

# LAKE BLUFFS DRAIN

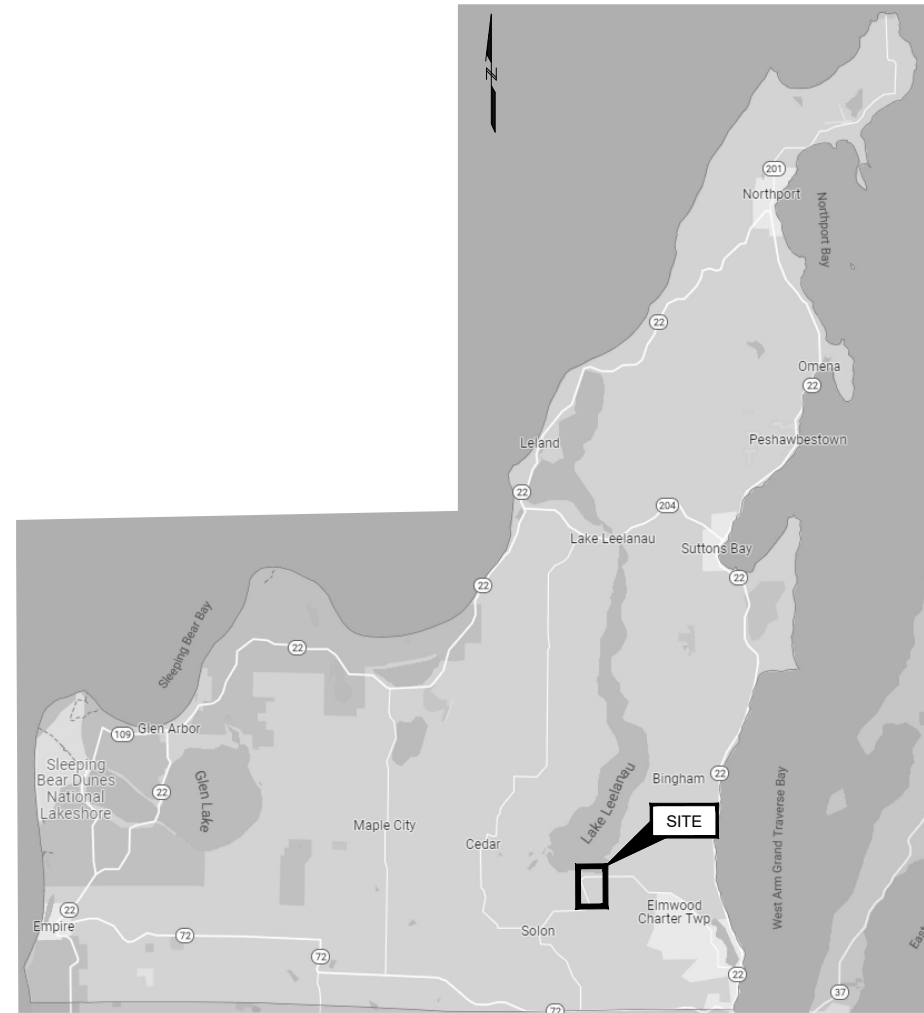
## LEELANAU COUNTY DRAIN COMMISSIONER

SECTION 14, TOWN 28 NORTH, RANGE 12 WEST, SOLON TOWNSHIP,  
LEELANAU COUNTY, MICHIGAN



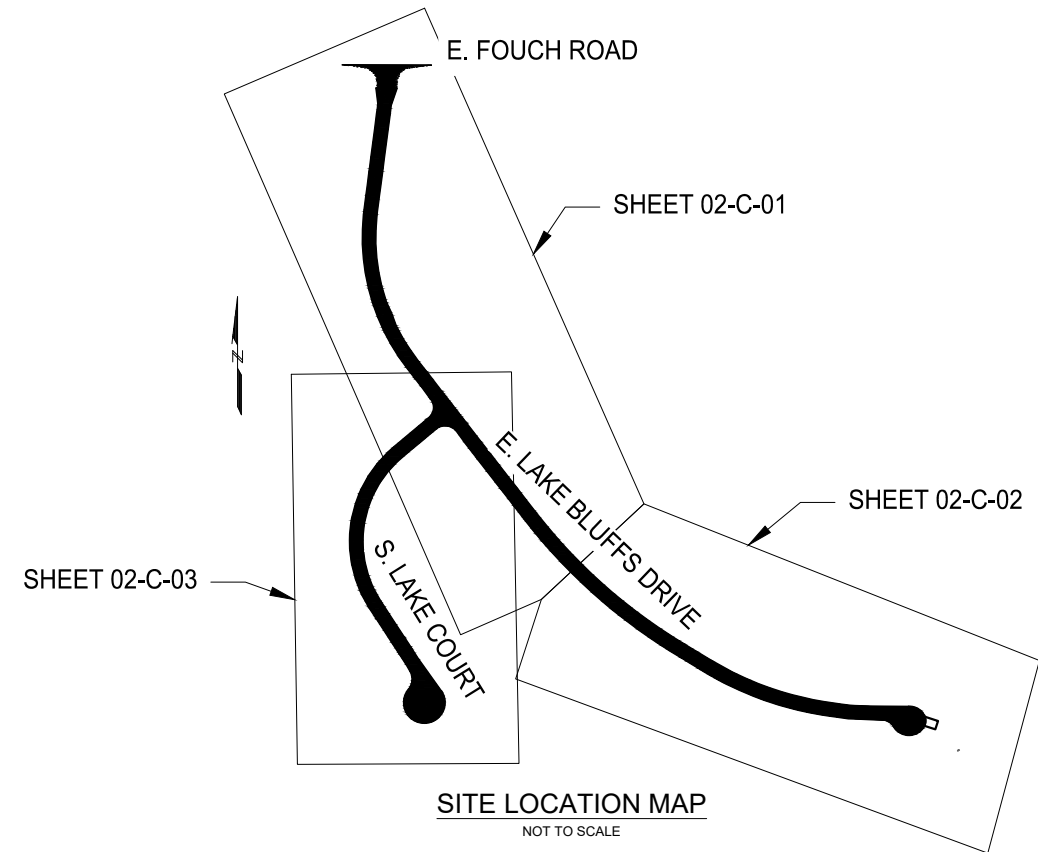
**STEVEN CHRISTENSEN**  
**LEELANAU COUNTY DRAIN COMMISSIONER**  
 LAKE BLUFFS DRAIN  
 A PART OF SECTION 14, SOLON TWP.,  
 T28N, R12W, LEELANAU COUNTY, MICHIGAN

COVER SHEET



SOURCE:  
GOOGLE MAPS

**LEELANAU COUNTY MAP**  
NOT TO SCALE



**PROJECT & UTILITY CONTACTS**

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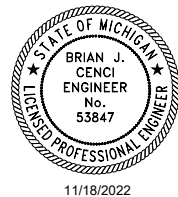
GEI CONSULTANTS OF MICHIGAN, P.C.  
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**ROAD COMISSION (FOUCH RD. ONLY)**  
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 O: (231) 271-3993

### SHEET LIST

SHEET NO.	REFERENCE NO.	DESCRIPTION
1	01-G-01	COVER SHEET
2	01-G-02	GENERAL NOTES AND LEGEND
3	01-G-03	SESC PLAN
4	02-C-01	P&P STA 0+00 TO STA 10+00
5	02-C-02	P&P STA. 10+00 TO STA. 18+00
6	02-C-03	P&P STA. 100+00 TO STA. 110+00
7	02-C-04	INFILTRATION BASIN DETAILS
8	02-C-05	PROPOSED ROAD FILL
9	99-D-01	TYPICAL CROSS SECTIONS
10	99-D-02	DETAILS 1
11	99-D-03	DETAILS 2
12	99-D-04	DETAILS 3

ENGINEER OF RECORD:



*Brian J. Cenci*  
 BRIAN J. CENCI, P.E. #53847

11/18/2022  
 DATE

Attention: 1" = 100'

If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
1	6/9/2022
2	11/18/2022
MODIFIED FOR NOV. 2022 RE-BID	
Designed By:	LCM
Checked By:	MFS
Drawn By:	BSF
Approved By:	BJC
GEI PROJECT: 2003322	
DWG. NO. <b>01-G-01</b>	
SHEET #1	
ARCHIVE #	

**GENERAL NOTES:**

**GENERAL CONSTRUCTION**

AT NO TIME SHALL TRACK EQUIPMENT BE PERMITTED TO TRAVEL ON OR ACROSS PAVED ROADWAY SURFACES WITHOUT PROVIDING ADEQUATE PROTECTION BETWEEN THE TRACKS AND PAVED ROADWAY SURFACE. IF THE PAVED ROADWAY SURFACE IS DAMAGED BY FAILURE TO PROVIDE ADEQUATE PROTECTION BETWEEN THE TRACKS AND PAVED ROADWAY SURFACE, THE CONTRACTOR SHALL BE REQUIRED TO REPAIR THE PAVED ROADWAY SURFACE AT NO ADDITIONAL COST.

CONTRACTOR SHALL MAINTAIN ACCESS FOR MAIL DELIVERY AND GARBAGE PICKUP AT ALL PARCELS. IF THESE SERVICES CANNOT BE PERFORMED, THE CONTRACTOR IS RESPONSIBLE FOR TAKING THE NECESSARY MEASURES TO CARRY THEM OUT.

ALL SPRINKLER SYSTEMS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR. COST IS TO BE INCLUDED IN OTHER WORK ITEMS OF THE PROJECT.

DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.

NO WORK SHALL BE PERFORMED BEFORE 7:00 AM OR AFTER 7:00 PM MONDAY THROUGH FRIDAY. NO WORK SHALL HAPPEN ON SATURDAYS, SUNDAYS, OR LEELANAU COUNTY HOLIDAYS UNLESS AUTHORIZED BY THE ENGINEER WITH AT LEAST 48 HOURS NOTICE PRIOR.

CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS PRIOR TO START OF CONSTRUCTION, CONSTRUCTION STAKING AND INSPECTION.

CONTRACTOR TO PROVIDE DUST CONTROL AND SWEEP ADJACENT ROADS DAILY, OR SEVERAL TIMES A DAY, SHOULD CONDITIONS REQUIRE.

ALL EXCAVATED MATERIAL NOT DESIGNATED FOR REUSE SHALL BE REMOVED FROM SITE AT TIME OF DISTURBANCE OR AS APPLICABLE. IF MATERIAL IS UNABLE TO BE REMOVED AT TIME OF DISTURBANCE, THE MATERIAL SHALL BE STOCKPILED ACCORDING TO THE SESC PLAN AND REMOVED PRIOR TO STORM EVENTS. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSING MATERIALS ACCORDING TO LOCAL AND STATE REQUIREMENTS.

ALL WORK SHALL BE WITHIN DRAIN RIGHT-OF-WAY OR PRIVATE ROAD RIGHT-OF-WAY. WORK OUTSIDE RIGHT-OF-WAY MUST BE AGREED UPON BY LANDOWNER AND ENGINEER WITH A SIGNED LANDOWNER AGREEMENT PRIOR TO WORK ON THAT PROPERTY.

THE CONTRACTOR IS TO RESTORE INCIDENTAL DAMAGES ON THE PROJECT AS DIRECTED BY THE ENGINEER.

ALL DRAIN SIDE SLOPES SHALL BE 2H:1V OR FLATTER, UNLESS SPECIFIED OTHERWISE.

THE WORDS "RIGHT SIDE" OR "LEFT SIDE" IMPLY A REFERENCE TO THE DRAIN FACING UPSTREAM.

CLEAR AND GRUB TREES AS INDICATED FOR CONSTRUCTION WITHIN DRAIN RIGHT-OF-WAY. REMOVE ALL TREES, STUMPS AND DEBRIS FROM SITE.

REMOVE EXISTING FENCES, LANDSCAPING, AND OTHER STRUCTURES IN DRAIN RIGHT-OF-WAY AS INDICATED ON THE PLANS. REMOVAL AND REINSTALLATION COST TO BE INCLUDED IN SITE CLEARING OR OTHER PAY ITEMS, PER CONTRACT DOCUMENTS.

CONTRACTOR SHALL COORDINATE REMOVAL OF ALL TREES WITHIN THE LIMITS OF CONSTRUCTION WITH THE ENGINEER.

DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.

**PERMANENT SIGNS**

ANY PERMANENT SIGNS OR STREET SIGNS REQUIRING RELOCATION DUE TO CONTRACTOR OPERATIONS SHALL BE SALVAGED AND RESET BY THE CONTRACTOR AT LOCATIONS DESIGNATED BY THE ENGINEER. SIGNS AND POSTS DAMAGED DURING THE REMOVAL AND STAGE OPERATIONS SHALL BE REPLACED WITH NEW SIGNS AND POSTS.

**PAVEMENT REMOVAL**

PAVEMENT REMOVAL AS SHOWN ON THE PLANS SHALL BE AT THE DISCRETION OF THE ENGINEER. IF IN HIS/HER JUDGEMENT, AREAS OF PAVEMENT MAY BE LEFT IN PLACE, OR ADDITIONAL AREAS ADDED, TO PROVIDE THE PROPER CROSS-SECTION AND BASE ADJUSTMENTS CAN BE MADE IN THE QUANTITIES.

**UTILITIES**

FOR THE PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, 1974, THE CONTRACTOR SHALL DIAL 1-800-482-7171 A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

THE EXISTING UTILITIES ON THESE DRAWINGS HAVE BEEN SHOWN ACCORDING TO THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION AND SHALL NOTIFY THE ENGINEER AS TO WHERE POSSIBLE CONFLICT EXISTS

ELECTRIC, GAS, AND COMMUNICATION UTILITIES LOCATED IN THE ROAD AND DRAIN RIGHT-OF-WAYS MUST BE LOCATED PRIOR TO EXCAVATION WORK AND ELEVATIONS MUST BE PROVIDED TO ENGINEER TO CONFIRM NO CONFLICTS EXIST. CONTRACTOR SHALL NOTIFY THE ENGINEER AS TO WHERE POSSIBLE CONFLICTS EXIST.

ANY UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

ALL MANHOLE RIMS IN ROADWAYS AND DRIVES SHALL BE ADJUSTED PRIOR TO FINAL PAVING TO BE FLUSH WITH FINISHED GRADE.

GRADING AROUND MANHOLES/CATCHBASINS, FLARED END SECTIONS, AND OTHER INLETS DETERMINED BY THE ENGINEER SHALL BE SMOOTH AND SHAPED TO PROVIDE POSITIVE DRAINAGE INTO THE INLETS.

ALL MANHOLE TO PLASTIC PIPE CONNECTIONS SHALL BE MADE WITH KOR-N-SEAL BOOT OR ENGINEER APPROVED EQUAL.

ALL CORRUGATED METAL PIPE SHALL BE TYPE II ALUMINIZED UNLESS OTHERWISE NOTED.

ALL STORM SEWER ARE TO BE PREMIUM JOINT UNLESS OTHERWISE SPECIFIED.

ALL FLARED END SECTIONS ARE TO HAVE FACTORY SUPPLIED ANIMAL GUARD.

DEMOLISH EXISTING STRUCTURE(S) AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. COST TO BE INCLUDED WITH THE ITEM BEING INSTALLED AS DIRECTED BY ENGINEER.

CONTRACTOR SHALL CONNECT ANY AND ALL FIELD TILE OUTLETS AND OTHER STORM LEADS TO PROPOSED STORM SEWER WITH PREMANUFACTURED TEES, WYES, GASKETS, SEALS, COUPLERS, BOOTS, ETC. COST IS TO BE INCLUDED IN UNIT BID PRICE FOR STORM SEWER INSTALLATION.

ALL UTILITY POLES IMPACTED DURING CONSTRUCTION SHALL BE SUPPORTED IF NECESSARY, PER THE SPECIFICATIONS OF THE INDIVIDUAL UTILITY COMPANY.

ALL UTILITIES ENCOUNTERED DURING CONSTRUCTION SHALL BE PROTECTED, PER REQUIREMENTS OF THE INDIVIDUAL UTILITY COMPANY.

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

PROPERTY CORNER MONUMENT VISIBLY OBSERVED ON SITE, WHETHER SHOWN OR NOT, SHALL BE PROTECTED. DAMAGED PROPERTY CORNERS WILL BE RESET AT CONTRACTOR'S EXPENSE.

**ADJUSTING MONUMENT BOXES**

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

**TRAFFIC CONTROL**

THE CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC AT ALL TIMES.

**PERMITS**

PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED BY THE APPROPRIATE AGENCIES. ANY REQUIRED PERMITS ARE LISTED IN THE CONTRACT DOCUMENTS, SECTION 01010 - SUMMARY OF WORK.

CONSTRUCTION PROCEDURES SHALL CONFORM TO THE REQUIREMENTS OF THE APPROPRIATE PERMITTING AGENCIES.

**MAILBOXES & TRASH PICKUP**

THE CONTRACTOR SHALL REMOVE AND TEMPORARILY RELOCATE ALL EXISTING MAIL BOXES AS NEEDED FOR CONSTRUCTION.

THE CONTRACTOR SHALL COORDINATE MAIL BOX RELOCATION WITH LANDOWNERS A MINIMUM OF ONE DAY IN ADVANCE.

ALL TEMPORARILY RELOCATED MAIL BOXES, STREET AND TRAFFIC SIGNS ARE TO BE REINSTALLED TO ORIGINAL LOCATIONS AS CONSTRUCTION ALLOWS.

CONTRACTOR WILL COORDINATE, MOVE TRASH BINS FROM END OF DRIVEWAYS TO NEAR FOUR RD. ON DAY OF PICKUP TO CONTINUE TO ALLOW FOR TRASH PICKUP SERVICES.

PAVED SURFACES - ROADS, DRIVEWAYS, PATHS, AND SIDEWALKS  
COORDINATE DRIVEWAY CLOSURES WITH LANDOWNERS A MINIMUM OF 48 HOURS IN ADVANCE.

ALL JOINTS AT INTERSECTION APPROACHES AND DRIVEWAYS SHALL BE SAW-CUT WITH BUTT-JOINTS UNLESS OTHERWISE NOTED. THE COST IS TO BE INCLUDED IN UNIT PRICE FOR ROAD AND DRIVEWAY REPAIR.

ALL DRIVING SURFACES ARE TO BE RESTORED TO IN-KIND DEPTH AND MATERIAL UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROTECT ALL BITUMINOUS ROADS NOT SPECIFIED TO BE REMOVED DURING CONSTRUCTION. REPAIR ANY UNAUTHORIZED DAMAGE AT CONTRACTORS EXPENSE.

BROKEN CONCRETE AND DEBRIS SHALL BE CONSIDERED WASTE AND SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE. COST OF WORK CONSIDERED INCIDENTAL TO CONSTRUCTION.

CONTRACTOR SHALL REMOVE ALL STREET AND/OR PRIVATE TRAFFIC SIGNAGE AS IS NEEDED FOR CONSTRUCTION AND SHALL RESTORE AFTER CONSTRUCTION WORK IS COMPLETED. ALL ASSOCIATED COSTS FOR THIS WORK TO BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

ALL WORK WITHIN THE ROAD RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND GENERAL SPECIFICATIONS OF SOLON TOWNSHIP, LEELANAU COUNTY ROAD DEPARTMENT, WHERE APPLICABLE.

**AGGREGATES**

AGGREGATE BASE  
AGGREGATE BASES SHALL USE MDOT AGGREGATE 22A, UNLESS OTHERWISE SPECIFIED.

THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREON IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.

**LINETYPES**

**DRAINAGE UTILITIES**

EXISTING	PROPOSED	DESCRIPTION
		UG STORM MAIN
		UNDER DRAIN (DRAIN TILE)
		CULVERT LINE
		BOX CULVERT
		CULVERT HEAD OR WING WALL
		DRAINAGE BASIN OUTLINE
		DRAINAGE BASIN (EDGE OF WATER)

**ROADWAY**

EXISTING - GRAVEL	PROPOSED - ASPHALT	DESCRIPTION
		EDGE OF ROADWAY

**ELECTRICAL POWER**

EXISTING	PROPOSED	DESCRIPTION
		UG ELECTRICAL

**NATURAL GAS**

EXISTING	PROPOSED	DESCRIPTION
		UG NATURAL GAS

**GENERAL/COMMUNICATION**

EXISTING	PROPOSED	DESCRIPTION
		UG COMCAST
		UG AT&T
		UG DUCT BANK

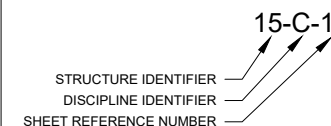
**MISCELLANEOUS**

EXISTING	PROPOSED	DESCRIPTION
		FENCE LINE
		TREE LINE
		DITCH LINE

**SYMBOLS**

DRAINAGE UTILITIES			MISCELLANEOUS		
EXISTING	PROPOSED	DESCRIPTION	EXISTING	PROPOSED	DESCRIPTION
		CATCH BASIN (ROUND)			MAIL BOX
		CATCH BASIN (SQUARE)			SIGN POST
		END SECTION	<b>COMMUNICATION</b>		
		INVERT ELEVATION			CABLE PEDESTAL
		BUSH OR SHRUB			FIBER PEDESTAL
		STUMP			TELEPHONE PEDESTAL
		DECIDUOUS TREES			MANHOLE FIBER
		MANHOLE TELEPHONE			TELEPHONE POLE
<b>ELECTRICAL POWER</b>			<b>NATURAL GAS</b>		
		NATURAL GAS METER			UG NATURAL GAS VALVE
		ELECTICAL PEDESTAL			NATURAL GAS MANHOLE

**DRAWING NUMBER DESIGNATION**



**DISCIPLINE IDENTIFIER**

DISCIPLINE	DISCIPLINE IDENTIFIER
GENERAL	G
REMOVAL	R
CIVIL - PLAN PROFILE	C
DETAILS	D

**NOTES:**

- STRUCTURE IDENTIFIER SHALL BE 01 FOR GENERAL PLAN SHEETS.
- STRUCTURE IDENTIFIER SHALL BE 02 FOR CIVIL UNDERGROUND UTILITY WORK.
- STRUCTURE IDENTIFIER SHALL BE 99 FOR STANDARD DETAILS.

**ABBREVIATIONS**

ABUT	ABUTMENTS	HWY	HIGHWAY
AGG	AGGREGATE	HYD	HYDRANT
ASPH	ASPHALT	IE	INVERT ELEVATION
B TO B	BACK TO BACK	IGLD	INTERNATIONAL GREAT LAKES DATUM
BM	BENCH MARK	IL	INLET
BS	BACKSLOPE	IN	INCH
B/C	BACK OF CURB	INSP	INSPECTION
BIT	BITUMINOUS	INTER	INTERSECTION
BR	BRIDGE	LB	POUND
CL	CENTERLINE	LEVCS	LEVEL COURSE
C&G	CURB & GUTTER	LFT	LINEAL FEET
CB	CATCH BASIN	LLV	LONG LEGNTH VERTICAL
CI	CAST IRON PIPE	LSUM	LUMP SUM
CO	SANITARY SEWER CLEANOUT	LWL	LOW WATER LEVEL
CSP	CORRUGATED STEEL PIPE	MH	MANHOLE
C-C	CENTER TO CENTER	MAINT	MAINTENANCE
CEN	CENTER	MGD	MILLION GALLONS PER DAY
CIP	COMPACTED IN PLACE	MON	MONUMENT
CMP	CORRUGATED METAL PIPE	NGVD	NATIONAL GEODETIC VERTICAL DATUM
CNTY	COUNTY	OC	ON CENTER
COMB	COMBINED	OF	OVERFLOW
COMP	COMPACTED	OH	OVERHEAD
CONC	CONCRETE	PL	PROPERTY LINE
CONST	CONSTRUCT	PP	POWER POLE
COR	CORNER	PAVT	PAVEMENT
CORR	CORRUGATED	PROJ	PROJECT
CR	CREEK	PPTY	PROPERTY
CTE	CONNECT TO EXISTING	PROP	PROPOSED
CULV	CULVERT	RB	ROUND BOTTOM
CYD	CUBIC YARDS	RR	RAILROAD
CS&B	CURB STOP AND BOX	RCP	REINFORCED CONCRETE PIPE
DIP	DUCTILE IRON PIPE	RDY	ROADWAY
DEFL	DEFLECTION	REINF	REINFORCING OR REINFORCEMENT
DET	DETAIL	ROW	RIGHT OF WAY
DR	DRIVE	SG	SUBGRADE
DWY	DRIVEWAY	SW	SIDEWALK
EG	EARTHGRADE	SALV	SALVAGED
EGL	ENERGY GRADE LINE	SAN	SANITARY SEWER
EL	ELEVATION	SN	SECTION
ELEC	ELECTRIC	SEC	SECTION (LAND SURVEY)
ELEV	ELEVATION	SEW	SEWER
EMB	EMBANKMENT	SFT	SQUARE FEET
ENC	ENCASED	SHLD	SHOULDER
ENG	ENGINEER	SIG	SIGNAL
EX	EXISTING	SPC	SPECIAL
EXC	EXCAVATION	SPEC	SPECIFICATIONS
EXIST	EXISTING	SPECROV	SPECIAL PROVISIONS
EXP	EXPANSION	STDSPEC	STANDARD SPECIFICATIONS
FL	FLOW LINE	STM	STORM SEWER
FM	FORCE MAIN	SUB	SUBBASE
F/C	FACE CURB	SURF	SURFACE
F-F	FACE TO FACE OF CURB	SYD	SQUARE YARDS
FL	FLOOR	TCSE	TOP COURSE
FT	FOOT/FEET	TDH	TOTAL DYNAMIC HEAD
FTG	FOOTING	TRANS	TRANSMISSION
GDE	GRADE	TWP	TOWNSHIP
GR	GUARD RAIL	TYP	TYPICAL
GAL	GALLONS	UG	UNDERGROUND
GPD	GALLONS PER DAY	UNIF	UNIFORM
GPM	GALLONS PER MINUTE	VFT	VERTICAL FEET
HDW	HEADWALL	VCP	VITRIFIED CLAY PIPE
HGL	HYDRAULIC GRADE LINE	WM	WATER MAIN
HWL	HIGH WATER LEVEL	WS	WATER SERVICE

**CROSS SECTIONS HATCH LEGEND**

MATERIAL DESCRIPTION	PROPOSED WORK PATTERN
RIPRAP, PLAN	
CHECK DAMS, SESC PLAN (SHEET 3)	
RIPRAP DIVERSIONS, PLAN	
TOPSOIL SURFACE, FURN, 3 INCH, SEEDING, MIXTURE THM, FERTILIZER, AND MULCH	
HMA, PLAN	
BERM, PLAN	
SMART DITCH, PLAN	



STEVEN CHRISTENSEN  
LEELANAU COUNTY DRAIN COMMISSIONER  
LAKE BLUFFS DRAIN  
A PART OF SECTION 14, SOLON TWP,  
T28N, R12W, LEELANAU COUNTY, MICHIGAN

GENERAL NOTES AND LEGEND

Attention: 1" = 1'

If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
1	6/9/2022
2	11/18/2022

MODIFIED FOR NOV. 2022 RE-BID

Designed By: LCM  
Checked By: MFS  
Drawn By: BSF  
Approved By: BJC

GEI PROJECT: 2003322

DWG. NO.  
**01-G-02**  
SHEET #2  
ARCHIVE #

Attention: 1" = 80'  
 If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
1	6/9/2022
2	11/18/2022

MODIFIED FOR NOV. 2022 RE-BID

Designed By:	LCM
Checked By:	MFS
Drawn By:	BSF
Approved By:	BJC

**SOIL EROSION AND SEDIMENTATION CONTROL NOTES**

- TEMPORARY MEASURES SHALL BE INSTALLED PRIOR TO OR UPON COMMENCEMENT OF EARTH CHANGE ACTIVITY AT EACH SITE.
- THE CONTRACTOR SHALL CONFORM TO SOIL EROSION AND SEDIMENTATION CONTROL ACT, PART 91 OF ACT 451 OF 1994 AND MUST PROVIDE NOTICE TO THE CEA PRIOR TO THE START OF CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT MEASURES ARE INSTALLED IN COMPLIANCE WITH THE MANUFACTURERS RECOMMENDATIONS, AND THE PLANS. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE SESC MEASURES ARE MONITORED AND MAINTAINED UNTIL ALL DISTURBED AREAS ARE STABILIZED AND TEMPORARY MEASURES ARE REMOVED. THE CONTRACTOR ACKNOWLEDGES THAT SESC MEASURES MAY NEED TO BE ADAPTED, ADJUSTED, OR ADDED BASED ON SITE CONDITIONS IN ORDER TO REMAIN IN COMPLIANCE WITH PART 91 REQUIREMENTS.
- ALL SOIL EROSION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED DAILY BY THE CONTRACTOR. THE CONTRACTOR SHALL INSPECT AFTER EACH RAIN EVENT TO ENSURE PROPER MAINTENANCE OF THE SOIL EROSION CONTROL MEASURES. ANY DEFICIENCIES OR REPAIRS TO SOIL EROSION CONTROL MEASURES ARE TO BE CORRECTED IMMEDIATELY.
- THE CONTRACTOR SHALL INSTALL FINAL SOIL EROSION CONTROL MEASURES WITHIN 72 HOURS OF FINAL GRADE IN ANY AREA (GRADE LISTED ON PLANS) UNLESS SPECIFIED OTHERWISE BY ENGINEER. WEEKLY INSPECTIONS OF SEEDED AREAS SHALL BE COMPLETED TO VERIFY GRASS GROWTH. ANY AREAS NOT ESTABLISHED SHALL BE FERTILIZED, SOILS AMENDED AND RE-SEED AS NECESSARY. ALL COST FOR ESTABLISHMENT OF SEEDED AREAS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE SPECIFIC SEEDING BEING INSTALLED.
- THE CONTRACTOR SHALL REMOVE TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES WITHIN 45 DAYS AFTER PERMANENT SOIL EROSION MEASURES ARE IN PLACE AND THE AREA IS STABILIZED ("STABILIZED" MEANS THE ESTABLISHMENT OF VEGETATION OR THE PROPER PLACEMENT, GRADING, OR COVERING OF SOIL TO ENSURE ITS RESISTANCE TO SOIL EROSION, SLIDING, OR OTHER EARTH MOVEMENT).
- REMOVAL OF TEMPORARY MEASURES IS THE RESPONSIBILITY OF THE CONTRACTOR.
- THE CONTRACTOR IS RESPONSIBLE FOR CLEANUP & RESTORATION INCLUDING PROGRESS CLEANING. PROGRESS CLEANING INCLUDES BUT IS NOT LIMITED TO REMOVAL OF WASTE MATERIALS, DEBRIS, RUBBISH, AND EXCESS SPOILS, COMPLETE LEVELING AND DAMAGE RESTORATION AT REGULAR INTERVALS DURING CONSTRUCTION.
- SEDIMENTS CAUSED BY ACCELERATED SOIL EROSION SHALL BE REMOVED FROM RUNOFF WATER BEFORE IT LEAVES THE SITE OF THE EARTH CHANGE.
- PLACE TURF ESTABLISHMENT ITEMS AS SOON AS POSSIBLE ON POTENTIAL ERODABLE SLOPES AS DIRECTED BY THE ENGINEER. CRITICAL DITCH GRADES SHALL BE PROTECTED WITH SOD OR SEED/MULCH OR MULCH BLANKET AS DIRECTED BY THE ENGINEER.
- IF NECESSARY A TEMPORARY CONTROL MEASURE SHALL BE DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF WATER AROUND, THROUGH OR FROM THE EARTH CHANGE AREA TO LIMIT WATER FLOW TO A NON-EROSIVE VELOCITY.
- MAINTAIN ON SITE OR HAVE READILY AVAILABLE SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS TO CONTAIN AND CLEAN UP FUEL OR CHEMICAL SPILLS AND LEAKS. NO SPILLED CHEMICALS OR PETROLEUM OR VEHICULAR FLUIDS ARE TO COME INTO CONTACT WITH DRAINAGE DITCHES, WETLAND OR WATERS OF THE STATE.
- ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED AND THREE INCHES OF TOPSOIL APPLIED. EXISTING TOPSOIL MAY BE USED FOR RESTORATION OF THIS ACTIVITY WHERE INDICATED. IF ADEQUATE TOPSOIL IS NOT AVAILABLE ON SITE THE CONTRACTOR SHALL PROVIDE THE TOPSOIL, APPROVED BY THE OWNER AND ENGINEER, AS NEEDED. THE AREA SHALL BE SEED, FERTILIZED, WATERED AND MAINTAINED UNTIL VEGETATION IS WELL ESTABLISHED. NOTE: FERTILIZER SHALL NOT BE USED WITHIN 50 FEET OF THE RIVER, LAKE OR STREAM AT THIS SITE. ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE PROJECT WILL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR WILL WATCH FOR WEATHER CHANGES THAT WILL CREATE EROSION CONDITIONS AND WILL APPLY EROSION CONTROL MEASURES BEFORE A STORM HITS THE SITE.
- STOCKPILES OF MATERIALS SHALL BE COVERED AND PROTECTED IN A MANNER TO PREVENT SILTATION OF SURROUNDING SITE OR EROSION FROM OCCURRING ON THE STOCKPILE.
- NO WORK THAT REQUIRES DEWATERING SHALL COMMENCE WITHOUT APPROVAL FROM THE ENGINEER. WATER DISCHARGED FROM DEWATERING SHALL NOT EXCEED 200 NTU.
- THE CONTRACTOR IS RESPONSIBLE FOR THE SESC PERMIT, IF APPLICABLE, AT ANY SPOIL DEPOSIT LOCATIONS. LOCATIONS MUST BE APPROVED BEFORE DEPOSITION.
- THE DRAIN COMMISSIONER MAY ASSESS COST FOR SITE RESTORATION, SITE STABILIZATION, AND/OR RESTORE OR REPAIR OFF-SITE DAMAGES IF THE CONTRACTOR DOES NOT COMPLY WITH THEIR CONTRACT OR PART 91.
- DETAILED DRAWINGS AND SPECIFICATIONS ARE LOCATED IN THE MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS SOILS EROSION AND SEDIMENTATION CONTROL AUTHORIZED PUBLIC AGENCY PROCEDURES MANUAL.
- MEASURES SHALL ONLY BE PAID FOR ONCE.

**SOIL EROSION & SEDIMENTATION CONTROL TABLE**

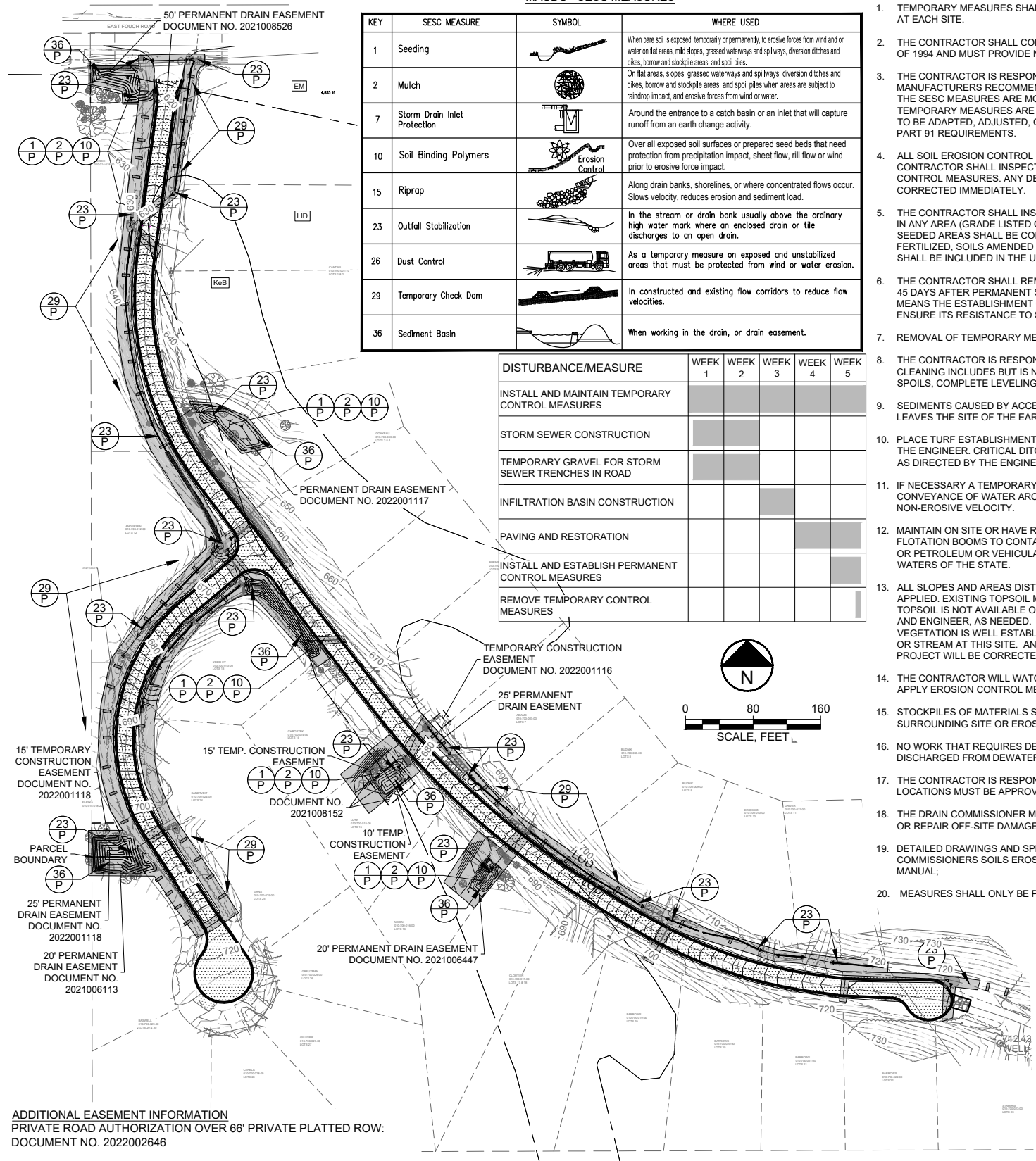
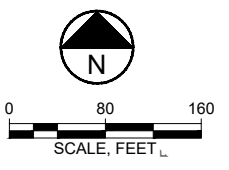
KEY	LOCATION	DESCRIPTION
1 P	ALL DISTURBED AREAS	SEEDING
2 P	ALL DISTURBED AREAS	MULCH/MULCH BLANKET
7 T	*CATCH BASINS	STORM DRAIN INLET PROTECTION
10 P	ALL DISTURBED AREAS	SOIL BINDING POLYMERS
15 P	AT INLETS/OUTLETS	RIPRAP
23 P	ALL OUTLETS	OUTFALL STABILIZATION
26 P	ENTIRE SITE	DUST CONTROL
29 P	DITCHES	PERMANENT CHECK DAM
36 P	INFILTRATION BASINS	SEDIMENT BASIN
TOTAL LIMITS OF DISTURBANCE = 1.65 AC		

\* ONCE CATCH BASIN COVERS AND CASTINGS ARE INSTALLED, CATCH BASINS INLET PROTECTION SHALL BE FURNISHED IF ALL DISTURBED AREAS ARE NOT STABILIZED AT TIME OF CATCH BASIN COVER INSTALLATION. COORDINATE WITH ENGINEER.

**MACDC - SESC MEASURES**

KEY	SESC MEASURE	SYMBOL	WHERE USED
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.
2	Mulch		On flat areas, 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.
7	Storm Drain Inlet Protection		Around the entrance to a catch basin or an inlet that will capture runoff from an earth change activity.
10	Soil Binding Polymers		Over all exposed soil surfaces or prepared seed beds that need protection from precipitation impact, sheet flow, rill flow or wind prior to erosive force impact.
15	Riprap		Along drain banks, shorelines, or where concentrated flows occur. Slows velocity, reduces erosion and sediment load.
23	Outfall Stabilization		In the stream or drain bank usually above the ordinary high water mark where an enclosed drain or tile discharges to an open drain.
26	Dust Control		As a temporary measure on exposed and unstabilized areas that must be protected from wind or water erosion.
29	Temporary Check Dam		In constructed and existing flow corridors to reduce flow velocities.
36	Sediment Basin		When working in the drain, or drain easement.

DISTURBANCE/MEASURE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
INSTALL AND MAINTAIN TEMPORARY CONTROL MEASURES					
STORM SEWER CONSTRUCTION					
TEMPORARY GRAVEL FOR STORM SEWER TRENCHES IN ROAD					
INFILTRATION BASIN CONSTRUCTION					
PAVING AND RESTORATION					
INSTALL AND ESTABLISH PERMANENT CONTROL MEASURES					
REMOVE TEMPORARY CONTROL MEASURES					



\*DOCUMENT NO. ON EASEMENT NOTES REFERS TO THE RECORDED DOCUMENT NUMBER FOR THE LEELANAU COUNTY REGISTER OF DEEDS

**SOIL TYPE LEGEND**

SYMBOL	SOIL DESCRIPTION
EM	EDWARDS MUCK-MARL BEDS COMPLEX
KeB	KALKASKA-EAST LAKE LOAMY SANDS, 0 TO 6 PERCENT SLOPES, LAKE MODERATED
LID	LEELANAU-EAST LAKE LOAMY SANDS, 12 TO 18 PERCENT SLOPES, LAKE MODERATED

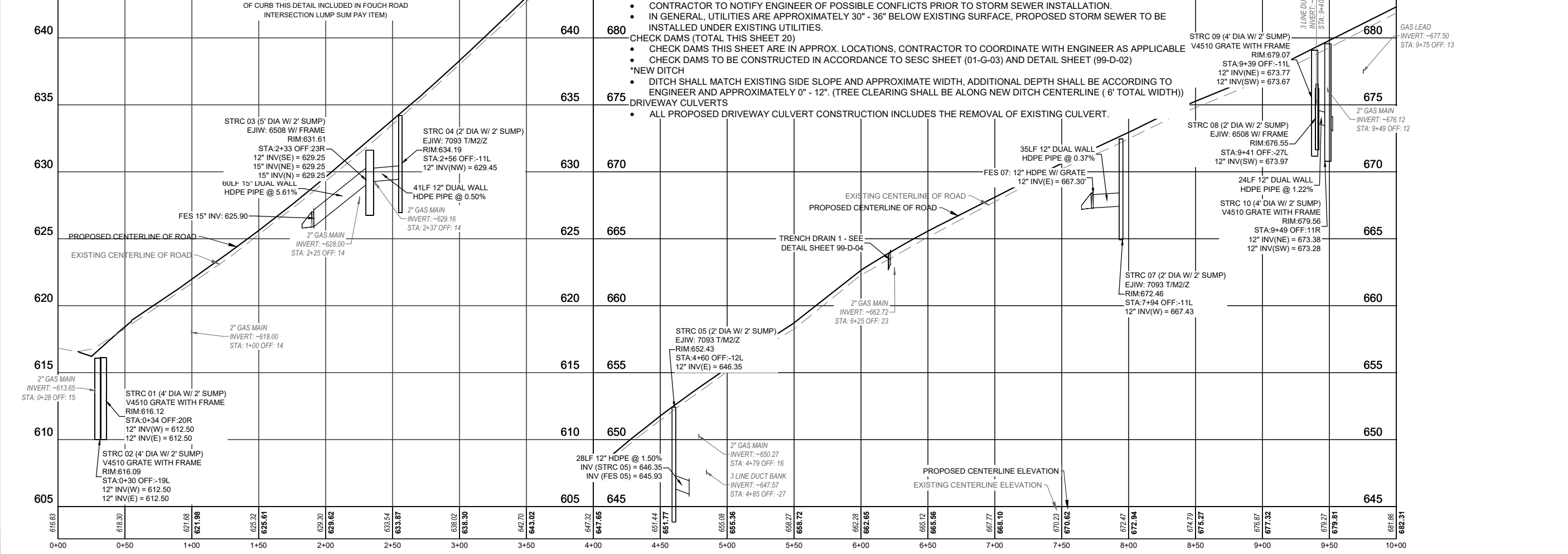
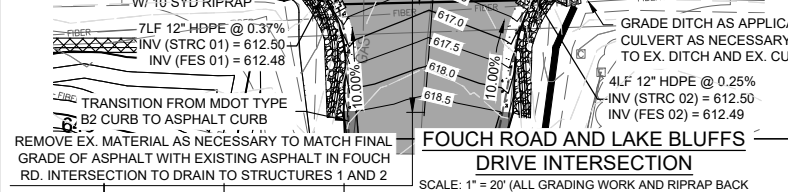
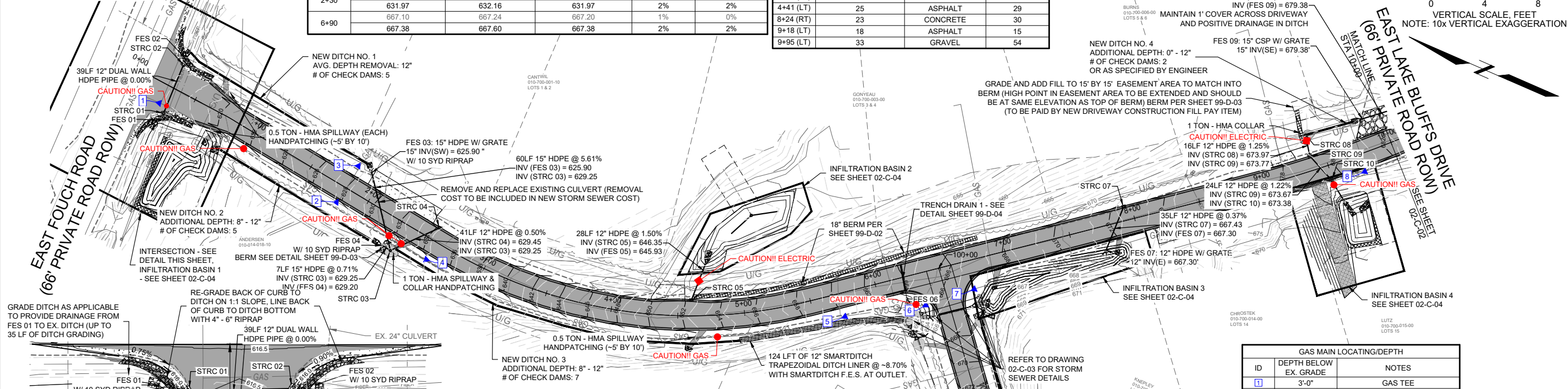
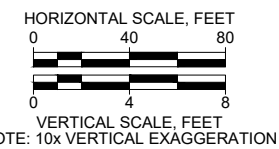
- RESTORATION NOTES:**
- ALL AREAS DISTURBED DURING CONSTRUCTION TO BE RESTORED PER SPECIFICATIONS.
  - PAYMENT FOR RESTORATION SHALL BE AS SHOWN ON THE PLANS AND PER THE PAY ITEMS IN THE BID SCHEDULE.
  - SLOPE AND DITCH RESTORATION SHALL BE PER MDOT'S SPECIAL PROVISION FOR SLOPE RESTORATION, NON-FREEWAY.
    - HIGH VELOCITY MULCH BLANKET SHALL BE USED IN ALL DITCH BOTTOMS WITH RUNNING SLOPES GREATER THAN 3% AND ON ALL SLOPES GREATER THAN 1 ON 3.
    - MULCH BLANKET SHALL BE USED ON ALL AREA WITH 1 ON 3 SLOPES.
    - MULCH SHALL BE USED ON ALL AREAS WITH SLOPES LESS THAN 1 ON 3.
  - ALL GRADES, DITCHES, SLOPES, ETC. SHALL BE RESTORED TO PRE-EXISTING OR BETTER CONDITIONS. THIS INCLUDES THE INSTALLATION OF RIP-RAP, DITCHES, CHECK DAMS, AND OTHER EROSION CONTROL ITEMS. PAYMENT FOR THIS WORK IS INCIDENTAL UNLESS OTHERWISE CALLED OUT.

K:\GEI\_Lansing\_Office\_Projects\2003322-Lake\_Bluffs\_Drain\00\_CAD\Design\Sheet\2003322-02-C\_03\_SESC\_Plan.dwg: 11/19/2022 10:11:44 AM: MARINO, LEAH: GEI:ah

**TREE REMOVAL**  
 6" - 12" = 40  
 13" - 24" = 20  
 25" OR GREATER = 2  
**TREE REMOVAL FOR ALL WORK ON SITE (NOT JUST THIS SHEET)**

EXISTING/PROPOSED ROAD ELEVATIONS AND SLOPES (POSITIVE SLOPE FROM CENTERLINE TO EDGE)				
STATION	LEFT EDGE OF ROAD (EX./PROP. ELEV.)	CENTERLINE OF ROAD (EX./PROP. ELEV.)	RIGHT EDGE OF ROAD (EX./PROP. ELEV.)	RIGHT SLOPE (%)
2+30	631.84	631.77	631.23	-1%
	631.97	632.16	631.97	2%
6+90	667.10	667.24	667.20	1%
	667.38	667.60	667.38	2%

DRIVEWAY SCHEDULE			
STATION	PROPOSED DRIVEWAY OPENING WIDTH (FT)	MATERIAL	DRIVEWAY AREA (SYD)
2+22 (LT)	57	ASPHALT	76
4+41 (LT)	25	ASPHALT	29
8+24 (RT)	23	CONCRETE	30
9+18 (LT)	18	ASPHALT	15
9+95 (LT)	33	GRAVEL	54



GAS MAIN LOCATING/DEPTH		
ID	DEPTH BELOW EX. GRADE	NOTES
1	3'-0"	GAS TEE
2	2'-8"	GAS TEE
3	2'-8"	GAS LEAD
4	2'-8"	GAS MAIN
5	1'-7"	GAS MAIN - IN EX. DITCH LINE
6	2'-7"	GAS MAIN
7	2'-7"	GAS TEE
8	3'-0"	GAS TEE

- NOTES**
- RRIPRAP SPILLWAY DIVERSIONS**
    - DIVERSION SPILLWAYS TO BE 6"-12" HIGH / 24" WIDE ANGLED RIPRAP DIVERSIONS.
    - DIVERSION SPILLWAYS TO BE PLACED TO THE BOTTOM OF THE DITCH SLOPE OR AS DIRECTED BY ENGINEER.
    - DIVERSION SPILLWAYS ON PLANS ARE IN APPROX. LOCATION. COORDINATE WITH ENGINEER FOR EXACT LOCATION.
  - UTILITY LOCATING**
    - CONTRACTOR TO FIELD LOCATE ALL GAS MAINS, GAS LEADS, UNDERGROUND ELECTRIC, AND COMMUNICATION LINES AT ALL STORM SEWER CROSSINGS, PRIOR TO CROSSING.
    - CONTRACTOR TO NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO STORM SEWER INSTALLATION.
    - IN GENERAL, UTILITIES ARE APPROXIMATELY 30" - 36" BELOW EXISTING SURFACE, PROPOSED STORM SEWER TO BE INSTALLED UNDER EXISTING UTILITIES.
  - CHECK DAMS (TOTAL THIS SHEET 20)**
    - CHECK DAMS THIS SHEET ARE IN APPROX. LOCATIONS, CONTRACTOR TO COORDINATE WITH ENGINEER AS APPLICABLE
    - CHECK DAMS TO BE CONSTRUCTED IN ACCORDANCE TO SESC SHEET (01-G-03) AND DETAIL SHEET (99-D-02)
  - \*NEW DITCH**
    - DITCH SHALL MATCH EXISTING SIDE SLOPE AND APPROXIMATE WIDTH, ADDITIONAL DEPTH SHALL BE ACCORDING TO ENGINEER AND APPROXIMATELY 0" - 12". (TREE CLEARING SHALL BE ALONG NEW DITCH CENTERLINE (6' TOTAL WIDTH))
  - DRIVEWAY CULVERTS**
    - ALL PROPOSED DRIVEWAY CULVERT CONSTRUCTION INCLUDES THE REMOVAL OF EXISTING CULVERT.

STEVEN CHRISTENSEN  
 LEELANAU COUNTY DRAIN COMMISSIONER  
 LAKE BLUFFS DRAIN  
 A PART OF SECTION 14, SOLON TWP.,  
 T28N, R12W, LEELANAU COUNTY, MICHIGAN

P&P STA 0+00 TO STA 10+00

Attention:  
 If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
1	6/9/2022
2	11/18/2022

Designed By: LCM  
 Checked By: MFS  
 Drawn By: BSF  
 Approved By: BJC  
 GEI PROJECT: 2003322  
 DWG. NO. 02-C-01  
 SHEET #  
 ARCHIVE #

**TREE REMOVAL**  
 6" - 12" = 40  
 13" - 24" = 20  
 25" OR GREATER = 2  
 TREE REMOVAL FOR ALL WORK  
 ON SITE (NOT JUST THIS SHEET)

DRIVEWAY SCHEDULE (ALL CULVERTS SHALL HAVE 1' COVER)			
STATION	PROPOSED DRIVEWAY OPENING WIDTH (FT)	MATERIAL	DRIVEWAY AREA (SYD)
11+00 (LT)	25	GRAVEL	20
12+23 (RT)	28	ASPHALT	29
12+95 (LT)	28	CONCRETE	36
14+50 (LT)	18	ASPHALT	35
15+06 (LT)	27	ASPHALT	57
17+56 (RT)	20	GRAVEL	35



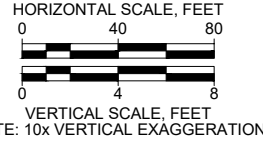
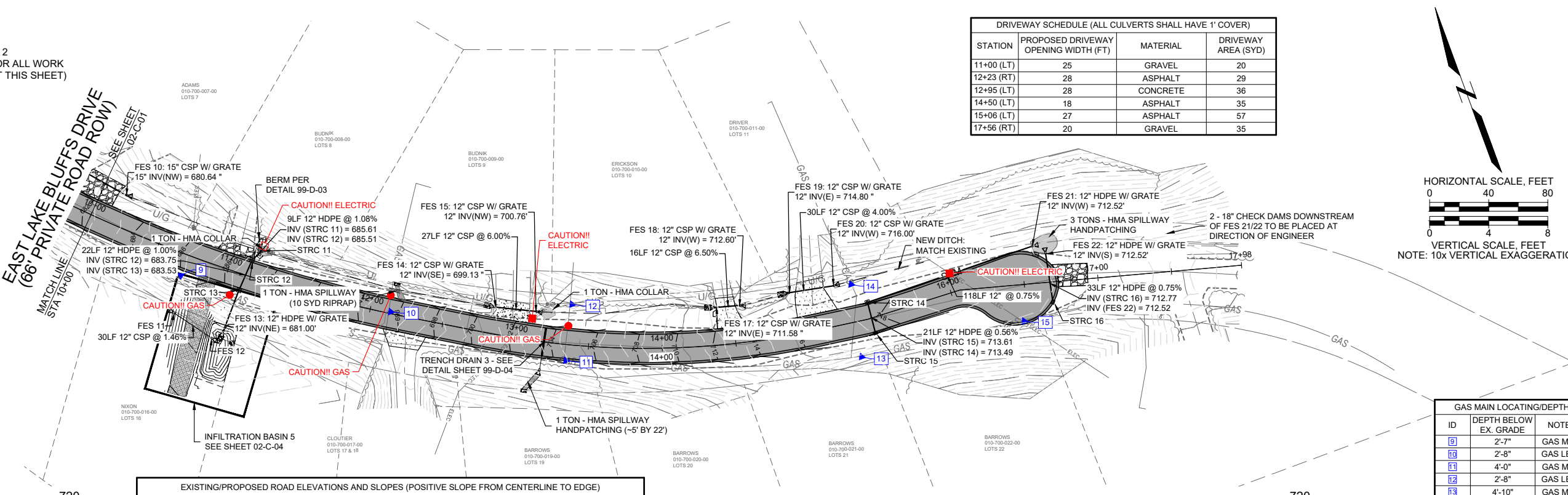
**STEVEN CHRISTENSEN**  
**LEELANAU COUNTY DRAIN COMMISSIONER**  
 LAKE BLUFFS DRAIN  
 A PART OF SECTION 14, SOLON TWP.,  
 T28N, R12W, LEELANAU COUNTY, MICHIGAN

P&P STA. 10+00 TO STA. 18+00

Attention: 1" = 100'  
 If this scale bar does not measure 1" then drawing is not original scale.

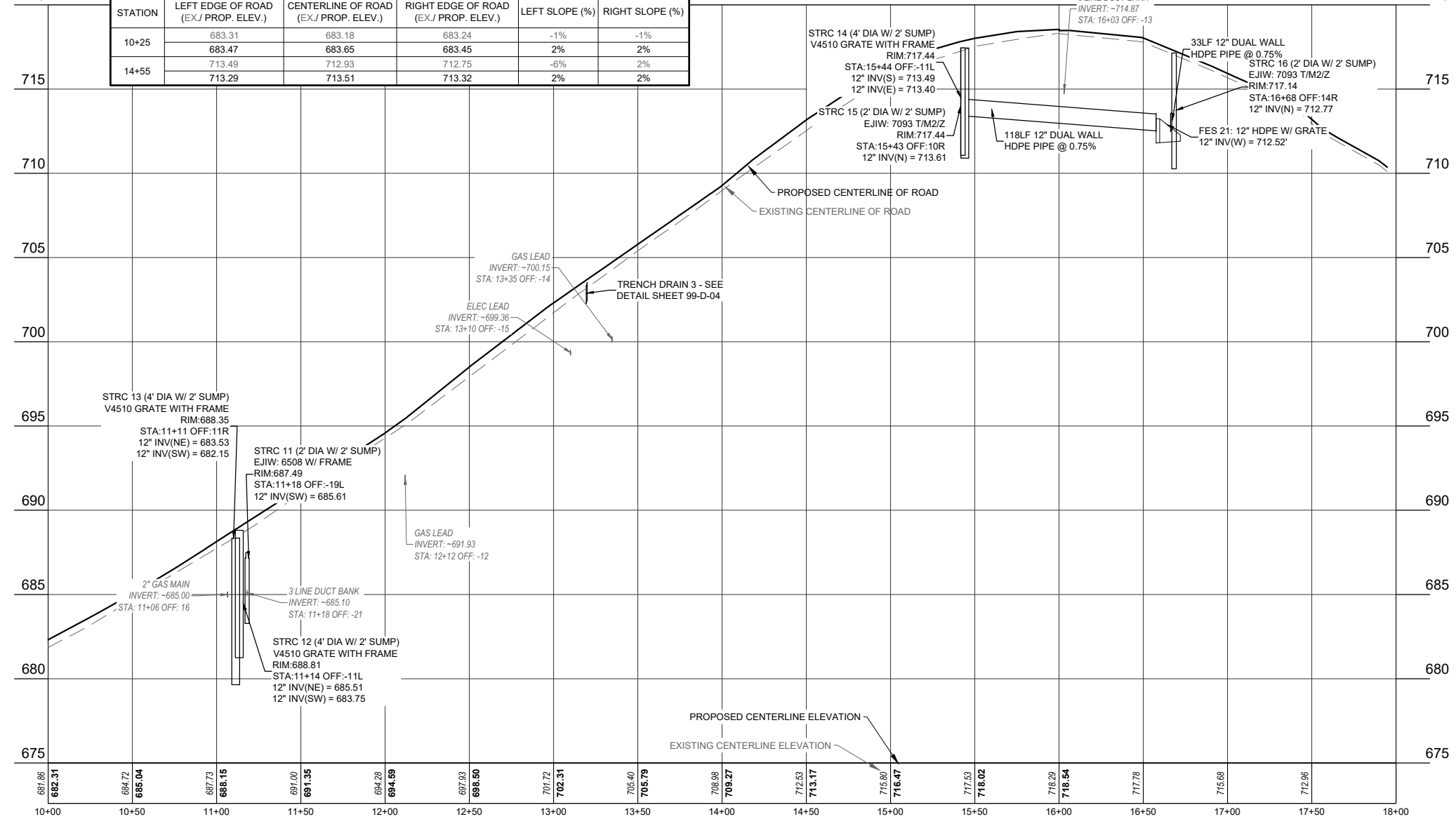
RELEASE #	DATE
1	6/9/2022
2	11/18/2022

Designed By: LCM  
 Checked By: MFS  
 Drawn By: BSF  
 Approved By: BJC  
 GEI PROJECT: 2003322  
 DWG. NO. **02-C-02**  
 SHEET #5  
 ARCHIVE #



ID	DEPTH BELOW EX. GRADE	NOTES
9	2'-7"	GAS MAIN
10	2'-8"	GAS LEAD
11	4'-0"	GAS MAIN
12	2'-8"	GAS LEAD
13	4'-10"	GAS MAIN
14	3'-0"	GAS LEAD
15	3'-9"	GAS MAIN

EXISTING/PROPOSED ROAD ELEVATIONS AND SLOPES (POSITIVE SLOPE FROM CENTERLINE TO EDGE)					
STATION	LEFT EDGE OF ROAD (EX./PROP. ELEV.)	CENTERLINE OF ROAD (EX./PROP. ELEV.)	RIGHT EDGE OF ROAD (EX./PROP. ELEV.)	LEFT SLOPE (%)	RIGHT SLOPE (%)
10+25	683.31	683.18	683.24	-1%	-1%
14+55	713.29	713.51	713.32	2%	2%

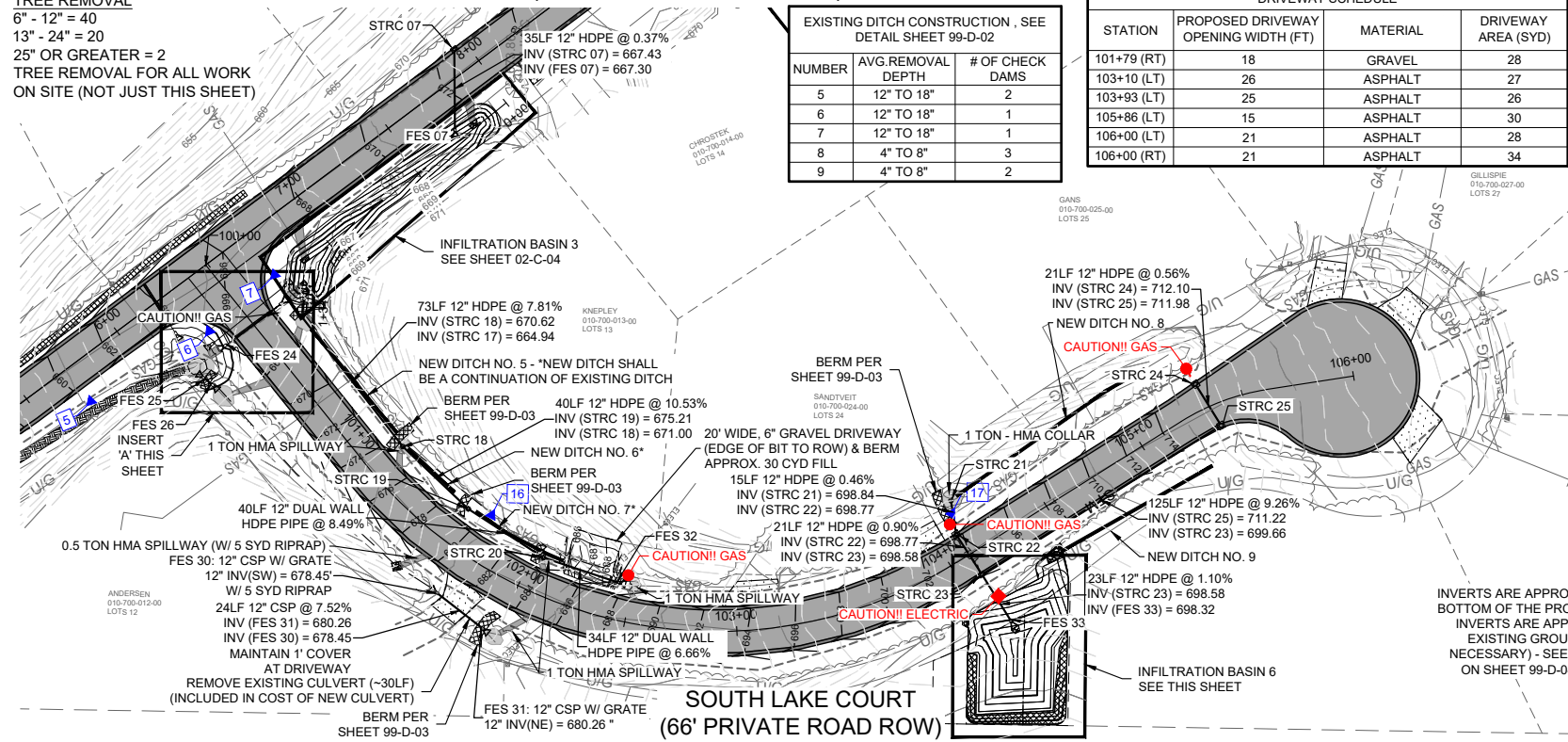


- NOTES**
- RIPRAP DIVERSION SPILLWAYS
    - DIVERSION SPILLWAYS TO BE 6"-12" HIGH / 24" WIDE ANGLED RIPRAP DIVERSIONS.
    - DIVERSION SPILLWAYS TO BE PLACED TO THE BOTTOM OF THE DITCH SLOPE OR AS DIRECTED BY ENGINEER.
    - DIVERSION SPILLWAYS ON PLANS ARE IN APPROXIMATE LOCATION. COORDINATE WITH ENGINEER FOR EXACT LOCATION.
  - UTILITY LOCATING
    - CONTRACTOR TO FIELD LOCATE ALL GAS MAINS, GAS LEADS, UNDERGROUND ELECTRIC, AND COMMUNICATION LINES AT ALL STORM SEWER CROSSINGS AND BETWEEN STA. 9+50 AND 13+50 (ALONG PROPOSED STORM SEWER TRENCH).
    - CONTRACTOR TO NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO STORM SEWER INSTALLATION.
    - IN GENERAL, UTILITIES ARE APPROXIMATELY 30" - 36" BELOW EXISTING SURFACE. PROPOSED STORM SEWER TO BE INSTALLED UNDER EXISTING UTILITIES.
  - CHECK DAMS (TOTAL THIS SHEET 8)
    - CHECK DAMS THIS SHEET ARE IN APPROXIMATE LOCATIONS, CONTRACTOR TO COORDINATE WITH ENGINEER AS APPLICABLE
    - CHECK DAMS TO BE CONSTRUCTED IN ACCORDANCE TO SESC SHEET (01-G-03) AND DETAIL SHEET (99-D-03)
  - NEW DITCH
    - DITCH SHALL MATCH EXISTING SIDE SLOPE AND APPROXIMATE WIDTH, ADDITIONAL DEPTH SHALL BE ACCORDING TO ENGINEER AND APPROXIMATELY 8" - 12". (TREE CLEARING SHALL BE ALONG NEW DITCH CENTERLINE ( 6' TOTAL WIDTH))
  - DRIVEWAY CULVERTS
    - ALL PROPOSED DRIVEWAY CULVERT CONSTRUCTION INCLUDES THE REMOVAL OF EXISTING CULVERT.
    - DRIVEWAY CULVERTS SHALL HAVE 1' COVER, GRADE DITCH AS APPLICABLE TO MAINTAIN THE COVER AND POSITIVE DRAINAGE.

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**TREE REMOVAL**  
 6" - 12" = 40  
 13" - 24" = 20  
 25" OR GREATER = 2  
 TREE REMOVAL FOR ALL WORK  
 ON SITE (NOT JUST THIS SHEET)

**LAKE BLUFFS DRIVE (66' PRIVATE ROAD ROW)**



**EXISTING DITCH CONSTRUCTION, SEE DETAIL SHEET 99-D-02**

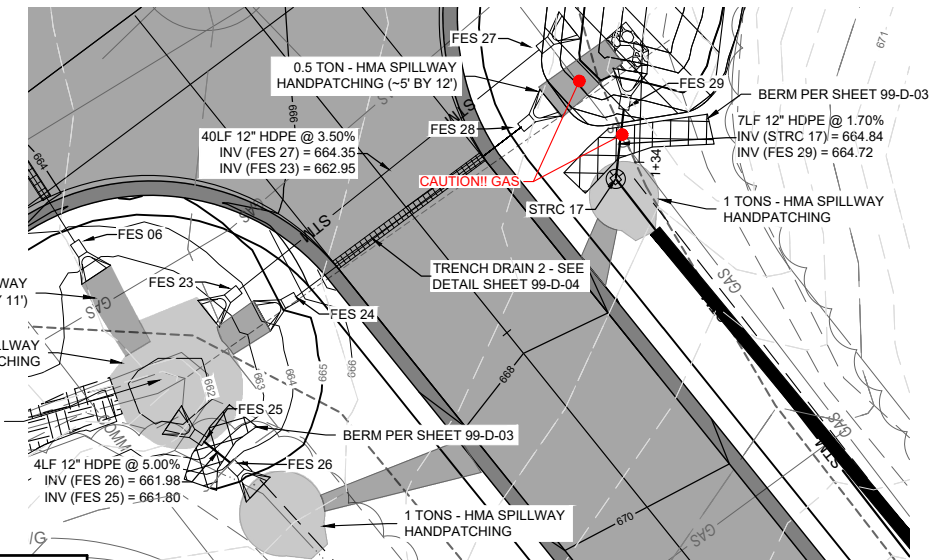
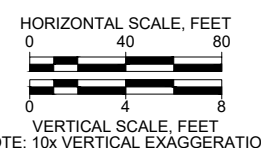
NUMBER	AVG. REMOVAL DEPTH	# OF CHECK DAMS
5	12" TO 18"	2
6	12" TO 18"	1
7	12" TO 18"	1
8	4" TO 8"	3
9	4" TO 8"	2

**DRIVEWAY SCHEDULE**

STATION	PROPOSED DRIVEWAY OPENING WIDTH (FT)	MATERIAL	DRIVEWAY AREA (SYD)
101+79 (RT)	18	GRAVEL	28
103+10 (LT)	26	ASPHALT	27
103+93 (LT)	25	ASPHALT	26
105+86 (LT)	15	ASPHALT	30
106+00 (LT)	21	ASPHALT	28
106+00 (RT)	21	ASPHALT	34

**EXISTING/PROPOSED ROAD ELEVATIONS AND SLOPES (POSITIVE SLOPE FROM CENTERLINE TO EDGE)**

STATION	LEFT EDGE OF ROAD (EX./PROP. ELEV.)	CENTERLINE OF ROAD (EX./PROP. ELEV.)	RIGHT EDGE OF ROAD (EX./PROP. ELEV.)	LEFT SLOPE (%)	RIGHT SLOPE (%)
101+85	681.11	681.58	681.58	4%	0%
104+50	681.70	681.89	682.08	2%	-2%
	707.34	707.35	707.06	0%	3%
	707.52	707.71	707.52	2%	2%

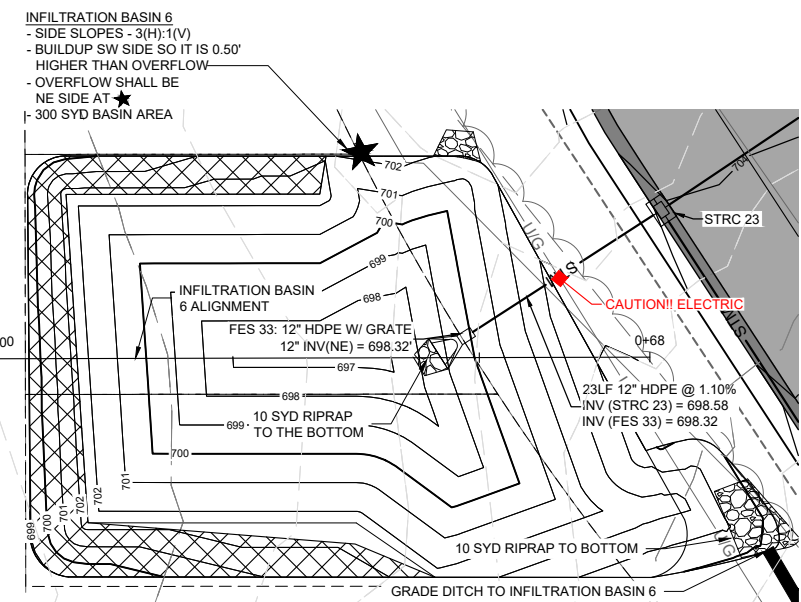


INVERTS ARE APPROXIMATE, FESs SHALL BE AT BOTTOM OF THE PROPOSED DITCH (PROPOSED INVERTS ARE APPROXIMATELY 1 - 1.5' BELOW EXISTING GROUND ELEVATION) (GRADE AS NECESSARY) - SEE TRENCH DETAIL PROFILES ON SHEET 99-D-04 FOR MORE INFORMATION

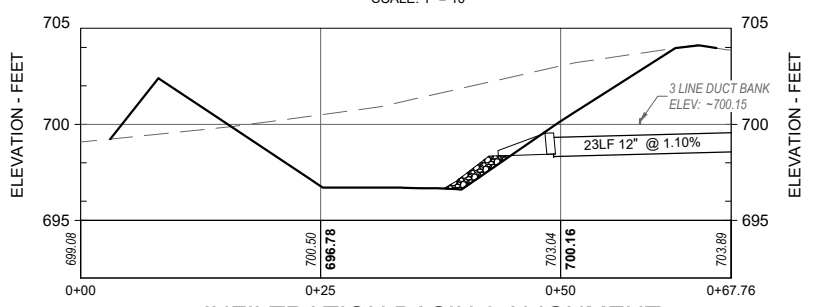
**GAS MAIN LOCATING/DEPTH**

ID	DEPTH BELOW EX. GRADE	NOTES
16	4'-0"	GAS MAIN
17	3'-0"	GAS LEAD

**INSERT 'A'**  
SCALE: 1" = 20'

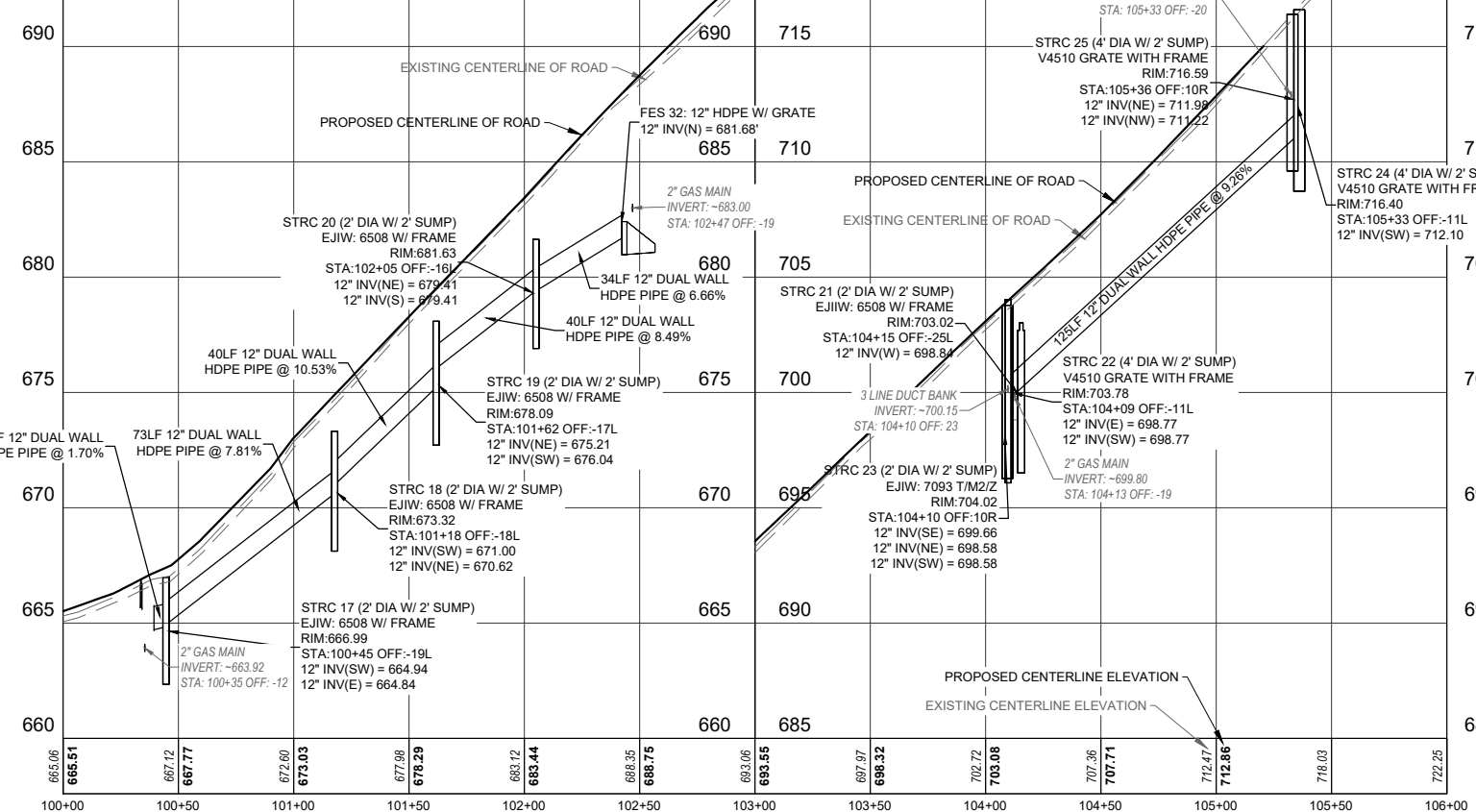


**INFILTRATION BASIN 6 - PLAN VIEW DETAIL**  
SCALE: 1" = 10'



**INFILTRATION BASIN 6 ALIGNMENT**  
HORIZONTAL SCALE: 1" = 10'  
VERTICAL SCALE: 1" = 5'

- NOTES**
- RIPRAP DIVERSION SPILLWAYS**
    - DIVERSION SPILLWAYS TO BE 6"-12" HIGH / 24" WIDE ANGLED RIPRAP DIVERSIONS.
    - DIVERSION SPILLWAYS TO BE PLACED TO THE BOTTOM OF THE DITCH SLOPE OR AS DIRECTED BY ENGINEER.
    - DIVERSION SPILLWAYS ON PLANS ARE IN APPROXIMATE LOCATION. COORDINATE WITH ENGINEER FOR EXACT LOCATION.
  - UTILITY LOCATING**
    - CONTRACTOR TO FIELD LOCATE ALL GAS MAINS, GAS LEADS, UNDERGROUND ELECTRIC, AND COMMUNICATION LINES AT ALL STORM SEWER CROSSINGS.
    - CONTRACTOR TO NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO STORM SEWER INSTALLATION.
    - IN GENERAL, UTILITIES ARE APPROXIMATELY 30" - 36" BELOW EXISTING SURFACE, PROPOSED STORM SEWER TO BE INSTALLED UNDER EXISTING UTILITIES.
  - CHECK DAMS (TOTAL THIS SHEET = 24)**
    - CHECK DAMS THIS SHEET ARE IN APPROXIMATE LOCATIONS, CONTRACTOR TO COORDINATE WITH ENGINEER AS APPLICABLE
    - CHECK DAMS TO BE CONSTRUCTED IN ACCORDANCE TO SESC SHEET (01-G-03) AND DETAIL SHEET (99-D-03)
  - NEW DITCH**
    - DITCH SHALL MATCH EXISTING SIDE SLOPE AND APPROXIMATE WIDTH, ADDITIONAL DEPTH SHALL BE ACCORDING TO ENGINEER AND APPROXIMATELY 12" - 18". (TREE CLEARING SHALL BE ALONG NEW DITCH CENTERLINE (6' TOTAL WIDTH))
  - DRIVEWAY CULVERTS**
    - ALL PROPOSED DRIVEWAY CULVERT CONSTRUCTION INCLUDES THE REMOVAL OF EXISTING CULVERT.



**STEVEN CHRISTENSEN**  
 LEELANAU COUNTY DRAIN COMMISSIONER  
 LAKE BLUFFS DRAIN  
 A PART OF SECTION 14, SOLON TWP.,  
 T28N, R12W, LEELANAU COUNTY, MICHIGAN

P&P STA. 100+00 TO STA. 110+00

**Attention:**  
 If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
1	6/9/2022
2	11/18/2022

DESCRIPTION  
 MODIFIED FOR NOV. 2022 RE-BID

Designed By: LCM  
 Checked By: MFS  
 Drawn By: BSF  
 Approved By: BJC  
 GEI PROJECT: 2003322  
 DWG. NO. **02-C-03**  
 SHEET #6  
 ARCHIVE #

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Attention:  
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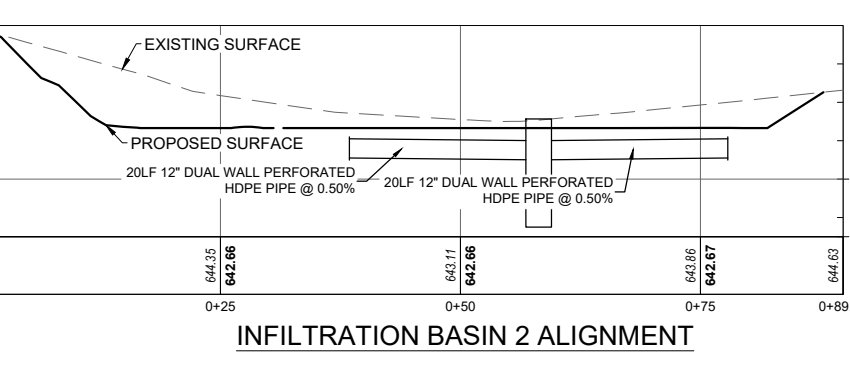
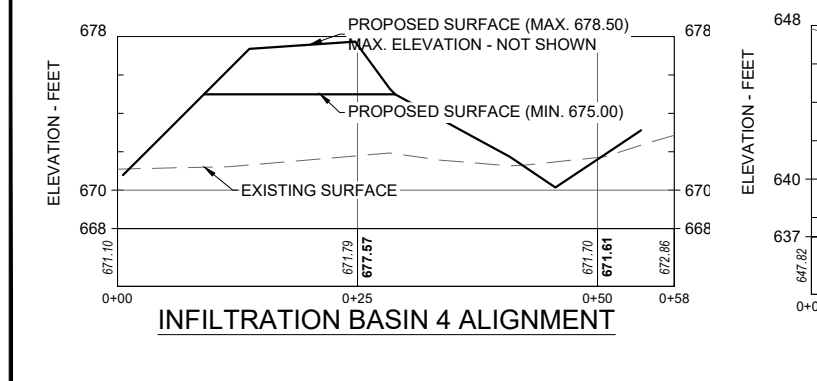
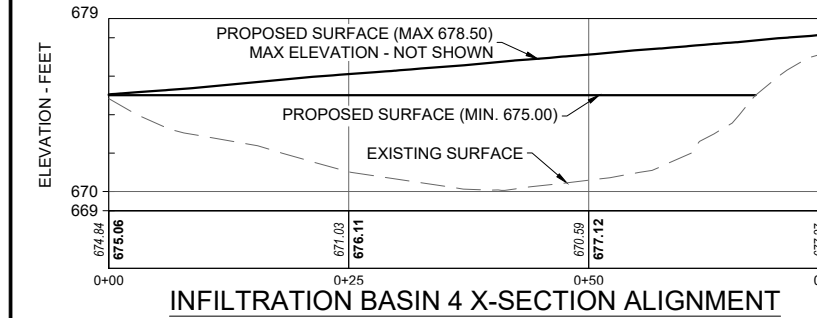
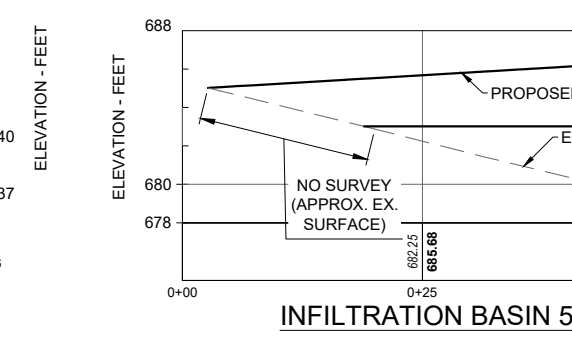
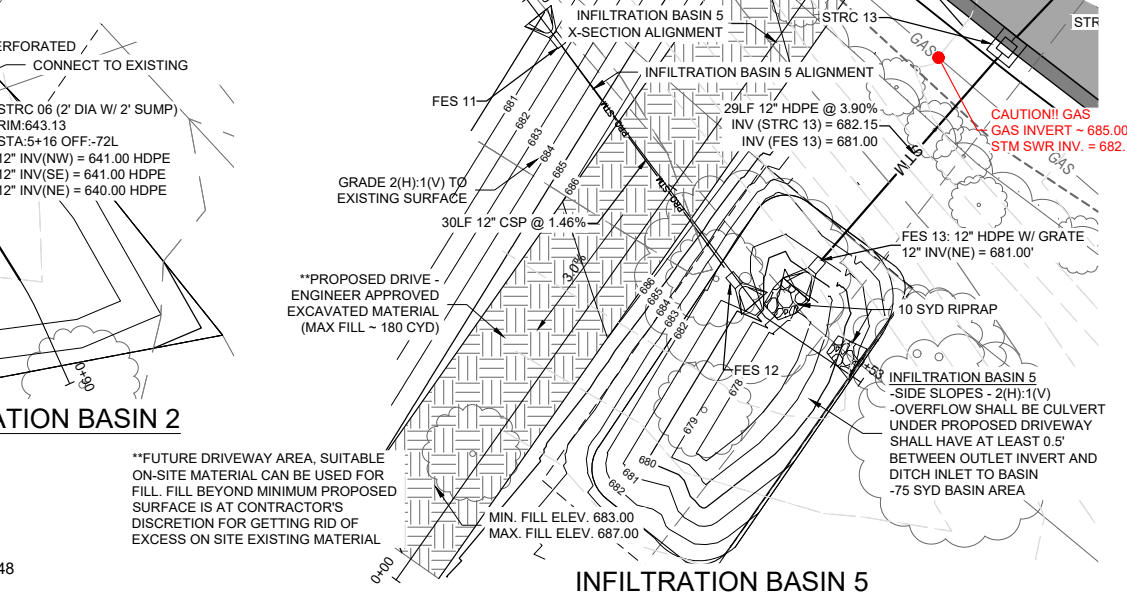
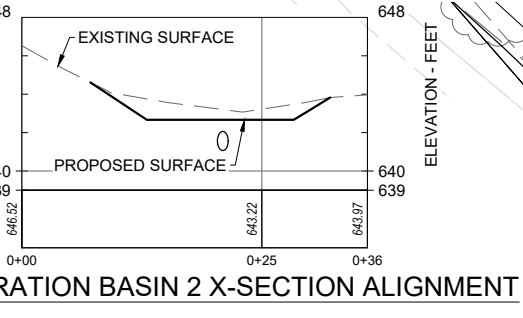
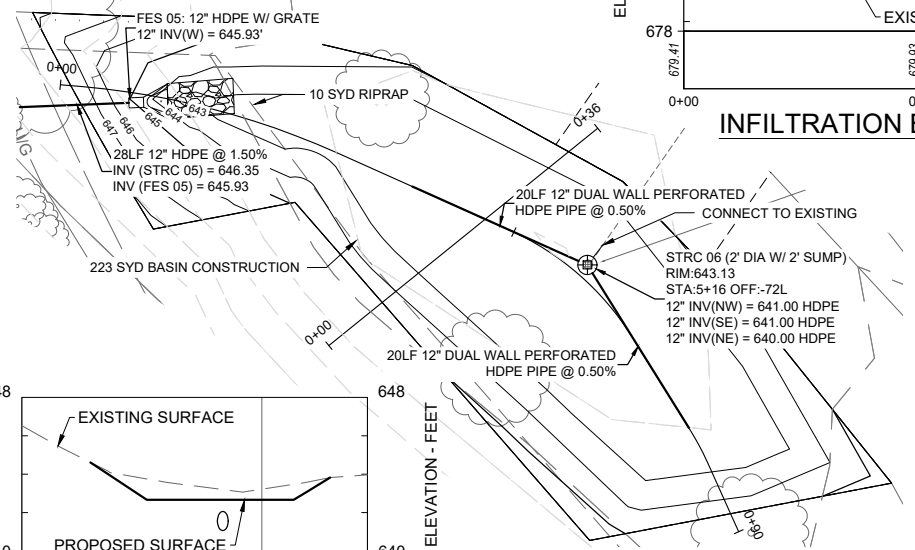
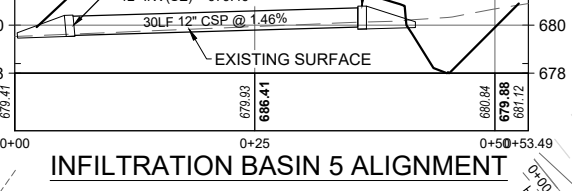
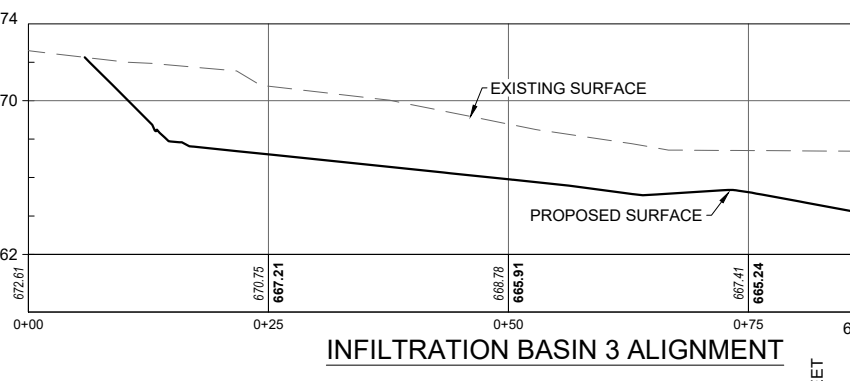
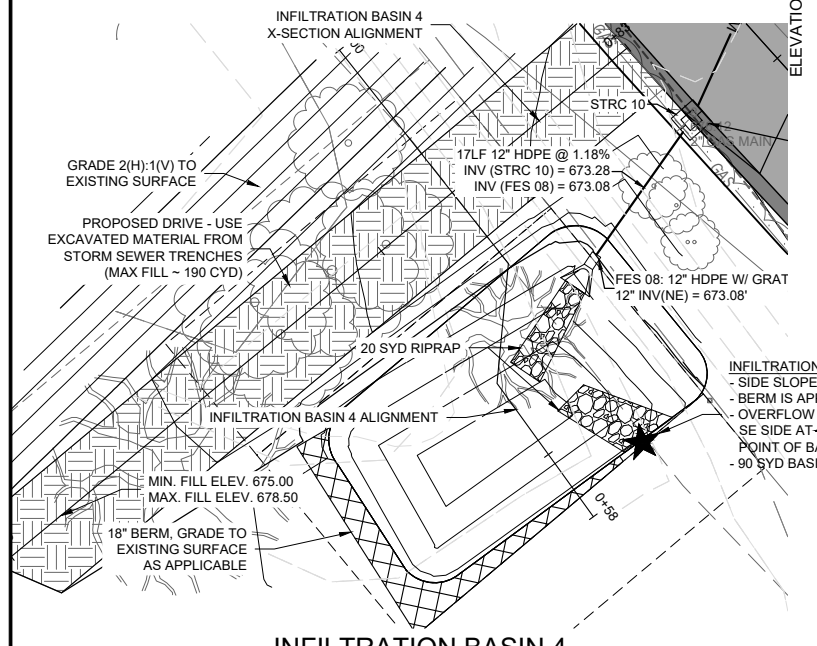
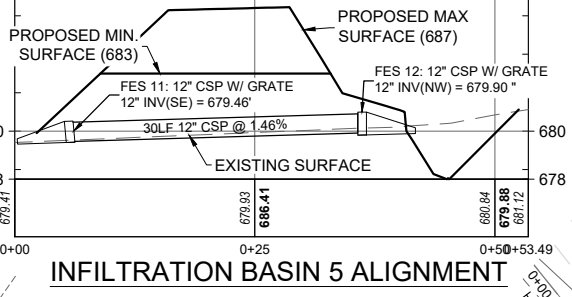
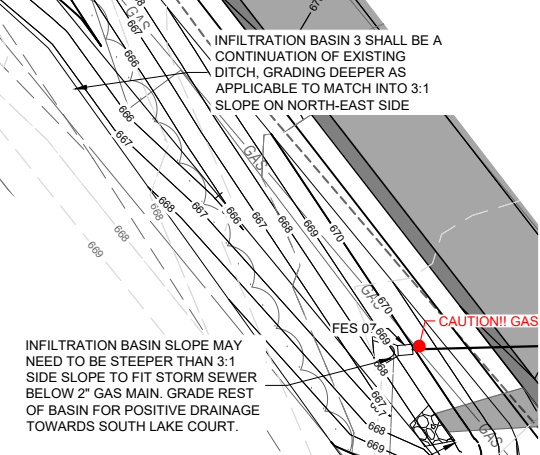
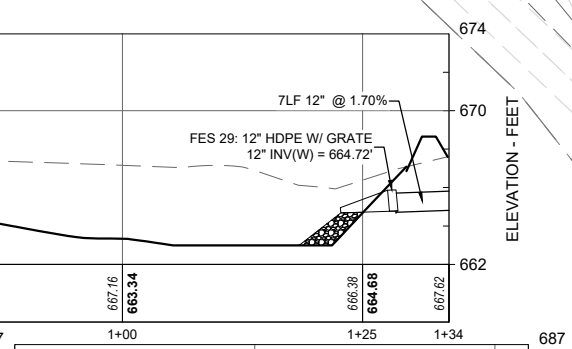
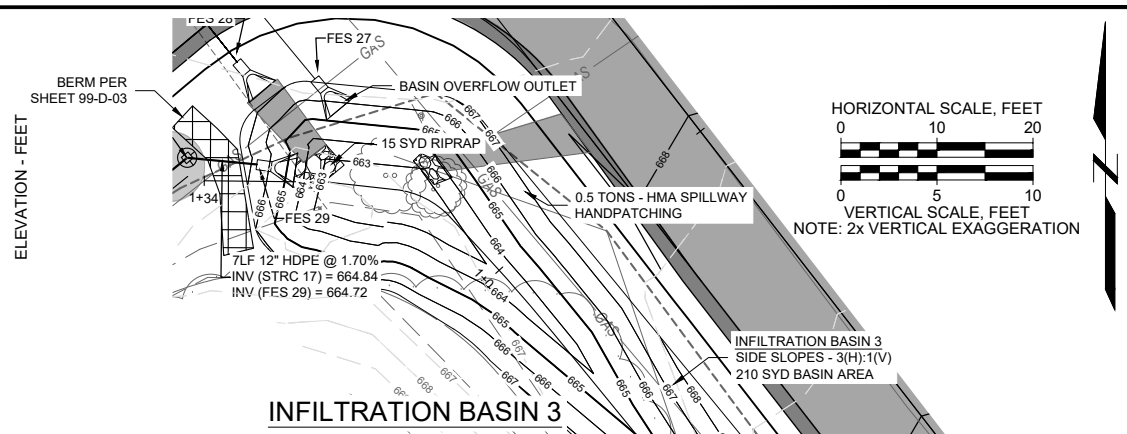
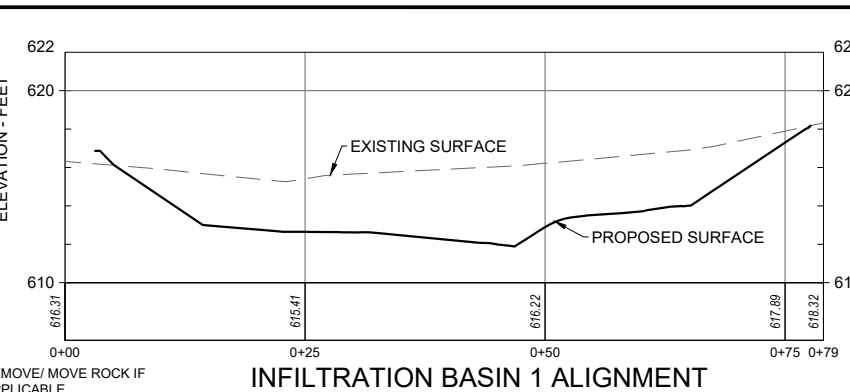
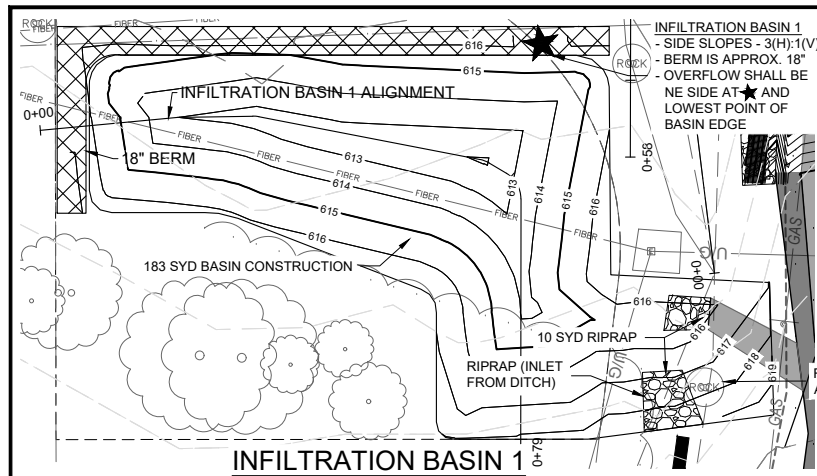
RELEASE #	DATE
1	6/9/2022
2	11/18/2022

DESCRIPTION  
 MODIFIED FOR NOV. 2022 RE-BID

Designed By: LCM  
 Checked By: MFS  
 Drawn By: BSF  
 Approved By: BJC

GEI PROJECT: 2003322

DWG. NO.  
**02-C-04**  
 SHEET #7  
 ARCHIVE #



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STEVEN CHRISTENSEN  
 LEELANAU COUNTY DRAIN COMMISSIONER  
 LAKE BLUFFS DRAIN  
 A PART OF SECTION 14, SOLON TWP,  
 T28N, R12W, LEELANAU COUNTY, MICHIGAN

PROPOSED ROAD FILL

Attention:  
  
 If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
1	6/9/2022
2	11/18/2022

Designed By: LCM  
 Checked By: MFS  
 Drawn By: BSF  
 Approved By: BJC

GEI PROJECT: 2003322  
 DWG. NO.  
**02-C-05**  
 SHEET #8  
 ARCHIVE #



PROPOSED FILL OF ADDITIONAL GRAVEL OR CUT OF EXISTING GRAVEL (IN FEET) TO ACHIEVE PROPOSED CROSS SECTION OF ROAD.

PROPOSED CUT/FILL FOR ROAD CONSTRUCTION			
NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
1	-0.8	-0.7	Red
2	-0.7	-0.6	Red
3	-0.6	-0.5	Red
4	-0.5	-0.4	Dark Green
5	-0.4	-0.3	Dark Green
6	-0.3	-0.2	Dark Green
7	-0.2	-0.1	Light Green
8	-0.1	0.0	Light Green
9	0.0	0.1	Light Green
10	0.1	0.2	Light Green
11	0.2	0.3	Light Green
12	0.3	0.4	Light Green
13	0.4	0.5	Light Green
14	0.5	0.6	Cyan
15	0.6	0.7	Cyan
16	0.7	0.8	Cyan
17	0.8	0.9	Cyan
18	0.9	1.0	Cyan
19	1.0	1.1	Magenta
20	1.1	1.2	Magenta
21	1.2	1.3	Magenta
22	1.3	1.4	Magenta
23	1.4	1.5	Magenta
24	1.5	1.6	Magenta
25	1.6	1.7	Magenta

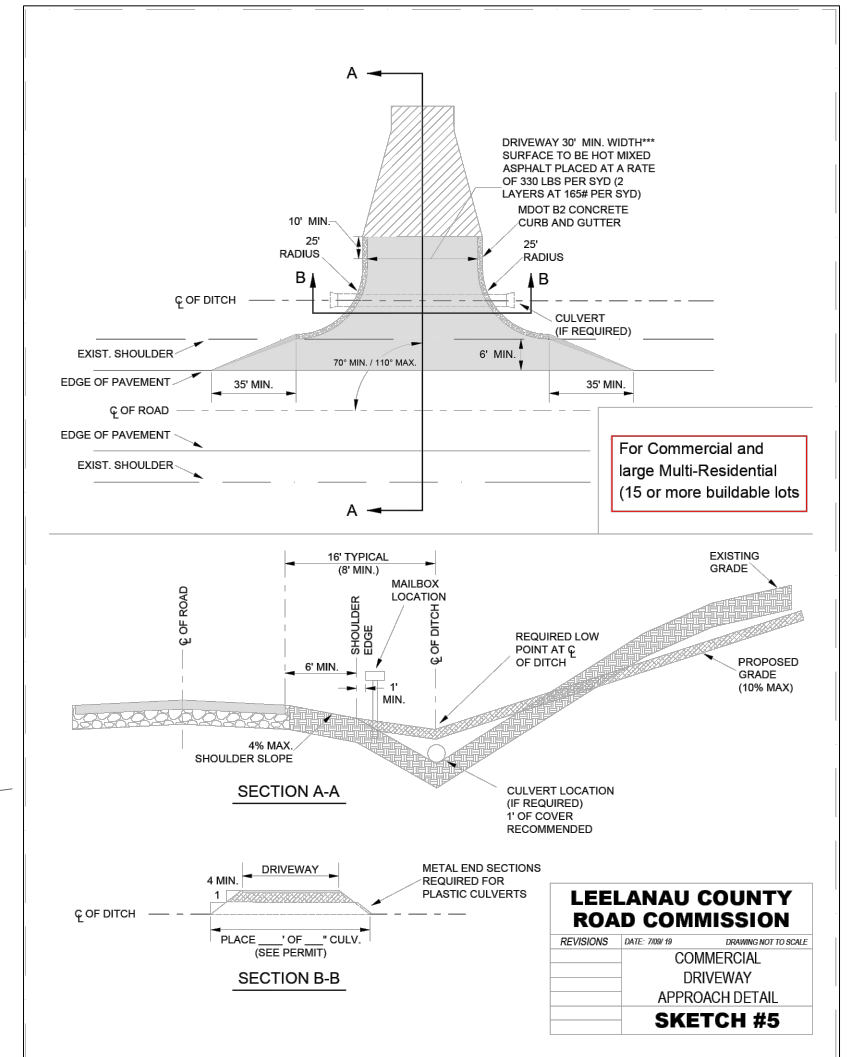
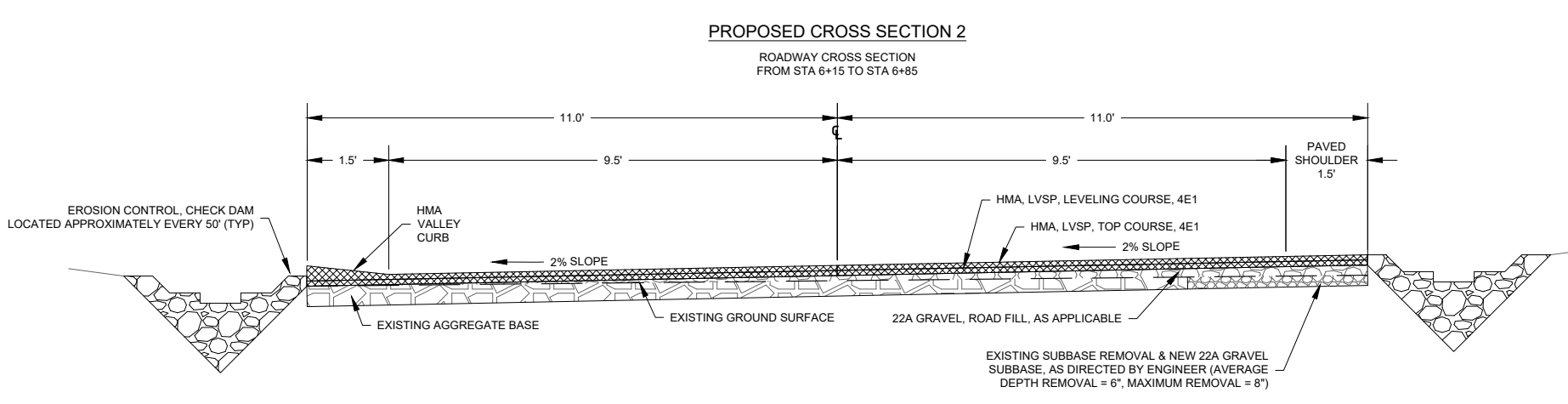
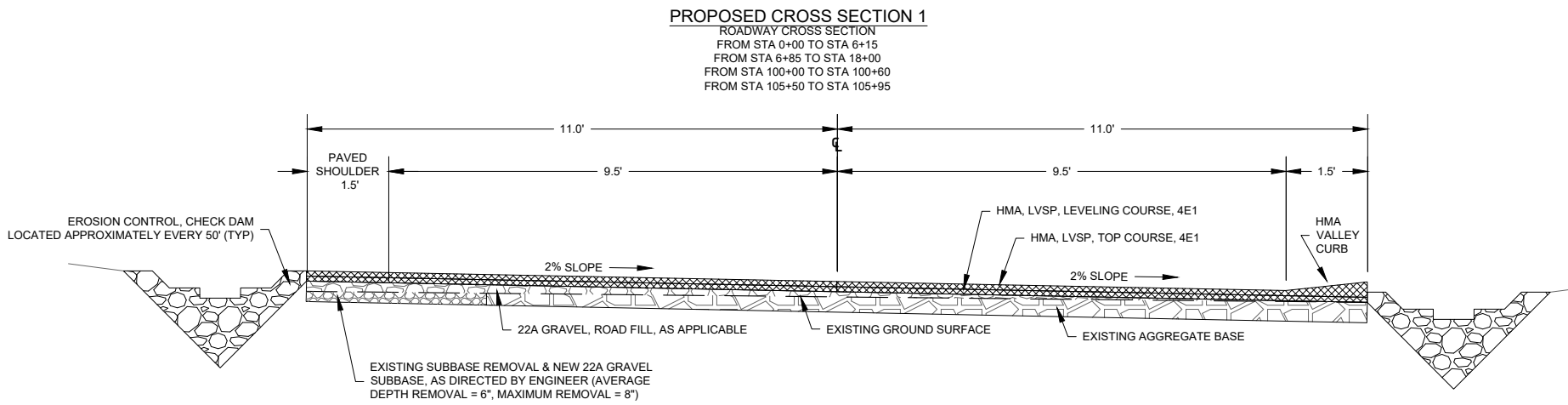
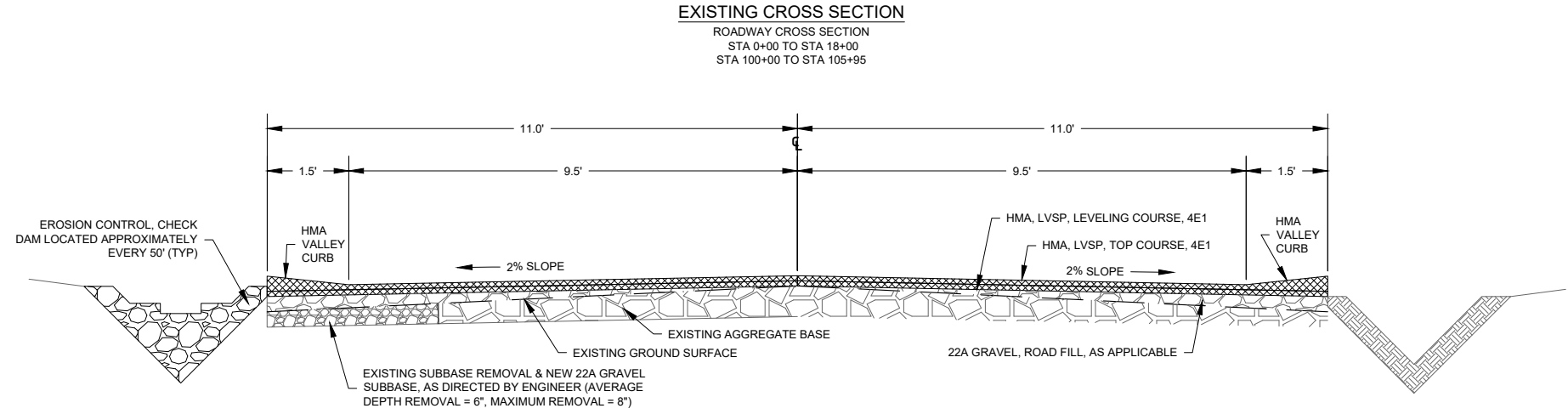
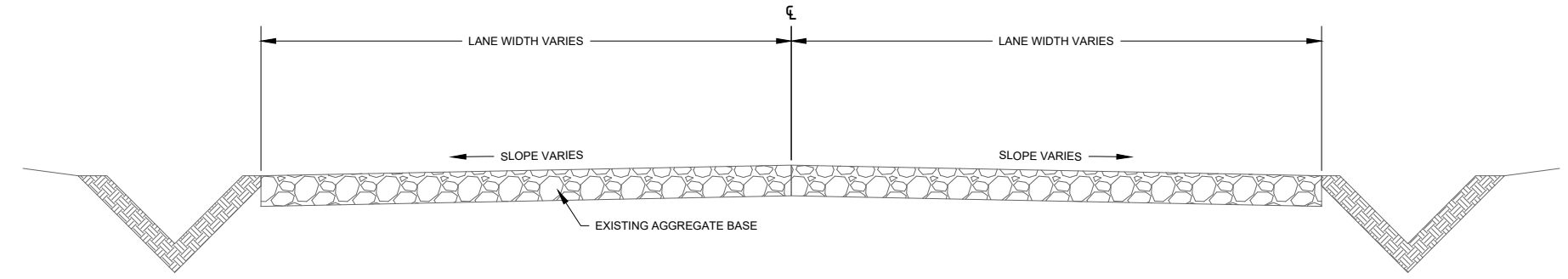
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\*NOTE: PROPOSED BACK OF CURB CONDITIONS (I.E. DITCH, CHECK DAMS, ETC.) VARIES AND MAY NOT MATCH PROPOSED CROSS SECTION PER STATIONING, REFER TO PLAN & PROFILE SHEETS FOR PROPOSED CONDITIONS OUTSIDE ROADWAY.

STEVEN CHRISTENSEN  
 LEELANAU COUNTY DRAIN COMMISSIONER  
 LAKE BLUFFS DRAIN  
 A PART OF SECTION 14, SOLON TWP.,  
 T28N, R12W, LEELANAU COUNTY, MICHIGAN

TYPICAL CROSS SECTIONS



For Commercial and  
 large Multi-Residential  
 (15 or more buildable lots)

**LEELANAU COUNTY ROAD COMMISSION**

REVISIONS	DATE	DESCRIPTION

COMMERCIAL DRIVEWAY APPROACH DETAIL  
**SKETCH #5**

Attention: 1" = 10'  
 If this scale bar does not measure 1" then drawing is not original scale.


RELEASE #	DATE
1	6/9/2022
2	11/18/2022

Designed By: LCM  
 Checked By: MFS  
 Drawn By: BSF  
 Approved By: BJC

GEI PROJECT: 2003322

DWG. NO.  
**99-D-01**  
 SHEET #9  
 ARCHIVE #

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Attention:  
  
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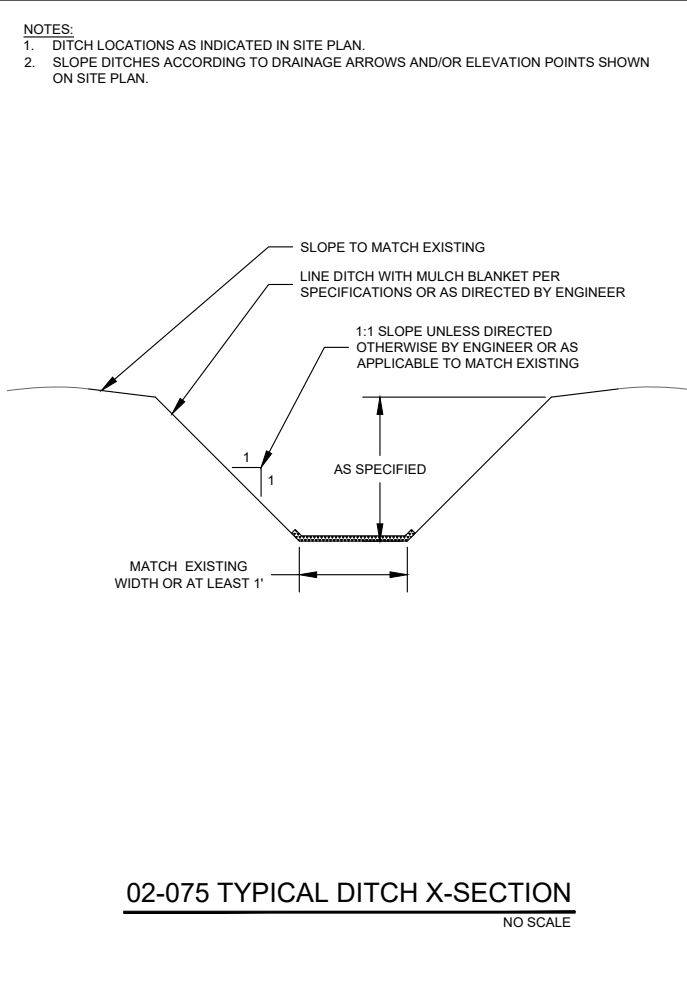
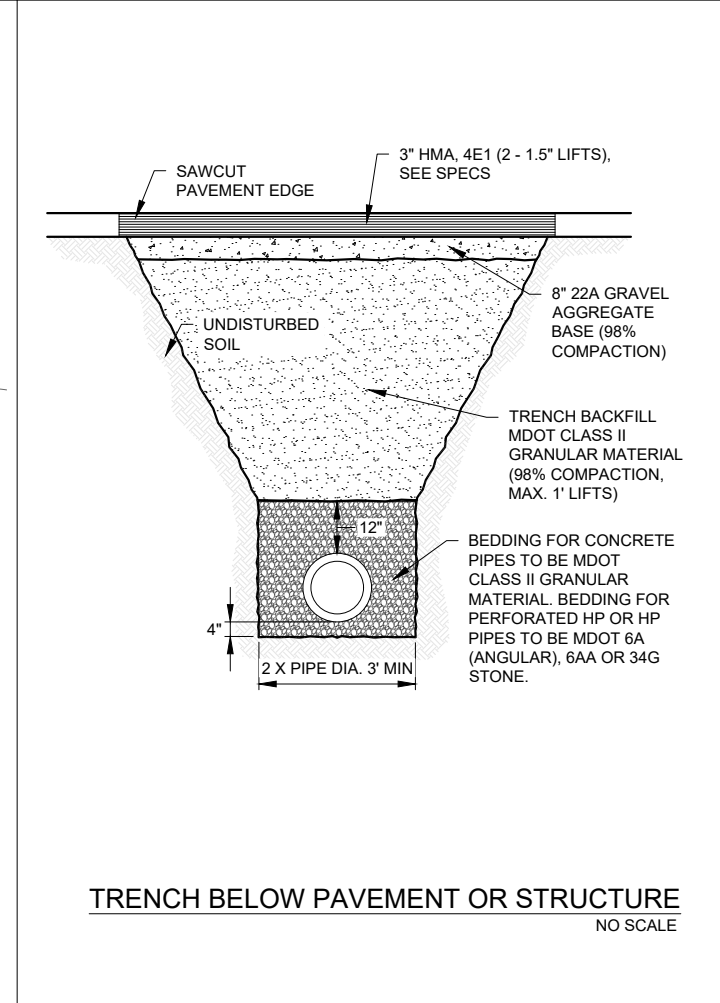
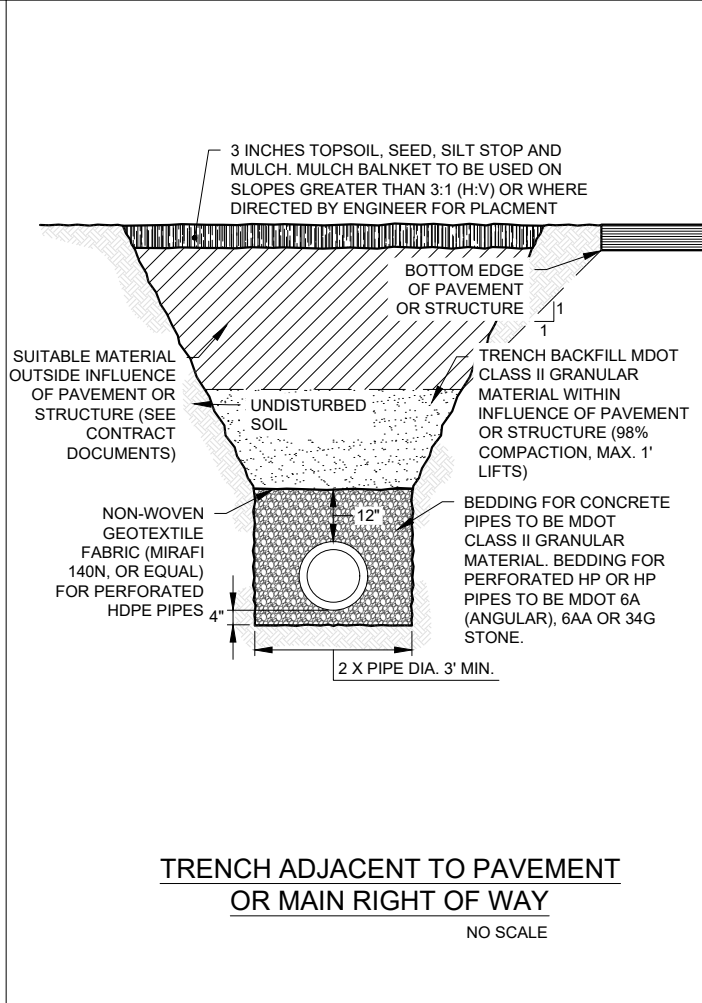
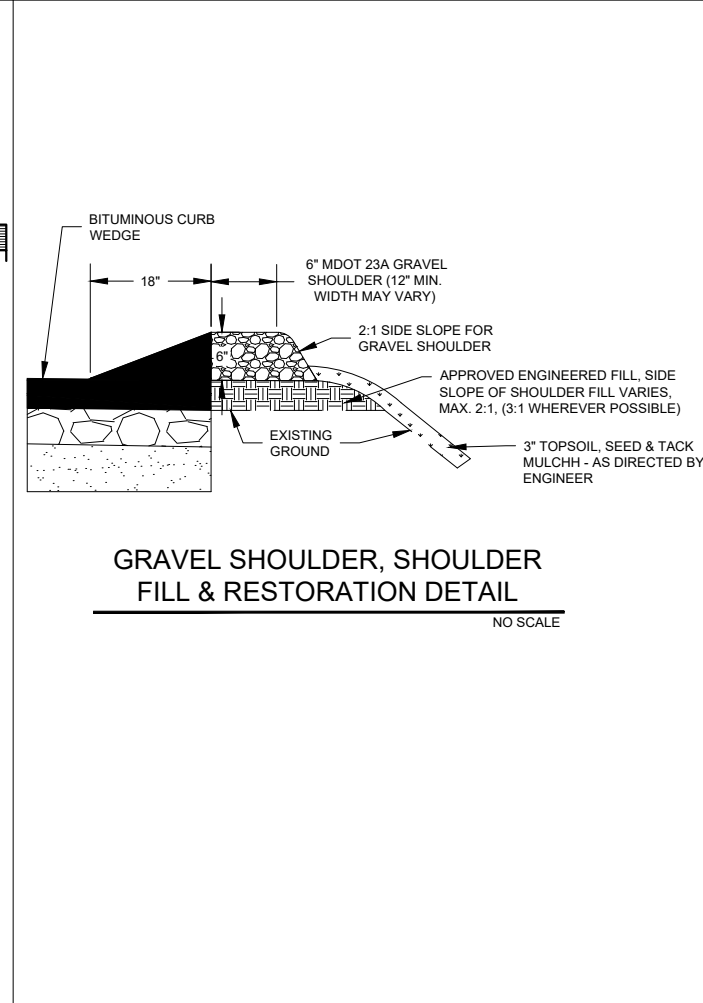
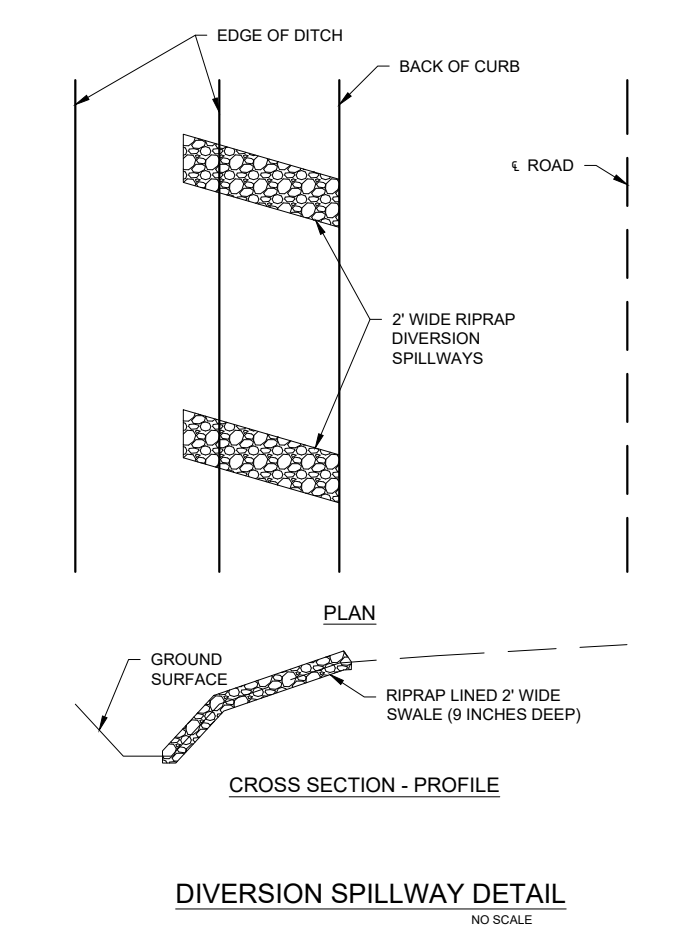
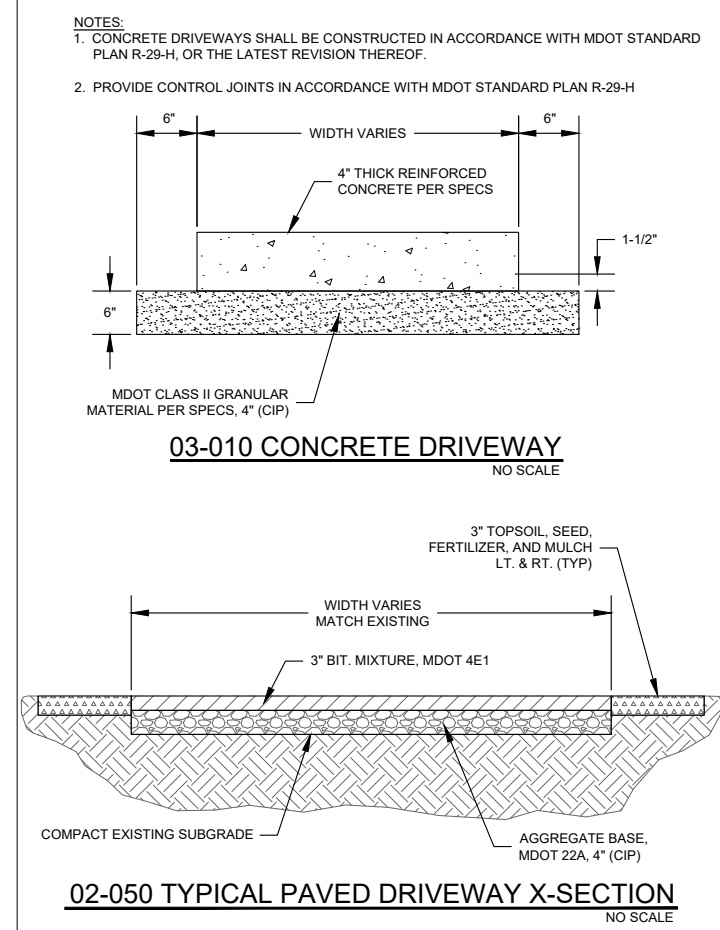
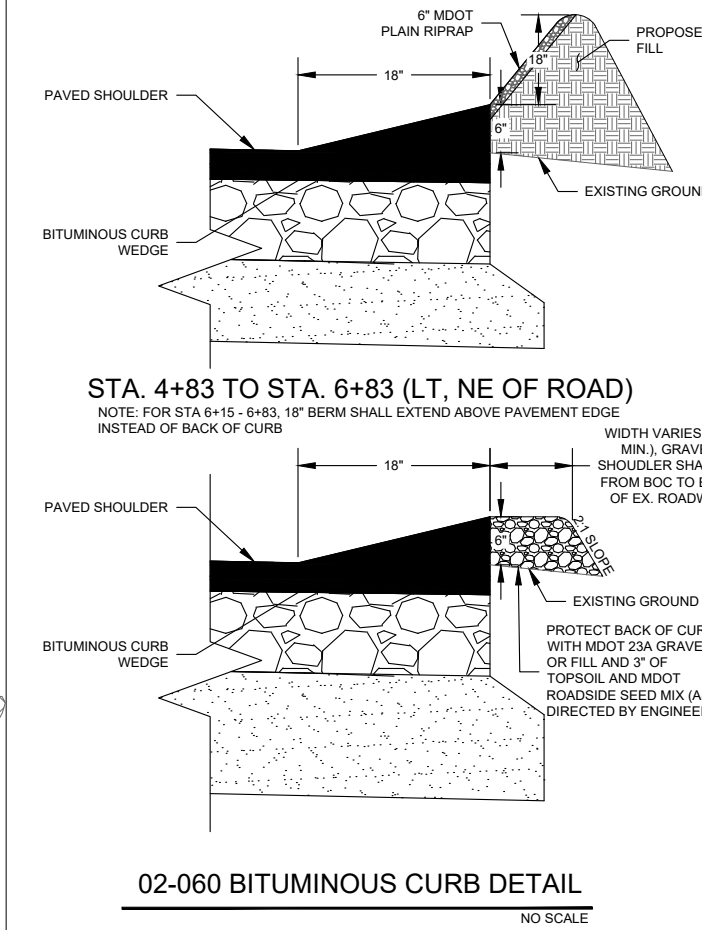
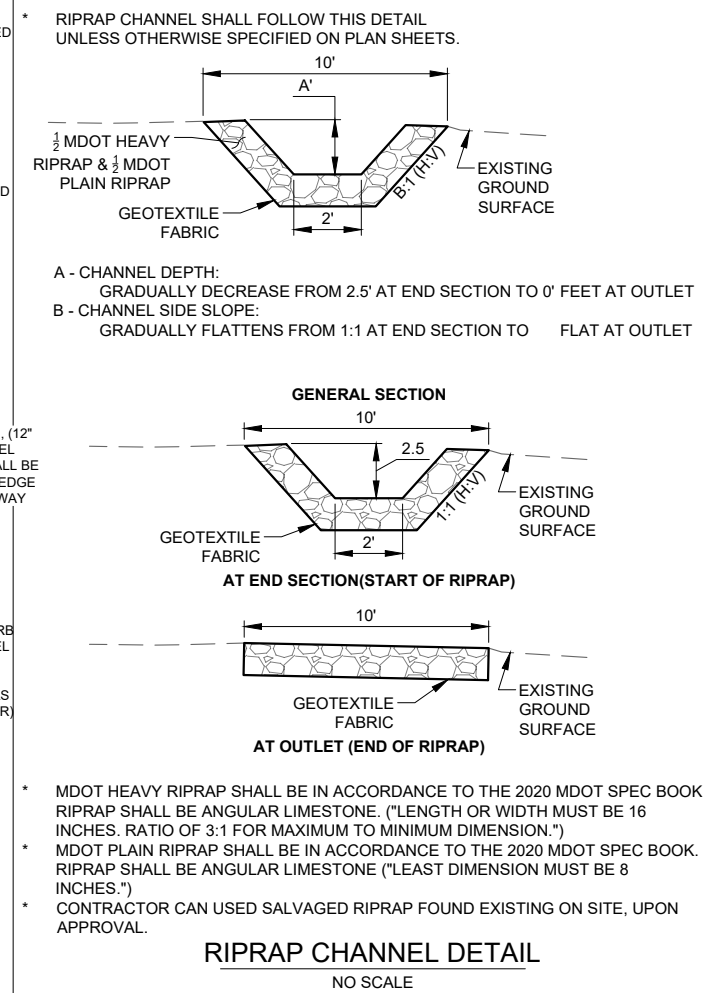
RELEASE #	DATE
1	6/9/2022
2	11/18/2022

DESCRIPTION  
 1 6/9/2022  
 BID SET  
 2 11/18/2022  
 MODIFIED FOR NOV. 2022 RE-BID

Designed By: LCM  
 Checked By: MFS  
 Drawn By: BSF  
 Approved By: BJC

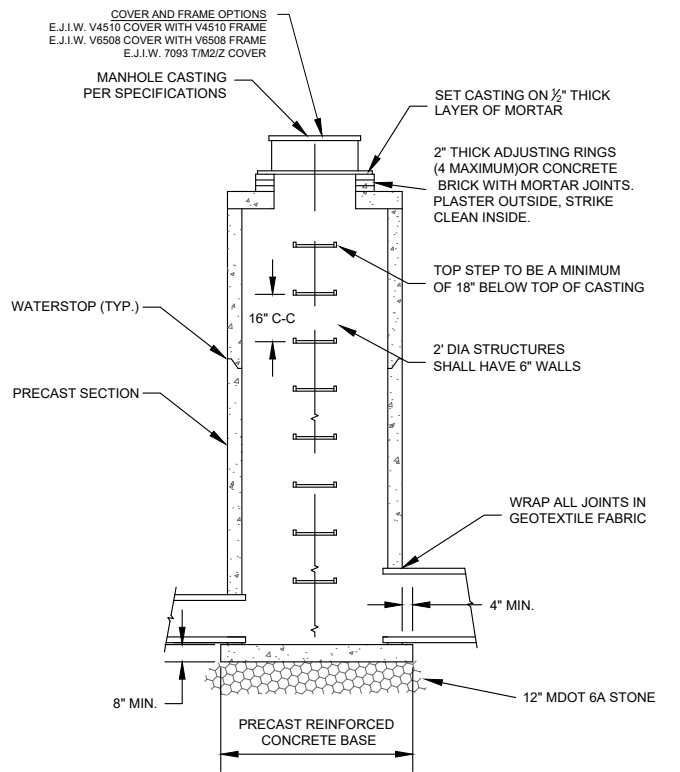
GEI PROJECT: 2003322

DWG. NO.  
**99-D-02**  
 SHEET #10  
 ARCHIVE #

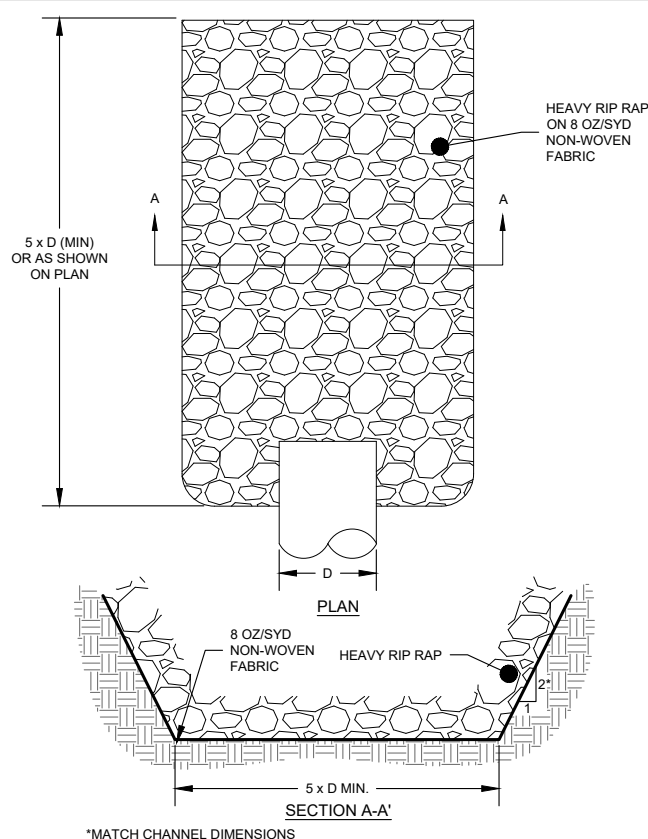


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NOTE:  
NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY. A 12" OR 16" BARREL SECTION SHALL BE INSTALLED UNDER THE CONE WHENEVER POSSIBLE.



**02-305 STANDARD CONCRETE STORM MANHOLE**  
NO SCALE



**02-330 DISCHARGE TO CHANNEL**  
NO SCALE

ADS, Inc. Drainage Handbook

Specifications ♦ 1-37

**ADS FLARED END SECTION SPECIFICATION**

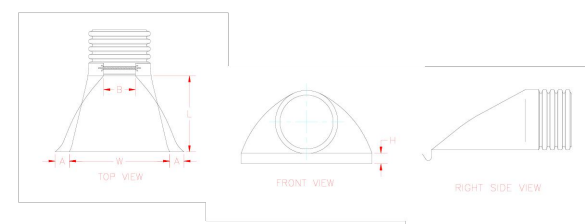
**Scope**  
This specification describes 12- through 36-inch (300 to 900mm) ADS Flared End Sections for use in culvert and drainage outlet applications.

**Requirements**  
The ADS Flared End Section shall be high density polyethylene meeting ASTM D3350 minimum cell classification 213320C; contact manufacturer for additional cell classification information. When provided, the metal threaded fastening rod shall be stainless steel.

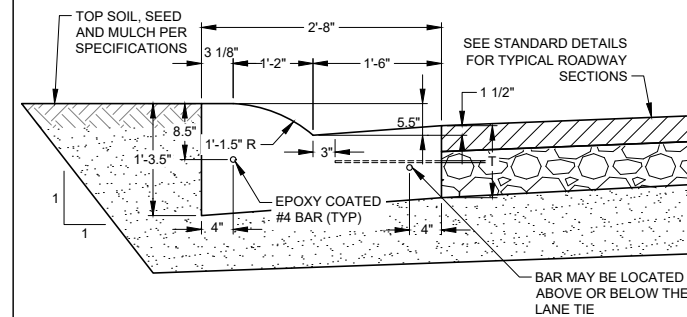
**Installation**  
Installation shall be in accordance with ADS installation instructions and with those issued by state or local authorities. Contact your local ADS representative or visit [www.ads-pipe.com](http://www.ads-pipe.com) for the latest installation instructions.

Diameter in (mm)	PIPE DIAMETER, in (mm)					
	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)
A	6.5 (165)	6.5 (165)	7.5 (191)	7.5 (191)	7.5 (191)	7.5 (191)
B (max)	10.0 (254)	10.0 (254)	15.0 (381)	18.0 (475)	22.0 (569)	25.0 (635)
H	6.5 (165)	6.5 (165)	6.5 (165)	6.5 (165)	6.5 (165)	6.5 (165)
L	25.0 (635)	25.0 (635)	32.0 (813)	38.0 (914)	58.0 (1473)	58.0 (1473)
W	29.0 (737)	29.0 (737)	38.0 (965)	45.0 (1143)	69.0 (1753)	69.0 (1753)

\*Product detail may differ slightly from actual product appearance

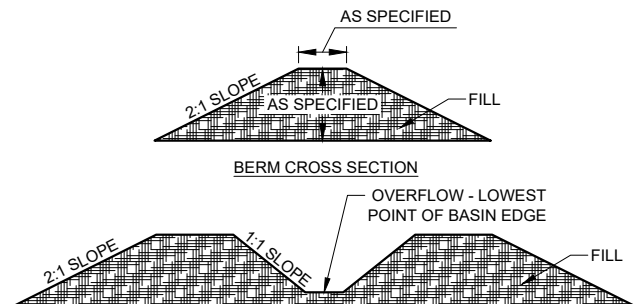


DETAIL	DIMENSION	LANE TIES	CONCRETE CYD/LFT
	T		
B1	9"	AS SHOWN	0.0900
B2	9"	OMITTED	0.0900
B3	10"	AS SHOWN	0.0941

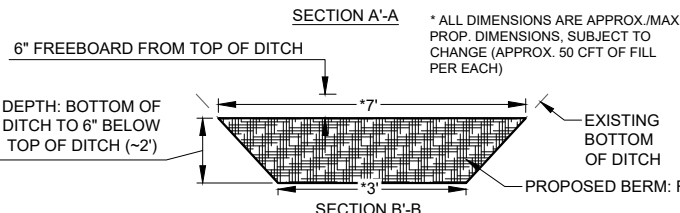
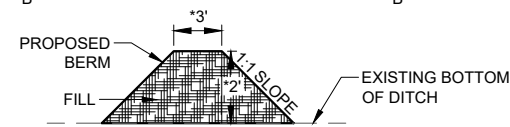
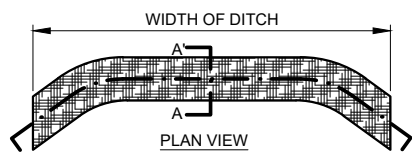


**CONCRETE CURB AND GUTTER MDOT TYPE B**  
SCALE: NTS

NOTES:  
CONCRETE CURB AND/OR GUTTER SHALL BE CONSTRUCTED IN ACCORDANCE WITH MDOT STANDARD PLAN R-30-F

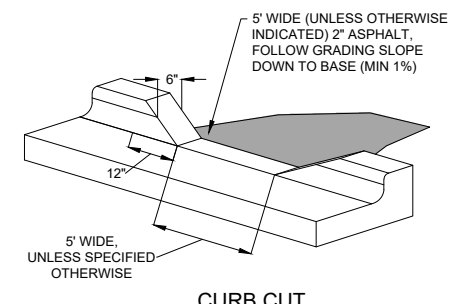


**INFILTRATION BASIN BERM DETAIL**

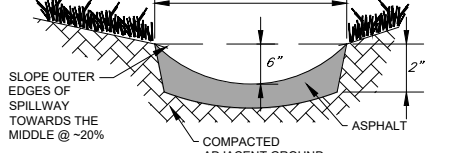


**BERM AT CATCH BASIN OR DRIVEWAY CULVERT INLETS**

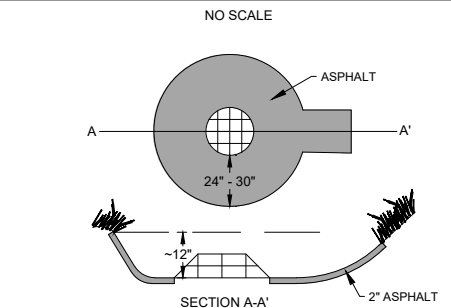
\* ALL DIMENSIONS ARE APPROX./MAX. PROP. DIMENSIONS, SUBJECT TO CHANGE (APPROX. 50 CFT OF FILL PER EACH)



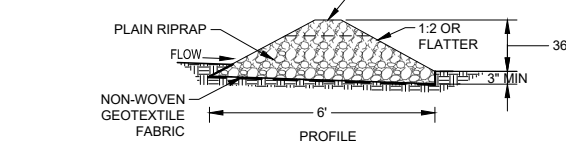
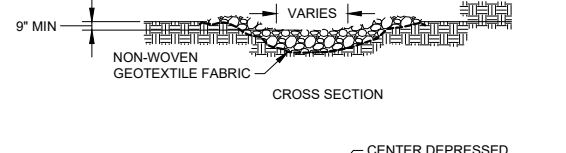
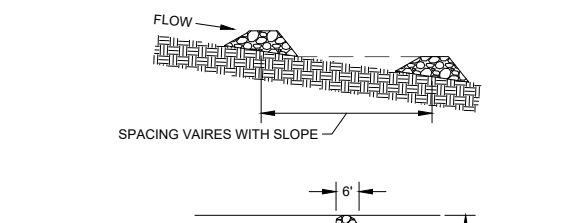
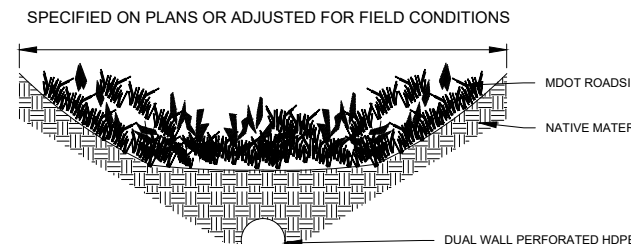
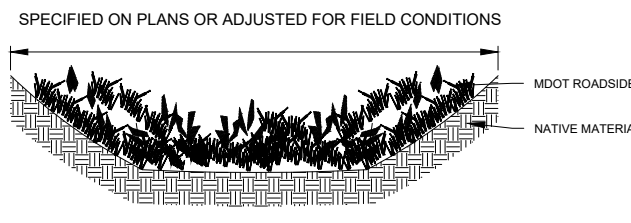
**SPILLWAY BEHIND CURB CROSS-SECTION DETAIL**



**ASPHALT COLLAR**



**NO SCALE**



**CHECK DAM WITH GEOTEXTILE FABRIC DETAIL**  
NOT TO SCALE

\*NOTE: WHEN USED IN SERIES, THE TOE OF THE UPSTREAM CHECK DAM SHOULD BE SET AT THE SAME ELEVATION AS THE LOWEST POINT IN THE TOP OF THE DOWNSTREAM CHECK DAM OR AS DIRECTED BY ENGINEER.

Attention:  
0 1"  
If this scale bar does not measure 1" then drawing is not original scale.

RELEASE #	DATE
1	6/9/2022
2	11/18/2022

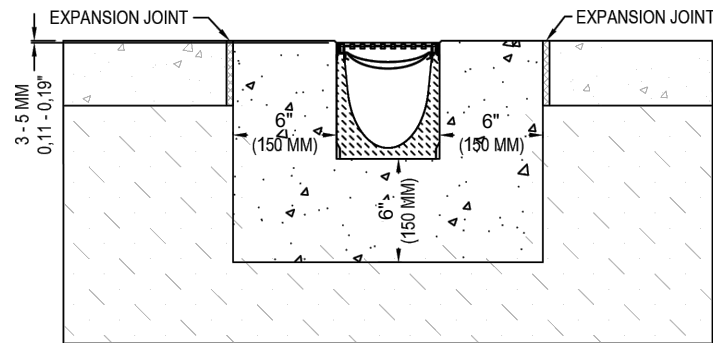
DESCRIPTION  
1  
2  
MODIFIED FOR NOV. 2022 RE-BID

Designed By: LCM  
Checked By: MFS  
Drawn By: BSF  
Approved By: BJC

GEI PROJECT: 2003322

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200 Series Installation Detail  
ASTM LOAD Class E Concrete Encasement



SECTION

**SPECIFICATIONS**

FILCOTEN PRO-V NW200 - LOAD CLASS E

**GENERAL**

THE SURFACE DRAINAGE SYSTEM SHALL BE FILCOTEN FIBER COMPOSITE NW100 CHANNEL SYSTEM WITH CONCRETED EDGE MADE OF GALVANIZED STEEL RAILS AS MANUFACTURED BY BG GRASPOINTNER, INC AND DISTRIBUTED BY HYDRO BG USA INC., A WHOLLY OWNED SUBSIDIARY.

**MATERIALS**

CHANNELS SHALL BE MANUFACTURED FROM FILCOTEN FIBER COMPOSITE WITH CONCRETED EDGE GALVANIZED STEEL RAIL. MINIMUM PROPERTIES OF FILCOTEN FIBER COMPOSITE WILL BE AS FOLLOWS:

COMPRESSIVE STRENGTH:	11,700 PSI
FLEXURAL STRENGTH:	1,700 PSI
FREE OF RELEASE AGENTS:	YES
WATER ABSORPTION SUFFICIENT FOR ADHESION WITH CONCRETE SURFACES:	YES
NON FLAMMABLE:	YES
UV RESISTANT:	YES
RECYCLABLE 100%:	YES
DILUTE ACID AND ALKALI RESISTANT:	YES
FROST THAW SALT TESTED AS PER EN1433 WITH A TEST TEMPERATURE UP TO -40°C (-40°F):	YES
MATERIAL FREE OF VOC, BIOCIDES, HEAVY METALS:	YES

THE SYSTEM SHALL BE 8" (200MM) NOMINAL INTERNAL WIDTH WITH 10.43" UP TO 14.37" (265MM UP TO 365MM), OVERALL WIDTH AND A BUILD-IN SLOPE OF 0.5% AND STEPPED SLOPE SYSTEM. ALL CHANNELS ARE EQUIPPED WITH INTERLOCKING CONNECTION MALE/FEMALE AND SEALANT JOINT.

CHANNEL SHALL WITHSTAND LOADING TO PROPER LOAD CLASS AS OUTLINED BY EN 1433. GRATE TYPE SHALL BE APPROPRIATE TO MEET THE SYSTEM LOAD CLASS SPECIFIED AND INTENDED APPLICATION. GRATES SHALL BE SECURED USING 4-POINT BOLTING LOCKING SYSTEM. CHANNEL AND GRATE SHALL BE CERTIFIED TO MEET THE SPECIFIED EN 1433 LOAD CLASS. THE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

**NOTES:**

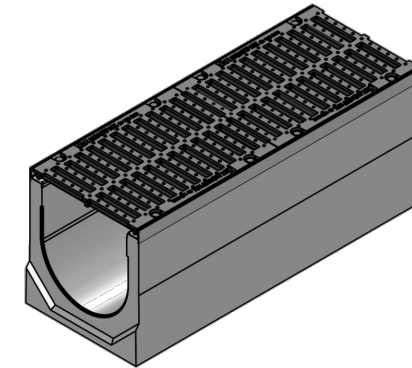
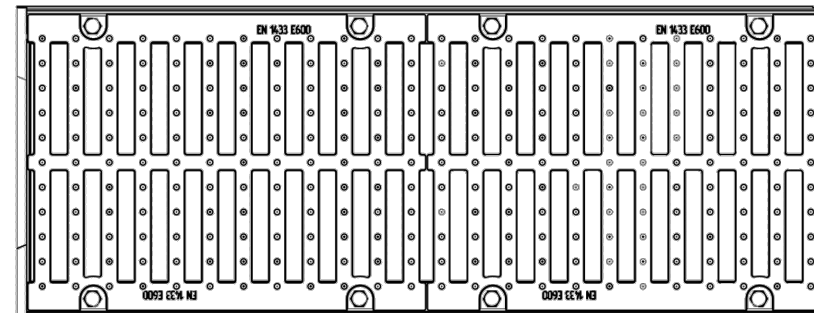
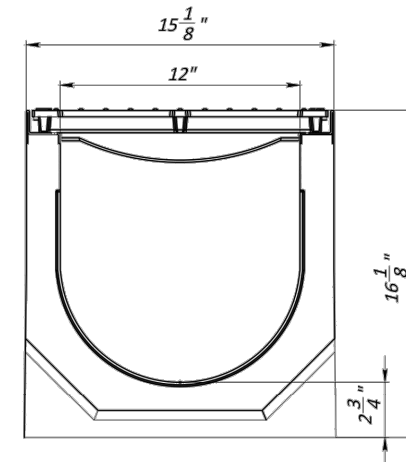
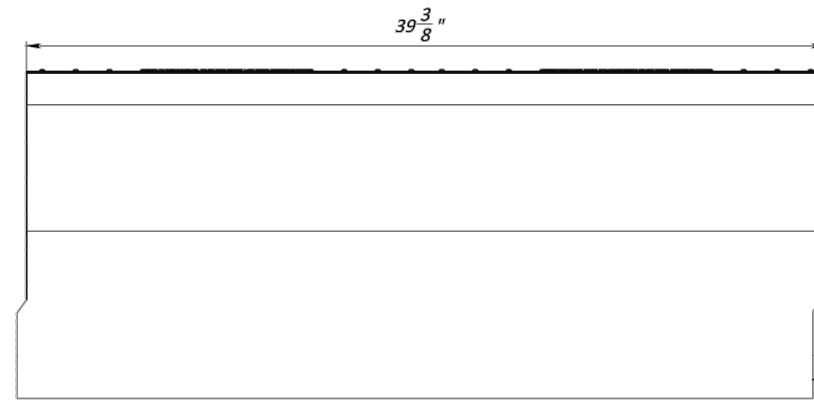
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWING.
3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY.
4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.



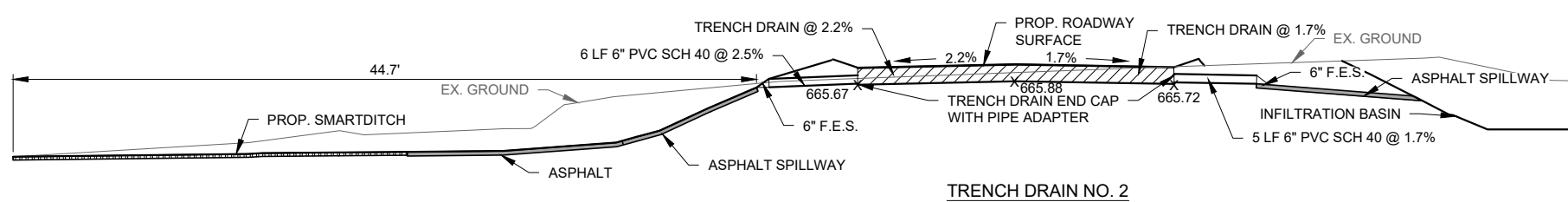
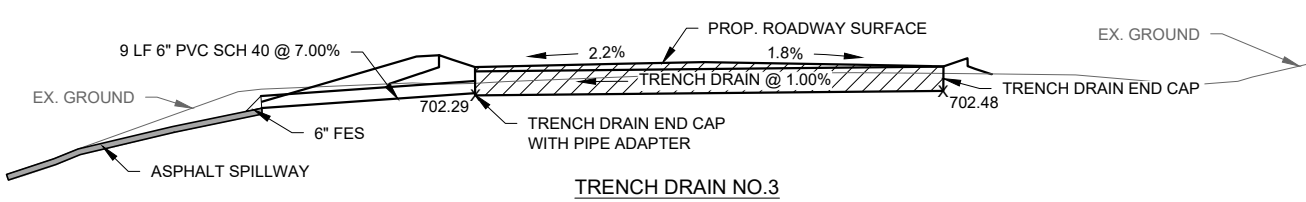
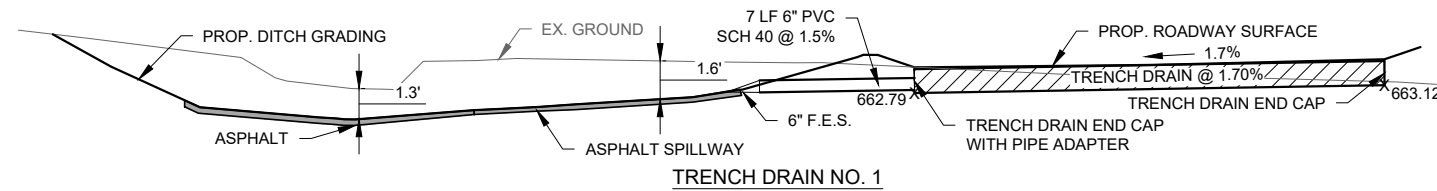
200 Series

FILCOTEN PRO V 200 GALVANIZED STEEL RAIL CLASS E CONCRETE PAVEMENT

12" Concrete Channel Set

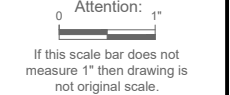


Rev.	Sheet	Doc. No.	Sign.	Date	12" Concrete Channel Set		
				11.15.14	Art.	04700	
					Let.	Weight (lb)	Scale
						440	1:5
					Sheet	Sheets 1	
					Concrete		VODALAND
					Copied by		Size A3



STEVEN CHRISTENSEN  
LEELANAU COUNTY DRAIN COMMISSIONER  
LAKE BLUFFS DRAIN  
A PART OF SECTION 14, SOLON TWP,  
T28N, R12W, LEELANAU COUNTY, MICHIGAN

DETAILS 3



RELEASE #	DATE
1	6/9/2022
2	11/18/2022

Designed By: LCM  
Checked By: MFS  
Drawn By: BSF  
Approved By: BJC

GEI PROJECT: 2003322  
DWG. NO. 99-D-04  
SHEET #12  
ARCHIVE #

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