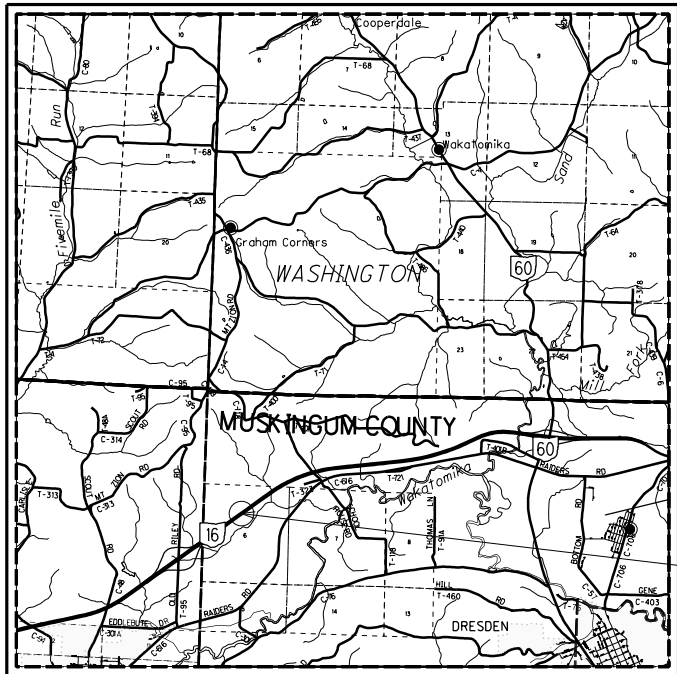


I:\ProjectData\MUS\1352\Design\Roadway\Sheets\1352\_LGTO01.dgn Sheet 3/9/2023 7:44:22 AM nkadakis



LOCATION MAP

LATITUDE: 40°08'38" LONGITUDE: -82°05'09"



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

DESIGN DESIGNATION

CURRENT ADT (2019)	6485
DESIGN YEAR ADT (2044)	6500
DESIGN HOURLY VOLUME (2044)	650
DIRECTIONAL DISTRIBUTION	50%
TRUCKS (24 HOUR B&C)	16%
DESIGN SPEED	70 MPH
LEGAL SPEED	70 MPH
DESIGN FUNCTIONAL CLASSIFICATION:	
02 OTHER FREEWAY AND EXPRESSWAY	
NHS PROJECT	YES

DESIGN EXCEPTIONS

**UNDERGROUND UTILITIES**

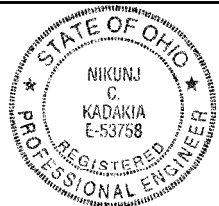
Contact Two Working Days  
Before You Dig

**OHIO811.org**  
Before You Dig

OHIO811, 8-1-1, or 1-800-362-2764  
(Non-members must be called directly)

PLAN PREPARED BY:  
ODOT OGE/DISTRICT 5

ENGINEERS SEAL:



SIGNED: *N. C. Kadakia*  
DATE: February 17, 2023

STANDARD CONSTRUCTION DRAWINGS							SUPPLEMENTAL SPECIFICATIONS	SPECIAL PROVISIONS
CB-2-3, 2-4	1/20/23	MT-101.70	1/17/20				800-2023 4/21/23	
		MT-101.75	1/17/20				832 7/15/22	
DM-1.1	7/17/20	MT-104.10	10/16/15					
DM-1.2	7/16/21	MT-105.10	1/17/20					
DM-4.3	1/15/16							
DM-4.4	1/15/16	F-3.4	7/19/13					
MGS-1.1	7/16/21							
MGS-2.1	1/19/18							
MGS-5.3	7/15/16							
RM-1.1	1/15/21							
RM-4.2	4/17/20							
MT-95.45	1/17/20							
MT-97.10	4/19/19							

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
**MUS-SR16-6.70**  
MUSKINGUM COUNTY  
CASS TOWNSHIP

INDEX OF SHEETS:

TITLE SHEET	1
TYPICAL SECTIONS	2
GENERAL NOTES	3-5
MAINTENANCE OF TRAFFIC	6-8
GENERAL SUMMARY	9
ESTIMATED QUANTITIES	10-11
PLAN AND PROFILE - S.R. 16	12
PLAN AND PROFILE - WALL	13
CROSS SECTIONS	14-24
DRAINAGE DETAILS	25-27
RIGHT OF WAY	28-30
SOIL PROFILE SHEETS	31-55

PROJECT DESCRIPTION

LANDSLIDE REPAIR ALONG STATE ROUTE 16 USING  
SOLDIER PILE WALL WITH LAGGING.

EARTH DISTURBED AREAS

PROJECT EARTH DISTURBED AREA: 4.02 ACRES  
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: 4.02 ACRES  
NOTICE OF INTENT EARTH DISTURBED AREA: 4.02 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.

2023 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 *Sham Z. Estep*  
DATE 3/10/2023 DISTRICT DEPUTY DIRECTOR

APPROVED \_\_\_\_\_  
DATE \_\_\_\_\_ DIRECTOR, DEPARTMENT OF  
TRANSPORTATION

FEDERAL PROJECT NO.  
**E230396**

PID NO.  
**113521**

CONSTRUCTION PROJECT NO.

RAILROAD INVOLVEMENT  
**NONE**

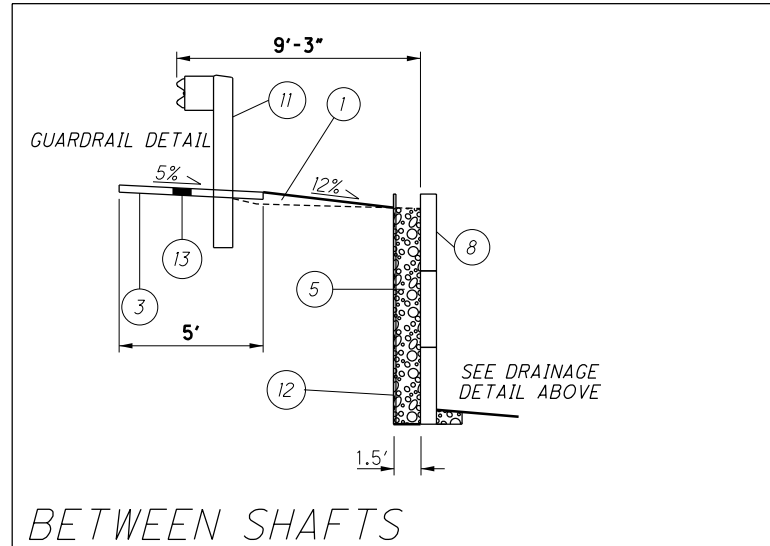
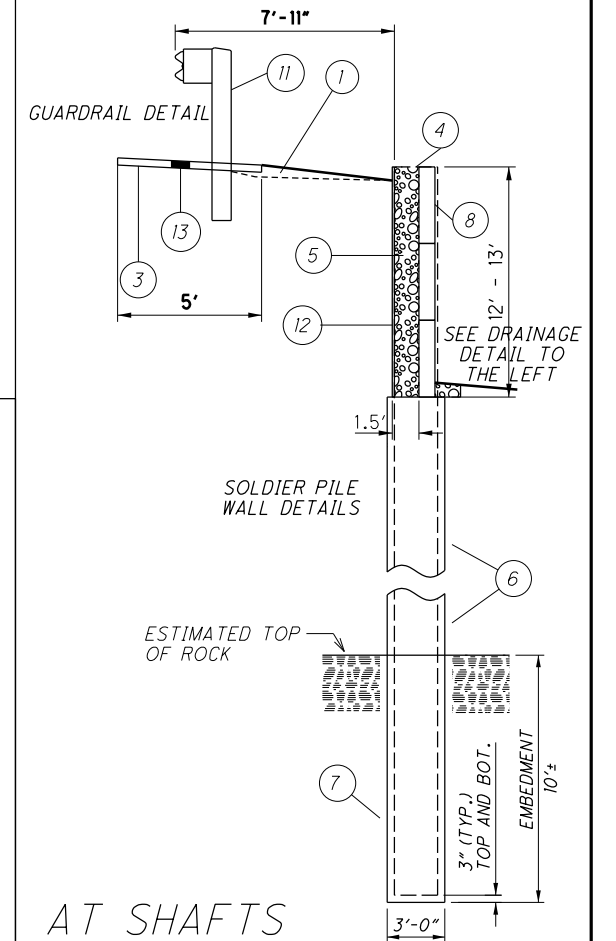
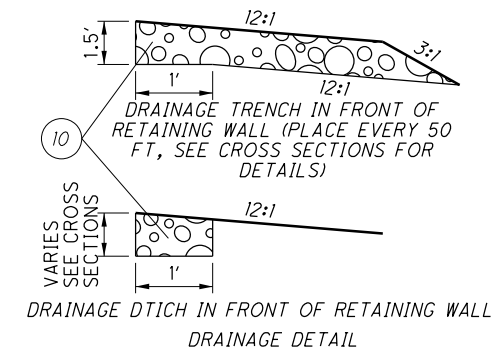
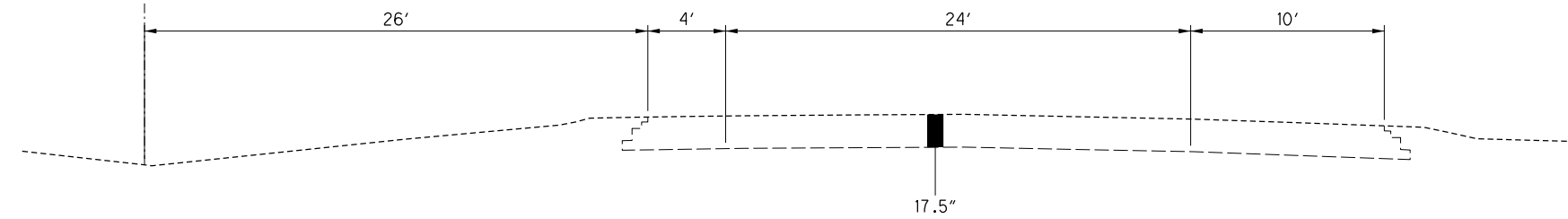
**MUS-16-6.70**

1  
55

I:\ProjectData\MUS\11352\Design\Roadway\Sheets\11352\_LG000.dgn Sheet 3/9/2023 7:44:24 AM nkadakkia

CL S.R. 16

EXISTING PAVEMENT



RETAINING WALL DETAILS

AT SHAFTS

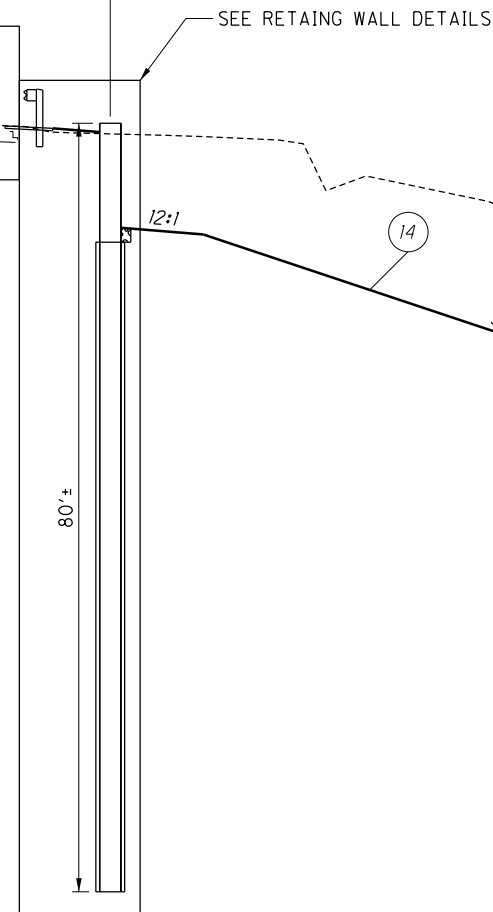
BETWEEN SHAFTS

LEGEND

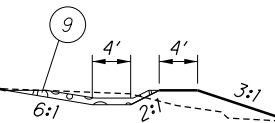
- 1 ITEM 203, EMBANKMENT
- 2 ITEM 203, EXCAVATION
- 3 ITEM 204, SUBGRADE COMPACTION
- 4 ITEM 507, STEEL PILES, MISC.: SOLDIER PILES W27X94
- 5 ITEM 518, POROUS BACKFILL
- 6 ITEM 524, DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK, AS PER PLAN
- 7 ITEM 524, DRILLED SHAFTS, 36" DIAMETER, INTO BEDROCK, AS PER PLAN
- 8 ITEM 530, SPECIAL - STRUCTURES, PRECAST CONCRETE LAGGING
- 9 ITEM 601, ROCK CHANNEL PROTECTION, TYPE D WITH GEOTEXTILE FABRIC
- 10 ITEM 605, AGGREGATE DRAINS
- 11 ITEM 606, GUARDRAIL, TYPE MGS
- 12 ITEM 503, COFFERDAMS AND EXCAVATION BRACING (STEEL PLATES)
- 13 ITEM 617, COMPACTED AGGREGATE, AS PER PLAN (6")
- 14 ITEM 659, SEEDING AND MULCHING, CLASS 2

SEE EXISTING PAVEMENT

PROPOSED TYPICAL SECTION  
STA. 1119+00 TO STA. 1125+00  
(EXISTING GROUND AT STA. 1122+50)



VARIES (SEE CROSS SECTIONS FOR DETAILS)



TYPICAL SECTIONS

MUS-16-6.70

2  
55

I:\ProjectData\MUS\1352\Design\Roadway\Sheet's\1352\_GN001.dgn Sheet 3/9/2023 7:44:25 AM nkadakkia

UTILITIES

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

NATIAL GAS AND OIL COOPERATIVE  
120 O'NEIL DRIVE  
HEBRON, OHIO 43025  
ATTN: GREG WILSON  
740-348-1254  
GWILSON@THEENERGYCOOP.COM

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE SHEET 29 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: ODOT VRS  
MONUMENT TYPE: SEE TABLE BELOW

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: NAVD88  
GEOID: Geoid 18

HORIZONTAL POSITIONING

REFERENCE FRAME: NAD83 (2011)  
ELLIPSOID: GRS80  
MAP PROJECTION: LAMBERT CONFORMAL CONIC  
COORDINATE SYSTEM: CUSTOM GROUND, BASED ON SPCS OHIO SOUTH ZONE  
COMBINED SCALE FACTOR: 1.00000706  
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.

CONSTRUCTION NOISE

ACTIVITIES AND LAND USE ADJACENT TO THIS PROJECT MAY BE AFFECTED BY CONSTRUCTION NOISE. IN ORDER TO MINIMIZE AND ADVERSE CONSTRUCTION MOISE IMPACTS, DO NOT OPERATE POWER-OPERATED CONSTRUCTION-TYPE DEVICES BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM. IN ADDITION, DO NOT OPERATE AT ANY TIME ANY DEVICE IN SUCH A MANNER THAT THE NOISE CREATED SUBSTANTIALLY EXCEEDS THE NOISE CUSOMARILY AND NECESSARILY ATTENDANT TO THE REASONABLE AND EFFICIENT PERFORMANCE OF SUCH EQUIPMENT.

CONSTRUCTION NOTIFICATION

THE CONTRACTOR WILL ADVISE THE PROJECT ENGINEER A MINIMUM OF TWENTY-ONE (21) DAYS PRIOR TO THE FOLLOWING: THE START OF CONSTRUCTION ACTIVITIES, LANE RESTRICTIONS, LANE CLOSURES, AND OR ROAD CLOSURES. THE PROJECT ENGINEER WILL FORWARD THIS INFORMATION TO THE FOLLOWING:

DISTRICT PUBLIC INFORMATION OFFICER (PIO)  
BY FAX: (614) 887-4510 OR  
BY EMAIL: D05.PIO@dot.ohio.gov

DISTRICT PERMIT SECTION  
BY FAX: (614) 887-4525 OR  
BY EMAIL: Brian.Bosch@dot.ohio.gov

CENTRAL OFFICE SPECIAL HAUL PERMITS SECTION  
BY FAX: (614) 728-4099 OR  
BY EMAIL: Hauling.Permits@dot.ohio.gov

THE PIO WILL, IN TURN, NOTIFY THE PUBLIC, THE LOCAL EMERGENCY SERVICES, AFFECTED SCHOOLS AND BUSINESSES, AND ANY OTHER IMPACTED LOCAL PUBLIC AGENCY OF ANY OF THE ABOVE MENTIONED ITEMS, VIA MEDIA SOURCES.

ITEM 607, FENCE, TYPE 47RA

A QUANTITY WAS CREATED FOR THE PROPOSED AMOUNT OF FENCE, TYPE 47RA TO BE CONSTRUCTED ONCE THE PROJECT IS FINISHED. THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 607, FENCE TYPE 47RA 749 FT

GUARDRAIL WORK

ALL MATERIALS EXCAVATED FOR POST HOLES OR CONCRETE ANCHORS SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH 503.07 OF THE SPECIFICATIONS, AND AREA RESTORED TO A NEAT CONDITION SATISFACTORY TO THE ENGINEER. THE COST OF THIS WORK IS TO BE INCLUDED IN THE APPROPRIATE GUARDRAIL BID ITEM. THE LOCATIONS OF GUARDRAIL RUNS ARE SUBJECT TO ADJUSTMENTS TO ASSURE THAT THE PLANNED INSTALLATION WILL AFFORD MAXIMUM PROTECTION FOR TRAFFIC.

ITEM 606 ANCHOR ASSEMBLY, MGS TYPE E

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

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

REFER TO THE MANUFACTURER'S INSTRUCTIONS REGARDING THE INSTALLATION OF, AND THE GRADING AROUND THE FOUNDATION TUBES AND GROUND STRUT. THE TOP OF ANY FOUNDATION TUBE SHOULD BE LESS THAN 4 INCHES ABOVE THE GROUND. THE PLACEMENT OF THE FOUNDATION TUBES SHOULD BE AN APPROPRIATE DEPTH BELOW THE LEVEL LINE IN ORDER TO MAINTAIN THE FINISHED GUARDRAIL HEIGHT OF 31 INCHES FROM THE EDGE OF THE SHOULDER. ON-SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4 INCHES ABOVE THE GROUND LINE.

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

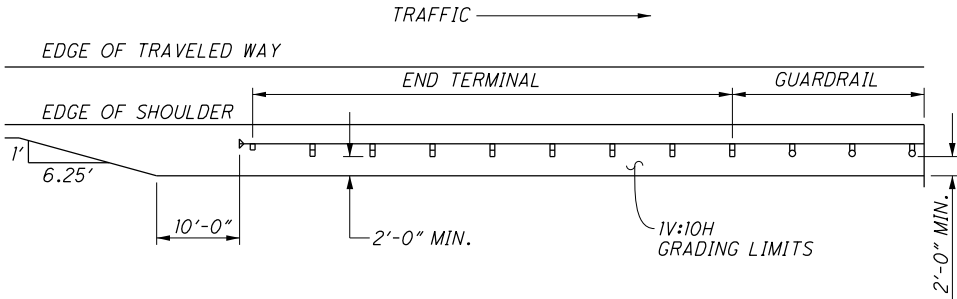
PLACEMENT OF GUARDRAIL

GUARDRAIL, TYPE MGS  
STA. 1118+25.00 TO STA. 1126+00.00 = 775 FT.

ANCHOR ASSEMBLY, MGS TYPE E  
STA. 1117+75.00 TO STA. 1118+25.00 = 1 EACH

GRADING FOR ANCHOR ASSEMBLY, MGS TYPE E

THE GRADING LAYOUT SHOWN HERE SHALL BE USED WITH ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE E, AS DETAILED BELOW.



ITEM 623, CONSTRUCTION LAYOUT STAKES AND SURVEYING, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF ITEM 623, CONSTRUCTION LAYOUT STAKES AND SURVEYING, THE CONTRACTOR SHALL PROVIDE THE FOLLOWING INFORMATION TO THE DEPARTMENT.

THE CONTRACTOR SHALL PROVIDE AS-BUILT DATA FOR THE SPECIFIED COMPLETED CONSTRUCTION ITEMS IN OHIO STATE PLANE COORDINATES (GRID). THE CONSTRUCTION ITEMS SHALL BE LOCATED AS PER THE SURVEY FEATURE CODE LIST FOUND ON THE OHIO DEPARTMENT OF TRANSPORTATION OFFICE OF CADD & MAPPING SERVICES WEBSITE. AFTER ALL DATA HAS BEEN COLLECTED, AN EMAIL CONTAINING A COMMA DELIMITED ASCII FILE AND A SURVEYOR'S CERTIFICATION SHALL BE DELIVERED TO:  
CODY.GIERHART@DOT.OHIO.GOV

THE ASCII FILE SHALL INCLUDE A HEADER CONTAINING NAME OF SURVEYOR, DATE(S) OF COLLECTION, HORIZONTAL DATUM (I.E. NAD83, 2011, OHIO STATE PLANE COORDINATE SYSTEM NORTH/SOUTH), VERITCAL DATUM (I.E. NAVD 88, GEOID12A), AND METHOD OF COLLECTION (I.E. OHIO VRS, GPS RTK, TOTAL STATION, ETC.) AND BE IN A TABLE FORMATTED AS FOLLOWS: POINT NUMBER, NORTHING, EASTING, ELEVATION, FEATURE CODE, DESCRIPTION.

THE FOLLOWING ITEMS ARE REQUIRED FOR COLLECTION FOR THIS PROJECT: GUARDRAIL, AND LIMITS OF THE DRILLED SHAFT LAGGING WALL. THE ABOVE LISTED ITEMS SHALL BE COLLECTED USING SURVEY-GRADE EQUIPMENT MEETING THE REQUIREMENTS OF SECTION 400 IN THE OHIO DEPARTMENT OF TRANSPORTATION SURVEY & MAPPING SPECIFICATIONS MANUAL.

ALL COST ASSOCIATED WITH OBTAINING THE INFORMATION LISTED ABOVE SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 623, CONSTRUCTION LAYOUT STAKES AND SURVEYING, AS PER PLAN, AND SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIALS NECESSARY TO PERFORM THE WORK AS DESCRIBED ABOVE.

THE FOLLOWING QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY:

ITEM 623, CONSTRUCITON LAYOUT STAKES AND SURVEYING, AS PER PLAN LS

ITEM 659, SEEDING AND MULCHING

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

659, SEEDING AND MULCHING, CLASS 2 14828 SY (FROM SHEET 11)

659, COMMERCIAL FERTILIZER 2.00 TON  
1 TON PER 7,410 SY OF THE PERMANENT SEEDED AREA  
14,828 ÷ 7,410 = 2.00

659, LIME 3.06 ACRES  
14,828 ÷ 4,840 = 3.06

659, WATER 80 M GAL  
0.0054 M GAL PER SY OF THE PERMANENT SEEDED AREA  
14,828 X 0.0054 = 80

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

I:\ProjectData\MUS\1352\Design\Roadway\Sheet's\1352\_GN002.dgn Sheet 3/9/2023 7:44:26 AM nkadakia

**ITEM 530, SPECIAL - STRUCTURES, PRECAST CONCRETE LAGGING**

THIS WORK CONSISTS OF FURNISHING AND PLACING PRECAST REINFORCED CONCRETE PANELS BETWEEN THE SOLDIER PILES TO FUNCTION AS LAGGING FOR THE RETAINING WALL. PROVIDE PRECAST CONCRETE LAGGING FROM A PRECAST CONCRETE MANUFACTURER CERTIFIED UNDER SUPPLEMENT 1073. DO NOT ALLOW THE PLACEMENT DIMENSIONS OF THE REINFORCING STEEL TO VARY BY MORE THAN 1/4". PLACE THE PANEL BETWEEN THE FLANGES OF THE SOLDIER PILES AND BEARING AGAINST THE FLANGES OF THE EXPOSED SIDE OF THE WALL.

FURNISH MATERIALS CONFORMING TO THE FOLLOWING:

- PORTLAND CEMENT (701.02, 701.04, OR 701.05)
- REINFORCING STEEL (709.00)
- MICROSILICA (701.10)
- GROUND GRANULATED BLAST FURNACE SLAG (701.11)
- FLY ASH (701.13)
- FINE AGGREGATE (703.02)
- COARSE AGGREGATE (703.02)
- AIR-ENTRAINING ADMIXTURE (705.10)
- CHEMICAL ADMIXTURES (705.12)

REJECT PANELS HAVING ANY OF THE FOLLOWING:

- DEFECTS THAT INDICATE IMPERFECT MOLDING.
- DEFECTS THAT INDICATE HONEYCOMBED OR OPEN TEXTURE CONCRETE.
- DEFECTS IN THE PHYSICAL CHARACTERISTICS OF THE CONCRETE, OR DAMAGE TO THE AESTHETIC SURFACE TREATMENTS.
- CONCRETE CHIPS OR SPALLS THAT EXCEED 4" (100 MM) WIDE OR 2" (50 MM) DEEP. REPAIR ALL CHIPS AND SPALLS THAT ARE SMALLER.
- STAINED FORM FACES, DUE TO FORM OIL, CURING OR OTHER CONTAMINANTS.
- SIGNS OF AGGREGATE SEPARATION.
- CRACKS WIDER THAN 0.01" (0.25 MM) OR PENETRATING MORE THAN 1" (25 MM) OR LONGER THAN 12" (300 MM).
- FACING PANELS THAT DO NOT MEET THE SPECIFIED TOLERANCES.
- EXPOSED REINFORCING STEEL.
- INSUFFICIENT CONCRETE COMPRESSIVE STRENGTH.

PANEL MARKINGS:

PERMANENTLY MARK THE BACK SURFACE OF EACH PANEL WITH THE DATE OF MANUFACTURE, THE PANEL IDENTIFICATION FROM THE SHOP DRAWINGS, THE PRODUCTION LOT NUMBER, AND THE PRECASTER'S INSPECTION AND ACCEPTANCE MARK. THE PRECASTER'S MARK REPRESENTS THAT THE PANEL MEETS ALL SPECIFICATION REQUIREMENTS. THE PRECASTER SHALL MAINTAIN A RECORD OF THE FABRICATION DRAWINGS ACCORDING TO SUPPLEMENT 1073 AND THIS SPECIFICATION FOR EACH PANEL PRODUCED.

HANDLING, STORING, AND SHIPPING PANELS:

HANDLE, STORE, AND SHIP PANELS TO AVOID CHIPPING, CRACKING, AND FRACTURING THE PANELS, AND EXCESSIVE BENDING STRESSES. SUPPORT PANELS ON FIRM BLOCKING WHILE STORING AND SHIPPING. DO NOT SHIP PANELS UNTIL CONCRETE HAS ATTAINED THE REQUIRED COMPRESSIVE STRENGTH OF 4500 PSI. SUBMIT SHIPMENT DOCUMENTATION THAT INCLUDES THE PRECASTER'S RECORD OF FINAL INSPECTION OF ALL PRECAST COMPONENTS, THE MEASUREMENT OF TOLERANCES, STRENGTH, DIMENSIONS, AND THE DAILY SOURCE REPORT SHIPPING DOCUMENT TO THE ENGINEER AS THE FACING PANELS ARE DELIVERED TO THE PROJECT SITE.

**ITEM 530, SPECIAL - STRUCTURES, PRECAST CONCRETE LAGGING (CONT.)**

FACING PANEL INSPECTION:

INSPECT ALL FACING PANELS FOR ANY DAMAGE AND REJECT PANELS ACCORDING TO THE ABOVE STIPULATIONS. PANELS DAMAGED BY IMPROPER HANDLING, STORING, TRANSPORTING, OR ERECTION SHALL BE REPAIRED OR REPLACED AT THE DISCRETION OF THE ENGINEER. PROVIDE DOCUMENTATION OF DAMAGE AND PROPOSE THE COMPLETE REPAIR METHOD FOR THE DAMAGED PANEL TO THE ENGINEER.

ELASTOMERIC BEARING PADS:

INSTALL ELASTOMERIC BEARING PADS (DUROMETER 60) AT ALL PANEL-TO-PANEL INTERFACES AS WELL AS ALL PANEL-TO-DRILLED SHAFT INTERFACES AS PER THE DETAIL ON SHEET 5.

METHOD OF CONSTRUCTION:

THE CONTRACTOR MAY CHOOSE DIFFERENT COMBINATIONS OF PANELS FOR THE CONSTRUCTION OF THE LAGGING WALL. THE TALLER PANELS SHALL BE PLACED AT THE BOTTOM. THE TOP ELEVATION OF THE LAGGING WALL HAS NOT BEEN ADJUSTED FOR THE BEARING PAD THICKNESS.

PAYMENT:

THE DEPARTMENT WILL MAKE PAYMENT TO THE CONTRACTOR FOR EACH PANEL AT THE CONTRACT UNIT PRICE FOR THE ITEMS BELOW, AND SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, BEARING PADS, AND OTHER INCIDENTALS REQUIRED TO FURNISH AND PROPERLY INSTALL THE PANELS.

ITEM 530, SPECIAL - STRUCTURES, PRECAST CONCRETE LAGGING

**ITEM 503 COFFERDAMS AND EXCAVATION BRACING**

THE DESIGN SHOWN ON THE PLANS FOR TEMPORARY SUPPORT OF EXCAVATION IS ONE REPRESENTATIVE DESIGN THAT MAY BE USED TO CONSTRUCT THE PROJECT. THE CONTRACTOR MAY CONSTRUCT THE DESIGN SHOWN ON THE PLANS OR PREPARE AN ALTERNATE DESIGN TO SUPPORT THE SIDES OF EXCAVATIONS. IF CONSTRUCTING AN ALTERNATE DESIGN FOR TEMPORARY SUPPORT OF EXCAVATION, PREPARE AND PROVIDE PLANS IN ACCORDANCE WITH C&MS 501.05. THE DEPARTMENT WILL PAY FOR THE TEMPORARY SUPPORT OF EXCAVATION AT THE CONTRACT LUMP SUM PRICE FOR COFFERDAMS AND EXCAVATION BRACING. THE DEPARTMENT WILL NOT MAKE ADDITIONAL PAYMENT FOR PROVIDING AN ALTERNATE DESIGN.

**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.

**ITEM 524 - DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK AS PER PLAN**

**ITEM 524 - DRILLED SHAFTS, 36" DIAMETER, INTO BEDROCK AS PER PLAN**

THIS WORK CONSISTS OF FURNISHING AND INSTALLING DRILLED SHAFTS FOR SOLDIER PILE AND LAGGING WALLS. THE DRILLED SHAFTS ARE REINFORCED WITH SOLDIER PILES INSTEAD OF REINFORCING STEEL CAGES. THE SOLDIER PILES EXTEND ABOVE THE TOP OF THE DRILLED SHAFT. FURNISH AND INSTALL DRILLED SHAFTS IN ACCORDANCE WITH C&MS 524 EXCEPT AS MODIFIED AND SUPPLEMENTED BELOW.

EXCAVATE THE HOLE FOR THE DRILLED SHAFTS WITHIN 3 INCHES OF THE PLAN LOCATION. PLACE THE SOLDIER PILE VERTICALLY WITHIN THE HOLE SO IT IS NOT INCLINED MORE THAN 1 INCH BETWEEN THE TOP AND BOTTOM. PLACE THE SOLDIER PILE SO THAT THE FLANGES ARE PARALLEL TO THE CENTERLINE OF THE ROW OF DRILLED SHAFTS. DO NOT ALLOW THE ORIENTATION OF THE FLANGES TO VARY BY MORE THAN 10 DEGREES. SUPPORT THE SOLDIER PILE SO THAT IT DOES NOT MOVE DURING CONCRETE PLACEMENT.

USE CLASS QC 5 CONCRETE ACCORDING TO C&MS 511. PLACE CONCRETE TO THE ELEVATION FOR THE TOP OF THE DRILLED SHAFT. THE CONTRACTOR MAY PLACE CONCRETE USING THE FREE FALL METHOD PROVIDED THE DEPTH OF WATER IS LESS THAN 6 INCHES AND THE CONCRETE FALLS WITHOUT STRIKING THE SIDES OF THE HOLE. POURING CONCRETE ALONG THE WEB OF THE SOLDIER PILE IS ACCEPTABLE.

CHECK THE POSITION, THE VERTICAL ALIGNMENT AND ORIENTATION OF THE SOLDIER PILE IMMEDIATELY AFTER CONCRETE PLACEMENT. MAKE CORRECTIONS AS NECESSARY TO MEET THE ABOVE TOLERANCES.

REMOVE CONCRETE AS NECESSARY FROM AROUND THE SOLDIER PILE IN ORDER TO PLACE THE LAGGING. PLACE LAGGING SO THAT THE SOLDIER PILE FLANGE OVERLAPS THE END OF THE LAGGING BY AT LEAST 3 INCHES AT BOTH ENDS OF THE LAGGING. WAIT AT LEAST 12 HOURS AFTER PLACING CONCRETE BEFORE PLACING LAGGING.

SEQUENCE OF INSTALLATION

THE INSTALLATION SEQUENCE SHALL BE SUCH THAT NO DRILLED SHAFT IS INSTALLED ADJACENT TO EITHER AN OPEN DRILLED SHAFT EXCAVATION OR A DRILLED SHAFT IN WHICH THE CONCRETE HAS LESS THAN A 48 HOUR CURE. INSTALLING THE SHAFTS IN AN ALTERNATING SEQUENCE OR ANY OTHER SEQUENCE THAT MEETS THIS CRITERIA IS PERMISSIBLE.

PROTECTION OF UNATTENDED OPEN SHAFTS

CARE SHALL BE EXERCISED AS TO COVER UNATTENDED OPEN SHAFTS. TEMPORARY COVERS SHALL BE OF ADEQUATE STRENGTH TO PREVENT A PERSON OR ANIMAL FROM FALLING IN. NO DRILLED SHAFT EXCAVATION SHALL BE LEFT UN-PROTECTED OVERNIGHT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS USED TO CONSTRUCT THE DRILLED SHAFTS AND PLACE LAGGING. ANY TEMPORARY GRADING, EXCAVATION, EMBANKMENT, AGGREGATE, DRAINAGE, SHEETING, ETC. NEEDED TO COMPLETE THE WORK SHALL BE INCLUDED IN THE BID PRICE FOR THE DRILLED SHAFTS. THE COST OF ANY EXCAVATION AND SUBSEQUENT REPLACEMENT OF EMBANKMENT (PER ITEM 203 EMBANKMENT) SHALL BE INCLUDED IN THE VARIOUS BID ITEMS FOR THE DRILLED SHAFTS AND LAGGING, UNLESS SEPARATELY ITEMIZED. NO SEPARATE PAYMENT WILL BE MADE.

**ITEM 524 - DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK AS PER PLAN (CONT.)**

**ITEM 524 - DRILLED SHAFTS, 36" DIAMETER, INTO BEDROCK AS PER PLAN (CONT.)**

METHOD OF MEASUREMENT

THE DEPARTMENT WILL MEASURE DRILLED SHAFTS ABOVE BEDROCK, AS PER PLAN, ALONG THE AXIS OF THE DRILLED SHAFT FROM THE LOWERMOST ELEVATION OF THE BEARING SEAT TO THE TOP OF BEDROCK, AS DETERMINED BY THE ENGINEER. THE DEPARTMENT WILL MEASURE DRILLED SHAFTS INTO BEDROCK, AS PER PLAN, ALONG THE AXIS OF THE DRILLED SHAFT FROM TOP OF BEDROCK TO THE BOTTOM OF THE DRILLED SHAFT, AS DETERMINED BY THE ENGINEER.

PAYMENT IS FULL COMPENSATION FOR CONSTRUCTING THE DRILLED SHAFTS, INCLUDING FURNISHING AND PLACING CONCRETE, REMOVAL OF CONCRETE FROM AROUND THE SOLDIER PILE IN ORDER TO PLACE LAGGING.

**ITEM 507 STEEL PILES, MISC.: SOLDIER PILES W27X94**

THIS WORK CONSISTS OF FURNISHING AND PLACING STEEL SOLDIER PILES INTO DRILLED HOLES. FURNISH SOLDIER PILES CONSISTING OF STRUCTURAL STEEL MEMBERS THAT MEET THE PLAN REQUIREMENTS AND CONFORM TO ASTM A572, GRADE 50. DO NOT FIELD WELD OR SPLICE STEEL SOLDIER PILES; WITH PANEL SEATS BEING THE EXCEPTION.

MEASUREMENT FOR PAYMENT WILL BE LIMITED TO THE DISTANCE BETWEEN THE TOP AND BOTTOM OF STEEL MEMBER, AS DETERMINED BY THE ENGINEER. THE DEPARTMENT WILL PAY FOR SOLDIER PILES AT THE CONTRACT UNIT PRICE PER FT OF ITEM 507 STEEL PILES MISC.: SOLDIER PILES - W27X94.

**CONTINGENCY QUANTITIES**

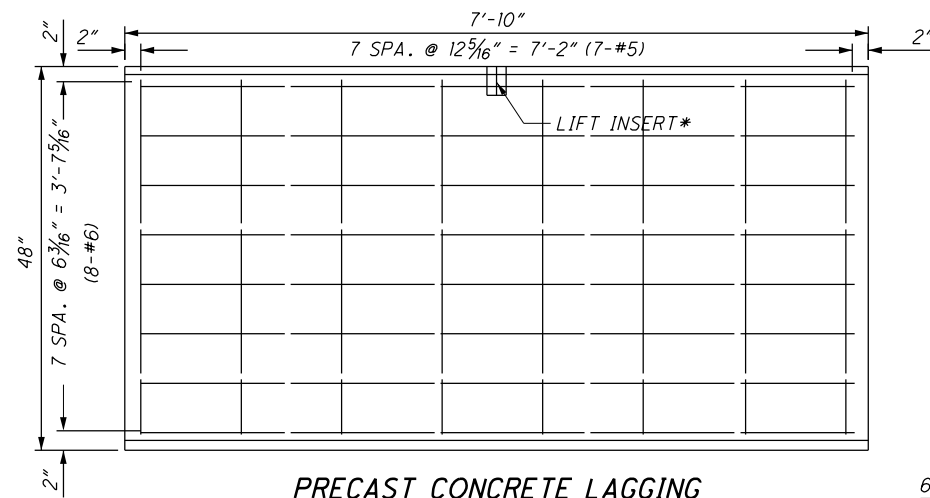
THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF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

THE BELOW CONTINGENCY QUANTITIES ARE BEING INCLUDED TO TIE INTO THE EXISTING CONDUITS AT THE PROPOSED CATCH BASINS. SINCE A SMALL QUANTITY OF CONDUIT WILL BE INSTALLED AT EACH CATCH BASIN LOCATION, THE INSTALLATION PLAN AND PERFORMANCE REPORT REQUIREMENTS OF 611 ARE BEING WAIVED. THE CONTRACTOR WILL STILL BE REQUIRED TO PERFORM THE CONSTRUCTION INSPECTION FORMS AS REQUIRED BY 611. PAYMENT FOR THESE ITEMS SHALL BE MADE AT THE UNIT PRICE BID AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT, AND MATERIALS NECESSARY TO TIE INTO THE EXISTING CONDUIT AND THE PROPOSED CATCH BASIN.

ITEM 611, 6" CONDUIT, TYPE F 50 FT  
ITEM 611, 15" CONDUIT, TYPE B 10 FT  
ITEM 611, 21" CONDUIT, TYPE B 5 FT

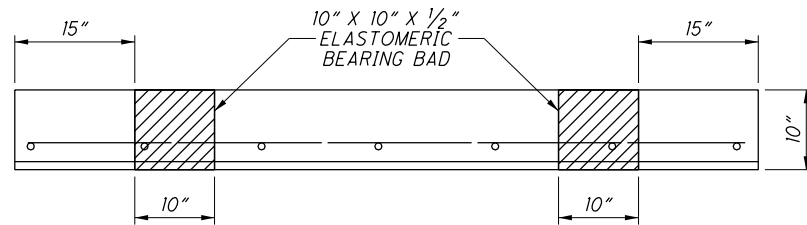


I:\ProjectData\MUS\1352\Design\Roadway\Sheets\1352\_LGN003.dgn Sheet 3/9/2023 7:44:27 AM nkadakia



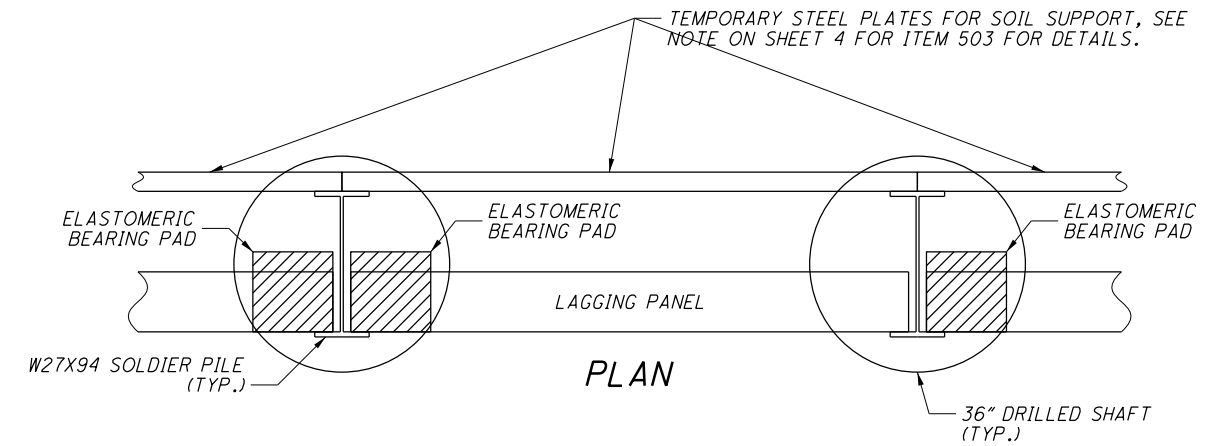
**PRECAST CONCRETE LAGGING**

TOTAL REQUIRED = 219

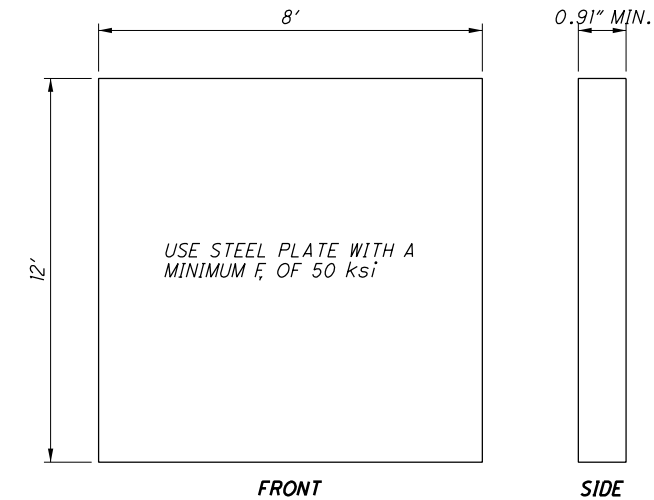


**ELASTOMERIC BEARING PAD**

\*LIFT INSERTS:  
THE PRECAST PANEL MANUFACTURER SHALL DESIGN THE LIFT INSERT, AS WELL AS DETERMINE THE NUMBER OF INSERTS REQUIRED PER PANEL.



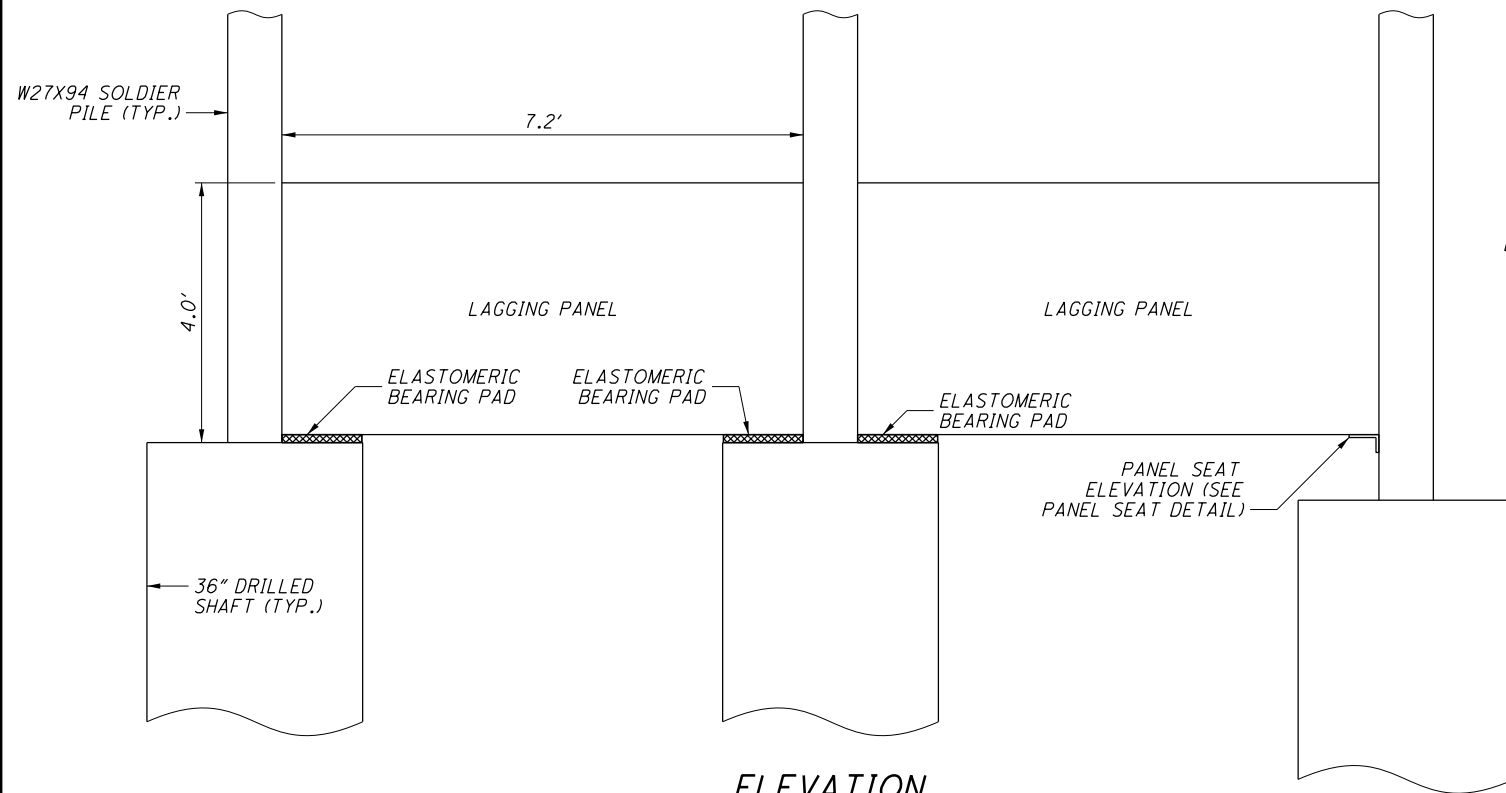
**PLAN**



**FRONT**

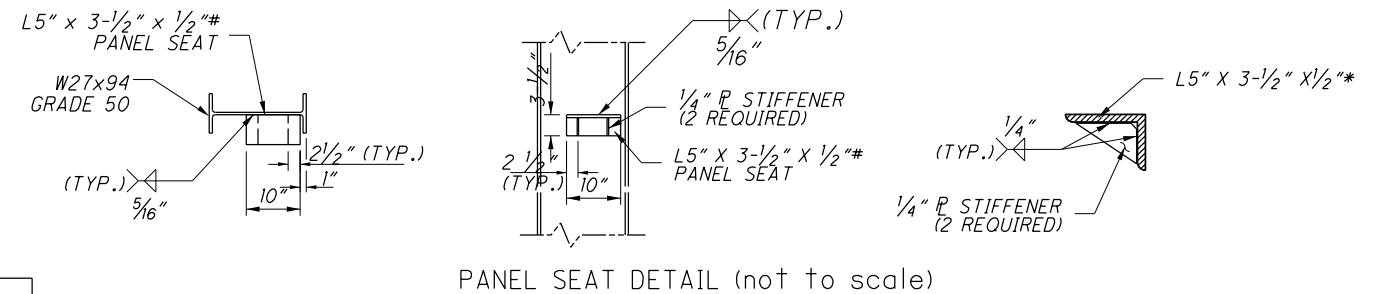
**SIDE**

**STEEL PLATE DETAILS**



**ELEVATION**

NOTE: ONLY TWO SECTIONS SHOWN FOR ILLUSTRATIVE PURPOSES



NOTES:

PANEL SEATS CAN BE FIELD WELDED TO THE CORRECT ELEVATION.

\* PANEL SEAT, STIFFENERS OF PANEL SEAT STEEL IS INCLUDED IN PAYMENT FOR ITEM - 507 STEEL PILES, MISC.: SOLDIER PILES W27X94.

**GENERAL NOTES**

**MUS-16-6.70**

5  
55

CALCULATED  
AUC  
CHECKED  
NK

I:\ProjectData\MUS\11352\Design\M0T\Sheet's\11352\_MN001.dgn Sheet 3/9/2023 7:44:27 AM nkadokla

ITEM 614 MAINTAINING TRAFFIC

BEFORE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAMES AND TELEPHONE NUMBERS OF A PERSON OR PERSONS WHO CAN BE CONTACTED 24 HOURS A DAY BY THE OHIO DEPARTMENT OF TRANSPORTATION AND ALL INTERESTED POLICE AGENCIES. THIS PERSON OR PERSONS SHALL BE RESPONSIBLE FOR REPLACING NECESSARY TRAFFIC CONTROL DEVICES IMMEDIATELY, AS PER 614.03.

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

THE CONTRACTOR SHALL ARRANGE HIS OPERATIONS SO AS TO PREVENT ANY INTERFERENCE TO THE CONTINUOUS FLOW OF TRAFFIC. ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE RESTRICTED AT ALL TIME TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE APPOROVED BY THE PROJECT ENGINEER.

ANY CONFLICTING SIGNS AND PAVEMENT MARKINGS WHETHER INSIDE OR OUTSIDE THE WORK LIMITS SHALL BE REMOVED OR COVERED AND TEMPORARY SIGNS AND MARKINGS ERECTED AND PLACED WHEN APPLICABLE BY THE CONTRACTOR.

A MINIMUM OF TWO LANES OF TRAFFIC IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES ON **S.R.16 AT ALL TIMES**, EXCEPT AS NOTED BELOW.

THE LANE CLOSURES WILL ONLY BE IMPLEMENTED AT THE TIMES LISTED ON THE OHIO DEPARTMENT OF TRANSPORTATION'S WEB SITE " PERMITTED LANE CLOSURE TIMES' SECTION LOCATED AT THE ADDRESS SHOWN BELOW.

<http://www.dot.state.oh.us/>

THE PERMITTED CLOSURE TIMES LISTED ON THE WEBSITE WILL BE IN EFFECT 14 CALENDAR DAYS PRIOR TO THE BID LETTING DATE FOR THIS PROJECT.

NO WORK WITHIN ACTIVE TRAVEL LANES OR WHICH WILL SLOW TRAFFIC IS PERMITTED AT ANY OTHER TIMES.

LANE CLOSURES WILL BE ACCOMPLISHED IN ACCORDANCE WITH THE STANDARD DRAWING MT-95.30.

IT IS THE INTENT TO RESTRICT LANE CLOSURES TO THE MINIMUM AMOUNT OF TIME NECESSARY TO PERFORM THE WORK AS DESCRIBED IN THE PLANS. THE CONTRACTOR WILL NOT COMMENCE ANY LANE CLOSURE BEFORE THE HOURS AS SPECIFIED OR COMMENCE ANY CLOSURE AT A TIME WHICH WILL NOT ALLOW COMPLETION OF THE WORK PRIOR TO HOURS SPECIFIED. SHOULD THE CONTRACTOR CLOSE THE LANES BEFORE THE ALLOWABLE TIME AND/OR FAIL TO RE-OPEN ALL LANES TO TRAFFIC BY THE ALLOWABLE TIME A DISINCENTIVE OF \$50.00 PER MINUTE SHALL BE ASSESSED FOR EACH MINUTE OUTSIDE THE PERMITTED LANE CLOSURE.

THE CONTRACTOR WILL HAVE ON SITE AND IN WORKING AND OR SUITABLE CONDITION; ALL EQUIPMENT, TOOLS, LABORERS, LEO'S, TRAFFIC CONTROL DEVICES AND INCIDENTALS NECESSARY TO EFFICIENTLY PERFORM THE CLOSURE BEFORE INITIALIZING THE LANE CLOSURE.

(THE NOTE CONTINUED ON NEXT COLUMN).

ITEM 614 MAINTAINING TRAFFIC (CONTINUED)

NO WORK SHALL BE PERFORMED AND ALL EXISTING LANES ON **S.R.16** SHALL BE OPENED TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR EVENTS:

MEMORIAL DAY, FOURTH OF JULY, LABOR DAY

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 WEEK	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)	12:00N WEDNESDAY THROUGH 6:00AM MONDAY
FRIDAY	12:00N THURSDAY THROUGH 6:00AM MONDAY
SATURDAY	12:00N FRIDAY THROUGH 6:00AM MONDAY

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED A DISINCENTIVE OF **\$50** FOR EACH MINUTE THE ABOVE DESCRIBED LANE CLOSURE RESTRICTIONS ARE VIOLATED. ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

NOTIFICATION OF ROAD CLOSURE OR RESTRICTION

THE CONTRACTOR WILL ADVISE THE PROJECT ENGINEER A MINIMUM OF SEVEN (7) CALENDAR DAYS PRIOR TO THE FOLLOWING:  
THE START OF CONSTRUCTION ACTIVITIES, LANE RESTRICTIONS, LANE CLOSURES, AND OR ROAD CLOSURES. THE PROJECT ENGINEER WILL FORWARD THIS INFORMATION TO THE FOLLOWING:

DISTRICT PUBLIC INFORMATION OFFICER (PIO) BY FAX AT (614) 887-4510 OR EMAIL AT [D05.PIO@DOT.STATE.OH.US](mailto:D05.PIO@DOT.STATE.OH.US)

DISTRICT PERMIT SECTION BY FAX AT (614) 887-4525 OR EMAIL AT [BRIAN.BOSCH@DOT.STATE.OH.US](mailto:BRIAN.BOSCH@DOT.STATE.OH.US)

CENTRAL OFFICE SPECIAL HAUL PERMITS SECTION BY FAX AT (614) 728-4099 OR EMAIL AT [HAULING.PERMITS@DOT.STATE.OH.US](mailto:HAULING.PERMITS@DOT.STATE.OH.US)

THE PIO WILL, IN TURN, NOTIFY THE PUBLIC, THE LOCAL EMERGENCY SERVICES, AFFECTED SCHOOLS AND BUSINESSES, AND ANY OTHER IMPACTED LOCAL PUBLIC AGENCY OF ANY OF THE ABOVE MENTIONED ITEMS, VIA MEDIA SOURCES.

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.

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.

(THE CONTRACTOR SHALL IMPLEMENT A SYSTEM WHEREBY CHANGEABLE MESSAGES WILL BE IMPLEMENTED WITHIN TWO HOURS FOLLOWING TELEPHONE NOTIFICATION FROM THE PROJECT ENGINEER TO A DESIGNATED PHONE.)

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.

(NOTE CONTINUED NEXT COLUMN).

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

(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.

(2 SIGNS X 4 MONTHS = 8 SNMT)

**ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 8 SNMT**

I:\ProjectData\MUS\1352\Design\M01\Sheet.s\1352\_MN002.dgn Sheet 3/9/2023 7:44:29 AM nkadakia

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

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED. IN ADDITION TO THE REQUIREMENTS OF C&MS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

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

FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP).  
IN GENERAL, LEOS SHOULD BE POSITIONED IN ADVANCE OF AND ON THE SAME SIDE AS THE LANE RESTRICTION OR AT THE POINT OF ROAD CLOSURE, AND TO MANUALLY CONTROL TRAFFIC MOVEMENTS THROUGH SIGNALIZED INTERSECTIONS IN WORK ZONES.

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

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

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

LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE.

(NOTE CONTINUED NEXT COLUMN).

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

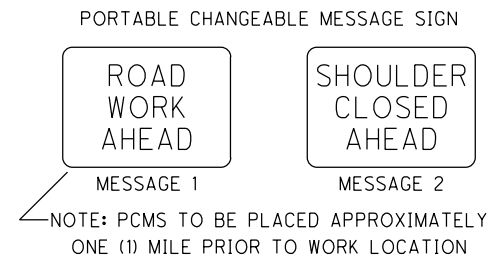
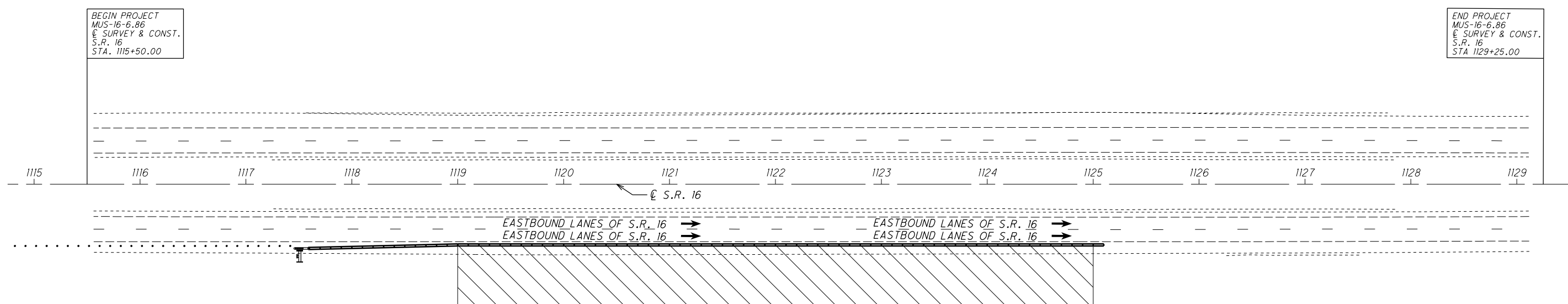
THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED. ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

**ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR  
FOR ASSISTANCE 24 HOUR**

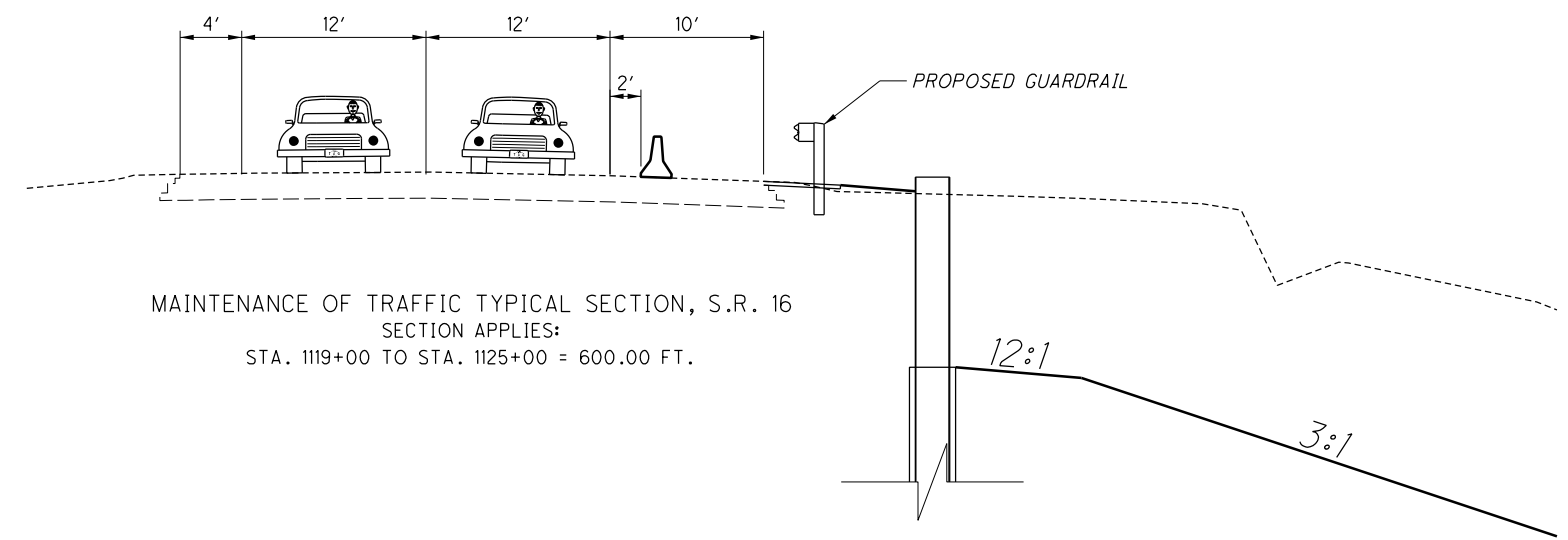
CALCULATED	AJC	MAINTENANCE OF TRAFFIC GENERAL NOTES	MUS -16 -6.70	7 55
	CHECKED NK			

I:\ProjectData\MUS\1352\Design\M01\Sheets\1352\_LMB001.dgn Sheet 3/9/2023 7:44:30 AM nkadakla



SURVEY & CONSTRUCTION STATION TO STATION	LENGTH  FEET	614			622
		WORK ZONE IMPACT ATTENUATOR (UNIDIRECTIONAL)  EACH	BARRIER REFLECTOR, TYPE B  EACH	OBJECT MARKER, ONE-WAY  EACH	PORTABLE BARRIER 32"  FEET
STA. 1115+50 TO STA. 1129+25	1375	1	45	15	752

QUANTITIES CARRIED TO THE GENERAL SUMMARY



MAINTENANCE OF TRAFFIC TYPICAL SECTION, S.R. 16  
SECTION APPLIES:  
STA. 1119+00 TO STA. 1125+00 = 600.00 FT.

SHEET NUM.													PART.	ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
4		6	7	8		10	11	12				01/NHS/OT							
													LS	201	11000	LS		ROADWAY	
																		CLEARING AND GRUBBING	
								3					3	202	20010	3	EACH	HEADWALL REMOVED	Headings supposed to be bold texts, not the items. Add Monitoring well removed items
								803					803	202	34900	803	FT	PIPE REMOVED	
								707					707	202	75000	707	FT	FENCE REMOVED	
								31,802					31,802	203	10000	31,802	CY	EXCAVATION	
								7,057					7,057	203	20000	7,057	CY	EMBANKMENT	
								458					458	204	10000	458	SY	SUBGRADE COMPACTION	
							775						775	606	15050	775	FT	GUARDRAIL, TYPE MGS	
							1						1	606	26100	1	EACH	ANCHOR ASSEMBLY, TYPE E	
								749					749	607	15100	749	FT	FENCE, TYPE 47RA	
								76					76	617	10101	76	CY	COMPACTED AGGREGATE, AS PER PLAN	2
							16						16	626	00110	16	EACH	BARRIER REFLECTOR, TYPE 2, ONE-WAY	
																		EROSION CONTROL	
								14,828					14,828	659	10000	14,828	SY	SEEDING AND MULCHING	
								2					2	659	20000	2	TON	COMMERCIAL FERTILIZER	
								3					3	659	31000	3	ACRE	LIME	
								80					80	659	35000	80	M GAL	WATER	
													6,000	832	30000	6,000	EACH	EROSION CONTROL	
								554					554	601	32304	554	CY	DRAINAGE	
																		ROCK CHANNEL PROTECTION, TYPE D WITH GEOTEXTILE FABRIC	
													7	601	10000	7	SY	RIPRAP USING 6" REINFORCED CONCRETE SLAB	
													2	602	20000	2	CY	CONCRETE MASONRY	
50													50	611	01500	50	FT	6" CONDUIT, TYPE F	
10													10	611	05900	10	FT	15" CONDUIT, TYPE B	
													245	611	08200	245	FT	18" CONDUIT, TYPE F (707.05 TYPE C OR 707.21)	
5													5	611	08900	5	FT	21" CONDUIT, TYPE B	
													3	611	98541	3	EACH	CATCH BASIN, NO. 2-4, AS PER PLAN WITH APRON	12
								2					2	SPECIAL	69065300	2	EACH	GROUND WATER MONITORING WELL ABANDONMENT	12
																		MAINTENANCE OF TRAFFIC	
			24										24	614	11110	24	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE	
				1									1	614	12380	1	EACH	WORK ZONE IMPACT ATTENUATOR, 24" WIDE HAZARDS, (UNIDIRECTIONAL)	
				45									45	614	13312	45	EACH	BARRIER REFLECTOR, TYPE 2, ONE-WAY	
				15									15	614	13350	15	EACH	OBJECT MARKER, ONE WAY	
		8											8	614	18600	8	SNMT	PORTABLE CHANGEABLE MESSAGE SIGN	
				752									752	622	41100	752	FT	PORTABLE BARRIER, UNANCHORED	
LS													LS	503	11110	LS		RETAINING WALLS (XXX)	
																		COFFERDAMS AND EXCAVATION BRACING	
							5,338						5,338	507	00400	5,338	FT	STEEL PILES, MISC.: W27X94	5
								428					428	518	21100	428	CY	POROUS BACKFILL	2
													3,694	524	94703	3,694	FT	DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK, AS PER PLAN	4
							749						749	524	94705	749	FT	DRILLED SHAFTS, 36" DIAMETER, INTO BEDROCK, AS PER PLAN	4
								6,862					6,862	SPECIAL	53051010	6,862	SF	RETAINING WALL, PRECAST CONCRETE LAGGING	4
								800					800	605	31100	800	FT	AGGREGATE DRAINS	
																		INCIDENTALS	
		LS											LS	614	11000	LS		MAINTAINING TRAFFIC	
LS													LS	623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING	
													LS	624	10000	LS		MOBILIZATION	

CALCULATED

AJC

CHECKED

INK

GENERAL SUMMARY

MUS -16 -6.70

9

55



SHAFT NO.	STATION	BOTTOM OF SHAFT	TOP OF SHAFT	EST. TOP OF ROCK	507			524		
					STEEL PILES, MISC.: SOLDER PILES W27X94			DRILLED SHAFTS, 36" DIAMETER, ABOVE BEDROCK, AS PER PLAN		
					FT	FT	FT	FT	FT	FT
1	1119+08	755.3	812.0	765.7	68.5	46.4	10.3			
2	1119+16	755.0	811.6	765.3	68.8	46.4	10.3			
3	1119+24	754.6	811.6	764.9	68.8	46.8	10.3			
4	1119+32	754.2	811.3	764.5	69.5	46.8	10.3			
5	1119+40	753.8	811.3	764.1	69.5	47.2	10.3			
6	1119+48	753.4	810.8	763.7	69.5	47.1	10.3			
7	1119+56	753.0	810.8	763.3	69.5	47.5	10.3			
8	1119+64	752.7	810.4	762.9	70.0	47.5	10.3			
9	1119+72	752.3	810.4	762.5	69.8	47.9	10.3			
10	1119+80	751.9	809.9	762.1	70.5	47.8	10.3			
11	1119+88	751.5	809.9	761.8	70.5	48.2	10.3			
12	1119+96	751.1	809.4	761.4	70.5	48.0	10.2			
13	1120+04	750.7	809.4	761.0	70.5	48.4	10.2			
14	1120+12	750.4	808.8	760.6	71.0	48.2	10.2			
15	1120+20	750.0	808.8	760.2	70.5	48.6	10.2			
16	1120+28	749.6	808.2	759.8	71.0	48.4	10.2			
17	1120+36	749.2	808.2	759.4	71.0	48.8	10.2			
18	1120+44	748.8	807.8	759.0	71.5	48.7	10.2			
19	1120+52	748.4	807.8	758.6	71.5	49.1	10.2			
20	1120+60	748.0	807.3	758.3	71.5	49.1	10.2			
21	1120+68	747.7	807.3	757.9	71.5	49.5	10.2			
22	1120+76	747.3	806.9	757.5	72.0	49.4	10.2			
23	1120+84	746.9	806.9	757.1	72.0	49.8	10.2			
24	1120+92	746.5	806.4	756.7	72.0	49.8	10.2			
25	1121+00	746.1	806.4	756.3	72.0	50.1	10.2			
26	1121+08	745.7	806.0	755.9	72.5	50.1	10.2			
27	1121+16	745.4	806.0	755.5	72.5	50.4	10.2			
28	1121+24	745.0	805.5	755.1	73.0	50.4	10.2			
29	1121+32	744.6	805.5	754.7	73.0	50.8	10.2			
30	1121+40	744.2	805.1	754.4	73.0	50.7	10.1			
31	1121+48	743.8	805.1	754.0	73.0	51.1	10.1			
32	1121+56	743.4	804.6	753.6	73.5	51.1	10.1			
33	1121+64	743.1	804.6	753.2	73.5	51.5	10.1			
34	1121+72	742.7	804.2	752.8	74.0	51.4	10.1			
35	1121+80	742.3	804.2	752.4	74.0	51.7	10.1			
36	1121+88	741.9	803.5	752.0	74.0	51.5	10.1			
37	1121+96	741.5	803.5	751.6	74.0	51.9	10.1			
38	1122+04	741.1	803.2	751.2	74.5	51.9	10.1			
39	1122+12	740.8	803.2	750.9	74.5	52.3	10.1			
40	1122+20	740.4	802.7	750.5	74.5	52.3	10.1			
41	1122+28	740.0	802.7	750.1	74.5	52.7	10.1			
42	1122+36	739.6	802.3	749.7	75.0	52.6	10.1			
43	1122+44	739.2	802.3	749.3	75.0	53.0	10.1			
44	1122+52	739.0	801.8	749.0	75.0	52.8	10.0			
45	1122+60	738.9	801.8	748.9	75.0	52.9	10.0			
46	1122+68	738.9	801.4	748.9	75.0	52.5	10.0			
47	1122+76	738.8	801.4	748.8	74.5	52.5	10.0			
48	1122+84	738.8	801.0	748.8	74.5	52.2	10.0			
49	1122+92	738.7	801.0	748.7	74.0	52.3	10.0			
50	1123+00	738.7	800.5	748.7	74.0	51.9	10.0			
51	1123+08	738.6	800.5	748.6	74.0	51.9	10.0			
52	1123+16	738.6	800.0	748.6	74.0	51.4	10.0			
53	1123+24	738.5	800.0	748.5	73.5	51.5	10.0			
54	1123+32	738.4	799.4	748.5	73.5	51.0	10.0			
55	1123+40	738.4	799.4	748.4	73.0	51.0	10.0			
56	1123+48	738.3	799.1	748.3	73.0	50.8	10.0			
57	1123+56	738.3	799.1	748.3	72.5	50.8	10.0			
58	1123+64	738.2	798.7	748.2	72.5	50.4	10.0			
59	1123+72	738.2	798.7	748.2	72.5	50.5	10.0			
60	1123+80	738.1	798.2	748.1	72.5	50.1	10.0			
61	1123+88	738.1	798.2	748.1	72.0	50.1	10.0			
62	1123+96	738.0	797.8	748.0	72.0	49.8	10.0			
63	1124+04	738.0	797.8	748.0	71.5	49.8	10.0			
64	1124+12	737.9	797.4	747.9	71.5	49.4	10.0			
65	1124+20	737.9	797.4	747.9	71.5	49.5	10.0			
66	1124+28	737.8	796.9	747.8	71.5	49.1	10.0			
67	1124+36	737.8	796.9	747.8	71.0	49.2	10.0			
68	1124+44	737.7	796.5	747.7	71.0	48.8	10.0			
69	1124+52	737.6	796.5	747.7	70.5	48.8	10.0			
70	1124+60	737.6	796.0	747.6	70.5	48.4	10.0			
71	1124+68	737.5	796.0	747.5	70.5	48.4	10.0			
72	1124+76	737.5	795.4	747.5	70.5	47.9	10.0			
73	1124+84	737.4	795.4	747.4	70.0	47.9	10.0			
74	1124+92	737.4	795.0	747.4	70.0	47.6	10.0			
SUB-TOTALS					5338.3	3694.3	748.5			
TOTALS CARRIED TO GENERAL SUMMARY					5338	3694	749			

518 POROUS BACKFILL		
LENGTH =	584	FT
STA. 1124+92 (END OF RETAINING WALL) - STA. 1119+08 (START OF RETAINING WALL)		
BEHIND RETAINING WALL		
AVERAGE HEIGHT OF BACKFILL =	12	FT
AVERAGE WIDTH OF BACKFILL =	1.5	FT
(1.38' BTW BACK OF PILES AND BACK OF CONC. PANELS + THICKNESS OF STEEL PLATES)		
AVERAGE AREA OF BACKFILL =	18	SF
(AVERAGE HEIGHT X AVERAGE WIDTH)		
TOTAL VOLUME =	428	CY
(AVERAGE AREA IN BEHIND RETAINING WALL + AVERAGE AREA IN FRONT OF RETAINING WALL) x LENGTH OF RETAINING WALL x 110% / 27		
518 POROUS BACKFILL = 428 CY CARRIED TO GENERAL SUMMARY		

605 AGGREGATE DRAINS		
PLACED FROM STA. 1119+08 TO STA. 1124+92		
LENGTH IN FRONT OF WALL=	584	FT
LENGTH OF EACH DRAIN=	13	FT
NUMBER OF DRAINS=	11	
LENGTH OF DRAINS=	143	FT
TOTAL LENGTH=	800	FT
605 AGGREGATE DRAINS = 800 FT CARRIED TO GENERAL SUMMARY		

530 SPECIAL - RETAINING WALL, PRECAST CONCRETE LAGGING			
PLACED FROM STA. 1119+08 TO STA. 1124+92			
PANEL LENGTH	7.83	FT	
PANEL HEIGHT	4.00	FT	
PANEL AREA	31.33	SF	
ESTIMATED NUMBER OF PANELS			
	219		
TOTAL PANEL AREA CARRIED TO GENERAL			
	6862	SF	

601 RCP, TYPE D WITH GEOTEXTILE FABRIC		
PLACED FROM STA. 1119+00 TO STA. 1125+00		
LENGTH OF DITCH	605	FT
AVERAGE WIDTH OF DITCH	16	FT
AVERAGE DEPTH OF DITCH	1.5	FT
RCP PAD @ Sta. 1119+00		
WIDTH OF PAD	3	FT
AREA OF PAD	20	SQ FT
VOLUME OF PAD	2	CY
RCP Pad @ Sta. 1122+00		
WIDTH OF PAD	3	FT
AREA OF PAD	20	SQ FT
VOLUME OF PAD	2	CY
RCP Pad @ Sta. 1125+00		
WIDTH OF PAD	4	FT
AREA OF PAD	20	SQ FT
VOLUME OF PAD	3	CY
QUANTITY CARRIED TO GENERAL SUMMARY		
VOLUME	554	CY

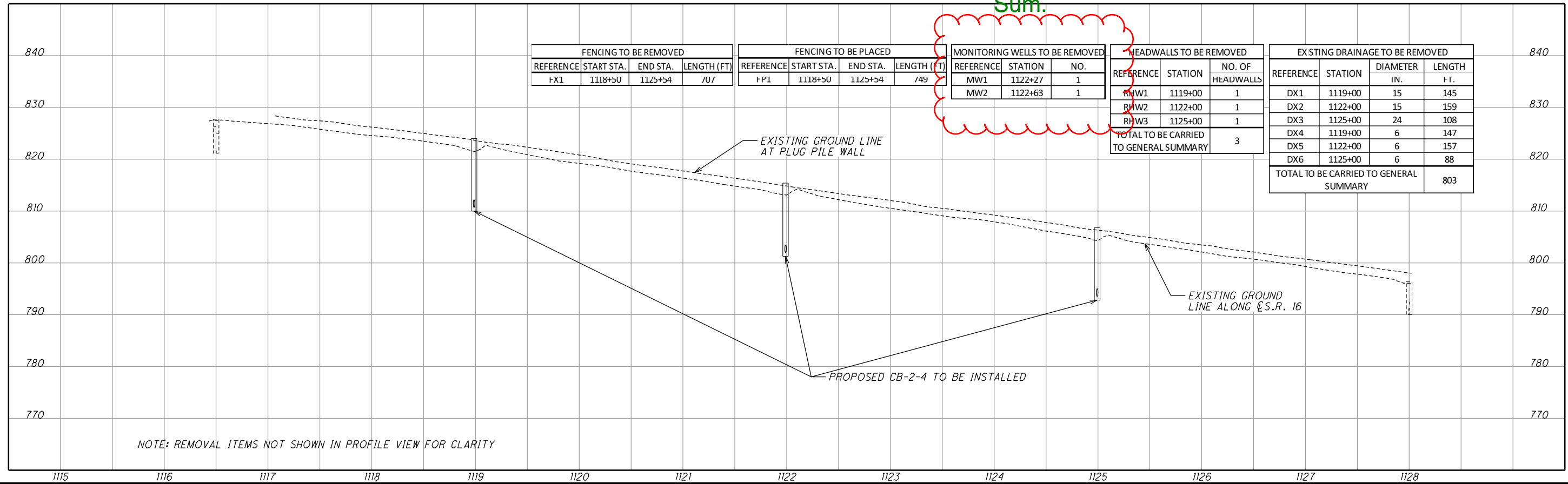
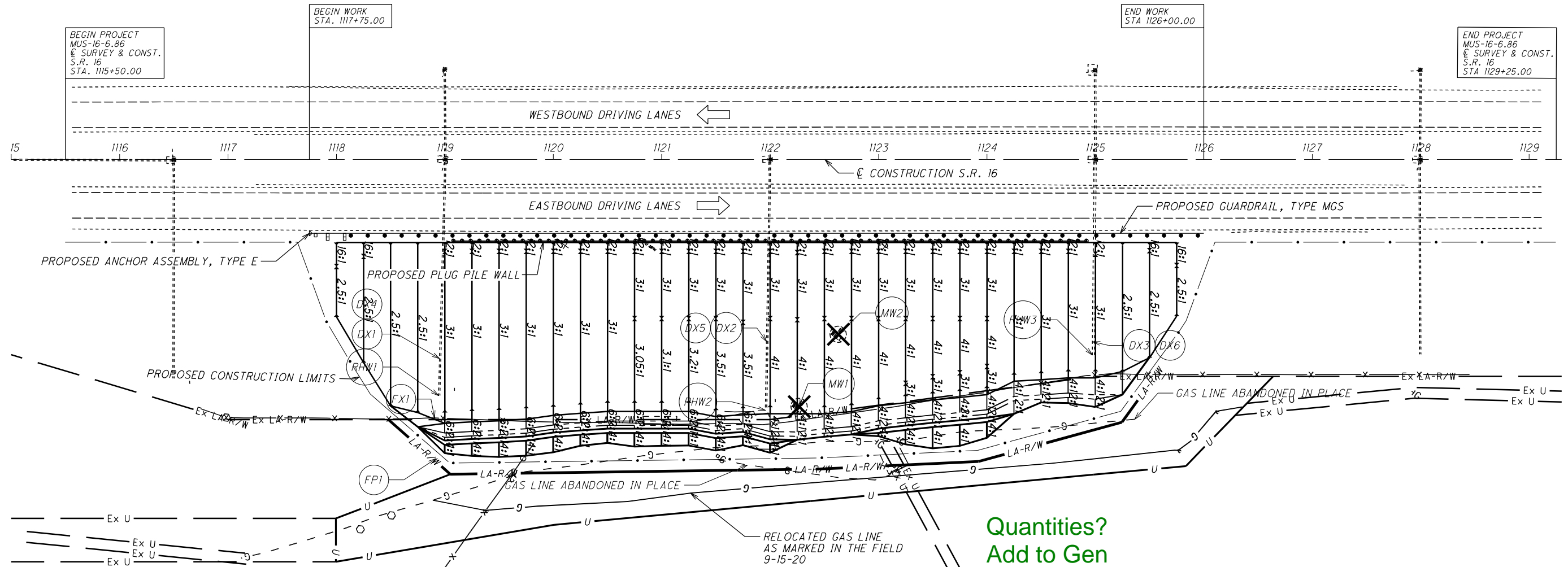
606 GUARDRAIL, TYPE MGS			
START STATION	END STATION	LENGTH	
1118+25	1126+00	775	FT
606 ANCHOR ASSEMBLY, TYPE E			
START STATION	END STATION	AMOUNT	
1117+75	1118+25	1	EACH
626 BARRIER REFLECTOR, TYPE 2, ONE-WAY			
1 REFLECTOR PER 50 FT OF GUARDRAIL		16	EACH

204 SUBGRADE COMPACTION				
START STATION	END STATION	LENGTH FT	WIDTH FT	TOTAL AREA SY
1117+75	1126+00	825	5	458

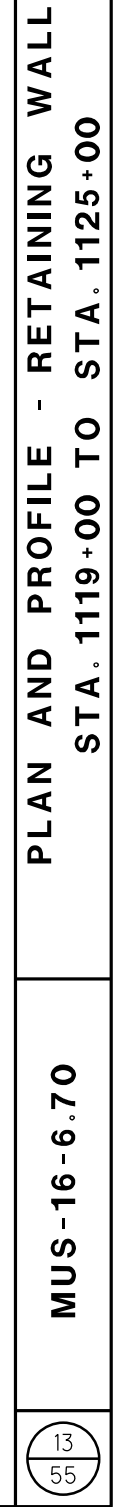
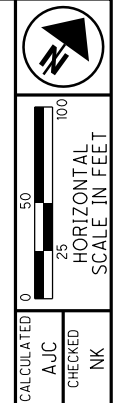
617 COMPACTED AGGREGATE, AS PER PLAN (6")					
START STATION	END STATION	LENGTH FT	DEPTH FT	WIDTH FT	VOLUME CY
1117+75	1126+00	825	0.5	5	76

Station	203 EXCAVATION		203 EMBANKMENT			659 SEEDING AND MULCHING	
	AREA SF	VOLUME CY	AREA SF	VOLUME CY		WIDTH FT	AREA SY
1118+75	0		0			0	
		782		607			265
1119+00	1688		1311			191	
		1254		664			550
1119+25	1019		123			206	
		1062		135			570
1119+50	1275		168			205	
		1192		176			571
1119+75	1301		212			206	
		1202		200			572
1120+00	1296		221			206	
		1194		193			570
1120+25	1284		196			205	
		1192		181			569
1120+50	1290		194			205	
		1210		173			568
1120+75	1324		179			204	
		1235		163			565
1121+00	1345		173			203	
		1250		144			564
1121+25	1356		138			203	
		1235		114			562
1121+50	1313		109			202	
		1211		98			559
1121+75	1302		102			201	
		1648		560			534
1122+00	2257		1107			184	
		1658		531			529
1122+25	1325		40			197	
		1201		56			548
1122+50	1270		82			197	
		1151		83			545
1122+75	1217		98			196	
		1111		101			542
1123+00	1183		119			194	
		1068		131			542
1123+25	1124		164			196	
		1006		161			543
1123+50	1048		184			195	
		945		183			539
1123+75	994		211			193	
		893		186			529
1124+00	934		190			188	
		843		158			512
1124+25	888		151			181	
		824		130			494
1124+50	893		129			175	
		747		83			479
1124+75	721		50			170	
		1064		614			446
1125+00	1577		1277			151	
		730		591			210
1125+25	0		0			0	
SUB-TOTALS							13480
TOTALS CARRIED TO GENERAL SUMMARY		31802		7057			14828

I:\ProjectData\MUS\11352\Design\Roadway\Sheets\11352\_LP001.dgn Sheet 3/9/2023 7:44:43 AM nkadakkia



NOTE: REMOVAL ITEMS NOT SHOWN IN PROFILE VIEW FOR CLARITY



14  
55





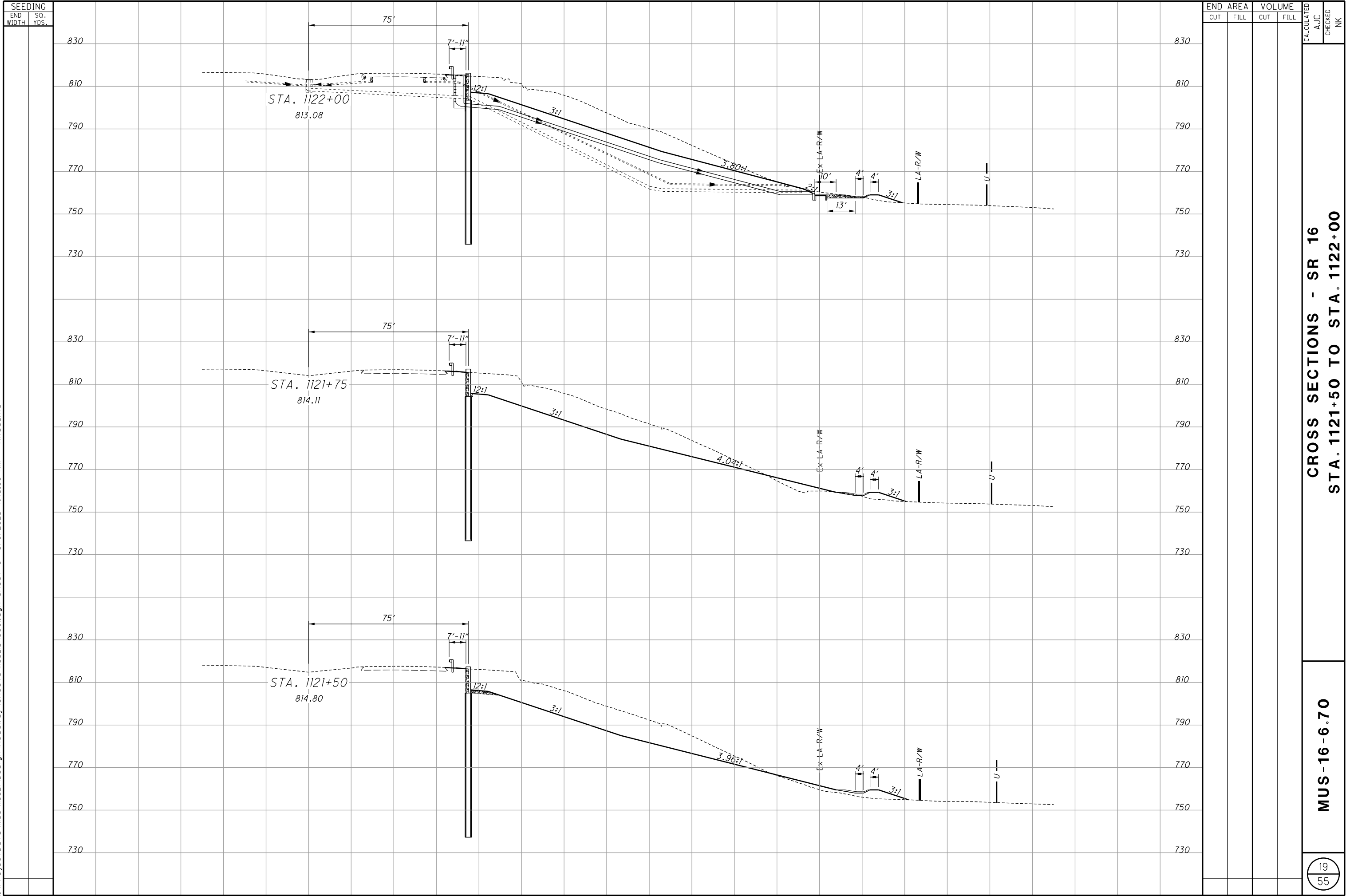
16  
55

17  
55



[illegible]

I:\ProjectData\MUS\11352\Design\Roadway\Sheets\11352L\_X500L.dgn Sheet 6 3/9/2023 7:45:08 AM nkadakia



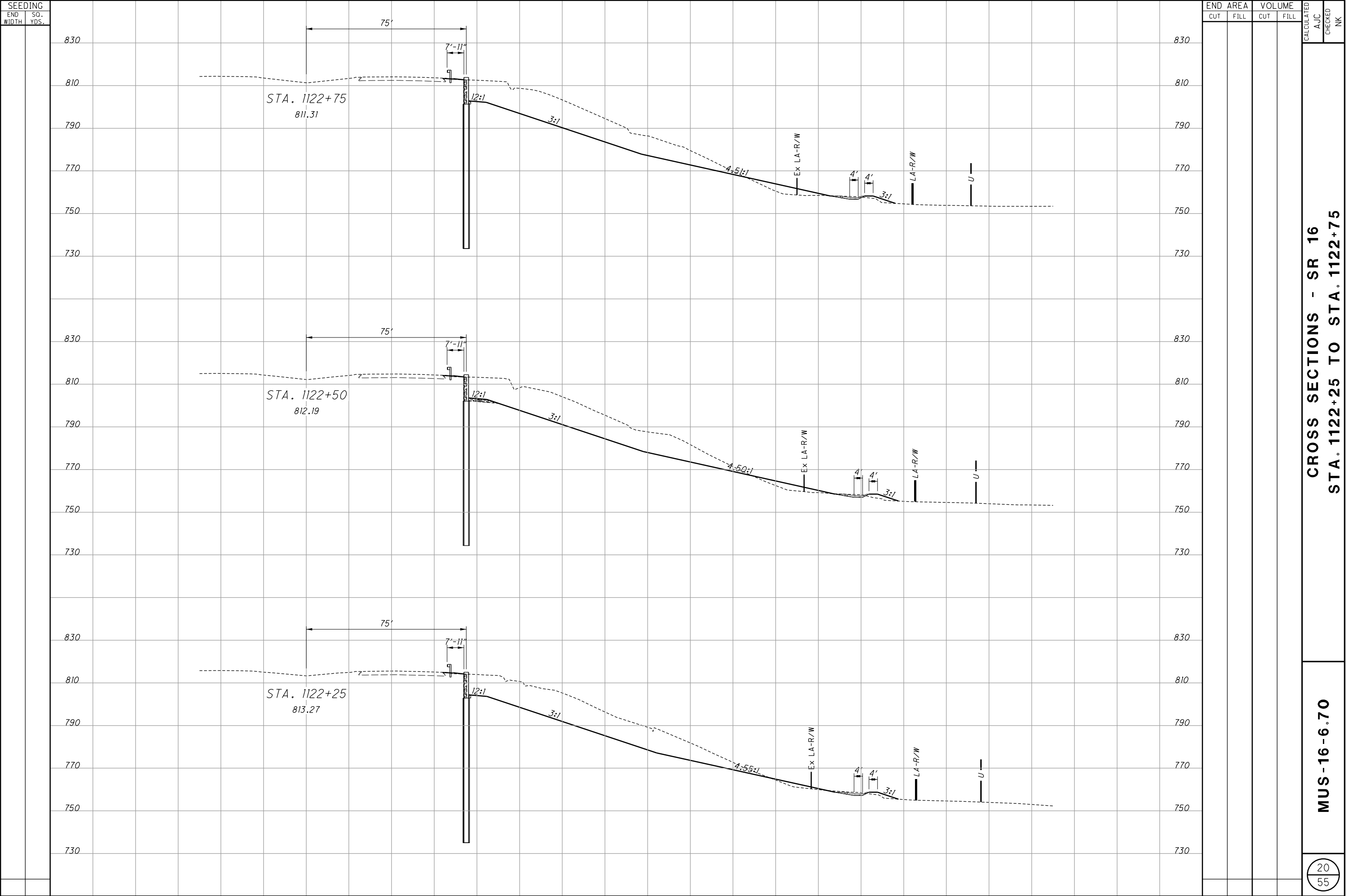
CROSS SECTIONS - SR 16  
STA. 1121+50 TO STA. 1122+00

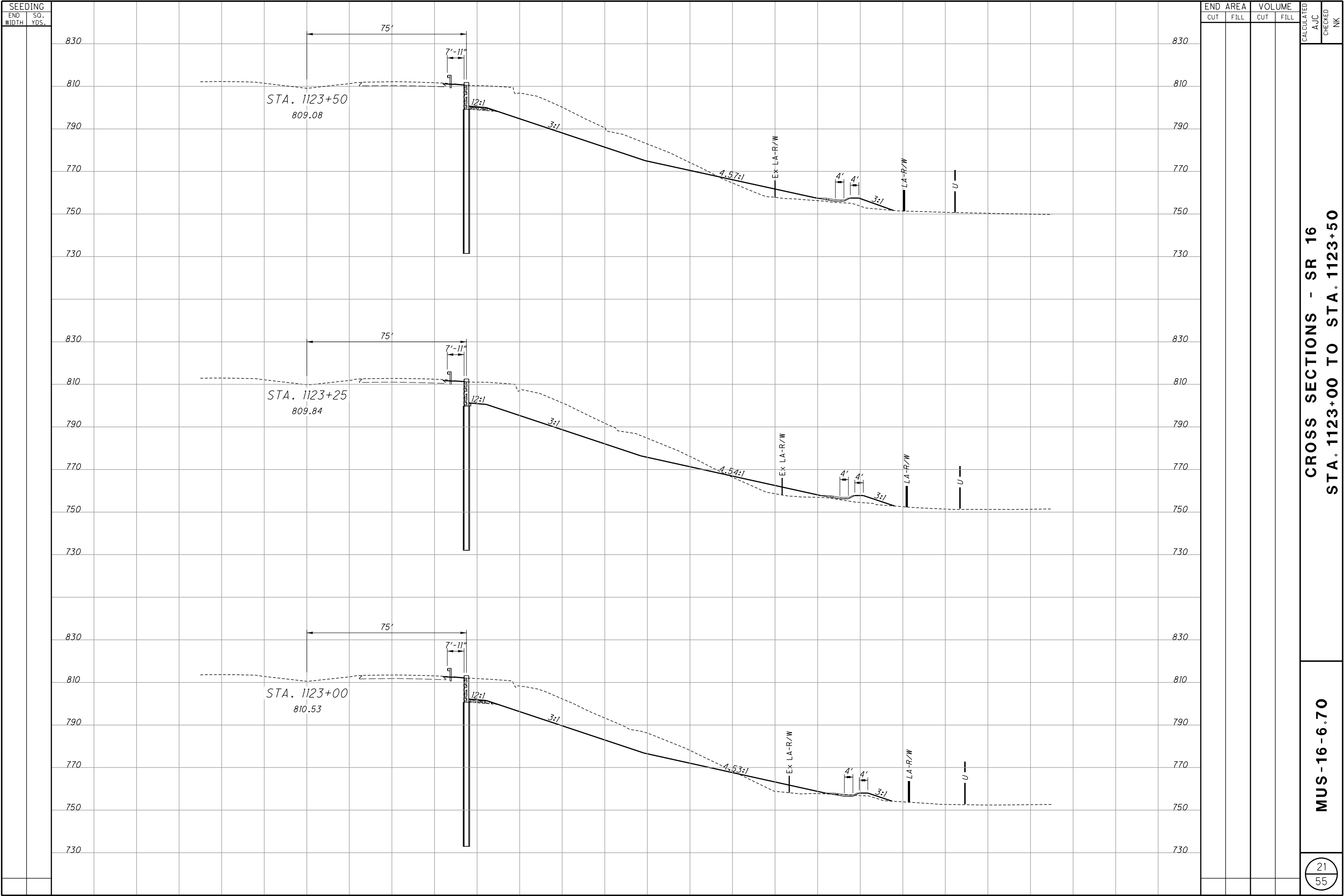
MUS-16-6.70

19  
55

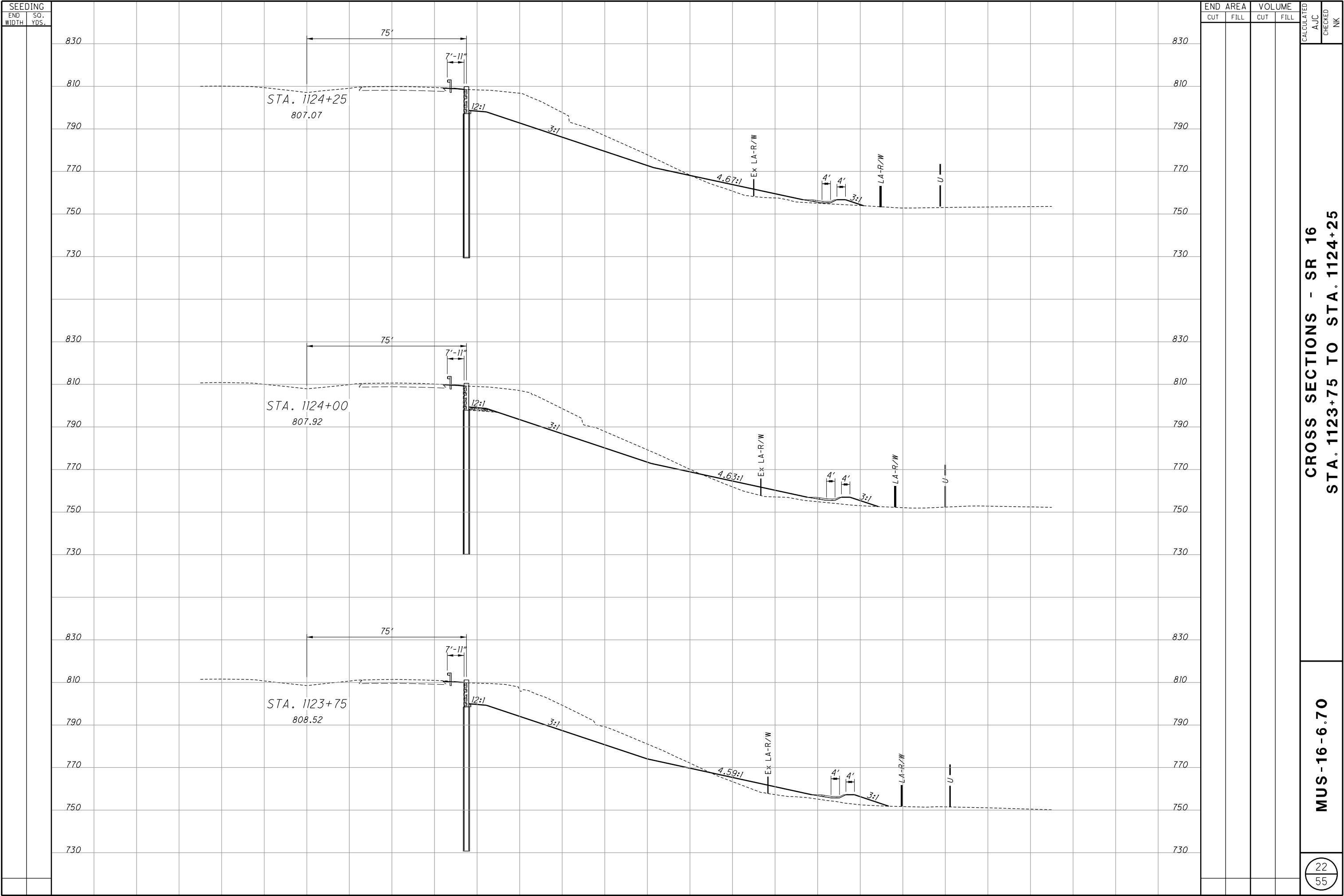


I:\ProjectData\MUS\11352\Design\Roadway\Sheets\11352L\_X500L.dgn Sheet 7 3/9/2023 7:45:08 AM nkadakla

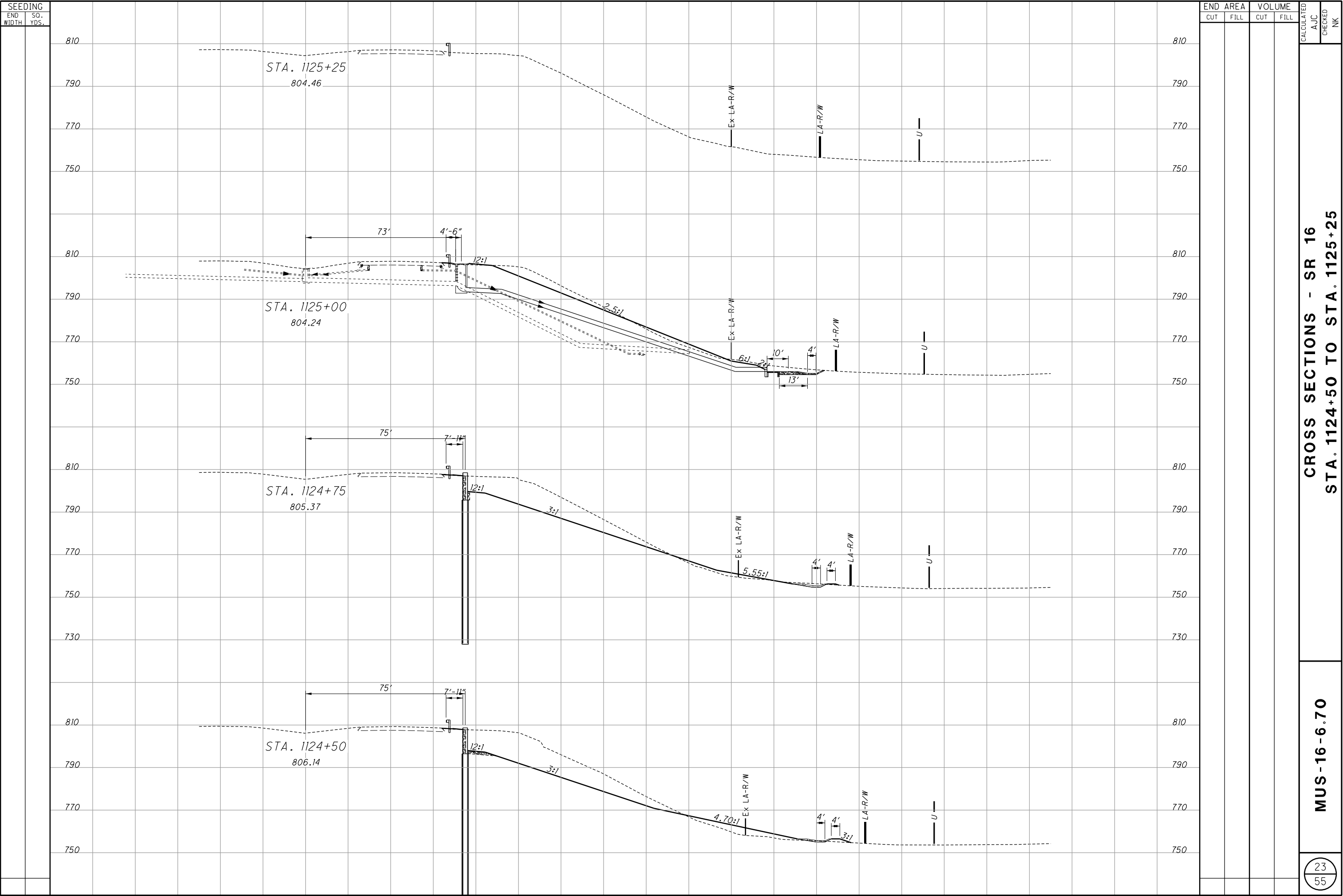




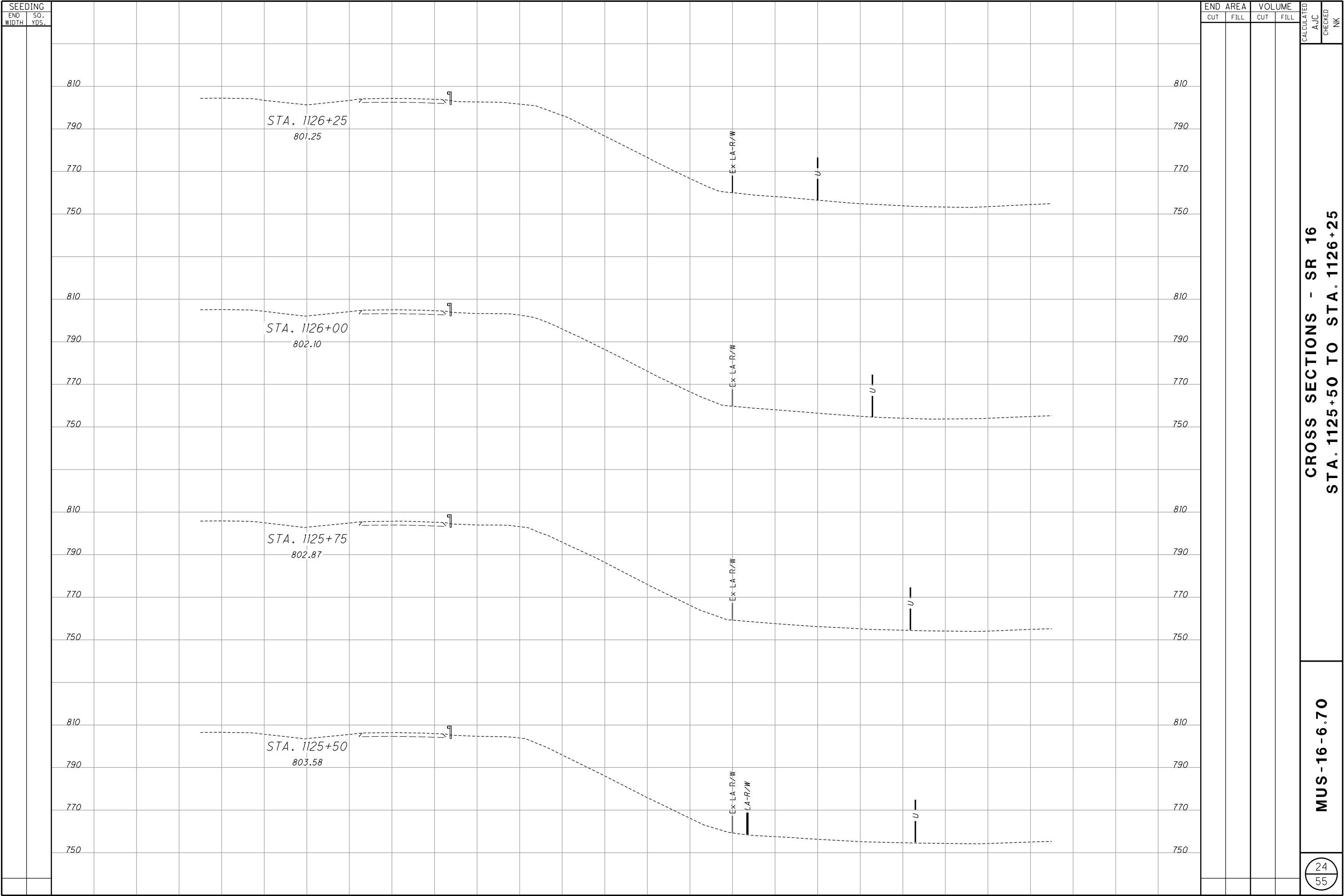
I:\ProjectData\MUS\11352\Design\Roadway\Sheets\11352L\_X500L.dgn Sheet 9 3/9/2023 7:45:10 AM nkadakkia



I:\ProjectData\MUS\11352\Design\Roadway\Sheets\11352L\_X500L.dgn Sheet 10 3/9/2023 7:45:10 AM nkadakla



I:\ProjectData\MUS\11352\Design\Roadway\Sheets\11352L\_X500L.dgn Sheet 11 3/9/2023 7:45:11AM nkadokia

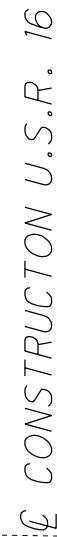


CROSS SECTIONS - SR 16  
STA. 1125+50 TO STA. 1126+25

MUS-16-6.70



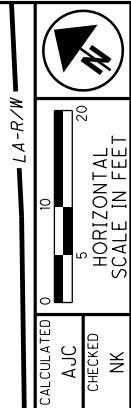
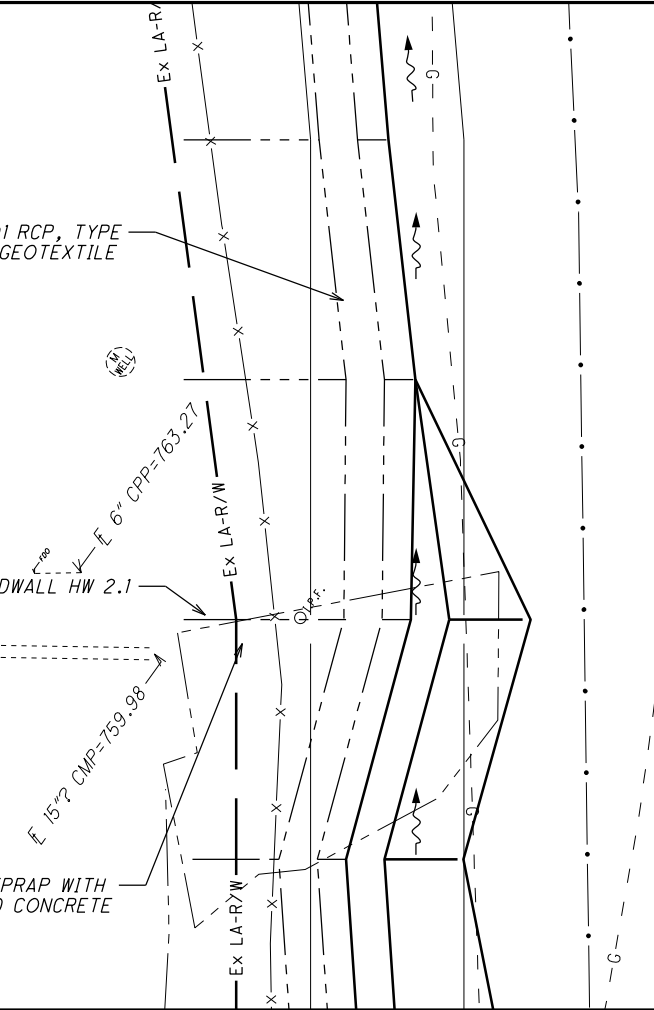




PROPOSED HEADWALL HW 2.1

ITEM 601 RCP, TYPE  
D WITH GEOTEXTILE  
FABRIC

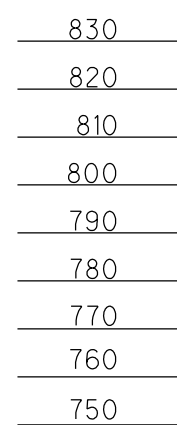
ITEM 601 RIPRAP WITH —  
REINFORCED CONCRETE



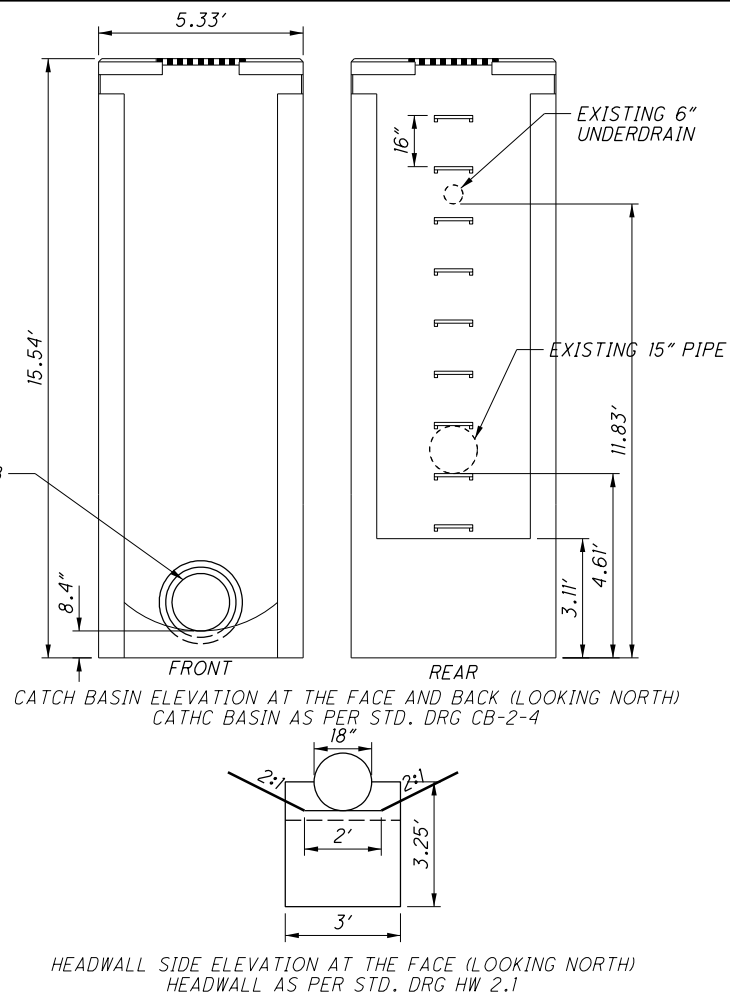
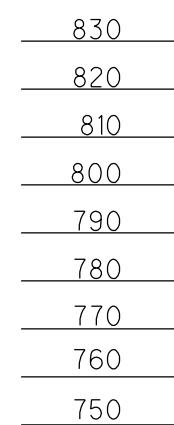
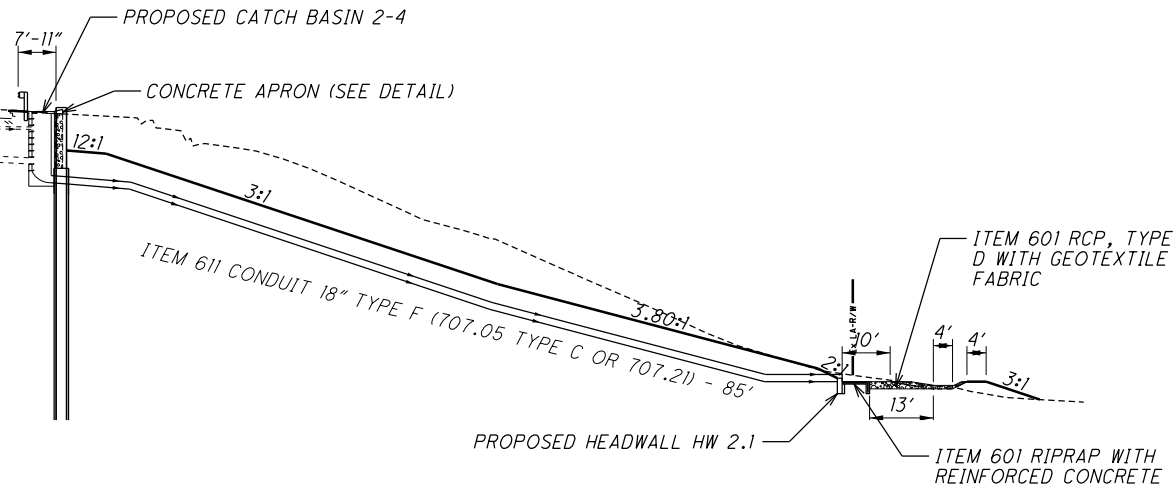
**DRAINAGE DETAILS**  
**MUS-16-6.84**

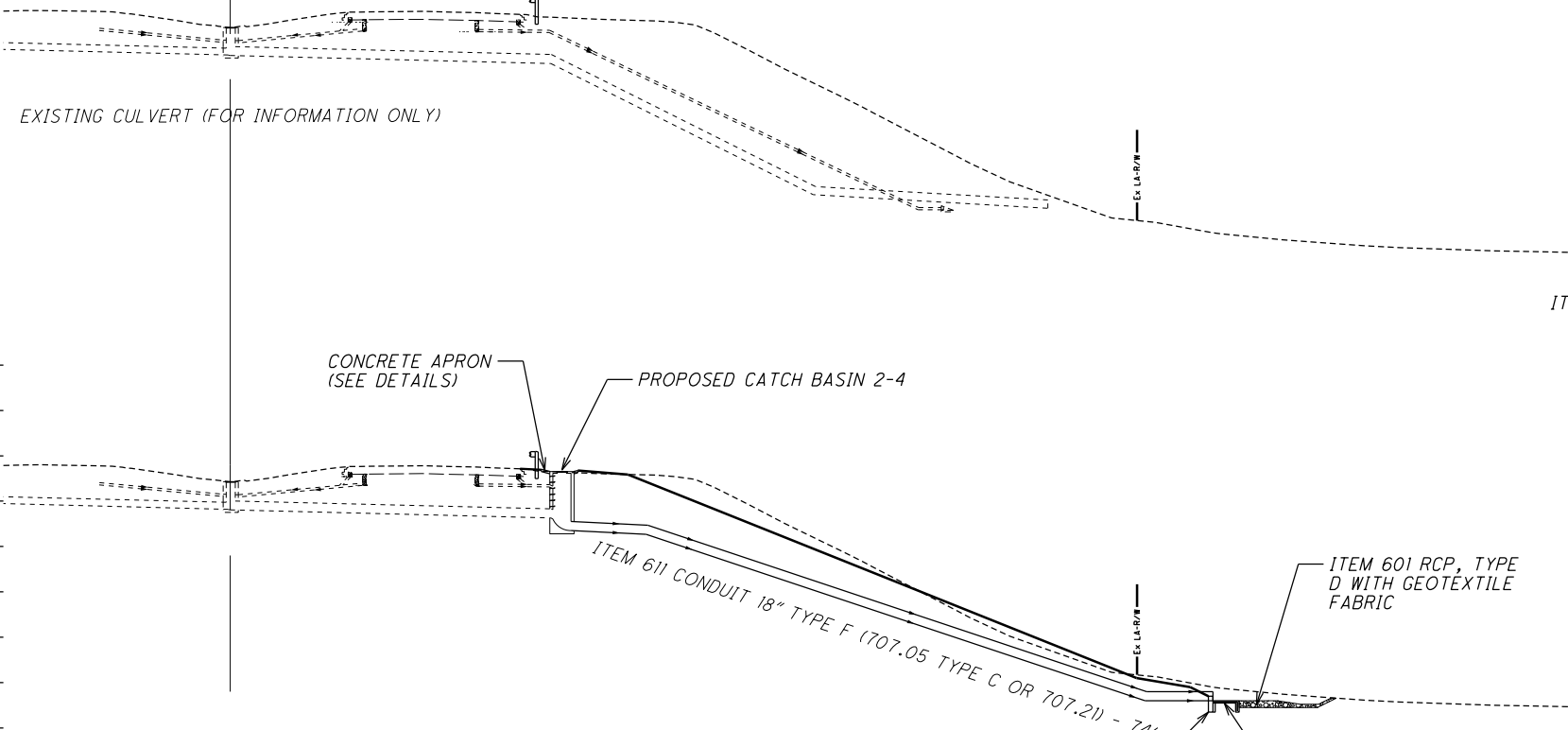


EXISTING CULVERT (FOR INFORMATION ONLY)

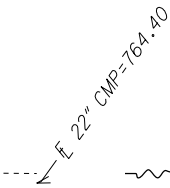
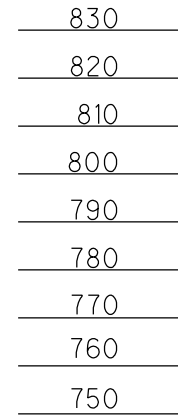


NOTE: PLEASE VERIFY THE DEPTH AND LOCATION OF THE EXISTING CONDUITS AND UNDERDRAINS BEFORE CASTING THE PROPOSED CATCH BASIN.





— ITEM 601 RIPRAP WITH  
REINFORCED CONCRETE



ITEM 601  
RIPRAP WITH  
REINFORCED  
CONCRETE

— CONCRETE APRON (SEE DETAIL)

EXISTING CULVERT (FOR INFORMATION ONLY)

— PROPOSED CATCH BASIN 2-4

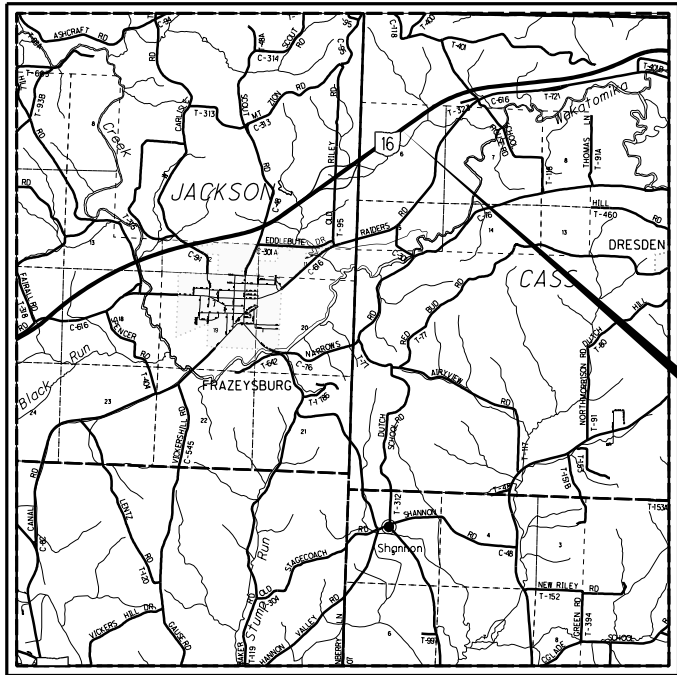
ITEM 611 CONDUIT 18" TYPE F (707.05 TYPE C OR 707.21) - 74'

PROPOSED HEADWALL HW 2.1 -

7 CENTER OF GRAVE=804.28  
LOW POINT OF GRAVE=804.02  
6" CPP NW=801.00  
8" CPP SE=798.89  
8" CPP NW=798.24  
8" CPP SE=798.03



I:\ProjectData\MUS\113521\Design\RW\Sheets\113521\_RL001.dgn Sheet 3/9/2023 7:45:16 AM nkadakkia



LOCATION MAP

LATITUDE: 40°08'36" LONGITUDE: -82°05'13"



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

UTILITY OWNERS

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

NATIONAL GAS AND OIL COOPERATIVE  
120 O'NEIL DRIVE  
HEBRON, OHIO 43025  
ATTN: GREG WILSON  
740-348-1254  
GWILSON@THEENERGYCOOP.COM

CONVENTIONAL SYMBOLS

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

STRUCTURE KEY

	RESIDENTIAL
	COMMERCIAL
	OUT-BUILDING

LEGEND:  
WL = FEE SIMPLE WITH LIMITATION OF ACCESS  
LA = LIMITED ACCESS EASEMENT  
T = TEMPORARY EASEMENT  
U = PUBLIC UTILITY EASEMENT

# RIGHT OF WAY LEGEND SHEET MUS-16-6.70

MUSKINGUM COUNTY  
CASS TOWNSHIP  
SECTION 6, T3N, R8W

PLAN PREPARED BY:

FRIM NAME: ODOT, DISTRICT 5  
PLANS PREPARED BY: JUSTINE DEITRICK  
FIELD REVIEW BY: LW  
OWNERSHIP VERIFIED BY: LW  
DATE COMPLETED: 2/1/2022

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 REVISED CODE OF OHIO.

PROJECT DESCRIPTION

LANDSLIDE REPAIR ALONG STATE ROUTE 16 USING SOLDIER PILE WALL WITH LAGGING.

PROJECT CONTROL

ODOT VRS DERRIVED PROJECT GROUND  
PROJECT GROUND RELATIVE TO  
NAD83(2011) STATE PLANE, OHIO SOUTH ZONE  
PAF 1.00000706  
NORTH AMERICAN VERTICAL DATUM (NAVD 88)  
(CONUS), GEOID 12B (CONUS).

UNDERGROUND UTILITIES

Contact Two Working Days  
Before You Dig



OHIO811, 8-1-1, or 1-800-362-2764  
(Non-members must be called directly)

I, hereby certify that this plat is prepared under the direction and supervision of Luke Walker, P.S. #8701 for the Ohio Department of Transportation, and is based on a survey performed for the Ohio Department of Transportation in September 2020 by Buckley Group under the supervision of Robert C. Canter, P.S. #7226. The results of that survey are contained herein.

Underground utility locations are shown for informational purposes only. Though they are believed to be accurate, their location is as marked on the ground by the utility company per OHIO811 Confirmation Numbers B016001857-00B, and A125200917, those markings subsequently being surveyed as a part of this project.

The horizontal geometry expressed herein is based on ODOT VRS derived; Project Ground Coordinate System, relative to NAD83(2011) State Plane Ohio South Zone 3402 scaled about the origin by a project adjustment factor of 1.00000706. Orthometric heights are relative to NAVD88, GEOID 18.

As a part of this project I have reestablished the locations of the existing property lines and centerline of existing Right of Way for property takes contained herein.

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 monuments at the proposed property corners, and other points shown herein. The iron pins and caps will be 3/4" x 30" rebar with aluminum cap stamped "ODOT R/W District 5". All of my work contained herein was conducted in accordance with Ohio Administrative Code 4733-37 commonly known as "A Minimum Standards for Boundary Surveys in the State of Ohio" unless so noted.

The words I and my as used herein are to mean that either myself or someone working under my direct supervision.

Luke Walker, Professional Surveyor # 8701

Date: \_\_\_\_\_

SURVEYORS SEAL

SIGNED: \_\_\_\_\_  
DATE: \_\_\_\_\_

FEDERAL PROJECT NO.

PID NO.

CALCULATED  
JED  
CHECKED  
LW

RIGHT OF WAY  
LEGEND SHEET

MUS-16-6.70

1 / 3

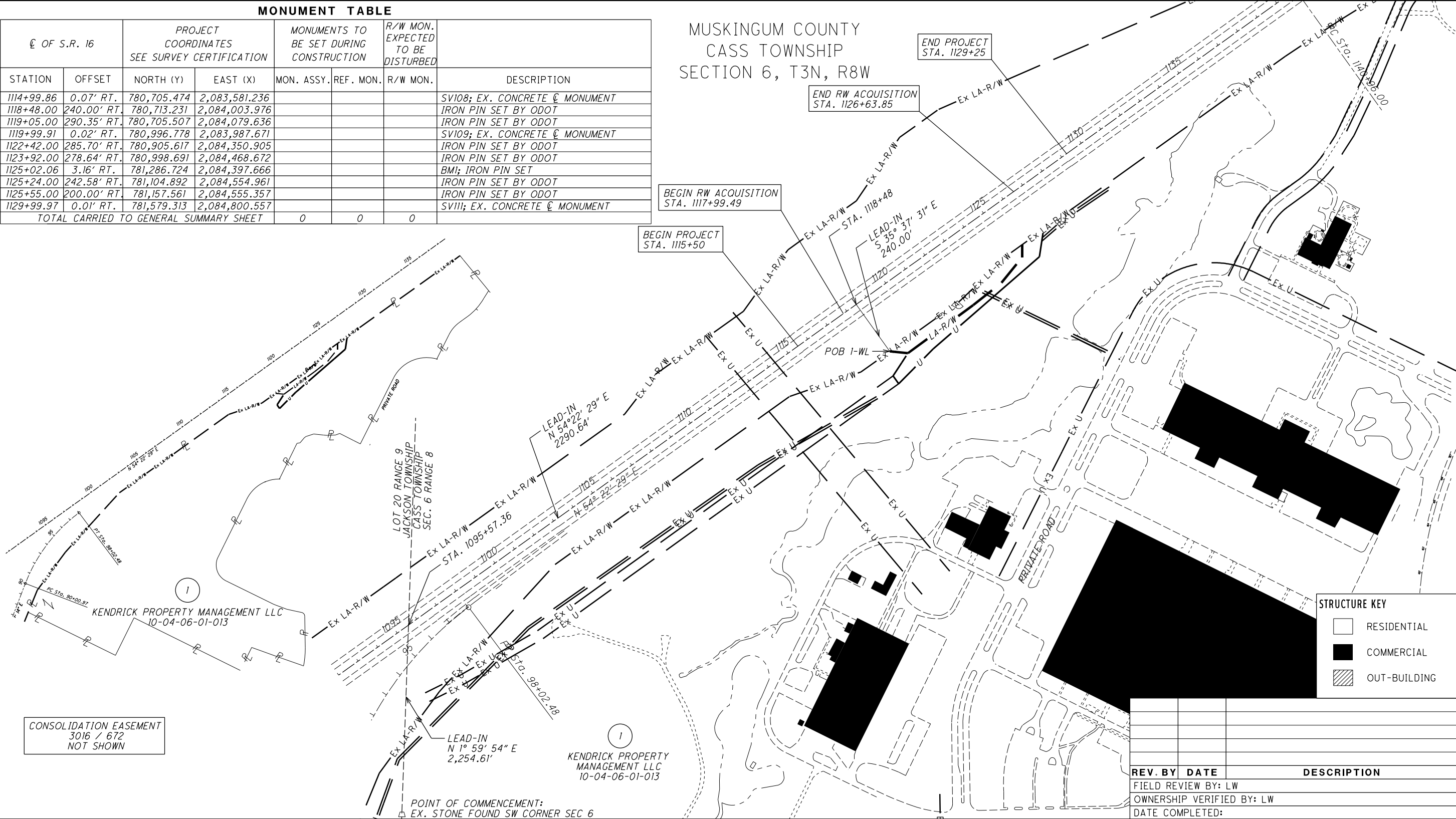
0  
0

00000

I:\ProjectData\MUS\13521\Design\RW\Sheets\13521\_RM001.dgn Sheet 3/9/2023 7:45:18 AM nkadakkia

MONUMENT TABLE							
C OF S.R. 16		PROJECT COORDINATES SEE SURVEY CERTIFICATION		MONUMENTS TO BE SET DURING CONSTRUCTION	R/W MON. EXPECTED TO BE DISTURBED		
STATION	OFFSET	NORTH (Y)	EAST (X)	MON. ASSY.	REF. MON.	R/W MON.	DESCRIPTION
1114+99.86	0.07' RT.	780,705.474	2,083,581.236				SV108; EX. CONCRETE C MONUMENT
1118+48.00	240.00' RT.	780,713.231	2,084,003.976				IRON PIN SET BY ODOT
1119+05.00	290.35' RT.	780,705.507	2,084,079.636				IRON PIN SET BY ODOT
1119+99.91	0.02' RT.	780,996.778	2,083,987.671				SV109; EX. CONCRETE C MONUMENT
1122+42.00	285.70' RT.	780,905.617	2,084,350.905				IRON PIN SET BY ODOT
1123+92.00	278.64' RT.	780,998.691	2,084,468.672				IRON PIN SET BY ODOT
1125+02.06	3.16' RT.	781,286.724	2,084,397.666				BMI; IRON PIN SET
1125+24.00	242.58' RT.	781,104.892	2,084,554.961				IRON PIN SET BY ODOT
1125+55.00	200.00' RT.	781,157.561	2,084,555.357				IRON PIN SET BY ODOT
1129+99.97	0.01' RT.	781,579.313	2,084,800.557				SVIII; EX. CONCRETE C MONUMENT
TOTAL CARRIED TO GENERAL SUMMARY SHEET				0	0	0	

MUSKINGUM COUNTY  
CASS TOWNSHIP  
SECTION 6, T3N, R8W



**TOTAL NUMBER OF :**  
1 OWNERSHIPS      0 TOTAL TAKES  
2 PARCELS        0 OWNERSHIPS W/ STRUCTURES INVOLVED

RECORD AREA - TOTAL PRO - NET TAKE = NET RESIDUE  
**ALL AREAS IN ACRES**

**GRANTEE:**  
ALL RIGHT OF WAY ACQUIRED IN THE NAME OF THE  
STATE OF OHIO UNLESS OTHERWISE SHOWN.

\* DENOTES RIGHT OF WAY ENCROACHMENT  
\*\* SURVEYED AREA

PARCEL NO.	OWNER	OWNERS RECORD	AUDITOR'S PARCEL	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUC-TURE	NET RESIDUE		TYPE FUND	REMARKS	AS ACQUIRED
		DEED BOOK & PG.								LEFT	RIGHT			DEED BOOK & PG.
I-WL	KENDRICK PROPERTY MANAGEMENT LLC	OR BK 2683, PG. 723	10-04-06-01-013	96.228	0.000	0.787	0.000	0.787	NO		95.441	STATE	EXISTING GATE AND FENCE TO BE REMOVED	
I-U	NATIONAL GAS AND OIL COOPERATIVE					0.828		0.828						

NOTE: ALL TEMPORARY PARCELS TO BE OF 12 MONTH DURATION.  
NOTE: UNDER NO CIRCUMSTANCES ARE TEMPORARY EASEMENTS TO BE USED FOR STORAGE OF MATERIAL OR EQUIPMENT BY THE CONTRACTOR UNLESS NOTED OTHERWISE.

0

100

200

HORIZONTAL SCALE IN FEET

PID NO.

113521

R/W DESIGNER

JED

R/W REVIEWER

LW

PROPERTY MAP

MUS-16-6.70

2

3

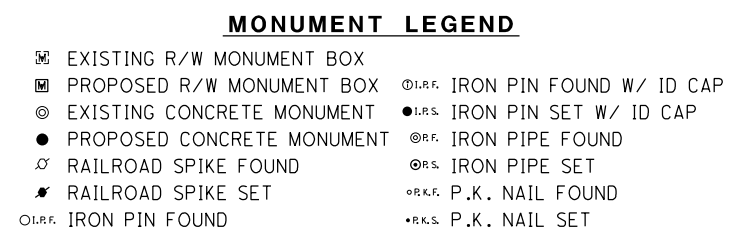
0

0

20  
10  
40  
HORIZONTAL  
SCALE IN FEET

R/W DESIGNER	JED
R/W REVIEWER	LW

**MUS-16-6.70**



NOTE: MUS-16-2.66 - 1WL BK 1983, PG. 851  
MCEO SURVEY # 10040601015 LINN ENGINEERING INC. 8/19/2016  
RECIPROCAL AGREEMENT OR BK 2426, PG. 693

I:\ProjectData\MUS\11352\Design\Geotechnical\Sheets\11352\_LYCO01.dgn Sheet 3/9/2023 7:45:20 AM nkadok1a

PROJECT DESCRIPTION

LANDSLIDE REPAIR ALONG STATE ROUTE 16 USING SOLDIER PILE WALL WITH LAGGING.

HISTORIC RECORDS

A HISTORICAL GEOTECHNICAL EXPLORATION, MUS-16-2.66, WAS OBTAINED FROM ODOT’S TRANSPORTATION INFORMATION MAPPING SYSTEM (TIMS). THIS EXPLORATION WAS COMPLETED IN 1997 FOR THE CONSTRUCTION OF THE CURRENT ALIGNMENT OF MUS-16. BORINGS B-62 AND B-63 (LABELED B-062-0-97 AND B-063-0-97) WERE UTILIZED FOR THE LANDSLIDE ANALYSIS OF THE CURRENT PROJECT.

THE HISTORIC PROJECT PLAN SET FOR MUS-16-2.66 INDICATED A 2:1 SLOPE CONSTRUCTED STARTING AT THE EDGE OF THE PROPOSED SHOULDER. HOWEVER, THE EXISTING SLOPE STARTS ABOUT 35 FEET PAST THIS POINT, MEANING ADDITIONAL FILL WAS PLACED ON THE SLOPES FOR REASONS UNKNOWN.

GEOLOGY

THE PROJECT IS LOCATED WITHIN THE NON-GLACIATED MUSKINGUM-PITTSBURGH PLATEAU PHYSIOGRAPHIC REGION WHICH IS CHARACTERIZED AS A MODERATE TO HIGH RELIEF DISSECTED PLATEAU WHICH HAS BROAD MAJOR DRAINAGE VALLEYS. THESE DRAINAGE VALLEYS CONTAIN OUTWASH AND LACUSTRINE TERRACES. OVERBURDEN SOILS ARE PREDOMINANTLY COHESIVE AND ARE UNDERLAIN BY BEDROCK FOUND WIHTIN THE REGION IS PREDOMINATELY COMPROMISED OF SILTSTONES, SHALES, SANDSTONES, COAL AND CLAYSTONES OF MISSISSIPPIAN- AND PENNSYLVANIAN-AGE.

RECONNAISSANCE

FIELD RECONNAISSANCE WAS COMPLETED BY PERSONNEL FROM THE OFFICE OF GEOTECHNICAL ENGINEERING AND DISTRICT 5 ON MAY 28, 2020. A HEAD SCARP WAS PRESENT APPROXIMATELY 25 FEET FROM THE EDGE OF THE PAVED SHOLDER RUNNING 428.5 FEET FROM APPROXIMATELY STA. 1119+25 TO STA. 1123+54. A TOE BULGE WAS PRESENT BENEATH AND EXTENDING APPROXIMATELY 30 FEET PAST THE RIGHT-OF-WAY (ROW) FENCE. THE MAIN TENSION CRACK WAS OBSERVED TO RUN APPROXIMATELY PARALLEL TO THE ROADWAY WITH ADDITIONAL TENSION CRACKS NOTED ALONG THE OUTSIDE SLOPE. THE ADDITIONAL TENSION CRACKS WERE NOTED TO HAVE MINOR DROPS, BUT NO MAJOR DISTRESS SIGNS. SEVERAL LARGE BLOCKS OF SHALE AND SILTSONE WERE NOTED WITHIN THE SCARP EXPOSURE AND LARGE BLOCKS OF SILTSTONE AND SANDSTONE WERE NOTED AT THE EMBANKMENT GROUND SURFACE.

THE EMBANKMENT APPEARS TO BE FILL PLACED ON A SIDE HILL WITH A 2H:1V SLOPE. THE CURRENT EMBANKMENT HAS A TRANSITION TO THE 2H:1V SLOPE APPROXIMATELY 35 FEET PAST THE EDGE OF PAVEMENT WHICH WAS WIDER THAN WHAT WAS DESIGNATED IN THE CONSTRUCTION PLANS.

THE EMBANKMENT FAILURE HAD CAUSED A NATURAL GAS TRANSMISSION PIPELINE JUST BEYOND THE ROW TO RUPTURE. THE TRANSMISSION COMPANY HAS CONSTRUCTED A TEMPORARY LINE DUE TO THE INSTABILITY.

THE ADJACENT LAND USAGE IS COMMERCIAL TO THE SOUTH AND UNDEVELOPED HILLSIDE TO THE NORTH.

SUBSURFACE EXPLORATION

FIVE (5) BORINGS, B-001-0-20, B-002-0-20 TO B-002-2-20, AND B-003-0-20, WERE COMPLETED AS PART OF THE SUBSURFACE EXPLORATION. THE BORINGS WERE DRILLED BETWEEN JUNE 24, 2020 AND JULY 16, 2020.
















BORINGS B-001-0-20, B-002-0-20, AND B-003-0-20 WERE DRILLED USING A TRUCK MOUNTED CME 55 ROTARY DRILL RIG AND 3 1/4-INCH I.D. HOLLOW STEM AUGERS TO ADVANCE THE BORINGS THROUGH THE SOIL. DISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE STANDARD PENETRATION TEST (AASHTO T206) AT 2.5-FOOT INTERVALS WITHIN THE OVERBURDEN SOILS. THE HAMMER SYSTEM USED WAS LAST CALIBRATED ON APRIL 15, 2020, AND THE AVERAGE DRILL ROD ENERGY RATIO (ER) IS 83.6%.

BORINGS B-002-1-20 AND B-002-2-20 WERE DRILLED USING A TRACK MOUNTED CME 850R ROTARY DRILL RIG AND 3 3/4-INCH I.D. HOLLOW STEM AUGERS TO ADVANCE THE BORINGS THROUGH THE SOIL. DISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE STANDARD PENETRATION TEST (AASHTO T206) AT CONTINUOUS INTERVALS WITHIN THE OVERBURDEN SOILS. THE HAMMER SYSTEM USED WAS LAST CALIBRATED ON MAY 1, 2019, AND THE AVERAGE DRILL ROD ENERGY RATIO (ER) IS 89.1%.

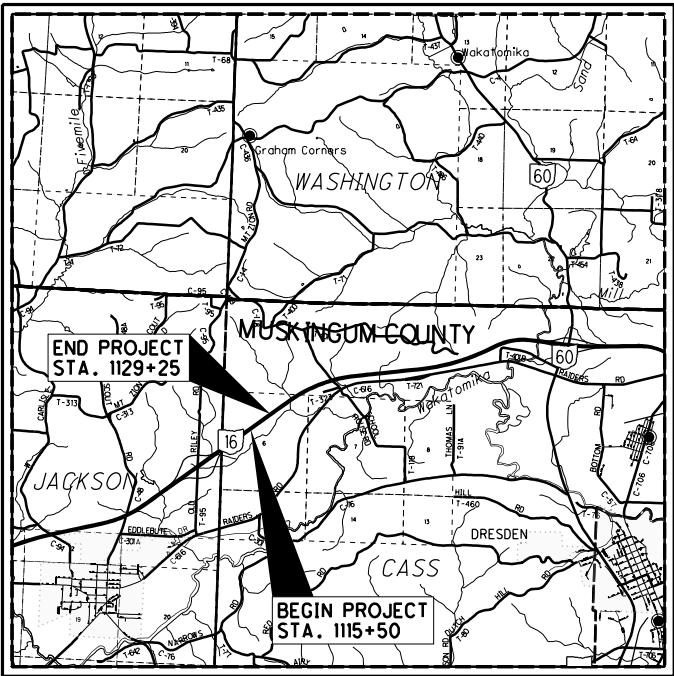
ALL BORINGS WERE ADVANCED INTO BEDROCK AND SAMPLED (AASHTO T225) USING AN N-SERIES WIRELINE CORE BARREL, WATER METHOD.

EXPLORATION FINDINGS

B-001-0-20 THROUGH B-003-0-20 LOCATED JUST OFF THE SHOULDER, B-002-1-20 WAS COMPLETED APPROXIMATELY MID-SLOPE AND B-002-2-20 WAS COMPLETED AT THE TOE OF SLOPE ADJACENT TO THE ROW FENCE. ALL BORINGS, EXCEPT B-002-2-20, WERE ADVANCED THROUGH THE EXISTING EMBANKMENT SLOPE. THE ENCOUNTERED SURFACE MATERIALS VARIED BETWEEN 0 TO 8 INCHES OF TOPSOIL. BENEATH THE SURFACE MATERIAL, THE BORINGS ENCOUNTERED PREDOMINANTLY COHESIVE SOILS CONSISTING OF SANDY SILT (A-4a), SILT (A-4b), SILT AND CLAY (A-6a), AND SILTY CLAY (A-6b) THAT RANGED FROM VERY SOFT TO HARD IN CONSISTENCY AND WERE IN DAMP TO WET CONDITIONS. THE ENCOUNTERED GRANULAR MATERIALS CONSISTED OF STONE FRAGMENTS WITH SAND AND SILT (A-2-4) AND NON-PLASTIC SANDY SILT (A-4a) AND SILT (A-4b) THAT RANGED IN COMPACTNESS FROM VERY LOOSE TO VERY DENSE AND WERE IN DAMP TO WET CONDITIONS.

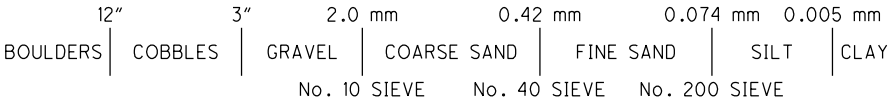
LEGEND		ODOT CLASS	CLASSIFIED MECH./VISUAL	
DESCRIPTION				
	STONE FRAGMENTS WITH SAND AND SILT	A-2-4	8	6
	SANDY SILT	A-4a	38	58
	SILT	A-4b	5	4
	SILT AND CLAY	A-6a	12	24
	SILTY CLAY	A-6b	2	3
		TOTAL	65	95
	BOULDERS	VISUAL		
	SANDSTONE	VISUAL		
	SILTSTONE	VISUAL		
	PAVEMENT OR BASE = X = APPROXIMATE THICKNESS	VISUAL		
	SOD AND TOPSOIL = X = APPROXIMATE THICKNESS	VISUAL		
	B-ZZZ-W-YY PROJECT BORING LOCATION - PLAN VIEW.			
	B-ZZZ-W-YY INSTRUMENTED BORING LOCATION - PLAN VIEW.			
	B-ZZZ-W-YY HISTORIC BORING LOCATION - PLAN VIEW.			
	DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.			
WC	INDICATES WATER CONTENT IN PERCENT.			
N <sub>60</sub>	INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.			
X/Y/D"	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X= NUMBER OF BLOWS FOR 6 INCHES (UNCORRECTED). Y/D"= NUMBER OF BLOWS (UNCORRECTED) FOR D INCHES OF PENETRATION AT REFUSAL.			
X/D"	NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X/D"= NUMBER OF BLOWS (UNCORRECTED) FOR D INCHES OF PENETRATION AT REFUSAL.			
	INDICATES WATER AT COMPLETION.			
W—	INDICATES FREE WATER ELEVATION.			
●	INDICATES A PLASTIC MATERIAL WITH A MOISTURE CONTENT EQUAL TO OR GREATER THAN THE LIQUID LIMIT MINUS 3.			
⊖	INDICATES A NON-PLASTIC MATERIAL WITH A MOISTURE CONTENT GREATER THAN 25 % OR GREATER THAN 19 % WITH A WET APPEARANCE.			
γ	INDICATES UNIT WEIGHT OF ROCK.			
NP	INDICATES A NON-PLASTIC SAMPLE.			
NQ	"N" SERIES ROCK CORE BARREL OF "Q" WIRELINE BIT SIZE.			
Qu	INDICATES UNCONFINED COMPRESSION TEST, ASTM D7012.			
SS	INDICATES A SPLIT SPOON SAMPLE.			
TR	INDICATES TOP OF ROCK ELEVATION.			









BEDROCK TEST SUMMARY				
BORING NO.	SAMPLE	SAMPLE ELEVATION	DEPTH	Qu (PSI)
B-001-0-20	S-1	756.0’	66.0’ - 66.3’	5,893
B-003-0-20	S-1	741.1’	68.5’ - 68.9’	6,247
B-003-0-20	S-2	731.7’	77.9’ - 78.2’	7,277
HISTORIC BEDROCK TEST SUMMARY				
B-062-0-97	S-1	776.1’	41.0’	4,620



LOCATION MAP  
SCALE IN MILES

PARTICLE SIZE DEFINITIONS



LEGEND		ODOT CLASS	CLASSIFIED MECH./VISUAL	
HISTORIC BORING DESCRIPTIONS				
	GRAVEL	A-1-a	-	2
	SANDY SILT	A-4a	-	1
	SILT AND CLAY	A-6a	-	6
	SILTY CLAY	A-6b	-	1
	CLAY	A-7-6	-	1
	TOTAL		-	11
	SANDSTONE	VISUAL		
	SHALE	VISUAL		
	SILTSTONE	VISUAL		
qr	INDICATES UNCONFINED COMPRESSION TEST.			

RECON. - PPP & SAT 5/28/20  
DRILLING - KAM 6/24/20 - 7/15/20  
CEM 6/24/20 - 7/16/20  
DRAWN - AJC 9/27/21  
REVIEWED - SAT 9/27/21

I:\ProjectData\MUS\1352\Design\Geotechnical\Sheets\1352\_LYC002.dgn Sheet 3/9/2023 7:45:20 AM nkadk1a

EXPLORATION FINDINGS (CONT.)

BOULDERS WERE ENCOUNTERED IN BORINGS B-001-0-20 AND B-002-0-20 AT DEPTHS OF 64.4 FT, ELEV. 765 MSL, AND 53.5 FT, ELEV. 760 MSL, RESPECTIVELY. THE BOULDER LAYERS EXTENDED TO THE ENCOUNTERED BEDROCK.

ALL THE BORINGS ENCOUNTERED BEDROCK. B-001-0-20, B-002-0-20 AND B-003-0-20 WERE DRILLED PARALLEL TO SR 16 JUST OFF THE SHOULDER. THE BORINGS ENCOUNTERED HIGHLY TO MODERATELY WEATHERED, SLIGHTLY STRONG SANDSTONE AT APPROXIMATELY ELEVATIONS 757.6 FEET, 745.3 FEET AND 740.8 FEET, RESPECTIVELY. B-001-0-20 ENCOUNTERED LAYERS OF WEAK SHALE FROM ELEVATIONS 754.8 FEET TO 752.8 FEET APPROXIMATELY WITHIN THE SANDSTONE LAYER. B-001-0-20 AND B-003-0-20 BOTH ENCOUNTERED CLAY SEAMS WITHIN THE SANDSTONE LAYER THAT VARIED IN THICKNESS FROM 0.1 FT TO 0.6 FT. BOTH B-002-0-20 AND B-003-0-20 WERE TERMINATED IN THE SANDSTONE LAYER. BENEATH THE SANDSTONE LAYER, B-001-0-20 ENCOUNTERED HIGHLY TO MODERATELY WEATHERED, WEAK SILTSTONE AT APPROXIMATELY ELEVATION 751.8 FEET IN WHICH THE BORING WAS TERMINATED.

B-002-1-20 WAS DRILLED APPROXIMATELY MID-SLOPE AND ENCOUNTERED MODERATELY WEATHERED, WEAK SANDSTONE AT APPROXIMATELY ELEVATION 684.8 FEET WHICH BECAME SLIGHTLY WEATHERED, SLIGHTLY TO MODERATELY STRONG AT APPROXIMATELY ELEVATION 683.3 FEET WHICH BECAME UNWEATHERED AT APPROXIMATELY ELEVATION 676.2 FEET IN WHICH THE BORING WAS TERMINATED.

B-002-2-20 WAS DRILLED THROUGH THE TOE BULGE OF THE LANDSLIDE AND ENCOUNTERED UNWEATHERED, SLIGHTLY TO MODERATELY STRONG SANDSTONE AT APPROXIMATELY ELEVATION 666.3 FEET IN WHICH THE BORING WAS TERMINATED.

UNCONFINED COMPRESSIVE STRENGTH TESTING RESULTS OF THE SANDSTONE RANGED FROM 5,893 TO 7,277 PSI.

WATER WAS ONLY ENCOUNTERED IN BORINGS B-002-1-20 AND B-002-2-20. IN BORING B-002-1-20 FREE WATER WAS INITIALLY ENCOUNTERED AT A DEPTH OF 42.6 FT BELOW THE GROUND SURFACE, ELEV. 745.7 MSL AND NOTED AT A DEPTH OF 21.8 FT BELOW THE GROUND SURFACE, ELEV. 766.5 MSL. FREE WATER WAS ENCOUNTERED IN B-002-2-20 AT DEPTHS OF 21.15 FT AND 30.2 FT BELOW THE GROUND SURFACE, ELEV. 738.6 AND 729.6 MSL.

SPECIFICATIONS

THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS, DATED JANUARY 2020.

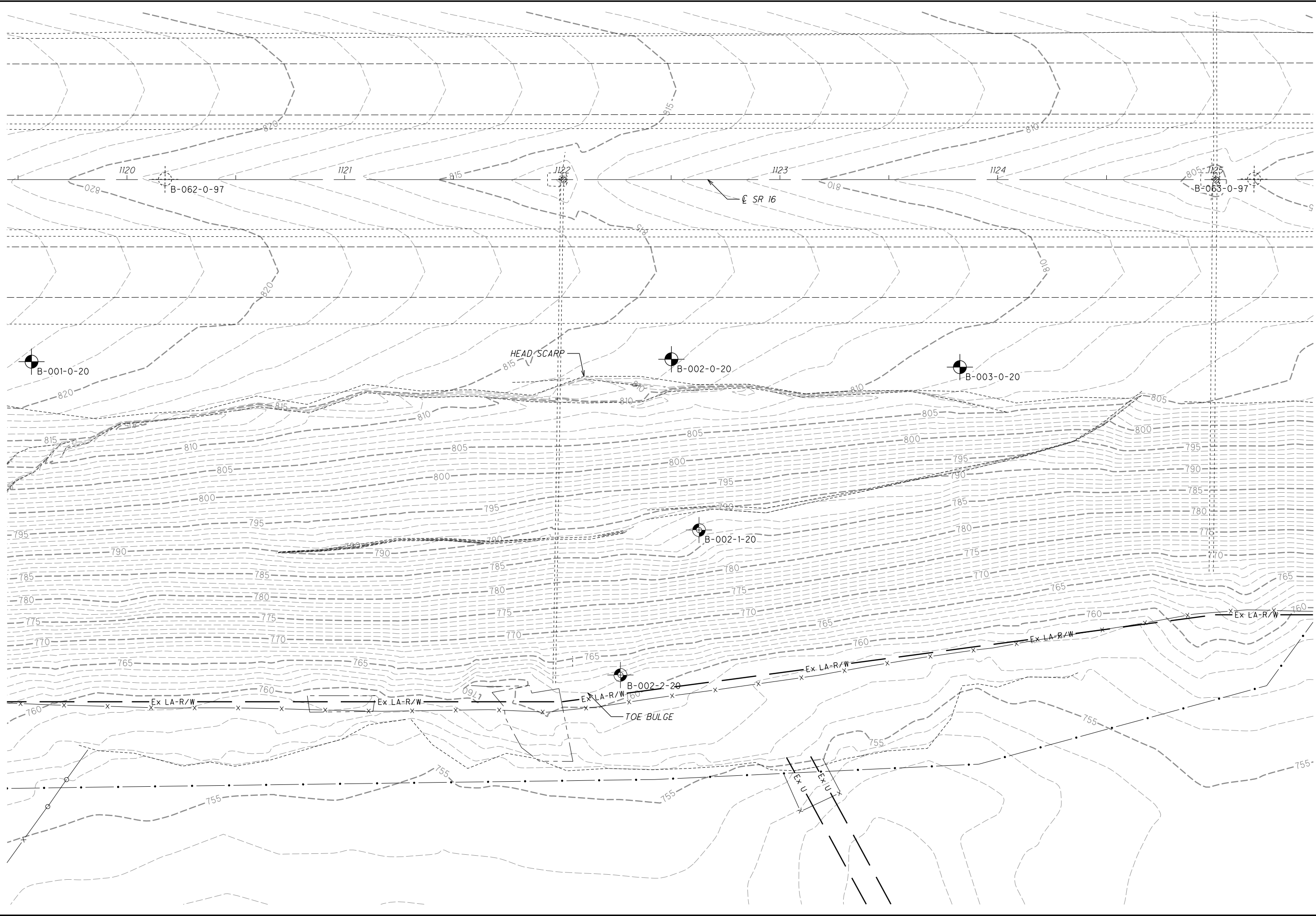
AVAILABLE INFORMATION



THE SOIL, BEDROCK, AND GROUNDWATER INFORMATION COLLECTED FOR THIS SUBSURFACE EXPLORATION THAT CAN BE CONVENIENTLY DISPLAYED ON THE SOIL PROFILE SHEETS HAS BEEN PRESENTED. GEOTECHNICAL REPORTS, IF PREPARED, ARE AVAILABLE FOR REVIEW ON THE OFFICE OF CONTRACT SALES WEBSITE.

DRAWN AUC	SOIL PROFILE - LANDSLIDE EXPLORATION NOTES (CONT.)		MUS-16-6.86	2 / 25	<div><div>32</div><div>55</div></div>
CHECKED SAT					

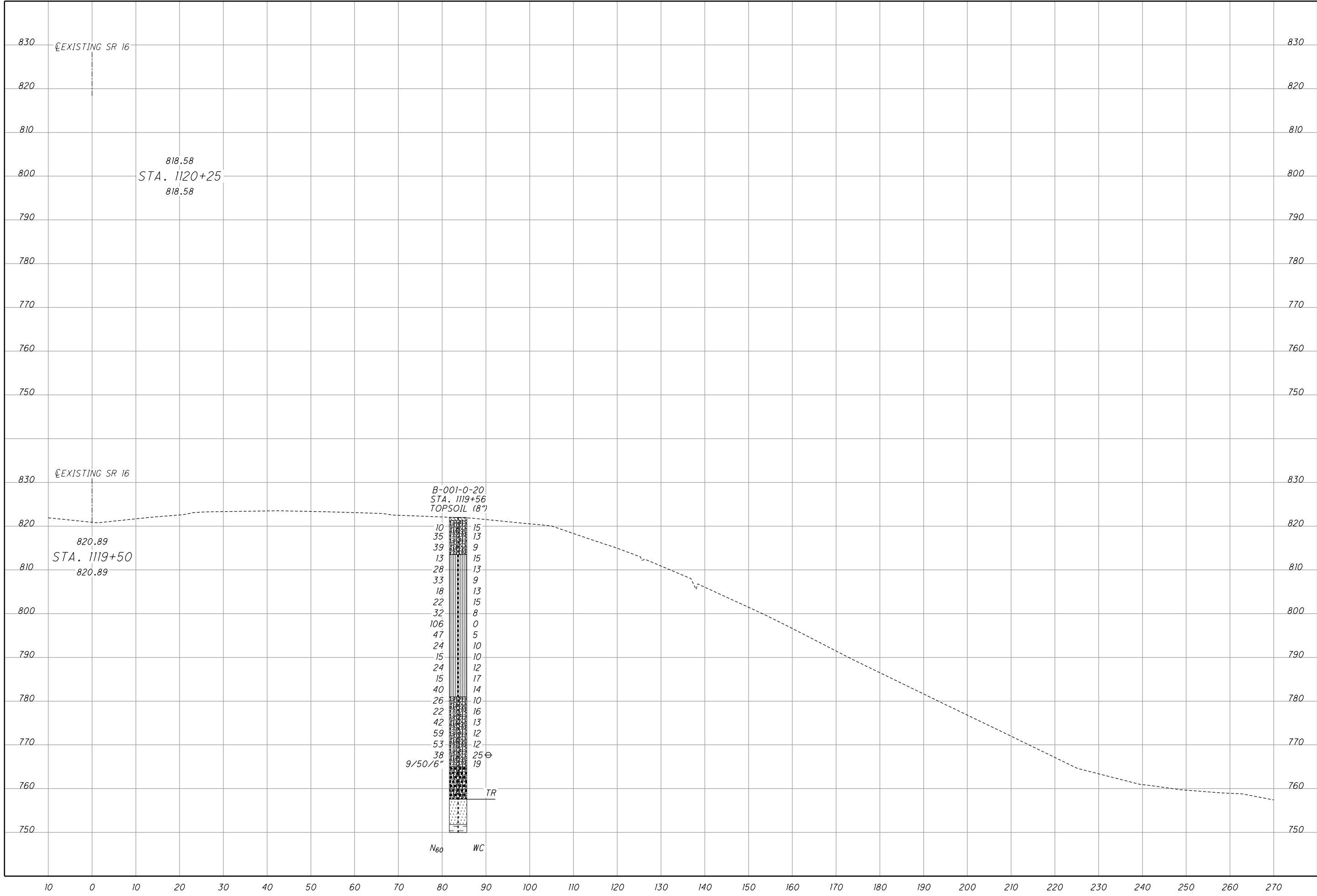


I:\ProjectData\MUS\11352\Design\Geotechnical\Sheets\11352\_LYP001.dgn Sheet 3/9/2023 7:45:21AM nkadokia



	
	
DRAWN AJC	CHECKED SAT
<b>SOIL PROFILE - LANDSLIDE</b> <b>STA. 1119+50 TO STA. 1125+25</b>	
<b>MUS-16-6.86</b>	
3 / 25	
<div><div>33</div><div>55</div></div>	

I:\ProjectData\MUS\11352\Design\Geotechnical\Sheets\11352\_LYX001.dgn Sheet 3/9/2023 7:45:22 AM nkadokla



DRAWN  
AUC

CHECKED  
SAT

MUS-16-6.86

4 / 25

34

55

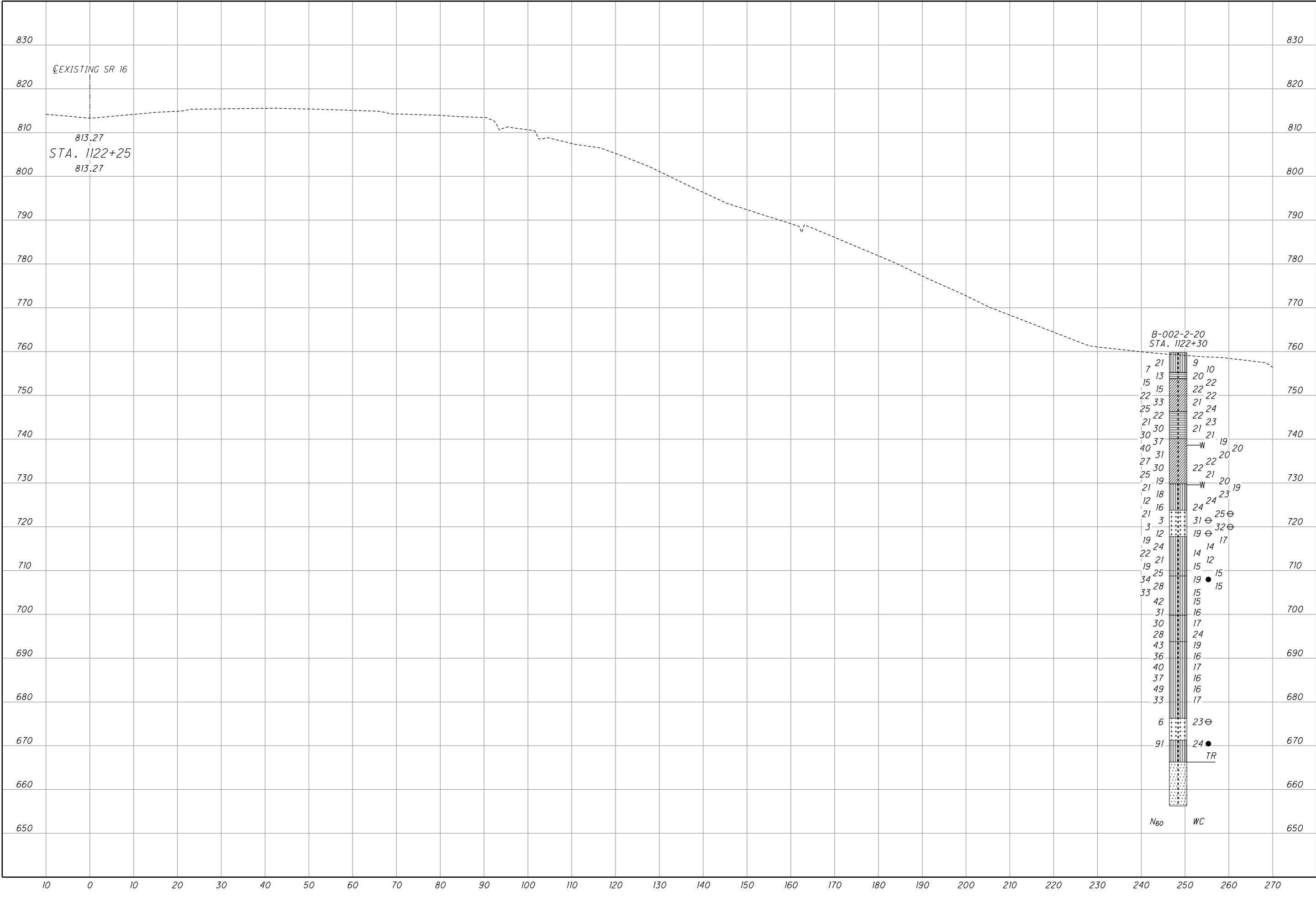
SOIL PROFILE - LANDSLIDE

CROSS SECTIONS - STA. 1119+50 & STA. 1120+25

0 5 10 20

HORIZONTAL SCALE IN FEET

I:\ProjectData\MUS\11352\Design\Geotechnical\Sheets\11352\_LY002.dgn Sheet 3/9/2023 7:45:23 AM nkadokla



DRAWN  
AUC

CHECKED  
SAT

MUS-16-6.86

5 / 25

SOIL PROFILE - LANDSLIDE

CROSS SECTIONS - STA. 1122+25

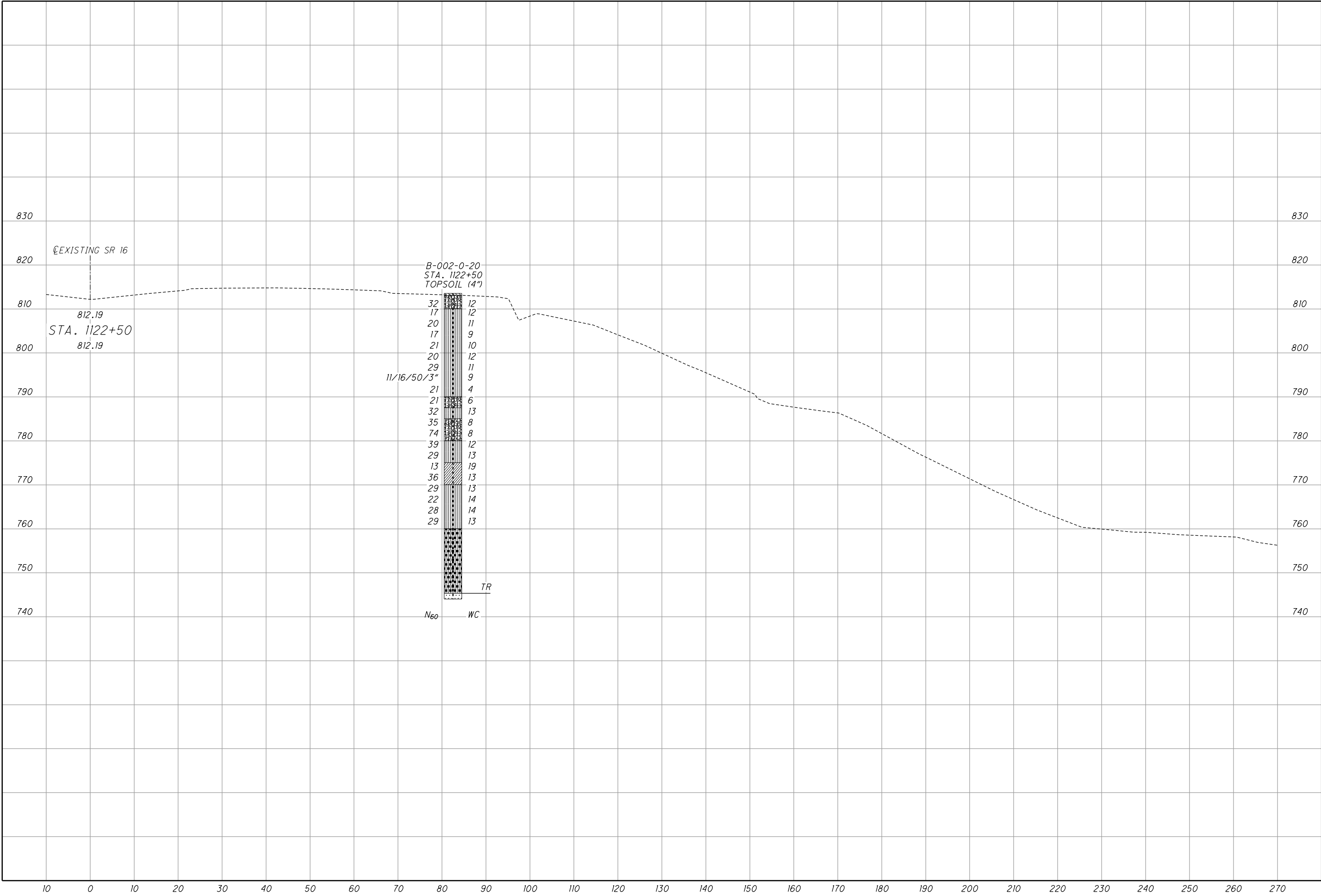
0 5 10 20

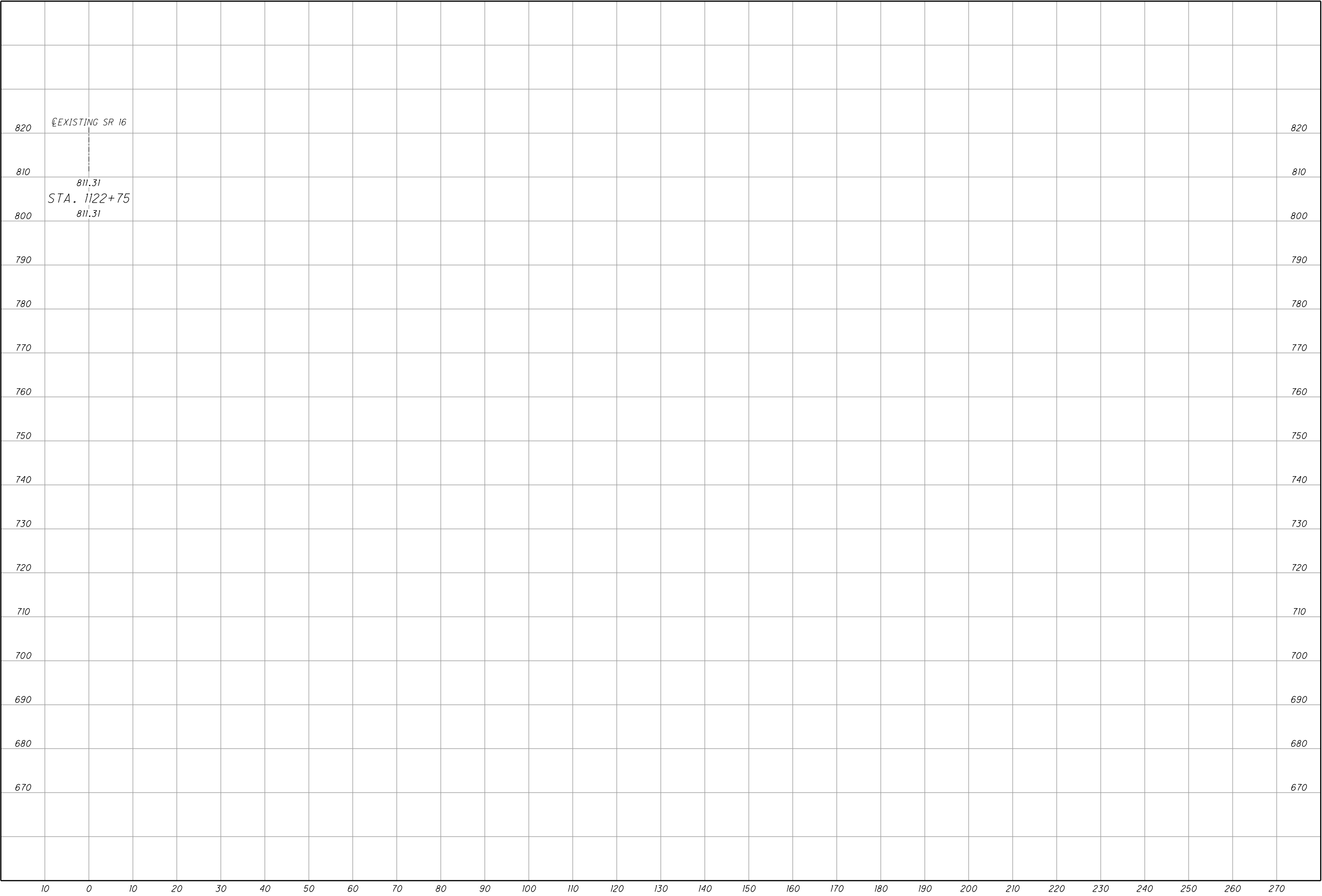
HORIZONTAL  
SCALE IN FEET

35

55

I:\ProjectData\MUS\11352\Design\Geotechnical\Sheets\11352\_LYX003.dgn Sheet 3/9/2023 7:45:24 AM nkadokla





DRAWN  
AUC

CHECKED  
SAT

0520

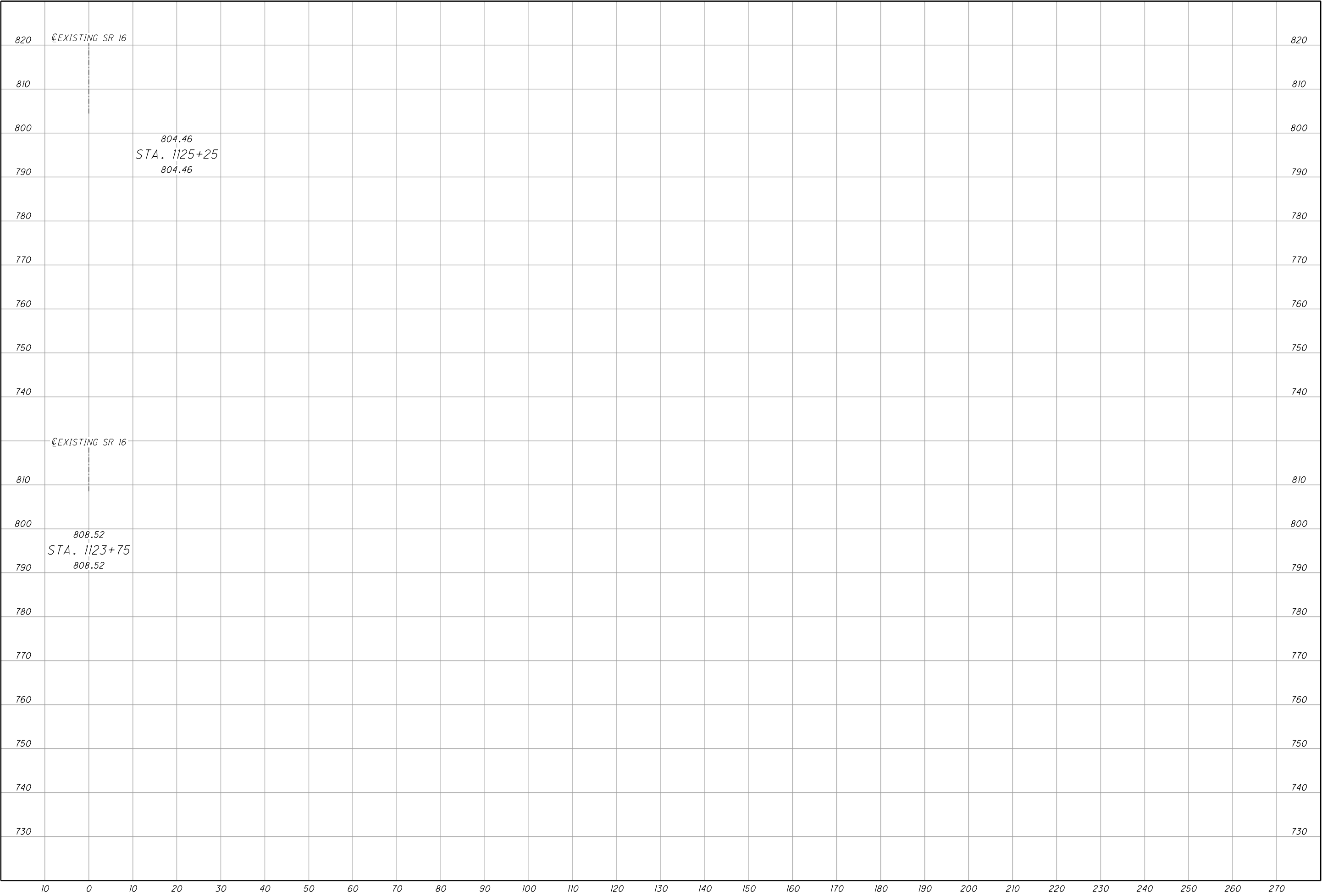
HORIZONTAL  
SCALE IN FEET

SOIL PROFILE - LANDSLIDE  
CROSS SECTIONS - STA. 1122+75

MUS-16-6.86

7 / 25

3755



DRAWN  
AUC

CHECKED  
SAT

MUS-16-6.86

8 / 25

SOIL PROFILE - LANDSLIDE

CROSS SECTIONS - STA. 1123+75 & STA. 1125+25

0 5 10 20

HORIZONTAL  
SCALE IN FEET

38

55



PID:	113521	SFN:	PROJECT:	MUS-16-6.86	STATION / OFFSET:	1119+56, 84' RT.	END:	6/29/20	PG 2 OF 2	B-001-0-20										
MATERIAL DESCRIPTION AND NOTES					GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	S04 ppm	HOLE SEALED				
MEDIUM DENSE, BROWN, STONE FRAGMENTS WITH SAND AND SILT; LITTLE CLAY; CONTAINS COBBLES AND OCCASSIONAL BOULDER, FILL, DAMP (continued) @57.0': PREDOMINATELY COBBLES AND BOULDERS @57.0': PREDOMINATELY COBBLES AND BOULDERS (continued)					ELEV.		DEPTHS		SPT/ RQD	N <sub>60</sub>	REC SAMPLE ID	HP (tsf)	GRADATION (%)			ATTERBERG				
					762.0															
SANDSTONE, BROWNISH GRAY WITH YELLOWISH BROWN, HIGHLY TO MODERATELY WEATHERED, SLIGHTLY STRONG, VERY FINE TO FINE GRAINED, THIN BEDDED, BLOCKY, GOOD; RQD 27%, REC 91%. @ 66.0' - 66.3'; γ = 165 pcf; Qu = 5,893 psi  @ 67.2' - 69.2'; CONTAINS VERY WEAK SHALE LAYERS WITH LOSS					757.6		TR		38		63	NQ2-2					CORE			
@ 69.6' - 70.2'; CLAY SEAM  SILTSTONE, GRAY, HIGHLY TO MODERATELY WEATHERED, WEAK, THIN BEDDED, BLOCKY, GOOD; RQD 77%, REC 100%.					751.8				28		90	NQ2-3					CORE			
					750.0		EOB													
							72													

NOTES: LAT/LONG FROM OGE HANDHELD GPS UNIT. ELEV FROM OSIP LIDAR DATA. NO WATER RECOVERY WHILE CORING. HOLE DRY UPON COMPLETION. ABANDONMENT METHODS. MATERIALS. QUANTITIES: PUMPED 2 BAGS BENTONITE GROUT

<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin-right: 10px;"> 40 55 </div> <div style="text-align: center;"> 10 / 25 </div> </div>	<b>MUS-16-6.86</b>	<b>SOIL PROFILE - LANDSLIDE BORING LOG B-001-O-20 (CONT.)</b>		DRAWN AJC
				CHECKED SAT





PID: 113521	SFN:	PROJECT:	MUS-16-6.86	STATION / OFFSET:		1122+50.83' RT.		START: 6/29/20		END: 7/2/20			PG 2 OF 2		B-002-0-20				
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	REC N <sub>60</sub> (%)	SAMPLE ID	HP (tsf)	GRADATION (%)			ATTERBERG			WC	ODOT CLASS (GI)	SO4 ppm	HOLE SEALED
										GR	CS	FS	SI	CL	LL				
STIFF, BROWN, SANDY SILT, SOME CLAY, LITTLE STONE FRAGMENTS, FILL, DAMP (continued) @53.5' - 68.2'; ENCOUNTERED BOULDERS/COBBLES @53.5' - 68.2'; ENCOUNTERED BOULDERS/COBBLES (continued)				753.5	— — 61 — — 62 — — 63 — — 64 — — 65 — — 66 — — 67 — — 68 — — 69	0	40	NQ2-2								CORE			
SANDSTONE, GRAY AND YELLOWISH BROWN, HIGHLY TO MODERATELY WEATHERED, SLIGHTLY STRONG, VERY FINE TO FINE GRAINED, THIN BEDDED, VERY BLOCKY, POOR.				745.3	TR	0	100	NQ2-3								CORE			
				744.0	EOB														

NOTES: LAT/LONG FROM LOGE HANDHELD GPS UNIT. ELEV FROM OSIP LIDAR DATA. HOLE DRY BEFORE CORING.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 2 BAGS BENTONITE GROUT

PROJECT: MUS-16-6.86				DRILLING FIRM / OPERATOR: ODOT / LEWIS				DRILL RIG: CME 850R TRACKED				STATION / OFFSET: 1122+63, 161' RT.								EXPLORATION N																																																																																																																																																																																																																																																																																																																																																																							
TYPE: LANDSLIDE				SAMPLING FIRM / LOGGER: ODOT / MCINTOSH				HAMMER: CME AUTOMATIC				ALIGNMENT: CL SR16								B-002-1-20																																																																																																																																																																																																																																																																																																																																																																							
PID: 113521 SFN:				DRILLING METHOD: 3.75' HSA / NQ2				CALIBRATION DATE: 5/1/19				ELEVATION: 788.3 (ft) EOB: 115.0 ft.								PAGE																																																																																																																																																																																																																																																																																																																																																																							
START: 7/1/20 END: 7/16/20				SPT / NQ2				ENERGY RATIO (%): 89.1				LAT / LONG: 40.143552, -82.085879								1 OF 2																																																																																																																																																																																																																																																																																																																																																																							
MATERIAL DESCRIPTION AND NOTES				ELEV. 788.3		SPT/ RQD		REC N <sub>60</sub>		HP SAMPLE ID		GRADATION (%)				ATTERBERG				ODOT CLASS (gi)		WC		SO4 ppm		INCL.																																																																																																																																																																																																																																																																																																																																																																	
STIFF, BROWN AND GRAY, SANDY SILT, "AND" STONE FRAGMENTS, LITTLE CLAY, FILL, DAMP				788.3		1		3		10		17		SS-1		1.00		46		2		14		24		14		25		19		6		7		A-4a (1)		-																																																																																																																																																																																																																																																																																																																																																					
																																								@6.0'; MEDIUM STIFF				788.3		2		13		56		SS-2		1.00		-		-		-		-		-		-		7		A-4a (V)		-																																																																																																																																																																																																																																																																																																																			
																																																																										@9.0'; SOFT				788.3		16		83		SS-3		1.50		43		2		15		25		20		5		8		A-4a (1)		-																																																																																																																																																																																																																																																																																			
																																																																																																										@12.0'; STIFF TO VERY STIFF				788.3		12		44		SS-4		0.50		-		-		-		-		-		-		7		A-4a (V)		-																																																																																																																																																																																																																																																			
																																																																																																																																										@15.0'-16.5'; STIFF				788.3		4		50		SS-5		0.50		-		-		-		-		-		-		7		A-4a (V)		-																																																																																																																																																																																																																			
																																																																																																																																																																										VERY STIFF, BROWN AND GRAY, SILT AND CLAY, LITTLE SAND, TRACE STONE FRAGMENTS, MOIST				788.3		7		25		SS-14		2.50		32		1		15		27		23		29		20		9		15		A-4a (3)		-																																																																																																																																																																															
																																																																																																																																																																																																														@27.0'; HARD, MOTTLED BROWN WITH GRAY, TRACE SAND				788.3		19		100		SS-16		2.50		10		4		21		38		27		19		8		16		A-4a (V)		-																																																																																																																																													
																																																																																																																																																																																																																																																@41.0'; GRAYISH BROWN				788.3		46		100		SS-27		4.50		1		0		4		38		57		36		21		15		20		A-6a (10)		-																																																																																																									
																																																																																																																																																																																																																																																																																				VERY STIFF, GRAY, SILT, SOME CLAY, LITTLE SAND, TRACE STONE FRAGMENTS, DAMP				788.3		18		100		SS-28		3.50		3		2		14		53		28		22		18		4		17		A-4b (8)		-																																																																					
																																																																																																																																																																																																																																																																																																																								HARD, GRAY AND BROWN, SANDY SILT, "AND" STONE FRAGMENTS, LITTLE CLAY, DAMP				788.3		27		67		SS-30		4.5+		38		9		17		26		10		23		21		2		14		A-4a (0)		-																																	
																																																																																																																																																																																																																																																																																																																																																												@51.0'; VERY STIFF				788.3		36		67		SS-31		2.50		-		-		-		-		-		-		16		A-4a (V)		-	



PROJECT: MUS-16-6.86				DRILLING FIRM / OPERATOR: ODOT / LEWIS				DRILL RIG: CME 850R TRACKED				STATION / OFFSET: 1122+30, 248' RT.				EXPLORATION ID					
TYPE: LANDSLIDE				SAMPLING FIRM / LOGGER: ODOT / MCINTOSH				HAMMER: CME AUTOMATIC				ALIGNMENT: CL SR16				B-002-2-20					
PID: 113521 SFN:				DRILLING METHOD: 3.75" HSA / NQ2				CALIBRATION DATE: 5/1/19				ELEVATION: 759.8 (ft) EOB: 103.5 ft.				PAGE					
START: 6/24/20 END: 7/1/20				SPT / NQ2				ENERGY RATIO (%): 89.1				LAT / LONG: 40.143346, -82.085846				1 OF 2					
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	REC SAMPLE ID	HP (tsf)	GRADATION (%)				ATTERBERG				SO4 ppm	INCL.			
				759.8			N <sub>60</sub>	(%)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (G)			
VERY STIFF, BROWN, SANDY SILT, SOME STONE FRAGMENTS, SOME CLAY, DAMP					1																
					2	7	21	33	3.00	22	5	21	31	21	25	17	8	9	A-4a (3)	-	
					3																
					4	3	7	22	1.50	-	-	-	-	-	-	-	-	10	A-4a (V)	-	
					5	3	13	78	3.00	22	1	13	32	32	35	18	17	20	A-6b (9)	-	
					6	4	15	67	3.00	-	-	-	-	-	-	-	-	22	A-6a (V)	-	
					7																
					8	3	15	100	1.50	7	0	4	38	51	36	21	15	22	A-6a (10)	-	
					9	3	22	78	4.5+	-	-	-	-	-	-	-	-	22	A-6a (V)	-	
					10																
HARD, MOTTLLED BROWN AND GRAY, SILTY CLAY, TRACE STONE FRAGMENTS, TRACE SAND, MOIST					11	5	33	78	4.50	-	-	-	-	-	-	-	21	A-6a (V)	-		
					12	4	25	78	4.50	-	-	-	-	-	-	-	-	24	A-6a (V)	-	
					13																
					14	3	22	78	4.50	5	0	2	28	65	35	18	17	22	A-6b (11)	-	
					15																
					16	5	21	78	4.25	-	-	-	-	-	-	-	-	23	A-6b (V)	-	
					17	4	30	78	4.5+	-	-	-	-	-	-	-	-	21	A-6b (V)	-	
					18																
					19	5	30	89	4.5+	-	-	-	-	-	-	-	-	21	A-6b (V)	-	
					20	5	37	89	4.5+	1	0	3	33	63	31	18	13	19	A-6a (9)	-	
@24.0'; GRAY					21	5	40	89	4.5+	-	-	-	-	-	-	-	20	A-6a (V)	-		
					22																
					23	4	31	89	4.5+	-	-	-	-	-	-	-	-	20	A-6a (V)	-	
					24																
					25	5	27	89	4.50	0	0	1	32	67	33	19	14	22	A-6a (10)	-	
					26	5	30	89	4.00	-	-	-	-	-	-	-	-	22	A-6a (V)	-	
					27																
					28	5	25	89	4.50	-	-	-	-	-	-	-	-	21	A-6a (V)	-	
					29	2	19	89	3.50	-	-	-	-	-	-	-	-	20	A-6a (V)	-	
					30	4	21	89	4.00	2	0	6	42	50	33	20	13	19	A-6a (9)	-	
@25.5'; VERY STIFF TO HARD					31																
					32	3	18	100	3.50	-	-	-	-	-	-	-	-	23	A-6a (V)	-	
					33																
					34	2	12	89	3.00	-	-	-	-	-	-	-	-	24	A-6a (V)	-	
					35																
					36	2	16	89	1.50	-	-	-	-	-	-	-	-	24	A-6a (V)	-	
					37	3	21	89	1.00	2	0	19	65	14	NP	NP	NP	25	A-4b (8)	-	
					38	0	3	100	-	3	0	34	54	9	NP	NP	NP	31	A-4b (6)	-	
					39																
					40	0	3	100	-	-	-	-	-	-	-	-	-	32	A-4b (V)	-	
@38.0'; VERY LOOSE, SOME SAND					41	1	12	100	2.50	-	-	-	-	-	-	-	19	A-4b (V)	-		
					42																
					43	3	19	78	-	25	5	33	26	11	NP	NP	NP	17	A-4a (0)	-	
					44	4	24	56	-	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
					45																
					46	7	22	56	-	28	10	20	32	10	NP	NP	NP	14	A-4a (1)	-	
					47	4	21	44	-	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
					48	4	19	56	-	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
					49																
					50	5	25	44	-	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
@40.5'; MEDIUM DENSE					51	8	34	67	-	37	6	14	32	11	21	17	4	19	A-4a (2)	-	
					52																
					53	5	28	78	4.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
					54	7	33	78	3.00	26	8	17	37	12	21	17	4	15	A-4a (3)	-	
					55																
					56	8	42	78	3.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
					57																
					58																
					59	10	31	78	4.00	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
					60																

STANDARD ODOT LOG W/ SULFATE (11 X 17) - OH DOT 9DT - 9/29/21 09:49 - X:\GINT\PROJECTS\2020 COMPLETE\600769.GPJ

PID: 113521	SFN:	PROJECT:	MUS-16-6.86	STATION / OFFSET: 1122+30, 248' RT.		START: 6/24/20			END: 7/1/20			PG 2 OF 2		B-002-2-20								
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	HP (tsf)	GRADATION (%)			WC	ODOT CLASS (GI)	SO4 ppm	INCL.						
MEDIUM DENSE, MOTTLED BROWN AND GRAY, SANDY SILT, SOME GRAVEL, LITTLE CLAY, MOIST				699.8		61	9															
						62	10	78	2.50	22	7	20	37	14	NP	NP	17	A-4a (3)	-			
						63																
						64	5	8	100	2.50	-	-	-	-	-	-	24	A-4a (V)	-			
						65	11															
						66																
						67	10	13	100	3.00	15	5	13	41	26	24	18	6	19	A-4a (6)	-	
						68	16															
						69	8	10	100	3.50	-	-	-	-	-	-	-	16	A-4a (V)	-		
						70	14															
@63.5'; WET				693.8		71	7															
						72	12	40	100	3.50	-	-	-	-	-	-	17	A-4a (V)	-			
						73	15															
						74	8	11	78	3.00	40	4	12	31	13	22	17	5	16	A-4a (2)	-	
						75	14															
						76	11															
						77	15	49	100	3.50	-	-	-	-	-	-	-	16	A-4a (V)	-		
						78	18															
						79	6	9	33	2.50	-	-	-	-	-	-	-	17	A-4a (V)	-		
						80	13															
LOOSE, GRAY, SILT, "AND" GRAVEL, LITTLE CLAY, DAMP				676.3		81																
						82																
						83																
						84	1	2	6	100	1.50	2	0	29	53	16	NP	NP	23	A-4b (7)	-	
						85	2	2														
						86																
						87																
						88																
						89	12	23	91	67	1.50	42	2	9	24	23	25	17	8	24	A-4a (2)	-
						90	38															
STIFF, GRAY, SANDY SILT, "AND" GRAVEL, SOME CLAY, WET				671.3		91																
						92																
						93																
						94																
						95																
						96																
						97																
						98	98		98	NQ2-1											CORE	
						99																
						100																
SANDSTONE, GRAY, UNWEATHERED, SLIGHTLY TO MODERATELY STRONG, FINE TO MEDIUM GRAINED, THIN TO MEDIUM BEDDED, INTACT, VERY GOOD; RQD 98%, REC 98%.				666.3	TR	101																
						102																
						103																
						104																
						105																
						106																
						107																
						108																
						109																
						110																

STANDARD ODOT LOG W/ SULFATE (11 X 17) - OH DOT.GDT - 9/29/21 09:49 - X:\GINT\PROJECTS\2020 COMPLETE\600769.GPJ

NOTE: WATER LEVEL AT 21.15' AT THE BEGINNING OF THE DAY ON 6/29/2020 AND WATER LEVEL AT 20.55' AT THE BEGINNING OF THE DAY ON 6/30/2020.

NOTES: LAT/LONG FROM OGE HANDHELD GPS UNIT. ELEV FROM OSIP LIDAR DATA.  
ABANDONMENT METHODS, MATERIALS, QUANTITIES: TREMIED 150 LB. BENTONITE GROUT. 376 LB. CEMENT. 120 GAL. WATER

PROJECT: MUS-16-6.86				DRILLING FIRM / OPERATOR: ODOT / CAREY				DRILL RIG: CME 55 TRUCK				STATION / OFFSET: 1123+83, 86' RT.				EXPLORATION ID					
TYPE: LANDSLIDE				SAMPLING FIRM / LOGGER: ODOT / MCLEISH				HAMMER: CME AUTOMATIC				ALIGNMENT: CL SR16				B-003-0-20					
PID: 113521 SFN:				DRILLING METHOD: 3.25" HSA / NQ2				CALIBRATION DATE: 4/15/20				ELEVATION: 809.6 (ft) EOB: 80.0 ft.				PAGE					
START: 7/13/20 END: 7/15/20				SAMPLING METHOD: SPT / NQ2				ENERGY RATIO (%): 83.6				LAT / LONG: 40.143908, -82.085686				1 OF 2					
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	REC N <sub>60</sub>	SAMPLE ID	HP (tsf)	GRADATION (%)				ATTERBERG			SO <sub>4</sub> ppm	HOLE SEALED			
										GR	CS	FS	SI	CL	LL	PL			PI	WC	
VERY STIFF, BROWN, SANDY SILT, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP				809.6		1															
						2	4	21	SS-1	-	42	4	10	28	16	26	20	6	10	A-4a (2)	-
						3															
						4	3	11	SS-2	-	-	-	-	-	-	-	-	-	10	A-4a (V)	-
						5															
						6															
						7	5	17	SS-3	4.00	50	4	6	24	16	30	19	11	12	A-6a (1)	-
						8															
						9	9	22	SS-4	-	-	-	-	-	-	-	-	-	12	A-6a (V)	-
						10															
HARD, BROWN AND GRAY, SANDY SILT, SOME COBBLES AND BOULDERS, DAMP				803.6		11															
						12	4	7	SS-5	2.00	16	4	14	32	34	32	19	13	17	A-6a (7)	-
						13															
						14	4	12	SS-6	2.00	-	-	-	-	-	-	-	-	11	A-6a (V)	-
						15															
						16															
						17	7	8	SS-7	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	-
						18															
						19	6	9	SS-8	2.50	28	3	10	33	26	29	19	10	10	A-4a (5)	-
						20															
DENSE, BROWN AND GRAY, SANDY SILT, SOME STONE FRAGMENT, LITTLE CLAY, CONTAIN COBBLES AND BOULDERS, DAMP				793.6		21	50/3"	-	67	SS-9	-	-	-	-	-	-	7	A-4a (V)	-		
						22															
						23															
						24	12	39	SS-10	-	25	4	34	24	13	NP	NP	NP	6	A-4a (0)	-
						25															
						26															
						27	7	24	SS-11	-	-	-	-	-	-	-	-	-	8	A-4a (V)	-
						28															
						29	10	32	SS-12	4.50	17	4	25	30	24	23	16	7	11	A-4a (4)	-
						30															
VERY LOOSE, BROWN, SILTY SAND, WITH ROCK FRAGMENTS, DAMP				788.6		31	50	-	83	SS-13	-	-	-	-	-	-	5	A-4a (V)	-		
						32															
						33															
						34	9	26	SS-14	4.00	25	3	13	33	26	31	19	12	14	A-6a (6)	-
						35															
						36															
						37	3	21	SS-15	1.00	-	-	-	-	-	-	-	-	17	A-6a (V)	-
						38															
						39	4	24	SS-16	2.00	-	-	-	-	-	-	-	-	13	A-6a (V)	-
						40															
VERY SOFT, GRAY AND BROWN, SILT AND CLAY, SOME STONE FRAGMENTS, LITTLE SAND, DAMP				776.1		41															
						42	4	26	SS-17	4.5+	-	-	-	-	-	-	-	-	12	A-4a (V)	-
						43															
						44	7	31	SS-18	4.5+	27	7	23	29	14	21	15	6	11	A-4a (2)	-
						45															
						46															
						47	9	31	SS-19	4.50	-	-	-	-	-	-	-	-	11	A-4a (V)	-
						48															
						49	10	28	SS-20	4.50	-	-	-	-	-	-	-	-	14	A-4a (V)	-
						50															
HARD, BROWN AND GRAY, SANDY SILT, SOME STONE FRAGMENTS, LITTLE CLAY, DAMP				768.6		51															
						52	6	31	SS-21	4.5+	34	7	19	28	12	22	17	5	12	A-4a (1)	-
						53															
						54	15	40	SS-22	4.5+	43	7	8	27	15	27	17	10	13	A-4a (1)	-
						55															
						56															
						57	5	33	SS-23	2.50	-	-	-	-	-	-	-	-	16	A-4a (V)	-
						58															
						59	11	40	SS-24	3.00	49	7	8	25	11	27	19	8	17	A-4a (0)	-
						60															

PID: 113521	SFN:	PROJECT:	MUS-16-6.86	STATION / OFFSET:		1123+83.86' RT.	START: 7/13/20			END: 7/15/20			PG 2 OF 2	B-003-0-20							
MATERIAL DESCRIPTION AND NOTES				ELEV.	DEPTHS	SPT/ RQD	N <sub>60</sub>	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)			ODOT CLASS (G)	SO4 ppm	HOLE SEALED					
HARD, BROWN AND GRAY, SANDY SILT, SOME STONE FRAGMENTS, LITTLE CLAY, DAMP (continued) @61.0'; STIFF				749.6	61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80	18	72	100	SS-25	1.50	-	-	-	-	14	A-4a (V)	-				
						25															
						27															
SANDSTONE, GRAYISH BROWN AND YELLOWISH BROWN, HIGHLY WEATHERED, SLIGHTLY STRONG, VERY FINE TO FINE GRAINED, THIN BEDDED, ARGILLACEOUS, CONTAINS CLAY SEAMS, VERY BLOCKY, POOR; RQD 49%, REC 97%. @ 67.3' - 67.8' & 68.3' - 68.7; CLAY SEAM @ 67.8' - 68.3'; HIGH ANGLE FRACTURE @ 68.5' - 68.9'; γ = 149 pcf; Qu = 6,247 psi @ 68.8'; MODERATELY WEATHERED, BLOCKY, GOOD. @ 69.2' - 69.6'; CLAY SEAM				743.3	TR																
						23	77	NQ2-1													
@ 72.0' - 72.5'; HIGH ANGLE FRACTURE						47	92	NQ2-2													
@ 75.0' - 75.1'; CLAY SEAM @ 75.3' - 75.9'; HIGH ANGLE FRACTURE																					
@ 77.9' - 78.2'; γ = 160 pcf; Qu = 7,277 psi @ 78.6' - 78.8'; CLAY SEAM @ 79.2' - 79.5'; MID-ANGLE FRACTURE						63	97	NQ2-3													

NOTES: LAT/LONG FROM OGE HANDHELD GPS UNIT. ELEV FROM OSIP LIDAR DATA. HOLE DRY BEFORE CORING.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 2 BAGS BENTONITE GROUT





RESOURCE INTERNATIONAL, INC.  
281 ENTERPRISE DRIVE  
WESTERVILLE, OHIO 43081  
(614) 885-1959

## REPORT OF SOIL EXPLORATION

Client Woolpert  
Project MUS-16-2.66  
Project Number W-5207

Boring Number B-62  
Sheet 1 of 3  
Completion Depth 50.0'  
Date Started: 12/10/96  
Date Finished: 12/11/96  
Drilled By: J.T.

Station 1120+00  
Offset Centerline  
Elevation 817.11 ft

Boring Method 3.25" HSA  
Hammer Weight 140 lbs.  
Hammer Drop 30 inches

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
				6" - Topsoil 0.5			
SS-1 1	3	67		Brown SILT and CLAY, some coarse to fine sand, trace fine gravel. Stiff. Moist.	15		
	6		2.5				
SS-2 16	22	83		Brown coarse to fine SANDY SILT, little fine to coarse gravel, trace clay. Hard. Damp.	9		
	33		5.0				
				Brown SILTY CLAY, some fine sand, little fine to coarse gravel. Hard. Moist.	11		
SS-3 19	24	72					
	42		7.5				
				Brown highly weathered SHALE. Damp.			
SS-4 27	50/3"	33					
			10.0				
SS-5 17	17	44		Brown SILT and CLAY, some fine sand, little fine to coarse gravel. Hard. Damp.	17		
	25		12.5				
SS-6 41	50/4"	33		Brown highly weathered SHALE. Damp.			
			13.5				

NOTES:

### SAMPLE TYPE

SS - 2" OD Split Spoon  
GS - Geoprobe Sample  
ST - Shelby Tube  
RC - Rock Core  
AS - Auger Sample

### GROUND WATER READING

At Completion N/A \*\*

After 24 Hrs N/A

\*\* wash water used during the coring process

### BORING METHOD

HSA - Hollow Stem Augers  
CFA - Continuous Flight Augers  
MD - Mud Drilling  
WD - Wash Drilling  
RC - Rock Coring



RESOURCE INTERNATIONAL, INC.  
281 ENTERPRISE DRIVE  
WESTERVILLE, OHIO 43081  
(614) 885-1959

## REPORT OF SOIL EXPLORATION

Client Woolpert  
Project MUS-16-2.66  
Project Number W-5207

Boring Number B-62  
Sheet 2 of 3  
Completion Depth 50.0'

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
SS-7	50/3"	17	17.5				
			20.0				
RC-1			20.0	SILTSTONE; brown and gray, soft to medium hard, broken, interbedded SHALE; dark gray, medium hard, slightly broken, slightly jointed, slightly carbonaceous. -RC-1: Recovery = 75% -Core Loss = 30 inches -RQD = 18%			
			22.5				
			25.0				
			27.5				
			30.0				
RC-2			30.0				
			32.5				
			35.0				
				-RC-2: Recovery = 98% -Core Loss = 2 inches -RQD = 61%			

NOTES:

SOIL PROFILE - LANDSLIDE  
HISTORIC BORING LOG B-062-0-97

MUS-16-6.86

19/25

49  
55

I:\ProjectData\MUS\1352\Design\Geotechnical\Sheets\1352\_LY012.dgn Sheet 3/9/2023 7:47:13 AM nkadk1a



RESOURCE INTERNATIONAL, INC.  
281 ENTERPRISE DRIVE  
WESTERVILLE, OHIO 43081  
(614) 885-1959

REPORT OF SOIL EXPLORATION

Client Woolpert  
Project MUS-16-2.66  
Project Number W-5207

Boring Number B-62  
Sheet 3 of 3  
Completion Depth 50.0'

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
RC-3			40.0				
			42.5	-qr (@ 41.0' on siltstone) = 4620 psi -RC-3: Recovery = 97% -Core Loss = 4 inches -RQD = 56%			
			45.0				
			47.5				
			50.0	Bottom of Boring = 50.0 feet	50.0		

NOTES:



RESOURCE INTERNATIONAL, INC.  
281 ENTERPRISE DRIVE  
WESTERVILLE, OHIO 43081  
(614) 885-1959

### REPORT OF SOIL EXPLORATION

Client Woolpert  
Project MUS-16-2.66  
Project Number W-5207

Boring Number B-63  
Sheet 1 of 2  
Completion Depth 35.0'  
Date Started: 12/20/96  
Date Finished: 12/20/96  
Drilled By: J.T.

Station 1125+00  
Offset Centerline  
Elevation 808.12 ft

Boring Method 3.25" HSA  
Hammer Weight 140 lbs.  
Hammer Drop 30 inches

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
				6" - Topsoil	0.5		
SS-1	6	72	2.5	Brown CLAYEY SILT, some coarse to fine sand, trace fine gravel. Stiff to very stiff. Damp to moist.	17		
SS-2	7	67	5.0		16		
SS-3	11	67	7.5		15		
SS-4	11	67	10.0		10		
SS-5	11	56	12.5	Gray coarse to fine GRAVEL (limestone fragments). Dense. Damp.	11.0		
SS-6	15	56					
NOTES:							

SAMPLE TYPE  
SS - 2" OD Split Spoon  
GS - Geoprobe Sample  
ST - Shelby Tube  
RC - Rock Core  
AS - Auger Sample

GROUND WATER READING  
At Completion ▼ Dry Ft  
After 24 Hrs ▼ N/A

BORING METHOD  
HSA - Hollow Stem Augers  
CFA - Continuous Flight Augers  
MD - Mud Drilling  
WD - Wash Drilling  
RC - Rock Coring



RESOURCE INTERNATIONAL, INC.  
281 ENTERPRISE DRIVE  
WESTERVILLE, OHIO 43081  
(614) 885-1959

### REPORT OF SOIL EXPLORATION

Client Woolpert  
Project MUS-16-2.66  
Project Number W-5207

Boring Number B-63  
Sheet 2 of 2  
Completion Depth 35.0'

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
			16.0	Brown indurated CLAY, some coarse to fine gravel (limestone and sandstone fragments). Hard. Damp.			
SS-7	17	67	20.0				
	30						
	31						
			21.5	Brown highly weathered SANDSTONE. Damp.			
SS-8	11	56	25.0				
	11						
	16						
			26.5	Brown highly weathered SHALE. Damp.			
SS-9	17	44	30.0				
	24						
	36						
SS-10	50/4"	22	35.0	Bottom of Boring = 35.0 feet			
NOTES:							

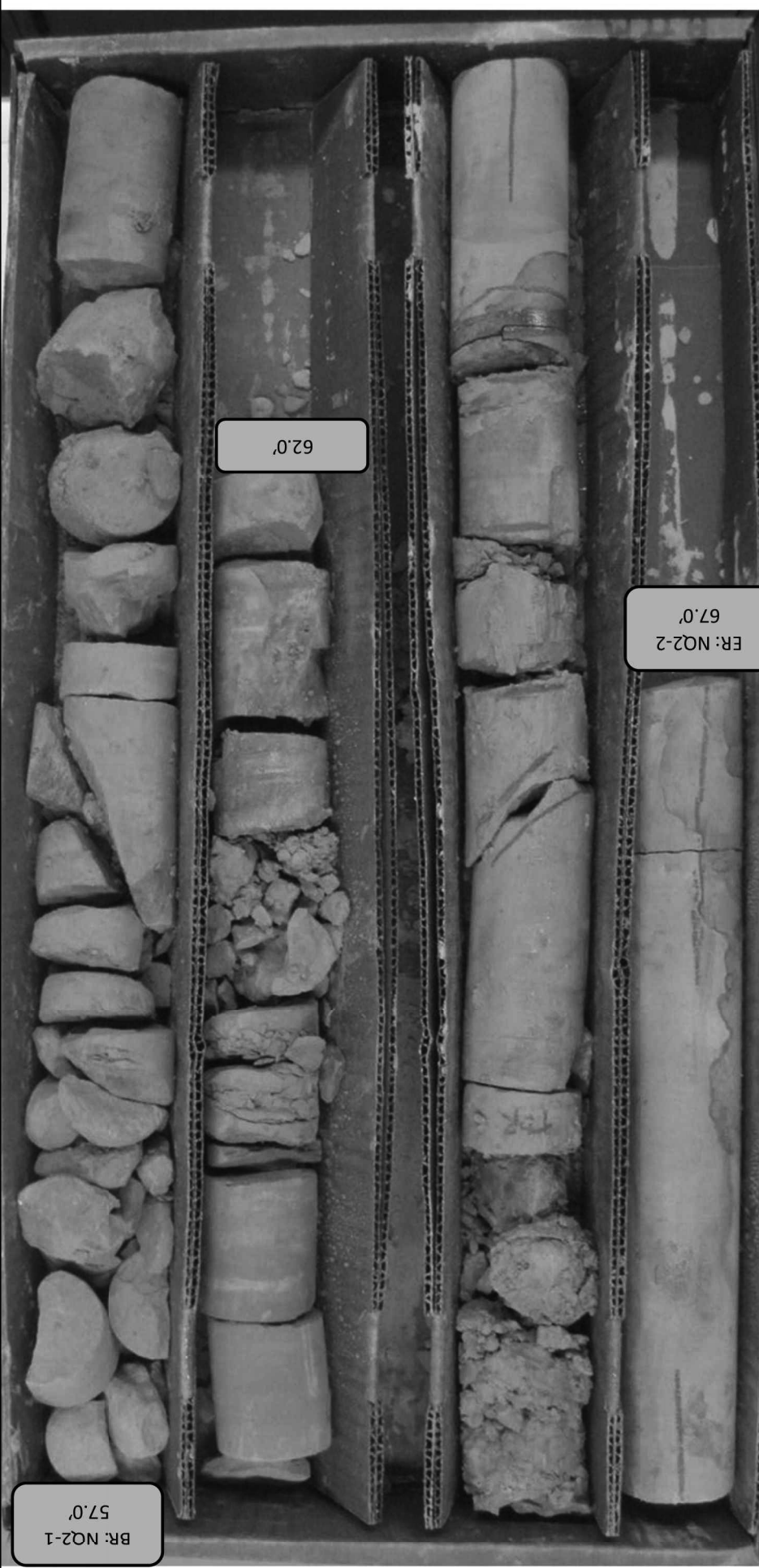
SOIL PROFILE - LANDSLIDE  
HISTORIC BORING LOG B-063-0-97

MUS-16-6.86

21/25

51  
55

B-001-0-20



RUN #:	DEPTH		RECOVERY		RQD	
NQ2-1	57.0'	62.0'	40/60	67%	6/60	10%
NQ2-2	62.0'	67.0'	38/60	63%	23/60	38%
MUS-16-6.83 PID 113521						

B-001-0-20



RUN #:	DEPTH		RECOVERY		RQD	
NQ2-3	67.0'	72.0'	54/60	90%	17/60	28%
MUS-16-6.83 PID 113521						

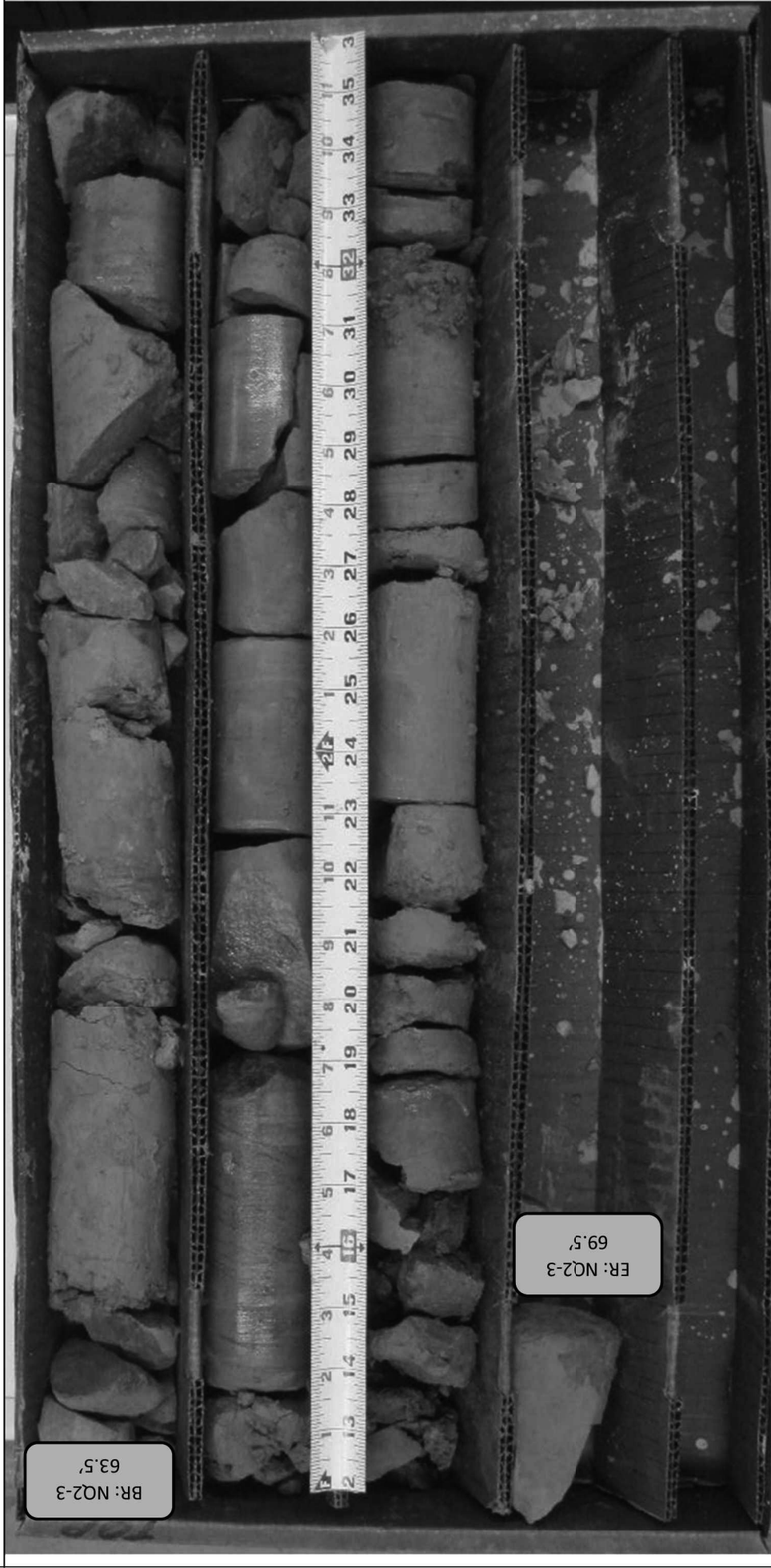


B-002-0-20



RUN #:	DEPTH	RECOVERY	RQD
NQ2-1	53.5'	31/60	52%
NQ2-2	58.5'	24/60	40%
MUS-16-6.83 PID 113521			

B-002-0-20



RUN #:	DEPTH	RECOVERY	RQD
NQ2-3	63.5'	72/72	100%
MUS-16-6.83 PID 113521			



Office of Geotechnical Engineering

B-002-1-20



RUN #:	DEPTH	RECOVERY	RQD
NQ2-1	105.0'	119/120 99%	98/120 82%
MUS-16-6.86 PID 113521			



Office of Geotechnical Engineering

B-002-2-20



RUN #:	DEPTH	RECOVERY	RQD
NQ2-1	93.5'	118/120 98%	118/120 98%
MUS-16-6.83 PID 113521			

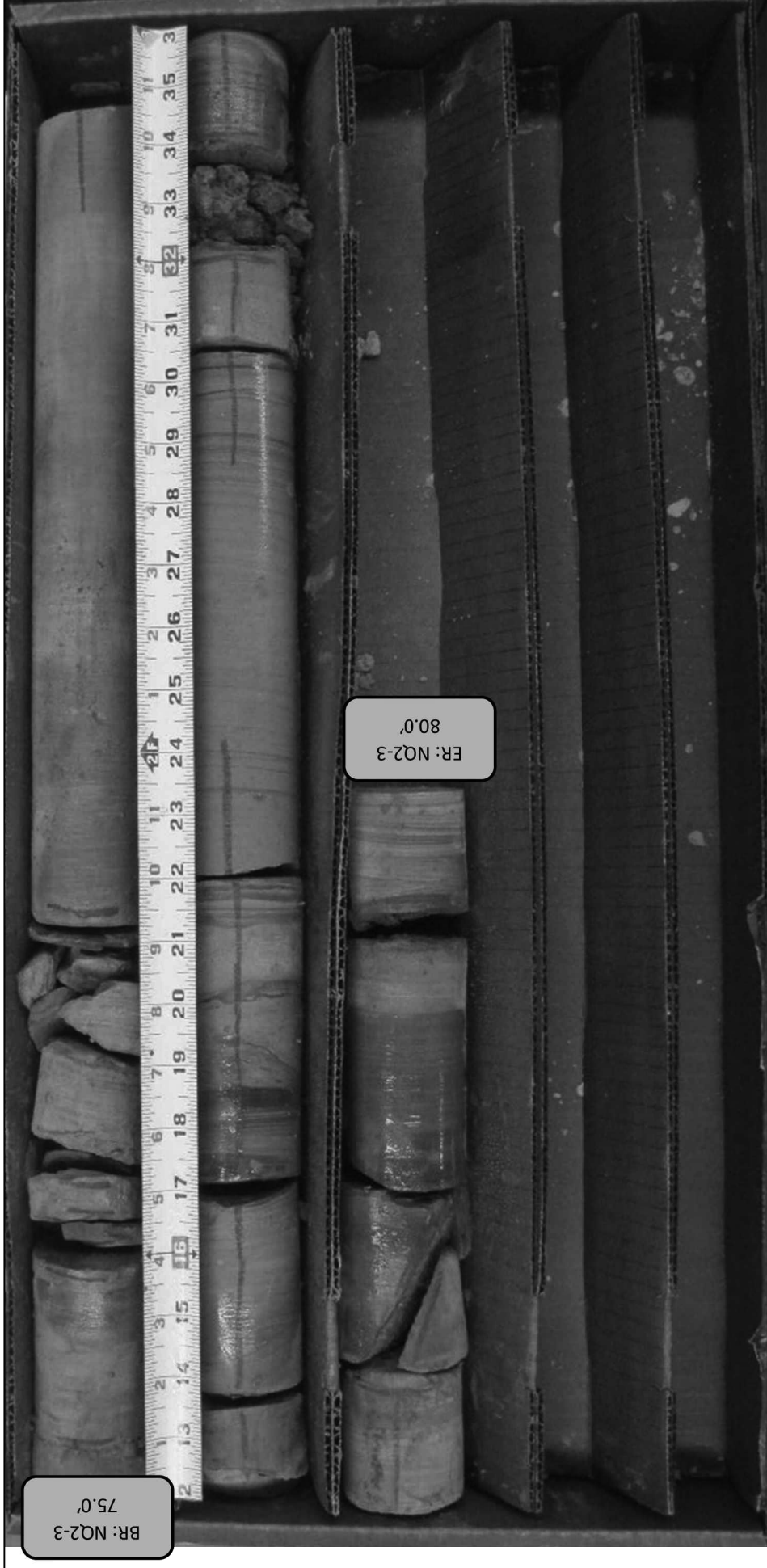


B-003-0-20



RUN #:	DEPTH	RECOVERY	RQD
NQ2-1	65.0'	46/60	77%
NQ2-2	70.0'	55/60	92%
MUS-16-6.83 PID 113521			

B-003-0-20



RUN #:	DEPTH	RECOVERY	RQD
NQ2-3	75.0'	58/60	97%
MUS-16-6.83 PID 113521			