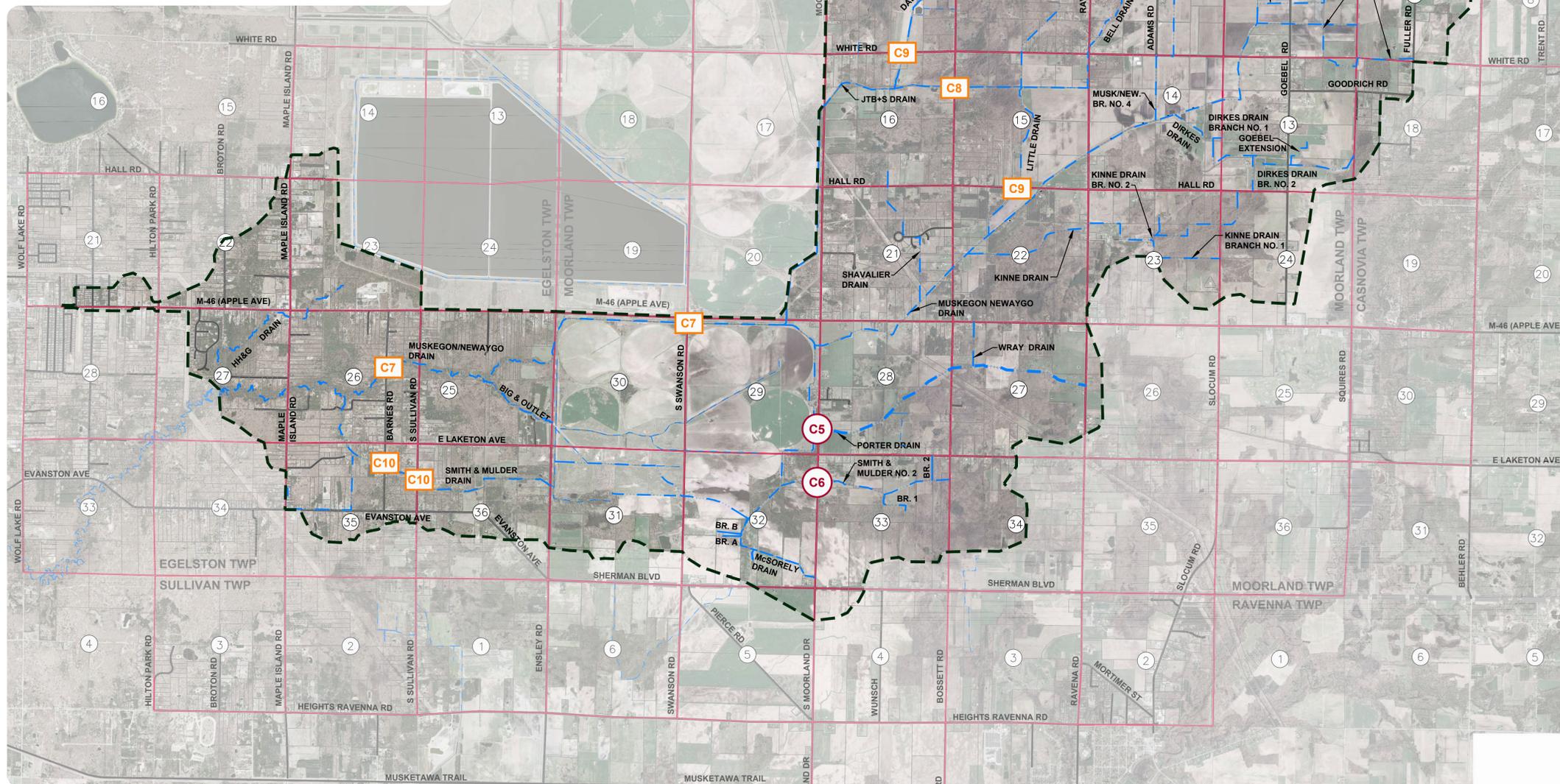
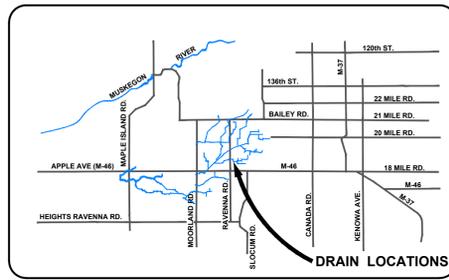




# BLACK CREEK CONSOLIDATED DRAIN-DIVISION II

EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN



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  - C17 - DALEY BRANCH 4 DRAIN (FMRLY) E WHITE RD. CROSSING TRAFFIC DETOUR

**LEGEND**

- ▲ - WELL
- - MONUMENT
- - FOUND IRON STAKE
- - SET IRON STAKE
- - SIGN
- - GUY ANCHOR
- - UTILITY POLE
- - LIGHT POLE
- - POST
- ☒ - MAILBOX
- ⊕ - FIRE HYDRANT
- ⊕ - WATER VALVE
- ⊕ - GAS METER
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- - STEAM UTILITY LINE
- - STORM UTILITY LINE
- - SANITARY UTILITY LINE
- - FIBER OPTIC UTILITY LINE
- - OVERHEAD UTILITY LINE

- ENCLOSED CHANNEL DRAIN
- OPEN CHANNEL DRAIN
- DRAINAGE DISTRICT BOUNDARY
- SECTION LINE
- TOWNSHIP LINE
- ROADS
- PROPERTY LINES
- # SECTION NUMBERS
- XX ENG - SHEET NUMBERS
- C1 LRE - SHEET NUMBERS

**UTILITY CONTACTS**

- CONSUMERS ENERGY  
KURT GOLDING  
MISSDIGDESIGNTICKETS  
@CMSENERGY.COM
- GREAT LAKES ENERGY COOPERATIVE  
KIMBERLY MATELSKI  
(231) 487-1332 (O)  
DISPATCH@GLEENERGY.COM
- MUSKEGON AREA INTERMEDIATE SCHOOL DISTRICT  
KEN LOPEZ  
(616) 393-0138 (O)  
MITICKETS@DIGTRACK.COM
- GAS-DTE GAS TRANSMISSION  
BARBARA SAUNDERS  
(313) 235-5111 (O) &  
GREG BLOSSER  
(313) 235-1080 (O)  
BLOSSER@DTEENERGY.COM
- GAS-AMERIGAS  
CHAD KROUSE  
(231) 638-3183 (O)  
CHAD.KROUSE@AMERIGAS.COM
- MUSKEGON COUNTY WASTEWATER  
STEVE BARNARD  
(231) 724-3441 (O)  
MISSDIG@CO.MUSKEGON.MI.US
- FRONTIER/VERIZON  
KATHRYN ANDERSON  
(810) 724-3127 (O)  
MI.MISSDIG.FACILITIES.  
DESIGN.REQUEST@FTR.COM
- WINDSTREAM COMMUNICATIONS  
(800) 289-1901 (O)  
LOCATE.DESK@WINDSTREAM.COM

ALL UTILITIES AS SHOWN ARE APPROXIMATE LOCATIONS DERIVED FROM ACTUAL MEASUREMENTS AND AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATION NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THE AREA.

2121 S. MICH. RD. NW  
WALKER, MI 49544  
PH. 616.301.7888  
WWW.LRE.MI.COM

LRE  
ENGINEERS & SURVEYORS

4063 Grand Oak Drive Suite 4109  
Lansing, MI 48911  
917.887.1100  
18901 Robbins Road Suite 105  
Grand Haven, MI 49427  
eng@engmi.com

Eng  
Engineering & Surveying

CLIENT: MUSKEGON COUNTY DRAIN COMMISSIONER  
141 E APPLE AVE, MUSKEGON, MI 49842

PROJECT: BLACK CREEK CONSOLIDATED DRAIN - DIVISION II  
EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS

REVISIONS	NO.	ISSUED FOR	DATE
	1.	EX. COND. SURVEY	DEC. 2017
	2.	PRELIMINARY PLANS	AUG. 2019
	3.	BID	JUNE 2020

PROJECT NUMBER	DATE
17-038	JUNE 2020
18-038	JUNE 2020
19-038	JUNE 2020
20-038	JUNE 2020
21-038	JUNE 2020
22-038	JUNE 2020
23-038	JUNE 2020
24-038	JUNE 2020
25-038	JUNE 2020
26-038	JUNE 2020
27-038	JUNE 2020
28-038	JUNE 2020
29-038	JUNE 2020
30-038	JUNE 2020
31-038	JUNE 2020
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39-038	JUNE 2020
40-038	JUNE 2020
41-038	JUNE 2020
42-038	JUNE 2020
43-038	JUNE 2020
44-038	JUNE 2020
45-038	JUNE 2020
46-038	JUNE 2020
47-038	JUNE 2020
48-038	JUNE 2020
49-038	JUNE 2020
50-038	JUNE 2020

COVER SHEET

CS

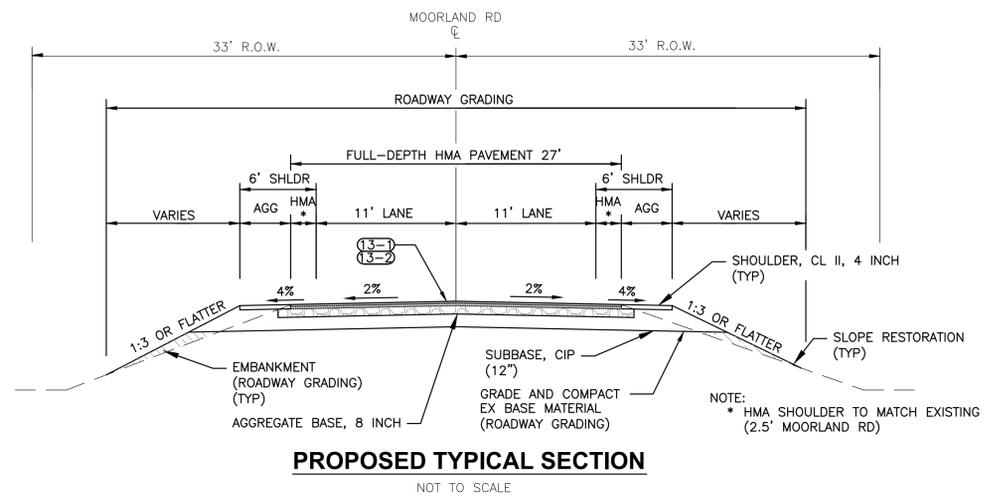
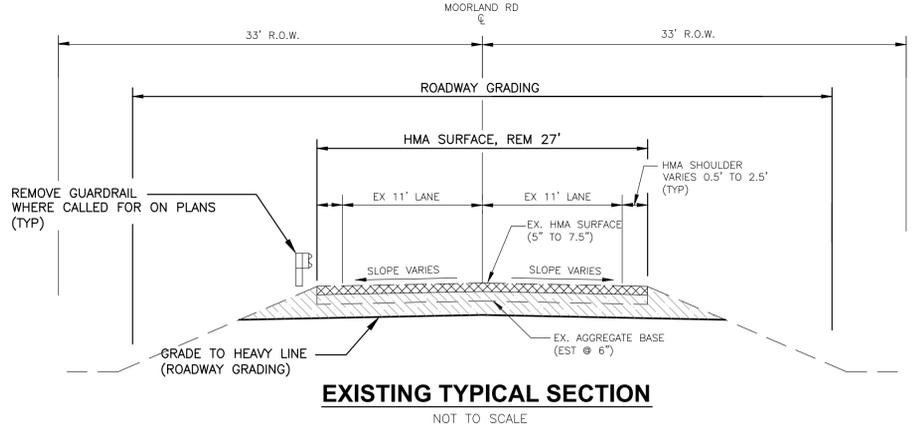
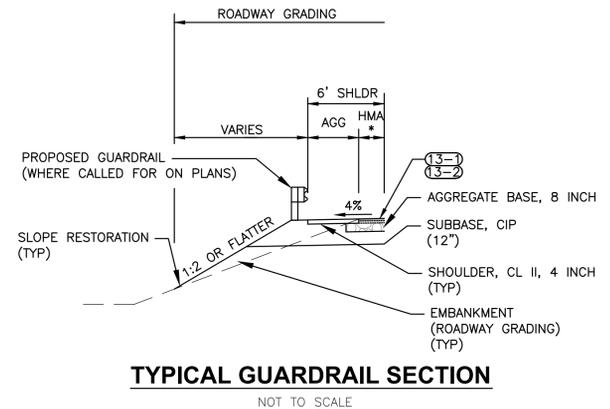
REVISIONS:	NO.	DATE	ISSUED FOR
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	2.	AUG. 2019	PRELIMINARY PLANS
	3.	JUNE 2020	BID

CLIENT: MUSKOGON COUNTY DRAIN COMMISSIONER  
141 E. APPLE AVE, MUSKOGON, MI 49842  
PROJECT: BLACK CREEK CONSOLIDATED DRAIN - DIVISION II  
EGEGSON, MOORLAND, RAVERANA & CASNOVIA TOWNSHIPS

PROJECT NUMBER:	DATE
17-008	SEPT. 2017
	AUG. 2019
	JUN. 2020
	JUNE 2020

SURVEYED BY: CF JS  
DESIGNED BY: ANS/KAP  
DRAFTED BY: NDJ  
CACC/DJF

TYPICALS  
SHEET NUMBER  
**C1**



IDENT NO.	ITEM	RATE PER SYD	PERFORMANCE GRADE	REMARKS
13-1	HMA, 13A	220 LBS	58-28	TOP COURSE (2") AWI=260
13-2	HMA, 13A	220 LBS	58-28	LEVELING COURSE (2")
	* BOND COAT	.08-.12 GAL		

3 WORKING DAYS  
**BEFORE YOU DIG  
CALL MISS DIG**  
1-800-482-7171

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REVISIONS:	NO.	DATE	ISSUED FOR
1.	EX COND. SURVEY	DEC. 2017	
2.	PRELIMINARY PLANS	AUG. 2019	
3.	BID	JUNE 2020	

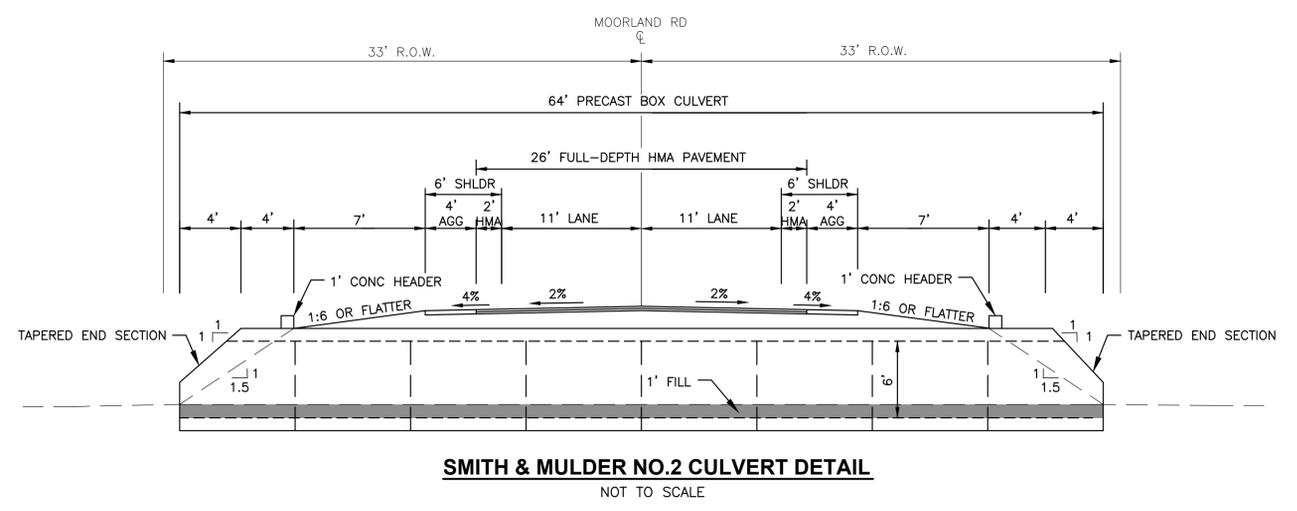
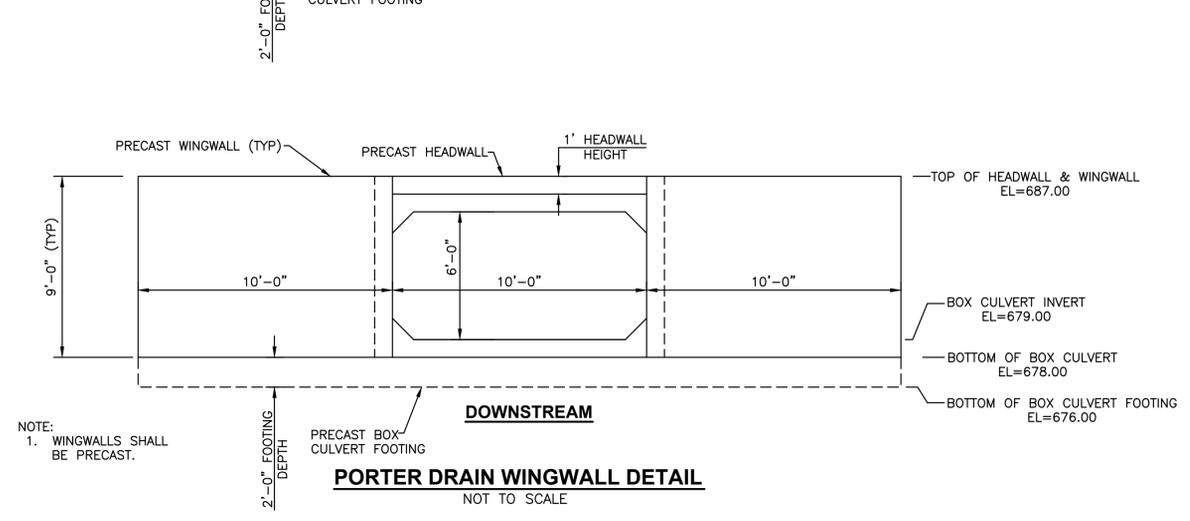
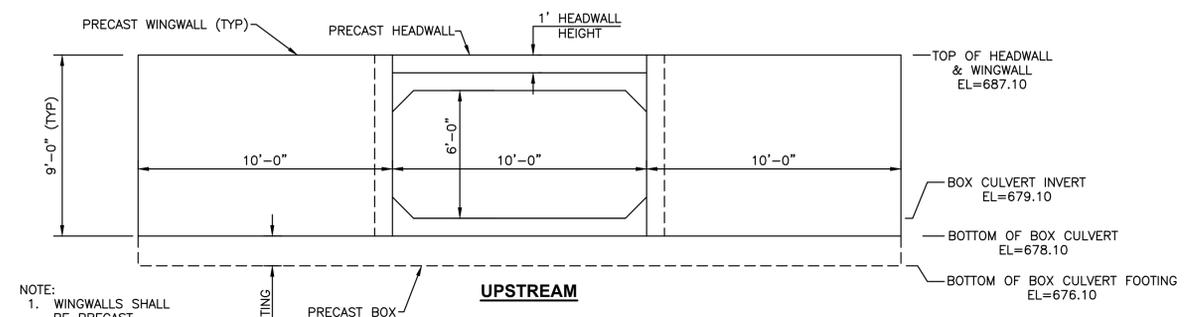
**MUSKOGON COUNTY DRAIN COMMISSIONER**  
141 E APPLE AVE, MUSKOGON, MI 49842  
**BLACK CREEK CONSOLIDATED DRAIN - DIVISION II**  
EGEESON, MOORLAND, RAVERANA & CASNOVIA TOWNSHIPS

DATE	PROJECT
SEPT. 2017	MUSKOGON COUNTY DRAIN COMMISSIONER
AUG. 2019	BLACK CREEK CONSOLIDATED DRAIN - DIVISION II
JUN. 2020	
JUNE 2020	

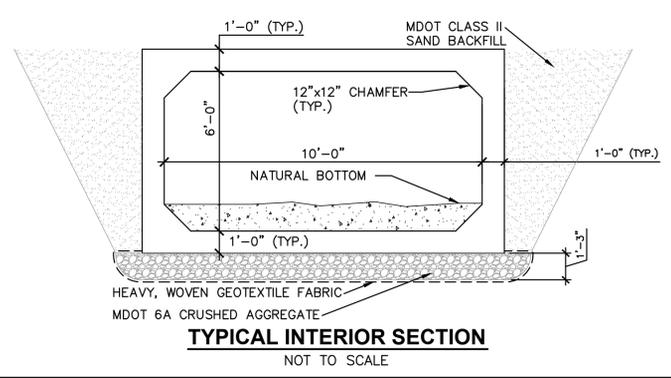
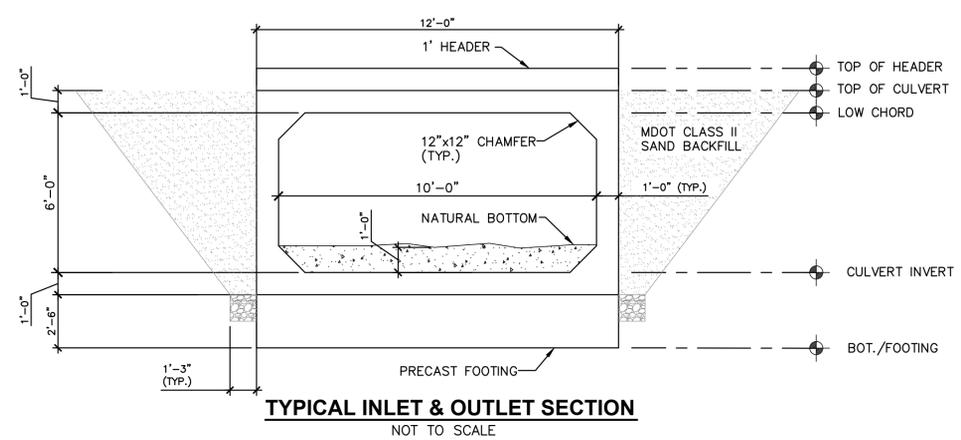
PROJECT NUMBER: 17-008  
SURVEYED BY: CF JS  
DESIGNED BY: AWS/KAP  
DRAFTED BY: NDJ  
CACC/DJF

**MOORLAND RD. BOX CULVERT DETAILS**

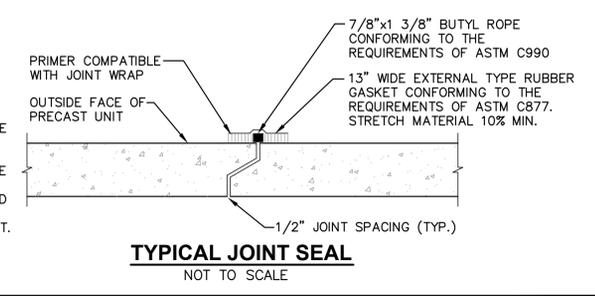
SHEET NUMBER  
**C2**



- NOTES**
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITY LOCATIONS AND ELEVATIONS PRIOR TO REMOVAL OF EXISTING CROSSING TO ENSURE A CONFLICT DOES NOT EXIST WITH PROPOSED CULVERT AND WINGWALLS. ALL COSTS TO BE INCLUDED IN COST FOR PROPOSED CROSSING.
  - PROTECT AND MAINTAIN SERVICE OF OTHER UTILITIES AT CROSSINGS.
  - CONTRACTOR TO GRADE EDGE OF ROAD AS SHOWN ON PLANS WITHIN LIMITS OF PROPOSED GUARD RAIL. ALL COSTS TO BE INCLUDED IN UNIT BID PRICE FOR BOX CULVERT, HEADWALLS/WINGWALLS, AND GUARD RAILS.
  - GUARD RAIL SHALL BE SPACED AND ANCHORED TO BOX CULVERT PER MDOT STANDARD R-73-F. POST SHALL BE 8 FEET IN LENGTH WHEN LOCATED ON OR PAST SHOULDER HINGE POINT.
  - CONTRACTOR TO REMOVE EXISTING GUARD RAIL AT DRAIN CROSSINGS AS NECESSARY TO PERFORM PROPOSED WORK. UNDAMAGED COMPONENTS OF THE EXISTING GUARD RAIL SYSTEM MAY BE REUSED. ALL DAMAGED COMPONENTS OF EXISTING GUARD RAIL WHERE CROSSING IS BEING REPLACED SHALL BE REPLACED WITH NEW GUARD RAIL WHETHER THEY ARE DAMAGED PRIOR TO OR DURING CONSTRUCTION. ALL GUARD RAIL COMPONENTS THAT ARE NO LONGER USABLE FOR THE PROPOSED CULVERT CONFIGURATION ARE TO BE REPLACED. ALL GUARD RAIL COMPONENTS NOT BEING REUSED ARE TO BE DISPOSED OF BY CONTRACTOR. ALL COSTS INCLUDED IN LUMP SUM BID ITEMS FOR GUARD RAILS AT EACH CROSSING.
  - BOX CULVERT SECTIONS TO BE MANUFACTURED TO MDOT 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION, SECTION 406.03, W/HL-93 MODIFIED LOADING AND 18" OF COVER. THE DESIGN WILL MEET ALL OTHER APPLICABLE ASTM C-1577 SPECIFICATIONS.
  - JOINTS TO BE SEALED W/11 2" EZ-STIK, EXTERIOR TREATED W/MASTIC AND COVERED W/36" WIDE FILTER FABRIC PER MDOT 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION, SECTION 406.03.G.2.
  - INSTALL BOX CULVERT JOINT TIE ASSEMBLIES PER MDOT SPECIAL PROVISION.
  - MDOT CL II SAND BACKFILL TO BE USED ON BOX CULVERT. SAND PLACED BETWEEN TOP OF BOX CULVERT TO BOTTOM OF 12" SUBBASE PER PAVEMENT SECTION DETAIL TO BE INCLUDED IN PRICE OF THE BOX CULVERT.
  - GUARDRAIL TO BE INSTALLED BY MDOT PRE-QUALIFIED GUARDRAIL CONTRACTOR.
  - ALL EXCESS SPOILS FROM CULVERT INSTALLATION SHALL BE HAULED OFFSITE. COST TO BE INCLUDED IN BID PRICE FOR CULVERT.



NOTE:  
THE BOX CULVERT SECTIONS SHALL HAVE BELL AND SPIGOT JOINTS. THE CONTRACTOR SHALL INCLUDE A JOINT DETAIL ON THE SHOP DRAWINGS TO BE APPROVED BY THE ENGINEER. THE EXTERNAL TYPE RUBBER GASKET SHALL BE COVERED WITH A 2' STRIP ON GEOTEXTILE BLANKET CENTERED OVER THE JOINT.



**GENERAL NOTES**

- ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL CODES, RULES AND REGULATIONS. OBTAIN ALL NECESSARY LOCAL, STATE AND FEDERAL PERMITS AND PAY PERMIT FEES FOR THE WORK OR CONFIRM REQUIRED PERMITS HAVE BEEN OBTAINED BY OTHERS PRIOR TO COMMENCING CONSTRUCTION.
- BE RESPONSIBLE AT ALL TIMES FOR SITE SAFETY IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE MICHIGAN OCCUPATIONAL HEALTH AND SAFETY AUTHORITY HAVING JURISDICTION.
- COMPLY WITH THE CONDITIONS AND REQUIREMENTS OF THE SOIL EROSION AND SEDIMENTATION CONTROL PART 91, INCLUDING BUT NOT LIMITED TO, CERTIFIED STORMWATER OPERATOR REQUIREMENTS. INSTALL ALL CONTROL MEASURES PRIOR TO COMMENCING CONSTRUCTION.
- PROVIDE TRAFFIC CONTROL BARRICADES, SIGNS, LIGHTS, ETC. IN ACCORDANCE WITH THE LATEST EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC. MAINTAIN THESE DEVICES AT ALL TIMES DURING CONSTRUCTION. SIGNS SHALL BE IN PLACE PRIOR TO STARTING WORK.
- MAINTAIN A CLEAN WORK AREA. THOROUGHLY CLAN AND/OR SWEEP STREETS AND ROADWAYS AS REQUIRED BY THE GOVERNING AUTHORITY.
- MAINTAIN ACCESS TO EXISTING DRIVEWAYS AND MAILBOXES DURING CONSTRUCTION. COORDINATE WITH THE AUTHORITIES HAVING JURISDICTION. CONDUCT OPERATION TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. ANY CLOSURE REQUIRES PERMISSION FROM THE AUTHORITIES HAVING JURISDICTION.
- RESTORE ALL DISTURBED AREAS NOT COVERED BY OTHER SURFACE TREATMENT PER THE SLOPE RESTORATION SPECIAL PROVISION
- PROTECT EXISTING SITE IMPROVEMENTS TO REMAIN FROM DAMAGE. RESTORE/REPLACE DAMAGED IMPROVEMENTS TO ORIGINAL CONDITION ACCEPTABLE TO PARTIES HAVING JURISDICTION.
- PROTECT TREES TO REMAIN FROM DAMAGE DURING CONSTRUCTION.
- REFER PLAN SCALE DISCREPANCIES TO THE ENGINEER FOR CLARIFICATION.
- THE INFORMATION CONTAINED ON THESE DRAWINGS PERTAINING TO EXISTING CONDITIONS, SUCH AS BUT NOT LIMITED TO, UTILITIES, TOPOGRAPHY, SUBSURFACE CONDITIONS, IS FURNISHED SOLELY AS THE BEST INFORMATION AVAILABLE AND ITS ACCURACY IS NOT GUARANTEED. THE USE OF THIS INFORMATION DOES NOT PROVIDE RELIEF FOR ANY RESPONSIBILITY FOR DAMAGES DUE TO ANY INACCURACIES.
- ALL REMOVED MATERIALS ARE THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE NOTED. CLEANUP AND DISPOSE OF ALL EXCESS MATERIALS OFF SITE AT A LOCATION DESIGNATED FOR USE AND IN ACCORDANCE WITH LOCAL REGULATIONS OR AT AN ONSITE LOCATION DESIGNATED BY THE OWNER.

**MDOT GENERAL NOTES**

UTILITIES

MISS DIG/UNDERGROUND UTILITY NOTIFICATION FOR THE PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174 OF 2013, THE CONTRACTOR SHALL CONTACT MISS DIG SYSTEM, INC. BY PHONE AT 811 OR 800-482-7171 OR VIA THE WEB AT EITHER ELOCATE.MISSDIG.ORG FOR SINGLE ADDRESS OR RTE.MISSDIG.ORG, A MINIMUM OF 3 BUSINESS DAYS PRIOR TO EXCAVATING, EXCLUDING WEEKENDS AND HOLIDAYS.

OUT OF SERVICE UTILITIES IF PLAN INFORMATION INDICATES AN EXISTING UNDERGROUND UTILITY IS OR WILL BE OUT OF SERVICE WITHIN THE LIMITS OF THIS CONTRACT, THE CONTRACTOR IS CAUTIONED TO TREAT SUCH A LINE AS IF IT WERE STILL IN SERVICE AND NOTIFY "MISS DIG" WHEN WORKING IN THE AREA OF THE OUT OF SERVICE FACILITY.

EXISTING WATER MAINS AND SEWERS THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PROPERLY IDENTIFIED EXISTING WATER MAINS AND/OR EXISTING SEWERS DURING THE CONSTRUCTION OF THIS PROJECT.

ROW / REAL ESTATE

PROPERTY OWNERS PROPERTY OWNER'S NAMES, WHERE SHOWN, ARE FOR INFORMATION ONLY, AND THEIR ACCURACY IS NOT GUARANTEED.

LAWN SPRINKLER SYSTEMS AND LANDSCAPING OWNERS OF EXISTING LAWN SPRINKLER SYSTEMS AND/OR LANDSCAPING SHALL BE NOTIFIED (IN WRITING WITH A COPY SENT TO THE ENGINEER) BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF ANY WORK TO BE DONE THAT WILL AFFECT THOSE SYSTEMS AND/OR LANDSCAPING. IF THE PROPERTY OWNER FAILS TO RELOCATE THE LAWN SPRINKLER SYSTEM PRIOR TO THE CONTRACTOR BEGINNING WORK, AND IF THE CONTRACTOR CUTS THE SYSTEM DURING THE CONSTRUCTION, THE CONTRACTOR SHALL CAP THE SYSTEM PIPE AND WITNESS THE LOCATION OF THE CAP WITH A WOODEN STAKE FOR THE PROPERTY OWNER'S USE. THE CONTRACTOR SHALL PLACE THE SALVAGED SPRINKLER HEADS ON THE PROPERTY OWNER'S PROPERTY. IF THE PROPERTY OWNER FAILS TO RELOCATE THE LANDSCAPING PRIOR TO THE CONTRACTOR BEGINNING WORK, THE CONTRACTOR SHALL CAREFULLY SALVAGE THE LANDSCAPING ITEMS AND STOCKPILE THEM ON THE PROPERTY OWNER'S PROPERTY FOR THE PROPERTY OWNER. ANY OTHER MODIFICATION TO THE LAWN SPRINKLER SYSTEMS AND/OR LANDSCAPING IS THE RESPONSIBILITY OF THE OWNER AND IS NOT PART OF THIS CONTRACT. THIS WORK IS INCLUDED IN OTHER ITEMS OF THE PROJECT.

SURVEY

ADJUSTING MONUMENT BOXES ALL GOVERNMENT CORNERS ON THIS PROJECT SHALL BE PRESERVED, WHETHER SHOWN OR NOT. IT MAY BE NECESSARY TO PLACE OR ADJUST MONUMENT BOXES, AS REQUIRED.

EARTHWORK

EARTHWORK QUANTITIES ARE COMPUTED BY THE AVERAGE END AREA METHOD BASED UPON GROUND SURVEY INFORMATION.

SLOPES CLASS A SLOPES SHALL BE CONSTRUCTED ON THIS PROJECT.

EARTH DISTURBANCE LIMITS THE EARTH DISTURBANCE LIMIT FOR THIS PROJECT WILL BE LIMITED TO 10' BEYOND THE SLOPE STAKE LINE OR TO THE ROW LINE WHICHEVER IS LESS FOR ALL AREAS EXCEPT FOR WETLAND AREAS. FOR AREAS ADJACENT TO WETLANDS, THE EARTH DISTURBANCE LIMIT WILL BE LIMITED TO THE SLOPE STAKE LINE. RESTORATION MEASURES HAVE BEEN INCLUDED IN THIS SET OF PLANS FOR THE APPROVED AREAS OF DISTURBANCE. THE CONTRACTOR SHALL SUBMIT AN EARTH CHANGE PLAN FOR ANY WORK BEYOND THE APPROVED LIMITS TO THE ENGINEER TO REVIEW FOR APPROVAL PRIOR TO THE DISTURBANCE. ALL COSTS FOR OBTAINING AND EXECUTING AN APPROVED EARTH CHANGE PLAN, INCLUDING RESTORATION, SHALL BE AT THE CONTRACTOR'S EXPENSE.

SOIL EROSION MEASURES APPROPRIATE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTH-DISTURBING ACTIVITIES. PLACE TURF ESTABLISHMENT ITEMS AS SOON AS POSSIBLE ON POTENTIAL ERODABLE SLOPES AS DIRECTED BY THE ENGINEER. CRITICAL DITCH GRADES SHALL BE PROTECTED WITH EITHER SOD OR SEED/MULCH OR MULCH BLANKET AS DIRECTED BY THE ENGINEER.

BASES

AGGREGATE BASE AGGREGATE BASES SHALL USE AGGREGATE 21AA, UNLESS OTHERWISE SPECIFIED.

DRAINAGE

ILLICIT CONNECTIONS TO STORM WATER SYSTEM CONNECTIONS TO EXISTING STORM CONVEYANCE SYSTEMS NOT SHOWN ON THE PLANS MUST BE RECONNECTED WITH MINIMAL INTERRUPTION IN SERVICE. SIZE, TYPE AND LOCATION BY STATION AND OFFSET AND ANY SUSPECT ILLICIT DISCHARGE OBSERVED SHALL BE REPORTED TO THE ENGINEER PRIOR TO RECONNECTING. CONTRACTOR SHALL PROCEED AS DIRECTED BY THE ENGINEER.

PAVEMENT

SOIL BORINGS AND/OR PAVEMENT CORES THE SOIL BORING LOGS AND/OR PAVEMENT CORES REPRESENT POINT INFORMATION. NO INFERENCE SHOULD BE MADE THAT SUBSURFACE OR PAVEMENT CONDITIONS ARE THE SAME AT OTHER LOCATIONS.

SLOPE RESTORATION

SEEDING MIX SEEDING MIX FOR RESTORATION SHALL BE MDOT TYPE TDS.

MULCH BLANKET MULCH BLANKET FOR RESTORATION SHALL BE COCONUT & JUTE: NORTH AMERICAN GREEN C-125BN.

**MISCELLANEOUS QUANTITIES**

THE FOLLOWING ITEMS OF WORK SHALL BE DONE AS THEY APPLY THROUGHOUT THE PROJECT. THESE ITEMS ARE NOT DETAILED OR INCLUDED ON THE PLAN AND PROFILE SHEETS.

ITEMS FOR PROJECT

1	LS	Mobilization, Max. 10%
1	LS	Project Cleanup

ITEMS FOR CONSTRUCTION ZONE TRAFFIC

1	LS	Maintaining Traffic, Division II
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**NOTES APPLYING TO MDOT STANDARD PLANS**

WHERE THE FOLLOWING ITEMS ARE CALLED FOR ON PLANS, THEY ARE TO BE CONSTRUCTED ACCORDING TO THE MDOT STANDARD PLAN GIVEN BELOW OPPOSITE EACH ITEM UNLESS OTHERWISE INDICATED.

TITLE	ROAD	PLAN NO.
GUARDRAIL TYPES A, B, BD, T, TD, MGS-8, & MGS-8D		R-60-J*
BEDDING AND FILLING AROUND PIPE CULVERTS		R-82-D
UTILITY TRENCHES		R-83-C
BOX CULVERT JOINT TIE ASSEMBLIES		R-84-A
PRECAST CONCRETE END SECTION FOR PIPE CULVERT		R-86-F
STEEL END SECTION		R-88-D
SOIL EROSION & SEDIMENTATION CONTROL MEASURES		R-96-E
SEEDING AND TREE PLANTING		R-100-H
GRADING CROSS-SECTIONS		R-105-D
<b>WORK ZONE DEVICES</b>		
GROUND DRIVEN SIGN SUPPORTS FOR TEMP SIGNS		WZD-100-A
TEMPORARY TRAFFIC CONTROL DEVICES		WZD-125-E

\* DENOTES SPECIAL DETAIL

**LEGEND**

- ▲ - WELL
- ⊙ - HIGHWAY
- - MONUMENT
- - FOUND IRON STAKE
- - SET IRON STAKE
- | — - SIGN
- RR - RR SIGN
- | — - GUY POLE
- | — - GUY ANCHOR
- | — - UTILITY POLE
- ★ - LIGHT POLE
- - POST
- ⊙ - SOIL BORING
- ⊙ - U.G. UTILITY MARKER
- MB - MAILBOX
- AC - AC UNIT
- ⊕ - FIRE HYDRANT
- ⊕ - WATER VALVE
- TR - ELECTRIC TRANSFORMER
- G - GAS METER
- W - WATER METER
- T - TELEPHONE RISER
- E - ELECTRIC METER
- C - CATCH BASIN
- ⊕ - ROUND CATCH BASIN
- ⊕ - UTILITY MANHOLE
- ⊕ - STORM MANHOLE
- ⊕ - SANITARY MANHOLE
- ⊕ - ELECTRIC MANHOLE
- ⊕ - TELEPHONE MANHOLE
- ⊕ - DECIDUOUS TREE
- ⊕ - CONIFEROUS TREE
- — — — — WATER UTILITY LINE
- — — — — TELEPHONE UTILITY LINE
- — — — — ELECTRIC UTILITY LINE
- — — — — GAS UTILITY LINE
- — — — — STEAM UTILITY LINE
- — — — — STORM UTILITY LINE
- — — — — SANITARY UTILITY LINE
- — — — — FIBER OPTIC UTILITY LINE
- — — — — OVERHEAD UTILITY LINE
- — — — — MINOR CONTOURS
- — — — — MAJOR CONTOURS
- — — — — BITUMINOUS VALLEY GUTTER
- — — — — EXISTING CONTOURS
- CX - SHEET NUMBERS

**TYPICALS LEGEND**

- [Pattern] - HMA SURFACE, REM
- [Pattern] - ROADWAY GRADING
- [Pattern] - HMA PAVEMENT
- [Pattern] - AGGREGATE MATERIAL

**PROPOSED PAVEMENT LEGEND**

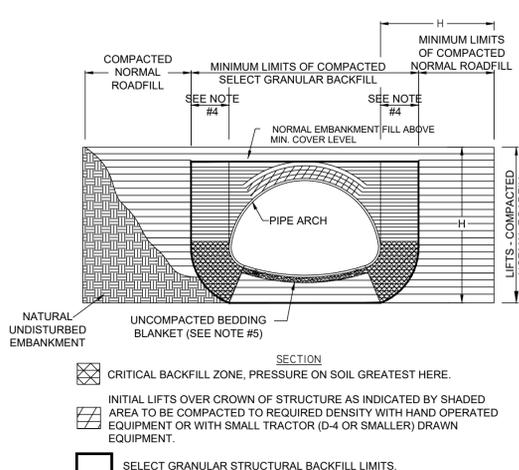
- [Pattern] - FULL DEPTH HMA PAVEMENT REMOVAL AND REPLACEMENT

2121 3 Mile Rd. NW  
 Walker, MI 49544  
 Ph: 616-301-7888  
 www.LREMI.com  
**LRE**  
 ENGINEERS & SURVEYORS  
 REVISIONS:  
 NO. DATE  
 1. EX COND. SURVEY DEC. 2017  
 2. PRELIMINARY PLANS AUG. 2019  
 3. BID JUNE 2020  
 CLIENT: MUSKOGON COUNTY DRAIN COMMISSIONER  
 141 E APPLE AVE, MUSKOGON, MI 49842  
 PROJECT: BLACK CREEK CONSOLIDATED DRAIN - DIVISION II  
 EGEESON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
 PROJECT NUMBER: 17-008  
 SURVEYED BY: CF JS  
 DESIGNED BY: ANS/KAP  
 DRAFTED BY: NDJ  
 CACC/DJF  
 SHEET NUMBER: C3



3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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**NOTES:**

- ALL SELECT GRANULAR BACKFILL TO BE PLACED IN A BALANCED FASHION IN THIN LIFTS (6"-8" LOOSE TYPICALLY) AND COMPACTED TO 90 PERCENT DENSITY PER AASHTO T-160.
- COMPLETE AND REGULAR MONITORING OF THE CSP ARCH SHAPE IS NECESSARY DURING ALL BACKFILLING OF THE STRUCTURE.
- PREVENT EXCESSIVE DISTORTION OF SHAPE AS NECESSARY BY VARYING COMPACTION METHODS AND EQUIPMENT.
- THIS WIDTH SHOULD BE EQUAL TO 1/2 SPAN TO ONE SPAN WIDTH TYPICALLY. GREATER OR LESSER DISTANCE MAY BE REQUIRED. DISTANCE DEPENDS ON BEARING LOAD FOR ANY GIVEN LOADING, STRUCTURE SHAPE AND BACKFILL MATERIAL. THIS MUST BE EVALUATED BY THE PROJECT ENGINEER FOR EACH SPECIFIC SITUATION.
- SHAPED BED FOR A MINIMUM WIDTH OF SPAN/2. MINIMUM BEDDING THICKNESS IS TWICE THE CORRUGATION DEPTH.
- EMBANKMENT WIDTH H TO BE SUCH THAT A STABLE EMBANKMENT CAPABLE OF RESISTING SIDE PRESSURES FROM CSP PIPE-ARCH SHAPE WILL BE MAINTAINED THROUGHOUT THE LIFE OF INSTALLATION. THIS WIDTH TO BE DETERMINED BY THE PROJECT ENGINEER.

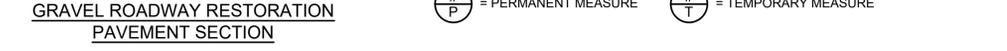


**CONTECH**  
CONSTRUCTION PRODUCTS INC.  
DRAWN BY: CMD REV. BY: XX SCALE: N/A  
DATE: 4/20/04 DATE: XX 1

**APPROXIMATE CONSTRUCTION SCHEDULE FOR SESC MEASURES**

SESC - CONSTRUCTION SEQUENCE	JUNE 2022	JULY 2022	AUG 2022	SEP 2022
<b>INSTALL TEMPORARY SESC MEASURES:</b>				
A. STABILIZED CONSTRUCTION ACCESSES	■			
B. CONSTRUCTION PROTECTION FENCE	■			
C. CHECK DAM	■			
D. SEEDING		■		
<b>MAINTAIN TEMPORARY SESC MEASURES</b>			■	■
SITE GRADING & REMOVALS			■	■
CULVERT CONSTRUCTION			■	■
PAVEMENT CONSTRUCTION			■	■
FINAL GRADE			■	■
FINAL SITE STABILIZATION (TO BE COMPLETED WITHIN 24 HOURS OF FINAL GRADING OR ACTIVITY WITHIN THAT AREA)			■	■
REMOVE TEMPORARY SESC MEASURES			■	■
PERMANENT SESC MEASURES			■	■

Ⓟ = PERMANENT MEASURE Ⓡ = TEMPORARY MEASURE

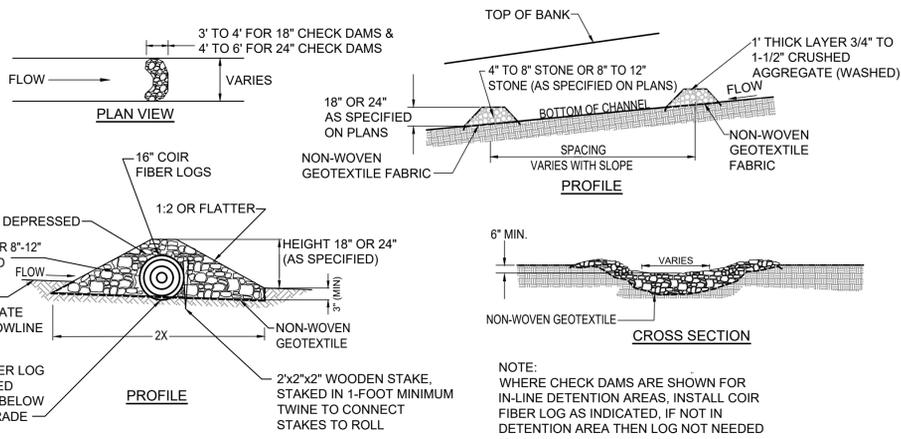


**CONSTRUCTION & SOIL EROSION AND SEDIMENTATION CONTROL NOTES:**

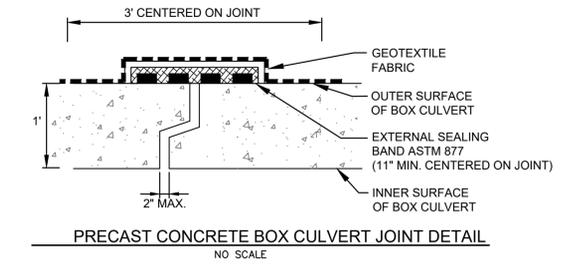
- ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE BEFORE CONSTRUCTION BEGINS. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING ALL MEASURES AT LEAST ONCE EACH WEEK AND/OR WITHIN 24 HOURS OF A PRECIPITATION EVENT THAT RESULTS IN STORM WATER RUNOFF OR DISCHARGE.
- SURFACE RESTORATION OF ALL SEWER TRENCHES IN LAWN AREAS SHALL BE TOP SOILED, SEEDED, AND MULCHED WITHIN 5 CALENDAR DAYS OF BACKFILLING THE TRENCH.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND SHALL PROVIDE ALL EQUIPMENT AND MATERIAL NECESSARY TO KEEP DUST IN CHECK AT ALL TIMES. THE CONTRACTOR SHALL RESPOND IMMEDIATELY TO ANY AND ALL COMPLAINTS. STREETS, PARKING LOTS, DRIVEWAYS, PAVED ACCESS ROADS, AND ALL OTHER PAVED SURFACES SHALL BE SWEEPED AT LEAST ONCE A DAY AND/OR AS NEEDED THROUGHOUT THE DAY.
- MULCH AND/OR MULCH BLANKET SHALL BE APPLIED AND ANCHORED APPROPRIATELY ON ALL SLOPES 3:1 OR GREATER ON ALL SLOPES DEEMED NECESSARY TO PREVENT OR CORRECT EROSION PROBLEMS AND ON ALL DISTURBED AREA DUE TO CONSTRUCTION.
- ALL TEMPORARY SOIL EROSION MEASURES SHALL BE REMOVED AFTER PERMANENT MEASURES HAVE BEEN ESTABLISHED.
- ALL CONSTRUCTION SHALL BE CONFINED TO AREAS OF DISTURBANCE WITHIN THE ROAD RIGHT OF WAY AND/OR WITHIN STORM SEWER EASEMENTS. NO WORK, MATERIAL, OR STOCKPILES WILL BE ALLOWED OUTSIDE OF THESE LIMITS.
- ALL TRENCHES SHALL BE BACKFILLED TO GRADE OR PROPERLY PROTECTED IN ACCORDANCE WITH PROJECT PLANS & SPECIFICATIONS AT THE END OF EVERY DAY. AT NO TIME SHALL A TRENCH BE LEFT OPEN FOR A PERIOD LONGER THAN 48 HOURS.
- UNLESS SPECIFICALLY NOTED OTHERWISE, ALL UTILITY TRENCHES SHALL CONFORM TO TYPICAL TRENCH DETAIL. SEE SHEET 3 OF 4
- PROTECT ALL TREES AND VEGETATION NOT SCHEDULED TO BE REMOVED. ENGINEER APPROVAL IS REQUIRED FOR ANY UNSCHEDULED REMOVAL OF TREES, SHRUBS OR LANDSCAPING.
- EROSION AND SEDIMENTATION FROM WORK ON THIS PROJECT SHALL BE CONTAINED WITHIN THE WORK AREA AND NOT ALLOWED TO COLLECT ON OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
- SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT-UP SEDIMENT. CONTRACTORS SHALL BE RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILT FENCE SHOULD IT FAIL OR BECOME DAMAGED DURING THE CONSTRUCTION.
- INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. IF INLET FILTERS CANNOT BE CLEANED, OR ARE DAMAGED, THEN THE FILTER AND/OR STONE SHALL BE REPLACED.

**SESC Notes**

- General Maintenance**
- Temporary SESC measures to be maintained by the contractor at all times.
  - Silt fence**
    - Silt fence is to be trenched in no less than 6 inches below the ground surface
    - Inspect silt fence immediately following each rainfall
    - Repair when silt fence is sagging or has been removed from ground
    - When silt collects to half the height of the fence all silt is to be removed and fence repaired
    - Remove silt fence when permanent SESC measures are in place and vegetation is established
  - Seeding and Mulching**
    - Seeding practices include topsoil (as required), and mulch or mulch blanket (as directed by Engineer or required on plans)
    - Where necessary, appropriate mulch blanket must be applied based on slope and growing conditions as approved by the engineer.
    - All slopes and highly erosive areas will be temporarily seeded and mulched when construction activity is not taking place
    - Seed and mulch is to be inspected following each rain event to determine if concentrated flows are present
    - In the event that seed and mulch are removed by erosive runoff, repairs are to be made immediately.
    - Site will be permanently stabilized within 5 days of final grade
  - Storm drain inlet protection**
    - Storm drain inlets to be inspected weekly and after each rain event.
    - Empty sediment and keep inlet protection clean during inspection and maintenance operations.
  - Compliance with Part 91 of PA 481**
    - Respond immediately to stormwater operator and/or soil erosion and sedimentation control inspector concerns. Make corrective measures as Required
  - Continued Maintenance Plan**
    - Stormwater operator/APA owner or maintenance supervisor will inspect monthly through the first growing season. Non established vegetation will be repaired/reseeded as necessary

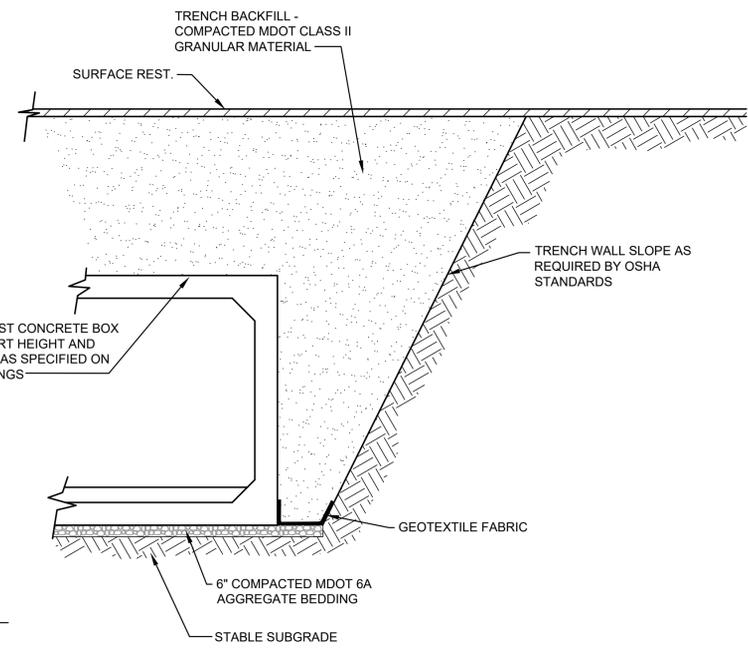
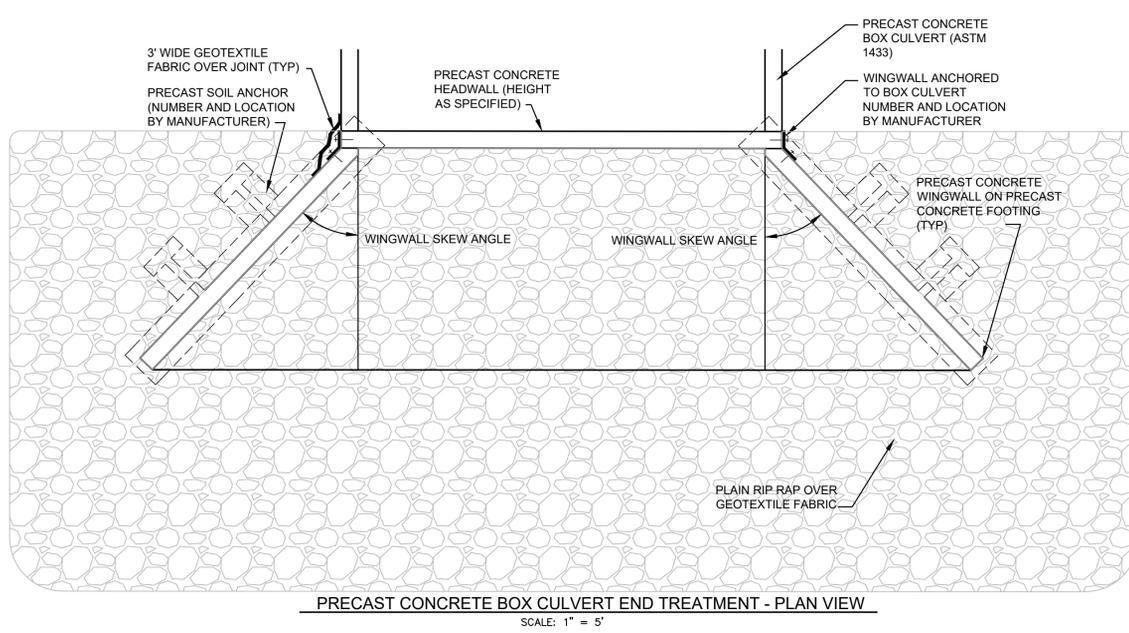
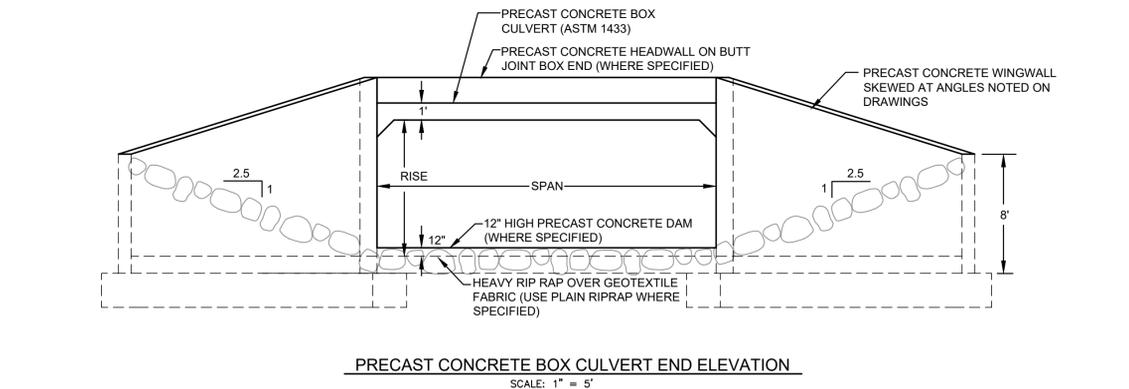


**CHECK DAM DETAIL**  
NOTE: BASE WIDTH SHOULD BE AT LEAST 2X THE HEIGHT  
NO SCALE

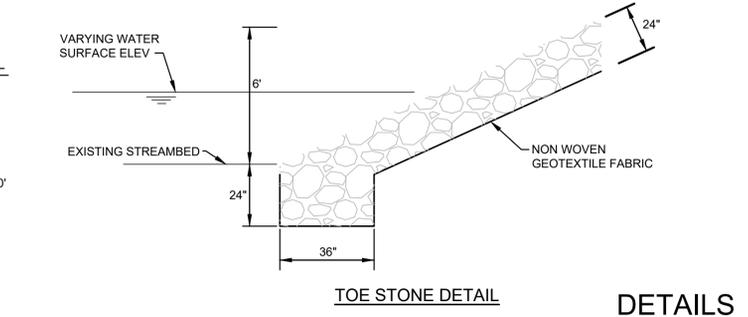


**EROSION CONTROL MEASURES**

1	SEEDING		When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles. On flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles when areas are subject to raindrop impact, and erosive forces from wind or water.
2	MULCH		Along drain banks, shorelines, or where concentrated flows occur. Slows velocity, reduces erosion and sediment load.
7	RIPRAP		Riprap and toe of slope protection is used in areas where velocities are causing drain bank erosion and are too high to stabilize using other methods
8	RIPRAP TOE OF SLOPE		As a temporary measure on exposed and unstabilized areas that must be protected from wind or water erosion.
26	DUST CONTROL		In constructed and existing flow corridors to reduce flow velocities.
40	CHECK DAM		When construction or maintenance activities are limited by the presence of water and a dry work area is required.
48	DEWATERING		



**BOX CULVERT TRENCH DETAIL**  
SCALE: 1" = 5'  
PLACE RIPRAP UP EMBANKMENT TO A HEIGHT EQUAL TO THE TOP OF THE WING WALLS AND PLACE RIPRAP BEHIND THE WAIN WALLS AS SHOWN



**TOE STONE DETAIL**  
SCALE: 1" = 5'

DETAILED DRAWINGS AND SPECIFICATIONS ARE LOCATED IN THE MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS SOIL EROSION AND SEDIMENTATION CONTROL AUTHORIZED PUBLIC AGENCY PROCEDURES MANUAL

SYMBOLGY FOR INSERTION INTO CONSTRUCTION DRAWINGS:

- Ⓟ = PERMANENT MEASURE
- Ⓡ = TEMPORARY MEASURE

REVISIONS

NO.	DATE	BY	DATE	BY	DATE

4063 Grand Oak Drive Suite A109  
Lansing, MI 48911  
517.887.1100

16930 Robbins Road Suite 105  
Grand Haven, MI 49417  
616.743.7070

engdot.com



BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER  
BLACK CREEK CONSOLIDATED DRAIN  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
**16041**

SHEET NO.  
DIVISION 2  
**C4**

REVISIONS:	NO.	ISSUED FOR	DATE
	1.	EX COND. SURVEY	DEC. 2017
	2.	PRELIMINARY PLANS	AUG. 2019
	3.	BID	JUNE 2020

CLIENT: MUSKOGON COUNTY DRAIN COMMISSIONER  
141 E APPLE AVE, MUSKOGON, MI 49842  
PROJECT: BLACK CREEK CONSOLIDATED DRAIN - DIVISION II  
EGEESON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS

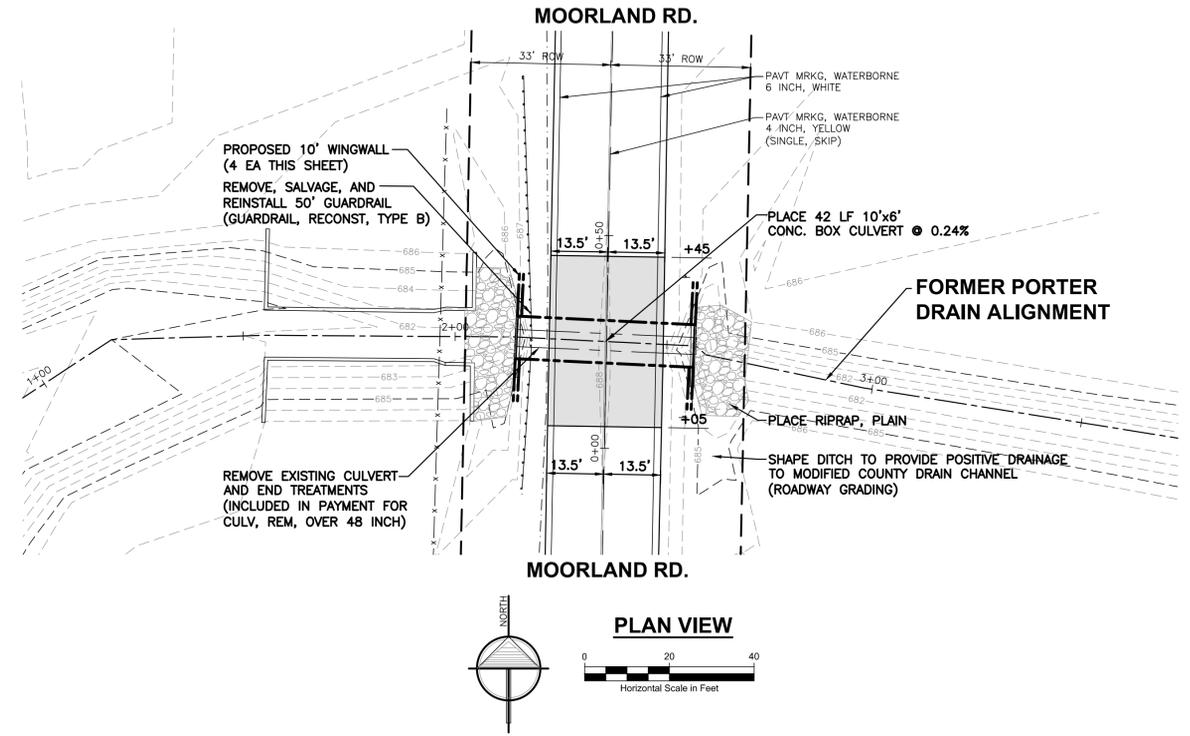
PROJECT NUMBER:	DATE
17-008	SEPT. 2017
	AUG. 2019
	JUN. 2020
	JUNE 2020

SURVEYED BY: CF JS  
DESIGNED BY: AWS/KAP  
DRAFTED BY: NDJ  
CACC/DJF

SHEET NAME: MOORLAND RD. CULVERT REPLACEMENT (FORMER PORTER DRAIN)  
SHEET NUMBER: C5

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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REMOVAL QUANTITIES - THIS SHEET

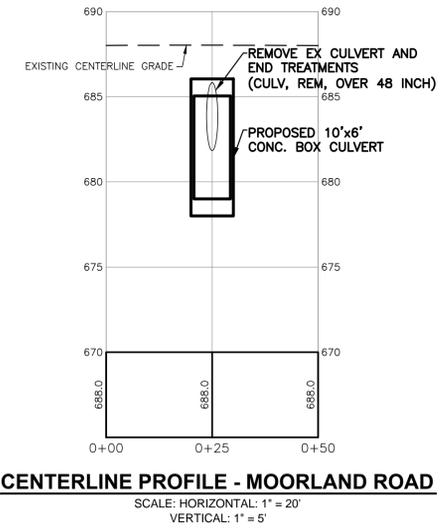
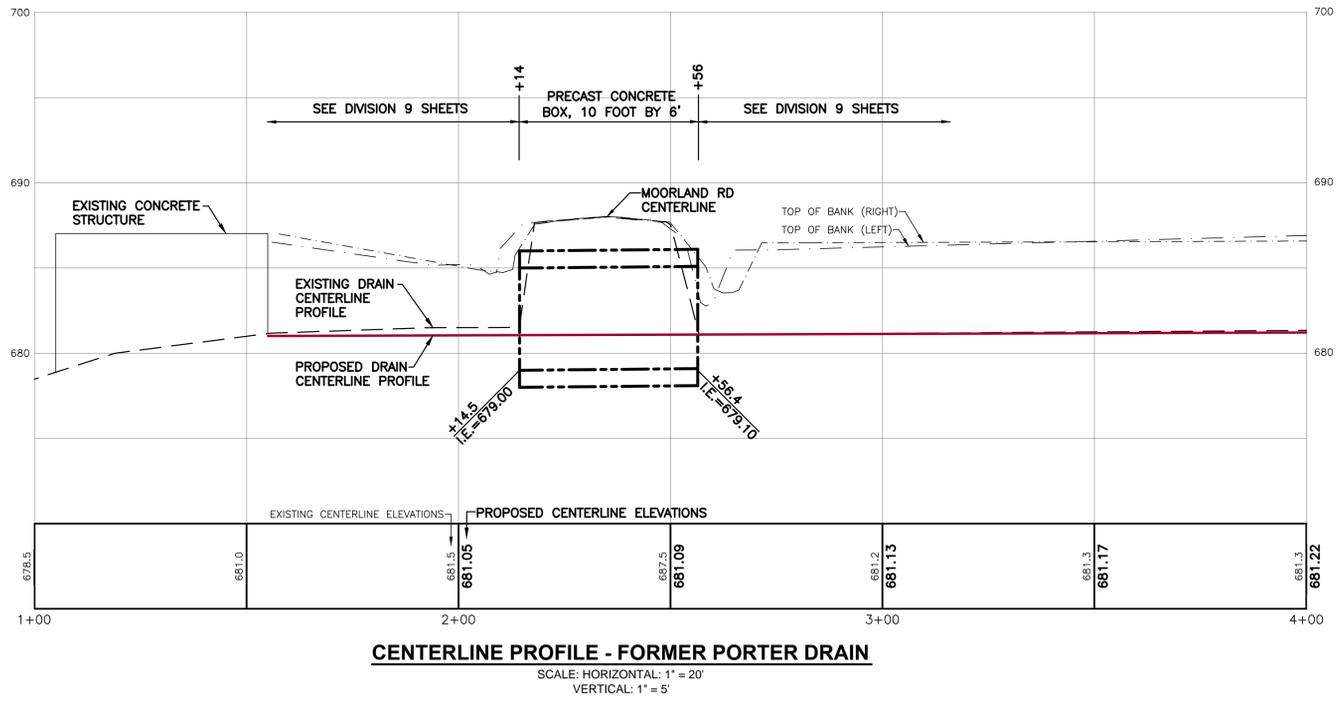
0.4	Sta	Roadway Grading
120	Syd	HMA Surface, Rem
1	Ea	Culv, Rem, over 48 inch

SESC QUANTITIES - THIS SHEET

100	Ft	Erosion Control, Silt Fence
20	Ft	Erosion Control, Check Dam, Stone
5	Cyd	Erosion Control, Maintenance, Sediment Removal

PROPOSED QUANTITIES - THIS SHEET

120	Cyd	Subbase, CIP
32	Syd	Shoulder, CL II, 4 inch
130	Syd	Aggregate Base, 8 inch
30	Ton	HMA, 13A
150	Syd	Slope Restoration, Type B
100	Syd	Riprap, Plain
10	Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
80	Ft	Pavt Mrkg, Waterborne, 6 inch, White
50	Ft	Guardrail, Reconst, Type B
42	Ft	Culv, Precast Conc Box, 10 foot by 6 foot
4	Ea	Culv, Precast Conc Wingwall, Porter
1	Ea	Bypass Pumping, Porter



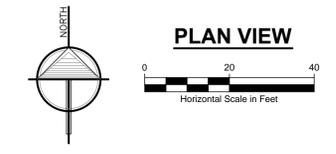
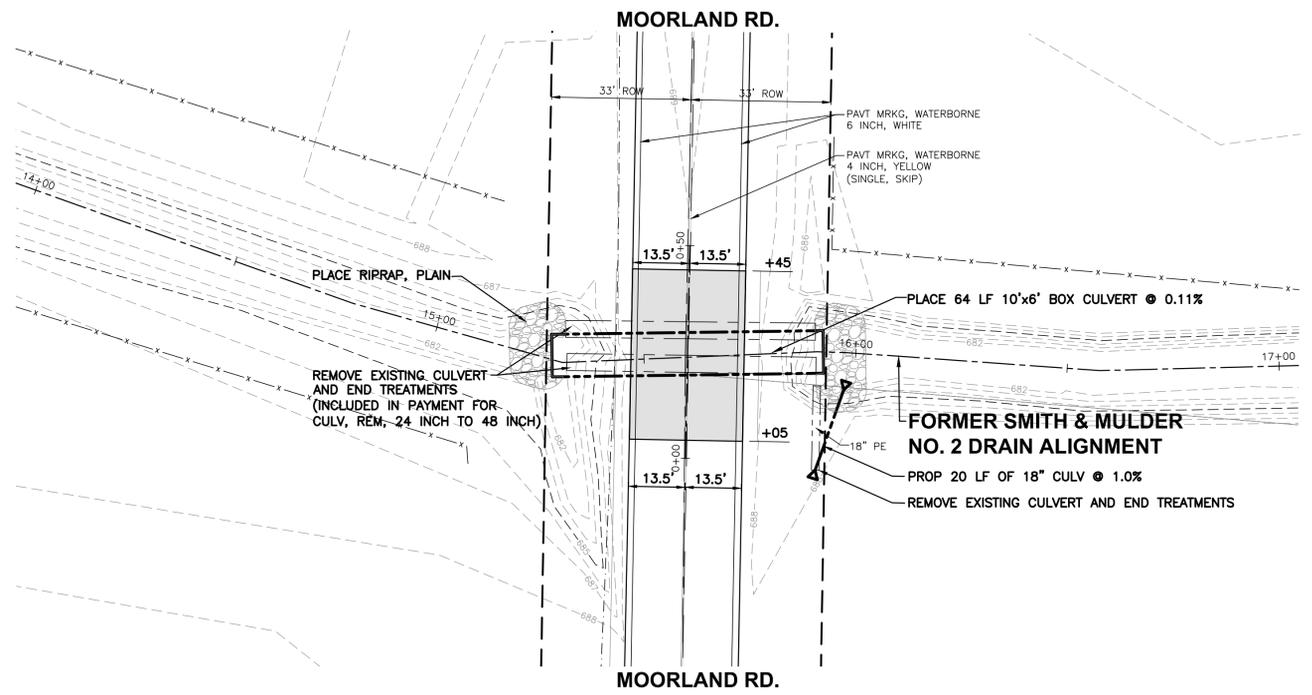
REVISIONS:	NO.	DATE	ISSUED FOR
	1.	DEC 2017	EX COND. SURVEY
	2.	AUG 2019	PRELIMINARY PLANS
	3.	JUNE 2020	BID

CLIENT: MUSKOGON COUNTY DRAIN COMMISSIONER  
141 E APPLE AVE, MUSKOGON, MI 49842  
PROJECT: BLACK CREEK CONSOLIDATED DRAIN - DIVISION II  
EGEISON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS

PROJECT NUMBER:	DATE
17-008	SEPT 2017
	AUG 2019
	JUN 2020
	JUNE 2020

SURVEYED BY: CF JS  
DESIGNED BY: AWS/KAP  
DRAFTED BY: NDJ  
CACC/DJF

SHEET NAME: MOORLAND RD. CULVERT REPLACEMENT (FORMER SMITH & MULDER NO. 2 DRAIN)  
SHEET NUMBER: C6



REMOVAL QUANTITIES - THIS SHEET

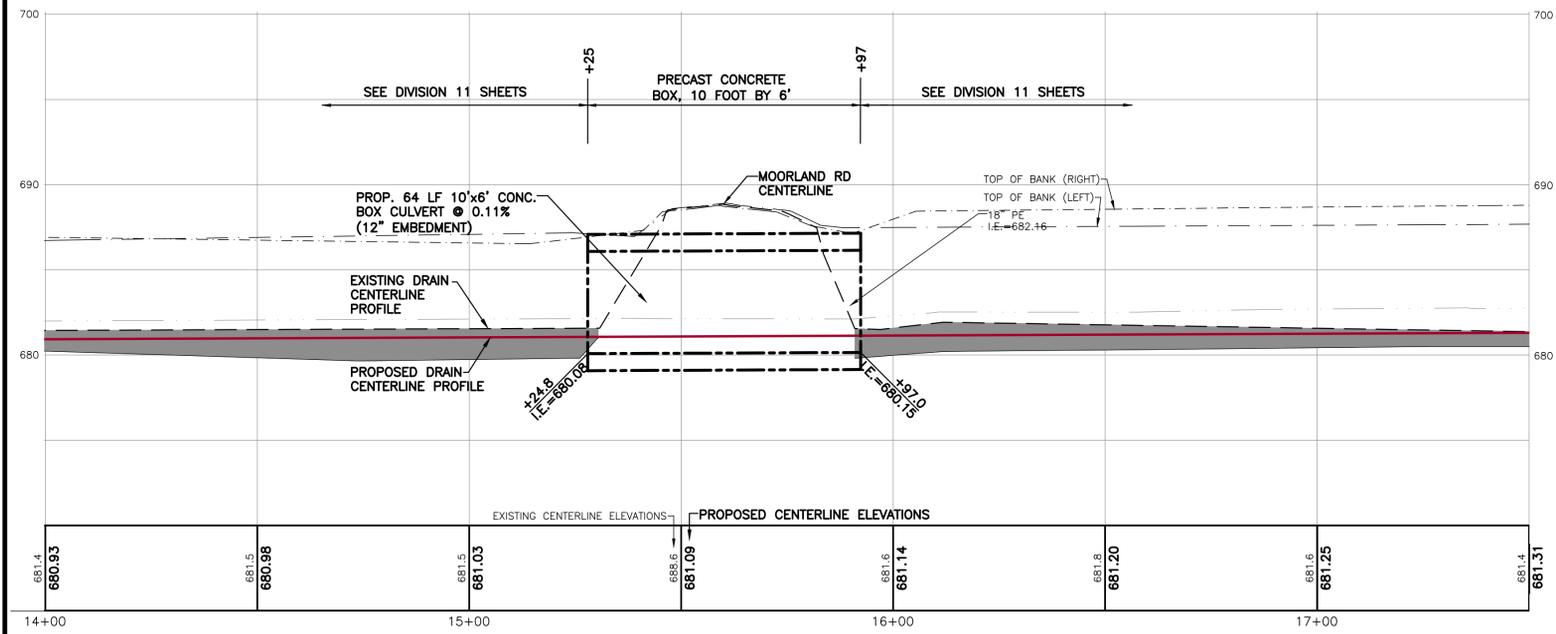
0.4	Sta	Roadway Grading
120	Syd	HMA Surface, Rem
1	Ea	Culv, Rem, Less than 24 inch
2	Ea	Culv, Rem, 24 inch to 48 inch

PROPOSED QUANTITIES - THIS SHEET

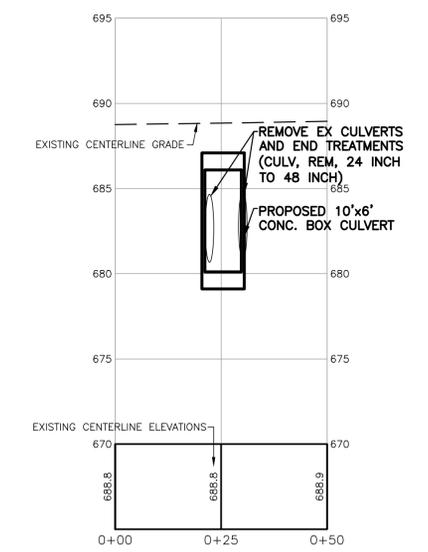
120	Cyd	Subbase, CIP
32	Syd	Shoulder, CL II, 4 inch
130	Syd	Aggregate Base, 8 inch
30	Ton	HMA, 13A
150	Syd	Slope Restoration, Type B
100	Syd	Riprap, Plain
10	Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow
80	Ft	Pavt Mrkg, Waterborne, 6 inch, White
64	Ft	Culv, Precast Conc Box, 10 foot by 6 foot
1	Ea	Bypass Pumping, Smith & Mulder No. 2
20	Ft	Culv, CI F, 18 inch
2	Ea	Culv End Sect, 18 inch

SESC QUANTITIES - THIS SHEET

100	Ft	Erosion Control, Silt Fence
20	Ft	Erosion Control, Check Dam, Stone
5	Cyd	Erosion Control, Maintenance, Sediment Removal



CENTERLINE PROFILE - FORMER SMITH AND MULDER DRAIN  
SCALE: HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 5'

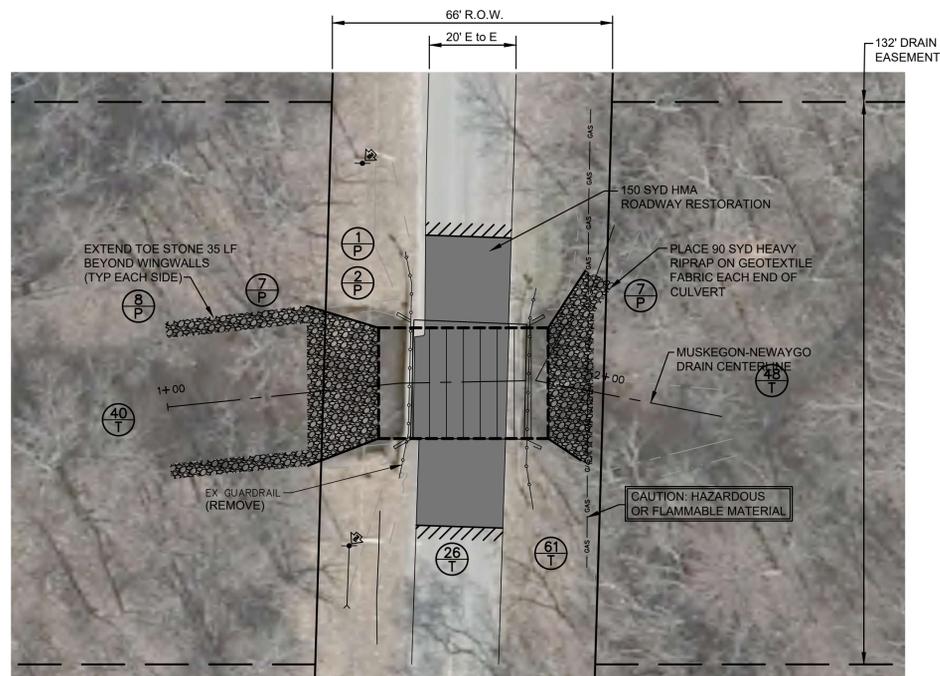


CENTERLINE PROFILE - MOORLAND ROAD  
SCALE: HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 5'

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

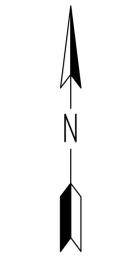


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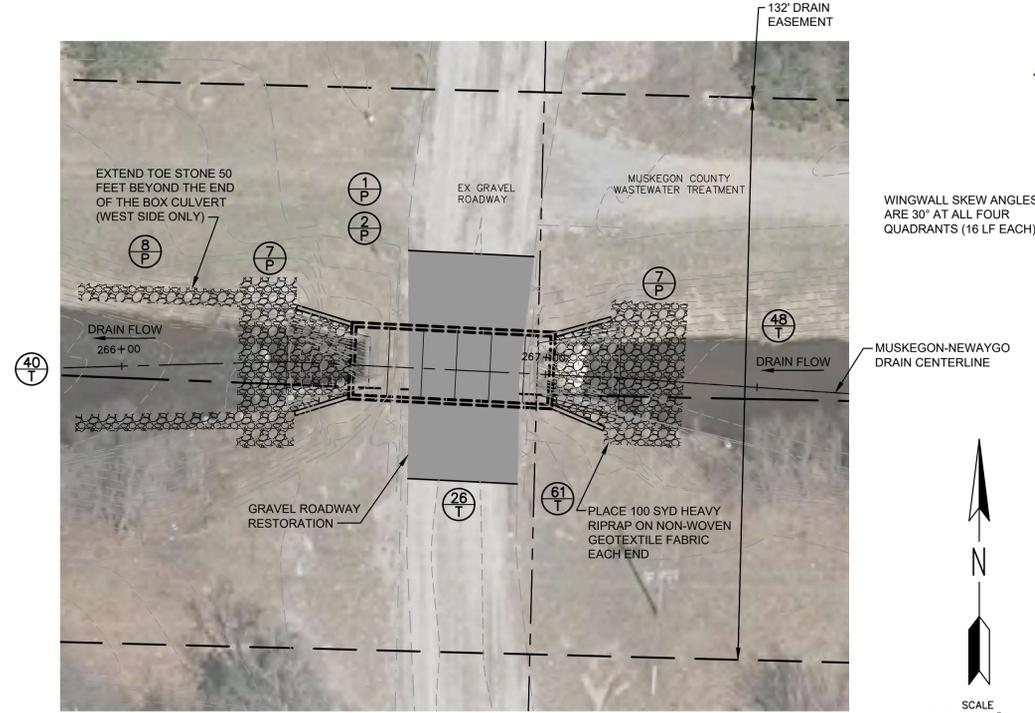


MUSKEGON-NEWAYGO DRAIN AT  
BARNES RD CROSSING  
(66' R.O.W.)

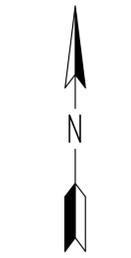
WINGWALL SKEW ANGLES:  
NORTHWEST WALL: 30° (16 LF)  
SOUTHWEST WALL: 30° (16 LF)  
NORTHEAST WALL: 75° (16 LF)  
SOUTHEAST WALL: 45° (8 LF)



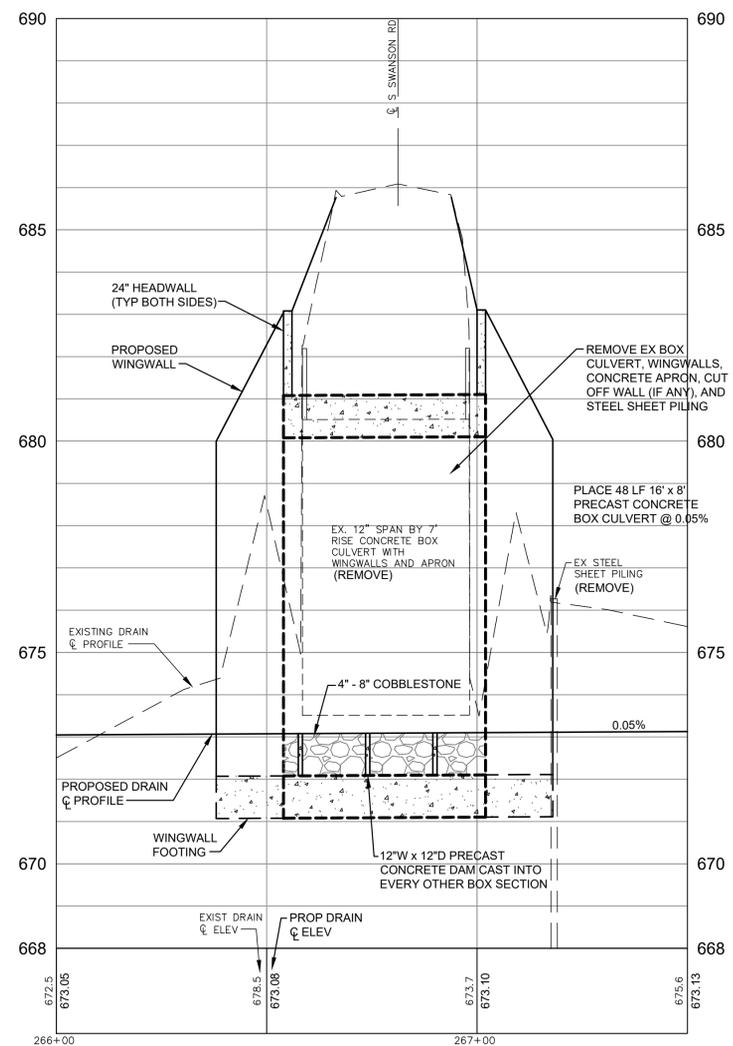
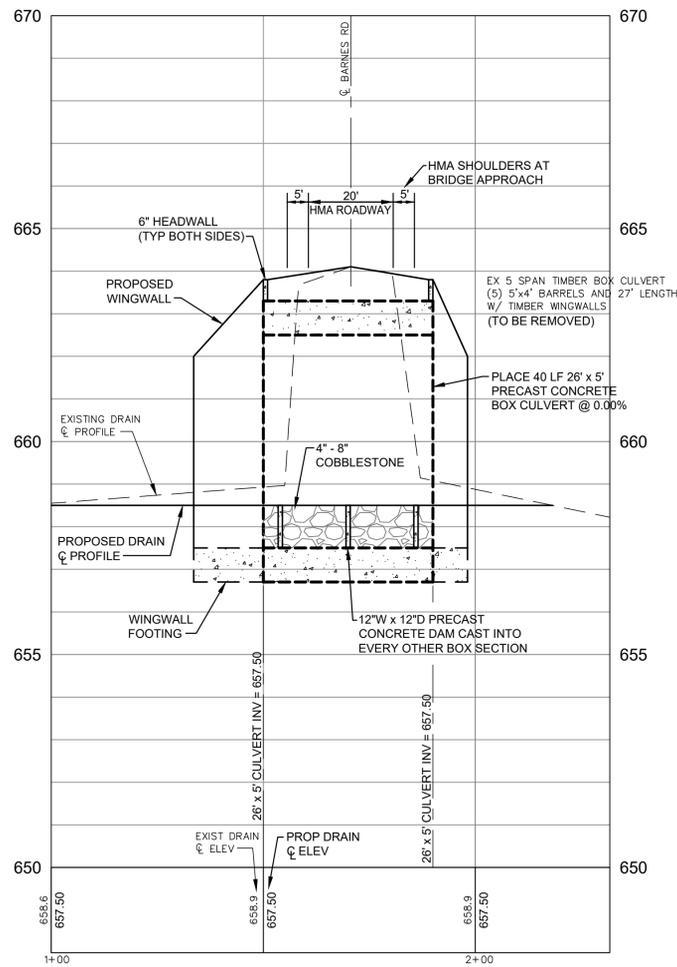
SCALE  
HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 2'



MUSKEGON-NEWAYGO DRAIN (FMRLY)  
S SWANSON RD CROSSING



SCALE  
HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 2'



ROADWAY CROSSING DETAILS



NO.	REVISIONS	DATE	BY	DATE	BY	DATE	BY

4063 Grand Oak Drive Suite A109  
Lansing, MI 48911  
517.887.1100

16930 Robbins Road Suite 105  
Grand Haven, MI 49417  
616.743.7070  
engdot.com



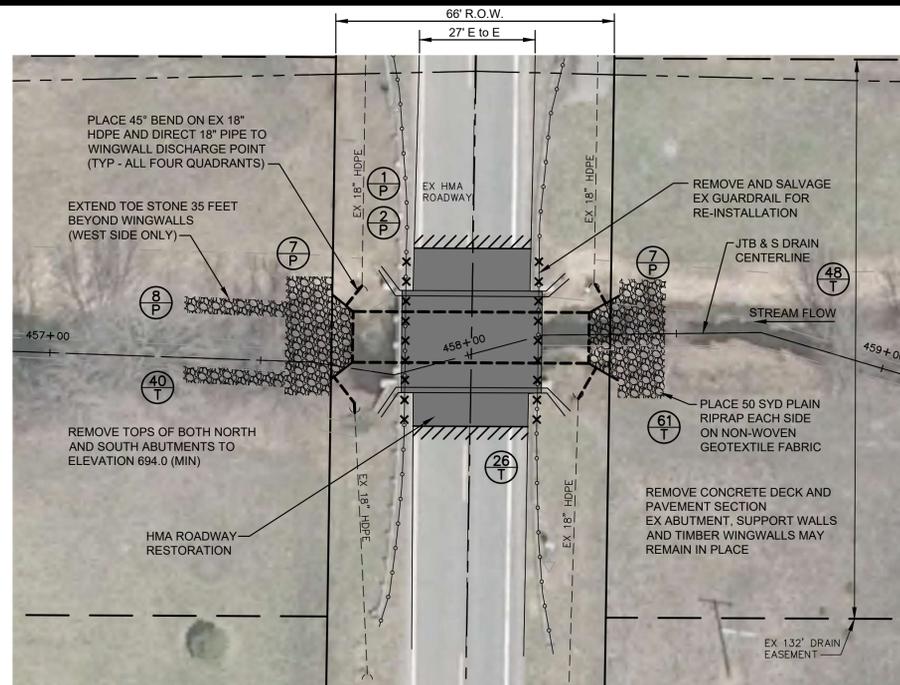
BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER

BLACK CREEK CONSOLIDATED DRAIN  
PART OF EGGLESTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
16041

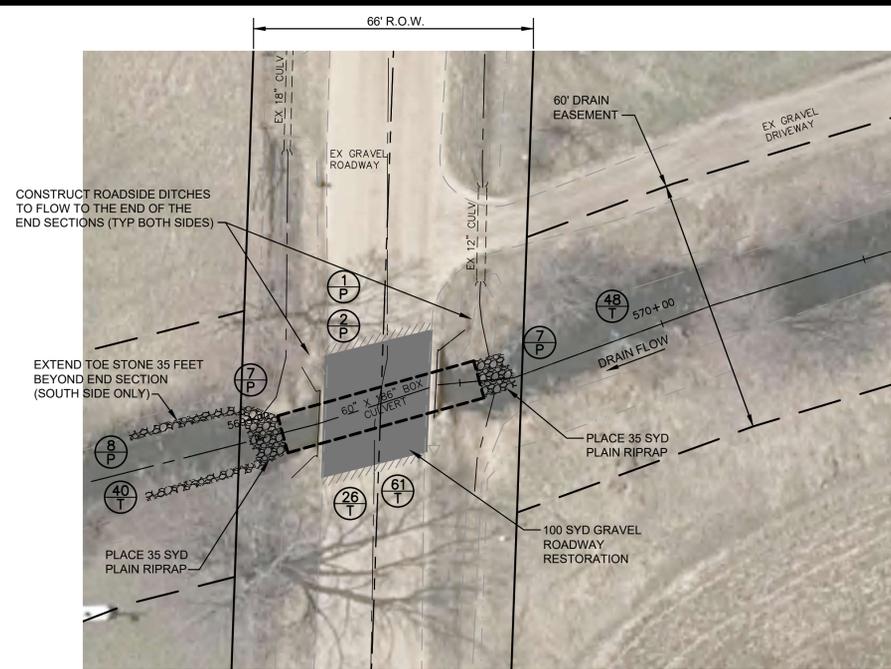
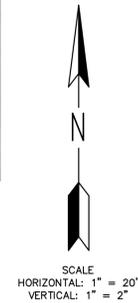
SHEET NO.  
DIVISION 2  
C7

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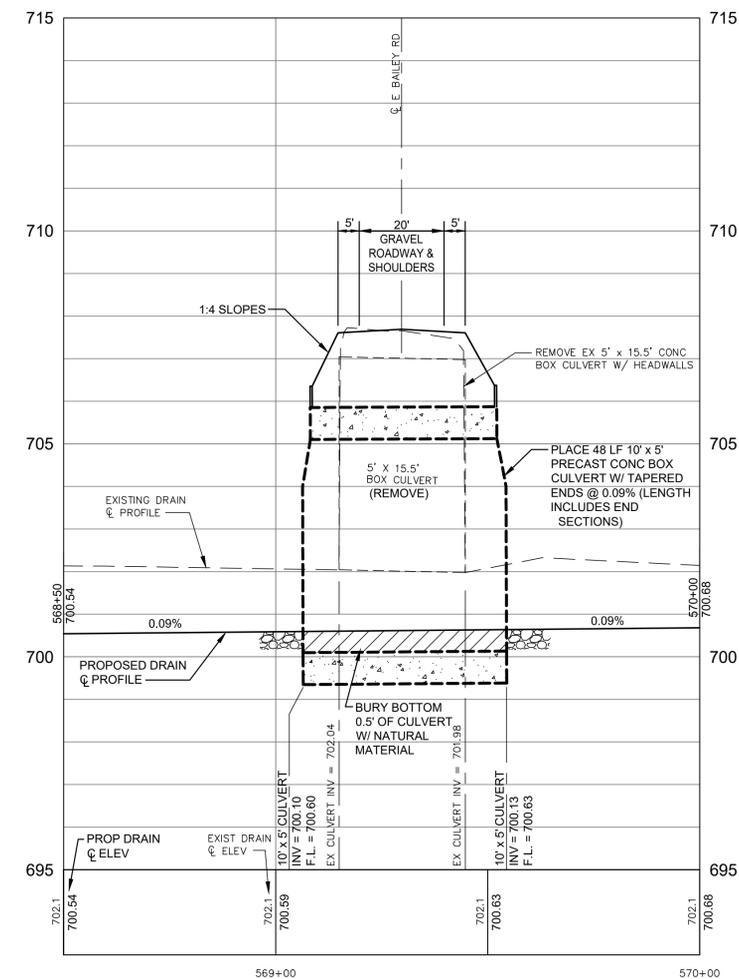
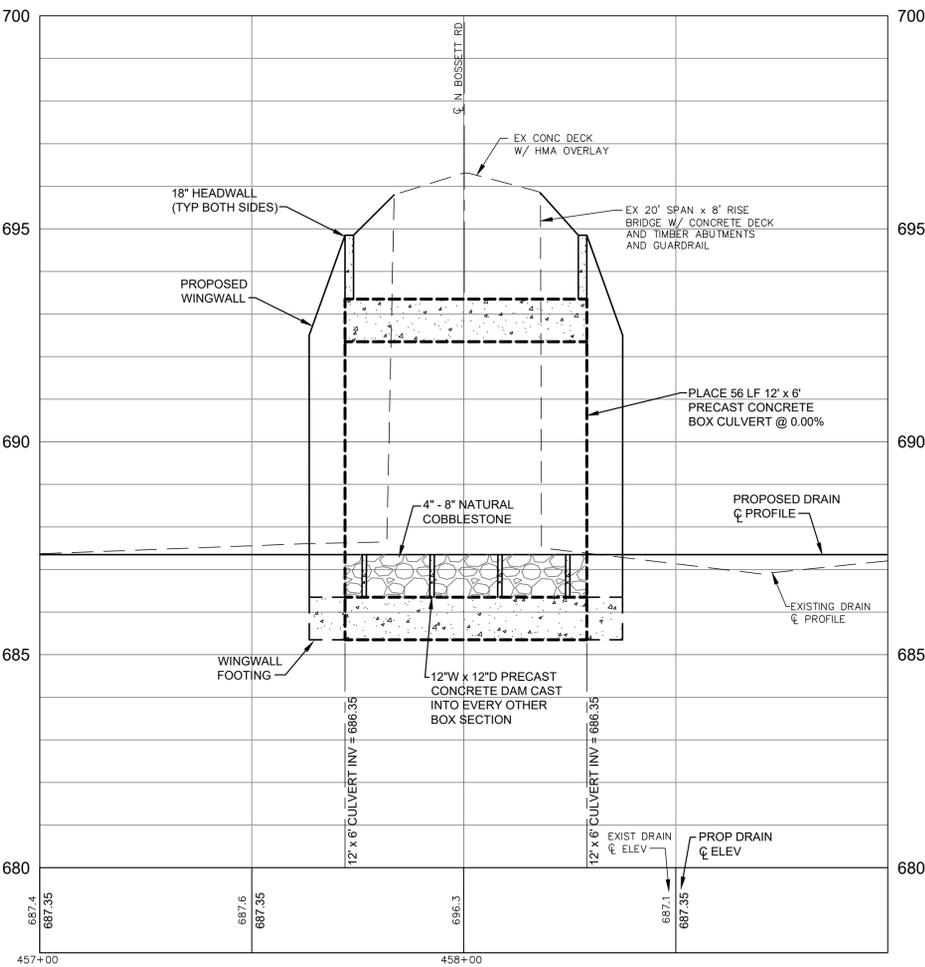
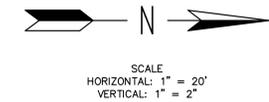


**JTB+S DRAIN (FMRLY)  
N BOSSETT RD CROSSING  
(66' R.O.W.)**

WINGWALL SKEW ANGLES  
ARE 45° AT ALL FOUR  
QUADRANTS (8 LF EACH)



**JTB+S-SLATER DRAIN (FMRLY)  
E BAILEY RD CROSSING  
(66' R.O.W.)**



**ROADWAY CROSSING DETAILS**



NO.	REVISIONS	DATE	BY	DATE	BY

4063 Grand Oak Drive Suite A109  
Lansing, MI 48911  
517.887.1100

16930 Robbins Road Suite 105  
Grand Haven, MI 49417  
616.743.7070

engdot.com



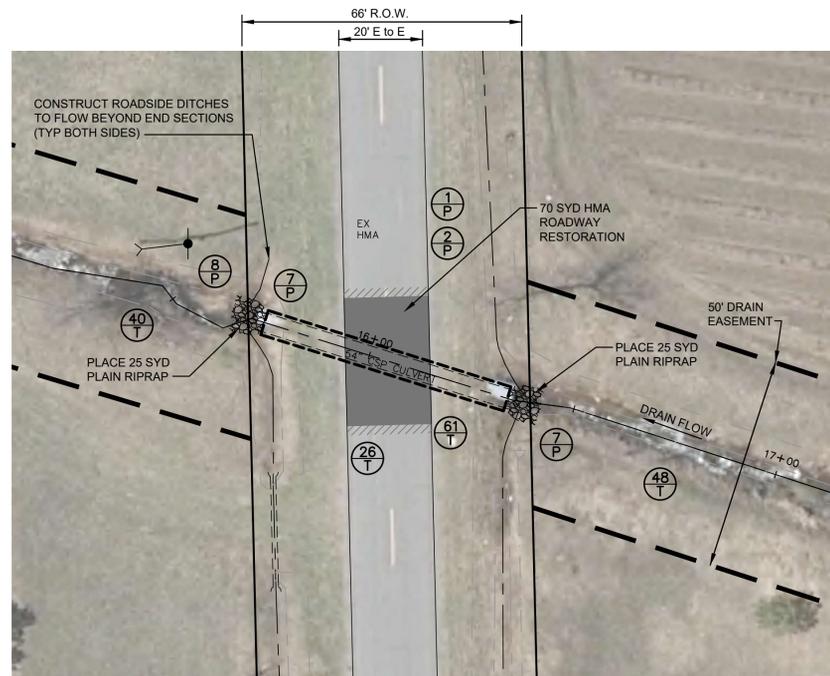
**BRENDA M. MOORE**  
MUSKEGON COUNTY DRAIN COMMISSIONER

**BLACK CREEK CONSOLIDATED DRAIN**  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

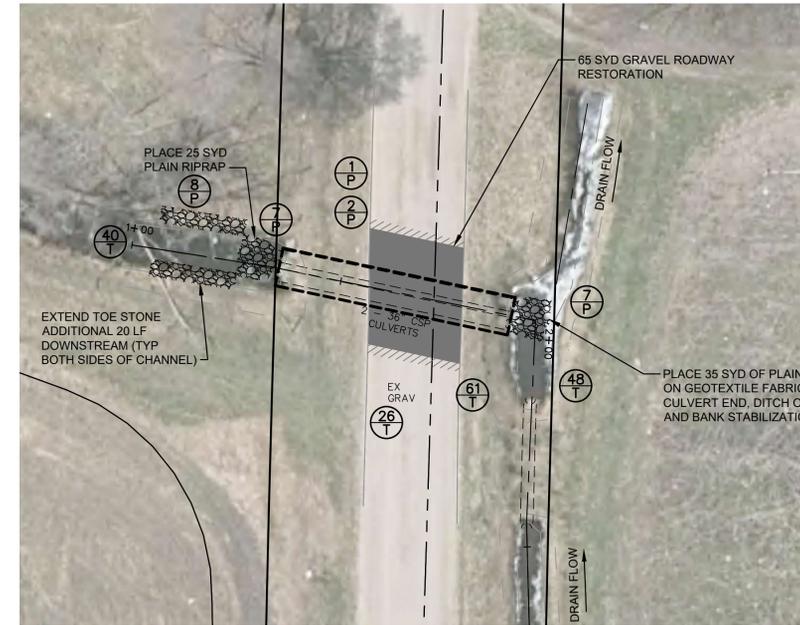
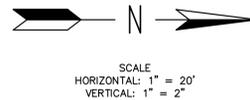
PROJECT NO.  
**16041**

SHEET NO.  
DIVISION 2  
**C8**

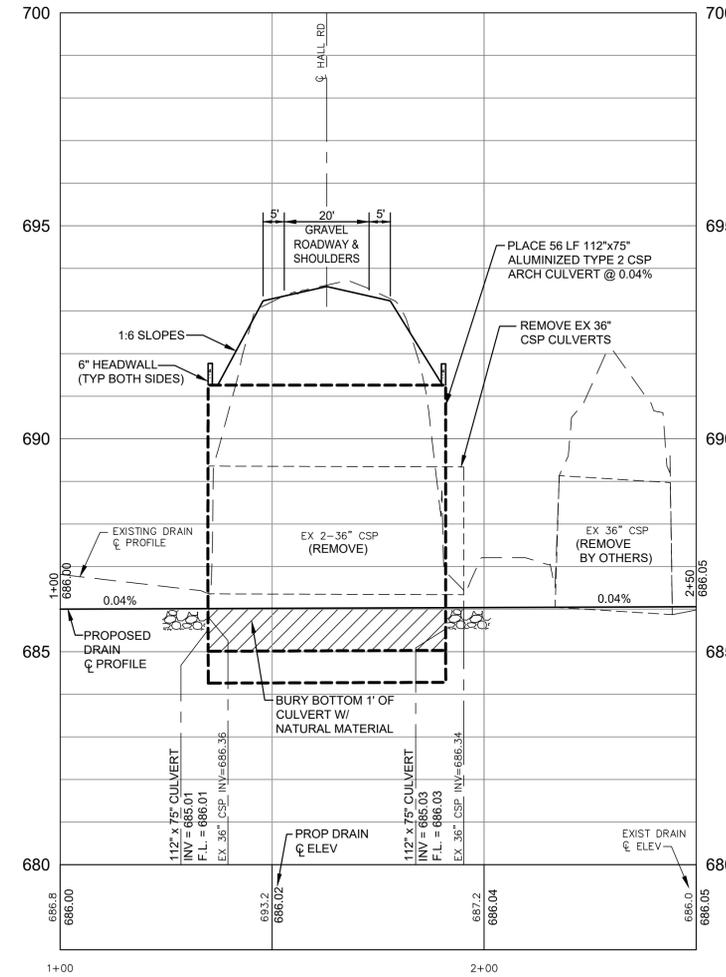
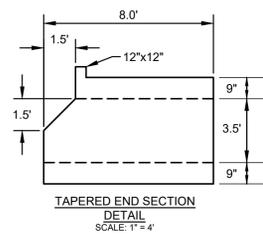
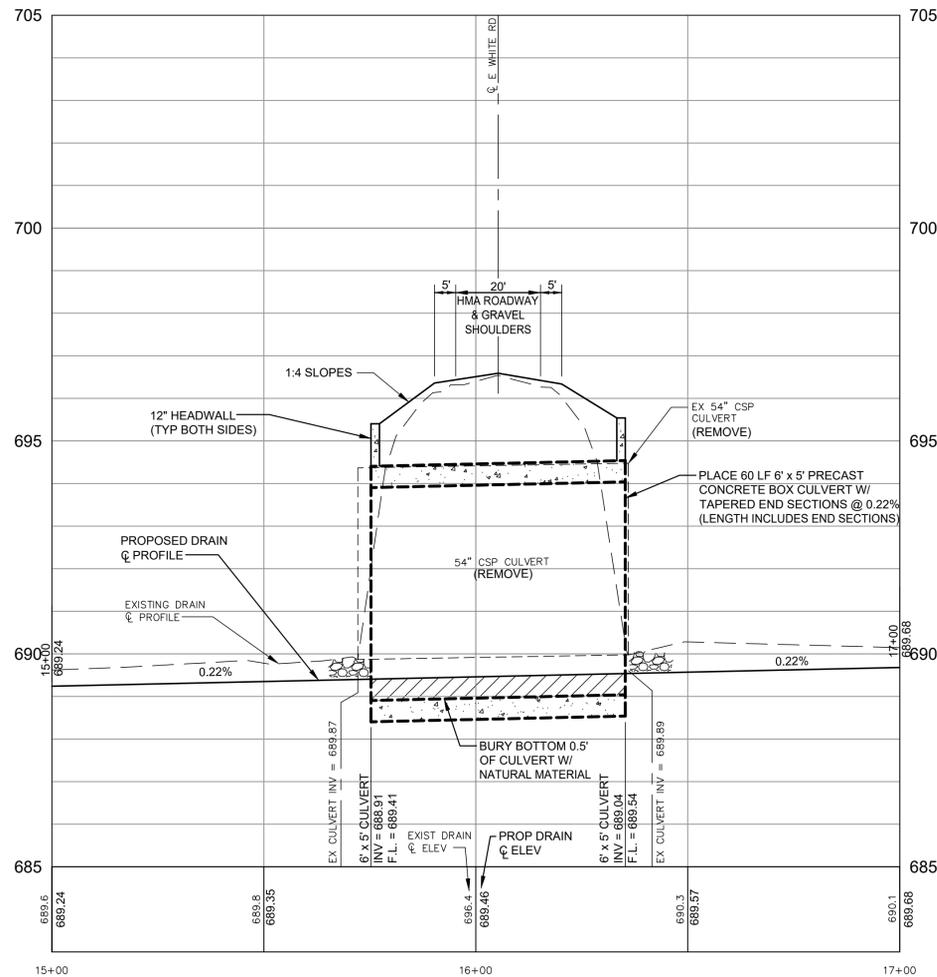
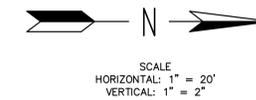
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DALEY DRAIN (FMRLY)  
E WHITE RD CROSSING  
(66' R.O.W.)



LITTLE DRAIN (FMRLY)  
HALL RD CROSSING  
(66' R.O.W.)



ROADWAY CROSSING DETAILS



EASEMENT WIDTH FOR THE  
LITTLE DRAIN IS SUFFICIENT  
GROUND ON EITHER SIDE  
OF THE DRAIN

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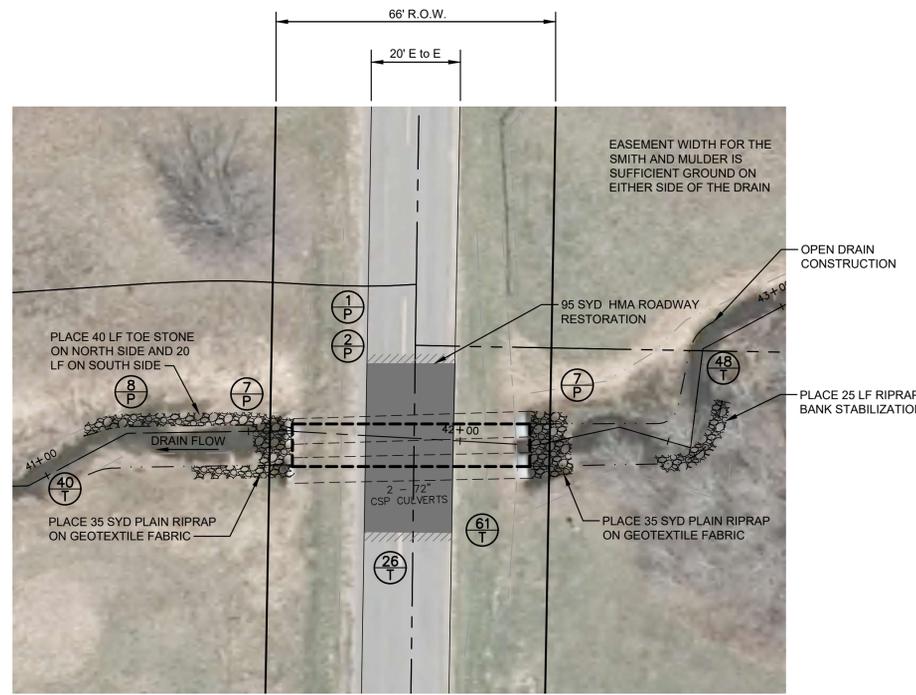
BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER

BLACK CREEK CONSOLIDATED DRAIN  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
16041

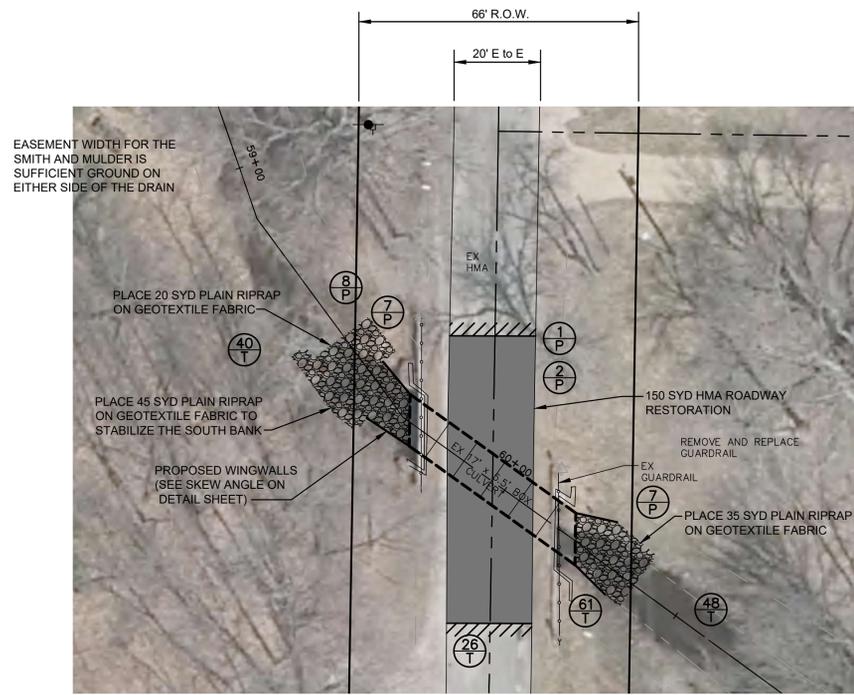
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DIVISION 2  
C9

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**SMITH & MULDER DRAIN (FMRLY)  
BARNES RD CROSSING**  
(66' R.O.W.)

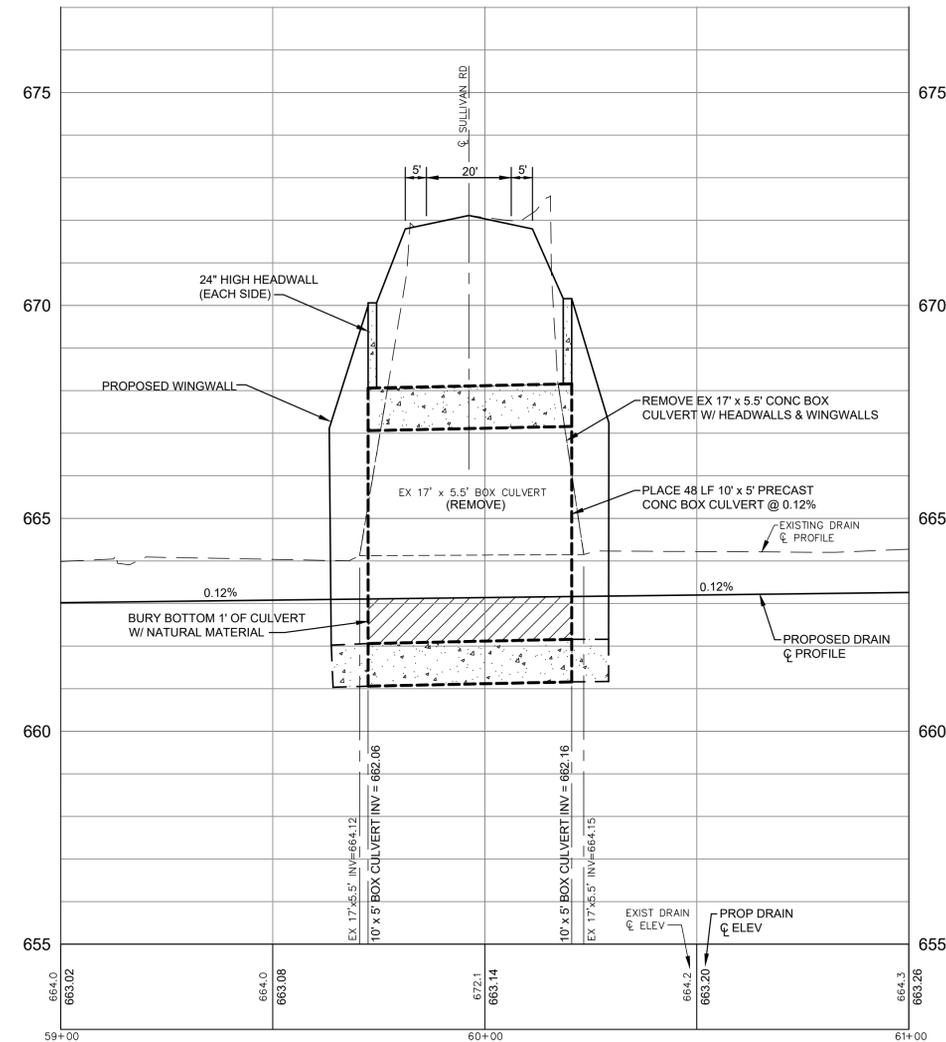
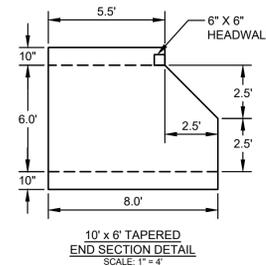
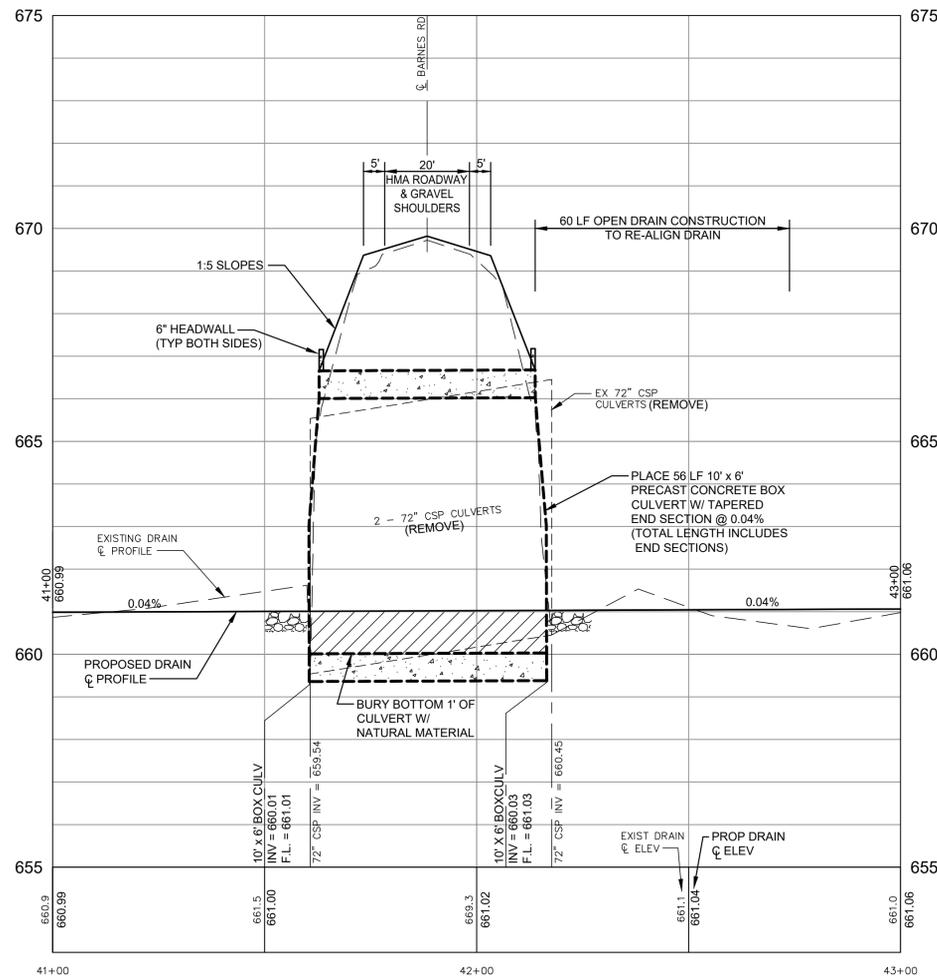
SCALE  
HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 2'



**SMITH & MULDER DRAIN (FMRLY)  
SULLIVAN RD CROSSING**  
(66' R.O.W.)

SCALE  
HORIZONTAL: 1" = 20'  
VERTICAL: 1" = 2'

WINGWALL SKEW ANGLES:  
NORTHWEST WALL: 30° (8 LF)  
SOUTHWEST WALL: 15° (8 LF)  
NORTHEAST WALL: 30° (8 LF)  
SOUTHEAST WALL: 15° (8 LF)



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Grand Haven, MI 49417  
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MUSKEGON COUNTY DRAIN COMMISSIONER

**BLACK CREEK CONSOLIDATED DRAIN**  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
**16041**

SHEET NO.  
**C10**

DIVISION 2

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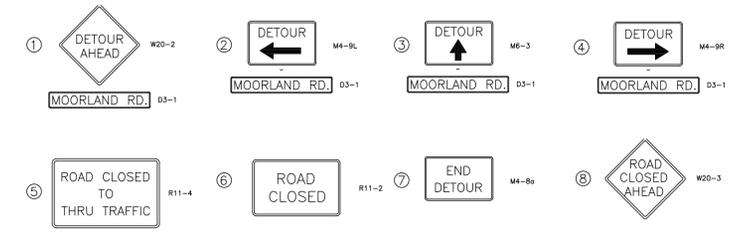
REVISIONS:	NO.	ISSUED FOR	DATE
	1.	EX COND. SURVEY	DEC. 2017
	2.	PRELIMINARY PLANS	AUG. 2019
	3.	BID	JUNE 2020

CLIENT: MUSKOGEE COUNTY DRAIN COMMISSIONER  
141 E APPLE AVE, MUSKOGEE, MI 49842  
PROJECT: BLACK CREEK CONSOLIDATED DRAIN - DIVISION II  
EGEESEON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS

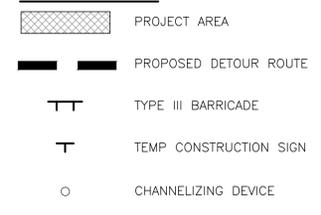
DATE	PROJECT NUMBER
SEPT. 2017	17-008
AUG. 2019	
JUN. 2020	
JUNE 2020	

SURVEYED BY: CF JS  
DESIGNED BY: AWS/KAP  
DRAFTED BY: NDJ  
CAGC/DJF

SHEET NAME: MAINTAINING TRAFFIC PLAN (MOORLAND RD.)  
SHEET NUMBER: C11



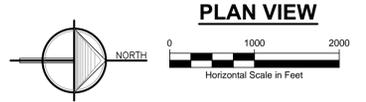
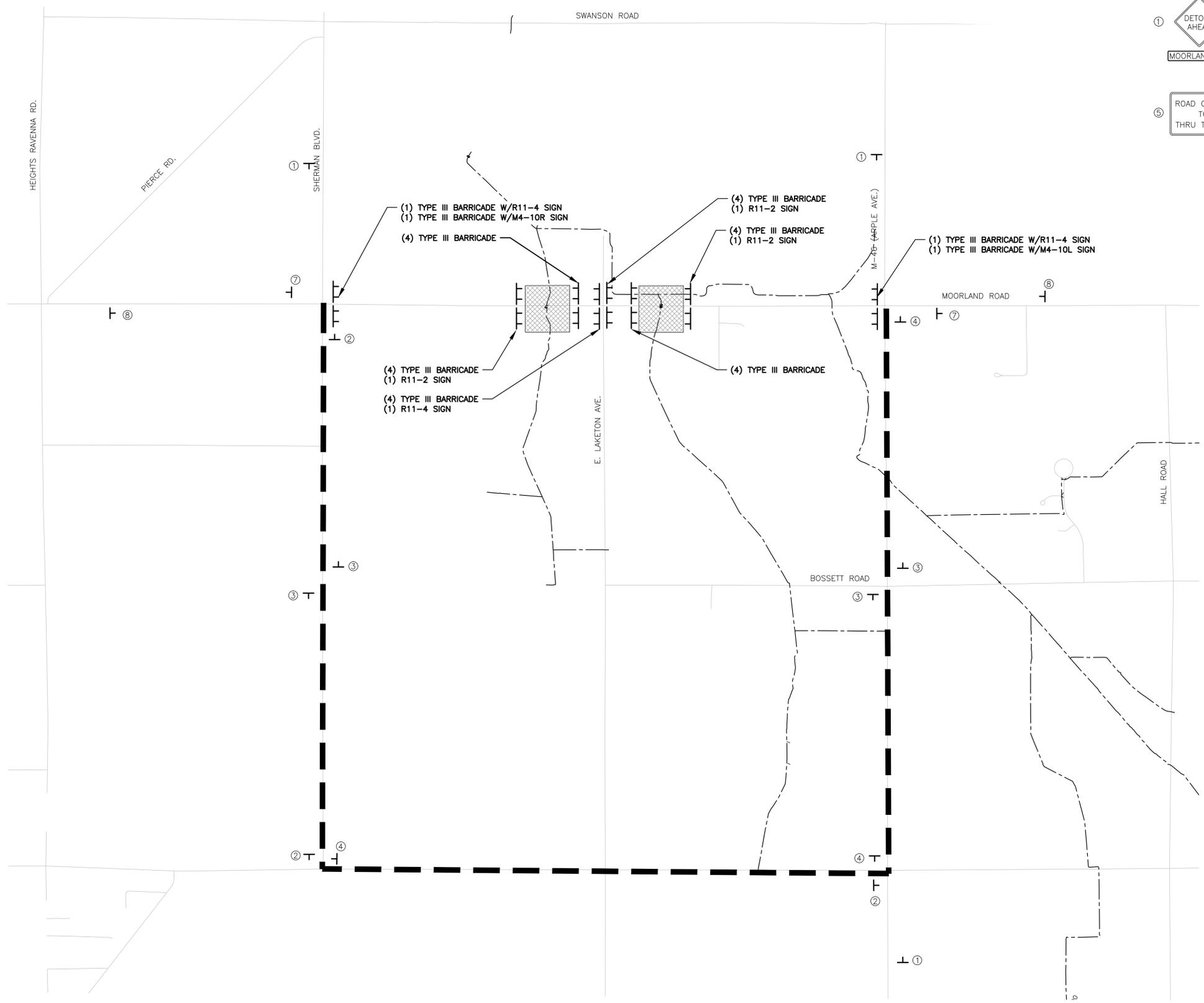
**MOT LEGEND**



**NOTES**

- ALL TRAFFIC CONTROL DEVICES SHALL COMPLY WITH THE MMUTCD.
- PLACE ALL SIGNS ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE MDOT TYPICAL M0050a.

SIGN	DESCRIPTION	QTY	IN. x IN.	TOTAL (SFT)
W20-2	DETOUR AHEAD	3	36 x 36	27
M4-9L	DETOUR LEFT ARROW	3	30 x 24	15
M4-9R	DETOUR RIGHT ARROW	3	30 x 24	15
M4-9	DETOUR STRAIGHT ARROW	4	30 x 24	20
M4-8a	DETOUR ENDS	2	24 x 18	6
R11-4	ROAD CLOSED TO THRU TRAFFIC	3	60 x 30	37.5
M4-10L	DETOUR LEFT ARROW	1	48 x 18	6
M4-10R	DETOUR RIGHT ARROW	1	48 x 18	6
R11-2	ROAD CLOSED	3	48 x 18	18
W20-3	ROAD CLOSED AHEAD	2	48 x 48	32
D3-1	MAIN ST.	13	30 x 12	32.5



**PLAN VIEW**

3 WORKING DAYS  
**BEFORE YOU DIG**  
CALL MISS DIG®  
1-800-482-7171

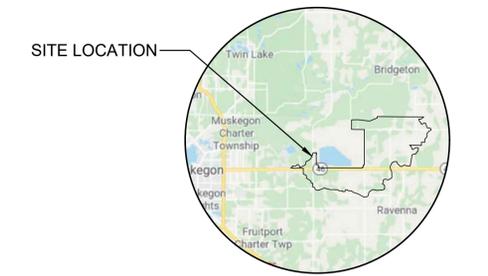


ALL UTILITIES AS SHOWN ARE APPROXIMATE LOCATIONS DERIVED FROM ACTUAL MEASUREMENTS AND AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATION NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THE AREA.





**BRENDA M. MOORE**  
**MUSKEGON COUNTY DRAIN COMMISSIONER**  
**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
 PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
 MUSKEGON COUNTY, MICHIGAN

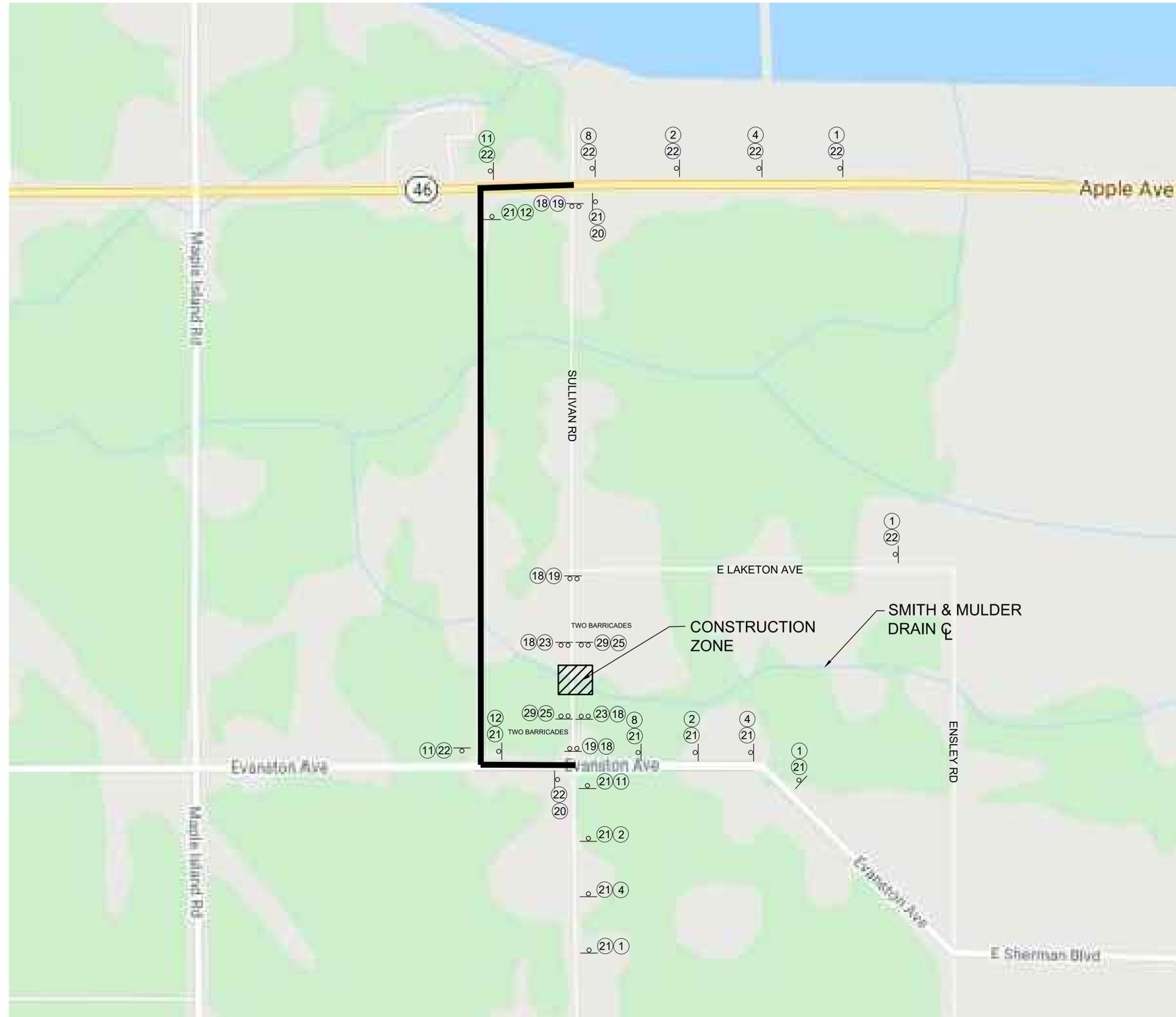


LOCATION MAP  
NO SCALE

**LEGEND**

— = DETOUR ROUTE

 W21-1 48" x 48" TYPE II B ①	 W20-2 48" x 48" TYPE II B ②	 W20-3 48" x 48" TYPE II B ④
 M4-9S ⑧	 M4-9L ⑪	 M4-9R ⑫
 ROAD CLOSED TO THRU TRAFFIC 8" to 12" 20" 5' MIN 8" to 12" 20" 5' MIN 8" to 12" 4' MIN CLOSURE TYPE III BARRICADE ⑱		
 ROAD CLOSED TO THRU TRAFFIC R11-4 60" x 30" TYPE II B BLACK LEGEND WHITE BACKGROUND ⑲	 END DETOUR NB SULLIVAN "END DETOUR" M4-9S 24" x 18" TYPE II B BLACK & ORANGE ⑳	
 ROAD CLOSED R11-2 60" x 30" TYPE II B BLACK LEGEND WHITE BACKGROUND ㉓	 INJURE/ KILL A WORKER \$7500+ 15 YEARS R5-18b ㉑	 WORK ZONE BEGINS R5-18C ㉒
 D3-1 ⑳	 D3-1 ㉒	



**SMITH & MULDER DRAIN (FRMLY) SULLIVAN RD CROSSING TRAFFIC DETOUR**

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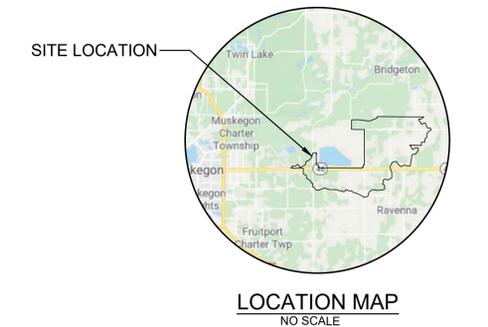
**BRENDA M. MOORE**  
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**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
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 MUSKEGON COUNTY, MICHIGAN

PROJECT NO.	16041
SHEET NO.	C13
DIVISION NO.	2

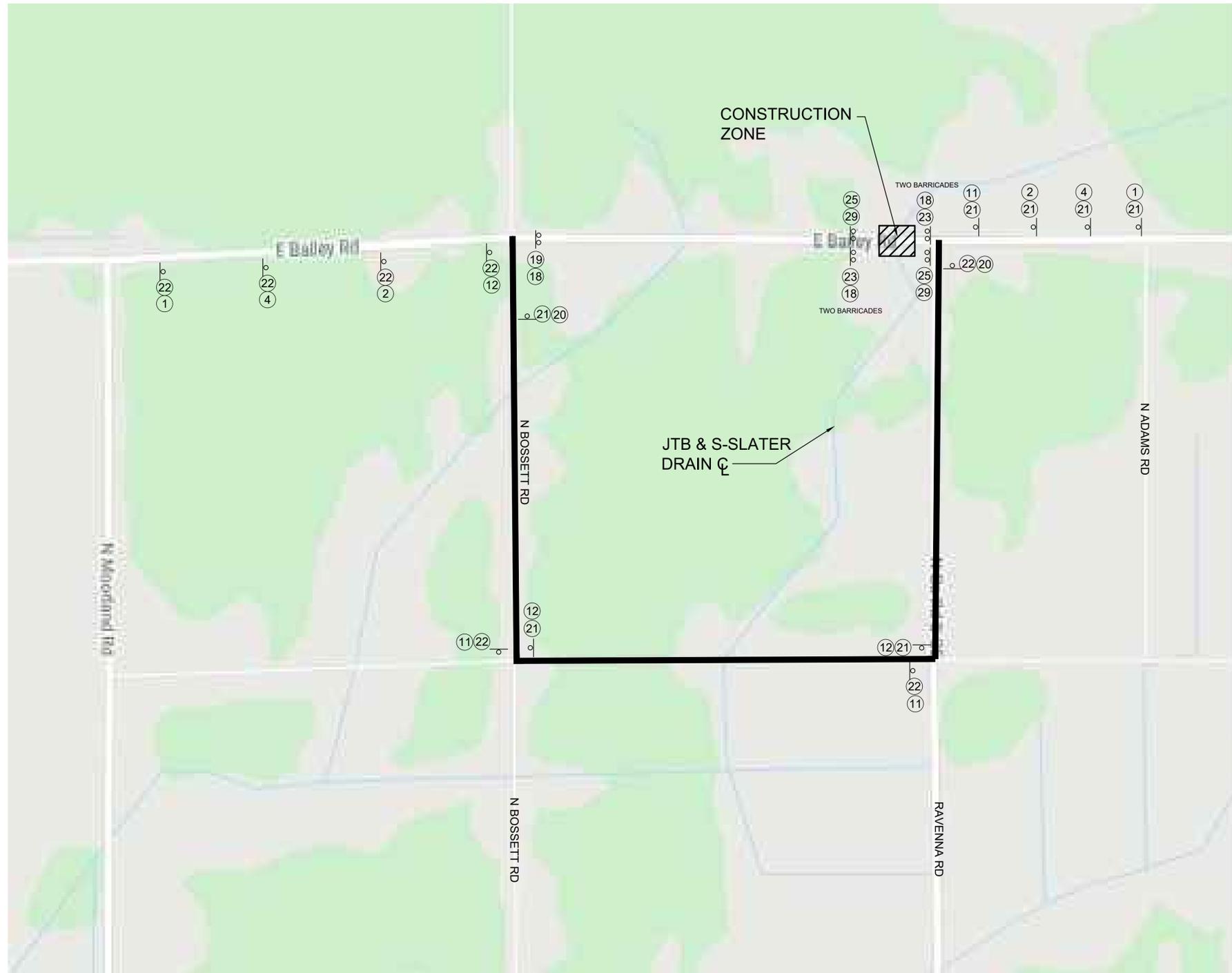
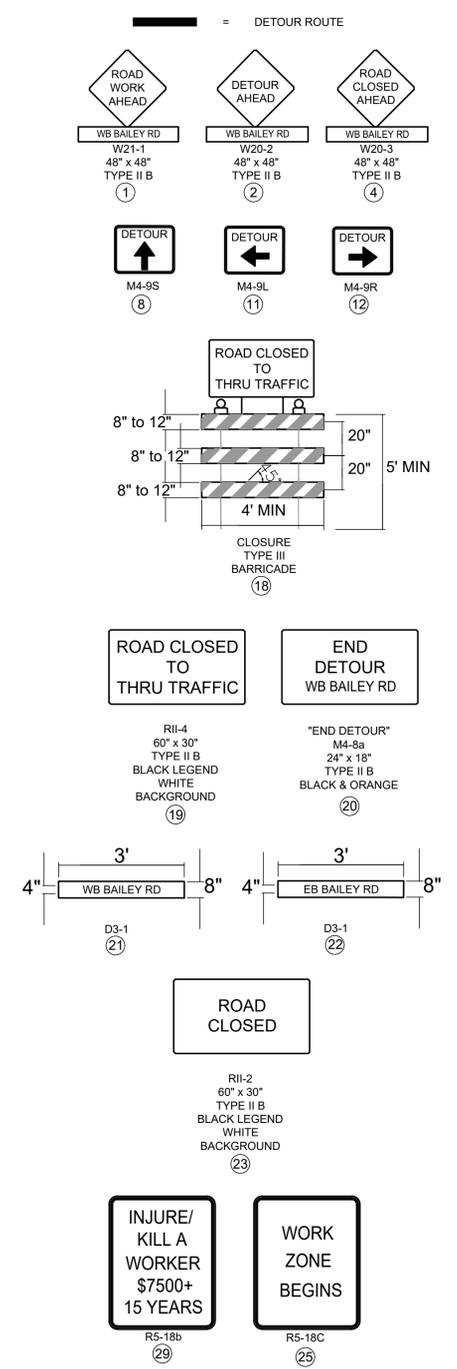
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**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
 PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
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**LEGEND**



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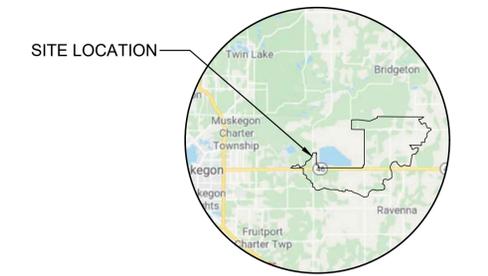
PROJECT NO.	16041
SHEET NO.	DIVISION 2 <b>C14</b>

**JTB & S-SLATER DRAIN (FRMLY) E BAILEY RD CROSSING TRAFFIC DETOUR**

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**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
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 MUSKEGON COUNTY, MICHIGAN



LOCATION MAP  
NO SCALE

**LEGEND**

— = DETOUR ROUTE

 ROAD WORK AHEAD NB BOSSETT RD W21-1 48" x 48" TYPE II B (1)	 DETOUR AHEAD NB BOSSETT RD W20-2 48" x 48" TYPE II B (2)	 ROAD CLOSED AHEAD NB BOSSETT RD W20-3 48" x 48" TYPE II B (4)
 DETOUR M4-9S (8)	 DETOUR M4-9L (11)	 DETOUR M4-9R (12)

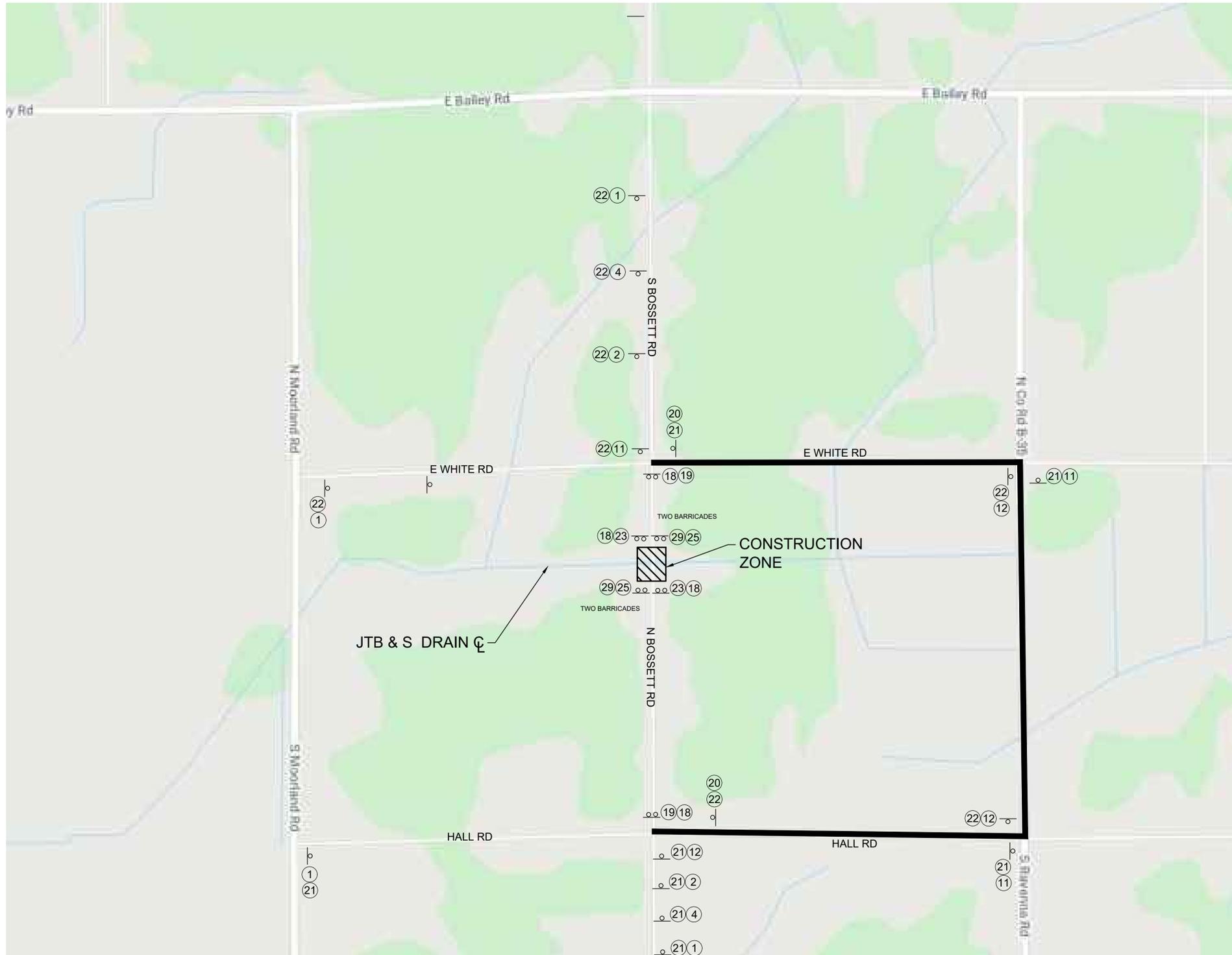
ROAD CLOSED TO THRU TRAFFIC  
 8" to 12" x 20" x 20" x 5' MIN  
 4' MIN  
 CLOSURE TYPE III BARRICADE  
 (18)

 ROAD CLOSED TO THRU TRAFFIC R11-4 60" x 30" TYPE II B BLACK LEGEND WHITE BACKGROUND (19)	 END DETOUR NB BOSSETT RD "END DETOUR" M4-9S 24" x 18" TYPE II B BLACK & ORANGE (20)
--	--

 ROAD CLOSED R11-2 60" x 30" TYPE II B BLACK LEGEND WHITE BACKGROUND (23)	 INJURE/ KILL A WORKER \$7500+ 15 YEARS R5-18b (29)	 WORK ZONE BEGINS R5-18c (25)
--	--	--

4" x 3' x 8" x 4" x 8"  
 D3-1  
 (21)

4" x 3' x 8" x 4" x 8"  
 D3-1  
 (22)



**JTB & S DRAIN (FRMLY) N BOSSETT RD**  
**CROSSING TRAFFIC DETOUR**

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**Eng**  
 Engineering & Surveying

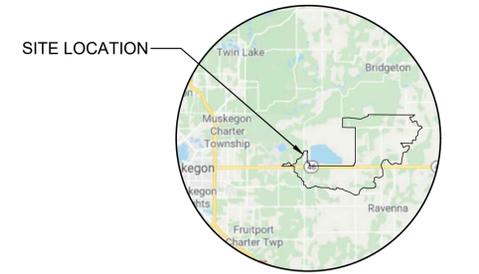
**BRENDA M. MOORE**  
**MUSKEGON COUNTY DRAIN COMMISSIONER**  
**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
 PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
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PROJECT NO.	16041
SHEET NO.	DIVISION 2 <b>C15</b>

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**BRENDA M. MOORE**  
**MUSKEGON COUNTY DRAIN COMMISSIONER**  
**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
 PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
 MUSKEGON COUNTY, MICHIGAN



LOCATION MAP  
NO SCALE

**LEGEND**

— = DETOUR ROUTE

 ROAD WORK AHEAD NB HALL RD W21-1 48" x 48" TYPE II B (1)	 DETOUR AHEAD NB HALL RD W20-2 48" x 48" TYPE II B (2)	 ROAD CLOSED AHEAD NB HALL RD W20-3 48" x 48" TYPE II B (4)
 DETOUR M4-9S (8)	 DETOUR M4-9L (11)	 DETOUR M4-9R (12)

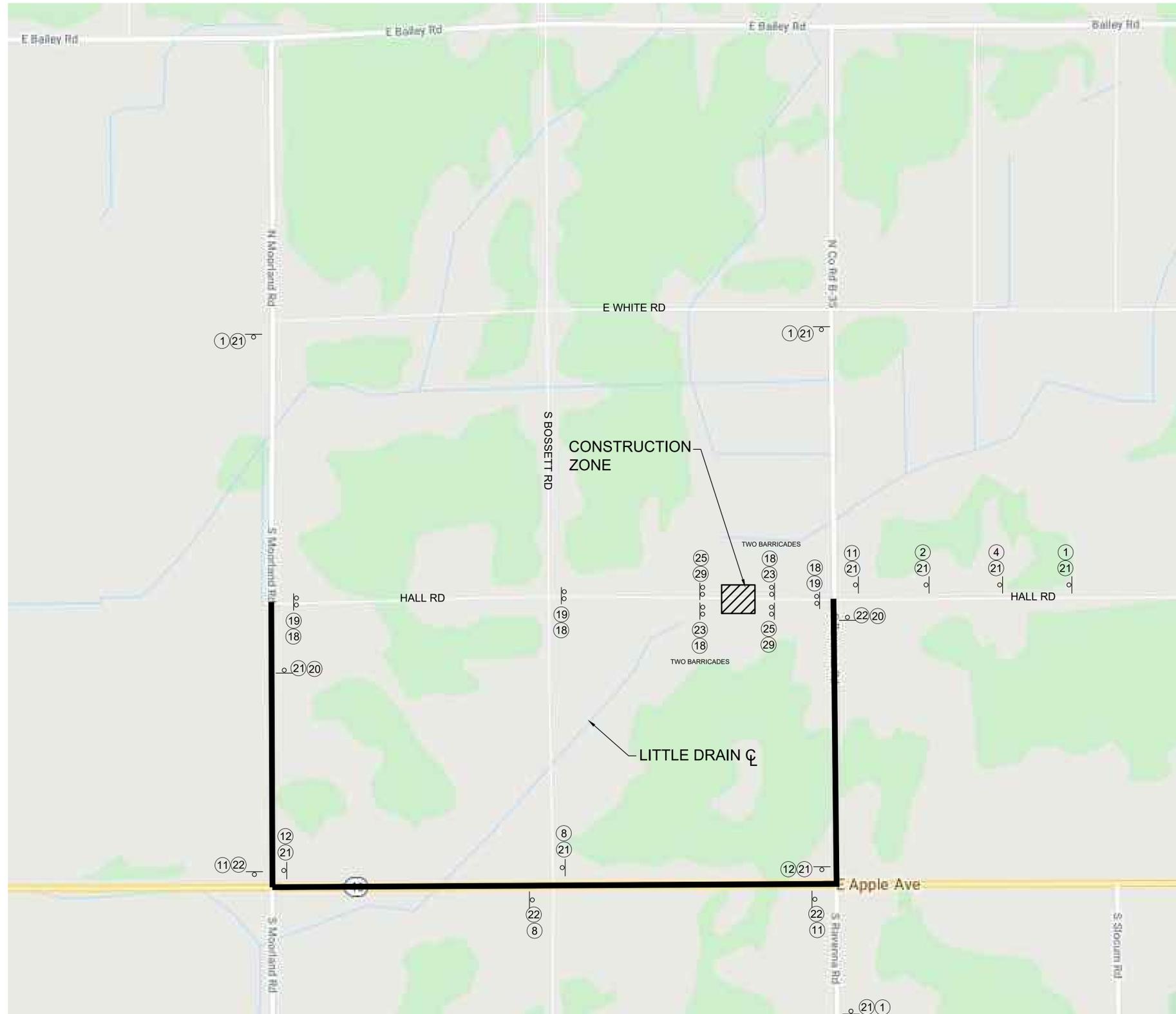
ROAD CLOSED TO THRU TRAFFIC  
 8" to 12" x 20" x 20" x 4' MIN  
 CLOSURE TYPE III BARRICADE  
 (18)

 ROAD CLOSED TO THRU TRAFFIC R11-4 60" x 30" TYPE II B BLACK LEGEND WHITE BACKGROUND (19)	 END DETOUR NB HALL RD "END DETOUR" M4-9S 24" x 18" TYPE II B BLACK & ORANGE (20)
--	---

 NB HALL RD D3-1 (21)	 SB HALL RD D3-1 (22)
--------------------------------	--------------------------------

ROAD CLOSED  
 R11-2  
 60" x 30"  
 TYPE II B  
 BLACK LEGEND  
 WHITE BACKGROUND  
 (23)

 INJURE/ KILL A WORKER \$7500+ 15 YEARS R5-18b (29)	 WORK ZONE BEGINS R5-18C (25)
--	--



**LITTLE DRAIN (FRMLY) HALL RD  
CROSSING TRAFFIC DETOUR**

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**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
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SHEET NO.	DIVISION 2 <b>C16</b>

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