CUY - IR 90-18.22/VAR
210489 PID - 92069
Dist 12 9/16/2021

Contract Proposal available @ www.contracts.dot.state.oh.us

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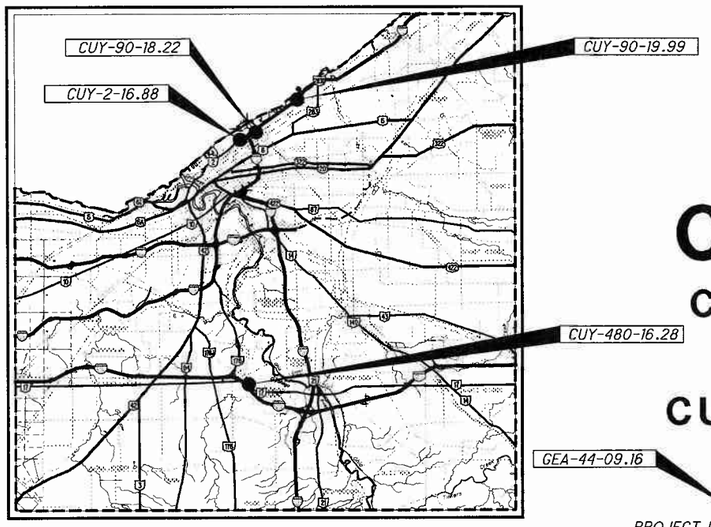
STATE OF OHIO

DEPARTMENT OF TRANSPORTATION

CUY-90-18.22/VAR

CITY OF CLEVELAND, VILLAGE OF BROOKLYN HEIGHTS AND NEWBURY TOWNSHIP CUYAHOGA AND GEAUGA COUNTIES



PROJECT LOCATION MAP SHOWN ON SHT 2

LOCATION MAP

LATITUDE: 41° 31' 5" LONGITUDE: 81° 40' 24"

SCALE IN MILES
0 2 4 6 8

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

DESIGN DESIGNATION

	CUY-2-1688	CUY-90-1822	CUY-90-1999	CUY-480-1628	GEA-44-0916
CURRENT ADT (2021)	21000	112000	125700	107500	7300
DESIGN YEAR ADT (2051)	22000	129000	126000	123600	8400
DESIGN HOURLY VOLUME (2051)	2200	12900	12600	12360	1260
DIRECTIONAL DISTRIBUTION	0.50	0.50	0.50	0.50	0.50
TRUCKS (24 HOUR B&C)	1470	5600	6300	9700	800
DESIGN SPEED	55	70	70	70	50
LEGAL SPEED	50	60	60	60	45
FUNCTIONAL CLASSIFIFCATION	OTHER FREEWAY AND EXPRESSWAY	INTERSTATE	INTERSTATE	INTERSTATE	PRINCIPAL ARTERIAL
NHS PROJECT	YES	YES	YES	YES	NO

DESIGN EXCEPTIONS

NONE

UNDERGROUND UTILITIES
Contact Two Working Days Before You Dig
OHIO811.org Before You Dig
OHIO811, 8-1-1, or 1-800-362-2764
(Non-members must be called directly)

PLAN PREPARED BY:
KS ASSOCIATES
KS Associates, Inc.
260 Burns Road, Suite 100
Elyria, OH 44035
P 440 365 4730
F 440 365 4790
www.ksassociates.com

ENGINEERS SEAL:

STATE OF OHIO HAMID V. HOMAEE 57241 REGISTERED PROFESSIONAL ENGINEER

SIGNED:
DATE: 1/5/2021

INDEX OF SHEETS:

PROJECT DESCRIPTION

REHABILITATION OF FIVE EXISTING CULVERTS LOCATED IN THE CITY OF CLEVELAND (SR 2 & IR 90), THE VILLAGE OF BROOKLYN HEIGHTS (IR 480) AND NEWBURY TOWNSHIP (SR 44).

EARTH DISTURBED AREAS

SITE:	1	2	3	4	5	
PROJECT EARTH DISTURBED AREA:	0.1	0.1	0.1	0.6	0.2	ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA:	0.4	0.4	0.4	0.3	0.2	ACRES
NOTICE OF INTENT EARTH DISTURBED AREA:	N/A	N/A	N/A	N/A	N/A	ACRES

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

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 6/8/21 DISTRICT DEPUTY DIRECTOR

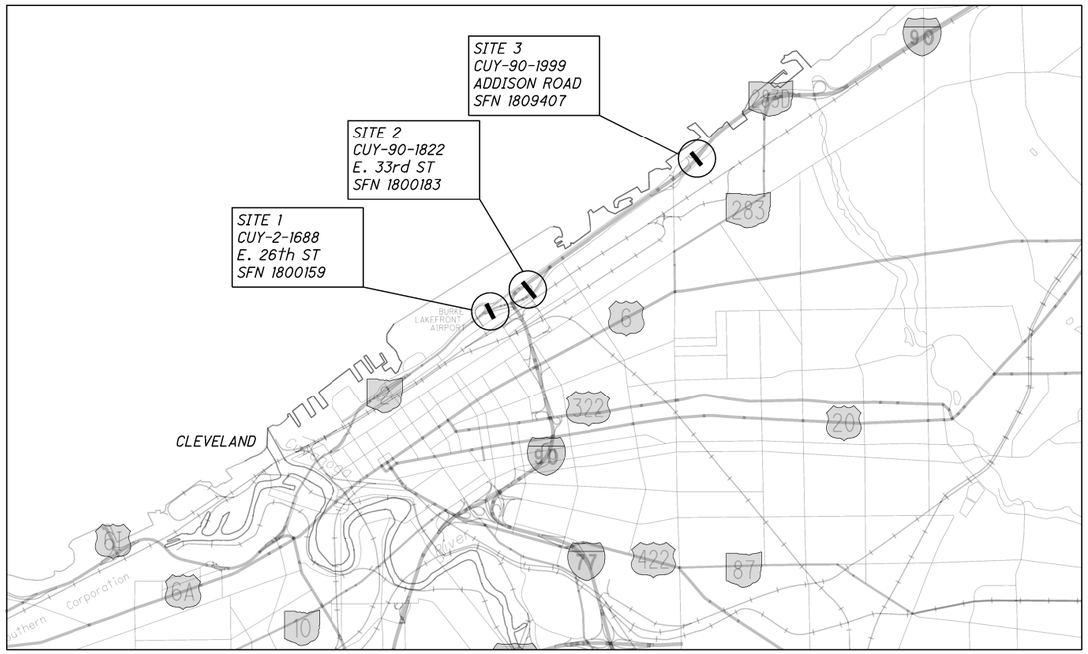
APPROVED Jack Marchbanks DS
DATE 7/28/21 DIRECTOR, DEPARTMENT OF TRANSPORTATION

STANDARD CONSTRUCTION DRAWINGS

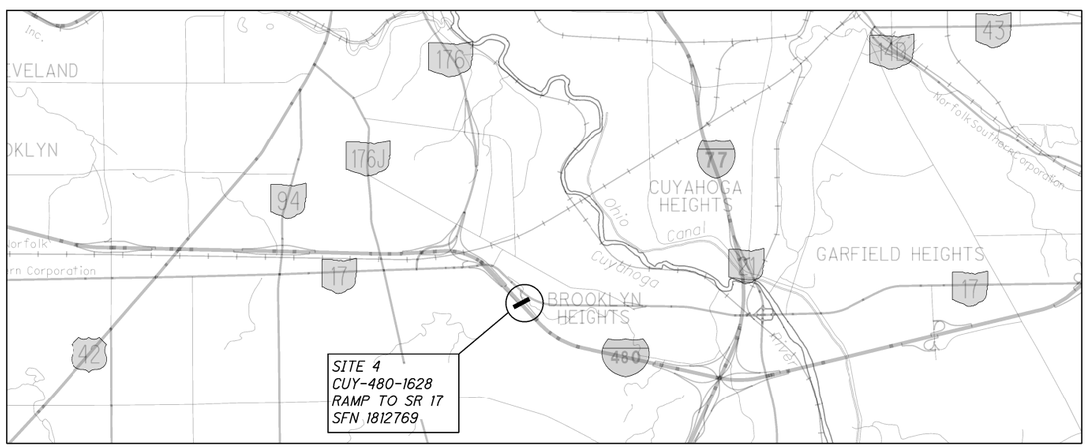
CB-1.1	7/19/19	F-3.2	7/18/14	MT-96.20	7/15/16				
CB-2.1	7/20/18	F-3.3	7/19/13	MT-97.10	4/19/19				
CB-2.2	7/20/18	F-3.4	7/19/13	MT-97.11	1/20/17				
CB-2.3	1/15/16			MT-99.30	1/19/18				
		MGS-1.1	1/19/18	MT-101.80	1/16/15				
HW-1.1	7/20/18	MGS-2.1	1/19/18	MT-103.10	1/19/18				
		MGS-4.3	1/18/13	MT-104.10	10/16/15				
MH-1.1	1/15/16								
MH-1.2	1/15/16	RM-4.2	10/24/19						
MH-1.3	1/18/13								
MH-3.1	1/18/13	MT-95.30	7/19/19						
		MT-95.40	1/20/17						
DM-1.1	7/21/17	MT-95.41	7/21/17						
DM-1.2	1/18/13	MT-95.45	4/19/19						
		MT-95.50	7/21/17						
F-1.1	7/19/13	MT-96.11	1/18/19						

SUPPLEMENTAL SPECIFICATIONS		SPECIAL PROVISIONS
800-2019	7/16/21	WATERWAY PERMIT
832	10/19/18	11/10/2020
863	10/17/14	

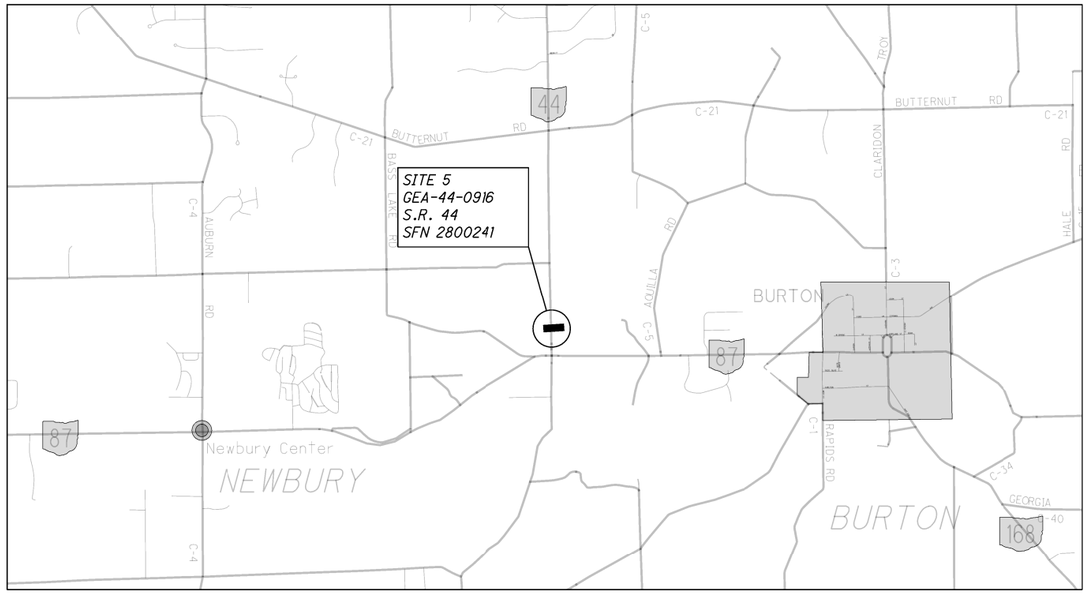
FEDERAL PROJECT NO. E190917
PID NO. 92069
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
CUY-90-18.22/VAR
1
63



SITES 1-3
CUYAHOGA COUNTY



SITE 4
CUYAHOGA COUNTY



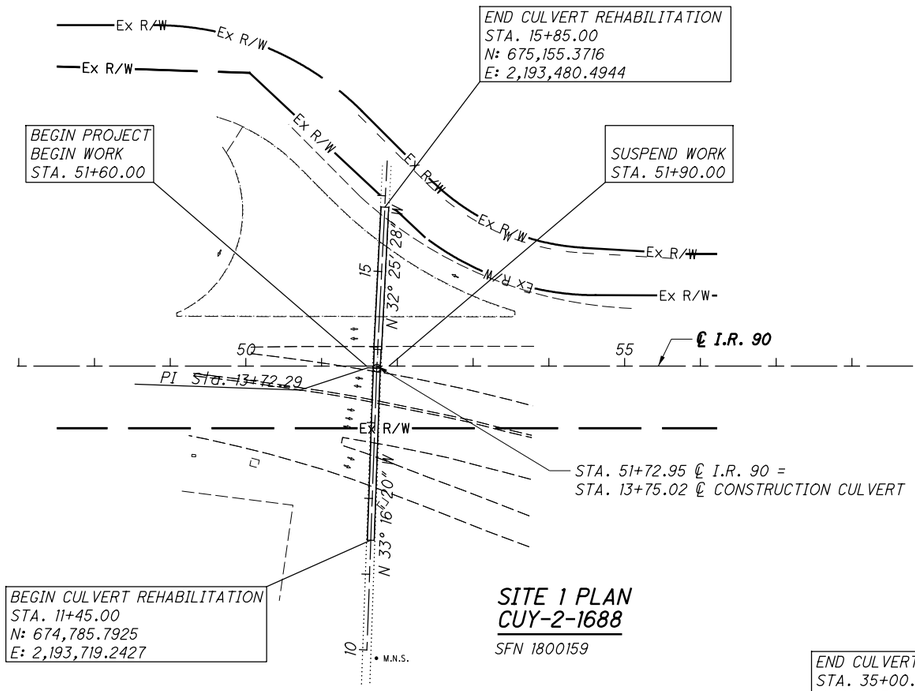
SITE 5
GEAUGA COUNTY

CALCULATED MEM
CHECKED SJP

HORIZONTAL SCALE IN FEET
0 1500 3000 6000

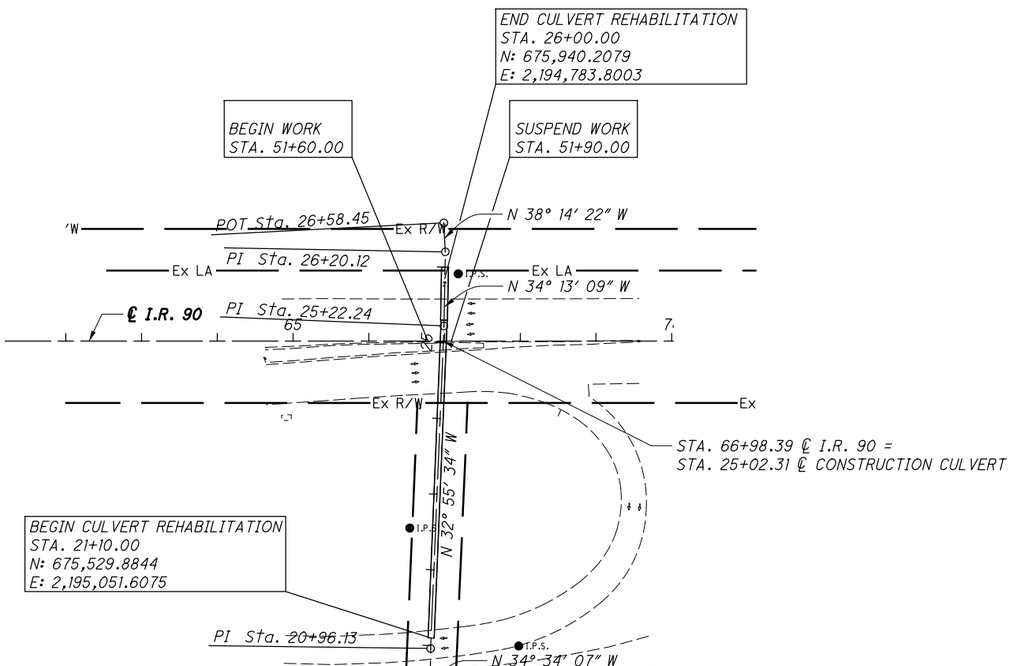
PROJECT LOCATION MAP

CUY-90-18.22/VAR



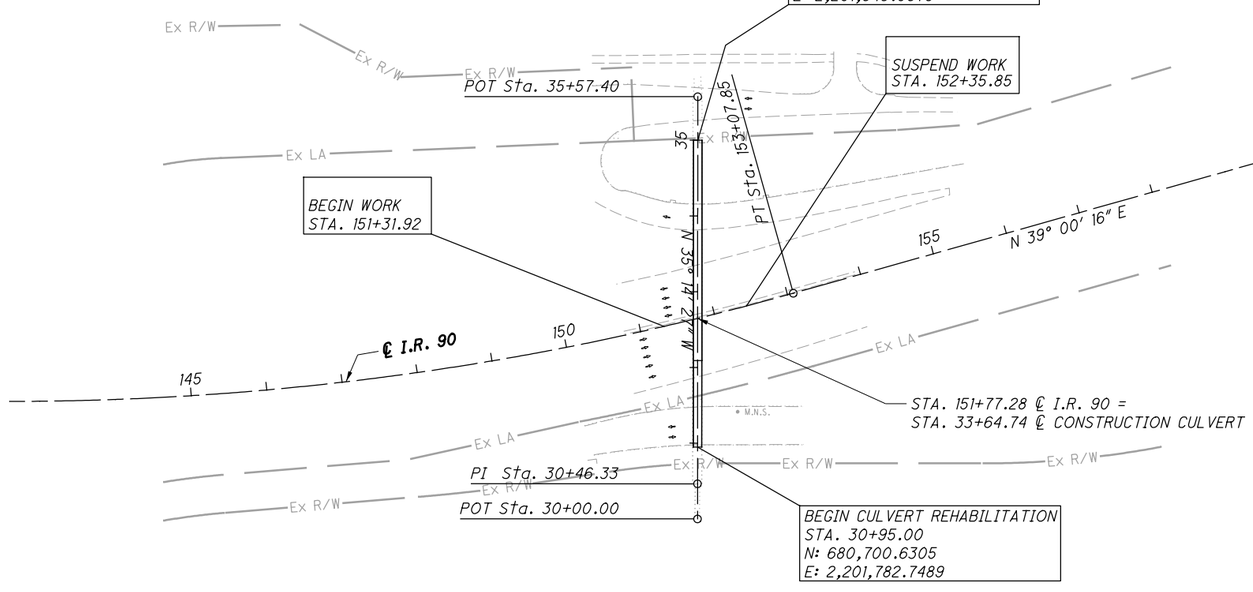
SITE 1 PLAN
CUY-2-1688

SFN 1800159



SITE 2 PLAN
CUY-90-1822

SFN 1800183



SITE 3 PLAN
CUY-90-1999

SFN 1809407

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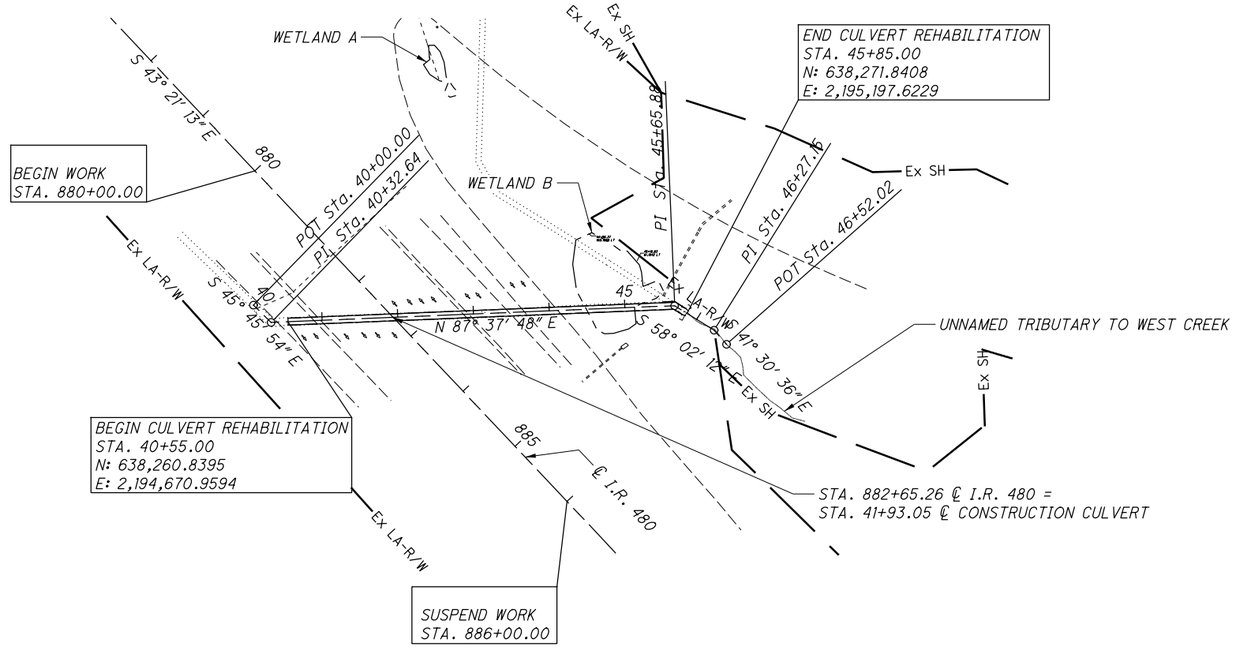
HORIZONTAL SCALE IN FEET
0 50 100 200

CALCULATED MEM
CHECKED SJP

SCHEMATIC PLAN
CULVERT SITES 1, 2 & 3

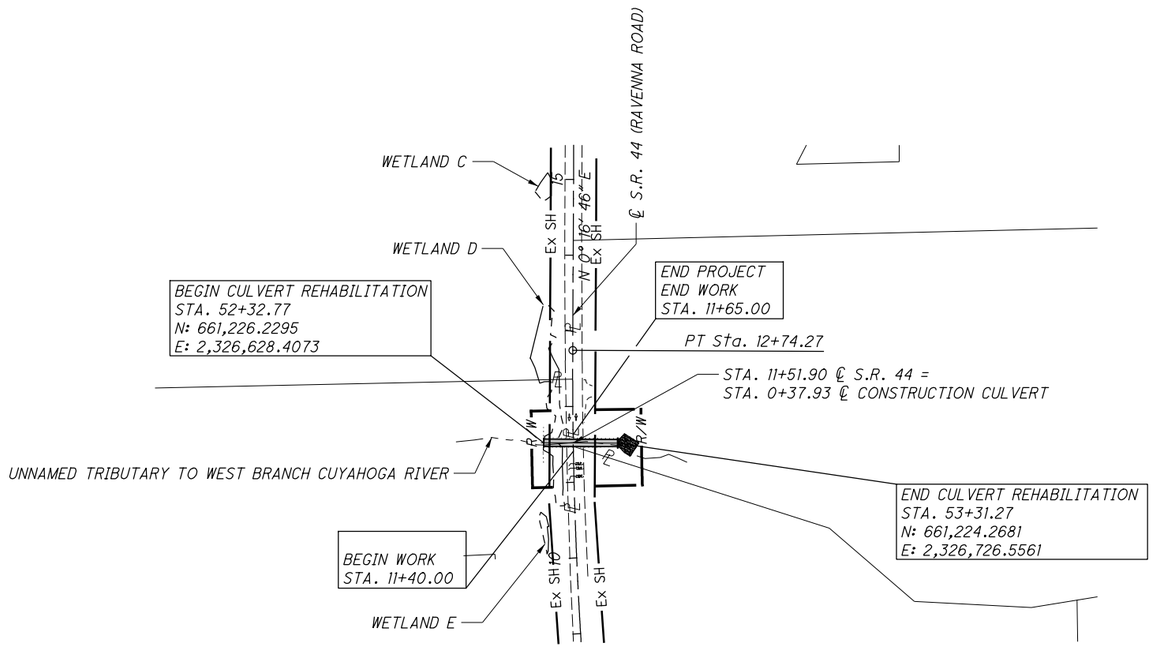
CUY-90-18.22/VAR

3
63



SITE 4 PLAN
CUY-480-1628

SFN 1812769



SITE 5 PLAN
GEA-44-0916

SFN 2800241

HORIZONTAL SCALE IN FEET
0 50 100 200

CALCULATED MEM
CHECKED SJP

SCHEMATIC PLAN
CULVERT SITES 4 & 5

CUY-90-18.22/VAR

4
63

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UTILITIES

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

CITY OF CLEVELAND
DIVISION OF PUBLIC POWER
1300 LAKESIDE AVE.
CLEVELAND, OHIO 44114
ATTN: CHRIS HIRZEL
(216) 664-3922, X115
CHIRZEL@CPP.ORG

CITY OF CLEVELAND
DIVISION OF WATER
1201 LAKESIDE AVE.
CLEVELAND, OHIO 44114
ATTN: FRED ROBERTS
(216) 664-2444 X5590
FRED ROBERTS@CLEVELANDWATER.COM

CITY OF CLEVELAND
DIVISION OF WATER POLLUTION CONTROL
12302 KIRBY ROAD
CLEVELAND, OHIO 44108
ATTN: RACHID ZOGHAIB
(216) 664-3785
RZOGHAIB@CLEVELANDWPC.COM

AT&T
13630 LORAIN AVE., 2ND FLOOR
CLEVELAND, OHIO 44111
ATTN: SCOTT KLEBE
(216) 476-6057
SK1274@ATT.COM

CEI FIRST ENERGY
THE ILLUMINATING COMPANY
6896 MILLER ROAD
BRECKSVILLE, OHIO 44141
ATTN: JEFFREY DENNISON
(440) 994-8249
DENNISONJ@FIRSTENERGYCORP.COM

DOMINION ENERGY OHIO
320 SPRINGSIDE DRIVE, SUITE 320
AKRON, OHIO 44333
ATTN: JOHN MEERDINK
(216) 214-6252
JOHN.C.MEERDINK@DOMINIONENERGY.COM

WINDSTREAM
560 TERNES AVENUE
ELYRIA, OHIO 44035
ATTN: GEOFFREY VOIGT
(800) 289-1901
GEOFFREY.VOIGT@WINDSTREAM.COM

NORTHEAST OHIO REGIONAL SEWER DISTRICT
3900 EUCLID AVENUE
CLEVELAND, OHIO 44115
ATTN: MARY MACIEJOWSKI
(216) 881-6600
MACIEJOWSKIM@NEORSD.ORG

ORWELL NATURAL GAS
8470 STATION STREET
MENTOR, OHIO 44060
ATTN: TIM REILLY
(440) 701-5100
TREILLY@EGAS.NET

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE SHEETS 3 & 4 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/ODOT VRS RTK GPS /CONVENTIONAL
MONUMENT TYPE:	MAG NAILS / IRON PINS

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM:	NAVD 1988
GEOID:	GEOID 12A

HORIZONTAL POSITIONING

REFERENCE FRAME:	NAD83 (2011)
ELLIPSOID:	GRS80
MAP PROJECTION:	LAMBERT CONFORMAL CONIC
COORDINATE SYSTEM:	OHIO STATE PLANE, NORTH ZONE (3401)

COMBINED SCALE FACTOR:

SFN 1800159	0.999947358
SFN 1800183	0.999947358
SFN 1809407	0.999949524
SFN 1812769	0.999928864
SFN 2800241	0.999910947

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.

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

ALTHOUGH THERE ARE NO TREES OR STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE LIMITS OF THE PROJECT, A LUMP SUM QUANTITY IS INCLUDED IN THE GENERAL SUMMARY FOR ITEM 201, CLEARING AND GRUBBING. ALL PROVISIONS AS SET FORTH IN THE SPECIFICATIONS UNDER THIS ITEM ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

IF CONTRACTOR MEANS AND METHODS REQUIRE TREE REMOVAL, TREES SHALL BE MARKED IN THE FIELD WITH SURVEY TAPE AND ON THE PLANS AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO REMOVAL. TREE REMOVAL WILL ONLY BE PERMITTED BETWEEN OCTOBER 2020 AND MARCH OF 2021 AND AT NO COST TO THE PROJECT.

BENCHING OF FOUNDATION SLOPES

ALTHOUGH CROSS-SECTIONS INDICATE SPECIFIC DIMENSIONS FOR PROPOSED BENCHING OF THE EMBANKMENT FOUNDATIONS IN CERTAIN AREAS, NO WAIVER OF THE SPECIFICATIONS IS INTENDED. BENCH ALL OTHER SLOPED EMBANKMENT AREAS AS SET FORTH IN 203.05. NO ADDITIONAL PAYMENT WILL BE MADE FOR BENCHING REQUIRED UNDER THE PROVISIONS OF 203.05.

HEALTH AND SAFETY PLAN

THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE ENGINEER A SITE SPECIFIC HEALTH AND SAFETY PLAN (SSHSP) IN ACCORDANCE WITH APPROPRIATE REGULATORY REQUIREMENTS INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

CONTRACTOR TO VERIFY AIR QUALITY PRIOR TO ENTERING OR PERFORMING ANY ACTIVITIES IN THE CULVERTS AND SHALL PROVIDE ADEQUATE VENTILATION PER OSHA REQUIREMENTS.

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.

ITEM 607 - FENCE REBUILT, TYPE (CLT)

CAREFULLY RECONDITION AND RE-ERECT FENCE AND COMPONENT PARTS AS DETAILED ON THE PLANS. DO NOT DAMAGE THE FENCE OR COMPONENT PARTS. ANY NEW PARTS WHICH ARE NEEDED, AS DETERMINED BY THE ENGINEER, WILL BE SUPPLIED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE.

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

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

FENCE LENGTHS

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

AIRWAY/HIGHWAY CLEARANCE FOR AIRPORTS AND HELIPORTS

THIS PROJECT HAS BEEN IDENTIFIED AS BEING WITHIN THE INFLUENCE AREA OF A PUBLIC USE AIRPORT OR HELIPORT. NO TEMPORARY STRUCTURES OR CONSTRUCTION EQUIPMENT AT MAXIMUM OPERATING HEIGHT SHALL EXCEED A HEIGHT OF 50 FT (AGL). IF ANY TEMPORARY STRUCTURES OR CONSTRUCTION EQUIPMENT WILL EXCEED THIS HEIGHT, FURTHER COORDINATION WITH THE FEDERAL AVIATION ADMINISTRATION (FAA), AND ODOT OFFICE OF AVIATION, WILL BE NECESSARY PRIOR TO ERECTING SUCH TEMPORARY STRUCTURES OR OPERATING SUCH EQUIPMENT ON THE PROJECT. THE CONTRACTOR WILL BE REQUIRED TO SUBMIT FORM 7460-1 TO THE FAA. NOTIFY THE ODOT OFFICE OF AVIATION WHEN SUBMITTING FAA FORM 7460-1.

NO TEMPORARY STRUCTURES OR CONSTRUCTION EQUIPMENT SHALL EXCEED THE PERMISSIBLE HEIGHT, UNTIL A COPY OF THE FAA APPROVAL AND THE ODOT OFFICE OF AVIATION PERMIT HAS BEEN FURNISHED TO THE PROJECT ENGINEER.

EXPRESS PROCESSING CENTER
THE FEDERAL AVIATION ADMINISTRATION
SOUTHWEST REGIONAL OFFICE
AIR TRAFFIC AIRSPACE BRANCH ASW-520
2601 MEACHAN BLVD.
FORT WORTH, TX 76137-4298

OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF AVIATION
2829 WEST DUBLIN-GRANVILLE ROAD
COLUMBUS, OHIO 43235
614-387-2346

CALCULATED MTG
CHECKED SJP

GENERAL NOTES

CUY-90-18.22/VAR

DRAINAGE

REVIEW OF DRAINAGE FACILITIES

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

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

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

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 611 CONDUIT ITEMS.

EROSION CONTROL

SEEDING AND MULCHING

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

659, SOIL ANALYSIS TEST
5 EACH

659, TOPSOIL
1,713 CU. YD.

659, SEEDING AND MULCHING
15,428 SQ. YD.

659, REPAIR SEEDING AND MULCHING
772 SQ. YD.

659, INTER-SEEDING
772 SQ. YD.

659, COMMERCIAL FERTILIZER
2.16 TON

659, LIME
3.19 ACRES

659, WATER
83.4 M. GAL.

659, MOWING
104 M. SQ.FT.

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.

CALCULATED MTG
CHECKED SJP

GENERAL NOTES

CUY-90-18.22/VAR

6
63

CONSTRUCTION ACCESS NOTES

SITE 1
CUY-2-16.88

TWO WORK ZONES ARE AVAILABLE FOR CONTRACTOR ACCESS TO THE CULVERT. ONE WORK ZONE WILL BE ACCESSIBLE FROM EASTBOUND SR-2 AND ONE FROM WESTBOUND SR-2, AS SHOWN ON THE PLANS.

WORK ZONE NO. 1 IS TO BE LOCATED ALONG THE OUTSIDE SHOULDER OF THE EASTBOUND SR-2 EXIT RAMP TO I-90W, I-77S, I-71S. RAMP SHOULDER CLOSURE TO FOLLOW ODOT SCD MT-95.45. CLOSURE TO UTILIZE IMPACT ATTENUATOR TO ALLOW CONTRACTOR ACCESS TO THE WORK ZONE AND STAGING AREA. CONSTRUCTION VEHICLES EXITING THE WORK ZONE SHALL FOLLOW THE EASTBOUND SR-2 EXIT RAMP.

WORK ZONE NO. 2 IS TO BE LOCATED IN THE INFIELD OF THE WESTBOUND SR-2 EXIT RAMP TO SOUTH MARGINAL ROAD. THE SR-2 OUTSIDE SHOULDER CLOSURE SHALL FOLLOW ODOT SCD MT-95.45 WHILE THE INSIDE SHOULDER OF THE EXIT RAMP SHALL FOLLOW ODOT SCD MT-98.28. CONSTRUCTION VEHICLES ENTERING AND EXITING THE WORK ZONE AND STAGING AREA SHALL USE A CONSTRUCTION ENTRANCE LOCATED BEYOND THE PORTABLE CONCRETE BARRIER. VEHICLES EXITING THE WORK ZONE SHALL FOLLOW SR-2 WESTBOUND.

AT NO TIME WILL THE CURRENT TRAFFIC LANES ALONG SR-2 AND I-90 BE IMPACTED BY THE PROJECT.

SITE 2
CUY-90-18.22

TWO WORK ZONES ARE AVAILABLE FOR CONTRACTOR ACCESS TO THE CULVERT. ONE WORK ZONE WILL BE ACCESSIBLE FROM EASTBOUND I-90 AND ONE FROM NORTH MARGINAL ROAD, AS SHOWN ON THE PLANS.

WORK ZONE NO. 1 IS TO BE LOCATED ALONG THE INFIELD OF THE EASTBOUND I-90 LOOP EXIT RAMP TO SR-2. RAMP SHOULDER CLOSURE TO FOLLOW ODOT SCD MT-95.45. CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE WORK ZONE FROM A CONSTRUCTION ACCESS DRIVE LOCATED BEYOND THE PORTABLE CONCRETE BARRIER ALONG THE EASTBOUND I-90 LOOP RAMP TO WESTBOUND SR-2.

WORK ZONE NO. 2 IS TO BE LOCATED BETWEEN THE WESTBOUND I-90/SR-2 LANES AND NORTH MARGINAL ROAD. CONSTRUCTION ACCESS TO THE WORK ZONE AND STAGING AREA SHALL BE AVAILABLE FROM I-90 / SR-2 WESTBOUND. A SHOULDER CLOSURE ALONG WESTBOUND I-90 / SR-2 PER ODOT SCD MT-95.45 SHALL BE UTILIZED.

AT NO TIME WILL THE CURRENT TRAFFIC LANES ALONG I-90 BE IMPACTED BY THE PROJECT.

SITE 3
CUY-90-19.99

TWO WORK ZONES ARE AVAILABLE FOR CONTRACTOR ACCESS TO THE CULVERT. ONE WORK ZONE WILL BE ACCESSIBLE FROM DICK GODDARD WAY AND ONE FROM WESTBOUND I-90, AS SHOWN ON THE PLANS.

WORK ZONE NO. 1 IS TO BE LOCATED BETWEEN EASTBOUND I-90 AND DICK GODDARD WAY. CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE WORK ZONE FROM A CONSTRUCTION ACCESS DRIVE LOCATED ADJACENT DICK GODDARD WAY. NO SHOULDER CLOSURE ALONG EASTBOUND I-90 SHALL BE REQUIRED BECAUSE EXISTING GUARDRAIL IS PRESENT.

WORK ZONE NO. 2 IS TO BE LOCATED ALONG THE OUTSIDE SHOULDER OF THE WESTBOUND I-90 EXIT RAMP TO EAST 55TH STREET. RAMP SHOULDER CLOSURE TO FOLLOW ODOT SCD MT-95.45. CLOSURE TO UTILIZE IMPACT ATTENUATOR TO ALLOW CONTRACTOR ACCESS TO THE WORK ZONE AND STAGING AREA. CONSTRUCTION VEHICLES EXITING THE WORK ZONE SHALL FOLLOW THE EXIT RAMP.

AT NO TIME WILL THE CURRENT TRAFFIC LANES ALONG I-90 BE IMPACTED BY THE PROJECT.

SITE 4
CUY-480-16.28

TWO WORK ZONES ARE AVAILABLE FOR CONTRACTOR ACCESS TO THE CULVERT. ONE WORK ZONE WILL BE ACCESSIBLE FROM THE WESTBOUND I-480 EXIT TO SR-176 / SR-17 GRANGER ROAD AND ONE FROM THE ENTRANCE RAMP FROM SR-17 TO I-480 EASTBOUND, AS SHOWN ON THE PLANS.

WORK ZONE NO. 1 IS TO BE LOCATED ALONG THE OUTSIDE SHOULDER OF THE WESTBOUND I-480 EXIT RAMP TO SR-17. RAMP SHOULDER CLOSURE TO FOLLOW ODOT SCD MT-95.45. CLOSURE WILL NOT REQUIRE AN IMPACT ATTENUATOR IF THE PORTABLE CONCRETE BARRIER IS STARTED BEHIND THE EXISTING GUARDRAIL. CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE WORK ZONE FROM A CONSTRUCTION ACCESS DRIVE LOCATED ADJACENT THE RAMP. CONSTRUCTION VEHICLES EXITING THE WORK ZONE SHALL FOLLOW THE EXIT RAMP.

THE PROPOSED ACCESS ROAD TO THE OUTLET OF THE PIPE HAS A 20% GRADE. CONTRACTOR TO EMPLOY EQUIPMENT DESIGNED TO OPERATE ON THIS TYPE OF TERRAIN.

WORK ZONE NO. 2 IS TO BE LOCATED ADJACENT THE SR-17 ENTRANCE RAMP TO I-480 EASTBOUND. RAMP SHOULDER CLOSURE TO FOLLOW ODOT SCD MT-95.45.

AT NO TIME WILL THE CURRENT TRAFFIC LANES ALONG I-480 BE IMPACTED BY THE PROJECT.

SITE 5
GEA-44-09.16

CONTRACTOR ACCESS AND PLACEMENT OF CONSTRUCTION MATERIALS TO BE ACCOMPLISHED BY CLOSING A SINGLE LANE OF SR-44 USING TEMPORARY TRAFFIC SIGNALS PER ODOT SCD MT-96.11.

CALCULATED MTG
CHECKED SJP

MAINTENANCE OF TRAFFIC GENERAL NOTES

CUY-90-18.22/VAR

7
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ITEM 614, MAINTAINING TRAFFIC (LANES OPEN DURING HOLIDAYS OR SPECIAL EVENTS)

NO WORK SHALL BE PERFORMED AND ALL EXISTING LANES SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR EVENTS:

CHRISTMAS	FOURTH OF JULY
NEW YEARS	LABOR DAY
MEMORIAL DAY	THANKSGIVING
(OTHER HOLIDAY OR EVENT)	

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF HOLIDAY OR EVENT	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00N FRIDAY THROUGH 6:00AM MONDAY
MONDAY	12:00N FRIDAY THROUGH 6:00AM TUESDAY
TUESDAY	12:00N MONDAY THROUGH 6:00AM WEDNESDAY
WEDNESDAY	12:00N TUESDAY THROUGH 6:00AM THURSDAY
THURSDAY	12:00N WEDNESDAY THROUGH 6:00AM FRIDAY
THURSDAY	(THANKSGIVING ONLY) 6:00AM WEDNESDAY THROUGH 6:00AM MONDAY
FRIDAY	12:00N THURSDAY THROUGH 6:00AM MONDAY
SATURDAY	12:00N FRIDAY THROUGH 6:00AM MONDAY

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE PER THE LANE VALUE CONTRACT (PN 127).

DRUM REQUIREMENTS

IN ADDITION TO THE REQUIREMENTS OF THE PLANS, SPECIFICATION AND PROPOSAL, DRUMS FURNISHED BY THE CONTRACTOR SHALL BE NEW AND UNUSED AT THE TIME OF ARRIVAL ON THE PROJECT. ANY DRUMS BROUGHT ON THE PROJECT, WHICH HAVE PREVIOUSLY BEEN USED ELSEWHERE, WILL NOT BE ACCEPTED.

PAYMENT FOR DRUMS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR MAINTAINING TRAFFIC UNLESS SEPARATELY ITEMIZED.

WORK ZONE MARKINGS AND SIGNS

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

ITEM 614, REPLACEMENT SIGN

FLATSHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT SIGNS SHALL BE NEW. OTHER MATERIALS MAY BE IN USED, BUT GOOD, CONDITION SUBJECT TO APPROVAL BY THE ENGINEER.

PAYMENT FOR THE NEW SIGNS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM 614, REPLACEMENT SIGN, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF DAMAGED SIGNS, HARDWARE AND SUPPORTS, AND PROVIDING THE NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ECT.

AN ESTIMATED QUANTITY OF 10 EACH HAS BEEN PROVIDED IN THE GENERAL SUMMARY.

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 5 M. GAL.

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

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

CALCULATED MTG
CHECKED SJP

MAINTENANCE OF TRAFFIC GENERAL NOTES

CUY-90-18.22/VAR

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 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 THE 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.

NOTIFICATION TIME TABLE

ITEM	DURATION OF CLOSURE	NOTICE DUE TO PERMITS & PIO
RAMP & ROAD CLOSURES	>= 2 WEEKS	21 CALENDAR DAYS PRIOR TO CLOSURE
	> 12HOURS & < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	< 12 HOURS	4 CALENDAR DAYS PRIOR TO CLOSURE
LANE CLOSURES & RESTRICTIONS	>= 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	< 2 WEEKS	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.

CONTRACTOR TO REFER TO HTTP://PLCM.DOT.STATE.OH.US/ FOR PERMITTED LANE CLOSURES

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGNS, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, WHEN NO LONGER NEEDED, A CHANGEABLE MESSAGE SIGN. THE SIGN SHALL BE OF A TYPE SHOWN ON A LIST OF APPROVED PCMS UNITS AVAILABLE ON THE OFFICE OF MATERIALS MANAGEMENT WEB PAGE. THE LIST CONTAINS CLASS A AND B UNITS WITH MINIMUM LEGIBILITY DISTANCES OF 800 FEET AND 650 FEET, RESPECTIVELY.

EACH SIGN SHALL BE TRAILER-MOUNTED AND EQUIPPED WITH A FUNCTIONAL DIMMING MECHANISM, TO DIM THE SIGN DURING DARKNESS, AND A TAMPER AND VANDAL PROOF ENCLOSURE. EACH SIGN SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ON-SITE PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT. THE SIGN SHALL ALSO BE CAPABLE OF BEING POWERED BY AN ELECTRICAL SERVICE DROP FROM A LOCAL UTILITY COMPANY. THE PCMS SHALL BE DELINEATED IN ACCORDANCE WITH C&MS 614.03.

THE PROBABLE PCMS LOCATIONS AND WORK LIMITS FOR THOSE LOCATIONS ARE SHOWN ON SHEETS 10, 11, 12, 13, AND 15 OF THE PLAN. PLACEMENT, OPERATION, MAINTENANCE AND ALL ACTIVATION OF THE SIGNS BY THE CONTRACTOR SHALL BE AS DIRECTED BY THE ENGINEER. THE PCMS SHALL BE LOCATED IN A HIGHLY VISIBLE POSITION YET PROTECTED FROM TRAFFIC. THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER, RELOCATE THE PCMS TO IMPROVE VISIBILITY OR ACCOMMODATE CHANGED CONDITIONS. WHEN NOT IN USE, THE PCMS SHALL BE TURNED OFF. ADDITIONALLY, WHEN NOT IN USE FOR EXTENDED PERIODS OF TIME, THE PCMS SHALL BE TURNED AWAY FROM ALL TRAFFIC.

THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ODOT PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT, AND TO REVISE SIGN MESSAGES, IF NECESSARY.

ALL MESSAGES TO BE DISPLAYED ON THE SIGN WILL BE PROVIDED BY THE ENGINEER. A LIST OF ALL REQUIRED PRE-PROGRAMMED MESSAGES WILL BE GIVEN TO THE CONTRACTOR AT THE PROJECT PRECONSTRUCTION CONFERENCE. THE SIGN SHALL HAVE THE CAPABILITY TO STORE UP TO 99 MESSAGES. MESSAGE MEMORY OR PRE-PROGRAMMED DISPLAYS SHALL NOT BE LOST AS A RESULT OF POWER FAILURES TO THE ON-BOARD COMPUTER. THE SIGN LEGEND SHALL BE CAPABLE OF BEING CHANGED IN THE FIELD. THREE-LINE PRESENTATION FORMATS WITH UP TO SIX MESSAGE PHASES SHALL BE SUPPORTED. PCMS FORMAT SHALL PERMIT THE COMPLETE MESSAGE FOR EACH PHASE TO BE READ AT LEAST TWICE.

THE PCMS SHALL CONTAIN AN ACCURATE CLOCK AND PROGRAMMING LOGIC WHICH WILL ALLOW THE SIGN TO BE ACTIVATED, DEACTIVATED OR MESSAGES CHANGED AUTOMATICALLY AT DIFFERENT TIMES OF THE DAY FOR DIFFERENT DAYS OF THE WEEK.

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGNS, AS PER PLAN (CONT.)

(THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE DATA LINK WHICH WILL (IN ACTIVE CELLULAR PHONE AREAS) ALLOW REMOTE SIGN ACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES. ONE REMOTE DATA INPUT DEVICE (LAPTOP COMPUTER PLUS MODEM OR EQUIVALENT) SHALL BE FURNISHED FOR USE BY THE DISTRICT TRAFFIC ENGINEER, OR EQUIVALENT, AND SHALL BE INSURED AGAINST THEFT.) THE PCMS UNIT SHALL BE MAINTAINED IN GOOD WORKING ORDER BY THE CONTRACTOR IN ACCORDANCE WITH THE PROVISIONS OF C&MS 614.07. THE CONTRACTOR SHALL, PRIOR TO ACTIVATING THE UNIT, MAKE ARRANGEMENTS, WITH AN AUTHORIZED SERVICE AGENT FOR THE PCMS, TO ASSURE PROMPT SERVICE IN THE EVENT OF FAILURE. ANY FAILURE SHALL NOT RESULT IN THE SIGN BEING OUT OF SERVICE FOR MORE THAN 12 HOURS, INCLUDING WEEKENDS. FAILURE TO COMPLY MAY RESULT IN AN ORDER TO STOP WORK AND OPEN ALL TRAFFIC LANES AND/OR IN THE DEPARTMENT TAKING APPROPRIATE ACTION TO SAFELY CONTROL TRAFFIC. THE ENTIRE COST TO CONTROL TRAFFIC, ACCRUED BY THE DEPARTMENT DUE TO THE CONTRACTOR'S NONCOMPLIANCE, WILL BE DEDUCTED FROM MONEYS DUE, OR TO BECOME DUE THE CONTRACTOR ON HIS CONTRACT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR 24-HOUR-PER-DAY OPERATION AND MAINTENANCE OF THESE SIGNS ON THE PROJECT FOR THE DURATION OF THE PHASES WHEN THE PLAN REQUIRES THEIR USE.

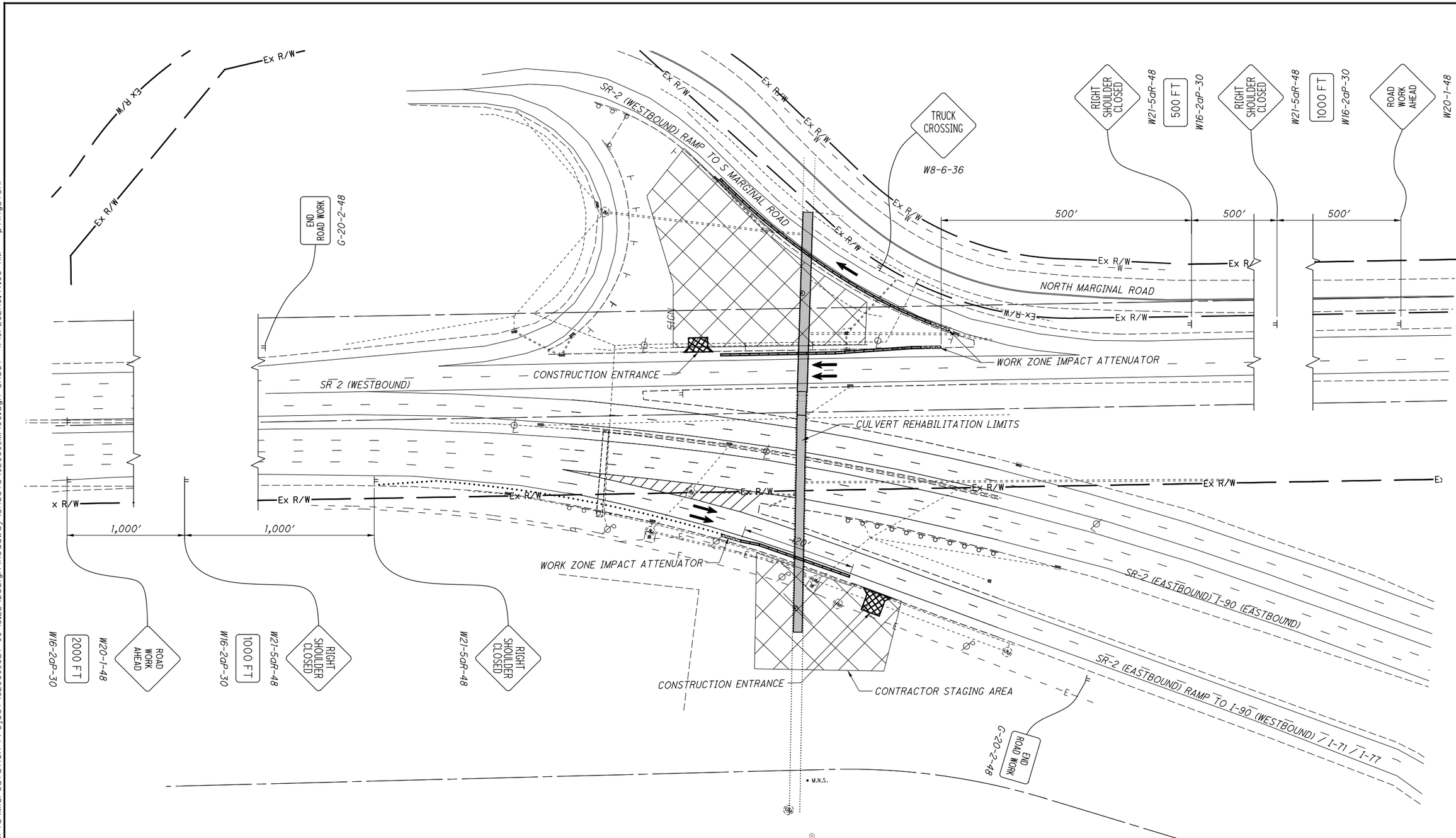
PAYMENT FOR THE ABOVE DESCRIBED ITEM SHALL BE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, FUELS, LUBRICATING OILS, SOFTWARE, HARDWARE, AND INCIDENTALS TO PERFORM THE ABOVE DESCRIBED WORK.

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 90 SIGN MONTH ASSUMING 10 PCMS SIGN(S) FOR 9 MONTH(S)

CALCULATED MTG CHECKED SJP

MAINTENANCE OF TRAFFIC GENERAL NOTES

CUY-90-18.22/VAR



NOTES:

1. SHOULDER CLOSURES REQUIRED PER ODOT SCD MT-95.45 AND AS SHOWN ON THE PLANS.

2. ROAD WORK AHEAD SIGNS (W20-1-48) TO BE PLACED AT ENTRANCE RAMPS FROM CITY OF CLEVELAND PARKING LOTS TO SR 2 WEST BOUND (RAMPS 195A & B)

LEGEND

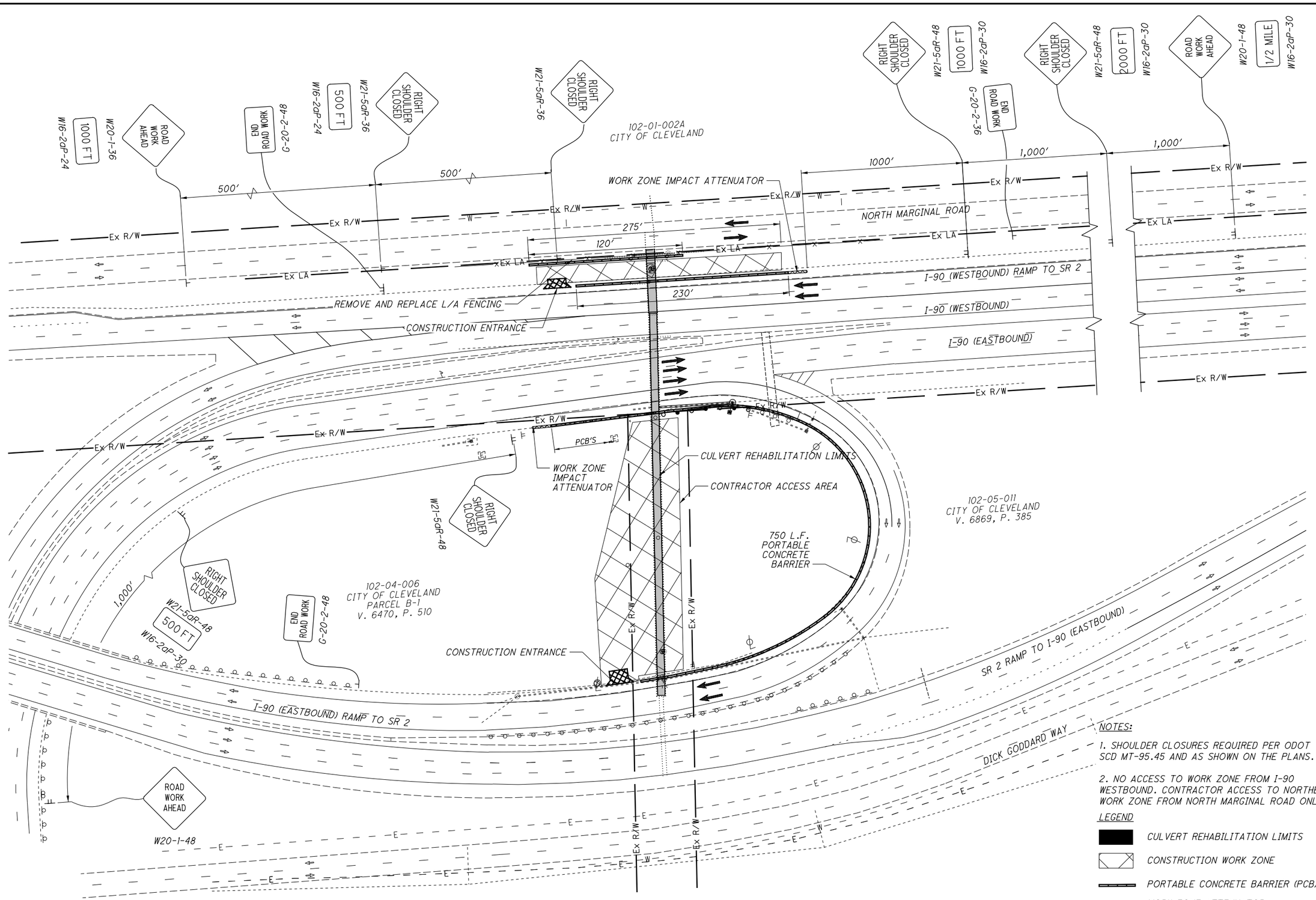
- CULVERT REHABILITATION LIMITS
- CONSTRUCTION WORK ZONE
- PORTABLE CONCRETE BARRIER (PCB)
- WORK ZONE ATTENUATOR
- CONSTRUCTION ENTRANCE
- CONSTRUCTION SIGNS

HORIZONTAL SCALE IN FEET: 0, 25, 50, 100

CALCULATED MTG | CHECKED SJP

CONSTRUCTION ACCESS & MOT PLAN
SITE 1 - CUY-2-1688

CUY-90-18.22/ VAR



NOTES:

1. SHOULDER CLOSURES REQUIRED PER ODOT SCD MT-95.45 AND AS SHOWN ON THE PLANS.

2. NO ACCESS TO WORK ZONE FROM I-90 WESTBOUND. CONTRACTOR ACCESS TO NORTHERN WORK ZONE FROM NORTH MARGINAL ROAD ONLY.

LEGEND

- CULVERT REHABILITATION LIMITS
- CONSTRUCTION WORK ZONE
- PORTABLE CONCRETE BARRIER (PCB)
- WORK ZONE ATTENUATOR
- CONSTRUCTION ENTRANCE
- CONSTRUCTION SIGNS

HORIZONTAL SCALE IN FEET: 0, 25, 50, 100

CALCULATED MTG | CHECKED SJP

CONSTRUCTION ACCESS & MOT PLAN SITE 2 - CUY-90-1822

CUY-90-18.22/ VAR

11
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CONSTRUCTION ACCESS & MOT PLAN
SITE 3 - CUY-90-1999

CUY-90-18.22/ VAR

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HORIZONTAL SCALE IN FEET
0 20 50 100

CALCULATED MTG
CHECKED SJP

105-02-002A
CITY OF CLEVELAND

PORTABLE CONCRETE BARRIER
SHOULDER CLOSURE AND LEAD-IN
SIGNAGE PER MT-95.45

NORTH MARGINAL ROAD

Ex R/W
Ex LA
OH-T

RIGHT SHOULDER CLOSED
W21-5aR-48
500 FT
W16-2aP-30

RIGHT SHOULDER CLOSED
W21-5aR-48
1000 FT
W16-2aP-30

ROAD WORK AHEAD
W20-1-36
1500 FT
W16-2aP-30

500'

RAMP FROM I-90 WEST TO E. 55TH ST / MARGINAL ROADS

I-90 WESTBOUND

I-90 EASTBOUND

CONTRACTOR ACCESS AREA

CONSTRUCTION ENTRANCE

WORK ZONE IMPACT ATTENUATOR

220'

CULVERT REHABILITATION LIMITS

REMOVE AND REPLACE 200' L/A FENCING

RAMP FROM E. 55TH TO I-90 EAST

12'-0" MIN.

22'

PORTABLE CONCRETE BARRIER

200'

ROAD NARROWS
W5-1-36

100'

ROAD WORK AHEAD
W20-1-36

125' SHIFT TAPER

DICK GODDARD WAY

WORK ZONE EDGE LINE

560'

105-02-008
BREEZE INC.
AFN 200512020866

105-02-001
FIRSTENERGY GENERATION CORP.
AFN 200511231223

NOTES:

1. SHOULDER CLOSURES REQUIRED PER ODOT SCD MT-95.45 AND AS SHOWN ON THE PLANS.

2. NO ACCESS TO WORK AREA FROM I-90 EASTBOUND. CONTRACTOR TO ACCESS SOUTHERN WORK AREA FROM DICK GODDARD WAY ONLY.

3. NO ACCESS TO WORK AREA FROM NORTH MARGINAL ROAD. CONTRACTOR TO ACCESS NORTHERN WORK AREA FROM I-90 (WESTBOUND) EXIT RAMP ONLY.

LEGEND

- CULVERT REHABILITATION LIMITS
- CONSTRUCTION WORK ZONE
- PORTABLE CONCRETE BARRIER (PCB)
- WORK ZONE ATTENUATOR
- CONSTRUCTION ENTRANCE
- CONSTRUCTION SIGNS
- BARRELS AND 4" WHITE EDGE LINE

NOTES:

1. SEE SHEET 14 FOR ACCESS ROAD DETAILS.

2. NO ACCESS TO WORK AREA FROM SR-17. CONTRACTOR TO ACCESS NORTHERN WORK AREA FROM I-480 (WESTBOUND) EXIT RAMP ONLY.

LEGEND

- CULVERT REHABILITATION LIMITS
- CONSTRUCTION WORK ZONE
- PORTABLE CONCRETE BARRIER (PCB)
- CONSTRUCTION ENTRANCE & ACCESS ROAD
- CONSTRUCTION SIGNS

Ex SH
Ex LA-R/W
S.R. 17
CONTRACTOR ACCESS AREA
UNNAMED TRIBUTARY TO WEST CREEK
WETLAND A
ACCESS ROAD
12'-0" TEMPORARY ACCESS ROAD
PORTABLE CONCRETE BARRIER
WETLAND B
CONSTRUCTION ENTRANCE
320'
EXIT 17B BROOKPARK ROAD
EXIT 17A S.R. 176 NORTH
CULVERT REHABILITATION LIMITS
I-480 WESTBOUND LANES
RAMP FROM S.R. 17 AND S.R. 176
150'
500'
RIGHT SHOULDER CLOSED
W21-5aR-48
ROAD WORK AHEAD
W20-1-48
TRUCK CROSSING
W8-6-48
500 FT
W16-2aP-30
END ROAD WORK
G-20-2-48
PORTABLE CONCRETE BARRIER SHOULDER CLOSURE AND LEAD-IN SIGNAGE PER MT-95.45

HORIZONTAL SCALE IN FEET
0 25 50 100

CALCULATED MTG
CHECKED SJP

CONSTRUCTION ACCESS & MOT PLAN
SITE 4 - CUY-480-1628

CUY-90-18.22/VAR

13
63

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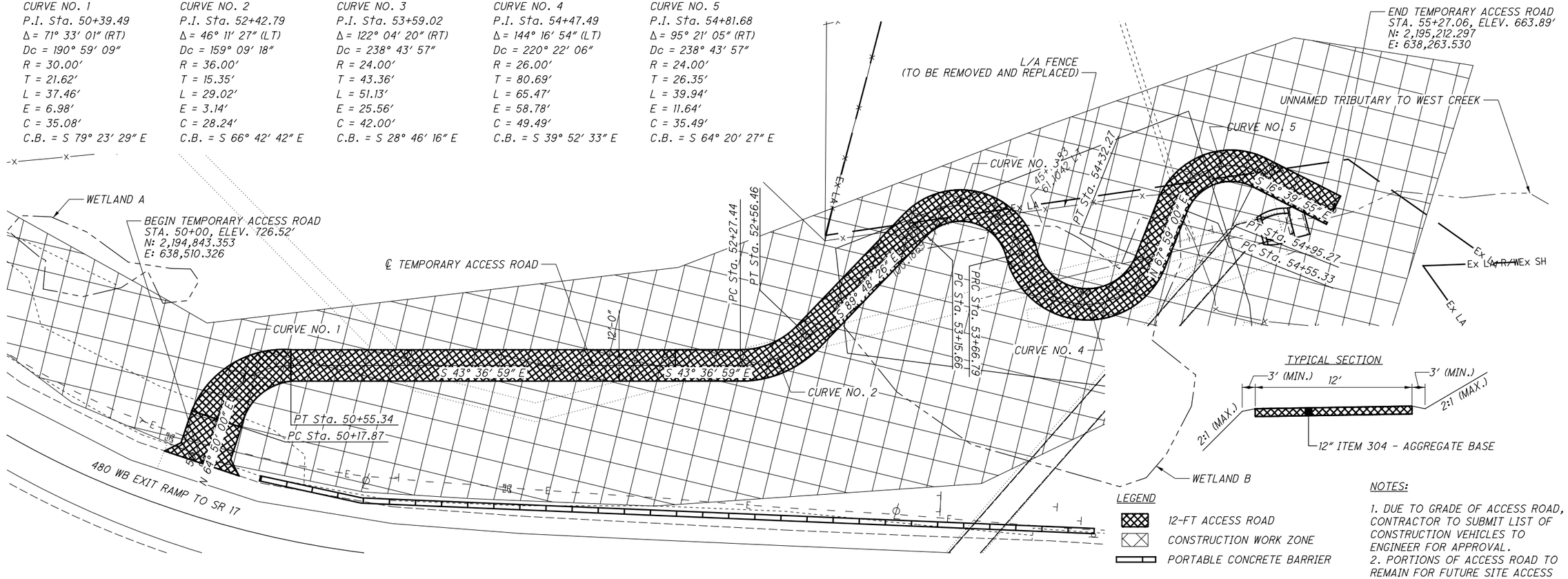
CURVE NO. 1
P.I. Sta. 50+39.49
Δ = 71° 33′ 01″ (RT)
Dc = 190° 59′ 09″
R = 30.00′
T = 21.62′
L = 37.46′
E = 6.98′
C = 35.08′
C.B. = S 79° 23′ 29″ E

CURVE NO. 2
P.I. Sta. 52+42.79
Δ = 46° 11′ 27″ (LT)
Dc = 159° 09′ 18″
R = 36.00′
T = 15.35′
L = 29.02′
E = 3.14′
C = 28.24′
C.B. = S 66° 42′ 42″ E

CURVE NO. 3
P.I. Sta. 53+59.02
Δ = 122° 04′ 20″ (RT)
Dc = 238° 43′ 57″
R = 24.00′
T = 43.36′
L = 51.13′
E = 25.56′
C = 42.00′
C.B. = S 28° 46′ 16″ E

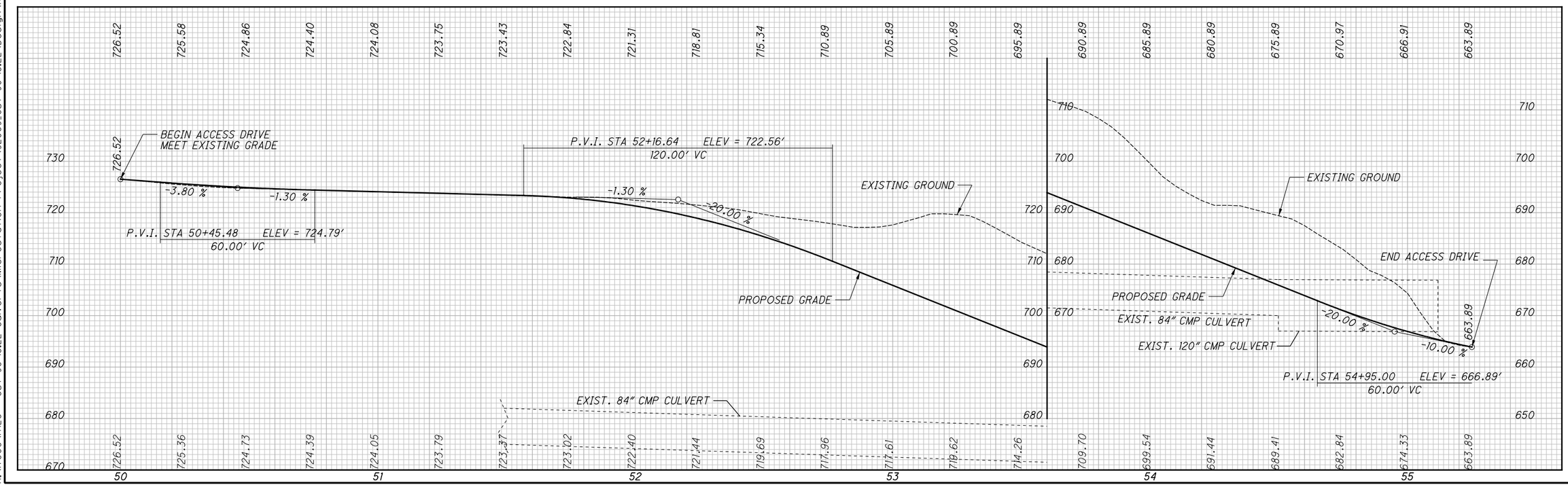
CURVE NO. 4
P.I. Sta. 54+47.49
Δ = 144° 16′ 54″ (LT)
Dc = 220° 22′ 06″
R = 26.00′
T = 80.69′
L = 65.47′
E = 58.78′
C = 49.49′
C.B. = S 39° 52′ 33″ E

CURVE NO. 5
P.I. Sta. 54+81.68
Δ = 95° 21′ 05″ (RT)
Dc = 238° 43′ 57″
R = 24.00′
T = 26.35′
L = 39.94′
E = 11.64′
C = 35.49′
C.B. = S 64° 20′ 27″ E



NOTES:

1. DUE TO GRADE OF ACCESS ROAD, CONTRACTOR TO SUBMIT LIST OF CONSTRUCTION VEHICLES TO ENGINEER FOR APPROVAL.
2. PORTIONS OF ACCESS ROAD TO REMAIN FOR FUTURE SITE ACCESS AS DIRECTED



HORIZONTAL SCALE IN FEET
0 10 20 40
CALCULATED MTG
CHECKED SJP

SITE 4 - CUY-480-1628 ACCESS ROAD PLAN AND PROFILE

CUY-90-18.22/ VAR

14
63

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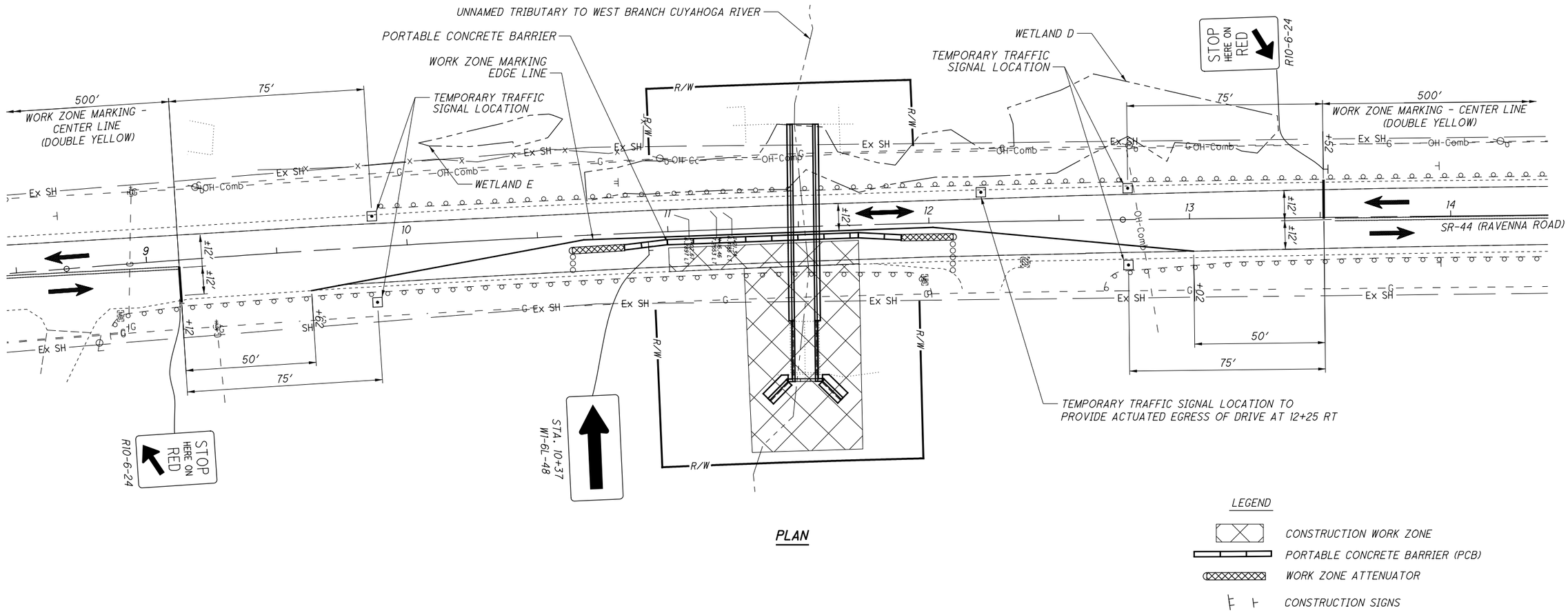

PLAN

LEGEND

- CONSTRUCTION WORK ZONE
- PORTABLE CONCRETE BARRIER (PCB)
- WORK ZONE ATTENUATOR
- CONSTRUCTION SIGNS

NOTES:

1. ALL WORK IS TO BE COMPLETED USING THE EAST END OF THE EXISTING CULVERT AS AN ACCESS POINT.
2. CONTRACTOR TO UTILIZE SINGLE LANE CLOSURE AND SHOULDER AS STAGING AREA FOR PLACEMENT OF EQUIPMENT AND MATERIALS TO BE USED FOR REHABILITATION OF CULVERT.
3. CONTRACTOR TO OPTIMIZE TEMPORARY TRAFFIC SIGNAL TIMING TO PREVENT NORTHBOUND SR44 TRAFFIC FROM BACKING UP INTO THE SIGNALIZED INTERSECTION AT SR 87. CONTRACTOR SHALL MONITOR TRAFFIC THROUGHOUT THE DAY AND ADJUST SIGNAL TIMINGS AS NEEDED TO BALANCE NORTHBOUND AND SOUTHBOUND TRAFFIC FLOWS
4. UTILIZE ODOT SCD MT-96.11 FOR ADDITIONAL ONE-LANE, TWO-WAY TRAFFIC DETAILS, INCLUDING ADVANCED WARNING SIGN PLACEMENT
5. IF CONTRACTOR MEANS AND METHODS REQUIRE REMOVAL OF GUARDRAIL, IT SHALL BE REERECTED PRIOR TO REMOVAL OF MAINTENANCE OF TRAFFIC MEASURES. IF GUARDRAIL IS DAMAGED BY THE CONTRACTOR, IT SHALL BE REPLACED IN KIND AT NO COST TO THE PROJECT.

HORIZONTAL SCALE IN FEET: 0, 10, 20, 40

CALCULATED MTG | CHECKED SJP

MAINTENANCE OF TRAFFIC PLAN
SITE 5 - GEA-44-0916

CUY-90-18.22

SHEET NUM.												PART.		ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE SHEET NO.
10	11	12	13	15	17	18	19	20-21	22-29	30	55	01/IMS/BR	02/NHS/BR		EXT	TOTAL			
																		ROADWAY	
												LS	LS	201	11000	LS		CLEARING AND GRUBBING	
						100						100		202	38200	100	FT	GUARDRAIL REMOVED FOR REUSE	
						1						1		202	58100	1	EACH	CATCH BASIN REMOVED	
									1,352			1,352		203	10000	1,352	CY	EXCAVATION	
						10			1,622			1,632		203	20000	1,632	CY	EMBANKMENT	
						100						100		606	16000	100	FT	GUARDRAIL REBUILT	
												100	100	607	23004	200	FT	FENCE REBUILT, TYPE CLT	5
									1,400			1,400		863	00300	1,400	SY	GEOGRID, TYPE P3	
																		EROSION CONTROL	
											8		8	601	11000	8	SY	RIPRAP, TYPE D	
								39				39		601	20000	39	SY	CRUSHED AGGREGATE SLOPE PROTECTION	
									281			281		601	34000	281	CY	ROCK CHANNEL PROTECTION, TYPE A WITHOUT FILTER	
										35			35	601	34200	35	CY	ROCK CHANNEL PROTECTION, TYPE C WITHOUT FILTER	
					1	1	1	1		1		3	2	659	00100	5	EACH	SOIL ANALYSIS TEST	5
					444	333	211	697		28		1,241	472	659	00300	1,713	CY	TOPSOIL	
					4,000	3,000	1,900	6,278		250		11,178	4,250	659	10000	15,428	SY	SEEDING AND MULCHING	
					200	150	95	314		13		559	213	659	14000	772	SY	REPAIR SEEDING AND MULCHING	
					200	150	95	314		13		559	213	659	15000	772	SY	INTER-SEEDING	
					0.56	0.42	0.27	0.88		0.03		1.57	0.59	659	20000	2.16	TON	COMMERCIAL FERTILIZER	
					0.83	0.62	0.39	1.3		0.05		2.31	0.88	659	31000	3.19	ACRE	LIME	
					21.6	16.2	10.3	33.9		1.4		60.4	23	659	35000	83.4	MGAL	WATER	
					27	20	13	42		2		75	29	659	40000	104	MSF	MOWING	
												LS	LS	832	15000	LS		STORM WATER POLLUTION PREVENTION PLAN	
												LS	LS	832	15002	LS		STORM WATER POLLUTION PREVENTION INSPECTIONS	
												LS	LS	832	15010	LS		STORM WATER POLLUTION PREVENTION INSPECTION SOFTWARE	
												43,883.5	43,883.5	832	30000	87,767	EACH	EROSION CONTROL	
						11						11		611	05900	11	FT	**DRAINAGE** 15" CONDUIT, TYPE B	
						80						80		611	08900	80	FT	21" CONDUIT, TYPE B	
								20				20		611	11200	20	FT	24" CONDUIT, TYPE F	
						1						1		611	98300	1	EACH	CATCH BASIN, NO. 5	
						1						1		611	99574	1	EACH	MANHOLE, NO. 3	
																		STRUCTURE 20 FOOT SPAN AND UNDER (SITE 1 - SFN 1800159)	
																		STRUCTURE 20 FOOT SPAN AND UNDER (SITE 2 - SFN 1800183)	
																		STRUCTURE 20 FOOT SPAN AND UNDER (SITE 3 - SFN 1809407)	
																		STRUCTURE 20 FOOT SPAN AND UNDER (SITE 4 - SFN 1812769)	
																		STRUCTURE 20 FOOT SPAN AND UNDER (SITE 5 - SFN 2800241)	
																		MAINTENANCE OF TRAFFIC	
	2	1										3	3	614	12380	6	EACH	WORK ZONE IMPACT ATTENUATOR, 24" WIDE HAZARDS, (UNIDIRECTIONAL)	
		1		2								1	2	614	12384	3	EACH	WORK ZONE IMPACT ATTENUATOR, 24" WIDE HAZARDS, (BIDIRECTIONAL)	
	2	2	2	2								6	4	614	12500	10	EACH	REPLACEMENT SIGN	
												54	36	614	18601	90	SNMT	PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN	9
					0.06								0.06	614	21000	0.06	MILE	WORK ZONE CENTER LINE, CLASS I	
					0.19								0.19	614	22010	0.19	MILE	WORK ZONE EDGE LINE, CLASS I, 6"	
					30								30	614	26000	30	FT	WORK ZONE STOP LINE, CLASS I	
												LS	LS	615	10000	LS		ROADS FOR MAINTAINING TRAFFIC	
												3	2	616	10000	5	MGAL	WATER	8
	1,220	450	530	660								2,200	1,320	622	41100	3,520	FT	PORTABLE BARRIER, UNANCHORED	
																		INCIDENTALS	
												LS	LS	614	11000	LS		MAINTAINING TRAFFIC	
												6	6	619	16010	12	MNTH	FIELD OFFICE, TYPE B	
												LS	LS	623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING	
												LS	LS	624	10000	LS		MOBILIZATION	

CALCULATED RAP CHECKED XXX

GENERAL

CUY-90-18.22/VAR

TOTAL SUMMARY - ALL SITES

16
63

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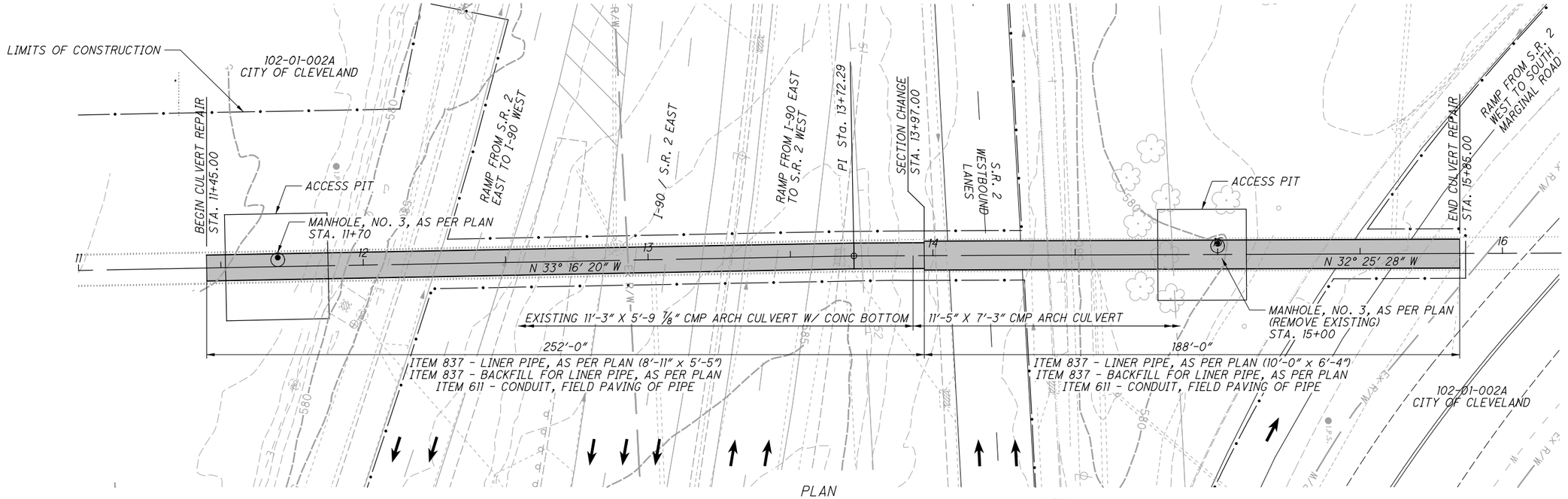
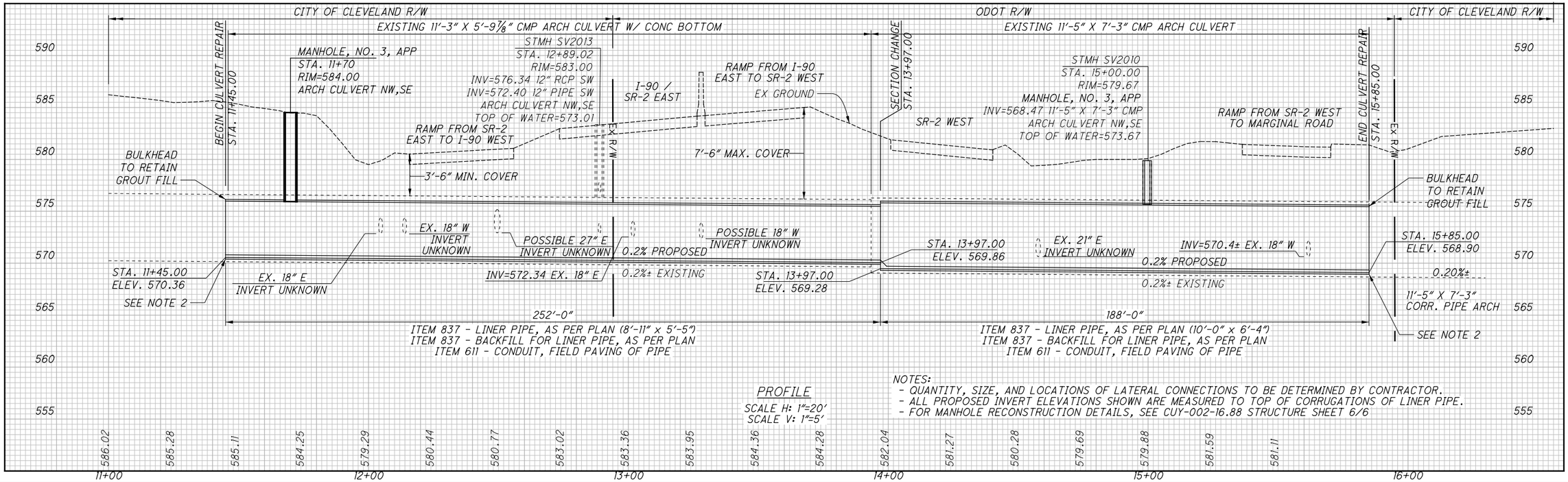


PLAN
SCALE: 1"=20'

NOTES:

1. SEE CUY-002-1688 SITE PLAN SHEET, SHEET 31, FOR COMPLETE LIMITS OF CONSTRUCTION.
2. CONTRACTOR SHALL INSTALL NON-SHRINK HYDRAULIC CEMENT POST GROUTING TO PROVIDE A SMOOTH TRANSITION AROUND THE FULL INTERFACE OF THE EXISTING STRUCTURE AND PROPOSED LINER. TYPICAL AT UPSTREAM AND DOWNSTREAM LINER LIMITS.



PROFILE
SCALE H: 1"=20'
SCALE V: 1"=5'

NOTES:
- QUANTITY, SIZE, AND LOCATIONS OF LATERAL CONNECTIONS TO BE DETERMINED BY CONTRACTOR.
- ALL PROPOSED INVERT ELEVATIONS SHOWN ARE MEASURED TO TOP OF CORRUGATIONS OF LINER PIPE.
- FOR MANHOLE RECONSTRUCTION DETAILS, SEE CUY-002-16.88 STRUCTURE SHEET 6/6

HORIZONTAL SCALE IN FEET
0 10 20 40
CALCULATED MTG
CHECKED SJP

CULVERT PLAN AND PROFILE
SITE 1 - CUY-2-1688

CUY-90-18.22/VAR

17
63

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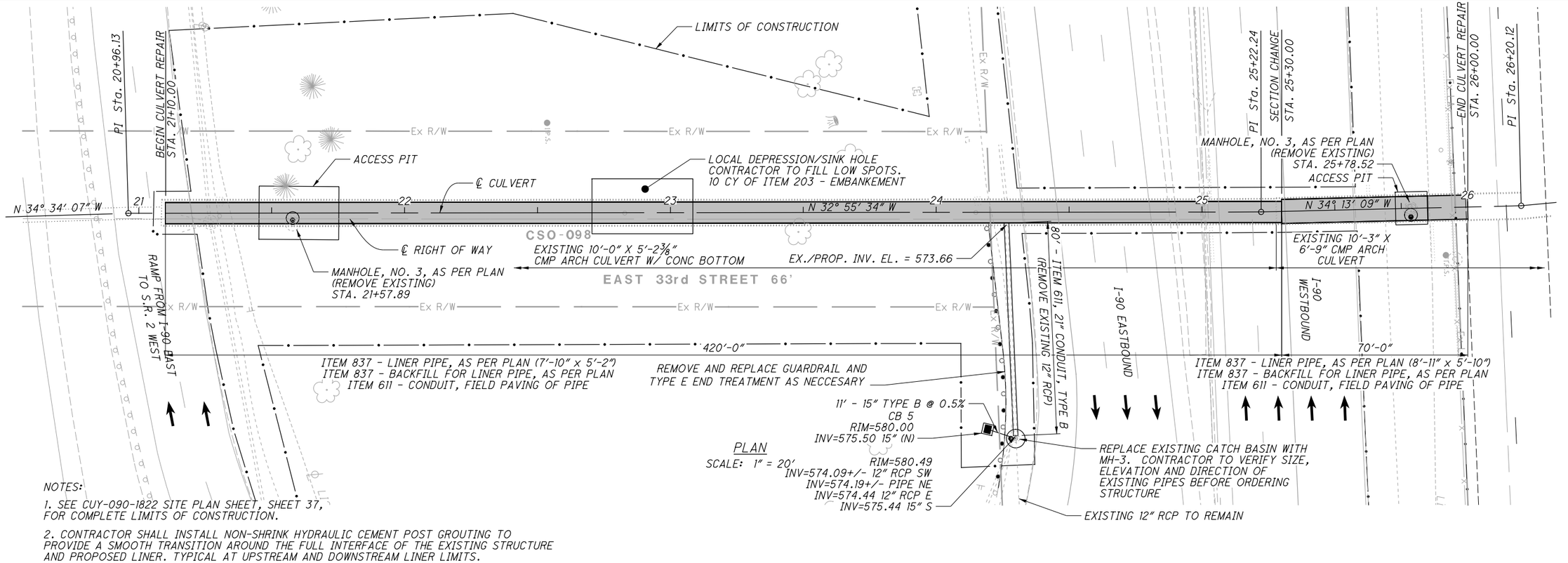
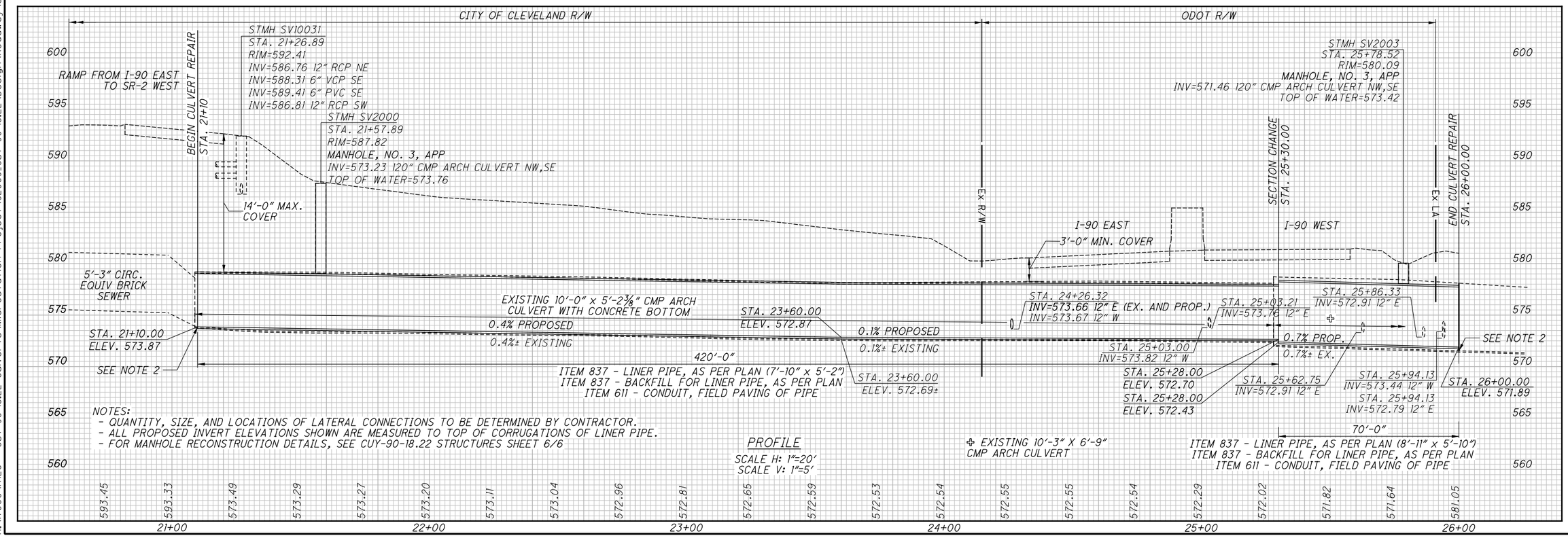


NOTES:

1. SEE CUY-090-1822 SITE PLAN SHEET, SHEET 37, FOR COMPLETE LIMITS OF CONSTRUCTION.

2. CONTRACTOR SHALL INSTALL NON-SHRINK HYDRAULIC CEMENT POST GROUTING TO PROVIDE A SMOOTH TRANSITION AROUND THE FULL INTERFACE OF THE EXISTING STRUCTURE AND PROPOSED LINER. TYPICAL AT UPSTREAM AND DOWNSTREAM LINER LIMITS.



NOTES:
- QUANTITY, SIZE, AND LOCATIONS OF LATERAL CONNECTIONS TO BE DETERMINED BY CONTRACTOR.
- ALL PROPOSED INVERT ELEVATIONS SHOWN ARE MEASURED TO TOP OF CORRUGATIONS OF LINER PIPE.
- FOR MANHOLE RECONSTRUCTION DETAILS, SEE CUY-90-18.22 STRUCTURES SHEET 6/6

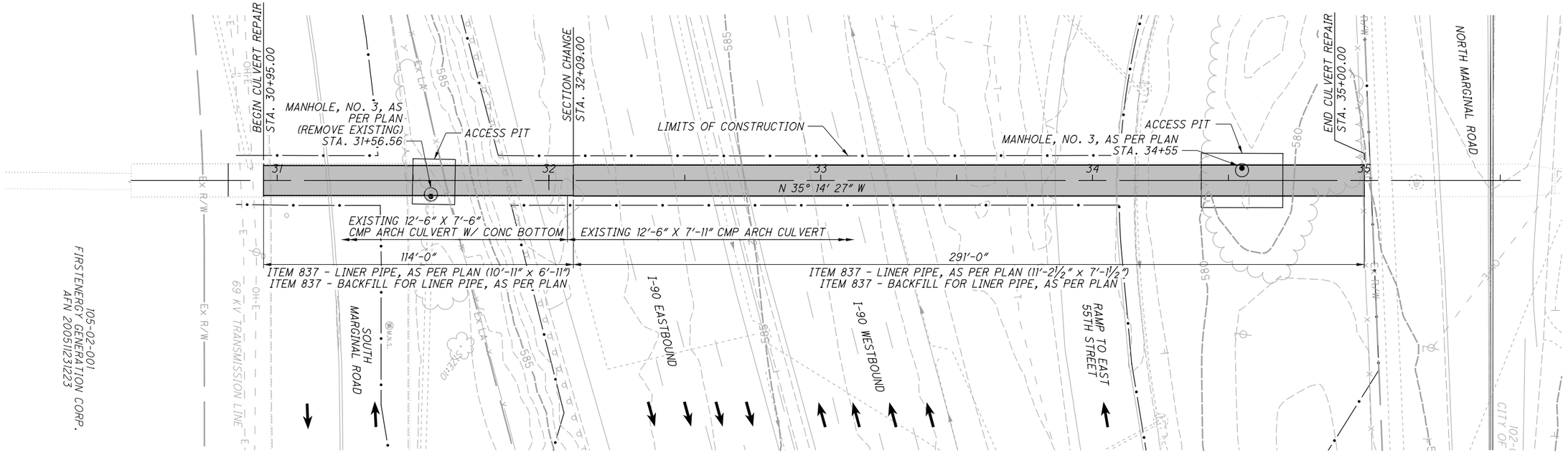
PROFILE
SCALE H: 1"=20'
SCALE V: 1"=5'

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED MTG
CHECKED SJP

CULVERT PLAN AND PROFILE
SITE 2 - CUY-90-1822

CUY-90-18.22/VAR

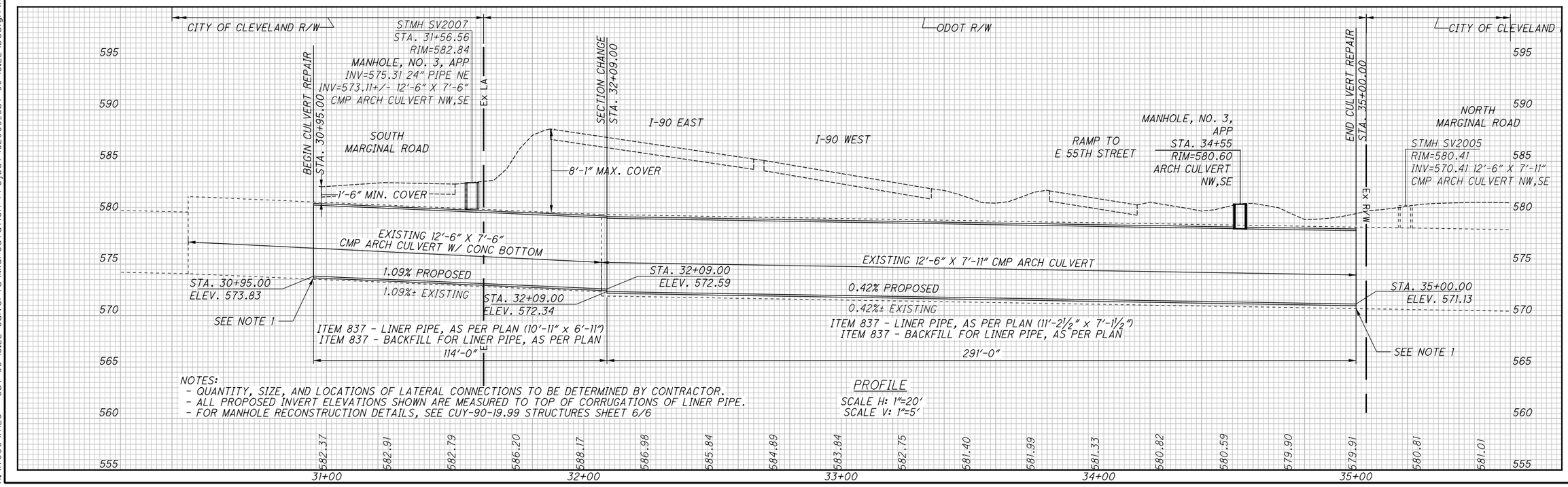


PLAN
SCALE: 1" = 20'

NOTES:

1. SEE CUY-090-1999 SITE PLAN SHEET, SHEET 43, FOR COMPLETE LIMITS OF CONSTRUCTION.

2. CONTRACTOR SHALL INSTALL NON-SHRINK HYDRAULIC CEMENT POST GROUTING TO PROVIDE A SMOOTH TRANSITION AROUND THE FULL INTERFACE OF THE EXISTING STRUCTURE AND PROPOSED LINER. TYPICAL AT UPSTREAM AND DOWNSTREAM LINER LIMITS.



NOTES:
- QUANTITY, SIZE, AND LOCATIONS OF LATERAL CONNECTIONS TO BE DETERMINED BY CONTRACTOR.
- ALL PROPOSED INVERT ELEVATIONS SHOWN ARE MEASURED TO TOP OF CORRUGATIONS OF LINER PIPE.
- FOR MANHOLE RECONSTRUCTION DETAILS, SEE CUY-90-19.99 STRUCTURES SHEET 6/6

PROFILE
SCALE H: 1"=20'
SCALE V: 1"=5'

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED MTG
CHECKED SJP

CULVERT PLAN AND PROFILE
SITE 3 - CUY-90-1999

CUY-90-18.22/VAR

19
63

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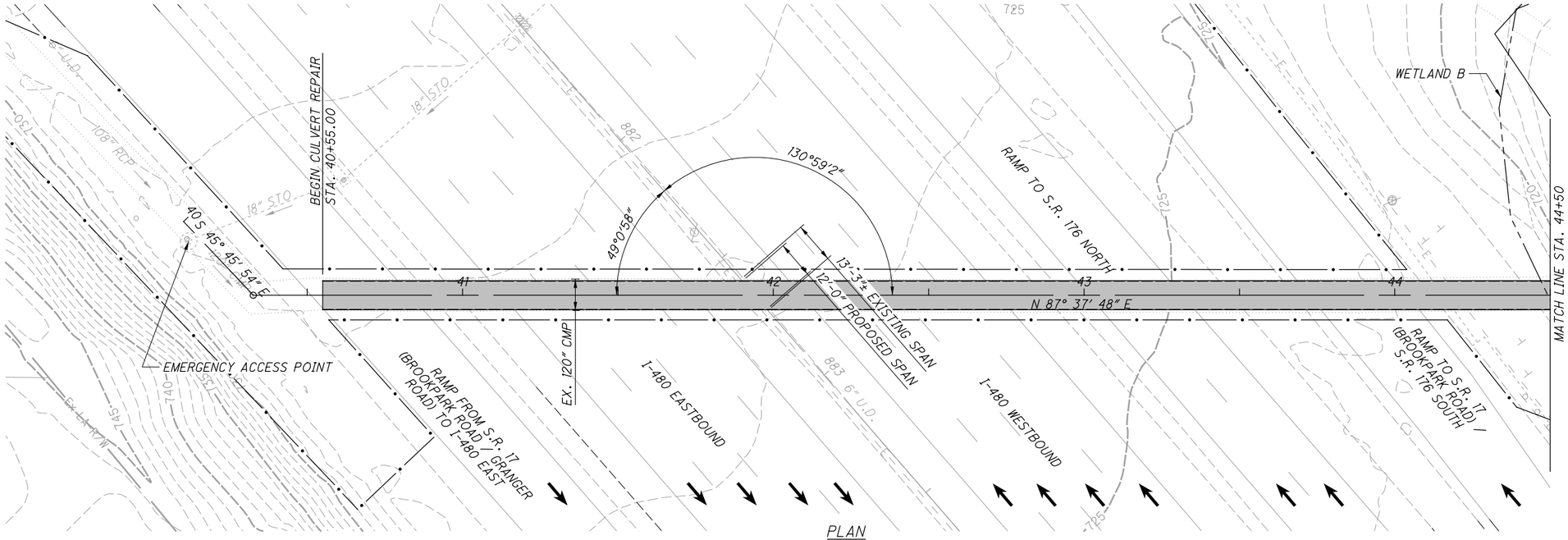
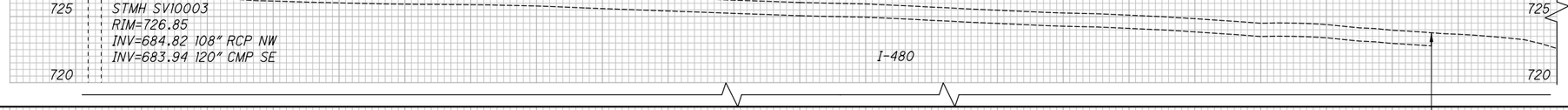
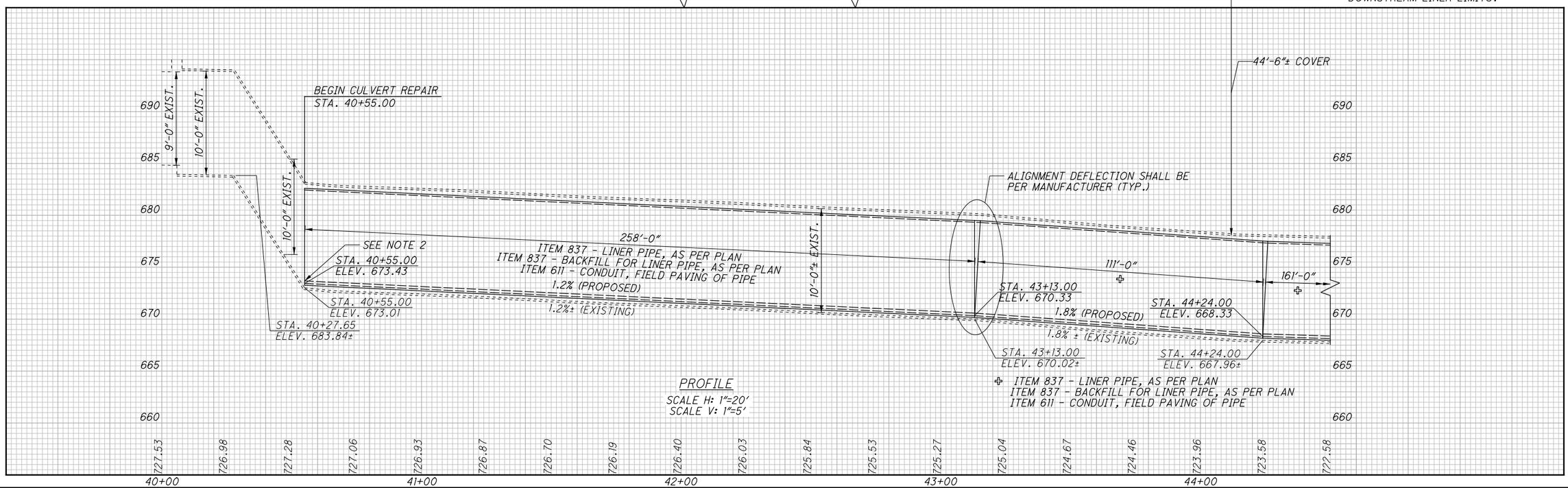


PLAN

SCALE: 1" = 20'





PROFILE

SCALE H: 1"=20'
SCALE V: 1"=5'

✣ ITEM 837 - LINER PIPE, AS PER PLAN
ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN
ITEM 611 - CONDUIT, FIELD PAVING OF PIPE

NOTES:

1. SEE CUY-480-1628 SITE PLAN SHEET, SHEET 49, FOR COMPLETE LIMITS OF CONSTRUCTION.
2. CONTRACTOR SHALL INSTALL NON-SHRINK HYDRAULIC CEMENT POST GROUTING TO PROVIDE A SMOOTH TRANSITION AROUND THE FULL INTERFACE OF THE EXISTING STRUCTURE AND PROPOSED LINER. TYPICAL AT UPSTREAM AND DOWNSTREAM LINER LIMITS.

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED MTG
CHECKED SJP

CULVERT PLAN AND PROFILE
SITE 4 - CUY-480-1628

CUY-90-18.22/VAR

20
63

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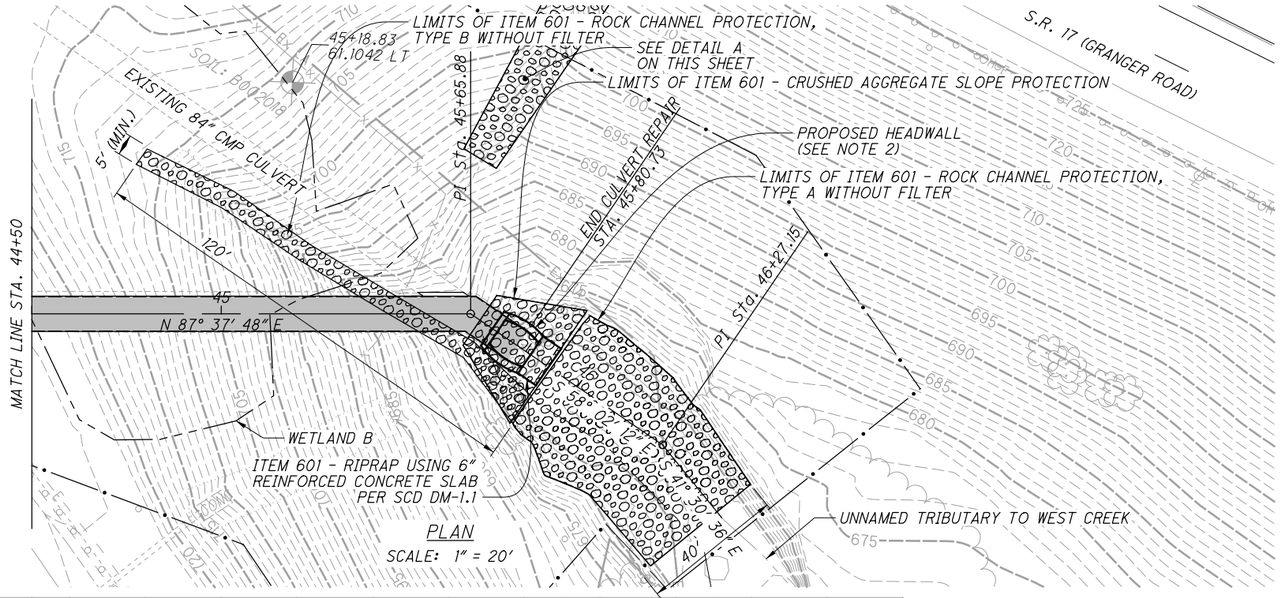
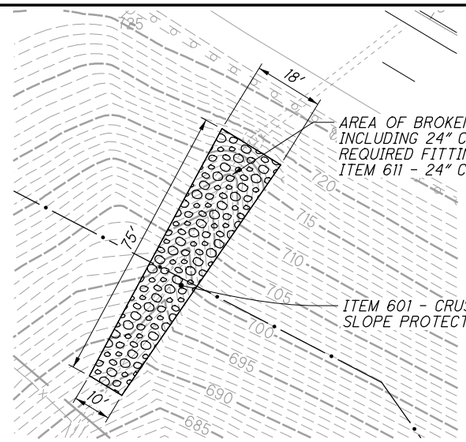
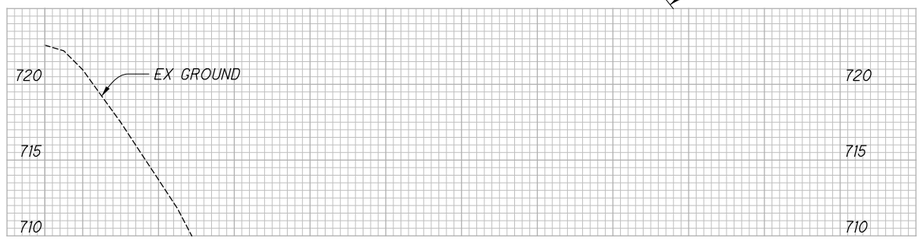
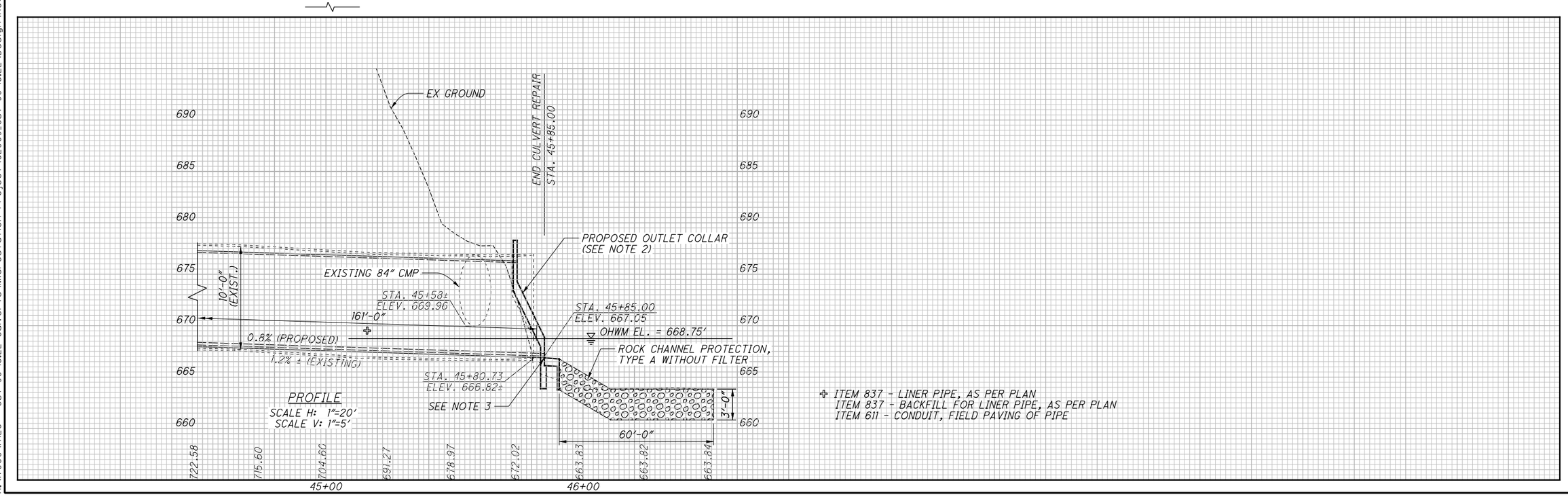




DETAIL A





PROFILE
SCALE H: 1"=20'
SCALE V: 1"=5'

NOTES:

1. SEE CUY-480-1628 SITE PLAN SHEET, SHEET 49, FOR COMPLETE LIMITS OF CONSTRUCTION.

2. SEE CUY-480-16.28 DETAIL SHEET, SHEET 55, FOR ADDITIONAL OUTLET COLLAR DETAILS.

3. CONTRACTOR SHALL INSTALL NON-SHRINK HYDRAULIC CEMENT POST GROUTING TO PROVIDE A SMOOTH TRANSITION AROUND THE FULL INTERFACE OF THE EXISTING STRUCTURE AND PROPOSED LINER. TYPICAL AT UPSTREAM AND DOWNSTREAM LINER LIMITS.

✣ ITEM 837 - LINER PIPE, AS PER PLAN
ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN
ITEM 611 - CONDUIT, FIELD PAVING OF PIPE

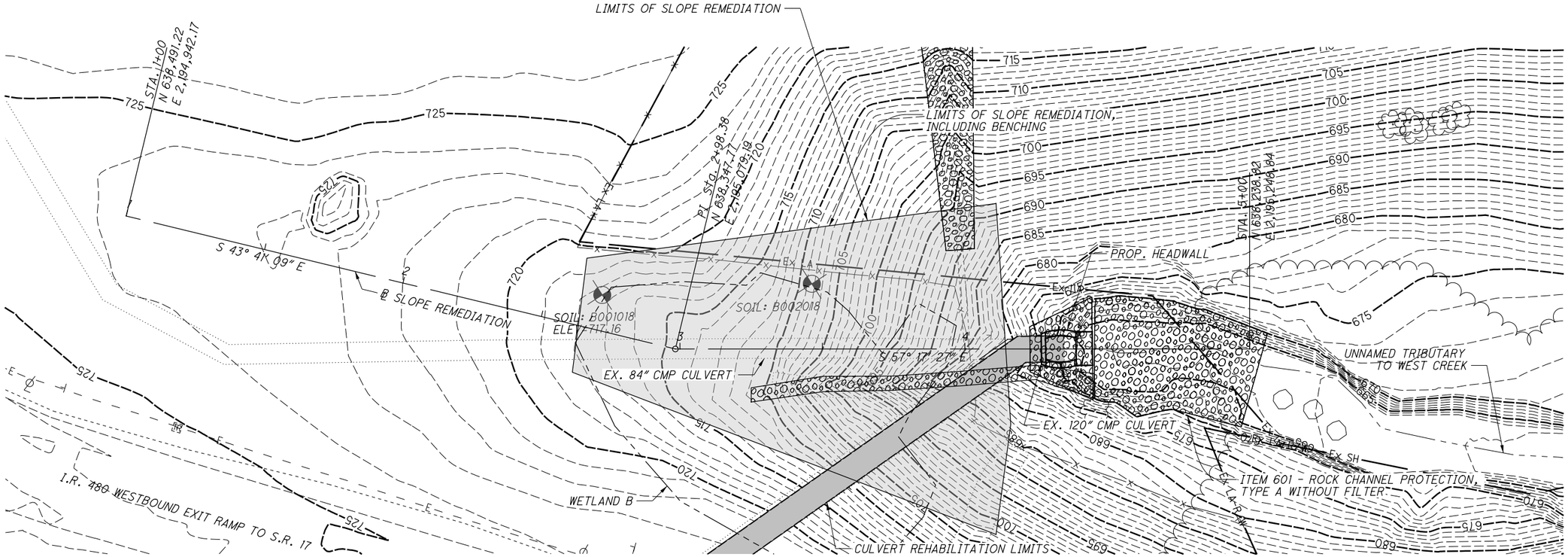
HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED MTG
CHECKED SJP

CULVERT PLAN AND PROFILE
SITE 4 - CUY-480-1628

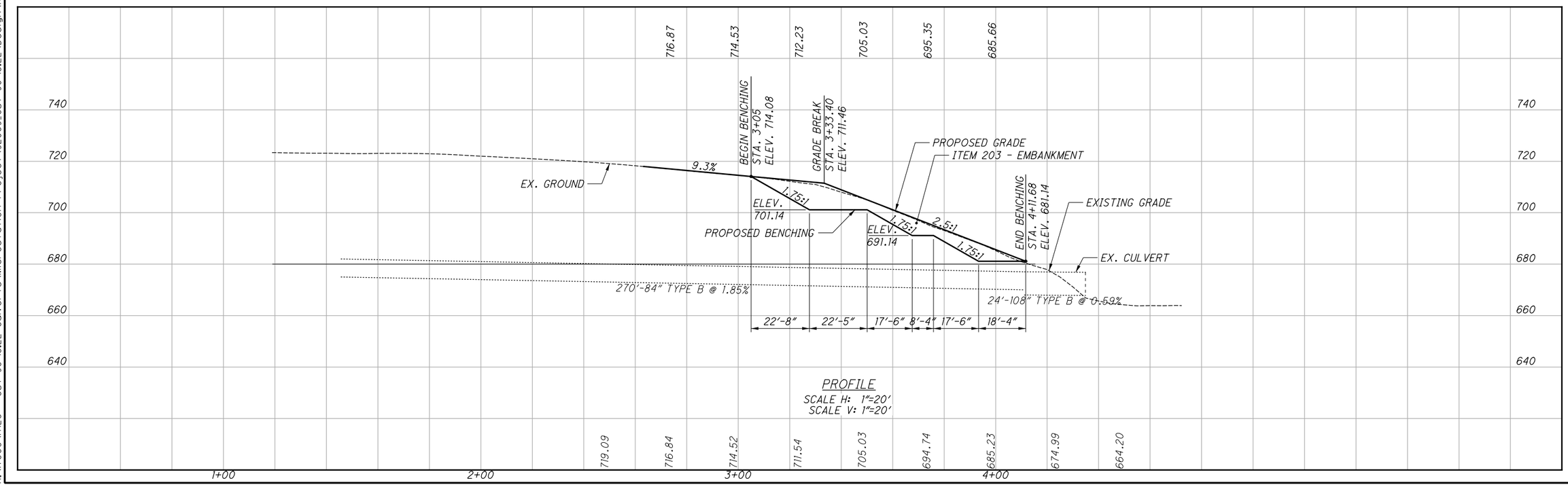
CUY-90-18.22/VAR

21
63



PLAN

SCALE: 1" = 20'



PROFILE

SCALE H: 1"=20'
SCALE V: 1"=20'

SLOPE REMEDIATION BENCHING DETAILS
SITE 4 - CUY-480-1628

CUY-90-18.22/VAR

22
63

CALCULATED MTG
CHECKED SJP

HORIZONTAL SCALE IN FEET
0 5 10 20

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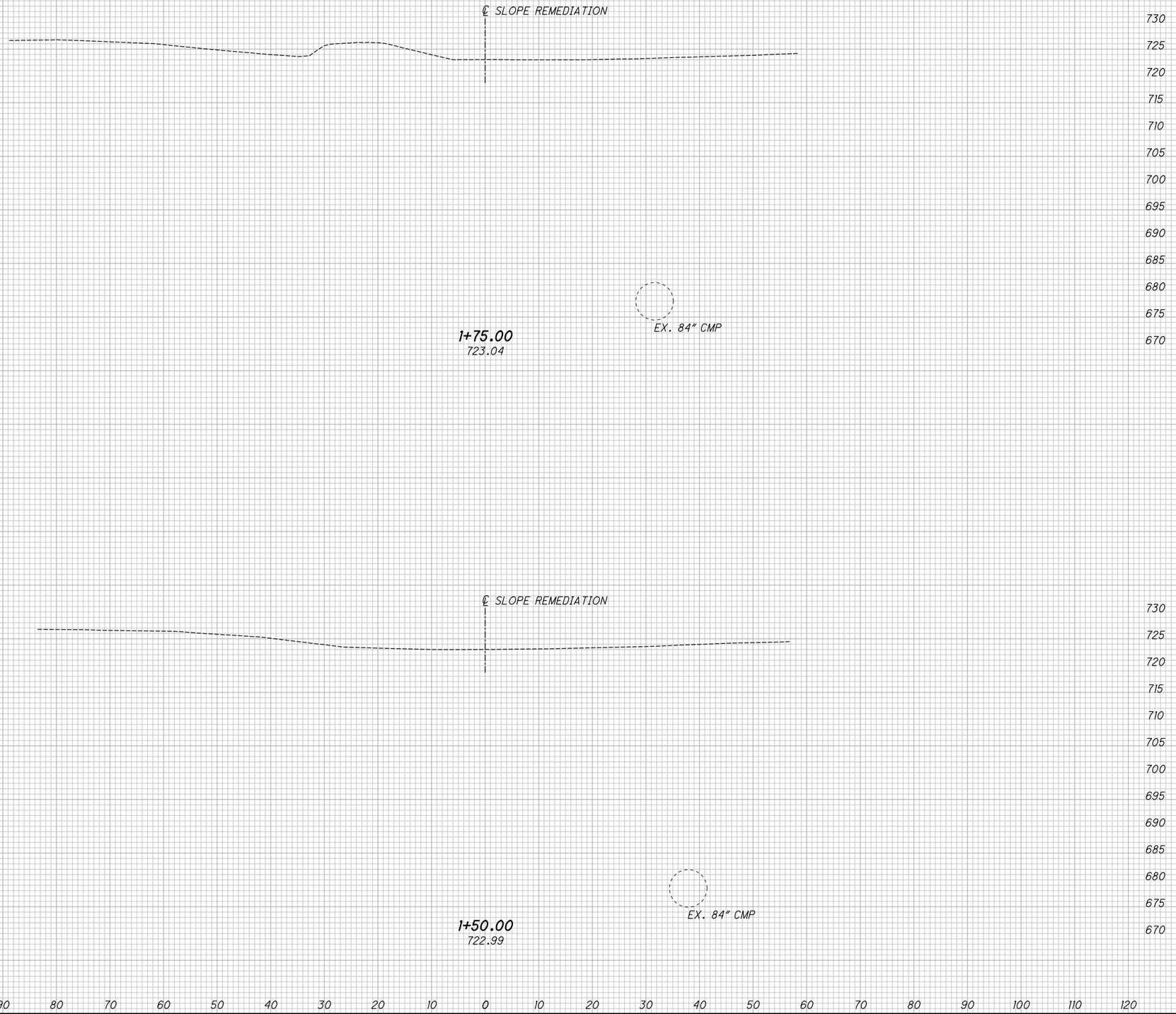
SEEDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME	
CUT	FILL	CUT	FILL
		0	0

CALCULATED	CHECKED
MTG	SJP

CROSS SECTIONS CUY-480-1628 SLOPE REMEDIATION STA. 1+50.00 TO STA. 1+75.00

CUY-90-18.22/VAR

23
63

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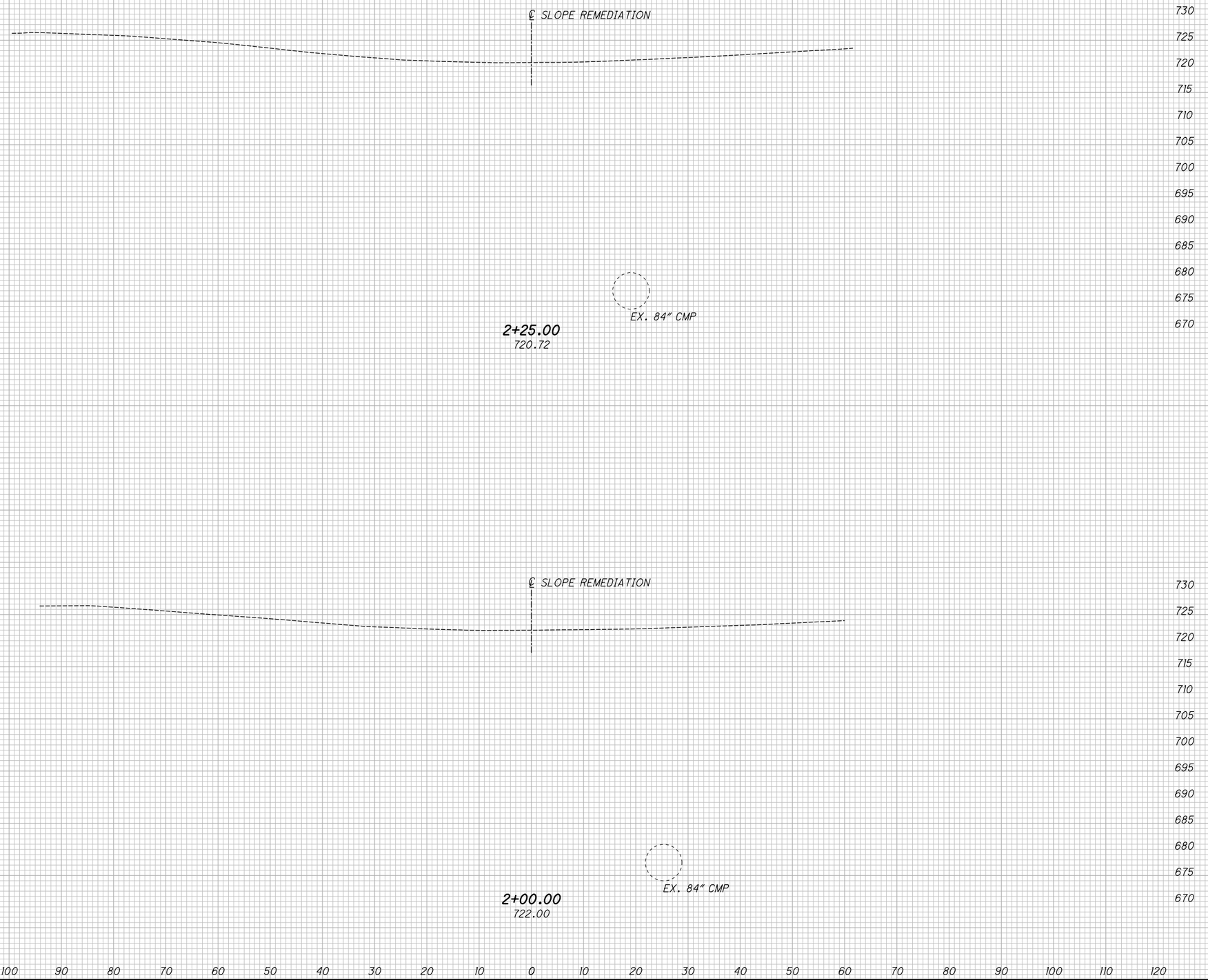
SEEDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME	
CUT	FILL	CUT	FILL
		0	0

CALCULATED MTG
CHECKED SJP

CROSS SECTIONS CUY-480-1628 SLOPE REMEDIATION STA. 2+00.00 TO STA. 2+25.00

CUY-90-18.22/VAR

24
63

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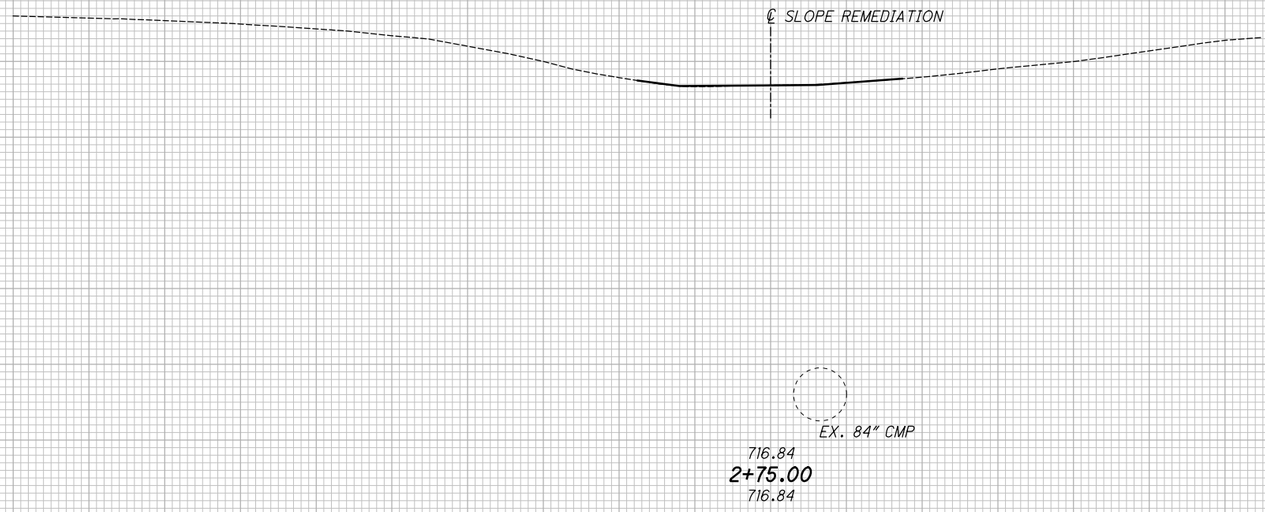
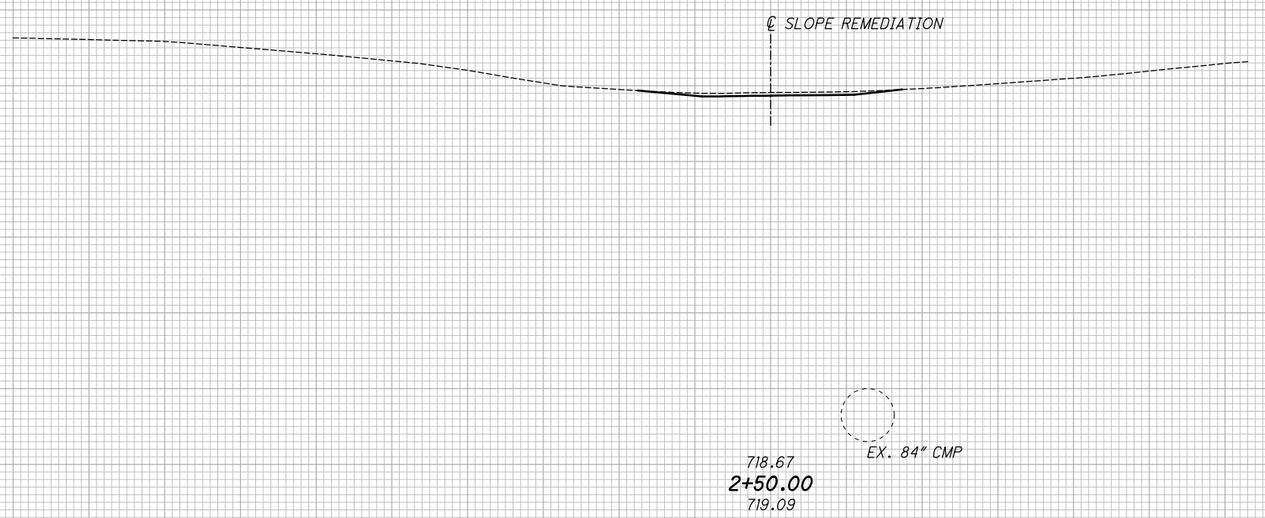
SEEDING	
END WIDTH	SQ. YDS.





725 720 715 710 705 700 695 690 685 680 675 670 665

130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	0		
0	0		
		0	0

CALCULATED MTG
CHECKED SJP

CROSS SECTIONS CUY-480-1628 SLOPE REMEDIATION STA. 2+50.00 TO STA. 2+75.00

CUY-90-18.22/VAR

25
63

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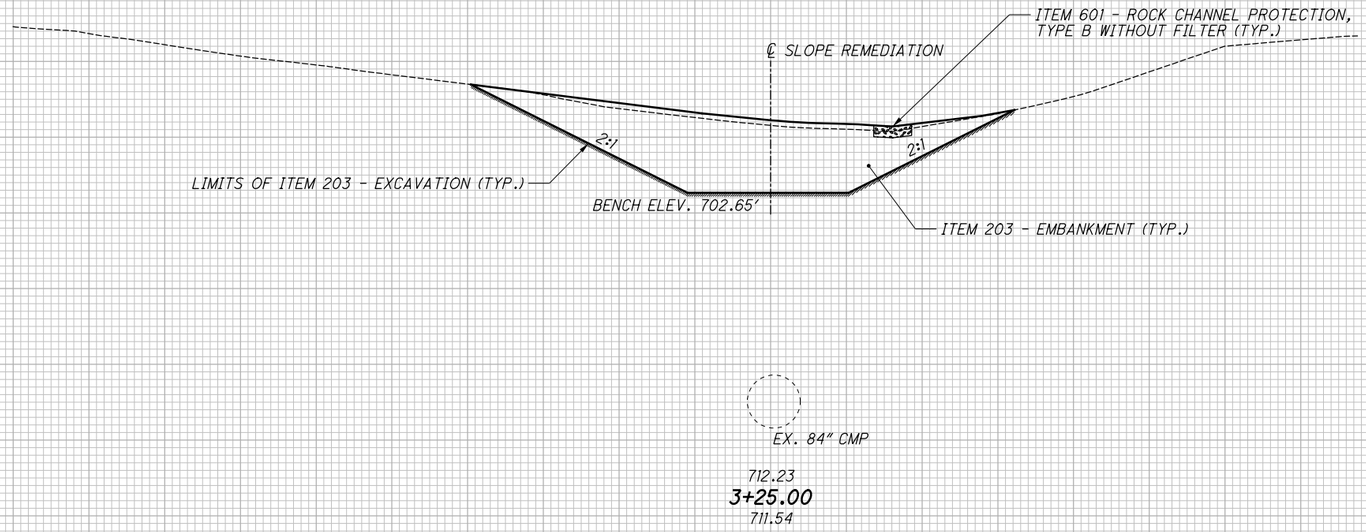
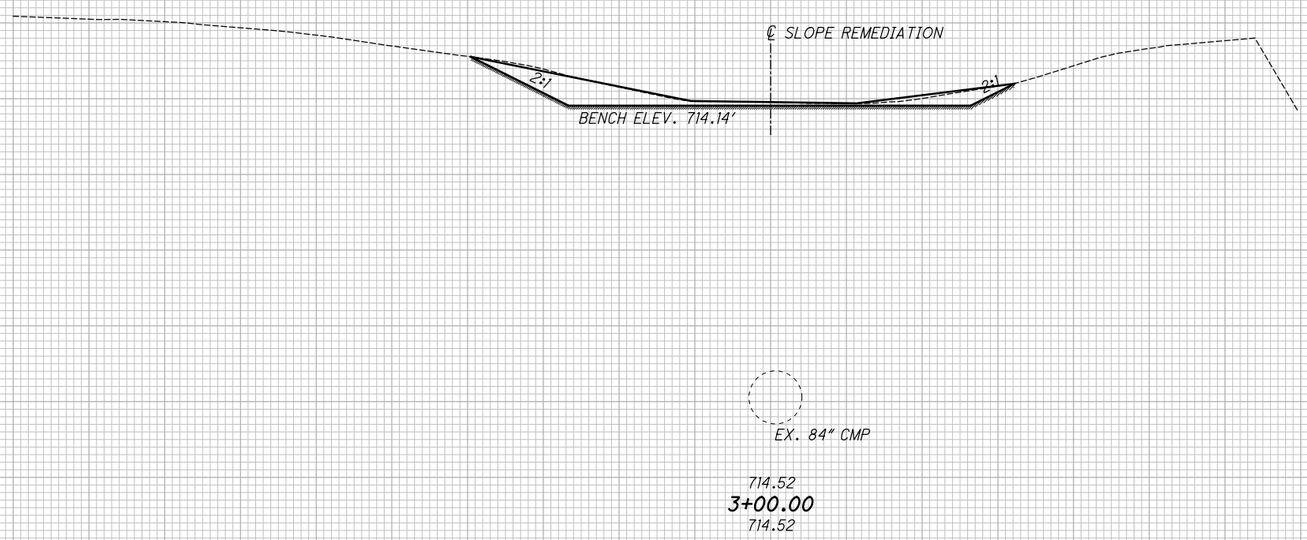
SEEDING	
END WIDTH	SQ. YDS.





END AREA		VOLUME	
CUT	FILL	CUT	FILL
414	449		
		234	252
92	96		
		43	44
		277	296

130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

CALCULATED MTG
CHECKED SJP

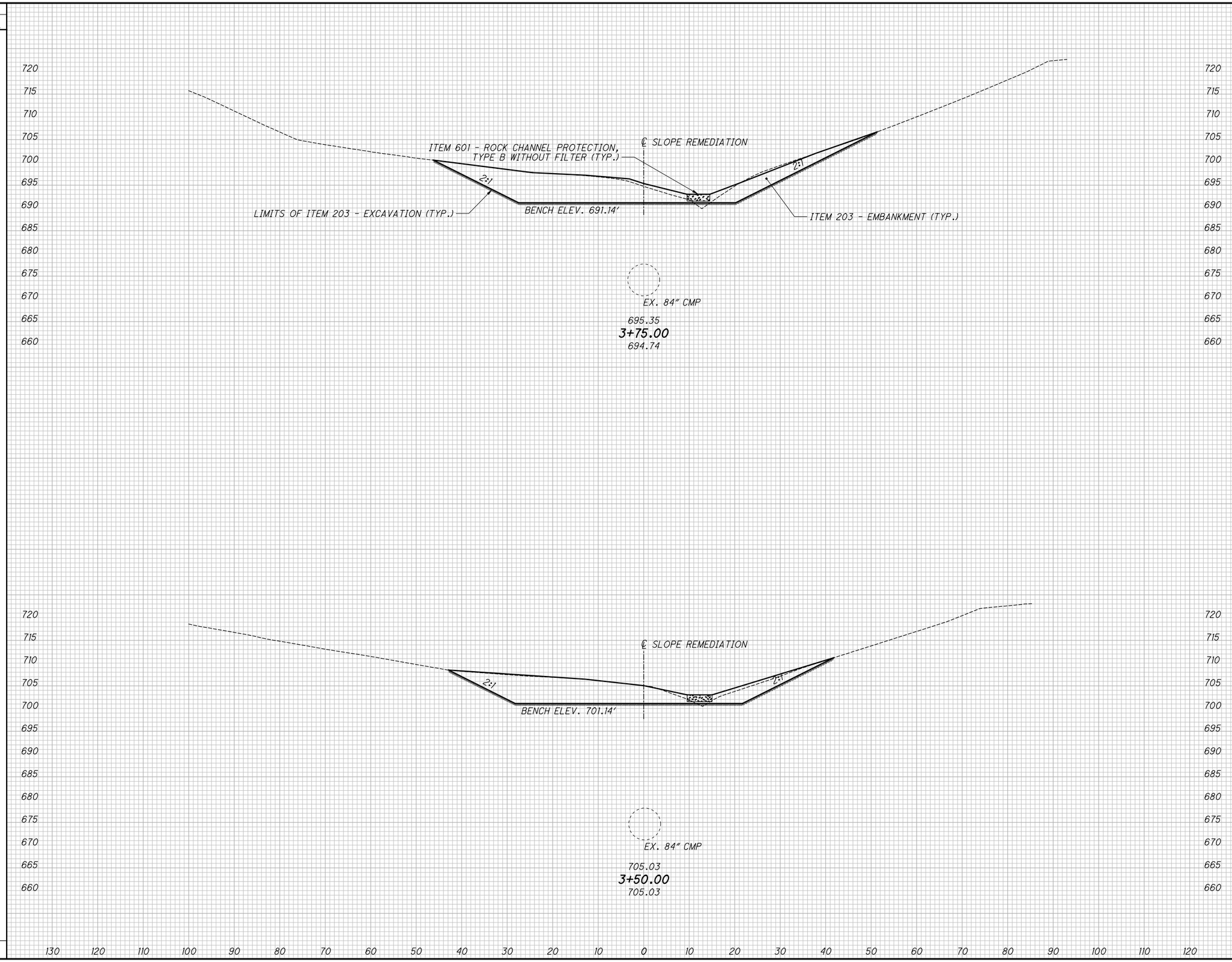
CROSS SECTIONS CUY-480-1628 SLOPE REMEDIATION
STA. 3+00.00 TO STA. 3+25.00

CUY-90-18.22/VAR

26
63

R:\17000\17126 - CUY-90-18.22 Culverts\Microstation Project\92069_CUY-90-18.22\Design\Roadway\Sheets\92069_XS404.dgn Sheet004 1/19/2021 10:49:39 AM pfingstenr

SEEDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME	
CUT	FILL	CUT	FILL
327	352		
		274	298
265	291		
		314	343
		588	641

CALCULATED MTG
CHECKED SJP

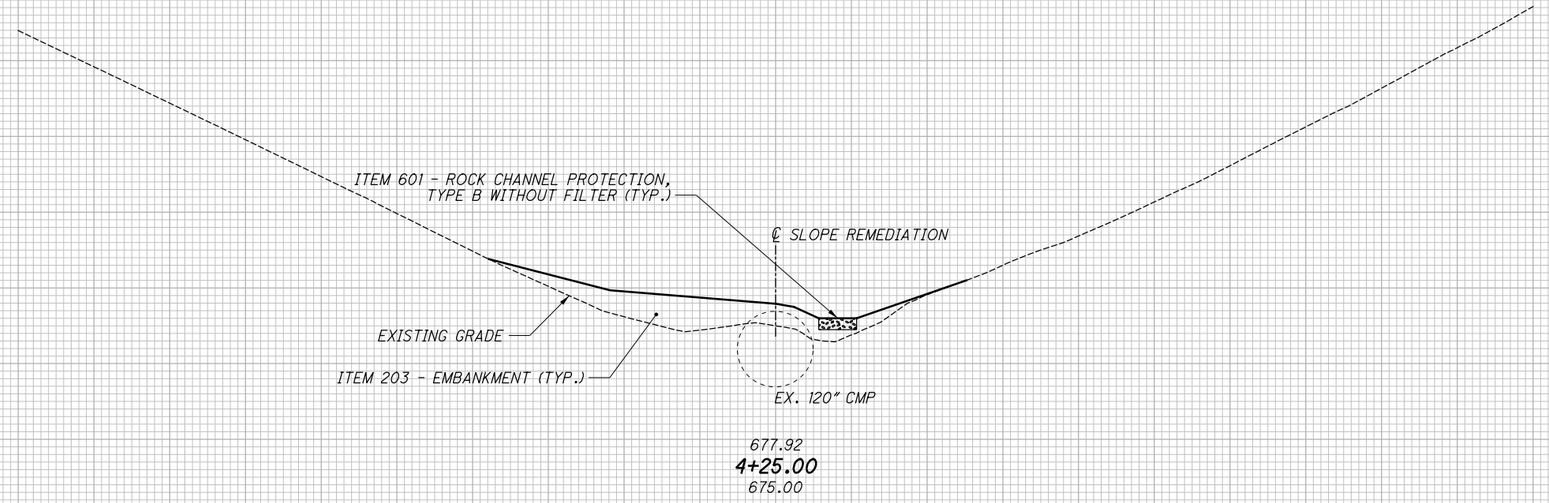
CROSS SECTIONS CUY-480-1628 SLOPE REMEDIATION STA. 3+50.00 TO STA. 3+75.00

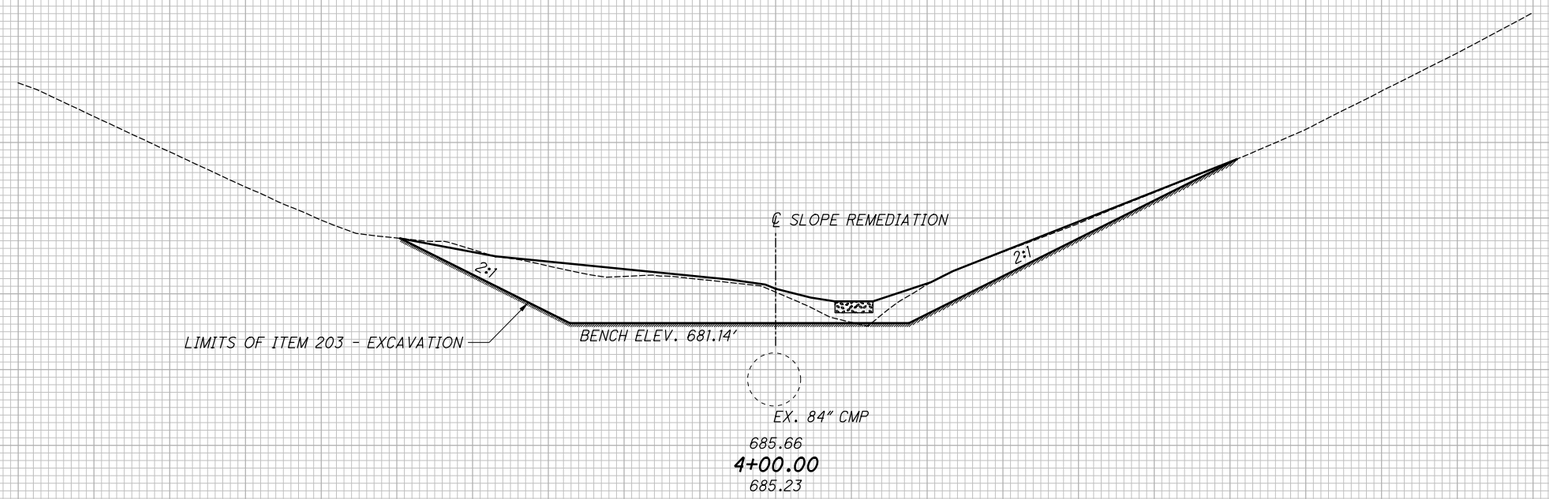
CUY-90-18.22/VAR

27
63

R:\7000\17126 - CUY-90-18.22 Culverts\Microstation Project\92069_CUY-90-18.22\Design\Roadway\Sheets\92069_XS405.dgn Sheet005 1/19/2021 10:49:41 AM pfingstenr

SEEDING	
END WIDTH	SQ. YDS.





END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	147		
		168	261
363	416		
		319	356
		487	617

CALCULATED MTG
CHECKED SJP

CROSS SECTIONS CUY-480-1628 SLOPE REMEDIATION STA. 4+00.00 TO STA. 4+25.00

CUY-90-18.22/VAR

28
63

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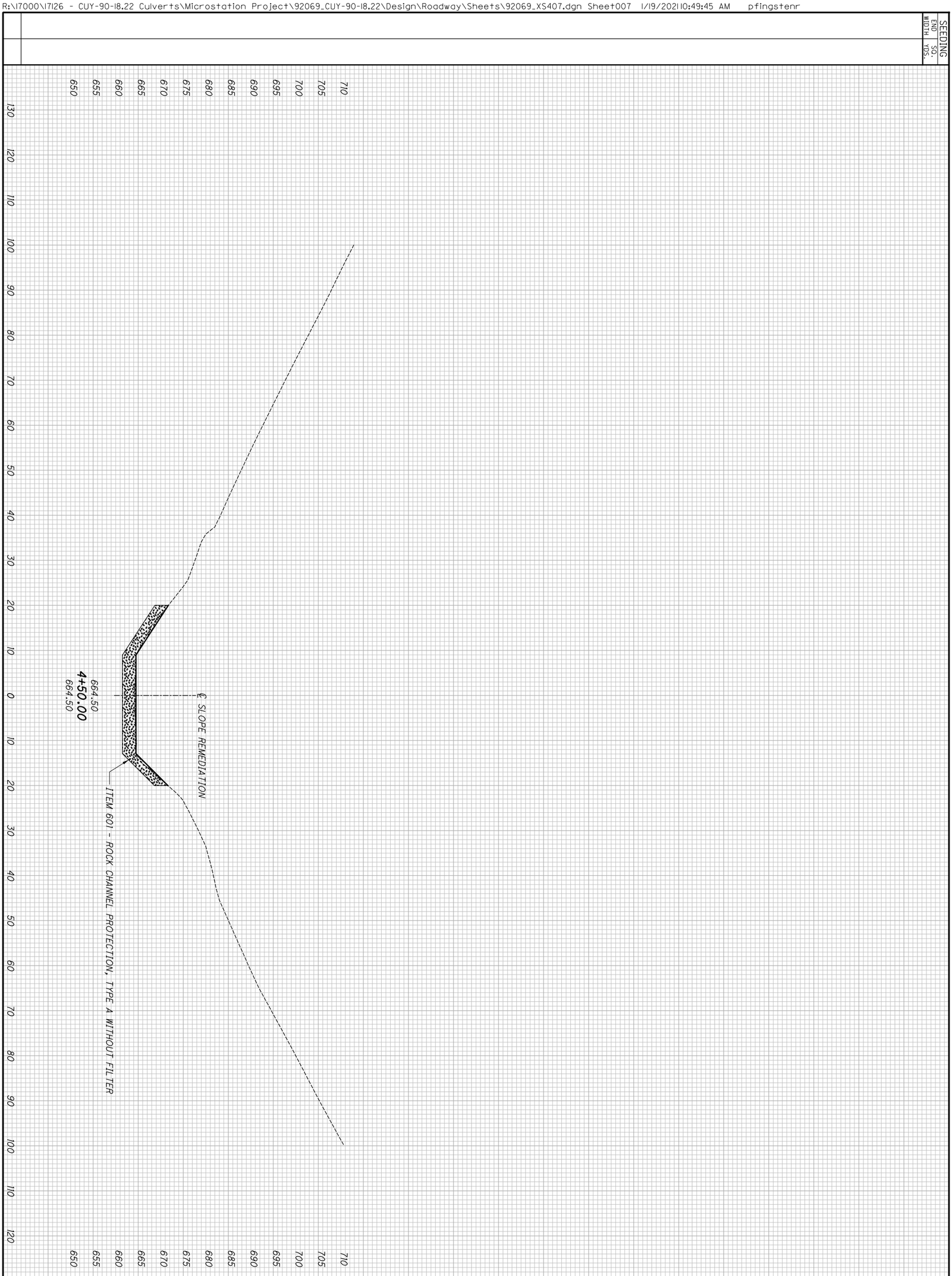
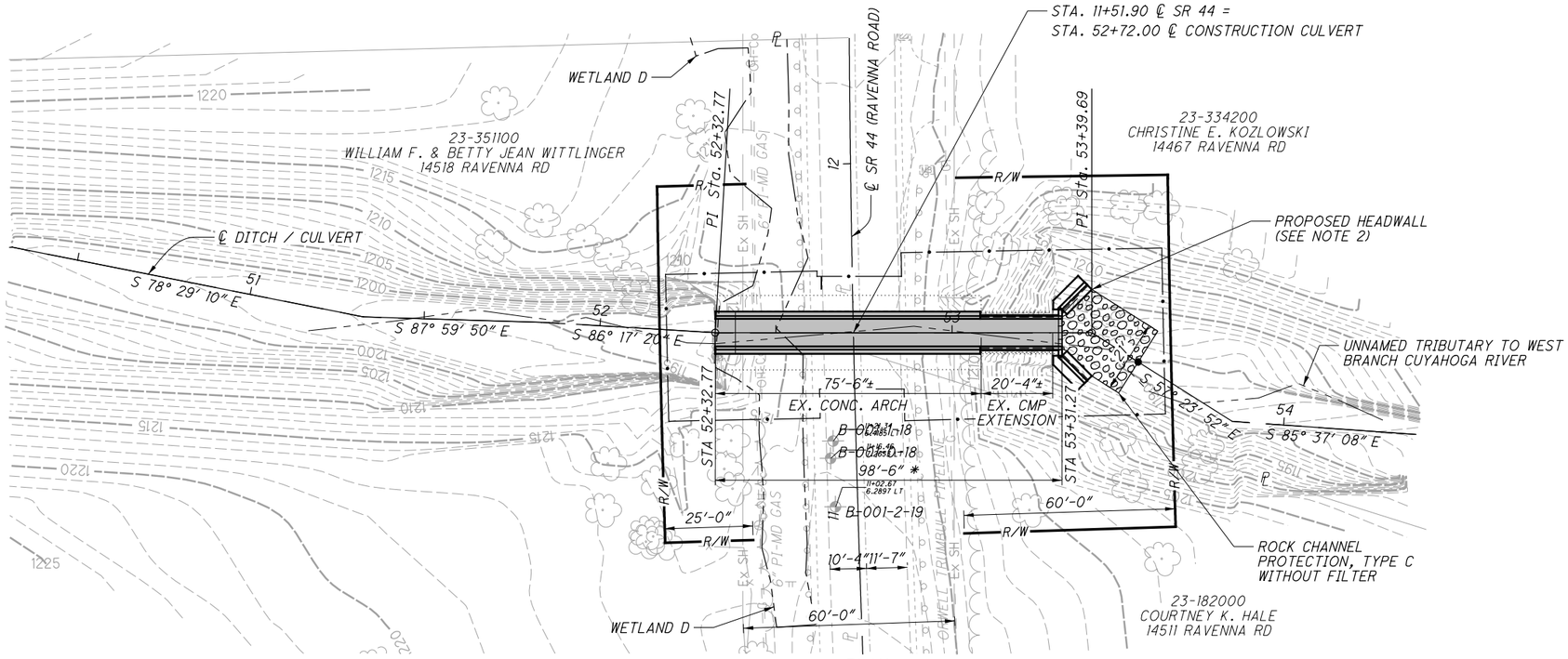


CUY-90-18.22/ VAR

CROSS SECTIONS CUY-480-1628 SLOPE REMEDIATION
STA. 4+50.00

CALCULATED MTG
CHECKED SJP

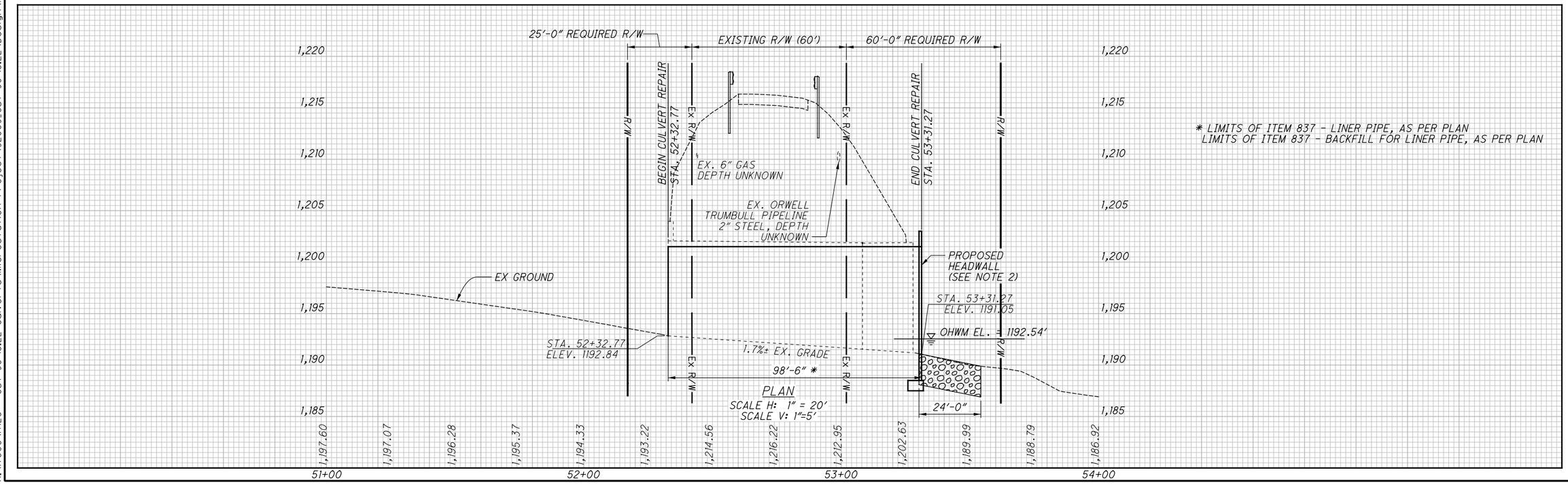


PLAN
SCALE: 1" = 20'

NOTES:

1. SEE GEA-044-0916 SITE PLAN SHEET, SHEET 56, FOR COMPLETE LIMITS OF CONSTRUCTION.

2. SEE GEA-044-0916 DETAIL SHEET, SHEET 62, FOR ADDITIONAL HEADWALL DETAILS.



PLAN
SCALE H: 1" = 20'
SCALE V: 1"=5'

* LIMITS OF ITEM 837 - LINER PIPE, AS PER PLAN
LIMITS OF ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN

HORIZONTAL SCALE IN FEET
0 10 20 10

CALCULATED MTG
CHECKED SJP

CULVERT PLAN AND PROFILE
SITE 5 - GEA-44-0916

CUY-90-18.22/VAR

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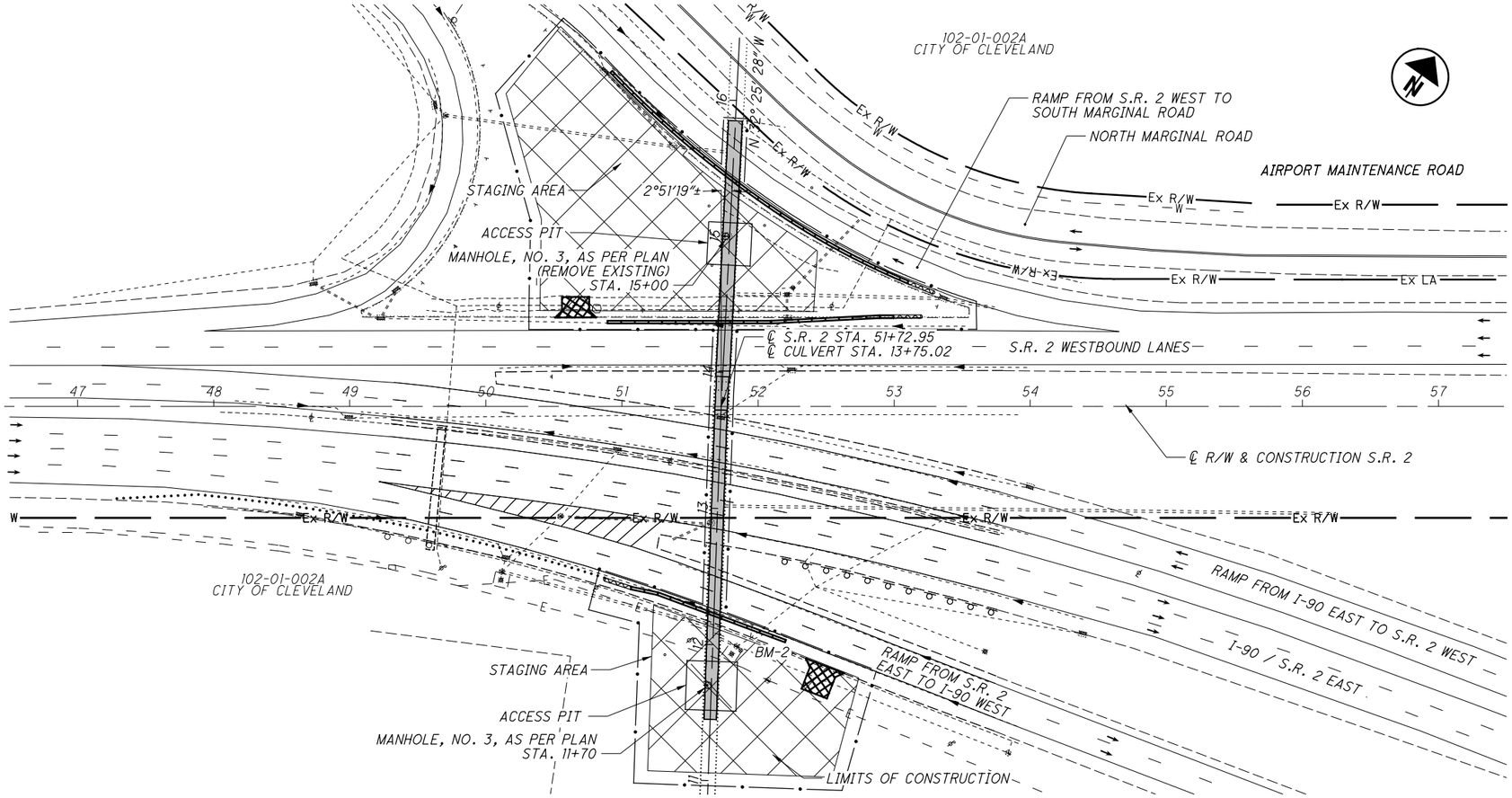
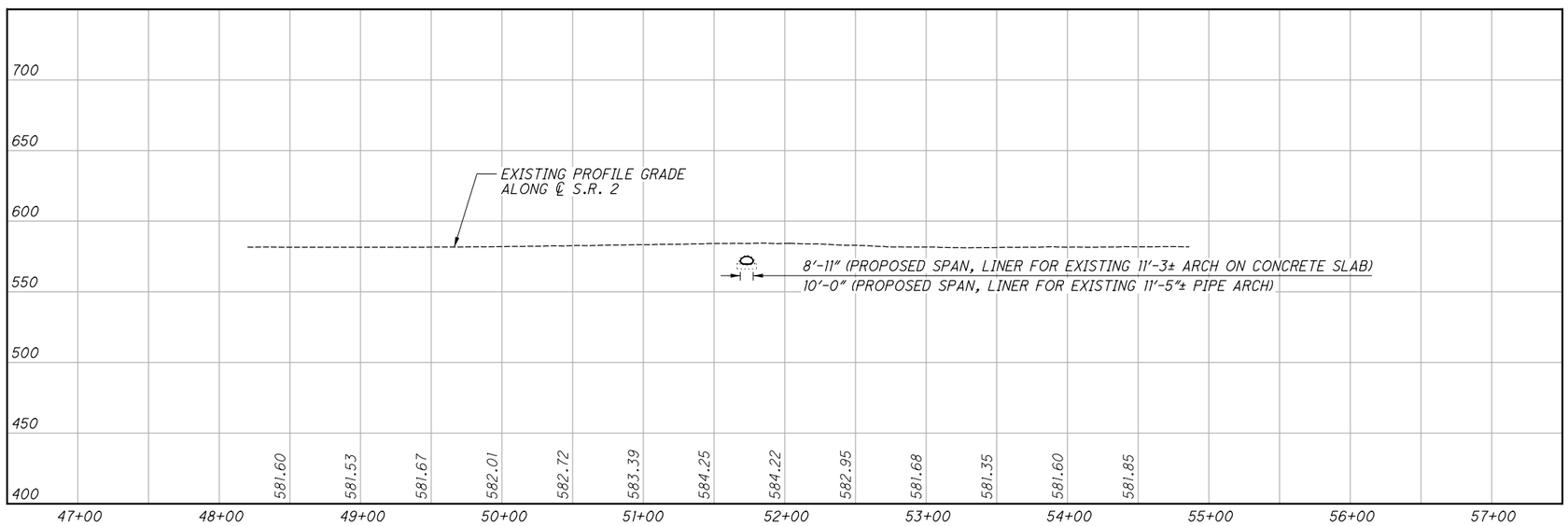


PLAN



PROFILE ALONG ℄ CONSTRUCTION

BENCHMARK DATA

BM #1 STA. 52+26, 87' LT. - CHISELED SQUARE ON N.E. CORNER OF CONCRETE PAD FOR CATCH BASIN, ELEV = 578.89

BM #2 STA. 51+87, 179' RT. - CHISELED SQUARE ON N.E. CORNER OF CONCRETE PAD FOR CATCH BASIN, ELEV = 579.62

LEGEND

STRUCTURAL LINING LIMITS

STAGING AREA

NOTES

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

DESIGN TRAFFIC:

2021 ADT = 21,000 2021 ADTT = 1,470
2051 ADT = 22,000 2051 ADTT = 1,540
DIRECTIONAL DISTRIBUTION = 0.50

HYDRAULIC DATA

Q (10) =	237 CFS	V (10) =	5.91 FT/S
Q (25) =	291 CFS	V (25) =	7.27 FT/S
Q (50) =	319 CFS	V (50) =	7.46 FT/S

SEE STRUCTURE NOTES FOR BYPASS PUMPING REQUIREMENTS

PROPOSED WORK

- REMOVE EXISTING MANHOLE ON THE EXISTING CULVERT AND OPEN ACCESS PIT(S)
- DEWATER EXISTING STRUCTURE
- PREPARE CULVERT BARREL TO RECEIVE STRUCTURAL LINER
- INSTALL STRUCTURAL LINER PIPE AND GROUT IN PLACE IN STAGES
- CONSTRUCT NEW MANHOLE
- BACKFILL ACCESS PIT(S)

EXISTING STRUCTURE

TYPE: CORRUGATED METAL PIPE CULVERT

SPANS: 11'-3"± ALONG SKEW (11'-3"± ARCH ON CONCRETE SLAB)
11'-5"± ALONG SKEW (10'-3"± PIPE ARCH)

ROADWAY: S.R. 2 EB AND WB LANES

LOADING: HS-20

SKEW: 2° 51' 19"± LEFT FORWARD

WEARING SURFACE: ASPHALT CONCRETE

APPROACH SLABS: NONE

ALIGNMENT: TANGENT

CROWN: VARIES

STRUCTURAL FILE NUMBER: 1800159

DATE BUILT: 1953

DISPOSITION: OPEN

PROPOSED STRUCTURE

TYPE: STRUCTURAL PLATE LINER INSTALLED WITHIN EXISTING STRUCTURE AND BACKFILLED WITH GROUT

SPANS: 8'-11" ALONG SKEW (8'-11" LINER FOR ARCH ON CONCRETE SLAB)
10'-0" ALONG SKEW (10'-0" LINER FOR PIPE ARCH)

ROADWAY: S.R. 2 EB AND WB LANES

LOADING: HL-93 AND 60 PSF FUTURE WEARING SURFACE

SKEW: 2°51' 19" TO WB S.R. 2

APPROACH SLABS: NONE

COORDINATES: LATITUDE 41° 30' 59.83" N
LONGITUDE 81° 40' 36.31" W

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

REVIEWED HVH DATE 09/18/20
STRUCTURE FILE NUMBER 1800159

DRAWN RAP
REVISED

DESIGNED RAP
CHECKED RY

COUNTY
STA. 50+00
STA. 53+00

SITE PLAN
SITE 1 - BRIDGE NO. CUY-2-1688
EAST 26TH STREET STORM SEWER

CUY-90-18.22/ VAR
PID No. 92069

1 / 6

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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFER TO THE FOLLOWING ODOT STANDARD DRAWING(S):

MH-1.1 DATED 01/15/2016
MH-1.2 DATED 01/15/2016
MH-1.3 DATED 01/18/2013

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATION(S):

800 DATED 04/16/2021
837 DATED 07/19/2019

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 8TH EDITION, INCLUDING ALL REVISIONS AND INTERIM SPECIFICATIONS, AND THE ODOT BRIDGE DESIGN MANUAL, 2019 AND QUARTERLY UPDATES.

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 (HEADWALL)

REINFORCING STEEL
-MINIMUM YIELD STRENGTH 60 KSI

EXISTING STRUCTURE VERIFICATION

EXISTING STRUCTURE VERIFICATION: DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02 AND 513.04.

BASE CONTRACT BID PRICES UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE. HOWEVER, THE DEPARTMENT WILL PAY FOR ALL PROJECT WORK BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED IN THE FIELD.

ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

THIS WORK CONSISTS OF THE REMOVAL OF EXISTING MANHOLES, PORTIONS OF THE EXISTING CMP AS NEEDED FOR ACCESS, AND ANY OTHER PORTIONS OF THE EXISTING STRUCTURE NECESSARY TO FACILITATE INSTALLATION OF THE PLATE LINER.

PERFORM WORK CAREFULLY DURING REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND INCORPORATED INTO THE PROPOSED STRUCTURE. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE RAM TYPE OF EQUIPMENT IS PROHIBITED. SUBMIT CONSTRUCTION PLANS ACCORDING TO CMS 501.05. ANY DAMAGE TO PORTIONS OF THE EXISTING STRUCTURE TO REMAIN SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST.

MEASUREMENT & PAYMENT: THE DEPARTMENT WILL MEASURE THE QUANTITY OF REMOVALS ON A LUMP SUM BASIS. THE DEPARTMENT WILL PAY FOR THE ACCEPTED QUANTITIES OF REMOVALS AT THE CONTRACT PRICE FOR ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN.

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

PROVISIONS OF CMS ITEM 503 SHALL APPLY EXCEPT AS MODIFIED HEREIN:

LAKE BACKWATER

A BACKWATER CONDITION CONDITION EXISTS AT THIS LOCATION, AND THE DEPTH OF STANDING WATER IN THE CULVERT WILL VARY WITH THE LAKE (ERIE) LEVEL. THE DEWATERING AND CONSTRUCTION SEQUENCE AS DETAILED IN THESE PLANS IS FOR REFERENCE ONLY AND NOT TO SCALE; CONTRACTOR MEANS AND METHODS WILL VARY. THE CONTRACTOR SHALL SUBMIT SITE SPECIFIC DEWATERING PROCEDURES PRIOR TO ORDERING MATERIAL. CONTRACTOR SHALL COORDINATE ALL WORK WITH NORTHEAST OHIO REGIONAL SEWER DISTRICT (NEORSD). HISTORIC LAKE LEVELS ARE VIEWABLE AT THE TIDES AND CURRENTS SECTION OF THE NATIONAL OCEANIC AND ATMOSPHERIC (NOAA) WEBSITE:

https://tidesandcurrents.noaa.gov/map/

SITE SURCHARGE

WITH HIGH LAKE LEVELS, A WET WEATHER EVENT MAY LEAD TO SEWER SURCHARGING SINCE THE CULVERT WILL BE OPEN. THE CONTRACTOR SHALL PROVIDE PROVISIONS AND PROCEDURES FOR SITE CLEANUP IF A SURCHAGE EVENT OCCURS.

BYPASS PUMPING

THE REPAIR SITE IS LOCATED IN AN EXISTING CULVERT WHICH EXPERIENCES SIGNIFICANT COMBINED SEWER FLOW DURING WET WEATHER. ALL FLOW FROM WET WEATHER EVENTS MUST BE PERMITTED TO PASS THROUGH THE WORK OPERATIONS BY USING PIPE PLUGS WHICH ARE READILY REMOVABLE. THE CONTRACTOR SHALL HAVE PROVISIONS AND PROCEDURES IN PLACE TO DISMANTLE OR PROTECT THE WORK DURING WET WEATHER. CONTRACTOR SHALL SCHEDULE LINER INSTALLATION ONLY DURING DRY WEATHER PERIODS AND DURING MONTHS WITH THE LOWEST POTENTIAL WET WEATHER EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY INTERRUPTION OF, OR DAMAGE TO, THE WORK DUE TO WET WEATHER FLOWS.

THE CONTRACTOR SHALL SCHEDULE LINER INSTALLATION DURING MONTHS WITH THE LOWEST NORMAL FLOW AND LOWEST POTENTIAL FOR OUTFALLS CAUSED BY RAIN EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. CONTRACTOR SHALL COORDINATE ALL WORK WITH NORTHEAST OHIO REGIONAL SEWER DISTRICT (NEORSD).

THE DEWATERING/BYPASS AND CONSTRUCTION SEQUENCE IN THESE PLANS IS NOT TO SCALE AND FOR REFERENCE ONLY; THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER SITE SPECIFIC DEWATERING AND BYPASS PUMPING PROCEDURES PRIOR TO ORDERING MATERIAL.

ALL MATERIALS, LABOR, SUBMITTALS, AND INCIDENTALS REQUIRED FOR THE PERFORMANCE OF WORK AS DETAILED HEREIN AND IN THESE PLANS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN.

ITEM 837 - LINER PIPE, AS PER PLAN

THE PROPOSED STRUCTURE TYPE SHALL BE A FLANGED, GALVANIZED STEEL, TUNNEL LINER PLATE PIPE ARCH CONFORMING TO THE GEOMETRY SHOWN ON SHEET 6/7 AND CAPABLE OF BEING ASSEMBLED WITHIN THE EXISTING STRUCTURE AS DETAILED IN THESE PLANS. THE PROPOSED STRUCTURE SHALL BE DESIGNED FOR HL-93 LOADING WITH 60 PSF FUTURE WEARING SURFACE AND ASSUME THE EXISTING STRUCTURE PROVIDES NO STRUCTURAL CAPACITY. VENDOR TO PROVIDE GAUGE THICKNESS.

MATERIAL:

LINER PLATES SHALL BE FABRICATED FROM BLACK STEEL PLATES CONFORMING TO ASTM SPECIFICATION A 1011. PLATES SHALL BE OF THE GAGE SHOWN ON THE PLANS AND SHALL BE CURVED TO SUIT THE TUNNEL CROSS SECTION SHOWN. PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123, EXCEPT THAT THE ZINC SHALL BE APPLIED AT A RATE OF 2.0 OUNCES PER SQUARE FOOT TOTAL FOR BOTH SIDES.

ALL PLATES SHALL BE PUNCHED FOR BOLTING ON BOTH LONGITUDINAL AND CIRCUMFERENTIAL SEAMS AND SHALL BE SO FABRICATED AS TO PERMIT COMPLETE ERECTION FROM THE INSIDE OF THE EXISTING STRUCTURE. THE LONGITUDINAL SEAM SHALL BE OF THE LAPPED TYPE, WITH AN OFFSET EQUAL TO THE GAGE OF METAL FOR THE FULL WIDTH OF PLATE TO ALLOW THE CROSS SECTION OF THE PLATE TO BE CONTINUOUS THROUGH THE SEAM. CIRCUMFERENTIAL BOLT HOLE SPACING SHALL BE 6-1/4".

GROUT HOLES, ADJUSTING RODS, ANTI-FLOTATION DEVICES, BASE CHANNELS, AND SKID RAILS SHALL BE IN ACCORDANCE WITH THE LINER MANUFACTURER'S RECOMMENDATIONS. GROUT PORT/VENT LOCATIONS IN THE ROADWAY ARE PERMISSIBLE BUT SHOULD BE CONFIGURED TO MINIMIZE IMPACT TO TRAFFIC.

BOLTS AND NUTS:

BOLTS AND NUTS SHALL BE 5/8" IN DIAMETER AND LENGTH AS RECOMMENDED BY THE MANUFACTURER. BOLTS SHALL CONFORM TO ASTM A 449, TYPE 1 OR ASTM A 307. FOR LONGITUDINAL SEAMS, BOLTS SHALL BE A 449, TYPE 1, FOR PLATE THICKNESS EQUAL TO OR GREATER THAN 0.209. FOR PLATE THICKNESS LESS THAN .209, THE BOLTS SHALL BE A 307, GRADE A. ALL CIRCUMFERENTIAL BOLTS MAY BE A 307, GRADE A. NUTS SHALL CONFORM TO ASTM A 563, GRADE A, HEX.

GALVANIZING WHEN REQUIRED SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM B-695, CLASS 50.

INSTALLATION:

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS INCLUDING ASSEMBLY DRAWINGS, ARCH ASSEMBLY METHODS, DEWATERING METHODS, BULKHEAD, AND BLOCKING DETAILS TO THE ENGINEER FOR REVIEW. THE CONTRACTOR MAY PUSH OR PULL ASSEMBLED LINER SECTIONS INTO PLACE IF NECESSARY PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL UTILIZE METHODS THAT FACILITATE PLACEMENT OF THE LINER SECTIONS WHILE MINIMIZING DAMAGE TO THE PLATE OR ITS GALVANIZED ZINC COATING. THE CONTRACTOR SHALL TOUCH UP ANY DAMAGE TO THE GALVANIZED ZINC COATING CAUSED BY HANDLING OR ASSEMBLY. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE DETAILS AND LOCATIONS OF LATERAL CONNECTIONS, GROUT PORTS, FITTINGS, BLOCKING, AND BLOCKING HARDWARE FOR APPROVAL. A GROUTING METHOD AND CULVERT INSTALLATION PROCEDURE SHALL ALSO BE SUBMITTED FOR APPROVAL. LINER PLATE SHALL BE ASSEMBLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. LONGITUDINAL SEAMS SHALL BE STAGGERED BETWEEN RINGS.

CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, INCLUDING: SIZE, TYPE, AND LOCATIONS OF ALL LATERAL CONNECTIONS; DEFLECTIONS/DAMAGE TO THE EXISTING STRUCTURES; AND HORIZONTAL AND VERTICAL DEFLECTIONS TO THE OVERALL STRUCTURE ALIGNMENT.

ALL NECESSARY REPAIRS/REMOVALS TO THE EXISTING CULVERT TO PROVIDE CLEARANCE FOR THE PROPOSED LINER/GROUT SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT AS NEEDED TO MAINTAIN STRUCTURAL INTEGRITY AT ALL TIMES.

FIELD CUTTING OF LINER SHALL BE AS MINIMAL AS REQUIRED TO PERMIT CONNECTION OF LATERALS AND SHALL NOT COMPROMIZE THE STRUCTURAL CAPACITY OF THE LINER. GALVANIZING SHALL BE TOUCHED UP FOR ANY CUT EDGES. LARGER LATERAL CONNECTIONS MAY WARRANT USE OF HEAVIER GAUGE PLATE OR OTHER REINFORCEMENT AND SHALL BE DESIGNED BY PLATE VENDOR. ALL LATERAL CONNECTIONS SHALL BE INCLUDED IN THE BID UNIT PRICE FOR THIS ITEM.

CONTRACTOR SHALL PROVIDE SHOP FABRICATED TRANSITION LINER SECTIONS TO ACCOMODATE DEFLECTIONS IN THE HORIZONTAL OR VERTICAL ALIGNMENT OF THE EXISTING STRUCTURES.

ALL VENTILATION NEEDED FOR THE PERFORMANCE OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.

THE COSTS OF ALL ABOVE DECRIBED ITEMS, WORK, AND INCIDENTALS TO CONSTRUCT THE LINER AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1800159	

STRUCTURE NOTES
SITE 1 - BRIDGE NO. CUY-2-1688
EAST 26TH STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

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ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN

THE BACKILL FOR THE LINER PIPE, HENCEFORTH REFERRED TO AS GROUT, IS FOR FILLING THE ANNULAR SPACE BETWEEN THE EXISTING CONDUIT AND PROPOSED LINER. AFTER INSTALLATION OF THE LINER, BUT PRIOR TO GROUTING, BULKHEADING AND VENTING SHALL BE CONSTRUCTED. A WATERTIGHT, CEMENTITIOUS BULKHEAD (OR COLLAR) SHALL BE FORMED BETWEEN THE HOST STRUCTURE AND THE ARCH LINER AT EACH END OF THE ARCH AND SHALL PROVIDE LONG TERM DURABILITY. BULKHEAD DESIGNS SHALL BE SUFFICIENT TO RESIST GROUT PRESSURES OR HYDROSTATIC WATER PRESSURE WITHIN THE ANNULAR SPACE.

THE GROUT SHALL BE PLACED IN CONTROLLED LIFTS IN ACCORDANCE WITH THE SUBMITTED STAGED GROUTING PLAN. EACH LIFT SHALL BE ALLOWED TO ACHIEVE INITIAL SET BEFORE THE SUBSEQUENT LIFT CAN BE PLACED. ADDITIONALLY, THE CONTRACTOR TOGETHER WITH THE ENGINEER SHALL SOUND THE AREA OF EACH LIFT ONCE IT HAS ACHIEVED INITIAL SET TO ENSURE THAT THE GAP BETWEEN THE EXISTING STRUCTURE AND PROPOSED ARCH HAS BEEN COMPLETELY FILLED. ANY VOIDS DETECTED BY THE SOUNDING SHALL BE CORRECTED BY PLACING ADDITIONAL GROUT BEFORE PROCEEDING WITH PLACEMENT OF THE SUBSEQUENT LIFT.

IF PORTS ARE USED TO PUMP GROUT THROUGH THE STEEL LINER PIPE, THEY SHALL BE SHOP INSTALLED. IF FIELD-INSTALLED PORTS ARE REQUIRED, THEY SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT COMPROMISE THE STRUCTURAL CAPACITY OF THE LINER.

IF ANY PORTION OF THE EXISTING STRUCTURE SLAB IS REMOVED FOR CONTRACTOR ACCESS, THE GROUT SHALL BE FILLED TO THE ORIGINAL SLAB TOP ELEVATION.

THE MATERIALS SHALL BE MIXED IN EQUIPMENT OF SUFFICIENT SIZE AND CAPACITY TO PROVIDE THE DESIRED AMOUNT OF GROUT MATERIAL FOR EACH GROUTING STAGE. THE EQUIPMENT SHALL BE CAPABLE OF MIXING THE GROUT AT DENSITIES REQUIRED FOR THE APPROVED PROCEDURE AND SHALL ALSO BE CAPABLE OF CHANGING DENSITY AS DICTATED BY FIELD CONDITIONS ANY TIME DURING THE GROUTING OPERATION.

THE MIX DESIGN(S) SHALL BE DEVELOPED TO COMPLETELY FILL THE ANNULAR SPACE, AND SHALL ADDRESS THE FOLLOWING CONSIDERATIONS: SIZE OF ANNULAR VOID, VOIDS (BASED ON SIZE AND ACCESS) IN THE SURROUNDING STRUCTURE ENVELOPE, ABSENCE OR PRESENCE OF GROUNDWATER, SUFFICIENT STRENGTH AND DURABILITY TO PREVENT MOVEMENT OF THE LINER PLATE, PROVISIONS FOR ADEQUATE RETARDATION AND SHRINKAGE OF LESS THAN 1 PERCENT BY VOLUME. GROUT SHALL BE MIXED IN SMALL QUANTITIES AS NEEDED, AND SHALL NOT BE RE-TEMPERED OR USED AFTER IT HAS BEGUN TO SET.

THE GAUGED PUMPING PRESSURE SHALL NOT EXCEED THE ARCH LINER MANUFACTURER'S APPROVED RECOMMENDATIONS. PUMPING EQUIPMENT SHALL BE OF SIZE SUFFICIENT TO INJECT GROUT AT VELOCITY AND PRESSURE RELATIVE TO THE SIZE OF THE ANNULAR SPACE. GAUGES TO MONITOR GROUT PRESSURE SHALL BE ATTACHED IMMEDIATELY ADJACENT TO EACH INJECTION PORT. THE GAUGE SHALL CONFORM TO AN ACCURACY OF NOT MORE THAN ONE-HALF PERCENT ERROR OVER THE FULL RANGE OF THE GAUGE. THE RANGE OF THE GAUGE SHALL BE NOT MORE THAN 100 PERCENT GREATER THAN THE DESIGN GROUT PRESSURE. PRESSURE GAUGES SHALL BE INSTRUMENT OIL FILLED AND ATTACHED TO A SADDLE TYPE DIAPHRAGM SEAL (GAUGE SAVER) TO PREVENT CLOGGING WITH GROUT. ALL GAUGES SHALL BE CERTIFIED AND CALIBRATED IN ACCORDANCE WITH ANSI B40 GRADE 2A.

PRE-CONSTRUCTION MEETING:

THE ARCH LINER MANUFACTURER MUST PROVIDE A REPRESENTATIVE TO CONDUCT A PRE-CONSTRUCTION MEETING THAT COVERS ALL ASPECTS OF THE LINING AND GROUTING PROCESS AND SAID PERSON MUST BE A REGISTERED PROFESSION ENGINEER. HE OR SHE MUST ALSO BE ON SITE DURING GROUTING OPERATIONS.

EXPERIENCE:

THE ARCH LINER MANUFACTURER SHALL SHOW EXTERNAL PROOF THAT THEIR EMPLOYEE WHO WILL CONDUCT THE PRE-CONSTRUCTION MEETING SHALL HAVE PARTICIPATED IN THE SUCCESSFUL RELINE OF AT LEAST 10 STRUCTURES OF THIS TYPE AND SIZE ON PREVIOUS PROJECTS.

SUBMITTALS REQUIREMENTS:

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER AT LEAST TEN (10) WORKING DAYS PRIOR TO COMMENCING THE LINER PIPE INSTALLATION:

STRUCTURAL DESIGN CALCULATIONS FOR THE LINER PIPE FOLLOWING SECTION 12 OF THE AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES USING THE LRFD METHOD VERIFYING CAPACITY SIGNED BY A LICENSED PROFESSIONAL ENGINEER. THESE CALCULATIONS SHALL ASSUME THE EXISTING STRUCTURE HAS FAILED AND CONTRIBUTES NO STRENGTH TO THE PROPOSED LINER.

WRITTEN VERIFICATION BY THE LINER MANUFACTURER THAT THE LINING AND GROUTING PLAN CONFORMS WITH ALL PROVISIONS, CAUTIONS, AND RESTRICTIONS OF THESE SPECIFICATIONS, CONTRACT PLANS, AND MANUFACTURER REQUIREMENTS.

THE COSTS OF ALL ABOVE MENTIONED ITEMS, TEMPORARY FORMS/BULKHEADS, AND TEMPORARY SUPPORTS REQUIRED TO CONSTRUCT THE LINER BACKFILL AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

CALC:	RAP	DATE:	8/21/2020
CHECKED:	RY	DATE:	8/28/2020

ESTIMATED QUANTITIES (CUY-002-1688)

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.	SEE SHEET
202	11201	LS		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN				LS	2/6
203	35110	72	CY	GRANULAR MATERIAL, TYPE B				72	
503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN				LS	2/6
503	21100	72	CY	UNCLASSIFIED EXCAVATION				72	
611	96560	440	FT	CONDUIT, FIELD PAVING OF PIPE				440	
611	99575	2	EACH	MANHOLE, NO. 3, AS PER PLAN				2	6/6
837	10001	440	FT	LINER PIPE, AS PER PLAN				440	2/6
837	21001	440	FT	BACKFILL FOR LINER PIPE, AS PER PLAN				440	3/6

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
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RY		1800159	

STRUCTURE NOTES
SITE 1 - BRIDGE NO. CUY-002-1688
EAST 26TH STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

3/6

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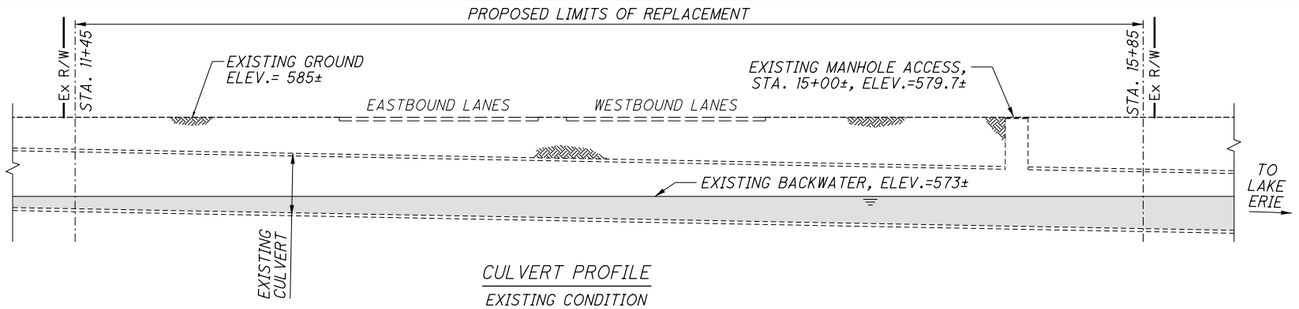
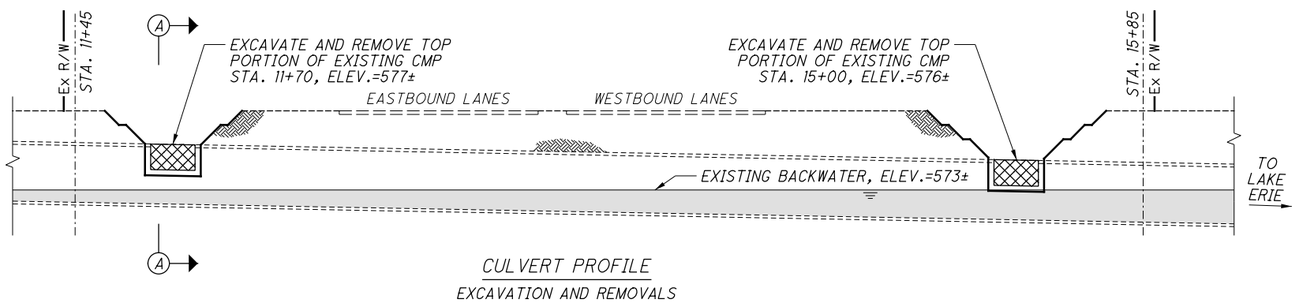


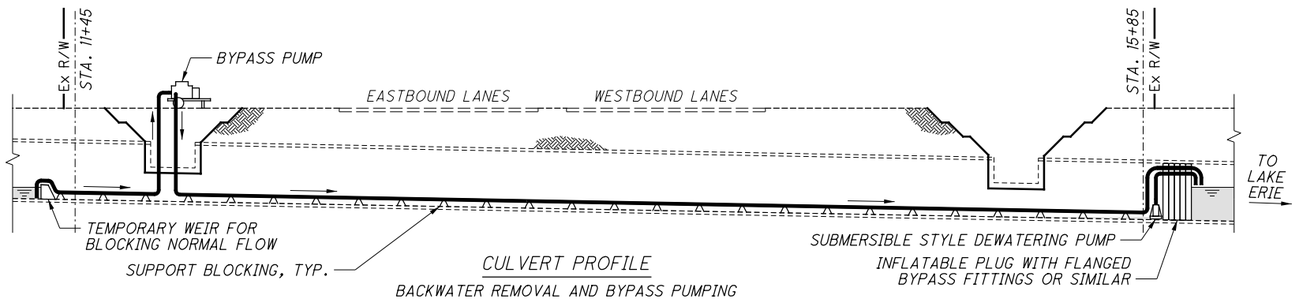
CULVERT PROFILE

EXISTING CONDITION



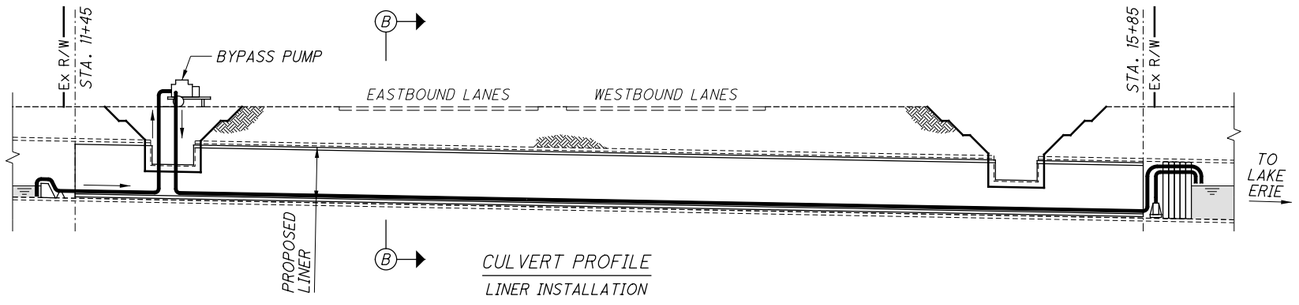
CULVERT PROFILE

EXCAVATION AND REMOVALS



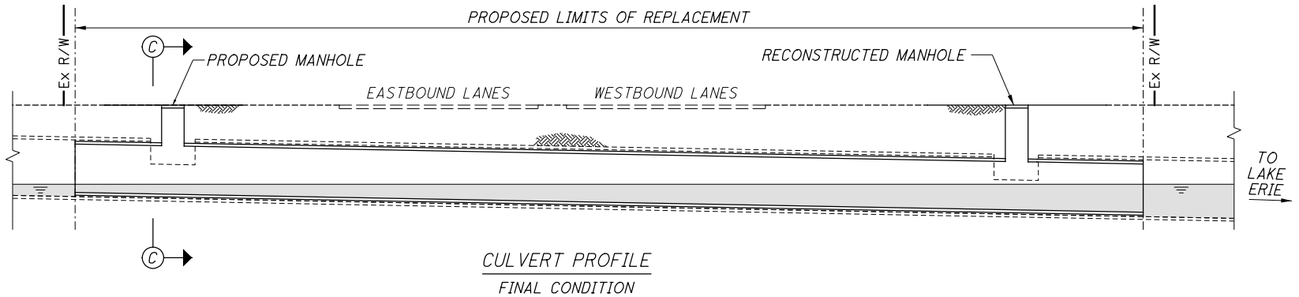
CULVERT PROFILE

BACKWATER REMOVAL AND BYPASS PUMPING



CULVERT PROFILE

LINER INSTALLATION

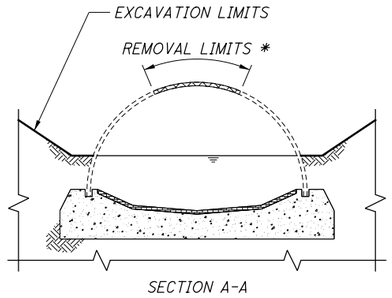


CULVERT PROFILE

FINAL CONDITION

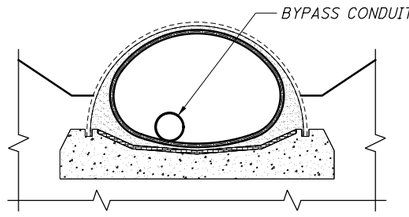
NOTES

- ALL ELEVATIONS SHOWN ARE APPROXIMATE AND FOR REFERENCE ONLY. SEE CULVERT PLAN AND PROFILE FOR DETAILED ELEVATION INFORMATION
- EXCAVATION LIMITS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR MEANS AND METHODS MAY VARY.

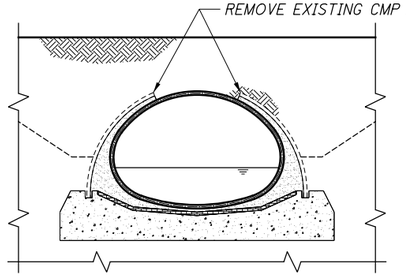


SECTION A-A

* NOTE: CONTRACTOR TO PROVIDE NEEDED OPENING REQUIRED BY MEANS AND METHODS TO CONSTRUCT. SIGNED AND SEALED PLANS AND INSTALLATION PROCEDURES TO BE SUBMITTED PRIOR TO START OF WORK.



SECTION B-B



SECTION C-C

EXISTING CONDITION

- ALL CONSTRUCTION ACTIVITES ARE TO OCCUR DURING PERIODS OF LOW FLOW. ALL STORM EVENTS MUST BE ALLOWED TO PASS WITHOUT DISTURBING PROPOSED WORK

EXCAVATION AND REMOVALS

- EXPOSE AND REMOVE TOP PORTION OF EXISTING CULVERT AS NEEDED FOR ACCESS. REMOVAL LIMITS SHALL BE ABOVE THE EXISTING FLOW LEVEL. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE STRUCTURAL INTEGRITY OF THE EXISTING CULVERT AT ALL TIMES

DEWATERING AND BYPASS PUMPING

THE DOWNSTREAM PLUG MUST BE SUFFICIENT TO RETAIN THE LAKE WATER BUT READILY REMOVABLE TO PERMIT PASSAGE OF FLOW DURING A STORM EVENT. COSTS OF DEWATERING AND BYPASS OPERATIONS ARE TO BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

LINER INSTALLATION

- LINER INSTALLATION AND GROUTING STAGES WILL VARY BASED ON CONTRACTOR MEANS AND METHODS
- INSTALLATION SEQUENCE MUST BE SUBMITTED TO ENGINEER FOR APPROVAL PER THE STRUCTURE GENERAL NOTES

FINAL CONDITION

- REMOVE DEWATERING AND BYPASS PUMPING MEASURES
- INSTALL REMAINING LINER SEGMENTS AT ACCESS LOCATIONS
- BACKFILL

NOT TO SCALE

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

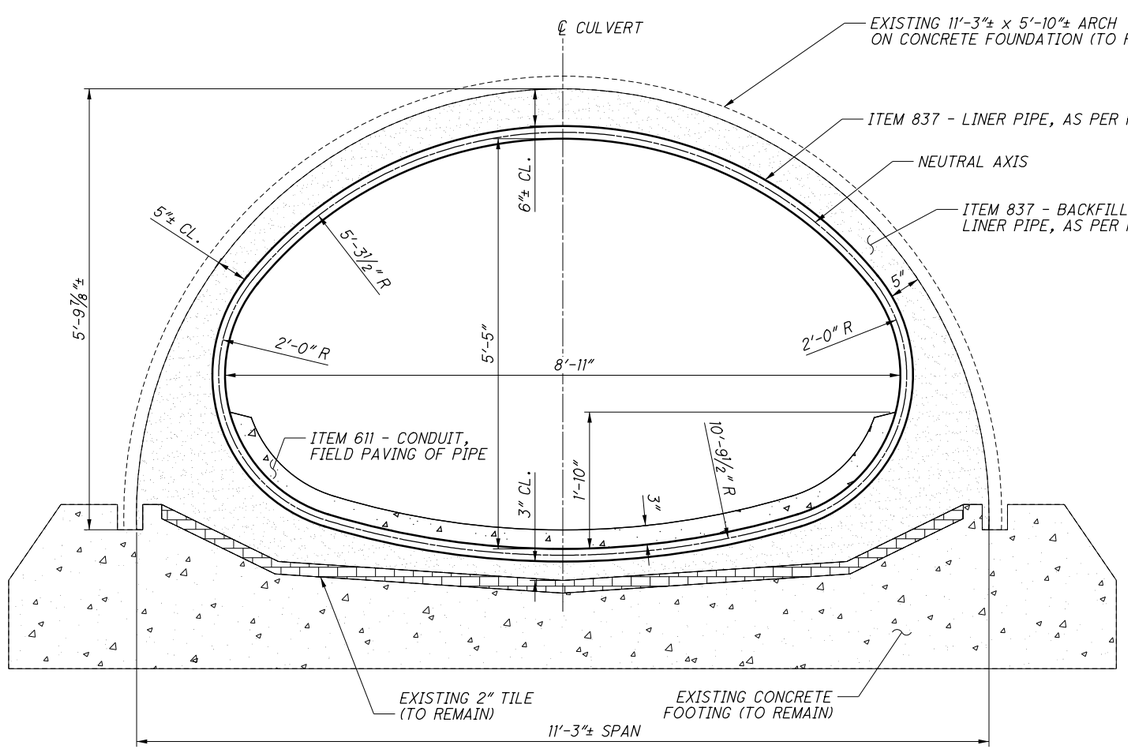
DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1800159	

CONSTRUCTION SEQUENCE

SITE 1 - BRIDGE NO. CUY-2-1688
EAST 26TH STREET STORM SEWER

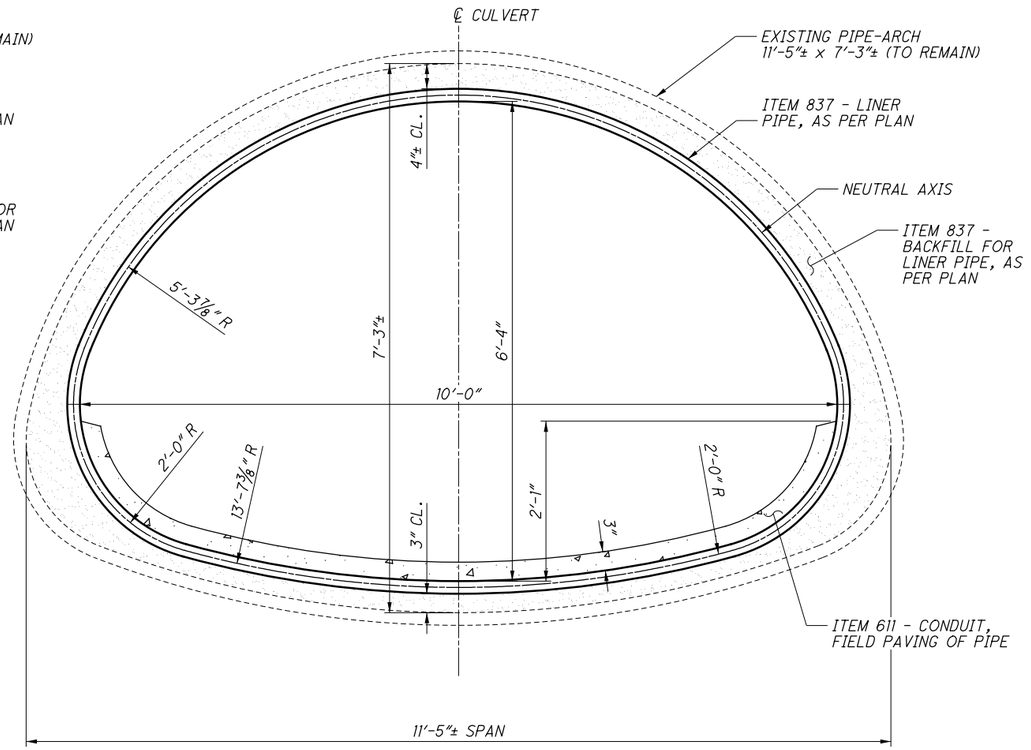
CUY-90-18.22/VAR

PID No. 92069



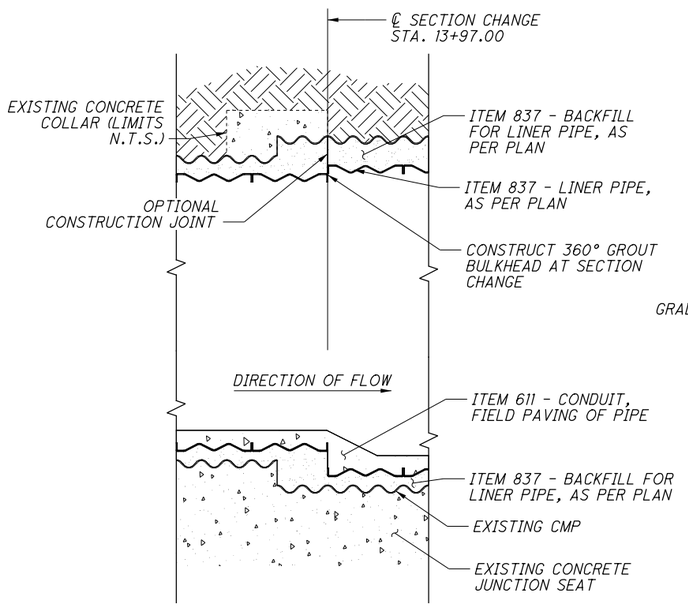
TYPICAL SECTION

STA. 11+45.00 TO STA. 13+97±
LOOKING DOWNSTREAM (UPSTATION)



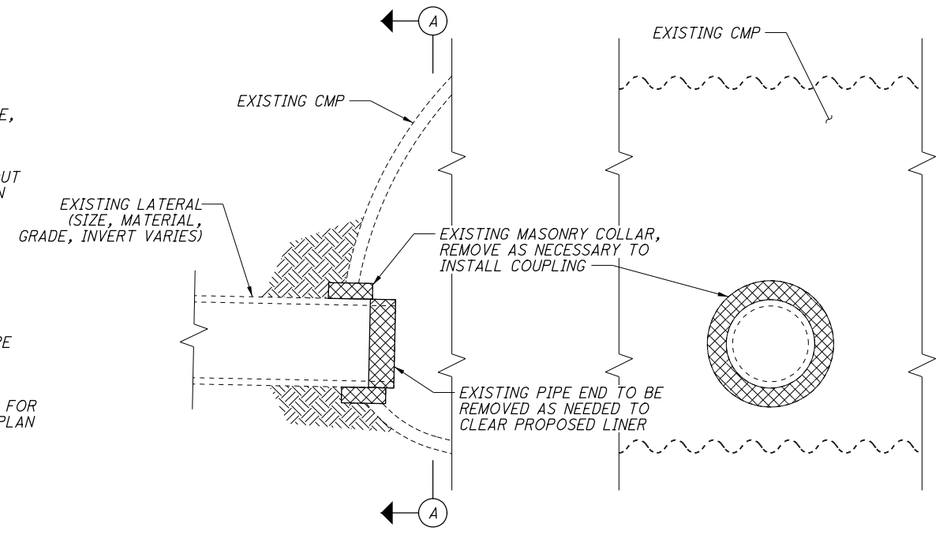
TYPICAL SECTION

STA. 13+97± TO STA. 15+85.00
LOOKING DOWNSTREAM (UPSTATION)



JUNCTION DETAIL

PROFILE ALONG ℄ CULVERT
AT LINER SECTION CHANGE, N.T.S.



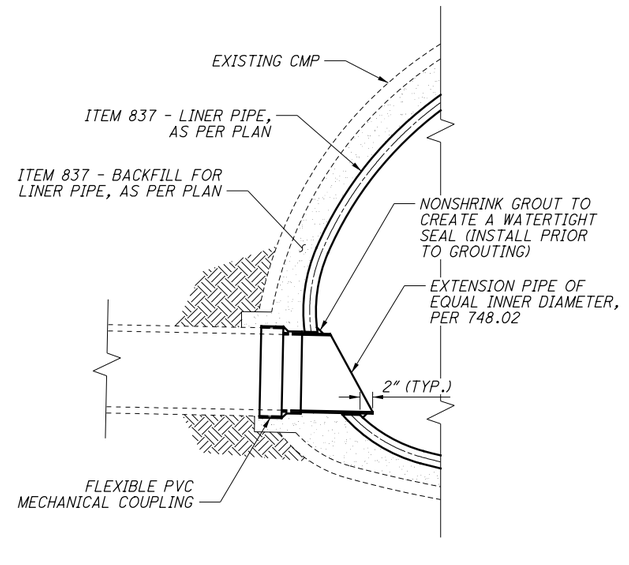
SECTION ALONG ℄ LATERAL

NOTE: CONTRACTOR TO VERIFY SIZE AND LOCATIONS OF ALL EXISTING LATERALS. VERIFICATION AND CONNECTIONS OF LATERALS TO BE INCIDENTAL TO COST OF LINER. FOR BIDDING PURPOSES, CONTRACTORS SHALL ASSUME 10 EACH LATERAL CONNECTIONS OF VARIOUS SIZES.

SECTION A-A

TYPICAL LATERAL CONNECTION DETAIL

LEFT SHOWN, RIGHT SIMILAR



PROPOSED CONDITION

DESIGN AGENCY
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260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
MEM	MEM	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1800159	

CULVERT DETAILS

SITE 1 - BRIDGE NO. CUY-2-1688
EAST 26TH STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

5 / 6

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63

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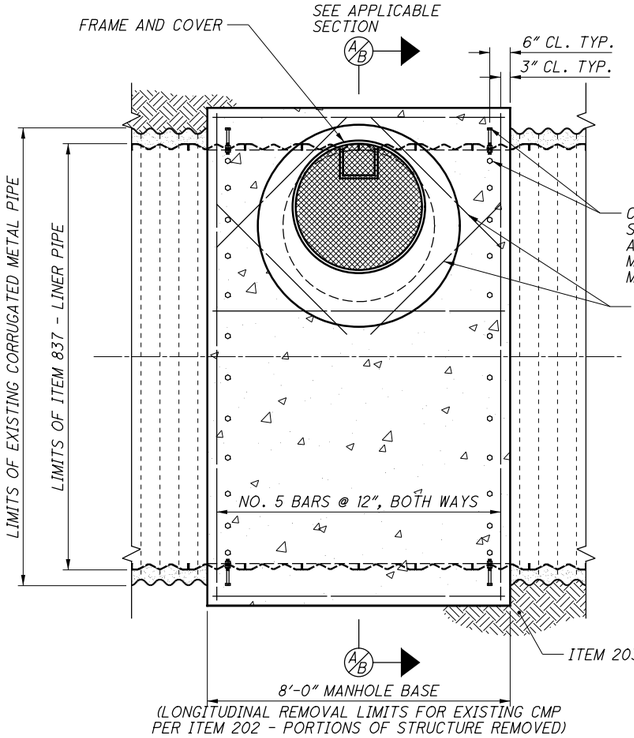
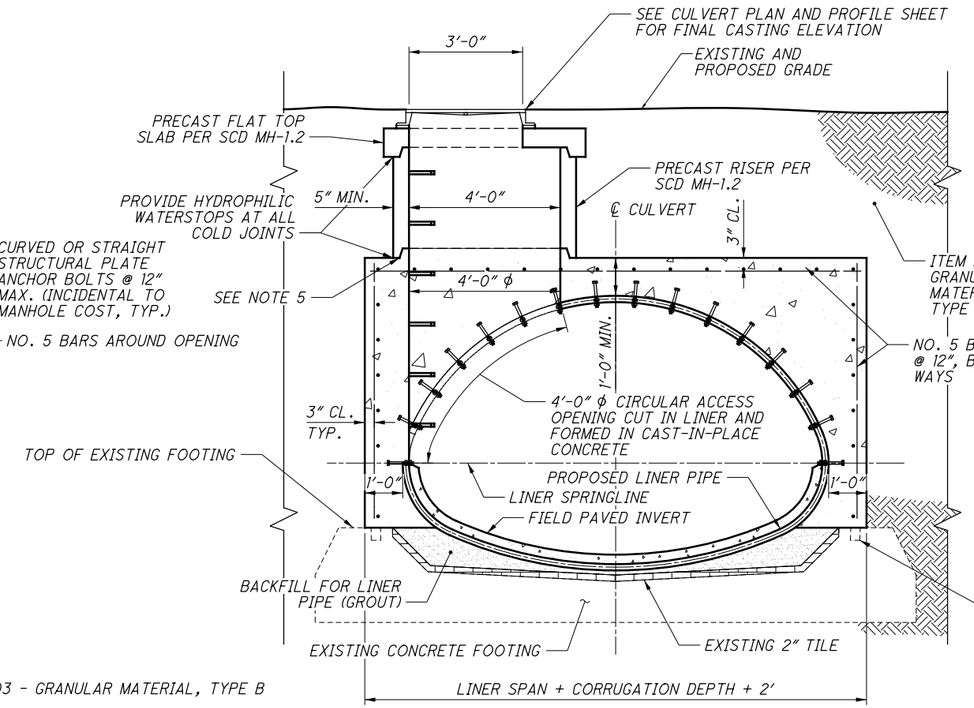


PLAN



SECTION A-A

MANHOLE BASE WHEN EXISTING FOUNDATION IS PRESENT

NOTES

1) CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS. CONTRACTOR SHALL SIZE THE PRECAST RISER SECTIONS AND/OR INCREASE THE CLEAR COVER ABOVE THE PROPOSED LINER TO MITIGATE THE NEED FOR PRECAST GRADE RINGS OR OTHER MEANS OF ELEVATING THE CASTING TO FINAL GRADE. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER PRIOR TO ORDERING MATERIAL.

2) FOR ADDITIONAL DETAILS, SEE ODOT STANDARD CONSTRUCTION DRAWINGS MH-1.1, MH-1.2, AND MH-1.3.

3) CASTINGS SHALL PROVIDE 36" NOMIMAL OPENING.

4) REMOVAL OF ANY PORTION OF THE EXISTING STRUCTURE AND MANHOLES (IF PRESENT) REQUIRED TO COMPLETE THE NEW MANHOLE INSTALLATION AS DETAILED HEREIN SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 202 - PORTIONS OF STRUCTURE REMOVED.

5) INSTEAD OF A TONGUE AND GROOVE JUNCTION BETWEEN THE RISER AND THE BASE, THE BASE MAY HAVE A FLAT SURFACE AND THE RISER MAY HAVE A SQUARE END SET IN A BED OF MORTAR ON THE BASE.

6) ALL MATERIALS, LABOR, AND INCIDENTALS, INCLUDING REINFORCING STEEL, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 611 - MANHOLE, NO. 3, AS PER PLAN.

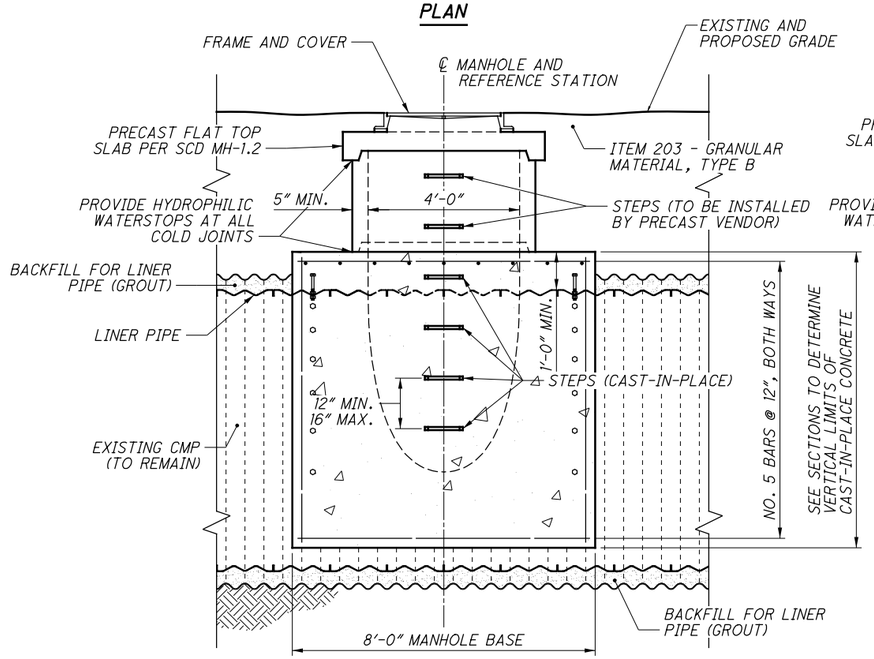
FURNISH MATERIALS CONFORMING TO THE FOLLOWING:

REINFORCING STEEL - 509 - EPOXY COATED, GRADE 60

CAST-IN-PLACE CONCRETE - 511 - CONCRETE, CLASS QC1

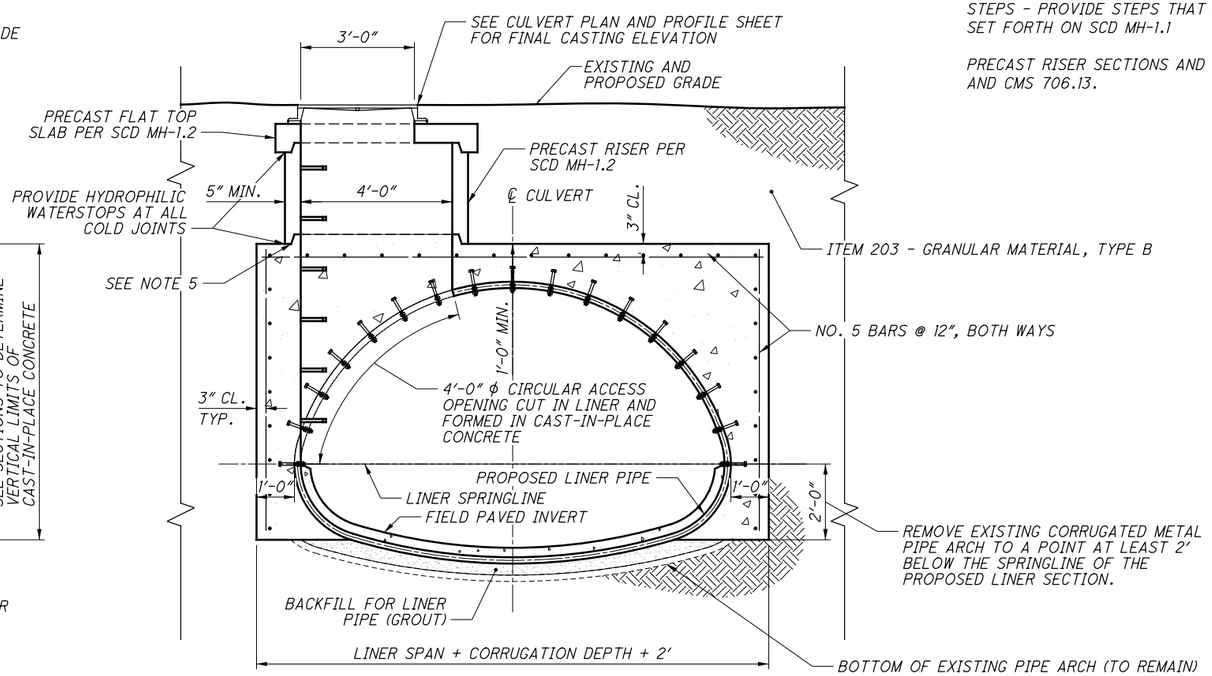
STEPS - PROVIDE STEPS THAT MEET THE REQUIREMENTS SET FORTH ON SCD MH-1.1

PRECAST RISER SECTIONS AND TOPS - PER SCD MH-1.2 AND CMS 706.13.



ELEVATION

SHOWN WITH EXISTING CMP



SECTION B-B

MANHOLE WITHOUT EXISTING FOUNDATION

DESIGN AGENCY
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260 BURNS ROAD, ELYRIA, OHIO 44035

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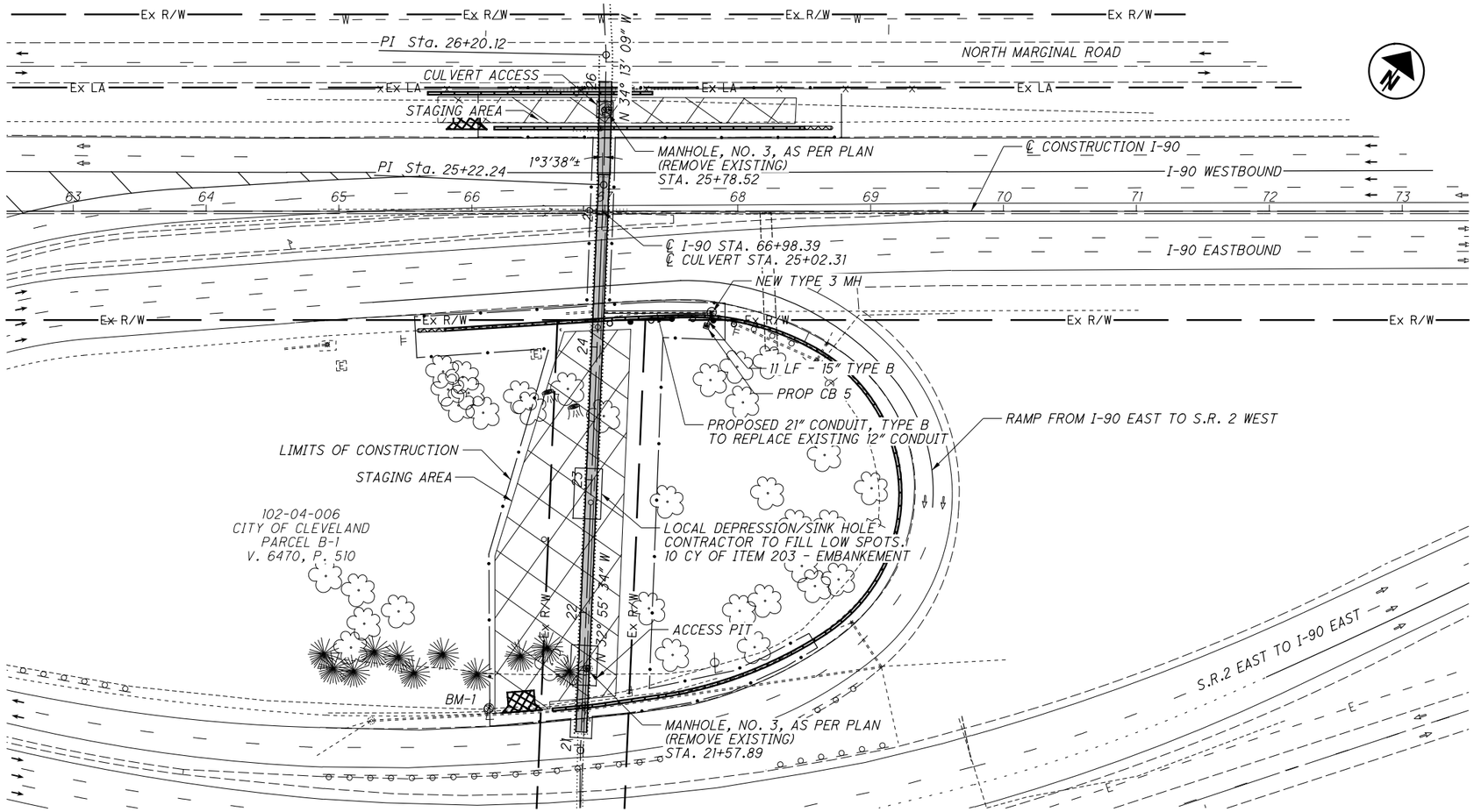
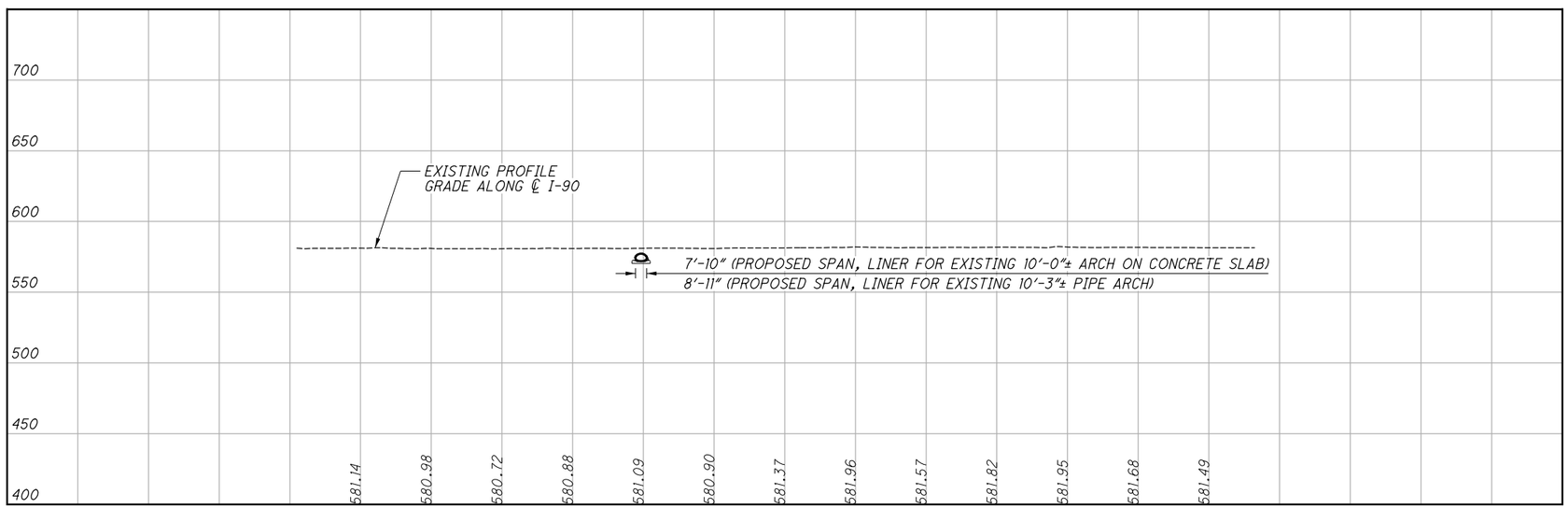
RY			1800159

MANHOLE DETAILS

SITE 1 - BRIDGE NO. CUY-2-1688
EAST 26TH STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069





BENCHMARK DATA

BM #1 STA. 66+13.07, 374' RT. - CHISELED SQUARE ON LIGHT POLE BASE, ELEV = 593.50

NOTES

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

DESIGN TRAFFIC:
2021 ADT = 112,000 2021 ADTT = 5,600
2051 ADT = 129,000 2051 ADTT = 6,450
DIRECTIONAL DISTRIBUTION = 0.50

LEGEND

STRUCTURAL LINING LIMITS

STAGING AREA

HYDRAULIC DATA

Q (10) =	184 CFS	V (10) =	7.78 FT/S
Q (25) =	228 CFS	V (25) =	9.62 FT/S
Q (50) =	241 CFS	V (50) =	9.87 FT/S

SEE STRUCTURE NOTES FOR BYPASS PUMPING REQUIREMENTS

PROPOSED WORK

- REMOVE EXISTING MANHOLE ON THE EXISTING CULVERT AND OPEN ACCESS PIT(S)
- DEWATER EXISTING STRUCTURE
- PREPARE CULVERT BARREL TO RECEIVE STRUCTURAL LINER
- INSTALL STRUCTURAL LINER PIPE AND GROUT IN PLACE IN STAGES
- CONSTRUCT NEW MANHOLE
- BACKFILL ACCESS PIT(S)

EXISTING STRUCTURE

TYPE: CORRUGATED METAL PIPE CULVERT
SPANS: 10'-0"± ALONG SKEW (10'-0"± ARCH ON CONCRETE SLAB)
10'-3"± ALONG SKEW (10'-3"± PIPE ARCH)
ROADWAY: I-90 EB AND WB LANES AND EXIT RAMP
LOADING: HS-20
SKEW: 1° 3' 38"± LEFT FORWARD
WEARING SURFACE: ASPHALT CONCRETE
APPROACH SLABS: NONE
ALIGNMENT: TANGENT
CROWN: VARIES
STRUCTURAL FILE NUMBER: 1800183
DATE BUILT: 1953
DISPOSITION: OPEN

PROPOSED STRUCTURE

TYPE: STRUCTURAL PLATE LINER INSTALLED WITHIN EXISTING STRUCTURE AND BACKFILLED WITH GROUT
SPANS: 7'-10" ALONG SKEW (7'-10" LINER FOR ARCH ON CONCRETE SLAB)
8'-11" ALONG SKEW (8'-11" LINER FOR PIPE ARCH)
ROADWAY: I-90 EB AND WB LANES AND EXIT RAMP
LOADING: HL-93 AND 60 PSF FUTURE WEARING SURFACE
SKEW: 1° 3' 38" LEFT FORWARD
APPROACH SLABS: NONE
COORDINATES: LATITUDE 41° 31' 7.41" N
LONGITUDE 81° 40' 25.98" W

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RY		1800183	

COUNTY
STA. 65+00
STA. 69+00

SITE PLAN
SITE 2 - BRIDGE NO. CUY-90-1822
EAST 33RD STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

1 / 6

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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFER TO THE FOLLOWING ODOT STANDARD DRAWING(S):

MH-1.1 DATED 01/15/2016
MH-1.2 DATED 01/15/2016
MH-1.3 DATED 01/18/2013

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATION(S):

800 DATED 04/16/2021
837 DATED 07/19/2019

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 8TH EDITION, INCLUDING ALL REVISIONS AND INTERIM SPECIFICATIONS, AND THE ODOT BRIDGE DESIGN MANUAL, 2019 AND QUARTERLY UPDATES.

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 (HEADWALL)

REINFORCING STEEL
-MINIMUM YIELD STRENGTH 60 KSI

EXISTING STRUCTURE VERIFICATION

EXISTING STRUCTURE VERIFICATION: DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02 AND 513.04.

BASE CONTRACT BID PRICES UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE. HOWEVER, THE DEPARTMENT WILL PAY FOR ALL PROJECT WORK BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED IN THE FIELD.

ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

THIS WORK CONSISTS OF THE REMOVAL OF EXISTING MANHOLES, PORTIONS OF THE EXISTING CMP AS NEEDED FOR ACCESS, AND ANY OTHER PORTIONS OF THE EXISTING STRUCTURE NECESSARY TO FACILITATE INSTALLATION OF THE PLATE LINER.

PERFORM WORK CAREFULLY DURING REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND INCORPORATED INTO THE PROPOSED STRUCTURE. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE RAM TYPE OF EQUIPMENT IS PROHIBITED. SUBMIT CONSTRUCTION PLANS ACCORDING TO CMS 501.05. ANY DAMAGE TO PORTIONS OF THE EXISTING STRUCTURE TO REMAIN SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST.

MEASUREMENT & PAYMENT: THE DEPARTMENT WILL MEASURE THE QUANTITY OF REMOVALS ON A LUMP SUM BASIS. THE DEPARTMENT WILL PAY FOR THE ACCEPTED QUANTITIES OF REMOVALS AT THE CONTRACT PRICE FOR ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN.

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

PROVISIONS OF CMS ITEM 503 SHALL APPLY EXCEPT AS MODIFIED HEREIN:

LAKE BACKWATER

A BACKWATER CONDITION CONDITION EXISTS AT THIS LOCATION, AND THE DEPTH OF STANDING WATER IN THE CULVERT WILL VARY WITH THE LAKE (ERIE) LEVEL. THE DEWATERING AND CONSTRUCTION SEQUENCE AS DETAILED IN THESE PLANS IS FOR REFERENCE ONLY AND NOT TO SCALE; CONTRACTOR MEANS AND METHODS WILL VARY. THE CONTRACTOR SHALL SUBMIT SITE SPECIFIC DEWATERING PROCEDURES PRIOR TO ORDERING MATERIAL. CONTRACTOR SHALL COORDINATE ALL WORK WITH NORTHEAST OHIO REGIONAL SEWER DISTRICT (NEORSD). HISTORIC LAKE LEVELS ARE VIEWABLE AT THE TIDES AND CURRENTS SECTION OF THE NATIONAL OCEANIC AND ATMOSPHERIC (NOAA) WEBSITE:

https://tidesandcurrents.noaa.gov/map/

SITE SURCHARGE

WITH HIGH LAKE LEVELS, A WET WEATHER EVENT MAY LEAD TO SEWER SURCHARGING SINCE THE CULVERT WILL BE OPEN. THE CONTRACTOR SHALL PROVIDE PROVISIONS AND PROCEDURES FOR SITE CLEANUP IF A SURCHAGE EVENT OCCURS.

BYPASS PUMPING

THE REPAIR SITE IS LOCATED IN AN EXISTING CULVERT WHICH EXPERIENCES SIGNIFICANT COMBINED SEWER FLOW DURING WET WEATHER. ALL FLOW FROM WET WEATHER EVENTS MUST BE PERMITTED TO PASS THROUGH THE WORK OPERATIONS BY USING PIPE PLUGS WHICH ARE READILY REMOVABLE. THE CONTRACTOR SHALL HAVE PROVISIONS AND PROCEDURES IN PLACE TO DISMANTLE OR PROTECT THE WORK DURING WET WEATHER. CONTRACTOR SHALL SCHEDULE LINER INSTALLATION ONLY DURING DRY WEATHER PERIODS AND DURING MONTHS WITH THE LOWEST POTENTIAL WET WEATHER EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY INTERRUPTION OF, OR DAMAGE TO, THE WORK DUE TO WET WEATHER FLOWS.

THE CONTRACTOR SHALL SCHEDULE LINER INSTALLATION DURING MONTHS WITH THE LOWEST NORMAL FLOW AND LOWEST POTENTIAL FOR OUTFALLS CAUSED BY RAIN EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. CONTRACTOR SHALL COORDINATE ALL WORK WITH NORTHEAST OHIO REGIONAL SEWER DISTRICT (NEORSD).

THE DEWATERING/BYPASS AND CONSTRUCTION SEQUENCE IN THESE PLANS IS NOT TO SCALE AND FOR REFERENCE ONLY; THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER SITE SPECIFIC DEWATERING AND BYPASS PUMPING PROCEDURES PRIOR TO ORDERING MATERIAL.

ALL MATERIALS, LABOR, SUBMITTALS, AND INCIDENTALS REQUIRED FOR THE PERFORMANCE OF WORK AS DETAILED HEREIN AND IN THESE PLANS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN.

ITEM 837 - LINER PIPE, AS PER PLAN

THE PROPOSED STRUCTURE TYPE SHALL BE A FLANGED, GALVANIZED STEEL, TUNNEL LINER PLATE PIPE ARCH CONFORMING TO THE GEOMETRY SHOWN ON SHEET 6/7 AND CAPABLE OF BEING ASSEMBLED WITHIN THE EXISTING STRUCTURE AS DETAILED IN THESE PLANS. THE PROPOSED STRUCTURE SHALL BE DESIGNED FOR HL-93 LOADING WITH 60 PSF FUTURE WEARING SURFACE AND ASSUME THE EXISTING STRUCTURE PROVIDES NO STRUCTURAL CAPACITY. VENDOR TO PROVIDE GAUGE THICKNESS.

MATERIAL:

LINER PLATES SHALL BE FABRICATED FROM BLACK STEEL PLATES CONFORMING TO ASTM SPECIFICATION A 1011. PLATES SHALL BE OF THE GAGE SHOWN ON THE PLANS AND SHALL BE CURVED TO SUIT THE TUNNEL CROSS SECTION SHOWN. PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123, EXCEPT THAT THE ZINC SHALL BE APPLIED AT A RATE OF 2.0 OUNCES PER SQUARE FOOT TOTAL FOR BOTH SIDES.

ALL PLATES SHALL BE PUNCHED FOR BOLTING ON BOTH LONGITUDINAL AND CIRCUMFERENTIAL SEAMS AND SHALL BE SO FABRICATED AS TO PERMIT COMPLETE ERECTION FROM THE INSIDE OF THE EXISTING STRUCTURE. THE LONGITUDINAL SEAM SHALL BE OF THE LAPPED TYPE, WITH AN OFFSET EQUAL TO THE GAGE OF METAL FOR THE FULL WIDTH OF PLATE TO ALLOW THE CROSS SECTION OF THE PLATE TO BE CONTINUOUS THROUGH THE SEAM. CIRCUMFERENTIAL BOLT HOLE SPACING SHALL BE 6-1/4".

GROUT HOLES, ADJUSTING RODS, ANTI-FLOTATION DEVICES, BASE CHANNELS, AND SKID RAILS SHALL BE IN ACCORDANCE WITH THE LINER MANUFACTURER'S RECOMMENDATIONS. GROUT PORT/VENT LOCATIONS IN THE ROADWAY ARE PERMISSIBLE BUT SHOULD BE CONFIGURED TO MINIMIZE IMPACT TO TRAFFIC.

BOLTS AND NUTS:

BOLTS AND NUTS SHALL BE 5/8" IN DIAMETER AND LENGTH AS RECOMMENDED BY THE MANUFACTURER. BOLTS SHALL CONFORM TO ASTM A 449, TYPE 1 OR ASTM A 307. FOR LONGITUDINAL SEAMS, BOLTS SHALL BE A 449, TYPE 1, FOR PLATE THICKNESS EQUAL TO OR GREATER THAN 0.209. FOR PLATE THICKNESS LESS THAN .209, THE BOLTS SHALL BE A 307, GRADE A. ALL CIRCUMFERENTIAL BOLTS MAY BE A 307, GRADE A. NUTS SHALL CONFORM TO ASTM A 563, GRADE A, HEX.

GALVANIZING WHEN REQUIRED SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM B-695, CLASS 50.

INSTALLATION:

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS INCLUDING ASSEMBLY DRAWINGS, ARCH ASSEMBLY METHODS, DEWATERING METHODS, BULKHEAD, AND BLOCKING DETAILS TO THE ENGINEER FOR REVIEW. THE CONTRACTOR MAY PUSH OR PULL ASSEMBLED LINER SECTIONS INTO PLACE IF NECESSARY PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL UTILIZE METHODS THAT FACILITATE PLACEMENT OF THE LINER SECTIONS WHILE MINIMIZING DAMAGE TO THE PLATE OR ITS GALVANIZED ZINC COATING. THE CONTRACTOR SHALL TOUCH UP ANY DAMAGE TO THE GALVANIZED ZINC COATING CAUSED BY HANDLING OR ASSEMBLY. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE DETAILS AND LOCATIONS OF LATERAL CONNECTIONS, GROUT PORTS, FITTINGS, BLOCKING, AND BLOCKING HARDWARE FOR APPROVAL. A GROUTING METHOD AND CULVERT INSTALLATION PROCEDURE SHALL ALSO BE SUBMITTED FOR APPROVAL. LINER PLATE SHALL BE ASSEMBLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. LONGITUDINAL SEAMS SHALL BE STAGGERED BETWEEN RINGS.

CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, INCLUDING: SIZE, TYPE, AND LOCATIONS OF ALL LATERAL CONNECTIONS; DEFLECTIONS/DAMAGE TO THE EXISTING STRUCTURES; AND HORIZONTAL AND VERTICAL DEFLECTIONS TO THE OVERALL STRUCTURE ALIGNMENT.

ALL NECESSARY REPAIRS/REMOVALS TO THE EXISTING CULVERT TO PROVIDE CLEARANCE FOR THE PROPOSED LINER/GROUT SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT AS NEEDED TO MAINTAIN STRUCTURAL INTEGRITY AT ALL TIMES.

FIELD CUTTING OF LINER SHALL BE AS MINIMAL AS REQUIRED TO PERMIT CONNECTION OF LATERALS AND SHALL NOT COMPROMIZE THE STRUCTURAL CAPACITY OF THE LINER. GALVANIZING SHALL BE TOUCHED UP FOR ANY CUT EDGES. LARGER LATERAL CONNECTIONS MAY WARRANT USE OF HEAVIER GAUGE PLATE OR OTHER REINFORCEMENT AND SHALL BE DESIGNED BY PLATE VENDOR. ALL LATERAL CONNECTIONS SHALL BE INCLUDED IN THE BID UNIT PRICE FOR THIS ITEM.

CONTRACTOR SHALL PROVIDE SHOP FABRICATED TRANSITION LINER SECTIONS TO ACCOMODATE DEFLECTIONS IN THE HORIZONTAL OR VERTICAL ALIGNMENT OF THE EXISTING STRUCTURES.

ALL VENTILATION NEEDED FOR THE PERFORMANCE OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.

THE COSTS OF ALL ABOVE DECRIBED ITEMS, WORK, AND INCIDENTALS TO CONSTRUCT THE LINER AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
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RY		1800183	

STRUCTURE NOTES
SITE 2 - BRIDGE NO. CUY-90-1822
EAST 33RD STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN

THE BACKILL FOR THE LINER PIPE, HENCEFORTH REFERRED TO AS GROUT, IS FOR FILLING THE ANNULAR SPACE BETWEEN THE EXISTING CONDUIT AND PROPOSED LINER. AFTER INSTALLATION OF THE LINER, BUT PRIOR TO GROUTING, BULKHEADING AND VENTING SHALL BE CONSTRUCTED. A WATERTIGHT, CEMENTITIOUS BULKHEAD (OR COLLAR) SHALL BE FORMED BETWEEN THE HOST STRUCTURE AND THE ARCH LINER AT EACH END OF THE ARCH AND SHALL PROVIDE LONG TERM DURABILITY. BULKHEAD DESIGNS SHALL BE SUFFICIENT TO RESIST GROUT PRESSURES OR HYDROSTATIC WATER PRESSURE WITHIN THE ANNULAR SPACE.

THE GROUT SHALL BE PLACED IN CONTROLLED LIFTS IN ACCORDANCE WITH THE SUBMITTED STAGED GROUTING PLAN. EACH LIFT SHALL BE ALLOWED TO ACHIEVE INITIAL SET BEFORE THE SUBSEQUENT LIFT CAN BE PLACED. ADDITIONALLY, THE CONTRACTOR TOGETHER WITH THE ENGINEER SHALL SOUND THE AREA OF EACH LIFT ONCE IT HAS ACHIEVED INITIAL SET TO ENSURE THAT THE GAP BETWEEN THE EXISTING STRUCTURE AND PROPOSED ARCH HAS BEEN COMPLETELY FILLED. ANY VOIDS DETECTED BY THE SOUNDING SHALL BE CORRECTED BY PLACING ADDITIONAL GROUT BEFORE PROCEEDING WITH PLACEMENT OF THE SUBSEQUENT LIFT.

IF PORTS ARE USED TO PUMP GROUT THROUGH THE STEEL LINER PIPE, THEY SHALL BE SHOP INSTALLED. IF FIELD-INSTALLED PORTS ARE REQUIRED, THEY SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT COMPROMISE THE STRUCTURAL CAPACITY OF THE LINER.

IF ANY PORTION OF THE EXISTING STRUCTURE SLAB IS REMOVED FOR CONTRACTOR ACCESS, THE GROUT SHALL BE FILLED TO THE ORIGINAL SLAB TOP ELEVATION.

THE MATERIALS SHALL BE MIXED IN EQUIPMENT OF SUFFICIENT SIZE AND CAPACITY TO PROVIDE THE DESIRED AMOUNT OF GROUT MATERIAL FOR EACH GROUTING STAGE. THE EQUIPMENT SHALL BE CAPABLE OF MIXING THE GROUT AT DENSITIES REQUIRED FOR THE APPROVED PROCEDURE AND SHALL ALSO BE CAPABLE OF CHANGING DENSITY AS DICTATED BY FIELD CONDITIONS ANY TIME DURING THE GROUTING OPERATION.

THE MIX DESIGN(S) SHALL BE DEVELOPED TO COMPLETELY FILL THE ANNULAR SPACE, AND SHALL ADDRESS THE FOLLOWING CONSIDERATIONS: SIZE OF ANNULAR VOID, VOIDS (BASED ON SIZE AND ACCESS) IN THE SURROUNDING STRUCTURE ENVELOPE, ABSENCE OR PRESENCE OF GROUNDWATER, SUFFICIENT STRENGTH AND DURABILITY TO PREVENT MOVEMENT OF THE LINER PLATE, PROVISIONS FOR ADEQUATE RETARDATION AND SHRINKAGE OF LESS THAN 1 PERCENT BY VOLUME. GROUT SHALL BE MIXED IN SMALL QUANTITIES AS NEEDED, AND SHALL NOT BE RE-TEMPERED OR USED AFTER IT HAS BEGUN TO SET.

THE GAUGED PUMPING PRESSURE SHALL NOT EXCEED THE ARCH LINER MANUFACTURER'S APPROVED RECOMMENDATIONS. PUMPING EQUIPMENT SHALL BE OF SIZE SUFFICIENT TO INJECT GROUT AT VELOCITY AND PRESSURE RELATIVE TO THE SIZE OF THE ANNULAR SPACE. GAUGES TO MONITOR GROUT PRESSURE SHALL BE ATTACHED IMMEDIATELY ADJACENT TO EACH INJECTION PORT. THE GAUGE SHALL CONFORM TO AN ACCURACY OF NOT MORE THAN ONE-HALF PERCENT ERROR OVER THE FULL RANGE OF THE GAUGE. THE RANGE OF THE GAUGE SHALL BE NOT MORE THAN 100 PERCENT GREATER THAN THE DESIGN GROUT PRESSURE. PRESSURE GAUGES SHALL BE INSTRUMENT OIL FILLED AND ATTACHED TO A SADDLE TYPE DIAPHRAGM SEAL (GAUGE SAVER) TO PREVENT CLOGGING WITH GROUT. ALL GAUGES SHALL BE CERTIFIED AND CALIBRATED IN ACCORDANCE WITH ANSI B40 GRADE 2A.

PRE-CONSTRUCTION MEETING:

THE ARCH LINER MANUFACTURER MUST PROVIDE A REPRESENTATIVE TO CONDUCT A PRE-CONSTRUCTION MEETING THAT COVERS ALL ASPECTS OF THE LINING AND GROUTING PROCESS AND SAID PERSON MUST BE A REGISTERED PROFESSION ENGINEER. HE OR SHE MUST ALSO BE ON SITE DURING GROUTING OPERATIONS.

EXPERIENCE:

THE ARCH LINER MANUFACTURER SHALL SHOW EXTERNAL PROOF THAT THEIR EMPLOYEE WHO WILL CONDUCT THE PRE-CONSTRUCTION MEETING SHALL HAVE PARTICIPATED IN THE SUCCESSFUL RELINE OF AT LEAST 10 STRUCTURES OF THIS TYPE AND SIZE ON PREVIOUS PROJECTS.

SUBMITTALS REQUIREMENTS:

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER AT LEAST TEN (10) WORKING DAYS PRIOR TO COMMENCING THE LINER PIPE INSTALLATION:

STRUCTURAL DESIGN CALCULATIONS FOR THE LINER PIPE FOLLOWING SECTION 12 OF THE AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES USING THE LRFD METHOD VERIFYING CAPACITY SIGNED BY A LICENSED PROFESSIONAL ENGINEER. THESE CALCULATIONS SHALL ASSUME THE EXISTING STRUCTURE HAS FAILED AND CONTRIBUTES NO STRENGTH TO THE PROPOSED LINER.

WRITTEN VERIFICATION BY THE LINER MANUFACTURER THAT THE LINING AND GROUTING PLAN CONFORMS WITH ALL PROVISIONS, CAUTIONS, AND RESTRICTIONS OF THESE SPECIFICATIONS, CONTRACT PLANS, AND MANUFACTURER REQUIREMENTS.

THE COSTS OF ALL ABOVE MENTIONED ITEMS, TEMPORARY FORMS/BULKHEADS, AND TEMPORARY SUPPORTS REQUIRED TO CONSTRUCT THE LINER BACKFILL AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

CALC:	RAP	DATE:	8/13/2020
CHECKED:	RY	DATE:	8/28/2020

ESTIMATED QUANTITIES (CUY-090-1822)

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.	SEE SHEET
202	11201	LS		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN				LS	2/6
203	35110	59	CY	GRANULAR MATERIAL, TYPE B				59	
503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN				LS	2/6
503	21100	59	CY	UNCLASSIFIED EXCAVATION				59	
611	96560	480	FT	CONDUIT, FIELD PAVING OF PIPE				480	
611	99575	2	EACH	MANHOLE, NO. 3, AS PER PLAN				2	6/6
837	10001	480	FT	LINER PIPE, AS PER PLAN				480	2/6
837	21001	480	FT	BACKFILL FOR LINER PIPE, AS PER PLAN				480	3/6

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1800183	

STRUCTURE NOTES
SITE 2 - BRIDGE NO. CUY-90-1822
EAST 33RD STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

3 / 6

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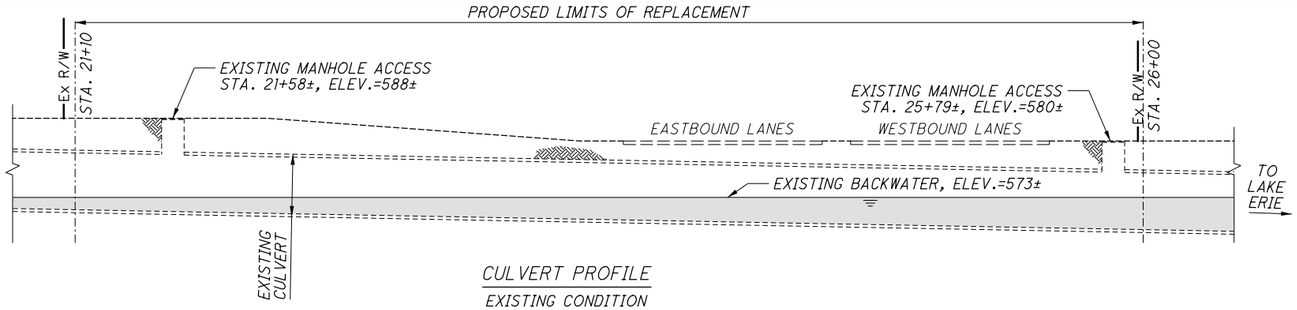
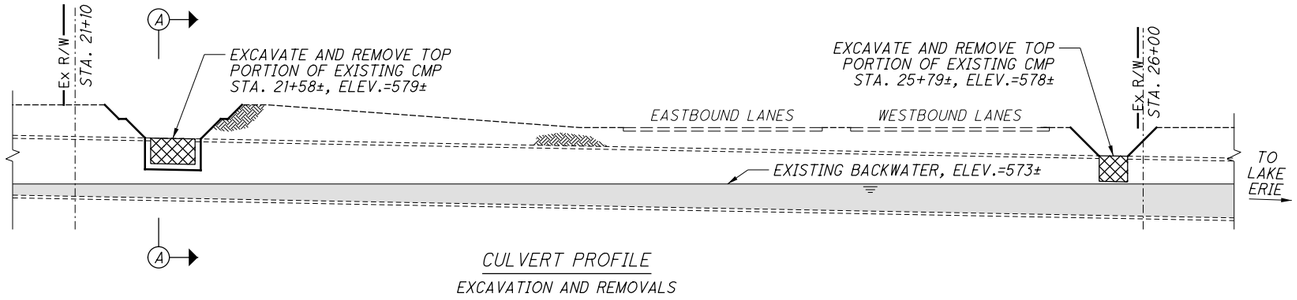
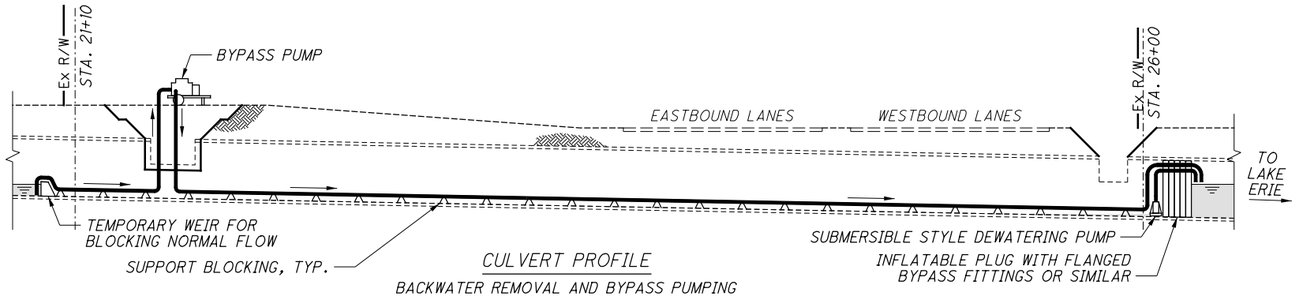


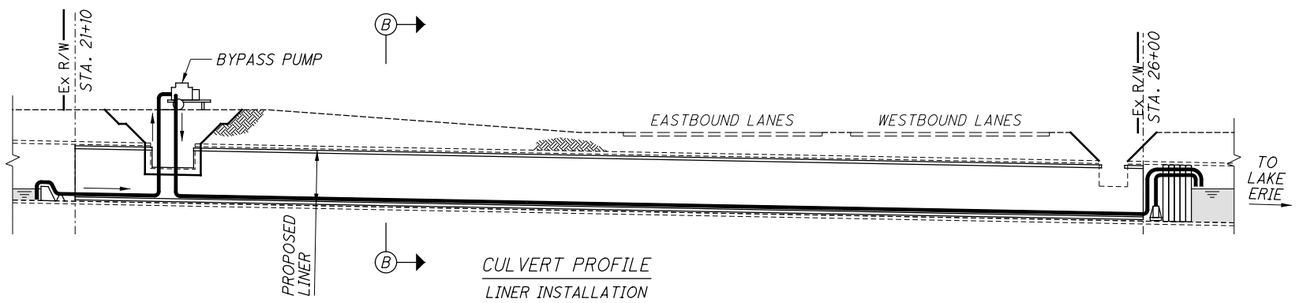
CULVERT PROFILE
EXISTING CONDITION



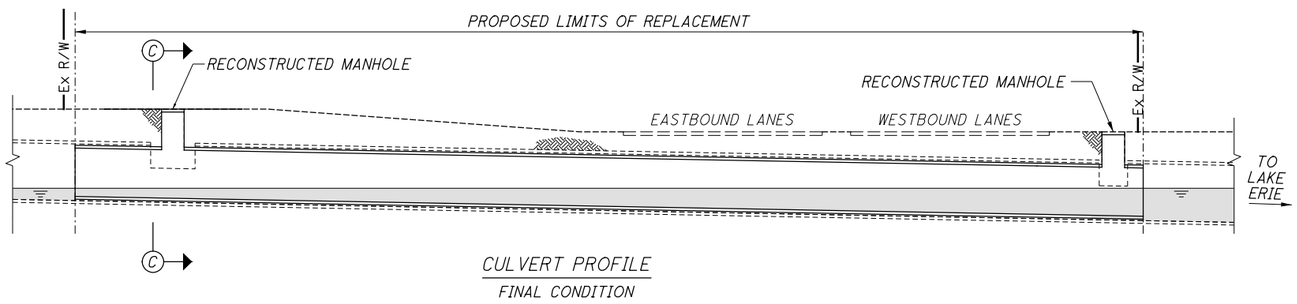
CULVERT PROFILE
EXCAVATION AND REMOVALS



CULVERT PROFILE
BACKWATER REMOVAL AND BYPASS PUMPING



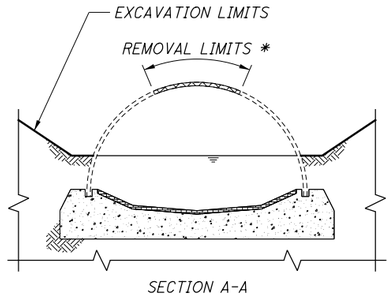
CULVERT PROFILE
LINER INSTALLATION



CULVERT PROFILE
FINAL CONDITION

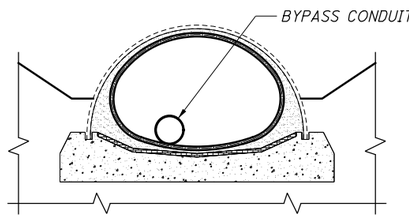
NOTES

- ALL ELEVATIONS SHOWN ARE APPROXIMATE AND FOR REFERENCE ONLY. SEE CULVERT PLAN AND PROFILE FOR DETAILED ELEVATION INFORMATION
- EXCAVATION LIMITS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR MEANS AND METHODS MAY VARY.

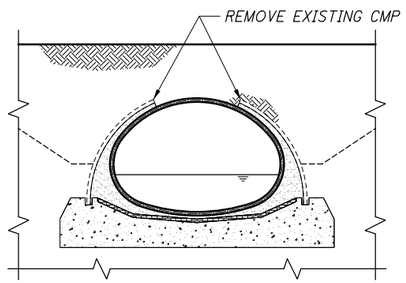


SECTION A-A

* NOTE: CONTRACTOR TO PROVIDE NEEDED OPENING REQUIRED BY MEANS AND METHODS TO CONSTRUCT. SIGNED AND SEALED PLANS AND INSTALLATION PROCEDURES TO BE SUBMITTED PRIOR TO START OF WORK.



SECTION B-B



SECTION C-C

EXISTING CONDITION

- ALL CONSTRUCTION ACTIVITES ARE TO OCCUR DURING PERIODS OF LOW FLOW. ALL STORM EVENTS MUST BE ALLOWED TO PASS WITHOUT DISTURBING PROPOSED WORK

EXCAVATION AND REMOVALS

- EXPOSE AND REMOVE TOP PORTION OF EXISTING CULVERT AS NEEDED FOR ACCESS. REMOVAL LIMITS SHALL BE ABOVE THE EXISTING FLOW LEVEL. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE STRUCTURAL INTEGRITY OF THE EXISTING CULVERT AT ALL TIMES

DEWATERING AND BYPASS PUMPING

THE DOWNSTREAM PLUG MUST BE SUFFICIENT TO RETAIN THE LAKE WATER BUT READILY REMOVABLE TO PERMIT PASSAGE OF FLOW DURING A STORM EVENT. COSTS OF DEWATERING AND BYPASS OPERATIONS ARE TO BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

LINER INSTALLATION

- LINER INSTALLATION AND GROUTING STAGES WILL VARY BASED ON CONTRACTOR MEANS AND METHODS
- INSTALLATION SEQUENCE MUST BE SUBMITTED TO ENGINEER FOR APPROVAL PER THE STRUCTURE GENERAL NOTES

FINAL CONDITION

- REMOVE DEWATERING AND BYPASS PUMPING MEASURES
- INSTALL REMAINING LINER SEGMENTS AT ACCESS LOCATIONS
- BACKFILL

NOT TO SCALE

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
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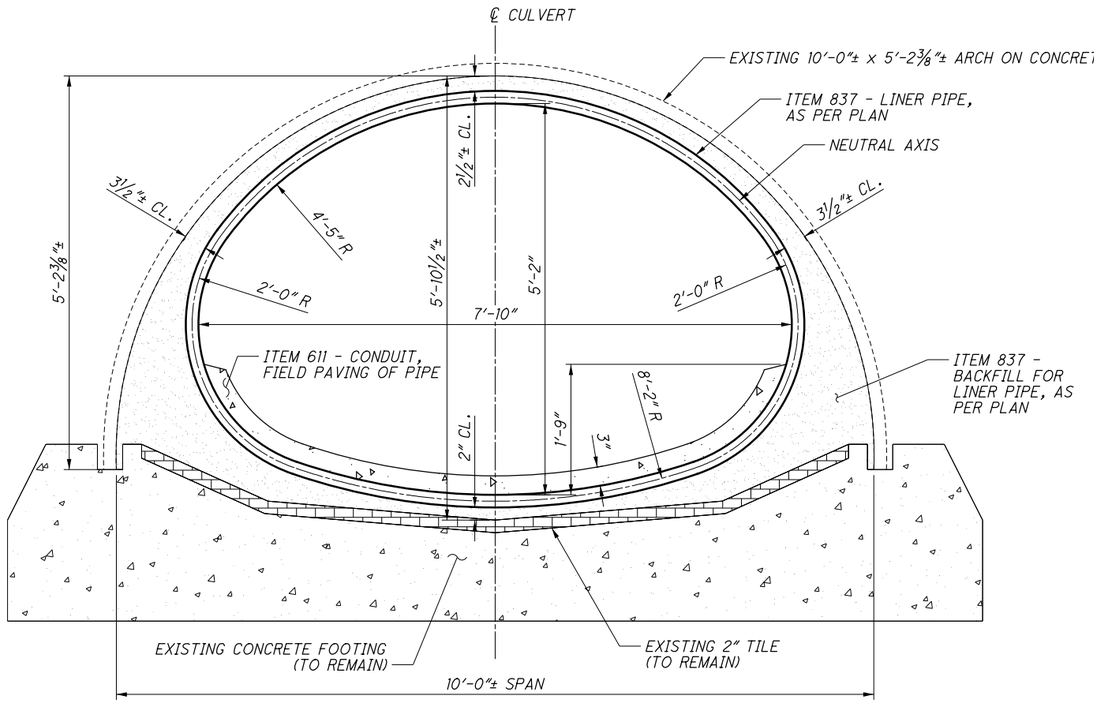
RY		1800183	

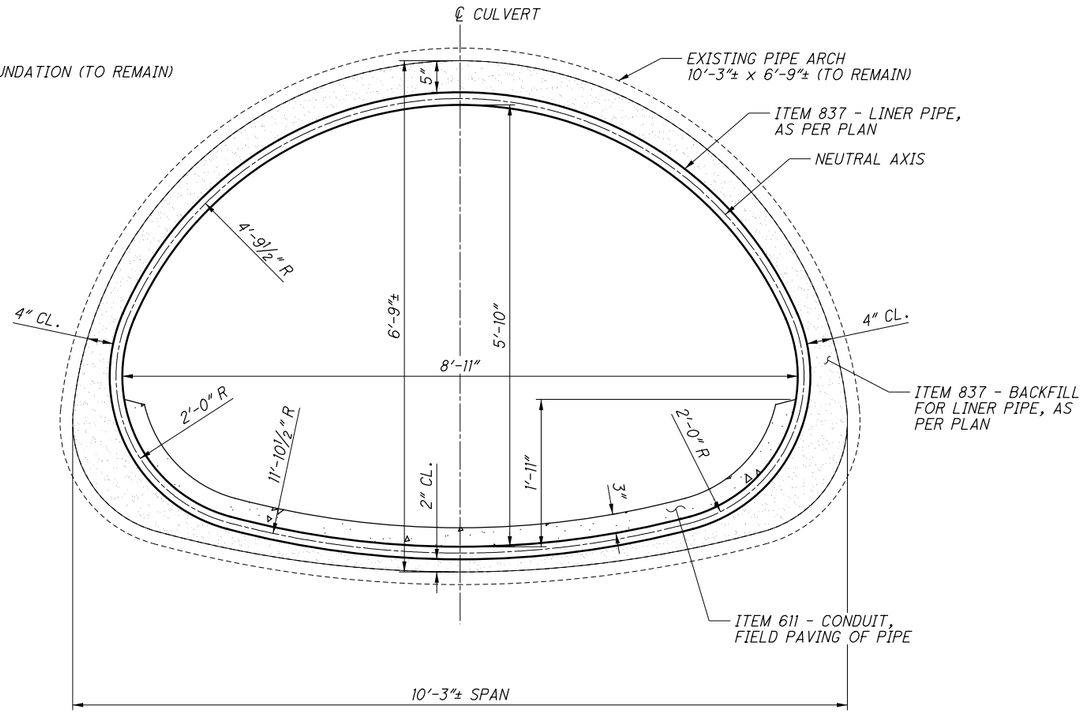
CONSTRUCTION SEQUENCE
SITE 2 - BRIDGE NO. CUY-90-1822
EAST 33RD STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069



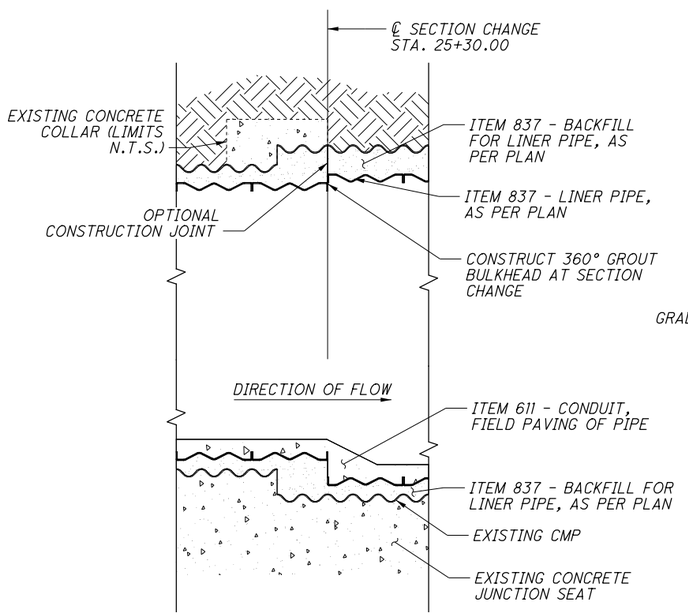
TYPICAL SECTION

STA. 21+10 TO STA. 25+30±
LOOKING DOWNSTREAM (UPSTATION)



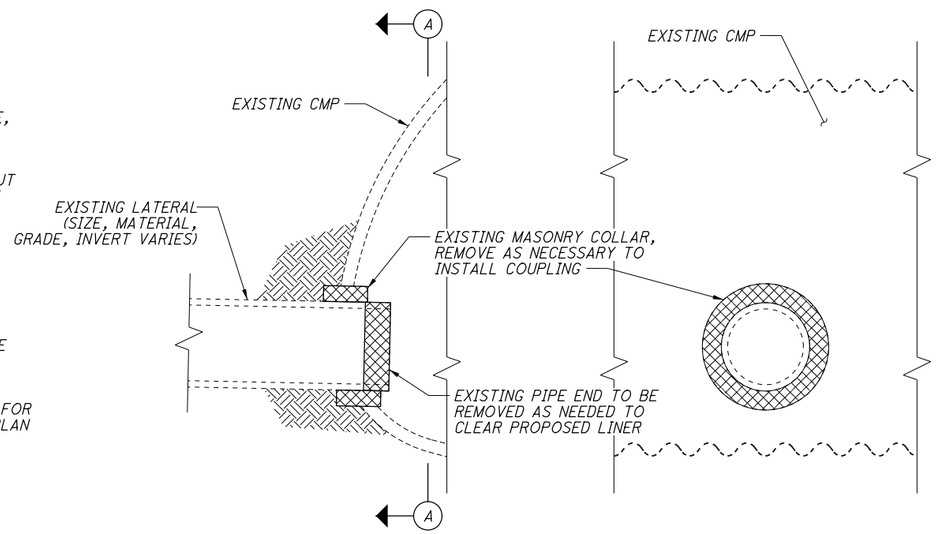
TYPICAL SECTION

STA. 25+30± TO STA. 25+75.00
LOOKING DOWNSTREAM (UPSTATION)



JUNCTION DETAIL

PROFILE ALONG ℄ CULVERT
AT LINER SECTION CHANGE, N.T.S.



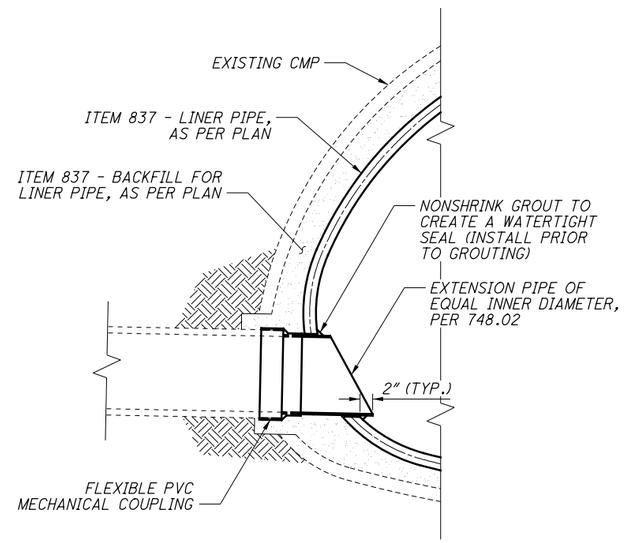
SECTION ALONG ℄ LATERAL

SECTION A-A

NOTE: CONTRACTOR TO VERIFY SIZE AND LOCATIONS OF ALL EXISTING LATERALS. VERIFICATION AND CONNECTIONS OF LATERALS TO BE INCIDENTAL TO COST OF LINER. FOR BIDDING PURPOSES, CONTRACTORS SHALL ASSUME 10 EACH LATERAL CONNECTIONS OF VARIOUS SIZES.

TYPICAL LATERAL CONNECTION DETAIL

LEFT SHOWN, RIGHT SIMILAR



PROPOSED CONDITION

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1800183	

CULVERT DETAILS

SITE 2 - BRIDGE NO. CUY-90-1822
EAST 33RD STREET STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

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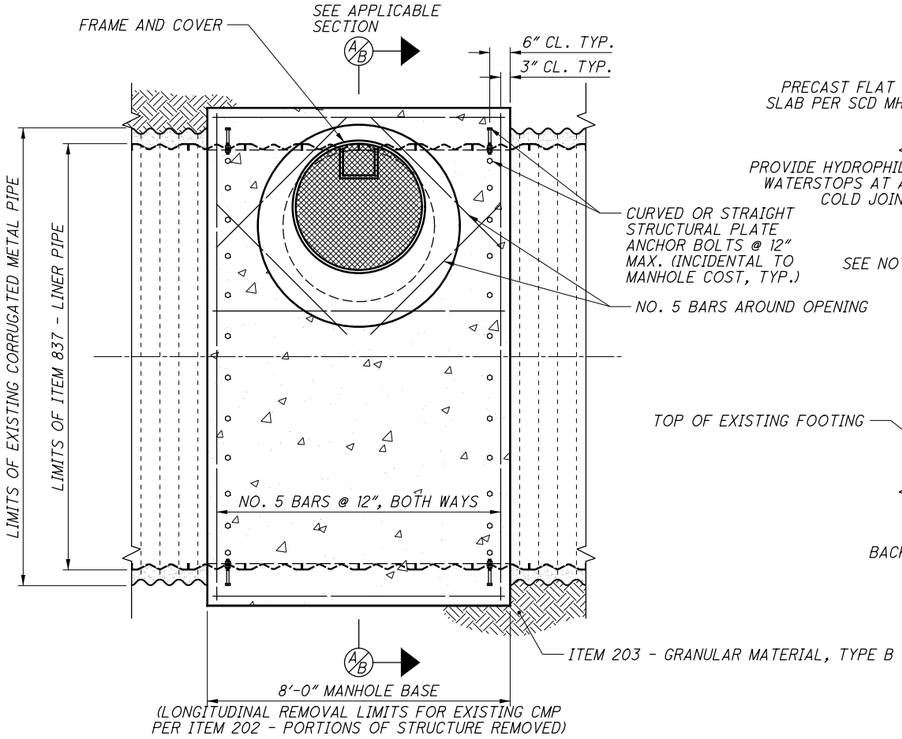
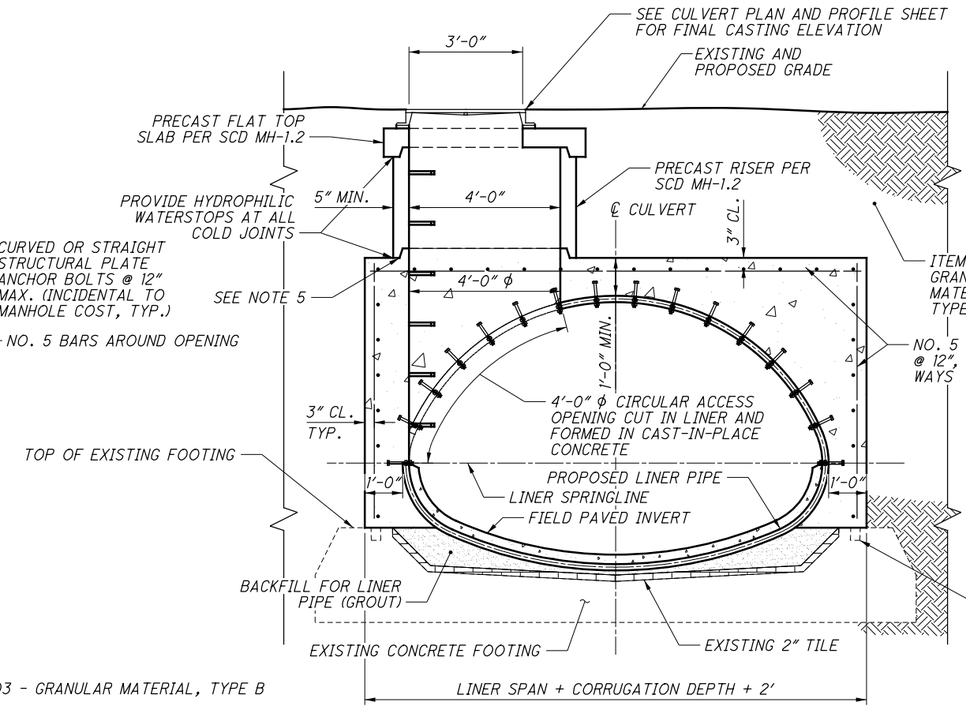


PLAN



SECTION A-A

MANHOLE BASE WHEN EXISTING FOUNDATION IS PRESENT

NOTES

1) CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS. CONTRACTOR SHALL SIZE THE PRECAST RISER SECTIONS AND/OR INCREASE THE CLEAR COVER ABOVE THE PROPOSED LINER TO MITIGATE THE NEED FOR PRECAST GRADE RINGS OR OTHER MEANS OF ELEVATING THE CASTING TO FINAL GRADE. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER PRIOR TO ORDERING MATERIAL.

2) FOR ADDITIONAL DETAILS, SEE ODOT STANDARD CONSTRUCTION DRAWINGS MH-1.1, MH-1.2, AND MH-1.3.

3) CASTINGS SHALL PROVIDE 36" NOMIMAL OPENING.

4) REMOVAL OF ANY PORTION OF THE EXISTING STRUCTURE AND MANHOLES (IF PRESENT) REQUIRED TO COMPLETE THE NEW MANHOLE INSTALLATION AS DETAILED HEREIN SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 202 - PORTIONS OF STRUCTURE REMOVED.

5) INSTEAD OF A TONGUE AND GROOVE JUNCTION BETWEEN THE RISER AND THE BASE, THE BASE MAY HAVE A FLAT SURFACE AND THE RISER MAY HAVE A SQUARE END SET IN A BED OF MORTAR ON THE BASE.

6) ALL MATERIALS, LABOR, AND INCIDENTALS, INCLUDING REINFORCING STEEL, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 611 - MANHOLE, NO. 3, AS PER PLAN.

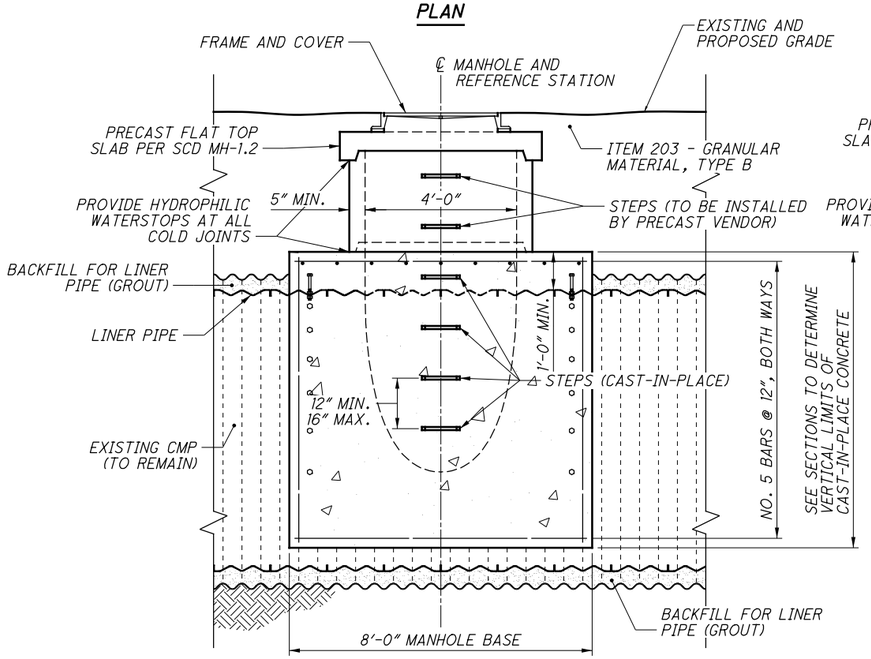
FURNISH MATERIALS CONFORMING TO THE FOLLOWING:

REINFORCING STEEL - 509 - EPOXY CODATED, GRADE 60

CAST-IN-PLACE CONCRETE - 511 - CONCRETE, CLASS QC1

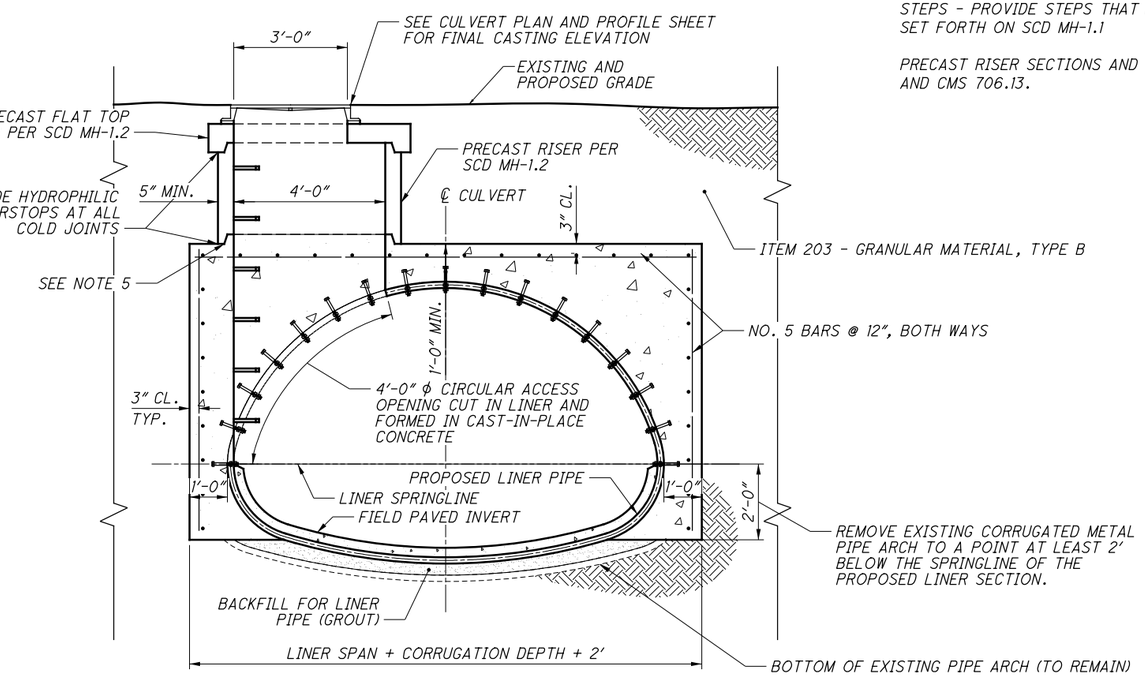
STEPS - PROVIDE STEPS THAT MEET THE REQUIREMENTS SET FORTH ON SCD MH-1.1

PRECAST RISER SECTIONS AND TOPS - PER SCD MH-1.2 AND CMS 706.13.



ELEVATION

SHOWN WITH EXISTING CMP



SECTION B-B

MANHOLE WITHOUT EXISTING FOUNDATION

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1800183	

MANHOLE DETAILS

SITE 2 - BRIDGE NO. CUY-90-1822
EAST 33RD STREET STORM SEWER

CUY-90-18.22/VAR

PID No. 92069

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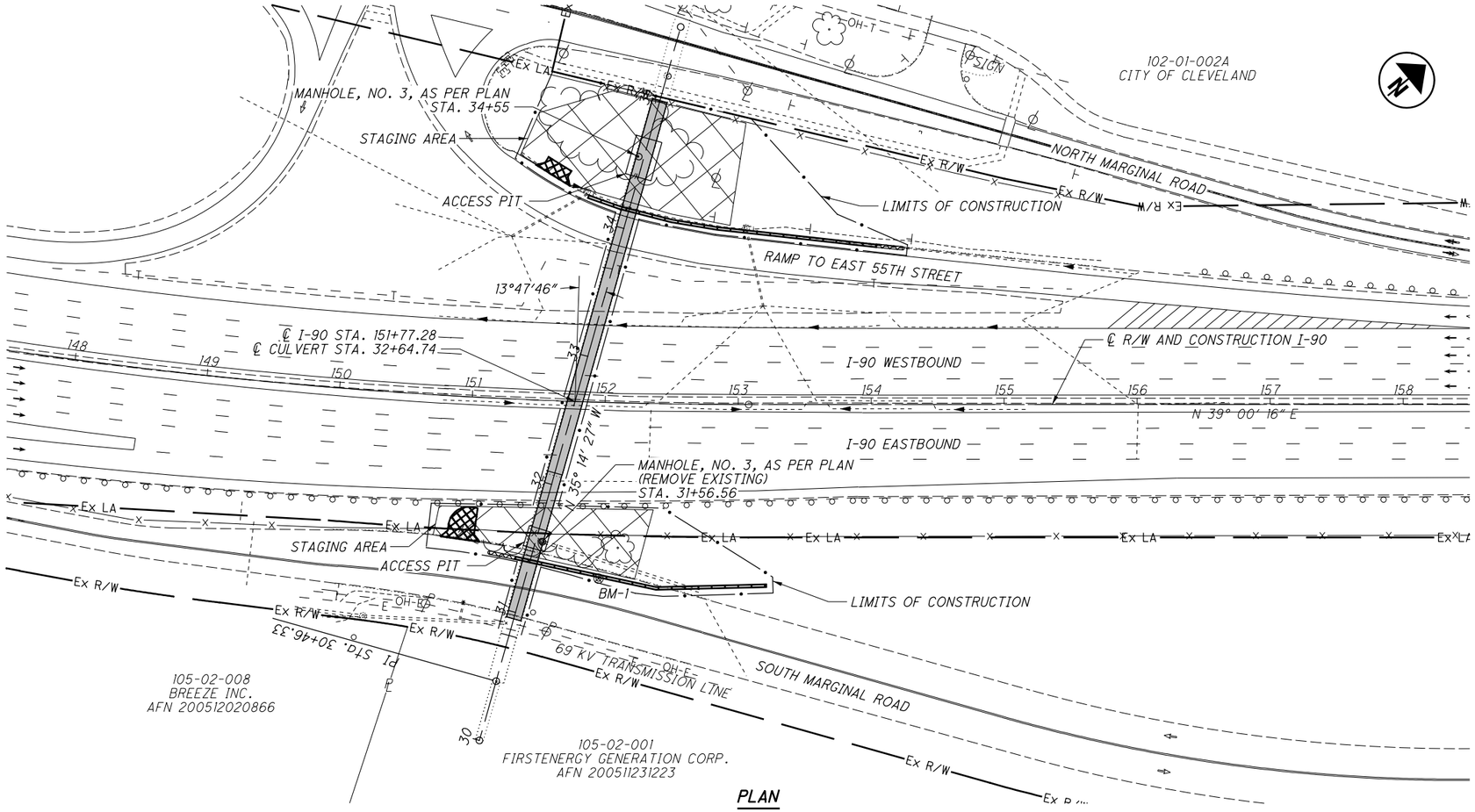

PLAN

PROFILE ALONG ℄ CONSTRUCTION

BENCHMARK DATA

BM #1 STA. 151+98.91, 597.70' RT. - MAG NAIL SET IN NORTH EDGE OF DICK GODDARD WAY, 1440' EAST OF EAST 55TH STREET. CP 303, ELEV = 582.80

NOTES

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

DESIGN TRAFFIC:
2021 ADT = 125,700 2021 ADTT = 6,300
2051 ADT = 126,000 2051 ADTT = 6,315
DIRECTIONAL DISTRIBUTION = 0.50

LEGEND

STRUCTURAL LINING LIMITS

STAGING AREA

HYDRAULIC DATA

Q (10) =	366 CFS	V (10) =	8.84 FT/S
Q (25) =	435 CFS	V (25) =	10.51 FT/S
Q (50) =	477 CFS	V (50) =	11.44 FT/S

SEE STRUCTURE NOTES FOR BYPASS PUMPING REQUIREMENTS

PROPOSED WORK

- REMOVE EXISTING MANHOLE ON THE EXISTING CULVERT AND OPEN ACCESS PIT(S)
- DEWATER EXISTING STRUCTURE
- PREPARE CULVERT BARREL TO RECEIVE STRUCTURAL LINER
- INSTALL STRUCTURAL LINER PIPE AND GROUT IN PLACE IN STAGES
- CONSTRUCT NEW MANHOLE
- BACKFILL ACCESS PIT(S)

EXISTING STRUCTURE

TYPE: CORRUGATED METAL PIPE CULVERT
SPANS: 13'-0"± ALONG SKEW (12'-6"± ARCH ON CONCRETE SLAB)
13'-0"± ALONG SKEW (12'-6"± PIPE ARCH)
ROADWAY: I-90 EB AND WB LANES AND EXIT RAMP
LOADING: HS-20
SKEW: 13° 47' 46"± LEFT FORWARD
WEARING SURFACE: ASPHALT CONCRETE
APPROACH SLABS: NONE
ALIGNMENT: TANGENT
CROWN: VARIES
STRUCTURAL FILE NUMBER: 1809407
DATE BUILT: 1952
DISPOSITION: OPEN

PROPOSED STRUCTURE

TYPE: STRUCTURAL PLATE LINER INSTALLED WITHIN EXISTING STRUCTURE AND BACKFILLED WITH GROUT
SPANS: 11'-4" ALONG SKEW (10'-11" LINER FOR ARCH ON CONCRETE SLAB)
11'-7" ALONG SKEW (11'-2½" LINER FOR PIPE ARCH)
ROADWAY: I-90 EB AND WB LANES AND EXIT RAMP
LOADING: HL-93 AND 60 PSF FUTURE WEARING SURFACE
SKEW: 13° 47' 46" LEFT FORWARD
APPROACH SLABS: NONE
COORDINATES: LATITUDE 41° 31' 56.03" N
LONGITUDE 81° 38' 55.15" W

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED RAP | DRAWN RAP | REVIEWED HVH | DATE 09/18/20
CHECKED RY | REVISED | STRUCTURE FILE NUMBER 1809407

COUNTY
STA. 150+00
STA. 155+00

SITE PLAN
SITE 3 - BRIDGE NO. CUY-90-1999
ADDISON ROAD STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFER TO THE FOLLOWING ODOT STANDARD DRAWING(S):

MH-1.1 DATED 01/15/2016
MH-1.2 DATED 01/15/2016
MH-1.3 DATED 01/18/2013

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATION(S):

800 DATED 04/16/2021
837 DATED 07/19/2019

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 8TH EDITION, INCLUDING ALL REVISIONS AND INTERIM SPECIFICATIONS, AND THE ODOT BRIDGE DESIGN MANUAL, 2019 AND QUARTERLY UPDATES.

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 (HEADWALL)

REINFORCING STEEL
-MINIMUM YIELD STRENGTH 60 KSI

EXISTING STRUCTURE VERIFICATION

EXISTING STRUCTURE VERIFICATION: DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02 AND 513.04.

BASE CONTRACT BID PRICES UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE. HOWEVER, THE DEPARTMENT WILL PAY FOR ALL PROJECT WORK BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED IN THE FIELD.

ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

THIS WORK CONSISTS OF THE REMOVAL OF EXISTING MANHOLES, PORTIONS OF THE EXISTING CMP AS NEEDED FOR ACCESS, AND ANY OTHER PORTIONS OF THE EXISTING STRUCTURE NECESSARY TO FACILITATE INSTALLATION OF THE PLATE LINER.

PERFORM WORK CAREFULLY DURING REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND INCORPORATED INTO THE PROPOSED STRUCTURE. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE RAM TYPE OF EQUIPMENT IS PROHIBITED. SUBMIT CONSTRUCTION PLANS ACCORDING TO CMS 501.05. ANY DAMAGE TO PORTIONS OF THE EXISTING STRUCTURE TO REMAIN SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST.

MEASUREMENT & PAYMENT: THE DEPARTMENT WILL MEASURE THE QUANTITY OF REMOVALS ON A LUMP SUM BASIS. THE DEPARTMENT WILL PAY FOR THE ACCEPTED QUANTITIES OF REMOVALS AT THE CONTRACT PRICE FOR ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN.

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

PROVISIONS OF CMS ITEM 503 SHALL APPLY EXCEPT AS MODIFIED HEREIN:

LAKE BACKWATER

A BACKWATER CONDITION CONDITION EXISTS AT THIS LOCATION, AND THE DEPTH OF STANDING WATER IN THE CULVERT WILL VARY WITH THE LAKE (ERIE) LEVEL. THE DEWATERING AND CONSTRUCTION SEQUENCE AS DETAILED IN THESE PLANS IS FOR REFERENCE ONLY AND NOT TO SCALE; CONTRACTOR MEANS AND METHODS WILL VARY. THE CONTRACTOR SHALL SUBMIT SITE SPECIFIC DEWATERING PROCEDURES PRIOR TO ORDERING MATERIAL. CONTRACTOR SHALL COORDINATE ALL WORK WITH NORTHEAST OHIO REGIONAL SEWER DISTRICT (NEORSD). HISTORIC LAKE LEVELS ARE VIEWABLE AT THE TIDES AND CURRENTS SECTION OF THE NATIONAL OCEANIC AND ATMOSPHERIC (NOAA) WEBSITE:

https://tidesandcurrents.noaa.gov/map/

SITE SURCHARGE

WITH HIGH LAKE LEVELS, A WET WEATHER EVENT MAY LEAD TO SEWER SURCHARGING SINCE THE CULVERT WILL BE OPEN. THE CONTRACTOR SHALL PROVIDE PROVISIONS AND PROCEDURES FOR SITE CLEANUP IF A SURCHAGE EVENT OCCURS.

BYPASS PUMPING

THE REPAIR SITE IS LOCATED IN AN EXISTING CULVERT WHICH EXPERIENCES SIGNIFICANT COMBINED SEWER FLOW DURING WET WEATHER. ALL FLOW FROM WET WEATHER EVENTS MUST BE PERMITTED TO PASS THROUGH THE WORK OPERATIONS BY USING PIPE PLUGS WHICH ARE READILY REMOVABLE. THE CONTRACTOR SHALL HAVE PROVISIONS AND PROCEDURES IN PLACE TO DISMANTLE OR PROTECT THE WORK DURING WET WEATHER. CONTRACTOR SHALL SCHEDULE LINER INSTALLATION ONLY DURING DRY WEATHER PERIODS AND DURING MONTHS WITH THE LOWEST POTENTIAL WET WEATHER EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY INTERRUPTION OF, OR DAMAGE TO, THE WORK DUE TO WET WEATHER FLOWS.

THE CONTRACTOR SHALL SCHEDULE LINER INSTALLATION DURING MONTHS WITH THE LOWEST NORMAL FLOW AND LOWEST POTENTIAL FOR OUTFALLS CAUSED BY RAIN EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. CONTRACTOR SHALL COORDINATE ALL WORK WITH NORTHEAST OHIO REGIONAL SEWER DISTRICT (NEORSD).

THE DEWATERING/BYPASS AND CONSTRUCTION SEQUENCE IN THESE PLANS IS NOT TO SCALE AND FOR REFERENCE ONLY; THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER SITE SPECIFIC DEWATERING AND BYPASS PUMPING PROCEDURES PRIOR TO ORDERING MATERIAL.

ALL MATERIALS, LABOR, SUBMITTALS, AND INCIDENTALS REQUIRED FOR THE PERFORMANCE OF WORK AS DETAILED HEREIN AND IN THESE PLANS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN.

ITEM 837 - LINER PIPE, AS PER PLAN

THE PROPOSED STRUCTURE TYPE SHALL BE A FLANGED, GALVANIZED STEEL, TUNNEL LINER PLATE PIPE ARCH CONFORMING TO THE GEOMETRY SHOWN ON SHEET 6/7 AND CAPABLE OF BEING ASSEMBLED WITHIN THE EXISTING STRUCTURE AS DETAILED IN THESE PLANS. THE PROPOSED STRUCTURE SHALL BE DESIGNED FOR HL-93 LOADING WITH 60 PSF FUTURE WEARING SURFACE AND ASSUME THE EXISTING STRUCTURE PROVIDES NO STRUCTURAL CAPACITY. VENDOR TO PROVIDE GAUGE THICKNESS.

MATERIAL:

LINER PLATES SHALL BE FABRICATED FROM BLACK STEEL PLATES CONFORMING TO ASTM SPECIFICATION A 1011. PLATES SHALL BE OF THE GAGE SHOWN ON THE PLANS AND SHALL BE CURVED TO SUIT THE TUNNEL CROSS SECTION SHOWN. PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123, EXCEPT THAT THE ZINC SHALL BE APPLIED AT A RATE OF 2.0 OUNCES PER SQUARE FOOT TOTAL FOR BOTH SIDES.

ALL PLATES SHALL BE PUNCHED FOR BOLTING ON BOTH LONGITUDINAL AND CIRCUMFERENTIAL SEAMS AND SHALL BE SO FABRICATED AS TO PERMIT COMPLETE ERECTION FROM THE INSIDE OF THE EXISTING STRUCTURE. THE LONGITUDINAL SEAM SHALL BE OF THE LAPPED TYPE, WITH AN OFFSET EQUAL TO THE GAGE OF METAL FOR THE FULL WIDTH OF PLATE TO ALLOW THE CROSS SECTION OF THE PLATE TO BE CONTINUOUS THROUGH THE SEAM. CIRCUMFERENTIAL BOLT HOLE SPACING SHALL BE 6-1/4".

GROUT HOLES, ADJUSTING RODS, ANTI-FLOTATION DEVICES, BASE CHANNELS, AND SKID RAILS SHALL BE IN ACCORDANCE WITH THE LINER MANUFACTURER'S RECOMMENDATIONS. GROUT PORT/VENT LOCATIONS IN THE ROADWAY ARE PERMISSIBLE BUT SHOULD BE CONFIGURED TO MINIMIZE IMPACT TO TRAFFIC.

BOLTS AND NUTS:

BOLTS AND NUTS SHALL BE 5/8" IN DIAMETER AND LENGTH AS RECOMMENDED BY THE MANUFACTURER. BOLTS SHALL CONFORM TO ASTM A 449, TYPE 1 OR ASTM A 307. FOR LONGITUDINAL SEAMS, BOLTS SHALL BE A 449, TYPE 1, FOR PLATE THICKNESS EQUAL TO OR GREATER THAN 0.209. FOR PLATE THICKNESS LESS THAN .209, THE BOLTS SHALL BE A 307, GRADE A. ALL CIRCUMFERENTIAL BOLTS MAY BE A 307, GRADE A. NUTS SHALL CONFORM TO ASTM A 563, GRADE A, HEX.

GALVANIZING WHEN REQUIRED SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM B-695, CLASS 50.

INSTALLATION:

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS INCLUDING ASSEMBLY DRAWINGS, ARCH ASSEMBLY METHODS, DEWATERING METHODS, BULKHEAD, AND BLOCKING DETAILS TO THE ENGINEER FOR REVIEW. THE CONTRACTOR MAY PUSH OR PULL ASSEMBLED LINER SECTIONS INTO PLACE IF NECESSARY PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL UTILIZE METHODS THAT FACILITATE PLACEMENT OF THE LINER SECTIONS WHILE MINIMIZING DAMAGE TO THE PLATE OR ITS GALVANIZED ZINC COATING. THE CONTRACTOR SHALL TOUCH UP ANY DAMAGE TO THE GALVANIZED ZINC COATING CAUSED BY HANDLING OR ASSEMBLY. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE DETAILS AND LOCATIONS OF LATERAL CONNECTIONS, GROUT PORTS, FITTINGS, BLOCKING, AND BLOCKING HARDWARE FOR APPROVAL. A GROUTING METHOD AND CULVERT INSTALLATION PROCEDURE SHALL ALSO BE SUBMITTED FOR APPROVAL. LINER PLATE SHALL BE ASSEMBLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. LONGITUDINAL SEAMS SHALL BE STAGGERED BETWEEN RINGS.

CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, INCLUDING: SIZE, TYPE, AND LOCATIONS OF ALL LATERAL CONNECTIONS; DEFLECTIONS/DAMAGE TO THE EXISTING STRUCTURES; AND HORIZONTAL AND VERTICAL DEFLECTIONS TO THE OVERALL STRUCTURE ALIGNMENT.

ALL NECESSARY REPAIRS/REMOVALS TO THE EXISTING CULVERT TO PROVIDE CLEARANCE FOR THE PROPOSED LINER/GROUT SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT AS NEEDED TO MAINTAIN STRUCTURAL INTEGRITY AT ALL TIMES.

FIELD CUTTING OF LINER SHALL BE AS MINIMAL AS REQUIRED TO PERMIT CONNECTION OF LATERALS AND SHALL NOT COMPROMIZE THE STRUCTURAL CAPACITY OF THE LINER. GALVANIZING SHALL BE TOUCHED UP FOR ANY CUT EDGES. LARGER LATERAL CONNECTIONS MAY WARRANT USE OF HEAVIER GAUGE PLATE OR OTHER REINFORCEMENT AND SHALL BE DESIGNED BY PLATE VENDOR. ALL LATERAL CONNECTIONS SHALL BE INCLUDED IN THE BID UNIT PRICE FOR THIS ITEM.

CONTRACTOR SHALL PROVIDE SHOP FABRICATED TRANSITION LINER SECTIONS TO ACCOMODATE DEFLECTIONS IN THE HORIZONTAL OR VERTICAL ALIGNMENT OF THE EXISTING STRUCTURES.

ALL VENTILATION NEEDED FOR THE PERFORMANCE OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.

THE COSTS OF ALL ABOVE DECRIBED ITEMS, WORK, AND INCIDENTALS TO CONSTRUCT THE LINER AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1809407	

STRUCTURE NOTES
SITE 3 - BRIDGE NO. CUY-90-1999
ADDISON ROAD STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN

THE BACKILL FOR THE LINER PIPE, HENCEFORTH REFERRED TO AS GROUT, IS FOR FILLING THE ANNULAR SPACE BETWEEN THE EXISTING CONDUIT AND PROPOSED LINER. AFTER INSTALLATION OF THE LINER, BUT PRIOR TO GROUTING, BULKHEADING AND VENTING SHALL BE CONSTRUCTED. A WATERTIGHT, CEMENTITIOUS BULKHEAD (OR COLLAR) SHALL BE FORMED BETWEEN THE HOST STRUCTURE AND THE ARCH LINER AT EACH END OF THE ARCH AND SHALL PROVIDE LONG TERM DURABILITY. BULKHEAD DESIGNS SHALL BE SUFFICIENT TO RESIST GROUT PRESSURES OR HYDROSTATIC WATER PRESSURE WITHIN THE ANNULAR SPACE.

THE GROUT SHALL BE PLACED IN CONTROLLED LIFTS IN ACCORDANCE WITH THE SUBMITTED STAGED GROUTING PLAN. EACH LIFT SHALL BE ALLOWED TO ACHIEVE INITIAL SET BEFORE THE SUBSEQUENT LIFT CAN BE PLACED. ADDITIONALLY, THE CONTRACTOR TOGETHER WITH THE ENGINEER SHALL SOUND THE AREA OF EACH LIFT ONCE IT HAS ACHIEVED INITIAL SET TO ENSURE THAT THE GAP BETWEEN THE EXISTING STRUCTURE AND PROPOSED ARCH HAS BEEN COMPLETELY FILLED. ANY VOIDS DETECTED BY THE SOUNDING SHALL BE CORRECTED BY PLACING ADDITIONAL GROUT BEFORE PROCEEDING WITH PLACEMENT OF THE SUBSEQUENT LIFT.

IF PORTS ARE USED TO PUMP GROUT THROUGH THE STEEL LINER PIPE, THEY SHALL BE SHOP INSTALLED. IF FIELD-INSTALLED PORTS ARE REQUIRED, THEY SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT COMPROMISE THE STRUCTURAL CAPACITY OF THE LINER.

IF ANY PORTION OF THE EXISTING STRUCTURE SLAB IS REMOVED FOR CONTRACTOR ACCESS, THE GROUT SHALL BE FILLED TO THE ORIGINAL SLAB TOP ELEVATION.

THE MATERIALS SHALL BE MIXED IN EQUIPMENT OF SUFFICIENT SIZE AND CAPACITY TO PROVIDE THE DESIRED AMOUNT OF GROUT MATERIAL FOR EACH GROUTING STAGE. THE EQUIPMENT SHALL BE CAPABLE OF MIXING THE GROUT AT DENSITIES REQUIRED FOR THE APPROVED PROCEDURE AND SHALL ALSO BE CAPABLE OF CHANGING DENSITY AS DICTATED BY FIELD CONDITIONS ANY TIME DURING THE GROUTING OPERATION.

THE MIX DESIGN(S) SHALL BE DEVELOPED TO COMPLETELY FILL THE ANNULAR SPACE, AND SHALL ADDRESS THE FOLLOWING CONSIDERATIONS: SIZE OF ANNULAR VOID, VOIDS (BASED ON SIZE AND ACCESS) IN THE SURROUNDING STRUCTURE ENVELOPE, ABSENCE OR PRESENCE OF GROUNDWATER, SUFFICIENT STRENGTH AND DURABILITY TO PREVENT MOVEMENT OF THE LINER PLATE, PROVISIONS FOR ADEQUATE RETARDATION AND SHRINKAGE OF LESS THAN 1 PERCENT BY VOLUME. GROUT SHALL BE MIXED IN SMALL QUANTITIES AS NEEDED, AND SHALL NOT BE RE-TEMPERED OR USED AFTER IT HAS BEGUN TO SET.

THE GAUGED PUMPING PRESSURE SHALL NOT EXCEED THE ARCH LINER MANUFACTURER'S APPROVED RECOMMENDATIONS. PUMPING EQUIPMENT SHALL BE OF SIZE SUFFICIENT TO INJECT GROUT AT VELOCITY AND PRESSURE RELATIVE TO THE SIZE OF THE ANNULAR SPACE. GAUGES TO MONITOR GROUT PRESSURE SHALL BE ATTACHED IMMEDIATELY ADJACENT TO EACH INJECTION PORT. THE GAUGE SHALL CONFORM TO AN ACCURACY OF NOT MORE THAN ONE-HALF PERCENT ERROR OVER THE FULL RANGE OF THE GAUGE. THE RANGE OF THE GAUGE SHALL BE NOT MORE THAN 100 PERCENT GREATER THAN THE DESIGN GROUT PRESSURE. PRESSURE GAUGES SHALL BE INSTRUMENT OIL FILLED AND ATTACHED TO A SADDLE TYPE DIAPHRAGM SEAL (GAUGE SAVER) TO PREVENT CLOGGING WITH GROUT. ALL GAUGES SHALL BE CERTIFIED AND CALIBRATED IN ACCORDANCE WITH ANSI B40 GRADE 2A.

PRE-CONSTRUCTION MEETING:

THE ARCH LINER MANUFACTURER MUST PROVIDE A REPRESENTATIVE TO CONDUCT A PRE-CONSTRUCTION MEETING THAT COVERS ALL ASPECTS OF THE LINING AND GROUTING PROCESS AND SAID PERSON MUST BE A REGISTERED PROFESSION ENGINEER. HE OR SHE MUST ALSO BE ON SITE DURING GROUTING OPERATIONS.

EXPERIENCE:

THE ARCH LINER MANUFACTURER SHALL SHOW EXTERNAL PROOF THAT THEIR EMPLOYEE WHO WILL CONDUCT THE PRE-CONSTRUCTION MEETING SHALL HAVE PARTICIPATED IN THE SUCCESSFUL RELINE OF AT LEAST 10 STRUCTURES OF THIS TYPE AND SIZE ON PREVIOUS PROJECTS.

SUBMITTALS REQUIREMENTS:

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER AT LEAST TEN (10) WORKING DAYS PRIOR TO COMMENCING THE LINER PIPE INSTALLATION:

STRUCTURAL DESIGN CALCULATIONS FOR THE LINER PIPE FOLLOWING SECTION 12 OF THE AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES USING THE LRFD METHOD VERIFYING CAPACITY SIGNED BY A LICENSED PROFESSIONAL ENGINEER. THESE CALCULATIONS SHALL ASSUME THE EXISTING STRUCTURE HAS FAILED AND CONTRIBUTES NO STRENGTH TO THE PROPOSED LINER.

WRITTEN VERIFICATION BY THE LINER MANUFACTURER THAT THE LINING AND GROUTING PLAN CONFORMS WITH ALL PROVISIONS, CAUTIONS, AND RESTRICTIONS OF THESE SPECIFICATIONS, CONTRACT PLANS, AND MANUFACTURER REQUIREMENTS.

THE COSTS OF ALL ABOVE MENTIONED ITEMS, TEMPORARY FORMS/BULKHEADS, AND TEMPORARY SUPPORTS REQUIRED TO CONSTRUCT THE LINER BACKFILL AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

CALC:	RAP	DATE:	8/21/2020
CHECKED:	RY	DATE:	8/28/2020

ESTIMATED QUANTITIES (CUY-090-1999)

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.	SEE SHEET
202	11201	LS		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN				LS	2/6
203	35110	36	CY	GRANULAR MATERIAL, TYPE B				36	
503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN				LS	2/6
503	21100	36	CY	UNCLASSIFIED EXCAVATION				36	
611	99575	2	EACH	MANHOLE, NO. 3, AS PER PLAN				2	6/6
837	10001	405	FT	LINER PIPE, AS PER PLAN				405	2/6
837	21001	405	FT	BACKFILL FOR LINER PIPE, AS PER PLAN				405	3/6

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STRUCTURE NOTES
SITE 3 - BRIDGE NO. CUY-90-1999
ADDISON ROAD STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

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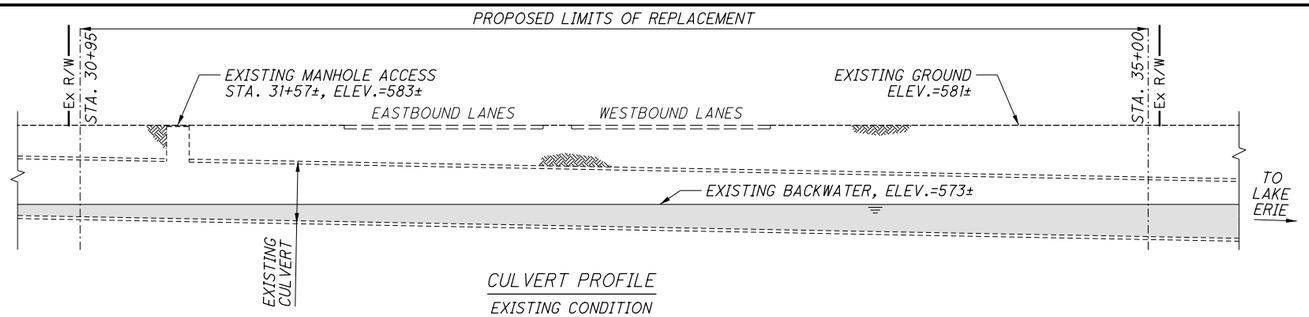
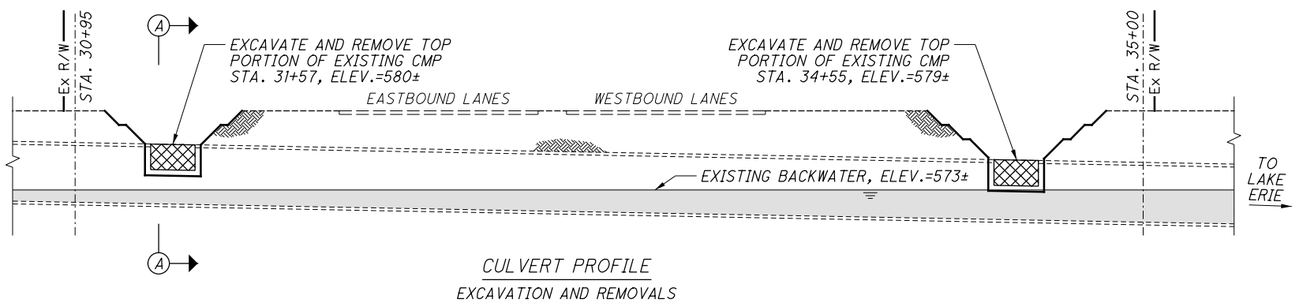
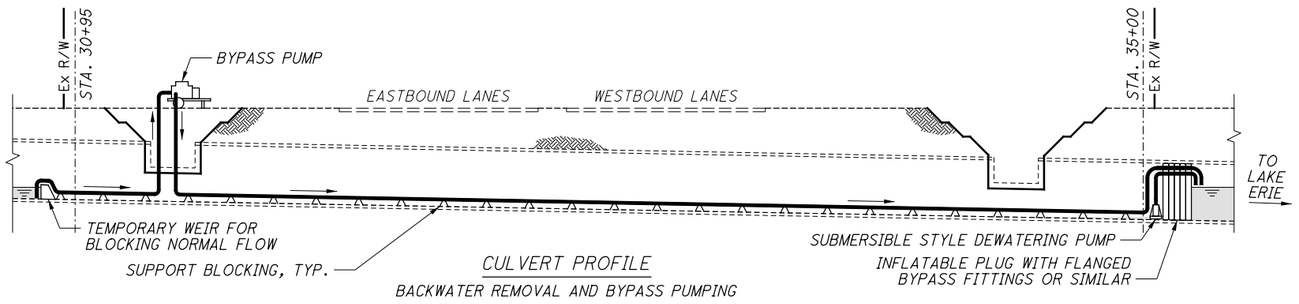


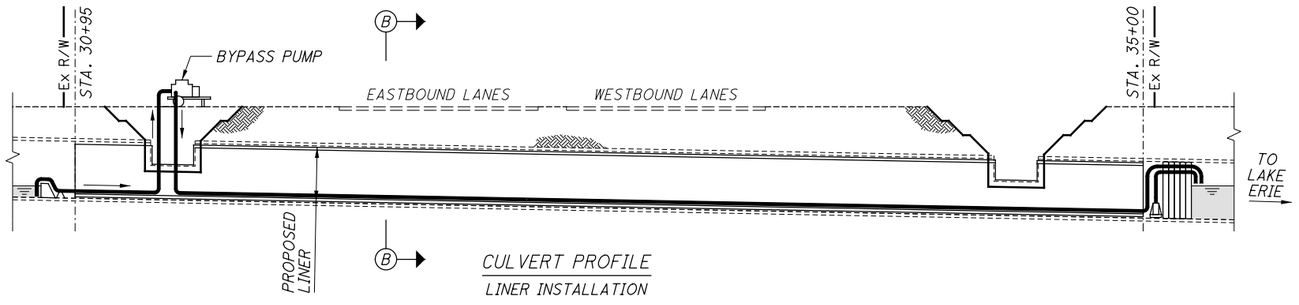
CULVERT PROFILE
EXISTING CONDITION



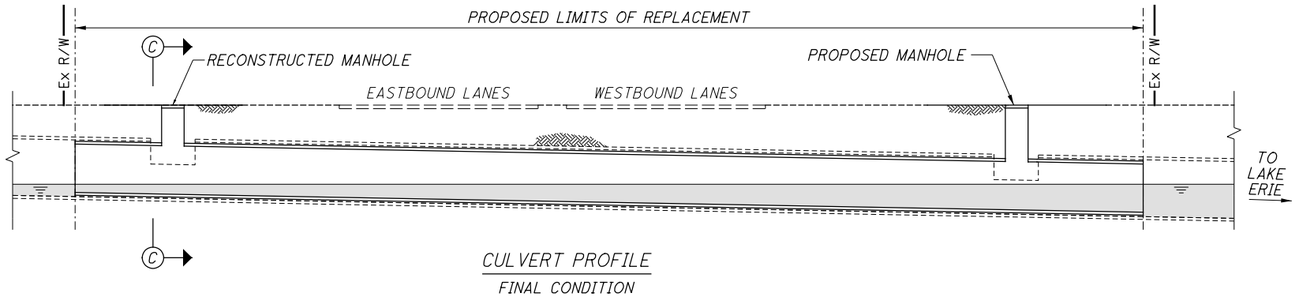
CULVERT PROFILE
EXCAVATION AND REMOVALS



CULVERT PROFILE
BACKWATER REMOVAL AND BYPASS PUMPING



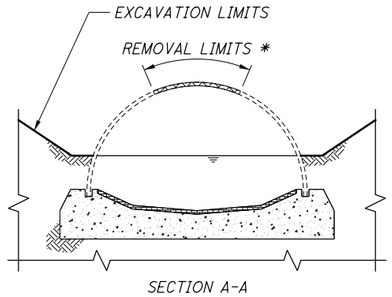
CULVERT PROFILE
LINER INSTALLATION



CULVERT PROFILE
FINAL CONDITION

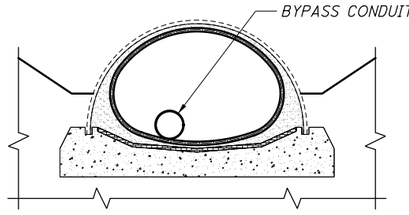
NOTES

- ALL ELEVATIONS SHOWN ARE APPROXIMATE AND FOR REFERENCE ONLY. SEE CULVERT PLAN AND PROFILE FOR DETAILED ELEVATION INFORMATION
- EXCAVATION LIMITS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR MEANS AND METHODS MAY VARY.

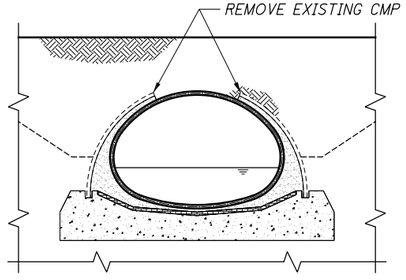


SECTION A-A

* NOTE: CONTRACTOR TO PROVIDE NEEDED OPENING REQUIRED BY MEANS AND METHODS TO CONSTRUCT. SIGNED AND SEALED PLANS AND INSTALLATION PROCEDURES TO BE SUBMITTED PRIOR TO START OF WORK.



SECTION B-B



SECTION C-C

EXISTING CONDITION

- ALL CONSTRUCTION ACTIVITES ARE TO OCCUR DURING PERIODS OF LOW FLOW. ALL STORM EVENTS MUST BE ALLOWED TO PASS WITHOUT DISTURBING PROPOSED WORK

EXCAVATION AND REMOVALS

- EXPOSE AND REMOVE TOP PORTION OF EXISTING CULVERT AS NEEDED FOR ACCESS. REMOVAL LIMITS SHALL BE ABOVE THE EXISTING FLOW LEVEL. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE STRUCTURAL INTEGRITY OF THE EXISTING CULVERT AT ALL TIMES

DEWATERING AND BYPASS PUMPING

THE DOWNSTREAM PLUG MUST BE SUFFICIENT TO RETAIN THE LAKE WATER BUT READILY REMOVABLE TO PERMIT PASSAGE OF FLOW DURING A STORM EVENT. COSTS OF DEWATERING AND BYPASS OPERATIONS ARE TO BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

LINER INSTALLATION

- LINER INSTALLATION AND GROUTING STAGES WILL VARY BASED ON CONTRACTOR MEANS AND METHODS
- INSTALLATION SEQUENCE MUST BE SUBMITTED TO ENGINEER FOR APPROVAL PER THE STRUCTURE GENERAL NOTES

FINAL CONDITION

- REMOVE DEWATERING AND BYPASS PUMPING MEASURES
- INSTALL REMAINING LINER SEGMENTS AT ACCESS LOCATIONS
- BACKFILL

NOT TO SCALE

DESIGN AGENCY
KS Associates Inc.
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CONSTRUCTION SEQUENCE
SITE 3 - BRIDGE NO. CUY-90-1999
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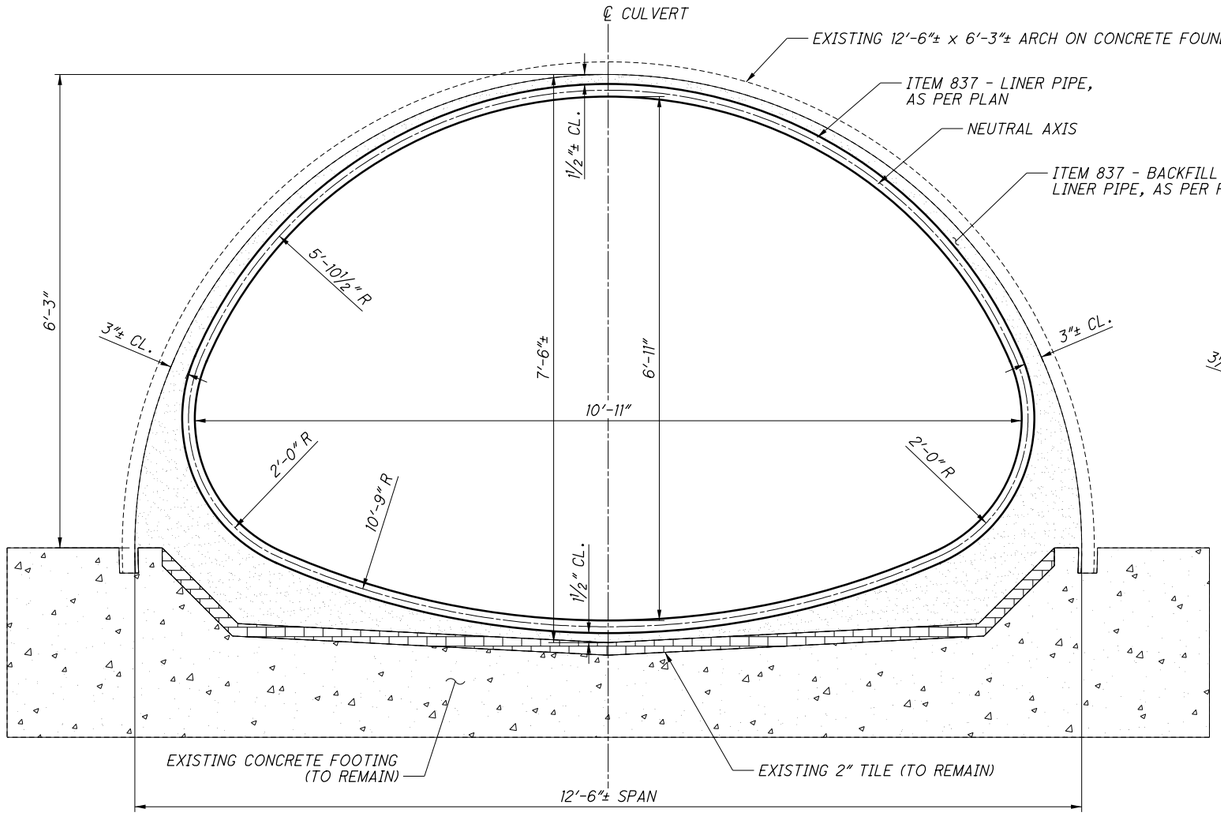
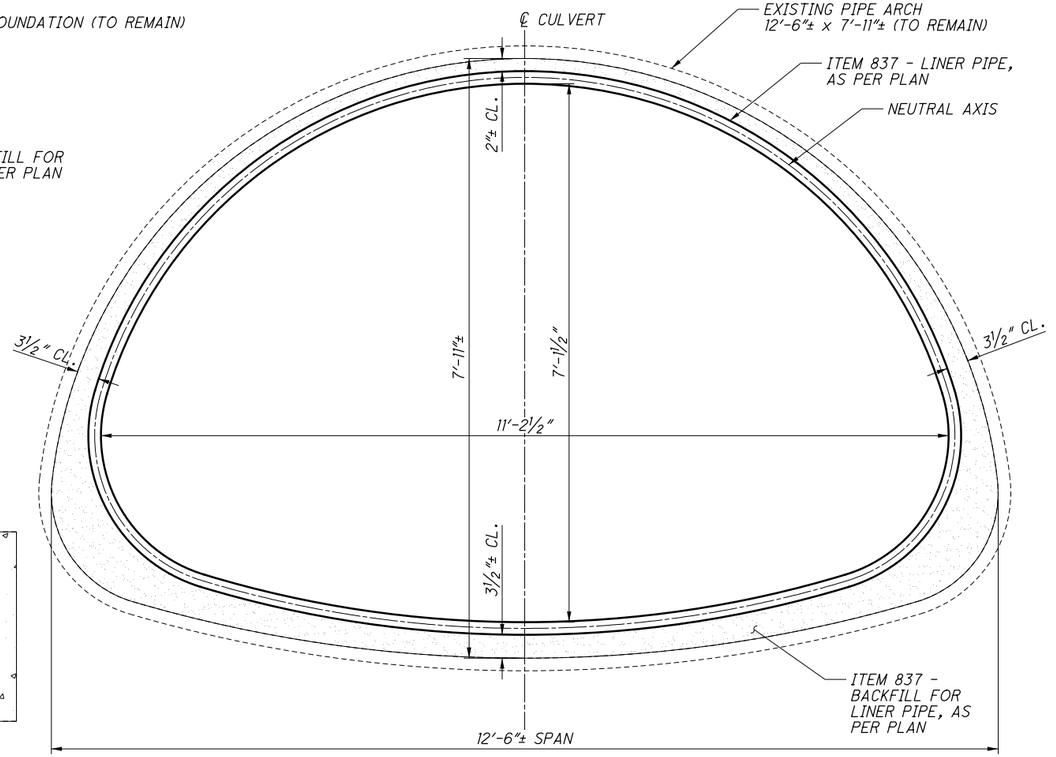


TYPICAL SECTION

STA. 30+95.00 TO STA. 32+09±
LOOKING DOWNSTREAM (UPSTATION)



TYPICAL SECTION

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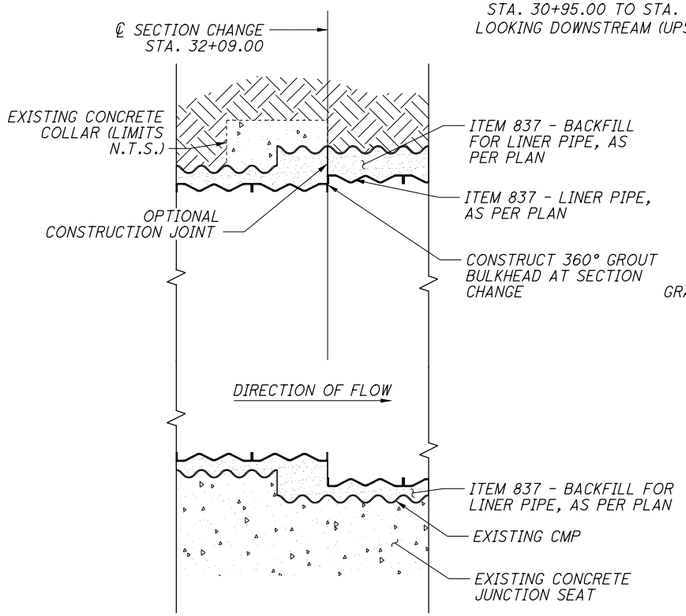
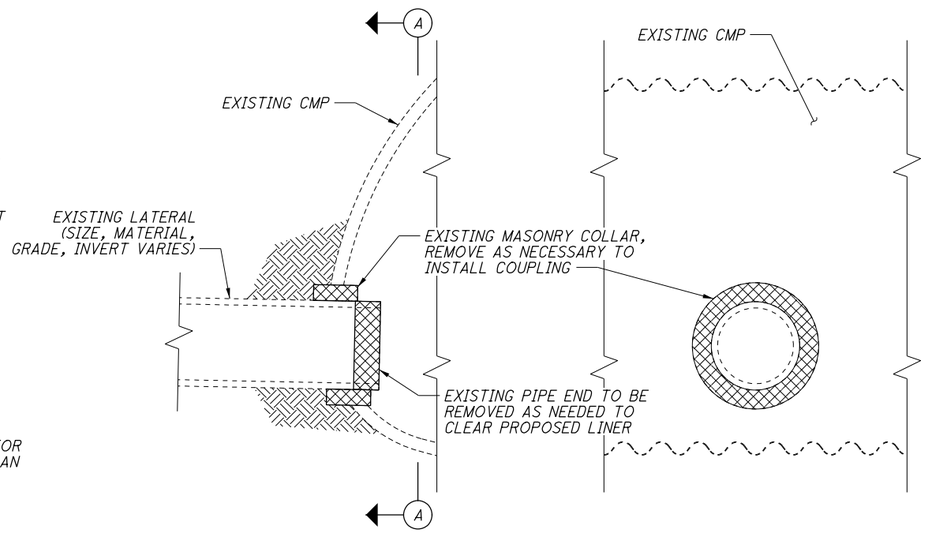
LOOKING DOWNSTREAM (UPSTATION)



JUNCTION DETAIL

PROFILE ALONG ℄ CULVERT
AT LINER SECTION CHANGE, N.T.S.

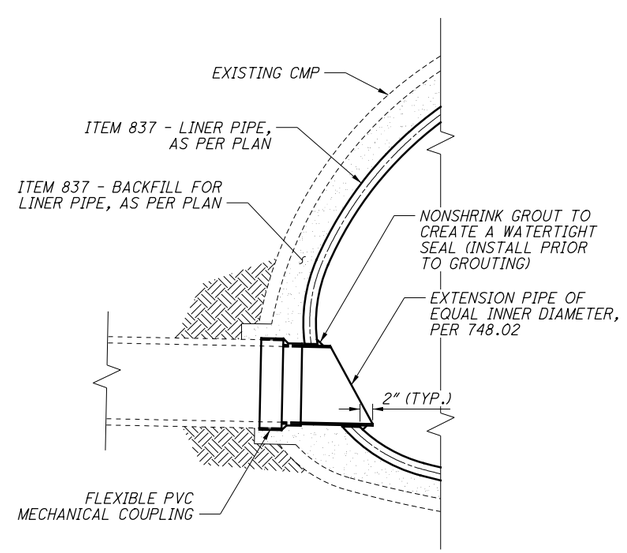


SECTION ALONG ℄ LATERAL **SECTION A-A**

NOTE: CONTRACTOR TO VERIFY SIZE AND LOCATIONS OF ALL EXISTING LATERALS. VERIFICATION AND CONNECTIONS OF LATERALS TO BE INCIDENTAL TO COST OF LINER. FOR BIDDING PURPOSES, CONTRACTORS SHALL ASSUME 10 EACH LATERAL CONNECTIONS OF VARIOUS SIZES.

LATERAL CONNECTION DETAIL

LEFT SHOWN, RIGHT SIMILAR



PROPOSED CONDITION

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
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CULVERT DETAILS

SITE 3 - BRIDGE NO. CUY-90-1999
ADDISON ROAD STORM SEWER

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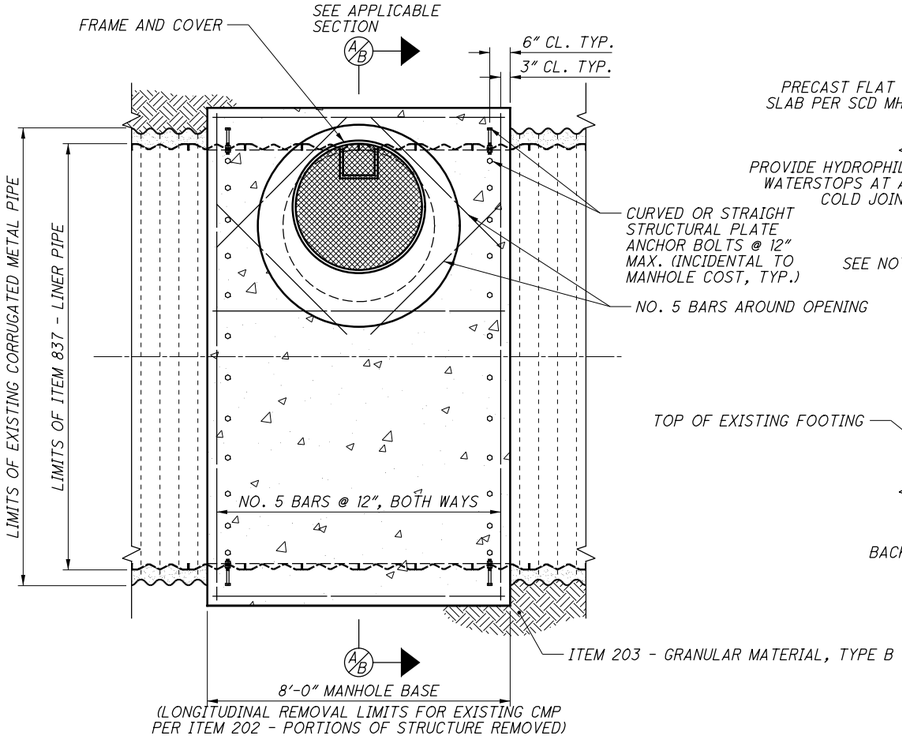
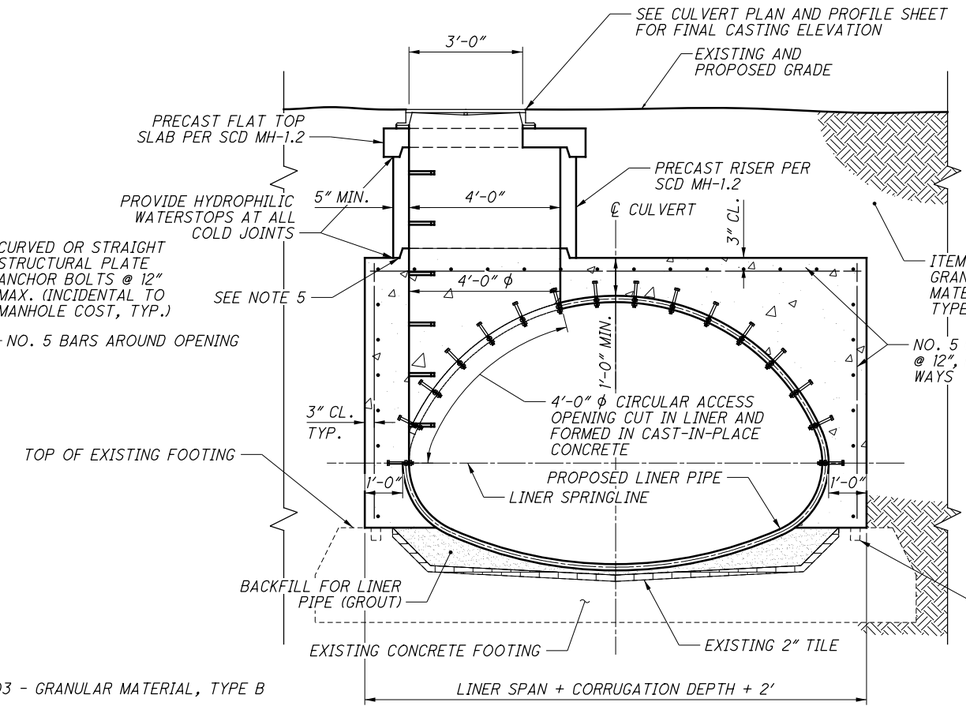


PLAN



SECTION A-A

MANHOLE BASE WHEN EXISTING FOUNDATION IS PRESENT

NOTES

1) CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS. CONTRACTOR SHALL SIZE THE PRECAST RISER SECTIONS AND/OR INCREASE THE CLEAR COVER ABOVE THE PROPOSED LINER TO MITIGATE THE NEED FOR PRECAST GRADE RINGS OR OTHER MEANS OF ELEVATING THE CASTING TO FINAL GRADE. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER PRIOR TO ORDERING MATERIAL.

2) FOR ADDITIONAL DETAILS, SEE ODOT STANDARD CONSTRUCTION DRAWINGS MH-1.1, MH-1.2, AND MH-1.3.

3) CASTINGS SHALL PROVIDE 36" NOMIMAL OPENING.

4) REMOVAL OF ANY PORTION OF THE EXISTING STRUCTURE AND MANHOLES (IF PRESENT) REQUIRED TO COMPLETE THE NEW MANHOLE INSTALLATION AS DETAILED HEREIN SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 202 - PORTIONS OF STRUCTURE REMOVED.

5) INSTEAD OF A TONGUE AND GROOVE JUNCTION BETWEEN THE RISER AND THE BASE, THE BASE MAY HAVE A FLAT SURFACE AND THE RISER MAY HAVE A SQUARE END SET IN A BED OF MORTAR ON THE BASE.

6) ALL MATERIALS, LABOR, AND INCIDENTALS, INCLUDING REINFORCING STEEL, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 611 - MANHOLE, NO. 3, AS PER PLAN.

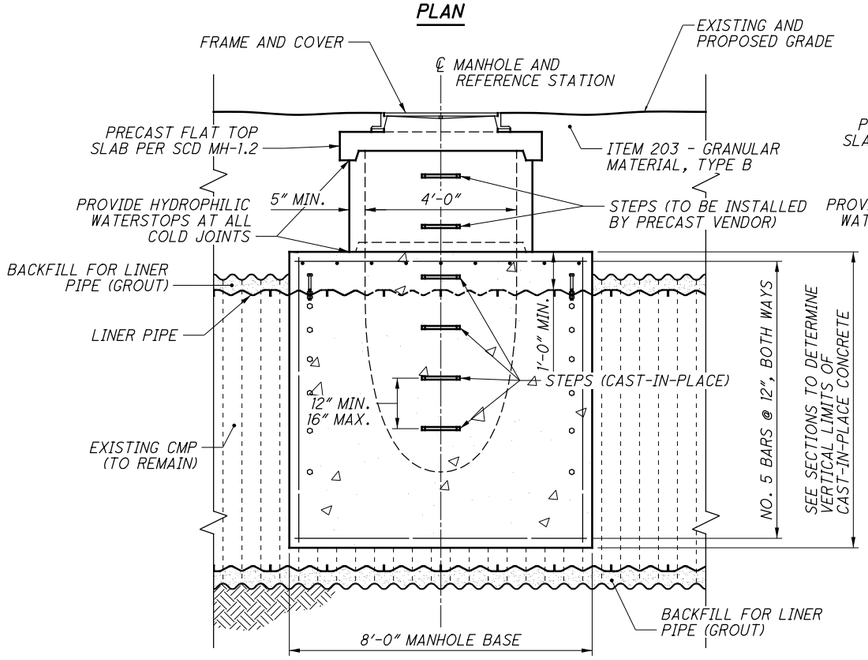
FURNISH MATERIALS CONFORMING TO THE FOLLOWING:

REINFORCING STEEL - 509 - EPOXY COATED, GRADE 60

CAST-IN-PLACE CONCRETE - 511 - CONCRETE, CLASS QC1

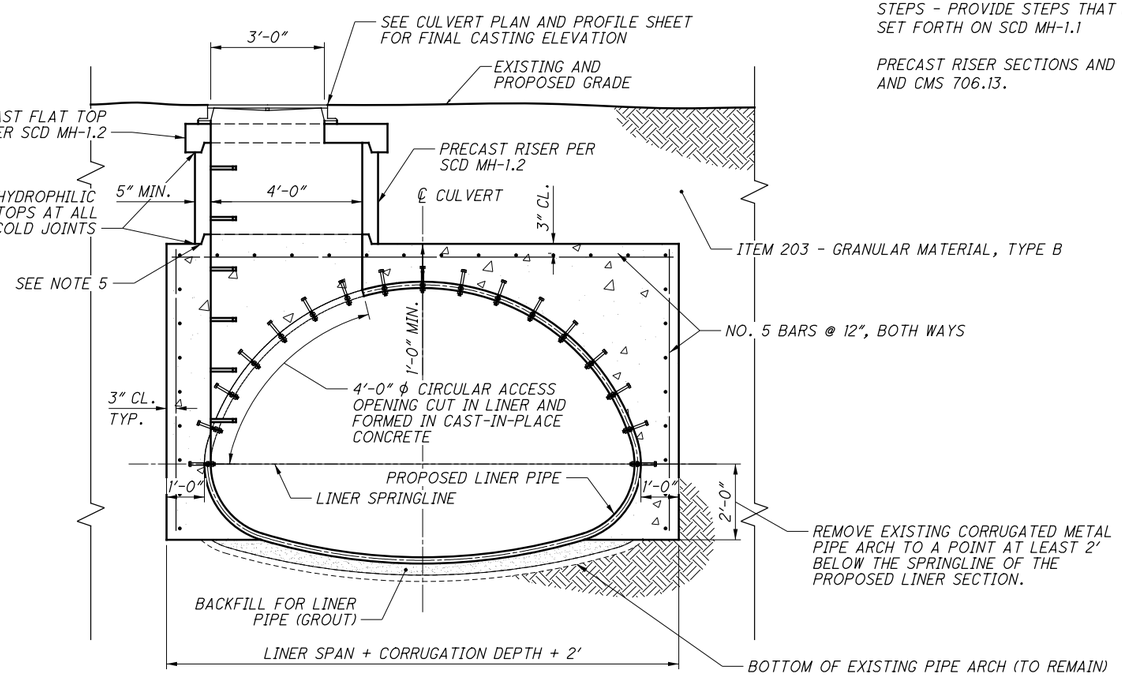
STEPS - PROVIDE STEPS THAT MEET THE REQUIREMENTS SET FORTH ON SCD MH-1.1

PRECAST RISER SECTIONS AND TOPS - PER SCD MH-1.2 AND CMS 706.13.



ELEVATION

SHOWN WITH EXISTING CMP



SECTION B-B

MANHOLE WITHOUT EXISTING FOUNDATION

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20

CHECKED: RY
REVISED:
STRUCTURE FILE NUMBER: 1809407

MANHOLE DETAILS
SITE 3 - BRIDGE NO. CUY-90-1999
ADDISON ROAD STORM SEWER

CUY-90-18.22/VAR
PID No. 92069

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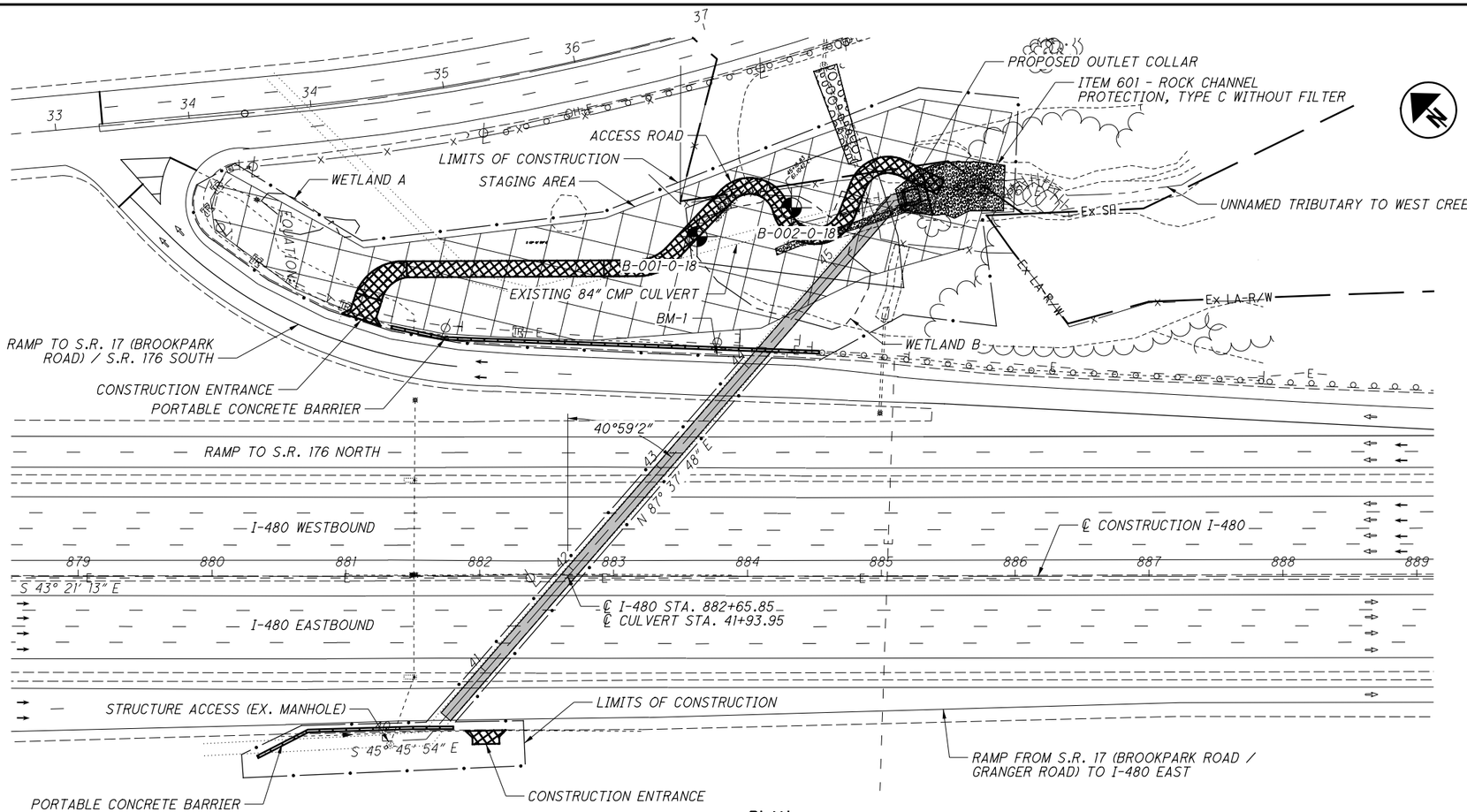
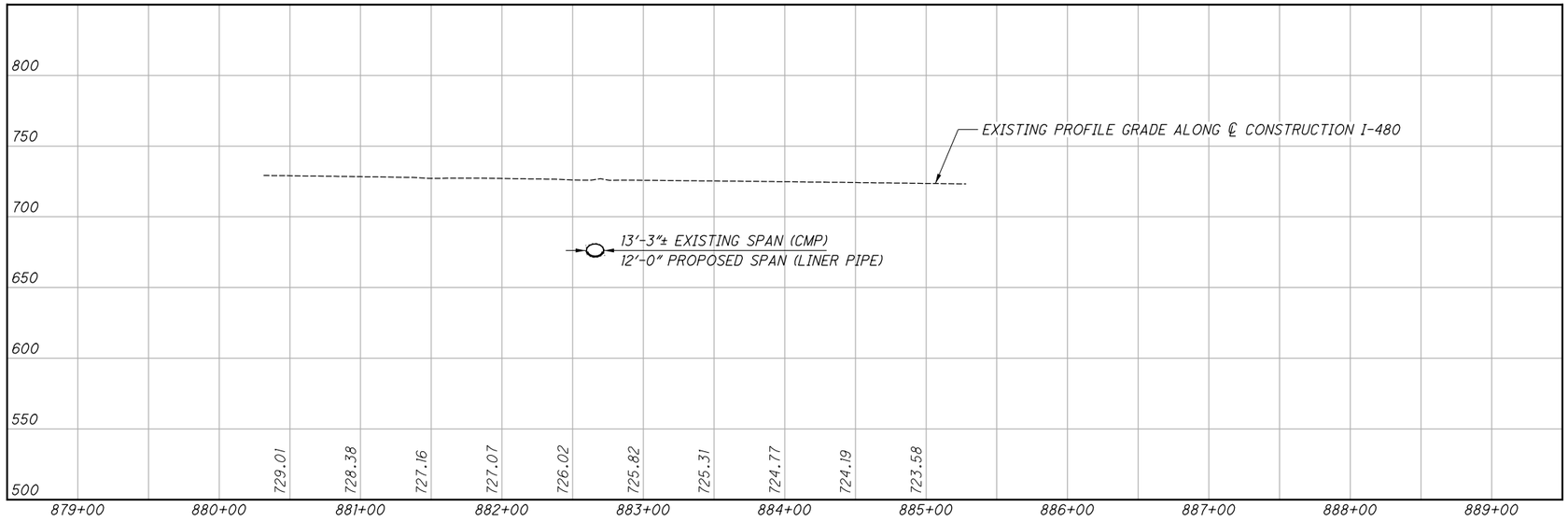


PLAN



PROFILE ALONG ℄ CONSTRUCTION

BENCHMARK DATA

BM #1 STA. 883+77, 175' LT. - CHISELED "X" ON TOP OF THE N.E. BOLT OF ON LIGHT POLE, ELEV = 725.47

NOTES

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

DESIGN TRAFFIC:
2021 ADT = 107,500 2021 ADTT = 9,700
2051 ADT = 123,600 2051 ADTT = 11,150
DIRECTIONAL DISTRIBUTION = 0.50

LEGEND

- PROJECT BORING LOCATION
- STRUCTURAL LINING LIMITS
- STAGING AREA

HYDRAULIC DATA

DRAINAGE AREA = 2.59 SQ. MILES

Q (10) =	573 CFS	V (10) =	18.37 FT/S
Q (25) =	711 CFS	V (50) =	14.48 FT/S
Q (50) =	827 CFS	V (50) =	15.74 FT/S

SEE STRUCTURE NOTES FOR BYPASS PUMPING REQUIREMENTS

PROPOSED WORK

- ISTALL CONSTRUCTION ACCESS ROAD
- REMOVE EXISTING HEADWALL
- PREPARE CULVERT BARREL TO RECEIVE STRUCTURAL LINER
- INSTALL SITE DEWATERING/BYPASS MEASURES
- INSTALL STRUCTURAL LINER PIPE AND GROUT IN PLACE IN STAGES
- CONSTRUCT NEW HEADWALL
- INSTALL SLOPE STABILIZATION MEASURES

EXISTING STRUCTURE

TYPE: CORRUGATED METAL PIPE CULVERT
SPANS: 13'-3"± ALONG SKEW (120" CMP)
ROADWAY: I-480 EB AND WB LANES AND EXIT RAMP
LOADING: HS-20
SKEW: 40° 59' 2"± LEFT FORWARD
WEARING SURFACE: ASPHALT CONCRETE
APPROACH SLABS: NONE
ALIGNMENT: TANGENT
CROWN: VARIES: 0.02 FT/FT MAX
STRUCTURAL FILE NUMBER: 1812769
DATE BUILT: 1974
DISPOSITION: OPEN

PROPOSED STRUCTURE

TYPE: STRUCTURAL PLATE LINER INSTALLED WITHIN EXISTING STRUCTURE AND BACKFILLED WITH GROUT
SPANS: 12'-0" ALONG SKEW (9'-0" DIA. TUNNEL LINER PLATE)
ROADWAY: I-480 EB AND WB LANES AND EXIT RAMP
LOADING: HL-93 AND 60 PSF FUTURE WEARING SURFACE
SKEW: 40° 59' 2" LEFT FORWARD
APPROACH SLABS: NONE
COORDINATES: LATITUDE 41° 24' 55.11" N
LONGITUDE 81° 40' 28.26" W

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

REVIEWED HVH DATE 09/18/20
STRUCTURE FILE NUMBER 1812769
DRAWN RAP REVISED
DESIGNED RAP CHECKED RY

COUNTY
STA. 880+00
STA. 887+00

SITE PLAN
SITE 4 - BRIDGE NO. CUY-480-1628
STORM CULVERT BY WB EXIT RAMP TO SR 17

CUY-90-18.22/VAR
PID No. 92069

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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFER TO THE FOLLOWING STANDARD BRIDGE DRAWING(S):

HW-1.1 DATED (REVISED) 07/20/2018

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATION(S):

800 DATED 04/16/2021
837 DATED 07/19/2019

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 8TH EDITION, INCLUDING ALL REVISIONS AND INTERIM SPECIFICATIONS, AND THE ODOT BRIDGE DESIGN MANUAL, 2019 AND QUARTERLY UPDATES.

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 (HEADWALL)

REINFORCING STEEL
-MINIMUM YIELD STRENGTH 60 KSI

EXISTING STRUCTURE VERIFICATION

EXISTING STRUCTURE VERIFICATION: DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02 AND 513.04.

BASE CONTRACT BID PRICES UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE. HOWEVER, THE DEPARTMENT WILL PAY FOR ALL PROJECT WORK BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED IN THE FIELD.

ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

THIS WORK CONSISTS OF THE REMOVAL OF THE EAST HEADWALL, A PORTION OF THE EXISTING CMP, AND ANY OTHER PORTIONS OF THE EXISTING STRUCTURE NECESSARY TO FACILITATE INSTALLATION OF THE PLATE LINER.

PERFORM WORK CAREFULLY DURING REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND INCORPORATED INTO THE PROPOSED STRUCTURE. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE RAM TYPE OF EQUIPMENT IS PROHIBITED. SUBMIT CONSTRUCTION PLANS ACCORDING TO CMS 501.05. ANY DAMAGE TO PORTIONS OF THE EXISTING STRUCTURE TO REMAIN SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST.

MEASUREMENT & PAYMENT: THE DEPARTMENT WILL MEASURE THE QUANTITY OF REMOVALS ON A LUMP SUM BASIS. THE DEPARTMENT WILL PAY FOR THE ACCEPTED QUANTITIES OF REMOVALS AT THE CONTRACT PRICE FOR ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN.

FOUNDATION BEARING RESISTANCE

_(1)_ FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM SERVICE LOAD PRESSURE OF _(2)_ KIPS PER SQUARE FOOT AND A MAXIMUM STRENGTH LOAD PRESSURE OF _(2)_ KIPS PER SQUARE FOOT. THE FACTORED BEARING RESISTANCE IS _(3)_ KIPS PER SQUARE FOOT.

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

PROVISIONS OF CMS ITEM 503 SHALL APPLY EXCEPT AS MODIFIED HEREIN. THE REPAIR SITE IS LOCATED IN AN EXISTING CULVERT WHICH EXPERIENCES SIGNIFICANT FLOW DURING WET WEATHER. ALL FLOW FROM WET WEATHER EVENTS MUST BE PERMITTED TO PASS THROUGH THE WORK OPERATIONS BY USING PIPE PLUGS WHICH ARE READILY REMOVABLE. THE CONTRACTOR SHALL HAVE PROVISIONS AND PROCEDURES IN PLACE TO DISMANTLE OR PROTECT THE WORK DURING WET WEATHER. CONTRACTOR SHALL SCHEDULE LINER INSTALLATION ONLY DURING DRY WEATHER PERIODS AND DURING MONTHS WITH THE LOWEST POTENTIAL WET WEATHER EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY INTERRUPTION OF, OR DAMAGE TO, THE WORK DUE TO WET WEATHER FLOWS.

THE CONTRACTOR SHALL SCHEDULE LINER INSTALLATION DURING MONTHS WITH THE LOWEST NORMAL FLOW AND LOWEST POTENTIAL FOR OUTFALLS CAUSED BY RAIN EVENTS TO MITIGATE INSTALLATION INTERRUPTIONS. CONTRACTOR SHALL COORDINATE ALL WORK WITH NORTHEAST OHIO REGIONAL SEWER DISTRICT (NEORSD).

THE DEWATERING/BYPASS AND CONSTRUCTION SEQUENCE IN THESE PLANS IS NOT TO SCALE AND FOR REFERENCE ONLY; THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER SITE SPECIFIC BYPASS PUMPING PROCEDURES PRIOR TO ORDERING MATERIAL.

ALL MATERIALS, LABOR, SUBMITTALS, AND INCIDENTALS REQUIRED FOR THE PERFORMANCE OF WORK AS DETAILED HEREIN AND IN THESE PLANS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN.

ITEM 511 - CLASS QC1 CONCRETE, HEADWALL, AS PER PLAN

PROVISIONS OF CMS ITEM 511 EXCEPT AS MODIFIED HEREIN. HEADWALL CONCRETE BID UNIT PRICE SHALL INCLUDE THE COST OF REINFORCEMENT AS DETAILED ON SHEET 9/9.

ITEM 837 - LINER PIPE, AS PER PLAN

THE PROPOSED STRUCTURE TYPE SHALL BE A FLANGED, GALVANIZED STEEL, TUNNEL LINER PLATE PIPE ARCH CONFORMING TO THE GEOMETRY SHOWN ON SHEET 7/9 AND CAPABLE OF BEING ASSEMBLED WITHIN THE EXISTING STRUCTURE AS DETAILED IN THESE PLANS. THE PROPOSED STRUCTURE SHALL BE DESIGNED FOR HL-93 LOADING WITH 60 PSF FUTURE WEARING SURFACE AND ASSUME THE EXISTING STRUCTURE PROVIDES NO STRUCTURAL CAPACITY. VENDOR TO PROVIDE GAUGE THICKNESS.

MATERIAL:

LINER PLATES SHALL BE FABRICATED FROM BLACK STEEL PLATES CONFORMING TO ASTM SPECIFICATION A 1011. PLATES SHALL BE OF THE GAGE SHOWN ON THE PLANS AND SHALL BE CURVED TO SUIT THE TUNNEL CROSS SECTION SHOWN. PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123, EXCEPT THAT THE ZINC SHALL BE APPLIED AT A RATE OF 2.0 OUNCES PER SQUARE FOOT TOTAL FOR BOTH SIDES.

ALL PLATES SHALL BE PUNCHED FOR BOLTING ON BOTH LONGITUDINAL AND CIRCUMFERENTIAL SEAMS AND SHALL BE SO FABRICATED AS TO PERMIT COMPLETE ERECTION FROM THE INSIDE OF THE EXISTING STRUCTURE. THE LONGITUDINAL SEAM SHALL BE OF THE LAPPED TYPE, WITH AN OFFSET EQUAL TO THE GAGE OF METAL FOR THE FULL WIDTH OF PLATE TO ALLOW THE CROSS SECTION OF THE PLATE TO BE CONTINUOUS THROUGH THE SEAM. CIRCUMFERENTIAL BOLT HOLE SPACING SHALL BE 6-1/4".

GROUT HOLES, ADJUSTING RODS, ANTI-FLOTATION DEVICES, BASE CHANNELS, AND SKID RAILS SHALL BE IN ACCORDANCE WITH THE LINER MANUFACTURER'S RECOMMENDATIONS. GROUT PORT/VENT LOCATIONS IN THE ROADWAY ARE PERMISSIBLE BUT SHOULD BE CONFIGURED TO MINIMIZE IMPACT TO TRAFFIC.

BOLTS AND NUTS:

BOLTS AND NUTS SHALL BE 5/8" IN DIAMETER AND LENGTH AS RECOMMENDED BY THE MANUFACTURER. BOLTS SHALL CONFORM TO ASTM A 449, TYPE 1 OR ASTM A 307. FOR LONGITUDINAL SEAMS, BOLTS SHALL BE A 449, TYPE 1, FOR PLATE THICKNESS EQUAL TO OR GREATER THAN 0.209. FOR PLATE THICKNESS LESS THAN .209, THE BOLTS SHALL BE A 307, GRADE A. ALL CIRCUMFERENTIAL BOLTS MAY BE A 307, GRADE A. NUTS SHALL CONFORM TO ASTM A 563, GRADE A, HEX.

GALVANIZING WHEN REQUIRED SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM B-695, CLASS 50.

INSTALLATION:

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS INCLUDING ASSEMBLY DRAWINGS, ARCH ASSEMBLY METHODS, DEWATERING METHODS, BULKHEAD, AND BLOCKING DETAILS TO THE ENGINEER FOR REVIEW. THE CONTRACTOR MAY PUSH OR PULL ASSEMBLED LINER SECTIONS INTO PLACE IF NECESSARY PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL UTILIZE METHODS THAT FACILITATE PLACEMENT OF THE LINER SECTIONS WHILE MINIMIZING DAMAGE TO THE PLATE OR ITS GALVANIZED ZINC COATING. THE CONTRACTOR SHALL TOUCH UP ANY DAMAGE TO THE GALVANIZED ZINC COATING CAUSED BY HANDLING OR ASSEMBLY. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE DETAILS AND LOCATIONS OF LATERAL CONNECTIONS, GROUT PORTS, FITTINGS, BLOCKING, AND BLOCKING HARDWARE FOR APPROVAL. A GROUTING METHOD AND CULVERT INSTALLATION PROCEDURE SHALL ALSO BE SUBMITTED FOR APPROVAL. LINER PLATE SHALL BE ASSEMBLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. LONGITUDINAL SEAMS SHALL BE STAGGERED BETWEEN RINGS.

CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, INCLUDING: SIZE, TYPE, AND LOCATIONS OF ALL LATERAL CONNECTIONS; DEFLECTIONS/DAMAGE TO THE EXISTING STRUCTURES; AND HORIZONTAL AND VERTICAL DEFLECTIONS TO THE OVERALL STRUCTURE ALIGNMENT.

ALL NECESSARY REPAIRS/REMOVALS TO THE EXISTING CULVERT TO PROVIDE CLEARANCE FOR THE PROPOSED LINER/GROUT SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT AS NEEDED TO MAINTAIN STRUCTURAL INTEGRITY AT ALL TIMES.

FIELD CUTTING OF LINER SHALL BE AS MINIMAL AS REQUIRED TO PERMIT CONNECTION OF LATERALS AND SHALL NOT COMPROMIZE THE STRUCTURAL CAPACITY OF THE LINER. GALVANIZING SHALL BE TOUCHED UP FOR ANY CUT EDGES. LARGER LATERAL CONNECTIONS MAY WARRANT USE OF HEAVIER GAUGE PLATE OR OTHER REINFORCEMENT AND SHALL BE DESIGNED BY PLATE VENDOR. ALL LATERAL CONNECTIONS SHALL BE INCLUDED IN THE BID UNIT PRICE FOR THIS ITEM.

CONTRACTOR SHALL PROVIDE SHOP FABRICATED TRANSITION LINER SECTIONS TO ACCOMODATE DEFLECTIONS IN THE HORIZONTAL OR VERTICAL ALIGNMENT OF THE EXISTING STRUCTURES.

ALL VENTILATION NEEDED FOR THE PERFORMANCE OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.

THE COSTS OF ALL ABOVE DECRIBED ITEMS, WORK, AND INCIDENTALS TO CONSTRUCT THE LINER AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1812769	

STRUCTURE NOTES
SITE 4 - BRIDGE NO. CUY-480-1628
STORM CULVERT BY WB EXIT RAMP TO SR 17

CUY-90-18.22/VAR
PID No. 92069

ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN

THE BACKILL FOR THE LINER PIPE, HENCEFORTH REFERRED TO AS GROUT, IS FOR FILLING THE ANNULAR SPACE BETWEEN THE EXISTING CONDUIT AND PROPOSED LINER. AFTER INSTALLATION OF THE LINER, BUT PRIOR TO GROUTING, BULKHEADING AND VENTING SHALL BE CONSTRUCTED. A WATERTIGHT, CEMENTITIOUS BULKHEAD (OR COLLAR) SHALL BE FORMED BETWEEN THE HOST STRUCTURE AND THE ARCH LINER AT EACH END OF THE ARCH AND SHALL PROVIDE LONG TERM DURABILITY. BULKHEAD DESIGNS SHALL BE SUFFICIENT TO RESIST GROUT PRESSURES OR HYDROSTATIC WATER PRESSURE WITHIN THE ANNULAR SPACE.

THE GROUT SHALL BE PLACED IN CONTROLLED LIFTS IN ACCORDANCE WITH THE SUBMITTED STAGED GROUTING PLAN. EACH LIFT SHALL BE ALLOWED TO ACHIEVE INITIAL SET BEFORE THE SUBSEQUENT LIFT CAN BE PLACED. ADDITIONALLY, THE CONTRACTOR TOGETHER WITH THE ENGINEER SHALL SOUND THE AREA OF EACH LIFT ONCE IT HAS ACHIEVED INITIAL SET TO ENSURE THAT THE GAP BETWEEN THE EXISTING STRUCTURE AND PROPOSED ARCH HAS BEEN COMPLETELY FILLED. ANY VOIDS DETECTED BY THE SOUNDING SHALL BE CORRECTED BY PLACING ADDITIONAL GROUT BEFORE PROCEEDING WITH PLACEMENT OF THE SUBSEQUENT LIFT.

IF PORTS ARE USED TO PUMP GROUT THROUGH THE STEEL LINER PIPE, THEY SHALL BE SHOP INSTALLED. IF FIELD-INSTALLED PORTS ARE REQUIRED, THEY SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT COMPROMISE THE STRUCTURAL CAPACITY OF THE LINER.

IF ANY PORTION OF THE EXISTING STRUCTURE SLAB IS REMOVED FOR CONTRACTOR ACCESS, THE GROUT SHALL BE FILLED TO THE ORIGINAL SLAB TOP ELEVATION.

THE MATERIALS SHALL BE MIXED IN EQUIPMENT OF SUFFICIENT SIZE AND CAPACITY TO PROVIDE THE DESIRED AMOUNT OF GROUT MATERIAL FOR EACH GROUTING STAGE. THE EQUIPMENT SHALL BE CAPABLE OF MIXING THE GROUT AT DENSITIES REQUIRED FOR THE APPROVED PROCEDURE AND SHALL ALSO BE CAPABLE OF CHANGING DENSITY AS DICTATED BY FIELD CONDITIONS ANY TIME DURING THE GROUTING OPERATION.

THE MIX DESIGN(S) SHALL BE DEVELOPED TO COMPLETELY FILL THE ANNULAR SPACE, AND SHALL ADDRESS THE FOLLOWING CONSIDERATIONS: SIZE OF ANNULAR VOID, VOIDS (BASED ON SIZE AND ACCESS) IN THE SURROUNDING STRUCTURE ENVELOPE, ABSENCE OR PRESENCE OF GROUNDWATER, SUFFICIENT STRENGTH AND DURABILITY TO PREVENT MOVEMENT OF THE LINER PLATE, PROVISIONS FOR ADEQUATE RETARDATION AND SHRINKAGE OF LESS THAN 1 PERCENT BY VOLUME. GROUT SHALL BE MIXED IN SMALL QUANTITIES AS NEEDED, AND SHALL NOT BE RE-TEMPERED OR USED AFTER IT HAS BEGUN TO SET.

THE GAUGED PUMPING PRESSURE SHALL NOT EXCEED THE ARCH LINER MANUFACTURER'S APPROVED RECOMMENDATIONS. PUMPING EQUIPMENT SHALL BE OF SIZE SUFFICIENT TO INJECT GROUT AT VELOCITY AND PRESSURE RELATIVE TO THE SIZE OF THE ANNULAR SPACE. GAUGES TO MONITOR GROUT PRESSURE SHALL BE ATTACHED IMMEDIATELY ADJACENT TO EACH INJECTION PORT. THE GAUGE SHALL CONFORM TO AN ACCURACY OF NOT MORE THAN ONE-HALF PERCENT ERROR OVER THE FULL RANGE OF THE GAUGE. THE RANGE OF THE GAUGE SHALL BE NOT MORE THAN 100 PERCENT GREATER THAN THE DESIGN GROUT PRESSURE. PRESSURE GAUGES SHALL BE INSTRUMENT OIL FILLED AND ATTACHED TO A SADDLE TYPE DIAPHRAGM SEAL (GAUGE SAVER) TO PREVENT CLOGGING WITH GROUT. ALL GAUGES SHALL BE CERTIFIED AND CALIBRATED IN ACCORDANCE WITH ANSI B40 GRADE 2A.

PRE-CONSTRUCTION MEETING:

THE ARCH LINER MANUFACTURER MUST PROVIDE A REPRESENTATIVE TO CONDUCT A PRE-CONSTRUCTION MEETING THAT COVERS ALL ASPECTS OF THE LINING AND GROUTING PROCESS AND SAID PERSON MUST BE A REGISTERED PROFESSION ENGINEER. HE OR SHE MUST ALSO BE ON SITE DURING GROUTING OPERATIONS.

EXPERIENCE:

THE ARCH LINER MANUFACTURER SHALL SHOW EXTERNAL PROOF THAT THEIR EMPLOYEE WHO WILL CONDUCT THE PRE-CONSTRUCTION MEETING SHALL HAVE PARTICIPATED IN THE SUCCESSFUL RELINE OF AT LEAST 10 STRUCTURES OF THIS TYPE AND SIZE ON PREVIOUS PROJECTS.

SUBMITTALS REQUIREMENTS:

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER AT LEAST TEN (10) WORKING DAYS PRIOR TO COMMENCING THE LINER PIPE INSTALLATION:

STRUCTURAL DESIGN CALCULATIONS FOR THE LINER PIPE FOLLOWING SECTION 12 OF THE AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES USING THE LRFD METHOD VERIFYING CAPACITY SIGNED BY A LICENSED PROFESSIONAL ENGINEER. THESE CALCULATIONS SHALL ASSUME THE EXISTING STRUCTURE HAS FAILED AND CONTRIBUTES NO STRENGTH TO THE PROPOSED LINER.

WRITTEN VERIFICATION BY THE LINER MANUFACTURER THAT THE LINING AND GROUTING PLAN CONFORMS WITH ALL PROVISIONS, CAUTIONS, AND RESTRICTIONS OF THESE SPECIFICATIONS, CONTRACT PLANS, AND MANUFACTURER REQUIREMENTS.

THE COSTS OF ALL ABOVE MENTIONED ITEMS, TEMPORARY FORMS/BULKHEADS, AND TEMPORARY SUPPORTS REQUIRED TO CONSTRUCT THE LINER BACKFILL AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

CALC:	RAP	DATE:	8/4/2020
CHECKED:	RY	DATE:	8/5/2020

ESTIMATED QUANTITIES (CUY-480-1628)

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.	SEE SHEET
202	11201	LS		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN				LS	2/7
503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN				LS	2/7
511	46511	8	CY	CLASS QC1 CONCRETE, HEADWALL, AS PER PLAN				8	2/7
512	10100	10	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)				10	
611	96560	530	FT	CONDUIT, FIELD PAVING OF PIPE				530	
837	10001	530	FT	LINER PIPE, AS PER PLAN				530	2/7
837	21001	530	FT	BACKFILL FOR LINER PIPE, AS PER PLAN				530	3/7

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1812769	

STRUCTURE NOTES
SITE 4 - BRIDGE NO. CUY-480-1628
STORM CULVERT BY WB EXIT RAMP TO SR 17

CUY-90-18.22/VAR
PID No. 92069

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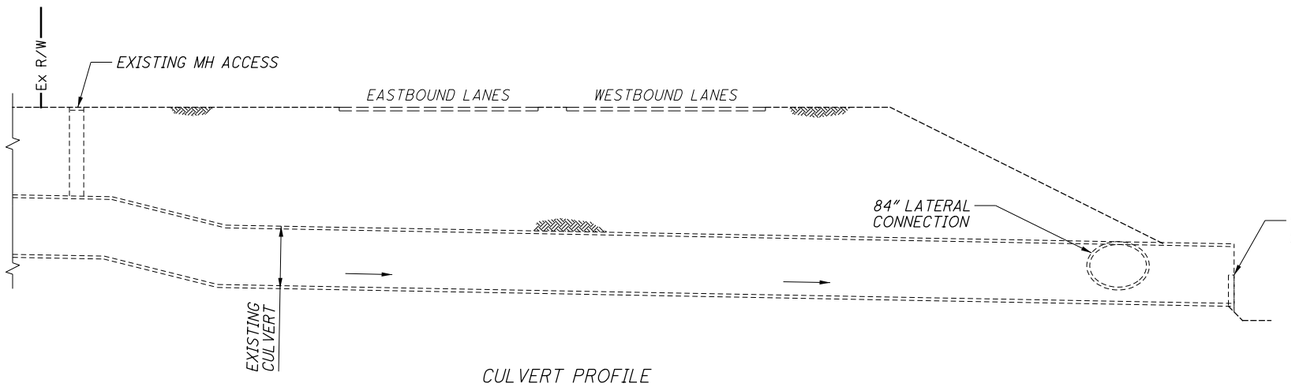
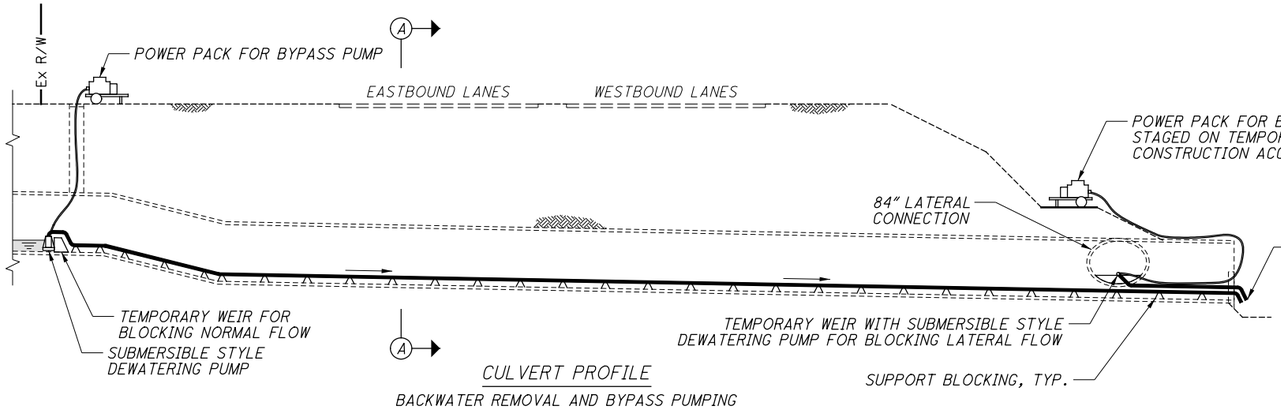
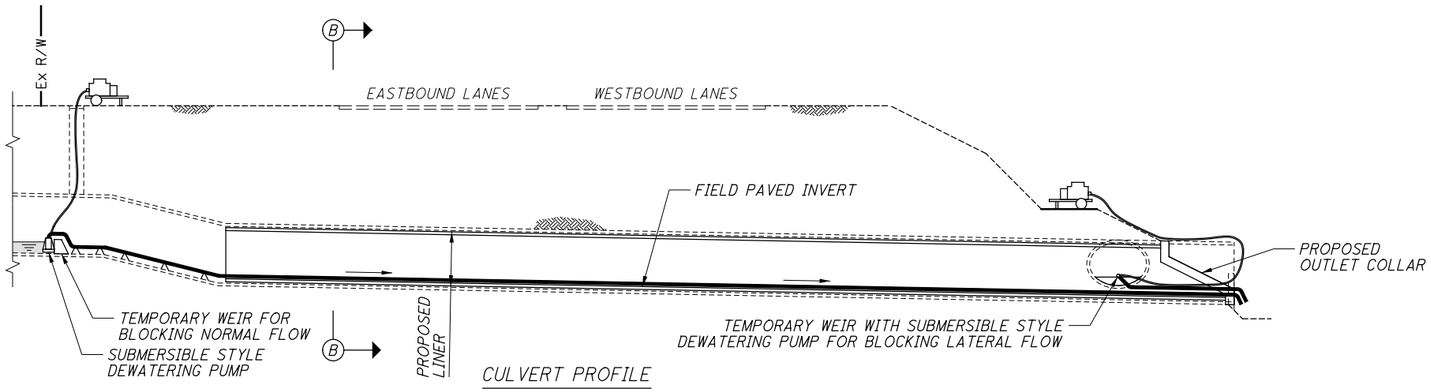


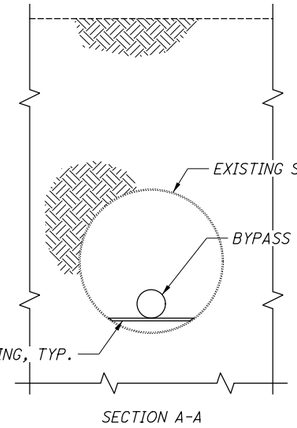
CULVERT PROFILE
EXISTING CONDITION



CULVERT PROFILE
BACKWATER REMOVAL AND BYPASS PUMPING



CULVERT PROFILE
LINER AND HEADWALL INSTALLATION



SECTION A-A

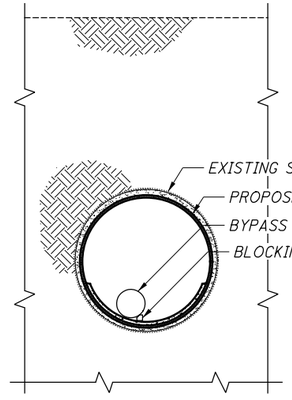
EXISTING CONDITION

- ALL CONSTRUCTION ACTIVITES ARE TO OCCUR DURING PERIODS OF LOW FLOW. ALL STORM EVENTS MUST BE ALLOWED TO PASS WITHOUT DISTURBING PROPOSED WORK
- INSTALL CONSTRUCTION ACCESS DRIVE AS DETAILED IN THIS PLAN SET

DEWATERING AND BYPASS PUMPING

- INSTALL WEIRS IN THE 120" CMP AND 84" CMP LATERAL TO STOP FLOW OF WATER
- INSTALL BYPASS PUMPS TO TRANSPORT WATER THROUGH CONSTRUCTION LIMITS

COSTS OF DEWATERING AND BYPASS OPERATIONS ARE TO BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN



SECTION B-B

LINER INSTALLATION

- LINER INSTALLATION AND GROUTING STAGES WILL VARY BASED ON CONTRACTOR MEANS AND METHODS
- INSTALLATION SEQUENCE MUST BE SUBMITTED TO ENGINEER FOR APPROVAL PER THE STRUCTURE GENERAL NOTES
- INSTALL FIELD PAVED INVERT DURING BYPASS OPERATIONS

FINAL CONDITION

- INSTALL PROPOSED OUTLET COLLAR
- REMOVE DEWATERING AND BYPASS PUMPING MEASURES
- COMPLETE FINISH GRADING

NOT TO SCALE

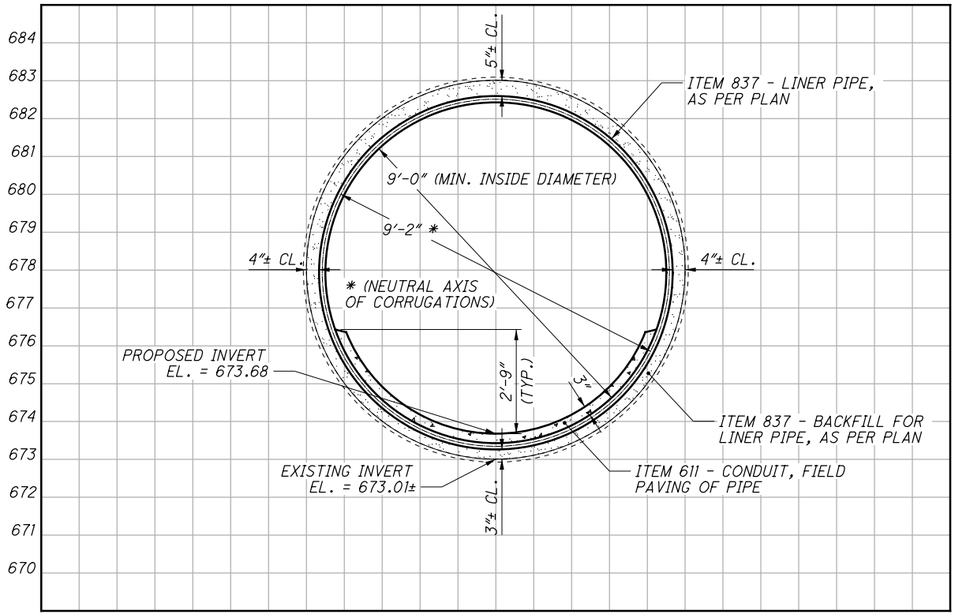
CONSTRUCTION SEQUENCE

SITE 4 - BRIDGE NO. CUY-480-1628
STORM CULVERT BY WB EXIT RAMP TO SR 17

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

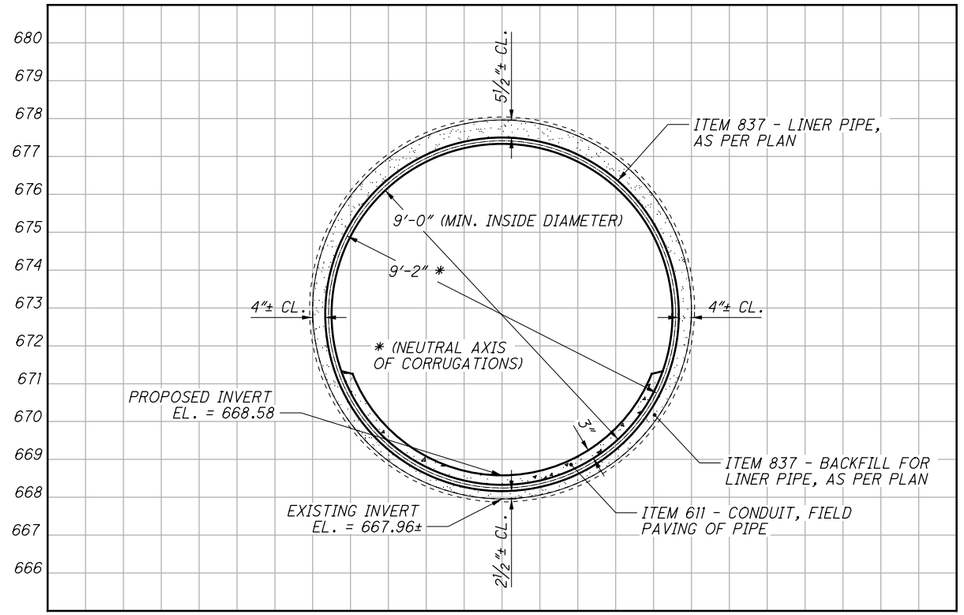
DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1812769	

CUY-90-18.22/VAR
PID No. 92069



STA. 40+55

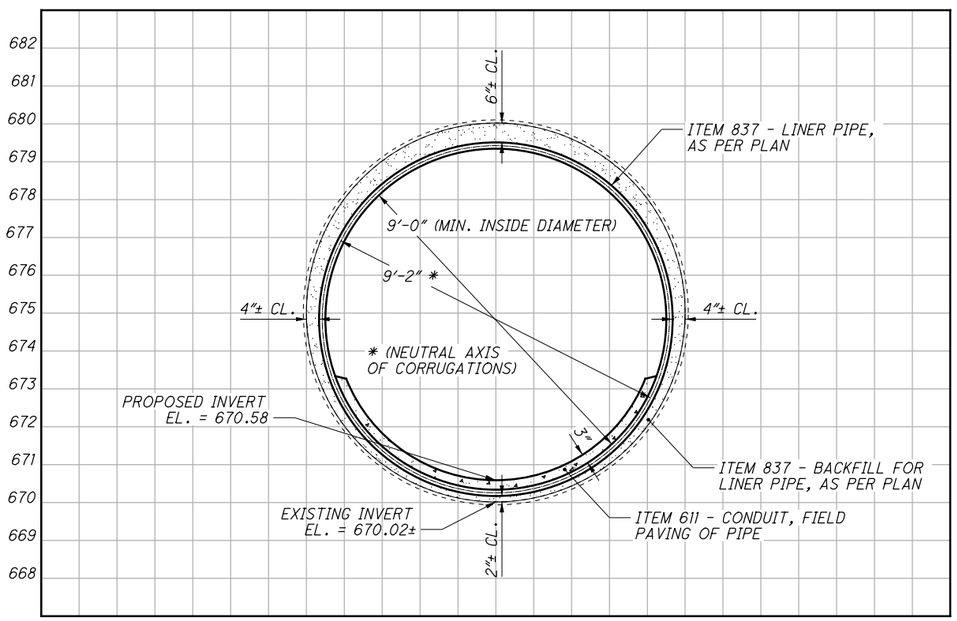
BEGIN RELINE, LOOKING DOWNSTREAM (UPSTATION)



STA. 44+24

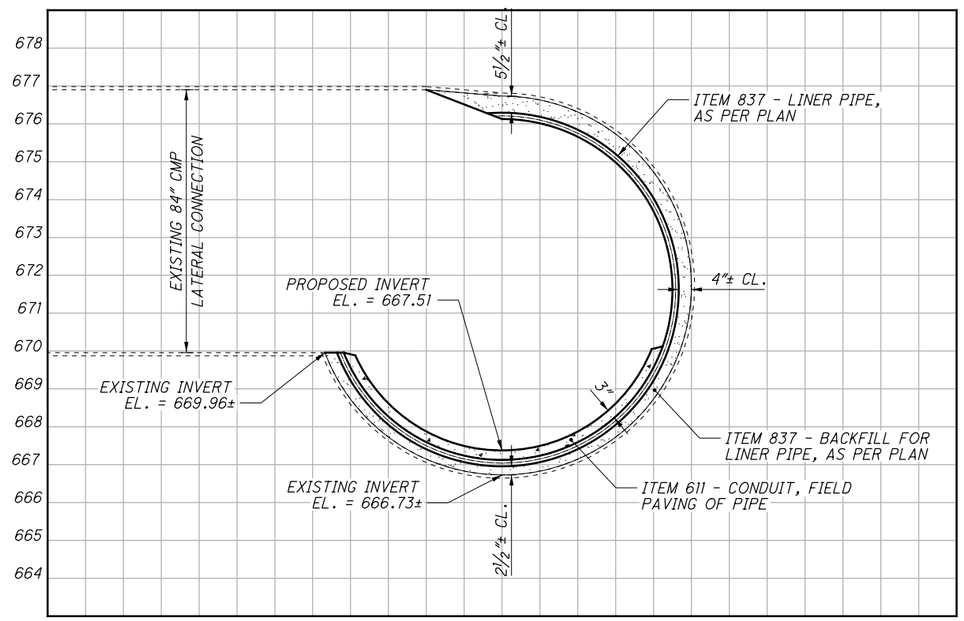
LOOKING DOWNSTREAM (UPSTATION)
DEFLECTION JOINT

NOTE: CLEARANCES SHOWN BETWEEN PROPOSED AND EXISTING PIPE ARE NOMINAL. ACTUAL DIMENSIONS ENCOUNTERED IN THE FIELD MAY VARY.



STA. 43+13

LOOKING DOWNSTREAM (UPSTATION)
DEFLECTION JOINT



STA. 45+60

84" CMP CONNECTION, LOOKING DOWNSTREAM (UPSTATION)

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1812769	

CULVERT SECTIONS
SITE 4 - BRIDGE NO. CUY-480-1628
STORM CULVERT BY WB EXIT RAMP TO SR 17

CUY-90-18.22/ VAR
PID No. 92069

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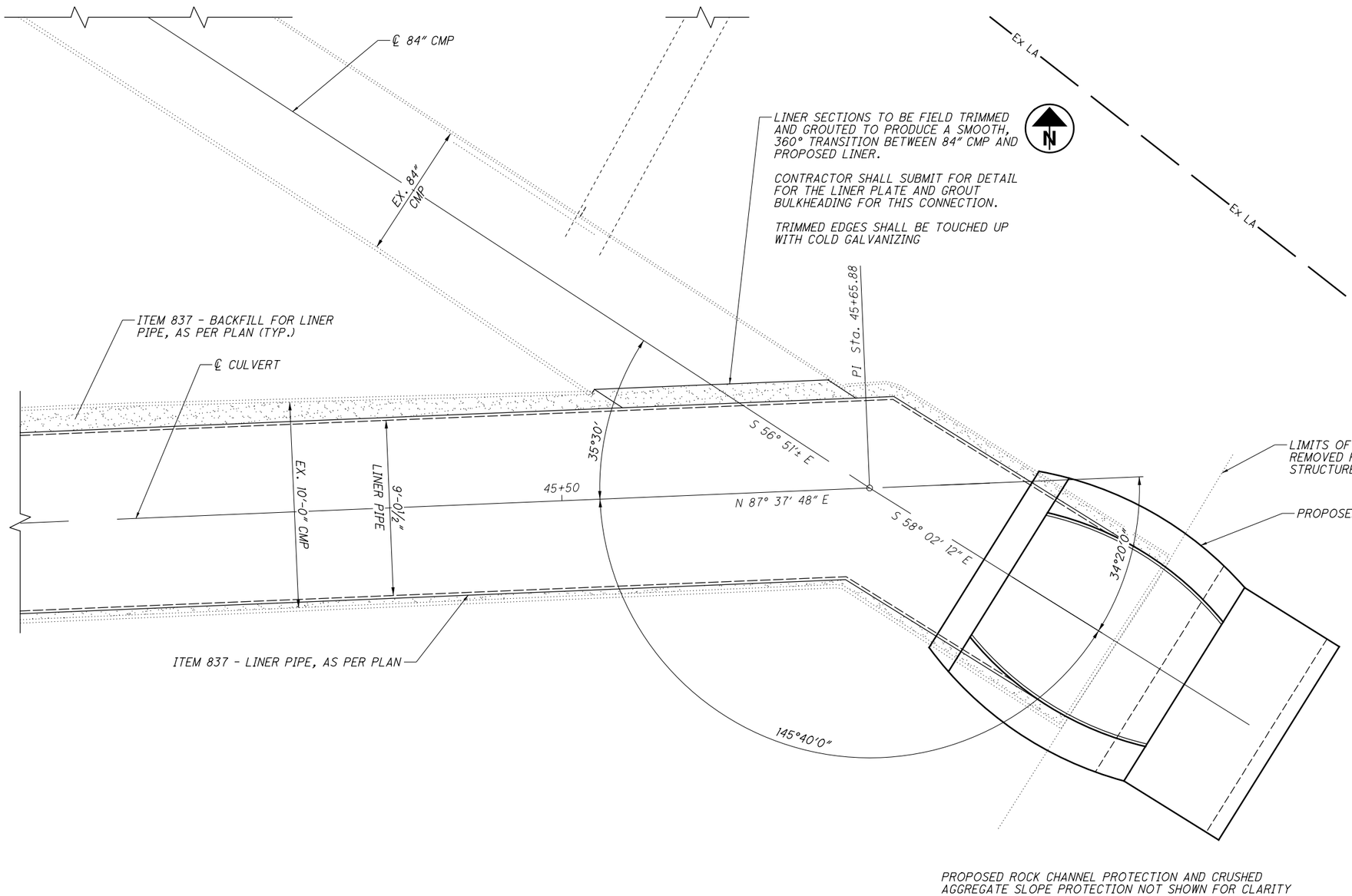

84" LATERAL CONNECTION DETAIL

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		1812769	

JUNCTION DETAILS
SITE 4 - BRIDGE NO. CUY-480-1628
STORM CULVERT BY WB EXIT RAMP TO SR 17

CUY-90-18.22/VAR
PID No. 92069

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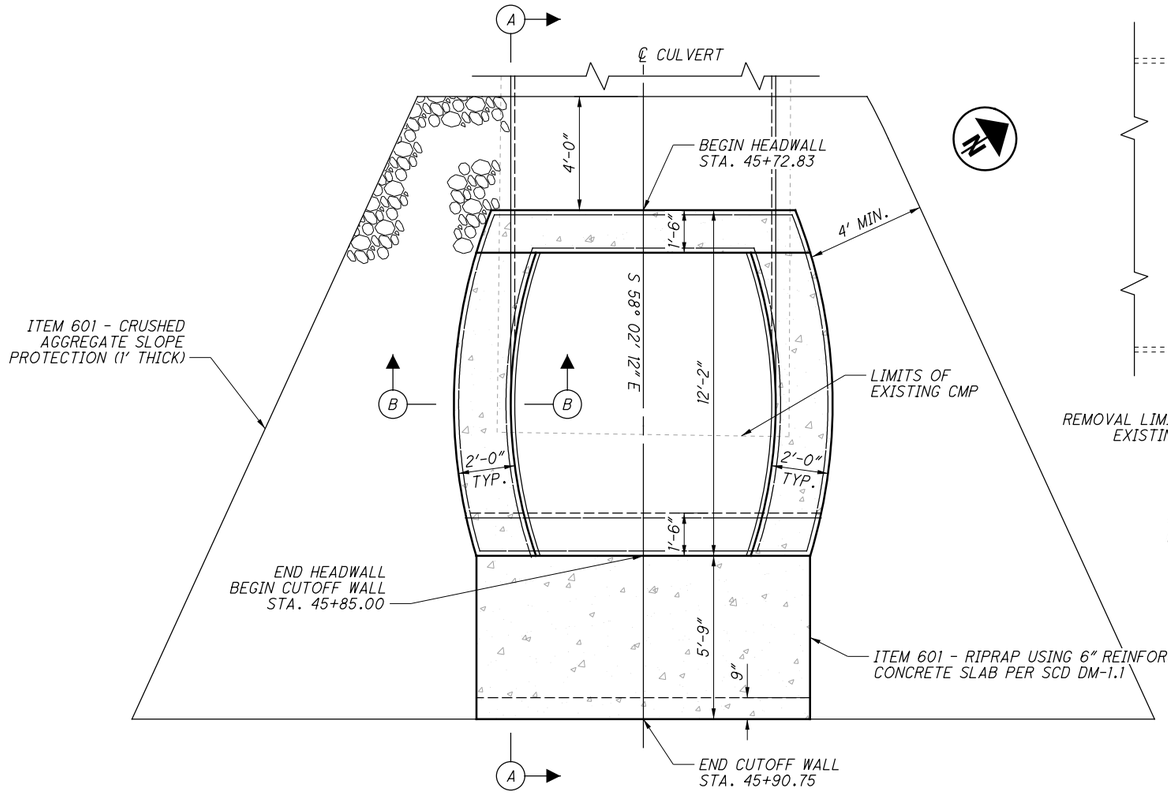
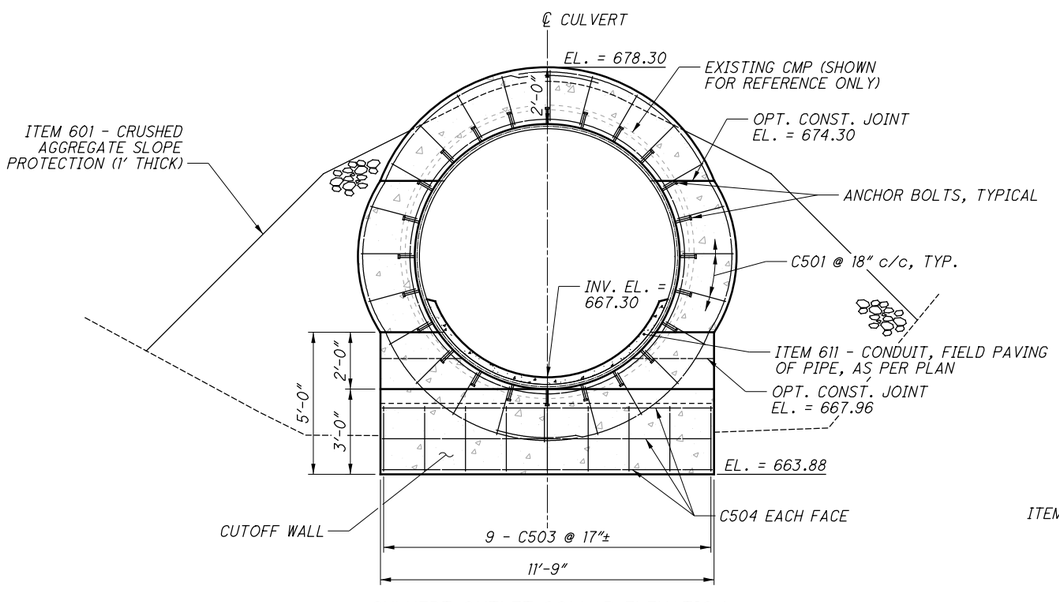
63

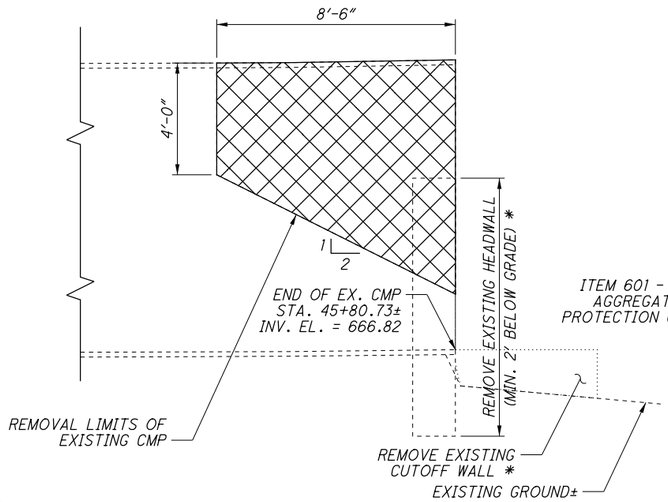


CULVERT OUTLET COLLAR PLAN



CULVERT OUTLET COLLAR ELEVATION

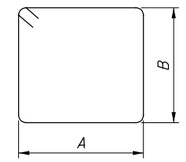
LOOKING DOWNSTATION



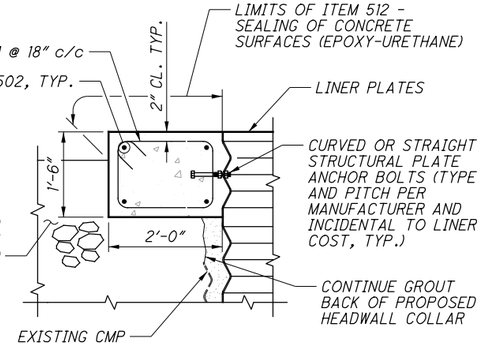
* ALL REMOVALS SHOWN SHALL BE PER ITEM 202 - PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

REMOVAL DETAILS

EXISTING CULVERT PROFILE

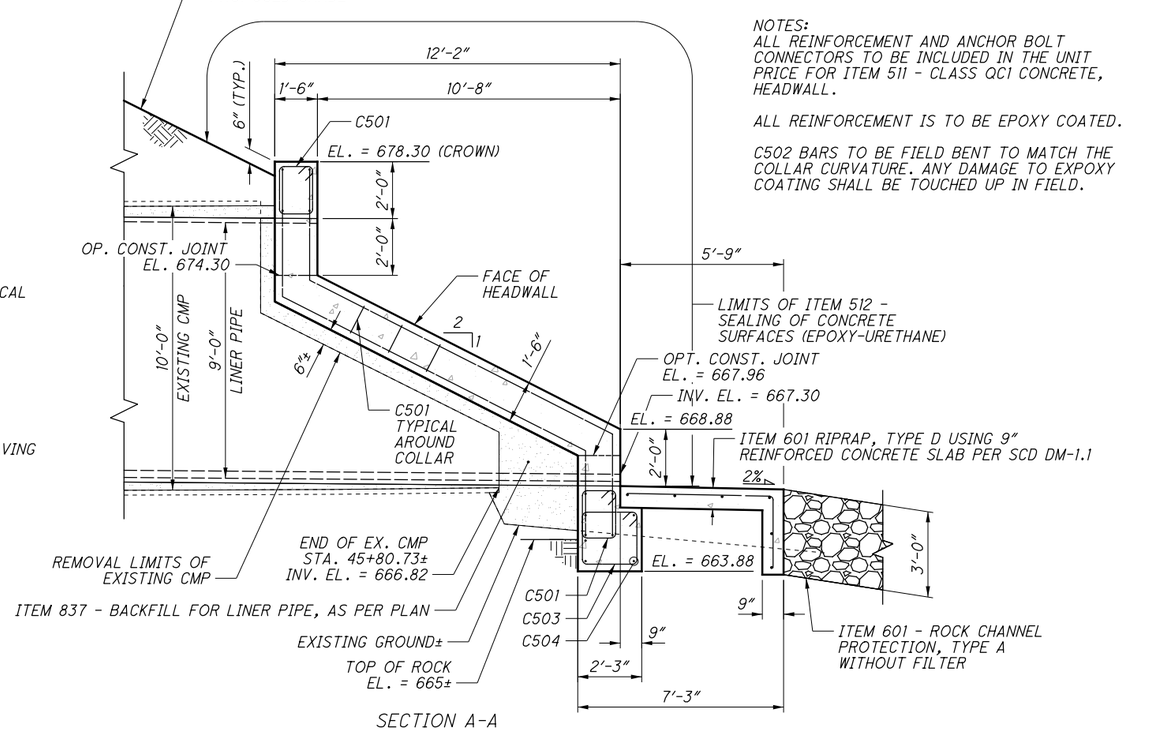


TYPE-3



SECTION B-B

MARK	NUMBER TOTAL	LENGTH	WEIGHT	TYPE	DIMENSIONS A	DIMENSIONS B
C501	24	6'-4"	159	3	1'-2"	1'-8"
C502	8	30'-0"	250	STR		
C503	9	8'-2"	77	3	1'-11"	1'-10"
C504	6	11'-5"	71	STR		
		TOTAL	557			



SECTION A-A

COLLAR DETAILS

NOTES:
ALL REINFORCEMENT AND ANCHOR BOLT CONNECTORS TO BE INCLUDED IN THE UNIT PRICE FOR ITEM 511 - CLASS QC1 CONCRETE, HEADWALL.

ALL REINFORCEMENT IS TO BE EPOXY COATED.

C502 BARS TO BE FIELD BENT TO MATCH THE COLLAR CURVATURE. ANY DAMAGE TO EXPOXY COATING SHALL BE TOUCHED UP IN FIELD.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED RAP | DRAWN RAP | CHECKED RY | REVIEWED HVH | DATE 09/18/20 | REVISED | STRUCTURE FILE NUMBER 1812769

CULVERT OUTLET COLLAR DETAILS
SITE 4 - BRIDGE NO. CUY-480-1628
STORM CULVERT BY WB EXIT RAMP TO SR 17

CUY-90-18.22 / VAR
PID No. 92069

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63

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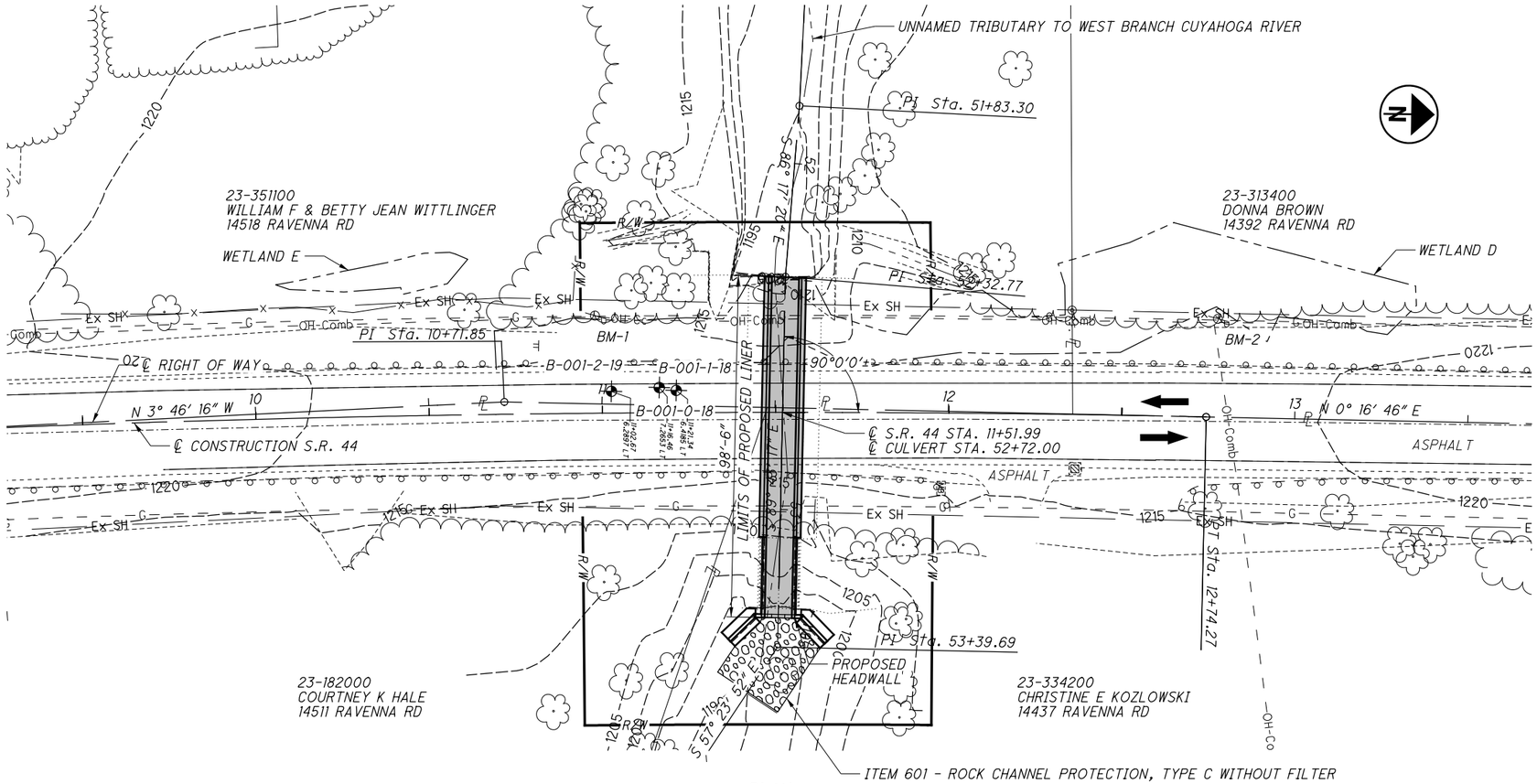
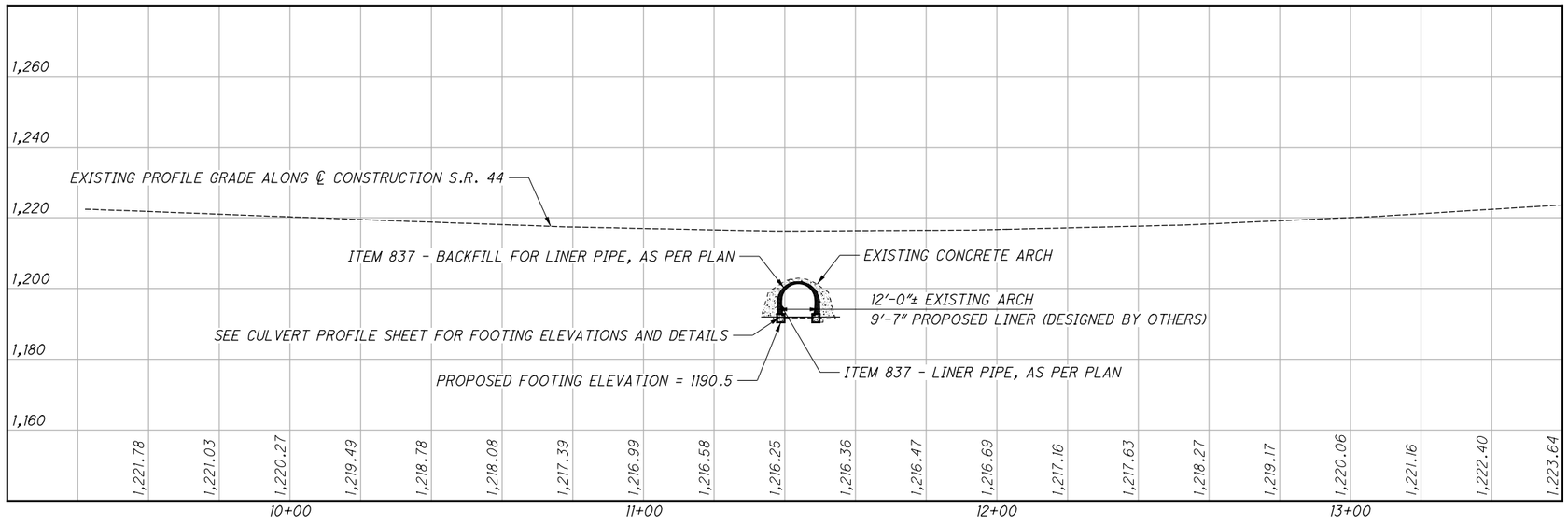


PLAN



PROFILE ALONG ℄ CONSTRUCTION

BENCHMARK DATA

BM #1 STA. 10+90, 27' LT. - R.R. SPIKE SET IN EASTERLY FACE OF POWER POLE #577263 SOUTH OF CULVERT ON WEST SIDE OF S.R. 44, ELEV = 1217.33

BM #2 STA. 12+69, 28' LT. - R.R. SPIKE SET IN EASTERLY FACE OF POWER POLE NORTH OF CULVERT ON WEST SIDE OF S.R. 44, ELEV = 1216.84

LEGEND

PROJECT BORING LOCATION

STRUCTURAL LINING LIMITS

NOTES

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

DESIGN TRAFFIC:

2021 ADT = 7300 2021 ADTT = 800

2051 ADT = 8400 2051 ADTT = 920

DIRECTIONAL DISTRIBUTION = 0.50

HYDRAULIC DATA

DRAINAGE AREA = 0.59 SQ. MILES

Q (25) = 180 CFS V (25) = 2.41 FT/S

Q (100) = 243 CFS V (100) = 2.57 FT/S

Q (500) = 317 CFS V (500) = 2.76 FT/S

STRUCTURE CLEARS THE 500 YEAR DESIGN HW BY 3.5 FEET.

PROPOSED WORK

- REMOVE FAILED OUTLET (EAST) HEADWALL
- PREPARE CULVERT BARREL TO RECEIVE STRUCTURAL LINER
- INSTALL LINER FOUNDATIONS, STRUCTURAL LINER PIPE, AND GROUT IN PLACE
- CONSTRUCT NEW OUTLET HEADWALL
- PLACE ROCK CHANNEL PROTECTION

EXISTING STRUCTURE

TYPE: UNREINFORCED CONCRETE ARCH WITH CMP ARCH EXTENSION ON SHALLOW SPREAD FOUNDATIONS

SPANS: 12'-0"±

ROADWAY: 22'± BETWEEN EDGE LINES, 31'± F/F GUARDRAIL

LOADING: H-15

SKEW: 0°±

WEARING SURFACE: ASPHALT

APPROACH SLABS: NONE

STRUCTURAL FILE NUMBER: 2800241

DATE BUILT: 1934

PROPOSED STRUCTURE

TYPE: STRUCTURAL PLATE LINER INSTALLED WITHIN EXISTING STRUCTURE AND BACKFILLED WITH GROUT

SPANS: 9'-7" (TO NEUTRAL AXIS OF CORRUGATIONS)

ROADWAY: 22' BETWEEN EDGE LINES, 31' F/F GUARDRAIL

LOADING: HL-93 AND 60 PSF FUTURE WEARING SURFACE

SKEW: 0°

WEARING SURFACE: ASPHALT

APPROACH SLABS: NONE

COORDINATES: LATITUDE 41° 28' 29.52" N

LONGITUDE 81° 11' 37.26" W

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

REVIEWED HVH DATE 09/18/20
STRUCTURE FILE NUMBER 2800241

DRAWN RAP
REVISED

DESIGNED RAP
CHECKED RY

COUNTY
STA. 11+00
STA. 12+00

SITE PLAN
SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

CUY-90-18.22/VAR
PID No. 92069

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STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS

REFER TO THE FOLLOWING STANDARD BRIDGE DRAWING(S):

HW-1.1 DATED (REVISED) 07/20/2018

AND TO THE FOLLOWING SUPPLEMENTAL SPECIFICATION(S):

800 DATED 04/16/2021
837 DATED 07/19/2019

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 8TH EDITION, INCLUDING ALL REVISIONS AND INTERIM SPECIFICATIONS, AND THE ODOT BRIDGE DESIGN MANUAL, 2019 AND QUARTERLY UPDATES.

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 (HEADWALL)

REINFORCING STEEL
-MINIMUM YIELD STRENGTH 60 KSI

EXISTING STRUCTURE VERIFICATION

EXISTING STRUCTURE VERIFICATION: DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02 AND 513.04.

BASE CONTRACT BID PRICES UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE. HOWEVER, THE DEPARTMENT WILL PAY FOR ALL PROJECT WORK BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED IN THE FIELD.

ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

THIS WORK CONSISTS OF THE REMOVAL OF THE COLLAPSED EAST HEADWALL, THE EXISTING CMP EXTENSION AS NEEDED FOR SITE ACCESS, AND ANY OTHER PORTIONS OF THE EXISTING STRUCTURE NECESSARY TO FACILITATE INSTALLATION OF THE PLATE LINER.

PERFORM WORK CAREFULLY DURING REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND INCORPORATED INTO THE PROPOSED STRUCTURE. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE RAM TYPE OF EQUIPMENT IS PROHIBITED. SUBMIT CONSTRUCTION PLANS ACCORDING TO CMS 501.05. ANY DAMAGE TO PORTIONS OF THE EXISTING STRUCTURE TO REMAIN SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST.

MEASUREMENT & PAYMENT: THE DEPARTMENT WILL MEASURE THE QUANTITY OF REMOVALS ON A LUMP SUM BASIS. THE DEPARTMENT WILL PAY FOR THE ACCEPTED QUANTITIES OF REMOVALS AT THE CONTRACT PRICE FOR ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN.

ITEM 837 - LINER PIPE, AS PER PLAN

THE PROPOSED STRUCTURE TYPE SHALL BE A FLANGED, GALVANIZED STEEL, TUNNEL LINER PLATE PIPE ARCH CONFORMING TO THE GEOMETRY SHOWN ON SHEET 3/8 AND CAPABLE OF BEING ASSEMBLED WITHIN THE EXISTING STRUCTURE AS DETAILED IN THESE PLANS. THE PROPOSED STRUCTURE SHALL BE DESIGNED FOR HL-93 LOADING WITH 60 PSF FUTURE WEARING SURFACE AND ASSUME THE EXISTING STRUCTURE PROVIDES NO STRUCTURAL CAPACITY. VENDOR TO PROVIDE GAUGE THICKNESS.

MATERIAL:

LINER PLATES SHALL BE FABRICATED FROM BLACK STEEL PLATES CONFORMING TO ASTM SPECIFICATION A 1011. PLATES SHALL BE OF THE GAGE SHOWN ON THE PLANS AND SHALL BE CURVED TO SUIT THE TUNNEL CROSS SECTION SHOWN. PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123, EXCEPT THAT THE ZINC SHALL BE APPLIED AT A RATE OF 2.0 OUNCES PER SQUARE FOOT TOTAL FOR BOTH SIDES.

ALL PLATES SHALL BE PUNCHED FOR BOLTING ON BOTH LONGITUDINAL AND CIRCUMFERENTIAL SEAMS AND SHALL BE SO FABRICATED AS TO PERMIT COMPLETE ERECTION FROM THE INSIDE OF THE EXISTING STRUCTURE. THE LONGITUDINAL SEAM SHALL BE OF THE LAPPED TYPE, WITH AN OFFSET EQUAL TO THE GAGE OF METAL FOR THE FULL WIDTH OF PLATE TO ALLOW THE CROSS SECTION OF THE PLATE TO BE CONTINUOUS THROUGH THE SEAM. CIRCUMFERENTIAL BOLT HOLE SPACING SHALL BE 6-1/4".

GROUT HOLES, ADJUSTING RODS, ANTI-FLOTATION DEVICES, BASE CHANNELS, AND SKID RAILS SHALL BE IN ACCORDANCE WITH THE LINER MANUFACTURER'S RECOMMENDATIONS. GROUT PORT/VENT LOCATIONS IN THE ROADWAY ARE PERMISSIBLE BUT SHOULD BE CONFIGURED TO MINIMIZE IMPACT TO TRAFFIC.

BOLTS AND NUTS:

BOLTS AND NUTS SHALL BE 5/8" IN DIAMETER AND LENGTH AS RECOMMENDED BY THE MANUFACTURER. BOLTS SHALL CONFORM TO ASTM A 449, TYPE 1 OR ASTM A 307. FOR LONGITUDINAL SEAMS, BOLTS SHALL BE A 449, TYPE 1, FOR PLATE THICKNESS EQUAL TO OR GREATER THAN 0.209. FOR PLATE THICKNESS LESS THAN .209, THE BOLTS SHALL BE A 307, GRADE A. ALL CIRCUMFERENTIAL BOLTS MAY BE A 307, GRADE A. NUTS SHALL CONFORM TO ASTM A 563, GRADE A, HEX.

GALVANIZING WHEN REQUIRED SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM B-695, CLASS 50.

INSTALLATION:

THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS INCLUDING ASSEMBLY DRAWINGS, ARCH ASSEMBLY METHODS, DEWATERING METHODS, BULKHEAD, AND BLOCKING DETAILS TO THE ENGINEER FOR REVIEW. THE CONTRACTOR MAY PUSH OR PULL ASSEMBLED LINER SECTIONS INTO PLACE IF NECESSARY PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL UTILIZE METHODS THAT FACILITATE PLACEMENT OF THE LINER SECTIONS WHILE MINIMIZING DAMAGE TO THE PLATE OR ITS GALVANIZED ZINC COATING. THE CONTRACTOR SHALL TOUCH UP ANY DAMAGE TO THE GALVANIZED ZINC COATING CAUSED BY HANDLING OR ASSEMBLY. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE DETAILS AND LOCATIONS OF LATERAL CONNECTIONS, GROUT PORTS, FITTINGS, BLOCKING, AND BLOCKING HARDWARE FOR APPROVAL. A GROUTING METHOD AND CULVERT INSTALLATION PROCEDURE SHALL ALSO BE SUBMITTED FOR APPROVAL. LINER PLATE SHALL BE ASSEMBLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. LONGITUDINAL SEAMS SHALL BE STAGGERED BETWEEN RINGS.

CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, INCLUDING: SIZE, TYPE, AND LOCATIONS OF ALL LATERAL CONNECTIONS; DEFLECTIONS/DAMAGE TO THE EXISTING STRUCTURES; AND HORIZONTAL AND VERTICAL DEFLECTIONS TO THE OVERALL STRUCTURE ALIGNMENT.

ALL NECESSARY REPAIRS/REMOVALS TO THE EXISTING CULVERT TO PROVIDE CLEARANCE FOR THE PROPOSED LINER/GROUT SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT TO MAINTAIN STRUCTURAL INTEGRITY AT ALL TIMES.

FIELD CUTTING OF LINER SHALL BE AS MINIMAL AS REQUIRED TO PERMIT CONNECTION OF LATERALS AND SHALL NOT COMPROMIZE THE STRUCTURAL CAPACITY OF THE LINER. GALVANIZING SHALL BE TOUCHED UP FOR ANY CUT EDGES. LARGER LATERAL CONNECTIONS MAY WARRANT USE OF HEAVIER GAUGE PLATE OR OTHER REINFORCEMENT AND SHALL BE DESIGNED BY PLATE VENDOR AND INCLUDED IN THE BID UNIT PRICE FOR THIS ITEM.

CONTRACTOR SHALL PROVIDE SHOP FABRICATED TRANSITION LINER SECTIONS TO ACCOMODATE DEFLECTIONS IN THE HORIZONTAL OR VERTICAL ALIGNMENT OF THE EXISTING STRUCTURES.

THE COSTS OF ALL ABOVE DECRIBED ITEMS, WORK, AND INCIDENTALS TO CONSTRUCT THE LINER AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		2800241	

STRUCTURE NOTES
SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

CUY-90-18.22/VAR
PID No. 92069

ITEM 837 - BACKFILL FOR LINER PIPE, AS PER PLAN

THE BACKILL FOR THE LINER PIPE, HENCEFORTH REFERRED TO AS GROUT, IS FOR FILLING THE ANNULAR SPACE BETWEEN THE EXISTING STRUCTURE AND PROPOSED LINER. AFTER INSTALLATION OF THE LINER, BUT PRIOR TO GROUTING, BULKHEADING AND VENTING SHALL BE CONSTRUCTED. A WATERTIGHT, CEMENTITIOUS BULKHEAD (OR COLLAR) SHALL BE FORMED BETWEEN THE HOST STRUCTURE AND THE ARCH LINER AT EACH END OF THE ARCH AND SHALL PROVIDE LONG TERM DURABILITY. BULKHEAD DESIGNS SHALL BE SUFFICIENT TO RESIST GROUT PRESSURES OR HYDROSTATIC WATER PRESSURE WITHIN THE ANNULAR SPACE.

THE GROUT SHALL BE PLACED IN CONTROLLED LIFTS IN ACCORDANCE WITH THE SUBMITTED STAGED GROUTING PLAN. EACH LIFT SHALL BE ALLOWED TO ACHIEVE INITIAL SET BEFORE THE SUBSEQUENT LIFT CAN BE PLACED. ADDITIONALLY, THE CONTRACTOR TOGETHER WITH THE ENGINEER SHALL SOUND THE AREA OF EACH LIFT ONCE IT HAS ACHIEVED INITIAL SET TO ENSURE THAT THE GAP BETWEEN THE EXISTING STRUCTURE AND PROPOSED ARCH HAS BEEN COMPLETELY FILLED. ANY VOIDS DETECTED BY THE SOUNDING SHALL BE CORRECTED BY PLACING ADDITIONAL GROUT BEFORE PROCEEDING WITH PLACEMENT OF THE SUBSEQUENT LIFT.

IF PORTS ARE USED TO PUMP GROUT THROUGH THE STEEL LINER PIPE, THEY SHALL BE SHOP INSTALLED. IF FIELD-INSTALLED PORTS ARE REQUIRED, THEY SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT COMPROMISE THE STRUCTURAL CAPACITY OF THE LINER.

IF ANY PORTION OF THE EXISTING STRUCTURE SLAB IS REMOVED FOR CONTRACTOR ACCESS, THE GROUT SHALL BE FILLED TO THE ORIGINAL SLAB TOP ELEVATION.

THE MATERIALS SHALL BE MIXED IN EQUIPMENT OF SUFFICIENT SIZE AND CAPACITY TO PROVIDE THE DESIRED AMOUNT OF GROUT MATERIAL FOR EACH GROUTING STAGE. THE EQUIPMENT SHALL BE CAPABLE OF MIXING THE GROUT AT DENSITIES REQUIRED FOR THE APPROVED PROCEDURE AND SHALL ALSO BE CAPABLE OF CHANGING DENSITY AS DICTATED BY FIELD CONDITIONS ANY TIME DURING THE GROUTING OPERATION.

THE MIX DESIGN(S) SHALL BE DEVELOPED TO COMPLETELY FILL THE ANNULAR SPACE, AND SHALL ADDRESS THE FOLLOWING CONSIDERATIONS: SIZE OF ANNULAR VOID, VOIDS (BASED ON SIZE AND ACCESS) IN THE SURROUNDING STRUCTURE ENVELOPE, ABSENCE OR PRESENCE OF GROUNDWATER, SUFFICIENT STRENGTH AND DURABILITY TO PREVENT MOVEMENT OF THE LINER PLATE, PROVISIONS FOR ADEQUATE RETARDATION AND SHRINKAGE OF LESS THAN 1 PERCENT BY VOLUME. GROUT SHALL BE MIXED IN SMALL QUANTITIES AS NEEDED, AND SHALL NOT BE RE-TEMPERED OR USED AFTER IT HAS BEGUN TO SET.

THE GAUGED PUMPING PRESSURE SHALL NOT EXCEED THE ARCH LINER MANUFACTURER'S APPROVED RECOMMENDATIONS. PUMPING EQUIPMENT SHALL BE OF SIZE SUFFICIENT TO INJECT GROUT AT VELOCITY AND PRESSURE RELATIVE TO THE SIZE OF THE ANNULAR SPACE. GAUGES TO MONITOR GROUT PRESSURE SHALL BE ATTACHED IMMEDIATELY ADJACENT TO EACH INJECTION PORT. THE GAUGE SHALL CONFORM TO AN ACCURACY OF NOT MORE THAN ONE-HALF PERCENT ERROR OVER THE FULL RANGE OF THE GAUGE. THE RANGE OF THE GAUGE SHALL BE NOT MORE THAN 100 PERCENT GREATER THAN THE DESIGN GROUT PRESSURE. PRESSURE GAUGES SHALL BE INSTRUMENT OIL FILLED AND ATTACHED TO A SADDLE TYPE DIAPHRAGM SEAL (GAUGE SAVER) TO PREVENT CLOGGING WITH GROUT. ALL GAUGES SHALL BE CERTIFIED AND CALIBRATED IN ACCORDANCE WITH ANSI B40 GRADE 2A.

PRE-CONSTRUCTION MEETING:

THE ARCH LINER MANUFACTURER MUST PROVIDE A REPRESENTATIVE TO CONDUCT A PRE-CONSTRUCTION MEETING THAT COVERS ALL ASPECTS OF THE LINING AND GROUTING PROCESS AND SAID PERSON MUST BE A REGISTERED PROFESSION ENGINEER. HE OR SHE MUST ALSO BE ON SITE DURING GROUTING OPERATIONS.

EXPERIENCE:

THE ARCH LINER MANUFACTURER SHALL SHOW EXTERNAL PROOF THAT THEIR EMPLOYEE WHO WILL CONDUCT THE PRE-CONSTRUCTION MEETING SHALL HAVE PARTICIPATED IN THE SUCCESSFUL RELINE OF AT LEAST 10 STRUCTURES OF THIS TYPE AND SIZE ON PREVIOUS PROJECTS.

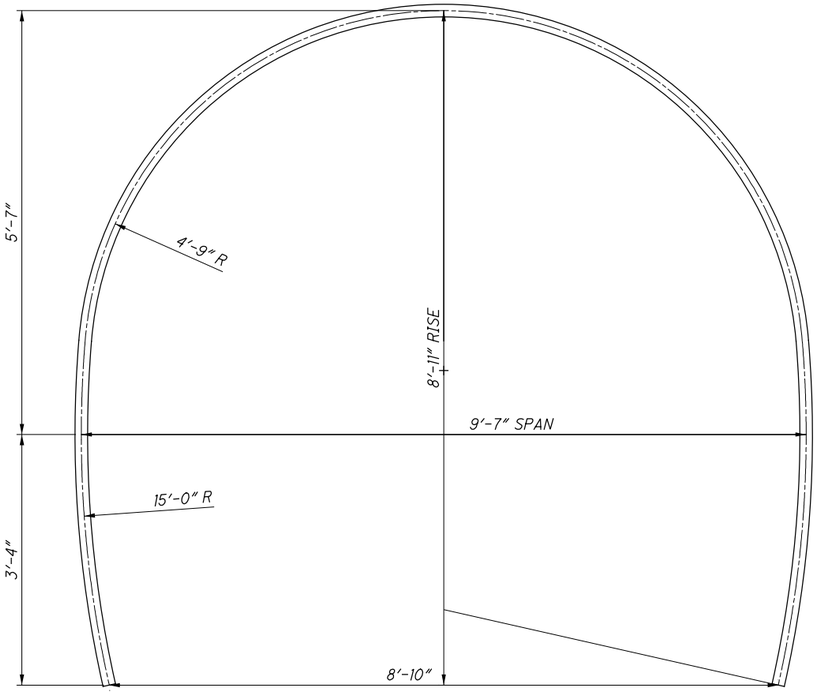
SUBMITTALS REQUIREMENTS:

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER AT LEAST TEN (10) WORKING DAYS PRIOR TO COMMENCING THE LINER PIPE INSTALLATION:

STRUCTURAL DESIGN CALCULATIONS FOR THE LINER PIPE FOLLOWING SECTION 12 OF THE AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES USING THE LRFD METHOD VERIFYING CAPACITY SIGNED BY A LICENSED PROFESSIONAL ENGINEER. THESE CALCULATIONS SHALL ASSUME THE EXISTING STRUCTURE HAS FAILED AND CONTRIBUTES NO STRENGTH TO THE PROPOSED LINER.

WRITTEN VERIFICATION BY THE LINER MANUFACTURER THAT THE LINING AND GROUTING PLAN CONFORMS WITH ALL PROVISIONS, CAUTIONS, AND RESTRICTIONS OF THESE SPECIFICATIONS, CONTRACT PLANS, AND MANUFACTURER REQUIREMENTS.

THE COSTS OF ALL ABOVE MENTIONED ITEMS, BYPASS PUMPING, COFFERDAMS, TEMPORARY FORMS/BULKHEADS, AND TEMPORARY SUPPORTS REQUIRED TO CONSTRUCT THE LINER BACKFILL AS DETAILED IN THESE PLANS SHALL BE INCLUDED FOR PAYMENT OF THIS ITEM.



NOTE: ALL DIMENSIONS SHOWN TO NEUTRAL AXIS OF CORRUGATIONS. DEPTH OF CORRUGATIONS SHALL NOT EXCEED 2".

LINER GEOMETRY

CALC:	RAP	DATE:	8/12/2020
CHECKED:	RY	DATE:	8/13/2020

ESTIMATED QUANTITIES (GEA-044-0916)

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.	SEE SHEET
202	11201	LS		PORTIONS OF STRUCTURE REMOVED, AS PER PLAN				LS	2/8
503	11100	LS		COFFERDAMS AND EXCAVATION BRACING				LS	
503	21104	42	CY	UNCLASSIFIED EXCAVATION, INCLUDING ROCK				42	
509	10000	5266	LB	EPOXY COATED REINFORCING STEEL				5266	
511	46510	41	CY	CLASS QC1 CONCRETE, FOOTING				41	
511	46610	8	CY	CLASS QC1 CONCRETE, HEADWALL				8	
512	10100	33	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)				33	
516	25000	54	SF	NYLON REINFORCED NEOPRENE SHEETING				54	
837	10001	99	FT	LINER PIPE, AS PER PLAN				99	2/8
837	21001	99	FT	BACKFILL FOR LINER PIPE, AS PER PLAN				99	3/8

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		2800241	

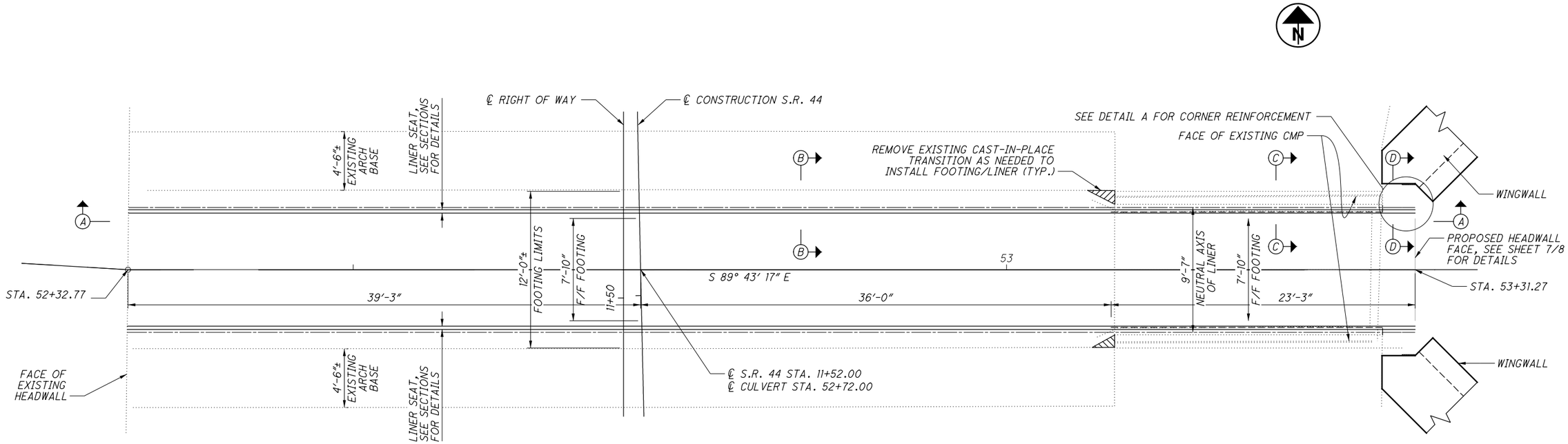
STRUCTURE NOTES 2

SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

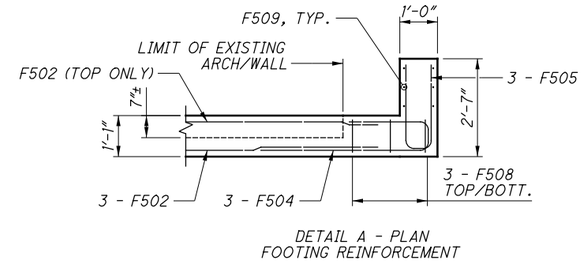
CUY-90-18.22/VAR
PID No. 92069

3 / 8

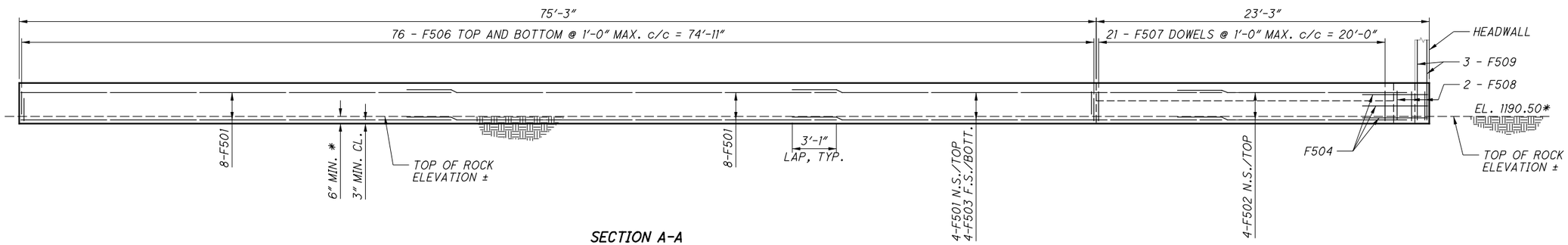
58
63



FOUNDATION PLAN



DETAIL A - PLAN
FOOTING REINFORCEMENT



SECTION A-A

FOUNDATION ELEVATION
LEFT SHOWN, RIGHT OPPOSITE HAND

ABBREVIATIONS

E.S. - EACH SIDE
N.S. - NEAR SIDE
F.S. - FAR SIDE
BOTT. - BOTTOM
TYP. - TYPICAL
MIN. - MINIMUM
MAX. - MAXIMUM

* PROVIDE MINIMUM 6" SOCKET INTO ROCK OR PLAN ELEVATION, WHICHEVER IS LOWER. ROCK ELEVATION SHOWN IS APPROXIMATE.

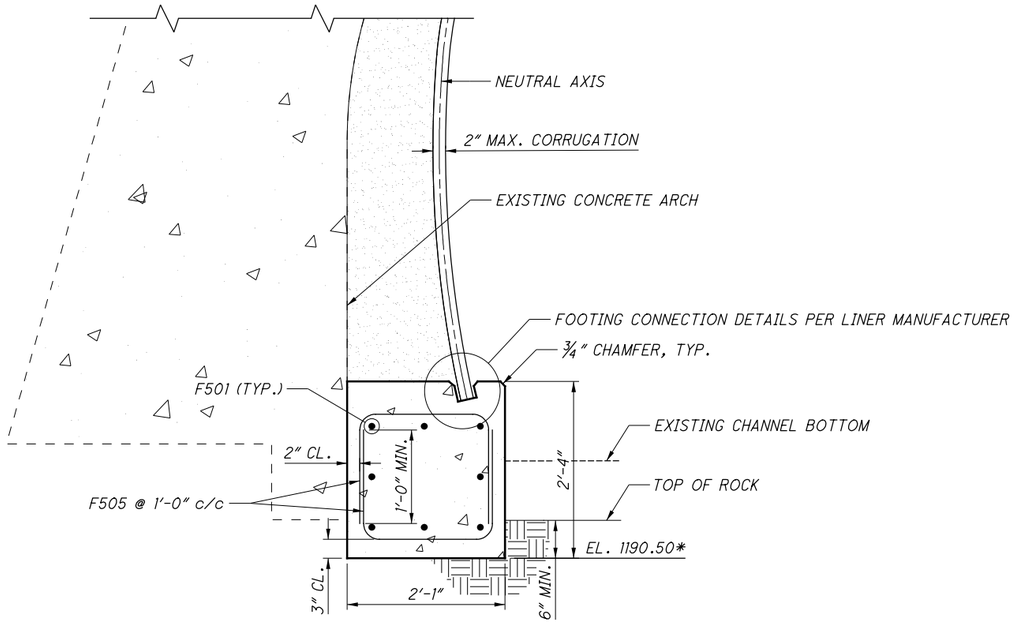
SEE SHEET 5/8 FOR SECTIONS B THROUGH D

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		28002241	

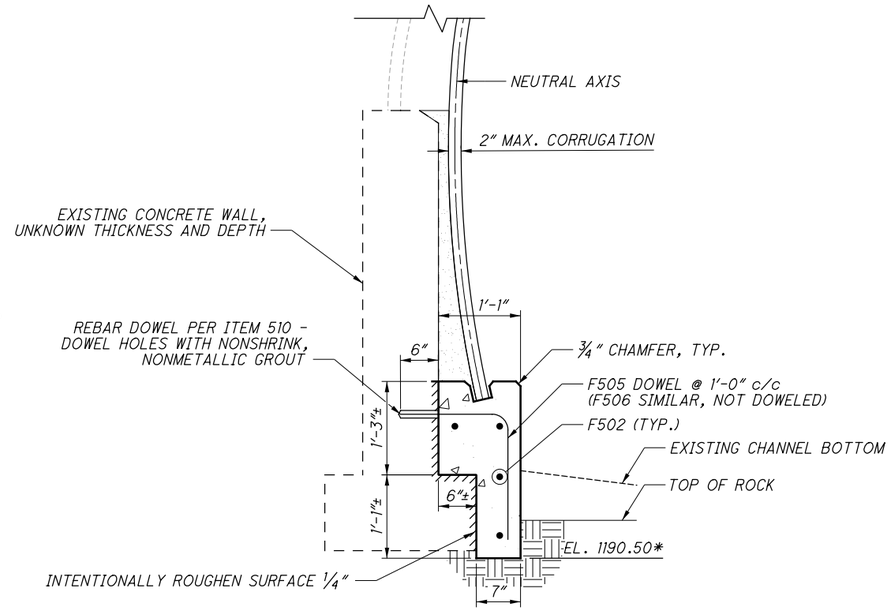
FOUNDATION DETAILS
SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

CUY-90-18.22/ VAR
PID No. 92069



SECTION B-B

EXISTING CONCRETE ARCH
LEFT SHOWN, RIGHT OPPOSITE HAND

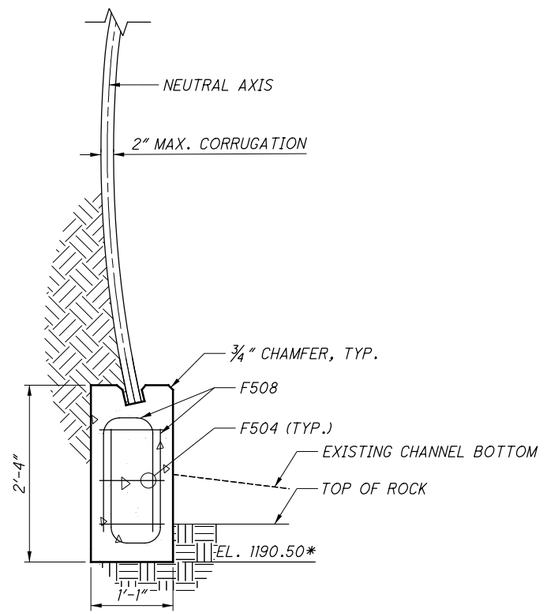


SECTION C-C

EXISTING CMP EXTENSION
LEFT SHOWN, RIGHT OPPOSITE HAND

** PROVIDE MINIMUM 6" SOCKET INTO ROCK OR PLAN ELEVATION, WHICHEVER IS LOWER. ROCK ELEVATION SHOWN IS APPROXIMATE.*

NOTE: THE LAP ON F505 BARS MAY BE ADJUSTED TO ALLOW THE BOTTOM F505 TO BETTER CONTOUR THE ROCK PROFILE PROVIDED 1'-0" THE MINIMUM LAP LENGTH AND CLEAR COVER REQUIREMENTS ARE MET.



SECTION D-D

EXISTING CMP EXTENSION
LEFT SHOWN, RIGHT OPPOSITE HAND

ABBREVIATIONS

E.S. - EACH SIDE
N.S. - NEAR SIDE
F.S. - FAR SIDE
BOTT. - BOTTOM
TYP. - TYPICAL
MIN. - MINIMUM
MAX. - MAXIMUM

- SEE SHEET 5/8 FOR SECTION CUTS

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		2800241	

FOUNDATION DETAILS

SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

CUY-90-18.22/VAR
PID No. 92069

5 / 8

60
63

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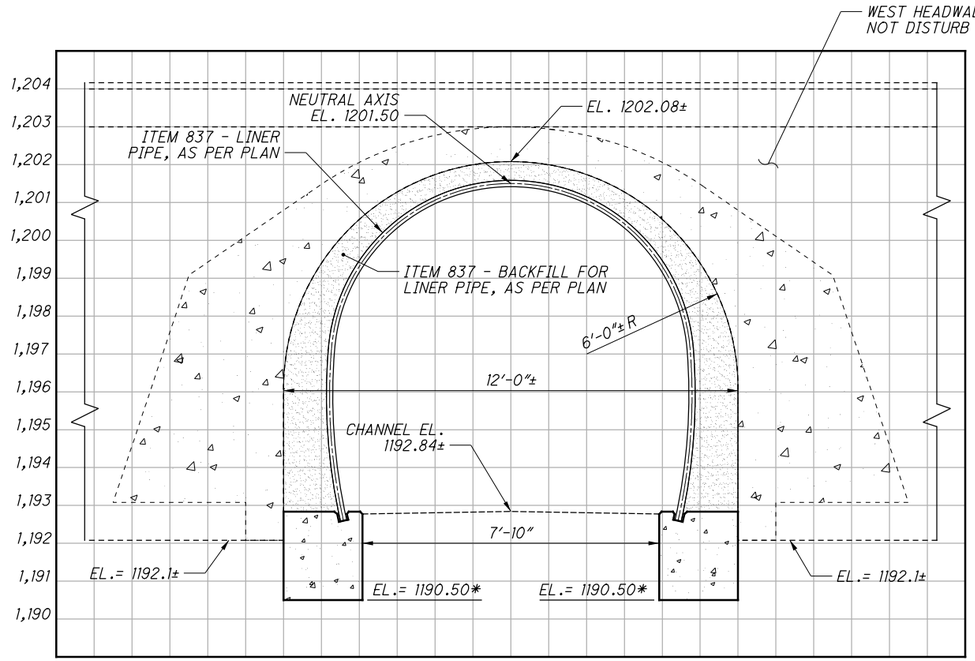
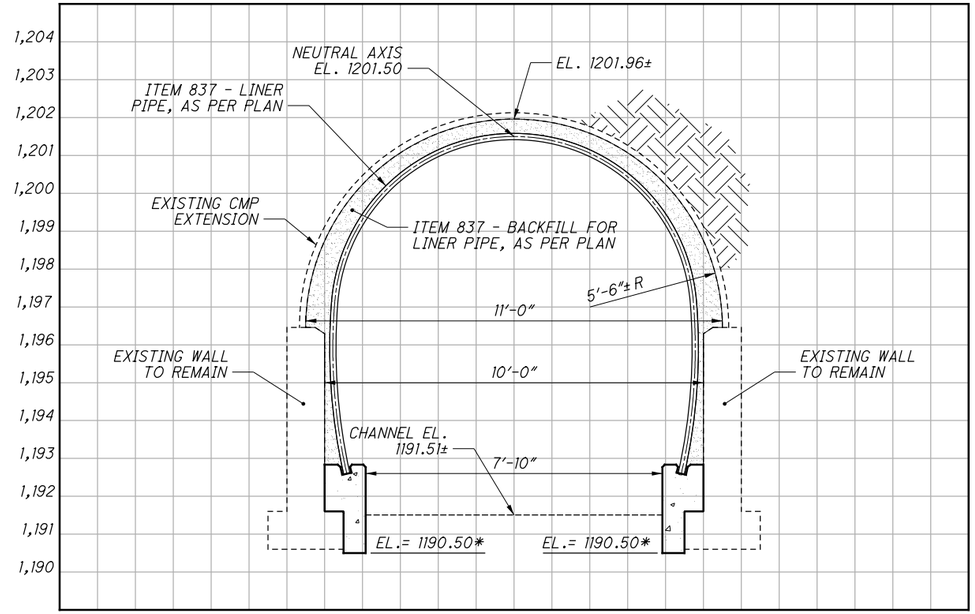


STA. 52+33

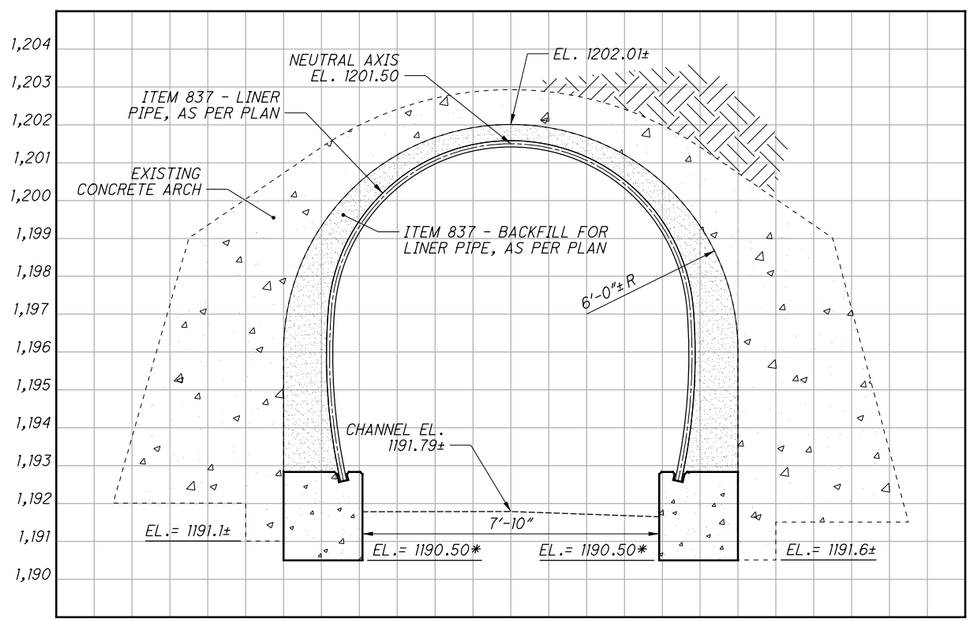
INLET, LOOKING DOWNSTREAM (UPSTATION)



STA. 53+09

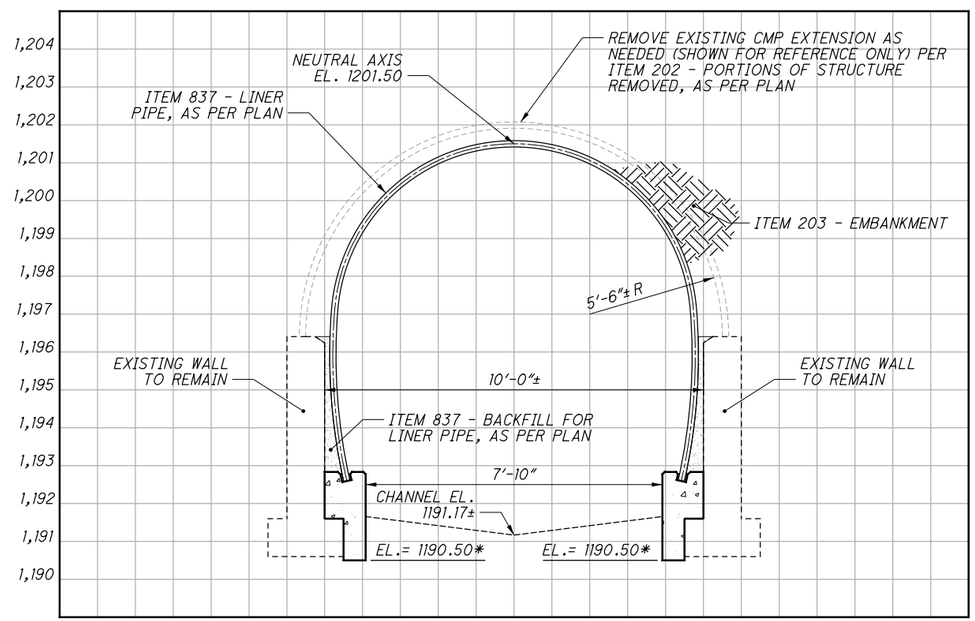
LOOKING DOWNSTREAM (UPSTATION)

* PROVIDE MINIMUM 6" SOCKET INTO BEDROCK. SEE FOUNDATION PLAN SHEET FOR ADDITIONAL INFORMATION.



STA. 53+08

LOOKING DOWNSTREAM (UPSTATION)



STA. 53+28

OUTLET, LOOKING DOWNSTREAM (UPSTATION)

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
RAP	RAP	HVH	09/18/20
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RY		2800241	

CULVERT SECTIONS

SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

CUY-90-18.22/ VAR

PID No. 92069

6 / 8

61
63

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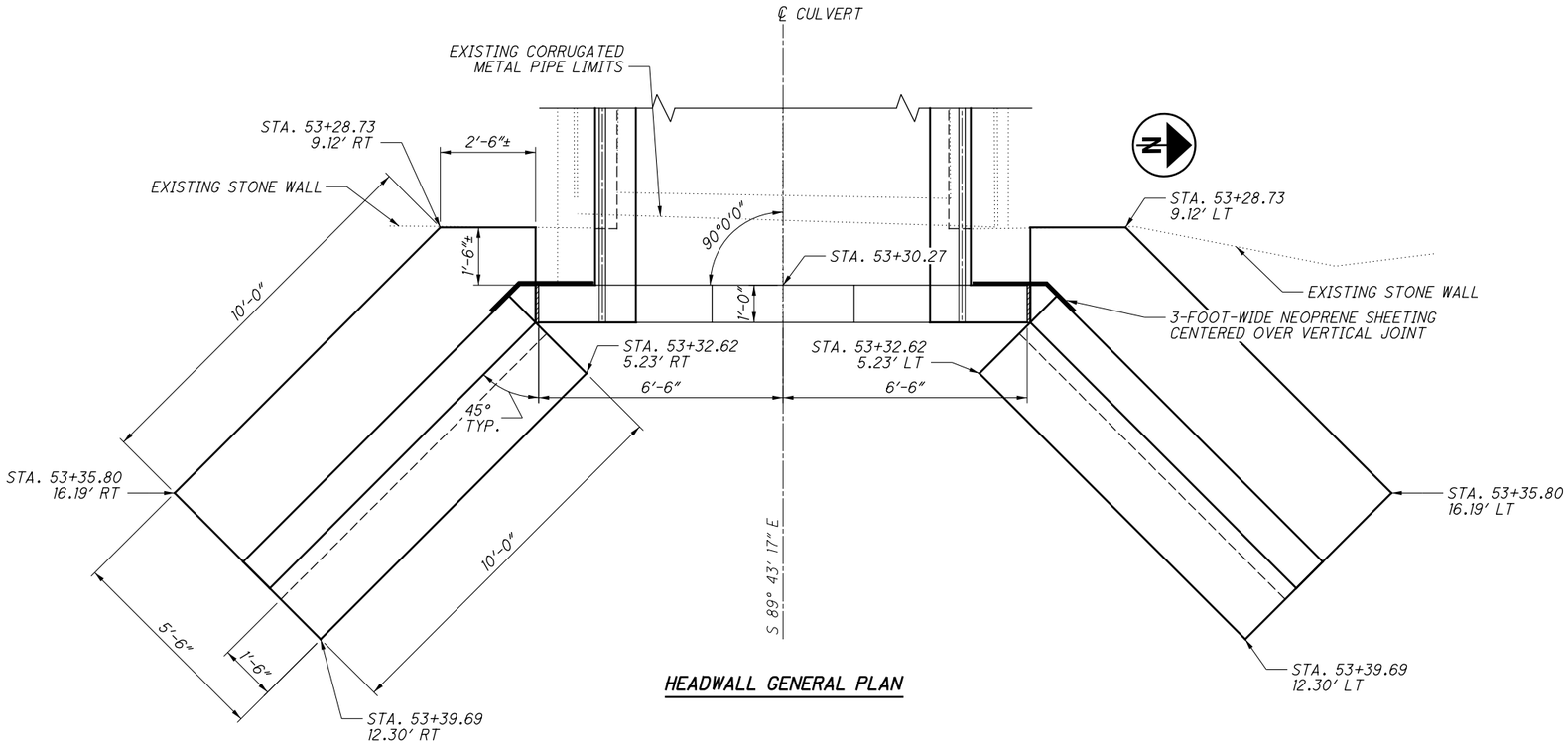
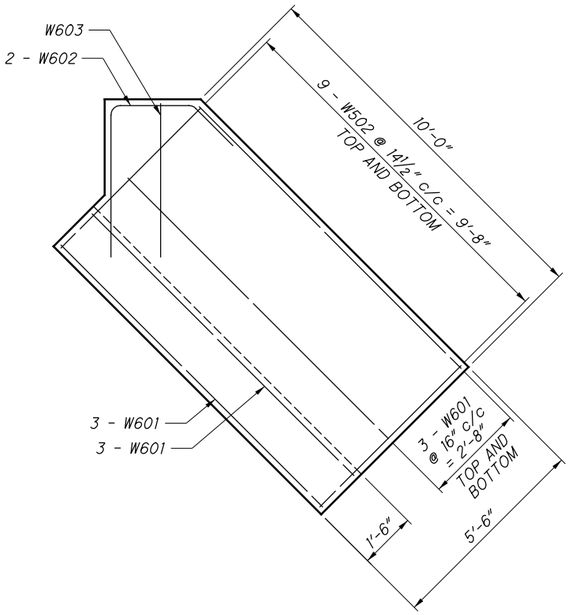
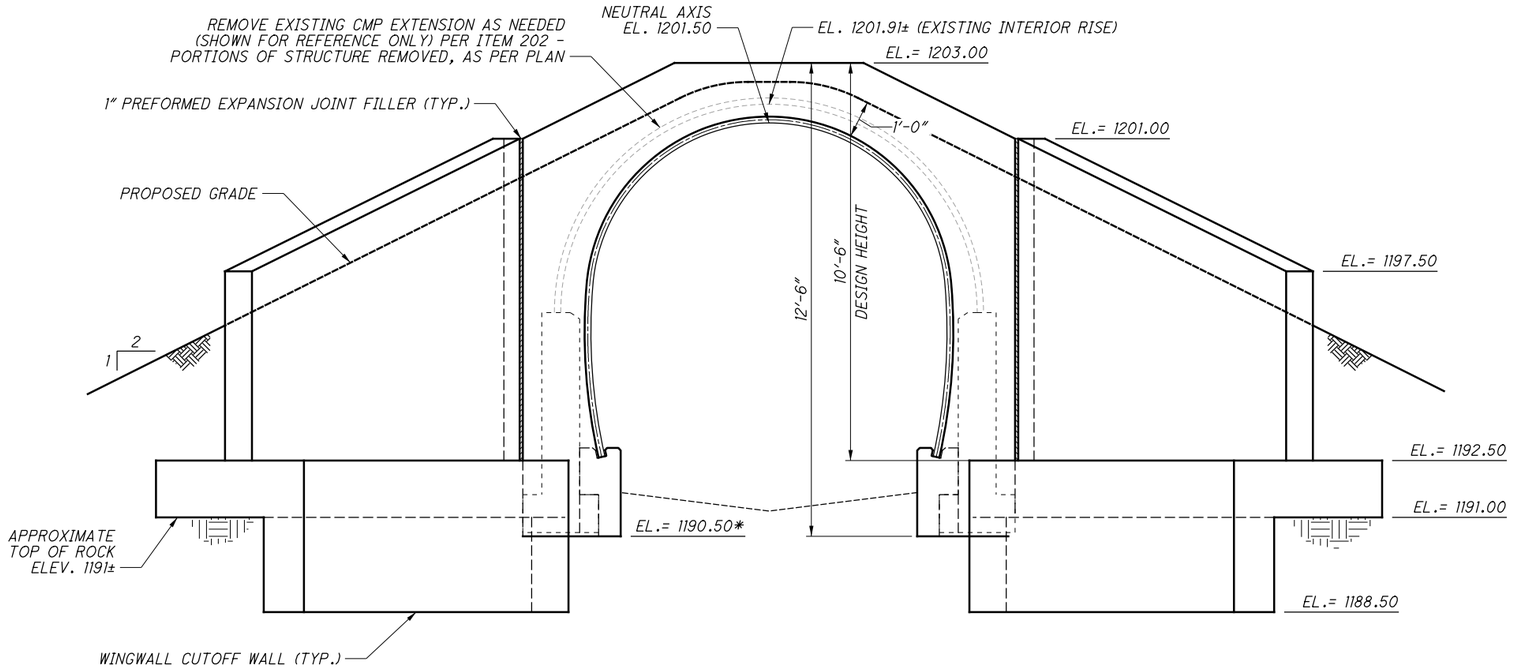


HEADWALL GENERAL PLAN



WINGWALL FOOTING PLAN

RIGHT SHOWN, LEFT OPPOSITE HAND



HEADWALL ELEVATION

LOOKING DOWNSTATION (UPSTREAM)

* PROVIDE MINIMUM 6″ SOCKET INTO BEDROCK

NOTES

SEE SHEET 5/8 FOR FOOTING REINFORCING DETAILS.

THE INTERFACE BETWEEN THE TOP OF FOOTING AND BASE OF WINGWALL STEM SHALL BE INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4″ BY MEANS OF A SERRATED TROWEL.

ALL FOOTING ELEVATIONS ARE SHOWN TO APPROXIMATE TOP OF BEDROCK AT ELEVATION 1191±. EXCAVATION OF BEDROCK MAY BE REQUIRED FOR THE CONSTRUCTION OF THE THE WINGWALL CUTOFF WALL OR FOUNDATION KEYS. FOUNDATION DIMENSIONS SHOWN ARE TO BE CONSIDERED MINIMUM; LOOSE MATERIAL ABOVE BEDROCK SHALL BE REMOVED SO THAT THE FOUNDATIONS BEAR FULLY ON COMPETENT BEDROCK. THE COST OF ANY ADDITIONAL CONCRETE NEEDED TO FILL THE VOID BETWEEN TOP OF ROCK AND PROPOSED BOTTOM OF FOOTING SHALL BE INCIDENTAL TO ITEM 511. ANY NECESSARY BEDROCK EXCAVATION IS TO BE INCLUDED WITH ITEM 503 - UNCLASSIFIED EXCAVATION, INCLUDING ROCK AND SHALL BE PERFORMED IN A MANNER WHICH LEAST DISTURBS THE SURROUNDING ROCK TO REMAIN. ADDITIONAL INFORMATION IS AVAILABLE IN THE SITE GEOTECHNICAL REPORT.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

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RY		2800241	

HEADWALL DETAILS
SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

CUY-90-18.22/ VAR
PID No. 92069

7 / 8

62
63

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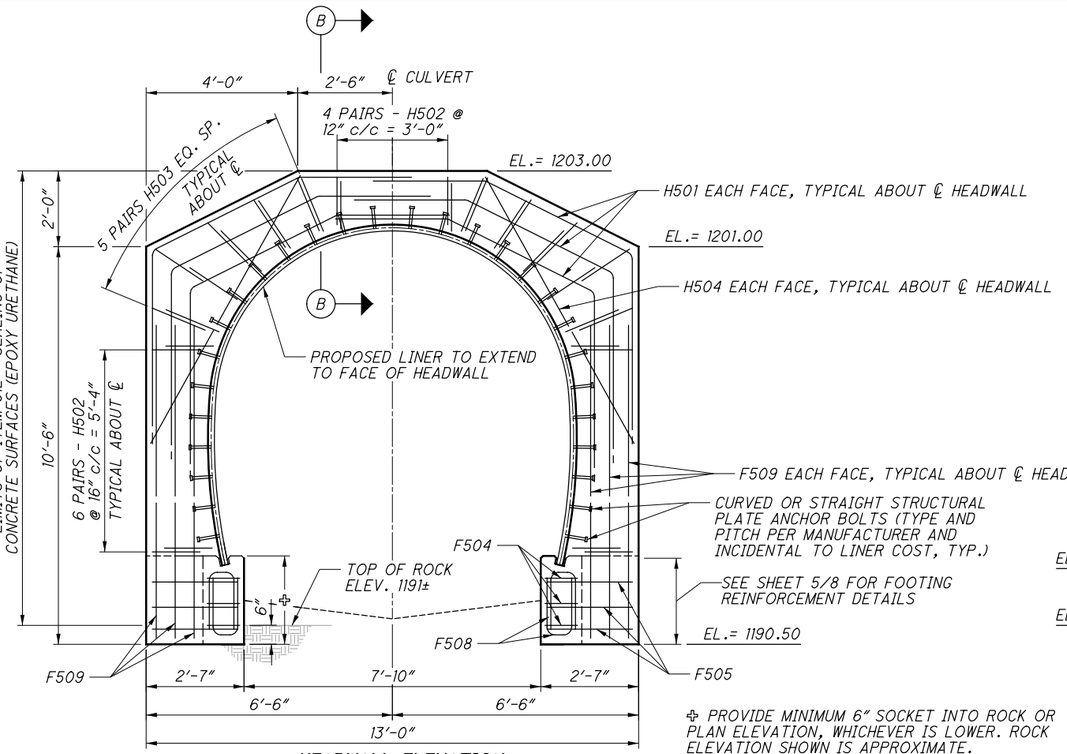
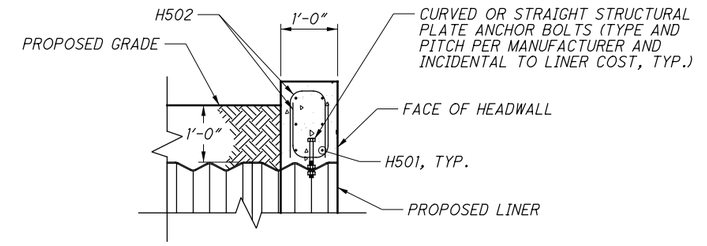
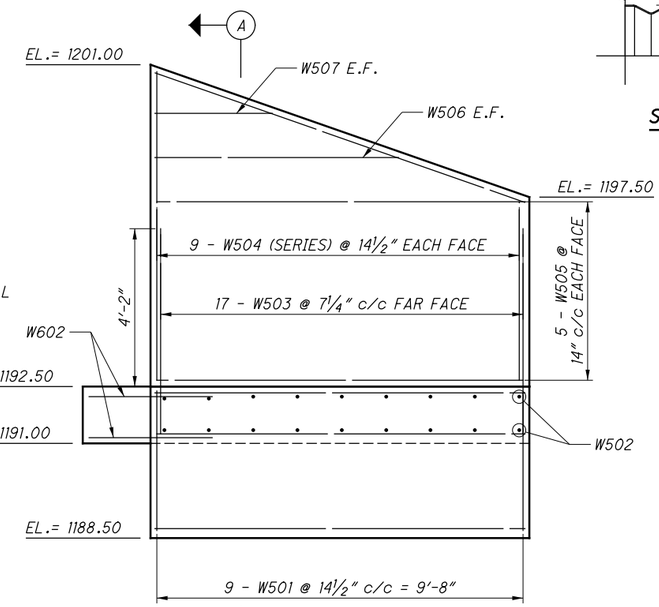


HEADWALL ELEVATION

LOOKING DOWNSTATION (UPSTREAM)

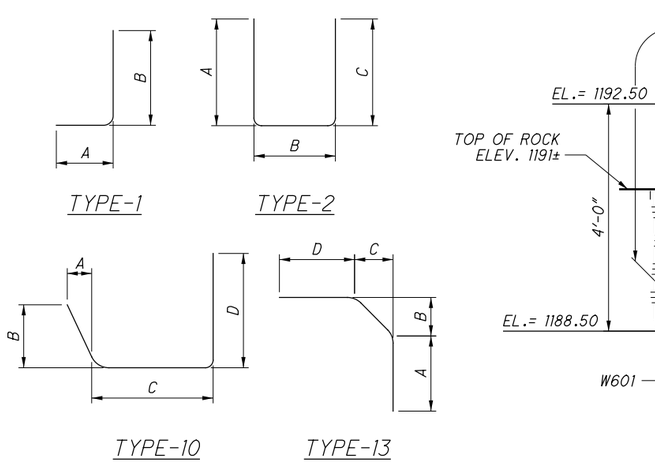


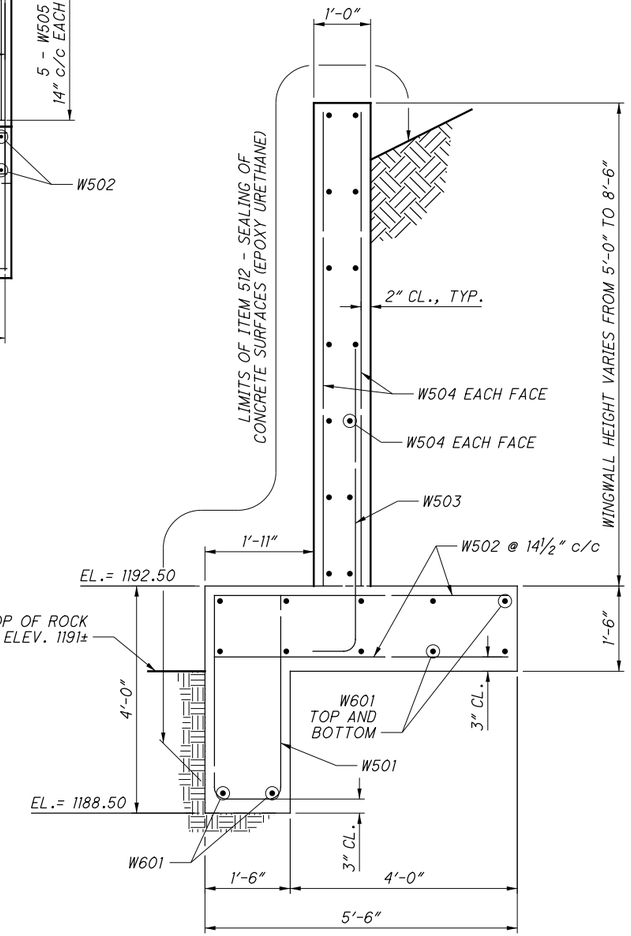
SECTION B-B



WINGWALL ELEVATION

RIGHT SHOWN, LEFT OPPOSITE HAND





SECTION A-A

MARK	NUMBER LEFT	NUMBER RIGHT	NUMBER TOTAL	LENGTH	WEIGHT	TYPE	DIMENSIONS A	B	C	D	E	R	INC
FOOTING													
F501	20	20	40	30'-0"	1252	STR							
F502	4	4	8	16'-0"	134	STR							
F503	4	4	8	21'-3"	177	STR							
F504	3	3	6	7'-2"	45	2	4'-6"	0'-9"	2'-2"				
F505	3	3	6	4'-11"	31	2	2'-3"	0'-8"	2'-3"				
F506	152	152	304	4'-10"	1533	2	1'-8"	1'-9"	1'-8"				
F507 ⊗	21	21	42	2'-11"	128	1	1'-5"	1'-8"					
F508	6	6	12	3'-10"	48	2	1'-8"	0'-9"	1'-8"				
F509	6	6	12	8'-3"	103	STR							
SUB-TOTAL					3,451								
HEADWALL													
H501			12	12'-4"	154	13	5'-1"	1'-11"	3'-10"	3'-0"			
H502			32	2'-11"	97	2	1'-3"	0'-8"	1'-3"				
H503			20	3'-5"	71	2	1'-6"	0'-8"	1'-6"				
H504			4	7'-10"	33	STR							
SUB-TOTAL					355								
WINGWALLS													
W501	9	9	18	8'-1"	152	2	3'-7"	1'-2"	3'-7"				
W502	18	18	36	5'-2"	194	STR							
W503	17	17	34	6'-0"	213	1	0'-9"	5'-5"					
	2 SR	2 SR	4 SR	4'-9"									
W504	OF	OF	OF	TO	241	STR							0'-5"
	9	9	9	8'-1"									
W505	10	10	20	9'-8"	202	STR							
W506	2	2	4	6'-4"	26	STR							
W507	2	2	4	3'-0"	13	STR							
W601	12	12	24	9'-8"	348	STR							
W602	2	2	4	7'-5"	45	10	1'-0"	1'-0"	2'-2"	4'-0"			
W603	1	1	2	8'-9"	26	2	4'-0"	1'-1"	4'-0"				
SUB-TOTAL					1,460								
SHEET TOTAL					5,266								

ALL REINFORCING STEEL TO BE EPOXY COATED.

⊗ INDICATES DOWEL BAR

THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, P601 IS A NO. 6 BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE INDICATED. R INDICATES INSIDE RADIUS UNLESS OTHERWISE NOTED. "STD." WRITTED IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

DESIGN AGENCY
KS Associates Inc.
260 BURNS ROAD, ELYRIA, OHIO 44035

DESIGNED	DRAWN	REVIEWED	DATE
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RY		2800241	

HEADWALL DETAILS
SITE 5 - BRIDGE NO. GEA-44-0916
BRIDGE OVER UNNAMED STREAM NORTH OF S.R. 87

CUY-90-18.22/VAR
PID No. 92069

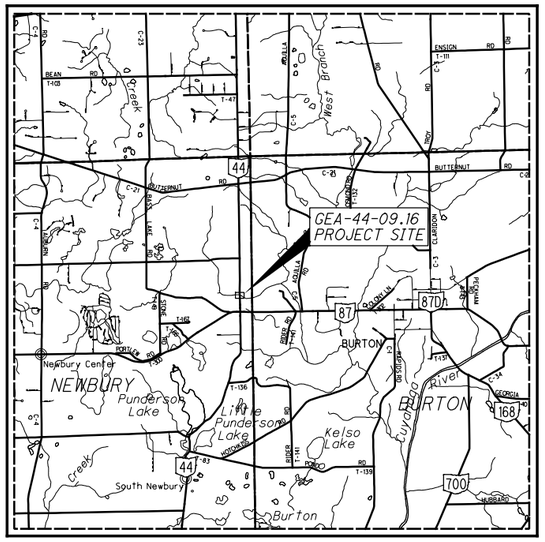
8 / 8

63 / 63

RIGHT OF WAY LEGEND SHEET

GEA-44-09.16 RAVENNA ROAD

COUNTY OF GEAUGA, TOWNSHIP OF NEWBURY
ORIGINAL NEWBURY TOWNSHIP LOT NO. 36, TRACT NO. 1
TOWNSHIP 7 NORTH, RANGE 8 WEST



LOCATION MAP

LATITUDE: N 41°28'34" LONGITUDE: W 81°11'34"

SCALE IN MILES

0 1 2 3 4

N

PROJECT DESCRIPTION

REHABILITATION OF CULVERT AT GEA-44-09.16 WITH MINIMAL IMPACTS TO THE S.R. 44 (RAVENNA ROAD) PAVEMENT BY RELINING THE CULVERT WITH A STRUCTURAL TUNNEL LINER INSTALLED ON SHALLOW FOUNDATIONS. WORK TO ALSO INCLUDE RECONSTRUCTION OF DOWNSTREAM HEADWALL AND PLACEMENT OF ROCK CHANNEL PROTECTION INCLUDED IN PLAN PID 92069 CUY-90-18.22 CULVERTS.

STATIONS AND OFFSETS ARE REFERENCED FROM THE CENTERLINE OF RIGHT OF WAY OF RAVENNA ROAD.

INDEX OF SHEETS:

PLANS PREPARED BY:

FIRM NAME : KS ASSOCIATES
R/W DESIGNER: MARK A. MCNULTY
R/W REVIEWER: TREVOR A. BIXLER
MARK A. MCNULTY
FIELD REVIEWER: KEVIN STRAUSER
PRELIMINARY FIELD REVIEW DATE: 08-28-19
TRACINGS FIELD REVIEW DATE: 02-07-2020
OWNERSHIP UPDATED BY: MARK A. MCNULTY
DATE COMPLETED: 1-20-20
PLAN COMPLETION DATE:

UTILITY OWNERS

CEI FIRST ENERGY
THE ILLUMINATING COMPANY
7755 AUBURN ROAD
CONCORD, OHIO 44077
ATTN: FREDERICK E. RANDOLPH
OFFICE: (440) 358-4991
FRANDOLPH@FIRSTENERGYCORP.COM

ORWELL NATURAL GAS
8470 STATION STREET
MENTOR, OHIO 44060
ATTN: TIM REILLY
OFFICE: (440) 701-5115
MOBILE: (440) 728-0575
FAX: (440) 205-8669
TREILLY@EGAS.NET

WINDSTREAM
100 OBEN BROWN STREET
HUDSON, OHIO 44236
ATTN: JON HOBBY
PHONE: (440) 285-5474
JON.HOBBY@WINDSTREAM.COM

DOMINION ENERGY OHIO GAS COMPANY
320 SPRINGSIDE DR. SUITE 320
AKRON, OHIO 44333
ATTN: MIKE ANTONIUS
PHONE: (330) 664-2488
FAX: (330) 664-2686

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.

STRUCTURE KEY

- RESIDENTIAL
- COMMERCIAL
- OUT-BUILDING

MONUMENT LEGEND

- EXISTING R/W MONUMENT BOX
- I.R.F. IRON PIN FOUND
- I.R.S. IRON PIN SET
- P.K.F. IRON PIPE FOUND
- P.K.F. NAIL FOUND

CONVENTIONAL SYMBOLS

- P.K.F. NAIL FOUND
- I.P.F. IRON PIN FOUND
- P.F. IRON PIPE FOUND
- I.P.S. IRON PIN SET
- BENCH MARK
- MONUMENT BOX
- LIGHT POLE
- POWER POLE
- PUBLIC SIGN
- CATCH BASIN
- GAS VALVE
- GAS LINE MARKER
- MAILBOX
- DECIDUOUS TREE

- Ex SH — EX. STANDARD HIGHWAY EASEMENT
- SH — PR. STANDARD HIGHWAY EASEMENT
- TMP — PR. STANDARD TEMPORARY EASEMENT
- CONSTRUCTION LIMITS
- CENTERLINE
- —G— GAS LINE
- —OH-Comb— OVERHEAD COMBINATION LINES
- OVERHEAD ELECTRIC LINE
- GUARD RAIL
- FENCE

ABBREVIATIONS

B	BOOK
BM	BENCHMARK
CONC	CONCRETE
CNPT	CONTROL POINT
INST.	INSTRUMENT
NO.	NUMBER
P	PAGE
R	RECORD
S	SURVEYED

TYPES OF TITLE LEGEND:
SH = STANDARD HIGHWAY EASEMENT TO BE ACQUIRED IN THE NAME OF STATE OF OHIO DEPARTMENT OF TRANSPORTATION

T = TEMPORARY EASEMENT TO BE ACQUIRED IN THE NAME OF STATE OF OHIO DEPARTMENT OF TRANSPORTATION

I, TREVOR A. BIXLER, P. S. HAVE CONDUCTED A SURVEY OF THE EXISTING CONDITIONS FOR THE OHIO DEPARTMENT OF TRANSPORTATION IN SEPTEMBER AND OCTOBER, 2018. THE RESULTS OF THAT SURVEY ARE CONTAINED HEREIN. THE HORIZONTAL COORDINATES EXPRESSED HEREIN ARE BASED ON THE OHIO STATE PLANE COORDINATES SYSTEM NORTH ZONE ON NAD 83 (2011) DATUM. THE PROJECT COORDINATES (US SURVEY FEET) ARE RELATIVE TO STATE PLANE GRID COORDINATES (US SURVEY FEET) BY A PROJECT ADJUSTMENT FACTOR OF 1.0000890605. 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.

STATE OF OHIO
TREVOR A. BIXLER
7730
REGISTERED PROFESSIONAL SURVEYOR

T. A. Bixler 2-10-20

TREVOR A. BIXLER, PROFESSIONAL LAND SURVEYOR NO. 7730 DATE

UNDERGROUND UTILITIES

CONTACT BOTH SERVICES
CALL TWO WORKING DAYS
BEFORE YOU DIG

CALL
1-800-362-2764
(TOLL FREE)

OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

OIL & GAS PRODUCERS PROTECTIVE SERVICE CALL: 1-800-925-0988

FEDERAL PROJECT NO. E190917
PID NO. 92069
CALCULATED MAM CHECKED TAB
RIGHT OF WAY LEGEND SHEET
GEA-44-09.16
1 / 6

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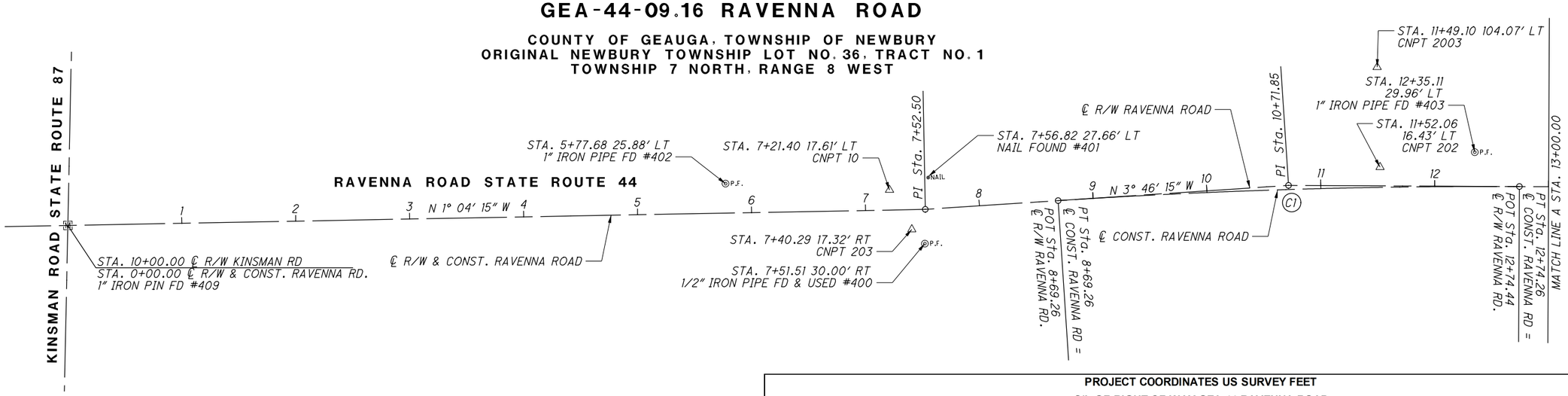
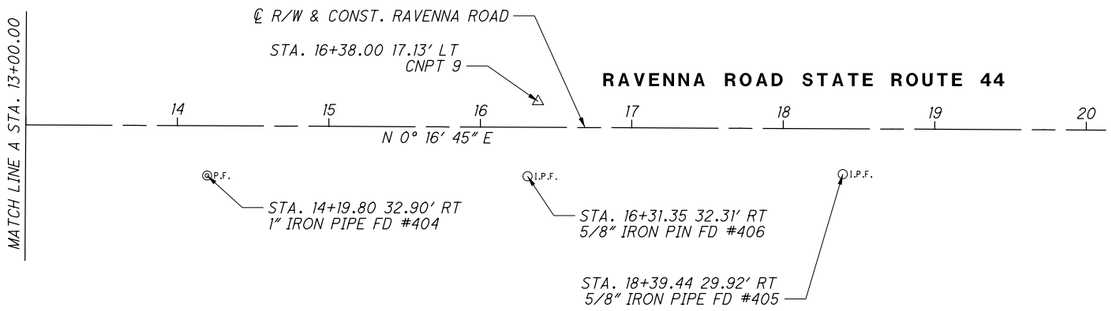
GEA-44-09.16 RAVENNA ROAD

COUNTY OF GEAUGA, TOWNSHIP OF NEWBURY
ORIGINAL NEWBURY TOWNSHIP LOT NO. 36, TRACT NO. 1
TOWNSHIP 7 NORTH, RANGE 8 WEST





CURVE DATA

C1

P.I. Sta. 10+71.85
Δ = 4° 03' 00" (RT)
Dc = 1° 00' 00"
R = 5,729.60'
T = 202.59'
L = 405.00'
E = 3.58'
C = 404.92'
C.B. = N 1° 44' 45" W

MONUMENT LEGEND

- EXISTING R/W MONUMENT BOX
- I.P.F. IRON PIN FOUND
- P.F. IRON PIPE FOUND
- I.P.S. IRON PIPE SET
- NAIL NAIL FOUND

PROJECT COORDINATES US SURVEY FEET
C/L OF RIGHT OF WAY GEA-44 RAVENNA ROAD

NUMBER	STATION	OFFSET (ft)	RT/LT	NORTH (ft)	EAST (ft)	FEATURE	DESCRIPTION
9	16+38.00	17.13	LT	661711.96	2326651.56	CNPT	3/4" X 30" IRON PIN 2" ALUM. CAP
10	7+21.40	17.61	LT	660795.65	2326669.91	CNPT	3/4" X 30" IRON PIN 2" ALUM. CAP
202	11+52.06	16.43	LT	661226.01	2326649.89	CNPT	5/8" X 30" IRON PIN WITH RED CAP
203	7+40.29	17.32	RT	660815.19	2326704.48	CNPT	5/8" X 30" IRON PIN WITH RED CAP
400	7+51.51	30.00	RT	660826.64	2326716.95	IPIPE	1/2" IRON PIPE FOUND
401	7+56.82	27.66	LT	660829.56	2326659.05	NAIL	NAIL FOUND
402	5+77.68	25.88	LT	660651.80	2326664.33	IPIPE	1" IRON PIPE FOUND
403	12+35.11	29.96	LT	661309.13	2326636.77	IPIPE	1" IRON PIPE FOUND
404	14+19.80	32.90	RT	661493.51	2326700.53	IPIPE	1" IRON PIPE FOUND
405	18+39.44	29.92	RT	661913.16	2326699.59	IPIN	5/8" IRON PIN FOUND
406	16+31.35	32.31	RT	661705.06	2326700.97	IPIN	5/8" IRON PIN FOUND
409	0+00.00	0.00		660074.70	2326701.00	MONBOX	1" IRON PIN FOUND
2003	11+49.10	104.07	LT	661223.48	2326562.24	CNPT	5/8" X 30" IRON PIN WITH RED CAP
5001	11+15.50	30.00	LT	661189.52	2326636.15	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5002	11+15.50	48.00	LT	661189.61	2326618.15	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5003	11+82.50	48.00	LT	661256.61	2326618.48	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5004	11+82.50	30.00	LT	661256.52	2326636.48	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5005	11+38.33	30.00	RT	661212.06	2326696.26	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5006	11+85.50	30.00	RT	661259.23	2326696.49	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5007	11+85.50	87.50	RT	661258.95	2326753.99	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5008	11+27.50	87.50	RT	661200.95	2326753.71	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP
5009	11+27.50	64.49	RT	661201.06	2326730.70	CALPT	3/4" X 30" IRON PIN 2" ALUM. CAP

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T. A. Bixler 2-10-20

TREVOR A. BIXLER, PROFESSIONAL LAND SURVEYOR NO. 7730 DATE:

STATE OF OHIO
TREVOR A. BIXLER
7730
REGISTERED PROFESSIONAL SURVEYOR

SURVEYOR'S NOTES:

1. THE HORIZONTAL DATUM IS THE OHIO STATE PLANE, NORTH ZONE NAD83(2011) GRID NORTH.

THIS SURVEY IS ON GROUND COORDINATES.

GRID (U.S. SURVEY FEET) VALUES WERE CONVERTED TO GROUND (U.S. SURVEY FEET) VALUES USING A PROJECT ADJUSTMENT FACTOR (PAF) OF 1.0000890605.

2. VERTICAL DATUM IS NAVD 1988.

3. EXISTING RIGHT OF WAY WIDTH AND LOCATION WERE DETERMINED BY CENTERLINE AND RIGHT OF WAY MONUMENTS FOUND, GEAUGA COUNTY RECORDS AND TAX MAPS. ADDITIONAL RECORDS USED ARE LISTED BELOW:

ROADWAY PLANS:
PAINESVILLE - RAVENNA ROAD GEA-44 (8.88-10.92) DATED 3-19-1926
GEA-44 (8.88-15.86) DATED 8-30-1950

SURVEYS:

PLAT OF SURVEY FOR O'REILLY LAND CO. LTD PREPARED BY SCHWARTZ LAND SURVEYING, INC. DATED 8-15-2004

PLAT OF SURVEY OF GLIDDEN ESTATES PREPARED BY F.R. ZETHMAYR DATED JUNE AND AUGUST, 1944.

SETTING OF ALL MONUMENTS SHALL BE PERFORMED BY A SURVEYOR REGISTERED IN THE STATE OF OHIO.

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.

RECEIVED _____, 20___
RECORDED _____, 20___
BOOK _____ PAGE _____
COUNTY RECORDER

2 / 6

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HORIZONTAL SCALE IN FEET
0 25 50 100

PID NO. 92069

R/W DESIGNER MAM
R/W REVIEWER TAB

CENTERLINE PLAT

GEA-44-09.16

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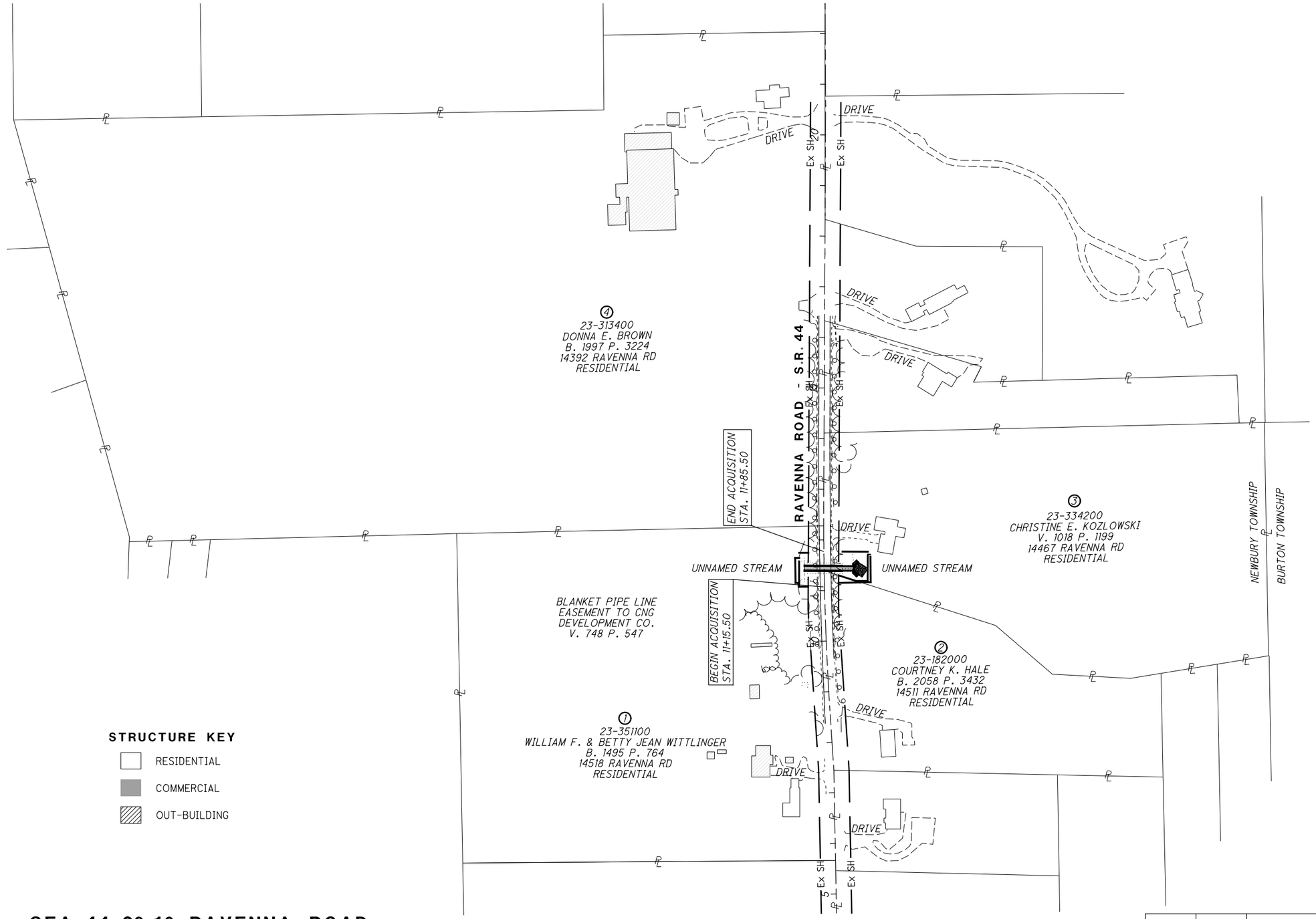

GEA-44-09.16 RAVENNA ROAD

COUNTY OF GEAUGA, TOWNSHIP OF NEWBURY
ORIGINAL NEWBURY TOWNSHIP LOT NO. 36, TRACT NO. 1
TOWNSHIP 7 NORTH, RANGE 8 WEST

REV. BY	DATE	DESCRIPTION

DATE COMPLETED

HORIZONTAL SCALE IN FEET
0 50 100 200

PID NO. 92069

R/W DESIGNER MAM
R/W REVIEWER TAB

PROPERTY MAP

GEA-44-09.16

3 / 6

0
0

TOTAL NUMBER OF :

3 OWNERSHIPS
5 PARCELS
0 TOTAL TAKES
0 OWNERSHIPS W/ STRUCTURES INVOLVED

GRANTEE:

ALL RIGHT OF WAY ACQUIRED IN THE NAME OF
STATE OF OHIO DEPT. OF TRANSPORTATION UNLESS OTHERWISE SHOWN.

TYPES OF TITLE LEGEND:
SH = STANDARD HIGHWAY EASEMENT
T = TEMPORARY EASEMENT

ALL AREAS IN ACRES

PARCEL NO.	OWNER	SHEET NO.	OWNERS RECORD	AUDITOR'S PARCEL	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUC-TURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS	AS ACQUIRED BOOK	AS ACQUIRED PAGE
1-SH	WILLIAM F. & BETTY JEAN WITTLINGER	5-6	B. 1495 P. 764	23-351100	10.9810(D)	0.4555	0.0277	0.0000	0.0277	N	10.4978			RELINE EXISTING CULVERT, EXISTING WING WALLS		
														3-12" TREES		
1-T		5-6					0.0085		0.0085	N				RELINE EXISTING CULVERT		
2-T	COURTNEY K. HALE	5-6	B. 2058 P. 3432	23-182000	4.2000(A)	0.2691	0.0073		0.0073	N				RELINE EXISTING CULVERT, CONSTRUCT NEW CULVERT		
														CONSTRUCT NEW HEADWALL, PERFORM GRADING		
3-SH	CHRISTINE E. KOZLOWSKI	5-6	V. 1018 P. 1199	23-334200	8.4000(A)	0.1905	0.0723	0.0000	0.0723	N		8.1372		RELINE EXISTING CULVERT, CONSTRUCT NEW CULVERT,		
														CONSTRUCT NEW HEADWALL, PERFORM GRADING		
														12" AND 21" TREES		
3-T		5-6					0.0080		0.0080	N			100% STATE	RELINE EXISTING CULVERT, CONSTRUCT NEW CULVERT,		
														CONSTRUCT NEW HEADWALL, PERFORM GRADING		
4	DONNA E. BROWN	5-6	B. 1997 P. 3224	23-313400	33.5030(D)									NO ADDITIONAL R/W REQUIRED		

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

(A) AREA FROM GEAUGA COUNTY AUDITOR
(D) AREA FROM OWNERS RECORD

NET RESIDUE = RECORD AREA - TOTAL PRO - NET TAKE

NET TAKE = GROSS TAKE - PRO IN TAKE

NOTE: ALL TEMPORARY PARCELS TO BE OF 12 MONTH DURATION.

REV. BY	DATE	DESCRIPTION
FIELD REVIEW BY KEVIN STRAUSER		DATE: 02-07-20
OWNERSHIP VERIFIED BY: MARK MCNULTY		DATE: 1-20-20
DATE COMPLETED		

FEDERAL PROJECT NO. E190917
PID NO. 92069
STATE JOB NO. 527381
R/W DESIGNER MAM
R/W REVIEWER TAB

SUMMARY OF ADDITIONAL R/W

GEA-44-09.16

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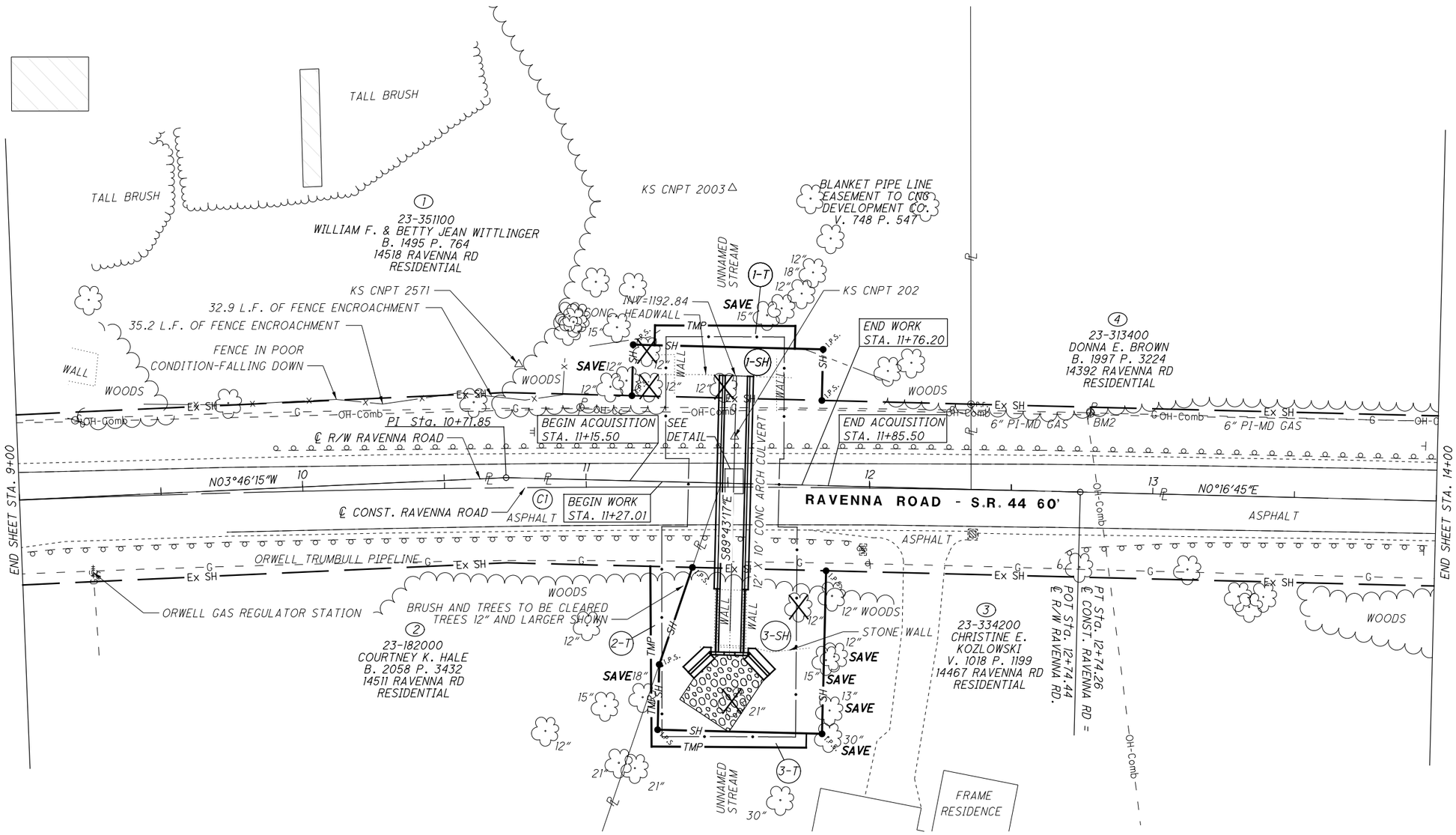
GEA-44-09.16 RAVENNA ROAD

COUNTY OF GEAUGA, TOWNSHIP OF NEWBURY
ORIGINAL NEWBURY TOWNSHIP LOT NO. 36, TRACT NO. 1
TOWNSHIP 7 NORTH, RANGE 8 WEST



℄ CURVE DATA

C1

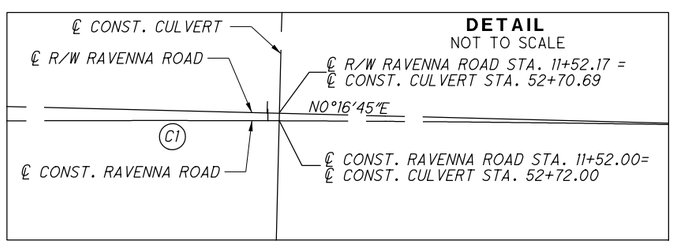
P.I. Sta. 10+71.87
Δ = 4° 03′ 00″ (RT)
Dc = 1° 00′ 00″
R = 5,729.60′
T = 202.59′
L = 405.00′
E = 3.58′
C = 404.92′
C.B. = N 1° 44′ 45″ W

STRUCTURE KEY

- RESIDENTIAL
- COMMERCIAL
- OUT-BUILDING

FOR BENCHMARKS SEE PID 92069 CUY-90-18.22/VAR CONSTRUCTION SITE PLAN FOR THE GEA-44-09.16 LOCATION.

TREES 12" AND LARGER LOCATED



REV. BY	DATE	DESCRIPTION

DATE COMPLETED

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HORIZONTAL SCALE IN FEET
0 10 20 40

PID NO. 92069

R/W DESIGNER MAM
R/W REVIEWER TAB

RIGHT OF WAY PLAN
STA 9+00 TO 14+00

GEA-44-09.16

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GEA-44-09.16 RAVENNA ROAD

COUNTY OF GEAUGA, TOWNSHIP OF NEWBURY
ORIGINAL NEWBURY TOWNSHIP LOT NO. 36, TRACT NO. 1
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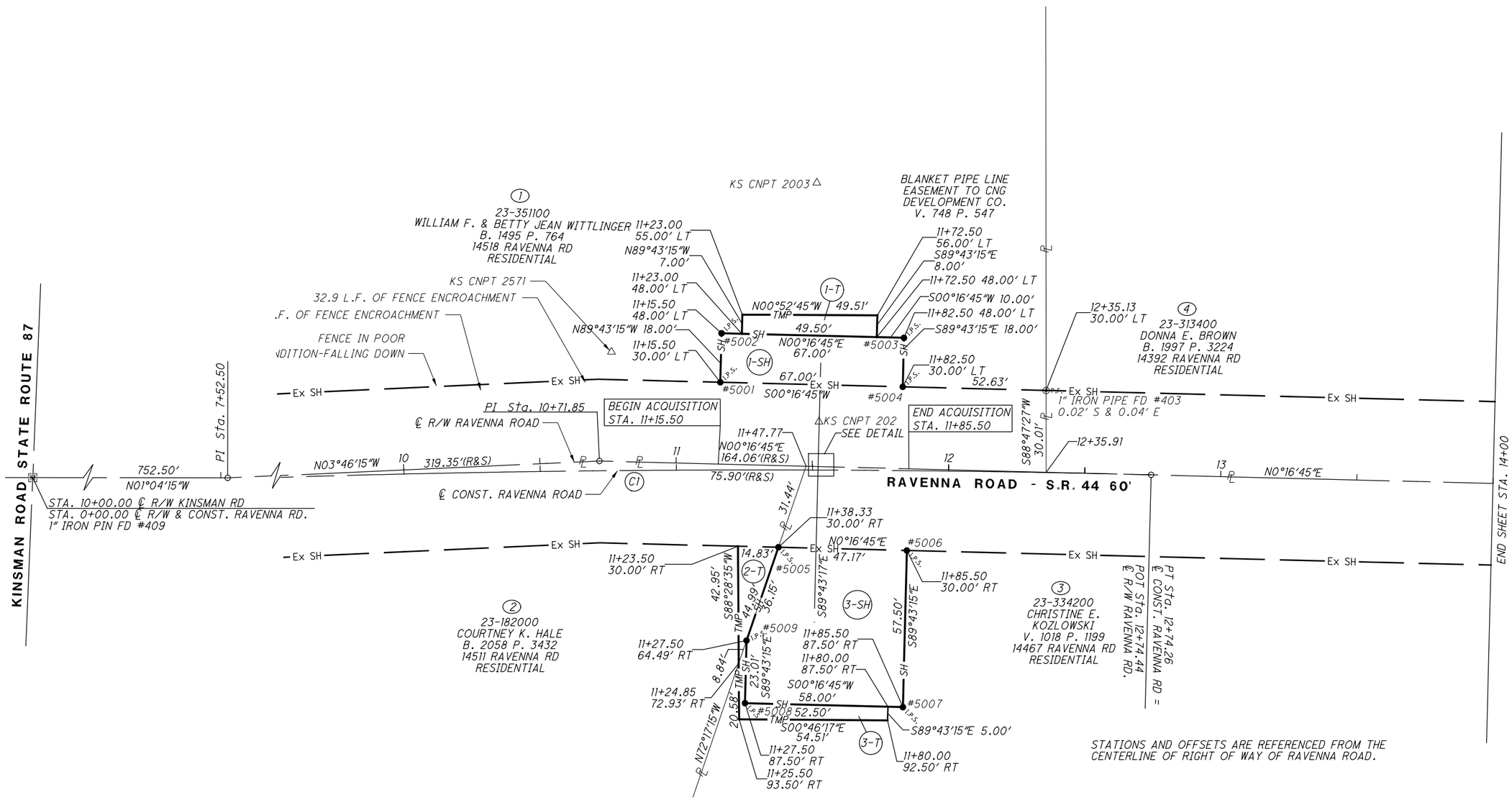

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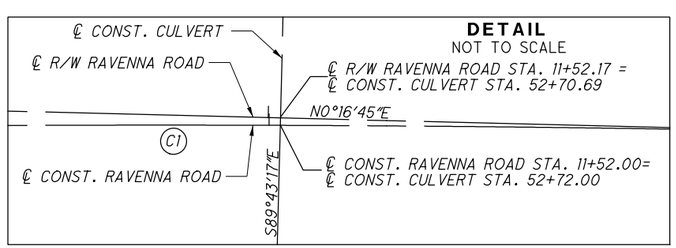

REV. BY	DATE	DESCRIPTION
DATE COMPLETED		

HORIZONTAL SCALE IN FEET
0 10 20 40

PID NO. 92069

R/W DESIGNER MAM
R/W REVIEWER TAB

RIGHT OF WAY PLAN
STA 9+00 TO 14+00

GEA-44-09.16

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SPECIAL PROVISIONS

WATERWAY PERMITS CONDITIONS

C-R-S: CUY-90-18.22/VAR

PID: 92069

Date: 11/10/2020

1. Waterway Permits Time Restrictions:

Regional General Permit – Section B (Maintenance) is authorized for CUY-90-18.22/VAR, PID 92069. A copy of Regional General Permit B shall be kept at the work site at all times and made available to all contractors and subcontractors. The permit is effective starting: November 10, 2020. The permit expires: October 24, 2024.

For authorized work in aquatic resources (including streams, wetlands, jurisdictional ditches, captured streams, lakes, ponds), the Department will consider the Contractor's submission of a reauthorization to the waterway permit expiration date based on project constraints. If more than one permit is authorized for the project, then all permits become invalid once the first permit expires. In order for the request to be considered, the Contractor must submit a justification to the Engineer at least 90 days prior to the waterway permit expiration date. The Engineer will submit the request for a time extension to the Ohio Department of Transportation, Office of Environmental Services, Waterway Permits Unit (ODOT-OES-WPU) for consideration and coordination with the U.S. Army Corps of Engineers (USACE), Ohio Environmental Protection Agency (OEPA), U.S. Coast Guard (USCG), U.S. Fish and Wildlife Service (USFWS), and Ohio Department of Natural Resources (ODNR) as appropriate.

2. Deviations From Permitted Construction Activities:

No deviation from the requirements for work in aquatic resources depicted in the plans, Special Provisions, and/or Working Drawings may be made unless a modification has been submitted to ODOT-OES-WPU and approved by the appropriate agencies (i.e., USACE, OEPA, USCG, ODNR, and USFWS).

For emergency situations resulting in unanticipated impacts to aquatic resources, provide notification (verbal or written) to the Engineer as soon as possible following discovery of the situation. Written notification to the Engineer and notification to the ODOT-OES-WPU (614-466-2159) must be made within 24 hours.

For non-emergency situations, notify the Engineer in writing for submission to the ODOT-OES-WPU (614-466-2159) for consideration and coordination with the appropriate agencies. Notification must be made at least 90 days prior to planned, non-permitted activities. Consideration of the requested deviation is at the discretion of the Director and must be coordinated with the appropriate regulatory agencies.

3. In-Stream Work Restrictions:

Work in the following aquatic resources is further restricted as follows:

Stream Name /Description	Location	Work restriction dates (No in-stream work permitted)
UNT to West Creek	CUY-480-16.28 STA. 885+50	None
UNT to West Branch Cuyahoga River	GEA-44-9.16 STA. 11+50	None

UNT = unnamed tributary stream

*Restriction dates do not apply if the stream has been dewatered prior to April 15.

In-stream work has been defined as the placement and/or removal of fill materials (temporary or permanent) below ordinary high water of a stream. Examples of "fill" include, but are not limited to: bridge piers, abutments, culverts, rock channel protection, scour protection, and temporary access fills.

Fills placed within a stream identified in the above table (outside of the work restriction dates) can continue to be worked from during the work restriction dates, but cannot be expanded, removed, or otherwise modified (below ordinary high water) until once again outside of the work restriction dates.

4. Materials:

Materials utilized in or adjacent to aquatic resources for temporary or permanent fill or bank protection shall consist of suitable material free from toxic contaminants in other than trace quantities. Asphalt products are specifically excluded for use as fill. Chromated Copper Arsenate (CCA), creosote, and other pressure treated lumber shall not be used in structures that are placed in aquatic resources.

5. Cultural Resources:

Per CMS 107.10, if archeological sites, historical sites, or human remains are discovered, cease all work in the immediate area and notify the Engineer who will immediately contact the ODOT-District Environmental Coordinator and ODOT-OES-Cultural Resource Section at 614-466-2159. In the event of human remains are identified by OES-Cultural Resources Section, the Engineer shall also contact the Cuyahoga County Sheriff's Office at (216) 443-6000 or the Geauga County Sheriff's Office at (440) 286-1234.

6. Aquatic Resource Demarcation:

The table below includes detailed fill quantities authorized within the aquatic resources. Aquatic resources not authorized for impact by these Special Provisions shall be demarcated in the field as per SS 832 prior to site disturbance. The fence shall remain in place and be maintained throughout the construction process. Following the completion of the project, the fence and posts shall be removed.

Resource ID	Resource Location	Impact Location	Temporary Impact Amount	Permanent Impact Amount	Total Impact Amount
UNT to West Creek	CUY-480-16.28	STA. 885+50	88 feet (0.036 acre)	88 feet (0.036 acre)	88 feet (0.036 acre)
UNT to West Branch Cuyahoga River	GEA-44-9.16	STA. 11+50	73 feet (0.034 acre)	73 feet (0.034 acre)	73 feet (0.034 acre)
Wetland A	CUY-480-16.28	STA. 881+00	0 acre	0.023 acre	0.023 acre
Wetland B	CUY-480-16.28	STA. 884+50	0 acre	0.218 acre	0.218 acre
Wetland D	GEA-44-9.16	STA. 11+50	0 acre	0.017 acre	0.017 acre

7. Spill containment:

Provide and Maintain an Oil Spill Kit with a minimum capacity of 65 gallons. The Spill Kit shall contain:
- 6 - 3 in. X 8 ft. Oil only socks
- 4 - 18 in. X18 in. Oil only pillows
- 2 - 5 in. X 10ft. Booms

- 50 - 16in. X 20 in. Oil only pads
- 10- Disposable Bags
- 1 - 65 Gallon drum with lid
- 25 pounds of Granular Oil Absorbent

The Oil Spill Kit shall be located within 150 feet of any equipment working in a stream or wetland. The oil Spill Kit shall be maintained for the life of the contract. Any materials utilized during the project will be replaced within 48 hours. All costs associated with furnishing and maintaining the above referenced spill containment kit is incidental to work.

8. Blasting:

State law requires notification to the Ohio Department of Natural Resources should blasting be required within or near stream channels (See ORC 1533.58 & CMS 107.09). Notify the Engineer, in writing, a minimum of 30 days in advance of blasting, for submission to ODOT-OES-WPU (614-466-2159) for coordination with ODNR.

9. Project Inspection:

Inspection of Work may include inspection by representatives of other government agencies or railroad corporations that pay a portion of the cost of the Work or regulate the Work through State and Federal law. Comments from the representatives of these agencies shall be directed to the Engineer who will immediately contact the ODOT-District Environmental Coordinator and ODOT-OES-WPU at 614-466-2159.

10. Temporary Access Fills:

Special Provisions Notes:

Definitions:

Hydraulic Opening
The cross-sectional area allowing an unimpeded discharge equal to twice the highest monthly flow without producing a rise in the backwater above the Ordinary High Water Mark (OHWM).

Standard Temporary Discharge
Discharge equal to twice the *highest monthly flow* without producing a rise in the backwater above the OHWM. The U.S. Geologic Service publication "Techniques for estimating Selected Streamflow Characteristics of Rural Unregulated Streams in Ohio" provides equations that estimate monthly flow for Ohio Waterways These flows are also available in a web application by USGS StreamStats, (https://water.usgs.gov/osw/streamstats/ohio.html). The highest monthly flow is the highest monthly mean discharge occurring in a 12-month period from January to December.

Average Monthly Flow
The average monthly flow represents the estimated "normal" flow.

Temporary Access Fills (TAFs)
Include, but are not limited to, dewatering fills, causeways, cofferdams, access pads, temporary bridges, etc. below the OHWM.

Requirements

21 calendar days prior to the initiation of any in-stream work, provide the Engineer with Working Drawings that include:

- Plan view drawing (50 scale or less) showing the location of all TAFs proposed for use on the project
- Scaled cross section and profile drawing showing the OHWM and the proposed hydraulic opening.
- Identify the minimum diameter size, placement location and thickness of non-erodible Dumped Rock Fill material on the plan and profile.
- Calculations analyzing the hydraulic impacts of the TAF on the waterway. Include in the calculations an analysis of the hydraulic opening sized adequately to pass the Standard Temporary Discharge without producing a rise in backwater above the OHWM. Include, in the analysis, calculated channel velocities adjacent to the TAF, culvert exit velocities, calculated headwater and tailwater elevations, and any additional appropriate calculations to assess potential impacts to the waterway during normal and anticipated high flow (twice the highest monthly flow) events.
- A description of all temporary material to be placed below the OHWM elevation.
- A description of the installation and staging of all temporary fill over the life of the contract.
- Identify the protection methods and/or structural Best Management Practices for minimizing impacts to the waterway.
- Volume of temporary fill below the OHWM elevation.
- A description of the diversion ditches, equipment, conduits or means for maintaining normal flows in the waterway.
- A description of the removal of all temporary fill and restoration of the channel and all areas impacted by the TAFs.
- A schedule outlining the timing of the placement and removal of all temporary fill.
- Have competent individuals prepare and check the Working Drawings and hydraulic calculations. Provide a cover sheet containing the preparer(s) and checker(s): First Name, Last Name and Initials. The preparer(s) and checker(s) shall not be the same individual. Have an Ohio Registered Engineer review, approve, sign, seal and date the Working Drawings and hydraulic calculations according to ORC 4733 and OAC 4733-35. Include the following statement on the Working Drawings: "These Working Drawings were prepared in compliance with the terms of these Special Provisions and all contract documents."

Do not begin in-stream work until the Engineer has accepted the Working Drawings and hydraulic calculations.

The design and construction of the Contractor's TAF must minimize impacts to water bodies, stream banks, stream beds, and riparian zones to the maximum extent practicable.

Fording of waterways and other aquatic resources is prohibited.

Construct TAFs in such a manner that will maintain flows, minimize upstream flooding, and avoid overtopping the TAF on a regular basis. ***TAFs shall be designed and constructed so that the hydraulic opening provides capacity for a discharge equal to twice the highest monthly flow without producing a rise in the backwater above the (OHWM)***.

If the Contractor proposes a TAF which does not meet all the requirements of these Special Provisions, the Contractor must submit a request in writing for a modified TAF to the Engineer. The request must include all Working Drawings and hydraulic calculations required by these Special Provisions. The Department makes no guarantee to grant the request. The Contractor's proposed TAF request will be coordinated by OES with the USACE and the OEPA, as appropriate. The time frame allowed for the coordination of the contractor's proposed TAF will be a minimum of 60 days.

Installation of any temporary fill without appropriate authorization is strictly prohibited. All direct coordination with the USACE and/or OEPA will be performed through OES.

TAFs Construction and Payment

Begin planning and installing causeways and access fills as early in construction as possible to avoid conflicts with these Special Provisions or other environmental commitments that have been included in the construction plans.

TAFs in Streams and Rivers may include, but are not limited to, causeways, cofferdams, access pads, sheet piling, temporary bridges, etc. The Contractor must make every attempt to minimize disturbance to waterbodies, stream banks, stream beds and riparian zones during the construction, maintenance, and removal of the TAF. Construct the TAFs as narrow as practical. Install in-stream conduits parallel to the stream banks. Make the TAFs in shallow areas rather than deep pools where possible. Minimize clearing, grubbing, and excavation of stream banks, and approach sections. Construct the TAFs as to not cause erosion or allow sediment deposits in the waterway.

Prior to the initiation of any in-stream work, establish a monument upstream of the proposed TAF to visually monitor the water elevation in the waterway where the fill is permitted. Maintain the monument throughout the project. Provide a visual mark on the monument that identifies the elevation 1 foot above the OHWM. Ensure that the monument can be read from the bank of the waterway. Have this elevation set and certified by an Ohio Registered Surveyor. All costs associated with furnishing and maintaining the above referenced monument is incidental to the work.

Should the surface water elevation exceed the elevation 1 foot above OHWM, the Department will compensate the Contractor for repair of any resulting damage to the TAF up to the elevation of 1 foot above the OHWM, except as noted. The Department will recognize this event as an excusable, non-compensable delay in accordance with Section 108.06 B. of the Construction & Materials Specifications.

Follow the requirements in Item 502 for Structures for Maintaining Traffic and in Item 503 for Cofferdams and Excavation Bracing and any modifications to these items as shown in the plans. The Department will not pay for repair and maintenance of TAFs associated with Items 502 and 503 as a result of surface water elevation exceeding 1 foot above the OHWM. Compensation for damages associated with waterway flows will be provided as described in Items 502 and 503.

Construct the TAFs, not including Items 502 and 503, to a water elevation at least 1 foot (0.3 m) above the OHWM. If more than one-third the width of the stream is filled, then use culvert pipes to allow the movement of aquatic life. Ensure that any ponding of water behind the TAF will not damage property, flood roadways, or threaten human health and safety.

The following minimum requirements apply to TAFs where culverts are used.

A. Furnish culverts on the existing stream bottom.
B. Avoid a drop in water elevation at the downstream end of the culvert that would result in an adverse impact to the waterway.
C. Furnish a sufficient number of culverts in addition to stream openings to provide a discharge equal to twice the highest monthly flow without producing a rise in the backwater above the OHWM.
D. Furnish culverts with a minimum diameter of 18 inches (0.5 m).

All TAFs must be constructed of suitable materials. Causeways and access fills must be encapsulated with clean, non-erodible, nontoxic Dumped Rock Fill, Type A, B, C, or D, meeting the requirements of C&MS 703.19.B. Utilize appropriately sized Dumped Rock Fill determined by the Contractor's engineer for encapsulating the sides of the TAF. Encapsulate all sides of the TAF with the non-erodible material. For causeways, contractors may use clean aggregate meeting C&MS 703.01 Size Number 1 and 2 for creating a working surface above the OHWM. Extend the non-erodible encapsulating material to at least the elevation of the top of the working surface. Extend clean aggregate up the slope from the original

stream bank for 50 feet (10 m) to remove erodible material and prevent tracking from equipment onto the TAF.

When the work requiring TAF is complete, all portions of the TAF (including all rock and culverts) will be removed in its entirety. Do not dispose of TAF material in other aquatic resources or where erosion into another aquatic resource is possible. The stream bottom affected by the TAFs will be restored to its pre-construction elevations. The TAFs will not be paid as a separate item but will be included by the Contractor as part of the total project cost.

Unless specific TAF compensation is included in the plans, all environmental protection and control associated with the authorized activities, are incidental to the work within the boundaries of the aquatic resources.

11. Excavation Activities:

Excavated material will be placed at an upland site and disposed of in such a manner that sediment and runoff to streams and other aquatic resources is controlled and minimized. Additionally, no more than incidental fallback into aquatic resources is permitted during the excavation process. If any changes to the proposed work are deemed necessary, notify the Engineer who will immediately contact the ODOT-District Environmental Coordinator and ODOT-OES-WPU at 614-466-2159

12. Demolition Debris:

The temporary discharge of demolition debris into aquatic resources (including but not limited to bridges, culverts, abutments, wing walls, piers) is conditionally authorized for this project. Perform demolition activities in a manner to prevent the discharge of fine (erodible) debris into aquatic resources. Utilize TAF or other catchment methods accepted by the Engineer and authorized by these Special Provisions to prevent erodible demolition debris from entering aquatic resources. Demolition debris may not remain in the waterway for more than 72 hours and must be removed in its entirety. If removal of debris material cannot be achieved within 72 hours, notify the Engineer in writing, who will contact ODOT-OES-WPU at 614-466-2159.