

ADMINISTRATIVE MEETING

March 22, 2023 - 4:00 PM

City - County Building Room 326 / Zoom Online Meeting; https://us06web.zoom.us/j/88993382382

AGENDA

- 1. Call to Work Session, introductions
- 2. Commission comments, questions
- 3. Committee Discussion
 - a. Resolution Recreating the Helena Public Art Committee
- 4. Recommendations from the Helena Citizens Council
- 5. City Manager's Report
- 6. Presentations
 - a. ARPA and General Fund Savings Update
 - b. City of Helena Engineering and Design Standards 2022 Update
 - c. Helena's Recent Sustainability Efforts
- 7. Public Comment
- 8. Adjourn

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Phone: (406) 447- 8490 TTY Relay Service 1-800-253-4091 or 711 Email: citycommunitydevelopment@helenamt.gov Mailing Address & Physical Location: 316 North Park Avenue, Room 445, Helena, MT 59623.

City of Helena, Montana

February 3, 2023	
То:	City Manager Tim Burton & City Commission Members
From:	Dannai Clayborn, Clerk of the Commission Troy Sampson, Community Facilities Superintendent Bridget Johnston, Community Facilities
Subject:	Resolution Recreating the Helena Public Art Committee
Present Situation:	As part of the Commission initiative to modernize and improve support to the City's advisory board system, the Helena Public Art Committee resolution will be recreated and the board reestablished. The revised resolution will include directives given by the City Commission to be instituted throughout the general advisory boards and committees. During the Administrative meeting on February 3, 2021, the Commission gave consensus direction to institute administrative and governing policies which would create consistent support internally from staff to the City's general advisory bodies. In addition, the policies would create more efficient processes of engagement between the advisory groups and the Commission based upon staff availability and resources, including input from department liaisons and the Commission members. It was determined several initiatives should be pursued, including the re-creation of resolutions for the general advisory boards and committees to include the specific policy direction of the Commission. The order of resolutions to be recreated took into consideration any board sunset dates, complexity of the resolutions, staff availability, and other internal factors.
<u>Proposal/Objective</u> :	Helena Public Art Committee (HPAC) was chosen as the next committee to be recreated in resolution due to HPAC's interest in recommending projects which may impact various Department budgets and timelines. Formally adopting the Commission's policies as part of the resolution would assist in the HPAC's efforts to make recommendations to the Commission for annual consideration as part of the overall budget process. Staff is seeking consensus approval from the Commission on the resolution re- creating the Helena Public Art Committee to include the Commission identified policies for consistent administration and governance of the advisory board system.
Notice of Public Hearing:	NA
ATTACHMENTS:	

HPAC Draft Resolution 3.15.23

Res. No. _____

RESOLUTION NO.

A RESOLUTION AMENDING RESOLUTIONS 11316, 19340 AND 20110 REAFFIRMING THE HELENA PUBLIC ART COMMITTEE AS A CITY OF HELENA ADVISORY BOARD

WHEREAS, pursuant to the Helena City Code § 2-6-1, the Helena City Commission may establish various committees to foster and promote the general quality of life within the City;

WHEREAS, the Helena City Commission called for the establishment of a Helena Public Art Committee on November 16, 1998, for the purposes of promoting community awareness of and involvement in providing public art in Helena. The first meeting of the Committee was held on April 6, 1999;

WHEREAS, it was established in Resolution 11316_that "public art contributes directly to the quality of life in Helena by enhancing the image of the community, instilling a concern for beauty and good design, and involving the community by inviting citizens to participate in important decisions about the community;" and

WHEREAS, it appears to be in the best interest of the City of Helena and its citizens that Resolutions No. 11316, which established the Public Arts Committee and resolutions 19340, and

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Res. No.

20110 which amended the Committee membership, be further amended as set forth below.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMISSION OF THE CITY OF HELENA, MONTANA:

//

Section 1. That Resolutions No. 11316, 19340, and 20110 are hereby amended.

Section 2. The Helena Public Art Committee is hereby recreated for the purpose of promoting awareness and involvement in public art in Helena and to identify public art projects that enhance the image of our community and recommend such projects to the City Commission for consideration.

Section 4. The Helena Public Art Committee shall be comprised of 9 members each of whom must be citizens of the City of Helena. 8 of the 9 members will be members at large and 1 of the 9 members shall be a youth member. Membership may be amended and/or defined by a policy to be developed by the City Commission.

Section 5. Terms for City Resident membership shall be as follows:

All members at large as of the date of adoption of this resolution will continue with the assigned terms and status.

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Res. No.

Section 6. All Members at Large shall serve a full term of three years from the date of appointment. Terms will remain staggered.

Section 7. Youth Representatives will be appointed for a term of two years from the date of appointment.

Section 8. Terms will be limited to two full terms. Interim appointments will not be considered full terms. Individuals serving in the interim will be eligible for a first full term upon completion of an interim term.

Section 9. This board will be staffed and assigned as directed by the City Manager.

Section 10. This board will fulfill its obligations to review, analyze, and recommend to the Helena City Commission goals, and objectives for Helena's public art by issuing to the City Commission a report in May of the first year following adoption of this resolution and in October of each year thereafter. The report will create a framework for public art project proposals for consideration by the City Commission and to be vetted by City staff at the direction of the City Manager.

Section 11. This board shall, within three (3) months of the appointment of all members, adopt and follow the approved

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Res. No.

policies for boards set forth by the Clerk of the Commission.

Section 12. This resolution will be reviewed by the City Commission on or before 4/30/2028. Upon review the Commission may choose to amend, rescind or sunset the existing resolution.

PASSED AND EFFECTIVE BY THE COMMISSION OF THE CITY OF HELENA,

MONTANA, THIS ____DAY OF ____, 20__.

MAYOR

ATTEST:

CLERK OF THE COMMISSION

City of Helena, Montana

March 16, 2023	
То:	Tim Burton, City Manager
From:	Amanda Opitz, City Grants Administrator Sheila Danielson, Finance Director
Subject:	ARPA and General Fund Savings Update
<u>Present Situation</u> :	City of Helena received approximately \$8,486,620 in Local Recovery Funds from the US Treasury and claimed this entire distribution as lost public sector revenue claimed for police and fire services, which created \$8,486,620 in general fund savings. The City Commission has already allocated \$6,060,720 of the savings for the following projects and set aside a contingency for \$1,6000,000:
	City Internal Projects
	 Ten Mile Water Treatment Plant project City's Enterprise Resource Planning system Police Department's Computer Aided Dispatch and Record Management System Helena Civic Center HVAC System Replacement of the Mt. Helena Radio Building Law and Justice Center 2nd Floor Remodel Grandstreet Theater roof replacement Replair and paving of a section of Centennial Trail Replacement of a Type VI Wildland Fire apparatus equipment and insurance deductible for truck replacement Feasibility study for a pedestrian bridge on Henderson St.
	Community-based Projects
	 Our Redeemer's Housing Project from Rocky Mountain Development Council Community Food Resource Center Project from Helena Food Share Wildfire Risk Assessment & Education Program from Tri-County Fire Safe Working Group
	The remaining amount for allocation is \$978,900. At the Nov. 30 administrative meeting, the Commission brought forward top projects of interest that were pulled from an external Letter of Intent to Apply process that yielded 43 projects from 41 organizations, with a total ask of \$15,730,482. Seven projects were invited to submit a full application based on the number of votes received by each Commissioner, including the three projects previously mentioned. Applications for the "Community Aid Grant" were open from Dec. 21, 2022 through Jan. 20, 2023. City staff performed an initial review of applications on Jan. 24 and presented those findings at the Feb. 1 Administrative meeting.
	The following Community Aid Grant applications remain without a funding decision:
	 Emergency Shelter Acquisition Project from Family Promise of Greater Helena Warren Nelson Stadium Enhancements from Carroll College Sustainability Study Project from Helena Regional Sports Association Mobile Hygiene & Meal Prep Units from United Way of Lewis & Clark Co.

Proposal/Objective:

- Review standing internal City project requests
- Review remaining external projects for consideration
- Provide staff direction on Commission readiness to proceed with additional

Notice of Public Hearing: N/A

ATTACHMENTS:

Presentation - 3.22.23

ARPA & General Fund Savings



Local Recovery Funds Balance

Total Distribution from U.S. Treasury, claimed as revenue loss and spent on government services in police & fire, creating savings in the general fund	\$8,486,620
Allocated to Ten Mile WTP project	(\$1,800,000)
Allocated to internal Manager-recommended projects: Civic Center HVAC, CAD/RMS, Mt. Helena Radio Building, L&J Ctr. 2 nd Floor Remodel, ERP System	(\$1,823,720)
Allocated for Contingency	(\$1,600,000)
Allocated to internal Commission-recommended projects: Grandstreet roof, Type VI Wildland Truck, Centennial trail repair & paving; Henderson pedestrian bridge feasibility and partial design	(\$464,000)
Rescind \$153,000 of original \$200k request for Type VI Wildland Truck* *Due to insurance settlement	\$153,000
Allocated to Community Aid Grant Projects– Our Redeemer's Housing Project, Community Food Resource Center, Wildfire Risk Assessment and Education	(\$1,973,000)
Dollars Remaining for Commission Distribution Page 10 of 233	\$978,900

Pending Internal Requests – Presented 2/1/23

Balance of Funds	\$978,900
Internal Requests Memorial Park Ice Rink Warming House Study Study for scope of work, cost estimates and schematic design for potential facility upgrades	(\$15,000)
Law & Justice Center and City/County Bldg. Capital 50/50 Split \$469,000 total request (split by City & County) for FY24 Capital infusion	(\$234,500)
Dollars Remaining for Commission Distribution, If These Internal Requests Funded	\$ 729,400

Summary: External Community Aid Grant Pending Projects

Consensus F	Projects - Allocated 3/13/23		
Projects	Organization		Consensus Allocation
Our Redeemers Project	Rocky Mtn Development Council	\$	1,580,000
Wildfire Risk Assessment & Education	Tri County Fire Safe Working Group	\$	143,000
Community Food Resource Center	Food Share	\$	250,000
Fire Truck Pump Equipment and Insurance Deductible	City of Helena	\$	47,000
	Subtotal	\$	2,020,000
		\$	2,998,900
	Subtotal of Consensus Projects	\$	(2,020,000)
	Total	\$	978,900
Remaining Community Projects fro	om Full Community Aid Grant Application	Pro	Cess
Warren Nelson Stadium Enhancement	Carroll College	\$	700,000
Sustainability Study for Rec Center	Helena Regional Sports Authority	\$	64,000
Mobile Hygiene & Meal Prep Units	United Way of Lewis & Clark Co.	\$	400,000
Client Services Building/Emergency Shelter	Family Promise	\$	750,000
	Subtotal	\$	1,914,000

Commission Discussion & Next Steps

Questions:

- Is the Commission prepared to move forward with additional allocations?
- If the Commission is not yet prepared to move forward, what information would be helpful to receive in future meetings?

City of Helena, Montana

March 16, 2023	
То:	City Manager, Tim Burton
From:	Jamie Clark, City Engineer Ryan Leland, Public Works Director David Knoepke, Transportation Systems Director
Subject:	City of Helena Engineering and Design Standards 2022 Update
Present Situation:	Existing City of Helena Engineering and Design Standards have been in place and not updated since June 10, 2013.
<u>Proposal/Objective</u> :	City Public Works Department and Transportation Systems Department have worked over the past 3 years to revise and re-write the current City of Helena Engineering and Design Standards, adopted on June 10, 2013. This process has included numerous public meetings, open comment periods and significant updating and editing. The Engineering Department would like to adopt updated and clarified engineering standards to bring the aging standards up to date and to reflect current public works and transportation engineering and design best practices. Staff presented the updated Engineering Standards to the City Commission at the February 1 st , administrative meeting. There were three items that were brought up by the public during the meeting:
	 First the comment was to allow 3" minimum thickness of asphalt instead of 4" minimum thickness. This comment was received during the public process and staff had changed the standards to allow 3" of asphalt prior to bring the standards to the Commission. The second comment was to allow C901 high density polyethylene pipe for water service lines instead of the type K copper. Staff still prefers type K
	copper pipes for service lines because it is a superior material and allows to quicker and easier tracking for locates. However, staff has revised the standards to allow for C901 poly pipe for service lines.
	• The third comment was to allow for 18-foot travel width for local city street instead of the 20-foot travel width as required by fire code. City Staff have reviewed the comments and still believes the city should require the 20-foot travel width in order to meet the fire code, allow for better emergency vehicle access, and allow for more area for snow plowing.
Notice of Public Hearing:	N/A
ATTACHMENTS:	
2022 Helena Engineering Stand	lards

Engineering Standards 2022 Update Comments Sheet

D Engineering Standards Revision Timeline





ENGINEERING AND DESIGN STANDARDS

2022 UPDATE

City of Helena Public Works Department 316 North Park Avenue, Room 417 Helena, MT 59623 (406) 447-8430

ACRONYMS

- AASHTO American Association of State Highway and Transportation Officials
- ADA Americans with Disabilities Act
- **ADT Average Daily Traffic**
- **API American Petroleum Institute**
- **ASTM American Society for Testing and Materials**
- **AWWA American Water Works Association**
- **BMP Best Management Practice**
- **CMP Corrugated Metal Pipe**
- **CPT Corrugated Polyethylene Tubing**
- **CPE Corrugated Polyethylene Storm Sewer Pipe**
- **CP** Coalescing Plate
- **DEQ Montana Department of Environmental Quality**
- ESAL Equivalent Single Axle Load
- FHWA Federal Highway Administration
- HDPE High Density Polyethylene Pipe
- IFC International Fire Code
- ITE Institute of Transportation Engineers
- **LID Low Impact Development**
- LOS Level of Service
- **MDT Montana Department of Transportation**
- **MPWSS Montana Public Works Standard Specifications**
- MS4 Municipal Separate Storm Sewer Systems
- MSE Mechanically Stabilized Earth
- **MUTCD Manual on Uniform Traffic Control Devices**
- NRCS US Department of Agriculture Natural Resources Conservation Service
- PROWAG Public Rights-Of-Way Accessibility Guidelines
- **PVC Polyvinyl Chloride Pipe**
- **RCP Reinforced Concrete Pipe**
- **ROW- Right-of-Way**
- **SC Spill Control**
- **SDF System Development Fee**
- **SWPPP Storm water Pollution Prevention Plan**

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PART 1 – GENERAL PROVISIONS

PART 1 GENERAL PROVISIONS

1.1 INFRASTRUCTURE ACCEPTANCE POLICY

Interim use of the underground public utilities will be considered only after all required information is presented. The City will accept the new utilities for interim use and maintenance after the completion of the preliminary punch list items that affect the use and adequacy of the utility. A letter of acceptance for interim use will then be issued from the City Engineer and sent to the developer/owner and the Community Development Department for their files. The developer/owner will be responsible for the complete installation of all required infrastructure, even though the interim use of the utilities is allowed before final acceptance. A financial guarantee will be required for the punch list items that have not been accepted by the City prior to filing the final plat, annexation, or issuance of the building permit when the property is already within the City limits.

The purpose of this policy is to define the procedures and parameters by which the City of Helena will accept developer/owner-installed publicly owned and maintained infrastructure.

1.1.1 INTERIM USE

If a developer/owner wishes to begin construction of structures in an approved subdivision or any other property that has required infrastructure improvements, the Public Works Department will require the following items be completed prior to the interim or final use of the new facilities:

- The water, sewer, and storm water utilities will be completely installed, inspected, tested, and accessible to City personnel.
- All temporary and permanent BMP's must be functional and maintained not only at the time of interim acceptance but through final site stabilization.
- A comprehensive walk-through with City Engineering staff, the engineer of record, and the developer.
- The engineer of record will certify that all the utilities have been completed in substantial accordance with the plans and specifications. The engineer's certification will include a preliminary punch list of items that remain to be completed upon the installation of the finished grade or pavement.
- Copies of the required tests are supplied to the engineering division as well as the affected utility. The tests include the log or tape of the TV sewer inspection, bacteriological tests, pressure tests, hydrant flow tests, and other testing as required.
- Electronic and paper as-built drawings certified by a professional engineer of the underground public utilities to be accepted. The electronic file must be AutoCAD compatible and acceptable to the City Engineering Division.
- Immediate repair or replacement of failures due to problems with materials and/or workmanship.
- A schedule for the completion of the balance of the improvements.
- A copy of the daily field inspection log, including construction progress photographs.

- All easements not included in the public rights-of-way for the water and sewer must be recorded prior to interim acceptance.
- All rights-of-way for the part of the subdivision that is proposed for interim acceptance must be dedicated to the City.
- A bill of sale for the interim water and sewer infrastructure must be provided to the City if required by the City Engineer.
- Roads must be completed to finished grade and accessible to emergency vehicles.

City Staff will respond in writing to a request for interim acceptance within 15 working days from the date that the written request and all the required information have been received by the Engineering Division.

1.1.2 FINAL ACCEPTANCE

Final acceptance of the water, sewer, storm water, and street will occur upon completion and acceptance of all required infrastructure installation. Final acceptance will be granted by the City Engineer upon the completion of the following items:

- A comprehensive walk-through with City staff, the engineer of record and the developer, including flow testing the curb and gutter.
- Completion of the final punch-list items.
- Inspection and repair of the previously accepted facilities found to be out of compliance with the interim acceptance conditions. The City reserves the right to require re-inspection and repair of the conditionally accepted infrastructure if damage from final construction is suspected.
- Final certification from the engineer of record that the entire development has been completed in substantial accordance with the approved plans and specifications.
- Submission of final as-built drawings in an electronic AutoCAD format meeting the requirements of the City of Helena Computer Aided (CAD) Standards. As-built drawings must be stamped and signed by a professional engineer.
- Submission of the complete set of daily field inspection logs and photographs.
- A Bill of Sale for all the infrastructure provided to the City.
- Copies of the required tests supplied to the Engineering Division and the affected utility. The tests include the log or tape of the TV storm sewer main inspection, compaction tests, and other testing as required.

City Staff will respond in writing to a request for final acceptance within 15 working days from the date that the written request and all the required information have been received by the Engineering Division.

Final acceptance of a completed utility system component <u>may</u> be granted prior to completion of the infrastructure development as a whole, if the City of Helena is provided with a financial guarantee (in the form of a bond or irrevocable letter of credit) that the remaining infrastructure

components will be completed within a specific time frame and that the completed infrastructure operates independently of the guaranteed portion.

The required one-year warranty period for the final improvements begins on the date of final written acceptance of the installed infrastructure. Any required repairs to the utilities systems approved for interim use will also have a warranty for a one-year period following the final acceptance. A one-year warranty TV inspection of all storm water and sanitary sewer main will be required 11 months after interim acceptance.

1.2 SYSTEM DEVELOPMENT FEES (WATER, SEWER)

Any party desiring to connect to the City water system or sanitary sewer system or upgrade their water or sewer service shall be subject to a system development fee (SDF) in accordance with Helena City Code, 6-2-9 (Water SDF) and 6-3-7 (Sewer SDF), respectively.

1.3 UTILITY REBATE AGREEMENTS

Any party who has paid for the construction of an extension of a sewer main, or water main including installation of a hydrant, valve, or other appurtenance to a sewer or water main in accordance with Helena City Code is eligible for a proportional rebate from any owner of adjacent property who subsequently applies to directly install a service connection to the extension or the subject water or sewer main.

The conditions under which rebates can be made are included in Helena City Code Sections 6-2-6-C and 6-3-4-B for water mains and sanitary sewer mains, respectively.

1.4 TEMPORARY WATER USE

Any water used from the City of Helena for construction purposes including, but not limited to dust control, soil compaction, hydrostatic testing, masonry, and/or dry wall, shall be metered and costs for water charged at a rate established by the City Commission. No use of temporary water is allowed except with written authorization through the Engineering Division and Utility Maintenance Division Superintendent.

1.5 TEMPORARY SEWER USE

No discharge to the City's wastewater collection system is allowed except through an approved connection, or by special written authorization given by the City Engineer and Utility Maintenance Division Superintendent. Rates for the discharge to the City's system will be at rates established by the City Commission.

1.6 STORM WATER

All on-site storm water facilities must be constructed and operational prior to construction of any impervious area. As-built drawings and a professional engineer's certification must be supplied to the Department of Public Works prior to acceptance or approval of the on-site storm water facilities.

All construction BMPs must remain in-place and maintained in good working order until 70% of the disturbed area has been re-vegetated. The construction BMPs will be for water quality as required in the MS4 permit and protection of the City's storm water system.

1.7 DEVIATION PROCESS

Any proposed deviation from these Engineering Design standards must be requested in writing to the Public Works Department and include the engineer of record's stamp and signature on the deviation form and certifying statement along with the infrastructure submittal for the proposed project. A deviation will only be granted when the minimum standards cannot be met or when the proposed item(s) meets or exceeds minimum standards as determine by the City Engineer and Transportation Engineer.

All deviation requests must contain information sufficient for reviewers to understand the deviation requested, the specific standard(s) to which the deviation applies, and to communicate the hardship or justification for the deviation requested. As a rule, increased cost, "engineering judgement" or "professional opinion" are not valid justifications for a deviation request.

Any deviation request will increase the City's review time to allow for time for committee review and decision. Any deviation request that needs an action by the City Commission or a State Agency will increase the review time additionally as needed to accomplish these action(s).

All deviations submitted must contain, at a minimum the following information in the engineer of record's stamped and signed deviation request:

- 1. **Formal Deviation Request** A brief statement by the engineer of record outlining the proposed deviation and summarizing the request and its effects on the proposed project and existing infrastructure.
- 2. **Deviation Form** A completed City of Helena Deviation Form including engineer of record's signed statement.
- 3. **Specific Standard(s)** A list of the specific standards being deviated from and in what manner they will be deviated from.
- 4. **Specific Justification(s)** A complete description of the hardships that would occur if the standard(s) were adhered to. Please provide detailed justification, including facts and figures as needed to show hardship for each standard deviated from in detail.
- 5. Alternatives Considered Please indicate all alternatives, engineering or otherwise considered before the formal deviation request was made.
- 6. **Engineer of record's Deviation Statement** Stamped and signed deviation request package must be accompanied with the signed statement on the deviation request form.

DEVIATION REVIEW PROCESS:

All deviations will be reviewed by at least three (3) Engineering Division staff for a recommendation of approval or denial by simple majority and forwarded to the City Engineer. The City Engineer will review the staff recommendations, consult with the Public Works and Transportation Systems Directors, and then approve or deny the deviation based the information provided, staff recommendations, and consultation with the Public Works and Transportation Systems Directors.

1.8 CONSTRUCTION PLAN REQUIREMENTS

No public infrastructure construction shall begin until construction plans have been approved by the City of Helena.

Construction plans and specifications must be signed and stamped by a licensed professional engineer registered in the State of Montana.

Construction plans and specifications shall be prepared in accordance with City of Helena Engineering and Design Standards, City of Helena Computer Aided (CAD) Standards, and Montana Public Works Standard Specifications.

Any deviation from the approved standards shall be requested in accordance with the deviation process (see Section 1.7).

Electronic CAD drawings, PDF's and paper copies of all construction plans and specifications must be submitted to the City of Helena for review.

Minimum Requirements for <u>ALL</u> Civil Plan Sheets

- 1. Title block Across the bottom or along the right side:
 - a. Owner
 - b. Name of the project
 - c. Engineering firm information and Engineer's seal Original signature shall be placed across the seal
 - d. Sheet title
 - e. Sheet number
 - f. Revision(s) table
- 2. All plans shall be drawn to scale and tied to the City of Helena's survey control for horizontal and vertical datum as provided by the City Engineer.
- 3. North arrow shall be shown on each plan view sheet. North arrow shall also point either up or to the right.
- 4. Scale shown on each plan, profile, section, and detail.
- 5. Legend relevant to each sheet shown all special symbols, line types and hatch used.
- 6. Plan and profile must be shown on the same sheet, with profiles on the bottom half of the sheet.
- 7. Accepted sheet sizes are 24" by 36", 22" by 34", and 11" by 17".
- 8. Rights-of-way labeled and dimensioned.
- 9. Lot & block numbers and/or ownership information shown for all lots.
- 10. Easement information with dimensions.
- 11. Caution notes shown when working next to any existing utilities (public and/or private).
- 12. Final Grades shall be shown as a solid line and called out specifically.

- 13. Existing Grade shall be shown as a dashed line and called out specifically.
- 14. Drawing Scales (Selected scale shall be legible and provide appropriate detail.): 1"=10', 20', 30', 40', 50', 60', 100' or 200'.
 - a. Plan View:
 - 1"=10', 20' 50' or 100' (or match plan view scale) b. Profile View – Horizontal: 1"= 1', 2', 5' or 10' (1:1, 2:1, 5:1 or 10:1
 - c. Profile View Vertical:
- exaggeration) 100 feet or 50 feet

Minimum Requirements for Individual Civil Plan, Section, and Detail Sheets

- 1. Cover Sheet:
 - a. Project Location

d. Stationing interval:

- b. Vicinity map
- c. Client Name
- d. Sheet Index
- e. Statement identifying that the latest edition of MPWSS and City Standards will apply to the project
- 2. General Notes, Abbreviations and Legend Sheet(s):
 - a. General and Construction Notes
 - b. Abbreviations
 - c. Legend
- 3. Horizontal Control Sheet:
 - a. Existing Site Layout
 - b. Horizontal and Vertical Datums
 - c. Basis of Bearing
 - d. All benchmarks and control elevation points
 - e. Property lines, and ownership (where applicable)
- 4. Typical Road Sections Sheet:
 - a. Rights-of-way
 - b. Typical sections, including pavement section and relative placement of utilities
 - c. Compaction requirements
 - d. Backslopes/Cross-slopes
 - e. Sidewalks
 - f. Curb & Gutter
 - g. Non-motorized Facilities where required
 - h. Station limits
- 5. Erosion Control Plan Sheet(s):
 - a. Existing and proposed contours shown/labeled
 - b. Existing and proposed storm lines and inlets shown
 - c. List the total disturbed acreage, including offsite, and delineate limits of construction
 - d. Appropriate BMPs used and identified
 - e. Phasing of BMPs with construction activities listed/described

- f. BMP details provided shall be per City of Helena and Montana Department of Environmental Quality's Storm Water Management During Construction Field Guide for Best Management Practices
- g. Show areas to be sodded or seeded with specified annual and long-term perennial vegetation
- h. Show areas of permanent erosion control (other than vegetation)
- 6. Post-Construction Storm Water and Water Quality Treatment Plan Sheet(s):
 - a. Plan view showing horizontal locations of the pond, including existing and proposed contours, locations of low flow or trickle channels, outlet structure, emergency overflow spillway, pipe, or channel inlets, etc. with appropriate horizontal control
 - b. All streets, roadways, highways, property lines, ROW lines, existing and proposed easements
 - c. Profile along from all the inlet to the outlet structure and pipe with all invert and outlet structure elevations and water surface elevations
 - d. Grading details for all pipe and culvert inlets and outlets
 - e. Water surface limits for the minor storm, major storm, and emergency overflow conditions
 - f. Summary table on plan view with stage-storage-discharge characteristics
 - g. Maintenance access improvements
 - h. Utilities adjacent to or crossing the detention area
 - i. Description of long-term operation and maintenance of BMPs
 - j. Standard and additional details and notes, and as required
- 7. Grading Sheet(s):
 - a. Both onsite and offsite existing/proposed contours
 - b. Date and name of firm who prepared geotechnical report with corresponding note stating: "Work shall be done in accordance with the Geotechnical Report by _____, dated _____." If required by the City Engineer.
 - c. Drainage clarified by flow arrows, high points, low points, ridges, and valley gutters
 - d. Show driveway locations for all lots adjacent to storm inlets
 - e. Positive overflow provided at all low points; easements dedicated as needed
 - f. Cross-sections and flow data for all swales and open channels provided
 - g. Street Flow Computation Table provided for all public streets for minor and major events
 - h. Inlet Interception Computation Table provided for all public inlets for minor and major events
 - i. Pipe Hydraulics Computation Table provided for all public storm sewers for minor and major events
 - j. Provide electronic copies of all hydraulic computations on CD or digital media
- 8. Roadway Sheet(s):

Plan View

- a. For streets, centerline stationing at a minimum of every 100', bearings and curve data labeled (R, D, L, PC and PT stationing)
- b. Proposed new construction including paving width and limits, curb and gutter, cross pans, sidewalks, and pedestrian ramps

- c. Existing and Finished grades with finished grade slopes
- d. Existing and proposed utilities
- e. Intersection, driveway, and island curb radii labeled
- f. All sidewalks and barrier free ramps shown, labeled and dimensioned
- g. Existing, proposed, future streets and drives shown and labeled
- h. Rights-of-way and sight visibility easements provided if required
- i. Storm inlets identified with paving stations and top of curb elevations at center of inlet.
- j. Drainage clarified by flow arrows at crests, sags, ridges, intersections, and valley gutters
- k. Show driveway locations for all lots adjacent to storm inlets and intersections

Profile View

- a. Show and label existing and proposed centerline, left, right curb lines, if not the same
- b. Any required utility adjustments
- c. Top of curb/pavement elevations labeled at every 50-foot stations
- d. Vertical curve stationing and elevations including PVC, PVI, PVT, high point/low point location, curve length, algebraic grade difference, and "K" values shown at a minimum
- e. Street grades shown to the nearest hundredth of a percent. Maximum and minimum grades per engineering standards in Section 5.
- 9. Utility Improvement Plan Sheet(s):

Plan View

- a. Show, label and dimension location of all mains, services, manholes (with rim elevations), inlets, meters, fire hydrants, valves, fittings, FDC locations, back-flow preventers, cleanouts, or other proposed infrastructure, and spacing from other utilities
- b. Show, label, and dimension location of all private utilities within public right-of-way
- c. Dimension location of all mains from other utilities
- d. Show and label water line leading to fire sprinkler systems as "fire line" where applicable
- e. Show location for all utility services and stub-outs labeled with size, slope, and length
- f. Show stationing along centerline of utility or roadway
- g. Show and label all easements
- h. Curve data and stationing provided as necessary
- i. Label valves with paving station near barrier free ramps or ADA routes
- 10. Storm Sewer and Culverts Sheet(s):

Plan View

- a. Show horizontal locations of all pipes, inlets, manholes, junction boxes, and outlet structures with appropriate horizontal control
- b. All streets, roadways, highways, property lines, ROW lines, existing and proposed easements
- c. Minor and major storm hydraulic grade lines
- d. Pipe outlet protection on plan and profile views
- e. Utilities adjacent to or crossing storm sewer or culvert alignment
- f. Grading details for all pipe and culvert inlets and outlets
- g. Maintenance access improvements

h. Standard and additional details and notes, and as required

Profile View

- a. Profile all proposed utility mains
- b. Existing and proposed ground line at centerline of pipe shown and labeled correctly
- c. Laterals, or culverts with all inverts, rim elevations, sizes, lengths, slopes, and type
- d. Indicate length, type/class, slope, and size of all lines
- e. Indicate the type and diameter for all manholes
- f. All utility crossings and parallel sewer/storm lines shown in profile
- g. Indicate length, type, and size of encasement, as needed

11. Open Channels, Swales, Channel Stabilization Sheet(s):

Plan View

- a. Show horizontal locations of all channels and swales, including locations of grade control structures and stabilization measures, such as check structures, drop structures, toe protection, bank stabilization, low flow, or trickle channels, with appropriate horizontal control
- b. All streets, roadways, highways, property lines, ROW lines, existing and proposed easements
- c. Profile along channel alignment with all invert elevation and top of channel bank elevations, and design flow rates
- d. Water surface limits on plan view
- e. Water surface profiles for the minor storm, major storm, and emergency conditions
- f. Maintenance access improvements
- g. Side tributary channels and pipe outlets
- h. Utilities adjacent to or crossing channel alignment
- i. Standard and additional details and notes, and as required.
- 12. Lighting Sheet(s):
 - a. Show all streetlight locations, consideration should be given to electrical layout from utility company
 - b. Show all stop signs and traffic related signage locations
 - c. Streetlights located on opposite side of street from Stop Sign
 - d. Verification of fire hydrant placement relative to streetlights and stop signs (3' clear zone)
 - e. If symbols used in plan, include appropriate legend for clarification
- 13. Signing and Striping Sheet(s):
 - a. Sign installation schedule
 - 1. Show and dimension all existing and proposed signing and striping
 - 2. Label all proposed signs and striping with sizes and type
 - b. Signing and Striping Notes
 - c. Sign Details
- 14. Traffic Signal Sheet(s) if applicable:
 - a. See Section 5.9

- 15. Traffic Control Plan Sheet(s):
 - a. Design site specific traffic control plan, i.e., MDT standard alone is inadequate
 - b. Indicate posted speed limit or design speed
 - c. Show all sign designation, sign graphic, and sign size
 - d. Show channelization device type, locations, and spacing
 - e. Show all traffic barricades and indicate type
 - f. Show all detour routes and detour signage
 - g. Show flagger locations where applicable
 - h. Show message boards with text for two or more phases where applicable
 - i. Show flashing arrow boards where applicable
 - j. If symbols used in plan, include appropriate legend for clarification

PART 2 – WATER SYSTEMS

PART 2 WATER SYSTEMS

2.1 **DESIGN REQUIREMENTS**

Water systems shall be designed, constructed, and tested in accordance with the current editions of circular DEQ-1 – *Montana Department of Environmental Quality* – *Standards for Water Works and the Montana Public Works Standard Specifications* and these standards. The purpose of these standards is to establish the **minimum** requirements for the design and construction of municipal facilities and improvements.

2.2 DESIGN REPORT

All water main extensions will require the Engineer of Record to submit a written, stamped report to the City Engineer addressing the fire, irrigation, and domestic flow requirements. The design report shall demonstrate compliance with these requirements, and provide an overview of the proposed project or development, proposed water system improvements, water service demands, system impact, feasibility and basic design requirements and shall include, at a minimum, the following information:

- 1. **Water Demands** Include estimated water demands based on projected land use, occupancy and building type for the following conditions:
 - a. Average Daily (gallons-per-minute)
 - b. Maximum Hourly (gallons-per-minute)
 - c. Fire flow (gallons-per-minute), and;
 - d. Irrigation (gallons-per-minute)
- 2. **System Layout** Describe and show the proposed distribution system layout, including locations for connections with the existing water distribution system.
- 3. **Conformance with Master Plan** Describe how the proposed water utility improvements conform with the adopted Helena Water Facilities Plan.
- 4. **Network Analysis** Include a distribution system analysis, performed through appropriate manual calculations or computer simulation, identifying any system impacts based on proposed demands and provide design solutions to ensure future water system growth, while maintaining appropriate system pressures and flow rates. Computer analyses, when required are to be submitted in both hard copy and electronic format. Hydrant test results used for network analysis shall be less than two years old at the time of submission.
- 5. **Main Sizing** Indicate the required sizing of the proposed distribution mains based on water demands.
- 6. **Special Conditions** Identify any special conditions, such as the presence of contaminated soils, conflicts with other utilities, unusual installation depths, or any requirements that require special provisions for construction.

Estimating water usage for residential developments shall be based on 150 gallons per day per capita per single residence using an average of 2.39 persons per residence.

Estimating irrigation water usage for residential developments shall be based on the application of 1 (one) inch of water per week on irrigated areas and shall be based on the proposed layout of the

development. If the exact layout of the development is unknown at the time of submittal, residential irrigation demand estimated shall be based on zoning district and residential lot coverage requirements of each district as follows:

Residential Zoning	Maximum Lot Coverage	Estimated Weekly Irrigation
Open Space Residential (OSR)	No Max	1" x 70% of lot area
Residential (R-1 & R-2)	30% Max Coverage	1" x 70% of lot area
Residential (R-3)	40% Max Coverage	1" x 60% of lot area
Residential-Office (R-4/R-O)	60% Max Coverage	1" x 40% of lot area

Table 2-1. Irrigation Water Use For Residential Zoning Districts

Estimated water usage for non-residential developments shall be determined on a case-by-case basis by the design engineer based on the projected land use, occupancy and building type, using fixture counts/International Building Code methodology whenever possible. The design engineer shall provide all relevant references, assumptions, and calculations for alternate methods of non-residential water demand estimation within the submitted report. If the design engineer is not able to estimate water usage using these methods, the engineer may use 160% of the approved wastewater generation estimate (112 gallons per day per capita) for the same development as per the City of Helena's Wastewater Collection System Master Plan.

For residential or non-residential developments that will utilize an average daily flow of less than 25,000 gallons at build-out, the report shall include data on test results at the nearest hydrant which shows the static pressure at zero flow from the hydrant and the residual pressure with available flow from the hydrant.

At the discretion of the Public Works Department, the Design Engineer may be required to conduct computer hydraulic modeling to demonstrate compliance with the Section 2.4. of these standards.

For residential or non-residential developments that will utilize an average daily flow of 25,000 gallons or more at build-out, or that require utilization of a pressure booster pump(s) and/or pressure reducing valve(s), the report will be required by the Public Works Department to include computer hydraulic modeling results and a working computer model that shows the adequacy to meet fire and domestic flow requirements and the Section 2.4.1 of these standards. The normal operating range of pressure allowed for water system design is 50-110 psi or as approved by the Public Works Department without the use of booster or fire pumps.

2.3 WATER SERVICE AREA – EXPANSION

The official water service area for the city is that area of the city within the boundaries of the city and currently served by city water, any areas presently served outside the city and any subsequently approved amendments thereto.

Applications for water service area enlargements shall be made on forms prescribed by the city manager and shall be accompanied by all documentation requested by the city. An application

form is included in "Appendix A" of this standards document. The property shall meet the following conditions prior to making application for enlargement of the service area:

- Within the City limits or approved for annexation to the City of Helena
- Contiguous to the boundary of the service area as the same exists;
- Entirely within the City's full service, urban planning area;
- Entirely within the City's facilities planning area; and
- Capable of being adequately served by extension of existing infrastructure.

2.4 WATER MAINS

2.4.1 DESIGN CONSIDERATIONS

Hydraulic Analysis – The design of all water mains shall be based on a hydraulic analysis considering flow demands and pressure requirements. The main must be designed to maintain a minimum normal working pressure of 35 psi and maintain an absolute minimum pressure of 20 psi under all flow conditions. Maximum normal working pressures should not exceed 110 psi. Developments with line pressures in exceedance of 120 psi are required to install pressure reducing valves to reduce pressure to 50-110 psi unless otherwise approved in writing by the Director of Public Works or City Engineer.

Fire flows – All mains shall be designed to provide adequate fire flows unless specifically waived by the City of Helena Public Works Department in writing. The minimum required fire flow shall be 1750 gallons per minute for two hours for residential housing or as determined by the City Fire Marshal at a minimum of twenty pounds per square inch residual pressure at the hydrant during flow.

Diameter – All water main piping shall be at least 8" diameter, unless otherwise authorized by the Director of Public Works in writing. Larger diameters will be required in order to maintain the minimum pressure requirements of Montana Circular DEQ-1 Standards for Water Works. The City also may require over sizing of mains to meet fire flow requirements, and/or overall system requirements as outlined in the most current Helena Water Facilities Plan.

As Constructed Drawings – The professional engineer certifying the work shall submit two (2) copies of stamped, signed as-constructed drawings in hard copy and one electronic copy in AutoCAD .dwg and .pdf format to the Engineering Division prior to final acceptance of the main(s).

2.4.2 MATERIALS

Piping – Acceptable water main pressure pipe shall be as follows.

Ductile Iron water main piping 12" in diameter or smaller shall be Class 52 wall thickness pipe material meeting AWWA C151, American National Standard for Ductile Iron Pipe. All water main piping larger than 12" in diameter shall be Class 51 thickness pipe material meeting AWWA C151 Standards.

PVC water main piping shall be DR-14 PVC pressure pipe and shall meet AWWA C-900 Standards. Acrylonitrile butadiene (NBR) gaskets will be required for water main installations in areas of known or suspected hydrocarbon contamination.
If specifically allowed in writing by the City of Helena Public Works Department, zinc coated ductile iron pipe meeting AWWA C150 and C151 and with zinc coating system conforming in every respect to ISO 8179-1 "Ductile iron pipes – External zinc-based coating – Part 1:Metallic zinc with finishing layer. Second edition 2004-06-01" can be used. Zinc coating shall be a minimum of 200 g/m² surface area coverage. The use of zinc coated ductile Iron pressure pipe will only be allowed in areas of high corrosion potential as determined on a case-by-case basis by the Public Works Department. Acrylonitrile butadiene (NBR) gaskets will be required for water main installations in areas of known or suspected hydrocarbon contamination. Polyethylene wrap is not required on zinc coated ductile iron pipe installations; however, cathodic protection shall still meet the requirements of Section 2.4.3. of these standards.

Requests to use alternate pipe materials shall be made in writing to the City Engineer and shall include justification for doing so by the design engineer <u>prior</u> to submitting plans for review.

Fittings – All water main fittings, including valves, tees, crosses, caps, plugs, reducers and elbows equal to or greater than 11-1/4° shall use mechanical joint restraints. All mechanical joint restraints shall be "Megalug," "Uniflange" or approved equal. Joint restraint use shall be in addition to meeting thrust block requirements in accordance with MPWSS. Flanged fittings are not allowed in buried service.

2.4.3 INSTALLATION

Existing Valve Operation – In order to isolate sections of the existing water system to allow for new construction, it will be necessary to operate existing system valves. The City Utility Maintenance Division (457-8567) shall be notified when existing valves must be operated and shall undertake those operations. No one shall operate city owned valves except City Utility Maintenance Division personnel without express written permission from the Utility Maintenance Division.

New water system valves that have been installed by a contractor or developer and not yet accepted but are connected to the existing City of Helena water distribution system are considered to be part of the City of Helena system and are subject to the operating guidelines of this section. The City Utility Maintenance Division (457-8567) shall be notified when these valves must be operated and shall undertake those operations. No one shall operate water main valves connected to the City water distribution system except City Utility Maintenance Division personnel without express written permission from the Utility Maintenance Division.

Cover – The minimum cover for all water mains from top of pipe to final finished grade shall be $6\frac{1}{2}$ unless otherwise approved in writing by the Director of Public Works or City Engineer.

Encasement – All water main piping, fittings, valves, etc. (excluding PVC and zinc coated ductile iron pipe) shall be encased in polyethylene wrap with a minimum thickness of 8 mils. All encasement shall be in accordance with AWWA C105 Standards.

Electrical Thawing – Conductive brass wedges shall be installed at all joints in ductile iron pipe to provide for electrical thawing and continuity. Electrical continuity shall be provided at all flexible, dresser-type couplings. Bonded jumper wires can be used if needed to provide for electrical continuity.

Tracer –Tracer wire shall be installed along the top of all new water mains. Tracer wire for water lines is to be #10 AWG high-strength copper clad steel with a 30-mil HDPE insulation jacket (color blue) and have a 600-pound average tensile break load. Tracer wire may be manufactured by Copperhead Industries or an approved equal.

Tracer wire shall be grounded at all dead ends, except fire hydrant legs, using a 24-inch-long minimum copper clad grounding rod. A grounding clamp approved for direct burial use shall be used to connect the tracer wire to the grounding rod. Direct burial grounding clamps shall be EK17 as manufactured by Erico or approved equal.

Tracer wire shall be securely affixed to the top exterior surface of the pipe using PVC pipe tape at 5-foot intervals. Tracer wire shall be looped around valves, saddles, curb stops, and other appurtenances in such a manner that there is no interference with the operation of the appurtenances. Tracer wire shall be continuous and without splices, breaks, or cuts except for spliced-in connections as approved by the Engineer. Where any approved spliced-in connections occur, 3M DBR watertight connectors, or approved equal, shall be used to provide electrical continuity. All spliced connections must be inspected and approved by the Engineer of Record before being buried.

Tracer wire shall be brought to the surface at all junctions and terminals, including at all valve boxes for water valves and fire hydrant legs, except for fire hydrant auxiliary valves located within 10 feet of a hydrant installed with tracer wire. DryConn Waterproof Direct Bury Lugs as manufactured by King Innovation, or approved equal, shall be used to splice into the main line tracer wire. The main line tracer wire shall not be broken or cut. Tracer wire shall be spiral wrapped around the exterior of the valve box riser pipe and brought into the valve box top section. Provide 5 feet minimum of additional wire neatly coiled within each valve box.

Prior to final acceptance, a continuity test shall be performed on tracer wire with the Certifying Engineer present to verify that the trace wire is continuous and allows for the proper tracing of the piping. If the Engineer identifies locations where the trace wire is not continuous, to include all connection points between new and existing water mains, the Contractor, at no additional cost to the City, shall make necessary repairs/corrections. Continuity testing shall be conducted prior to repaving roadways.

Six-inch wide detectable tape marked "WATER" shall be installed two feet below finished grade along the alignment of the new main and attached to all valve box risers.

Cathodic Protection – The City of Helena cathodic protection policy for the protection of water mains is as follows:

- A. Cathodic protection, polyethylene wrap and sacrificial anode design/installation are required for all projects including fittings, valves, valve boxes or hydrants if no site-specific soil data is presented in the design report submitted.
- B. If soils testing is undertaken at the site for the sake of opting out of cathodic protection, the data will be included in the stamped and signed design report and applied to AWWA C105-10 Table A.1. If the "score" on Table A.1. is less than 10, and justified/documented in the design report, then polyethylene wrap is required but sacrificial anode design is not. Polyethylene wrap is not required for zinc coated ductile iron pressure pipe.
- C. If the soil test data indicates a score of 10 or above on AWWA C105-10 Table A.1., then polyethylene wrap and sacrificial anode design are both required.

A cathodic protection plan and accompanying design calculations stamped by a Certified NACE professional or licensed professional engineer in Montana is required with the design submittal. As-constructed drawings shall show the location, size and configuration of sacrificial anodes and testing stations.

If the engineer of record wishes to opt out of the sacrificial anode design and installation, a stamped and signed design report must be submitted including relevant soil testing data, as stated in the policy, above.

Open Trenches – Trenches for the installation of water mains shall be properly backfilled as quickly as possible, but no more than 48 hours after initial digging. (City Ordinances 7-2-8 and 7-2-9).

Protection of Mains – When working near and/or exposing existing City water mains and service lines, workers shall utilize hand-digging within 2' of mains and service lines in order to avoid damage to those pipes. If damage occurs, the cost of repair and penalties in accordance with City Ordinance 7-2-7 can be imposed.

Chlorination - All new water mains shall be chlorinated and tested as per the current edition of the Montana Public Works Standard Specifications 7^{th} or most recent edition Section 02660 - Water Distribution.

Testing – All new water mains shall be tested in accordance with Montana Public Works Standard Specifications 7^{th} or most recent edition Section 02660 – Water Distribution. The City reserves the right to perform any and all of these tests prior to acceptance of water infrastructure.

2.4.4 EXTENSION

Any extension of an existing City water main must be extended across the entire frontage of the property to be served, as required by Helena City Code 6-2-6 and these standards. Main extensions shall include all valves, pipe sizes, hydrants and appurtenances deemed necessary by the City. Public mains may be required to be connected, extended, or looped in addition to the proposed extension to provide an adequate and functional water supply and provide for future extensions to adjacent properties.

Cut in tees and/or crosses using mechanical joints and thrust/restraint blocking shall be used for all new water mains branching off of existing water mains whenever possible. Tapping tees for the installation of new water mains shall not be allowed without the written approval of the Director of Public Works or City Engineer.

2.4.5 SEWER LINE CROSSINGS

Crossings - A minimum of 18" vertical separation is required when a water main crosses above or below a sanitary sewer, measured outside to outside of pipe. Please refer to MPWSS for further information on sewer line crossings. Water service lines require a minimum of 12" vertical separation from sanitary sewer mains when crossing and should cross above sanitary sewer mains whenever possible.

Less than 18" vertical separation may be allowed when a gravity sewer at the crossing is made from a single 20' length of AWWA pressure pipe and the crossing is approximately 90°. Specific written authorization from the M ontana Department of Environmental Quality **and** the City of Helena Public Works Department is required for a vertical separation of less than 18".

No exception of the minimum 18" vertical separation requirement is permitted when the sewage pipe is a force main.

Parallel – Unless specifically authorized by the Montana Department of Environmental Quality **and** the City of Helena Public Works Department in writing, a minimum of 10' horizontal separation is required when a water main and sanitary sewer are installed parallel, measured from inside edge to inside edge of the mains.

2.4.6 TAPPING CITY WATER

<u>The City of Helena Water Department shall tap all water mains.</u> Preparations for exposing the water main and preparing the water main for tapping, as well as scheduling for the City to make the tap are all responsibilities of the water main installer. The City of Helena Water Department can be contacted at (406) 457-8567. All taps require at least 24-hours' notice to the Utility Maintenance Division of the City of Helena. If taps require main shutdown, 48-hours' notice is required, and the contractor is required to notify the affected water users of the shutdown and provide temporary water supply if needed as per Montana Public Works Standard Specification Section 01580.

Any person desiring to make connection to the City's water or sewer mains must make application in writing and pay for the cost of tapping and any associated system development fees in accordance with Helena City Code.

Taps of sizes of 1" on all mains require the contractor to provide a properly sized tapping saddle and corporation valve for mains of 6" and larger (currently up to 36"). Special provisions apply for 1" taps on 4" cast iron or ductile mains. For integrity of the main, these taps require the use of a properly sized tapping saddle, which is required to be purchased and supplied by the plumbing contractor.

Taps for sizes 1¹/₂" and 2" services on all sizes and types of mains (ductile iron, cast iron, PVC and steel) require a properly sized tapping saddle and corporation valve purchased and supplied by the plumbing contractor.

All taps of sizes 1"-2" shall be made using a Mueller or Ford style FS323 stainless steel saddle or approved equal. Taps on all mains require the contractor to provide and install a properly sized tapping saddle and corporation valve.

Taps of 4" and larger on all mains require a properly sized tapping saddle, tapping valve and a valve box to be purchased, supplied, and installed by the plumbing contractor. All tapping saddles and valves 4" and larger must be air tested to 1.5 times main pressure prior to tapping.

Bronze or stainless-steel double strap or wide band tapping saddles are required on service lines up to 2" in diameter.

On all taps the plumbing contractor must provide and install the tapping saddle.

Taps must have a minimum of 36" of separation on the same horizontal plane or a minimum of 18" separation when vertical separation is 2" or greater.

PVC and steel mains require special restrictions and requirements as follows:

• All taps 1" through 2" on PVC and steel mains require a tapping saddle and corporation valve. Plumbing contractors are required to purchase and supply tapping saddles for 1"taps. Plumbing contractors must supply properly sized corporation valve and tapping saddle for taps of 1½" and 2".

- Taps of 4" and larger (up to 12") on PVC and steel mains require a tapping saddle, tapping valve and a valve box to be purchased and supplied by the plumbing contractor.
- Taps 4" to 12" on steel mains 20" and larger require a welded-on saddle for tapping.
- When approved, all taps 14" or larger require a contract tapping service or company.

2.4.7 VALVES

Valves shall be installed in the distribution system at sufficient intervals to facilitate system repair and maintenance as determined by the Public Works Department, but in no case shall there be fewer than one valve every 600'. Generally, there shall be two valves on each tee and three valves on each cross.

All Gate Valves shall conform to AWWA C515 Standards and shall open CLOCKWISE.

All Butterfly Valves shall conform to AWWA C504 Standards and shall open CLOCKWISE.

All Tapping Valves shall open COUNTERCLOCKWISE

All valves, including hydrant valves shall be mechanically restrained. All mechanical joint restraints shall be "Megalug," "Uniflange" or approved equal. Joint restraint use shall be in addition to meeting thrust/restraint block requirements in accordance with MPWSS. Joint restraints must be accessible after installation and shall not be buried in concrete.

All water valve boxes shall have an asphalt collar installed after paving and final grade adjustment. See Standard Drawing 2-1 for asphalt collars.

All water valve boxes shall be aligned to allow a 4" diameter PVC pipe to be inserted in the valve box and centered over the valve nut.

All water valve boxes shall not be extended more than 50%.

2.4.8 FIRE HYDRANTS

Unless otherwise approved by the Fire Marshal, fire hydrants shall be spaced no further apart than one standard City block, which is approximately 400'. The Fire Marshal reserves the right to require additional fire hydrants if the demand of the structure(s) requires more flow than the minimum spacing provides. The placement of all hydrants shall be subject to approval of the City of Helena Fire Marshal.

Fire hydrants shall be 250 psig, 5¹/₄", 3-way, "Kennedy K81A", or approved equal, conforming to AWWA C502 Standards. All hydrants shall be painted OSHA yellow above the ground line. All hydrants shall be installed with the safety flange 3-6 inches above finished grade.

All hydrants shall be equipped with a #4 pentagon $(1\frac{1}{4}")$ operating stem nut and shall open in a CLOCKWISE direction. The direction of opening shall be indicated by a permanent arrow on the hydrant top.

All hydrants shall be designed for final grade of hydrant safety flanges set at 3" to 6" above finished grade. Minimum bury depth of hydrant barrel shall be 7' with a maximum bury hydrant of 8.5' as determined by the elevation of the safety flange. Hydrant barrel may be extended with

the use of a single extension not to exceed two feet. Any other extensions will only be allowed with prior approval of the Public Works Department and when no other option exists.

Pipe deflection on hydrant leads shall be minimal and shall not result in finished hydrant more than 1° out of plumb.

The hydrant auxiliary valve shall be located in the street pavement or boulevard with a standard mechanical joint water valve and asphalt collar. No valves or collars shall be located within the curb and gutter. When possible, valves or collars shall not be placed in sidewalks.

All hydrants shall be installed in accordance with City of Helena Standard Drawing 2-2.

2.4.9 WATER VAULTS

All underground vaults and manholes associated with the City's water system shall be constructed of pre-cast concrete sections meeting ASTM C478 or C858.

All water vault manhole covers shall have the word "water" cast into the top surface.

All water vault manhole frames shall have an asphalt collar patch poured after paving and final grade adjustment. See Standard Drawing 3-1.

2.4.10 ABANDONMENT OF EXISTING WATER MAINS

Abandoning existing water mains is only to be done with written permission from the Director of Public Works. Water mains shall be abandoned by excavation and removal whenever possible. If permission is granted by the Director to abandon water mains in place, all valves and valve boxes are to be removed, the main is to be completely filled with flowable fill, non-shrink grout or another approved flowable material and the ends completely plugged with concrete to a watertight condition. All in place abandonments must be inspected and approved by an Engineering Division representative prior to backfilling.

2.5 WATER SERVICE LINES

2.5.1 MATERIALS

All service lines shall be a minimum of 1" in diameter.

All water service lines 3.5" and smaller diameter shall consist of Type K copper pipe meeting ASTM B88-62 or 250 psi DR9 CTS HDPE pipe meeting AWWA C901 from the main to the curb box. HDPE service lines must be installed with tracer wire meeting the standards set forth in Section 2.4.3 of these standards and brought to the surface at the curb box for location.

All water service lines 4" diameter and larger shall consist of ductile iron pipe meeting AWWA C151, American National Standard for Ductile Iron pipe or PVC pressure pipe meeting AWWA C900 Standard.

All water service lines from the curb valve to the use connection shall meet all current plumbing codes as used by the City of Helena Building Division.

Stainless steel inserts are required for all compression-type fittings if the use of poly pipe is approved.

In accordance with Sections 1417 (a) and (b) of the Safe Drinking Water Act amendments of 1986 (Public Law 99-339), the use of solders and flux containing more than 0.2% lead and pipes and fittings containing more than 8% lead is prohibited in the installation and repair of residential or nonresidential plumbing connected to a public water supply system.

2.5.2 INSTALLATION

All water service lines must be so arranged that the supply to each separate house premises or buildings may be controlled by a separate shutoff valve and curb box placed within the right of way near the property to be served. When possible, curb boxes shall not be placed in sidewalks. Curb box shall be placed in the boulevard when one exists, or six inches behind the sidewalk where a curbside sidewalk exists and space inside the right-of-way exists. One singular, identifiable entity will be responsible for all the water used through each service.

Flag lots must have a minimum of 10 horizontal feet of frontage at the public right-of-way. Water service lines installed for a flag lot shall only serve a single platted parcel.

All individual condominiums or separate buildings must be served by individual service line from the main whenever possible. In the cases where individual service lines are not feasible, one service will be allowed with only one master meter that is the responsibility of the condominium associations or one individual for payment. Multiple meters that are read and billed by the City of Helena will not be allowed on a single service. In cases where the street is less than ten years old with a single service to the condominium lot, individual meters may be allowed with manifold and a master shutoff valve along with individual shutoff valves located within City ROW. See Standard Drawing 2-8.

All water service lines shall be installed in accordance with City of Helena Standard Drawing 2-3 with a minimum of $6\frac{1}{2}$ of cover from the top of service pipe to final finished grade or be insulated with "blue board" type Styrofoam insulation.

No portion of any water service line shall be located within a property it does not service.

All water service lines shall be encased in 8 mil polyethylene wrap for a minimum distance of 3' from the main. Water service lines shall have a minimum of 18 inches of lateral separation.

All water service line connections to the water main must be made by a licensed plumber (Helena City Code 6-2).

At all locations where water service lines are installed beneath new curb, the face of the curb shall be stamped with a "W" in lettering at least 3" tall, for marking the water service location.

All crossings under existing curbs by tunneling are prohibited.

All services must be connected to a City main. Service lines may not be connected to fire lines or fire hydrant leads.

All service lines must have a tracer wire and it must be installed and tested for all service lines regardless of pipe types. Service line tracer wire shall conform to the requirements set forth in Section 2.4.3 for water mains and be installed from the water main and terminate within the structure or vault. Water service lines shall also be installed with six-inch wide detectable tape marked "WATER" located two feet below finished grade along the alignment of the new service line.

2.5.3 ABANDONMENT OF EXISTING SERVICE LINES

Abandonment of existing water service lines shall be made at the point of connection with the public main by a method approved by the Director of Public Works in writing as per City of Helena City Code.

A street opening permit is required for disconnecting water service lines at the water main in the street right of way. All water service line abandonments shall be inspected and approved by Public Works/Utility Maintenance staff prior to backfilling. The service line shall be disconnected from the corporation stop and the corporation stop shall be in the off position. If the corporation stop or main is leaking, the inspector will advise the utility maintenance division so the leak can be repaired prior to backfilling the ditch.

2.5.4 CURB STOPS AND BOXES

Curb Stops – All curb stops shall be installed in accordance with City of Helena Standard Drawing 2-3 and MPWSS. All curb stops shall have a bronze plug, tee head key with either a Minneapolis top thread or standard no thread, with a copper flare nut or compression fitting on both connections.

Curb Boxes – All curb boxes shall be extension-type having a minimum box length, fully retracted, of 6'. All curb boxes shall consist of a Minneapolis or arch pattern (Buffalo) Style and shall be a Mueller or Ford metal curb box, or equal as approved by the Director of Public Works in writing. All curb boxes shall have screw-on or other type lid, which can be attached to the top of the riser.

Maximum depth of any curb box, measured from top of the operating nut to the face of the curb box lid shall be 8'. Minimum depth of any curb box, measured from the top of the operating nut to the face of the curb box lid shall be 6' - 6". Bending or altering of curb box keys for operation is prohibited. Valve extension rods are not permitted.

Whenever possible, curb boxes shall not be placed in sidewalks. Curb boxes shall be placed in the boulevard, when one exists or 6" behind the sidewalk, where a curbside sidewalk exists and there is ample space within right of way. Top of curb box shall be to grade and located 2' in back of curb line in boulevard at "W" stamp location at all other locations.

All curb boxes shall be installed within 1° of plumb and centered directly over the corporation stop nut. A 1" rigid pipe must be able to pass through the curb box and over the operating nut. The curb box should be protected and maintained until final occupancy. The curb box will be part of the final occupancy inspection for building permit.

2.5.5 SERVICE LINE METERS

All meters shall remain the property of the City.

Water meters shall be purchased from the City by the water user and shall be installed by the water user/plumber as approved by the City.

All water meters must have valves upstream and downstream of the meter to isolate the meter for servicing. Meter isolation valves are required within 24" of the center line of the meter on the upstream and downstream sides of the meter.

All new and replacement residential water meters shall have a dual check backflow preventer and expansion tank included as supplied by the City of Helena Utility Maintenance Department. Dual check assemblies and expansion tanks shall be retrofitted on to all residential replacement water meters installed in the City of Helena during meter replacement.

All meters shall be located at least 5' away from any electrical devices/equipment.

All meters larger than 2" shall be either turbine, compound or ultrasonic meters and shall be installed in accordance with the manufacturer's recommendations, including a strainer. All bypass assemblies installed must include the same components as the main service with the exception of the meter.

All residential water meters shall be installed within 5' of the crawl space entrance. The area leading to the water meter shall be free of obstructions and easily accessible.

Water meters shall be the same size/diameter as the service line serving the water meter.

Installer must provide a minimum of 4 times pipe diameter of straight run pipe (no fittings, bends etc.) upstream, and a minimum of 2 times pipe diameter of straight run pipe downstream of any commercial meter for proper operation.

Provide a minimum of 18 inches of clearance in all directions from the meter for maintenance purposes. The meter must be installed horizontally in line and no more than 4 feet above floor. The meter must also be located in close proximity to a floor drain whenever possible to allow for draining/servicing.

All equipment shall be properly supported using anchored floor stands or mounted rigidly to the wall with Unistrut or approved equal.

Water Meters shall not be located within any property they do not service.

Meter size and type used shall be specified and shown on project plans (print).

Water service line size(s) shall be specified and shown on project plans (print).

Pressure reducing valve(s) shall be installed downstream of all water meters containing turbine components.

A Neptune strainer shall be provided by the City and are required for each meter containing a turbine component. The strainer is required to be mounted directly to the inlet of the water meter.

On any commercial meter that has a bypass line that bypasses the main line backflow preventer, water meter and pressure reducing valve. The meter bypass line shall be the same size/diameter as the main service line. A locking isolation valve shall be provided on all meter bypass lines.

Meter bypass lines are required to have pressure reducing valves and backflow protection equal to the main line backflow preventers.

All backflow preventers shall be tested by a city approved and licensed backflow tester before final occupancy can be given.

All backflow preventer discharge lines shall be piped directly to a floor drain.

2.5.6 BACKFLOW PREVENTION

"Backflow" is defined as the undesirable reversal of water flow or the reversal of water flow containing other liquids, gases or other substances from a connected source that flows into the distribution pipes of the public water supply.

The City may require, at its discretion, the installation of appropriate backflow protection devices on new or existing service lines when the water user is involved in water use practices that pose a threat to the City's water system. All existing sources for water that are not part of the City of Helena's water system must be disconnected from the City's system.

Backflow prevention is specifically governed by the City of Helena Backflow Prevention Policy.

2.5.7 FIRE SPRINKLER SYSTEMS

All fire sprinkler systems shall be designed to 90% of the maximum operating pressure with a pressure relief valve installed to protect the system from pressure surges. The City of Helena may move the existing Low Malben Pressure Zone to the maximum service elevation of 4009' and create the new Valley Pressure Zone to the maximum service elevation of 3819'. Any new system with a ground elevation that falls within the changing or new pressure zones, must design the system to the calculated design pressure received from the City Engineering Department. A Fire Pressure Zone Map is available in the City Engineering Department. A completed copy of Fire Flow Request Form shall accompany sprinkler system plans submitted to the City of Helena Fire Marshal.

Per Uniform Plumbing Code, reduced pressure backflow preventers are required on all systems having a fire department connection.

PART 3 – SANITARY SEWER SYSTEMS

PART 3 SANITARY SEWER SYSTEMS

3.1 DESIGN REQUIREMENTS

Sanitary sewer systems shall be designed, constructed, and tested in accordance with the current editions of Circular DEQ-2 – *Montana Department of Environmental Quality* – *Design Standards for Wastewater Facilities and the Montana Public Works Standard Specifications* and these standards. The purpose of these standards is to establish the **minimum** requirements for the design and construction of municipal facilities and improvements.

3.2 DESIGN REPORT

All sanitary sewer main extensions shall require the Design Engineer to submit a written, stamped report to the City Engineer which addresses the design requirements listed herein. The design report shall demonstrate compliance with these requirements and provide an overview of the proposed project or development, proposed sanitary sewer system improvements, wastewater flow estimates, system impact, feasibility and basic design requirements and shall include, at a minimum, the following information.

1. **Wastewater Generation:** Include estimated wastewater generation estimates based on projected land use, occupancy and building type for the following conditions:

a. Average-Day (gallons-per-minute),

b. Peak Hourly (gallons-per-minute),

c. Infiltration/Inflow (gallons-per-minute).

- 2. **System Layout:** Describe and show the proposed collection system layout, including locations for connections with the existing wastewater utility system.
- 3. Service Area: Describe the initial and ultimate area, measured in acres that could be served by the new wastewater facilities.
- 4. **Population:** Define the initial and ultimate population and population densities that could be served by the new wastewater facilities.
- 5. **Conformance with Master Plan** Describe how the proposed wastewater utility improvements conform with the most recent adopted Wastewater Collection System Master Plan.
- 6. **Industrial Wastes -** Define the estimated quantities and quality of any industrial wastes that could be discharged to the wastewater system.
- 7. **Collection System Analysis** Include a collection system impacts analysis, identifying any system impacts based on proposed demands and providing design solutions to ensure perpetuation of future wastewater utility system growth and maintain system capacity and flow rates.
- 8. **Main Sizing** Indicate the required sizing of proposed collection mains based on wastewater demands and a capacity analysis. The design report shall demonstrate that all sanitary sewer main extensions have adequate capacity to convey wastewater from the anticipated service area and meet the minimum flow velocities and/or flow depth requirements in Chapter 30 of MDEQ Circular-2.

- Wastewater Effluent Characteristics Indicate the makeup of the proposed 9. wastewater discharges. If wastewater to be discharged into the City of Helena's collection system is to be anything other than domestic wastes, the design Engineer shall include information concerning the characteristics of proposed wastewater effluent, including the following:
 - (a) Acidity-alkalinity,
 - (b) Phosphorus,
 - (c) pH,
 - (d) Sulfates and sulfides,
 - (e) Synthetic and organic compounds,
 - (f) Hazardous constituents,
 - (g) BOD5 (total and soluble fraction, carbonaceous and nitrogenous demand),
 - (h) COD (total and soluble),
 - (i) TSS,
 - (j) Nitrogen (TNK, NO3, NO4, NH4, organic), and
 - (k) Inorganic s (salts, metals)
- 10. **Special Conditions** - Identify any special conditions, such as conflicts with other utilities, unusual installation depths or oversizing requirements that require special provisions for improvements construction.

Estimating wastewater flows for residential developments shall be based on 112 gallons per day per capita for single residence using an average of 2.39 people per residence as shown in Table 3-1.

Estimating wastewater flows for non-residential developments shall be determined on a case-bycase basis by the design engineer based on the projected land use, occupancy and building type, using Circular MT DEQ-4, Tables 3.1-1 and 3.1-2 whenever possible. The design engineer shall provide all relevant references, assumptions, and calculations for alternate methods of non-residential wastewater flow estimation used within the submitted report.

If the design engineer is not able to provide detailed wastewater estimation information for nonresidential developments, the estimated wastewater flows shall be based on the proposed use of the property as shown in the following table:

Development Type	Average Day Wastewater Load
Residential	112 gallons/day/capita
Average Persons per Housing Unit	2.39 Persons
Non-Residential ¹	
Commercial Use ¹	4,000 gallons/acre/day ¹
Industrial Use ¹	3,500 gallons/acre/day ¹
Infiltration Allowance ¹	150 gallons/acre/day ¹
1 Area based on total gross area of the development	

Table 3-1. Wastewater Load by Development Type

Area based on total gross area of the development.

The allowance for inflow and infiltration shall be 150 gallons per acre of coverage area per day or otherwise approved by Public Works Department in writing. Peaking factors do not apply to the infiltration allowance.

The City may require, at its discretion, the capacity of the sewer to be increased.

3.3 WASTEWATER SERVICE AREA

The official wastewater service area for the city is that area of the city within the boundaries of the city and currently served by city sewer, any areas presently served outside the city and any subsequently approved amendments thereto.

Applications for sewer service area enlargements, as specified in City Code 6-5-3, shall be made on forms prescribed by the City Manager, and shall be accompanied by all documentation requested by the city. An application form is included in Appendix A of this standards document.

The property shall meet the following conditions prior to making application for enlargement of the service area:

- Within the City limits or approved for annexation to the City of Helena
- Contiguous to the boundary of the service area as the same exists;
- Entirely within the City's full service, urban planning area;
- Entirely within the City's facilities planning area; and
- Capable of being adequately served by extension of existing or existing infrastructure.

3.4 SANITARY SEWER MAINS

3.4.1 DESIGN CONSIDERATIONS

Slope – Gravity sewer mains shall be installed with slope adequate to maintain flow velocities of at least 2.0 feet per second (fps) when depth of flow is at or below 0.3 of the sewer main inside diameter, based on Manning's equation with an "n" value of 0.013. Recommended minimum pipe slopes listed in Section 33.41 of Circular DEQ-2 will be considered adequate.

Capacity - Public sanitary sewers and appurtenances shall be designed to accommodate peak hourly flows (q), including allowance for infiltration, while flowing no more than half full (q/Q of 0.50) when no additional connections are possible and a quarter full (q/Q of 0.25) when future growth is anticipated. The development must upsize the existing affected downstream mains if the capacity (Q) of the sewer main is calculated to be three quarters full (q/Q of 0.75). The allowance for groundwater infiltration shall be 150 gallons per acre of coverage area per day or otherwise approved by Public Works Department. The City may require, at its discretion, the capacity of the receiving sewer(s) to be increased.

Diameter – Gravity sewer mains shall have a minimum diameter of 8 inches. Increasing the diameter in order to meet the minimum pipe slope requirements will not be allowed.

Manholes- Shall be a minimum of 48" inside diameter for all manholes with a depth less than 13' measured from finished manhole rim to deepest invert. All manholes with burial depth equal to or greater than 13' shall be a minimum of 60" internal diameter. Manholes with a burial depth equal to or greater than 15' shall have the design stamped by a professional engineer licensed in the state of Montana.

A drop type manhole must be provided for a sewer entering a manhole at an elevation of 24 inches or more above the manhole invert. Drop manhole use shall be avoided wherever feasible. Where the difference in elevation between the incoming sewer and the manhole invert is less than 24 inches the invert shall be filleted to prevent solids deposition. Drop manholes should be constructed using an inside drop connection whenever possible. Inside drop connections must be secured to the interior wall of the manhole using 316 stainless steel hardware and provide access for cleaning. All interior drop connections shall include a drop bowl and shall be manufactured by Reliner/Duran Inc. Drop holes with a force main connection shall include a drop bowl hood. All drop manholes shall conform to City of Helena Standard Drawing 3-12. Exterior drop manholes shall only be used with prior written approval of the Director of Public Works or City Engineer and shall conform to MT DEQ Circular 2.

Flow Direction – On the infrastructure plans all sewer mains shall be labeled as to the flow direction.

Accessibility - Sewer mains shall be installed in public right-of way wherever possible. Where mains cannot be installed in ROW a 20' wide exclusive City easement with a 14' all weather surface road must be constructed in the easement. Complete easement information must be shown on the submitted plans.

3.4.2 MATERIALS

Gravity Piping – Gravity sewer main piping shall consist of any of the following materials:

- PVC meeting ASTM D3034, SDR-26 (8" to 15")
- PVC meeting ASTM F679 PS115 (18" and larger)
- Concrete meeting ASTM C14, C76 or C655

Other sanitary sewer materials specifically approved by the City of Helena are given following.

Pressure Piping – Pressure sewer mains (force mains) shall consist of PVC Pressure Pipe, ASTM D2241, Class 200 SDR-21, or AWWA C900 Class 235 DR-18.

All pressure sewer mains (force mains) must have a tracer wire installed and tested for all lines regardless of pipe type. Pressure sewer mains tracer wire shall conform to the requirements set forth in Section 2.4.3 for water mains and be installed from the lift station building and terminate at the receiving manhole ring and cover. Pressure sewer mains shall also be installed with six-inch wide detectable tape marked "SEWER" located two feet below finished grade along the alignment of the new pressure sewer main.

Manholes – All manholes shall be constructed using reinforced pre-cast concrete unless specifically allowed by the Public Works Department in writing. Structural strength shall withstand H-20 design load.

All manholes installed at outfall lines must have PVC or polyurea liner installed to protect against H₂S gas.

Manhole Ring and Cover – Manhole cover shall have the City of Helena logo and shall be stamped "SANITARY SEWER" and shall be in compliance with City of Helena Standard Drawing 3-2. Final adjustment ring shall be made with Infra-Riser by East Jordan or approved equal.

3.4.3 INSTALLATION

Alignment and Grade - Public sanitary sewers shall be installed with a straight alignment and grade between manholes as required in MPWSS.

Location - Municipal wastewater system facilities shall be designed and constructed so that all such facilities are readily accessible for maintenance and repair. In addition, such facilities shall be situated to preclude the entrance of surface water into said facilities. All sewer mains shall be centered in the right-of-way or easement to the greatest extent possible. If this is not possible the sewer main shall be installed in the center of the driving lane and manholes kept out of the vehicle wheel lines to prevent damage.

Depth – Sanitary sewers shall be buried to a depth sufficient to prevent freezing and shall have a minimum depth of 4 feet. Shallower depths may be allowed by the Public Works Department if suitable pipe insulating provisions have been made and approved by the Department in writing.

Manholes – All sanitary sewer manholes shall be installed in accordance with City of Helena Standard Drawing 3-3 and applicable MPWSS Drawings. All drop manholes shall conform to City of Helena Standard Drawing 3-12.

Testing – All new sanitary sewer mains and manholes shall be tested in accordance with Montana Public Works Standard Specifications 7th or most recent edition Section 02730 – Sanitary Sewer Collection System. The City reserves the right to perform any and all of these tests prior to acceptance of sewer infrastructure. Pressure sewer mains must be leak tested and documented to1.5 X design pressure prior to acceptance by the City.

3.4.4 EXTENSION

Any extension of an existing City sanitary sewer main must be extended through the entire frontage length of the property to be served, with a standard manhole located at the terminus of the new sewer main as per Helena City Code 6-3-4 and these standards.

Sewer main extensions shall include all manholes, clean-outs and appurtenances deemed necessary by the City.

3.4.5 WATER LINE CROSSINGS

Crossings - A minimum of 18" vertical separation is required when a sanitary sewer main crosses above or below a water main, measured outside to outside of pipe. Please refer to MPWSS for further information on water line crossings.

Less than 18" vertical separation may be allowed when the <u>gravity</u> sewer at the crossing is made using a single 20' length of AWWA pressure pipe and the crossing is approximately 90° and the length of pipe is centered over the crossing. Specific authorization from the Montana Department of Environmental Quality and the Public Works Department in writing is required for a vertical separation of less than 18".

No exception of the minimum 18" vertical separation requirement is permitted when the sewage pipe is a force main.

Parallel – Unless specifically authorized by the Montana Department of Environmental Quality and the Public Works Department in writing, a minimum of 10' horizontal separation (measured edge to edge of mains) is required when a sanitary sewer main and water main are installed parallel.

3.4.6 ABANDONMENT OF EXISTING SANITARY SEWER MAINS

All sanitary sewer mains and manholes to be abandoned shall be excavated, removed, and disposed of whenever possible. The abandonment of existing sanitary sewer mains and manholes in place shall only be allowed with written permission from the Director of Public Works and shall be in accordance with these standards. All sanitary sewer mains and structures abandoned in place shall be inspected and approved by a City Engineering Division representative prior to backfilling. All sanitary sewer mains and structures abandoned in place shall be shown on the project's submitted record drawings.

Manholes – Sanitary sewer manholes shall be abandoned in place by removing all castings and/or entry grates and salvaging them to the City of Helena Utility Maintenance Department. Manhole sections are to be excavated and cone and upper shaft sections removed and disposed of to a minimal depth of five (5) feet below the finished ground surface. The manhole base shall be broken up using jackhammer, concrete core drill or equipment mounted hydraulic or pneumatic hammer, and the remaining manhole sections completely filled with sand, gravel, flowable fill or other approved material. The excavation shall then be backfilled using approved materials and compacted to 95% minimum relative compaction up to finished grade.

Mains - All sewer mains abandoned in place shall be completely filled with flowable fill or nonshrink grout or other material approved in writing by the Director of Public Works. Concrete plugs shall be placed at both ends of the abandoned sanitary sewer main.

3.5 SEWER SERVICE LINES

3.5.1 MATERIALS

Gravity Sewer Service Piping – Gravity sewer service piping shall consist of the following materials for the following situations:

PVC meeting ASTM D3034, SDR-26 or PVC Schedule 40 – Solvent Weld or SBR Gasket Joint for normal installations.

PVC Schedule 40 or Cement Lined Ductile Iron for installations within 2 feet of a building foundation.

PVC Schedule 40 for water main or water service crossing

PVC Schedule 40 with acrylonitrile butadiene (NBR) gaskets for installations in areas of hydrocarbon contamination.

Pressure Sewer Service Piping – Pressure sewer service lines shall consist of PVC Pressure Pipe, ASTM D2241, Class 200 SDR-21.

3.5.2 INSTALLATION

All sanitary sewer service lines must be so arranged that the discharge from each separately owned house premises, or buildings on separate lots is a separate service line that connects to the main. The owner of each house or premises is liable for the charges for the wastewater service provided by the city to that owner's house or premises.

Flag lots must have a minimum of 10 horizontal feet of frontage at the public right-of-way. Sewer service lines installed for a flag lot shall only serve a single platted parcel.

All sewer service lines shall be installed in accordance with MPWSS with a minimum of 4' of cover from the top of service pipe to final finished grade.

At all locations where sewer service lines are installed beneath new curb, the face of the curb shall be stamped with an "S" in lettering at least 3" tall, for marking the sewer service location.

All service line crossings under existing curbs by tunneling are prohibited.

All sanitary sewer service lines must have a tracer wire installed and tested for all service lines regardless of pipe type. Service line tracer wire shall conform to the requirements set forth in Section 2.4.3 for water mains and be installed from the sewer main and terminate within the structure or vault. Sanitary sewer service lines shall also be installed with six-inch wide detectable tape marked "SEWER" located two feet below finished grade along the alignment of the new sanitary sewer service line.

3.5.3 TAPPING CITY SEWER

Any person desiring to make connection to the city's water or sewer mains must make application in writing and pay for the cost of tapping in accordance with Helena City Code 6-2-4.

All applications for service connection to the city's wastewater system must be made at the office of the Building and Safety Division of the Community Development Department on the form for that purpose. Every such application must be made by the owner of the property to be served or the owner's authorized agent and must include the nature of wastewater discharged into the system. All sewer taps shall be inspected and approved by City Staff.

Taps on existing sewer mains to be completed using the properly sized Insert-a-tee.

When tapping a main that has been previously rehabilitated or lined, the original host pipe must be removed from an area sufficient to make tap directly to the new/inner pipe or liner.

Taps on sewer or storm water pipes should be in the upper quadrant of the pipe in the 10 o'clock or 2 o'clock positions with an Insert-a-tee fitting. See the following figure:



3.5.4 METERING WHEN NOT ON CITY WATER

For new city sewer services which do not use the city water system or whose water consumption or wastewater discharge is not otherwise metered, the Helena Public Works Director shall require the installation of a suitable metering device to determine an equitable charge for sewer services.

3.5.5 SOLIDS HANDLING/GRINDER PUMP/COMMUNITOR SERVICES

If a proposed sewer service is to handle bulk solids or garbage with discharged materials greater than one half inch (1/2"), or organic materials greater than one quarter inch (1/4") a grinder pump or comminutor must be installed such that all wastewater discharges are capable of passing through a quarter inch screen (1/4") as per Title 6 of City Code. A communitor or grinder pump service may be required at the discretion of the Director of Public Works based on the proposed use of the property and for pumped sanitary sewer services.

3.5.6 ABANDONMENT OF EXISTING SANITARY SEWER SERVICES

Abandonment of existing sanitary sewer service lines shall be made at the point of connection with the public sanitary sewer main by a method approved by the Director of Public Works in writing as per City of Helena City Code.

A street opening permit is required for permanently disconnecting sanitary sewer service lines at the sanitary sewer main in the street right of way. All sanitary sewer service line abandonments shall be inspected and approved by Public Works/Utility Maintenance staff prior to backfilling. The service line shall be disconnected, truncated and sealed within three (3) feet of the sanitary sewer main.

3.6 LIFT STATIONS

3.6.1 CAPACITY

The design capacity for a lift station shall be designed on a case-by-case basis by the design engineer to a reasonable capacity based on established wastewater flow estimation methodology or as outlined in Section 3.2 of these standards and other applicable standards including MT DEQ Circular 2. The designer shall provide a table in the design report for the design capacity for each non-residential lot. Multi-family lots with a 4-plex or greater are also considered commercial lots. During the building review process a letter from an engineer must be submitted certifying that the sewer capacity is not greater than the original design capacity of the lot. If the capacity for the building is greater, additional capacity may be required.

3.6.2 BUILDING

The building shall be constructed of masonry block and similar to the architectural style of the existing lift stations. The building style must be compatible with the surrounding zoning. The developer must install sidewalk adjacent to all rights-of way, a driveway, and curb cut so maintenance equipment can access the building and wet well.

3.6.2.1 LANDSCAPING

All lift stations must have low water/native vegetation and trees with an irrigation system for the landscape screening.

3.6.2.2 FENCING

All lift stations must be fenced with an 8' high black vinyl coated chain link fence with 2-strand barbed wire top. A minimum of two lockable gates must be provided; one for pedestrian access and one double gate that is able to swing 180° for allowing maintenance vehicles and equipment to access the site.

3.6.3 WET WELL

Must be lined with a spray on PVC or polyurea coating or approved equal by the Public Works Department.

3.6.4 PIPING

All piping must be stainless steel within the wet well and ductile iron in the building. The pipe must also be configured to accommodate bypass pumping with a blind flanged tee and isolation valve after the last check valve.

All fittings must be located out from under the lift station slab or located within a grated trench. All fittings must be accessible without damaging the building.

3.6.5 VALVING

All check valves must have external levers.

A three-way Dezurik plug valve must be installed at the point the two pumping lines join.

3.6.6 SAFETY

The wet well shall have a safety grate that is easily removable and integral to the hatch. The grate must be rated to at least 1000 lb. of loading. In addition to the hatch with a safety grate, removable handrails must also be supplied.

A compressor and two full-face masks with a minimum 50' hoses will be required for a fresh air supply. SCBA will not be acceptable as a fresh air supply.

3.6.7 PUMPS

The pumps shall be Gorman-Rupp, Paco, Flyght or equal as approved in writing by the Public Works Department.

3.6.8 TELEMETRY

The telemetry must be designed in accordance with the City of Helena Telemetry Design Standards.

3.6.9 PIGGING STATIONS

Any lift station with a force main of more than 2000' that does not have an existing flow of 50% of the design capacity at the time of construction must have pigging stations at regular intervals for periodic cleaning of the force main and considerations for lift station bypass during pigging operations.

3.6.10 ODOR CONTROL

All vents from the wet well or force main must be fitted with a carbon filter.

3.6.11 ON SITE GENERATOR

All lift stations must be supplied with an on-site generator. Generator sizing must be based on appropriate load testing and/or manufacturers' requirements. The generator must be a natural gas or diesel fuel unit located in a separate room within the building. An access door big enough to remove the generator for maintenance will be required for all lift station installations.

PART 4 – STORM DRAINAGE SYSTEMS

PART 4 STORM DRAINAGE SYSTEMS

4.1 INTRODUCTION AND STORM DRAINAGE POLICY

Storm drainage shall comply with Helena City Code: Title 6 - Public Works, Chapter 6 - Storm Water Control, and Title 3 - Building Regulations, Chapter 14 - Floodplain Regulations.

Storm drainage design criteria shall be the following in order of priority: City Engineering and Design Standards, Montana Public Works Standard Specifications, and then the most stringent criteria found in the technical references cited in these standards.

The most current City of Helena Storm Drainage Master Plan must be evaluated in the context of any site development such that the hydrologic and hydraulic conditions are accounted for and any impacts from or to a development are mitigated.

All State and Federal requirements shall be applied to all storm drainage systems. Where applicable, Railroad, Montana Department of Transportation, and Airport design specific requirements shall apply.

The following technical publications were utilized to develop these standards and may be referenced for all storm drainage design except as modified by these standards. A full bibliography is provided in Section 4.8.

- 1. Open Channel Hydraulics by Ven Te Chow
- 2. Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14, FHWA
- 3. Hydraulic Design of Highway Culverts, Hydraulic Design Series No. 5, FHWA
- 4. Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22 by FHWA
- 5. Montana Post-Construction Storm Water BMP Design Guidance Manual, MT DEQ
- 6. Storm Water Management During Construction Field Guide For Best Management Practices, MT DEQ
- 7. Montana Department of Transportation Drainage Manual Adoption of AASHTO Drainage Manual Chapter 7, MDT
- 8. National Engineering Handbook, Part 630: Hydrology by NRCS
- 9. Urban Hydrology for Small Watersheds, Technical Release 55 by NRCS
- 10. Urban Storm Drainage Criteria Manual, Volumes 1 to 3 by Urban Drainage and Flood Control District

All site development or redevelopment with up to 5,000 square feet impervious shall provide conveyance and discharge of runoff in a manner that does not adversely impact adjacent property owners.

All site development with greater than 5,000 square feet of impervious area shall provide water quality treatment and storm water retention or detention with release rates at or below the historic (undeveloped) peak flow rates for the 5-year and 100-year storm events.

All site redevelopment with greater than 5,000 square feet of impervious area shall provide water quality treatment and storm water retention or detention with a release rate at or below the historic

(undeveloped) peak flow rate for the 5-year storm event and provide conveyance of the developed peak flow rate for the 100-year storm event.

The volume of water requiring water quality treatment is referred to as the Runoff Reduction Volume (RRV) in these standards.

All runoff control facilities and conveyance systems shall be installed to prevent damage or nuisance water to adjacent properties and the public right-of-way due to the proposed development or redevelopment.

Discharge from any developed site shall not exceed the pre-developed (historic) conditions and shall discharge at the same flow rate and location as the pre-developed (historic) conditions or as approved by the City Engineer and as allowed for redevelopment.

All impacts to wetlands must comply with State and Federal regulations. Additionally, wetlands within the City are a limited and valuable resource and must be maintained or otherwise compensated for if they are negatively impacted by a development regardless of their State or Federal standing. If it is determined by the City Engineer that wetlands potentially exist on the site and will be impacted by the development, the owner/developer must hire a professional ecologist to determine the existence and extent of the wetlands.

A professional engineer certification is required for the design and completed construction of all storm water facilities.

Storm water runoff into the sanitary sewer system is prohibited.

Public storm drainage systems serve greater than one parcel, except where a residential parcel conveys runoff from three (3) or fewer off-site residential parcels.

Private storm drainage systems serve one parcel and where excepted above.

Public storm drainage systems will be maintained by the City

Private storm drainage systems shall be maintained by the property owner.

Storm drainage easements to the City must be provided for all components of public and private storm drainage systems on private land from the right-of-way, to and including, storm water runoff control and water quality treatment.

Storm drainage easements shall allow the City the right to enter private land for the purposes of operation and maintenance of public storm drainage systems and when private property owner(s) fail to adequately maintain their private storm drainage system.

4.2 DRAINAGE REPORT AND PLAN SUBMITTAL REQUIREMENTS

A Drainage Report and Plan is required for any development which creates more 5,000 square feet of impervious area or when a public storm sewer system is required.

The purpose of the Drainage Report is to identify and provide solutions to the problems that may occur on-site and off-site because of the development. All reports shall be prepared on 8 ½" by

11" paper and bound as a stand-alone document (Plans, maps, figures, and tables may be on 11"x17" sheets folded to 8 $\frac{1}{2}$ " by 11").

The drawings, figures and tables shall be bound with the report or included in a pocket attached to the report. The report shall be stamped by a professional engineer licensed in Montana.

Report Contents: The Drainage Report generally consists of a narrative portion and appendices with supporting calculations and other pertinent information. The narrative portion shall provide detailed discussion regarding the general location and description of the site, off-site and on-site drainage basins and sub-basins, drainage design criteria, storm water management facility design, and conclusions. Discussion of methodology, assumptions, input, and a summary of results shall be provided in the narrative for all hydrologic or hydraulic modeling efforts. Peak flow rates, storage volumes (RRV, detention), critical water surface elevations, and storm water management facility sizes shall be included in the report narrative.

The appendices must provide the appropriate backup information and calculations, but the reader should not have to review information contained in the appendices to have a clear and thorough understanding of the project and the storm water management analysis and facility designs.

The following is an outline of the minimum Drainage Report and Plan requirements:

4.2.1 COVER SHEET

- Name of Project
- Address
- Owner
- Developer
- Engineer
- Submittal date and revision dates as applicable

4.2.2 GENERAL LOCATION AND DESCRIPTION

Site Location

- Site Vicinity Map
- Township, Range, and Section
- Existing and proposed streets, roadways, and highways adjacent to and within the proposed development, or within the area served by the proposed drainage improvements
- Names of surrounding or adjacent developments, including land use or zoning information

Description of Property

- Area in Acres
- Ground Cover, vegetation, site topography and slopes
- NRCS Soils Classification Map and discussion
- Natural Drainageways and Wetlands
- Floodplains delineated on FEMA FIRM Maps
- Existing irrigation canals or ditches
- Significant geologic features
- Proposed land use
- Groundwater Conditions

4.2.3 DRAINAGE DESIGN REGULATIONS AND CRITERIA

Regulations

• Discussion of applicable Local, State and Federal regulations.

FEMA Flood Insurance Rate Maps

- Identify the FEMA FIRM the project is located on
- Identify any FEMA flood hazards
- Discuss proposed floodplain modifications
- Floodplain modifications must be designed in compliance with the City of Helena Floodplain Ordinance and all State and Federal regulations, standards, and guidance.

Additional Permitting Requirements

- Compliance with Section 404 of the Clean Water Act
- Compliance with the Endangered Species Act
- Compliance with other local, State, or Federal Permitting requirements

Existing Drainage Studies

- Discuss previous drainage studies for the project that influence the storm water facility design
- Discuss drainage studies for adjacent developments and how those developments affect the storm water facility design

4.2.4 EXISTING SITE CONDITIONS

Physical Constraints

• Discuss impacts to storm water design, caused by site constraints, such as streets, utilities, existing structures, etc.

Groundwater

- Discuss groundwater investigations and results
- Identify potential groundwater issues
- Discuss methods to manage groundwater impacts

Waterways and Wetlands

- Discuss any waterway and wetlands investigations and results
- Identify any waterways and potential wetlands adjacent to or on the site
- Discuss methods to protect, preserve and mitigate impacts to waterways and wetlands

4.2.5 HYDROLOGIC AND HYDRAULIC DESIGN METHODS

Hydrology

- Runoff calculations method(s)
- Design storm recurrence intervals and depths
- Detention storage calculation method(s)
- Detention storage release rate calculation method

Hydraulics

- Methods used to determine channel and storm sewer capacities
- Hydraulic and energy grade line calculation method and discussion of energy loss coefficients
- Methods used for design of hydraulic structures, outlet protection and erosion control
- Methods used for designing storm water pond outlet structures

4.2.6 DRAINAGE BASINS

- On-site and off-site drainage basin characteristics and flow patterns and paths under historic and developed conditions.
- Existing and proposed land uses within the basins
- Discussion of the impacts of the off-site flow patterns and paths under fully developed conditions
- Discussion of irrigation facilities that will influence or be impacted by the site drainage

4.2.7 EXISTING STORM WATER CONVEYANCE OR STORAGE PONDS

Existing Storm Water Conveyance Facilities

• Discussion of how existing conveyance facilities will be incorporated or modified

Existing Storm Water Storage Ponds

• Discussion of how existing Storage Ponds will be incorporated or modified

4.2.8 PROPOSED STORM WATER CONVEYANCE OR STORAGE PONDS

Storm Water Conveyance Facilities

- Discuss general conveyance concepts
- Discuss proposed drainage paths and patterns
- Discuss allowable street capacities
- Discuss storm sewer design, including inlet and pipe locations and sizes, tributary basins and areas, peak flow rates at design points, hydraulic grade lines, groundwater impacts, etc.
- Discuss storm sewer outfall locations and design, including method of energy dissipation
- Discuss how runoff is conveyed from all outfalls to the nearest public storm water system
- Discuss open channel and swale designs, including dimensions, alignments, tributary basins, peak flow rates, stabilization, water surface elevations, groundwater impacts, etc.
- Discuss easements
- Discuss facilities proposed offsite for the conveyance to a public storm drainage system

Storm Water Ponds

• Discuss storm water pond designs, including tributary area, release rates, storage volumes, and water surface elevations, emergency overflow conditions, outlet structure design, groundwater impacts, etc.

- Discuss the design of all water quality treatment BMPs, including tributary areas, sizing, treatment volumes (RRV), design features, etc.
- Discuss pond outfall locations and design, including method of energy dissipation
- Discuss how runoff is conveyed from all pond outfalls to the public storm drainage system
- Discuss easements

4.2.9 EROSION AND SEDIMENT CONTROL

- Discuss overall erosion and sediment control plan
- Discuss BMPs used on the site
- Discuss soil type, site topography and potential for erosion
- Discuss use, size and location of sediment basin and sediment trap

4.2.10 CONCLUSIONS

Compliance with Standards

- City of Helena Engineering Design Standards
- Applicable Local, State and Federal Regulations

Engineering Deviations

- Identify provisions by section number for which a deviation will be requested
- Provide justification for each deviation requested

4.2.11 **REFERENCES**

• Reference all criteria, reports, or other technical information used in development of the drainage report and plan

4.2.12 APPENDICES

Hydrologic Computations

- Determination of runoff coefficients, times of concentration, and runoff calculation
- Land use assumptions for off-site areas
- Peak flow rate calculations for the minor and major storms
- Rainfall Information
- Hydrograph data, if applicable
- Connectivity diagram showing relationship/connectivity of basins, conveyance facilities, detention ponds, and design points
- Floodplain hydrology

Hydraulic Computations

- Culvert Capacities
- Storm sewer capacities and hydraulic grade lines, including the loss coefficients
- Street capacities
- Inlet capacities
- Open channel or swale capacities

SECTION PART 4 STORM DRAINAGE SYSTEMS 4.2 DRAINAGE REPORT AND PLAN SUBMITTAL REQUIREMENTS 4.2.1.13 Drainage Plans

- Stabilization and grade control improvements
- Water surface profiles
- Emergency spillway sizing calculations
- Downstream capacity to and of the receiving public drainage system
- Energy dissipation at pipe outfalls
- Floodplain modeling

Storm Water Ponds

- Infiltration investigation and capacity
- Groundwater investigation
- Retention Pond sizing and drain-down
- Detention Pond stage-storage-discharge determination
- Water Quality Treatment sizing and discharge

4.2.13 DRAINAGE PLANS

Overall Drainage Plan

- Appropriate size and scale for legibility
- Title block and legend
- Show boundaries of entire development or project
- Existing or proposed streets, roadways, or highways
- Topography
- Show limits of all major basins, including off-site basins
- General drainage patterns and flow paths, including those entering and leaving the site
- Location and outline of detention/retention and water quality facilities
- Significant existing and proposed infrastructure including: storm water ponds, waterways, wetlands, channels, storm sewers, above and below ground utilities, gas transmission lines, railroads, etc.
- Floodplain boundaries

4.2.14 DETAILED DRAINAGE PLANS

- Title block and legend
- Basin designations, design points, flow rates, volumes, release rates identified
- Scale 1"= 20' to 1"= 100', or as required to show sufficient detail
- Existing (dashed or screened) and proposed (solid) contours with two (2) foot maximum contour intervals. In terrain where the slope exceeds 15%, the maximum interval is five (5) feet. Contour must extend a minimum of 100 feet beyond property lines
- Existing utilities and structures
- All property lines and easements with type of easements noted
- Adjacent developments or ownerships
- Streets and roadways with ROW and paved widths, type of curb and gutter or roadside swale, slope, flow directions, and cross-slopes
- Drainage basin and sub-basin limits

- Existing and proposed storm water management facilities, including irrigation ditches, roadside swales, open channels and drainageways, storm sewers, culverts, detention ponds, water quality enhancement structures or features, etc. Information must be included regarding materials, sizes, shapes, and slopes
- Proposed outfall points and existing or proposed facilities to convey runoff to the nearest public drainage system with capacity for discharge rates from the site
- Location and elevation of all existing and proposed FEMA 100-year floodplain boundaries
- Summary Runoff Table, includes Basin ID, contributing area, runoff coefficient, % imperviousness, runoff value, design point and the routed flows.

4.2.15 EROSION AND SEDIMENT CONTROL PLANS

• See Section 4.7.2. for erosion and sediment control plan sheet requirements.

4.3 HYDROLOGIC ANALYSIS AND DESIGN

4.3.1 DESIGN STORM EVENTS

- Water Quality 0.5 Inches of Precipitation
- 5-year, 24-hour storm (Runoff Control and Street conveyance)
- 25-year, 24-hour storm (Channels and Storm Sewers Conveyance)
- 100-year, 24-hour storm (Combined Conveyance and Runoff Control)

4.3.2 RAINFALL

The rainfall depths provided in the following table are for use with hydrograph analyses to estimate peak rates of runoff and runoff volumes. These values were obtained from Chapter 7 Appendix B of the Montana Department of Transportation Drainage Manual, 2017.

Design Storm	Precipitation, inches
Water Quality	0.50
5-year, 24-hour	1.57
25-year, 24-hour	2.05
100-year, 24-hour	2.44

Table 4-1. Precipitation Levels for the City of Helena

Rainfall intensity-duration-values provided in the following table are for use with the Rational Method for determining peak rates of runoff. These values were obtained from Chapter 7 Appendix B of the Montana Department of Transportation Drainage Manual, 2017.

Duration	Return Period		
Duration	5-year	25-year	100-year
5 minutes	4.26	6.38	8.31
10 minutes	2.82	4.21	5.45
15 minutes	2.15	3.21	4.14
30 minutes	1.31	1.95	2.51
60 minutes	0.74	1.09	1.39

Table 4-2.	Precipitation	Intensity	Values,	Inches/Hour

4.3.3 HYDROLOGIC MODELS

There are two methods for allowed estimating storm runoff peak flows: SCS Runoff Curve Number Method and the Rational Method. Technical guidance for the SCS curve number method can be found in TR-55. Technical guidance for the Rational Method can be found in the Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22; and the National Engineering Handbook, Part 630 Hydrology.

There are two methods allowed for estimating storm runoff volumes: SCS hydrograph procedure and Simplified Volume. The SCS hydrograph procedure can found in TR-55 and for routing hydrographs in TR-20. The Simplified Volume method is only allowed for sizing retention storm water ponds and detention ponds with less than 10 acres of tributary area. The Simplified Volume method is described in Section 4.5.5. Retention Ponds.

The SCS methods may be used for estimating runoff peak flows and total runoff volumes. A SCS hydrograph procedure shall be used for all tributary areas greater than 160 acres and for routing runoff flows through detention ponds with tributary areas greater than 10 acres. The SCS methods shall be performed with 24-hour storm events, Type II rainfall distributions, and resolved to 5-minute time intervals.

The rational method may be used for determining peak runoff flows from tributary basins up to 160 acres.

Offsite Drainage Evaluation: Drainage analysis must include an evaluation of all off-site drainage basins impacting the proposed site. Offsite drainage evaluation must include the results of the hydrologic and hydraulic analysis contained in the most current City of Helena Storm Water Master Plan.

Any site discharging developed flows must evaluate the route and downstream capacity of the drainage system and provide adequate capacity from the site to the point where flows are reduced to the pre-developed rates and discharge conditions.

Offsite drainage areas exceeding 25% of the site area or 25 acres, whichever is smaller, must be routed around, to discharge below, the site or regional storm water pond.

Offsite drainage areas routed to a storm water pond shall be included in the pond rate, volume, and water quality controls for its existing developed condition or its future developed condition based on zoning, whichever has more impervious area.

4.4 CONVEYANCE DESIGN

4.4.1 **OPEN CHANNELS**

Natural Channels: In general, natural channels are limited in within the Helena, and as such, these standards do not provide guidance in this regard. Any impacts to a natural waterway will be evaluated with City Engineering on a case-by-case basis.

<u>Man-made Channels</u>: Only vegetated man-made channels are allowed in the City. No hard lined, rock or concrete, channels are allowed. Man-made channels must be evaluated for stability during the post-construction (pre-vegetation) and ultimate (vegetated) condition. Design criteria for man-made channels is provided in the following table.

Design Item	Minor Channel	Major Channel
100-year Flow Capacity	Less than 50 cfs	More than 50 cfs
Maximum 100-year Velocity	7 feet per second	5 feet per second
Manning <i>n</i>	0.035	0.035
Maximum Froude Number	0.8	0.5
Maximum Depth	2 feet	5 feet
Maximum Slope	2.5%	0.6%
Maximum Side Slope	3:1	4:1
Maximum Centerline Bend Radius	2 times top width	2 times top width
Minimum Freeboard	0.5feet	1.0 feet
Minimum Freeboard >2 to 5 feet Depth	1.0 feet	1.0 feet

Table 4-3. Design Criteria for Man-Made, Grass-Lined Channels

Temporary erosion control linings are necessary prior to establishment of vegetation. Temporary erosion control lining must be biodegradable and designed to be stable during the 5-year storm event.

Grade control structures may be required to meet the maximum longitudinal channel slopes in Table 4.3. Grade control structures shall be designed in accordance with Federal Highway Administration, Hydraulic Design of Energy Dissipaters for Culverts and Channels, Hydraulic Engineering Circular No. 14.

Any use of riprap shall be mixed with soil at a rate of 1/3 soil to 2/3 riprap and covered with 6 inches of topsoil.

Technical design guidance for Open-channels can be found in Open-Channel Hydraulics by Ven Te Chow.

Major channels must be excavated and not have any embankments.

4.4.2 STORM SEWERS

Materials: As allowed by MPWSS with the following exceptions: Concrete pipe shall be steel reinforced and rubber gasket joints, the minimum diameter pipe size for public storm sewer systems shall be 12 inches. and High-Density Polyethylene and Metal pipe are not allowed.

All open ends of storm sewers have a concrete flared end section and galvanized steel safety rack. All safety racks shall be constructed from smooth steel pipe with a minimum outside diameter of one (1) inch at four (4) inches on-center. The safety racks ends and bracing should be constructed with steel angle sections.

Riprap inlet and outlet protection is required at all open ends of storm sewers.

Any use of riprap shall be mixed with soil at a rate of 1/3 soil to 2/3 riprap and covered with six (6) inches of topsoil.

All storm sewers must be designed for a minimum of H-20 loading unless other circumstances require higher structural loading requirements.

Hydraulic Design: Storm Sewers shall have non-pressurized (non-surcharged) flow during the 25-year storm event. Storm Sewers shall not have the hydraulic grade line greater than one (1) foot above the ground surface at any point during the 100-year storm event.

Hydraulic and energy grade line shall be calculated by accounting for all pipe friction losses and structure losses. Hydraulic and energy grade lines shall be shown on all storm sewer plan a profile sheets for public storm sewer systems.

Backwater effects of outfalls into channels and storm water ponds must be accounted for in the design of storm sewers.

Maximum internal velocity shall be 25 feet-per-second (fps) during the 25-year storm event, and the minimum velocity shall be 2.5 fps at 10% of full flow capacity. The maximum outlet velocity into a waterway, open channel, or storm water pond shall not exceed 15 fps.

Inlet and outlet protection shall be designed in accordance with Federal Highway Administration, Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14.

Vertical Alignment: The minimum clearance between storm sewer and water main, either above or below, shall be 18 inches, or as otherwise restricted. Concrete encasement of the water line will be required for clearance of 18 inches or less. Minimum vertical clearance to other buried utilities is provided in the following table.

Utility Type	Clear Distance
Cable TV	Per Utility Owner, 12 inches minimum
Gas	Per Utility Owner, 12 inches minimum
Power	Per Utility Owner, 12 inches minimum
Sewer main	12 inches
Telephone, Fiber Optics	Per Utility Owner, 12 inches minimum
Water main*	18 inches or DEQ Circular 1, whichever is greater

 Table 4-4.
 Vertical Clear Distances from Storm Sewers

* All storm sewer crossings of water mains less than three (3) feet clear distances shall have two (2) inches of rigid insulation placed between the pipes for a width two (2) feet wider than the storm sewer and for four (4) feet on either side of the water main.

The minimum slope shall be 0.5% for pipes 24 inches and greater and 1% for pipes smaller than 24 inches.

All storm sewers shall be buried a minimum of one (1) foot below the pavement section and 1.5 feet below finished grade in landscaped areas. Storm sewer pipe shall not be buried greater than 15 feet deep.

Open pipe outfalls must discharge a minimum of one (1) foot above a channel invert or storm water pond.

Manhole or inlet access is required at all vertical bends.

Horizontal Alignment: Storm sewers shall not be placed under any structure, retaining wall greater than three (3) feet tall, or building. Storm sewers shall be a minimum of 10 feet from any permanent above-ground structure, retaining wall greater than three (3) feet tall, or building, or the same distance as the buried depth of the storm sewer, whichever is greater. Storm sewers shall not be placed in under the landscaped boulevards or medians except to make crossings or when buried greater than three (3) feet from the top of the pipe to finished grade.

Utility crossing shall occur between 45 degrees and 90 degrees. Where storm sewer pipes cross over or below a water main, one full length of pipe shall be used with the pipes centered for maximum joint separation. Minimum horizontal clearance to other buried utilities is provided in the following table.

Utility Type	Clear Distance
Cable TV	Per Utility Owner, 5 feet minimum
Gas	Per Utility Owner, 5 feet minimum
Power	Per Utility Owner, 5 feet minimum
Sewer main	5 feet
Telephone, Fiber Optics	Per Utility Owner, 5 feet minimum
Water main	10 feet or DEQ Circular 1, whichever is greater

 Table 4-5. Horizontal Clear Distances from Storm Sewers

Manhole or inlet access is required at all changes in horizontal alignment.

Storm Sewer System Connections: Connections to a public storm sewer system must occur at an accessible structure such as a manhole or inlet, or by an open pipe outfall to channel or storm water pond. Connections must be made by saw cutting or through an existing knockout and sealed to a watertight connection with non-shrink grout.

Angle between the inflow pipe and outflow pipe shall be 90 degrees or greater.

Private storm sewer systems must be accessible by an easement on the private property through a straight run of pipe no greater than 400 feet in length, and through a manhole, inlet, or end of an open pipe.

Roof drains or underdrains must be connected meeting the requirements of this section.

<u>Abandoning Storm Sewer Pipes and Structures</u>: The Contractor shall either remove or completely fill the pipeline to be abandoned with flowable fill.

Structures within the public right-of-way, a public easement, or which are part of the publicly owned and maintained system must be removed completely or the top 24 inches of the structure must be completely removed and the structure filled with flowable fill, compacted pipe bedding, or trench backfill material.

No storm sewer pipes or structure may be abandoned in place if they conflict with existing and future public works infrastructure installation or maintenance.

4.4.3 MANHOLES

Materials:

- All manholes must be concrete.
- All manhole covers must be ductile or cast iron.

<u>Manhole Design/Construction Requirements</u>: The minimum undisturbed wall between openings is 12 inches.

All manhole covers shall have City of Helena logo and stamped "STORM SEWER" in block letters at least one and a quarter inch $(1 \frac{1}{4})$ inches high, recessed to be flush with the surface (Standard Drawing 4-9).

Where riser bricks (blocks) are used to bring the frame to grade, the maximum height of the brick shall be two rows. If more than two rows of bricks are required, a precast riser section shall be used along with no more than two rows of bricks to complete the adjustment.

No steps are permitted in a manhole. All manholes shall have a one (1) foot sump below the lowest invert.

All manholes must be designed for a minimum of H-20 loading unless other circumstances require higher structural loading requirements.

Manholes

Location: Manhole lids shall not be placed in the wheel travel path. Manholes shall be located a maximum distance of 400 feet for pipe diameters up to 36 inches and 600 feet for pipe diameters greater than 36 inches.

<u>Hydraulics</u>: Head losses shall be accounted for at all manholes.

4.4.4 INLETS

<u>Materials:</u>

- All inlets must be concrete.
- All grates shall be cast or ductile iron.

Inlet Design/Construction Requirements: All grates shall have "No Dumping, Drains to Stream" stamped in block letters at least two (2) inches high and recessed so as to be flush with the surface. On-grade inlets shall be vaned. Inlet grates shall be bike and pedestrian safe.

No steps are permitted in an inlet. All inlets shall have a one (1) foot sump below the lowest invert.

All inlets must be designed for a minimum of H-20 loading unless other circumstances require higher structural loading requirements.

Location: Inlets shall be located in the curb line. Where roads are super-elevated, an inlet shall be placed where the standard cross-slope of the road begins to diminish (1% cross-slope) to prevent flow across travel lanes. Inlets shall be placed on the upstream side of all pedestrian crossings.

<u>Hydraulics</u>: For sub-basins less than one (1) acre, inlets with a curb opening are required at all low points. For drainage sub-basins greater than one (1) acre, double inlets with a curb opening are required at all low points.

Area drains in low points shall be sized assuming 50% of the inlet grate capacity is clogged and ineffective. Inlet capacities and by-pass flow shall be calculated. By-pass flow leaving the site shall be reduced to the historic rate.

Head losses shall be accounted for at all inlets.

4.4.5 CULVERTS

The requirements under storm sewers apply to culverts. The minimum culvert diameter is 18 inches.

Hydraulic design of culverts shall be performed in accordance with Federal Highways Administration, Hydraulic Design of Highway Culverts, Hydraulic Design Series No. 5.

Inlet and outlet protection shall be designed in accordance with Federal Highway Administration, Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14.

The maximum headwater during the 100-year storm event shall be 1.5 times the culvert diameter or culvert rise.

4.4.6 STREETS

All drainage design involving the use of streets for drainage shall meet the standards in the following tables for evaluating allowable encroachments within public streets for conveying runoff.

Street	Maximum Encroachment for Calculating Theoretical Conveyance Capacity		
Classification	5-year Storm Event	100-year Storm Event	
Local	For six (6) inch curb, no curb overtopping and flow may spread to crown of street, whichever is lower depth.	Residential dwellings, public, commercial, and industrial buildings shall not be inundated at the lowest adjacent grade. The	
Collector	For six (6) inch curb, flow may spread to back of walk and to crown of street, whichever is lower depth. Flow spread must leave at least one 10-foot lane free of water.	depth of water at the gutter flowline shall not exceed 12 inches or the water surface shall not extend past the street right-of-way (or adjacent drainage easement), whichever is more restrictive	
Arterial	For six (6) inch curb, flow may spread to back of walk and to crown of street, whichever is lower depth. Flow spread must leave at least 10-feet free of water for each travel direction.	Residential dwellings, public, commercial, and industrial buildings shall not be inundated at the lowest adjacent grade. To allow for emergency vehicle access, the depth of water shall not exceed six (6) inches at the street crown, 12 inches at the gutter flowline, or the water surface shall not extend past the street right-of-way (or adjacent drainage easement), whichever is more restrictive.	

Table 4-6. Allowable Drainage Encroachment within Public Streets by Street Classification.

Cross-street flow is not allowed for collector and arterial roads.

4.4.7 FLOODPLAINS

All work within the Federal Emergency Management Agency (FEMA) flood hazard area shall comply with FEMA regulations, standards, and guidance, Helena City Code: Title 3 Building Regulations, Chapter 14 Floodplain Regulations, and as required by the City Engineer.

4.5 STORM WATER RUNOFF CONTROL & WATER QUALITY TREATMENT

All site development or redevelopment with up to 5,000 square feet impervious shall provide conveyance and discharge of runoff in a manner that does not adversely impact adjacent property owners.

All site development with greater than 5,000 square feet of impervious area shall provide water quality treatment and storm water retention or detention with release rates at or below the historic (undeveloped) peak flow rates for the 5-year and 100-year storm events.

All site redevelopment with greater than 5,000 square feet of impervious area shall provide water quality treatment and storm water retention or detention with a release rate at or below the historic (undeveloped) peak flow rate for the 5-year storm event and provide conveyance of the proposed (developed) peak flow rate for the 100-year storm event.

Site development - new impervious area on undeveloped land.

Undeveloped land - bare ground or ground covered with vegetation

Redevelopment - replacement of existing impervious area with new impervious area

Impervious area - land covered with pavement, concrete or buildings or other impervious surface Gravel parking areas shall be considered 50% impervious

Undeveloped or developed-combination of all impervious surfaces for use in hydrologic analyses
Low Impact Development (LID) techniques may be used in lieu of water quality treatment. LID design guidance is available using the Montana Post-Construction Storm Water BMP Design Guidance Manual (MTDEQ, 2017) or the Urban Storm Drainage Criteria Manual (UDFCD, 2010). LID techniques shall be designed in coordination with the City Engineering.

All portions of above-ground storm water ponds must be vegetated. Specific standards for types of runoff control and water quality treatment ponds are provided in these standards. For additional pond design guidance review of the Montana Post-Construction Storm Water BMP Design Guidance Manual (MTDEQ, 2017) or the Urban Storm Drainage Criteria Manual (UDFCD, 2010) is recommended. See Post-Construction Storm Water Management Plan Review Checklist in Appendix A.

4.5.1 **REGIONAL PONDS**

Any site proposing to use a regional pond (storm water pond serving more than one lot) must be designed to provide capacity for the fully developed tributary drainage basin.

If an existing regional pond is proposed to be used for storm water runoff control and water quality treatment, that pond must be modified to meet the current standards for its entire tributary area. A schematic design standard for an above ground extended detention basin that could be adapted for use as a regional facility is provided in Standard Drawing 4-8.

4.5.2 ABOVE-GROUND DETENTION PONDS

Design Frequency, Volume, and Release Rates: Above-ground detention ponds must store excess runoff from the developed condition and release it at the historic (pre-developed) rates to the public storm water system or an existing drainageway for the 5-year and 100-year, 24-hour storm events. Inflow and outflow hydrographs must be generated to estimate the pre-developed and developed runoff volumes and rates.

Configuration Requirements: The following design requirements for above-ground detention ponds must be incorporated into the pond design:

- The maximum capacity is 10 acre-feet.
- The maximum water depth is five (5) feet;
- The top of any cut slope and the toe of any fill slope shall be 3 horizontal feet or greater from the property boundary;
- The length to width ratio shall be 2:1 or greater;
- A minimum of one (1) foot of freeboard shall be provided;
- Side slopes shall be 3H:1V or flatter;
- Inlet and outlet shall be arranged at opposite ends of the pond;
- The base shall have a minimum slope of 0.5% from the inlet to the outlet;
- A schematic design standard for an extended detention basin meeting the above configuration requirements is provided in Standard Drawing 4-8;
- Retaining walls are not allowed to exceed three (3) feet inside or outside of the pond;

- If groundwater is encountered or expected to be within three (3) feet of the bottom of the storm water pond, then the storm water pond shall be designed in coordination with, and as required by the City Engineer, as a wet bottom pond; and
- Outlets shall be designed in accordance with Section 4.5.7. Outlet Structures.

4.5.3 PARKING LOT DETENTION PONDS

Only detention ponds are allowed in a private parking lot. Parking lot retention ponds are not allowed.

Design Frequency, Volume, and Release Rates: The same requirements as in Section 4.5.2. Above Ground Detention Ponds apply.

Parking lot detention ponds may not be used to store either the water quality or the 5-year storm event volume.

Inflow and outflow hydrographs must be generated to estimate the pre-developed and developed runoff volumes and rates.

<u>**Configuration Requirements**</u>: In addition to the configuration requirements under Section 4.5.2. Above Ground Detention Ponds, the following shall apply to parking lot detention ponds:

- Parking lot detention may not exceed 12 inches in depth;
- Parking lot detention ponds must be located in the outer portion of the parking lot, a minimum of 40 feet from the building; and
- Parking lot detention ponds shall not inundate handicap parking spaces.

4.5.4 UNDERGROUND DETENTION POND

Only private underground detention ponds are allowed. Underground retention ponds are not allowed. Prior to discharge to an underground detention pond, storm water must pass through an above-ground water quality treatment pond. The requirements under Section 4.4. CONVEYANCE DESIGN for storm sewers and manholes shall apply to underground detention ponds except that all material types per MPWS are allowed and as approved by the City Engineer.

Design Frequency, Volume, and Release Rates: The same requirements as in Section 4.5.2. Above-Ground Detention Ponds apply.

<u>Configuration Requirements</u>: Sites smaller than one acre must drain to a single underground detention pond unless there is a physical impracticability as determined by City Engineering. Sites larger than one (1) acre must drain to a maximum of one (1) pond per acre such that any pond has a minimum tributary area of one (1) acre unless there is a physical impracticability as determined by the City Engineer. Configuration requirements include:

- Underground detention ponds must be located under a parking lot or landscaped area;
- The minimum width and height of any underground detention vault shall be 36 inches;

- The void or pore space in buried gravel or rock is not allowed for use a storage capacity;
- Multiple underground chambers must be connected by a head pipe at the upstream end and a tail pipe at the downstream end. The head and tail pipes must be of similar size as the chambers;
- Inlet pipes must be connected to the head pipe;
- Only one outlet is allowed which must be connected to the tail pipe;
- Access manholes, meeting the requirements under Section 4.4.3. Manholes, are required at the inlet pipe(s), outlet pipe and at 400 foot spacing along each chamber; and
- Underground detention ponds are not allowed where groundwater is present within five (5) feet of the base of the pond.

4.5.5 RETENTION PONDS

Design Frequency, Volume, and Release Rates: Retention ponds shall be above-ground, and designed to capture the 100-year, 24-hour storm event and infiltrate that volume in 24 hours. Inflow outflow hydrographs may be used for retention pond sizing or the Simplified Volume Method outlined below may be used. Infiltration rates shall be based on soil classification or percolation testing as described in Section 4.5.6. Water Quality Treatment Ponds.

Simplified Volume Method

The minimum pond volume shall be the runoff volume less the infiltration volume. The runoff and infiltration volumes must be calculated as indicated below:

$$RV = \frac{C \times P_{100yr,24hr} \times A}{12}$$

Where:

RV =	Runoff Volume (cubic feet)
C =	Composite runoff coefficient
$P_{100yr, 24hr} =$	100-year, 24-hour precipitation Depth (inches)
A =	Area (square feet)

$$IV = \frac{I \times T \times (A_b + 0.5A_s)}{12}$$

Where:

IV =	Infiltration Volume (cubic feet)
I =	Infiltration rate (inches/hour)
T =	24 (hours)
$A_b =$	Area of pond base (square feet)
$A_s =$	Area of pond side slope (square feet)

Configuration Requirements:

- Retention ponds must be above-ground;
- The maximum capacity is 10 acre-feet;
- The maximum water depth is five (5) feet;
- The top of any cut slope and the toe of any fill slope shall be 10 feet or greater from the property boundary;
- The length to width ratio shall be 2:1 or greater;
- A minimum of one (1) foot of freeboard shall be provided;
- Side slopes shall be 3H:1V or flatter; and
- Retaining walls are not allowed to exceed three (3) feet inside or outside of the pond.

If groundwater is encountered or expected to be within three (3) feet of the bottom of the storm water pond, then the storm water pond shall be designed in coordination with, and as required by the City Engineer as a Wet Bottom Pond.

4.5.6 WATER QUALITY TREATMENT PONDS

All site development or redevelopment with an impervious area of greater than 5,000 square feet must be routed to an on-site quality treatment pond. Water quality ponds for development and redevelopment greater than one (1) acre must be designed in accordance with Infiltration Basins in the Montana Post-Construction Storm Water BMP Design Guidance Manual.

Low Impact Development (LID) techniques may be used in lieu of water quality treatment. LID design guidance is available using the Montana Post-Construction Storm Water BMP Design Guidance Manual (MTDEQ, 2017) or the Urban Storm Drainage Criteria Manual (UDFCD, 2010). LID techniques shall be designed in coordination with the City Engineering.

All motorized (recreational, small engine, passenger, truck, and construction) vehicle and equipment fueling stations, and service/repair facilities shall route all parking lot storm water to an appropriately sized oil/sand and water separator or separate water quality treatment pond.

All dumpster areas shall drain to a separate and adjacent Water Quality Treatment Pond.

Design Frequency, Volume, and Release Rates: Water Quality Treatment Ponds shall be designed to capture and infiltrate, evaporate and/or evapotranspirate runoff volume from 0.5 inches of precipitation from a 24-hour storm over the tributary area. This volume is referred to as the Runoff Reduction Volume (RRV).

- The RRV shall be calculated as shown in the Montana Post-Construction Storm Water BMP Design Guidance Manual. An additional 10% must be included with the RRV for sediment storage. Imperviousness of roofs, pavement and concrete shall be 100%.
- The RRV shall be in addition to the capture volume for detention ponds. No additional volume is required for retention ponds.

- Water quality treatment ponds shall be designed to infiltrate the RRV in less than 48 hours.
- If infiltration within 48 hours is not possible based on geotechnical percolation tests, then the RRV may be released over 48 hours. The maximum tributary area to the water quality treatment pond is 300 acres or when a base flow exceeds 50% of the release rate.

Water Quality Pond Configuration for greater than 5000 sf of imperviousness and less than a 1-acre development or redevelopment:

- The minimum RRV shall be 250 cubic feet;
- The surface area of the RRV shall encompass no more that ½ of the area of the base of the storm water pond;
- RRV shall be located at the outlet and below the lowest outlet invert of the storm water pond;
- The maximum water depth is three (3) feet; and
- Side slopes shall be minimum 3H:1V.

Infiltration Rates: Infiltration rates for sizing water quality treatment and retention ponds shall be based on the percolation rate and USDA soil texture as required below.

Soil types shall be determined based on grain size distribution by sieve analysis (ASTM D6913) and hydrometer analysis (ASTM D422) for major subdivisions, commercial sites and sites serving more than one (1) acre of imperviousness.

Percolation rates shall be determined by ASTM D 3385 for major subdivisions, commercial sites and sites serving more than one acre of imperviousness. The percolation rate and soil type shall be measured and obtained at a depth equal to the proposed bottom grade of the facility. The location of the soil sample and percolation test shall be shown on a map.

The maximum percolation rates for soil types shall be:

Soil Texture Class	Infiltration Rates		
(U.S.D.A.)	(Inches per Hour)		
Coarse sands, cobbles	20.0		
Medium sand	8.0		
Fine sand, loamy sand	2.4		
Sandy loam	1.0		
Loam	0.5		

Table 4-7. Maximum Percolation Rates for Soil Types

The actual or maximum percolation rates, whichever is less, shall be reduced by one-half for use as the infiltration rate to determine the drain-down time of the RRV. This reduction is to account for sedimentation and silting in of the natural soil profile and subsequent reduced infiltration rate over time.

4.5.7 OUTLET STRUCTURES

Outlet structures shall be designed in accordance with Urban Drainage and Flood Control District, Urban Storm Drainage Criterial Manual, Volume 3, Chapter 4: Treatment BMPs, Treatment Fact Sheet T-12 Outlet Structures. A simplified outlet structure meeting these standards is provided in Standard Drawings 4-9 and 4-10.

4.5.8 EMERGENCY SPILLWAY

All storm water ponds must have an emergency spillway with a capacity equal to peak flow from the undetained 100-year storm event.

The emergency spillway must have non-erosive velocities or include erosion protection.

No structures or surface features (e.g., fences, barriers, landscaping) that would divert the overflow are allowed within the flow path of runoff discharged from the emergency spillway flow path.

4.5.9 MAINTENANCE ACCESS AND RESTRICTIONS

A vehicle access ramp shall be provided from a parking lot or road to the base of all storm water ponds with a minimum width of 12 feet, a maximum slope of 15% and must be surfaced with six (6) inches of road base course.

When required by the City Engineer or when safety is a concern, a gate, removable bollards, and fencing must be included to restrict access to the pond.

4.5.10 EMBANKMENTS

All embankments greater than three (3) feet in height or impounding more than one (1) acre-foot of water shall be compacted to ASTM D1557, have minimum crest width of eight (8) feet, and shall have a permeability of less that 1×10^{-5} cm/sec.

The maximum embankment height is six (6) feet. The embankment height is measured from the downslope toe to the crest of the embankment.

Anti-seep collars shall be installed on all conveyance pipes within the embankment.

4.5.11 VEGETATION AND LANDSCAPING

All storm water ponds, except parking lot and under-ground ponds, and channels shall be covered with six (6)-inches of topsoil and be vegetated with seed mixes for native areas in Open Space Areas as shown below or sod if the area is irrigated. Wetland areas must be seeded with a wetland seed mix approved by the City of Helena Open Lands Manager.

Native Areas in City of Open Space shall be seeded with the following seed mixes:

Droughty Site	(south aspects)	Moderately cool sites (north aspects)		
Common Name	Pounds per Acre	Common Name	Pounds per Acre	
Slender wheatgrass	4	Slender wheatgrass	4	
Mountain Brome	4	Canby bluegrass	2	
Idaho Fescue	3	Bluebunch wheatgrass	4	
Bluebunch wheatgrass	4	Blue wildrye	4	
Prairie Junegrass	2	Mountain Brome	4	
		Richardson's needlegrass	3	

 Table 4-8. Native Area Seeding Mixes by Site Characteristics

All slopes steeper than 5% and longer than 50 feet, or steeper 10% and longer than 20 feet shall be cover with a biodegradable erosion control mat.

All other slopes shall be covered with straw mulch with a tackifier or crimped. Straw mulch shall be placed to a uniform depth of one (1) inch and crimped by impressing into the soil $1-\frac{1}{2}$ inches at eight (8) inches on-center.

4.6 STORM DRAINAGE EASEMENTS

Public storm drainage systems serve greater than one parcel, except where a residential parcel conveys runoff from three (3) or fewer off-site residential parcels.

Private storm drainage systems serve one parcel and where excepted above.

Public storm drainage systems will be maintained by the City

Private storm drainage systems shall be maintained by the property owner.

Storm drainage easements to the City must be provided for all components of public and private storm drainage systems on private land from the right-of-way, to and including, storm water runoff control and water quality treatment.

Storm drainage easements shall allow the City the right to enter private land for the purposes of inspection, operation, and maintenance of public storm drainage systems and when private property owner(s) fail to adequately maintain their private storm drainage system.

Structures unrelated to the storm water drainage system are not allowed in storm drainage easements.

No landscaping, fences or other surface features which may impede, divert, or otherwise alter the flow of runoff, or obstruct maintenance are allowed in storm drainage easements.

All operation and maintenance costs the City incurs for private storm drainage systems will be assessed to the property owner.

All costs associated with restoration of landscaping, fences or other surface features for operation and maintenance of private storm drainage systems shall be the property owners.

If a property owner has recorded agreement with the City defining maintenance responsibilities of a private storm drainage system, the City shall operate and maintain the private storm drainage system in accordance with the agreement.

Storm drainage easements for access shall be a minimum of 15 feet wide, unobstructed and have a maximum slope of 15%.

Storm drainage easements shall be shown on the Drainage Plan, Preliminary and Final Plats, or shall be dedicated and recorded prior to final approval of any project.

4.6.1 STORM SEWERS AND CULVERTS

Minimum easement width for storm sewers up to 36 inches wide is 20 feet. Minimum easement width for storm sewer 36 inches wide or greater shall be the width of the storm sewer plus 20 feet.

Storm sewers shall be located in the center 1/3 of the easement. No trees shall be planted in a storm sewer easement.

4.6.2 STORM WATER PONDS

Private storm water ponds and outlet works are required by these criteria for proper functioning of the overall public drainage system, and therefore are required to be placed within a storm drainage easement with access from City right-of-way.

Easements for storm water ponds shall contain the design volume, freeboard, embankments, spillway, and maintenance access.

4.6.3 OPEN CHANNELS AND NATURAL WATERWAYS

Easements for open channels and natural waterways shall be a minimum of 15 feet wide or equal to the width of the 100-year water surface elevation plus freeboard, whichever is greater.

Maintenance access to the open-channel or natural waterway easement shall be provided at a minimum every 500 feet.

4.7 CONSTRUCTION EROSION AND SEDIMENT CONTROL

4.7.1 GENERAL CONSTRUCTION SITE REQUIREMENTS

Any construction project which disturbs the earth and exposes soil shall implement and maintain effective soil erosion and control measures, also referred to as Construction Best Management Practices (BMPs), which will protect surface water quality and not discharge soil or other pollutants from the project site.

No construction project shall discharge any pollutant off site.

Storm water runoff from undisturbed tributary areas shall be routed around the areas of disturbance or accounted for in the sizing of erosion and sediment control measures.

Any construction project which pours concrete shall use an excavated concrete washout area or water-tight basin of sufficient size to contain all excess concrete and wash water.

4.7.2 EROSION AND SEDIMENT CONTROL PLAN SHEET(S)

A separate Erosion and Sediment Control Plan sheet(s) is required for all commercial projects and for any residential project with a site disturbance greater than one (1) acre. At a minimum the Erosion and Sediment Control Plan sheet(s) shall include:

- Sediment basin for drainage basins greater than 10 acres located at the low point of the project;
- Sediment trap for drainage basins less than 10 acres, located at the low point of the project;
- A secondary sediment trap is required for any part of a disturbed site that exceeds one (1) acre where runoff cannot be routed to the primary sediment basin or sediment trap;
- Perimeter diversion swales or diversion dikes to route flow to the sediment basin or sediment trap;
- Silt fence or straw waddles must be installed for areas less than one (1) acre that cannot be routed to a sediment trap or basin;
- Vehicle tracking control;
- Construction staging area with debris disposal;
- Temporary sanitation facilities;
- Chemical storage and fueling area; and
- Concrete washout area.

The Sediment and Erosion Control Plan must reference and include construction details of Best Management Practices as presented in the Storm Water Management during Construction Field Guide for Best Management Practices published by the Montana Department of Environmental Quality.

4.7.3 SWPPP REVIEW AND APPROVAL

Whenever site disturbance exceeds one (1) acre, coverage under the Montana Department of Environmental Quality, General Permit for Storm Water Discharges Associated with Construction Activity is required. Coverage under this permit requires preparation submittal of a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) submitted to Montana Department of Environmental Quality prior to ground disturbance.

Infrastructure and Building Plans and Design Documentation (including the Drainage Report and Plan discussed in these standards) shall be submitted to the City of Helena Engineering and Building Divisions for review and approval. When the City determines that the design documentation and plans meet City standards, the City will issue written approval of the project design.

Prior to beginning earth disturbing activities, the property owner, or the property owner's construction agent must submit copies of the following documents:

- Storm water Pollution Prevention Plan;
- Calculation for the amount of total impervious area within the property boundary;
- Notice of Intent; and
- Montana Department of Environmental Quality confirmation of SWPPP and NOI submission.

A Building Permit <u>will not</u> be issued until the City of Helena has received, reviewed, and approved the SWPPP, NOI, and DEQ confirmation of submission.

Final stabilization, and release under the Montana Department of Environmental Quality, General Permit for Storm Water Discharges Associated with Construction Activity, shall only occur when soil-disturbing activities at a site have been completed and a vegetative cover has been established with a density of at least 70% of the pre-disturbance levels, or equivalent permanent physical erosion reduction methods have been employed.

4.8 **REFERENCES**

- 1. Chow, Ven Te, Open Channel Hydraulics, 1959
- 2. Federal Highway Administration, Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14, July 2006
- 3. Federal Highway Administration, Hydraulic Design of Highway Culverts, Hydraulic Design Series No. 5, April 2012
- 4. Federal Highway Administration, Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22, August 2013
- 5. Montana Department of Environmental Quality, Montana Post-Construction Storm Water BMP Design Guidance Manual, September 2017
- 6. Montana Department of Environmental Quality, Storm Water Management During Construction Field Guide For Best Management Practices, April 2014.
- 7. Montana Department of Transportation, Drainage Manual, Adoption of American Association of State Highway and Transportation Officials Drainage Manual by Montana Department of Transportation, 1995, Appendix B revised 2017
- 8. United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), National Engineering Handbook, Part 630: Hydrology, September 1997.
- 9. Natural Resources Conservation Service (United States Department of Agriculture), Urban Hydrology for Small Watersheds, Technical Release 55, June 1986
- 10. Urban Drainage and Flood Control District (UDFCD), Urban Storm Drainage Criteria Manual, *Volumes 1 to 3*, November 2010

PART 5 - TRANSPORTATION STANDARDS

PART 5 TRANSPORTATION STANDARDS

5.1 OVERVIEW

5.1.1 PURPOSE

It is the purpose of this section to establish minimum standards for public transportation facilities for vehicles, public transit, pedestrians, and bicycles, hereafter constructed or improved as a condition of City approval of a development, or a transportation project constructed by the City of Helena. These standards are intended to promote the implementation of Helena's Growth Policy, ADA Transition Plan and to minimize total costs over the life of the transportation system.

Implementing these standards requires balancing of several policy concerns, including but not limited to:

- Providing a safe and efficient multi-modal transportation system.
 - Implementing the complete streets policy.
 - Discouraging excessive speed; and
 - Requiring no more right-of-way than necessary

5.1.2 **DEFINITIONS**

Words and phrases in these standards have the same general meaning as those contained in the City Code, and the MPWSS. If terms are conflicting or unclear, the City Engineer will clarify the meaning and intent. These standards may be modified for exceptional cases if approved by the City Engineer, or if the City Commission authorizes a variance.

Block: A usually rectangular space or area of land in the city that is enclosed, surrounded or bounded by streets.

Curb Extension: Also called bulb-outs, extend the sidewalk into the parking lane or shoulder to narrow the roadway and provide additional pedestrian space at key locations; they can be used at corners and at mid-block locations (with approval).

Development: Construction, renovation, or installation of a building or structure, a change in use of a building or structure, or a change in the use of land when the construction, installation or other action creates additional demand for public facilities.

Effective Corner Radius: The radius available for the design vehicle to make the vehicle turn, accounting for the presence of parking, bike lanes, medians, or other features.

Multi-modal Transportation Network: All facilities, vehicles, and devices designed to facilitate the mobility of people.

Street: Any roadway, public or private, open to the use of the public for vehicular and/or pedestrian travel, as well as bridges, tunnels, underpasses, overpasses and any other similar portions of the roadway network.

Streets that provide legal and physical access to lots pursuant to 12-2-4 of Helena City Code must be dedicated to the City and must be of the width for the designated classification for that zone and traffic impact and meet all aspects of these engineering standards.

Streets that do not provide access to the external boundaries of a lot or parcel and only provide internal access for purposes of accessing building and structures within the lot or parcel are "private streets" and must meet the width requirements of these standards. Such private streets are not open to the public and the maintenance is the responsibility of the property owner.

5.1.3 FUNCTIONAL CLASSIFICATIONS – PURPOSE

The purpose of a functional classification system for city roads is to define varying levels and types of transportation infrastructure and to provide for the safe and efficient movement of people and goods, while at the same time preserving residential areas and maintaining the economic vitality of commercial and industrial areas. Due to the different characteristics regarding land use, network density, and travel patterns, the system classifies transportation facilities as either urban or rural roads. Within urban roads, they are further divided into arterials, collectors, or local roads. Existing and proposed functional classifications are as delineated in the most recent update of the Greater Helena Area Long Range Transportation Plan (LRTP).

5.1.4 FUNCTIONAL CLASSIFICATIONS URBAN ROADS

Urban roads are classified as outlined below:

Principal Arterial: The principal arterial is a basic element of the City's road system. All other functional classifications supplement the principal arterial network. Access to a principal arterial is ideally limited to intersections with other principal arterials or to the interstate system. Direct access is minimal and controlled. The main characteristics of principal arterials are they provide high mobility, serve the major centers of activity, carry the highest traffic volumes, and the longest trip distances within an urbanized area. This classification of road carries a high proportion of the total traffic within an urban area. The principal arterial's intended function is to provide for the expedient movement of traffic. Posted speed limits on major arterials generally range from 25 mph to 70 mph and these typically carry greater than 15,000 vehicles per day.

Minor Arterial: The minor arterial interconnects with and augments the principal arterial system. It also provides access to lower classifications of roads on the system and may allow traffic to directly access destinations. They provide for movement within sub-areas of the city, whose boundaries are largely defined by the principal arterial road system. They serve through traffic, while at the same time providing direct access for commercial, industrial, office and multi-family development but, generally, not for single-family residential properties. The purpose of minor arterials is to increase traffic mobility by connecting to the principal arterial system and providing access to adjacent land uses. Posted speed limits on minor arterials generally range from 25 mph to 55 mph and they typically carry between 5,000 and 15,000 vehicles per day.

Major Collector: The major collector provides for land access and traffic circulation within and between residential neighborhoods, and commercial and industrial areas. It provides for the equal priority of the movement of traffic, coupled with access to residential, business, and industrial areas. A collector roadway may at times traverse residential neighborhoods. Posted speed limits on collectors typically range from 25 mph to 45 mph and these typically carry between 3,500 and 5,000 vehicles per day.

Minor Collector: The minor collector provides for land access and traffic circulation within and between residential neighborhoods, and commercial/industrial areas. Future growth of the City outside the subdivision will have limited use of the roadway. It provides for the equal priority of the movement of traffic, coupled with access to residential, business, and industrial areas. Posted speed limits on collectors generally range from 25 mph to 35 mph and these typically carry between 2,500 and 3,500 vehicles per day.

Local Office/Commercial Street: Local Office/Commercial Streets will apply to developments ranging from very pedestrian-oriented retail locations (similar to Main Streets) to business parks. Land uses along Local Office/Commercial Streets include office, commercial, and/or mixed-use developments, which may be either pedestrian- or auto-oriented. Although land uses on these streets may be pedestrian-oriented, auto-oriented, or somewhere in-between, the general intent is that these local streets (and the uses along them) will accommodate travel by a variety of modes. Continuous sidewalks are required along all of these streets. Other treatments include trees, street furniture in pedestrian activity areas, and appropriately scaled signage. Cyclists are expected to operate in mixed traffic, since the traffic volumes and speeds are low. Posted speed limits on Local Office/Commercial Streets generally posted at 25 mph and are designed for 1,500 to 2,500 vehicles per day.

Local Residential: Local roads comprise all facilities not included in the higher systems. Their primary purpose is to permit direct access to abutting lands and to connect to higher classifications. Usually through-traffic movements are intentionally discouraged. Cyclists are expected to operate in mixed traffic, since the traffic volumes and speeds are low. Posted speed limits on local roads are posted at 25 mph and typically carry less than 1,500 vehicles per day.

5.2 TRANSPORTATION DESIGN STANDARDS

It shall be the policy of the City of Helena to review and approve all projects for access management and control measures during the review phase of a project. The City reserves the right to mandate or limit certain access control feature implementation should it be in the best interest of the traveling public or the City's concerns. All streets and publicly dedicated rights of way must comply with these City Engineering Standards.

5.2.1 ROADWAY DESIGN & TECHNICAL CRITERIA

This section sets forth the minimum design and technical criteria to be used in the preparation of all roadway plans. All roadway plans should be designed in conformance with these City of Helena Engineering and Design Standards, MPWSS, the Public Right-Of-Way Accessibility Guidelines (PROWAG), and applicable City of Helena ordinances and policies.

5.2.2 SIDEWALKS/CURB AND GUTTERS

Roadway typical sections shall be as shown on the exhibits in Appendix B of this document. Deviations from these typical sections shall be made on a case-by-case basis only after thorough review by the City Engineer, the Transportation Systems Department and may require City Commission approval.

Concrete sidewalks or an asphalt multi-use path shall be constructed on both sides of all roadways unless otherwise approved by action of the City Commission. Sidewalks shall be 6" thick across driveways and 4" thick elsewhere with a minimum 8" or 6" base course, respectively.

All sidewalks shall be a minimum width of 5'.All multi-use paths shall be a minimum of 10' wide.

Integral curb and gutter shall be used on all roadways with a maximum cross-slope of 5% from the lip of the gutter to the flow line of the gutter. For hot plant mix pavements, the pavement must be installed between 1/8" to 1/4" above the gutter lip. Roll or drop curbs, when approved shall be installed with the initial curb and gutter construction. Alterations to existing curb cuts shall be submitted for approval by the Transportation Engineer.

Pedestrian ramps shall be ADA/PROWAG compliant, installed at all intersections and at midblock crossings, when approved, for all new construction or reconstruction of curb and sidewalk. All pedestrian curb ramps shall include PROWAG compliant, cast-iron detectable warning surfaces approved by the Transportation Systems Department.

All sidewalks, sidewalk crossings, pedestrian ramps or other pedestrian facilities in the rights-ofway shall be constructed in accordance with the best practices as identified in the current edition of Public Rights-of-Way Accessibility Guidelines (PROWAG).

Guardrail may be required in certain situations adjacent to sidewalk. Guardrail shall be designed and constructed in accordance with the current American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide standards or as directed by the Transportation Systems Department and City Engineer.

5.2.3 BICYCLE FACILITIES AND MULTI-USE PATHS

The arrangement, type, and location of all bicycle facilities, and multi-use paths, trails, and routes shall conform to the most recent update of the Greater Helena Area Transportation Plan. All new construction shall conform to the standards for bicycle facilities detailed herein and the AASHTO Guide for the Development of Bicycle Facilities. All new construction of pedestrian facilities shall conform to the AASHTO Guide for Planning, Design, and Operation of Pedestrian Facilities and all applicable ADA and PROWAG guidance.

Bike lanes are required upon reconstruction on all collector or higher classified street, as identified in the Greater Helena Area Long Range Transportation Plan (LRTP) or other commission approved non-motorized plan. All other bike lanes identified in the LRTP will be implemented as conditions are met for installation. For minor collector or lesser classified street, bike lanes will be discouraged unless identified by the LRTP.

On-Street Bike Lanes (Without On-Street Parking): Bicycle lanes on streets without onstreet parking shall be at least 5' wide, exclusive of the gutter pan. On existing streets where onstreet bike lanes are being added and available right-of-way or improvement space is restricted, the width of the bicycle lane may be reduced to at least 5' wide, inclusive of the gutter pan.

On-Street Bike Lanes (With On-Street Parking): Bicycle lanes on new and existing streets shall be at least 5' wide, exclusive of the parking lane.

Multi-Use Paths or Trails: Multi-use paths or trails shall be at least 10' wide with an inside edge radius of at least 15'. The minimum asphalt pavement thickness shall be 3" with a minimum of 6" of high quality untreated aggregate base. Intersections with typical sidewalks or roadways shall have the appropriate signing and sight distance per MUTCD guidance.

5.2.4 DRIVEWAY STANDARDS – CURB CUT REQUIREMENTS

Driveways along public and private roadways shall comply with the existing driveway and curb cut requirements as set forth under Helena City Code 7-5 (Ordinance #1937). The purpose of this ordinance is to standardize, regulate and control the location, size, type, construction, maintenance and quantity of curb cuts, driveway aprons and sidewalk driveway crossings in the City of Helena from the standpoint of proper design, safe and efficient entry to and exit from City streets to private property, safety of vehicular traffic in the streets, and safety of pedestrian traffic on the sidewalk area. Frontages of sixty feet (60') or less shall be limited to one curb cut with not more than two (2) curb cuts to be provided to any single tract or business establishment, except where the property frontage exceeds six hundred feet (600'). Curb cuts serving the same property must be separated by not less than 25' of full height curb.

Any curb cut that is proposed within the Functional Area of an Intersection as defined in AASHTO Geometric Design of Highways and Streets ("Green Book"), must be reviewed and may be denied by the Transportation Engineer if deemed hazardous or providing unsafe traffic movements.

5.2.5 HORIZONTAL ALIGNMENT

<u>**Turning Radius</u>**: All roadways shall intersect at right angles as nearly as possible, with no roadways intersecting at an angle less than 75° .</u>

Turning Movements: All roadways shall be designed to accommodate the largest emergency response vehicle without encroaching onto oncoming traffic. The effective corner radius shall be 28' or larger.

<u>**Curb Return Radius</u>**: Minimum curb returns shall be as shown in Table 5-1. A larger radius may be used with the approval of the Transportation Engineer.</u>

Street Classification	Local (ft)	Collector (ft)	Minor Arterial (ft)	Principal Arterial (ft)	
Local	20	25	28	28	
Collector	20	25	28	28	
Minor Arterial	20	25	**	**	
Major Arterial	20	25	**	**	

Table 5-1. Curb Return Radius at Intersections*

* Measured from top back of curb

** Per AASHTO standards

Design Speed: Design speed shall be as shown in Table 5-2. The design speed is typically higher than or equal to the posted speed limit. The design speed determines various geometric design features of roadways. In an urban area with a gridded transportation system the design speed is not a major factor, because of the closely spaced intersections and mainly determines sight distance and turning radiuses.

Horizontal Curves: The minimum centerline radius for horizontal curves shall be as shown in Table 5-2. Deviations from the requirements in Table 5-2 may be considered on a case-by-case basis for local streets only.

Intersections: Avoid short gaps between opposing "T" intersections. Two streets meeting a third street from opposite sides shall meet at the same point, or their centerlines shall be off-set at least 125'.

<u>Superelevation</u>: Superelevation may be required for arterial roadways and selected collector roadways. Horizontal curve radius and superelevation shall be in accordance with the recommendations of AASHTO. Superelevation shall not be used on local roadways.

Spiral Curves: Spiral curves shall not be used on roadways within the City of Helena (State Highways excluded) except by written approval of the Transportation Engineer.

<u>Railroad Crossing</u>: All railroad crossings on streets shall be concrete for the full width of the roadway per Railroad requirements.

Barricades: Wherever roadways terminate due to project phasing, subdivision boundaries, etc., barricades are required in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and City standards.

Street Type	Arter	·ial	Collector	Local	Alley/Emergency Access Road	
Terrain*	Principal	Minor	Ordinary	Ordinary	Ordinary	
Horizontal centerline radius on curves (Min.)	**	**	300'	150'	150'	
Tangent length between reverse curves	**	**	100'	50'	50'	
Stopping sight distance	**	**	360'	155'	80'	
Angle at intersection centerline	**	**	>75°	>75°	>75°	
Length of tangent at intersection	**	**	150'	100'	80'	
Max. cul-de-sac length	N/A	N/A	N/A	600'	***	
Cul-de-sac right-of- way radius	N/A	N/A	N/A	62'	***	
Max. vertical alignment grade	10%	10%	10%	10%	10%	
Min. vertical alignment grade	**	**	0.5%	0.5%	0.5%	
Max. vertical alignment grade within 75' of intersection centerline	**	**	4%	4%	4%	
Design speed (mph)	50	45	35	25	15	
Min. Vertical Curve K Factor						
Crest	**	**	**	**	**	
Sag	**	**	**	**	**	
Min. Vertical Curve						
Length						
Crest	**	**	90'	50'	50'	
Sag	**	**	70'	50'	50'	

 Table 5-2.
 Alignment Controls

* Mountainous terrain is defined as terrain which has a cross slope exceeding 15%.

** All design criteria shall be to AASHTO standards.

*** Must meet turnaround requirements or exits onto public right-of-way per most current International Fire Code.

5.2.6 VERTICAL ALIGNMENT

<u>Permissible Roadway Grades</u>: The minimum allowable vertical alignment grade for any roadway (or alley) is 0.5%. The maximum allowable grade for any roadway and alley is 10% per Helena City code 12-4-3 and IFC.

<u>Changing Grades</u>: Continuous grade changes, or "roller-coastering," is not desirable, but may be considered in areas with flat topography in order to improve the drainage performance of a street. Any exception to this requirement will require written approval of the Transportation Engineer. The use of grade breaks in lieu of vertical curves is not desirable, especially at higher design speeds. The table below sets the allowable difference in grade (A) for a given design speed, above which a vertical curve is required.

Design Speed (mph)	Maximum grade change, % (A)
25	1.85
30	1.30
35	0.95
40	0.75
45	0.55
50	0.45
55	0.40

Vertical Curves: All vertical curves shall be symmetrical. Design criteria for vertical curves are found in Table 5-2. The minimum desirable grade within a sag (sump) vertical curve is 0.5%. However, in areas with flat topography, this may be difficult to achieve, and in that scenario the length of the flattest portion of the vertical curve should be minimized to prevent ponding of surface water runoff. Any exception to this requirement will require written approval of the Transportation Engineer. All vertical curves shall be labeled, in the profile, with length of curve (L) and K (=L/A).

Intersections: The following additional criteria shall apply at intersections.

The grade of the "through" street shall take precedence at intersections. At intersections of roadways with the same classifications, the more important roadway, as determined by the Transportation Engineer, shall have this precedence. Side streets shall be warped to match through streets. Carrying the crown of the side street into the intersecting through street is not permitted.

The elevation at the point of tangency (PT) of the curb return on the through street is always set by the grade of the through street in conjunction with normal pavement cross slope.

At an arterial-arterial intersection, a more detailed review on the entire intersection's drivability shall be performed by the designer and submitted for review and approval.

<u>**Curb Returns</u>**: All curb returns shall be filleted using 6" thick concrete. The minimum fall around curb returns, when turning water, shall be 1.25%. to establish minimum fall when turning water. The maximum flowline slope around a curb return is 4%, subject to meeting ADA and PROWAG requirements at curb ramps. Show and label high point location, elevation, and intersection of flowline in plan view, if applicable.</u>

<u>Connection with Existing Roadways</u>: Connections with existing roadways shall be smooth transitions conforming to normal vertical curve criteria if the algebraic difference in grade (A) between the existing and proposed grade exceeds 1%. When a vertical curve is used to make this transition, it shall be fully accomplished prior to the connection with the existing improvement. Field-verified slope and elevation of existing roadways shall be shown on the plans.

Offsite Design and Construction: The design grade, and existing ground at that design grade, of all roadways that dead end due to project phasing, subdivision boundaries, etc., shall be continued in the same plan and profile as the proposed design for at least 500' or to its intersection with an arterial roadway. This limit shall be extended to 1000' when arterial roadways are being designed, or as necessary based on sound engineering judgment for the offsite terrain. If the offsite roadway adjacent to the proposed development is not fully improved, the developer is responsible for the design and construction of a transition with a 4' road base shoulder for the safe conveyance of traffic from the improved section to the existing roadway. The following formula shall be applied to the taper or lane change necessary for this transition:

Speed Limit

40 MPH or Less $L = WS^2 / 60$ 45 MPH or Greater $L = W \times S$

where:

L = length of transition in feet

W = width of offset in feet

S = speed limit or 85^{th} percentile speed (whichever is greater)

The Transportation Engineer should be consulted for any unusual transition conditions. Grade breaks greater than 1% are not allowed when matching existing dirt or gravel streets.

The cost of offsite pavement transitions shall be borne by the developer.

5.2.7 SIGHT DISTANCE

Roadways shall comply with the existing sight distance requirements as set forth under Helena City Code 7-3-7 (Ordinance #3098). The intent and purpose of this ordinance is to reduce potential traffic accidents by evaluating and maintaining adequate visibility at intersection corners. Sight obstructions at intersections are a major contributing factor to traffic accidents. Sight obstructions are defined as anything that obstructs a driver's clear zone of visibility (i.e., bushes, shrubs, trees, fences, hedges, etc.).

5.2.8 MEDIAN/CURB EXTENSIONS TREATMENT

Median or curb extensions should be integral curb and gutter unless otherwise approved. Medians or curb extensions less than 8' wide should be capped with M-4000 concrete a minimum of 4" thick. Wider medians should be topsoiled and seeded with an approved seed mix. The minimum median width is 4'. The minimum curb extension width is 6'. All medians, curb extensions or raised islands should be made clearly visible at night through the use of adequate reflectorization and/or illumination. Flexible delineators shall be placed at the beginning and end of all medians or curb extensions, and at the point of any horizontal alignment change. All median curbs or curb extensions shall be painted yellow.

5.2.9 ROADWAY DRAINAGE

Drainage systems shall be designed in accordance with Section 4 of this document. Development plans for the drainage system, including a drainage report, are required for concurrent review with, and shall be considered a part of the roadway design.

Crosspans: Crosspans (valley gutters) shall be constructed in accordance with MPWSS except that the minimum width shall be six feet (6'). Crosspans are not allowed across collector or arterial roadways. Crosspans may be used parallel with collector or arterial roadways to convey storm runoff across residential roadways. Crosspans are required for storm water control at intersections where a storm water system is not accessible.

Inlets: Inlets shall be located to intercept the major curb flow at the point curb flow capacity is exceeded by the storm runoff. Inlets should be aligned with lot lines wherever possible.

Inlets shall also be installed to intercept cross-pavement flows at points of transition in superelevation (see Section 4.4.4). Due to the presence of pedestrian ramps, inlets are not allowed in the curb return, but will be located at the tangent points of the curb return.

Cross Slope: Except at intersections, or where superelevation is required, it is desirable for roadways to be level from top of curb to top of curb and shall have a 3% crown for all streets with a grade less than or equal to 6%. Any deviation to this requirement will require written approval of the Transportation Engineer. For example, this may not be achievable for streets built on side slopes, especially where existing development presents constraints in terms of driveway slopes.

On streets where the grade exceeds 6%, a 2% crown will be allowed. The cross slope will be measured from centerline to lip of gutter, or lip of median gutter to lip of outside gutter on roadways with raised center islands. Parabolic or curve crowns are not allowed. Maximum pavement cross slope allowed is 5% at warped intersections, as measured above. In no case shall the pavement cross slope at warped intersections exceed the grade of the through street. When warping side streets at intersections, the crown transition should be completed within 75' horizontally for local streets, 100' horizontally for collector streets, and 150' horizontally for arterial streets. Quarter crowning may be accepted on a case-by-case basis needing prior approval from the Transportation Engineer.

Temporary Erosion Control: Temporary erosion control is required at the ends of all roadways that are not completed due to project phasing, subdivision boundaries, etc. Prevention of erosion at the roadway terminus shall be by methods approved by the City Engineer.

Sidewalk Chases: Storm water runoff from concentrated points of discharge shall not be allowed to flow over sidewalks but shall drain to the roadway by the use of chase sections. The use of

sidewalk chases is discouraged, and their use is limited to situations where it is not possible to use standard storm inlets and piping.

Chase sections shall not be located within a curb cut of a driveway. Chase sections shall be identified by station and elevation.

5.2.10 ROADWAY SPECIFICATIONS

Pavement Thickness: Pavement thickness design must be completed for all new or reconstructed roadways and shall be based on the current AASHTO Guide for Design of Pavement Structures, or the current Asphalt Institute Manual Series No. 1 (MS-1) for thickness design. The Pavement Design Report, based upon specific site soil data and design year traffic loading conditions, shall be prepared by a professional engineer, or other qualified professional approved by the Transportation Engineer, and submitted to the Transportation Engineer along with the plans and specifications for the project. The design shall be based on at least a 20-year performance period traffic volume; however, the minimum design lane 18,000-lb Equivalent Single Axle Load (ESAL) used in the pavement design shall not be less than 50,000-lb ESAL. The minimum asphalt pavement thickness for any new collector or arterial shall be four inches (4"), which shall be placed in two lifts. The minimum asphalt pavement thickness for any new local road shall be three inches (3"), which shall be placed in two lifts. A minimum of six inches (6") of high quality untreated aggregate base shall be provided for designs utilizing asphalt pavement over untreated aggregate base. Where full depth asphalt is designed, an adequate stabilizer lift shall be included, consistent with unpaved roadway design practices, to provide a suitable sub-base capable of withstanding the traffic required for the initial construction of the roadway.

<u>Utility Trenches</u>: Utility trenches cut through asphalt less than ten (10) years old, which may include but are not limited to water and sewer services, shall be saw cut the entire width of the street or to centerline of the roadway depending on location of excavation. If a road cut on a street older than ten (10) years is within eighteen inches (18") of the lip of curb, the entire width to the gutter shall be removed and replaced. Consult with the City Streets Division for guidance. Proposed excavation limits must be approved by the Transportation Systems Department. All excavations shall be backfilled with flowable fill material, complying with the requirements of Flowable Fill contained in the MPWSS, or compacted screened fractured ³/₄" gravel with approval from the City Streets Division. The intent is to protect the integrity of the roadway riding surface and eliminate the potential for roadway failure due to settlement of trench backfill material. Density testing reports may be required to verify proper compaction.

Utility trenches in existing collector or higher classified streets shall be backfilled with flowable fill and capped with either asphalt or concrete slurry (2 Sack) on the same day as the completion of the street opening.

When flowable fill is required but not available, compacted screened fractured ³/₄" gravel can be used with approval from the City Streets Division.

Seven days prior to any street opening, an application with a traffic and/or pedestrian control plan shall be submitted to the City Streets Division for review and approval. All street openings shall be for a maximum of 24 hours unless there is written approval from the City Streets Division. On collector or higher classified streets the street opening will be limited to 8:30 AM to 4:30 PM. If a multiday closure is required the trench shall be backfilled each night, so the street can be open to traffic after 4:30 PM and not closed again until 8:30 AM. Any traffic control exceeding one day

shall have a traffic control maintainer on call at all times to restore any traffic control devices to the approved plan location as submitted to the Transportation Engineering Division. Night work will be considered to facilitate the project or repair.

All utility work patches, before final paving, shall be overcut by a minimum of twelve inches (12"). Sawcut lines are to be neat and squared off. If the overcut sawcut lies within a striped lane or other longitudinal marking then pavement restoration shall extend to the pavement markings. The City Engineer or Transportation Systems Department can approve or deny a request for reducing pavement restoration width.

Micro-trenching (trenches with a width of less than 2 inches) will only be allowed after and engineering study and plans have submitted and approved by the City. The study and plans will include but is not limited to location and depth (minimum of 18 inches below the bottom of the asphalt), of the proposed trench, type of trenching and backfill to be used, schedule of trenching and backfill, and an over cut of 6 inches either side of the trench will be required. The City reserves the right to deny any application that does not meet the requirements of the City.

All patches shall consist of a minimum of six inches (6") compacted road mix capped with a minimum of four inches (4") compacted ³/₄" hot mix asphalt patch or the existing pavement structure depths whichever is greater.

For temporary patches, when hot mix asphalt is not available, place a minimum of six inches (6") of compacted road mix capped with a minimum of six inches (6") of 2 sack concrete slurry. Flowable fill up to the surface level, may also be used as a temporary patch. Cold mix asphalt can be used on a case-by-case basis as approved by the City Streets Division. All temporary patches shall be replaced with hot mix asphalt as soon as hot mix asphalt is available.

All excavated materials (i.e., concrete, asphalt, dirt, rock, etc.) must be removed from the job site by the date of expiration of the permit. In no case shall materials be placed to block access outside of signed closure or remain in the street or public right of way beyond the completion of the excavation work and removal of traffic control.

No tunneling is allowed under sidewalks, or curb and gutter. However, directional boring will be allowed upon approval of the City Engineer. If the excavation extends under the curb, gutter, and sidewalk, the curb, gutter, or sidewalk shall be removed at the closest joint past the extent of the trench.

All utility trenches, including the curb, gutter, and sidewalk, shall be warrantied by the person or contractor requesting the street opening for <u>two</u> (2) years after acceptance by the Transportation Systems Department of the completed restoration to all portions of the right of way disturbed by the opening, including the road surface, curb and gutter, and sidewalk, and the proper disposal of all waste material.

5.2.11 MONUMENTATION

Monuments in monument boxes shall be provided in new or reconstructed streets at all section corners, quarter corners, and sixteenth corners.

5.2.12 COMPLETE STREETS

All newly and reconstructed roadways shall be designed to accommodate and coordinate all modes of transportation, both motorized and non-motorized, and people of all ages and abilities. Complete street features may include, but are not limited to: sidewalks, bicycle lanes, motor vehicle lanes, shared-use lanes and path, paved shoulders, street trees, landscaping, vegetative planting strips, curb and gutter, ADA curb ramps, crosswalks, refuge islands, pedestrian and traffic signals, directional signs, street furniture, bicycle parking facilities, public transportation stops and facilities, transit priority signalization, traffic calming devices such as rotary circles and curb bulb-outs, and surface treatments such as paving blocks, textured asphalt, and concrete, narrow vehicle lanes, raised medians, and dedicated transit lanes. All designs must be in compliance with City of Helena "Complete Streets" Resolution No. 19799 and these standards.

Deviations or Variances from Complete Streets Policy:

(a) In considering all deviations or variances, alternatives shall be explored such as the use of the revised travel lane configurations, paved shoulders, signage, traffic calming, education or enforcement to accommodate pedestrians, cyclists, transit and persons with disabilities.

(b) In considering all deviations or variances, future project phasing and improvements should address how complete streets principles will be accommodated.

(c) Deviations or variances shall consider the multi-modal transportation network in the immediate vicinity.

(d) When deviations or variances occur, alternatives and accommodations shall be documented.

5.3 RIGHT-OF-WAY (ROW) STANDARDS

The typical roadway sections shown in "Appendix C" identify the minimum amount of right-ofway that may be necessary to accommodate full build-out of each type of facility. The appropriate classification for new streets will be determined by the multi-modal traffic impact study for the development along with all the relevant planning documents for the City of Helena including but not limited to Helena Zoning Map, the Greater Helena Transportation Plan, Transit Plan, and Non-Motorized Pedestrian and Bike Route Plan. The features needed for a street to be considered a complete street are listed in Table 5-3 of this section. Each road classification has a list of complete street features that must be considered and may or may not be required according to the discretion of City staff or the City Commission. The complete street check list, found in Appendix A, must be completed for each street. All local streets may be considered with one checklist as long as all features included in the typical section, including on-street parking, are the same.

5.3.1 TYPICAL ROADWAY SECTIONS

The typical roadway section shall be as shown on the typical exhibit sections included in Appendix C. The roadway section used shall be detailed on the construction plans submitted for each new roadway or improvement to an existing roadway. Any deviations from the standard roadway typical section will require approval from the Transportation Engineer.

The typical section shall show the width of the right-of-way, width of roadway or alleyway, type and compacted depth of surfacing and paving materials, and such other dimensions as may be necessary or required. The location and width of sidewalks, walkways, boulevards, and curbs or curb and gutter shall also be shown, where applicable.

5.3.2 EXISTING ROW HIERARCHY

Although many existing roads within the City of Helena do not have the necessary right-of-way based on these standards, it shall be the policy of the City of Helena to attain the desired right-of-way (ROW) widths on all new roadway and development projects. For existing ROW, the street shall be designed for a complete street. However, if the ROW (for existing streets only) is narrower than what is required, and additional ROW cannot be obtained, the following list will set the hierarchy of which complete street features may be exempt from installation or the minimum set width:

- 1. The Boulevard can be narrowed to not less than 4' for a Local Street and 5' for every other classification. In special cases, the boulevard can be completely eliminated. However, Commission approval is required for this situation per City Code 7-4-2(A.2).
- 2. On-street parking on one or both sides of the street can be eliminated.
- 3. For collector and arterial streets, the lane can be narrowed to 10' which includes the center turning lanes.
- 4. For collector and arterial streets, the bike lane can be eliminated.
- 5. Sidewalk on one side of the street can be eliminated. Commission approval required per City Code 7-4-2(A.2).
- 6. The minimum ROW widths for existing street will be evaluated on a case-by-case basis.

Street Features	Local Residential	Local Office/ Commercial	Minor Collector	Major Collector	Minor Arterial	Major Arterial
	20'	24'	20'	20'	22'	48'
Driving Lanes	(2 lanes min.) (10' each lane)	(2 lanes min.) (12' each lane)	(2 lanes min.) (10' each lane)	(2 lanes min.) (10' each lane)	(2 lanes min.) (11' each lane)	(4 lanes min.) (12' each lane)
Sidoryally	10'	10'	10'	10'	10'	10'
Sidewalk	(5' Each Side)	(5' Each Side)				
Bike/Ped Path (can replace sidewalks on one side) if required by the Greater Helena Trans Plan or proposed in the subdivision master plan	10' (5' additional each side of the street that the path replaces the sidewalk)	10' (5' additional each side of the street that the path replaces the sidewalk)	10' (5' additional each side of the street that the path replaces the sidewalk)	10' (5' additional each side of the street that the path replaces the sidewalk)	10' (5' additional each side of the street that the path replaces the sidewalk)	10' (5' additional each side of the street that the path replaces the sidewalk)
Curb and Gutter	4' (2' each side)	4' (2' each side)				
Buffer Strip	2' (1' each side behind sidewalk)	2' (1' each side behind sidewalk)				
Parking Lane	12' (6' each side)	12' (6' each side)				
Bike lane				10' (5' each side)	10' (5' each side)	10' (5' each side)
Daulawand	14'	14'	14'	14'	14'	20'
Boulevard	(7' each side)	(10' each side)				
Utility Corridor - for electric, phone, and	4'	4'	4'	4'	4'	4'

Table 5-3. Complete Street Component Matrix (minimum widths)

SECTION PART 5 TRANSPORTATION STANDARDS 5.3 RIGHT-OF-WAY (ROW) STANDARDS

Street Features	Local Residential	Local Office/ Commercial	Minor Collector	Major Collector	Minor Arterial	Major Arterial
cable- if not placed under sidewalk or street						
Bus Lanes					12'	12'
Bus Stops	8'	8'	8'	8'	8'	8'
Center Medians					4' min.	4' min.
Center Turn Lanes		12'		10'	11'	12'
Storm water Elements	Varies - if proposed by developer					
Traffic Calming	Additional ROW maybe needed		Additional ROW maybe needed			

At a minimum each side must have at least a sidewalk or Bike/Ped Path

All streets must accommodate the Complete Streets policy and be consistent with the Greater Helena Transportation Plan

* <u>Deviations from the required components may be allowed with sufficient justification</u>. By way of example, a deviation from a requirement for on-street parking components on one or both sides of the street may be allowed with sufficient justification, which could include (but not be limited to) a showing that the street involved is a local side street with no fronting buildings, a showing that such deviation is warranted by applicable zoning, or a showing that adjoining uses would provide sufficient off-street parking.

5.4 TRAFFIC CALMING

Traffic calming is defined as a "combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users". In simple terms, traffic-calming techniques are typically aimed at lowering vehicle speeds, decreasing truck volumes, and/or reducing the amount of cut-through traffic in a given area. If applied properly, these techniques result in a more pleasant environment for pedestrians and bicyclists.

Traffic calming applied to roadway designs for new development should be evaluated on a caseby-case basis and if utilized should be appropriate for the intended function of each street or street segment. Streets designed to function as part of the major street system should be designed primarily to move traffic in an efficient, convenient, and safe manner. Local streets and residential collectors should be designed to provide access to properties while discouraging through-traffic and higher travel speeds that often accompany it. New street designs and developments should consider traffic calming strategies to reinforce the appropriate functions of the designed streets. These would include layout and connectivity of street systems and pedestrian/bicycle facilities, intersection treatments, and basic design standards for width, curvature, parking, and landscaping. Specific traffic calming features which are easily incorporated into the design phase include: entrance treatments; narrow streets; short block lengths; small corner radii; surface valley gutters; "T" intersections; roundabouts; and landscaping to create a "closed-in" environment. Appropriate traffic calming measures must be used to discourage excess speeds on all local and collector streets.

For existing facilities, the City has adopted a Traffic Calming Program which outlines the steps necessary to install traffic calming techniques, where appropriate, in response to neighborhood requests for assistance with traffic concerns. Refer to the most recent update of the Greater Helena Area Transportation Plan for areas of improvements that have been identified.

5.5 BRIDGES

The City of Helena requires bridges to be designed in accordance with current Montana Department of Transportation (MDT) standards for "on-system" bridges and the AASHTO Standard Specifications for Highway Bridges for "off-system" bridges. At a minimum, the information to be included in a set of bridge design plans is summarized in this section.

5.5.1 BRIDGE PLANS SHEET SEQUENCE:

- 1. Title Sheet/Quantities Sheet;2. General Layout of Structure Sheet.
- 3. Footing Plan Sheet.
- 4. Bent/Pier Sheet (by Bent Number).
- 5. Erection Plan Sheet.
- 6. Slab Detail Sheet.
- 7. Beam/Girder Sheet.
- 8. Detail Sheets (Camber, Splice Details, Diaphragm Details, Shoe/Joint Details, Barrier Rail); and
- 9. Standards Drawing Sheet.

5.5.2 BRIDGE DETAILS & DETAIL SHEETS

A complete set of bridge plans includes sufficient information for the contractor to successfully bid and complete the structural scope of the project. Details which are required to be included on plan sheets for projects within the City of Helena are as found in Chapter 5 of the MDT Structures Manual (Volume I). Any additional details that the bridge designer wants to include to supplement those listed in Chapter 5 of the MDT Structures Manual (Volume I) will be accepted.

All "on-system" bridge plans will be sent to the Montana Department of Transportation Bridge Bureau for their concurrent review and approval.

5.6 UTILITY CORRIDORS WITHIN NEW SUBDIVISIONS OR UNDEVELOPED ANNEXATIONS

All new utility installations within the public ROW requires written approval from the City Engineer prior to installation, so as to assure that the new utilities do not incommode or endanger the public in the use of the street in accordance with MCA 69-4-101

All new utilities shall be placed underground except where underground installation is not feasible as defined in MCA 69-4-102(2). Transformers and junction boxes maybe installed above ground in locations approved by the City

All new underground utilities installed parallel to City owned utilities within the public street rightof-way shall be located horizontally at least 5' away from the city owned utilities. If 5' cannot be maintained the utility must apply to the City Engineering Division for a deviation.

Utilities shall not be installed in street boulevards except above ground features such as light poles, residential transformers, and secondary pedestals, etc., along with the associated wiring for these features, may be allowed providing that the placement of these features will not interfere with the planting, growth, and care of boulevard trees or impede traffic sight distance. Perpendicular crossings of the boulevard may be allowed if placed in such a manner not to prohibit planting of the boulevard. All utilities that are less than 4.5' in depth are encouraged to be installed in protective conduit whenever possible. The protective conduit will allow for the maintenance and replacement of the utility without damaging any boulevard trees.

All utilities shall be installed at the required depth, as determined by the utility, relative to the finished grade of the finished surface.

As part of any subdivision or development involving the extension of City Utilities, the subdivider or developer shall provide engineered plans for all utilities including gas, power, phone, fiber, etc. on the infrastructure plans for review and approval. All applicable laws, rules and regulations of appropriate regulatory authority having jurisdiction over such facilities shall be observed.

For new subdivision or location where the streets are less than 10 years old and television, telephone, power, or natural gas has not been installed, provisions shall be made for installation without the cutting of paved roadways.

Repairs to existing utilities shall follow the street opening process of the City of Helena and all requirements in Section 5.2.10 of this document.

5.7 LANDSCAPING REQUIREMENTS

Landscaping requirements shall comply with the requirements as set forth under the Helena City Code 7-4, 7-10 & 11-24 (Ordinance #3150). The intent is to enhance, conserve and stabilize property values and the roadside environment by encouraging pleasant and attractive surroundings; encourage preservation of existing trees on proposed building sites and along roadways; and contribute to the relief of heat, noise, wind, and glare through the proper placement of living plants and trees.

5.8 MULTI-MODAL STUDIES

Private or public developments which increases the peak hour trips per day to the City Street System shall have a Multi-modal Traffic Impact Study (TIS) completed by an Engineer with adequate experience and expertise in transportation engineering.

The Multi-modal Study should present an objective technical analysis in a straightforward and logical manner that leads the reviewer through the analytical process to the resulting conclusions and recommendations. Sufficient detail should be provided so that the reviewer is able to follow the path and methodology of the study. All assumptions should be clearly documented with published sources referenced as necessary. All Multi-modal Studies shall be signed and stamped by a licensed professional engineer registered in the State of Montana.

Multi-modal Studies have been divided into three levels depending on the impact to the City roadway system. Each level has certain requirements to be met. An outline of the three different levels can be found in Appendix B.

5.9 TRAFFIC SIGNAL REQUIREMENTS

The need for new traffic signals will be based on warrants contained in the MUTCD and on City policies. In determining the location of a new signal, safety and traffic circulation & progression will be the primary considerations.

The City of Helena requires traffic signal design and plans to be completed in accordance with current MDT standards. The information to be included on these plans is summarized in this section.

5.9.1 ELECTRICAL PLANS SHEET SEQUENCE:

- 1. Title Sheet (if stand-alone traffic signal project).
- 2. Table of Contents Sheet (if stand-alone traffic signal project).
- 3. Electrical Quantity Summary Sheet.
- 4. Electrical Detail Sheets; and
- 5. Plan Sheets.

5.9.2 ELECTRICAL DETAILS AND DETAIL SHEETS

A complete set of electrical plans includes sufficient information for the contractor to successfully bid and complete the electrical scope of the project. Details which are required to be included on plan sheets for projects within the City of Helena include:

- Schedules for signal and luminaire poles, conduit & wire, and loop detectors.
- Service wiring diagrams for signals, controllers, and luminaries.
- Conduit installation and underground service wiring details.
- Pull box, pole base and watertight connection details.
- Details of photo-electric control installation and wiring.
- Signal and luminaire standard pole base and foundation details.
- Signal head and luminaire mounting and assembly details.
- Controller mounting, assembly, wiring, conversion, and foundation details.
- Details of loop detector installation.
- Phasing detail and diagram; and
- Peak hour volume count diagrams.

All traffic signal plans will be sent to the MDT Traffic Bureau for their concurrent review, regardless of it being on an MDT facility or not.

5.10 SIGNING AND PAVEMENT MARKING REQUIREMENTS

All signs and pavement markings shall be approved by the City of Helena Transportation Systems Department.

5.10.1 STREET NAME SIGNS

Street identification signs shall be installed at all new intersections in accordance with the MUTCD.

For ground-mounted street name signs on roads with speed limits of 25 mph or less, furnish 6-inch double sided extruded aluminum sign plates "street blades" with green High-intensity Prismatic (H.I.P.) sheeting, in lengths between 24" and 42" (in six-inch increments), and comply with the following lettering requirements:

- Use 4-inch FHWA 2000 Series C (Series C), white H.I.P. lettering for street names. Name lettering shall be composed of a combination of lower-case letters with initial upper-case letters. If using Series C font causes the text to not fit on a 42" blade, then 4-inch Series B font may be used.
- Use 2-inch Series C, white H.I.P., upper-case lettering for street directional prefix (N, S, E, W) where required.

- Use 2-inch Series C, white H.I.P. lettering for roadway suffix (street abbreviations: Ave, Blvd, Pl, St, etc.) which shall be composed of a combination of lower-case letters with an initial upper-case letter.
- Use 2-inch Series C, white H.I.P. lettering for block numbers and locate above the roadway suffix.

Vertical Spacing:

Directional prefix and street name should be one inch (1") from the bottom of the sign unless the name contains descending letters such as "g", "p" or "y".

Names with descending letters and their prefixes, should be shifted 0.5" toward the top of the sign plate or located 1.5" from the bottom of the sign.

Block numbers (above) and roadway suffixes (below) should be located 0.5" from the top and bottom of the sign respectively.

Horizontal Spacing:

Spacing between the directional prefix, street name and block number/roadway suffix should be 3" but may vary between 2" & 4".

The block number and suffix should be centered horizontally above and below each other.

Entire text should be centered on the sign plate with a minimum of 2" spacing from each end of the sign plate.

5.10.2 REGULATORY SIGNS

All regulatory traffic control signs will be completed in accordance with the MUTCD.

An engineering study/review shall be performed before installation of any new stop sign. In general, stop signs shall be installed on local streets when they intersect with any collector or arterial streets, but shall not be installed arbitrarily.

5.10.3 PAVEMENT MARKINGS

All pavement markings for crosswalks, stop bars, words, symbols, and intersection striping shall be inlaid thermoplastic (refer to MPWSS) or as approved thermoplastic alternative. Crosswalk markings should not be used indiscriminately. An engineering study should be performed before crosswalks are installed at locations away from traffic signals or stop signs. Mid-block crosswalks are discouraged and must be approved by the Transportation Engineer.

Roadway centerlines, bike lanes, and outside lane lines, away from major intersections, shall be epoxy paint (refer to MPWSS).

Temporary or final striping shall be installed within 5 business days of the completion of hot plant mix paving operations. For concrete pavement, a minimum of 28 days cure time is required prior to the placement of the final striping.

5.11 STREET LIGHTING REQUIREMENTS

Street lighting along public and private roadways shall comply with the existing lighting requirements as set forth under Helena City Code 10-3 (Ordinance #2889 & #3119). The purpose is to encourage lighting practices and systems which will minimize light pollution, glare, and light

trespass; conserve energy and resources while maintaining nighttime safety, utility, and security; and reverse the degradation of the nighttime visual environment.

5.12 WORK ZONE TRAFFIC AND PEDESTRIAN CONTROL

A Traffic and Pedestrian Control Plan must be submitted to the Transportation Engineer at least seven (7) days before construction begins for all work within the public right-of-way. The location and description of all traffic and pedestrian control devices must be shown on the Traffic and Pedestrian Control Plan. The plan must be approved by the Transportation Department prior to beginning construction. If the required traffic and pedestrian control devices are not in place, the Contractor will not be allowed to begin work on the project.

All traffic and pedestrian control devices shall be kept in place and maintained in good visible condition throughout the project. The Transportation Engineer, or the Engineer's representative, reserves the right to reject any traffic and pedestrian control device observed to be in inferior condition. A traffic and pedestrian control device maintainer shall be on call 24 hours a day to restore the control devices per the approved plan. All traffic control devices intended to be used from sunset to sunrise shall meet the MUTCD's reflectivity requirements. Emergency access to the work area shall be maintained and given priority at all times. The MUTCD and the MDT Guidelines for Work Zone Safety shall be followed to provide information for the safety of the public.

All barricades and obstructions shall be protected at night by suitable illumination from sunset to sunrise. Barricades shall be of substantial construction and shall be constructed to increase their visibility at night. Suitable warning signs shall be placed and illuminated at night to show in advance where construction, barricades or detours exist.

5.13 GEOTECHNICAL/SLOPE STABILIZATION CONSIDERATIONS

Due to the varied topography encountered throughout the City of Helena, special geotechnical considerations are often needed in the design of the various roadway projects. Maximum slope requirements for Earth Cut slopes and Earth Fill slopes under normal design conditions are 3:1.

There may be special circumstances where 3:1 slope may not be feasible, such as in areas of limited right-of-way or where extremely mountainous terrain is present. In those cases, alternate means of slope retention may be warranted. In cases where the above referenced standard slopes cannot be met, a geotechnical report will be required if different slopes are being proposed, or conversely if the use of retaining walls are being considered.

All geotechnical reports shall be signed and stamped by a professional engineer registered in the State of Montana. The geotechnical report shall contain the basic information as listed below:

- A description of the soil types encountered at the site in question and their properties.
- An assessment of soil slope stability.
- Recommendations for non-standard slopes, based on properties and information collected during field data collection and subsequent analysis.
- A copy of any boring logs made during the field exploration process; and

• Copies of all design calculations, exhibits, and a description of the design methodology used to arrive at the recommended design.

If the geotechnical report proves that other slope stabilization measures are necessary, such as soil pinning or retaining wall structures, a more detailed analysis shall be submitted for review to the City Engineering office. Possible retaining wall types that can be utilized in the City of Helena are reinforced concrete wall, mechanically stabilized earth (MSE) walls, and timber structure walls. The following shall be included in the geotechnical report:

- Information on settlement characteristics of the soil (i.e., amount of settlement expected time rate of settlement, surcharge or camber if required);
- Information on bearing capacity of the soil.
- Information on expected skin friction of the soil (if piles or drilled shafts will be utilized); and
- Information on soil pressure, stability, and alternates (if a soil retaining wall is being considered).

In areas of excessive fill or steep back slopes, roadside guardrail may be needed. Guardrail needs shall be as determined using AASHTO guidelines.

5.14 TEMPORARY AND PERMANENT BARRICADES

Temporary and permanent barricades shall conform to the standards contained in the MUTCD.

Type I or Type II barricades may be used when traffic is maintained through the area being constructed/reconstructed.

Type III barricades may be used when roadways and/or proposed future roadways are closed to traffic. Type III barricades may extend completely across the roadway (such as a fence) or from curb to curb. Where provision must be made for access of equipment and authorized vehicles, the Type III barricades may be provided with movable sections that can be closed when work is not in progress, or with indirect openings that will discourage public entry. When job site access is provided through the Type I barricades, the developer/contractor shall assure proper closure at the end of each working day.

In the general case, Type III permanent barricades shall be installed to close arterials or other through streets hazardous to traffic. They shall also be used to close off lanes where tapers are not sufficiently delineated.

Type III barricades shall be used at the end of a local street abruptly without cul-de-sac bulb or on temporarily stubbed off streets. Each barricade shall be used together with an end-of-road marker.

Barricades on dead-end streets that may be extended in the future will have a sign placed upon them, as approved by the Transportation Engineer.

5.15 TRANSPORTATION DESIGN SPECIFICATIONS

The standards for the design of City of Helena roads and bridges shall consist of the latest edition of the following references, in addition to items discussed in this document:

Montana Public Works Standard Specifications (MPWSS)

Manual on Uniform Traffic Control Devices (MUTCD)

MDT Guidelines for Work Zone Safety

Public Rights-Of-Way Accessibility Guidelines (PROWAG)

ADA Standards for Accessible Design

City of Helena Subdivision Regulations (City Code Title 12)

City of Helena Zoning Ordinance

Montana Structures Manual

AASHTO Guide for Design of Pavement Structures

Asphalt Institute Manual Series No. 1 (MS-1)

AASHTO Roadside Design Guide

MDT Traffic Engineering Manual

AASHTO Standard Specifications for Highway Bridges

Greater Helena Area Transportation Plan

AASHTO Geometric Design of Highways and Streets

Helena City Code

International Fire Code (IFC)

National Association of City Transportation Officials (NACTO) Design Guidelines

APPENDIX A CHECKLISTS/APPLICATIONS
CITY OF HELENA PUBLIC WORKS DEPARTMENT

Instructions for Completing Water/Wastewater Service Area Enlargement Application Within the Existing City Limits

Indicate the name and mailing address of applicant(s) under Items 1 and 2.

Fill in the <u>COMPLETE</u> legal description of the property involved in the appropriate space under Item 3. The description used must be complete and be the official legal description. Fill in present zoning and proposed zoning where applicable under Item #5.

If a subdivision, include lot number, block number, name of subdivision; and if applicable, the number of the filing of the subdivision, (**Example**: Lot, 4, Block 14, Bull Run #2, Second Filing).

If unplatted property, include section quarter (smaller portions as applicable) by section number, township, and range. (**Example**: NE1/4 of the NE1/4, Section 33, Township 10 North, Range 3 West).

Indicate the name of the engineer and attorney for applicant(s) under Items 6 and 7.

Attach to the application a plat of the property to be considered in the application. In addition, note the following is to be supplied:

- a) Type of development proposed.
- b) Land use proposed.
- c) Type of building construction proposed (condominiums, townhouse, apartments, single family dwellings, others);
- d) Total number of persons to be ultimately served by the proposed development.
- e) Estimated average and maximum day water consumption and/or estimated volume of sewage flow. These figures to be supplied on a per person basis and a total basis for proposed development.

Attach to the application a copy of a current Title Memorandum showing <u>ALL</u> owners of record for <u>ALL</u> property involved (Item #8).

Under Item 9, fill in the date of execution on second page of form and have the forms <u>SIGNED</u> and <u>NOTARIZED</u> by <u>ALL</u> of the proper parties in the spaces provided. The proper parties include <u>ANY</u> and <u>ALL</u> person(s) having a lawful interest in the property.

In the case of a partnership or other group(s) of persons, one individual may sign for all others PROVIDED the person signing has a current and proper Power of Attorney authorizing such signature. A copy of the power of Attorney must be attached to the executed forms. Otherwise, **ALL** individual person(s) must sign. Please note special place on form applying to corporations.

If the property is being purchased under a Contract for Deed then <u>ALL</u> of the contract sellers must sign the document <u>IN ADDITION</u> to <u>ALL</u> contract buyers signing.

If there are any encumbrances against the property involved, a SUBORDINATION AGREEMENT must also be executed and a model agreement is available from the Public Works Department.

Record the executed documents with the County Clerk and Recorder. The documents are to be **<u>RECORDED</u>** with a book and page reference. They are <u>**NOT**</u> to be filed. Obtain a copy of the recorded documents to be returned to the Public Works Department.

<u>AFTER</u> all documents are recorded, a title report must be presented to the Public Works Department. Such title reports may be obtained by contacting a title insurance company. Obtain from your files a copy of the title insurance policy issued when you purchased the property and then request from the title company a "JUDGEMENT AND LIEN SEARCH SUBSEQUENT TO THE TITLE POLICY." Present both the copy of the title policy and the Judgment and Lien Search document to the Public Works Department. As a minimum, the title policy information presented must show <u>ALL</u> fee simple owners as well as <u>ALL</u> liens, claims and encumbrances against the property.

Return a <u>COPY</u> of the recorded documents, not the original documents, to the Public Works Department for review along with the title policy information requested above.

It is extremely important that all the above steps be followed explicitly. Failure to fully comply with all requirements will necessitate having to repeat the procedure in its entirety. The water or sewer service desired cannot be obtained until the necessary paperwork is submitted and approved.

Assistance with the forms may be obtained by contacting the Public Works Department.

THANK YOU FOR YOUR COOPERATION!



PUBLIC WORKS DEPARTMENT

APPLICATION FOR WATER/WASTEWATER SERVICE AREA ENLARGEMENT WITHIN THE EXISTING CITY LIMITS

SUBMIT ORIGINALS IN DUPLICATE

1. Applicant's Name:

2. Mailing Address:

3. Legal description of area to be served:

4. The total population to be served by the proposed development is ______ and the estimated average and maximum day consumption in gallons per capita required to serve said development is as follows:

Water:	Average Day	gpcd	Maximum Day	gpcd
--------	-------------	------	-------------	------

 Wastewater: Average Day _____ gpcd
 Maximum Day _____ gpcd

5. Present Zoning: _____ Proposed Zoning: _____

- 6. Engineer for Applicant:
- 7. The attached Title Memorandum indicates the "Owner of Record" for all of the property requesting inclusion in the Water Service Area.
- 8. The (DEDICATED) (PROPOSED) (APPROVED PRELIMINARY) or (RECORDED) attached plat or certificate of survey describes all the property for which this application is submitted, the type of development and land use proposed for the property in question, the type of construction of the buildings and streets to be located on the property in question, the total population to be served by the proposed development, and the estimated average and maximum day consumption in gallons per capita required to serve said development.
- 9. City of Helena

Public Works Department

316 North Park Avenue

Helena, MT 59623

Being desirous of obtaining water service from the City of Helena and as a necessary prerequisite thereto, we the owners of the property described in Section 3, above, petition the City Commission to grant and approve an enlargement of the City of Helena Water Service Area so as to include said property within said Water Service Area. It is clearly understood

that consideration of the application shall be governed by Title 6, Chapter 3, Municipal Code and Ordinance #2925.

It is understood to be the fundamental policy of the Public Works Department and the City Commission that the City shall not indefinitely reserve unused water service capacity to the detriment of the City and its existing and prospective customers.

If this application shall be approved, it is understood and agreed that construction of a water system extension to serve the subject property shall be commenced within two (2) years of the date of approval of this application; and said construction shall be prosecuted continuously to completion within a reasonable time. Notwithstanding any prior approval of the approved Water Service Area if construction of the water system extension is not commenced within two (2) years of the date of approval of this application; and if said construction is not prosecuted continuously to completion within a reasonable time, the subject property shall be excluded from the approved Water Service Area.

If the subject property is not within the corporate limits of Helena, Montana and is not required to be annexed into the corporate limits in conjunction with approval of this application, the owners for themselves, their successors, and assigns agree to petition the Lewis and Clark County Commissioners to create a Special Improvement Maintenance District in order to maintain the water main and fire hydrant facilities installed; and further agree that the maintenance district shall be legally constituted and created prior to commencement of water service.

The owners for themselves, their successors, and assigns agree to comply with all Rules, Regulations, Policies, Resolutions and Ordinances of the Helena Public Works Department, the Helena City Commission, the Lewis and Clark County Commissioners, and the Montana Public Service Commission which may govern the extension, use, operation, maintenance and rates, charges, and rentals of the water system of the City of Helena, Montana.

Record Owner's Signature	Date
Record Owner's Signature	Date
Record Owner's Signature	Date
Record Owner's Signature	Date
a Corporate Owner, by	
(Its Corporate Or application)	fficer designed as representative for purpose of
DATE:	

If

 10. Submitted to City Commission:

 Public Hearing Held:

 Approved by City Commission:

Denied by city Commission:

11. SUBJECT TO ATTACHED LETTER.

12. By: _____

Public Works Director

CERTIFICATE (TAXES)

The undersigned desires to apply for water and/or sanitary sewer service for the following described property in Lewis and Clark County, Montana:

(Insert or attach legal description)

In order to initiate the application procedure, the undersigned does hereby CERTIFY as follows:

Definitions:

"Interested parties" are defined as lessor, lessee, sub-lessor, sub-lessee, contract buyer, principal, agent, optionee, owner, licensee and developer or assignee of any of the foregoing having any interest in the above described real property whether as an individual, partner (general, special or limited) and/or as a corporation and/or controlling person or persons in a corporation and/or as a trustee or beneficiary of a trust, as a cooperative, non-profit corporation, religious corporation sole or otherwise. (Mortgagees and other lien holders are exempted from this definition of interested parties).

1. That the undersigned and other interested parties in the above-described property have paid and are currently not delinquent with respect to all taxes, special assessments and impositions against this property and any other property situated in Lewis and Clark County, Montana in which said parties are interested.

2. That the undersigned and other interested parties in the above-described property have not protested the payment of any taxes, assessments and impositions with respect to this property and other property situated in Lewis and Clark County, Montana in which said parties are interested parties.

The undersigned further certifies that the following are all the "interested parties" as defined above who have any interest in the above-described real property:

Name	Address	Nature of Interest

(Add additional sheets as needed)

The undersigned hereby certifies all the above information as being full and complete disclosures, UNDER PENALTY OF PERJURY.

DATED

DATED

(WITNESS)

(ADDRESS)

(WITNESS)

(ADDRESS)

(CITY, STATE, ZIP CODE)

(CITY, STATE, ZIP CODE)

TELEPHONE: ______TELEPHONE:

City of Helena, Montana - Complete Streets Checklist

Page 2 of 10

DATE RECEIVED

CITY OF HELENA PUBLIC WORKS CONSTRUCTION STORMWATER MANAGEMENT PLAN REVIEW CHECKLIST

NAME OF PROJECT	PROJECT FILE NO.	ADDRESS
TOTAL PROJECT ACRES	Т	OTAL DISTURBED ACRES
Latitude:	Longitude:	
	GPS LOCATION OF CONSTRUCTION SITE	
APPLICANT	ADDRESS	PHONE NUMBER
OWNER (If different from Applicant)	ADDRESS	PHONE NUMBER
	Review History	
First Review		
Plan Received on:	Approved/Denie	d:
Review Completed on:	Comment	s:
Reviewed by:		
Second Review		
Plan Received on:	Approved/Denie	d:
Review Completed on:	Comment	S:
Reviewed by:		
Third Review		
Plan Received on:	Approved/Denie	d:
Reviewed by:	Comment	S:
	REPORT OF TECHNICAL REVIEW	
The Construction Stormwater Mar components identified within the a	nagement Plan for the above named project ttached checklist.	or activity includes the necessary
The Construction Stormwater Mar necessary components identified	nagement Plan for the above named project within the attached checklist through failure	or activity does not include the to include the following:
Review by:		

Construction Stormwater Management Plan Review Checklist Template

Project Name:

			nplete	omplete	N/A
Ge	ner	al Information	Cor	Inc	
1.	Des	cribe the project location (address, parcel number, etc)			
	a.	Description of project activity			
2.	Are	as (ac)			
	a.	Total disturbed area			
	b.	Existing impervious area			
3.	Cor	struction schedule/sequence			
4.	Ide	ntify site features			
	a.	Limits of improvements relative to neighbors or a Vicinity Map			
	b.	Limits of clearing and grading			
	с.	Existing vegetation delineated			
	d.	Existing and proposed site topography			
	e.	Existing and proposed runoff direction			
	f.	Surface waters and storm conveyance systems within 200' of project			
	g.	Description of outfall and receiving surface waters			
	h.	Protection of waterways, receiving surface waters and natural resources			
	i.	Construction Stormwater Management Plan is phased with construction			
	j.	Stockpile locations, staging areas and access points defined			
	k.	Show all areas of construction, including but not limited to: structures, retaining walls, roads, drives, utilities, trenches, scaffolds, catch basins, etc.			
	I.	Description of site soil			
	m.	Description of watershed tributary to site			
5.	Mai	ntenance Plan for Control Facilities			
6.	Cop	ies of Design Waivers or Variances			
7.	Cop	ey of NOI and SWPPP as submitted to DEQ, if applicable			
Er	osio	n and Sediment Controls			
1.	Des	ign considerations and erosion control BMPs are specified to:			
	a.	Control stormwater volume and velocity within the site to minimize soil erosion through use of controls such as check dams, fiber rolls, etc.			
	b.	Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion through use of controls such as stilling basins, fiber rolls, etc.			
	c.	Minimize the amount of soil exposed during construction activity			
	d.	Minimize the disturbance of steep slopes			

			mplete	omplete	N/A
Er	osio	n and Sediment Controls (cont.)	Col	Inco	
	e.	Minimize sediment discharges from the site through use of perimeter controls such as silt fence, fiber rolls, diversion berms, etc.			
	f.	Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible			
	g.	Minimize soil compaction and, unless infeasible, preserve topsoil			
So	oil St	abilization			
1.	The	following soil stabilization requirements are clearly communicated:			
	a.	Stabilization of disturbed areas must be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days			
	b.	If initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be specified			
De	wat	ering			
1.	lf aj suc	oplicable, discharges from dewatering activities are managed by appropriate controls h as sedimentation basins, sediment traps, etc.			
		Note: This does not preclude the contractor from the requirement to obtain a dewatering permit from MT DEQ.			
Pollution Prevention Measures					
1.	Pol	ution prevention measures are specified to:			
	a.	Specify treatment of wash waters in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge			
	b.	Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to storm water			
	C.	Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures			
Prohibited Discharges					
1.	Wa	stewater from washout of concrete is prohibited or managed by appropriate controls			
2.	A s	atement (or statements) which prohibit discharges of the following:			
	a.	Wastewater from washout and cleanout of stucco, paint, from release oils, curing compounds and other construction materials			
	b.	Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance			
	C.	Soaps or solvents used in vehicle and equipment washing			
Su	irfac	e Outlets			
1.	1. When discharging from basins and impoundments, outlet structures that withdraw water from the surface are used (unless infeasible)				

DATE RECEIVED

CITY OF HELENA PUBLIC WORKS POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN REVIEW CHECKLIST

TOTAL PROJECT ACRES TO Latitude: Longitude: GPS LOCATION OF CONSTRUCTION SITE APPLICANT ADDRESS OWNER (If different from Applicant) ADDRESS Plan Received on:	
Latitude: Longitude: GPS LOCATION OF CONSTRUCTION SITE APPLICANT ADDRESS OWNER (If different from Applicant) ADDRESS OWNER (If different from Applicant) ADDRESS First Review Review History Plan Received on: Approved/Denied: Review Completed on: Comments: Reviewed by: Comments: Third Review Third Review	TAL DISTURBED ACRES
GPS LOCATION OF CONSTRUCTION SITE APPLICANT ADDRESS OWNER (If different from Applicant) ADDRESS OWNER (If different from Applicant) ADDRESS Review History First Review Plan Received on: Review Completed on: Comments: Reviewed by: Second Review Plan Received on: Reviewed on: Comments: Reviewed by: Third Review	
APPLICANT ADDRESS OWNER (If different from Applicant) ADDRESS Review History Review History First Review Approved/Denied: Review Completed on: Comments: Reviewed by: Approved/Denied: Second Review Approved/Denied: Reviewed by: Comments: Review Completed on: Comments: Reviewed by: Comments: Third Review Third Review	
OWNER (If different from Applicant) ADDRESS Review History First Review Approved/Denied: Plan Received on: Approved/Denied: Review Completed on: Comments: Reviewed by: Approved/Denied: Second Review Approved/Denied: Plan Received on: Approved/Denied: Reviewed by: Comments: Plan Received on: Comments: Reviewe Completed on: Comments: Third Review Third Review	PHONE NUMBER
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Reviewed by:	
Second Review Plan Received on: Review Completed on: Reviewed by: Third Review	
Plan Received on: Approved/Denied: Review Completed on: Comments: Reviewed by: Third Review	
Review Completed on: Comments: Reviewed by: Third Review	
Reviewed by:	
Third Review	
Plan Received on: Approved/Denied:	
Review Completed on: Comments:	
Reviewed by:	
REPORT OF TECHNICAL REVIEW	
The Stormwater Management Plan for the above named project or activity incl construction controls in order to comply with the State and local post-construction identified within the attached checklist).	udes the necessary post- on stormwater requirements (as
The Stormwater Management Plan for the above named project or activity doe post-construction controls in order to comply with the State and local post-cons (as identified within the attached checklist) through failure to include the following the following the state of the st	s not include the necessary struction stormwater requirements ng:
Review by:	- /
Signature:	Date:

_

Ge	eneral Information	Complete	Incomplete	N/A
1.	Location			
	a. Address, subdivision name, legal description, etc			
2.	Type of development (residential, commercial, etc)			
3.	Areas (ac)			
	a. Total disturbed area			
	b. Existing impervious area			
	c. Post-development impervious area			
4.	Drainage basin maps are provided which clearly label the following:			
	a. Existing basin boundaries			
	b. Existing time of concentration flowpaths for each basin			
	c. Post-development basin boundaries			
	d. Post-development time of concentration flowpaths for each basin			
	e. Discharge location(s)			
	f. Receiving waters within 200 feet of project are identified			
5.	Montana Licensed Engineer Stamp			
Dr	ainage Plan Content			
1.	Topographic map of existing and finished grade contours at 2-foot max intervals			
2.	Location of each permanent stormwater control			
3.	Plan and profile of each permanent stormwater control			
4.	Invert elevations, slopes, and lengths of storm drain facilities			
5.	Size, types, invert elevations and lengths of all culverts and pipe systems			
6.	Discharge points clearly labeled			
7.	Receiving surface waters identified			
8.	Existing on-site natural resources identified and protected			
9.	FEMA floodplains identified			
Ca	alculations and Design Documentation			
1.	Hydrology calculations			
	a. State runoff method used (rational, SCS, etc)			
	b. State modeling constants and assumptions			
	c. Description of design storms (frequency, depth, duration)			
	d. Existing and post-development land uses			

Са	Iculations and Design Documentation (Continued)	Complete	Incomplete	V/N
	e. Existing and post-development peak runoff rate for each design storm			
	f. Existing and post-development runoff volume for each design storm			
2.	Post-construction BMP sizing calculations			
	a. State design requirements (0.5-inch requirement, TSS removal, or other)			
	b. Required permanent controls capacities, flow rates, and operating levels			
	c. Sizing calculations with results			
	d. A statement documenting compliance with design requirements			
	e. If 0.5-inch or TSS removal requirements are not met, provide documentation showing the impracticability of infiltration, evapotranspiration, capture for reuse, and treatment	g it.		
3.	Culvert and pipe system capacities and outlet velocities			
4.	Ditch capacities and velocities			
Ad	ditional Information			
1.	Permits, easements, setbacks, and discharge agreements			
2.	Floodplain maps			
3.	Operations and Maintenance Manual for each permanent stormwater control			
	a. Identify the owner			
	b. Identify the party responsible for long-term O&M			
	c. A schedule of inspection and maintenance for routine and non-routine maintenance tasks to be conducted			
	d. System failure and replacement criteria to define the structure's performance requirements			
4.	Geotechnical Report			



CITY OF HELENA

COMPLETE STREETS

PLAN & SPECIFICATION SUBMITTAL CHECKLIST

Project Name:	
Engineering Firm:	
Engineering Contact:	
Telephone No.:	

On 20 December 2010, the City of Helena adopted the Complete Streets Resolution (Resolution #19799). The Resolution implements a Complete Streets policy to require the planning, design, and construction of streets to accommodate all modes of transportation and persons of all abilities, with the goal of optimizing safety, interconnectivity, compatibility, and convenience. In addition to the policy, City planning documents such as the Greater Helena Area Transportation Plan, Helena Transit Plan, and Non-motorized Plans, as well as these standards must be considered when designing a street.

The City of Helena's approach to Complete Streets is a modular approach where each feature has a set minimum width. The pavement and ROW widths are determined by which features are deemed necessary for each particular section. Not all features may be required for every street, but each must be considered. If a feature is not required, the ROW may or may not be reduced.

The following checklist that must be completed for each new street or street section is based on the complete street feature in Table 5-3 that establishes minimum widths for each feature. As stated before, each feature must be considered and justification provided, if the feature is not included in the street section. If a feature is not required, the ROW may or may not be reduced based on future need of the particular feature. City Staff, and ultimately the City Commission, will determine if a feature is needed. Please note that some deviation from the complete streets standards may require commission approval, for instance exemption from installing a sidewalk or boulevard.

The attached plans and specifications for the above-mentioned project are in compliance with City of Helena Complete Street Policy and City Street Standards.

Sections 5.2.12 & 5.3 — Complete Streets and Right-of Way Standards

	of Street/s:	
tim	nted ADT of each street:	
1.	Are the travel lanes at least 10' wide?	🗆 Yes 🗖 No
	Width of Lanes:	
	Deviation request:	
	Justification:	
2. gu	Is parallel parking (6' lane) included on both sides of the structure pan)?	eet (excluding th □ Yes □ No
	Deviation request:	
	Justification:	
3.	Are 5' sidewalks included on both sides?	□ Yes □ No
	Is a bike/ped path requested in place of one of the sidewalks:	🗆 Yes 🗆 No
	Deviation request: Curbside sidewalk and variances to eliminate Bike/Ped path must be approved by the Commission.	the sidewalk or
	Justification:	
Λ	Ans 72 Developmends in almost on hoth sides?	
4.	Are / Boulevarus included on both sides?	⊔ Yes ⊔ No
4.	Are 7 Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission):	approved by th
4.	Are 7 Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission):	approved by th
4 . 5 .	Are / Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission): Justification: Does the Helena Transit Plan identify a Bus Stop in this area	approved by th
 5. 6. 	Are 7 Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission): Justification: Does the Helena Transit Plan identify a Bus Stop in this area Are any transit stops proposed?	approved by the second
5 . 6 .	Are / Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission): Justification: Does the Helena Transit Plan identify a Bus Stop in this area Are any transit stops proposed? Has the stop been approved by Capital Transit or the Trans Department?	approved by the second
 5. 6. 	Are / Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission): Justification: Does the Helena Transit Plan identify a Bus Stop in this area Are any transit stops proposed? Has the stop been approved by Capital Transit or the Trans Department? Will the stop have a shelter?	approved by the second
+. 5. 6.	Are / Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission): Justification: Does the Helena Transit Plan identify a Bus Stop in this area Are any transit stops proposed? Has the stop been approved by Capital Transit or the Trans Department? Will the stop have a shelter? Will the stop service Capital Transit or other transit operations?	approved by the approved by th
+. 5. 6.	Are / Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission): Justification: Does the Helena Transit Plan identify a Bus Stop in this area Are any transit stops proposed? Has the stop been approved by Capital Transit or the Trans Department? Will the stop have a shelter? Will the stop be near a lobby or other shelter that will generally public or employees?	approved by the second
+. 5. 6.	Are / Boulevards included on both sides? Deviation request (All curbside sidewalk requests must be Commission): Justification: Justification: Does the Helena Transit Plan identify a Bus Stop in this area Are any transit stops proposed? Has the stop been approved by Capital Transit or the Trans Department? Will the stop have a shelter? Will the stop be near a lobby or other shelter that will generally public or employees? Can the stop accommodate bike, pedestrians, and ADA users?	approved by t approved by t ? U Yes D No D Yes D No O Yes D No D Yes D No D Yes D No be available to th D Yes D No D Yes D No D Yes D No

D	
Deviation	request.
Dernation	request.

Justification:

8. Does the Helena Transportation Plan or Non-Motorized Plan request or identify any bike lanes or off-street paths in area?
 Bike lanes are discouraged on Local Street unless identified in a Commission-approved plan.

Deviation request:

Justification:

9. Are there any other modes of transportation that need to be considered for this proposal? (i.e. golf cart, horses, light rail, snowmobile, etc.) □ Yes □ No

A brief explanation which additional modes are included with this proposal:

B. LOCAL OFFICE/COMMERCIAL STREETS: N/A for this proposal

Name	of Street/s:	
Estim	ated ADT of Each Street:	
1.	Are the travel lanes at least 12' wide?	🗆 Yes 🗖 No
	Width of Lanes:	
	Deviation request:	
	Justification:	
2.	Is parallel parking (6' lane) included on both sides of the str gutter pan)?	reet (excluding th □ Yes □ No
	Deviation request:	
	Justification:	
3.	Are 5' sidewalks included on both sides?	□ Yes □ No
	Is a bike/ped path requested in place of one of the sidewalks:	🗆 Yes 🗆 No
	Deviation request: Curbside sidewalk and variances to eliminate the sidewalk or Bike/Ped path must be approved by the Commission.	
	Justification:	
4.	Are 7' boulevards included on both sides?	□ Yes □ No
	Deviation request (All curbside sidewalk requests must be Commission):	e approved by th

Page 3 of 10

In	stifi.	ontion	••
Ju	SUIII	cation	1.

5.	Does the Helena Transit Plan identify a Bus Stop in this area?	□ Yes □ No				
6.	Are any transit stops proposed?	□ Yes □ No				
	Has the stop been approved by Capital Transit or the Transpo Department?	ortation System				
	Will the stop have a shelter?	□ Yes □ No				
	Will the stop service Capital Transit or other transit operations?	□ Yes □ No				
	Will the stop be near a lobby or other shelter that will generally be public or employees?	e available to th				
	Can the stop accommodate bike, pedestrians, and ADA users?	□ Yes □ No				
7.	Is an additional 1' ROW strip included behind the sidewalk o included on both sides?	r bike/ped patl □ Yes □ No				
	Deviation request:					
	Justification:					
	approved plan. Deviation request:					
	Deviation request:					
9.	 Are there any other modes of transportation that need to be considered for proposal? (i.e. golf cart, horses, light rail, snowmobile, etc.) 					
	A brief explanation which additional modes are included with this proposal:					
C. <u>MINC</u>	DR COLLECTOR STREETS: I N/A for th	<u>is proposal</u>				
<u>Name</u>	of Street/s:					
Estim	ated ADT of Each Street:					
1.	Are the travel lanes at least 10'?					
		□ Yes□ No				
	Width of Lanes	□ Yes□ No				
	Width of Lanes Deviation request:	□ Yes□ No				
	Width of Lanes Deviation request: Justification:	□ Yes□ No				
2.	Width of Lanes Deviation request: Justification: Is parallel parking (6' lanes) included both sides of the street (6' lanes)	□ Yes□ No				

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em:	□ Yes □ No □ Yes □ No the Commission) □ Yes □ No □ Yes □ No
ewalks included on both sides? ed path requested in place of one of the sidewalks: request: (All sidewalk variances must be approved by on: ulevards included on both sides? request: (All curbside sidewalk requests must be on) on: on: determine ed path requests for the sidewalk requests negative on) for the sidewalk requests on) for the sidewalk requests for the sidewalk requests	□ Yes □ No □ Yes □ No the Commission) □ Yes □ No □ Yes □ No
ed path requested in place of one of the sidewalks: request: (All sidewalk variances must be approved by on:	□ Yes □ No the Commission) □ Yes □ No □ Yes □ No
request: (All sidewalk variances must be approved by on:	the Commission)
on:	☐ Yes ☐ No approved by th approved by th a? ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No be available to th ☐ Yes ☐ No
ulevards included on both sides? request: (All curbside sidewalk requests must be on)	☐ Yes ☐ No approved by th approved by th ? ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No be available to th ☐ Yes ☐ No
request: (All curbside sidewalk requests must be on)	approved by the second
Helena Transit Plan identify a Bus Stop in this area ransit stops proposed? op have a shelter? op service Capital Transit or other transit operations? top be near a lobby or other shelter that will generally employees?	a? □ Yes □ No □ Yes □ No □ Yes □ No □ Yes □ No be available to th □ Yes □ No
ransit stops proposed? op have a shelter? op service Capital Transit or other transit operations? top be near a lobby or other shelter that will generally employees?	□ Yes □ No □ Yes □ No □ Yes □ No be available to th □ Yes □ No
op have a shelter? op service Capital Transit or other transit operations? top be near a lobby or other shelter that will generally employees?	☐ Yes ☐ No ☐ Yes ☐ No be available to th ☐ Yes ☐ No
op service Capital Transit or other transit operations? top be near a lobby or other shelter that will generally employees?	☐ Yes ☐ No be available to t ☐ Yes ☐ No
cop be near a lobby or other shelter that will generally employees?	be available to t
on accommodate hike nedestrians and ADA users?	
op accommodate blke, pedestrians, and ADA users:	🗆 Yes 🗖 No
itional 1' ROW strip included behind the sidewalk on both sides?	x or bike/ped pa □ Yes □ No
request:	
on:	
Helena Transportation Plan or Non-Motorized ny bike lanes or off-street paths in area? s are discouraged on Minor Collector Street unle on-approved plan	Plan request of Yes IN ess identified in
request:	
on:	
	Helena Transportation Plan or Non-Motorized ny bike lanes or off-street paths in area? s are discouraged on Minor Collector Street unle on-approved plan request:

MAJ(DR COLLECTOR STREETS:	<u>for this proposal</u>				
Name	of Street/s:					
Estim	ated ADT of Each Street:					
1.	Are the travel lanes at least 10'?	□ Yes□ No				
	Width of Lanes					
	Deviation request:					
	Justification:					
2.	Is a turn lane (10' lane) proposed?	□ Yes □ No				
	Deviation request:					
	Justification:					
3.	Is parallel parking (6' lanes) included on both sides of the gutter pan)?	e street (excluding the □ Yes □ No				
	Deviation request:					
	Justification:					
4.	Are 5' sidewalks included on both sides?	□ Yes □ No				
	Is a bike/ped path requested in place of one of the sidewalks:	🗆 Yes 🗖 No				
	Deviation request: (All sidewalk variances must be approved by the					
	Justification:					
5.	Are 7' Boulevards included on both sides?	□ Yes □ No				
	Deviation request: (All curbside sidewalk requests must Commission) Justification:	be approved by the				
6.	Does the Helena Transit Plan identify a Bus Stop in this a	area? 🛛 Yes 🗆 No				
7.	Are any transit stops proposed?	□ Yes □ No				
	Will the stop have a shelter?	🗆 Yes 🗆 No				
	Will the stop service HAT or other transit operations?	□ Yes□ No				
	Will the stop be near a lobby or other shelter that will genera public or employees?	ally be available to the □ Yes□ No				
	Can the stop accommodate bike, pedestrians, and ADA users	? 🛛 Yes 🗆 No				

8.	Is an additional 1' ROW strip included behind the sidewalk of included on both sides?	or bike/ped path □ Yes □ No
	Deviation request:	
	Justification:	
9.	Does the Helena Area Transportation Plan or Non-Motorized identify any bike lanes or off-street paths in area?	Plan request or □No □Yes
	Deviation request:	
	Justification:	
10). Are 5' Bike Lanes included on both sides of the street?	□ Yes □ No
	(Bike Lanes are required unless specifically excluded by the Transportation Plan or other Commission Approved Non-mo	Greater Helena torized Plan)
	Deviation request:	
	Justification:	
11	. Are there any other modes of transportation that need to be co	nsidered for this □ Yes □ No
	proposal. (i.e. goin cart, noises, nght ran, showmoone, etc.)	
	Explain which additional modes are included with this proposal:	
E. <u>MINO</u> Name	Explain which additional modes are included with this proposal:	
E. <u>MIN(</u> <u>Name</u> Estim	Explain which additional modes are included with this proposal:	
E. <u>MIN(</u> <u>Name</u> Estim 1.	Explain which additional modes are included with this proposal:	□ Yes□ No
E. <u>MIN(</u> <u>Name</u> Estim 1.	Explain which additional modes are included with this proposal:	□ Yes□ No
E. <u>MIN(</u> <u>Name</u> Estim 1.	Explain which additional modes are included with this proposal: DR ARTERIAL STREETS:	□ Yes□ No
E. <u>MIN(</u> <u>Name</u> Estim 1.	Explain which additional modes are included with this proposal:	□ Yes□ No
E. <u>MINO</u> <u>Name</u> Estim 1.	Explain which additional modes are included with this proposal:	□ Yes□ No
E. <u>MIN(</u> <u>Name</u> Estim 1.	Explain which additional modes are included with this proposal: DR ARTERIAL STREETS: N/A for this proposal e of Street/s: hated ADT of Each Street: Are the travel lanes at least 11'? Width of Lanes Deviation request: Justification: Is a turn lane (12' lane) proposed? Deviation request:	□ Yes□ No
E. <u>MIN(</u> <u>Name</u> Estim 1.	Explain which additional modes are included with this proposal:	□ Yes□ No
E. <u>MIN(</u> <u>Name</u> Estim 1. 2. 3.	Explain which additional modes are included with this proposal:	□ Yes□ No □ Yes□ No □ Yes□ No et (excluding the □ Yes □ No
E. <u>MIN(</u> <u>Name</u> Estim 1. 2. 3.	Explain which additional modes are included with this proposal:	□ Yes□ No □ Yes□ No □ Yes□ No et (excluding the □ Yes□ No

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4. Are 5' sidewalks included on both sides?

□ Yes □ No

Is a bike/ped path requested in place of one of the sidewalks **Deviation** Yes **No** No Deviation request: (All sidewalk variances must be approved by the Commission)

	Justification:	
5.	Are 7' Boulevards included on both sides?	🗆 Yes 🗖 No
	Deviation request: (All curbside sidewalk requests must be Commission)	e approved by th
6.	Does the Helena Transit Plan identify a Bus Stop in this area	a? 🛛 Yes 🗆 No
7.	Are any transit stops proposed?	🗆 Yes 🗖 No
	Will the stop have a shelter?	🗆 Yes 🗖 No
	Will the stop service HAT or other transit operations?	🗆 Yes 🗖 No
	Will the stop be near a lobby or other shelter that will generally public or employees?	be available to th
	Can the stop accommodate bike, pedestrians, and ADA users?	🗆 Yes 🗖 No
8.	Is an additional 1' ROW strip included behind the sidewall included on both sides?	k or bike/ped pat □ Yes □ No
	Deviation request:	
9.	Does the Helena Transportation Plan or Non-Motorized identify any bike lanes or off street paths in area?	Plan request o □No □Yes
	Deviation request:	
	Justification:	
10	Justification:	□ Yes □ No
10	Justification: Are 5' Bike Lanes included on both sides of the street? (Bike Lanes are required unless specifically excluded by the Transportation Plan or other Commission Approved Non-m	□ Yes □ No ne Greater Helen notorized Plan)
10	Justification:	□ Yes □ No ne Greater Helen notorized Plan)
10	Justification:	□ Yes □ No ne Greater Helen notorized Plan)
10	Justification:	□ Yes □ No ne Greater Helen notorized Plan) Yes □ No □ N/A

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	12.	12. Are there any other modes of transportation that need to be considered for this proposal? (i.e. golf cart, horses, light rail, snowmobile, etc.)				
		Explain which additional modes are included with this proposal:				
F.	<u>MAJ(</u>	DR ARTERIAL STREETS:	this proposal			
	Name	of Street/s:				
	Estim	ated ADT of Each Street:				
	1.	Are the travel lanes at least 12'?	anes No			
		Width of Lanes:				
		Deviation request:				
	2.	Is a turn lane (12' lane) proposed?	□ Yes □ No			
		Deviation request:				
	3.	Is parallel parking (6' lanes) included on both sides of the str gutter pan)?	eet (excluding the es □ No			
		Deviation request:				
		Justification:				
	4.	Are 5' sidewalks included on both sides?	□ Yes □ No			
		Is a bike/ped path requested in place of one of the sidewalks:	🗆 Yes 🗆 No			
		Deviation request: (All sidewalk variances must be approved by	the Commission)			
		Justification:				
	5.	Are 10' Boulevards included on both sides?	□ Yes □ No			
		Deviation request: (All curbside sidewalk requests must be Commission) Justification:	approved by the			
	6.	Does the Helena Transit Plan identify a Bus Stop in this area	? 🛛 Yes 🗆 No			
	7.	Does the Helena Transit Plan identify a Bus Lane in this area	? 🗆 Yes 🗆 No			
		Is a bus lanes included as part of the typical section? Justification:	□ Yes □ No			

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8.	Are any transit stops proposed	🗆 Yes 🗖 No
	Will the stop have a shelter?	🗆 Yes 🗆 No
	Will the stop service HAT or other transit operations?	🗆 Yes 🗆 No
	Will the stop be near a lobby or other shelter that will genera public or employees?	ally be available to the □ Yes □ No
	Can the stop accommodate bike, pedestrians, and ADA users	? 🗆 Yes 🗆 No
9.	Is an additional 1' ROW strip included behind the sidew included on both sides?	alk or bike/ped path □ Yes □ No
	Deviation request:	
10.	Does the Helena Transportation Plan or Non-Motoriz identify any bike lanes or off-street paths in area?	zed Plan request or □ Yes □ No
	Deviation request:	
	11. Are 5' Bike Lanes included on both sides of the street	t? 🛛 Yes 🗆 No
	(Bike Lanes are required unless specifically excluded by Transportation Plan or other Commission Approved Nor	the Greater Helena -motorized Plan)
	Deviation request:	
12.	Are all Medians at least 4'?	∃Yes □No □N/A
	Deviation request:	
13.	Are there any other modes of transportation that need to proposal? (i.e. golf cart, horses, light rail, snowmobile, etc.)	be considered for this
	Explain which additional modes are included with this propo	sal:
G. <u>Traffi</u>	c Calming/Stormwater Treatment	
1.	Is any traffic calming proposed?	□ Yes □ No
	Location of traffic calming:	
	Type of Traffic Calming Measure Proposed at each location Calming Table in the Transportation Section of Appendix C)	on: (Reference Traffic
	Is addition ROW required?	□ Yes □ No
City of He	elena, Montana - Complete Streets Checklist	Page 10 of 10

2. Are any Storm water treatment elements included within the ROW?

	□ Yes □ No
Location of storm water elements:	
Type of treatment at each location:	
Is addition ROW required?	□ Yes □ No

Certified by: _____ (Stamp)

APPENDIX B

MULTI-MODAL TRAFFIC IMPACT STUDY REQUIREMENTS

PURPOSE

OFHE

The City of Helena requires traffic impact studies (TIS) to assess transportation impacts associated with public or private development projects and provide consistency with City of Helena Growth Policy (HGP), Lewis and Clark County Growth Policy (LCGP), Helena Area Transit Development Plan (HATDP) and Greater Helena Area Long Range Transportation Plan – 2014 Update (GHALRTP) criteria. The data collection required for these studies shall be the responsibility of the owner/developer/consultant.

GENERAL REQUIREMENTS AND THRESHOLDS FOR TRAFFIC STUDIES

Level I Study - Less than 10 total PM peak hour trips to an intersection or access

Level II Study - 11 to 30 total PM peak hour trips to an intersection or access

Level III Study - Greater than 30 PM total peak hour trips to an intersection or access

	Торіс	Level I	Level II	Level III
I.	Introduction	\checkmark	✓	\checkmark
II.	Executive Summary		✓	\checkmark
III.	Proposed Development	\checkmark	✓	\checkmark
IV.	Existing Conditions	\checkmark	✓	\checkmark
V.	Traffic Forecasts			\checkmark
VI.	Traffic Analysis	\checkmark	✓	\checkmark
VII.	Other Items to Address			\checkmark
VIII.	Mitigation Alternatives		~	\checkmark
IX.	Recommendations and Conclusions		✓	\checkmark
X.	Appendices		\checkmark	\checkmark

Specific safety or capacity issues associated with a site, staff may request those be addressed, regardless of the number of site trips generated.

An outline of City of Helena requirements for a traffic study is provided on the following page. A proposal establishing the scope of the traffic study shall be submitted for review to the City Engineer based on guidelines in this document. Prior to or concurrent with the scope proposal, the applicant shall submit a preliminary trip generation and trip distribution analysis.

OUTSIDE AGENCIES AND JURISDICTIONS

There are streets within or adjacent to the City limits that are under the jurisdiction of MDT and/or Lewis and Clark County. Where development will impact their facilities, MDT and/or Lewis and Clark County may have additional requirements for a traffic study. Prior to approval of a final traffic study scope, a meeting with all impacted agencies is required to verify that the proposed scope addresses each agency's concerns.

GENERAL OUTLINE FOR TRAFFIC IMPACT STUDY

- I. Introduction
 - A. Cover page (All Levels)
 - B. General project description (All Levels)
 - C. Assumptions (Level II and III studies)
- II. Executive summary (Level II and III studies)
- III. Proposed development (All levels)
 - A. Trip Generation and Distribution
 - B. Development Phasing/Schedule
 - C. Access locations, configuration, and sight distance
 - D. Site Circulation and Parking
 - E. Study Area
- IV. Existing conditions (All Levels)
 - A. Existing street network and street classifications
 - B. Existing traffic volumes and turn movements
 - C. Existing LOS and V/C
 - D. Pedestrian and Bicycle facilities (safety/compliance/connectivity/etc.)
 - E. Existing transit routes and facilities
 - F. Crash History
- V. Traffic forecasts (Level III studies)
 - A. Study scenarios

Non-site traffic

- B. Site generated traffic
- VI. Traffic analysis (All Levels)
 - A. Site Access
 - B. Site Circulation and Parking
 - C. Intersections (LOS and V/C)
 - Capacity Analysis of Roadway Segment
 - D. Warrants, Turn Lanes, Traffic Signals
 - E. Queuing and Storage
 - F. Sight Distance
 - Traffic Calming

VII.

- G. Safety analysis/Crash History analysis (may be combined with *Section IV F*)
- Other items to address (Level III studies)
- A. Applicable MDT Criteria
- B. GHALRTP identified improvements within the study area
- C. Any known improvement projects within the study area (City, County, State)
- VIII. Mitigation alternatives (Level III studies)
- IX. Recommendations and conclusions (Level II and III studies)
- X. Appendices (Level II and III studies)

I. INTRODUCTION

- A. Cover page shall include project name, address or location and study consultant. Level II and Level III TIS shall be stamped by a professional engineer registered in the state of Montana.
- B. The general description should include any existing and proposed site uses including square footage/acreage; current/proposed zoning and/or any proposed zoning changes. Project phasing, proposed or future, shall be identified. The description of uses shall reflect the uses allowed by City of Helena zoning regulations. In addition to the general site description, the surrounding land uses, and zoning need to be documented. A map showing the site and surrounding area is required.
- C. Any assumptions used shall be documented completely with the appropriate justification also documented. Examples of assumptions include but are not limited to trip generation rates, independent variables, study area, trip distribution, any modal splits, worst case scenario, etc.

II. EXECUTIVE SUMMARY

The executive summary provides a clear and concise one- or two-page summary which shall include but is not limited to existing deficiencies, major section findings, mitigation alternatives to address existing deficiencies and those issues resulting from development and preferred alternatives.

III. PROPOSED DEVELOPMENT

- A. ITE trip rates are typically used by the City to project traffic. Trip rates and code(s) for the development need to be provided based on the latest version of the ITE Trip Generation Manual and reflect uses identified in the City of Helena zoning regulations. The City of Helena Community Development Department has made available local generation rates that can be used to project traffic. The gross daily trips, in addition to any adjustments for internal site, pass-by, or diverted link trips, shall be documented. Upon approval from the Transportation Engineer, trip generation studies from a similar site may be used instead of the ITE manual. If the development does not fit within an ITE category, alternative trip generation methodology may be required including a separate trip generation study of similar sites. Daily AM and PM peak trip generation shall be provided based on Peak Hour of Generator or Peak Hour of Adjacent Street, whichever is more conservative if the difference in the average rates is greater than or equal to 0.5 and both are available a.
- B. Trip distribution for the proposed development shall be addressed both in a narrative and as a diagram in the TIS. Assumptions for the trip distribution shall be included and based on existing count information or a logical explanation of

expected origins and destinations based on the proposed uses. In some instances, it may be appropriate to use origin and destination information upon Transportation Engineer's approval.

- C. Timelines for completion of phases is required including years for any subsequent phases. The year of opening should be based on a realistic schedule of when all public improvements and building construction will be complete and ready to occupy. The applicant may provide trip generation and distribution information for each phase and for build-out of the project. Mitigation for impacts shall be done consistent with an approved phasing plan if mitigation based on phasing is clearly identified in the TIS.
- D. Specific access locations shall be identified in the TIS. The location of access points shall consider the classification and design standards of the adjacent street, applicable access control requirements, sight distance, number of lanes, vehicle storage and queuing, signage and striping, on-site circulation needs and pedestrian and bicycle facilities. Analysis of access points needs to include existing and proposed driveway locations.
- E. On-site circulation and parking facilities shall be explained in adequate detail to document any impacts to adjacent public streets and development sites and compliance with applicable City code and development standards. Particular attention should be provided for applicable delivery, loading and drive-thru facilities.
- F. The TIS shall cover the entire area of influence from the proposed development including any intersections or accesses receiving 20 or more trips per day, access points within 150-feet of any major street and any other item that needs to be considered such as nearby school zones or transportation projects. A map and description/justification of the study area shall be provided.

IV. EXISTING CONDITIONS

A. A description and map of existing conditions in the study area shall include but is not limited to: street classifications, speed limits, ROW and pavement widths, bike lanes, median strips, sidewalks, lane configurations, intersections, traffic control, bicycle, and pedestrian facilities, schools, and transit routes. Also identify any known capacity or functional deficiencies (review the GHALRTP and any relevant area or corridor studies).

- B. Traffic counts shall be taken Tuesday, Wednesday, or Thursday when Helena School District and Helena College is in regular session. Developments with unusual peak hours, an analysis of the peak hour of the traffic generator is also required. For example, schools require analysis of the peak hour during the commencement and let-out for the school day. Depending on the school type there may be significant student or parent traffic. Counts taken during vacations, or any other time when school is not in session will not be accepted. Another area in Helena that requires special consideration is the State Capital area or routes leading to the Capital. Traffic counts shall be adjusted to levels consistent to that of what is observed during a Legislative session. Banquet or church facilities may also need special consideration. Recent counts (within one year) from a governmental agency such as the City or MDT may be used with prior approval. Counts shall accurately reflect the existing intersection or access conditions, including turning movements and bicycle and pedestrian counts and movements. Classification of counts shall be required to identify truck traffic. Cite reference sources and document the date, time of day and location of counts. Please notify the appropriate jurisdiction or utility prior to mounting traffic counting devices on infrastructure. Identify and justify the methods used to quantify non-site generated trips.
- C. Existing Level of Service (LOS) based on delay and volume to capacity ratio (V/C) shall be provided for each intersection identified for analysis in the traffic study scope. Intersections which are impacted with at least 20 trips from the proposed site during the AM or PM peak hours, or have trip volumes increase by at least 10% and are within expected routes of travel are typically reviewed. Where there are other facilities, such as a school, in the vicinity that have a peak hour outside the typical AM or PM peak, those shall be studied. The Transportation Engineer will make the final determination of the study area. Highway Capacity Manual methodology shall be used for the analysis, which needs to include performance measures for average intersection, worst case, and critical movements. Location maps shall be used to identify the locations of the intersection and LOS. More information is provided in *Section VI Traffic Analysis*.
- D. A summary of existing pedestrian and bicycle facilities shall be provided to document how the development will be served and any connectivity deficiencies to existing facilities. Missing or deficient sections of sidewalks or curb ramps (including ADA best practices requirements) within or adjacent to the site shall be identified.
- E. Transit routes serving the site and/or the distance to the closest transit stop or shelter should be documented.

F. Crash history shall be analyzed to document any existing safety conditions that may be aggravated or impacted by the development or development mitigation. The minimum history is typically latest five years.

V. TRAFFIC FORECASTS

Any modal split should be addressed for Sections B and C including documentation and justification. Documentation shall include reference to any standards or prior studies. Any modal split shall be approved prior to initiation of the TIS.

- A. The study scenarios for traffic forecasts and analysis should include the following:
 - Existing conditions
 - Existing plus proposed development (each applicable phase and build out)
 - 20-year horizon (typical) plus development (Mitigation design life 20-years).

Since improvements are designed for a minimum life of 20-years, analysis of any mitigation for a 20-year horizon is prudent. Variations to the planning horizon may be allowed on a case-by-case basis, depending on the size of the development and the potential need for mitigation. The planning horizon noted in the GHALRTP is 20-years. Growth rates used in the GHALRTP are approximately 0.94% per year (p. 52). Past AADT's may be used for growth rates.

For land use actions such as a zone change, conditional use permit, annexation or subdivision, the traffic forecasts and analysis shall include the reasonable worst-case scenario of the area subject to the land use action, i.e., the total acres and max density. A proposed development plan, typically, doesn't provide the worst-case scenario. Per development regulations, a full range of development potential (min. to max.) under current vs. proposed land use designations shall be addressed in the analysis. Reasonable worst-case analysis must have justification and should be based on maximum viable development.

- B. Non-site traffic includes existing traffic plus proposed or approved development in the area not accounted for in existing traffic counts. If other traffic studies for surrounding developments are used to estimate non-site traffic, those sources must be adequately documented. Trips need to be adjusted for each scenario based on the approved growth factor. Any assumptions for trip generation must be documented.
- C. ITE trip generation rates are generally used as noted in Section III A above and adjusted by approved growth rates. Explanation of trip distribution and assignment should include any assumptions. Provide a diagram noting percentages and trip numbers from both the proposed development and non-site trips. Directional distribution for both the AM and PM peak hours should be

included. Trip distributions under different scenarios should be adjusted based on any anticipated improvements or new street connections associated with the development or identified within the planning horizon in the GHALRTP or Comprehensive Capital Improvement Program (CCIP). For example, new streets in a phased subdivision may impact the distribution, or a planned CCIP project that occurs five years out could change the distribution between the build out and 20-year scenarios.

VI. TRAFFIC ANALYSIS

- A. Traffic analysis including vision clearance/sight distance, proximity to intersections, turn lanes, queuing, existing access spacing and conflicts with pedestrians or bicycles shall be provided for all proposed site accesses. Criteria for minimum access spacing and the number of access points are outlined in the Engineering and Design Standards, development regulations and City Code. Interior site circulation, emergency vehicle and truck traffic shall also be considered in the analysis of access locations.
- B. Impacts to site circulation from queuing such as drive through facilities, geometric considerations for emergency vehicular access and trucks needs to be addressed. Any change from the City's Engineering and Design Standards or City Code must be identified.
- C. Intersection analysis, including LOS and V/C, shall be provided for any intersection significantly impacted by the proposal. An intersection is considered significantly impacted as described in *Section IV.C*, or if the intersection is suspected of operating at LOS D or lower in the build year with build year background traffic. An analysis is required for each study scenario, including each cumulative sequence of phasing through the build-out condition. The analysis needs to clearly show the LOS and V/C of the intersection with and without the development.

Intersection analysis needs to balance signal timing based on the traffic demand. Assumed and proposed signal timing needs to be documented and suggested timing improvements identified. The intersection average LOS, V/C, critical movements, and worst movements should be identified. Evaluation of the intersections needs to document the expected queue lengths and available vehicle storage. Deficiencies in existing storage and lane configuration need to be identified. This would include but not limited to lane widths and curb radii where truck traffic is expected.

- D. Applicable warrants for turn lanes and traffic signals should be identified. Where it is expected that a signal may be needed based on a failing level of service, applicable warrants shall be evaluated to justify the need for a signal.
- E. Queuing analysis should include both the average queue length and the 95th percentile queue length. The 95th percentile shall be used for design and for determining the required storage. Conflicts with queued vehicles should be addressed, such as, street or driveway accesses, adjacent vehicle lanes, RR tracks, etc.
- F. Sight Distance for new intersections, streets and access points needs to meet the requirements of the City's Sight Distance Triangle (City Code 7-3-7). Deficiencies in site distance with the proposed development plan shall be identified and discussed. This should also address sight distance to crosswalks and traffic control devices such as proposed signals, stop signs and road signs. The tree planting plan must be reviewed for conflicts with proposed traffic control devices/signs.
- G. Analysis should be consistent with City of Helena Engineering and Design Standards Traffic Calming Section 5.4. There may or may not be a need for traffic calming with the development. The minimum thresholds of vehicle counts and speeds should be identified to determine if traffic calming is consistent with City policy and would provide a significant benefit. Potential locations and types of traffic calming should be evaluated.
- H. This Section may be combined with *Section IV F*. Current crash data for the past five years, and any other safety issues, should be identified and evaluated within the study area for potential impacts to the study scenarios. Crash history shall be analyzed to document if there are any existing safety conditions that may be impacted or aggravated by the development or development mitigation.

Graphics including tables, lane configurations and turning movements should be included to supplement and summarize the traffic analysis.

In summary, the traffic analysis should encompass the evaluation of intersection and access LOS, queuing, traffic signals, additional travel lanes, turn lanes, intersection functional areas, access control, bicycle movements, pedestrian movements, signal coordination, transit facilities, acceleration and deceleration lanes, merge lanes, weaving sections, future extension of transportation facilities through surrounding properties, etc.

VII. OTHER ITEMS TO ADDRESS

Other items that should be addressed include: nearby school zones, pending improvements from either nearby developments or nearby State, County, and City identified improvement projects or project identified in the GHALRTP or CCIP.

VIII. MITIGATION ALTERNATIVES

Possible mitigation identified in the above analysis sections should be discussed here. If the TIS identifies safety concerns as a whole or per movement of a LOS of "D" or less, improvements and funding strategies shall be considered concurrent with a development proposal. Mitigation should be addressed for each phase of a development. Any ROW required for mitigation also needs to be identified.

Adequate capacity should be provided and maintained on arterial and collector streets to accommodate intersection LOS standards and to avoid traffic diversion to local streets. The LOS standards shall be:

- V/C less than 0.85
- LOS D or better during morning (7:00-9:00 am) and evening (4:00-6:00pm) peak hours of operation for all intersections with arterial or collector streets
- LOS C for all other times of the day

Examples of mitigation to be addressed include, but are not limited to:

- Site access lane configuration, access restrictions / right in, right out
- Center turn lanes / dedicated turn lanes
- Additional vehicular lanes / left turn lanes / revised lane configurations
- Queuing lengths and storage capacity
- Geometric changes such as vertical or horizontal curves
- Speed limit investigations
- Bike lanes, ADA facilities, sidewalks, and multi-use paths
- Traffic control devices and signage
- Traffic signals, signal timing, phasing and coordination
- Traffic calming
- Transit facilities

IX. RECOMMENDATIONS AND CONCLUSIONS

This should be a list of recommendations by the Engineer and include key findings of the study. Any required improvements must be identified. When a phasing plan is proposed, improvements should be clearly identified by phase and the expected year for completion of mitigation and non-construction years. Additionally, any improvements that are not required of the development, but recommended to mitigate traffic issues in the study area, should be identified for City consideration and transportation planning purposes.

X. APPENDICES

Appendices to the TIS should include but are not limited to:

- Definitions, applicable references, and standards
- Traffic count data (including other traffic studies cited or used)
- Maps
- Warrant worksheets
- Signal progression worksheets, where applicable
- Analysis software printouts

Software analysis printouts shall be clearly labeled with consistent background/phasing nomenclature and applicable time period. Printout lane numbers, geometries and vehicular volumes shall all be consistent with other sections of the TIS and the land use application

APPENDIX C STANDARD DETAIL DRAWINGS
Water Standard Details











REVISED: 2/12/13

SCALE: NONE

Vacuum Valve and Manhole Vault









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Sewer Standard Details















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STANDARD BASE SLABS						
SIZE	DIMENSIONS	WEIGUT		REINFORCING		
	OD x T	WEIGHT	UVERHANG	BARS		
in	in	lbs	in	in		
30	44 X 6	790	3.5	#4@11		
36	51 X 6	1,065	3.5	#4@11		
42	58 X 6	1,380	3.5	#4@11		
48	64 X 6	1,680	3.0	#4@11		
60	79 X 8	3,400	3.5	#4 @ 11		
72	93 X 8	4,720	3.5	#4@11		
84	107 X 8	6,250	3.5	#4 @ 11		
96	121 X 8	7,990	3.5	#4@11		
120	146 X 12	17,450	2.0	#4@6		

NON-STANDARD BASE SLABS						
SIZE	DIMENSIONS			REINFORCING		
	OD x T	WEIGHT	UVERNANG	BARS		
in	in	lbs	in	in		
48	72 X 8	2,830	7.0	#4@11		
60	86 X 8	4,030	7.0	#4 @ 11		
72	100 X 8	5,460	7.0	#4 @ 11		
84	114 X 8	7,090	7.0	#4 @ 11		

1. Slabs are manufactured per ASTM C478.

- 2. Various sizes of drain holes can be provided.
- 3. Special sizes are available upon request.
- 4. Base slabs can be cast as monolithic with barrel section for an additional charge.

0.60 PS CABLE MAY BE SUBSTITUTED FOR #4 REBAR @ SAME SPACING









REVISED: 2/26/19

SCALE: NONE

Drop Manhole Standard Drawing

3-12

Stormwater Specific Standard Details









(TYP.)

"4". MAX.







ROUND				
PIPE SIZE	Н			
12"	2 1/2"			
15"	3"			
18"-24"	4"			
27"-36"	5"			
42"-54"	6"			
60"-72"	7"			
78"-90"	8"			





BAR SIZES								
STANDARD DESIGN				HEAVY DESIGN				
PIPE SIZE	HOLE DIA. REQ'D	Bolt Dia.	BAR SIZE	PIPE SIZE	HOLE DIA. REQ'D	Bolt Dia.	BAR SIZE	
12"-24"	3/4"	5/8"	5/8"	12"-18"	3/4"	5/8"	3/4"	
27"-48"	7/8"	3/4"	3/4"	21"-42"	7/8"	3/4"	1"	
54"-90"	1 1/8"	1"	1"	48"-90"	1 1/8"	1"	1 1/4"	
BOLT LENGTH = PIPE WALL THICKNESS + 2 $1/2"$								

Note: Hot dip galvanized per ASTM A153.











Transportation Standard Details








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DRIVE APPROACH WIDTHS:

-SINGLE FAMILY RESIDENTIAL DISTRICTS (R-1, R-2) = TWELVE FEET (12') MIN. TO TWENTY-FOUR FEET (24') MAX.

-MULTIPLE FAMILY RESIDENTIAL ZONES (R-3) = TWELVE FEET (12') MIN. TO THIRTY FEET (30') MAX.

-RESIDENTIAL OFFICE, COMMERCIAL AND INDUSTRIAL DISTRICTS = TWELVE FEET (12') MIN. TO FORTY FEET (40') MAX.

-TWO ADJOINING PROPERTIES OF SIXTY FEET (60') OR LESS MAY SHARE A COMMON DRIVE = TWELVE FEET (12') MIN. TO THIRTY FEET (30') MAX.

-PROPERTIES WITH RIGHT OF WAY FRONTAGE OVER SIXTY FEET (60') MAY HAVE TWO CURB CUTS FOR THE SAME PROPERTY IF SEPARATED BY TWENTY-FIVE FEET (25') OR MORE OF FULL HEIGHT CURB.

-PROPERTIES WITH OVER SIX HUNDRED FEET (600') OF FRONTAGE MAY HAVE MORE THAN TWO CURB CUTS.

NOTE A:

-NO CURB CUT SHALL BE CONSTRUCTED CLOSER THAN TEN FEET (10') FROM THE SIDE PROPERTY LINE EXCEPT IN RESIDENTIAL ZONES OR AS MAY BE REGULATED BY CITY SPECIFICATIONS IN EFFECT AT THE TIME OF SUCH WORK.

NOTE B:

-DRIVE APPROACHES SHALL NOT BE CLOSER THAN FIVE FEET (5') TO ANY UTILITY FACILITIES, LIGHT STANDARDS, FIRE HYDRANT, STREET SIGNS, SIGNALS OR OTHER PUBLIC IMPROVEMENT OR INSTALLATION.

ALL DRIVE APPROACHES SHALL COMPLY WITH CURRENT PROWAG STANDARDS.





CITY OF HELENA ENGINEERING STANDARDS

REVISED: 1/28/22

SCALE: NONE

BOULEVARD DRIVEWAY APPROACH DETAIL (WITH FLARE SECTIONS)

STANDARD DRAWING:

5-5B



-FLARES SHALL BE MIN. 4' (1.2m) IN WIDTH. STANDARD DRIVEWAY WIDTH DOES NOT CHANGE.

-ALL DRIVE APPROACHES SHALL COMPLY WITH CURRENT ADA/PROWAG STANDARDS.

CITY OF HELENA ENGINEERING STANDARDS

REVISED: 1/28/22

SCALE: NONE

CURBSIDE SIDEWALK DRIVEWAY APPROACH DETAIL (WITH RAMP SECTIONS)

STANDARD DRAWING:

5-5C



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GENERAL NOTES

- 1. ANY DEVIATIONS FROM THE CITY OF HELENA ENGINEERING AND DESIGN STANDARDS REQUIRES A DEVIATION REQUEST TO BE SUBMITTED TO CITY STAFF FOR REVIEW PRIOR TO ANY CONSTRUCTION.
- 2. CURB RAMP LOCATION SHALL BE PLACED WITHIN THE WIDTH OF THE ASSOCIATED CROSSWALK, OR AS SHOWN IN THE PROJECT PLANS.
- 3. SIDEWALKS SHALL BE 6 INCHES THICK ACROSS DRIVEWAYS AND 4 INCHES THICK ELSEWHERE.
- 4. ALL SIDEWALKS SHALL BE A MINIMUM WIDTH OF 5 FEET.
- 5. INTEGRAL CURB AND GUTTER SHALL BE USED ON ALL ROADWAYS. A MAXIMUM SLOPE OF 24:1 FROM THE LIP OF GUTTER TO THE FLOWLINE OF THE GUTTER.
- 6. PAVEMENT MUST BE INSTALLED BETWEEN $\frac{1}{8}$ " TO $\frac{1}{4}$ " ABOVE THE GUTTER LIP.
- 7. ¹/₂" EXPANSION JOINTS SHALL CONFORM TO AASHTO M213.
- 8. WHERE "GRADE BREAK" IS CALLED OUT, THE ENTIRE LENGTH OF THE GRADE BREAK BETWEEN THE TWO ADJACENT SURFACE PLANES SHALL BE FLUSH.
- 9. DO NOT PLACE GRATINGS, JUNCTION BOXES, ACCESS COVERS OR OTHER APPURTENANCES IN FRONT OF THE CURB RAMP OR ON ANY PART OF THE CURB RAMP OR LANDING.
- 10. THE CURB RAMP MAXIMUM RUNNING SLOPE SHALL NOT REQUIRE THE RAMP LENGTH TO EXCEED 15 FEET TO AVOID CHASING THE SLOPE INDEFINITELY WHEN CONNECTING TO STEEP GRADES. WHEN APPLYING THE 15 FOOT MAXIMUM LENGTH, THE RUNNING SLOPE OF THE CURB RAMP SHALL BE AS FLAT AS FEASIBLE.
- 11. CURB RAMPS, LANDINGS AND FLARES SHALL RECEIVE BROOM FINISH.
- 12. PEDESTRIAN CURB MAY BE OMITTED IF THE GROUND SURFACE AT THE BACK OF THE CURB RAMP AND/OR LANDING WILL BE AT THE SAME ELEVATION AS THE CURB RAMP OR LANDING AND THERE WILL BE NO MATERIAL TO RETAIN.
- 13. ALL PEDESTRIAN CURB RAMPS SHALL INCLUDE PROWAG COMPLIANT CAST IRON DETECTABLE WARNING SURFACES.
- 14. THE DETECTABLE WARNING SURFACE SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP (EXCLUSIVE OF FLARES) OR THE LANDING.
- 15. THE DETECTABLE WARNING SURFACE SHALL BE PLACED AT THE BACK OF CURB, AND NEED NOT FOLLOW THE RADIUS.
- 16. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED TO BE PERPENDICULAR TO THE GRADE BREAK AT THE BACK OF CURB.
- 17. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED TO BE PARALLEL TO THE DIRECTION OF TRAVEL.
- 18. IF CURB AND GUTTER ARE NOT PRESENT, SUCH AS A SHARED-USE PATH CONNECTION, THE DETECTABLE WARNING SURFACE SHALL BE PLACED AT THE PAVEMENT EDGE.
- 19. SEE STANDARD DRAWINGS FOR SIDEWALK AND CURB RAMP DETAILS.
- 20. WHEN THE GRADE BREAK BETWEEN THE CURB RAMP AND THE LANDING IS LESS THAN OR EQUAL TO 5 FT. FROM THE BACK OF CURB AT ALL POINTS, PLACE THE DETECTABLE WARNING SURFACE ON THE BOTTOM OF THE CURB RAMP.
- 21. ALL SIDEWALK, CURB RAMP AND LANDING CROSS SLOPES SHALL NOT EXCEED 2%; 1.5% CROSS SLOPE IS RECOMMENDED.

CITY OF HELENA
ENGINEERING STANDARDS

ADA CURB RAMP GENERAL NOTES

STANDARD DRAWING:

SCALE: NONE







1 auc 134 01 230	Page	194	of	233
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			Â	CURB RAMP WIDTH 5' MIN. TO MATCH LANDING WIDTH SEE PROJECT PLANS	LEGEND	SLOPE IN EITHER DIRECTION
¹ ㎡ E TRANSITION IF PRESENT, OR TO	C SEE PROJECT F XPANSION JOINT (TYP.) — TO SIDEWALK BUFFER, BACK OF CURB (TYP.) CONCRETE CURB AND GO	ONCRETE SIDEWALK EE GENERAL NOTE 18 PLANS 5' MIN. CURB RAMP CURB RAMP	2% MAX	GRADE BREAK	EE PROJECT PLA 'MIN. LANDSCAPIN MATCH TO E WITH CITY O AND DESIGN	NS IG STRIP XISTING OR COMPLY IF HELENA ENGINEERING I STANDARDS
	FACE OF	CURB TYPE P (SHO CONCRETE PEDESTRI, SEE GENERAL	CROSSWALK PLAN VIEV ERPENDIC WN WITH BU	SEE GENERAL NO DETECTABLE WARNIN CONCRETE DEPRESSE SEE STANDARD DRAWI SULAR B FFER)	NE 12 NG SURFACE D CURB AND GUT NG 5-4	TER
		CURB R	ADIUS DETA	DETECTABLE WARNING SURFAC CONCRETE DEPRESSED C SEE STANDARD DRAWING 3" RADIUS (TYP.) CONCRETE CURB AND GUTTER SEE STANDARD DRAWING 5-4	CE SURB AND GUTTEI 5-4	2
NOTES 1. PROVIDE A SEPAR CROSSWALK OR A 2. SEE THE CONTRAC CURB DETAILS.	ATE CURB RAMP FOR EAC S SHOWN IN THE CONTRA CT PLANS FOR THE CURB I	H MARKED OR UNMARKED CROSS CT PLANS. DESIGN SPECIFIED. SEE STANDAR	WALK. CURB R/ D PLAN F-10.12	AMP LOCATION SHALL BE PLACED WIT FOR CURB, CURB AND GUTTER, DEPRI	HIN THE WIDTH O ESSED CURB ANE	F THE ASSOCIATED) GUTTER, AND PEDESTRIAN
CITY OF ENGINEERING	HELENA G STANDARDS	PE	RPEN	IDICULAR		standard drawing: 5-8B
REVISED: 1/28/22	SCALE: NONE					







CON SEE : ¹ " EX	GRADE BREAK	15' MAX. SEE GENERAL NOTE 10 5% MIN. 8.3% MAX.	5' MIN. SEE PROJECT PLANS GRADE BREAK 2% MAX. LANDING SECTION	15' MAX. SEE GENERAL NOTE 10 5% MIN. 8.3% MAX.	-GRADE BREAK CONCRETE SIDEWALK SEE STANDARD DETAIL
	CONC	RETE PEDESTRIAN CURE	3		
	3 CONCE	SEE GENERAL NOTE 12		- DETECTABLE WARNING SURF	FACE CURB AND GUTTER
	SEES	CURB F	RADIUS DETAIL		LEGEND SLOPE IN EITHER DIRECTION
NOTES 1. PROVIDE A SEPAF CROSSWALK OR A 2. SEE CONTRACT P DETAILS.	RATE CURB RAMP FOR EAC S SHOWN IN THE CONTRA LANS FOR THE CURB DESIG	H MARKED OR UNMARKE 2T PLANS. 2N SPECIFIED. SEE STANI	ED CROSSWALK. CURB RAMP LOC DARD PLAN F-10.12 FOR CURB, CU	ATION SHALL BE PLACED WITH	IN THE WIDTH OF THE ASSOCIATED CURB, GUTTER AND PEDESTRIAN CURB
CITY OF ENGINEERING	HELENA G STANDARDS		COMBINA CURB RA	TION AMP	standard drawing: 5-10B
REVISED: 1/28/22	SCALE: NONE				



Types of Traffic Calming Measures

Vertical Deflection						
Measure	Definition/Application	Advantages	Disadvantages	Special Considerations		
Speed Hump	 Paved hump in the street that causes discomfort at high speeds. Speed reduction Possible traffic reduction 	 Effective if used in series at 300 to 500 foot spacing. Self-enforcing. Relatively inexpensive. 	 If not properly designed, drivers may skirt around to reduce impact. Drivers may speed up between humps. May increase volumes on other streets. Difficult to properly construct. 	 Emergency vehicles Drainage Signage Snow removal Estimated Cost Range = \$2,000 to \$4,000 		
Raised Crosswalk	 Speed hump designed as a pedestrian crossing. Speed reduction at crossing Possible traffic reduction 	 Highlights crosswalk. Excellent pedestrian safe treatment. Aesthetically pleasing if designed. Relatively inexpensive. 	 Drivers may speed up between humps. May increase volumes on other streets. Difficult to properly construct. 	 Emergency vehicles Drainage Signage Snow removal Estimated Cost Range = \$2,000 to \$4,000 		
Pumble Strins	Patterned sections of rough pavement. Possible speed reduction 	 Relatively inexpensive to install. Create driver awareness. 	 High maintenance. May adversely impact bicyclists. Noisy by design, and not recommended for all areas 	• Emergency vehicles Estimated Cost Range = \$2,000 to \$4,000		
Surface Valley Gutters	Dips in the street that can be used to carry run-off as well as cause discomfort to drivers at high speeds. • Speed reduction • Possible traffic reduction	 Effective if used in series at 300 to 500 foot spacing. Self-enforcing. Relatively inexpensive during initial construction. 	 Drivers may speed up between dips. May increase volumes on other streets. Not usually appropriate for existing streets with established drainage patterns. 	 Emergency vehicles Drainage Signage Estimated Cost Range = \$2,000 to \$4,000 		

Vertical Deflection

	Raised plateau where streets intersect.	• Slows vehicles in the most critical area, reducing	• Increases difficulty of making a turn.	 Emergency vehicles Drainage
Raised Intersection	Speed reductionPossible traffic reduction	 conflict. Highlights intersection. Excellent pedestrian safety treatment. Aesthetically pleasing if well designed. Better for emergency vehicles than speed humps. 	 Increased maintenance. Requires adequate signage and driver education. 	 Signage Snow removal Estimated Cost Range = \$6,000 to \$10,000

Horizontal Deflection

Measure	Definition/Application	Advantages	Disadvantages	Special Considerations
Gateway Treatment	Entry treatment that communicates a sense of neighborhood identity and a change in traffic conditions. • Speed reduction at entry • Traffic reduction	 Positive indication of a change in environment from arterial road to residential street. Reduces pedestrian crossing distances. On wide streets, provides space for landscaping in the median. 	• Low speed of turning vehicles may restrict flow on adjacent arterial.	 Emergency vehicle access Lighting Irrigation and maintenance of landscaping Estimated Cost Range = \$5,000 to \$25,000
Single-Lane Slow Point/	Mid-block expansion of landscaped areas and/or on- street parking in order to physically narrow the street to a single traffic lane.	 Minor inconvenience to drivers. Minimal inconvenience to local traffic. Shorter crossing distance for padastrians 	 Unfriendly to bicyclists unless designed to accommodate them. Conflict between opposing drivers arriving simultaneously could 	 Emergency vehicle access Lighting Signage Irrigation and maintenance of landscaping
Lane Narrowing	Speed ReductionTraffic Reduction	 Provides space for landscaping. Effective when used in series. 	 Contrary to driver expectation of unobstructed flow. 	Estimated Cost Range = \$8,000 to \$20,000

Measure	Definition/Application	Advantages	Disadvantages	Special Considerations
Two-Lane Slow Point	Mid-block expansion of landscaped areas and/or on- street parking in order to physically narrow the street. • Speed reduction • Possible traffic reduction	 Minor inconvenience to drivers. Regulates parking if bulb- outs are placed in no parking zones. Protects parked vehicles. Reduces pedestrian crossing distance. Provides space for landscaping. 	 Less effective in reducing speed and diverting traffic than the single-lane application. Unfriendly to bicyclists unless designed to accommodate them. 	 Lighting Signage Irrigation and maintenance of landscaping Estimated Cost Range = \$8,000 to \$20,000
Single-Lane Angled Slow Point	Offset curb extensions used to narrow the street to a single lane and create angled deviations in the path of travel. • Speed reduction • Traffic reduction	 Minor inconvenience to drivers. Minimal inconvenience to local traffic. Shorter crossing distance for pedestrians. Provides space for landscaping. Effective when used in series. 	 Unfriendly to bicyclists unless designed to accommodate them. Conflict between opposing drivers arriving simultaneously could create problems. Contrary to driver expectation of unobstructed flow. 	 Emergency vehicle access Lighting Signage Irrigation and maintenance of landscaping Estimated Cost Range = \$8,000 to \$20,000
Two-Lane Angled Slow Point	Offset curb extensions used to narrow the street and create angled deviations in the path of travel. • Speed reduction • Possible traffic reduction	• Same as Single-Lane Angled Slow Point, except pedestrian safety is reduced.	• Same as Single-Lane Angled Slow Point, except less effective in controlling speeds because drivers can create a straighter through movement by driving over centerline.	 Lighting Signage Irrigation and maintenance of landscaping Estimated Cost Range = \$8,000 to \$20,000

Horizontal Deflection

Measure	Definition/Application	Advantages	Disadvantages	Special Considerations
Mid-Block Median	Island or barrier in the center of a street that narrows lanes and segregates traffic.	 Provides a refuge for pedestrians and bicyclists. Can improve the 	• Limited reduction in vehicle speeds.	 Lighting Signage Irrigation and maintenance
	Possible speed reductionPossible traffic reduction	streetscape if landscaped.		Estimated Cost Range = \$5,000 to \$10,000
	Modification of "T" intersection layout which gives priority to turning traffic.	 Reduces through traffic along the top of the "T". May provide space for landscaping. 	• Can cause confusion regarding priority movements, which may lead to accidents.	 Lighting Signage Irrigation and maintenance of landscaping
Modified "T" Intersection	Speed reductionPossible traffic reduction			Estimated Cost Range = \$5,000 to \$10,000
	Physical curb reduction of road width at an intersection.	• Reduces pedestrian crossing distance.	• Unfriendly to bicyclists unless designed to	LightingSignage
	• Speed reduction	• Can be used in multiple applications or on a single segment of roadway.	Can be used in multiple applications or on a single segment of roadway.accommodate them.• Landscaping may cause sight line problems.	• Irrigation and maintenance of landscaping
Neckdown/Curb Bulbs		• Aesthetically pleasing if landscaped.		Estimated Cost Range = \$20,000 to \$30,000
	Offset curb extensions that cause deviation in the path of travel.	 Imposes minimal inconvenience on local traffic. 	 May create opportunities for head-on conflicts on narrow streets. 	 Lighting Signage Irrigation and maintenance
	Speed reductionPossible traffic reduction	 Reduces pedestrian crossing distance. Provides large area for landscaping. 	Cost is greater than many other devices.Unfriendly to bicyclists unless designed to	of fandscaping
Deviation/Chicanes		 Reduces speed without significantly increasing emergency response time. Aesthetically pleasing. 	accommodate them.	Estimated Cost Range = \$20,000 to \$30,000

Horizontal Deflection				
Driveway Link	Narrow winding driveway section placed between two standard street segments. • Speed reduction • Traffic reduction	 Changes the initial impression of the street. Appears to be a road closure yet allows through movements for local traffic. Provides a large area for landscaping. 	 High cost can be prohibitive. Best installed in conjunction with street reconstruction or initial construction. Unfriendly to bicyclists unless designed to accommodate them. 	 Emergency vehicle access Lighting Signage Irrigation and maintenance of landscaping Estimated Cost Range = \$20,000 to \$50,000
Traffic Circle (Does not include Modern Roundabouts)	 Raised circular area placed in the center of an intersection. Drivers travel in a counter-clockwise direction and are required to yield upon entry. Speed reduction at intersection Possible traffic reduction 	 Reduces accidents by 50% to 90% over stop control. Provides space for landscaping. Cheaper to maintain than signals. Effective at multi-leg intersections. Provides equal access to intersections for all drivers. Provides a good environment for bicyclists. 	 May be restrictive for larger vehicles if designed to a low speed. (This can be minimized by the use of a mountable apron.) Right of way may need to be purchased to accommodate left turns by large vehicles. Initial safety issues as drivers adjust. May increase volumes on adjacent streets. 	 Lighting Signage Irrigation and maintenance of landscaping Emergency vehicle Access Estimated Cost Range = \$10,000 to \$50,000
Shared Zone	A block with narrow entry points and high-density parking which functions similarly to a parking lot. • Speed reduction • Traffic reduction	 Provides a low speed shared environment that is safe for all users. Improves amenity without restricting access. Provides flexibility for on- street parking. 	 High cost unless part of original design. May result in an increased number of low speed accidents. 	 Emergency vehicle access Signage Estimated Cost Range = \$15,000 to \$25,000

Obstruction

Measure	Definition/Application	Advantages	Disadvantages	Special Considerations
	Small traffic islands installed at intersections to restrict and channelize turning movements.	 Changes driving patterns May reduce cut through traffic. May be attractive if landscaped 	 May increase trip length for some drivers. May increase response times for emergency vehicles 	 Lighting Signage Irrigation and maintenance of landscaping
Forced Turn Barriers/ Diverters	Traffic reductionPossible speed reduction	landscaped.	venicies.	Estimated Cost Range = \$4,000 to \$8,000
Bicycle Access	Barrier placed diagonally across a four-legged intersection, interrupting traffic flow across the intersection.	 Eliminates through traffic Provides area for landscaping. Reduces traffic conflict points. 	 May inconvenience residents gaining access to their properties. May inhibit access by emergency vehicles. 	 Lighting Signage Irrigation and maintenance of landscaping
Diagonal Road Closure	Traffic reductionSpeed reduction	 Increases pedestrian safety Can include bicycle path connection. 	May divert through traffic to other local streets.Altered traffic patterns may increase trip length.	Estimated Cost Range = \$10,000 to \$20,000
	Blockage of one direction of traffic on a two-way street. The open lane of traffic is signed one-way, and traffic from the blocked lane is not allowed to drive around the barrier in the open lane.	 Reduces through traffic in one direction. Allows two-way traffic on the remainder of the street. Shorter crossing distance for pedestrians. Provides space for 	 Reduces access for residents. Compliance with semi-diverters is not 100%. May increase trip length. 	 Lighting Signage Irrigation and maintenance of landscaping
Partial Street Closure	Traffic reductionSpeed reduction	 Iandscaping. Two-way bicycle access can be maintained. Emergency vehicles can drive around partial closure with care. 		Estimated Cost Range = \$10,000 to \$20,000 each side of intersection

Measure	Definition/Application	Advantages	Disadvantages	Special Considerations
Cul-De-Sac/Street Closure	Street closed to motor vehicles at the end of a block using planters, bollards, barriers, etc. • Traffic reduction • Speed reduction	 Eliminates through traffic. Improves safety for all street users. Pedestrian and bicycle access maintained. 	 Reduces emergency vehicle access. Reduces access to properties for residents. May increase trip lengths. May increase volumes on other streets. Reduces connectivity 	 Emergency vehicle access Lighting Signage Irrigation and maintenance of landscaping Estimated Cost Range = \$15,000 to \$25,000
	Street closed to motor vehicles mid-block using planters, bollards, barriers, etc. • Traffic reduction	 Eliminates through traffic. Improves safety for all street users. Pedestrian and bicycle access maintained. 	 Reduces emergency vehicle access. Reduces access to properties for residents. May increase trip lengths. May increase volumes on 	 Emergency vehicle access Lighting Signage Irrigation and maintenance of landscaping Estimated Cost Range =
Mid-Block Street Closure	• Speed reduction		other streets. Reduces connectivity 	\$15,000 to \$25,000
One-Way Street	Street upon which motor vehicles may operate in just one direction.Possible traffic reduction	 Increased safety due to lack of opposing traffic. Can be used to open up more resident parking. Maintains reasonable access for emergency vehicles. Can discourage through traffic. 	 Can lead to increased vehicle speeds. May increase trip lengths. May increase volumes on other streets. Initial safety concerns as drivers adjust. Alternative route must exist. Reduces connectivity 	 Signage Emergency vehicle access Estimated Cost Range = \$2,000 to \$3,000
→ ← → → ← → □ □ □ Imploding/Exploding One-Way Street Intersections	Intersection at which opposing legs carry one-way traffic in different directions. • Traffic reduction	 Increased safety due to lack of opposing traffic. Maintains reasonable access for emergency vehicles. Interrupts the flow of through traffic. 	 May increase trip lengths. May increase volumes on other streets. Initial safety concerns as drivers adjust. Alternative route must exist. 	 Signage Emergency vehicle access Estimated Cost Range = \$5,000 to \$10,000

* Narrow streets, boulevards, and street trees also provide traffic calming



CITY OF HELENA 2022 ENGINEERING STANDARDS UPDATE Date: 3/25/2022

COMMENTS RECEIVED

1. Comments were taken at public meetings on 2/7/22 at 5PM and 2/22/22 at 3PM and ongoing on the City's Website until 3/7/22. Some additional comments were received via email after or before that time, all comments that were received below.

Date Commenter	Comment	Relevant Section	Торіс	Department/Division	Full Comment	City Re
2/7/2022 Mark Runkle	Plastic curb stops should be allowed.	2.5.4	Curb Stops and Boxes	Utility Maintenance	Poly curb boxes allowed? Review strength and use only in corrosive soil.	Poly cu difficult box in p keep m as long
2/7/2022 Jeremy Morris - Stahly Engineering	Provide standardized cathodic protection design for PVC pipe and fitting combinations.	2.4.3	Cathodic Protection of Water Mains	Engineering/Water Distribution	Consider standardized cathodic protection for certain assemblies and multi- joint applications with use of PVC pipe to avoid excessive use of anode bags.	Cathodi enginee preserv protecti burial d by case
2/7/2022 Jeremy Morris - Stahly Engineering	5,000 square feet impervious area requirement	4.5	Storm Water Runoff Control & Water Quality Treatment	Engineering/Storm Water	Does the 5,000 square feet of impervious area pertain to the total area or redevelopment area? Is it 5,000 square feet total or an increase of 5,000 square feet? Please provide clarification	This se
2/7/2022 Jeremy Morris - Stahly Engineering	Underground water quality storage should be permitted. Underground stormwater storage should be allowed.	Part 4	Storm Drainage Systems - Underground Detention	Engineering/Storm Water Transportation	Underground water quality storage should be permitted. Underground stormwater storage should be allowed.	Underg complia develop easily o subject previou
2/7/2022 Jeremy Morris - Stahly Engineering	4-inches vs. 3-inches asphalt on local streets	5.2.10	Roadway Specifications	Transportation	We would like a minimum pavement section of 3-inches thick vs. 4-inches thick as required on local roads.	The Cit do.
2/7/2022 Jeremy Morris - Stahly Engineering Mark Runkle	Street widths for local streets 32 feet vs 34 or 36 feet.	Std Dwg 5-1A	Roadway Specifications	Transportation	Developers would like to see (narrower) 32 foot road widths instead of 36 that is required at present for local roads. The wider the roads, the faster people drive. 32 foot roadways would reduce speeds.	Fire Co parking back of
2/7/2022 Jeremy Morris - Stahly Engineering	Non Typical road sections should be added.	Part 5	Roadway Specifications	Transportation	Would like to see non-typical roadway sections added to Engineering Standards for some types of roads.	These a therefore
2/7/2022 Jeremy Morris - Stahly Engineering	Turning Movements - Clarification	5.2	Transportation Design Standards	Transportation	Would like to see additional clarification provided for the turning	Definitio
2/7/2022 Forrest Zimmerman Colleen Nichols - Helena Residents	Engineering Standards General	All	Revised Engineering and Design Standards 2022 Update	All	movements required for roadway/parking lot design. General Comment - We support the 2022 updated Engineering and Design Standards	No resp
4/20/2022 Greg Wirth - Stahly Engineering	Manhole Depth Clarification	3.4.1	Sanitary Sewer Main Design Considerations	Engineering/Sanitary Sewer	Please provide clarification on how manhole depth is measured to decide whether or not a 60-inch diameter manhole is needed.	Section manhol
2/22/2022 Holly Manning-Robert Peccia and Associates	Easement wording comment	4.6	Storm Drainage Easements	Engineering/Storm Sewer	All components of Section 4.6 are wordy.	lt was fe configu for a va
2/22/2022 Jeremy Morris - Stahly Engineering	Underground water quality storage should be permitted. Underground stormwater storage should be allowed.	Part 4	Storm Drainage Systems - Underground Detention	Engineering/Storm Sewer	If underground stormwater storage were permitted, private systems could be required to submit an annual maintenance record or be fined.	Underg complia develop easily c subject previou
2/22/2022 Mark Runkle	Underground water quality storage should be permitted. Underground stormwater storage should be allowed.	Part 4	Storm Drainage Systems - Underground Detention	Engineering/Storm Water Transportation	Underground water quality storage should be permitted. Underground stormwater storage should be allowed.	Underg complia develop easily c subject previou
2/22/2022 Ron Bartsch	Private road widths	Std Dwg 5-1A	Roadway Specifications	Transportation	Private roads should be allowed to be narrower than 32 feet of asphalt if permitted to have limited/no parking etc.	The Cit
2/22/2022 Jeremy Morris - Stahly Engineering	4-inches vs. 3-inches asphalt on arteria and collector streets	I Std Dwg 5-1A	Roadway Specifications	Transportation	Clarification in writing for limiting 4-inch vs. 3-inch asphalt for streets. 4-inches for arterials and collectors only. Would like this to be specifically clarified in the revised standards.	The Cit do. Plea
2/22/2022 Ron Bartsch	HDPE Pipe use	2.4.2, 3.4.2.	Water Mains/Sanitary Sewer Mains - Materials	Utility Maintenance/Engineering/Wate r Distribution/Sewer Collection	Would like to see HDPE pipe permitted outside of traveled roadway/allowed for private infrastructure	For the repair, I Section

esponse/Evaluation

urb boxes are subject to soil creep and excessive bending. Poly curb boxes can be t to locate and corrosion resistance can be achieved by properly wrapping the curb poly wrap and being installed as specified in the standards. The City would like to netal curb stops for location and to preserve a high quality standard for service lines g as it provides the service line zero interest loan replacement program.

dic protection design is typically the responsibility of the design/certifying ser.Looked into this and there really is no "standardized design" possible while still ving maximum efficiency. There are several factors incorporated into cathodic tion design, including but not limited to: site soil characteristics, fitting configuration, depth, anode size/characteristics and availability that require it to be done on a case is basis.

ction has been edited to provide additional clarification.

ground water quality treatment and retention storage is not allowed to improve iance with the City's MS4 general permit which requires better use of low impact pment, and because underground water quality treatment and retention are not observable for maintenance needs and potential illicit discharges, they are also it to failure due to clogging from fines and they are not easily maintained when usly porous soils are clogged with fines.

ty would like to increase the longevity of local roads which a 4" asphalt section will

bde requires 20;' unobstructed width which equates to two 10' lanes. The minimum glane width is 6' of asphalt and a 2' curb & gutter pan makes a total width of 36' from f curb to back of curb with parking lanes on both sides.

are "standards", anything non-typical would be a deviation from the standard and ore is not included.

ion for "Effective corner radius" added to the final standards.

oonse needed to comment of support.

n 3.4.1. has been edited to clarify that manhole depth is measured from finished ble rim to the deepest invert of the manhole.

felt that this level of detail is needed to provide for easements in any number of urations and situations, so that each could be addressed indivually without the need ariance.

ground water quality treatment and retention storage is not allowed to improve iance with the City's MS4 general permit which requires better use of low impact opment, and because underground water quality treatment and retention are not observable for maintenance needs and potential illicit discharges, they are also it to failure due to clogging from fines and they are not easily maintained when usly porous soils are clogged with fines.

ground water quality treatment and retention storage is not allowed to improve iance with the City's MS4 general permit which requires better use of low impact pment, and because underground water quality treatment and retention are not observable for maintenance needs and potential illicit discharges, they are also it to failure due to clogging from fines and they are not easily maintained when usly porous soils are clogged with fines.

ity has not way to enforce no parking along private roads. Therefore, to ensure ency access, 32' of asphalt surface is the standard road width.

ty would like to increase the longevity of local roads which a 4" asphalt section will ase see previous comment.

sake of universal parts, ensuring uniform system quality, maintenance and ease of Utility Maintenance Division would like to limit pipe materials to those specified. 2.4.2 permits the request to use alternate materials when justified.

2/22/2022 Ron Bartsch	HDI	DPE Curb Stops	2.5.4	Curb Stops and Boxes	Utility Maintenance	Would like to see HDPE curb boxes allowed.	Poly cu difficult box in keep m long as
2/22/2022 Solomon Redfern - H Gravel	Helena Sand and Fire	e Hydrant Leads	2.4.8	Tapping City Water	Utility Maintenance	Would like to see the installation of fire hydrant leads not always require the installation of 6-inch MJ Tee. Certain situations should	The up tapping
2/22/2022 Solomon Redfern - H Gravel	Helena Sand and Ser clea	rvice line required 18-inch vertical earance over sanitary sewer mains.	2.4.5	Sewer Line Crossings	Engineering/Sanitary Sewer	allow for the use of a 6-inch tapping saddle for fire hydrant leads. Does not agree with the need for 18-inch vertical separation between water services and sanitary sewer mains.	After re vertica above
4/25/2022 Tyson Pallister - City Department	y Building 3/8"	" minus bedding on service lines	N/A	Sewer Service Line Installations	Engineering/Sanitary Sewer	Would like to see maximum bedding size for sanitary sewer services 3/8" minus not 3/4" minus. When compaction occurs he has seen 2/4" dives through contract lines	Beddir Desigr
2/22/2022 Chris Drake	Add	ditional clarification on backflow evention in engineering standards	2.5.6	Backflow Prevention	Utility Maintenance	Would like to see additional clarification provided in the engineering standards for backflow prevention.	A dired section for det
2/22/2022 Mark Runkle	City	y taps done by city personnel.	2.4.6	tapping City Water	Utility Maintenance	Would like to allow private contractors to tap City water mains.	City Co authori with ar Desigr of the l
2/22/2022 Greg Wirth - Stahly E	Engineering NW	V Energy, Boulevards/Curb Stop	Std Drawing 2-3A	Curb Stop Location	Utility Maintenance	Greg wanted us to consult with NW energy regarding curb stop	The Ut
2/22/2022 Greg Wirth - Stahly E	Engineering Cor Rev	cation immunity Development Engineer iview	General Comment	Engineering Standards Review	Engineering	New Community Development Engineer/Community Development Director should review the standards/ be part of the approval process.	project t The Ci shown proces comm
2/22/2022 Kim Mack - City Build	Iding Department Sho	ow Website	General Comment	Engineering Standards Review	Engineering		
3/8/2022 Mark Runkle	Thr	rust Block Requirement	2.4.2	Water Main Materials/Installation	Engineering	Eliminate the use of thrust blocking if joint restraints are required. The Commenter also provided video and literature from a restrained joint manufacturer, and the following video. https://youtu.be/px8hZLOVKsc	The us require of both
2/22/2022 Aaron Larson - Miller Engineering	ennium Disc wate	screpancy in tapping sizes/minimum ter service size.	2.4.6, 2.5.1	Tapping City Water/Water Service Line Materials	Engineering/Utility Maintenance	I noticed a discrepancy, under 2.4.6 Tapping City Water paragraph 4, it talks about ¾" taps in mains. Then in 2.5.1 Water Service Lines, it say All service lines shall be a minimum of 1" in diameter. Is 2.5.1 correct and ¾" services will be phased out? or are they still allowed?	This di water s with th
2/23/2022 Chris Drake	Bac	ckflow Requirements Clarification	2.5.6	Backflow Prevention	Utility Maintenance	During the meeting on 2/22, it was said that additional clarifications would be added to the proposed standard regarding commercial water entry and backflow requirements. When will these clarifications be available for public review?	The ac separa include policies
2/23/2022 Big Sky (plumbing?)) Troy PVC	/C Water Main/Plastic Service Line	2.4.2, 2.5.1	Water Main Materials/Water Service Line Materials	Engineering/Utility Maintenance	The City of Helena needs to amend its current code to allow for C900 PVC to be used in all Water main applications and Polypropylene piping to be used for all water services up to 2".	The Ci curren shown default
3/10/2020 Paul Cartwright	Trai Clas	ansportation - Functional assifications	5.1.3	Functional Classification of Roadways	Transportation	Many of roads in the city, especially in the older, more compact core, carry far fewer vehicles than the standards deem typical for their functional classification. This remains true even with the loads projected for 2035 in the Long Range Transportation Plan. Will the City require the cross-section of new or rebuilt roads to match the functional classification of a road or the real world load? How will this be decided?	The ty
3/10/2020 Paul Cartwright	Tra	ansportation - Curb Return Radius	5.2.5	Horizontal Alignment	Transportation	Curb return radii for lower functional class roads are greater than needed. Such large radii mean the pedestrian ramps point to the middle of the intersection rather than across the street; these radii also increase the cost of installing ramps and building streets. Large radii encourage faster vehicle turning movements, which could endanger pedestrians. Large radii are needed where larger vehicles are likely to be present and where the receiving street has striped lanes. On streets without designated lanes—which by definition are lower volume streets—large vehicles can use as much of the street width as necessary to complete the turn; large radii are not required. A reasonable return radius can be determined by inspecting street corners on local and collector streets in the older parts of town, many of which have radii of 5 ft or even 3 ft. (And now, at the end of winter, appears to be a good time to make that inspection.) One rarely sees tire tracks or damage at a 5 ft radius. This suggests a 7 ft radius would be more than adequate. Also, a 7 ft radius would exactly fit the 7 ft minimum requirement for boulevard width.	(Valid

urb boxes are subject to soil creep and excessive bending. Poly curb boxes can be It to locate and corrosion resistance can be achieved by properly wrapping the curb poly wrap and being installed as specified in the standards. The City would like to metal curb stops for location and preserve a high quality standard for service lines as it provides the service line replacement program.

pdated engineering standards currently allow for the use of an MJ AWWA and 6-inch g saddle for fire hydrant leads. Standard drawing 2-2 reflects this.

esearching current plumbing code, this section has been amended to reduce the al separation for service lines to 12-inches. The water service should also be installed the sewer main whenever possible. The standard was changed to reflect this.

ng size for service lines does not appear to be addressed by the Engineering and n Standards, this is addressed in MPWSS and plumbing code.

ct reference to the City of Helena Backflow Prevention Policy was inserted into n 2.5.6 of the City of Helena Engineering and Design Standards. This policy provides tailed backflow prevention in a separate document.

ode Title 6, Chapter2, Section 6-2-3, Rule 20 States: "No person other than an rized employee of the utility maintenance division shall make any tap or connection ny main or distributing pipe of the city." - As such, this section of the Engineering and n Standards is based on City Code. Changing existing City Code is beyond the scope Engineering and Design Standards Update.

tility Maintenance Department regularly works with NW Energy and other utilities on t coordination.

ity has not had any applicants for the community development engineer. The CDE is n on the org chart below the City Engineer, so they were not able to be included in this ss. The new community development director was hired after the review and ent period has elapsed.

use of thrust blocking is standard procedure for pressure pipe installation and is red by the Montana Public Works Standard Specifications. The City requires the use th to ensure a quality end product for the taxpayers of the City.

iscrepancy was corrected in the final printing of the Engineering Standards. 1-inch service is the minimum size allowed in the City of Helena. They were phased out ne previous engineering standard revision.

doption of a comprehensive backflow prevention policy has been undertaken in a ate effort by the City of Helena Utility Maintenance Division. This process has ed open public meetings and comment. Clarification of City backflow prevention as are outlined within this policy.

ity currently allows the use of C900 pipe for water main installations. The City ttly allows the use of HDPE water service line on a case-by-case basis for locations to have corrosive soils. The City would like to keep copper service line use as the t in order to preserve a high quality standard for service lines as long as it provides rvice line zero interest loan replacement program. pical vehicle volume is not a requirement

point) - Except for emergency vehicles.

ND020 / McDennigh Epris d wy ddin S 1 Unit We (Kd) (Simmed Image manner Point, Distring KDW with analting intel, Simmed mained KdW ND020 / McDOnnigh Derestes Simme Simmed Simmed Simmed Image manner							
XIUDDD Pd.Cakeght Onego Name Image Status Image Status <t< td=""><td>3/10/2020 Paul Cartwright</td><td>Right of Way Widths</td><td>5.3</td><td>Right of Way (ROW) Standards</td><td>Transportation</td><td>Point 6, Determining ROW width on existing streets: Same comment as on functional classification. Some decision criteria should be listed.</td><td>ROW v to acco</td></t<>	3/10/2020 Paul Cartwright	Right of Way Widths	5.3	Right of Way (ROW) Standards	Transportation	Point 6, Determining ROW width on existing streets: Same comment as on functional classification. Some decision criteria should be listed.	ROW v to acco
NODCRD Fear Canadragia Local Road Cana Section Descript 5-A. Inter Annual Read Cana Secti	3/10/2020 Paul Cartwright	Complete Streets	Table 5-3.	Complete Street Component Matrix	Transportation	The complete street component matrix should be qualified by a statement that the size and number of components depend on the expected traffic using the street and that designers should use only the minimum necessary to make the street function adequately for all modes. This applies to everything, from lane width to presence of bike lane to bulb-outs at intersections and all. Given present housing affordability and future street maintenance costs, the City should be thoughtful about how much infrastructure it takes on.	If we c like we transpo
1100220 Pad Cannight Oxfeel Reg of Descention Targe station	3/10/2020 Paul Cartwright	Local Road Cross Section	Drawing 5-1A, Drawing 5-1B, Table	Local Road Cross Section Drawing, Complete Street Component Matrix	Transportation	Travel lane width does not match matrix on p.69. Should be 9 feet.	Compo
PUCCODD Put Colongrit More Artenia Head Cooks Sectors Descript 9.1 table b. Comport MM* More Artenia Head Cooks Genoor, Corprite Sitest Toraportition Trave time with open of maintainto (p. 9.8. Piculule 1-11 tor. Corporation Descript 1-1 tor. Descript 1-1 tor. Descri	3/10/2020 Paul Cartwright	Collector Road Cross Section	5-3 Drawing 5-2 Table 5-3	Collector Road Cross Section, Complete Street	Transportation	Travel lane width does not match matrix on p.69. Should be 10 feet.	Compo
SYD222D Piel Cakingkt Derive Ruds Ne/4 Ceven Rud Disave Temportable Convent Rud Disave Temportable 427.0222 Piel Cakingkt Drivel Ruds S.5.2 Sead for PieverRo Utily Maintenance of for a low-charger to balker or pieles of pieles pieles and piele sead in the service of the service pieles of pieles pieles and pieles of pieles of pieles of pieles pieles of pieles	3/10/2020 Paul Cartwright	Minor Arterial Road Cross Section	Drawing 5-3, Table 5-	Minor Arterial Road Cross Section, Complete Street	Transportation	Travel lane width does not match matrix on p.69. Should be 11 feet.	Compo
4/21/22/22 Trant Scheuer Critical Weter Services 2.5.6 Beachdor Prevention Utility Maintenance offered the following definition for a critical weature in single in service: "Critical weature services and voir a four moments at any time. Typicality critical services and out of a cost in starty time. Typicality critical services and out of a cost in starty time. Typicality critical services and out of a cost in starty time. Typicality critical services and out of a cost in starty time. Typicality critical services and cost of a cost in starty time. Typicality critical services and cost of a cost in starty time. Typicality critical services and cost of a cost in starty time. Typicality critical services and cost of the cost in the water service is available to the property, parallel backtory perivelicity, parallel backtory per	3/10/2020 Paul Cartwright	Gravel Roads	N/A/	Gravel Road Standard	Transportation	Gravel road cross-section The standards should include a cross-section for a low-volume modern gravel road. These are much cheaper to build and maintain than paved roads and can more readily accommodate utility updates/repairs. Because funds even now are inadequate to maintain all the roads in town, some roads will be going to gravel, whatever the policy is. Better to do so in an organized and systematic way. Allowing such roads where suitable also would lower the cost of, and resistance to, bringing annexed areas up to city standards.	The Cit waiver
42020222 Paul Cartwright Complete Streets 5.2.12 Complete Streets Policy Transportation Unlike the outprice streets section of the 2022 standards (5.2.12) gives no Design accompany to the complete Streets section of the 2022 standards (5.2.12) gives no Design accompany to the complete Streets section of the 2022 standards (5.2.12) gives no Design accompany to the complete Street Stre	4/21/2022 Trent Scheuer	Critical Water Services	2.5.6	Backflow Prevention	Utility Maintenance	Utility Maintenance offered the following definition for a critical water service: "Critical water services are water services where the water cannot be shut off - even for a few moments at any time. Typically critical services are found at hospitals, emergency care centers, film-processing laboratories, industrial plants where the water is in continuous use. When the need for a critical service is made known, the water supplier usually will need to do one of two things. The water supplier could require multiple services. In this case, all services would need to be protected by the same level of backflow prevention. If only a single water service is available to the property, parallel backflow protections may be required. In this case a single service connection is provided with two or more backflow prevention assemblies. One may be shut off for field testing or maintenance	The ac separa include policies
2/22/2022, Sarah Perry Engineering Standards General General Comment Engineering Standards Review Engineering Hink the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards chould clearly state the policy is chout at the standards clearly state the policy is chout at the state of the policy is chout at the policy is chout at the state of the polic	4/20/2022 Paul Cartwright	Complete Streets	5.2.12	Complete Streets Policy	Transportation	The complete streets section of the 2022 standards (5.2.12) gives no clue that the commission policy is about appropriate features. This section repeats the laundry list in the resolution without making it clear that the developer is supposed to pick and choose the features that make sense. The section even calls a request to ignore certain features as a "deviation" from the policy, which is silly. To exclude features that are dumb or unneeded in the context of a specific street implements rather than deviates from the policy. The checklist in the appendix does go some way towards showing the policy wasn't trying to be totally unreasonable. But still, there's no indication of why features should be included or omitted from a design. This is an approach likely to cause maximum grumpiness among developers and/or encourage them to avoid developing in Helena, only exacerbating a problem we already have. Public Works should take a close look at the complete streets resolution and the discussion. The resolution carried 5-0 (even Mayor Smith!) because the commissioners knew we weren't ordering every street to have the whole laundry list of features. Engineering standards have to cover all eventualities, but features should not be	Design accom
	2/22/2022, Sarah Perry 4/20/2022, 5/13/2022	Engineering Standards General	General Comment	Engineering Standards Review	Engineering	treated as if they are required on each street. That is, the evaluation should be treated as an opt-in rather than an opt-out. Standards should be based on the purpose and likely use of the street. The goal should be the cheapest durable solution to meet the goals of the policy. Uthink the standards should clearly state the policy is about Ms. Perry has called and emailed several times to indicate that she strongly supports passing the updated engineering standards.	These

widths on existing streets are already platted and have exemptions in the standards ommodate.

design to minimums for projected adequacy we will hinder future development much the see in areas of the City with roadways and alleys that are too narrow for today's portation needs whether that is emergency services or bicycles.

onent Matrix has been corrected to match drawings. (10' lanes min)

onent Matrix has been corrected to match drawings. (10' lanes min)

onent Matrix has been corrected to match drawings.(11' lanes min)

ity currently does not allow new gravel roads to be constructed. May consider if r right to protest SID or deed restruiction, etc.

adoption of a comprehensive backflow prevention policy has been undertaken in a rate effort by the City of Helena Utility Maintenance Division. This process has ded open public meetings and comment. Clarification of City backflow prevention es are outlined within this policy.

ners can chose which features to include as long as all modes of transportation are nodated.

comments/support has been logged.

Engineering Standards Revision Timeline For City Commission Administrative Meeting 12-14-22

Author: J.Clark

June 10, 2013 – Current City of Helena Engineering and Design Standards Approved by City Commission. This motion was accompanied by a second motion to "recognize city staff will have to make grammatical and other non-substantive changes to the standards."

June-July 2013 – Proposals were solicited from independent consultants for the independent review of the Engineering Standards. Dr. Bill Macgregor of Butte, MT was selected to independently review, edit, and finalize the 2013 Engineering Standards. The final approved document was completed in Mid-August 2013.

February 2018 – The City Engineer (Leland)indicated to Staff that he would like to update the 2013 Engineering Standards in response to changing development and stormwater regulations. Staff Engineers at the time (Clark, Culpo, Knoepke) began revision of the 2013 Engineering Standards. A 2018 Draft document was started at this time.

February 2018-January 2019 – Staff worked on revisions to the 2018 draft standards based on working issues and clarifications needed that had arisen since the 2013 standards were adopted.

February 2019 – The Helena Building Industry Association (HBIA) members were directly emailed, and comments solicited on the draft standards. A public meeting was held on February 28, 2019, in room 326 of the City-County Building after HBIA members were directly contacted and comments received and discussed. A PowerPoint presentation outlining proposed changes to the standards was presented. This meeting included City of Helena Building Department staff and HBIA members.

April 15, 2019 – Morrison-Maierle Inc. was contracted by the City to Provide professional engineering independent peer review and formatting of the City of Helena, Draft Engineering and Design Standards update prior to adoption and publication and to provide final formatting of the Engineering and Design Standards, provide final drafting edits to details, compile document into a printable pdf, and provide one hardcopy of the final version. This was contracted at an amount of \$15,000.00. MMI produced a formatted, edited .pdf that was the original basis of the 2022 design standards that are being presented today. This draft was completed on 6/11/2019.

June/July 2019 - June 16th and 23rd. The City Ran the following ad to solicit public comment on the draft standards:

The City of Helena is in the process of updating their Engineering and Design Standards. As part of the process, the City of Helena is providing 45 days for public review and comment which commenced on Monday, June 17th, 2019, and is closing on July 31st, 2019. The City of Helena is also holding an open house meeting on July 16th at 4:00 p.m. and July 18th at 6:00 p.m. in Room 426 of the City-County Building. A pdf version of the Draft 2019 Engineering and Design Standards is available for download the following at web address: https://www.helenamt.gov/pw/engineering/engineering-standards.html or by going to the City of Helena's web page, then Departments, Engineering, Engineering Standards, Draft 2019 Engineering Standards Update. All comments must be submitted in writing by mail to: City of Helena, 316 N. Park Avenue, Helena, Montana 59623, Attention Matt Culpo or by email to mculpo@helenamt.gov

The public open house, presentations and meetings was held on these dates, and robust discussions were held on items of particular interest

July 31,2019 – Draft Standards public comment period closes.

August 2019 – It was decided by City and Engineering Department Management that a public working groups would be held for the public and stakeholders to provide additional public outreach and discussion of the draft engineering standards.

October 8, 2019 – City Departmental review and comment period closed on draft standards.

December 2019 – A working group meeting for the draft engineering standards was formed by public advertisement, direct emailing of 60+ stakeholders and phone calls to a diverse group of stakeholders. The first meeting was attended by over 20 individuals including architects, developers, engineers and building contractors.

December 10, 2019 - Working group meeting 1 met and held an open discussion of Engineering Standards Sections 1-3, General Provisions, Water and Sewer. Minutes were taken and discussion items noted.

January 7, 2020 - Working group meeting 2 met and held an open discussion of Engineering Standards Section 4 Stormwater. Minutes were taken and discussion items noted.

February 24, 2020 - Working group meeting 3 met and held an open discussion of Engineering Standards Section 5 Transportation. Minutes were taken and discussion items noted.

December 2019 – January 2022 – Engineering draft and working group comments were compiled and integrated into the draft 2018 document and became the 2019 draft document. Changes and staffing changes in City Management, Public Works and Engineering Departments allowed for the Engineering and Design Standards revision to be tabled, concurrent with the COVID-19 pandemic and shifting priorities.

January 2022 – New City, Public Works and Engineering Department Management occurred and with the end of the pandemic, and subsequent economic resurgence, the adoption of the revised engineering standards became a renewed priority for new management.

January 2022 – Advertisement of public meetings for the comments on the current draft of the engineering standards were placed in the Helena IR and on to the City's Web Page.

February 7, 2022 – Public meeting was held in the City County Building Room 426 at 5 pm for discussion and comment on the 2019 draft engineering standards. The meeting was presented via zoom and in person and was attended by over a dozen local stake holders including engineers, developers, private citizens, and city employees. All comments were logged and documented. Public comment was ongoing on the City of Helena Website.

February 22, 2022 - Public meeting was held in the City County Building Room 426 at 3 pm for discussion and comment on the 2019 draft engineering standards. The meeting was presented via zoom and in person and was attended by over a dozen local stake holders including engineers, developers, private citizens, and city employees. All comments were logged and documented. Public comment was ongoing on the City of Helena Website.

March 7, 2022 – Public comment period ends for 2022 draft engineering standards. Some additional comments received via email were logged until April 25, 2022. All comments were documented and addressed in spreadsheet form and compiled into the City Commission memo following.

May 25, 2022 – Draft City Commission memo written by City Engineer and sent to Director of Public Works for review and editing prior to submitting as administrative meeting agenda item.

November 30, 2022 – Item scheduled to be heard at City of Helena Administrative meeting.

SUMMARY:

Public Meetings and Working Group Meetings were held on:

- February 28, 2019
- June 16, 2019
- June 23, 2019
- January 7, 2020
- February 24, 2020
- February 7, 2022
- February 22, 2022
- Formal Advertised Public Comment Period March 7, 2022, to April 25, 2022

City of Helena, Montana

March 15, 2023			
То:	City Manager, Tim Burton		
From:	Ryan Leland, Public Works Director Ed Coleman, Public Works Deputy Director Leea Anderson, Environmental Regulation Pretreatment Manager Miranda Griffis, Sustainability & Recycling Coordinator		
Subject:	Helena's Recent Sustainability Efforts		
Present Situation:	Below is a list of City efforts on sustainability projects.		
	Water		
	• Mayor's National Water Conservation Challenge is a competition between cities to encourage citizens and other entities to commit to water conservation practices. Helena, likely due to extensive outreach and education by the City, ranked highest out of the major seven cities in Montana. Helena intends to enter the challenge again in 2023.		
	 In spring of 2022, the Environmental Regulatory and Pretreatment Manager, reached out to all of the domestic sprinkler companies in Helena to explain the best time to set sprinklers for water and energy conservation purposes. The Sustainability Coordinator, will be doing the same in spring of 2023. 		
	• In June of 2022, the City sent out water conservation flyers in the utility bills. The City plans to do the same in 2023.		
	 Several Informational videos and snippets were created by the City for informational and water conservation p u r p o s e s : <u>https://www.helenamt.gov/Departments/Public-Works/Drinking-Water</u> 		
	 Red Mountain Flume improvements will increase the quantity and quality of water Helena is able to provide to its citizen's. Currently the flume experiences 80% water loss. The City Commission granted ARPA funding for Flume improvement projects projected to reduce the water lost in the Flume. 		
	• Reservoir relining projects at Hale and main line replacements have resulted in the conservation of nearly half a million gallons of water per day.		
	• Water meter upgrades and replacements more accurately measure quantities delivered to residents and have alert Helena citizens when there may be a potential leak in their home.		
	• Xeriscaping at the Law and Justice Center. Status – ongoing. Site prep and initial planting was completed in the summer of 2022. There may need to be replanting due to mortality. Installation of informational signs and potential expansion of hte xeriscaping area is projected for 2023.		
	 Lead Service Line Replacement. The City of Helena is required by DEQ and EPA to inventory and eventually remove and replace all public and privately owned lead or galvanized water service lines. The initial inventory identified 771 service lines, and DEQ has earmarked approximately \$8,000,000 in 		

funding for the City of Helena to remove and replace those service lines.

Solid Waste and Recycling

- Strategic Plan for Waste Reduction. In 2021, the City Commission adopted Resolution 20643, which established a goal for the City to reduce solid waste disposal to landfills by 50% by 2040, with an interim target of 35% reduction by 2030. The City is currently at 26%. The resolution called for the development of a Strategic Plan designed to achieve the City's goals. Status is complete. The plan was completed in June of 2022 on schedule and within the \$60,000 budget. As part of this project, three public meetings were held and extensive outreach including citizen surveys were conducted.
- The City is currently working on an integrated solid waste master plan with Lewis and Clark County. Concepts and recommendations from the Strategic Plan will help to inform City specific portions of the Master Plan.
- The City's entire website was recently revamped and the Recycling site was updated and made more user-friendly <u>https://helenamt.gov/government/departments/public-works/solid-</u> waste/recycling
- _The City has created an informational video "Recycling Basics" as well as cut out two shorter videos "Cardboard Recycling" and "Plastic Recycling."
- The Public Works Department has a public relations consultant under contract to assist with outreach and education efforts.
- Annual Latex Paint Recycling. The City holds two latex paint recycling events annually and receives approximately 500-700 cans of paint per event.
- Annual Household Hazardous Waste Disposal. The City holds an annual household hazardous waste disposal event with approximately 70 participants in 2022.
- The City currently has to ship its glass to Salt Lake City for recycling. Previously, the glass was recycled locally by Ash Grove Cement Company; however, due to contamination from plastic flow regulation devices, Ash Grove no longer takes City glass. The City is working with engineering students from MSU to come up with a solution to separating the plastic flow devices from the glass.
- On February 15, 2023, the City applied for a \$293,000 Recycling Education and Outreach grant from the Bipartisan Infrastructure Law.
- On February 15, 2023, the City applied for a \$3,290,000 Solid Waste Infrastructure for Recycling grant from the Bipartisan Infrastructure Law for recycling and composting Equipment.
- Recycling at the drop-off locations and the Transfer Station is made possible through a cooperative agreement with Lewis and Clark County. The County contributes half of the recycling budget each year. These funds are used to pay for recycling education and outreach, special diversion events, collection at each of the drop off locations, and recycling processing fees.
- There are currently 6 recycling drop-off locations not including the Transfer Station throughout the Helena area. The City and County will be deploying 2 additional drop-off locations in 2023. Kim Smith has agreed to allow for one to be placed near the former Valley Excavating gravel pit off McHugh Drive.

A site for the second drop-off location is still being reviewed. The two additional drop-off locations are estimated to divert between 200-330 tons combined per year.

• The City of Helena's subscription based curbside recycling pickup service is contracted through a public-private partnership with Helena Recycling. The City renewed the contract through January 2, 2025. Per the City's contract, the contractor retains all of the recycling commodities received during collection. Citizen's that choose to participate in this program opt to have their recycling picked up at their residences. Each subscription costs \$16.20 per month with the City subsidizing \$8.20 of each subscription from the Residential Solid Waste fund. This reduces the cost for those that opt into the program to \$8 per month. Total diversion in 2022 was approximately 360 tons.

Wastewater

- Wastewater Treatment Plant. Helena's wastewater treatment plant has a discharge permit from DEQ that allows treated wastewater to be discharged into a ditch that leads to Prickly Pear Creek. Helena discharges approximately 3 million gallons a day into Prickly Pear Creek providing additional water for year-round fisheries habitat, recreation, and agricultural use.
- The City allows commercial septic pumpers to dispose of septic waste directly into the wastewater plant for the benefit of the environment and the public. Improper land application of septage can lead to surface and/or ground water pollution, cause odors and the spread of disease vectors.
- Helena is required by DEQ and EPA to run a Pretreatment Program, which regulates any business that discharges industrial wastewater into the City's wastewater treatment system. This regulation is to prevent an upset at the wastewater plant potentially resulting in inadequate treatment. In September of 2021, EPA issued an Administrative Order for Compliance to the City for not running an acceptable Pretreatment Program. In August of 2022, the City had addressed all of EPA's concerns and returned to compliance.
- In the fall of 2022, the City created an informational video "Our Water Cycle" relating to how the City's water/wastewater system benefits the e n v i r o n m e n t <u>https://helenamt.gov/government/departments/public-</u> works/wastewater-treatment
- _In 2023, the City plans to utilize the \$76,250 allocated to Helena from the Energy Efficient and Conservation Block Grant to perform maintenance to the piping on the methane boiler used to heat the digester at the Wastewater Treatment Plant.
- The City will continue to pursue plant optimization and is reviewing the feasibility of phasing out the current blowers with more energy efficient Turbo Blowers as plant capacity demands increase. The current blower is a 200 horsepower Spencer and use approximately \$120,000 worth of electricity per year. The Turbo Blowers are more efficient and could save a significant amount of electricity, approximately \$38,000 worth per year. The City is also performing tests on a new mixer. Each new mixer has the potential to save \$1,100 worth of electricity per year per mixer. There are 18 mixers for total potential energy savings of approximately \$20,000 per year.
- The City's Wastewater Treatment plant is currently experiencing legislative and regulatory permitting uncertainties. In response, the City is reviewing additional nutrient removal capabilities at the Wastewater Treatment Plant.
The City is also looking at ways to improve the water quality in Prickly Pear Creek and executed a sampling and analysis plan in the summer of 2022. The sampling plan was designed to obtain additional data on the effects of the City's wastewater treatment plant on the overall stream health and help identify additional sources of nutrients and their effects on the stream. Results of the study are still being compiled.

<u>Energy</u>

- Citywide LED light installation. Upgrades to the lighting at the Civic Center and main fire station are complete, upgrades at the Tenmile Water Treatment Plant continue, and upgrades are in progress at the first floor of the City/County Building. The initial incandescent lighting was replaced with F32T8 fluorescent troffers. The fluorescent lighting has now been replaced with variable output LED troffer panels and strips that are set to the lowest wattage available.
- Installation of electric vehicle charging stations. The City will be installing two level 2 electric vehicle charging stations. One at the Bill Roberts Golf Course and one at the Jackson Street Parking Garage. This legacy project faced many challenges including ADA compliance, electrical availability, site electrical capabilities, material and equipment availability, increased material and labor costs, and absence of timely contracting. Installation at the Jackson Street Parking Garage began in the late Fall of 2022 with complete installation estimated for spring of 2023. Installation at Bill Roberts Golf Course is estimated to begin and be completed in the spring of 2023. The project received a \$17,000 grant from DEQ and potentially qualifies for at least a 6% direct pay incentive through the Inflation Reduction Act.
- Installation of Solar Panels on the Transportation Shop roof. This legacy project faced many challenges including structural integrity of the roof (panels will now be ground mounted), delayed implementation of the required bid/procurement process, net metering application issues, unforeseen project issues, and increased materials and labor costs. The prep work at the site has been completed with project installation and final project completion estimated for the spring of 2023. Project received a \$50,000 grant through the NorthWestern Energy's Universal System Benefit program and potentially qualifies for a 30% direct pay incentive through the Inflation Reduction Act.
- Sustainability Evaluation and Plan. Identification/documentation of current and future City projects and their net environmental gain and feasibility. Evaluation of City facilities for sustainability projects such as insulation and efficiencies, electrical capabilities, potential for solar panel installation, electric vehicle charging capabilities, water conservation, equipment upgrades, etc. This evaluation will allow for planning, budgeting, pursuit of grant funding, and coordination between Departments. Status – Future Project.
- Green Tariff. Missoula County, Missoula, Bozeman, and Helena (Parties) teamed up to work with Northwestern Energy to provide an option of "clean electricity" to Montana cities at an adjusted energy rate. In March of 2021, the Parties entered into a \$100,000 contract with Energy Solutions to support the development of a green tariff to advance the Parties goals of 100% clean electricity by 2030. The status is ongoing via quarterly meetings between Helena, Bozeman, Missoula, and Missoula County.
- Replacement of two 50+year old steam boilers have been approved for the Law and Justice Center. The current boilers have a 56%-60% thermal cycle efficiency and will be replaced with four new smaller hot water boilers with a

97% combustion and thermal efficiency for considerable energy savings.

- The Transportation Systems Department was recently awarded \$500,000 through DEQ's Clean Truck, Bus & Airport Equipment Grant Program. This funding was used to purchase a 100% Electric Global Environmental M4EV Street Sweeper, replacing and decommissioning a 13-year-old, diesel-powered street sweeper. This upgrade is expected to reduce annual CO emissions by 85 pounds (100% reduction from diesel) and annual NOx emissions by 150 pounds (100% reduction from diesel). Project may also qualify for a \$40,000 direct pay incentive through the Inflation Reduction Act.
- The use of solar powered flowing aerators at Chessman Reservoir has eliminated the City's need to add copper sulfate to the reservoir to inhibit algae growth.
- The 3.52 kW solar project installed at the Wastewater Treatment Plant in 2009 has continued to function. This project was completed through the NorthWestern Energy Universal System Benefit program.
- The City's Solar Revolving Loan Program started in 2016 and has assisted 48 residences with loans to install residential solar systems. To date, the program has provided nearly \$530,000 in revolving funds to residents.
- Waste oil burners are used by the City to provide heat during the winter months in leu of electric or natural gas at City facilities. The waste oil is collected from citizens at the Transfer Station. Expansion of facility's capabilities to store additional used oil has allowed the City to reuse a low cost, locally sourced resource for facility heat. In addition to saving the City the cost of having to pay an entity to accept the material, the City experiences a large potential energy savings by utilizing the waste oil. One gallon of waste oil is equivalent to approximately \$4.88 of electricity. In 2022, the City received approximately 36.1 tons of waste oil at the Transfer Station, which had the potential to conserve nearly \$47,000 in electricity used for heating. The City is reviewing options to further expand current waste oil storage capabilities.

Sustainability Projects and Environmental Work

- 2021 Annual Sustainability Report. Status recently completed. The document is posted to the City's website <u>https://www.helenamt.gov/files/content/helena/departments/public-</u> works/sustainability/2021-city-of-helena-annual-sustainability-report.pdf.
- Airport Resiliency Study. The City will be participating as a stakeholder in the Helena Regional Airport Resiliency Study where the Airport Authority will be evaluating different alternatives for generating power for the airport.
- The City recently upgraded its Sustainability webpage making it more user friendly, easier to find information regarding what citizens can do for energy and water conservation, as well as created a "Sustainability Spotlight" so local citizens or businesses can be recognized for their sustainability efforts.
- Tenmile Water Treatment Plant. Helena's Tenmile Water Treatment Plant discharges wastewater from its water treatment processes into a tributary of Tenmile Creek. This discharge is regulated by DEQ. The City's Public Works team worked with DEQ to provide them with the necessary information to renew the permit, and the renewed permit became effective July 1, 2022. The City of Helena was the first entity to successfully apply for and receive an individual discharge permit using DEQ's online permitting system.

	 The Tenmile drainage area is home to the Upper Tenmile Superfund Site. Per EPA's website, the 53-square-mile Upper Tenmile Creek Mining Area includes about 150 active and abandoned mines in the historic Rimini Mining District. Mining for gold, lead, copper, and zinc began in the 1870s and continued through the 1930s. In 2002, EPA issued a Record of Decision identifying that the selected remedy to address the sources of pollution in Upper Tenmile includes excavation, disposal, and reclamation of mine wastes. The City has been coordinating with and requesting that EPA and DEQ adequately address these issues. Thanks to the City's regular communications with DEQ and EPA, on the ground remedial activities should commence in the summer of 2023. MS4 Permit Compliance. The City holds a permit from DEQ for Storm Water Discharges Associated with Municipal Separate Storm Sewer Systems (MS4). In February of 2022 DEQ conducted an audit on Helena's Storm Water Management Program. The audit showed that the City was not operating an effective storm water program and was in violation. The City's
	Public Works team revamped the Storm Water Management Program and had returned to compliance by August of 2022.
Proposal/Objective:	This item if for informational purposes. The City plans to provide this information on its Sustainability web page in the near future.
Notice of Public Hearing:	N/A

ATTACHMENTS:		
D	Helena's Sustainability Efforts - City Commission Presentation	
۵	Admin Memo with Links	

City of Helena Sustainability 2023



What is Sustainability?

Sustainability projects are those that conserve resources, reduce environmental impacts, and allow the City to grow in a responsible manner.

- Adequate drinking water supply
- Available wastewater treatment capacity
- Facility efficiencies
- Waste management and diversion
- Public outreach and education

Water Sustainability Projects

- <u>Water conservation videos</u>
- Red Mountain Flume improvements
- Mayor's National Water Conservation Challenge
- Water conservation flyers in utility bills
- Outreach to local sprinkler companies
- Reservoir relining projects and mainline replacements
- Optimization at the Tenmile Water Treatment Plan has resulted electrical efficiencies and a 40% reduction in chemicals
- Meter replacement for leak detection
- Xeriscaping at the Law and Justice Center
- Lead Service Line Replacement: \$8,000,000 in grant funding

Solid Waste Sustainability Projects

- Strategic Plan for Waste Reduction
- Integrated Solid Waste Master Plan
- <u>Recycling videos</u>
- Annual Latex Paint Recycling Events
- Annual Household Hazardous Waste Disposal
- MSU partnership for glass recycling improvements
- Applied for \$293,000 in grants from the Recycling Education and Outreach-Bipartisan Infrastructure Law
- Applied for \$3,290,000 in grants from the Solid Waste Infrastructure and Recycling- Bipartisan Infrastructure Law
- Cooperative agreement with the County
- Two additional drop-off locations for recycling- estimated to divert between 100-165 tons each per year
- Subscription based curbside recycling pickup service- diverted 360 Tons in 2022

Wastewater Sustainability Projects

- Commercial Septic Pumpers
- Pretreatment program
- Wastewater Cycle video
- Maintenance to methane boiler through Energy Efficient and Conservation Block Grant, \$76,250
- Optimization pursuing Turbo Blower to reduce electric usage and testing a more efficient mixer
- 3 million gallons per day discharge to Prickly Pear Creek provides for fisheries habitat, agricultural, and recreational use
- Wastewater Master Plan underway

Energy Sustainability Projects

- Electric Vehicle Charging Stations- \$17,000 DEQ Grant, and potentially additional federal funding
- Solar Panels at the Transportation Shop- \$50,000 NorthWestern Energy grant, and potential additional federal funding
- Sustainability Evaluation and Plan
- Green Tariff
- Replacement of boilers at the Law and Justice Center
- Citywide LED light installation
- Electric Street Sweeper- \$500,000 DEQ grant, and potential additional federal funding
- Solar aerators at Chessman Reservoir
- 3.52 kW solar at the Wastewater Treatment Plant installed in 2009
- City Solar Loan Program
- Waste oil burners

Sustainability Program Projects

- Website
- Sustainability Spotlight
- City staff liaison for the Commission's Advisory Board, the Citizen Conservation Board
- Annual Sustainability Report
- Airport Resiliency Study
- Superfund site reclamation in the Tenmile Creek watershed
- Stormwater program

Questions



Page 227 of 233

Novus Memo - Administrative

For City Manager / City Attorney Review

Print a hardcopy of completed memo. Submit Memo, <u>with all the necessary signatures</u> and attachments, to the City Attorney's office **no less than 1 week prior to Novus Deadline.**

Approved by:	Date:
Proofed by:	Date:
Signature	
All attachments are included.	

This is a Quasi-Judicial Matter and will need to be flagged as such in Novus

Department Presentation (NO Action from Commission)

[Select Date] Novus Deadline for Administrative Meeting on <u>3/22/2023</u>

To:	Mayor and Commissioners
From:	Ryan Leland, Public Works Director
	Ed Coleman, Public Works Deputy Director
	Leea Anderson, Environmental Regulation Pretreatment Manager
	Miranda Griffis, Sustainability Coordinator
Subject:	PUBLIC WORKS-

	Informational Presentation of Helena's Recent Sustainability Efforts
Present Situation:	Below is a list of City efforts on sustainability and environmental projects.
	 Legacy Projects Installation of electric vehicle charging stations. Status is pending since this legacy project faced many challenges including ADA compliance, electrical availability, increased material and labor costs, and absence of timely contracting. Installation at the Jackson Street Parking Garage began in the late Fall of 2022 with complete installation estimated for spring of 2023. Installation at

Bill Roberts Golf Course is estimated to begin and be completed in the spring of 2023.

- Installation of Solar Panels on the Transportation Shop roof. Status is pending since this legacy project faced many challenges including structural integrity of the roof (panels will now be ground mounted), delayed implementation of the required bid/procurement process, and increased materials and labor costs. Completion estimated spring of 2023.
- Green Tariff. Missoula County, Missoula, Bozeman, and Helena (Parties) teamed up to work with Northwestern Energy to provide an option of "clean electricity" to Montana cities at an adjusted energy rate. In March of 2021, the Parties entered into a \$100,000 contract with Energy Solutions to support the development of a green tariff to advance the Parties goals of 100% clean electricity by 2030. The status is ongoing via quarterly meetings between Helena, Bozeman, Missoula, and Missoula County.
- Xeriscaping at the Law and Justice Center. Status ongoing. Site prep and initial planting was completed in the summer of 2022. There will need to be replanting due to mortality with installation of informational signs and potential expansion of the xeriscaping area in 2023.
- 2021 Annual Sustainability Report. Status recently completed. The document is posted to the City's website <u>https://www.helenamt.gov/files/content/helena/departments/public-works/sustainability/2021-city-of-helena-annual-sustainability-report.pdf</u>.
- Strategic Plan for Waste Reduction. In 2021, the City Commission adopted Resolution 20643, which established a goal for the City to reduce solid waste disposal to landfills by 50% by 2040, with an interim target of 35% reduction by 2030. The City is currently at 26%. The resolution called for the development of a Strategic Plan designed to achieve the City's goals. Status is complete. The plan was completed in June of 2022 on schedule and within the \$60,000 budget. As part of this project, three public meetings were held and extensive outreach including citizen surveys were conducted.
 - The City is currently working on an integrated solid waste master plan with Lewis and Clark County. Concepts and recommendations from the Strategic Plan will help to inform City specific portions of the Master Plan.

- The City's entire website was recently revamped and the Recycling site was updated and made more user-friendly <u>https://helenamt.gov/government/departments/public-</u> <u>works/solid-waste/recycling</u>. The City has created an informational video "Recycling Basics" as well as cut out two shorter videos "Cardboard Recycling" and "Plastic Recycling."
- The Public Works Department has a public relations consultant under contract to assist with outreach and education efforts.
- Annual Latex Paint Recycling. The City holds two latex paint recycling events annually and receives approximately 500-700 cans of paint per event.
- Annual Household Hazardous Waste Disposal. The City holds an annual household hazardous waste disposal event with approximately 70 participants in 2022.
- The City currently has to ship its glass to Salt Lake City for recycling. Previously, the glass was recycled locally by Ash Grove Cement Company; however, due to contamination from plastic flow regulation devices, Ash Grove no longer takes City glass. The City is working with engineering students from MSU to come up with a solution to separating the plastic flow devices from the glass.
- Mayor's National Water Conservation Challenge is a competition between cities to encourage citizens and other entities to commit to water conservation practices. Helena, likely due to extensive outreach and education by the City, ranked highest out of the major seven cities in Montana. Helena intends to enter the challenge again in 2023.
 - In spring of 2022, Leea Anderson the Environmental Regulatory and Pretreatment Manager, reached out to all of the domestic sprinkler companies in Helena to explain the best time to set sprinklers for water and energy conservation purposes. Miranda Griffis, the Sustainability Coordinator, will be doing the same in spring of 2023.
 - In June of 2022, the City sent out water conservation flyers in the utility bills. The City plans to do the same in 2023.
 - Several Informational videos and snippets were created by the City for informational and water conservation purposes:

https://www.helenamt.gov/Departments/Public-Works/Drinking-Water

 In the fall of 2022, the City created an informational video "Our Water Cycle" relating to how the City's water/wastewater system benefits the environment <u>https://helenamt.gov/government/departments/public-</u> works/wastewater-treatment

Ongoing/Future Projects

- On February 15, 2023, the City applied for a \$293,000 Recycling Education and Outreach grant from the Bipartisan Infrastructure Law.
- On February 15, 2023, the City applied for a \$3,290,000 Solid Waste Infrastructure for Recycling grant from the Bipartisan Infrastructure Law for recycling and composting Equipment.
- Citywide LED light installation. Upgrades to the lighting at the Civic Center and main fire station are complete, upgrades at the Tenmile Water Treatment Plant continue, and upgrades are in progress at the first floor of the City/County Building. The initial incandescent lighting was replaced with F32T8 fluorescent troffers. The fluorescent lighting has now been replaced with variable output LED troffer panels and strips that are set to the lowest wattage available.
- Replacement of two 50+year old steam boilers have been approved for the Law and Justice Center. The current boilers have a 56%-60% thermal cycle efficiency and will be replaced with four new smaller hot water boilers with a 97% combustion and thermal efficiency for considerable energy savings.
- The Transportation Systems Department was recently awarded \$500,000 through DEQ's Clean Truck, Bus & Airport Equipment Grant Program. This funding was used to purchase a 100% Electric Global Environmental M4EV Street Sweeper, replacing and decommissioning a 13-year-old, diesel-powered street sweeper. This upgrade is expected to reduce annual CO emissions by 85 pounds (100% reduction from diesel) and annual NOx emissions by 150 pounds (100% reduction from diesel.
- Sustainability Evaluation and Plan. Identification/documentation of current and future City projects and their net environmental gain. Evaluation of City facilities for sustainability projects such as insulation, solar panels, equipment upgrades, etc. This evaluation

will allow for planning, budgeting, and coordination between Departments. Status – Future Project.

- Airport Resiliency Study. The City will be participating as a stakeholder in the Helena Regional Airport Resiliency Study where the Airport Authority will be evaluating different alternatives for generating power for the airport.
- The City recently upgraded its Sustainability webpage making it more user friendly, easier to find information regarding what citizens can do for energy and water conservation, as well as created a "Sustainability Spotlight" so local citizens or businesses can be honored for their sustainability efforts.

Environmental Work

- Wastewater Treatment Plant. Helena's wastewater treatment plant has a discharge permit from DEQ that allows treated wastewater to be discharged into a ditch that leads to Prickly Pear Creek. Helena discharges approximately 3 million gallons a day into Prickly Pear Creek providing additional water for year-round recreation, agricultural use, and other downstream uses.
 - The City allows commercial septic pumpers to dispose of septic waste directly into the wastewater plant for the benefit of the environment and the public. Improper land application of septage can lead to surface and/or ground water pollution, cause odors and the spread of disease vectors.
 - Helena is required by DEQ and EPA to run a Pretreatment Program, which regulates any business that discharges industrial wastewater into the City's wastewater treatment system. This regulation is to prevent an upset at the wastewater plant potentially resulting in inadequate treatment. In September of 2021, EPA issued an Administrative Order for Compliance to the City for not running an acceptable Pretreatment Program. In August of 2022, the City had addressed all of EPA's concerns and returned to compliance.
- Tenmile Water Treatment Plant. Helena's Tenmile Water Treatment Plant discharges wastewater from its water treatment processes into a tributary of Tenmile Creek. This discharge is regulated by DEQ. The City's Public Works team worked with DEQ to provide them with the necessary information to renew the permit, and the renewed permit became effective July 1, 2022. The City of Helena was the first entity to successfully apply for

and receive an individual discharge permit using DEQ's online permitting system.

	 The Tenmile drainage area is home to the Upper Tenmile Superfund Site. Per EPA's website, the 53-square-mile Upper Tenmile Creek Mining Area includes about 150 active and abandoned mines in the historic Rimini Mining District. Mining for gold, lead, copper, and zinc began in the 1870s and continued through the 1930s. In 2002, EPA issued a Record of Decision identifying that the selected remedy to address the sources of pollution in Upper Tenmile includes excavation, disposal, and reclamation of mine wastes. The City has been coordinating with and requesting that EPA and DEQ adequately address these issues. Thanks to the City's regular communications with DEQ and EPA, on the ground remedial activities should commence in the summer of 2023.
	• MS4 Permit Compliance. The City holds a permit from DEQ for Storm Water Discharges Associated with Municipal Separate Storm Sewer Systems (MS4). In February of 2022 DEQ conducted an audit on Helena's Storm Water Management Program. The audit showed that the City was not operating an effective storm water program and was in violation. The City's Public Works team revamped the Storm Water Management Program and had returned to compliance by August of 2022.
	Lead Service Line Replacement. The City of Helena is being required by DEQ and EPA to inventory and eventually remove and replace all public and privately owned lead or galvanized water service lines. The initial inventory identified 771 service lines, and DEQ has earmarked approximately \$8,000,000 in funding for the City of Helena to remove and replace those service lines.
Proposal / Objective:	N/A – This item is for informational purposes. The City plans to provide this information on its Sustainability web page in the near future.
Notice of Public Hearing:	N/A
Attachments:	Helena's Sustainability Efforts – City Commission Presentation