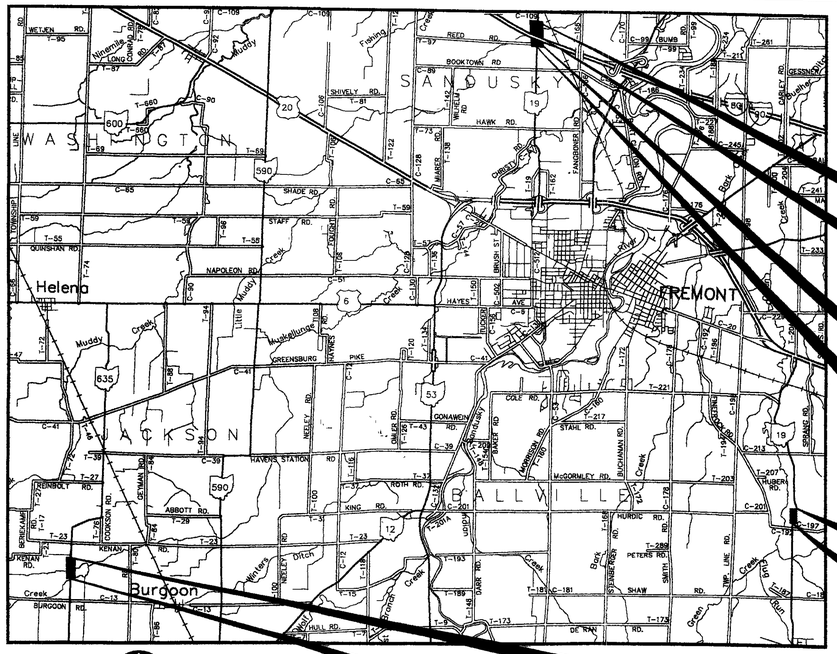
STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SAN-19-2.43/13.68/13.75
GREEN CREEK TOWNSHIP & SANDUSKY TOWNSHIP
SAN-635-1.60
JACKSON TOWNSHIP
SANDUSKY COUNTY



LOCATION MAP
SCALE: 1"=1 MILE

PORTION TO BE IMPROVED _____
INTERSTATE & DIVIDED HIGHWAYS ____
UNDIVIDED STATE & FEDERAL ROUTES__
OTHER ROADS _____

END PROJECT
STA. 726+75
19-13.75

RESUME PROJECT
STA. 726+00
41° 24' 30" NORTH LATITUDE
83° 08' 08" WEST LONGITUDE
USGS QUADRANT NO. N4115-W8315/7.5
HELENA, OHIO

SUSPEND PROJECT
STA. 723+15
19-13.68

RESUME PROJECT
STA. 722+50
41° 24' 27" NORTH LATITUDE
83° 08' 08" WEST LONGITUDE
USGS QUADRANT NO. N4115-W8315/7.5
HELENA, OHIO

SUSPEND PROJECT
STA. 12+40
19-2.43

BEGIN PROJECT
STA. 10+60
41° 17' 30" NORTH LATITUDE
83° 03' 07" WEST LONGITUDE
USGS QUADRANT NO. N4115-W8300/7.5
FREMONT EAST, OHIO

END PROJECT
STA. 85+00
635-1.60

BEGIN PROJECT
STA. 84+00
41° 16' 33" NORTH LATITUDE
83° 16' 59" WEST LONGITUDE
USGS QUADRANT NO. N4122.5-W8307.5/7.5
LINDSEY, OHIO

PROJECT DESCRIPTION

REPLACEMENT OF CULVERTS
SAN-19-2.43/13.68/13.75 OVER UNNAMED DITCHES AND CULVERT SAN-635-1.60 OVER TRIBUTARY TO MUSKELLUNGE CREEK WITH IMPROVEMENTS TO APPROACH ROADWAYS.

EARTH DISTURBED AREAS

	19-2.43	19-13.68	19-13.75	635-.60	TOTAL
1. PROJECT EARTH DISTURBED AREAS	1.04 A.	0.44 A.	0.55 A.	1.12 A.	3.15 A.
2. ESTIMATED CONTRACTOR EARTH DISTURBED AREA	---	---	---	---	0.27 A.
3. NOTICE OF INTENT EARTH DISTURBED AREA	---	---	---	---	4.90 A.

INDEX OF SHEETS

2005 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 SHEET 11.

DESIGN DESIGNATION

	SAN-19-2.43	SAN-19-13.68/13.75	SAN-635-1.60
CURRENT ADT (2005)	= 2300	= 6500	= 650
DESIGN ADT (2025)	= 2800	= 8700	= 950
DESIGN HOURLY VOLUME (2025)	= 310	= 870	= 110
DIRECTIONAL DISTRIBUTION	= 55%	= 55%	= 55%
TRUCKS (24 HOUR B&C)	= 2%	= 6%	= 8%
DESIGN SPEED	= 55 MPH	= 55 MPH	= 55 MPH
LEGAL SPEED	= 55 MPH	= 55 MPH	= 55 MPH
DESIGN FUNCTIONAL CLASSIFICATION	= RURAL MAJOR COLLECTOR	= RURAL MAJOR COLLECTOR	= RURAL MINOR COLLECTOR

DESIGN EXCEPTIONS

SAN-19-2.43

DESIGN EXCEPTION	APPROVAL DATES	SHEET NUMBERS
HORIZONTAL ALIGNMENT	12-31-02	19-20
SSD	12-31-02	19-20
SUPERELEVATION	12-31-02	5-6, 24

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

PLANS PREPARED BY:
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135
FAX 419-227-4674

ENGINEER'S SEAL
STATE OF OHIO
MARK A. DROLL
E-59311
REGISTERED
PROFESSIONAL ENGINEER
SIGNED: Mark A. Droll
DATED: 9-17-03

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-3.1 7/16/04	GR-1.1 7/16/04	RM-1.1 4/18-03	DM-1.1 1/21/05	MT-101.60 10/18/02	
	GR-2.1 1/16/04		DM-1.4 1/21/05		
BP-4.1 7/16/04		CB-1.1 7/15/05		MT-105.10 10/18/02	
	GR-2.4 4/18/03		DM-4.3 7/19/02		
F-2.1 7/28/00		HW-1.1 1/21/05		MT-105.11 10/18/02	
	GR-3.1 4/18/03		DM-4.4 7/19/02		
F-3.3 7/28/00		HW-2.2 7/15/05			
	GR-4.2 4/15/05				
F-3.4 7/28/00					
	GR-5.2 1/16/03				
	GR-5.3 1/16/03				

SUPPLEMENTAL SPECIFICATIONS		SPECIAL PROVISIONS
800	10/21/05	U.S. ARMY CORPS
802	4/17/04	OF ENGINEERS
832	2/12/03	NWP #3
833	2/12/03	DATED 10-10-03
836	4/15/05	

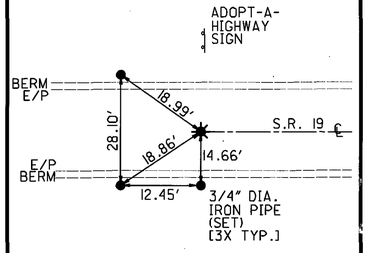
APPROVED Todd M. Audet
DISTRICT DEPUTY DIRECTOR
DATE 9-16-05

APPROVED Gordon Proctor
DIRECTOR, DEPARTMENT OF TRANSPORTATION
DATE 10-14-05

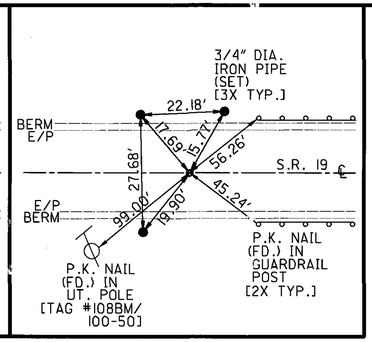
FEDERAL PROJECT NO. NON-FEDERAL
PID NO. 23594
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
SAN-19-2.43/13.68/13.75
SAN-635-1.60
1/57

SAN - SR 19/635-2.43/13.68/13.75/1.60
050618 PID - 23594
Dist 2 12/14/2005

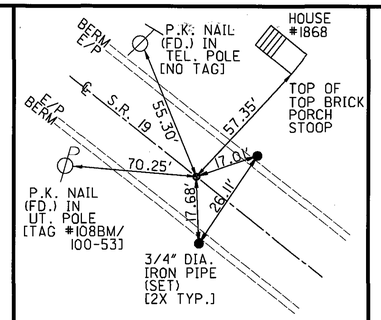
NOT TO SCALE
(TYP. 4X)



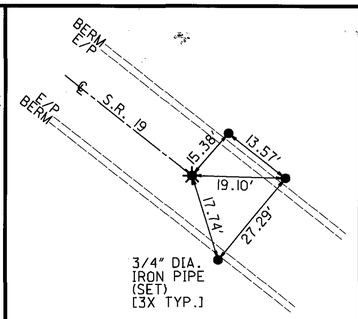
REFERENCES
STA. 8+00.00
COTTON GIN SPINDLE (SET)



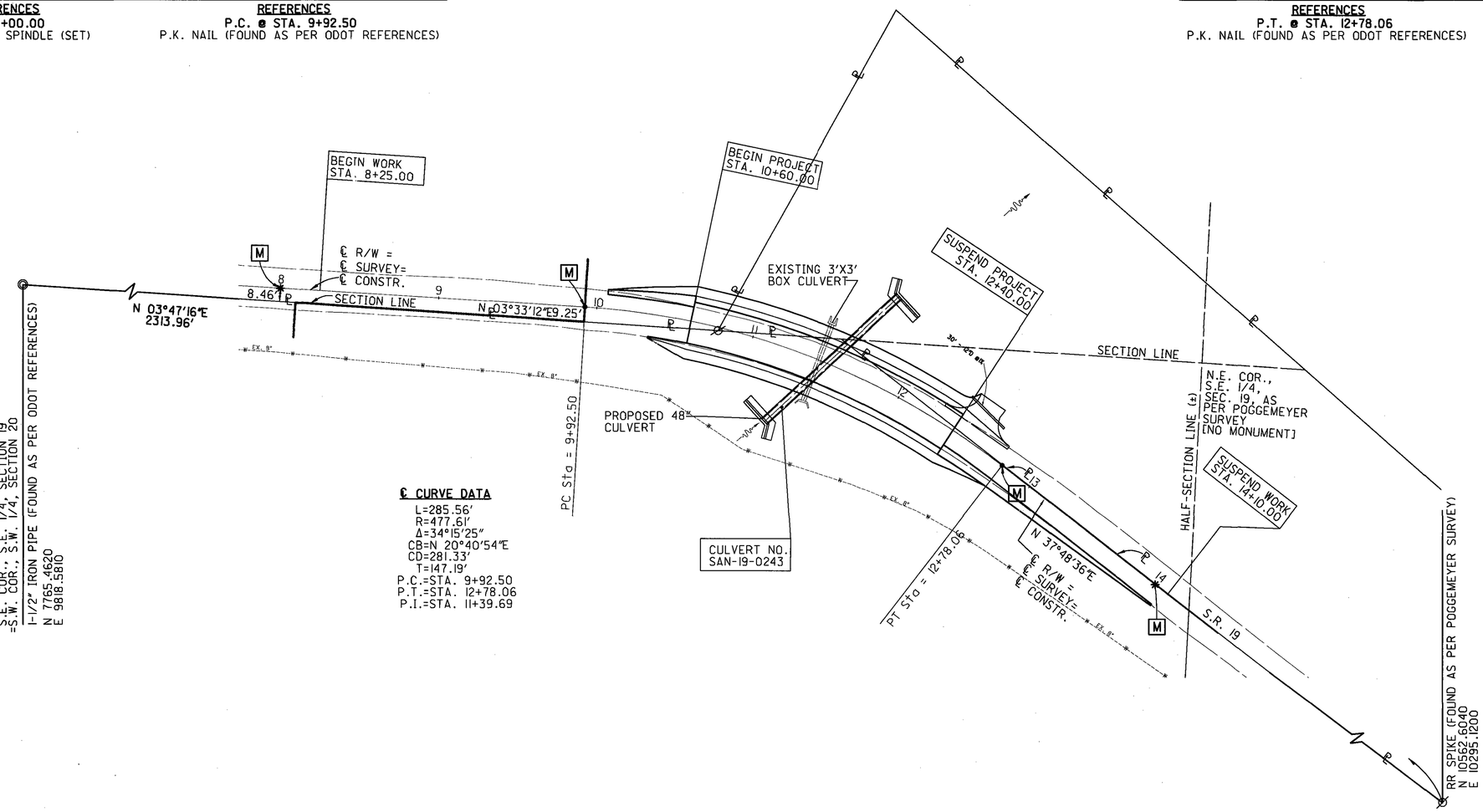
REFERENCES
P.C. @ STA. 9+92.50
P.K. NAIL (FOUND AS PER ODOT REFERENCES)



REFERENCES
P.T. @ STA. 12+78.06
P.K. NAIL (FOUND AS PER ODOT REFERENCES)



REFERENCES
STA. 14+00.00
COTTON GIN SPINDLE (SET)



℄ CURVE DATA
L=285.56'
R=477.61'
Δ=34°15'25"
CB=N 20°40'54"E
CD=281.33'
T=147.19'
P.C.=STA. 9+92.50
P.T.=STA. 12+78.06
P.I.=STA. 11+39.69

S.E. COR., S.E. 1/4, SECTION 19
=S.W. COR., S.W. 1/4, SECTION 20
1-1/2" IRON PIPE (FOUND AS PER ODOT REFERENCES)
N 7765.4620
E 9818.5810

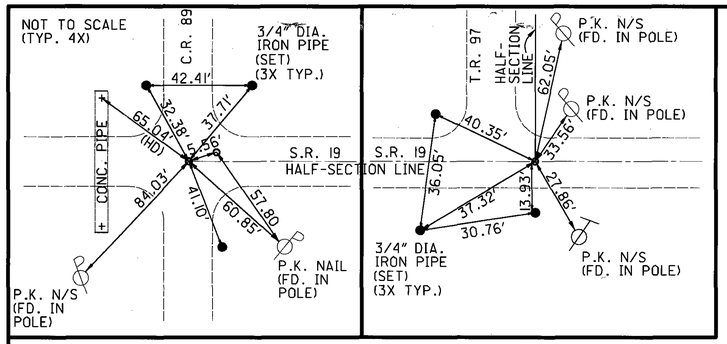
THERE ARE NO EXISTING LANDSCAPED AREAS WITHIN THE WORK LIMITS

0 20 40 80
SCALE IN FEET

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

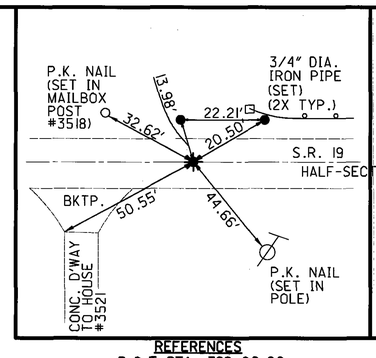
SCHEMATIC PLAN & CENTERLINE REFERENCES SAN-19-2.43

SAN-19-2.43/13.68/13.75
SAN-635-1.60

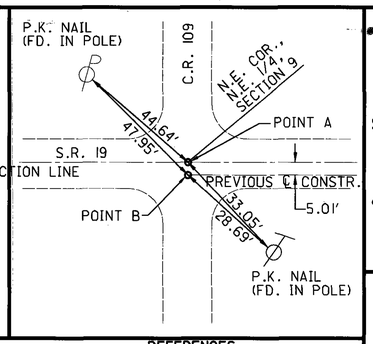


REFERENCES
P.I. STA. 695+17.02
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT S.E. COR., S.W. 1/4, SECTION 9

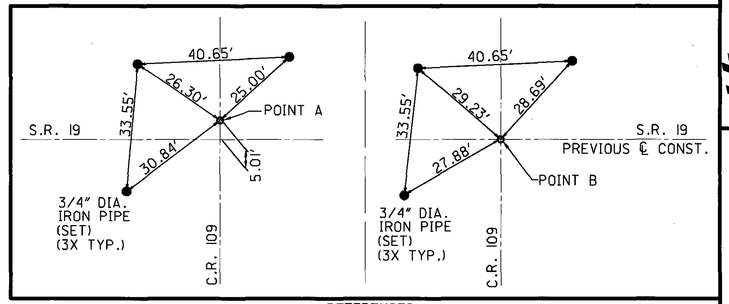
REFERENCES
P.I. STA. 721+75.34
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT N.E. COR., S.W. 1/4, SECTION 9



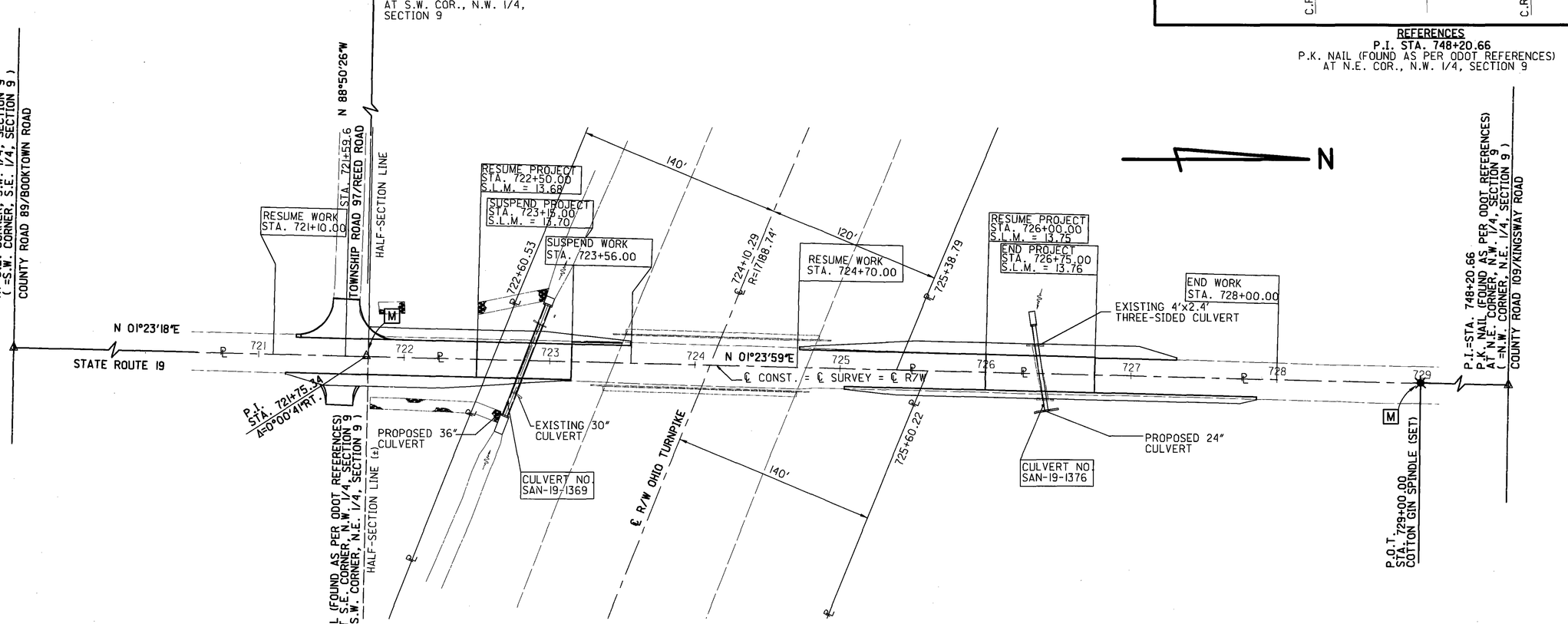
REFERENCES
P.O.T STA. 729+00.00
COTTON GIN SPINDLE (SET)



REFERENCES
P.I. STA. 748+20.66
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT N.E. COR., N.W. 1/4, SECTION 9



REFERENCES
P.I. STA. 748+20.66
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT N.E. COR., N.W. 1/4, SECTION 9



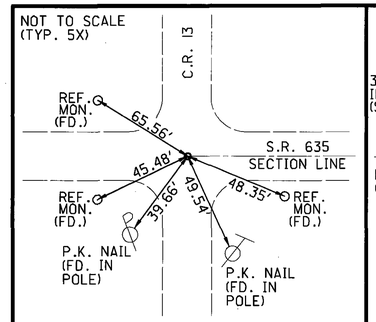
THERE ARE NO EXISTING LANDSCAPED AREAS WITHIN THE WORK LIMITS

0 20 40 80
SCALE IN FEET

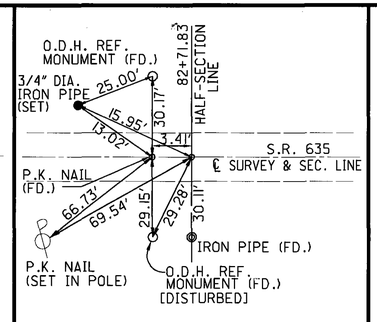
KOHLI & KALINER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

SCHEMATIC PLAN & CENTERLINE REFERENCES
SAN-19-13.68/13.75

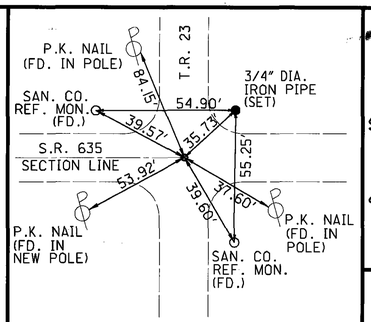
SAN-19-2.43/13.68/13.75
SAN-635-1.60



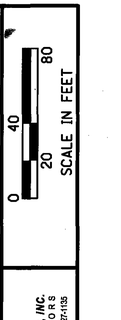
REFERENCES
℄ SURVEY STA. 56+09.85
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT S.W. COR., S.W. 1/4, SEC. 29



REFERENCES
℄ SURVEY STA. 82+71.83
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT S.W. COR., N.W. 1/4, SEC. 29



REFERENCES
℄ SURVEY STA. 109+24.53
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT N.W. COR., N.W. 1/4, SEC. 29



ESTABLISHED S.W. COR., N.E. 1/4, SECTION 30 BASED ON MUSTERIC SURVEY (GEOMETRICALLY ONLY; NO MONUMENT)

N 89°18'33"W

HALF-SECTION LINE

BEGIN WORK STA. 82+40.00

BEGIN PROJECT STA. 84+00.00 S.L.M. = 1.59

END PROJECT STA. 85+00.00 S.L.M. = 1.61

END WORK STA. 88+00.00

N.E. 1/4, SECTION 30

S.E. 1/4, SECTION 30

℄ SURVEY STA. 82+71.83 P.K. NAIL (FOUND) AT S.W. CORNER, N.W. 1/4, SECTION 29 (= ℄ CONSTRUCTION STA. 82+71.83/ 3.54' LEFT)

℄ SURVEY N 00°11'54"W

82 83 84 85 86 87 88

℄ CONSTR.

℄ R/W= ℄ SURVEY= SECTION LINE

℄ CONSTRUCTION N 00°23'04"W

STATE ROUTE 635

N 00°00'00"E

3.78'

EXISTING 5'x6' CULVERT

PROP. 6'x5' BOX CULVERT

CULVERT NO. SAN-635-0160

PT. N.W. 1/4, SECTION 29

1-STORY RANCH HOUSE

S 89°17'38"E

TRIBUTARY TO MUSKELLUNGE CREEK

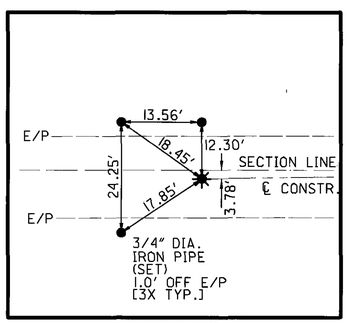
IRON PIPE OVER STONE (FOUND) AT S.E. COR., N.W. 1/4, SECTION 30

℄ SURVEY STA. 56+09.85 P.K. NAIL (FOUND AS PER ODOT REFERENCES) AT S.W. COR., S.W. 1/4, SEC. 29 (=S.E. COR., S.E. 1/4, SECTION 30)

COUNTY ROAD 13/BURGOON ROAD

℄ SURVEY STA. 82+00.00/3.78' RT. = ℄ CONSTRUCTION STA. 82+00.00 COTTON GIN SPINDLE (SET)

S.W. 1/4, SECTION 29

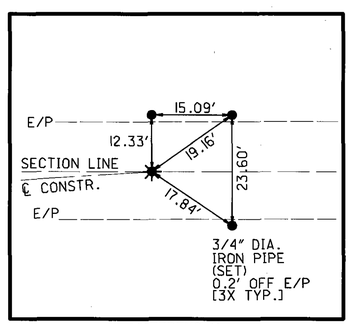


REFERENCES
℄ CONSTRUCTION STA. 82+00.00
[=℄ SURVEY STA. 82+00.00/3.78' RT.]

℄ SURVEY= ℄ CONSTRUCTION STA. 88+00.00 COTTON GIN SPINDLE (SET)

℄ SURVEY STA. 109+24.53 P.K. NAIL (FOUND AS PER ODOT REFERENCES) AT N.W. CORNER, N.W. 1/4, SECTION 29

TOWNSHIP ROAD 23/KENAN ROAD



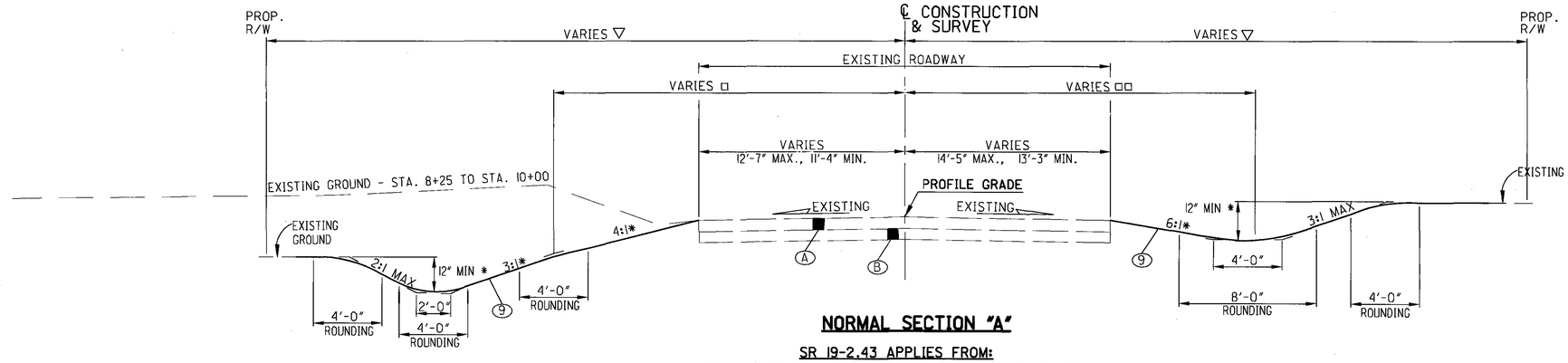
REFERENCES
℄ CONSTRUCTION STA. 88+00.00
[=℄ SURVEY STA. 88+00.00]

THERE ARE NO EXISTING LANDSCAPED AREAS WITHIN THE WORK LIMITS

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1153

SCHEMATIC PLAN & CENTERLINE REFERENCE SAN-635-1.60

SAN-19-2.43/13.68/13.75 SAN-635-1.60



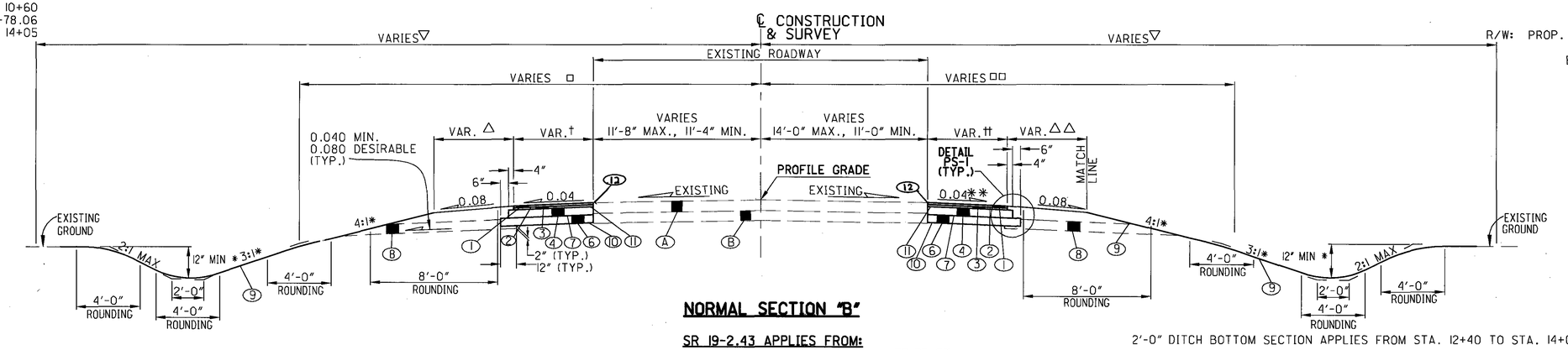
NORMAL SECTION "A"

SR 19-2.43 APPLIES FROM:

STA. 8+25 (RT.) TO STA. 10+06.25 (RT.) = 181.25 FT.
STA. 10+00 (LT.) TO STA. 10+06.25 (LT.) = 6.25 FT.
TOTAL = 187.50 FT.

R/W: PROP. = 10+06.25 TO 10+60
12+40 TO 12+78.06
EX. = 12+78.06 TO 14+05

R/W: PROP. = 10+06.25 TO 10+60
12+40 TO 13+25
EX. = 13+25 TO 14+05

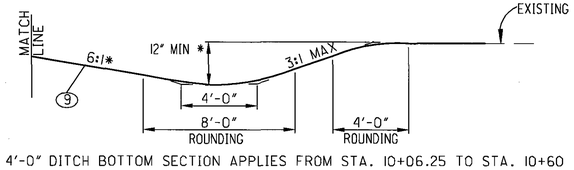


NORMAL SECTION "B"

SR 19-2.43 APPLIES FROM:

STA. 10+06.25 TO STA. 10+60 = 53.75 FT.
STA. 12+40 TO STA. 14+05 = 165.00 FT.
TOTAL = 218.75 FT.

2'-0" DITCH BOTTOM SECTION APPLIES FROM STA. 12+40 TO STA. 14+05



4'-0" DITCH BOTTOM SECTION APPLIES FROM STA. 10+06.25 TO STA. 10+60

LEGEND

(1) ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)

(2) ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, APPLIED AT 0.04 GAL. PER S.Y.

(3) ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN

(4) ITEM 301 - 6" ASPHALT CONCRETE BASE, PG64-22

(6) ITEM 304 - 6" AGGREGATE BASE

(7) ITEM 408 - PRIME COAT, APPLIED AT 0.40 GAL. PER S.Y.

(8) ITEM 605 - AGGREGATE DRAINS

(9) ITEM 659 - SEEDING AND MULCHING

(10) ITEM 204 - SUBGRADE COMPACTION

(11) ITEM 407 - TACK COAT, APPLIED AT 0.075 GAL PER S.Y.

* - UNLESS OTHERWISE SHOWN ON THE CROSS SECTIONS

(A) 8" ASPHALT CONCRETE

(B) 7.5" AGGREGATE BASE

(12) ITEM 409 - SEALER MISC.: LONGITUDINAL JOINT SEALER

THE LIMITS OF THE CLEAR ZONE GRADED SLOPES ARE BASED ON A CONTROL LINE BETWEEN THE FOLLOWING STATIONS:

□ VARIES FROM 0'-0" AT STA. 8+48.9 TO 42'-0" AT STA. 11+68.9
VARIES FROM 42'-0" AT STA. 11+88.0 TO 12'-0" AT STA. 15+08.0

□□ VARIES FROM 12'-0" AT STA. 7+88.0 TO 39'-0" AT STA. 11+08.0
VARIES FROM 39'-0" AT STA. 11+28.4 TO 0'-0" AT STA. 14+48.4

△ VARIES FROM 0'-0" AT STA. 10+06.25 TO 6'-0" AT STA. 10+60

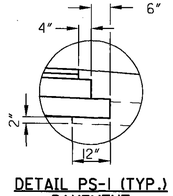
△△ VARIES FROM 0'-0" AT STA. 10+34.25 TO 6'-0" AT STA. 10+60
VARIES FROM 6'-0" AT STA. 12+40 TO 0'-0" AT STA. 12+78.3

† VARIES FROM 3'-0" AT STA. 10+06.25 TO 7'-0" AT STA. 10+60

†† VARIES FROM 1'-0" AT STA. 10+34.25 TO 4'-0" AT STA. 10+60
VARIES FROM 7'-0" AT STA. 12+40 TO 1'-0" AT STA. 14+05

** VARIES FROM 0.04 AT STA. 10+06.25 TO 0.39 AT STA 10+60
VARIES FROM 0.067 AT STA. 12+40 TO 0.04 AT STA 12+68.35

▽ VARIES - SEE SHEET 46-57 FOR DIMENSIONS

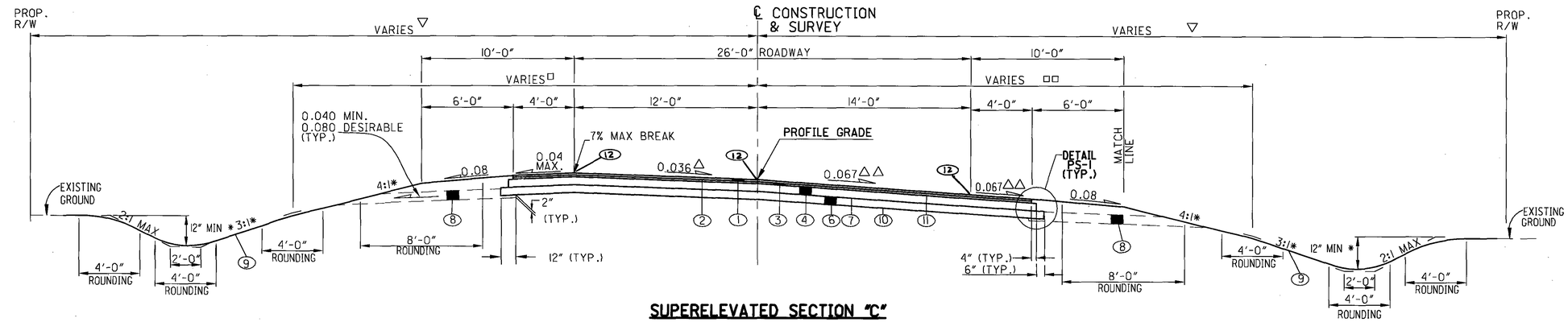


DETAIL PS-1 (TYP.)
PAVEMENT
STEP DETAIL

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

TYPICAL SECTIONS SAN-19-2.43

SAN-19-2.43/13.68/13.75
SAN-635-1.60

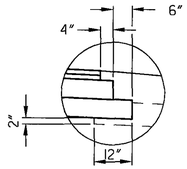


SUPERELEVATED SECTION "C"

SR 19-2.43 APPLIES FROM:
STA. 10+60 TO STA. 12+40= 180 FT.

2'-0" DITCH BOTTOM SECTION APPLIES FROM STA. 11+25 TO STA. 12+40

4'-0" DITCH BOTTOM SECTION APPLIES FROM STA. 10+60 TO STA. 11+25



DETAIL PS-1
PAVEMENT
STEP DETAIL

LEGEND

(1) ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)

(2) ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, APPLIED AT 0.04 GAL. PER S.Y.

(3) ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN

(4) ITEM 301 - 6" ASPHALT CONCRETE BASE, PG64-22

(6) ITEM 304 - 6" AGGREGATE BASE

(7) ITEM 408 - PRIME COAT, APPLIED AT 0.40 GAL. PER S.Y.

(8) ITEM 605 - AGGREGATE DRAINS

(9) ITEM 659 - SEEDING AND MULCHING

(10) ITEM 204 - SUBGRADE COMPACTION

(11) ITEM 407 - TACK COAT, APPLIED AT 0.075 GAL PER S.Y.

(12) ITEM 409-SEALER MISC: LONGITUDINAL JOINT SEALER

* - UNLESS OTHERWISE SHOWN ON THE CROSS SECTIONS

□ & □□ - SEE SHEET 5 FOR NOTES

△ VARIES FROM 0.001 AT STA. 10+60 TO 0.036 AT STA 11+26.60

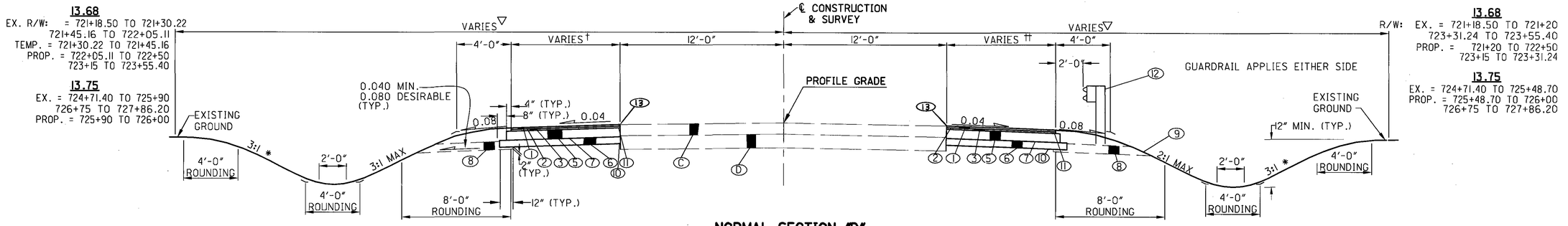
△△ VARIES FROM 0.039 AT STA. 10+60 TO 0.067 AT STA. 11+10.40

▽ VARIES - SEE SHEET 46-57 FOR DIMENSIONS

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

TYPICAL SECTIONS SAN-19-2.43

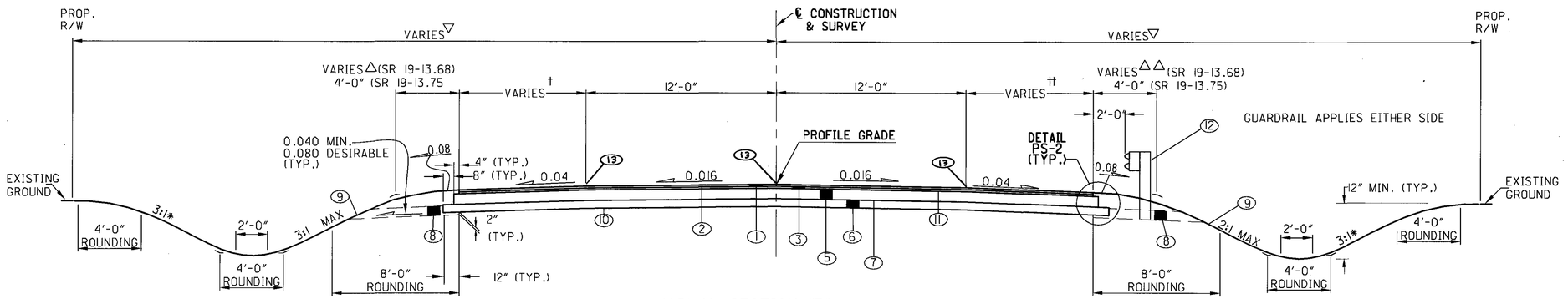
SAN-19-2.43/13.68/13.75
SAN-635-1.60



NORMAL SECTION "D"

SR 19-13.68 APPLIES FROM:
STA. 721+18.50 TO STA. 722+50 = 131.50 FT.
STA. 723+15 TO STA. 723+55.40 = 40.40 FT.
TOTAL = 171.90 FT.

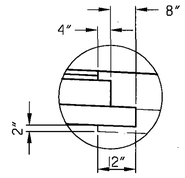
SR 19-13.75 APPLIES FROM:
STA. 724+71.40 TO STA. 726+00 = 128.60 FT.
STA. 726+75 TO STA. 727+86.20 = 111.20 FT.
TOTAL = 239.80 FT.



NORMAL SECTION "E"

SR 19-13.68 APPLIES FROM:
STA. 722+50 TO STA. 723+15 = 65.00 FT.

SR 19-13.75 APPLIES FROM:
STA. 726+00 TO STA. 726+75 = 75.00 FT.



DETAIL PS-2
PAVEMENT
STEP DETAIL

LEGEND

(1) ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)
(2) ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, APPLIED AT 0.04 GAL. PER S.Y.
(3) ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN
(5) ITEM 301 - 8" ASPHALT CONCRETE BASE, PG64-22
(6) ITEM 304 - 6" AGGREGATE BASE
(7) ITEM 408 - PRIME COAT, APPLIED AT 0.40 GAL. PER S.Y.
(8) ITEM 605 - AGGREGATE DRAINS
(9) ITEM 659 - SEEDING AND MULCHING
(10) ITEM 204 - SUBGRADE COMPACTION
(11) ITEM 407 - TACK COAT, APPLIED AT 0.075 GAL PER S.Y.
(12) ITEM 606 GUARDRAIL, TYPE 5
* - UNLESS OTHERWISE SHOWN ON THE CROSS SECTIONS
(C) 8.5" ASPHALT CONCRETE
(D) 14" AGGREGATE BASE

(13) ITEM 409 - SEALER MISC: LONGITUDINAL JOINT SEALER

S.R. 19-13.68

† VARIES FROM 8'-0" AT STA 721+74.85 TO 8'-0" AT STA. 722+97
VARIES FROM 8'-0" AT STA. 722+97 TO 3'-0" AT STA. 723+55.4
†† VARIES FROM 1'-0" AT STA. 721+18.5 TO 8'-0" AT STA. 721+44.75
VARIES FROM 8'-0" AT STA. 721+44.75 TO 8'-0" AT STA. 722+27.40
VARIES FROM 8'-0" AT STA. 722+27.40 TO 1'-0" AT STA. 723+09
VARIES FROM 1'-0" AT STA. 723+09 TO 1'-0" AT STA. 723+15

S.R. 19-13.75

† VARIES FROM 2'-0" AT STA. 723+71.40 TO 8'-0" AT STA. 725+51.60
VARIES FROM 8'-0" AT STA. 725+51.60 TO 8'-0" AT STA. 726+75.00
VARIES FROM 8'-6" AT STA 726+75.00 TO 1'-6" AT STA. 727+31.00
†† VARIES FROM 2'-0" AT STA. 725+03.00 TO 5'-0" AT STA. 725+38.7
VARIES FROM 5'-0" AT STA. 725+38.7 TO 5'-0" AT STA. 727+75.00
VARIES FROM 5'-0" AT STA. 727+75 TO 2'-0" AT STA. 727+86.20

S.R. 19-13.68

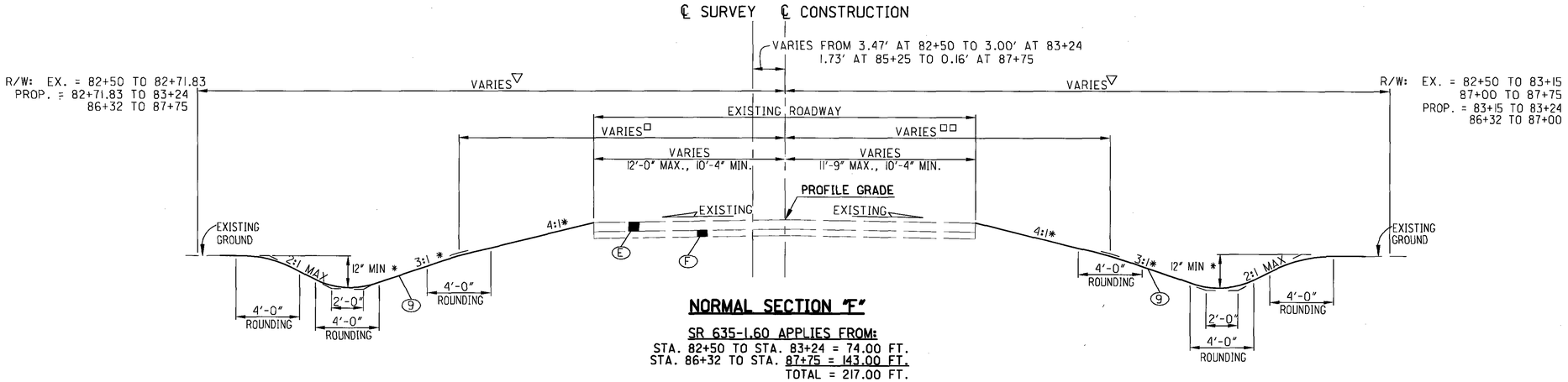
△ VARIES FROM 4'-0" AT STA. 721+74.85 TO 4'-0" AT STA. 722+97
VARIES FROM 4'-0" AT STA 722+97 TO 7'-6" AT STA. 723+38.25
VARIES FROM 7'-6" AT STA. 723+38.25 TO 0' AT STA. 723+43
△△ VARIES FROM 4'-0" AT STA. 721+77 TO 4'-0" AT STA. 722+27.40
VARIES FROM 4'-0" AT STA. 722+27.40 TO 9'-3" AT STA. 722+88.9
VARIES FROM 9'-3" AT STA. 722+88.9 TO 4'-0" AT STA. 723+15
VARIES 4'-0" AT STA. 723+15 TO 4'-0" AT STA. 723+28

▽ VARIES - SEE SHEET 46-57 FOR DIMENSIONS

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

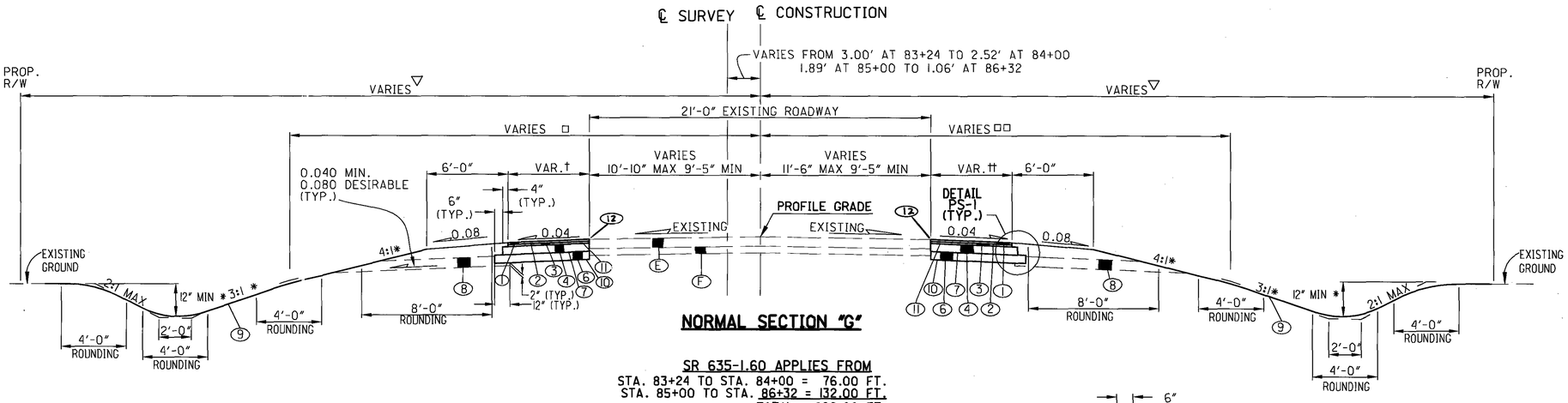
TYPICAL SECTIONS SAN 19-13.68/13.75

SAN-19-2.43/13.68/13.75
SAN-635-1.60



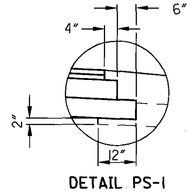
NORMAL SECTION "F"

SR 635-1.60 APPLIES FROM:
STA. 82+50 TO STA. 83+24 = 74.00 FT.
STA. 86+32 TO STA. 87+75 = 143.00 FT.
TOTAL = 217.00 FT.



NORMAL SECTION "G"

SR 635-1.60 APPLIES FROM
STA. 83+24 TO STA. 84+00 = 76.00 FT.
STA. 85+00 TO STA. 86+32 = 132.00 FT.
TOTAL = 208.00 FT.



DETAIL PS-1
PAVEMENT
STEP DETAIL

LEGEND

(1) ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)

(2) ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, APPLIED AT 0.04 GAL. PER S.Y.

(3) ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN

(4) ITEM 301 - 6" ASPHALT CONCRETE BASE, PG64-22

(6) ITEM 304 - 6" AGGREGATE BASE

(7) ITEM 408 - PRIME COAT, APPLIED AT 0.40 GAL. PER S.Y.

(8) ITEM 605 - AGGREGATE DRAINS

(9) ITEM 659 - SEEDING AND MULCHING

(10) ITEM 204 - SUBGRADE COMPACTION

(11) ITEM 407 - TACK COAT, APPLIED AT 0.075 GAL PER S.Y.

* - UNLESS OTHERWISE SHOWN ON THE CROSS SECTIONS

□ & □□ - SEE SHEET 7 FOR NOTES

(E) 7" ASPHALT CONCRETE

(F) 5" AGGREGATE BASE

(12) ITEM 409-SEALER MISC: LONGITUDINAL JOINT SEALER

S.R. 635-1.60

† VARIES FROM 1'-0" AT STA. 83+24 TO 6'-5" AT STA. 84+00
VARIES FROM 5'-2" AT STA 85+00 TO 1'-0" AT STA. 85+25

†† 0'-0" AT STA. 83+75 TO 0'-0" AT STA. 84+00
VARIES FROM 7'-5" AT STA. 85+00 TO 1'-0" AT STA. 86+32

▽ VARIES - SEE SHEET 46-57 FOR DIMENSIONS

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

TYPICAL SECTIONS SAN-635-1.60

SAN-19-2.43/13.68/13.75
SAN-635-1.60

8
57

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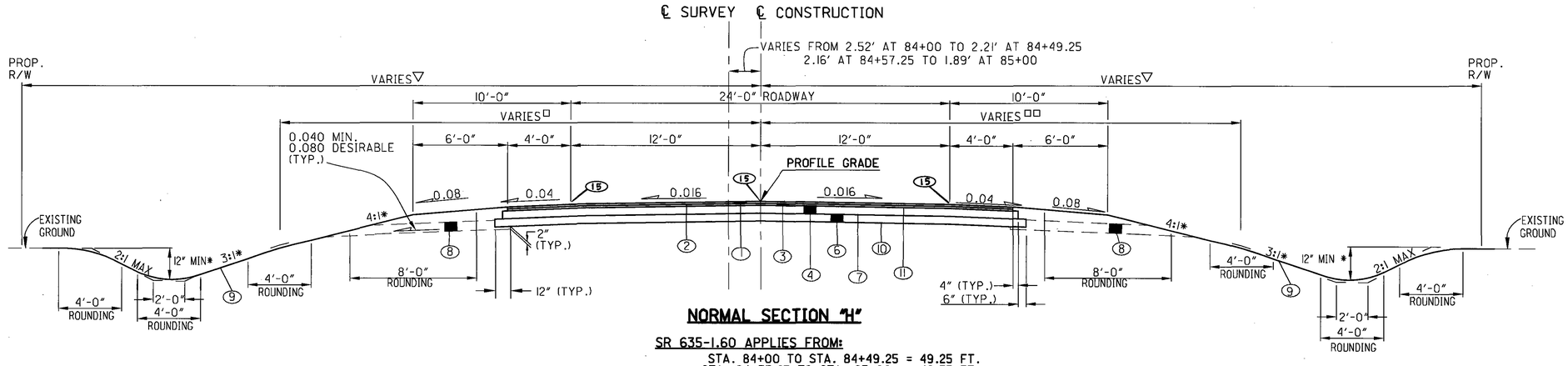
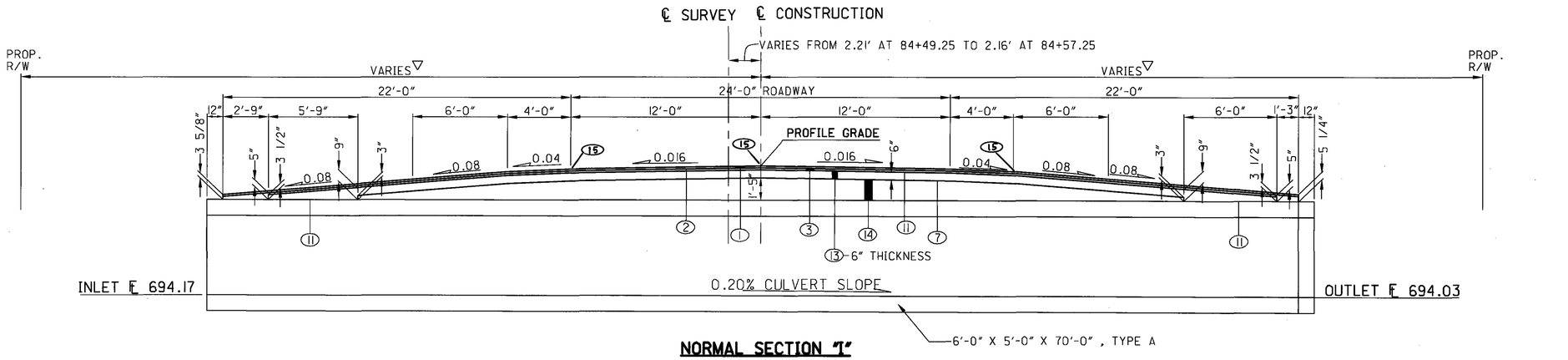


NORMAL SECTION "H"

SR 635-1.60 APPLIES FROM:
STA. 84+00 TO STA. 84+49.25 = 49.25 FT.
STA. 84+57.25 TO STA. 85+00 = 42.75 FT.
TOTAL = 92 FT.



NORMAL SECTION "I"

SAN-SR 635-1.60
APPLIES FROM STA. 84+49.25
TO STA. 84+57.25
TOTAL = 8.00 FT.

LEGEND

(1) ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)

(2) ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, APPLIED AT 0.04 GAL. PER S.Y.

(3) ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN

(4) ITEM 301 - 6" ASPHALT CONCRETE BASE, PG64-22

(6) ITEM 304 - 6" AGGREGATE BASE

(7) ITEM 408 - PRIME COAT, APPLIED AT 0.40 GAL. PER S.Y.

(8) ITEM 605 - AGGREGATE DRAINS

(9) ITEM 659 - SEEDING AND MULCHING

(10) ITEM 204 - SUBGRADE COMPACTION

(11) ITEM 407 - TACK COAT, APPLIED AT 0.075 GAL PER S.Y.

(13) ITEM 302 - ASPHALT CONCRETE BASE, PG64-22, THICKNESS AS SHOWN

(14) ITEM 304 - AGGREGATE BASE, THICKNESS AS SHOWN

* - UNLESS OTHERWISE SHOWN ON THE CROSS SECTIONS

(E) 7" ASPHALT CONCRETE

(F) 5" AGGREGATE BASE

(15) ITEM 409-SEALER MISC.: LONGITUDINAL JOINT SEALER

THE LIMITS OF THE SAFETY GRADED SLOPES ARE BASED ON A CONTROL LINE BETWEEN THE FOLLOWING STATIONS:

S.R. 365-1.60

□ VARIES FROM 0'-0" AT STA. 81+59.25 TO 34'-0" AT STA. 84+49.25

VARIES FROM 34'-0" AT STA. 84+57.25 TO 12'-0" AT STA. 87+47.25

□□ VARIES FROM 12'-0" AT STA. 81+59.25 TO 34'-0" AT STA. 84+49.25

VARIES FROM 34'-0" AT STA. 84+57.25 TO 0'-0" AT STA. 87+47.25

▽ VARIES - SEE SHEET 46-57 FOR DIMENSIONS

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

TYPICAL SECTIONS SAN-635-1.60

SAN-19-2.43/13.68/13.75
SAN-635-1.60

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

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

SAN-19-2.43

TOLEDO EDISON
DAVE COSTIC
(419)249-4118
300 MADISON AVE
TOLEDO, OH 43605

SPRINT
JERRY ENDICOTT
(419)599-4011
375 E. RIVERVIEW
NAPOLEON, OH 43545

VERIZON
RON HARRIS
(419)354-9455
300 W. GYPSY LANE RD.
BOWLING GREEN, OH 43402

TIME WARNER CABLE
JOE SHRIDER
(419)429-7400
205 CRYSTAL AVE.
FINDLAY, OH 45840

NORTHERN OHIO RURAL WATER
PATTY ESCHEN
(419)668-7213
2205 U.S. ROUTE 20 E
NORWALK, OH 44857

SAN-19-13.68/13.75

TOLEDO EDISON
DAVE COSTIC
(419)249-4118
300 MADISON AVE
TOLEDO, OH 43605

AMERITECH
JOE EVANS
S.M.&P. UTILITY RESOURCES
(330)985-9911
1210 KELLY AVE.
AKRON, OH 44306

ADELPHIA CABLE
LORI GUERRO
(800)346-2288
129 MAPLE ST.
PORT CLINTON, OH 43452

SAN-635-1.60

TOLEDO EDISON
DAVE COSTIC
(419)249-4118
300 MADISON AVE
TOLEDO, OH 43605

VERIZON
RON HARRIS
(419)354-9455
300 W. GYPSY LANE RD.
BOWLING GREEN, OH 43402

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

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

ELEVATION DATUM: ALL ELEVATIONS ARE BASED ON NGVD29 DATUM.

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

INSTREAM WORK: IN STREAM WORK WILL BE LIMITED WHERE PRACTICABLE AND ONLY CLEAN NON-ERODIBLE MATERIAL WILL BE USED FOR FORDS AND COFFERDAMS. THIS TEMPORARILY PLACED MATERIAL WILL BE REMOVED AND THE STREAM BOTTOM RESTORED TO NEAR NATURAL CONDITIONS WHEN THE WORK IS COMPLETED.

FARM DRAINS: ALL FARM DRAINS, WHICH ARE ENCOUNTERED DURING CONSTRUCTION, SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS. 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, WHICH ARE ENCOUNTERED ABOVE THE ELEVATION OF ROADWAY DITCHES, SHALL BE OUTLETTED INTO THE ROADWAY DITCH BY 603 TYPE F CONDUIT. THE OPTIMUM OUTLET ELEVATION SHALL BE ONE FOOT ABOVE THE FLOWLINE ELEVATION OF THE DITCH. LATERAL FIELD TILES WHICH CROSS THE ROADWAY SHALL BE INTERCEPTED BY 603, TYPE E CONDUIT, AND CARRIED IN A LONGITUDINAL DIRECTION TO AN ADEQUATE OUTLET OR ROADWAY CROSSING.

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

EROSION CONTROL PADS AND ANIMAL GUARDS SHALL BE PROVIDED AT THE OUTLET END OF ALL FARM DRAINS AS PER STANDARD CONSTRUCTION DRAWING DM-1.1, EXCEPT WHEN THEY OUTLET INTO A DRAINAGE STRUCTURE. PAYMENT FOR THE EROSION CONTROL PADS AND ANIMAL GUARDS AND ANY NECESSARY BENDS OR BRANCHES SHALL BE INCLUDED FOR PAYMENT IN THE PERTINENT CONDUIT ITEMS.

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

		19-2.43	19-13.68	19-13.75	635-1.60	TOTAL
603	6" CONDUIT, TYPE E	50 FT	50 FT	50 FT	50 FT	200 FT
603	6" CONDUIT, TYPE F	50 FT	50 FT	50 FT	50 FT	200 FT
603	8" CONDUIT, TYPE E	50 FT	50 FT	50 FT	50 FT	200 FT
603	8" CONDUIT, TYPE F	50 FT	50 FT	50 FT	50 FT	200 FT
603	12" CONDUIT, TYPE B	50 FT	50 FT	50 FT	50 FT	200 FT
603	12" CONDUIT, TYPE E	50 FT	50 FT	50 FT	50 FT	200 FT

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

SEEDING AND MULCHING: THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS:

	19-2.43	19-13.68	19-13.75	635-1.60	TOTAL
659, SEEDING AND MULCHING	3149	1440	1338	3973	9900 SQ YD
659, TOPSOIL	350	160	149	441	1100 CU YD
659, COMMERCIAL FERTILIZER	0.43	0.19	0.18	0.54	1.34 TON
659, WATER	17	8	7	21	53 M.GAL
659, INTER-SEEDING	166	72	67	199	504 SQ YD

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

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

CONVERSION OF STANDARD CONSTRUCTION DRAWINGS: THE METRIC STANDARD DRAWINGS REFERENCED IN THIS PLAN SHALL BE CONVERTED TO ENGLISH UNITS USING THE SI (METRIC) TO ENGLISH CONVERSION FACTORS PROVIDED IN SECTION 109.02 OF THE 2002 CONSTRUCTION AND MATERIAL SPECIFICATIONS. CONVERSIONS SHALL BE APPROPRIATELY PRECISE AND SHALL REFLECT STANDARD INDUSTRY ENGLISH VALUES WHERE SUITABLE.

UNSUITABLE FOUNDATION SOILS: IF UNSUITABLE FOUNDATION SOILS ARE ENCOUNTERED IN THE AREAS OF THE PROPOSED ROADBED, THEY SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL MEETING THE REQUIREMENTS OF 203.02.R. THE LOCATIONS AND DIMENSIONS WILL BE AS DETERMINED BY THE ENGINEER.

THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:

ITEM 203 100 CU. YDS. EMBANKMENT
ITEM 203 100 CU. YDS. EXCAVATION

MONUMENTS: MONUMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS AS SHOWN ON THE STANDARD CONSTRUCTION DRAWINGS AND AT THE LOCATIONS SHOWN ON SHEET NUMBERS 46, 47, AND 48.

ITEM 442, ASPHALT CONCRETE INTERMEDIATE COURSE,19mm, TYPE A (448), AS PER PLAN: SHALL FOLLOW THE SPECIFICATIONS FOR THE 442 ITEM EXCEPT FOR SECTION 442.04 ASPHALT BINDER. THE BINDER SHALL BE PG70-22M FOR THE INTERMEDIATE COURSE.

ITEM 605 - AGGREGATE DRAINS: AGGREGATE DRAINS SHALL BE PLACED AT 50 FOOT INTERVALS ON EACH SIDE OF NORMAL CROWNED SECTIONS, STAGGERED SO THAT EACH DRAIN IS 25 FEET FROM THE ADJACENT DRAIN ON THE OPPOSITE SIDE, AND AT 25 FOOT INTERVALS ON THE LOW SIDE ONLY OF SUPERELEVATED SECTIONS. AN AGGREGATE DRAIN SHALL BE PLACED AT THE LOW POINT OF EACH SAG VERTICAL CURVE. FOR LOCATION OF AGGREGATE DRAINS, SEE SHEET 14.

CLEARING AND GRUBBING: ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS SHALL BE REMOVED UNDER THE LUMP SUM BID FOR ITEM 201, CLEARING AND GRUBBING. THE FOLLOWING IS AN APPROXIMATE ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED.

SIZES	NO. TREES	NO. STUMPS	TOTAL
18"	4	-	4

IN STREAM WORK

NO IN-STREAM WORK SHOULD BE DONE BETWEEN APRIL 15 TO JUNE 15 TO PROTECT SPAWNING FISH.

INDIANA BAT CONSIDERATIONS

SANDUSKY COUNTY IS WITHIN THE KNOWN RANGE OF THE INDIANA BAT, WHICH IS A FEDERALLY ENDANGERED SPECIES. ALL TREE REMOVAL SHOULD BE PERFORMED BETWEEN SEPTEMBER 15 TO APRIL 15 TO AVOID IMPACTING INDIANA BAT SUMMER ROOSTING AND BROOD-REARING HABITAT. OTHERWISE AN INDIANA BAT NET SURVEY SHALL BE REQUIRED.

ITEM 606 - ANCHOR ASSEMBLY, TYPE E-98: THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING EITHER OF THE FOLLOWING GUARDRAIL END TERMINALS:

1) THE ET-2000 (1997) MANUFACTURED BY TRINITY INDUSTRY, 1170 N. STATE STREET, GIRARD, OHIO 44420 (TELEPHONE: 330-545-4373).

THE LENGTH OF THE ET-2000 (1997) SYSTEM IS CONSIDERED TO BE 50'-0", INCLUSIVE OF TWO 25'-0" LONG RAIL ELEMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AS DETAILED ON THE FOLLOWING PRE-APPROVED SHOP DRAWINGS:

DWG #	DRAWING NAME	DWG./REV. DATE	ODOT APPROVAL DATE
SS265M	ET-2000 (1997) PLAN, ELEVATION & SECTIONS	6/20/97	3/6/98
SS142	ET-2000 PLUS 50'-0" PLAN, ELEVATION & SECTION 25'-0" RAIL, SLEEVE W/PL POSTS 1-4	4/12/00	7/31/00
SS141	ET-2000 PLUS PLAN, ELEVATION & SECTION 25'-0" RAIL, HBA POSTS 1-4	2/29/00	7/31/00
SS158	ET-2000 PLUS 50'-0" WITH 12'-6" PANELS & HBA POSTS 1-4 PLAN, ELEVATION & SECTION	5/22/00	7/31/00

2) THE SKT-350 MANUFACTURED BY ROAD SYSTEMS, INC., 2516 MALLORY LANE, STOW, OHIO 44224 (TELEPHONE: 330-346-0721).

THE LENGTH OF THE SKT-350 SYSTEM IS CONSIDERED TO BE 50'-0", INCLUSIVE OF FOUR 12'-6" LONG RAIL ELEMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AS DETAILED ON THE FOLLOWING PRE-APPROVED SHOP DRAWINGS:

DWG #	DRAWING NAME	DWG./REV. DATE	ODOT APPROVAL DATE
SKT-4M	SEQUENTIAL KINKING TERMINAL (SKT-350) ASSEMBLY WITH 4 FOUNDATION TUBES	12/11/97	3/6/98

THE FACE OF THE TYPE E-98 IMPACT HEAD SHALL BE COVERED WITH A SHEET OF TYPE G REFLECTIVE SHEETING, PER CMS 730.19, APPROXIMATELY 18" x 18".

REFER TO THE MANUFACTURER'S INSTRUCTION REGARDING THE INSTALLATION OF, AND THE GRADING AROUND, THE FOUNDATION TUBES AND GROUND STRUT. THE TOP OF ANY FOUNDATION TUBE SHOULD BE LESS THAN 4-INCHES ABOVE THE GROUND. THE PLACEMENT OF THE FOUNDATION TUBES SHOULD BE AN APPROPRIATE DEPTH BELOW THE LEVEL LINE IN ORDER TO MAINTAIN THE FINISHED GUARDRAIL HEIGHT OF 27-3/4 INCHES FROM THE EDGE OF THE SHOULDER.

ON-SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4-INCHES ABOVE THE GROUND LINE.

PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID FOR ITEM 606, ANCHOR ASSEMBLY, TYPE E-98, EACH, AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL ANCHOR ASSEMBLY SYSTEM, INCLUDING ALL RELATED TRANSITIONS, REFLECTIVE SHEETING, HARDWARE, GRADING, EMBANKMENT AND EXCAVATION NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

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

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

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

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

CALCULATED RLM | CHECKED BLW

DESIGN AGENCY
KOHLI & KALHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

GENERAL NOTES

SAN-19-2.43/13.68/13.75
SAN-635-1.60

ITEM 607-FENCE REBUILT, TYPE 47: THIS ITEM SHALL INCLUDE THE CAREFUL RECONDITIONING AND RE-ERECTION OF FENCE AND COMPONENT PARTS AS DETAILED ON THE PLANS AND AS DIRECTED BY THE ENGINEER. FENCE OR COMPONENT PARTS WHICH ARE DAMAGED OR ARE OTHERWISE UNSATISFACTORY FOR REUSE SHALL BE REPLACED IN KIND BY THE CONTRACTOR. ANY NEW PARTS WHICH ARE NEEDED, AS DETERMINED BY THE ENGINEER, SHALL BE SUPPLIED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE.

THE AMOUNT OF REBUILT FENCE TO BE PAID FOR WILL BE THE NUMBER OF FEET REBUILT, COMPLETE IN PLACE AND MEASURED AS PROVIDED FOR IN 607.09.

PAYMENT FOR THE ABOVE WILL BE PAID FOR AT THE CONTRACT PRICE PER FOOT FOR ITEM 607, FENCE REBUILT, TYPE 47.

ITEM SPECIAL-MAILBOX SUPPORT: THIS WORK SHALL CONSIST OF FURNISHING AND ERECTING MAILBOX SUPPORTS AND ANY ASSOCIATED MOUNTING HARDWARE IN ACCORDANCE WITH PLAN DETAILS, AND ATTACHING AN OWNER-SUPPLIED MAILBOX AT LOCATIONS SPECIFIED IN THE PLAN, OR OTHERWISE ESTABLISHED BY THE ENGINEER.

WOOD POSTS SHALL BE NOMINAL 4" BY 4" SQUARE OR 4 1/2" DIAMETER ROUND, AND CONFORM TO 710.14.

STEEL POSTS SHALL BE NOMINAL PIPE SIZE 2" I.D., AND CONFORM TO AASHTO M 181.

HARDWARE (PLATES, SCREWS, BOLTS, ETC.) SHALL BE COMMERCIAL-GRADE GALVANIZED STEEL.

POSTS SHALL BE SET PER THE FIRST PARAGRAPH OF 606.03, AND SHALL IN NO INSTANCE BE ENCASED IN CONCRETE.

SUPPORT HARDWARE SHALL ACCOMMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION, AND NO MORE THAN TWO BOXES MAY BE MOUNTED ON A SINGLE POST.

THE MAILBOX SHALL BE SECURELY AND NEATLY ATTACHED BY THE CONTRACTOR TO THE NEW SUPPORT. THE CONTRACTOR SHALL FURNISH ALL NECESSARY ATTACHMENT HARDWARE (NUTS, BOLTS, PLATES, SPACERS, AND WASHERS) AS NECESSARY TO ACCOMODATE THE COMPLETE INSTALLATION.

IN THE ABSENCE OF A NEW BOX SUPPLIED BY THE OWNER, THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT. DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY BOX DAMAGED BY IMPROPER HANDLING ON HIS PART, AS JUDGED AND DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POST MASTER REGARDING THE TIMING OF THE MOVEMENT OF ANY MAILBOX TO A NEW LOCATION.

PAYMENT UNDER THIS ITEM SHALL BE LIMITED TO FINAL PERMANENT INSTALLATIONS. TEMPORARY INSTALLATIONS SHALL BE IN ACCORDANCE WITH 107.10. HOWEVER, THE SAME MATERIAL AND SIZE LIMITATIONS AS FOR PERMANENT INSTALLATIONS SHALL APPLY.

MAILBOX SUPPORTS, COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH, FOR ITEM SPECIAL MAILBOX SUPPORT SYSTEM,(SINGLE).

FENCE LENGTHS: THE LENGTHS OF FENCE SHOWN IN THE PLANS ARE HORIZONTAL DIMENSIONS. MEASUREMENTS OF THE FINAL QUANTITIES SHALL BE MADE IN ACCORDANCE WITH ITEM 607.

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

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

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

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

ITEM 409 - SEALER, MISC.: LONGITUDINAL JOINT SEALER

409 DESCRIPTION

THE WORK SHALL CONSIST OF FURNISHING AND INSTALLING A HOT-APPLIED ASPHALTIC JOINT ADHESIVE/SEALER ON LONGITUDINAL COLD CONSTRUCTION JOINTS IN ASPHALT CONCRETE PAVEMENTS AS SHOWN IN THE PLANS IN ACCORDANCE WITH THESE SPECIAL PROVISIONS.

409 MATERIALS

MATERIALS SHALL MEET THE FOLLOWING REQUIREMENTS:

Characteristic	Test	Value
Brookfield Viscosity @ 400°F	ASTM D 3236	4000 - 10000 cp
Cone Penetration @ 77°F	ASTM D 5329	60 - 100
Flow @ 140°F	ASTM D 5329	5mm maximum
Resilience @ 77°F	ASTM D 5329	30% minimum
Ductility @ 77°F	ASTM D 113	30 cm minimum
Ductility @ 39.2°F	ASTM D 113	30 cm minimum
Tensile Adhesion @ 77°F	ASTM D 5329	500% minimum
Softening Point	ASTM D 36	170°F minimum
Asphalt Compatibility	ASTM D 5329	Pass

THE MATERIAL SHALL BE "CRAFCO PAVEMENT JOINT ADHESIVE, PRODUCT NO. 34524" OR APPROVED EQUAL.

409 INSTALLATION

INSTALLATION SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER.

409 BASIS OF PAYMENT

WORK UNDER THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LBS, FURNISHED AND PLACED. PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO PERFORM THE WORK, COMPLETE IN PLACE AND ACCEPTED.

PAYMENT SHALL BE MADE UNDER:

ITEM 409, SEALER, MISC.: LONGITUDINAL JOINT SEALER

LOCATION SR-19-2.43 = 978 FT.
LOCATION SR-19-13.68 = 539 FT.
LOCATION SR-19-13.75 = 705 FT.
LOCATION SAN-635-1.60 = 716 FT.
2938 FT.

$$2938 \text{ FT.} \times \frac{1 \text{ LB.}}{3 \text{ FT.}} = 979 \text{ LB.}$$

QUANTITIES WERE DETERMINED BY THE RATE 1 LB./3 FT.
QUANTITY CARRIED TO THE GENERAL SUMMARY.

CALCULATED RLM CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

GENERAL NOTES

SAN-19-2.43/13.68/13.75
SAN-635-1.60

10A
57

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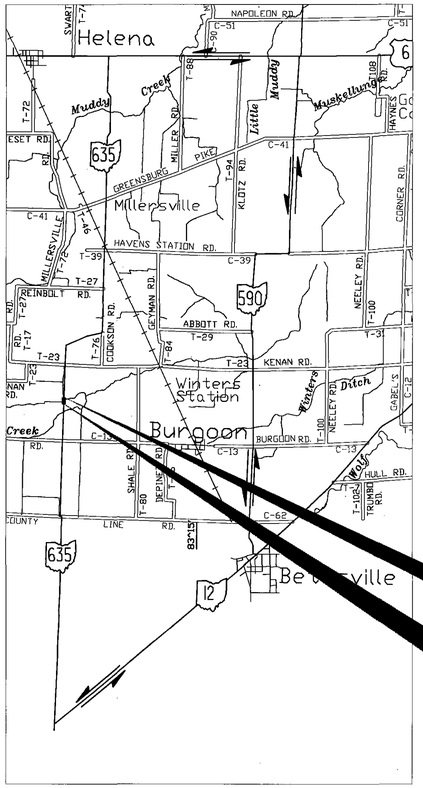
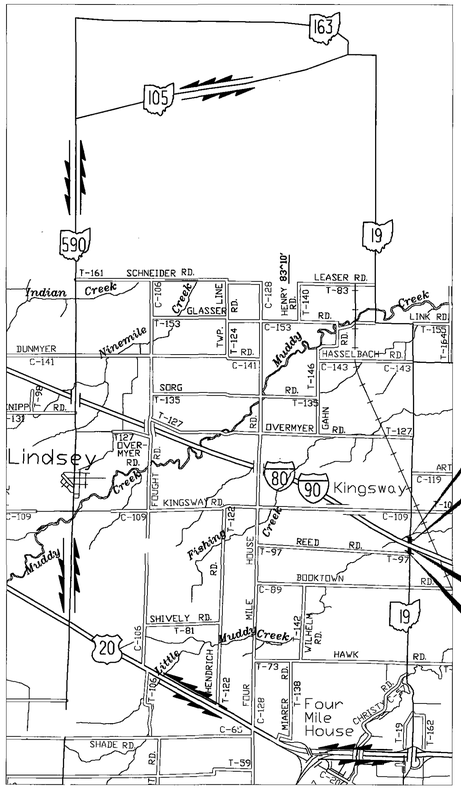
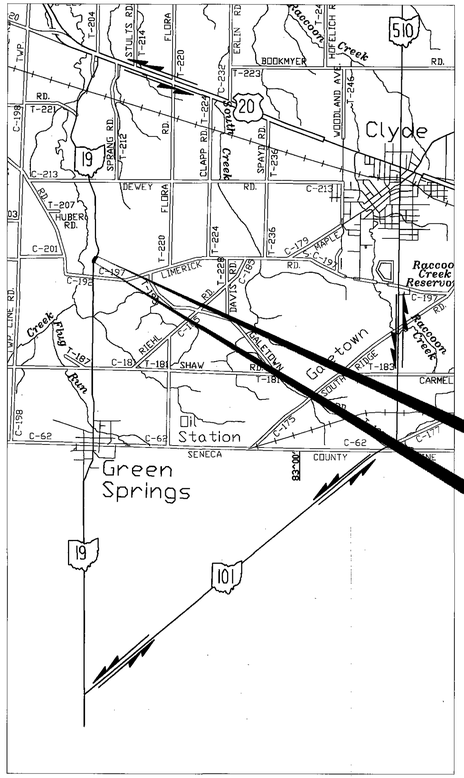


END PROJECT
STA. 85+00
635-1.60
BEGIN PROJECT
STA. 84+00
41°16'33" NORTH LATITUDE
83°16'59" WEST LONGITUDE



END PROJECT
STA. 726+75
19-13.75
RESUME PROJECT
STA. 726+00
41°24'30" NORTH LATITUDE
83°08'08" WEST LONGITUDE

SUSPEND PROJECT
STA. 723+15
19-13.68
RESUME PROJECT
STA. 722+50
41°24'27" NORTH LATITUDE
83°08'08" WEST LONGITUDE



SUSPEND PROJECT
STA. 12+40
19-2.43
BEGIN PROJECT
STA. 10+60
41°17'30" NORTH LATITUDE
83°03'07" WEST LONGITUDE

N

LOCATION MAPS
SCALE: 1"=1 MILE

INTERSTATE & DIVIDED HIGHWAYS _____
UNDIVIDED STATE & FEDERAL ROUTES _____
OTHER ROADS _____

DETOUR SAN 635-1.60 _____
DETOUR SAN-19-2.43 _____
DETOUR SAN-19-13.68/13.75 _____

DETOUR LIMITATIONS: TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES, EXCEPT FOR A PERIOD NOT TO EXCEED THE DAYS LISTED BELOW, WHEN THROUGH TRAFFIC MAY BE DETOURED AS SHOWN ON THIS SHEET.
ROAD CLOSURE DURATIONS SHALL BE AS FOLLOWS:

SAN-19-2.43 SHALL BE CONSTRUCTED WITH A ROAD CLOSURE DURATION OF TEN (10) CONSECUTIVE CALENDAR DAYS.

SAN-19-13.68/13.75 SHALL BE CONSTRUCTED WITH A ROAD CLOSURE DURATION OF TEN (10) CONSECUTIVE CALENDAR DAYS.

SAN-635-1.60 SHALL BE CONSTRUCTED WITH A ROAD CLOSURE DURATION OF FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.

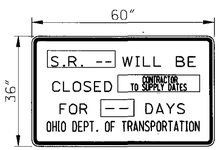
THE CONTRACTOR SHALL NOTIFY THE ROADWAY SERVICES ENGINEER AT LEAST FOURTEEN (14) WORK DAYS PRIOR TO HIS ANTICIPATED DATE OF CLOSURE IN ORDER TO ESTABLISH THE DETOUR AND INFORM THE PUBLIC. THE DETOUR SHALL BE ESTABLISHED, MAINTAINED, AND SUBSEQUENTLY REMOVED BY ODOT FORCES. ACCESS TO ADJACENT PROPERTIES AND FIELD DRIVES AFFECTED BY ANY OF THE CONSTRUCTION OPERATIONS SHALL BE MAINTAINED AT ALL TIMES UNLESS PERMISSION TO CLOSE THE FACILITY IS OBTAINED FROM THE OWNERS AND THE ENGINEER. LIQUIDATED DAMAGES SHALL BE ASSESSED IN ACCORDANCE WITH SECTION 108.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS FOR EACH CALENDAR DAY THAT THE ROADWAY REMAINS CLOSED BEYOND THE SPECIFIED LIMIT. WORK ZONE OR PERMANENT PAVEMENT MARKINGS MUST BE IN PLACE PRIOR TO OPENING THE ROAD TO TRAFFIC.

DUST CONTROL: THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

	19-2.43	19-13.68	19-13.75	635-1.60	TOTAL
616 - WATER	4	1	1	4	10 M. GAL

ITEM 614 – MAINTAINING TRAFFIC: NOTICE OF CLOSURE SIGNS, AS DETAILED IN THESE PLANS, SHALL BE ERECTED BY THE CONTRACTOR AT LEAST ONE WEEK IN ADVANCE OF THE SCHEDULED ROAD CLOSURE. THE SIGNS SHALL BE ERECTED ON THE RIGHT HAND SIDE OF THE ROAD FACING TRAFFIC. THEY SHALL BE PLACED SO AS NOT TO INTERFERE WITH THE VISIBILITY OF ANY OTHER TRAFFIC CONTROL SIGNS. ON ROADWAYS, THEY SHOULD BE ERECTED AT THE POINT OF CLOSURE.

THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN STANDARD 48" X 30" "ROAD CLOSED" SIGNS, SIGN SUPPORTS, BARRICADES, GATES, AND LIGHTS, AS DETAILED IN STANDARD CONSTRUCTION DRAWING MT-101.60 AT THE FOLLOWING LOCATIONS DURING PERIODS IN WHICH THE AFFECTED ROADS ARE CLOSED TO TRAFFIC:



OC-60B

LOCATIONS:

SAN 19-2.43
SR 19 JUST NORTH OF LIMERICK RD.
SR 19 JUST SOUTH OF DEWEY RD.

SAN 19-13.68/13.75
SR 19 JUST NORTH OF REED RD.
SR 19 JUST SOUTH OF KINGSWAY RD.

SAN 635-1.60
SR 635 JUST NORTH OF BURGOON RD.
SR 635 JUST SOUTH OF KENAN RD.

PAYMENT FOR ANY ADDITIONAL SIGNS AND/OR BARRICADES REQUIRED TO PROVIDE CLARITY TO THE TRAFFIC CONTROL SCHEMES SET FOR IN THE PLANS OR THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, OR PAYMENT FOR ANY SIGNS AND/OR BARRICADES WHICH REQUIRE RELOCATION TO PROVIDE CLARITY AS DIRECTED BY THE ENGINEER, SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614, "MAINTAINING TRAFFIC".

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

WORK ZONE MARKINGS AND SIGNS: THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY FOR USE AT LOCATIONS IDENTIFIED BY THE ENGINEER FOR WORK ZONE PAVEMENT MARKINGS AND SIGNS PER THE REQUIREMENTS OF CMS 614.04 AND 614.11.

ITEM 614, WORK ZONE CENTERLINE, CLASS II: SEE SHEET 14 FOR QUANTITIES.

FLOODLIGHTING: FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHTTIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE THE ADEQUACY OF THE FLOODLIGHT PLACEMENT, THE CONTRACTOR AND THE ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED, THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS.

PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC (SECTION 642-2).

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Monroe Street, Lima, Ohio 45801 419/227-1155

MAINTENANCE OF TRAFFIC

SAN-19-2.43/13.68/13.75
SAN-635-1.60

GENERAL SUMMARY

SHEET NUMBERS																			ITEM	ITEM EXTENSION	GRAND TOTAL	UNIT	DESCRIPTION
10	11	14	15	16	17	18	19	20	25	28	31	32	38	42	45	46	47	48					
																							ROADWAY
LUMP																			201	11000	LUMP		CLEARING AND GRUBBING
													LUMP	LUMP	LUMP				202	11000	LUMP		STRUCTURE REMOVED
		2							1										202	20010	3	EACH	HEADWALL REMOVED
		302					8	487		265	276	11							202	23010	1349	SQ YD	PAVEMENT REMOVED, ASPHALT
		113								40	25								202	35100	178	FT	PIPE REMOVED, 24" & UNDER
		50																	202	35200	50	FT	PIPE REMOVED, OVER 24"
		312					82	387		487.5	162								202	38000	1430.5	FT	GUARDRAIL REMOVED
									1										202	58100	1	EACH	CATCH BASIN REMOVED
									77										202	75000	77	FT	FENCE REMOVED
100		2548																	203	10000	2648	CU YD	EXCAVATION
100		2189																	203	20000	2289	CU YD	EMBANKMENT
			909	599	637	517		43	32		52								204	10000	2789	SQ YD	SUBGRADE COMPACTION
																4	2	2	604	38500	8	EACH	MONUMENT ASSEMBLY
									350	425									606	13000	775	FT	GUARDRAIL, TYPE 5
										50									606	17290	50	FT	GUARDRAIL, TYPE 5, LONG-SPAN
										1									606	22010	1	EACH	ANCHOR ASSEMBLY, TYPE E-98 (SEE SHEET 10)
									2	1									606	26500	3	EACH	ANCHOR ASSEMBLY, TYPE T
									2	2									606	35000	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1
									77										607	15000	77	FT	FENCE, TYPE 47
								1											SPECIAL	69050000	1	EACH	MAILBOX SUPPORT
								1											SPECIAL	69050350	1	EACH	MAILBOX REMOVED AND RESET
																							EROSION CONTROL
		4						32		8									601	32204	44	CU YD	ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER
1100																			659	00300	1100	CU YD	TOPSOIL
9900																			659	10000	9900	SQ YD	SEEDING AND MULCHING
504																			659	15000	504	SQ YD	INTER-SEEDING
1.34																			659	20000	1.34	TON	COMMERCIAL FERTILIZER
53																			659	35000	53	M GAL	WATER
		65					88	111			37								670	00700	301	SQ YD	DITCH EROSION PROTECTION
																			832	10000	1	EACH	STORM WATER POLLUTION PREVENTION PLAN
																			832	30000	6200	EACH	EROSION CONTROL
		16					66			36	59								836	10000	177	SQ YD	SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1
		43						160		22	37								836	10020	262	SQ YD	SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 2
		44						85		4		22							836	10030	155	SQ YD	SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 3
																							DRAINAGE
200																			603	01400	200	FT	6" CONDUIT, TYPE E
200																			603	01500	200	FT	6" CONDUIT, TYPE F
200																			603	02500	200	FT	8" CONDUIT, TYPE E
200																			603	02600	200	FT	8" CONDUIT, TYPE F
									20										603	03300	20	FT	10" CONDUIT, TYPE C
200									39										603	04400	239	FT	12" CONDUIT, TYPE B
								30			25								603	04900	55	FT	12" CONDUIT, TYPE D
200																			603	05100	200	FT	12" CONDUIT, TYPE E
									20										603	06100	20	FT	15" CONDUIT, TYPE C
									42										603	07400	42	FT	18" CONDUIT, TYPE B
										40									603	10600	40	FT	24" CONDUIT, TYPE C
									1										604	04500	1	EACH	CATCH BASIN, NO. 2-2B
		280																	605	31100	280	FT	AGGREGATE DRAINS

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

GENERAL SUMMARY

SAN-19-2.43/13.68/13.75
SAN-635-1.60

GENERAL SUMMARY

SHEET NUMBERS																	ITEM	ITEM EXTENSION	GRAND TOTAL	UNIT	DESCRIPTION
10	10A	11	14	15	16	17	18	19	20	25	28	31	32	38	42	45					
																					PAVEMENT
				138	120	126	77										301	46000	461	CU YD	ASPHALT CONCRETE BASE, PG64-22
							10										302	46000	10	CU YD	ASPHALT CONCRETE BASE, PG64-22
				144	96	101	97		6	6		8					304	20000	458	CU YD	AGGREGATE BASE
				61	40	41	39										407	10000	181	GALLON	TACK COAT
				32	21	22	20										407	14000	95	GALLON	TACK COAT FOR INTERMEDIATE COURSE
				331	216	227	202		13	12		9					408	10000	1010	GALLON	PRIME COAT
	979																409	98010	979	LB	SEALER MISC.: LONGITUDINAL JOINT SEALER (SEE SHEET 10A)
				34	22	23	21										442	10500	100	CU YD	ASPHALT CONCRETE SURFACE COURSE, 9.5 mm, TYPE A (448)
				34	22	23	22										442	20201	101	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, 19 mm, TYPE A (448), AS PER PLAN (SEE SHEET 10)
										1							448	46024	1	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22 (DRIVEWAYS)
									2	1		3					448	48020	6	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22 (DRIVEWAYS)
																					TRAFFIC CONTROL
			2									4					630	84900	6	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL
			2									4					630	86002	6	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL
			0.65														642	00090	0.65	MILE	EDGE LINE
			0.33														642	00290	0.33	MILE	CENTER LINE
																					CAST-IN-PLACE STRUCTURES
														LUMP	LUMP	LUMP	503	11100	LUMP		COFFERDAMS, CRIBS AND SHEETING
														LUMP	LUMP	LUMP	503	21300	LUMP		UNCLASSIFIED EXCAVATION
																14	510	10000	14	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT
																171	512	33000	171	SQ YD	TYPE 2 WATERPROOFING
																11	512	44400	11	SQ YD	TYPE B WATERPROOFING
																32	516	13600	32	SQ FT	1" PREFORMED EXPANSION JOINT FILLER
														LUMP		LUMP	518	21230	LUMP		POROUS BACKFILL WITH FILTER FABRIC
										12					4		601	11000	16	SQ YD	RIPRAP USING 6" REINFORCED CONCRETE SLAB
										1.7	0.7			46.8	6.3	52.0	602	20000	107.5	CU YD	CONCRETE MASONRY
															60		603	10200	60	FT	24" CONDUIT, TYPE A
										82							603	16200	82	FT	36" CONDUIT, TYPE A
														116			603	20700	116	FT	48" CONDUIT, TYPE A
																70	603	94710	70	FT	6'X5' CONDUIT, TYPE A, 706.05 (3" MINIMUM COVER)
														39		36	512	10100	75	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)
																					MAINTENANCE OF TRAFFIC
			0.33														614	21400	0.33	MILE	WORK ZONE CENTERLINE, CLASS II
		10															616	10000	10	M GAL	WATER
																	SPECIAL	10810000	LUMP		CPM PROGRESS SCHEDULE
		LUMP															614	11000	LUMP		MAINTAINING TRAFFIC
																	619	16010	6	MONTH	FIELD OFFICE, TYPE B
																	623	10000	LUMP		CONSTRUCTION LAYOUT STAKES
																	624	10000	LUMP		MOBILIZATION

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

GENERAL SUMMARY

SAN-19-2.43/13.68/13.75
SAN-635-1.60

ITEM 659 - WATER

SAN-19-2.43

3149 S.Y. * 9 S.F./S.Y. * 300 GAL/1000 S.F. * 2 APPLICATIONS * 1 MGAL/1000 GAL = 17 M.GAL □

SAN-19/13.68

1440 S.Y. * 9 S.F./S.Y. * 300 GAL/1000 S.F. * 2 APPLICATIONS * 1 MGAL/1000 GAL = 8 M.GAL □

SAN-19/13.75

1338 S.Y. * 9 S.F./S.Y. * 300 GAL/1000 S.F. * 2 APPLICATIONS * 1 MGAL/1000 GAL = 7 M.GAL □

SAN-635-1.60

3973 S.Y. * 9 S.F./S.Y. * 300 GAL/1000 S.F. * 2 APPLICATIONS * 1 MGAL/1000 GAL = 21 M.GAL □

53 M.GAL □

ITEM 659 - COMMERCIAL FERTILIZER

SAN-19-2.43

3149 S.Y. * 9 S.F./S.Y. * 30 LBS/1000 S.F. * 1 TON/2000 LB = 0.43 TON □

SAN-19/13.68

1440 S.Y. * 9 S.F./S.Y. * 30 LBS/1000 S.F. * 1 TON/2000 LB = 0.19 TON □

SAN-19/13.75

1338 S.Y. * 9 S.F./S.Y. * 30 LBS/1000 S.F. * 1 TON/2000 LB = 0.18 TON □

SAN-635-1.60

3973 S.Y. * 9 S.F./S.Y. * 30 LBS/1000 S.F. * 1 TON/2000 LB = 0.54 TON □

1.34 TON □

ITEM 659 - TOPSOIL

SAN-19-2.43

3149 S.Y. * 111 C.Y./1000 S.Y. = 350 C.Y. □

SAN-19/13.68

1440 S.Y. * 111 C.Y./1000 S.Y. = 160 C.Y. □

SAN-19/13.75

1338 S.Y. * 111 C.Y./1000 S.Y. = 149 C.Y. □

SAN-635-1.60

3973 S.Y. * 111 C.Y./1000 S.Y. = 441 C.Y. □

1100 C.Y. □

□ - QUANTITIES CARRIED TO SHEET 10

PAVEMENT MARKINGS

STATION FROM	STATION TO OR AT	LENGTH (FT)	642 EDGE LINE (WHITE)	642 CENTERLINE DASHED (YELLOW)	614 WORK ZONE CENTERLINE, CLASS II
			MILE	MILE	MILE
SAN-19-2.43					
8+25	14+10	585	0.22	0.11	0.11
SAN-19/13.68					
721+10	723+56	246	0.09	0.05	0.05
SAN-19/13.75					
724+70	728+00	330	0.13	0.06	0.06
SAN-635-1.60					
82+40	88+00	560	0.21	0.11	0.11
TOTAL			0.65	0.33	0.33

EARTHWORK

SHEET NO.	203 EXCAVATION	203 EMBANKMENT	659 SEEDING & MULCHING
SAN-19-2.43			
21	141	3	564
22	284	1038	1849
23	129	30	736
SUB-TOTAL	554	1071	3149 □
SAN-19/13.68			
26	176	114	713
27	124	151	727
SUB-TOTAL	300	265	1440 □
SAN-19/13.75			
29	73	24	483
30	169	57	855
SUB-TOTAL	242	81	1338 □
SAN-635-1.60			
33	134	74	688
34	885	462	1799
35	433	236	1486 □
SUB-TOTAL	1452	772	3973
TOTAL	2548	2189	9900 □

ITEM 605 AGGREGATE DRAIN

STATION	SIDE	LENGTH (FT)	STATION	SIDE	LENGTH (FT)
SAN-19-2.43			**SAN-19/13.75**		
13+00	RT	7	727+53	RT	10
12+50	RT	11	727+03	RT	10
12+00	RT	17	726+53	RT	10
11+50	RT	15	726+03	RT	10
11+00	RT	14	725+53	RT	10
10+50	RT	14			
10+25	LT	10			
SUB-TOTAL		88	SUB-TOTAL		50
SAN-19/13.68			**SAN-635-1.60**		
723+05	RT	8	86+25	RT	7
722+80	LT	8	85+75	RT	7
722+55	RT	8	85+25	RT	8
722+30	LT	8	85+00	LT	15
722+05	RT	8	84+75	RT	14
721+80	LT	8	84+25	RT	20
			84+00	LT	14
			83+50	LT	9
SUB-TOTAL		48	SUB-TOTAL		94
			TOTAL		280

SHEET NO.	REF NO	STATION FROM	STATION TO OR AT	SIDE	REMOVALS 202 PAVEMENT REMOVED, ASPHALT	202 PIPE REMOVED, 24" & UNDER	202 GUARDRAIL REMOVED	202 PIPE REMOVED, OVER 24"	202 HEADWALL REMOVED	630 REMOVAL OF GRD. MTD. SIGN & DISPOSAL	630 REMOVAL OF GRD. MTD. POST SUPPORT & DISPOSAL	EROSION CONTROL 601 ROCK CHANNEL PROTECTION TYPE C W/FABRIC FILTER	670 DITCH EROSION PROTECTION	836 SEED & EROSION CONTROL W/TURF REINFORCING MAT TYPE 1	836 TYPE 2	836 TYPE 3
					S.Y.	FT	FT	FT	EACH	EACH	EACH	CU YD	SQ YD	SQ YD	SQ YD	SQ YD
25	1-R	721+25.58	723+55.40	LT&RT	302											
25	2-R	721+39	721+70	RT		31										
25	3-R	721+76	723+33	RT			157			1	1					
25	4-R	721+92	723+47	LT			155			1	1					
25	5-R		722+84	LT&RT				50	2							
25	6-R	721+41	721+79	LT		38										
25	7-R	721+01	721+21	LT		20										
25	8-R	722+40	722+64	RT		24										
25	1-E	721+82	722+00	LT										16		
25	2-E	722+50	722+99	LT											43	
25	3-E	721+77	722+50	RT									65			
25	4-E	722+50	723+00	RT												44
25	5-E	722+97	723+06	LT								4				
TOTAL					302	113	312	50	2	2	2	4	65	16	43	44

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Walnut Street, Lima, Ohio 45801 419-221-1153

CALCULATED RLM
CHECKED BLW

SUB-SUMMARIES

SAN-19-2.43/13.68/13.75
SAN-635-1.60

ROADWAY

℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 6" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
10+60 TO 12+40	26.00' * 180.00' * 1 1/2" / 12 ÷ 27 = 21.67 C.Y.	26.00' * 180.00' * 0.04 GAL. / S.Y. ÷ 9 = 20.80 GAL.	26.00' * 180.00' * 1 1/2" / 12 ÷ 27 = 21.67 C.Y.	26.00' * 180.00' * 0.075 GAL. / S.Y. ÷ 9 = 39.00 GAL.	26.00' * 180.00' * 6" / 12 ÷ 27 = 86.67 C.Y.	26.00' * 180.00' * 0.4 GAL. / S.Y. ÷ 9 = 208.00 GAL.	26.00' * 180.00' * 6" / 12 ÷ 27 = 86.67 C.Y.	26.00' * 180.00' ÷ 9 = 520.00 S.Y.
SUB-TOTAL	21.67 C.Y.	20.80 GAL.	21.67 C.Y.	39.00 GAL.	86.67 C.Y.	208.00 GAL.	86.67 C.Y.	520.00 S.Y.

SHOULDER

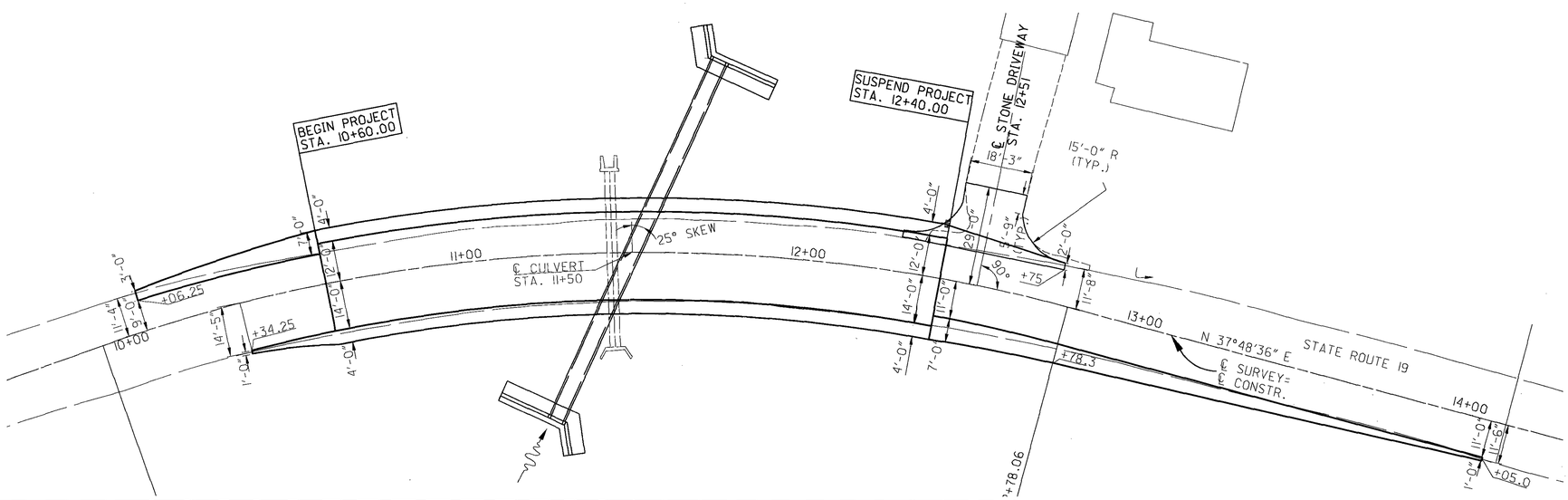
℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE AT, 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 6" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.
10+06.25 TO 10+60, LT.	3.00' + 7.00' / 2 * 53.75' * 1 1/2" / 12 ÷ 27 = 1.24 C.Y.	3.00' + 7.00' / 2 * 53.75' * 0.04 GAL. / S.Y. ÷ 9 = 1.19 GAL.	3.00' + 7.00' / 2 * 53.75' * 1 1/2" / 12 ÷ 27 = 1.24 C.Y.	3.00' + 7.00' / 2 * 53.75' * 0.075 GAL / S.Y. ÷ 9 = 2.24 GAL.	3.33' + 7.33' / 2 * 53.75' * 6" / 12 ÷ 27 = 5.31 C.Y.	3.33' + 7.33' / 2 * 53.75' * 0.4 GAL. / S.Y. ÷ 9 = 12.74 GAL.
10+34.25 TO 10+60, RT.	1.00' + 4.00' / 2 * 25.75' * 1 1/2" / 12 ÷ 27 = 0.30 C.Y.	1.00' + 4.00' / 2 * 25.75' * 0.04 GAL. / S.Y. ÷ 9 = 0.29 GAL.	1.00' + 4.00' / 2 * 25.75' * 1 1/2" / 12 ÷ 27 = 0.30 C.Y.	1.00' + 4.00' / 2 * 25.75' * 0.075 GAL / S.Y. ÷ 9 = 0.54 GAL.	1.33' + 4.33' / 2 * 25.75' * 6" / 12 ÷ 27 = 1.35 C.Y.	1.33' + 4.33' / 2 * 25.75' * 0.4 GAL. / S.Y. ÷ 9 = 3.24 GAL.
10+60 TO 12+40	8.00' * 180.00' * 1 1/2" / 12 ÷ 27 = 6.67 C.Y.	8.00' * 180.00' * 0.04 GAL. / S.Y. ÷ 9 = 6.40 GAL.	8.00' * 180.00' * 1 1/2" / 12 ÷ 27 = 6.67 C.Y.	8.00' * 180.00' * 0.075 GAL / S.Y. ÷ 9 = 12.00 GAL.	8.67' * 180.00' * 6" / 12 ÷ 27 = 28.89 C.Y.	8.67' * 180.00' * 0.4 GAL. / S.Y. ÷ 9 = 69.33 GAL.
12+40 TO 12+75, LT.	4.00' + 2.00' / 2 * 35.00' * 1 1/2" / 12 ÷ 27 = 0.49 C.Y.	4.00' + 2.00' / 2 * 35.00' * 0.04 GAL. / S.Y. ÷ 9 = 0.47 GAL.	4.00' + 2.00' / 2 * 35.00' * 1 1/2" / 12 ÷ 27 = 0.49 C.Y.	4.00' + 2.00' / 2 * 35.00' * 0.075 GAL / S.Y. ÷ 9 = 0.88 GAL.	4.33' + 2.33' / 2 * 35.00' * 6" / 12 ÷ 27 = 2.16 C.Y.	4.33' + 2.33' / 2 * 35.00' * 0.4 GAL. / S.Y. ÷ 9 = 5.19 GAL.
12+40 TO 14+05, RT.	7.00' + 1.00' / 2 * 165.00' * 1 1/2" / 12 ÷ 27 = 3.06 C.Y.	7.00' + 1.00' / 2 * 165.00' * 0.04 GAL. / S.Y. ÷ 9 = 2.93 GAL.	7.00' + 1.00' / 2 * 165.00' * 1 1/2" / 12 ÷ 27 = 3.06 C.Y.	7.00' + 1.00' / 2 * 165.00' * 0.075 GAL / S.Y. ÷ 9 = 5.50 GAL.	7.33' + 1.33' / 2 * 165.00' * 6" / 12 ÷ 27 = 13.24 C.Y.	7.33' + 1.33' / 2 * 165.00' * 0.4 GAL. / S.Y. ÷ 9 = 31.78 GAL.
SUB-TOTAL	11.76 C.Y.	11.28 GAL.	11.76 C.Y.	21.16 GAL.	50.95 C.Y.	122.28 GAL.

℄ CONST. STA.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
10+06.25 TO 10+60, LT.	3.83' + 7.83' / 2 * 53.75' * 6" / 12 ÷ 27 = 5.81 C.Y.	4.50' + 8.50' / 2 * 53.75' ÷ 9 = 38.82 S.Y.
10+34.25 TO 10+60, RT.	1.83' + 4.83' / 2 * 25.75' * 6" / 12 ÷ 27 = 1.59 C.Y.	2.50' + 5.50' / 2 * 25.75' ÷ 9 = 11.44 S.Y.
10+60 TO 12+40	9.67' * 180.00' * 6" / 12 ÷ 27 = 32.22 C.Y.	11.00' * 180.00' ÷ 9 = 220.00 S.Y.
12+40 TO 12+75, LT.	4.83' + 2.83' / 2 * 35.00' * 6" / 12 ÷ 27 = 2.48 C.Y.	5.50' + 3.50' / 2 * 35.00' ÷ 9 = 17.50 S.Y.
12+40 TO 14+05, RT.	7.83' + 1.83' / 2 * 165.00' * 6" / 12 ÷ 27 = 14.77 C.Y.	8.50' + 2.50' / 2 * 165.00' ÷ 9 = 100.83 S.Y.
SUB-TOTAL	56.87 C.Y.	388.59 S.Y.

SUB SUMMARY

	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 6" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
	21.67 C.Y.	20.80 GAL.	21.67 C.Y.	39.00 GAL.	86.67 C.Y.	208.00 GAL.	86.67 C.Y.	520.00 S.Y.
	11.76 C.Y.	11.28 GAL.	11.76 C.Y.	21.16 GAL.	50.95 C.Y.	122.28 GAL.	56.87 C.Y.	388.59 S.Y.
TOTALS	33.43 C.Y.	32.08 GAL.	33.43 C.Y.	60.16 GAL.	137.62 C.Y.	330.28 GAL.	143.54 C.Y.	908.59 S.Y.

QUANTITIES CARRIED TO GENERAL SUMMARY



DESIGN AGENCY

KOHLI & KALIMER ASSOCIATES, INC.
ENGINEERS & SURVEYORS
5115 Backlick Road, Annandale, Virginia 22003 (703)271-1155

0 10 20 40 SCALE IN FEET

CALCULATED RLM
CHECKED BLW

PAVEMENT CALCULATIONS - SAN-19-2.43
CULVERT NO. SAN-19-0243

SAN-19-2.43/13.68/13.75
SAN-635-1.60

15
57

ROADWAY

℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 8" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.	ITEM 304 - 8" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
722+50 TO 723+15	24.00' * 65.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 7.22 C.Y.	24.00' * 65.00' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 6.93 GAL.	24.00' * 65.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 7.22 C.Y.	24.00' * 65.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 13.00 GAL.	24.00' * 65.00' * $\frac{8"}{12}$ ÷ 27 = 38.52 C.Y.	24.00' * 65.00' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 69.33 GAL.	24.00' * 65.00' * $\frac{6"}{12}$ ÷ 27 = 28.89 C.Y.	24.00' * 65.00' ÷ 9 = 173.33 S.Y.
SUB-TOTAL	7.22 C.Y.	6.93 GAL.	7.22 C.Y.	13.00 GAL.	38.52 C.Y.	69.33 GAL.	28.89 C.Y.	173.33 S.Y.

SHOULDER

℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A, (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT AT 0.075 GAL./S.Y.	ITEM 301 - 8" ASPHALT CONCRETE BASE, PG64-22	ITEM 408 - PRIME COAT AT 0.4 GAL./S.Y.
721+18.50 TO 721+44.75, RT.	$\frac{1.00' + 8.00'}{2}$ * 26.25' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.55 C.Y.	$\frac{1.00' + 8.00'}{2}$ * 26.25' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 0.53 GAL.	$\frac{1.00' + 8.00'}{2}$ * 26.25' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.55 C.Y.	$\frac{1.00' + 8.00'}{2}$ * 26.25' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 0.98 GAL.	$\frac{1.33' + 8.33'}{2}$ * 26.25' * $\frac{8"}{12}$ ÷ 27 = 3.13 C.Y.	$\frac{1.33' + 8.33'}{2}$ * 26.25' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 5.64 GAL.
721+44.75 TO 722+27.40, RT.	8.00' * 82.65' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 3.06 C.Y.	8.00' * 82.65' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 2.94 GAL.	8.00' * 82.65' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 3.06 C.Y.	8.00' * 82.65' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 5.51 GAL.	8.33' * 82.65' * $\frac{8"}{12}$ ÷ 27 = 17.00 C.Y.	8.33' * 82.65' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 30.60 GAL.
722+27.40 TO 723+09, RT.	$\frac{8.00' + 1.00'}{2}$ * 81.60' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.70 C.Y.	$\frac{8.00' + 1.00'}{2}$ * 81.60' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 1.63 GAL.	$\frac{8.00' + 1.00'}{2}$ * 81.60' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.70 C.Y.	$\frac{8.00' + 1.00'}{2}$ * 81.60' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 3.06 GAL.	$\frac{8.33' + 1.33'}{2}$ * 81.60' * $\frac{8"}{12}$ ÷ 27 = 9.73 C.Y.	$\frac{8.33' + 1.33'}{2}$ * 81.60' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 17.52 GAL.
723+09 TO 723+15, RT.	1.00' * 6.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.03 C.Y.	1.00' * 6.00' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 0.03 GAL.	1.00' * 6.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.03 C.Y.	1.00' * 6.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 0.05 GAL.	1.33' * 6.00' * $\frac{8"}{12}$ ÷ 27 = 0.20 C.Y.	1.33' * 6.00' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 0.35 GAL.
721+25.58 TO 721+93.66, LT.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 25^2}{4})\right]+\left[2.0'*18.08'\right]\right\}$ * $\frac{1\ 1/2"}{12}$ ÷27= 3.50 C.Y.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 25^2}{4})\right]+\left[2.0'*18.08'\right]\right\}$ * $\frac{0.04\ GAL.}{S.Y.}$ ÷9= 3.36 GAL.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 25^2}{4})\right]+\left[2.0'*18.08'\right]\right\}$ * $\frac{1\ 1/2"}{12}$ ÷27= 3.50 C.Y.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 25^2}{4})\right]+\left[2.0'*18.08'\right]\right\}$ * $\frac{0.075\ GAL.}{S.Y.}$ ÷9= 6.30 GAL.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 24.67^2}{4})\right]+\left[2.0'*18.75'\right]\right\}$ * $\frac{8"}{12}$ ÷27= 19.37 C.Y.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 24.67^2}{4})\right]+\left[2.0'*18.75'\right]\right\}$ * $\frac{0.4\ GAL.}{S.Y.}$ ÷9= 34.82 GAL.
721+82* TO 722+97, LT.	8.00' * 115.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 4.26 C.Y.	8.00' * 115.00' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 4.09 GAL.	8.00' * 115.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 4.26 C.Y.	8.00' * 115.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 7.67 GAL.	8.33' * 115.00' * $\frac{8"}{12}$ ÷ 27 = 23.65 C.Y.	8.33' * 115.00' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 42.58 GAL.
722+97 TO 723+55.4, LT.	$\frac{8.00' + 3.00'}{2}$ * 58.40' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.49 C.Y.	$\frac{8.00' + 3.00'}{2}$ * 58.40' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 1.43 GAL.	$\frac{8.00' + 3.00'}{2}$ * 58.40' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.49 C.Y.	$\frac{8.00' + 3.00'}{2}$ * 58.40' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 2.68 GAL.	$\frac{8.33' + 3.33'}{2}$ * 58.40' * $\frac{8"}{12}$ ÷ 27 = 8.41 C.Y.	$\frac{8.33' + 3.33'}{2}$ * 58.40' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 15.13 GAL.
SUB-TOTAL	14.59 C.Y.	14.01 GAL.	14.59 C.Y.	26.25 GAL.	81.49 C.Y.	146.64 GAL.

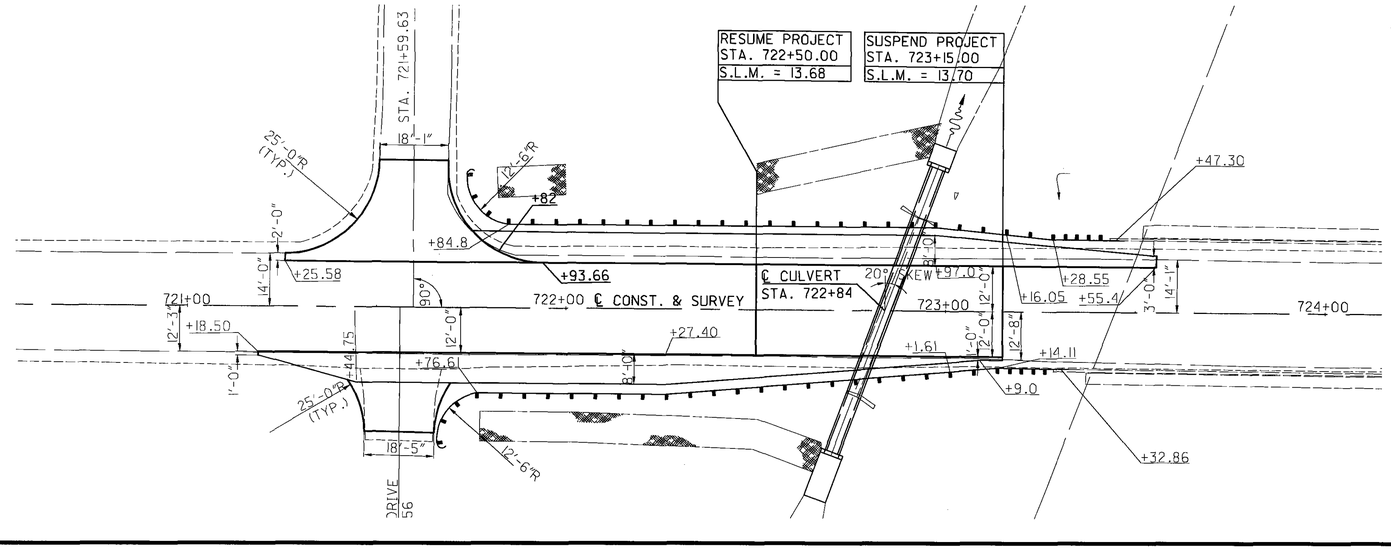
℄ CONST. STA.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
721+18.50 TO 721+44.75, RT.	$\frac{2.00' + 9.00'}{2}$ * 26.25' * $\frac{6"}{12}$ ÷ 27 = 2.67. C.Y.	$\frac{2.50' + 9.50'}{2}$ * 26.25' ÷ 9 = 17.50 S.Y.
721+44.75 TO 722+27.40, RT.	9.00' * 82.65' * $\frac{6"}{12}$ ÷ 27 = 13.78 C.Y.	9.50' * 82.65' ÷ 9 = 87.24 S.Y.
722+27.40 TO 723+09, RT.	$\frac{9.00' + 2.00'}{2}$ * 81.60' * $\frac{6"}{12}$ ÷ 27 = 8.31 C.Y.	$\frac{9.50' + 2.50'}{2}$ * 81.60' ÷ 9 = 54.40 S.Y.
723+09 TO 723+15, RT.	2.00' * 6.00' * $\frac{6"}{12}$ ÷ 27 = 0.22 C.Y.	2.50' * 6.00' ÷ 9 = 1.67 S.Y.
721+25.58 TO 721+93.66, LT.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 24.0^2}{4})\right]+\left[2.0'*20.08'\right]\right\}$ * $\frac{6"}{12}$ ÷27= 15.51 C.Y.	$\left\{\left[(25.0'*68.08')-2(\frac{\pi 23.5^2}{4})\right]+\left[2.0'*21.08'\right]\right\}$ ÷ 9 = 97.41 S.Y.
721+82* TO 722+97, LT.	9.00' * 115.00' * $\frac{6"}{12}$ ÷ 27 = 19.17 C.Y.	9.50' * 115.00' ÷ 9 = 121.39 S.Y.
722+97 TO 723+55.4, LT.	$\frac{9.00' + 4.00'}{2}$ * 58.40' * $\frac{6"}{12}$ ÷ 27 = 7.03 C.Y.	$\frac{9.50 + 4.50'}{2}$ * 58.40' ÷ 9 = 45.42 S.Y.
SUB-TOTAL	66.69 C.Y.	425.03 S.Y.

* MIDPOINT OF CURVE

SUB SUMMARY

	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT AT 0.075 GAL./S.Y.	ITEM 301 8" ASPHALT CONCRETE BASE, PG64-22	ITEM 408 PRIME COAT AT 0.4 GAL./S.Y.	ITEM 304 6" AGGREGATE BASE	ITEM 204 SUBGRADE COMPACTION
	7.22 C.Y.	6.93 GAL.	7.22 C.Y.	13.00 GAL.	38.52 C.Y.	69.33 GAL.	28.89 C.Y.	173.33 S.Y.
	14.59 C.Y.	14.01 GAL.	14.59 C.Y.	26.25 GAL.	81.49 C.Y.	146.64 GAL.	66.69 C.Y.	425.03 S.Y.
TOTALS	21.81 C.Y.	20.94 GAL.	21.81 C.Y.	39.25 GAL.	120.01 C.Y.	215.97 GAL.	95.58 C.Y.	598.36 S.Y.

QUANTITIES CARRIED TO GENERAL SUMMARY



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DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

SCALE IN FEET 0 10 20 40

CALCULATED RLM
CHECKED BLW

PAVEMENT CALCULATIONS - SAN-19-13.68
CULVERT NO. SAN-19-1369

SAN-19-2.43/13.68/13.75
SAN-635-1.60

16
57

ROADWAY

℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 8" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.	ITEM 304 - 8" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
726+00 TO 726+75	24.00' * 75.00' * 1 1/2" / 12 ÷ 27 = 8.33 C.Y.	24.00' * 75.00' * 0.04 GAL / S.Y. ÷ 9 = 8.00 GAL.	24.00' * 75.00' * 1 1/2" / 12 ÷ 27 = 8.33 C.Y.	24.00' * 75.00' * 0.075 GAL. / S.Y. ÷ 9 = 15.00 GAL.	24.00' * 75.00' * 8" / 12 ÷ 27 = 44.44 C.Y.	24.00' * 75.00' * 0.4 GAL. / S.Y. ÷ 9 = 80.00 GAL.	24.00' * 75.00' * 6" / 12 ÷ 27 = 33.33 C.Y.	24.00' * 75.00' ÷ 9 = 200.00 S.Y.
SUB-TOTAL	8.33 C.Y.	8.00 GAL.	8.33 C.Y.	15.00 GAL.	44.44 C.Y.	80.00 GAL.	33.33 C.Y.	200.00 S.Y.

SHOULDER

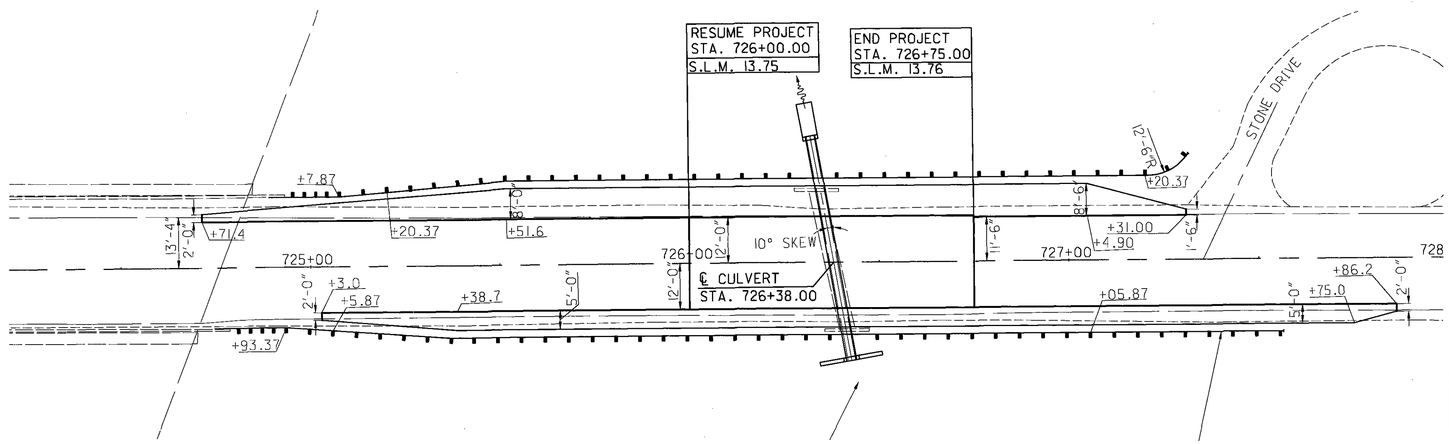
℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A, (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT AT 0.075 GAL./S.Y.	ITEM 301 - 8" ASPHALT CONCRETE BASE, PG64-22	ITEM 408 - PRIME COAT AT 0.4 GAL./S.Y.
725+03 TO 725+38.7, RT	2.00' + 5.00' / 2 * 35.70' * 1 1/2" / 12 ÷ 27 = 0.58 C.Y.	2.00' + 5.00' / 2 * 35.70' * 0.04 GAL. / S.Y. ÷ 9 = 0.56 GAL.	2.00' + 5.00' / 2 * 35.70' * 1 1/2" / 12 ÷ 27 = 0.58 C.Y.	2.00' + 5.00' / 2 * 35.70' * 0.075 GAL. / S.Y. ÷ 9 = 1.04 GAL.	2.33' + 5.33' / 2 * 35.70' * 8" / 12 ÷ 27 = 3.38 C.Y.	2.33' + 5.33' / 2 * 35.70' * 0.4 GAL. / S.Y. ÷ 9 = 6.08 GAL.
725+38.7 TO 727+75, RT	5.00' * 236.30' * 1 1/2" / 12 ÷ 27 = 5.47 C.Y.	5.00' * 236.30' * 0.04 GAL. / S.Y. ÷ 9 = 5.25 GAL.	5.00' * 236.30' * 1 1/2" / 12 ÷ 27 = 5.47 C.Y.	5.00' * 236.30' * 0.075 GAL. / S.Y. ÷ 9 = 9.85 GAL.	5.33' * 236.30' * 8" / 12 ÷ 27 = 31.10 C.Y.	5.33' * 236.30' * 0.4 GAL. / S.Y. ÷ 9 = 55.98 GAL.
727+75 TO 727+86.2, RT	5.00' + 2.00' / 2 * 11.20' * 1 1/2" / 12 ÷ 27 = 0.18 C.Y.	5.00' + 2.00' / 2 * 11.20' * 0.04 GAL. / S.Y. ÷ 9 = 0.17 GAL.	5.00' + 2.00' / 2 * 11.20' * 1 1/2" / 12 ÷ 27 = 0.18 C.Y.	5.00' + 2.00' / 2 * 11.20' * 0.075 GAL. / S.Y. ÷ 9 = 0.33 GAL.	5.33' + 2.33' / 2 * 11.20' * 8" / 12 ÷ 27 = 1.06 C.Y.	5.33' + 2.33' / 2 * 11.20' * 0.4 GAL. / S.Y. ÷ 9 = 1.91 GAL.
724+71.4 TO 725+51.6, LT	2.00' + 8.00' / 2 * 80.20' * 1 1/2" / 12 ÷ 27 = 1.86 C.Y.	2.00' + 8.00' / 2 * 80.20' * 0.04 GAL. / S.Y. ÷ 9 = 1.78 GAL.	2.00' + 8.00' / 2 * 80.20' * 1 1/2" / 12 ÷ 27 = 1.86 C.Y.	2.00' + 8.00' / 2 * 80.20' * 0.075 GAL. / S.Y. ÷ 9 = 3.34 GAL.	2.33' + 8.33' / 2 * 80.20' * 8" / 12 ÷ 27 = 10.55 C.Y.	2.33' + 8.33' / 2 * 80.20' * 0.4 GAL. / S.Y. ÷ 9 = 19.00 GAL.
725+51.6 TO 726+75, LT	8.00' * 123.40' * 1 1/2" / 12 ÷ 27 = 4.57 C.Y.	8.00' * 123.40' * 0.04 GAL. / S.Y. ÷ 9 = 4.39 GAL.	8.00' * 123.40' * 1 1/2" / 12 ÷ 27 = 4.57 C.Y.	8.00' * 123.40' * 0.075 GAL. / S.Y. ÷ 9 = 8.23 GAL.	8.33' * 123.40' * 8" / 12 ÷ 27 = 25.38 C.Y.	8.33' * 123.40' * 0.4 GAL. / S.Y. ÷ 9 = 45.69 GAL.
726+75 TO 727+04.9, LT	8.50' * 29.90' * 1 1/2" / 12 ÷ 27 = 1.18 C.Y.	8.50' * 29.90' * 0.04 GAL. / S.Y. ÷ 9 = 1.13 GAL.	8.50' * 29.90' * 1 1/2" / 12 ÷ 27 = 1.18 C.Y.	8.50' * 29.90' * 0.075 GAL. / S.Y. ÷ 9 = 2.12 GAL.	8.83' * 29.90' * 8" / 12 ÷ 27 = 6.52 C.Y.	8.83' * 29.90' * 0.4 GAL. / S.Y. ÷ 9 = 11.73 GAL.
727+04.9 TO 727+31, LT	8.50' + 1.50' / 2 * 26.10' * 1 1/2" / 12 ÷ 27 = 0.60 C.Y.	8.50' + 1.50' / 2 * 26.10' * 0.04 GAL. / S.Y. ÷ 9 = 0.58 GAL.	8.50' + 1.50' / 2 * 26.10' * 1 1/2" / 12 ÷ 27 = 0.60 C.Y.	8.50' + 1.50' / 2 * 26.10' * 0.075 GAL. / S.Y. ÷ 9 = 1.09 GAL.	8.83' + 1.83' / 2 * 26.10' * 8" / 12 ÷ 27 = 3.43 C.Y.	8.83' + 1.83' / 2 * 26.10' * 0.4 GAL. / S.Y. ÷ 9 = 6.18 GAL.
SUB-TOTAL	14.44 C.Y.	13.86 GAL.	14.44 C.Y.	26.00 GAL.	81.42 C.Y.	146.57 GAL.

℄ CONST. STA.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
725+03 TO 725+38.7, RT	3.00' + 6.00' / 2 * 35.70' * 6" / 12 ÷ 27 = 2.98 C.Y.	3.50' + 6.50' / 2 * 35.70' ÷ 9 = 19.83 S.Y.
725+38.7 TO 727+75, RT	6.00' * 236.30' * 6" / 12 ÷ 27 = 26.26 C.Y.	6.50' * 236.30' ÷ 9 = 170.66 S.Y.
727+75 TO 727+86.2, RT	6.00' + 3.00' / 2 * 11.20' * 6" / 12 ÷ 27 = 0.93 C.Y.	6.50' + 3.50' / 2 * 11.20' ÷ 9 = 6.22 S.Y.
724+71.4 TO 725+51.6, LT	3.00' + 9.00' / 2 * 80.20' * 6" / 12 ÷ 27 = 8.91 C.Y.	3.50' + 9.50' / 2 * 80.20' ÷ 9 = 57.92 S.Y.
725+51.6 TO 726+75, LT	9.00' * 123.40' * 6" / 12 ÷ 27 = 20.57 C.Y.	9.50' * 123.40' ÷ 9 = 130.26 S.Y.
726+75 TO 727+04.9, LT	9.50' * 29.90' * 6" / 12 ÷ 27 = 5.26 C.Y.	10.00' * 29.90' ÷ 9 = 33.22 S.Y.
727+04.9 TO 727+31, LT	9.50' + 2.50' / 2 * 26.10' * 6" / 12 ÷ 27 = 2.90 C.Y.	10.00' + 3.00' / 2 * 26.10' ÷ 9 = 18.85 S.Y.
SUB-TOTAL	67.81 C.Y.	436.96 S.Y.

SUB SUMMARY

	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE, AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 8" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
	8.33 C.Y.	8.00 GAL.	8.33 C.Y.	15.00 GAL.	44.44 C.Y.	80.00 GAL.	33.33 C.Y.	200.00 S.Y.
	14.44 C.Y.	13.86 GAL.	14.44 C.Y.	26.00 GAL.	81.42 C.Y.	146.57 GAL.	67.81 C.Y.	436.96 S.Y.
TOTALS	22.77 C.Y.	21.86 GAL.	22.77 C.Y.	41.00 GAL.	125.86 C.Y.	226.57 GAL.	101.14 C.Y.	636.96 S.Y.

QUANTITIES CARRIED TO GENERAL SUMMARY



DESIGN AGENCY
KOHL & KALHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

SCALE IN FEET 0 10 20 40

CALCULATED RLM
CHECKED BLW

PAVEMENT CALCULATIONS - SAN-19-13.75
CULVERT NO. SAN-19-1376

SAN-19-2.43/13.68/13.75
SAN-635-1.60

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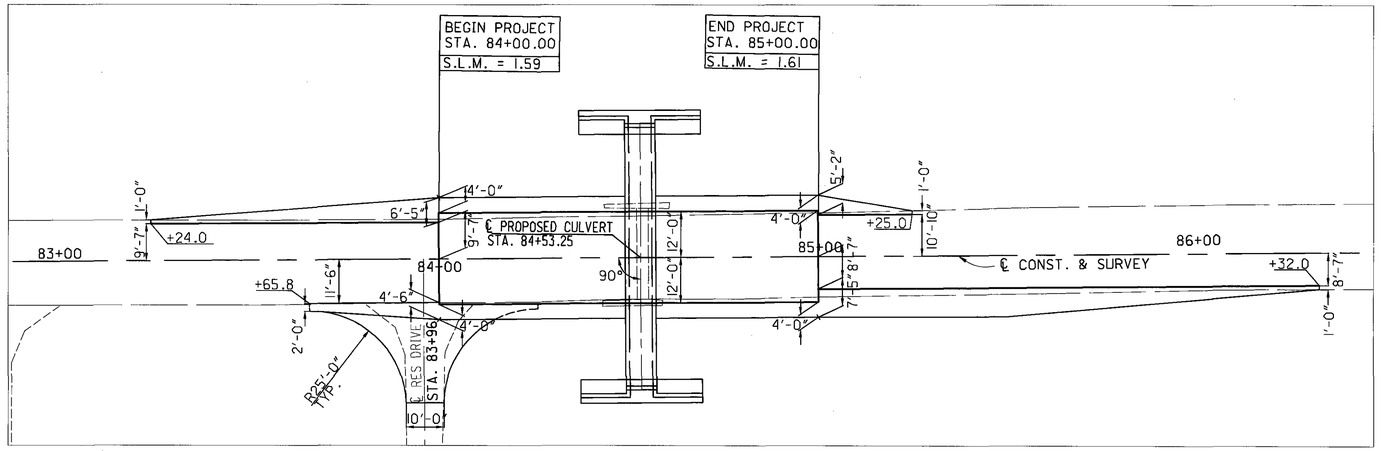
ROADWAY

℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 6" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.
84+00 TO 84+49.25	24.00' * 49.25' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 5.47 C.Y.	24.00' * 49.25' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 5.25 GAL.	24.00' * 49.25' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 5.47 C.Y.	24.00' * 49.25' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 9.85 GAL.	24.00' * 49.25' * $\frac{6"}{12}$ ÷ 27 = 21.89 C.Y.	24.00' * 49.25' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 52.53 GAL.
84+49.25 TO 84+57.25	68.00' * 8.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 2.52 C.Y.	68.00' * 8.00' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 2.42 GAL.	2.75' * 8.00' * $\frac{2\ 1/8" + 5"}{2}$ ÷ 12 ÷ 27 = 0.24 C.Y. 64.00' * 8.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 2.37 C.Y. 1.25' * 8.00' * $\frac{5" + 3\ 3/4"}{2}$ ÷ 12 ÷ 27 = 0.14 C.Y.	64.00' * 8.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 4.27 GAL. 8.50' * 8.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 0.57 GAL. (LT.) 7.25' * 8.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 0.48 GAL. (RT.)	ITEM 302 - 6" ASPHALT CONCRETE BASE, PG64-22, VARIABLE THICKNESS 5.75' * 8.00' * $\frac{3\ 1/2" + 9"}{2}$ ÷ 12 ÷ 27 = 0.89 C.Y. 52.25' * 8.00' * $\frac{6"}{12}$ ÷ 27 = 7.74 C.Y. 6.00' * 8.00' * $\frac{9" + 3\ 1/2"}{2}$ ÷ 12 ÷ 27 = 0.93 C.Y. 9.56 C.Y.	52.25' * 8.00' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 18.58 GAL.
84+57.25 TO 85+00	24.00' * 42.75' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 4.75 C.Y.	24.00' * 42.75' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 4.56 GAL.	24.00' * 42.75' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 4.75 C.Y.	24.00' * 42.75' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 8.55 GAL.	24.00' * 42.75' * $\frac{6"}{12}$ ÷ 27 = 19.00 C.Y.	24.00' * 42.75' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 45.60 GAL.
SUB-TOTAL	12.74 C.Y.	12.23 GAL	12.97 C.Y.	23.72 GAL.	40.89 C.Y.	116.71 GAL.

℄ CONST. STA.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
84+00 TO 84+49.25	24.00' * 49.25' * $\frac{6"}{12}$ ÷ 27 = 21.89 C.Y.	24.00' * 49.25' ÷ 9 = 131.33 S.Y.
84+49.25 TO 84+57.25	9.50' * 8.00' * $\frac{3.0" + 12.4"}{2}$ ÷ 12 ÷ 27 = 1.81 C.Y. 4.00' * 8.00' * $\frac{12.4" + 14.4"}{2}$ ÷ 12 ÷ 27 = 1.32 C.Y. 12.00' * 8.00' * $\frac{14.4" + 17.0"}{2}$ ÷ 12 ÷ 27 = 4.65 C.Y. 12.00' * 8.00' * $\frac{17.0" + 15.0"}{2}$ ÷ 12 ÷ 27 = 4.74 C.Y. 4.00' * 8.00' * $\frac{15.0" + 13.2"}{2}$ ÷ 12 ÷ 27 = 1.39 C.Y. 10.75' * 8.00' * $\frac{13.2" + 3.0"}{2}$ ÷ 12 ÷ 27 = 2.15 C.Y.	N/A
84+57.25 TO 85+00	24.00' * 42.75' * $\frac{6"}{12}$ ÷ 27 = 19.00 C.Y.	24.00' * 42.75' ÷ 9 = 114.00 S.Y.
SUB-TOTAL	56.95 C.Y.	245.33 S.Y.



SHOULDER

℄ CONST. STA.	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 - TACK COAT, AT 0.075 GAL./S.Y.	ITEM 301 - 6" ASPHALT CONCRETE BASE PG64-22	ITEM 408 - PRIME COAT, AT 0.4 GAL./S.Y.
83+24 TO 84+00, LT.	$\frac{1.00' + 6.42'}{2}$ * 76.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.30 C.Y.	$\frac{1.00' + 6.42'}{2}$ * 76.00' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 1.25 GAL.	$\frac{1.00' + 6.42'}{2}$ * 76.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.30 C.Y.	$\frac{1.00' + 6.42'}{2}$ * 76.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 2.35 GAL.	$\frac{1.33' + 6.75'}{2}$ * 76.00' * $\frac{6"}{12}$ ÷ 27 = 5.69 C.Y.	$\frac{1.33' + 6.75'}{2}$ * 76.00' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 13.65 GAL.
83+65.80 TO 84+00, RT.	$\frac{2.00' + 4.50'}{2}$ * 34.20' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.51 C.Y.	$\frac{2.00' + 4.50'}{2}$ * 34.20' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 0.49 GAL.	$\frac{2.00' + 4.50'}{2}$ * 34.20' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.51 C.Y.	$\frac{2.00' + 4.50'}{2}$ * 34.20' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 0.93 GAL.	$\frac{2.33' + 4.83'}{2}$ * 34.20' * $\frac{6"}{12}$ ÷ 27 = 2.27 C.Y.	$\frac{2.33' + 4.83'}{2}$ * 34.20' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 5.45 GAL.
84+00 TO 84+49.25	8.00' * 49.25' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.82 C.Y.	8.00' * 49.25' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 1.75 GAL.	8.00' * 49.25' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.82 C.Y.	8.00' * 49.25' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 3.28 GAL.	8.67' * 49.25' * $\frac{6"}{12}$ ÷ 27 = 7.90 C.Y.	8.67' * 49.25' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 18.97 GAL.
84+57.25 TO 85+00	8.00' * 42.75' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.58 C.Y.	8.00' * 42.75' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 1.52 GAL.	8.00' * 42.75' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 1.58 C.Y.	8.00' * 42.75' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 2.85 GAL.	8.67' * 42.75' * $\frac{6"}{12}$ ÷ 27 = 6.86 C.Y.	8.67' * 42.75' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 16.47 GAL.
85+00 TO 85+25, LT.	$\frac{5.17' + 1.00'}{2}$ * 25.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.36 C.Y.	$\frac{5.17' + 1.00'}{2}$ * 25.00' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 0.34 GAL.	$\frac{5.17' + 1.00'}{2}$ * 25.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 0.36 C.Y.	$\frac{5.17' + 1.00'}{2}$ * 25.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 0.64 GAL.	$\frac{5.50' + 1.33'}{2}$ * 25.00' * $\frac{6"}{12}$ ÷ 27 = 1.58 C.Y.	$\frac{5.50' + 1.33'}{2}$ * 25.00' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 3.80 GAL.
85+00 TO 86+32, RT.	$\frac{7.42' + 1.00'}{2}$ * 132.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 2.57 C.Y.	$\frac{7.42' + 1.00'}{2}$ * 132.00' * $\frac{0.04\ GAL.}{S.Y.}$ ÷ 9 = 2.47 GAL.	$\frac{7.42' + 1.00'}{2}$ * 132.00' * $\frac{1\ 1/2"}{12}$ ÷ 27 = 2.57 C.Y.	$\frac{7.42' + 1.00'}{2}$ * 132.00' * $\frac{0.075\ GAL.}{S.Y.}$ ÷ 9 = 4.63 GAL.	$\frac{7.75' + 1.33'}{2}$ * 132.00' * $\frac{6"}{12}$ ÷ 27 = 11.10 C.Y.	$\frac{7.75' + 1.33'}{2}$ * 132.00' * $\frac{0.4\ GAL.}{S.Y.}$ ÷ 9 = 26.64 GAL.
SUB-TOTAL	8.14 C.Y.	7.82 GAL.	8.14 C.Y.	14.68 GAL.	35.40 C.Y.	84.98 GAL.

℄ CONST. STA.	ITEM 304 - 6" AGGREGATE BASE	ITEM 204 - SUBGRADE COMPACTION
83+24 TO 84+00, LT.	$\frac{1.83' + 7.25'}{2}$ * 76.00' * $\frac{6"}{12}$ ÷ 27 = 6.39 C.Y.	$\frac{2.50' + 7.92'}{2}$ * 76.00' ÷ 9 = 44.00 S.Y.
83+65.80 TO 84+00, RT.	$\frac{2.83' + 5.33'}{2}$ * 34.20' * $\frac{6"}{12}$ ÷ 27 = 2.59 C.Y.	$\frac{3.50' + 6.00'}{2}$ * 34.20' ÷ 9 = 18.05 S.Y.
84+00 TO 84+49.25	9.67' * 49.25' * $\frac{6"}{12}$ ÷ 27 = 8.82 C.Y.	11.00' * 49.25' ÷ 9 = 60.19 S.Y.
84+57.25 TO 85+00	9.67' * 42.75' * $\frac{6"}{12}$ ÷ 27 = 7.65 C.Y.	11.00' * 42.75' ÷ 9 = 52.25 S.Y.
85+00 TO 85+25, LT.	$\frac{6.00' + 1.83'}{2}$ * 25.00' * $\frac{6"}{12}$ ÷ 27 = 1.81 C.Y.	$\frac{6.67' + 2.50'}{2}$ * 25.00' ÷ 9 = 12.73 S.Y.
85+00 TO 86+32, RT.	$\frac{8.25' + 1.83'}{2}$ * 132.00' * $\frac{6"}{12}$ ÷ 27 = 12.32 C.Y.	$\frac{8.92' + 2.50'}{2}$ * 132.00' ÷ 9 = 83.72 S.Y.
SUB-TOTAL	39.58 C.Y.	270.94 S.Y.

SUB SUMMARY

	ITEM 442 - 1 1/2" ASPHALT CONCRETE SURFACE COURSE, 9.5mm, TYPE A (448)	ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE AT 0.04 GAL./S.Y.	ITEM 442 - 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, 19mm, TYPE A (448), AS PER PLAN	ITEM 407 TACK COAT AT 0.075 GAL./S.Y.	ITEM 301 6" ASPHALT CONCRETE BASE, PG64-22	ITEM 302 6" ASPHALT CONCRETE BASE, PG64-22, VARIABLE THICKNESS	ITEM 408 PRIME COAT AT 0.4 GAL./S.Y.	ITEM 304 6" AGGREGATE BASE	ITEM 204 SUBGRADE COMPACTION
	12.74 C.Y.	12.23 GAL.	12.97 C.Y.	23.72 GAL.	40.89 C.Y.	9.56 C.Y.	116.71 GAL.	56.95 C.Y.	245.33 S.Y.
	8.14 C.Y.	7.82 GAL.	8.14 C.Y.	14.68 GAL.	35.40 C.Y.	- - -	84.98 GAL.	39.58 C.Y.	270.94 S.Y.
TOTALS	20.88 C.Y.	20.05 GAL.	21.11 C.Y.	38.40 GAL.	76.29 C.Y.	9.56 C.Y.	201.69 GAL.	96.53 C.Y.	516.27 S.Y.

QUANTITIES CARRIED TO GENERAL SUMMARY

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

SCALE IN FEET 0 10 20 40

CALCULATED RLM
CHECKED BLW

PAVEMENT CALCULATIONS - SAN-635-1.60
CULVERT NO. SAN-635-0160

SAN-19-2.43/13.68/13.75
SAN-635-1.60

18
57

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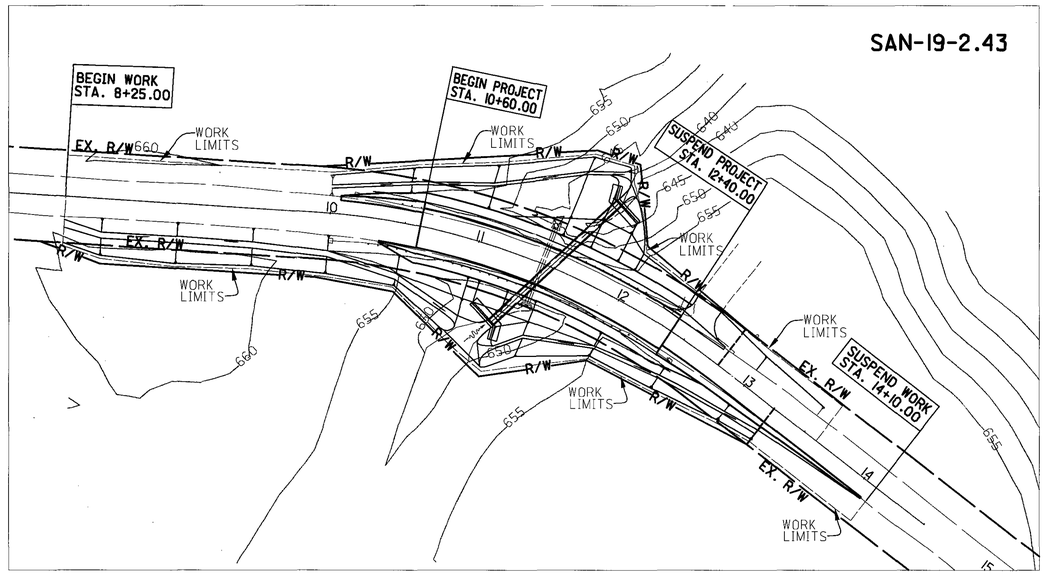
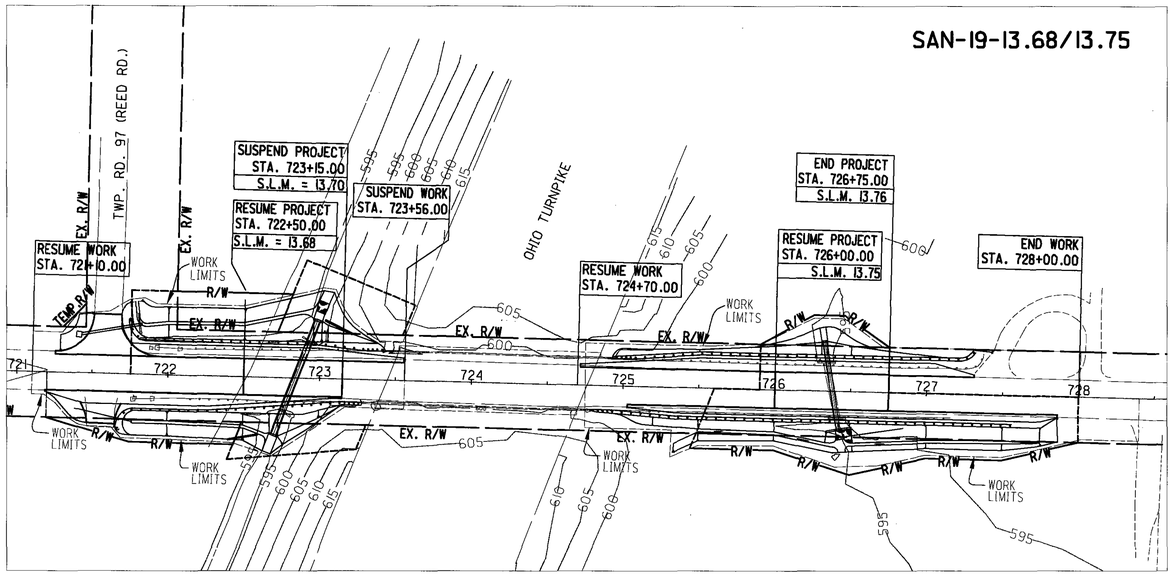
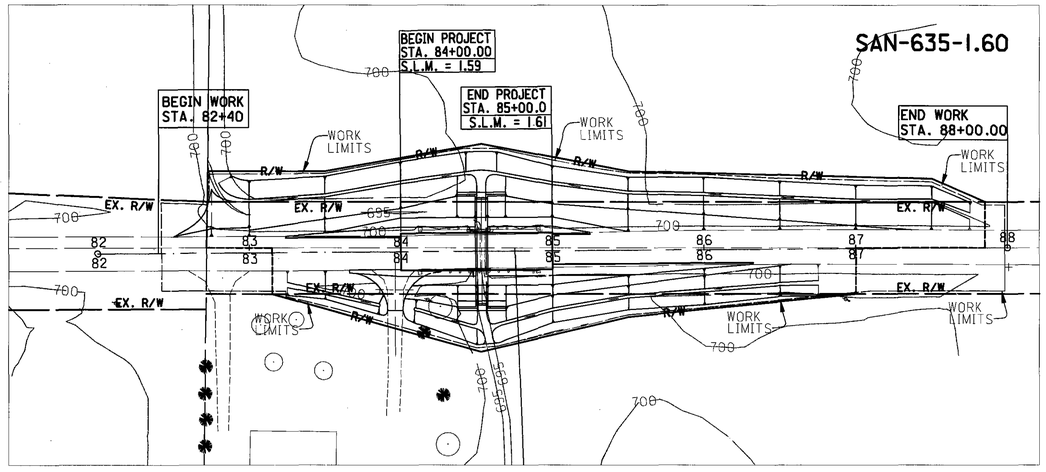






PROJECT DATA					
	SAN-19-2.43	SAN-19-13.68	SAN-19-13.75	SAN-635-1.60	TOTALS
TOTAL AREA (RIGHT-OF-WAY)	1.15 ACRES	0.54 ACRES	0.61 ACRES	1.18 ACRES	3.48 ACRES
PROJECT EARTH DISTURBED AREA:	1.04 ACRES	0.44 ACRES	0.55 ACRES	1.12 ACRES	3.15 ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA:					0.27 ACRES
NOTICE OF INTENT EARTH DISTURBED AREA:					4.90 ACRES
IMPERVIOUS (PAVED) AREA FOR PRE-CONSTRUCTION SITE:	0.11 ACRES	0.07 ACRES	0.05 ACRES	0.07 ACRES	
IMPERVIOUS (PAVED) AREA FOR POST CONSTRUCTION SITE:	0.17 ACRES	0.12 ACRES	0.11 ACRES	0.12 ACRES	
RUNOFF COEFFICIENT FOR PRE-CONSTRUCTION SITE:	0.59	0.61	0.54	0.59	
RUNOFF COEFFICIENT FOR POST CONSTRUCTION SITE:	0.62	0.66	0.61	0.62	
SOIL AND WATER CONSERVATION MAPS:	SEE COUNTY SCS (SEE BELOW)				
IMMEDIATE RECEIVING WATERS:	UNNAMED DITCH	UNNAMED DITCH		TRIBUTARY TO MUSKELLUNGE CREEK	
SUBSEQUENT RECEIVING WATER:	GREEN CREEK	LITTLE MUDDY CREEK		MUSKELLUNGE CREEK	

PROJECT DESCRIPTION

REPLACEMENT OF CULVERTS SAN-19-2.43/13.68/13.75 OVER UNNAMED DITCHES AND CULVERT SAN-635-1.60 OVER TRIBUTARY TO MUSKELLUNGE CREEK WITH IMPROVEMENTS TO APPROACH ROADWAYS.

USGS QUADRANGLE MAPS:

19-2.43
USGS QUADRANT NO. N4115-W8300/7.5
FREMONT EAST, OHIO

19-13.68
USGS QUADRANT NO. N4115-W8315/7.5
HELENA, OHIO

19-13.75
USGS QUADRANT NO. N4115-W8315/7.5
HELENA, OHIO

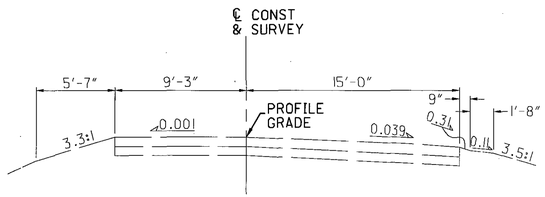
635-1.60
USGS QUADRANT NO. N4122.5-W8307.5/7.5
LINDSEY, OHIO

0 20 40 80
SCALE IN FEET

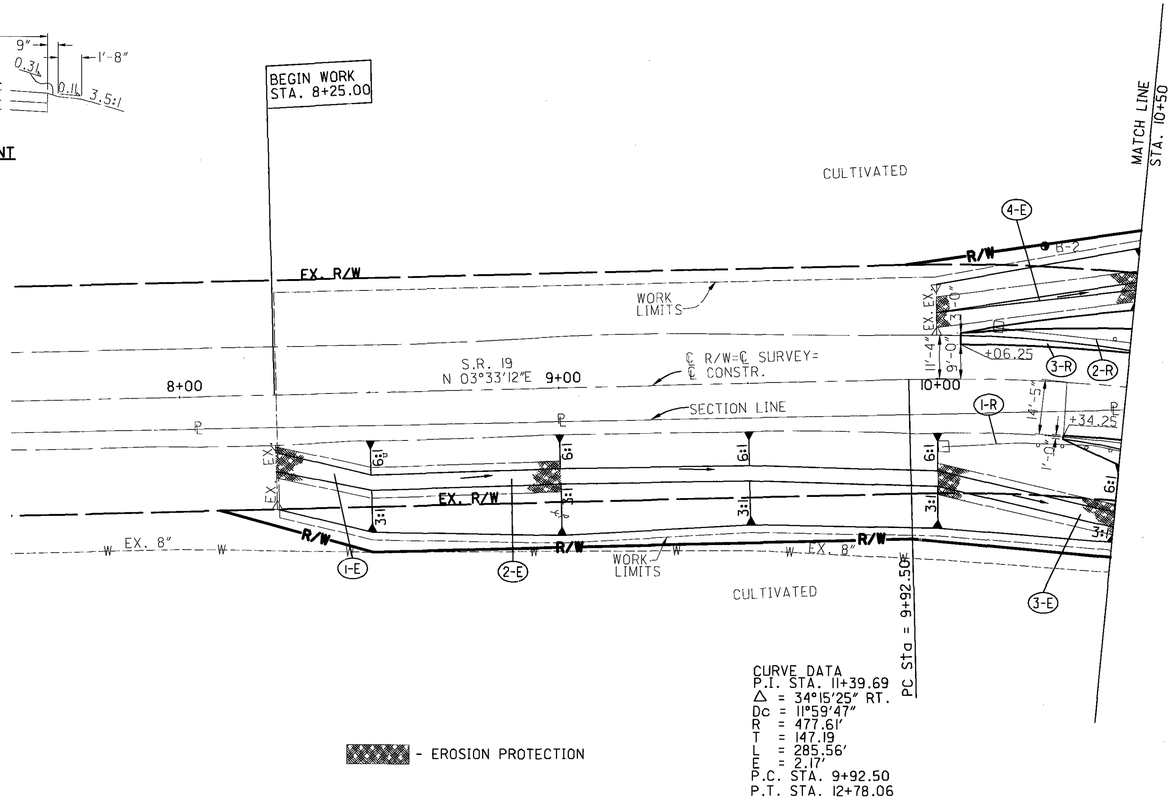
DESIGN AGENCY
KOHLI & KALHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

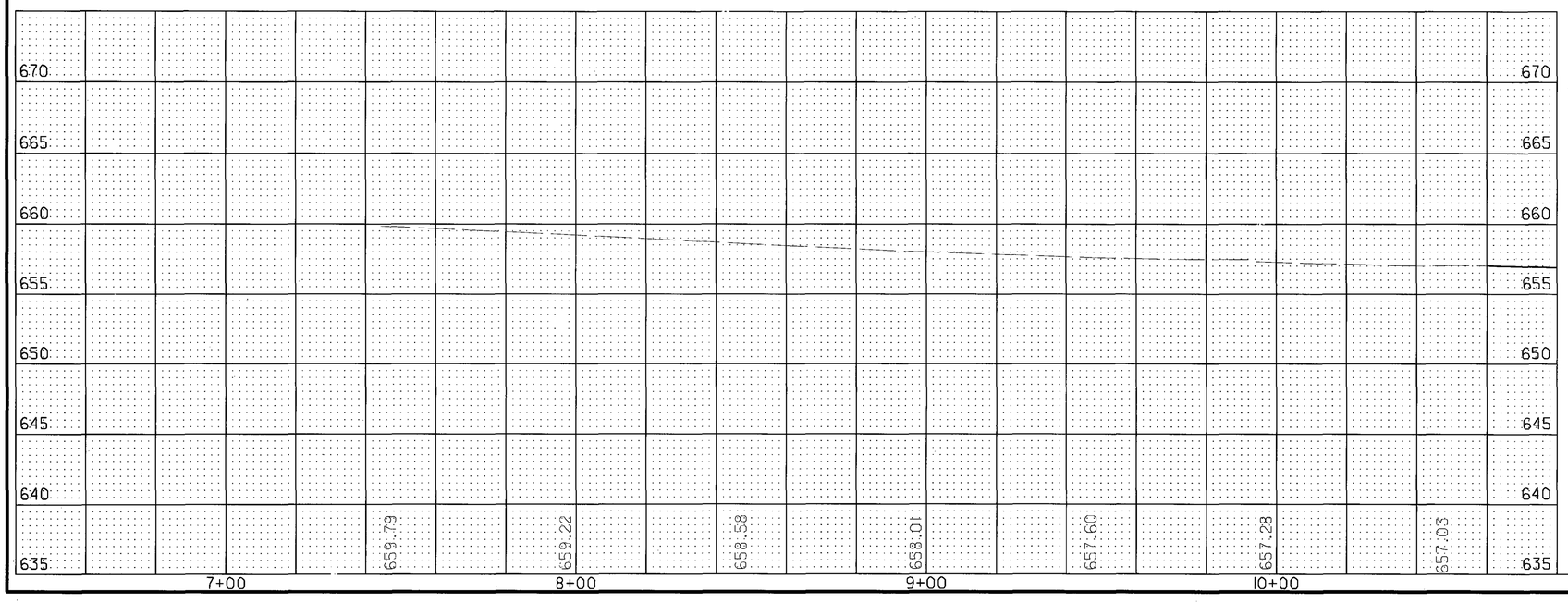
PROJECT SITE PLAN

SAN-19-2.43/13.68/13.75 SAN-635-1.60



TYPICAL SECTION OF ADJOINING PAVEMENT
STA. 10+60
8" ASPHALT CONCRETE
7.5" AGGREGATE BASE





ESTIMATED QUANTITIES – QUANTITIES CARRIED TO GENERAL SUMMARY

REF NO	STATION TO STATION	SIDE	202 PAVEMENT REMOVED ASPHALT SQ YD	202 GUARDRAIL REMOVED FT.	670 DITCH EROSION PROTECTION SQ YD	836 SEEDING & EROSION CONTROL MULCH REINFORCING MAT TYPE 1 SQ YD
1-R	10+00 TO 10+50	RT		48	44	44
2-R	10+15 TO 10+50	LT		34		
3-R	10+06.25 TO 10+50	LT	8			
1-E	8+25 TO 8+50	RT			22	
2-E	8+50 TO 9+00	RT			44	
3-E	10+00 TO 10+50	RT			44	
4-E	10+00 TO 10+50	LT				
TOTALS CARRIED TO GENERAL SUMMARY			8	82	66	88

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

CALCULATED RLM
CHECKED BLW

0 10 20 40 SCALE IN FEET

SAN-19-2.43/13.68/13.75
SAN-635-1.60

PLAN AND PROFILE - SAN-19-2.43
STA. 7+00 TO STA. 10+50

19
57

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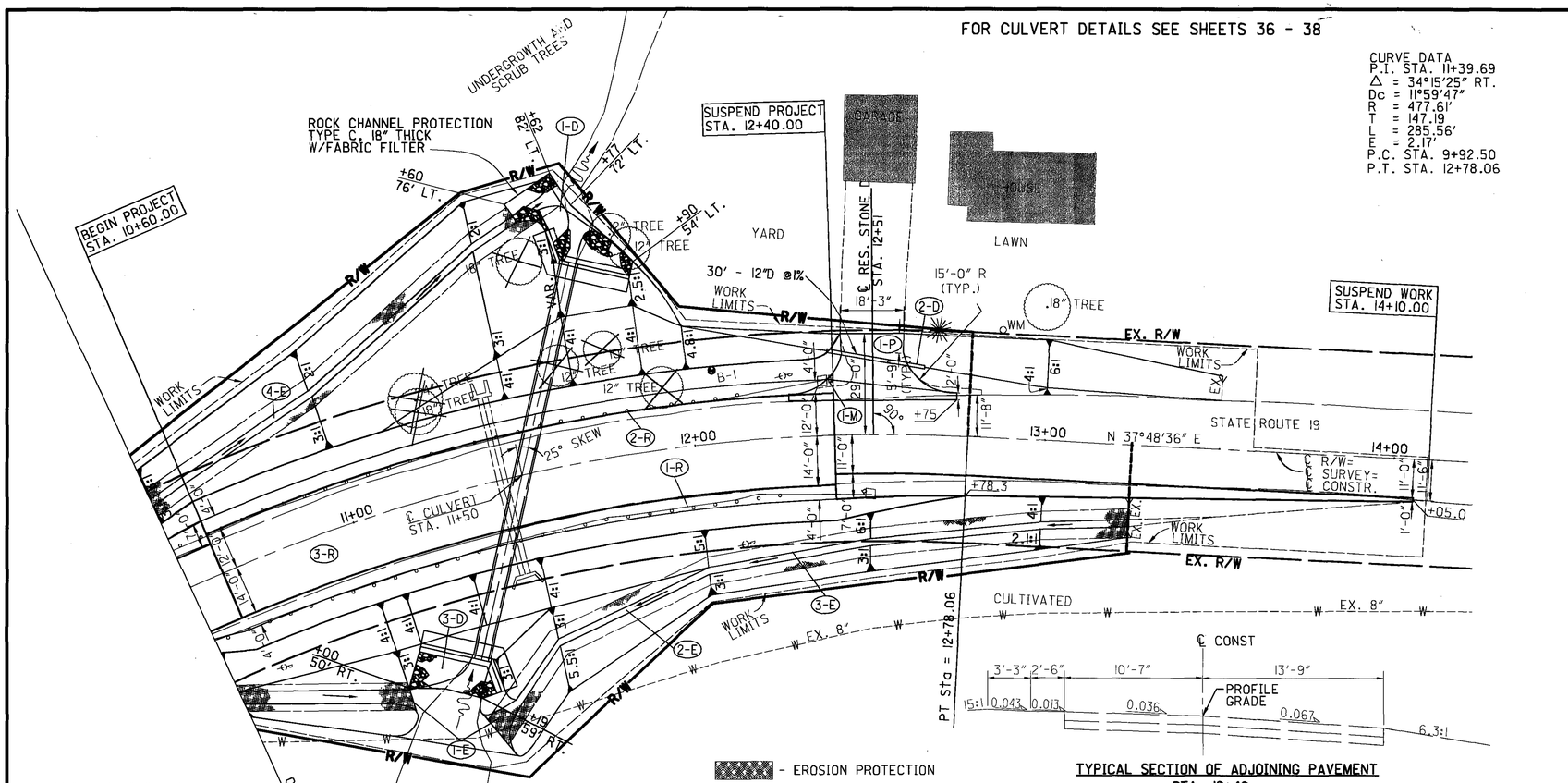
FOR CULVERT DETAILS SEE SHEETS 36 - 38



ESTIMATED QUANTITIES – QUANTITIES CARRIED TO GENERAL SUMMARY

REF NO	STATION TO STATION	SIDE	202 PAVEMENT REMOVED ASPHALT	202 GUARDRAIL REMOVED	204 SUB. COMP.	304 AGGREGATE BASE	408 PRIME COAT	448 ASPH. CONC. SURF. COURSE, TYPE 1, PG64-22 (DRIVEWAYS)	601 R.C.P. TYPE C, 18" THICK W/FABRIC FILTER	690 SPECIAL MAILBOX SUPPORT	690 MAILBOX REMOVED AND RESET	603 12" D CONDUIT	670 DITCH EROSION PROTECTION	836 SEEDING & EROSION CONTROL W/TURF REINFORCING MAT TYPE 1	836 TYPE 2	836 TYPE 3
			SQ YD	FT.	SQ YD	CU YD	GAL.	CU YD	CU YD	EACH	EACH	FT	SQ YD	SQ YD	SQ YD	SQ YD
1-R	10+50 TO 12+50	RT		200												
2-R	10+50 TO 12+37	LT		187												
3-R	10+50 TO 14+05	LT&RT	487													
1-M	12+39	LT									1					
1-P	12+27 TO 12+75	LT			43	6	13	2		1						
1-E	10+50 TO 11+50	RT							18			30				
2-E	11+50 TO 12+00	RT							14							
3-E	12+00 TO 13+25	RT											111	44	85	
4-E	10+50 TO 11+62	LT											111	116		
1-D	11+62 TO 11+82	LT														
2-D	12+37 TO 12+66	LT														
3-D	11+00 TO 11+28	RT														
TOTALS CARRIED TO GENERAL SUMMARY			487	387	43	6	13	2	32	1	1	30	111	160	85	

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 Cedar Hollow Street, Lima, Ohio 45801 419/227-1155

CALCULATED RLM
CHECKED BLW

SCALE IN FEET 0 10 20 40

PLAN AND PROFILE - SAN-19-2.43 STA. 10+50 TO STA. 14+10

SAN-19-2.43/13.68/13.75
SAN-635-1.60

20/57

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SEEDING END WIDTH	SEEDING YD²
49	
29	
	164
30	
	164
29	
	164
30	
	72
22	
0	
TOTAL	564

EARTHWORK END AREA CUT	EARTHWORK END AREA FILL	EARTHWORK VOLUME CUT	EARTHWORK VOLUME FILL
15	1		
		37	1
25	0		
		52	0
31	0		
		44	1
17	1		
		8	1
0	0		
FT²	FT²	YD³	YD³
TOTALS		141	3

EXISTING R/W
WORK LIMITS
FWD.
BACK
+25
BEGIN 670, DITCH EROSION CONTROL
10+00
657.28
9+50
657.60
9+00
658.01
8+50
658.58
8+00
659.22
7+50
659.79
STA. 8+25
BEGIN WORK
655.40
655.90
656.40
657.00
6:1
3:1
RESUME 836, TYPE I
SUSPEND 670, DITCH EROSION PROTECTION
BEGIN 670, DITCH EROSION PROTECTION SUSPEND 836, TYPE I
BEGIN 836, SEEDING & EROSION CONTROL W/TURF REINFORCING MAT, TYPE I STA. 8+25
R/W
EX. 8" WATER
660
655

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY

KOHLI & KALIVIER ASSOCIATES, INC.
ENGINEERS & SURVEYORS
511 Seal Mantel Street, Lima, Ohio 45801 419-227-1159

CROSS SECTIONS SAN-19-2.43
STA. 7+50 TO STA. 10+00

SAN-19-2.43/13.69/13.72
SAN-635-1.60

21
57

SEEDING END WIDTH	SEEDING YD²
50	495
128	631
99	431
56	292
49	
TOTAL	1849

EARTHWORK END AREA CUT	EARTHWORK END AREA FILL	EARTHWORK VOLUME CUT	EARTHWORK VOLUME FILL
28	29		
		59	425
36	430		
		-15	-111
		96	538
68	151		
		81	148
42	49		
40	49		
		15	13
39	23		
		20	13
30	19		
29	19		
		24	11
17	3		
16	3		
		4	1
15	1		
FT²	FT²	YD³	YD³
TOTALS		284	1038

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
911 East Haines Street, Lodi, CA 95240 (209) 333-1155

CROSS SECTIONS SAN-19-2.43 STA. 10+50 TO STA. 12+00

SAN-19-2.43/13.68/13.75
SAN-635-1.60

22
57

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SEEDING END WIDTH	SEEDING YD²	EARTHWORK END AREA CUT FT²	EARTHWORK END AREA FILL FT²	EARTHWORK VOLUME CUT YD³	EARTHWORK VOLUME FILL YD³
0		0	0		
18		1	0		
	20			1	0
18		2	0		
	94			6	0
16		4	0		
34				23	2
	197				
37		21	1		
	214			18	1
	-39	18	2		
40		26	2	28	2
	250	35	3		
50				13	1
		35	4		
		26	4		
				40	24
		28	29		
TOTAL	736	TOTALS		129	30

EXISTING R/W

660

655

650

14+50
657.31

FWD.
BACK +10

14+10
SUSPEND WORK

+10 FWD.
BACK

WORK LIMITS

EX. 8" WATER

14+00
657.76

WORK LIMITS

FWD.
BACK

END 670, DITCH EROSION PROTECTION STA. 13+25

13+50
657.74

EX. 8" WATER

665

R/W

6:1

4:1

657.0

13+00
657.58

655.25

EX. 8" WATER

+75 FWD.
BACK

CORRECTION FOR DRIVE, LT.

- PAVEMENT REMOVED, ASPHALT (TYP.)

0.90%

30'-12"D. @1%
INLET - +66, 19.5' LT. - 656.0
OUTLET - +37, 25' LT. - 655.7

12+50
657.16

654.20

EX. 8" WATER

+40 FWD.
BACK

+00

12+40
SUSPEND PROJECT

CALCULATED RLM

CHECKED BLW

DESIGN AGENCY

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

CROSS SECTIONS SAN-19-2.43 STA. 12+50 TO STA. 14+50

SAN-19-2.43/13.68/13.75
SAN-635-1.60

23
57

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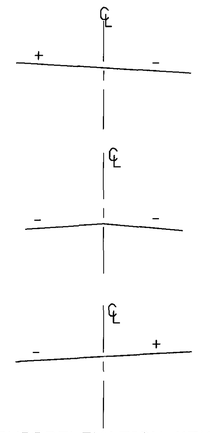
PAVEMENT ELEVATIONS AND SUPERELEVATION

LEFT E.O.S. ELEV.	LEFT SHOULDER SLOPE CORRECTION	LEFT SHOULDER SLOPE	LEFT SHOULDER WIDTH	LEFT E.O.P. ELEV.	ELEVATION CORRECTION	CROSS SLOPE	LANE WIDTH (LEFT)	STATION	PROFILE GRADE	LANE WIDTH (RIGHT)	CROSS SLOPE	ELEVATION CORRECTION	RIGHT E.O.P. ELEV.	RIGHT SHOULDER WIDTH	RIGHT SHOULDER SLOPE	RIGHT SHOULDER SLOPE CORRECTION	RIGHT E.O.S. ELEV.	REMARKS
657.37	-0.14	-0.034	4	657.51	+0.43	+0.036	12	12+40	657.08	14	-0.067	-0.94	656.14	4	-0.067	-0.27	655.87	END PROJECT - MATCH EXISTING
657.27	-0.14	-0.034	4	657.41	+0.43	+0.036	12	12+25	656.98	14	-0.067	-0.94	656.04	4	-0.067	-0.27	655.77	
657.12	-0.14	-0.034	4	657.26	+0.43	+0.036	12	12+00	656.83	14	-0.067	-0.94	655.89	4	-0.067	-0.27	655.62	
657.03	-0.14	-0.034	4	657.17	+0.43	+0.036	12	11+75	656.74	14	-0.067	-0.94	655.80	4	-0.067	-0.27	655.53	
657.00	-0.14	-0.034	4	657.14	+0.43	+0.036	12	11+50	656.71	14	-0.067	-0.94	655.77	4	-0.067	-0.27	655.50	
657.01	-0.14	-0.034	4	657.15	+0.43	+0.036	12	11+26.60	656.72	14	-0.067	-0.94	655.78	4	-0.067	-0.27	655.51	BEGIN FULL SUPERELEVATION
657.01	-0.14	-0.035	4	657.15	+0.42	+0.035	12	11+25	656.73	14	-0.067	-0.94	655.79	4	-0.067	-0.27	655.52	
656.92	-0.16	-0.04	4	657.08	+0.32	+0.027	12	11+10.40	656.76	14	-0.067	-0.94	655.82	4	-0.067	-0.27	655.55	
656.89	-0.16	-0.04	4	657.05	+0.25	+0.021	12	11+00	656.80	14	-0.061	-0.85	655.95	4	-0.061	-0.24	655.71	
656.84	-0.16	-0.04	4	657.00	+0.08	+0.007	12	10+75	656.92	14	-0.047	-0.66	656.26	4	-0.047	-0.19	656.07	
656.86	-0.16	-0.04	4	657.02	-0.01	-0.001	12	10+60	657.03	14	-0.039	-0.55	656.48	4	-0.039	-0.16	656.32	BEGIN PROJECT - MATCH EXISTING

E.O.S. = OUTSIDE EDGE OF SHOULDER
E.O.P. = EDGE OF PAVEMENT (ROADWAY)



SUPERELEVATION KEY

CALCULATED BLW
CHECKED MAD

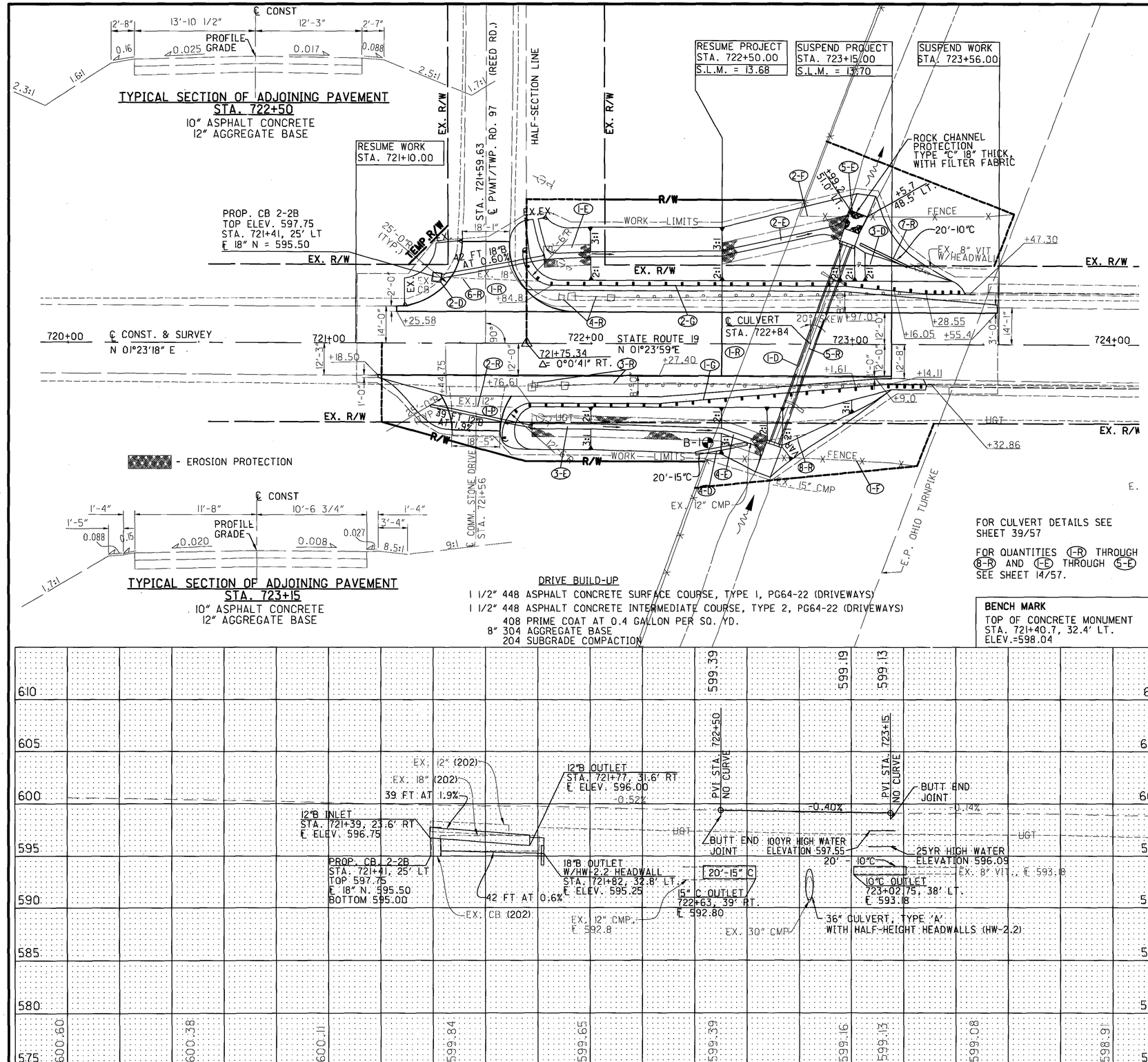
DESIGN AGENCY

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 Cleveland Avenue, Lima, Ohio 45801 419/227-1135

SUPERELEVATION TABLE
SAN-19-2.43

SAN-19-2.43/13.68/13.75
SAN-635-1.60

24
57



EXISTING STRUCTURE

TYPE: 30" DIAMETER CONCRETE CULVERT WITH CONCRETE HEADWALLS
SIZE: 30" DIAMETER X 50'±
ROADWAY: 26.4'±
APPROACH SLABS: NONE
SKEW: 21° L.F.
WEARING SURFACE: ASPHALT CONCRETE
ALIGNMENT: TANGENT
CONDITION: POOR
DISPOSITION: TO BE REMOVED

PROPOSED STRUCTURE

TYPE: 36" DIAMETER CIRCULAR CONCRETE CULVERT, TYPE 'A', WITH CONCRETE HEADWALLS
SIZE: 36" DIAMETER X 82.0'
ROADWAY: 24'-0"
SKEW: 20° L.F.
WEARING SURFACE: 3" MIN. ASPHALT CONCRETE
ALIGNMENT: TANGENT
LOADING: HS-25 AND ALTERNATE MILITARY LOADING
CROWN: 0.016
LATITUDE: 41°24'27" NORTH
LONGITUDE: 83°08'08" WEST

SCALE IN FEET 0 10 20 40

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHL & KALIHER ASSOCIATES, INC.
P.O. BOX 1425 FREMONT, OHIO 43420
311 East Market Street, Lima, Ohio 45801 419-227-1135

ESTIMATED QUANTITIES — QUANTITIES CARRIED TO GENERAL SUMMARY

FOR REMOVAL AND EROSION CONTROL QUANTITIES SEE SHEET 14

REF NO	STATION TO STATION	SIDE	202 CATCH BASIN REMOVED EACH	202 HEADWALL REMOVED EACH	202 FENCE REMOVED FT	204 SUBGRADE COMPACTION SQ YD	304 AGGREGATE BASE CU YD	408 PRIME COAT GAL	448 1 1/2" ASPHALT CONCRETE SURFACE COURSE TYPE 1 PG64-22 (DRIVEWAYS) CU YD	448 1 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE 2 PG64-22 (DRIVEWAYS) CU YD	601 RIPRAP USING 6" REINFORCED CONCRETE SLAB SQ YD	602 CONCRETE MASONRY CU YD	603 36" CONDUIT, TYPE A FT	603 CONDUIT 10" C FT	603 CONDUIT 12" B FT	603 CONDUIT 15" C FT	603 CONDUIT 18" B FT	604 CATCH BASIN NO. 2-28 EACH	606 ANCHOR ASSEMBLY, TYPE T EACH	606 BRIDGE TERMINAL ASSEMBLY, TYPE I EACH	606 GUARDRAIL, TYPE 5 STR. 12.5R FT	606 GUARDRAIL, TYPE 5 STR. 25R FT	607 FENCE TYPE 47 FT
1-D	722+84	LT&RT									12	1.4	82				20						
2-D	721+40 TO 721+82	LT	1	1								0.3											
3-D	723+01 TO 723+21	LT														20							
4-D	722+40 TO 722+60	RT																					
1-F	722+44 TO 722+81	RT			37										42			1					
2-F	722+80 TO 723+14	LT			40																		37
1-G	721+66 TO 723+32.86	RT														20							
2-G	721+73 TO 723+47.3	LT																					40
1-P	721+44.5 TO 721+67.5	RT				32	6	12	1	1													
TOTALS			1	1	77	32	6	12	1	1	12	1.7	82	20	39	40	42	1	2	2	150 18.75	162.5 18.75	77

SAN-19-13.68 SAN-635-1.60 STA. 724+00

PLAN AND PROFILE SAN-19-2.43/13.68/13.75 SAN-635-1.60 STA. 720+00 TO STA. 724+00

25/57

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SEEDING END WIDTH	SEEDING YD²
72	375
63	286
40	-89
	169
	-28
36	
0	
TOTAL	713

CORRECTION FOR INTERSECTION, LT.

CORRECTION FOR DRIVE, RT.

65 60 55 50 45 40 35 30 25 20 15 10 5 ℄ 5 10 15 20 25 30 35 40 45 50 55 60 65

600 / 595

EX. R/W

WORK LIMITS

R/W

3:1

2:1

RESUME 836, TYPE 2

594.00

18" B OUTLET STA. 721+82, 32.8' LT ℄ 595.25

BEGIN 836 SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE I STA. 721+82 SUSPEND 836

594.25

599.39
722+50
599.39

RESUME PROJECT 722+50

722+00
599.65

721+50
599.84

721+10
RESUME WORK

721+00
600.11

720+50
600.38

720+00
600.60

EX. C.B. (202)

EX. 18" (202)

PROP. CB 2-2B
ELEV. 597.75
STA. 721+41. 25' LT
℄ 18" N = 595.50

PAVEMENT REMOVED, ASPHALT

EX. 12" (202)

PROP. 12"B

UGT

594.75

BEGIN 836, TYPE 3 END, 670

15" C OUTLET STA. 722+63. 39' RT ℄ 592.80

12" B OUTLET STA. 721+77. 31.6' RT ℄ 596.00

595.50

BEGIN 670, DITCH EROSION PROTECTION, STA. 721+77

2.65%

FWD +10 BACK

FWD BACK

FWD +75 BACK

CORRECTION FOR SIDEROAD

FWD +18.5 BACK

EARTHWORK END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
64	48		
51	48		
		107	74
65	32		
		42	27
25	27		
9	27		
		9	13
		+12	
10	0		
		6	0
1	0		
0	0		
FT²	FT²	YD³	YD³
TOTALS		176	114

CALCULATED RLM

CHECKED BLW

DESIGN AGENCY

KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419/227-1155

CROSS SECTIONS SAN-19-13.68 STA. 720+00 TO STA. 722+50

SAN-19-2.43/13.68/13.75
SAN-635-1.60

26/57

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SEEDING END WIDTH	SEEDING YD²
0	
24	
	16
24	
	297
	83
	431
	-17
72	
TOTAL	727

EARTHWORK END AREA CUT	EARTHWORK END AREA FILL	VOLUME CUT	VOLUME FILL
0	0		
3	0		
		8	21
8	28		
42	28		
		23	19
42	42		
		24	32
56	89		
0	0		
		69	79
64	48		
TOTALS		124	151

FWD +56
BACK
724+00
598.91
SUSPEND WORK
723+56
UGT
EX. R/W
WORK LIMITS
723+50
599.08
+55.4
FWD
BACK
SUSPEND PROJECT
723+15
FWD +15
BACK
WORK LIMITS
2:1
3:1
UGT
END 836, TYPE 3
10"C OUTLET
723+02.75, 38' LT.
℄ 593.18
599.19
723+00
599.16
R/W
EXISTNG CULVERT
OUTLET ELEV. 590.57
STA. 722+94.01
ITEM 601 - RIPRAP USING 6" REINFORCED CONCRETE SLAB
OUTLET STA. 722+98.0
38.5' LT.
℄ ELEV. 590.75
EXISTING CULVERT
INLET ELEV. 590.86
STA. 722+75.11
INLET STA. 722+70.0
38.5' RT.
℄ ELEV. 591.15
FWD +87
BACK
CORRECTION FOR CULVERT
4:1
6:1
EXISTING 30"
PROPOSED 36" ø CULVERT - TYPE A
0.488%
FWD +81
BACK
599.25
722+84
599.20
+50
ROCK CHANNEL PROTECTION, TYPE C
18" THICK, WITH FILTER FABRIC (TYP.)
STD. DWG. HW-2.2 (TYP.)
ITEM 601 - RIPRAP USING 6" REINFORCED CONCRETE SLAB
- PAVEMENT REMOVED, ASPHALT

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Maine Street, Lima, Ohio 45801 419-227-1155

CROSS SECTIONS SAN-19-13.68 STA. 723+00 TO STA. 724+00

SAN-19-2.43/13.68/13.75
SAN-635-1.60

27/57

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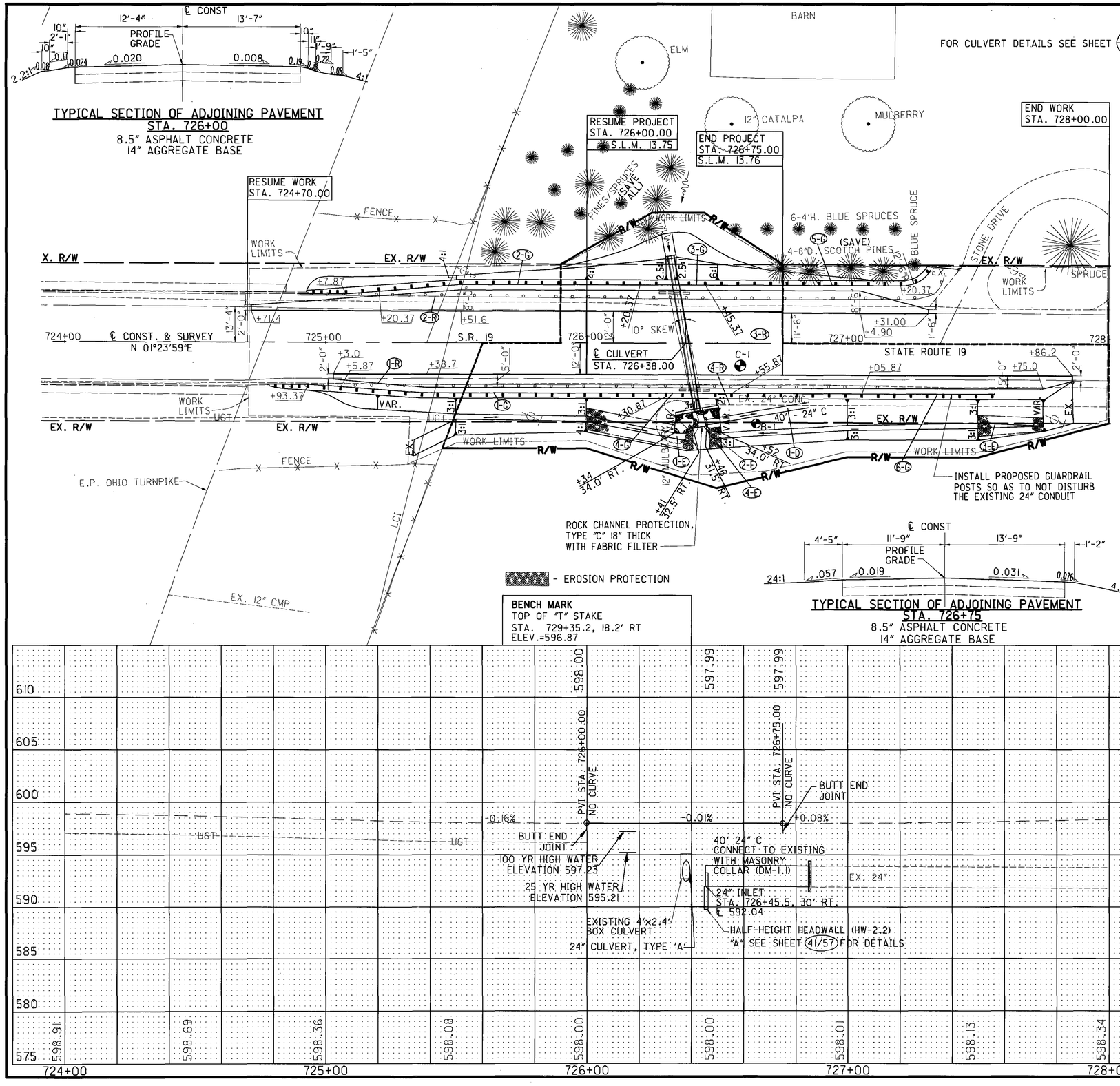

EXISTING STRUCTURE

TYPE: REINFORCED CONCRETE THREE-SIDED CULVERT
SIZE: 4.0' SPAN X 2.4' RISE
ROADWAY: 24'±
SKEW: 12° R.F.
ALIGNMENT: TANGENT
SUPERELEVATION: NONE
CONDITION: POOR
DISPOSITION: TO BE REMOVED

PROPOSED STRUCTURE

TYPE: 24" DIAMETER CIRCULAR CONCRETE CULVERT, TYPE "A", WITH REINFORCED CONCRETE HEADWALLS
SIZE: 24" DIAMETER X 60.0'
ROADWAY: 24'-0"
SKEW: 10° R.F.
ALIGNMENT: TANGENT
LOADING: HS-25 AND ALTERNATE MILITARY LOADING
SUPERELEVATION: NONE
LATITUDE: 41°24'30" NORTH
LONGITUDE: 83°08'08" WEST

ESTIMATED QUANTITIES – QUANTITIES CARRIED TO GENERAL SUMMARY

REF NO	STATION TO STATION	SIDE	202 GUARDRAIL REMOVED	FT	202 PAVEMENT REMOVED, ASPHALT	SQ YD	202 PIPE REMOVED, 24" & UNDER	FT	601 ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER	CU YD	602 CONCRETE MASONRY	CU YD	603 24" CONDUIT, TYPE C	FT	606 GUARDRAIL, TYPE 5 LONG SPAN	FT	606 ANCHOR ASSEMBLY TYPE E-98	EACH	606 ANCHOR ASSEMBLY TYPE T	EACH	606 BRIDGE TERMINAL ASSEMBLY TYPE I	EACH	606 GUARDRAIL, TYPE 5	STR. FT	606 GUARDRAIL, TYPE 5	12.5R FT	836 SEEDING & EROSION CONTROL WITH TURF REINFORCING MAT	TYPE 1 SQ YD	TYPE 2 SQ YD	TYPE 3 SQ YD
1-D	726+45.5 TO 726+85.5	RT										0.7	40																4
1-E	726+00 TO 726+40	RT																			1	EACH							
2-E	726+45 TO 726+50	RT																			1	EACH	156.25						
3-E	727+50 TO 727+75	RT																			1	EACH	131.25						
4-E	726+40 TO 726+45	RT							8										1	EACH									
1-G	724+74.62 TO 726+30.87	RT																											
2-G	724+89.12 TO 726+20.37	LT																											
3-G	726+20.37 TO 726+45.37	LT													25														
4-G	726+30.87 TO 726+55.87	RT													25														
5-G	726+45.37 TO 727+31.24	LT															1	EACH											
6-G	726+55.87 TO 727+55.87	RT															1	EACH											
1-R	724+78.62 TO 727+15.92	RT	237.5																										
2-R	724+93.12 TO 727+37.07	LT	250																										
3-R	724+71.4 TO 727+86.2	LT&RT			265		40																						
4-R	726+45 TO 726+85	RT																											
TOTALS			487.5		265		40		8		0.7		40		50		1		1		2		425		36		22		4

CALCULATED RLM
CHECKED BLW

SCALE IN FEET 0 10 20 40

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
317 East Market Street, Lima, Ohio 45801 419-221-1153

SAN-19-13.75
728+00

PLAN AND PROFILE SAN-19-2.43/13.68/13.75
STA. 724+00 TO STA. 728+00

SAN-19-2.43/13.68/13.75
SAN-635-1.60

28/57

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SEEDING END WIDTH	SEEDING YD²
39	200
33	178
31	105
32	0
TOTAL	483

EX R/W
R/W
WORK LIMITS
4:1
3:1
598.00
726+00
598.00
726+00
RESUME PROJECT
595.00
BEGIN 836, SEEDING AND EROSION CONTROL WITH TURF REINFORCED MAT, TYPE I
725+50
598.08
UGTO
595.25
PAVEMENT REMOVED, ASPHALT
2:1
725+00
598.36
724+70
RESUME WORK
724+50
598.69
FWD +70
BACK +70
FWD +03
BACK +03
FWD +71.4
BACK +71.4

EARTHWORK END AREA CUT	FILL	VOLUME CUT	FILL
FWD 32 / BACK 16	15 / 15		
		36	19
23	6		
		30	5
FWD 12 / BACK 9	0 / 0		
		1	0
9	0		
		6	0
FWD 3 / BACK 0	0 / 0		
TOTALS	FT² FT²	YD³ 73	YD³ 24

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

CROSS SECTIONS SAN-19-13.75
STA. 724+50 TO STA. 726+00

SAN-19-2.43/13.68/13.75
SAN-635-1.60

29
57

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SEEDING		EARTHWORK			
END WIDTH	YD²	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
0		0	0		
20		3	0		
	88			16	2
24					
	32	21	3		
				14	2
24		19	4		
45		21	4		
	171			28	6
36		27	6		
				24	6
	281	24	6		
		39	6		
				34	11
65		35	17		
	289			53	30
-6					
39		22	15		
TOTAL	855	FT²	FT²	YD³	YD³
		TOTALS		169	57

65 60 55 50 45 40 35 30 25 20 15 10 5 ℄ 5 10 15 20 25 30 35 40 45 50 55 60 65

605 600 595 590

EX. R/W

WORK LIMITS

728+50
598.39

728+40
END WORK

728+00
598.34

FWD +86.2 BACK

END 836, TYPE 2
STA. 727+75

727+50
598.13

BEGIN 836, TYPE 2
594.25

FWD +38 BACK

727+00
598.01

726+75
END PROJECT

594.00

597.99
726+50
598.00

SUSPEND 836, TYPE 3

593.75

BEGIN 836, TYPE 3
STA. 726+45

EXISTING CULVERT
INLET ELEV. 592.82
STA. 726+43.25

EXISTING CULVERT
OUTLET ELEV. 592.76
STA. 726+31.85

INLET STA. 726+32.14
33.25' LT.
℄ ELEV. 593.00

FULL HEIGHT HEADWALL (HW-1.0) SEE SHEET 41/57 FOR DETAILS

OUTLET STA. 726+42.56
25.85' RT.
℄ ELEV. 592.40

40'-24" C (CONNECT TO EXISTING)

CORRECTID FOR CULVERT

1.00% PROPOSED 24" CULVERT - TYPE A

HALF-HEIGHT HEADWALL "A" (HW-2.2)
SEE SHEET 41/57 FOR DETAILS

598.00
726+38
598.00

HALF-HEIGHT HEADWALL "B" (HW-2.2)
SEE SHEET 41/57 FOR DETAILS

ITEM 601 - RIPRAP USING 6" REINFORCED CONCRETE SLAB STD.. DWG. HW-2.2

SUSPEND 836, TYPE 1
STA.. 726+40.

ROCK CHANNEL PROTECTION, TYPE "C" 18" THICK

24" C

EX. 24"

3:1 2:1 6:1 2.5:1 10:1 4:1

▨ - PAVEMENT REMOVED, ASPHALT

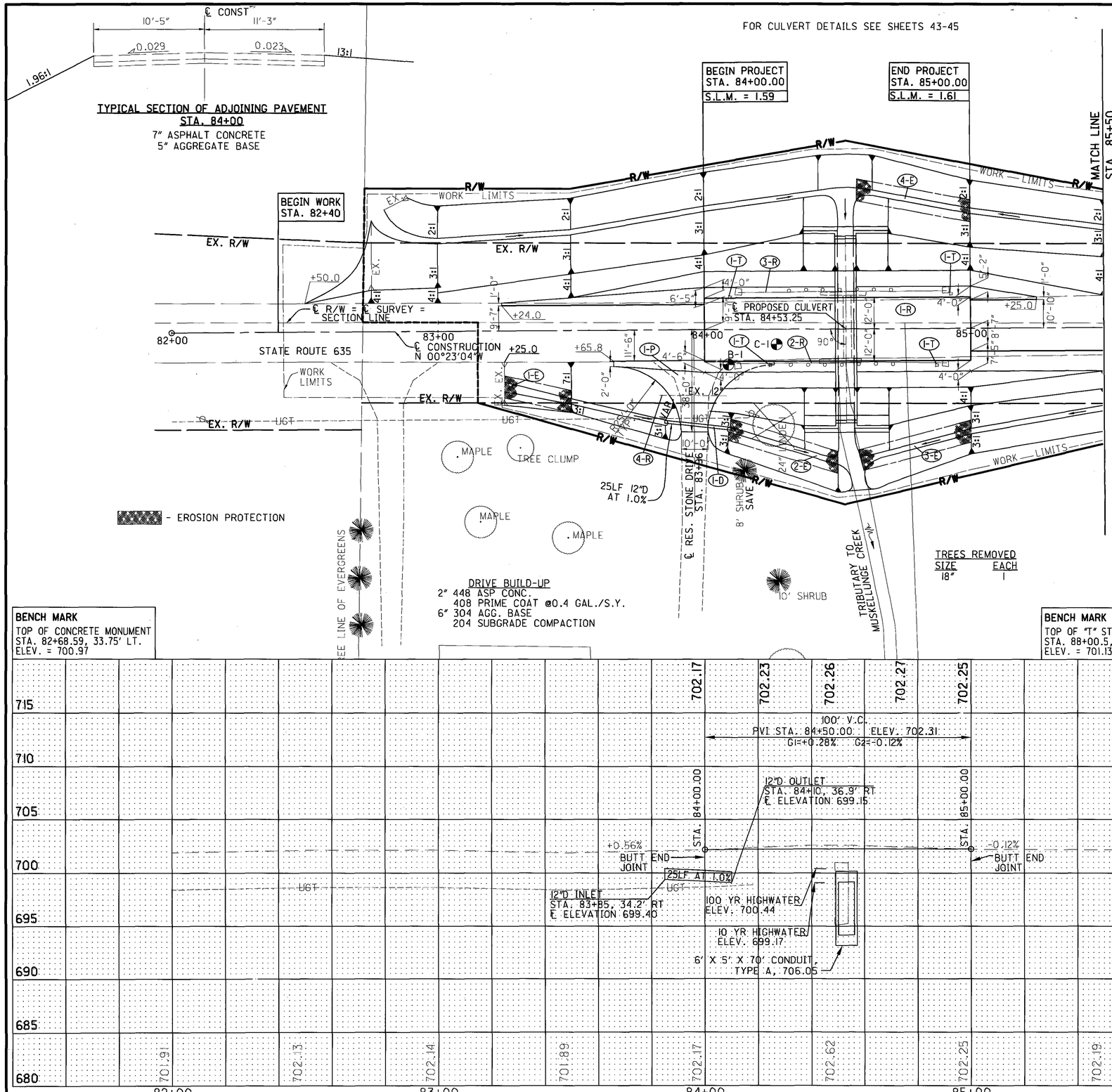
CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALINER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
3115 Superior Street, Lorain, Ohio 44052 440-277-1155

CROSS SECTIONS SAN-19-13.75 STA. 726+38 TO STA. 728+50

SAN-19-2.43/13.68/13.75
SAN-635-1.60

30/57



EXISTING STRUCTURE

TYPE: REINFORCED CONCRETE BOX CULVERT WITH CONCRETE HEADWALLS
SIZE: 5'x6'
ROADWAY: 26'-3"± F/F GUARDRAIL
SKEW: NONE
WEARING SURFACE: ASPHALT CONCRETE
ALIGNMENT: TANGENT
CONDITION: POOR
DISPOSITION: TO BE REMOVED

PROPOSED STRUCTURE

TYPE: PRECAST REINFORCED CONCRETE BOX CULVERT, TYPE "A" WITH REINFORCED CONCRETE HEADWALLS.
SIZE: 6.0' X 5.0' X 70.0' CONDUIT
ROADWAY: 24'-0" WITH CLEAR ZONE GRADED SLOPES
SKEW: NONE
WEARING SURFACE: 3" MIN. ASPHALT CONCRETE
ALIGNMENT: TANGENT
LOADING: HS-25 AND ALTERNATE MILITARY LOADING
CROWN: 0.016
LATITUDE: 41°16'33" NORTH
LONGITUDE: 83°16'59" WEST

ESTIMATED QUANTITIES – QUANTITIES CARRIED TO GENERAL SUMMARY

REF NO	STATION TO STATION	SIDE	202 PAVEMENT REMOVED ASPHALT	202 PIPE REMOVED, 24" & UNDER	202 GUARDRAIL REMOVED	204 SUBGRADE COMPACTION	304 AGGREGATE BASE	408 PRIME COAT	448 ASPHALT CONCRETE SURFACE COURSE TYPE 1, PG64-22 DRIVEWAYS	603 12" CONDUIT TYPE D	630 REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	630 REMOVAL OF GROUND MOUNTED POST SUP. & DISP.	670 DITCH EROSION PROTECTION	836 SEEDING & EROSION CONTROL W/TURF REINFORCING MAT TYPE 1	836 SEEDING & EROSION CONTROL W/TURF REINFORCING MAT TYPE 2
			SQ YD	FT.	FT.	SQ YD	CU YD	GAL.	C.Y.	FT.	EACH	EACH	SQ YD	SQ YD	SQ YD
1-E	83+25 TO 83+50	RT													
2-E	84+08 TO 84+50	RT												22	37
3-E	84+58 TO 85+00	RT												37	
4-E	84+58 TO 85+00	LT											37		
1-R	83+24 TO 85+50	LT&RT	276												
2-R	84+11 TO 84+92	RT			81							4			
3-R	84+11 TO 84+92	LT			81							4			
4-R	83+83 TO 84+08	RT		25											
1-T	84+09 TO 84+93	LT&RT								25					
1-P	83+65.8 TO 84+15	RT				52	8	9	3						
1-D	83+85 TO 84+10	RT								25	4	4	37	59	37
TOTALS			276	25	162	52	8	9	3	25	4	4	37	59	37

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419/227-1155

CALCULATED RLM
CHECKED BLW

SCALE IN FEET 0 10 20 40

SAN-SR 635-1.60

PLAN AND PROFILE - SAN-SR STA. 82+00 TO STA. 85+50

SAN-19-2.43/13.68/13.75
SAN-635-1.60

3/57

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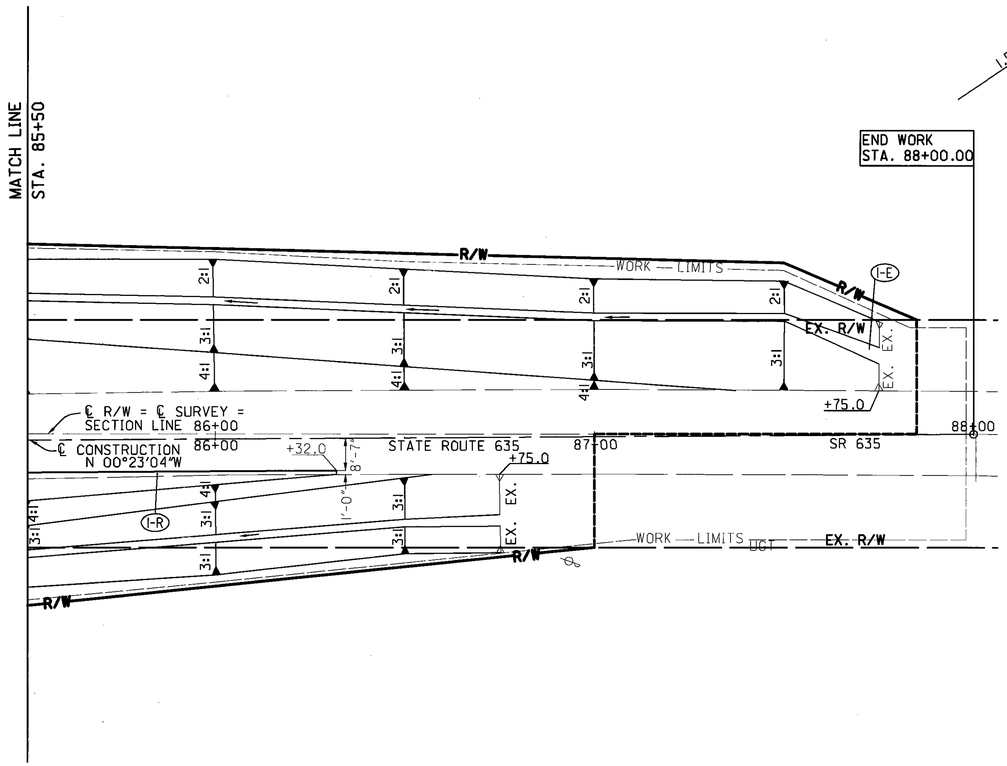
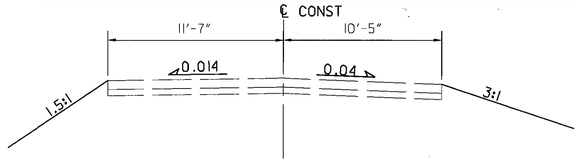
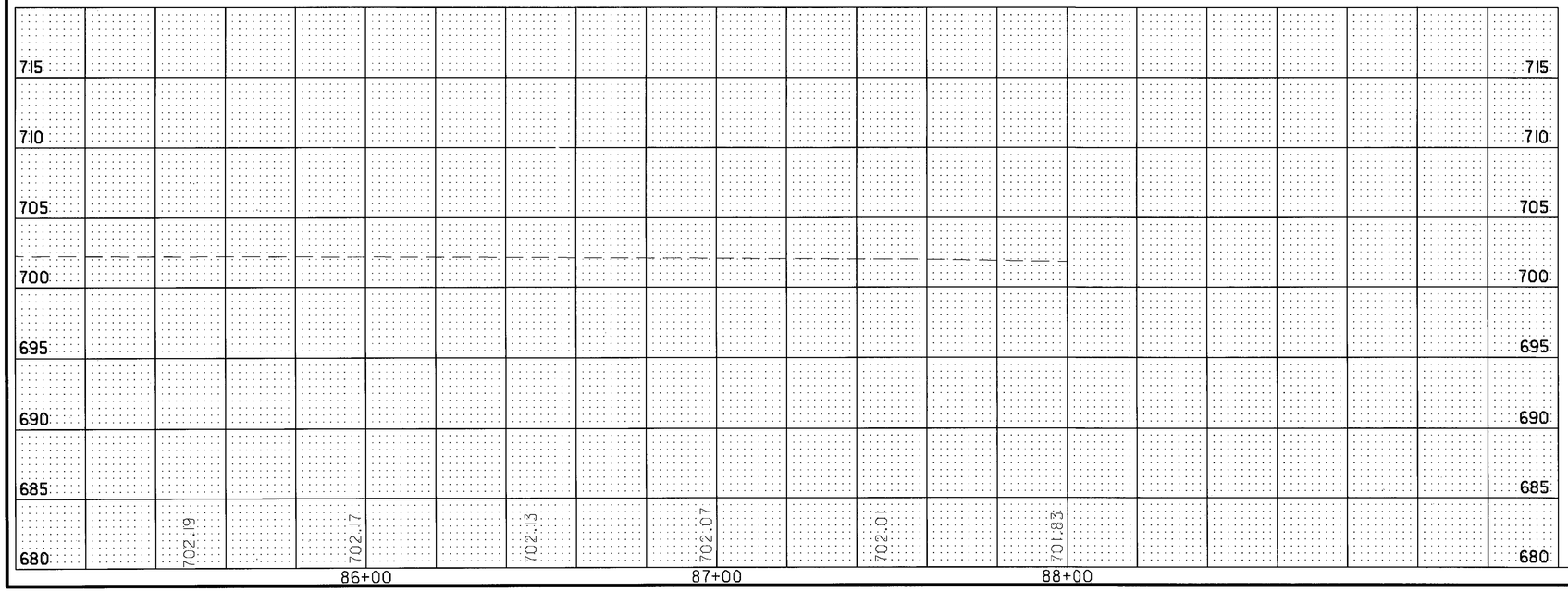




TYPICAL SECTION OF ADJOINING PAVEMENT
STA. 85+00
7" ASPHALT CONCRETE
5" AGGREGATE BASE

ESTIMATED QUANTITIES - QUANTITIES CARRIED TO GENERAL SUMMARY

REF NO	STATION TO STATION	SIDE	202 PAVEMENT REMOVED ASPHALT SQ YD	836 SEEDING & EROSION CONTROL W/TURF REINFORCING MAT TYPE 3 SQ YD
I-R	85+50 TO 86+32	RT	11	
I-E	87+50 TO 87+75	LT		
TOTALS			11	22



DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

CALCULATED RLM
CHECKED BLW

0 10 20 40
SCALE IN FEET

SAN-19-2.43/13.68/13.75
SAN-635-1.60

PLAN AND PROFILE - SAN-SR 635-1.60
STA. 85+50 TO STA. 88+00

32
57

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SEEDING END WIDTH	SEEDING YD²
71	
	364
60	
	164
58	
	147
	-40
48	
	53
48	
0	
TOTAL	688

CORRECTION FOR DRIVE, RT.

FWD. +40
BACK

EARTHWORK			
END AREA		VOLUME	
CUT	FILL	CUT	FILL
70	38		
		110	61
49	28		
		23	13
1	0		
		1	0
0	0		
FT²	FT²	YD³	YD³
TOTALS		134	74

- 694.50
- 694.75
- 699.50
- 83+50 701.89
- 83+00 702.14
- 82+75 702.14
- 82+50 702.13
- STA. 82+40 BEGIN WORK
- 82+00 701.91
- 81+50 702.02
- BEGIN 836, SEEDING & EROSION CONTROL W/TURF REINFORCING MAT, TYPE I - STA. 83+25 SUSPEND 836, TYPE 1 STA. 83+50
- PAVEMENT REMOVED, ASPHALT

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1195

CROSS SECTIONS - SAN-635-1.60
STA. 81+50 TO STA. 83+50

SAN-19-2.43/13.68/13.75
SAN-635-1.60

33/57

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SEEDING		
	END WIDTH	YD²
	71	
		442
		88
		533
	104	
		517
	-34	CORRECTION FOR CULVERT
		82
	-84	CORRECTION FOR DRIVE RT.
		425
	71	
	+50	
TOTAL		1799

EARTHWORK				
	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
	73	47		
			73	52
+25 FWD.	85	66		
BACK	87	66		
			82	69
FWD.	91	84		
BACK	93	84		
			244	133
+57.25 FWD.	215	84		
BACK	0	0		
			+58	
+49.25 FWD.	0	0		
BACK	218	66		
			294	120
FWD.	104	66		
BACK	92	66		
			105	66
			-12	
+65.80 FWD.	73	38		
BACK	70	38		
			41	22
+50	70	38		
	FT²	FT²	YD³	YD³
TOTALS			885	462

R/W
WORK LIMITS
EX. R/W
℄ R/W & SURVEY
℄ CONST.
85+50
702.19
END PROJECT
STA. 85+00
702.25
85+00
702.25
695.25
697.25
695.00
697.00
END 836, TYPE 1
END 670, DITCH EROSION PROTECTION
BEGIN 670, DITCH EROSION PROTECTION
STA. 84+58
EXISTING CULVERT
INLET ELEV. 695.16
STA. 84+49.5
EXISTING CULVERT
OUTLET ELEV. 694.67
STA. 84+53.0
BEGIN 836, TYPE 1
STA. 84+58
INLET E 694.17
6' SPAN X 5' RISE X 70' CULVERT, TYPE A, 706.05
0.20%
OUTLET E 694.03
VARIES
702.26
84+53.25
702.61
CORRECTION FOR EARTHWORK AT CULVERT
6' SPAN X 5' RISE X 70' CULVERT, TYPE A, 706.05
702.26
84+50
702.62
SUSPEND 836, TYPE 2
STA. 84+50
BEGIN 836, TYPE 2
STA. 84+08
UGT
12"D OUTLET
84+10, 36.9 RT.
E 699.15
702.17
84+00
702.17
694.30
BEGIN PROJECT
STA. 84+00
PAVEMENT REMOVED, ASPHALT
2.5%
83+96
℄ DRIVE
702.15
12"D INLET
83+85, 34.2' RT.
E 699.40
694.32
CORRECTION FOR DRIVE RT.

CALCULATED RLM
CHECKED BLW

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1115

CROSS SECTIONS - SAN-635-1.60 STA. 83+96 TO STA. 85+50

SAN-19-2.43/13.68/13.75
SAN-635-1.60

34
57

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SEEDING END WIDTH	SEEDING YD²
0	
35	
	194
35	
	200
37	
58	
	336
63	
	367
69	
	389
71	
TOTAL	1486

EARTHWORK	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
	0	0		
			27	17
	29	18		
			63	38
	39	23		
			89	44
	57	25		
			39	18
+32 FWD.	61	30		
BACK	62	30		
			80	40
	73	38		
			135	79
+50	73	47		
	FT²	FT²	YD³	YD³
TOTALS			433	236

65 60 55 50 45 40 35 30 25 20 15 10 5 ℄ 5 10 15 20 25 30 35 40 45 50 55 60 65

705 / 700 / 695

℄ CONST. = ℄ R/W & SURVEY

EX. R/W

FWD. BACK

88+00
701.83

END WORK
STA. 88+00

℄ CONST.

℄ R/W & SURVEY

EX. R/W

R/W
WORK LIMITS

END 836, TYPE 3
STA. 87+75

2:1
3:1

87+50
702.01

696.25

BEGIN 836, TYPE 3

WORK LIMITS

4:1

87+00
702.07

696.00

86+50
702.13

695.75

697.75

86+00
702.17

695.50

697.50

▨ - PAVEMENT REMOVED, ASPHALT

℄ CONST.

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419/227-1135

CALCULATED RLM
CHECKED BLW

CROSS SECTIONS - SAN-SR 635-1.60
STA. 86+00 TO STA. 88+00

SAN-19-2.43/13.68/13.75
SAN-635-1.60

35
57

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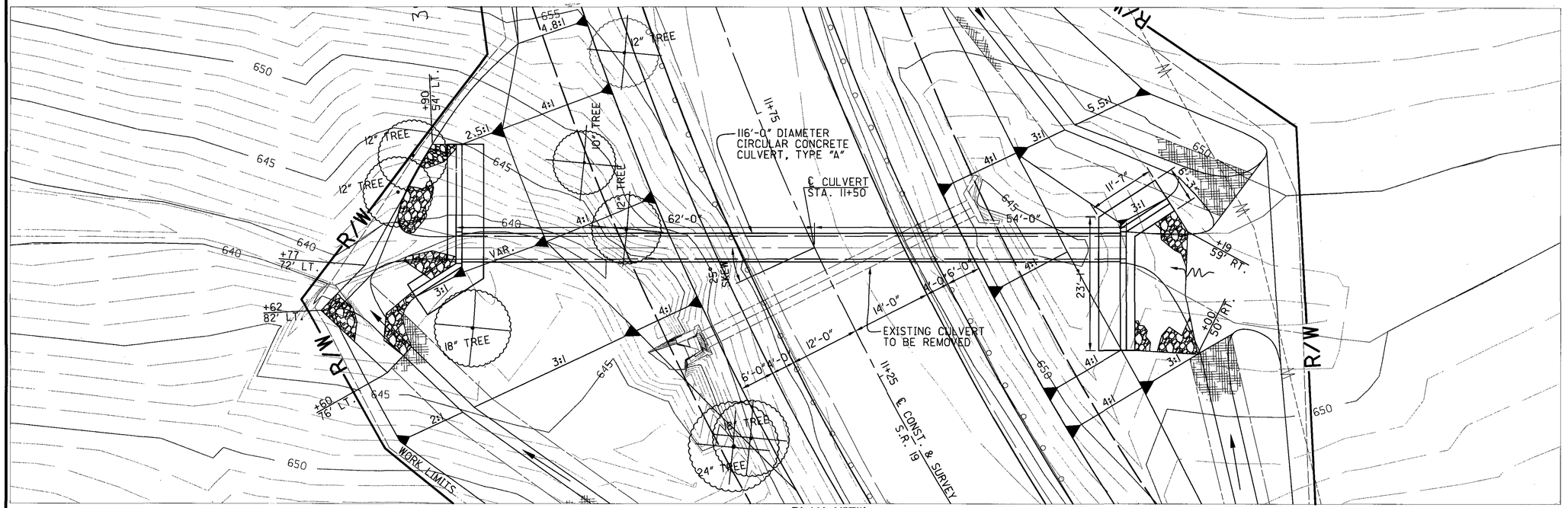
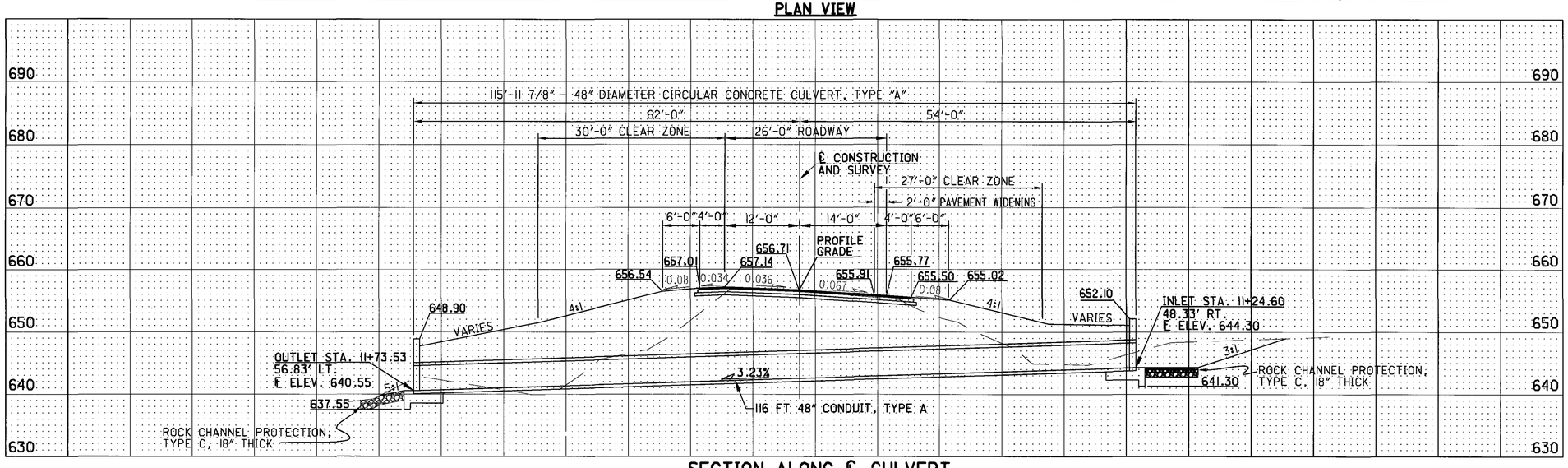


PLAN VIEW



SECTION ALONG ℄ CULVERT

SEE SHEET 2 FOR REFERENCE POINTS

DESIGN TRAFFIC

2005 ADT = 2300
2025 ADT = 2800
2025 ADTT = 56

BORING	STA.	OFFSET	ELEV.
B-2	10+24.3	35.4' LT	657.66
B-1	12+07.7	20.8' LT	655.89

▨ - EROSION PROTECTION

EARTHWORK LIMITS

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DISPOSITION OF UTILITIES:

ALL UTILITIES SHALL BE RELOCATED (IF NECESSARY) BY OTHERS.

HYDRAULIC DATA

Q_{25} = 54 cfs V_{25}= 4.30 fps HWELEV = 647.85
Q_{100}= 71 cfs V_{100}= 5.65 fps HWELEV = 648.49
DRAINAGE AREA = 0.18 SQ. MI.

BENCH MARK
DISK IN N.E. WINGWALL OF BRIDGE CR-213-0.67, APPROX. 0.03 MILE WEST OF S.R. 19
ELEV. = 634.14

EXISTING STRUCTURE

TYPE: REINFORCED CONCRETE BOX CULVERT
SIZE: 3.0' SPAN X 3.0' RISE
ROADWAY: 24'±
SKEW: NONE
ALIGNMENT: 11° 59' 47" CURVE TO THE RIGHT
SUPERELEVATION: VARIES 0.067 MAX
CONDITION: POOR
DISPOSITION: TO BE REMOVED

PROPOSED STRUCTURE

TYPE: 48" DIAMETER CIRCULAR CONCRETE CULVERT, TYPE "A", WITH REINFORCED CONCRETE HEADWALLS
SIZE: 48" DIAMETER X 116.0'
ROADWAY: 24'-0"
SKEW: 25° L.F.
ALIGNMENT: 11° 59' 47" CURVE TO THE RIGHT
LOADING: HS-25 AND ALTERNATE MILITARY LOADING
SUPERELEVATION: VARIES 0.067 MAX
LATITUDE: 41°17'30" NORTH
LONGITUDE: 83°03'07" WEST

DESIGN AGENCY
KOHLI & KALHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Monroe Street, Lima, Ohio 45801 419-227-1153

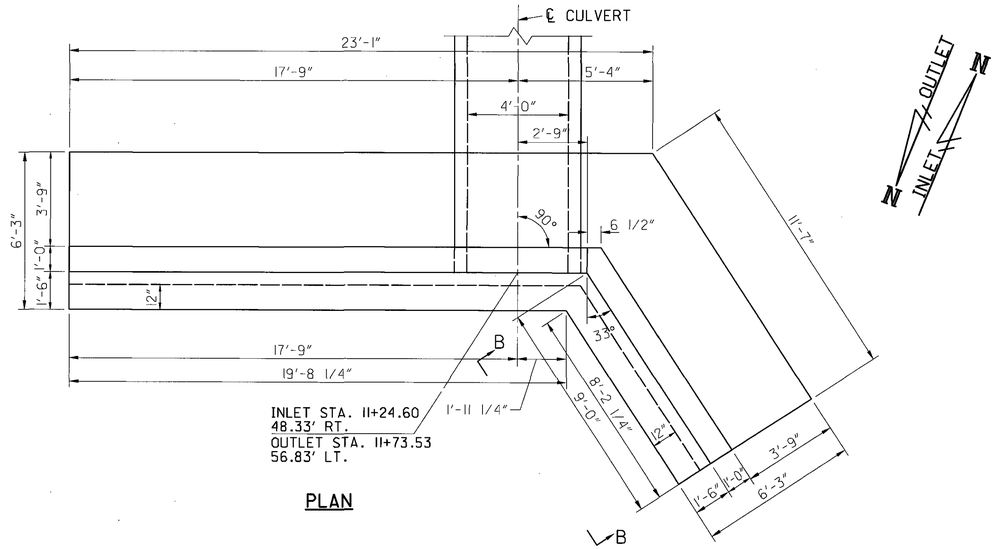
DESIGNED	DRAWN	REVIEWED	DATE
BLW	BLW	DGB	12-23-02
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MAD			

CULVERT PLAN AND SECTION
CULVERT NO. SAN-19-0243

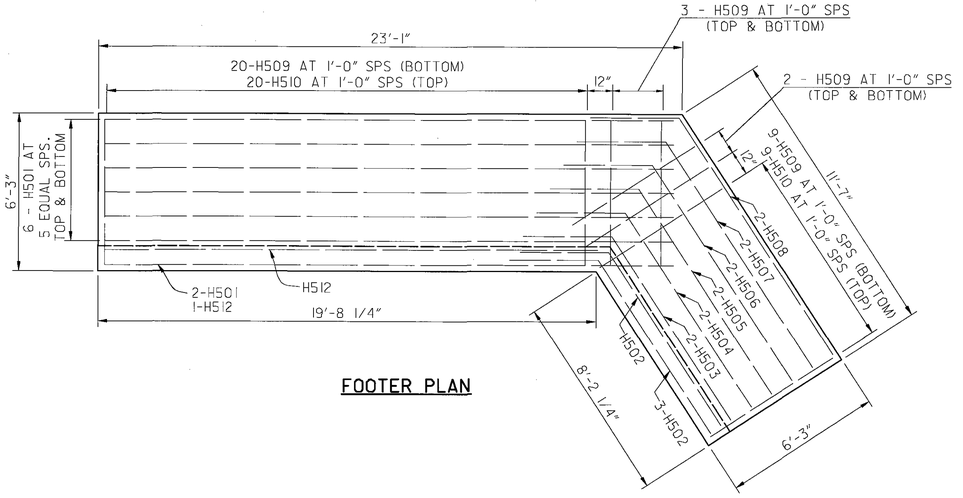
SAN-19-2.43/13.68/13.75
SAN-635-1.60

1/3

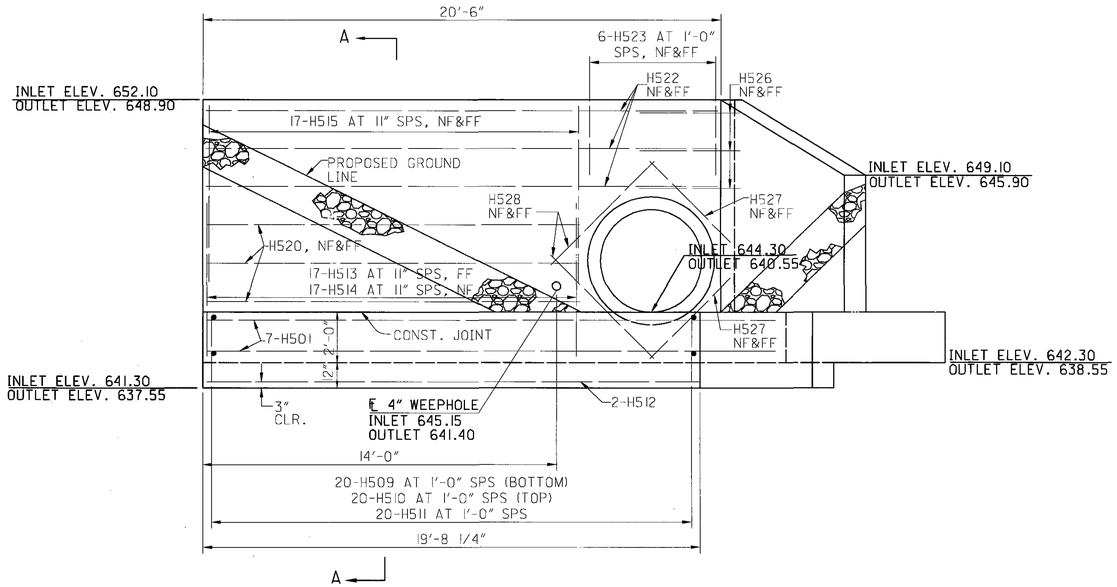
36/57



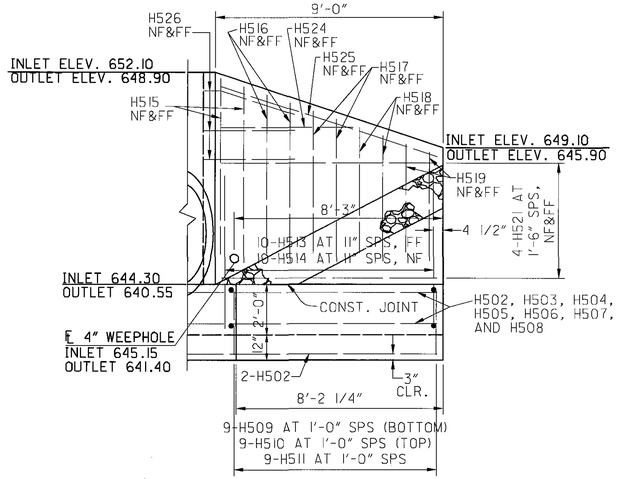
PLAN



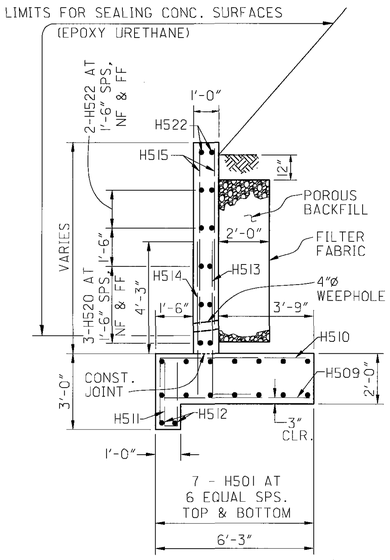
FOOTER PLAN



ELEVATION



VIEW B-B



SECTION A-A

NOTES:

ABBREVIATIONS:
NF-NEAR FACE
FF-FAR FACE
SPS-SPACES

POROUS BACKFILL WITH FILTER FABRIC. 2 FEET THICK, SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO 1 FOOT BELOW THE EMBANKMENT SURFACE, AND LATERALLY TO THE ENDS OF THE WINGWALLS. TWO CUBIC FEET OF BAGGED NO. 3 AGGREGATE SHALL BE PLACED AT EACH WEEPHOLE. BAGGED AGGREGATE IS INCLUDED WITH POROUS BACKFILL FOR PAYMENT.

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
3111 State Avenue Street, Lima, Ohio 45801 419-227-1153

DESIGNED	DRAWN	REVIEWED	DATE
BLW	BLW	DGB	12-23-02
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MAD			

HEADWALL DETAILS
CULVERT NO. SAN-19-0243

SAN-19-2.43/13.68/13.75
SAN-635-1.60

2 / 3

37
57

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GENERAL NOTES

DESIGN SPECIFICATIONS:
THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS 1996, INCLUDING THE 1997, 1998, 1999 AND 2000 INTERIM SPECIFICATIONS, AND TO THE ODOT BRIDGE DESIGN MANUAL.

DESIGN DATA:
DESIGN LOADING: HS-25 AND ALTERNATE MILITARY LOADING
CONCRETE CLASS C: COMPRESSIVE STRENGTH 4000 P.S.I.
REINFORCING STEEL: ASTM A615, A616, A617
GRADE 60 MINIMUM YIELD STRENGTH: 60,000 P.S.I.

REMOVAL OF EXISTING STRUCTURE:
WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC, THE EXISTING STRUCTURE SHALL BE REMOVED UPON RECEIVING PERMISSION FROM THE ENGINEER. INCLUDED IN THIS QUANTITY SHALL BE ALL HEADWALLS, WINGWALLS, AND CULVERT.

UTILITY LINES:
ALL EXPENSE INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE UTILITIES. THE CONTRACTOR AND UTILITIES ARE TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

FOUNDATION BEARING PRESSURE:
CULVERT FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM BEARING PRESSURE OF 1.30 TONS PER SQUARE FOOT. THE ALLOWABLE BEARING PRESSURE IS 1.75 TONS PER SQUARE FOOT.

REINFORCING BAR SPLICE:
REINFORCING BAR SPLICE LENGTHS SHALL CONFORM TO THE MINIMUM LENGTHS SPECIFIED BY 509.08 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ESTIMATED QUANTITIES

(QUANTITIES CARRIED TO GENERAL SUMMARY SHEETS 12-13)

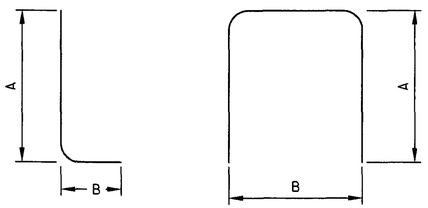
ITEM	TOTAL	UNIT	DESCRIPTION	INLET HEADWALL	OUTLET HEADWALL	GENERAL
202	LUMP		STRUCTURE REMOVED			LUMP
503	LUMP		COFFERDAMS, CRIBS & SHEETING			LUMP
503	LUMP		UNCLASSIFIED EXCAVATION	LUMP	LUMP	
518	LUMP		POROUS BACKFILL WITH FILTER FABRIC	LUMP	LUMP	
602	46.8	CU YD	CONCRETE MASONRY	23.1	23.7	
603	116	FT	48" CONDUIT, TYPE A			116
512	39	SQ YD	SEALING OF CONRETE SURFACES (EPOXY URETHANE)	19	20	

REINFORCING STEEL LIST
INLET & OUTLET HEADWALLS
EPOXY COATED (FOR INFORMATION ONLY)

MARK	NO.	LENGTH	WEIGHT	SHAPE	A	B	C
H501	28	22'-6"	657	S			
H502	8	11'-7"	97	B3	8'-2"	3'-6"	57°
H503	4	12'-1"	50	B3	8'-8"	3'-6"	57°
H504	4	12'-7"	52	B3	9'-2"	3'-6"	57°
H505	4	13'-1"	55	B3	9'-8"	3'-6"	57°
H506	4	13'-7"	57	B3	10'-2"	3'-6"	57°
H507	4	14'-1"	59	B3	10'-8"	3'-6"	57°
H508	4	14'-7"	61	B3	11'-2"	3'-6"	57°
H509	78	5'-9"	468	S			
H510	58	8'-2"	494	B1	5'-9"	2'-6"	
H511	58	5'-3"	318	B2	2'-6"	6"	
H512	4	19'-6"	81	S			
H513	54	7'-5"	418	B1	6'-0"	1'-6"	
H514	54	6'-0"	338	S			
H515	76	6'-11"	548	S			
H516	8	6'-3"	52	S			
H517	8	5'-7"	47	S			
H518	8	4'-11"	41	S			
H519	8	4'-3"	35	S			
H520	12	14'-9"	185	S			
H521	16	8'-9"	146	S			
H522	12	20'-3"	253	S			
H523	12	5'-11"	74	B2	2'-9"	8"	
H524	4	5'-3"	22	S			
H525	4	9'-0"	38	S			
H526	12	6'-11"	87	B3	3'-6"	3'-6"	57°
H527	8	4'-6"	38	S			
H528	8	5'-9"	48	S			
		TOTAL:	4819				

NOTES:
1. ALL DIMENSIONS ARE OUT TO OUT.
2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
3. AN "S" IN THE "SHP" COLUMN INDICATES STRAIGHT BARS.
4. REFER TO CMS SECTION 509.05 FOR STANDARD BEND DIMENSIONS.
5. WEIGHT IS IN POUNDS.

BENDING DIAGRAM



DESIGN AGENCY
KOHLI & KALINER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

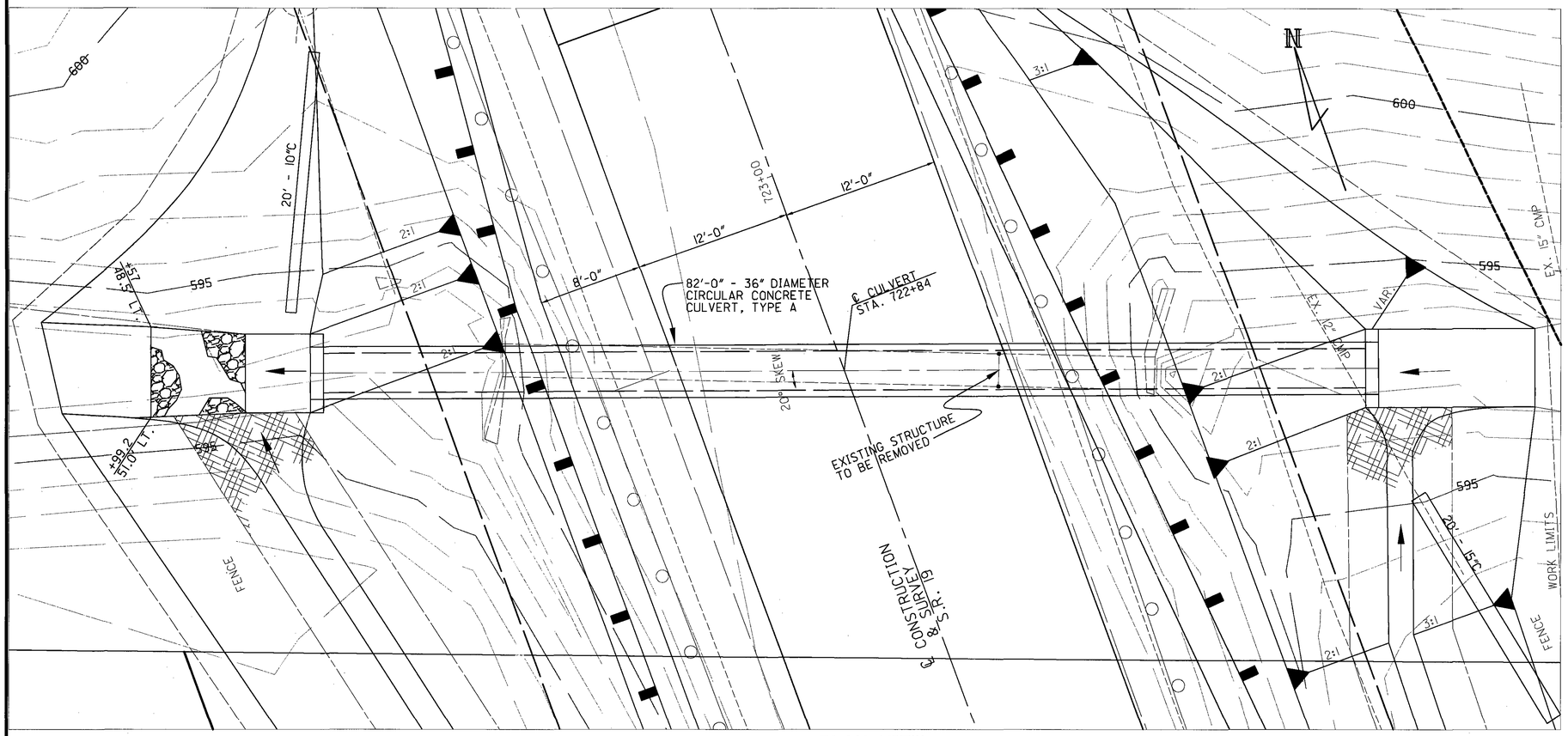
DESIGNED BLW | DRAWN BLW | REVIEWED DGB | DATE 12-23-02
CHECKED MAD | REVISED | STRUCTURE FILE NUMBER

GENERAL NOTES / QUANTITIES / RE-STEEL
CULVERT NO. SAN-19-0243

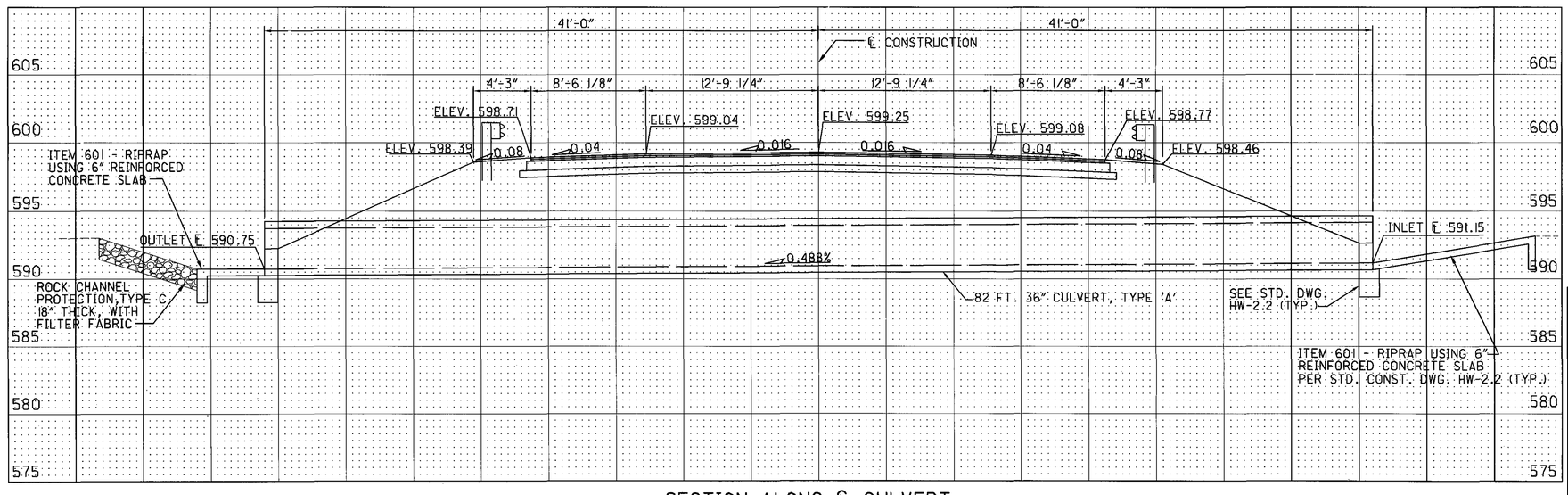
SAN-19-2.43/13.68/13.75
SAN-635-1.60

3/3

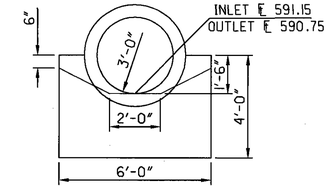
38/57



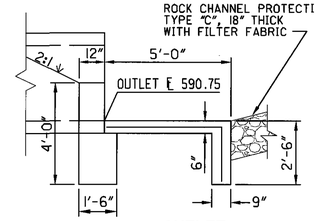
PLAN VIEW



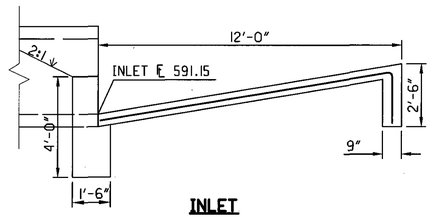
SECTION ALONG ℄ CULVERT



ELEVATION



OUTLET



INLET

HEADWALLS PER STANDARD
CONSTRUCTION DRAWINGS HW-2.2

DISPOSITION OF UTILITIES:

ALL UTILITIES SHALL BE RELOCATED (IF NECESSARY) BY OTHERS.

EARTHWORK LIMITS

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

HYDRAULIC DATA

Q_{25} = 54 cfs V_{25} = 7.64 fps HWELEV = 596.09

Q_{100}= 69 cfs V_{100}= 9.76 fps HWELEV = 597.55

DRAINAGE AREA = 0.29 SQ. MI.

NOTE: FOR STRUCTURE PAY QUANTITIES SEE SHEETS 14 & 25.

EXISTING STRUCTURE	PROPOSED STRUCTURE
TYPE: 30" DIAMETER CONCRETE CULVERT WITH CONCRETE HEADWALLS	TYPE: 36" DIAMETER CIRCULAR CONCRETE CULVERT, TYPE 'A', WITH CONCRETE HEADWALLS
SIZE: 30" DIAMETER X 50'±	SIZE: 36" DIAMETER X 82.0'
ROADWAY: 26.4'±	ROADWAY: 24'-0"
APPROACH SLABS: NONE	SKEW: 20° L.F.
SKEW: 21° L.F.	WEARING SURFACE: 3" MIN. ASPHALT CONCRETE
WEARING SURFACE: ASPHALT CONCRETE	ALIGNMENT: TANGENT
ALIGNMENT: TANGENT	LOADING: HS-25 AND ALTERNATE MILITARY LOADING
CONDITION: POOR	CROWN: 0.016
DISPOSITION: TO BE REMOVED	LATITUDE: 41°24'27" NORTH
	LONGITUDE: 83°08'08" WEST

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
511 East Illinois Street, Lima, Ohio 45801 419/227-1115

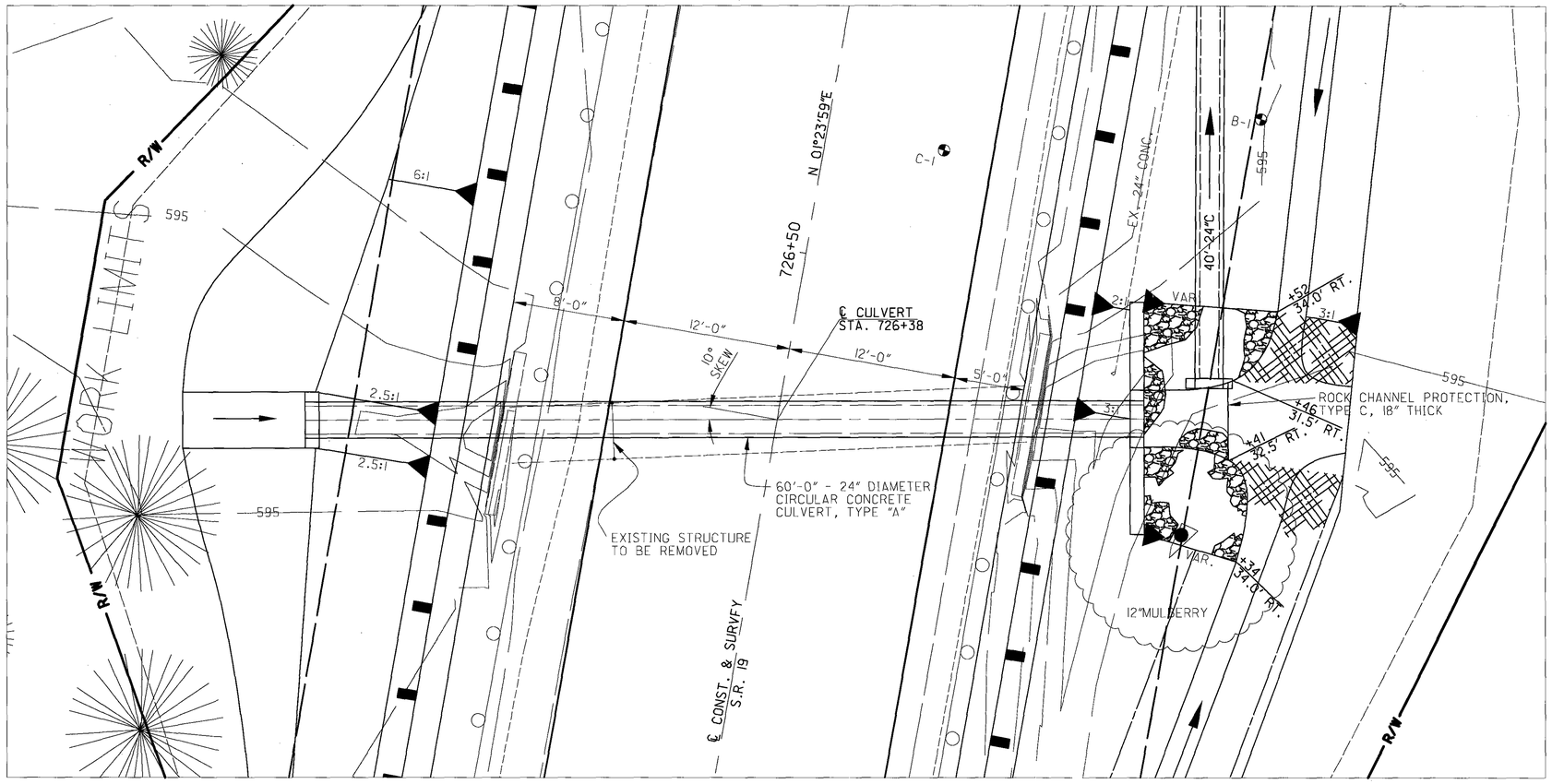
DESIGNED	DRAWN	REVIEWED	DATE
BLW	BLW	DGB	12-23-02
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MAD			

CULVERT PLAN AND SECTION
CULVERT NO. SAN-19-1369

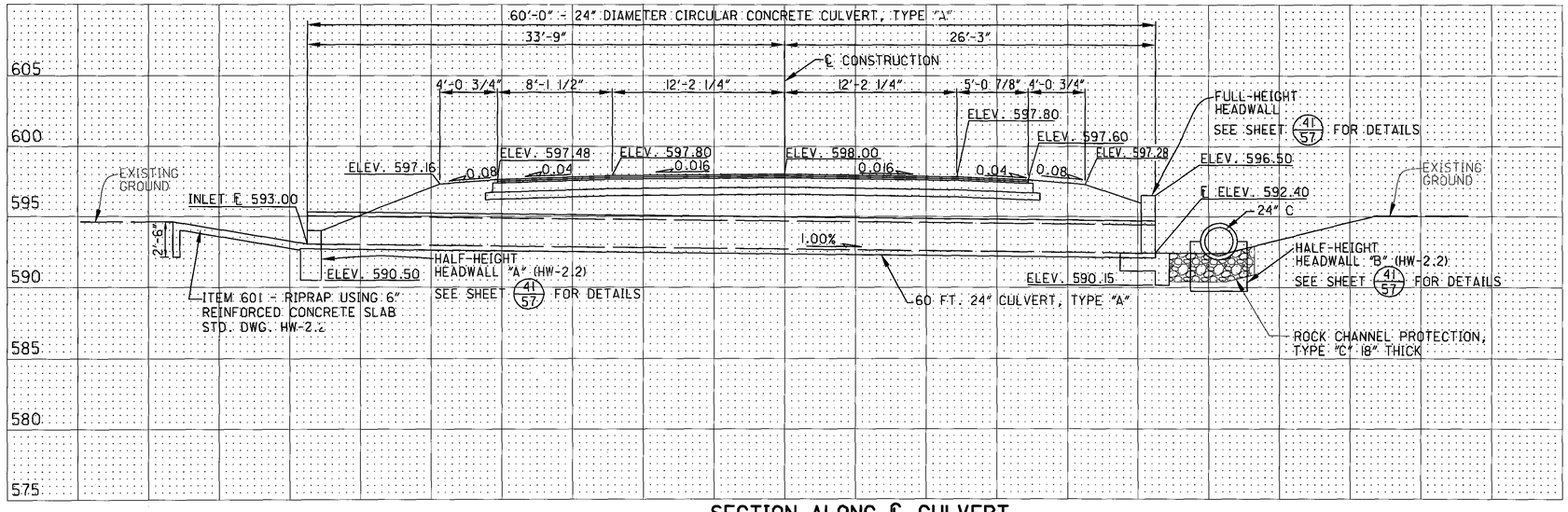
SAN-19-2.43/13.68/13.75
SAN-635-1.60

1 / 1

39
57



PLAN VIEW



SECTION ALONG ℄ CULVERT

N

DESIGN TRAFFIC
2005 ADT = 6500
2025 ADT = 8700
2025 ADTT = 522

BENCH MARK
TOP OF "T" STAKE
STA. 729+35.2, 18.2' RT
ELEV.=596.87

SEE SHEET 3 FOR REFERENCE POINTS

BORING	STA.	OFFSET	ELEV.
B-1	726+65.0	30.5' RT	595.03
C-1	726+58.9	8.5' RT	597.83

DISPOSITION OF UTILITIES:

ALL UTILITIES SHALL BE RELOCATED (IF NECESSARY) BY OTHERS.

EARTHWORK LIMITS

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

HYDRAULIC DATA

Q_{25} = 5.0 cfs V_{25} = 1.59 fps HW ELEV = 595.21
Q_{100} = 6.20 cfs V_{100} = 1.97 fps HW ELEV = 597.23
DRAINAGE AREA = 2.8 AC.

EXISTING STRUCTURE

TYPE: REINFORCED CONCRETE THREE-SIDED CULVERT
SIZE: 4.0' SPAN X 2.4' RISE
ROADWAY: 24'±
SKEW: 12° R.F.
ALIGNMENT: TANGENT
SUPERELEVATION: NONE
CONDITION: POOR
DISPOSITION: TO BE REMOVED

PROPOSED STRUCTURE

TYPE: 24" DIAMETER CIRCULAR CONCRETE CULVERT, TYPE "A", WITH REINFORCED CONCRETE HEADWALLS
SIZE: 24" DIAMETER X 60.0'
ROADWAY: 24'-0"
SKEW: 10° R.F.
ALIGNMENT: TANGENT
LOADING: HS-25 AND ALTERNATE MILITARY LOADING
SUPERELEVATION: NONE
LATITUDE: 41°24'30" NORTH
LONGITUDE: 83°08'08" WEST

DESIGN AGENCY
KOHLI & KALHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1156

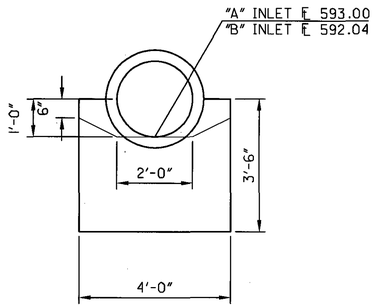
DESIGNED	DRAWN	REVIEWED	DATE
BLW	BLW	DGB	12-23-02
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MAD			

CULVERT PLAN AND SECTION
CULVERT NO. SAN 19-1376

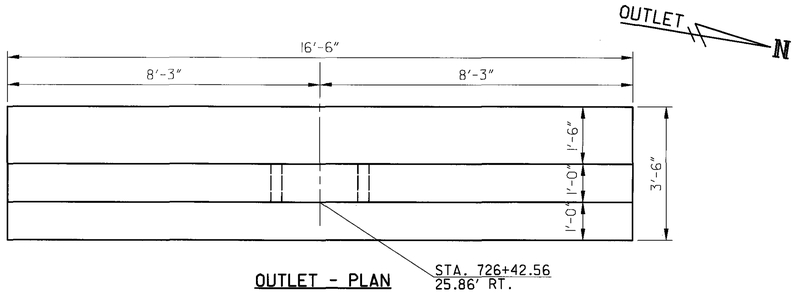
SAN-19-2.43/13.68/13.75
SAN-635-1.60

1/3

40/57

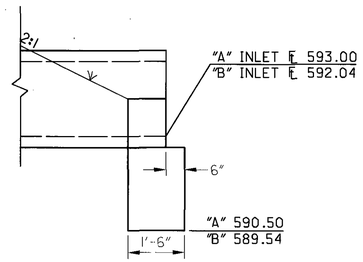


INLET - ELEVATION

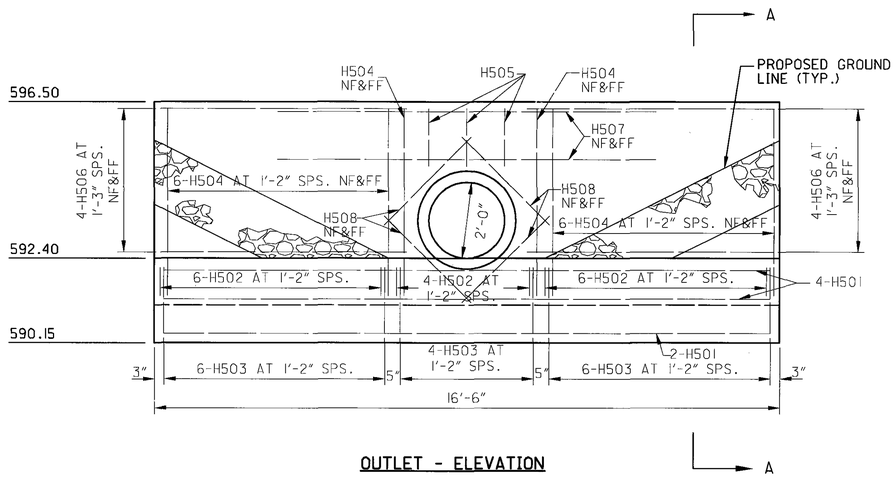


OUTLET - PLAN

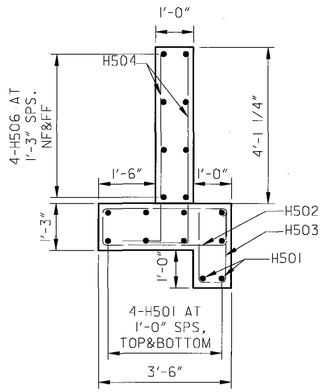
NOTES:
ABBREVIATIONS:
NF-NEAR FACE
FF-FAR FACE
SPS-SPACES



INLET



OUTLET - ELEVATION



SECTION A-A

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

DESIGNED	DRAWN	REVIEWED	DATE	STRUCTURE FILE NUMBER
BLW	BLW	DGB	12-23-02	
CHECKED	REVISED			
MAD				

HEADWALL DETAILS

CULVERT NO. SAN-19-1376

SAN-19-2.43/13.68/13.75
SAN-635-1.60

2/3

41/57

GENERAL NOTES

DESIGN SPECIFICATIONS:
THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS 1996, INCLUDING THE 1997, 1998, 1999 AND 2000 INTERIM SPECIFICATIONS AND TO THE ODOT BRIDGE DESIGN MANUAL.

DESIGN DATA:
DESIGN LOADING: HS-25 AND ALTERNATE MILITARY LOADING
CONCRETE CLASS C: COMPRESSIVE STRENGTH 4000 P.S.I.
REINFORCING STEEL: ASTM A615, A616, A617
GRADE 60 MINIMUM YIELD STRENGTH: 60,000 P.S.I.

REMOVAL OF EXISTING STRUCTURE:
WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC, THE EXISTING STRUCTURE SHALL BE REMOVED UPON RECEIVING PERMISSION FROM THE ENGINEER. INCLUDED IN THIS QUANTITY SHALL BE ALL HEADWALLS, WINGWALLS, AND CULVERT.

UTILITY LINES:
ALL EXPENSE INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE UTILITIES. THE CONTRACTOR AND UTILITIES ARE TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

FOUNDATION BEARING PRESSURE:
CULVERT FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM BEARING PRESSURE OF 0.66 TONS PER SQUARE FOOT. THE ALLOWABLE BEARING PRESSURE IS 1.00 TON PER SQUARE FOOT.

REINFORCING BAR SPLICE:
REINFORCING BAR SPLICE LENGTHS SHALL CONFORM TO THE MINIMUM LENGTHS SPECIFIED BY 509.08 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ESTIMATED QUANTITIES

(QUANTITIES CARRIED TO GENERAL SUMMARY SHEETS 12 - 13)

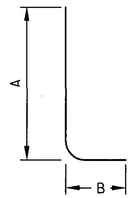
ITEM	TOTAL	UNIT	DESCRIPTION	INLET HEADWALL	OUTLET HEADWALL	GENERAL
202	LUMP		STRUCTURE REMOVED			LUMP
503	LUMP		COFFERDAMS, CRIBS & SHEETING			LUMP
503	LUMP		UNCLASSIFIED EXCAVATION	LUMP	LUMP	
601	4	SQ YD	RIPRAP USING 6" REINFORCED CONCRETE SLAB	4		
602	6.3	CU YD	CONCRETE MASONRY	0.7	5.6	
603	60	FT	24" CONDUIT, TYPE A			60

REINFORCING STEEL LIST
OUTLET HEADWALL
EPOXY COATED (FOR INFORMATION ONLY)

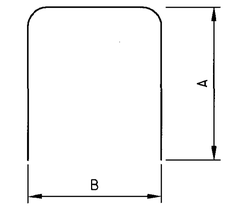
MARK	NO.	LENGTH	WEIGHT	SHAPE	A	B
H501	10	16'-0"	167	S		
H502	16	8'-0"	134	B3	3'-0"	9"
H503	16	3'-9"	63	B2	1'-9"	6"
H504	28	5'-10"	170	B1	4'-11"	1'-0"
H505	3	3'-5"	11	B2	1'-6"	8"
H506	16	6'-6"	108	S		
H507	4	10'-0"	42	S		
H508	8	3'-3"	27	S		
TOTAL: 722 POUNDS						

NOTES:
1. ALL DIMENSIONS ARE OUT TO OUT.
2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
3. AN "S" IN THE "SHP" COLUMN INDICATES STRAIGHT BARS.
4. REFER TO CMS SECTION 509.05 FOR STANDARD BEND DIMENSIONS.
5. WEIGHT IS IN POUNDS.

BENDING DIAGRAM



B1



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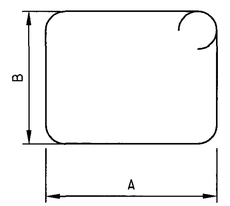

B3

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1135

REVIEWED DGB DATE 12-23-02 | STRUCTURE FILE NUMBER
DRAWN BLW | REVISED
DESIGNED BLW | CHECKED MAD

GENERAL NOTES / QUANTITIES / RE-STEEL
CULVERT NO. SAN-19-1376

SAN-19-2.43/13.68/13.75
SAN-635-1.60

3 / 3

42 / 57

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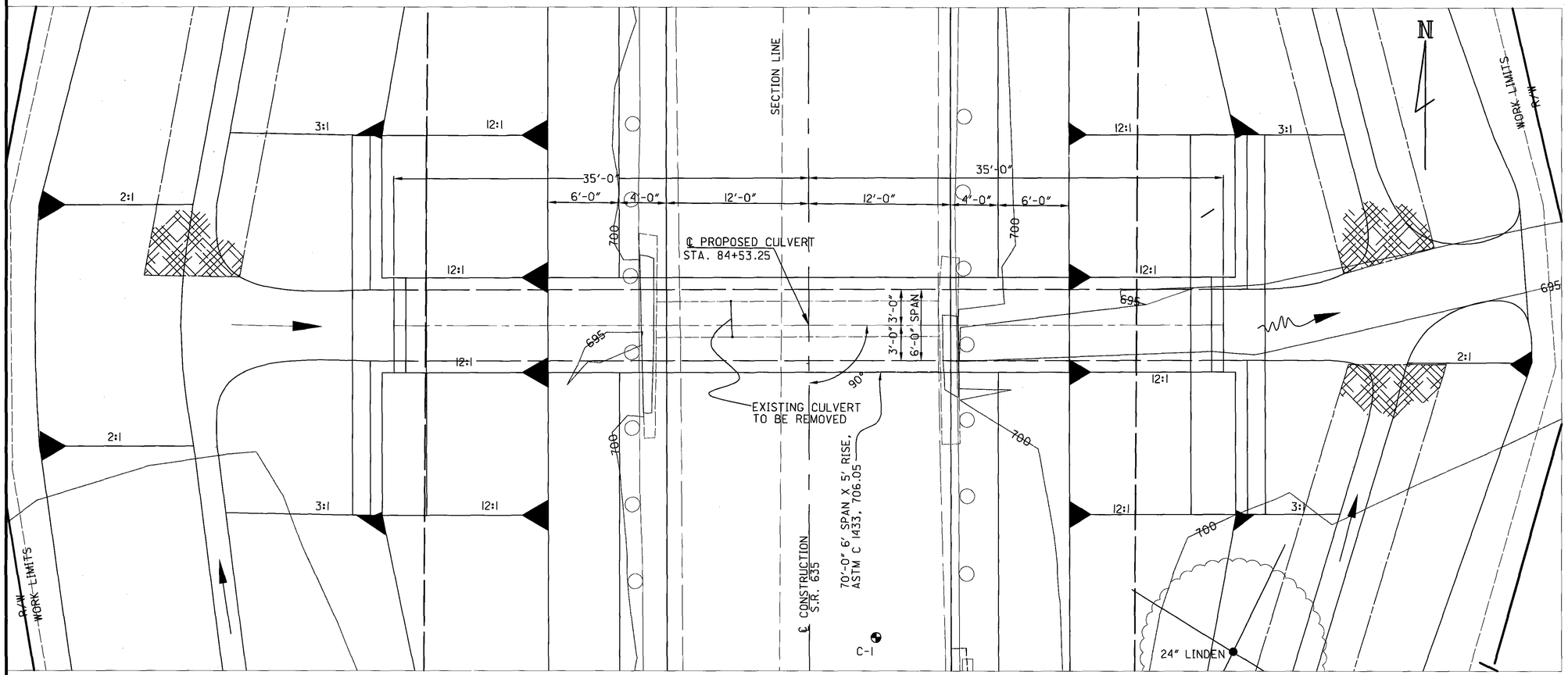
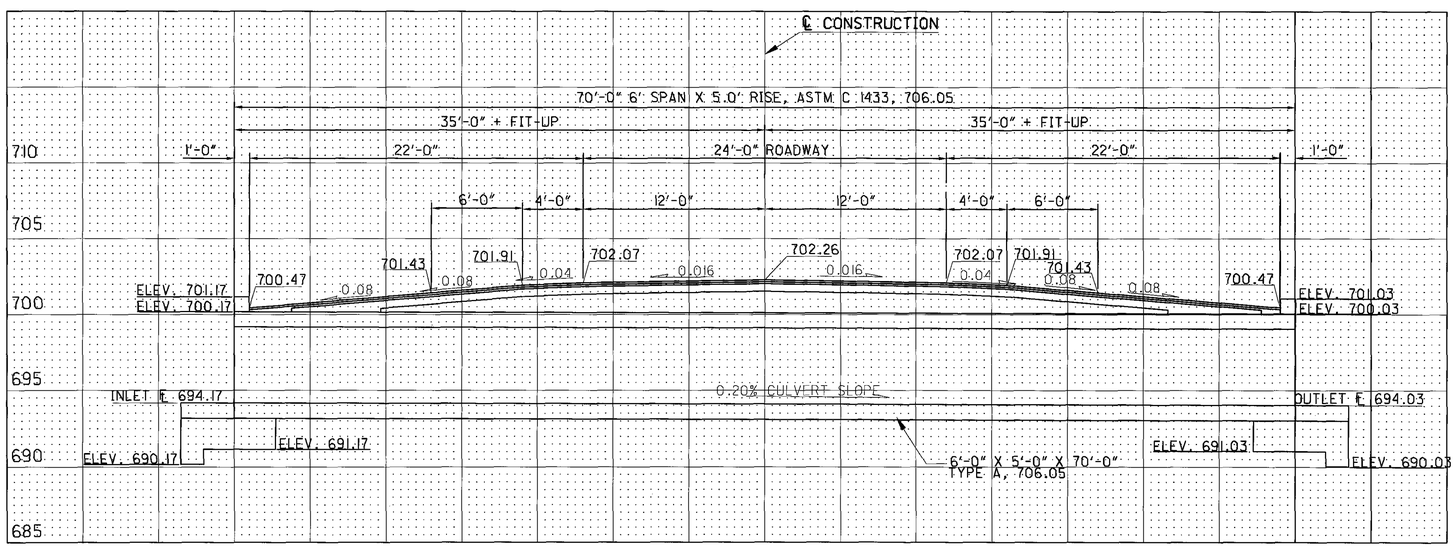


PLAN VIEW



SECTION ALONG ℄ CULVERT

BENCH MARKS

TOP OF CONCRETE MONUMENT
STA. 82+68.59, 33.75' LT.
ELEV. = 700.97

TOP OF "T" STAKE
STA. 88+00.5, 12.5' RT.
ELEV. = 701.13

DESIGN TRAFFIC

2005 ADT = 650
2025 ADT = 950
2025 ADTT = 76

SEE SHEET 4 FOR REFERENCE POINTS

BORING	STA.	OFFSET	ELEV.
B-1	84+10	13.0' RT	701.76
C-1	84+27	5.6' RT	702.36

DISPOSITION OF UTILITIES:

ALL UTILITIES SHALL BE RELOCATED (IF NECESSARY BY) OTHERS.

EARTHWORK LIMITS

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

EXISTING STRUCTURE

TYPE: REINFORCED CONCRETE BOX CULVERT WITH CONCRETE HEADWALLS
SIZE: 5'x6'
ROADWAY: 26'-3"± F/F GUARDRAIL
SKEW: NONE
WEARING SURFACE: ASPHALT CONCRETE
ALIGNMENT: TANGENT
CONDITION: POOR
DISPOSITION: TO BE REMOVED

PROPOSED STRUCTURE

TYPE: PRECAST REINFORCED CONCRETE BOX CULVERT, TYPE "A" WITH REINFORCED CONCRETE HEADWALLS.
SIZE: 6.0' X 5.0' X 70.0' CONDUIT
ROADWAY: 24'-0" WITH SAFETY GRADED SLOPES
SKEW: NONE
WEARING SURFACE: 3" MIN. ASPHALT CONCRETE
ALIGNMENT: TANGENT
LOADING: HS-25 AND ALTERNATE MILITARY LOADING
CROWN: 0.016
LATITUDE: 41°16'33" NORTH
LONGITUDE: 83°16'59" WEST

HYDRAULIC DATA

Q_{10} = 84 cfs V_{25}= 2.87 fps HWELEV = 699.14
Q_{100}= 132 cfs V_{100}= 4.40 fps HWELEV = 700.44
DRAINAGE AREA = 0.64 SQ. MI.

DESIGN AGENCY
KOHL & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
511 East Rahn Road, Dayton, Ohio 45429 (937)435-1155

DESIGNED	DRAWN	REVIEWED	DATE
BLW	BLW	DGB	12-23-02
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MAD			

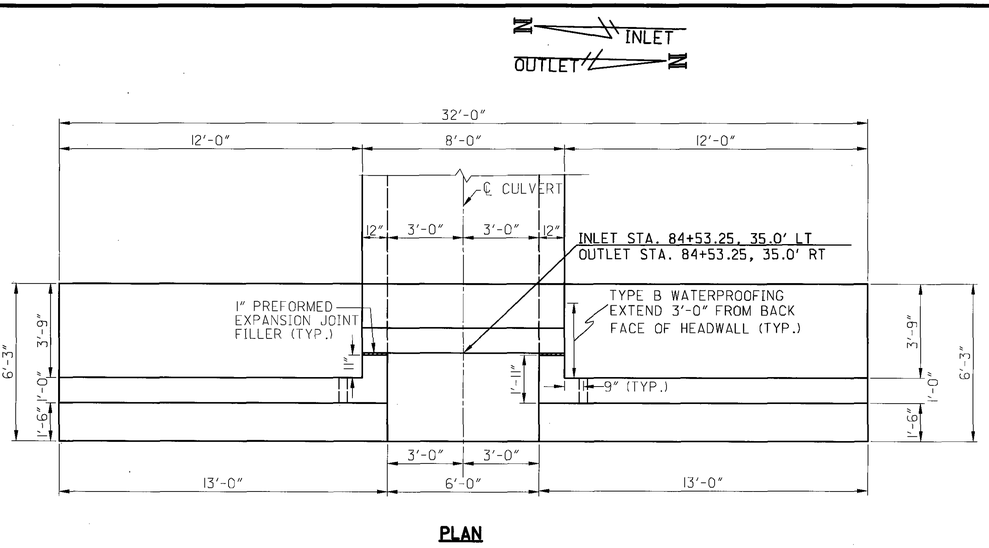
CULVERT PLAN AND SECTION
CULVERT NO. SAN-635-0160

SAN-19-2.43/13.68/13.75
SAN-635-1.60

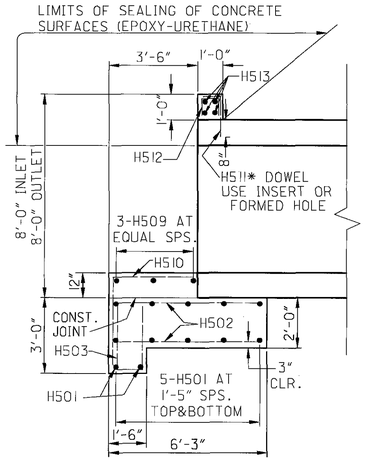
1 / 3

43
57

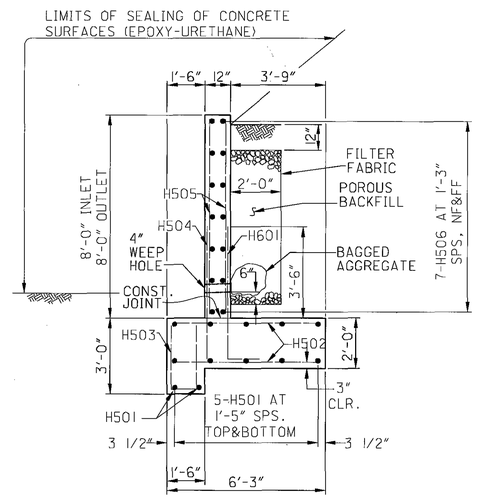
D:\wp\SAN635\160\culvert plan.dwg, 09/12/03 04:10:51 PM



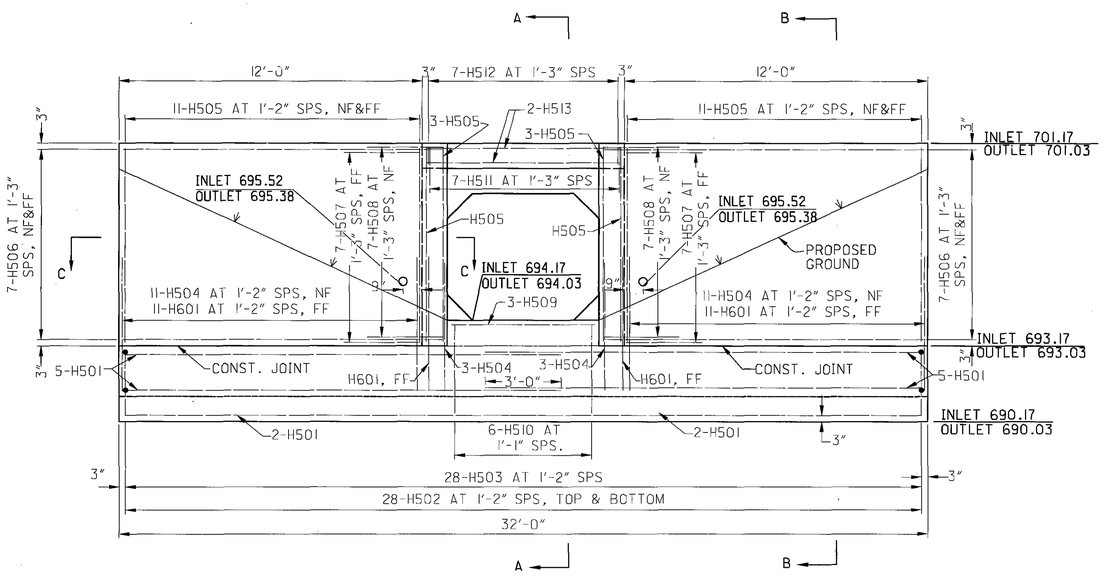
PLAN



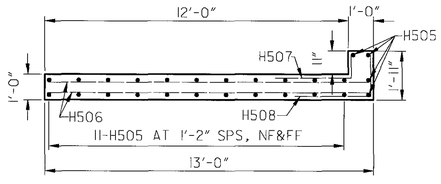
SECTION A-A



SECTION B-B



ELEVATION



SECTION C-C

NOTES:

ABBREVIATIONS:
NF-NEAR FACE
FF-FAR FACE
SPS-SPACES

*REINFORCING DOWEL BARS ANCHORED AS PER CMS ITEM 510, DOWEL HOLES, WITH NON-SHRINK, NON-METALLIC GROUT, MEETING THE REQUIREMENTS OF 705.20. A MINIMUM 8" DEEP HOLE SHALL BE REQUIRED.

POROUS BACKFILL WITH FILTER FABRIC, 2 FEET THICK, SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO 1 FOOT BELOW THE EMBANKMENT SURFACE, AND LATERALLY TO THE ENDS OF THE WINGWALLS. TWO CUBIC FEET OF BAGGED NO. 3 AGGREGATE SHALL BE PLACED AT EACH WEEPHOLE. BAGGED AGGREGATE IS INCLUDED WITH POROUS BACKFILL FOR PAYMENT.

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1155

DESIGNED	DRAWN	REVIEWED	DATE
BLW	BLW	DGB	12-23-02
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MAD			

HEADWALL DETAILS
CULVERT NO. SAN-635-0160

SAN-19-2.43/13.68/13.75
SAN-635-1.60

2/3

44/57

GENERAL NOTES

DESIGN SPECIFICATIONS:
THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS 1996, INCLUDING THE 1997, 1998, 1999 AND 2000 INTERIM SPECIFICATIONS AND TO THE ODOT BRIDGE DESIGN MANUAL.

DESIGN DATA:
DESIGN LOADING: HS-25 AND ALTERNATE MILITARY LOADING
CONCRETE CLASS C: COMPRESSIVE STRENGTH 4000 P.S.I.
REINFORCING STEEL: ASTM A615, A616, A617
GRADE 60 MINIMUM YIELD STRENGTH: 60,000 P.S.I.

REMOVAL OF EXISTING STRUCTURE:
WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC, THE EXISTING STRUCTURE SHALL BE REMOVED UPON RECEIVING PERMISSION FROM THE ENGINEER. INCLUDED IN THIS QUANTITY SHALL BE ALL HEADWALLS, WINGWALLS, AND CULVERT

UTILITY LINES:
ALL EXPENSE INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE UTILITIES. THE CONTRACTOR AND UTILITIES ARE TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

FOUNDATION BEARING PRESSURE:
CULVERT FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM BEARING PRESSURE OF 1.4 TONS PER SQUARE FOOT. THE ALLOWABLE BEARING PRESSURE IS 2.0 TONS PER SQUARE FOOT.

REINFORCING BAR SPLICE:
REINFORCING BAR SPLICE LENGTHS SHALL CONFORM TO THE MINIMUM LENGTHS SPECIFIED BY 509.08 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

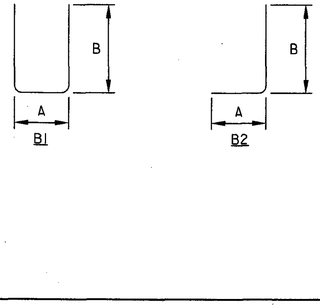
ESTIMATED QUANTITIES
(QUANTITIES CARRIED TO GENERAL SUMMARY SHEETS 12 & 13)

ITEM	TOTAL	UNIT	DESCRIPTION	INLET HEADWALL	OUTLET HEADWALL	GENERAL
202	LUMP		STRUCTURE REMOVED			LUMP
503	LUMP		COFFERDAMS, CRIBS & SHEETING			LUMP
503	LUMP		UNCLASSIFIED EXCAVATION	LUMP	LUMP	
510	14	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	7	7	
512	171	SQ YD	TYPE 2 WATERPROOFING			171
512	11	SQ YD	TYPE B WATERPROOFING	5.5	5.5	
516	32	SQ FT	1" PREFORMED EXPANSION JOINT FILLER	16	16	
518	LUMP		POROUS BACKFILL WITH FILTER FABRIC	LUMP	LUMP	
602	52.0	CU YD	CONCRETE MASONRY	26.0	26.0	
603	70	FT	6'X5' CONDUIT, TYPE A, 706.05 (3" MINIMUM COVER)			70
512	36	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	18	18	

REINFORCING STEEL LIST
INLET & OUTLET HEADWALLS
EPOXY COATED (FOR INFORMATION ONLY)

MARK	NO.	LENGTH	WEIGHT	SHAPE	A	B	C
H501	48	17'-3"	864	S			
H502	112	5'-9"	672	S			
H503	56	5'-9"	336	B1	1'-0"	2'-6"	
H504	56	5'-3"	307	S			
H505	104	7'-8"	832	S			
H506	56	12'-8"	740	S			
H507	28	3'-9"	110	B2	11"	3'-0"	
H508	28	4'-5"	129	B2	1'-7"	3'-0"	
H509	6	5'-8"	35	S			
H510	12	6'-6"	81	B2	3'-2"	3'-6"	
H511*	14	2'-0"	29	B2	8"	1'-6"	
H512	14	1'-10"	27	B1	8"	8"	
H513	8	7'-8"	64	S			
H601	48	6'-1"	439	B2	1'-0"	5'-3"	
		TOTAL	4665				

BENDING DIAGRAM



NOTES:
1. ALL DIMENSIONS ARE OUT TO OUT.
2. ALL REINFORCING STEEL SHALL BE EPOXY CODED.
3. AN "S" IN THE "SHAPE" COLUMN INDICATES STRAIGHT BARS.
4. REFER TO CMS SECTION 509.05 FOR STANDARD BEND DIMENSIONS.
5. WEIGHT IS IN POUNDS.

* DOWEL BAR

DESIGN AGENCY
KOHLI & KALIHER ASSOCIATES, INC.
ENGINEERS AND SURVEYORS
311 East Market Street, Lima, Ohio 45801 419-227-1133

DESIGNED BLW | DRAWN BLW | REVIEWED DGB | DATE 12-23-02
CHECKED MAD | REVISED | STRUCTURE FILE NUMBER

GENERAL NOTES / QUANTITIES / RE-STEEL
CULVERT NO. SAN-635-0160

SAN-19-2.43/13.68/13.75
SAN-635-1.60

3 / 3

45
57

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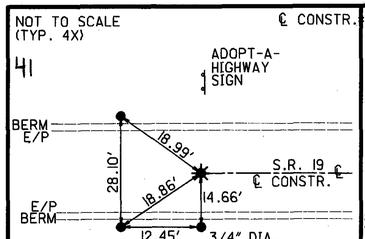
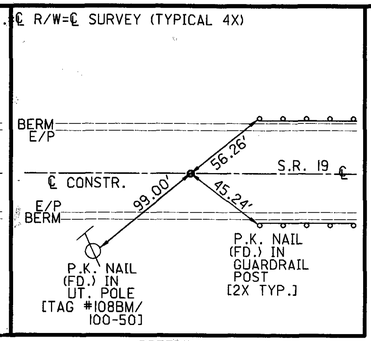
SAN-19-2.43
SECTIONS 19 & 20, T-4-N, R-16-E, GREEN CREEK TOWNSHIP, SANDUSKY COUNTY

NOT TO SCALE (TYP. 4X)

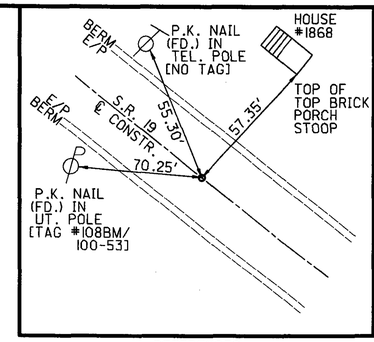


REFERENCES
℄ CONSTR. STA. 8+00.00
COTTON GIN SPINDLE (SET)
N 9798.4644
E 9944.6961

℄ R/W=℄ SURVEY (TYPICAL 4X)



REFERENCES
P.C. ● ℄ CONSTR. STA. 9+92.50
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
N 9990.5943
E 9956.6264



REFERENCES
P.T. ● ℄ CONSTR. STA. 12+78.06
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
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E 10055.9837

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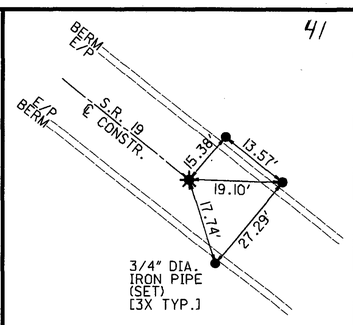
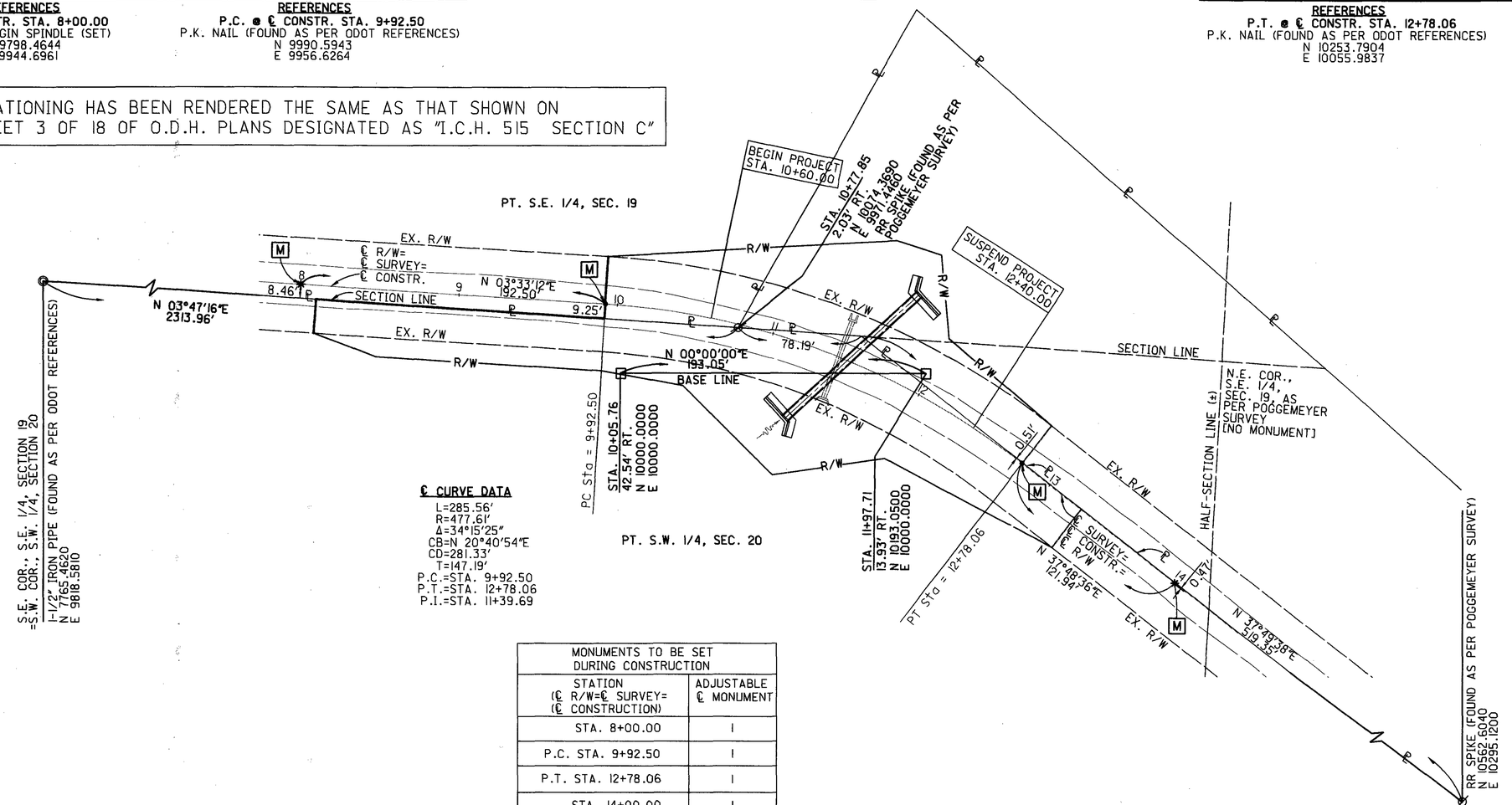


REFERENCES
℄ CONSTR. STA. 14+00.00
COTTON GIN SPINDLE (SET)
N 10350.1287
E 10130.7386

MONUMENT LEGEND
- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- [M] PROPOSED MONUMENT BOX

N

STATIONING HAS BEEN RENDERED THE SAME AS THAT SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"



℄ CURVE DATA
L=285.56'
R=477.61'
Δ=34°15'25"
CB=N 20°40'54"E
CD=281.33'
T=147.19'
P.C.=STA. 9+92.50
P.T.=STA. 12+78.06
P.I.=STA. 11+39.69

MONUMENTS TO BE SET DURING CONSTRUCTION	
STATION (℄ R/W=℄ SURVEY= (℄ CONSTRUCTION)	ADJUSTABLE ℄ MONUMENT
STA. 8+00.00	1
P.C. STA. 9+92.50	1
P.T. STA. 12+78.06	1
STA. 14+00.00	1

THE PROPOSED RIGHT OF WAY SHALL BE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY (SAME AS CENTERLINE OF SURVEY AND CENTERLINE OF CONSTRUCTION). STATIONING HAS BEEN RENDERED THE SAME AS THAT SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"

ADJUSTABLE CENTERLINE MONUMENTS, REFERENCE MONUMENTS AND RIGHT OF WAY MONUMENTS ARE SHOWN ON STANDARD CONSTRUCTION DRAWING RM 1.1M (REV. 4-8-97) OF THE OHIO DEPARTMENT OF TRANSPORTATION. THE PLACING OF THE MONUMENTS SHALL BE UNDER THE DIRECTION OF A REGISTERED SURVEYOR AND ARE TO BE SET, AS SHOWN, BY THE HIGHWAY CONTRACTOR AT THE TIME OF CONSTRUCTION. ANY ALTERATIONS, WITH PRIOR APPROVAL OF THE OHIO DEPARTMENT OF TRANSPORTATION, SHALL BE NOTED AND O.D.O.T. SHALL BE NOTIFIED OF THE NEW LOCATIONS.

BASIS OF BEARINGS

ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY, AND ARE BASED ON AN ASSUMED CARDINAL DIRECTION FOR AN ARBITRARY SURVEY BASE LINE SET FOR PURPOSES OF DATA COLLECTION AT THE PROJECT SITE.

NOTES

THE EXISTING R/W WIDTH OF STATE ROUTE 19 IS BASED ON THE DIMENSIONS SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"

I HEREBY CERTIFY THAT THIS PLAT IS A TRUE DELINEATION OF SURVEYS MADE BY KOHLI & KALIHER ASSOCIATES, INC., THRU THE DATE BELOW.

THE ESTABLISHMENT OF THE PROPERTY LINES AND EXISTING RIGHT-OF-WAY LINES SHOWN ON THIS PLAN AS OF THIS DATE WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION.

BY Michael G. Buettner
SURVEYOR'S NAME

SURVEYOR NO. 6881 DATE JUNE 11, 2003

RECEIVED June 25, 2003
RECORDED June 25, 2003
BOOK 23 PAGE 41

Colleen Carmack
COUNTY RECORDER

STATE OF OHIO ★ MICHAEL G. BUETTNER 6881 REGISTERED SURVEYOR ★

200300009104
Filed for Record in SANDUSKY COUNTY, OHIO
COLLEEN CARMACK
06-25-2003 At 01:20 pm.
PLAT 129.60
Book 23 Page 41 - 43

200300009104
UH DEPT OF TRANSPORTATION
CALL JOHN LINGER
1-800-645-3312

SCALE IN FEET: 0, 20, 40, 80

P.I.D. NO. 23594

R/W DESIGNER RLM
R/W REVIEWER MGB

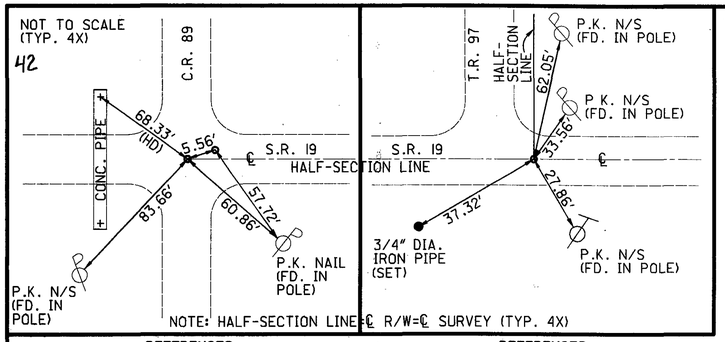
CENTERLINE PLAT
SAN-19-2.43

SAN-19-2.43/13.69/13.72
SAN-635-1.60

1/12

46/57

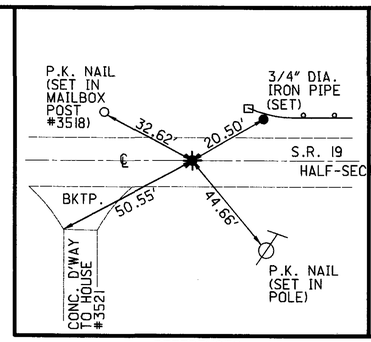
SAN-19-13.69/13.72
SECTION 9, T-5-N, R-15-E,
SANDUSKY TOWNSHIP, SANDUSKY COUNTY



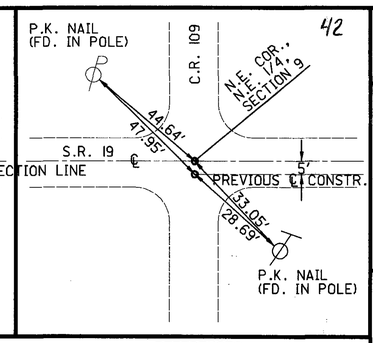
NOTE: HALF-SECTION LINE=℄ R/W=℄ SURVEY (TYP. 4X)

REFERENCES
P.I. STA. 695+17.02
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT S.E. COR., S.W. 1/4, SECTION 19
N 7381.6858
E 9971.5547

REFERENCES
P.I. STA. 721+75.34
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT N.E. COR., S.W. 1/4, SECTION 19
N 10039.2249
E 10035.9612



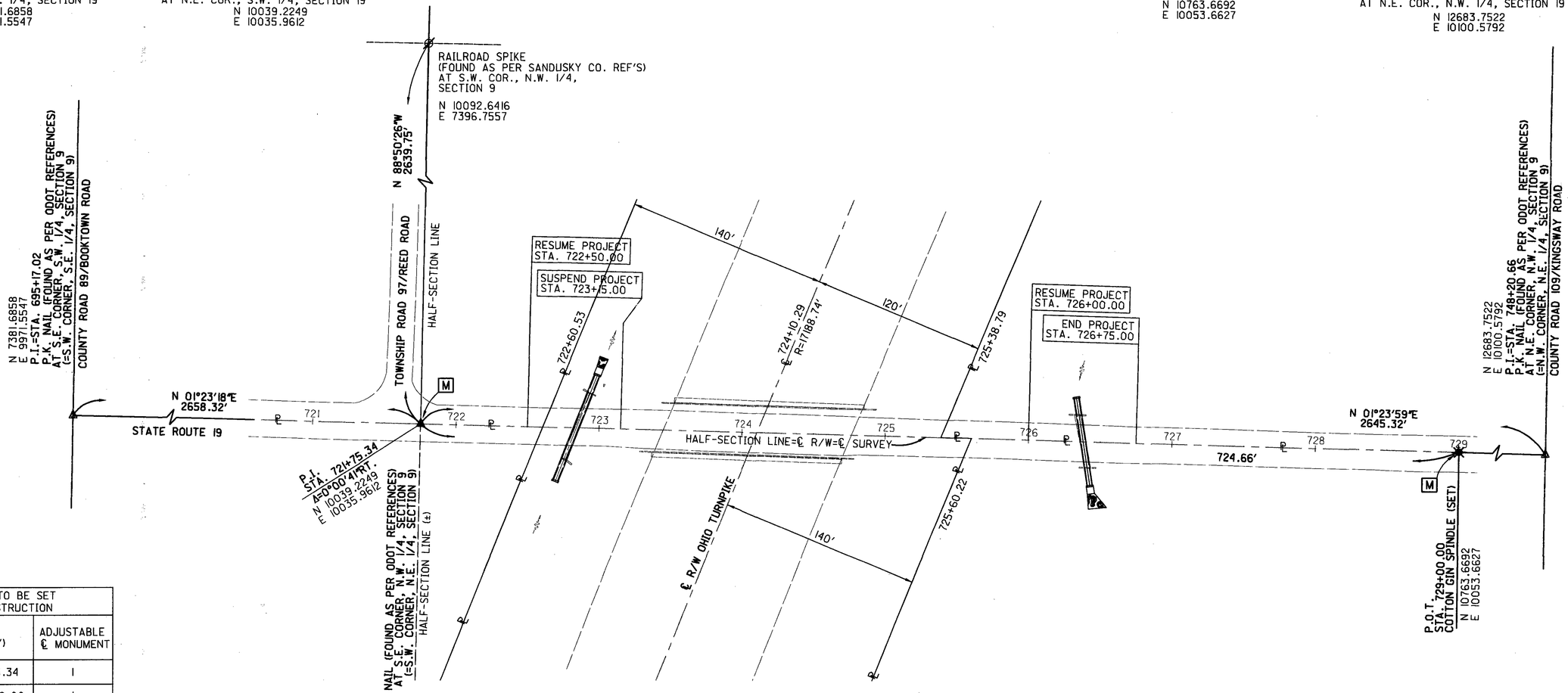
REFERENCES
P.O.T STA. 729+00.00
COTTON GIN SPINDLE (SET)
N 10763.6692
E 10053.6627



REFERENCES
P.I. STA. 748+20.66
P.K. NAIL (FOUND AS PER ODOT REFERENCES)
AT N.E. COR., N.W. 1/4, SECTION 19
N 12683.7522
E 10100.5792

MONUMENT LEGEND
- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- ⌀ RAILROAD SPIKE (SET)
- ⌀ RAILROAD SPIKE (FOUND)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- [M] PROPOSED MONUMENT BOX

N



MONUMENTS TO BE SET DURING CONSTRUCTION	
STATION (℄ R/W=℄ SURVEY)	ADJUSTABLE ℄ MONUMENT
P.I. STA. 721+75.34	1
P.O.T. STA. 729+00.00	1

THE PROPOSED RIGHT OF WAY SHALL BE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY (SAME AS CENTERLINE OF SURVEY).

ADJUSTABLE CENTERLINE MONUMENTS, REFERENCE MONUMENTS AND RIGHT OF WAY MONUMENTS ARE SHOWN ON STANDARD CONSTRUCTION DRAWING RM 1.1M (REV. 4-8-97) OF THE OHIO DEPARTMENT OF TRANSPORTATION. THE PLACING OF THE MONUMENTS SHALL BE UNDER THE DIRECTION OF A REGISTERED SURVEYOR AND ARE TO BE SET, AS SHOWN, BY THE HIGHWAY CONTRACTOR AT THE TIME OF CONSTRUCTION. ANY ALTERATIONS, WITH PRIOR APPROVAL OF THE OHIO DEPARTMENT OF TRANSPORTATION, SHALL BE NOTED AND O.D.O.T. SHALL BE NOTIFIED OF THE NEW LOCATIONS.

BASIS OF BEARINGS
ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. BEARINGS ARE BASED ON A RECORD BEARING OF N 01°23'59"E FOR THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 9.

NOTES
1. THE EXISTING R/W WIDTH OF STATE ROUTE 19 IS BASED ON DIMENSIONS FROM ODOT RIGHT-OF-WAY PLANS DESIGNATED S.H. 280. SEC. B, WHICH IN TURN REFERENCES VOL. 2, PAGE 89 OF THE SANDUSKY COUNTY ROAD RECORDS.

2. THE EXISTING R/W WIDTH OF TOWNSHIP ROAD 97 (REED ROAD) IS BASED ON THE ROAD LAW FOR THE YEAR 1843. (SEE VOL. 3, PAGE 130 OF SANDUSKY COUNTY ROAD RECORDS)

I HEREBY CERTIFY THAT THIS PLAT IS A TRUE DELINEATION OF SURVEYS MADE BY KOHLI & KALIHER ASSOCIATES, INC., THRU THE DATE BELOW.

THE ESTABLISHMENT OF THE PROPERTY LINES AND EXISTING RIGHT-OF-WAY LINES SHOWN ON THIS PLAN AS OF THIS DATE WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION.

BY Michael G. Buettner
SURVEYOR'S NAME

SURVEYOR NO. 6681 DATE JUNE 11, 2003

RECEIVED June 25, 2003
RECORDED June 25, 2003
BOOK 41 PAGE 42

Colleen Carmack
COUNTY RECORDER

STATE OF OHIO
MICHAEL G. BUETTNER
6881
REGISTERED
SURVEYOR

SCALE IN FEET
0 20 40 80

P.I.D. NO. 23594

R/W DESIGNER RLM
R/W REVIEWER MGB

CENTERLINE PLAT
SAN-19-13.69/13.72

SAN-19-2.43/13.69/13.72
SAN-635-1.60

2/12

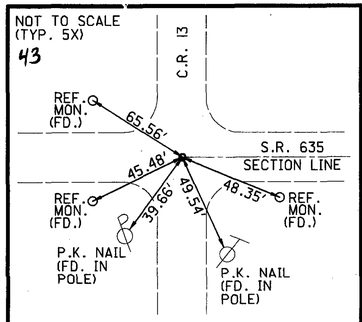
47/57

SAN-635-1.60
SECTIONS 29 & 30, T-4-N, R-14-E, JACKSON TOWNSHIP, SANDUSKY COUNTY

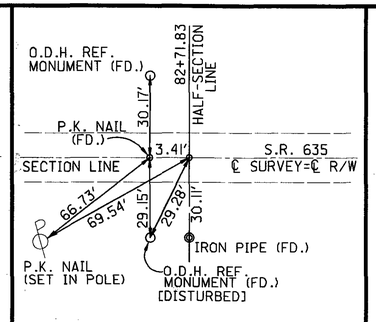
N

NOT TO SCALE (TYP. 5X)

43



REFERENCES
P.K. NAIL (FOUND AS PER ODOT REFERENCES) AT S.W. COR., S.W. 1/4, SEC. 29



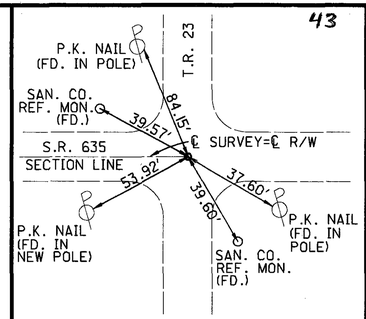
REFERENCES
℄ SURVEY STA. 82+71.83
P.K. NAIL (FOUND AS PER ODOT REFERENCES) AT S.W. COR., N.W. 1/4, SEC. 29

NOTE: SECTION LINE=℄ R/W=℄ SURVEY (TYP. 4X)

MONUMENT LEGEND
- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- ⌀ RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- [M] PROPOSED MONUMENT BOX

MONUMENTS TO BE SET DURING CONSTRUCTION	
STATION (℄ R/W=℄ SURVEY)	ADJUSTABLE ℄ MONUMENT
P.I. STA. 82+71.83	1
P.O.T. STA. 88+00.00	1

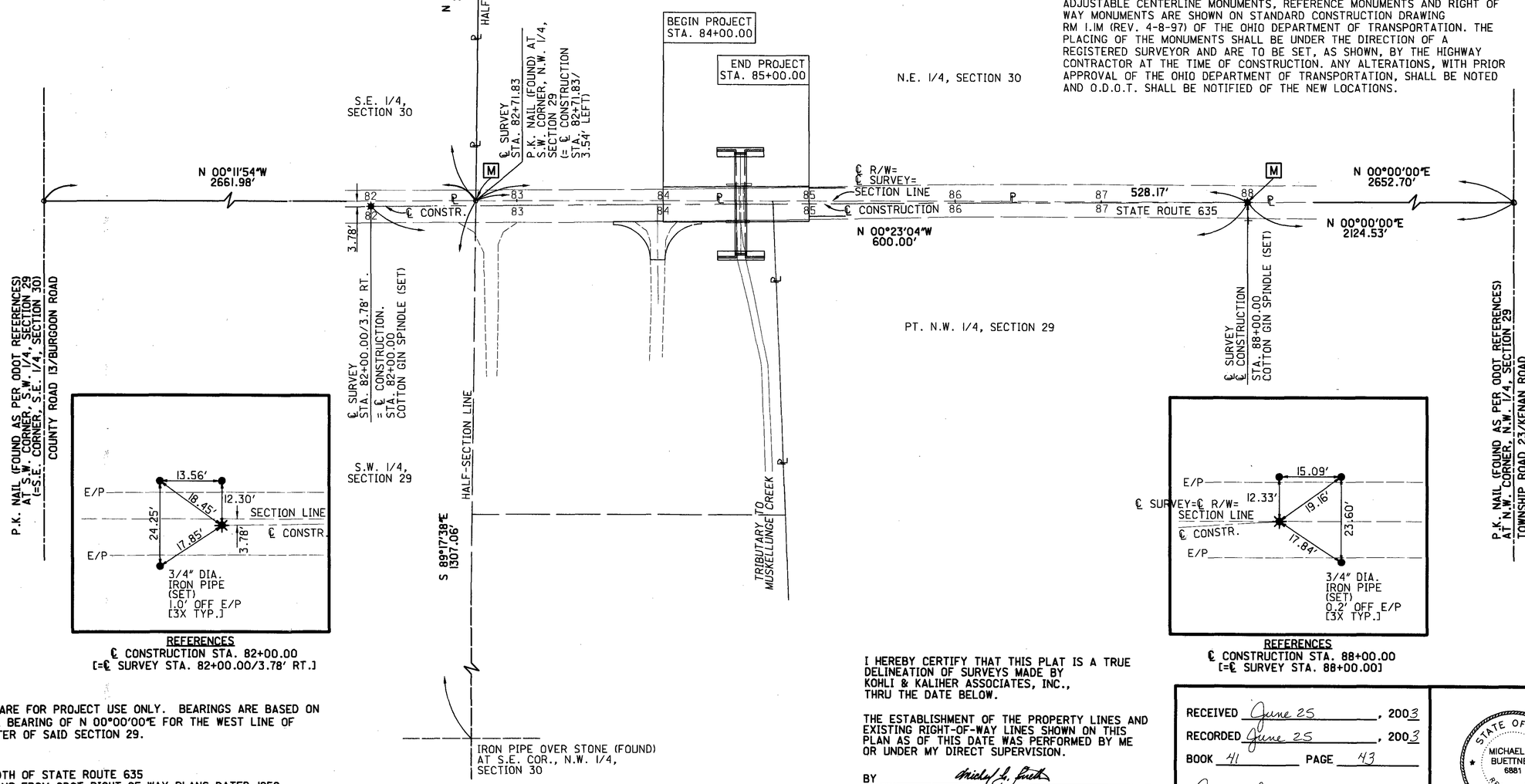
43



REFERENCES
P.K. NAIL (FOUND AS PER ODOT REFERENCES) AT N.W. COR., N.W. 1/4, SEC. 29

THE PROPOSED RIGHT OF WAY SHALL BE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY (SAME AS CENTERLINE OF SURVEY, BUT NOT SAME AS CENTERLINE OF CONSTRUCTION).

ADJUSTABLE CENTERLINE MONUMENTS, REFERENCE MONUMENTS AND RIGHT OF WAY MONUMENTS ARE SHOWN ON STANDARD CONSTRUCTION DRAWING RM 1.1M (REV. 4-8-97) OF THE OHIO DEPARTMENT OF TRANSPORTATION. THE PLACING OF THE MONUMENTS SHALL BE UNDER THE DIRECTION OF A REGISTERED SURVEYOR AND ARE TO BE SET, AS SHOWN, BY THE HIGHWAY CONTRACTOR AT THE TIME OF CONSTRUCTION. ANY ALTERATIONS, WITH PRIOR APPROVAL OF THE OHIO DEPARTMENT OF TRANSPORTATION, SHALL BE NOTED AND O.D.O.T. SHALL BE NOTIFIED OF THE NEW LOCATIONS.



REFERENCES
℄ CONSTRUCTION STA. 82+00.00
[=℄ SURVEY STA. 82+00.00/3.78' RT.]

REFERENCES
℄ CONSTRUCTION STA. 88+00.00
[=℄ SURVEY STA. 88+00.00]

BASIS OF BEARINGS
ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. BEARINGS ARE BASED ON AN ASSUMED CARDINAL BEARING OF N 00°00'00"E FOR THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 29.

NOTES
THE EXISTING R/W WIDTH OF STATE ROUTE 635 IS BASED ON DIMENSIONS FROM ODOT RIGHT-OF-WAY PLANS DATED 1959 AND DESIGNATED SAN-635-(1.32)-(5.63)

I HEREBY CERTIFY THAT THIS PLAT IS A TRUE DELINEATION OF SURVEYS MADE BY KOHLI & KALIHER ASSOCIATES, INC., THRU THE DATE BELOW.

THE ESTABLISHMENT OF THE PROPERTY LINES AND EXISTING RIGHT-OF-WAY LINES SHOWN ON THIS PLAN AS OF THIS DATE WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION.

BY Shirley A. Smith
SURVEYOR'S NAME

SURVEYOR NO. 6881 DATE JUNE 11, 2003

RECEIVED June 25, 2003
RECORDED June 25, 2003
BOOK 41 PAGE 43
Colleen Carmack
COUNTY RECORDER

STATE OF OHIO
MICHAEL G. BUETTNER
6881
REGISTERED
SURVEYOR

SCALE IN FEET
0 20 40 80

P.I.D. NO. 23594

R/W DESIGNER RLM
R/W REVIEWER MGB

CENTERLINE PLAT
SAN-635-1.60

SAN-19-2.43/13.69/13.72
SAN-635-1.60

3/12

48/57

SAN-19-2.43
SECTIONS 19 & 20, T-4-N, R-16-E, GREEN CREEK TOWNSHIP, SANDUSKY COUNTY

N

MONUMENT LEGEND
- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- [M] PROPOSED MONUMENT BOX

CONVENTIONAL SIGNS
- ℄ PROPERTY LINE
- ℄ CENTER LINE
- EX. R/W EXISTING R/W LINE
- R/W PROPOSED R/W LINE
- POWER POLE
- TELEPHONE POLE
- EXISTING GUARDRAIL
- PROPOSED GUARDRAIL

BASIS OF BEARINGS
ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY, AND ARE BASED ON AN ASSUMED CARDINAL DIRECTION FOR AN ARBITRARY SURVEY BASE LINE SET FOR PURPOSES OF DATA COLLECTION AT THE PROJECT SITE.

NOTES
THE EXISTING R/W WIDTH OF STATE ROUTE 19 IS BASED ON THE DIMENSIONS SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"

STATIONING HAS BEEN RENDERED THE SAME AS THAT SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"

AVIGATION EASEMENT (DV.406, P.1190) PROPERTY

(1) SENECA JOHN FARMS, INC.
T.P. #06-19-00-0003-00
(DV.305, P.627)
100.990 AC.
PT. S.E. 1/4, SEC. 19

(3) GARY R. HOWELL & CHRISTINE E. HOWELL
T.P. #06-20-00-0011-00
(DV.371, P.1033)
2.356 AC.

EASEMENT TO NORTHWESTERN TELEPHONE SERVICE CO. "ALONG WEST SIDE ROUTE 19 FOR PLACEMENT/MAINT. OF BURIED CABLE" (DV.264, P.328)

EASEMENT TO NORTHWESTERN TELEPHONE SERVICE CO. (DV.264, P.340)

BEGIN ACQUISITION STA. 8+10.00
BEGIN WORK STA. 8+25.00
BEGIN PROJECT STA. 10+60.00
SUSPEND PROJECT STA. 12+40.00
SUSPEND WORK STA. 14+10.00
SUSPEND ACQUISITION STA. 13+25.00

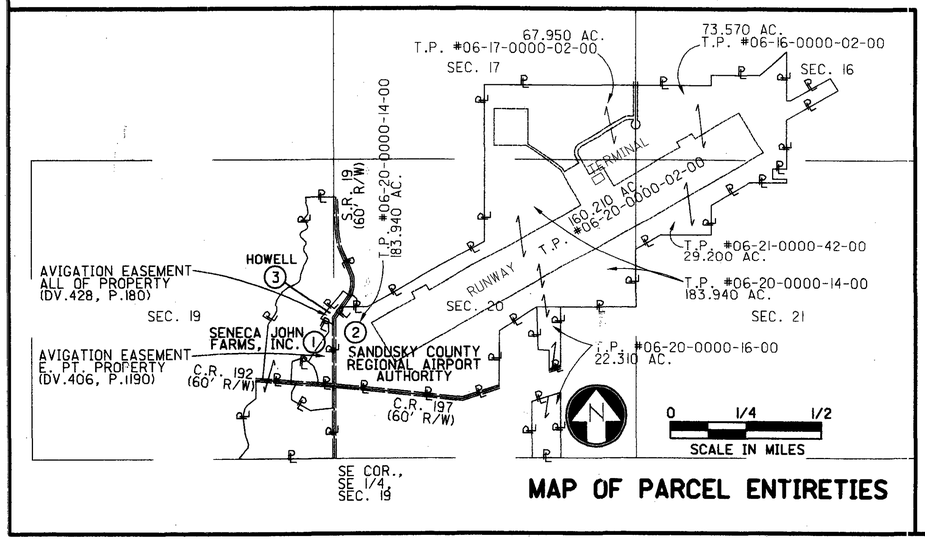
EX. R/W
R/W
℄ R/W=
℄ SURVEY=
℄ CONSTR.
℄ R/W=SECTION LINE
STATE ROUTE 19
SECTION LINE
HALF-SECTION LINE
HOUSE
BARN

PC Sta = 9+92.50
PT Sta = 12+78.06

N.E. COR., S.E. 1/4, SEC. 19, AS PER POGGEMEYER SURVEY [NO MONUMENT]

PT. S.W. 1/4, SEC. 20

(2) SANDUSKY COUNTY REGIONAL AIRPORT AUTHORITY
T.P. #06-20-00-0014-00
(DV.396, P.739)
183.940 AC.



MAP OF PARCEL ENTIRETIES

UNDERGROUND UTILITIES
THE LOCATION OF UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITIES AS REQUIRED BY SECTION 153.64, OHIO REVISED CODE

UTILITY OWNERS

SPRINT
122 S. ELIZABETH STREET
LIMA, OHIO 45801
419-226-6120

VERIZON
RON HARRIS
300 W. GYPSY LANE RD.
BOWLING GREEN, OH 43402
419-354-9455

NORTHERN OHIO RURAL WATER
PATTY
2205 U.S. ROUTE 20 E
NORWALK, OH 44857
419-668-7213

TOLEDO EDISON
DAVE COSTIC
300 MADISON AVENUE
TOLEDO, OHIO 43605
419-249-4118

TIME WARNER CABLE
JOE SHRIDER
205 CRYSTAL AVE.
FINDLAY OH 45840
419-429-7400

STRUCTURE KEY:
- RESIDENTIAL
- AGRICULTURAL/ OUTBUILDING
- OTHER

REV.	DATE	DESCRIPTION
	C.A.L.	7-03-03 Parcel 3, Change Owner
	C.A.L.	6-13-03 Correct Utility info
DATE OF COMPLETION		JUNE 10, 2003

SCALE IN FEET: 0, 20, 40, 80

R/W DESIGNER: RLM
R/W REVIEWER: MGB
P.I.D. NO. 23594

PROPERTY MAP
SAN-19-2.43

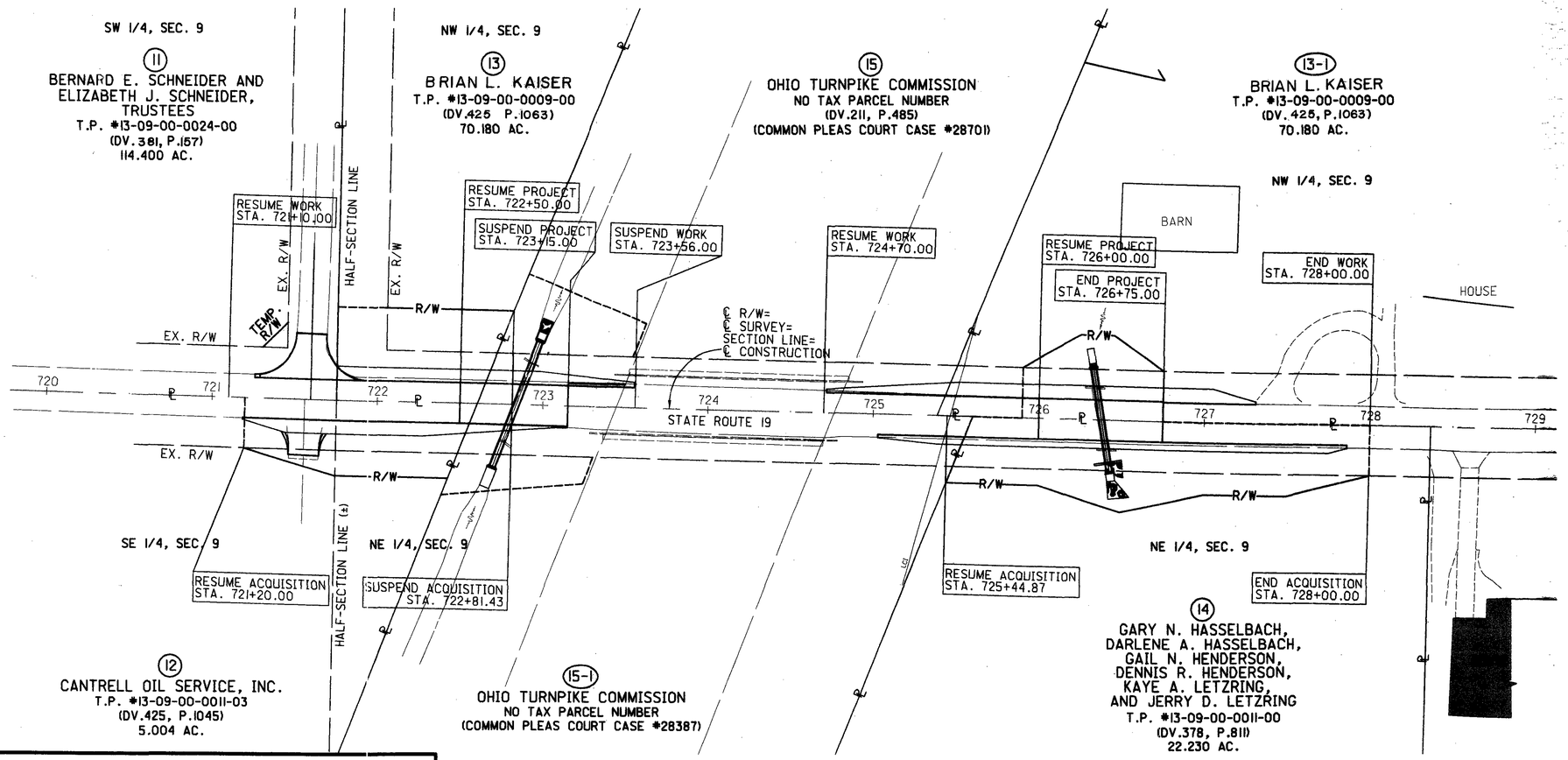
SAN-19-2.43/13.69/13.72
SAN-635-1.60

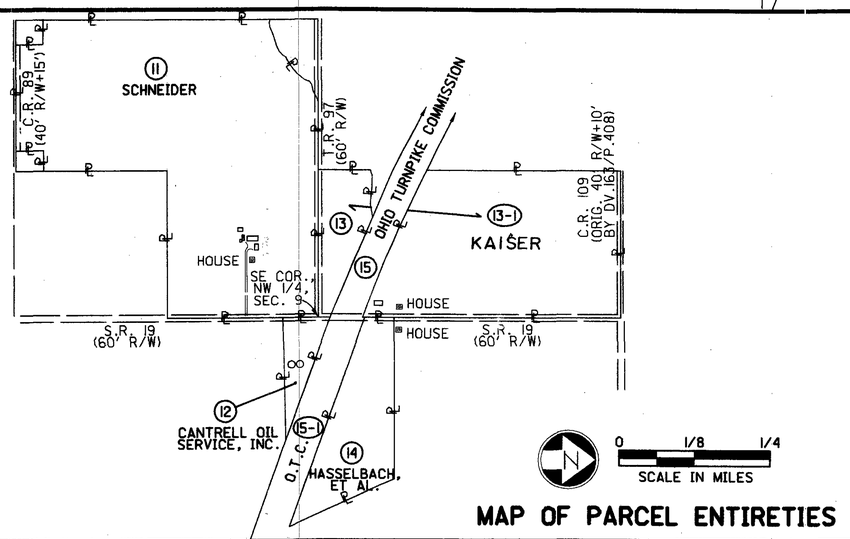
4/12
49/59

SAN-19-13.69/13.72
SECTIONS 9, T-5-N, R-15-E,
SANDUSKY TOWNSHIP, SANDUSKY COUNTY

N

MONUMENT LEGEND
- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✳ COTTON GIN SPINDLE (SET)
- RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- [M] PROPOSED MONUMENT BOX





MAP OF PARCEL ENTIRETIES

CONVENTIONAL SIGNS
- P —— PROPERTY LINE
- ℄ —— CENTER LINE
- EX. R/W —— EXISTING R/W LINE
- R/W —— PROPOSED R/W LINE
- TEMP. R/W — TEMPORARY R/W LINE
- POWER POLE
- TELEPHONE POLE
- EXISTING GUARDRAIL
- PROPOSED GUARDRAIL

BASIS OF BEARINGS
ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. BEARINGS ARE BASED ON A RECORD BEARING OF N 01°23'59"E FOR THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 9.

NOTES
1. THE EXISTING R/W WIDTH OF STATE ROUTE 19 IS BASED ON DIMENSIONS FROM ODOT RIGHT-OF-WAY PLANS DESIGNATED S.H. 280. SEC. B, WHICH IN TURN REFERENCES VOL. 2, PAGE 89 OF THE SANDUSKY COUNTY ROAD RECORDS.
2. THE EXISTING R/W WIDTH OF TOWNSHIP ROAD 97 (REED ROAD) IS BASED ON THE ROAD LAW FOR THE YEAR 1843. (SEE VOL. 3, PAGE 130 OF SANDUSKY COUNTY ROAD RECORDS)

UNDERGROUND UTILITIES
THE LOCATION OF UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITIES AS REQUIRED BY SECTION 153.64, OHIO REVISED CODE

UTILITY OWNERS

AMERITECH
130 N. ERIE STREET
TOLEDO, OHIO 43624
419-245-7304

TOLEDO EDISON
DAVE COSTIC
300 MADISON AVENUE
TOLEDO, OHIO 43605
419-249-4118

ADELPHIA CABLE
LORI GUERRO
129 MAPLE ST.
PORT CLINTON, OH 43452
(800) 346-2288

STRUCTURE KEY:
- RESIDENTIAL
- AGRICULTURAL/ OUTBUILDING
- OTHER

REV.	DATE	DESCRIPTION
C.A.L.	7-03-03	Parcel 13, Change Owner Name
C.A.L.	6-13-03	Correct Utility Info
DATE OF COMPLETION		JUNE 10, 2003

0 40 80
0 20
SCALE IN FEET

P.I.D. NO. 23594

R/W DESIGNER RLM
R/W REVIEWER MGB

PROPERTY MAP
SAN-19-13.69/13.72

SAN-19-2.43/13.69/13.72
SAN-635-1.60

5/12

50/57

SAN-635-1.60
SECTIONS 29 & 30, T-4-N, R-14-E, JACKSON TOWNSHIP, SANDUSKY COUNTY

MONUMENT LEGEND

- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- [M] PROPOSED MONUMENT BOX

CONVENTIONAL SIGNS

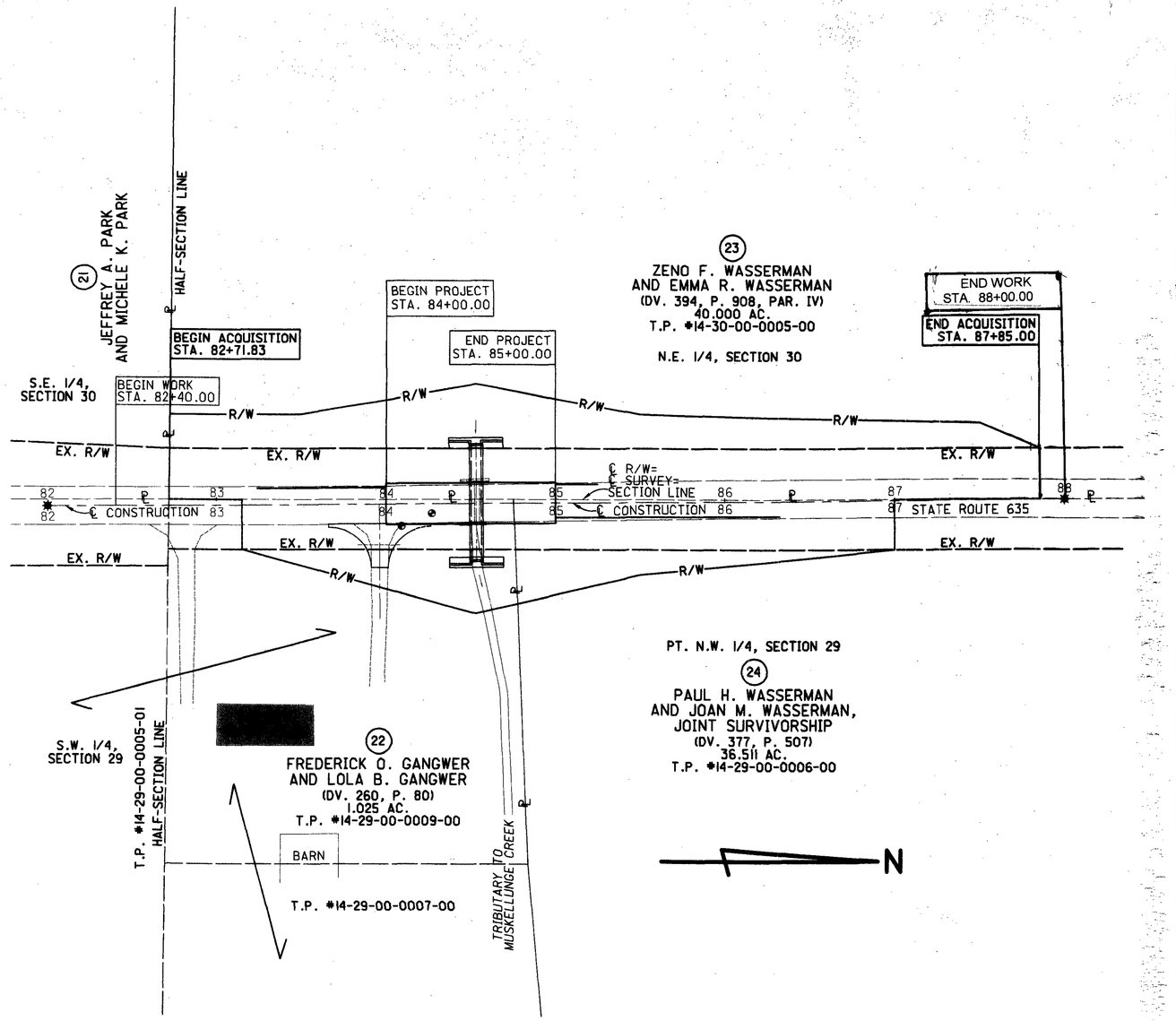
- ℄ PROPERTY LINE
- ℄ CENTER LINE
- EX. R/W EXISTING R/W LINE
- R/W PROPOSED R/W LINE
- TEMP. R/W TEMPORARY R/W LINE
- POWER POLE
- TELEPHONE POLE
- EXISTING GUARDRAIL
- PROPOSED GUARDRAIL

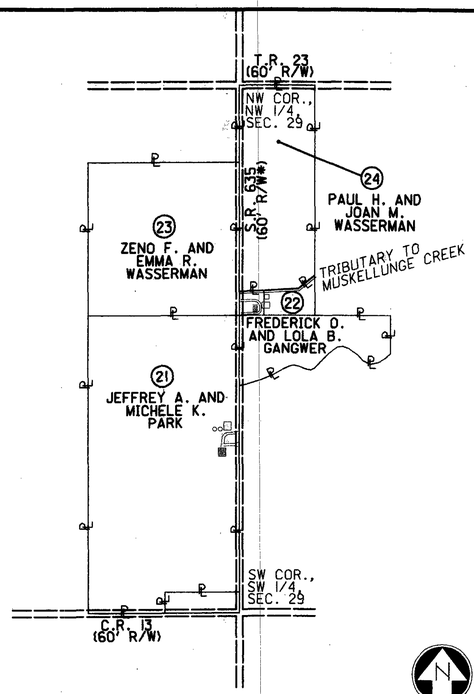
UNDERGROUND UTILITIES

THE LOCATION OF UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITIES AS REQUIRED BY SECTION 153.64, OHIO REVISED CODE

TOLEDO EDISON
DAVE COSTIC
300 MADISON AVENUE
TOLEDO, OHIO 43605
419-249-4118

VERIZON
RON HARRIS
300 W. GYPSY LANE RD.
BOWLING GREEN, OHIO 43402
419-354-9455





MAP OF PARCEL ENTIRETIES

*-ORIGINALLY 60' R/W, BUT ADD'L EASEMENTS MAY APPLY

BASIS OF BEARINGS
ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. BEARINGS ARE BASED ON AN ASSUMED CARDINAL BEARING OF N 00°00'00"E FOR THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 29.

NOTES
THE EXISTING R/W WIDTH OF STATE ROUTE 635 IS BASED ON DIMENSIONS FROM ODOT RIGHT-OF-WAY PLANS DATED 1959 AND DESIGNATED SAN-635-(1.32)-(5.63)

STRUCTURE KEY:
- RESIDENTIAL
- AGRICULTURAL/ OUTBUILDING
- OTHER

REV.	DATE	DESCRIPTION
C.A.L.	6-13-03	END WORK FLAG

DATE OF COMPLETION JUNE 10, 2003

0 20 40 80 SCALE IN FEET

P.I.D. NO. 23594

R/W DESIGNER RLM
R/W REVIEWER MDB

PROPERTY MAP SAN-635-1.60

SAN-19-2.43/13.69/13.72 SAN-635-1.60

6/12

51/57

TOTAL NUMBER OF---
11 OWNERSHIPS
13 PARCELS
0 TOTAL TAKES
0 OWNERSHIPS WITH STRUCTURES INVOLVED
0 OWNERSHIPS WITH "P" ITEMS

SUMMARY OF ADDITIONAL RIGHT OF WAY

GRANTEE: All right-of-way acquired in the name of the State of Ohio
Record Area minus Total P.R.O. minus Net Take equals Net Residue

PARCEL	SHEET NO.	OWNER	AUDITOR'S TAX PARCEL NO.	OWNERS RECORD BOOK	OWNERS RECORD PAGE	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUCTURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS AND PERSONALTY	AS ACQUIRED BOOK	AS ACQUIRED PAGE
		SAN-19-2.43												State			
1-SH	4,9	Seneca John Farms, Inc.	06-19-00-0003-00	305	627	100.990	3.527	0.101	0.077	0.024	---	97.439					
2-SH	4,9	Sandusky County Regional Airport Authority	06-20-00-0014-00	396	739	183.940	3.467	0.526	0.328	0.198	---		180.275				
		"	06-16-00-0002-00	422	1197	73.570	1.636						71.934				
		"	06-17-00-0002-00	388	570	67.950	0						67.950				
		"	06-20-00-0002-00	398	1069	160.210	0						160.210				
		"	06-20-00-0016-00	389	432	22.310	0.136						22.174				
		"	06-21-00-0042-00	398	1090	29.200	0						29.200				
Total						537.180	5.239	0.526	0.328	0.198			531.743				
3-SH	4,9	**Gary R. Howell and Christine E. Howell**	06-20-00-0011-00	371	1033	2.356	0.375	0.228	0.109	0.119	---	1.862					
		SAN-19-13.69/13.72															
11-T	5,10	Bernard E. Schneider and Elizabeth J. Schneider, Trustees	13-09-00-0024-00	381	157	114.400	3.179	0.003	0	0.003	---	111.218			Temporary easement for grading purposes		
12-SH	5,10	Cantrell Oil Service, Inc.	13-09-00-0011-03	425	1045	5.004	0.270	0.127	0.093	0.034	---		4.700				
13-SH	5,10	**Brian L. Kaiser**	13-09-00-0009-00	**425**	**1063**	70.180	0.951	0.121	0.080	0.041	---						
~~13-SH-1~~	5,11	"	"	"	"	"	2.568	0.083	0.024	0.059	---						
Total						70.180	3.519	0.204	0.104	0.100		66.561					
14-SH	5,11	Gary N. Hasselbach, Darlene A. Hasselbach, Gail N. Henderson, Dennis R. Henderson, Kaye A. Letzring, and Jerry D. Letzring	13-09-00-0011-00	378	811	22.230	0.194	0.246	0.169	0.077	---		21.959				
15-WA	5,10	Ohio Turnpike Commission	No Tax Parcel Number	Common Pleas Court Case #28701 & 211	485	NA		0.064	0	0.064					Work Agreement for Grading Purposes and for Resultant Removal/Rebuilding of OTC Fence		
15-1-WA	5,10	"	"	Common Pleas Court Case #28387		NA		0.039	0	0.039					Work Agreement for Grading Purposes and for Resultant Removal/Rebuilding of OTC Fence		
16-21		Not Used															

NOTE: ALL TEMPORARY PARCELS TO BE OF 12 MONTHS DURATION

NOTE: UNDER NO CIRCUMSTANCES ARE TEMPORARY EASEMENTS TO BE USED FOR STORAGE OF MATERIAL OR EQUIPMENT BY THE CONTRACTOR UNLESS NOTED OTHERWISE

NOTE: ALL AREAS ARE IN ACRES

REV.	DATE	DESCRIPTION
C.A.L.	7-03-03	Par's 3, 13 Change Owners
C.A.L.	6-13-03	Correct Labeling Parcel 13-SH-1
FIELD REVIEW BY		DATE
OWNERSHIP VERIFIED BY		DATE
DATE COMPLETED		JUNE 10, 2003

FEDERAL PROJECT NO. TE-21
STATE JOB NO. 424950
P.I.D. NO. 23594
R/W DESIGNER RLM
R/W REVIEWER MGB
SUMMARY OF ADDITIONAL RIGHT OF WAY
SAN-19-2.43/13.69/13.72
SAN-635-1.60
7/12
52/57

SUMMARY OF ADDITIONAL RIGHT OF WAY

GRANTEE: All right-of-way acquired in the name of the State of Ohio
Record Area minus Total P.R.O. minus Net Take equals Net Residue

PARCEL	SHEET NO.	OWNER	AUDITOR'S TAX PARCEL NO.	OWNERS RECORD BOOK	OWNERS RECORD PAGE	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUC-TURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS AND PERSONALTY	AS ACQUIRED BOOK	AS ACQUIRED PAGE
		SAN-635-1.60															
21	6,12	Jeffrey A. Parks and												State	NO TAKE		
		Michele K. Parks															
22-SH	6,12	Frederick O. Gangwer and	14-29-00-0009-00	260	80	1.025	0.141	0.190	0.111	0.079	---		0.805				
		Lola B. Gangwer	14-29-00-0007-00	268	118	2.464	0						2.464				
			14-29-00-0005-01	338	318	13.051	0.573						12.478				
Total						16.540	0.714	0.190	0.111	0.079			15.747				
23-SH	6,12	Zeno F. Wasserman and	14-30-00-0005-00	394	908	40.000	0.913	0.608	0.353	0.255	---	38.832					
		Emma R. Wasserman															
24-SH	6,12	Paul H. Wasserman and	14-29-00-0006-00	377	507	36.511	2.575	0.220	0.154	0.066	---		33.870				
		Joan M. Wasserman,															
		Joint Survivorship															

NOTE: ALL TEMPORARY PARCELS TO BE OF 12 MONTHS DURATION

NOTE: UNDER NO CIRCUMSTANCES ARE TEMPORARY EASEMENTS TO BE USED FOR STORAGE OF MATERIAL OR EQUIPMENT BY THE CONTRACTOR UNLESS NOTED OTHERWISE

NOTE: ALL AREAS ARE IN ACRES

REV.	DATE	DESCRIPTION
C.A.L.	6-13-03	add parcel 21
FIELD REVIEW BY		DATE
OWNERSHIP VERIFIED BY		DATE
DATE COMPLETED		JUNE 10, 2003

FEDERAL PROJECT NO. TE-21

STATE JOB NO. 424950

P.I.D. NO. 23594

R/W DESIGNER RLM

R/W REVIEWER MGB

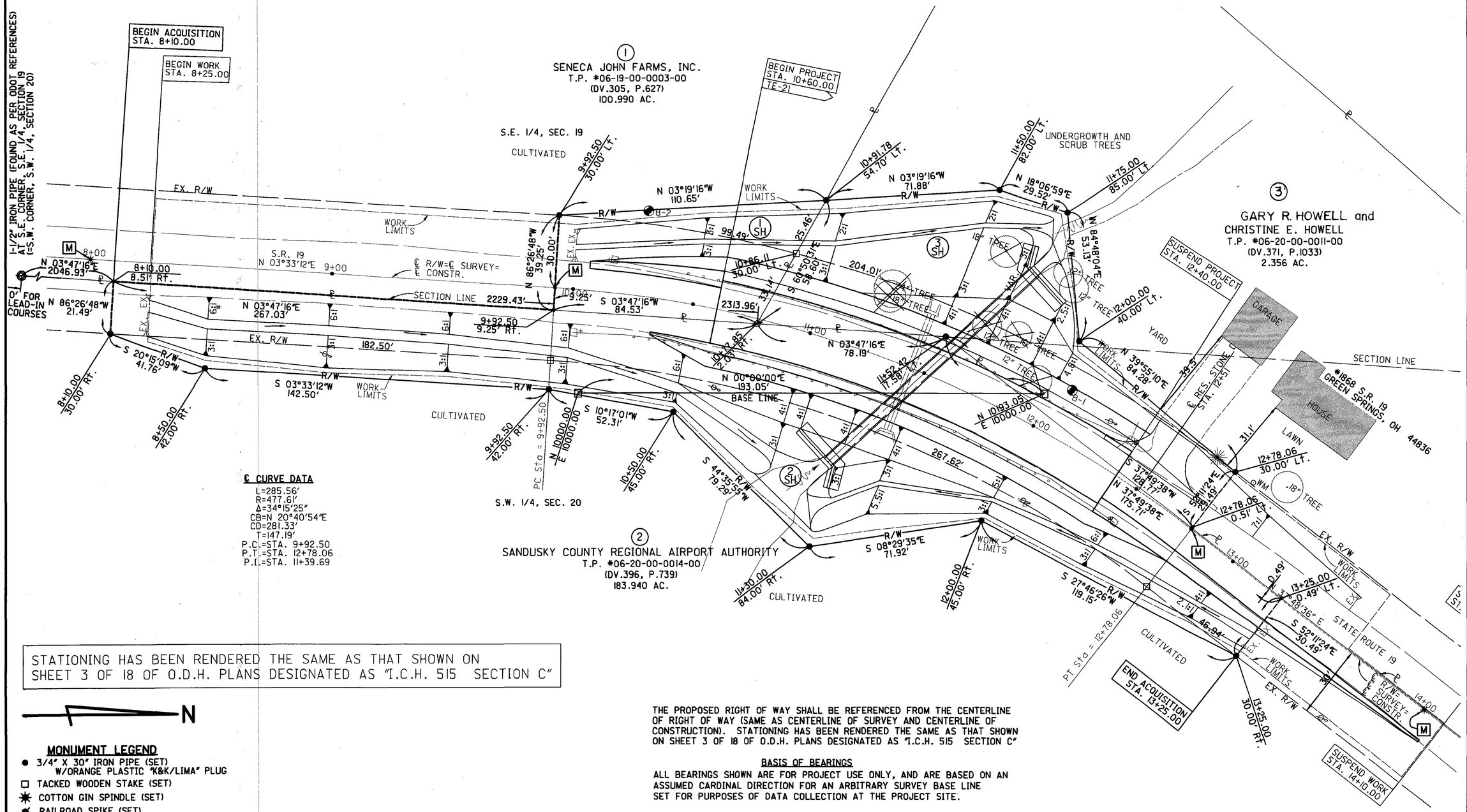
SUMMARY OF ADDITIONAL RIGHT OF WAY

SAN-19-2.43/13.69/13.72
SAN-635-1.60

8/12

53/57

SAN-19-2.43
SECTIONS 19 & 20, T-4-N, R-16-E,
GREEN CREEK TOWNSHIP, SANDUSKY COUNTY



℄ CURVE DATA
L=285.56'
R=477.61'
Δ=34°15'25"
CB=N 20°40'54"E
CD=281.33'
T=147.19'
P.C.=STA. 9+92.50
P.T.=STA. 12+78.06
P.I.=STA. 11+39.69

STATIONING HAS BEEN RENDERED THE SAME AS THAT SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"

N

MONUMENT LEGEND
- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✷ COTTON GIN SPINDLE (SET)
- ◪ RAILROAD SPIKE (SET)
- ⌀ RAILROAD SPIKE (FOUND)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- Ⓜ PROPOSED MONUMENT BOX

THE PROPOSED RIGHT OF WAY SHALL BE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY (SAME AS CENTERLINE OF SURVEY AND CENTERLINE OF CONSTRUCTION). STATIONING HAS BEEN RENDERED THE SAME AS THAT SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"

BASIS OF BEARINGS

ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY, AND ARE BASED ON AN ASSUMED CARDINAL DIRECTION FOR AN ARBITRARY SURVEY BASE LINE SET FOR PURPOSES OF DATA COLLECTION AT THE PROJECT SITE.

NOTES

THE EXISTING R/W WIDTH OF STATE ROUTE 19 IS BASED ON THE DIMENSIONS SHOWN ON SHEET 3 OF 18 OF O.D.H. PLANS DESIGNATED AS "I.C.H. 515 SECTION C"

STRUCTURE KEY:
- RESIDENTIAL
- AGRICULTURAL/ OUTBUILDING
- OTHER

REV.	DATE	DESCRIPTION
C.A.L.	7-03-03	Correct owner's name, parcel 3

DATE OF COMPLETION JUNE 10, 2003

SCALE IN FEET: 0, 10, 20, 40

P.I.D. NO. 23594

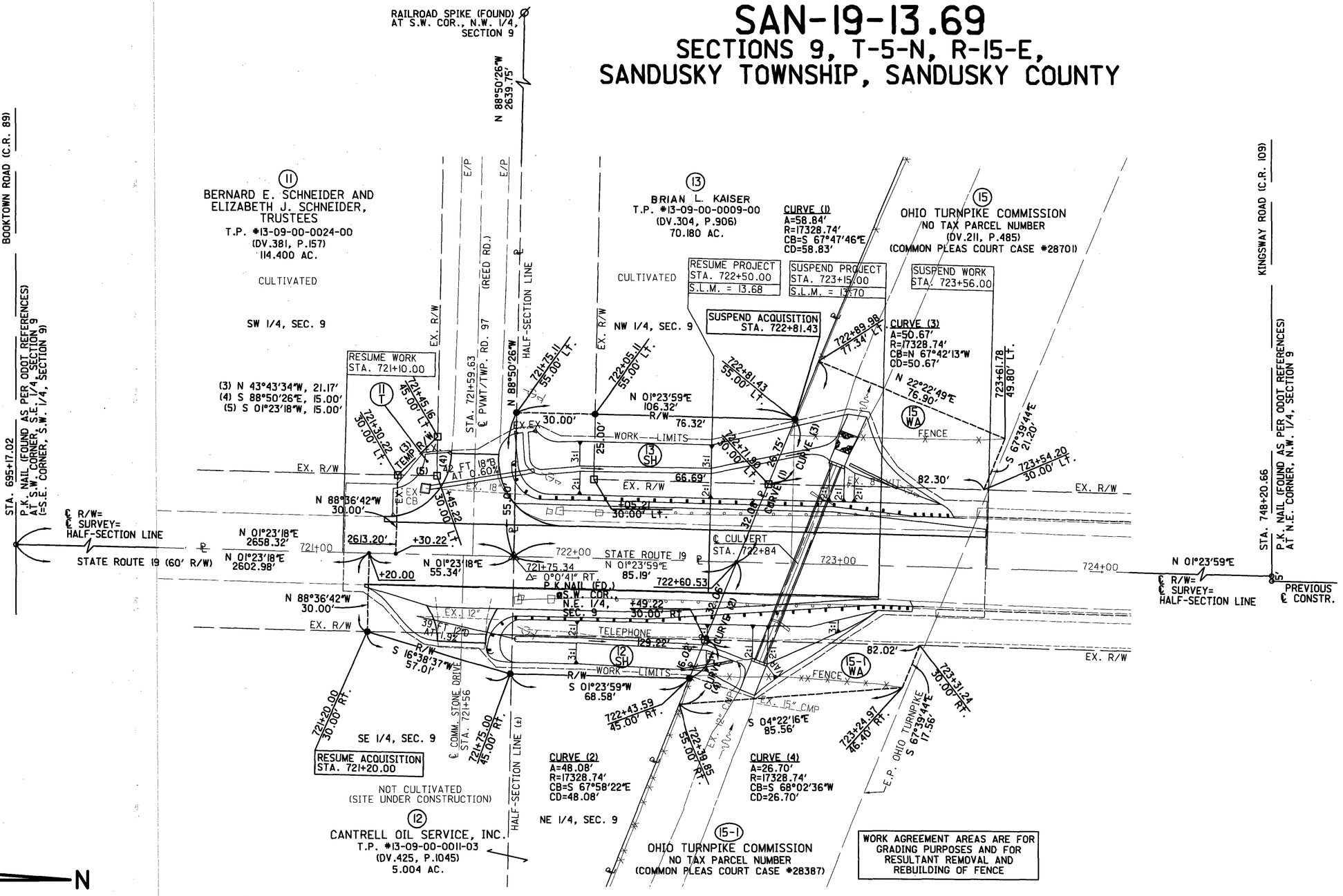
R/W DESIGNER RLM
R/W REVIEWER MGB

RIGHT OF WAY PLAN
SAN-19-2.43
STA. 8+00 TO 14+00

SAN-19-2.43/13.69/13.72
SAN-635-1.60

9/12
54/57

SAN-19-13.69
SECTIONS 9, T-5-N, R-15-E,
SANDUSKY TOWNSHIP, SANDUSKY COUNTY



N

MONUMENT LEGEND

- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- ⌀ RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- [M] PROPOSED MONUMENT BOX

BASIS OF BEARINGS

ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. BEARINGS ARE BASED ON A RECORD BEARING OF N 01°23'59"E FOR THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 9.

NOTES

1. THE EXISTING R/W WIDTH OF STATE ROUTE 19 IS BASED ON DIMENSIONS FROM ODOT RIGHT-OF-WAY PLANS DESIGNATED S.H. 280. SEC. B, WHICH IN TURN REFERENCES VOL. 2, PAGE 89 OF THE SANDUSKY COUNTY ROAD RECORDS.
2. THE EXISTING R/W WIDTH OF TOWNSHIP ROAD 97 (REED ROAD) IS BASED ON THE ROAD LAW FOR THE YEAR 1843. (SEE VOL. 3, PAGE 130 OF SANDUSKY COUNTY ROAD RECORDS)
3. THE PROPOSED RIGHT OF WAY SHALL BE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY (SAME AS CENTERLINE OF CONSTRUCTION AND CENTERLINE OF SURVEY).

STRUCTURE KEY:
- RESIDENTIAL
- AGRICULTURAL/ OUTBUILDING
- OTHER

C.A.L.	7-03-03	PARCEL 13, OWNER NAME
REV.	DATE	DESCRIPTION

DATE OF COMPLETION JUNE 10, 2003

SCALE IN FEET: 0, 10, 20, 40

P.I.D. NO. 23594

R/W DESIGNER RLM
R/W REVIEWER MGB

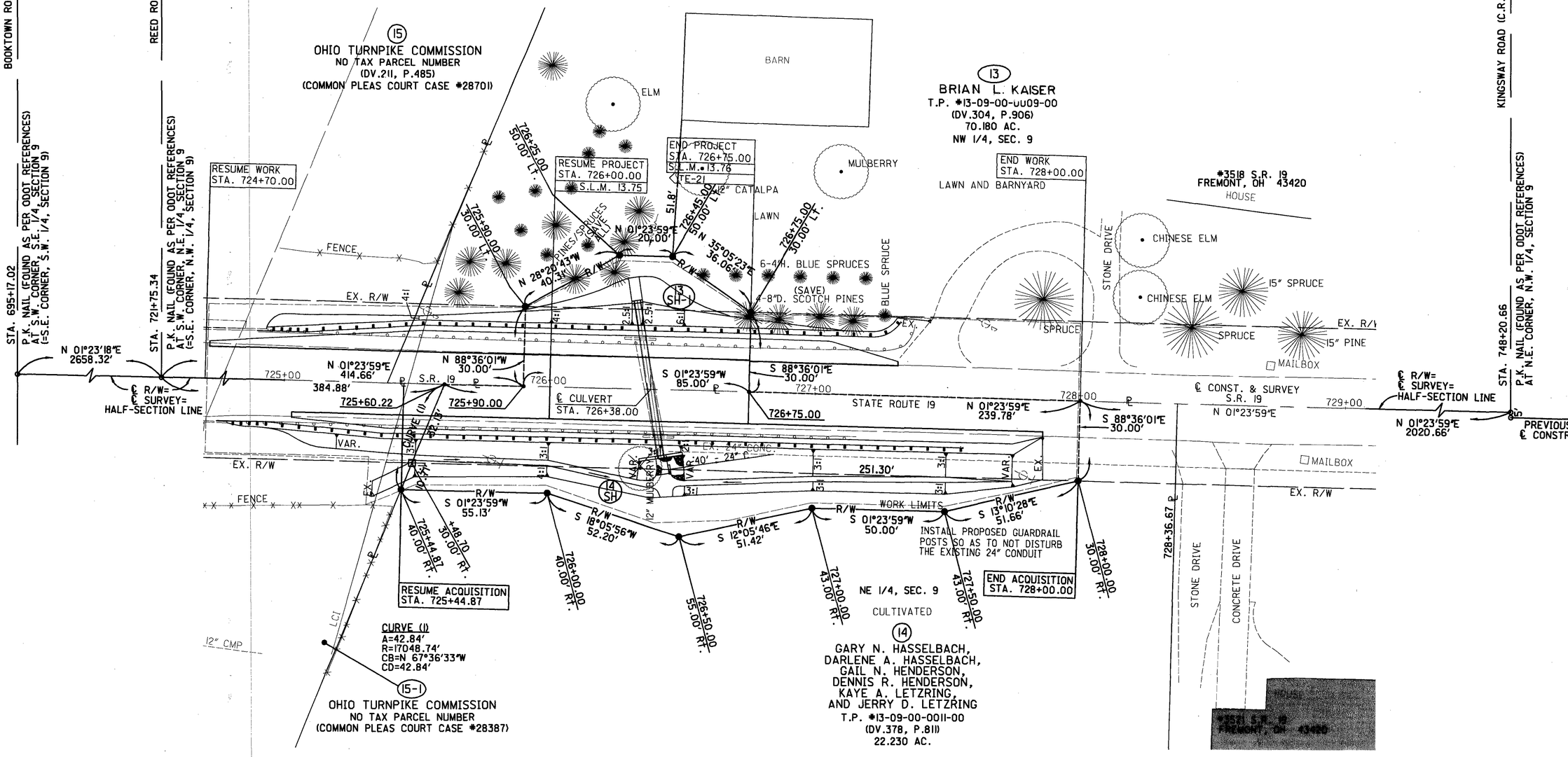
RIGHT OF WAY PLAN
SAN-19-13.69
STA. 720+50 TO 724+00

SAN-19-2.43/13.69/13.72
SAN-635-1.60

10/12

55/57

SAN-19-13.72
SECTIONS 9, T-5-N, R-15-E,
SANDUSKY TOWNSHIP, SANDUSKY COUNTY



N

MONUMENT LEGEND

- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- ◪ RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)
- Ⓜ PROPOSED MONUMENT BOX

THE PROPOSED RIGHT OF WAY SHALL BE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY (SAME AS CENTERLINE OF CONSTRUCTION AND CENTERLINE OF SURVEY).

BASIS OF BEARINGS
ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. BEARINGS ARE BASED ON A RECORD BEARING OF N 01°23'59"E FOR THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 9.

NOTES
THE EXISTING R/W WIDTH OF STATE ROUTE 19 IS BASED ON DIMENSIONS FROM ODOT RIGHT-OF-WAY PLANS DESIGNATED S.H. 280. SEC. B, WHICH IN TURN REFERENCES VOL. 2, PAGE 89 OF THE SANDUSKY COUNTY ROAD RECORDS.

STRUCTURE KEY:
- RESIDENTIAL
- AGRICULTURAL/ OUTBUILDING
- OTHER

REV.	DATE	DESCRIPTION
C.A.L.	7-03-03	PARCEL 13, OWNER NAME

DATE OF COMPLETION JUNE 10, 2003

0 10 20 40 SCALE IN FEET

R/W DESIGNER RLM
R/W REVIEWER MGB

P.I.D. NO. 23594

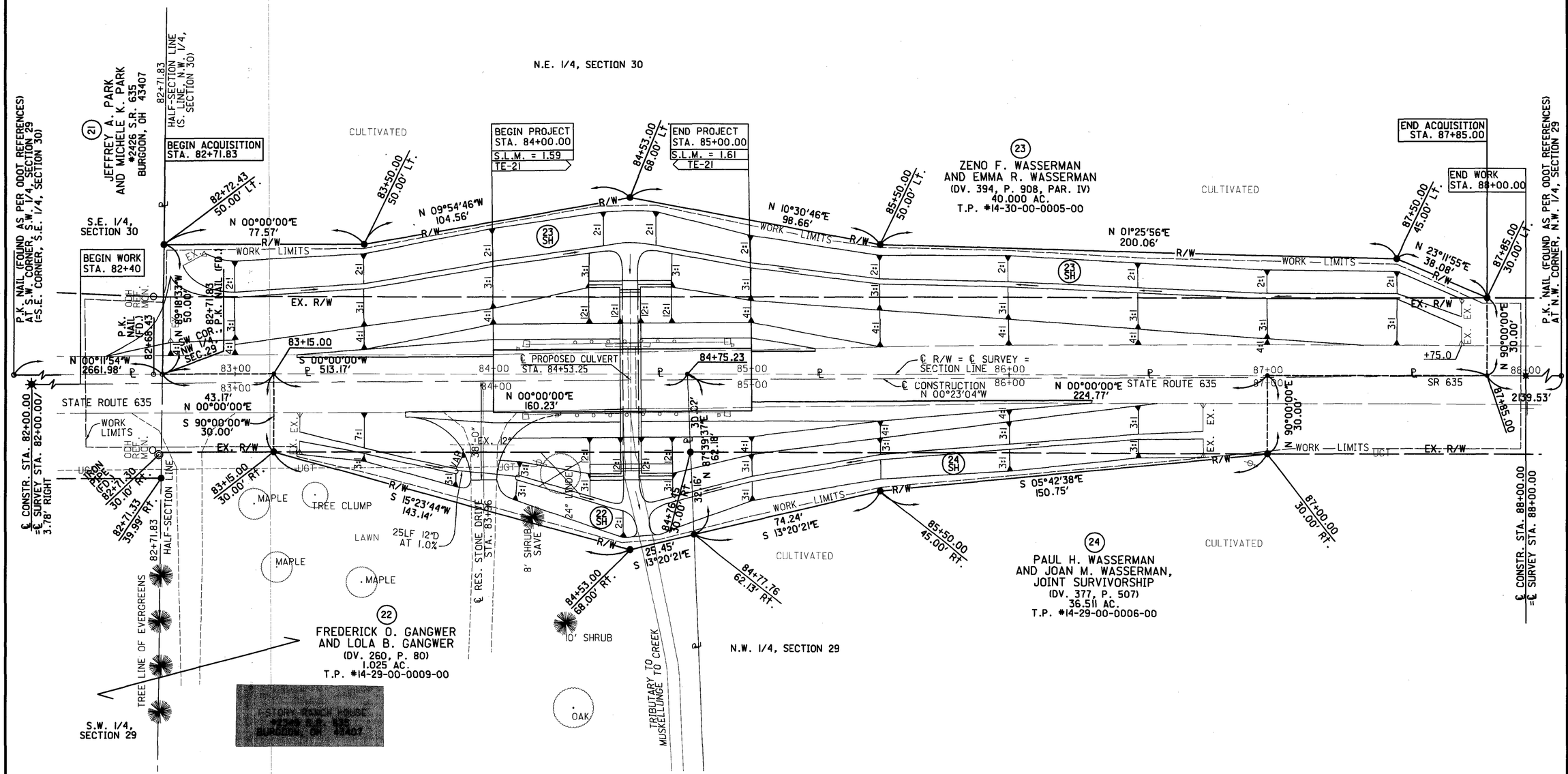
RIGHT OF WAY PLAN
SAN-19-13.72
STA. 724+75 TO 729+00

SAN-19-2.43/13.69/13.72
SAN-635-1.60

11/12

56/57

SAN-635-1.60
SECTIONS 29 & 30, T-4-N, R-14-E,
JACKSON TOWNSHIP, SANDUSKY COUNTY



MONUMENT LEGEND

- ● 3/4" X 30" IRON PIPE (SET) W/ORANGE PLASTIC "K&K/LIMA" PLUG
- □ TACKED WOODEN STAKE (SET)
- ✱ COTTON GIN SPINDLE (SET)
- ◪ RAILROAD SPIKE (SET)
- • P.K. NAIL (SET)
- ○ P.K. NAIL (FOUND)

THE PROPOSED RIGHT OF WAY SHALL BE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY (SAME AS CENTERLINE OF SURVEY, BUT NOT SAME AS CENTERLINE OF CONSTRUCTION).

ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. BEARINGS ARE BASED ON AN ASSUMED CARDINAL BEARING OF N 00°00'00"E FOR THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 29.

NOTES

THE EXISTING R/W WIDTH OF STATE ROUTE 635 IS BASED ON DIMENSIONS FROM ODOT RIGHT-OF-WAY PLANS DATED 1959 AND DESIGNATED SAN-635-(1.32)-(5.63)

STRUCTURE KEY:
- RESIDENTIAL
- AGRICULTURAL/ OUTBUILDING
- OTHER

REV.	DATE	DESCRIPTION

DATE OF COMPLETION JUNE 10, 2003

SCALE IN FEET: 0 10 20 40

P.I.D. NO. 23594

R/W DESIGNER RLM
R/W REVIEWER MGB

RIGHT OF WAY PLAN
SAN-635-1.60
STA. 82+00 TO 88+00

SAN-19-2.43/13.69/13.72
SAN-635-1.60

12/12

57/57

SOIL STUDY FOR PROPOSED
BRIDGE REPLACEMENT
SAN-19-2.43 OVER UNNAMED CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

INTRODUCTION

THE PROJECT INCLUDES THE PROPOSED REPLACEMENT OF THE EXISTING CULVERT AT SAN-19-2.43.

GEOLOGY OF THE SITE

THE PROJECT SITE IS LOCATED IN AN AREA OF SANDUSKY COUNTY, OHIO, WHERE THE SOIL PROFILE CONDITIONS FORMED DUE TO GLACIAL ACTIVITIES. THE SOIL PROFILE BENEATH THIS SITE CONSISTS OF TOPSOIL, OVERLYING GLACIAL TILL CLAYS AND SILTS.

EXPLORATION

THE SOIL EXPLORATION FOR THE CULVERT FOUNDATIONS CONSISTED OF TWO DRIVE SAMPLE BORING TO A DEPTH OF 35 FEET. THE BORING WAS DRILLED IN MARCH, 2002. ALL BORINGS WERE MADE BY MEANS OF MECHANICALLY POWERED HOLLOW-STEM ROTARY AUGERS MOUNTED ON A MOBILE DRILL RIG.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE SURFACE ELEVATION AT THE BORING 1 IS 655.89 FEET AND THE SURFACE ELEVATION AT BORING 2 IS 657.66 FEET. TOPSOIL IS ENCOUNTERED AT THE GROUND SURFACE. THE TOPSOIL THICKNESS RANGES FROM 2.4 INCHES TO 6.0 INCHES.

BELOW THE TOPSOIL, FILL DEPOSITS ARE ENCOUNTERED IN BORING 1. THE FILL DEPOSITS CONSIST OF BROWN SILT AND CLAY WITH TRACE OF SAND AND SOME CRUSHED STONE. THIS LAYER EXTENDS TO A DEPTH OF 3.0 FEET. IN BORING 2, BROWN SILT AND CLAY WITH TRACE OF SAND IS ENCOUNTERED IN BORING 2. THIS LAYER EXTENDS TO A DEPTH OF 3.5 FEET.

BELOW ALL THESE MATERIALS, GLACIAL TILL DEPOSITS IS FOUND. THE SOIL CONSISTS OF BROWN SILT AND CLAY WITH SOME SAND AND TRACE OF GRAVEL.

FOR DETAILED INFORMATION ABOUT THE SOIL CONDITIONS AT A PARTICULAR LOCATION REFER TO THE BORING LOGS.

NOTES

DETAILED INFORMATION CONCERNING THE EXPLORATION FINDINGS MAY BE FOUND IN THE SUBSURFACE INVESTIGATION REPORT FOR THIS PROJECT PREPARED BY BOWSER-MORNER ASSOCIATES, INC. (BOWSER-MORNER REPORT NO. 124870-0402-478, DATED APRIL 11, 2002). THE GEOTECHNICAL REPORT DISCUSSES THE SUBSURFACE SOIL AND GROUNDWATER CONDITIONS ENCOUNTERED, PRESENTS THE SOIL AND LABORATORY DATA, AND MAKES RECOMMENDATIONS CONCERNING FOUNDATION SUPPORT SYSTEMS. PLEASE REFER TO THE ABOVE-REFERENCED REPORT FOR FURTHER INFORMATION.

LEGEND

- Exploratory Boring Location - Plan View
- Exploratory Core Location
- TR Top of Rock
- H Horizontal Bars on Boring Logs Indicate Approximate Soil Transition Depths.
- Existing Fill Materials
- X/Y/Z Figures Beside the Boring Log in Profile Indicates the Number of Blows for Standard Penetration Test.
  - X=Number of Blows for First 6 Inches
  - Y=Number of Blows for Second 6 Inches
  - Z=Number of Blows for Third 6 Inches
- ▽ Initial Groundwater Depth in Borings
- ▼ Creek Water Level

PARTICLE SIZE DEFINITIONS

12"	3"	2.0mm	0.42mm	0.074mm	0.005mm
Boulders |	Cobbles |	Gravel |	Coarse Sand |	Fine Sand |	Silt |	Clay
		No. 10 sieve	No. 40 sieve	No. 200 sieve		

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 2-INCH O.D. SPLIT SPOON SAMPLER AT CONTINUOUS 2.5-FOOT AND/OR 5-FOOT DEPTH INTERVALS DRIVEN BY MEANS OF A 140-POUND HAMMER WITH A FREE FALL OF 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER TWO 0.5 FOOT INCREMENTS IS CONSIDERED THE STANDARD PENETRATION RESISTANCE.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 3-INCH O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS, UNIFORM PRESSING APPLIED BY THE DRILLING RIG. (NOTE: NO PRESS SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A NW-PAM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD. (NOTE: NO CORE BORINGS WERE OBTAINED DURING THIS INVESTIGATION.)

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.5-FOOT INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING THE DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED IN ORDER TO DETERMINE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING. (NOTE: NO WASH SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

ADDITIONAL SOIL INFORMATION

THE SOIL PROFILE AND/OR STRUCTURE FOUNDATION INVESTIGATION SHEETS CONTAIN ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME ASPECT OF THIS PROJECT. MORE INFORMATION, IF ANY, MAY BE OBTAINED IN DISTRICT 2, THE OFFICE OF MATERIALS MANAGEMENT, OR THE OFFICE OF STRUCTURAL ENGINEERING.

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

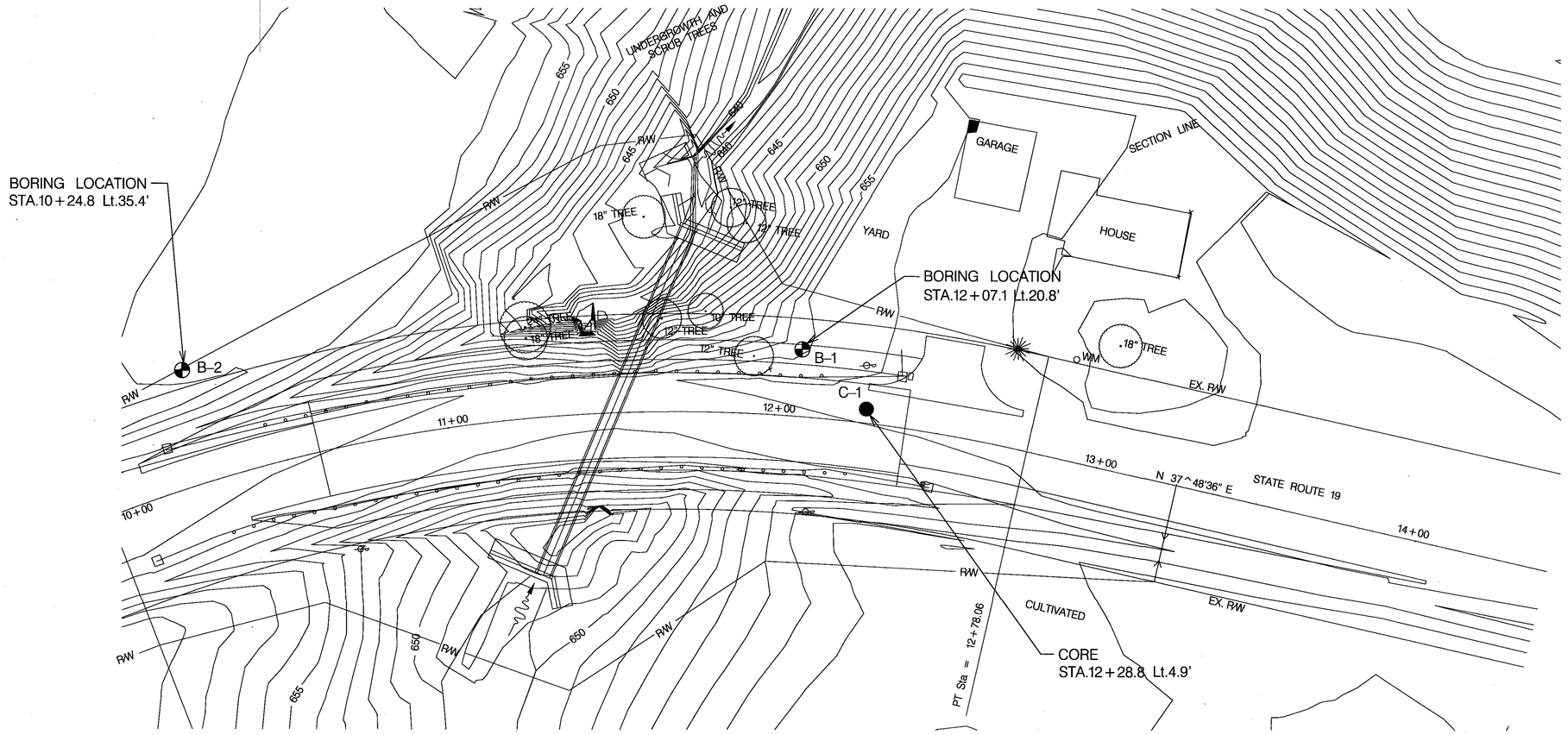
BOWSER MORNER.

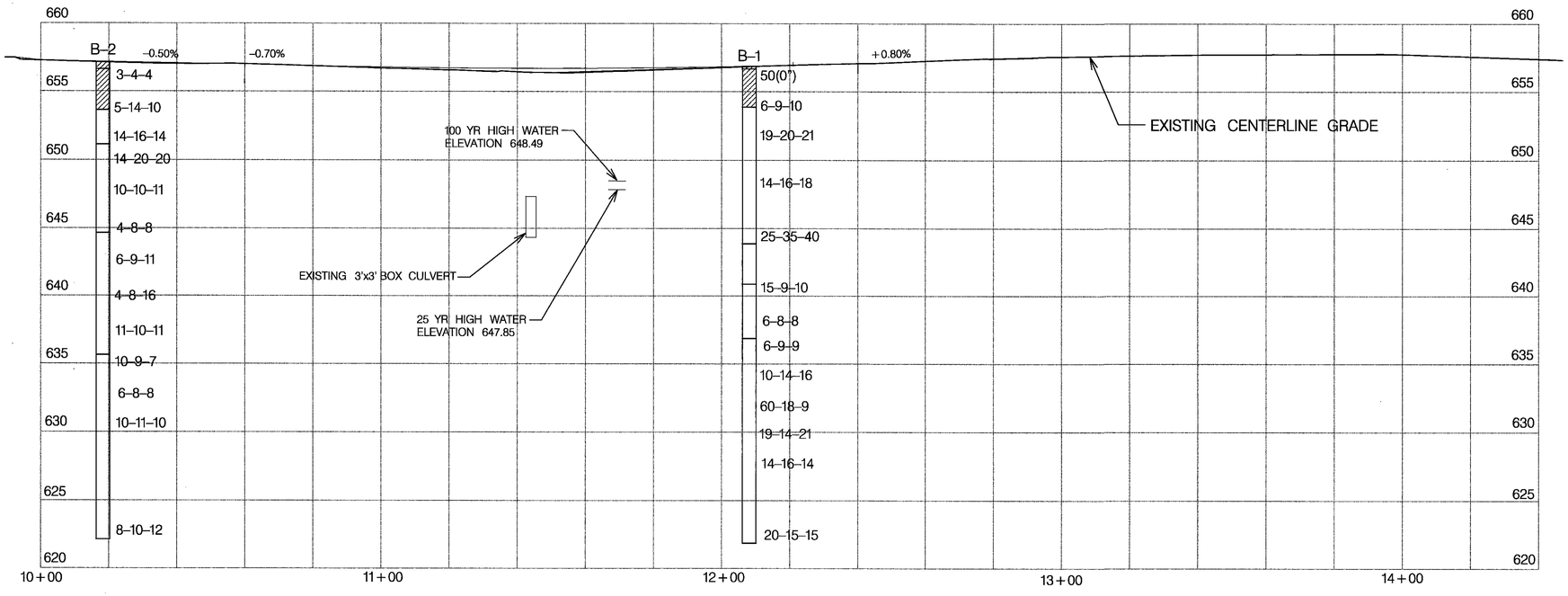
TITLE SHEET

SAN-19-2.43 OVER UNNAMED CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

1/3

124870





HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER

PLAN AND PROFILE

SAN–19–2.43 OVER UNNAMED CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

124870

LOG OF BORING NO. 1

Sampler Type: Split Spoon
Date Started: 17-Mar-02
Casing Length:
Date Completed: 17-Mar-02
Station & Offset: 12+07.1, 20.8' Lt.
Surface Elevation: 655.89 ft
Ground Water Observations: NONE ft (Initial); NONE ft (Completion); n/a ft (After n/a hrs.)

SOIL EXPLORATION
STATE ROUTE 19 AND STATE ROUTE 635, SAN-19-2.43
Sandusky, Sandusky County, Ohio
Bowser-Morner Job No. 124870

Elev. (ft)	Depth (ft)	Blows per (6")	Description	Sample No.	Sample Depth (ft)	Physical Characteristics: % Gravel	% C. Sand	% F. Sand	% Silt	% Clay	LL (%)	PI (%)	W.C. (%)	ODOT Class.
655.89	0.0													
655.69	0.2		Topsoil											
652.89	3.0	50(0")	(FILL) Hard brown silt and clay, trace of sand, some crushed stone, moist	1A	1.0-2.5								*	
	5.0	6/9/10	Very stiff brown clay and silt, some sand, trace of gravel, moist	2A	3.5-5.0								15.4	
		19/20/21		3A	6.0-7.5								15.1	
		14/16/18		4A	8.5-10.0								16.4	
	10.0													
		25/35/40		5A	11.0-12.5	5.1	7.3	13.3	31.1	43.2	37	18	18.3	A-6b
	13.0		(Becomes very stiff and gray at 13')											
		15/9/10		6A	13.5-15.0								15.9	
	15.0													
	16.0	6/8/8	(Becomes stiff at 16')	7A	16.0-17.5	3.9	7.2	12.9	30.8	45.2	29	12	17.2	A-6a
		6/9/9		8A	18.5-20.0								15.7	
	20.0													
	21.0	10/14/16	(Becomes hard at 21')	9A	21.0-22.5								16.1	
		60/18/9		10A	23.5-25.0								16.8	
	25.0													
		19/14/21		11A	26.0-27.5								17.0	
		14/16/14		12A	28.5-30.0								17.3	
	30.0													
		20/15/15		13A	33.5-35.0								16.8	
620.89	35.0		Bottom of boring at 35'											
	40.0													

*Saturated hole caved at 22'

LOG OF BORING NO. 2

Sampler Type: Split Spoon, Liners
Date Started: 15-Mar-02
Casing Length:
Date Completed: 15-Mar-02
Station & Offset: 10+24.3, 35.4' Lt.
Surface Elevation: 657.66 ft
Ground Water Observations: NONE ft (Initial); NONE ft (Completion); n/a ft (After n/a hrs.)

SOIL EXPLORATION
STATE ROUTE 19 AND STATE ROUTE 635, SAN-19-2.43
Sandusky, Sandusky County, Ohio
Bowser-Morner Job No. 124870

Elev. (ft)	Depth (ft)	Blows per (6")	Description	Sample No.	Sample Depth (ft)	Physical Characteristics: % Gravel	% C. Sand	% F. Sand	% Silt	% Clay	LL (%)	PI (%)	W.C. (%)	ODOT Class.
657.66	0.0													
657.16	0.5		Topsoil											
		3/4/4	Medium stiff brown silt and clay, trace of sand, moist	1A	1.0-2.5								21.9	
654.16	3.5													
		5/14/10	Very stiff brown clay and silt, some sand, trace of gravel, moist	2A	3.5-5.0								15.9	
	5.0													
		14/16/14		1B	6.0-7.5								14.5	
	6.0		(Becomes hard at 6')											
		14/20/20		2B	8.5-10.0								15.1	
	10.0													
		10/10/11		3B	11.0-12.5								15.7	
	12.5		(Becomes very stiff and gray at 12.5')											
		4/8/8		4B	13.5-15.0								16.6	
	15.0													
		6/9/11		5B	16.0-17.5								15.0	
		4/8/16		4A	18.5-20.0								16.9	
	20.0													
	21.5	11/10/11	(With sand seams at 21.5')	5A	21.0-22.5								14.8	
		10/9/7		6A	23.5-25.0								16.9	
	25.0													
		6/8/8		7A	26.0-27.5								15.7	
		10/11/10		8A	28.5-30.0								17.8	
	30.0													
		8/10/12		9A	33.5-35.0								17.9	
622.66	35.0		Bottom of boring at 35'											
	40.0													

D_{50} VALUES		
SAMPLE 1-5A	=	0.0075mm
SAMPLE 1-7A	=	0.0070mm

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER

BORING DATA

SAN-19-2.43 OVER UNNAMED CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

3/3

124870

SOIL STUDY FOR PROPOSED
CULVER REPLACEMENT
SAN-19-13.69 OVER UNNAMED DITCH
SANDUSKY, SANDUSKY COUNTY, OHIO

INTRODUCTION

THE PROJECT INCLUDES THE PROPOSED REPLACEMENT OF THE EXISTING CULVERT AT SAN-19-13.69.

GEOLOGY OF THE SITE

THE PROJECT SITE IS LOCATED IN AN AREA OF SANDUSKY COUNTY, OHIO, WHERE THE SOIL PROFILE CONDITIONS FORMED DUE TO GLACIAL ACTIVITIES. THE SOIL PROFILE BENEATH THIS SITE CONSISTS OF TOPSOIL, OVERLYING LACUSTRINE CLAYS AND SILTS.

EXPLORATION

THE SOIL EXPLORATION FOR THE CULVERT FOUNDATIONS CONSISTED OF ONE DRIVE SAMPLE BORING TO A DEPTH OF 20 FEET. THE BORING WAS DRILLED IN MARCH, 2002. ALL BORINGS WERE MADE BY MEANS OF MECHANICALLY POWERED HOLLOW-STEM ROTARY AUGERS MOUNTED ON A MOBILE DRILL RIG.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE SURFACE ELEVATION AT THE BORING WAS 597.81 FEET. TOPSOIL WAS ENCOUNTERED AT THE GROUND SURFACE. THE TOPSOIL THICKNESS WAS 2.4 INCHES.

BELOW THE TOPSOIL LACUSTRINE DEPOSITS IS FOUND. THE SOIL CONSISTS OF BROWN SILT AND CLAY WITH TRACE SAND.

FOR DETAILED INFORMATION ABOUT THE SOIL CONDITIONS AT A PARTICULAR LOCATION REFER TO THE BORING LOGS.

NOTES

DETAILED INFORMATION CONCERNING THE EXPLORATION FINDINGS MAY BE FOUND IN THE SUBSURFACE INVESTIGATION REPORT FOR THIS PROJECT PREPARED BY BOWSER-MORNER ASSOCIATES, INC. (BOWSER-MORNER REPORT NO. 125033-0402-180, DATED APRIL 12, 2002). THE GEOTECHNICAL REPORT DISCUSSES THE SUBSURFACE SOIL AND GROUNDWATER CONDITIONS ENCOUNTERED, PRESENTS THE SOIL AND LABORATORY DATA, AND MAKES RECOMMENDATIONS CONCERNING FOUNDATION SUPPORT SYSTEMS. PLEASE REFER TO THE ABOVE-REFERENCED REPORT FOR FURTHER INFORMATION.

LEGEND

- Exploratory Boring Location - Plan View
- Exploratory Core Location
- TR Top of Rock
- H Horizontal Bars on Boring Logs Indicate Approximate Soil Transition Depths.
- Existing Fill Materials
- X/Y/Z Figures Beside the Boring Log in Profile Indicates the Number of Blows for Standard Penetration Test.
  - X=Number of Blows for First 6 Inches
  - Y=Number of Blows for Second 6 Inches
  - Z=Number of Blows for Third 6 Inches
- ▽ Initial Groundwater Depth in Borings
- ▼ Creek Water Level

PARTICLE SIZE DEFINITIONS

12"	3"	2.0mm	0.42mm	0.074mm	0.005mm
Boulders |	Cobbles |	Gravel |	Coarse Sand |	Fine Sand |	Silt |	Clay
			No. 20 sieve	No. 40 sieve	No. 200 seive	

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 2-INCH O.D. SPLIT SPOON SAMPLER AT CONTINUOUS 2.5-FOOT AND/OR 5-FOOT DEPTH INTERVALS DRIVEN BY MEANS OF A 140-POUND HAMMER WITH A FREE FALL OF 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER TWO 0.5 FOOT INCREMENTS IS CONSIDERED THE STANDARD PENETRATION RESISTANCE.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 3-INCH O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS, UNIFORM PRESSING APPLIED BY THE DRILLING RIG. (NOTE: NO PRESS SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A NW-PAM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD. (NOTE: NO CORE BORINGS WERE OBTAINED DURING THIS INVESTIGATION.)

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.5-FOOT INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING THE DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED IN ORDER TO DETERMINE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING. (NOTE: NO WASH SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

ADDITIONAL SOIL INFORMATION

THE SOIL PROFILE AND/OR STRUCTURE FOUNDATION INVESTIGATION SHEETS CONTAIN ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME ASPECT OF THIS PROJECT. MORE INFORMATION, IF ANY, MAY BE OBTAINED IN DISTRICT 2, THE OFFICE OF MATERIALS MANAGEMENT, OR THE OFFICE OF STRUCTURAL ENGINEERING.

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

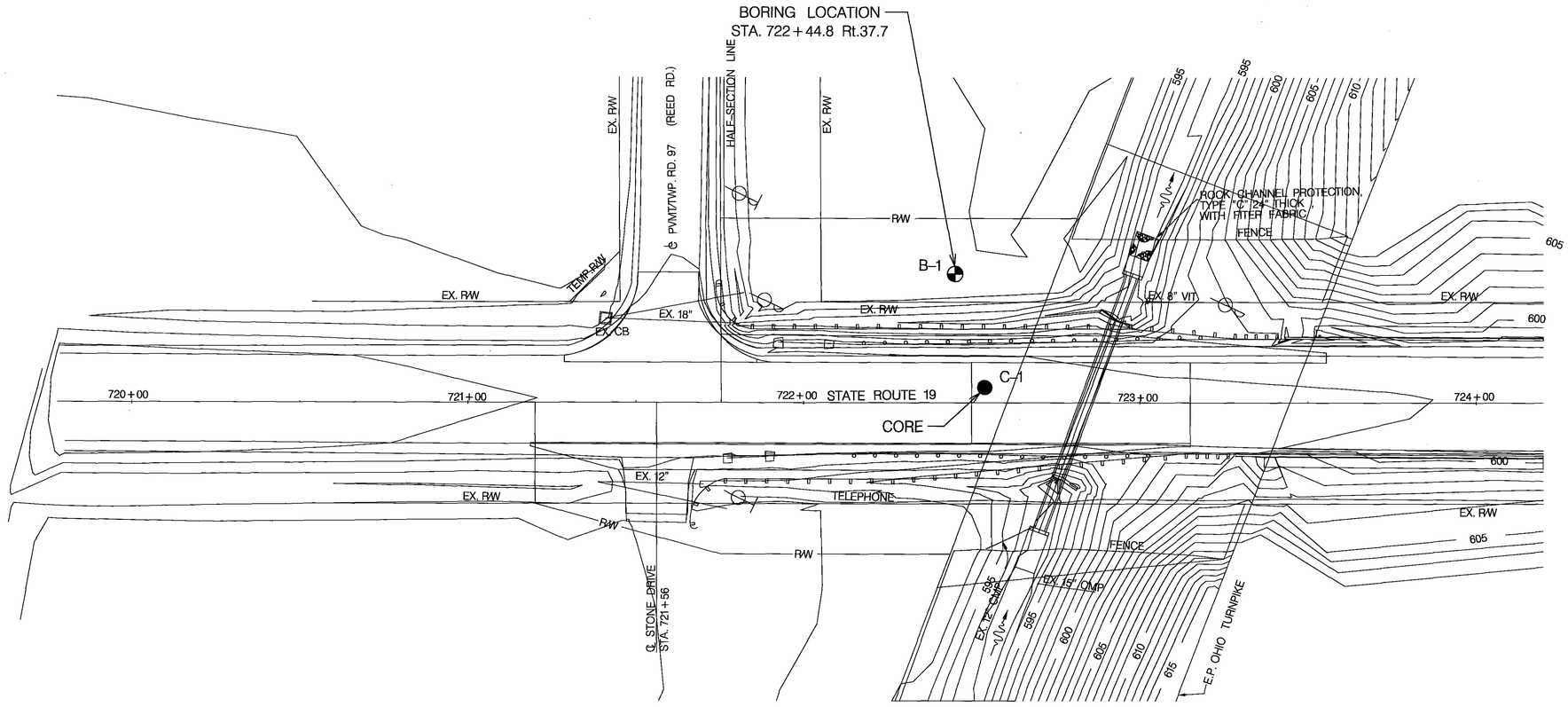
BOWSER MORNER

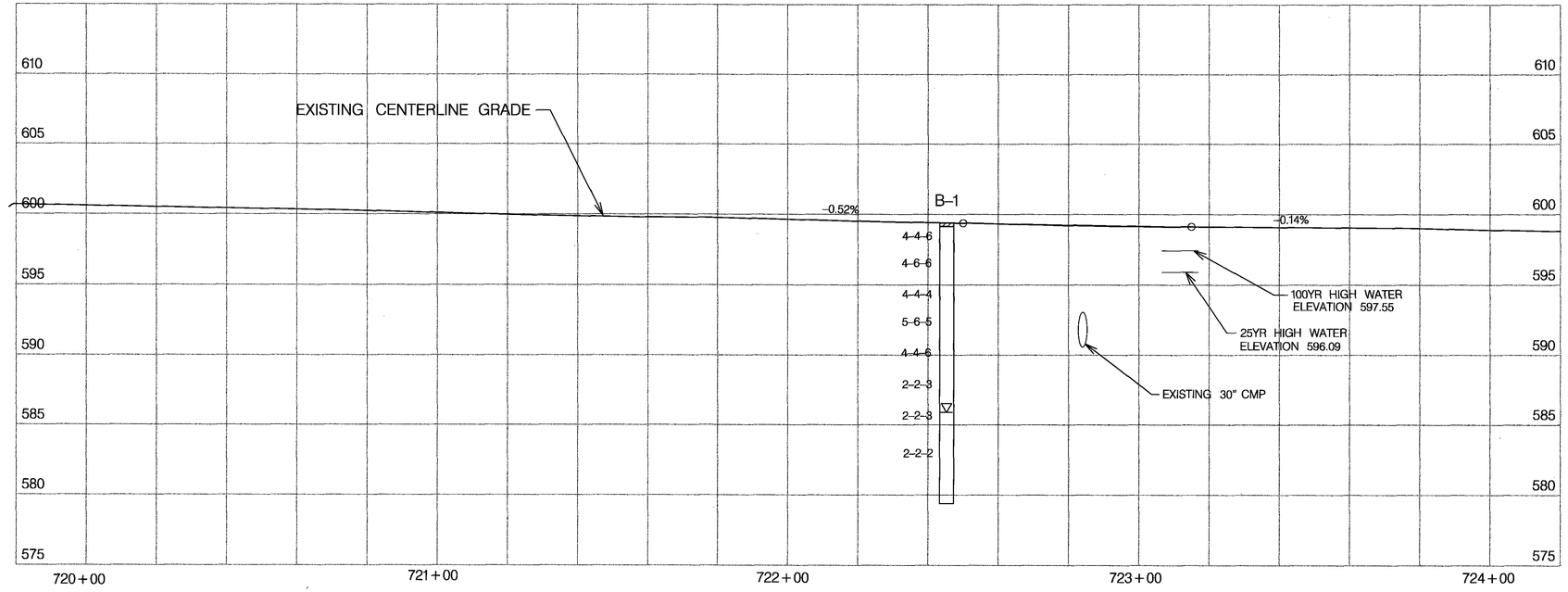
TITLE SHEET

SAN-19-13.69 OVER UNNAMED DITCH
SANDUSKY, SANDUSKY COUNTY, OHIO

1/3

125033





HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER

PLAN AND PROFILE

SAN-19-1369 OVER UNNAMED DITCH
SANDUSKY, SANDUSKY COUNTY, OHIO

2
3

125033

LOG OF BORING NO. 1

Sampler Type: Split Spoon, Liners
Surface Elevation: 597.81 ft
Soil Exploration: SAN-19-13.69

Date Started: 15-Mar-02
Casing Length: N/A
Ground Water Observations: 13.5 ft (Initial)
Culvert, State Route 19 and State Route 635

NONE ft (Completion)
Sandusky, Sandusky County, Ohio

Date Completed: 15-Mar-02
Station & Offset: 722+44.8, 37.7' Rt.
NONE ft (After 0.5 hrs.)
Bowser-Morner Job No. 125033

Elev. (ft)	Depth (ft)	Blows per (ft)	Description	Sample No.	Sample Depth (ft)	Physical Characteristics: % Gravel	% C. Sand	% F. Sand	% Silt	% Clay	LL (%)	PI (%)	W.C. (%)	ODOT Class.	ODOT Group Index
597.81	0.0														
597.61	0.2		Topsoil												
			Medium stiff brown silt and clay, trace of sand, moist												
		4-4-6		1A	1.0-2.5	0.1	0.8	6.0	54.3	38.8	40	19	20.0		
		4-6-6	(Becomes stiff at 3.5')	2A	3.5-5.0								19.9		
	5.0														
		4-4-4		1B	6.0-7.5								22.2		
			(Becomes medium stiff with some clay at 6')												
		5-6-5		2B	8.5-10.0								27.4		
			(Becomes stiff at 9.5')												
	10.0														
		4-4-6		3B	11.0-12.5								32.0		
			(Hole caved at 12')												
		2-2-3	(Becomes soft and gray at 12')	4B	13.5-15.0								31.9		
	15.0														
		2-2-3		5B	16.0-17.5								31.3		
		2-2-2		3A	18.5-20.0								30.9		
577.81	20.0		Bottom of boring at 20'												
	25.0														

D_{50} VALUES	
SAMPLE 1–1A =	0.0096mm
SAMPLE 1–1B =	0.0169mm

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER

BORING DATA

SAN–19–13.69 OVER UNNAMED DITCH
SANDUSKY, SANDUSKY COUNTY, OHIO

3
3

125033

SOIL STUDY FOR PROPOSED CULVERT REPLACEMENT SAN-19-1372 OVER UNNAMED DITCH SANDUSKY, SANDUSKY COUNTY, OHIO

INTRODUCTION

THE PROJECT INCLUDES THE PROPOSED REPLACEMENT OF THE EXISTING CULVERT AT SAN-19-13.72.

GEOLOGY OF THE SITE

THE PROJECT SITE IS LOCATED IN AN AREA OF SANDUSKY COUNTY, OHIO, WHERE THE SOIL PROFILE CONDITIONS FORMED DUE TO GLACIAL ACTIVITIES. THE SOIL PROFILE BENEATH THIS SITE CONSISTS OF TOPSOIL, OVERLYING LACUSTRINE CLAYS AND SILTS.

EXPLORATION

THE SOIL EXPLORATION FOR THE CULVERT FOUNDATIONS CONSISTED OF ONE DRIVE SAMPLE BORING TO A DEPTH OF 20 FEET. THE BORING WAS DRILLED IN MARCH, 2002. ALL BORINGS WERE MADE BY MEANS OF MECHANICALLY POWERED HOLLOW-STEM ROTARY AUGERS MOUNTED ON A MOBILE DRILL RIG.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE SURFACE ELEVATION AT THE BORING WAS 595.03 FEET. TOPSOIL WAS ENCOUNTERED AT THE GROUND SURFACE. THE TOPSOIL THICKNESS WAS 2.4 INCHES.

BELOW THE TOPSOIL, LACUSTRINE DEPOSITS IS FOUND. THE SOIL CONSISTS OF BROWN SILT AND CLAY WITH TRACE SAND.

FOR DETAILED INFORMATION ABOUT THE SOIL CONDITIONS AT A PARTICULAR LOCATION REFER TO THE BORING LOGS.

NOTES

DETAILED INFORMATION CONCERNING THE EXPLORATION FINDINGS MAY BE FOUND IN THE SUBSURFACE INVESTIGATION REPORT FOR THIS PROJECT PREPARED BY BOWSER-MORNER ASSOCIATES, INC. (BOWSER-MORNER REPORT NO. 125034-0402-179, DATED APRIL 12, 2002). THE GEOTECHNICAL REPORT DISCUSSES THE SUBSURFACE SOIL AND GROUNDWATER CONDITIONS ENCOUNTERED, PRESENTS THE SOIL AND LABORATORY DATA, AND MAKES RECOMMENDATIONS CONCERNING FOUNDATION SUPPORT SYSTEMS. PLEASE REFER TO THE ABOVE-REFERENCED REPORT FOR FURTHER INFORMATION.

LEGEND

- Exploratory Boring Location - Plan View
- Exploratory Core Location
- TR Top of Rock
- H Horizontal Bars on Boring Logs Indicate Approximate Soil Transition Depths.
- Existing Fill Materials
- X/Y/Z Figures Beside the Boring Log in Profile Indicates the Number of Blows for Standard Penetration Test.
  - X=Number of Blows for First 6 Inches
  - Y=Number of Blows for Second 6 Inches
  - Z=Number of Blows for Third 6 Inches
- ▽ Initial Groundwater Depth in Borings
- ▼ Creek Water Level

PARTICLE SIZE DEFINITIONS

12"	3"	2.0mm	0.42mm	0.074mm	0.005mm
Boulders |	Cobbles |	Gravel |	Coarse Sand |	Fine Sand |	Silt | Clay
			No. 20 sieve	No. 40 sieve	No. 200 seive

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 2-INCH O.D. SPLIT SPOON SAMPLER AT CONTINUOUS 2.5-FOOT AND/OR 5-FOOT DEPTH INTERVALS DRIVEN BY MEANS OF A 140-POUND HAMMER WITH A FREE FALL OF 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER TWO 0.5 FOOT INCREMENTS IS CONSIDERED THE STANDARD PENETRATION RESISTANCE.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 3-INCH O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS, UNIFORM PRESSING APPLIED BY THE DRILLING RIG. (NOTE: NO PRESS SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A NW-PAM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD. (NOTE: NO CORE BORINGS WERE OBTAINED DURING THIS INVESTIGATION.)

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.5-FOOT INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING THE DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED IN ORDER TO DETERMINE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING. (NOTE: NO WASH SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

ADDITIONAL SOIL INFORMATION

THE SOIL PROFILE AND/OR STRUCTURE FOUNDATION INVESTIGATION SHEETS CONTAIN ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME ASPECT OF THIS PROJECT. MORE INFORMATION, IF ANY, MAY BE OBTAINED IN DISTRICT 2, THE OFFICE OF MATERIALS MANAGEMENT, OR THE OFFICE OF STRUCTURAL ENGINEERING.

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

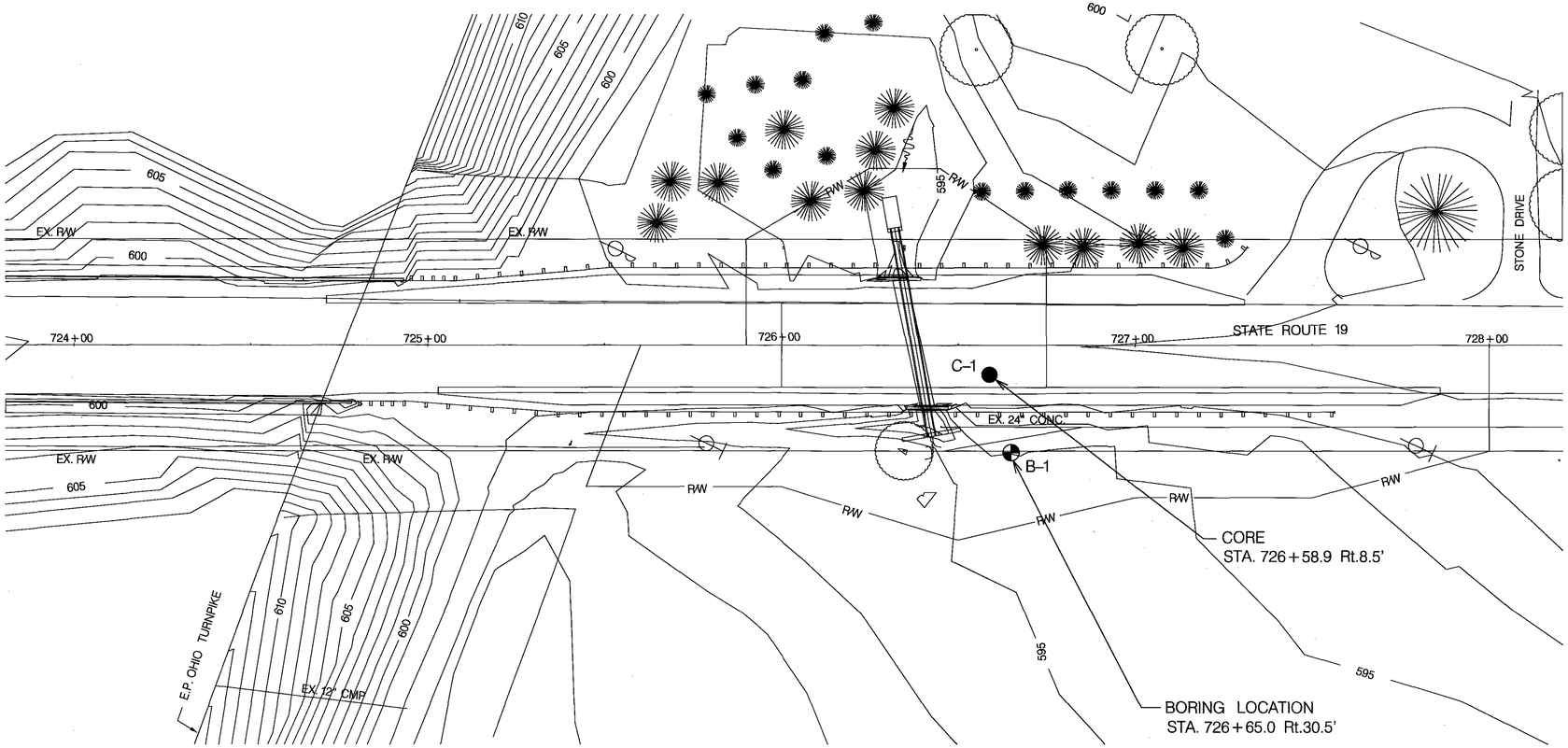
BOWSER MORNER.

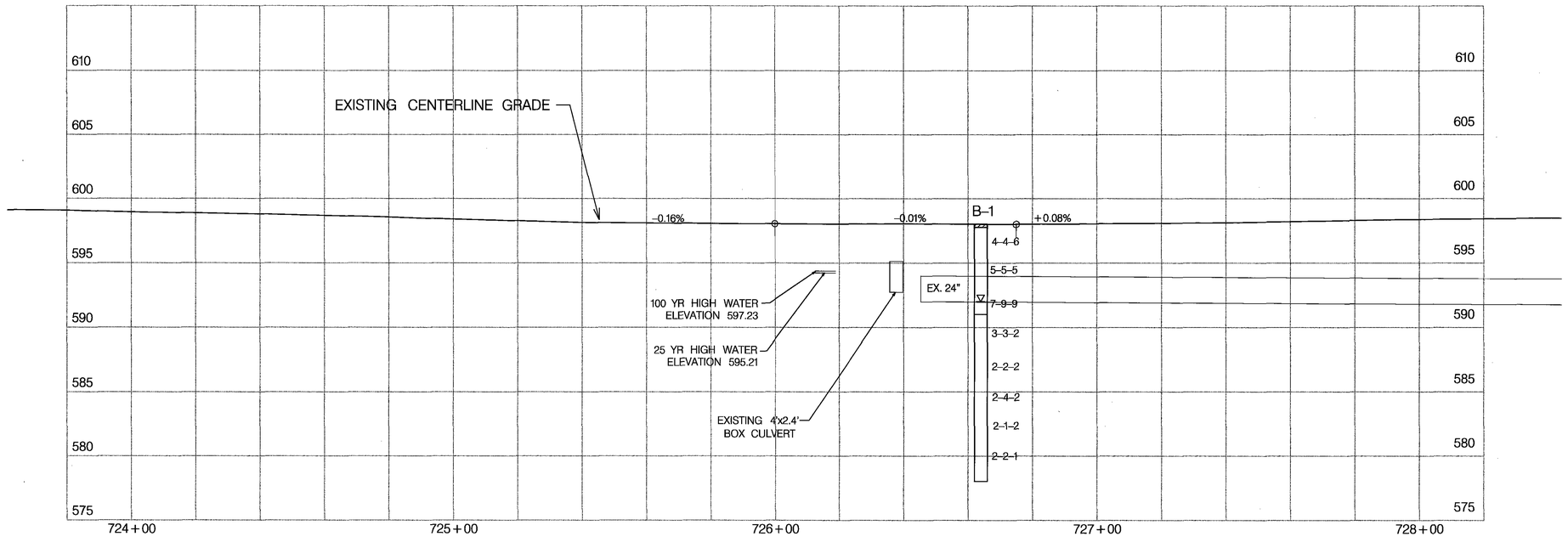
TITLE SHEET

SAN-19-13.72 OVER UNNAMED DITCH
SANDUSKY, SANDUSKY COUNTY, OHIO

1
3

125034





HORIZONTAL SCALE IN FEET
40 20 0 20

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER.

PLAN AND PROFILE

SAN–19–13.72 OVER UNNAMED DITCH
SANDUSKY, SANDUSKY COUNTY, OHIO

2/3

125034

LOG OF BORING NO. 1

Sampler Type: Split Spoon, Liners
Surface Elevation: 595.03 ft
Soil Exploration: SAN-19-13.72

Date Started: 15-Mar-02
Casing Length: N/A
Ground Water Observations: 6.0 ft (initial)
Culvert, State Route 19 and State Route 635

Date Completed: 15-Mar-02
Station & Offset: 726+65.0, 30.5' Rt.
0.0 ft (Completion)
Sandusky, Sandusky County, Ohio
0.0 ft (After 0.5 hrs.)
Bowser-Morner Job No. 125034

Elev. (ft)	Depth (ft)	Blows per (ft)	Description	Sample No.	Sample Depth (ft)	Physical Characteristics: % Gravel	% C. Sand	% F. Sand	% Silt	% Clay	LL (%)	PI (%)	W.C. (%)	ODOT Class.	ODOT Group Index
595.03	0.0														
			Topsoil												
594.83	0.2		Medium stiff brown silt and clay, trace of sand, trace of gravel, moist												
		4-4-6		1A	1.0-2.5										
		5-5-6		2A	3.5-5.0	2.6		3.9	59.7	33.8	35	15	36.3		
	5.0														
		7-9-9		1B	6.0-7.5								24.7		
588.03	7.0														
			Brown silt and clay, trace of sand, moist												
	8.5	3-3-2		2B	8.5-10.0	0.3		2.6	47.2	49.9	40	19	27.7		
			(Becomes soft and gray at 8.5')												
	9.5														
	10.0		(Thin sand seams at 9.5')												
		2-2-2	(Hole caved at 10')	3B	11.0-12.5								33.5		
		2-4-2		4B	13.5-15.0								35.0		
	15.0														
		2-1-2		5B	16.0-17.5								30.7		
		2-2-1		3A	18.5-20.0								29.8		
575.03	20.0														
			Bottom of boring at 20'												
	25.0														

D_{50} VALUES	
SAMPLE 1-2A =	0.0137mm
SAMPLE 1-2B =	0.0050mm

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER

BORING DATA

SAN-19-13.72 OVER UNNAMED DITCH
SANDUSKY, SANDUSKY COUNTY, OHIO

3/3

125034

SOIL STUDY FOR PROPOSED
BRIDGE REPLACEMENT
SAN-635-1.60 OVER TRIBUTARY OF MUSKELLUNGE CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

INTRODUCTION

THE PROJECT INCLUDES THE PROPOSED REPLACEMENT OF THE EXISTING CULVERT AT SAN-635-1.60.

GEOLOGY OF THE SITE

THE PROJECT SITE IS LOCATED IN AN AREA OF SANDUSKY COUNTY, OHIO, WHERE THE SOIL PROFILE CONDITIONS FORMED DUE TO GLACIAL ACTIVITIES. THE SOIL PROFILE BENEATH THIS SITE CONSISTS OF TOPSOIL, OVERLYING FILL OVERLYING GLACIAL TILL CLAYS AND SILTS.

EXPLORATION

THE SOIL EXPLORATION FOR THE CULVERT FOUNDATIONS CONSISTED OF ONE DRIVE SAMPLE BORING TO A DEPTH OF 15 FEET. THE BORING WAS DRILLED IN MARCH, 2002. ALL BORINGS WERE MADE BY MEANS OF MECHANICALLY POWERED HOLLOW-STEM ROTARY AUGERS MOUNTED ON A MOBILE DRILL RIG.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE SURFACE ELEVATION AT THE BORING WAS 701.76 FEET. TOPSOIL WAS ENCOUNTERED AT THE GROUND SURFACE. THE TOPSOIL THICKNESS WAS 3.6 INCHES.

BELOW THE TOPSOIL, FILL DEPOSITS IS FOUND. THE SOIL CONSISTS OF DARK GRAY SILT AND CLAY WITH SOME SAND.

BELOW THE FILL LAYER, GLACIAL TILL DEPOSITS OF BROWN AND GRAY SILT AND CLAY WITH SOME SAND AND TRACE OF GRAVEL IS ENCOUNTERED. THIS LAYER EXTENDES TO A DEPTH OF 7.0 FEET. BELOW THIS LAYER, GRAY SILT AND SAND IN VARYING AMOUNTS WITH TRACE TO SOME CLAY AND GRAVEL IS ENCOUNTERED. AUGER REFUSAL IS ENCOUNTERED AT A DEPTH OF 15.0 FEET.

FOR DETAILED INFORMATION ABOUT THE SOIL CONDITIONS AT A PARTICULAR LOCATION REFER TO THE BORING LOGS.

NOTES

DETAILED INFORMATION CONCERNING THE EXPLORATION FINDINGS MAY BE FOUND IN THE SUBSURFACE INVESTIGATION REPORT FOR THIS PROJECT PREPARED BY BOWSER-MORNER ASSOCIATES, INC. (BOWSER-MORNER REPORT NO. 125035-0402-172, DATED APRIL 9, 2002). THE GEOTECHNICAL REPORT DISCUSSES THE SUBSURFACE SOIL AND GROUNDWATER CONDITIONS ENCOUNTERED, PRESENTS THE SOIL AND LABORATORY DATA, AND MAKES RECOMMENDATIONS CONCERNING FOUNDATION SUPPORT SYSTEMS. PLEASE REFER TO THE ABOVE-REFERENCED REPORT FOR FURTHER INFORMATION.

LEGEND

- Exploratory Boring Location - Plan View
- Exploratory Core Location
- TR Top of Rock
- H Horizontal Bars on Boring Logs Indicate Approximate Soil Transition Depths.
- Existing Fill Materials
- X/Y/Z Figures Beside the Boring Log in Profile Indicates the Number of Blows for Standard Penetration Test.
  - X=Number of Blows for First 6 Inches
  - Y=Number of Blows for Second 6 Inches
  - Z=Number of Blows for Third 6 Inches
- ▽ Initial Groundwater Depth in Borings
- ▼ Creek Water Level

PARTICLE SIZE DEFINITIONS

Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
12"	3"	2.0mm	0.42mm	0.074mm	0.005mm	
		No. 10 sieve	No. 40 sieve	No. 200 sieve		

GENERAL INFORMATION

DRIVE SAMPLES

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 2-INCH O.D. SPLIT SPOON SAMPLER AT CONTINUOUS 2.5-FOOT AND/OR 5-FOOT DEPTH INTERVALS DRIVEN BY MEANS OF A 140-POUND HAMMER WITH A FREE FALL OF 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER TWO 0.5 FOOT INCREMENTS IS CONSIDERED THE STANDARD PENETRATION RESISTANCE.

PRESS SAMPLES

PRESS SAMPLES ARE TAKEN BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A 3-INCH O.D. THIN-WALL PRESS SAMPLING TUBE. THE PRESS SAMPLING TUBE IS ADVANCED BY CONTINUOUS, UNIFORM PRESSING APPLIED BY THE DRILLING RIG. (NOTE: NO PRESS SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

CORE BORINGS

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY POWERED, ROTARY-TYPE DRILL RIG EMPLOYING A NW-PAM CORE BARREL WITH AN INDUSTRIAL DIAMOND CUTTING HEAD. (NOTE: NO CORE BORINGS WERE OBTAINED DURING THIS INVESTIGATION.)

SAMPLING AND TESTING

THE BORING LOG SHEETS SHOW A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TEST IN THREE 0.5-FOOT INCREMENTS, AND A SAMPLE DESCRIPTION BASED ON LABORATORY TEST RESULTS UTILIZING THE ODOT CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS, INCLUDING THE DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY, AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION, AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT A SAMPLER CANNOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED IN ORDER TO DETERMINE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING. (NOTE: NO WASH SAMPLES WERE OBTAINED DURING THIS INVESTIGATION.)

ADDITIONAL SOIL INFORMATION

THE SOIL PROFILE AND/OR STRUCTURE FOUNDATION INVESTIGATION SHEETS CONTAIN ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME ASPECT OF THIS PROJECT. MORE INFORMATION, IF ANY, MAY BE OBTAINED IN DISTRICT 2, THE OFFICE OF MATERIALS MANAGEMENT, OR THE OFFICE OF STRUCTURAL ENGINEERING.

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

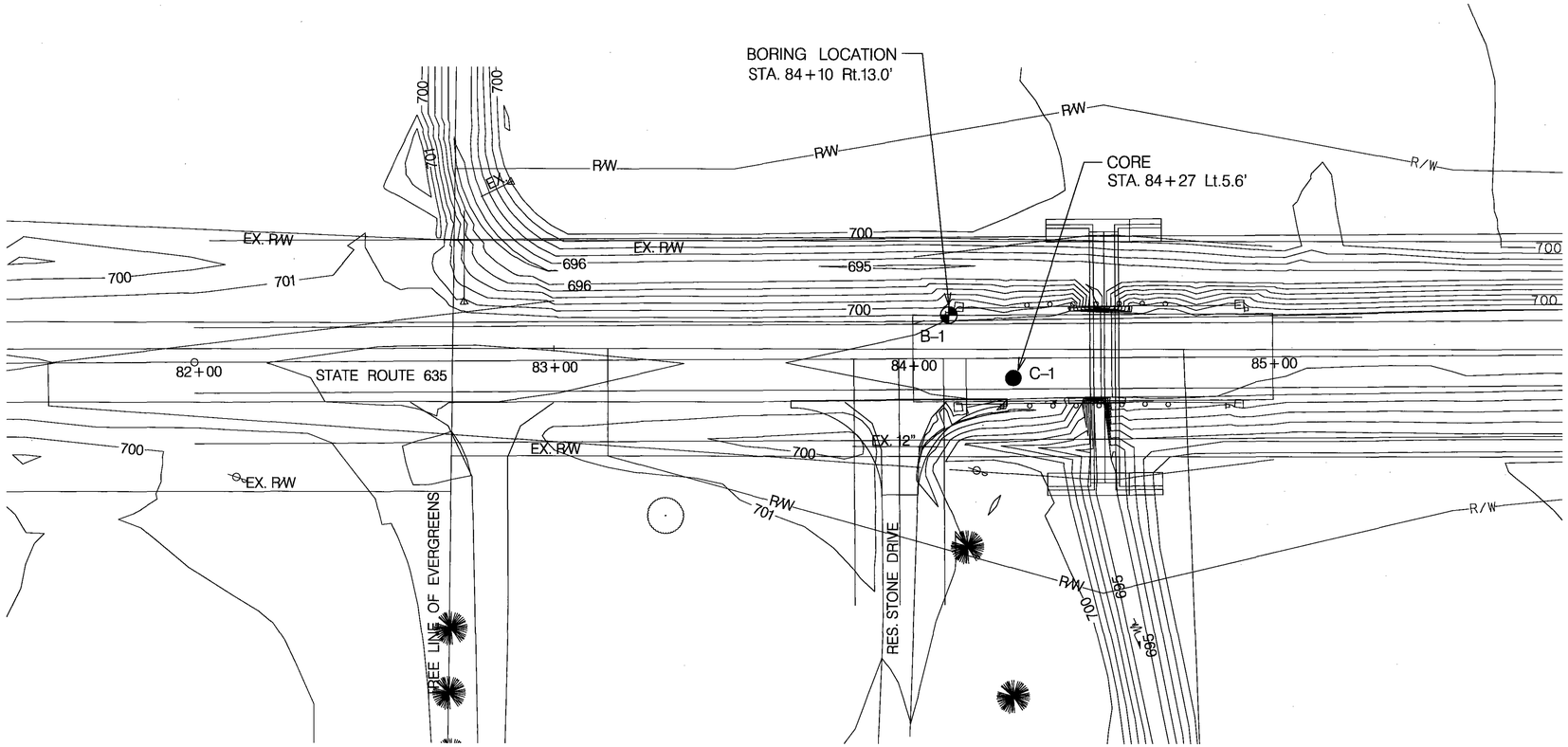
BOWSER MORNER

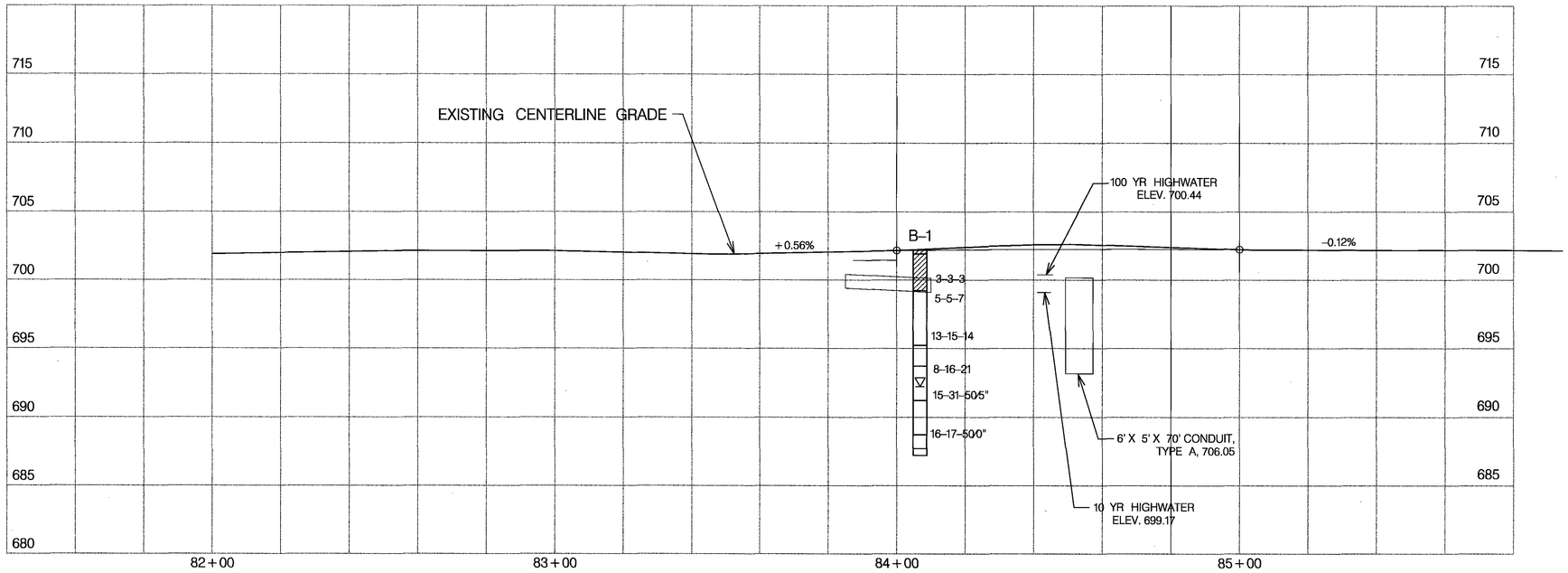
TITLE SHEET

SAN-635-1.60 OVER MUSKELLUNGE CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

1/3

125035





HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER

PLAN AND PROFILE

SAN–635–1.60 OVER MUSKELLUNGE CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

2/3

125035

LOG OF BORING NO. 1

Sampler Type: Split Spoon, Tubes
Surface Elevation: 701.76 ft
Date Started: 16-Mar-02
Casing Length: N/A
Ground Water Observations: 10.0 ft (Initial)
11.0** ft (Completion)
Date Completed: 16-Mar-02
Station & Offset: 84+10, 13.0' Rt.
N/A ft (After N/A hrs.)

SOIL EXPLORATION
Culvert Replacement
SAN-635-1.60
Sandusky County, Ohio
Bowser-Morner Job No. 125035

Elev. (ft)	Depth (ft)	Blows per (ft)	Description	Sample No.	Sample Depth (ft)	Physical Characteristics: % Gravel	% C. Sand	% F. Sand	% Silt	% Clay	LL (%)	PI (%)	W.C. (%)	ODOT Class.	ODOT Group Index
701.76	0.0														
701.46	0.3		Topsoil												
		3-3-3	(FILL) Medium stiff dark gray silt and clay, some sand, moist	1A	1.0-2.5								29.2		
698.76	3.0														
		5-6-7	Stiff brown and gray silt and clay, some sand, trace of gravel, moist	2A	3.5-5.0								20.8		
	5.0														
		13-15-14		1B	6.0-7.5	3.9	6.9	14.2	43.8	31.2	29	10	13.3	A-4a	8
694.76	7.0														
693.26	8.5		Very stiff gray silt, some sand, some clay, trace of gravel, moist												
		8-16-21	Hard gray silt, some sand, some clay, some gravel, moist	2B	8.5-10.0	11.8	12.1	19.5	38.6	18.0	19	5	9.9	A-4a	4
	10.0														
690.76	11.0	15-31-50/5"		3B	11.0-12.5								12.3		
688.26	13.5		*Dense gray sand, and silt, some clay trace of gravel, moist*												
		16-17-50/0"	Dense gray sand, some silt, trace of clay, trace of gravel, wet	4B	13.5-15.0								15.8		
687.26	14.5														
686.76	15.0		Weathered rock (Auger refusal at 15')												
			Bottom of boring at 15'												
	20.0														
	25.0														

*Hole caved at 11.0'

D_{50} VALUES		
SAMPLE 1–1A	=	0.0096mm
SAMPLE 1–1B	=	0.0169mm

HORIZONTAL SCALE IN FEET
20 0 20 40

DRAWN BY SCY
CHECKED BY NN

BOWSER MORNER

BORING DATA

SAN-635-1.60 OVER MUSKELLUNGE CREEK
SANDUSKY, SANDUSKY COUNTY, OHIO

3/3

125035