DIVISION 2

SITE CONSTRUCTION

SECTION 02200

SITE CLEARING, REMOVAL OF DAM STRUCTURE

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes demolition and removal of designated structures; removal of trees and shrubs; removal and storage of topsoil; removal as disposal demolished materials from project site; protection of items to remain and list of material or equipment to be salvaged and preserved for OWNER.

1.02 RELATED SECTIONS

A. Related Sections include the following:

2. Section 01010 "Project Summary" for a description of project scope of work.

3. Section 02315 "Excavation and Fill" for excavation, fill, hauling and disposal.

4. Section 02500 "Project Utility Service" for associated utility protocols.

1.03 RECORD DRAWINGS

A. Accurately record locations of capped utilities and subsurface obstructions.

1.04 SEQUENCING AND SCHEDULE

A. Include site clearing and removal and abandonment schedule on Detailed Progress Schedule.

B. Schedule work to coincide with new construction.

1.05 PROCEDURES

A. All sanitary sewer, storm sewer, watermain and other piping, which is no longer in service shall be removed or abandoned in accordance with the latest revision of the MDOT Standard Specifications for Construction as modified herein.

1.06 MEASUREMENT AND PAYMENT

A. Measurement shall be by the unit "Lump Sum" upon completion of this item as determined by the ENGINEER.

B. Payment shall be by the Contract Unit price per "Lump Sum" as provided on the Bid Form. The Unit Price payment shall be compensation in full for all labor, tools, equipment, and materials required to completely remove and properly dispose of the existing dam structure, trees and other woody material in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Project Drawings and shall include, but not limited to all incidentals necessary to complete this item of construction.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting.

B. Identify waste and salvage areas for placing removed materials.

C. Locate and identify existing utilities to remain.

3.02 PREPARATION

A. Erect and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the public, OWNER, CONTRACTOR'S employees and existing improvements to remain.

B. Protect existing landscaping materials, trees, appurtenances, structures and utilities during demolition and removal operations.

C. Repair or replace trees or shrubs damaged by construction operations at no additional cost to the OWNER.

D. Prevent movement or settlement of adjacent structures. Provide bracing and shoring.

E. Mark location of utilities.

F. Protect bench marks, survey control points, and property corners from damage or displacement.

G. Salvage marketable timber.

3.03 DEMOLITION REQUIREMENTS

A. Conduct demolition to minimize interference with adjacent structures and utilities.

B. Cease operations immediately when adjacent structures appear to be in danger. Notify authority having jurisdiction and the ENGINEER. Do not resume operations until directed.

C. Conduct operations with minimum interference to public or private accesses. Maintain egress and access from adjacent structures at all times.

D. Obtain written permission from adjacent property owners when demolition equipment will traverse, infringe upon or limit access to their property.

E. Sprinkle work with water to minimize dust. Provide hoses and water connections required for this purpose.

F. Disconnect, cap and identify designated utilities within demolition areas.

G. Remove foundation walls and footings to minimum of 2 feet below finished grade.

H. Remove concrete slabs on grade.

I. Remove materials to be reinstalled or retained in manner to prevent damage.

J. Backfill areas resulting from demolition in accordance with Specifications.

K. Rough grade and compact areas affected by demolition to maintain site grades and contours.

L. Continuously clean up and remove demolished materials from site. Do not allow materials to accumulate on site.

M. Do not burn or bury materials on site. Leave site in clean condition.

3.04 REMOVAL

A. Remove debris, rock, and extracted plant life from site.

B. Partially remove paving, curbs and sidewalks as indicated on Project Drawings or as directed in the field by the ENGINEER. Neatly saw cut edges at right angle to surface.

3.05 DISPOSAL OF UNSALVAGEABLE MATERIAL

A. Do not dispose of material, temporarily or permanently, in any wetland or flood plain.

B. Dispose of all unmarketable timber and other vegetative debris resulting from construction operations.

3.06 TOPSOIL EXCAVATION

A. Excavate topsoil from excavated or regarded areas without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in approved area to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material until disposal.

D. Do not remove topsoil from site without OWNER'S permission. OWNER shall have first right of refusal for all excess topsoil.

3.07 SELECTIVE THINNING

A. Remove and dispose of undesirable trees, stumps, undergrowth, and debris off site.

B. Trees and areas of undergrowth to be removed will be designated on the Project Drawings or in the field by the ENGINEER.

C. This work will not be considered complete until acceptance of the project.

END OF SECTION 02200

SECTION 02206

DEWATERING

PART 1 GENERAL

1.01 WORK INCLUDES

A. Dewatering required to permit excavation, backfill, and construction to be performed on the project site in the dry. Control of surface water shall be considered as part of the work under this specification.

1.02 RELATED SECTIONS

A. Related Sections include the following:

1. Section 01010 "Project Summary" for a description of project scope of work.
2. Section 02270 "Soil Erosion and Sedimentation Control" for associated erosion and sedimentation controls within restoration areas.
3. Section 02315 "Excavation and Fill" for the excavation, hauling, and disposal of muck soils, along with the placement of clean topsoil within the project work area.
4. Section 02500 "Project Utility Service" for utility protocols.

1.03 REFERENCES (Not Used).

1.04 SUBMITTALS

A. Dewatering Plan Drawings and Design Data:

1. Submit drawings and data showing the dewatering method to be employed in excavation areas 30 days before commencement of excavation.
2. Include a written report outlining control procedures to be adopted if dewatering problem arises.
3. Identify capacities of pumps, prime movers, and standby equipment.
4. Detailed description of dewatering procedure and maintenance method.

1.05 QUALITY ASSURANCE

A. The CONTRACTOR shall maintain all dewatering operations during the period that the temporary ground and surface water controls are required until the excavation has been completed and accepted by ENGINEER and OWNER. Such maintenance shall consist of the periodic and regular inspection of the dewatering system, repair of all pumps or other equipment, and replacement of defective equipment or materials.

B. Any deficiencies in dewatering measures noted by ENGINEER, OWNER, or governmental authority shall be promptly remedied by CONTRACTOR at their expense.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 INSTALLATION

A. The CONTRACTOR shall be responsible for providing all materials, equipment, labor, and services necessary for management of surface and groundwater, including seepage and precipitation.

B. Install a dewatering system to lower and control ground and surface water in order to permit excavation and placement of backfill materials to be performed under dry conditions. Make the dewatering system adequate to pre-drain the water-bearing strata above and below the bottom of utilities and other excavations.

C. Surface water may be extracted with an above-ground pump placed in a non-wetland location. The intake may be placed in the existing drainage ditch, in a created sump, or underground, as determined by the CONTRACTOR.

D. Following surface water dewatering, CONTRACTOR may, at his discretion, install a supplemental tile drainage or other similar system to maintain water levels at the desired elevation.

E. CONTRACTOR may also use a dewatering system that extracts groundwater through vacuum wells or other similar mechanism. All extracted water must come from locations outside the horizontal and vertical extents of earth excavation.

F. In addition, reduce hydrostatic pressure head in water-bearing strata below utilities and other excavations, to extent that water levels in the construction area are a minimum of 1 foot below prevailing excavation surface at all times.

3.02 WATER DISPOSAL

A. Dispose of water removed from the excavations in such a manner that will not endanger portions of work under construction or completed, and will not cause inconvenience to the OWNER, adjacent landowners, or to others working near site.

B. Once construction activities have begun, maintenance pumping must come through the extraction of groundwater that is not directly impacted by earth excavation or construction activities.

C. All maintenance dewatering must be disposed of in the manner described above until excavation, fill, and placement of structures is complete.

D. The CONTRACTOR shall be responsible for control of runoff in all work areas including, but not limited to, excavations, access roads, parking area, and staging areas. The CONTRACTOR shall provide, operate, and maintain all ditches, basins, sumps, culverts, site grading, and pumping facilities to divert, collect, and remove all water from the work areas.

3.03 OPERATION

A. Prior to any excavation below the ground water table, place system into operation to lower water table as required to facilitate construction.

B. The CONTRACTOR shall be responsible for providing all facilities required to divert, collect, control, and remove water from all construction work areas and excavations. Surface water shall drain away from active excavations.

C. Dewatering equipment shall be provided to remove and dispose of all surface and ground water entering excavations, trenches, or other parts of the work during construction. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the excavation work is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result. Water levels in the construction area shall be a minimum of 1 foot below the prevailing excavation surface.

D. Dewatering system shall be of sufficient size and capacity necessary to lower and maintain ground water table to an elevation at least 1 foot below lowest subgrade or bottom of pipe trench and to allow material to be excavated and/or placed in a reasonably dry condition. Materials to be removed shall be sufficiently dry to permit excavation to grades shown and to stabilize excavation slopes where sheeting is not required. Operate dewatering system continuously until backfill work has been completed. Drainage features shall have sufficient capacity to avoid flooding of work areas.

E. Maintain stability of sides and bottom of excavation. Control of surface and subsurface water is part of dewatering requirements. Maintain adequate control so that the stability of excavated and constructed slopes are not adversely affected by saturated soil, including water entering prepared subbase and subgrades where underlying materials are not free draining or are subject to swelling or freeze-thaw action.

F. Drainage features shall be so arranged and altered as required to avoid degradation of the final excavated surface(s). The CONTRACTOR shall utilize all necessary erosion and sediment control measures as described herein to avoid construction related degradation of the natural water quality.

3.04 CORRECTIVE ACTION

A. If dewatering requirements are not satisfied due to inadequacy or failure of the dewatering system, perform work necessary for reinstatement of damages to grading or work in place resulting from such inadequacy or failure by CONTRACTOR, at no additional cost to the OWNER.

3.05 DAMAGES

A. Immediately repair damages to any adjacent facilities or properties caused by dewatering operations at no additional cost to the OWNER.

3.06 REMOVAL

A. Document compliance with all conditions of any regulating permits and provide such information to the ENGINEER. Obtain written approval from ENGINEER before discontinuing operation of dewatering system.

3.07 SEQUENCING

A. Install silt fence around perimeter of wetland, as shown on the Project Drawings.

3.08 PAYMENT

A. CONTRACTOR shall be paid on a lump sum basis for installation, operation, and removal of the dewatering system, based on a plan that must be submitted to and approved by the ENGINEER prior to installation.

END SECTION 02206

SECTION 02230

CONSTRUCTED RIFFLE

PART 1 GENERAL

1.01 A Constructed Riffle is comprised of river stone placed in the bed of the river. Stone sills shall extend past the banks a minimum of 10 feet. The stone shall be formed and placed pattern so a small low flow partially sinuous channel runs through the riffle.

1.02 RELATED SECTIONS

A. Related Sections include the following:

5. Section 01010 " Project Summary" for a description of project scope of work.

6. Section 02315 "Excavation and Fill" for associated excavation, fill, overall site grading, and materials placement.

7. Section 02924 "Seeding and Live Stake Installation" for subsequent seeding or installation of live stake materials.

1.03 REFERENCES

A. Michigan Department of Transportation (MDOT) Standard Specification for Construction, 1990.

1.04 METHOD OF MEASUREMENT

A. Measurement for Constructed Riffles shall be per each, installed to the satisfaction of the ENGINEER.

1.05 BASIS OF PAYMENT

A. Payment for Boulder Constructed Riffles shall be per each. Payment as specified shall be considered full compensation for all labor, materials, equipment and incidentals necessary to perform the Work as required.

PART 2 PRODUCTS

2.01 MATERIALS

A. River Stone: Stone material for this item shall be river cobble, gravel and sand mixture, free of shale and imported to the project site. The river stone shall be used to chink the gaps between the large boulders and create a constant slope throughout the riffle. Select backfill Slag or recycled aggregate will be rejected.

B. Pea Gravel (or pea stone): Pea gravel shall be washed and graded between 3/16 inch and 3/8 inch.

C. The CONTRACTOR shall submit manufacturer specifications to the ENGINEER prior to ordering materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that Constructed Riffle materials are acceptable to ENGINEER and/or OWNER.

3.02 PLACEMENT

A. Construct the Constructed Riffle by first shaping the channel to the approximate grades specified. The finished riffle will meet the riffle crest and start of run elevations on the Drawings within ± 0.1-ft. Extend the excavation into the channel banks where necessary.

B. Place stream diversion. If working on one side of the channel excavate sill into the bank and excavate approximately 18-inches below grade across the channel. Install pea stone layer, tamp layer with excavator bucket. Install riffle stone to grade. With each layer of stone, use the bucket to tamp stone.

C. Backfill and chink all voids with select backfill material that consists of cobble, gravel, and fines to fill any voids. Fill the voids on the upstream side of the stone such that water will flow over the riffle surface rather than through gaps in the boulders.

D. Once all of the footing, surface, and sill boulders are placed and chinked, install Pea Gravel against the upstream side of footing and surface boulders along bank sill as shown on the plans. Place Pea Gravel all along the upstream side of the sill in the boulder constructed riffle. The Pea Gravel must extend a minimum of 6 inches below the footer boulders and up near the top of the surface boulders.

E. Backfill the banks and compact to within a foot of the final grade with cohesive soil as practicable. Place a single row of erosion control blanket parallel to the channel on both banks in the low spot left from the bank excavation a minimum of 1 foot into the channel from the proposed toe of the bank. Then the erosion control blanket may extend up the banks for its final installation.

F. Final grade shall provide a smooth slope up to the top of the low flow channel with the boulders protruding 0.2 to 0.4 feet from the surface of the low flow channel.

G. Plant live stakes at the top of each sill as specified in the project drawings. Final grades around the riffles should be within 0.2-feet of those indicated on the project drawings. Excavation of channel material may be necessary to achieve the correct grades. This shall be considered incidental to construction of Boulder Constructed Riffles.

END OF SECTION 02230

SECTION 02240

BOULDER J-HOOK

PART 1 GENERAL

1.01 This work consists of preparing areas at which a Boulder J-Hook Vane is to be placed, excavation of channel material, furnishing and placing footing boulders, surface boulders, Pea Gravel and gravel substrate, and finishing banks, structure slopes, and stream channel at the locations specified on the plans.

1.02 RELATED SECTIONS

A. Related Sections include the following:

8. Section 01010 " Project Summary" for a description of project scope of work and utility protocols.

9. Section 02315 "Excavation and Fill" for associated excavation, fill, overall site grading, and topsoil placement upon clearing and grubbing completion.

1.03 REFERENCES

A. Michigan Department of Transportation (MDOT) Standard Specification for Construction, 1990.

PART 2 PRODUCTS

2.01 MATERIALS

A. Select Backfill Material: Select backfill material for this item shall be limestone, sandstone, or dolomite river cobble, gravel and sand mixture, free of shale and imported to the project site. Slag or recycled aggregate will be rejected.

B. Pea Gravel (or pea stone): Pea gravel shall be washed and graded between 3/16 inch and 3/8 inch.

C. Boulders: Boulders for this item shall be constructed of angular, flat, or cubed durable sandstone rock of sufficient hardness to resist weathering and shall be free of shale, cracks and other blemishes. Boulders shall have a maximum weighted loss of 30 percent when subjected to five cycles of sodium sulfate soundness test, MP 703.00.22. Slag or recycled aggregate will be rejected. Minimum boulder diameter is shown on the plans. Boulder source must be submitted to the ENGINEER for approval.

D. The CONTRACTOR shall submit manufacturer specifications to the ENGINEER prior to ordering materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that Boulder J-Hook Vane materials are acceptable to ENGINEER and/or OWNER.

3.02 PLACEMENT

A. Construct J-Hook vane structures by first shaping the bankfull channel to the grades specified, including scour pools and gravel substrate. Next, excavate enough bed material to place the footing boulders, surface boulders, sill boulders, and gravel.

B. Placement of boulders for J-Hook structures should start at the center of the stream, or invert, and proceed outward to the banks. Place footing boulders and surface boulders at the channel invert, leaving gaps between the surface boulders at the invert as shown in the plans. Place footing boulders and surface boulders in vane arm at angle and slope shown on the plans.

C. Check the elevation of the inverts in accordance with the profile to within 0.3 feet. Once the inverts have been established, the remainder of the footing boulders and surface boulders shall be placed tightly against each other, minimizing voids. All surface boulders shall be offset upstream from the footing boulders a minimum of 1/3 width of the footing boulder to allow for a "splash pad". Check the elevations of where the vane arm ties into the bank and the channel bottom in accordance with plans.

D. Backfill and chink all voids with select backfill material that consists of cobble, gravel, and fines to seal any gaps. Fill the voids on the upstream side of surface boulders (except at the gapped surface boulders above the invert) with stone material such that water will flow over the surface boulders rather than through gaps in the boulders. Once all of the footing, surface, and sill boulders are placed and chinked, install Pea Gravel against the upstream side of footing and surface boulders along the vane arm and bank sill as shown on the plans. Secure Pea Gravel by backfilling with native gravel/cobble mixture from stream channel. The surface of Boulder J-Hook Vanes shall be finished to a smooth and compact surface in accordance with the lines, grades and cross sections or elevations shown on the Project Drawings.

E. Select backfill material and channel finishing is considered incidental for this item.

3.03 METHOD OF MEASUREMENT

A. Measurement for Boulder J-Hook Vanes shall be per each, installed to the satisfaction of the ENGINEER.

3.04 BASIS OF PAYMENT

A. Payment for Boulder J-Hook Vanes shall be per each. Any harvesting of materials from the project site is considered incidental for this item. Payment as specified shall be considered full compensation for all labor, materials, equipment and incidentals necessary to perform the Work as required.

END OF SECTION 02240

SECTION 02250

TOEWOOD PROTECTION

PART 1 GENERAL

1.01 Woody Debris Toe Protection consists of natural materials to reinforce the outer channel bank along a meander, as well as provide habitat in a pool with woody debris. The layering of coarse woody material, small woody debris, live stakes and soil create a stable interlocking matrix. The top layers of sod mats provide instant stability above low flow conditions. If sod mats are not available, then coir fiber soil lifts may be used with select live stake materials.

1.02 RELATED SECTIONS

A. Related Sections include the following:

10. Section 01010 " Project Summary" for a description of project scope of work and utility protocols.

11. Section 02315 "Excavation and Fill" for associated excavation, fill, overall site grading, and topsoil placement upon clearing and grubbing completion.

12. Section 02924 "Seeding and Live Stake Installation" for subsequent seeding or installation of live stake materials.

1.03 REFERENCES

A. Michigan Department of Transportation (MDOT) Standard Specification for Construction, 1990.

PART 2 PRODUCTS

2.01 MATERIALS

A. Woody Materials: The coarse woody material shall be a minimum of 12 inches in diameter or greater and shall be different lengths interlocking together. Small woody material shall consist of small logs, limbs, tree tops and brush. Woody material shall be gathered from onsite trees and woody plants taken during the clearing and grubbing process.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that Woody Debris Toe materials are acceptable to ENGINEER and/or OWNER.

3.02 PLACEMENT

A. Construct Woody Debris Toe Protection by first shaping the bankfull channel to the grades specified, including scour pools and placement of gravel substrate. Next, excavate enough bank and bed material to place the woody debris for the structure. Build woody debris out from the existing bank at a depth equal to the typical pool cross sections shown in the plans. The woody debris and backfill matrix will cover the outer bank from the bottom of the pool up to the low flow stage. Woody debris shall not extend more than 12

inches beyond the bank into the channel at the upstream and downstream tie-in locations, and the woody debris should extend up to the low flow elevation to provide adequate depth of woody debris while keeping the wood saturated.

B. Next place boulders and soil excavated from on-site on top of woody debris up to bankfull stage as shown on the Drawings. The outer face of the coir fiber lifts shall match the slope of the proposed cross section. Coir Fiber soil lifts are to be built tight with adequate live stakes to have 3 per square yard along the bank. Live Stakes shall be installed as per described in the Live Stake technical specification.

3.03 METHOD OF MEASUREMENT

A. Measurement for Woody Toe Protection shall be per linear foot, installed to the satisfaction of the ENGINEER.

3.04 BASIS OF PAYMENT

A. Payment for Woody Toe Protection shall be per linear foot. The harvesting of woody material and slash from the project site is considered incidental for this item. Payment as specified shall be considered full compensation for all labor, materials, equipment and incidentals necessary to perform the Work as required.

END OF SECTION 02250

SECTION 02270

SOIL EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.01 WORK INCLUDES

A. Completion and submission of the required Soil Erosion and Sedimentation Control Permit.

B. Performing required site storm water inspections in accordance with permit and Michigan Department of Environmental Quality (MDEQ) rules and regulations.

C. Placement, maintenance, relocation, and removal of temporary erosion control measures.

D. Placement of permanent erosion control measures.

E. Placement of silt fence, turbidity curtains, culverts, sediment traps, excavated sediment traps, check dams, and other such effective measures deemed necessary to control soil erosion or as may be directed by the ENGINEER.

1.02 RELATED SECTIONS

A. Related Sections include the following:

13. Section 01010 " Project Summary" for a description of project scope of work and utility protocols.

14. Section 02315 "Excavation and Fill" for associated excavation, fill, overall site grading, and topsoil placement upon clearing and grubbing completion.

15. Section 02900 "Planting" for subsequent seeding or installation of specified plug, shrub, or tree species.

1.03 REFERENCES

A. Michigan Soil Erosion and Sedimentation Control Guidebook.

B. Soil Erosion and Sedimentation Control Measures (refer MDOT Standard Plans R-96-C or latest revision thereof).

C. Part 91 of Public Act 451.

D. Latest revision of the MDOT Standard Specifications for Construction.

1.04 SUBMITTALS

A. CONTRACTOR shall be responsible for obtaining all necessary Soil Erosion and Sedimentation Control (SESC) permits from the appropriate agencies.

B. The CONTRACTOR shall submit two (2) copies of the approved SESC permit to the ENGINEER prior to construction for ENGINEER'S approval.

C. The ENGINEER shall review the CONTRACTOR'S SESC plan and make any corrections and/or modifications to the SESC plan required by the permits and/or ENGINEER and return to the CONTRACTOR for incorporation into the Work.

D. Submit a minimum of two (2) copies of the SESC plan and Site Storm Water Operator's Certificate to the ENGINEER at the preconstruction conference.

1.05 QUALITY ASSURANCE

A. The CONTRACTOR shall maintain all temporary erosion and sedimentation controls during the period that the temporary controls are required and all permanent erosion controls until the Contract has been completed and accepted by ENGINEER and OWNER. Such maintenance shall consist of the repair of all damaged areas, replacement of defective measures, and periodic removal of sediment.

B. Any deficiencies in soil erosion and sedimentation control measures noted by ENGINEER shall be promptly remedied by CONTRACTOR at their expense.

PART 2 PRODUCTS

2.01 SILT FENCE

A. Shall be 24 inches high and constructed of post-supported, heavy geotextile filter cloth or approved equal.

2.02 STRAW MULCH

A. Straw mulch shall be clean, seed-free, salt-hay or threshed straw of wheat, rye, oats, or barley in areas where erosion control matting is not required.

2.03 EROSION CONTROL BLANKETS

A. North American Green C-125BN erosion control blanket, or an approved equal, consisting of a 100% coconut fiber held together with 100% biodegradable netting.

PART 3 EXECUTION

3.01 PREPARATION

A. CONTRACTOR shall stage equipment and materials in any location with prior approval of ENGINEER.

B. Trees and shrubs are not to be removed during erosion control measure placement unless located within the limits of installation, required by the Project Drawings, and/or with the express permission of the ENGINEER.

C. Verification of all erosion control measures, volumes, and quantities shall be the responsibility of CONTRACTOR.

3.02 DISPOSAL

A. Remove non-clean rubble and trash encountered during erosion control measure installation such as bricks, garbage, concrete, rebar, or debris, and legally dispose of them off landowner's property unless otherwise noted in accordance with the provisions of Section 02315 "Excavation and Fill."

3.03 PROTECTION

A. Protect existing site conditions and improvements to remain from damage during construction. Restore any damaged improvements to their original condition, as acceptable to OWNER.

3.04 SILT FENCE

A. This work shall consist of furnishing, erecting, maintaining, removing, and disposing of a silt fence, consisting of a post-supported geotextile. All material removed for trenching in the silt fence must be placed on the upstream side of the silt fence. In areas where water ponds behind the silt fence, a stone filter may be needed to outlet the water and prevent failure. Broken posts are to be replaced immediately at the CONTRACTOR'S expense.

B. If applicable, silt fence shall be installed around all designated topsoil stockpiles.

C. Silt fence must be trenched in a minimum of 6 – 12 inches.

D. Stakes shall be installed on the downslope side of the fence and along the same contour.

E. Joints shall be wrapped to provide seal between two runs of fence.

F. Silt fence ends shall turn uphill.

G. Fence shall be inspected every 7 days and after precipitation events.

H. Remove sediment in front of fence when sediment reaches 9 inches or 50% of its capacity, whichever is less.

I. Temporary silt fence shall be removed when the area is permanently stabilized and approved, unless ordered to be left in place by the ENGINEER. Temporary controls adjacent to lakes, watercourses, or wetlands shall be left in place until the adjacent slopes have turf establishment. Care shall be exercised during removal of erosion controls to minimize erosion or sedimentation into watercourses. Any damage caused during the removal operations shall be repaired at the CONTRACTOR'S expense.

3.05 STRAW MULCH

A. CONTRACTOR shall install blown straw mulch at a rate of 2 tons per acre in all seeded areas that are not covered with biodegradable erosion control fabric.

B. Mulch shall be applied in a uniform fashion leaving no areas of bare soil

C. Straw mulch shall be applied within 72 hours of seed installation.

D. Following installation, all straw mulch shall be crimped, punched, or otherwise secured in place

3.06 EROSION CONTROL BLANKETS

A. CONTRACTOR will install specified native seed mix depicted in Project Drawings and in accordance with Section 02924 "Seeding and Live Stake Installation."

B. CONTRACTOR will cover all disturbed areas within the filled ditch with North American Green C-125BN erosion control blanket, or approved equal, as depicted in the Project Drawings immediately after seed mixes are planted in accordance with Section 02900 "Planting." Blanket shall be pinned with 12-inch wire or wood staples spaced 3 feet on-center and 2 feet on-center along the outside edges.

3.07 PAYMENT

A. Payment for erosion controls shall be made on a per-unit basis, measured in place, based on costs provided in the Bid Form.

END OF SECTION 02270

SECTION 02315

EXCAVATION AND FILL

PART 1 GENERAL

1.01 WORK INCLUDES

A. Excavating soils as shown on the Project Drawings.

B. Stockpiling soils in the additional temporary workspace as shown on the Project Drawings.

C. Using excavated material to fill the toewood structure and bankfull bench areas as shown on the Project Drawings.

1.02 RELATED SECTIONS

A. Section 01010 "Project Summary" for a description of project scope of work.

B. Section 02500 "Project Utility Service" for utility protocols.

C. Section 02270 "Soil Erosion and Sedimentation Control" for associated erosion and sedimentation controls within restoration areas.

D. Section 02900 "Planting" for subsequent seeding or installation of specified species.

1.03 REFERENCES (Not Used)

1.04 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials. Topsoil shall have 4-8% organic matter, by weight.

B. Non-clean Rubble and Trash: Bricks, garbage, concrete with rebar, debris, scrap metal, wire, drainage tile remnants, or other non-natural materials occurring at the site.

1.05 SUBMITTALS (Not Used)

1.06 QUALITY ASSURANCE

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from OWNER and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. The CONTRACTOR shall notify MISS DIG, Utility Communications System, 800-482-7171, 72 hours prior to starting any excavating with power equipment. It is the CONTRACTOR'S responsibility to have utilities adequately located prior to starting any

and all work. If utilities are damaged during CONTRACTOR'S work, it is the sole responsibility of the CONTRACTOR to repair the utility to a condition as good or better than before the damage occurred. All cost for repairing utilities damaged by CONTRACTOR shall be paid by CONTRACTOR at no cost to the OWNER.

C. CONTRACTOR shall provide evidence that excavated soils have a total moisture content less than 100% as proportion of dry mass, which is equal to greater than 50% solids. Acceptable test methods shall include ASTM D2216 or D2974 or approved alternate.

D. The work shall be performed by properly trained and equipped personnel. All intrusive work involving potential contact with hazardous materials shall be performed by personnel that have completed initial and annual OSHA HAZWOPER training and medical surveillance, in accordance with 29 CFR 1910.120(e) and (f).

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 PREPARATION

A. CONTRACTOR shall be responsible for adhering to the site access plans and coordinating with each property owner and ENGINEER on travel corridors. The CONTRACTOR shall be responsible for any temporary roads, bridges, or culverts necessary to traverse the site and their removal after construction. Temporary structures shall be incidental to the excavations. Approval for all temporary structures or features shall be obtained prior to their installation.

B. CONTRACTOR shall coordinate with MDOT and the SCRC to obtain any required Right-of-Way Construction Permits prior to project initiation.

C. CONTRACTOR shall use all approved means necessary to control dust on and near the work, on and near all off-site borrow areas, and on all traveled surfaces if such dust is caused by the CONTRACTOR'S operations during performance of the work. All surfaces should be thoroughly moistened as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of any other work on the site, as directed by the OWNER or ENGINEER. Cost for performing dust control activities shall be regarded as incidental to the project.

D. CONTRACTOR shall be responsible for all costs associated with the excavation of soil. Any temporary roads or parking facilities required for haul trucks shall be the responsibility of the CONTRACTOR.

E. CONTRACTOR should assume all material is non-hazardous and does not contain contaminated material unless otherwise noted. Any concerns with excavated material composition should be brought to the attention of ENGINEER.

F. CONTRACTOR shall stage equipment in locations shown on the Project Drawings. Additional staging areas may be permitted with approval of ENGINEER.

G. Earth moving equipment and haul truck travel routes shall be minimized across the site to prevent excessive compaction of site soils. The CONTRACTOR shall mechanically disk all travel routes outside of existing concrete pads or road beds upon completion of work.

Travel routes should be graded flat to promote site drainage and avoid water retention or subsequent wetland development.

H. Trees and shrubs are not to be removed unless located within the limits of excavation, access/haul routes, required by the Drawings, and/or with the express permission of the ENGINEER.

I. Verification of earth excavation and topsoil quantities shall be the responsibility of CONTRACTOR.

3.02 DISPOSAL

A. Remove non-soil material, non-recyclable debris, or non-clean fill such as bricks, drainage tiles, or garbage, and legally dispose of them off landowner's property unless otherwise noted. All concrete and metal materials shall be recycled to the extent possible, with the remaining debris to be disposed of at a Type II landfill.

B. Excavated soil and clean fill may only be temporarily stockpiled as shown on Project Drawings or in a location approved by ENGINEER and landowners.

C. Any temporary material or debris stockpile locations shall be approved by ENGINEER.

D. CONTRACTOR should assume all material specifically listed in this section is non-hazardous and does not contain contaminated material unless otherwise noted.

E. CONTRACTOR shall be entirely responsible for their materials and equipment stored on the site pending disposal.

F. All debris and materials resulting from the demolition shall be removed from the site promptly as accumulated.

3.03 PROTECTION

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by OWNER or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify ENGINEER not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without ENGINEER'S written permission.

B. Benchmarks: Protect and maintain benchmarks and survey control points from disturbance during construction.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to OWNER.

3.04 GRADING AND FILL PLACEMENT

A. All required clearing shall be completed in accordance with Section 02200 Site Clearing, Removal of Dam Structure.

B. All fill placement shall be completed in accordance with Section 02315 Excavation and Fill

C. All required dewatering shall be completed in accordance with Section 02206.

D. Excavate, rough grade, and fill to the dimensions and grades shown on the Project Drawings or as directed by the ENGINEER.

E. As applicable, each 6-inch subsurface topsoil layer of fill shall be placed the full width of the cross section with each layer to be thoroughly compacted prior to placement of the next 6-inch layer.

F. Final height after compaction shall allow for settlement and 6 inches of topsoil placement to attain final grades as depicted on Project Drawings.

3.05 SOIL PLACEMENT AND FINAL GRADING

A. CONTRACTOR shall blend or mix soils, as appropriate, to ensure the upper 6 inches of soil in all areas proposed for planting or seeding on site is evenly mixed and contains a minimum of 5% organic matter by weight unless otherwise noted.

B. Following final grading, the top 6 inches of soil shall be loosened to an average 250 PSI (as measured with Dickey-John penetrometer) to allow for proper plant growth as needed.

3.06 PAYMENT

A. Payment for soil placement and grading will be made on a unit basis, for material removed from site, either per cubic yard or per ton. CONTRACTOR shall be responsible for maintaining truck slips or landfill records for material removed from site and shall submit with monthly invoicing. Payment for material placed on site will be paid on a lump basis and will be paid monthly based on an estimated percent complete. Final payment will be made based on a post-construction survey completed by the ENGINEER. The CONTRACTOR may complete its own post-construction survey for verification at its discretion.

END SECTION 02315

SECTION 02500

PROJECT UTILITY SERVICES

PART 1 GENERAL

1.01 MISS DIG

A. The CONTRACTOR shall notify MISS DIG, Utility Communications System, 800-482-7171, at least 3 working days prior to starting any excavating with power equipment. It is the CONTRACTOR'S responsibility to have utilities adequately located prior to starting any and all work. If utilities are damaged during CONTRACTOR'S work, it is the sole responsibility of the CONTRACTOR to repair the utility to a condition as good as or better than before the damage occurred. All cost for repairing utilities damaged by CONTRACTOR shall be paid by CONTRACTOR at no cost to the OWNER.

1.02 UTILITIES FOR CONSTRUCTION PURPOSES

A. Unless otherwise provided in the Specifications, the CONTRACTOR shall make their own arrangements for electricity, gas, water, and sewer services for use during the construction work and shall pay for all connections, extensions, and services.

1.03 RELOCATION OF ABOVE-GROUND UTILITIES

A. All power, light, telephone, and other public or private service poles, and all appurtenances extending above ground located within the limits of any necessary excavation and their appurtenant structures and/or the construction of any structure will be moved and relocated at no expense to the OWNER unless noted otherwise on the Project Drawings. For any utility located outside the above limits, which the CONTRACTOR wishes to have moved to facilitate the use of their equipment or progress of the work, the CONTRACTOR shall make the necessary arrangements with the owner of the utility to have it moved, and the CONTRACTOR shall pay any or all costs involved thereby. In the event that there is any question as to whether or not any utility is located within the limits of excavation as defined heretofore, the ENGINEER shall decide and their decision shall be binding upon the OWNER and upon the CONTRACTOR.

1.04 UTILITY LOCATION AND PROTECTION

A. The utilities shown on the Project Drawings are located according to the latest available information. The OWNER does not guarantee the accuracy of such information. The CONTRACTOR shall make a conscientious effort and shall provide reasonable assistance to the ENGINEER as may be required to verify the locations and/or elevations of all existing utilities that may be affected by the proposed construction.

B. At points where the CONTRACTOR'S operations are near the properties of railroad, telephone, and power companies or are near existing underground utilities, damage to which might result in considerable expense, loss or inconvenience, work shall not commence until all arrangements necessary for the protection thereof have been made.

C. The CONTRACTOR shall protect, shore, brace, support, and maintain all utilities affected by their operations. The CONTRACTOR shall be responsible for all damage to utility properties or facilities and shall make their own arrangements, satisfactory to the

OWNER, with the agency or authority having jurisdiction thereover concerning repair or replacement or payment of costs incurred in connection with said damage.

D. In the event of interruption of water or other utility services as a result of being exposed or unsupported, the CONTRACTOR shall promptly notify the utility owner and shall cooperate with the said owner in the restoration of service. If water service or other essential service is interrupted, repair work shall be continuous until the service is restored. No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire department.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION 02500

SECTION 02900

PLANTING

PART 1 GENERAL

1.01 WORK INCLUDES

A. Installing native 24-36-inch bare root trees and shrubs.

1.02 RELATED SECTIONS

A. Section 01010 "Project Summary" for a description of project scope of work.

B. Section 02315 "Excavation and Fill" for associated excavation, fill, overall site grading, and topsoil placement.

C. Section 02270 "Erosion and Sedimentation Controls" for associated erosion control measure installation.

1.03 REFERENCES (Not Used).

1.04 SUBMITTALS

A. All plant material shall be true to species and shall originate from the same EPA Level III Ecoregion as the site or an adjacent EPA Level III Ecoregion.

B. CONTRACTOR shall submit a copy of the final species list to the ENGINEER prior to installation.

C. All species substitutions must be approved by the ENGINEER.

1.05 QUALITY ASSURANCE

A. Planting shall be performed by a qualified contractor experienced in this type of work.

B. CONTRACTOR shall provide an on-site supervisor experienced in tree, shrub, and plug planting with a minimum 4-year degree in natural resources, biology, or related field.

C. Any and all work not completed to this specification shall be corrected by the CONTRACTOR at no additional cost to the OWNER.

D. CONTRACTOR shall guarantee 90% survival of plant species and shall replace plants until September 1, 2020 to meet this requirement at no additional cost to the OWNER. CONTRACTOR shall be solely responsible for all means necessary to meet this standard, whether it be watering, fertilizing, replanting, or other measure.

E. CONTRACTOR shall provide maintenance of plantings until September 1, 2020. Specifically, CONTRACTOR shall water, mow, or control invasive or unwanted species throughout the course of the 2020 growing season, at the direction of the ENGINEER.

PART 2 PRODUCTS

A. Materials must meet standards established in American Standard for Nursery Stock, ANSI Z60.1.

1. Bare root plants shall have a healthy, well branched root system characteristic of the species and with adequate spread.

2. Plant plugs shall be 38 or 50-cell sized material and true to species shown on Project Drawings.

3. 2 inch caliper trees shall be true native species and the trunk shall have a diameter no less than 2 inches at breast height (DBH). Trees must be potted or balled-and-burlap, unless otherwise approved by the ENGINEER.

PART 3 EXECUTION

3.01 TIMING

A. A. Trees for this project shall be installed between April 1 and June 1 in accordance with project schedule. If planting must be delayed due to tree or shrub availability, alternate timing must be approved by the ENGINEER.

B. Tree and planting zones are approximate. Trees shall be placed randomly in locations shown on the Project Drawings and with further on-site direction provided by ENGINEER.

3.02 METHODS

A. Excavation

1. The CONTRACTOR shall excavate a planting hole 1.5-2 times the size of the root ball. If the sides of the hole are glazed, they shall be sufficiently roughened prior to tree/shrub installation.

2. The depth of the planting hole shall correspond to the distance from the bottom of the root ball to the root collar, or slightly less.

3. Erosion control blanket or straw will be installed prior to tree planting in accordance with Section 31 25 00 Erosion and Sedimentation Controls. Holes shall be cut in erosion control blanket to allow the successful installation of trees while maintaining overall blanket integrity and function.

B. Installation

1. All trees shall be set with the top of the root collar at or slightly above finished grade. Trees shall be centered in the hole and set plumb. Wire baskets or string shall be removed from the top half of the root ball after the tree has been placed in the planting hole.

2. Bare root trees shall have their roots spread into a natural position, free of bunching, kinking, or circling. Soil shall be tamped into place so as to eliminate any air pockets present. Bare root trees may be installed utilizing soil auger, tree planting bar, shovel, or other appropriate hand tool.

3. Any planting methods not mentioned specifically shall conform to standards typically practiced for this type of work, and shall conform to the standards dictated in the *American Standard for Tree Care Operations, ANSI A300.*

4. Herbaceous plants shall be installed in groupings of 200-500 and shall be spaced approximately 18 inches on-center. Each grouping shall be enclosed with animal exclusion fencing.

5. All plants shall be installed at water levels within +/- 6 inches of the planned normal water level (NWL).

6. All herbaceous plants installed below water shall be secured in place with a 6-12 inch U-shaped metal sod staple. Alternate methods of securing plants will be considered if approved by the ENGINEER.

7. Inspection and Replacement. The CONTRACTOR will notify the ENGINEER when all work is completed, and the ENGINEER will make an inspection of the work. The CONTRACTOR shall remove all plants that are unacceptable in the opinion of the ENGINEER within 15 days of notification. Replacement plant installation, planting operations, and plant maintenance shall be in accordance with the original planting contract specifications. Replacement plants must be planted at the direction of the ENGINEER.

3.03 PAYMENT

A. Payment for plantings will be made on a per-unit basis based on costs provided in the Bid Form. Staking, exclusion fencing, or other similar items shall be considered incidental to the installation and shall be included with the unit costs for plantings.

END OF SECTION 02900

SECTION 02924

SEEDING AND LIVE STAKE INSTALLATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Installing native wetland and upland seed material as detailed on the Project Drawings.

B. Installing live stakes.

1.02 RELATED SECTIONS

A. Section 01000 "Description of the Project".

B. Division 2 Section 02222 "Excavation" for associated excavation, fill, overall site grading, and topsoil placement.

C. Division 2, Section 02270 "Erosion and Sedimentation Controls" for subsequent installation of erosion control measures and blankets over seeded areas.

1.03 REFERENCES (Not used).

1.04 SUBMITTALS

A. With the exception of the fescue seed, all plant material shall be true to species and shall originate from the same EPA Level III as the site Ecoregion or an adjacent EPA Level III Ecoregion.

B. CONTRACTOR shall submit a copy of the final species list to the ENGINEER prior to installation. All species substitutions must be approved by the ENGINEER.

C. All seed shall be PLS (Pure Live Seed) tested to ensure seed is of high quality. Seed quantities shall be adjusted to ensure a minimum of 85% PLS, according to the test results. CONTRACTOR shall provide PLS test results and a copy of the seed bag label at the request of the ENGINEER.

1.05 QUALITY ASSURANCE

A. Seeding shall be performed by a qualified contractor experienced in this type of work.

B. CONTRACTOR shall provide an on-site supervisor experienced in native plant seeding with a minimum 4-year degree in natural resources, biology, or related field.

C. Any and all work not completed to this specification shall be corrected by the CONTRACTOR at no additional cost to the OWNER.

D. Seeded areas shall have at least 80% ground cover of seeded species (including cover crop) after one full growing season following installation. The ENGINEER shall have the sole responsibility for determining if sufficient ground cover exists after one full growing season.

E. If the requirement of 1.5 (D) is not satisfied, the CONTRACTOR shall provide all equipment, labor, and materials necessary to reseed the deficient areas to be in conformance with 80 percent ground cover at no additional cost to the OWNER.

PART 2 PRODUCTS

2.01 PLANT SPECIES

A. Plant species and approximate quantities shall be as shown on Project Drawings. Approximate acreages have been listed for reference, but actual amounts may be altered according to actual site conditions. BIDDER will enter a per-acre cost for each zone.

2.02 LIVE STAKES

A. Live stakes are obtained by harvesting cuttings from an existing stand of the desired shrubs during the dormant season (November 15 – March 15). Live cuttings for live stakes shall be ½ to 1 ½-inch in diameter and 2.5-4-ft in length. Buds on the stakes shall be oriented in an upward direction. The basal ends shall be tapered to a point for easy insertion into the soil. The top shall be cut smooth and square. Side branches shall be removed with the bark left intact prior to installation.

B. The source of all live cuttings shall be purchased stock, located on-site or within the same ecoregion as the project location.

PART 3 EXECUTION

3.01 TIMING

A. Seed for this project shall be installed between March 15 and June 15 or September 15 and December 1 of a given year, unless otherwise approved by the ENGINEER.

B. Emergent seed and erosion control blankets shall be installed while the site is dewatered, unless not practical due to construction sequencing.

C. The harvest and installation of live stakes shall be performed only during the dormant season between November 1 and March 31, or as directed by the ENGINEER. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted for approval by the ENGINEER. All materials and construction techniques shall be inspected and approved the ENGINEER prior to installation.

3.02 METHODS

A. Seed shall be installed utilizing one of the following methods:

1. Seed shall be installed by hand broadcasting or by utilizing a no-till native seed drill (Truax, Tye, Great Plains, or approved equal) OR a native drop seeder (Truax Trillion seeder). Only seeding equipment manufactured for native seed installation shall be utilized. Seed shall not be placed more than 1/8-inch into the soil.

2. In areas too wet to seed with machinery, seed shall be hand-broadcast by incorporating seed into wet soil clumps and distributing throughout target area. The ENGINEER must approve use of this technique prior

to implementation and must be present at the start of implementation to ensure proper execution.

3. Seed shall not be installed via hydroseeding equipment under any circumstances.

B. Live materials must be protected against drying out and overheating during transport. They shall be transported in covered, un-heated vehicles, moistened and kept in soak pits and on-site prior to installation. Live materials shall receive continuous shade, sheltered from the wind and continuously protected by drying out by heeling into moist soils. Where water is available, live cuttings shall be sprayed or immersed. Warm water stimulates growth and shall only be used by approval of the ENGINEER. Any costs associated with storage are incidental to overall costs for purchase and installation.

C. Live stakes shall be planted in a dormant state, typically in early spring. Along streambanks live stakes shall be planted in pilot holes in tight soils or directly into loose soils and shall be set in roughly diagonal patterns at the spacing specified on the plans. Cuttings may be driven into stone or riprap areas, provided that the cuttings are ultimately driven into soil or gravel. Holes in stone areas can be opened up by driving a rebar rod (or suitable implement) that can be used as a lever to enlarge openings between stones.

D. The cutting must be driven at least two-thirds and preferably four-fifths into the ground to promote rooting and prevent desiccation. No more than 6 to 8-inches of the stake shall be exposed. The CONTRACTOR shall use a dead blow hammer for driving the stake into the ground. Live stakes shall be installed with buds facing upward.

E. All live stakes split during installation may be left in place but must be supplemented with a new live stake that is un-split after it is installed.

3.03 SOIL PREPARATION AND FERTILIZER

A. See Section 02315 Excavation and Fill for soil preparation details.

B. No fertilizer shall be required.

C. No mulch shall be required.

END OF SECTION 02924

DIVISION 13

SPECIAL CONSTRUCTION

SECTION 13100

FLOATING DOCK, KAYAK LAUNCH, AND GANGWAY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floating dock system.

B. Kayak and canoe launch with accessible transfer system.

C. Gangway.

1.02 SUBMITTALS

A. Submit the following in accordance with Conditions of the Contract and necessary product specifications.

1. Product Data: For each listed component and component accessory.
2. Shop Drawing: Show the layout of the floating dock system, kayak and canoe launch with Gangway, and attachments to other work.
   a. Include details of each component and component accessory including connections.
   b. includes required recycled content of product.
3. Samples: For each exposed finish and profile.
4. Material Certifications.
5. Recycled Material Content Documentation
6. Product Test Reports.
7. Maintenance Data.
8. Warranty.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer. Installer's responsibilities include fabricating and installing and providing professional engineering services needed to assume engineering responsibility. The dock system, anchorage, and connections shall be designed according to the recommendations of the American Society of Civil Engineers Manual and Report on Engineering Practice Number 50, "Planning and Design Guidelines for Small Craft Harbors", the revised edition.

1.04 WARRANTY

A. Floatation (8 Years) – Modular dock units and lifts are warranted against cracks, breakage, leaks, and ultraviolet deterioration caused by defects in material and manufacturing workmanship for a period of eight (8) years from the date of final acceptance by the OWNER.

B. Hardware and Accessories (1 Year) – Hardware and accessories are warranted against defects in material and manufacturing workmanship for a period of one (1) year from the data of final acceptance by the OWNER.

PART 2 COMPONENTS

2.01 FLOATING DOCK SYSTEM

A. Float and Deck Design

1. The docking surface and float structure shall be constructed as a single, integrated component. Each section shall support the dead load plus a live load of 62.5 lbs. /soft.

2. Individual dock stations shall consist of a specified number of interior, air filled pylons. Each pylon shall support the dead load plus a live load of 55 pounds and have a volume of no less than 1540 cubic inches (in3).

3. Individual dock sections shall be constructed of Virgin Polymers, Thermoplastic, and Rotational Molding Grade Linear Low Density Polyethylene (LLDPE) with an ultraviolet inhibitor system (UV-16) or better spectrometer specifications.

   a. Standard color: Beige

   b. The density of the section shall be approximately .932 grams per cubic centimeter (g/cm3) or .0338 pounds per cubic inch (lbs. /in3), per ASTM 792-00.

   c. The dock section shall have a cold brittleness temperature equal to, or less than, -130 degrees Fahrenheit (F), per ASTM D-746

4. Dock section exterior wall thickness properties:

   a. The mean exterior material thickness shall be no less than .310 inches (in).

   b. The corners shall be no less than .650 inches (in).

   c. The exterior edge thickness shall be no less than 0.50 inches (in) at any particular point.

   d. The walls of the dock sections shall resist a shear of no less than 1900 pounds per square inch (lb. /in2) per ASTM D-732, as well as having the capability of resisting a mean minimum impact of no less than 207 foot pounds (ft-lb), per ASTM D5420.

   e. The tensile strength at average failure shall be no less than 2550 pounds per square inch (lb. /in2) width 14% elongation at yield, per ASTM D-638-03.

5. The decking surface shall be composed of a textured surface with a grid pattern. The decking surface shall have 0.5 inch (in.) wide by 0.5 inch (in) deep drainage troughs positioned at intervals no less than 4.5 inches and no greater than 6.5 inches over the entire length of the dock.

   a. The deck shall have coefficient of friction equal to 0.35 during dry conditions and 0.61 during wet conditions per ASTM D2394.

b. The mean deck thickness shall be no less than 0.315 inches (in).

c. The deck thickness shall be no less than 0.290 inches (in) at any particular point.

d. The deck shall resist a punching shear no less than 1900 pounds per square inch (lb. /in2), per ASTM D-732.

e. The deck shall resist a minimum impact of no less than 120-foot pounds (ft-lb) near the center, or at the point where the deck is thinnest, per ASTM D-3029.

f. The deck shall resist a minimum impact of no less than 150 foot pounds (ft-lb) within 16 inches (in) of the outside of the dock, per ASTM D-3029.

B. Floating Dock Structure

1. The dock structure, as a whole shall consist of the individual sections, which are to be coupled together in the configuration on the Architectural drawings. Any material used in the dock structure shall provide for resistance to rust, corrosion, and the effects of any fuel or gasoline.

2. The dock structure shall act as one unit when assembled, so that wave and/or wind action shall produce a minimum amount of motion. The structure shall be secured with piles, securing shall allow the structure to rise and fall freely with any water level changes and allow the structure to span waves from crest to crest.

C. Connections of Dock Sections

1. Each dock section shall have molded-in female-type pockets spaced symmetrically along the top and bottom edges, around the entire perimeter of the dock section. Pockets shall be spaced at 19.5 inch (in) intervals, center line to center line, from each other. All un- used pockets are to be filled with the manufacturer's pocket filler.

2. The molded-in female-type pockets shall accept a male-type coupler which shall be secured into the female pocket with the use of a 0.5 inch (in) x 13 (in) coupler bolt and nut.

3. Each connection point shall allow for some slippage that will allow for disconnection without causing damage either to the male-type couplers of the female-type pockets.

4. The dock sections shall be connected at increments of 19.5 inches (in), in relation to each other. These connections may be made from any one side of any dock section to any other side of another dock section.

5. The male-type coupler shall be constructed of recycled post/pre-consumer recycled tire rubber and shall withstand a pullout force of no less than 2500 ponds (lb.) before failure of coupler occurs.

6. Each of the molded in female connection pockets shall provide for a pullout strength of no less than 3500 pounds (lb.), before damage is caused to the dock station.

7. The accessories shall be connected to the dock system through the use of molded in coupler pockets around the perimeter of the dock sections by the

use of either male or female type half-couplers. The male-type half-coupler shall have a 3.625 inch "T"-bolt embedded within it. The female type half-coupler shall have a 3.625 inch "T"-nut embedded within it. Both types of half-coupler shall withstand a pullout force of no less than 2600 pounds (lb.) before failure occurs.

D. Anchorage

1. The dock system shall be designed to allow for the use of proper anchorage based on the environmental and water conditions at the installation site.

E. Security Curbing

1. Security curbing shall be provided around the perimeter of floating dock.
2. Color: Brown.

F. Load Design

1. Dead Load
   a. The dead load shall consist of the entire dock system plus any additional attachments to the dock system.
   b. Each dock section, without additional attachments, shall provide a freeboard of approximately 12.75" inches (in).
   c. The surfaces of adjacent deck surfaces shall have an elevation difference of no more than 0.125 inches (in).
   d. The deck surface of each 80 inch (in) X 10 foot (ft.) dock section shall not slope more than 0.35 inches (in) over the width of dock section.
2. Live Load Due to Vertical Loads
   a. Under dead load conditions plus an additional 30 pounds per square foot (lb. /ft.2) of uniform live load, flotation shall provide for a minimum of 7 inches (in) of freeboard.
   b. The dock structure shall support a concentrated vertical load of up to 400 pounds (lb.) at any particular point on the surface of the deck. The structure shall accomplish this while maintaining flotation.
3. Live Load Due to Horizontal Loads
   a. The dock system shall sustain the stated design loads applied by normal current and/or debris which are normal to a particular location.
   b. The dock system shall be capable of sustaining continuous wave action of up to 1 foot and occasional wave action not in excess of 3 feet during storm conditions.
   c. The dock sections shall sustain any loads applied by non-moving ice without damage.
   d. The dock system shall be compatible for the use of any boat or vessel size with a properly designed anchorage/mooring system.

e. The dock system and anchorage shall be capable of withstanding sustained wind loads of 77 miles per hour (mph), or 15 pounds per square foot (lb. /in2), at 100% boat occupancy, unless otherwise specified.

2.02 Kayak and Canoe Launch Accessible Transfer System

A. Entry Launch

1. The body of the entry launch shall be constructed of the same material as the floating dock system. See Section 2.1, A for all applicable material properties.
2. The entry launch shall have rollers to allow for water soft movement.
3. The entry launch shall have anodized aluminum side rails mounted on each side.
4. All hardware shall be stainless steel or anodized aluminum rated for marine grade.
5. Provide a stainless steel connection kit compatible with the launch and dock systems.

B. Accessible Transfer Bench and Grab Rail

1. The accessible transfer branch and its components shall be constructed of marine grade anodized aluminum.
2. The accessible transfer bench shall provide two vertical heights.
3. The accessible transfer bench shall provide two projecting transfer slide boards that lands securely on the grab bar.
4. The grab bar shall be constructed of marine grade anodized aluminum and mounted to the entry launch.

2.03 Gangway

A. Gangway Design

1. All construction is to be accordance with the minimum provisions of States Organizations for Boating Access (SOBA) and the guidelines stated by, "Marines and Small Craft Harbors".
2. Gangway shall be constructed of marine grade 6061-T6 aluminum. All welds shall conform to the American Welding Society Structural Welding Code for aluminum.
3. All non-self-drilling fasteners shall be 300. Series stainless steel.
4. Gangways shall be designed to support 90 pounds per linear foot (lbs. /film). The deck and structural components shall be designed to support a concentrated load of 400 pounds applied to any 12 inch X 12 inch square. Lateral designed wind loads shall not exceed 77MPH.
5. Handrails shall be continuous along both sides of the walking surface and shall extend 12 inches past the walking surface on both ends. The top rail portion shall not be less than 34 inches no more than 38 inches above the walking surface. The ends of the handrails shall be returned into the

handrail body or terminate with no sharp or catching edges. The mounting and components of the handrails shall be capable of withstanding a lateral load of 50 pounds per linear foot.

PART 3 EXECUTION

3.01 Experience

A. The contractor of the floating dock system, kayak launch, and gangway shall have evidence of satisfactory experience for a minimum of five years in design, manufacturing, and installation of all components herein specified.

B. To demonstrate competence, the CONTRACTOR shall be required to submit to the OWNER, a listing of a minimum of three projects for which he has furnished the components specified herein.

3.02 Fabrication

A. All components specified herein shall be manufactured at a facility adequately equipped to accomplish the manufacturing process and delivered ready for assembly at the site.

3.03 Shipping

A. Shoring for transit shall be provided. Contractor shall incur all costs for the replacement of all damaged components.

3.04 Installation

A. All components specified herein shall be carefully unloaded and kept in orderly piles or stacks until installed.

B. All components specified herein shall be securely tied to avoid wind damage until permanent connections are made.

C. Wherever possible, parts shall be mounted so that they can be removed and replaced without interference from, injury to, or removal of other parts.

3.05 Contractor's Supervision

A. The contractor shall provide a qualified representative at the job site during the assembly, installation, and anchorage of all components specified herein.

3.06 Cleaning and Protection

A. Remove temporary protective coverings and strippable films, if any, as the floating dock, kayak launch, and gangway are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, clean finished surfaces as recommended by the manufacturer. Maintain in a clean condition during constructions.

END OF SECTION 13100

SECTION 13200

DESIGN/BUILD TIMBER PANEL LAM RECREATION PLATFORM

PART 1 GENERAL

1.01 SCOPE

A. The Contractor shall be responsible for designing, detailing, fabrication, delivery, construction and erection of the Timber Panel-Lam Recreation Platform.

1.02 UNIT PRICES

A. Payment for "Design/Build Timber Panel-Lam Recreation Pier" shall be compensation in full for all costs of design, supply, fabricating, and installation for recreation platform.

1.03 REFERENCES

A. AASHTO LRFD Bridge Design Specifications, current edition and interims.

B. AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, current edition.

C. American Wood Protection Association (AWPA) Standards, current edition.

D. American Wood Council (AWC) National Design Specifications (NDS) for Wood Construction.

E. American Institute for Timber Construction (AITC), Timber Construction Manual.

PART 2 DESIGN

2.01 TIMBER PANEL-LAM RECREATION PLATFORM

A. Recreation platform shall be "Timber Panel-Lam Recreation Platform" as designed by Wheeler, or approved equal.

Distributor: Krenn Timber Bridge
Bob Krenn
269.207.7483
krenntimber@gmail.com

B. Platform superstructure shall be designed using longitudinal dowel-laminated timber deck panels.

C. Design shall be in accordance with AASHTO specification, all current interims and the following criteria:

1. Platform dimensions:
   a. See plan documents for platform dimensions.
2. All dead loads, applied dead loads, live loads, and wind loads as specified in the AASHTO specification.
3. Live loads:
   a. 90 psf pedestrian load.
   b. Point Load = 1000 lbs plus 33% impact, applied at a single point.

c. Lateral Wind Load = 35 psf on the full height of the bridge as if enclosed.

d. Uplift Wind Load = 20 psf applied at the windward quarter point of the bridge width.

4. Deflection requirements according to AASHTO.

D. Railing shall be provided on the full perimeter of platform. At least 25% of the total railing length shall be 30" above deck surface. 30" railing is also required at fishing stations. Remaining railing height shall extend at least 42" above deck surface. The orientation of the safety rail elements shall be horizontal.

E. Horizontal safety rails shall contain a 4" sphere.

F. Railing shall include a 4" minimum toe rail located no more than 2" clear above the deck. Toe rails shall be designed per AASHTO as horizontal rails.

G. The platform shall be founded on driven timber piles to the minimum penetration and capacity as designated by final design. Contractor shall provide pile driving records to verify pile penetration and capacity.

H. Design and materials for connection of superstructure to substructure shall be included with the superstructure and compatible with substructure design.

I. Bearing elevations, structure depth, clearance and profile grade must conform to site conditions.

PART 3 MATERIALS

3.01 STRUCTURAL TIMBER

A. This section shall include only such lumber and timber, as is part of the completed work. It shall not include falsework, forms, bracing, sheeting or other lumber and timber used for erection purposes.

B. Lumber and timber shall meet the requirements of AASHTO M168.

C. Knotholes and holes from causes other than knots shall be measured and limited as provided for knots. All visible pieces of lumber and timber having knots that are unsightly in appearance shall be rejected. Cluster knots and knots in groups are not permitted.

D. Only pieces consisting of sound wood free from any form of decay shall be accepted. No piece of exceptionally light weight shall be accepted.

E. Lumber and timber shall conform to the dimensions specified for either rough or surfaced stock.

F. Lumber and timber to be graded as per WWPA Western Lumber Grading Rules or SPIB Standard Grading Rules for Southern Pine Lumber as applicable.

3.02 PRESERVATIVE TREATMENT

A. This section covers the wood preservatives and the preservative treatment of lumber, timber, and posts conforming to the Specifications as referenced or otherwise specified in the plans. Temporary bracing shall not require preservative treatment.

B. Preservative treatment of lumber and timber shall be by the pressure process in accordance AWPA Standards and AASHTO Designation M 133.

C. Lumber and timber used for deck panels, pile caps and piling shall be pressure treated with Copper Naphthenate in AWPA P9 Type A Hydrocarbon Solvent in accordance with AWPA P-36 and HSA-14 with retentions to meet AWPA UC4B.

D. Lumber used for rail posts, safety railing and cap rail shall be treated with a waterborne preservative meeting the requirements of AWPA UC3B.

E. Unless otherwise directed by the ENGINEER the material shall be graded prior to treatment. Material shall be accepted after treatment on the basis of its condition prior to treatment, on the basis of inspection of the treatment procedure substantiated by plant records, on the condition of the material after treatment and on absorption, penetration and visual inspection.

F. So far as practicable all adzing, boring, chamfering, framing, gaining, mortising, surfacing and general framing, etc., shall be done prior to treatment. If cut after treatment, coat cut surfaces according to AWPA M4.

G. F. All Douglas Fir and other species that are difficult to penetrate shall be incised prior to treatment.

3.03 HARDWARE

A. All hardware (machine bolts, carriage bolts, drift pins, lag screws, dowels, rods, nails, spikes, washers, connectors, etc.) shall conform to ASTM 307-97.

B. Unless a Dome Head Bolt or approved equal is used, all bolt heads or tightening nuts in contact with Structural Timber and lumber shall have a washer of sufficient thickness and bearing area to ensure a minimum deformation of the contacted surface when tightened to develop not more than the maximum allowable tensile stress of that bolt

C. Bolt heads or tightening nuts in contact with metal surfaces shall have a cut washer or approved equal placed between the bolt head or nut and the metal surface.

D. All hardware shall be hot-dipped galvanized in accordance with AASHTO M111-91.

PART 4 SUBMITTALS

4.01 SEALED PLAN

A. A detailed platform plan and supporting calculations sealed by a Professional Engineer registered in the State of Michigan and experienced in heavy timber design shall be submitted to the OWNER within 2-4 weeks after award of contract.

B. The bridge plan shall be unique and include all design details and all details necessary for the fabrication and installation of the bridge superstructure. Details of individual fabricated pieces are not required.

C. Structural calculations for the design of the platform shall include complete design, analysis and code checks.

4.02 TIMBER CERTIFICATION

A. Solid sawn timber members shall conform to the requirements of the grading rules agency for the species, type, and grade specified in the plans, or as referenced in the Specifications. Glued-Laminated members shall conform to the American Institute of Timber Construction 117-201 for the combination, species, use, and appearance as specified in the plans or referenced in the Specifications. Grading Agency Certification is required on all timber material.

B. The manufacturer shall be regularly engaged in the production of the specified product or item and provide certification of the fabrication process performed by a third party agency that is accredited by the American Lumber Standards Committee (ALSC), as specified in the ALSC Treated Wood Program.

PART 5 QUALITY ASSURANCE

5.01 MANUFACTURER

A. All material shall be well manufactured. All lumber and timber shall be straight, well sawed, sawed squared at ends and have opposite surfaces parallel unless otherwise required by the plans and specifications.

B. Deck panels shall be assembled with 3/8" diameter ring shank dowels. All dowels are to be simultaneously driven with equal force using a mechanical press the full length of the deck, ensuring all heads are flush with the surface of the timber plank. Multiple impact tools are not to be used to set dowels because of potential for wood fiber rupture.

C. Deck panels to be delivered to jobsite after being fully assembled at fabrication plant.

D. All plank for deck panels shall be precision end trimmed to length with 1/4 inch underlength and no overlength tolerance permitted.

5.02 WORKMANSHIP

A. Workmanship shall be first class throughout. Nails and spikes shall be driven with sufficient force to set the heads flush with the surface of the wood, thus ensuring the surface shall be free from deep or frequent hammer marks.

B. Proper pre-drilling of holes for screws, nails, spikes, lags or bolts where necessary to avoid splitting of timber will be required.

5.03 HANDLING

A. Lumber and timber shall be handled with sufficient care to avoid breaking through portions penetrated by treatment, and thereby exposing untreated wood. Chains, peavies, cant hooks, pickaroons, timber dogs, pike poles and other pointed tools that would burr, blemish, penetrate or permanently deform the contacted member shall not be used. Rope, rubber or fabric slings.

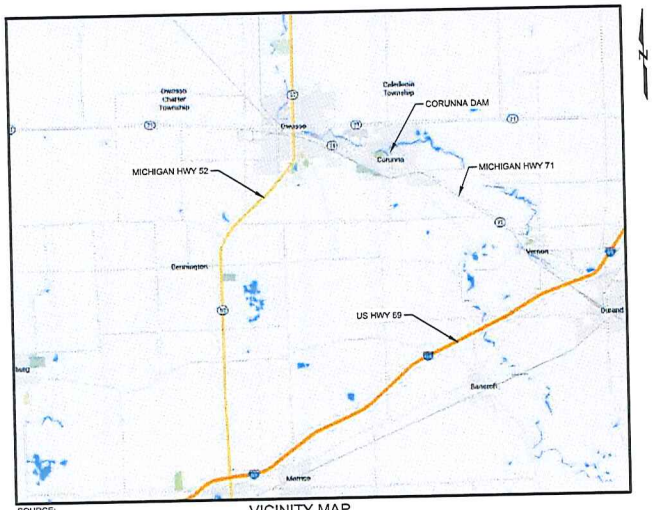
END OF SECTION 13200

Attachment A

Project Drawings
(submitted under separate cover)

CORUNNA DAM REMOVAL AND PARK IMPROVEMENTS PROJECT

CITY OF CORUNNA, MICHIGAN
ISSUED FOR BID DRAWINGS



SOURCE: ESRI WORLD STREET MAP

VICINITY MAP
(NOT TO SCALE)

SOURCE: ESRI WORLD IMAGERY

SITE LOCATION MAP
(NOT TO SCALE)

SHEET INDEX

SHEET NO.	DRAWING NO.	TITLE
1	G-01	COVER SHEET
2	G-02	NOTES, ABBREVIATIONS AND LEGEND
3	C-01	KEY PLAN
4	C-02	SITE PHOTOS
5	C-03	EXISTING CONDITIONS - DAM SITE
6	C-04	EXISTING CONDITIONS - N. BRADY STREET
7	C-05	SITE ACCESS AND PREPARATION PLAN
8	C-06	PROPOSED TRAFFIC DETOUR DURING CONSTRUCTION
9	C-07	PROPOSED CONDITIONS - DAM SITE
10	C-08	PROPOSED STREAM PROFILE
11	C-09	PROPOSED CROSS SECTIONS (1 OF 6)
12	C-10	PROPOSED CROSS SECTIONS (2 OF 6)
13	C-11	PROPOSED CROSS SECTIONS (3 OF 6)
14	C-12	PROPOSED CROSS SECTIONS (4 OF 6)
15	C-13	PROPOSED CROSS SECTIONS (5 OF 6)
16	C-14	PROPOSED CROSS SECTIONS (6 OF 6)
17	C-15	N. BRADY STREET CANOE/KAYAK LAUNCH PROPOSED - SITE PLAN
18	C-16	SHIAWASSEE ST PARKING LOT - SITE PLAN
19	C-17	DAM PROPOSED CONDITIONS - SITE PLAN
20	C-18	RESTORATION PLAN - DAM SITE
21	C-19	RESTORATION PLAN - N. BRADY STREET
22	C-20	STREAM RESTORATION DETAILS
23	C-21	SITE DETAILS
24	C-22	VIEWING PLATFORM PLAN AND SECTION
25	C-23	REINFORCED EARTH EMBANKMENT

SOURCE: GEI CONSULTANTS, INC.

MICHIGAN STATE MAP
(NOT TO SCALE)

PREPARED FOR:

CITY OF CORUNNA
402 NORTH SHIAWASSEE
CORUNNA, MI 48817
(989)743-3650
CONTACT: JOE SAWYER,
CITY MANAGER

PREPARED BY:

GEI CONSULTANTS OF MICHIGAN, P.C.
940 N. MAIN STREET
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CONTACT: SCOTT DIERKS, PE

GEI Consultants

MICHIGAN TRUST FUND GRANT NO. 16-0052
MICHIGAN DNR DAM MANAGEMENT GRANT NO. 15-004
U.S. FISH & WILDLIFE SERVICE FISH PASSAGE GRANT NO. F16AC01138

GEI PROJECT NO. 1610412

THE WORK DEPICTED IN THESE PLANS IS TO BE CONSTRUCTED TO MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2012 EDITION UNLESS OTHERWISE NOTED.

Issued For Bid

NO.	DATE	ISSUE/REVISION	APP
1	1/7/2019	ISSUED FOR BID	SD
0	3/14/2018	PERMIT DRAWINGS	SD

DWG. NO. G-01

SHEET NO. 1 OF 25

GENERAL PROJECT NOTES

1. ALL DISTURBED AREAS SHALL BE RESTORED IN KIND UNLESS SPECIFIED IN THE CONSTRUCTION DOCUMENTS.
2. CONTRACTOR SHALL NOTIFY MISS DIG 811 A MINIMUM OF 3 WORKING DAYS PRIOR TO CONSTRUCTION BEGINNING (FIELD VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES).
3. THE CONTRACTOR WILL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF THE EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLAN.
4. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE LAWS OF THE STATE OF MICHIGAN AND MICHIGAN OSHA SAFETY RULES AND REGULATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY REMAINING ITEMS AND MATERIALS LOCATED WITHIN THE INFLUENCE OF CONSTRUCTION.
6. CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION PLAN PRIOR TO PERFORMING ANY WORK.
7. PRIMARY SITE ACCESS SHALL BE FROM THE EAST OF THE DAM. ACCESS THE WEST SIDE SHALL BE ACCOMPLISHED VIA THE RIVER OR ALTERNATIVE ACCESS AREAS.
8. MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING INTO THE RIVER DURING ALL CONSTRUCTION ACTIVITIES. IF DEBRIS DOES ENTER THE RIVER IT SHALL BE REMOVED IMMEDIATELY.
9. INSTALL TURBIDITY CURTAIN PRIOR TO CONSTRUCTION WHERE EXCAVATION BELOW WATER SURFACE OCCURS. CONTRACTOR MAY RELOCATE TURBIDITY CURTAIN TO A NEW WORK AREA AFTER STABILIZING PRIOR WORK AREA.
10. EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS AND SPECIFICATIONS CONTAINED THEREIN, ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND ALL APPLICABLE SHIAWASSEE COUNTY STANDARDS. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS/STANDARDS/ORDINANCES.
11. ANY EXISTING UTILITIES, PAVEMENT, CURBS, SIDEWALKS, STRUCTURES, TREES, ETC., NOT PLANNED FOR DEMOLITION OR REMOVAL THAT ARE DAMAGED OR REMOVED SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
12. MANHOLE FRAMES, COVERS, VALVES, CLEANOUTS, ETC. SHALL BE RAISED TO FINISHED GRADE PRIOR TO FINAL PAVING CONSTRUCTION.
13. ALL AREAS DISTURBED OR EXPOSED DURING CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. HOWEVER, THE TYPE OF REVEGETATION MUST EQUAL OR EXCEED THE TYPE OF VEGETATION PRESENT BEFORE CONSTRUCTION UNLESS OTHERWISE SPECIFIED.
14. ANY METHODS, STREET MARKINGS, AND SIGNAGE NECESSARY FOR WARNING MOTORISTS, WARNING PEDESTRIANS, OR DIVERTING TRAFFIC DURING CONSTRUCTION SHALL CONFORM TO THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION.
15. ALL PAVEMENT MARKINGS, MARKERS, PAINT, TRAFFIC BUTTONS, TRAFFIC CONTROLS, AND SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, AND BRIDGES AND THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.
16. ALL PUBLIC STREETS THAT ARE TO BE CLOSED OR INTERRUPTED DUE TO THE CONSTRUCTION ACTIVITIES WILL REQUIRE COORDINATION WITH THE CITY OF CORUNNA FOR A PUBLIC SERVICE ANNOUNCEMENT, A MINIMUM OF 72 HOURS NOTICE WILL BE GIVEN TO THE CITY FOR SAID CLOSURES OR INTERRUPTIONS.
17. THE HOURS OF CONSTRUCTION OPERATIONS WILL FOLLOW THE NOISE RESTRICTIONS AS PER CITY OF CORUNNA ORDINANCE, OR 7AM-7PM, WHICHEVER IS SHORTER.
18. AT NO TIME SHALL EXCAVATED MATERIAL(S) OR IMPORTED MATERIAL(S) BE STOCKPILED ON PAVED ROADWAY SURFACES. IF THE PAVED ROADWAY SURFACE IS DAMAGED BY THE CONTRACTOR AS A RESULT OF STOCKPILING EXCAVATED MATERIAL(S) OR IMPORTED MATERIAL(S) ON PAVED ROADWAY SURFACES, THE CONTRACTOR SHALL BE REQUIRED TO REPAIR THE PAVED ROADWAY SURFACE AT NO ADDITIONAL COST TO THE OWNER.
19. 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 TO THE OWNER.
20. CONTRACTOR SHALL PROVIDE ADEQUATE SUPPORT AND BRACING DURING EXCAVATION, DEWATERING, AND BACKFILLING OPERATIONS TO PROTECT THE STRUCTURAL INTEGRITY OF ALL CURBING, SHOULDERS, SEWERS, PAVED AREAS, AND UTILITIES LOCATED WITHIN THE PUBLIC ROAD RIGHT-OF-WAY. SHEETING AND BRACING SHALL BE REQUIRED WHEN ANY EXCAVATION IS LOCATED WITHIN THE 1-ON-1 SLOPE FROM THE SHOULDER POINT OR BACK OF CURB TO THE BOTTOM OF ANY EXCAVATION.
21. SAFETY REQUIREMENTS SHALL BE CONFORMED TO AND ALL OPERATIONS SHALL BE CONDUCTED SO AS NOT TO DAMAGE, DESTROY, OR ENDANGER THE INTEGRITY OF THE ROADWAY PAVEMENT STRUCTURE. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE CONDUCTED IN ACCORDANCE WITH MIOSHA SAFETY RULES AND REGULATIONS.
22. THE CONTRACTOR SHALL NOT BE PERMITTED TO PERFORM SITE CLEARING AND GRUBBING OUTSIDE OF THE LIMITS INDICATED ON THE DRAWINGS.
23. ALL ROADS WITHIN THE INFLUENCE OF THE PROJECT MUST REMAIN CLEAN AT ALL TIMES. CONTRACTOR SHALL SWEEP ROADS AS DIRECTED BY THE OWNER OR ENGINEER.
24. ALL CONSTRUCTION DEBRIS SHALL BE CLEANED UP AT THE END OF EVERY WORKING DAY.
25. ALL EXCAVATIONS AND OTHER WORK AREAS SHALL MEET OSHA SAFETY STANDARDS. NO EXCAVATIONS SHALL REMAIN OPEN WHILE UNATTENDED BY THE CONTRACTOR.

SOIL EROSION CONTROL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PLACED BY THE CONTRACTOR SHALL BE IN FULL COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING AND OBTAINING ALL APPLICABLE SOIL EROSION AND SEDIMENTATION CONTROL PERMITS.
3. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACK FILLING AND/OR GRADING OPERATIONS.
4. SPECIAL PRECAUTIONS SHALL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
5. CLEANUP SHALL BE DONE IN A MANNER TO ENSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.
6. THE PROJECT SHALL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENTATION CONTROL COMPLIANCE. DEFICIENCIES SHALL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS OF NOTICE.
7. CONSTRUCTION SHALL DISTURB LESS THAN 5 ACRES, THUS A NPDES STORM WATER DISCHARGE PERMIT SHALL NOT BE REQUIRED. ANTICIPATED AREA OF DISTURBANCE IS APPROXIMATELY 4.75 ACRES.
8. BEST MANAGEMENT PRACTICES FOR SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE USED ON THIS PROJECT AS SHOWN ON THE PLANS AND AS DEFINED BY THE ENGINEER.
9. TURF RESTORATION OF DISTURBED AREAS SHALL INCLUDE 3 INCH TOPSOIL SURFACE, NATIVE UPLAND SEED MIX, CHEMICAL FERTILIZER NUTRIENT, AND MULCH BLANKETS. APPROXIMATE AREA OF TURF RESTORATION IS 0.36 ACRES.
10. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL ON THE SITE THROUGHOUT THE DURATION OF THE CONSTRUCTION PROCESS.

WATER CONTROL NOTES

1. CONTRACTOR SHALL SUBMIT A PLAN FOR WATER CONTROL TO THE ENGINEER FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO BEGINNING WORK.
2. CONTRACTOR SHALL PERFORM ALL EXCAVATING AND FILL IN THE DRY.
3. SHIAWASSEE RIVER FLOW DATA IS SHOWN ON THE TABLE. CONTRACTOR IS RESPONSIBLE FOR SIZING WATER CONTROL FACILITIES TO PROTECT WORK.
4. THE EXISTING MILL RACE MAY BE USED FOR DRAWN DOWN AND WATER CONTROL

SURVEY NOTES

1. TOPOGRAPHIC AND BATHYMETRIC SURVEY DATA COLLECTED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. ON 10/17/2014.
2. SURVEY CONTROL IS BASED ON MICHIGAN STATE PLANE SOUTHERN ZONE COORDINATE SYSTEM NAD83.
3. VERTICAL DATUM IS BASED ON NAVD88.
4. BASEMAP CREATED BY UTILIZING SURVEY DATA AND AERIAL IMAGERY FROM GOOGLE EARTH DATED 6/23/2016.
5. MEASUREMENTS AND ELEVATIONS ARE APPROXIMATE AND MUST BE FIELD VERIFIED PRIOR TO ANY CONSTRUCTION ACTIVITIES.

MISS DIG System, Inc.

ABBREVIATIONS

AMF	= ANNUAL MEAN FLOW
APP	= APPROVED
APPROX	= APPROXIMATELY
ASTM	= AMERICAN SOCIETY FOR TESTING AND MATERIALS
BF	= BANKFULL
BM	= BENCHMARK
CL	= CENTERLINE
DND	= DO NOT DISTURB
DWG, DWGS	= DRAWING OR DRAWINGS
EA	= EACH
EL., ELEV	= ELEVATION
FT	= FEET OR FOOT
FP	= FLOODPRONE
LB	= POUND
LT	= LEFT
MAX	= MAXIMUM
MIN	= MINIMUM
N/A	= NOT APPLICABLE
OHWM	= ORDINARY HIGH WATER MARK
PLF	= POUND PER LINEAR FOOT
REQ'D	= REQUIRED
POB	= POINT OF BEGINNING
POE	= POINT OF ENDING
RT	= RIGHT
STA	= STATION
TYP	= TYPICAL
UON	= UNLESS OTHERWISE NOTED

HATCH LEGEND:

- BACKFILL
- RESTORATION
- CONCRETE
- AGGREGATE
- UNDISTURBED SOIL
- RIPRAP
- DELINEATED WETLAND
- GRAVEL PARKING LOT
- BUILDING
- EXISTING ASPHALT PAVEMENT
- APPROXIMATE IMPOUNDED SEDIMENT
- ASPHALT PAVEMENT REMOVAL
- FILL SLOPE
- CUT SLOPE

LINE TYPE LEGEND:

- EXISTING CONTOURS
- PROPOSED CONTOURS
- STAGING AREA
- SILT FENCE
- TEMPORARY CONSTRUCTION FENCING
- WATER SURFACE
- EDGE OF EXISTING ROAD
- GEOTEXTILE FABRIC
- COFFERDAM
- GUARDRAIL
- LIMITS OF RIPRAP
- POB / POE
- ORDINARY HIGH WATER MARK
- LONG TERM ANNUAL MEAN WATER LEVEL
- 10-YEAR FLOOD WATER LEVEL
- 25-YEAR FLOOD WATER LEVEL
- 100-YEAR FLOOD WATER LEVEL
- LIMITS OF CONSTRUCTION
- FLOODPRONE
- LIMITS OF VEGETATION
- BANKFULL WATER LEVEL
- EXISTING OVERHEAD WIRE
- EXISTING SANITARY SEWER
- EXISTING FIBER OPTIC CABLE
- EXISTING GAS LINE
- PROPERTY LINE
- BENCHMARK
- MANHOLE
- POWER POLE
- GUARD POST/BOLLARD
- MONITORING WELL
- EXISTING TREE
- EXISTING STUMP
- TOE WOOD
- B-00 BORING HOLE LOCATION

GENERAL LEGEND:

PLAN OF EXISTING CONDITIONS
SCALE: 1" = 10'
0 10 20
SCALE: 1" = 10'
MAIN TITLE

1 / G-02 PHOTO DESCRIPTION
PHOTO TITLE. THE NUMBER "1" REFERS TO THE PHOTO DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE PHOTO IS CALLED OUT.

1 / G-02 DETAIL TYPICAL SILT FENCE
0 1 2
SCALE: 1" = 1'
DETAIL TITLE WITH DRAWING SCALE. THE NUMBER "1" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS CALLED OUT.

A / G-02 SECTION - STA. 0+00
SCALE: 3/4" = 1'-0"
0 1' 2' 3'
SECTION TITLE WITH DRAWING SCALE. THE LETTER "A" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CALLED OUT.

A / G-02 A / G-02
SECTION LOCATION. THE LETTER "A" REFERS TO THE SECTION DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CALLED OUT.

1 / G-02
DETAIL LOCATION. THE NUMBER "1" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS SHOWN.

1 / C-02
PHOTO LOCATION. THE NUMBER "1" REFERS TO THE PHOTO DESIGNATION. THE NUMBER "C-02" REFERS TO THE DRAWING NUMBER WHERE THE PHOTO IS SHOWN.

0 30 60
SCALE: 1" = 30'
DRAWING SCALE IN UNITS SPECIFIED

A / C-01
ELEVATION LOCATION. THE LETTER "A" REFERS TO THE SECTION DESIGNATION. THE NUMBER "C-01" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS SHOWN.

WATER SURFACE ELEVATION 32' UPSTREAM OF DAM

FLOW EVENT	EXISTING ELEVATION (FT)	PROPOSED ELEVATION (FT)
SEPT. LOW FLOW	730.6	728.9
LONG TERM ANNUAL FLOW	733.9	729.9
BANKFULL FLOW	735.4	731.7
100-YEAR FLOW	738.4	737.2

SHIAWASSEE RIVER FLOW DATA

FLOW EVENT	FLOW (CFS)
SEPT. LOW FLOW	35
LONG TERM ANNUAL FLOW	339
BANKFULL FLOW	1,258
100-YEAR FLOW	6,200

Issued For Bid

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

NO.	DATE	ISSUE/REVISION	APP
1	1/7/2019	ISSUED FOR BID	SD
0	3/14/2018	PERMIT DRAWINGS	SD

GEI Consultants
940 N. MAIN STREET
ANN ARBOR, MI 48104-1035
(734)680-1090

Designed: S. Prentice
Checked: K. Price
Drawn: I. Roberts
Approved By: S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

GEI Project 1610412

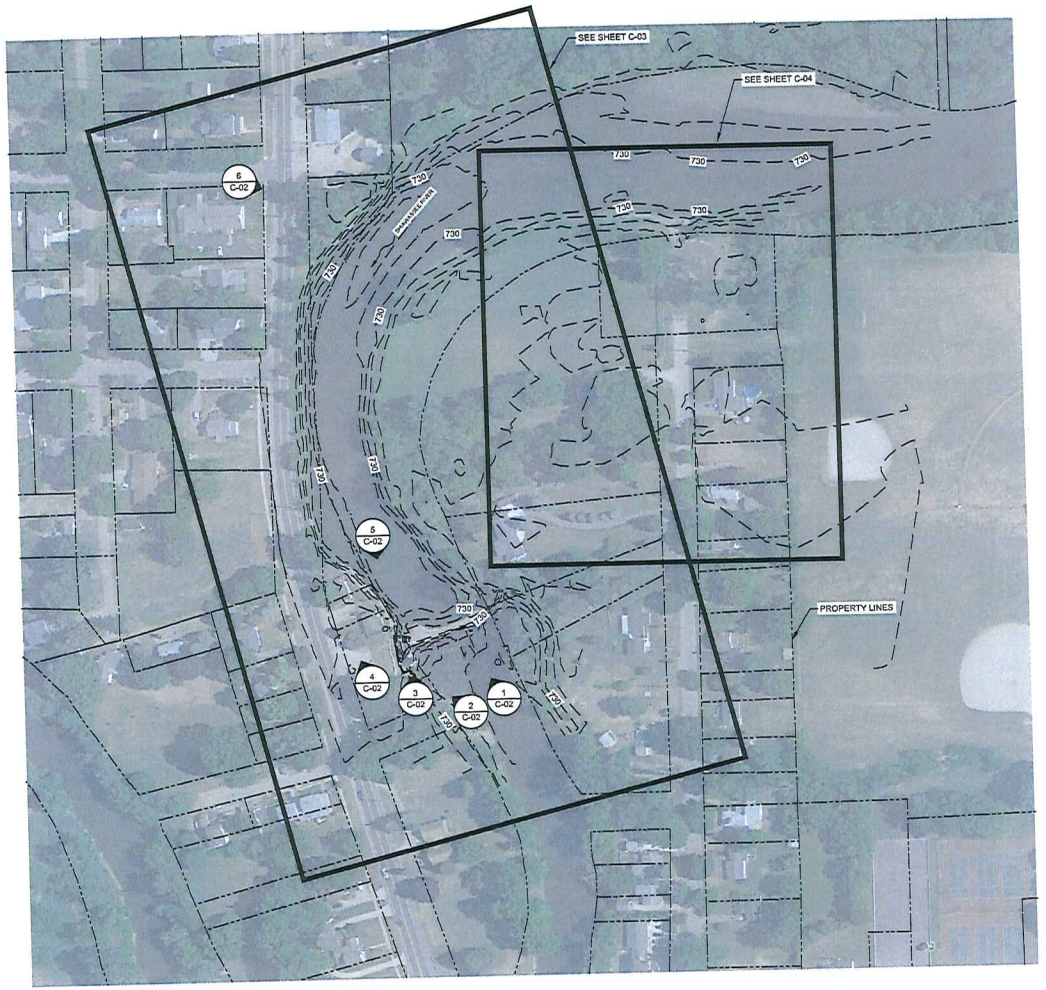
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

NOTES, ABBREVIATIONS AND LEGEND

DWG. NO. G-02

SHEET NO. 2 OF 25

w:\city_of_corunna\CAD\Design\productions\G-02 Legend Sheet.dwg - 12/10/2018



N

0 100 200
SCALE: 1" = 100'

Issued For Bid

NO.	DATE	ISSUE/REVISION	
1	1/7/2019	ISSUED FOR BID	SD
0	3/14/2018	PERMIT DRAWINGS	SD

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

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Designed: S. Prentice
Checked: K. Price
Drawn: I. Roberts
Approved By: S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

GEI Project 1610412

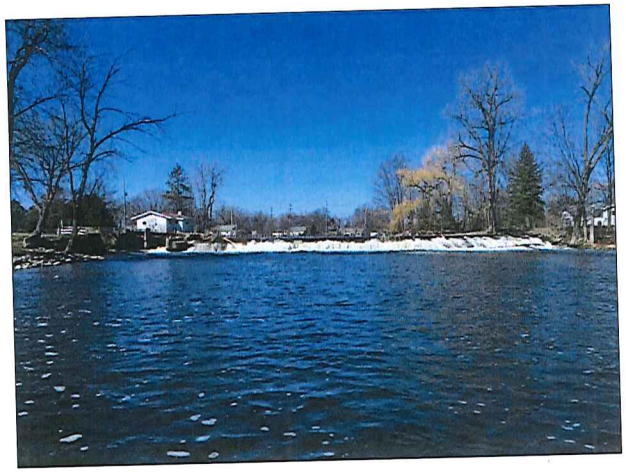
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

KEY PLAN

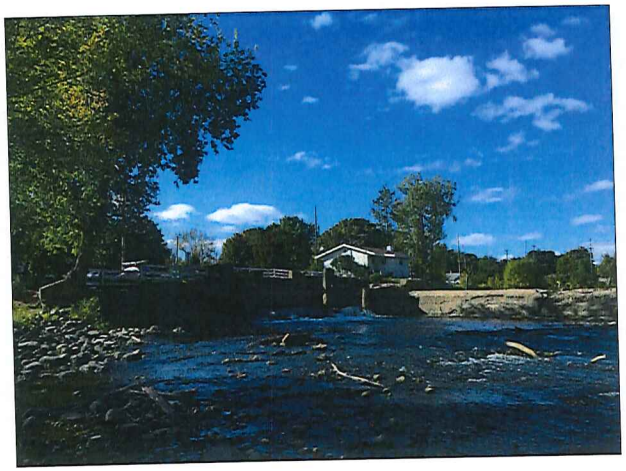
DWG. NO. C-01

SHEET NO. 3 OF 25

w:\City_of_corunna\CAD\Design\production\C-01 Key Plan.dwg - 12/10/2018



1 C-01 PHOTO
DOWNSTREAM OF THE DAM LOOKING NORTH AT ENTIRE SPILLWAY



2 C-01 PHOTO
DOWNSTREAM OF THE DAM LOOKING NORTHWEST AT THE MILLRACE

3 C-01 PHOTO
CORNER OF MILLRACE LOOKING NORTHEAST

4 C-01 PHOTO
PARKING AREA ON WEST SIDE OF DAM LOOKING NORTH. TREES SHOWN MAY ONLY BE REMOVED AS DIRECTED BY OWNER OR HIS REPRESENTATIVE.

5 C-01 PHOTO
RIPRAP/CRUSHED CONCRETE BANK JUST UPSTREAM OF DAM ON WEST BANK.

6 C-01 PHOTO
CORNER OF SHIAWASSEE AND OAK LOOKING SOUTHEAST TO VIEWING PLATFORM AREA. PLATFORM WILL GO UNDER OAK TREE ALONG BANK WHERE HOUSE IS VISIBLE ACROSS THE RIVER IN THE PHOTO.

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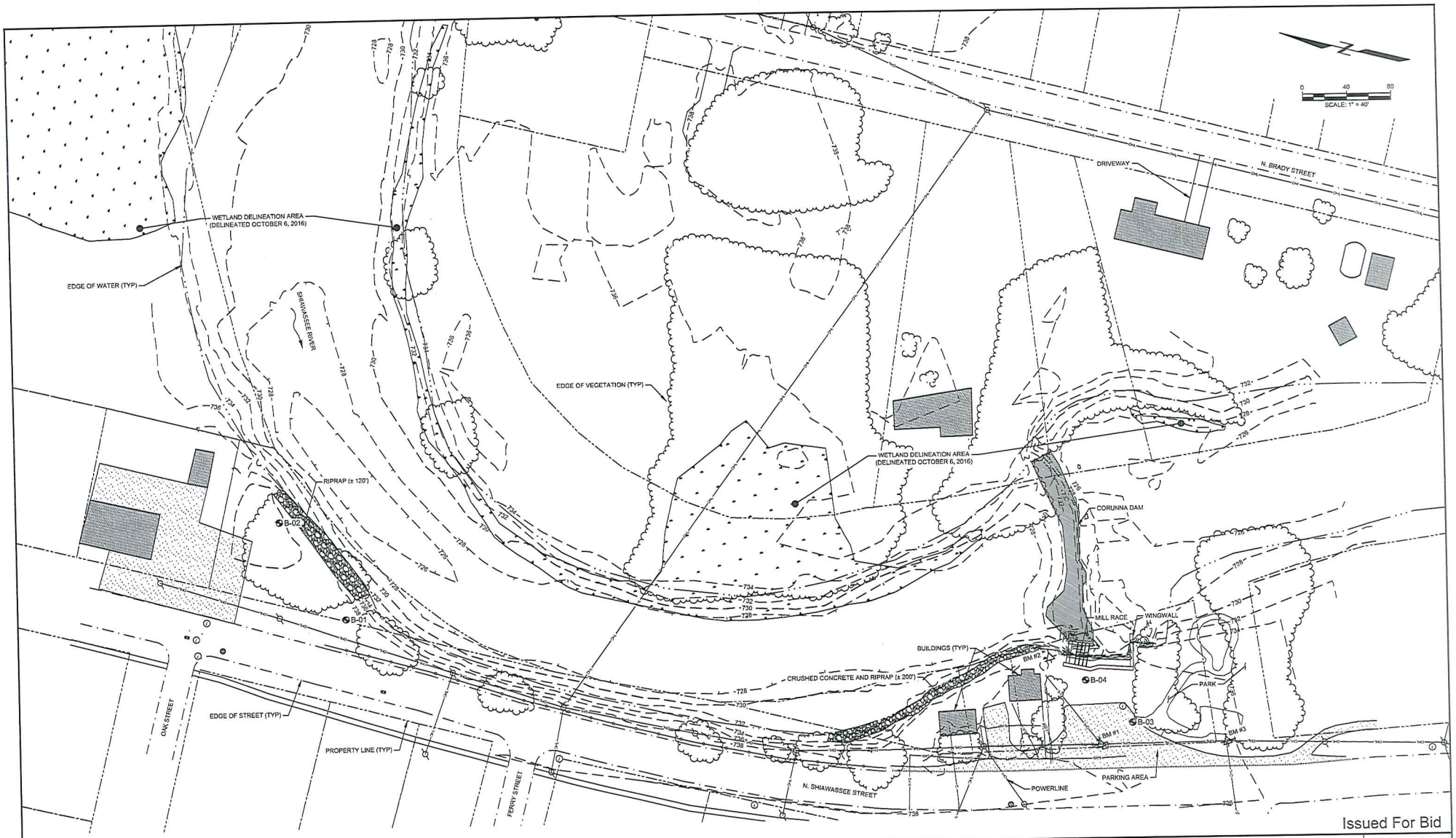
City of Corunna, Michigan

SITE PHOTOS

DWG. NO. C-02

SHEET NO. 4 OF 25

W:\City_of_corunna\CAD\Design\production\C-02 Site Photos.dwg - 12/10/2018



Boring Name	Northing	Easting
Boring B-01	542153.43	13189676.68
Boring B-02	542232.83	13189748.95
Boring B-03	541435.56	13189750.88
Boring B-04	541486.06	13189778.42

NOTES:

1. BORING LOGS SHOWN IN PROJECT MANUAL.

Attention:

0 1"

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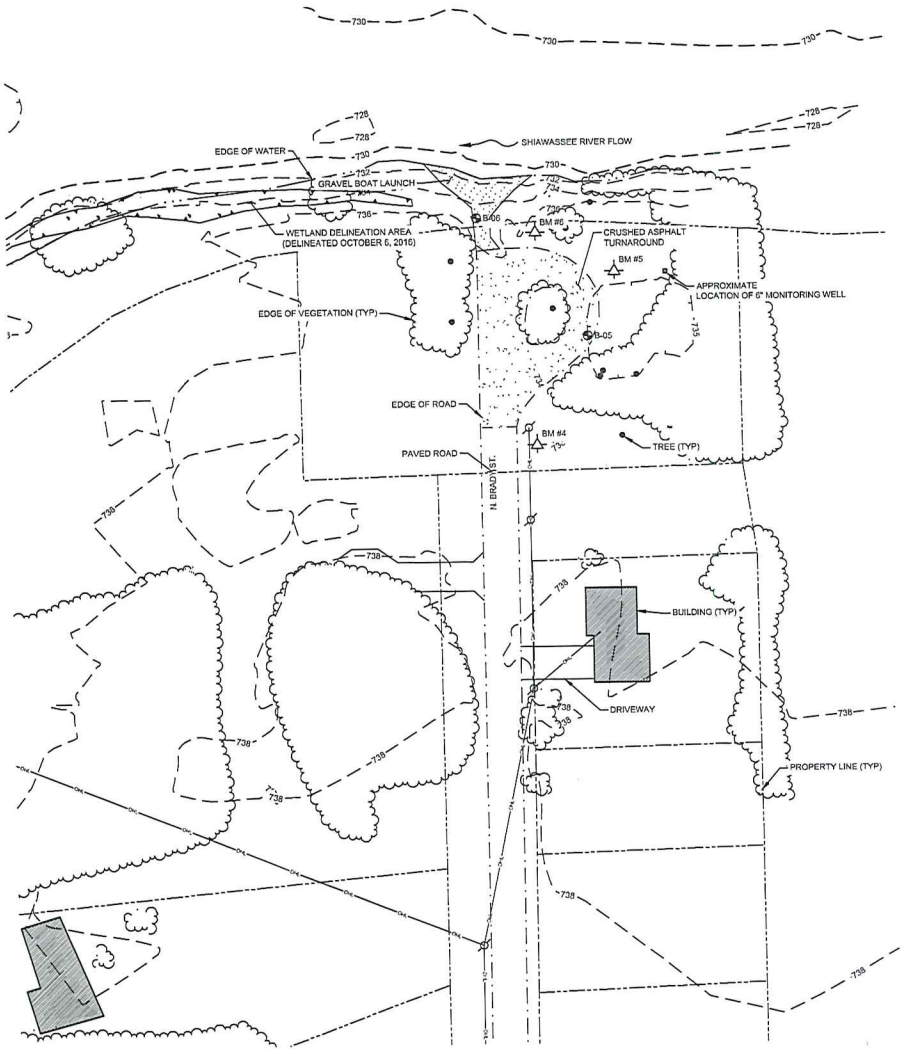
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

EXISTING CONDITIONS - DAM SITE

DWG. NO. C-03

SHEET NO. 5 OF 25

w:\city_of_corunna\CAD\Design\production\C-03 Dam Site Existing Conditions Plan.dwg - 12/10/2018



Boring Name	Northing	Easting
Boring B-05	542099.04	13190343.44
Boring B-06	542177.91	13190270.83

NOTES:

1. BORING LOGS SHOWN IN PROJECT MANUAL.

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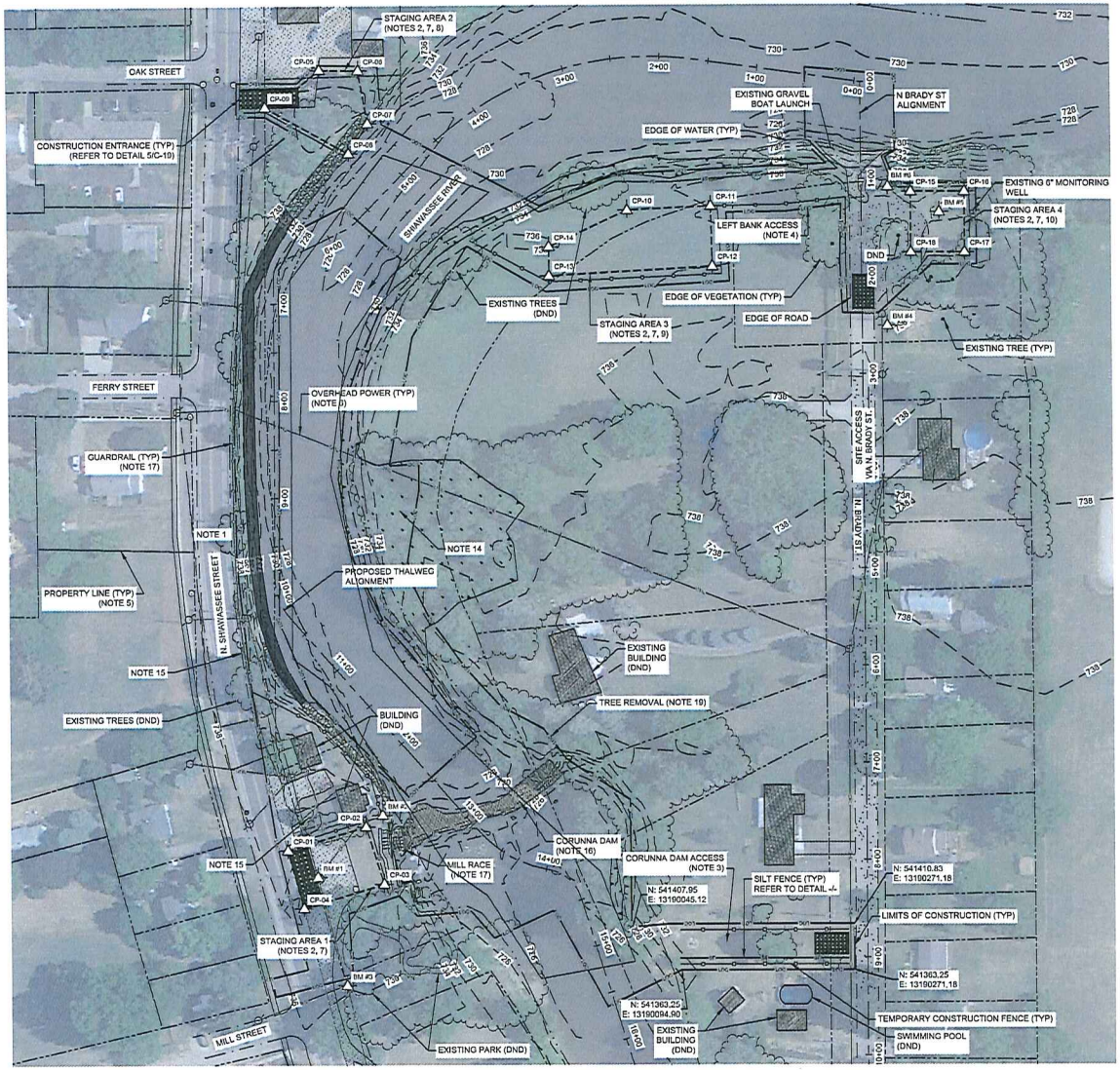
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

EXISTING CONDITIONS - N. BRADY STREET

DWG. NO. C-04

SHEET NO. 6 OF 25



ACCESS NOTES:

1) SHIAWASSEE STREET SHALL REMAIN OPEN TO THE PUBLIC THROUGHOUT THE DURATION OF CONSTRUCTION.
2) ACCESS TO THE SITE IS PROVIDED FROM SHIAWASSEE STREET AT HERITAGE PARK, SHIAWASSEE STREET NEAR OAK STREET AND VIA N. BRADY STREET.
3) ACCESS ROUTE BETWEEN DOWNSTREAM OF CORUNNA DAM AND N. BRADY STREET SHALL BE DETERMINED IN FIELD BY THE ENGINEER AND PROPERTY OWNER. NO BREAK AREAS OR PORTABLE TOILETS WILL BE ALLOWED IN THIS AREA. AVOID OR TRANSPLANT EXISTING TREES ALONG ACCESS ROUTE.
4) ACCESS ROUTE ALONG THE LEFT BANK IS LOCATED ON PRIVATE PROPERTY. TIMBER MATS OR OTHER SUITABLE MATERIAL WILL BE USED TO LIMIT DISTURBANCE TO EXISTING LAWN. NO BREAK AREAS OR PORTABLE TOILETS WILL BE ALLOWED IN THIS AREA. AVOID OR TRANSPLANT EXISTING TREES ALONG ACCESS ROUTE.
5) PROPERTY LINES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
6) MULTIPLE OVERHEAD POWERLINES ARE PRESENT THROUGHOUT THE SITE. CONTRACTOR SHALL NOT DISTURB.

STAGING NOTES:

7) STAGING AREAS ARE:
   a. STAGING AREA 1: SHIAWASSEE STREET AT HERITAGE PARK
   b. STAGING AREA 2: SHIAWASSEE STREET NEAR OAK STREET
   c. STAGING AREA 3: WEST OF N. BRADY STREET ON PRIVATE PROPERTY
   d. STAGING AREA 4: N. BRADY STREET
8) STAGING AREA 2 IS ADJACENT TO AN AMBULANCE BAY. AMBULANCE BAY OPERATIONS ARE NOT TO BE DISTRIBUTED.
9) STAGING AREA 3 IS LOCATED ON PRIVATE PROPERTY. TIMBER MATS OR OTHER SUITABLE MATERIAL WILL BE USED TO LIMIT DISTURBANCE TO EXISTING LAWN. NO BREAK AREAS OR PORTABLE TOILETS WILL BE ALLOWED IN THIS AREA.
10) STAGING AREA 4 IS THE PRIMARY STAGING AREA. BREAK AREAS AND PORTABLE TOILETS ARE ALLOWED IN STAGING AREA 4 ONLY.

ENVIRONMENTAL NOTES:

11) EQUIPMENT SHALL BE CHECKED AND CLEANED OF SEDIMENT AND FLUID LEAKS BEFORE ENTERING RIVER.
12) ON-SITE NOISE WILL BE LIMITED TO THE GREATEST EXTENT PRACTICABLE.
13) STONE SHALL BE PLACED IN THE RIVER IF NECESSARY TO MINIMIZE ECOLOGICAL IMPACTS. IF STONE IS PLACED IN RIVER, IT SHALL REMAIN IN THE RIVER TO BE INTEGRATED INTO THE TOEWOOD STRUCTURE FILL.

DEMOLITION AND CLEARING NOTES:

14) REMOVE TREES ADJACENT TO GUARDRAIL ON SHIAWASSEE STREET FROM STATION 7+00 TO 10+50. REMOVE TREES AND LOGS ON GROUND 6" IN DIAMETER OR GREATER WITHIN LIMITS OF CONSTRUCTION ALONG RIGHT BANK FROM STATION 8+50 TO 11+50.
15) TREES WITHIN THE EASEMENT NEXT TO STAGING AREA 1 MAY NEED TO BE REMOVED. THESE TREES SHALL BE REMOVED ONLY AT THE DIRECTION OF THE OWNER OR OWNER'S REPRESENTATIVE.
16) CORUNNA DAM IS CONSTRUCTED OF A RIPRAP FILLED TIMBER CRIB THAT IS CAPPED WITH CONCRETE.
   a. TO THE GREATEST EXTENT PRACTICABLE, THE TIMBERS FROM THE TIMBER CRIB SHALL BE REMOVED INTACT, STORED SEPARATELY ONSITE, AND GIVEN TO THE CITY FOR USE ELSEWHERE.
   b. THE RIPRAP FROM THE DAM SHALL BE INTEGRATED INTO THE CONSTRUCTED RIFFLE.
   c. CONCRETE AND REBAR SHALL BE DISPOSED OF OFFSITE.
17) THE MILL RACE AND WING WALLS ARE TO BE DEMOLISHED AND MATERIAL HAULED OFFSITE.
18) GUARDRAIL SHALL NOT BE REMOVED. IF DAMAGED, CONTRACTOR TO REPLACE IN KIND AT HIS EXPENSE.
19) REMOVE THREE TREES IMMEDIATELY ADJACENT TO WEST SIDE OF DAM. DO NOT REMOVE ANY TREES IN LAWN OR LANDSCAPED AREAS. TREES SHALL BE REMOVED ONLY AT THE DIRECTION OF THE OWNER OR OWNER'S REPRESENTATIVE.

PROJECT CONTROL

ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM #1	541459.09	13189724.67	738.20	SPIKE IN NORTH SIDE OF UTILITY POLE
BM #2	541522.67	13189791.10	738.02	NORTHEAST CORNER OF CONCRETE RETAINING WALL
BM #3	541347.96	13189754.23	736.33	SPIKE IN NORTH SIDE OF UTILITY POLE
BM #4	542026.15	13190308.45	737.00	MAGNAIL NORTH SIDE OF UTILITY POLE
BM #5	542142.17	13190361.69	738.85	MAGNAIL SOUTH SIDE OF 30" STUMP
BM #6	542168.20	13190309.71	737.15	MAGNAIL IN WEST SIDE OF LIGHT POLE

STAGING AREA LOCATIONS

STAGING AREA	ID	NORTHING	EASTING
1	CP-01	541486.62	13189694.10
	CP-02	541510.85	13189773.97
	CP-03	541452.28	13189792.31
	CP-04	541427.21	13189710.36
2	CP-05	542260.43	13189731.71
	CP-06	542289.69	13189771.34
	CP-07	542235.27	13189780.60
	CP-08	542204.39	13189760.74
	CP-09	542252.13	13189676.88
3	CP-10	542144.93	13190044.26
	CP-11	542148.83	13190129.21
	CP-12	542087.13	13190130.58
	CP-13	542077.96	13189964.23
	CP-14	542107.35	13189964.23
4	CP-15	542163.42	13190332.78
	CP-16	542163.42	13190387.50
	CP-17	542100.94	13190387.50
	CP-18	542100.94	13190332.78

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Corunna, MI 48817

GEI Project 1610412

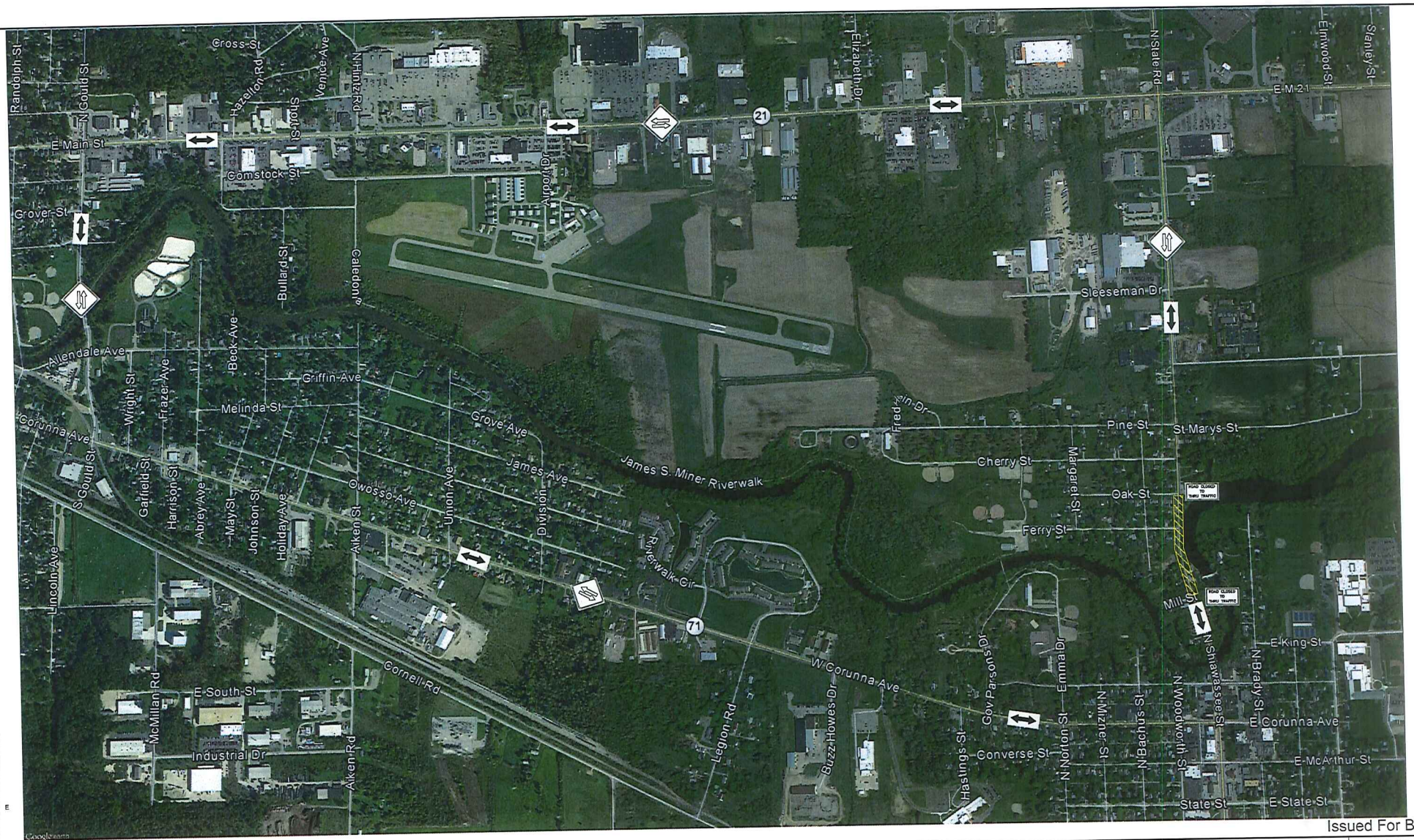
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

SITE ACCESS AND PREPARATION PLAN

DWG. NO. C-05

SHEET NO. 7 OF 25

\\mqtfs-fs01\ W:\city_of_corunna\CAD\Dcs-gm\product\cm\C-05 Site Access and Preparation Plan.dwg - 12/10/2018



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LEGEND:

TEMPORARY ROAD CLOSURE

TRAFFIC DETOUR

N

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City of Corunna, Michigan

PROPOSED TRAFFIC DETOUR DURING CONSTRUCTION

DWG. NO. C-06

SHEET NO. 8 OF 25

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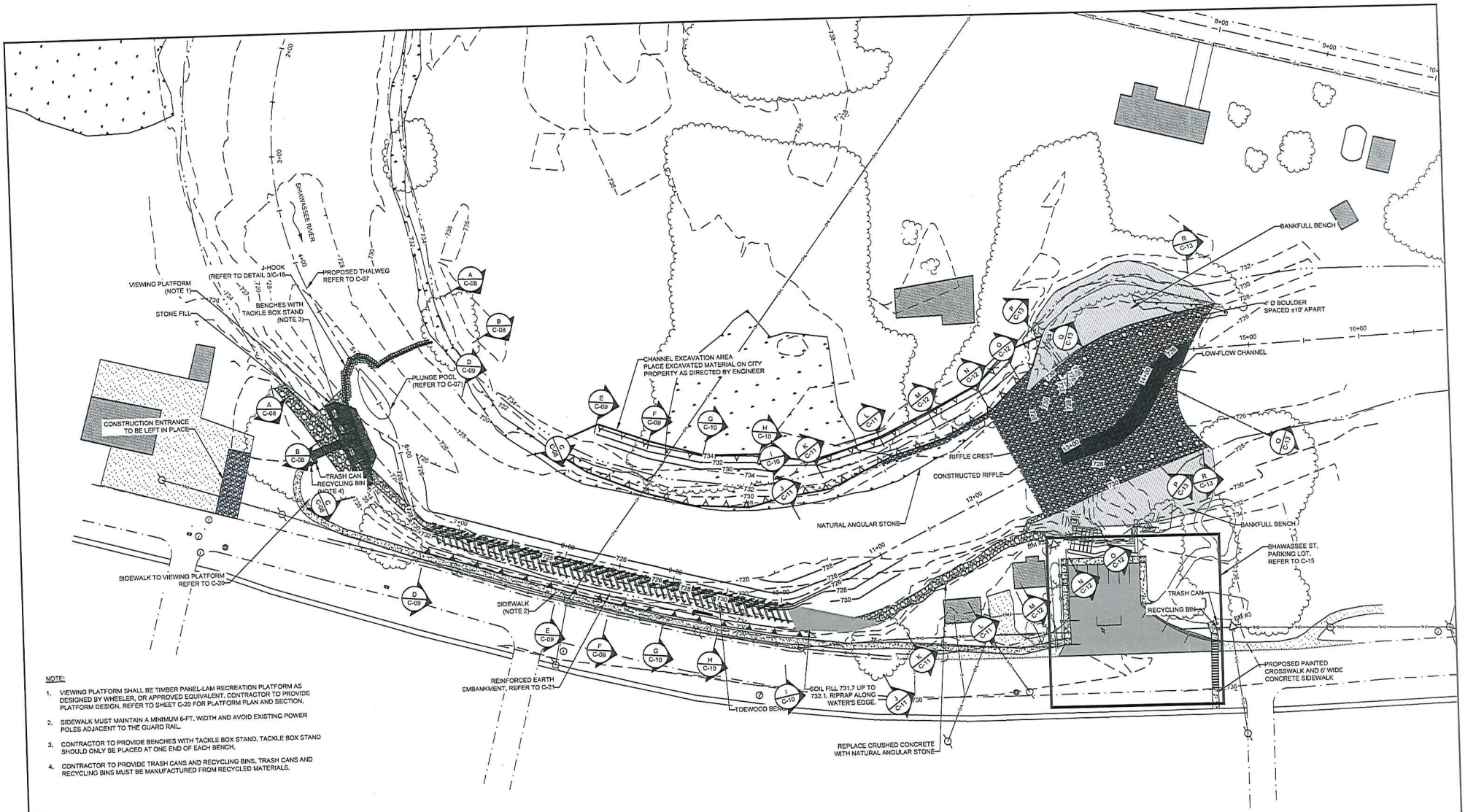

NOTE:

1. VIEWING PLATFORM SHALL BE TIMBER PANEL-LAM RECREATION PLATFORM AS DESIGNED BY WHEELER, OR APPROVED EQUIVALENT. CONTRACTOR TO PROVIDE PLATFORM DESIGN. REFER TO SHEET C-20 FOR PLATFORM PLAN AND SECTION.
2. SIDEWALK MUST MAINTAIN A MINIMUM 6-FT. WIDTH AND AVOID EXISTING POWER POLES ADJACENT TO THE GUARD RAIL.
3. CONTRACTOR TO PROVIDE BENCHES WITH TACKLE BOX STAND. TACKLE BOX STAND SHOULD ONLY BE PLACED AT ONE END OF EACH BENCH.
4. CONTRACTOR TO PROVIDE TRASH CANS AND RECYCLING BINS. TRASH CANS AND RECYCLING BINS MUST BE MANUFACTURED FROM RECYCLED MATERIALS.

0 40 80
SCALE: 1" = 40'

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GEI Project 1610412

City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

PROPOSED CONDITIONS - DAM SITE

DWG. NO. C-07

SHEET NO. 9 OF 25

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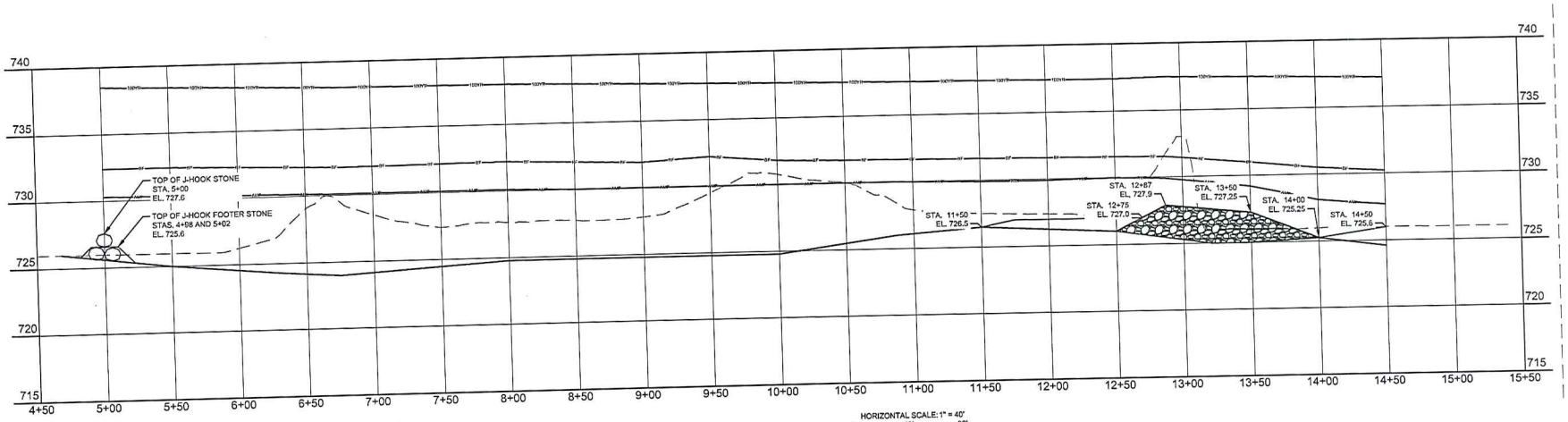

PROPOSED THALWEG PROFILE

HORIZONTAL SCALE: 1" = 40'
0 40' 80'

0 4' 8'
VERTICAL SCALE: 1" = 4'
NOTE: 10x VERTICAL EXAGGERATION

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City of Corunna, Michigan

PROPOSED STREAM PROFILE

DWG. NO. C-08

SHEET NO. 10 OF 25

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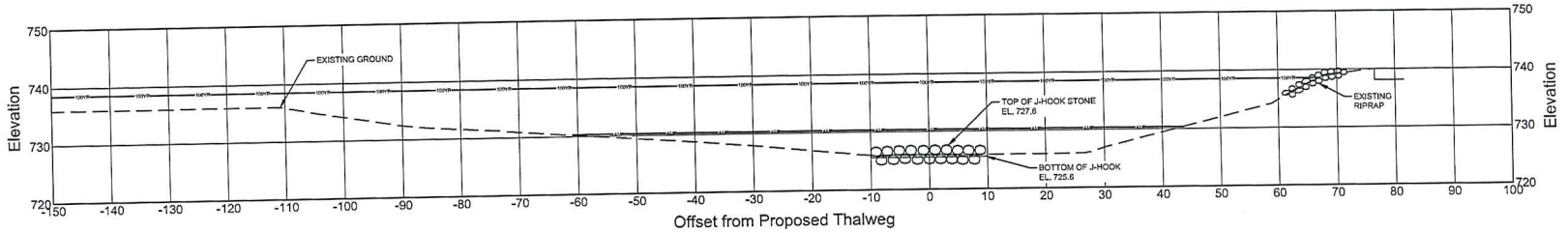
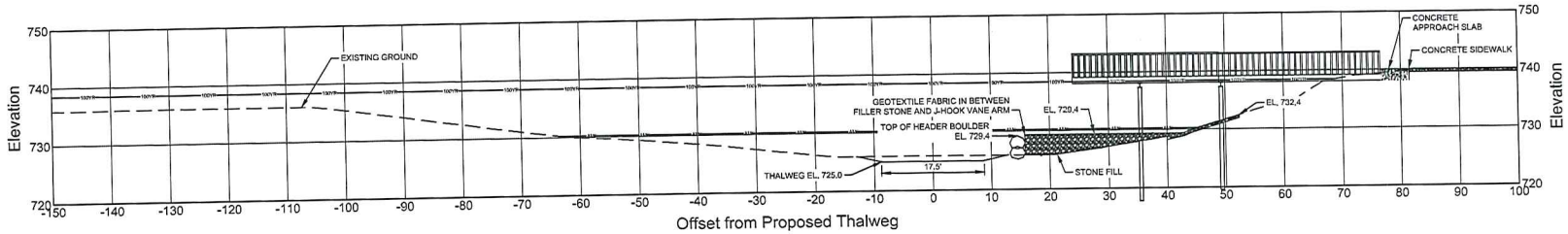


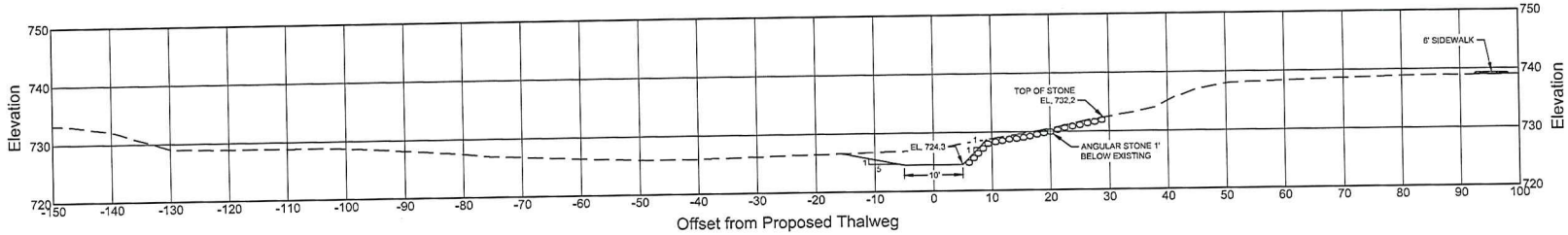
A C-06 SECTION - STA. 5+00
START OF J-HOOK

SCALE: 1" = 10'



B C-06 SECTION - STA. 5+50
VIEWING PLATAFORM / PLUNGE POOL

SCALE: 1" = 10'



C C-06 SECTION - STA. 6+30
START OF TOEWOOD BENCH

SCALE: 1" = 10'

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PROPOSED CROSS SECTIONS (1 OF 6)

DWG. NO. C-09

SHEET NO. 11 OF 25

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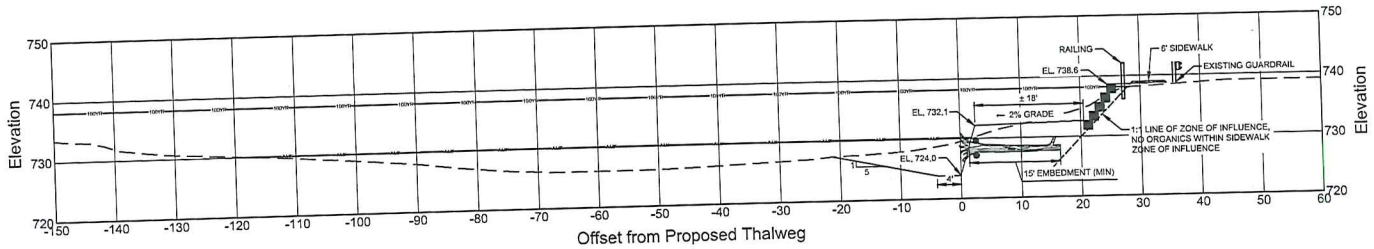
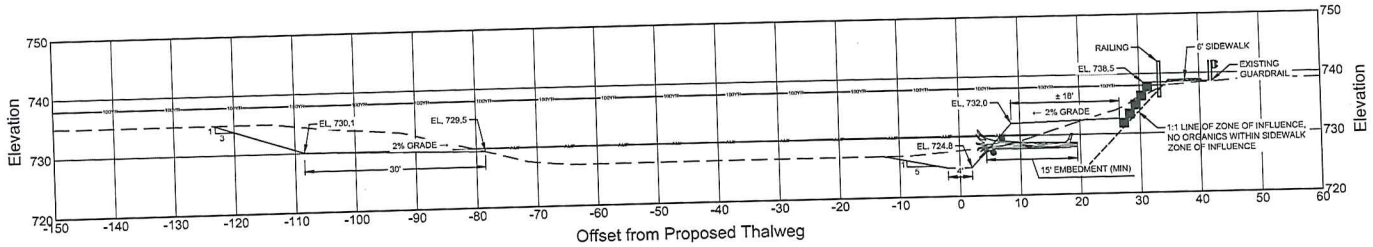


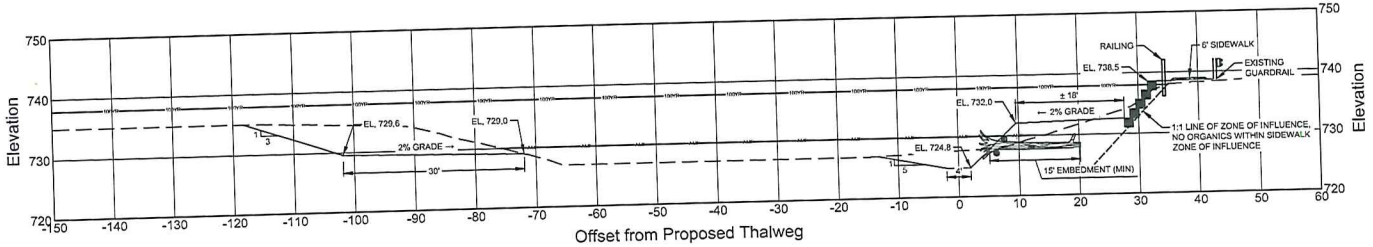
D C-06 SECTION - STA. 6+75
START OF RETAINING WALL/TOEWOOD BENCH

SCALE: 1" = 10'



E C-06 SECTION - STA. 8+00
LEFT BANK EXCAVATION

SCALE: 1" = 10'



F C-06 SECTION - STA. 8+50

SCALE: 1" = 10'

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PROPOSED CROSS SECTIONS (2 OF 6)

DWG. NO. C-10

SHEET NO. 12 OF 25

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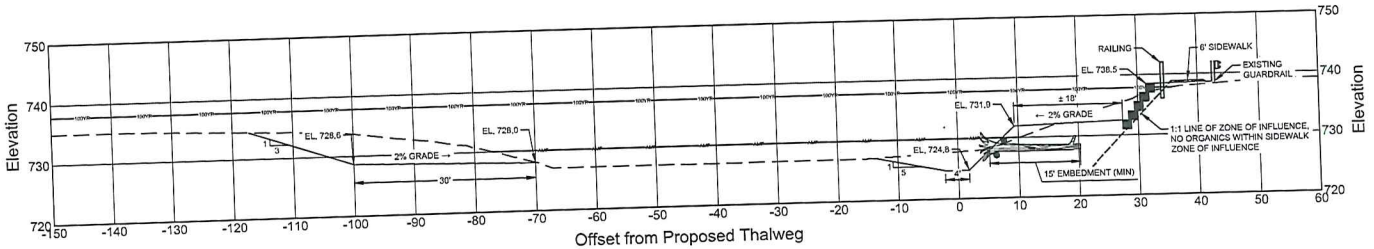
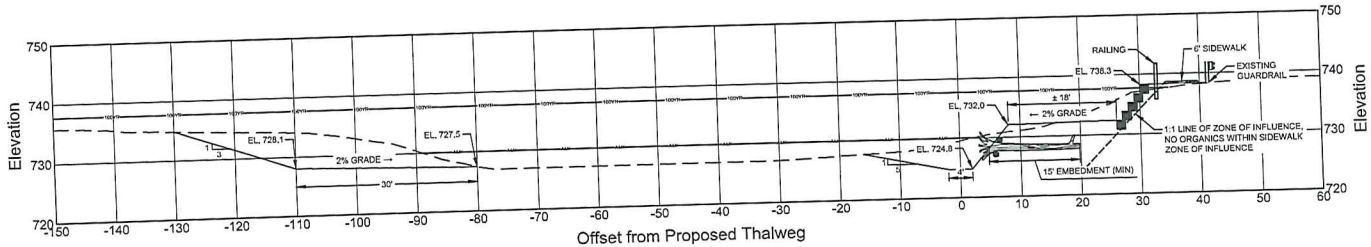


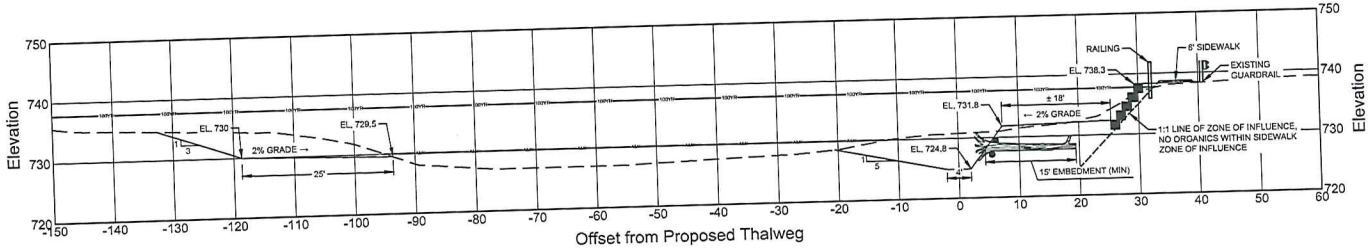
G C-06 SECTION - STA. 9+00

SCALE: 1" = 10'



H C-06 SECTION - STA. 9+50

SCALE: 1" = 10'



I C-06 SECTION - STA. 10+00
END OF RETAINING WALL/TOEWOOD BENCH

SCALE: 1" = 10'

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PROPOSED CROSS SECTIONS (3 OF 6)

DWG. NO. C-11

SHEET NO. 13 OF 25

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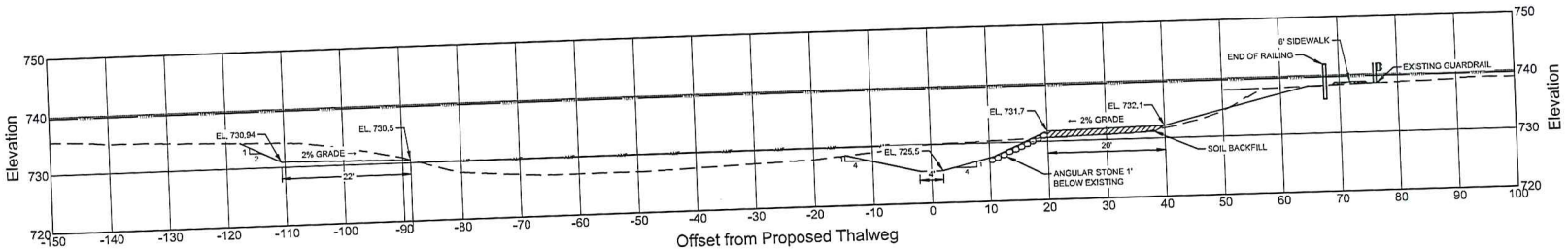
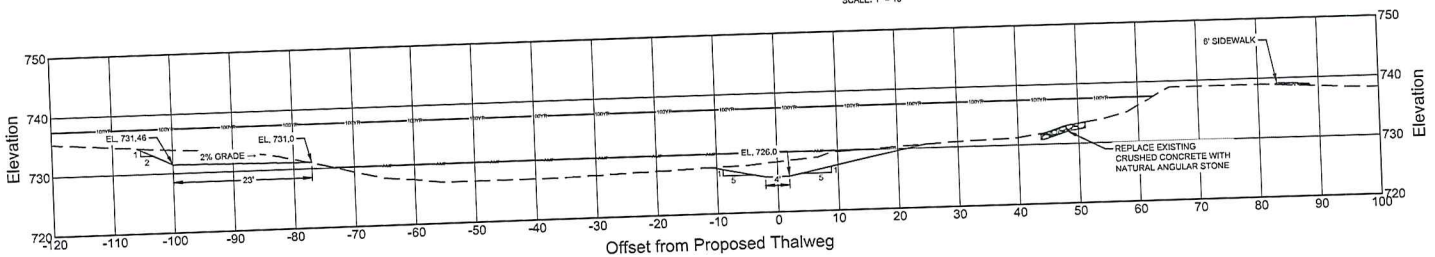


J C-06 SECTION - STA. 10+50

SCALE: 1" = 10'



K C-06 SECTION - STA. 10+87

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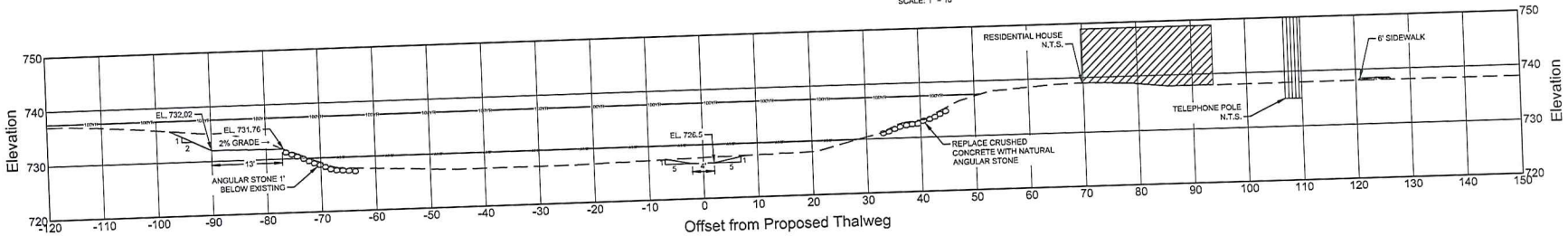

L C-06 SECTION - STA. 11+50

SCALE: 1" = 10'

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GEI Consultants
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Checked: K. Price
Drawn: I. Roberts
Approved By: S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

GEI Project 1610412

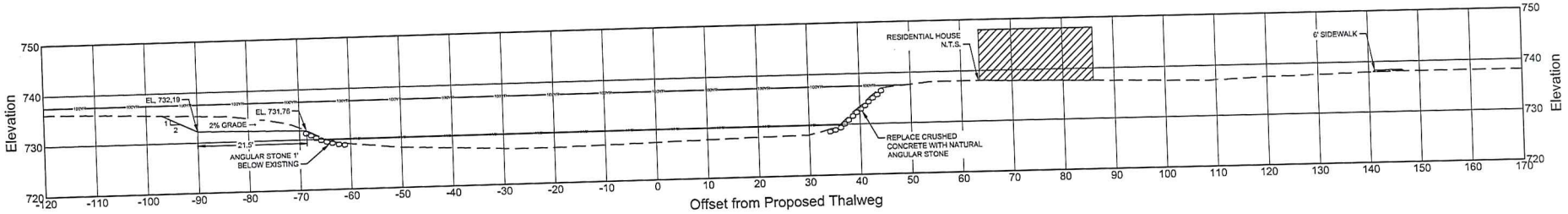
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

PROPOSED CROSS SECTIONS (4 OF 6)

DWG. NO. C-12

SHEET NO. 14 OF 25

w:\city_of_corunna\CAD\Design\production\C-09,10,11,12,13, 14 Proposed Cross Sections.dwg - 12/12/2018



M C-06 SECTION - STA. 12+00

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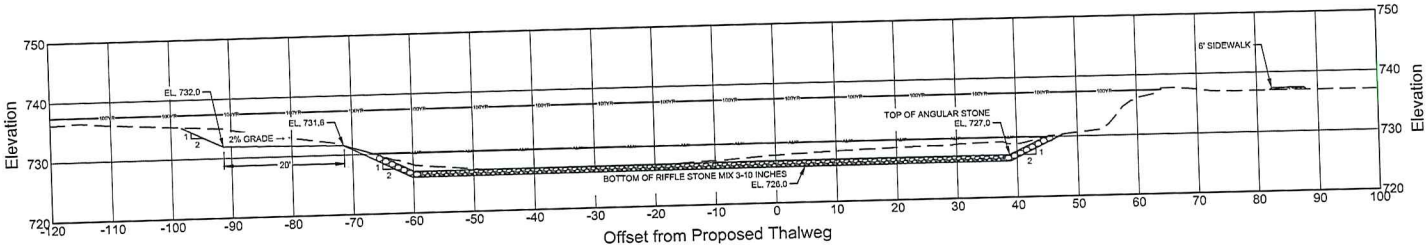

N C-06 SECTION - STA. 12+50

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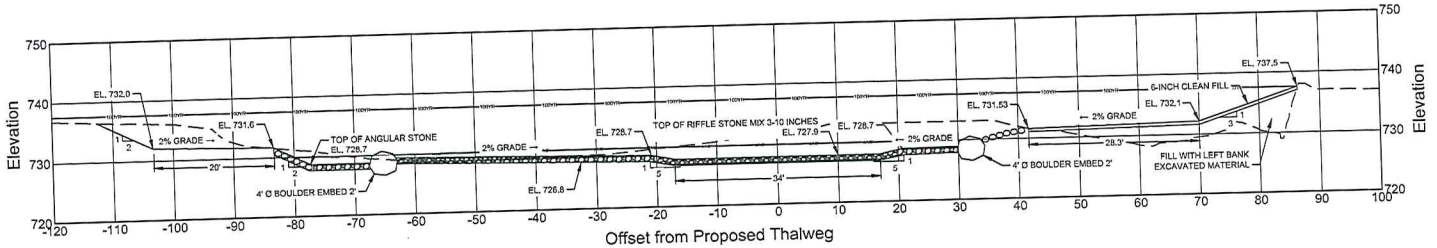

O C-06 SECTION - STA. 12+87

SCALE: 1" = 10'

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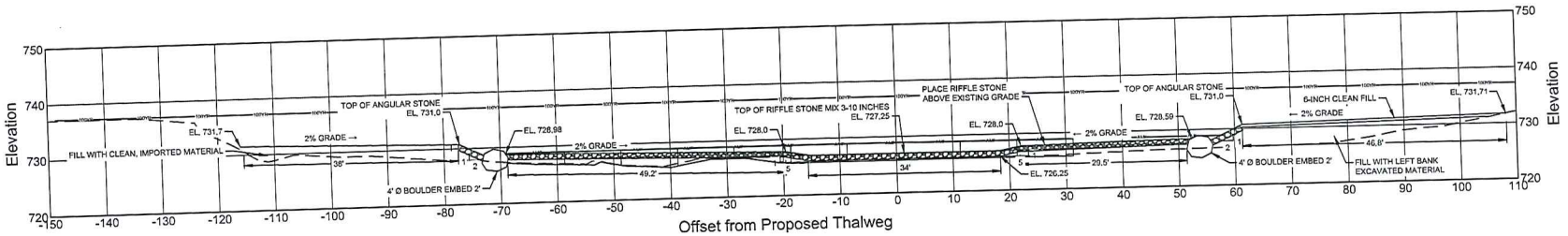
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

PROPOSED CROSS SECTIONS (5 OF 6)

DWG. NO. C-13

SHEET NO. 15 OF 25



P C-06 SECTION - STA. 13+50

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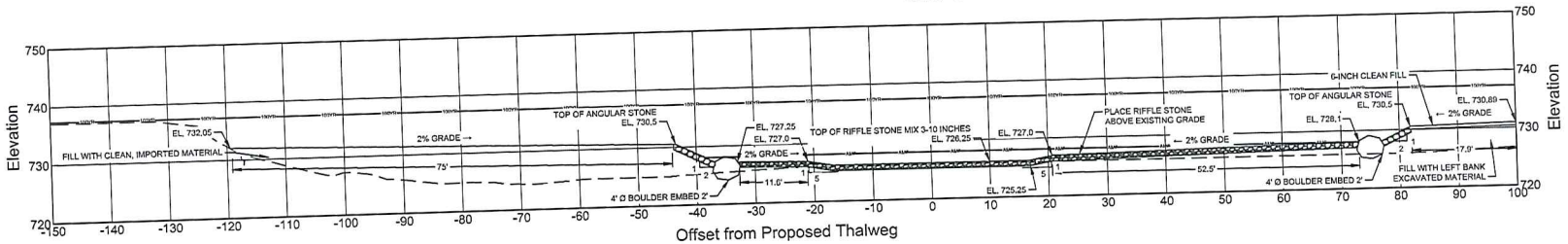

Q C-06 SECTION - STA. 14+00

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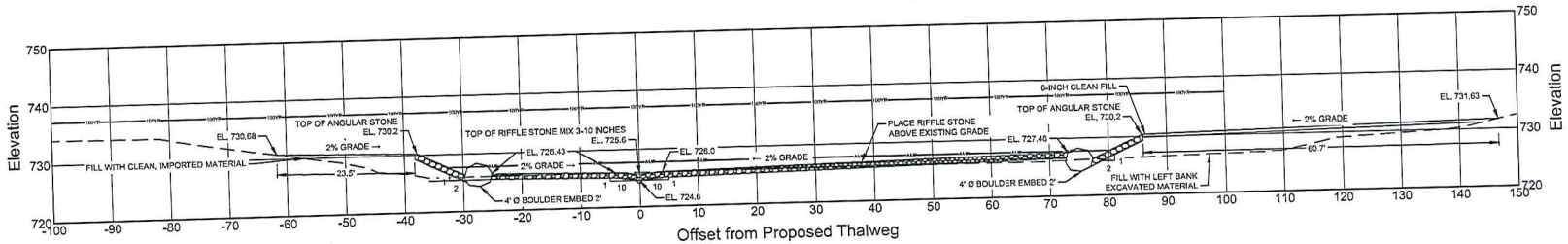

R C-06 SECTION - STA. 14+50

SCALE: 1" = 10'

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City of Corunna
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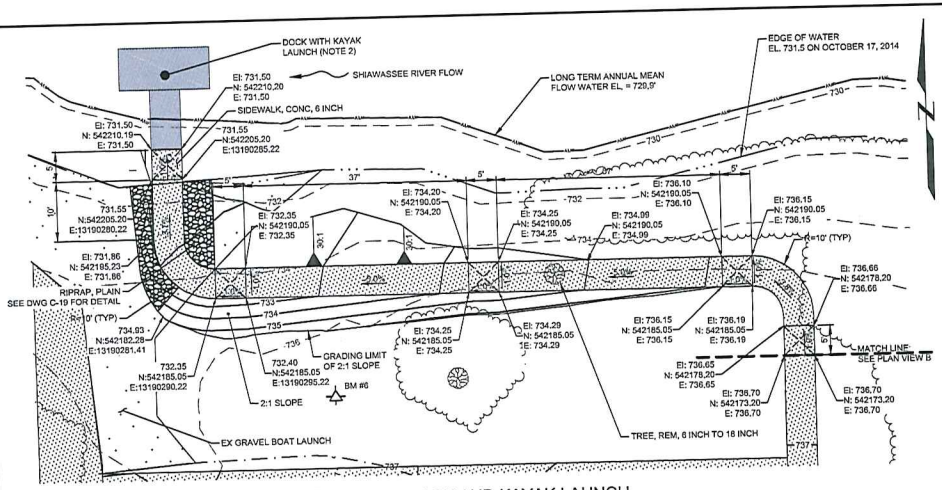
City of Corunna, Michigan

PROPOSED CROSS SECTIONS (6 OF 6)

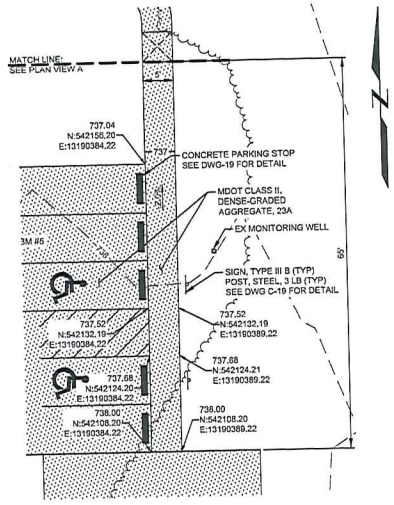
DWG. NO. C-14

SHEET NO. 16 OF 25



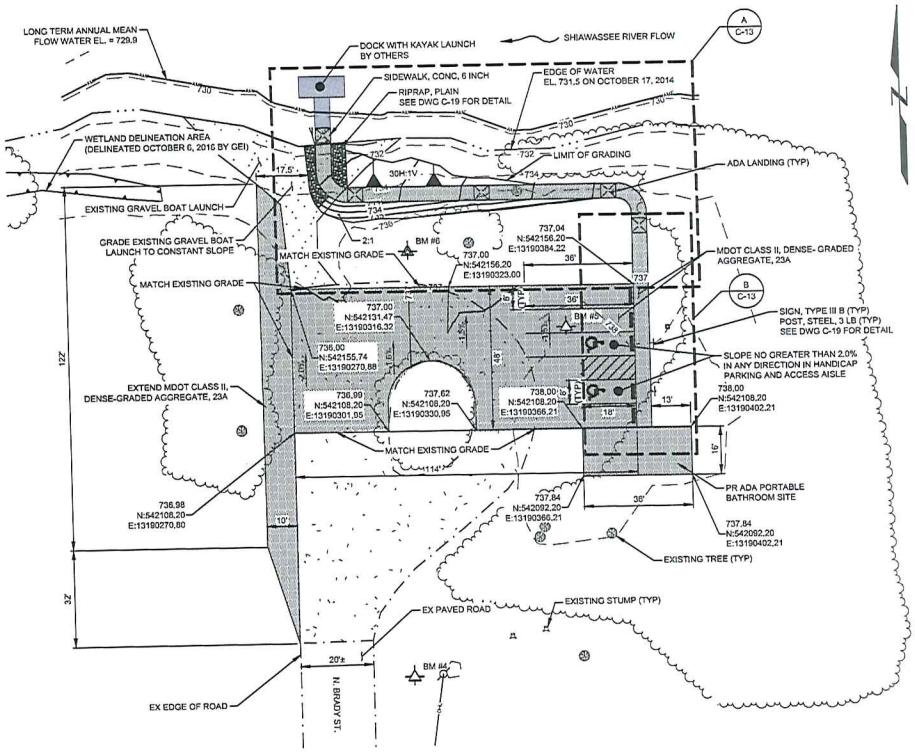
A C-13 PLAN - DOCK AND KAYAK LAUNCH

SCALE: 1" = 10'



B C-13 PLAN - ADA PATH

SCALE: 1" = 10'



PLAN - N. BRADY STREET BOAT LAUNCH

SCALE: 1" = 20'

NOTES:

1. TOPOGRAPHIC SURVEY PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS ON THE DATES OF OCTOBER 17, 2014; DECEMBER 10, 2016; AND APRIL 5, 2017.
2. DOCK WITH KAYAK LAUNCH SHALL BE EZDOCK EZLAUNCH 500596 OR EQUIVALENT. CONTRACTOR TO PROVIDE DOCK WITH KAYAK LAUNCH DETAIL, ANCHORAGE, AND SIDEWALK CONNECTION DETAILS.
3. HANDICAP PARKING SYMBOLS ARE SHOWN FOR REFERENCE PURPOSES.

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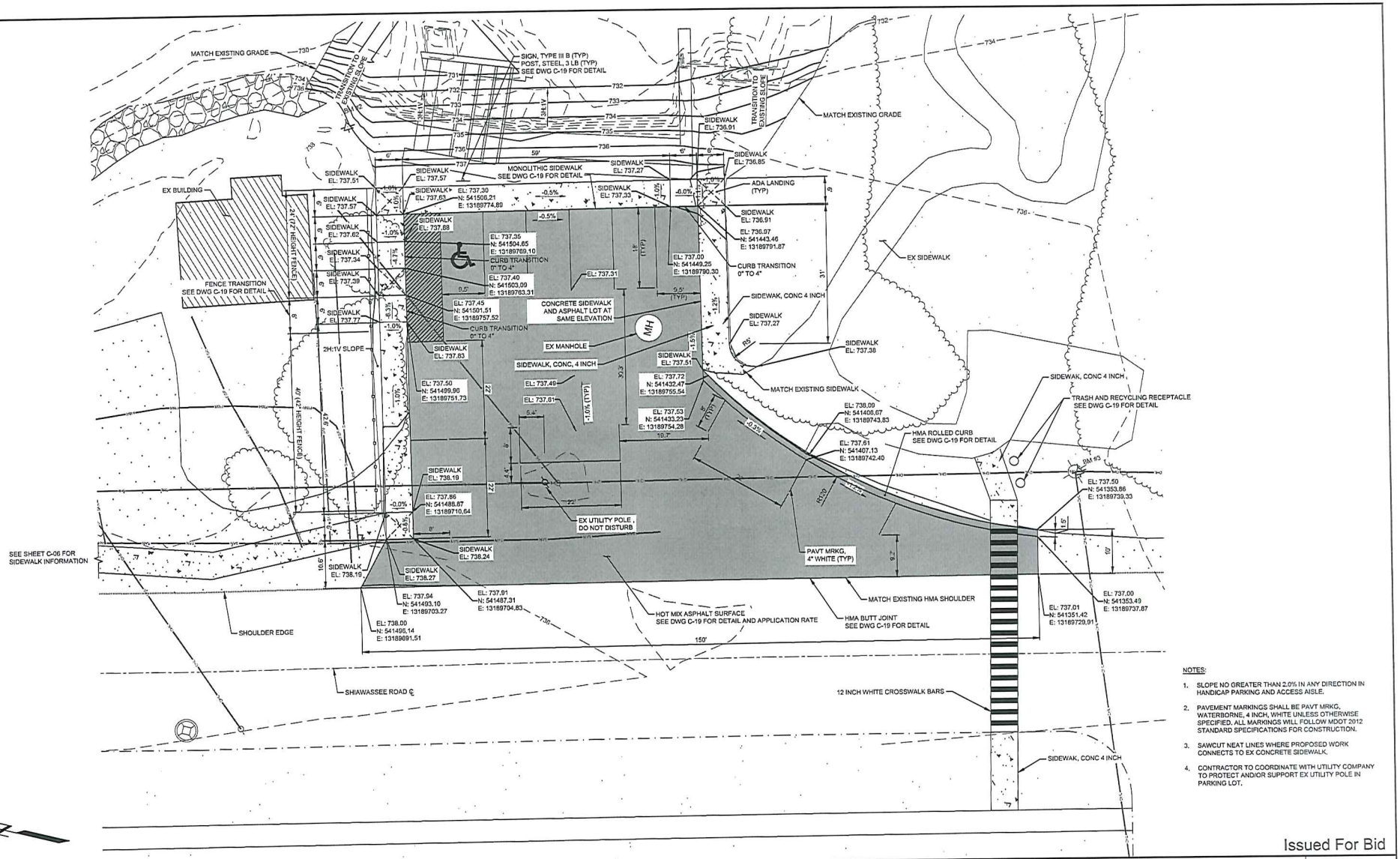
City of Corunna, Michigan

N. BRADY STREET CANOE/KAYAK LAUNCH
PROPOSED - SITE PLAN

DWG. NO. C-15

SHEET NO. 17 OF 25

w:\city_of_corunna\CAD\Design\production\C-15 N Brady St Plan of Proposed Conditions.dwg - 1/8/2019



NOTES:

1. SLOPE NO GREATER THAN 2.0% IN ANY DIRECTION IN HANDICAP PARKING AND ACCESS AISLE.
2. PAVEMENT MARKINGS SHALL BE PAVT MRKG, WATERBORNE, 4 INCH, WHITE UNLESS OTHERWISE SPECIFIED. ALL MARKINGS WILL FOLLOW MDOT 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION.
3. SAWCUT NEAT LINES WHERE PROPOSED WORK CONNECTS TO EX CONCRETE SIDEWALK.
4. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY TO PROTECT AND/OR SUPPORT EX UTILITY POLE IN PARKING LOT.

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City of Corunna, Michigan

SHIAWASSEE ST PARKING LOT - SITE PLAN

DWG. NO. C-16

SHEET NO. 18 OF 25

w:\city_of_corunna\CAD\Design\production\C-16 Shiawassee Rd Parking Lot Site Plan.dwg - 1/8/2019

Control Point List		
Point #	Northing	Easting
CP-1	541404.92	13189909.91
CP-2	541444.06	13189882.64
CP-3	541427.14	13189884.15
CP-4	541430.48	13189858.97
CP-5	541436.40	13189838.36
CP-6	541465.66	13189819.92
CP-7	541508.58	13189834.28
CP-8	541484.93	13189796.82
CP-9	541535.13	13189813.30
CP-10	541512.55	13189810.61
CP-11	541524.40	13189800.07
CP-12	541548.91	13189795.06
CP-13	541570.92	13189784.20
CP-14	541565.61	13189776.65
CP-15	541593.53	13189758.63

Control Point List		
Point #	Northing	Easting
CP-16	541587.98	13189753.83
CP-17	541623.67	13189735.71
CP-18	541618.07	13189728.14
CP-19	541641.72	13189713.56
CP-20	541629.43	13189709.05
CP-21	541643.27	13189686.47
CP-22	541664.09	13189684.31
CP-23	541684.67	13189671.32
CP-24	541733.40	13189661.84
CP-25	541751.80	13189682.07
CP-26	541802.40	13189679.94
CP-27	541852.55	13189679.45
CP-28	541902.05	13189679.46
CP-29	541952.23	13189679.22
CP-30	542075.62	13189683.73

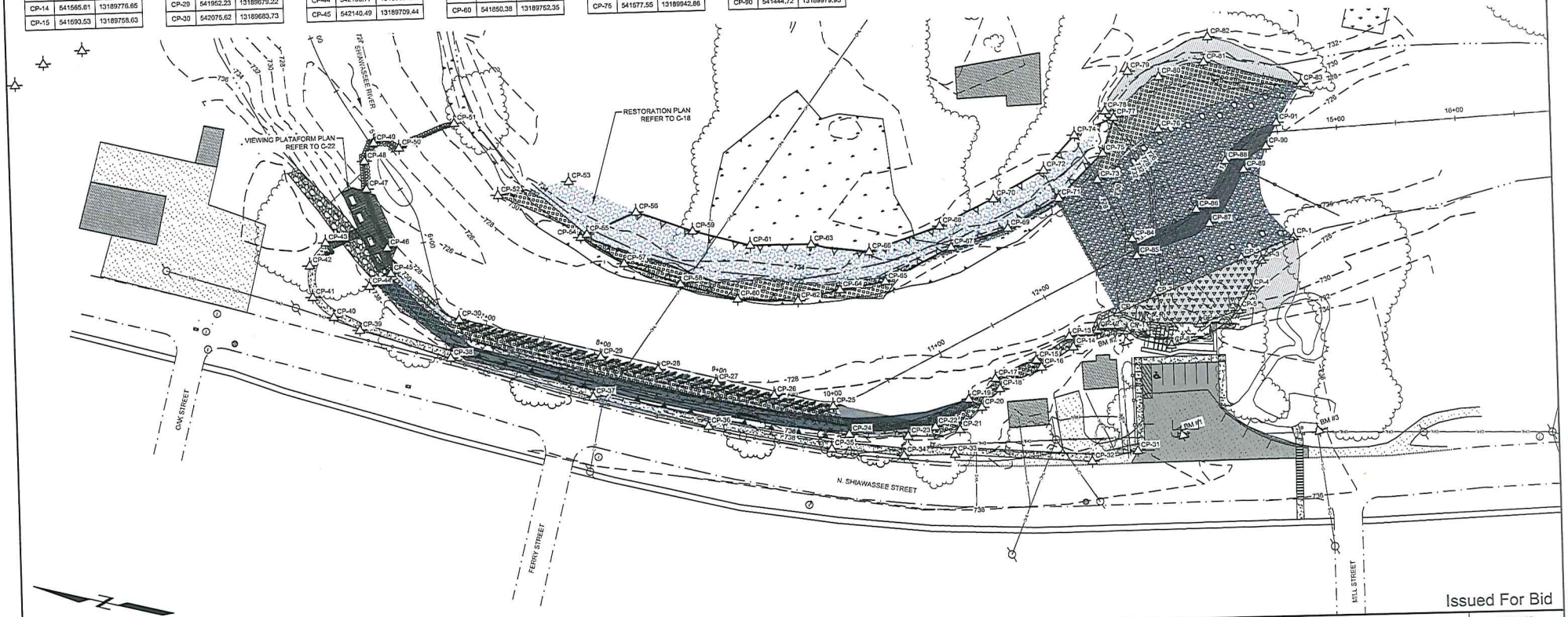
Control Point List		
Point #	Northing	Easting
CP-31	541493.10	13189703.27
CP-32	541528.65	13189685.69
CP-33	541642.97	13189665.38
CP-34	541684.62	13189654.80
CP-35	541745.10	13189646.76
CP-36	541850.76	13189641.85
CP-37	541950.89	13189644.74
CP-38	542075.36	13189650.32
CP-39	542155.46	13189656.42
CP-40	542179.41	13189662.12
CP-41	542200.51	13189674.73
CP-42	542208.99	13189700.64
CP-43	542200.28	13189722.81
CP-44	542155.77	13189694.51
CP-45	542140.49	13189709.44

Control Point List		
Point #	Northing	Easting
CP-46	542148.22	13189730.00
CP-47	542176.50	13189775.05
CP-48	542183.34	13189797.92
CP-49	542179.06	13189814.81
CP-50	542157.26	13189815.46
CP-51	542116.45	13189846.31
CP-52	542066.95	13189794.35
CP-53	542011.38	13189819.05
CP-54	541991.08	13189774.66
CP-55	541966.54	13189778.69
CP-56	541950.20	13189806.13
CP-57	541950.35	13189761.13
CP-58	541900.37	13189754.38
CP-59	541900.21	13189800.88
CP-60	541850.38	13189752.35

Control Point List		
Point #	Northing	Easting
CP-61	541850.22	13189799.59
CP-62	541800.35	13189762.18
CP-63	541800.18	13189812.08
CP-64	541767.95	13189779.36
CP-65	541732.36	13189794.82
CP-66	541751.30	13189816.64
CP-67	541684.66	13189835.97
CP-68	541698.11	13189851.48
CP-69	541641.57	13189862.60
CP-70	541658.90	13189884.33
CP-71	541605.58	13189897.42
CP-72	541623.17	13189917.70
CP-73	541577.03	13189920.00
CP-74	541604.46	13189952.58
CP-75	541577.55	13189942.86

Control Point List		
Point #	Northing	Easting
CP-76	541536.24	13189973.54
CP-77	541575.24	13189975.04
CP-78	541583.94	13189978.81
CP-79	541572.59	13190016.25
CP-80	541545.97	13190017.74
CP-81	541511.57	13190038.14
CP-82	541513.18	13190059.98
CP-83	541427.82	13190039.12
CP-84	541537.35	13189877.53
CP-85	541530.18	13189864.13
CP-86	541490.02	13189914.24
CP-87	541476.60	13189905.01
CP-88	541475.48	13189960.18
CP-89	541458.62	13189956.28
CP-90	541444.72	13189979.93

Control Point List		
Point #	Northing	Easting
CP-91	541440.66	13190001.75



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SCALE: 1" = 40'

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GEI Project 1610412

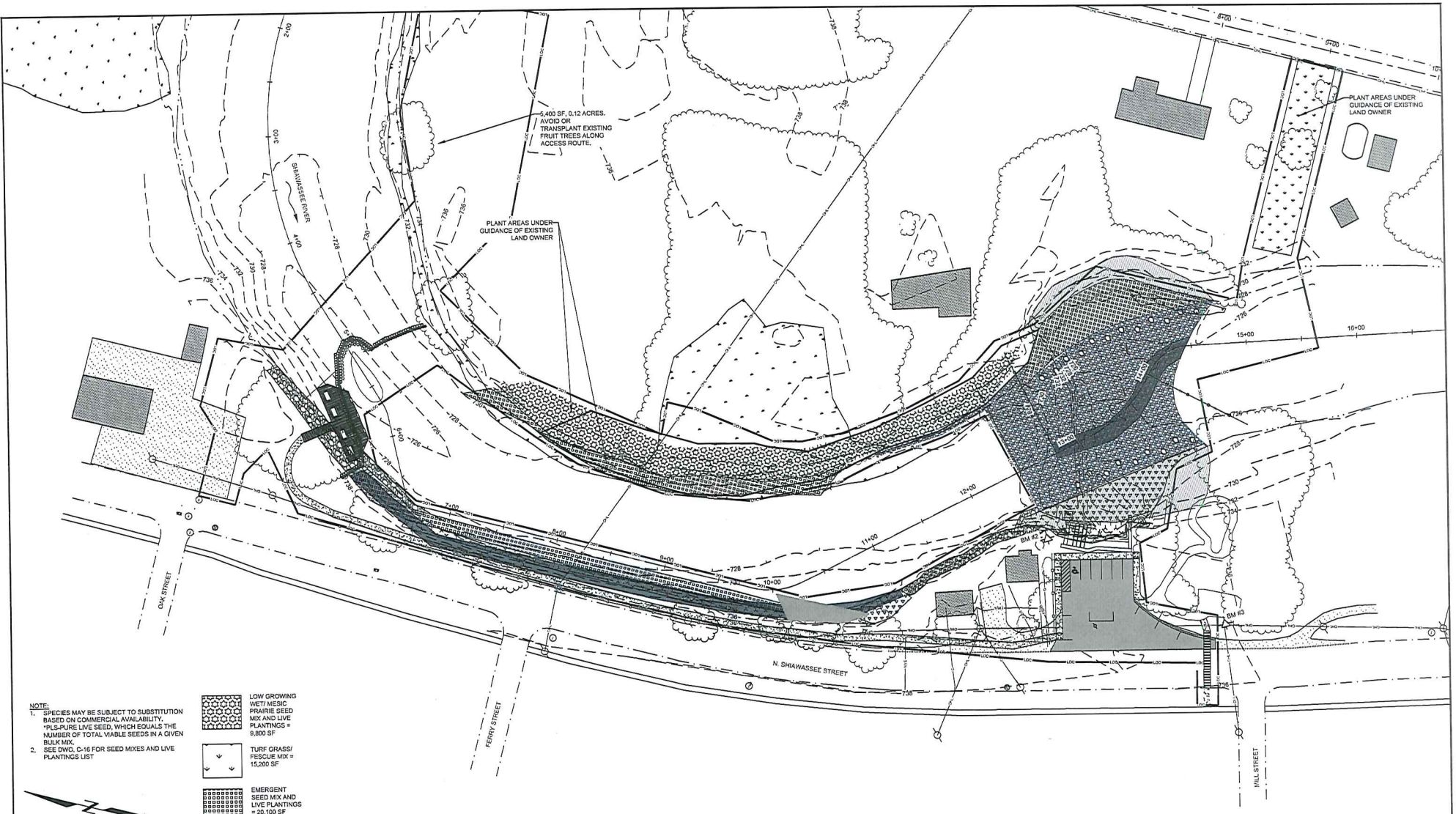
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DAM PROPOSED CONDITIONS - SITE PLAN

DWG. NO. C-17

SHEET NO. 19 OF 25

w:\city_of_corunna\CAD\Design\production\C-17 Dam Site Plan.dwg - 1/4/2019



NOTE:
1. SPECIES MAY BE SUBJECT TO SUBSTITUTION BASED ON COMMERCIAL AVAILABILITY. *PLS-PURE LIVE SEED, WHICH EQUALS THE NUMBER OF TOTAL VIABLE SEEDS IN A GIVEN BULK MIX.
2. SEE DWG. C-16 FOR SEED MIXES AND LIVE PLANTINGS LIST

- LOW GROWING WET/ MESIC PRAIRIE SEED MIX AND LIVE PLANTINGS = 9,800 SF
- TURF GRASS/ FESCUE MIX = 15,200 SF
- EMERGENT SEED MIX AND LIVE PLANTINGS = 20,100 SF
- EMERGENT SEED MIX = 3,000 SF
- BANK STABILIZATION SEED MIX = 2,000 SF

0 40 80
SCALE: 1" = 40'

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Attention:
0 1"
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City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

RESTORATION PLAN - DAM SITE

DWG. NO. C-18

SHEET NO. 20 OF 25

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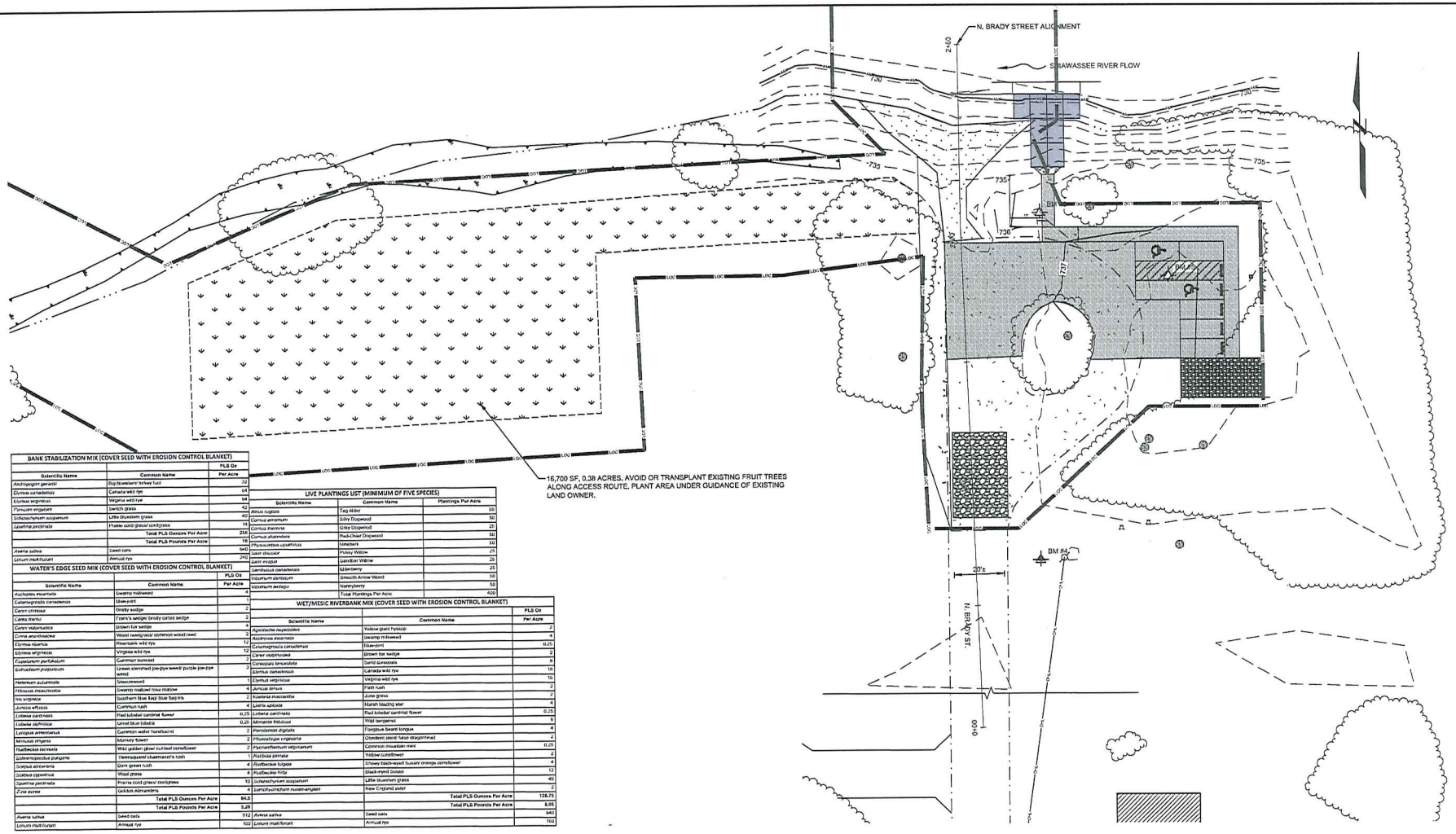

BANK STABILIZATION MIX (COVER SEED WITH EROSION CONTROL BLANKET)

Scientific Name	Common Name	PLS Oz Per Acre
Andropogon gerardii	Big bluestem/ turkey foot	32
Elymus canadensis	Canada wild rye	64
Elymus virginicus	Virginia wild rye	64
Panicum virgatum	Switch grass	42
Schizachyrium scoparium	Little bluestem grass	40
Sporobolus heterolepis	Prairie cord grass/ cordgrass	14
	Total PLS Ounces Per Acre	256
	Total PLS Pounds Per Acre	16
Avena sativa	Seed oats	640
Lolium multiflorum	Annual rye	240

WATER'S EDGE SEED MIX (COVER SEED WITH EROSION CONTROL BLANKET)

Scientific Name	Common Name	PLS Oz Per Acre
Alisma subcordatum	Southern water plantain	4
Asclepias incarnata	Swamp milkweed	4
Calamagrostis canadensis	Bluejoint	4
Carex crinita	Fringed sedge	2
Carex frankii	Frank's sedge/ bristly cattail sedge	2
Carex lupulina	Hop sedge	4
Carex stipata	Common fox sedge	2
Eupatorium perfoliatum	Common boneset	2
Eutrochium purpureum	Green stemmed joe-pye weed/ purple joe-pye weed	2
Helenium autumnale	Sneezeweed	2
Hibiscus moscheutos	Swamp mallow/ rose mallow	4
Iris virginica	Southern blue flag/ blue flag iris	2
Juncus effusus	Common rush	4
Lobelia cardinalis	Red lobelia/ cardinal flower	0.25
Lobelia siphilitica	Great blue lobelia	0.25
Lycopus americanus	Common water horehound	2
Mimulus ringens	Monkey flower	2
Packera obovata	Wild golden glow/ cut-leaf ragwort	2
Schoenoplectus pungens	Threesquare/ chairmaker's rush	1
Scirpus atrovirens	Dark green rush	4
Scirpus cyperinus	Wool grass	4
Sparganium eurycarpum	Broad-fruited bur-reed	10
Zizia aurea	Golden Alexanders	4
	Total PLS Ounces Per Acre	84.5
	Total PLS Pounds Per Acre	5.28
Avena sativa	Seed oats	512
Lolium multiflorum	Annual rye	160

LIVE PLANTINGS LIST (MINIMUM OF FIVE SPECIES)

Scientific Name	Common Name	Plantings Per Acre
Alnus rugosa	Tag Alder	68
Cornus amomum	Silky Dogwood	50
Cornus foemina	Gray Dogwood	25
Cornus stolonifera	Red-Osier Dogwood	50
Physocarpus opulifolius	Ninebark	50
Salix discolor	Pussy Willow	25
Salix exigua	Sandbar Willow	25
Sambucus canadensis	Elderberry	25
Viburnum dentatum	Smooth Arrow Wood	50
Viburnum lentago	Nannyberry	50
	Total Plantings Per Acre	400

WET/MESIC RIVERBANK MIX (COVER SEED WITH EROSION CONTROL BLANKET)

Scientific Name	Common Name	PLS Oz Per Acre
Agastache nepetoides	Yellow giant hyssop	2
Asclepias incarnata	Swamp milkweed	4
Calamagrostis canadensis	Bluejoint	0.25
Carex stipatiformis	Brown fox sedge	2
Coreopsis lanceolata	Sand coreopsis	8
Elymus canadensis	Canada wild rye	16
Elymus virginicus	Virginia wild rye	16
Juncus tenuis	Path rush	2
Koeleria macrantha	June grass	2
Liatris spicata	Marsh blazing star	4
Lobelia cardinalis	Red lobelia/ cardinal flower	0.25
Monarda fistulosa	Wild bergamot	8
Penstemon digitalis	Foxglove beard tongue	4
Physostegia virginiana	Obedient plant/ false dragonhead	2
Pycnanthemum virginianum	Common mountain mint	0.25
Ratibida pinnata	Yellow coneflower	2
Rudbeckia fulgida	Showy black-eyed Susan/ orange coneflower	4
Rudbeckia hirta	Black-eyed Susan	12
Schizachyrium scoparium	Little bluestem grass	40
Symphyotrichum novae-angliae	New England aster	2
	Total PLS Ounces Per Acre	128.75
	Total PLS Pounds Per Acre	8.05
Avena sativa	Seed oats	640
Lolium multiflorum	Annual rye	160

TURF GRASS/ FESCUE MIX

PLAN - N. BRADY STREET BOAT LAUNCH

0 20 40
SCALE: 1" = 20'

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Attention:

0 1"

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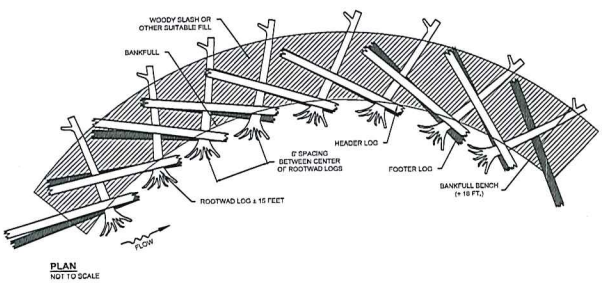
City of Corunna, Michigan

RESTORATION PLAN - N. BRADY STREET

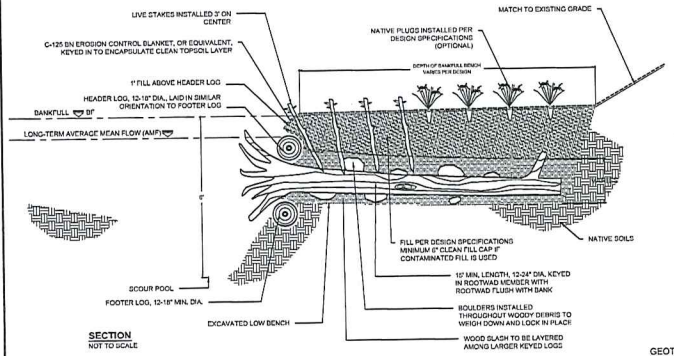
DWG. NO. C-19

SHEET NO. 21 OF 25

— W:\City_of_Corunna\CAD\Design\production\C-19 N Brady St Planting and Restoration Plan.dwg - 1/4/2019

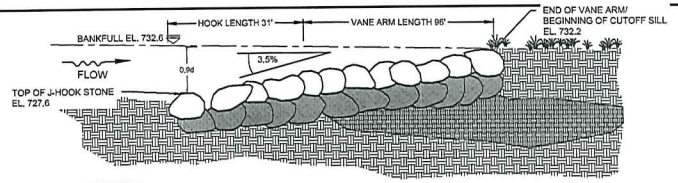


PLAN
NOT TO SCALE

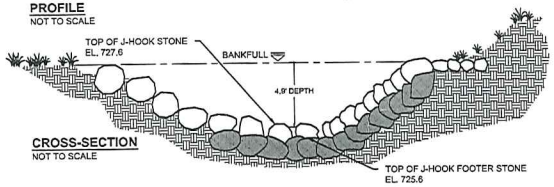


SECTION
NOT TO SCALE

1 — TOEWOOD DETAIL
NOT TO SCALE

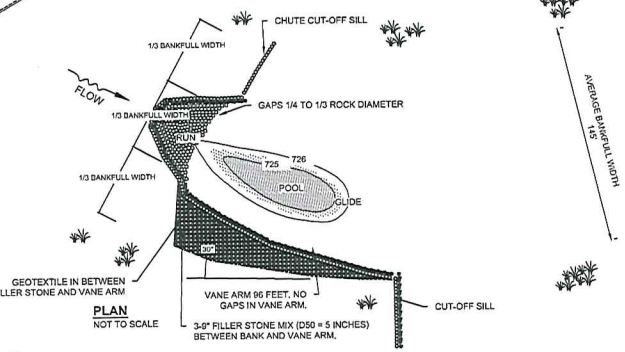


PROFILE
NOT TO SCALE



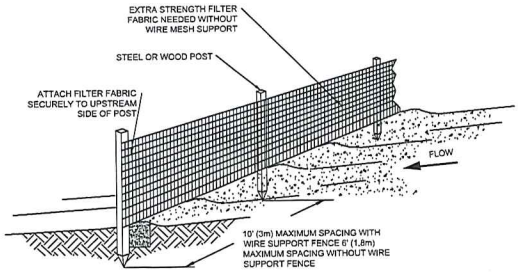
CROSS-SECTION
NOT TO SCALE

*BOULDERS WILL BE 12"-24" FOR CUT-OFF SILL, VANE, AND FOOTER

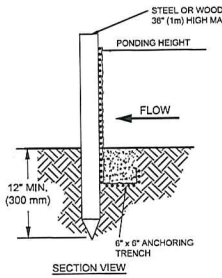


PLAN
NOT TO SCALE

3 — J-HOOK WITH ROCK SILL
NOT TO SCALE



PERSPECTIVE VIEW

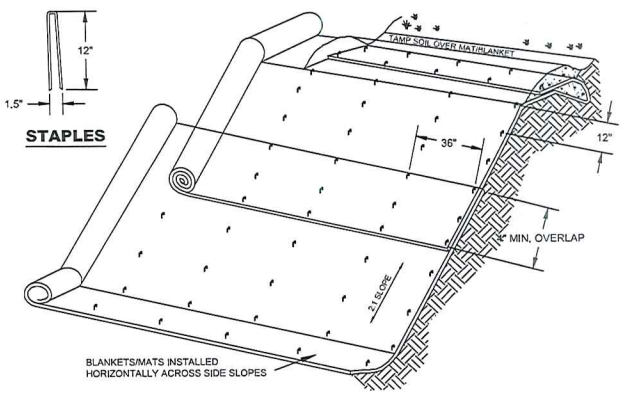


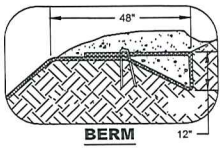
SECTION VIEW

NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" (225mm) MAXIMUM RECOMMENDED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

2 — SILT FENCE
NOT TO SCALE



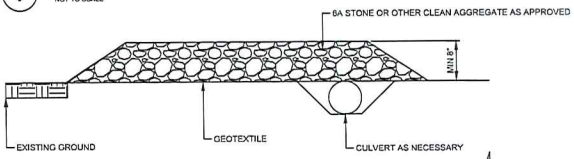


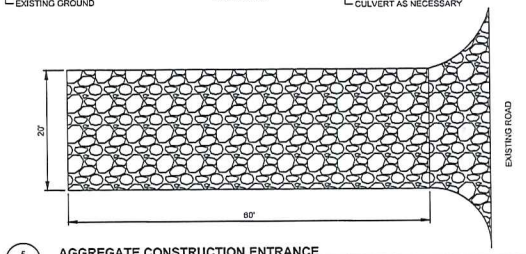
BERM

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

4 — EROSION CONTROL BLANKET
NOT TO SCALE





5 — AGGREGATE CONSTRUCTION ENTRANCE
NOT TO SCALE

Issued For Bid

Attention:			
0 1" If this scale bar does not measure 1" then drawing is not original scale.			
1	1/7/2019	ISSUED FOR BID	SD
0	3/14/2018	PERMIT DRAWINGS	SD
NO.	DATE	ISSUE/REVISION	APP

GEI Consultants
940 N. MAIN STREET
ANN ARBOR, MI 48104-1035
(734)930-1600

Designed:	S. Prentice
Checked:	K. Price
Drawn:	I. Roberts
Approved By:	S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

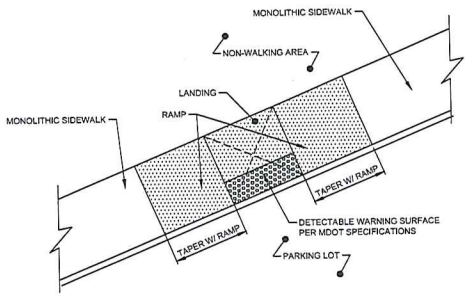
GEI Project 1610412

City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

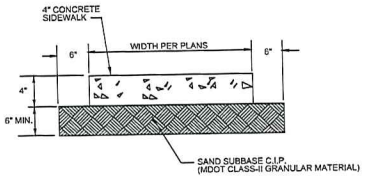
DWG. NO. C-20

STREAM RESTORATION DETAILS

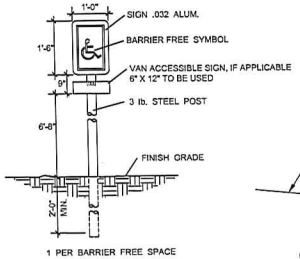
SHEET NO. 22 OF 25



6 - ADA AND CONCRETE SIDEWALK AND APPROACH
NO SCALE

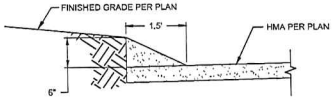


4" CONCRETE SIDEWALK
NO SCALE

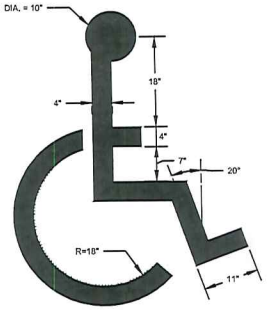


1 PER BARRIER FREE SPACE

VAN ACCESSIBLE HANDICAP SIGNAGE DETAIL
NO SCALE

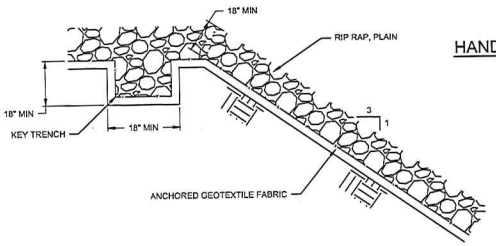


HMA WEDGE CURB
NO SCALE

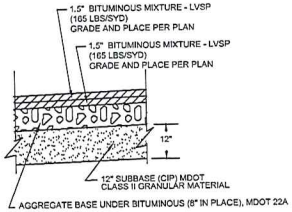


PAINTED HANDICAP SYMBOL
NO SCALE

NOTE:
1. HANDICAP SYMBOL AND BACKGROUND SHALL BE PAINTED TO CONFORM TO INTERNATIONAL SYMBOL OF ACCESSIBILITY, REFER TO ADA DETAIL 7/A2

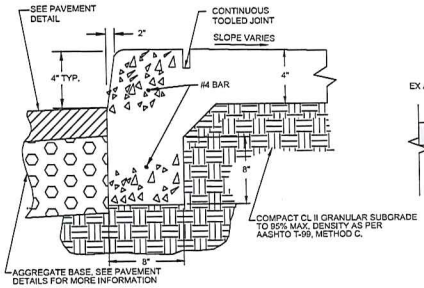


TYPICAL RIP RAP PROTECTION DETAIL
NO SCALE

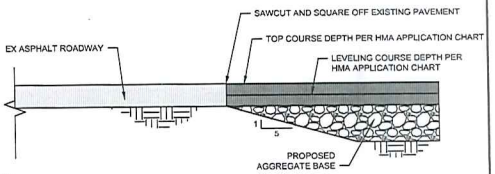


NOTES:
1. EXISTING MATERIAL MAY BE SUBSTITUTED FOR SUBBASE PROVIDED IT MEETS SPECIFICATIONS FOR MDOT CLASS II GRANULAR MATERIAL.
2. CONTRACTOR MUST SUBMIT ASPHALT MIX DESIGN TO ENGINEER FOR APPROVAL.

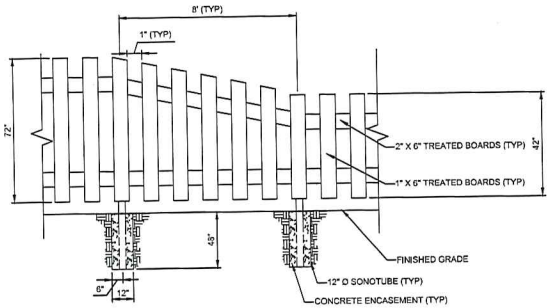
7 - HOT MIX ASPHALT PAVEMENT LIGHT DUTY
NO SCALE



MONOLITHIC SIDEWALK DETAIL
NO SCALE

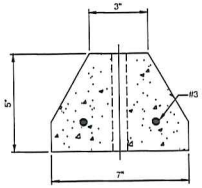


BUTT JOINT DETAIL
NO SCALE

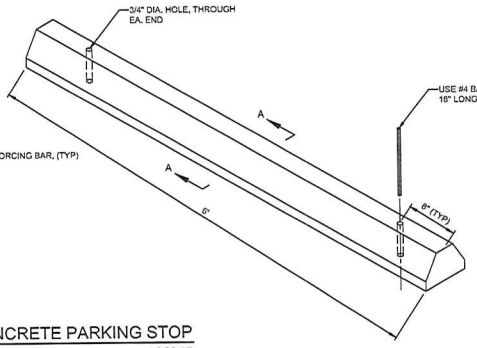


WOODEN FENCE TRANSITION DETAIL
NO SCALE

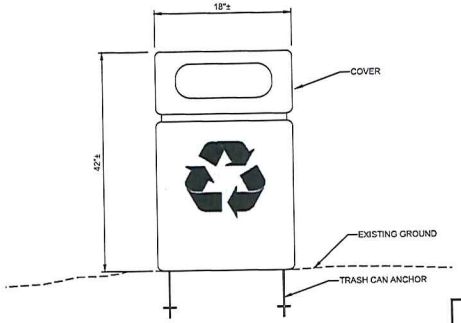
NOTES:
1. ALL FASTENERS SHALL BE EXTERIOR COATED 2.5" LONG STEEL DECK SCREWS. FASTEN FENCE PANELS TO POSTS WITH EXTERIOR COATED 4" LONG STEEL DECK SCREWS.
2. CONTRACTOR TO COORDINATE THE COLOR OF FENCE WITH OWNER.
3. FENCE POST WILL BE 4"X6" TREATED POSTS FOR GROUND CONTACT WITH A MINIMUM EMBEDMENT OF 4'. HOLES SHALL BE A MINIMUM OF 12" DIAMETER LOCATED 8' ON CENTER.



SECTION A-A (TYP)



CONCRETE PARKING STOP
NO SCALE



TRASH AND RECYCLING RECEPTACLE DETAIL
NO SCALE

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1	1/7/2019	ISSUED FOR BID	SD
0	3/14/2018	PERMIT DRAWINGS	SD

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

GEI Consultants
940 N. MAIN STREET
ANN ARBOR, MI 48104-1035
(734)660-1600

Designed: S. Prentice
Checked: K. Price
Drawn: I. Roberts
Approved By: S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

GEI Project 1610412

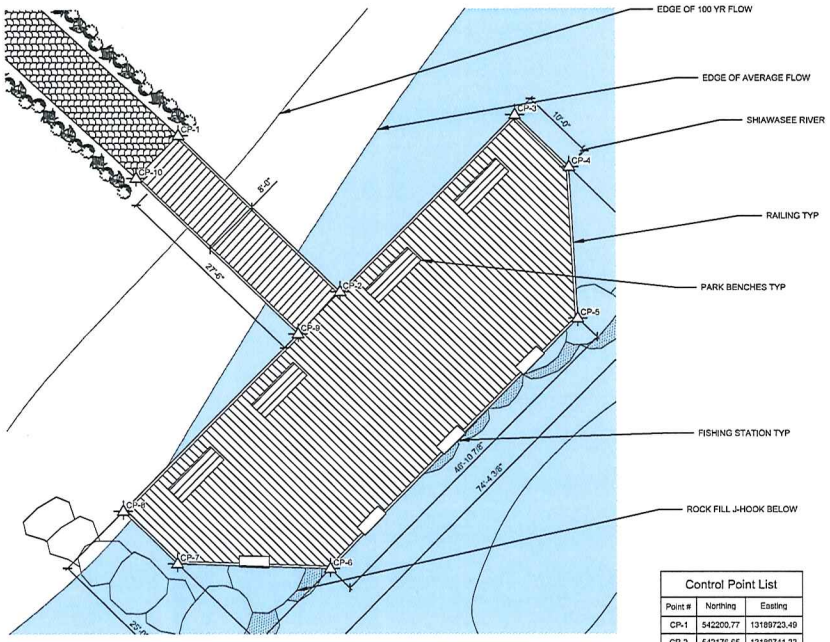
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DWG. NO. C-21

SHEET NO. 23 OF 25

SITE DETAILS

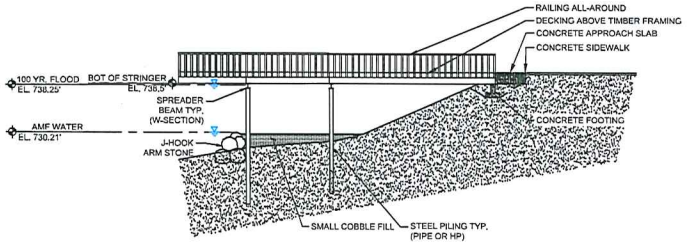
w:\city_of_corunna\CAD\asgmtproduction\C-21 Site Details.dwg - 1/4/2019



PLAN
CORUNNA DECK CONCEPT

0 10 20
SCALE: 1" = 10'

Control Point List		
Point #	Northing	Easting
CP-1	542200.77	13189723.49
CP-2	542176.65	13189741.33
CP-3	542196.39	13189768.00
CP-4	542188.36	13189773.95
CP-5	542168.13	13189771.64
CP-6	542140.23	13189734.14
CP-7	542144.12	13189714.18
CP-8	542152.16	13189708.23
CP-9	542171.90	13189734.00
CP-10	542196.01	13189717.00



ELEVATION
PLATFORM

0 10 20
SCALE: 1" = 10'

NOTE:

1. CONTRACTOR TO PROVIDE VIEWING PLATFORM DESIGN INCLUDING PILING. DESIGN SHALL MET DIMENSIONS AND DETAILS SHOWN ON PLANS. CONTRACTOR SHALL PROVIDE DESIGN SUBMITTAL SEALED BY MICHIGAN PROFESSIONAL ENGINEER.
2. SIZE AND SPACING OF STRUCTURAL ELEMENTS SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. VIEWING PLATFORM RAILING HEIGHT SHALL BE NO GREATER THAN 30 INCHES IN HEIGHT AT FISHING STATIONS AND RAILING HEIGHT SHALL BE NO GREATER THAN 30 INCHES FOR GREATER THAN 25% OF THE TOTAL RAILING LENGTH.

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Attention:

0 1"

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0	3/14/2018	PERMIT DRAWINGS	SD

GEI Consultants
940 N. MAIN STREET
ANN ARBOR, MI 48104-1035
(734)680-1600

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Checked: K. Price
Drawn: I. Roberts
Approved By: S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

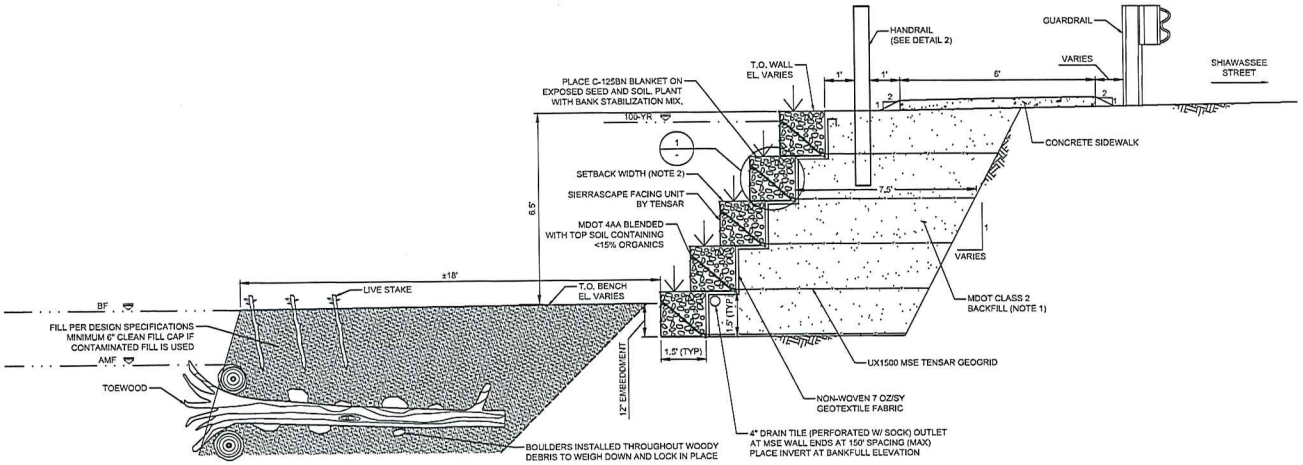
GEI Project 1610412

City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DWG. NO. C-22

VIEWING PLATFORM PLAN AND SECTION

SHEET NO. 24 OF 25

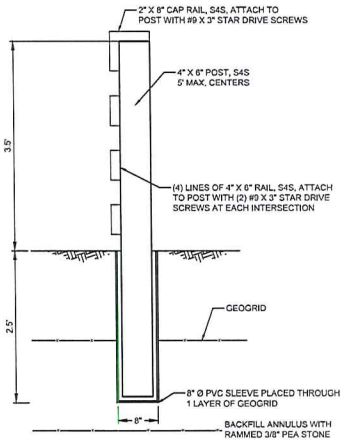


NOTES:

1. COMPACT BACKFILL TO 95% PER ASTM D 1687 MODIFIED PROCTOR.

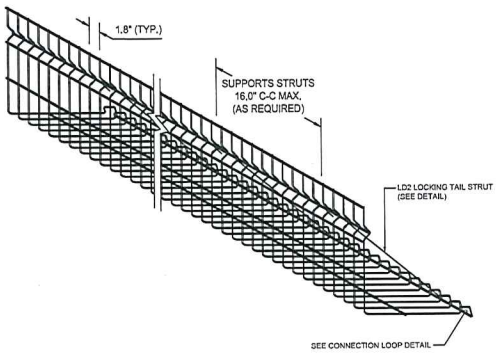
TYPICAL BATTERED CROSS SECTION

SCALE: N.T.S.



2 - DETAIL
SAMPLE RAIL

SCALE: N.T.S.



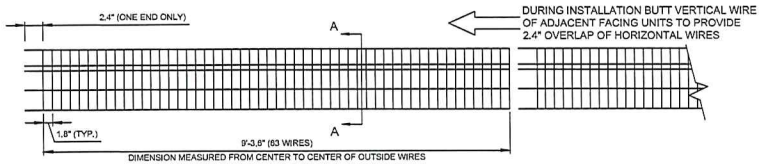
1 - DETAIL
SIERRASCAPE FACING UNIT

SCALE: N.T.S.

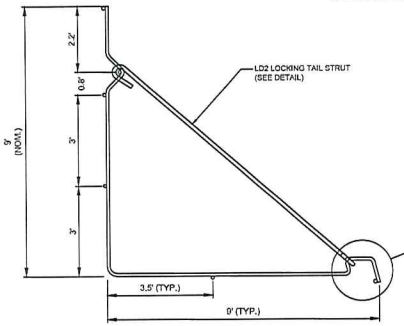
NOTE:

1) ALL FACING UNITS SHALL BE GALVANIZED PER ASTM A123 AFTER BENDING.

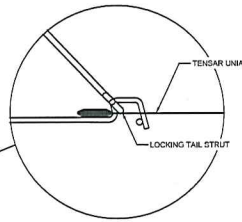
2) SETBACK WIDTH SHALL BE TYPICALLY 12 INCHES. SETBACK WIDTH CAN BE REDUCED TO A MINIMUM OF 6 INCHES IN LOCALIZED AREAS TO ACCOMMODATE POWER POLES OR OTHER SITE CONSTRAINTS WITHIN SIDEWALK FOOTPRINT UNDER DIRECTION OF ENGINEER.



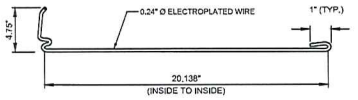
ELEVATION VIEW



SECTION A-A



CONNECTION LOOP DETAIL



LD2 LOCKING TAIL STRUT DETAIL

Issued For Bid

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1	1/7/2019	ISSUED FOR BID	SD
0	3/14/2018	PERMIT DRAWINGS	SD

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

GEI Consultants
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Checked: K. Price
Drawn: I. Roberts
Approved By: S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

GEI Project 1610412

City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

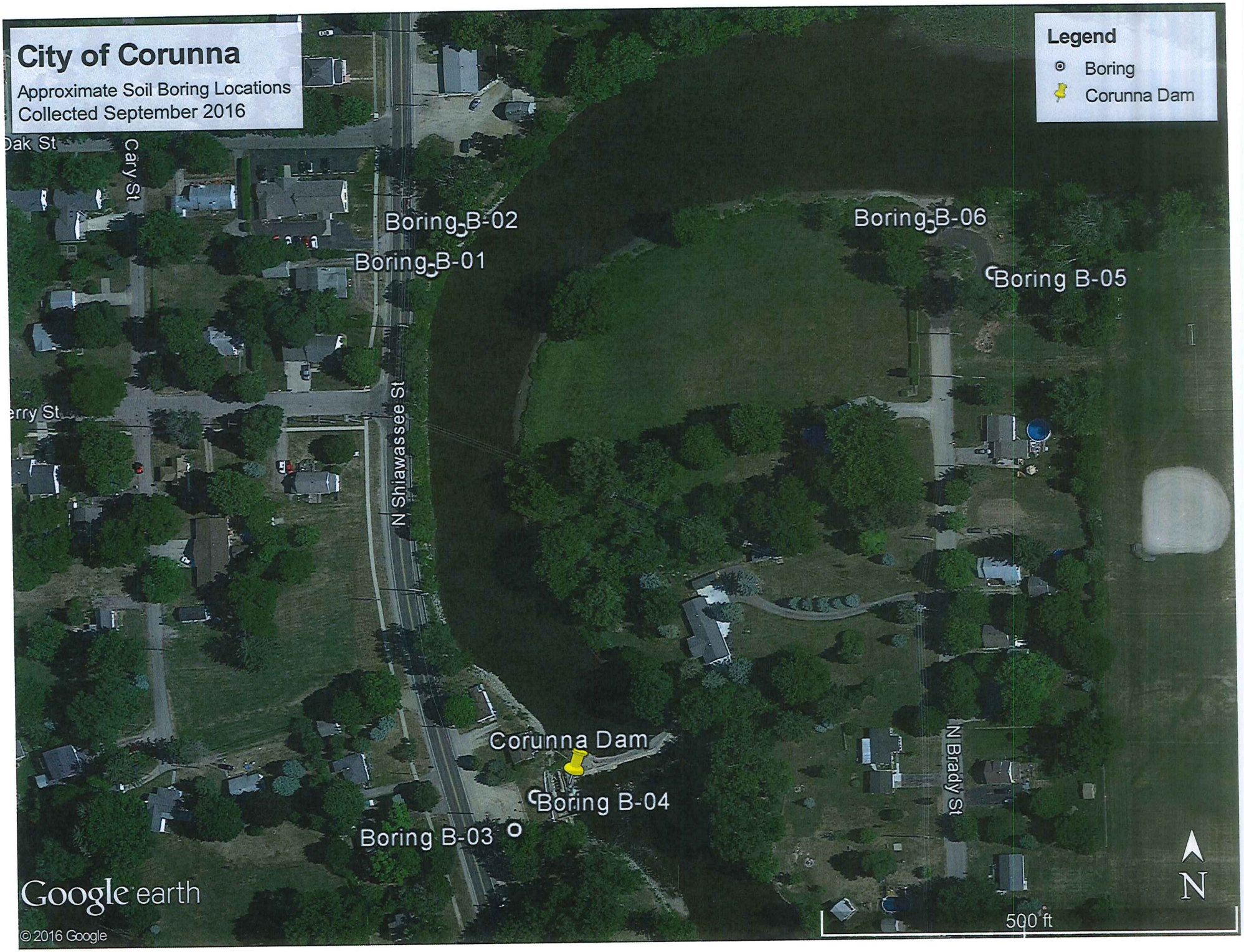
REINFORCED EARTH EMBANKMENT

DWG. NO. C-23

SHEET NO. 25 OF 25

Attachment B

Soil Boring Information
(submitted under separate cover)


City of Corunna
Approximate Soil Boring Locations
Collected September 2016
Legend
Boring
Corunna Dam
Oak St
Cary St
Boring B-02
Boring B-01
Boring B-06
Boring B-05
erry St
N Shiawassee St
Corunna Dam
Boring B-04
Boring B-03
N Brady St
N
500 ft
Google earth
© 2016 Google

GEI Consultants

CLIENT: **City of Corunna**

PROJECT NAME: **Corunna Dam Removal**

LOG OF BORING NUMBER **B-1**

ENGINEER **GEI Consultants of Michigan, P.C.**

LOCATION: Corunna, Michigan

SURFACE ELEVATION (ft)

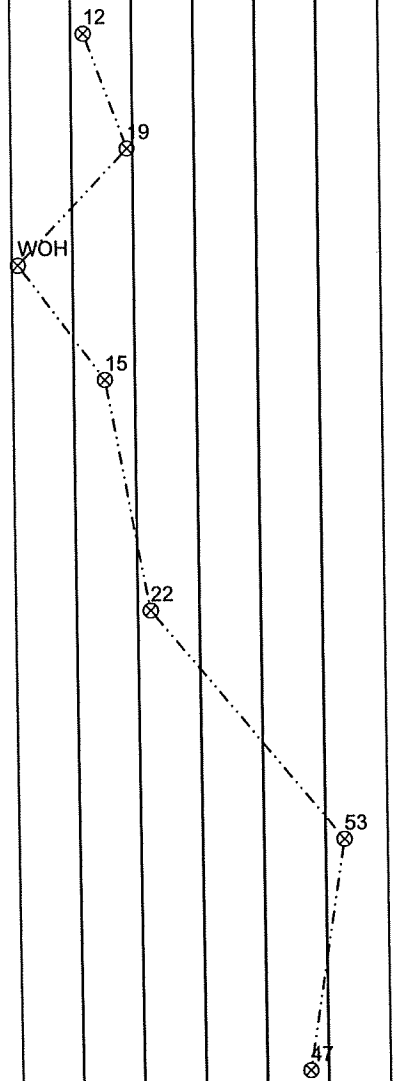
DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					Topsoil - dark brown
	1	SS			1.0 Fill: Clayey sand with roots - tan - medium dense
	2	SS			3.5 Clayey sand - brown - medium dense, moist (SC)
5	3	SS			6.5 Clayey sand (SC) - gray - very loose to medium dense, wet (SC)
	4	SS			
10					11.0 Medium to coarse sand with gravel - gray - medium dense, wet (SP)
	5	SS			
15					15.0 Clayey sand with gravel - gray - very dense, wet (SC)
	6	SS			
20					
	7	SS			
25					25.0 End of Boring Boring advanced to 25.0 feet with hollow-stem auger Boring backfilled with soil cuttings

Dry Unit Weight

UNCONFINED COMPRESSIVE STRENGTH TONS/FT^2
1 2 3 4 5

PLASTIC LIMIT (%) WATER CONTENT (%) LIQUID LIMIT (%)
10 20 30 40 50

STANDARD PENETRATION BLOWS/FT
10 20 30 40 50 60



The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WATER LEVEL: 6.0 ft. WS	BORING STARTED 9/29/2016	GEI OFFICE Ann Arbor, Michigan	
	BORING COMPLETED 9/29/2016	ENTERED BY BJV	APPROVED BY HEP
NORTHING EASTING	RIG/FOREMAN CME 55 / DLZ/ (Matt)	GEI PROJECT NO. 1610412	PAGE NO. 1 OF 1

MIDWEST BORING LOG 1610412 CORUNNA DAM REMOVAL - HEIDI - ANN ARBOR.GPJ GEI DATA TEMPLATE.GDT 10/27/16

GEI Consultants

CLIENT: **City of Corunna**

PROJECT NAME: **Corunna Dam Removal**

LOG OF BORING NUMBER **B-2**

ENGINEER **GEI Consultants of Michigan, P.C.**

LOCATION: Corunna, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL	Dry Unit Weight	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT (%) WATER CONTENT (%) LIQUID LIMIT (%) (10 20 30 40 50) / ⊗ STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 60)
SURFACE ELEVATION (ft)				Topsoil - dark brown		
	1	SS		1.0 Fill: Fine to medium sand - tan - very loose		⊗ 3
	2	SS		2.5 Clayey sand with gravel - brown - loose to medium dense, moist (SC)		⊗ 5
5	3	SS				⊗ 22
	4	SS				⊗ 19
10						
	5	SS		13.5 Clayey sand with coarse sand and gravel - gray - medium dense, wet (SC)		⊗ 15
15	6	SS				⊗ 28
20				20.0 End of Boring Boring advanced to 20.0 feet with hollow-stem auger Boring backfilled with soil cuttings		
25						

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WATER LEVEL: 8.5 ft. WS	BORING STARTED 9/29/2016	GEI OFFICE Ann Arbor, Michigan	
	BORING COMPLETED 9/29/2016	ENTERED BY BJV	APPROVED BY HEP
NORTHING EASTING	RIG/FOREMAN CME 55 / DLZ/(Matt)	GEI PROJECT NO. 1610412	PAGE NO. 1 OF 1

MIDWEST BORING LOG 1610412 CORUNNA DAM REMOVAL - HEIDI - ANN ARBOR.GPJ GEI DATA TEMPLATE.GDT 10/27/16

GEI Consultants

CLIENT: **City of Corunna**

PROJECT NAME: **Corunna Dam Removal**

LOG OF BORING NUMBER **B-3**

ENGINEER **GEI Consultants of Michigan, P.C.**

LOCATION: Corunna, Michigan

SURFACE ELEVATION (ft)

DEPTH (FT) ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					Fill: Gravel Road
	1	SS			1.0 Fill: Fine to medium sand with gravel - tan - medium dense to loose
	2	SS			
	3	SS			4.5 Medium to coarse sand with gravel - brown - loose, moist (SP)
5					5.5 End of Boring Boring advanced to 5.5 feet with hollow-stem auger Boring backfilled with soil cuttings
10					
15					
20					
25					

Dry Unit Weight

UNCONFINED COMPRESSIVE STRENGTH TONS/FT^2
1 2 3 4 5

PLASTIC LIMIT (%) WATER CONTENT (%) LIQUID LIMIT (%)
10 20 30 40 50

⊗ STANDARD PENETRATION BLOWS/FT
10 20 30 40 50 60

11
4
6

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WATER LEVEL: Not Recorded	BORING STARTED 9/29/2016	GEI OFFICE Ann Arbor, Michigan	
	BORING COMPLETED 9/29/2016	ENTERED BY BJV	APPROVED BY HEP
NORTHING EASTING	RIG/FOREMAN CME 55 / DLZ/(Matt)	GEI PROJECT NO. 1610412	PAGE NO. 1 OF 1

MIDWEST BORING LOG 1610412 CORUNNA DAM REMOVAL - HEIDI - ANN ARBOR.GPJ GEI DATA TEMPLATE.GDT 10/27/16

GEI Consultants

CLIENT: **City of Corunna**

PROJECT NAME: **Corunna Dam Removal**

LOG OF BORING NUMBER **B-4**

ENGINEER **GEI Consultants of Michigan, P.C.**

LOCATION: Corunna, Michigan

DEPTH (FT) ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	Dry Unit Weight	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT (%) WATER CONTENT (%) LIQUID LIMIT (%) (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 60)
SURFACE ELEVATION (ft)					Topsoil - dark brown		
	1	SS			1.5 Fill: Fine to medium sand - tan - medium dense to loose		15
	2	SS					4
	3	SS			3.5 Clayey sand with gravel - gray - loose, moist (SC)		5
5					5.5 End of Boring Boring advanced to 5.5 feet with hollow-stem auger Boring backfilled with soil cuttings		
10							
15							
20							
25							

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WATER LEVEL: Not Encountered	BORING STARTED 9/29/2016	GEI OFFICE Ann Arbor, Michigan	
	BORING COMPLETED 9/29/2016	ENTERED BY BJV	APPROVED BY HEP
NORTHING EASTING	RIG/FOREMAN CME 55 / DLZ/(Matt)	GEI PROJECT NO. 1610412	PAGE NO. 1 OF 1

MIDWEST BORING LOG 1610412 CORUNNA DAM REMOVAL - HEIDI - ANN ARBOR.GPJ GEI DATA TEMPLATE.GDT 10/27/16

GEI Consultants

CLIENT: **City of Corunna**

PROJECT NAME: **Corunna Dam Removal**

LOG OF BORING NUMBER **B-5**

ENGINEER **GEI Consultants of Michigan, P.C.**

LOCATION: Corunna, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	Dry Unit Weight	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT (%) WATER CONTENT (%) LIQUID LIMIT (%) (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 60)
SURFACE ELEVATION (ft)					Topsoil - dark brown		
	1	SS			1.0 Clayey sand with gravel - brown - medium dense, moist (SC)		14
	2	SS					12
	3	SS			3.5 Medium to coarse sand with gravel - tan - medium dense to loose, moist (SP)		5
5					5.0 Medium to coarse sand with roots - gray - loose, wet (SP)		
					5.5 End of Boring Boring advanced to 5.5 feet with hollow-stem auger Boring backfilled with soil cuttings		
10							
15							
20							
25							

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WATER LEVEL: 5.0 ft. WS	BORING STARTED 9/29/2016	GEI OFFICE Ann Arbor, Michigan	
	BORING COMPLETED 9/29/2016	ENTERED BY BJV	APPROVED BY HEP
NORTHING EASTING	RIG/FOREMAN CME 55 / DLZ/(Matt)	GEI PROJECT NO. 1610412	PAGE NO. 1 OF 1

MIDWEST BORING LOG 1610412 CORUNNA DAM REMOVAL - HEIDI - ANN ARBOR.GPJ GEI DATA TEMPLATE.GDT 10/27/16

GEI Consultants

CLIENT: **City of Corunna**

PROJECT NAME: **Corunna Dam Removal**

LOG OF BORING NUMBER **B-6**

ENGINEER **GEI Consultants of Michigan, P.C.**

LOCATION: Corunna, Michigan

SURFACE ELEVATION (ft)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	Dry Unit Weight	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT (%) / WATER CONTENT (%) / LIQUID LIMIT (%) (10 20 30 40 50) / ⊗ STANDARD PENETRATION BLOWS/FT (10 20 30 40 50 60)
					Fill: Gravel		
	1	SS			1.0 Clayey sand - gray - loose to medium dense (SC)		⊗ 4
	2	SS			- with trace coarse sand and fine gravel at 3.5 to 5.0 feet		⊗ 14
5					5.0 End of Boring Boring advanced to 5.0 feet with hollow-stem auger Boring backfilled with soil cuttings		
10							
15							
20							
25							

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WATER LEVEL: Not Encountered	BORING STARTED 9/29/2016	GEI OFFICE Ann Arbor, Michigan	
	BORING COMPLETED 9/29/2016	ENTERED BY BJV	APPROVED BY HEP
NORTHING EASTING	RIG/FOREMAN CME 55 / DLZ/(Matt)	GEI PROJECT NO. 1610412	PAGE NO. 1 OF 1

MIDWEST BORING LOG 1610412 CORUNNA DAM REMOVAL - HEIDI - ANN ARBOR.GPJ GEI DATA TEMPLATE.GDT 10/27/16

Attachment C

MDEQ Approved Permit
(submitted under separate cover)

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION
PERMIT

Issued To:

Mr. Joe Sawyer, Manager
City of Corunna
402 North Shiawassee Street
Corunna, MI 48817

Permit No: WRP013179 **v.1**
Submission No.: HNC-K9BH-B0SQC
Site Name: Corunna Dam
Issued:
Revised:
Expires:

This permit is being issued by the Michigan Department of Environmental Quality (DEQ), Water Resources Division, under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); specifically:

- ☒ **Part 301, Inland Lakes and Streams**
- ☒ **Part 303, Wetlands Protection**
- ☒ **Part 315, Dam Safety**
- ☒ **Part 31, Water Resources Protection (Floodplain Regulatory Authority)**
- ☐ **Part 323, Shorelands Protection and Management**
- ☐ **Part 325, Great Lakes Submerged Lands**
- ☐ **Part 353, Sand Dunes Protection and Management**

Permission is hereby granted, based on permittee assurance of adherence to State of Michigan requirements and permit conditions, to:

Authorized Activity:

Permanently drawdown the impoundment by a maximum of 6.5 vertical feet and remove the Corunna Dam structure, Dam ID No. 379, located on the Shiawassee River in the City of Corunna. Restore a natural river channel through the former impoundment area. Construct rock riffle, J-hook, floodplain bench, and toe wood structures for channel and bank stabilization and in-stream habitat creation. Construct a walkway, viewing platform, and boat launch. Excavate approximately 5,833 cubic yards of material, including 2,667 cubic yards from below the ordinary high-water marks (OHWM) and 5,833 cubic yards from within the 100-year floodplain of the Shiawassee River; and place approximately 7,817 cubic yards of fill, including 3,860 cubic yards below the OHWM and 7,817 cubic yards from within the 100-year floodplain of the Shiawassee River. Dredge approximately 0.38 acres and fill approximately 0.01 acres of existing wetland areas, resulting in a permanent loss of approximately 0.2 acres of wetland area.

Waterbody Affected: Shiawassee River
Property Location: Shiawassee County, City of Corunna, Town/Range/Section 07N03E21, Property Tax No. 026-12-015-002

Authority granted by this permit is subject to the following limitations:

A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
B. The permittee, in exercising the authority granted by this permit, shall not cause unlawful pollution as defined by Part 31 of the NREPA.
C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
D. All work shall be completed in accordance with the approved plans and specifications submitted with the application and/or plans and specifications attached to this permit.
E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved.
F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with 2013 PA 174 (Act 174) and comply with each of the requirements of Act 174.
G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits, or complying with other state statutes.
H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
I. Permittee shall notify the DEQ within one week after the completion of the activity authorized by this permit.
J. This permit shall not be assigned or transferred without the written approval of the DEQ.
K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific state act, federal act, and/or rule under which this permit is granted.
L. All dredged or excavated materials shall be disposed of in an upland site (outside of floodplains, unless exempt under Part 31 of the NREPA, and wetlands).
M. In issuing this permit, the DEQ has relied on the information and data that the permittee has provided in connection with the submitted application for permit. If, subsequent to the issuance of a permit, such information and data prove to be false, incomplete, or inaccurate, the DEQ may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
N. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representative of the permittee, undertaken in connection with this permit. The permittee's obligation to indemnify the State of Michigan applies only if the state: (1) provides the permittee or its designated representative written notice of the claim or cause of action within 30 days after it is received by the state, and (2) consents to the permittee's participation in the proceeding on the claim or cause of action. It does not apply to contested case proceedings under the Administrative Procedures Act, 1969 PA 306, as amended, challenging the permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.
O. Noncompliance with these terms and conditions and/or the initiation of other regulated activities not specifically authorized shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, the DEQ may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.
P. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity from the DEQ. Such revision request shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by the DEQ prior to being implemented.
Q. This permit may be transferred to another person upon written approval of the DEQ. The permittee must submit a written request to the DEQ to transfer the permit to the new owner. The new owner must also submit a written request to the DEQ to accept transfer. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties that includes all of the above information may be provided to the DEQ. The DEQ will review the request and, if approved, will provide written notification to the new owner.

R. Prior to initiating permitted construction, the permittee is required to provide a copy of the permit to the contractor(s) for review. The property owner, contractor(s), and any agent involved in exercising the permit are held responsible to ensure that the project is constructed in accordance with all drawings and specifications. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by the permit.

S. Construction must be undertaken and completed during the dry period of the wetland. If the area does not dry out, construction shall be done on equipment mats to prevent compaction of the soil.

T. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA).

U. Authority granted by this permit does not waive permit requirements under the authority of Part 305, Natural Rivers, of the NREPA. A Natural Rivers Zoning Permit may be required for construction, land alteration, streambank stabilization, or vegetation removal along or near a natural river.

V. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.

W. Unless specifically stated in this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the water body are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.

X. For projects with potential impacts to fish spawning or migration, no work shall occur within fish spawning or migration timelines (i.e., windows) unless otherwise approved in writing by the Michigan Department of Natural Resources, Fisheries Division.

Y. Work to be done under authority of this permit is further subject to the following special instructions and specifications:

1. All dam construction shall be completed in accordance with the attached design plans prepared by GEI Consultants, dated March 14, 2017.
2. All dam construction activities must be conducted under the knowledge and supervision of a licensed professional engineer.
3. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity and/or mitigation plan from the DEQ. Such revision requests shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by the DEQ prior to being implemented.
4. This permit may be transferred to another person upon written approval of the DEQ. The permittee must submit a written request to the DEQ to transfer the permit to the new owner. The new owner must also submit a written request to accept transfer of the permit. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties which includes all the above information may be provided to the DEQ. The DEQ will review the request and if approved, will provide written notification to the new owner.
5. A permit may be extended for cause; however, the life of this permit may not exceed five (5) years. To request an extension of a permit, a written request must be submitted to the DEQ before the expiration date of the permit. The request must indicate the reasons for the extension. The DEQ will review the request and, if approved, provide written notification to the permittee.
6. Any modification or revision to the approved design plans and/or specifications must be approved, in writing, by the WRD, DEQ.
7. Notification shall be made to the DEQ's WRD, five days prior to starting the project. Please notify Mr. Lucas Trumble, P.E., at 517-420-8923 or trumblel@michigan.gov.
8. The project is limited to area of permittee's ownership and riparian interest. All spoils, including organic and inorganic soils, vegetation, and debris, shall be placed above the ordinary high-water mark, leveled, and stabilized with sod and/or seed and mulch in such a manner as not to erode into any waterbody or wetland.

9. The design flood or one percent annual chance (100-year) floodplain elevation at this location on the Shiawassee River ranges from 738 feet NAVD-88 to approximately 737 feet NAVD-88 along the project site.

10. No fill, excess soil, or other material shall be placed in the 100-year floodplain, any wetland or surface water area not specifically authorized by this permit, its plans, and specifications.

11. Any temporary dam constructed as part of this project shall have the dam crest placed at such an elevation that the dam will not cause upstream flooding in the event of high flow conditions. In no case shall the crest be set at an elevation greater than two feet above the ordinary high-water mark of the stream. "Ordinary high-water mark" means the line between upland and bottomland that persists through successive changes in water levels, below which the presence and action of the water is so common or recurrent that the character of the land is marked distinctly from the upland and is apparent in the soil itself, the configuration of the surface of the soil, and the vegetation. The dam shall be removed within 14 days of placement.

12. The project is located within a community that participates in the National Flood Insurance Program (NFIP). As a participant in the NFIP, the community must comply with the Michigan Building Code (including Appendix G and listed supporting materials); the Michigan Residential Code; and Title 44 of the Code of Federal Regulations, Part 60, Criteria for Land Management and Use. The community is also responsible to ensure that its floodplain maps and studies are maintained to show changes to flood elevations and flood delineations as described in 44 CFR, Part 65, Identification and Mapping of Special Hazard Areas.

13. The proposed fill will change the one percent annual chance (100-year) flood elevations that are published in the community's Flood Insurance Rate Map and/or Flood Elevation Study.

14. A Conditional Letter of Map Revision must be received from the Federal Emergency Management Agency (FEMA) prior to placement of the fill or start of work. A Letter of Map Revision must be obtained upon completion of the project.

15. No work shall be done in the stream during periods of above-normal flows except as necessary to prevent erosion.

16. Unless specifically stated under the "Permitted Activity" of this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the waterbody are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.

17. A storm water discharge permit may be required under the Federal Clean Water Act for construction activities that disturb one or more acres of land and discharge to surface waters. For sites over five (5) acres, the permit coverage may be obtained by a Part 91, Soil Erosion and Sedimentation Control (SESC) permit, or coverage as an Authorized Public Agency (APA), and filing a "Notice of Coverage" form to the DEQ's WRD. For sites with disturbance from one acre up to five acres, storm water coverage is automatic once the SESC permit is obtained or if work is being conducted by an APA. These one to five acre sites are not required to apply for coverage, but are required to comply with storm water discharge permit requirements. Information on the storm water discharge permit is available from the WRD's Storm Water Permit Program at **www.michigan.gov/soilerosion** under the "Construction Storm Water Info."

18. Prior to the initiation of any permitted construction activities, a sedimentation barrier shall be constructed immediately downgradient of the construction site. Sedimentation barriers shall be specifically designed to handle the sediment type, load, water depth, and flow conditions of each construction site throughout the anticipated time of construction and unstable site conditions. The sedimentation barrier shall be maintained in good working order throughout the duration of the project.

Upon project completion, the accumulated materials shall be removed and disposed of at an upland (non-wetland, non-floodplain) site and stabilized with seed and mulch. The sedimentation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.

19. Prior to the start of construction, all adjacent non-work wetland areas shall be protected by a properly trenched sedimentation barrier to prevent sediment from entering the wetland. Orange construction fencing shall be installed as needed to prohibit construction personnel and equipment from entering or performing work in these areas. Fence shall be maintained daily throughout the construction process. Upon project completion, the accumulated materials shall be removed and disposed of at an upland site, the sedimentation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.

20. All earth moving equipment shall be thoroughly cleaned and washed prior to entering the work site to prevent contamination by invasive plant species.

21. Prior to commencement of any dredging authorized by this permit, the entire dredged area shall be enclosed with a turbidity curtain to prevent off-site siltation. The turbidity curtain shall be installed to extend from the bed of the waterbody to a point above the existing water's surface. The turbidity curtain shall be maintained for the duration of the project and shall be left in place after completion of dredging until all disturbed sediments have settled. In the event there is a problem with the turbidity curtain, and a failure to contain the sediments from leaving the project site, the project shall be immediately stopped, evaluated, and appropriate measures shall be taken to stop the release of sediments/turbidity. The permittee, agent or contractor shall immediately notify the Pollution Emergency Alerting System (PEAS) at 1-800-292-4706 and Lucas Trumble, P.E. at 517-420-8923 or by email at trumblel@michigan.gov, on the turbidity curtain failure and the measures being taken to stop the release of sediments/turbidity.

22. Dredged material, including organic and inorganic sediment, vegetation, and other material removed from bottomlands, shall not be placed in any wetland, floodplain or critical dune, or below the ordinary high-water mark of any inland lake, Great Lake, or stream. Dredged material placed on upland shall be stabilized in such a manner to prevent erosion of any material into any waterbody, including wetlands, or floodplain.

23. The permittee is cautioned that excessive dredging resulting in the impairment of the structural integrity of seawalls on neighboring riparian properties is subject to civil damage litigation.

24. No work or dredging within the water authorized by this permit is allowed from May 1st to June 30th due to critical spawning, migration, and/or recreational use periods.

25. The permittee is advised of other potential requirements and legal liabilities under other statutes for placement of dredge material on upland and is responsible for compliance with all applicable local, state, and federal regulations. Please review the information under Dredging Documents at the attached link: https://www.michigan.gov/deq/0,4561,7-135-3312_4123-14201--,00.html

26. Drawdown of the impoundment shall be completed at a rate not to exceed 0.5 vertical feet per 24-hour period.

27. The applicant will monitor the drawdown for fish and mussel stranding and rescue stranded fish, mussels, and other animals. Rescued fish and mussels must be relocated to areas of adequate depth.

28. During removal of the existing structure, every precaution shall be taken to prevent debris from entering any watercourse. Any debris reaching the watercourse during the removal and/or reconstruction of the structure shall be immediately retrieved from the water. All material shall be disposed of in an acceptable manner consistent with local, state, and federal regulations.

29. All fill shall consist of clean inert material that will not cause siltation nor contain soluble chemicals, organic matter, pollutants, or contaminants. All fill shall be contained in such a manner so as not to erode into any surface water, floodplain, or wetland. All raw areas associated with the permitted activity shall be stabilized with sod and/or seed and mulch, riprap, or other technically effective methods as necessary to prevent erosion.

30. All rock and stone shall be properly sized and graded based on wave action and velocity, and shall consist of natural field stone or rock (free of paint, soil or other fines, asphalt, soluble chemicals, or organic material).

31. Broken concrete may be used as a base layer to fill in scour holes. Broken concrete must be clean, free of debris, have no reinforcing steel protruding, and be capped in fractured limestone or natural stone, adequately sized to remain in place.

32. The toe wood and in-stream structures shall be firmly anchored to prevent flotation or lateral movement.

33. Fill shall not be placed to prevent surface water drainage across the site. Site runoff shall be directed to public or natural drainage ways and not unnaturally discharged onto adjacent properties.

34. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.

35. No fill, excess soil, or other material shall be placed in any wetland, floodplain, or surface water area not specifically authorized by this permit, its plans, and specifications.

36. The permittee is hereby cautioned that any discharge of sediment into waters of the state is a violation of Part 31 of the NREPA. Any sedimentation caused by the construction or use of the permitted structure, subjects the permittee to provisions of Part 31.

37. All slurry resulting from any dewatering operation shall be discharged through a filter bag or pumped to a sump located away from wetlands and surface waters and allowed to filter through natural upland vegetation, gravel filters, or other engineered devices for a sufficient distance and/or period of time necessary to remove sediment or suspended particles. The discharge of slurry water resulting from hydrodemolition or saw cutting of concrete is not allowed to enter a lake, stream, or wetland.

38. All raw areas in uplands resulting from the permitted construction activity shall be effectively stabilized with sod and/or seed and mulch (or other technology specified by this permit or project plans) in a sufficient quantity and manner to prevent erosion and any potential siltation to surface waters or wetlands. Temporary stabilization measures shall be installed before or upon commencement of the permitted activity, and shall be maintained until permanent measures are in place. Permanent measures shall be in place within five (5) days of achieving final grade.

39. All raw earth within 100 feet of a lake, stream, or wetland that is not brought to final stabilization by the end of the active growing season shall be temporarily stabilized with mulch blankets in accordance with the following dates: September 20th for the Upper Peninsula, October 1st for the Lower Peninsula north of US-10, and October 10th for the Lower Peninsula south of US-10.

40. The permittee shall furnish a written statement from a professional engineer, certifying that he has supervised the removal of the dam and that it was removed in accordance with the plans and specifications approved by the WRD, DEQ.

41. The permittee shall submit a final engineering report to the Dam Safety Program, WRD, which shall include, but not be limited to, documentation of the extent of construction, results of construction material testing, soil boring logs, test pit data collection, summaries of instrumentation monitoring for the construction, and other pertinent project information. The report shall also include a set of final project drawings documenting the extent of construction, signed and sealed by a professional engineer licensed in the State of Michigan.

42. Final approval of the dam removal will not be granted until a site inspection by the DEQ has confirmed that the dam has been removed in accordance with the approved plans and specifications.

43. The following performance standards will be used to evaluate the stream restoration project:

    a. Construction has been completed in accordance with the DEQ's approved plans and specifications included in the permit.

    b. Restoration of the stream channel to a stable pattern, dimension, and profile based on reference stream parameters and the design plans. Maintenance of stable stream parameters for a minimum of two bankfull (or greater) stream flow events.

    c. Any in-stream structures (i.e. toe wood, j-hooks, constructed riffles, etc.) shall perform as designed. The structures shall stay in place and there shall be no bank erosion, piping, undermining, or other indication of instability associated with the in-stream structures including no buoyancy issues with any large wood installations.

    d. At the end of the monitoring period, the areas of restored stream channel shall exhibit floodplain connectivity appropriate for proper stream functioning as evidenced by a weighted Bank Height Ratio of between 1.2 and 1.0, and a weighted Entrenchment Ratio of greater than 1.4.

44. The permittee shall monitor the stream restoration project for a minimum of five (5) years following grading, planting, and introduction of hydrology. A monitoring report, which compiles and summarizes all data collected during the monitoring period, shall be submitted annually by the permittee. Monitoring reports shall cover the period of January 1 through December 31, and be submitted to the DEQ prior to January 31 of the following year. The permittee shall conduct the following activities and provide the information collected in the monitoring reports:

    a. Provide annual photographic documentation of the development of the restored stream channel from permanent photo stations located within the restored stream channel and/or floodplain. At a minimum, photo stations shall be located to show three permanent channel cross-sections, each in-stream structure (i.e. toe wood, j-hook, constructed riffle, etc.), and any areas where problems are identified (significant erosion or deposition, unvegetated areas, headcuts, etc.). Photos should be taken from the same locations annually and must be labeled with the station/location, date photographed, and direction (i.e., facing upstream). Additional photos should be included as needed. A map featuring the locations of the photo stations shall be provided.

    b. Channel dimensions should be measured on an annual basis at a minimum of three permanent locations. Bankfull width, depth, and cross-sectional area, as well as width to depth ratio, bank height ratio, and entrenchment ratio should all be reported. Current year channel dimensions should be compared with results from all previous years, including graphic overlays of each cross-section.

    c. Document substrate characteristics and any areas of erosion and/or deposition within the stream channel.

    d. Assess the stability and performance of any in-stream structures or large wood installations.

    e. Provide a written summary of data from previous monitoring periods and a discussion of changes or trends based on all monitoring results. This summary shall include identification of all performance standards and whether each standard has been met. A table containing this information, and original channel data, shall be included.

f. Provide a written summary and map of all the problem areas that have been identified and, if needed, potential corrective measures to address these problem areas.

45. Provide documentation that the channel has experienced two flow events equal to or greater than bankfull flows.

46. The permittee shall monitor for invasive species in the area that the drawdown occurred for a minimum of five (5) years following completion of the project. Invasive species including, but not limited to, *Phragmites australis* (Common Reed), *Lythrum salicaria* (Purple Loosestrife), and *Phalaris arundinacea* (Reed Canary Grass) shall not dominate the vegetation in any extensive area (greater than 0.01 acre in size) where the drawdown occurred. If there are extensive areas in which an invasive species is one of the dominant plant species, the permittee shall submit an evaluation of the problem and a proposed plan to reduce the invasive species to the DEQ for approval.

    a. Provide a map with locations, types, and amount of riparian wetlands restored and/or remaining as a result of the dam removal at the end of the five-year monitoring period.

47. Authority granted by this permit does not waive permit or program requirements under Part 91 of the NREPA or the need to acquire applicable permits from the CEA. To locate the Soil Erosion Program Administrator for your county, visit www.mi.gov/deqstormwater and select "Soil Erosion and Sedimentation Control Program" under "Related Links."

48. The authority to conduct the activity as authorized by this permit is granted solely under the provisions of the governing act as identified above. This permit does not convey, provide, or otherwise imply approval of any other governing act, ordinance, or regulation, nor does it waive the permittee's obligation to acquire any local, county, state, or federal approval or authorization necessary to conduct the activity.

49. This permit does not authorize or sanction work that has been completed in violation of applicable federal, state, or local statutes.

50. The permit placard shall be kept posted at the work site, in a prominent location at all times for the duration of the project, or until permit expiration.

This permit shall become effective on the date of the DEQ representative's signature. Upon signing by the permittee named herein, this permit must be returned to the DEQ's, WRD, Hydrologic Studies and Dam Safety Unit, for final execution.

Permittee hereby accepts and agrees to comply with the terms and conditions of this permit.

X _____

Permittee Date

X _____

Printed Name and Title of Permittee

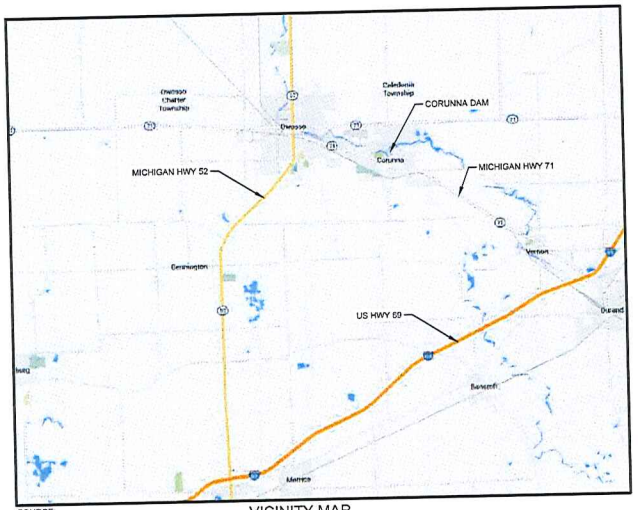
Issued By: _____

Lucas A. Trumble, P.E.
Hydrologic Studies and Dam Safety Unit
Water Resources Division
517-420-8923

cc: City of Corunna Clerk
Shiawassee County Drain Commissioner
Shiawassee CEA
Ms. Merilee Lawson, City of Corunna
Mr. Gary Burke, Friends of the Shiawassee River
Mr. Scott Dierks, P.E., GEI
Mr. Sam Prentice, P.E., GEI
Ms. Donna Cervelli, P.E., DEQ
Ms. Bethany Matousek, DEQ
Ms. Carol Valor, DEQ

CORUNNA DAM REMOVAL AND PARK IMPROVEMENTS PROJECT

CITY OF CORUNNA, MICHIGAN
PERMIT SUBMITTAL DRAWINGS



SOURCE: ESRI WORLD STREET MAP

VICINITY MAP
(NOT TO SCALE)

SOURCE: ESRI WORLD IMAGERY

SITE LOCATION MAP
(NOT TO SCALE)

SOURCE: GEI CONSULTANTS, INC.

MICHIGAN STATE MAP
(NOT TO SCALE)

SHEET INDEX

SHEET NO.	DRAWING NO.	TITLE
1	G-01	COVER SHEET
2	G-02	NOTES, ABBREVIATIONS AND LEGEND
3	C-01	DAM SITE PLAN OF EXISTING CONDITIONS
4	C-02	N. BRADY STREET CANOE/KAYAK LAUNCH PLAN OF EXISTING CONDITIONS
5	C-03	DAM SITE MOBILIZATION/ACCESS/TEMPORARY CONTROLS/DEMOLITION PLAN
6	C-04	N. BRADY STREET CANOE/KAYAK LAUNCH MOBILIZATION/ACCESS/TEMPORARY CONTROLS/DEMOLITION PLAN
7	C-05	DAM SITE PROPOSED SITE PLAN
8	C-06	N. BRADY STREET CANOE/KAYAK LAUNCH PROPOSED SITE PLAN
9	C-07	DAM SITE NATURAL RESOURCE IMPACTS
10	C-08	N. BRADY STREET CANOE/KAYAK LAUNCH NATURAL RESOURCE IMPACTS
11	C-09	STREAM PROFILE
12	C-10	PROPOSED CROSS SECTIONS (1 OF 5)
13	C-11	PROPOSED CROSS SECTIONS (2 OF 5)
14	C-12	PROPOSED CROSS SECTIONS (3 OF 5)
15	C-13	PROPOSED CROSS SECTIONS (4 OF 5)
16	C-14	PROPOSED CROSS SECTIONS (5 OF 5)
17	C-15	DAM SITE PLANTING AND RESTORATION PLAN
18	C-16	N. BRADY STREET CANOE/KAYAK LAUNCH PLANTING AND RESTORATION PLAN
19	C-17	STREAM RESTORATION DETAILS
20	C-18	SITE DETAILS
21	C-19	BOARDWALK PLAN
22	C-20	BOARDWALK SECTION
23	C-21	CANOE/KAYAK LAUNCH DETAILS
24	C-22	REINFORCED EARTH EMBANKMENT AND TURBIDITY CURTAIN DETAILS

PREPARED FOR:

CITY OF CORUNNA
402 NORTH SHIAWASSEE
CORUNNA, MI 48817
(989)743-3650
CONTACT: JOE SAWYER,
CITY MANAGER

PREPARED BY:

GEI CONSULTANTS OF MICHIGAN, P.C.
940 N. MAIN STREET
ANN ARBOR, MI 48104-1035
(734)680-1600
CONTACT: SCOTT DIRKS, PE

GEI Consultants

PRELIMINARY

NO.	DATE	ISSUE/REVISION	APP
0	3/14/2017	PERMIT DRAWINGS	SD

DRAFT

DWG. NO. G-01

SHEET NO. 1 OF 24

GEI PROJECT NO. 1610412

Tetra Tech W:\City_of_Corunna\CAD\Design\Productions\G-01 Cover Page.dwg - 3/14/2018

GENERAL PROJECT NOTES

1. ALL DISTURBED AREAS SHALL BE RESTORED IN KIND UNLESS OTHER DETAILS FOR AN AREA ARE ALREADY SPECIFIED IN THE CONSTRUCTION DOCUMENTS.
2. CONTRACTOR SHALL NOTIFY MISS DIG 811 A MINIMUM OF 3 WORKING DAYS PRIOR TO CONSTRUCTION BEGINNING AND FIELD VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES.
3. THE CONTRACTOR WILL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF THE EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLAN.
4. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH MICHIGAN OSHA SAFETY RULES AND REGULATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY REMAINING ITEMS AND MATERIALS LOCATED WITHIN THE INFLUENCE OF CONSTRUCTION.
6. CONTRACTOR SHALL SUBMIT PLAN FOR WATER CONTROL TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING WORK.
7. PRIMARY SITE ACCESS SHALL BE FROM THE EAST OF THE DAM. ACCESS THE WEST SIDE SHALL BE ACCOMPLISHED VIA THE RIVER OR ALTERNATIVE ACCESS AREAS.
8. MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING INTO THE CREEK DURING ALL CONSTRUCTION ACTIVITIES. IF DEBRIS DOES ENTER THE CREEK IT SHALL BE REMOVED IMMEDIATELY.
9. INSTALL TURBIDITY CURTAIN PRIOR TO CONSTRUCTION WHERE EXCAVATION BELOW WATER SURFACE OCCURS.

SOIL EROSION CONTROL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PLACED BY THE CONTRACTOR SHALL BE IN FULL COMPLIANCE WITH ALL LOCAL AND STATE REGULATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING AND OBTAINING ALL APPLICABLE SOIL EROSION AND SEDIMENTATION CONTROL PERMITS.
3. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACK FILLING AND/OR GRADING OPERATIONS.
4. SPECIAL PRECAUTIONS SHALL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
5. CLEANUP SHALL BE DONE IN A MANNER TO ENSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.
6. THE PROJECT SHALL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENTATION CONTROL COMPLIANCE. DEFICIENCIES SHALL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS OF NOTICE.
7. CONSTRUCTION SHALL DISTURB LESS THAN 5 ACRES, THUS A NPDES STORM WATER DISCHARGE PERMIT SHALL NOT BE REQUIRED. ANTICIPATED AREA OF DISTURBANCE IS APPROXIMATELY 1.0 ACRES.
8. BEST MANAGEMENT PRACTICES FOR SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE USED ON THIS PROJECT AS SHOWN ON THE PLANS AND AS DEFINED BY THE ENGINEER.
9. TURF RESTORATION OF DISTURBED AREAS SHALL INCLUDE 3 INCH TOPSOIL SURFACE, NATIVE UPLAND SEED MIX; CHEMICAL FERTILIZER NUTRIENT; AND MULCH BLANKETS. APPROXIMATE AREA OF TURF RESTORATION IS 0.5 ACRES.
10. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL ON THE SITE THROUGHOUT THE DURATION OF THE CONSTRUCTION PROCESS.

RIP RAP NOTES

MATERIALS:

STONE RIPRAP, UNLESS OTHERWISE SHOWN ON THE PLANS, USE DURABLE NATURAL STONE WITH A MINIMUM BULK SPECIFIC GRAVITY OF 2.40 AS DETERMINED BY MDOT. PROVIDE STONE THAT, WHEN TESTED IN ACCORDANCE WITH MDOT, HAS A MAXIMUM WEIGHT LOSS OF 18% AFTER 5 CYCLES OF MAGNESIUM SULFATE SOLUTION AND 14% AFTER 5 CYCLES OF SODIUM SULFATE SOLUTION.

FOR ALL TYPES OF STONE RIPRAP PERFORM A SIZE VERIFICATION TEST ON THE FIRST 5,000 SQ. YD. OF FINISHED RIPRAP STONE AT A LOCATION DETERMINED BY THE ENGINEER. WEIGH EACH STONE IN A SQUARE TEST AREA WITH THE LENGTH OF EACH SIDE OF THE SQUARE EQUAL TO 3 TIMES THE SPECIFIED RIPRAP THICKNESS. THE WEIGHT OF THE STONES, EXCLUDING SPALLS, SHOULD BE AS SPECIFIED BELOW. ADDITIONAL TESTS MAY BE REQUIRED. DO NOT PLACE ADDITIONAL RIPRAP UNTIL THE INITIAL 5,000 SQ. YD. OF RIPRAP HAS BEEN APPROVED.

PROVIDE FILTER FABRIC IN ACCORDANCE WITH DMS-6200, "FILTER FABRIC." FOR PROTECTION STONE RIPRAP, PROVIDE TYPE 2 FILTER FABRIC UNLESS OTHERWISE SHOWN ON THE PLANS. FOR TYPE R, F, OR COMMON STONE RIPRAP, PROVIDE TYPE 2 FILTER FABRIC WHEN SHOWN ON THE PLANS.

CONSTRUCTION:

DRESS SLOPES AND PROTECTED AREAS TO THE LINES AND GRADES SHOWN ON THE PLANS BEFORE THE PLACEMENT OF RIPRAP. PLACE RIPRAP ACCORDING TO DETAILS AND DIMENSIONS SHOWN ON THE PLANS OR AS DIRECTED.

PROVIDE THE FOLLOWING TYPES OF STONE RIPRAP WHEN SHOWN ON THE PLANS:

- DRY RIPRAP. DRY RIPRAP IS STONE RIPRAP WITH VOIDS FILLED WITH ONLY SPALLS OR SMALL STONES.

USE SPALLS AND SMALL STONES LIGHTER THAN 25 LB. TO FILL OPEN JOINTS AND VOIDS IN STONE RIPRAP, AND PLACE TO A TIGHT FIT.

UNLESS OTHERWISE APPROVED, PLACE FILTER FABRIC WITH THE LENGTH RUNNING UP AND DOWN THE SLOPE. ENSURE FABRIC HAS A MINIMUM OVERLAP OF 2 FT. SECURE FABRIC WITH NAILS OR PINS. USE NAILS AT LEAST 2 IN. LONG WITH WASHERS OR U-SHAPED PINS WITH LEGS AT LEAST 9 IN. LONG. SPACE NAILS OR PINS AT A MAXIMUM OF 10 FT, IN EACH DIRECTION AND 5 FT. ALONG THE SEAMS. ALTERNATIVE ANCHORAGE AND SPACING MAY BE USED WHEN APPROVED.

CONSTRUCT RIPRAP AS SHOWN ON THE PLANS. PLACE STONES IN A SINGLE LAYER WITH CLOSE JOINTS SO THAT MOST OF THEIR WEIGHT IS CARRIED BY THE EARTH AND NOT BY THE ADJACENT STONES. PLACE THE UPRIGHT AXIS OF THE STONES AT AN ANGLE OF APPROXIMATELY 90° TO THE EMBANKMENT SLOPE. PLACE EACH COURSE FROM THE BOTTOM OF THE EMBANKMENT UPWARD WITH THE LARGER STONES IN THE LOWER COURSES.
FILL OPEN JOINTS BETWEEN STONES WITH SPALLS. PLACE STONES TO CREATE A UNIFORM FINISHED TOP SURFACE. DO NOT EXCEED A 6-IN. VARIATION BETWEEN THE TOPS OF ADJACENT STONES. REPLACE, EMBED DEEPER, OR CHIP AWAY STONES THAT PROJECT MORE THAN THE ALLOWABLE AMOUNT ABOVE THE FINISHED SURFACE.

ABBREVIATIONS

AMF	= ANNUAL MEAN FLOW
APP	= APPROVED
APPROX	= APPROXIMATELY
ASTM	= AMERICAN SOCIETY FOR TESTING AND MATERIALS
BF	= BANKFULL
BM	= BENCHMARK
CL	= CENTERLINE
DND	= DO NOT DISTURB
DWG, DWGS	= DRAWING OR DRAWINGS
EA	= EACH
EL, ELEV	= ELEVATION
FT	= FEET OR FOOT
FP	= FLOODPRONE
FP	= FLOODPRONE
LB	= POUND
LT	= LEFT
MAX	= MAXIMUM
MIN	= MINIMUM
N/A	= NOT APPLICABLE
OHWM	= ORDINARY HIGH WATER MARK
PLF	= POUND PER LINEAR FOOT
REQ'D	= REQUIRED
POB	= POINT OF BEGINNING
POE	= POINT OF ENDING
RT	= RIGHT
STA	= STATION
TYP	= TYPICAL
UON	= UNLESS OTHERWISE NOTED

HATCH LEGEND:

BACKFILL
RESTORATION
CONCRETE
AGGREGATE
UNDISTURBED SOIL
RIPRAP
DELINEATED WETLAND
GRAVEL PARKING LOT
BUILDING
EXISTING ASPHALT PAVEMENT
APPROXIMATE IMPOUNDED SEDIMENT
ASPHALT PAVEMENT REMOVAL

LINE TYPE LEGEND:

STAGING AREA
SILT FENCE
TEMPORARY CONSTRUCTION FENCING
WATER SURFACE
EDGE OF EXISTING ROAD
GEOTEXTILE FABRIC
COFFERDAM
GUARDRAIL
LIMITS OF RIPRAP
POB / POE
ORDINARY HIGH WATER MARK
LONG TERM ANNUAL MEAN WATER LEVEL
10-YEAR FLOOD WATER LEVEL
25-YEAR FLOOD WATER LEVEL
100-YEAR FLOOD WATER LEVEL
LIMITS OF CONSTRUCTION
FLOODPRONE
LIMITS OF VEGETATION
BANKFULL WATER LEVEL
EXISTING OVERHEAD WIRE
EXISTING SANITARY SEWER
EXISTING FIBER OPTIC CABLE
EXISTING GAS LINE
BENCHMARK
MANHOLE
POWER POLE
GUARD POST/BOLLARD
EROSION BALES
EXISTING TREE
EXISTING STUMP
TOE WOOD
B-00 BORING HOLE LOCATION

BID ALTERNATIVE NOTES

1. GRADING AND ENTRANCE/EXIT AT OAK STREET
2. ACCESS TO PROPOSED VIEWING PLATFORM FROM WEST BANK.

GENERAL LEGEND:

PLAN OF EXISTING CONDITIONS — SCALE: 1" = 10' — MAIN TITLE

1 / G-02 DETAIL - TYPICAL SILT FENCE — SCALE: 3/4" = 1'-0" — DETAIL TITLE WITH DRAWING SCALE. THE NUMBER "1" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS CALLED OUT.

A / G-02 SECTION - STA. 0+00 — SCALE: 3/4" = 1'-0" — SECTION TITLE WITH DRAWING SCALE. THE LETTER "A" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CALLED OUT.

A / G-02 — SECTION LOCATION. THE LETTER "A" REFERS TO THE SECTION DESIGNATION. THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CALLED OUT.

1 / G-02 — DETAIL LOCATION, THE NUMBER "1" REFERS TO THE DETAIL DESIGNATION, THE NUMBER "G-02" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS SHOWN.

0 30 60 — SCALE: 1" = 30' — DRAWING SCALE IN UNITS SPECIFIED

A / C-01 — ELEVATION LOCATION, THE LETTER "A" REFERS TO THE SECTION DESIGNATION. THE NUMBER "C-01" REFERS TO THE DRAWING NUMBER

WATER SURFACE ELEVATION 32' UPSTREAM OF DAM

FLOW EVENT	EXISTING ELEVATION (FT)	PROPOSED ELEVATION (FT)
SEPT. LOW FLOW	730.6	728.9
LONG TERM ANNUAL FLOW	733.9	729.9
BANKFULL FLOW	735.4	731.7
100-YEAR FLOW	738.4	737.2

SHIAWASSEE RIVER FLOW DATA

FLOW EVENT	FLOW (CFS)
SEPT. LOW FLOW	35
LONG TERM ANNUAL FLOW	330
BANKFULL FLOW	1,258
100-YEAR FLOW	6,200

WATER CONTROL NOTES

1. CONTRACTOR SHALL SUBMIT A PLAN FOR WATER CONTROL TO THE ENGINEER FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO BEGINNING WORK.
2. CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION PLAN PRIOR TO PERFORMING ANY WORK.
3. CONTRACTOR SHALL PERFORM ALL EXCAVATING AND FILL IN THE DRY.
4. SHIAWASSEE RIVER FLOW DATA IS SHOWN ON THE TABLE. CONTRACTOR IS RESPONSIBLE FOR SIZING WATER CONTROL FACILITIES TO PROTECT WORK.

SURVEY NOTES

1. SURVEY DATA COLLECTED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
2. SURVEY CONTROL IS BASED ON MICHIGAN STATE PLANE SOUTHERN ZONE COORDINATE SYSTEM NAD83.
3. VERTICAL DATUM ARE BASED ON NAVD88.
4. BASEMAP CREATED BY UTILIZING SURVEY DATA AND AVAILABLE AERIAL IMAGERY.
5. MEASUREMENTS AND ELEVATIONS ARE APPROXIMATE AND MUST BE FIELD VERIFIED PRIOR TO ANY CONSTRUCTION ACTIVITIES.
6. DRAWING SET IS FOR PERMITTING USE ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION.

Preliminary

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

NO.	DATE	ISSUE/REVISION	APP
0	3/14/2017	PERMIT DRAWINGS	SD

GEI Consultants
940 N. MAIN STREET
ANN ARBOR, MI 48104-1035
(734)669-1600

Designed: S. Prentice
Checked: K. Price
Drawn: I. Roberts
Approved By: S. Dierks

City of Corunna
402 North Shiawassee St.
Corunna, MI 48817

GEI Project 1610412

City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DWG. NO. G-02

NOTES, ABBREVIATIONS AND LEGEND

REV 1

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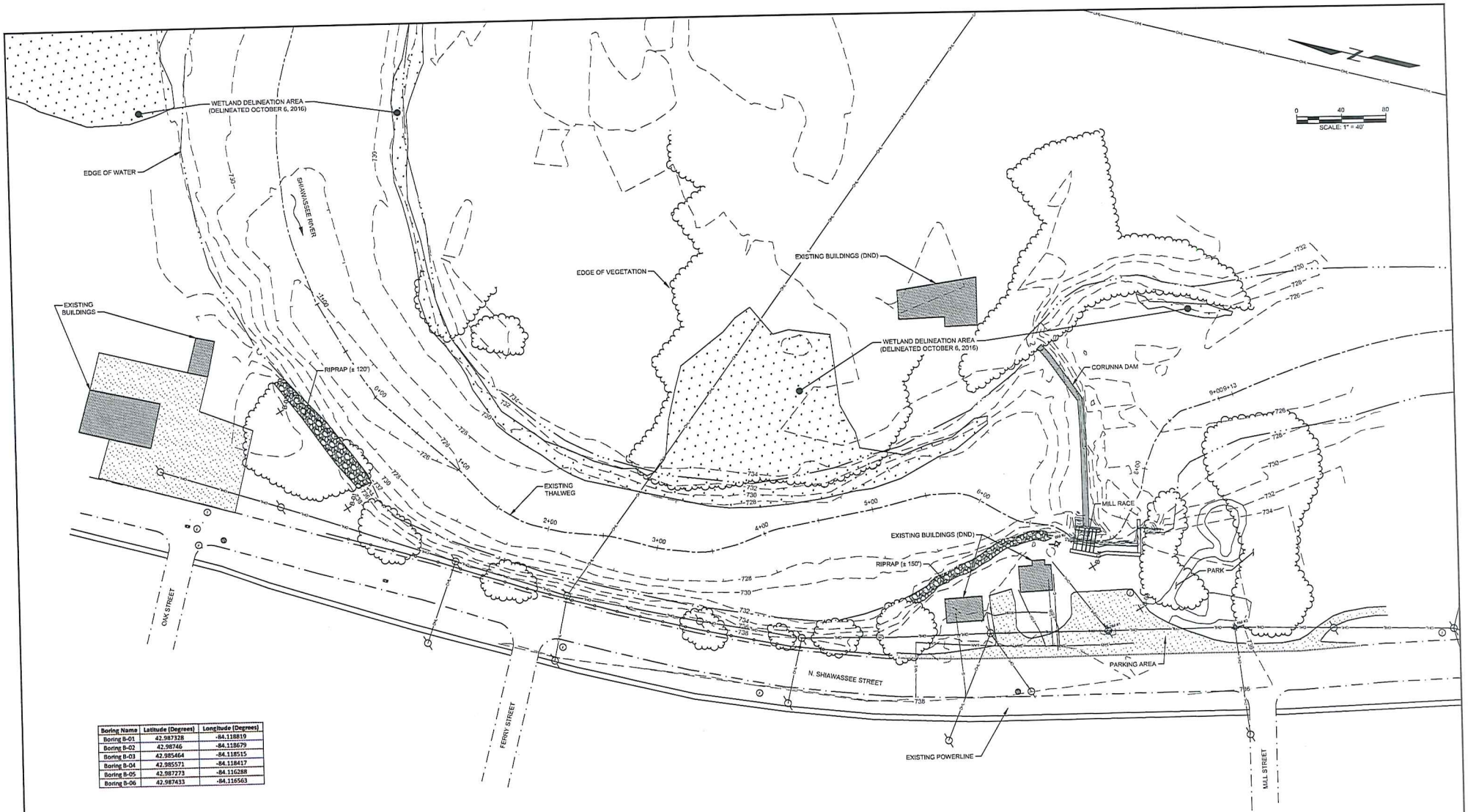

Boring Name	Latitude (Degrees)	Longitude (Degrees)
Boring B-01	42.987328	-84.118819
Boring B-02	42.98746	-84.118679
Boring B-03	42.985464	-84.118515
Boring B-04	42.985571	-84.118417
Boring B-05	42.987273	-84.116288
Boring B-06	42.987433	-84.116563

Preliminary

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DAM SITE PLAN OF EXISTING CONDITIONS

DWG. NO. C-01

REV 1

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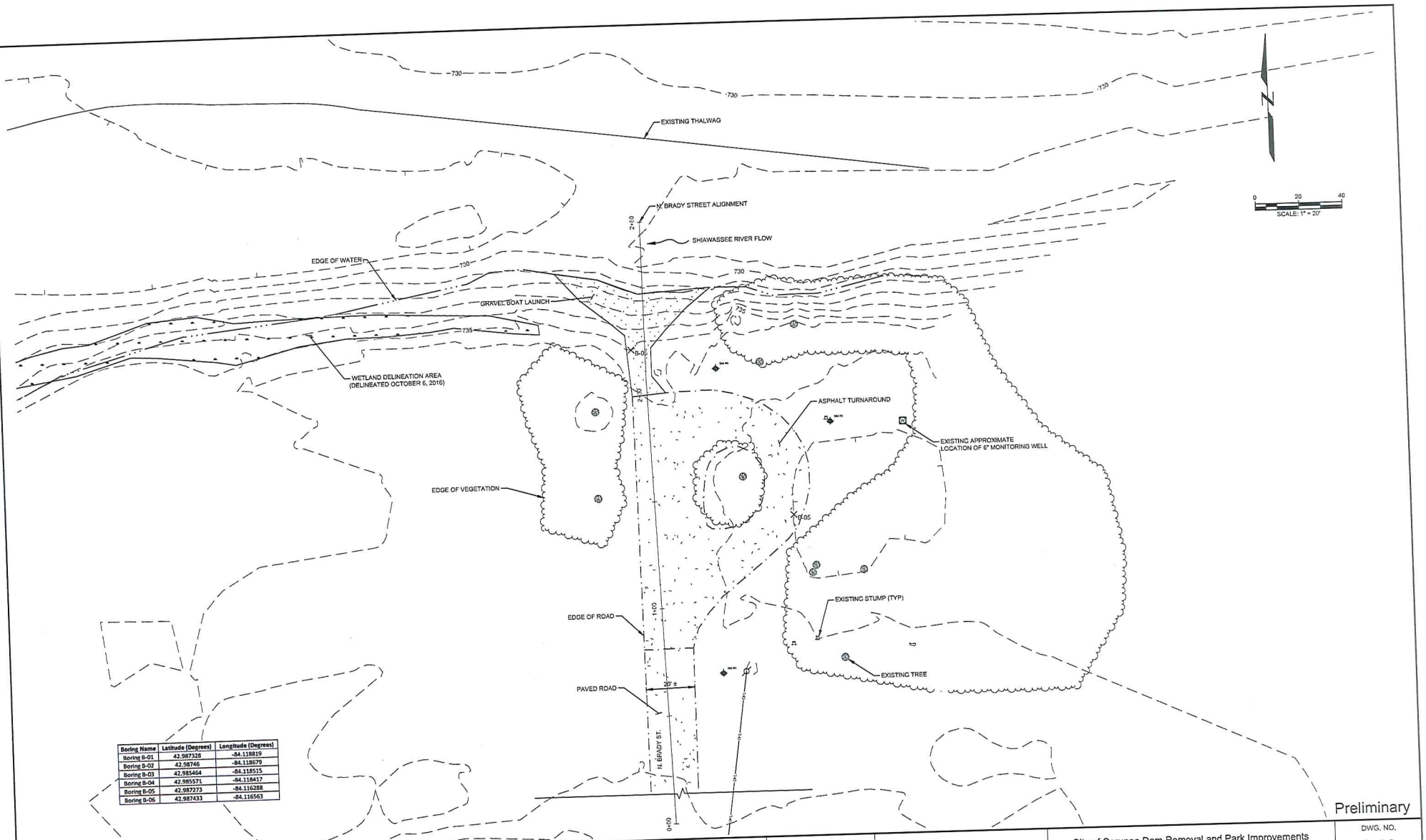

Boring Name	Latitude (Degrees)	Longitude (Degrees)
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Preliminary

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0 1"
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City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DWG. NO. C-02

N. BRADY STREET CANOE/KAYAK LAUNCH PLAN OF EXISTING CONDITIONS

REV 1

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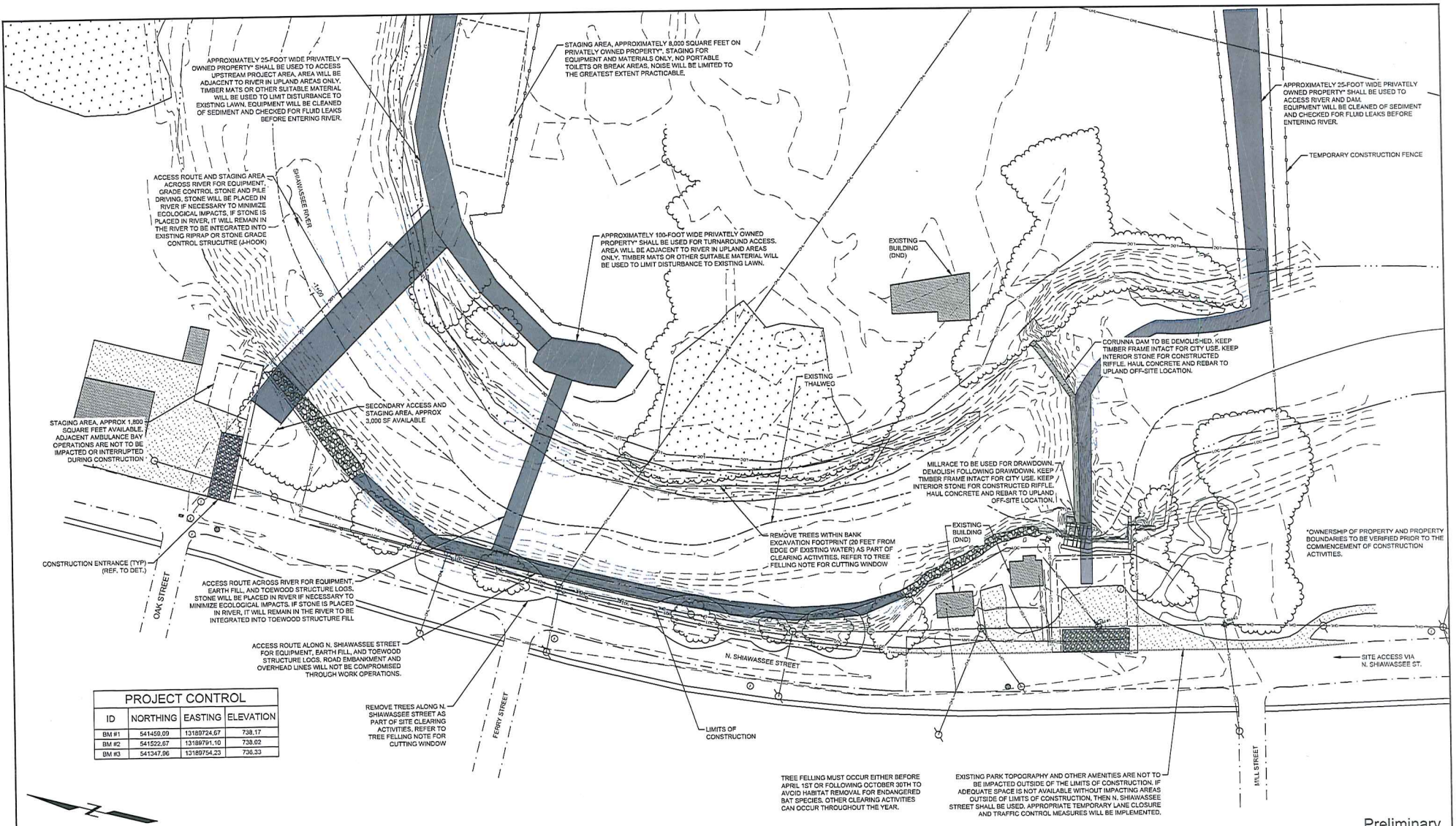

PROJECT CONTROL			
ID	NORTHING	EASTING	ELEVATION
BM #1	541459.09	13189724.67	738.17
BM #2	541522.67	13189791.10	738.02
BM #3	541347.06	13189754.23	736.33

0 40 80
SCALE: 1" = 40'

Preliminary

Attention:
0 1"
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City of Corunna, Michigan

DAM SITE MOBILIZATION/ACCESS/TEMPORARY CONTROLS/DEMOLITION PLAN

DWG. NO. C-03
REV 1

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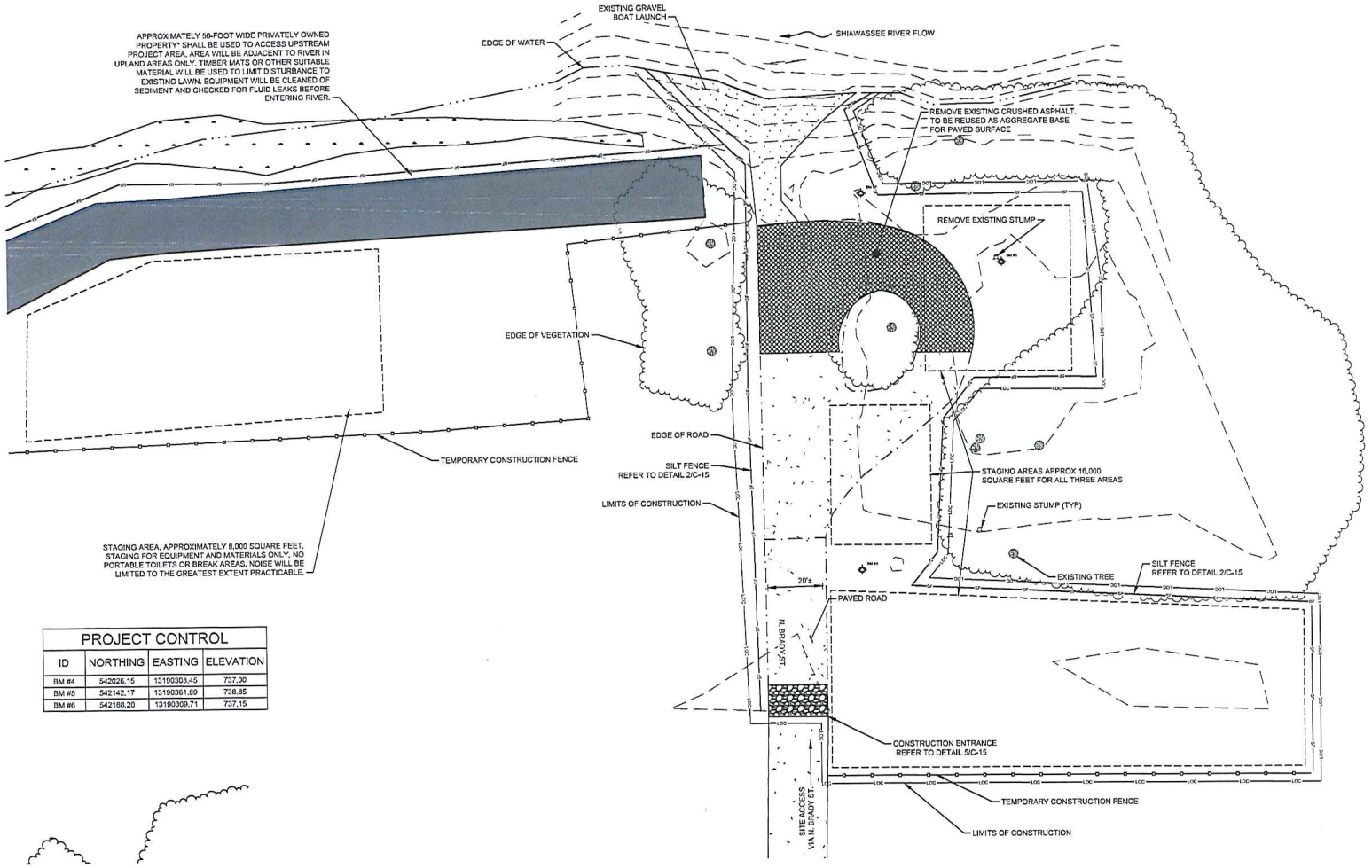

PROJECT CONTROL			
ID	NORTHING	EASTING	ELEVATION
BM #4	542026.15	13190308.45	737.00
BM #5	542142.17	13190361.69	738.85
BM #6	542168.20	13190309.71	737.15

Preliminary

Attention: 0 1" If this scale bar does not measure 1" then drawing is not original scale.				
NO.	DATE	ISSUE/REVISION	APP	
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GEI Consultants
940 N. MAIN STREET
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GEI Project 1610412

City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DWG. NO. C-04

N. BRADY STREET CANOE/KAYAK LAUNCH MOBILIZATION/ACCESS/TEMPORARY CONTROLS/DEMOLITION PLAN

REV 1

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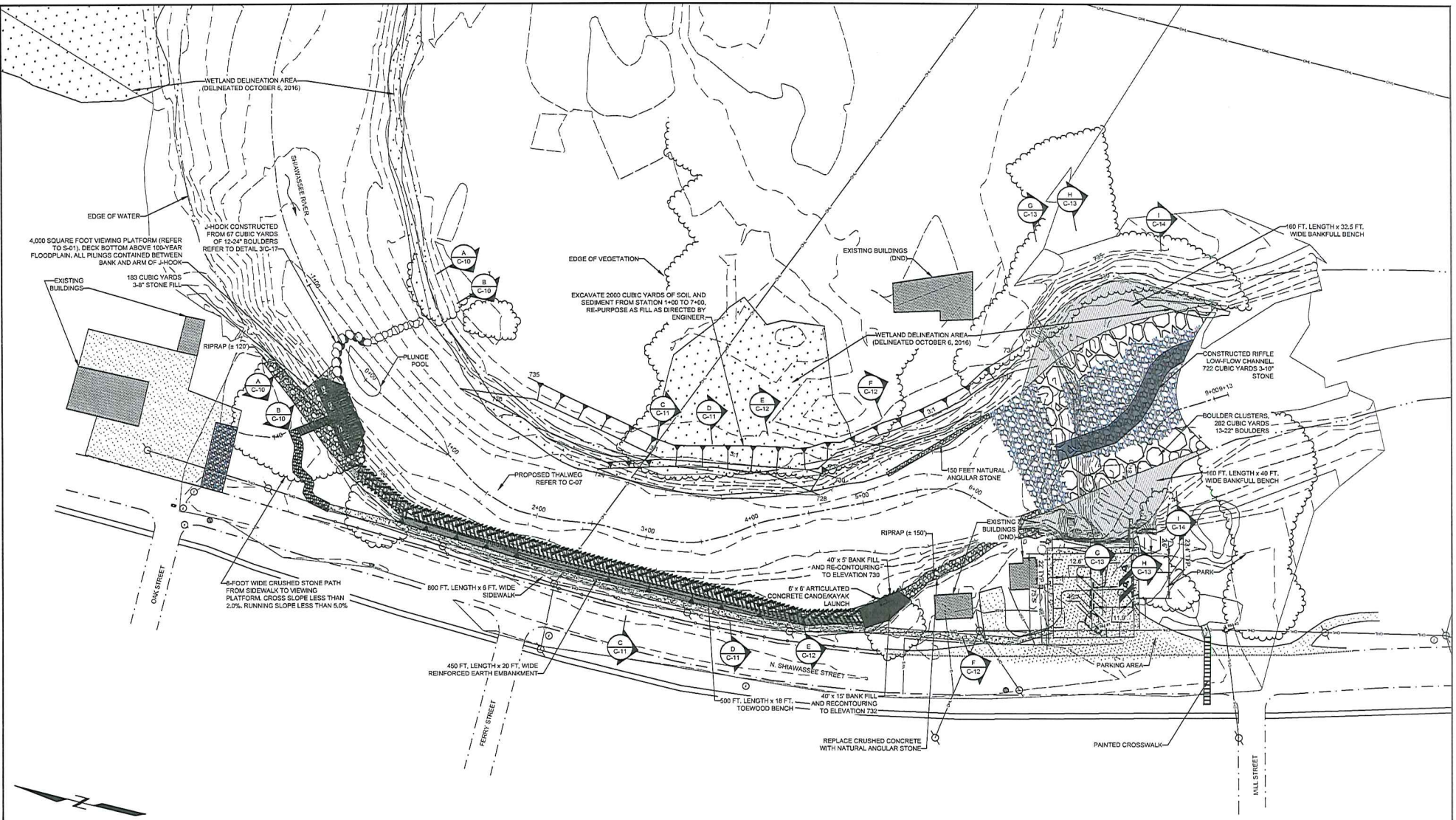

Preliminary

0 40 80
SCALE: 1" = 40'

NO.	DATE	ISSUE/REVISION	APP
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Corunna, MI 48817

GEI Project 1610412

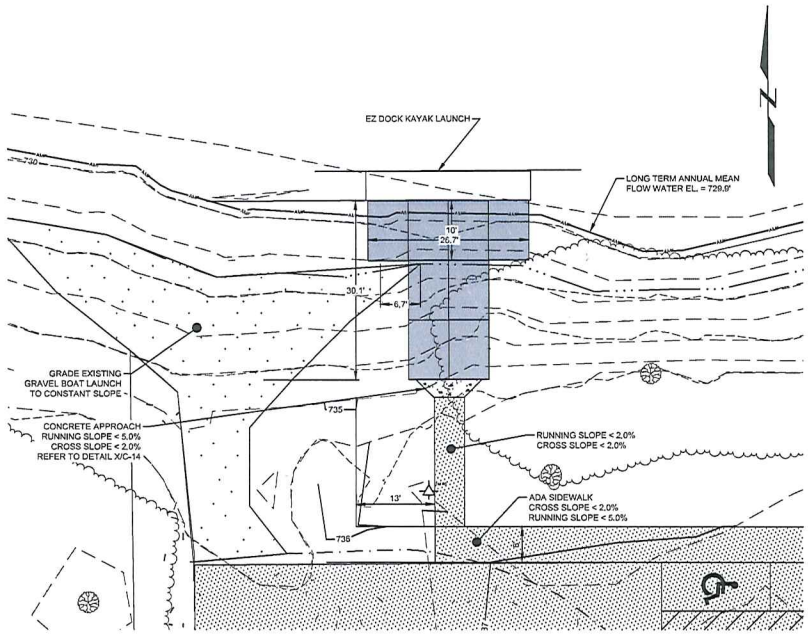
City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DWG. NO. C-05

DAM SITE PROPOSED SITE PLAN

REV 1

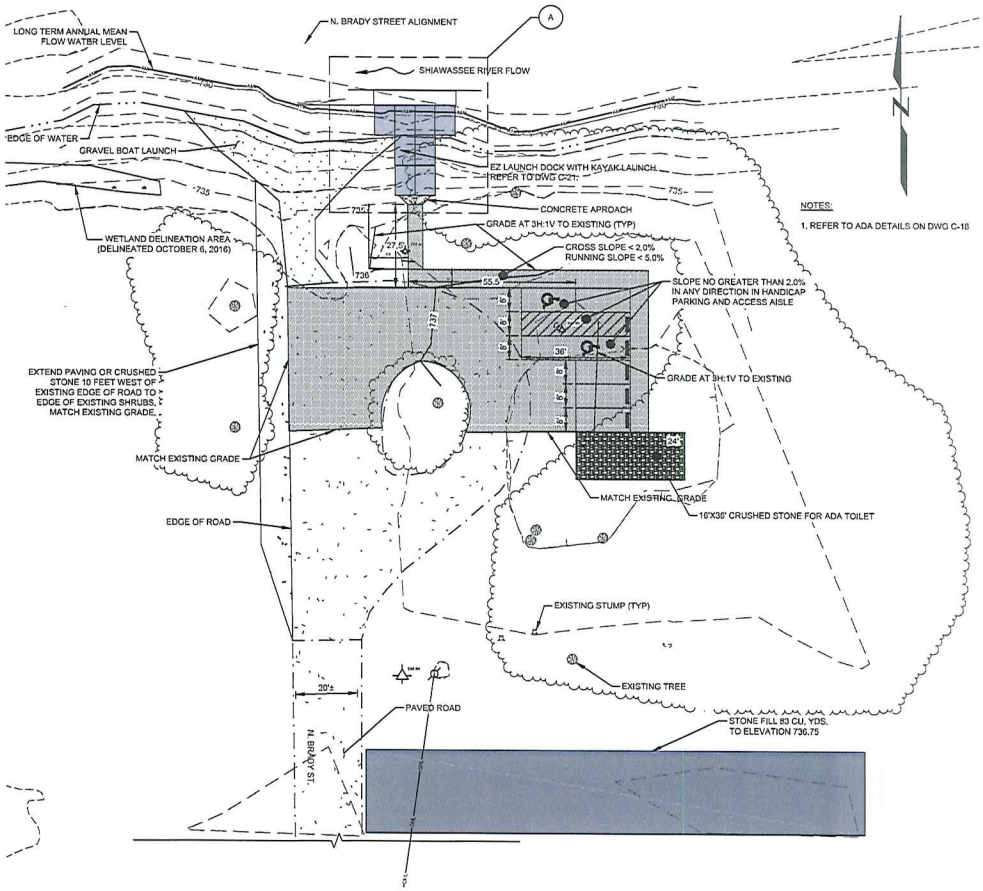
W:\City_of_Corunna\CAD\Design\Production\C-05 Dam Site Proposed Conditions Plan.dwg - 3/7/2017



A PLAN - EZ DOCK AND KAYAK LAUNCH

0 10 20

SCALE: 1" = 10'



PLAN - N. BRADY STREET BOAT LAUNCH

0 20 40

SCALE: 1" = 20'

Preliminary

Attention:				
0 1"				
If this scale bar does not measure 1" then drawing is not original scale.				
	0	3/14/2017	PERMIT DRAWINGS	SD
	NO.	DATE	ISSUE/REVISION	APP

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Corunna, MI 48817

GEI Project 1610412

City of Corunna Dam Removal and Park Improvements
City of Corunna, Michigan

DWG. NO. C-06

N. BRADY STREET CANOE/KAYAK LAUNCH
PROPOSED SITE PLAN

REV 1