

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

POR-76-20.18

**PALMYRA TOWNSHIP
PORTAGE COUNTY**

PROJECT DESCRIPTION

THIS PROJECT INVOLVES LANDSLIDE REMEDIATION OF 0.13 MILES OF WESTBOUND INTERSTATE 76 IN PORTAGE COUNTY OHIO BY THE USE OF PASSIVE SOIL NAILS AND A STABILITY BERM. MINOR PAVEMENT REPAIRS ARE ALSO INCLUDED WITH THIS PROJECT.

EARTH DISTURBED AREAS

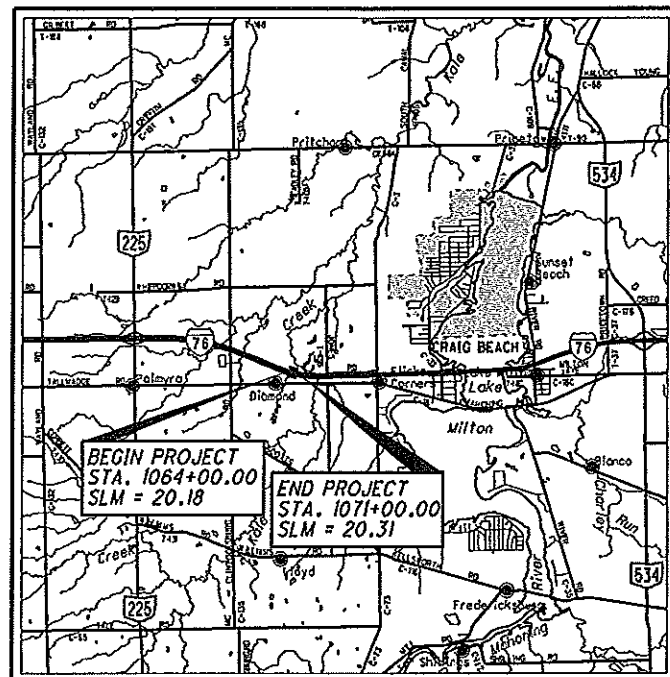
PROJECT EARTH DISTURBED AREA: N/A
(MAINTENANCE PROJECT)
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: N/A
(MAINTENANCE PROJECT)
NOTICE OF INTENT EARTH DISTURBED AREA: N/A
(MAINTENANCE PROJECT)

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.

2016 SPECIFICATIONS

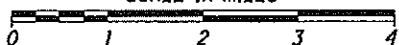
THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.



LOCATION MAP

LATITUDE: 41°06'02" LONGITUDE: 81°01'10"

SCALE IN MILES



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

DESIGN DESIGNATION

DESIGN SPEED - - - - - 70 MPH
LEGAL SPEED - - - - - 65 MPH
DESIGN FUNCTIONAL CLASSIFICATION:
OI INTERSTATE (URBAN)
NHS PROJECT - - - - - YES
DESIGN EXCEPTIONS - - - - - NONE REQUIRED

INDEX OF SHEETS:

TITLE SHEET	1
TYPICAL SECTION	2
GENERAL NOTES	3-4
MAINTENANCE OF TRAFFIC	5, 5A
GENERAL SUMMARY	6
SUBSUMMARY / UNDERDRAIN TABLE	7
PLAN	8-9
CROSS SECTIONS	10-14
PASSIVE SOIL NAIL DETAILS	15-17
SOIL PROFILES	

UNDERGROUND UTILITIES
CONTACT BOTH SERVICES TWO WORKING DAYS BEFORE YOU DIG.

Call Before You Dig
1-800-362-2764

(Non-members must be called directly)
OIL & GAS PRODUCERS
UNDERGROUND PROTECTION SERVICE
1-800-925-0988

PLAN PREPARED BY:

1500 Lake Shore Drive, Suite 100
Columbus, Ohio 43204
(614) 488-4383

ENGINEERS SEAL:
FOR ROADWAY

SIGNED: *Angela L. Boyce*
DATE: 1/30/19

ENGINEERS SEAL:
FOR SOIL NAILS

SIGNED: *Elliot Magoto*
DATE: 1/30/19

STANDARD CONSTRUCTION DRAWINGS				SUPPLEMENTAL SPECIFICATIONS	SPECIAL PROVISIONS
BP-3.1	7/18/14	MT-101.90	7/21/17	800 4/19/19	
BP-9.1	1/18/19	MT-105.10	7/19/13	832 10/19/18	
DM-1.1	7/21/17	TC-61.30	1/20/17		
DM-4.2	7/20/12				
DM-4.3	1/15/16				
DM-4.4	1/15/16				
MGS-1.1	1/19/18				
MGS-2.1	1/19/18				
MGS-4.3	1/18/13				
MT-95.40	1/20/17				
MT-95.45	7/21/17				
MT-101.70	7/20/18				
MT-101.75	7/15/16				

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: *[Signature]*
DATE: 2/8/19 DISTRICT DEPUTY DIRECTOR

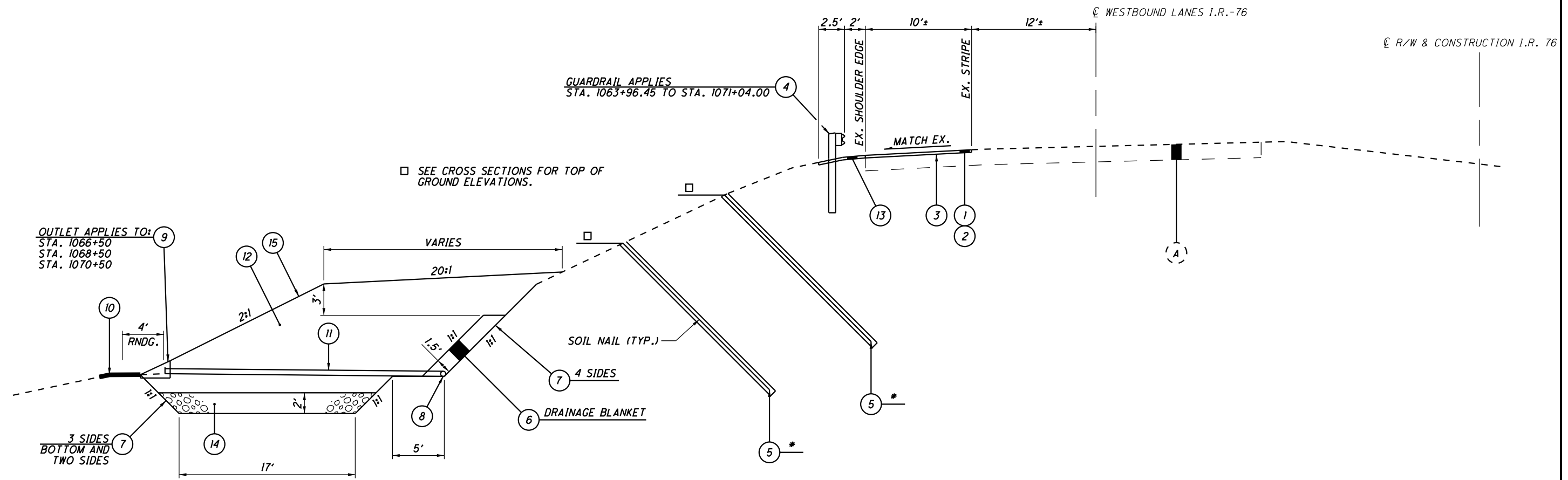
APPROVED: *[Signature]*
DATE: 3/14/19 DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO. E170(450)
PID NO. 103201
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
POR-76-20.18
17

POR - IR 76-20.18 Side
190346 PID - 103201
Dist 4 6/6/2019
Contract Proposal Available @
www.contracts.dot.state.oh.us/home

S:\175527005\POR\103201\Design\Roadway\51

U:\17527005\POR\103201\Design\Roadway_Sheets\103201_GY001.dgn 1/29/2019 12:20:12 PM sparker



TYPICAL SECTION

SECTION APPLIES:
 STA. 1064+00.00 TO STA. 1071+00.00
 (SEE CROSS SECTIONS FOR ADDITIONAL DETAILS AND LAYOUT)

LEGEND

- ① ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE, 3"
- ② ITEM 442 - 3" ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE B (448), AS PER PLAN (PLACE IN TWO 1-1/2" LIFTS)
- ③ ITEM 407 - NON-TRACKING TACK COAT
- ④ ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS
- ⑤ ITEM 610 - RETAINING WALL, MISC: PASSIVE SOIL NAILS
- ⑥ ITEM 203 - GRANULAR EMBANKMENT, (NO. 57 STONE)
- ⑦ ITEM 204 - GEOTEXTILE FABRIC, 712.09, TYPE A
- ⑧ ITEM 611 - 6" CONDUIT, TYPE F, 707.41 (PERFORATED)
- ⑨ ITEM 611 - PRECAST REINFORCED CONCRETE OUTLET
- ⑩ ITEM 601 - TIED CONCRETE BLOCK MAT, TYPE 1
- ⑪ ITEM 611 - 6" CONDUIT, TYPE F FOR UNDERDRAIN OUTLETS
- ⑫ ITEM 203 - EMBANKMENT
- ⑬ ITEM 441 - 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448), (UNDER GUARDRAIL), AS PER PLAN
- ⑭ ITEM 203 - GRANULAR MATERIAL, TYPE C
- ⑮ ITEM 671 - EROSION CONTROL MAT, TYPE E
- (A) EXISTING PAVEMENT (18")

* PASSIVE SOIL NAILS TO BE INSTALLED TO AVOID CONFLICT WITH GUARDRAIL POSTS. FOR ADDITIONAL DETAILS SEE SHEET 15.

ROUNDING

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

UTILITIES

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

OHIO EDISON
730 SOUTH AVENUE
YOUNGSTOWN, OH. 44502
MR. MIKE BECK
(330) 740-7704, EXT. 7704

MAINTAIN MINIMUM VERTICAL CLEARANCE OF 21 FEET FROM OVERHEAD POWERLINE FROM STA. 1067+00 TO STA. 1067+50.

THERE ARE NO KNOWN UNDERGROUND UTILITIES ON THIS PROJECT.

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE BELOW 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: AS NOTED IN PROJECT CONTROL TABLE SHOWN ON THIS SHEET

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: NAVD 88
GEOID: GEOID 2012A

HORIZONTAL POSITIONING

REFERENCE FRAME: NAD 83 (2011) (EPOCH: 2010.0000)
ELLIPSOID: GRS 80
MAP PROJECTION: LAMBERT CONFORMAL CONIC
COORDINATE SYSTEM: OHIO STATE PLANE (NORTH ZONE) (3401)
COMBINED SCALE FACTOR: 0.9999069813
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.

PRIMARY PROJECT CONTROL POINTS - PAF 0.99989702001 SCALE ABOUT ORIGIN POINT N=0, E=0 PROJECT COORDINATES USED FOR CONTROL POINTS				
SOURCE OF CONTROL	PROJ. NORTH	PROJ. EAST	MON. TYPE	ELEV.
T200	525870.139	2376359.614	IPINS	1008.37
T210	525897.910	2376766.626	IPINS	997.79
T220	525984.078	2376434.329	IPINS	1006.53

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.

PROTECTION OF RIGHT-OF-WAY LANDSCAPING

PRIOR TO BEGINNING WORK, THE CONTRACTOR, THE PROJECT ENGINEER, AND A REPRESENTATIVE OF THE MAINTAINING AGENCY WILL REVIEW AND RECORD ALL LANDSCAPING ITEMS WITHIN THE RIGHT-OF-WAY (BOTH WITHIN AND OUTSIDE THE CONSTRUCTION LIMITS) A RECORD OF THIS REVIEW WILL BE KEPT IN THE PROJECT ENGINEER'S FILES. PRIOR TO FINAL ACCEPTANCE, A FINAL REVIEW OF LANDSCAPING ITEMS WILL BE MADE.

CONSTRUCT ALL ACTIVITIES, EQUIPMENT STORAGE, AND STAGING TO WITHIN THE CONSTRUCTION LIMITS. UNLESS OTHERWISE IDENTIFIED IN THE PLANS OR PROPOSAL, THE CONSTRUCTION LIMITS ARE IDENTIFIED AS 30 FEET FROM THE EDGE OF PAVEMENT.

SUBMIT A WRITTEN REQUEST TO THE PROJECT ENGINEER TO USE ANY AREA OUTSIDE THESE LIMITS. THE DOCUMENT SUBMITTED MUST CLEARLY IDENTIFY THE AREA AND EXPLAIN THE PROPOSED USE AND RESTORATION OF THE AREA. USE OF THESE AREAS FOR DISPOSAL OF WASTE MATERIAL AND CONSTRUCTION DEBRIS, EXCAVATION OF BORROW MATERIAL AND PLACEMENT OF PORTABLE PLANTS IS PROHIBITED. THE REQUEST MUST BE APPROVED, IN WRITING, BEFORE THE CONTRACTOR HAS PERMISSION TO USE THE AREA.

ANY ITEMS DAMAGED BEYOND THE CONSTRUCTION LIMITS, AS DEFINED ABOVE, WILL BE REPLACED IN KIND OR AS APPROVED BY THE PROJECT ENGINEER.

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.

BENCHING OF FOUNDATION SLOPES

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

ITEM 203 - EMBANKMENT USING NO. 57 AGGREGATE

FURNISH DURABLE, NATURAL AGGREGATE NO. 57 SIZE. PLACE THE AGGREGATE AT THE THICKNESS AND SLOPE AS SHOWN ON THE TYPICAL SECTION AND CROSS-SECTIONS.

CONNECTION BETWEEN EXISTING AND PROPOSED GUARDRAIL

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

SEEDING AND MULCHING

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

- ITEM 659 - TOPSOIL _ _ _ _ _ .474 CY
- ITEM 659 - COMMERCIAL FERTILIZER _ _ _ _ _ 0.58 TON
- ITEM 659 - LIME _ _ _ _ _ 0.88 AC
- ITEM 659 - WATER _ _ _ _ _ 23 MGAL
- ITEM 671 - EROSION CONTROL MAT, TYPE E _ _ _ _ .4266 SY

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

ITEM 202 - REMOVAL MISC.: GEOWEB SLOPE PROTECTION REMOVED

THE CONTRACTOR SHALL CAREFULLY REMOVE AND DISPOSE OF THE EXISTING GEOWEB WITHIN THE LIMITS SHOWN IN THE PLANS. PRECAUTIONS SHALL BE TAKEN DURING REMOVAL AS TO NOT DAMAGE OR DISTURB THE GEOWEB THAT IS TO REMAIN IN PLACE.

THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE WORK INCLUDING DISPOSAL. PAYMENT FOR ALL WORK WILL BE INCLUDED IN THE UNIT PRICE BID PER ITEM 202 - REMOVAL MISC.: GEOWEB SLOPE PROTECTION REMOVED.

CALCULATED
SLP
CHECKED
ALB

GENERAL NOTES

POR-76-20.18

U:\17527005\POR\03201\Design\Roadway\Sheets\03201_GN001.dgn 1/29/2019 12:20:13 PM siparker

PAVING UNDER GUARDRAIL

THIS OPERATION SHALL INCLUDE PREPARATION OF THE AREA UNDER THE GUARDRAIL TO BE PAVED USING ITEM 209, LINEAR GRADING, AS PER PLAN, AND PAVING UNDER THE GUARDRAIL USING 441 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448), (UNDER GUARDRAIL), AS PER PLAN.

ITEM 209, LINEAR GRADING, AS PER PLAN, SHALL CONSIST OF EXCAVATING TOPSOIL, AND PLACING GRANULAR MATERIAL.

ALL COLLECTED DEBRIS AND TOPSOIL, INCLUDING RHIZOMES, ROOTS AND OTHER VEGETATIVE PLANT MATERIAL SHALL BE REMOVED AND DISPOSED OF AS SPECIFIED IN 105.17.

THE REMOVED MATERIAL SHALL BE REPLACED WITH COMPACTABLE GRANULAR MATERIAL CONFORMING TO 703.16 PLACED TO GRADE AS DETAILED ON THE TYPICAL SECTION OR AS APPROVED BY THE ENGINEER.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO PERFORM THE WORK OUTLINED ABOVE SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 209, LINEAR GRADING, AS PER PLAN.

PAVING UNDER GUARDRAIL SHALL CONSIST OF PLACING ITEM 441 TO THE DEPTH SPECIFIED USING ONE OF THE FOLLOWING METHODS:

METHOD A: 1. SET GUARDRAIL POSTS 2. PLACE ITEM 441

METHOD B: 1. PLACE ITEM 441 2. BORE ASPHALT AT POST LOCATIONS (MAY BE OMITTED IF STEEL POSTS ARE USED) 3. SET GUARDRAIL POSTS 4. PATCH AROUND POSTS. THE MATERIALS USED FOR PATCHING SHALL BE AN ASPHALT CONCRETE APPROVED BY THE ENGINEER. PATCHED AREAS SHALL BE COMPACTED USING EITHER HAND OR MECHANICAL METHODS. FINISHED SURFACES SHALL BE SMOOTH AND SLOPED TO DRAIN AWAY FROM THE POSTS.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO PERFORM THE WORK OUTLINED ABOVE, WITH THE EXCEPTION OF SETTING GUARDRAIL POSTS, SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 441, ASPHALT CONCRETE, INTERMEDIATE COURSE, TYPE 1, (448), (UNDER GUARDRAIL), AS PER PLAN.

ITEM 442 - ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE B (448), AS PER PLAN

703.05 DO NOT USE COARSE AGGREGATE FROM A SOURCE DESIGNATED 'SR' OR 'SRH' ACCORDING TO THE OFFICE OF MATERIALS MANAGEMENT (OMM) IN ANY JOB MIX FORMULA (JMF) FOR THIS ITEM.

ITEM 202 - FENCE REMOVED FOR REUSE, AS PER PLAN

THE FOLLOWING QUANTITY HAS BEEN PROVIDED IN THE PLANS TO BE USED AS DIRECTED BY THE ENGINEER TO PROVIDE ACCESS TO THE SITE VIA UNIVERSAL DRIVE. THE CONTRACTOR SHALL REMOVE, STORE AND REINSTALL THE EXISTING FENCE.

THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE WORK. PAYMENT FOR ALL WORK WILL BE INCLUDED IN THE UNIT PRICE BID PER ITEM 202 - FENCE REMOVED FOR REUSE, AS PER PLAN.

ITEM 202 - FENCE REMOVED FOR REUSE,
AS PER PLAN _ _ _ _ _ 50 FT.

WETLANDS AVOIDANCE

WETLANDS ARE PRESENT NEAR THE TOE-OF-SLOPE OUTSIDE OF THE PROJECT CONSTRUCTION LIMITS AS IDENTIFIED IN THE PLAN. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO AVOID IMPACT TO THE WETLANDS LOCATED IN PROXIMITY OF THE PROJECT CONSTRUCTION LIMITS USING ITEM 832 - CONSTRUCTION FENCE AND ITEM 832 - PERIMETER FILTER FABRIC FENCE. THE CONSTRUCTION FENCE AND PERIMETER FILTER FABRIC FENCE SHALL BE INSTALLED ALONG THE PROPOSED CONSTRUCTION LIMITS AT THE IDENTIFIED WETLAND AREAS BY THE CONTRACTOR PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES WITHIN THE LIMITS AND ADJACENT AREA, INCLUDING ANY NECESSARY CLEARING AND GRUBBING ACTIVITIES. THE CONSTRUCTION FENCE AND PERIMETER FILTER FABRIC FENCE SHALL BE MAINTAINED BY THE CONTRACTOR THROUGHOUT PROJECT CONSTRUCTION AND SHALL BE REMOVED BY THE CONTRACTOR UPON PROJECT COMPLETION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR IMPACT THE WETLAND AREA AS INDICATED ON THE PLAN. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR STORE EQUIPMENT AND/OR MATERIALS WITHIN WETLAND AREAS.

PAYMENT FOR ITEM 832 - CONSTRUCTION FENCE AND ITEM 832 - PERIMETER FILTER FABRIC FENCE WILL BE MADE UNDER ITEM 832 - EROSION CONTROL.

U:\17527005\POR\103201\Design\Roadway\Sheets\103201_GN002.dgn 1/29/2019 12:20:14 PM siparker

CALCULATED
SLP
CHECKED
ALB

GENERAL NOTES

POR-76-20.18

MAINTENANCE OF TRAFFIC

THIS ITEM SHALL CONSIST OF MAINTENANCE OF TRAFFIC ON EXISTING ROADWAYS AND RAMPS IN ACCORDANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, CURRENT EDITION, LATEST REVISION, THE SPECIFICATIONS AND THE FOLLOWING:

1. A MINIMUM OF ONE ELEVEN FOOT LANE IN EACH DIRECTION SHALL BE MAINTAINED ON THE EXISTING PAVEMENT AND COMPLETED PAVEMENT DURING CONSTRUCTION OF THE WORK.
2. THE CONTRACTOR SHALL INFORM THE DISTRICT OFFICE (330) 786-2208, EIGHTEEN (18) DAYS PRIOR TO THE BEGINNING OF WORK.
3. LANE RESTRICTIONS OR LANE REDUCTIONS SHALL NOT BE PERMITTED AFTER NORMAL WORKING HOURS. NORMAL WORKING HOURS SHALL BE THOSE HOURS DURING WHICH THE CONTRACTOR HAS A FULL COMPLEMENT OF EMPLOYEES AND EQUIPMENT ACTIVELY REMOVING AND/OR PLACING PAVEMENT MATERIALS.
4. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR BE PERMITTED TO HAVE SUCCESSIVE WORK ZONES UNLESS THE DISTANCE BETWEEN THE DRUMS, BARRICADES OR CONES EXCEEDS ONE [1] MILE.
5. ONLY DURING OFF-PEAK PERIODS (ie ANY PERIOD OTHER THAN 6-8AM AND 3-6PM) SHALL THE CONTRACTOR INSTALL AND SUBSEQUENTLY RESET ALL TRAFFIC CONTROL NECESSARY FOR THE WORK ZONE FOR EACH CONSTRUCTION PHASE.
6. PRIOR TO OPENING TO TRAFFIC EACH LANE SHALL BE IN A SAFE, PASSABLE CONDITION. ALL TRANSVERSE JOINTS SHALL EXTEND ACROSS THE FULL LANE AND SHOULDER WIDTH AND EACH LANE SHALL BE FREE FROM UNEVEN LONGITUDINAL JOINTS. THE CONTRACTOR SHALL PROVIDE ASPHALT WEDGES FOR TRANSVERSE JOINTS WHEREVER THERE ARE PAVEMENT ELEVATION DIFFERENCES.

THE FOLLOWING QUANTITIES SHALL BE USED FOR THE MAINTENANCE OF TRAFFIC ON THIS PROJECT:

614, WORK ZONE MARKING SIGN, 5 EACH

TO BE USED AS DIRECTED BY THE ENGINEER

614, WORK ZONE EDGE LINE, CLASS 1, 0.5 MILE

TRAFFIC CONTROL INSPECTOR

THE CONTRACTOR SHALL DESIGNATE AN INDIVIDUAL OTHER THAN THE SUPERINTENDENT, AND SUBJECT TO THE APPROVAL OF THE ENGINEER, TO CONTINUOUSLY INSPECT ALL TRAFFIC CONTROL DEVICES WHENEVER CONSTRUCTION WORK IS BEING PERFORMED WITHIN THE WORK LIMITS OF THE PROJECT. THE DESIGNATED INDIVIDUAL SHALL ALSO INSPECT ALL TRAFFIC DEVICES AT THE BEGINNING AND AT THE END OF EACH WORK DAY. THE DESIGNATED INDIVIDUAL OR A QUALIFIED REPRESENTATIVE SHALL ALSO BE AVAILABLE ON AN AROUND THE CLOCK BASIS TO REPAIR AND/OR REPLACE DAMAGED OR MISSING TRAFFIC CONTROL DEVICES. THESE INDIVIDUALS SHALL BE EQUIPPED WITH CELLULAR PHONES AND THEIR NAMES AND PHONE NUMBERS SHALL BE GIVEN TO THE PROJECT ENGINEER AT THE PRE-CONSTRUCTION MEETING. THE DESIGNATED INDIVIDUAL MAY HAVE OTHER CONSTRUCTION RELATED DUTIES AS LONG AS IMMEDIATE ATTENTION IS GIVEN TO TRAFFIC CONTROL. PAYMENT FOR THE SERVICES OF THE TRAFFIC CONTROL INSPECTOR SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 MAINTAINING TRAFFIC.

ADVANCED NOTICE TO PAVE

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL TO THE DISTRICT CONSTRUCTION ENGINEER A DETAILED SCHEDULE 15 DAYS PRIOR TO THE PLACEMENT OF THE OVERLAY COURSES, ON HOW THEY PROPOSE TO PROSECUTE THE PAVING OPERATIONS. THE DETAILS SHALL SHOW THE ORDER OF PERFORMANCE OF EACH STAGE (START TO FINISH) OF THE WORK INCLUDING THE MAINTENANCE OF TRAFFIC THAT WILL BE USED.

SHOULDER CLOSURE

DURING SLIDE REPAIR OPERATIONS THE CONTRACTOR MAY CLOSE THE RIGHT SHOULDER ON I-76 EASTBOUND FOR THE FULL DURATION OF THE WORK.

NOTIFICATION OF TRAFFIC RESTRICTIONS

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

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

NOTIFICATION TIME TABLE		
ITEM	DURATION OF CLOSURE	NOTICE DUE TO PERMITS & PIO
RAMP & ROAD CLOSURES	>= 2 WEEKS	21 CALENDAR DAYS PRIOR TO CLOSURE
	> 12HOURS & < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	< 12 HOURS	4 CALENDAR DAYS PRIOR TO CLOSURE
LANE CLOSURES & RESTRICTIONS	>= 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	< 2 WEEKS	5 BUSINESS DAYS PRIOR TO CLOSURE
START OF CONSTRUCTION & TRAFFIC PATTERN CHANGES	N/A	14 CALENDAR DAYS PRIOR TO IMPLEMENTATION

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

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 CMS 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:

DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.

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.

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 ZONE.

THE LEOS WORK AT THE DIRECTION OF THE ENGINEER. 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. ONCE THE LEO HAS COMPLETED THE DUTIES DESCRIBED ABOVE AND STILL HAS TIME REMAINING ON HIS/HER SHIFT, THE LEO MAY BE ASKED TO PATROL THROUGH THE WORK ZONE (WITH FLASHING LIGHTS OFF) OR BE PLACED AT A LOCATION TO DETER MOTORISTS FROM SPEEDING. 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. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 100 HOURS

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

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

U:\17527005\POR\03201\Design\MOT\Sheets\03201_MN001.dgn 1/29/2019 12:20:15 PM siporker

CALCULATED
TFS
CHECKED
MS

MAINTENANCE OF TRAFFIC GENERAL NOTES

POR-76-20.18

WORK ON THE SHOULDER OF I-76

FROM THE TIME THAT WORK BEGINS, THE OUTSIDE SHOULDER OF I-76 SHALL BE CLOSED UTILIZING 1600 FT OF PORTABLE TEMPORARY MOVABLE BARRIER. ANYTIME THE CONTRACTOR NEEDS TO HAVE EQUIPMENT OR VEHICLES ON THE CLOSED SHOULDER, THE CONTRACTOR SHALL CLOSE THE RIGHT LANE OF I-76 AND MOVE THE BARRIER OUT TO INCLUDE THE CLOSED LANE. THE LANE CLOSURE ON I-76 SHALL NOT BE PERMITTED DURING TIMES OF 6AM-8AM, 3PM-6PM, AND WEEKENDS. THIS WILL REQUIRE THE BARRIER TO BE MOVED AND RESET DAILY WHILE THE CONTRACTOR IS WORKING FROM THE SHOULDER. BELOW ARE THE REQUIREMENTS FOR THE MOVABLE BARRIER.

A. DESCRIPTION

THIS ITEM CONSISTS OF FURNISHING, INSTALLING AND RELOCATING A PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM, INCLUDING THE NECESSARY BARRIER TRANSFER DEVICES, IN ACCORDANCE WITH THIS SPECIFICATION, THE PLANS AND AS DIRECTED BY THE ENGINEER.

B. MATERIALS AND CONSTRUCTION METHODS

ALL TEMPORARY BARRIER INSTALLATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD) INCLUDING ALL REVISIONS UP TO THE DATE OF ADVERTISEMENT OF THE CONTRACT.

THE PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM SHALL BE FULLY TESTED TO AND SHALL MEET THE RECOMMENDED CRITERIA AS DEFINED IN THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 FOR TEST LEVEL 3 WHEN PROPERLY INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, THE PLANS AND AS DIRECTED BY THE ENGINEER.

FOR DESIGN IMPACTS THE PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM SHALL BE CAPABLE OF A LATERAL DEFLECTION OF NO MORE THAN 8 FEET WHEN IMPACTED.

THE PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM SHALL BE CONSTRUCTED FROM A SERIES OF INDIVIDUAL SECTIONS. EACH BARRIER SECTION SHALL BE NO LONGER THAN 50 FEET (15 METERS) AND NO SHORTER THAN 3 FEET (1 METER). A PORTABLE IMPACT ATTENUATOR SHALL BE INSTALLED AT THE LEADING EDGE OF THE BARRIER INSTALLATION AND THE FIRST TWO (2) SECTIONS OF BARRIER SHALL BE ANCHORED TO THE ROADWAY IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS WITH AN APPROPRIATE IMPACT ATTENUATOR. THE LAST TWO (2) SECTIONS OF BARRIER SHALL ALSO BE ANCHORED TO THE ROADWAY IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. BARRIER-TO-BARRIER CONNECTIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

SECTIONS OF THE PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM SHALL BE EQUIPPED WITH WHEEL AND JACK MECHANISMS THAT ALLOW FOR MANUAL MOVEMENT OF THE BARRIER IF DIRECTED BY THE ENGINEER.

A BARRIER TRANSFER DEVICE SHALL BE PROVIDED AS PER THE MANUFACTURER'S RECOMMENDATIONS AND SHALL BE INCIDENTAL TO THIS ITEM. THE BARRIER TRANSFER DEVICE SHALL BE A SELF-CONTAINED UNIT OR CAN BE AN ATTACHMENT FOR ANY TYPICAL CONSTRUCTION APPARATUS. THE BARRIER TRANSFER DEVICES SHALL BE CAPABLE OF LATERALLY ADJUSTING THE BARRIER AT A RATE NO MORE THAN ONE (1) MILE IN THIRTY (30) MINUTES. THE MOVABLE BARRIER SYSTEM SHALL BE MOVED AT THE BEGINNING OF THE WORK DAY TO CLOSE A LANE AS REQUIRED BY THE ENGINEER AND SHALL BE MOVED AT THE END OF THE WORK DAY TO OPEN A LANE AS REQUIRED BY THE ENGINEER.

BARRIER REFLECTORS AND OBJECT MARKERS, SPACED AT ALTERNATING 50 FOOT INTERVALS PER STANDARD DRAWING MT-101.70, SHALL BE INSTALLED ON THE PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM. PAYMENT FOR THE APPROPRIATE BARRIER REFLECTORS AND OBJECT MARKERS SHALL BE INCLUDED IN THIS BID ITEM.

THE CONTRACTOR SHALL SUBMIT HIS OR HER PLAN FOR PHASING OF THE PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM TO THE ENGINEER TWO WEEKS PRIOR TO MOBILIZING THE PORTABLE TEMPORARY MOVABLE BARRIER SYSTEM FOR APPROVAL.

TO REPOSITION THE MOVABLE BARRIER SYSTEM TO CLOSE OR OPEN A LANE, THE CONTRACTOR SHALL POSITION THREE (3) TMA'S IN THE LEFT LANE/SHOULDER. ONE TMA SHALL REMAIN AT THE END OF THE LEFT LANE TAPER, ONE SHALL FOLLOW THE BARRIER POSITIONING VEHICLE AND ONE TMA SHALL FOLLOW FURTHER BEHIND THE SECOND TMA. BARRIER MOVEMENT SHALL OCCUR IN THE DIRECTION OF TRAFFIC FLOW. A LEO SHALL FOLLOW THE SECOND TMA.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE PRODUCT SPECIFICATION INFORMATION, DESIGN CUT SHEETS AND OTHER INFORMATION NECESSARY FOR APPROVAL AS DETERMINED BY THE ENGINEER.

CONTRACTOR MUST ANTICIPATE THE COST OF THE WALL, BARRIER REFLECTORS, OBJECT MARKERS, IMPACT ATTENUATOR, RELOCATING DEVICE, AND THE COST TO MOVE AND RESET THE WALL FOR AS MANY DAYS AS IS NECESSARY TO COMPLETE THE WORK AND INCLUDE THIS COST IN HIS BID COST FOR ITEM 622 BARRIER MISC.: PORTABLE MOVABLE BARRIER SYSTEM 1600 FT.

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.

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.

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

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

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

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 2 SIGN MONTH ASSUMING 1 PCMS SIGNS FOR 2 MONTHS

U:\17527005\POR\03201\Design\MOT\Sheets\03201_MN002.dgn 1/29/2019 12:20:17 PM sipar\ker

CALCULATED
TFS
CHECKED
MS

MAINTENANCE OF TRAFFIC GENERAL NOTES

POR-76-20.18

5A
17

U:\17527005\POR\103201\Design\Roadway\Sheets\103201_GG001.dgn 1/29/2019 12:20:18 PM siparker

SHEET NUM.													PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE SHEET NO.	CALCULATED SLP	CHECKED ALB
3	4	5	5A	7	14	17						01/IMS/OT	EXT	TOTAL							
ROADWAY																					
LS												LS	201	11000	LS	CLEARING AND GRUBBING					
				506								506	202	23010	506	SY	PAVEMENT REMOVED, ASPHALT				
				700								700	202	38000	700	FT	GUARDRAIL REMOVED				
	50											50	202	75201	50	FT	FENCE REMOVED FOR REUSE, AS PER PLAN			4	
				525								525	202	98300	525	SY	REMOVAL MISC.: GEOWEB SLOPE PROTECTION REMOVED			3	
												3,529	203	10000	3,529	CY	EXCAVATION				
												7,184	203	20000	7,184	CY	EMBANKMENT				
												277	203	35000	277	CY	GRANULAR EMBANKMENT, (NO. 57 STONE)				
												1,035	203	35120	1,035	CY	GRANULAR MATERIAL, TYPE C				
												3,224	204	50100	3,224	SY	GEOTEXTILE FABRIC, 712.09, TYPE A				
												7	209	60201	7	STA	LINEAR GRADING, AS PER PLAN			4	
				700								700	606	15100	700	FT	GUARDRAIL, TYPE MGS WITH LONG POSTS				
EROSION CONTROL																					
				6								6	601	21050	6	SY	TIED CONCRETE BLOCK MAT, TYPE I				
474												474	659	00300	474	CY	TOPSOIL				
0.58												0.58	659	20000	0.58	TON	COMMERCIAL FERTILIZER				
0.88												0.88	659	31000	0.88	ACRE	LIME				
23												23	659	35000	23	MGAL	WATER				
4,266												4,266	671	15040	4,266	SY	EROSION CONTROL MAT, TYPE E				
												12,554	832	30000	12,554	EACH	EROSION CONTROL				
DRAINAGE																					
				102								102	611	00510	102	FT	6" CONDUIT, TYPE F FOR UNDERDRAIN OUTLETS				
				640								640	611	01500	640	FT	6" CONDUIT, TYPE F, 707.41 (PERFORATED)				
				3								3	611	99710	3	EACH	PRECAST REINFORCED CONCRETE OUTLET				
PAVEMENT																					
				784								784	254	01000	784	SY	PAVEMENT PLANING, ASPHALT CONCRETE, 3"				
				67								67	407	20000	67	GAL	NON-TRACKING TACK COAT				
				30								30	441	50701	30	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448), (UNDER GUARDRAIL), AS PER PLAN			4	
				66								66	442	20001	66	CY	ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (448), AS PER PLAN			4	
				700								700	618	40100	700	FT	RUMBLE STRIPS, (ASPHALT CONCRETE)				
TRAFFIC CONTROL																					
				7								7	626	00110	7	EACH	BARRIER REFLECTOR, TYPE 2, 1-WAY				
				0.14								0.14	644	00104	0.14	MILE	EDGE LINE, 6"				
RETAINING WALLS (001)																					
						146						146	610	50000	146	EACH	RETAINING WALL, MISC.: PASSIVE SOIL NAILS			17	
MAINTENANCE OF TRAFFIC																					
		100										100	614	11110	100	HR	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE				
		5										5	614	12460	5	EACH	WORK ZONE MARKING SIGN				
			2									2	614	18601	2	SNMT	PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN			5A	
		0.5										0.5	614	22000	0.5	MILE	WORK ZONE EDGE LINE, CLASS 1, 4"				
			1,600									1,600	622	90000	1,600	FT	BARRIER, MISC.: PORTABLE MOVABLE BARRIER SYSTEM			5A	
INCIDENTALS																					
												LS	614	11000	LS		MAINTAINING TRAFFIC				
												2	619	16010	2	MNTH	FIELD OFFICE, TYPE B				
												LS	623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING				
												LS	624	10000	LS		MOBILIZATION				

GENERAL SUMMARY

POR-76-20.18

U:\17527005\POR\103201\Design\Roadway_Sheets\103201_GC001.dgn 1/29/2019 12:20:20 PM siparker

SUBSUMMARY																
REF NO.	SHEET NO.	STATION		SIDE	202			209	254	407	441	442	606	618	644	626
		FROM	TO		GUARDRAIL REMOVED FT	PAVEMENT REMOVED, ASPHALT SY	REMOVAL MISC.: GEOWEB SLOPE PROTECTION REMOVED SY	LINEAR GRADING, AS PER PLAN STA.	PAVEMENT PLANING, ASPHALT CONCRETE, 3" SY	NON-TRACKING TACK COAT GAL	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448), (UNDER GUARDRAIL), AS PER PLAN, 3" CY	ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE B (448), AS PER PLAN, 3" CY	GUARDRAIL, TYPE MGS WITH LONG POSTS FT	RUMBLE STRIPS, (ASPHALT CONCRETE) FT	EDGE LINE, 6", WHITE MILE	BARRIER REFLECTOR, TYPE 2, 1-WAY EACH
		I.R. 76														
EL-1	8, 9	1064+00.00	1071+00.00	LT											0.14	
GR-1	8, 9	1063+96.45	1071+04.00	LT		506		7			29.17		700			7
P-1	8, 9	1064+00.00	1071+00.00	LT					783.88	66.63		65.32				
R-1	8, 9	1063+96.45	1071+04.00	LT	700											
R-2	9	1069+40.00	1071+25.00	LT			524.63									
RS-1	8, 9	1064+00.00	1071+00.00	LT									700			
TOTALS					700	506	524.63	7	783.88	66.63	29.17	65.32	700	700	0.14	7
TOTALS CARRIED TO GENERAL SUMMARY					700	506	525	7	784	67	30	66	700	700	0.14	7

UNDERDRAIN TABLE														
REF NO.	SHEET NO.	STATION		SIDE	LEFT OUTLET TO	OUTLET ELEV.	OUTLET STATION	OUTLET OFFSET	REMARKS	601		611		BENDS AND BRANCHES FOR INFORMATION ONLY
		FROM	TO							TIED CONCRETE BLOCK MAT, TYPE 1 SY	6" CONDUIT, TYPE F, 707.41 (PERFORATED) FT	6" CONDUIT, TYPE F, FOR UNDERDRAIN OUTLETS FT	PRECAST REINFORCED CONCRETE OUTLET EACH	
		I.R. 76												
UD-1	8	1064+00.00	1066+50.00	LT	SLOPE	987.38	1066+50.00	122.97		1.78	246	28	1	1
UD-2	8, 9	1066+50.00	1068+50.00	LT	SLOPE	981.42	1068+50.00	122.78		1.78	197	30	1	1
UD-3	9	1068+50.00	1070+50.00	LT	SLOPE	967.25	1070+50.00	147.33		1.78	197	44	1	3
TOTALS										5.34	640	102	3	
TOTALS CARRIED TO GENERAL SUMMARY										6	640	102	3	

CALCULATED
SLP
CHECKED
ALB

SUBSUMMARY / UNDERDRAIN TABLE

POR-76-20.18

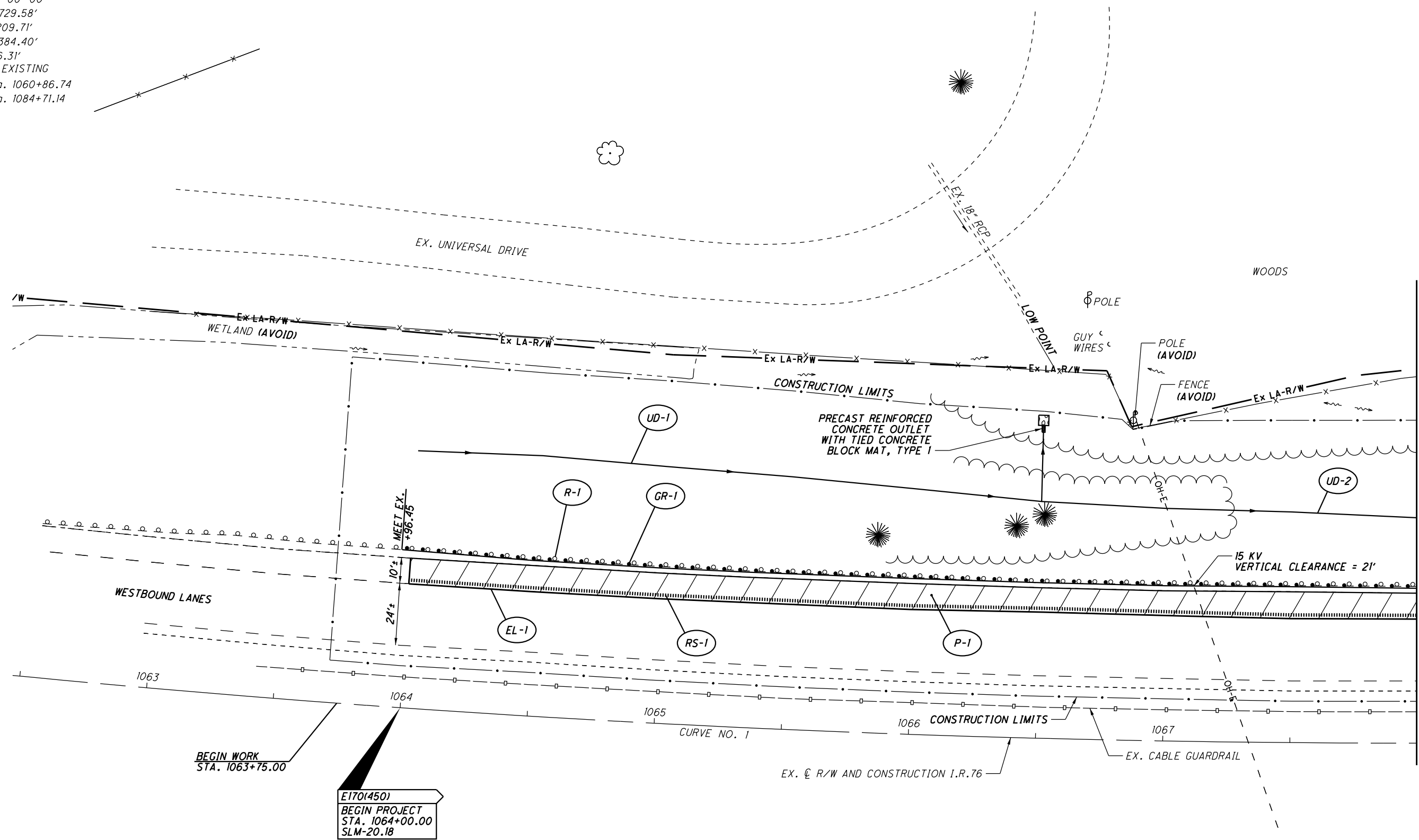
I.R. 76
 EX. CURVE NO. 1
 P.I. Sta. 1072+96.45
 $\Delta = 23^\circ 50' 38''$ (LT)
 $D_c = 1^\circ 00' 00''$
 $R = 5,729.58'$
 $T = 1,209.71'$
 $L = 2,384.40'$
 $E = 126.31'$
 $e_{max} = \text{EXISTING}$
 PC Sta. 1060+86.74
 PT Sta. 1084+71.14

CALCULATED SLP CHECKED ALB

0 20 40
 HORIZONTAL SCALE IN FEET

PLAN - I.R. 76
 STA. 1064+00.00 TO STA. 1068+00.00

POR-76-20.18



BEGIN WORK
 STA. 1063+75.00

E170(450)
 BEGIN PROJECT
 STA. 1064+00.00
 SLM-20.18

PAVEMENT MARKING LEGEND

- EL ITEM 644 - EDGE LINE, 6", WHITE
- RS ITEM 618 - RUMBLE STRIPS, (ASPHALT CONCRETE)

BENCHMARK
 CHISELED SQUARE ON THE NORTHEAST CORNER OF THE NORTHERLY ABUTMENT WALL OF THE EASTBOUND BRIDGE OVER UNIVERSAL ROAD.
 STATION = 1062+55.3, OFFSET = 14.4 FT RT., ELEV. = 1012.86

3" PAVEMENT PLANING WITH 3" OVERLAY

NOTE:
 ACCESS TO THE SITE WILL NOT BE PERMITTED FROM I.R. 76

FOR QUANTITIES, SEE SHEET 7
 FOR PASSIVE SOIL NAILS, SEE SHEETS 15-17

U:\17527005\POR\103201\Design\Roadway\Sheets\103201_GPO01.dgn 1/29/2019 12:20:21 PM sipar\ker

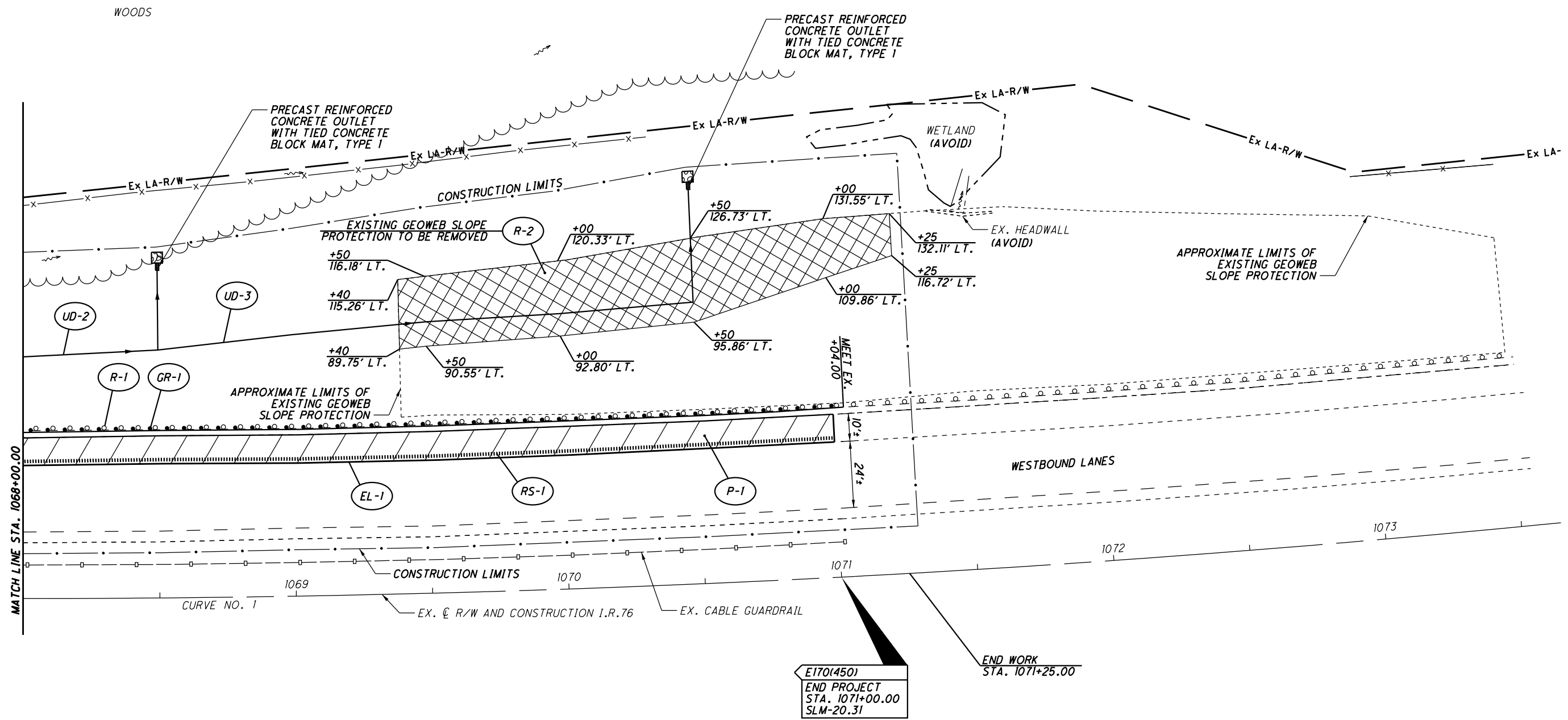
I.R. 76
 EX. CURVE NO. 1
 P.I. Sta. 1072+96.45
 $\Delta = 23^\circ 50' 38''$ (LT)
 $D_c = 1^\circ 00' 00''$
 $R = 5,729.58'$
 $T = 1,209.71'$
 $L = 2,384.40'$
 $E = 126.31'$
 $e_{max} = \text{EXISTING}$
 PC Sta. 1060+86.74
 PT Sta. 1084+71.14

CALCULATED SLP CHECKED ALB

0 10 20 40
 HORIZONTAL SCALE IN FEET

PLAN - I.R. 76
 STA. 1068+00.00 TO STA. 1071+00.00

POR-76-20.18



PAVEMENT MARKING LEGEND

- EL ITEM 644 - EDGE LINE, 6", WHITE
- RS ITEM 618 - RUMBLE STRIPS, (ASPHALT CONCRETE)

BENCHMARK
 CHISELED SQUARE ON THE NORTHEAST CORNER OF THE NORTHERLY ABUTMENT WALL OF THE EASTBOUND BRIDGE OVER UNIVERSAL ROAD. STATION = 1062+55.3, OFFSET = 14.4 FT RT., ELEV. = 1012.86

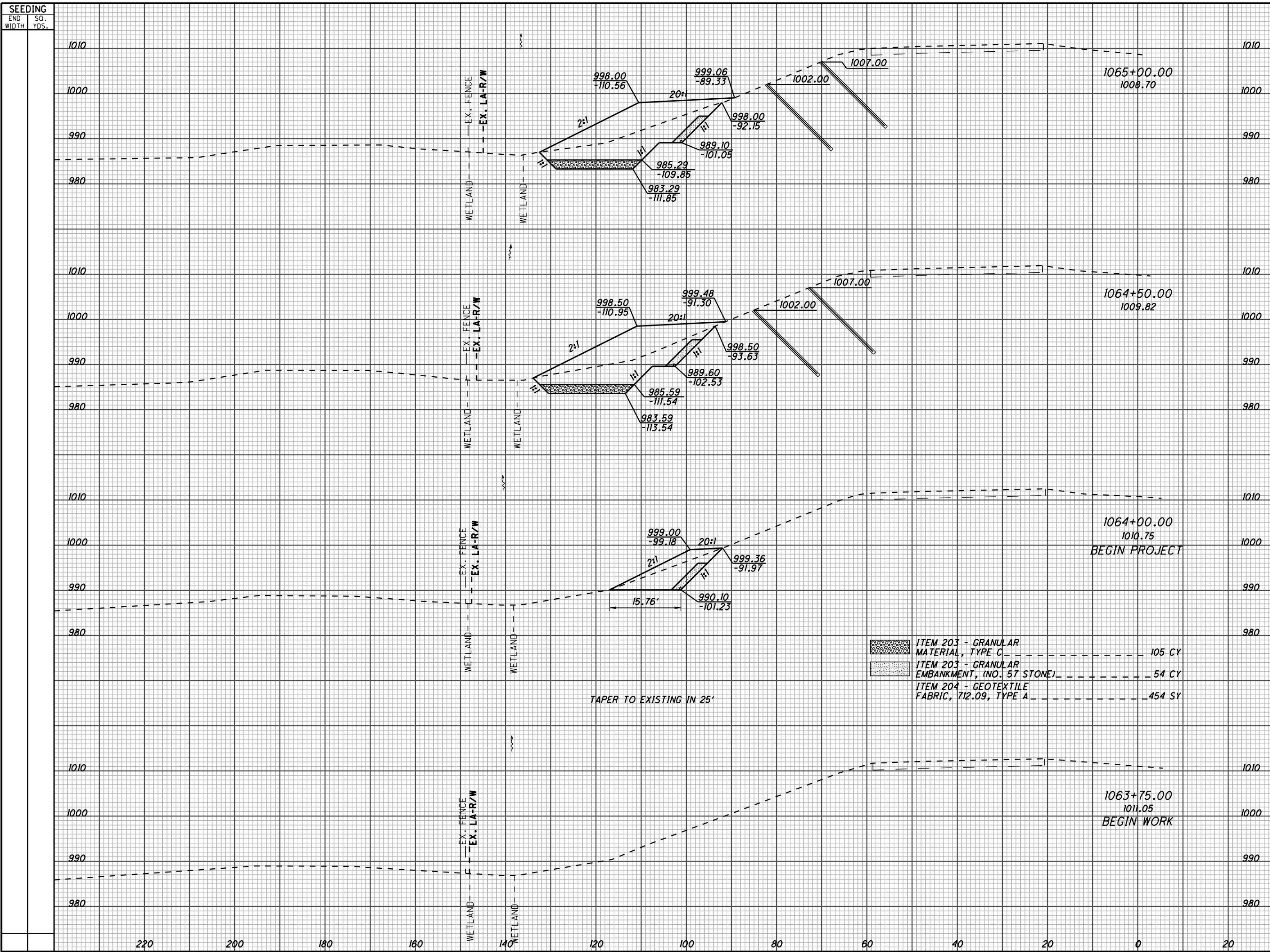
- 3" PAVEMENT PLANING WITH 3" OVERLAY
- LIMITS OF EXISTING GEOWEB SLOPE PROTECTION TO BE REMOVED

NOTE:
 ACCESS TO THE SITE WILL NOT BE PERMITTED FROM I.R. 76

FOR QUANTITIES, SEE SHEET 7
 FOR PASSIVE SOIL NAILS, SEE SHEETS 15-17

U:\17527005\POR\103201\Design\Roadway_Sheets\103201_GPO02.dgn 1/29/2019 12:20:22 PM sjparker

U:\17527005\POR\03201\Design\Roadway\Sheets\03201_XS001.dgn 1/29/2019 12:20:24 PM siparker



- ITEM 203 - GRANULAR MATERIAL, TYPE C ----- 105 CY
 - ITEM 203 - GRANULAR EMBANKMENT, (NO. 57 STONE) ----- 54 CY
 - ITEM 204 - GEOTEXTILE FABRIC, 712.09, TYPE A ----- 454 SY
- TAPER TO EXISTING IN 25'

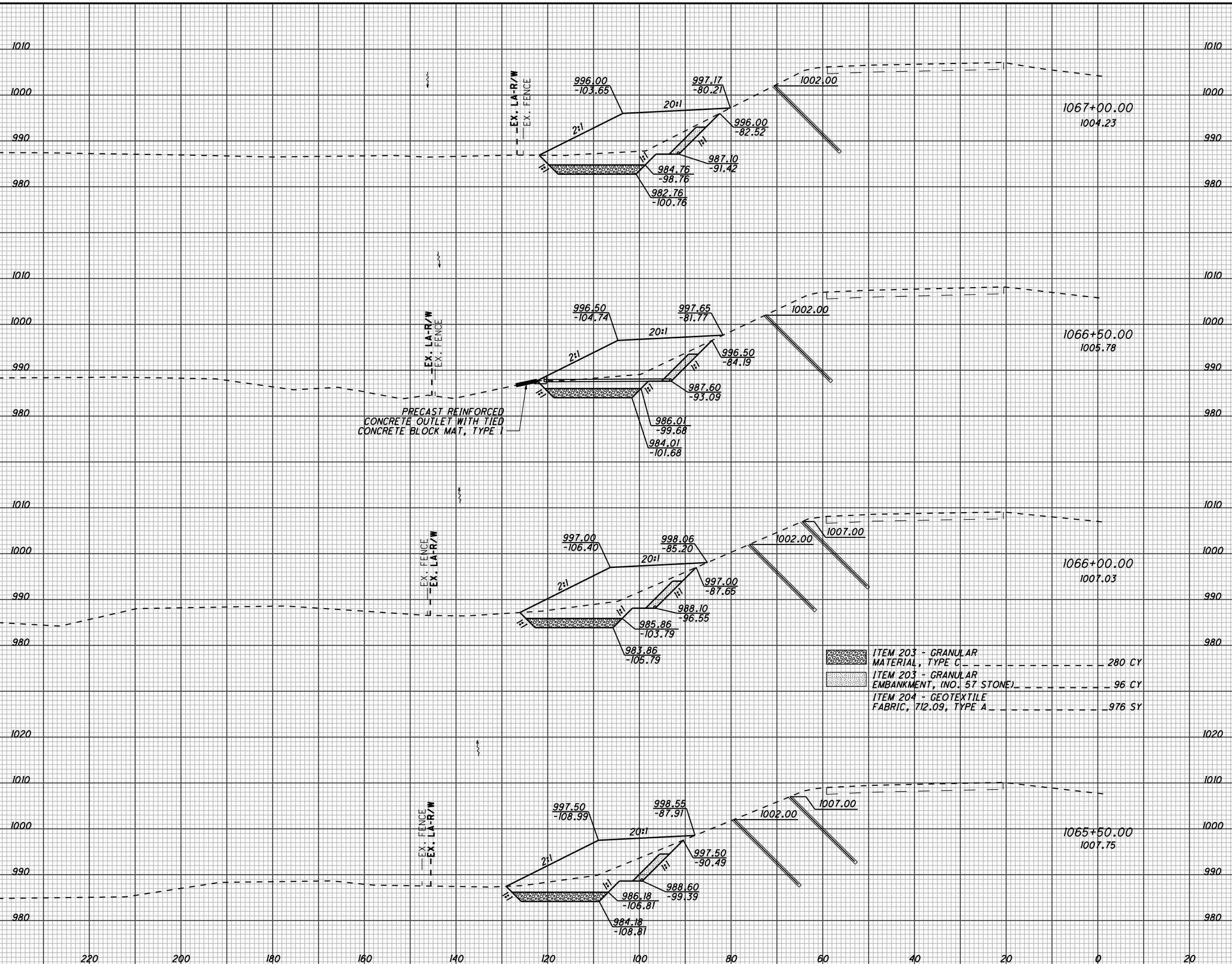
END STA.	AREA		VOLUME		CALCULATED SLP	CHECKED ALB
	CUT	FILL	CUT	FILL		
1065+00.00	191	289	339	527		
1064+50.00	175	280	230	342		
1064+00.00	73	89	34	41		
1063+75.00	0	0	0	0		
TOTAL	449	658	603	910		

CROSS SECTIONS I.R.76
STA. 1063+75.00 TO STA. 1065+00.00

POR-76-20.18

U:\17527005\POR\103201\Design\Roadway_Sheets\103201_XS002.dgn 1/29/2019 12:20:25 PM siparker

SEEDING
END SO.
WIDTH YDS.



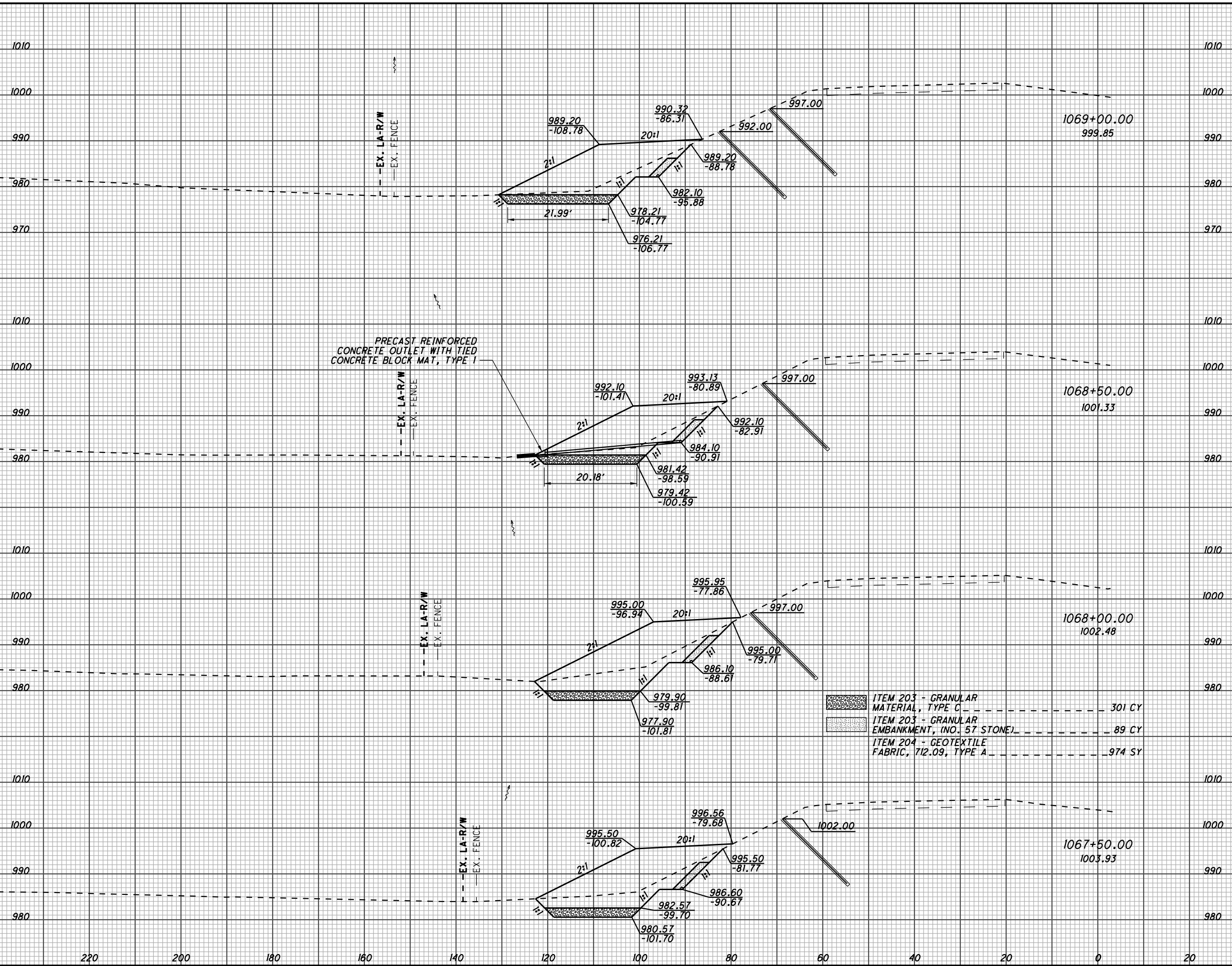
END STA.	AREA		VOLUME		CALCULATED SLP	CHECKED ALB
	CUT	FILL	CUT	FILL		
1067+00.00	133	282	243	500		
1066+50.00	129	258	251	475		
1066+00.00	142	255	269	473		
1065+50.00	148	256	314	505		
TOTAL			1077	1953		

CROSS SECTIONS I.R.76
STA. 1065+50.00 TO STA. 1067+00.00

POR-76-20.18

U:\17527005\POR\03201\Design\Roadway_Sheets\03201_XS003.dgn 1/29/2019 12:20:26 PM sparker

SEEDING	
END WIDTH	SO. YDS.
1010	1010
1000	1000
990	990
980	980
970	970
1010	1010
1000	1000
990	990
980	980
1010	1010
1000	1000
990	990
980	980
1010	1010
1000	1000
990	990
980	980

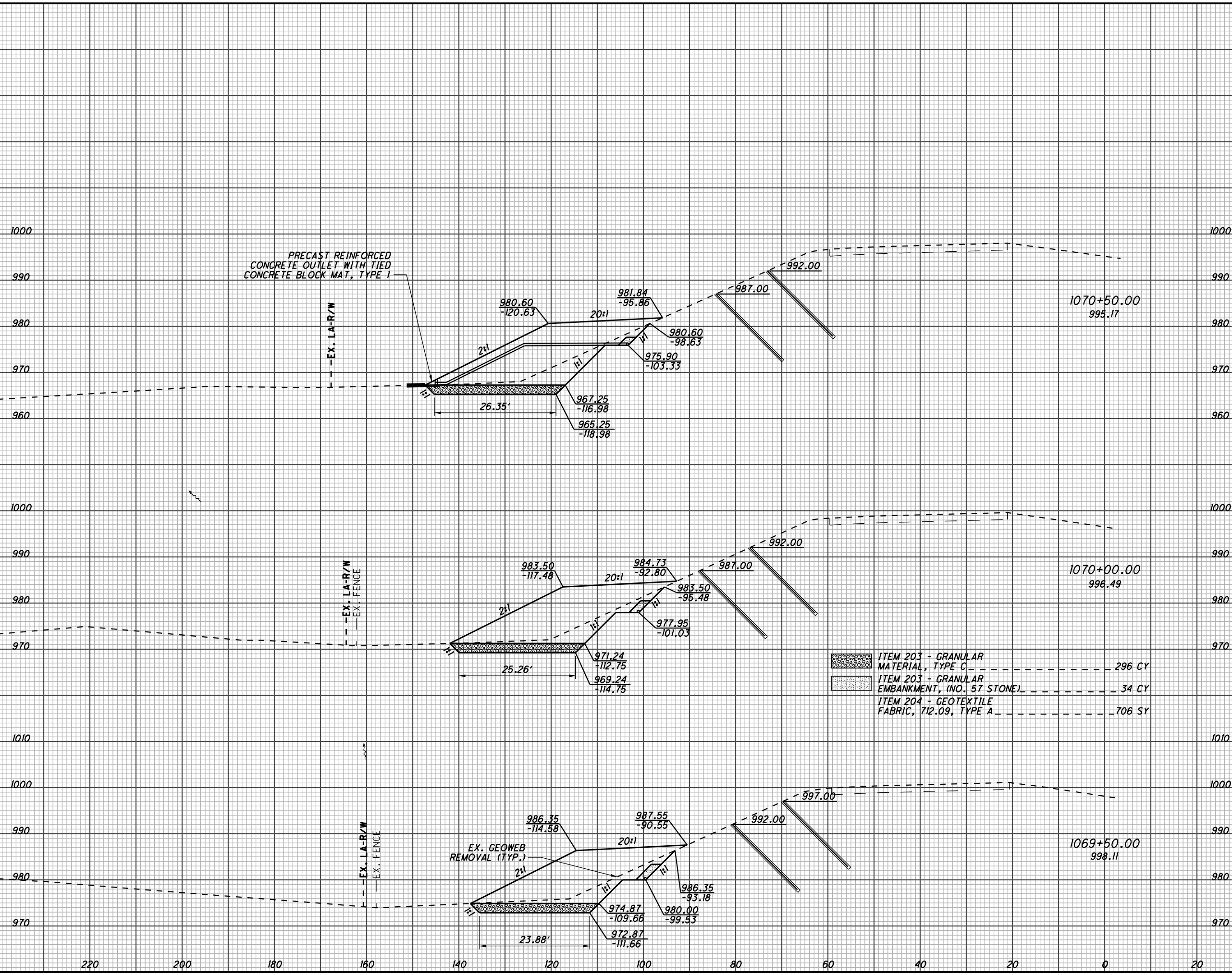


END	AREA		VOLUME		CALCULATED SLP	CHECKED ALB
	CUT	FILL	CUT	FILL		
1010						
1000						
990						
980						
970						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						
990						
980						
1010						
1000						

U:\17527005\POR\103201\Design\Roadway_Sheets\103201_XS004.dgn 1/29/2019 12:20:27 PM siparker

SEEDING	
END WIDTH	SO. YDS.

END AREA		VOLUME		CALCULATED	
CUT	FILL	CUT	FILL	SLP	CHECKED
				ALB	

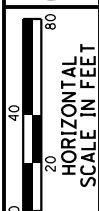


129	350	228	620		
117	320	214	567		
114	292	206	514		
		648	1701		

CROSS SECTIONS I.R.76
STA. 1069+50.00 TO STA. 1070+50.00

POR-76-20.18

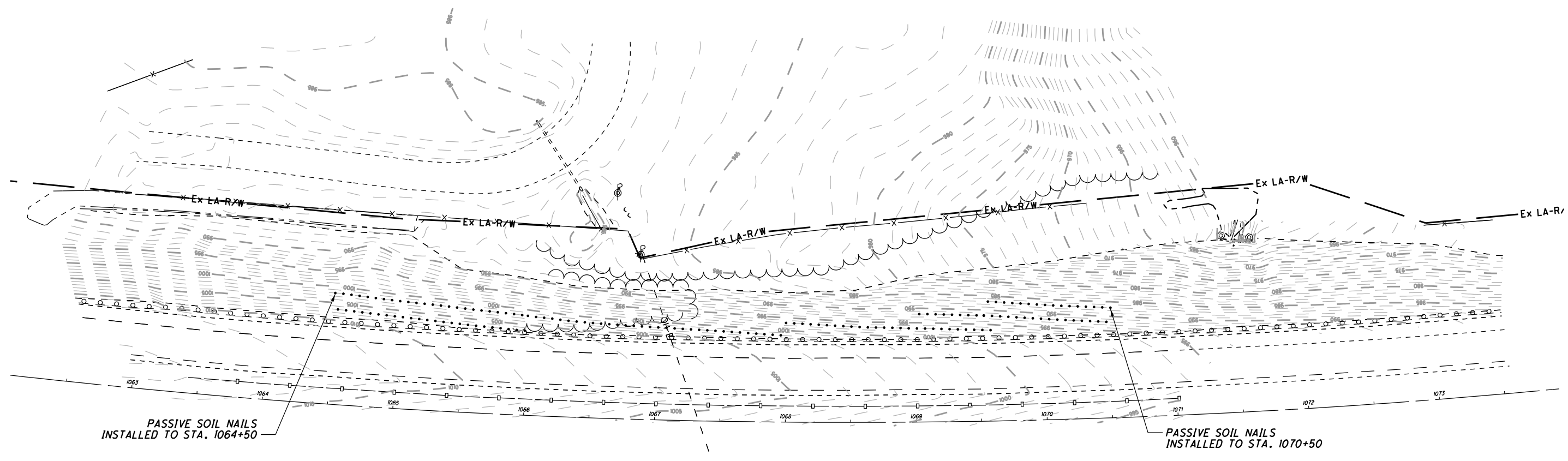
U:\17527005\POR\103201\Design\Roadway_Sheets\103201_WP001.dgn 1/29/2019 12:20:30 PM siparker



CALCULATED SLP
CHECKED ENM

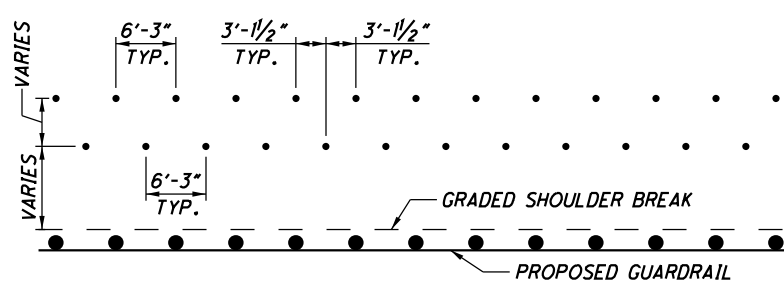
PLAN
PASSIVE SOIL NAIL LOCATIONS

POR-76-20.18



PASSIVE SOIL NAILS
INSTALLED TO STA. 1064+50

PASSIVE SOIL NAILS
INSTALLED TO STA. 1070+50

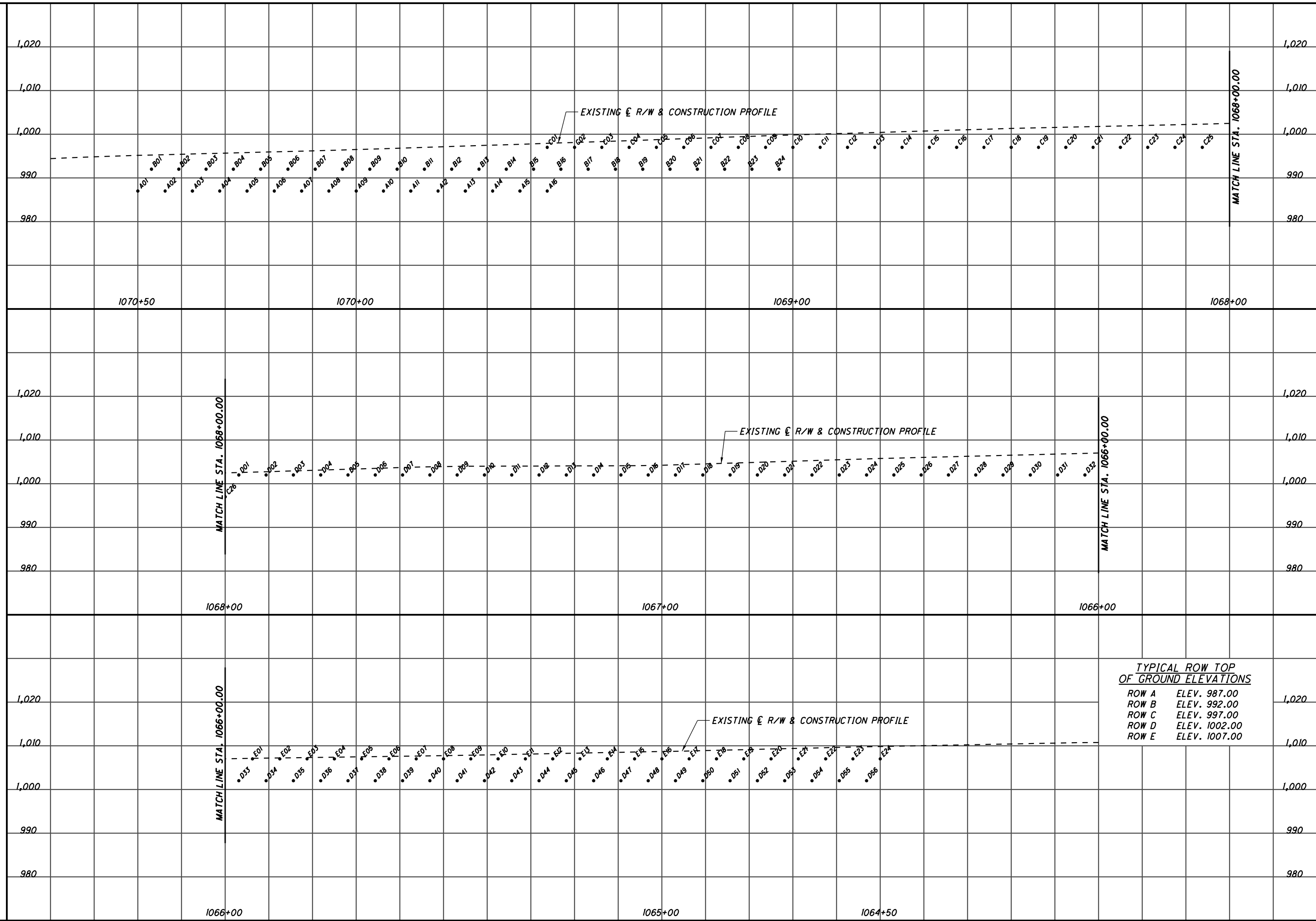


SOIL NAIL SPACING (TYPICAL)

NOTE:
PASSIVE SOIL NAILS TO BE INSTALLED TO AVOID CONFLICT
WITH GUARDRAIL POSTS.

LEGEND
• - PASSIVE SOIL NAIL

U:\17527005\POR\103201\Design\Roadway_Sheets\103201_GF001.dgn 1/29/2019 12:20:31 PM sipar-ker



PASSIVE SOIL NAIL DESIGN NOTES

1. DESCRIPTION

THIS WORK CONSISTS OF THE INSTALLATION OF PASSIVE SOIL NAILS TO REHABILITATE THE SLOPE FAILURE LOCATED ON INTERSTATE 76, PORTAGE COUNTY, OHIO. THE PASSIVE SOIL NAILS WILL BE INSTALLED TO REINFORCE THE UPPER PORTION OF THE SLOPE NEAR THE SHOULDER OF THE INTERSTATE.

2. CONSTRUCTION CONSIDERATIONS

2.1 DESIGN DATA FOR SOIL NAILS

PARAMETERS	SPECIFICATIONS
DRILL HOLE DIAMETER	9 INCHES
NAIL BONDED LENGTH	20 FEET
DESIGN ULTIMATE SOIL NAIL BOND STRESSES	7 PSI
REQUIRED ALLOWABLE SOIL NAIL PULLOUT RESISTANCE	0.190 KIPS/FT
MAXIMUM NAIL SPACING	VERTICAL: 5 FEET HORIZONTAL: 6.25 FEET
NAIL INCLINATION	45° FROM HORIZONTAL
NAIL BAR	*9 GRADE 60, EPOXY COATED PER ODOT CMS 709
CENTRALIZERS	INCLUDED
NAIL GROUT	4,000 PSI 28-DAY AND 1,500 PSI 3-DAY COMPRESSIVE STRENGTH -FINE AGGREGATE PER ODOT CMS 703.03 -PORTLAND CEMENT PER ODOT CMS 701.02

3. CONSTRUCTION PLAN

AT LEAST 30 DAYS BEFORE STARTING PASSIVE SOIL NAILS WORK, THE CONTRACTOR WILL SUBMIT THE FOLLOWING TO THE ENGINEER:

- A. START DATE AND PROPOSED PASSIVE SOIL NAIL CONSTRUCTION SEQUENCE. INCLUDE PROPOSED METHODS.
- B. DRILLING METHODS AND EQUIPMENT INCLUDING SET UP.

ITEM 610 - RETAINING WALL, MISC: PASSIVE SOIL NAILS

1. DESCRIPTION OF WORK

THIS WORK CONSISTS OF INSTALLATION OF PERMANENT PASSIVE SOIL NAILS AND ALL MATERIALS NEEDED FOR INSTALLATION. A PERMANENT PASSIVE SOIL NAIL CONSISTS OF THE NAIL, GROUT, AND SOIL NAIL APPURTENANCES.

2. SOIL NAILS

2.1 NAILS

SOLID *9 BAR PER CMS 709. GRADE 60 DEFORMED-BAR CONTINUOUS WITHOUT SPLICES OR WELDS, NEW STRAIGHT, UNDAMAGED, EPOXY COATED, AND ENCAPSULATED AS SHOWN ON THE PLANS.

2.2.1 SOIL NAIL APPURTENANCES

CENTRALIZERS - MANUFACTURED FROM SCHEDULE 40 PVC PIPE OR TUBE, STEEL, OR OTHER MATERIAL NOT DETRIMENTAL TO THE NAIL STEEL (WOOD SHALL NOT BE USED); SECURELY ATTACHED TO THE NAIL BAR; SIZED TO POSITION THE NAIL BAR WITHIN 1 INCH OF THE CENTER OF THE DRILL HOLE; SIZED TO ALLOW TREMIE PIPE INSERTION TO THE BOTTOM OF THE DRILL HOLE; AND SIZED TO ALLOW GROUT TO FREELY FLOW UP THE DRILL HOLE.

2.2.2 NAIL GROUT - 4000 PSI 28-DAY STRENGTH AND A 1500 PSI 3-DAY COMPRESSIVE STRENGTH

2.2.2.1 FINE AGGREGATE - ODOT CMS 703.03

2.2.2.2 PORTLAND CEMENT - ODOT CMS 701.02

2.2.2.3 ADMIXTURES - ODOT CMS 499.03 ADMIXTURES THAT CONTROL BLEED, IMPROVE FLOWABILITY, REDUCE WATER CONTENT, AND RETARD SET MAY BE USED IN THE GROUT SUBJECT TO REVIEW AND ACCEPTANCE BY THE ENGINEER. ACCELERATORS ARE NOT PERMITTED. ADMIXTURES WILL BE COMPATIBLE WITH THE GROUT AND MIXED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

3. NAIL INSTALLATION

3.1 STORING AND HANDLING

STORE AND HANDLE SOIL NAILS IN A MANNER THAT AVOIDS DAMAGE OR CORROSION. REPLACE NAILS EXHIBITING ABRASIONS, CUTS, WELD SPLATTER, CORROSION, OR PITTING. REPAIR OR REPLACE ANY NAILS EXHIBITING DAMAGE TO THE ENCAPSULATION OR EPOXY COATING.

3.2 FABRICATION

WHEN APPROPRIATE, REPAIR DAMAGE TO THE EPOXY COATING. PROVIDE CENTRALIZERS SIZED TO POSITION THE NAIL WITHIN 1 INCH OF THE CENTER OF THE DRILL HOLE. POSITION CENTRALIZERS A MAXIMUM OF 10 FEET APART AND WITHIN 24 INCHES FROM THE TOP AND BOTTOM OF THE NAIL. USE CENTRALIZERS THAT DO NOT IMPEDE THE FREE FLOW OF GROUT UP INTO THE DRILL HOLE.

3.3 DRILLING

SELECT DRILLING EQUIPMENT SUITABLE TO THE GROUND CONDITIONS. DO NOT USE WATER, DRILLING MUD, OR OTHER FLUIDS FOR DRILLING OR REMOVING CUTTINGS. IF UNSTABLE GROUND IS ENCOUNTERED, USE CASED DRILLING METHODS TO SUPPORT THE CIRCUMFERENCE OF THE DRILL HOLES.

3.4 GROUTING

INSERT THE NAIL INTO THE HOLE AND GROUT THE DRILL HOLE WITHIN 2 HOURS OF COMPLETING DRILLING. INJECT THE GROUT AT THE LOWEST POINT OF EACH DRILL HOLE THROUGH A TREMIE PIPE, CASING, HOLLOW-STEM AUGER, OR DRILL RODS. COMPLETELY FILL THE DRILL HOLE IN ONE CONTINUOUS OPERATION TO WITHIN 2 INCHES BELOW TOP OF PROPOSED FINAL GRADED ELEVATION. TO PREVENT VOIDS, KEEP THE OUTLET END OF THE GROUT CONDUIT BELOW THE SURFACE OF THE GROUT AS THE CONDUIT IS WITHDRAWN.

4. MEASUREMENT

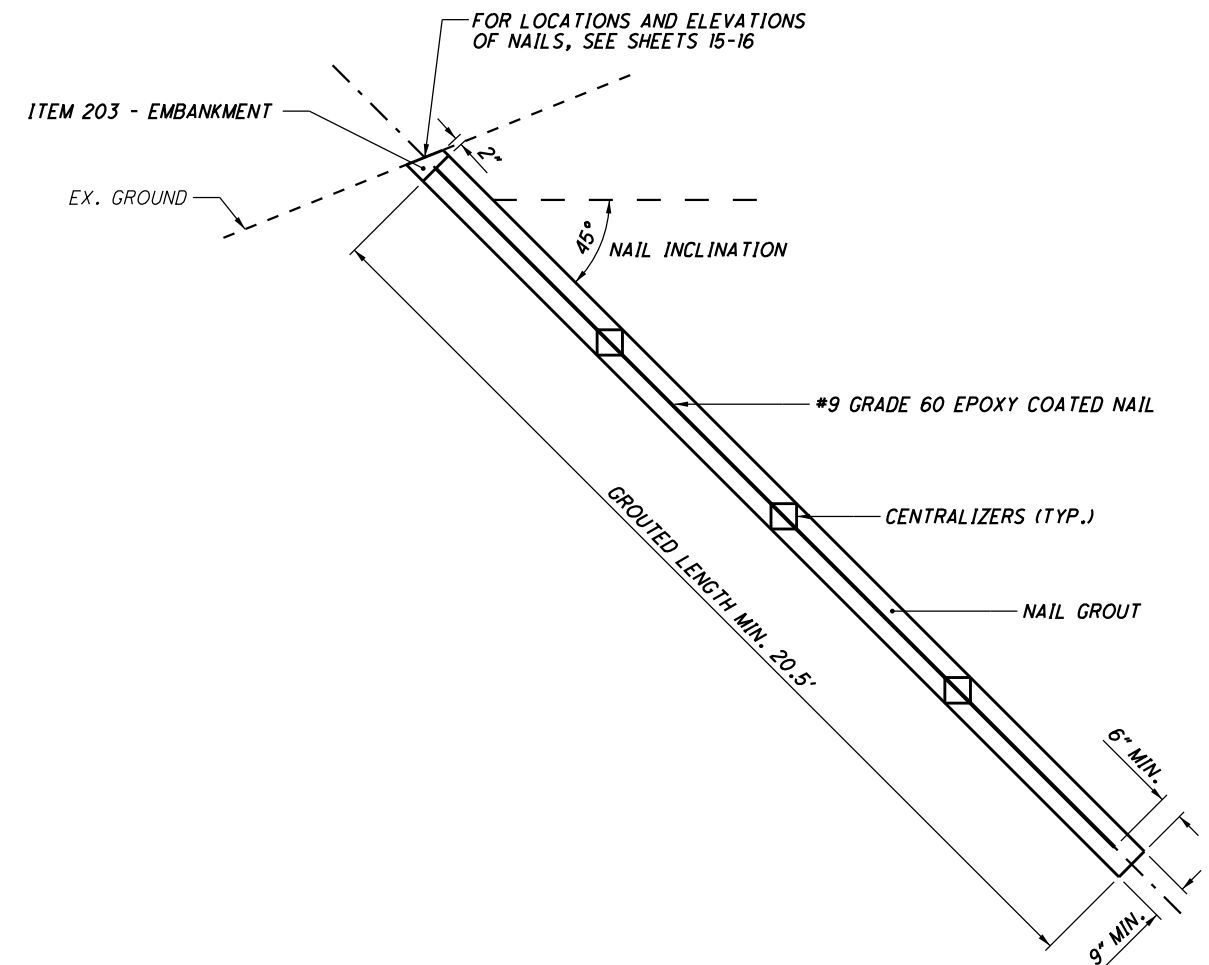
MEASURE ITEM 610 - RETAINING WALL, MISC: PASSIVE SOIL NAILS BY THE EACH FOR EVERY PASSIVE SOIL NAIL ACCEPTED BY THE PROJECT ENGINEER.

5. PAYMENT

THE ACCEPTED QUANTITIES WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER UNIT OF MEASUREMENT FOR THE PAY ITEMS LISTED IN THE BID SCHEDULE. PAYMENT WILL BE FULL COMPENSATION FOR THE WORK. THE CONTRACTOR SHALL FURNISH ALL THE LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE WORK INCLUDING DISPOSAL. PAYMENT FOR ALL WORK WILL BE INCLUDED IN THE PRICE BID PER ITEM 610 - RETAINING WALL, MISC: PASSIVE SOIL NAILS.

THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 610 - RETAINING WALL, MISC.: PASSIVE SOIL NAILS - - - - - 146 EACH



PASSIVE SOIL NAIL TYPICAL DETAIL

U:\17527005\POR\103201\Design\Roadway\Sheets\103201_WY001.dgn 1/29/2019 12:20:32 PM siparker

CALCULATED
---NA---
CHECKED
---NA---

PASSIVE SOIL NAIL TYPICAL SECTION AND NOTES

POR-76-20.18

PROJECT DESCRIPTION

REPAIRING A HISTORICALLY PROBLEMATIC LANDSLIDE LOCATED ON INTERSTATE ROUTE 76 (IR-76) IN DIAMOND, OHIO NEAR MILE 20.18 IN PALMYRA TOWNSHIP, PORTAGE COUNTY, OHIO.

HISTORIC RECORDS

HISTORICAL GEOTECHNICAL EXPLORATIONS WERE FOUND IN THE VICINITY OF THE PROJECT SITE DATING BACK TO 2005. HISTORICAL BORINGS WITHIN THE PROJECT LIMITS EXTEND FROM STATION 1069+94 TO STATION 1073+20. HISTORICAL BORINGS WERE USED TO UNDERSTAND THE GENERAL GEOLOGY OF THE PROJECT AREA AND ARE PRESENTED IN THE PLAN SET.

GEOLOGY

THE PROJECT SITE IS LOCATED IN THE BOUNDARIES OF THE KILLBUCK-GLACIATED PITTSBURGH PLATEAU AND THE AKRON-CANTON INTERLOBATE PLATEAU REGIONS OF OHIO. THE PROJECT SITE IS COMPRISED OF WISCONSINIAN-AGED CLAY TO LOAM GLACIAL TILL OVER MISSISSIPPIAN-AND PENNSYLVANIAN-AGE SHALES, SANDSTONES, CONGLOMERATES, AND COALS.

RECONNAISSANCE

ON SEPTEMBER 16, 2016 A SITE RECONNAISSANCE VISIT WAS MADE TO EVALUATE THE HIGHWAY EMBANKMENT IN PORTAGE COUNTY, OHIO. THE EMBANKMENT IS LOCATED NEAR MILE 20.18 BETWEEN STATIONS 1066+00 TO 1073+00 OF IR-76 ALONG THE WESTBOUND LANES. THE LANDSLIDE WITHIN THE HIGHWAY EMBANKMENT EXTENDS APPROXIMATELY 700 FEET. CRACKING WAS NOTED ALONG THE BENCH ALONG THE PAVED HIGHWAY SHOULDER. GAPS BETWEEN THE ASPHALT AND THE WOOD POSTS HOLDING THE GUARDRAIL IN PLACE AT THE TOP OF THE EMBANKMENT WERE OBSERVED AND ARE INDICATIONS OF SLOPE MOVEMENT. ADDITIONAL CRACKING WAS OBSERVED NEAR THE TOP OF THE EMBANKMENT, BUT DUE TO VEGETATION COVER, NO ADDITIONAL EVIDENCE OF SLOPE MOVEMENT COULD BE OBSERVED ALONG THE EMBANKMENT.

SUBSURFACE EXPLORATION

A TOTAL OF EIGHT BORINGS WERE PERFORMED AS PART OF THIS GEOTECHNICAL EXPLORATION. AMONGST THE EIGHT BORINGS, SLOPE INCLINOMETERS WERE INSTALLED IN FIVE BORINGS; TWO NEAR THE SHOULDER (B-001-0-16 AND B-004-0-16), TWO NEAR THE MIDSLOPE (B-003-0-16 AND B-005-0-16), AND ONE NEAR THE TOE (B-004-1-16).

BORINGS B-001-0-16, B-002-0-16, B-004-0-16, B-006-0-16 AND B-007-0-16 WERE LOCATED NEAR OR WITHIN THE EXISTING OUTSIDE SHOULDER OF I-76, BORINGS B-003-0-16 AND B-005-0-16 WERE LOCATED ALONG THE MIDSLOPE OF THE EMBANKMENT, AND BORINGS B-004-1-16 WAS LOCATED ALONG THE TOE OF THE EMBANKMENT SLOPE.

ALL BORINGS WERE ADVANCED WITH AN ATV-MOUNTED DRILL RIG USING 4.25-INCH INSIDE-DIAMETER HOLLOW-STEM AUGERS. DUE TO THE FAIRLY STEEP 2:1(H:V) SLOPE OF THE HIGHWAY EMBANKMENT, THE BORINGS ON THE SLOPE REQUIRED THE USE OF A WINCH TRUCK (POSITIONED AT THE TOP OF THE EMBANKMENT) TO PROVIDE ANCHORAGE DURING RIG PLACEMENT AND DRILLING OPERATIONS. THE AUTOMATIC HAMMER SYSTEM USED WAS LAST CALIBRATED ON NOVEMBER, 29TH, 2016, AND THE AVERAGE DRILL ROD ENERGY RATIO (ER) IS 90.2%. DISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE STANDARD PENETRATION TEST (AASHTO T206) AT CONTINUOUS INTERVALS FOR THE FULL SOIL DEPTH OF THE BORINGS. UNDISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH THIN-WALLED TUBE SAMPLING OF SOILS (AASHTO T207). FIVE BORINGS WERE ADVANCED INTO BEDROCK AND SAMPLED (AASHTO T225) USING AN N-SERIES WIRELINE CORE BARREL, WATER METHOD.

EXPLORATION FINDINGS

TOPSOIL WITHIN THE MAJORITY OF THE BORINGS WAS FOUND TO BE COMPOSED OF A SOFT TO MEDIUM STIFF BROWN MOTTLED GRAY, FINE GRAINED SOIL CONSISTING OF CLAYS AND SILTS THAT WERE DAMP TO MOIST AND VISUALLY CLASSIFIED AS A-7-6 SOILS. HOWEVER, TOPSOIL CONDITIONS FOUND IN BORINGS B-004-0-16 AND B-005-0-16 CONSISTED OF LOOSE BROWN GRANULAR SOILS THAT WERE DAMP TO MOIST AND VISUALLY CLASSIFIED AS A-3A.

EMBANKMENT SOILS WERE ENCOUNTERED BELOW THE TOPSOIL. THESE SOILS WERE DESCRIBED AS FINE GRAINED, BROWN MOTTLED GRAY IN COLOR AND RANGED FROM MEDIUM STIFF TO HARD. THE PREDOMINANT ODOT SOIL CLASSIFICATIONS ENCOUNTERED IN THIS LAYER WERE A-6B AND A-7-6. WITHIN THE EMBANKMENT AT BORINGS B-006-0-16 AND B-007-0-16, A 3-FOOT THICK GRAVEL AND/OR STONE FRAGMENT SEAM WAS ENCOUNTERED AT APPROXIMATE ELEVATIONS 986 AND 983 FEET, RESPECTIVELY. ADDITIONALLY, A SIMILAR GRAVEL AND/OR STONE FRAGMENT SEAM WAS ENCOUNTERED IN BORING B-005-0-16 AT APPROXIMATE ELEVATION 974 FEET. THESE SOILS CLASSIFIED AS A-1-A AND ARE MOST LIKELY THE NO. 8 AGGREGATE DRAINAGE CONNECTION THAT WAS ADDED TO THE EMBANKMENT FROM THE 1992 BENCHED EMBANKMENT REPAIR.

RESIDUAL SOILS WERE ENCOUNTERED AT A WIDE RANGE OF DEPTHS BELOW THE EMBANKMENT MATERIAL RANGING FROM ELEVATION 973 FEET TO 954 FEET. THESE SOILS MAY BE DESCRIBED AS FINE-GRAINED SOIL, BROWN MOTTLED WITH GRAY IN COLOR AND RANGED FROM STIFF TO HARD. THESE SOILS WERE TYPICALLY DAMP WITH SEAMS OF WET GRAY CLAY. ADDITIONALLY, A 4.5-FOOT SEAM OF WET A-4B SOIL WAS ENCOUNTERED IN BORING B-003-0-16 AT APPROXIMATE ELEVATION 974 FEET. THE PREDOMINANT ODOT SOIL CLASSIFICATIONS ENCOUNTERED IN THIS LAYER WERE A-4B, A-6A, A-6B, AND A-7-6.

SATURATED SANDS AND GRAVELS WERE ENCOUNTERED IN ALL BORINGS BESIDES BORINGS B-001-0-16 AND B-002-0-16. THESE SOILS WERE ENCOUNTERED BELOW APPROXIMATELY ELEVATION 954 FEET EXTENDING DOWN TO TOP OF BEDROCK. THESE GRANULAR SOILS WERE CLASSIFIED AS BROWN IN COLOR AND RANGED FROM LOOSE TO DENSE. THE PREDOMINANT ODOT SOIL CLASSIFICATIONS ENCOUNTERED IN THIS LAYER WERE A-1-B, A-3, A-3A.

WITHIN THE PROJECT VICINITY, BEDROCK WAS ENCOUNTERED IN MOST BORINGS AT APPROXIMATE ELEVATION 950 FEET EXCEPT FOR BORING B-001-0-16 WHICH ENCOUNTERED BEDROCK AT ELEVATION 960 FEET. BEDROCK WAS ENCOUNTERED IN ALL BORINGS EXCEPT FOR BORING B-002-0-16 DUE TO A LOST SHELBY TUBE WITHIN THE HOLE FORCING DRILLING OPERATIONS TO CEASE BECAUSE AUGER ADVANCEMENT COULD NOT CONTINUE. THE BEDROCK ENCOUNTERED THROUGHOUT THE PROJECT VICINITY WAS DESCRIBED AS WEAK, MODERATELY TO HIGHLY WEATHERED SHALE.

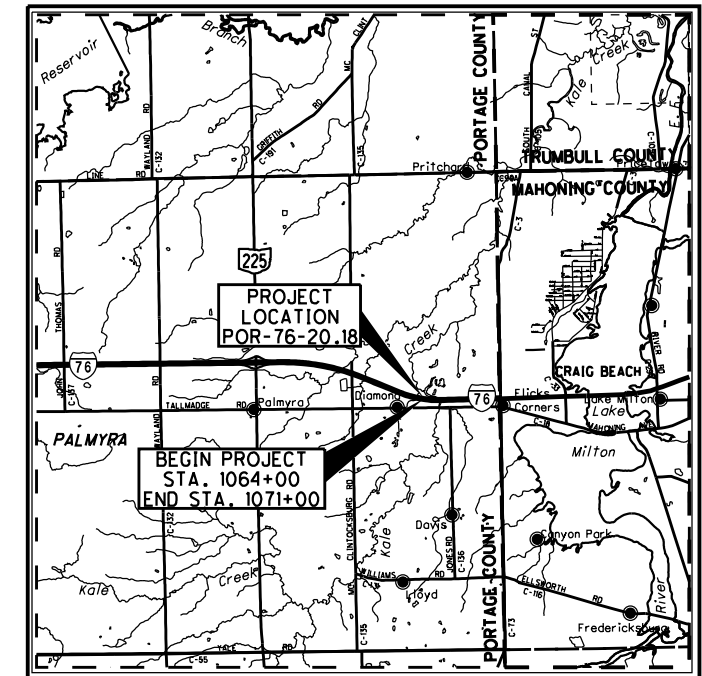
SPECIFICATIONS

THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS, DATED JULY 2016.

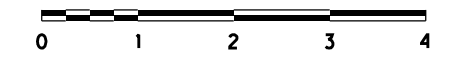
AVAILABLE INFORMATION

THE AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE GEOTECHNICAL EXPLORATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL EXPLORATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECTS OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN OFFICE OF GEOTECHNICAL ENGINEERING AT 1980 WEST BROAD STREET.

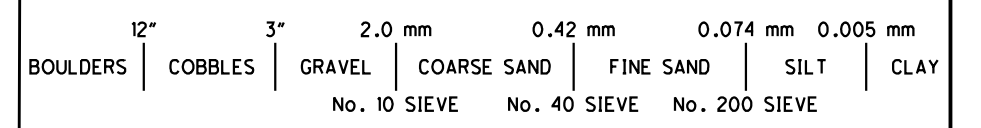
LEGEND		ODOT CLASS	CLASSIFIED MECH./VISUAL	
DESCRIPTION				
GRAVEL AND/OR STONE FRAGMENTS		A-1-a	1	7
GRAVEL AND/OR STONE FRAGMENTS WITH SAND		A-1-b	0	5
FINE SAND		A-3	1	2
COARSE AND FINE SAND		A-3a	0	12
SILT		A-4b	2	7
SILT AND CLAY		A-6a	3	18
SILTY CLAY		A-6b	9	73
CLAY		A-7-6	9	67
		TOTAL	25	191
SHALE		VISUAL		
SANDSTONE		VISUAL		
COAL		VISUAL		
PAVEMENT OR BASE = X = APPROXIMATE THICKNESS		VISUAL		
SOD AND/OR TOPSOIL = X = APPROXIMATE THICKNESS		VISUAL		
HISTORIC BORING LOCATION - PLAN VIEW				
BORING LOCATION - PLAN VIEW				
INCLINOMETER BORING LOCATION - PLAN VIEW				
DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.				
N60 INDICATES STANDARD PENETRATION RESISTANCE NORMALIZED TO 60% DRILL ROD ENERGY RATIO.				
N INDICATES STANDARD PENETRATION RESISTANCE FOR HISTORICAL BORINGS. NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X = NUMBER OF BLOWS FOR 6 INCHES (UNCORRECTED). Y/D" = NUMBER OF BLOWS (UNCORRECTED) FOR D" OF PENETRATION AT REFUSAL.				
WC INDICATES WATER CONTENT IN PERCENT.				
NP INDICATES A NON-PLASTIC SAMPLE.				
SS INDICATES A SPLIT SPOON SAMPLE, STANDARD PENETRATION TEST.				
ST INDICATES A SHELBY TUBE SAMPLE.				
INDICATES A PLASTIC SOIL WITH WATER CONTENT GREATER THAN LIQUID LIMIT MINUS THREE.				
INDICATES A NON-PLASTIC SOIL WITH MOISTURE CONTENT GREATER THAN 19% WITH A WET APPEARANCE.				



LOCATION MAP
SCALE IN MILES



PARTICLE SIZE DEFINITIONS

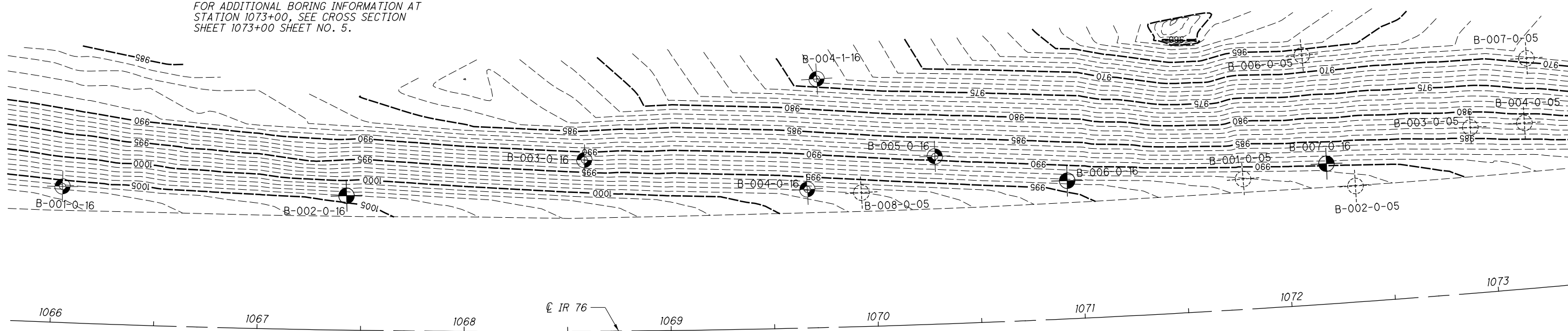


RECON. - PC 09/16/16
 DRILLING - PC 10/27/16 TO 11/18/16
 DRAWN - MJ 05/18
 REVIEWED - ENM 05/18

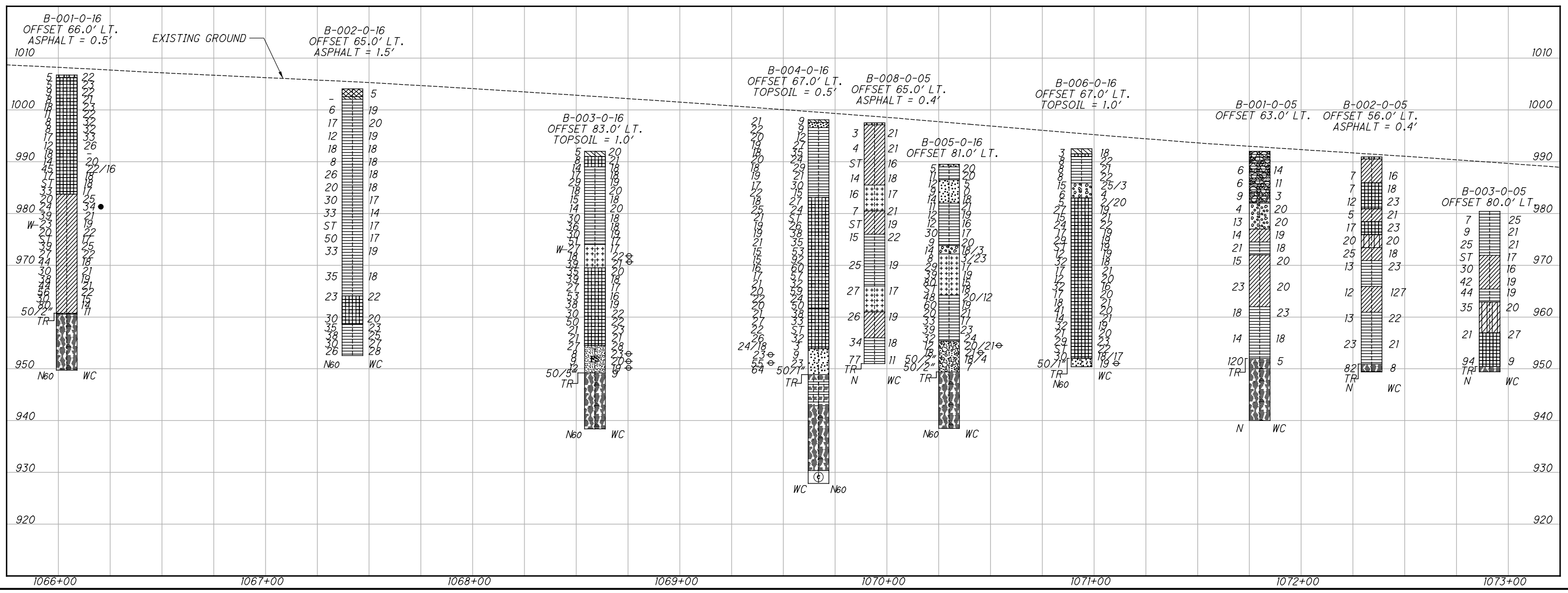
LEGEND - CONTINUED		ODOT CLASS	CLASSIFIED MECH./VISUAL	
HISTORIC BORING DESCRIPTIONS				
GRAVEL AND/OR STONE FRAGMENTS		A-1-a	1	0
SANDY SILT		A-4a	2	1
SILT		A-4b	3	0
SILT AND CLAY		A-6a	21	0
SILTY CLAY		A-6b	34	0
ELASTIC CLAY		A-7-5	2	0
CLAY		A-7-6	5	1
		TOTAL	68	2
SHALE		VISUAL		

U:\175527005\POR\103201\Design\Geotechnical\Sheets\103201Y\001.dgn 1/14/2019 9:48:53 AM siparker

NOTES:
 FOR ADDITIONAL BORING INFORMATION AT STATION 1069+50, SEE CROSS SECTION SHEET 1069+50 SHEET NO. 3.
 FOR ADDITIONAL BORING INFORMATION AT STATION 1072+00, SEE CROSS SECTION SHEET 1072+00 SHEET NO. 4.
 FOR ADDITIONAL BORING INFORMATION AT STATION 1073+00, SEE CROSS SECTION SHEET 1073+00 SHEET NO. 5.

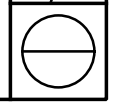


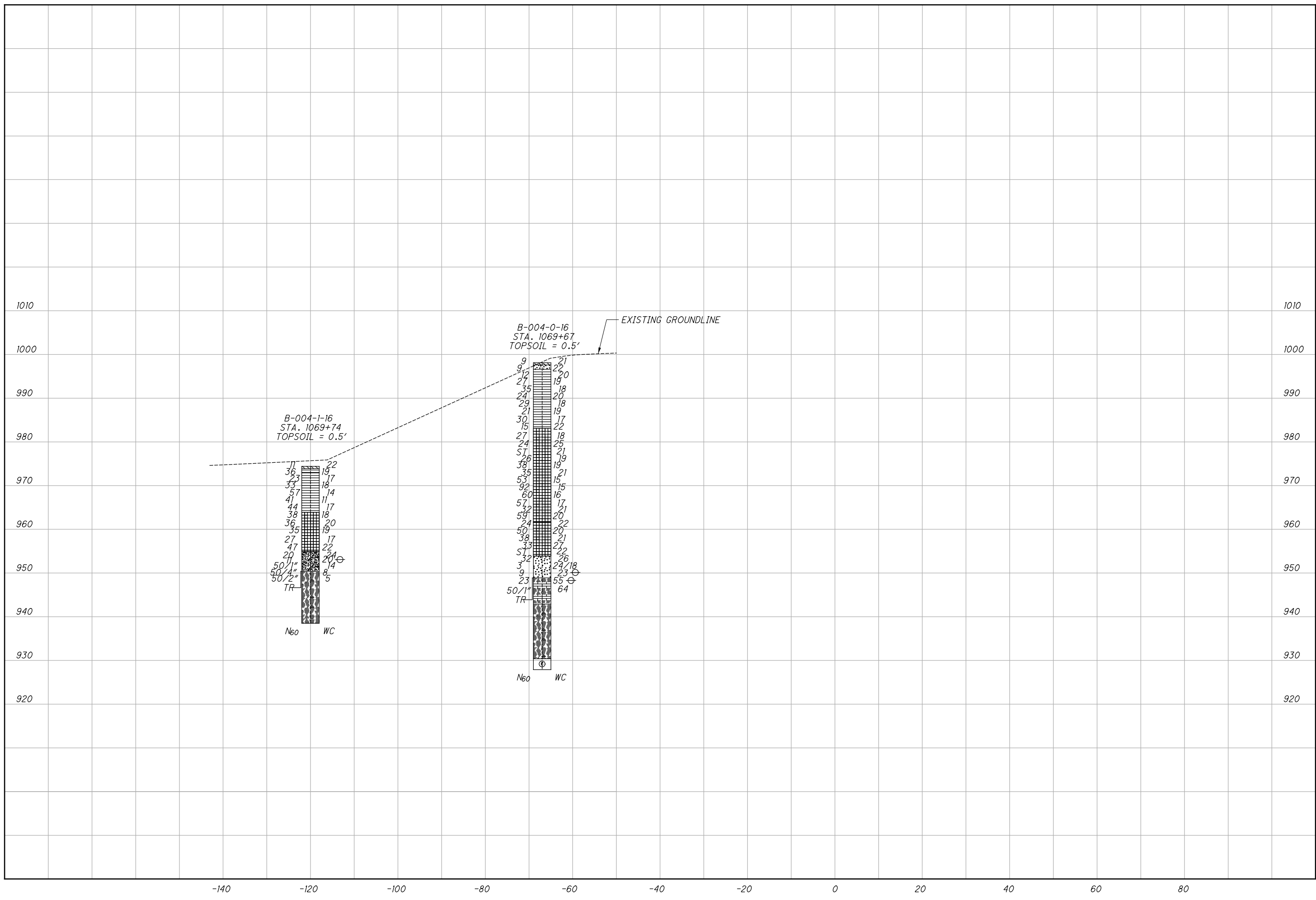
U:\17527005\FOR\10320\Design\Geotechnical\Sheets\10320\F002.dgn Sheet 1/9/2019 3:59:58 PM Mjennings



LANDSLIDE EXPLORATION
STA. 1065+80 TO STA. 1073+50

POR-76-20.18

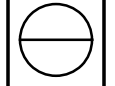




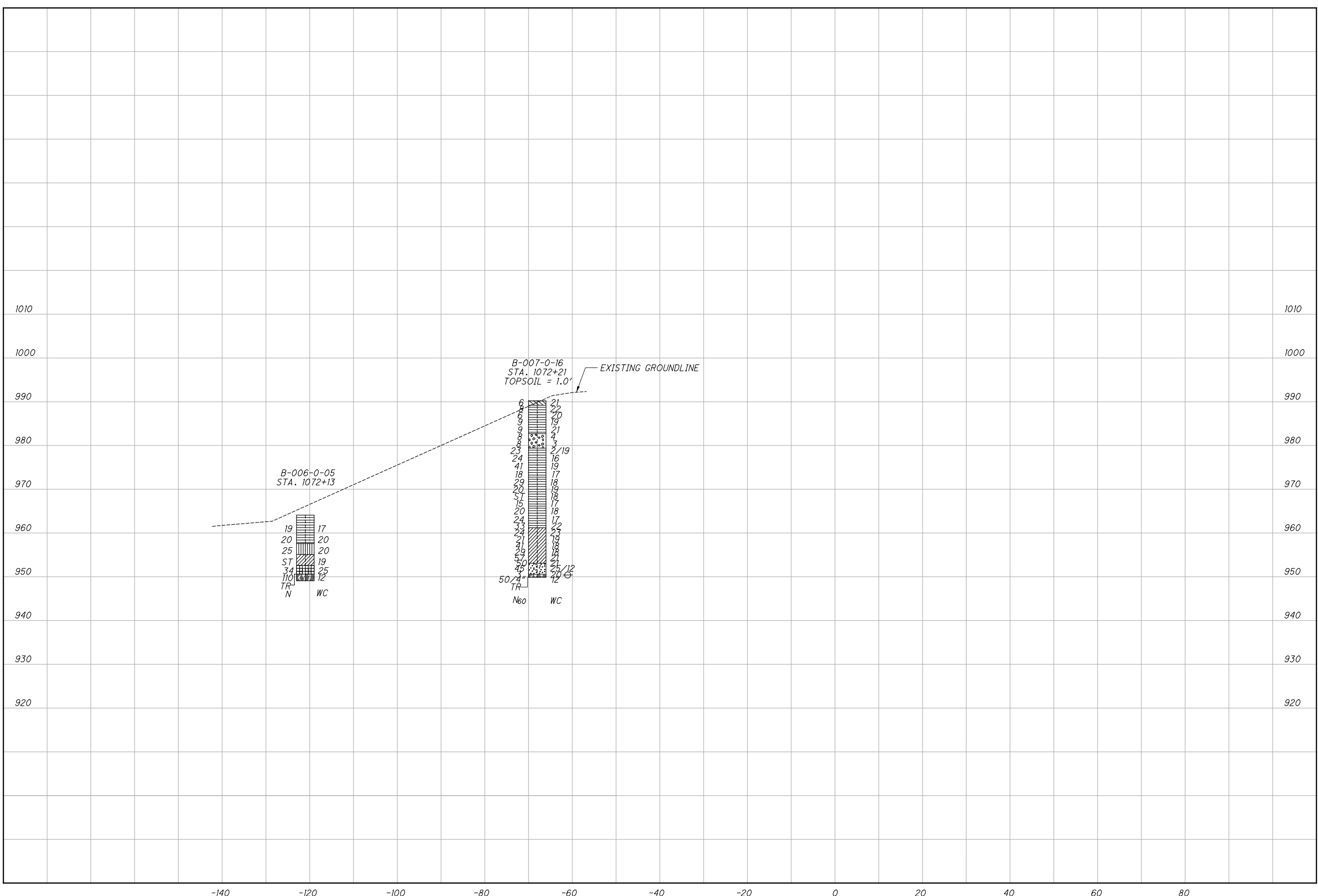
DRAWN MSJ
CHECKED JRM

LANDSLIDE EXPLORATION
CROSS SECTION STATION 1069+50

POR-76-20.18



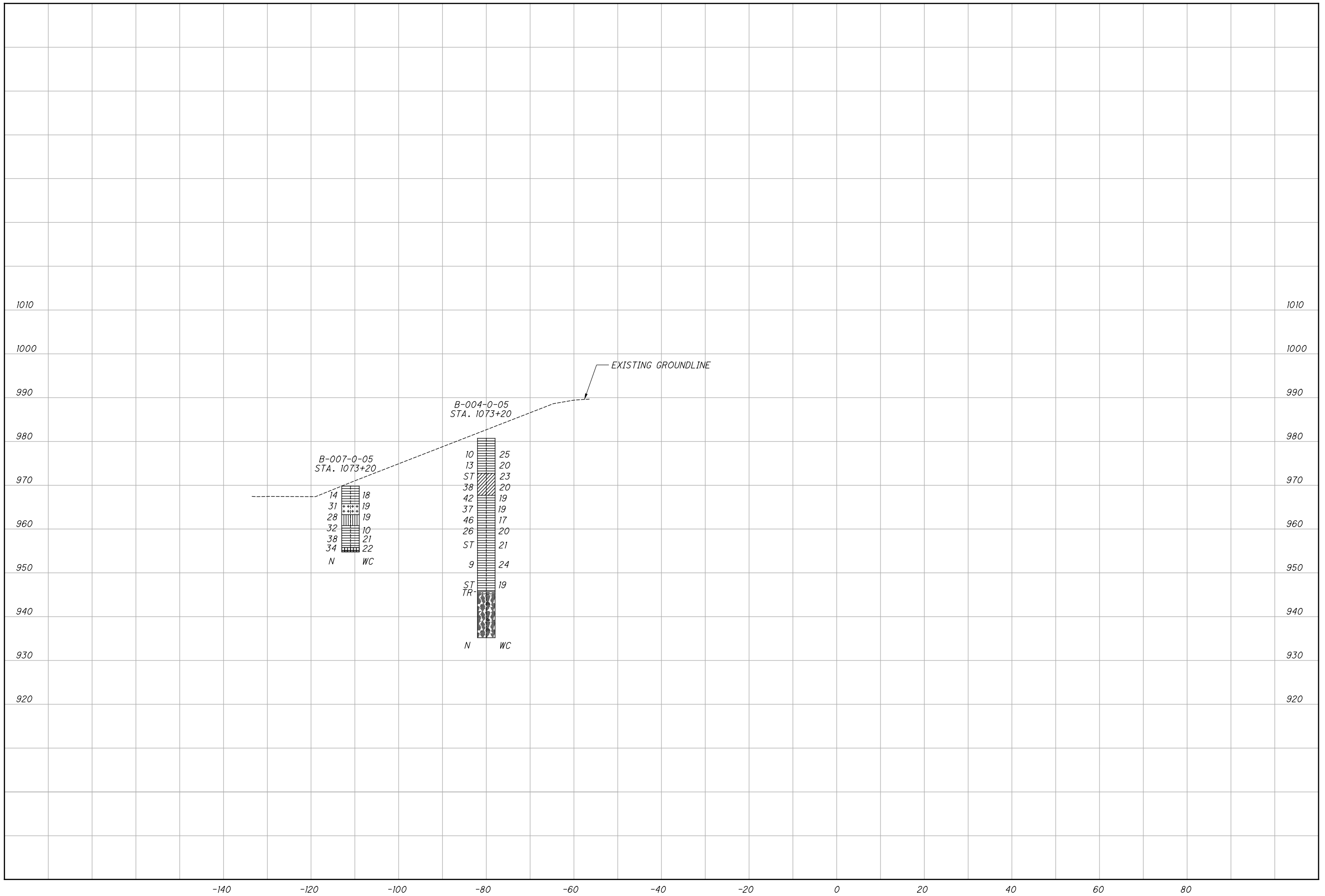
J:\175527005\POR\103201\Design\Geotechnical\Sheets\103201YX1072+00.dgn Sheet 1/9/2019 4:25:43 PM M.Jennings



DRAWN	MSJ
CHECKED	JRM

0 5 10 20
HORIZONTAL
SCALE IN FEET

**LANDSLIDE EXPLORATION
CROSS SECTION STATION 1072+00**



DRAWN MSJ
CHECKED JRM

LANDSLIDE EXPLORATION
CROSS SECTION STATION 1073+00

POR-76-20.18



OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

PROJECT: POR-76-20.18 TYPE: LANDSLIDE PID: 103201 SFN: START: 11/18/16 END: 11/18/16	DRILLING FIRM / OPERATOR: STANTEC / T.C SAMPLING FIRM / LOGGER: STANTEC / P.CICHOCKI DRILLING METHOD: 4.25" HSA / NQ SAMPLING METHOD: SPT / ST	DRILL RIG: CME 45 TRUCK HAMMER: CME AUTOMATIC CALIBRATION DATE: 11/29/16 ENERGY RATIO (%): 90.2	STATION / OFFSET: 1067+42.65' LT. ALIGNMENT: I-76 ELEVATION: 1004.1 (MSL) EOB: 51.5 ft. LAT / LONG: 41.100813, -81.019381										EXPLORATION ID B-002-0-16 PAGE 1 OF 1							
			ELEV. 1004.1	DEPTHS	SPT/ RQD	N _s	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS		SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)
Asphalt				1		7	SS-1	-	-	-	-	-	-	-	-	-	5	UCF (V)		
TOPSOIL				2																
MEDIUM STIFF TO STIFF, BROWN AND GRAY MOTTLED, SILTY CLAY, LITTLE GRAVEL, TRACE SAND, DAMP	1002.6 1002.1			3	6	47	SS-2	3.00	-	-	-	-	-	-	-	-	19	A-6b (V)		
				4																
				5																
				6	17	100	SS-3	3.5-4.0	10	2	6	33	49	35	19	16	20	A-6b (10)		
				7																
				8	12	100	SS-4	3.00	-	-	-	-	-	-	-	-	19	A-6b (V)		
				9																
				10																
				11	18	87	SS-5	2.75-3.0	-	-	-	-	-	-	-	-	18	A-6b (V)		
				12																
				13	8	100	SS-6	2.0-2.5	-	-	-	-	-	-	-	-	18	A-6b (V)		
				14																
				15																
				16	26	87	SS-7	4.00	-	-	-	-	-	-	-	-	18	A-6b (V)		
				17																
				18	20	100	SS-8	4.00	-	-	-	-	-	-	-	-	18	A-6b (V)		
				19																
				20																
				21	30	87	SS-9	4.5+	-	-	-	-	-	-	-	-	17	A-6b (V)		
				22																
				23	10	100	SS-10	4.5+	-	-	-	-	-	-	-	-	14	A-6b (V)		
				24																
				25																
				26																
				27																
				28																
				29	50	100	SS-12	4.5+	-	-	-	-	-	-	-	-	17	A-6b (V)		
				30																
				31	33	100	SS-13	4.5+	-	-	-	-	-	-	-	-	19	A-6b (V)		
				32																
				33																
				34																
				35																
				36	11	100	SS-14	4.5+	-	-	-	-	-	-	-	-	18	A-6b (V)		
				37																
				38																
				39																
				40																
				41	6	100	SS-15	2.75-3.25	-	-	-	-	-	-	-	-	22	A-6b (V)		
				42																
				43																
				44																
				45	10	100	SS-16	1.5-1.75	-	-	-	-	-	-	-	-	20	A-6b (V)		
				46	11	100	SS-17	2.25-2.75	-	-	-	-	-	-	-	-	23	A-6b (V)		
				47	11	100	SS-18	2.25	10	1	4	26	59	38	18	20	25	A-6b (12)		
				48	11	100	SS-19	0.50	-	-	-	-	-	-	-	-	27	A-6b (V)		
				49	10	100	SS-20	0.50	-	-	-	-	-	-	-	-	28	A-6b (V)		
				50	8	100	SS-20	0.50	-	-	-	-	-	-	-	-	28	A-6b (V)		
				51																
				EOB																

NOTES: NONE
ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

PROJECT: POR-76-20.18 TYPE: LANDSLIDE		DRILLING FIRM / OPERATOR: STANTEC / M/M		DRILL RIG: CME 45 TRUCK		STATION / OFFSET: 1068+59, 83' LT.		EXPLORATION ID B-003-0-16											
PID: 103201 SFN:		SAMPLING FIRM / LOGGER: STANTEC / P.CICHOCKI		HAMMER: CME AUTOMATIC		ALIGNMENT: I-76		PAGE											
START: 11/7/16 END: 11/9/16		DRILLING METHOD: 4.25" HSA / NQ		CALIBRATION DATE: 11/29/16		ELEVATION: 992.0 (MSL) EOB: 53.6 ft.		1 OF 1											
SAMPLING METHOD: SPT / ST		SAMPLING METHOD: SPT / ST		ENERGY RATIO (%): 90.2		LAT / LONG: 41.100774, -81.018928													
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT / RQD	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	INCL.	
TOPSOIL		992.0		1	80	SS-1	1.5-1.75	-	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
SOFT TO MEDIUM STIFF, BROWN MOTTLED GRAY, CLAY, LITTLE SILT, DAMP TO MOIST		991.0		2	73	SS-2	3.75-4.0	-	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
STIFF TO HARD, BROWN MOTTLED GRAY, SILTY CLAY, LITTLE SAND, TRACE GRAVEL, DRY		989.0		3	100	SS-3	4.00	-	-	-	-	-	-	-	-	-	18	A-6b (V)	
				4	100	SS-4	3.25	-	-	-	-	-	-	-	-	-	18	A-6b (V)	
				5	60	SS-5	3.50	-	-	-	-	-	-	-	-	-	19	A-6b (V)	
				6	100	SS-6	4.00	-	-	-	-	-	-	-	-	-	20	A-6b (V)	
				7	87	SS-7	2.00	-	-	-	-	-	-	-	-	-	18	A-6b (V)	
				8	67	SS-8	3.00	-	-	-	-	-	-	-	-	-	20	A-6b (V)	
				9	100	SS-9	2.5-3.0	-	-	-	-	-	-	-	-	-	18	A-6b (V)	
				10	100	SS-10	4.00	-	-	-	-	-	-	-	-	-	18	A-6b (V)	
				11	100	SS-11	4.00	-	-	-	-	-	-	-	-	-	19	A-6b (V)	
				12	100	SS-12	4.00	-	-	-	-	-	-	-	-	-	17	A-6b (V)	
				13	100	SS-13	4.00	-	-	-	-	-	-	-	-	-	17	A-4b (V)	
STIFF, BROWN, SILT, LITTLE CLAY, TRACE SAND AND GRAVEL, MOIST TO WET		974.0		14	100	SS-14	0.25-2.5	-	-	-	-	-	-	-	-	-	22	A-4b (V)	
				15	100	SS-15	1.0-2.0	2	1	2	82	13	NP	NP	NP	NP	21	A-4b (8)	
				16	100	SS-16	4.00	-	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
				17	100	SS-17	4.00	-	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
				18	100	SS-18	4.00	-	-	-	-	-	-	-	-	-	17	A-7-6 (V)	
				19	93	SS-19	4.00	-	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
				20	100	SS-20	4.00	-	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
				21	100	SS-21	4.00	11	1	4	26	58	42	21	21	21	22	A-7-6 (13)	
				22	100	SS-22	4.00	-	-	-	-	-	-	-	-	-	22	A-7-6 (V)	
				23	100	SS-23	4.00	-	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
				24	100	SS-24	2.50	8	0	2	21	69	42	21	21	21	21	A-7-6 (13)	
				25	100	SS-25	3.00	-	-	-	-	-	-	-	-	-	28	A-7-6 (V)	
				26	60	SS-26	-	-	-	-	-	-	-	-	-	-	23	A-3 (V)	
				27	93	SS-27	-	15	10	66	6	3	NP	NP	NP	NP	20	A-3 (0)	
				28	100	SS-28	-	-	-	-	-	-	-	-	-	-	19	A-3 (V)	
				29	100	SS-29	-	-	-	-	-	-	-	-	-	-	9	Rock (V)	
				30	61	NQ-1												CORE	
				31	100	NQ-2												CORE	
				32															
				33															
				34															
				35															
				36															
				37															
				38															
				39															
				40															
				41															
				42															
				43															
				44															
				45															
				46															
				47															
				48															
				49															
				50															
				51															
				52															
				53															

NOTES: NONE
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 1 BAG BENTONITE GROUT; PUMPED 3 BAGS CEMENT

OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

PROJECT: POR-76-20.18	DRILLING FIRM / OPERATOR: STANTEC / M.M. STANTEC / P. CICHOCKI	DRILL RIG: CME 45 TRUCK	STATION / OFFSET: 1069+67.67 LT.	EXPLORATION ID
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: STANTEC / P. CICHOCKI	HAMMER: CME AUTOMATIC	ALIGNMENT: 1-76	B-004-0-16
PID: 103201 SFN:	DRILLING METHOD: 4.25" HSA / NQ	CALIBRATION DATE: 11/29/16	ELEVATION: 998.1 (MSL) EOB: 70.2 ft.	PAGE
START: 11/10/16 END: 11/11/16	SAMPLING METHOD: SPT / ST	ENERGY RATIO (%): 90.2	LAT / LONG: 41.100657, -81.018601	1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N _s	REC SAMPLE (%)	HP (tsf)	GRADATION (%)							WC	ODOT CLASS (GI)	INCL.		
							GR	CS	FS	SI	CL	LL	PL				PI	
TOPSOIL	998.1	1	2	3	9	27	SS-1	-	-	-	-	-	-	-	-	21	A-3a (V)	
LOOSE, BLACK AND BROWN, COARSE AND FINE SAND, AND CLAY, DAMP	997.6	2	3	3	9	80	SS-2	1.0-2.0	-	-	-	-	-	-	-	-	22	A-6b (V)
		3	3	3	9	80	SS-3	-	-	-	-	-	-	-	-	-	20	A-6b (V)
STIFF TO VERY STIFF, BROWN MOTTLED GRAY, SILTY CLAY, LITTLE SAND AND GRAVEL, DAMP TO MOIST	996.6	4	4	4	12	80	SS-3	-	-	-	-	-	-	-	-	-	20	A-6b (V)
		5	7	11	27	100	SS-4	2.5-3.0	-	-	-	-	-	-	-	-	19	A-6b (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	6	7	11	35	53	SS-5	4.00	-	-	-	-	-	-	-	-	18	A-6b (V)
		7	11	12	35	53	SS-5	4.00	-	-	-	-	-	-	-	-	18	A-6b (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	8	7	9	24	100	SS-6	2.5-4.0	-	-	-	-	-	-	-	-	20	A-6b (V)
		9	7	9	29	100	SS-7	4.00	-	-	-	-	-	-	-	-	18	A-6b (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	10	4	6	21	100	SS-8	2.5-3.0	-	-	-	-	-	-	-	-	19	A-6b (V)
		11	6	8	21	100	SS-8	2.5-3.0	-	-	-	-	-	-	-	-	19	A-6b (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	12	9	10	30	60	SS-9	3.0-3.25	-	-	-	-	-	-	-	-	17	A-6b (V)
		13	10	10	30	60	SS-9	3.0-3.25	-	-	-	-	-	-	-	-	17	A-6b (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	14	3	4	15	100	SS-10	1.5-2.25	16	3	7	36	38	34	17	17	22	A-6b (11)
		15	4	6	15	100	SS-10	1.5-2.25	16	3	7	36	38	34	17	17	22	A-6b (11)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	16	5	8	27	80	SS-11	4.00	-	-	-	-	-	-	-	-	18	A-7-6 (V)
		17	8	10	27	80	SS-11	4.00	-	-	-	-	-	-	-	-	18	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	18	7	8	24	100	SS-12	0.7-3.5	-	-	-	-	-	-	-	-	25	A-7-6 (V)
		19	8	8	24	100	SS-12	0.7-3.5	-	-	-	-	-	-	-	-	25	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	20				75	ST-13	-	2	1	2	36	59	43	23	20	21	A-7-6 (13)
		21					75	ST-13	-	2	1	2	36	59	43	23	20	21
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	22	5	7	26	100	SS-14	1.5-4.0	-	-	-	-	-	-	-	-	19	A-7-6 (V)
		23	12	13	38	100	SS-15	2.5-3.0	-	-	-	-	-	-	-	-	19	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	24	7	10	35	100	SS-16	4.00	9	2	5	34	50	44	19	25	21	A-7-6 (15)
		25	10	13	35	100	SS-16	4.00	9	2	5	34	50	44	19	25	21	A-7-6 (15)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	26	8	14	53	100	SS-17	4.00	-	-	-	-	-	-	-	-	15	A-7-6 (V)
		27	14	21	53	100	SS-17	4.00	-	-	-	-	-	-	-	-	15	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	28	24	30	92	80	SS-18	4.00	-	-	-	-	-	-	-	-	15	A-7-6 (V)
		29	30	31	92	80	SS-18	4.00	-	-	-	-	-	-	-	-	15	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	30	10	17	60	100	SS-19	4.00	-	-	-	-	-	-	-	-	16	A-7-6 (V)
		31	17	23	60	100	SS-19	4.00	-	-	-	-	-	-	-	-	16	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	32	11	16	57	100	SS-20	4.00	-	-	-	-	-	-	-	-	17	A-7-6 (V)
		33	16	22	57	100	SS-20	4.00	-	-	-	-	-	-	-	-	17	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	34	6	7	32	100	SS-21	4.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)
		35	7	14	32	100	SS-21	4.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	36	11	19	59	87	SS-22	4.00	-	-	-	-	-	-	-	-	20	A-7-6 (V)
		37	19	20	59	87	SS-22	4.00	-	-	-	-	-	-	-	-	20	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	38	4	7	24	100	SS-23	2.00	-	-	-	-	-	-	-	-	22	A-7-6 (V)
		39	7	9	24	100	SS-23	2.00	-	-	-	-	-	-	-	-	22	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	40	11	15	50	100	SS-24	4.00	-	-	-	-	-	-	-	-	20	A-7-6 (V)
		41	15	18	50	100	SS-24	4.00	-	-	-	-	-	-	-	-	20	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	42	11	11	38	87	SS-25	4.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)
		43	11	14	38	87	SS-25	4.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	44	6	9	33	100	SS-26	3.75	-	-	-	-	-	-	-	-	27	A-7-6 (V)
		45	9	13	33	100	SS-26	3.75	-	-	-	-	-	-	-	-	27	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	46				100	ST-27	-	4	1	4	28	63	41	20	21	22	A-7-6 (13)
		47					100	ST-27	-	4	1	4	28	63	41	20	21	22
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	48	5	10	32	100	SS-28	-	-	-	-	-	-	-	-	-	26	A-7-6 (V)
		49	10	11	32	100	SS-28	-	-	-	-	-	-	-	-	-	26	A-7-6 (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	50	4	1	3	100	SS-29A	-	-	-	-	-	-	-	-	-	24	A-7-6 (V)
		51	1	1	3	100	SS-29B	-	-	-	-	-	-	-	-	-	18	A-3a (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	52	2	2	9	80	SS-30	-	-	-	-	-	-	-	-	-	23	A-3a (V)
		53	4	4	9	80	SS-30	-	-	-	-	-	-	-	-	-	23	A-3a (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	983.1	54	4	6	23	100	SS-31	-	-	-	-	-	-	-	-	-	55	A-3a (V)
		55	6	9	23	100	SS-31	-	-	-	-	-	-	-	-	-	55	A-3a (V)
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	948.9	TR	50	1	-	100	SS-32	-	-	-	-	-	-	-	-	64	Rock (V)	
VERY STIFF TO HARD, BROWN MOTTLED GRAY, CLAY, SOME SILT, TRACE SAND AND GRAVEL, DAMP TO MOIST	942.9		30		100	NQ-1											CORE	

BORING CONTINUES NEXT SHEET



OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

PROJECT: POR-76-20.18 TYPE: LANDSLIDE		DRILLING FIRM / OPERATOR: STANTEC / M/M		DRILL RIG: CME 45 TRUCK		STATION / OFFSET: 1070+30, 81' LT.		EXPLORATION ID																									
PID: 103201 SFN:		SAMPLING FIRM / LOGGER: STANTEC / P.CICHOCKI		HAMMER: CME AUTOMATIC		ALIGNMENT: I-76		B-005-0-16																									
START: 10/31/16 END: 11/3/16		DRILLING METHOD: 4.25" HSA / NQ		CALIBRATION DATE: 11/29/16		ELEVATION: 989.5 (MSL) EOB: 51.0 ft.		PAGE																									
SAMPLING METHOD:		SPT / ST		ENERGY RATIO (%): 90.2		LAT / LONG: 41.100653, -81.018370		1 OF 1																									
MATERIAL DESCRIPTION AND NOTES																																	
		ELEV.		DEPTHS		SPT/ RQD		REC SAMPLE ID (%)		HP (tsf)		GR		CS		FS		SI		CL		LL		PL		PI		WC		ODOT CLASS (GI)		INCL.	
LOOSE, BROWN, COARSE AND FINE SAND, DAMP TOPSOIL		989.5		1		1		5		73		SS-1A																A-3a (V)					
MEDIUM STIFF TO STIFF, BROWN, SILTY CLAY, TRACE GRAVEL AND SAND, DAMP		986.5		2		3		11		80		SS-2		1.25														A-6b (V)					
LOOSE, BROWN, COARSE AND FINE SAND		982.0		3		4		12		33		SS-3																A-3a (V)					
MEDIUM STIFF TO STIFF, BROWN, SILTY CLAY, TRACE GRAVEL AND SAND, DAMP		982.0		4		5		14		20		SS-4																A-3a (V)					
		982.0		5		6		9		13		SS-4																A-3a (V)					
		982.0		6		7		14		20		SS-5																A-3a (V)					
		982.0		7		8		11		100		SS-6		0.5-1.0														A-6b (V)					
		982.0		8		9		12		93		SS-7		2.00		17		2		6		31		44		39		20		19		A-6b (12)	
LOOSE, BROWN, GRAVEL AND STONE FRAGMENTS, TRACE SILT AND CLAY, DAMP		973.8		10		11		12		100		SS-8		3.00																A-6b (V)			
VERY STIFF TO HARD, BROWN, SILT, SOME CLAY, TRACE GRAVEL AND SAND, DAMP		972.2		12		13		30		93		SS-9		2.5-3.0																A-6b (V)			
		972.2		13		14		9		100		SS-10		2.5-3.0																A-6b (V)			
		972.2		14		15		3		100		SS-11A		2.50																A-6b (V)			
		972.2		15		16		4		100		SS-11B																		A-1-a (V)			
		972.2		16		17		5		87		SS-12A																		A-1-a (V)			
		972.2		17		18		3		100		SS-12B		0.25-1.0																A-4b (V)			
		972.2		18		19		2		100		SS-13		0.25-1.5																A-4b (V)			
		972.2		19		20		7		100		SS-14		1.5-4.5+																A-4b (V)			
		972.2		20		21		12		100		SS-14		1.5-4.5+																A-4b (V)			
		972.2		21		22		18		87		SS-15		4.50																A-4b (V)			
		972.2		22		23		24		100		ST-16				1		3		65		30		26		18		8		18		A-4b (8)	
		972.2		23		24		11		48		SS-17A																		A-4b (V)			
		972.2		24		25		15		100		SS-17B		2.00																A-6b (V)			
		972.2		25		26		17		60		SS-18		2.00																A-6b (V)			
		972.2		26		27		18		100		SS-19		0.25-4.0																A-6b (V)			
		972.2		27		28		4		20		SS-20		4.50																A-6b (V)			
		972.2		28		29		9		33		SS-20		4.50																A-6b (V)			
		972.2		29		30		13		100		SS-21		4.5+		2		1		9		37		51		35		18		23		A-6b (11)	
		972.2		30		31		11		39		SS-22		4.5+																A-6b (V)			
		972.2		31		32		10		32		SS-23A		1.75																A-6b (V)			
		972.2		32		33		11		12		SS-23B																		A-1-b (V)			
		972.2		33		34		4		18		SS-24																		A-1-b (V)			
		972.2		34		35		5		7																				A-1-b (V)			
		972.2		35		36		15		100		SS-25A																		A-1-b (V)			
		972.2		36		37		50/2"		-		SS-25B																		Rock (V)			
		972.2		37		38		50/2"		-		SS-26																		Rock (V)			
		972.2		38		39		50/2"		-		SS-26																		Rock (V)			
		972.2		39		40		TR																									
		972.2		40		41																											
		972.2		41		42																											
		972.2		42		43				92		NQ-1																				CORE	
		972.2		43		44																											
		972.2		44		45																											
		972.2		45		46																											
		972.2		46		47																											
		972.2		47		48				100		NQ-2																				CORE	
		972.2		48		49																											
		972.2		49		50																											
		972.2		50		51																											
		972.2		51		EOB																											

NOTES: NONE
ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 1 BAG BENTONITE GROUT; PUMPED 3 BAGS CEMENT

OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

PROJECT:	POR-76-20.18	DRILLING FIRM / OPERATOR:	STANTEC / T.C	DRILL RIG:	CME 45 TRUCK	STATION / OFFSET:	1070+94, 67' LT.	EXPLORATION ID	B-006-0-16							
TYPE:	LANDSLIDE	SAMPLING FIRM / LOGGER:	STANTEC / P.CICHOCKI	HAMMER:	CME AUTOMATIC	ALIGNMENT:	I-76									
PID:	103201	DRILLING METHOD:	4.25" HSA / NQ	CALIBRATION DATE:	11/29/16	ELEVATION:	992.5 (MSL) EOB:	42.1 ft.	PAGE							
START:	11/14/16	SAMPLING METHOD:	SPT / ST	ENERGY RATIO (%):	90.2	LAT / LONG:	41.100575, -81.018158		1 OF 1							
MATERIAL DESCRIPTION AND NOTES																
ELEV.	DEPTHS	SPT/ROD	N _s	REC SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
992.5	1	WOH	3	SS-1	0.25	-	-	-	-	-	-	-	-	-	18	A-7-6 (V)
991.5	2	WOH	8	SS-2	0.5-1.0	-	-	-	-	-	-	-	-	-	22	A-6b (V)
991.0	3	2	8	SS-3	1.0-2.0	-	-	-	-	-	-	-	-	-	21	A-6b (V)
	4	2	8	SS-4	1.5-2.5	16	2	5	32	45	40	19	21	22	A-6b (12)	
985.9	5	3	15	SS-5A	0.75	-	-	-	-	-	-	-	-	25	A-6b (V)	
	6	5	6	SS-5B	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
	7	3	6	SS-6	-	85	5	5	4	1	NP	NP	NP	4	A-1-a (0)	
983.0	8	2	5	SS-7A	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	
	9	1	5	SS-7B	1.00	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
	10	2	8	SS-8	3.5-4.0	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
	11	8	15	SS-9	2.75	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
	12	4	24	SS-10	4.00	-	-	-	-	-	-	-	-	22	A-7-6 (V)	
	13	6	17	SS-11	2.5-3.0	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
	14	8	73	SS-12	3.25	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
	15	11	95	ST-13	-	1	2	5	33	59	43	21	22	19	A-7-6 (13)	
	16	2	12	SS-14	3.00	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
	17	3	80	SS-15	3.50	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
	18	9	93	SS-16	2.0-2.5	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
	19	12	73	SS-17	2.25	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
	20	3	100	SS-18	4.5+	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
	21	5	100	SS-19	3.0-3.5	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
	22	6	100	SS-20	2.75-4.0+	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
	23	5	67	SS-21	4.00	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
	24	10	100	SS-22	2.75-3.0	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
959.0	25	3	100	SS-23	1.25-2.5	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
	26	4	100	SS-24	3.50	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
	27	7	100	SS-25	1.25-1.5	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
	28	8	100	ST-26	-	16	2	6	30	46	42	20	22	22	A-7-6 (13)	
	29	10	100	SS-27A	3.50	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
	30	11	100	SS-27B	-	-	-	-	-	-	-	-	-	17	A-3a (V)	
	31	13	100	SS-28	-	-	-	-	-	-	-	-	-	19	A-3a (V)	
	32	14	50/17													
	33	4														
	34	5														
	35	7														
	36	7														
	37	9														
	38	10														
	39															
	40	8														
952.0	41	9														
950.4	42	11														
		27														

NOTES: NONE
ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS



OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

PROJECT: POR-76-20.18		DRILLING FIRM / OPERATOR: STANTEC / T.C. STANTEC / P.CICHOCKI		DRILL RIG: CME 45 TRUCK		STATION / OFFSET: 1072+21.68' LT.		EXPLOSION ID								
TYPE: LANDSLIDE		SAMPLING FIRM / LOGGER: STANTEC / P.CICHOCKI		HAMMER: CME AUTOMATIC		ALIGNMENT: I-76		B-007-0-16								
PID: 103201 SFN:		DRILLING METHOD: 4.25" HSA / NQ		CALIBRATION DATE: 11/29/16		ELEVATION: 990.2 (MSL) EOB: 40.3 ft.		PAGE								
START: 11/15/16 END: 11/15/16		SPT / ST		ENERGY RATIO (%): 90.2		LAT / LONG: 41.100504, -81.017713		1 OF 1								
MATERIAL DESCRIPTION AND NOTES		ELEV.		SPT/ROD		REC SAMPLE		GRADATION (%)		ATTERBERG		ODOT CLASS (GI)		BACK FILL		
		990.2		N _a		ID		GR		CS FS SI CL		LL PL PI		WC		
TOPSOIL		989.2	2	2	6	SS-1	1.25-1.5	-	-	-	-	-	-	21	A-6b (V)	
MEDIUM STIFF, BROWN MOTTLED GRAY, SILTY CLAY, TRACE SAND, DAMP			2	2	8	SS-2	0.75-2.75	-	-	-	-	-	-	22	A-6b (V)	
			2	2	6	SS-3	2.25	-	-	-	-	-	-	20	A-6b (V)	
			2	2	9	SS-4	2.0-2.25	-	-	-	-	-	-	19	A-6b (V)	
			3	3	9	SS-5	1.5-2.0	-	-	-	-	-	-	21	A-6b (V)	
LOOSE, BROWN, GRAVEL AND STONE FRAGMENTS LITTLE SAND, TRACE SILT AND CLAY, DAMP		982.7	2	2	8	SS-6	-	-	-	-	-	-	-	4	A-1-a (V)	
			1	1	8	SS-7	-	-	-	-	-	-	-	3	A-1-a (V)	
			2	2	23	SS-8A	-	-	-	-	-	-	-	2	A-1-a (V)	
			6	6	23	SS-8B	4.5+	-	-	-	-	-	-	19	A-6b (V)	
STIFF TO VERY STIFF, BROWN, SILTY CLAY, TRACE SAND AND GRAVEL, DAMP		979.4	4	4	24	SS-9	4.50	-	-	-	-	-	-	16	A-6b (V)	
			7	7	41	SS-10	4.0-4.25	-	-	-	-	-	-	19	A-6b (V)	
			12	12	18	SS-11	2.5-2.75	-	-	-	-	-	-	17	A-6b (V)	
			4	4	29	SS-12	3.25	-	-	-	-	-	-	18	A-6b (V)	
			5	5	20	SS-13	4.5+	-	-	-	-	-	-	19	A-6b (V)	
			8	8	90	ST-14	-	0	1	3	45	51	37	20	17	A-6b (11)
			2	2	15	SS-15	1.25-3.5	-	-	-	-	-	-	17	A-6b (V)	
			4	4	20	SS-16	1.75	-	-	-	-	-	-	18	A-6b (V)	
			5	5	24	SS-17	2.25	-	-	-	-	-	-	17	A-6b (V)	
			8	8	33	SS-18	2.75-3.25	-	-	-	-	-	-	22	A-6b (V)	
			10	10	24	SS-19	2.25-3.0	-	-	-	-	-	-	23	A-6b (V)	
			7	7	21	SS-20	3.5-3.75	-	-	-	-	-	-	19	A-6a (V)	
VERY STIFF TO HARD, BROWN, SILT AND CLAY, LITTLE GRAVEL, TRACE SAND, DAMP TO MOIST		961.2	3	3	41	SS-21	2.75-4.0+	-	-	-	-	-	-	18	A-6a (V)	
			13	13	29	SS-22	4.00	13	2	7	39	33	19	14	18	A-6a (10)
			5	5	57	SS-23	4.00	-	-	-	-	-	-	21	A-6a (V)	
			8	8	50	SS-24	4.00	-	-	-	-	-	-	21	A-6a (V)	
			11	11	45	SS-25A	-	-	-	-	-	-	-	25	A-6a (V)	
			14	14	45	SS-25B	-	-	-	-	-	-	-	12	A-3a (V)	
MEDIUM DENSE, BROWN, COARSE AND FINE SAND, LITTLE CLAY AND SILT, MOIST TO WET		953.1	12	12	3	SS-26	-	-	-	-	-	-	-	20	A-3a (V)	
			16	16	3	SS-26	-	-	-	-	-	-	-	20	A-3a (V)	
Residual Soil		949.9	14	14	-	SS-27	-	-	-	-	-	-	-	12	Rock (V)	
			50/4"	50/4"	-	SS-27	-	-	-	-	-	-	-	12	Rock (V)	

NOTES: NONE
ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

State of Ohio
Department of Transportation
Office of Geotechnical Engineering



Date Started 9/14/05 Sampler: Type SS Dia. Water Elev. Project Identification: PORTAGE
Date completed 9/14/05 Boring No. B-1* Station & Offset 1071+80.63' LT. Surface Elev. 992.0' LANDSLIDE INVESTIGATION

Elev.	Depth	Std. Pen./ R.O.D.	Rec. Loss ft	Description	Sample No.	Physical Characteristics					ODOT Class			
						Agg	C.S.	F.S.	Silt/Clay	L.L.		P.I./W.C.		
992.0	0													
990.5	2	2/3/3		BROWN AND GRAY SANDY SILT, CLAY & GRAVEL	23	-	-	-	-	-	-	14	VISUAL	
988.5	4	2/3/3		BROWN W/GRAY GRAVELLY SANDY SILT & CLAY	24	-	-	-	-	-	-	11	VISUAL	
986.0	6	4/4/5		BROWN SILTY SANDY GRAVEL	25	73	8	8	9	2	NP	3	A-1-a	
983.5	8	1/2/2		BROWN GRAVELLY CLAY	26	17	5	8	37	33	34	15	20	A-6a
981.0	12	4/5/8		BROWN AND GRAY SILT AND CLAY W/TRACE OF ORG.	27	0	3	7	39	51	35	15	20	A-6a
978.5	14	4/6/8		BROWN SILTY CLAY	28	10	3	7	39	41	34	16	19	A-6b
976.0	16	6/8/13		BROWN AND GRAY SILT AND CLAY	29	0	2	6	48	44	33	14	18	A-6a
973.5	20	4/1/8		BROWN AND GRAY GRAVELLY CLAY	30	12	3	8	39	38	37	19	20	A-6b
	22													
	24													
967.0	26	8/11/12		BROWN AND GRAY SILTY CLAY	31	10	1	4	36	49	36	16	20	A-6b
	28													
962.0	30	7/9/9		BROWN AND GRAY GRAVELLY CLAY	32	16	1	4	32	47	38	17	23	A-6b
	32													
	34													

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

Form TE-61, Revised 9/96

* NOTE: SLOPE INCLINOMETER TUBING INSTALLED IN THIS HOLE.

Boring No. B-1 Station & Offset 1071+80.63' LT. Surface Elev. 992.0' Project POR-76-20.50

Water Elev. _____



Elev.	Depth	Std. Pen./ R.O.D.	Rec. Loss ft	Description	Sample No.	Physical Characteristics					ODOT Class			
						Agg	C.S.	F.S.	Silt/Clay	L.L.		P.I./W.C.		
957.0	36	4/6/8		BROWN AND GRAY GRAVELLY CLAY	33	19	2	6	37	36	35	16	18	A-6b
	38													
	40			TOP OF ROCK										
952.0	42	15/45/75		BLACK BROKEN AND JOINTED SHALE	34	-	-	-	-	-	-	-	5	VISUAL
950.0	44													
	46													
	48	0	8.5	SHALE, BLACK, MEDIUM CARBONACEOUS, SLIGHTLY ARENACEOUS, HIGHLY BROKEN AND JOINTED; INTERBEDDED W/A THICK DARK GRAY, HARD, JOINTED FLINT SEAM. CORE LOSS 15 % R.O.D. IS 0										
	50													
940.0	52													

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

Form TE-61, Revised 9/96

↑ BOTTOM OF BORING



POR-76-20.18

LANDSLIDE EXPLORATION
HISTORIC BORING LOG B-001-0-05

DRAWN
MSJ
CHECKED
JRM

14/22

OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

State of Ohio
Department of Transportation
Office of Geotechnical Engineering

8
19

Date Started 8/29/05 Sampler Type SS Dia. 950.7' Project Identification: PORTAGE
Date completed 9/1/05 Station & Offset 1073+20, 80' LT. Water Elev. POP-76-20.50
Boring No. B-4# Surface Elev. 980.7' LANDSLIDE INVESTIGATION

Elev. 980.7	Depth 0	Std. Pen. / R.O.D.	Rec. Logs / ft	Description	Sample No.	Physical Characteristics						DOT Class		
						Agg.	C.S.	F.S.	Silt	Clay	L.L.		P.I.	W.C.
979.2	2	4/5/5		BROWN SILTY CLAY	1	8	2	6	36	46	38	18	25	A-6b
977.2	4	4/5/8		BROWN AND GRAY SILTY CLAY W/TRACE OF ROOTS	2	0	1	3	49	47	37	17	20	A-6b
974.7	6			BROWN AND GRAY SILTY CLAY	3-P	0	2	6	39	53	39	18	23	A-6b
972.2	8	P.S.		BROWN SILT AND CLAY	4	0	3	6	26	65	34	15	20	A-6a
969.7	10	11/17/21		BROWN SILT AND CLAY	5	0	2	6	40	52	34	13	19	A-6a
967.2	12	15/20/22		BROWN SILTY CLAY	6	0	3	6	40	51	36	16	19	A-6b
964.7	14	12/17/20		BROWN SILTY CLAY	7	0	2	6	36	56	35	16	17	A-6b
962.2	16	15/22/24		BROWN AND GRAY SILTY CLAY	8	0	1	5	37	57	36	16	20	A-6b
960.7	20	7/12/14		GRAY SILTY CLAY	9-P	0	1	5	33	61	37	17	21	A-6b
955.7	22	P.S.		GRAY SILTY CLAY	10	0	1	3	29	67	37	17	24	A-6b
950.7	26	4/4/5		GRAY SILTY CLAY	11-P	16	23	20	22	19	36	22	19	A-6b
945.7	30			BROWN GRAVELLY SANDY CLAY	12	-	-	-	-	-	-	-	-	10 VISUAL
945.7	32	80(0.3')		(NOTE: 3.0' OF HEAVING SAND WAS FOUND IN AUGERS AT 35.0" DEEP) BLACK BROKEN AND JOINTED SHALE										
935.2	34		5.0	SHALE, BLACK, MEDIUM, CARBONACEOUS, ARENACEOUS, WITH THIN CLAY SEAMS, W/SUCKENSIDES, HIGHLY BROKEN AND JOINTED; WITH A THICK DARK GRAY, HARD, JOINTED FLINT SEAM NEAR THE BOTTOM. NO CORE LOSS. R.O.D. IS 0										
	36		5.0											
	38		0.0											
	40													
	42													
	44		5.0											

Particle Sizes: Agg= >2.00mm, Coarse Sand= 2.00-0.42mm, Fine Sand= 0.42-0.074mm, Silt= 0.074-0.005mm, Clay= <0.005mm
Form TE-16, Revised 8/95

* NOTE: SLOPE INCLINOMETER TUBING INSTALLED IN THIS HOLE.

← BOTTOM OF BORING

LOG OF BORING

State of Ohio
Department of Transportation
Office of Geotechnical Engineering

13
19

Date Started 9/13/05 Sampler Type SS Dia. 950.3' Project Identification: PORTAGE
Date completed 9/13/05 Station & Offset 1072+13, 121' LT. Water Elev. POP-76-20.50
Boring No. B-6# Surface Elev. 964.1' LANDSLIDE INVESTIGATION

Elev. 964.1	Depth 0	Std. Pen. / R.O.D.	Rec. Logs / ft	Description	Sample No.	Physical Characteristics						DOT Class		
						Agg.	C.S.	F.S.	Silt	Clay	L.L.		P.I.	W.C.
962.6	2	6/8/11		BROWN GRAVELLY CLAY W/TRACE OF ASPHALT FRAGS.	17	12	3	7	35	43	38	18	17	A-6b
960.6	4	8/9/11		BROWN AND GRAY GRAVELLY CLAY	18	19	2	5	32	42	39	19	20	A-6b
958.1	6	9/11/14		BROWN AND GRAY CLAYEY SILT	19	0	3	6	39	52	36	16	20	A-4a
955.6	8			BROWN AND GRAY SANDY CLAY	P-20	6	8	8	38	40	32	12	19	A-6a
953.1	10	P.S.		BROWN AND GRAY CLAY	21	0	2	1	22	75	48	24	25	A-7-6
950.6	12	12/15/19		BROWN AND GRAY CLAY	22	-	-	-	-	-	-	-	-	12 VISUAL
948.1	14	12/35/75, AUGERED		BLACK SOFT CLAY-SHALE UNDERLAIN BY BLACK BROKEN AND JOINTED SHALE										

Particle Sizes: Agg= >2.00mm, Coarse Sand= 2.00-0.42mm, Fine Sand= 0.42-0.074mm, Silt= 0.074-0.005mm, Clay= <0.005mm
Form TE-16, Revised 8/95

* NOTE: WATER MONITORING WELL INSTALLED IN THIS HOLE.

← BOTTOM OF BORING

OHIO DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL ENGINEERING

LOG OF BORING

State of Ohio
Department of Transportation
Office of Geotechnical Engineering



Date Started 9/13/05 Sampler Type SS Dia. Waiver Elev. Project Identification PORTAGE
Date completed 9/13/05 APPROX. Surface Elev. 369.8
Boring No. B-7 Station & Offset 1073+20.111' L.T. LANDSLIDE INVESTIGATION

Elev.	Depth Std. Pen. / R.O.D.	Req. Logs / ft	Description	Physical Characteristics						DOT Class		
				Agg.	C.S.	F.S.	Silt	Clay	L.L.		P.I.	W.C.
963.8	0											
969.3	2		BROWN SILTY CLAY W/ROOTS	9	2	5	37	47	36	16	18	A-6b
966.3	4		BROWN SANDY SILT	0	1	22	54	23	NP	NP	19	A-4b
963.8	6		BROWN SANDY SILT	0	1	21	32	46	26	10	19	A-4a
961.3	8		BROWN SILTY CLAY	0	1	6	37	56	37	17	10	A-6b
958.8	10		BROWN GRAVELLY CLAY	20	1	5	29	45	38	18	21	A-6b
956.3	14		BROWN GRAVELLY CLAY	17	1	4	25	53	41	19	22	A-7-6

Particle Sizes: Agg= >2.00mm, Coarse Sand= 2.00-0.42mm, Fine Sand= 0.42-0.074mm, Silt= 0.074-0.005mm, Clay= <0.005mm
Form TE-61, (Revised 9/96)

← BOTTOM OF BORING

LOG OF BORING

State of Ohio
Department of Transportation
Office of Geotechnical Engineering



Date Started 9/20/05 Sampler Type SS Dia. Waiver Elev. Project Identification PORTAGE
Date completed 9/20/05 APPROX. Surface Elev. 397.5
Boring No. B-8* Station & Offset 1069+94.65' L.T. LANDSLIDE INVESTIGATION

Elev.	Depth Std. Pen. / R.O.D.	Req. Logs / ft	Description	Physical Characteristics						DOT Class		
				Agg.	C.S.	F.S.	Silt	Clay	L.L.		P.I.	W.C.
997.5	0											
996.0	2		0.4' ASPHALT									VISUAL
994.0	4		BROWN GRAVELLY CLAY W/TRACE OF ASPHALT FRAGS.	22	3	6	34	35	34	14	21	A-6a
991.5	6		BROWN AND GRAY SANDY GRAVELLY CLAY W/ASPHALT FRAGS.	21	6	11	26	36	32	13	21	A-6a
989.0	8		BROWN AND GRAY GRAVELLY CLAY	16	3	8	38	35	29	11	16	A-6a
986.5	10		BROWN AND GRAY GRAVELLY CLAY	11	3	7	42	37	32	13	18	A-6a
984.0	14		BROWN AND GRAY CLAYEY SILT	0	2	9	54	35	26	8	17	A-4b
981.5	16		BROWN AND GRAY SANDY CLAY	10	3	8	38	41	34	15	21	A-6a
979.0	18		BROWN AND GRAY GRAVELLY CLAY	12	3	7	39	39	32	14	19	A-6a
977.5	20		BROWN AND GRAY SILTY CLAY	0	2	7	38	53	37	16	22	A-6b
972.5	26		BROWN AND GRAY GRAVELLY CLAY	16	1	7	38	38	35	16	19	A-6b
967.5	32		BROWN AND GRAY CLAYEY SILT	0	1	5	56	38	25	7	17	A-4b
962.5	36		BROWN AND GRAY SILT AND CLAY	0	2	6	49	43	31	13	19	A-6a
957.5	40		BROWN SILTY CLAY	7	1	3	30	59	38	16	18	A-6b
952.5	46		BROWN SAND & ST. FRAGS. UNDERLAIN BY BLACK SOFT CLAY-SHALE									VISUAL

TOP OF ROCK

← BOTTOM OF BORING

Particle Sizes: Agg= >2.00mm, Coarse Sand= 2.00-0.42mm, Fine Sand= 0.42-0.074mm, Silt= 0.074-0.005mm, Clay= <0.005mm
Form TE-61, (Revised 9/96)

* NOTE: WATER MONITORING WELL INSTALLED IN THIS HOLE.

Unconfined Compressive Strength of Cohesive Soil ASTM D 2166

Project Name POR-76 Landslides Project Number 175526004
 Source B-001-0-16, 19.5'-21.5' Lab ID 14
 Visual Description Lean Clay (CL), gray brown, moist, firm

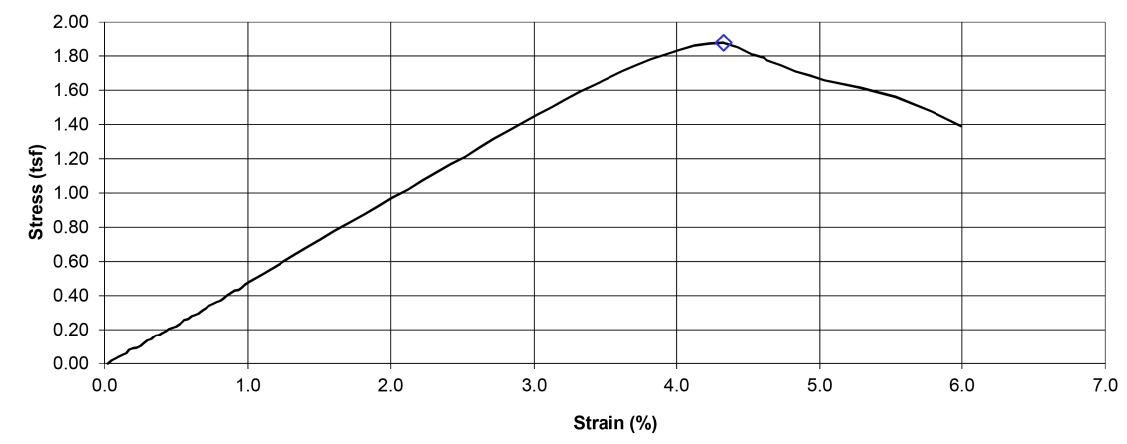
		Recovered	1.7'
		Test Interval	19.5' - 20.0'
Specimen Type: <u>Undisturbed</u>	LL <u>41</u>	PL <u>21</u>	
		PI <u>20</u>	
		Date Extruded	12/20/2016
		Date Tested	12/21/2016
Initial Wet Density (pcf)	130.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	18.4		
Initial Dry Density (pcf)	110.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	1.88
Average Height (in)	6.022	Undrained Shear Strength (tsf)	0.94
Average Diameter (in)	2.883	Strain at Maximum Stress (%)	4.3
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Unconfined Compressive Strength of Cohesive Soil ASTM D 2166

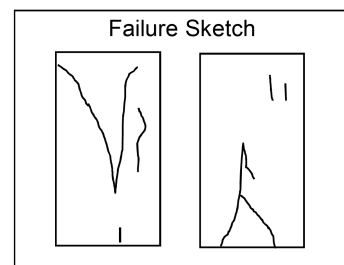
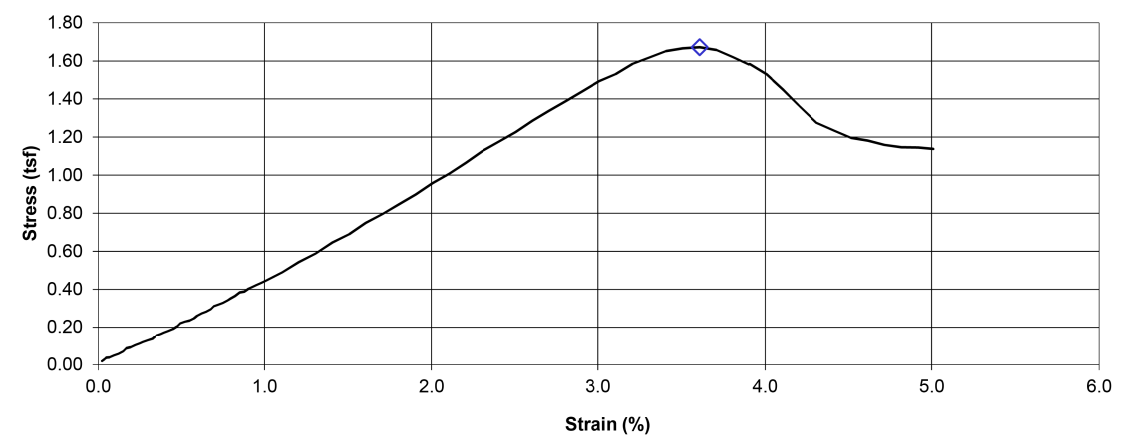
Project Name POR-76 Landslides Project Number 175526004
 Source B-002-0-16, 25.0'-27.0' Lab ID 42
 Visual Description Lean Clay (CL), gray brown, moist, firm

		Recovered	1.9'
		Test Interval	25.0' - 25.5'
Specimen Type: <u>Undisturbed</u>	LL <u>36</u>	PL <u>20</u>	
		PI <u>16</u>	
		Date Extruded	12/20/2016
		Date Tested	12/21/2016
Initial Wet Density (pcf)	133.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	16.5		
Initial Dry Density (pcf)	114.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	1.67
Average Height (in)	6.039	Undrained Shear Strength (tsf)	0.84
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	3.6
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain

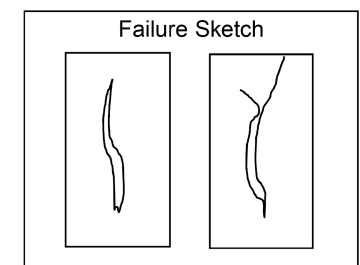


Stress vs. Strain



Comments
 LAB TESTING
 %GR %CS %FS %Silt %Clay LL PL PI WC
 3 2 6 40 49 41 21 20 18

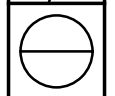
Reviewed By RJ



Comments
 LAB TESTING
 %GR %CS %FS %Silt %Clay LL PL PI WC
 3 3 7 40 47 36 20 16 17

Reviewed By RJ

U:\175527005\POR\103201\Design\Geotechnical\Sheets\103201YD001.dgn Sheet 1/9/2019 4:51:27 PM M.Jennings



**Unconfined Compressive Strength
of Cohesive Soil**
ASTM D 2166

Project Name POR-76 Landslides Project Number 175526004
Source B-004-0-16, 18.0'-20.0' Lab ID 64
Visual Description Lean Clay (CL), brown, moist, firm

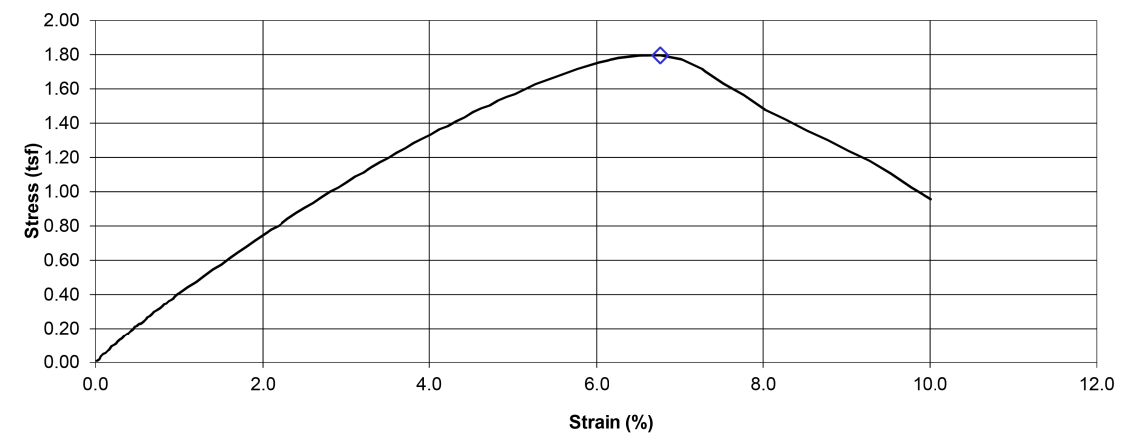
	Recovered	1.2'
	Test Interval	18.0' - 18.5'
Specimen Type: <u>Undisturbed</u>	LL <u>43</u>	PL <u>23</u>
		PI <u>20</u>
	Date Extruded	<u>12/20/2016</u>
	Date Tested	<u>12/21/2016</u>
Initial Wet Density (pcf)	<u>128.8</u>	
Initial Moisture Content (%)	<u>21.3</u>	Initial MC Taken <u>Before Test, From Trimmings</u>
Initial Dry Density (pcf)	<u>106.2</u>	
At Test Moisture Content (%)	<u>N/A</u>	At Test MC Taken <u>N/A</u>
At Test Dry Density (pcf)	<u>N/A</u>	
Specific Gravity	<u>N/A</u>	
Degree of Saturation (%)	<u>N/A</u>	Unconfined Compressive Strength (tsf) <u>1.80</u>
Average Height (in)	<u>6.032</u>	Undrained Shear Strength (tsf) <u>0.90</u>
Average Diameter (in)	<u>2.846</u>	Strain at Maximum Stress (%) <u>6.8</u>
Height to Diameter Ratio	<u>2.1</u>	Strain rate to failure (% / min.) <u>1.00</u>

**Unconfined Compressive Strength
of Cohesive Soil**
ASTM D 2166

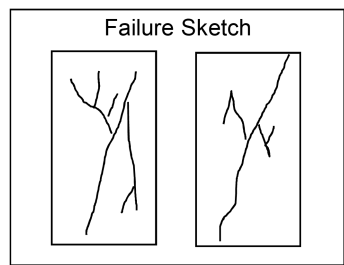
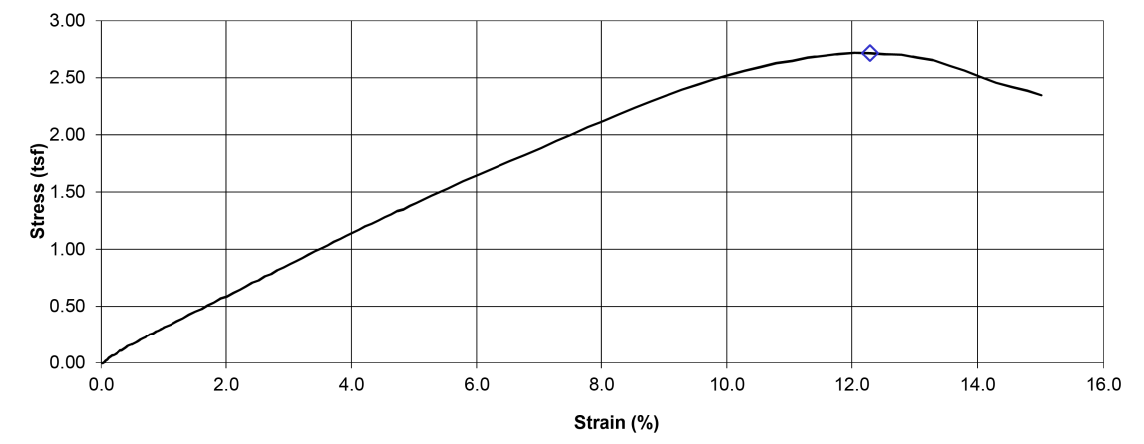
Project Name POR-76 Landslides Project Number 175526004
Source B-004-0-16, 40.0'-42.0' Lab ID 78
Visual Description Lean Clay (CL), brown, moist, firm

	Recovered	1.4'
	Test Interval	40.0' - 40.5'
Specimen Type: <u>Undisturbed</u>	LL <u>41</u>	PL <u>20</u>
		PI <u>21</u>
	Date Extruded	<u>12/21/2016</u>
	Date Tested	<u>12/21/2016</u>
Initial Wet Density (pcf)	<u>128.0</u>	
Initial Moisture Content (%)	<u>22.1</u>	Initial MC Taken <u>Before Test, From Trimmings</u>
Initial Dry Density (pcf)	<u>104.8</u>	
At Test Moisture Content (%)	<u>N/A</u>	At Test MC Taken <u>N/A</u>
At Test Dry Density (pcf)	<u>N/A</u>	
Specific Gravity	<u>N/A</u>	
Degree of Saturation (%)	<u>N/A</u>	Unconfined Compressive Strength (tsf) <u>2.72</u>
Average Height (in)	<u>6.045</u>	Undrained Shear Strength (tsf) <u>1.36</u>
Average Diameter (in)	<u>2.888</u>	Strain at Maximum Stress (%) <u>12.3</u>
Height to Diameter Ratio	<u>2.1</u>	Strain rate to failure (% / min.) <u>1.00</u>

Stress vs. Strain

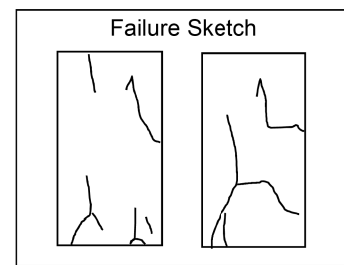


Stress vs. Strain



Comments
LAB TESTING
%GR %CS %FS %Silt %Clay LL PL PI WC
2 1 2 36 59 43 23 20 21

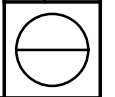
Reviewed By RJ



Comments
LAB TESTING
%GR %CS %FS %Silt %Clay LL PL PI WC
4 1 4 28 63 41 20 21 22

Reviewed By RJ

U:\175527005\POR\103201\Design\Geotechnical\Sheets\103201YD002.dgn Sheet 1/9/2019 4:53:54 PM MLenning



Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name POR-76 Landslides Project Number 175526004
 Source B-006-0-16, 18.0'-20.0' Lab ID 99
 Visual Description Lean Clay (CL), brown, moist, firm

		Recovered	1.2'
		Test Interval	18.0' - 18.5'
Specimen Type: <u>Undisturbed</u>	LL <u>43</u>	PL <u>21</u>	
		PI <u>22</u>	
		Date Extruded	12/21/2016
		Date Tested	12/21/2016
Initial Wet Density (pcf)	<u>129.1</u>	Initial MC Taken	<u>Before Test, From Trimmings</u>
Initial Moisture Content (%)	<u>19.0</u>	At Test MC Taken	<u>N/A</u>
Initial Dry Density (pcf)	<u>108.5</u>		
At Test Moisture Content (%)	<u>N/A</u>		
At Test Dry Density (pcf)	<u>N/A</u>		
Specific Gravity	<u>N/A</u>		
Degree of Saturation (%)	<u>N/A</u>	Unconfined Compressive Strength (tsf)	<u>1.79</u>
Average Height (in)	<u>6.039</u>	Undrained Shear Strength (tsf)	<u>0.90</u>
Average Diameter (in)	<u>2.874</u>	Strain at Maximum Stress (%)	<u>14.0</u>
Height to Diameter Ratio	<u>2.1</u>	Strain rate to failure (% / min.)	<u>1.00</u>

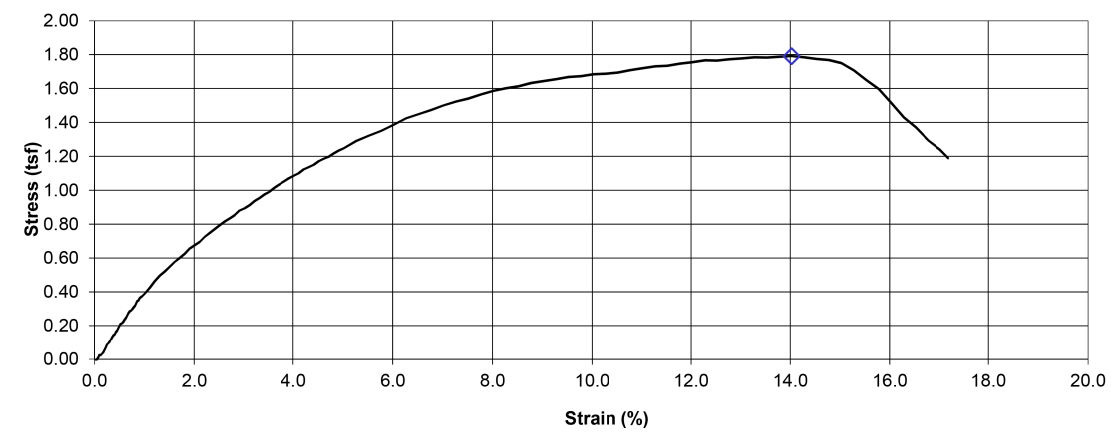
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

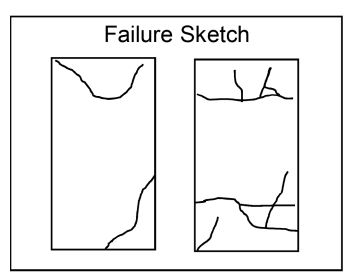
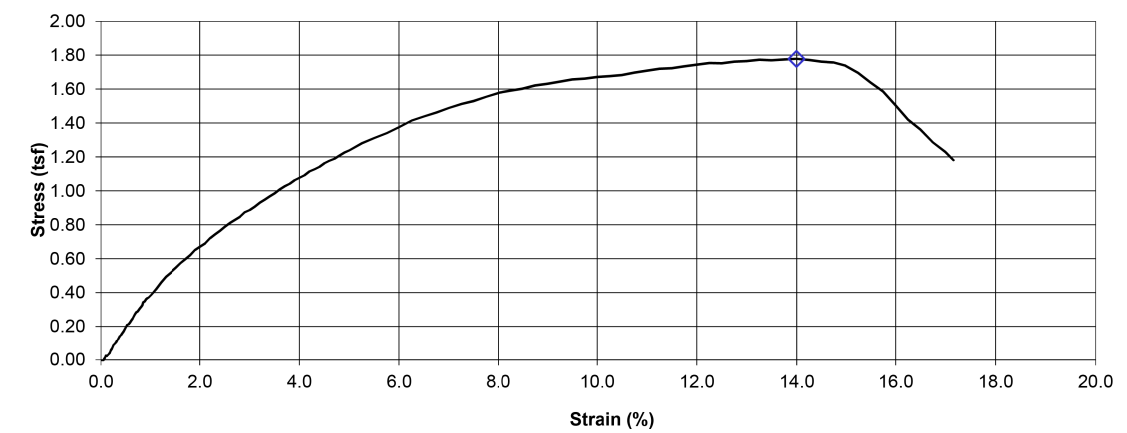
Project Name POR-76 Landslides Project Number 175526004
 Source B-006-0-16, 38.0'-40.0' Lab ID 112
 Visual Description Lean Clay with Sand (CL), gray brown, moist, firm

		Recovered	1.4'
		Test Interval	38.0' - 38.5'
Specimen Type: <u>Undisturbed</u>	LL <u>42</u>	PL <u>20</u>	
		PI <u>22</u>	
		Date Extruded	12/21/2016
		Date Tested	12/21/2016
Initial Wet Density (pcf)	<u>119.8</u>	Initial MC Taken	<u>Before Test, From Trimmings</u>
Initial Moisture Content (%)	<u>21.5</u>	At Test MC Taken	<u>N/A</u>
Initial Dry Density (pcf)	<u>98.6</u>		
At Test Moisture Content (%)	<u>N/A</u>		
At Test Dry Density (pcf)	<u>N/A</u>		
Specific Gravity	<u>N/A</u>		
Degree of Saturation (%)	<u>N/A</u>	Unconfined Compressive Strength (tsf)	<u>1.78</u>
Average Height (in)	<u>6.052</u>	Undrained Shear Strength (tsf)	<u>0.89</u>
Average Diameter (in)	<u>2.884</u>	Strain at Maximum Stress (%)	<u>14.0</u>
Height to Diameter Ratio	<u>2.1</u>	Strain rate to failure (% / min.)	<u>1.00</u>

Stress vs. Strain

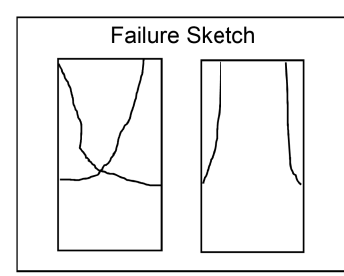


Stress vs. Strain



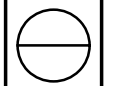
Comments
 LAB TESTING
 %GR %CS %FS %Silt %Clay LL PL PI WC
 1 2 5 33 59 43 21 22 19

Reviewed By RJ



Comments
 LAB TESTING
 %GR %CS %FS %Silt %Clay LL PL PI WC
 16 2 6 30 46 42 20 22 22

Reviewed By RJ



U:\175527005\POR\103201\Design\Geotechnical\Sheets\103201YD003.dgn Sheet 1/9/2019 4:54:59 PM M.Jennings

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name POR-76 Landslides Project Number 175526004
 Source B-007-0-16, 19.5'-21.5' Lab ID 130
 Visual Description Lean Clay (CL), brown, moist, firm

		Recovered	1.5'
		Test Interval	19.5' - 20.0'
Specimen Type: <u>Undisturbed</u>	LL <u>37</u>	PL <u>20</u>	
		PI <u>17</u>	
		Date Extruded	12/21/2016
		Date Tested	12/21/2016
Initial Wet Density (pcf)	124.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	18.4		
Initial Dry Density (pcf)	105.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	1.60
Average Height (in)	6.044	Undrained Shear Strength (tsf)	0.80
Average Diameter (in)	2.877	Strain at Maximum Stress (%)	7.0
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

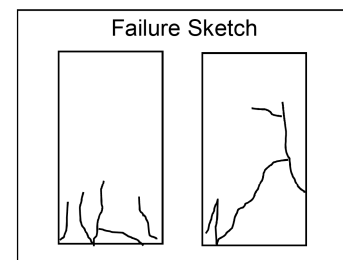
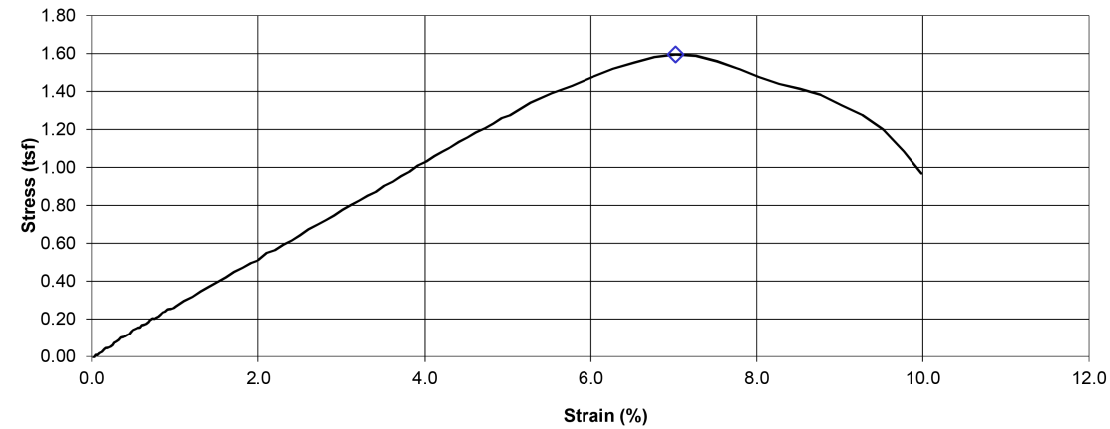
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name POR-76 Landslides Project Number 175526004
 Source B-001-0-16, 30.5'-32.5' Lab ID 21A
 Visual Description Lean Clay (CL), brown and gray, moist, firm

		Recovered	1.4'
		Test Interval	30.5' - 31.0'
Specimen Type: <u>Undisturbed</u>	LL <u>31</u>	PL <u>17</u>	
		PI <u>14</u>	
		Date Extruded	12/20/2016
		Date Tested	N/A
Initial Wet Density (pcf)	130.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	17.4		
Initial Dry Density (pcf)	111.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.008	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

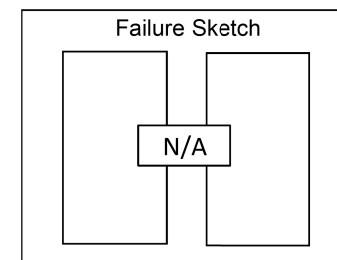
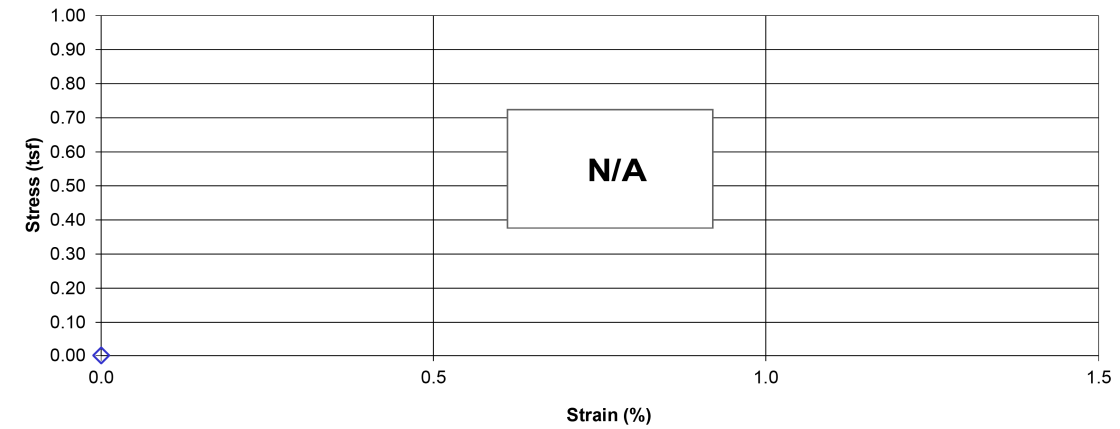
Stress vs. Strain



Comments
 LAB TESTING
 %GR %CS %FS %Silt %Clay LL PL PI WC
 0 1 3 45 51 37 20 17 18

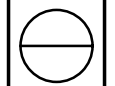
Reviewed By RJ

Stress vs. Strain



Comments
 LAB TESTING
 %GR %CS %FS %Silt %Clay LL PL PI WC
 1 2 12 40 45 31 17 14 17

Reviewed By RJ



Unconfined Compressive Strength of Cohesive Soil ASTM D 2166

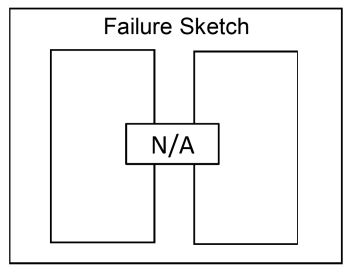
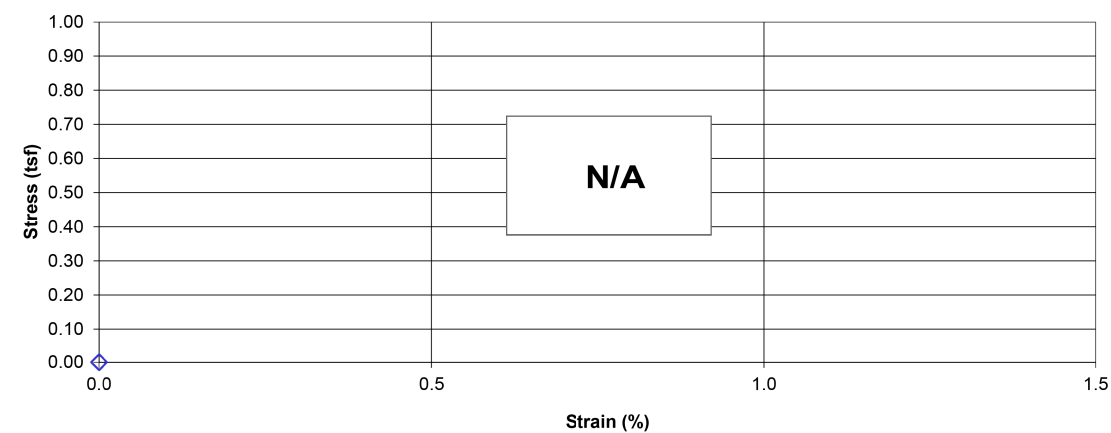
Project Name POR-76 Landslides Project Number 175526004
 Source B-005-0-16, 22.5'-24.5' Lab ID 191B
 Visual Description Lean Clay (CL), brown and gray, moist, firm

Recovered 1.4'
 Test Interval 23.1' - 23.6'

Specimen Type: Undisturbed LL 26 PL 18 PI 8
 Date Extruded 12/21/2016
 Date Tested N/A

Initial Wet Density (pcf) 128.3
 Initial Moisture Content (%) 18.0 Initial MC Taken Before Test, From Trimmings
 Initial Dry Density (pcf) 108.7
 At Test Moisture Content (%) N/A At Test MC Taken N/A
 At Test Dry Density (pcf) N/A
 Specific Gravity N/A
 Degree of Saturation (%) N/A
 Average Height (in) 6.083
 Average Diameter (in) 2.876
 Height to Diameter Ratio 2.1
 Unconfined Compressive Strength (tsf) N/A
 Undrained Shear Strength (tsf) N/A
 Strain at Maximum Stress (%) N/A
 Strain rate to failure (% / min.) N/A

Stress vs. Strain



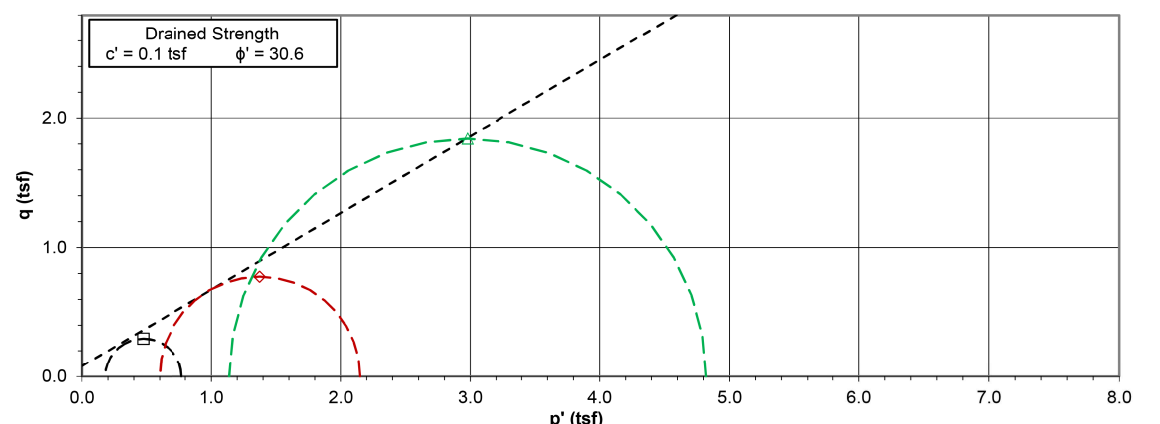
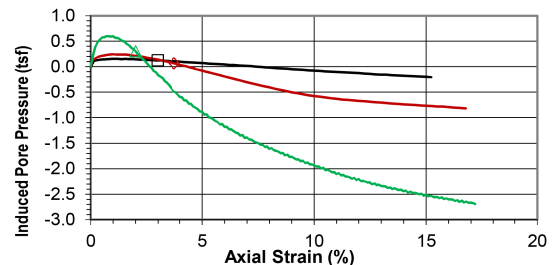
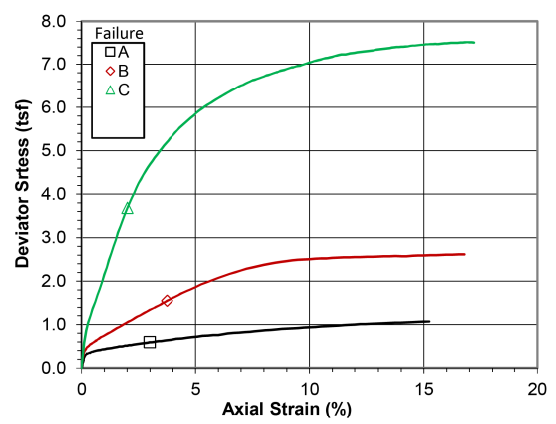
Comments
 LAB TESTING
 %GR %CS %FS %Silt %Clay LL PL PI WC
 1 1 3 65 30 26 18 8 18

Reviewed By RJ

Consolidated Undrained Triaxial Compression ASTM D 4767

Project Name POR-76 Landslides Project 175526004
 Set ID 1

Test	Lab ID	Source	Description	Gs	LL	PL	PI
A	191A	B-005-0-16, 22.5'-23.0'	Lean Clay (CL), brown, moist, firm	2.75	26	18	8
B	21A	B-001-0-16, 30.5'-31.0'	Lean Clay (CL), brown and gray, moist, firm	2.78	31	17	14
C	191B	B-005-0-16, 23.1'-23.6'	Lean Clay (CL), brown and gray, moist, firm	2.75	26	18	8



Comments Specimen A and C classification data from ST-16 (A-4b, GR=1, CS=1, FS=3, SI=65, CL=30)
 Specimen B classification data from ST-21 (A-6a, GR=1, CS=2, FS=12, SI=40, CL=45)

Reviewed By KG

Specimen	Initial Specimen Conditions		
	A	B	C
Average Height (in)	6.063	6.008	6.083
Average Diameter (in)	2.866	2.878	2.876
Moist Unit Weight (pcf)	129.9	130.9	128.3
Moisture Content (%)	19.4	20.0	20.1
Dry Unit Weight (pcf)	108.7	109.1	106.8
Void Ratio	0.576	0.588	0.605
Degree of Saturation (%)	92.9	94.4	91.5
Consolidated Specimen Conditions			
Moist Unit Weight (pcf)	131.8	133.9	130.8
Moisture Content (%)	20.7	19.8	21.6
Dry Unit Weight (pcf)	109.3	111.7	107.6
Void Ratio	0.568	0.550	0.593
Degree of Saturation (%)	100.0	100.0	100.0
Eff. Con. Stress, σ'_3 (tsf)	0.310	0.664	1.439
At Drained Failure			
Failure Criterion	Max. Eff. Prin. Stress Ratio		
Axial Strain (%)	2.985	3.743	2.003
Deviator Stress (tsf)	0.589	1.549	3.681
Induced Pore Press. (tsf)	0.124	0.064	0.300
Minor Eff. Stress, σ'_3 (tsf)	0.180	0.600	1.139
Major Eff. Stress, σ'_1 (tsf)	0.769	2.149	4.820
Eff. Stress Ratio, σ'_1/σ'_3	4.280	3.583	4.231
p' (tsf)	0.474	1.374	2.980
q (tsf)	0.295	0.775	1.840

U:\175527005\POR\103201\Design\Geotechnical\Sheets\103201YD005.dgn Sheet 1/9/2019 4:57:14 PM Mlermings