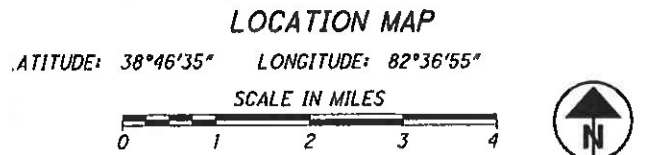
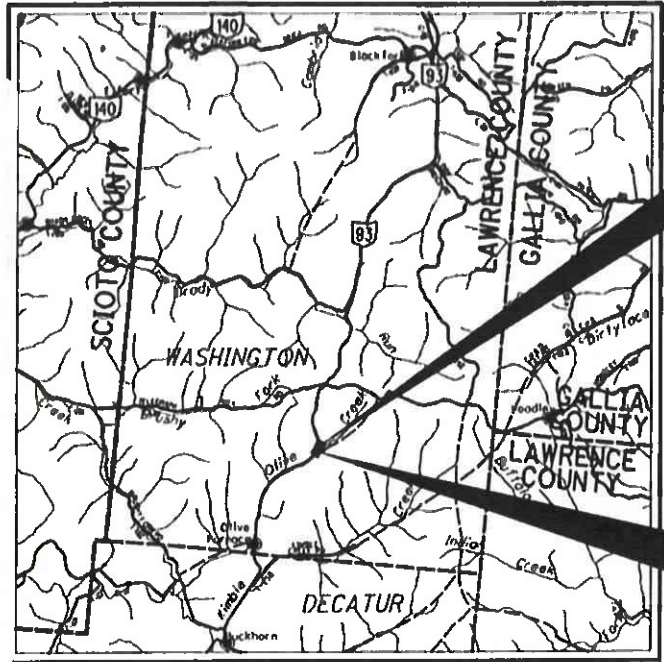


LAW - SR 93-22.71
190568 PID - 10374
Dist 9 11/21/2019



PORTION TO BE IMPROVED	
INTERSTATE HIGHWAY	
FEDERAL ROUTES	
STATE ROUTES	
COUNTY & TOWNSHIP ROADS	
OTHER ROADS	

DESIGN DESIGNATION

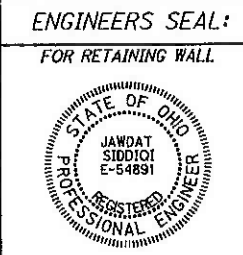
CURRENT ADT (2019)	1,600
DESIGN YEAR ADT (2039)	1,600
DESIGN HOURLY VOLUME (2039)	190
DIRECTIONAL DISTRIBUTION	60%
TRUCKS (24 HOUR B&C)	10.0%
Td	5%
DESIGN SPEED	55 MPH
LEGAL SPEED	55 MPH
DESIGN FUNCTIONAL CLASSIFICATION:	
04 MINOR ARTERIAL (RURAL)	
NHS PROJECT	NO

DESIGN EXCEPTIONS

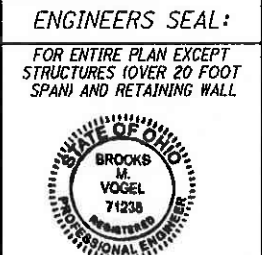
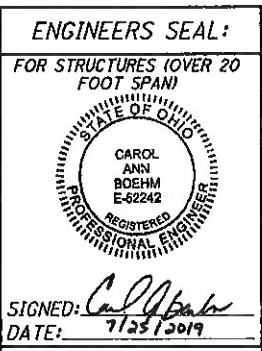
DESIGN FEATURE	APPROVAL DATE	SHEET NO.
DEGREE OF CURVE	11/06/18	14
SUPERELEVATION RATE	11/06/18	14



KORDA
KORDA/NEMETH ENGINEERING, INC - CONSULTING ENGINEERS
1650 Watermark Drive, Suite 200 - Columbus, OH 43215-7010
TEL. 614-487-1650 WEB www.korda.com



SIGNED: Jawad Siddiqi
DATE: 7/25/2019



SIGNED: Brooks M. Vogel
DATE: 7/25/2019

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
LAW-93-22.71
WASHINGTON TOWNSHIP
LAWRENCE COUNTY

INDEX OF SHEETS:

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STANDARD CONSTRUCTION DRAWINGS						SUPPLEMENTAL SPECIFICATIONS	
BP-3.1	7/18/14	MT-96.11	1/18/19	PCB-91	1/18/13	800-2019	7/19/19
DM-4.2	7/20/12	MT-96.26	7/15/16	TST-I-99	7/20/18	832	10/19/18
DM-4.3	1/15/16	MT-97.10	4/19/19			902	7/19/19
DM-4.4	1/15/16	MT-101.70	7/20/18			987	1/16/09
		MT-101.75	7/15/16				
MGS-1.1	1/19/18	MT-101.90	7/21/17				
MGS-2.1	1/19/18	MT-105.10	7/19/13				
MGS-3.1	1/19/18						
MGS-4.3	1/18/13	TC-41.20	10/18/13				
MGS-5.3	7/15/16	TC-42.20	10/18/13				
		TC-52.10	10/18/13				
RM-1.1	7/18/14	TC-52.20	7/20/18				
RM-4.2	4/18/14	TC-61.30	7/19/19				
		TC-65.10	1/17/14				
		TC-65.11	7/21/17				

PROJECT DESCRIPTION
COMPLETE REPLACEMENT OF EXISTING SINGLE SPAN CONCRETE SLAB BRIDGE OVER OLIVE CREEK WITH A PRECAST CONCRETE THREE-SIDED FLAT TOP CULVERT INCLUDING MINIMAL ROADWAY APPROACH WORK. ALSO INCLUDES ROADWAY EMBANKMENT STABILIZATION AND CHANNEL RELOCATION BY NEW RETAINING WALL CONSTRUCTION.

EARTH DISTURBED AREAS
PROJECT EARTH DISTURBED AREA: 0.67 ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: 0.25 ACRES
NOTICE OF INTENT EARTH DISTURBED AREA: N/A (NOI NOT REQUIRED)

2019 SPECIFICATIONS
THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

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

APPROVED:
DATE: 08-05-2019 DISTRICT DEPUTY DIRECTOR

APPROVED:
DATE: 9/10/19 DIRECTOR, DEPARTMENT OF TRANSPORTATION

EXISTING LEGEND

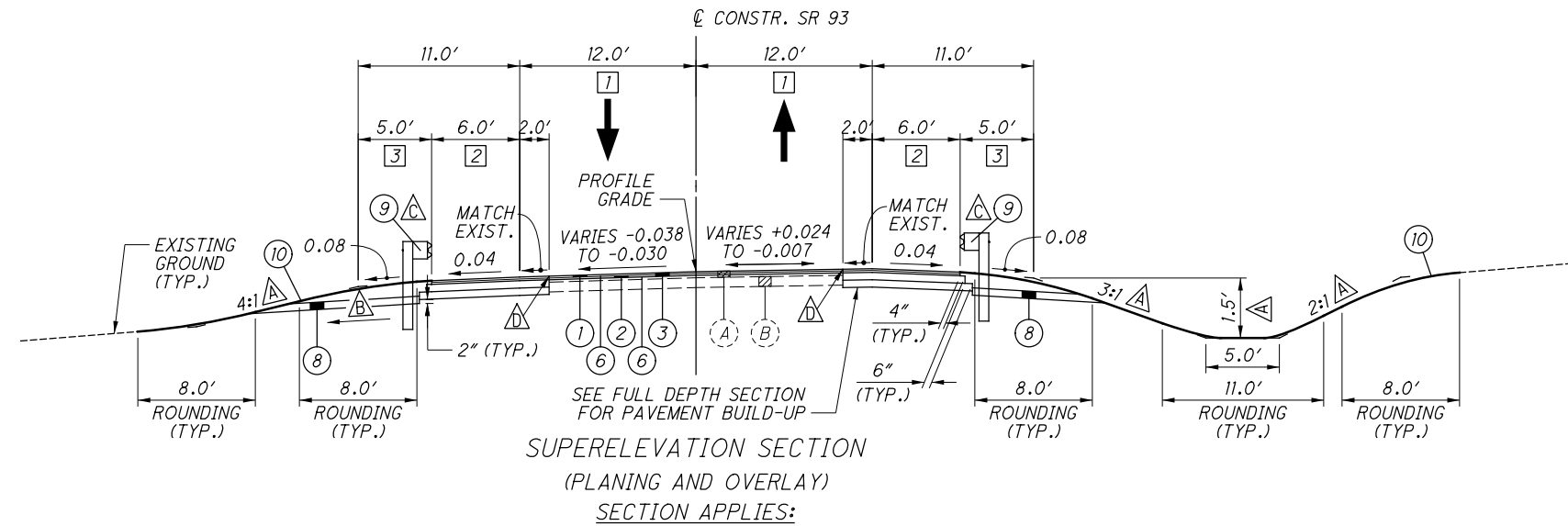
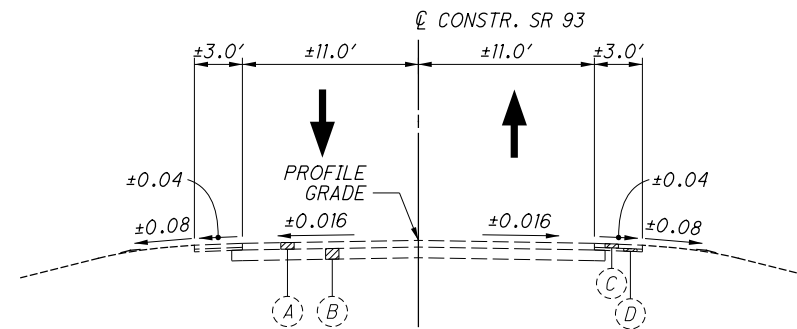
- (A) ± 5" ASPHALT CONCRETE
(B) ± 8" AGGREGATE BASE
(C) ± 3" ASPHALT CONCRETE
(D) ± 2" COMPACTED AGGREGATE

LEGEND

- (1) ITEM 441 - 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22
(2) ITEM 441 - 1 3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
(3) ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE (3" DEPTH)
(4) ITEM 301 - 6" ASPHALT CONCRETE BASE, PG64-22
(5) ITEM 304 - 6" AGGREGATE BASE
(6) ITEM 407 - TACK COAT
(7) ITEM 204 - SUBGRADE COMPACTION
(8) ITEM 605 - AGGREGATE DRAINS
(9) ITEM 606 - GUARDRAIL, TYPE MGS
(10) ITEM 659 - SEEDING AND MULCHING

NOTES:

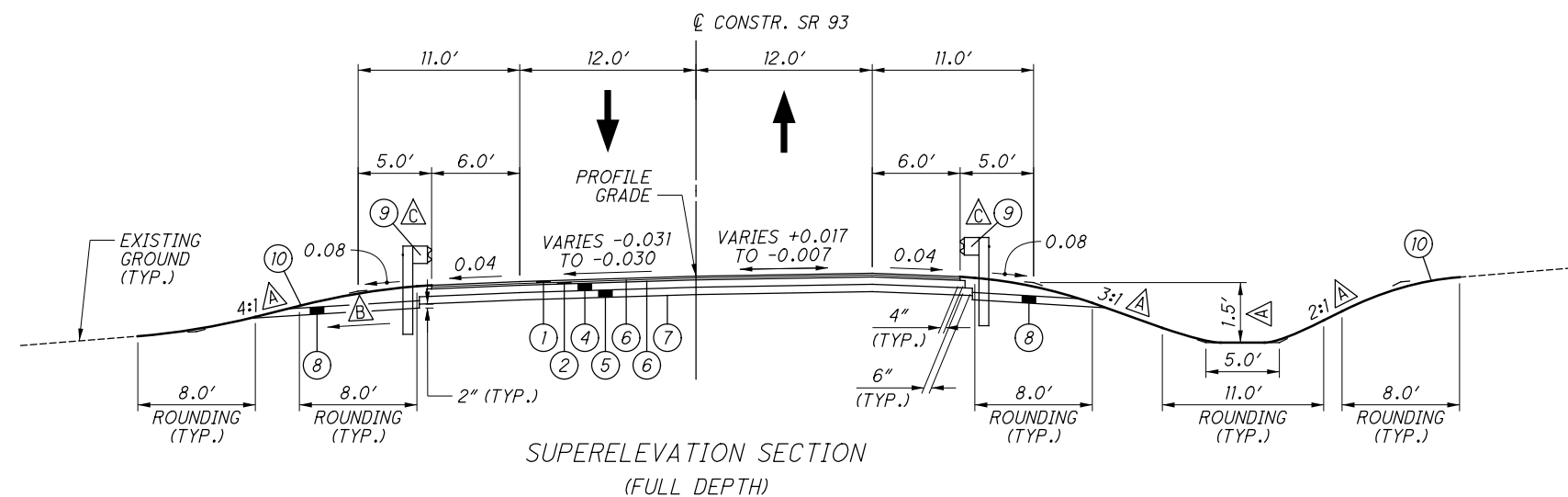
- (A) OR AS SHOWN ON CROSS SECTIONS.
(B) 0.04 MINIMUM, 0.08 DESIRABLE (TYP.).
(C) GUARDRAIL IS SHOWN FOR CLARITY OF LATERAL OFFSET ONLY. REFER TO PLAN AND PROFILE SHEETS FOR LIMITS OF GUARDRAIL.
(D) SAWCUT PAVEMENT TO FULL DEPTH EXPOSING A SOUND PAVEMENT EDGE AND REMOVE EXISTING PAVEMENT TO FULL DEPTH. EXACT LOCATION SHALL BE DETERMINED IN THE FIELD. PAYMENT FOR SAWCUTTING IS INCLUDED IN ITEM 202 - PAVEMENT REMOVED. FOR ESTIMATING PURPOSES THE PLANS INCLUDE AN AVERAGE WIDTH OF 2.0 FEET OF PAVEMENT REMOVED.



1 STA. 1199+00.00 TO STA. 1199+75.00
VARIES 11.0' TO 12.0'
STA. 1201+25.00 TO STA. 1201+50.00
VARIES 11.33' TO 12.0'

2 STA. 1199+00.00 TO STA. 1199+75.00
VARIES 3.0' TO 6.0'
STA. 1201+25.00 TO STA. 1201+50.00
VARIES 4.0' TO 3.0'

3 STA. 1199+00.00 TO STA. 1199+75.00
VARIES 2.0' TO 5.0'
STA. 1201+25.00 TO STA. 1201+50.00
VARIES 3.0' TO 2.0'



STA. 1199+75.00 TO STA. 1201+25.00

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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:

TELEPHONE: AT&T OHIO
160 N. 6TH STREET
ZANESVILLE, OHIO 43701
CONTACT: MR. BARRETT TAMASOVICH
TELECOMMUNICATIONS SPECIALIST
TELEPHONE: (740) 454-3552
EMAIL: BT2178@ATT.COM

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.

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE THIS SHEET OF THE PLANS FOR A TABLE CONTAINING PROJECT CONTROL INFORMATION.

USE THE FOLLOWING PROJECT CONTROL, VERTICAL POSITIONING, AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

PROJECT CONTROL

POSITIONING METHOD: STATIC GPS
MONUMENT TYPE: 5/8" IRON PIN AND ODOT CAP (SET)

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: N.A.V.D. 88 (DERIVED FOR NGS MONUMENT D-214 NEAR SITE)
GEOID: N/A

HORIZONTAL POSITIONING

REFERENCE FRAME: NAD83/2011 (EPOCH 2010)
ELLIPSOID: GRS80
MAP PROJECTION: LAMBERT CONFORMAL CONIC
COORDINATE SYSTEM: OHIO STATE PLANE, SOUTH ZONE (3402)
COMBINED SCALE FACTOR: 1.00003749
ORIGIN OF COORDINATE SYSTEM: 0,0

USE THE POSITIONING METHODS AND MONUMENT TYPE USED IN THE ORIGINAL SURVEY TO RESTORE ALL MONUMENTS RELATED TO PRIMARY PROJECT CONTROL THAT ARE DAMAGED OR DESTROYED BY CONSTRUCTION ACTIVITIES. RESTORE THE DAMAGED OR DESTROYED MONUMENTS IN ACCORDANCE WITH CMS 623.

UNITS ARE IN U.S. SURVEY FEET.

SURVEYING PARAMETERS (CONTINUED)

PROJECT CONTROL DATA (GROUND COORDINATES)								
POINT NO.	DESCRIPTION	STATION	℄	OFFSET	SIDE	NORTHING	EASTING	ELEVATION
SV 1	IRON PIN SET	1199+28.52	SR 93	22.12'	RT	282,382.0520	1,934,789.8700	726.31
SV 2	IRON PIN SET	1202+13.15	SR 93	17.38'	LT	282,635.7520	1,934,928.3520	728.98

CENTERLINE OF CONSTRUCTION HORIZONTAL CONTROL DATA (GROUND COORDINATES)						
DESCRIPTION	STATION	℄	OFFSET	SIDE	NORTHING	EASTING
PC	1198+22.20	SR 93	0.00'	℄	282,323.4915	1,934,696.7895
PT	1200+27.58	SR 93	0.00'	℄	282,474.1119	1,934,835.5582
POT	1203+50.00	SR 93	0.00'	℄	282,737.5464	1,935,021.4587

PROJECT BENCHMARKS						
NAME	STATION	℄	OFFSET	SIDE	ELEVATION	DESCRIPTION
NGS D-214	1197+23.00	SR 93	23.00'	LT	726.91	NGS MONUMENT D-214. BENCHMARK DISC SET IN ROCK OUTCROP.
BM #1	1198+58.57	SR 93	16.36'	LT	727.77	BENCH-TIE SET ON BACK SIDE OF GUARDRAIL.
BM #2	1202+13.93	SR 93	17.42'	RT	730.43	BENCH-TIE SET ON BACK SIDE OF GUARDRAIL.

WORK LIMITS

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. PROVIDE THE INSTALLATION AND OPERATION OF ALL WORK ZONE TRAFFIC CONTROL AND WORK ZONE TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

CLEARING AND GRUBBING

REMOVE ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS 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	0	4
30"	1	0	1
48"	0	0	0
60"	0	0	0

REFERENCE MONUMENTS

CONSTRUCT REFERENCE MONUMENTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THE STANDARD CONSTRUCTION DRAWINGS AND AT THE LOCATIONS SHOWN ON SHEET NO

3940

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ITEM 204 - PROOF ROLLING

THE FOLLOWING QUANTITY IS PROVIDED IN THE GENERAL SUMMARY TO ADDRESS LOCATIONS REQUIRING PROOF ROLLING.

ITEM 204 - PROOF ROLLING 1 HOUR.

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.

ITEM 605 - AGGREGATE DRAINS		
STATION	SIDE	FEET
1199+25	LT	16.5
1199+75	LT	16.5
1200+50	LT	11.5
1201+25	LT	15.0
TOTALS TO GENERAL SUMMARY		60

ADDITIONAL SOIL INFORMATION

SOIL BORINGS WERE NOT PERFORMED AS PART OF THIS PROJECT. HISTORIC SOIL BORING RECORDS INDICATE WHERE THE TOP OF ROCK IS SHOWN IN THE PLANS. THESE HISTORIC BORINGS ARE AVAILABLE UPON REQUEST FROM THE ODOT DISTRICT 9 OFFICE.

CONSTRUCTION SCHEDULE

CONSTRUCTION OF THIS PROJECT SHALL NOT BEGIN UNTIL APRIL 1ST, 2020 UNLESS OTHERWISE APPROVED BY THE DISTRICT CONSTRUCTION ENGINEER.

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CONNECTION BETWEEN EXISTING AND PROPOSED GUARDRAIL

WHEN IT IS NECESSARY TO SPLICE PROPOSED GUARDRAIL TO EXISTING GUARDRAIL, ONLY THE EXISTING GUARDRAIL SHALL BE CUT, DRILLED, OR PUNCHED. THE CONNECTION SHALL BE MADE USING A W-BEAM, BEAM SPLICE AS SHOWN IN AASHTO M 180-12, EXCEPT THE BEAM WASHERS ARE NOT TO BE USED. PAYMENT SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE RESPECTIVE GUARDRAIL ITEMS.

ITEM 606 – ANCHOR ASSEMBLY, MGS TYPE E

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING ANY OF THE GUARDRAIL END TERMINALS FOR TYPE MGS GUARDRAIL AS LISTED ON ROADWAY ENGINEERING’S WEB PAGE UNDER ROADSIDE SAFETY DEVICES FOR APPROVED GUARDRAIL END TREATMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER’S SPECIFICATIONS.

THE FACE OF THE TYPE E IMPACT HEAD SHALL BE COVERED WITH A SHEET OF TYPE G REFLECTIVE SHEETING, PER CMS 730.19.

REFER TO THE MANUFACTURER’S INSTRUCTIONS 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 31 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, MGS TYPE E, 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.

PART-WIDTH CONSTRUCTION

BECAUSE OF THE NECESSITY TO BUILD THIS PROJECT UNDER TRAFFIC AND TO CONSTRUCT THE FULL PAVEMENT WIDTH IN STAGES, EXERCISE CARE TO PREVENT THE CONSTRUCTION OF A BUTT JOINT IN THE BASE COURSES. LAP LONGITUDINAL JOINTS AS SHOWN ON STANDARD CONSTRUCTION DRAWING BP-3.1.

SEEDING AND MULCHING

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

659, SEEDING AND MULCHING, AS PER PLAN 839 SQ. YD.

659, REPAIR SEEDING AND MULCHING 42 SQ. YD

659, COMMERCIAL FERTILIZER 0.04 TON

659, LIME 0.04 ACRES

659, WATER 5 M. GAL.

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.

ITEM 659, SEEDING AND MULCHING, AS PER PLAN

FINAL RESTORATION OF THE SITE WILL INCLUDE SEEDING USING THE WAYNE NATIONAL FOREST SEED MIX. THE CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE NEEDS OF THE AREA TO ASSURE VEGETATION TAKES TO CONTROL SOIL EROSION.

TO REDUCE THE LIKELIHOOD OF THE INTRODUCTION OF NON-INVASIVE SPECIES ALL EQUIPMENT SHALL BE CLEANED OF VEGETATION, DEBRIS, AND SOIL BEFORE ENTERING THE PROJECT AREA.

DISPOSAL OF ANY SUBSTANCES THAT WOULD BE CONSIDERED WASTE OR REFUSE OR THE STORAGE OF ANY HAZARDOUS WASTE OR MANUFACTURED/REFINED CHEMICAL PRODUCTS ON THE SOIL OR IN THE UNNAMED TRIBUTARY IS NOT ALLOWED.

THE PROJECT WORK SHALL REMAIN WITHIN THE AREAS OF THE CONSTRUCTION LIMITS.

ANY AREAS DEEMED TEMPORARY WORK SPACE ON NATIONAL FOREST SERVICE (NFS) LANDS SHALL BE RESTORED. IF FUTURE MAINTENANCE IS NEEDED IN THESE TYPE OF AREAS, THE UNITED STATES DEPARTMENT OF AGRICULTURE (USDA) FOREST SERVICE AUTHORIZATION DATED FEB. 21, 2019 SHALL APPLY.

THE PROJECT AREA AND AREAS ON NFS LANDS ARE SHOWN ON THE PLANS AND ARE MADE A PART OF THE USDA FOREST SERVICE AUTHORIZATION DATED FEB. 21, 2019 SHALL APPLY.

SEED MIX – WAYNE NATIONAL FOREST

FEBRUARY 1 TO MAY 1	AUGUST 16 TO NOVEMBER 15
25 LBS/ACRE SPRING OATS	50 LBS/ACRE WINTER WHEAT OR ANNUAL RYE
10 LBS/ACRE ORCHARD GRASS	10 LBS/ACRE ORCHARD GRASS
15 LBS/ACRE PERENNIAL RYE GRASS	15 LBS/ACRE PERENNIAL RYE GRASS
10 LBS/ACRE TIMOTHY GRASS	10 LBS/ACRE TIMOTHY GRASS

MAY 1 TO AUGUST 15	NOVEMBER 16 TO JANUARY 31
50 LBS/ACRE ANNUAL RYE GRASS	50 LBS/ACRE WINTER WHEAT OR ANNUAL RYE
5 LBS/ACRE ORCHARD GRASS	10 LBS/ACRE ORCHARD GRASS
15 LBS/ACRE PERENNIAL RYE GRASS	15 LBS/ACRE PERENNIAL RYE GRASS
10 LBS/ACRE TIMOTHY GRASS	10 LBS/ACRE TIMOTHY GRASS

TO AID IN ESTABLISHMENT THE FOLLOWING FERTILIZER AND LIME RECOMMENDED RATES ARE ENCOURAGED. LIME MAY NOT BE NEEDED IF KNOWN SOIL pH IS HIGHER THAN 6.

QUANTITY	MATERIAL
200 LBS/ACRE	14-14-14 FERTILIZER / ACRE
400 LBS/ACRE	PELLETIZED LIME / ACRE

MULCH:
THE PURPOSE OF MULCHING IS TO PROVIDE A PROTECTIVE COVER OVER SEEDED AREAS TO REDUCE SEED PREDATION BY BIRDS, REDUCE SOIL EROSION AND AID IN VEGETATION RECOVERY BY HOLDING IN MOISTURE.

MULCHING IS NOT NECESSARY ON VERY SHADED AND FLAT AREAS (LESS THAN 15% SLOPE).

IF THE SLOPE OF THE PROJECT AREA IS GREATER THAN 15%, THE CONTRACTOR MUST MULCH WITH WEED FREE STRAW AT 1½ TONS PER ACRE (SIXTY 50-LB. BALES PER ACRE). THIS IS EQUIVALENT TO 1½ (50 LB.) BALES PER 1,000 SQUARE FEET.

ON SLOPES GREATER THAN 25% ADDITIONAL MULCHING MATERIALS, SUCH AS FIBER OR PLASTIC MATTING OR NETTING, MUST ALSO BE USED.

FERTILIZATION:
IF SOIL CONDITIONS JUSTIFY ITS USE, THEN MINIMUM FERTILIZATION IS RECOMMENDED AND SHOULD BE NO MORE THAN 5 TO 10 POUNDS PER 1,000 SQUARE FEET OR 200 TO 400 POUNDS PER ACRE OF 14-14-14.

THE FOREST SERVICE MAY CONSIDER ALTERNATIVE RESTORATION MEASURES DEPENDING ON SITE CONDITIONS OR NEGOTIATED TERMS OF THE PROJECT.

ITEM 671, EROSION CONTROL MAT, TYPE --

THIS ITEM SHALL BE CONSTRUCTED AS PER CMS 671 EXCEPT THAT THE SEED MIX SHALL BE THE WAYNE NATIONAL FOREST SEED MIX AS PER THE SEEDING AND MULCHING, AS PER PLAN NOTE ON THIS SHEET.

ALL MATERIALS AND LABOR NECESSARY TO COMPLETE THE WORK AS REQUIRED SHALL BE INCLUDED IN THE UNIT PRICE FOR THIS ITEM.

ENDANGERED BAT HABITAT REMOVAL

THE PROJECT IS LOCATED WITHIN THE KNOWN HABITAT RANGES OF THE FEDERALLY LISTED AND PROTECTED INDIANA BAT AND NORTHERN LONG-EARED BAT. NO TREES SHALL BE REMOVED UNDER THIS PROJECT FROM APRIL 1 THROUGH SEPTEMBER 30. ALL NECESSARY TREE REMOVAL SHALL OCCUR FROM OCTOBER 1 THROUGH MARCH 31. THIS REQUIREMENT IS NECESSARY TO AVOID AND MINIMIZE IMPACTS TO THESE SPECIES AS REQUIRED BY THE ENDANGERED SPECIES ACT. FOR THE PURPOSES OF THIS NOTE, A TREE IS DEFINED AS A LIVE, DYING, OR DEAD WOODY PLANT, WITH A TRUNK THREE INCHES OR GREATER IN DIAMETER AT A HEIGHT OF 4.5 FEET ABOVE THE GROUND SURFACE, AND WITH A MINIMUM HEIGHT OF 13 FEET.

CALCULATED
CLP
CHECKED
BMV

GENERAL NOTES

LAW -93-22.71

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ITEM 614, MAINTAINING TRAFFIC

ON SR 93, A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES BY USE OF THE EXISTING PAVEMENT, THE COMPLETED PAVEMENT, ITEM 615 PAVEMENT FOR MAINTAINING TRAFFIC, ITEM 615 ROADS FOR MAINTAINING TRAFFIC, AND TEMPORARY SURFACES USING ITEMS 410 AND 614.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DETERMINED BY THE ENGINEER FOR THE MAINTENANCE OF TRAFFIC.

ITEM 614, ASPHALT CONCRETE FOR MAINTAINING TRAFFIC	25 CU. YD.
ITEM 616, WATER	4 M. GAL.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH C&MS 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.

TRENCH FOR WIDENING

TRENCH EXCAVATION FOR BASE WIDENING AND/OR SUBGRADE STABILIZATION SHALL BE ONLY ON ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE, BASE MATERIAL AND SUBGRADE MATERIAL SHALL FOLLOW AS CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL OF THE ENGINEER.

OVERNIGHT TRENCH CLOSING

THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 5 INCHES BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT EXCEPT FOR A SHORT LENGTH (25 FEET OR LESS) OF A WORK SECTION AT THE END OF THE TRENCH. IN CASE WORK MUST BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED BASE WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

DUST CONTROL

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

ITEM 616, WATER	4 M. GAL
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EARTHWORK FOR MAINTAINING TRAFFIC

THE FOLLOWING QUANTITIES HAVE BEEN INCLUDED IN THE PLAN FOR INFORMATION ONLY:

EXCAVATION FOR MAINTAINING TRAFFIC	130 CU. YD.
EMBANKMENT FOR MAINTAINING TRAFFIC	26 CU. YD.

WHEN UNDERCUTS ARE NECESSARY FOR MAINLINE PAVEMENT OR EMBANKMENT CONSTRUCTION, EVALUATE THE NEED FOR TEMPORARY ROAD UNDERCUTS IF WITHIN A CLOSE PROXIMITY TO THE MAINLINE UNDERCUTS. A GEOTECHNICAL EVALUATION SHOULD BE CONSIDERED TO DETERMINE IF THE EXISTING SOIL CONDITIONS ARE ADEQUATE TO SUPPORT THE TEMPORARY ROAD. ADDITIONAL SOIL BORING'S ALONG THE TEMPORARY ROAD ARE NOT NORMALLY REQUIRED.

ITEM 614, WORK ZONE IMPACT ATTENUATOR FOR 24" WIDE HAZARDS (UNIDIRECTIONAL OR BIDIRECTIONAL)

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A NON-GATING IMPACT ATTENUATOR. FURNISH AN IMPACT ATTENUATOR FROM THE OFFICE OF ROADWAY ENGINEERING'S APPROVED LIST FOR WORK ZONE IMPACT ATTENUATORS, FROM THE ROADWAY STANDARDS WEB PAGE FOR ROADWAY STANDARDS WEB PAGE.

INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE CONTRACTOR SHALL REPAIR OR REPLACE A DAMAGED UNIT WITHIN 24 HOURS OF A DAMAGING IMPACT.



WHEN BIDIRECTIONAL DESIGNS ARE SPECIFIED, THE CONTRACTOR SHALL SUPPLY APPROPRIATE TRANSITIONS.

WHEN GATING IMPACT ATTENUATORS ARE DESIRED, THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER FOR ACCEPTANCE.

THE COST FOR THE ADDITIONAL BARRIER REQUIRED FOR A GATING IMPACT ATTENUATOR SHALL BE INCLUDED IN THE COST OF THE GATING IMPACT ATTENUATOR.

PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT AND MAINTAIN A COMPLETE AND FUNCTIONAL IMPACT ATTENUATOR SYSTEM, INCLUDING ALL RELATED BACKUPS, TRANSITIONS, LEVELING PADS, HARDWARE AND GRADING, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

FULLY-ACTUATED OPERATION OF WORK ZONE TRAFFIC SIGNAL

THE WORK ZONE SIGNAL CONTROL REQUIRED FOR THIS PROJECT AND SHOWN ON SHEETS  AND  AND SCDS MT-96.11,

MT-96.20 AND MT-96.26 SHALL BE FULLY TRAFFIC-ACTUATED AND OPERATE IN A MANNER SIMILAR TO THAT DESCRIBED IN SECTION 733.02 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.

THE INITIAL CONTROLLER TIMING SHALL BE AS FOLLOWS:

	SIGNAL PHASE	
	SR 93 NORTHBOUND	SR 93 SOUTHBOUND
MIN. GREEN	20	20
EXTENSION	5	5
MAX. GREEN	40	40
YELLOW	5	5
ALL RED	30	30

SIGNAL WILL REST ON RED WHEN NO VEHICLES ARE DETECTED.

THE CONTRACTOR SHALL ALSO DESIGN, FURNISH, INSTALL AND MAINTAIN A TRAFFIC DETECTOR ON EACH TRAFFIC APPROACH WHICH WILL RELIABLY DETECT ALL LEGAL TRAFFIC APPROACHING (BUT NOT LEAVING) THE SIGNAL AS IT PASSES OR WAITS IN THE DESIGNATED DETECTOR ZONE SHOWN IN THE PLANS. DETECTOR DESIGNS WHICH DO NOT PROVIDE RELIABLE DETECTION, FREE FROM FALSE CALLS, SHALL BE IMMEDIATELY REPLACED BY THE CONTRACTOR.

DELINEATION OF PORTABLE AND PERMANENT BARRIER

BARRIER REFLECTORS AND OBJECT MARKERS SHALL BE INSTALLED ON ALL PORTABLE BARRIER (PB) USED FOR TRAFFIC CONTROL AND ON PERMANENT CONCRETE BARRIER (INCLUDING BRIDGE PARAPETS) LOCATED WITHIN 5 FEET OF THE EDGE OF THE ADJACENT TRAVEL LANE.


BARRIER REFLECTORS SHALL CONFORM TO C&MS 626, EXCEPT THAT THE SPACING SHALL BE AS PER TRAFFIC SCD MT-101.70. OBJECT MARKERS AND THEIR INSTALLATION SHALL CONFORM TO C&MS 614.03 AND SCD MT-101.70. WHEN THE PB CONTAINS GLARE SCREEN, ONE SET OF THREE VERTICAL STRIPES OF SHEETING SHALL BE CONSIDERED EQUIVALENT TO AN OBJECT MARKER, ONE-WAY.

INCREASED BARRIER DELINEATION, AS SPECIFIED HEREIN, SHALL BE INSTALLED ON ALL PB AND CONCRETE PERMANENT BARRIER LOCATED WITHIN 5 FEET OF THE EDGE OF THE TRAVELED LANE UNDER EITHER OF THE FOLLOWING CONDITIONS: ALONG TAPERS AND TRANSITION AREAS AND ALONG CURVES (OUTSIDE ONLY) WITH DEGREE OF CURVATURE GREATER THAN OR EQUAL TO 3 DEGREES.

THE INCREASED BARRIER DELINEATION SHALL CONSIST OF EITHER DELINEATION PANELS OR THE TRIPLE STACKING OF WORK ZONE BARRIER REFLECTORS.

DELINEATION PANELS SHALL CONSIST OF PANELS OF DELINEATION, APPROXIMATELY 34 INCHES LONG AND 6 INCHES WIDE AND SHALL BE "CRIMPED." PANELS SHALL BE INSTALLED AND SPACED PER TRAFFIC SCD MT-101.70.

TRIPLE-STACKED BARRIER REFLECTORS SHALL CONSIST OF ALIGNING THREE BARRIER REFLECTORS VERTICALLY, AT LOCATIONS WHERE A SINGLE BARRIER REFLECTOR WOULD BE OTHERWISE ATTACHED. THERE SHALL BE NO OPEN SPACE BETWEEN THE ADJACENT BARRIER REFLECTORS. THE TRIPLE-STACKED BARRIER REFLECTORS SHALL CONFORM TO C&MS 626, EXCEPT THAT THEY SHALL BE SPACED AND ALIGNED PER TRAFFIC SCD MT-101.70.

ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE PLANS ON SHEET .

PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIAL, LABOR, INCIDENTALS AND EQUIPMENT NECESSARY FOR FURNISHING, INSTALLING, MAINTAINING AND REMOVING EACH OF THE ABOVE ITEMS.

ALONG RUNS OF INCREASED BARRIER DELINEATION WHERE THIS ITEM IS PROVIDED, THE QUANTITY SHALL BE MEASURED AS THE ENTIRE LENGTH OF THE RUN OF INCREASED BARRIER DELINEATION, INCLUDING THE SPACES BETWEEN THE INDIVIDUAL DELINEATION PANELS OR STACKS OF BARRIER REFLECTORS.

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DELINEATION OF TEMPORARY AND PERMANENT GUARDRAIL

BARRIER REFLECTORS SHALL BE INSTALLED ON ALL TEMPORARY GUARDRAIL USED FOR TRAFFIC CONTROL AND ON ALL PERMANENT GUARDRAIL LOCATED WITHIN 5 FEET OF THE EDGE OF THE ADJACENT TRAVEL LANE. BARRIER REFLECTORS SHALL CONFORM TO C&MS 626.

OBJECT MARKERS SHALL BE INSTALLED ON ALL TEMPORARY AND PERMANENT GUARDRAIL LOCATED WITHIN 5 FEET OF THE EDGE OF THE ADJACENT TRAVEL LANE. GUARDRAIL-MOUNTING OF OBJECT MARKERS SHALL BE MADE BY INSTALLING THE OBJECT MARKERS ON THE EXTENSION BLOCKS RATHER THAN DIRECTLY ONTO THE GUARD-RAIL ITSELF. OBJECT MARKERS SHALL CONFORM TO C&MS 614.03 AND THE SPACING SHALL BE APPROXIMATELY 50 FEET.

ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE PLANS ON SHEET

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PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIAL, LABOR, INCIDENTALS AND EQUIPMENT NECESSARY FOR FURNISH-ING, INSTALLING, MAINTAINING AND REMOVING THE ABOVE ITEM(S).

ITEM 614 - LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PER-MITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCE-MENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

- DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.
- DURING A TRAFFIC SIGNAL INSTALLATION WHEN IMPACTING THE NORMAL FUNCTION OF THE SIGNAL OR THE FLOW OF TRAFFIC OR WHEN TRAFFIC NEEDS TO BE DIRECTED THROUGH AN ENERGIZED TRAFFIC SIGNAL CONTRARY TO THE SIGNAL DISPLAY (E.G., DIRECTING MOTORISTS THROUGH A RED LIGHT).

IN ADDITION TO THE REQUIREMENT OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHOULD BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS AS APPROVED BY THE ENGINEER:

- FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP).

IN GENERAL, LEOS SHOULD BE POSITIONED IN ADVANCE OF AND ON THE SAME SIDE AS THE LANE RESTRICTION OR AT THE POINT OF ROAD CLOSURE, AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH SIGNALIZED INTERSECTIONS IN WORK ZONES.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST’S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE.

THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS’ DUTIES AND PLACE-MENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES.

ENSURE PROVIDED LEOS HAVE BEEN TRAINED APPROPRIATE TO THE JOB DECISIONS THEY ARE REQUIRED TO MAKE WHILE ON THE PROJECT, IN ACCORDANCE WITH C&MS 614.03.

THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE WHICH SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT.

LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINT-ENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 40 HOURS

THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

NOTIFICATION OF TRAFFIC RESTRICTIONS

THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW TO INFORM SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS.

INFORMATION SHOULD INCLUDE, BUT IS NOT LIMITED TO, ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTICE OF CLOSURE SIGN TIME TABLE		
ITEM	DURATION OF CLOSURE	SIGN DISPLAYED TO PUBLIC
RAMP & ROAD CLOSURES	>=2 WEEKS >12 HOURS & <2 WEEKS <12 HOURS	14 CALENDAR DAYS PRIOR TO CLOSURE 7 CALENDAR DAYS PRIOR TO CLOSURE 2 BUSINESS DAYS PRIOR TO CLOSURE
LANE CLOSURES & RESTRICTIONS	>= 2 WEEKS < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE 5 BUSINESS DAYS PRIOR TO CLOSURE
START OF CONSTRUCTION & TRAFFIC PATTERN CHANGES	N/A	14 CALENDAR DAYS PRIOR TO IMPLEMENTATION

ANY UNFORESEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME TABLE.

ITEM 622, PORTABLE BARRIER, 32", AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF ITEM 622 AND SCD PCB-91 ANCHOR THE PORTABLE BARRIER WITH 4 ANCHORING BOLTS PER BARRIER SECTION INSTALLED AT EACH CORNER OF THE BARRIER SECTION. ANCHORING BOLTS SHALL BE A MINIMUM OF 36 INCHES LONG.

SEQUENCE OF TRAFFIC

PHASE 1

- 1. CONSTRUCT TEMPORARY PAVEMENT NECESSARY FOR PHASE 1, MAINTAIN ONE-LANE, TWO-DIRECTIONAL TRAFFIC USING SCD MT-97.10, FLAGGER CLOSING ONE LANE OF A TWO LANE HIGHWAY

PHASE 2

- 1. ERECT THE TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY PAVEMENT MARKINGS AND TEMPORARY TRAFFIC SIGNAL DEVICES REQUIRED TO MAINTAIN ONE-LANE, TWO-DIRECTIONAL TRAFFIC ON THE LEFT SIDE OF SR 93.
- 2. MAINTAIN ONE-LANE, TWO-DIRECTIONAL TRAFFIC CONTROLLED BY TEMPORARY TRAFFIC SIGNALS ON THE LEFT SIDE OF SR 93, AS SHOWN ON THE PLANS AND APPLICABLE STANDARD CONSTRUCTION DRAWINGS.
- 3. CONSTRUCT PHASE 2 ROADWAY ITEMS AND STRUCTURE ITEMS, AS SHOWN ON THE PLANS. THIS INCLUDES BUT IS NOT LIMITED TO PORTIONS OF THE STRUCTURE, ROADWAY, GUARDRAIL, RETAINING WALL AND TRAFFIC CONTROL ITEMS. PLACE TEMPORARY PAVEMENT NECESSARY FOR PHASE 3 TRAFFIC. REFER TO STRUCTURE PHASE CONSTRUCTION DETAILS ON SHEET 30/40.
- 4. PERMANENT PAVEMENT SHALL BE CONSTRUCTED THROUGH THE SURFACE COURSE.

PHASE 3

- 1. WHEN PHASE 2 CONSTRUCTION IS COMPLETE ERECT THE TEMPORARY TRAFFIC CONTROL DEVICES, TEMPORARY PAVEMENT MARKINGS AND TEMPORARY TRAFFIC SIGNAL DEVICES REQUIRED TO MAINTAIN ONE-LANE, TWO-DIRECTIONAL TRAFFIC ON THE RIGHT SIDE OF SR 93.
- 2. MAINTAIN ONE-LANE, TWO-DIRECTIONAL TRAFFIC CONTROLLED BY TEMPORARY TRAFFIC SIGNALS ON THE RIGHT SIDE OF SR 93, AS SHOWN ON THE PLANS AND APPLICABLE STANDARD CONSTRUCTION DRAWINGS.
- 3. CONSTRUCT PHASE 3 ROADWAY ITEMS AND STRUCTURE ITEMS, AS SHOWN ON THE PLANS. THIS INCLUDES PORTIONS OF THE STRUCTURE, PAVEMENT, GUARDRAIL AND TRAFFIC CONTROL ITEMS. REFER TO STRUCTURE PHASE CONSTRUCTION DETAILS ON SHEET 30/40.
- 4. PERMANENT PAVEMENT SHALL BE CONSTRUCTED THROUGH THE SURFACE COURSE.

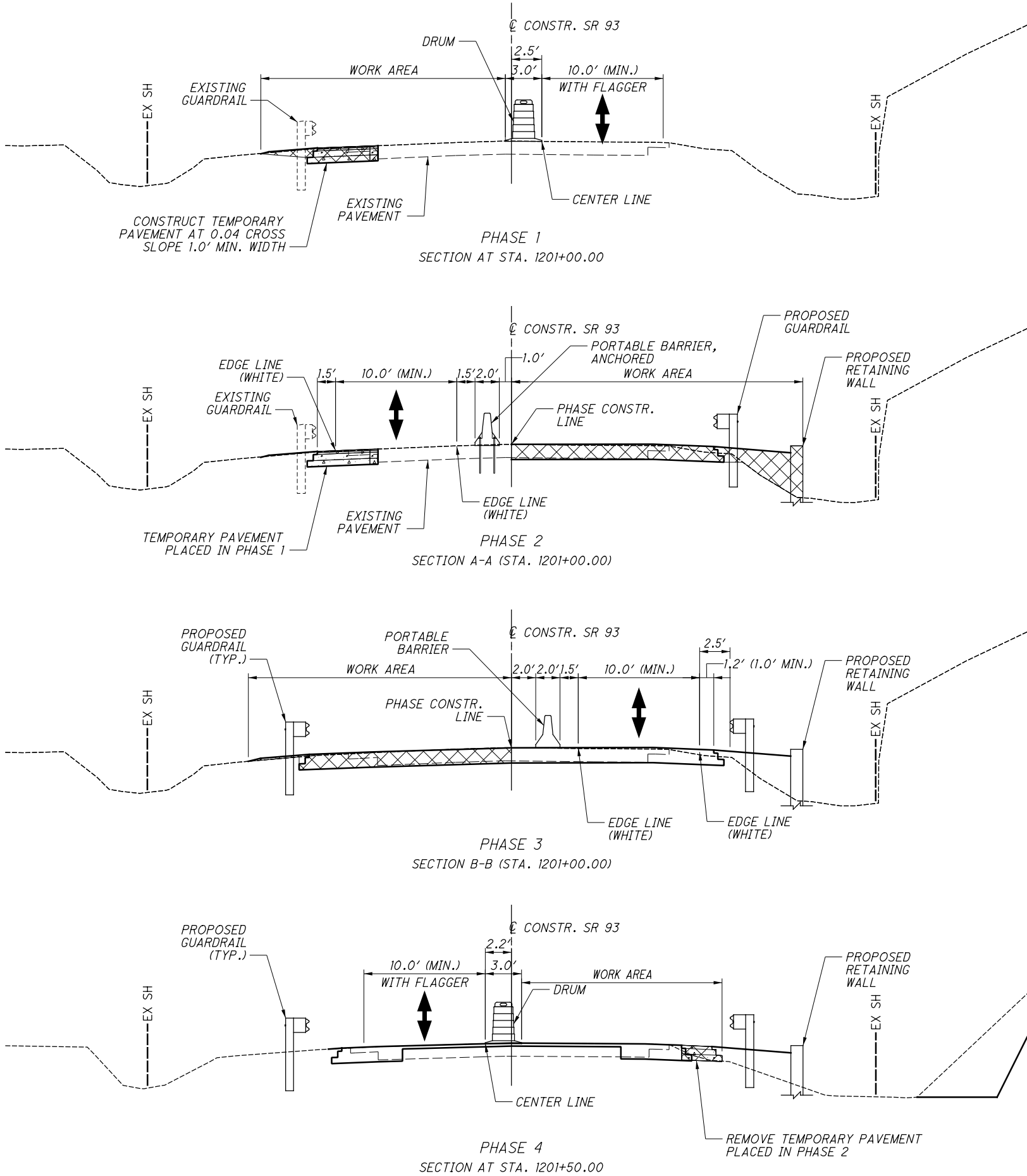
PHASE 4

- 1. WHEN PHASE 3 CONSTRUCTION IS COMPLETE OPEN SR 93 TO TWO-LANE, TWO-WAY TRAFFIC. MAINTAIN 10' MINIMUM LANE WIDTH.
- 2. REMOVE THE TEMPORARY PAVEMENT AND CONSTRUCT SHOULDERS TO FINISHED GRADE. MAINTAIN ONE-LANE, TWO-DIRECTIONAL TRAFFIC USING SCD MT-97.10, FLAGGER CLOSING ONE LANE OF A TWO LANE HIGHWAY.

PHASE 5

- 1. WHEN PHASE 4 CONSTRUCTION IS COMPLETE OPEN SR 93 TO TWO-LANE, TWO-WAY TRAFFIC AND OPEN ALL SHOULDERS.
- 2. PLACE PERMANENT PAVEMENT MARKINGS, USING FLAGGERS AND ONE-LANE OPERATION, AS PER SCD MT-97.10.
- 3. COMPLETE ALL REMAINING ITEMS.

MOT TYPICAL SECTIONS





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LEGEND

- TEMPORARY SIGN SUPPORT
- WORK ZONE TRAFFIC ATTENUATOR
- PORTABLE BARRIER
- DRUMS
- TYPE III BARRICADE
- TRAFFIC DIRECTION ARROW
- TEMPORARY TRAFFIC SIGNAL
- TEMPORARY TRAFFIC SIGNAL POLE
- SOLDIER PILE AND LAGGING
- WORK AREA
- TEMPORARY PAVEMENT
- TYPE A WARNING LIGHT

GENERAL NOTES

- ALL WARNING LIGHTS SHALL BE TYPE A.
- COVER ALL CONFLICTING EXISTING PAVEMENT MARKINGS (614.11.G.1.b) AND SIGNS.
- MAINTAIN TWO-WAY, ONE LANE TRAFFIC AS DETAILED IN SCD MT-96.11 AND THESE PLANS.
- SUGGESTED SIGNAL POLE LOCATIONS (TYP.).
- PB END TREATMENT WITH OPENING FOR CONTRACTOR ACCESS AS PER SCD MT-96.11 AND SPECIFICALLY NOTE 6F.

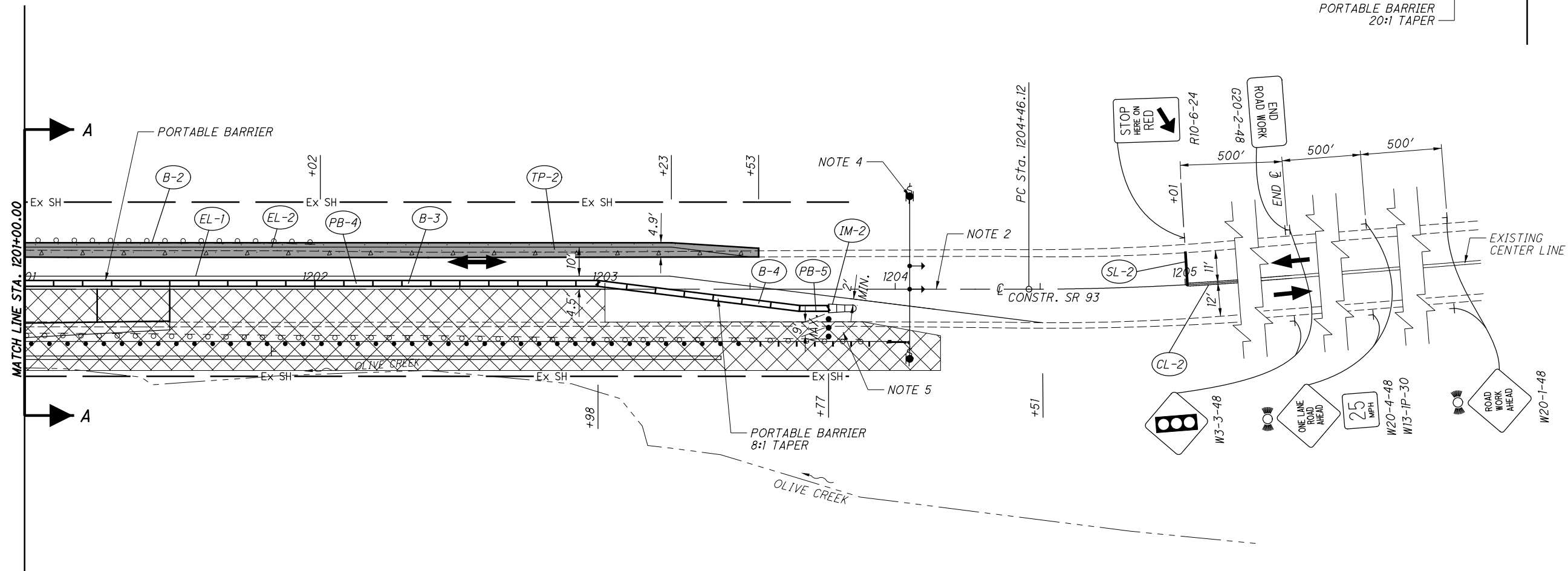
CROSS REFERENCES

SHEET	DESCRIPTION
7	MOT SECTIONS
8	MOT SUBSUMMARY
30	STRUCTURE STAGED
	CONSTRUCTION DETAILS



MAINTENANCE OF TRAFFIC PHASE 2
STA. 1197+00.00 TO STA. 1205+00.00

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LEGEND

- TEMPORARY SIGN SUPPORT
- WORK ZONE TRAFFIC ATTENUATOR
- PORTABLE BARRIER
- DRUMS
- TYPE III BARRICADE
- TRAFFIC DIRECTION ARROW
- TEMPORARY TRAFFIC SIGNAL
- TEMPORARY TRAFFIC SIGNAL POLE
- SOLDIER PILE AND LAGGING
- WORK AREA
- TEMPORARY PAVEMENT
- TYPE A WARNING LIGHT

GENERAL NOTES

- ALL WARNING LIGHTS SHALL BE TYPE A.
- COVER ALL CONFLICTING EXISTING PAVEMENT MARKINGS (614.11.G.1.b) AND SIGNS.
- MAINTAIN TWO-WAY, ONE LANE TRAFFIC AS DETAILED IN SCD MT-96.11 AND THESE PLANS.
- SUGGESTED SIGNAL POLE LOCATIONS (TYP.).

CROSS REFERENCES

SHEET	DESCRIPTION
7	MOT SECTIONS
8	MOT SUBSUMMARY
30	STRUCTURE STAGED
	CONSTRUCTION DETAILS

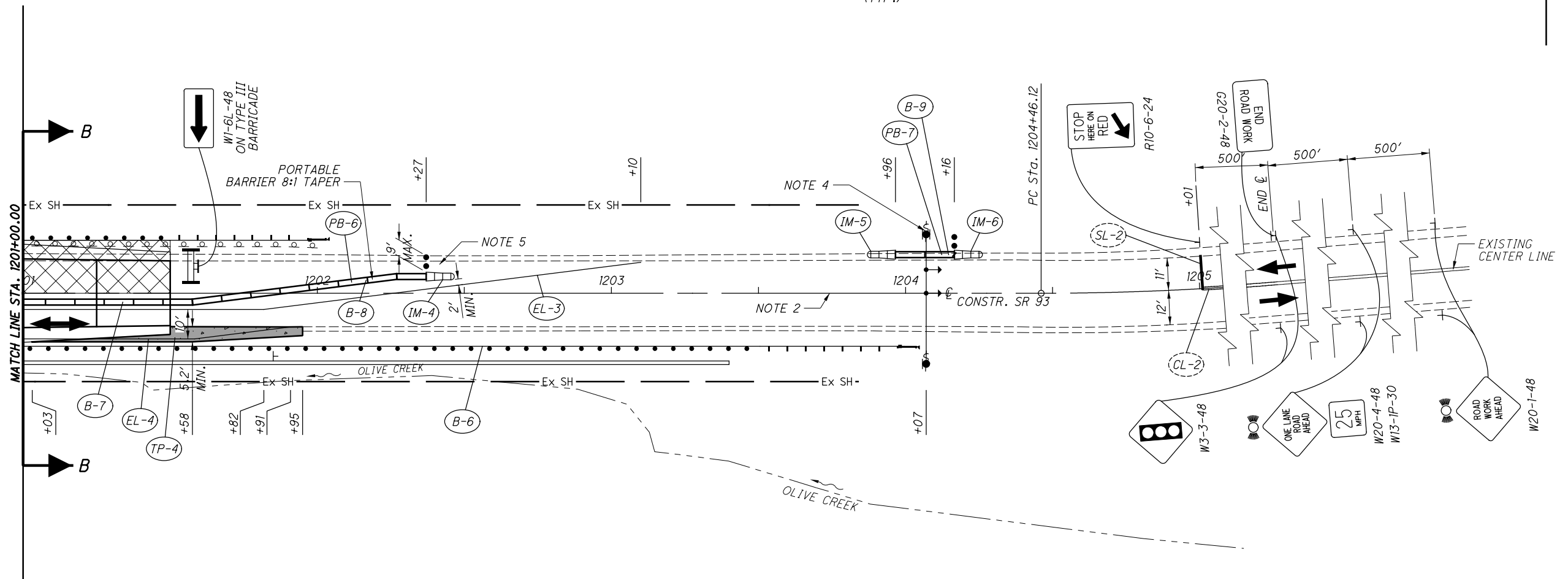


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MAINTENANCE OF TRAFFIC PHASE 3
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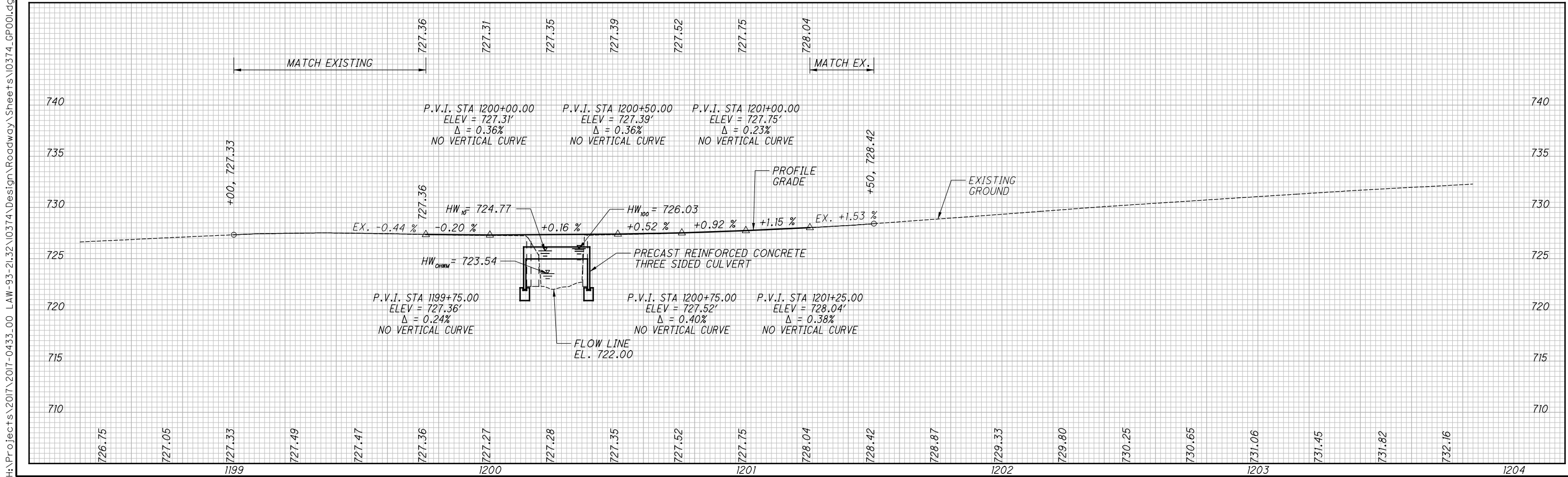
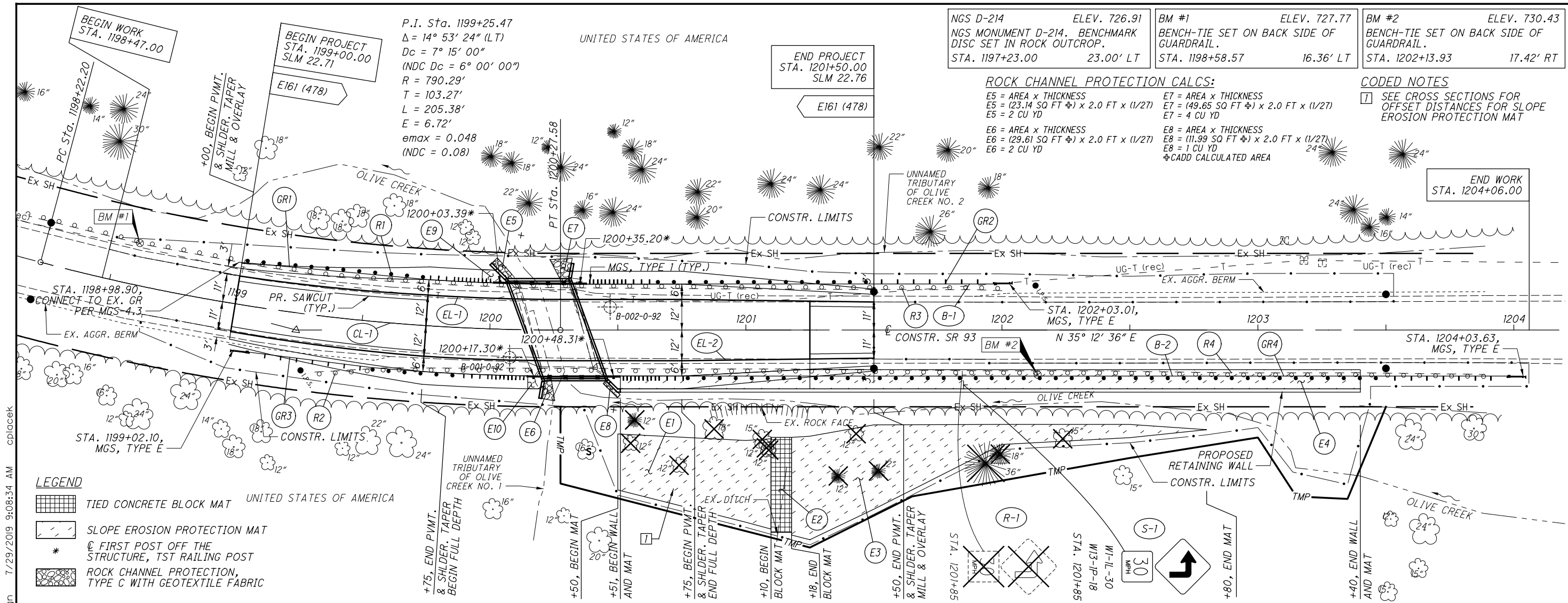


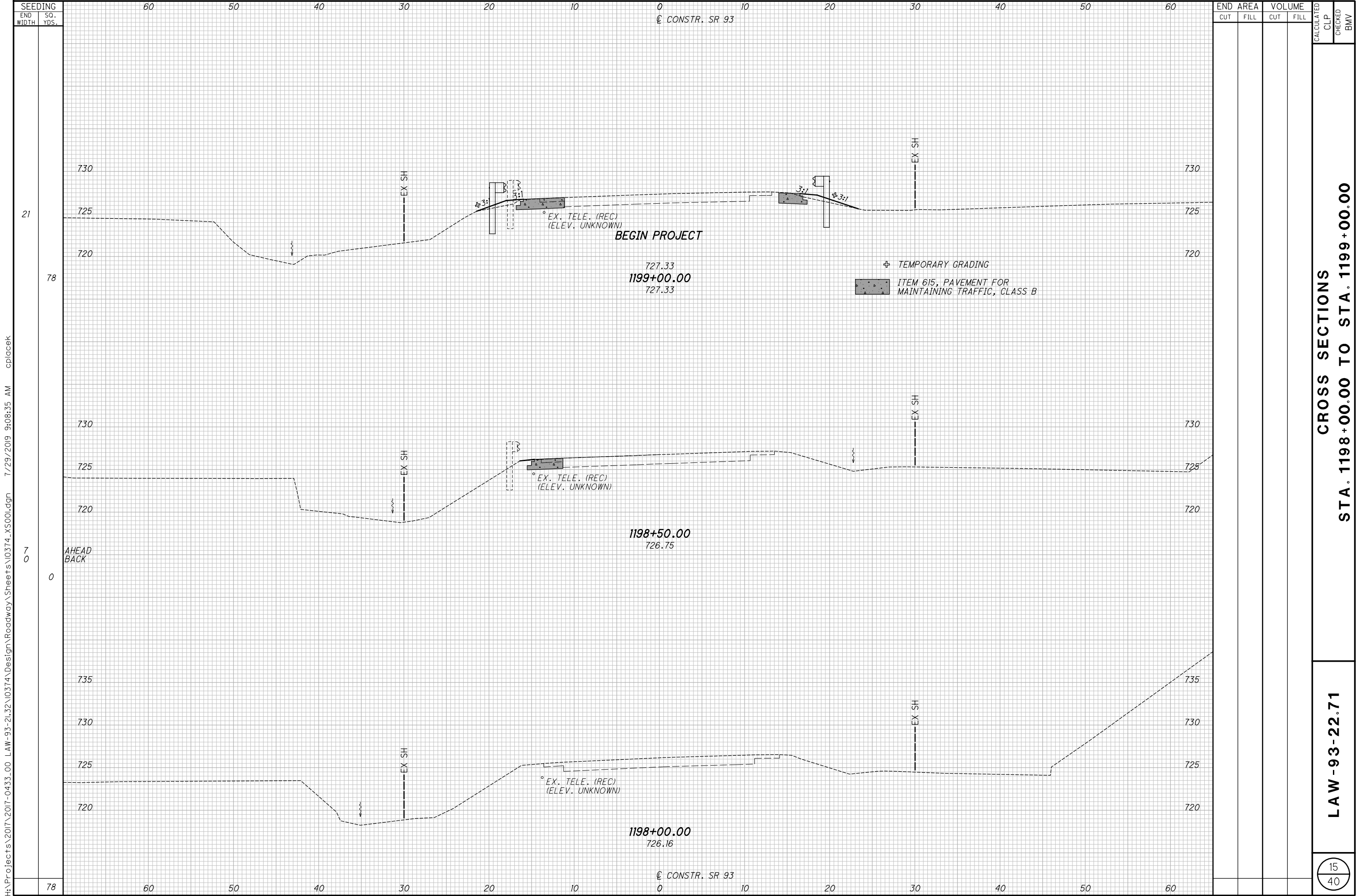
GENERAL SUMMARY

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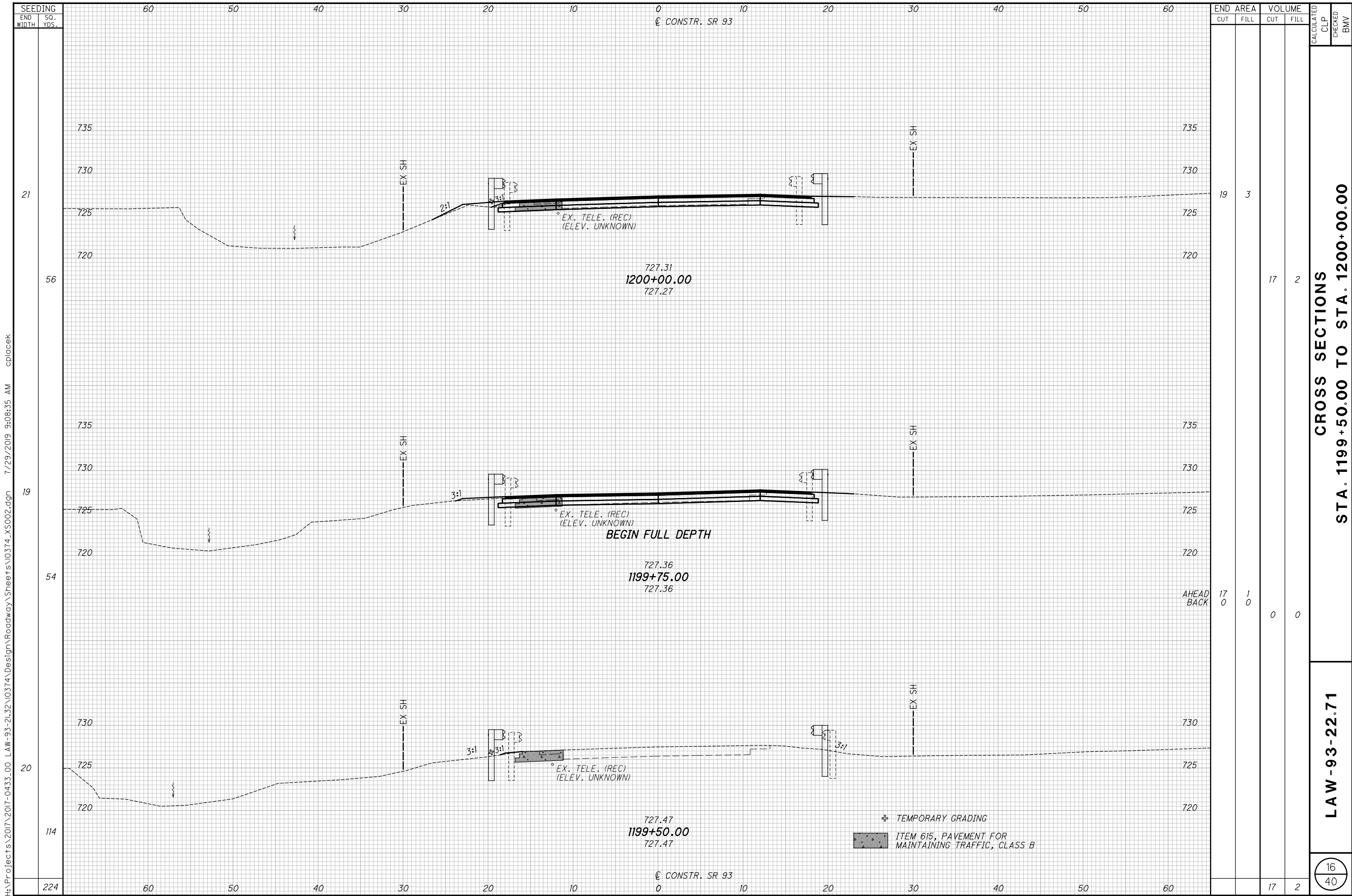


CROSS SECTIONS
STA. 1198+00.00 TO STA. 1199+00.00

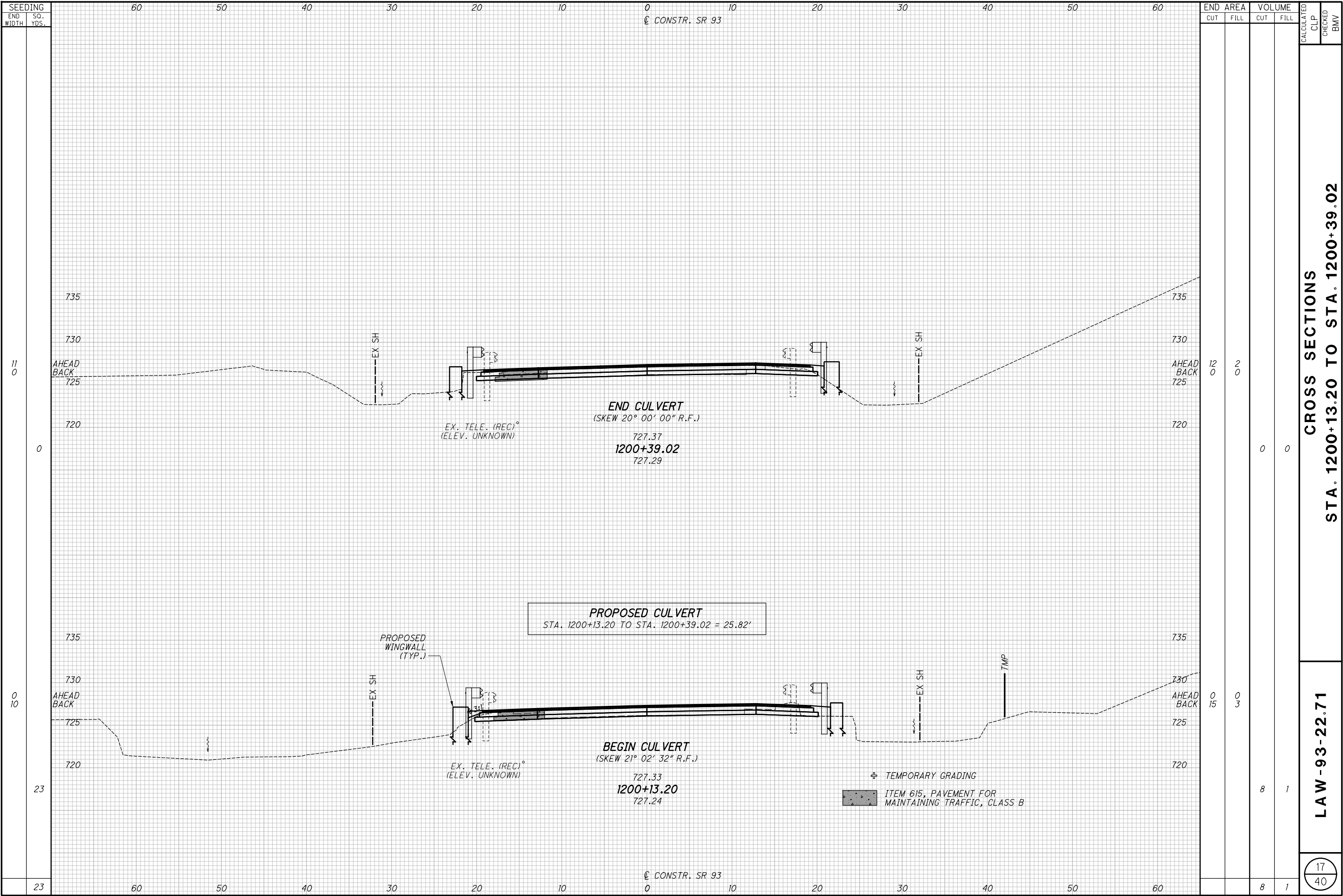
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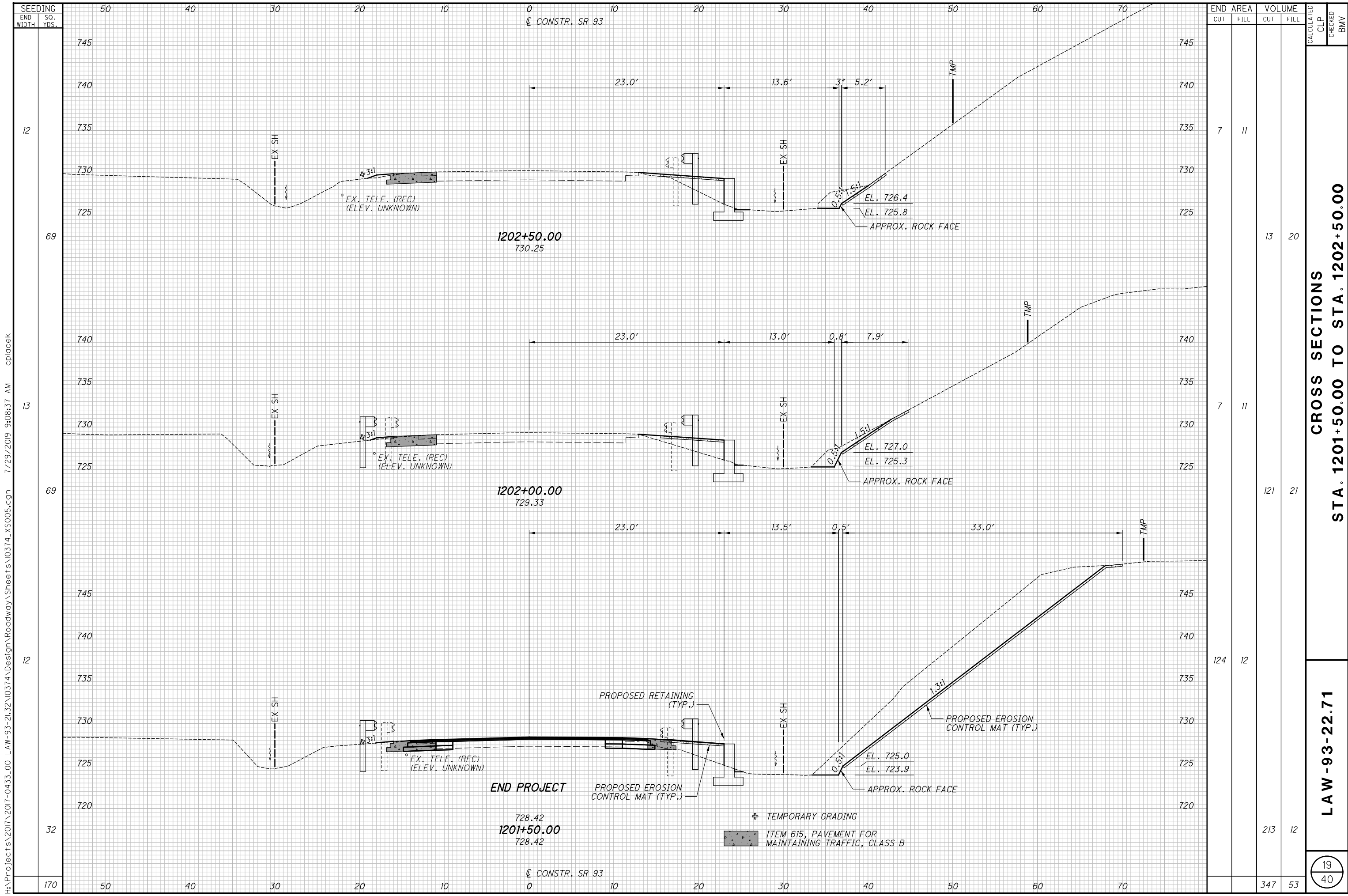
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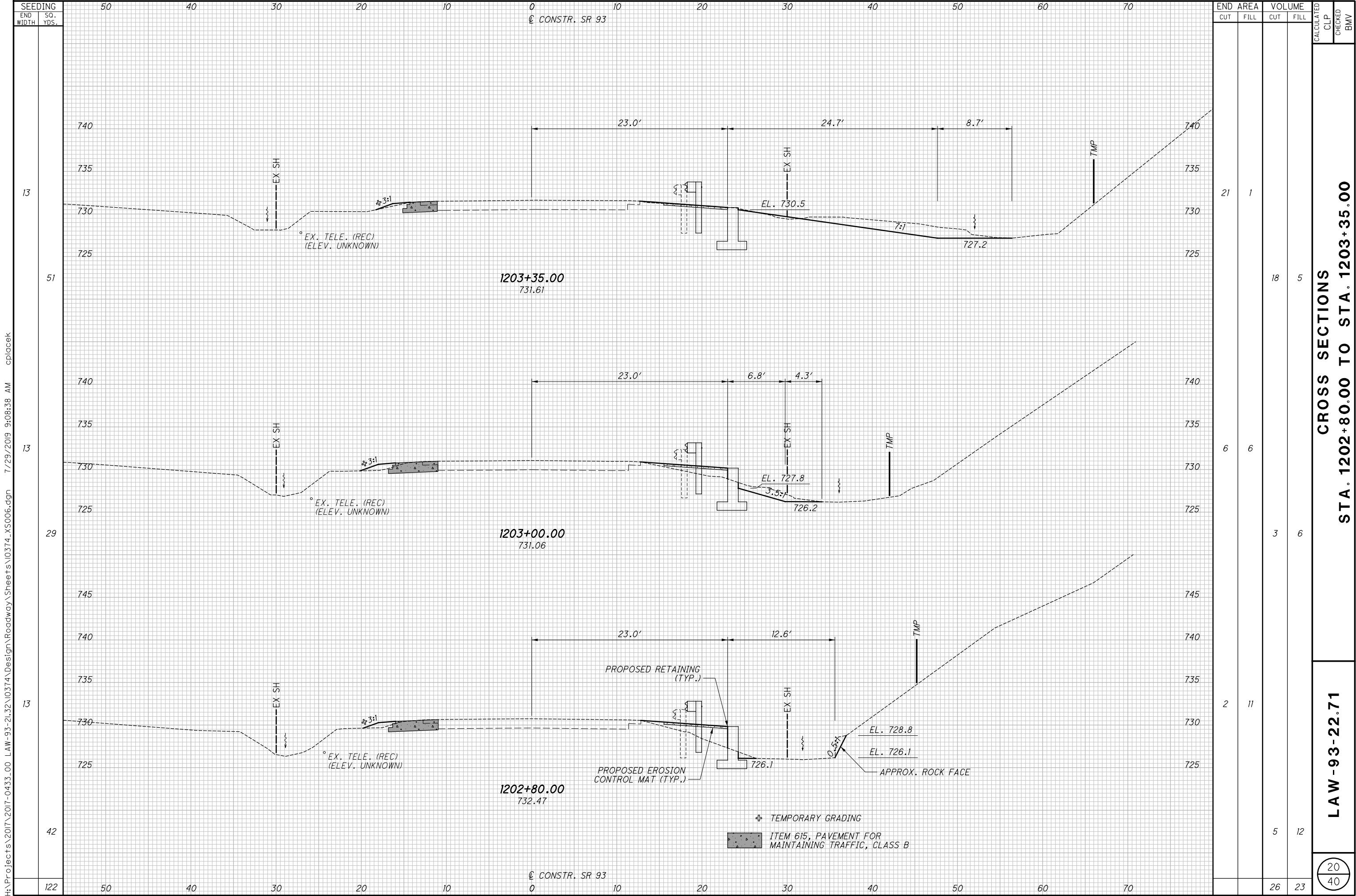
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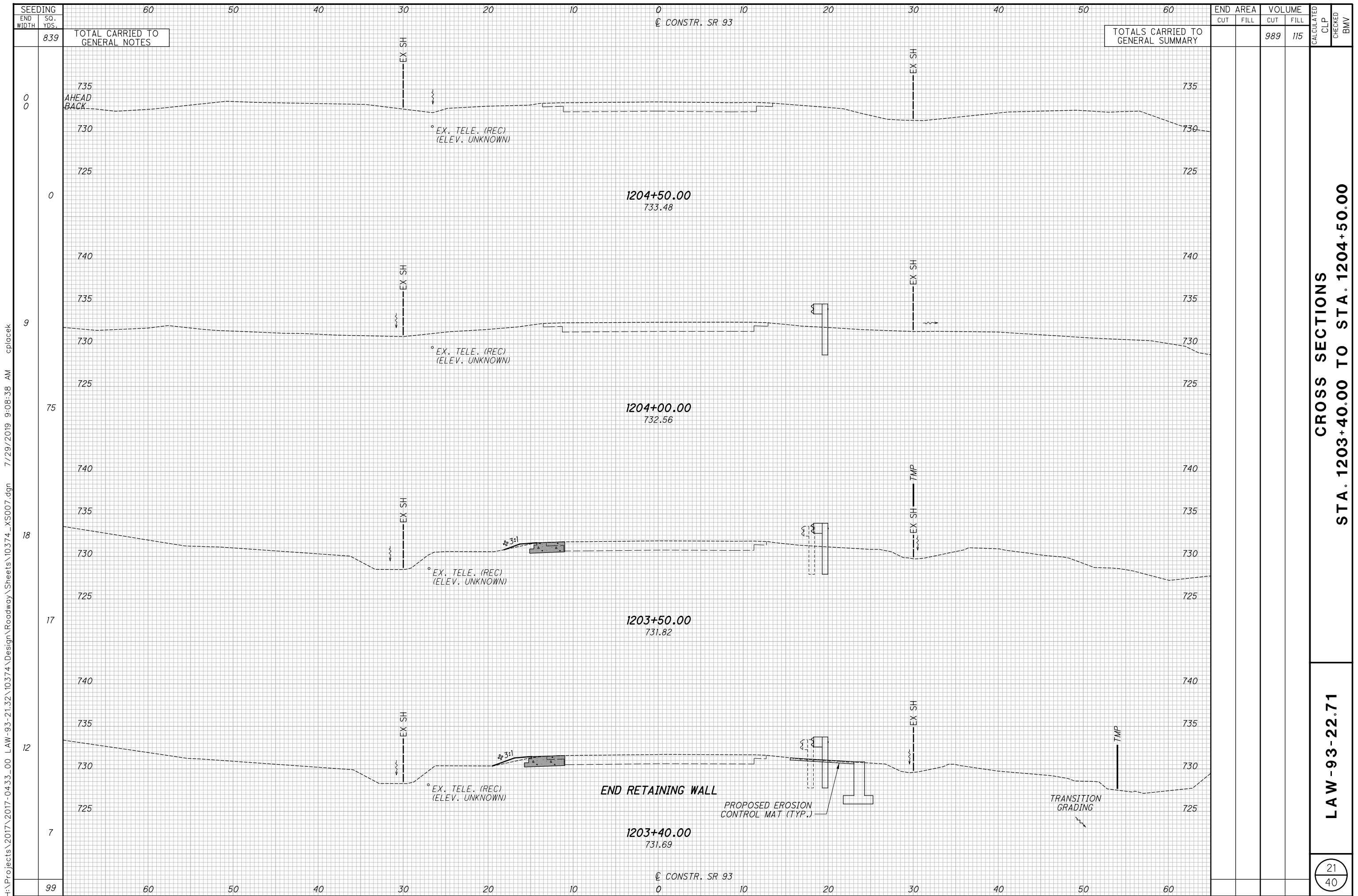


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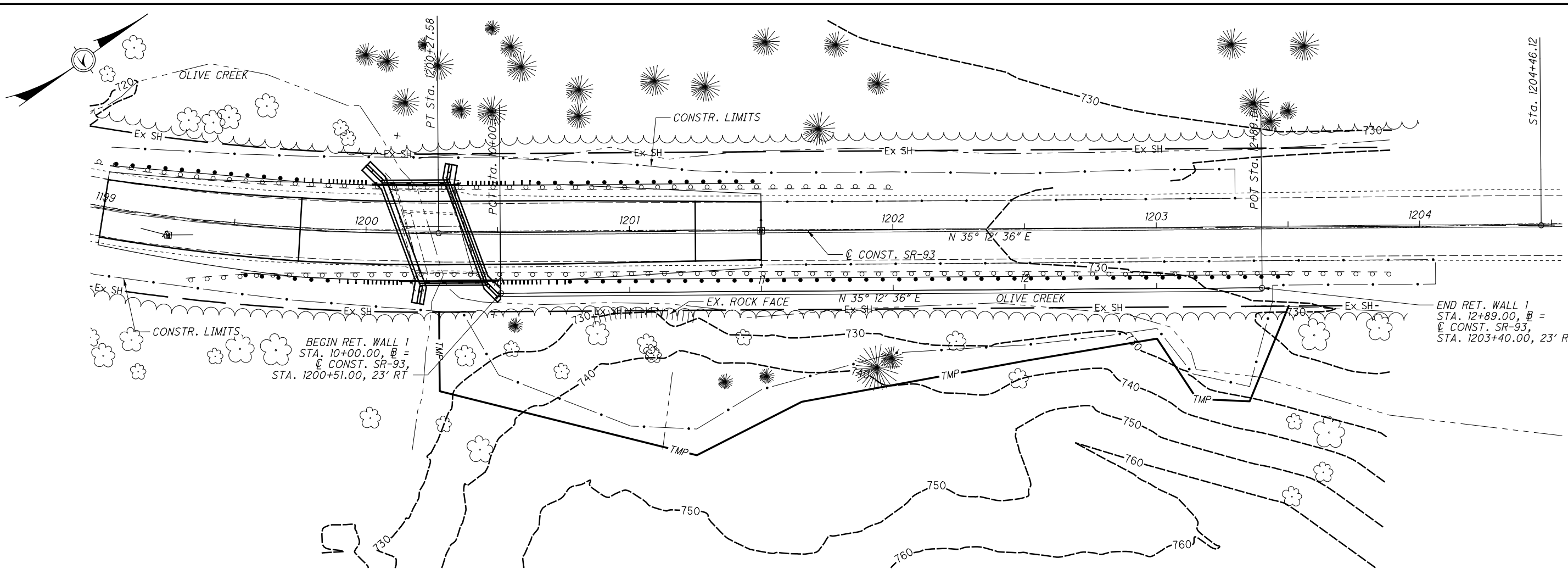






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PROP. TOP OF WALL ELEVATIONS AND PROPOSED GRADE AT THE BACK	FACE OF WALL	727.45	726.99	727.06		727.17		727.43	727.62		727.94		728.45		728.96		729.32		729.47		729.98		730.40		730.83	
PROP. BOTTOM OF FOOTING ELEVATIONS		721.02	721.18	721.50		722.01		722.51	722.69		723.01		723.51		724.02		724.37		724.52		725.02		725.44		725.86	
735		<div><div>BEGIN RET. WALL 1 STA. 10+00.00, @ = @ CONST. SR-93, STA. 1200+51.00, 23' RT</div><div>289'-0"</div><div>29'-0" 30'-0" 30'-0" 30'-0" 30'-0" 30'-0" 30'-0" 30'-0" 30'-0" 25'-0" 25'-0"</div><div>END RET. WALL 1 STA. 12+89.00, @ = @ CONST. SR-93, STA. 1203+40.00, 23' RT</div></div>																								740
730		<div><div>PROP. TOP OF WALL & PROP. GRADE AT BACK FACE OF WALL</div><div>EX. GROUND AT FRONT FACE OF WALL</div><div>PROPOSED FINISHED GROUND ELEVATION AT FRONT FACE OF WALL</div></div>																								730
725	4" DIA. WEEPHOLES (TYP.)																									725
720	BOTTOM OF FOOTING	<div><div>EXPANSION JOINT (TYP.)</div><div>CONTRACTION JOINT (TYP.)</div><div>FOOTING SLOPE RATIO @ 1.67%</div></div>																								720
715																										715
EX. GROUND EL. AT FRONT FACE OF WALL		722.68	723.06	723.11		723.35		724.43	724.65		725.19		725.68		725.51		725.86		726.17		727.47		729.34		730.72	
@ STATION		10+10	10+29		10+59		10+89		11+19		11+49		11+79		12+09		12+39		12+64		12+89					

10+00

11+00

12+00

13+00

ELEVATION ALONG @ RETAINING WALL 1

DESIGNED
EB

CHECKED
CH

DRAWN
MJ

REVIEWED
JS

DATE
02/2019

DESIGN AGENCY
NEAS INC.

SITE PLAN

RETAINING WALL 1

BRIDGE REPLACEMENT PROJECT

LAW-93-22.71

PID No. 10374

1 / 4

23 / 40

2800 CORPORATE EXCHANGE DRIVE
SUITE 240, COLUMBUS, OH 43231

STRUCTURE FILE NUMBER

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ESTIMATED QUANTITIES					CALC BY:	MJ	DATE:	2/13/2019
					CHCK BY:	CH	DATE:	2/13/2019
ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION: CAST-IN-PLACE RETAINING WALL 1 ESTIMATED QUANTITIES	SHEET #			
503	21100	210	CY	UNCLASSIFIED EXCAVATION	2			
503	31100	38	CY	ROCK EXCAVATION	2			
509	10000	6441	LB	EPOXY COATED REINFORCING STEEL	3			
511	46210	93	CY	CLASS QC1 CONCRETE, RETAINING/WINGWALL INCLUDING FOOTING	4			
512	10100	204	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	4			
512	33000	14	SY	TYPE 2 WATERPROOFING	4			
516	13600	16	SF	1" PREFORMED EXPANSION JOINT FILLER	4			
518	21200	23	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC	4			

DESIGN SPECIFICATIONS

DESIGN SPECIFICATIONS: THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2017, AND THE ODOT BRIDGE DESIGN MANUAL, 2007

LOAD MODIFIER FOR OPERATIONAL IMPORTANCE

OPERATIONAL IMPORTANCE: A LOAD MODIFIER OF 1.00 HAS BEEN ASSUMED FOR THE DESIGN OF THIS STRUCTURE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, ARTICLE 1.3.5 AND THE ODOT BRIDGE DESIGN MANUAL, 2007.

DESIGN STRESSES

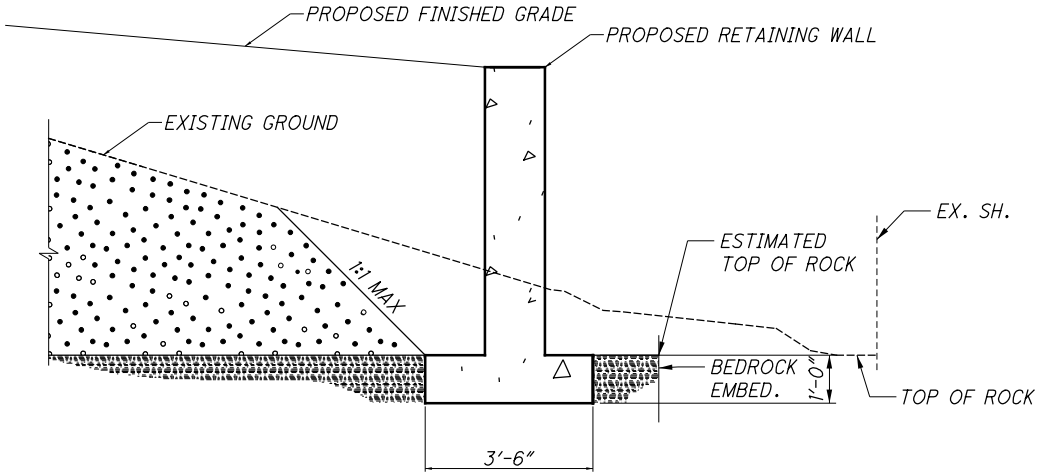
DESIGN DATA:
CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 4.0 KSI
REINFORCING STEEL - MINIMUM YIELD STRENGTH 60 KSI

FOUNDATION BEARING RESISTANCE:

WALL FOOTING, AS DESIGNED, PRODUCES A MAXIMUM SERVICE LOAD PRESSURE OF 0.84 KIPS PER SQUARE FOOT AND A MAXIMUM STRENGTH LOAD PRESSURE OF 1.13 KIPS PER SQUARE FOOT. THE FACTORED BEARING RESISTANCE IS 8.8 KIPS PER SQUARE FOOT.

LEGEND:

- E.F. = EACH FACE
- EMBED. = EMBEDMENT
- T&B = TOP AND BOTTOM
- TYP. = TYPICAL
- C.J. = CONSTRUCTION JOINT



TYPICAL EXCAVATION DETAIL
(FOR ESTIMATING PURPOSES)

DESIGN AGENCY
NEAS INC.
2800 CORPORATE EXCHANGE DRIVE
SUITE 240, COLUMBUS, OH 43231

DATE
02/2019
REVIEWED
JS
STRUCTURE FILE NUMBER

DRAWN
MJ
REVISED

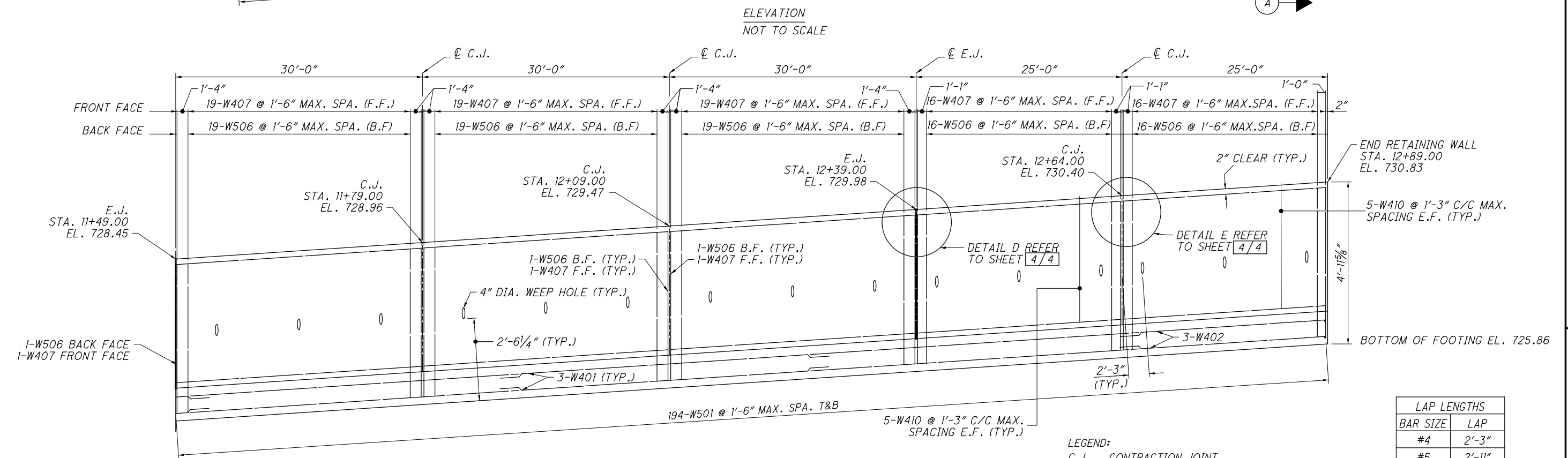
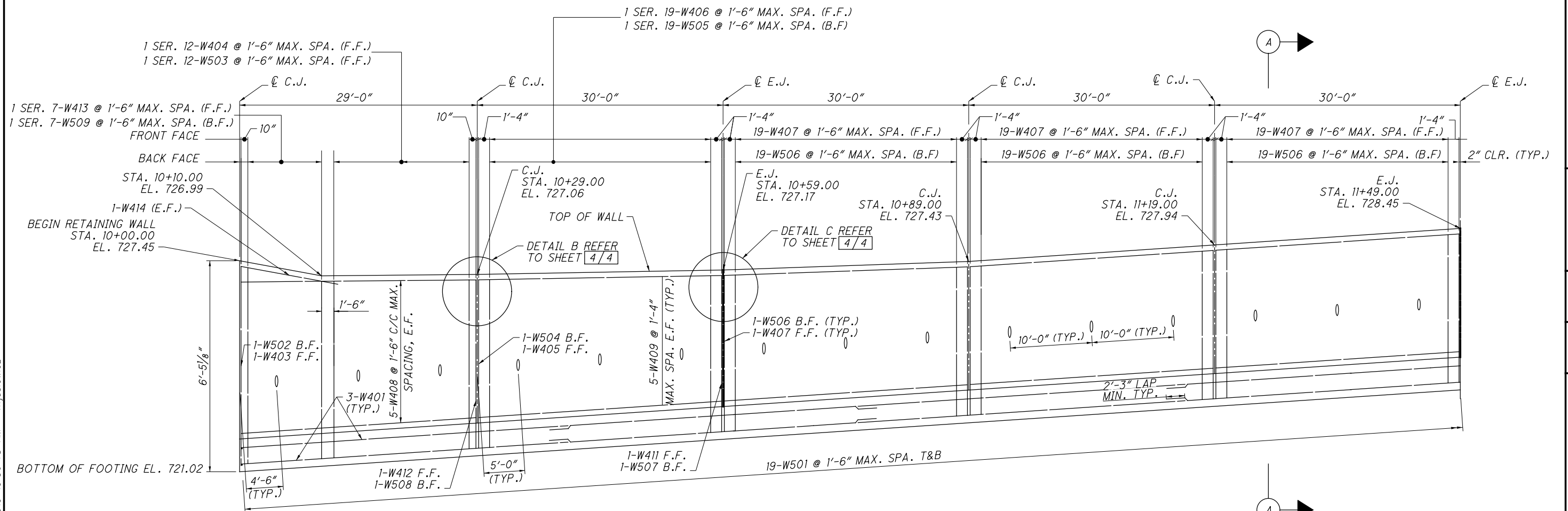
DESIGNED
EB
CHECKED
CH

GENERAL NOTES AND ESTIMATED QUANTITIES
RETAINING WALL 1
BRIDGE REPLACEMENT PROJECT

LAW-93-22.71
PID No. 10374

2 / 4

24
40



LAP LENGTHS	
BAR SIZE	LAP
#4	2'-3"
#5	2'-11"

LEGEND:

C.J.	CONTRACTION JOINT
E.J.	EXPANSION JOINT
E.F.	EACH FACE
CLR.	CLEAR
B.F.	BACK FACE
F.F.	FRONT FACE
SER.	SERIES
SPA.	SPACING
MAX.	MAXIMUM

NOTES:

1. FOR SECTION A-A SEE SHEET

4/4

.
2. FOR DETAIL B SEE SHEET

4/4

.
3. FOR DETAIL C SEE SHEET

4/4

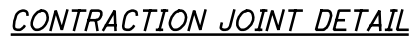
.
4. FOR DETAIL D SEE SHEET

4/4

.
5. FOR DETAIL E SEE SHEET

4/4

.



STR - STRAIGHT
F.F. FRONT FACE
B.F. BACK FACE

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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS:

REFER TO THE FOLLOWING STANDARD BRIDGE DRAWINGS:

TST-1-99 REVISED 07-20-18
PCB-91 REVISED 01-18-13

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATIONS:

800 REVISED 01-18-19
832 DATED 10-19-18

DESIGN SPECIFICATIONS:

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2017, AND THE ODOT BRIDGE DESIGN MANUAL, 2007.

OPERATIONAL IMPORTANCE

A LOAD MODIFIER OF 1.00 HAS BEEN ASSUMED FOR THE DESIGN OF THIS STRUCTURE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, ARTICLE 1.3.5 AND THE ODOT BRIDGE DESIGN MANUAL, 2007.

DESIGN LOADING

DESIGN LOADING: HL-93
FUTURE WEARING SURFACE (FWS) OF 0.060 KIPS/SQ.FT.

DESIGN DATA

CONCRETE CLASS QC1- COMPRESSIVE STRENGTH 4.0 KSI
(SUBSTRUCTURE: FOOTINGS AND WINGWALLS)

REINFORCING STEEL - MINIMUM YIELD STRENGTH 60 KSI

PRECAST STRUCTURES: FOR THE THREE SIDED FLAT TOPPED STRUCTURES SEE CMS 611 AND 705.051

EARTH COVER 6" MINIMUM TO 1'-5" MAXIMUM

ITEM 202, STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN

REMOVE STRUCTURE IN PHASES AS PER CMS ITEM 202.03 AND AS PER PLAN SHOWN ON SHEET 4/11

FOUNDATION BEARING RESISTANCE

FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM SERVICE LOAD PRESSURE OF 3.2 KIPS PER SQUARE FOOT AND A MAXIMUM STRENGTH LOAD PRESSURE OF 4.6 KIPS PER SQUARE FOOT. THE FACTORED BEARING RESISTANCE IS 7.2 KIPS PER SQUARE FOOT.

FOOTINGS

PLACE FOOTINGS IN BEDROCK AT THE ELEVATION SHOWN.

ITEM 503, COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN:

THE DESIGN SHOWN ON THE PLANS FOR TEMPORARY SUPPORT OF EXCAVATION IS ONE REPRESENTATIVE DESIGN THAT MAY BE USED TO CONSTRUCT THE PROJECT. THE CONTRACTOR MAY CONSTRUCT THE DESIGN SHOWN ON THE PLANS OR PREPARE AN ALTERNATE DESIGN TO SUPPORT THE SIDES OF EXCAVATIONS. IF CONSTRUCTING AN ALTERNATE DESIGN FOR TEMPORARY SUPPORT OF EXCAVATION, PREPARE AND PROVIDE PLANS IN ACCORDANCE WITH C&MS 501.05. THE DEPARTMENT WILL PAY FOR THE TEMPORARY SUPPORT OF EXCAVATION AT THE CONTRACT LUMP SUM PRICE FOR COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN. NO ADDITIONAL PAYMENT WILL BE MADE FOR PROVIDING AN ALTERNATE DESIGN.

INCLUDE ALL HP10X42 (50 KSI STEEL), CONCRETE, FLOWABLE FILL, 4"X10" TIMBER LAGGING, AND BEDROCK CORING WITH ITEM 503 COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN.

ITEM 511, CLASS QC1 CONCRETE, RETAINING/WINGWALL NOT INCLUDING FOOTING, AS PER PLAN:

THE DEPARTMENT WILL PERMIT THE USE OF PRECAST CONCRETE IN LIEU OF CAST-IN-PLACE CONCRETE FOR HEADWALLS AND WINGWALLS IN ACCORDANCE WITH C&MS 602.03. THE DEPARTMENT WILL PAY FOR THE WINGWALL AND HEADWALL CONCRETE IN SQUARE YARD AS DETERMINED FROM PLAN DIMENSIONS USING THE WALL HEIGHTS ABOVE THE FOOTING AND LENGTH ALONG THE EXTERIOR FACES OF THE WALLS. THE DEPARTMENT WILL CONSIDER THE REINFORCING STEEL IN THE WINGWALLS AND HEADWALLS, INCLUDING THE REINFORCEMENT THAT EXTENDS INTO THE FOOTINGS, AS INCIDENTAL TO THE RETAINING/WINGWALL CONCRETE. THE TOTAL QUANTITY OF CAST-IN-PLACE WINGWALL AND HEADWALL CONCRETE IS 9 CU. YD. THE TOTAL QUANTITY OF CAST-IN-PLACE WINGWALL AND HEADWALL REINFORCING STEEL IS 1228 LBS.

ITEM 517 RAILING (TWIN STEEL TUBE), AS PER PLAN

ALL POSTS SHALL BE FLUSH MOUNTED POSTS, ANCHORED INTO THE TOP OF THE PRECAST UNITS AS SHOWN ON SHEET 10/11 SEE STD. DWG. TST-1-99 FOR ADDITIONAL DETAILS. ANCHOR BOLTS SHALL BE PRECAST INTO THE UNITS AT THE SHOP. ALL MATERIAL, LABOR, EQUIPMENT, AND INCIDENTALS REQUIRED TO COMPLETE THIS WORK WILL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 517, RAILING (TWIN STEEL TUBE), AS PER PLAN.

PROPOSED WORK:

1. SET ANCHORED PORTABLE CONCRETE BARRIER AS SHOWN IN THE EXISTING SUPERSTRUCTURE TRANSVERSE SECTION ON THE STAGED CONSTRUCTION DETAILS AND INSTALL ALL OTHER NECESSARY TRAFFIC DEVICES TO MAINTAIN A TWO WAY, ONE LANE TRAFFIC LANE ON THE BRIDGE.

2. REMOVE ASPHALT WEARING SURFACE FROM TOP OF EAST SIDE OF SLAB BRIDGE.

3. SAW CUT EXISTING ABUTMENTS AT LOCATION OF PHASE 2 REMOVAL LINES AS SHOWN ON STAGED CONSTRUCTION SHEET AND REMOVE ENOUGH OF THE EXISTING STRUCTURE NECESSARY TO INSTALL TEMPORARY SHORING.

4. INSTALL TEMPORARY SHORING.

5. DEMOLISH EAST SIDE OF EXISTING BRIDGE.

6. CONSTRUCT PHASE 2 OF THE PROPOSED STRUCTURE.

7. CONSTRUCT RETAINING WALL.

8. RELOCATE CHANNEL.

9. MOVE PORTABLE BARRIER TO PHASE 2 SIDE OF THE NEW STRUCTURE PER PHASE 3 CONSTRUCTION DETAILS.

10. DEMOLISH REMAINING PORTION OF EXISTING BRIDGE.

11. CONSTRUCT PHASE 3.

ABBREVIATIONS:

ADT	-AVERAGE DAILY TRAFFIC	N.F.	-NEAR FACE
ADTT	-AVERAGE DAILY TRUCK TRAFFIC	O/O	-OUT TO OUT
BM	-BENCH MARK	OHWM	-ORDINARY HIGH WATER MARK
BOT.	-BOTTOM	PB	-PORTABLE BARRIER
BRG.	-BEARING	PEJF	-PERFORMED EXPANSION JOINT FILLER
C.J.	-CONSTRUCTION JOINT	P.G.	-PROFILE GRADE
CL	-CENTERLINE	RF	-RIGHT FORWARD
CLR.	-CLEARANCE	RT	-RIGHT
CONSTR.	-CONSTRUCTION	SR	-STATE ROUTE
DIA.	-DIAMETER	SER	-SERIES
Ø	-DRAWING	SHLDR	-SHOULDER
E.F.	-EACH FACE	SPA.	-SPACES
ELEV.	-ELEVATION	STA.	-STATION
& EL.	-EQUAL SPACES	STD.	-STANDARD
EQ. SPA.	-EXISTING	T & B	-TOP AND BOTTOM
EXIST.	-EXISTING	T/R	-TOP OF ROCK
& EX.	-FAR FACE	T/S	-TOP OF SLOPE
F.F.	-FACE TO FACE	TYP.	-TYPICAL
F/F	-FACE TO FACE	U.N.O.	-UNLESS NOTED OTHERWISE
FTG.	-FOOTING	V.C.	-VERTICAL CURVE
FWS	-FUTURE WEARING SURFACE		
HW	-HIGH WATER		
LT	-LEFT		
MAX.	-MAXIMUM		
MIN.	-MINIMUM		

GENERAL NOTES
BRIDGE NO.: LAW-93-2273
SR 93 OVER OLIVE CREEK

LAW-93-22.71
PID No. 10374

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CALC BY: CAB DATE: 12-05-18
CHKD BY: RMW DATE: 12-21-18

ESTIMATED QUANTITIES					
ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	SHEET #
202	11003	LUMP	LS	STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN	2/11
202	23500	85	SY	WEARING COURSE REMOVED	
503	11101	LUMP	LS	COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN	2/11
503	21100	39	CY	UNCLASSIFIED EXCAVATION	
503	31100	39	CY	ROCK EXCAVATION	
509	10000	1934	LB	EPOXY COATED REINFORCING STEEL	
511	46001	24	SY	CLASS QC1 CONCRETE, RETAINING/WINGWALL NOT INCLUDING FOOTING, AS PER PLAN	2/11
511	46510	17	CY	CLASS QC1 CONCRETE, FOOTING	
512	10100	56	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
512	33000	41	SY	TYPE 2 WATERPROOFING	
512	33010	123	SY	TYPE 3 WATERPROOFING	
516	13600	18	SF	1" PREFORMED EXPANSION JOINT FILLER	
517	70001	72.33	FT	RAILING (TWIN STEEL TUBE), AS PER PLAN	2/11
518	21200	5	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC	
611	70000	42.57	FT	CONDUIT, TYPE A, PRECAST REINFORCED CONCRETE THREE SIDED FLAT TOPPED CULVERT (24'-0" SPAN X 3'-0" RISE, 20° SKEW)	

ITEM 601 ROCK CHANNEL PROTECTION, TYPE C WITH GEOTEXTILE FABRIC AND ITEM 622 PORTABLE BARRIER, 32", BRIDGE MOUNTED ARE INCLUDED WITH ROADWAY ITEMS FOR PAYMENT.

TOTAL QUANTITIES CARRIED TO THE GENERAL SUMMARY ON SHEET 12/40.

DESIGN AGENCY

KORDA

KORDA/NEETH ENGINEERING, INC - CONSULTING ENGINEERS
1650 Motermark Drive, Suite 200 - Columbus Oh 43205-7000
TEL: 614-487-1650 WEB: www.korda.com

REVIEWED

DATE

1/30/2019

DRAWN

CAB

REVISD

DESIGNED

CAB

CHECKED

RMW

STRUCTURE FILE NUMBER

4401957

ESTIMATED QUANTITIES

BRIDGE NO.: LAW-93-2273

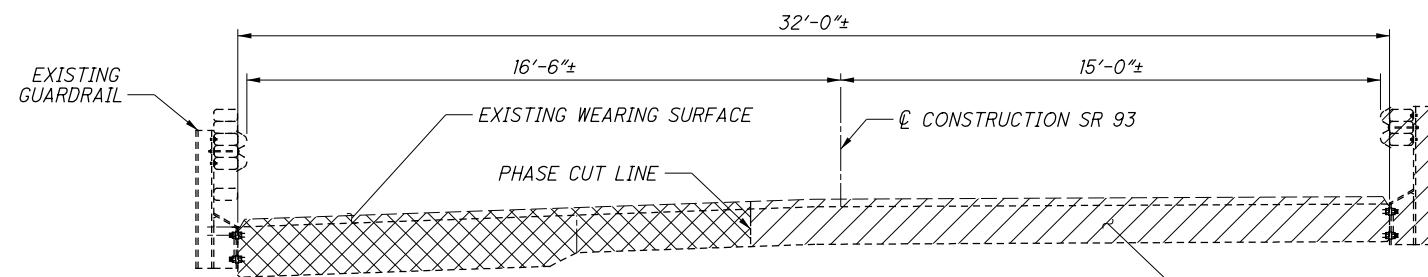
SR 93 OVER OLIVE CREEK

LAW-93-22.71

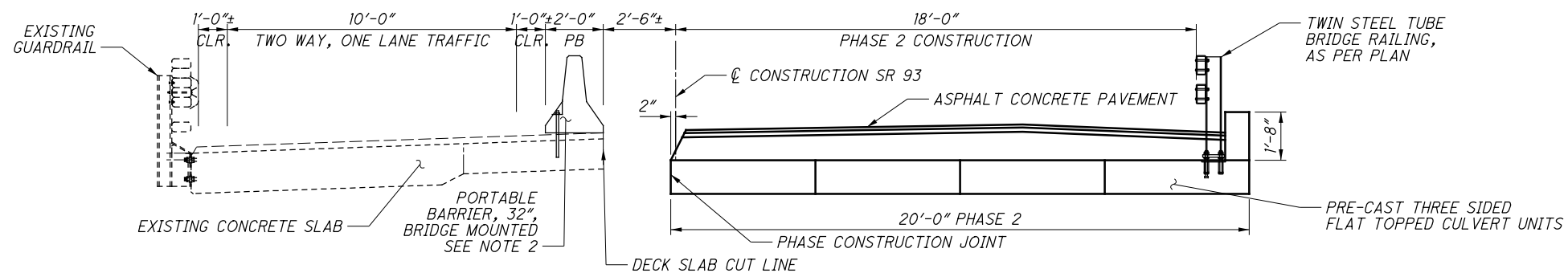
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3/11

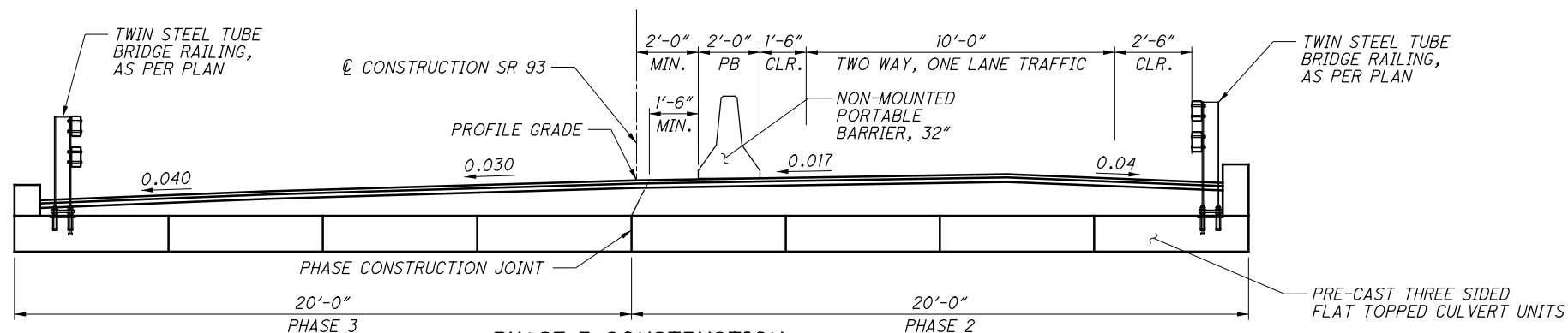
29/40



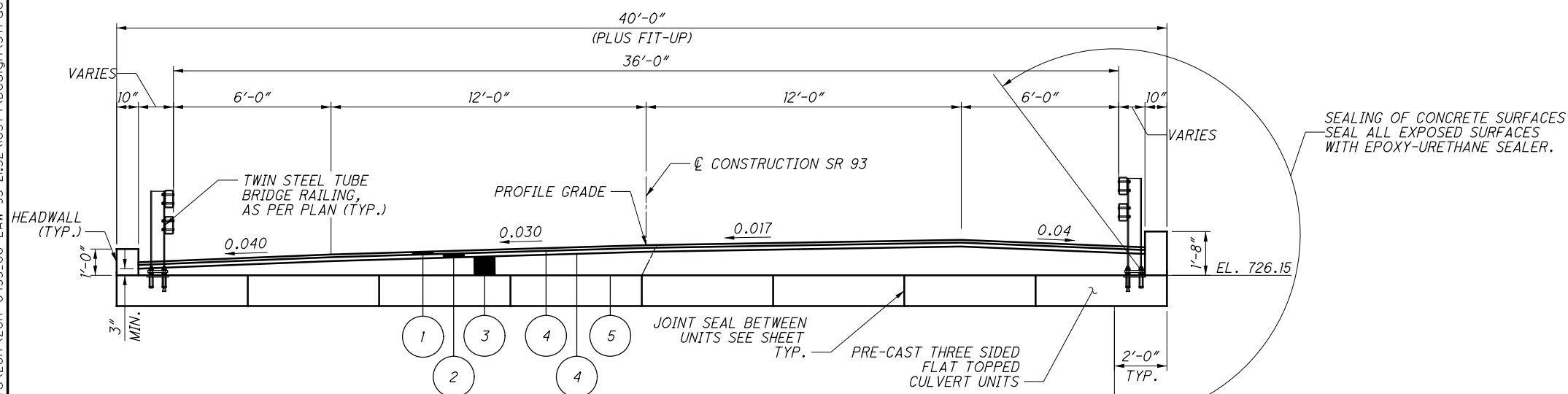
EXISTING BRIDGE TRANSVERSE SECTION



PHASE 2 CONSTRUCTION



PHASE 3 CONSTRUCTION





TRANSVERSE SECTION

NOTE:

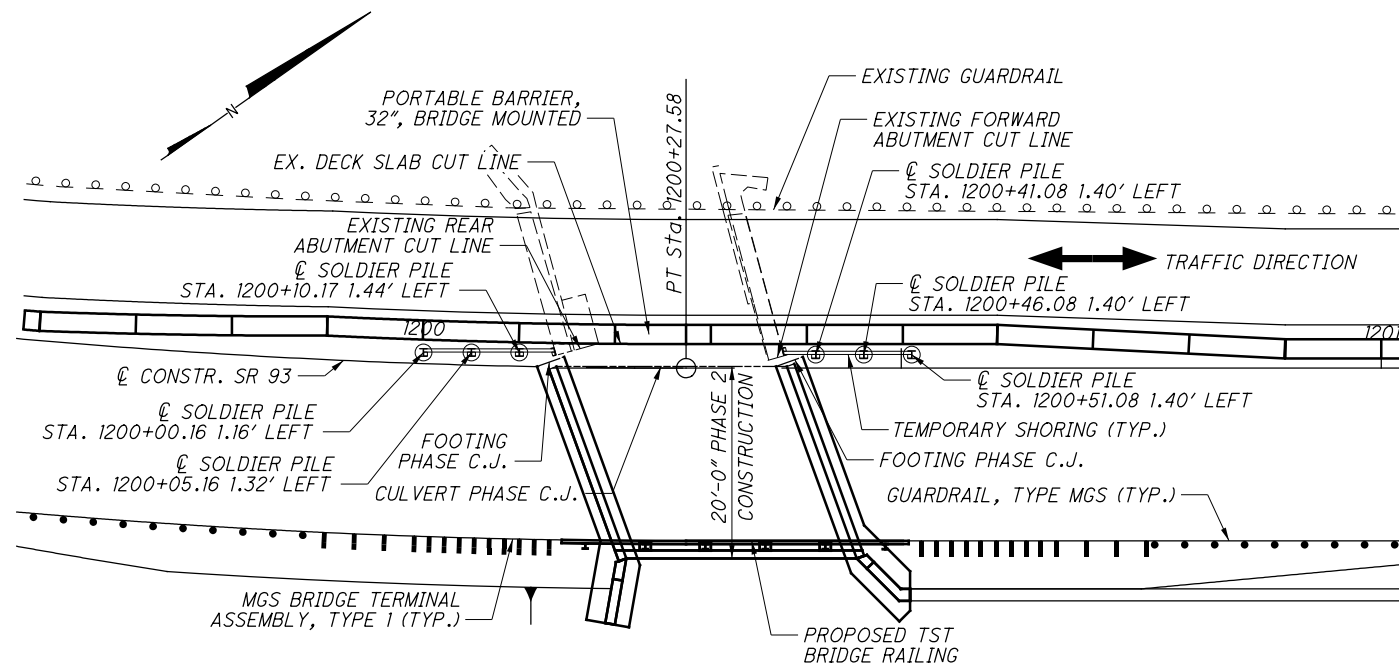
1. SEE MAINTENANCE OF TRAFFIC PLANS FOR PHASE 1 CONSTRUCTION DETAILS.
2. PORTABLE BARRIER, 32" BRIDGE MOUNTED:
ALL BARRIER SEGMENTS SHALL BE FASTENED TO THE EXISTING BRIDGE DECK WITH A MINIMUM OF 2 ANCHORS PER SEGMENT.
3. SEE STD. DWG. PCB-91 FOR ADDITIONAL DETAILS.

LEGEND

- 1 ITEM 441 - 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22
- 2 ITEM 441 - 1 3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
- 3 ITEM 301 - 3" MIN. ASPHALT CONCRETE BASE, PG64-22
- 4 ITEM 407 - TACK COAT
- 5 ITEM 512 - TYPE 3 WATERPROOFING

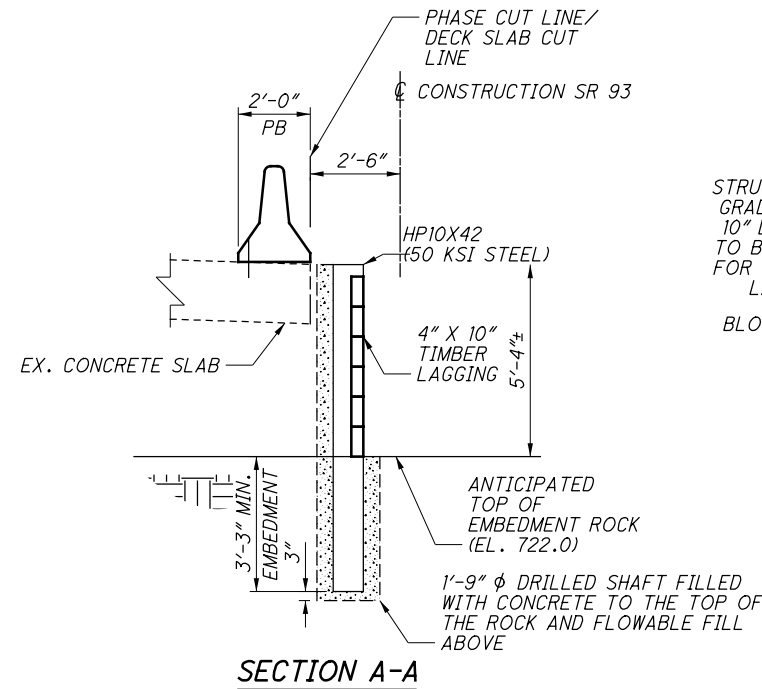
-  PHASE 2 REMOVAL
-  PHASE 3 REMOVAL

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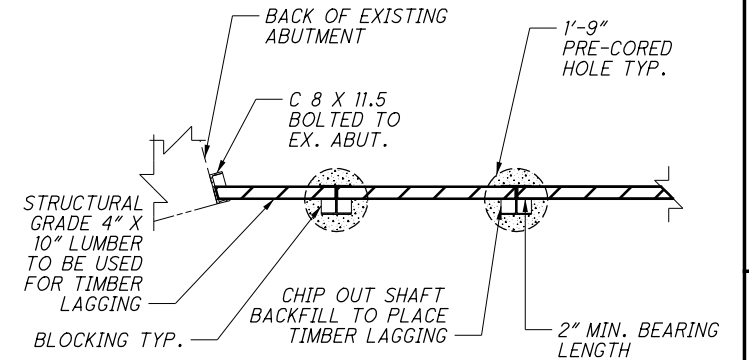


PHASE 2 PLAN

NOTE:
1. FOR FOOTING PHASE
CONSTRUCTION JOINT SEE
FOUNDATION PLAN SHEET 6/11 .

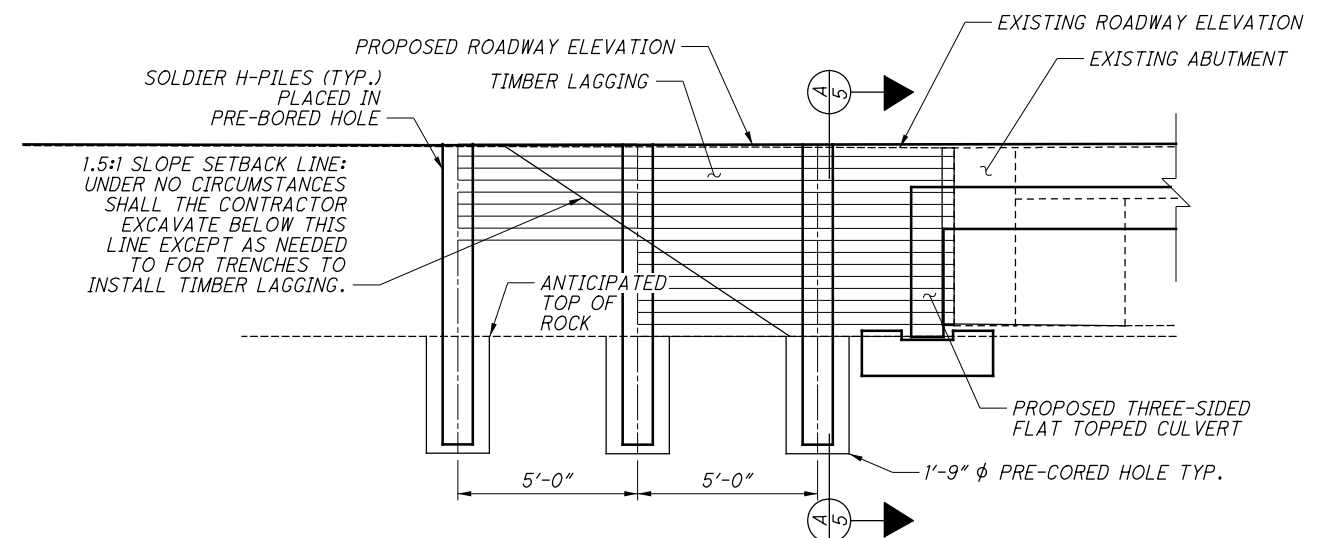


SECTION A-A



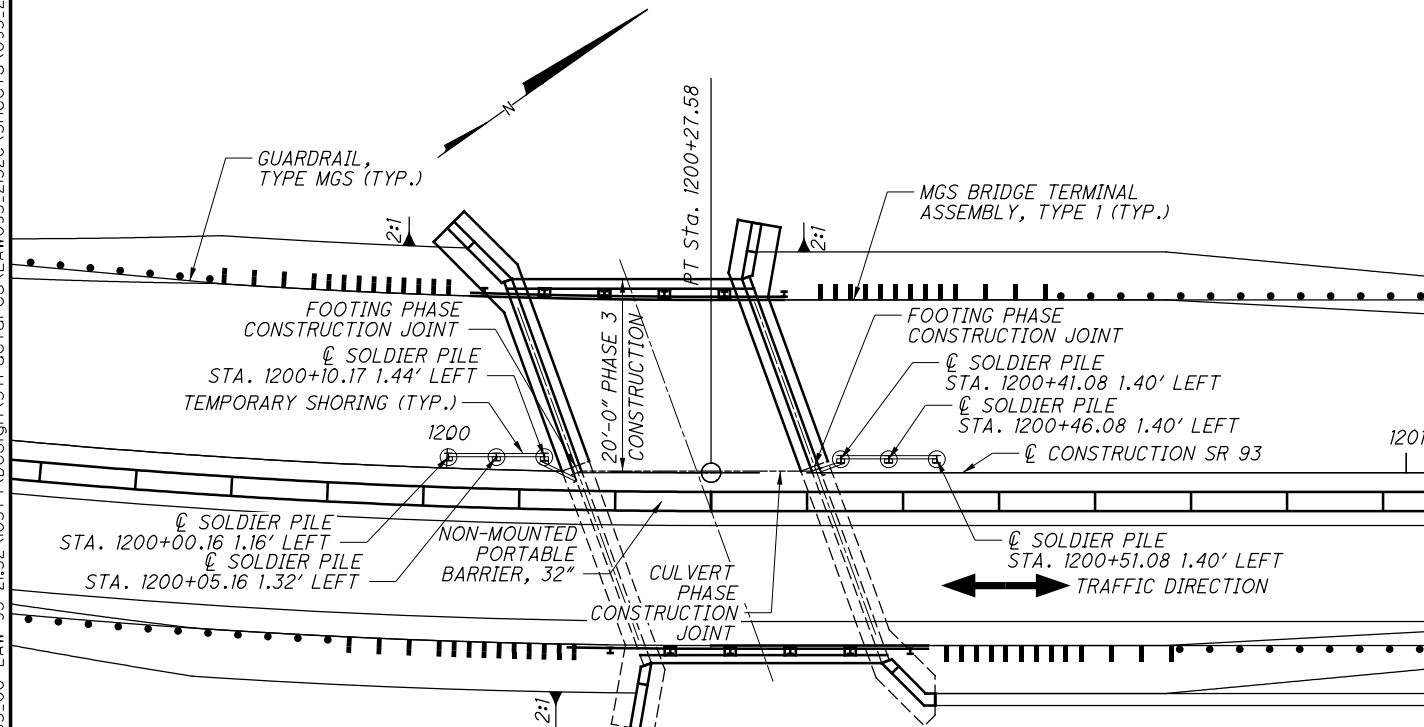
PARTIAL PLAN

- NOTES:
1. WHEN NO LONGER NEEDED FOR EXCAVATION SUPPORT, REMOVE LAGGING AND CUT OFF SOLDIER PILES TO THE BOTTOM OF THE SUBGRADE.
 2. SOLDIER PILES SHALL BE 50 KSI STEEL.
 3. LAGGING SHALL BE STRUCTURAL GRADE LUMBER WITH A MINIMUM BENDING STRESS OF 1500 PSI.
 4. INCLUDE ALL HP 10X42, CONCRETE, FLOWABLE FILL, 4"X10" TIMBER LAGGING, AND BEDROCK CORING WITH ITEM 503 COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN.
 5. CONCRETE PLACED TO THE TOP OF ROCK SHALL MEET THE REQUIREMENTS OF ITEM 499 CLASS QC1 WITH A DESIGN STRENGTH OF 4000 PSI.



ELEVATION

SOLDIER PILE AND LAGGING WALL
(SIMILAR OPPOSITE SIDE)

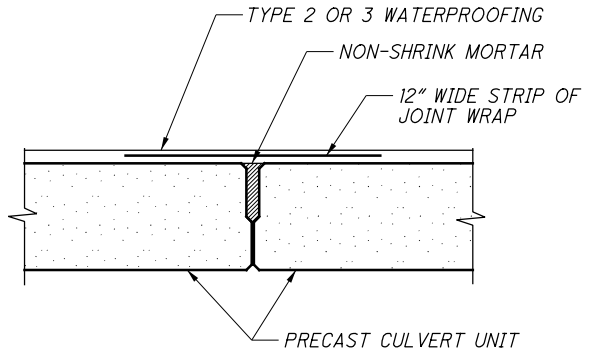
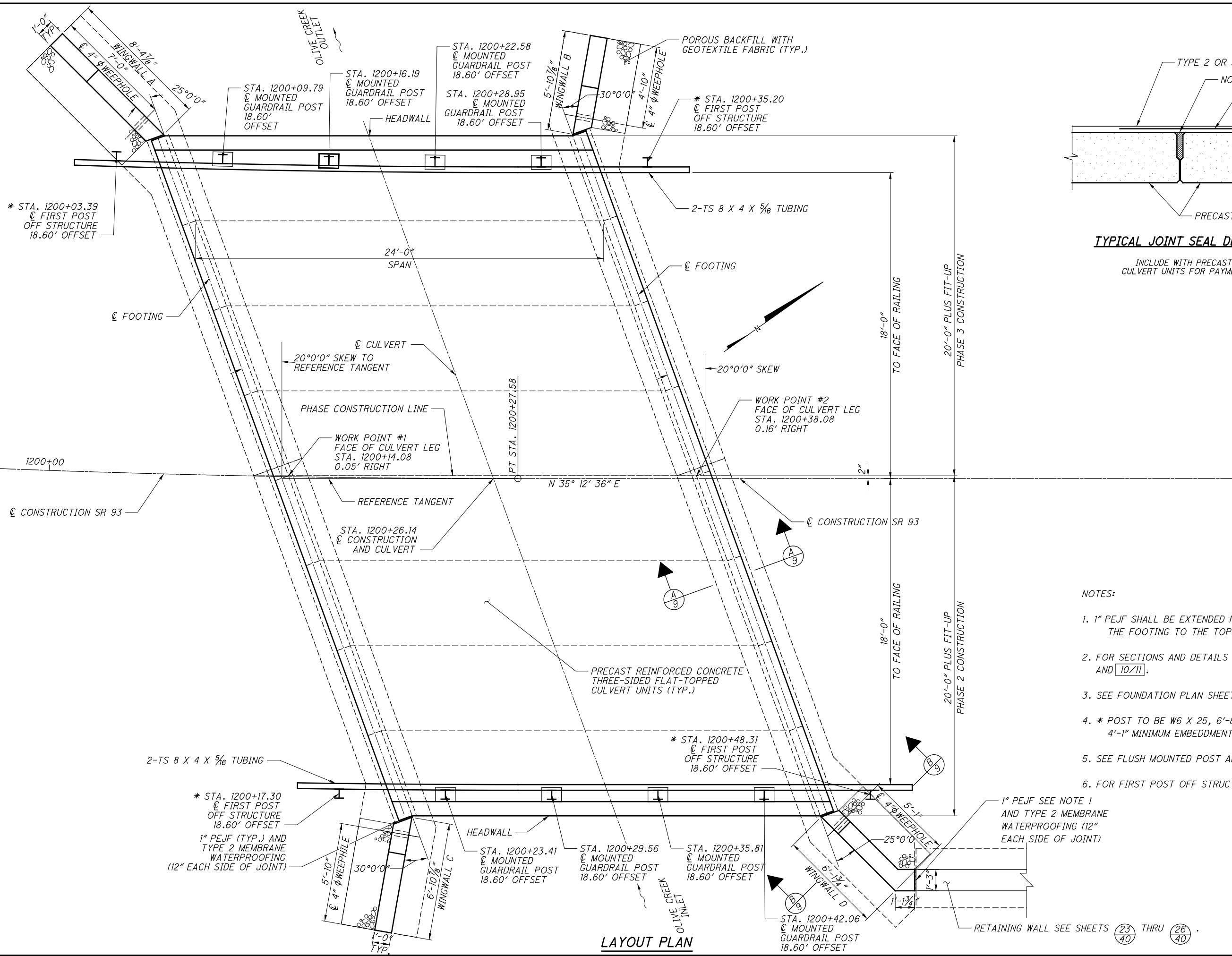


PHASE 3 PLAN



FOR CULVERT LAYOUT PLAN SEE SHEET 7/11
FOR SECTIONS SEE SHEET 9/11

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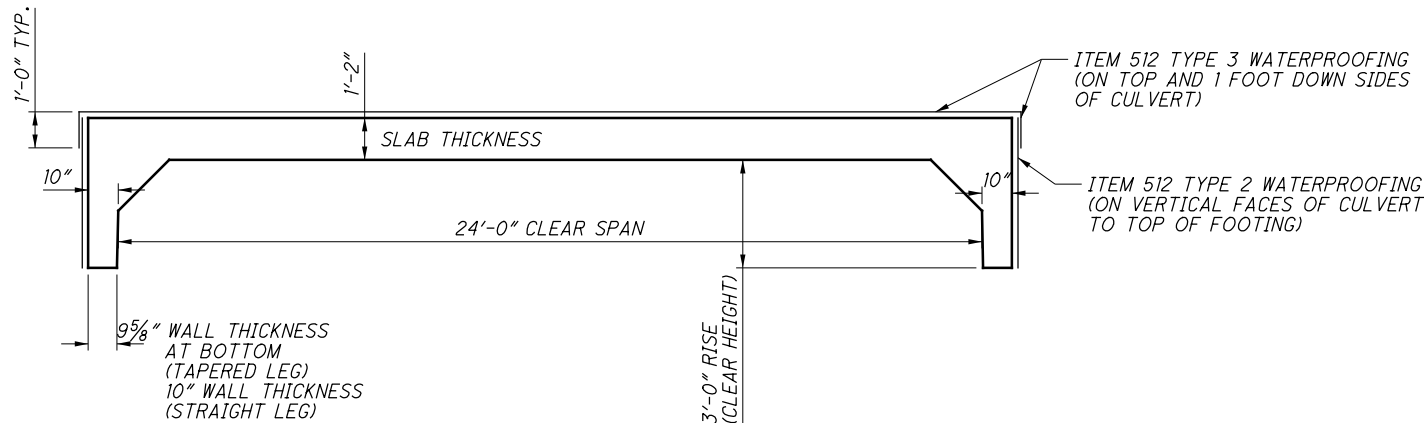
TYPICAL JOINT SEAL DETAIL

INCLUDE WITH PRECAST CULVERT UNITS FOR PAYMENT

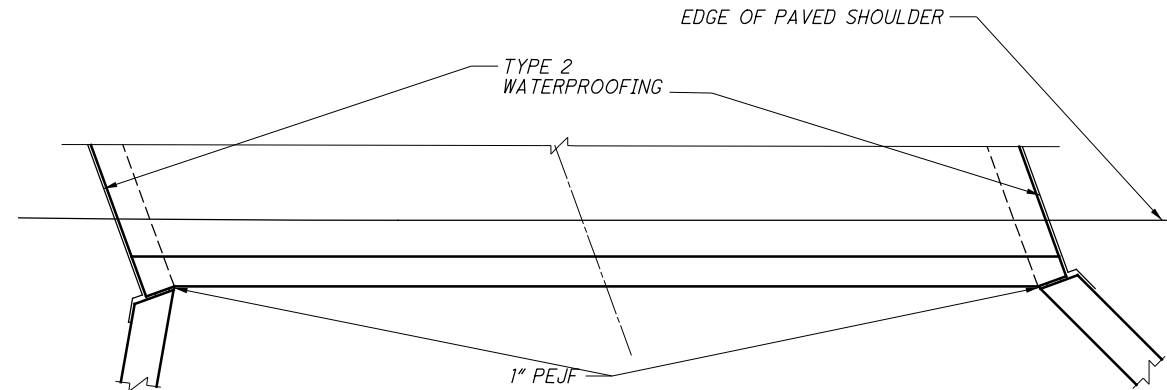
- NOTES:
1. 1" PEJF SHALL BE EXTENDED FROM THE TOP OF THE FOOTING TO THE TOP OF THE WALL.
 2. FOR SECTIONS AND DETAILS SEE SHEETS 8/11, 9/11 AND 10/11.
 3. SEE FOUNDATION PLAN SHEET 6/11.
 4. * POST TO BE W6 X 25, 6'-8" LONG, 4'-1" MINIMUM EMBEDMENT
 5. SEE FLUSH MOUNTED POST ANCHOR DETAIL SHEET 10/11.
 6. FOR FIRST POST OFF STRUCTURE DETAIL SEE SHEET 10/11.

LAYOUT PLAN

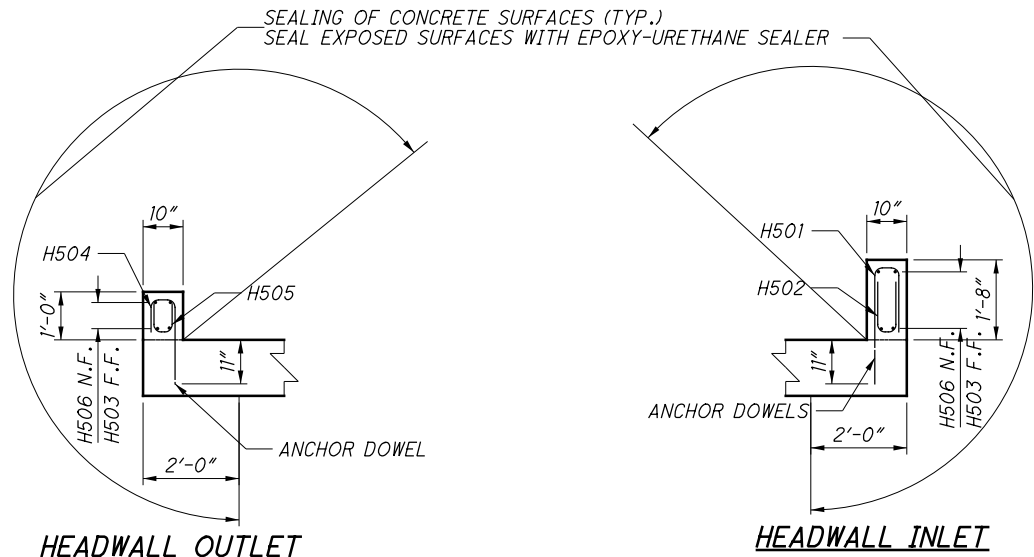
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CULVERT SECTION



PLAN VIEW



HEADWALL OUTLET

HEADWALL INLET

ITEM 512 WATERPROOFING

APPLY AN EXTERNAL WATERPROOFING MEMBRANE TO PRECAST REINFORCED CONCRETE THREE SIDED FLAT TOPPED CULVERTS. USE ITEM 512 WATERPROOFING, TYPE 2 ALONG THE VERTICAL SIDES AND TYPE 3 ACROSS THE TOP OF THE STRUCTURE. PROVIDE AN OVERLAP OF A MINIMUM OF 12 INCHES OF THE TOP MEMBRANE TO THE VERTICAL MEMBRANE. THE EXTERIOR JOINT GAP ON THE TOP AND SIDES BETWEEN THE PRECAST CULVERT SECTIONS SHALL BE FILLED WITH NON-SHRINK MORTAR PRIOR TO INSTALLING THE JOINT WRAP AND THE WATERPROOFING.

1" PREFORMED EXPANSION JOINT FILLER SHALL BE EXTENDED FROM TOP OF FOOTING TO THE TOP OF WALL.

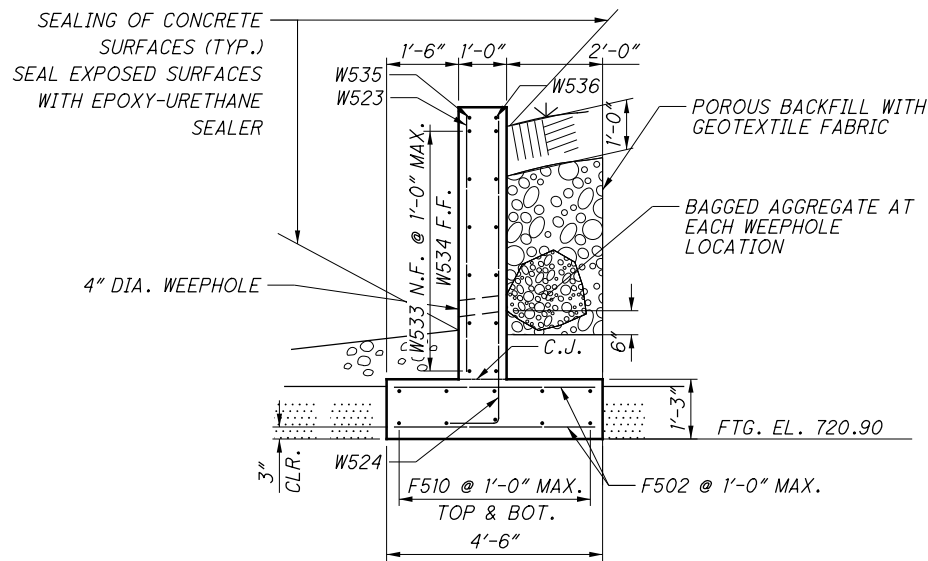
POROUS BACKFILL WITH GEOTEXTILE FABRIC, 2 FEET THICK SHALL BE PLACED BEHIND WINGWALLS ONLY AND SHALL EXTEND, TO 1 FOOT BELOW THE EMBANKMENT SURFACE, AND Laterally TO THE ENDS OF THE WINGWALLS. PLACE TWO CUBIC FEET OF BAGGED NO. 3 AGGREGATE AT EACH WEEPHOLE. THE DEPARTMENT WILL INCLUDE BAGGED AGGREGATE WITH POROUS BACKFILL FOR PAYMENT.

FOR SECTION LOCATIONS SEE PLAN SHEETS **6/11** AND **7/11**.

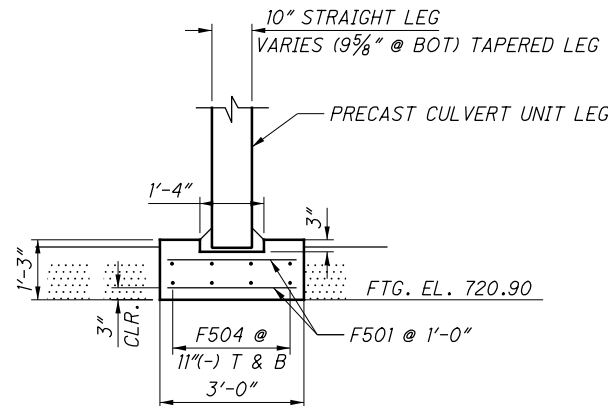
HEADWALL ANCHOR DOWELS

ANCHOR PER C&MS 510 WITH NON-SHRINK, NON-METALLIC GROUT CONFORMING TO C&MS 705.20 AND TO A DEPTH OF 11". PAYMENT FOR DOWEL HOLES, GROUT AND INSTALLATION SHALL BE INCLUDED WITH ITEM 511.

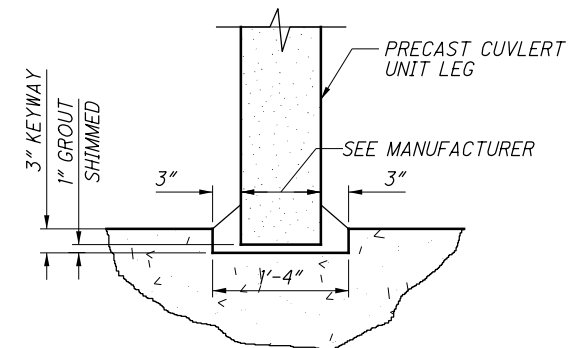
THREADED INSERTS OR NON-PROTRUDING MECHANICAL CONNECTORS CAPABLE OF DEVELOPING AT LEAST 125 PERCENT OF THE SPECIFIED YIELD STRENGTH OF THE REINFORCEMENT SHOWN ARE AN ACCEPTABLE ALTERNATIVE TO RESIN BONDING. MAINTAIN A MINIMUM COVER OF 3 INCHES AT THE BOTTOM OF THE CULVERT SLAB. MECHANICAL CONNECTORS SHALL HAVE AN "L-SHAPED" BAR INSIDE THE CULVERT WITH A MINIMUM HORIZONTAL LENGTH OF 12 INCHES. THE DEPARTMENT WILL CONSIDER PAYMENT FOR INSERTS OR MECHANICAL CONNECTORS AS INCIDENTAL TO ITEM 611.



SECTION B-B



SECTION A-A



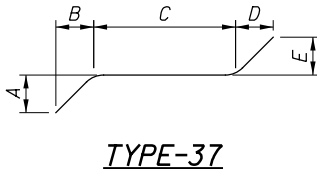
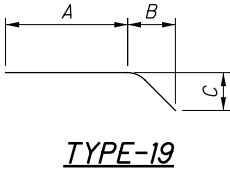
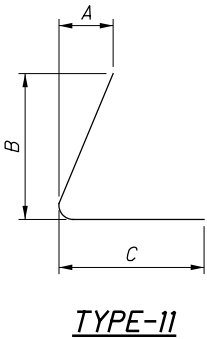
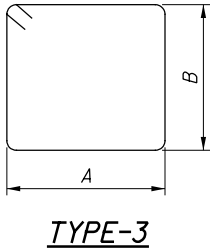
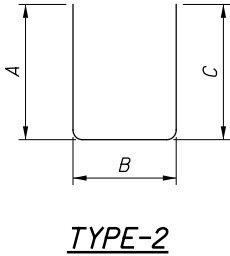
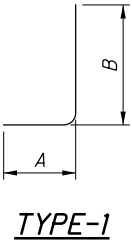
KEYWAY DETAIL

FILL ENTIRE KEYWAY INCLUDING NOMINAL 1" VOID BETWEEN BOTTOM OF KEYWAY AND BOTTOM OF PRECAST CULVERT UNIT LEG WITH NON-SHRINK GROUT (INCLUDE WITH PRECAST UNITS FOR PAYMENT.

NOTES:

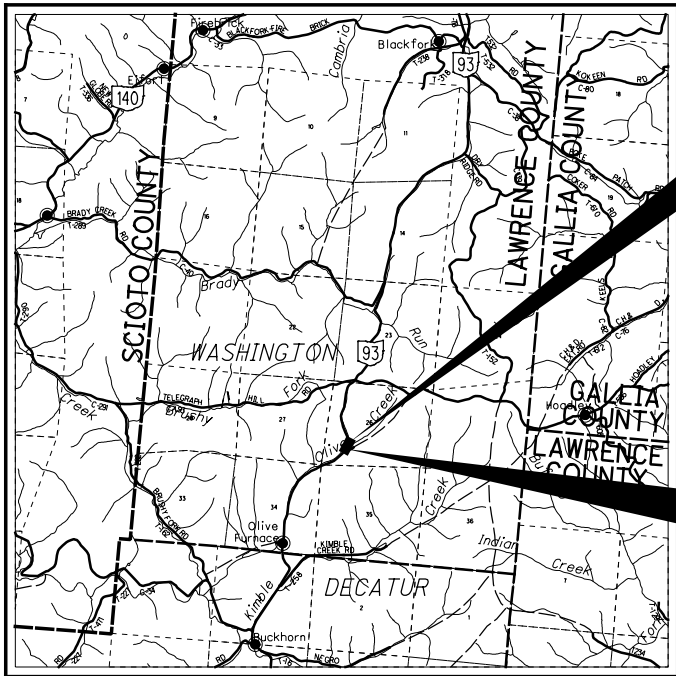
1. ALL BARS SHALL BE EPOXY COATED.
2. LENGTHS ARE RECORDED IN FEET - INCHES.
3. "STR." IN THE TYPE COLUMN INDICATES STRAIGHT BARS.
4. REFER TO C.M.S. SEC. 509.05 FOR STANDARD BEND DIMENSIONS.
5. ALL DIMENSIONS ARE OUT-TO-OUT.
6. □ THE LENGTHS OF THE BARS DESIGNATED FOR MECHANICAL CONNECTORS ARE THE NOMINAL LENGTHS MEASURED TO THE CONSTRUCTION JOINT. ADJUSTMENT IN THE LENGTHS OF BARS DUE TO MECHANICAL SPLICING SHALL BE MADE PRIOR TO THE FABRICATION.
7. THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, P601 IS A NO. 6 BAR.
8. R INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED.
9. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.
10. ⌘ INCLUDED WITH ITEM 511, CLASS QC1 CONCRETE, RETAINING/WINGWALL NOT INCLUDING FOOTING, AS PER PLAN.

MARK	NUMBER	LENGTH	WEIGHT	TYPE	DIMENSIONS						
	TOTAL				A	B	C	D	E	R	INC
FOOTINGS											
F501	152	2'-8"	423	STR							
F502	58	4'-2"	252	STR							
	8 SR	2'-11"									
F503	OF	TO	83	STR							0'-5"
	3	3'-9"									
	2 SR	22'-6"			19'-3" □						
F504	OF	TO	203 □	19	TO	2'-10"	1'-7"				1'-3"
	4	26'-3"			23'-0" □						
	2 SR	21'-10"			18'-8" □						
F505	OF	TO	200 □	19	TO	2'-11"	1'-4"				1'-5"
	4	26'-1"			22'-11" □						
	2 SR	20'-8"			17'-6"						
F506	OF	TO	190	19	TO	2'-11"	1'-4"				1'-5"
	4	24'-11"			21'-9"						
	2 SR	21'-5"			18'-2"						
F507	OF	TO	194	19	TO	2'-10"	1'-7"				1'-3"
	4	25'-2"			21'-11"						
	2 SR	6'-2"									
F508	OF	TO	75	STR							0'-6"
	5	8'-2"									
	2 SR	1'-6"									
F509	OF	TO	16	STR							1'-0"
	3	3'-6"									
	2 SR	6'-8"									
F510	OF	TO	76	STR							0'-4"
	5	8'-0"									
F511	2	5'-3"	11	19	4'-0"	0'-11"	0'-11"				
	2 SR	7'-7"									
F512	OF	TO	93	STR							0'-8"
	5	10'-3"									
	2 SR	5'-2"									
F513	OF	TO	64	STR							0'-6"
	5	7'-2"									
F514	16	3'-3" □	54 □	STR							
FOOTING TOTAL			1934	POUNDS							
HEADWALLS											
H501	25	2'-11"	76	2	1'-4"	0'-6"	1'-4"				
H502	25	2'-3"	59	2	1'-0"	0'-6"	1'-0"				
H503	4	25'-5"	106	STR							
H504	25	1'-7"	41	2	0'-8"	0'-6"	0'-8"				
H505	25	1'-3"	33	2	0'-6"	0'-6"	0'-6"				
H506	4	25'-3"	105	37	0'-2"	0'-7"	24'-0"	0'-8"	0'-3"		
H507	1	3'-2"	3	2	1'-4"	0'-9"	1'-4"				
H508	1	1'-10"	2	2	0'-8"	0'-9"	0'-8"				
HEADWALL TOTAL			425 ⚡	POUNDS							



MARK	NUMBER	LENGTH	WEIGHT	TYPE	DIMENSIONS						
	TOTAL				A	B	C	D	E	R	INC
WINGWALLS											
W501	10	6'-8"	70	1	1'-0"	5'-10"					
W502	12	4'-8"	58	STR							
	1 SR	5'-8"				4'-10"					
W503	OF	TO	19	1	1'-0"	TO					0'-4"
	3	6'-4"				5'-6"					
	1 SR	3'-8"									
W504	OF	TO	13	STR							0'-4"
	3	4'-4"									
	1 SR	5'-5"				4'-7"					
W505	OF	TO	18	1	1'-0"	TO					0'-5"
	3	6'-3"				5'-5"					
	1 SR	3'-5"									
W506	OF	TO	12	STR							0'-5"
	3	4'-3"									
W507	4	8'-0"	33	STR							
W508	4	7'-8"	32	STR							
W509	1	7'-2"	7	STR							
W510	1	6'-10"	7	STR							
W511	1	8'-2"	9	19	5'-2"	2'-10"	1'-0"				
W512	1	7'-10"	8	19	4'-10"	2'-10"	1'-0"				
W513	4	5'-5"	23	STR							
W514	4	5'-0"	21	STR							
W515	1	4'-2"	4	STR							
W516	1	3'-9"	4	STR							
W517	1	5'-6"	6	19	2'-5"	2'-10"	1'-3"				
W518	1	5'-1"	5	19	2'-0"	2'-10"	1'-3"				
W519	7	5'-4"	39	STR							
W520	5	7'-4"	38	1	1'-0"	6'-6"					
	1 SR	3'-8"									
W521	OF	TO	23	STR							0'-4"
	5	5'-0"									
	1 SR	5'-8"				4'-10"					
W522	OF	TO	33	1	1'-0"	TO					0'-4"
	5	7'-0"				6'-2"					
	1 SR	5'-0"									
W523	OF	TO	21	STR							0'-1"
	4	5'-3"									
	1 SR	6'-11"				6'-1"					
W524	OF	TO	30	1	1'-0"	TO					0'-1"
	4	7'-2"				6'-4"					
W525	4	6'-5"	27	STR							
W526	4	6'-0"	25	STR							
W527	1	5'-9"	6	STR							
W528	1	5'-4"	6	STR							
W529	1	2'-11"	3	STR							
W530	1	2'-6"	3	STR							
W531	1	6'-8"	7	19	1'-11"	4'-6"	1'-7"				
W532	1	6'-3"	7	19	1'-6"	4'-6"	1'-7"				
W533	5	6'-9"	35	19	5'-10"	0'-8"	0'-8"				
W534	5	5'-8"	30	19	4'-10"	0'-7"	0'-7"				
W535	1	5'-8"	6	19	1'-2"	4'-6"	0'-4"				
W536	1	5'-4"	6	19	0'-10"	4'-6"	0'-4"				
W537	2	0'-11"	2	STR							
W538	1	5'-0"	5	STR							
W539	1	6'-10"	7	1	1'-0"	6'-0"					
W540	11	3'-9"	43	11	1'-3"	2'-9"	0'-9"				
W541	12	3'-9"	47	11	1'-6"	2'-7"	0'-9"				
W542	1	2'-9"	3	11	1'-0"	1'-9"	0'-9"				
W543	1	1'-10"	2	11	0'-6"	1'-0"	0'-9"				
WINGWALL TOTAL			803 ±	POUNDS							

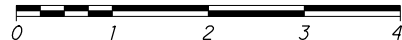
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LOCATION MAP

LATITUDE: 38°46'35" LONGITUDE: 82°36'55"

SCALE IN MILES



NOTES: UTILITY CONTACTS

TELEPHONE: AT&T OHIO
160 N. 6TH STREET
ZANESVILLE, OHIO 43701
CONTACT: MR. BARRETT TAMASOVICH
TELECOMMUNICATIONS SPECIALIST
TELEPHONE: (740) 454-3552
EMAIL: BT2178@ATT.COM

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

RIGHT OF WAY LEGEND SHEET LAW-93-22.71

LAWRENCE COUNTY

WASHINGTON TOWNSHIP

SECTION 26, TOWNSHIP 4, RANGE 18
CONGRESS LANDS EAST OF THE SCIOTO

INDEX OF SHEETS:

LEGEND SHEET	1
CENTERLINE PLAT	2
SUMMARY OF ADDITIONAL R/W AND R/W DETAIL	3

CONVENTIONAL SYMBOLS

County Line	-----	Edge of Shoulder (Ex)	-----
Township Line	-----	Edge of Shoulder (Pr)	-----
Section Line	-----	Ditch / Creek (Ex)	-----
Corporation Line	----- or -----	Ditch / Creek (Pr)	-----
Fence Line (Ex)	-----x-----x-----x-----x-----	Tree Line (Ex)	-----
Center Line	-----	Ownership Hook Symbol	Example -----
Right of Way (Ex)	-----Ex R/W-----	Property Line Symbol	Example -----
Right of Way (Pr)	-----R/W-----	Break Line Symbol	Example -----
Standard Highway Ease.(Ex)	-----Ex SH-----	Tree (Pr)	Example -----
Standard Highway Ease.(Pr)	-----SH-----	Tree (Ex)	Example -----
Temporary Right of Way	-----TMP-----	Shrub (Ex)	Example -----
Channel Ease. (Pr)	-----CH-----	Tree (Remove)	Example -----
Utility Ease. (Ex)	-----Ex U-----	Shrub (Remove)	Example -----
Railroad	----- or -----	Evergreen (Ex)	Example -----
Guardrail (Ex)	----- (Pr) -----	Evergreen (Remove)	Example -----
Construction Limits	-----	Stump (Remove)	Example -----
Edge of Pavement (Ex)	-----	Wetland (Pr)	Example -----
Edge of Pavement (Pr)	-----	Grass (Pr)	Example -----
		Aerial Target	Example -----
		Post (Ex)	Example -----
		Mailbox (Ex)	Example -----
		Mailbox (Pr)	Example -----
		Light (Ex)	Example -----
		Telephone Marker (Ex)+TEL	Example -----
		Fire Hydrant (Ex)	Example -----
		Water Meter (Ex)	Example -----
		Water Valve (Ex)	Example -----
		Utility Valve Unknown (Ex.)	Example -----
		Telephone Pole (Ex)	Example -----
		Power Pole (Ex)	Example -----
		Light Pole (Ex)	Example -----

STRUCTURE KEY

	RESIDENTIAL
	COMMERCIAL
	OUT-BUILDING

TYPES OF TITLE LEGEND:
T = TEMPORARY EASEMENT

PROJECT DESCRIPTION

COMPLETE REPLACEMENT OF EXISTING SINGLE SPAN CONCRETE SLAB BRIDGE OVER OLIVE CREEK WITH A PRECAST CONCRETE THREE-SIDED FLAT TOP CULVERT INCLUDING MINIMAL ROADWAY APPROACH WORK. ALSO INCLUDES ROADWAY EMBANKMENT STABILIZATION AND CHANNEL RELOCATION BY NEW RETAINING WALL CONSTRUCTION.

PLANS PREPARED BY:

FIRM NAME : KORDA/NEMETH ENGINEERING
R/W DESIGNER: DAVID R. HIMMELMAN
R/W REVIEWER: TONY W. MEACHAM
FIELD REVIEWER: DAVID R. HIMMELMAN
PRELIMINARY FIELD REVIEW DATE: 10/04/18
FINAL FIELD REVIEW DATE: 11/26/18
OWNERSHIP UPDATED BY: 11/27/18
DATE COMPLETED: 11/28/18
PLAN COMPLETION DATE: 11/28/18

I, Tony W. Meacham, P. S. have conducted a survey of the existing conditions for the Ohio Department of Transportation in January 2018. The results of that survey are contained herein. The horizontal coordinates expressed herein are based on the Ohio State Plane Coordinates System South Zone on NAD 83 (2011) datum. The Project Coordinates (US Survey Feet) are relative to State Plane Grid Coordinates (Meters or US Survey Feet) by a Project Adjustment Factor of 1.000037486438. As a part of this project I have reestablished the locations of the existing property lines and the existing centerline of Right of Way for property takes contained herein. As a part of this project I have established the proposed property lines, calculated the Gross Take, present roadway occupied (PRO), Net Take and Net Residue; as well as prepared the legal descriptions necessary to acquire the parcels as shown herein. As a part of this work I have set right of way monuments at the property corners, property line intersection, points along the right of way and/or angle points on the right of way, Section Corners and other points as shown herein. All of my work contained herein was conducted in accordance with Ohio Administrative Code 4733-37 commonly known as "Minimum Standards for Boundary Surveys in the State of Ohio" unless noted. The words I and my as used herein are to mean either myself or someone working under my direct supervision.

Tony W. Meacham, Professional Land Surveyor No. 7799

11/28/18
Date:

SURVEYORS SEAL



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MONUMENT TABLE							
E of STATE ROUTE 93		PROJECT COORDINATES SEE SURVEY CERTIFICATION		MONUMENTS TO BE SET DURING CONSTRUCTION		R/W MON. EXPECTED TO BE DISTURBED	
STATION	OFFSET	NORTH (Y)	EAST (X)	MON. ASSY.	REF. MON.	R/W MON.	DESCRIPTION
1196+00.00	14.00' LT	282191.702	1934517.347		1		P.O.T. SR 93
1196+00.00	14.00' RT	282170.221	1934535.307		1		P.O.T. SR 93
1198+22.20	16.00' LT	282335.766	1934686.526		1		P.C. SR 93
1198+22.20	15.00' RT	282311.984	1934706.411		1		P.C. SR 93
1201+50.00	15.00' LT	282582.786	1934893.889		1		P.O.T. SR 93
1201+50.00	15.00' RT	282565.489	1934918.400		1		P.O.T. SR 93
1203+50.00	14.00' LT	282745.618	1935010.020		1		P.O.T. SR 93
1203+50.00	15.00' RT	282728.898	1935033.714		1		P.O.T. SR 93
TOTAL CARRIED TO GENERAL SUMMARY SHEET					8		

SETTING OF ALL MONUMENTS SHALL BE PERFORMED BY A SURVEYOR REGISTERED IN THE STATE OF OHIO. THE MONUMENT ASSEMBLIES AND REFERENCE MONUMENTS WILL BE INSTALLED BY THE CONTRACTOR AT THE TIME OF CONSTRUCTION. THE IRON PIN AND CAP (WHEN REQUIRED) ARE TO BE INSTALLED BY THE CONTRACTOR'S SURVEYOR.

CHANGES OR ALTERATIONS TO THE LOCATION OF ANY MONUMENTS SHOWN IN THIS TABLE, REQUIRE PRIOR APPROVAL FROM THE DISTRICT REAL ESTATE ADMINISTRATOR OF THE OHIO DEPARTMENT OF TRANSPORTATION. IN THE EVENT THAT CHANGES OR ALTERATIONS ARE APPROVED, A REVISED CENTERLINE PLAT WITH THE NEW LOCATIONS SHALL BE RECORDED IN THE APPLICABLE COUNTY RECORDS AND THE OHIO DEPARTMENT OF TRANSPORTATION. SPECIFICATIONS FOR MONUMENT ASSEMBLIES, REFERENCE MONUMENTS AND RIGHT OF WAY MONUMENTS ARE SHOWN ON STANDARD CONSTRUCTION DRAWING RM-1.1.

LAWRENCE COUNTY

WASHINGTON TOWNSHIP

SECTION 26, TOWNSHIP 4, RANGE 18

CONGRESS LANDS EAST OF THE SCIOTO

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Lawrence County, OH
SHARON GOSSETT HAGER COUNTY RECORDER
File# 2018-00007916

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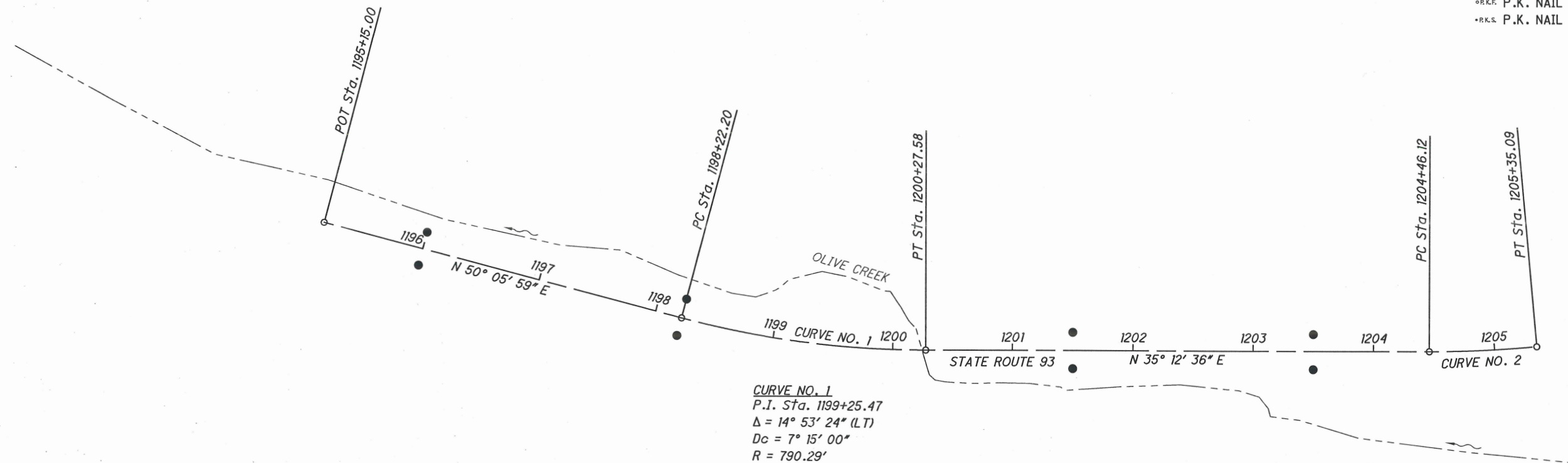
BASIS FOR BEARINGS:

The project (ground level) coordinates values are relative to State Plane Coordinates (Ohio South Zone NAD 83 with 2011 NSRS adjustment. by a Combined Scale Factor (CSF) = 1.000037486438 and is based on a mean project latitude of 38°46'30.78598" North and an elevation of 726.310 feet. Coordinate values are from an actual GPS survey made in 2018 by Korda Engineering, Inc. Elevations are NAVD 1988. To obtain grid coordinates, divide the project distance coordinates by the (CSF).

NOTE: THE EXISTING R/W LOCATION WERE DETERMINED BY USING A "BEST FIT OF THE EXISTING IMPROVEMENT." THE EXISTING RIGHT OF WAY WIDTH WAS SHOWN ON THE 1977 ROADWAY PLANS SHOWING A WIDTH OF 60 FEET.

MONUMENT LEGEND

- EXISTING R/W MONUMENT BOX
- PROPOSED R/W MONUMENT BOX
- EXISTING CONCRETE MONUMENT
- PROPOSED CONCRETE MONUMENT
- RAILROAD SPIKE FOUND
- RAILROAD SPIKE SET
- IRON PIN FOUND
- IRON PIN FOUND W/ ID CAP
- IRON PIN SET W/ ID CAP
- IRON PIPE FOUND
- IRON PIPE SET
- P.K. NAIL FOUND
- P.K. NAIL SET



CURVE NO. 1
P.I. Sta. 1199+25.47
Δ = 14° 53' 24" (LT)
Dc = 7° 15' 00"
R = 790.29'
T = 103.27'
L = 205.38'
E = 6.72'
C = 204.80'
C.B. = N 42° 39' 17" E

CURVE NO. 2
P.I. Sta. 1204+90.64
Δ = 5° 20' 19" (RT)
Dc = 6° 00' 00"
R = 954.93'
T = 44.52'
L = 88.98'
E = 1.04'
C = 88.94'
C.B. = N 32° 32' 26" E

I, Tony W. Meacham, P. S. have conducted a survey of the existing conditions for the Ohio Department of Transportation in January 2018. The results of that survey are contained herein. The horizontal coordinates expressed herein are based on the Ohio State Plane Coordinate System, South Zone on NAD 83 (2011) datum. The Project Coordinates (US Survey feet) are relative to State Plane Grid Coordinates (meters or US Survey feet) by a Project Adjustment Factor multiplier of 1.000037486438. As a part of this project I have reestablished the locations of the existing property lines and centerline of existing Right of Way for property takes contained herein. All of my work contained herein was conducted in accordance with Ohio Administrative Code 4733-37 commonly known as "A Minimum Standards for Boundary Surveys in the State of Ohio" unless noted. The words I and my as used herein are to mean either myself or someone working under my direct supervision.

Tony W. Meacham, Professional Land Surveyor No. 7799

Date: 11/28/18

RECEIVED _____, 20____
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BOOK _____ PAGE _____
COUNTY RECORDER

SURVEYORS SEAL



CENTERLINE PLAT

LAW-93-22.71

2 / 3

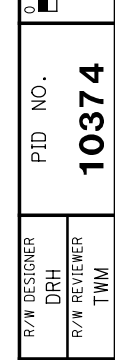
39
40

PID NO. 10374

R/W DESIGNER DRH
R/W REVIEWER TWM




HORIZONTAL
SCALE IN FEET



SUMMARY OF ADDITIONAL RIGHT OF WAY AND RIGHT OF WAY DETAIL

CLP	4/2/19	LABEL UNNAMED TRIBUTARIES
REV. BY	DATE	DESCRIPTION
FIELD REVIEW BY DAVID HIMMELMAN	DATE: 11/26/18	
OWNERSHIP VERIFIED BY DAVID HIMMELMAN	DATE: 11/27/18	
DATE COMPLETED 11/28/18		


 3 / 3
 LAW-93-22.71

FINAL REPORT
STRUCTURE FOUNDATION EXPLORATION
BRIDGE LAW-93-2271 (CROSSING OLIVE CREEK)
LAW-93-22.71
LAWRENCE COUNTY, OHIO
PID#: 10374

Prepared For:

Korda Engineering
1650 Watermark Drive
Columbus, OH 43215

Prepared by:

NATIONAL ENGINEERING AND ARCHITECTURAL SERVICES INC.
2800 Corporate Exchange Drive, Suite 240
Columbus, Ohio 43231

NEAS PROJECT 17-0130

February 11, 2019



Structure Foundation Exploration
Bridge LAW-93-2132 Replacement Over Olive Creek
LAW-93-22.71
Lawrence County, Ohio
PID: 10374

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1. INTRODUCTION

1.1. General

NEAS presents our Structure Foundation Exploration Report for the proposed Bridge LAW-93-2132 replacement project (LAW-93-22.71, PID 10374) located in Decatur Township, Lawrence County, Ohio. This report presents: 1) a summary of the encountered surficial and subsurface conditions via regional geology and project borings performed at the bridge replacement site; 2) our recommendations for bridge and retaining wall foundation design in accordance with the Load and Resistance Factor Design (LRFD) method as set forth in AASHTO's Publication *LRFD Bridge Design Specifications, 8th Edition* (BDS) (AASHTO, 2017) and *ODOT's 2007 LRFD Bridge Design Manual* (BDM) (ODOT, 2007); and, 3) our recommendations for pavement design parameters in accordance with ODOT's *Geotechnical Bulletin 1* (GB1) and *Pavement Design Manual* (PDM) (ODOT, 2015).

The scope of work performed by NEAS was conducted in general accordance with Barr Engineering, Inc. DBA National Engineering and Architectural Services Inc's (NEAS's) proposal to Korda Engineering (Korda) dated December 1, 2017.

1.2. Proposed Construction

NEAS understands that Korda is working with the Ohio Department of Transportation (ODOT) to develop construction plans for the proposed LAW-93-22.71 project in Lawrence County, Ohio. It is our understanding that it is ODOT's intent to replace the existing concrete slab bridge (LAW-93-2132) carrying State Route (SR) 93 over Olive Creek, with a new structure on the existing alignment with widening of the existing roadway and approaches. It is also our understanding that the existing bridge and approaches have experienced erosion of the streambed and embankment slope rock/soils over the life of the existing structure. Due to the known signs of erosion at the site as well as plans to widen the existing roadway and approaches at the bridge site, an approximate 250 ft long retaining wall is planned along portions of the existing creek bank to facilitate widening and protect existing and/or newly proposed embankment soil against erosion.

For our analyses the following assumptions were made: 1) the proposed replacement bridge LAW-93-2271 will consist of either a single-span slab bridge with full height abutments or a three-sided culvert structure; 2) the proposed wall will be either a Soldier Pile and Lagging (SPL) type wall or a cantilever Cast-in-Place (CIP) concrete wall; and, 3) widening of the existing roadway in conjunction with the construction of a retaining wall along the existing west creek bank (northeast of the proposed bridge) may require excavation within the opposite creek bank for hydraulic purposes.

The proposed structures will likely be supported by the natural bedrock through the use of either a shallow foundation or drilled shaft foundation system. Based on discussions with the ODOT Office of Structural Engineering, the use of a shallow foundation will require a minimum embedment depth of 1 ft into bedrock and a minimum of 1 ft below the Olive Creek flowline (thalweg), while the use of drilled shafts will require minimum 3 ft diameter shafts embedded a minimum of 4.5 ft into bedrock and below the Olive Creek flowline (thalweg).

2. GEOLOGY AND OBSERVATIONS OF THE PROJECT

2.1. Geology and Physiography

The project site is located within the Ironton Plateau physiographic region. This area is characterized as a dissected plateau of the moderately high-relief (300 ft), with coarse grained coal-bearing rock sequences common as well as lacustrine clay-filled Teays Valley remnants (ODGS, 1998). The geology in this region is described as Pleistocene-age Minford Clay, silt-loam and channery colluvium with Pennsylvanian-age cycles of sandstones, siltstones, shales, and economically important coals.

Based on the quaternary geology map of Ohio, the overburden soils are generally made up of colluvium derived from the local bedrock in unglaciated areas including scattered areas of residuum, weathered material, landslides, and bedrock outcrop (Pavey, et al., 1999).

Based on the Bedrock Geologic Units Map of Ohio (USGS & ODGS, 2005), bedrock within the project area is part of the Undivided Allegheny and Pottsville Groups with the primary and secondary rock types consisting of Pennsylvanian-age shale and siltstone, respectively. Other rock types within this formation include claystone, sandstone, limestone, and coal. The shale is described as being black, gray and olive and is characterized as clayey to silty. The siltstone within this formation is described as being gray, greenish and olive and is characterized as clayey to sandy. The siltstone is also described as being thin to medium bedded. The ODNR bedrock topography map of Ohio, does not contain bedrock elevation data within the area of the project site, though bedrock is expected to be shallow based on the geology of the site as described above.

The soils at the project site have been mapped (Web Soil Survey) by the Natural Resources Conservation Service as being Kanawha silt loam. The Kanawha silt loam unit consists of well-drained fine sandy loam to loam originating from shale, siltstone and sandstone bedrock (USDA, 2015). The Kanawha silt loam unit is classified as A-4 soils according to the AASHTO method of soil classification.

2.2. Hydrology/Hydrogeology

Groundwater can be expected at an elevation consistent with that of the immediately adjacent Olive Creek, as it is the most dominant hydraulic influence in the immediate vicinity. The water level of Olive Creek may be generally representative of the local groundwater table, though as the bridge site lies on sloping hillside and relatively thin overburden soils, it is not anticipated that a static groundwater table is present within the overburden. Rather it is anticipated that if encountered, groundwater is likely to be present at the bedrock surface or within the upper few feet of bedrock where the stratum is highly weathered or broken.

The bridge site is located in an area that has not been included within the Federal Emergency Management Agency's (FEMA) National Flood Hazard mapping program (FEMA, 2016).

2.3. Mining and Oil/Gas Production

No abandoned mines are noted on ODNR's Abandoned Underground Mine Locator within a mile of the project's boundaries (ODNR [1], 2016).

No oil or gas wells are noted on ODNR’s Ohio Oil & Gas Locator within a mile of the project’s boundaries. (ODNR [2], 2016).

2.4. Historical Records and Previous Phases of Project Exploration

A historic record search was performed through ODOT's Geotechnical Data Management System (GeoMS). The following report/plans were available for review and evaluation for this report:

- Original plans for Bridge No. LAW-93-2252 over Olive Creek as part of the LAW-93-(13.42)(16.31)(16.82)(22.52) Project, sheets 31-42 prepared by State of Ohio, Department of Highways, District 9 Bridge Office, dated February 1977.
- Soil boring logs and laboratory testing reports from a 1992 soil investigation for Bridge Structures LAW-93-(0463)(0513)(1631)(1985)(2252). Soil borings and testing performed and logs and test reports prepared by State of Ohio, Department of Transportation, Testing Laboratory, dated July 1992 .

Two historical soil borings (B-001-0-92 and B-002-0-92) that were drilled as part of the above indicated 1992 subsurface investigation for Bridge Structures LAW-93-(0463)(0513)(1631)(1985)(2252) are the borings used in this report for analysis. A summary of the utilized historic boring information (location, elevation, etc.) is provided in subsequent sections of this report.

2.5. Site Reconnaissance

A field reconnaissance visit for the project was not conducted by NEAS at the proposed bridge LAW-93-2271 site.

3. GEOTECHNICAL EXPLORATION

3.1. Field Exploration

The exploration for this project was conducted by the Ohio Department of Transportation, Testing Laboratory (ODOT) between July 13, 1992 and July 14, 1992 and included 2 borings drilled to depths between 9.2 and 10 ft below ground surface (bgs). The available information regarding the subsurface investigation can be found on each individual project boring log included within Appendix B. The information provided on the referenced logs serves as a basis for this report. A summary of stationing, offsets and elevations of the borings are shown on Table 1 below. The boring locations are depicted on the test boring location plan provided in Appendix A.

Table 1: Project Boring Summary

Boring ID	Location (Sta/Offset)	Latitude	Longitude	Elevation (NAVD 88) (ft)	Depth (ft)	Structure
B-001-0-92	1200+08, 11' RT	38.775411	-82.618346	730.0	9.2	Rear Abutment
B-002-0-92	1200+46, 9' LT	38.775528	-82.618324	730.0	10.0	Forward Abutment
Notes: 1. As-drilled boring locations and corresponding ground surface elevations based ODOT's Geotechnical Data Management System obtained boring information and boring logs, accessed March 6, 2018.						

3.2. Laboratory Testing Program

The laboratory testing program, performed by the ODOT Testing Laboratory included natural moisture content determinations, Atterberg Limits, and particle size analyses test. The individual laboratory data sheets and results are provided within Appendix B following the associated boring log. Data from the laboratory-testing program were also incorporated onto the produced borings logs.

3.2.1. Standard Penetration Test Results

Standard Penetration Tests and split-barrel (split-spoon) sampling of soils were performed at varying intervals (i.e., continuously, 2.5-ft intervals) in the project borings performed by ODOT. As the borings were performed as part of a 1992 soil investigation it is assumed that SPT sampling was performed using a typical safety hammer of the time. Therefore, field SPT N-values were not required to be converted to an efficiency (energy ratio) of 60% as it is assumed that the safety hammer had an efficiency of 60% in the field during testing. The SPT values are presented on the boring logs provided in Appendix B.

4. GEOTECHNICAL FINDINGS

The subsurface conditions encountered during ODOT's 1992 explorations are described in the following subsections and on each boring log presented in Appendix B. The subsurface soil and groundwater characterizations included herein, including summary test data, are based on the subsurface findings from the geotechnical explorations performed by ODOT as part of an investigation for Bridge Structures LAW 93 (0463)(0513)(1631)(1985)(2252).

4.1. Subsurface Conditions

The subsurface profile at the referenced bridge site is generally consistent with the geological model for the project in regards to the materials encountered. The subsurface profile at the proposed bridge improvement site consists of a pavement section underlain by about 5 ft of natural residual soil followed by sandstone bedrock. The existing pavement section was comprised of 5 to 6 inches of asphalt pavement and about 5 to 12 inches of roadway base material. The natural residual soil at the site was comprised of Gravel with Sand and Silt (A-2-4) that can be described as having a relative density of loose to medium dense. Bedrock was encountered within the borings performed at an approximate elevation of 725 ft above mean sea level (amsl) and consisted of brown and gray sandstone.

4.1.1. Overburden Soil

At the proposed bridge site, one soil stratum was identified below the existing pavement section. In general, the overburden material consisted of natural residual soil. This soil extended to bedrock which was encountered at depths ranging between 5.0 and 5.1 ft bgs (approximate elevation 725 ft amsl) and is classified on the borings logs as Gravel with Sand and Silt (A-2-4). The relative density of the residual soil encountered in this stratum can be described as loose to medium dense correlating to SPT N values between 13 and 19 blows per foot (bpf). Natural moisture contents of the residual soil ranged from 13 to 20 percent.

4.1.2. Bedrock

Bedrock was encountered in each of the borings performed at the bridge site and was classified as sandstone. The bedrock surface was present at depths between about 5.0 and 5.1 ft bgs. Based on the bedrock surface encountered in the borings across the bridge site, it appears that the bedrock surface is relatively flat and is estimated to be present at an elevation of about 725 ft amsl.

Rock coring was performed in each of the borings once auger refusal was encountered. Based on the rock core samples obtained from the boreholes, the bedrock is described as medium-grained, friable and thin to medium bedded. Recoveries of the bedrock core runs 100 percent at each borehole. Rock Quality Designation (RQD) values of the rock cores were not recorded.

4.1.3. Groundwater

Groundwater measurements were taken during the boring drilling procedures for each borehole. Groundwater was not observed during drilling in either boring performed as part of the ODOT performed bridge foundation exploration. It should be noted that groundwater is affected by many hydrologic characteristics in the area and may vary from those measured at the time of the exploration. The specific groundwater readings are included on the boring logs located within Appendix B.

5. ANALYSES AND RECOMMENDATIONS

We understand that the existing 23-ft long, single span bridge designated as LAW-93-2132 is proposed to be replaced. Based on project information provided by Korda, replacement options being considered consist of either a single-span slab bridge with full height abutments or a three-sided culvert structure. These proposed structures will likely be supported by the natural bedrock through the use of either a shallow foundation or drilled shaft foundation system. For the analysis purposes, it has been assumed that: 1) the flowline elevation at the existing bridge site is approximately 722 ft amsl; 2) groundwater elevation is approximately 1 feet above flowline elevation; 3) a shallow foundation will bear on the sandstone bedrock at a depth of 1 ft below flowline elevation (approximate elevation 721 ft amsl); and, 4) a drilled shaft foundation would extend to a depth of 4.5 ft below the flowline elevation (approximate elevation 717.5 ft amsl).

A foundation review was completed for both a shallow spread foundation system as well as a drilled shaft foundation for the referenced bridge based on the soil and bedrock characteristics gathered during the geotechnical exploration (i.e., SPT results, laboratory test results, etc.) and our geotechnical experience. Our analyses were performed according to LRFD BDS and BDM criteria. Foundation design parameters and factored bearing/drilled shaft resistances for the evaluated foundation systems are presented in their respective subsections below.

A review of rock slope cuts was also performed for the potential rock cut to be performed along the current east creek bank located northeast of the existing bridge. As widening of the existing roadway and construction of a retaining wall is proposed along the existing west creek bank (northeast of the proposed bridge) rock excavation may be required within the east creek bank for hydraulic purposes.

5.1. Soil Profile for Analysis

For analysis purposes, each substructure location (boring log) was reviewed and a generalized material profile was developed for analysis. Utilizing the generalized soil profile, engineering properties for each soil strata were estimated based on their field (i.e., SPT N₆₀ values, hand penetrometer values, etc.) and laboratory (i.e., Atterberg Limits, grain size, etc.) test results using correlations provided in published engineering manuals, research reports and guidance documents. The developed soil profile and estimated engineering soil properties for use in analysis (with sited correlation/reference material) is summarized within Table 2 below.

Table 2: Overburden Soil - Soil Profile and Estimated Engineering Properties

Bridge LAW-93-2132: Soil Profile and Estimated Engineering Properties				
Soil Description	Unit Weight ⁽¹⁾ (pcf)	Undrained Shear Strength ⁽²⁾ (psf)	Effective Cohesion ⁽³⁾ (psf)	Effective Friction Angle ⁽³⁾ (degrees)
Gravel with Sand and Silt Elevation: 730.0 ft - 724.9 ft (B-001-0-92) 730.0 ft - 725.0 ft (B-002-0-92)	125	-	-	35
Notes: 1. Values interpreted from Geotechnical Bulletin 7 Table 1. 2. Values calculated from Terzaghi and Peck (1967) if N ₆₀ <52, else Stroud and Butler (1975) was used. 3. Values interpreted from Geotechnical Bulletin 7 Table 2.				

5.1. Shallow Foundation Analysis

A shallow foundation bearing analysis was performed at the proposed bridge location in accordance with the LRFD BDS. Specifically, procedures in Section 10.6.3.2 of the LRFD BDS were used to calculate the factored bearing resistance. Based on the assumption that shallow foundations require a minimum embedment depth of 1 ft into bedrock and a minimum of 1 ft below the Olive Creek flowline, it is anticipated that footings will bear on the sandstone bedrock at an elevation of 721 ft amsl or lower. In accordance with the LRFD BDS and with limited bedrock engineering properties provided within the available boring logs, Table C10.6.2.6.1-1 "Presumptive Bearing Resistance for Spread Footing Foundations at the Service Limit State" in Section 10.2.6 of the LRFD BDS was used to estimate the nominal bearing resistance of the sandstone bedrock. Based on Table C10.6.2.6.1-1, the sandstone bedrock has a nominal bearing resistance of 16 kips per square foot (ksf). In design, the recommended nominal bearing resistance should be multiplied by a Resistance Factor of 0.45 (per Table 10.5.5.2.2-1 of the LRFD BDS for a factored bearing resistance of 7.2 ksf. Settlement of shallow foundations bearing on rock is anticipated to be negligible.

The shallow foundation system was assumed to consist of continuous spread footings bearing on competent sandstone bedrock as encountered approximately 1 ft below the assumed streambed elevation. It should be noted that at the time of this document, a depth of scour analysis had not been conducted and competent bedrock is assumed at a depth of 1 ft below streambed elevation; therefore, it is assumed that the bearing elevation used for analysis is below the depth of potential scour and/or the bedrock would not be subject to scour. Furthermore, based on discussions with the ODOT Office of Structural Engineering, the use of a shallow foundation embedded 1 ft into the sandstone bedrock is sufficient for scour purposes. If the assumed foundation bearing elevation is later determined to be above the depth of potential scour, NEAS should be notified and further analysis be performed.

5.2. Drilled Shaft Foundation Analysis

A drilled shaft foundation analysis was performed at the proposed bridge location in accordance with the LRFD BDS. Specifically, procedures in Section 10.8.3.5 of the LRFD BDS were used to calculate the factored resistance of drilled shafts.

In design calculations, NEAS recommends that nominal and factored resistances of deep foundation elements be calculated utilizing the tested unconfined compressive strength of the sandstone bedrock encountered at the site. However; as the 1992 ODOT performed site exploration and laboratory program did not include unconfined compressive strength testing on the cored sandstone, Table 202.1 “Rock properties of typical rocks found in Ohio” from ODOT’s Rock Slope Design Guide was referenced to estimate bedrock unconfined compressive strength properties. Based on Table 202.1, the low-end friable sandstone can be assumed to have an unconfined compressive strength of 2,400 psi. Utilizing the recommended unconfined compressive strength and classification information presented in the boring logs, drilled shaft tip and side resistance values were calculated per Section 10.8.3.5.4 "Estimation of Drilled Shaft Resistance in Rock" of the LRFD BDS. Based on our analysis, drilled shaft tip resistance can be calculated using a nominal tip resistance of 860 ksf. The calculated nominal tip resistance value should then be multiplied by a resistance factor of 0.50 to obtain a Factored Shaft Tip Resistance Value. Drilled shaft side resistance can be calculated using a nominal side resistance of 27 ksf; which should then be multiplied by a resistance factor of 0.55 to obtain a Factored Shaft Side Resistance Value. These two values can then be summed to result in the Factored Shaft Resistance of a Single-Drilled Shaft. Note that the side resistance associated with the overburden is ignored in this calculation. Furthermore, the upper 2 feet of rock is ignored when considering side resistance, and the base resistance is not considered unless the socket extends into the bedrock at least 1.5 times the shaft diameter (1.5*D).

5.3. Rock Slope Cut Recommendations

A review of the bedrock conditions along the east Olive Creek bank, northeast of the existing bridge and along the proposed retaining wall location was performed to determine potential rock cut slopes. Our review was based on the project boring logs, photographs of the referenced area, and project cross-sections. The rock slope review was performed in general accordance with ODOT's Rock Slope Design Guide (RSDG) dated January 2016.

Utilizing the available information, it is our opinion that the exposed rock at the proposed cut location can be visually described as moderately strong or stronger sandstone based on SGE 605.5. Therefore, the sandstone at the site can be described as a “Competent Unit” per Section 300 *Rock Slope Design Procedure* of the RSDG. In accordance with Section 303.1 *Competent Design Units*, rock slope may be determined based on Rock Quality Designation (RQD); however, as RQD information is not available for the site bedrock, NEAS has assumed the RSDG mid-range of 51% to 75% RQD for the site sandstone. It should be noted that the assumed 51% to 75% RQD range is based on photographs of the proposed rock cut area and the existing slope of the currently exposed rock. Based on a designation of a Competent Unit of rock with an RQD ranging from 51% to 75%, a cut slope of 0.5 Horizontal to 1 Vertical (0.5H:1V) can be used per Section 303.1 of the RSDG. It should be noted that although it is our opinion that a 0.5H:1V rock slope may be used in design, our opinion is solely based on the referenced available information and therefore it is recommended that the assumed RQD range be verified in the field through an accepted ODOT method (i.e., additional rock cores, geologist site visit, etc.). If the assumed RQD cannot be

verified, it is recommended that the site sandstone be assumed be have an RQD of less than 50% and a rock slope of 1H:1V be used in design.

5.4. Geotechnical Bulletin 1 Analysis

A proposed pavement subgrade analysis in accordance with ODOT's *Geotechnical Bulletin 1* (GB1) was performed within the project limits of SR-93 to evaluate the soil characteristics for use in pavement design and identify pavement design parameters. The subgrade analysis was performed utilizing the ODOT provided *GB1: Subgrade Analysis Spreadsheet* (GB1_SubgradeAnalysis.xls, Version 14.2 dated January 23, 2018) using the subgrade soil data obtained in the borings. The subgrade analysis parameters recommended for use in pavement design for SR-93 is presented in Table 3 below. Provided in the table are average Plasticity Index (PI) values, ranges of maximum, minimum and average N_{60L} values as well as the design CBR value recommended for use in pavement design. GB1 analysis output for the roadway segment can be found in Appendix C.

Table 3: Pavement Design Values

Maximum N _{60L}	Minimum N _{60L}	Average N _{60L}	Average PI Values	Design CBR
50	13	27.0	8.0	13

6. QUALIFICATIONS

This investigation was performed in accordance with accepted geotechnical engineering practice for the purpose of characterizing the subsurface conditions at the site of proposed Bridge LAW-93-2271 that carries SR-93 over Oliver Creek. This report has been prepared for Korda Engineering, ODOT and their design consultants to be used solely in evaluating the soils underlying the project site and presenting geotechnical engineering recommendations specific to this project. The assessment of general site environmental conditions or the presence of pollutants in the soil, rock and groundwater of the site was beyond the scope of this geotechnical exploration. Our recommendations are based on the results of our field explorations, laboratory tests results from representative soil samples, and geotechnical engineering analyses. The results of the field explorations and laboratory tests, which form the basis of our recommendations, are presented in the appendices as noted. This report does not reflect any variations that may occur between the borings or elsewhere on the site, or variations whose nature and extent may not become evident until a later stage of construction. In the event that any changes in the nature, design or location of the proposed bridge replacement project is made, the conclusions and recommendations contained in this report should not be considered valid until they are reviewed, and have been modified or verified in writing by a geotechnical engineer.

It has been a pleasure to be of service to Korda Engineering in performing this geotechnical exploration for the LAW-93-22.71 project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

Jawdat Siddiqi, P.E.
Principal

REFERENCES

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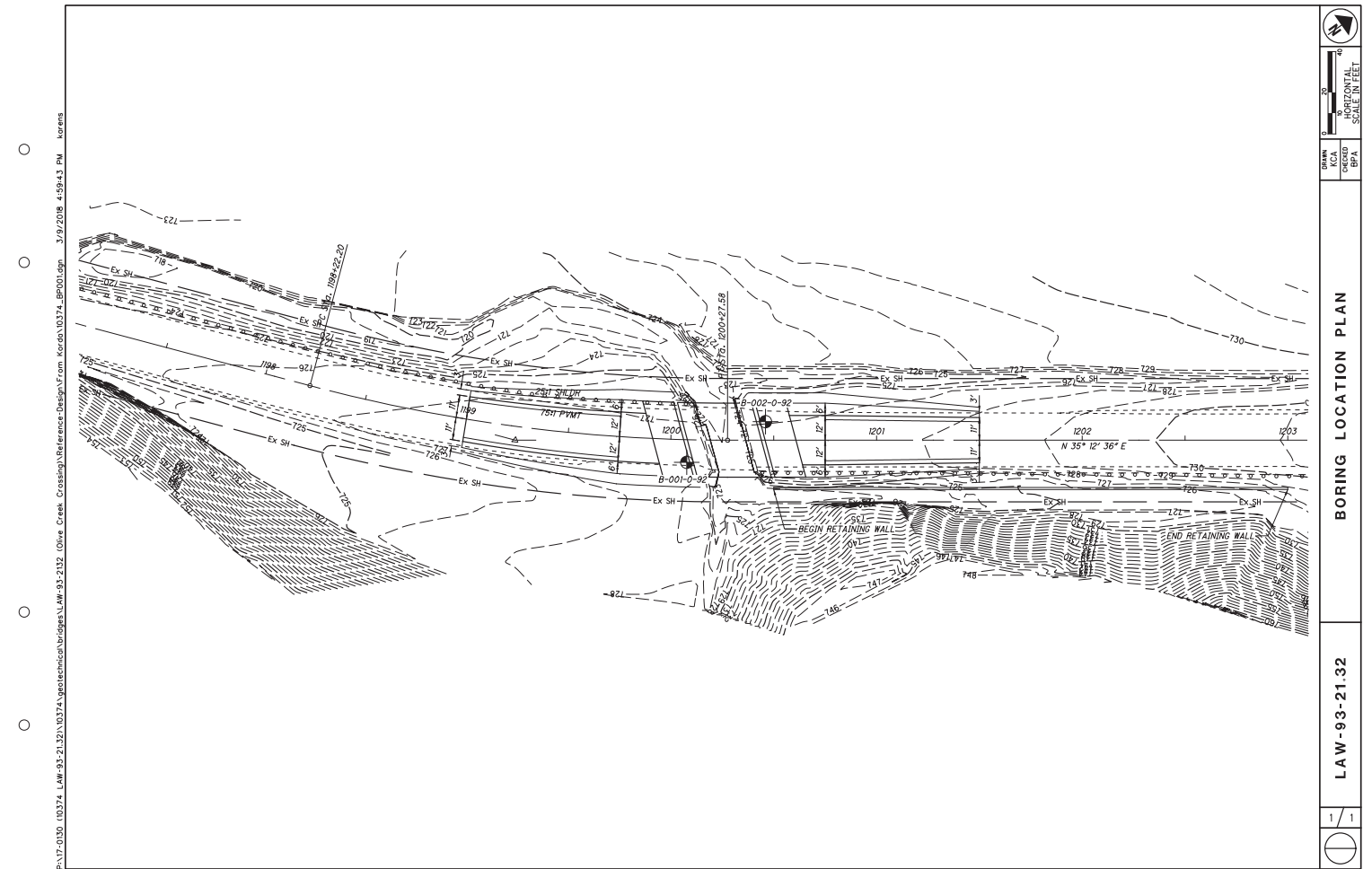
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APPENDIX A

BORING LOCATION PLAN



APPENDIX B

BORING LOGS & LABORATORY TEST RESULTS

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/13/92 Sampler Type SS Dia. 1 3/8" Water Elev. _____
 Date Completed 7/13/92 Casing Length _____ Dia. _____

Project Identification: LAWRENCE
LAW-93-2252
OVER OLIVE CREEK
STRUCTURE FOUNDATION INVESTIGATION

Boring No. B-1 Station & Offset 99+81.11' RT. (CULVERT) APPROX. Surface Elev. 730.0'

Elev.	Depth	Std. Pen. (N)	Rec. R.	Loss ft.	Description	Field No.	Lab. Nos.	Physical Characteristics										SHTL Class
								% Agg.	% S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.			
730.0	0																	
729.2	0.8	AUGERED			ASPHALT												VISUAL	
727.5	2.5				TOP OF ROCK													
725.0	4.5	4 5/8 50(0.1')			BROWN SILTY GRAVELLY SAND	1	72538	28	23	20	14	15	29	8	13		A-2-4	
724.9	6.0				BROWN SANDSTONE WEATHERED	2	72539	-	-	-	-	-	-	-	-	5	VISUAL	
720.8	8.0		4.1	0.0	SANDSTONE, BROWN, GRAY, MEDIUM-GRAINED, MICACEOUS, FRIABLE, THIN TO MEDIUM-BEDDED. NO CORE LOSS.													
	10.0				BOTTOM OF BORING													
	12.0																	
	14.0																	
	16.0																	
	18.0																	
	20.0																	
	22.0																	
	24.0																	
	26.0																	
	28.0																	
	30.0																	
	32.0																	
	34.0																	
	36.0																	

Particle Sizes: Agg. >2.00mm, Coarse Sand = 2.00 - 0.42mm, Fine Sand = 0.42 - 0.074 mm, Silt = 0.074 - 0.005 mm, Clay <0.005 mm

OHIO DEPARTMENT OF TRANSPORTATION
REPORT ON SOIL

Order Code : 01A Co. Rt.#, & Section : LAW-93-2252
Project Code : 4220 So. No. : 72538 Sample # : 001
Sta. & Offset: 99+81, 11R Sampled By : HAGER-PONN
Depth- From-To 02.5-04.0

SIEVE ANALYSIS TOTAL % PASSING		SOIL MORTAR(%) SIEVE ANALYSIS		OTHER TEST DATA ---- % ----	
3"	100	Aggregate :	28	Liquid	
2"	100			Limit :	29
1"	100	Coarse Sd.:	23		
3/4"	100			Plasticity	
1/2"	96	Fine Sand :	20	Index :	8
3/8"	94				
No.4	84	Silt No. :	14	Water	
No.10	72			Cont. :	13
No.40	49	Clay Sm. :	15		
No.200	29				

OHIO CLASSIFICATION: A-2-4

Visual Description of Material-
As Received : BR M'S SOME C W/ST

Visual Code B - Description :

Visual Moisture : K

OHIO DEPARTMENT OF TRANSPORTATION
REPORT ON SOIL

Order Code : 01B Co. Rt.#, & Section : LAW-93-2252
Project Code : 4220 So. No. : 72539 Sample # : 002
Sta. & Offset: 99+81, 11R Sampled By : HAGER-PONN
Depth- From-To 05.0-05.1

SIEVE ANALYSIS TOTAL % PASSING		SOIL MORTAR(%) SIEVE ANALYSIS		OTHER TEST DATA ---- % ----	
3"		Aggregate :		Liquid	
2"				Limit :	
1"		Coarse Sd.:			
3/4"				Plasticity	
1/2"		Fine Sand :		Index :	
3/8"					
No.4		Silt No. :		Water	
No.10				Cont. :	5
No.40		Clay Sm. :			
No.200					

OHIO CLASSIFICATION: 0

Visual Description of Material-
As Received : BR S & SST

Visual Code B - Description :

Visual Moisture : K

Brown Sandstone, weathered

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

B-002-0-92

2
2

LOG OF BORING

Date Started 7/14/92 Sampler Type SS Dia. 1 3/8" Water Elev. -
Date Completed 7/14/92 Casing Length Dia.

Project Identification: LAWRENCE
LAW-93-2252
OVER OLIVE CREEK
STRUCTURE FOUNDATION INVESTIGATION

Boring No. B-2 DATUM Station & Offset 100+19, 9' LT. (CULVERT) APPROX. Surface Elev. 730.0'

Elev.	Depth	Std. Pen. (IN)	Rec. #	Loss ft.	Description	Field No.	Lab. Nos.	Physical Characteristics								SHTL Class
								% Agg.	% S.	% F.S.	% Silt	% Clay	LL	PI	W.C.	
730.0	0															
728.5	2	AUGERED			ASPHALT											VISUAL
727.5	4	3/12/7			BROWN SILTY SANDY GRAVEL TOP OF ROCK	3	72540	37	12	22	22	7	NP	NP	20	A-2-4
725.0	6															
	8		5.0	0.0	SANDSTONE, BROWN, GRAY, MEDIUM-GRAINED, MICACEOUS, FRIABLE, THIN TO MEDIUM-BEDDED. NO CORE LOSS.											
720.0	10															
	12				BOTTOM OF BORING											
	14															
	16															
	18															
	20															
	22															
	24															
	26															
	28															
	30															
	32															
	34															
	36															

Particle Sizes: Agg. >2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074 mm, Silt = 0.074-0.005 mm, Clay <=0.005 mm

OHIO DEPARTMENT OF TRANSPORTATION
REPORT ON SOIL

Order
Code : 01A

Co. Rt.#.
& Section : LAW-93-2252

Project
Code : 4220

So. No. : 72540 Sample # : 003

Sta. &
Offset: 100+19, 9L

Sampled
By : HAGER-PONN

Depth-
From-To 02.5-04.0

SIEVE ANALYSIS		SOIL MORTAR(%)		OTHER TEST DATA	
TOTAL % PASSING		SIEVE ANALYSIS		---- % ----	
3"	100	Aggregate :	37	Liquid	
2"	100		-----	Limit :	NP
1"	100	Coarse Sd.:	12		
3/4"	100		-----	Plasticity	
1/2"	100	Fine Sand :	22	Index :	NP
3/8"	92		-----		
No.4	78	Silt No. :	22	Water	
No.10	63		-----	Cont. :	20
No.40	51	Clay Sm. :	7		
No.200	29		-----		

OHIO CLASSIFICATION: A-2-4

Visual Description of Material-
As Received : BR M'S W/C ST & SST FRGT

Visual Code B - Description :

Visual Moisture : K+

APPENDIX C

GB1 ANALYSIS

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES

Geotechnical Bulletin GB1

LAW-93-21.32
10374

Replace the deficient concrete slab bridge at mile marker 21.32 on SR 93 over Olive Creek in Lawrence County.

NEAS Inc.

Prepared By: Brendan P. Andrews, P.E.
Date prepared: 3/6/2018

Brendan P. Andrews
2868 East Kemper Road
Cincinnati, OH 45241

513) 337-9823
brendan.andrews@neasinc.com

NO. OF BORINGS: 2



V. 14.2

V. 14.2 1/23/2018

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-92	SR-93	1200+08	11	RT	ODOT-Soil Max		730.0	730.0	0.0
2	B-002-0-92	SR-93	1200+47	9	LT	ODOT-Soil Max		730.0	730.0	0.0



14.2

1/23/2018

[illegible]

PID: 10374

County-Route-Section: LAW-93-21.32
No. of Borings: 2

Geotechnical Consultant: NEAS Inc.
Prepared By: Brendan P. Andrews, P.E.
Date prepared: 3/6/2018

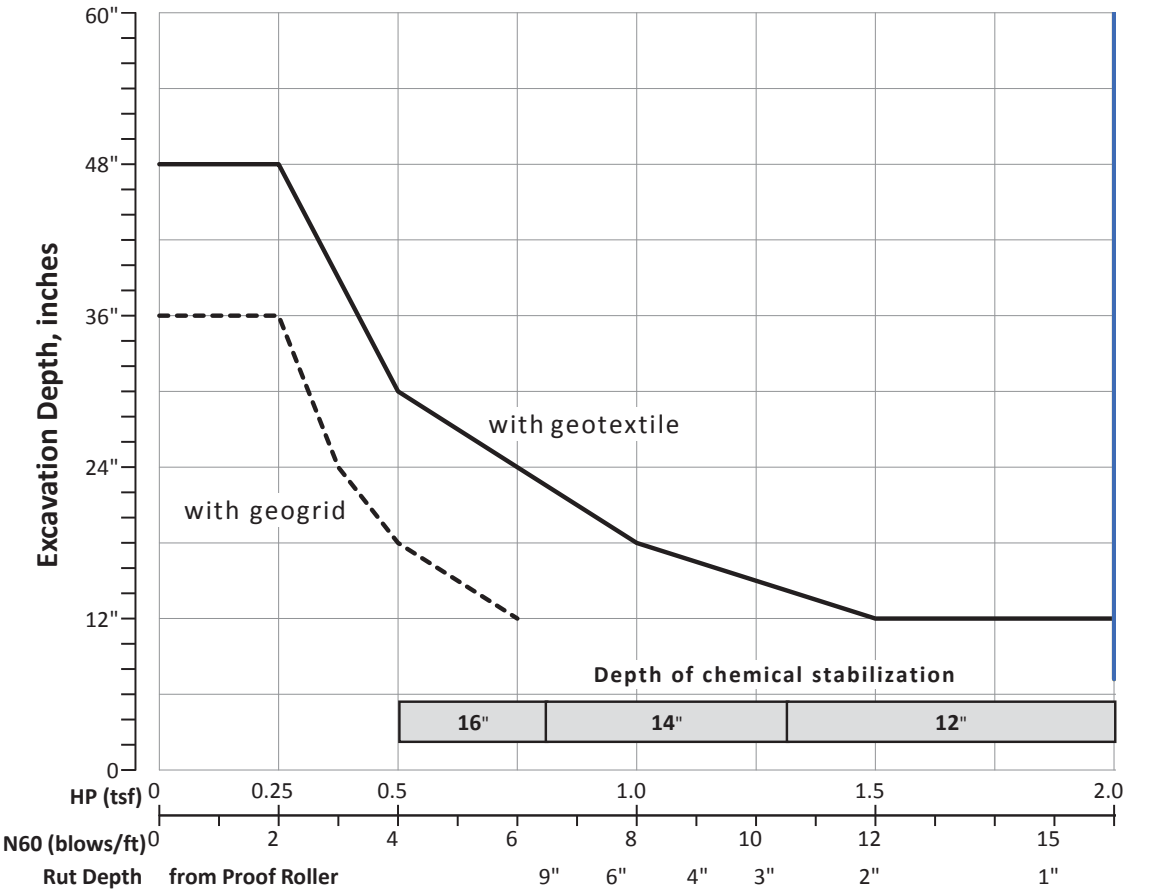
Chemical Stabilization Options			Excavate and Replace Stabilization Options		Design CBR	13
320	Rubblize & Roll	Option	Global Geotextile Average(N60L):	12"		
206	Cement Stabilization	Option	Override(HP):	12"		
	Lime Stabilization	No	Global Geogrid Average(N60L):	0"		
206	Depth	NA	Override(HP):	0"		

% Samples within 6 feet of subgrade				Excavate and Replace at Surface		% Proposed Subgrade Surface	
N ₆₀ ≤ 5	0%	HP ≤ 0.5	0%	Average		Unstable & Unsuitable	0%
N ₆₀ < 12	0%	0.5 < HP ≤ 1	0%	Maximum	0"	Unstable	0%
12 ≤ N ₆₀ < 15	33%	1 < HP ≤ 2	0%	Minimum	0"	Unsuitable	0%
N ₆₀ ≥ 20	33%	HP > 2	0%				
M+	0%						
Rock	0%						
Unsuitable	33%						

	N ₆₀	N _{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M _C	M _{OPT}	GI
Average	27	16		29	21	8	18	11	29	13	7	0
Maximum	50	19	0.00	29	21	8	22	15	29	20	10	0
Minimum	13	13	0.00	29	21	8	14	7	29	5	0	0

Classification Counts by Sample																			
ODOT Class	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Percent	33%	0%	0%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
% Rock Cohesive Granular	33%	67%										0%							100%
Surface Class Count	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Surface Class Percent	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE		
Calculated Average	New Values	Check to Override
	2.00	<input checked="" type="checkbox"/> HP
16.00		<input type="checkbox"/> N60L

Average HP
Average N_{60L}