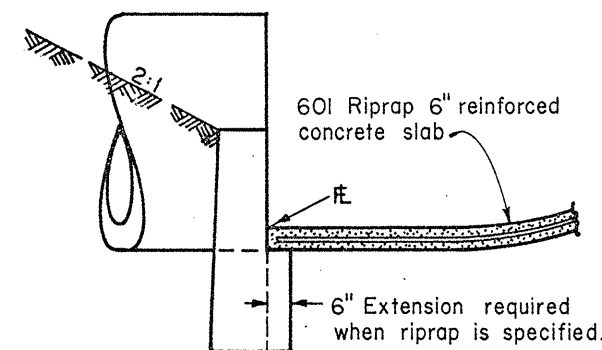


CONCRETE PIPE

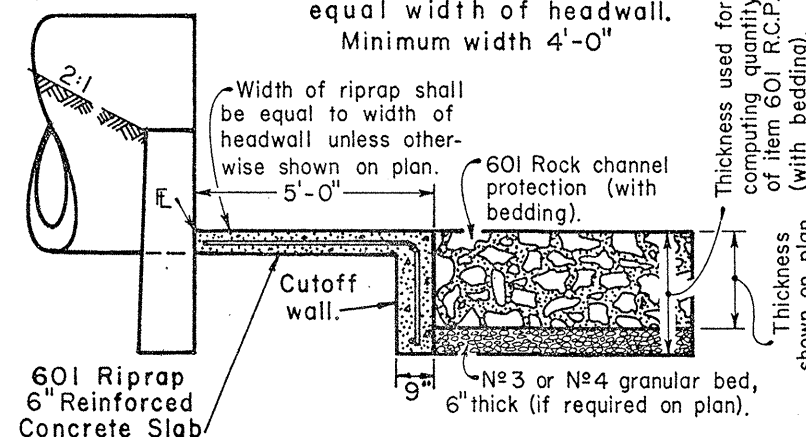
NOTES

CONCRETE for headwalls shall be Class C.
Concrete quantities are based on headwalls without the 6" extension under the inlet channel protection.

HEADWALL FOR CONCRETE PIPE											
CIRCULAR						ELLIPTICAL					
D	W	H	T	Conc. Cu. Yds.	Span	Rise	W	H	T	Conc. Cu. Yds.	
12"	2'-0"	3'-0"	12"	.20	23"	14"	3'-0"	3'-2"	12"	.29	
15"	2'-6"	3'-2"	12"	.25	30"	19"	3'-7"	3'-4"	12"	.35	
18"	3'-0"	3'-3"	12"	.31	34"	22"	3'-11"	3'-5"	12"	.38	
21"	3'-6"	3'-4"	12"	.37	38"	24"	4'-6"	3'-6"	12"	.44	
24"	4'-0"	3'-6"	12"	.43	42"	27"	4'-8"	3'-7"	12"	.45	
27"	4'-6"	3'-8"	12"	.49	45"	29"	5'-2"	3'-8"	12"	.49	
30"	5'-0"	3'-9"	12"	.56	49"	32"	5'-5"	3'-10"	12"	.52	
33"	5'-6"	3'-10"	12"	.62	53"	34"	5'-11"	4'-0"	14"	.66	
36"	6'-0"	4'-0"	12"	.69	60"	38"	6'-10"	4'-2"	14"	.82	
39"	6'-6"	4'-2"	12"	.77	68"	43"	8'-0"	4'-4"	16"	1.01	
42"	7'-0"	4'-3"	12"	.84	76"	48"	9'-2"	5'-0"	16"	1.34	
48"	8'-0"	4'-6"	14"	1.09	83"	53"	10'-4"	5'-2"	18"	1.65	
54"	9'-3"	4'-9"	14"	1.32	91"	58"	11'-6"	5'-5"	18"	1.97	
60"	10'-6"	5'-6"	16"	1.93	98"	63"	12'-7"	5'-7"	20"	2.38	
66"	11'-9"	5'-9"	18"	2.42	106"	68"	13'-9"	5'-10"	20"	2.69	
72"	13'-0"	6'-0"	18"	2.77	113"	72"	14'-9"	6'-0"	22"	3.14	
78"	14'-3"	6'-3"	20"	3.37	121"	77"	15'-11"	6'-3"	22"	3.49	
84"	15'-6"	6'-6"	22"	4.05	128"	82"	17'-0"	6'-5"	24"	4.04	
90"	16'-9"	6'-9"	22"	4.51	136"	87"	18'-2"	6'-8"	24"	4.84	
96"	18'-0"	7'-0"	24"	5.31	143"	92"	19'-4"	6'-10"	26"	5.12	
102"	19'-3"	7'-3"	26"	6.20	151"	97"	20'-6"	7'-1"	26"	5.42	
108"	20'-6"	7'-6"	26"	6.78	166"	106"	22'-7"	7'-5"	28"	6.60	
114"	21'-9"	7'-9"	28"	7.81	180"	116"	24'-10"	7'-10"	30"	7.99	
120"	23'-0"	8'-0"	30"	8.93							
126"	24'-3"	8'-3"	30"	9.57							
132"	25'-6"	8'-6"	32"	10.84							
144"	28'-0"	9'-0"	34"	13.00							



Width of protection shall equal width of headwall.
Minimum width 4'-0"



Cutoff wall depth (2'-6" min.) is variable to match required thickness of rock.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

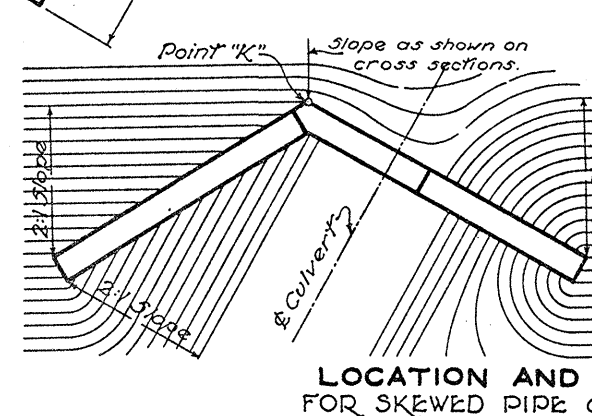
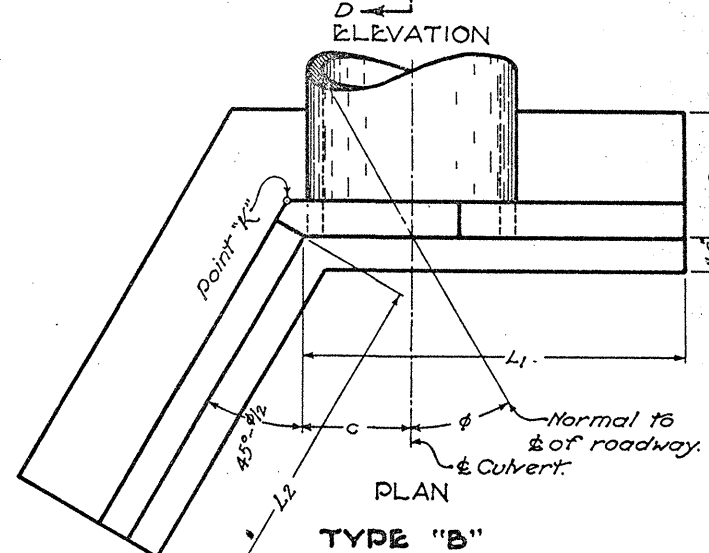
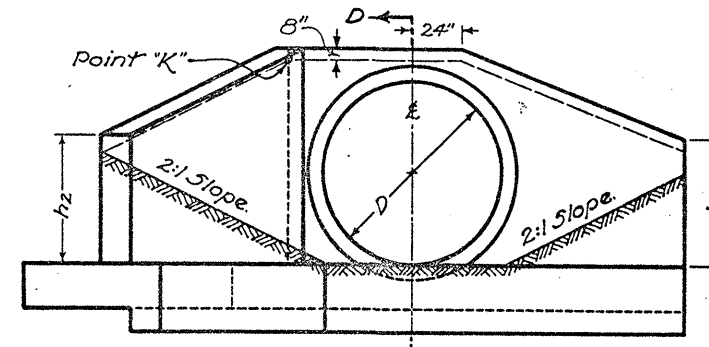
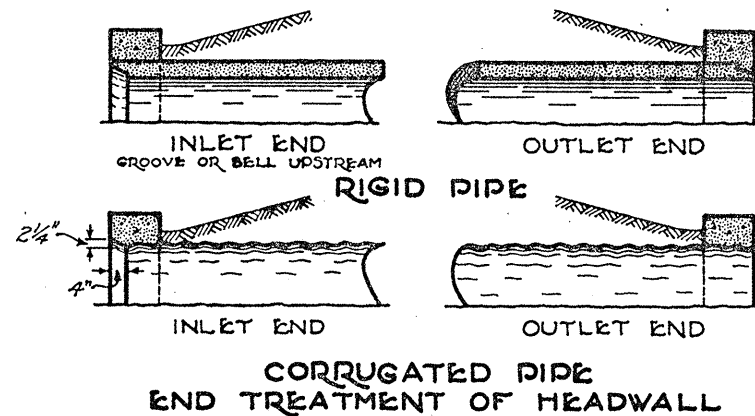
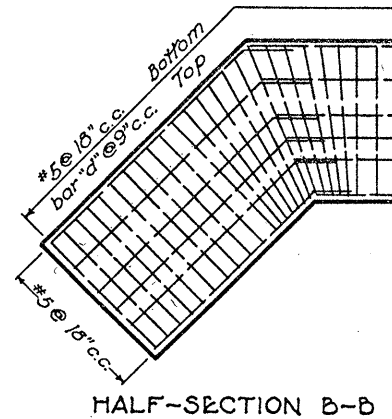
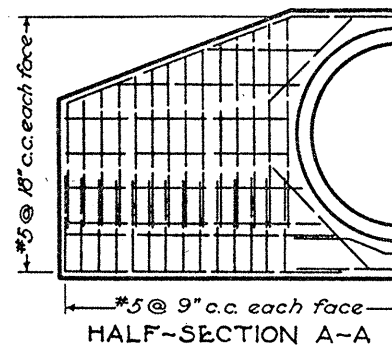
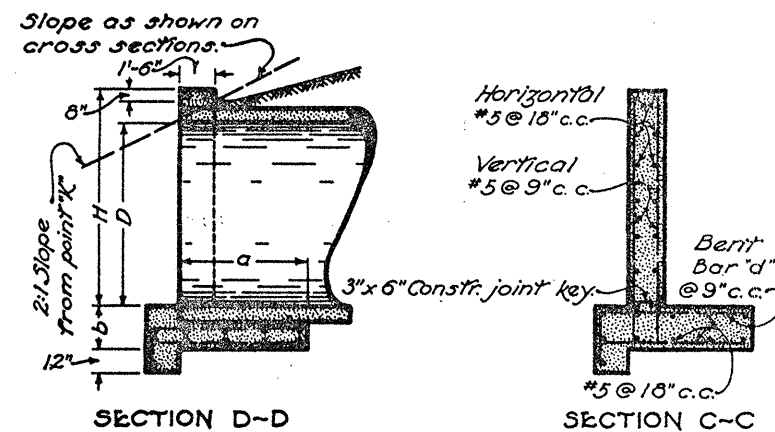
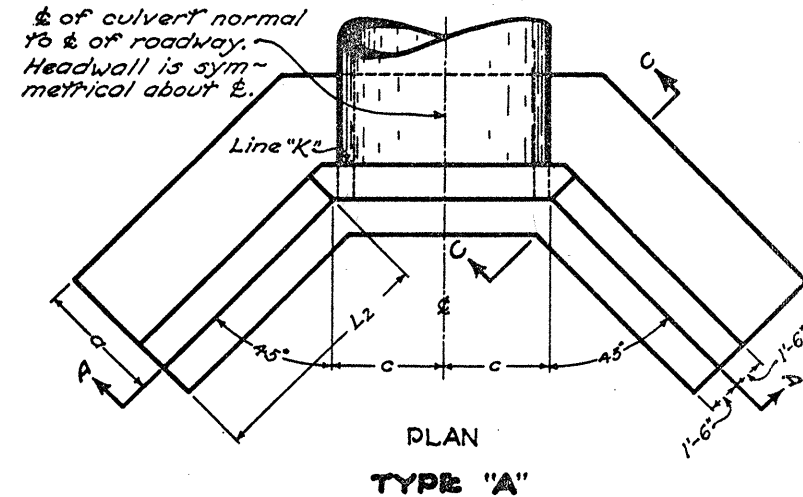
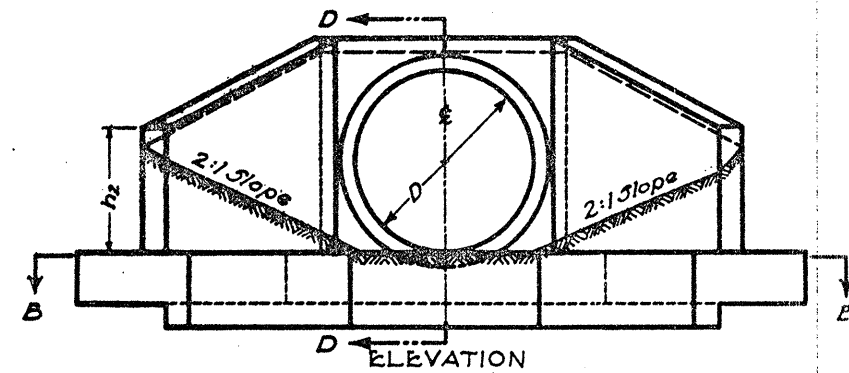
CONCRETE PIPE HEADWALLS

STANDARD CONSTRUCTION DRAWING
HW-4B

APPROVED *M. J. Cunningham* ENGR., L. & D.

DATE
4-1-80

HEADWALLS



NOTES

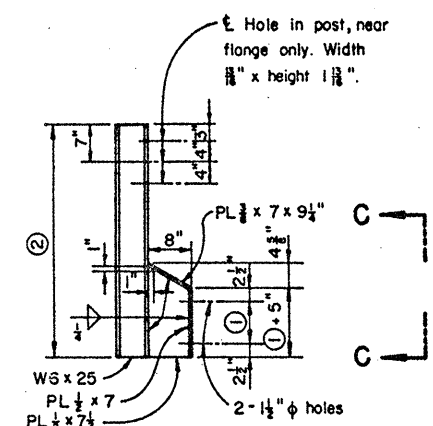
Nº3 HEADWALL where required will be provided for skewed and non-skewed culverts having a diameter or rise of 42 to 64 inches inclusive. Type "A" is used when the skew angle (ϕ) is 10 degrees or less and Type "B" when the skew angle is 11 degrees and over. CONCRETE shall be Class "C." REINFORCING STEEL BARS shall be $\frac{3}{8}$ inch round.

DIMENSIONS AND QUANTITIES are shown for circular sections only. When used with reinforced elliptical concrete pipe or corrugated metal pipe arches it will be necessary to determine such dimensions and quantities which shall generally conform with those listed for the nearest size circular pipe. The dimensions established by vertical diameter shall apply to rise and the dimensions established by horizontal diameter shall apply to span. Chamfer all exposed corners $\frac{3}{4}$ of an inch. FOUNDATION. Where the soil borings indicate a bearing capacity of less than 2600 pounds per square foot it will be necessary to increase the width of the footing.

HEADWALL location to be determined by the intersection of the embankment slope at the back of the headwall at point "K". The slopes adjacent to the headwall shall be 2:1.

							$\phi = 0^\circ$					$\phi = 15^\circ$							$\phi = 30^\circ$							$\phi = 45^\circ$							
PIPE DIAM. D	H	a	b	c	BAR d	L ₂	h ₂	C.Y. CONC. CMP.	C.Y. CONC. RCP.	STEEL LBS.	L ₁	L ₂	h ₁	h ₂	C.Y. CONC. CMP.	C.Y. CONC. RCP.	STEEL LBS.	L ₁	L ₂	h ₁	h ₂	C.Y. CONC. CMP.	C.Y. CONC. RCP.	STEEL LBS.	L ₁	L ₂	h ₁	h ₂	C.Y. CONC. CMP.	C.Y. CONC. RCP.	STEEL LBS.	PIPE DIAM. D	
42"	4'-11"	3'-3"	1'-6"	2'-6"	#5	3'-7"	3'-11"	7.0	6.7	598	8'-9"	4'-6"	3'-8"	3'-2"	7.3	7.1	619	7'-10"	5'-9"	3'-2"	3'-3"	7.5	7.3	633	7'-10"	7'-9"	3'-2"	3'-3"	8.7	8.5	718	42"	
48"	5'-5"	3'-6"	1'-6"	2'-9"	#5	4'-4"	3'-4"	8.5	8.2	793	10'-0"	5'-4"	4'-1"	3'-5"	9.0	8.7	776	8'-9"	6'-10"	3'-5"	3'-6"	9.1	8.8	801	8'-9"	9'-2"	3'-5"	3'-7"	10.6	10.3	925	48"	
54"	5'-11"	3'-9"	1'-6"	3'-0"	#5	5'-2"	3'-8"	10.3	10.0	1,069	11'-4"	6'-3"	4'-6"	3'-8"	10.9	10.5	1,026	9'-8"	7'-11"	3'-8"	3'-9"	10.8	10.5	1,024	9'-8"	10'-7"	3'-8"	3'-10"	12.6	12.2	1,188	54"	
60"	6'-6"	4'-0"	1'-6"	3'-3"	#5	5'-11"	3'-11"	12.3	11.8	1,149	12'-7"	7'-2"	4'-10"	4'-0"	12.9	12.4	1,174	10'-7"	9'-0"	3'-10"	4'-1"	12.7	12.3	1,157	10'-7"	12'-0"	3'-10"	4'-1"	14.8	14.3	1,354	60"	
72"	7'-7"	4'-6"	1'-7"	3'-9"	#7	7'-5"	4'-5"	17.0	16.2	1,783	15'-1"	8'-11"	5'-7"	4'-6"	17.8	17.1	1,811	12'-5"	11'-2"	4'-3"	4'-7"	17.3	16.6	1,788	12'-5"	14'-10"	4'-3"	4'-8"	20.2	19.6	2,076	72"	
84"	8'-8"	5'-0"	1'-10"	4'-3"	#8	9'-0"	5'-0"	23.7	22.8	2,595	17'-7"	10'-9"	6'-4"	5'-1"	24.8	23.9	2,596	14'-7"	13'-4"	4'-10"	5'-2"	24.1	23.3	2,511	14'-3"	17'-8"	4'-8"	5'-2"	27.9	27.0	2,990	84"	

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF HIGHWAYS	
HEADWALLS	
STANDARD CONSTRUCTION HW-3 DRAWING	
APPROVED <i>R. B. L. ENGR. L. & D.</i>	
DATE 6-1-65	



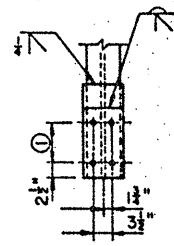
Dimension ① is 6" or 8" depending on box beam depth. See project plans and POST ANCHORAGE DETAILS, PRESTRESSED CONCRETE BOX BEAMS.

For Dimension ② see project plans.

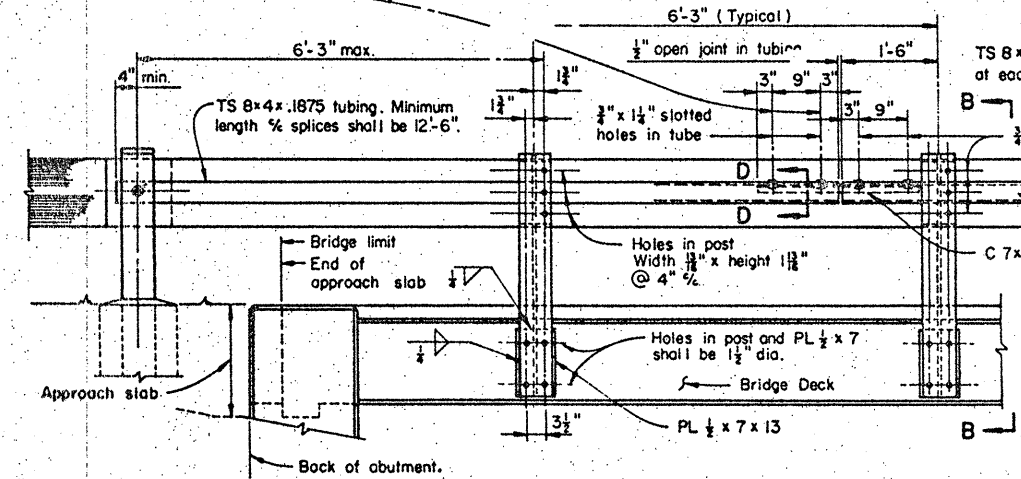
SECTION B-B
TYPE 2 POST

(For use with prestressed concrete box beams)

VIEW C-C



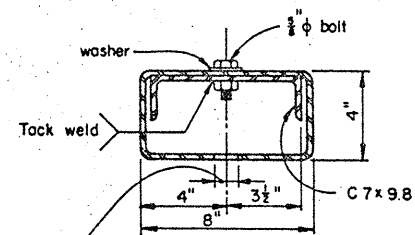
Bolts in slotted holes shall not be drawn up so tight as to prevent sliding between the tube and channel.



RAILING ELEVATION
(Type 1 posts shown)

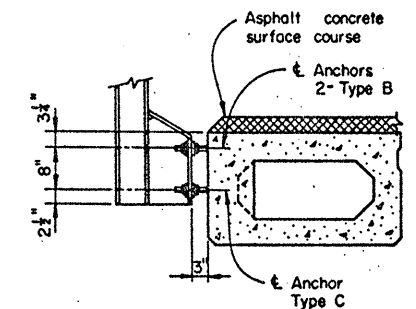
ACSC indicates Asphalt Concrete Surface Course. MWS indicates Monolithic Wearing Surface.

SECTION B-B
TYPE 1 POST

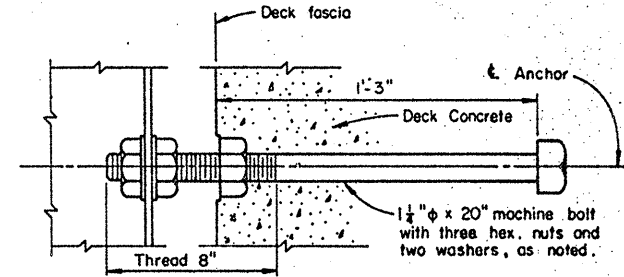


SECTION D-D

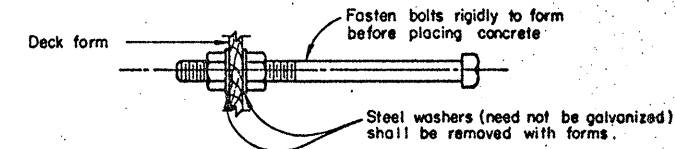
1" diameter drain hole (only in tube at lowest point when sag vertical curves are encountered). Location to be shown on project plans.



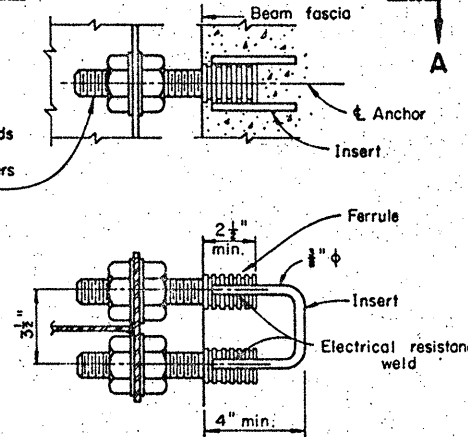
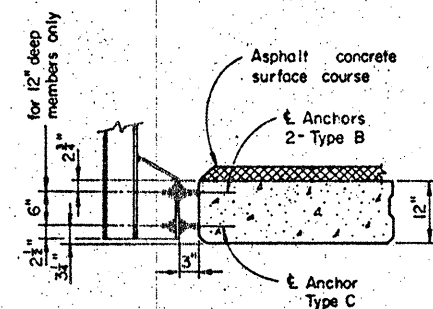
POST ANCHORAGE DETAILS
PRESTRESSED CONCRETE BOX BEAMS



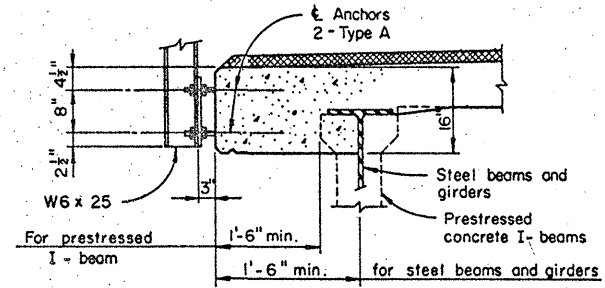
TYPE A ANCHOR DETAIL



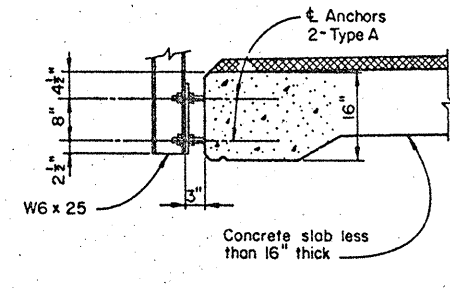
TYPE A ANCHORS SUPPORTED BY FORMS



SECTION A-A
TYPE C ANCHOR DETAIL

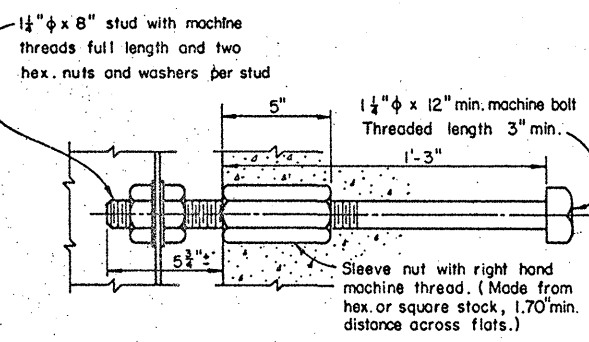


LONGITUDINAL BEAM BRIDGES

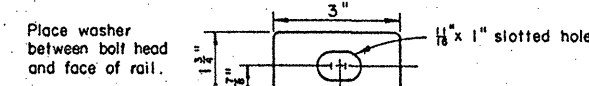


CONCRETE SLABS

POST ANCHORAGE DETAILS
(Not for use with prestressed concrete box beams)



TYPE B ANCHOR DETAIL



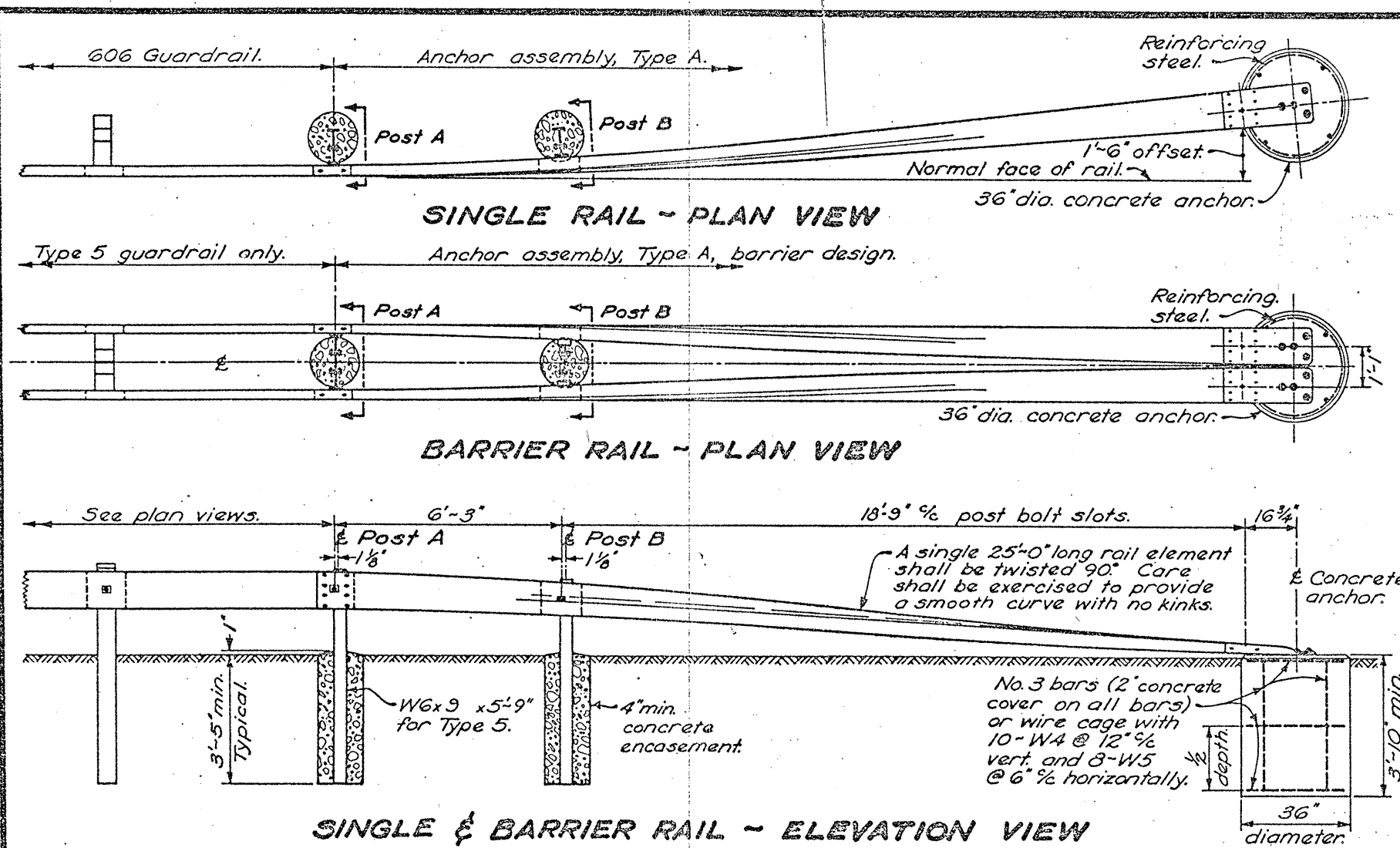
SPECIAL WASHER

MATERIAL: All anchor bolts, nuts and studs shall conform to the physical properties of ASTM-A325 except that the minimum elongation shall be 10%. The chemical properties are waived.

GALVANIZING: All guard rail posts, tubes, hardware and accessories shall be galvanized in accordance with ASTM A123 or ASTM A153, except as otherwise noted.

TYPE C ANCHOR INSERTS of a different type may be provided if approved by the Director.

REVISIONS				STATE OF OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS BUREAU OF BRIDGES			
				STANDARD			
				DEEP BEAM BRIDGE GUARD RAIL WITH TUBULAR BACKUP			
APPROVED: <i>Robert B. Clippa</i>				DRAWING NO.			
DATE: 4/10/73				ENGINEER OF BRIDGES			
PREPARED	TRACED	CHECKED	REVIEWED	INNES	TGC	CPD	BFG FHR
				MFW			
				OBR-2-73			



NOTES

GENERAL: For details not shown, see GR-1 and other Standard Construction Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

ANCHOR ASSEMBLY TYPE A can be used at each free end of Type 4, 5 or 7 guardrail or barrier rail. It is primarily an approach end.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets shown on GR-5 and GR-6. Use of the 1'-6" offset will generally be limited to upgrading existing highways for safety or the construction or reconstruction of highways with design traffic less than 1000 ADT or design speeds less than 50 mph.

SPACERS for Post B shall be made of 3/16" steel plate 710.15, or two sections of W6x9 or W8x10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

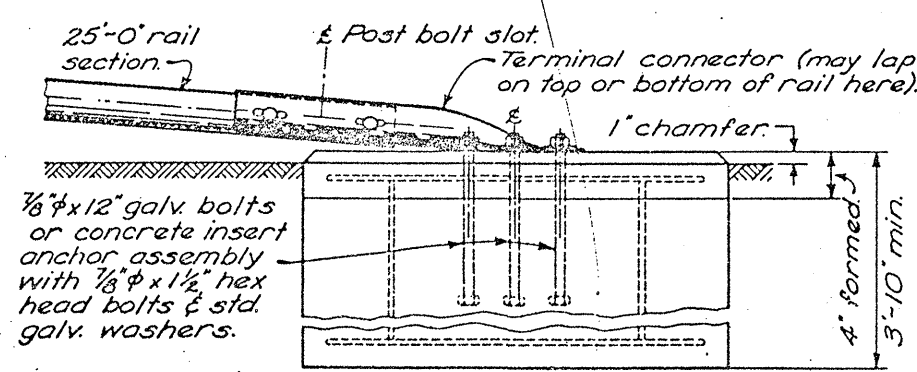
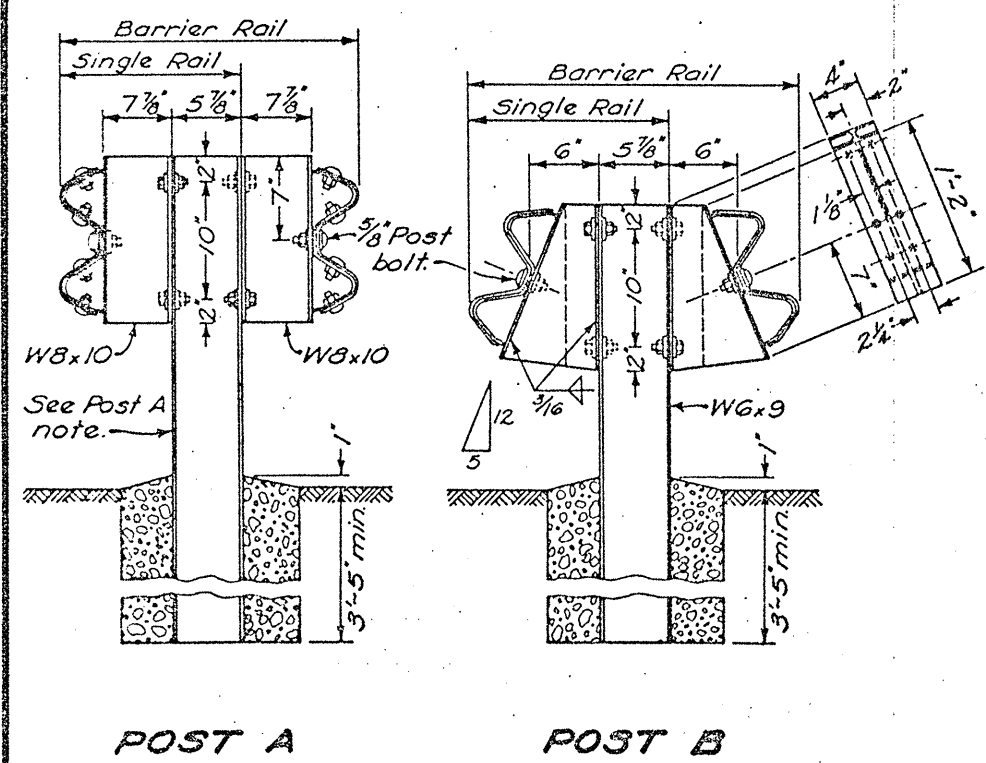
Spacers shall be fastened to their posts with two 5/8" hexhead bolts and nuts with standard washers on both sides.

POST BOLT WASHERS: Place a rectangular plate washer between the face of rail and post bolt head.

All other washers indicated on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 or 7 guardrail, Post A shall be a standard Type 4 or 7 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 5/8" φ.



BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
TYPE A ANCHOR ASSEMBLY	
STANDARD CONSTRUCTION DRAWING	GR-4
APPROVED _____	ENGR. L.B.D.

DATE
1-1-71
11-9-71
12-6-76
2-5-82

NOTES

POSTS may be round (single rail only) or 6"x8" square-sawn pressure-treated wood or W6x9 galvanized steel. The same type post shall be used throughout the length of project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 8" plus or minus 1" in diameter at the top and not more than 3" larger at the butt with a uniform taper.

Posts may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and spacer blocks shall be pressure-treated as per 710.14. Bolt holes shall be bored and tops of posts trimmed, if required, after posts are set.

FOR DETAILS not shown see GR-1.

SPACER BLOCKS: When wood spacer blocks are used with the steel post, a roofing nail shall be driven through the hole in the adjacent flange to prevent blocks from turning.

WASHERS: Place a rectangular plate washer between the face of rail and post bolt head or nut. All other washers indicated are standard galvanized steel of the appropriate size.

WELDED BEAM guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A769, Class 1 using A36 steel with the following exceptions:

7.2 Test reports of tensile properties for each lot shall accompany each shipment.

11. Ultrasonic inspection need not be performed on welded beams used for Item 606.

12. Beams which have imperfections repaired by welding shall not be accepted for use in Item 606.

15. Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

STEEL BEAM POSTS & BLOCKS

Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W 6x8.5	5.83"	3.94"	.194"	.170
Rolled W 6x9	5.90"	3.94"	.215"	.170
Rolled W 8x10	7.89"	3.94"	.205"	.170
Welded 6x8.5	6.10"	3.94"	.194"	.170
Welded 6x9	6.0"	3.94"	.215"	.170
Welded 8x10	8.0"	3.94"	.205"	.170

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

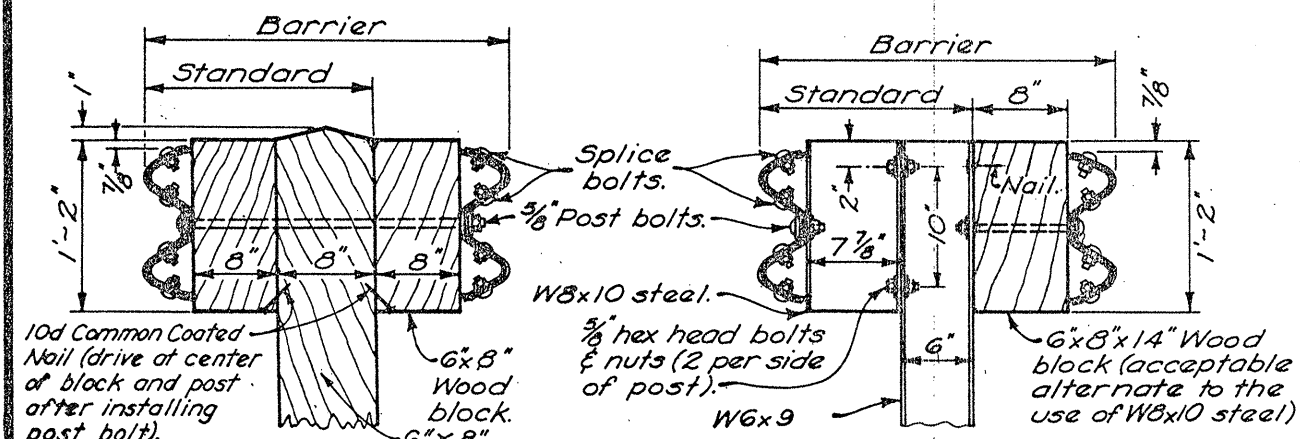
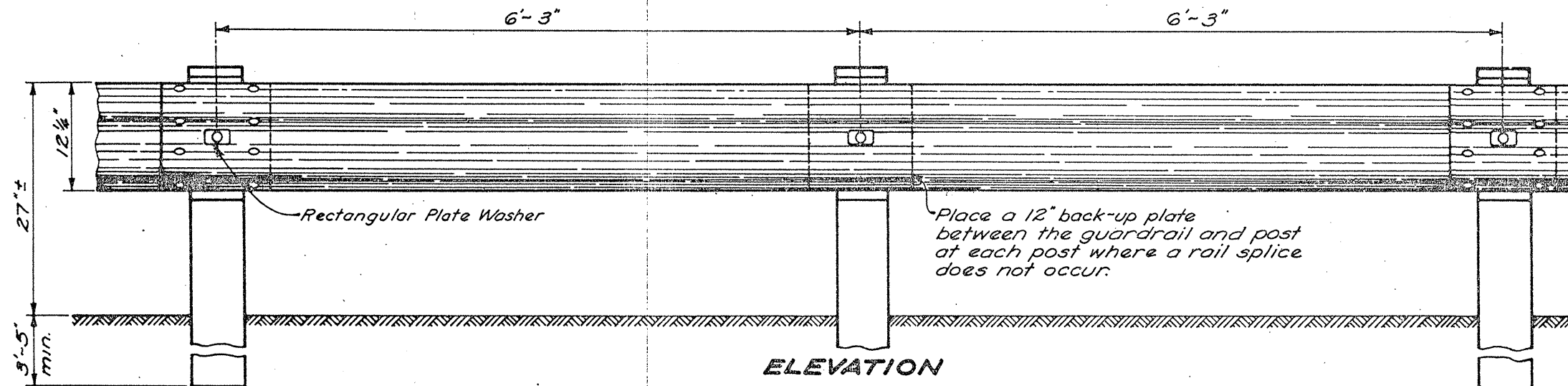
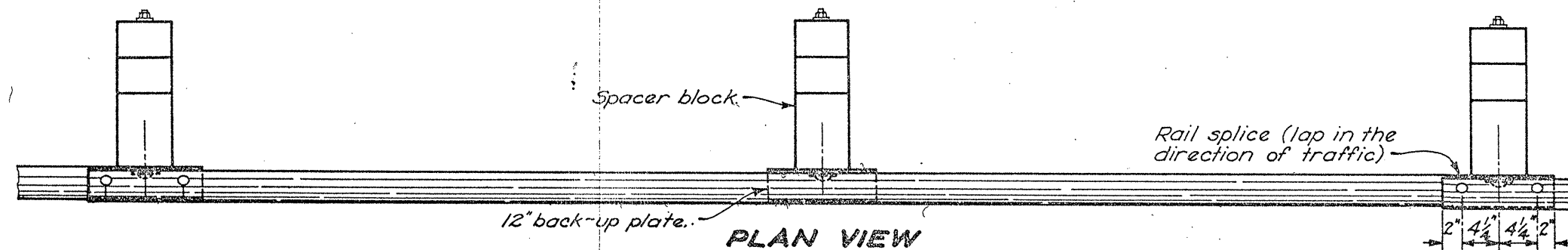
GUARDRAIL TYPE 5

STANDARD
CONSTRUCTION
DRAWING

GR-2B

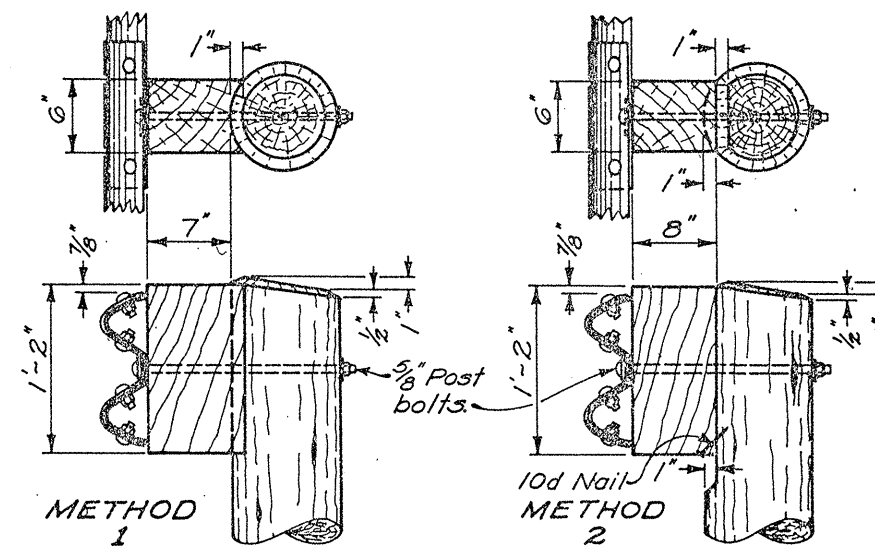
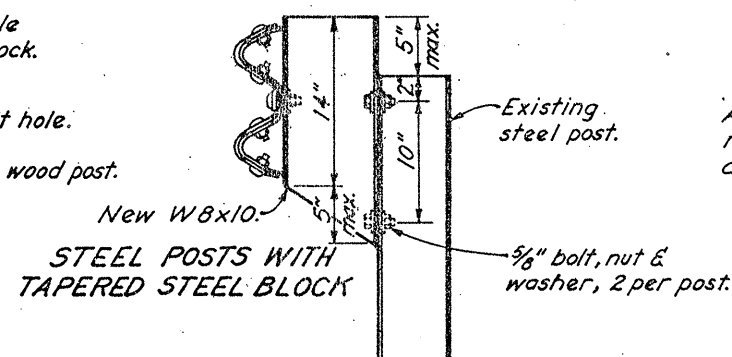
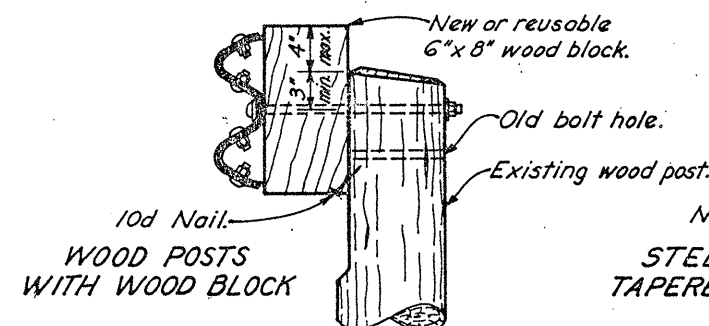
APPROVED *[Signature]* ENGR. L. & D.

DATE
2-15-88
1-1-71
11-9-71
12-6-76
2-5-82



SQUARE WOOD POST

STEEL POST



Alternate methods of placing the spacer blocks on the round posts may be submitted for consideration and approval by the Engineer.

ROUND WOOD POSTS

RAISING EXISTING GUARDRAIL HEIGHT

NOTES

BEAM RAIL ELEMENTS shall be 12'-6" effective length, unless otherwise specified, with $\frac{3}{4}$ " x $2\frac{1}{2}$ " post bolt slots on 6'-3" centers regardless of post spacing. Field punching or drilling of bolt holes or slots for irregularly spaced posts shall be according to 606.05.

BEAM RAIL SPLICE between two rail elements, or rail and terminal connector shall be lapped in the direction of traffic. The buffer or flared end sections shall lap on the traffic face. A 12" length of beam rail (Back-Up Plate), with a $\frac{3}{4}$ " dia. bolt hole or a $\frac{3}{4}$ " x $2\frac{1}{2}$ " slot, shall be provided at posts not having a rail splice.

SPECIAL POST MOUNTINGS: Inlet mounted posts are required for guardrail posts located on a drainage inlet. Footing anchors are required for guardrail posts located on footers with less than 3'-5" cover except that for footer cover of 2'-6" to 3'-5" the posts may be installed by using a 4" minimum concrete encasement. The inlet mounted post may be used for footing anchors in runs with steel posts.

When standard post depth is not available due to a culvert, the guardrail posts directly over the culvert shall not be driven, but set in holes with a 4" minimum concrete encasement for the maximum post depth available.

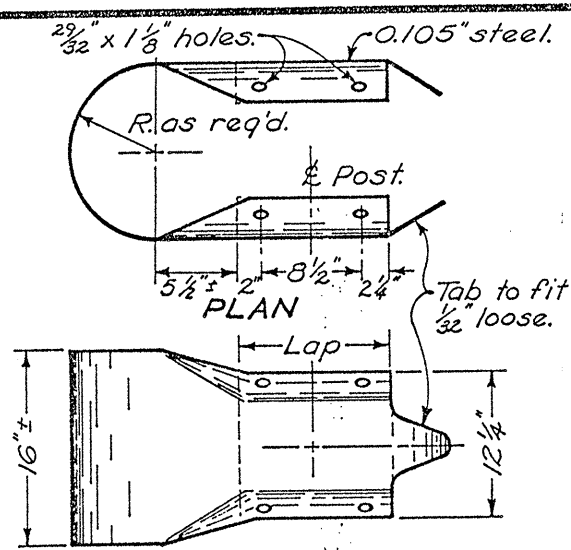
Cost of the inlet mounted posts, footing anchors, and concrete encasement shall be included in the unit price bid for guardrail of the type required by the plan.

STEEL POST SIZES: The W6 x 8.5 and W6 x 15.5 posts may be used in lieu of the W6 x 9 and W6 x 15 respectively which are shown on the various Standard Construction Drawings for guardrail.

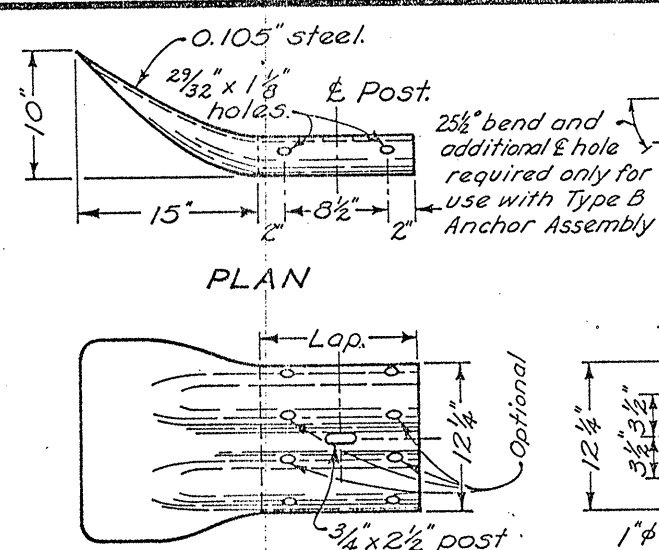
*** ANCHORS** conforming to 712.01, or anchors per FF-5-325 Group II, Type 4, Class 1 or 2 or Group VIII, Type 1 or 2 with proof load certification per 712.01, may be substituted with the same bolt diameter specified. If there is any question of deteriorated concrete, expansion anchors will not be allowed, as determined by the Engineer. Where self-drilling anchors are permitted and used for guardrail construction, the holes shall be drilled with the expansion shield (not by a drill bit) and the shield shall be installed flush with the concrete surface.

The Engineer shall visually inspect, after installation, all expansion anchors used in guardrail construction. The Engineer may require the Contractor to test load any expansion anchor to $\frac{1}{4}$ the certified proof load in direct pull. The equipment and method used shall meet the approval of the Engineer. Each expansion anchor that fails to meet the test requirements shall be reset or removed and replaced with bolts extending through the concrete or grouted in place, as directed by the Engineer.

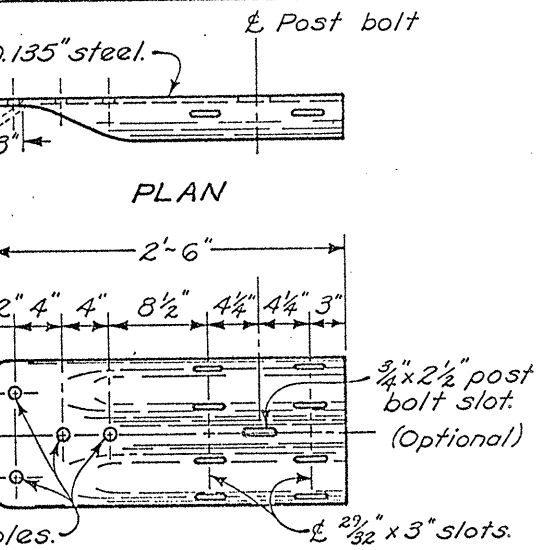
PROTECTIVE COATING: In lieu of the requirements of 710.06, expansion shields, anchors and insert anchor assemblies installed (embedded) in concrete may be coated according to good commercial practices. Any bolts screwed into these embedded devices shall meet 710.06.



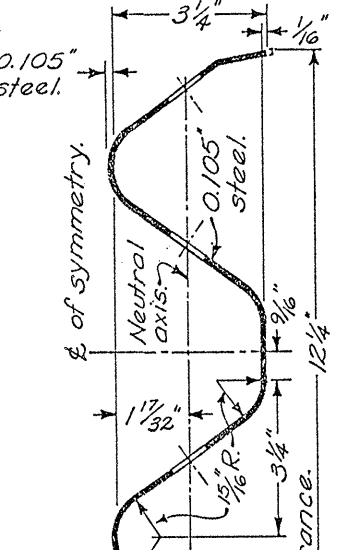
BUFFER END SECTION



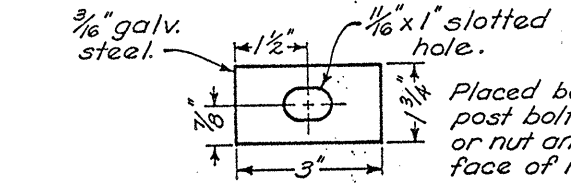
FLARED END SECTION



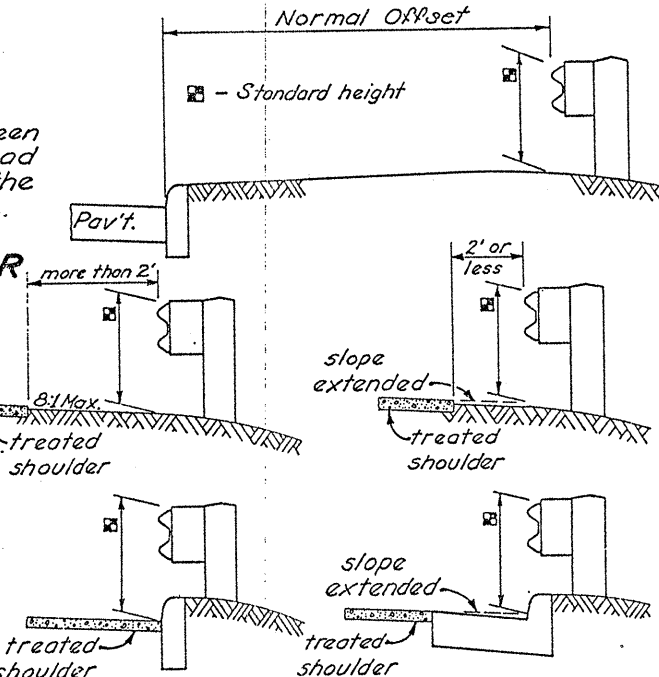
TERMINAL CONNECTOR



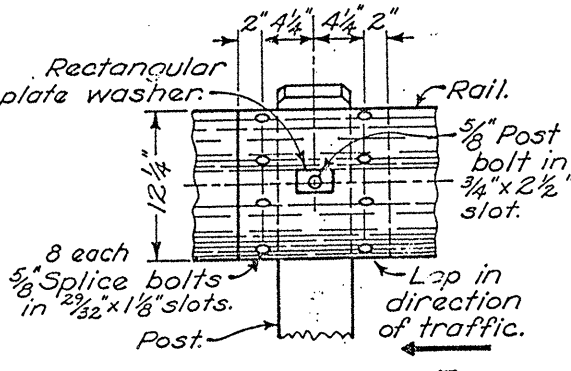
SECTION BEAM RAIL



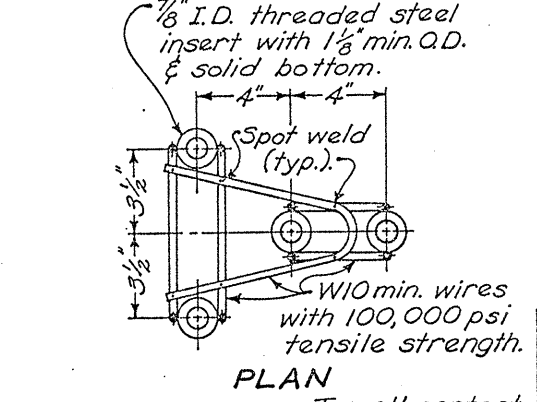
RECTANGULAR PLATE WASHER



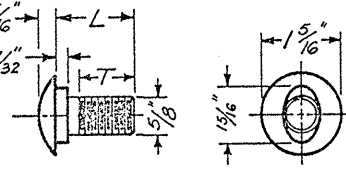
MEASURING GUARDRAIL HEIGHT



BEAM RAIL SPLICE



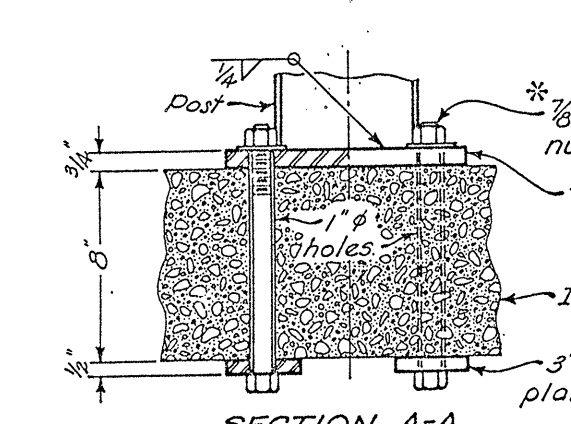
CONCRETE INSERT ANCHOR ASSEMBLY



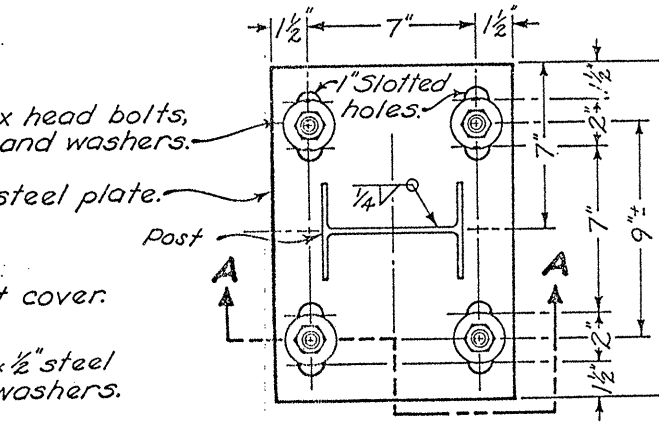
BUTTON HEAD BOLT

L (in.)	Turn	Bolt Use
18	20	3 1/2 Type 5: WP/WB
10	2 1/2	Type 4: WP
2	1 1/2	Type 5: SPWB
1 1/4	Full	Type 4: SP
		Type 5: SP/SB
		Splice bolt

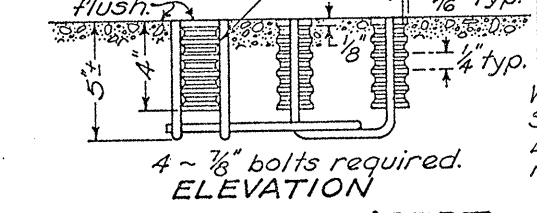
WP=wood post WB=wood block
SP=steel post SB=steel block
Longer bolt may be needed for round WP larger than 8" dia.



INLET MOUNTED POST



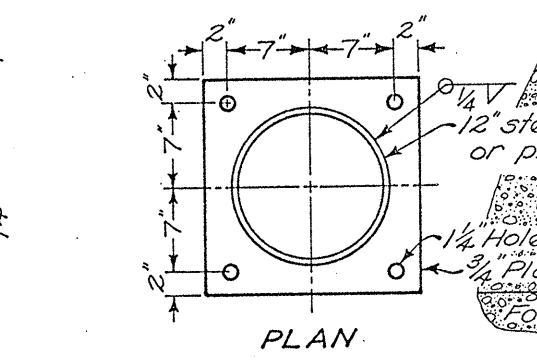
FOOTING ANCHOR



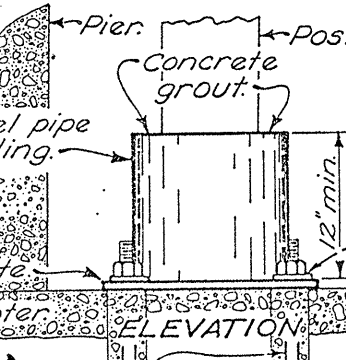
CONCRETE INSERT ANCHOR ASSEMBLY

BUTTON HEAD BOLT

(For post and splice bolts)



FOOTING ANCHOR



FOOTING ANCHOR

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

STANDARD CONSTRUCTION DRAWING
APPROVED: *[Signature]* ENGR., L. & D.
GR-1

DATE
12-6-76
2-5-82
1-11-85

NOTES

ASPHALT CONCRETE, 402 or 404, shall be compacted in three equal courses with compaction equipment as approved by the Engineer. Surface of the asphalt concrete shall be flush to $\frac{1}{4}$ " above the concrete pavement surface.

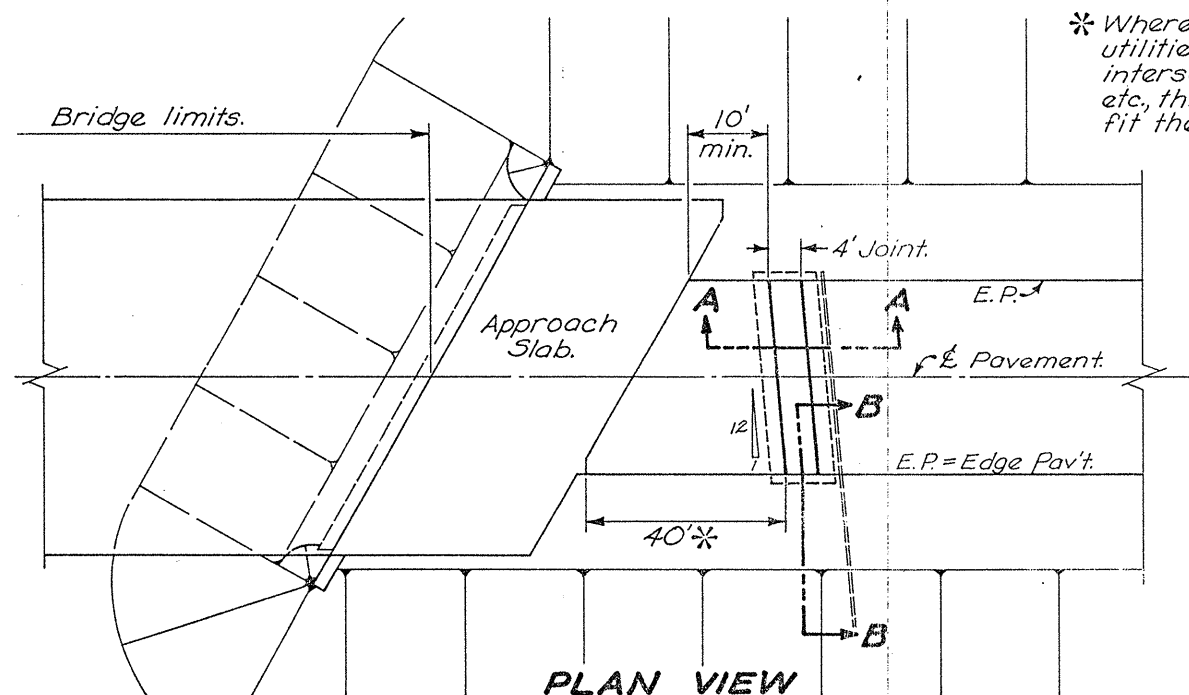
BARRICADES shall be provided during construction until the relief joint has been filled with asphalt.

MEASUREMENT of the pressure relief joint for pay purposes shall be along the centerline of the joint, edge to edge of pavement or back to back of curbs. Payment shall be per linear foot for Item Special, Pressure relief joint, Type A, which shall include all work and materials necessary to complete the joint, except for the pipe underdrain.

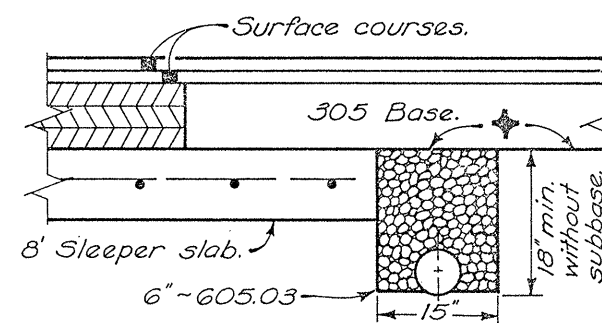
UNDERDRAIN: A perforated metal pipe underdrain, 707.01 Type III or 707.21 Type III shall be placed along the upgrade side of the sleeper slab. It shall extend from edge to edge of the sleeper slab and shall be outletted as shown on the plan, either to a longitudinal underdrain, a catch basin, or through the embankment or ditch inslope. These drains shall be paid for per linear foot of 605 6" shallow pipe underdrains, 707.01 Type III or 707.21 Type III.

EXPANSION JOINTS normally required in the bridge approach pavement per 451.08(c) will not be required.

* Where there are conflicts such as utilities, drainage structures, intersections, excessive bridge skew, etc., this dimension may be varied to fit the situation.



**PLAN VIEW
PRESSURE RELIEF JOINT - TYPE A**



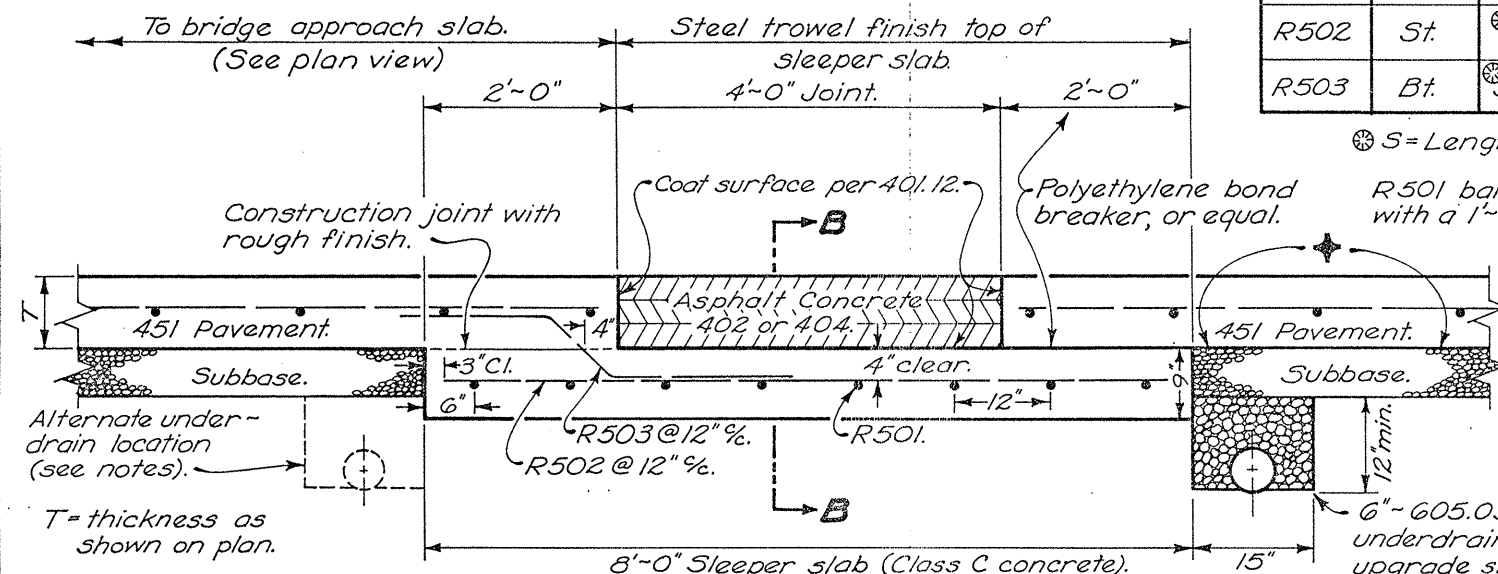
ALTERNATE PAVEMENT DETAIL

For details not shown, see Section A-A.

REINFORCING STEEL LIST $\frac{5}{8}$ " ϕ				
Mark	Shape	No.	Length	Bending Diagram
R501	St.	8	3'-6"	
R502	St.	5	7'-6"	
R503	Bt.	5-2	4'-3"	

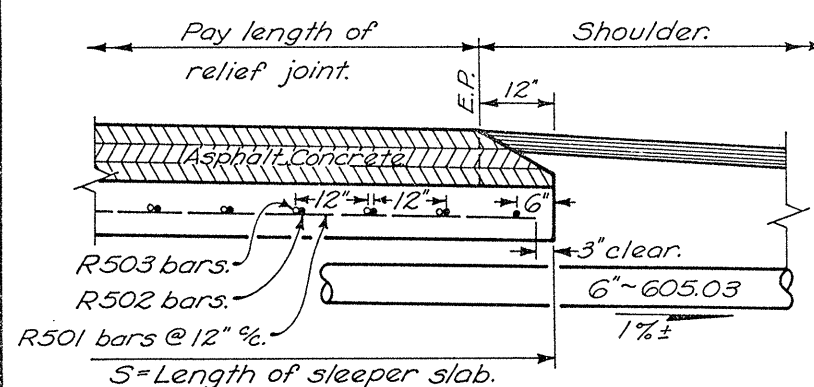
$\otimes$ S = Length of sleeper slab (in feet).

R501 bars may be furnished in segments with a 1'-7" bar lap between segments.

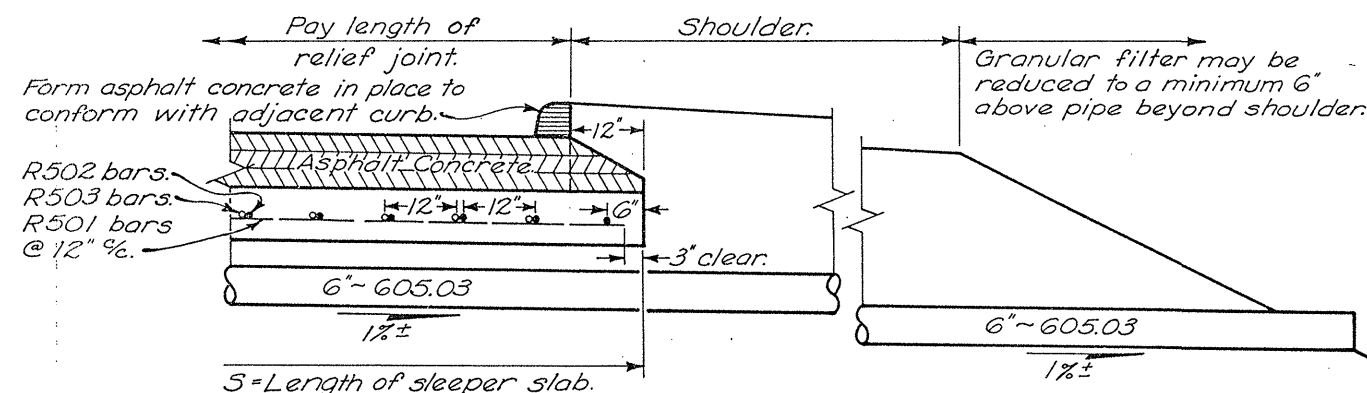


SECTION A-A

* Care shall be taken in the area 0' to 4' from the sleeper slab to be sure the surface of the subbase or subgrade is finished smooth and is flush with or slightly higher than the surface of the sleeper slab.



SECTION B-B

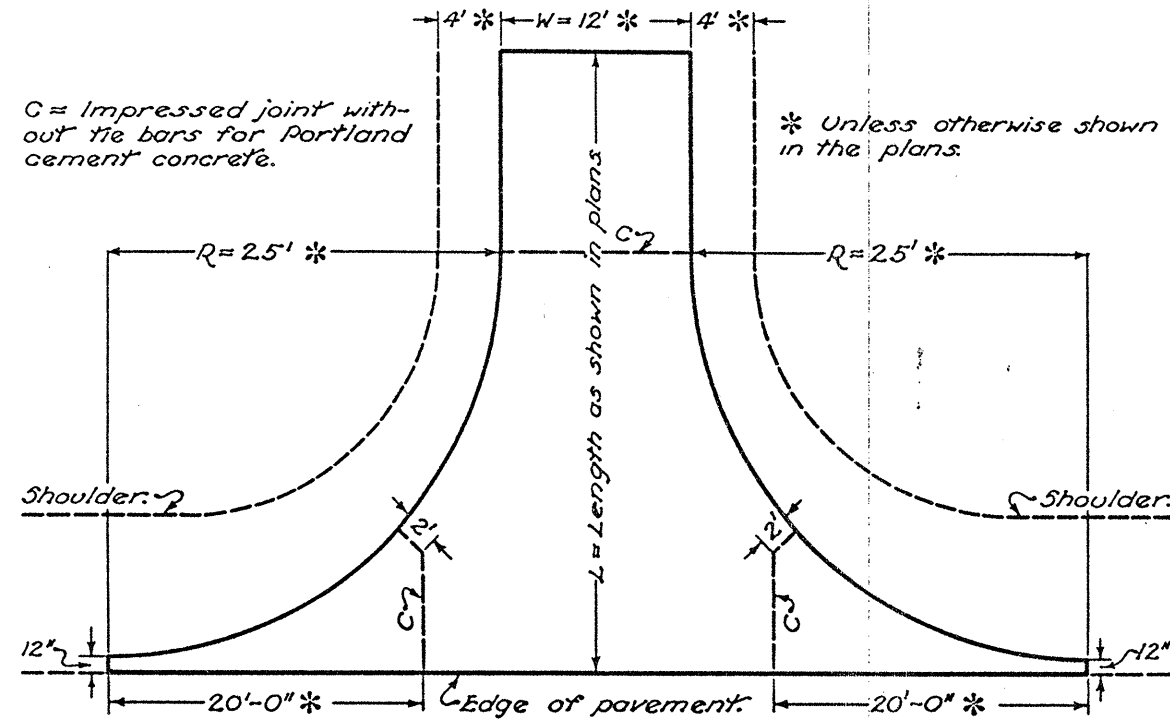


SECTION B-B WITH CURB

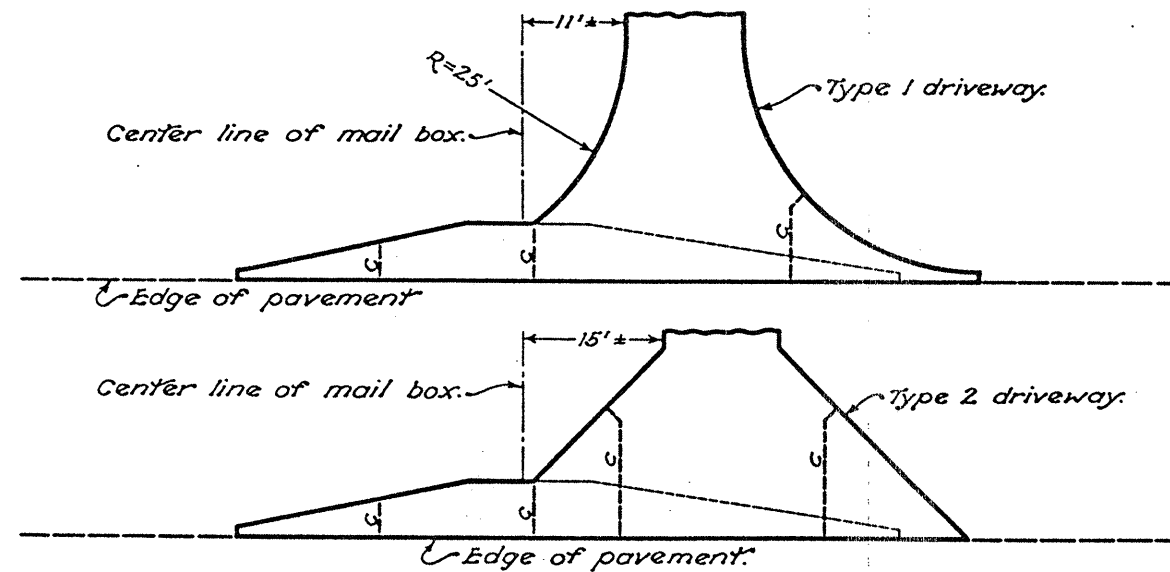
(showing an underdrain outlet through the embankment).

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
PRESSURE RELIEF JOINT TYPE A	
DATE 1-3-75 1-30-84	BP-10
STANDARD CONSTRUCTION DRAWING	
APPROVED	ENGR. L. F. D.

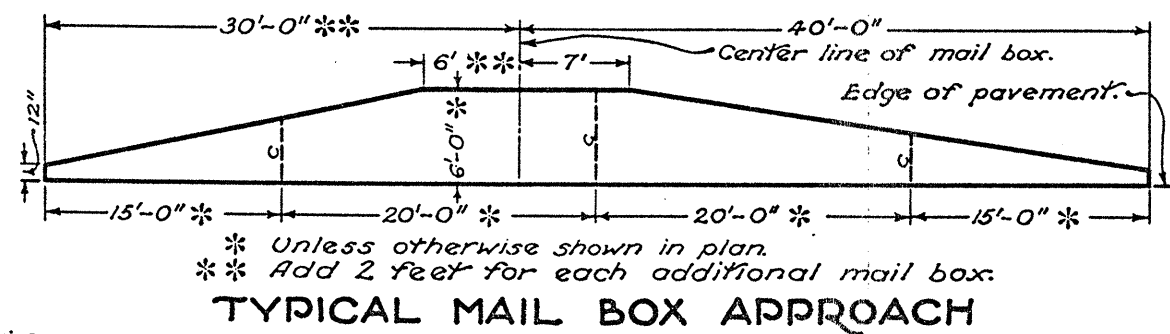
DRIVEWAYS



TYPE 1 DRIVEWAY

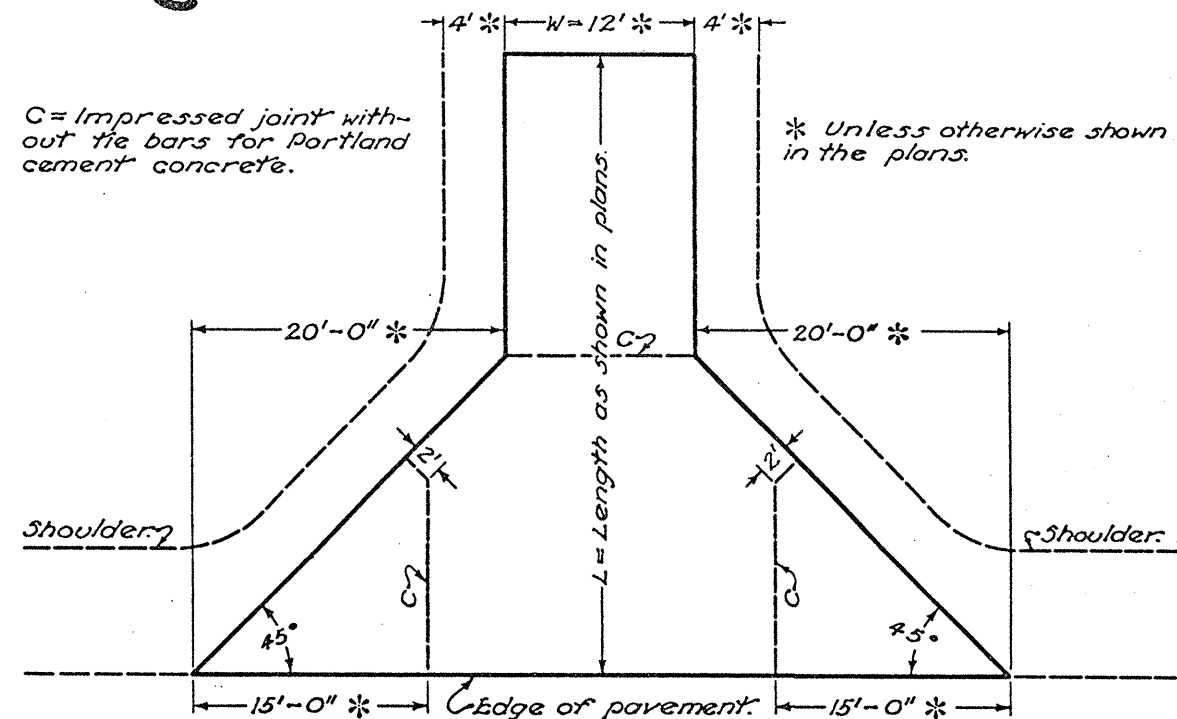


COMBINED DRIVEWAY & MAIL BOX APPROACH



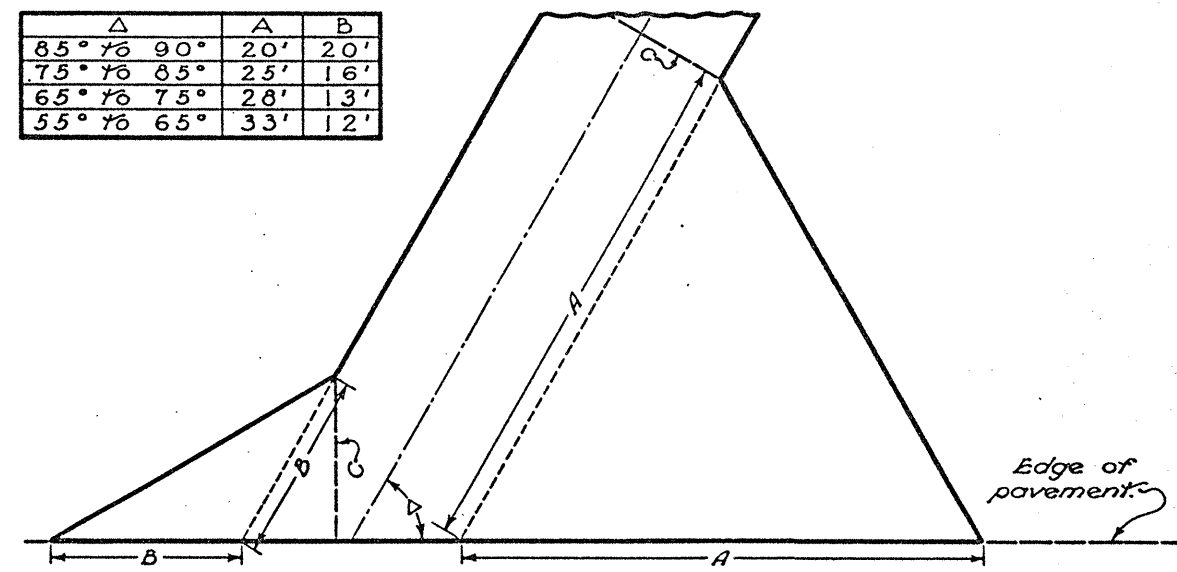
TYPICAL MAIL BOX APPROACH

$C =$ Impressed joint without tie bars for Portland cement concrete.



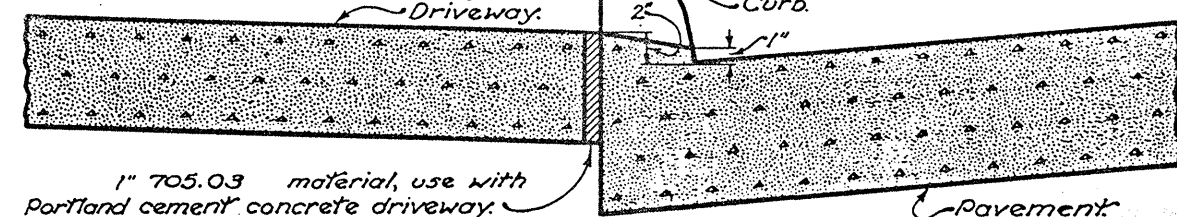
TYPE 2 DRIVEWAY

Δ	A	B
85° to 90°	20'	20'
75° to 85°	25'	16'
65° to 75°	28'	13'
55° to 65°	33'	12'



TYPE 2 SKEWED DRIVEWAY

Transition from standard curb section to drop curb section to be made in 10' distance from driveway.



DROP CURB DETAILS AT DRIVEWAYS

NOTES

GENERAL:— The design details shown hereon shall govern the construction of driveways unless otherwise shown in the project plans.

The pavement type and thickness shall be specified in the project plans.

Driveway and mail box approaches shall be combined when feasible.

JOINTS:— Impressed joints for portland cement concrete driveways shall be 1/4" minimum width by 3"± depth and shall be sealed with joint seal.

In addition to the joints shown hereon, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed seventeen feet in the portion of the driveway back of the flare.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

DRIVEWAYS

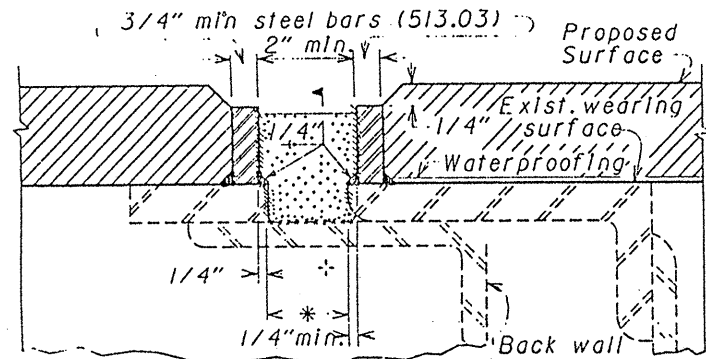
STANDARD
CONSTRUCTION
DRAWING
APPROVED *[Signature]* ENGR. L. & D.

DATE
6-1-65
10-1-87

BP-6

RESURFACING

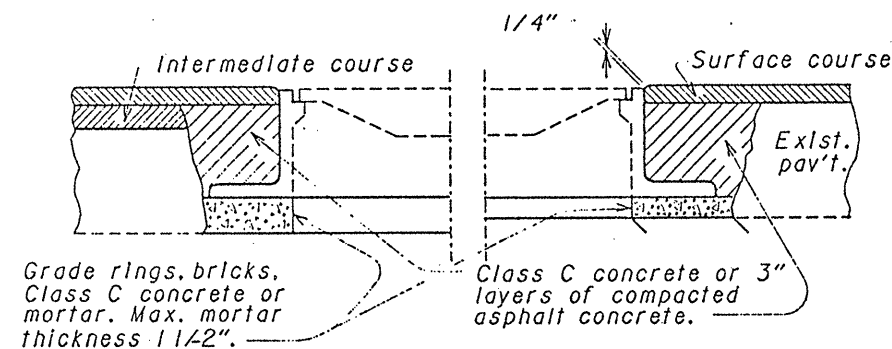
- * Increase as necessary to maintain 2" min. opening
- * Vertical extension of joints found to be closed to 1/2" or less may be non-performed as directed by the Engineer.



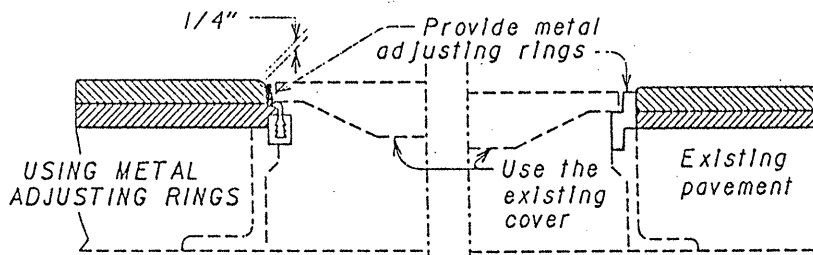
As a part of item 516, seal joint with a hot-applied bridge deck waterproofing material which also meets the requirements of 705.04. Sandblast vertical surfaces (**) and wipe clean. Seal joint before rust forms. If rust forms, re-sandblast. Use bond breaker on the horizontal surface (**).

MAINTENANCE OF TRAFFIC: Generally the bars shall be welded while the lane is closed for waterproofing or resurfacing. However, if traffic is routed over the bars before resurfacing, temporary ramps shall be constructed to the tops of the bars using 402 feathering at a max. slope of 6 ft/in. The ramps shall be removed prior to resurfacing. Payment for placing and removing the ramps shall be included in the lump sum bid for item 614.

VERTICAL EXTENSION OF STRUCTURAL EXPANSION JOINTS

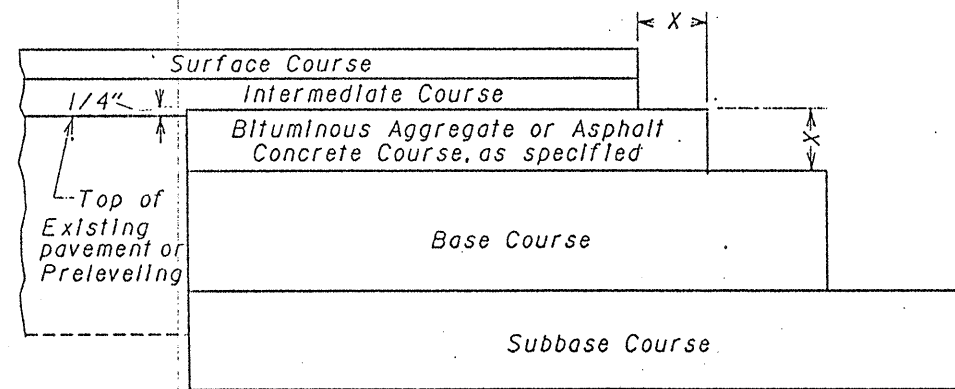


USING CONCRETE OR MORTAR



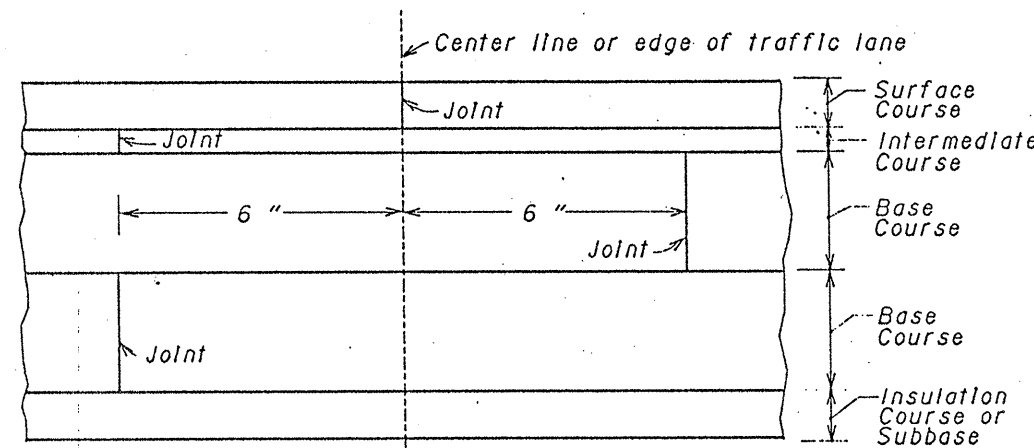
Metal adjusting rings shall: (a) attach securely to the existing frame by welding or mechanical devices; (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and (c) provide an even seat for the manhole cover. In addition,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

MANHOLES ADJUSTED TO GRADE

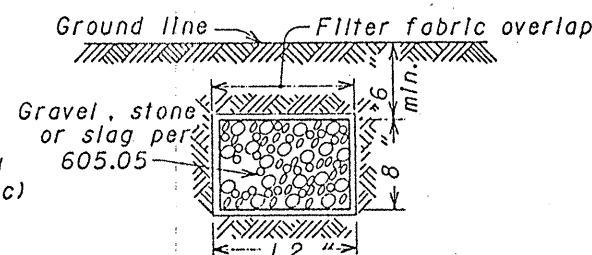


The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" above the edge of the existing pavement where no prelevelling is used. Where a prelevelling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" above the prelevelling.

COURSE DETAIL FOR WIDENING

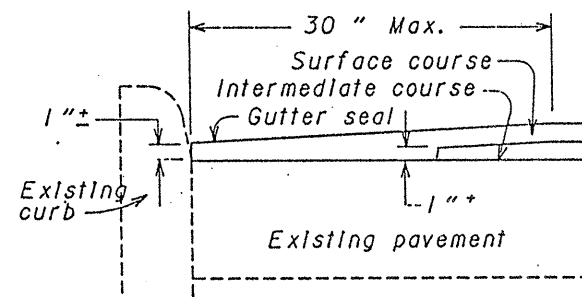


LAPPING LONGITUDINAL JOINTS



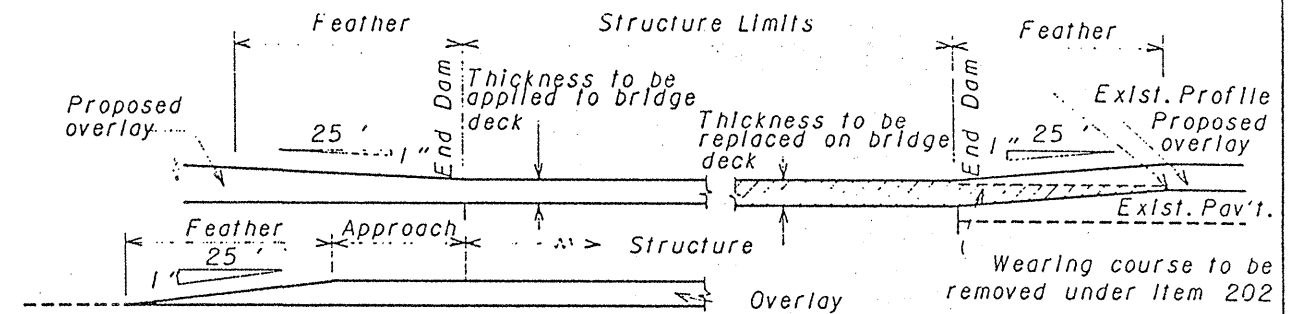
Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item

AGGREGATE DRAIN



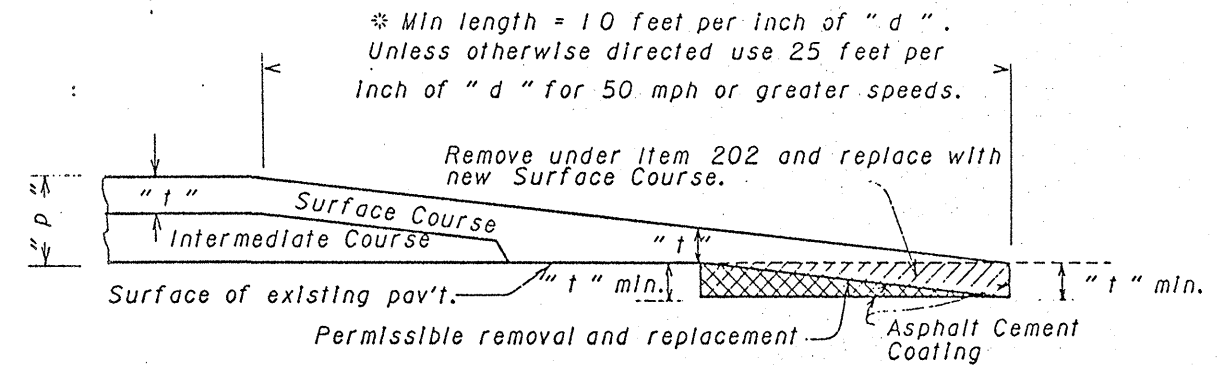
Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

GUTTER FINISH

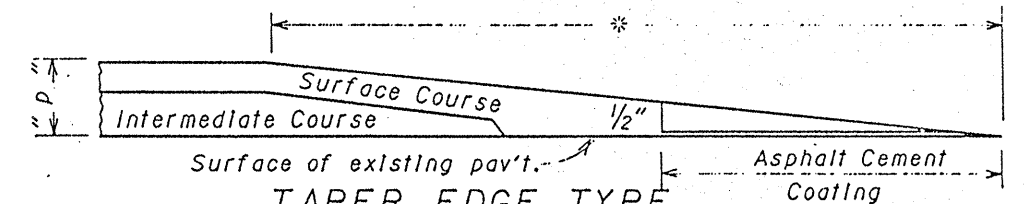


Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES



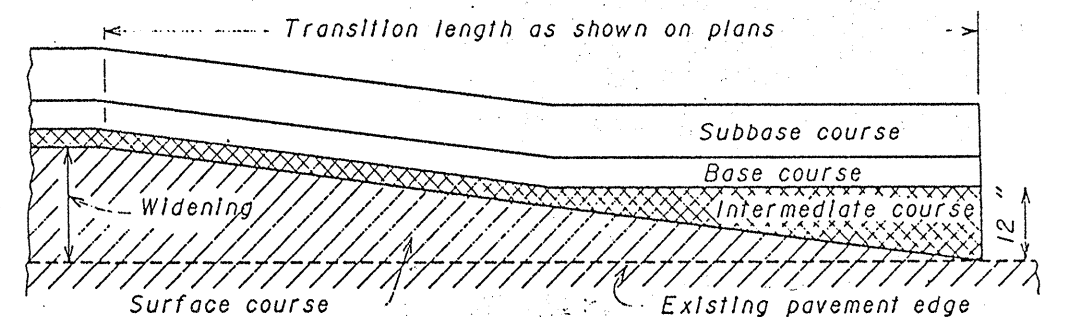
BUTT JOINT TYPE



TAPER EDGE TYPE

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

PLACING FEATHERED AREAS



MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

RESURFACING

STANDARD
CONSTRUCTION
DRAWING

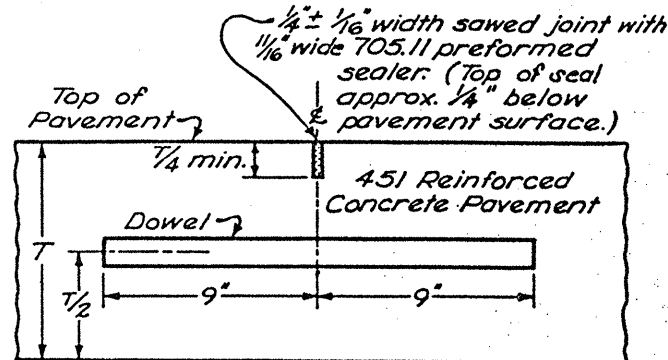
BP-5

APPROVED *N. A. Riedman* ENGR., L&D

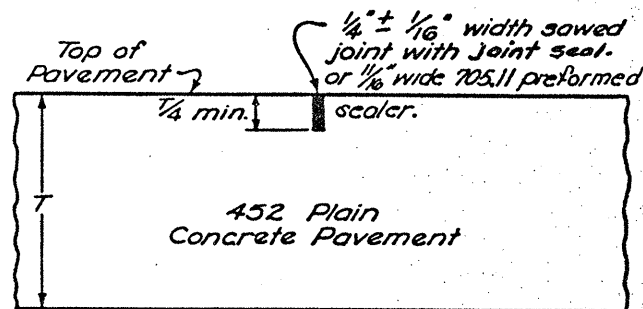
DATE
6-1-65
1-1-71
6-1-72
8-11-75
4-16-79
7-16-81
1-11-85
10-1-87

TRANSVERSE JOINTS

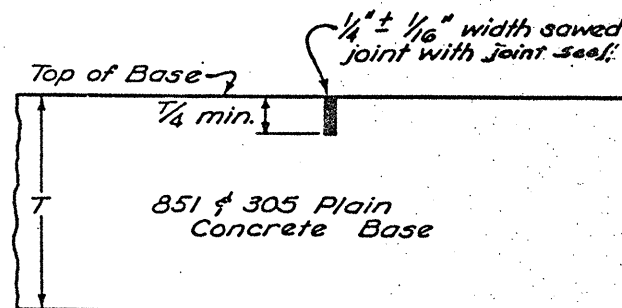
CONTRACTION JOINTS



SECTION - 451 PAVEMENT

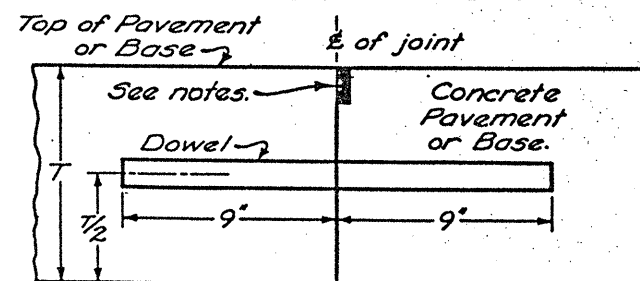


SECTION - 452 PAVEMENT



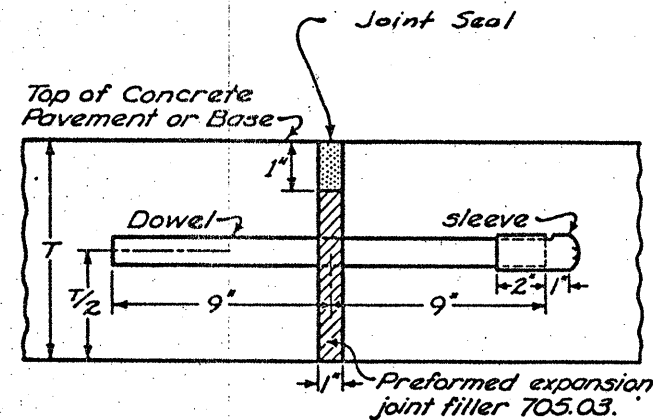
SECTION - 851 & 305 BASE

CONSTRUCTION JOINT

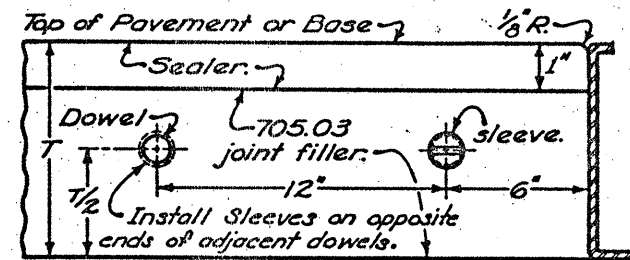


SECTION THROUGH CONSTRUCTION JOINT

EXPANSION JOINT



SECTION THROUGH EXPANSION JOINT



SIDE ELEVATION OF EXPANSION JOINT

GENERAL: Notes and details shown on this drawing shall be considered in conjunction with and supplemental to the pertinent specifications for portland cement concrete pavements and bases, and incidentals related thereto.

All joints shall be constructed normal to the centerline of the pavement lane unless otherwise directed.

Where dowels are specified, they shall be round, straight steel bars of the size indicated in the following table, and shall be shop coated with a suitable rust inhibitor. Dowels shall be spaced at 12" centers, beginning 6" from the longitudinal joint.

DOWEL SIZE	
(T) THICKNESS OF PAVEMENT	DIAMETER OF DOWEL
8.5" or less	1"
8.6" to 10"	1 1/4"
over 10"	1 1/2" or as shown on plan

ASSEMBLY: Each joint assembly used to hold dowels in position shall be continuous between longitudinal joints or between longitudinal joint and pavement edge. The assembly shall be firmly held in proper position by at least eight 1/2" steel pins driven at an angle to brace the assembly from lateral and vertical displacement during the placing of the concrete. These pins shall be at least 18" in length. Two of these pins shall be driven opposite each other at each end

of the assembly and the remaining pins shall be driven in staggered positions on each side of the assembly. In exceptional cases where it is impractical to use the 18" length pins, such as where hardpan or rock is encountered, the Engineer may authorize use of shorter pins provided the assembly is held firmly. Where the assembly is placed on granular material which may allow settlement or distortion of the assembly, a minimum of 6 steel plates, each having a bearing area of approximately 25 square inches and a cross-section which will not bend under the imposed load, shall be placed under the assembly. One plate shall be used at each of the four end pins. The remaining plates shall be spaced uniformly on each side of the assembly. The method of staking and placing bearing plates shall be approved by the Engineer.

Dowel spacing is shown for pavement lanes of even foot widths. Where other widths are specified, standard cages may be used with dowel spacings adjusted as follows:

The 6" dowel spacing shall be maintained at the longitudinal joint. The spacing at the outer edge of the lane may be increased up to 12". Where an odd width of lane occurs, a dowel shall be placed 6" from the outer edge of the lane if the standard cage would provide for a space exceeding 12". Such a dowel shall be held rigidly in proper position by a method satisfactory to the Engineer, or a dowel cage of greater length than required may be used by cutting the assembly and splicing to attain the required length.

This drawing is intended for use with a uniform depth pavement. When the project involves the placing of variable depth pavement, the joint components shall be held in place in accordance with the method shown in the plan or as approved by the Engineer.

EXPANSION JOINTS: Expansion joint filler shall be held rigidly in position and shall be continuous for the full width of each lane. The face of the expansion joint shall be perpendicular to the concrete surface and shall not be skewed horizontally except when abutting a skewed bridge approach slab.

Smooth dowels shall be used, and free movement shall be provided by applying a coating of an oil such as S.A.E. 140 or other "bond-breaking" material just prior to placing the concrete. One free end of each dowel shall be equipped, after coating, with a sleeve of metal or other approved material approximately 3" long, designed with crimped end and overlapping seams, fitting closely around the dowel. Each sleeve shall be provided with a depression or interior projection to act as a stop for the dowel, sufficiently distant from the crimped end to allow 1" for longitudinal dowel movement with pavement expansion. In lieu of this requirement, any other means may be used if approved by the Director.

Proper size dowel holes shall be punched or drilled into the preformed expansion joint filler in order to insure tight fitting dowels.

CONTRACTION JOINTS: All contraction joints in 451 reinforced concrete pavement shall be dowelled. Contraction joints in plain concrete base or pavement shall be dowelled if within 500' of a pressure relief joint. Contraction joints without dowels shall be skewed with the right edge of the joint 4 feet ahead of the left edge in the direction of travel for a 24-foot wide pavement.

To provide for longitudinal movement at the joint, dowels shall be smooth and coated with a bond breaking material

such as SAE 140 oil just prior to placing the concrete.* Contraction joints of the type specified shall be spaced in accordance with the following table:

CONTRACTION JOINT SPACING		
TYPES OF PAVEMENT OR BASE	MAXIMUM SPACING BETWEEN JOINTS	
451 Reinforced Concrete Pavement	40 lin. ft.	
452 Plain Concrete Pavement	17 lin. ft.	Skewed when not dowelled
851 & 305 Plain Concrete Base	20 lin. ft.	

CONSTRUCTION JOINTS: Smooth dowels shall be used in transverse construction joints in all portland cement concrete pavement and base. The joint shall be formed by using an adequate bulkhead that will provide a straight joint. The bulkhead shall have openings provided for dowel bars spaced as outlined under "ASSEMBLY". The bulkhead shall be shaped to fit the typical section of the pavement or base. Dowels shall be held rigidly in position during the placing of the concrete.

Construction joints in reinforced concrete pavement may be located at a contraction joint or between contraction joints, provided they are not closer than 10 feet to another parallel joint. In plain concrete pavement or concrete base a construction joint shall not be located closer than 5 feet to another parallel joint.

Kerf and seal conforming in all respects to details shown for contraction joints shall be provided at each construction joint in concrete pavement and base.

SEALING BASE CONTRACTION JOINTS:

All contraction joints for plain concrete bases shall be sealed as detailed hereon and the cost included in the unit price bid for Item 305 or 851.

The requirement for sealing base contraction joints may be waived by the Engineer provided the joints will not be contaminated by traffic or construction equipment and will be cleaned and free of all foreign material just prior to overlaying with the surface courses.

* Dowel coatings conforming to the requirements of specification 703.13 Type A do not require a bond breaker.

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
TRANSVERSE PAVEMENT JOINTS	
DATE 6-1-65 1-10-67 12-1-68 1-1-71 12-6-76 7-16-81 1-11-85 10-1-87	STANDARD CONSTRUCTION DRAWING BP-4
APPROVED: <i>[Signature]</i> ENGR., L. & D.	

LONGITUDINAL JOINTS

NOTES

GENERAL: Longitudinal joints shall be used when called for on the typical section and shall be constructed as shown on this drawing in 451 and 452 pavement and 305 base.

The joint shall be on the centerline of the pavement unless otherwise shown on the plans.

Tie bars shall be $\frac{5}{8}$ inch round, deformed bars. A satisfactory device shall be used to hold the tie bars in proper position or they may be installed by a mechanical installing device.

BUTT JOINT: The longitudinal joint between adjoining slabs poured in separate operations shall be a butt joint with hook bolts or tie bars, unless otherwise shown on plans. If tie bars are to be bent they shall be of billet grade steel and no part of the bend shall extend into the first slab poured.

Aluminum couplings for hook bolts may be substituted for steel, provided that the specified strength requirements for metal assemblies are met.

EXPANSION BOLT JOINT: Self-drilling anchors may be of the flush-end type or of the snap-off chuck-end type conforming to Federal Specification No. FF-S-325, Group III, Type 1(a) or (c) except for the outside diameter of the anchor. The hook bolt or alternate may be used to complete the assembly. Unless otherwise required by the plans expansion anchors and bolts shall be spaced at 30 inches where pavement widening is 6 feet or less in width and at 60 inches where widening exceeds 6 feet in width. Cost of expansion bolt joint shall be included in the unit price bid for new pavement and no separate payment will be made.

GROOVES: Grooves for sealing expansion bolt or butt joints in 451 or 452 pavements shall be formed by impressing a device or bar into the newly deposited concrete adjacent to the existing or previously poured lane. The device or bar shall be removed as soon as the concrete is in such condition as to preclude distortion of the concrete.

Adjoining slabs adjacent to grooved joints shall be edged with a thin metal edger having a radius of $\frac{1}{8}$ inch. Any impression left in the surface of the pavement by the flat part of the edging tool shall be eliminated.

In lieu of the above method the longitudinal joint may be sawed to a depth of one inch and an approximate width of $\frac{1}{8}$ inch.

After the joint is formed it shall be protected from dirt and foreign matter until the joint seal is placed.

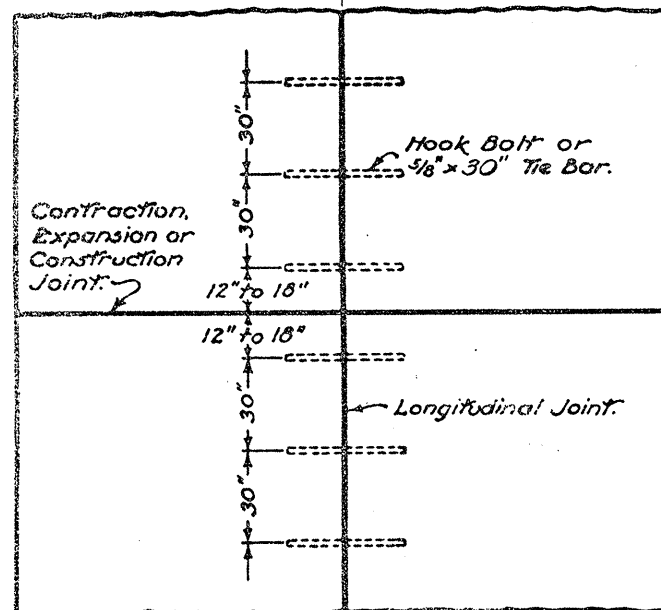
SEALING JOINTS: Sawed joints may be sealed with 705.01, 705.02 or 705.11 joint sealer.

Sealing of longitudinal joints in 305 base is not required.

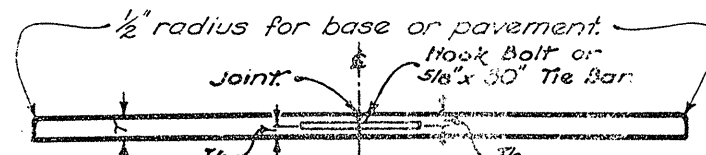
HOOKE BOLTS: Hook bolt inserts shall be turned to a tight fit when installed in threaded anchor shields, hook bolts or coupling.

METAL STRENGTH: Tie bars, hook bolt assemblies and hook bolt alternate shall have a minimum strength of 11,000 pounds.

TIE BAR OR HOOK BOLT SPACING

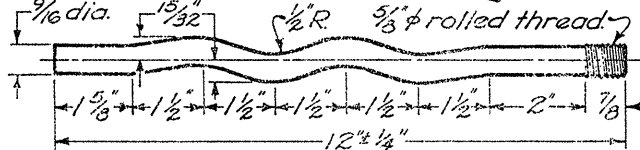


PLAN

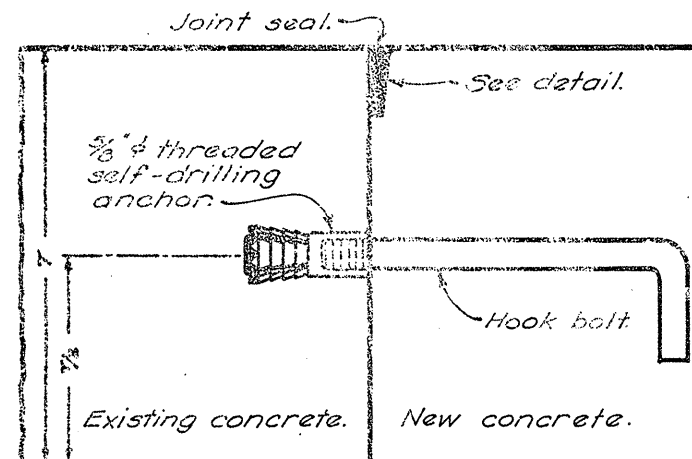


CROSS SECTION

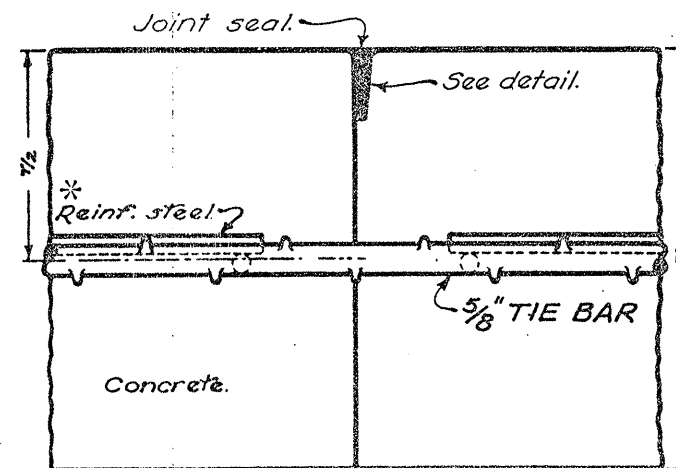
HOOKE BOLT ALTERNATE



EXPANSION BOLT JOINT

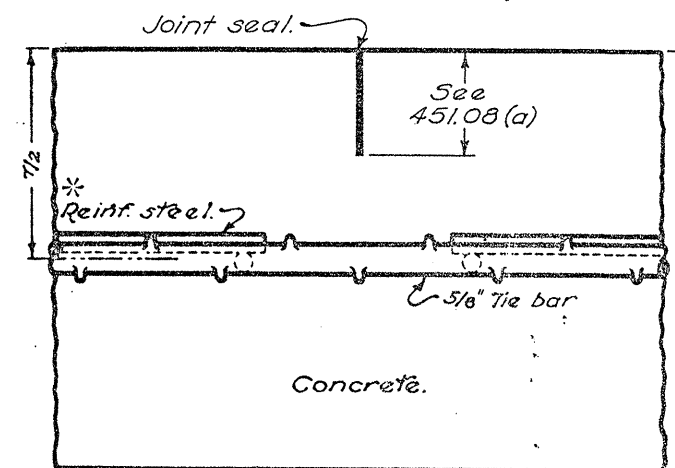


BUTT JOINT



DETAIL OF JOINT

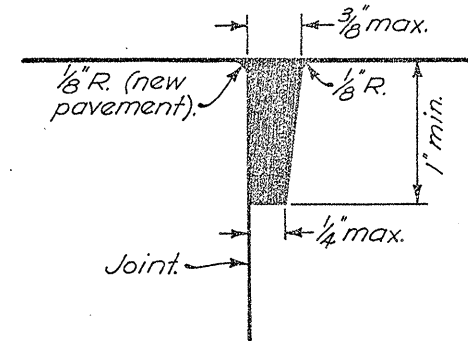
SAWED JOINT



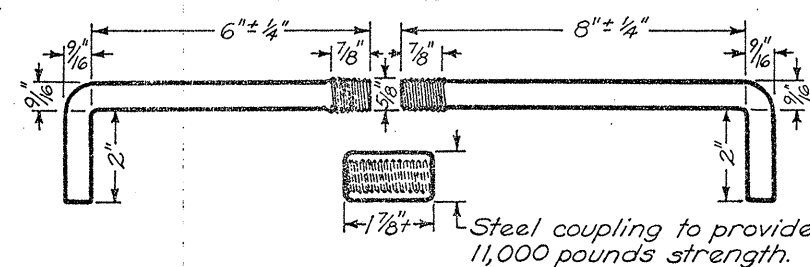
DETAIL OF JOINT

* For 451 only.

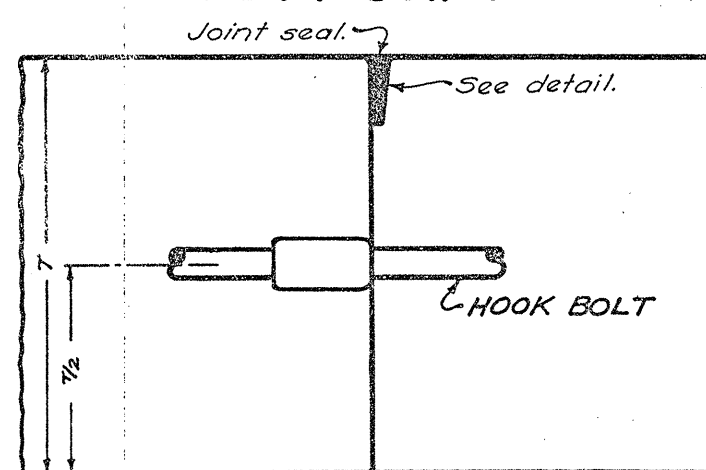
GROOVE AND SEAL DETAIL



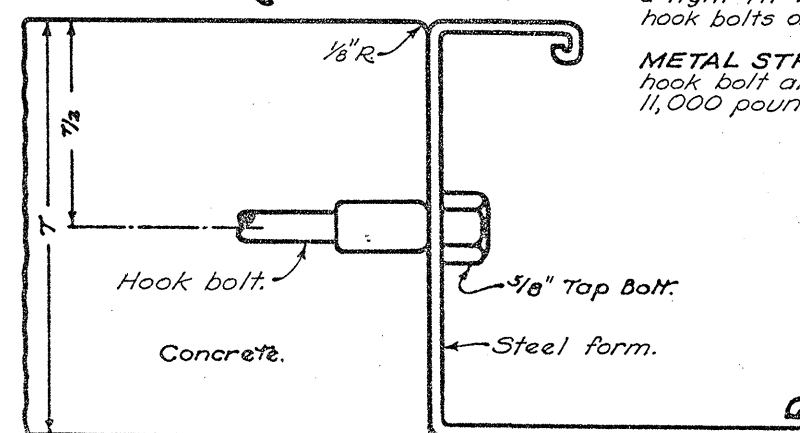
HOOKE BOLT



BUTT JOINT



ACCEPTABLE METHOD OF FORMING JOINT



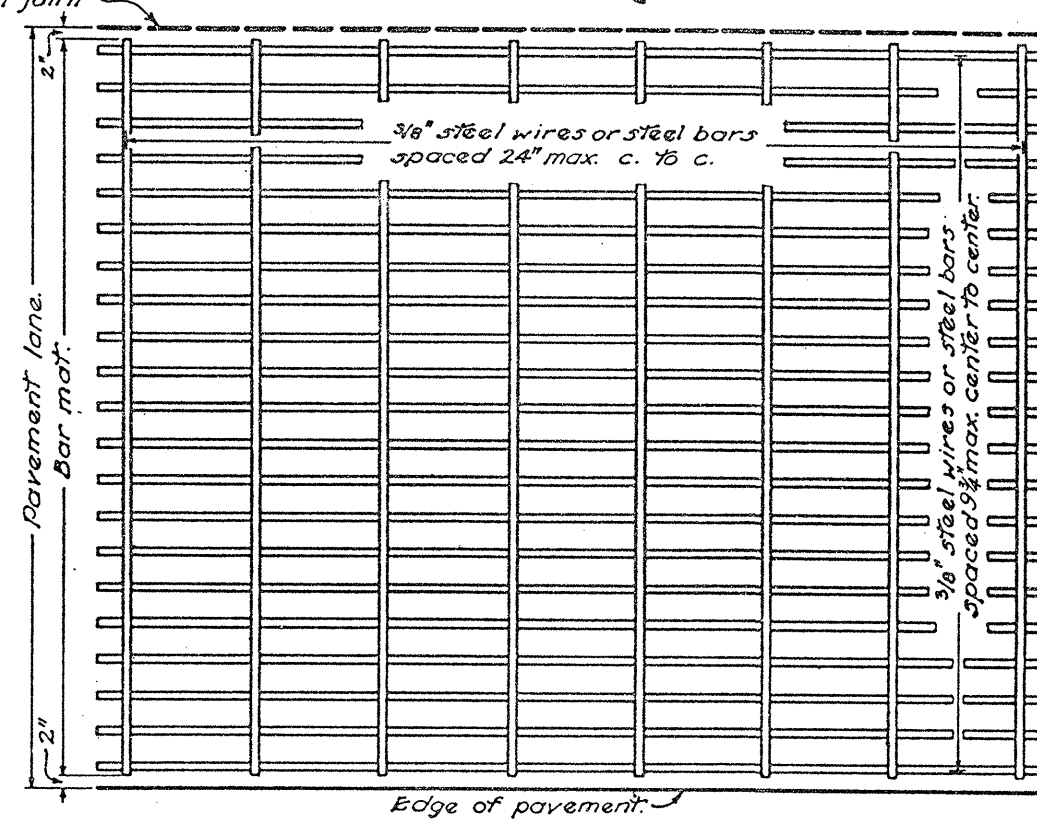
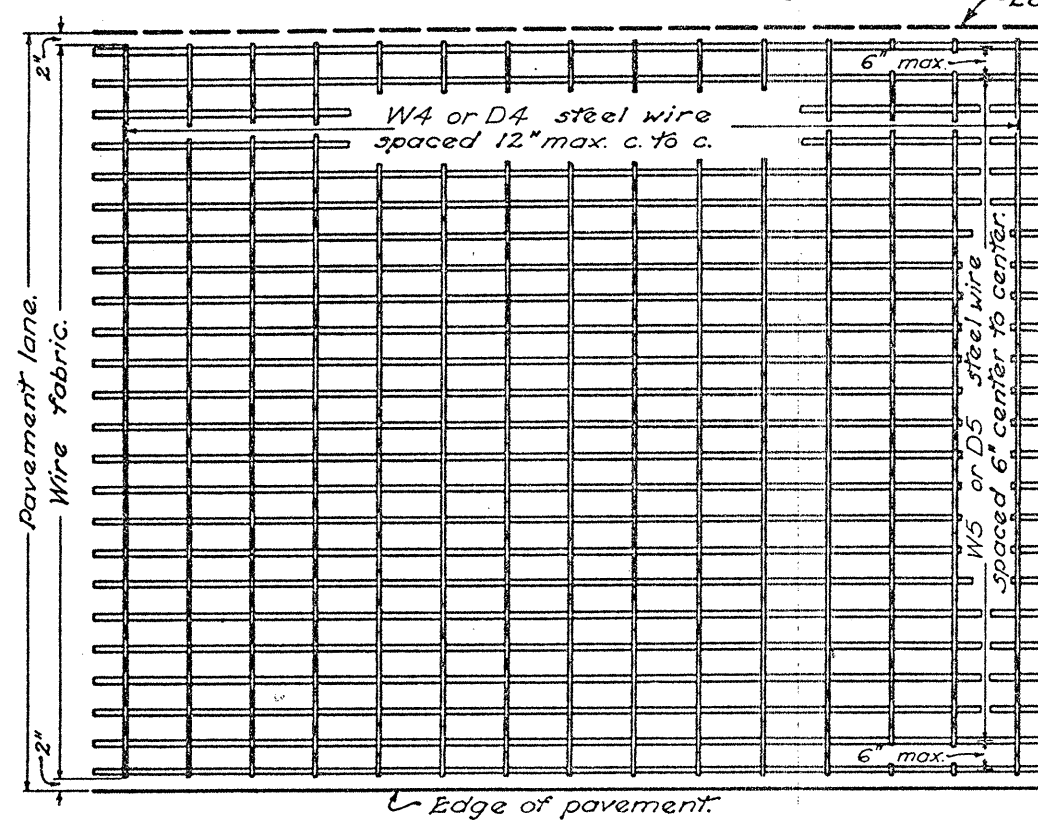
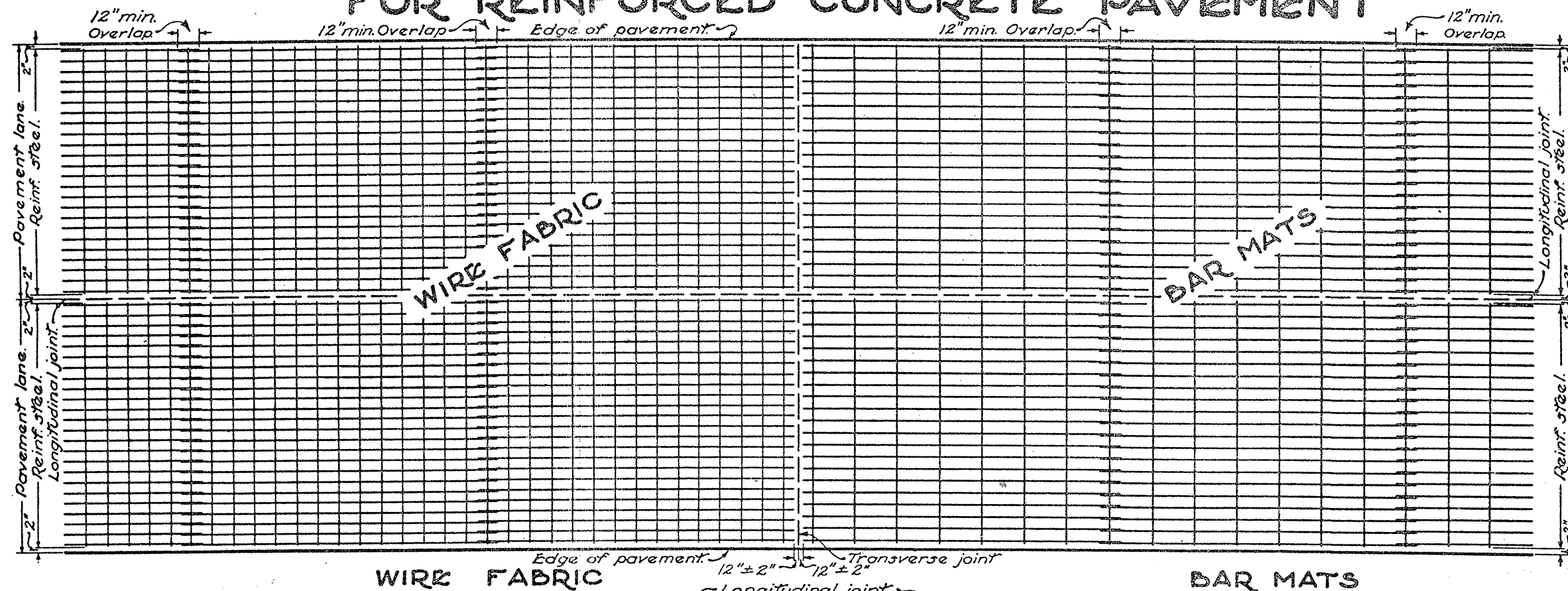
BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
LONGITUDINAL PAVEMENT JOINTS	
DATE 6-1-65 12-20-66 1-10-67 5-1-68 12-1-68 1-1-71 12-6-76	STANDARD CONSTRUCTION DRAWING APPROVED <i>M. J. Cunningham</i> ENGR., L. & D.
BP-3	

STEEL REINFORCING FOR REINFORCED CONCRETE PAVEMENT

NOTES

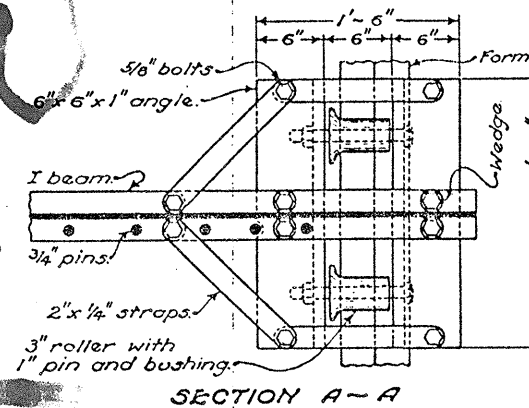
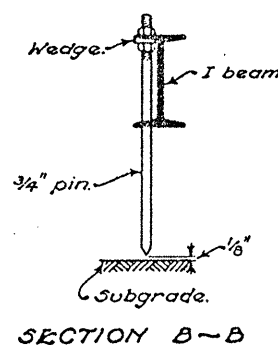
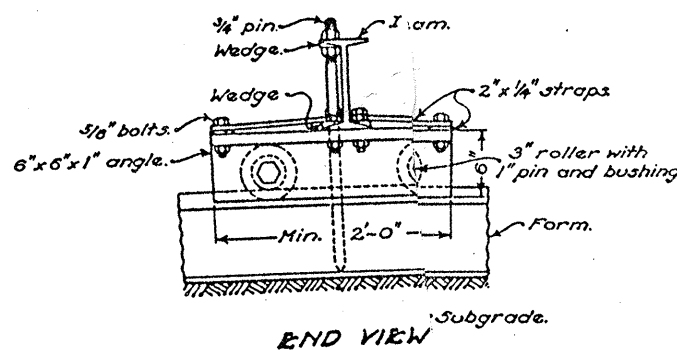
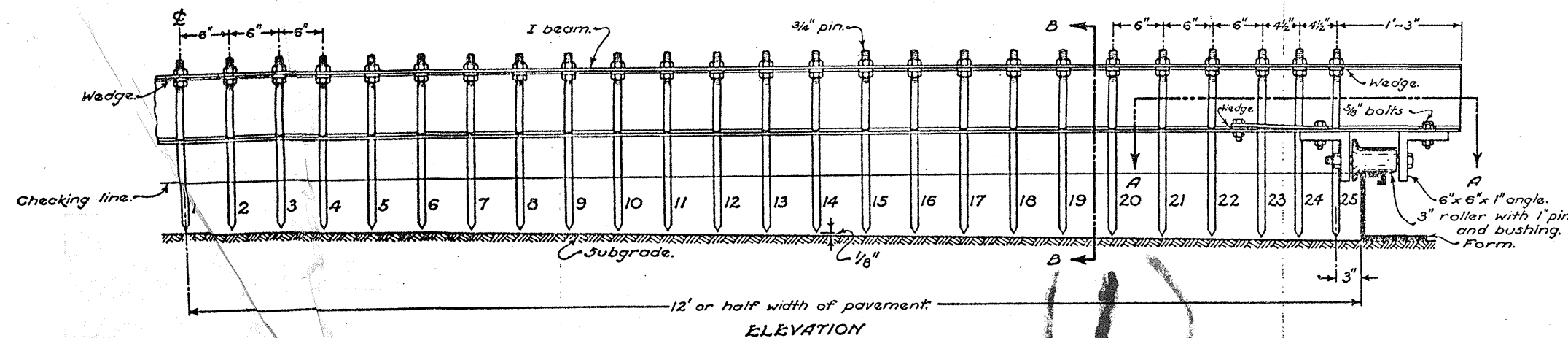
Steel reinforcing in normal or wider lane widths may consist of two units with an approved longitudinal hinge. The hinge shall consist of W4 or D4 steel wires connecting the two units such that the longitudinal members on either side of the hinge will be properly spaced when the reinforcing is in final position.

The distance from the top of the concrete pavement to the reinforcing steel may vary from $2\frac{1}{2}$ inches to $\frac{T}{3} + 1$ inch, where T = thickness of the concrete pavement.



BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
PAVEMENT REINFORCING	
DATE 6-1-65 1-10-67 1-17-68 12-1-68 12-6-76 1-11-85	BP-2
STANDARD CONSTRUCTION DRAWING	APPROVED <i>E. J. Lynch</i> ENGR., L. & D.

METAL SUBGRADE TEMPLAT



NOTES

The method of checking the setting of the pins shall be accomplished by means of a line with the templet in its service position supported on its rollers.

Weight of the templet to be not less than 50 lbs. per foot.

TYPE "A" PAVEMENT SLOPES: Pins Nos. 1 and 2 shall be spaced similar to pins Nos. 24 and 25. Depth of pins below I beam shall be constant and shall be determined by the depth of the pavement.

Type "A" Pavement slopes to be used for continuous 3/4 inch per ft. slope.

TYPE "B" CROWN to be used when two lanes adjacent to the high point of crown are finished in one operation.

ORDINATES BELOW TOP OF FORMS FOR 24' PAVEMENT, TYPE "B" CROWN

PAVE. DEPTH	PIN NUMBER																								
	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
7"	4 13/16"	4 27/32"	4 29/32"	4 31/32"	5 1/32"	5 3/16"	5 9/32"	5 3/8"	5 15/32"	5 9/16"	5 21/32"	5 3/4"	5 27/32"	5 15/16"	6 1/32"	6 1/8"	6 7/32"	6 5/16"	6 13/32"	6 1/2"	6 19/32"	6 11/16"	6 3/4"	6 13/16"	
8"	5 13/16"	5 27/32"	5 29/32"	5 31/32"	6 1/32"	6 3/16"	6 9/32"	6 3/8"	6 15/32"	6 9/16"	6 21/32"	6 3/4"	6 27/32"	6 15/16"	7 1/32"	7 1/8"	7 7/32"	7 5/16"	7 13/32"	7 1/2"	7 19/32"	7 11/16"	7 3/4"	7 13/16"	
9"	6 13/16"	6 27/32"	6 29/32"	6 31/32"	7 1/32"	7 3/16"	7 9/32"	7 3/8"	7 15/32"	7 9/16"	7 21/32"	7 3/4"	7 27/32"	7 15/16"	8 1/32"	8 1/8"	8 7/32"	8 5/16"	8 13/32"	8 1/2"	8 19/32"	8 11/16"	8 3/4"	8 13/16"	
TABLES OF OFFSETS BE TOP OF FORMS FOR POINTS OF SUBGRADE TEMPLAT ARE 1/8" ABOVE SPECIFIED DEPTH OF DAVEMENT																									

TABLES OF OFFSETS BELOW TOP OF FORMS FOR POINTS OF SUBGRADE TEMPLAT ARE 1/8" ABOVE SPECIFIED DEPTH OF PAVEMENT

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

SUBGRADE
TEMPLATES

DATE
6-1-65

STANDARD
CONSTRUCTION
DRAWING

BP-1

APPROVED: *R. B. Smith* ENGR. L. & D.