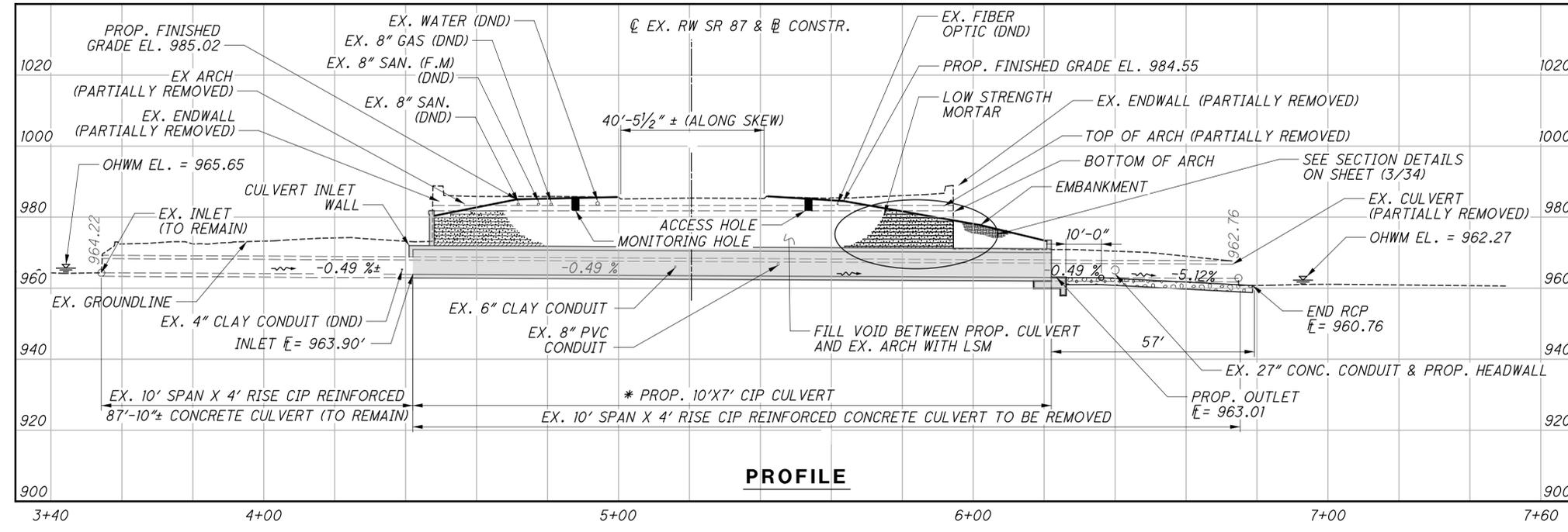
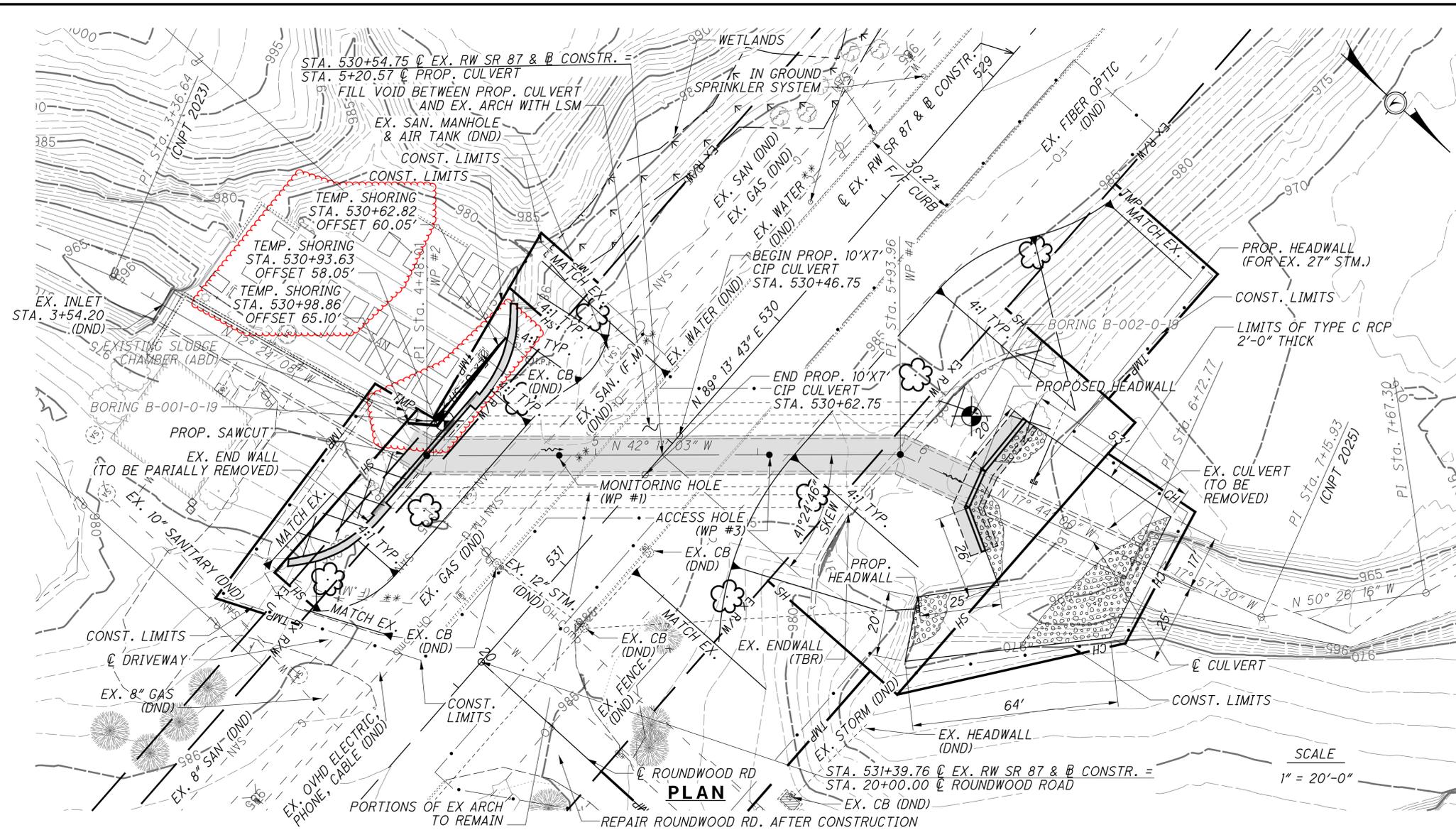


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SURVEY CONTROL DATA

MON 5000	STA. 509+19.01,	ELEV. 1009.39,	OFFSET @ SR 87
CNPT 10001	STA. 529+13.41,	ELEV. 986.05,	OFFSET 23.87', LT
CNPT 10002	STA. 531+12.05,	ELEV. 982.27,	OFFSET 120.13', LT
CNPT 10000	STA. 532+58.14,	ELEV. 987.39,	OFFSET 34.86', RT
MON 5001	STA. 543+10.67,	ELEV. 993.81,	OFFSET @ SR 87
CNPT 2025	STA. 529+70.46,	ELEV. 962.09,	OFFSET 171.65', LT
CNPT 2023	STA. 531+25.20,	ELEV. 965.26,	OFFSET 163.49', RT

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET 34

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.
 ALL SLOPES ARE 4:1 HORIZONTAL TO VERTICAL UNLESS OTHERWISE NOTED
 DESIGN TRAFFIC:
 2022 ADT = 7500 2022 ADTT = 675
 2042 ADT = 8700 2042 ADTT = 783
 DIRECTIONAL DISTRIBUTION = 60%

LEGEND

- ⊙ CORING LOCATION
- ⊙ BORING LOCATION
- ⊙ DND - DO NOT DISTURB
- ⊙ TBD - TO BE DETERMINED
- ⊙ TBR - TO BE REMOVED
- ⊙ ABD - ABANDONED
- ⊙ ROCK CHANNEL PROTECTION
- ⊙ ** - LOCATION PER MAPPING FROM CHAGRIN VALLEY ENGINEERING, LTD.

HYDRAULIC DATA

DRAINAGE AREA = 0.47 SQ. MILES
 Q (25) = 198 CFS WSEL (25) = 968.11 V (25) = 2.91 FT/S
 Q (100) = 292 CFS WSEL (100) = 969.29 V (100) = 3.38 FT/S

EXISTING STRUCTURE

TYPE: CAST-IN-PLACE REINFORCED CONCRETE ARCH (TO BE FILLED) SPANNING EXISTING ±10' x 4' CAST IN PLACE BOX CULVERT (TO BE PARTIALLY REPLACED)

SPANS: 29'-8"±
 ROADWAY: 30'-0"± F/F CURB
 LOADING: H-20
 SKEW: RT FWD 41°24'46"±
 APPROACH SLABS: NONE
 ALIGNMENT: TANGENT
 CROWN: NORMAL
 STRUCTURAL FILE NUMBER: 1807536
 DATE BUILT: 1933
 DISPOSITION: TO BE PARTIALLY REMOVED

PROPOSED STRUCTURE

TYPE: FOUR-SIDED CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT (10'x7')

SPANS: 13'-4" CLEAR SPAN (ALONG SKEW)
 ROADWAY: 30'-0"± F/F CURB
 LOADING: HL-93 + 60 PSF FWS
 SKEW: RT FWD 41°24'46"
 APPROACH SLABS: NONE
 ALIGNMENT: TANGENT
 CROWN: 0.016± FT/FT
 COORDINATES: LATITUDE N 41° 27' 36.82"
 LONGITUDE W 81° 25' 50.10"

DESIGN AGENCY: STAHL SHEAFFER ENGINEERING, LLC
 1401 SOUTH MAIN STREET SUITE 203
 NORTH CANTON, OHIO 44720
 DATE: 02/25/21
 REVIEWED: DLG
 DRAWN: PDF
 DESIGNED: PDF
 CUYAHOGA COUNTY
 STA. 530+46.38
 STA. 530+62.32
 CULVERT PLAN
 CUY-087-15.12
 SR 87 OVER GRISWALD CREEK
 CUY-087-15.12
 PID No. 21806
 1/17
 12/34

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 7TH EDITION (2014), INCLUDING THE 2015 AND 2016 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL, 2019.

DESIGN LOADING

DESIGN LOADING: HL-93

FUTURE WEARING SURFACE (FWS) OF 0.060 KIPS/SQ.FT.

DESIGN DATA

CONCRETE CLASS QC1
-COMPRESSIVE STRENGTH 4.0 KSI (SUBSTRUCTURE)

REINFORCING STEEL
-MINIMUM YIELD STRENGTH 60 KSI

ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN

THIS ITEM SHALL INCLUDE THE ELEMENTS INDICATED IN THE PLANS AND GENERAL NOTES AND THAT ARE NOT SEPARATELY LISTED FOR PAYMENT, EXCEPT FOR WEARING COURSE REMOVAL. ITEMS TO BE REMOVED INCLUDE ALL EXISTING MATERIALS BEING REPLACED BY NEW CONSTRUCTION AND MISCELLANEOUS ITEMS THAT ARE NOT SHOWN TO BE INCORPORATED INTO THE FINAL CONSTRUCTION AND ARE DIRECTED TO BE REMOVED BY THE ENGINEER. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE-RAMS WILL NOT BE PERMITTED. THE METHOD OF REMOVAL AND THE WEIGHT OF HAMMER SHALL BE APPROVED BY THE ENGINEER. PERFORM ALL WORK IN A MANNER THAT WILL NOT CUT, ELONGATE OR DAMAGE THE EXISTING REINFORCING STEEL TO BE PRESERVED. SHIELD, STABILIZE AND PROTECT ANY NEARY UNDERGROUND UTILITY, DRAINAGE OR SEWER LINES, AND MAN-HOLES OR CHAMBERS THAT ARE EXPOSED DURING THE ARCH OR CULVERT DEMOLITION. MAINTAIN THIS PROTECTION DURING CONSTRUCTION AS APPROVED BY THE ENGINEER SUBMIT CONSTRUCTION PLANS ACCORDING TO C&MS 501.05.

CUT LINE CONSTRUCTION JOINT PREPARATION

SAW CUT BOUNDARIES OF PROPOSED CONCRETE REMOVALS 1 INCH DEEP. REMOVE CONCRETE TO A ROUGH SURFACE. LEAVE THE EXISTING REINFORCING STEEL, IF REQUIRED IN THE PLANS, IN PLACE. INSTALL DOWEL BARS IF SPECIFIED. PRIOR TO CONCRETE PLACEMENT ABRASIVELY CLEAN JOINT SURFACES AND EXISTING EXPOSED REINFORCEMENT TO REMOVE LOOSE AND DISINTEGRATED CONCRETE AND LOOSE RUST. THOROUGHLY CLEAN THE JOINT SURFACE AND EXPOSED REINFORCEMENT OF ALL DIRT, DUST, RUST OR OTHER FOREIGN MATERIAL BY THE USE OF WATER, AIR UNDER PRESSURE, OR OTHER METHODS THAT PRODUCE SATISFACTORY RESULTS. EXISTING REINFORCING STEEL DOES NOT HAVE TO HAVE A BRIGHT STEEL FINISH BUT REMOVE ALL PACK AND LOOSE RUST. THOROUGHLY DRENCH EXISTING CONCRETE SURFACES WITH CLEAN WATER AND ALLOW TO DRY TO A DAMP CONDITION BEFORE PLACING CONCRETE.

ITEM 613 - LOW STRENGTH MORTAR, AS PER PLAN

PROVIDE TYPE 2 LOW STRENGTH MORTAR ONLY IN ACCORDANCE WITH ITEM 613.03. OTHER LOW STRENGTH MORTAR TYPES ARE PROHIBITED.

SUBSTRUCTURE CONCRETE REMOVAL

REMOVE CONCRETE BY MEANS OF APPROVED PNEUMATIC HAMMERS EMPLOYING POINTED AND BLUNT CHISEL TOOLS. HYDRAULIC HOE-RAM TYPE HAMMERS WILL NOT BE PERMITTED. THE WEIGHT OF THE HAMMER SHALL NOT BE MORE THAN 35 POUNDS FOR REMOVAL WITHIN 18 INCHES OF PORTIONS TO BE PRESERVED. OUTSIDE THE 18 INCH LIMIT, THE CONTRACTOR MAY USE HAMMERS NOT EXCEEDING 90 POUNDS UPON THE APPROVAL OF THE ENGINEER. DO NOT PLACE PNEUMATIC HAMMERS IN DIRECT CONTACT WITH REINFORCING STEEL THAT IS TO BE RETAINED IN THE REBUILT STRUCTURE.

FOUNDATION BEARING RESISTANCE

HEADWALL AND WINGWALL FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM SERVICE LOAD PRESSURE OF 1.6 KIPS PER SQUARE FOOT AND A MAXIMUM STRENGTH LOAD PRESSURE OF 2.2 KIPS PER SQUARE FOOT. THE FACTORED BEARING RESISTANCE IS 6.1 KIPS PER SQUARE FOOT.

ITEM 519 - PATCHING CONCRETE STRUCTURES, AS PER PLAN

THIS ITEM SHALL INCLUDE THE REMOVAL AND REPAIR OF SPALLED AND UNSOUND CONCRETE AND SUBSEQUENT CONCRETE PATCHING, IN ACCORDANCE WITH CMS ITEM 519, WHERE INDICATED IN THE PLANS AND AS DIRECTED BY THE ENGINEER. A UNITARY COST ONE (1) SQ. FT. HAS BEEN INCLUDED IN THE ESTIMATED QUANTITIES AND WILL BE PAID FOR AT THAT UNIT COST, FOR A QUANTITY AGREED TO BY THE ENGINEER, UPON REVIEW OF THE CONTRACTOR'S SOUNDING SURVEY (SEE ITEM SPECIAL BELOW).

PRIOR TO THE SURFACE CLEANING SPECIFIED IN 519.04 AND WITHIN 24 HOURS OF PLACING PATCHING MATERIAL, BLAST CLEAN ALL SURFACES TO BE PATCHED INCLUDING THE EXPOSED REINFORCING STEEL. ACCEPTABLE METHODS INCLUDE HIGH-PRESSURE WATER BLASTING WITH OR WITHOUT ABRASIVES IN THE WATER, ABRASIVE BLASTING WITH CONTAINMENT, OR VACUUM ABRASIVE BLASTING.

ITEM SPECIAL - PATCHING CONCRETE STRUCTURES, (SOUNDING SURVEY)

THIS ITEM SHALL INCLUDE A SURVEY BY THE CONTRACTOR TO DETECT AND MARK AREAS OF UNSOUND CONCRETE BY MANUALLY SOUNDING WITH A HAMMER, WHERE INDICATED IN THE PLANS AND AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL RECORD THE AREAS, BOTH ALREADY SPALLED AND DETECTED BY SOUNDING, BY MARKING THE CONCRETE WITH HEAVY LUMBER CRAYON IN APPROXIMATELY RECTANGLE SHAPES AND SUBSHAPES, AND THEN MEASURING, MARKING THE PERIMETER DIMENSIONS ON THE CONCRETE. THE AREAS SHALL THEN BE RECORDED, TALLIED AND SUBMITTED TO THE ENGINEER FOR REVIEW.

CALC:	DLG	2/24/2021
CHECKED:	SNS	5/21/2021

ESTIMATED QUANTITIES

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION
202	11202	LS		PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN
503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN
503	21300	LS		UNCLASSIFIED EXCAVATION
509	10000	52083	LB	EPOXY COATED REINFORCING STEEL
510	10000	372	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT
511	46010	18.7	CY	CLASS QC1 CONCRETE, RETAINING WALL NOT INCLUDING FOOTING
511	46510	40.5	CY	CLASS QC1 CONCRETE, FOOTING
511	47011	260	CY	CLASS QC1 CONCRETE, CULVERT, AS PER PLAN
511	50210	39.2	CY	CLASS QC1 CONCRETE, SUBSTRUCTURE
512	10100	200	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
512	33001	612	SY	TYPE 2 WATERPROOFING, AS PER PLAN
516	13600	29	SF	1" PREFORMED EXPANSION JOINT FILLER
518	21200	17	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC
519	11100	1	SF	PATCHING CONCRETE STRUCTURE
519	60000	LS		SPECIAL PATCHING CONCRETE STRUCTURE, AS PER PLAN (SOUNDING SURVEY)
613	41301	1062	CY	LOW STRENGTH MORTAR BACKFILL (TYPE 2), AS PER PLAN

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

THIS ITEM SHALL INCLUDE THE INSTALLATION OF TEMPORARY SHORING IN ACCORDANCE WITH CMS ITEM 503 AND THIS PLAN SET. SHEET PILING WAS DESIGNED USING PYWALL SOFTWARE AND IS IN ACCORDANCE WITH AASHTO LRFD 8TH EDITION AS SUPPLEMENTED BY THE ODOT BRIDGE DESIGN MANUAL 2020 EDITION. THE WALL HAS A DESIGN HEIGHT OF 11'. SEE BEOW FOR FURTHER WALL INFORMATION AND REQUIREMENTS.

DESIGN REQUIREMENTS:
 USE ONLY CONTINUOUS SHEET PILING
 MAX. ALLOWABLE EXPOSED FACE HEIGHT - 10'
 MIN. SHEET PILE LENGTH - 30'
 MIN. EMBEDMENT LENGTH - 20' (BELOW BASE OF EXCAVATION)
 MIN. ALLOWABLE FLEXURAL STRESS OF PILE - 25 KSI
 MIN. ALLOWABLE SECTION MODULUS - 28 CUBIC INCHES (PER FOOT OF WALL)

APPROXIMATE DIMENSIONS:
 TOP OF WALL ELEVATION - 973.99
 BOTTOM OF WALL ELEVATION - 943.99
 TOTAL WALL LENGTH - 40'
 TOTAL SQUARE FOOTAGE - 1200 SF
 (SQUARE FOOTAGE IS BASED ON FULL LENGTH OF SHEET PILES)

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DESIGN AGENCY
STAHL SHEAFFER ENGINEERING, LLC
1401 SOUTH MAIN STREET STE 203
NORTH CANTON, OH 44720

DATE
02/25/21
REVIEWED
DLG
STRUCTURE FILE NUMBER
1807536

DRAWN
PDF
REVISIONS
XXX
DESIGNED
PDF
CHECKED
SNS

GENERAL NOTES AND ESTIMATED QUANTITIES
CUY-087-15.12
SR 87 (S. WOODLAND RD.) OVER GRISWALD CREEK

CUY -087 -15.12
PID No. 21806