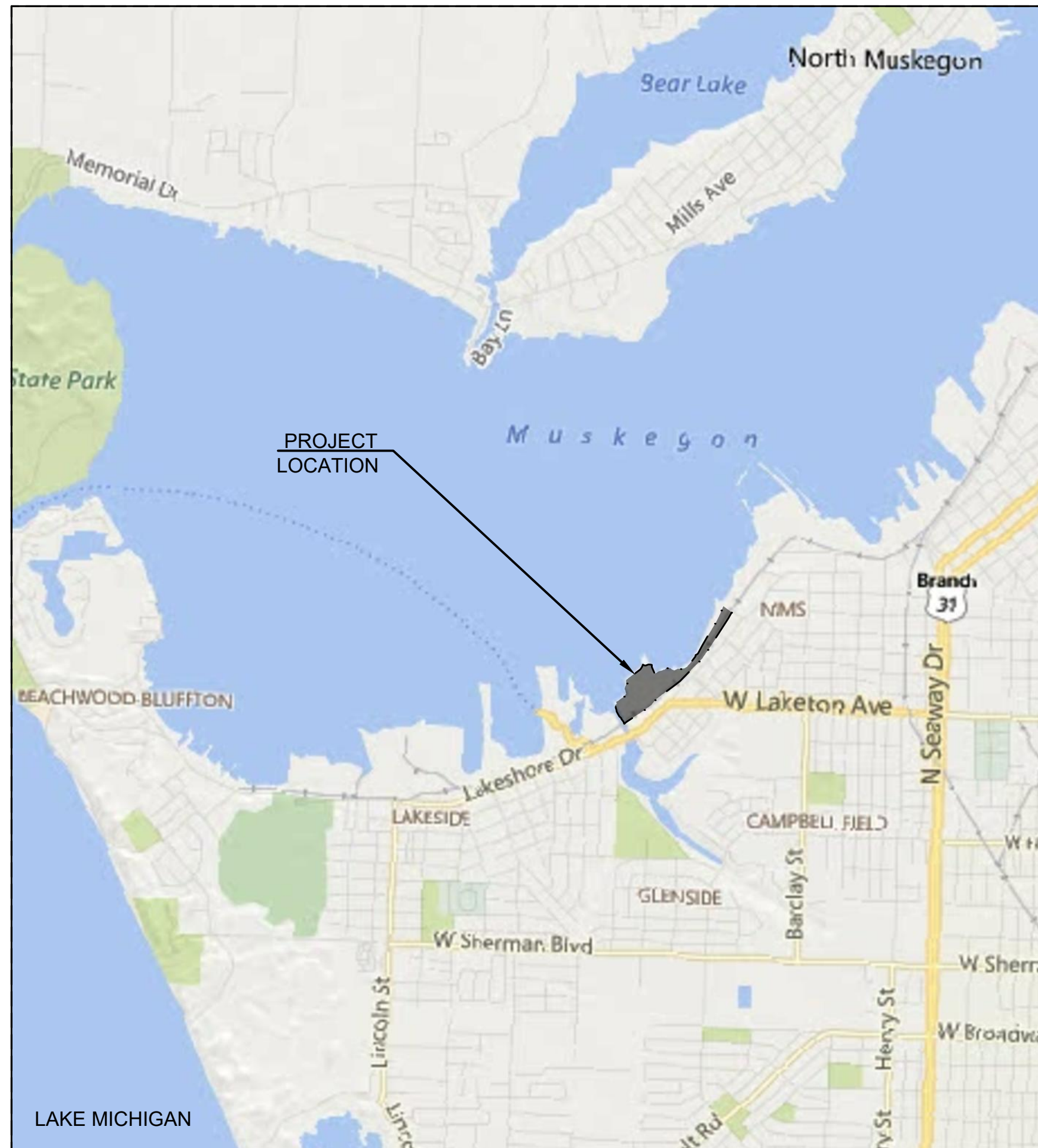
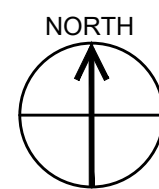


ISSUED FOR CONSTRUCTION

AMOCO FISH AND WILDLIFE HABITAT RESTORATION PROJECT



SITE LOCATION MAP
NOT TO SCALE



West Michigan Shoreline Regional Development Commission
(WMSRDC)



MUSKEGON, MUSKEGON COUNTY, MICHIGAN

INDEX TO DRAWINGS

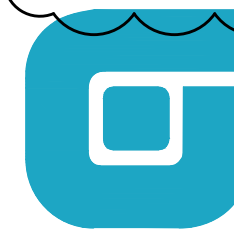
- TITLE SHEET
- C-101 - EXISTING CONDITIONS
- C-102 - SITE PREP AND EROSION AND SEDIMENTATION CONTROL PLAN
- C-103 - INVASIVE SPECIES TREATMENT PLAN
- C-104 - CLEARING AND DEMOLITION PLAN
- C-105 - SEDIMENT DEBRIS REMOVAL PLAN
- C-106 - GRADING (E1) PLAN AND WETLAND CREATION
- C-107 - SITE AMENITIES AND RESTORATION PLAN
- C-108 - NORTHERN SHORELINE REPAIR
- C-201 - CROSS SECTION AND PROFILES
- C-202 - CROSS SECTION AND PROFILES
- C-203 - CROSS SECTION AND PROFILES
- C-204 - CROSS SECTION AND PROFILES
- C-205 - BIKE PATH CROSS SECTIONS
- C-501 - HABITAT LOG DETAILS
- C-502 - FENCING DETAILS
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- C-504 - EROSION AND SEDIMENT CONTROL DETAILS
- C-505 - RESTORATION DETAILS
- C-506 - RESTORATION DETAILS



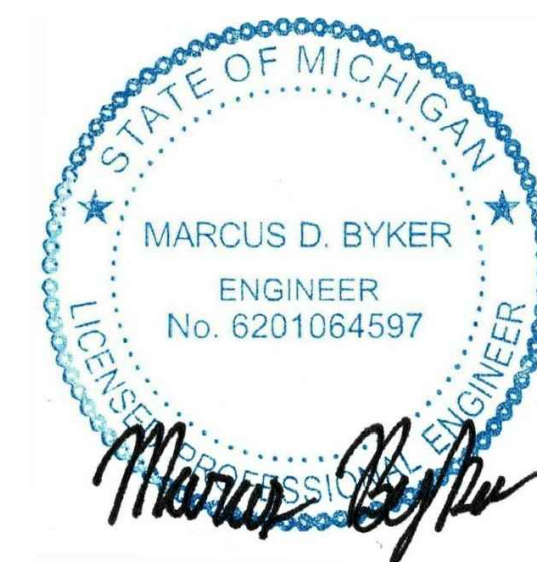
West Michigan's Shoreline City



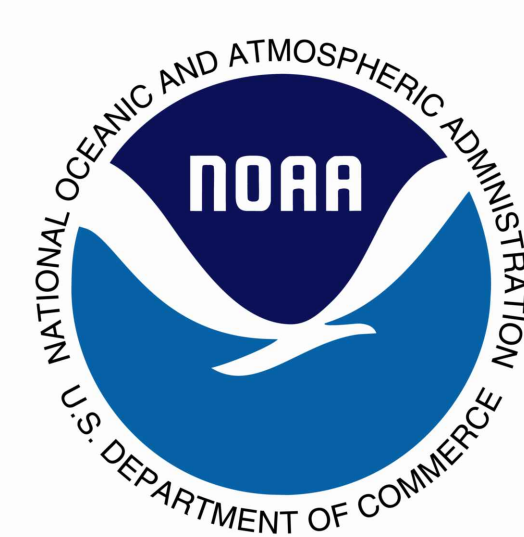
AUGUST 11, 2020



O'BRIEN & GERE ENGINEERS, INC.



IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.



GENERAL NOTES	NAVIGATION AIDS NOTES	ABBREVIATIONS	LEGEND
<ol style="list-style-type: none"> VERIFY ALL DIMENSIONS OF PERTINENT WORK IN THE FIELD, PRIOR TO COMMENCEMENT OF WORK. NOTIFY ENGINEER OF ANY DISCREPANCIES. COORDINATE ALL CONSTRUCTION ACTIVITIES WITH WMSRDC OR THEIR ASSIGNED REPRESENTATIVE. CONSTRUCTION METHODS AND MATERIALS NOT SPECIFIED ON THESE PLANS ARE TO MEET OR EXCEED THE STANDARD SPECIFICATIONS PROVIDED IN APPLICABLE TECHNICAL SPECIFICATIONS. LOCATION, SIZE, AND POTENTIAL IMPROVEMENTS TO STAGING AREA SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE. CONTRACTOR SHALL LAYOUT/STAKEOUT ALL SITE WORK AND SHALL BE RESPONSIBLE FOR FIELD ENGINEERING AND SURVEYING PER SPECIFICATION 01 70 00 PART 1-1.03. THE CONTRACTOR SHALL LOCATE, MARK, SAFEGUARD AND PRESERVE ALL SURVEY CONTROL MONUMENTS IN THE AREAS OF CONSTRUCTION. CONTRACTOR SHALL VERIFY SITE LAYOUT IS CONSISTENT WITH THE WORK INCLUDED IN THE CONTRACT DOCUMENTS AFTER MOBILIZATION AND BEFORE SITE WORK. STARTING OF SITE WORK SHALL BE CONTRACTORS ACCEPTANCE THAT SITE SURFACE CONDITIONS AND LAYOUT ARE AS STATED IN THE RFB AND ISSUED FOR CONSTRUCTION DOCUMENTS. THE CONTRACT LIMIT SHALL BE RESTRICTED TO ONLY AREAS WHERE THE WORK IS BEING CONDUCTED AND AS ORDERED BY WMSRDC OR THEIR ASSIGNED REPRESENTATIVE. WHERE POSSIBLE PRESERVE AND PROTECT ALL EXISTING ON-SHORE VEGETATION. RESTORE TO THEIR ORIGINAL CONDITION, ALL EXISTING PHYSICAL FEATURES DAMAGED BY THE UNAUTHORIZED ACT OR OMISSION OF THE CONTRACTOR. ORIGINAL CONDITION SHALL MEAN THE CONDITION IN WHICH THE FEATURE WAS FOUND AT THE START OF THE WORK. RESTORE ALL DISTURBED SURFACES TO ORIGINAL OR BETTER CONDITION. THE AS BUILT SURVEY WILL BE COMPLETED UNDER SEPARATE CONTRACT BY OTHERS AND SHALL INCLUDE, BUT WILL NOT BE LIMITED TO: <ol style="list-style-type: none"> SEGMENTED SHOAL TOE EXTENTS OF EACH SEGMENT. SEGMENTED SHOAL CREST AT EXTENTS OF EACH SEGMENT. CREST ELEVATION AT CENTER POINT OF EACH SEGMENTED BREAKWATER. LOCATION OF EACH INDIVIDUAL HABITAT LOG. LOCATION OF EACH NAVIGATION AID. TOPOGRAPHIC SURVEY OF WORK AREA WITH POINT ELEVATIONS COLLECTED ON A MINIMUM OF A 50-FOOT GRID AND POST-PROCESSED INTO 1-FOOT CONTOURS. LOCATION OF KEY DEFINING FEATURES, INCLUDING BUT NOT LIMITED TO: CONCRETE WALL, PAVEMENT EXTENTS, RIP-RAP (E12) EXTENTS, SIGNS, AND BENCHES. TO THE EXTENT POSSIBLE REMOVAL OF THE EXISTING BIKE PATH AND THE CONCRETE WALL SHALL OCCUR AFTER COMPLETION OF EARTHWORK ON THE INBOARD (LANDWARD) SIDE OF THESE FEATURES. SOIL GENERATED DURING EXCAVATION OF THE EXISTING BIKE PATH TO THE DESIGN GRADE SHALL BE SEGREGATED AND TRANSPORTED OFFSITE FOR DISPOSAL AT AN OWNER-APPROVED SUBTITLE D LANDFILL. IF POTENTIALLY CONTAMINATED SOIL (VISUALLY AFFECTED OR OLFACTORY OBSERVATIONS) IS IDENTIFIED AT ELEVATIONS DEEPER THAN DESIGN GRADES, THE OWNER'S REPRESENTATIVE WILL PROVIDE GUIDANCE ON WASTE MANAGEMENT, WHICH MAY INCLUDE ADDITIONAL EXCAVATION AND OFF-SITE DISPOSAL. ABANDONMENT OF EXISTING MONITORING WELLS LAKEWARD OF PROPOSED BIKE PATH IS IDENTIFIED ON C-104. INSTALLATION OF REPLACEMENT MONITORING WELLS MAY BE EVALUATED AT A TIME TO BE CONSIDERED. 	<ol style="list-style-type: none"> THE AIDS TO NAVIGATION SHALL BE BUOYS INSTALLED AROUND THE PROJECT AREA FOLLOWING INSTALLATION OF THE BREAKWATER STRUCTURES. NAVIGATION AIDS SHALL BE INSTALLED ACCORDING TO THE LOCATIONS SHOWN ON SHEET C-107. BUOYS SHALL BE SEALITE SL-700RB REGULATORY BUOY, WHITE 28" OR APPROVED EQUIVALENT. EACH AID TO MEET THE REQUIREMENTS OF A CLASS I PRIVATE AID TO NAVIGATION IN ACCORDANCE WITH THE FEDERAL REGULATIONS CONCERNING PRIVATE AIDS TO NAVIGATION (33 CFR 66) AND TO INCLUDE: <ol style="list-style-type: none"> DAYMARK - YELLOW DIAMOND-SHAPE BOARD YELLOW FLASHING LIGHT WITH A RANGE OF 3 STATUTE MILES OR 7-15 CANDELA. THE LIGHT SYSTEM SHALL BE A SELF-CONTAINED SOLAR LIGHT SYSTEM OR APPROVED EQUIVALENT. LIGHTS SHALL BE SEALITE SL-60 SOLAR MARINE LANTERN OR APPROVED EQUIVALENT. CONTRACTOR SHALL FURNISH ALL NEEDED ANCHORING MATERIALS AND CONTRACTOR SHALL SUBMIT A NAVIGATION AID SHOP DRAWING FOR APPROVAL PRIOR TO DEPLOYMENT. <div data-bbox="932 504 1578 665" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">REVISION NOTES</p> <ol style="list-style-type: none"> MINOR CHANGES ASSOCIATED WITH REVISION "F" ARE SHOWN USING REVISION CLOUDING AND KEYED NOTES. REVISION D, E OR F - "FOR PERMIT" - ALSO INVOLVED MODIFICATION OF PROPOSED TOPOGRAPHIC CONTOURS FROM STA. 0+00 TO STA. 10+20. FOR CLARITY, REVISION CLOUDS AND KEYED NOTES ARE NOT SHOWN FOR TOPOGRAPHIC, SILT FENCE, AND FENCE MODIFICATIONS. </div>	<p>AASHTO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS</p> <p>CECB COMPOST EROSION CONTROL BLANKET (E9)</p> <p>DBH DIAMETER BREST HEIGHT</p> <p>ELEV ELEVATION</p> <p>FT FOOT / FEET</p> <p>GALV GALVANIZED</p> <p>H / HORIZ HORIZONTAL</p> <p>HMA HOT MIX ASPHALT</p> <p>IGLD INTERNATIONAL GREAT LAKES DATUM</p> <p>IN INCH / INCHES</p> <p>KSI KILO-POUND PER SQUARE INCH</p> <p>LBS POUNDS</p> <p>MIN MINIMUM</p> <p>NAD83 THE NORTH AMERICAN DATUM OF 1983</p> <p>OC ON CENTER</p> <p>OD OUTER DIAMETER</p> <p>OHWM ORDINARY HIGH WATER MARK (581.5 IGLD85)</p> <p>PSI POUNDS PER SQUARE INCH</p> <p>PVC POLYVINYL CHLORIDE</p> <p>SF SQUARE FEET</p> <p>SVSP SEGMENTED VEGETATIVE SLOPE PROTECTION</p> <p>TYP TYPICAL</p> <p>V / VERT VERTICAL</p>	

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IN CHARGE OF	M. BYKER	G	8/11/2020	ISSUE FOR CONSTRUCTION	MDB
		F	7/23/2020	FOR PERMIT	MDB
DESIGNED BY	T. EALLONARDO	E	3/12/2020	FOR PERMIT REVIEW	MDB
		D	3/5/2020	ADDENDUM 1	MDB
CHECKED BY	C. HARLEY	C	2/26/2020	RESPONSE TO COMMENTS	MDB
		B	2/14/2020	ISSUE FOR BID	MDB
DRAWN BY	S. ENGELHARDT	A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL	MDB
		NO.	DATE	REVISION	INT.



WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION

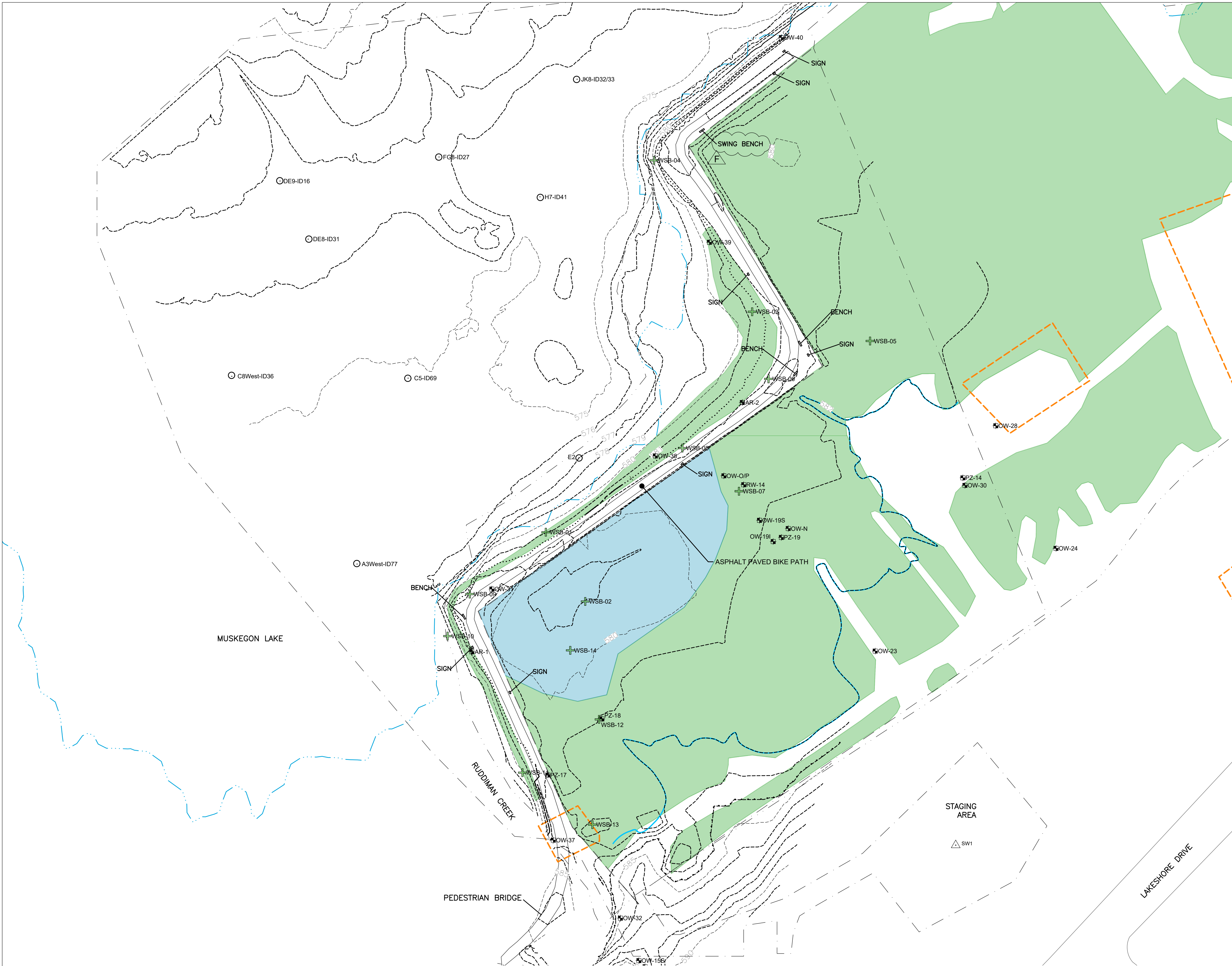
AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

GENERAL
NOTES

FILE NO.
33422.72430

DATE
AUGUST 11, 2020

G-001



LEGEND

- PROPERTY BOUNDARY
- - - WORK AREA
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EDGE OF WATER (IN UPLAND AREA AT TIME OF TOPO SURVEY)
- EXISTING BIKE PATH
- CONCRETE WALL AND FENCE
- DELINEATED WETLAND
- DELINEATED EMERGENT OR SCRUB-SHRUB WETLAND
- RESTRICTIVE COVENANT ZONES
- 2019 SEDIMENT SAMPLE LOCATIONS
- + UPLAND SOIL SAMPLE LOCATIONS
- △ SURVEY BENCHMARK
- EXISTING MONITORING WELL
- ORDINARY HIGH WATER (581.5 IGLD85)
- 100 YEAR FLOODPLAIN (584.0 IGLD85)

NOTES:

1. UPLAND TOPOGRAPHY DATA COLLECTED BY SEAWORKS GROUP, LLC OF BENTON HARBOR, MICHIGAN ON 5/13/2019 AND 5/15/2019 USING RTK GPS
2. HYDROGRAPHIC SURVEY DATA COLLECTED BY SEAWORKS GROUP, LLC OF BENTON HARBOR, MICHIGAN ON 5/14/2019 USING MULTIBEAM SONAR.
3. MUSKEGON LAKE WATER LEVEL AT TIME OF SURVEY WAS APPROXIMATELY 581.2 FT IGLD85
4. HORIZONTAL DATUM IS NAD83, GRID MICHIGAN SOUTH. VERTICAL DATUM IS IGLD85 IN INTERNATIONAL FEET.

SURVEY BENCHMARKS

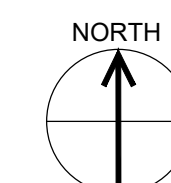
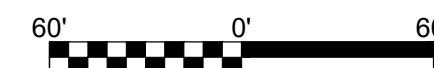
PID	EASTING	NORTHING	EL. (NAVD88)	DESCRIPTION
SW1	12,612,471.04	632,380.38	588.32'	MAGNAIL
SW2 (SOUTH OF WORK AREA)	12,612,202.17	632,222.68	592.26'	MAGNAIL
61201 (SOUTHEAST OF WORK AREA)	12,636,070.04	610,709.22	633.61'	BRASS DISC

*Construction sheet sets uses IGLD85 elevations; these benchmarks may need to be converted.

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PLAN

SCALE: 1"=60'



IN CHARGE OF	M. BYKER	F	8/11/2020	ISSUE FOR CONSTRUCTION	MDB
DESIGNED BY	T. EALLONARDO	E	3/12/2020	FOR PERMIT REVIEW	MDB
CHECKED BY	C. HARLEY	D	3/5/2020	ADDENDUM 1	MDB
DRAWN BY	S. ENGELHARDT	C	2/26/2020	RESPONSE TO COMMENTS	MDB
		B	2/14/2020	ISSUE FOR BID	MDB
		A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL	MDB
		NO.	DATE	REVISION	INT.



WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION

AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

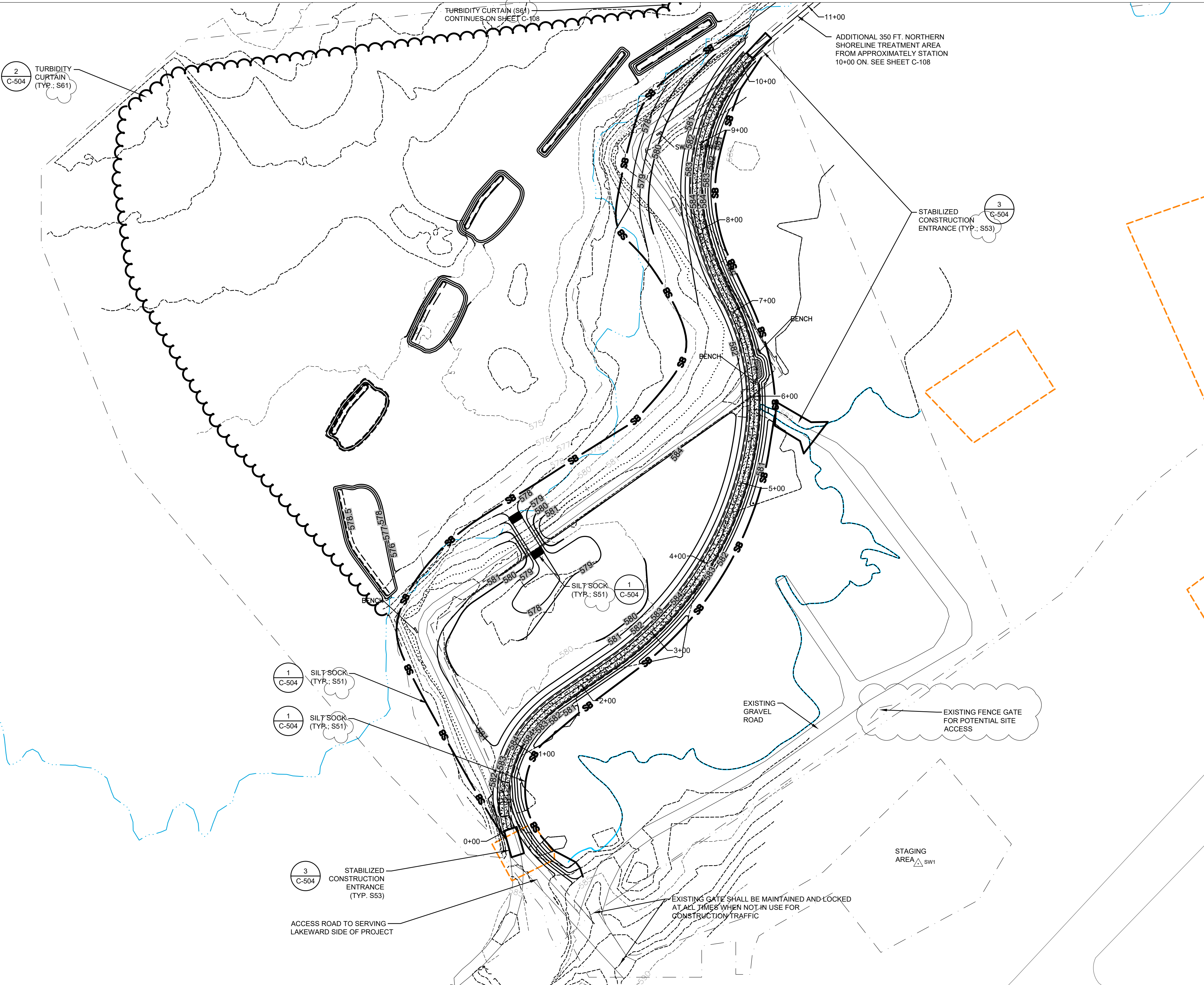
CIVIL

EXISTING CONDITIONS

FILE NO.
33422.72430

DATE
AUGUST 11, 2020

C-101



LEGEND

- PROPERTY BOUNDARY
- - - WORK AREA
- == PROPOSED TOPOGRAPHIC CONTOURS
- - - EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EDGE OF WATER LINE (IN UPLAND AREA OF TIME OF TOPO SURVEY)
- EXISTING BIKE PATH
- CONCRETE WALL AND FENCE
- RESTRICTIVE COVENANT ZONES
- ORDINARY HIGH WATER MARK (581.5 IGLD85)
- SILT BARRIER (S53)

EROSION AND SEDIMENTATION CONTROL NOTES:

1. PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES ON THE SITE, MEET WITH WMSRDC AND THEIR REPRESENTATIVE TO DISCUSS THE EROSION AND SEDIMENTATION CONTROL MEASURES FOR THE PROJECT AND SUBMIT AN EROSION AND SEDIMENTATION CONTROL PLAN IN ACCORDANCE WITH TECHNICAL SPECIFICATION 31 25 00 - EROSION AND SEDIMENT CONTROL.
2. SILT SOCK (S51) SHALL BE INSPECTED DAILY, AND REPLACED WHEN TORN, IS BULGING, OR NO LONGER MEETING THE INSTALLATION DETAILS.
3. IF FIELD CONDITIONS RENDER THE EROSION AND SEDIMENTATION CONTROL MEASURES INEFFECTIVE IN MINIMIZING POLLUTANTS FROM STORMWATER DISCHARGES THEN WMSRDC OR THEIR REPRESENTATIVE SHALL UPDATE OR AMEND THE CONFIGURATION OF EROSION AND SEDIMENTATION CONTROL MEASURES TO ADDRESS THE DEFICIENCY. THE CONTRACTOR SHALL INSTALL/CONSTRUCT ANY NEW MEASURES WITHIN SEVEN DAYS OF NOTIFICATION AS A RESULT OF THE MODIFICATIONS.
4. EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES. CONTROLS SHALL BE INSTALLED AND INSPECTED CONSISTENT WITH THE REQUIREMENTS OF THE SOIL EROSION AND SEDIMENTATION CONTROL PERMIT OBTAINED BY OTHERS FROM MUSKEGON COUNTY.
5. THE PURPOSE OF A TURBIDITY CURTAIN (S61) IS TO SEPARATE WORK AREAS IN OR ADJACENT TO WATERWAYS, TO PREVENT TURBIDITY FROM ENTERING THE WATERWAY.
 - 5.1. THE TURBIDITY CURTAIN (S61) SHALL BE PLACED AS CLOSE TO THE WORK AREA AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
 - 5.2. THE TURBIDITY CURTAIN (S61) SHALL NOT BE PLACED ACROSS A FLOWING WATER.
 - 5.3. THE TURBIDITY CURTAIN (S61) SHALL BE REMOVED BY PULLING TOWARD THE SHORE LINE TO MINIMIZE ESCAPE OF SEDIMENTS INTO THE WATERWAY.
 - 5.4. THE CONTRACTOR SHALL MONITOR THE INSTALLATION, TAKING INTO ACCOUNT WEATHER PATTERNS AND PREVAILING WIND DIRECTIONS THAT MAY AFFECT WATER LEVELS, VELOCITY AND MOVEMENT OF THE TURBIDITY CURTAIN (S61).
 - 5.5. THE CONTRACTOR MAY INSTALL AND MAINTAIN TURBIDITY CURTAIN (S61) IN SEGMENTS AS WORK PROGRESSES TO REDUCE THE LENGTH OF CURTAIN DEPLOYED PROVIDED THAT SEDIMENT MIGRATION IS CONTROLLED THROUGHOUT CONSTRUCTION. CURTAIN SHALL REMAIN IN PLACE UNTIL THE ADJACENT EARTHWORK IS COMPLETED AND THE AREA STABILIZED.
6. TO THE EXTENT POSSIBLE, THE EXISTING BIKE PATH SHALL REMAIN IN PLACE WHILE EARTHWORK AND RESTORATION OCCUR LANDWARD TO MINIMIZE OFF-SITE SEDIMENT MIGRATION.
7. STABILIZED CONSTRUCTION ENTRANCES (S53) SHALL BE INSTALLED AT SITE ACCESS/EGRESS LOCATIONS TO MINIMIZE TRACKING OF SEDIMENT OFF-SITE.

QUANTITIES ON THIS SHEET		
ITEM	QUANTITY	UNIT
STABILIZED CONSTRUCTION ENTRANCE (S53)	3	EACH
SILT SOCK (S51)	2,310	FT
TURBIDITY CURTAIN (S61) (TOTAL, AS DISPLAYED ON C-102 & C-108)	1,730	FT

NOTE: QUANTITIES REFERENCED IN ABOVE TABLE ARE ESTIMATED. CONTRACTOR TO VERIFY ALL QUANTITIES. QUANTITY ITEMS REPRESENT MAJOR ELEMENTS OF WORK. MINOR ELEMENTS MAY NOT BE QUANTIFIED.

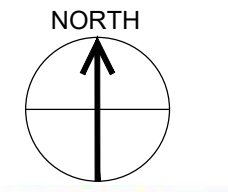


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DESIGNED BY	T. EALLONARDO	E	7/23/2020	FOR PERMIT	MDB
CHECKED BY	C. HARLEY	D	3/5/2020	ADDENDUM 1	MDB
DRAWN BY	S. ENGELHARDT	C	2/26/2020	RESPONSE TO COMMENTS	MDB
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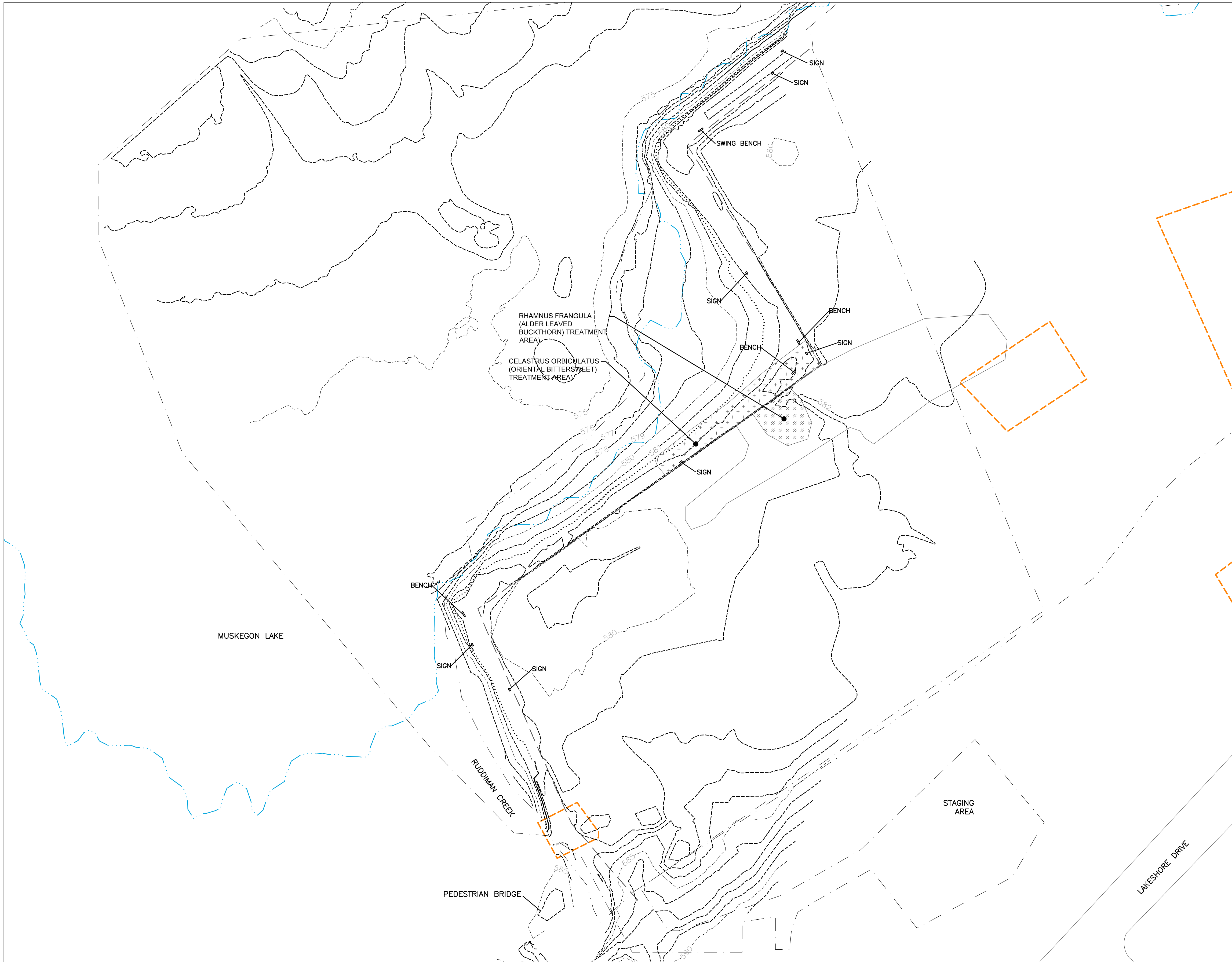
PLAN
SCALE: 1"=60'



WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL	FILE NO. 33422.72430	C-102
SITE PREP AND EROSION AND SEDIMENTATION CONTROL PLAN	DATE AUGUST 11, 2020	



LEGEND

- PROPERTY BOUNDARY
- - - WORK AREA
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EXISTING BIKE PATH
- CONCRETE WALL AND FENCE
- RESTRICTIVE COVENANT ZONES
- ORDINARY HIGH WATER MARK (581.5 IGLD85)

INVASIVE SPECIES TREATMENT NOTES:

1. TO THE EXTENT POSSIBLE, INVASIVE SPECIES WITHIN THE TREATMENT AREAS SHALL BE TREATED WITH AN APPROVED HERBICIDE PRIOR TO THE IMPLEMENTATION OF EARTHWORK. THE SELECTED METHOD MUST BE APPROPRIATE FOR THE TIMING OF APPLICATION AND SPECIES BEING TARGETED. APPLICATION OF HERBICIDES MUST BE COMPLETED BY A LICENSED APPLICATOR ACCORDING TO ALL APPLICABLE STATE REGULATIONS AND PER THE MANUFACTURERS RECOMMENDATIONS.
2. THE OWNER'S REPRESENTATIVE WILL ACQUIRE APPROPRIATE PERMITS AS WELL AS PUBLIC NOTIFICATION. THE CONTRACTOR SHALL PLACE REQUIRED SIGNAGE PRIOR TO IMPLEMENTING INVASIVE SPECIES TREATMENT.
3. FOLLOWING ANY EARTH WORK IN INVASIVE SPECIES TREATMENT AREAS, WASH EQUIPMENT AT AN APPROVED LOCATION TO AVOID SPREAD OF INVASIVE PLANT ROOT STOCKS AND SEEDS.
4. ALL HERBICIDES USED ON SITE MUST BE APPROVED FOR WETLAND USE.

QUANTITIES ON THIS SHEET

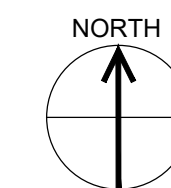
ITEM	QUANTITY	UNIT
RHAMNUS FRANGULA (ALDER LEAVED BUCKTHORN) TREATMENT AREA	2,830	SF
CELASTRUS ORBICULATUS (ORIENTAL BITTERSWEET) TREATMENT AREA	6,360	SF

NOTE: QUANTITIES REFERENCED IN ABOVE TABLE ARE ESTIMATED. CONTRACTOR TO VERIFY ALL QUANTITIES. QUANTITY ITEMS REPRESENT MAJOR ELEMENTS OF WORK. MINOR ELEMENTS MAY NOT BE QUANTIFIED.

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PLAN

SCALE: 1"=60'



IN CHARGE OF	M. BYKER			
DESIGNED BY	T. EALLONARDO	D	8/11/2020	ISSUE FOR CONSTRUCTION
CHECKED BY	C. HARLEY	C	2/26/2020	RESPONSE TO COMMENTS
DRAWN BY	S. ENGELHARDT	B	2/14/2020	ISSUE FOR BID
		A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL
		NO.	DATE	REVISION
				INT.

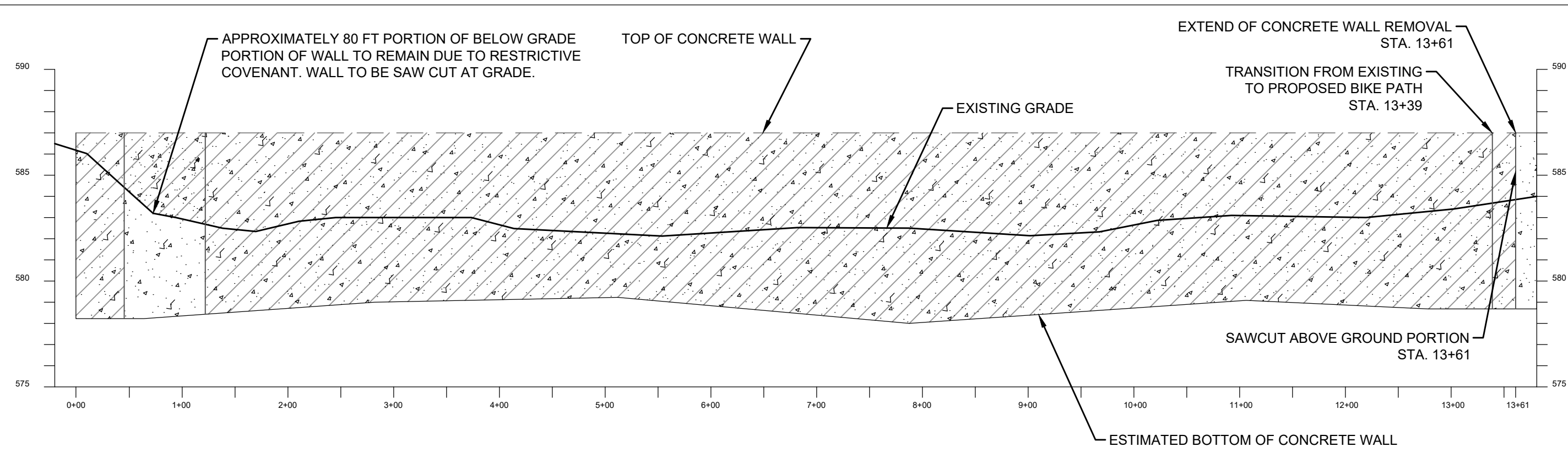


WMSRDC
 WEST MICHIGAN SHORELINE
 REGIONAL DEVELOPMENT COMMISSION
AMOCO FISH & WILDLIFE HABITAT RESTORATION
 MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL
INVASIVE SPECIES TREATMENT PLAN

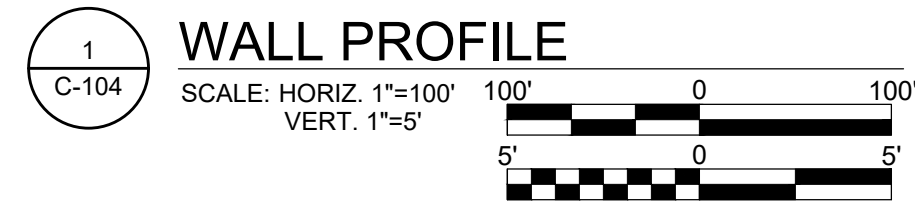
FILE NO.	33422.72430
DATE	AUGUST 11, 2020

C-103



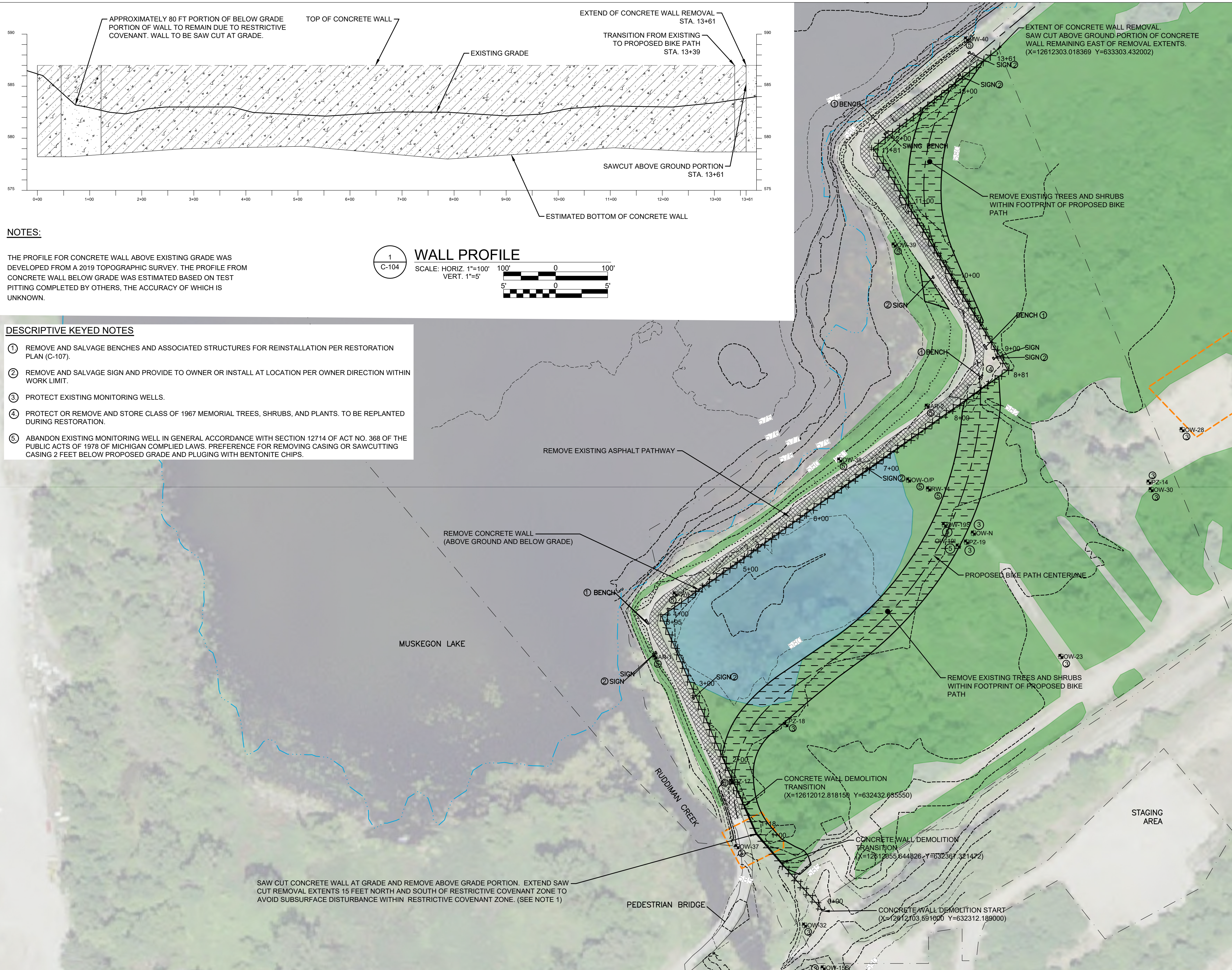
NOTES:

THE PROFILE FOR CONCRETE WALL ABOVE EXISTING GRADE WAS DEVELOPED FROM A 2019 TOPOGRAPHIC SURVEY. THE PROFILE FROM CONCRETE WALL BELOW GRADE WAS ESTIMATED BASED ON TEST PITTING COMPLETED BY OTHERS, THE ACCURACY OF WHICH IS UNKNOWN.



DESCRIPTIVE KEYED NOTES

- ① REMOVE AND SALVAGE BENCHES AND ASSOCIATED STRUCTURES FOR REINSTALLATION PER RESTORATION PLAN (C-107).
- ② REMOVE AND SALVAGE SIGN AND PROVIDE TO OWNER OR INSTALL AT LOCATION PER OWNER DIRECTION WITHIN WORK LIMIT.
- ③ PROTECT EXISTING MONITORING WELLS.
- ④ PROTECT OR REMOVE AND STORE CLASS OF 1967 MEMORIAL TREES, SHRUBS, AND PLANTS. TO BE REPLANTED DURING RESTORATION.
- ⑤ ABANDON EXISTING MONITORING WELL IN GENERAL ACCORDANCE WITH SECTION 12714 OF ACT NO. 368 OF THE PUBLIC ACTS OF 1978 OF MICHIGAN COMPLIED LAWS. PREFERENCE FOR REMOVING CASING OR SAWCUTTING CASING 2 FEET BELOW PROPOSED GRADE AND PLUGGING WITH BENTONITE CHIPS.



LEGEND

- PROPERTY BOUNDARY
- WORK AREA
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EXISTING BIKE PATH (TO BE REMOVED)
- CONCRETE WALL AND FENCE
- DELINEATED WETLAND
- DELINEATED EMERGENT OR SCRUB-SHRUB WETLAND
- RESTRICTIVE COVENANT ZONES
- XXXXXX REMOVE CONCRETE WALL - ABOVE AND BELOW GRADE
- ////// REMOVE CONCRETE WALL - ABOVE GRADE ONLY
- PROPOSED CLEARING AREA
- ORDINARY HIGH WATER MARK (581.5 IGLD85)

NOTES:

1. AVOID SUBSURFACE DISTURBANCE OF RESTRICTIVE COVENANT ZONE WITHIN WALL REMOVAL ALIGNMENT. LEGAL DESCRIPTION OF THE ZONE IS AS FOLLOWS: A description situated in the State of Michigan, County of Muskegon, City of Muskegon, (Township 10 North, Range 17 West), Section 36, described as follows: Commencing at the Northwest corner of Section 36 as recorded in Liber 2052, Page 578 of corners, said point being N87°28'24"W, 2659.39 feet from the North 1/4 corner of said Section 36 as recorded in Liber 2052, Page 579 of corners; thence S63°03'51" W, 691.04 to the point of beginning; thence S67°01' 28"W, 56.52 feet; thence N29°15' 1" O"W, 45.07 feet; thence N63°26' 54" E, 54.32 feet; thence S31°30'47"W, 48.72 feet to the point of beginning.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING DAMAGE TO EXISTING STRUCTURES, PAVED BIKE PATH, OR TURF GRASS.
3. TREES AND SHRUBS TO BE PRESERVED SHALL BE MARKED BY WMSRDC'S REPRESENTATIVE. CONTRACTOR SHALL PROTECT THESE PRIOR TO INITIATION OF CONSTRUCTION.
- 3.1. FENCING SHALL BE INSTALLED AT THE DRIPLINE OF TREES AND SHRUBS TO BE PRESERVED AND GROUND DISTURBANCE SHALL NOT OCCUR WITHIN THE DRIPLINE
4. CONCRETE FROM WALL REMOVAL AND CONCRETE SLAB SHALL BE BROKEN INTO MANAGEABLE SEGMENTS AND TRANSPORTED BY THE CONTRACTOR TO A LOCAL MUSKEGON RECYCLING FACILITY.
5. CONTRACTOR SHALL PROTECT BENCHES, BENCH SWING WITH CORRESPONDING STRUCTURE, AND SIGNS DURING CONCRETE DEMOLITION. BENCHES, BENCH SWING, AND SIGNS SHALL BE STORED IN STAGING AREA FOR USE DURING SITE RESTORATION.
6. TO EXTENT PRACTICAL, CONTRACTOR TO STAGE CLEARED TREES AND SHRUBS FOR USE DURING RESTORATION ACTIVITIES SPECIFIED ON SHEET C-107.

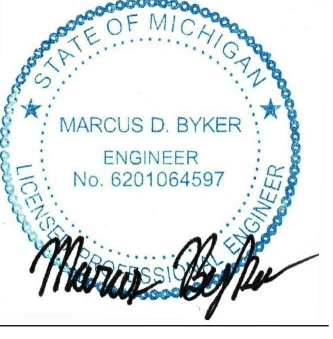
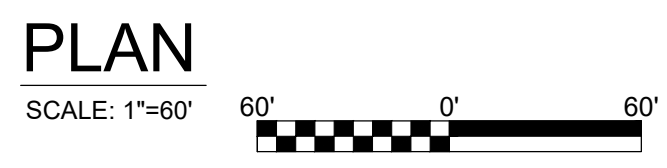
QUANTITIES ON THIS SHEET

ITEM	QUANTITY	UNIT
CONCRETE SAW CUTTING (TWO AREAS)	85	FT
CONCRETE WALL REMOVAL	1361 950 500	FT TON CY
EXISTING ASPHALT PATH REMOVAL (~10 FT WIDE)	1235 500 250	FT TON CY
REMOVAL AND SALVAGE SWING BENCH	1	EACH
REMOVAL AND SALVAGE SIGN	4	EACH
PROTECT EXISTING MONITORING WELLS	9	EACH
ABANDON EXISTING MONITORING WELLS	11	EACH
REMOVE EXISTING TREES AND SHRUBS	0.77 (APPROX)	ACRE

NOTE: QUANTITIES REFERENCED IN ABOVE TABLE ARE ESTIMATED. CONTRACTOR TO VERIFY ALL QUANTITIES. QUANTITY ITEMS REPRESENT MAJOR ELEMENTS OF WORK. MINOR ELEMENTS MAY NOT BE QUANTIFIED.

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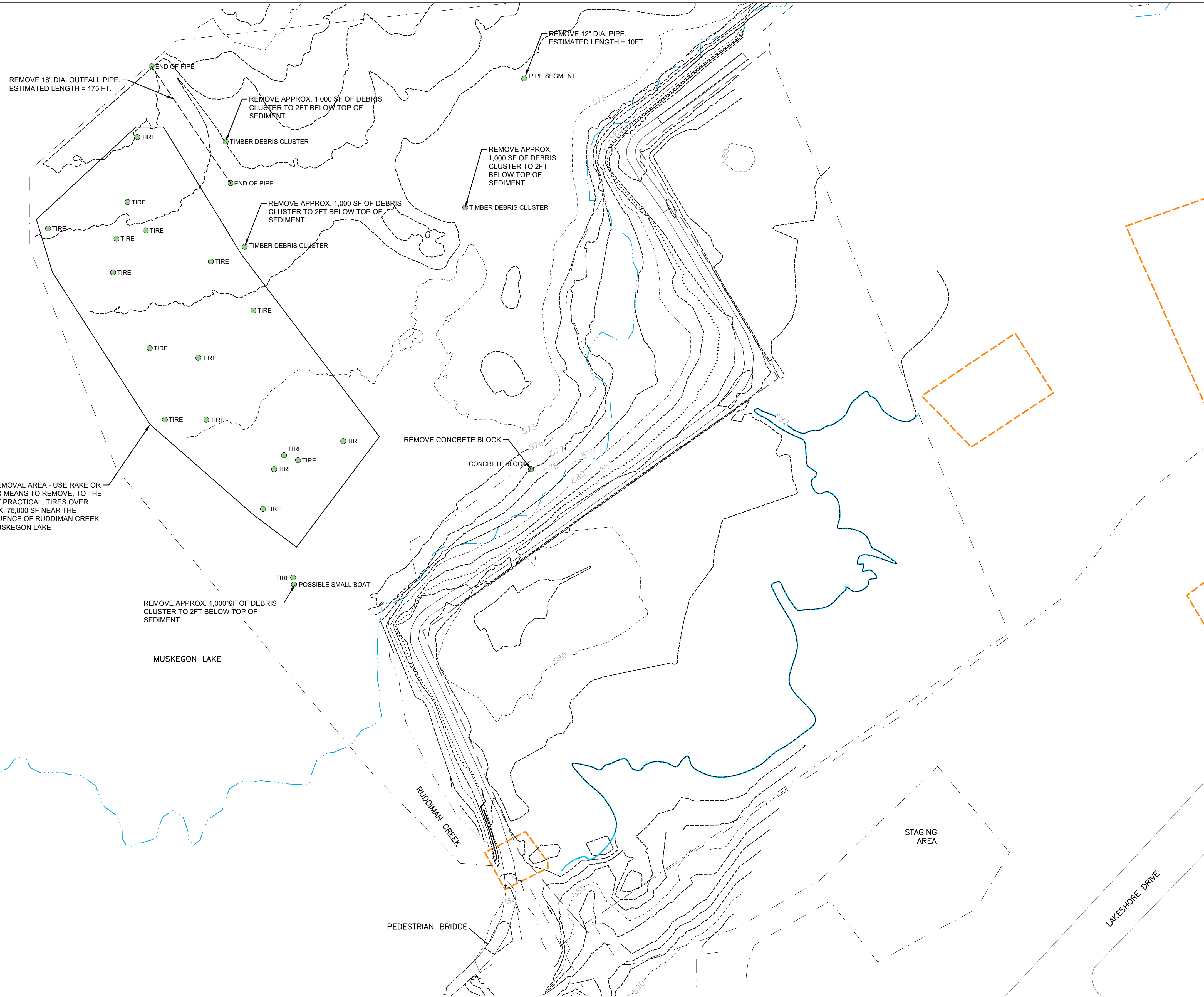
IN CHARGE OF	M. BYKER	F	8/11/2020	ISSUE FOR CONSTRUCTION	MDB
DESIGNED BY	T. EALLONARDO	E	7/23/2020	FOR PERMIT	MDB
CHECKED BY	C. HARLEY	D	3/5/2020	ADDENDUM 1	MDB
DRAWN BY	S. ENGELHARDT	C	2/26/2020	RESPONSE TO COMMENTS	MDB
		B	2/14/2020	ISSUE FOR BID	MDB
		A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL	MDB
		NO.	DATE	REVISION	INT.



AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CLEARING AND DEMOLITION PLAN

CIVIL	FILE NO. 33422.72430	C-104
	DATE AUGUST 11, 2020	



LEGEND

- PROPERTY BOUNDARY
- - - WORK AREA
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EDGE OF WATER (IN UPLAND AREA AT TIME OF TOPO SURVEY)
- EXISTING BIKE PATH
- CONCRETE WALL AND FENCE
- RESTRICTIVE COVENANT ZONES
- DEBRIS
- ORDINARY HIGH WATER MARK (581.5 IGLD85)

- NOTES:**
- CONTRACTOR TO DEPLOY SILT/TURBIDITY CURTAIN (S51/S61) AROUND DEBRIS REMOVAL ACTIVITIES.
 - LOCATION OF DEBRIS IS APPROXIMATE AND BASED ON SURVEY COMPLETED MAY 14, 2019. MULTIBEAM AND SIDESCAN SONAR FINDINGS ALONG WITH COORDINATES WILL BE PROVIDED TO CONTRACTOR FOR FIELD LOCATION OF DEBRIS.
 - CONTRACTOR SHALL COORDINATE BARGING AND OFFLOADING OF REMOVED DEBRIS AT AN OFFSITE LOCATION.
 - CONTRACTOR SHALL SEGREGATE DEBRIS TARGETED FOR LANDFILL DISPOSAL (TIRES, SMALL BOAT, TIMBER DEBRIS CLUSTER) FROM DEBRIS TARGETED FOR REUSE (METALLIC OBJECTS, CONCRETE PIPE AND CONCRETE BLOCKS). DEBRIS TARGETED FOR REUSE SHALL HAVE VISIBLE SEDIMENT REMOVED IN THE UPLAND STAGING AREA PRIOR TO REUSE. CONCRETE SHALL BE BROKEN INTO MANAGEABLE SEGMENTS AND TRANSPORTED BY THE CONTRACTOR TO A LOCAL MUSKEGON RECYCLING FACILITY.

QUANTITIES ON THIS SHEET		
ITEM	QUANTITY	UNIT
TIRE REMOVAL AREA	75,000	SF
REMOVE 18" DIA. OUTFALL PIPE, ~175 FT IN LENGTH	1	LUMP SUM
REMOVE 1000 SF DEBRIS CLUSTER TO 2 FT BELOW TOP OF SEDIMENT	4	EACH
REMOVE CONCRETE BLOCK	1	EACH
REMOVE 12" DIA. PIPE, ~10 FT IN LENGTH	1	LUMP SUM

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TIRE REMOVAL AREA - USE RAKE OR SIMILAR MEANS TO REMOVE, TO THE EXTENT PRACTICAL, TIRES OVER APPROX. 75,000 SF NEAR THE CONFLUENCE OF RUDDIMAN CREEK AND MUSKEGON LAKE

REMOVE APPROX. 1,000 SF OF DEBRIS CLUSTER TO 2FT BELOW TOP OF SEDIMENT

REMOVE CONCRETE BLOCK

REMOVE 12" DIA. PIPE. ESTIMATED LENGTH = 10FT.

REMOVE APPROX. 1,000 SF OF DEBRIS CLUSTER TO 2FT BELOW TOP OF SEDIMENT.

REMOVE APPROX. 1,000 SF OF DEBRIS CLUSTER TO 2FT BELOW TOP OF SEDIMENT.

REMOVE APPROX. 1,000 SF OF DEBRIS CLUSTER TO 2FT BELOW TOP OF SEDIMENT.

MUSKEGON LAKE

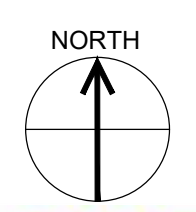
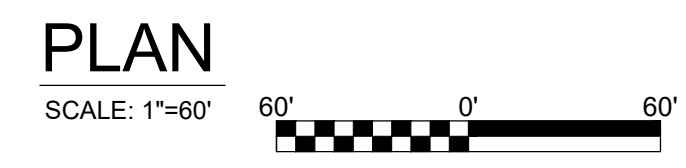
RUDDIMAN CREEK

PEDESTRIAN BRIDGE

STAGING AREA

LAKESHORE DRIVE

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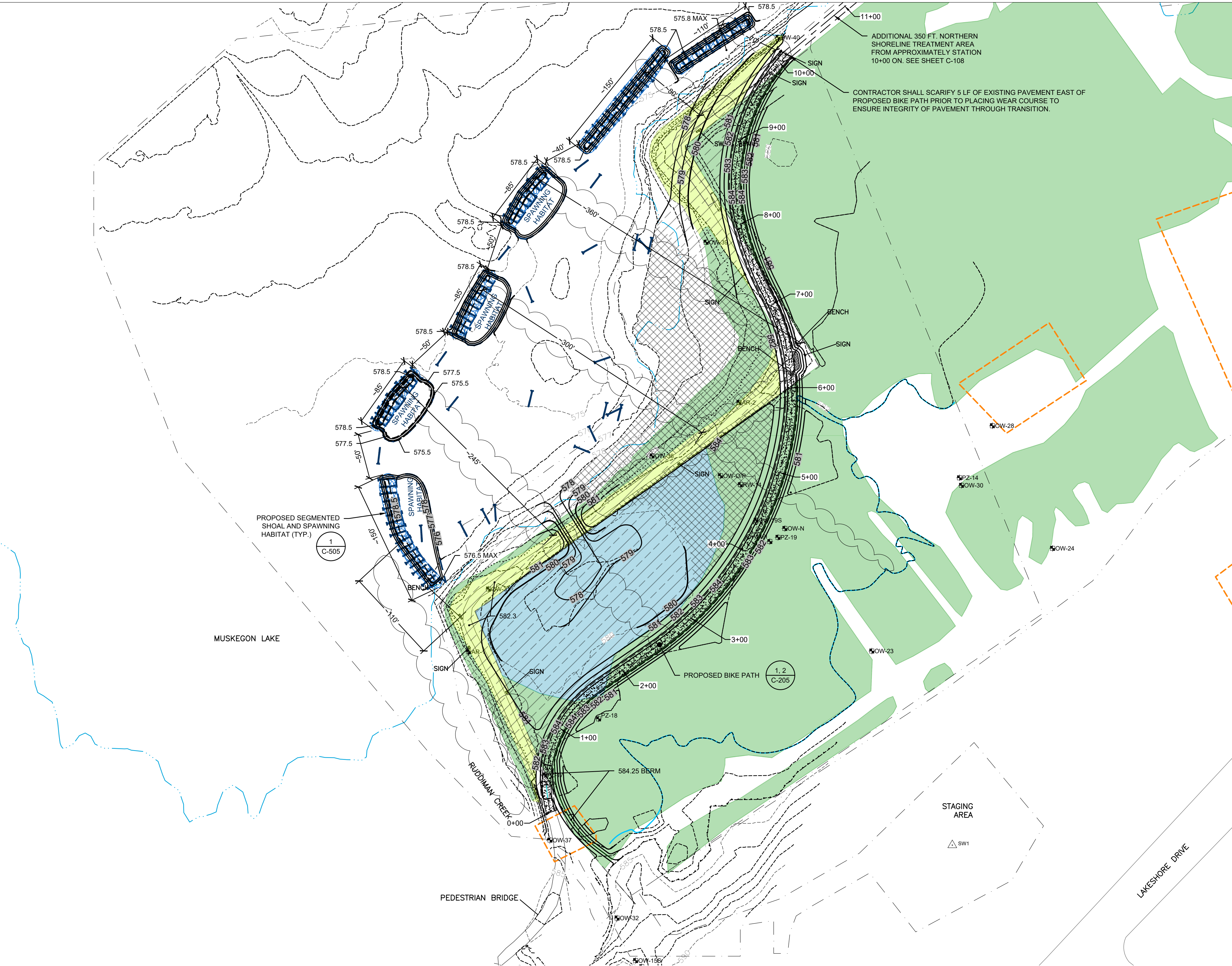
IN CHARGE OF	M. BYKER			
DESIGNED BY	T. EALLONARDO	D	8/11/2020	ISSUE FOR CONSTRUCTION
CHECKED BY	C. HARLEY	C	2/26/2020	RESPONSE TO COMMENTS
DRAWN BY	S. ENGELHARDT	B	2/14/2020	ISSUE FOR BID
		A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL
		NO.	DATE	REVISION
				INT.



WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION
AMOCO FISH & WILDLIFE HABITAT RESTORATION
 MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL	FILE NO. 33422.72430
	DATE AUGUST 11, 2020

C-105



LEGEND

- PROPERTY BOUNDARY
- WORK AREA
- PROPOSED TOPOGRAPHIC CONTOURS
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EXISTING BIKE PATH
- PROPOSED BIKE PATH
- PROPOSED CONCRETE BENCH AREA
- PROPOSED GRAVEL SHOULDER
- CONCRETE WALL AND FENCE
- DELINEATED WETLAND
- DELINEATED EMERGENT OR SCRUB-SHRUB WETLAND
- CREATED WETLAND - PROPOSED (0.58ac)
- RESTRICTIVE COVENANT ZONES
- SPAWNING HABITAT (1 C-505, 2 or 3 C-501)
- BALLASTED HABITAT LOG
- WETLAND ENHANCEMENT AREA (49,130 SQUARE FEET)
- WETLAND RESTORATION AREA (73,300 SQUARE FEET)
- ORDINARY HIGH WATER MARK (581.5 IGLD85)
- ~100 YEAR FLOODPLAIN (584.0 IGLD85)

- NOTES:**
- IN GENERAL, GRADING SHALL BE PERFORMED SUCH THAT A MINIMUM OF 1' OF THE WETLAND SOIL PROFILE IS PLACED WITHIN THE WETLAND RESTORATION WORK AREA. SEE THE WETLAND SOIL PROFILE GIVEN ON SHEET C-506 FOR MORE DETAIL.
 - EXCESS CUT SOIL SHALL BE STOCKPILED IN AN APPROVED STAGING AREA WITH APPROVED EROSION AND SEDIMENT CONTROLS, AND SENT TO AN OFFSITE LANDFILL.
 - WITHIN WETLAND ENHANCEMENT AREAS, TOPSOIL AND ASSOCIATED VEGETATION SHALL NOT BE DISTURBED UNLESS OTHERWISE NEEDED TO TREAT INVASIVE SPECIES PER SHEET C-103 OR TO REMOVE THE EXISTING BIKE PATH. DISTURBED AREAS WITHIN THE WETLAND ENHANCEMENT AREA SHALL BE RESTORED WITH THE WETLAND SOIL PROFILE.
 - WETLAND ENHANCEMENT AREAS SHALL BE PLANTED (E21) AND SEEDED (E8) ACCORDING TO PLANTING ZONES PROVIDED ON SHEET C-407 AND DETAILS PROVIDED ON SHEET C-506.
 - COMPOST EROSION CONTROL BLANKET (E9) SHALL BE INSTALLED IN ACCORDANCE WITH AASHTO DESIGNATION: R 52-10'.

QUANTITIES ON THIS SHEET		
ITEM	QUANTITY	UNIT
PROPOSED BIKE PATH	1,025	FT
GRADING, COMBINATION ROUGH/FINISH	2.55	ACRE
LOADING AND OFFSITE LANDFILL DISPOSAL (EST. 1.4 TONS/CY)	3220 2300	TON CY
SELECT FILL, IMPORT (EST. 1.4 TONS/CY)	3381 2415	TON CY
RIPRAP (E12) TOE PROTECTION, MDOT PLAIN (EST. 1.4 TONS/CY)	315 225	TON CY
GEOTEXTILE FABRIC, SOIL SEPARATION TYPE	1,070	SY
SEGMENTED VEGETATIVE SLOPE PROTECTION	1,750	SY
TOPSOIL (EST. 1.8 TONS/CY)	290 162	TON CY
COMPOST EROSION CONTROL BLANKET (E9)	3,005	SY
WETLAND SOIL PROFILE, 12-INCH LAYER PLACED WITHIN WETLAND RESTORATION AREAS (EST. 1.8 TON/CY)	4887 2715	TON / CY
SEGMENTED SHOAL STONE, 300-500 LB (EST. 1.4 TONS/CY)	1263.15 902.25	TON CY
BALLASTED HABITAT LOG, INSTALLED INCLUDING ANCHORS - NOT IN SHOAL	22	EACH
BALLASTED HABITAT STONE	110	EACH
BALLASTED HABITAT LOG, INSTALLED INCLUDING ANCHORS - WITHIN SHOAL	78	EACH
SPAWNING BED STONE BLEND (EST. 1.4 TONS/CY)	1260 900	TON CY

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IN CHARGE OF	M. BYKER
DESIGNED BY	T. EALLONARDO
CHECKED BY	C. HARLEY
DRAWN BY	S. ENGELHARDT

NO.	DATE	REVISION	INT.
G	8/11/2020	ISSUE FOR CONSTRUCTION	MDB
F	7/23/2020	FOR PERMIT	MDB
E	3/12/2020	FOR PERMIT REVIEW	MDB
D	3/5/2020	ADDENDUM 1	MDB
C	2/26/2020	RESPONSE TO COMMENTS	MDB
B	2/14/2020	ISSUE FOR BID	MDB
A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL	MDB

O'BRIEN & GERE ENGINEERS, INC
EAST LANSING, MICHIGAN

PLAN
SCALE: 1"=60'

WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION

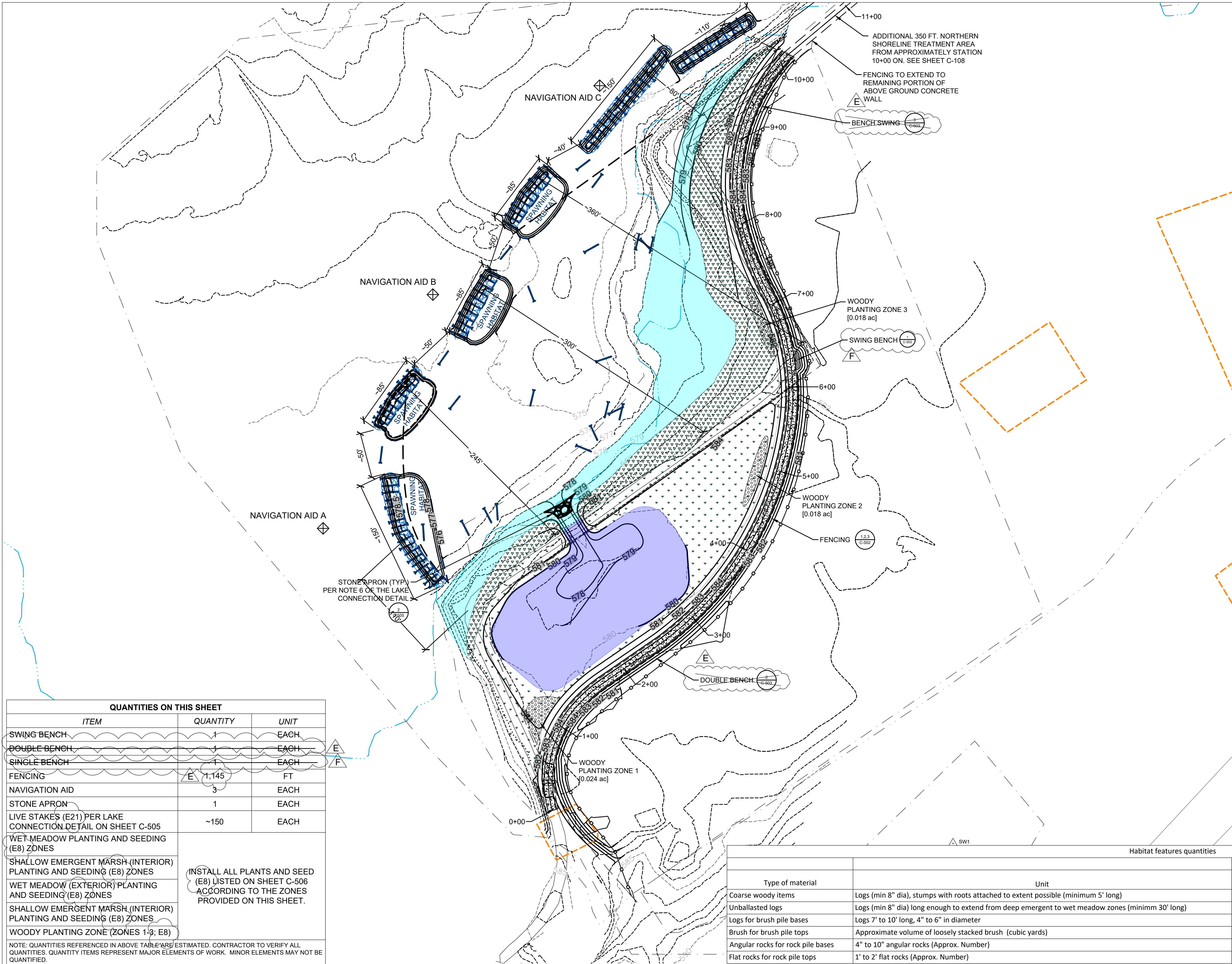
AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL

GRADING (E1) PLAN AND WETLAND CREATION

FILE NO. 33422.72430
DATE AUGUST 11, 2020

C-106



LEGEND

- PROPERTY BOUNDARY
- WORK AREA
- PROPOSED TOPOGRAPHIC CONTOURS
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EXISTING BIKE PATH
- PROPOSED BIKE PATH
- CONCRETE WALL AND FENCE
- RESTRICTIVE COVENANT ZONES
- FISH HABITAT
- BALLASTED HABITAT LOG
- WET MEADOW PLANTING AND SEEDING (E8) ZONE (INTERIOR) [0.74 ac.]
- SHALLOW EMERGENT MARSH PLANTING AND SEEDING (E8) ZONE (INTERIOR) [0.66 ac.]
- WET MEADOW PLANTING AND SEEDING (E8) ZONE (EXTERIOR) [0.57 ac.]
- SHALLOW EMERGENT MARSH PLANTING AND SEEDING (E8) ZONE (EXTERIOR) [0.71 ac.]
- NAVIGATION AID
- FENCE
- WOODY PLANTING ZONE
- ORDINARY HIGH WATER MARK (581.5 IGLD85)

HABITAT FEATURES:

1. COARSE WOODY DEBRIS ITEMS (I.E., INDIVIDUAL LOGS INCLUDING ROOT BALL AND BRANCHES, STUMPS INCLUDING ROOT BALL) SHALL BE PLACED RANDOMLY THROUGHOUT THE WETLAND RESTORATION AND WETLAND ENHANCEMENT AREAS. DEBRIS SHALL BE PLACED AT A MINIMUM OF 15 ITEMS PER ACRE. A MINIMUM OF 5 ITEMS PER ACRE SHALL BE LOGS THAT EXTEND FROM THE ZONE WITH THE HIGHEST ELEVATION TO THE ZONE WITH THE LOWEST (E.G., LOGS THAT EXTEND FROM THE WET MEADOW THROUGH THE SHALLOW EMERGENT ZONE TO THE EXTENT PRACTICABLE). LOGS TO BE USED SHALL BE A MINIMUM OF 8-INCH DIAMETER BREST HEIGHT (DBH).
2. BRUSH PILES SHALL BE PLACED RANDOMLY WITHIN THE WET MEADOW ZONES WITH A MINIMUM OF 4 BRUSH PILES PER ACRE. BRUSH PILES SHALL BE CONSTRUCTED AS FOLLOWS:
 - 2.1. TWO ROWS OF 7 TO 10 FT LONG, 4 TO 6 INCH DIAMETER HARDWOOD LOGS SHALL BE STACKED SUCH THAT THE TOP ROW IS PERPENDICULAR TO THE BOTTOM ROW. SPACING BETWEEN EACH LOG SHALL BE APPROXIMATELY 1 FT.
 - 2.2. BRUSH SHALL CONSIST OF HARDWOOD LIMBS AND BRANCHES WITH A MAXIMUM DIAMETER OF 2 INCHES.
 - 2.3. BRUSH SHALL BE STACKED ACROSS THE LOGS TO A HEIGHT OF UP TO 4 FT.
2. ROCK PILES SHALL BE PLACED RANDOMLY WITHIN THE SHALLOW EMERGENT AND WET MEADOW ZONES WITH A MINIMUM OF 5 ROCK PILES PER ACRE IN EACH ZONE. ROCK PILES SHALL BE A MINIMUM OF 25 SQUARE FEET IN SIZE. ROCK PILES SHALL BE AS FOLLOWS:
 - 2.1. ROCK PILE FOUNDATIONS SHALL CONSIST OF 25 SQUARE FT OF 4 TO 10 INCH ANGULAR ROCK WITH APPROXIMATELY 4 TO 6 INCHES OF VOID SPACE BETWEEN ROCKS, PILED TO AN APPROXIMATE HEIGHT OF 12 INCHES IN THE WET MEADOW AND SUCCESSIONAL FOREST ZONES AND 24 INCHES IN SHALLOW EMERGENT ZONE.
 - 2.2. ONE TO TWO SQUARE FOOT FLAT ROCK SHALL BE PLACED OVER APPROXIMATELY 90% OF THE FOUNDATION.
3. PLANT MATERIALS SHALL BE INSTALLED ACCORDING TO SPECIFICATION 31 22 19 AND AS PER THE PLANTING LISTS (E8) PROVIDED ON SHEET C-507.
4. QUANTITIES OF MATERIALS TO CONSTRUCT THE HABITAT FEATURES SHALL BE AS FOLLOWS. THESE QUANTITIES DO NOT INCLUDE THE HABITAT LOGS SHOWN ON THE PLAN VIEW AND DETAILED ON SHEET C-501.

QUANTITIES ON THIS SHEET		
ITEM	QUANTITY	UNIT
SWING BENCH	1	EACH
DOUBLE BENCH	1	EACH
SINGLE BENCH	1	EACH
FENCING	1,145	FT
NAVIGATION AID	3	EACH
STONE APRON	1	EACH
LIVE STAKES (E21) PER LAKE CONNECTION DETAIL ON SHEET C-505	~150	EACH
WET MEADOW PLANTING AND SEEDING (E8) ZONES	INSTALL ALL PLANTS AND SEED (E8) LISTED ON SHEET C-506 ACCORDING TO THE ZONES PROVIDED ON THIS SHEET.	
SHALLOW EMERGENT MARSH (INTERIOR) PLANTING AND SEEDING (E8) ZONES		
WET MEADOW (EXTERIOR) PLANTING AND SEEDING (E8) ZONES		
SHALLOW EMERGENT MARSH (INTERIOR) PLANTING AND SEEDING (E8) ZONES		
WOODY PLANTING ZONE (ZONES 1-3; E8)		

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Type of material	Unit	Quantity				TOTAL
		Wet meadow interior zone	Wet meadow exterior zone	Shallow emergent marsh interior zone	Shallow emergent marsh exterior zone	
Coarse woody items	Logs (min 8" dia), stumps with roots attached to extent possible (minimum 5' long)	7	6	7	7	27
Unballasted logs	Logs (min 8" dia) long enough to extend from deep emergent to wet meadow zones (minimum 30' long)	4	3	3	3	13
Logs for brush pile bases	Logs 7' to 10' long, 4" to 6" in diameter	42	28	0	0	70
Brush for brush pile tops	Approximate volume of loosely stacked brush (cubic yards)	16	10	0	0	26
Angular rocks for rock pile bases	4" to 10" angular rocks (Approx. Number)	100	75	75	75	325
Flat rocks for rock pile tops	1' to 2' flat rocks (Approx. Number)	60	45	45	45	195

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		NO.	DATE	REVISION	INT.

PLAN
SCALE: 1"=60'

NORTH

WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION

AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

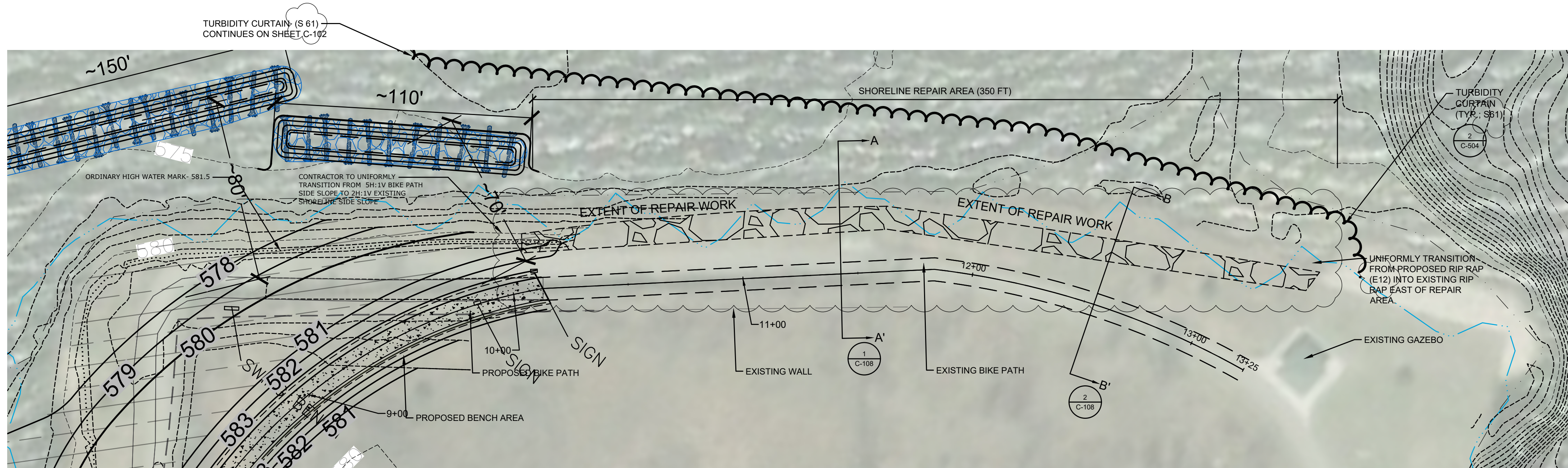
CIVIL

SITE AMENITIES AND RESTORATION
PLAN

FILE NO.
33422.72430

DATE
AUGUST 11, 2020

C-107

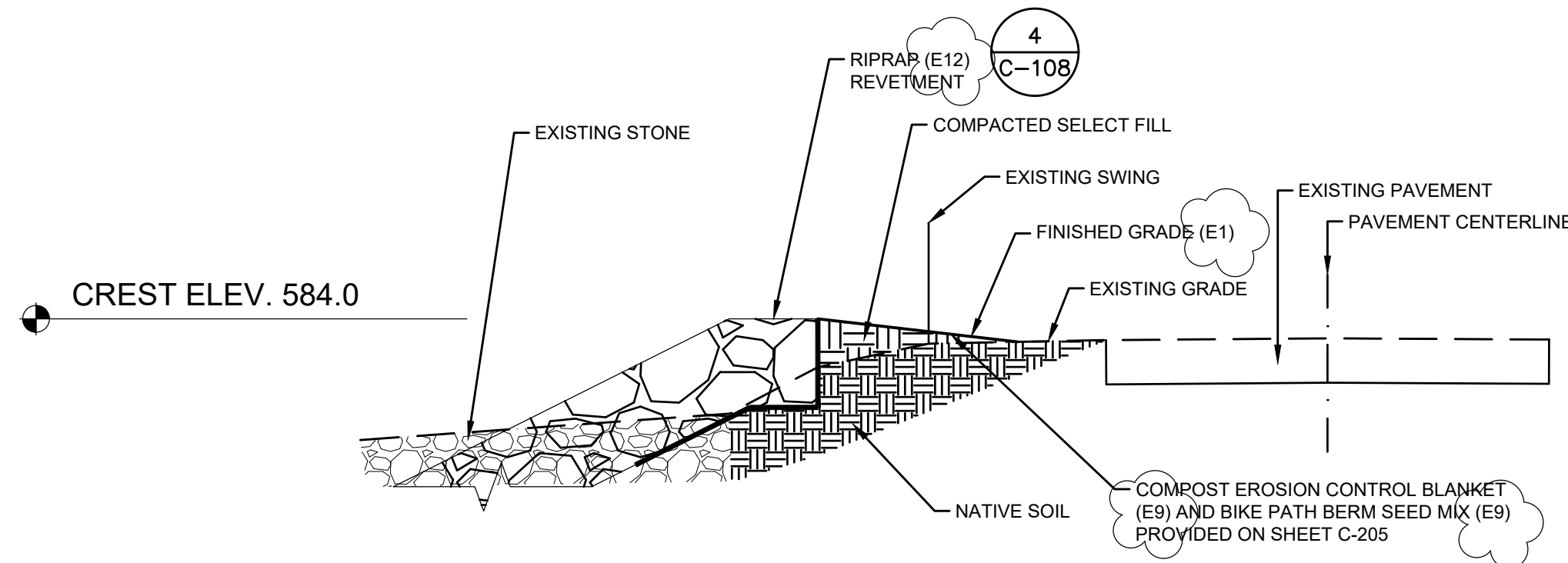
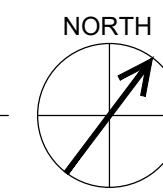


QUANTITIES ON THIS SHEET		
ITEM	QUANTITY	UNIT
RIP RAP (E12) REVETMENT, MDOT HEAVY (EST. 1.4 TONS/CY)	360 260	TON CY
GEOTEXTILE FABRIC	330	SY

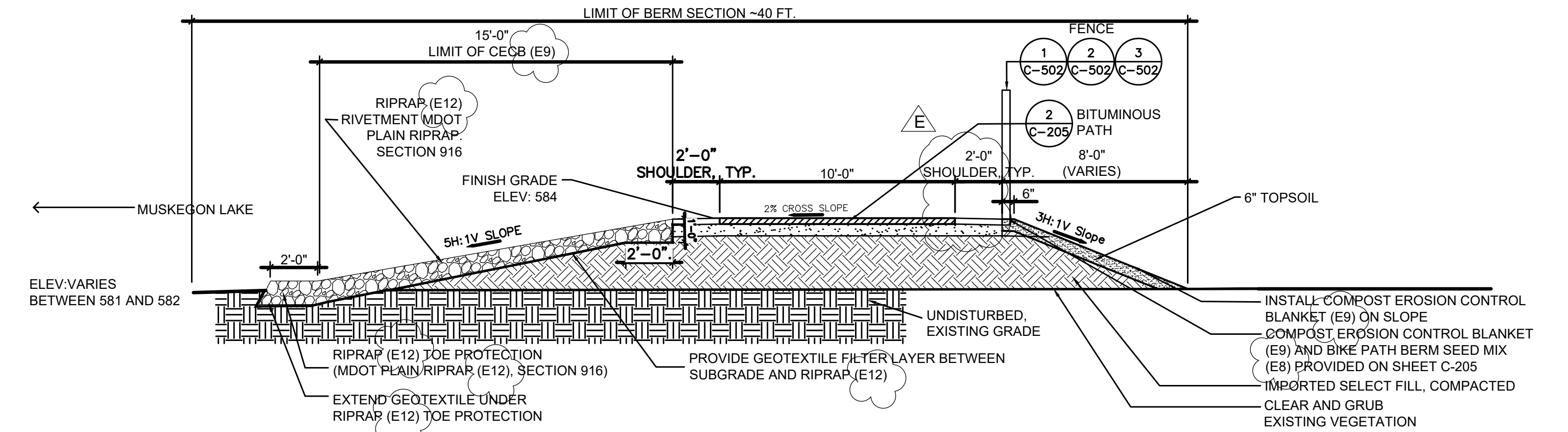
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NORTH SHORELINE PROTECTION RECONSTRUCTION SITE PLAN

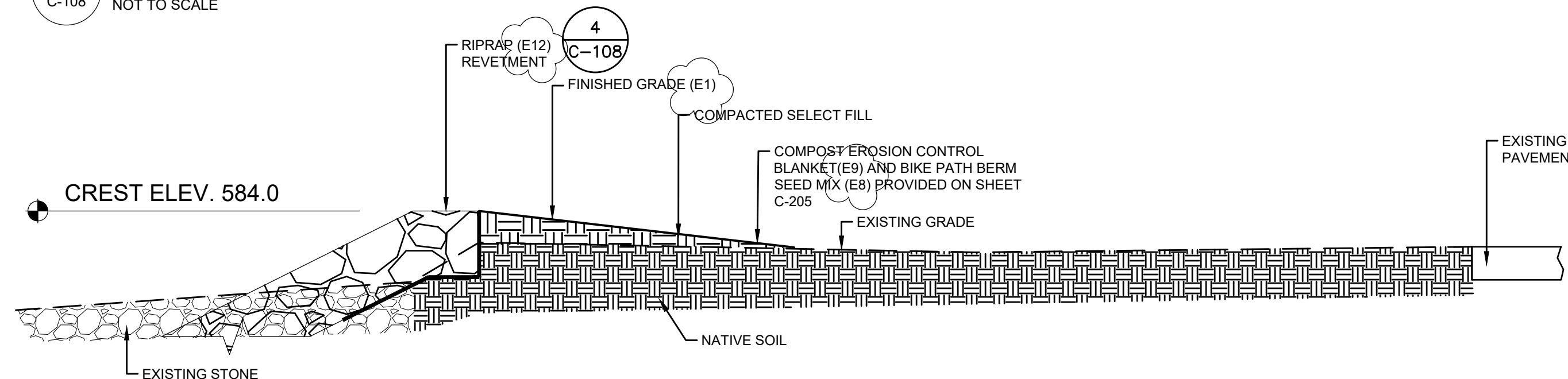
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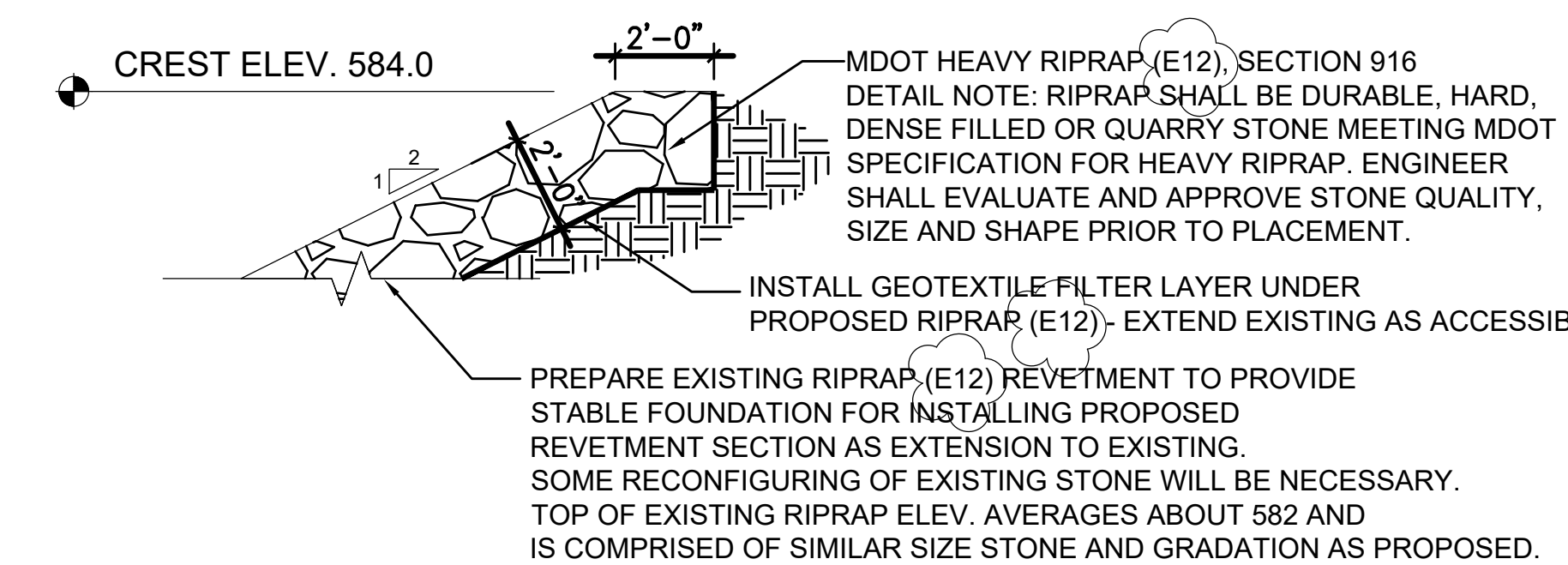
1 SECTION A-A' - STA. 10+20 TO STA. 11+75
C-108 NOT TO SCALE



3 TYPICAL BIKE PATH CROSS SECTION AT NORTHERN SHORELINE - STA. 9+00 TO STA. 10+20
C-108 NOT TO SCALE



2 SECTION B-B' - STA. 11+75 TO STA. 13+25
C-108 NOT TO SCALE



4 REVETMENT REPAIR DETAIL
C-108 NOT TO SCALE

EXISTING CROSS-SECTIONS DEVELOPED FROM FIELD SURVEY COMPLETED BY WEST MICHIGAN SHORELINE REDEVELOPMENT COMMISSION ON NOVEMBER 1, 2019 USING ROD AND LEVEL.

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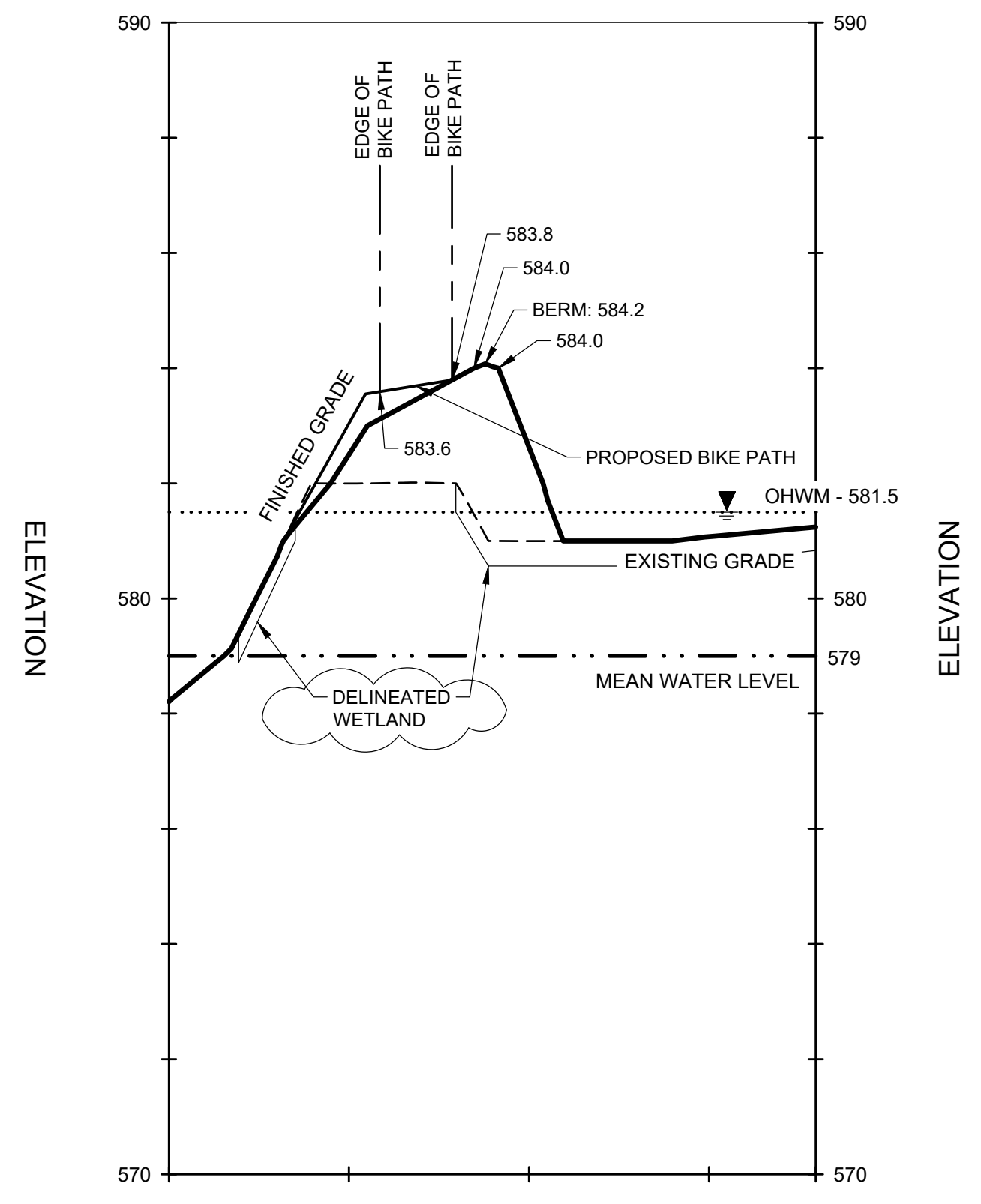
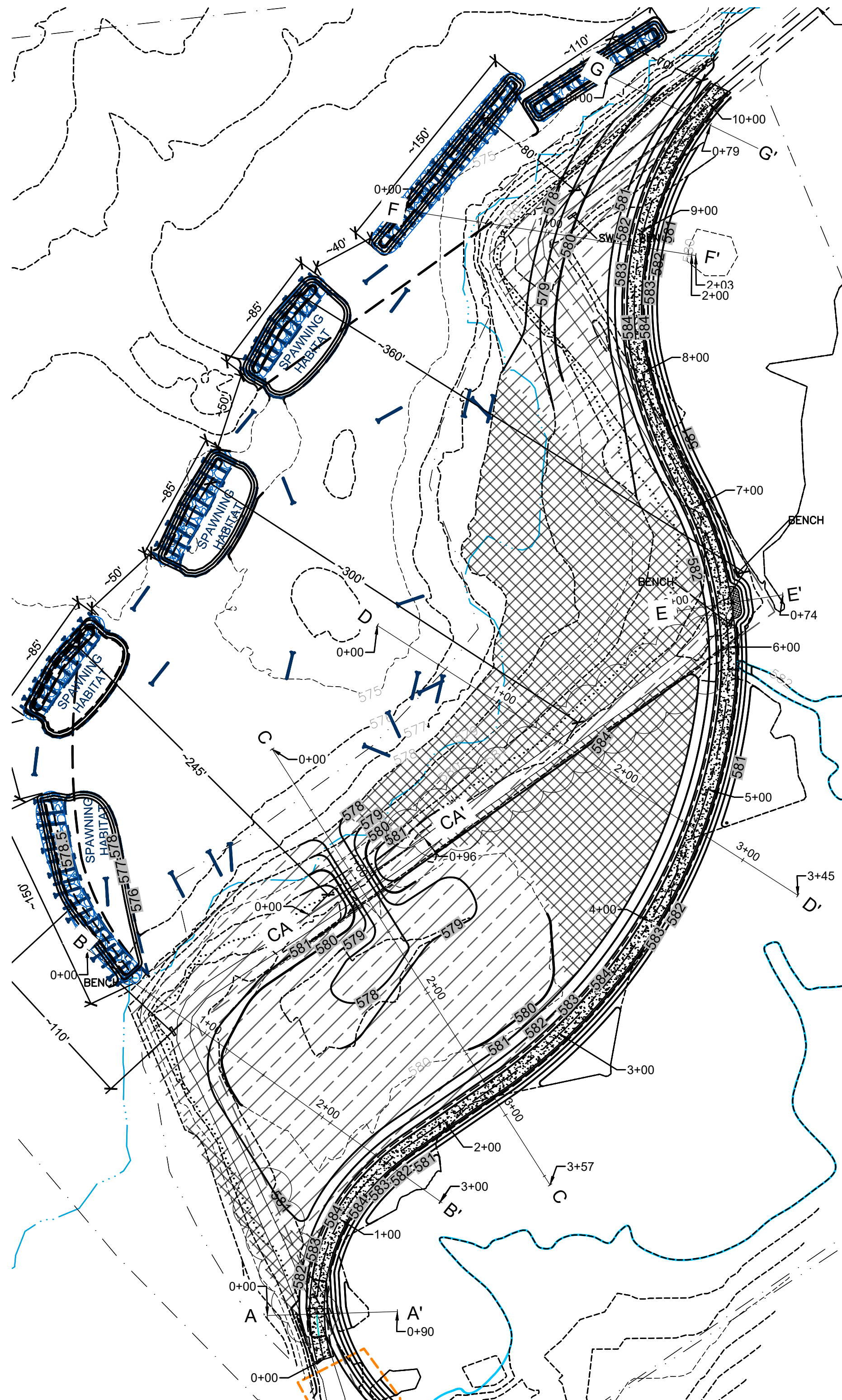
O'BRIEN & GERE ENGINEERS, INC
EAST LANSING, MICHIGAN

WSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION
AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

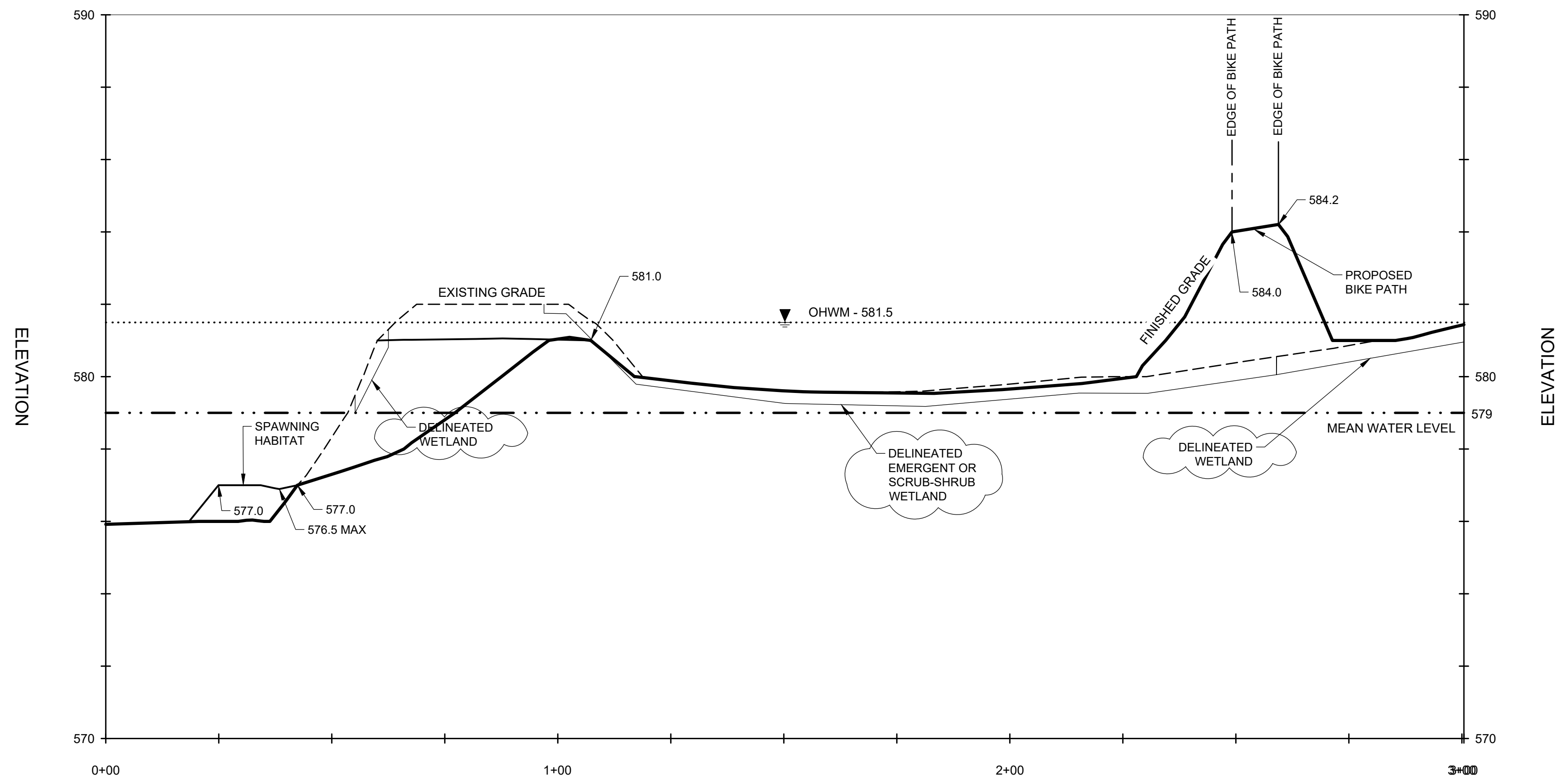
CIVIL
NORTHERN SHORELINE REPAIR

FILE NO.
33422.72430
DATE
AUGUST 11, 2020

C-108



SECTION A-A'
 SCALE: HORIZ. 1"=20'
 VERT. 1"=2.5'



SECTION B-B'
 SCALE: HORIZ. 1"=20'
 VERT. 1"=2.5'

- LEGEND**
- PROPERTY BOUNDARY
 - - - WORK AREA
 - PROPOSED TOPOGRAPHIC CONTOURS
 - EXISTING TOPOGRAPHIC CONTOURS
 - EDGE OF WATER LINE (MEAN WATER LEVEL)
 - EXISTING BIKE PATH
 - PROPOSED BIKE PATH
 - PROPOSED CONCRETE BENCH AREA
 - PROPOSED GRAVEL SHOULDER
 - CONCRETE WALL AND FENCE
 - RESTRICTIVE COVENANT ZONES
 - SPAWNING HABITAT (1 C-505)
 - BALLASTED HABITAT LOG (2 or 3 C-501)
 - WETLAND ENHANCEMENT AREA
 - WETLAND RESTORATION AREA
 - ORDINARY HIGH WATER MARK (581.5 IGLD85)

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IN CHARGE OF	M. BYKER	F	8/11/2020	ISSUE FOR CONSTRUCTION	MDB
DESIGNED BY	T. EALLONARDO	E	7/23/2020	FOR PERMIT	MDB
CHECKED BY	C. HARLEY	D	3/5/2020	ADDENDUM 1	MDB
DRAWN BY	S. ENGELHARDT	C	2/26/2020	RESPONSE TO COMMENTS	MDB
		B	2/14/2020	ISSUE FOR BID	MDB
		A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL	MDB
		NO.	DATE	REVISION	INT.

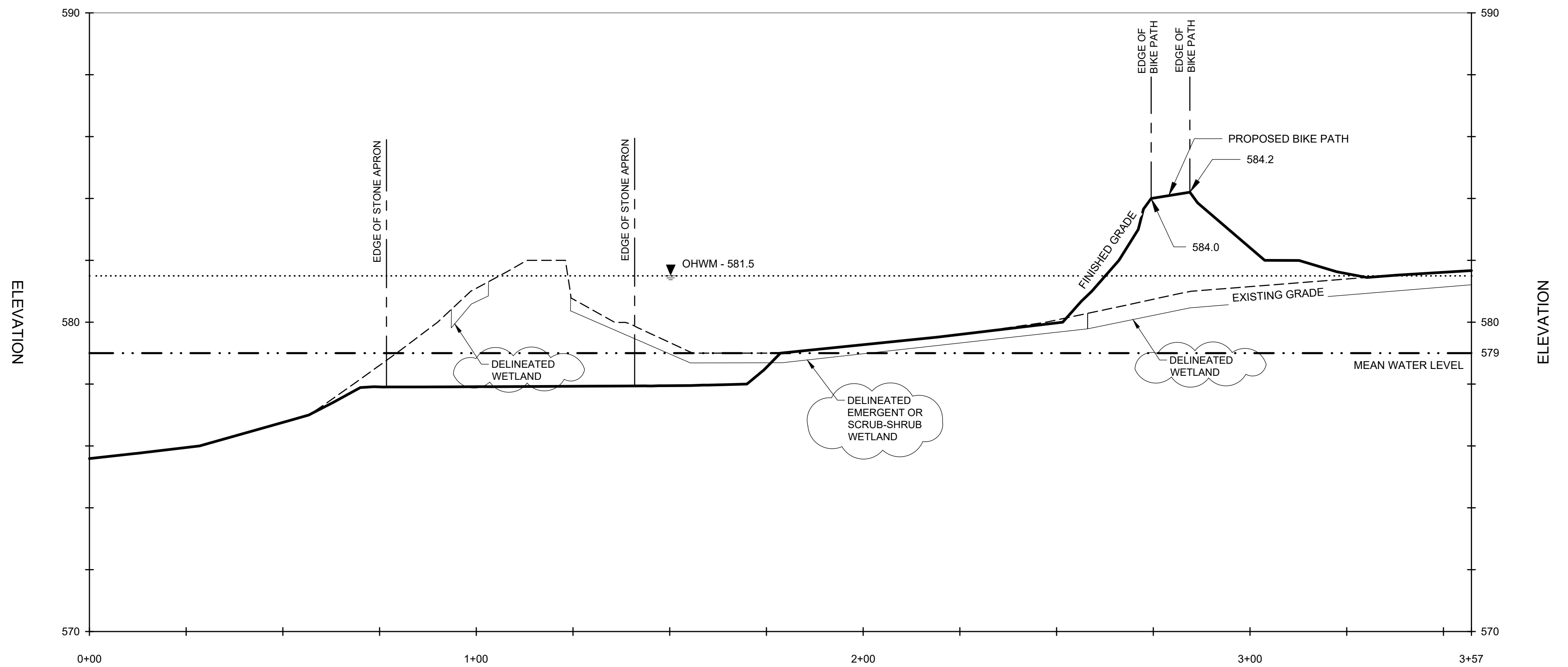
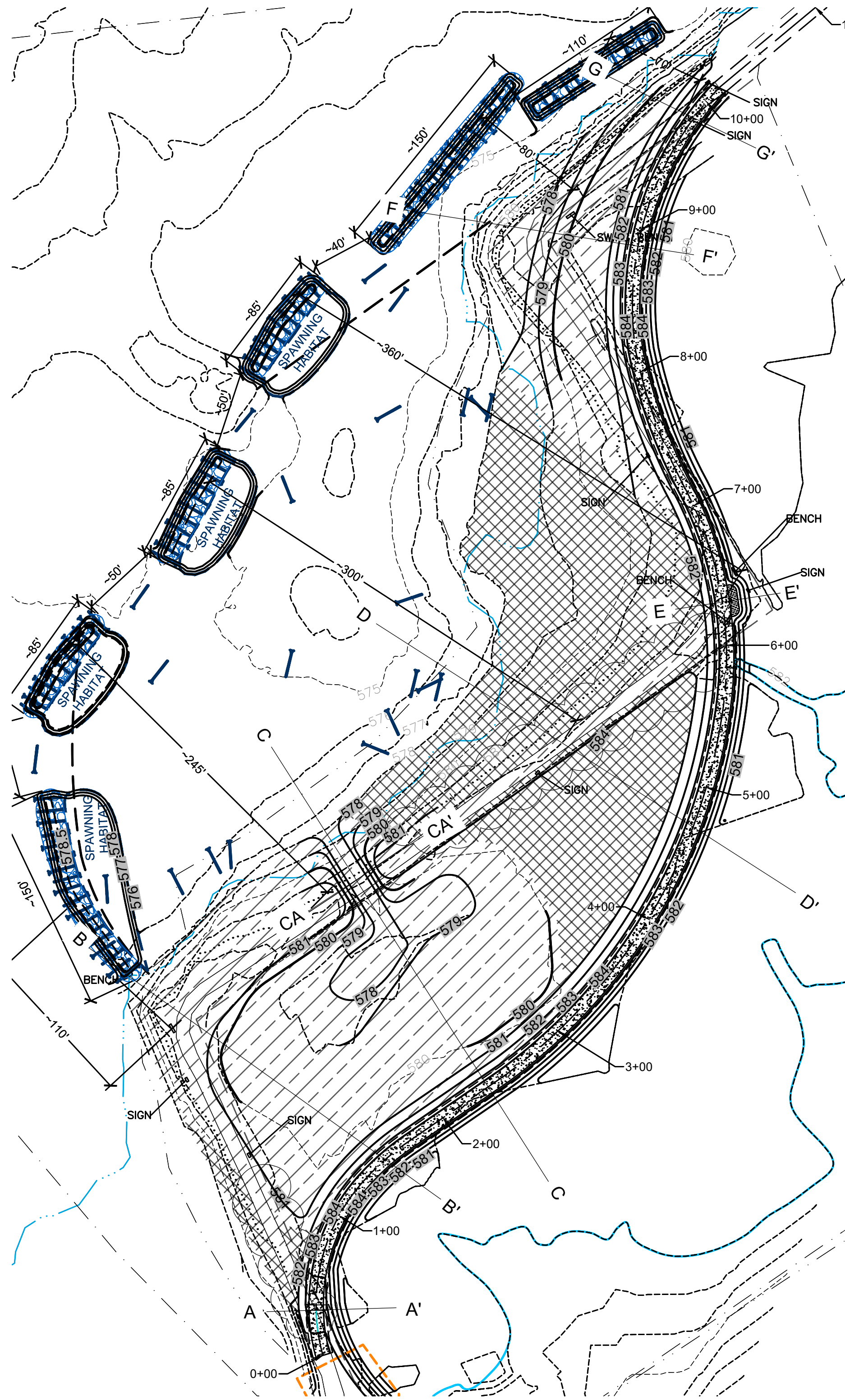


**AMOCO FISH & WILDLIFE
 HABITAT RESTORATION PROJECT**
 MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL
**CROSS SECTION AND
 PROFILES**

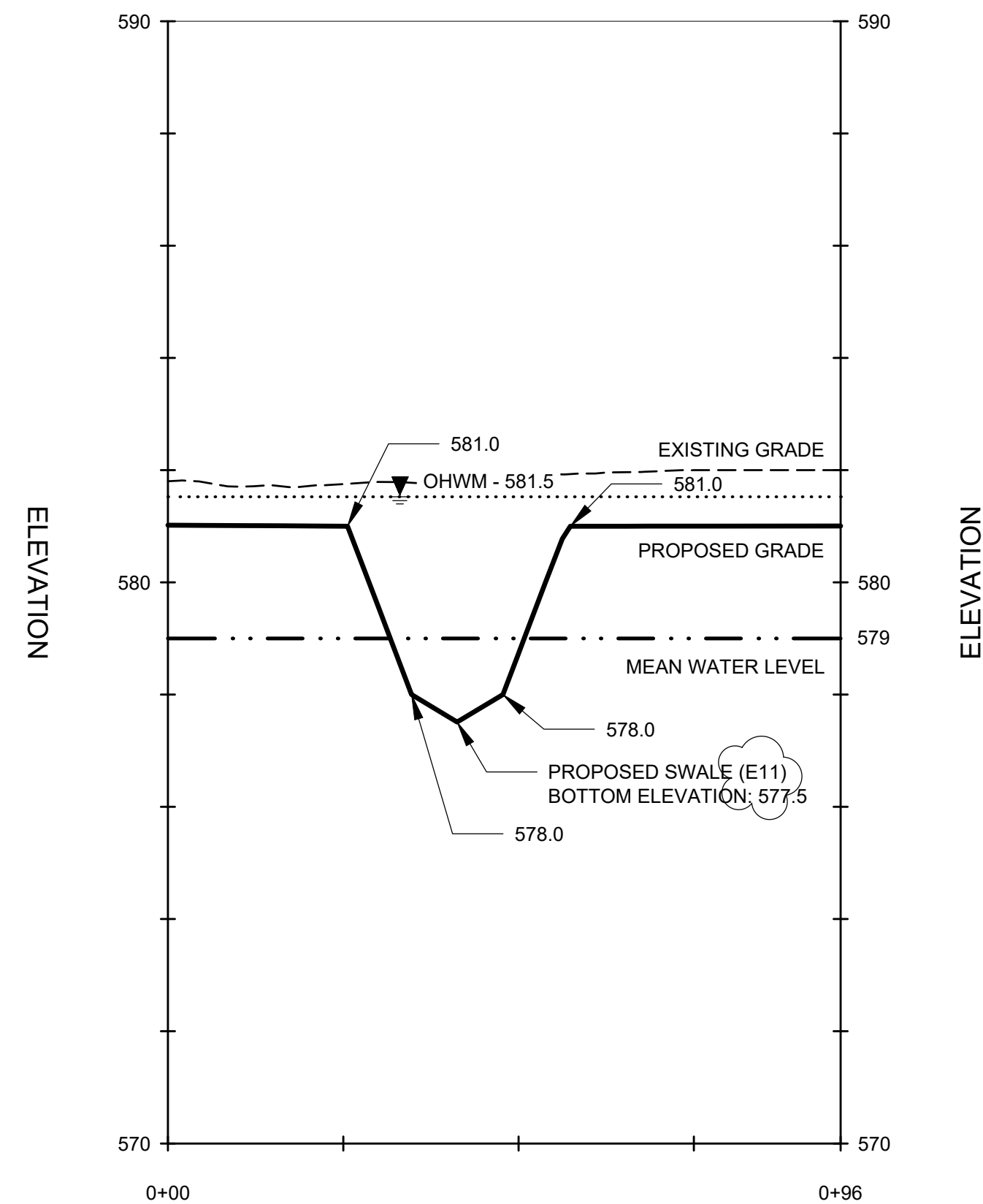
FILE NO.
 33422.72430
 DATE
 AUGUST 11, 2020

C-201



SECTION C-C'

SCALE: HORIZ. 1"=20'
VERT. 1"=2.5'



SECTION CA-CA'

SCALE: HORIZ. 1"=20'
VERT. 1"=2.5'

LEGEND

- PROPERTY BOUNDARY
- WORK AREA
- PROPOSED TOPOGRAPHIC CONTOURS
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EXISTING BIKE PATH
- PROPOSED BIKE PATH
- PROPOSED CONCRETE BENCH AREA
- PROPOSED GRAVEL SHOULDER
- CONCRETE WALL AND FENCE
- RESTRICTIVE COVENANT ZONES
- SPAWNING HABITAT 1 C-505
- BALLASTED HABITAT LOG 2 of 3 C-501
- WETLAND ENHANCEMENT AREA
- WETLAND RESTORATION AREA
- ORDINARY HIGH WATER MARK (581.5 IGLD85)

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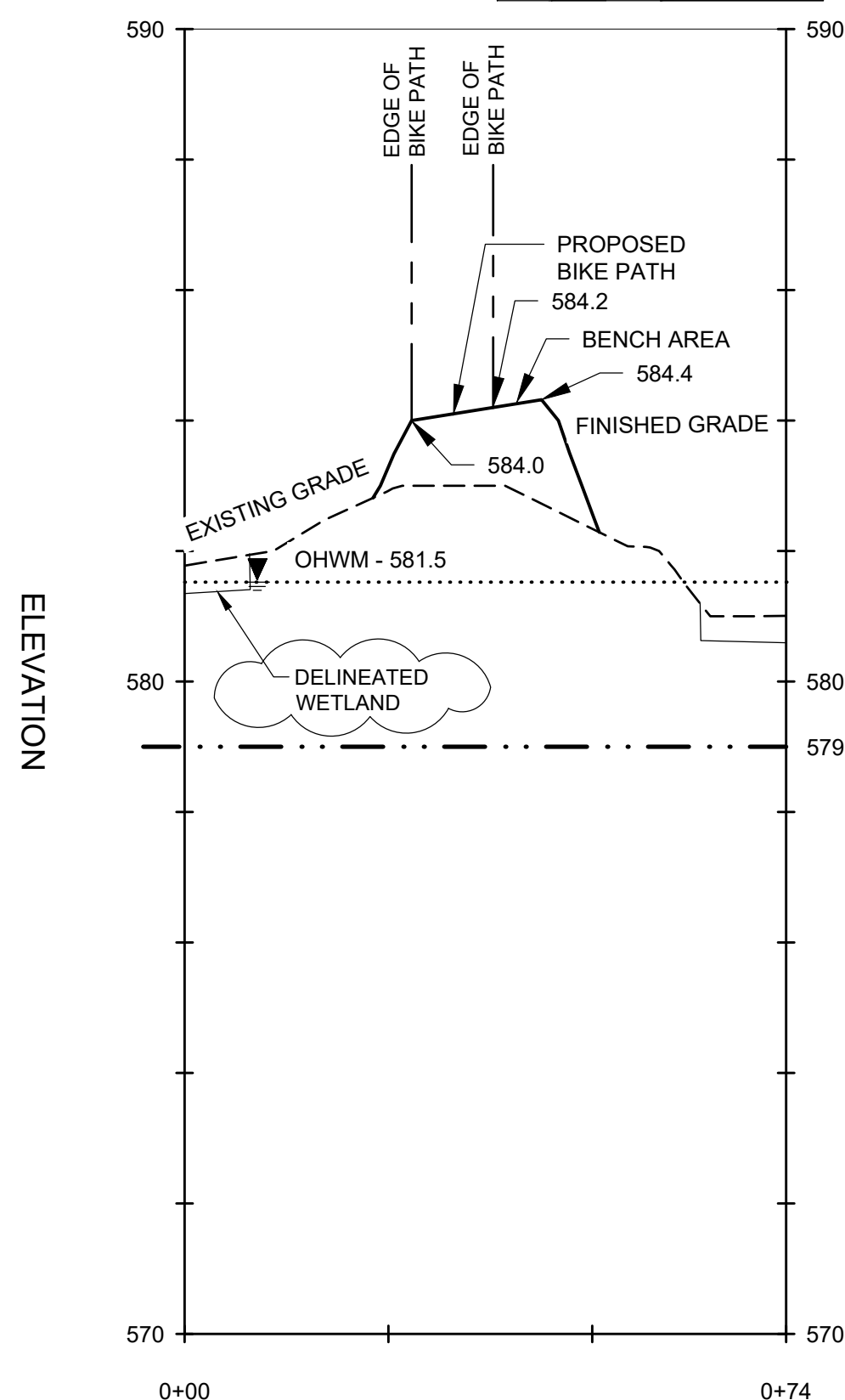
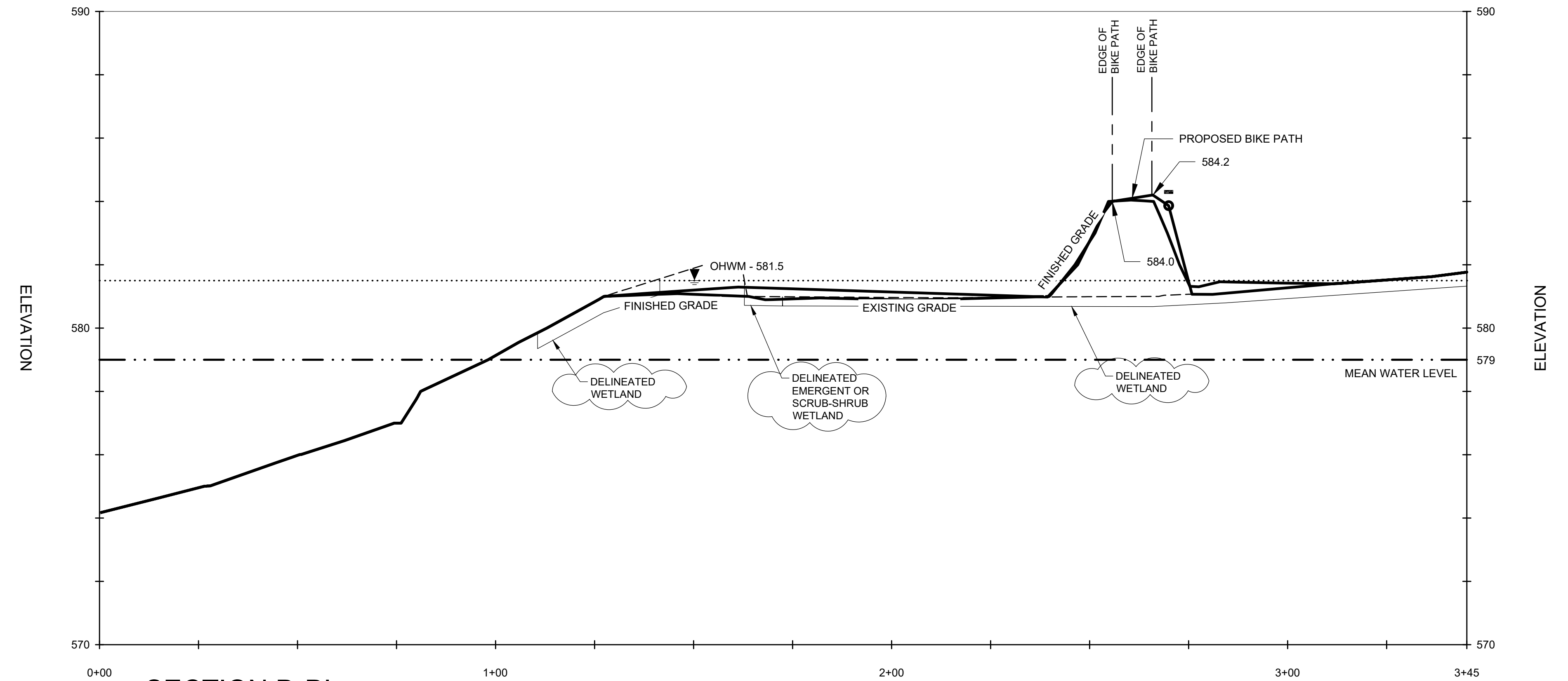
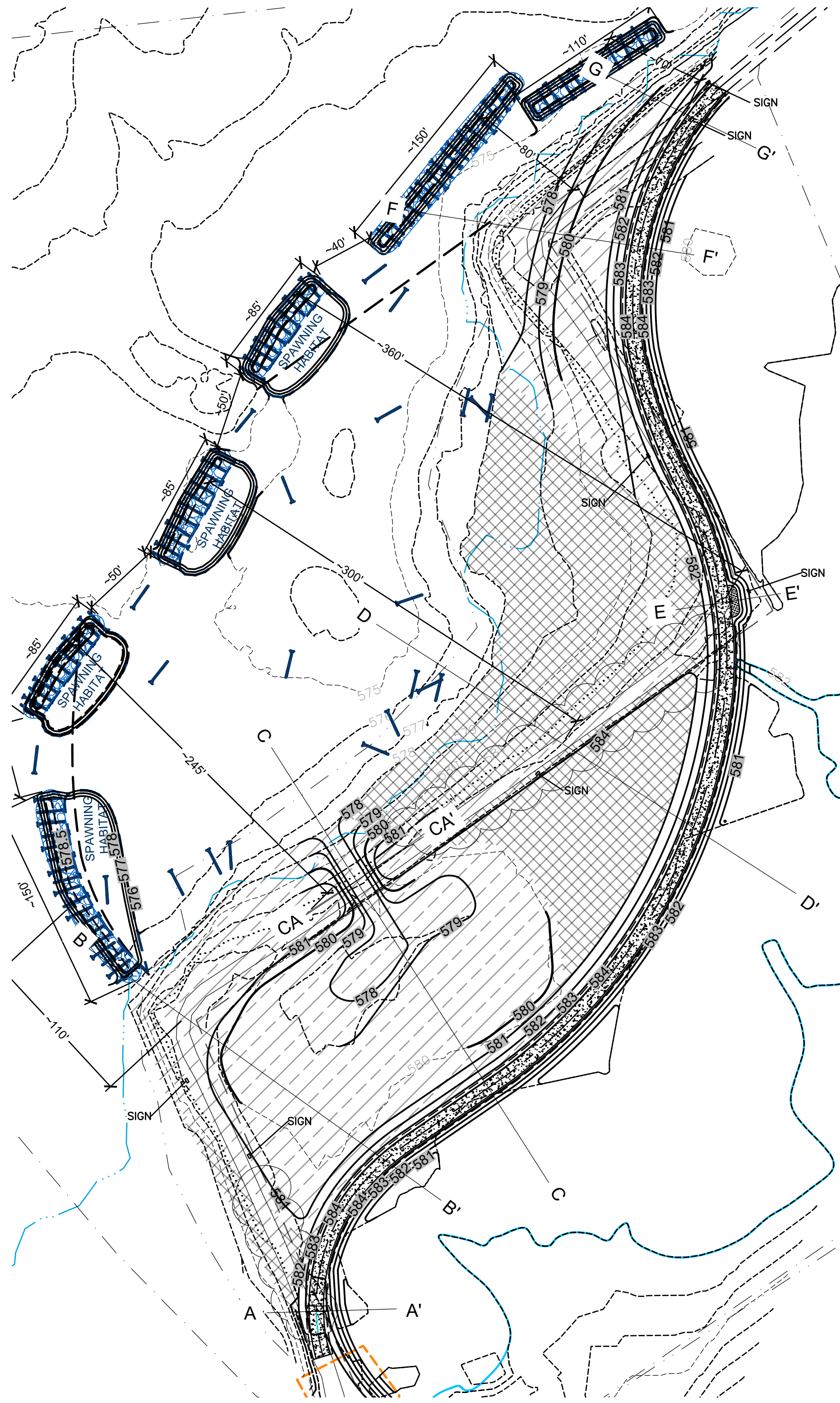


WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION
AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL
CROSS SECTION AND PROFILES

FILE NO.
33422.72430
DATE
AUGUST 11, 2020

C-202



LEGEND

- PROPERTY BOUNDARY
- - - WORK AREA
- PROPOSED TOPOGRAPHIC CONTOURS
- EXISTING TOPOGRAPHIC CONTOURS
- EDGE OF WATER LINE (MEAN WATER LEVEL)
- EXISTING BIKE PATH
- PROPOSED BIKE PATH
- PROPOSED CONCRETE BENCH AREA
- PROPOSED GRAVEL SHOULDER
- CONCRETE WALL AND FENCE
- RESTRICTIVE COVENANT ZONES
- SPAWNING HABITAT (1 C-505)
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- WETLAND RESTORATION AREA
- ORDINARY HIGH WATER MARK (581.5 IGLD85)

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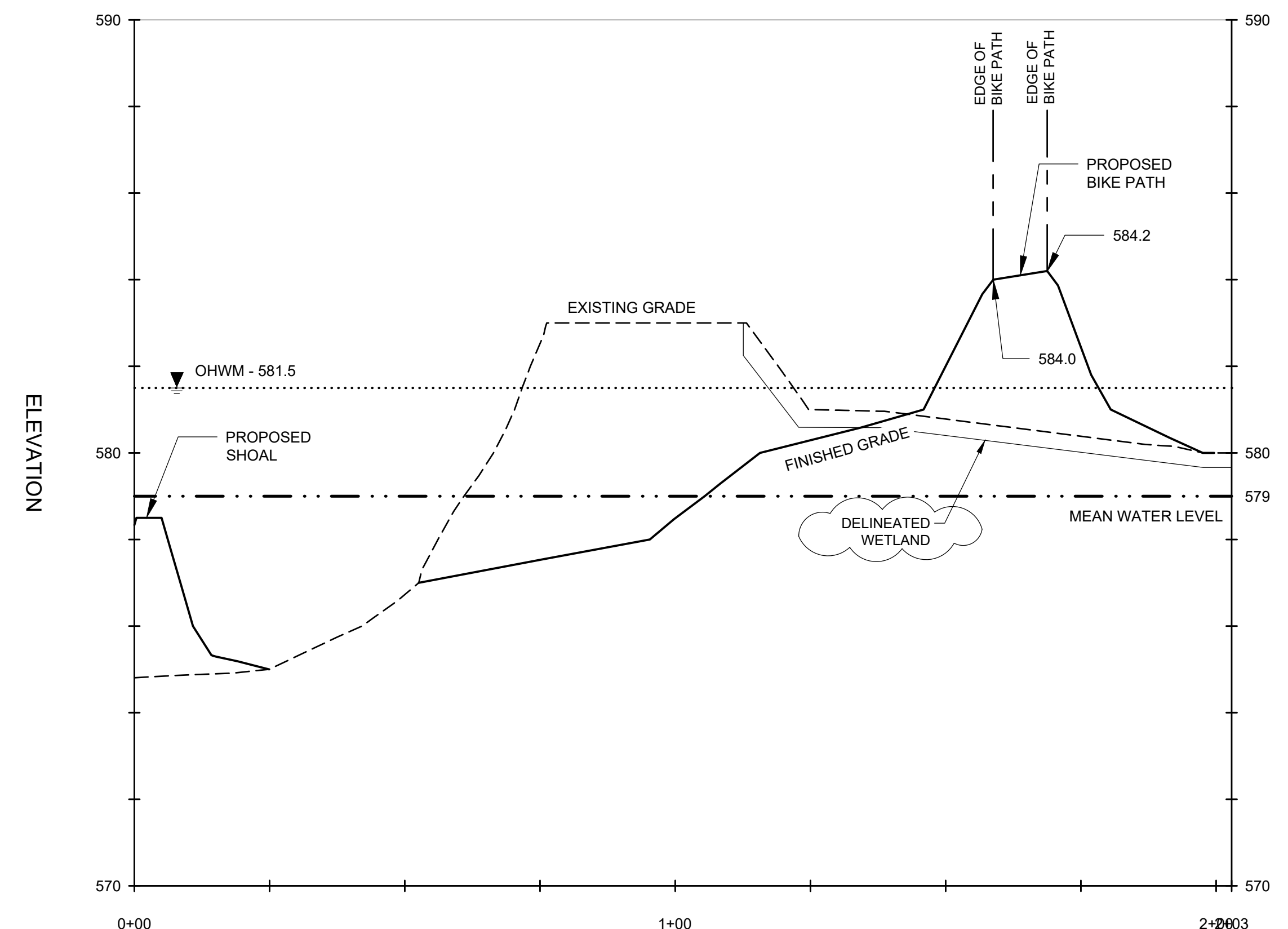
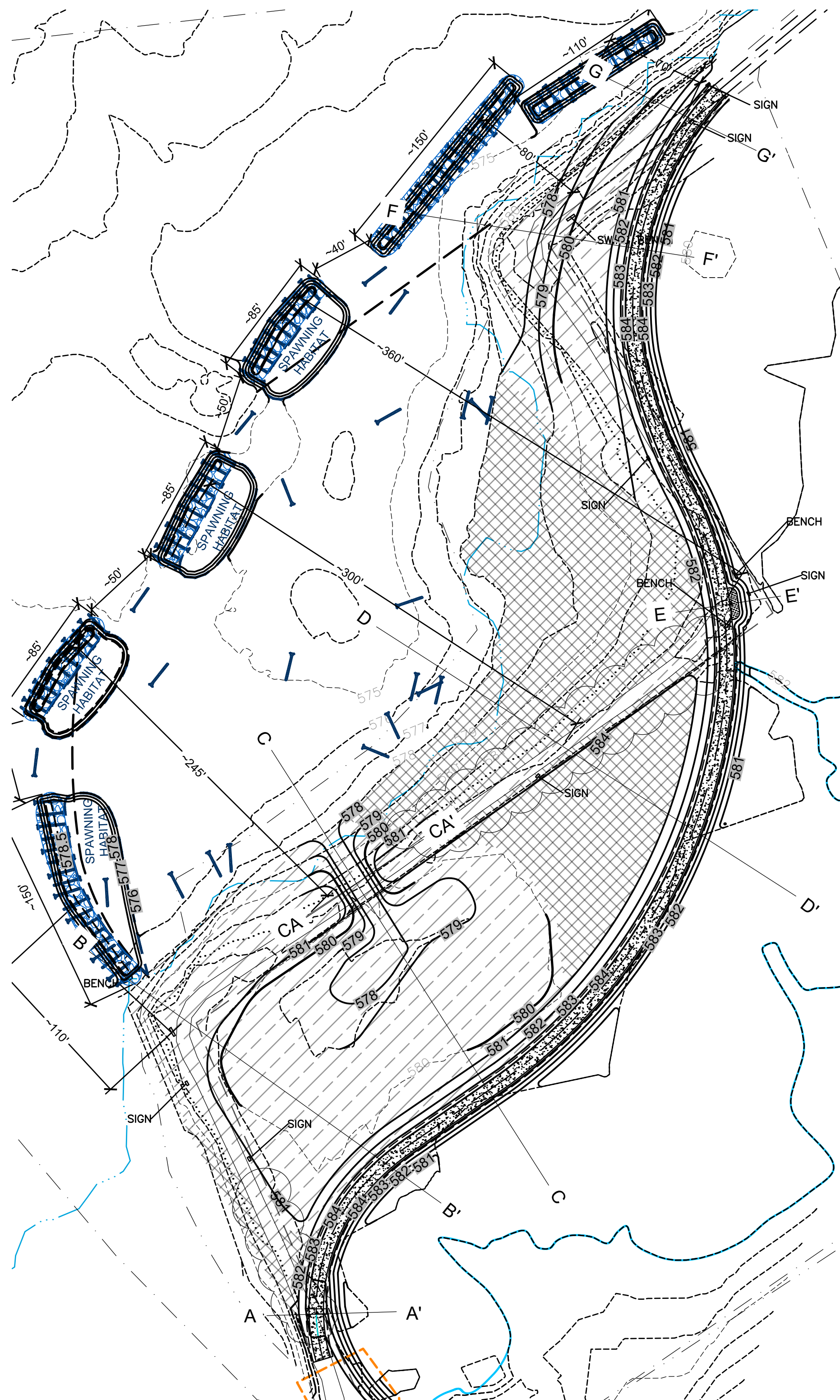


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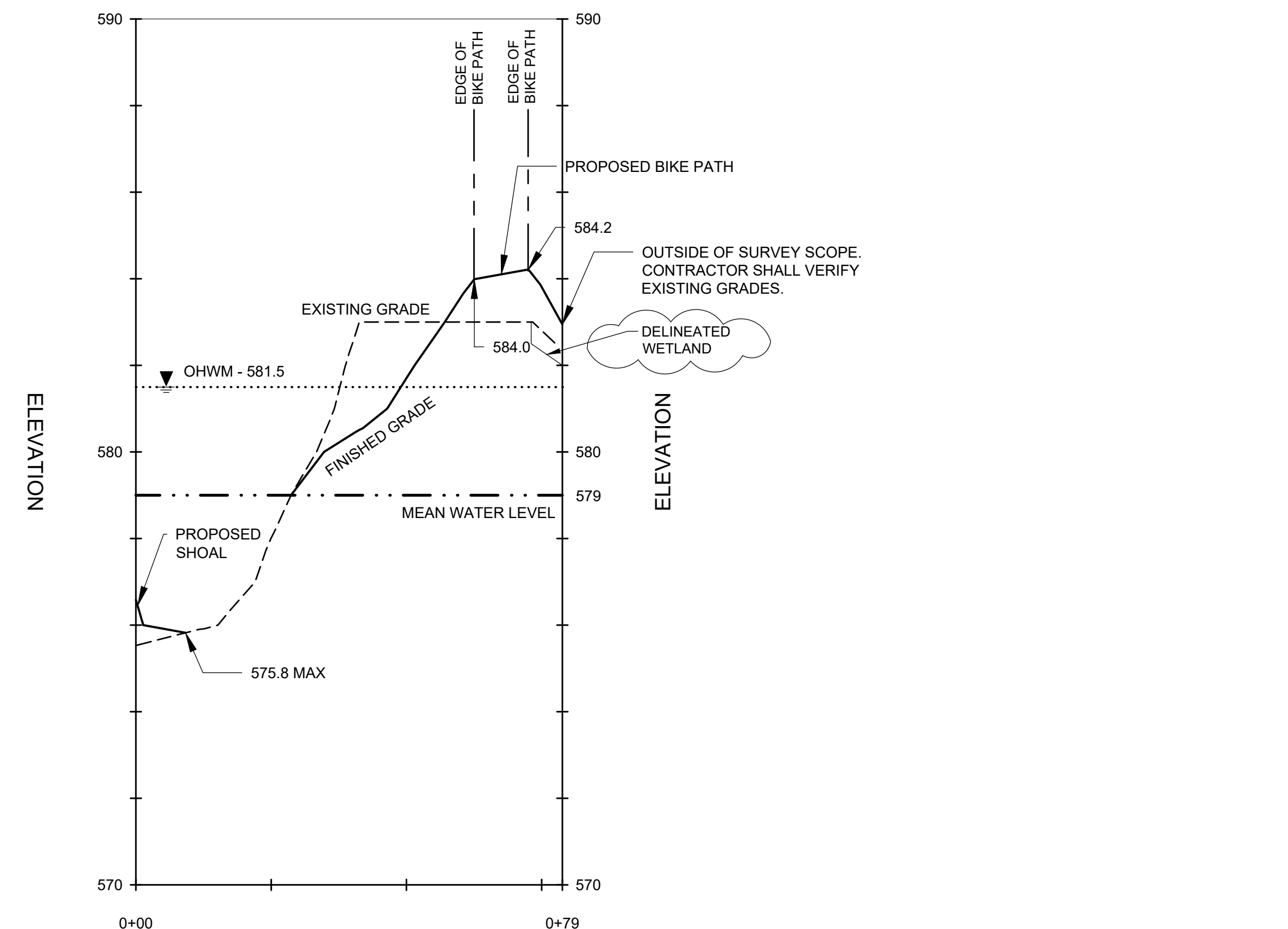


CIVIL
CROSS SECTION AND PROFILES

FILE NO.	33422.72430	C-203
DATE	AUGUST 11, 2020	



SECTION F-F'
 SCALE: HORIZ. 1"=20'
 VERT. 1"=2.5'



SECTION G-G'
 SCALE: HORIZ. 1"=20'
 VERT. 1"=2.5'

- LEGEND**
- PROPERTY BOUNDARY
 - - - WORK AREA
 - PROPOSED TOPOGRAPHIC CONTOURS
 - EXISTING TOPOGRAPHIC CONTOURS
 - EDGE OF WATER LINE (MEAN WATER LEVEL)
 - EXISTING BIKE PATH
 - PROPOSED BIKE PATH
 - PROPOSED CONCRETE BENCH AREA
 - PROPOSED GRAVEL SHOULDER
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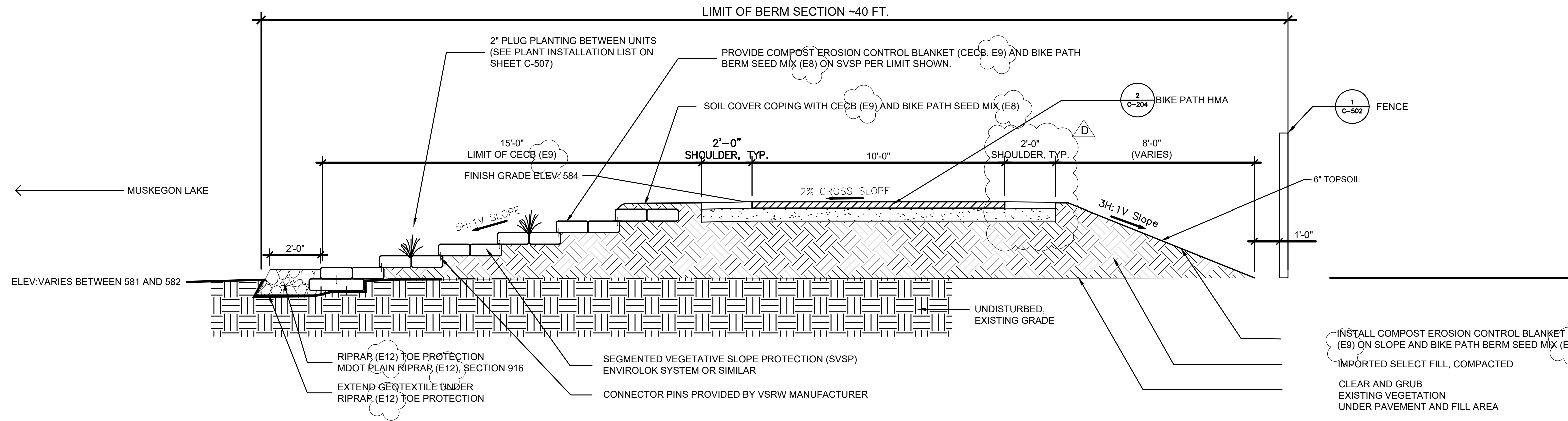


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		NO.	DATE	REVISION	INT.



CIVIL
CROSS SECTION AND PROFILES

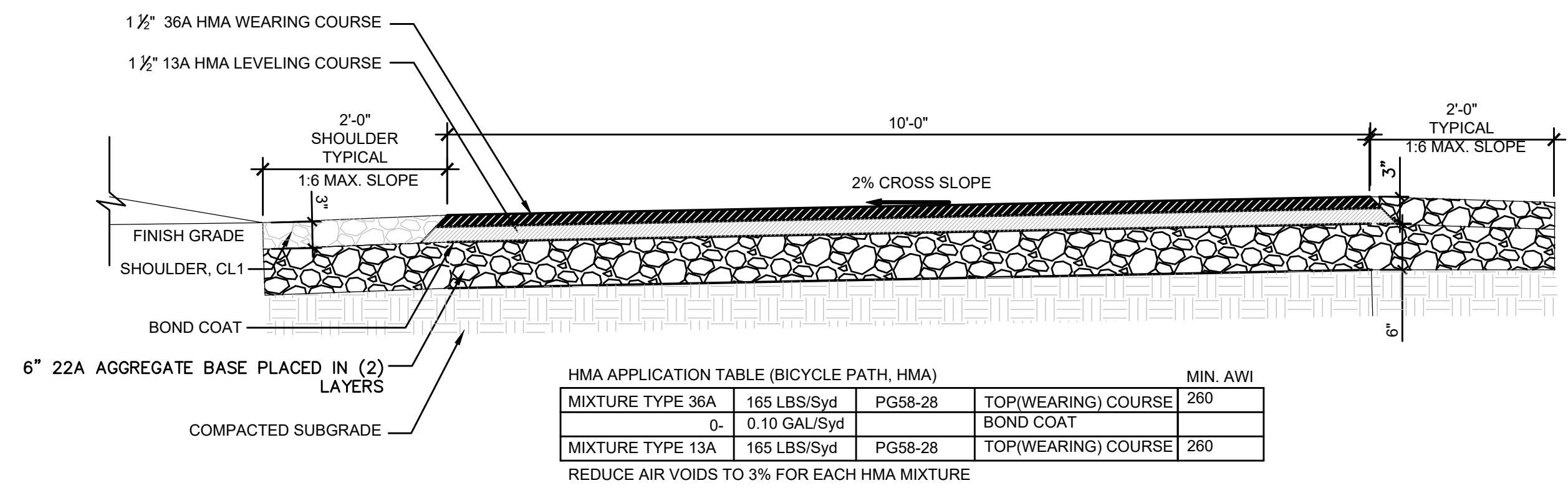
FILE NO.	33422.72430	C-204
DATE	AUGUST 11, 2020	



1
C-205
TYPICAL BIKE PATH CROSS SECTION - STA. 0+00 TO STA. 9+00
NOT TO SCALE

- INSTALL COMPOST EROSION CONTROL BLANKET (E9) ON SLOPE AND BIKE PATH BERM SEED MIX (E8)
- IMPORTED SELECT FILL, COMPACTED
- CLEAR AND GRUB EXISTING VEGETATION UNDER PAVEMENT AND FILL AREA

- NOTES:**
1. COMPOST EROSION CONTROL BLANKET (E9) TO MEET AASHTO DESIGNATION R 52-10, COMPOST FOR EROSION/SEDIMENT CONTROL (COMPOST BLANKETS).
 2. COMPOST EROSION CONTROL BLANKET (E9) SHALL BE A MINIMUM OF 1" THICK.



HMA APPLICATION TABLE (BICYCLE PATH, HMA)

MIXTURE TYPE	165 LBS/Syd	PG58-28	TOP/(WEARING) COURSE	MIN. AWI
MIXTURE TYPE 36A	165 LBS/Syd	PG58-28	TOP/(WEARING) COURSE	260
	0- 0.10 GAL/Syd		BOND COAT	
MIXTURE TYPE 13A	165 LBS/Syd	PG58-28	TOP/(WEARING) COURSE	260

REDUCE AIR VOIDS TO 3% FOR EACH HMA MIXTURE

2
C-205
BIKE PATH HMA
NOT TO SCALE

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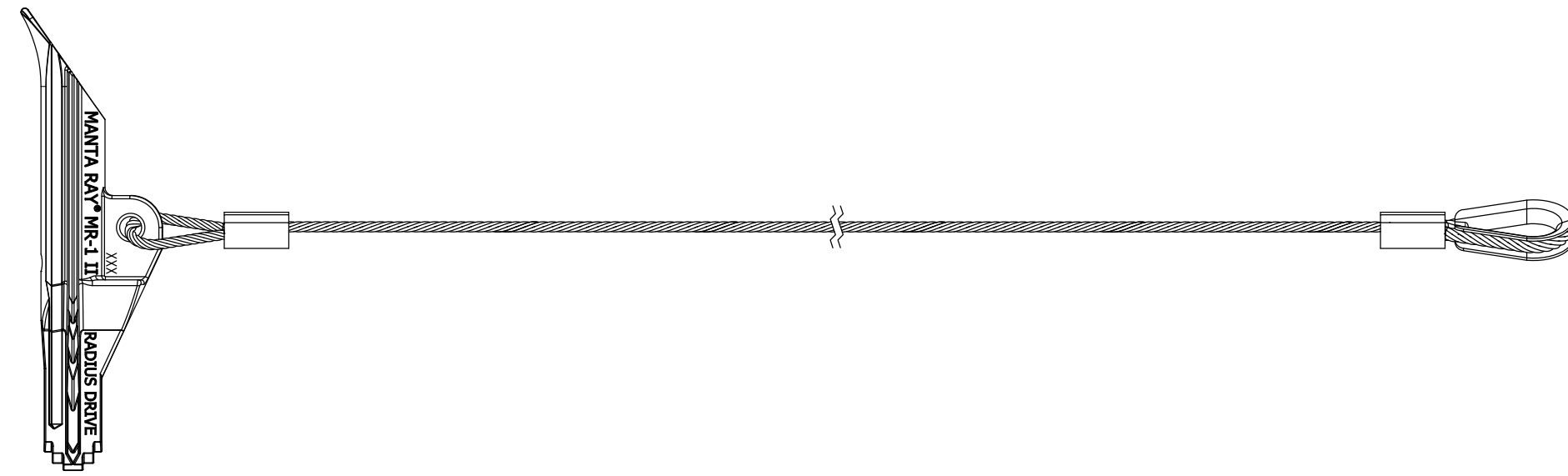
IN CHARGE OF	M. BYKER			
DESIGNED BY	T. EALLONARDO	E	8/11/2020	ISSUE FOR CONSTRUCTION
		D	7/23/2020	FOR PERMIT
		C	2/26/2020	RESPONSE TO COMMENTS
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		A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL
DRAWN BY	S. ENGELHARDT	NO.	DATE	REVISION
				INT.



CIVIL

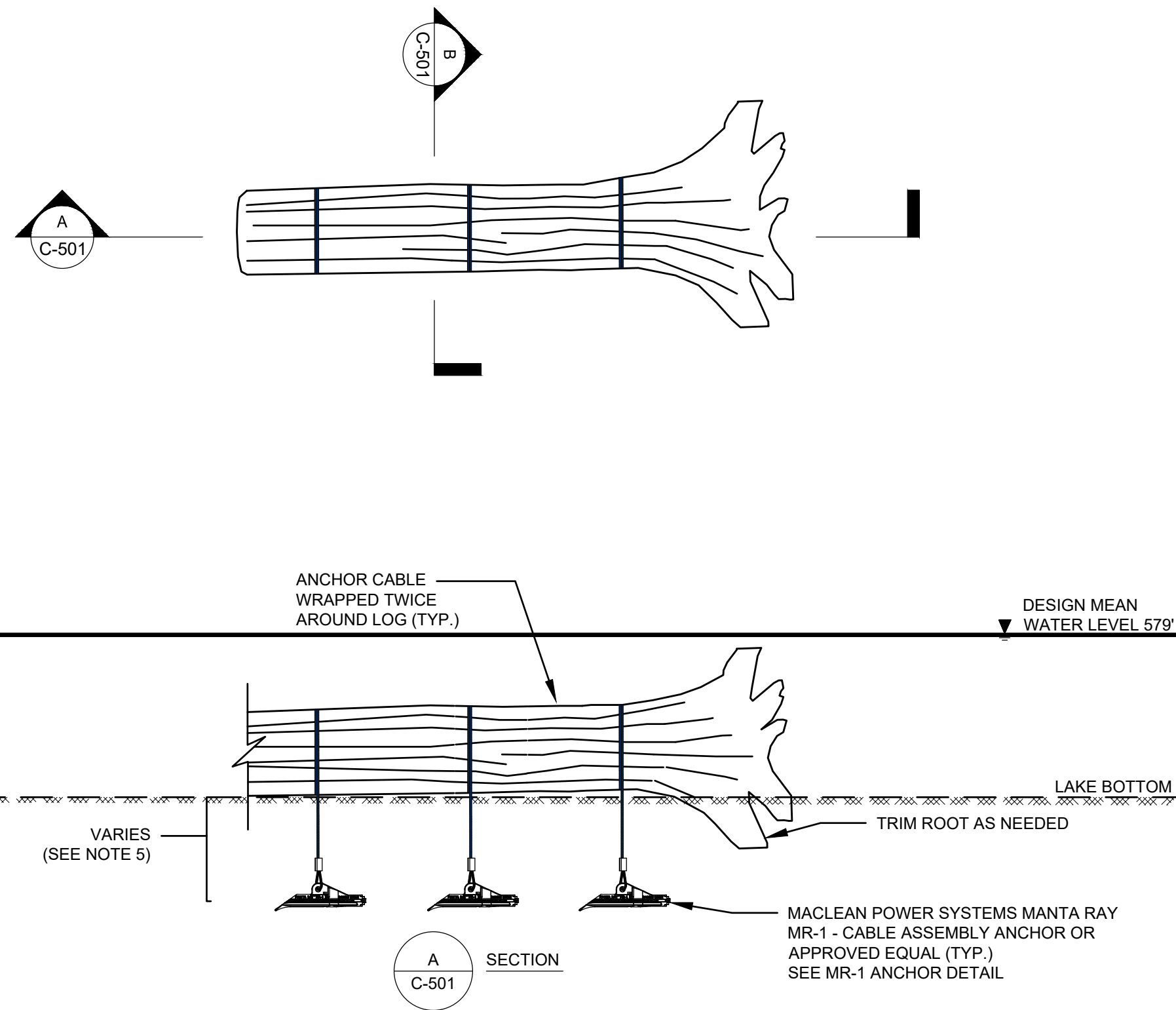
BIKE PATH CROSS SECTIONS

FILE NO.	33422.72430	C-205
DATE	AUGUST 11, 2020	



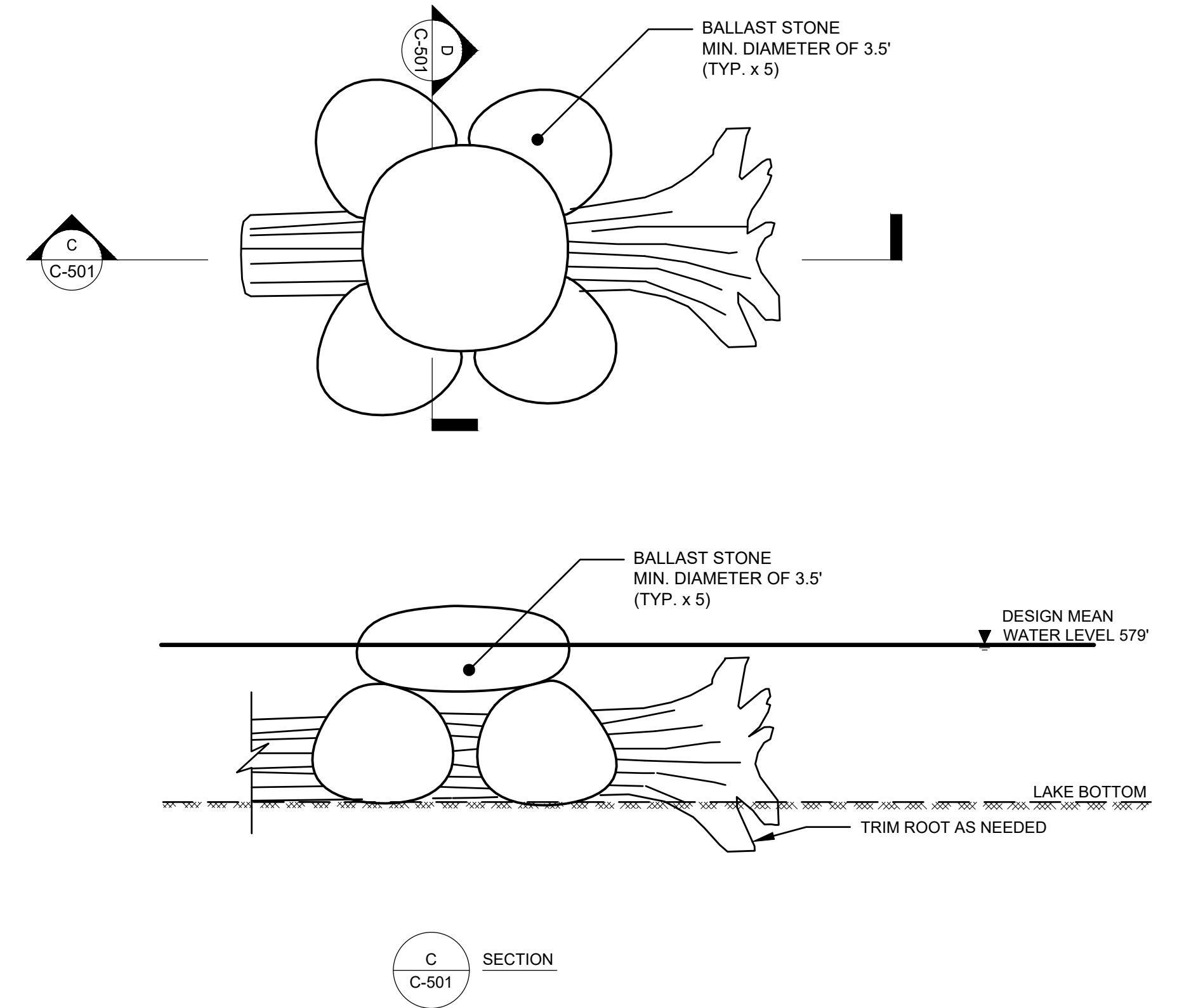
MR-1 ANCHOR DETAIL
C-501 NOT TO SCALE

- NOTES:**
1. MATERIAL: HEAD AND SHACKLE; DUCTILE IRON, 40 KSI YIELD (GALV PER ASTM A4153)
 2. MATERIAL: CABLE, 304 STAINLESS STEEL
 3. DIMENSIONS: INCHES
 4. SOIL BEARING SURFACE AREA: 71.9 IN²
 5. MIN INSTALL DEPTH 60 IN
 6. 5/16" CABLE ULTIMATE BREAKING STRENGTH: 9,000 LBS



2 BALLASTED HABITAT LOG ANCHOR DETAIL-OPTION A
C-501 NOT TO SCALE

- NOTES:**
1. HABITAT LOG SHALL CONSIST OF HARDWOOD SPECIES APPROVED BY THE ENGINEER.
 2. HABITAT LOG SHALL BE INTACT TO THE EXTENT POSSIBLE.
 3. THE LOG SHALL HAVE A MAXIMUM DIAMETER OF 1.5 FEET AND MAXIMUM LENGTH OF 20 FEET. LOGS SHALL HAVE A MINIMUM DIAMETER OF 1 FOOT AND A MINIMUM LENGTH OF 18 FEET.
 4. THE MACLEAN POWER SYSTEMS MANTA RAY MR-1 CABLE ASSEMBLY SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
 5. EACH ANCHOR SHALL BE INSTALLED TO THE DEPTH REQUIRED TO ALLOW THE ANCHOR TO BE SET TO A MINIMUM WORKING CAPACITY OF 4,000LBS.



3 BALLASTED HABITAT LOG DETAIL-OPTION B
C-501 NOT TO SCALE

- NOTES:**
1. HABITAT LOG SHALL CONSIST OF HARDWOOD SPECIES APPROVED BY THE ENGINEER.
 2. HABITAT LOG SHALL BE INTACT TO THE EXTENT POSSIBLE.
 3. THE LOG SHALL HAVE A MAXIMUM DIAMETER OF 1.5 FEET AND MAXIMUM LENGTH OF 20 FEET. LOGS SHALL HAVE A MINIMUM DIAMETER OF 1 FOOT AND A MINIMUM LENGTH OF 18 FEET.
 4. PLACE A MINIMUM OF 5 BALLAST STONES WITH A MINIMUM DIAMETER OF 3.5'. THE STONES SHALL BE PLACED TO MAKE FULL CONTACT WITH THE LOG.

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DRAWN BY	S. ENGELHARDT	B	2/14/2020	ISSUE FOR BID
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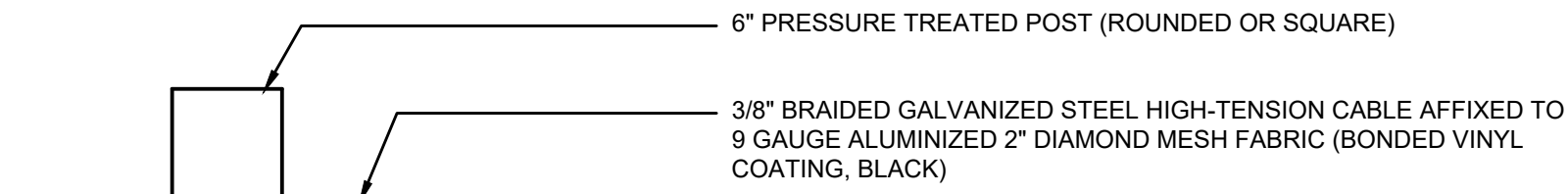
WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION
AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL
HABITAT LOG DETAILS

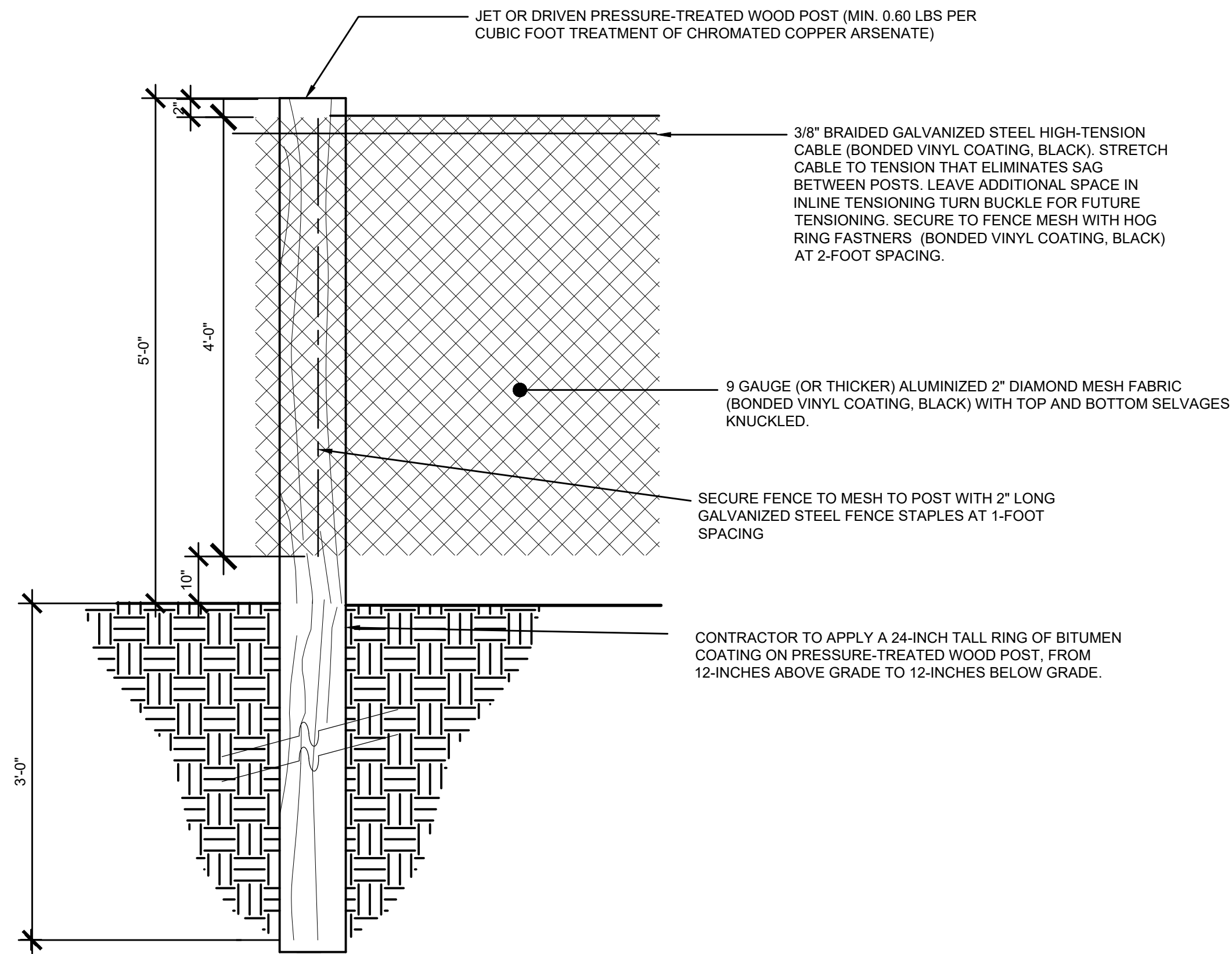
FILE NO.
33422.72430
DATE
AUGUST 11, 2020

C-501

NOTE:
CONTRACTOR TO SUPPLY SHOP DRAWINGS FOR ALL FENCE COMPONENTS. ALL FENCE HARDWARE TO BE BONDED VINYL COATING, BLACK.



PLAN



1
C-502
CHAIN LINK FENCE POST CONNECTION
NOT TO SCALE

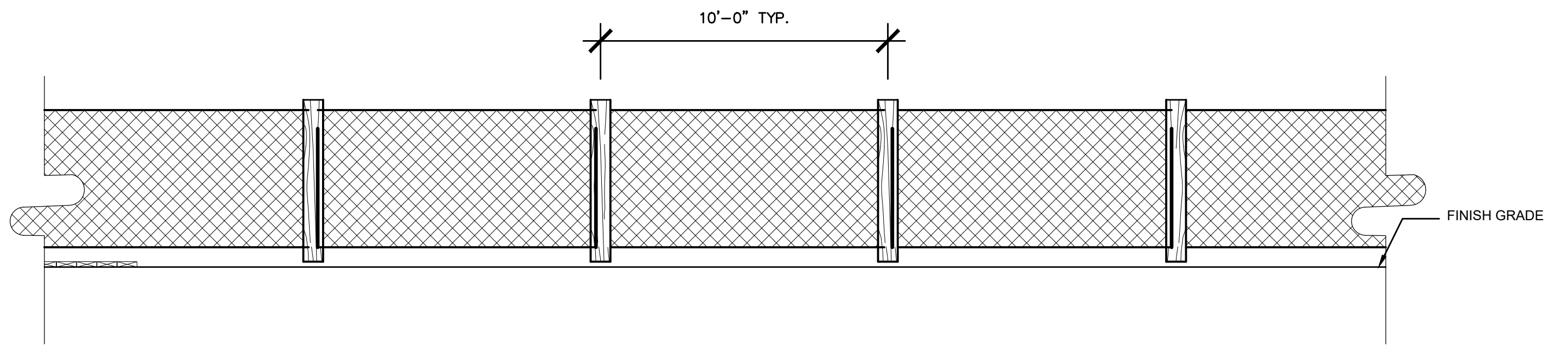
NOTE:

- FENCING DETAILS ADAPTED FROM DETAILS PROVIDED BY THE CITY OF MUSKEGON.
- PROVIDE SHOP DRAWING SUBMITTAL INDICATING PRODUCTS AND FABRICATION.

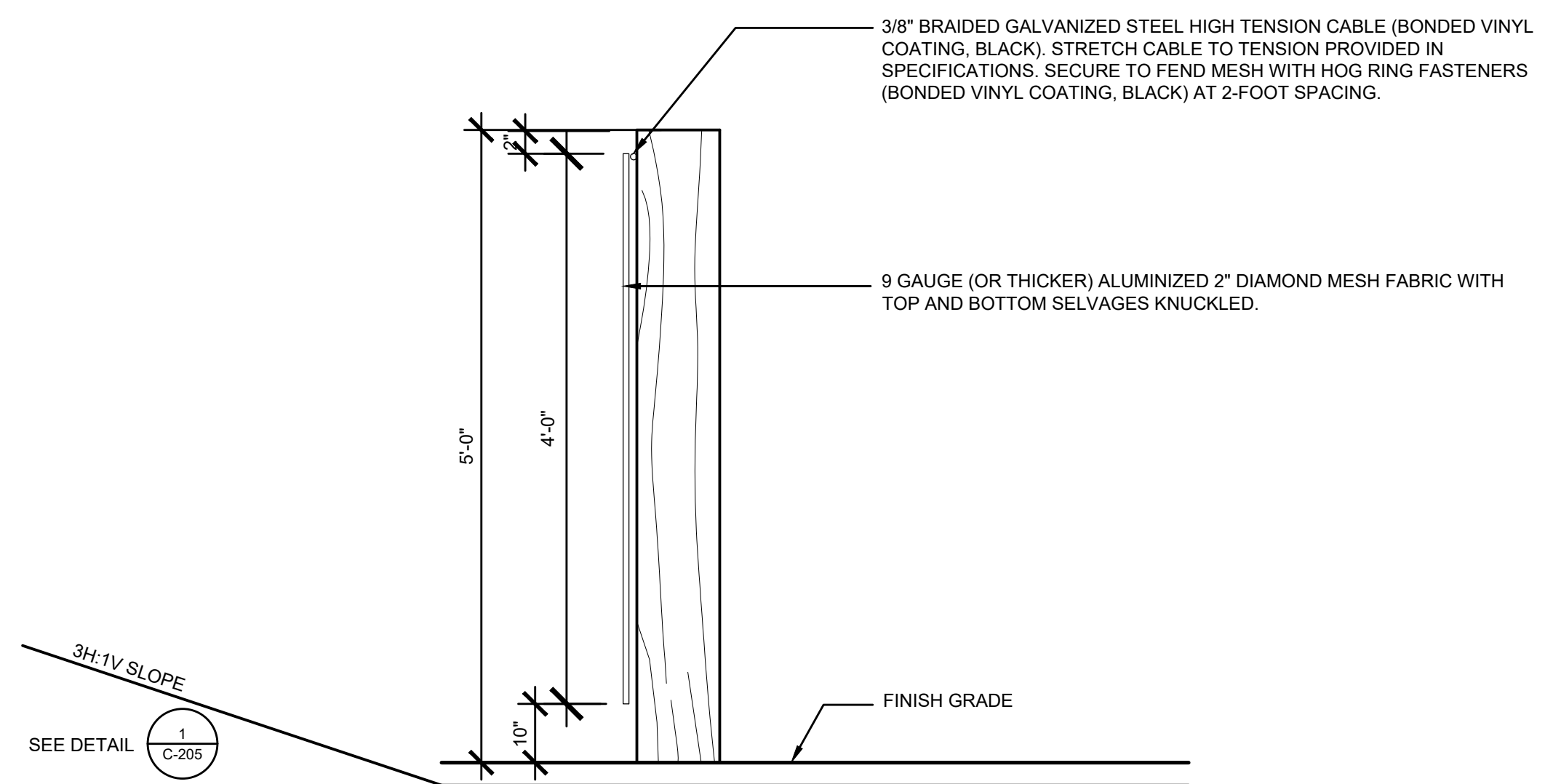
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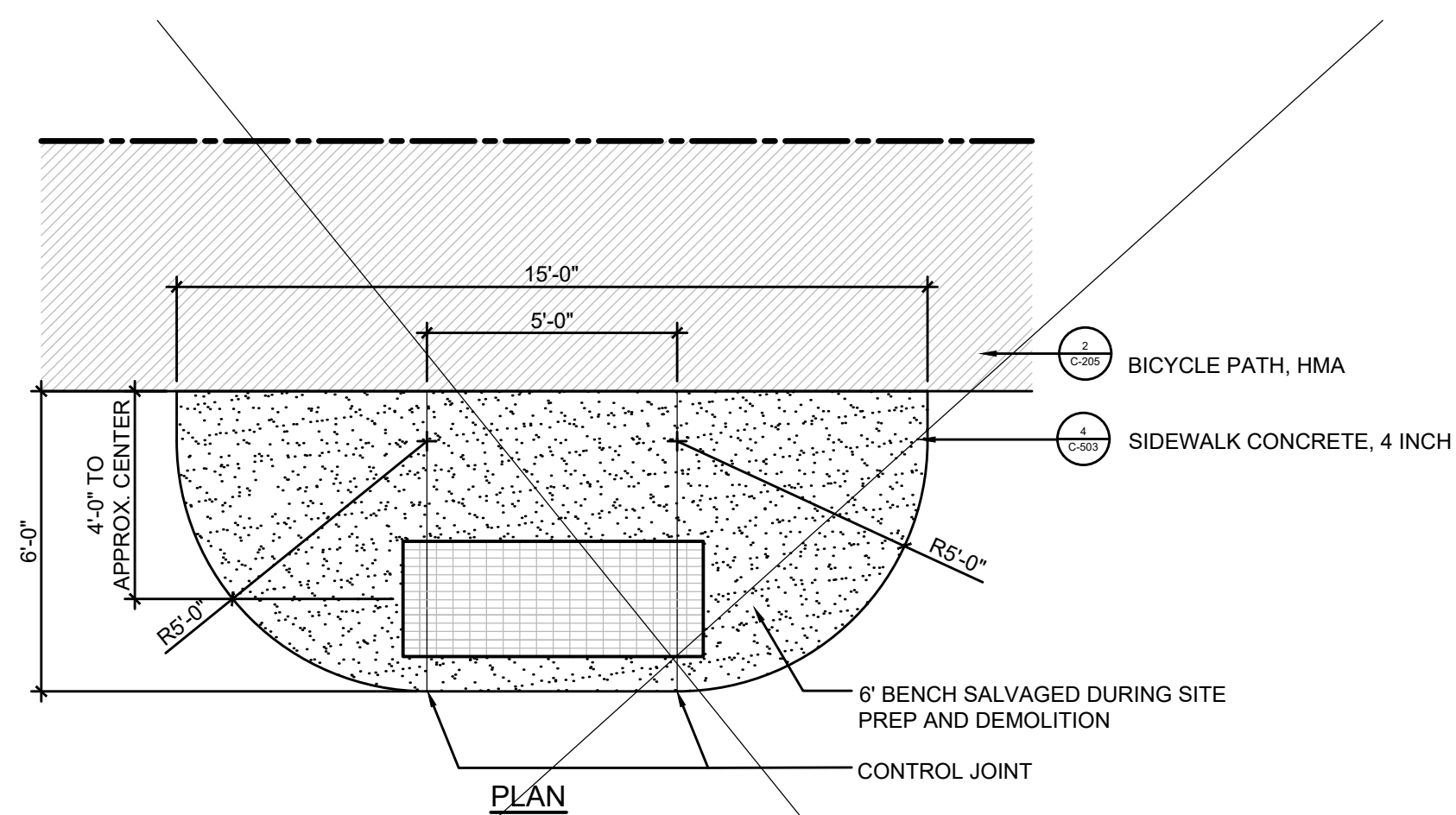


2
C-502
FENCE POST SPACING DETAIL
NOT TO SCALE



3
C-502
FENCE SECTION
NOT TO SCALE

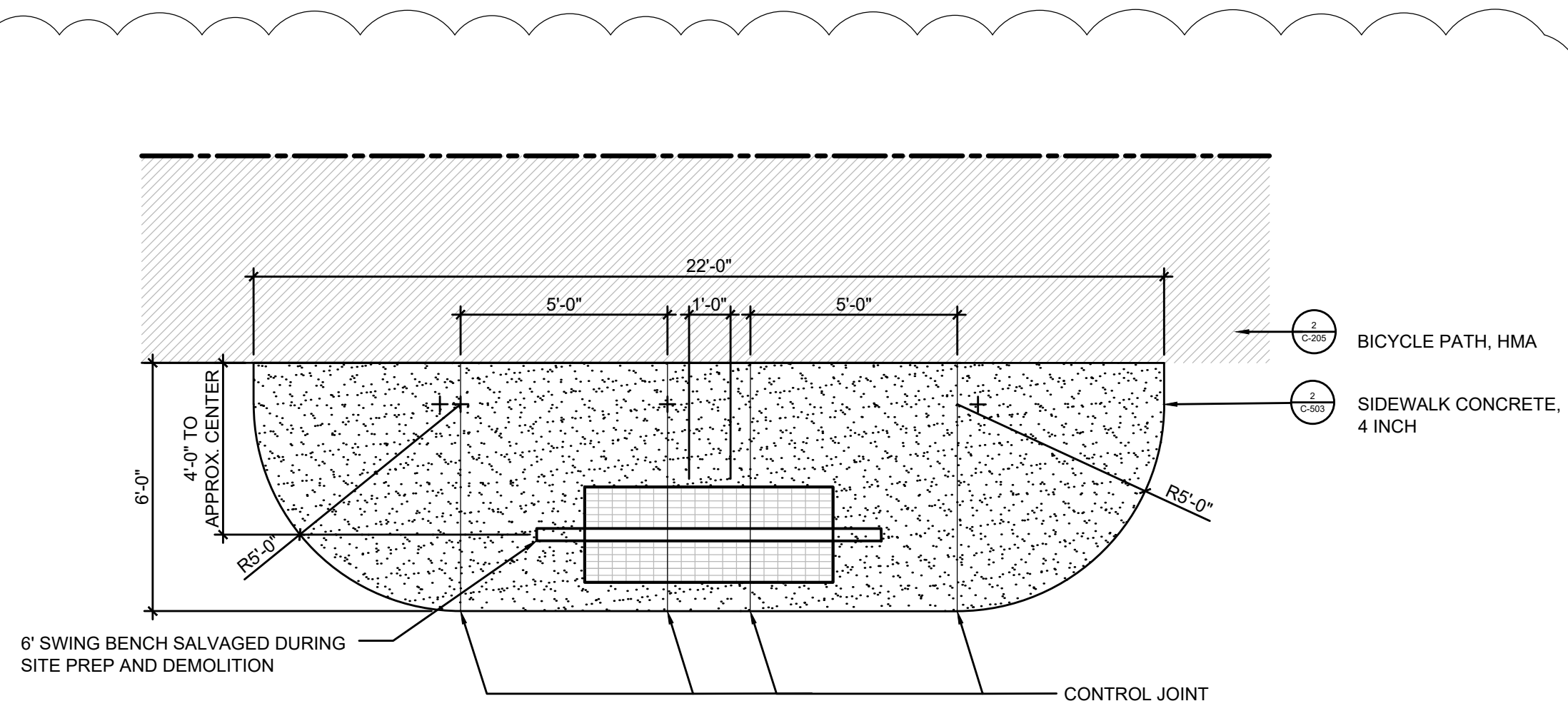
CIVIL	FILE NO. 33422.72430	C-502
FENCING DETAILS	DATE AUGUST 11, 2020	



NOTE:

SECURE SALVAGED BENCH TO CONCRETE USING 3" GALVANIZED EXPANSION BOLTS.

1
C-503
SINGLE BENCH LAYOUT
NOT TO SCALE



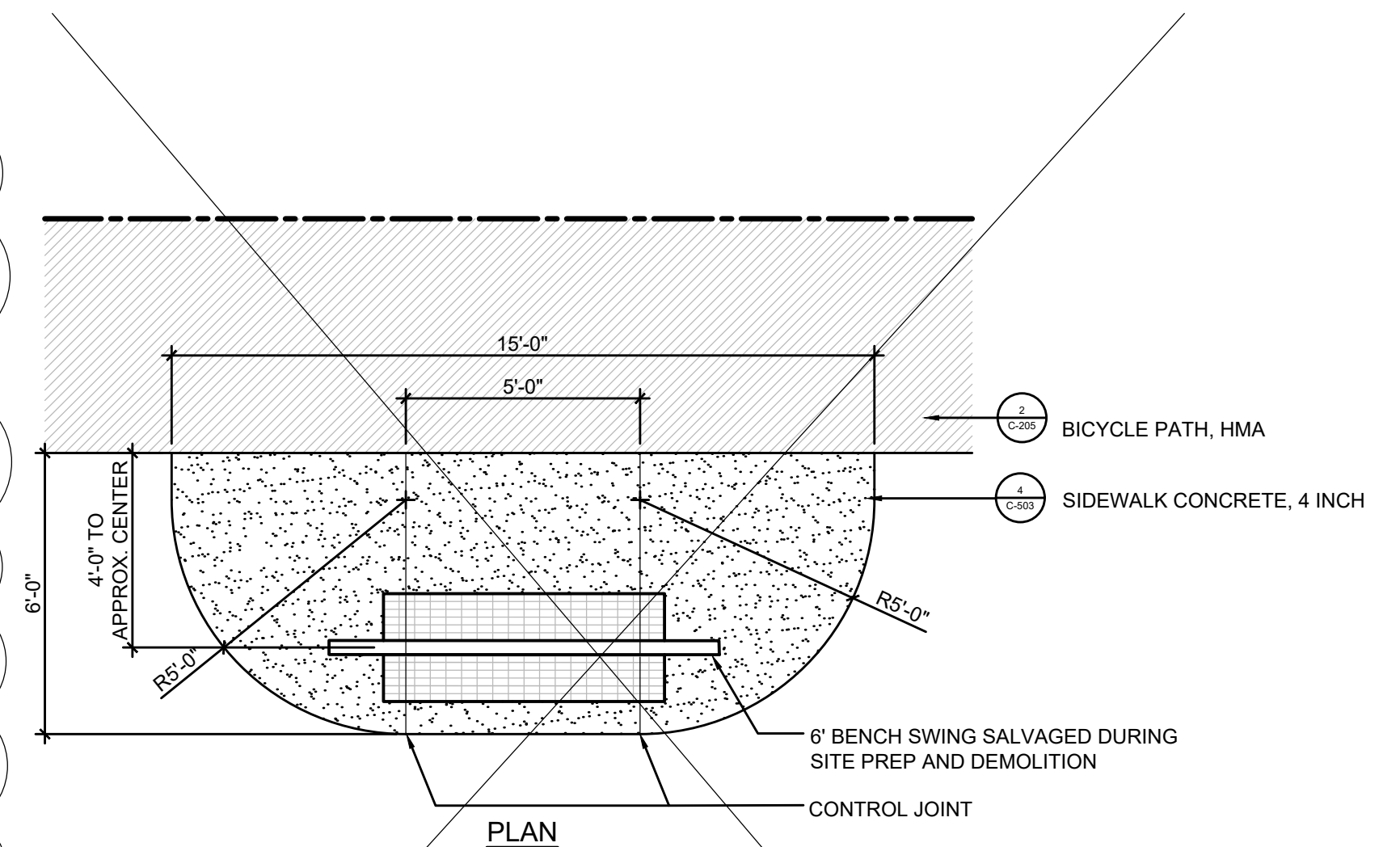
NOTE:

SECURE SALVAGED BENCH TO CONCRETE USING 3" GALVANIZED EXPANSION BOLTS.

1
C-503
SWING BENCH LAYOUT
NOT TO SCALE

NOTE:

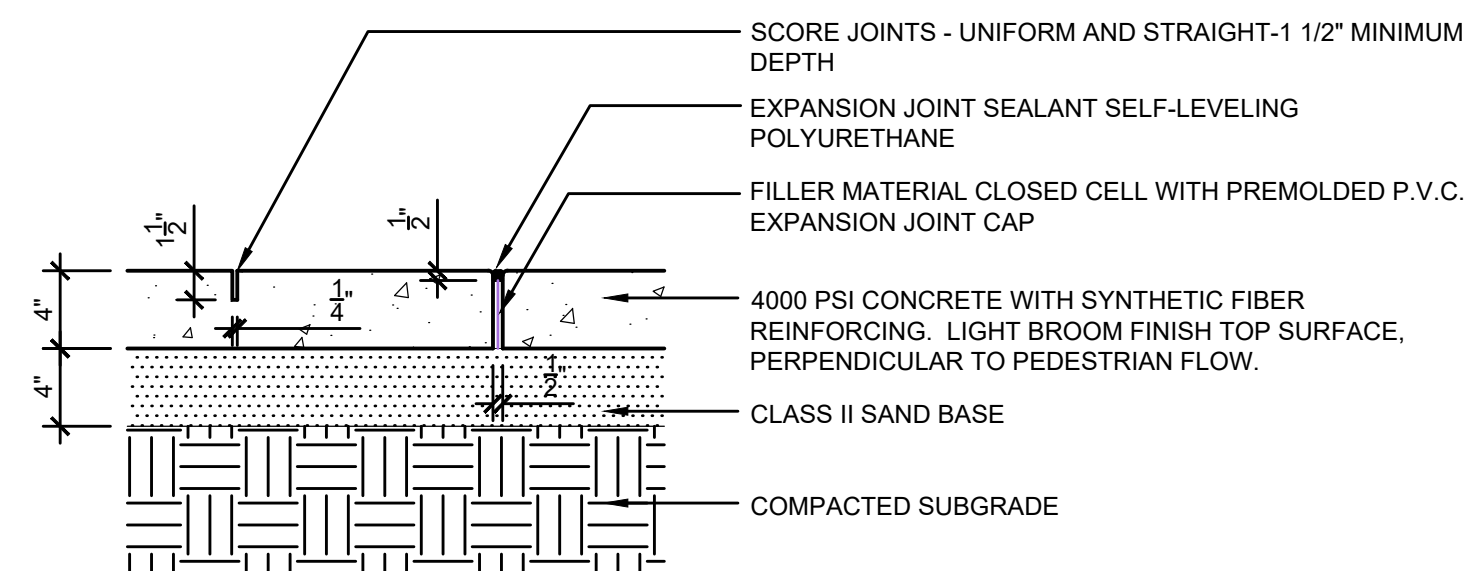
1. CONTRACTOR SHALL PLANT REMOVED TREES, PLANTS AND SHRUBS SALVAGED FROM THE FORMER 1967 MEMORIAL AREA IN LOCATIONS IDENTIFIED BY OWNER'S REPRESENTATIVE.



NOTE:

SECURE SALVAGED BENCH TO CONCRETE USING 3" GALVANIZED EXPANSION BOLTS.

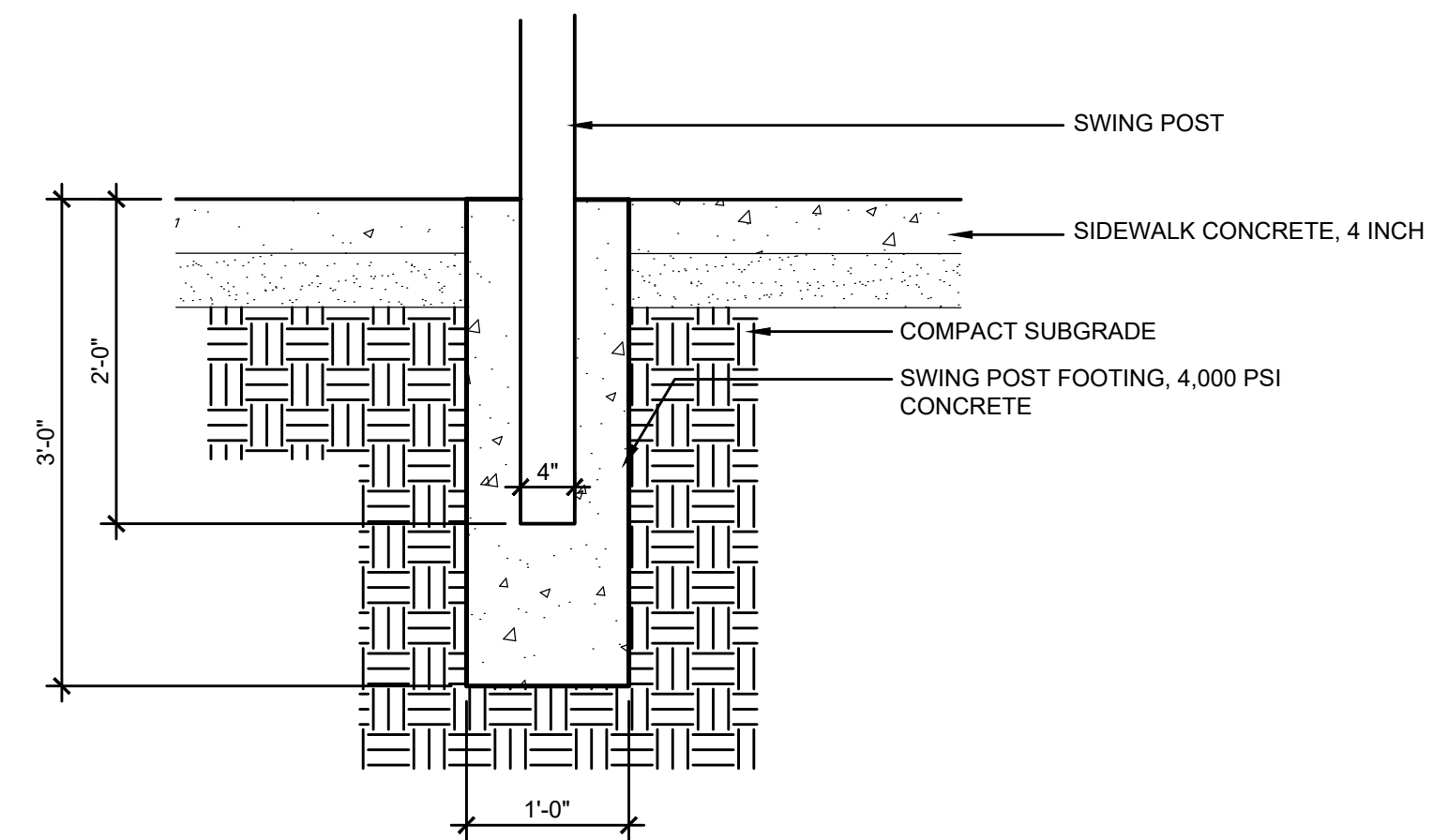
3
C-503
BENCH SWING LAYOUT
NOT TO SCALE



NOTES:

- CONTRACTION JOINTS TO BE PLACED 6' O.C. EXPANSION JOINTS TO BE PLACED 30' O.C. MAXIMUM. BROOM FINISH AFTER CONTRACTION JOINTS HAVE BEEN PLACED TO REMOVE TOOLING MARKS.
- CONCRETE TO INCLUDE FIBER MESH, REFER TO SPECIFICATIONS

2
C-503
SIDEWALK CONCRETE - 4 INCH
NOT TO SCALE



3
C-503
FOOTING SECTION
NOT TO SCALE

NOTE:

- BENCH, SIDEWALK AND FOOTING DETAILS ADAPTED FROM DETAILS PROVIDED BY THE CITY OF MUSKEGON.

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O'BRIEN & GERE ENGINEERS, INC
EAST LANSING, MICHIGAN

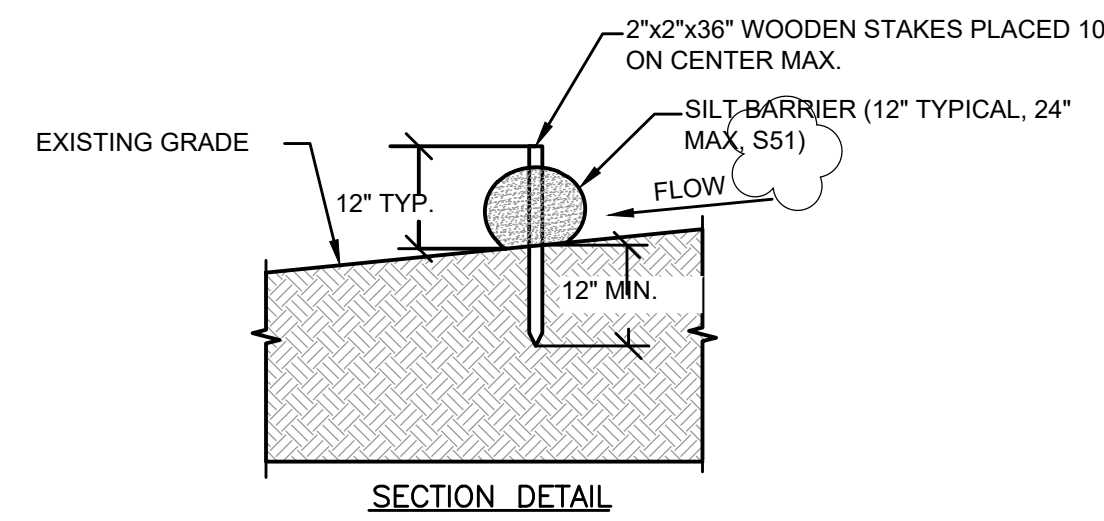


AMOCO FISH & WILDLIFE HABITAT RESTORATION
MUSKEGON, MUSKEGON COUNTY, MICHIGAN

CIVIL
BENCH DETAILS

FILE NO.
33422.72430
DATE
AUGUST 11, 2020

C-503



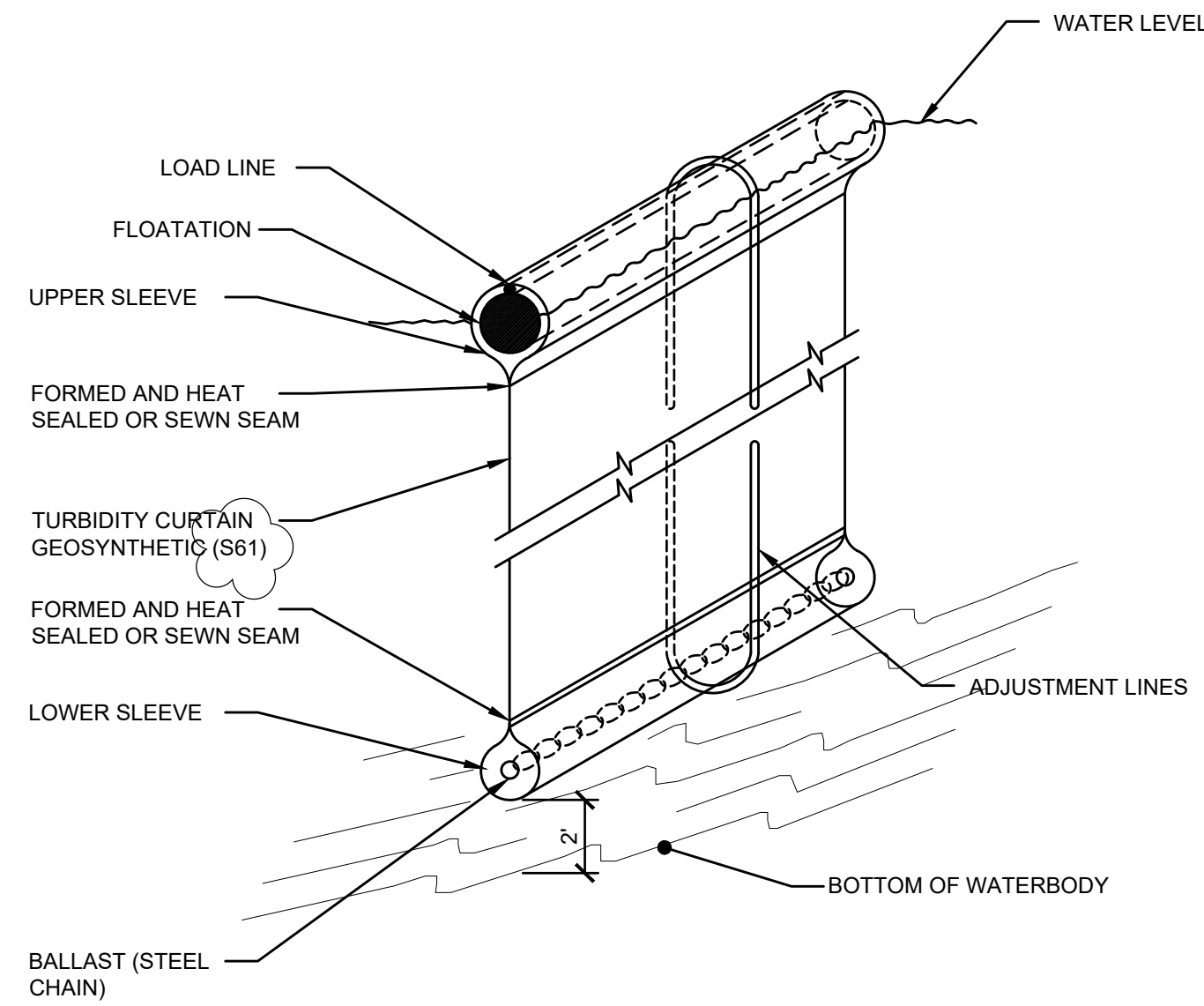
NOTES:

1. USE FILTREXX® SEDIMENT CONTROL SYSTEM BY FILTREXX® LAND IMPROVEMENT SYSTEMS OR APPROVED EQUAL.
2. STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE SILT BARRIER (S51) AT 10' INTERVALS MAXIMUM USING HARDWOOD STAKES.
3. SILT BARRIER (S51) TO BE ALIGNED ALONG CONTOUR AS CLOSELY AS POSSIBLE.
4. BOTH ENDS OF EACH BARRIER (S51) SECTION MUST EXTEND AT LEAST 10 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
5. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER (S51).
6. ANY SILT BARRIER (S51) SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPAIRED OR REPLACED.

STANDARD SYMBOL — SB — SB

SILT SOCK (S51) DETAIL

1
C-504
NOT TO SCALE

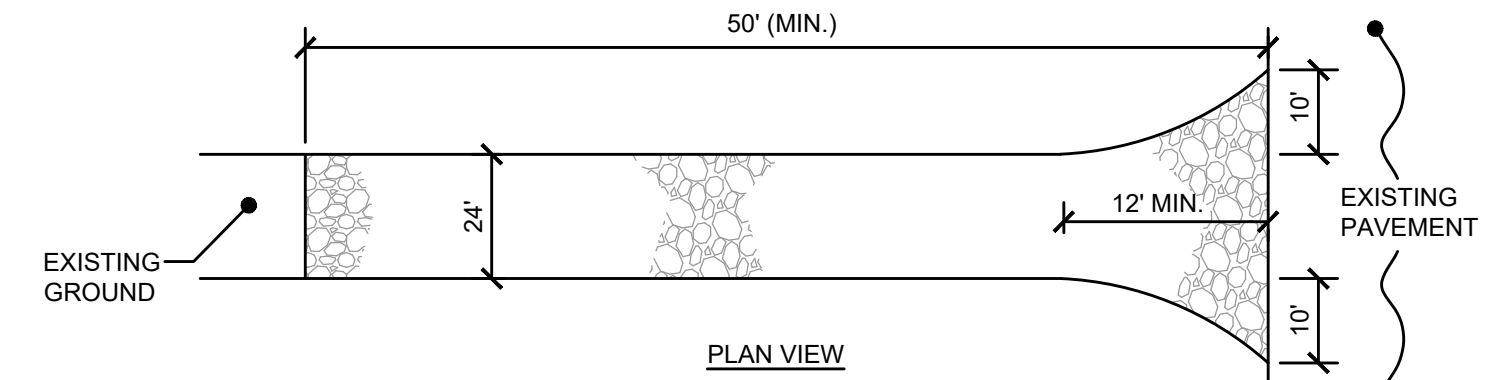


DETAIL NOTES:

1. FLOATING TURBIDITY CURTAIN (S61) TO BE INSTALLED DURING CONSTRUCTION AROUND WORK AS A WATER QUALITY MEASURE.
2. THE LOCATION OF TURBIDITY CURTAIN (S61) TO BE DETERMINED BASED ON FIELD CONDITIONS AND AS DIRECTED BY DIRECTOR'S REPRESENTATIVE.
3. THE TURBIDITY BARRIERS (S61) SHALL REMAIN IN PLACE AND BE MAINTAINED UNTIL THE AUTHORIZED WORK HAS BEEN COMPLETED AND ALL SUSPENDED AND ERODIBLE MATERIAL HAVE BEEN STABILIZED.
4. TURBIDITY CURTAIN (S61) SHOWN HERE SHALL BE IMPERMEABLE FASTWATER SCREEN TYPE II AS MANUFACTURED BY ELASTEC/AMERICAN MARINE, INC., OR APPROVED EQUAL.
5. TURBIDITY CURTAIN (S61) SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

TYPICAL TURBIDITY CURTAIN (S61) DETAIL

2
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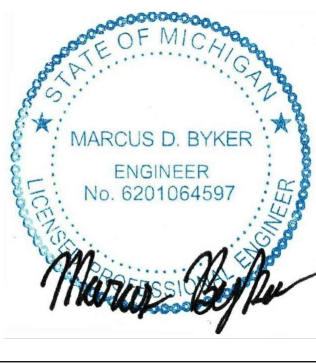
NOTES:

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS REQUIRED, BUT NOT LESS THAN 50 FEET
3. THICKNESS - NOT LESS THAN 6".
4. WIDTH 24' MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE EGRESS OCCURS.
5. FILTER FABRIC (MIRAFI 140N OR EQUAL) - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARDS CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS NOT POSSIBLE, A MOUNTABLE BERM 3' WIDE (MIN.) WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC OP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING (S54) - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO ADJACENT SEDIMENT BASINS.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED IN ACCORDANCE WITH THE PROJECT STORM WATER POLLUTION PREVENTION PLAN.
10. CONTRACTOR SHALL FIELD LOCATE AS REQUIRED WITH APPROVAL BY THE OWNER'S REPRESENTATIVE.

TEMPORARY STABILIZED CONSTRUCTION ENTRANCE (S53) DETAIL

3
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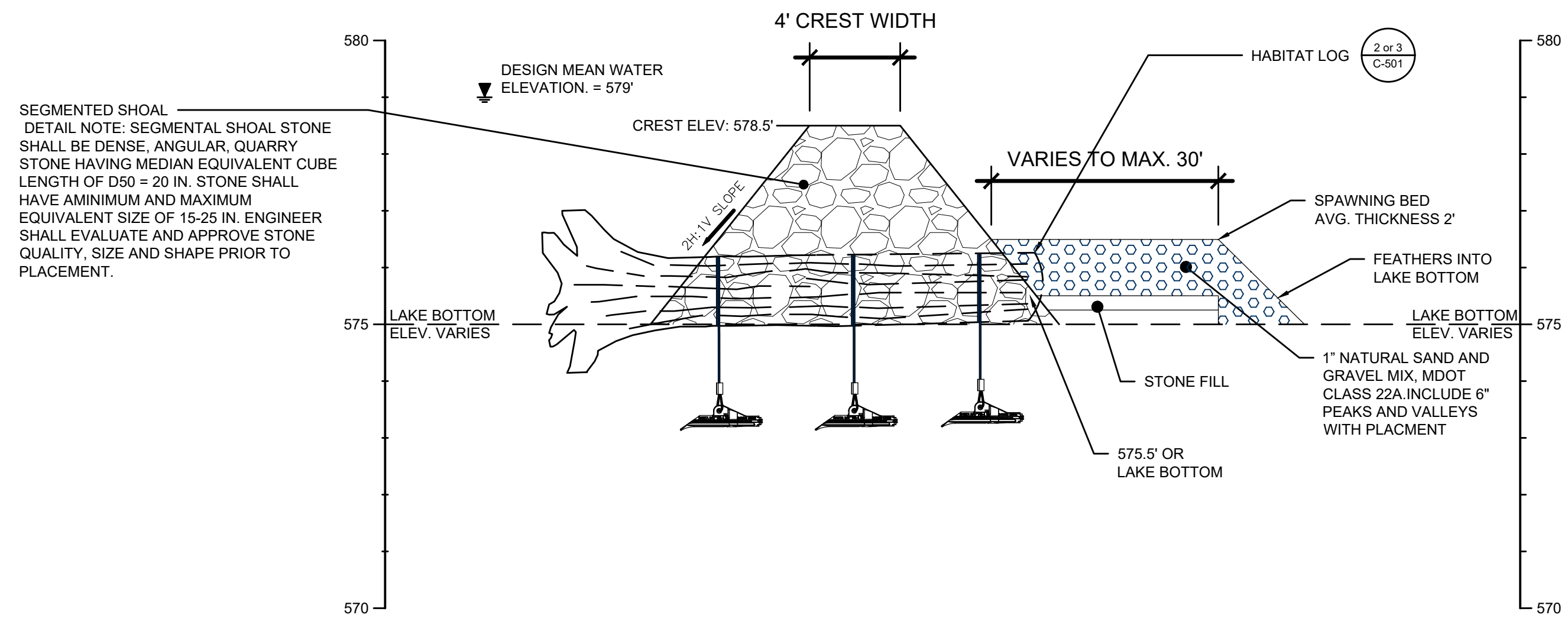
IN CHARGE OF	M. BYKER			
DESIGNED BY	T. EALLONARDO	D	8/11/2020	ISSUE FOR CONSTRUCTION
CHECKED BY	C. HARLEY	C	2/26/2020	RESPONSE TO COMMENTS
DRAWN BY	S. ENGELHARDT	B	2/14/2020	ISSUE FOR BID
		A	1/3/2020	JOINT PERMIT APPLICATION SUBMITTAL
		NO.	DATE	REVISION
				INT.



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EROSION AND SEDIMENT CONTROL DETAILS

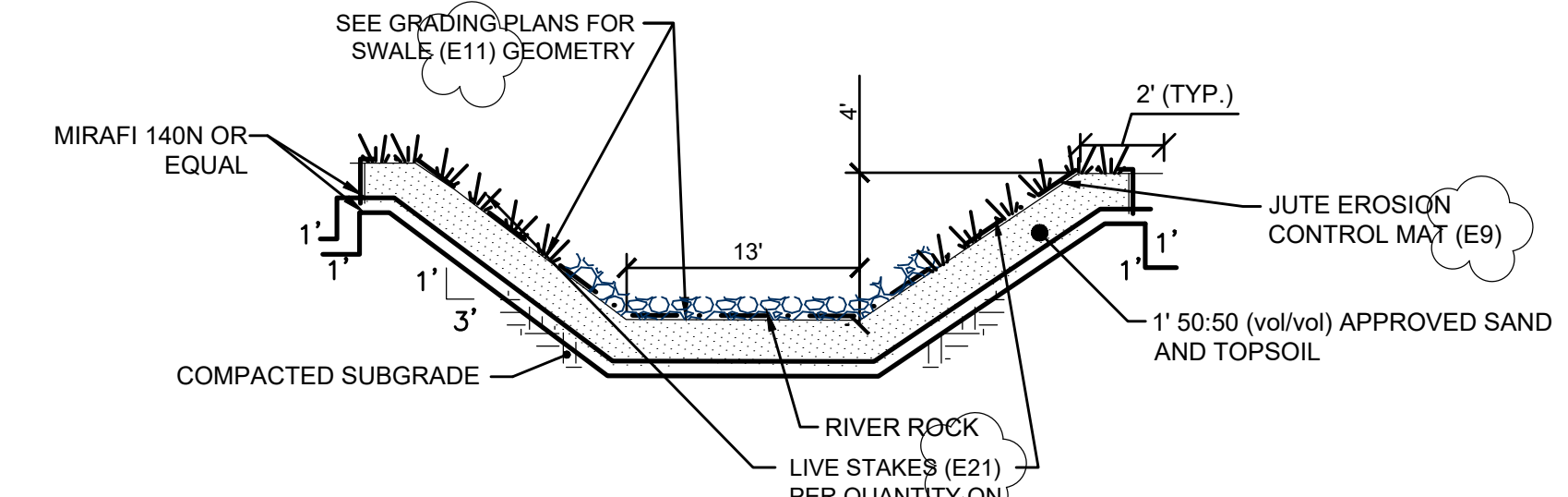
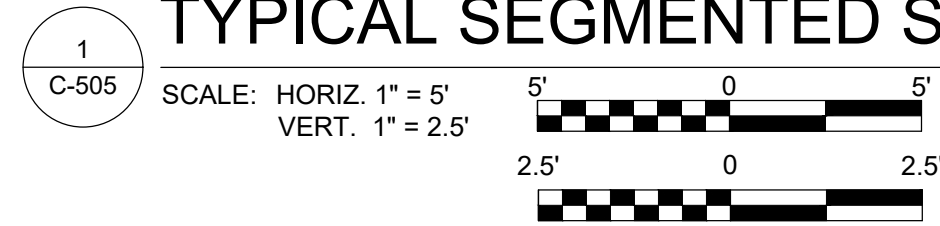
FILE NO.
33422.72430
DATE
AUGUST 11, 2020

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SEGMENTED SHOAL
 DETAIL NOTE: SEGMENTAL SHOAL STONE SHALL BE DENSE, ANGULAR, QUARRY STONE HAVING MEDIAN EQUIVALENT CUBE LENGTH OF D50 = 20 IN. STONE SHALL HAVE AMINIMUM AND MAXIMUM EQUIVALENT SIZE OF 15-25 IN. ENGINEER SHALL EVALUATE AND APPROVE STONE QUALITY, SIZE AND SHAPE PRIOR TO PLACEMENT.

TYPICAL SEGMENTED SHOAL AND SPAWNING HABITAT SECTION



NOTES:

- JUTE EROSION CONTROL MAT (E9) SHALL BE 11MM X 18MM MESH SIZE AND MIN. 0.25-IN THICK. MAT SHALL BE STAKED IN PLACE PER MANUFACTURER'S RECOMMENDATIONS.
- BOTH THE MIRAFI FABRIC AND JUTE MATTING (E9) SHALL BE KEYED IN AT THE TOP OF SLOPE AS SHOWN.
- APPLY WETLAND SEED MIX (E8) THROUGHOUT THE SWALE (E11) PROFILE PRIOR TO INSTALLING THE JUTE MATTING (E9).
- LIVE STAKES (E21) SHALL BE INSTALLED AT 4' SPACING ON BOTH BANKS FROM ELEV. 579' TO TOP OF BANK. STAKES SHALL BE DRIVEN THROUGH THE MATTING (E9) BY INSTALLING A PILOT HOLE AS NECESSARY.
- THE BOTTOM OF THE SWALE BELOW ELEV. 579 SHALL BE LINED WITH RIVER ROCK TO A DEPTH OF 4-INCHES.
 - RIVER ROCK
 STONE SUBSTRATE
 WASHED STONE SUBSTRATE SHALL BE THOROUGHLY WASHED, CLEAN, NON-ANGULAR, SOUND, HARD, ROUND, COBBLEY, "RIVER STONE" OR "RIVER ROCK" OR OTHER EQUAL MATERIAL FREE FROM COATINGS AND ORGANIC MATTER. WASHED STONE SUBSTRATE SHALL HAVE THE FOLLOWING GRADATION BY WEIGHT:

%PASSING	SIEVE
100	4-INCH
5-20	1 1/2 -INCH
0-10	1/2 -INCH
0-5	NO. 200
- AN APRON OF HEAVY RIPRAP (E12) THAT EXTENDS THE WIDTH OF THE SWALE (E11) UP TO ELEV. 579' SHALL BE INSTALLED AT THE TERMINUS OF THE SWALE.

LIVE STAKE (E21) NOTES:

- PORTIONS OF THE BANKS ABOVE ELEVATION 579 SHALL RECEIVE LIVE STAKES (E21) IN ACCORDANCE WITH THE FOLLOWING:
- A MINIMUM OF 2" TO 4" AND TWO LIVE BUDS OF THE LIVE STAKE (E21) SHALL BE EXPOSED ABOVE THE SOIL.
 - LIVE STAKES (E21) SHALL RANGE FROM 0.5" TO 1.5" IN DIAMETER, WITH THE FOLLOWING LENGTHS:
 PUSSY WILLOW (SALIX DISCOLOR): 3'
 BANKERS DWARF WILLOW (SALIX COTTETI): 3'
 RED OSIER DOGWOOD (CORNUS SERICEA): 3'
 - EQUAL NUMBERS OF EACH SPECIES SHALL BE PLANTED IN ROWS 48 INCHES APART THROUGHOUT THE AREA SHOWN.
 - THE FIRST ROW OF LIVE STAKES (E21) SHALL BE SET AT ELEVATION 579 WITHIN THE SWALE (E11) AND BE PLANTED TO THE TOP OF BANK.
 - LIVE STAKES (E21) SHALL BE CUT TO A POINT ON THE BASAL END FOR INSERTION ON THE GROUND.
 - USE A DEAD BLOW HAMMER TO DRIVE STAKES (E21) INTO THE GROUND. THE HAMMER HEAD SHOULD BE FILLED WITH SHOT OR SAND. A DIBBLE, IRON BAR, OR SIMILAR TOOL SHALL BE USED TO MAKE A PILOT HOLE TO PREVENT DAMAGING THE MATERIAL DURING INSTALLATION.
 - AFTER PLACEMENT, TAMP SOIL AROUND LIVE STAKES (E21).
 - ANY LIVE STAKE (E21) THAT IS DAMAGED SHALL BE LEFT IN PLACE AND SUPPLEMENTED WITH A REPLACEMENT LIVE STAKE ADJACENT.
 - NURSERY GROWN MATERIALS SHALL BE STORED UNDER CONTINUOUSLY COOL, COVERED, AND MOIST CONDITIONS PRIOR TO USE.
 - LIVE STAKES (E21) MUST BE INSTALLED AFTER LEAF DROP IN THE FALL AND BEFORE BUD BREAK IN THE SPRING.
 - SOAK THE LIVE BRANCHES (E21) FOR A MINIMUM OF 24 HOURS BEFORE PLANTING. SOAKING FOR 5-7 DAYS IS CONSIDERED IDEAL AND SHOULD PROMOTE ESTABLISHMENT.

LAKE CONNECTION DETAIL (E11)

2
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RESTORATION DETAILS

FILE NO.	33422.72430	C-505
DATE	AUGUST 11, 2020	

WETLAND SEED (E8) LIST

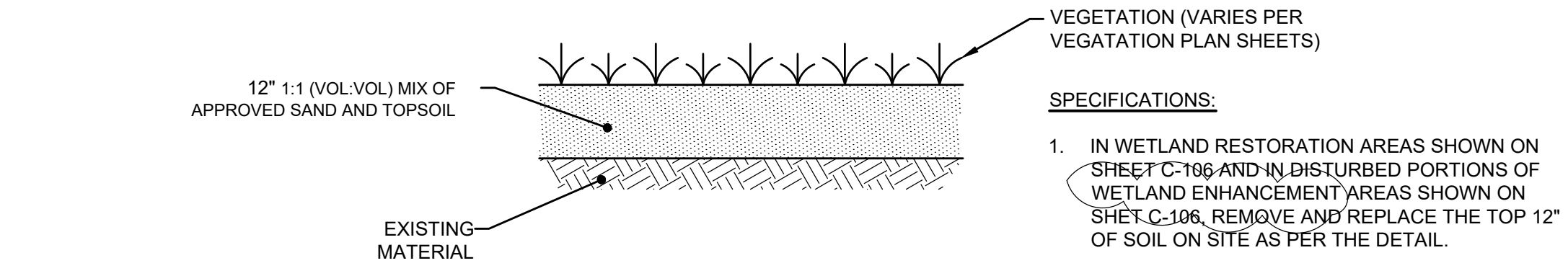
Table with 3 columns: Common name, Latin name, Weight percent. Lists various wetland species like Virginia wild rye, Nodding beggar-ticks, etc.

PLANT INSTALLATION LIST

Main table for plant installation with columns for Latin name, Common name, Unit, Unit rate, and various zone types (Wet meadow interior, exterior, Shallow emergent marsh, etc.).

PLANT INSTALLATION NOTES:

- 1. ALL PLANT MATERIALS SHALL COMPLY WITH STATE AND FEDERAL LAWS WITH RESPECT TO INSPECTION FOR PLANT DISEASES AND INSECT INFESTATIONS.
2. PLANTS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004) UNLESS OTHERWISE SPECIFIED.
3. PLANTS SHALL BE CONTAINERIZED STOCK OF HIGH QUALITY AND SYMMETRICAL. THEY SHALL BE HEALTHY, WELL BRANCHED AND DENSELY FOLIATED WHEN IN LEAF.
4. PLANTS SHALL BE FREE OF DISEASE AND INSECTS, EGGS, OR LARVAE, AND HAVE HEALTHY, WELL-DEVELOPED ROOT SYSTEMS.
5. PLANTS SHALL BE TAGGED TRUE TO SPECIES NAME AND VARIETY AND NOT CONTAIN WEEDS. TREES AND SHRUBS SHALL BE IN INDIVIDUAL POTS, EACH POT OR STEM SHALL BE TAGGED.
6. PLANTS SHALL ARRIVE AT THE JOB SITE FREE FROM PHYSICAL DAMAGE.
7. EACH SPECIES SHALL BE HANDLED AND PACKED IN A MANNER APPROVED FOR THAT PLANT. ALL PRECAUTIONS THAT ARE CUSTOMARY IN GOOD TRADE PRACTICE SHALL BE TAKEN TO INSURE THE ARRIVAL OF THE PLANTS AT THE SITE IN GOOD CONDITION.
8. ALL WOODY SEEDLINGS SHALL HAVE A HEAVY FIBROUS ROOT SYSTEM THAT HAS BEEN DEVELOPED BY PROPER HORTICULTURAL TREATMENT, TRANSPLANTING, AND ROOT PRUNING.



WETLAND SOIL PROFILE

1 C-506 NOT TO SCALE

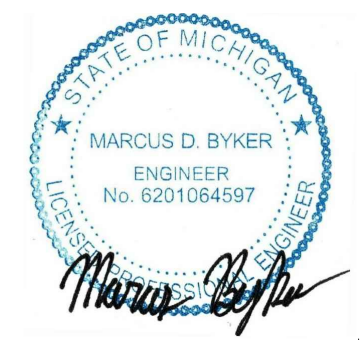
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WOODY PLANT ZONE LIST

Table with 8 columns: Common name, Latin name, Unit, Unit rate, Woody Plant Zone 1 (0.024 AC), Woody Plant Zone 2 (0.018 AC), Woody Plant Zone 3 (0.018 AC), TOTAL (0.06 AC). Lists species like Speckled alder, Buttonbush, etc.

BIKE PATH BERM SEED (E8) MIX

Table with 3 columns: Common name, Latin name, Weight percent. Lists species like Big Bluestem, Side-Oats Grama, etc.



Revision table with columns: IN CHARGE OF, DESIGNED BY, CHECKED BY, DRAWN BY, NO., DATE, REVISION, INT.

O'Brien & Gere Engineers, Inc. logo and address: EAST LANSING, MICHIGAN

AMOCO FISH & WILDLIFE HABITAT RESTORATION MUSKEGON, MUSKEGON COUNTY, MICHIGAN

RESTORATION DETAILS CIVIL FILE NO. 33422.72430 DATE AUGUST 11, 2020 C-506