

ADDENDUM NO. 1 FOR RED RUN DRAIN RESTORATION - PHASE 01

Issued: December 8, 2021

HRC Job No. 20200852

Intent:

This Addendum No. 1 is issued prior to receipt of Bids to provide clarification relative to the Bidding Documents. Failure to include this Addendum No. 1 and included Specification and Contract Drawing pages within the Bidding Documents may result in disgualification of the bid.

Changes to 002010 Specifications for Color Audio – Video Recording of Construction Areas:

1. Add 002010 Specifications for Color Audio – Video Recording of Construction Areas, 5 pages.

Changes to Section DC-123: Proposal:

- 1. Revise item 18: Stone Toe: revise quantity and unit to 2710 Cyd.
- 2. Add item 47: Add Stone Rip Rap 445 cyd

Changes to 00 12 20 Bid Item Description

1. <u>Add Item #49 – Stone Rip Rap pay item description to this section</u> <u>Item #49- Stone Rip Rap</u>

This bid item shall be paid for at the Contract Unit Price per **cubic yard**. Stone Rip Rap will be measured in place by the cubic yard stone placed as shown on the contract drawings. This pay item includes all materials, labor, and equipment necessary to complete the work. The work shall include removing unsuitable material and any impacted vegetation or trees, excavating the existing bank, placing gravel bedding materials, riprap and backfilling the excavation. The Stone Rip Rap shall be 12" – 18" in size.

Changes to Contract Drawings:

- 1. Revise Sheets 13 and 14: Stone rip rap, Clarified the location of the stone rip rap. The limits of the stone rip rap added. Reissue these Sheets.
- 2. Revise Sheet 26, Instream Structures Details, J Hook
 - a. Revise note in J Hook Cross Section (TYP): from 12-18" Ledge Rock (min) to 18" Ledge Rock Stone
- 3. Revise Sheet 27, Instream Structures Details, J-Hook
 - a. Revise ledge rock notes and details such that the ledge rock provided will be 18" stones. Reissue this Sheet.

Bloomfield Hills 555 Hulet Drive Bloomfield Hills, MI 48302 248-454-6300 **Delhi Township** 2101 Aurelius Rd. Suite 2A Holt, MI 48842 517-694-7760 Grand Rapids 1925 Breton Road SE Suite 100 Grand Rapids, MI 49506 616-454-4286 Howell 105 W. Grand River Howell, MI 48843 517-552-9199 Jackson 401 S. Mechanic St. Suite B Jackson, MI 49201 517-292-1295 Kalamazoo 834 King Highway Suite 107 Kalamazoo, MI 49001 269-665-2005 Lansing 215 S. Washington SQ Suite D Lansing, MI 48933 517-292-1488



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ACTION:

- 1. Add in section 00 20 10 Specifications for Color Audio Video Recording of Construction Areas
- 2. Reissue Section DC-123: Proposal, 10 pages
- 3. Reissue Construction Drawing Sheets 13 and 14, 2 pages
- 4. Reissue Construction Drawing Sheet 27, 1 page

QUESTIONS:

- Schedule and Timing timing with bareroot trees (has to be late fall, or late March) and a few other things are really important for success, so wonder if there's a completion provision other than the 300 days from award...that would get the earthwork out of restoration's way in time...? - With the approximate 1 year completion date, it would be up to the prime and subs to prepare and submit a schedule that would allow for proper planting in the fall of 2022. However, we understand availability of plantings may affect the schedule, the Owner may consider an extension.
- 2. Warranties I see references to one or two year warranties in different revegetation items. In order that we plan for right amount of maintenance, can you clarify how long warranty is? Maintenance and Guarantee bond shall be 2 years from final completion, with the exception of the invasive species control. The contractor for this project is responsible for invasive control through final approval.
- 3. Prairie seeding I assume invasive species control will be considered complete, and stockpiled topsoil that's spread back on prairie will need to be managed for invasive species for the 1-year warranty (unless CISMA is contracting this maintenance phase work...)? CISMA is not contracting for this work. The contractor for this project is responsible for invasive control throughout the project area until final approval
- 4. Invasive species "alternate species" was this actually contracted? We talked to CISMA when they had an RFP out, and they weren't sure the alternates would be awarded at the time...? CISMA is not contracting for this work. The contractor for this project is responsible for invasive control throughout the project area until final approval.
- 5. Clearing if alternates are in, I assume they're under this item? The plan sheet 24 indicates CISMA, but there's a spec for vegetation control...some clarification of who's responsible for managing invasive species/weeds would be helpful. See additional information below but CISMA will perform invasive control up to the start of work and start again after final acceptance. The Contractor is responsible for invasive control of the areas or work until final acceptance.
- 6. If the contractor is bringing in heavy loads or just plain heavy traffic, the road and parking for the Michigan Lottery Amphitheater is made of 21AA, and with rain it will cause serious bumpy road access. Whose responsible to maintenance? –Contractor shall maintain the road and parking for the Michigan Lottery Amphitheater particularly prior to events. On days of an event, maintenance shall be completed by 5:00 pm and the use of the road and parking area shall also cease by 5:00 pm.
- In the General Specifications it calls for an Engineer's and Inspector's Field Office. Is this something that will
 actually be required for the project? Field Office is not required but is up to the discretion of the
 Contractor. However, providing a bathroom facility is required.
- In the Contractor Furnished Survey Equipment section it states that we will provide one tripod, automatic level, and level rod. Again, is that something that we will actually have to provide? – No. we will eliminate providing survey equipment



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- 9. Also, the Audio/Visual Spec seems to be missing from the spec book, what are you looking for in regards to the filming? Section 00 20 10 Specifications for Color Audio Video Recording of Construction Areas is added in this addendum
- 10. Hydroseeding the specs conflict with plans, with specs listing broadcasting/other methods but plans state hydro...hydroseeding is not good for native seeds, and can damage or unevenly distribute seeds; we could hydro mulch after broadcasting, but it appears that all native areas get ECB so unsure why we need hydro mulch if immediately blanketing? Is hydroseed intended to be in uplands only? Upland areas getting Turf Restoration can be restored using hydroseed method.
- 11. Is staking required for any trees? Yes , please refer to the deciduous tree planting detail on sheet 31 of the plans
- 12. The project is not prevailing wage, correct? The project does not have a prevailing wage requirement.
- 13. Is clearing going to remove all vegetation in all prairie seeding areas, or are some areas going to need spray killing? The contractor shall remove all vegetation in the seeding areas prior to planting. It is presumed that a spray application will be necessary. It will be the Contractor's means and methods to remove the vegetation prior to seeding.
- 14. What is the current deer population in this area? We know herds have moved south in other areas, and this corridor seems likely to have increased use recently. We do not have information regarding the current deer population.
- 15. What size are the bareroot trees? ½" caliper or whip, please refer to sheet 30 of the plans
- 16. What type of erosion control blanket is needed on slopes? 9000syd only appears to be in drain channel area, is that correct? Erosion control blankets shall not be placed in the drain bottoms and be placed in the steeper areas on an as-needed basis.
- 17. Some plant materials state a warranty maintenance period of 1 year while other specs state maintenance period of 2 years for planted stock and seed, can you clarify the correct time? All planting material will have a two year warranty period.
- 18. The total area indicated for erosion control blanket does not match the total area listed for seeding, should these areas match? If not, should the rest of the site restoration be straw mulched? No, seeding will not get mulch blanket with the exception of steep slopes at the direction of the Project Engineer.
- 19. Are invasive species treatments expected within the excavation zone prior to excavation? CISMA will not treating invasives within the project limits once the project begins. The Contractor shall treat the invasives as necessary for their removal and to ensure they do not spread in the areas of work under this contract.
- 20. Who is to treat invasives after excavation? CISMA or contractor? If CISMA, warranty exclusions apply. CISMA will not be treating invasives within the project limits once the project begins. The Contractor shall treat the invasives as necessary for their removal and to ensure they do not spread in the areas of work under this contract.



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- 21. Will brush-hog operation will be needed for clearing activities? We do not expect a brush hog to clear for the shared use trail will be needed.
- 22. What is the performance standard for treatment of any invasive plants during the warranty period? Contractor is to control invasive species thorough out the duration of the project, will cease at final acceptance and not will continue thru warranty period.
- 23. Seeding Can hydromulch to be used for turfgrass on this project? Yes
- 24. Which seeded areas receive topsoil? All areas.
- 25. Is there a required plan for controlling vegetation along Sterling Drain in preparation for prairie and stormwater wetland seeding? This will be the Contractor's means and method. However, the Contractor shall provide method to Owner prior to commencement of vegetation control/ removal. All products used shall be submitted for review.
- 26. Which seeded areas are to receive erosion control blanket? Disturbed sloped areas along the Sterling Relief and Red Run drain as directed by the Project Engineer. Flat areas along the trail can be seed and mulch.
- 27. Landscape notes indicate final grade is responsibility of landscape contractor maintenance for erosion will be included in warranty maintenance of planting items. Yes
- Is a flood stage model water flow elevation, or summary statement of Sterling Relief Chain Channel basin hydrology, available from HRC? - Yes, Bankfull elevation is shown on the profile. Memo dated September 2020, 9 pages, is attached. This memo is for reference.
- 29. We do not think the plug list is entirely congruent with survival under drain conditions, and we think we can optimize butterfly hosting, bird habitat and salt tolerance. Will alternates be considered after award? Yes
- 30. Erosion Control Blanketing Is it acceptable to substitute equivalent materials to the North American Green products specified? Yes
- 31. Plan sheets 13 and 14 shows 12"-18" stone for erosion protection on cross section #6. The plan view does not show it. Where does it start and stop, and how wide is it? Sheet 13 and 14 will be reissued. The stone rip rap will extend approximately from station 39+00 to 42+50. The stone rip rap have approximately 1.5 feet buried and extend bankward ±1.5 feet , totaling ±3 feet in height. The width will be ±6 feet deep.
- 32. The 6" 21AA aggregate base under the 3.5" aggregate surface is not paid for under the 6" 21AA aggregate base item. It is included in the pathway grading. Why is it not its own paid item? Can this item be added to the contract bid by the ton line the surface course? The 6" 21AA aggregate base is included in Share Use Path, Grading, Special pay item. The 6" 21AA aggregate listed is the quantity of aggregate base for the concrete sidewalk.
- General Conditions item 50 insurance. There are 3 insurances that are not normally required for this line of work. Please confirm if we need them or not. E. builders risk insurance, H Professional Liability, I Contractors Pollution Liability. – All listed insurances are required.
- 34. The Means and Methods for constructing the J hooks are the contractors. Please confirm that dewatering will not be required for this work. Installation of the J hooks is up to contractor means and methods. If



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dewatering is deemed necessary for the work, it shall by up to the contractor and included in the appropriate bid items. However, due to the size, flows, channel depths, etc. we are assuming dewatering would be difficult and not done.

- 35. The Special Provision for Non Hazardous Contaminated Materials calls for it to be paid for by the Cubic Yard in one place. In another it calls for it to be "included with the related items of work". Please confirm that Non-Hazardous Contaminated Material will be paid for as an extra if encountered. If non-hazardous contaminated material is encountered, a change order will be negotiated and this paid for.
- 36. Maintenance: Is the owner going maintain the work area during the duration of the project and coordinate mowing with the contractor to facilitate site prep for application of herbicides and or plantings in areas not yet disturbed by work activities? The Owner will not be maintaining the project area once the contractor mobilizes. The contractor will then be responsible for maintenance and mowing.
- 37. Does this project require compliance with prevailing wage? No
- 38. Are seed mixes allowed to be substituted from another nursery/supplier than the ones listed? Yes, with project engineer approval, as long as the mix content remains the same.
- Please clarify/provide more details on the mulch blanket high velocity specification (e.g. double net biodegradable coconut fiber blanket). – Mulch blanket shall be suitable for high velocity, i.e. North American Grand, SC150 or approved equal. Mulch blanket shall be double netted, bio-degradable in ± 24 months, and shall be a min, of 70% straw and 30% coconut fiber matrix.
- 40. Specification PDF Pages 303, 306, 307, 310, and 314 include live stake specifications, and, and drawing Sheet 31 Landscape and Planting Details includes a live stake detail and notes. However, nowhere on the plans are live stakes depicted, nor is there a line item on the Bid Sheet for live stakes. Please confirm that live stakes are not part of this project, or please provide locations on the plans for where they are to be installed and any additional specifications for quantity, size, species, etc. Remove the detail for live stake planting. Live stake planting is not included in the contract.
- 41. Clarification of mulching for trees, bare root trees, and shrub plugs has been requested due to conflicting requirement in various spec sections. Mulch shall be place over the entire root area or disturbed area whichever greater. Provide mulch as follows:
 - a. Trees 4 inches hardwood mulch
 - b. Bare root trees, 4 inches hardwood mulch
 - c. Shrub 4 inches hardwood mulch
 - d. Shrub plugs do not receive mulch

ATTACHMENTS:

- 1. Pre-bid meeting minutes, 2 pages
- 2. Pre-bid sign in sheets, 2 sheets
- 3. Proposal Section, 10 pages
- 4. Specification Section 002010 Specifications for Color Audio Video Recording of Construction Areas
- 5. Contract Drawing Sheets 13, 14 and 27 dated 12/08/2021- Addendum No. 1, 3 pages
- 6. HRC/ Spicer memo: Study for the Repair, Maintenance, & Management of the Red Run Drain peak Flow and Floodplain analyses, 9 pages FOR REFERNCE ONLY



The Bidder shall acknowledge receipt of the Addendum No. 1 below and on the Proposal Form or the bid may not be considered.

This Proposal is based on the following Addenda in the table below:

| Addendum Number | Date Issued |
|-----------------|-------------|
| | |
| | |
| | |
| | |

HUBBELL, ROTH & CLARK, INC **CONSULTING ENGINEERS SINCE 1915** MAILING: PO Box 824 Bloomfield Hills, MI 48303-0824

SHIPPING: 555 Hulet Drive Bloomfield Hills, MI 48302-0360

PHONE: 248-454-6300 WEBSITE: hrcengr.com

Meeting Minutes Red Run Drain Restoration – Phase 01 **Pre-bid Meeting**

Date: Tuesday, November 30, 2021 Time: 9:00 am Meeting Location: on-site

- 1. Introductions & Attendance Sheet - Introductions were made. Sign-in sheets circulated
- 2. Project overview -
 - Installation of three J-Hooks
 - Installation of Stone toe along the north bank •
 - Construction of ± 5650 feet of a 10 feet wide gravel share use pathway •
 - Removal of sediment within the drain
 - Restoration (Grant work)
 - 2500 Shrubs i)
 - 325 Bare root trees ii)
 - iii) 4000 plugs
 - 50 Trees iv)
 - Seed mixes v)
 - a) Native Prairie mix
 - b) Stormwater mix
 - c) LoPrairie mix
- 3. Important dates:
 - Questions due: end of day, Friday, December 3rd
 - Addendum to be issued, Wednesday, December 8th
 - Bids due at the Office of the Water Resources Commission in Pontiac at 10:00 am, Tuesday, December 14th. Deliver plans to the upstairs office. Bids will be opened in the lunchroom downstairs. Masks are required inside the building.
 - Preliminary schedule:
 - Tentative award: January i)
 - Contracts execution: February ii)
 - Notice to Proceed: March iii)
- 4. Project Discussion

D

- 1. Access access can be from Schoenherr Road, Metro Parkway and also thru Freedom Hill Park The drive thru the park to drive with the Consumers Energy parcel can be used as staging area and access. An audio video survey is required or the drives in the Freedom Hill park.
- 2. A gas line traverses the Consumers Energy parcel. However, Consumer Energy is requiring protection of the gas line. Requirements are listed in section 00 12 20, Mobilization.

Requirements are included in mobilization. Included are the equipment, material to furnish, place and remove protection of the gas line in order use the Consumer Power parcel as access or staging. Mats shall be required

| Delhi Township | Detroit | Grand Rapids | Howell | Jackson | Kalama |
|-------------------|-------------------------|------------------------|--------------------|---------------------|---------|
| 2101 Aurelius Rd. | 535 Griswold St. | 801 Broadway NW | 105 W. Grand River | 401 S. Mechanic St. | 834 Kir |
| Suite 2A | Buhl Building, Ste 1650 | Suite 215 | Howell, MI 48843 | Suite B | Suite 1 |
| Holt, MI 48842 | Detroit, MI 48226 | Grand Rapids, MI 49504 | 517-552-9199 | Jackson, MI 49201 | Kalama |
| 517-694-7760 | 313-965-3330 | 616-454-4286 | | 517-292-1295 | 269-66 |

azoo ng Highway 07 azoo, MI 49001 55-2005

Lansing 215 S. Washington SQ Suite D Lansing, MI 48933 517-292-1488

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HRC Job No. 20200852

over the gas line. Mats shall be a minimum 8" x 3' x 8' with a minimum separation from the top of pipe to bottom of crane mat of 4.5'. Consumers Energy's field representation is mandatory during the crossing of our facility and any additional protection will be at the discretion of Consumers Energy personnel.

Access drive to Schoenherr Road is proposed on the plans. Contractor to protect sidewalk and curb(s) to prevent damage.

Trees were recently planted along the Sterling Relief. The Contractor shall protect all trees.

- 3. Project schedule: 300 days. Means and methods are up to the contractor. However, we anticipate the stone work will be completed first. The Owner will consider an extension if necessary to accommodate plant availability.
- The Red Run drain is flashy. Contractor should stage equipment and material out of flood plain. Red Run does not have USGS rain gauge within the influence of the drain. Flows are outlined in a HRC dated September 2020.
- 5. Coordinate all staging with Jeff Wheeler, Freedom Hill County Park Facilities, prior to staging.
- 6. This is a landfill site. Contractor to coordinate with South Macomb Disposal Authority representatives for approved staging areas.
- 7. Minimal or no excavation allowed on landfill cap or berm without prior approval. Contractor to coordinate with South Macomb Disposal Authority representatives.
- 8. Freedom Trail will be closed between the bridge and the access drive off of Metro Parkway. Trail along Metro Pkwy and sidewalk on Schoenherr heavily used by pedestrian traffic. Even though the sidewalk will be closed, we anticipate walking thru. Contractor to maintain a safe site.
- 9. Rip rap for the culvert end sections can be 6-8" in diameter.
- 5. Permits needed
 - EGLE permit issued
 - USACE underway
 - Road ROW permit Macomb County Department of Roads- permit approval issued. Contractor to pull permit
 - Soil Erosion and Sedimentation Control City of Sterling Heights submitted

HUBBELL, ROTH & CLARK, INC Project: Red Run Restoration Phase 01 **CONSULTING ENGINEERS SINCE 1915**

MEETING SIGN-IN SHEET

Location: Freedom Hill

Purpose: Pre-Bid Meeting

Date/Time: 11/30/2021 at 9:00 AM

| he en j | NAME | REPRESENTING | PHONE | E-MAIL | |
|------------|--------------------|----------------------|------------------------|---|----------|
| 1. | GENARD SANTOR | D MCPED | 2-515-6089 | gerand. Surtors Onwood 901 | org |
| 2. | Raul Rocha | GIBCO | 313-910-9060 | diroach 313 Drahoo.con | 1 |
| 3. | FARIS NALU | ANGLINCIVIL | 2488848870 | FARISBANGLIN | ¢ |
| 4. | Timmy De Angelis | Ere Construction, UC | 734626 86 89 jimm | CIVIL - COM nota eje construction Le com | |
| 5. | Annelle milinner | Rock Bottom Son | e 586.255.5242 | annette @ rostonesupply, co, | n |
| 6. | Dan Jocham | L'S Construction | 989-761-0131 | 1; 10pstriction mi @ amouil.com | ` |
| 7. | Scattherman | Sherman Nurser, | 810-459-2867 | Scots@ shermannurser | 1 |
| 8. | James Van; | V.I.L. Construction | 586 - 979 - 6020 | d_ Van; @ comcastinet | |
| 9. | Brinn Burgess | Superior Excusation | 248-853-7075 | bburgess@ superiorexcauation | K.COM |
| 10. | Charles Spencer | TSP Environmental | 734-664-6097 | Cspencer @ tspenvironmatal.com | 0 |
| 11. | Christing Moradian | LDS | 5847815800 | colagostini Q Idagostini | -62 |
| 12. | | | 586-722-3322 | 0 | |
| 10-9 14 | NAME | REPRESENTING | 206 * 126 * 1552 Es | HALONBPIPELINE COMENST. A E-MAIL | JET |

HUBBELL, ROTH & CLARK, INC Project: Red Run Restoration Phase 01 **CONSULTING ENGINEERS SINCE 1915**

MEETING SIGN-IN SHEET

_____ Location: Freedom Hill

Purpose: Pre-Bid Meeting

Date/Time: 11/30/2021 at 9:00 AM

| | NAME | REPRESENTING | PHONE | E-MAIL |
|-----|-------------------|-----------------------|------------------|--------------------------------------|
| 1. | ED NEIMAN | DP SOHWEHHOPER EXCAV. | 586.855,9565 | EDC dpschweißer . Com |
| 2. | Grey Peprock | TR Diebrach | 810-323-4027 | Gren @ TRPiedrak.com |
| 3. | Mike Babel | T.R. Prepvzak | 810 529 4017 | mike & typieprzah.com |
| 4. | MICK CERVILO | WARREN CONTRACTORS | 586-323-3350 | NICKEWARRENCONDEVICOM |
| 5. | PATRICK JONES | JSS | 586-709-6305 | Patrick @ 155 - macoub, com |
| 6. | Malcolar Charties | M.L. Chartres | 586 - 725 - 8373 | Mpeliartier @ Mehautier.com |
| 7. | Jason Richter | STE Group | (586) 468-1135 | frankrichter@sperlovel.net |
| 8. | DANIEULE DEVLIN | MCFWO | (586)260.6699 | danielle. der LIN @ MACONUS 401. com |
| 9. | Jeff Wheeler | Freedom Hill | 566 610 5987 | wheeler i b a ya has con |
| 10. | Emily Hanson | Davey Resource Group | 612-756-0464 | emily, hanson @ davey com |
| 11 | v | | | |
| 12. | | | | |
| | NAME | REPRESENTING | | E-MAIL |

| PROPOSAL FOR THE CONSTRUCTION OF RED RUN DRAIN RESTORATION – PHASE 1 RED RUN DRAIN, STERLING RELIEF DRAIN AND FREEDOM HILL RESTORATION IN MACOMB COUNTY, MICHIGAN |
|--|
| NAME OF BIDDER: |
| CONTACT NAME: |
| ADDRESS: |

DATE: ______ TELEPHONE NO. _____

CONTACT NAME EMAIL:

TO: Red Run Intercounty Drain Drainage District Board c/o Oakland County Water Resources Commissioner Building 95 West – One Public Works Drive Waterford, Michigan 48328-1907

The undersigned, as Bidder, hereby declares this bid is made in good faith without fraud or collusion with any persons bidding or proposing to supply materials or labor, and that it has examined the Contract Documents including but not limited to the Agreement, Contract Drawings, Advertisement, Information for Bidders, Proposal, Specifications, General Conditions, and the Supplementary Conditions and has also examined the soil boring logs, and other geotechnical information referenced in the Information For Bidders, and is familiar with the location of the work described herein and is fully informed as to the nature of the work and the conditions relating to its performance.

The Bidder acknowledges that it has not received or relied upon any representations or warranties of any nature whatsoever from the Office of the Oakland County Water Resources Commissioner and/or the Drainage District, its agents, representatives, or employees, as to any conditions to be encountered in accomplishing the work specifically, but not exclusively, including underground conditions, and that its bid is based solely upon the Bidder's own independent judgment.

The following documents shall be submitted with the Bid:

| ltem Number | Description | |
|----------------|---|--|
| 1. | Proposal, completed and signed acknowledging all addenda | |
| 2. | Proposal Guarantee/Bid bond (5%) | |
| 3. | Preliminary Schedule based on the Time noted in the Agreement and an anticipated Notice to Proceed date of: Project Engineer Enter Date | |
| 4. | Completed Form DC-118 Experience and Qualification Statement | |
| 5. | Signed Vendor Certification that it is not an "Iran Linked Business" | |

The Bidder hereby certifies that it has examined the Drawings, Specifications, Geotechnical Data, and other data provided by the Owner for bidding purposes. Further, the undersigned certifies that it has reviewed the proposed construction methods and finds them compatible with the conditions, which it anticipates from the above listed information, provided for bidding.

| JIM NASH | |
|---|------------|
| OAKLAND COUNTY WATER RESOURCES COMMISSIONER | |
| Page P-1 of P-10 | 11/16/2021 |
| | |

The Bidder shall complete the work under any job or field condition which was present and/or ascertainable prior to bidding. In addition, it shall also complete the work under whatever conditions it may create by its own sequence of construction, construction methods, or other conditions it may create, at no additional cost to the Owner.

The Bidder declares that it has familiarized itself with the location of the proposed work and the conditions under which it must be constructed; also, that it has carefully examined the Plans, Specifications, and Contract Documents (including the Geotechnical Data), which it understands and accepts as sufficient for the purpose, and agrees that it will contract with the Oakland County Water Resources Commissioner to furnish all labor, material, tools and equipment necessary to do all the work specified and prescribed for the completion of the above mentioned Contract for the following named unit prices:

| Item No. | Description | Quantity | Unit | Unit Price | Total Cost |
|-------------|---|-------------------|------------------|------------|------------|
| 1 | Mobilization (5% max) | 1 | Lsum | \$ | \$ |
| 2 | Tree, Rem, 6 Inch to 18 Inch (as needed) | 3 | Ea | \$ | \$ |
| 3 | Permits (Allowance) | 1 | Dlr | \$5,000.00 | \$5,000.00 |
| 4 | Prevent Spreading of Invasive Species Control Measures | 1 | Lsum | \$ | \$ |
| 5 | Erosion Control, Gravel Access Approach | 2 | Ea | \$ | \$ |
| 6 | Erosion Control, Turbidity Curtain, Deep, Modified | 1 | Lsum | \$ | \$ |
| 7 | Erosion Control, Silt Fence | 5,500 | Ft | \$ | \$ |
| 8 | Fence, Rem | 40 | Ft | \$ | \$ |
| 9 | HMA Surface, Rem | 205 | Sy | \$ | \$ |
| 10 | Sidewalk, Rem | 27 | Sy | \$ | \$ |
| 11 | Culv, Rem, 24 Inch to 48 Inch, Modified | 1 | Ea | \$ | \$ |
| 12 | Minor Bank Grading (as needed) | 7,500 | Syd | \$ | \$ |
| 13 | Culv, Cl A, 12 inch, Tr Det B, Modified | 59 | Ft | \$ | \$ |
| 14 | CMP, Gauge 16, 12 Inch, Modified | 142 | Ft | \$ | \$ |
| 15 | Dr. Structure, 24 Inch Dia., Modified | 2 | Ea | \$ | \$ |
| 16 | Dr. Stand Pipe. 24" Dia, CMP, Guage 16 | 1 | Ea | \$ | \$ |
| 17 | Site Preparation | 23 | Ac | \$ | \$ |
| 18 | Stone Toe | <mark>2710</mark> | <mark>Cyd</mark> | \$ | \$ |
| 19 | J Hooks | 3 | Ea | \$ | \$ |
| 20 | Excess Sediment Removal | 1,000 | Cyd | \$ | \$ |

BID SHEET

JIM NASH OAKLAND COUNTY WATER RESOURCES COMMISSIONER Page P-2 of P-10

11/16/2021

Form DC-123

| 21 | Shared Use Path, Grading, Special | 5650 | Ft | \$ | \$ |
|-----------------|---|------------------|------------------|------------|------------|
| 22 | Aggregate Base, 6 inch, 21AA, | 140 | Sy | \$ | \$ |
| 23 | Aggregate Surface Cse, 3.5 Inch, Modified | 1100 | Ton | \$ | \$ |
| 24 | Subgrade Undercutting, Type II, (as- needed) | 251 | CY | \$ | \$ |
| 25 | Geotextile, Stabilization (as-needed) | 600 | Sy | \$ | \$ |
| 26 | Sidewalk, Conc, 6 Inch, Modified | 1225 | Sft | \$ | \$ |
| 27 | HMA, 13A, 3 Inch | 1850 | Sft | \$ | \$ |
| 28 | Bollards, Collapsible | 2 | Ea | \$ | \$ |
| 29 | Fence, Modified | 48 | Ft | \$ | \$ |
| 30 | Mulch Blanket, High Velocity | 9,000 | Sy | \$ | \$ |
| 31 | Restoration - Turf | 5 | Ac | \$ | \$ |
| 32 | Restoration - Native Prairie Mix | 7.4 | Ac | \$ | \$ |
| 33 | Restoration – Lo Prairie Mix | 10.3 | Ac | \$ | \$ |
| 34 | Restoration - Stormwater Mix | 2.0 | Ac | \$ | \$ |
| 35 | Shrub Plantings | 2,500 | Ea | \$ | \$ |
| 36 | Bare Root Trees | 325 | Ea | \$ | \$ |
| 37 | Plugs Planting | 4,000 | Ea | \$ | \$ |
| 38 | Celtis Occidentalis, 2 Inch | 6 | Ea | \$ | \$ |
| 39 | Liriodendron Tulipifera, 2 Inch | 9 | Ea | \$ | \$ |
| 40 | Platanus x occidentalis (native), 2 Inch | 6 | Ea | \$ | \$ |
| 41 | Platanus x acerifolia, 2 Inch | 10 | Ea | \$ | \$ |
| 42 | Tilia americana, 2 Inch | 10 | Ea | \$ | \$ |
| 43 | Ulmus X, 2 Inch | 9 | Ea | \$ | \$ |
| 44 | Traffic Control | 1 | Ls | \$ | \$ |
| 45 | Signage (Allowance) | 1 | Dlr | \$3,000.00 | \$3,000.00 |
| 46 | Sign Installation | 1 | Dlr | \$1,500.00 | \$1,500.00 |
| 47 | Audio Video Survey | 1 | LS | \$ | \$ |
| 48 | Erosion Control, Inlet Filter | 5 | Ea | \$ | \$ |
| <mark>49</mark> | Stone Rip Rap | <mark>445</mark> | <mark>Cyd</mark> | \$ | \$ |
| | | | | | |
| | Total | | | \$ | |

TOTAL CONTRACT PRICE (words) \$_____

JIM NASH OAKLAND COUNTY WATER RESOURCES COMMISSIONER Page P-3 of P-10 Note: In case of discrepancy, unit prices shall be used to determine the total amount of this bid.

TAXES

The foregoing unit prices include all applicable Federal, State and Local taxes.

ADDENDA

This Proposal is based on the following Addenda in the table below:

| Addendum Number | Date Issued |
|-----------------|-------------|
| | |
| | |
| | |
| | |

SUBCONTRACTORS AND MAJOR EQUIPMENT MANUFACTURERS/SUPPLIERS

The Bidder agrees, in accordance with the Information For Bidders, that it is concurrently with this bid, furnishing the Owner the required information relative to the qualifications of Bidder and Subcontractors required to be identified pursuant to the Information For Bidders. Bidder also agrees that Bidder will provide all other information as required with this bid and/or within the times specified in the Information For Bidder or other Contract Documents. Bidder acknowledges that this bid may be rejected if Bidder fails to provide any of the required information with this bid and/or within the times outlined in the Information For Bidders or other Contract Documents.

BID GUARANTEE

The Bidder encloses a certified or cashier's check or bid bond in the amount of Five Percent (5%) of the accompanying total bid.

Certified Check
Cashier's Check
Bid Bond

The Bidder hereby declares that this bid was prepared by qualified personnel of its employ who inspected the Plans and Specifications, read and interpreted the Geotechnical Data and other information furnished by the Owner, and developed the Bidder's intended construction methods.

If this Proposal is accepted by the Owner and the undersigned shall fail to contract as aforesaid and to furnish the required surety bonds within ten (10) calendar days of the delivery date of the Notice of Award to the successful Bidder, then the undersigned shall be considered to have abandoned the Contract, and the Certified Check, Cashier's Check or Bid Bond accompanying this Proposal shall be forfeited to the Oakland County Water Resources Commissioner and/or the Drainage District.

If the Bidder enters into the Contract in accordance with this Proposal, or if its Proposal is rejected, then the accompanying bid guarantee shall be returned to the Bidder.

| JIM NASH | |
|---|------------|
| OAKLAND COUNTY WATER RESOURCES COMMISSIONER | |
| Page P-4 of P-10 | 11/16/2021 |

By submission of the Bid, each Bidder certifies, and in the case of a joint BID each party thereto certifies as to its own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other Bidder or with any competitor.

In submitting this bid it is understood that the right is reserved by the Oakland County Water Resources Commissioner and/or the Drainage District to reject any and all bids, to waive non-material irregularities and/or informalities, and to evaluate the responsiveness and responsibility of each Bidder. The Owner reserves the right to reject any bid submitted by any Bidder that the Owner determines is not a responsive and responsible Bidder based on information supplied by the Bidder or on any other information that the Owner receives or acquires on its own, including the Owner's past experience with the Bidder. The Owner further reserves the right to reject any bid submitted by any bid submitted by any bid submitted by any bid submitted by any other information that the Owner receives or acquires on its own, including the Owner's past experience with the Bidder. The Owner further reserves the right to reject any bid submitted by any bidder, based on the sole preference of the Owner.

The Bidder shall indicate its legal status as provided herein.

JIM NASH OAKLAND COUNTY WATER RESOURCES COMMISSIONER Page P-5 of P-10

LEGAL STATUS OF BIDDER

(The Bidder shall fill out the appropriate form below and strike out the other three listed below and complete the appropriate Resolution or Certificate.

A **Corporation** duly organized and doing business under the laws of the State of ______ for whom ______ whose signature is affixed to this Proposal, is duly authorized to execute Contracts.

A Limited Liability Company duly organized and doing business under the laws of the State of Michigan for whom ______ whose signature(s) is (are) affixed to this Proposal, is (are) duly authorized to execute Contracts.

A Partnership or Joint Venture, all members of which, with addresses, are:

An Individual, whose signature is affixed to this Proposal.

| Signed and Sealed this day of | ,20 |
|---------------------------------|-----|
| Authorized Signature of Bidder: | |
| Print Name: | |
| Title: | |
| | |

WITNESS By:

A. IF BIDDER IS A CORPORATION, COMPLETE THE FOLLOWING:

RESOLUTION OF THE BOARD OF DIRECTORS OF

RESOLVED, that any one or more of the officers of the Corporation referred to below be and hereby are authorized and empowered on behalf of the Corporation to transact any and all business with the County of Oakland, State of Michigan, acting by and through its statutory agent, the Oakland County Water Resources Commissioner (the "Water Resources Commissioner") and/or the ______ Drainage District which the Corporation could, in any way, transact and are further authorized to execute, acknowledge and deliver on behalf of the Corporation and in its name to the Water Resources Commissioner.

- 1. A Proposal and Bid Sheet for construction of all or part of the ______ Project in form and content as such officer deems necessary and appropriate and as approved by the Water Resources Commissioner.
- 2. All other agreements, instruments or documents as such officer deems necessary or appropriate in conjunction with the aforementioned project.

RESOLVED FURTHER, that the following are the true and correct names, signatures and titles of the officers of the Corporation referred to above:

| NAMES | SIGNATURES | TITLES |
|-------|------------|--------|
| | | |
| | | |

RESOLVED FURTHER, that the acts of said person(s) or any of them, shall at all times be given full faith and credit without the necessity of inquiry by the Water Resources Commissioner as to any of the circumstances attending the same and that the acts and doings of authorized person(s) or any of them in respect to the subject matter hereof are hereby fully ratified, approved, adopted and confirmed; and

RESOLVED FURTHER, that the authorizations herein set forth shall remain in full force and effect until written notice of their modification or discontinuance shall be given to and actually received by the Water Resources Commissioner at its offices.

| IN WIT | NESS WHERE | OF, the Board of Directors of | have executed this | Resolution a | s of |
|--------|------------|-------------------------------|------------------------|--------------|------|
| the | _ day of | , 20 | - | | |

BOARD OF DIRECTORS

JIM NASH OAKLAND COUNTY WATER RESOURCES COMMISSIONER Page P-7 of P-10

11/16/2021

B. IF BIDDER IS A LIMITED LIABILITY COMPANY, COMPLETE THE FOLLOWING:

OF

RESOLUTION OF MEMBERS _____, L.L.C.

The undersigned, being all of the members of ______, L.L.C. a _______, L.L.C. a ________, (state) limited liability company (the "Company") do hereby certify that the following is a true and correct copy of the resolutions duly adopted by the Company on the ______ day of _______, 20_____, that the same have not been modified or rescinded and are in full force and effect and that the resolutions have been adopted in accordance with the laws of the state of incorporation, the Articles of Organization and the Operating Agreement and that no further member consent is required or any necessary member consent has been obtained:

RESOLVED, that any one or more of the members of the Company referred to be and hereby are authorized on behalf of the Company to transact any and all business with the County of Oakland, State of Michigan, acting by and through its statutory agent, the Oakland County Water Resources Commissioner (the "Water Resources Commissioner") and/or ______ Drainage District which the Company could, in any way, transact and are further authorized to execute, acknowledge and deliver on behalf of the Company and in its name to the Water Resources Commissioner.

1. A Proposal and Bid Sheet for construction of all or part of the ______ Project in form and content as the members deem necessary and appropriate and as approved by the Water Resources Commissioner.

2. All other agreements, instruments or documents as the members deem necessary or appropriate in conjunction with the aforementioned project.

RESOLVED FURTHER, that the acts of said member(s) or any of them, shall at all times be given full faith and credit without the necessity of inquiry by the Water Resources Commissioner as to any of the circumstances attending the same and that the acts and doings of authorized person(s) or any of them in respect to the subject matter hereof are hereby fully ratified, approved, adopted and confirmed; and

RESOLVED FURTHER, that the authorizations herein set forth shall remain in full force and effect until written notice of their modification or discontinuance shall be given to and actually received by the Water Resources Commissioner at its offices.

IN WITNESS WHEREOF, the Members have executed this Resolution of ______, L.L.C. as of the _____ day of ______, 20____.

_____, L.L.C.

A ______ LIMITED LIABILITY COMPANY

MEMBERS:

JIM NASH OAKLAND COUNTY WATER RESOURCES COMMISSIONER Page P-8 of P-10

11/16/2021

C. IF BIDDER IS A LIMITED PARTNERSHIP, COMPLETE THE FOLLOWING:

CERTIFICATE OF GENERAL PARTNER

______, being the sole General Partner of ______ Limited Partnership, a ______ limited partnership (the "Partnership") hereby certifies that the following is a true and correct copy of the resolutions duly adopted by the Partnership on the _____ day of _____, 20____, that the same have not, in any way, been modified or rescinded and are in full force and effect and that the resolutions have been adopted in accordance with the laws of the state of formation the Certificate of Limited Partnership and that either no further partner consent is required or any necessary partner consent has been obtained:

RESOLVED, that ______, the sole General Partner, is hereby authorized and empowered on behalf of the Partnership to transact any and all business with Oakland County, acting by and through its statutory agent, the Oakland County Water Resources Commissioner (the "Water Resources Commissioner") and/or _____ Drainage District which Partnership could, in any way, transact and is further authorized to execute, acknowledge and deliver on behalf of the Partnership and in its name to the Water Resources Commissioner.

- 1. A Proposal and Bid Sheet for construction of all or part of the ______ Project in form and content as such General Partner deems necessary and appropriate and as approved by the Water Resources Commissioner.
- 2. All other agreements, instruments or documents as such General Partner deems necessary or appropriate in conjunction with the aforementioned project.

RESOLVED FURTHER, that the following are the true and correct names of all general and limited partners of the Partnership:

| NAMES | PARTNER |
|-------|---------|
| | General |
| | Limited |
| | Limited |

RESOLVED FURTHER, that the acts of General Partner shall at all times be given full faith and credit without the necessity of inquiry by the Water Resources Commissioner as to any of the circumstances attending the same and that the acts and doings of the General Partner in respect to the subject matter hereof are hereby fully ratified, approved, adopted and confirmed; and

RESOLVED FURTHER, that the authorizations herein set forth shall remain in full force and effect until written notice of their modification or discontinuance shall be given to and actually received by the Water Resources Commissioner at its offices.

| IN WITNESS WHEREOF, the sole General Partner of | | _ Limited Partnership, |
|---|------------|------------------------|
| hereby executes this Certificate of General Partner as of | the day of | , 20 |

GENERAL PARTNER

| JIM | NASH |
|----------------------|-------------------------------|
| OAKLAND COUNTY WATER | RESOURCES COMMISSIONER |
| Page P | -9 of P-10 |

D. IF BIDDER IS A PARTNERSHIP OR JOINT VENTURE, COMPLETE THE FOLLOWING:

CERTIFICATE OF PARTNERS

The undersigned do hereby certify that they are all the partners of _______, a _____ Co-Partnership or Joint Venture ("Partnership"), that the following is a true and correct copy of the resolutions duly adopted by the Partnership on the ______ day of ______, 20____, that the same have not, in any way, been modified or rescinded and are in full force and effect and that the resolutions have been adopted in accordance with the laws of the state of formation the Certificate of Co-Partnership and that either no further partner consent is required or any necessary partner consent has been obtained:

RESOLVED, that the undersigned are hereby authorized and empowered on behalf of the Partnership to transact any and all business with the County of Oakland, State of Michigan, acting by and through its statutory agent, the Oakland County Water Resources Commissioner (the "Water Resources Commissioner") and/or ______ Drainage District which the Partnership could, in any way, transact and are further authorized to execute, acknowledge and deliver on behalf of the Partnership and in its name to the Water Resources Commissioner.

- 1. A Proposal and Bid Sheet for construction of the _____ Project in form and content as such partner deems necessary and appropriate and as approved by the Water Resources Commissioner.
- 2. All other agreements, instruments or documents as such partner deems necessary or appropriate in conjunction with the aforementioned project.

RESOLVED FURTHER, that the said partners or any of them, shall at all times be given full faith and credit without the necessity of inquiry by the Water Resources Commissioner as to any of the circumstances attending the same and that the acts and doings of the partners or any of them in respect to the subject matter hereof are hereby fully ratified, approved, adopted and confirmed; and

RESOLVED FURTHER, that the authorizations herein set forth shall remain in full force and effect until written notice of their modification or discontinuance shall be given to and actually received by the Water Resources Commissioner at its offices.

| IN WITNESS W | VHEREOF, the partners of | | hereby executes this Resolution |
|--------------|--------------------------|------|---------------------------------|
| as of the | day of | , 20 | |

PARTNERS:

| JIM NASH | |
|------------------------------------|-----------|
| OAKLAND COUNTY WATER RESOURCES COM | MISSIONER |
| Page P-10 of P-10 | |

11/16/2021

1. QUALIFICATIONS

The pre-construction digital versatile disk (DVD) documentation shall be done by a responsible commercial firm known to be skilled and regularly engaged in the business of color audio-video construction documentation. The firm shall furnish such information as the Owner deems necessary to determine the ability of that firm to perform the work in accordance with contract specifications. This information may include a complete history of all construction work experience.

2. CONTRACTOR'S RESPONSIBILITIES

The Contractor shall provide all labor, materials, equipment, services and perform all operations necessary to furnish to the Owner a complete color audio-video recording of the surface features within the proposed construction zone of influence including access roads and haul routes. This record shall include, but not be limited to, all audio-videos, DVD storage cases, index labels and logs. The purpose of this coverage shall be to accurately document the pre-construction condition of these surface features.

a. Coverage

The recordings shall include coverage of all surface features located within the construction zone of influence. The construction zone of influence shall be defined (1) as the area within the permanent and temporary easements and areas adjacent to these easements which may be affected by routine construction operations; (2) road R.O.W. (3) as directed by the Owner. The surface features within the construction zone of influence shall include, but not be limited to, all roadways, pavements, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery and fences. Of particular concern shall be the existence or non-existence of any faults, fractures or defects.

Houses and buildings shall be identified visually by house or building number, when possible, in such manner that the progress of the recording and proposed construction areas may be located by reference to the house and buildings.

b. Recording Operation

The operator in charge must have experience on at least 25 miles preconstruction work and/or other similar construction work. Apprentice operators may not assume control over any work, but must, in the course of their duties, be continuously supervised by an experienced operator.

c. Recording Schedule

The recording shall be performed prior to the placement of any construction materials or equipment on the proposed construction site.

| JIM NASH |
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| OAKLAND COUNTY WATER RESOURCES COMMISSIONER |
| Page 1 of 5 |

00 20 10 SPECIFICATIONS FOR COLOR AUDIO-VIDEO RECORDING OF CONSTRUCTION AREAS

d. Delivery

The Contractor shall deliver the DVD recordings to the Owner upon their completion as a whole; or upon request of the Owner, deliver specific DVD recordings of any area to the Owner upon their completion. Upon delivery of the DVDs, transfer of ownership of those DVDs shall be made to the Owner.

e. Unacceptable Documentation

The Owner shall have the authority to reject all or any portion of the DVD documentation not conforming to specifications. Those rejected portions shall be re-done at no additional cost to the Owner.

f. Documentation Additions and Omissions

The Owner shall have the authority to designate what areas may be added to or omitted from DVD documentation.

g. Specification Deviations

Any deviation from these specifications must have the written approval of the Owner/Engineer.

3. PROCEDURAL REQUIREMENTS

The following procedures shall be implemented in the production of pre-construction color audio-DVD documentation. Above all, the documentation shall be executed in a conscientious and professional manner to assure the end product's maximum usefulness to the Owner.

- a. The coverage shall consist of a single, continuous, unedited recording which begins at one end of a particular construction area and continues to the other end of that construction area. However, where coverage is required in areas not accessible by conventional wheeled vehicles and smooth transport of the recording system is not possible, such coverage shall consist of an organized, interrelated sequence of recordings at various positions along that construction area.
- b. The DVD shall be divided into chapters with a maximum of 10 stations (1,000') per chapter.
- c. **Vehicle Rate of Travel** The vehicle rate of travel shall be indirectly proportional to the number, size and value of the surface features within that construction area's zone of influence. The following table classifies typical areas and sets the maximum average rates of travel in those areas, shall be used to establish approximate limits on actual average rates of travel:

| JIM NASH |
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| OAKLAND COUNTY WATER RESOURCES COMMISSIONER |
| Page 2 of 5 |

00 20 10

SPECIFICATIONS FOR COLOR AUDIO-VIDEO RECORDING OF CONSTRUCTION AREAS

RATE OF TRAVEL

| AR | EA RATE MAX. | TYPICALLY CHARACTERIZED BY | AVG. |
|-----|---|--|-------------|
| (1) | High Density (e.g. developed subdivision) | hard surface streets, curbs, drives & sidewalks; 50' lots; very few empty lots | 30 ft/min. |
| (2) | Med. Density (e.g. partially developed subdivision) | gravel roads, hard & soft surface drives, no sidewalks culverts and headwalls, 100' lots, few empty lots | 60 ft/min. |
| (3) | Low Density (e.g. Suburban fringe) | gravel roads, small fields or woods, occasional houses | 90 ft/min. |
| (4) | Extra Low Density (e.g. rural) | gravel roads, large fields, sparse number of houses | 120 ft/min. |
| | | | |

d. **Visibility** - All recording shall be performed during times of good visibility. No recording shall be done during period of significant precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording and to produce bright, sharp video recordings of those subjects.

No recording shall be performed when more than 10% of the ground area is covered with snow, unless otherwise authorized by the Owner,

4. TECHNICAL REQUIREMENTS

The total audio-video recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project as well as those more subjective requirements of high quality audio and video production. The video portion of the recording shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls, or any other form of picture imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume, clarity and be free from distortion.

a. Recording System

(1) **DVD**

The DVD used for the recordings shall be professional quality 12 cm color DVD media that conforms to either DVD-R or DVD+R recording standards using high quality DVD video and audio bitrates. No DVD's used for any previous recording will be used except when furnished by the Owner.

The recorded DVDs shall be compatible for playback with any standard DVD-R or DVD+R player.

| JIM NASH OAKLAND COUNTY WATER RESOURCES COMMISSIONER | |
|---|------------|
| Page 3 of 5 | 11/16/2021 |
| | |

SPECIFICATIONS FOR COLOR AUDIO-VIDEO RECORDING OF CONSTRUCTION AREAS

(2) Recorder

All video recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date the time of recording, the engineering stationing corresponding to the stationing on the plans or as directed by the engineer, the name of the street, easement or building being documented, the project and time to appear in the upper left hand corner of the picture.

Example: N on First Street W/E 84 + 20

(3) Audio Record

There shall be a corresponding and simultaneously recorded audio recording. This audio recording, containing the commentary of the camera operator, shall assist the viewer orientation and in any needed identification, differentiation, clarification or objective description of the structures being shown in the video portion of the recording.

The audio recording shall be free of any other voice communication.

At the start of production and the beginning of a new street, an identification summary shall be read into the record while at the same time a wide angle view with numeric displays is provided for facial record. Summary to include: DVD Number, Name of Job, Location of Job, Positional Location at start of job date, time, weather and other notable conditions.

(4) Camera

The color video camera used in the recording system shall have a horizontal resolution of 300 lines at center, a luminance signal to noise ratio of 45db, and a minimum illumination requirement of 25 foot-candles.

Camera to be adjusted to factory specifications and f-stop adjusted to optimum contrast. White balance pedestal, level and sync must be adjusted for factory recommended optimum performance under environmental conditions.

a. Camera Height and Stability

When conventional wheeled vehicles are used as conveyances for the recording system, the distance between the camera lens and the ground shall be not less than 12 feet. The camera shall be firmly mounted, such that transport of the camera during the recording process will not cause an unsteady picture.

b. Camera Control

Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during DVD playback. In addition, all other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chrome, white balance and electrical focus, shall be properly controlled or adjusted to maximize recorded picture quality.

(1) A wide angle of area will be shown first, then a series of pans, zooms and tilts as may be necessary to accomplish a comprehensive view. Close-ups

| JIM NASH OAKLAND COUNTY WATER RESOURCES COMMISSIONER | | | |
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| Page 4 of 5 | 11/16/2021 | | |
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SPECIFICATIONS FOR COLOR AUDIO-VIDEO RECORDING OF CONSTRUCTION AREAS

will be utilized as necessary to insure sufficient detail of items of interest. Progress shall continue linearly along the field of view, for example, one side of roadway must be completed before commencing recording of the opposite side.

- (2) Camera pans and tilts to be no faster than 90 degrees of arc in a five-second interval, or slower, to assure maximum clarity of scene detail.
- (3) Camera zoom to be no faster than a doubling of focal distance within a 1/2 second interval, or slower. Zoom is capable of 17 to 120 mm, then the minimum time to perform a full zoom is 3/5 seconds.
- (4) Each item of interest shall be clearly indicated in the video record for sufficient time to permit audio discussion and viewer comprehension.

(5) **DVD Indexing**

a. **DVD Identification**

All DVDs and their storage cases shall be properly identified by DVD index number, project title and general project location.

b. **DVD Logs**

Displayed on the storage case of each DVD shall be a log of that DVD's contents. That log shall describe the various segments of coverage contained on that DVD in terms of the chapters, names and sides of the streets or easements, coverage beginning, direction and endpoints, with corresponding DVD layer counter numbers.

c. Cumulative Index

A cumulative alphabetical index correlating the various segments of coverage to their corresponding DVDs shall be supplied to the Owner.

All equipment, accessories and materials to perform this service shall be furnished by the Contractor, except the plans of the proposed area to be televised, which are furnished by the engineer. Measurement will be based on the number of lineal feet of proposed pipe installation including manholes measured horizontally on the centerline thereof as indicated on the contract drawings.

END OF SECTION









| DRAINAGE BOARD | | | | | |
|--|--|--|--|--|--|
| AGRICULTURE & Rural Development | | | | | |
| WATER RESOURCES COMMISSIONER Jim Nash | | | | | |
| | W. HIGAN | | | | |
| | Nacomb County Public Works Commissioner | | | | |
| HUBBEL CONSULTI 555 HULET DRI BLOOMFIELD H | L, ROTH & CLARK, INC NG ENGINEERS SINCE 1915 WE P.O. BOX 824 HILLS, MICH. 48303 - 0824 | | | | |
| PHONE: (248) 454-6300 FAX (1st. Floor): (248) 454-6312 FAX (2nd. Floor): (248) 454-6359 WEB SITE: http:// www.hrcengr.com | | | | | |
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| 12-08-2021 | ADDENDUM No. | | | | |
| 12-08-2021 | ADDENDUM No. | | | | |
| 12-08-2021 11-17-2021 11-08-2021 | ADDENDUM No. A ISSUED FOR BIDS ISSUED FOR FINAL REVIEW | | | | |
| 12-08-2021 11-17-2021 11-08-2021 07-19-2021 | ADDENDUM No. | | | | |
| 12-08-2021 11-17-2021 11-08-2021 07-19-2021 04-13-2021 03-19-2021 | ADDENDUM No. ADDENDUM No. ISSUED FOR BIDS ISSUED FOR FINAL REVIEW ISSUED FOR OWNER REVIEW ISSUED FOR OWNER REVIEW ISSUED FOR OWNER REVIEW | | | | |
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| 12-08-2021 11-08-2021 11-08-2021 07-19-2021 04-13-2021 03-19-2021 03-19-2021 DATE DESIGNED | ADDENDUM No. ADDITIONS AND/OR REVISIONS | | | | |
| 12-08-2021 11-08-2021 11-08-2021 07-19-2021 04-13-2021 03-19-2021 03-19-2021 DATE DESIGNED H DRAWN H | ADDENDUM No. ADDITIONS AND/OR REVISIONS | | | | |
| 12-08-2021 11-17-2021 11-08-2021 01-13-2021 03-19-2021 03-19-2021 DESIGNED P DRAWN CHECKED | ADDENDUM No. A ADDENDUM No. A ISSUED FOR BIDS ISSUED FOR FINAL REVIEW ISSUED FOR OWNER REVIEW | | | | |

RED RUN INTERCOUNTY DRAIN











CROSS SECTION 6

| QUANTITIES THIS SHEET | Г | |
|---|------|-----|
| DESCRIPTION | UNIT | QTY |
| Aggregate Surface Cse, 3.5 inch, Modified | Sy | 560 |
| Shared Use Path, Grading, Special | Ft | 500 |
| Culv, Cl A, 12 inch, Tr Det B, Modified | Ft | 29 |
| Dr. Structure, 24 inch Dia, Modified | Ea | 1 |
| Stone Rip Rap, as needed | Cyd | 340 |



NOTE: UTILITY INFORMATION ON THIS DRAWING MAY BE FROM INFORMATION DISCLOSED TO THIS FIRM BY THE VARIOUS UTILITY COMPANIES, CITY/COUNTY AGENCIES AND OTHER VARIOUS SOURCES. UNDERGROUND UTILITIES WHICH ARE ON PRIVATE PROPERTY ARE USUALLY NOT DELINEATED UPON A UTILITY COMPANY'S PUBLISHED PLANS. THEIR LOCATION, IF SHOWN UPON THIS SURVEY, ARE APPROXIMATED FROM FOUND PAINT MARKS/STAKES, ETC. AS LOCATED BY THIS FIRM FROM SOURCES WHICH ARE UNKNOWN. NO GUARANTEE IS GIVEN AS TO THE COMPLETENESS OR ACCURACY THEREOF. PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES (IN CONFLICT WITH PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. CALL MISS DIG 3 WORKING DAYS PRIOR TO CONSTRUCTION.



THREE FULL WORKING DAYS BEFORE YOU DIG, CALL THE MISS DIG SYSTEM AT 800-482-7171 or 811.

ORIGINAL PLOT SIZE: ARCH D (24.00 X 36.00 INCHES)

MACOMB COUNTY

MICHIGAN

PATH ALIGNMENT & DRAIN RESTORATION PLAN AND PROFILE STA. 40+00 TO 45+00

| HRC JOB NO. 20200852 | SCALE 1" = 30' HORIZ. 1" = 5' VERT. | | |
|-------------------------|---|--|--|
| DATE December 2021 | NO. 14 OF | | |
| © 2021 Hubbell, Roth | & Clark, Inc. All Rights Reserved | | |



| RED RUN INTERCOUNTY DRAIN | | | | | | |
|--|--|--|--|--|--|--|
| Michigan Department of | | | | | | |
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| WATER RESOURCES COMMISSIONER Jim Nash | | | | | | |
| 1818 ***** | NU THE REPORT OF | | | | | |
| Сн Macomb Cour Public Works | ity Commissioner | | | | | |
| | | | | | | |
| 555 HULET DRIVE BLOOMFIELD HILLS, MIC | P.O. BOX 824 CH. 48303 - 0824 | | | | | |
| PHONE: (248) 454-6 FAX (1st. Floor): (248) 45 FAX (2nd. Floor): (248) 45 | 300 54-6312 54-6359 | | | | | |
| WEB SITE: http:// www.h | rcengr.com | | | | | |
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| 12-08-2021 ADDEND | | | | | | |
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| 04-13-2021 ISSUED 03-19-2021 ISSUED DATE ISSUED FO | FOR OWNER REVIEW FOR OWNER REVIEW | | | | | |
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| CHECKED N.J.K. APPROVED J.F.B. | | | | | | |
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Memo

To: Red Run Drain Intercounty Drainage Board

From: Project Team

Date: September 2020

Subject: Study for the Repair, Maintenance, & Management of the Red Run Drain

Peak Flow and Floodplain Analyses

Background

Red Run drain is one of the Clinton River tributaries, discharging into the Clinton River downstream of Utica Rd. in Clinton Township. The Red Run watershed consists of six sub-watersheds based on the topographically derived USGS/NRCS classification system.¹ The left map in Figure 1 shows the Clinton River Subwatersheds, and right map shows the Red Run drainage district.



Figure 1- Left Map: SEMCOG Clinton River Subwatershed Areas; Right Map: Red Run Subwatershed Areas

The subbasin upstream of the George W. Kuhn Retention Treatment Basin (GWK RTB) represents the area of the Red Run drainage with combined sewer systems. Stormwater runoff in this subbasin is captured by the storm sewer inlets and other infrastructure and is routed south to the Great Lakes Water Authority (GLWA) Wastewater Treatment Plant for treatment during dry weather. During heavy precipitation, excess flow is delivered to the George W. Kuhn Retention Treatment Basin where it is stored, screened, and disinfected before discharge to the Red Run Drain.

Red Run Drain Improvement in 1954

In 1954, the Red Run drain was improved to a trapezoidal channel with one vertical to two horizontal side slopes and a bottom width of 100 to 125 ft. The Red Run channel was deepened and widened from its confluence with the Clinton River to approximately eleven miles upstream to the intersection of Campbell and Twelve-mile roads, the current location of GWK RTB. The design depth is 13 feet, and the side slopes of the banks are one foot vertical and two foot horizontal. The berms are 30 ft wide, and the maximum height of the spoil bank is 12 Sft. The channel bottom width varies and is as follows:

- From Clinton River to Plumbrook: 125 ft
- From Plumbrook to Schoenherr Rd.: 105 ft
- From Schoenherr Rd to Beaver Creek: 100 ft
- From Beaver Creek to Bear Creek: 80 ft
- From Bear Creek to Van Dyke Rd.: 70 ft
- From Van Dyke Rd. to Mound Rd.: 45 ft
- From Mound Rd. to 12 mi d.: 40 ft
- From 12 mi Rd. to Campbell Rd.: 35 ft



Figure 2- Typical Red Run Cross Section, 1952³

Flashiness Index

Flashiness Index is one of the common metrics that can be used to evaluate changes in the watershed response. The Richards-Baker Flashiness Index (R-B Index) is an indicator of how frequently and rapidly short-term changes in stream flow occur. Increased flashiness often reflects unstable watersheds and degraded habitat that adversely affects aquatic life. Flashy flows caused by increased peak flow rates and volume from urban runoff disrupt aquatic habitat and increase the delivery and transport of pollutant loads. The R-B index increases as the impervious cover becomes greater. The impervious cover in the Red Run watershed will be discussed in the Regional Detention and Green Infrastructure Analyses

memo. The flashiness index was computed for all stream gage records in the Clinton River Watershed that had a minimum of 20 years of data as a part of the sediment transport study for this watershed by US Army Corps of Engineers in 2005. Flashiness can quantify the stream response time to precipitation events.

A high flashiness index indicates the quick response of stream to the precipitation events. The results of the sediment transport modeling study performed by USACE-Detroit District in 2005³ showed the flashiness at USGS Gage 04162900 on Big Beaver Creek near Warren has been increased, however at USGS Gage 04163400 on Plumbrook at Utica no significant change was observed. There is no active USGS gage on the Red Run drain to evaluate the flashiness index in the Red Run. Increased flashiness can result in increased sheet flow, soil erosion rate, and sediment transport from overland to the stream channel.

Peak Stream Discharge

The below table shows the peak stream discharge rates for the Red Run Drain and its tributaries. The 10, 50, 100, and 500-year peak stream discharge rates were reported in the FEMA FIS study⁴. The log-probability graph was applied to extrapolate the values for the flow frequencies that has not reported in FEMA FIS study such as 2 and 5 year recurrence intervals.

| | | | - | | | |
|-----------------------|----------------------------------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|-----------------------------------|
| | 2 year | 5 year | 10 year | 50 year | 100 year | 500 year |
| Drains | 50% Annual Chance (cfs) | 20% Annual Chance (cfs) | 10% Annual Chance (cfs) | 2% Annual Chance (cfs) | 1% Annual Chance (cfs) | 0.2% Annual Chance (cfs) |
| Red Run Drain | 5,500 | 8,500 | 10,780 | 15,910 | 17,390 | 23,340 |
| Bear Creek | 2,020 | 3,085 | 3,960 | 5,610 | 6,450 | 9,020 |
| Plumbrook Drain | 750 | 1,200 | 1,540 | 2,240 | 2,560 | 3,500 |
| Big Beaver Creek | 410 | 640 | 820 | 1,230 | 1,420 | 1,990 |
| Sterling Relief Drain | 360 | 645 | 875 | 1,470 | 1,800 | 2,690 |
| Meckler Drain | 225 | 360 | 460 | 730 | 840 | 1,160 |

Table 1- Peak Stream Discharge (cfs) for the Red Run Drain and its tributaries

Hydraulic Analysis

The drain capacity is the amount of flow that can pass through the drain before overtopping the banks. HRC requested the hydraulic model (HEC-RAS⁵) from FEMA and supplemented from model with AEW model. HEC-RAS model was run for three different peak stream discharge rates including 2, 10, and 100-year. The hydraulic capacity throughout the Red Run drain was depicted on a map (*see Attachment B1*). The hydraulic analysis map color-coded for 2, 10, and 100- year peak stream discharge.

Table 2 shows the peak stream discharge for six sections in the Red Run Drain which is input of the model. 10 and 100- year peak stream discharge were studied and reported by FIS, Macomb County, 2013³; 2-year peak stream discharge was estimated by extrapolating the peak stream discharge reported by FIS for each segment.

| Red Run Drain Sections | | 2 year | 10 year | 100 year |
|------------------------|---|----------------------------|----------------------------|---------------------------|
| | | 50% Annual Chance (cfs) | 10% Annual Chance (cfs) | 1% Annual Chance (cfs) |
| Q1 | Upstream of confluence with Bear Creek | 4,000 | 6,510 | 8,680 |
| Q2 | At Bear Creek | 4,700 | 8,580 | 13,000 |
| Q3 | At Big Beaver Creek | 5,000 | 9,210 | 14,260 |
| Q4 | At 15 mi Road | 5,100 | 9,360 | 14,820 |
| Q5 | Just upstream of confluence with Plumbrook | 5,400 | 10,060 | 16,040 |
| Q6 | At the mouth | 5,500 | 10,780 | 17,390 |

The Red Run Drain was originally designed to convey a 10- year peak stream discharge. The results of the current hydraulic/hydrology analysis shows the Red Run Drain still meets this design intent. However, the current analysis shows there are four areas in the Red Run, that drain has a potential of overtopping above the lower bank. The items below and Table 3 describes these four areas.

• Area 1: The hydraulic model shows the FEMA surveyed cross section, south side of the 14 Mile Road, has a low left bank and overtopping might occur for 10 year peak stream discharge. The FEMA cross section for this specific area is along the bank at south side of 14 Mile Road which does not accurately reflect overtopping as this really reflects water backing up on the green zone south side of the 14 Mile Road and eventually flowing back to the Drain after rain stopped.

- Area 2: The analysis shows there is a potential of 0.5 ft of overtopping over the right bank, downstream of the Maple Lane Bridge. The potential overtopping occurs in the drain easement (*Attachment B2*), green zone north of the 14 Mile Rd.
- Area 3: The potential overtopping for area 3 is only 0.3 ft which is negligible. There is also no building immediately next to the drain in area 3 that might be impacted by 10 year stream discharge at the Red Run Drain.
- Area 4: The analysis shows approximately 2.4 ft of water might overtop at 10 year peak stream discharge into the parking lot at the south side of the Bagnasco & Calcaterra Funeral Home. The FEMA map shows the parking lot is in the regulatory floodway. The parking lot remains within the drain easement (*Attachment B3*) and the potential overtopping is in the drain easement.

| Areas | | Does bank overtopping happen? | | | Depth of water above top of the | Description | |
|-------|--|----------------------------------|----------|-----------|------------------------------------|---|--|
| | | 2- year | 10- year | 100- year | bank (ft) | | |
| 1 | 14mi Rd Bridge South Side of Golf Course | No | Yes | Yes | 1.5 | Overtopping into the drain easement. | |
| 2 | Maple Lane Dr. | No | Yes | Yes | 0.5 | Overtopping into the drain easement. | |
| 3 | | No | Yes | Yes | 0.3 | Negligible. | |
| 4 | Parking Lot South Side of Funeral Homes | No | Yes | Yes | 2.4 | The parking lot is already in the floodway. | |

Table 3- Five Areas in the Red Run

In overall the Red Run drain is providing conveyance of the design event (or 10- year peak stream discharge).

Some cross-sections show the depression (or low) zone on the floodplains that is lower than banks elevation, and the water will be stored in the depression zones. The map in *Attachment C* shows the location of the depression zones (or low pockets) adjacent to the Red Run Drain. The low pocket areas are with the 500yr FEMA floodplain, and the results of our analysis are consistent with FEMA floodplain boundaries.

Shear Stress and Pilot channel

River stability is a river's ability to transport the stream flows and sediment produced by its watershed in the present climate, in such a manner that the channel maintains its dimension, pattern, and profile without either aggrading or degrading⁶. The initiation of grain movement is related to shear stress or tractive force empirically correlated with the corresponding movement of various grain sizes. The equation below shows the formula for estimating the shear stress. Shear stress estimation involves determining the hydraulic radius (or mean depth) (R) and slope of a stream channel (S).

$\tau = \gamma_w . R. S_w$



Figure 3 shows the laboratory and field data on critical shear stress required movement of grains.

Figure 3- Critical Shear Stress Required to Initiate Movement of Bed Material Grains

In 2010, the U.S. Army Corps of Engineers, Detroit District (USACE) conducted sediment sampling and analysis from eight locations within the Red Run Drain for estimating environmental impacts of disposal activities in the Drain. Sediment samples were taken 3ft below the drain bed. A description, measurement, and identification for each core sample are shown in the table below and *Attachment D*.

| Station ID | FIS Cross-Section | Description, measurement, and identification of the material | Latitude and longitude of station |
|------------|-------------------|--|---|
| RR-10-01 | AP 39,121 | 0-8" gravel, fine to coarse 8"-2.6' sandy, silty clay 2.6' refusal | N 42 31.737 W 083 04.560 |
| RR-10-02 | AH 31,199 | 0-6" rocks and gravel 6"-1.5' sand, coarse 1.5'-3' sandy clay | N 42 31.727 W 083 02.792 |
| RR-10-03 | AG 29,749 | 0-3' sand, coarse | N 42 31.592 W 083 02.584 |
| RR-10-04 | T 21,223 | 0-3' sand, coarse | N 42. 31.979 W 083 00.943 |
| RR-10-05 | N 16,418 | 0-1'sand, fine to coarse 1'-2' sand 2'-3' sandy clay | N 42 32.312 W 083 00.219 |
| RR-10-06 | L 14,796 | 0-1' sand 1-3' sand, coarse | N 42 32.374 W 082 59.989 |
| RR-10-07 | F 7,922 | 0-3' sand, coarse | N 42 33.157 W 82 59.158 |
| RR-10-08 | A 1,316 | 0-3' clay | N 42 34.098 W 82 58.183 |

Table 4- USACE Sediment Samples

For each sampling location, the required depths to move the sediment grain size were estimated and shown in Figure 6. The majority of the sediment grain size within the Red Run Drain is coarse sand. The required shear stress to move the fine to coarse sand and gravel was determined by a revised shields relation using Colorado data and Leopold trendline (Figure 5). With plotting the estimated shear stress in the dimensional shear stress equation ($\tau = \gamma_w.R.S_w$) required hydraulic radius (or mean water depth) can be determined. Figure 6 shows the hydraulic radius required to move sediment grains size in eight different locations that USACE conducted sediment samples. Approximately between 4 and 5 ft of mean water depth is required to move the sand from Red Run cross sections. In the heavier rainfall events, when the water depth goes up to 7 ft, other larger particles including gravel will move. Table 5 shows the sediment grain category and the size.



Sediment Transport- Leopold, Wolman& Miller

Figure 4- Required Hydraulic Radius for the Grains Movement

| Class | | Diameter (in) | | | | |
|--------------------|-----|---------------|--------|--------|-----------|--|
| | | Lower | Upper | Mean | Geometric | |
| Fine Sand | FS | 0.005 | 0.010 | 0.007 | 0.007 | |
| Medium Sand | MS | 0.010 | 0.020 | 0.014 | 0.014 | |
| Coarse Sand | CS | 0.020 | 0.039 | 0.028 | 0.028 | |
| Very Coarse Sand | VCS | 0.039 | 0.079 | 0.056 | 0.056 | |
| Very Fine Gravel | VFG | 0.079 | 0.157 | 0.111 | 0.111 | |
| Fine Gravel | FG | 0.157 | 0.315 | 0.223 | 0.223 | |
| Medium Gravel | MG | 0.315 | 0.630 | 0.445 | 0.445 | |
| Coarse Gravel | CG | 0.630 | 1.260 | 0.890 | 0.890 | |
| Very Coarse Gravel | VCG | 1.260 | 2.520 | 1.783 | 1.783 | |
| Small Cobbles | SC | 2.520 | 5.039 | 3.563 | 3.563 | |
| Large Cobbles | LC | 5.039 | 10.079 | 7.126 | 7.126 | |
| Small Boulders | SB | 10.079 | 20.157 | 14.252 | 14.252 | |
| Medium Boulders | MB | 20.157 | 40.315 | 28.504 | 28.504 | |
| Large Boulders | LB | 40.315 | 80.630 | 57.008 | 57.087 | |

Table 5- Sediment Grain Class⁷

Recommendations and Conclusions

The hydraulic capacity analysis the Red Run drain has enough capacity to deliver 10 year peak stream discharge. The hydraulic analysis color-coded map helps to visualize the reaches hydraulic capacity and can help at decision making to increase the drain capacity.

The majority of the sediment grain size within the Red Run Drain is coarse sand. Approximately between 4 and 5 ft of mean water depth is required to move the coarse sand within the Red Run Drain. As part of this study, a pilot channel was defined to evaluate the sediment transport in the Red Run. The average depth of the pilot channel is between 4 and 5 ft and the width can be defined according to the required frequency of sediment movement in the Red Run Drain. More engineering evaluation is required to estimate the frequency of sediment movement and the pilot channel width. The eight locations that USACE conducted the sediment samples can be used for the pilot channel study.

Reference

¹ Clinton River Watershed Management Plan, 2006.

² Local Flood Protection Project, Red Run Operation and Maintenance Manual, Corps of Engineers, Detroit District. July 1952.

³ Clinton River Sediment Transport Modeling Study. US Army Corps of Engineers-Detroit District, Prepared by W.F Bair& Associates Ltd. 2005.

⁴ Flood Insurance Study, Federal Emergency Management Agency, Macomb County, Michigan, November 2013

⁵ Hydrologic Engineering Center's River Analysis System.

⁶ River Stability, Dave Rosgen, Wildland Hydrology, 2008.

⁷ HEC-RAS River Analysis System. Supplemental to HEC-RAS Version 5.0 User's Manual. Version 5.0.4, April 2018.