



December 29, 2021

Adam Marsh, P.E.

Utility Engineer
City of Missoula
1345 W. Broadway
Missoula, MT 59802

Re: South Hills Stormwater Improvements
Scope of Professional Survey and Engineering Services
WGM #21-08-33

Dear Adam:

WGM Group is pleased to be a pre-qualified engineering firm as part of the City of Missoula's RFQ for utility improvement projects. Per your request, we present you with this scope of professional services for design for a series of stormwater improvement projects that generally lie in the South Hills area of Missoula. We present our proposed scope in the following five (5) phases. Each phase of work contains a description of our understanding, and our proposed tasks for the planning, design, and construction of improvements.

PHASE 1.0 – GRANDVIEW WAY IMPROVEMENTS

The primary purpose of this project phase is to address historic issues caused by groundwater seepage and springs in the Grandview Way area, specifically along Morning Side Ct and Rita Ct. The new storm drain extensions will provide drainage infrastructure to allow connection of offsite private sump pumps to the City's storm drain system. This will help solve issues with pavement damage and winter road icing from sump pump discharges to the public streets.

Based on our conversations with City staff, we understand this work generally includes two separate extensions of storm drain. One extension will begin at the existing storm drain inlet near the intersection of Hillview Way and Morning Side Ct and extend the full length of Morning Side Ct. The other extension will begin at the intersection of Grandview Way and Rita Ct and extend the full length of Rita Ct. The new storm drain extensions will be equipped with stub outs or structures behind the existing sidewalk that will allow existing and future sump pump discharge connections from private properties located along the two street corridors.

In addition to the storm drain extensions, the project will also include a new hydrodynamic separator (HDS) water quality unit, which will be located near the storm drain outfall into the detention pond that is located at the northeast corner of Grandview Way, adjacent to the Grandview Place Apartments.

It is assumed that no special geotechnical investigation or designs are required for the project and no geotechnical report is required. All excavations will be backfilled with native material and surface improvements will be restored to match existing conditions.

We propose the following scope of work for **Phase 1.0**:

1.1 Site Mapping

This task includes collecting detailed survey mapping, confirming right-of-way and property boundaries in the project area, and preparing a base map of existing conditions for use in preparing designs and construction documents. The following items are included:

- Establish horizontal and vertical survey control in the project area: Montana State Plane Coordinate System (FIPS2500) - NAD83(2011)(Epoch:2010.0000) and NAVD88.
- Collect new field mapping within both street corridors. Mapping will include existing utilities and public improvements within the City right-of-way. Mapping of topography and private improvements will extend 10-feet beyond the right-of-way. Two and a half (2.5) days of field mapping anticipated.
- Tie property monuments discovered in the field for adjacent properties. Develop right-of-way and property boundary linework for the project area based upon surveys of record and monument field ties.
- Coordinate a utility locate prior to field survey collection.
- Obtain sewer and water service ditch cards from Missoula Water and verify them with the field survey data.
- Prepare a base map in AutoCAD for use in design.
- Provide QA/QC by a licensed professional surveyor and engineer.

Deliverable(s): Base map of existing conditions

1.2 Design Development

This task includes the design development and production of construction-ready plans for the proposed improvements. All system components will be designed in accordance with the City of Missoula Public Works Standards and Specifications Manual (2021) and the Montana Public Works Standard Specifications. The following items are included:

- Engineer site visit with City staff to review project areas, visually identify constraints, determine any connection points desired by City, and develop project scope.
- Search and review record drawings for the existing storm drain and detention pond to assist in design development.
- Stormwater Analysis – WGM will perform a simplified stormwater analysis of the contributory drainage area for purposes of sizing the HDS unit and checking hydraulics. The drainage area is roughly 30-acres in size and extends primarily south and west from the proposed HDS location. To minimize effort, WGM will size the HDS unit based upon the Runoff Treatment Flow (RTF) rate method found in the *Montana Post-Construction Storm Water BMP Design Guidance Manual* (2017), and a simplified pipe system model for the HDS location.
 - Autodesk Storm and Sanitary Analysis (SSA) software will be used to perform a static hydraulic model of the pipe system near the HDS to check hydraulic performance. Modeling does not include development or analysis of runoff hydrographs.
- Evaluate alternatives for the alignment of the storm drain extensions and the HDS unit location/layout. Determine service connection points for the new storm drain extensions.

- Select HDS unit specifications based upon design constraints and manufacturer flow ratings. Unit shall be rated to remove 80% TSS from the water quality flow. Integrate into storm drain extension layout.
- Develop recommended pipe sizes based upon the number of estimated service connections, projected sump pump discharge rates, and an appropriate factor of safety. Hydraulic modeling not included.
- Develop preliminary layout (30%) plans depicting the HDS and storm drain extensions layout/alignment. Specify connections points, tie-ins, and pipes sizes.
- Meet and review preliminary layout with City staff. Integrate feedback prior to proceeding to final design.
- Document final methodology and design basis for storm drain extension and HDS unit in a technical memo submitted to the City. Full storm drainage report not anticipated to be necessary.
- Develop erosion control plan per City standards. Project anticipated to be under 1-acre and DEQ SWPPP submittal not required. It is assumed that the final contractor selected from bidding will prepare and submit the final City erosion control permitting.
- Prepare City Stage 3 level (90%) plans and technical specifications for City review and comment. Include City Stage 3 checklist, applicable checklist items, and preliminary engineer opinion of probable cost.
- Prepare Stage 4 released for construction plans and specifications signed and sealed by a Montana Licensed Professional Engineer. Address City Stage 3 comments. Include City Stage 4 checklist, applicable checklist items, and updated engineer opinion of probable cost.
 - Develop a contract manual for bidding, including: final technical specifications and special provisions and “front end” documents (bid requirements, contract forms, contract conditions, bonding, and bid form).
 - One (1) bid alternate for the HDS unit is included.
- Prior to City submittals, conduct internal reviews of the plans/specifications.
- Neighborhood Outreach – Public outreach will be performed to help determine where sump pump service connections are needed. Included are two mailings to the adjacent landowners. WGM will serve as primary contact during the outreach period (anticipated to be 30 calendar days) and respond to public comments and questions. Two (2) site visits to meet with individual landowners are included.

Deliverable(s): Technical design memo, Stage 3 submittal package, Stage 4 submittal package, two (2) neighborhood mailings, two (2) public meetings, public meeting figures, final SSA modeling files

1.3 Contract Documents & Bidding

This task includes preparing contract documents for project construction and advertising the project for bid. The following items are included:

- Prepare final contract documents (plans and contract manual) for bidding.
- Prepare request for bids and solicit to contractors through the QuestCDN system.

- Answer contractor bid questions.
- Conduct a pre-bid meeting.
- Complete any necessary contract addendums.
- Open bids, provide a certified bid tab, and prepare an award recommendation.
- Provide QA/QC by a licensed professional engineer.

Deliverable(s): Contract documents, bid tabulation, and award recommendation

1.4 Construction Administration

This task includes administration of the project during construction in accordance with the contract documents and City of Missoula policies. Construction administration is included for the entire project. If the construction limits are reduced by the City for budgetary reasons, the construction observation time may be reduced as determined by WGM and the City. The following items are included:

- Provide construction staking as identified in the contract documents. Twelve (12) hours of survey crew time included. Prepare associated staking plans and cut sheets.
- Conduct part-time construction observation. Construction assumed to be 45 working days. WGM assumes that an average of 2.5 hours per day will be dedicated to construction observation for this project. A total of 113 field hours has been budgeted. Inspection reports will be prepared for each site visit and submitted to the City on a weekly basis.
- Review and approve submittals required by contract documents.
- Coordinate, conduct, and review construction materials testing, including proctors, compaction, and gradation testing of both bedding and backfill. Assumes no concrete or asphalt testing. (\$5,000 budget)
- Review and process contractor pay requests.
- Prepare contract change orders (if necessary).
- Attend/review post-construction storm drain inspection and testing performed by contractor. Includes lamping and CCTV inspection. Two (2) site visits.
- Prepare/submit City Stage 5 submittal with test results and draft as-built plans.
- Conduct preliminary post-construction walk through with contractor and City of Missoula staff.
- Prepare and distribute a construction punch list and observe completion of identified items. Conduct independent final inspection.
- Prepare/submit City Stage 6 submittal with final project record drawings and test results.
- Conduct final post-construction walk through with contractor and City of Missoula staff to review completion of all final punch list items.
- Provide QA/QC by a licensed professional engineer.

Deliverable(s): Submittal approvals, pay application approvals, Stage 5 submittal package, Stage 6 submittal package, record drawings, punch list, and daily construction reports.

PHASE 2.0 – GHARRETT STREET IMPROVEMENTS

The primary purpose of this project phase is to address several different drainage issues along the Gharrett St corridor. To help facilitate mutual understanding of the scope of work, we have included a conceptual drainage improvements exhibit in **Attachment A**. Based on our site visit on November 16, 2021, conversations with City staff, and the concepts in **Attachment A**, we understand this work generally includes to following:

FULL DESIGN WORK (100%) – This work requires full final design and construction documents under the scope of this project. This work will be taken through the full City Stage Review process, and final contract documents will be developed.

- **Gharrett St (55th St to Rufus Rd)** – Modify the street drainage system to remove ponding locations and eliminate flows offsite during normal operation. Provide ADA crossings (4 included), curb/gutter extensions, sidewalk extensions, and street reconstruction where indicated on **Attachment A**.
- **Bonnie Ct, Anthony Ln, Highwood Dr, and Valley View Dr Intersections** – New cove gutter on west side of intersection only.
- **Southhills Dr Intersection** – New cove gutter on both west and east side of intersection.
- **Storm Drain Extension** – Approximately 590 LF of storm drain trunk main extension from Cardinal Dr to Arcadia Dr with new inlets at intersections.
- **Water Quality Unit** – Integrate a new hydrodynamic separator into the new storm drain extension to serve the Gharrett St drainage.

CONCEPT DESIGN WORK (30%) – This portion of work requires only conceptual designs for the purposes of coordinating currently proposed improvements with future improvements (avoiding conflicts), and to help inform the City’s future regional sidewalk planning efforts. This work will be taken through 30% concept design with an opportunity for City review, comment, and response.

- **Gharrett St (Rufus Rd to Cardinal Dr)** – For this segment of Gharrett St (including bounding intersections, WGM will develop a typical cross section and conceptual plan view layout for street improvements that includes the addition of sidewalks along both sides of Gharrett St. The cross section is also anticipated to include bike lanes. Work includes developing two cross sections for the following segments:
 - Rufus Rd to Arcadia Rd
 - Arcadia Dr to Cardinal Dr

It is assumed that no special geotechnical investigation, designs, or report are required for the project. All excavations where new improvements are not planned will be backfilled with native material, pavement sections will be restored to existing, and restoration will match existing conditions.

We propose the following scope of work for **Phase 2.0**:

2.1 Site Mapping

This task includes collecting detailed survey mapping, confirming right-of-way and property boundaries in the project area, and preparing a base map of existing conditions for use in design plans and construction documents. The following items are included:

- Establish horizontal and vertical survey control in the project area: Montana State Plane Coordinate System (FIPS2500) - NAD83(2011)(Epoch:2010.0000) and NAVD88.
- Collect new field mapping for Gharrett St improvement corridors. Mapping will include existing utilities and public improvements within the City right-of-way. Mapping will also include accessible topography and private improvements within 10-feet of the R/W boundary, such as landscaping and fencing. Three (3) days of field mapping included.
- Develop right-of-way and property boundary linework for the project area based upon surveys of record and monument field ties. Right-of-way research will also be performed for the conceptual (30%) design segment to help inform the typical street section designs, however no field ties will be performed.
- Coordinate a utility locate prior to field survey collection.
- For storm drain extension, obtain sewer and water connection data from Missoula Water and verify them with the field survey data.
- Prepare a base map in AutoCAD for use in design.
- Provide QA/QC by a licensed professional surveyor and engineer.

Deliverable(s): Base map of existing conditions

2.2 Design Development

This task includes the design of the proposed drainage improvements. All system components will be designed in accordance with the City of Missoula Public Works Standards and Specifications Manual (2021) and the Montana Public Works Standard Specifications.

The following general items are included:

- Engineer site visit with City staff to review project areas, visually identify constraints, and determine scope of project.
- For the storm drain extension, search and review record drawings. Determine whether record information affects planned improvements.
- Stormwater Modeling – WGM will develop a stormwater model of the contributing drainage area for the new storm drain extension. The primary goals of the modeling will be to:
 - Size pipes and layout inlets.
 - Development of a water quality design flow rate based on the 0.5" rainfall event for sizing the HDS unit.
 - Check hydraulic performance of the storm drain extension during the design (SCS 24-hour) 2-year, 10-year, and 100-year events to ensure safe performance.

- Include a simplified representation of the function of the upstream drainage system to ensure reasonable prediction of the design flows. WGM anticipates utilizing InfoSWMM software to perform hydrologic and hydraulic modeling, and the SWMM method to simulate runoff events.
 - Approximate the additional runoff volume introduced to the storm drain system by the proposed improvements compared to existing conditions.
- Evaluate street and drainage improvement alternatives that meet project goals, strive to minimize conflicts with existing utilities, minimize disturbance to existing right-of-way improvements, and satisfies DEQ required setbacks.
- Select HDS unit specifications based upon design constraints and manufacturer flow ratings. Unit shall be rated to remove 80% TSS from the water quality flow. Integrate into storm drain extension layout.
- 30% Package: Concept Design (Only) Items – The segment of Gharrett St that is to receive only conceptual design will include the following efforts:
 - Field measurements of sidewalk, curb, and lane widths.
 - Cross section development of up to two (2) typical cross sections.
 - Plan view layouts of typical cross sections, while retaining existing sidewalk areas where feasible.
 - Identification of major surface utility conflicts.
 - Identification of major retaining wall locations.
 - Engineer opinion of probable cost.
- 30% Package: Full Design Items – Develop preliminary layout (30%) depicting a plan view of the proposed street layout, street drainage improvements, storm drain extension, and water quality unit layout with approximate tie in points. Coordinate storm drain layout with future Gharrett Street conceptual designs (described in previous bullet) to the extent practicable.
- Meet and review preliminary layout with City staff. Integrate feedback prior to proceeding to final design.
- Perform final hydrologic and hydraulic designs for the storm drain extension, determine final pipe sizes, street inlet sizes/locations, HDS layout, and develop a stormwater design report for the Stage 3 plans.
- Develop erosion control plan per City standards. Project anticipated to be under 1-acre of disturbance. It is assumed that the final contractor selected from bidding will prepare and submit the final erosion control permitting to the City.
- Prepare City Stage 3 (approx. 90% level) submittal package, including plans and technical specifications for City review and comment. Include City Stage 3 checklist and applicable checklist items.
- Prepare Stage 4 released for construction plans and specifications signed and sealed by a Montana Licensed Professional Engineer. Address City Stage 3 comments. Include City Stage 4 checklist, applicable checklist items, and an updated engineer opinion of probable cost.

- Develop a contract manual for bidding, including: final technical specifications and special provisions and “front end” documents (bid requirements, contract forms, contract conditions, bonding, and bid form).
- One (1) bid alternate for the HDS unit is included.
- Prior to City submittals, conduct internal reviews of the plans/specifications.
- Special Meetings – WGM plans to attend one (1) in-person or virtual meeting with the Lighthouse Baptist Church and City personnel to discuss design considerations for the street improvements that may affect the church. The meeting is anticipated to take place prior to the completion of preliminary designs; therefore, four (4) hours of drafting time has been included to develop a conceptual improvements exhibit for the meeting.

Deliverable(s): Preliminary (30%) plans, Stage 3 submittal package, Stage 4 submittal package, stormwater design report, final InfoSWMM modeling files

Assumptions: The stormwater modeling analysis does not include development of a future conditions model with assumed future land use conditions. Wet utility conflicts will be avoided without special design. Ancillary curb and gutter impacts for the storm drain extension between Cardinal Dr and Arcadia Dr will be replaced in-kind and will not require design or staking.

2.3 Contract Documents & Bidding

This task includes preparing contract documents for project construction and publicly advertising the project for bid. The following items are included:

- Prepare final contract documents (plans and contract manual) for bidding.
- Prepare request for bids and solicit to contractors through the QuestCDN system.
- Answer contractor bid questions.
- Conduct a pre-bid meeting and optional onsite walk through with bidders.
- Complete any necessary contract addendums.
- Open bids, provide a certified bid tab, and prepare an award recommendation.
- Provide QA/QC by a licensed professional engineer.

Deliverable(s): Contract documents, bid tabulation, and award recommendation.

Assumptions: Scope does not include development of bid alternates not listed herein.

2.4 Construction Administration

This task includes administration of the project during construction in accordance with the contract documents and City of Missoula policies. Construction administration is included for the entire project. If the construction limits are reduced by the City for budgetary reasons, the construction observation time may be reduced as determined by WGM and the City. The following items are included:

- Provide construction staking as identified in the contract documents. Twenty (20) hours of survey crew time included. Prepare associated staking plans and cut sheets.

- Conduct part-time construction observation. Construction assumed to be 60 working days. WGM assumes that an average of 2.5 hours per day will be dedicated to construction observation for this project. A total of 150 field hours has been budgeted. Inspection reports will be prepared for each site visit and submitted to the City on a weekly basis.
- Review and approve submittals required by contract documents.
- Coordinate, conduct, and review construction materials testing, including proctors, compaction, gradation testing, and concrete testing. Assumes a Marshall test will be required for asphalt. (\$7,000 budget)
- Review and process contractor pay requests.
- Prepare contract change orders (if necessary).
- Attend/review post-construction storm drain inspection and testing performed by contractor. Includes lamping and CCTV inspection. Two (2) site visits.
- Prepare/submit City Stage 5 submittal with test results and draft as-built plans.
- Conduct preliminary post-construction walk through with contractor and City of Missoula staff.
- Prepare and distribute a construction punch list and observe completion of identified items. Conduct independent final inspection.
- Prepare/submit City Stage 6 submittal with final project record drawings and test results.
- Conduct final post-construction walk through with contractor and City of Missoula staff to review completion of all final punch list items.
- Provide QA/QC by a licensed professional engineer.

Deliverable(s): Submittal approvals, pay application approvals, Stage 5 submittal package, Stage 6 submittal package, record drawings, punch list, and inspection reports.

PHASE 3.0 – CATTAIL CORNER IMPROVEMENTS

The primary purpose of this project phase is to improve the functionality of the Cattail Corner stormwater treatment wetland and attempt to offset increased flows to the storm drain system due to the Gharrett Street project (**Phase 2**). Primary goals for Cattail Corner include: 1) increase water quality treatment capability by enhancing natural biological, chemical, and physical processes, 2) increase habitat complexity and values, and 3) improve the utilization of the facility through the reorganization of its internal layout.

This phase of work phase also includes the design of two (2) HDS unit retrofits – one located at the north end of Hillview Way and the other located near the intersection of Garland Dr and S Reserve St. Based on our site visit on December 3, 2021, and conversations with City staff, we understand this project phase generally includes to following:

Cattail Corner

- Increase Utilization – Revise the facility’s inlet structure to safely increase inflows and utilization of the facility without overburdening the system or decreasing functionality.

- South/North Cell Connection – Revise the structure(s) that connects south (wetland) cell and north (dry infiltration) cell to: provide better overflow control for increased utilization (discussed above), provide additional flow control and operational safety during high flows, and encourage additional infiltration of runoff.
- Pretreatment Forebay – Integrate a new pretreatment forebay to the wetland facility that traps sediment and floatable trash.
- Maintenance Access – Provide better equipment access to the inlet area from SW Higgins St for maintenance. If feasible, include other reasonable measures for better maintenance access to the embankment area, outfall area, and internal flow path.
- Habitat/Treatment Complexity – Revise the internal layout and topography of the wetland to provide a wider variety of water depths to encourage diversity of plants, habitat, ecology, and natural treatment processes. Improve the sinuosity of the horizontal flow path and provide a low-flow channel within the wetland cell to encourage higher treatment levels and additional suspended solids settling.
- Runoff Mitigation – Provide increased infiltration of overflow runoff by adding dry well sumps to try to offset/mitigate additional flows being introduced to the storm drain system from the proposed Gharrett Street Improvements (Phase 2).
- Native Revegetation – Manage the existing invasive species within the facility through partial physical removal and diversifying habitat. Improve the complexity of the wetland ecology, and provide revegetation/restoration of the facility using a variety of native plants and planting prescriptions.

HDS Unit Retrofits

- Hillview Way – Design the retrofit of an HDS unit on the 30-inch storm drain trunk line at the north end of Hillview Way. Final location to be decided, however potential locations include the widened R/W near the intersection of Walden Pl, and just inside the City-owned property for MFD Fire Station No. 3.
- Garland St – Design the retrofit of an HDS unit on the 36-inch storm drain trunk line that runs in Garland St. Potential locations include the Garland St R/W or a location just inside the City-owned property for Pheasant Run Park.

3.1 Site Mapping

This task includes collecting detailed survey mapping, confirming right-of-way and property boundaries in the project area, and preparing a base map of existing conditions for use in design plans and construction documents. The following items are included:

- Establish horizontal and vertical survey control in the project area: Montana State Plane Coordinate System (FIPS2500) - NAD83(2011)(Epoch:2010.0000) and NAVD88.
- Cattail Corner – Collect new field mapping for the pond facility and immediate area. Mapping will include existing utilities and improvements within the City-owned property. Mapping will also include accessible topography and private improvements within 25-feet of the property boundary, such as landscaping, fencing, structures, utilities, etc. Two and a half (2.5) days of field mapping included.

- HDS Retrofits – One and a half (1.5) days of field mapping are included for the two areas designated for the HDS retrofits. Survey assumes that HDS locations are narrowed down to a 300-foot strip of R/W.
- Develop right-of-way and property boundary linework for the project areas based upon surveys of record and monument field ties.
- Coordinate a utility locate prior to field survey collection.
- Obtain sewer and water connection data from Missoula Water and verify them with the field survey data.
- Prepare a base map in AutoCAD for use in design.
- Provide QA/QC by a licensed professional surveyor and engineer.

Deliverable(s): Base map of existing conditions

3.2 Geotechnical Investigation

WGM will team with Lorenzen Soil Mechanics (Lorenzen) to perform geotechnical investigation of the soils for the Cattail Corner stormwater facility. Lorenzen will provide the following services:

- Exploratory borings throughout the accessible portions of the facility to determine the structure of the subsoils. Two borings will be performed in the embankment that separates the north and south cells. Up to 10 total borings are included in the scope.
- Soil Classification & Profiles – Lorenzen will provide soil classification and soil profiles from borings.
- Soil Chemistry – Provide soil chemistry testing of the soils within the facility to help determine the appropriate native plant species for revegetation and any potential soil amendments.
- Sump Infiltration Testing – WGM staff will assist Lorenzen to provide sump infiltration testing of two of the existing sumps in the north cell to determine their existing infiltration rates. These rates will assist in hydraulic modeling of the facility and selecting additional infiltration improvements. The cost of contracting two water trucks to provide sufficient water for testing is included.
- Geotechnical Report – Lorenzen will develop a geotechnical report that includes the following recommendations: 1) patching disturbed embankments, 2) pond liner, 3) feasibility of adding sumps and increasing runoff infiltration, 4) structure bedding recommendations.

It is assumed that all excavations where new improvements are planned that are outside the facility will be backfilled with native material, pavement sections will be restored to existing, and restoration will match existing conditions, all without special geotechnical design.

Deliverable(s): Geotechnical report

3.3 Abbreviated Wetland Functions and Values Assessment

WGM's wetland scientist will delineate wetlands on the site according to the methods described in the *Corps of Engineers Wetland Delineation Manual* (1987). The *MDT Wetland Assessment Method* (2008) will be followed to perform a functions and values assessment to provide a

baseline for the wetland's functionality. The assessment can be used to help direct new improvements, preserve sensitive or high-quality aspects, and determine the success rate of new improvements. The assessment will include the following:

- Determine the wetland boundary.
- Determine primary plant species in the wetland.
- Identify any plants or sensitive areas that should be preserved during improvements.
- Evaluate the ecosystem values and determine habitat functions.
- Make general recommendations for improvements to increase wetland functions and values.
- Wetland functions and values assessment report.

Deliverable(s): Wetland functions and values report

3.4 Design Development

This task includes the design development and production of construction-ready plans for the proposed improvements. All system components will be designed in accordance with the City of Missoula Public Works Standards and Specifications Manual (2021) and the Montana Public Works Standard Specifications.

The following general items are included:

- Engineer site visit with City staff to review project areas, visually identify constraints, and determine scope of project.
- Search and review record drawings and design reports for the Cattail Corner facility to understand the original design intent. Examine record drawings for HDS locations. Determine whether record information affects planned improvements.
- Stormwater Modeling (Cattail Corner) – WGM will develop a stormwater model of the contributing drainage area for the Cattail Corner wetland. The primary goals of the modeling will be to: 1) quantify the inflows for various design events, 2) assist in the design of new improvements, 3) determine hydraulic performance for existing and proposed conditions, and 4) determine if the proposed design offsets the additional runoff volume introduced to the storm drain system by the Gharrett Street Improvements (**Phase 2**). The drainage area is roughly 950-acres in size and extends southeast from Cattail Corner, servicing residential storm drainage systems along High Park Way, Whittaker Dr, Highlands Golf Course, Stone Mountain, and undeveloped areas on the side of Mount Dean Stone. The modeling effort will include the following:
 - Develop existing and proposed conditions model for the stormwater facility with simplified representation of the function of the upstream drainage system, sumps, and detention facilities.
 - Development of a water quality design flow rate based on the 0.5" rainfall event for sizing the HDS unit.
 - Analysis of the hydraulic performance of the existing pond layout and the proposed pond layout with new improvements. The model will help inform design of the forebay, flow channels, overflow structures, and sumps.

- WGM anticipates utilizing InfoSWMM software to perform hydrologic and hydraulic modeling, and the SWMM method to simulate runoff events. Runoff hydrographs will be developed using existing land cover conditions and the following SCS 24-hour rainfall events: 0.5" water quality, 2-year, 10-year, and 100-year.
- Stormwater Modeling (HDS Retrofits) – WGM will develop simplified stormwater models for the contributing drainage areas of the HDS units. The primary goal of the modeling will be to:
 - Develop a water quality design flow rate based upon the 0.5" rainfall event and existing land use conditions.
 - Check hydraulic performance during the design (SCS 24-hour) 2-year, 10-year, and 100-year events to ensure safe performance.
 - Include a simplified representation of the function of the upstream drainage system to ensure reasonable prediction of the design flows. WGM anticipates utilizing InfoSWMM software to perform hydrologic and hydraulic modeling, and the SWMM method to simulate runoff events.
- Evaluate the findings from the geotechnical investigation (3.2) and abbreviated wetland functions and values assessment (3.3). Integrate into the recommended improvements.
- Evaluate improvement alternatives that meet project goals, minimize conflicts with existing utilities, and minimize disturbance to existing improvements. Since there is a wide range of alternatives, WGM will work closely with the City's representatives before arriving at final recommendations.
- Select HDS units' specifications based upon design constraints and manufacturer flow ratings. Unit shall be rated to remove 80% TSS from the water quality flow. Integrate into storm drain extension layout.
- Develop preliminary layout (30%) depicting a plan view of the proposed stormwater facility and HDS retrofit improvements.
- Meet and review preliminary layout with City staff. Integrate feedback prior to proceeding to final design.
- Perform final hydrologic and hydraulic modeling of the proposed improvements, determine final inlet design, pipe/structure sizes, water quality treatment flow, infiltrated volumes, HDS hydraulic performance, and develop a stormwater design report for submittal with the Stage 3 plans.
- Develop erosion control plan per City standards. Project anticipated to exceed 1-acre of disturbance, therefore a DEQ SWPPP will be required. It is assumed that the final contractor selected from bidding will prepare and submit the final City erosion control permitting and DEQ SWPPP.
- Prepare City Stage 3 plans and specifications (90%), including:
 - Cattail Corner
 - Site grading and embankment plans.
 - Inlet/outlet and overflow structure plans and details.
 - Forebay and maintenance access details.

- Revegetation and landscaping plans, including eradication of invasive species, native wetland plantings, and site landscaping both internal and external to the facility. Assumes no irrigation plans are needed.
- Dewatering provisions (if necessary)
- Erosion control plans.

HDS Units

- Layout plans, details, and connection points
 - Erosion control plans
 - Dewatering provisions (if necessary)
- Prepare City Stage 3 (approx. 90% level) submittal package, including plans and technical specifications for City review and comment. Include City Stage 3 checklist and applicable checklist items.
 - Prepare Stage 4 released for construction plans and specifications signed and sealed by a Montana Licensed Professional Engineer. Address City Stage 3 comments. Include City Stage 4 checklist, applicable checklist items, and an engineer opinion of probable cost.
 - Develop a contract manual for bidding, including: final technical specifications and special provisions and “front end” documents (bid requirements, contract forms, contract conditions, bonding, and bid form).
 - One (1) bid alternate for the HDS units is included.
 - Prior to City submittals, conduct internal reviews of the plans/specifications.
 - Public Outreach Exhibit – Due to Cattail Corner’s high visibility, the improvement efforts may require public outreach to help explain the goals and objectives of the project. WGM has included the creation of an illustrative exhibit for the facility specifically oriented to help the public understand the improvement concepts and final look of the facility. The exhibit may be used on the City’s website for the project.

Deliverable(s): Preliminary (30%) plans, Stage 3 submittal package, Stage 4 submittal package, stormwater design report, final stormwater modeling files

Assumptions: The stormwater modeling analysis does not include development of a future conditions model with assumed future land use conditions. Wet utility conflicts will be avoided without special design.

3.5 Floodplain Permitting

Cattail Corner is currently designated as a regulatory Zone AE floodplain on FEMA FIRM maps. This will necessitate obtaining a floodplain permit prior to construction of improvements. WGM proposes the following services related to this task:

- Joint Permit Application – Execute the Montana Joint Permit Application (JPA) to initiate the permitting process with the City of Missoula Floodplain Administrator. Graphics and exhibits will be developed to support the application.
- Floodplain Memo – WGM will develop a floodplain permitting memo to accompany the JPA. This memo will address the following typical requirements of the floodplain permit:

- No-Rise – Develop a conceptual no-rise argument to help prove that the proposed work will not impact the designated base flood elevation (BFE) for Cattail Corner. The argument will be based upon “no net fill”, which implies that the amount of material excavated from the facility will be greater than the fill placed into the facility, thereby creating more storage volume for flooding and reducing the BFE. InfoSWMM modeling may also be used as supporting information.
- 100-Year Design – New and revised inlet/outlet structures will be designed to for the 100-year flood event.
- Site Visit – If requested by the City floodplain administrator and DNRC engineering staff, WGM will perform a permitting site visit to review and discuss the floodplain permit application.

Deliverable(s): Floodplain permit application

Assumptions: City floodplain permit fees are not included.

3.6 Contract Documents & Bidding

This task includes preparing contract documents for project construction and publicly advertising the project for bid. The following items are included:

- Prepare final contract documents (plans and contract manual) for bidding.
- Prepare request for bids and solicit to contractors through the QuestCDN system.
- Answer contractor bid questions.
- Conduct a pre-bid meeting and optional onsite walk through with bidders.
- Complete any necessary contract addendums.
- Open bids, provide a certified bid tab, and prepare an award recommendation.
- Provide QA/QC by a licensed professional engineer.

Deliverable(s): Contract documents, bid tabulation, and award recommendation.

Assumptions: Scope does not include development of bid alternates not listed herein.

3.7 Construction Administration

This task includes administration of the project during construction in accordance with the contract documents and City of Missoula policies. Construction administration is included for the entire project. If the construction limits are reduced by the City for budgetary reasons, the construction observation time may be reduced as determined by WGM and the City. The following items are included:

- Provide construction staking as identified in the contract documents. Twenty (20) hours of survey crew time included. Prepare associated staking plans and cut sheets.
- Conduct part-time construction observation. Construction assumed to be 50 working days. WGM assumes that an average of 2.5 hours per day will be dedicated to construction observation for this project. A total of 125 field hours has been budgeted.

Inspection reports will be prepared for each site visit and submitted to the City on a weekly basis.

- Review and approve submittals required by contract documents.
- Coordinate, conduct, and review construction materials testing, including proctors, compaction, gradation testing, and concrete testing. Assumes no testing will be required for asphalt. (\$4,000 budget)
- Review and process contractor pay requests.
- Prepare contract change orders (if necessary).
- Attend/review post-construction storm drain inspection and testing performed by contractor. Includes lamping and CCTV inspection. Two (2) site visits.
- Prepare/submit City Stage 5 submittal with test results and draft as-built plans.
- Conduct preliminary post-construction walk through with contractor and City of Missoula staff.
- Prepare and distribute a construction punch list and observe completion of identified items. Conduct independent final inspection.
- Prepare/submit City Stage 6 submittal with final project record drawings and test results.
- Conduct final post-construction walk through with contractor and City of Missoula staff to review completion of all final punch list items.
- Provide QA/QC by a licensed professional engineer.

Deliverable(s): Submittal approvals, pay application approvals, Stage 5 submittal package, Stage 6 submittal package, record drawings, punch list, and inspection reports.

PHASE 5 – PROJECT MANAGEMENT

WGM's project manager will keep in regular communication with the City's primary contact during all phases of the project design development and construction. He will ensure efficient allocation of WGM's resources and provide budget tracking in accordance with the approved scope. Included in this phase is the following work:

- Client communications, status updates, and scheduling.
- Budget tracking and WGM resource allocation.
- Preparation of the ARPA environmental checklist. Assumes creation of original exhibits, agency notification, and special site visits not required. Also assumes no comment response coordination is necessary with DNRC.
- Assist with executing the Uniform Fund and Budget Tracking Form on a monthly basis for ARPA budget tracking (5 hours/month, 10 months).

PHASE 6 – MISCELLANEOUS ENGINEERING WORK

This task is intended to address miscellaneous engineering work that may be requested by the City and is outside this scope of work. The budget for this phase (approximately 5% of the engineering services budget) will only be used with prior authorization and direction by the City for specific work items.

ADDITIONAL SERVICES

Services not specifically described in the tasks above are not included in this scope of work but may be provided through a written scope and budget amendment.

FEE ESTIMATE

Our fee for this project will be billed on a time and materials basis and will not exceed the total below without a supplemental agreement. Fees are valid through December 2022 and may need to be adjusted if the project extends beyond this date.

Professional Services Fee Summary	
Phase 1: Grandview Way Improvements	\$80,217
Phase 2: Gharrett Street Improvements	\$131,987
Phase 3: Cattail Corner Improvements	\$142,297
Phase 4: Project Management	\$19,920
Phase 5: Miscellaneous Engineering Work (10%)	\$18,721
Total	\$393,142

SCHEDULE

WGM Group is prepared to begin work immediately upon authorization from the City of Missoula. We understand that the City's order of priority for design is **Phase 1.0**, then **Phase 2.0**, and finally **Phase 3.0**. Further, we understand that the design of the HDS retrofits subcomponent is the lowest priority. Currently, we believe the following project schedule is feasible:

		Project Timeline											
Key Task	2021	2022											
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Survey (all Phases)			■	■									
Design & CD's													
Phase 1.0			■	■	■	■							
Phase 2.0				■	■	■	■	■					
Phase 3.0					■	■	■	■	■				
Bidding & Award													
Phase 1.0						■	■						
Phase 2.0								■	■				
Phase 3.0										■	■		
Construction													
Phase 1.0							■	■	■	■			
Phase 2.0									■	■	■	■	
*Phase 3.0												■	■

*Depending on the late summer bid environment, Phase 3.0 may be constructed in 2023.

Thank you for the opportunity to provide these services. We look forward to working with you on this project. Please feel free to contact me with questions at (406) 552-8165.

Sincerely,
 WGM Group, Inc.

Eric Anderson, PE, CFM
 SENIOR PROJECT ENGINEER

ATTACHMENT A

FULL 100% DESIGN ITEMS



Tie into existing storm system. Install hyd. separator BMP. Replace inlets/structures as needed for tie in.

Extend storm drain two blocks, approximately 590 LF. Provide provisions to extend storm drain farther southward in future.

Abandon 2 sumps. and install new inlets in same locations.

Abandon 3 sumps and install new inlets in same locations.

New cove gutters, both east & west sides

Abandon failing sump on SE corner

New cove gutter. West side only.

Sump operational. No improvements needed on east side.

New cove gutter. West side only.

Highwood Music Studio

New cove gutter. West side only.

NE Corner to Rufus - Likely curb/gutter/sidewalk replacement due to street regrade

New cove gutter. West side only.

Extend sidewalk across Rufus Rd.

Provide **ADA crossing** of Meadowlark Ct and single **ADA crossing** of Gharrett St

Extend curb/gutter across entire church property. Provide sidewalk connection. Perpetuate two approaches for church.

Lighthouse Baptist Church

New cove gutter across Meadowlark Ct

Regrade full street to remove low point.

Eliminate failed sump

Replace asphalt curb w/ new concrete curb/gutter

New cove gutter across 55th St

NE Corner - Improve drainage & provide **ADA crossing** of Gharrett

Regrade east half of street to facilitate new cove gutter and ADA crossing

SE Corner - Improve drainage, eliminate ponding, provide **ADA crossing** of 55th