Planning Advisory Board/Zoning Commission
2 Park Drive South, Great Falls, MT
Commission Chambers, Civic Center
March 10, 2020 3:00 PM

OPENING MEETING

1. Call to Order 3:00 P.M.

2. Roll Call - Board Introductions

   Peter Fontana-Chair
   Charles Pankratz-Vice Chair
   Dave Bertelsen
   Kelly Buschmeyer
   Tory Mills
   Samantha Shinaberger
   Laura Vukasin

3. Recognition of Staff

4. Approval of Meeting Minutes - February 25, 2020

BOARD ACTIONS REQUIRING PUBLIC HEARING

BOARD ACTIONS NOT REQUIRING PUBLIC HEARING

5. Minor Subdivision – Reynolds Subdivision addressed as 2400 6th St NW and legally described as Lot 7 of the First Supplement to Hillside Tract, located in the SE1/4 of Section 34, Township 21 North, Range 3 East, P.M.M., Cascade County, Montana.

6. City of Great Falls Standards for Design and Construction.

7. City of Great Falls Extension of Services Plan.

COMMUNICATIONS

PUBLIC COMMENT

Public Comment on any matter and that is within the jurisdiction of the Planning Advisory Board/Zoning Commission. Please keep your remarks to a maximum of five (5) minutes. Speak into the microphone, and state your name and address for the record.

ADJOURNMENT

(Please exit the chambers as quickly as possible. Chamber doors will be closed 5 minutes after adjournment of the meeting.)

Assistive listening devices are available for the hard of hearing, please arrive a few minutes early for set up, or contact the City Clerk's Office in advance at 455-8451. Wi-Fi is available during the meetings for viewing of the online meeting documents.

Planning Advisory Board/Zoning Commission meetings are televised on cable channel 190 and streamed live at https://greatfallsmt.net. Meetings are re-aired on cable channel 190 the following Thursday at 7 p.m.

MINUTES OF THE MEETING
OF THE
GREAT FALLS PLANNING ADVISORY BOARD/ZONING COMMISSION
FEBRUARY 25, 2020

CALL TO ORDER

The regular meeting of the Great Falls Planning Advisory Board/Zoning Commission was called to order by Vice Chair Charles Pankratz at 3:00 p.m. in the Commission Chambers of the Civic Center.

ROLL CALL & ATTENDANCE

Planning Board Members present:

Charles Pankratz, Vice Chair
Kelly Buschmeyer
Tory Mills
Samantha Shinaberger
Laura Vukasin

Planning Board Members absent:

Peter Fontana, Chair
Dave Bertelsen

Planning Staff Members present:

Craig Raymond, Director Planning and Community Development
Thomas Micuda, Deputy Director, Planning and Community Development
Erin Borland, Planner III
Jamie Nygard, Sr. Admin Assistant

Other Staff present:

Joseph Cik, Assistant City Attorney

Mr. Raymond affirmed a quorum of the Board was present.

MINUTES

Vice Chair Charles Pankratz asked if there were any comments or corrections to the minutes of the meeting held on January 28, 2020. Seeing none, Ms. Vukasin moved to approve the minutes. Mr. Mills seconded, and all being in favor, the minutes were approved.

BOARD ACTIONS REQUIRING PUBLIC HEARING

Public Hearing- Rezone of S85' Lot 8, Block 180 and Lots 8-14, Block 199 of the First Addition to Great Falls and a non-administrative plat to aggregate Lots 8-14, Block 179

and Lot 1Alock 199 of the First Addition to Great Falls located in the SE1/4 of Section 1, T20N, R3E, P.M.M., Cascade County, MT.

Erin Borland, Planner III, presented to the board the proposal from the C.M. Russell Museum and the Trigg C.M. Russell Foundation Inc. The applicants are planning for an expansion and are requesting that the City rezone their acquired lots to the north of 5th Ave N. to match with the existing zoning of the museum. The lots are currently zoned R-3 Single–family high density and C-1 Neighborhood commercial and they would like them to be rezoned to PLI Public lands and institutional. The applicants are also requesting that the City approve aggregation of the properties as well as the vacation of the right-of-way of 5th Ave. N. The vacation of right-of-way is a decision made only by the City Commission and will be evaluated when the project goes before the Commission. In the near future the applicants will also seek to re-route several utilities in order to prepare for the future expansion.

PETITIONER'S PRESENTATION

Mrs. Borland introduced Thomas Figarelle, Executive Director at the C.M. Russell Museum,. Mr. Figarelle addressed that there would be more off street parking available in the aggregated lots which would clear up some of the congestion for the neighborhood. He also stated that there would be more green space for outdoor events. Eventually the museum would like to build a new atrium, store and loading dock. They also would like to add a multiuse area on the lower level for events. Mr. Figarelle did state that it would not be possible to hold the art auction at the museum. He also stated that there would not be more than one large event per month as a commitment to the neighbors.

Mr. Pankratz asked how the Neighborhood Council Meeting went for this proposed project and Ms. Borland responded that it went well and most people were excited about the project. Mr. Pankratz also asked about the timeframe to finish the project and Mr. Figarelle replied that Phase I would be estimated to be done in 2020-2021 and the building itself is hard to estimate. It may take up to 5-10 years, depending on funding. There will be a board of directors meeting in June and they will know more then.

PUBLIC QUESTION AND ANSWER SESSION

There were no questions from the public

PUBLIC COMMENT

Brett Doney, Great Falls Development Authority, 405 3rd St NW Suite 203, stated that he agrees with the staff's findings. He stated that this project will bring more economic development, tourism and a better quality of life to Great Falls.

Sydney Abernathy, 1127 4th Ave N., stated that she lives near the museum and was concerned about the parking, but now that she knows that there will be parking lots, she thinks that the plan looks good.

Mike LaRocQue, 510 12th St. N., was questioning his lot next to the small lot that the

museum owns across the street and what is going to be built on it. Mr. Figarelle responded that it is currently slated to be the Prepatory Studio, which would be no bigger than a small house.

Pam Hendrickson, 1321 5th Ave N., states that she lives in the area and the biggest concern for her is the traffic and noise. When there are events, sometimes her and her neighbors cannot even park at their houses, because there is nowhere to park. She also wanted to clarify with Mr. Figarelle that there will only be events once a month and Mr. Figarelle responded that this is correct. After hearing the answers today, she stated that she is mostly a proponent.

BOARD DISCUSSION AND ACTION

Ms. Vukasin asked the staff if the houses around the museum could get on-street parking restrictions like they have around Great Falls High School. Mr. Raymond responded that yes that can be written into the City Ordinance. Mr. Mills asked if that could be done later down the road based on the project's impacts. Mr. Raymond said yes, it can be done any time.

MOTION: That the Zoning Commission recommend the City Commission approve the rezoning request from R-3 Single-family high density and C-1 Neighborhood commercial to PLI Public lands and institutional as legally described in the Staff Report, and the accompanying Finds of Fact/Basis of Decision, subject to the Conditions of Approval being fulfilled by the applicants.

Made by: Ms. Vukasin
Second: Ms.Buschmeyer
VOTE: All in favor, the motion carried 5-0

MOTION: That the Planning Advisory recommend the City Commission approve the amended plat aggregating the various parcels as legally described in the Staff Report, and the accompanying Finds of Fact/Basis of Decision, subject to the Conditions of Approval being fulfilled by the applicants.

Made by: Ms. Shinaberger
Second: Ms. Vukasin
VOTE: All in favor, the motion carried 5-0

COMMUNICATIONS

Mr. Raymond let the board know that with the ongoing improvements that the City is making with the Development Review Process, there will be two new documents coming out for City Commission adoption – after review by the Planning Board. The first is the Extension of Services Plan which is a plan to provide guidance for extension of City services outside of the City limits. The second is the Standards for Design and Construction Manual which is outlines standards for building of public infrastructures to be used by engineers and developers.

PUBLIC COMMENT

Bret Doney invited the board members to the Missouri River Pitch Night on February 25, 2020 at 6:00 pm, at MT Pints. The meeting is to take ideas on how the City can better utilize the Missouri River Corridor as a business and development asset.

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ADJOURNMENT

There being no further business, Vice Chair Charles Pankratz adjourned the meeting at 3:48 p.m.

CHAIRMAN SECRETARY

Agenda #: 5
Meeting Date: March 10,2020

CITY OF GREAT FALLS
PLANNING ADVISORY BOARD / ZONING COMMISSION AGENDA REPORT

Item:	Minor Subdivision – Reynolds Subdivision addressed as 2400 6th St NW and legally described as Lot 7 of the First Supplement to Hillside Tract, located in the SE1/4 of Section 34, Township 21 North, Range 3 East, P.M.M., Cascade County, Montana.
Initiated By:	Janna Reynolds, Applicant and John Reynolds, Owner
Presented By:	Lonnie Hill, Planner I
Action Requested:	Recommendation to the City Commission.

Suggested Motion:

1. Board Member moves:

> "I move that the Planning Advisory Board recommend the City Commission (approve/deny) the minor subdivision of the First Supplement to Hillside Tract as legally described in the Staff Report, and the accompanying Findings of Fact, subject to the Conditions of Approval being fulfilled by the applicants."

2. Chairman calls for a second, public comment, board/commission discussion, and calls for the vote.

Background: The subject property consists of ± 0.929 acres or ± 40,467 square feet and is located on 6th Street NW. The property is zoned R-2 and was previously developed with a single-family home and detached garage on the front of the lot. The rear of the parcel has always contained a very large back yard area. To the north of the property is an existing single-family residential dwelling and to the south are two existing single-family residential dwellings, all zoned R-2. To the east of the property is the public right-of-way of 6th Street NW. To the west of the property is rural, vacant land outside of the city limits. The applicants are requesting a minor subdivision to create a second lot on which they propose to build a second single-family residence with an attached garage.

The driving force behind the subdivision request is the applicant's interest in adding more garage space. In 2019, the City's Board of Adjustment denied the applicant's variance request to construct a larger than permitted garage on the rear portion of the property. After the application for variance was denied, the applicant decided to create a second lot and supplement the garage structure with an attached dwelling unit. The subdivision request allows the applicant to address the original need for more garage storage space without triggering a code compliance issue.

Minor Subdivision Request: The applicants are requesting a minor subdivision of the subject property to create two lots. The proposed lot 7A would consist of ± 0.410 acres or 17,860 square feet. The proposed lot 7B would consist of ± 0.519 acres or 22,607 square feet. The proposed lots conform to the

R-2 development standards outlined in the Land Development Code. The applicant proposes to build a single-family residence with an attached garage on the rear lot, 7B. Access will be provided along a driveway adjacent to the south property line. For Lot 7A, the applicant has demolished the previous home and garage on the property and is in the process of constructing a new home and garage.

The proposed subdivision layout will create what is known as a flag lot (a deep lot which contains only a small amount of street frontage for access). These lots are generally discouraged in the City's subdivision regulations, but in this proposal such an arrangement is acceptable for the following reasons: 1) legal access is provided to the rear lot with a large vehicle turn-around also provided as requested by the Fire Department and , 2) there are other flag lots already in place along the west side of 6th Street NW, including the adjacent property to the south.

The basis for a decision to approve, conditionally approve, or deny a proposed subdivision is whether it is demonstrated that development of the proposed subdivision meets the requirements of the Montana Code Annotated (MCA), is consistent with the City's zoning regulations and is in the public interest. Staff has reviewed the proposed project in relation to the City's zoning regulations. Additionally, Staff developed Findings of Fact for the proposed subdivision and concludes the subdivision meets the basic requirements provided by 76-3-608(3) MCA. The full Findings of Fact are included as Exhibit C.

Neighborhood Council Input:
Pursuant to MCA and the Official Code of the City of Great Falls (OCCGF) §17.16.4.010 Table 16-2, minor subdivisions do not require public notification. As a courtesy, Lanni Klasner, Communications Specialist, emailed information regarding the proposed minor subdivision to Neighborhood Council #3 members. Two of the members responded with, "No comment". Otherwise, there was no input from the Neighborhood Council members.

Concurrences:
Representatives from the City's Public Works and Fire Departments have been involved in the review process for this application. All comments made by the above parties have been addressed by the client or in the conditions of this report.

Fiscal Impact:
The cost of site improvements, including utility services will be paid by the property owner, and existing public utilities can accommodate the increased capacity. Public safety services are currently being provided to the property and will not be affected.

Staff Recommendation:
Staff recommends approval of the minor subdivision legally described as Lot 7 of the First Supplement to Hillside Tract with conditions.

Conditions of Approval:
1. The proposed project shall be developed consistent with the conditions in this report, and all codes and ordinances of the City of Great Falls, the State of Montana, and all other applicable regulatory agencies.
2. The applicant shall provide an amended plat of the subject property which shall be in compliance with survey requirements of this Title and State law and incorporate corrections of any errors or omissions noted by Staff.
3. The proposed plans shall conform to the R-2 zoning district development standards in the Land Development Code within the OCCGF.

4. The proposed plans shall conform to the International Building Codes as adopted by the City of Great Falls Building Division.

Alternatives:
The Planning Advisory Board could recommend denial of the minor subdivision. For this action, the Planning Advisory Board must provide alternative Findings of Fact to support a denial of the minor subdivision request.

Attachments/Exhibits:
Exhibit A – Application
Exhibit B – Aerial Map
Exhibit C – Findings of Fact
Exhibit D – Site Plan
Exhibit E – Development Standards
Exhibit F – Draft of Amended Plat
Exhibit G – Site Photos
Exhibit H – Zoning Map

Date Stamp:

CITY OF GREAT FALLS
PLANNING & COMMUNITY DEVELOPMENT DEPT.
P.O. BOX 5021, GREAT FALLS, MT, 59403-5021
406.455.8430 • WWW.GREATFALLSMT.NET

LAND USE APPLICATION

REYNOLDS SUBDIVISION
Name of Project (if applicable):

2400 6TH ST NW, GREAT FALLS, MT 59404
Project Address:

JANNA REYNOLDS
Applicant/Owner Name:

2400 6TH ST NW, GREAT FALLS, MT 59404
Mailing Address:

406-799-6433
Phone:

jjreynolds15@gmail.com
Email:

RYAN BUFFINGTON
Representative Name:

406-761-3010
Phone:

ryan.buffington@tdhengineering.com
Email:

- ☐ Annexation by Petition: $500
- ☐ Preliminary Plat, Major: $1,500 + $50/lot
- ☐ Final Plat, Major: $1,500 + $25/lot
- X Minor Subdivision: $1,250
- ☐ Zoning Map Amendment: $2,000
- ☐ Conditional Use Permit: $1,500
- ☐ Planned Unit Development: $2,000
- ☐ Amended Plat, Non-administrative: $1,000

LEGAL DESCRIPTION:

HILLSIDE TRACT FIRST AMEND, TR 7
Lot/Block/Subdivision:

S34, T21 N, R03 E
Section/Township/Range:

ZONING (ZONING MAP AMENDMENT ONLY):

R-2
Current:

R-2
Proposed:

LAND USE (CONDITIONAL USE ONLY):

Current:

Proposed:

I (We), the undersigned, understand that the filing fee accompanying this application is not refundable. I (We) further understand that the fee pays for the cost of processing, and the fee does not constitute a payment for approval of the application. I (We) further understand that public hearing notice requirements and associated costs for land development projects are my (our) responsibility. I (We) further understand that other fees may be applicable per City Ordinances. I (We) also attest that the above information is true and correct to the best of my (our) knowledge.

Janna Reynolds
Applicant/Owner's Signature:

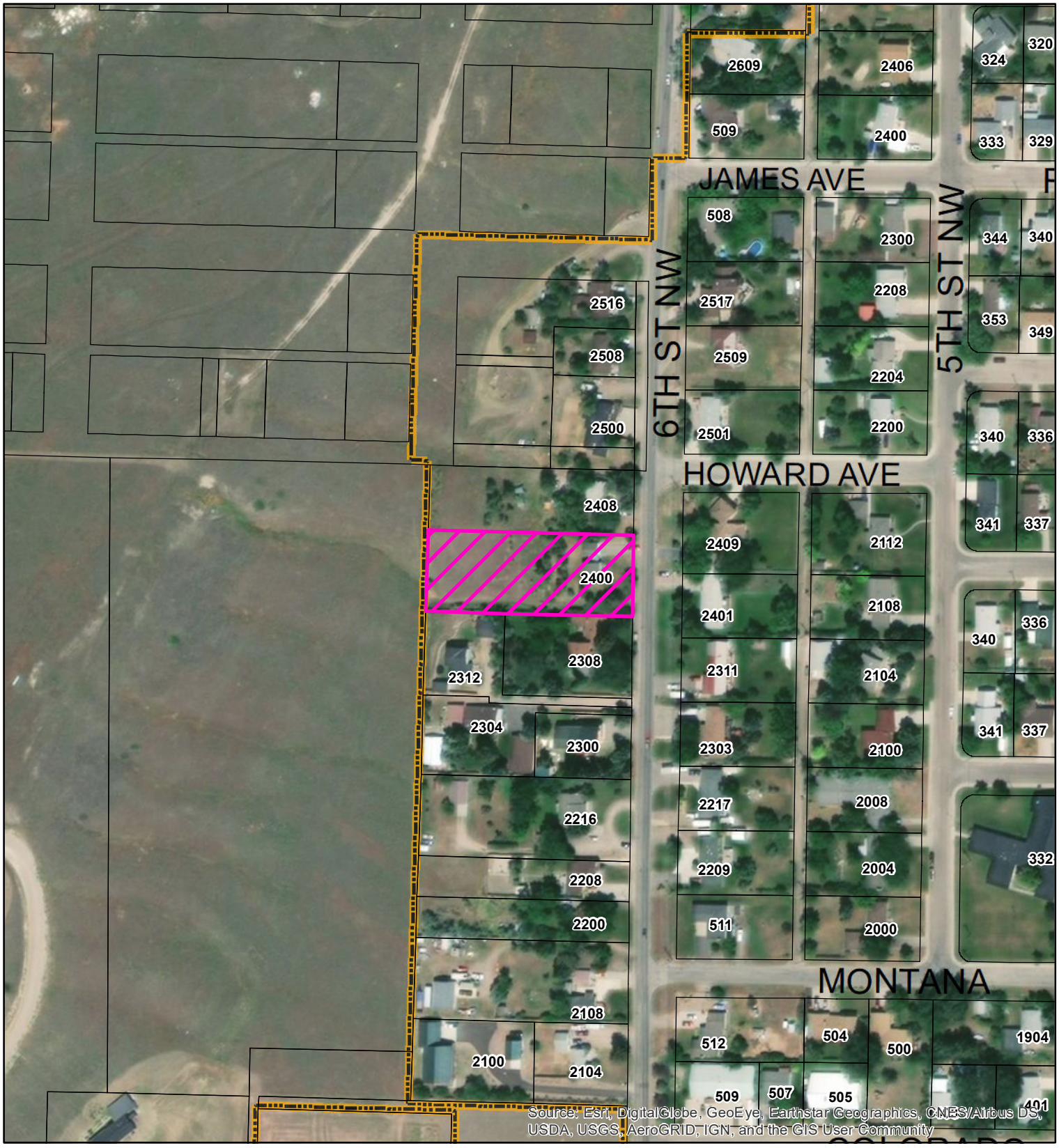
2/5/2020
Date:

RBuffington
Representative's Signature:

2/5/2020
Date:

Effective Date: 5/2019

Exhibit B - Aerial Map



2600 6th Street NW

Parcels

City Limits

0 100 200 400 Feet

Date: 3/2/2020
Author: LH, Planning

N
W E
S

FINDINGS OF FACT/BASIS OF DECISION – MONTANA SUBDIVISION AND PLATTING ACT

Minor subdivision of Lot 7 of the First Supplement to Hillside Tract, located in the SE1/4 of Section 34, Township 21 North, Range 3 East, P.M.M., Cascade County, Montana. (PREPARED IN RESPONSE TO 76-3-608(3) MCA)

PRIMARY REVIEW CRITERIA:

Effect on Agriculture and Agricultural Water User Facilities: The minor subdivision is located on 6th Street NW which is located in city limits. The City Limits run along the west property line of the proposed minor subdivision. The project site is surrounded by existing residential development on the north and south sides, public right-of-way on the east side, and vacant rural land to the west. Thus, the proposed minor subdivision will not interfere with any agricultural irrigation system or present any interference with agricultural operations in the vicinity.

Effect on Local Services: Lots in the proposed subdivision are currently served or will be served from public mains at the time of development. The Owner will pay the cost of the service lines from these utility mains. The owners of the two lots created by the subdivision will pay regular water and sewer charges, and monthly storm drain charges. The property proposed for this subdivision is currently receiving law enforcement and fire protection service from the City of Great Falls and the subdivision does not propose any changes to the current services. As part of the review process, the Fire Department identified that a large turn-around is necessary to ensure access in and out of the site for large Fire Department equipment. This turn-around has been incorporated into the preliminary site plan.

Effect on the Natural Environment: The subdivision is not expected to adversely affect soils or the water quality or quantity of surface or ground waters. Surface drainage from the subdivision will flow to 6th Street NW which will ultimately be integrated into existing City storm water infrastructure.

Effect on Wildlife and Wildlife Habitat: The subdivision is surrounded by existing residential development to the north and south, public right-of-way to the east, and vacant rural land to the west. This is not in an area of significant wildlife habitat beyond occasional deer and migrating fowl.

Effect on Public Health and Safety: Based on available information, the subdivision is not subject to abnormal natural hazards nor potential man-made hazards. The subdivision itself will not have a negative effect on Public Health and Safety.

REQUIREMENTS OF MONTANA SUBDIVISION AND PLATTING ACT, UNIFORM STANDARDS FOR MONUMENTATION, AND LOCAL SUBDIVISION REGULATIONS

The subdivision meets the requirements of the Montana Subdivision and Platting Act and the surveying requirements specified in the Uniform Standards for Monumentation and conforms to the design standards specified in the local subdivision regulations. The local government has complied with the subdivision review and approval procedures set forth in the local subdivision

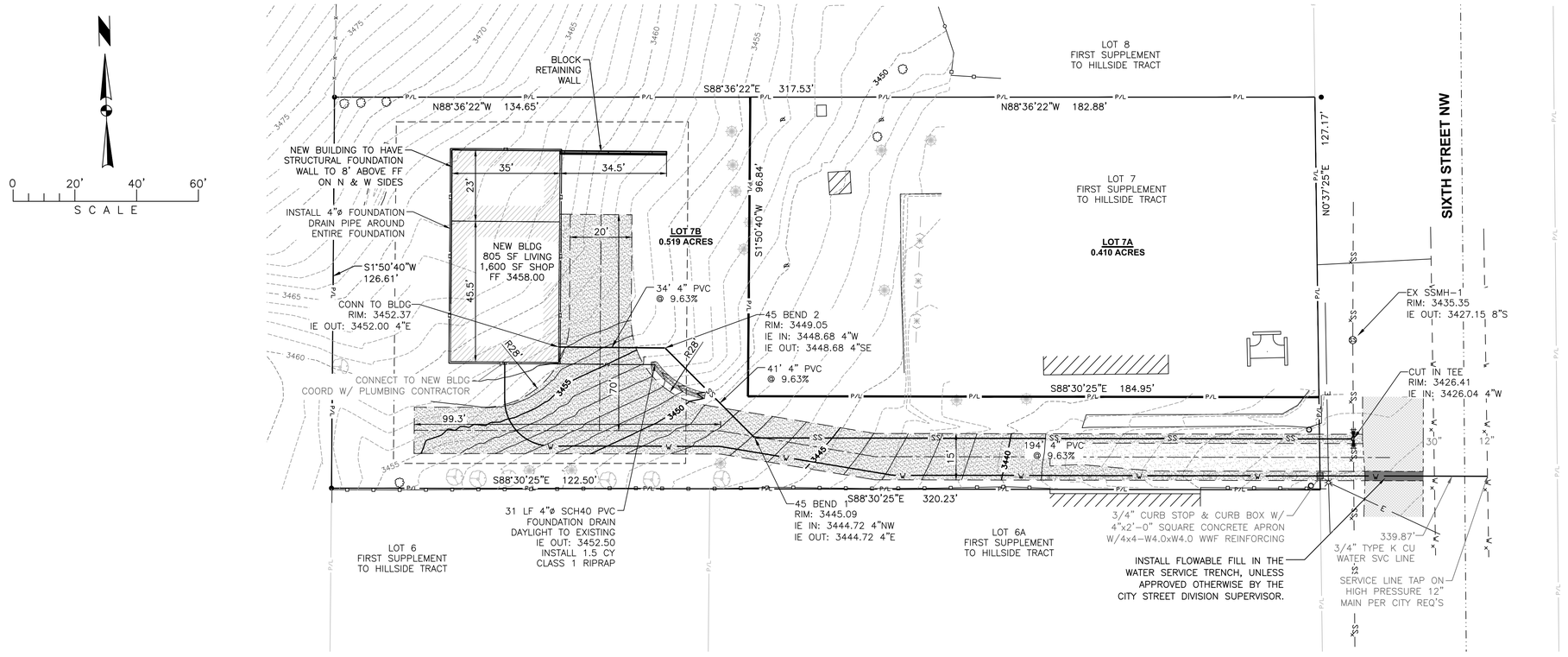
regulations.

EASEMENT FOR UTILITIES

The developer shall provide necessary utility easements to accommodate water mains, sanitary sewer mains and private utilities to serve all lots of the subdivision.

LEGAL AND PHYSICAL ACCESS

Legal and physical access to the proposed subdivision will be provided via a driveway that connects to 6th Street NW. This access, shown on the preliminary plat, will be created through the amended plat.



RESIDENTIAL STANDARD COMPARISON TABLE		
STANDARD	R-2	PROPOSED LOT
RESIDENTIAL DENSITY	–	NA
MINIMUM LOT SIZE FOR NEWLY CREATED LOTS	11,000 SF	22,621 SF
MINIMUM LOT WIDTH FOR NEWLY CREATED LOTS	80 FT	126.61 FT
LOT PROPORTION FOR NEWLY CREATED LOTS (MAXIMUM DEPTH TO WIDTH)	3:1	2.5:1
MAXIMUM BUILDING HEIGHT OF PRINCIPAL BUILDING	35 FEET	35 FEET
MAXIMUM BUILDING HEIGHT OF DETACHED PRIVATE GARAGE	24 FEET, BUT MAY NOT BE HIGHER THAN THE UPPERMOST ELEVATION OF THE PRINCIPAL BUILDING	NA
MAXIMUM BUILDING HEIGHT OF OTHER ACCESSORY BUILDINGS	12 FT	NA
MINIMUM FRONT YARD SETBACK	20 FT	61.4 FT
MINIMUM SIDE YARD SETBACK	PRINCIPAL BUILDING: 8 FEET EACH SIDE	17.4 FT
MINIMUM REAR YARD SETBACK	20 FEET FOR LOTS 150 FEET IN DEPTH AND OVER	38.2 FT
MAXIMUM LOT COVERAGE OF PRINCIPAL AND ACCESSORY BUILDINGS	OTHER TYPES: 35%	10.6%

NOT FOR CONSTRUCTION

REV	DATE	REVISION

TD&H Engineering
tdhengineering.com

DRAWN BY:	RCB
DESIGNED BY:	RCB
QUALITY CHECK:	DDN
DATE:	3/3/2020
JOB NO.	19-232
FIELDBOOK	

REYNOLD'S SUBDIVISION
GREAT FALLS, MT

SITE, UTILITY, & GRADING PLAN - PRELIMINARY

19-232 - C3 - SITE.DWG

SHEET **C3.0**

Exhibit 20-4. Development standards for residential zoning districts (see footnotes [4], [5] & [7] for general standards)

Standard	R-1	R-2	R-3	R-5	R-6	R-9	R-10
Residential density	-	-	-	1,875 sq. feet of lot area per dwelling unit	500 sq. feet of lot area per dwelling unit	1,200 sq. feet of lot area per dwelling unit	10 dwelling units per acre
Minimum lot size for newly created lots	15,000 sq. feet	11,000 sq. feet	7,500 sq. feet	7,500 sq. feet	7,500 sq. feet	7,500 sq. feet	n/a
Minimum lot width for newly created lots	90 feet	80 feet	60 feet	50 feet	50 feet	50 feet	n/a
Lot proportion for newly created lots (maximum depth to width)	3:1	3:1	2.5:1	2.5:1	2.5:1	2.5:1	n/a
Maximum building height of	35 feet	35 feet	35 feet	45 feet	65 feet	35 feet, single-family	12 feet to

principal building						50 feet, multi-family	exterior wall
Maximum building height of detached private garage [1]	24 feet, but may not be higher than the uppermost elevation of the principal building	24 feet, but may not be higher than the uppermost elevation of the principal building	24 feet, but may not be higher than the uppermost elevation of the principal building	24 feet, but may not be higher than the uppermost elevation of the principal building	24 feet, but may not be higher than the uppermost elevation of the principal building	24 feet, but may not be higher than the uppermost elevation of the principal building	16 feet
Maximum building height of other accessory buildings	12 feet	12 feet	12 feet	12 feet	12 feet	12 feet	12 feet
Minimum front yard setback [2]	30 feet	20 feet	20 feet	10 feet	15 feet	10 feet	n/a
Minimum side yard setback [3]	Principal building: 15 feet each side; accessory building: 2 feet each side provided the front of the building is at	Principal building: 8 feet each side; accessory building: 2 feet each side provided the front of the building is at	Principal building: 6 feet each side; accessory building: 2 feet provided the front of the building is at least	4 feet; 8 feet if adjoining a R-1, R-2, R-3 district	5 feet; 10 feet if adjoining a R-1, R-2, R-3 district	Principal building: 6 feet each side; accessory building: 2 feet each side provided the front of the building is at	n/a

	least 50 feet from the front lot line	least 40 feet from the front lot line	40 feet from the front lot line			least 40 feet from the front lot line	
Minimum rear yard setback [7]	20 feet for lots less than 150 feet in depth; 25 feet for lots 150 feet in depth and over	15 feet for lots less than 150 feet in depth; 20 feet for lots 150 feet in depth and over	10 feet for lots less than 150 feet in depth; 15 feet for lots 150 feet in depth and over	10 feet for lots less than 150 feet in depth; 15 feet for lots 150 feet in depth and over	15 feet	10 feet for lots less than 150 feet in depth; 15 feet for lots 150 feet in depth and over	n/a
Maximum lot coverage of principal and accessory buildings	Corner lot: 40% Other types: 30%	Corner lot: 45% Other types: 35%	Corner lot: 55% Other types: 50%	Corner lot: 60% Other types: 50%	Corner lot: 70% Other types: 60%	Corner lot: 70% Other types: 60%	none

[1] Attached private garages are considered a part of the principal building for application of height and setback development standards.

[2] An unenclosed front porch on a single family residence may extend into the front yard setback up to nine (9) feet, provided the porch does not occupy more than sixty (60) percent of the length of the main part of the house.
(Ord. 2950, 2007)

[3] See Section 17.20.6.020 for side yard requirements for zero lot-line projects and Section 17.20.7.010 for accessory buildings with accessory living spaces.

[4] Smaller lots and reduced setbacks and frontages may be accomplished through a Planned Unit Development (PUD).

[5] An existing structure that does not meet the setback requirements stated above can be rebuilt on its original foundation or the original foundation location.

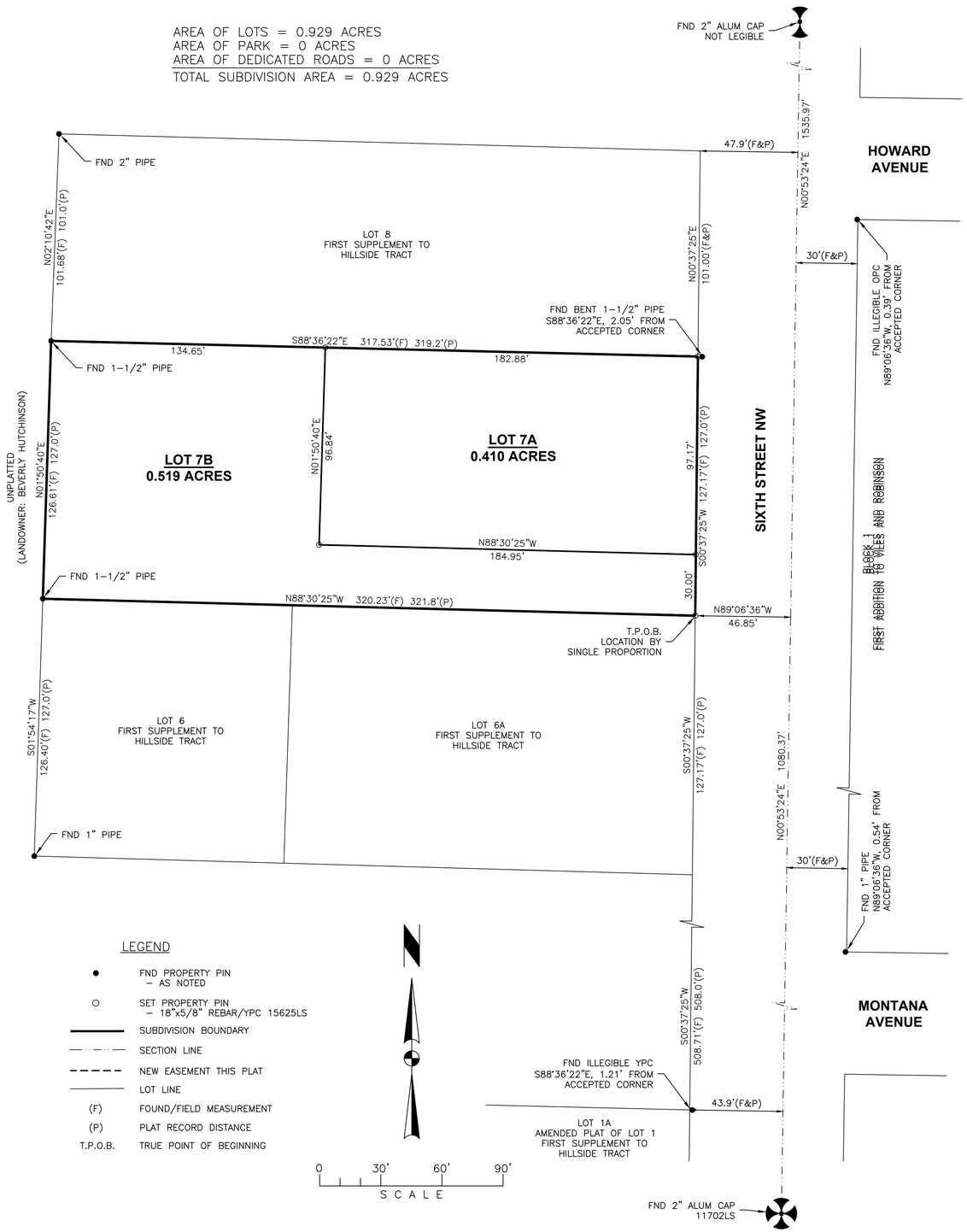
[6] For townhouses, see Section 17.20.6.050 for additional and superseding requirements.
(Ord. 2950, 2007)

[7] Permitted accessory structures and buildings shall have a minimum rear setback of 2 feet in all residential zoning districts.
(Ord. 2950, 2007)

AN AMENDED PLAT OF
LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION
LOCATED IN THE SE1/4 OF SECTION 34, T21N, R3E, P.M.M., CITY OF GREAT FALLS, CASCADE COUNTY, MONTANA

LANDOWNER: JOHN BRUCE REYNOLDS

AREA OF LOTS = 0.929 ACRES
AREA OF PARK = 0 ACRES
AREA OF DEDICATED ROADS = 0 ACRES
TOTAL SUBDIVISION AREA = 0.929 ACRES



LEGEND

- ● FND PROPERTY PIN – AS NOTED
- ○ SET PROPERTY PIN – 18"x5/8" REBAR/YPC 15625LS
- SUBDIVISION BOUNDARY
- SECTION LINE
- NEW EASEMENT THIS PLAT
- LOT LINE
- (F) FOUND/FIELD MEASUREMENT
- (P) PLAT RECORD DISTANCE
- T.P.O.B. TRUE POINT OF BEGINNING

CERTIFICATE OF OWNERSHIP

I(we), the undersigned property owner(s), do hereby certify that I(we) have caused to surveyed, subdivided, and platted into lots, blocks, and easements, the following described tract of land in the City of Great Falls, Cascade County, Montana, to–wit:

A tract of land being Lot 7 of the First Supplement to Hillside Tract Addition, located in the SE1/4 of Section 34, Township 21 North, Range 3 East, P.M.M., City of Great Falls, Cascade County, Montana, and being more particularly described as follows:

Beginning at the Southeast corner of said Section 34; thence North 00°53'24" East along the Easterly line of said Section 34, a distance of 1080.37 feet; thence North 89°06'36" West, a distance of 46.85 feet to the Southeast corner of said Lot 7 and being the True Point of Beginning; thence North 88°30'25" West along the Southerly boundary line of said Lot 7, a distance of 320.23 feet to the Southwest corner of said Lot 7; thence North 01°50'40" East along the Westerly boundary line of said Lot 7, a distance of 126.61 feet to the Northwest corner of said Lot 7; thence South 88°36'22" East along the Northerly boundary line of said Lot 7, a distance of 317.53 feet to the Northeast corner of said Lot 7 and being a point on the Westerly right–of–way line of Sixth Street NW; thence South 00°37'25" West along said Westerly right–of–way line, a distance of 127.17 feet to the True Point of Beginning and containing 0.929 acres, along with and subject to any existing easements.

The above described tract of land is to be known and designated as AN AMENDED PLAT OF LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION, City of Great Falls, Cascade County, Montana, and the lands included in all streets, avenues, and parks or public lands shown on said plat are hereby granted and donated to the use of the public forever.

CERTIFICATE OF EXEMPTION FROM PARK DEDICATION

I(we), the undersigned property owner(s), do hereby certify that being this subdivision will only create one additional parcel, a park dedication will not be required pursuant to 76–3–621(3)(d) MCA, stating "(3) A park dedication may not be required for: (d) a subdivision in which only one additional parcel is created".

Dated this _____ day of _____, A.D., _____

_____
JOHN BRUCE REYNOLDS

State of Montana)
: ss
County of Cascade)

On this _____ day of _____, _____, before me, the undersigned, a Notary Public for the State of Montana, personally appeared, John Bruce Reynolds, known to me to be the person who executed the Certificate of Ownership. IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

_____ (Notarial Seal)
Notary Public for the State of Montana
Residing at _____
My commission expires _____

CERTIFICATE OF PUBLIC WORKS DIRECTOR

I, Jim Rearden, Public Works Director for the City of Great Falls, Montana, do hereby certify that I have examined the accompanying plat of the AN AMENDED PLAT OF LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION, and the survey it represents, find that same conforms to regulations governing the platting of lands and presently platted adjacent land, as near as circumstances will permit, do hereby approve the same.

Dated this ___ day of _____, _____.

_____
Jim Rearden Public Works Director
City of Great Falls, Montana

CERTIFICATE OF CITY COMMISSION

I, Gregory T. Doyon, City Manager of the City of Great Falls, Montana, do hereby certify that the accompanying plat of the AN AMENDED PLAT OF LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION, was duly examined and approved by the City Commission of the City of Great Falls, Montana, at its regular meeting held on the _____ day of _____, _____.

_____
Gregory T. Doyon, City Manager
City of Great Falls, Montana

CERTIFICATE OF AVAILABILITY OF MUNICIPAL SERVICES

I, Gregory T. Doyon, City Manager of the City of Great Falls, Montana, do hereby certify that the City Commission of the City of Great Falls, Montana, at its regular meeting held on the _____ day of _____, _____, found that adequate municipal facilities for the supply of water and the disposal of sewage and solid waste, are available to the above described property, namely the said facilities of the City of Great Falls, Montana, and this certificate is made pursuant to Section 76–4–125(1)(d) M.C.A., permitting the Clerk and Recorder of Cascade County, Montana, to record the accompanying plat.

_____
Gregory T. Doyon, City Manager
City of Great Falls, Montana

CERTIFICATE OF GREAT FALLS PLANNING BOARD

We, the undersigned, Peter Fontana, President of the Great Falls Planning Board, City of Great Falls, Montana, and Craig Raymond, Secretary of said Great Falls Planning Board, do hereby certify that the accompanying plat of AN AMENDED PLAT OF LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION, has been submitted to the said Great Falls Planning Board, for examination by them and was approved at its regular meeting held on the _____ day of _____, _____.

_____
Peter Fontana, President
Great Falls Planning Board

_____
Craig Raymond, Secretary
Great Falls Planning Board

CERTIFICATE OF SURVEYOR

I, the undersigned, Daniel R. Kenczka, Professional Land Surveyor, Montana Registration No. 15625LS, do hereby certify that on November 18, 2019, I supervised this survey of the plat of AN AMENDED PLAT OF LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION, and platted same as shown on the accompanying plat and as described in accordance with the provisions of the Montana Subdivision and Platting Act, Sections 76–3–101 through 76–3–614, M.C.A., and Cascade County.

Dated this _____ day of _____, A.D., _____

_____
Daniel R. Kenczka, Montana Reg. No. 15625LS

MONTANA
DANIEL R. KENCZKA
No. 15625 LS
LICENSED
PROFESSIONAL LAND SURVEYOR

CERTIFICATE OF COUNTY TREASURER

I, Diane Heikkila, County Treasurer of Cascade County, Montana, do hereby certify that I have examined the records covering the areas included in the accompanying plat of the AN AMENDED PLAT OF LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION, and find that the current taxes are not delinquent.

Dated this _____ day of _____, A.D., _____

_____
County Treasurer, Cascade County, Montana

BASIS OF BEARING:
GRID NORTH, MONTANA STATE PLANE COORDINATE SYSTEM

PURPOSE OF SURVEY:
TO CREATE 2 LOTS FROM LOT 7 OF THE FIRST SUPPLEMENT TO HILLSIDE TRACT ADDITION

TD&H Engineering — tdhengineering.com

DRAWN BY: DRK	DATE: 12-19-19	QUALITY CHECK: X
SURVEYED BY: KFV	JOB NO. 19-232	FIELDBOOK X

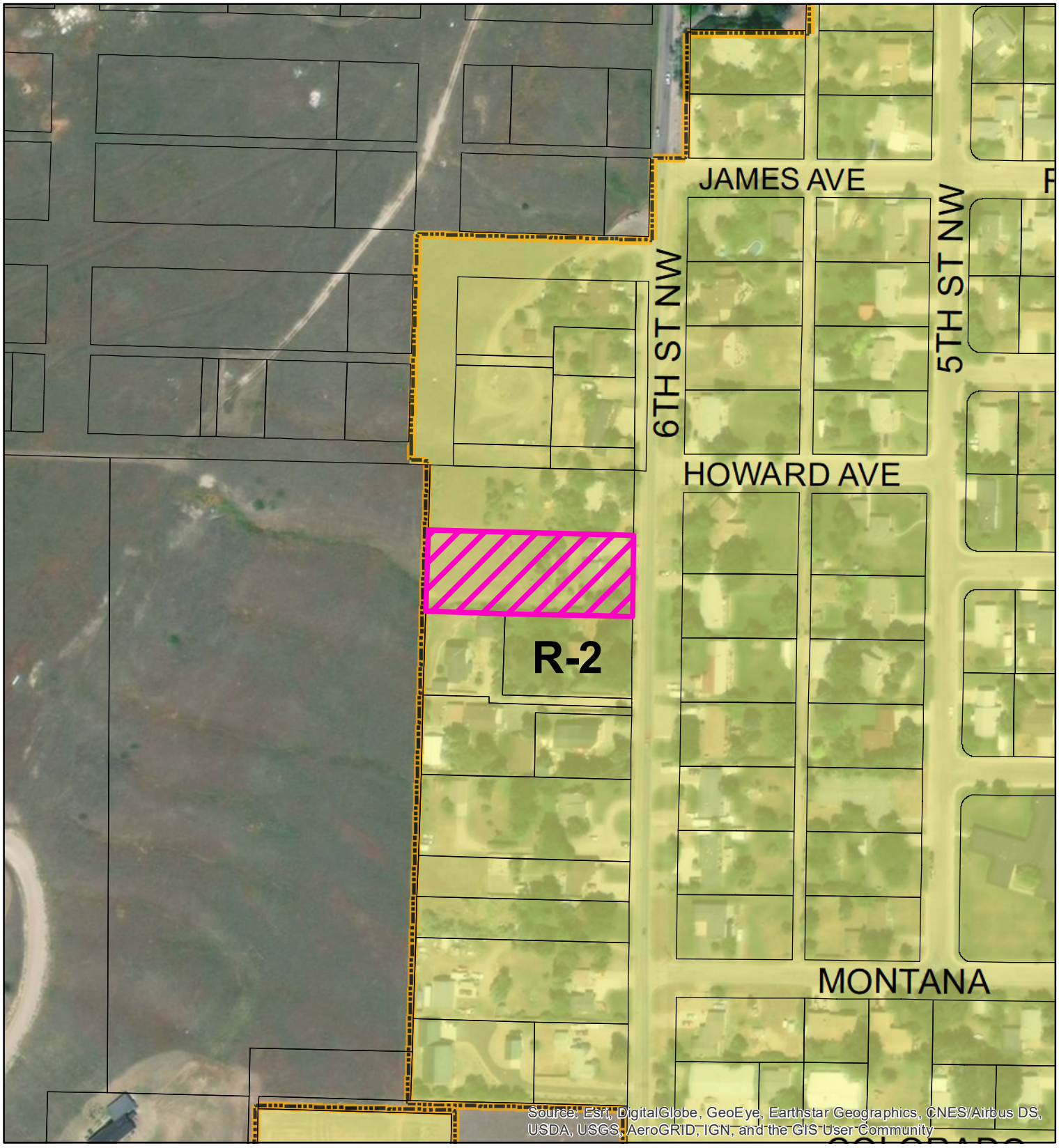
GREAT FALLS-BOZEMAN-KALISPELL-SHELBY
SPOKANE
LEWISTON
WATFORD CITY
MONTANA
WASHINGTON
IDAHO
NORTH DAKOTA

Site Photos

View from southeast corner looking west

View from the southwest corner looking east

Exhibit H - Zoning Map



2600 6th Street NW

Parcels

City Limits

0 100 200 400 Feet

Date: 3/3/2020
Author: LH, Planning

N
W E
20

Agenda #: 6
Meeting Date: _____

CITY OF GREAT FALLS
PLANNING ADVISORY BOARD / ZONING COMMISSION AGENDA REPORT

Item:	City of Great Falls Standards for Design and Construction.
Initiated By:	Public Works Department
Presented By:	Jesse Patton, Senior Civil Engineer
Action Requested:	Recommendation to the City Commission.

Suggested Motion:

1. Board Member moves:

"I move that the Planning Advisory Board recommend the City Commission (adopt/deny) the City of Great Falls Standards for Design and Construction."

2. Chairman calls for a second, public comment, board/commission discussion, and calls for the vote.

Background: This is the first comprehensive document that provides the minimum standards for design and construction of public improvements that will be owned and maintained by the City, as well as privately owned water and sewer service lines, and other site civil components that are reviewed and inspected by the City. Multiple municipalities throughout Montana have already adopted documents of this nature. Currently, the City of Great Falls uses design and construction standards that are found in the Montana Public Works Standards, the Official Code of the City of Great Falls (OCCGF), and other policy documents. As part of the current comprehensive review of the City's development process, as requested by the City Commission, Staff completed a comprehensive review of the existing "City Standards" with the goal of integrating all of the multiple sources into one source document that provides a consistent set of standards. The Standards for Design and Construction will be updated occasionally as the need for changes arise.

Staff is currently working on and will be recommending changes to the City Commission that will modify multiple Titles within the OCCGF. A majority of the code changes will include the removal of design and construction standards that are now included in the Standards for Design and Construction document. The recommended changes to OCCGF Title 17 (Land Development Code) will be presented to the Planning Advisory Board in the future.

Review Process:
Staff was tasked with reviewing and analyzing the existing standards located in City Code, City Policy Papers, and City standards with the purpose of the review to identify and consolidate all of the information into one document. The general process staff followed included:

1. Reviewing the following documents: Design Standards and Specifications Policy for the City of Bozeman, City of Billings Standard Modifications to Montana Public Works Standard Specifications, City of Whitefish Engineering Standards, the City of Omak Construction Standards for the Private Construction of Public Facilities, and the Montana Department of Transportation Road Design Manual;

2. Reviewing the OCCGF and documenting existing standards and recommending changes that are needed to authorize this new document and to standardize the information in the Official Code and the document;

3. Meeting with a focus group of design professionals and developers to solicit input regarding the information provided in the City of Great Falls Standards for Design and Construction;

4. Meeting with multiple division supervisors and City Inspectors to determine the best design and construction practices that are being utilized today and to identify, clarify, and update the standards accordingly; and

5. Compiling all of the information obtained during the review process into the City of Great Falls Standards for Design and Construction Document.

Concurrences: The Planning and Community Development and Public Works Departments have reviewed and approve of the information in the City of Great Falls Standards for Design and Construction.

Fiscal Impact: The purpose of this document is to help provide consistent and timely information to the public, including the development community, regarding City requirements associated with public and private infrastructure improvements. The fiscal impact of using these standards and their possible reduced maintenance costs over the life span of a specific improvement was not analyzed.

Staff Recommendation: Staff recommends the Planning Advisory Board recommend the City Commission adopt the City of Great Falls Standards for Design and Construction.

Alternatives: The Planning Advisory Board could choose to take no action, recommend that the City Commission deny the Standards document, or recommend that revisions be made to the document before it is presented to the City Commission.

Attachments/Exhibits:
City of Great Falls Standards for Design and Construction

STANDARDS FOR DESIGN AND CONSTRUCTION

City of Great Falls, Montana

Specifications Filed in the Office of the City Engineer

On ____, **2020**

ADOPTED: _____2020, Ordinance ____

TABLE OF CONTENTS

FOREWORD

This guide has been prepared to assist design engineers, architects, developers, contractors, or other interested individuals with the preparation of plans and specifications for public infrastructure improvements. The purpose of this information is to provide guidance regarding minimum standards for design, materials, and methods of construction; where any portion of such improvement is to be offered to the City for operation and maintenance. Every project is unique and as such, the information presented in this guide does not apply in all situations.

This guide is intended to be used in conjunction with the Montana Public Works Standard Specifications and the Official Code of the City of Great Falls. If any portion of this document is found to conflict with the Official Code of the City of Great Falls (OCCGF) the provisions of the OCCGF shall supersede this document.

Please note that the information in this guide will be revised on an as-needed basis as regulations and policies are modified. This information is subject to change over time and all changes shall be approved by the City of Great Falls Public Works Director. Please reference the latest rendition located on the City's web page at the time of construction.

Not all design criteria and drawings are applicable in all situations. It is not the intent of the City of Great Falls to unreasonably limit any innovative or creative effort that could result in a superior design based on the performance criteria of safety, economical maintenance, and pleasant appearance. Proposed departures from these standards by the Design Team will be evaluated by PW Engineering Staff on the basis that the proposal will produce acceptable results for the user, the environment, and the public.

Glossary of Acronyms and Terms

Term	Definition
AASHTO	American Association of State Highway and Transportation Officials
ADT	Average Daily Traffic
APWA	American Public Works Association
ARC	Antecedent Runoff Condition
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
CC&R	Conditions, Covenants, and Restrictions
cfs	Cubic Feet per Second
CI	Cast Iron
CMP	Corrugated Metal Pipe
CN	Curve Number
CoGF	City of Great Falls
DEQ	Department of Environmental Quality
DIP	Ductile Iron Pipe
ESAL	Equivalent Single Axle Load
ESC	Erosion and Sediment Control
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FL	Flange Joint
fps	Feet per Second
FS	Factor of Safety
GW	Grate Width
GSC	Geotechnical Site Characterization
HDPE	High Density Polyethylene
HDPP	High Density Polypropylene
HGL	Hydraulic Grade Line
HOA	Homeowner's Association
IBC	International Building Code
IDF	Intensity Duration Frequency
ITE	Institute of Transportation Engineers
LED	Light Emitting Diode
LOS	Level of Service
MDEQ	Montana Department of Environmental Quality
MDT	Montana Department of Transportation
MFE	Municipal Facilities Exclusion
MJ	Mechanical Joint
Mg/l	Milligrams per Liter
MPWSS	Montana Public Works Standard Specifications
MUTCD	Manual on Uniform Traffic Control Devices
NAVD 88	North American Vertical Datum 1988
NDW	Natural Drainage Way
NOAA	National Oceanic and Atmospheric Administration

NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWE	Northwestern Energy
O&M	Operation and Maintenance
OCCGF	Official Code of the City of Great Falls
OSHA	Occupation Safety and Health Administration
OSB	Oriented Strand Board
PCD	City of Great Falls Planning and Community Development Department
PLSS	Public Land Survey System
PO	Push-On Joint
POA	Property Owner's Association
Pollutant Generating Surface	Any surface where pollutants can be generated including, but not limited to roofs, landscaped areas, driving surfaces, and parking areas.
Professional Engineer	Montana Licensed Professional Engineer (AKA PE, MT PE, or Engineer)
Project Engineer	Developer's Consulting Engineer that is working on the project
PTOE	Professional Traffic Operations Engineer
PVC	Polyvinyl Chloride
PWD	City of Great Falls Public Works Department
RCP	Reinforced Concrete Pipe
Rebar	Reinforcing Bar
ROW	Right-of-Way
SCS	Soil Conservation Service
Sf	Square Foot
SOI	Sand, Oil Interceptors
Standards	Current City of Great Falls Standards for Design and Construction
Stormwater Facility	Any conveyance swale, ditch, pond, storage facility, structure, or BMP
TIA	Traffic Impact Analysis
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
UPC	Universal Plumbing Code
USCS	Unified Soil Classification System
USGS	United States Geological Survey
VCP	Vitrified Clay Pipe
WSDOT	Washington State Department of Transportation

CHAPTER 1 - CONSTRUCTION WITHIN CITY RIGHT-OF-WAY

Chapter 1 Construction Within City Right-of-Way

1.1. GENERAL PROVISIONS

1.1.1 Standards

A. The latest published edition of Division 1, Division 2, Division 3 and the Appendix of the Montana Public Works Standard Specifications (*MPWSS*) is adopted, except as amended herein. With respect to the design and/or construction of public facilities, and conflict(s) or difference(s) between the MPWSS, the Official City Code of Great Falls (OCCGF), and the CoGF Standards for Design and Construction (Standards) shall be resolved in favor of the OCCGF, these Standards, then the MPWSS;

B. New construction will be built under the Standards in effect at the time of plan approval; and

C. If construction of the approved plans is not completed within 3 years from the date of design approval, and updates to the Standards have occurred since the date of approval, the design plans, specifications, and reports shall be resubmitted for City review and approval. City review fees for additional reviews of previously approved plans may apply.

1.1.2 Public Right-of-Way Permit

A. Except when such person is operating under a contract with the CoGF, all construction, excavation, or other work on public or private property which will necessitate the use of the public right-of-way or easement shall require a public Right-of-Way Permit issued by the Planning and Community Development Department (PCD);

B. The work authorized by the Permit includes, but is not limited to: dry utility installation, connections, and repair within the ROW; retaining wall construction and repair within the ROW; excavating in, cutting through, or tearing open any City street, avenue, alley, sidewalk, boulevard, or any other public way;

C. Also included are any other uses of the public right-of-way where there is a possibility of creating a hazard. Examples of hazards are scaffolding, storage of materials or equipment, crane and equipment operations, demolition, sandblasting and painting operations, temporary construction or demolition dumpster placement and any other use deemed a hazard by the PWD;

D. The Permit will not be issued until all insurance and bonding requirements have been met;

E. The permittee shall accomplish the proposed work within the time allowed by the PWD Director and under the director's supervision (OCCGF Title 12);

F. In an emergency which requires repairs to be made immediately, the Contractor may excavate and complete the repairs without first having obtained a Permit. Prior to beginning work at the site during normal working hours, the Contractor shall notify the PWD Engineering Division at 406-771-1258. During emergency repair and prior to beginning work after hours, the Contractor shall notify "One Call" that an emergency repair is needed. In either case, the Contractor shall describe the circumstances and provide the location of the emergency repairs. The Contractor shall obtain the Permit no later than the next scheduled City workday and call for the appropriate inspections;

G. All provisions of the Standards shall be complied with regardless of the circumstances of the construction;
H. The Contractor shall be responsible for damages to any/all infrastructure, including damages to the street, within the public right-of-way. The Street Division Manager shall determine the appropriate roadway fix. This may include, but is not limited to, a mill and overlay, chip seal, or sand seal;
I. All excavation shall be thoroughly backfilled, and any such excavation or opening shall be restored to the condition it was prior to such excavation or opening, or better, except that the City will replace all asphaltic surfacing in paved streets, with costs to be paid by the applicant, unless the Public Works Director or designee authorizes the applicant to replace the asphaltic surfacing;
J. Flowable fill shall be used to backfill trench excavation on arterial and collector streets and when deemed necessary by the Street Division Supervisor or designee on local streets and alleys;
K. Flowable fill shall be used to cap street openings during the winter and whenever hot mix asphaltic surfacing is not available. The surfacing shall be maintained, by the permittee, until hot mix asphaltic surfacing becomes available; and
L. Any settlement in a restored area which occurs within two (2) years of the date of completion of the permanent surfacing, shall be considered as conclusive evidence of defective backfill. Upon failure or refusal of such permittee to correct such settlement within five (5) days after notice by the Public Works Director or designee to do so, the City may correct such settlement and any expense incurred by the City in correcting such settlement shall be paid by the permittee (OCCGF 12.4.060.B).

1.1.3 Sidewalk Permits and Curb Permits

A. Except when such person is operating under a contract with the CoGF, all construction, excavation, and other work associated with sidewalks and curbs within the public right-of-way or city easement shall require a Sidewalk Permit and/or a Curb and Gutter Permit issued by the Planning and Community Development Department (PCD);
B. The Contractor is responsible for contacting the City Engineering Office (406-771-1258) and requesting inspections; and
C. Refer to Chapter 8 “Transportation System” for sidewalk and curb design and construction standards.

1.1.3 Driveway Permits

A. Except when such person is operating under a contract with the CoGF, all construction, excavation, and other work associated with driveways and concrete crosswalks through driveways shall require a Curb Cut/Driveway permit issued by the PCD;
B. A request for a new curb cut and for a curb cut wider than what is allowed in Title 17 shall be submitted in writing to the City Engineer and construction shall not start until the City Engineer has issued a determination;
C. The Contractor is responsible for contacting the City Engineering Office (406-771-1258) and requesting inspections; and
D. Refer to Chapter 8 “Transportation System” for driveway design and construction standards.

1.1.3 City Fees

A. Water & Sewer Service Connection Fee
   I. A Connection Fee shall be paid **for the connection of each new water and sewer service to the system.** This fee must be paid even if a service line has previously been stubbed to the property line or other accessible location. Connection Fees for water and/or sewer must be paid before a Certificate of Occupancy will be issued by the Building Department and before service is approved. Connection Fees are established by City Ordinance.

1.1.4 Applicable Laws and Indemnification of the City

A. To the fullest extent permitted by law, the permittee shall fully indemnify, defend, and save the City, its agents, representatives, employees, and officers harmless from and against any and all claims, actions, costs, fees, losses, liabilities or damages of whatever kind or nature arising from or related to the permittee's performance of the permitted excavation and the permittee's work, or work of any subcontractor or supplier to applicant (OCCGF Title 12); and
B. The Contractor shall give all notices and comply with all federal, state and local laws, ordinances and regulations affecting the conduct of the work.

1.1.5 Interruption of Service

A. Any construction that will interrupt the normal operation of city sewer, water, storm, or transportation facilities requires notification of affected City departments and property owners and/or residents. The Contractor shall notify the PWD Engineering Division (Phone 406-771-1258) at least 2 business days prior to any street or alley closures;
B. All street closures or interruptions of utility services will require the Contractor to provide information specifying the location of construction and the duration of the closure;
C. The Contractor shall present the news release to the news media at least 2 business days prior to the beginning of any construction activity; and
D. The Contractor shall also notify utility users affected by the interruption of the type and duration of the interruption at least 2 workdays prior to beginning construction.

1.1.6 Traffic and Pedestrian Control

A. In the event of an emergency interruption, the Contractor shall notify the PWD, Police and Fire Departments immediately. The Contractor shall immediately dispatch members of his staff to notify affected individuals by telephone, letter, or personal contact;
B. A Traffic and Pedestrian Control Plan shall be submitted to the PWD for all work within the public right-of-way:
   I. Conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD);
   II. Show the location and description of all Traffic and Pedestrian Control Devices;
   III. No work shall commence on the project until the plan is approved;
   IV. Keep all devices in place and maintained throughout the project;
   V. Temporary pedestrian walkways shall meet the requirements of the Americans with Disabilities Act (ADA); and

VI. The PWD reserves the right to reject any device observed to be in substandard condition.

C. Emergency access to the work area shall be maintained at all times;

D. All barricades and obstructions shall be protected at night by suitable signal lights which shall be kept illuminated 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 to show in advance where construction, barricades or detours exist. All signs used at night shall be either retro-reflective with a material that has a smooth, sealed outer surface or illuminated to show the same shape and similar color both day and night;

E. If flagging is required it shall be accomplished by competent and properly equipped flag persons. Flagging shall be accomplished as described in the Montana Department of Transportation Flagger's Handbook and the MUTCD;

F. Traffic control devices shall be removed from visual contact with the traveling public when they are not being used for construction activities;

G. The Contractor shall remove all traffic and pedestrian control devices within 24 hours of the conclusion of the project construction; and

H. If the Contractor fails to maintain the Traffic and Pedestrian Control Devices in accordance with the regulations provided in the MUTCD, the City reserves the right to issue a stop work notice effective until issues have been corrected.

1.1.7 Liability Insurance (OCCGF Title 12)

A. Before any application to excavate, cut, access or tear open any public way is granted, such applicant shall furnish satisfactory evidence the applicant's activities are properly covered by applicable insurance coverage in amounts that shall be set by City Commission resolution and shown below.

COMMERCIAL GENERAL LIABILITY	
Each Occurrence (bodily injury and property damage)	$1,500,000

AUTOMOBILE LIABILITY	
Includes Scheduled, Hired, & Non-Owned Autos	$1,500,000 Combined Single Limit

WORKERS' COMPENSATION	
Workers' Compensation	Not less than statutory limits
Employer's Liability	$1,000,000

UMBRELLA COVERAGE

Applicant may provide applicable excess or umbrella coverage to supplement Applicant's existing insurance coverage, if existing policy limits do not satisfy the coverage requirements as set forth above.

1.1.8 Bonding (OCCGF Title 12)

A. All construction work within the public right-of-way or easement (sidewalk, boulevard, pavement, curb construction, water, storm drainage, sanitary sewer service line

installation, repair, etc.) will require the Contractor to have the required license and to provide the P&CD Department with a Performance Bond in the amount of $5,000 and shall remain in force for two years;

B. The bond must include a Compliance Guarantee; a Good Faith Guarantee and an Indemnity Guarantee;
C. Bonds may be in the form of a Surety Bond, a Certified Check, or an irrevocable Letter of Credit issued by a bank licensed to do business in the state of Montana;
D. Be payable to the City and/or State as their interests appear with respect to the expenditure of funds toward the construction of the street, avenue, alley, sidewalk, boulevard, or public way within the City;
E. Be conditioned for the protection of the City and/or State from and against any liability of any kind or character whatsoever which may arise as a result of the applicant's excavating in, cutting through, or opening up any such street, avenue, alley, sidewalk, boulevard, or other public way or which may in any way or manner be connected with or related thereto, payable by the applicant;
F. Be further conditioned that the permittee shall properly backfill and restore the surface of any and all excavations, openings, or cuttings made or dug in the public ways of the City, and shall do and complete all work in connection therewith in a good, competent, and workmanlike manner and in compliance with the specifications required therefore by the City and/or State; and
G. Remain on file with the P&CD Department; or
H. Include a water service line layer's license bond under the provisions of OCCGF Title 13, or a drain layer's license bond under the provisions of OCCGF Title 13, and the conditions of either of such bonds shall be amended to include the conditions as required by this section.

1.1.9 Guarantee for Equipment, Materials, and Workmanship

A. The Contractor shall guarantee all materials and equipment furnished, and construction work performed for maintenance and repair work on **existing city infrastructure** for a period of 2-years from the date of written acceptance of the work by the CoGF;
B. The guarantee for **new city infrastructure** shall be for a period of 2-years from the date of written acceptance of the work by the CoGF. In the case of a subdivision, the date of acceptance will be final plat approval or acceptance by the PWD, whichever is later; and
C. Guarantees shall be in the form of a Maintenance bond:
    I. Required prior to Final Plat or Certificate of Occupancy as may be deemed appropriate by the Director of Public Works;
    II. Equal to the percentage stated in the OCCGF Title 17;
    III. Shall remain in force throughout the guarantee period;
    IV. The City reserves the right to draw on the maintenance bond for repairs not completed by the responsible party within 30 calendar days of being advised that repairs are required;
    V. Maintenance bonds may be in the form of a Surety Bond, a Certified Check, or an irrevocable Letter of Credit issued by a bank licensed to do business in the state of Montana; and

VI. The Commencement Date for the Maintenance Bond shall be the date set for the completion of the required improvements as stated in the Subdivision Improvements Agreement, the date of Substantial Completion as certified by a Professional Engineer, or the date Final Plat is granted, whichever is later.

1.1.10 Excavation and Disposal of Material from Existing Public Right-of-Way and Easement

A. All material unsuitable, including but not limited to petroleum contaminated soil, for trench backfill, sub-base or base construction, excavated from the developed public right-of-way or easement shall be removed from the site and legally disposed of by the Contractor;
B. The disposal site shall meet Federal, State, County, and Local regulatory provisions for disposal of the unsuitable excavated material;
C. Unsuitable excavated material shall not be stockpiled on site without the written approval of the PWD; and
D. Excavated material shall be confined to the work zone as established during the preconstruction conference, the public right-of-way, or as shown in the contract documents.

1.1.11 Intersection Monuments

A. When a street is to be reconstructed, prior to any excavation, a thorough search shall be made for existing intersection monuments. If found, such monuments and any other survey monuments likely to be disturbed or destroyed, shall be preserved by or under direction of a Professional Land Surveyor in accordance with MCA 70-22-115; and
B. All monuments set shall meet the requirements of ARM 24.183.1101. Monuments set in pavement or concrete driving surfaces shall be placed inside of a cast iron monument box, per CoGF Standard 5-01.

1.1.12 Pollution Controls

A. During all construction in the right-of-way, the Contractor shall be responsible to maintain the construction site and all haul routes in accordance with the requirements of the COGF's Storm Drain Design Manual (See Chapter 7) and all applicable state and federal permits;
B. Excavation dewatering, disinfected water, petroleum contaminated water, or sediment laden run-off discharges to the storm drain or sanitary sewer are prohibited without the applicable permit or written authorization form the City MS-4 program or Industrial Pretreatment Program; and
C. See Chapter 7 of this document for more information on storm water quality and quantity requirements and permitting.

1.1.13 Pavement Restoration

A. All work shall be accomplished in accordance with current MPWSS and these Standards;
B. See Chapter 8 of this document for more information on pavement restoration requirements;
C. All excavations within 4 feet of the edge of the asphalt (including the outer edge, the crown, or adjacent seam) shall require removal and replacement from the edge of asphalt to the excavation edge. Asphalt patch areas that fall within the wheel path of the

vehicular travel lane shall be increased in size to the center of the lane or adjacent lane. In no circumstance will the edge of a patch area be allowed to fall within the wheel path;

D. Any damage to the existing asphalt surface caused by the Contractor's operations shall be repaired at the expense of the Contractor, including but not limited to gouges, scrapes, outrigger marks, and bucket marks. A slurry seal shall be considered the minimum standard for a repair to existing surfacing;
E. The Contractor shall be responsible for maintaining the area in a smooth and drivable condition until the permanent pavement is placed. If the ground is frozen, the road cut shall be temporarily repaired with a minimum thickness of 4-inches of flowable fill or a minimum thickness of 4-inches of cold patch material. The temporary repair shall be maintained by the Contractor for safe winter usage. The permanent restoration shall be made as soon as the ground is thawed in the spring, or as directed by the PWD; and
F. If the Contractor fails to restore the pavement within the 14-day period, or fails to maintain the trench or area as required, the City reserves the right to complete the restoration or maintenance, and all labor, equipment, material and administrative costs will be billed to the Contractor. The City reserves the right to call on the Contractor's Performance Bond if the bill is not paid within 30 days.

1.1.14 Stop Work Order

A. A written Stop Work Order may be issued by the PWD if the work in progress does not meet the Standards for the CoGF, or for any other valid reason; and
B. Work may resume only after a written Resume Work Order has been issued by the PWD.

1.1.15 Relocation of Utilities

A. Requests to relocate an existing public utility shall be submitted in writing to the PWD. A sketch shall be included that illustrates the existing location of the utility and the preferred relocation site. The request shall describe, in detail, the circumstances for the request;
B. Utility relocation shall be designed by a licensed professional engineer;
C. If the relocation is approved by the PWD, the utility shall be relocated by a bonded and insured utility contractor (see Section 1.1.7 and 1.1.8). Under no circumstances will the CoGF pay for any costs associated with the relocation of the utility; and
D. Relocation of water and sewer mains are also subject to MDEQ review and approval.

1.2. PROJECT REQUIREMENTS

1.2.1 Contractors Requirements

A. Registration:
    I. Any Contractor working within an existing Public Right-of-Way or Easement shall be registered with the Montana Department of Labor and Industry, Employment Relations Division.
B. Insurance and Bonding:
    I. Insurance and bonding shall be in accordance with Sections 1.1.7 and 1.1.8 as applicable; or
    II. As required in the City of Great Falls Construction Agreement when the project includes such agreement;

C. Preconstruction Meeting:
    I. Prior to the start of any construction, a preconstruction conference shall be held. The PWD, the Project Engineer, the Contractor, and any other parties pertinent to the project shall be represented. Items to be discussed at the pre-construction conference are construction schedule, shop drawing submittals, utility installation, materials testing, quality control, maintenance bond, and other items as may be necessary; and
    II. A paper copy of the plans approved by MDEQ (when applicable), three (3) paper copies of the City approved plans, and two (2) paper copies of shop drawing submittals approved by both the Project Engineer and the Contractor shall be submitted to the City Engineering Office prior to scheduling the Preconstruction meeting.

D. Shop Drawing Submittal:
    I. If the proposed items to be installed differ from the approved plans and specifications, the design engineer shall notify the City Engineering Office of the proposed revision and shop drawings shall be submitted for review not later than 10 business days prior to the proposed installation.

1.3. CONSTRUCTION STANDARDS

1.3.1 Underground Utilities

A. All underground electrical, gas, phone, and TV cable lines must be installed at least 5 feet horizontally from water, sanitary sewer and storm sewer mains and services.

1.4. CONSTRUCTION INSPECTION, TESTING, AND QUALITY CONTROL

1.4.1 Construction Inspection

A. A Professional Engineer, or the Professional Engineer's designated representative, shall provide construction inspection and testing as required. Failure to submit required testing and other documentation shall be considered valid justification for non-acceptance of construction work and/or public infrastructure. Inspection and testing shall be in accordance with the current edition of the MPWSS and the Standards; and

B. The following quality control procedures will apply to all utility and roadway construction projects. The City reserves the right to conduct independent quality assurance testing at the City's expense during any phase of the construction. The Contractor shall bear the expense of failed tests and the expense of bringing the material into conformance with the required specifications.
    I. All water main valves and fittings, fire hydrants, sewer manholes, wet wells and sewer/water main crossings shall be inspected and approved by the Professional Engineer, or his designated representative, prior to backfilling;
    II. Water and sewer construction testing shall be performed in accordance with these Standards, MDEQ, AWWA, and MPWSS;
    III. A Professional Engineer, or the Professional Engineer's designated representative, shall be present for all tests required in Sections 02660, 02720, and 02730 of the MPWSS. A written record of all test results shall be submitted to the PWD and certified by the Professional Engineer of record for the construction; and

IV. A Professional Engineer, or the Professional Engineer's designated representative, shall provide the PWD with photocopies of daily inspection reports, including Proctors and compaction test results for all projects. These reports shall be submitted on a weekly basis and certified by the Professional Engineer of record for the construction.

1.4.2 Compaction Testing

A. The following minimum compaction testing procedures shall apply to all utility and roadway construction projects. An independent accredited testing laboratory shall be retained to provide the following tests and frequency. Random longitudinal test locations are required. The following are minimum compaction test requirements. The Professional Engineer, or the Professional Engineer's designated representative, may require additional tests. For projects containing less than 300 linear feet of improvements, a minimum of one compaction test for each improvement shall be required for the improvements listed below.

I. Utility Trenches and Underground Structures:

a. Set of Tests:

i. For trenches up to 8 feet in depth, density tests shall be taken at 12 inches above the pipe, at one-half the trench depth, and at the surface.

ii. For trenches greater than 8 feet in depth, density tests shall be taken at 12 inches above the pipe, at one-third and two-third the trench depth levels, and at the surface.

b. The minimum density shall be 95% Standard Proctor, ± 3% optimum moisture.

c. Horizontal Frequency:

i. Utility Mains – One set of tests per 150 feet.

ii. Service Lines – One set of tests per 3 services, per utility type.

iii. Open Pit – Minimum of one set of tests (Open Pit – at each manhole, water valve, storm inlet, curb inlet, vault, etc.)

d. Each test location shall be separated horizontally from a prior test location.

II. Street Subgrade:

a. All sub-base: 95% Standard Proctor, ± 3% optimum moisture. One random density test, every 100 linear feet of street per lane with random offsets.

b. All crushed gravel base: 95% Standard Proctor, ± 3% optimum moisture. One random density test, every 100 linear feet of street per lane with random offsets.

III. Asphalt Surface:

a. Pavement and material testing requirements shall be in accordance with Section 1.4.1 and MPWSS Section 02510 Paragraph 3.28 and 3.29, except:

i. Add subsection 3.28H to the standard as follows: "Asphalt compaction samples will be taken according to AASHTO T 230 and tested in accordance with AASHTO T 166. One

location per lane per block as determined by the Engineer shall be required.

ii. Subsection 3.29E shall be replaced with: "The field density and thickness of the pavement is determined by measuring the cores tested. The actual thickness shall not be less than the design thickness, and shall in no case be less than four (4) inches."

iii. Subsection 3.29F shall be replaced with: "Asphalt thickness shall be measured using full depth core samples. Thickness shall be measured from the surface of the specimen to the bottom of the uniform plant mix which thickness shall not include foreign materials, seal coat, foundation material, soil, paper or foil. Thickness less than specified thickness as measured on the acceptance sample shall be subject to rejection for the lane and block from which the specimen was taken as determined by the Engineer."

1.4.3 Video Inspection

A. The City shall conduct a video inspection paid for by the contractor for sewer mains;
B. The contractor shall flush the main with water immediately prior to inspection;
C. Manholes and laterals shall be included in the video inspection;
D. Upon review of the video inspection by the authorized City representative, any deficiencies found shall be corrected by the contractor prior to final acceptance;
E. The CoGF reserves the right to inspect all underground utility systems by the use of a television camera prior to final acceptance; and
F. The cost of all video inspections by City staff will be billed to the contractor.

1.5. BOULEVARD LANDSCAPING

1.5.1 Requirements

A. Refer to the OCCGF Title 17 for requirements.
B. Boulevard landscaping shall be placed in accordance with the CoGF landscape requirements (OCCGF Title 17) and a plan approved by the CoGF Planning and Community Development Department (406-455-8430).

1.6. RECORD DRAWINGS AND PROJECT ACCEPTANCE

1.6.1 Certification

A. Upon project completion and before final acceptance, a Professional Engineer shall certify that the construction of the water, sewer and storm utilities and roadways meet the requirements of the approved construction documents.

1.6.2 Record Files

A. The Design Engineer or developer shall submit one full-size set of 4-mil Mylar Record Drawings (or approved equal) and a PDF copy and a copy of the DWG in digital format and one set of the test results required under Section 1.4 to the PWD.

1.6.3 Acceptance

A. The City will not accept the project until record drawings and test results have been approved by the City Engineer;
B. The Project Engineer shall provide the City Engineer's Office with quantities and unit costs of all infrastructure installed that is tied to a reimbursement; and
C. The owner shall submit a letter requesting ownership transfer of the newly constructed public infrastructure to the City (See Appendix A – Example Ownership Transfer Letter).

1.7. TWO-YEAR GUARANTEE INSPECTION FOR PROJECTS

1.7.1 Requirements

A. The Project Engineer, or his designated representative, shall conduct a two-year guarantee inspection, to be attended by a representative from the PWD;
B. The inspection shall take place not less than 90 days or more than 120 days prior to the expiration date of the Maintenance Bond; and
C. The maintenance bond will be released when all deficiencies have been corrected to the satisfaction of the City Engineer.

1.7.2 Warranty Work

A. The City Engineer, the Project Engineer, or the designated representative, shall notify the Principal as listed in the Maintenance Bond of any work found to be not in accordance with the approved construction documents;
B. The Principal shall restore the work to meet the requirements of the approved construction documents prior to the release of the Maintenance Bond; and
C. The City expressly reserves the right to draft the Maintenance bond for repairs not completed by the Owner, Developer, or Contractor within thirty calendar days of being advised that repairs are required.

CHAPTER 2 - DESIGN CRITERIA

Chapter 2 Design Criteria

2.1. PLANS

2.1.1 General Items

A. Coordinate System:
   I. Montana State Plane – International Foot.
B. Datum:
   I. North American Vertical Datum 1988 (NAVD 88); or
   II. City of Great Falls Datum.
C. Contours:
   I. Improved Areas:
      a. 5-foot major contour interval (max);
      b. 1-foot minor contour interval (max); and
      c. The CoGF reserves the right to request smaller or larger contour intervals for clarity if necessary.
   II. Unimproved Areas:
      a. 10-foot major contour interval (max);
      b. 2-foot minor contour interval (max); and
      c. The CoGF reserves the right to request smaller or larger contour intervals for clarity if necessary.
   III. Existing contours shall use a dashed line-style;
   IV. Proposed contours shall use a continuous line-style; and
   V. Major contour lines shall be thicker than minor contours and include elevation labels.
D. Alignment Data:
   I. Coordinate data shall be provided for:
      a. Beginning of alignment;
      b. Alignment changes in direction; and
      c. End of alignment.
   II. Provide the following curve data:
      a. Length of curve;
      b. Curve Radius; and
      c. Chord bearing and length.
   III. Bearings and distances:
      a. Provide between points on alignments.

2.1.2 Title Sheet(s) (Shall not exceed 3 Sheets):

A. Project Title;
B. Vicinity Map:
   I. Project Limits;
   II. Adjacent Street Names;
   III. North Arrow; and
   IV. Scale Bar.
C. Firm or Engineer Information:
   I. Name;

II. Address; and
III. Telephone Number.

D. MT Professional Engineer Stamp;
E. Point and Line Style Legend;
F. Public Land Survey System Information:
I. Township;
II. Range; and
III. Section(s)
a. If contained within a single section, provide the ½, ¼, or ¼ ¼ information as applicable (e.g. SW ¼ NE ¼).

G. Table of Contents.

2.1.3 Plan Sheets

A. Project Title;
B. Sheet Title;
C. Sheet Number;
D. MT Professional Engineer Stamp;
E. Revision Data (See Section 3.1.2);
F. North Arrow (True North or CoGF North); and
G. Scale Bar
I. Set to Standard Engineering Scales.

2.1.4 Plan and Profile Sheets

A. Shall be provided for all proposed water main, sanitary sewer main, storm main, and streets;
B. Include all items in Section 2.1.3 above; and
C. In profile show:
I. Vertical scale;
II. Proposed ground;
a. Continuous line-style;
III. Existing ground;
a. Dashed line-style.
IV. Crossings of other utilities and separations from them;
V. Parallel utilities shall be shown in grayed line-style;
VI. Pipe:
a. Length;
b. Slope (if gravity); and
c. Material type.
VII. Bury depth;
VIII. Groundwater depths (if identified);
a. Include date of recording.
IX. Structures and Appurtenances;
a. For Water:
i. Valves, fittings, services, fire hydrants, encasement, etc.
a) Label size and type; and
b) Provide station and offset or coordinates.

b. For Sanitary Gravity Sewer:
    i. Manholes, services, and other structures
        a) Label invert elevations;
        b) Label rim elevations; and
        c) Provide station and offset or coordinates.
c. For Sanitary Force Mains:
    i. Valves, fittings, air/vacuum valves, and other structures
        a) Label size and type; and
        b) Provide station and offset or coordinates.
d. For Storm Sewer:
    i. Manholes, catch basins, and other structures:
        a) Label invert elevations;
        b) Label rim and grate elevations; and
        c) Provide station and offset or coordinates.
    ii. Hydraulic Grade Lines (HGL).

X. Streets, roads, and pathways:
    a. Grades;
    b. Vertical curve data
        i. VPI Station and elevation;
        ii. Length;
        iii. Radius; and
        iv. k-value.

XI. Stormwater conveyance system:
    a. Show all pipes, culverts, ditches, and connections; and
    b. Include all sizes, material types, lengths, slopes, and invert elevations.

2.1.5 Detail Sheets

A. Provide applicable CoGF Standard Details;
    I. Highlight any additions, deletions, or modifications to CoGF Standard Details.
B. Include the following:
    I. Project Title;
    II. Sheet Title;
    III. Sheet Number;
    IV. Scale;
    V. MT Professional Engineer Stamp; and
    VI. Revision Data (See Section 3.1.2).

2.1.6 Road and Drainage Plans

A. Include all items in Section 2.1.3 above;
B. Include the following:
    I. Existing and proposed contours;
    II. Crest and sump point elevations;
    III. Flow arrows;
    IV. Record drawing information;
    V. Construction details or standard detail for all structures;
    VI. Drainage Easements;

a. If existing, provide recording number.

VII. Where swales, ditches, or channels interfere with driveway locations:
   a. Driveway locations shall be fixed and shown on the plans.

VIII. Existing and proposed lot grading plans.

2.1.7 Drainage Facilities and Swales

A. Include all items in Section 2.1.3 above;
B. Provide a cross-section of each pond or swale, including the following:
   I. Bottom elevation;
   II. Structure elevations;
   III. Maximum water surface elevation;
   IV. Inlet and outlet elevations; and
   V. Berm elevations and slopes.
C. Landscaping and vegetation requirements;
D. Compaction requirements;
E. Keyway locations and dimensions;
F. Coordinates and elevations of pond corners, swale/ditch angle points, inlet/outlet pipes, and all drainage structures; and
G. Material gradation, thickness, and dimensions of riprap pads.

2.1.8 Basin Maps

A. Required as part of the Drainage Submittal
B. Provide Pre-development and Post–development
C. Minimum elements:
   I. Vicinity map, project boundaries, PLSS information;
   II. Basin limits:
      a. Include on-site, off-site, and bypass areas contributing runoff to or from the project;
      b. Engineer shall field-verify basin limits, including off-site areas, and describe how the limits were determined; and
      c. Shall be clearly labeled and correlate with calculations.
   III. Time of concentration routes with each segment clearly labeled and correlated with calculations;
   IV. Contours:
      a. Shall extend beyond the project or drainage basin as necessary to confirm basin limits; and
      b. Refer to Section 2.1.1C.
   V. Any drainage way, including natural drainage ways, constructed drainage features, wetlands, creeks, streams, seasonal drainage ways, closed depressions, ditches, culverts, storm drain systems, and drywells;
   VI. Floodplain limits as defined by FEMA or other studies;
   VII. Geologically hazardous areas;
   VIII. Proposed drainage features;
   IX. North arrow and scale;
   X. Existing and proposed easements, parcel land, open space, and parkland; and
   XI. Adjacent streets.

CHAPTER 3 - PROJECT SUBMITTALS

Chapter 3 Project Submittals

3.1. PROCESS

3.1.1 Submittals

A. Civil Plans:
   I. Shall be submitted to PCD with 3 hard copies;
   II. Shall be provided in electronic PDF format;
   III. The Professional Engineer(s) responsible for the civil design portions of the project shall stamp the project cover sheet, or each individual sheet of the civil design; and
   IV. Include the general checklist as well as other applicable checklists.
      a. Checklists are available (call 406-771-1258 for additional info.).

B. Reports and Specifications:
   I. Shall be submitted to PCD with 1 hard copy;
   II. Shall be provided in electronic PDF format;
   III. Submit separate documents in the following order (as applicable):
      a. Project Manual or Applicable Specifications
      b. Water Design Report
      c. Sanitary Sewer Design Report
      d. Storm Drainage Design Report
      e. Traffic Impact Study
   IV. The Professional Engineer(s) responsible for the individual sections specified above shall stamp the front cover of each separate document.

C. It is recommend that water and sanitary sewer system designs be approved prior to submitting to MDEQ for review; and

D. The CoGF shall attempt to complete the initial review and provide written comments to the Development Team within thirty (30) calendar days of receiving a complete initial submittal.
   I. Contact the project permit coordinator in PCD for what the requirements are for a submittal to be deemed complete;
   II. A review meeting may be scheduled to discuss review comments if the design Engineer desires; and
   III. Pre-design and interim meetings with the design Engineer and City Engineering staff are encouraged.

3.1.2 Resubmittals

A. Civil Plans
   I. Individual sheets may only be provided with written approval from the CoGF engineer reviewing the Civil Plans;
   II. All changes shall include revision bubbles; and
   III. Revision notes shall be provided on the sheet including:
      a. Revision number
      b. Revision date
      c. Any applicable notes

B. Reports and Specifications:

I. Shall be submitted to PCD with 1 hard copy;
II. Shall be provided in electronic PDF format;
III. The resubmittal shall be the entire report or specification; and
IV. The Professional Engineer(s) responsible for the individual sections specified in Section 3.1.1 above shall stamp the front cover of each separate document.

C. The CoGF shall attempt to complete the subsequent review and provide written comments to the Development Team within thirty (30) calendar days of receiving a complete subsequent submittal.
   I. Contact the project permit coordinator in PCD for what the requirements are for a submittal to be deemed complete; and
   II. A review meeting may be scheduled to discuss review comments if the design Engineer desires.

3.1.3 Delivery

A. Provide digital files and paper copies to the front desk of the CoGF Planning and Community Development Department.
B. Call 406-455-8430 for more information.

3.1.4 Approval

A. Once all CoGF review comments have been adequately addressed and resolved the developer shall provide City Staff:
   I. Three (3) complete sets of the site civil final plans, signed and stamped by a PE (half sized plan sets are encouraged);
   II. One hard copy of the final reports and specifications, signed and stamped by a PE (reports and specifications shall contain the current version of the revised documents and plan sheets); and
   III. An electronic version of the approved plans, reports, and specifications (signed and stamped by a PE) shall be provided in PDF format.
B. Final stamped and approved plans will be distributed as follows:
   I. One set for CoGF Engineering Department;
   II. One set for CoGF Engineering Department Field Inspector; and
   III. One set provided to Contractor to be kept on site during construction.

3.2. RESPONSIBILITIES

3.2.1 Professional Engineer

A. Meet the minimum design standards as specified or referenced herein during design;
B. Verify compliance with the minimum construction standards as specified or referenced herein during construction;
C. Coordinate with Contractor, City Engineering Staff, and other local, state, and federal agencies to resolve issues that arise during construction and, if needed, prepare modified plans for review and approval; and
D. Prepare and provide PW Engineering Division and MDEQ with record drawings.

3.2.2 Contractor

A. Meet the minimum construction standards as specified or referenced herein;

B. Provide PW Engineering Division with 2 paper copies of the project submittals that have been reviewed and approved by both the Contractor and the Design Engineer;
C. Attend the pre-construction meeting;
D. Notify the PW Engineering Division (406-771-1258) a minimum of 48 hours before starting construction;
E. Ensure that a City Inspector is on site during construction of all work requiring inspections; and
F. Provide the PW Engineering Division with copies of all third party testing results.

3.2.3 City Engineering Staff (Type I) or Third Party Consultant (Type II)
A. Review the design and construction to verify compliance with current Standards;
B. Provide full time inspection of the public improvements;
    I. The full time inspector cannot authorize any deviation from the approved plans and specifications or substitution of materials or equipment, unless authorized by the Design Engineer and approved by the City Engineer or his/her designee.
C. Provide the Design Engineer with red line notes of changes that occurred during construction; and
D. Provide a copy of the "built in substantial accordance with the MDEQ approved plans" certification letter required by MDEQ.

3.2.4 Developer
A. Employ a Professional Engineer to design the project or development in accordance with the minimum design standards as specified or referenced herein;
B. Employ a contractor to meet the minimum construction standards as specified or referenced herein; and
C. Employ a Professional Engineer (CoGF Engineering Staff) to verify compliance with minimum construction standards throughout construction of all proposed CoGF infrastructure within the development.
    I. Type I – CoGF Engineering Staff
    II. Type II – ***Third Party*** Consultant (only allowed with City Engineer approval)

3.2.5 All Parties
A. If at any point of design or construction, an unapproved deviation from the Standards is realized by the Engineer, Contractor, the CoGF, or the Developer, immediate action shall be taken to correct the issue and bring the design or construction into compliance with the standards currently in effect at no cost to the CoGF; and
B. Any changes from approved drawings shall be reviewed, stamped, and approved in writing by the Design Engineer first, than the CoGF PCD Engineering Staff, than CoGF PWD Engineering Staff, prior to construction of said change.

3.3. DESIGN OR CONSTRUCTION DEVIATION

3.3.1 Requirements:
A. A Deviation will only be granted when minimum standards cannot be met or when the proposed item meets or exceeds minimum standards as determined by the City Engineer.

Deviations will not be considered on basis of cost, “engineering judgment”, or “professional opinion”;

B. Requests shall be made in writing and shall:
   I. Identify the specific section of the standards requiring a deviation;
   II. State the standard as currently adopted;
   III. State the standard as proposed for the deviation; and
   IV. Provide adequate justification for the deviation.
C. Requests shall be approved by both the CoGF PCD Engineering staff and the CoGF PWD Engineering staff in writing; and
D. Deviations from the Standards not individually approved as indicated above are not approved, even if shown in approved plans, specifications, or reports.

CHAPTER 4 - DEVELOPMENT

Chapter 4 Development

4.1. REQUIREMENTS

4.1.1 General

A. All subdivisions and developments shall comply with MDEQ requirements, the Official Code for the CoGF, and these Standards;

B. Roadways and utilities shall be constructed from the existing facilities to the far property line of the development or such other point within the development that may be specified by the City Engineer:

   I. Extension of water mains beyond the property line may be required as determined by the City Engineer for looping and redundancy; and

   II. All utilities shall be within a public right-of-way or easement to permit free and unobstructed access.

C. Obtain and provide the City with all easements and right-of-ways necessary to extend roadways and utilities to the far property line of the development:

   I. Obtain written approval from the CoGF PWD stating they have reviewed and approved the location of easements for the future extension of roadways and utilities which shall be submitted with the final plat along with an 11 x 17 legible copy of the approved final plat showing the utility and/or easement locations.

   II. An easement benefiting the City of Great Falls that is created on a final plat shall have the following language:

"Acceptance of shown new City of Great Falls easements:

A perpetual easement benefiting the City of Great Falls for the construction, maintenance, enlarging, reducing, replacing, or removal of underground utilities including above ground fire hydrants, valve boxes, and lids for accessing underground utilities, together with all necessary appurtenances thereto, in, under, through and across the real property shown on this plat together with the right to excavate and refill ditches and/or trenches throughout the location of said general utilities. The City of Great Falls or its designee agrees that in the event of any excavation within said easement for purpose of maintenance or repair, the area shall be backfilled and/or restore the surface to its then existing condition. For the protection of said easement, the property owner shall not make or construct any buildings, retaining walls, trees, shrubs, bushes, or other structures (including other utilities) that would impair the maintenance or operation of the utilities placed therein. Asphalt and Portland cement concrete paving, grass, traffic signs, mail boxes, fences, irrigation sprinkler systems are permissible improvements within the land covered by this easement. This grant of easement shall run with the land and shall be binding upon and shall inure to the benefit of the City of Great Falls, Montana its successors and assigns.

To the fullest extent permitted by law, the property owner shall indemnify, defend, and save City, its agents, representatives, employees, and officers harmless from and against any and all claims, costs, fees, losses, liabilities or damages of whatever kind or nature arising from or related to property owner's use of the real property described herein, except for the City's actions under this grant of easement."

D. There should be reserved along the front lot line and side street lot line of each residential and commercial lot a 10-foot wide utility easement along, contiguous and adjacent to the lot line to provide an area between the lot line and the easement line for the placement of privately owned underground utilities.

4.1.2 Utilities

A. All new utilities that can be placed underground should be placed underground, unless written permission is provided by the City Engineer;
B. City utility collection and distribution mains shall be located within the paved portion of the street or alley;
C. Water transmission mains, sewer interceptor mains, and sewer force mains shall be located as approved by the City Engineer;
D. Underground private utilities should be located on private property between the lot line and the easement line, unless written permission is provided by the City Engineer;
E. No underground utilities, except service sweeps to the streetlights shall be placed parallel to the roadway in the boulevard between the back of curb and sidewalk or within a sidewalk itself;
F. No aboveground utility boxes, pedestals, vaults, or transformers shall be placed within any City utility easement or access easement to any City facility, unless written permission is provided by the City Engineer; and
G. Streetlights shall be at least 2 feet from the back of curb. All above ground utilities shall be at least 1 foot from the sidewalk.

4.1.3 City Utility Easements:

A. All City utility easements shall be 20 feet wide for a single pipeline, with the pipe centerline 10 feet from one easement edge;
B. For easements with two pipelines, the minimum width shall be 30 feet with each pipe centerline 10 feet from the easement edge; and
C. For easements with three pipelines, the minimum width shall be 40 feet with each pipe centerline 10 feet from the easement edge and 10 feet from the outside of other pipe.

CHAPTER 5 - WATER SYSTEMS

Chapter 5 Water System

5.1. DESIGN AND CONSTRUCTION STANDARDS

5.1.1 Design Report

A. A design report prepared by a professional engineer licensed in the State of Montana which addresses fire and domestic flow requirements shall be submitted to and approved by the CoGF.
B. The design and design report shall meet the minimum requirements of *MDEQ Circular 1*.
C. The report shall include flow test results or modeled flow results, as approved by the CoGF, which show the static pressure and available flow from the hydrant at 20-psi residual pressure.
    I. The CoGF will perform the required hydrant flow testing at no cost, if so requested (Utility Dispatch Clerk 406-727-8045).
D. An overall plan of the development, *including all areas outside of the proposed development which would naturally be served through the proposed development shall be provided*.
E. The Design Engineer shall calculate and provide the average day demand, the max day demand, and the required fire flow.
    I. Refer to the current Water Facility Plan for existing system design data;
    II. Provide demand calculations in units of gpd and ERUs; and
    III. Provide velocity calculations in units of fps.

5.1.2 General Construction Standards

A. Water systems shall be constructed in accordance with the current edition of the Standards (this document), the current edition of the *MPWSS* for Water Distribution and other standards referenced elsewhere in this document. Any conflicts or differences in these documents shall be resolved in favor of the OCCGF, these Standards, and then the MPWSS.

5.1.3 Offsets

A. Water mains and appurtenances shall maintain horizontal and vertical offsets as required in *MDEQ Circular 1*.
B. Water service lines and appurtenances shall maintain minimum horizontal separation of 10 feet and a minimum vertical separation of 18 inches from all sewer mains, and storm mains, and sewer service lines, as measured from the outside of the pipe.
C. All underground electrical, gas, phone, fiber, and cable lines must be installed at least 3 feet horizontally and 1 foot vertically from water mains and services.

5.2. WATER MAINS AND SERVICE LINES

5.2.1 Water Pipe

A. Size

I. The main shall be sized to meet the demands of the proposed development and *areas outside of the proposed development which would naturally be served through the proposed development, or as directed by the City Engineer*;
II. Refer to the CoGF *Extension of Services* for oversizing and reimbursement information;
III. Minimum main size shall be 8-inch;
IV. Fire hydrant leads shall be 6-inch;
V. The Design Engineer shall refer to the current Water System Facility Plan and correspond with the City Engineering Office to determine if oversized mains are required for the development;
VI. Capacity shall meet the max day plus fire flow and peak hour demand;
    a. Required fire flow shall be determined by the Fire Code and verified by the CoGF Fire Department.
VII. Velocity shall not exceed 15 feet per second through a public main line; and
VIII. C value for flow calculations in PVC pipes shall be between 130 and 150.

B. Location
I. Mains shall be extended to far property line of the development or such other point that may be specified by the City Engineer. Subdivisions and corner lot developments may be required to extend mains to property lines in multiple directions;
II. Mains shall be under the paved section of the roadway, unless a deviation request is approved by the CoGF Engineering Division;
III. Water mains are located 10 feet away from the road center line on the west side of streets and on the north side of avenues.
IV. Transmission mains shall be located as approved by the City Engineer;
V. Fire hydrant leads shall not exceed 50 feet in length;
VI. Where mains or fire hydrant leads cannot be installed in the public ROW, a minimum 20-foot wide easement shall be provided with the line in the center of the easement. A wider easement may be required based on the bury depth of the main. Trees, lights, signs, retaining walls, and structures shall not be installed within the easement; and
VII. Mains shall be buried a minimum of 6.5-feet. Less bury depth requires City Engineering Office approval and insulation.

C. Material
I. C-900 PVC pipe shall be manufactured within one year of the bid date, free of any scrapes or defects, have a constant color throughout the pipe at the time of installation, and be in new condition;
II. 6-inch fire hydrant leads shall be PVC – DR14 gasket pipe conforming to AWWA C-900 Standards;
III. 8-12 inch water mains shall be PVC – DR14 gasket pipe conforming to AWWA C-900 Standards;
IV. 14-24 inch water mains shall be PVC – DR18 gasket pipe conforming to AWWA C-900 Standards;
V. Ductile Iron pipe can be required by the City Engineering Office in special conditions such as high working or surge pressures and when pipe is going to be buried in petroleum contaminated soils; and

VI. Water mains larger than 24-inch shall be Ductile Iron with a pressure class based on the working pressure of the main.

D. Ductile Iron – Shall meet current MPWSS material and construction requirements
   I. Ductile Iron pipe shall have a minimum thickness class of 51 (a higher class may be required in some situations);
   II. Only used as approved by the City Engineer;
   III. Joints shall be push-on;
   IV. Use nitrile gaskets with push-on and Mechanical Joint (MJ) connections for areas with hydrocarbon contamination; and

E. Pipe joint gaskets:
   I. Push-on joints utilize a single gasket meeting AWWA C111;
   II. Standard gasket shall be Styrene Butadiene Copolymer (SBR);
   III. Special gaskets for use in areas of hydrocarbon contaminated soils and/or ground water shall be Acrylonitrile (Nitrile) Butadiene and Grafoil gaskets on flange fittings; and
   IV. Design Engineer shall verify that the special gaskets are suitable, acceptable, and safe for use in the contaminated soils and/or ground water.

5.2.2 Valves

A. Size and Type
   I. 12-inch diameter and smaller shall be gate valves; and
   II. Larger than 12-inch diameter shall be butterfly valves.

B. Location
   I. Shall be installed at each leg of every tee and cross, and at each intersection crossing;
   II. Maximum spacing shall not exceed 500 feet unless otherwise approved by the City Engineer;
   III. Shall not be located underneath curb and gutters, sidewalks, boulevards, travel route of a multiple use path, or within the wheel path of a vehicular travel lane; and
   IV. A new valve shall be installed at all connections to existing water mains regardless of the proximity of an existing valve.

C. Gate Valves shall be Mueller, Kennedy, Clow, or Waterous Gate Valves with:
   I. Minimum 250 psig working pressure meeting AWWA C509 and/or C515;
   II. Resilient Seat;
   III. Push-on joint;
   IV. Valve to open counterclockwise;
   V. 2-inch square operating nut;
   VI. Fusion bonded epoxy exterior and interior coating; and
   VII. Double wrap with polyethylene encasement in accordance with AWWA C105;

D. Tapping valves shall be Mueller, Kennedy, Clow, or Waterous tapping valve with:
   I. Resilient Seat;
   II. 250 psig maximum working pressure;
   III. 500 psig static test pressure;
   IV. Tapping by mechanical joint;
   V. Open counterclockwise;

VI. 2-inch square operating nut;
VII. Double wrap with polyethylene encasement in accordance with AWWA C105;
VIII. Minimum 10 mil fusion bonded epoxy exterior and interior coating; and
IX. Flanged end drilling complies with ANSI B16.1 class 125.

E. Butterfly Valves shall be Mueller, M&H, Pratt, Kennedy, or Dezurik with:
I. Class 250;
II. Push-On joints or Mechanical Joint by Mechanical Joint;
III. Valve to open counterclockwise;
IV. Minimum 450 lbs torque rated operating stem and nut;
V. 2-inch square operating nut;
VI. Fusion bonded epoxy exterior and interior coating; and
VII. Double wrap with polyethylene encasement in accordance with AWWA C105.

F. Auxiliary fire hydrant valves shall be Mueller, Kennedy, Clow, or Waterous 6-inch gate valves with:
I. 250 psig rated gate valve;
II. Resilient Seat;
III. Flanged joint by push-on joint; and
IV. Double wrap with polyethylene encasement in accordance with AWWA C105.

G. Domestic water services and fire lines (4- and 6-inch) shall be Mueller, Kennedy, Clow, or Waterous gate valves with:
I. 250 psig rated gate valve;
II. Resilient Seat;
III. Flanged joint by push-on joint; and
IV. Double wrap with polyethylene encasement in accordance with AWWA C105.

5.2.3 Valve Boxes

A. Shall be cast iron, 3 piece screw type, Heavy Duty;
B. 5-1/4-inch diameter shaft;
C. Lid with “Water” lettering;
D. Shall be of sufficient length to be adjustable to finish grade;
E. Use of “drop in” risers will not be allowed;
F. Tyler model 6860 heavy duty series, East Jordan Iron Works 8560 series, or Star Pipe “heavy duty”;
G. Number 6 bases or as required for valve size; and
H. Valve box shall have a protective bituminous asphaltic seal coating.

5.2.4 Fire Hydrants

A. Location
I. Placement is subject to the approval of the Fire Chief and City Engineering Office;
II. Spacing shall not exceed 500 feet in residential areas;
III. Spacing shall not exceed 300 feet in commercial areas;
IV. Spacing shall not exceed 200 feet in industrial areas;
V. Provide a 3-foot separation from the center of the fire hydrant to the back of curb and/or from the edge of sidewalk; and
VI. Provide bollards for hydrants unprotected by curb.

B. Shall be Mueller Super Centurion 250 model A-423, Kennedy Guardian model K81A, or Waterous Pacer model WB67-250;
C. Furnish Fire Hydrants meeting ANSI/AWWA C502 standards, with a 250 psig standard maximum working pressure;
D. Shall include a 5-1/4 inch main valve opening;
E. 6 inch shoe with push-on joint;
F. One 4 inch pumper nozzle with NST #40484 gage and two 2-1/2 inch hose nozzles ASA specification B26 for National Standard Fire Hose Coupling Screw Threads (7.5 threads per inch);
G. Furnish "Compression" type hydrants with safety or traffic flange and safety stem coupling with above ground line;
H. Hydrants shall be of the dry top design with 2 or more "O" rings sealing the water from the operating mechanism;
I. The operating mechanism shall be automatically lubricated from a sealed, self-contained lubricating reservoir;
J. Hydrants shall be painted with "Mueller Yellow" Amercoat 370 fast-dry multipurpose epoxy or Polane SP polyurethane enamel;
K. Furnish fire hydrants of sufficient length such that the bury line is at the finished grade; and
L. Double wrap with polyethylene encasement in accordance with AWWA C105.

5.2.5 Fittings

A. Utilize ductile iron (AWWA C153 pressure rating 350 psig) or cast iron (AWWA C110 pressure rating 250 psig) fittings per the following:
    I. Cement Mortar (AWWA C104) or fusion bonded epoxy (AWWA C550) interior lined, double thickness meeting the ANSI/AWWA C104/A21.4 requirements;
    II. Approximately 1 mil thick asphaltic seal coating (ANSI/AWWA C153/A21.53) or fusion bonded epoxy coated;
    III. Push-on joints (Use other joints where necessary for restraint or other special conditions);
    IV. All AWWA C110 or C153 compact push-on (union-tite) water main fittings shall be supplied with restraint ears.
    V. Install ductile iron push-on by flange fittings for fire hydrants and service lines 4-inches and larger; and
    VI. All fittings must be manufactured in accordance with NSF61.

5.2.6 Couplings

A. Pipe couplings shall meet one of the following:
    I. Cast type with cast iron or ductile iron sleeves malleable or ductile iron flanges, shall be "long body"; or
    II. Gray iron or ductile iron, mechanical joint solid sleeves, shall be "long sleeves" such as Tyler Union C153 ductile iron "Long" solid sleeve; Romac Style "501" Long Barrel Coupling; Smith-Blair 442 Long sleeve coupling; Romac Alpha restraint coupling, or equal.
B. Couplers shall be fusion bonded epoxy coated; and
C. MEGALUG restraints, or approved equal, shall be used with mechanical joint sleeves.

5.2.7 Tapping Sleeves

A. Utilize full circumference tapping sleeve with NPT stainless steel test plug and cast iron or duticle iron body. Supply cast or ductile iron mechanical joint type sleeve with end and side gaskets;
B. Tapping sleeve outlet joint shall be flanged;
C. Outlet flange dimensions and drilling shall comply with ANSI B16.1 Class 125;
D. The flange shall be ductile iron or carbon steel complying with fusion bonded epoxy coating for stainless steel sleeves;
E. The working pressure for 4 inch through 12 inch shall be a minimum of 200 pisg and minimum of 150 psig for 14 inch and larger;
F. Fusion bonded epoxy coating inside and outside;
G. Double wrap with polyethylene per below requirements;
H. Utilize gaskets per requirements outlined in the gasket section above; and
I. Pressure test at a minimum of 100 psig for 10 minutes or as recommend by manufacturer.

5.2.8 Polyethylene Wrapping

A. PVC Main:
    I. Double wrap all ductile or cast iron *pipe fittings, valves, and hydrants* with polyethylene encasement in accordance with AWWA C105;
    II. The inner layer shall be 8 mil and outer layer shall be 8 mil of the polyethylene wrap for a total of 16 mil;
    III. At no time shall a "sling" or "strap" come into contact with the polyethylene; and
    IV. Polyethylene adhesive tape shall be used for all repairs to the wrap.
B. Ductile/Cast Iron Pipe:
    I. Double wrap all ductile or cast iron pipe and pipe fittings, valves, and hydrants with polyethylene encasement;
    II. The inner (1st) layer of polyethylene wrap will be V-BIO which consists of three layers of co-extruded linear low density polyethylene (LLDPE);
    III. The outer (2nd) layer of polyethylene wrap will be 4 mil cross laminated high density polyethylene;
    IV. At no time shall a "sling" or "strap" come into contact with the polyethylene; and
    V. Polyethylene adhesive tape shall be used for all repairs to the wrap.

5.2.9 Wax Tape System

A. The entire flange and all bolts on mechanical and flanged joints, restraints, sleeves, couplers, fittings, and valves shall be wrapped with a wax-system;
B. The wax tape system (such as provided by Trenton Corporation or approved equal) utilized for below ground applications consists of three separate parts:
    I. Primer;
    II. Wax Tape #1; and
    III. Poly ply outer tape.
C. The wax tape system does not replace the polyethylene wrapping requirement.

5.2.10 Location of Test Taps

A. A test tap shall be located within 5 feet of the beginning and end of the main;

B. Within 5 feet of the "source water"; and
C. Test taps shall be located with a maximum spacing of 400 feet along the main.

5.2.11 Water Services

A. General
   I. Service pipes shall be so arranged that each separate building and/or house shall be supplied by a separate service line from the City main;
   II. Structures containing two or more residences under separate ownership shall have separate service lines from the main, service valves, and meters for each residence;
   III. Structures containing two or more residences, offices, or businesses that are rental units under common ownership shall have one service line, valve, and meter for all occupants within a single structure;
   IV. Each water meter shall be controlled by an independent valve or curb stop;
   V. A valve or curb stop (with box) shall be installed in each service line so that the supply may be controlled from the street side of the property line;
   VI. The curb valve shall be perpendicular to the main and located in the public right-of-way or a city easement;
   VII. It is unlawful to extend a water service which is intended to supply water to a property facing one avenue or street to another property facing another avenue or street, if the water service has to cross a public right-of-way such as an avenue, street, or alley;
   VIII. When a lot or parcel is developed to a permitted use, all duplicate, excess, and/or unused water services and fire services, including stub-outs, shall be disconnected from the main and the main shall be plugged;
   IX. Construction on parcels aggregated will trigger abandonment of unused water and fire services at the main, this shall occur within six months;
   X. Water service lines supplying water to a building or buildings that are to be razed shall be plugged at the City water main;
      a. Unless the service has adequate bury depth, is copper, and will be put back into service in the near future; then
      b. The service shall be physically disconnected from the building side of the controlling curb stop and the curb box shall be reset over the curb stop.
   XI. New or reconstructed services shall meet current Standards, including location of curb stops and meter pits; and
   XII. Domestic water services shall not be tapped on a fire service line or fire hydrant main.

B. Construction of Water Service
   I. A fee shall be issued when it is necessary to tap an existing or new water main for a service connection or a test tap:
      a. The permittee/contractor shall pay by direct billing for all test taps, testing equipment, overtime, and chemicals used;
      b. When the project includes five (5) or less taps, the City will provide the equipment, labor, and materials required to tap the main for water

service lines that are ¾-inch up to 2-inches in diameter (this includes the corporation stop, curb stop, and box);

c. Saddles, clamps, and other extraneous fittings are not included in this fee and will be billed extra by the CoGF Finance Department;
d. When the project includes six (6) or more taps, the contractor shall provide the corporation stop, curb stop, and box;
    1. All excavation shall be ready for tapping crews at the same time;
    2. The maximum distance between taps shall be 1,000 feet; and
    3. Lost crew time due to unsafe or incomplete excavations shall be billed directly to the permitee/contractor in addition to the tapping fee.
e. The Contractor will excavate around the main and prepare a safe trench, meeting the minimum OSHA requirements, from the main to the approved curb stop location; and
f. Water service lines 4-inches and larger in diameter shall connect to the water main with a tee and gate valve.

II. The Contractor is responsible for utilizing a Licensed Plumber to install the service line (2-inches and smaller) from the main to the curb stop valve and the Contractor is responsible for installing the curb stop and box;
III. The Contractor is responsible for the installation of the backfill and complete site restoration per the requirements outlined throughout this documents;
IV. City personnel shall inspect the tap and service line **prior to backfill**;
    a. PWD Staff shall inspect irrigation service lines, domestic water service lines, and fire lines that are 4-inches and larger; and
    b. PCD Staff shall inspect irrigation service lines, domestic water service lines, and fire lines that are 2-inches and smaller.
V. Satisfactory pressure leakage and bacteriological tests on 4-inch and larger lines shall be conducted in accordance with City policy, these standard specifications, and the current edition of the MPWSS;
VI. On existing roads, the City will restore the pavement surface unless the Contractor is authorized by the Street Division to restore the pavement surface. This is because, periodically, additional pavement surface restoration, beyond that which is needed to make the service connection is required;
    a. The City will charge the Contractor for equipment, labor, and materials required to complete the work. The Contractor will not be charged for any of the additional pavement restoration that the City chooses to complete;
VII. Per the locally adopted Plumbing Code, the Owner will be responsible to hire a Licensed Plumber to construct the service line from the curb stop to the point of service; and

C. Location
I. Services shall connect to and extend from the main perpendicularly;
II. Services shall connect to the main on the front door side of the structure if multiple mains are available;
III. Services shall be buried a minimum of 6.5-feet below the final street grade and the finished grade of the consumer's premises; and

IV. Less bury depth requires PCD Staff approval and insulation.

D. Size
   I. The water service tap, corporation stop, service line, curb stop, and meter shall all be the same nominal size from the main to the meter;
   II. Acceptable water service and fire line sizes are as follows:
      a. ¾-inch service;
      b. 1-inch service;
      c. 1.5-inch service;
      d. 2-inch service;
      e. 4-inch service;
      f. 6-inch service;
      g. 8-inch service; and
      h. Obtain approval from City Engineering office for service lines larger than 8-inches.
   III. If a service line size is reduced prior to the meter pit or vault, the design engineer shall provide hydraulic data indicating maximum achievable flow rates at the meter are within the manufacturer's recommendations and obtain written authorization from the City Engineer.
E. Materials
   I. 2-inch and smaller services shall be type K soft copper from main to structure entrance valve;
      a. See below for service lines over 100 feet in length; and
      b. Pipe joint is flared end to entrance valve.
   II. From the entrance valve to a point a minimum on one (1) foot past the meter setting, the service material shall be of Type M or L hard copper pipe;
   III. Water service lines longer than 100 feet in length;
      a. From the curb stop to the structure shall be Type K soft copper or HDPE, 200 psig meeting AWWA C-901 standards;
      b. When 200 psig HDPE piping is used a meter pit approved by the City Engineer shall be installed 2 feet from the curb stop on the property side of the curb stop at the property owner's expense;
      c. Type K soft copper shall connect the curb stop and the meter pit;
      d. Fittings used to connect the copper pipe to the 200 psig HDPE pipe shall be all brass similar to Mueller "Insta Tight" finttings; and
      e. When 200 psig HDPE pipe is used, #14 high strength copper tracer wire shall be installed from the curb stop to the house in the trench with the service line.
   IV. 4-inch and larger fire lines and services shall be PVC AWWA C-900 DR-14 or Ductile Iron Pipe.
      a. Ductile iron pipe is required from 10 feet outside the foundation to the entrance valve inside the building and in areas of bury in petroleum contaminated soils;
      b. Cast iron is acceptable from the main to a point 10 feet outside the building only when the existing service is cast iron;

c. Double wrap all ductile or cast iron pipe and pipe fittings with Polyethylene Encasement in accordance with AWWA C105;
d. Pipe joints shall be push-on with single gasket meeting AWWA C111;
e. Utilize flange joint to gate valve connected to main; and
f. Utilize flange and/or mechanical joints where necessary.

V. Unsuitable materials – an existing galvanized or lead service line that is being repaired shall be replaced with an acceptable type material from the main to the structure.

5.2.12 Service Clamps (Saddles)

A. For 12-inch and smaller C900 PVC saddles shall be Muller H-13000 series, A.Y. Mcdonald 3805 series, or Ford S902 (Style B 2-piece bolted design);
B. For ductile iron or C900 PVC larger than 12-inches saddles shall be Muller BR2S or BR2W series or equal approved by the PWD;
C. Supply two-piece water service saddles with AWWA taper (C.C.) thread to match corporation stop or component identified on the Construction Drawings; and
D. Tighten and torque saddle bolts and straps with breakaway type torque wrench per manufacturer's recommendations.

5.2.13 Corporation Stop

A. Shall be Mueller B-25000, Ford FB600 Ballcorp, or AY McDonald 4701B with
I. Ball valves;
II. Bronze compoments;
III. 300 psig maximum working pressure;
IV. 90-degree turn;
V. AWWA taper inlet thread; and
VI. Copper flare straight outlet connection.

5.2.14 Curb Stop Valves

A. Shall be Mueller B-25204N or Ford B22M with:
I. Ball valve;
II. Bronze plug;
III. Copper flare nut on both ends;
IV. Large tee head key;
V. The Minneapolis pattern valve is not required;
VI. 90-degree turn;
VII. 300 psig maximum working pressure; and
VIII. Include a 10-inch x 10-inch x 2-inch concrete support block under curb stop.

5.2.15 Curb Boxes

A. Shall be Tyler 6500, A.Y. McDonald 5700, or Star Pipe Product SB series with:
I. Adjustable screw type;
II. Bolt down lid with brass bolt and "Water" lettering;
III. Standard curb boxes shall be a minimum of 6.5-feet to 7-foot extended length;
IV. Screw extensions as need to reach finish grade;

V. Tyler LP-5041, 6500, or Star Pipe SB series enlarged bases for 1.5-inch and 2-inch curb stops;
VI. Arch style enlarged base; and
VII. Curb boxes shall be "heavy duty" with protective bituminous asphaltic seal coating.

5.2.16 Entrance Valve

A. Shall be located within 2 feet of the point where the service enters the building and from 1 to 3 feet above the floor;
B. An approved valve of good quality and good hydraulic characteristics must be placed so that the water can be readily shut off from the building;
C. Full way gate valves or rotary valves, which include ball, cone and plug types are recommended;
D. Better quality compression stops or globe valves are permissible;
E. The inlet side of any entrance valve shall be mechanically joined to copper service lines ¾ inch through 2 inch by means of copper flare connections; and
F. The inlet side of any entrance valve on service lines 4 inches and larger in diameter shall be mechanically joined to the service pipe and properly supported and restrained against movement in accordance with PWD specifications.

5.2.17 Tapping Saddles

A. Ductile Iron
   I. Mueller BR 2 B; or
   II. Approved equal.
B. PVC Pipe
   I. Mueller H-13000 Series;
   II. AY McDonald 3805;
   III. Ford S902 Style B; or
   IV. Approved equal.
C. Bronze or brass alloy with 200 psig minimum work pressure;
D. AWWA taper thread outlet
E. Shall be Romac SST III or an equal approved by the PWD for service lines or main extensions larger than 4-inch; and
F. Bolts for flange connection on tapping sleeves shall be Cor-Ten or Cor-Blue.

5.2.18 Couplings

A. Shall be three part union;
B. Copper flare both ends; and
C. Mueller H-15400, or approved equal.

5.2.19 Mechanical Joint Restraints

A. Shall be Megalug or approved equal.

5.2.20 Pipe Bedding

A. Shall be placed in accordance with CoGF details 5-30 and/or 5-31;
B. Shall be haunched under pipe with shovel;

C. Type 1 bedding shall conform to MPWSS Section 02235 CRUSHED BASE COURSE ¾ inch Minus;
D. In the event ground water prohibits the use of ¾ inch minus base course, 3/8 inch aggregate (chips) may be used, with the Engineers approval, under the following conditions;
    a. Filter fabric shall be laid on the excavated ditch bottom and encase the bedding and pipe;
    b. The open graded aggregate shall be free draining and non-plastic;
    c. The open graded aggregate shall conform to all applicable portions of MPWSS Section 02250, GRAVEL MATERIAL, meeting the gradation requirements for No. 2 gravel material; and
    d. Trench plugs, as defined by CoGF detail 5-34, shall be installed once every 100 feet;
E. Place Type 1 Pipe Bedding from 4 inches below the bottom of the pipe, around the pipe, and up to 6 inches over the pipe;
F. The use of roller buckets and/or vibratory plates, attached to an excavator, for compaction within a public utility trench is not allowed;
G. The use of "Recycled Asphalt" as bedding, backfill, or base course is not allowed;
H. The use of "Recycled Concrete" as bedding or as a substitute for washed gravel is not allowed;
I. The use of "Recycled Concrete" as backfill is only allowed when blended with other materials and only when approved by the City Engineer's Office;
J. The use of Concrete Washout as bedding and/or backfill is only allowed when approved by the City Engineer's Office; and
K. Pipe bedding for all Polyethylene wrapped pipes shall consist of a clean sand meeting the following requirements:
    a. 100% passing the ¼-inch Sieve, 10 – 40% passing the No. 8 Sieve, and 0 – 10% passing the No. 16 Sieve;
    b. The liquid limit for the material passing the No. 40 Sieve is a maximum of 25; and
    c. The plasticity index shall not exceed 0.

5.2.21 Warning Tape
A. Shall be installed above all water mains and fire hydrant lines;
B. Shall be a minimum of 5 mils thick;
C. Shall be 3 inches wide;
D. Shall conform to APWA colors; and
E. Shall be buried 12 to 24 inches below the final grade.

5.2.22 Tracer Wire
A. Shall be #12 AWG fully annealed, high strength solid copper clad steel conductor
B. 30-mil high-density HDPE or HMWPE insulation, rated for direct bury use at 30 volts;
C. Shall be approved for direct bury;
D. Conductor must be at 21% conductivity for locate purposes and have a minimum break load of 450 pounds;

E. Insulation is to meet APWA/ULCC color code requirements for identification of the buried utility;
F. Shall be taped every 5 feet to the top of the water main;
G. Connectors should be capable of handling 2 to 4 wires per connector and designated as "water-proof", such as snake bite locking connectors by Copperhead Industries, LLC;
H. Connectors shall be dielectric silicon filled to seal out moisture and corrosion and installed in a manner so as to prevent any un-insulated wire exposure;
I. Shall be spliced with moisture displacement connectors;
J. Non-locking friction fit, twist on or taped connectors are prohibited;
K. Grounding Anode shall be 1.3-inch D x 18.5-inch L magnesium drive in anodes weighing a minimum of 1.5 pounds;
L. All anodes will include a HDPE cap with 20-feet of factory installed #12 AWG tracer wirer with 30 mil high density HDPE insulation meeting the above requirements;
M. Anodes shall be manufactured approved for direct bury;
N. Cobra T3, with optional shorting jumper, 1 inch conduit, above ground access box with hydrant flange adapter, as manufactured by Copperhead Industrial, LLC or approved equal;
O. Grade level/in-ground access boxes may be installed if approved by the City Engineering Office;
P. The access box shall have an encapsulated magnet, corrosion resistant isolated brass wire lugs, and opened with a standard pentagon head key wrench;
Q. Access boxes shall have a switchable lid in order to isolate the ground if necessary;
R. Access boxes shall meet APWA/ULCC color code requirements;
S. Sufficient wire/slack (2-feet) shall be left in the access box allowing the cover to be lifted intact and allowing for future vertical adjustments; and
T. Shall be made accessible in accordance with COGF detail 5-38.

5.2.23 Marker Posts

A. Shall be used when a main is located outside a paved surface;
B. Shall be fiber glass (FlexPost®) and a minimum of 5-feet tall, minimum of 3.5-inches wide and include the CoGF PW Utility Division contact information.
C. Shall conform to APWA colors;
D. Shall be installed at bends, tees, and crosses; and
E. Shall be installed at every valve or valve cluster and change in direction;

CHAPTER 6 - SANITARY SEWER SYSTEMS

Chapter 6 Sanitary Sewer System

6.1. DESIGN AND CONSTRUCTION STANDARDS

6.1.1 Design Report

A. A design report prepared by a PE licensed in the State of Montana which addresses sewer flows at full build-out of the development shall be submitted to and approved by the CoGF. The design report shall include an overall plan of development including all areas outside of the study area which would naturally be serviced through the study area.
B. The design and design report shall meet the minimum requirements of *MDEQ Circular 2*.
C. Average daily flows, peak hour flow criteria, wastewater flow rates by zoning areas, peaking factors, and other applicable design criteria shall be used as defined in the current *Sanitary Sewer Facility Plan*.
D. Sewer mains shall be sized for the ultimate development of the tributary area. Nothing shall preclude the City from requiring the installation of a larger sized main if the City determines a larger size is needed to meet the requirements for future service. Joint participation by the City may be applicable where over sizing is deemed appropriate by the City Engineer. The minimum diameter of any gravity sanitary sewer main shall be eight (8) inches.
E. List all improvements or proposed additions to the sanitary sewer system.
F. Assess the ability of the existing collection system to handle the peak design flow from the project and the impact of the Wastewater Treatment Plant.
G. For existing or proposed lift stations, provide the following:
    I. A description of the existing and/or proposed wet well, pumping system, and force main;
    II. The capacity of the existing and/or proposed lift station service area;
    III. A map showing the existing and/or proposed lift station service area;
    IV. A list of the existing users and their average design flows;
    V. The existing and/or proposed peak design flow and reserve capacity;
    VI. For lift stations to be owned and maintained by the CoGF, the minimum force main pipe size leaving the lift station shall be 4-inches in diameter;
    VII. The pump run and cycle times for the existing and/or proposed average and peak design flows;
    VIII. The hydraulic capacity of the existing and/or proposed force main(s);
    IX. A list of the proposed users and their average design flows;
    X. The proposed average and peak design flows to the lift station;
    XI. The reserve capacity of the lift station with the proposed project at full capacity;
    XII. The pump run and cycle times for the proposed average and peak design flows; and
    XIII. Recommendations for improvements to an existing lift station, if necessary, to enable the lift station to serve the proposed project.

6.1.2 General Construction Standards

A. Sewer systems shall be constructed in accordance with the current edition of the Standards (this document), the current edition of the *MPWSS*, as modified by the CoGF *Special Provisions* for Sanitary Sewer Collection Systems, the CoGF Municipal Code, and other standards referenced elsewhere in this document. Any conflicts or differences in these

documents shall be resolved in favor of the OCCGF, these Standards, and then the MPWSS.

6.1.3 System Usage Restriction & Industrial Pretreatment

A. Usage shall be in accordance with CoGF Municipal Code Title 13 or its subsequent amending or replacement title/ordinance(s);
B. Adhere to the City's Pretreatment and Surcharge requirements (*CoGF Municipal Code Title 13);*
C. No storm water shall discharge to any sanitary sewer unless approved by both the City Engineer and the Environmental Division Supervisor;
D. Pretreatment Facilities – An industrial user shall provide necessary wastewater treatment as required to comply with Title 13 (or its subsequent amending or replacement title/ordinances(s)). Detailed plans showing the pretreatment facilities and operating procedures shall be submitted to the Director for review and shall be acceptable to the City before construction of the facility. The review of such plans and operating procedures will in no way relieve the industrial user from the responsibility of modifying the facility as necessary to produce an effluent acceptable to the City under the provisions of Title 13;
E. Pretreatment Flow Equalization – An industrial user shall install and maintain necessary storage and flow control to achieve compliance with flow restrictions imposed by the City under CoGF Municipal Code Title 13; and
F. Monitoring Facilities – An industrial user shall install effluent monitoring facilities as required to comply with CoGF Municipal Code Title 13. Monitoring equipment shall be located and maintained on the industrial user's premises in a location outside of production areas and constructed such that City Staff may access the monitoring facilities unannounced to collect representative samples of the effluent. Monitoring facility shall be located such that samples collected are representative of the volume and nature of the industrial effluent that has not been diluted with regular sanitary waste or other unregulated flows;

6.1.4 Sulfide Generation Analysis

A. The City Engineer or the Environmental Division Supervisor may require a sulfide generation analysis; and
B. Pretreatment, non-corrosive linings, and special lift station design are required when dissolved sulfide is likely to exceed 0.2 mg/l or H_2S gas concentrations are expected to exceed 20 ppm within the sanitary sewer atmosphere.

6.1.5 Location

A. In a development that includes alleys, a sanitary sewer gravity main shall be horizontally located in the center of the alley.
B. In a development without alleys, a sanitary sewer gravity main shall be horizontally located within the paved portion of the road and 10 feet away from the road center line. The main shall be located on the east side of a street and on the south side of an avenue.
    I. Water mains are located 10 feet away from the road center line on the west side of streets and on the north side of avenues.

II. Storm mains are generally located near the center of the road and shall be located a minimum of 10 feet (outside of pipe/structure to outside of pipe/structure) away from the water main.

C. Sanitary sewer force mains and interceptor mains shall be located as approved by the City Engineer.
D. Where mains cannot be installed in the public ROW, a minimum 20-foot wide easement shall be provided with the main in the center of the easement. A wider easement may be required based on the bury depth of the main.
E. Sewer mains and manholes located in an easement shall be designed and constructed so that all such facilities are readily accessible for maintenance and repair. The design shall allow for a City Vac-Truck to drive over the manhole without requiring the vehicle to backup. A minimum 55-foot by 55-foot area is required for a Vac-Truck to turn around.
F. The minimum bury depth of a gravity sanitary sewer main shall be sufficient to prevent freezing and shall have a minimum of four (4) feet of cover as measured from the top of the pipe.
G. The minimum bury depth of a sanitary sewer force main shall be sufficient to prevent freezing and shall have a minimum of 6.5-feet of cover as measured from the top of the pipe.
H. The minimum bury depth of a gravity sanitary sewer service line shall be sufficient to prevent freezing and shall have a minimum of four (4) feet of cover as measured from the top of the pipe. The recommended minimum bury depth is six (6) feet as measured from the top of the pipe. Sufficient insulation shall be installed to protect the service line from freezing when the bury depth is less than six (6) feet.
I. Sewer valves and manhole covers shall not be located in curb and gutters, sidewalks, boulevards, or within the wheel path of vehicular travel lane.

6.1.6 Offsets

A. Sewer mains and appurtenances shall maintain horizontal and vertical offsets as required in *MDEQ Circular 2*.
B. Sewer service lines and appurtenances shall maintain minimum horizontal separation of 10 feet and a minimum vertical separation of 18 inches from all water mains and water service lines, as measured from the outside of the pipe.
C. All underground electrical, gas, phone, fiber, and cable lines must be installed at least 5 feet horizontally and 1 foot vertically from sewer mains and services.

6.2 SEWER MAINS AND SERVICE LINES

6.2.1 Gravity Sewer Mains

A. Design capacities of sewer mains shall be based on Table 1 as shown below. The effects of the proposed development's sewer loading on downstream sewer lines shall be analyzed and included in the design report.
B. The minimum main diameter shall be 8 inches.
C. Upsizing of mains will not be approved for utilization of minimum slopes to meet elevation restraints.

D. The minimum bury depth of a gravity sewer main is 4.0 feet as measured from the top of the pipe. Less bury depth is allowed in special cases when sufficient insulation is provided to protect the line from freezing.
E. Velocity:
    I. Minimum velocity of 2.5 fps, based on a flowing full condition; and
    II. Maximum velocity of 15 fps, unless approved by the City Engineer.

Table 1 - Sewer Flow Depths

Diameter of Sewer Main (inches)	Depth of Flow / Diameter (%)
≤ 10	70
> 10 – 15	73
> 15 – 18	75
> 21 – 27	77
> 27	80

F. Pipe 8 – 15 inches in diameter shall be PVC ASTM D 3034, SDR 35 and/or SDR 26 PVC with Styrene Butadiene Copolymer gasketed joints and fittings.
G. Pipe larger than 15 inches in diameter shall be PVC ASTM F 679, SDR 35/PS46 and/or SDR 26/PS115 with Styrene Butadiene Copolymer (SBR) gasketed joints and fittings.
H. In areas with hydrocarbon contamination Acylonitrile Butadiene (NBR) pipe joint gaskets shall be utilized.
I. Main to main connections shall be made with PVC gasketed coupling or stainless steel sleeved flexible coupling with flowable fill encasing the connection.
J. Double wrap all ductile or cast iron pipe and pipe fittings, located underground, with polyethylene encasement in accordance with the following:
    I. The inner layer of polyethylene wrap shall be V-Bio which shall consist of three layers of co-extruded linear low density polyethylene (LLDPE);
    II. The outside layer of polyethylene wrap shall be 4 Mil Cross Laminated High Density Polyethylene;
    III. At no time will "slings" or "straps" come into contact with the polyethylene; and
    IV. Polyethylene adhesive tape shall be used for all repairs to the wrap.
K. Utilize a wax tape system designed for below ground applications (that consists of three separate parts, a primer, wax tape #1, and an outer wrap, such as supplied by Trenton Corporation) on metal components including, but not limited to, the entire flange, all bolts on mechanical and flanged joints, restraints, sleeves, couplers, and valves; and
L. Prior to the City's acceptance of the sewer system the Contractor must provide television inspection of the system. The cost of television inspection will be the responsibility of the Contractor. If any deficiencies are found during the inspection, the Contractor shall correct them at the Contractor's expense.

6.2.2 Sewer Force Mains

A. Design shall be as required per *MDEQ Circular 2*, except as specified below:
    I. CoGF owned and maintained sewer force mains shall be sized as required to provide a minimum cleaning velocity of 2.5 fps (the minimum size is 4-inches); and
    II. Sewer force mains shall terminate at a manhole.

B. Sewer force mains shall be (at a minimum) PVC pressure pipe, ASTM 2241, class 200 SDR 21 or stronger pipe.
C. Sewer force mains pipe type shall meet or exceed 1.5 times the manufacturer's recommended maximum pressure.
D. The minimum bury depth of a sewer force main is 6.5 feet as measured from the top of the pipe. Less bury depth is allowed in special cases when insulation is provided and the Design Engineer provides heat flow calculations showing that the pipe will not freeze.
E. Service taps shall not be allowed on CoGF force mains.
F. Force main pressure type Sch-40 (or stronger) cleanouts, of the same size as the force main, shall be provided at approximately 600-foot intervals unless approved by the City Engineer. A removable cap for the force main cleanout shall also be tapped for and fitted with a threaded plug. Cleanouts shall be installed facing both directions with long radius sweeps and insulation. The force main shall be equipped with a plug valve and valve box immediately upstream of each force main cleanout.
G. Private force mains shall be connected to the sewer collection system at a manhole as shown in Detail 5-55;
    I. A manhole with a force main or force service connection shall be coated to protect the structure from deteriorating.
H. Tracer Wire shall meet the same requirements as for water main, except:
    I. Force mains burst through existing mains or installed without continuous trench access shall be installed with ¼-inch steel tracer cable.
I. Coordinate with the City Engineer's Office when designing and constructing private sewer force mains and pumps.

6.2.3 Sewer Services

A. General
    I. One sewer service per structure, that receives potable water, is required;
    II. The number of separate sewer service lines (connections at the main) shall not exceed the number of buildings with different addresses on the lot;
    III. Buildings without addresses shall not have an independent sewer service line connected to the main;
    IV. Deviations from these rules shall be handled on a case by case occurrence and only when deemed physically impossible and only as approved by the City Engineer; and
    V. Connection fees shall apply for each sewer service connection.
B. Where a building is to be razed (OCCGF Title 13):
    I. The sewer service shall be severed at the property line;
    II. If the sewer service is not going to be used for the foreseeable future, the service shall be abandoned at the public sewer main;
    III. The public sewer main shall be properly plugged; and
    IV. A PW City Inspector shall inspect the work.
C. Construction of Sewer or Storm Service:
    I. When it is necessary to tap an existing or new sewer main for a service connection:
        a. An in-line wye shall be installed on new sewer mains for sewer services;

b. Connection of sewer services to an existing main shall utilize service saddles clamped or strapped using stainless steel bands and an Inserta Tee as approved by the PWD. The Contractor will provide the equipment, labor, and materials required to tap the main via an Inserta Tee or approved equal;
c. The tap shall be made by a licensed drain layer and the drain layer shall be responsible for damages to the City main as a result of their own negligence;
d. The Contractor is responsible for installing the service line from the main to the property line; and
e. If the existing service line connection is damaged the contractor shall abtain approval from the PWD before tapping a new connection into the City sewer main. The Contractor shall repair or replace the damaged fitting as directed by the PWD.

II. Trenches within the streets or alleys shall be compacted to meet 95% of maximum dry density as determined by A.A.S.H.T.O., T-99 specifications;
III. Trenches in lawns and non-driven areas shall be compacted to meet 85% of the same specification;
IV. All work shall be warranted by the drain layer for 1 year against defects in materials and 2 years for defects in workmanship;
V. The Contractor is responsible for restoration of the public right of way to the pre-construction condition meeting minimum City Standards;
VI. PWD personnel shall inspect the tap and service line **prior to backfill**;
VII. On existing roads, the City will restore the pavement surface unless the Contractor is authorized by the Street Division to restore the pavement surface. This is because, periodically, additional pavement surface restoration, beyond that which is needed to make the service connection is required;
    a. The City will charge the Contractor for equipment, labor, and materials required to complete the surface restoration work associated with the service connection. The Contractor will not be charged for any of the additional pavement restoration that the City chooses to complete;
VIII. The Owner will be responsible to construct the service line from the property line to the point of service;
IX. Sewer service lines 8-inches and larger in diameter shall connect to the sewer main at a manhole;
X. Sewer service lines 4-inches and 6-inches in diameter shall tap the upper quadrant of the sewer main; and
XI. Storm service lines of any size have the option of connecting to the storm main at a manhole.

D. A new sewer service shall be installed with a minimum grade of 2%;
E. New sewer service lines on newly constructed public sewer mains shall be air tested;
F. Pipe bursting of existing sewer service lines:
    I. An existing service line that is less than the minimum grade (but not negative grade) can be burst at the existing grade;
    II. A video inspection shall be performed before and after the bursting process;
    III. Negative grade and obstructions shall be removed and repaired prior to bursting;

IV. The contractor shall fuse the HDPE in accordance with manufacturer specifications;
V. Sewer service pipe material used for pipe bursting shall be either DR-17 HDPE or DR-21 HDPE; and
VI. Permitting, testing, and inspection per City Code is required when pipe bursting an existing sewer service line.

G. Force Sewer Service line:
I. In the event that the existing sewer service cannot be repaired, burst, lined, or a new gravity sewer service cannot be installed the option to install a grinder pump/force sewer service line will be accepted on a case by case basis to be evaluated before installation by the City Engineer's Office;
II. Minimum pipe strength shall be schedule 40 PVC;
III. Minimum pipe diameter shall be 2-inches;
IV. Fernco coupler or approved equal, encased in concrete, shall be used to make connection between dissimilar pip materials (with approval from the City Engineer's Office, fully pressure rated Transition Couplings or Transition Fittings may be used);
V. A minimum 4-inch diameter cleanout is required within one foot of the transition from the new force service line to the new or existing downstream gravity line.
VI. The cleanout is not permitted to be installed in the public right-of-way;
VII. No force sewer line shall discharge directly into the City sewer main; and
VIII. Permitting, testing, and inspection per City Code is required when installing a force sewer service line.

H. Materials:
I. Gravity sewer services shall have a minimum 4-inch internal diameter and be sized as required for the design flow;
II. Gravity sewer service pipe shall have a minimum strength of SCH 40 PVC or be ductile iron pipe from the main to the interior of the structure;
III. Schedule 40 PVC fittings shall be connected according to manufactory's recommendation using purple primer along with the appropriate colored solvent cement;
IV. Connections between existing service and new or repaired service piping shall be by use of stainless steel banded flexible couplings encased in concrete as approved by the City Engineer or designee;
V. Fully pressure rated Transition Couplings or Transition Fittings that meet or exceed the requirements of ASTM D2513 Category 3 as manufactured by Poly-Cam or equal and approved by the City Engineering Office can be used in place of stainless steel banded flexible couplings when joining plastic pipes together; and
VI. Force service lines sized as required to provide 3-feet per second velocity, shall be PVC pressure pipe, ASTM 2241, Class 200 SDR 21 and force service lines shall meet or exceed 1.5 times the manufacture's recommended maximum pressure.

I. Taps
I. Taps for Gravity service lines that are smaller than 8-inches in diameter shall only be made at the main:
a. With an appropriately sized PVC wye for new construction; or

b. With an appropriately sized and installed Inserta Tee® for connections to existing mains.

II. Taps for gravity service lines 8-inches and larger shall be made at a manhole; and

III. Taps for Force service lines shall only be made at a manhole.

J. The minimum gravity sewer service grade shall be 2%. A grade down to 1% is only allowed under special conditions and only with the approval of the City Engineer's Office.

K. The terminal end of sanitary sewer services at undeveloped lots shall be marked with a steel T-Post buried to within 6-inch of the surface.

L. Double wrap all ductile or cast iron pipe and pipe fittings, located underground, with polyethylene encasement in accordance with the following:

I. The inner layer of polyethylene wrap shall be V-Bio which shall consist of three layers of co-extruded linear low density polyethylene (LLDPE);

II. The outside layer of polyethylene wrap shall be 4 Mil Cross Laminated High Density Polyethylene; and

III. At no time will "slings" or "straps" come into contact with the polyethylene; and

IV. Polyethylene adhesive tape shall be used for all repairs to the wrap.

M. Utilize a wax tape system designed for below ground applications (that consists of three separate parts, a primer, wax tape #1, and an outer wrap, such as supplied by Trenton Corporation) on metal components including, but not limited to, the entire flange, all bolts on mechanical and flanged joints, restraints, sleeves, couplers, and valves.

6.2.4 Pipe Bedding

A. Shall be placed in accordance with CoGF details 5-30 and/or 5-31;

B. Shall be haunched under pipe with shovel;

C. Type 1 bedding shall conform to MPWSS Section 02235 CRUSHED BASE COURSE ¾ inch Minus;

D. In the event ground water prohibits the use of ¾ inch minus base course, 3/8 inch aggregate (chips) may be used, with the Engineers approval, under the following conditions;

a. Filter fabric shall be laid on the excavated ditch bottom and encase the bedding and pipe;

b. The open graded aggregate shall be free draining and non-plastic;

c. The open graded aggregate shall conform to the following:

i. Percentage by weight passing the No. 2 sieve

1. 1-inch 100%
2. ¾-inch 90-100%
3. 3/8-inch 20-55%
4. No. 4 0-10%
5. No. 8 0-5%
6. No. 200 0-3%
7. Up to 5% "oversized" material is permitted provided that the "oversized" material passes the screen size immediately larger than the top size specified;
8. The material sieve shall be reasonably well graded; and

d. Trench plugs, as defined by CoGF detail 5-34, shall be installed once every 100 feet;

E. Place Type 1 Pipe Bedding from 4 inches below the bottom of the pipe, around the pipe, and up to 6 inches over the pipe;
F. The use of roller buckets and/or vibratory plates for compaction within a public utility trench is not allowed;
G. The use of "Recycled Asphalt" as bedding, backfill, or base course is not allowed;
H. The use of "Recycled Concrete" as bedding or as a substitute for washed gravel is not allowed;
I. The use of "Recycled Concrete" as backfill is only allowed when blended with other materials and only when approved by the City Engineer's Office;
J. The use of Concrete Washout as bedding and/or backfill is only allowed when approved by the City Engineer's Office;
K. Pipe bedding for all Polyethylene wrapped pipes shall consist of a clean sand meeting the following requirements:
    a. 100% passing the ¼-inch Sieve, 10 – 40% passing the No. 8 Sieve, and 0 – 10% passing the No. 16 Sieve;
    b. The liquid limit for the material passing the No. 40 Sieve is a maximum of 25; and
    c. The plasticity index shall not exceed 0.

6.2.5 Detectable Warning Tape

A. Shall be installed above all sanitary sewer gravity and force mains.
B. Shall be a minimum of 5 mils thick.
C. Shall be 3 inches wide.
D. Shall conform to APWA colors.
E. Shall be buried 12 to 24 inches below the final grade.

6.2.6 Marker Posts

A. Shall be used when a gravity sewer main or sewer force main is located outside a paved surface;
B. Shall be fiber glass (FlexPost®) and a minimum of 5-feet tall, minimum of 3.5-inches wide and include the CoGF PW Utility Division contact information.
C. Shall conform to APWA colors;
D. Shall be installed at manholes (gravity mains); and
E. Shall be installed at every manhole, valve, or change in direction (force mains).

6.3 MANHOLES

6.3.1 Manhole Design

A. Shall be Eccentric type per CoGF detail 5-65;
B. Shall be provided at a maximum of every 450 feet, terminations, changes in pipe diameter, changes in slope, and changes in direction;
C. Provide a minimum 1-foot distance between all outside edges of individual pipe penetrations (measured along the inside wall);
D. The outside of any pipe shall not encroach within 6 inches of a precast joint and/or as recommended by the manufacturer;
E. Shall be a minimum diameter of 4 feet and follow the National Precast Concrete Association *Manhole Sizing Recommendations*.

F. Inverts:
    I. The invert of the outlet pipe shall be a minimum of 0.1 feet lower than the invert of the lowest inlet pipe when the flow path is in a straight line;
    II. The invert of the outlet pipe shall be a minimum of 0.2 feet lower than the invert of the lowest inlet pipe when the flow path is not in a straight line through the manhole;
    III. The invert of the outlet pipe shall be a maximum of 0.4 feet lower than the invert of the highest inlet pipe, unless a "drop inlet" is installed;
    IV. Generally speaking, based on constructability of a "drop inlet" the inlet piping cannot be installed between 0.4 feet and 1.5 feet above the outlet piping invert; and
    V. Changes in direction greater than 90º within a single structure are prohibited.
G. When pipe diameters change at the manhole, the design capacity flow depth of the smaller inlet pipe(s) shall be at the same elevation as the design capacity flow depth of the larger outlet pipe. The design capacity flow depth shall be 0.8 times the pipe diameter.
H. Flow channels:
    I. Are required on all sanitary manholes;
    II. Shall provide smooth transitions between inlet and outlet pipe inverts; and
    III. Shall be as deep as the design capacity depth as shown in Table 1 before the start of the sloped shelf within the manhole.
I. Manholes shall be designed to counteract buoyant forces associated with the installation location.
J. The top of the manhole lid shall be set between 1/8-inch and 1/4-inch below the asphalt/concrete finish grade. In gravel surfaced areas, it shall be set 1-inch below the gravel finish grade.

6.3.2 Manhole Construction

A. Shall be constructed in accordance with CoGF detail 5-65.
B. Doghouse style manholes are allowed.
C. Manhole Rings and Covers
    I. Shall be as shown in CoGF detail 5-63, or approved equal. Paint is optional.
    II. Watertight gasket manhole covers shall be used in all locations where flooding may occur.
D. Manhole Testing shall conform to the requirements of MDEQ Circulars:
    I. Hydrostatic Testing (only allowed when ground water is below bottom of manhole during testing):
        a. Plug pipes in manhole; remove water in manhole; observe plugs over period of not less than 2 hours to ensure there isn't any leakage into manhole;
        b. Determine groundwater level outside manhole;
        c. Fill manhole with water to top of cone. Prior to test, allow manhole to soak for up to 24 hours. Water may be added over a 24 hour period to compensate for losses due to evaporation and absorption;
        d. Following the 24 hour saturation period any loss of water within a 30 minute period shall be a failed test and the manhole must be rejected; and
        e. Repair or replace (and test again) all manholes that do not meet the leakage test, or are unsatisfactory from visual inspection, to conform to the requirements herein.

II. Pneumatic Testing - vacuum test in accordance with ASTM C1244 and as follows:
   a. Plug pipe openings; securely brace plugs and pipe;
   b. Inflate compression band to affect seal between vacuum base and structure; connect vacuum pump to outlet port with valve open; draw vacuum to 10 inches of Hg; close valve; start test;
   c. Determine test duration for manhole from the following table:

Table 2 – Manhole Test Period

Manhole Diameter	Test Period
4 feet	60 seconds
5 feet	75 seconds
6 feet	90 seconds

   d. Record vacuum drop during test period; when vacuum drop is greater than 1 inch of Hg during test period, repair and retest manhole; when vacuum drop of 1 inch of Hg does not occur during test period, discontinue test and accept manhole.
   e. When vacuum test fails to meet 1 inch Hg drop in specified time after repair, repair and retest manhole.

6.4 LIFT STATIONS

6.4.1 Lift Station Design

A. Meet the design requirements of *MDEQ Circular 2*, with the following additional requirements.
B. CoGF owned and maintained lift stations shall have a minimum discharge pipe size of 4-inches.
C. A written report shall be submitted for any project that will create a new sewage lift station. The report shall contain, but not be limited to, the following:
   I. A description of the proposed wet well, pumping system, and force main;
   II. The capacity of the recommended pumps and potential for future upgrades;
   III. A map showing the potential lift station service area;
   IV. The average and peak design flows for the proposed project and for the potential service area;
   V. The hydraulic capacity of the force main;
   VI. The reserve capacity of the lift station when the proposed project is on line at full capacity (full build out);
   VII. The pump run and cycle times for the average and peak design flows;
   VIII. Strategies for improvements which may be necessary to accommodate future sewer extensions (i.e. increased storage, increased pumping, or auxiliary power capacity);
   IX. A statement of the pump selection process, including the Engineer's calculations for the total dynamic head, total discharge head, net positive suction head, and other pertinent pump selection criteria; and
   X. The designed pump operating curve plotted on a manufacturer's pump performance chart with the design operating point clearly identified.

D. A written report shall be submitted for any project that will contribute to an existing sewage lift station. Generally speaking the report only needs to evaluate the first downstream lift station. The report for a project that will contribute to an existing lift station shall contain, but not be limited to, the following:
    I. A description of the existing wet well, pumping system, and force main;
    II. The capacity of the existing pumps and potential for future upgrades;
    III. A map showing the potential lift station service area;
    IV. A list of the existing users and their average design flows;
    V. The existing peak design flow and reserve capacity;
    VI. The proposed average and peak design flows to the lift station;
    VII. The hydraulic capacity of the force main;
    VIII. The reserve capacity of the lift station when the proposed project is on line at full capacity (full build out);
    IX. The pump run and cycle times for the existing average and peak design flows;
    X. The pump run and cycle times for the proposed average and peak design flows; and
    XI. Recommendations for improvements, if necessary, to enable the lift station to serve the proposed project;
E. An emergency power supply will be required for all lift stations unless approved by the Public Works Director. If the available 50kW portable generator is acceptable for emergency power, a plug-in shall be provided (Appleton Electric Co. Power Tite, Catalog # ACR 6034, 60 amp, 250 VDC, 600 VAC or 100 amp equivalent depending on station size. In addition, a normal to emergency power switch shall be provided (Culter Hammer double throw safety switch, 60 amp, 600 volts, ac or 100 amp equivalent depending on station size).
F. Upon request from the Public Works Director, the Design Engineer shall submit a list of three lift stations of the type proposed which have been in operation for at least five years. The City reserves the right to accept or reject the proposed lift station.
G. An alarm system that is compatible with the City's alarm system shall be provided.
    I. The alarm system shall be capable of detecting power interruption, phase loss, low water, motor failure, seal failure (motor moisture sensor), high water, and high-high water conditions;
    II. An hour meter is required on each pump;
    III. Amperage meters are required on each leg of the electrical wiring;
    IV. Surge/lighting protection is required on all control panels;
    V. Cathodic protection is required for all lift stations having a metallic exterior;
    VI. The Design Engineer shall submit an analysis of the amount of cathodic protection required. The system should be Impressed Current with standard amperage monitoring and should have maintenance check points available; and
    VII. The station wet well should be equipped with high level tip over float with a run timer for backup pump start or be equipped with a dual backup tip over float system for stop and start commands. It is recommended that either system command a dual pump run scenario.

6.4.2 Lift Station Construction

A. Manufacturer
    I. Gorman Rupp; or

II. Equal as approved by CoGF PWD
    a. Design Engineer shall provide all necessary information to justify the product as equal;
    b. Design Engineer shall submit a list of 3 lift stations of the type proposed which have been in operation at least 5 years;
    c. The CoGF reserves the right to accept or reject the proposed lift station;
    d. If the station is a drywell/wet well can configuration such as is built by Dakota, a four foot egress tube is required with a mid-range fall protection platform;
    e. Any hatches shall be aluminum or stainless steel for easy Vacuum Truck or pump pulling accessibility; and
    f. Any wet well equipment (i.e. pull rails/chains, etc.) above water level shall be made of stainless steel for minimal corrosion.

B. Pump Type
    I. Submersible or submersible grinder; or
    II. Above ground, self-priming, suction lift;
        a. Only to be used with approval on a case by case determination.

C. Redundancy
    I. Duplex systems
        a. Minimum requirement for all systems.
    II. Triplex systems
        a. May be required by the City Engineer for large lift stations or lift stations requiring specialty items.
    III. Each motor shall include a motor saver.

D. Influent Pipe
    I. One full joint of Class 50, cement lined, ductile iron; and
    II. Spigot end shall extend 6-inches beyond interior of wet well wall.

E. Access Road
    I. 12-foot minimum width paved for access by sewer maintenance vehicles; and
    II. Access approach from street per Standards.

F. Bypass
    I. Shall have a dedicated valve;
    II. Shall connect downstream of the lift station check valves; and
    III. Provide a 4-inch cam-lock style connection with cap.

G. Electrical
    I. Wiring
        a. Shall be water resistant inside the lift station and enclosure.
    II. Backup Power
        a. Generac or approved equal;
        b. Diesel fueled or approved fuel source;
        c. Noise emissions not to exceed 65 dbA at 20 feet from the power supply;
        d. Shall be installed on concrete pad per manufacturer recommendations;
        e. Shall include an appropriately sized transfer switch, manufactured by the same manufacturer as the generator;
        f. Shall include an O&M manual; and
        g. Manufacturer shall perform training at startup.

III. Alarms
    a. Manufacturer:
        i. Mission Communications
    b. Model
        i. M-110
            a) Lift stations with pump motors under 20 horsepower.
        ii. M-800
            a) Lift stations with pump motors over 20 horsepower;
            b) Include a Digital Expansion Board to add 8 digital inputs; and
            c) Include an Analog Expansion Board to add 4 analog inputs.
    c. Alarm Conditions
        i. High water;
        ii. Low water;
        iii. Seal failure;
        iv. Power interruption; and
        v. High motor temp.

IV. Controls
    a. Each pump shall have:
        i. Hour meter;
        ii. Suction pressure gauge tap and valve; and
        iii. Discharge pressure gauge tap and valve.
    b. Pump run alternator;
    c. Amperage meter on each leg of the electrical wiring;
    d. Uninterruptible Power Supply (UPS) for lightning/surge protection for the power supply and other instrumentation. It also should provide a minimum of 20 minutes of backup power to the PLC and the level transducer. The UPS should not be hardwired but should be of the 120 volt plug-in configuration for ease of change out;
    e. Level control
        i. Primary control – Pressure transducer (said transducer shall be a submersible KPSI type with standard range of 0-23 feet and 0-10 psi). A wet well level indicator shall be provided on the drywell side or in above ground control panels.
        ii. Backup control – 5 float mercury switch system
            a) Shall be installed and function if primary control is lost
    f. Transfer switch and control panels shall be placed on a steel frame and embedded in concrete a pad with a pitched roof covering the pad and controls.
    g. Station controls should include an Allen Bradley Micro Logic 1100 PLC or current upgrade. Depending on station size, it should also include an Allen Bradley Panel view for control and monitoring. Controls should also include applicable analog input and output cards.
    h. If the control panel is above ground, it shall be equipped with a heat system to keep all electronics above 32° F.

V. Communications

a. Current communication protocol is cell phone and includes:
    i. SIM-Verizon LTE insertion assembly (ordered thru Veolia)
    ii. Low-power Draw 3G/4G Gateway Single Drive Item #1102555
    iii. LTE Broadband Antenna (Item #MM-S-DSMM00-03B-03)
    iv. Dual LTE Combo Antenna (# MM-D-DSM00-03B-15)
    v. Antenna Mount Kit (Item # GB-06)
    vi. 24 volt power supply
b. If the station is equipped with a landline phone system:
    i. Allen Bradley Modem – 9300 Rad Kit
    ii. Physical address of the station will be needed for phone co.
    iii. Phone line shall be plugged into the UPS.

VI. Lighting
a. Yard lighting shall be provided and connected to the power supply; and
b. Street lighting shall not be considered adequate to meet this requirement.

VII. Miscellaneous Electrical
a. Adjustable frequency drives (AFD's) and soft starts should be considered for larger facilities/pump configurations.
b. Power supply should be 480 volt, 3 phase. Single phase configuration is unacceptable.
c. Above ground pull boxes adjacent to the wet well are preferable for easy replacement of floats and level transducers. This eliminates dangerous confined space entry.
d. Drywells shall be equipped with a sump pump and float alarm in case of flooding.

H. Enclosures

I. Foundation
a. Monolithic concrete
b. Minimum 4 inches thick
c. Treated sole plate anchored to foundation

II. Roof
a. Gable style
b. Trusses spaced at 24 inch maximum
c. Designed to meet local snow load requirements
d. 4:12 slope
e. 5/8 inch OSB sheathing
f. 30-year 3-tab shingles

III. Walls
a. 8 foot floor to ceiling height
b. 6 inch wall studs
c. R-19 insulation
d. Exterior
    i. ½-inch OSB sheathing; and
    ii. Lap siding with 7-inch reveal
e. Interior
    i. T-111 siding

IV. Ceiling

a. R-49 insulation
b. 5/8-inch unfinished gypsum board

V. Other
a. 3068 steel door with deadbolt lock
b. Heating and air circulation systems
c. Ceiling mounted industrial lights in protective cages
d. All other necessary materials for a finished building

VI. Submittals by Design Engineer for CoGF Planning and Community Development approval
a. Structural plans
b. Mechanical plans Electrical plans
c. Heating and air circulation

I. Fencing
I. 6-foot chain link security or equivalent
II. 3-foot wide personnel gate
III. 12-foot wide gate with two 6-foot leaves
IV. Shall provide adequate room for access and facility maintenance
V. 3-foot minimum offset from all structures and appurtenances
VI. Gate placement shall promote maintenance vehicle access for pump removal
VII. Gate installations shall include duckbill style gate holdbacks

J. Landscaping
I. 4-inches of clean 1-inch minus gravel or other landscaping rock as approved by CoGF PWD for areas outside of public right-of-way; and
II. Areas inside public right-of-way shall meet the requirements of the CoGF Municipal Code and this standard.

6.5 INTERCEPTORS AND SEPARATORS

6.5.1 Grease Traps and Interceptors

A. In accordance with the OCCGF Title 13 and the City of Great Falls Fats Oils and Grease Program Manual and Management Policy grease traps and interceptors are required at all establishments that have the potential to introduce Fats Oils or Grease, excessive food waste, or other wastes to the sanitary sewer that may congeal or form blockages and sanitary sewer overflows and undergo any of the following activities after January 1, 2017:
I. New Construction;
II. Interior remodeling to accommodate expansion or operational modifications;
III. Changes in occupancy or use;
IV. Facilities which are experiencing difficulty in achieving compliance with maintenance and / or waste water discharge limitations; or
V. Any facility that has been determine by the City through reasonable investigation to be causing or contributing to blockages, impaired function or violation of any

of the Industrial Pretreatment General or Specific Prohibitions in of the sanitary sewer or lift station(s).

Controls that are designed and constructed in pursuant to these standards are subject to review and approval by the City's Industrial Pretreatment Program Coordinator prior to construction. For additional information contact the City of Great Falls Pretreatment Coordinator's Office at (406) 727-8390;

B. For the purpose of these standards, Grease Traps are defined as smaller interior devices often located in the kitchen space and or under fixtures and that have an overall volume of less than 100 gallons. Grease Interceptors are defined as larger devices located (usually) exterior to the building and subterranean, that have an overall volume greater than 500 gallons and are located on a sanitary sewer service line. For additional information contact the City of Great Falls Pretreatment Coordinator's Office at (406) 727-8390;
C. The standards in parts 6.5.2 and 6.5.3 apply to establishments that include but are not limited to:
    I. Breweries,
    II. Butcher Shops,
    III. Churches,
    IV. Commissaries,
    V. Grocery Stores,
    VI. Mobil Food Units,
    VII. Hotels\Motels,
    VIII. Nursing Homes and Assisted Living Facilities,
    IX. Department Store Eateries,
    X. Cinemas,
    XI. Cafes and Coffee Shops,
    XII. Smoothie, or Juice Shops,
    XIII. Ice Cream Shops,
    XIV. Fairground Eateries,
    XV. Rented Commercial Kitchens, and
    XVI. Restaurants of all types.

6.5.2 Grease Traps Design and Construction Standards

A. Sizing for traps shall comply with current Uniform Plumbing Code requirements and utilize the formula that uses fixture capacities (Minimum size allowed is 20 gpm.);
B. Design shall comply with Standard Drawing 5-76;
C. Traps, the associated sample port and flow restrictor orifice shall be located in an area that allows easy access for sampling, inspection, and cleaning;
D. Both above grade and below grade traps shall be properly vented and utilize a vented flow restrictor on the inlet line to the trap or at the fixture discharge line.

D. Traps shall have a sample port installed on the effluent line from the trap;
E. Food preparation sinks, dishwashing sinks and floor drains shall discharge into the trap;
F. Water entering the interceptor shall not exceed 140°F; and
G. Designs including food processors\grinders upstream of the trap must also contain a solids collector upstream of the trap, an appropriate (more frequent), maintenance schedule, or other configuration approved in writing by the City's Industrial Pretreatment Coordinator prior to construction.

6.5.3 Grease Interceptors Design and Construction Standards

A. Food preparation sinks, dishwashing sinks and floor drains shall discharge into the interceptor;
B. Sizing for interceptors shall comply with the current Uniform Plumbing Code requirements (Minimum size allowed is 500 gallons.);
C. Design shall comply with Standard Drawing 5-75;
D. Gravity grease interceptors shall have a sample port installed in accordance with Standard Drawings 5-75 and 5-70;
E. Gravity grease interceptors shall be properly vented;
F. Interceptor and sampling ports must be located in an area that easily accessible for sampling, inspection and cleaning;
G. Interceptor and sample port lids must be installed in a manner that allows for easy removal during sampling, inspection and cleaning;
H. Low temperature, sanitizing rinse, mechanical dishwashers are recommended;
I. Water entering the interceptor shall not exceed 140°F unless approved in writing by the City's Industrial Pretreatment Coordinator prior to construction;
J. Designs including food processors\grinders upstream of the trap must also contain a solids collector upstream of the trap, an appropriate (more frequent), maintenance schedule, or other configuration approved in writing by the City's Industrial Pretreatment Coordinator prior to construction; and
K. Enzymes and drain maintenance chemicals are prohibited.

6.5.4 Sand, Oil Interceptors

A. For the purpose of these standards Sand Oil Interceptor (SOI) are defined as multi-compartment tanks installed on sanitary sewer service line and designed to physically separate solids and liquids that are lighter and heavier than water from the waste water stream. SOIs are larger structures with a minimum size of 500 gallons that may be installed either internally or external to a building envelop, depending on the application. Industrial Users (as defined at OCCGF Title 13) that have the potential to discharge floatable liquids or solids, sediment and\or other wastes capable of impairing sanitary sewer function are required to install a SOI. Facilities commonly falling into this category include:
    I. Facilities with floor drains;
    II. Truck or heavy equipment washes;
    III. Commercial car washes;
    IV. Automotive service shops;
    V. Storage facilities and warehouses;
    VI. Parking garages or indoor parking facilities;
    VII. Laundromats; and

VIII. Other Industrial users that do not require more advanced controls to meet discharge permit requirements.

B. In accordance with the OCCGF Title 13, SOIs are required at all establishments that meet any of the following criteria after January 1, 1987:
   I. New Construction of any facility listed in A. above;
   II. Interior remodeling to accommodate expansion or operational modifications at any facility listed in A. above;
   III. Changes in occupancy or use to any facility listed in A. above;
   IV. Any facility experiencing difficulty in achieving compliance with maintenance and / or waste water discharge limitations; or
   V. Any facility that has been determine by the City through reasonable investigation to be causing or contributing to blockages, impaired function or violation of any of the Industrial Pretreatment General or Specific Prohibitions in of the sanitary sewer or lift station(s).

C. Controls that are designed and constructed in pursuant to these standards are subject to review and approval by the City's Industrial Pretreatment Program Coordinator prior to construction. For additional information contact the City of Great Falls Pretreatment Coordinator's Office at (406) 727-8390.

6.5.5 SOI Design and Construction Standards

A. Each business or establishment that requires a SOI shall have a SOI serving only that establishment. Common or shared SOI's are not permitted;

B. Sizing shall be determined using the SOI Sizing Calculation with a minimum size of 500 gallons as follows:
   I. SOI Capacity = (Process floor space in ft^2 / Use factor from Table below) * 7.48 gallons

Use Category [1]	Use Factor
Truck Wash, Heavy Equipment Wash or Commercial Car Wash	3 ft^2
Commercial Car Wash (Hand Sprayer)	6 ft^2
Automotive Service Shop or Machine Shop	15 ft^2
Storage Area or Warehouse	100 ft^2
Parking Garage[2]	1,000 ft^2
1. If your use category is not listed, contact the Industrial Pretreatment Coordinator's Office at 1(406) 727-8390. 2. Do not use the top level of a parking garage if it is exposed to storm events. This level shall be drained to the storm drain system.	

II. The maximum size of an SOI shall be 2,500 gallons. Facilities requiring SOIs larger than 2,500 gallons shall install multiple interceptors in series to accommodate the additional load on the system.

C. Design and construction shall comply with Standard Drawing 5-71;
D. SOIs shall be equipped with a sample port and the sample port shall comply with Standard Drawing 5-70;
E. SOIs shall be properly vented;
F. SOIs and the associated sample port shall be located in an area that allows easy access for sampling, inspection, and cleaning;
G. SOIs are not to be located in parking spaces or driveways with heavy traffic;
H. The SOI lid shall have oil absorbent pads in place at the functional liquid surface level in the primary chamber;
I. Laundry equipment in Commercial Buildings may be required to discharge through a wire basket and SOI as determined necessary by the City Building Official or Pretreatment Coordinator; and
J. Elevator pits with sump pumps shall not be directly connected to the sanitary sewer system unless approved in writing by Pretreatment Coordinator whom can be contacted at (406) 727-8390.

CHAPTER 7 - STORM SEWER SYSTEMS

Chapter 7 Storm Sewer Systems

1.1. GENERAL PROVISIONS

1.1.1 Refer to the City of Great Falls Storm Drainage Design Manual from June 1990 for the City's storm drainage system design and construction standards.

CHAPTER 8 - TRANSPORTATION SYSTEMS

Chapter 8 Transportation System

8.1. DESIGN STANDARDS

8.1.1 General

A. Roadway systems, including private roadways, shall be designed in accordance with the current edition of the Standards (this document), the current AASHTO guidelines, the current Manual on Uniform Traffic Control Devices (MUTCD), and the CoGF Official Code. Any conflicts or differences in these documents shall be resolved in favor of the CoGF Official Code, then these Standards, and then MUTCD.

B. All roads within a proposed subdivision shall be designed by a professional engineer and approved by the City Engineering Office.

8.1.2 Traffic Impact Analysis (TIA)

A. Required when the peak hour traffic of the proposed development at build-out exceeds three hundred (300) trip ends. When the peak hour traffic is between two hundred (200) and two hundred ninety-nine (299) trip ends, the CoGF may require a traffic impact analysis when circumstances warrant such review;

B. Shall be prepared and stamped by a professional engineer as approved by the CoGF, with expertise in transportation planning;

C. Trip generation rates for various land uses shall be based on the manual entitled "Trip Generation" (latest edition) published by the Institute of Transportation Engineers;

D. Trip generation rates from other sources may be used if it can be shown that the alternative source better reflects local conditions;

E. The development shall maintain or improve the existing LOS of the affected roadways;

F. Complete in accordance with MDT requirements and nationally accepted standards;

G. Contents:

I. The study's purpose and goals;

II. A description of the site and study area;

III. Existing traffic conditions:

a. Roadway geometries;

b. LOS of each intersection;

c. Traffic counts;

d. Crash analysis; and

e. Road capacity analysis

IV. Anticipated nearby land developments and transportation improvements;

V. Analysis and discussion of trip generation, distribution, and modal splits;

VI. The traffic assignment resulting from the proposed development;

VII. The projection and assignment of future traffic volumes;

VIII. The projection and assignment of future traffic volumes;

IX. Identify all negative impacts associated with the proposed development including LOS impacts;

X. Thoroughly detail a mitigation plan for the negative impacts based on nationally accepted standards and resources;

XI. Recommendations for off-site improvements to the primary access and related transportation facilities and infrastructure which are directly attributable to the development; and

XII. Account for other forms of transportation, including bicycle and pedestrian.

H. Study limits shall be determined by the City Engineering Office.

8.1.3 Intersections

A. Design in accordance with the current version of AASHTO A Policy on Geometric Design of Highways and Streets (AKA AASHTO Green Book);
B. Streets shall intersect at 90° angles, if topography permits, but in no case shall the angle of the intersection be less than 75° for a minimum distance of 60 feet as measured along the centerline, from the right-of-way line at the intersecting street;
C. No more than two streets may intersect at one point;
D. Two streets meeting a third street from opposite sides shall meet at the same point, or their centerlines shall be offset at least 125 feet for local roads and 300 feet for collectors;
E. Intersections of local streets with arterials shall be kept to a minimum;
F. Maximum straight tangent grade of approach to any intersection shall not exceed 2% for a distance of 60 feet as measure from edge of transverse pavement to provide for adequate starting, stopping, and stacking distances; and
G. The back of curb radius at a street intersection shall be 22.5 degrees.

8.1.4 Dead-end Streets

A. Dead-end streets shall meet the requirements of Title 17 of the CoGF official code;
B. Cul-de-sacs must meet a forty-two and one-half (42½) foot radius from center of cul-de-sac to back of curb, a fifty-five (55) foot radius on the right-of-way, and cannot be longer than five hundred (500) feet; and
C. Temporary dead-end streets shall be approved by the Fire Chief and City Engineer.

8.1.5 Sight Distance

A. Shall be determined by design speed as required by the AASHTO Green Book; and
B. A minimum of 200-feet is required for all horizontal and vertical curves.

8.1.6 Local, Collector, and Arterial Streets

A. Location shall comply with the City of Great Falls Growth Policy, Long Range Transportation Plan, and/or any other major street and highway plan as adopted by the CoGF;
B. The development of frontage roads or shared accesses serving new developments shall be used along collectors and arterials rather than the use of individual driveways or approaches;
C. Temporary dead-end streets shall have a fully functional temporary cul-de-sac until the permanent street connection is made;
D. Curved collector streets shall have a centerline radius not less than 250 feet; and
E. Curved local streets shall have a centerline radius not less than 100 feet.

Table 7 – Road Design Standards for Local Subdivision Streets

DESIGN	ARTERIAL	MINOR	COLLECTOR	LOCAL	ALLEY

STANDARDS		ARTERIAL			
Minimum Right-of-Way	110 Feet	100 Feet	80 Feet	60 Feet	20 Feet
Pavement Width	Approved by City Engineer	As approved by City Engineer	37 Feet[3]	31 Feet	10-12 Feet
Maximum Grade	5%	7%	10%	10%	10%
Minimum Grade	0.5%	0.5%	0.5%	0.5%	0.5%
Design Speed		As approved by City Engineer	35 mph	25 mph	15 mph
Crest minimum k-value	Based on Design Speed	Based on Design Speed (DS)	Based on DS	12	12
Sag minimum k-value	Based on DS	Based on DS	Based on DS	26	26
Crest Vertical Curve Length	Based on DS	Based on DS	Based on DS	75 ft (min)	75 ft (min)
Sag Vertical Curve Length	Based on DS	Based on DS	Based on DS	75 ft (min)	75 ft (min)
Cul-de-sac turnaround	a.	Minimum back of curb radius		42.5 ft	
	b.	Minimum right-of-way radius		55 ft	
	c.	Maximum length[4]		500 ft	

[3] On street parking governed by the Official Code of the City of Great Falls.
[4] Measured from the centerline of the intersection to the center point of the cul-de-sac.

8.1.7 Traffic Control Signs, Street Name Signs and Street Names

A. General

I. The developer shall provide all necessary permanent traffic control signs to the CoGF Traffic Foreman (406-781-8991) and the Traffic Division shall install the signs;

II. The signs shall be built in accordance with the MUTCD and approved by the Traffic Division;

III. Developer and/or Contractor shall contact the Traffic Foreman (406-781-8991) three (3) business days in advance of removing temporary traffic control and request that the permanent traffic control signs be installed;

IV. Should existing permanent traffic control signs need to be temporarily removed to facilitate construction, developer and/or contractor shall install the temporarily traffic control and notify the CoGF Traffic Foreman one (1) business day in advance of needed the CoGF to remove the permanent traffic control signs;

V. Road Name Signs shall be installed at each intersection;

VI. New roads shall be assigned a road name per the CoGF *"Site Addressing and Road Naming Policies and Procedures Manual"*;

VII. All proposed road names shall be submitted to the CoGF Addressing Division for approval prior to preliminary plat submittal; and

VIII. A road naming assignment by the City to any road shall not constitute or imply jurisdiction, ownership, right of use, guarantee of access, or acceptance into the City road maintenance program.

B. Road Geometric Guidelines

I. A road shall be essentially continuous, without gaps;

II. If a road has a branch or branches, separate names shall be used for the minor branch(es); and

III. Each road shall have the same name throughout its entire length, except that a road name may change when, and only when, there is a substantial intersection or at municipal boundaries.

8.1.8 Sidewalks:

A. All developments shall have sidewalks which will allow pedestrians to safely travel from any part of the development to the boundaries of the development;

B. Developments abutting existing or proposed roadways will be required to have sidewalks within the public right-of-way and parallel to the roadways;

C. The minimum width of a sidewalk shall be 5 feet in Collector and Local right-of-ways and 8 feet in Arterial right-of-ways;

D. The minimum width of sidewalks designated as "shared use paths" shall be 10 feet;

E. Sidewalks are required on both sides of the street in all subdivisions;

F. Sidewalks shall be separated from the street by a 6.5 foot wide boulevard in areas with a 60 foot right-of-way or 8.5 foot wide boulevard in areas with an 80 foot right-of-way;

G. All sidewalks shall rise three sixteenth (3/16) inch to the foot or one and one-half (1.5) percent from the curb to the property line and shall slope toward the street;

H. Sidewalks shall be configured according to the ADA requirements;

I. New or existing sidewalk being replaced through a new or existing driveway shall meet ADA requirements, this may require the contractor to remove portions of the existing driveway;

J. Cement concrete private walks shall be of uniform width and shall be built upon the established grade from the curb-line to the property line, and shall be not less than thirty-six (36) inches in width or more than sixty (60) inches in width (OCCGF 12.13.040.B);

K. Provided that in front of churches, schoolhouses, nursing homes, long term care facilities, medical facilities, court houses, and other public buildings, the cement concrete private walks may be of greater width than above mentioned (OCCGF 12.13.040.B);

L. Sidewalks shall be constructed per standard drawing 5-10C;

M. Sidewalks shall be constructed with 6.5 sac cement and have a 28 day strength of 4,000 psi; and

N. The back of curb radius at a street intersection shall be 22.5 degrees.

8.1.9 Boulevard/Open Space:

A. Boulevard/open space shall be landscaped in accordance with the CoGF Official City Code with a plan approved by the City of Great Falls Planning and Community Development Department (406-455-8430); and

B. Boulevards shall generally slope at a two (2) percent from the top back-of-curb elevation to the property line to ensure positive drainage towards the street.

8.1.10 Shared Use Paths:

A. Non-motorized shared use paths shall be designed with a 20 mph design speed and in accordance with the most recent version of AASHTO's "Guide for the Development of Bicycle Facilities" and "Guide for the Planning, Design and Operation of Pedestrian Facilities";
B. Paths shall be 10 feet wide unless physical constraints limit the width, in which case the City Engineer may consider a reduction to not less than 8 feet;
C. In limited instances, the PWD Director may require the path to be built to accommodate HS-20 loading if the path serves as an emergency or maintenance access route;
D. No catch basins, valve boxes, curb boxes, or other utility appurtenances shall be located within the path;
E. Signage and pavement markings shall conform to the most current MUTCD, unless otherwise approved by the CoGF;
F. The surfacing section required on paths is 4 inches of asphalt on 8 inches of 1.5 inch minus crushed rock base compacted to 95% max dry density, when the path will not be driven on;
G. Landings and ramps shall be constructed of concrete meeting ADA requirements and the CoGF sidewalk landing and ramp standards; and
H. No tripping hazard or obstruction may be located within 2 feet of the edge of the shared-use path, including but not limited to sign posts or landscaping features, unless approved by the CoGF.

8.1.11 On-Street Parking:

A. At intersections:
    I. Shall be outside of the clear sight triangle as detailed in CoGF municipal code; and
    II. The City Engineer reserves the right to increase clear sight triangles based on site specific conditions.
B. Along streets:
    I. Shall not be permitted on:
        a. Arterials;
        b. Collectors less than 34 feet in width as measured from edge of asphalt to edge of asphalt;
        c. Local streets less than 28 feet in width as measured from edge of asphalt to edge of asphalt;
        d. Any street with a rural road section; and
        e. Streets not meeting sight distance per Section 8.1.5.

8.1.12 Driveways:

A. Prior to the installation of a driveway curb cut or other access point onto a CoGF public street or right-of-way, the developer or owner shall obtain approval from the City Engineering Office.

B. Prior to the installation of a driveway curb cut or other access point onto a public street or right-of-way within the CoGF and under MDT's jurisdiction, the developer or owner shall obtain approval from both the City Engineering Office and from MDT;
C. The nearest edge of any driveway shall be not less than 35 feet from the edge of the pavement to the nearest intersecting street;
D. Curb cut widths shall conform to the requirements of the OCCGF 17.32.150;
E. All new driveway locations and modifications to existing driveways shall be reviewed and approved by the City Engineering Office prior to beginning construction;
F. All driveways shall have the back of curb dropped a minimum of 4 inches for the width of the driveway and the minimum driveway transition distance shall be from the back of the curb to the property line; occurring in a uniform manner (OCCGF 12.13.070.A);
G. Curb fillets constructed by filling the curb and gutter are prohibited as a means to transition from the street to the driveway (OCCGF 12.13.070.B);
H. Concrete crosswalks through driveways shall conform to ADA requirements, which may require the removal of portions of the existing driveway behind the property line; and
I. All driveways shall be constructed per standard drawings 5-10A, 5-10B, 5-10D, and/or 5-10E.

8.1.13 Placement of Utilities:
A. See Chapter 4 in these Standards; and
B. All applicable laws, rules and regulations of appropriate regulatory authority having jurisdiction over utilities shall be observed.

8.1.14 Traffic Calming Devices
A. Shall be recommended by a traffic study completed by a PTOE;
B. Shall not conflict with any operation and maintenance activities; and
C. Shall be approved by the Transportation Planner and the City Engineering Office.

8.1.15 Guardrails
A. In areas of excessive fill or steep back slopes, roadside guardrail shall be installed consistent with the standards in the latest version of "Roadside Design Guide" as published by AASHTO and these *Standards;* and
B. Location, style, and design of the roadside guardrail shall be reviewed and approved by the City Engineer's Office.

8.1.16 Pavement Design
A. A pavement design report shall be prepared for all street projects by a registered professional engineer, or qualified professional approved by the City Engineer;
B. The pavement design report shall be submitted CoGF for review and approval;
C. Pavement thickness shall be consistent with these *Standards*, the standards contained in the current AASHTO "Guide for Design of Pavement Structures" or the current Asphalt Institute Manual Series No. 1 (MS-1);
D. The design shall be based on the following:
    I. Site characteristics (e.g. soils);
    II. Based on at least a twenty year performance period traffic volume;

III. The minimum design lane equivalent 18,000 pound single axle load (ESAL) used in pavement design must not be less than:
   i. 50,000 ESAL on Local Roads;
   ii. 200,000 ESAL on Collector Roads;
   iii. 1,250,000 ESAL on Minor Arterial Roads; and
   iv. 4,500,000 ESAL on Arterial Roads.

IV. The minimum road section for Local and Collector Roads shall be 12 inches of 1½ inch minus base course under 4 inches of asphalt;

V. The minimum road section for Minor Arterial Roads shall be 16 inches of 1½ inch minus base course under 6 inches of asphalt; and

VI. The minimum road section for Major Arterial Roads shall be 20 inches of 1½ inch minus base course under 6 inches of asphalt.

8.1.17 Standards for Back Slope and Fill Slope

Cut Depth	*Allowable Back Slope*
0-5 feet	*5:1*
5-10 feet	*4:1*
10-15 feet	*3:1*
15-20 feet	*2:1*
>20 feet	*1.5:1*

Fill Height	*Allowable Fill Slope*
0-10 feet	6:1
10-20 feet	4:1
20-30 feet	3:1
>30 feet	2:1

8.2. CONSTRUCTION STANDARDS

8.2.1 General

A. Roadway systems, including private roadways, shall be constructed in accordance with the current edition of the *Standards* (this document), the *MPWSS,* and other standards referenced elsewhere in this document. Any conflicts or differences in these documents shall be resolved in favor of the OCCGF and then these *Standards*;

B. Upon completion of roadway construction, a professional engineer shall certify the construction of private roadways meets the requirements of the *Standards*;

C. When the existing asphalt thickness is greater than 4 inches, *at a minimum* the reconstructed road/trench opening shall be paved with a thickness equal to the existing thickness with Type B Asphalt Plant Mix Aggregate on top of a minimum of a 12-inch thick base course meeting the 1½ inch minus; and

D. Road section thickness shall meet the minimum requirements of these *Standards* unless the Geotechnical Report recommends thicker sections.

8.2.2 Materials:

A. Asphalt:
   I. At a minimum, all new roads or reconstructed roads shall be paved with a minimum of 4 inches of Type B Asphalt Plant Mix Aggregate, (PG 58-28) asphalt binder, and shall be accomplished in accordance with current MPWSS; and
   II. PG 64-28 Polymer Modified shall be used when required by MDT and/or PWD Street Manager.

B. Crushed base:
   I. The crushed base for streets shall be 1½ inch minus crushed stone in accordance with MPWSS Section 02235 and shall meet all requirements of said section;
   II. All new roads or reconstructed roads shall have a minimum of 12-inches of 1½ inch minus crushed stone installed in accordance with the current MPWSS; and
   III. A geotextile such as Mirafi 600X (or approved equal) shall be placed between the base course and the sub base (or existing sub surface ground).

C. Street Sub base (when required):
   I. The sub base for streets shall be crushed stone in accordance with MPWSS Section 02234 and may include up to 3 inch minus material with at least one fractured face. Larger material may be approved on a case-by-case basis, with at least one fractured face.

APPENDIX A – OWNERSHIP TRANSFER LETTER

Appendix A – Example Ownership Transfer Letter

City of Great Falls
Engineering Division
P.O. Box 5021
Great Falls, MT 59403

Re: Name of project/building/subdivision

(I)(We), the undersigned property owner(s), do hereby certify that (I)(We) have caused to be designed, constructed and tested the required infrastructure improvements necessitated by the development of (NAME of project/subdivision) in accordance with the approved plans.

As a condition of this development, we dedicate the improvements to the City of Great Falls (City). These improvements include all improvements within the City right-of-way including streets; sidewalks; street lighting; storm sewer, sanitary sewer, and water distribution mains; and other associated appurtenances. Also included in the dedication are water, sanitary sewer and storm drainage mains and appurtenances, and stormwater treatment facilities in easements or on dedicated land outside of rights-of-way. Specifically excluded from this dedication are stormwater facilities located outside of the City owned rights-of-way, which shall be owned and maintained by the property owners unless otherwise maintained by a stormwater service agreement (or HOA, POA, etc.).

(I)(We), further agree to the fullest extent permitted by law, (I)(We) shall fully indemnify, defend, and save City, its agents, representatives, employees, and officers harmless from and against any and all claims, actions, costs, fees, losses, liabilities or damages of whatever kind or nature arising from or related to the infrastructure improvements subject to this Agreement or work of any subcontractor or supplier.

Dated this _____day of _____, 20__.

(Acknowledged and notarized signatures of all
record owners of developed property)

APPENDIX B – DRIVEWAY APPLICATION

APPLICATION FOR DRIVEWAY CONSTRUCTION

CITY OF GREAT FALLS

406-771-1258

Owner Information and Site Location

1) Owner's Name:_____

2) Owner's Address:_____

3) Job Address:_____ Lot:_____ Block: _____

4) Phone Number:_____ Project Title:_____

Contractor Name:_____ Address:_____

Driveway Construction Requirements

1) Driveway construction within the public right-of-way shall be approved by the Great Falls City Engineer prior to construction.

2) The nearest edge of any driveway shall not be closer than 35 feet to the nearest edge of the pavement of the street intersecting the street serving the driveway. If curbing exists, the roadside face of the curbing shall be the measuring point.

3) All driveway construction shall be in conformance with the Standards and General Provisions for Design and Construction for Great Falls, Montana. The basic construction requirements are as follows:

    a) Existing curbing at the location of the driveway must be removed and replaced with drive over type curbing.

    b) Driveway approaches between the curbing and property line must be constructed with concrete. See detail 5-10A, 5-10B, 5-10D, or 5-10E City of Great Falls Standards for Design and Construction.

4) Driveway construction within the City Right-of-Way must be performed by a bonded and insured contractor.

5) The contractor must present an approved Application For Driveway Construction to the City of Great Falls Planning and Community Development Department in order to obtain a Public Right-of-Way Excavation Permit prior to beginning construction.

PLAN SUBMITTAL PROCESS

1) The property owner must submit a completed application with a site sketch to the City Engineer's Office for review.

2) The Public Works Department will respond within five (5) working days with an approval or disapproval.

3) If the application is approved, construction may proceed, (see Driveway Construction Requirements, Item 5).

4. If the application is disapproved the specific reasons will be given along with the requirements for re-submittal.

SITE PLAN SKETCH

APPROVAL BLOCK

Approved: _____ Date:_____
Title

This Application will be null and void if the driveway construction approved by this application is not completed within six (6) months from the date of approval.

Comments:_____

_____

_____

_____

APPENDIX C – CHECK LIST & DEVIATION REQUEST

No.	YES	N/A	Deviation Requested	Design Criteria
2.1.1.A				MT State Plane - International Feet
2.1.1.B				NAVD 88 or City of Great Falls Datum
2.1.1.C				Contours
2.1.1.D				Alignment data
2.1.2				Title Sheets
2.1.3				Plan Sheets
2.1.4				Plan and Profile Sheets
2.1.5				Detail Sheets
2.1.6				Road and Drainage Plans
2.1.7				Drainage Facilities and Swales
2.1.8				Basin Maps
No.	**YES**	**N/A**	**Deviation Requested**	**Project Submittals**
3.1.1.A				Civil Plans
3.1.1.B.III.a				Project Manual or applicable specifications
3.1.1.B.III.b				Water Design Report
3.1.1.B.III.c				Sanitary Sewer Design Report
3.1.1.B.III.d				Storm Drainage Design Report
3.1.1.B.III.e				Traffic Impact Study
3.1.2				Resubmittals
3.3.1				Deviation Requests
No.	**YES**	**N/A**	**Deviation Requested**	**Development Requirements**
4.1.1.B				Roadway and utility extensions
4.1.1.B.II				Right-of-ways and easements
4.1.2				Utility Requirements
4.1.3				Utility easements

Project: _____

Professional Engineer: _____

License No.: _____

Firm: _____

Date: _____

MT Professional Engineer's Stamp

Deviation requests noted on this form shall be submitted for review and approval in accordance with Section 3.3 of the Design and Construction Standards. Deviations not individually approved, even if shown in the approved plans, specifications, or reports, are not approved.

Project: _____

Firm : _____

Date : _____

No.	YES	N/A	Deviation Requested	Water System
5.1.1.A				Professional Stamp
5.1.1.B				MDEQ Circular 1 Requirements
5.1.1.C				Fire flow tests
5.1.3.A-B				Horizontal and vertical offsets
5.2.1.A				Water pipe size
5.2.1.B				Water pipe locations
5.2.1.C				Pipe materials
5.2.2.A				Valve sizes and types
5.2.2.B				Valve locations
5.2.3				Valve box materials
5.2.4				Fire hydrant
5.2.11.A				Water service general requirements
5.2.11.B				Water service construction
5.2.11.C				Water service locations
5.2.11.D				Water service sizes
5.2.12				Service saddle materials
5.2.13-14				Corp. and curb stop materials
5.2.15				Curb box materials
5.2.16				Entrance Valve materials
5.2.17				Tapping Saddles
5.2.18				Couplings
5.2.20				Pipe Bedding
5.2.21				Warning tape
5.2.22				Tracer wire
5.2.23				Marker post materials

Deviation requests noted on this form shall be submitted for review and approval in accordance with Section 3.3 of the Design and Construction Standards. Deviations not individually approved, even if shown in the approved plans, specifications, or reports, are not approved.

Project:_____

Firm : _____

Date : _____

No.	YES	N/A	Deviation Requested	Sanitary Sewer System
6.1.1.A				MT PE Stamp and overall plan at buildout
6.1.1.B				MDEQ Circular 2
6.1.1.C				Sanitary Sewer Facility Plan design criteria
6.1.1.D				Over sizing
6.1.1.F				Existing sewer system analysis
6.1.1.G				Existing or proposed lift station data
6.1.2				General construction standards
6.1.3				Usage restrictions
6.1.4				Sulfide generation analysis
6.1.5				Locations
6.1.6				Offsets
6.2.1				Gravity main sizing and velocities
6.2.2				Sewer force mains
6.2.2.G				Private sewer force line connected at manhole
6.2.3.A				General sewer service requirements
6.2.3.C-F				Sewer service construction standards
6.2.3.G				Force sewer service line
6.2.3.H				Sewer service line materials
6.2.3.I				Sewer taps
6.2.3.J-M				Misc. sewer service items
6.2.4				Sewer pipe bedding
6.2.5				Detectable warning tape
6.2.6				Marker posts
6.3.1				Manhole design
6.3.2				Manhole construction
6.4.1				Lift station design
6.4.2				Lift station construction
6.5.1				Grease traps and interceptors
6.5.2				Grease trap design and construction standards
6.5.3				Grease interceptors design and construction standards
6.5.4				Sand, oil interceptors
6.5.5				SOI design and construction standards

Deviation requests noted on this form shall be submitted for review and approval in accordance with Section 3.3 of the Design and Construction Standards. Deviations not individually approved, even if shown in the approved plans, specifications, or reports, are not approved.

Project:_____

Firm : _____

Date : _____

No.	YES	N/A	Deviation Requested	Transportation System
8.1.1				MUTCD, AASHTO guidelines, OCCGF, MT PE stamp
8.1.2				TIA requirements
8.1.3				Intersections
8.1.4				Dead-end streets
8.1.5				Sight distance
8.1.6				Local, collector, and arterial streets
8.1.7				Signs
8.1.8				Sidewalks
8.1.9				Boulevards/ open space
8.1.10				Shared use paths
8.1.11				On-street parking
8.1.12				Driveways
8.1.13				Placement of utilities
8.1.14				Traffic calming devices
8.1.15				Guardrails
8.1.16				Pavement design
8.1.17				Back slope and fill slope
8.2.1.A				MPWSS and Standards
8.2.1.B				MT PE
8.2.2.A				Asphalt material
8.2.2.B				Street sub base material
8.2.2.C				Crushed base course material

Deviation requests noted on this form shall be submitted for review and approval in accordance with Section 3.3 of the Design and Construction Standards. Deviations not individually approved, even if shown in the approved plans, specifications, or reports, are not approved.

APPENDIX D – LOW PRESSURE GRINDER PUMP SYSTEMS

SEWER DESIGN STANDARDS - LOW PRESSURE SEWER/GRINDER PUMP SYSTEMS

General.

1) A grinder pump and pressure sewer system is to be considered as an alternative for providing sewer service for a site, only if the site cannot be serviced by conventional gravity systems (including pumping stations).

2) Pressure sewer system is defined as an area to be serviced by more than a single grinder pump.

3) The City of Great Falls considers all Grinder Low Pressure/Grinder Pump Systems as private systems that are owned, operated and maintained by an entity such as an Owners Association. The formation of an Association with a System Operating & Maintenance Agreement is a City requirement of approval of such sewer system.

4) All systems shall comply with all applicable State of Montana standards and regulations.

Design Requirements.

1) Grinder pumps used in pressure sewer systems for residential areas can only be the ones that have been previously approved or ones that may be subject to approval by the City of Great Falls for systems applications. Determine the type and model of the pump suitable for the system.

2) All pump types and models are to be the same in a single pressure sewer system unless otherwise approved by the City of Great Falls.

3) Primary design parameters to be considered are the number of pumps under simultaneous operation, flow velocities in pressure sewer piping, and limiting the operating head at a pump. Consider the following guidelines in defining these parameters:

a) Number of pumps under simultaneous operation.

i. Semi-positive displacement pump systems shall be designed in accordance with the Manufacture's recommended specifications and design standards and shall conform to the maximum number of simultaneously operating pumps.

ii. Centrifugal pump systems shall be designed in accordance with the Manufacture's recommended specifications and design standards and be sized so that the pumps under simultaneous operation shall be able to discharge the peak flow generated by the dwelling units located upstream of any point in the pressure sewer system under consideration.

iii. For centrifugal pumps having a nominal discharge rate relatively close to that of an Environmental 1 (E/1) Pump, the maximum number of simultaneously operating pumps developed for E/1 pump systems may be used.

b) Flow velocities.

i. Size a system for the maximum number of pumps that may be expected to operate under the full development stage, thereby generating the highest flow velocities and pumping head. Also consider in the design system hydraulics during the initial stage when a fewer number of pumps are expected to operate and lower velocities may be expected.

ii. The minimum flow velocity should be approximately three (3) fps under simultaneous pump operating conditions, except for piping servicing one to two dwelling units where a two (2) fps minimum velocity shall be used. A three (3) fps minimum velocity criteria is required for pressure sewer profiles which have multiple high points and low points.

iii. The maximum velocity shall be approximately seven (7) fps under simultaneous pump operating conditions.

c) Operating head at a pump.

i. Maximum pumping head for system design to be ninety (90%) percent of the manufacturer's pump performance curve.

ii. Design a centrifugal pump not to operate at above ninety (90%) percent of its shut off head and at or below its cut off point. The shut off head is the head at zero pump discharge; the cut-off point is a point on the pump curve where discharge head decreases abruptly with a small incremental flow.

5) Size a pressure sewer system and develop alternative designs such that the above criteria can be met during the full development stage and the initial stage as well.

6) System Design

a) Pumps

i. With the selected maximum number of grinder pumps in simultaneous operation, design the piping system and submit all calculations, using the following design methods.

ii. For semi-positive displacement pump systems use the E/1 Design Handbook for Pressure Sewer Systems or other pump manufacture's design information. Computerized design may be used for complex systems to give better accuracy in hydraulic calculations.

iii. For centrifugal pump systems, a number of branches should be used to represent the piping layout similar to the design of semi-positive displacement pump systems. The

peak flow generated by all dwelling units in a branch shall be estimated. Locations of the pumps shall be designated and computer designs shall be used for analyzing system hydraulics during simultaneous pump operation.

iv. Pumps located at the most remotest part of a system, farthest from the point of discharge to gravity system, and pumps located at the lowest elevations in a system must be considered in pump selection for simultaneous operation.

v. In computing the static head, base the pump elevation on the developer's proposed elevation at which the grinder pump will be installed.

b. Pipe

i. Minimum Pipe Size 1-1/4-inch diameter, Maximum Pipe Size 4-inch pipe diameter.

ii. Allowable pipe material, SDR-21 PVC pipe and/or SDR-11 HDPE pipe. PVC pipe is generally installed in open-cut trench and HDPE pipe can be installed in open-cut trench or by horizontal directional drilling.

iii. Use Hazen-Williams (HW) friction coefficient of one hundred forty (140) for calculating head losses through piping. Consider head losses through fittings and bends and other minor losses when calculating the total dynamic head.

iv. Use sound engineering and hydraulic principles in design and analysis. Consider various scenarios of pipe sizes, system layout, and pump operation to arrive at an optimum design. Use of computer analysis enables checking for minimum and maximum flow velocities and pump discharge head under various operating scenarios.

v. Uphill pumping is preferred in a pressure sewer system where the point of discharge to gravity system is at a higher elevation than the rest of the system, so as to maintain positive pressure throughout the system. Eliminate vertical piping alignment that may be conducive to siphoning at high points or gravity drain/air binding in downhill pumping conditions. Ideally, high points and low points are to be avoided and a continuously rising pressure sewer profile toward the point of gravity discharge is to be designed. Place pressure sewer air vacuum and air release valves at all high points in a system, if the high point cannot be eliminated.

vi. PVC and/or HDPE piping is allowed, the nominal pipe diameters called for on the drawings may be different depending on the material. HDPE may be installed by horizontal directional drilling.

vii. Joints and thrust restraint. PVC gasketed integral bell and spigot joints or bell by bell gasketed couplings shall be retrained mechanically and/or using concrete thrust blocks. PVC solvent weld shall be joined together using solvent weld couplings or integral solvent weld bell and spigot joints. HDPE pipe is generally a continuous pipe from a

long coil or lengths of pipe and fittings joined by thermal butt-fusion, electrofusion, or by special mechanical couplings. Joints for all HDPE pipe that is to be installed by horizontal directional drilling will be butt-fused. HDPE has a very high coefficient of thermal expansion/contraction.

c. Horizontal and Vertical Alignment, Depth, Clearances.

i. Minimum depth of pipe is 6.5 feet below the ground elevation.

ii. Minimum horizontal clearance with domestic (drinking) water mains and service line pipes is 10.0 feet.

iii. Minimum vertical clearance with domestic (drinking) water mains and service lines is 18 inches.

iv. Avoid 90 degree bends in the pipeline alignment

v. Design the piping layout to minimize the total piping length.

vi. To install HDPE pipe by horizontal directional drilling construction areas will be required at one end of the operation for layout and fusing pipe lengths to be pulled unless coils are used, and at the other end to set up and operate the drilling/pulling machine and drilling fluid storage tank and waste fluid storage. The amount of area required depends on the specific equipment used. Generally, sufficient area will be available in the normal right-of-way and construction strip used in the pipeline design. Verify that adequate space is available in the right-of-way and construction strip limits.

vii. For minimum radius of curvature for PVC pressure sewer pipe, see Table below. Minimum radius of curvature for HDPE pipe installed in open-cut trench is forty (40) times the outside pipe diameter. Minimum radius of curvature for directionally drilled HDPE is dependent on allowable radius of curvature of Contractors' drilling rods. For design purposes, this can be assumed to be forty (40) feet. Radius of curvature at low points should be maximized.

Minimum Curve Radius for PVC Pressure Sewers

Pipe Size	Minimum Radius
1-1/4-inch to 1-1/2-inch	60 feet
2-inch	70 feet
2-1/2-inch	100 feet
3-inch	90 feet
4-inch	130 feet

d. Hydrogen Sulfide (H2S) Generation and Release Analysis and System Design.

i. Perform the analysis for the proposed design to determine the potential for hydrogen sulfide generation.

ii. Design the piping layout to minimize the total piping lengths and pipe sizes within the constraints of the hydraulic design criteria, so as to minimize sewage detention time in the system. Avoid downhill pumping conditions with a high point above the transition manholes, which will potentially cause the release and accumulation of hydrogen sulfide gas at the high points.

iii. The discharge of sewage from a pressure sewer into a gravity sewer can potentially generate odor and the release of hydrogen sulfide at the transition manhole and in the downstream gravity sewer. Turbulence at the connection manhole should be minimized. Consider the corrosive effects of hydrogen sulfide in the design and selection of gravity sewer pipe material downstream of the connection manhole

Appurtenances and Structures.

1) Each service line lateral shall be connected to the trunk force main using approved tapping saddles and corporation stops. Each service lateral shall also be equipped with a lateral assembly including compression adapters, curb shut off valve and check valve all located in an accessible vault structure with the public right-of-way boulevard area.

2) Install Flushing Connections at a minimum of every four hundred (400) feet in the system, or at dead ends. Flushing connections shall be freeze proof and access lids shall be rated for expected external loading.

3) Air release valves shall be included at any high points in system.

4) Connect the pressure sewer with the gravity sewer at a manhole on the gravity system.

a. <u>Coating Specification:</u>

i. Referenced standards and Specifications:

1. SP 6 Commercial Blast Cleaning
2. SP10 Near White Blast Cleaning
3. SP 13 Surface Preparation of Concrete

Materials: Interior Damp Proofing: Provide a two coat, Perma-shield MCU coating product, Tnemec 446 hydrophobic aromatic polyurethane, or approved equal. Epoxy Modified Mortar: Provide epoxy modified “skim coat” mortar for

concrete patching, filling voids and holes. Provide Tnemec Mortar Clad Series 218 or approved equal.

Surface Preparation Execution:

All interior concrete walls, cover, floor and all other expose interior surfaces will require the interior damp proofing. All interior surfaces to be coated shall be clean and dry. All dirt, dust, sand, grit, mud, oil, grease and other foreign matter shall be removed. Prepare all interior surfaces to be coated per Steel Structures Painting Council Specification SP 13 or blast cleaning SP 6.

Application Execution:

Apply the specified epoxy modified mortar skim coat to all interior surfaces per manufacturer's application instructions. Patch and fill voids and holes ¼" – ½" in depth. Apply skim cost covering 100% of all concrete surfaces areas at 1/16" – ¼" spread rate.

The interior coating shall be brush, rolled, or sprayed in two coats, 8-10 dry mil thickness per coat, 16-20 dry mil total thickness. Concrete surfaces shall be cured and dry prior to coating.

Curing:

Curing shall adhere to manufacture's curing and drying schedule. Coatings must be fully cured before placing low pressure/grinder pump system into service.

b). Connection Point:

i. Pressure sewer shall enter manhole at 2/3 depth elevation of the gravity sewer pipe.

5) Include locator wire and stations on all installations including laterals. Locator specifications can be found under the City's water system standards.

Pressure Testing

1) All pressure mains and laterals shall be pressure hydrostatically tested after partial backfilling and are fully charged. The hydrostatic pressure shall be 150 percent of the

maximum operating pressure. The duration of each test shall be 2 hours. Allowable leakage will be in accordance with AWWA C-600 or determined by the formula $L = 0.000083(D)(S)$ where L is the allowable leakage in gallon per hour , S is the length of pipe under test in feet and D is the pipe diameter in inches.

APPENDIX E – COMMERCIAL BACKFLOW PREVENTERS

COMMERCIAL BUSINESS BACKFLOW PREVENTERS

General.

Reduced Pressure Backflow, Double Check Valve Assembly, and Pressure Vacuum Backflow shall be used for the following: potable water service mains, fire line mains and lawn irrigation as per manufacturer installation manuals and authority having jurisdiction.

1) Backflow Preventers shall conform to the current adopted installation requirements of the International Association of Plumbing and Mechanical officials also known as "Uniform Plumbing Code" and these rules and regulations;

2) **Backflows shall be tested yearly;**

3) Backflow assembly tester shall be ASSE 5000 certified;

4) Backflow assembly certifiers shall be licensed per city licensing rules;

5) Property owner shall maintain backflow test reports (required 3 year minimum on file), and such reports shall be available upon request to the authority having jurisdiction; and

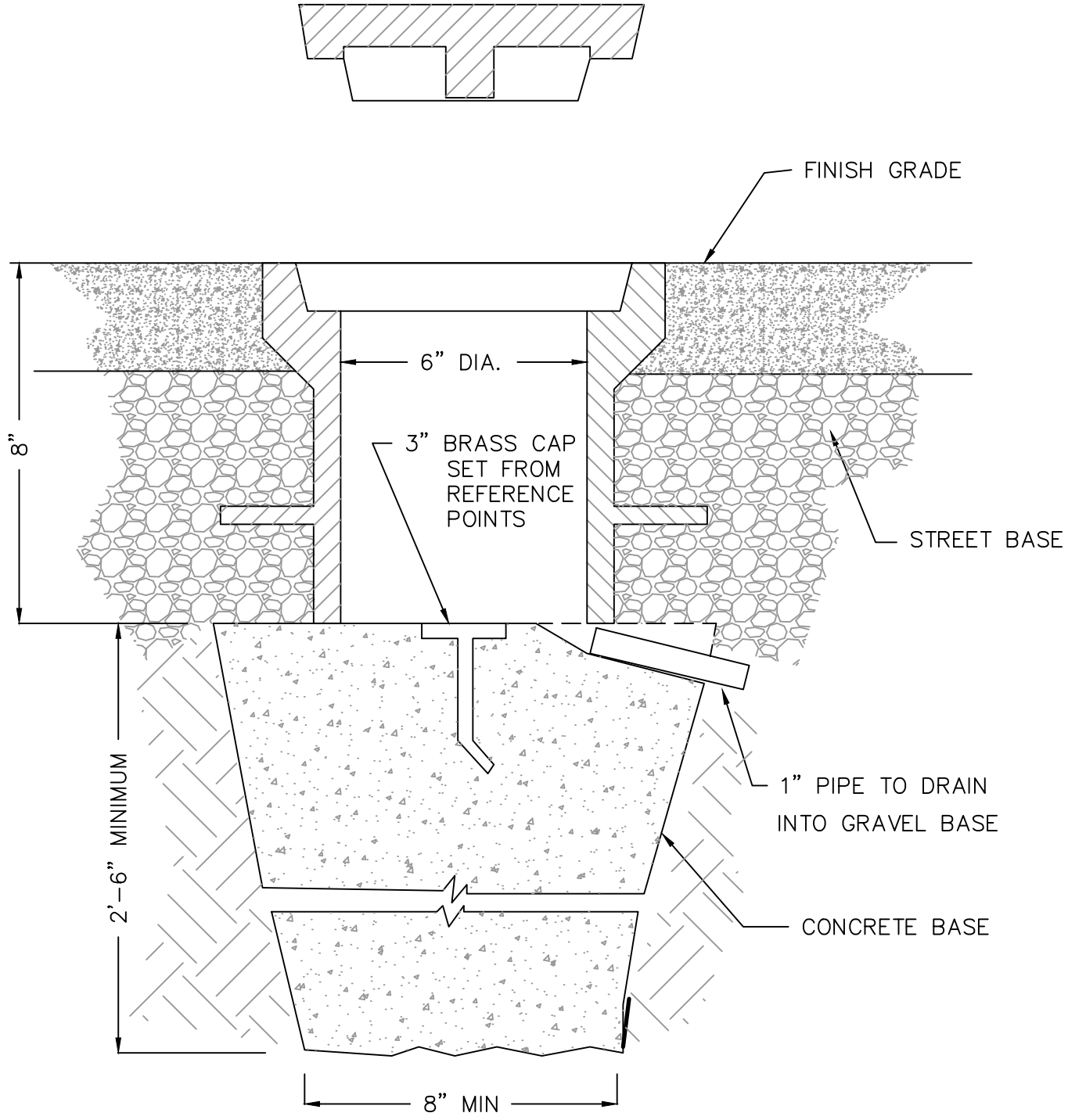
6) Floor drains or floor sinks (with trap primers) may be required when the backflow is installed within a building.

CITY OF GREAT FALLS STANDARD DETAILS

Typical Details - Article 5	Drawing Number	Current Drawing Date
Monument Box	5-01	1987
Straight Curb	5-03	1987
Barrier Curb	5-04	2011
Mountable Curb	5-05	1999
Integral Curb & Gutter Details	5-06	2017
Standard Concrete Alley Apron- Grass back of curb	5-08A	2012
Standard Concrete Alley Apron- Sidewalk back of curb	5-08B	2012
Standard Concrete Alley Apron- City Jobs	5-08C	2012
Standard Concrete Alley Apron- City Jobs	5-08D	2012
Standard A/C Paving Alley	5-09	1994
Driveway - Sidewalk at curb	5-10A	2019
Driveway - Sidewalk not at curb	5-10B	2019
Curb and Sidewalk cross section	5-10C	2015
Driveway - Straight Curb sidewalk not at curb	5-10D	2015
Driveway - Downtown Decorative Stamp	5-10E	2019
Old type sidewalks at Intersection	5-11	1987
Sidewalk Transition at curb to not at curb	5-13	1987
Sidewalk transition w/ handicap ramp at curb-not at curb	5-13B	2006
Park Path Cross section	5-14	1988
Valley Gutter - w/ existing curb & gutter	5-15	1991
Valley Gutter - w/ Double HC ramps	5-15A	2009
Valley Gutter - w/ Single HC ramp	5-15B	2009
Sidewalk drainage crossing gutter	5-16	2012
Handicap ramp at mid-block with boulevard sidewalk	5-17	2016
Handicap ramp at mid-block with attached sidewalk	5-17B	Under Review
Handicap ramp at mid-block w/ full width boulevard sidewalk	5-18	2016
Handicap ramp at center of corner	5-19	2016
Handicap ramps double at corner in boulevard areas	5-20	2016
Handicap ramps double at corner sidewalk at curb	5-21	2016
Handicap ramps double at corner sidewalk at curb	5-21B	Under Review
Handicap ramps Double Central Business dist.	5-22	2016
Handicap ramps Double Old Boulevard area	5-24	2016
Trench Detail - Type 1	5-30	1987
Trench Detail - Type 2	5-31	1999
Trench Method of Payment	5-32	1987
Water main Casing Detail	5-33	1995
Flowable Fill Trench Plug	5-34	2009
Trench Pavement Replacement	5-36	1987
Gate Valve Detail	5-39	2011
Fire Hydrant Detail - City of Great Falls	5-40	1992

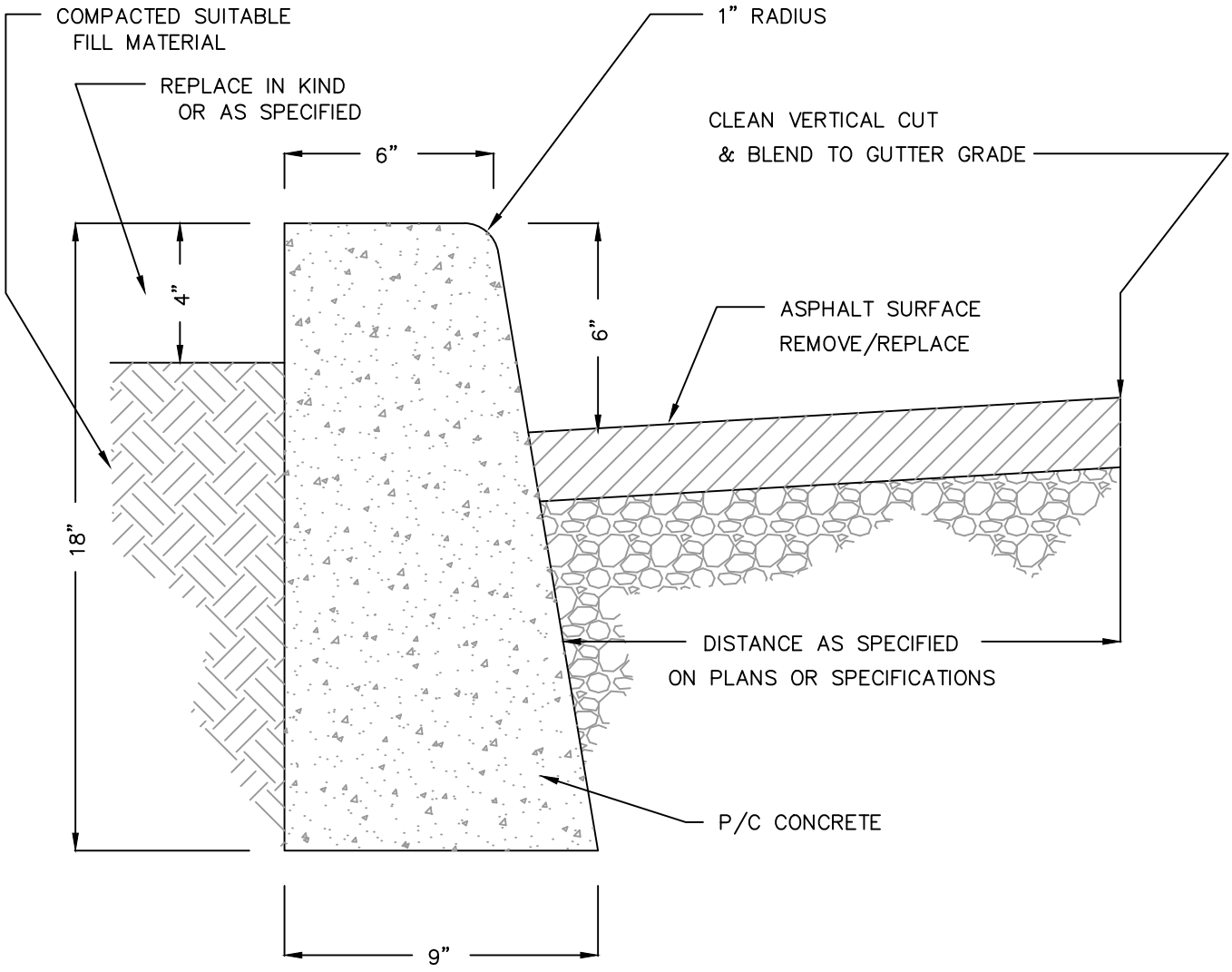
Fire Hydrant Replacement on exist. Hyd lead	5-41	1993
Fire Hydrant Guard (bollards)	5-42	1987
Thrust Blocking Details	5-43	1987
Water Service expansion loop	5-44	1987
Water Service replacement connections	5-45	2001
Water Service / Storm Draing Xing	5-45A	2017
Water meter installation	5-46	1987
Water Service entrance over 2"	5-47	1995
Meter Pit - Residential	5-48	1987
Meter Pit - Residential	5-48A	1994
Meter Vault - Large meters	5-49	2006
Irrigation Manhole - 1-1/2" meter and up	5-49A	2009
Sanitary sewer main at water main crossing	5-50	1993
Sewer Repair coupling	5-52	1987
Sewer Service connection in trench	5-53	1987
Sewer Service riser in trench	5-54	1987
Storm sewer inlet	5-60	2014
Storm sewer corner inlet apron	5-61A	2014
Storm sewer curb inlet apron - Type 1	5-61B	2014
Storm sewer curb inlet apron - Type 2	5-61C	2014
Storm sewer corner inlet apron	5-61D	2014
Sanitary Sewer Manhole ring & cover	5-63	1987
Sewer Manhole Short	5-64	1987
Sewer Manhole standard	5-65	2010
Manhole Connection - PVC	5-69	1987
Fixed Barricade	5-80	1993
Dead End - Warning Sign	5-81	2009

OLYMPIC NO. 5680 MONUMENT BOX



TYPICAL MONUMENT INSTALLATION

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 01



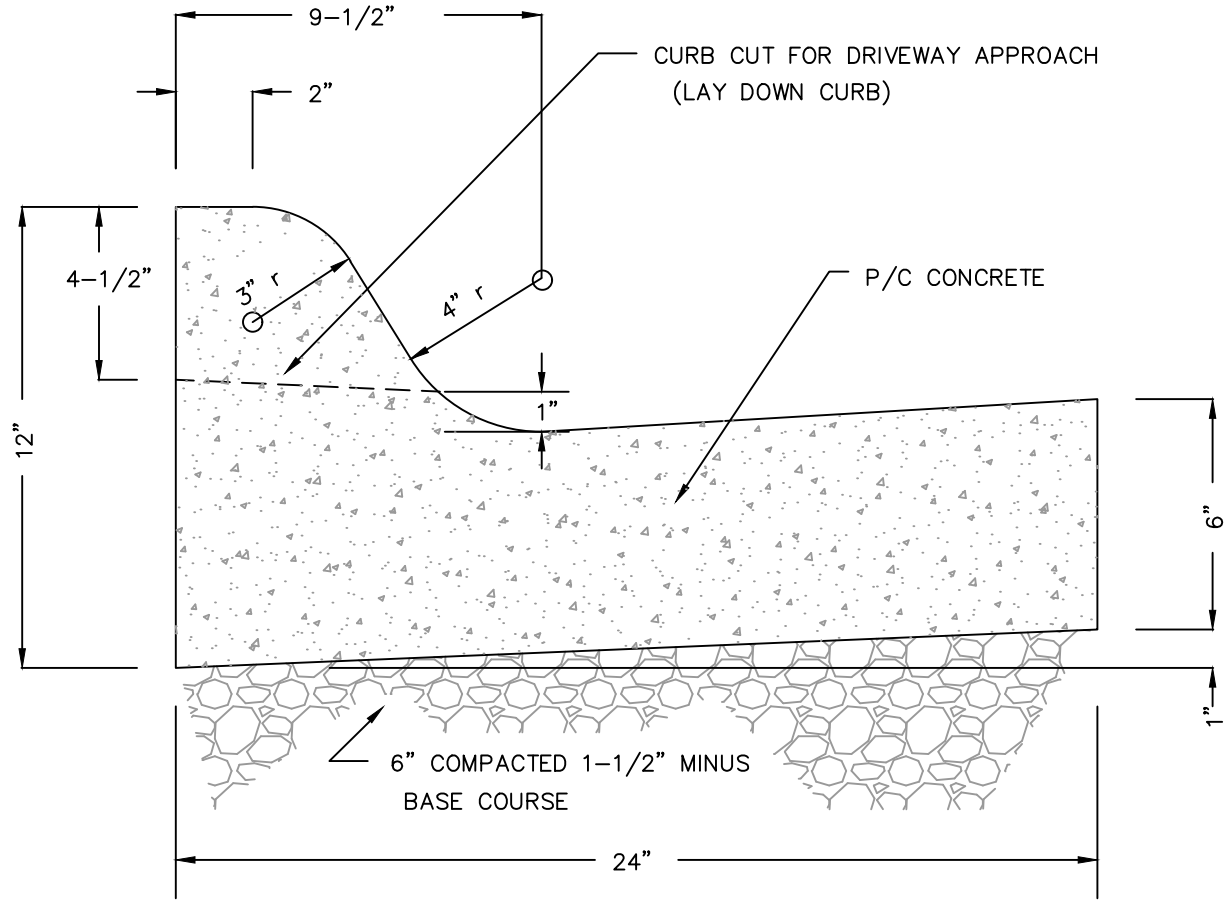
NOTE :

1. THE FACE OF THE CURB, WHERE CONTACTED BY PAVING SHALL BE THOROUGHLY PAINTED WITH BITUMINOUS MATERIAL ACCEPTABLE TO THE ENGINEER.

2. PLACE COMPACTED GRAVEL UNDER CURB AS REQUIRED ON PLANS OR IN SPECIFICATIONS.

STANDARD STRAIGHT CURB

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 0

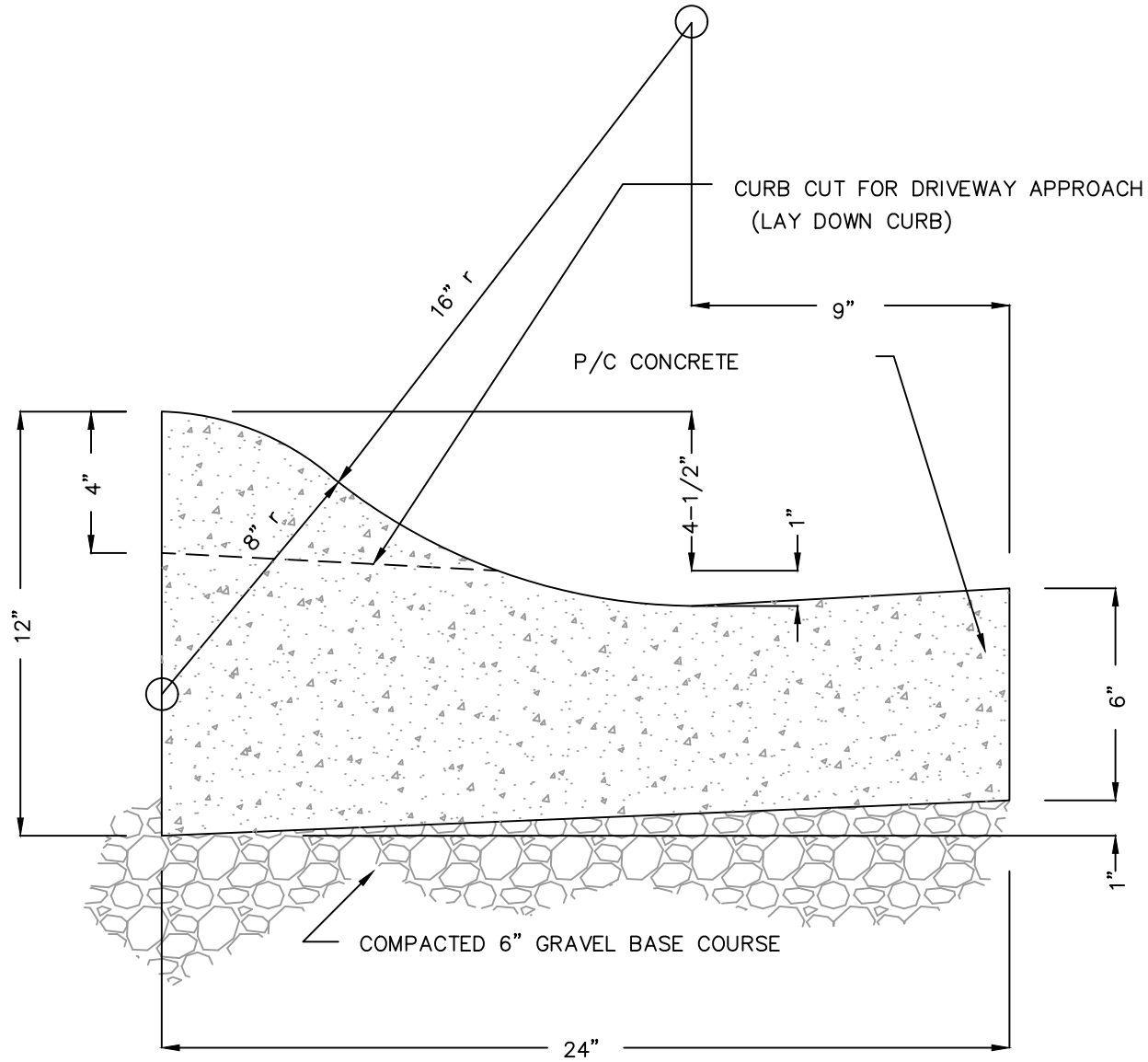


NOTES:

1. CURB & GUTTER SHALL HAVE A TOOLED CONTRACTION JOINT EVERY 10' AND BE SCORED A MIN. DEPTH OF 3/4"
2. CURB & GUTTER SHALL HAVE 1/2" EXPANSION JOINT AT P.C.'s, P.T.'s, CURB RETURNS, VERTICAL AND HORIZONTAL POINTS OF CURVATURE AND AT MAXIMUM OF 300' INTERVALS.
3. PLACE GRAVEL BASE COURSE AS REQUIRED IN SPECIFICATIONS.

TYPICAL BARRIER INTEGRAL CURB & GUTTER

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MARCH 2018	5 – 04



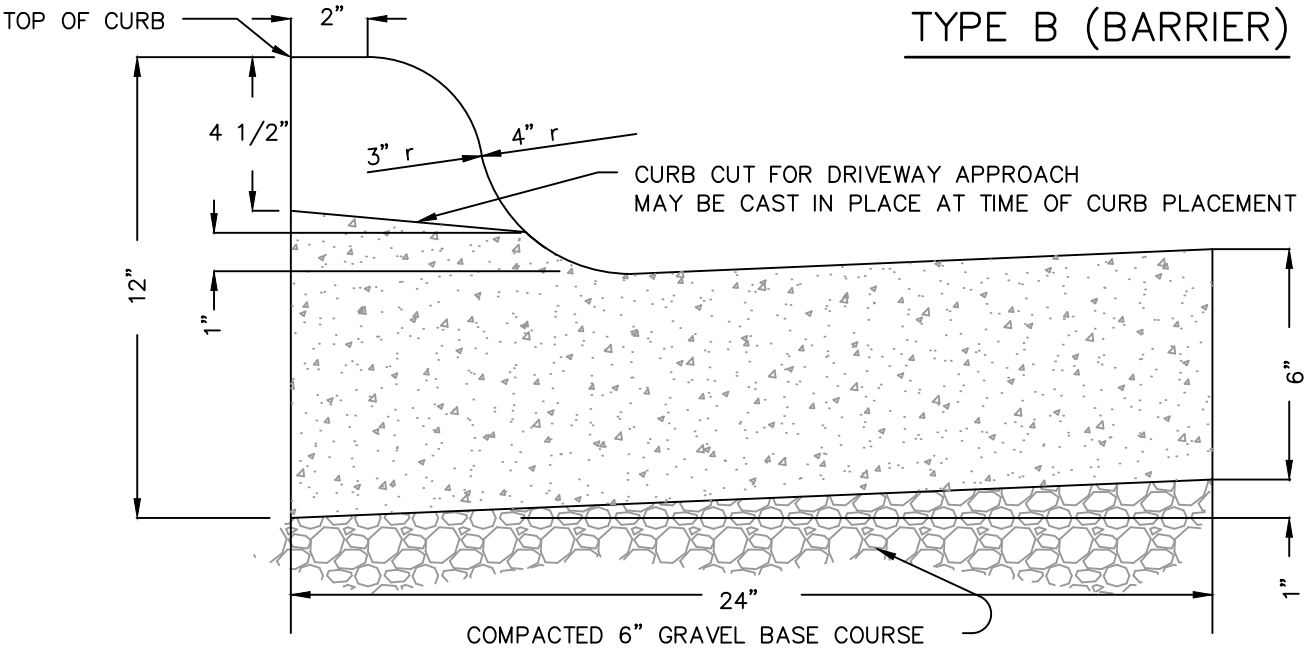
NOTES:

1. CURB & GUTTER SHALL HAVE A TOOLED CONTRACTION JOINT EVERY 10' AND BE SCORED A MIN. DEPTH OF 3/4"
2. CURB & GUTTER SHALL HAVE 1/2" EXPANSION JOINT AT P.C.'s, P.T.'s, CURB RETURNS, VERTICAL AND HORIZONTAL POINTS OF CURVATURE AND AT MAXIMUM OF 300' INTERVALS.
3. PLACE GRAVEL BASE COURSE AS REQUIRED IN SPECIFICATIONS.

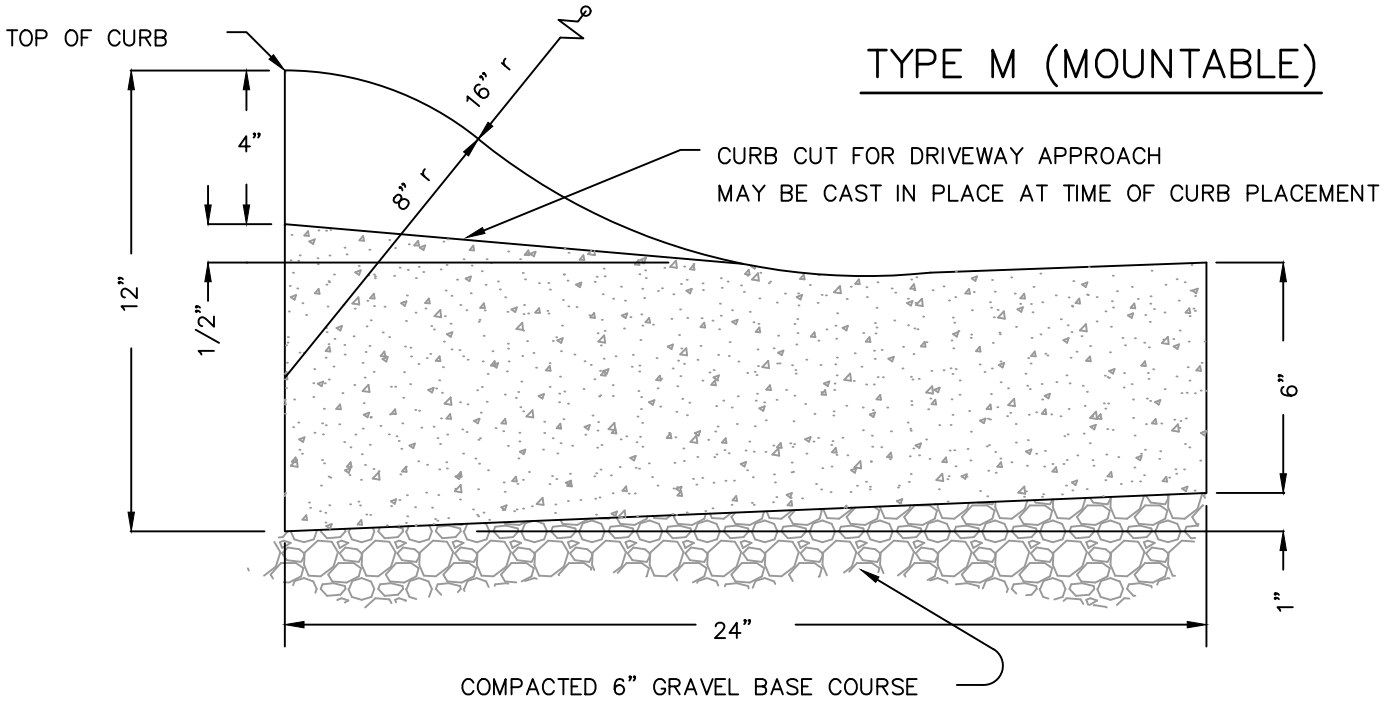
TYPICAL MOUNTABLE INTEGRAL CURB & GUTTER

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED MARCH 2018	5 – 05

TYPE B (BARRIER)



TYPE M (MOUNTABLE)

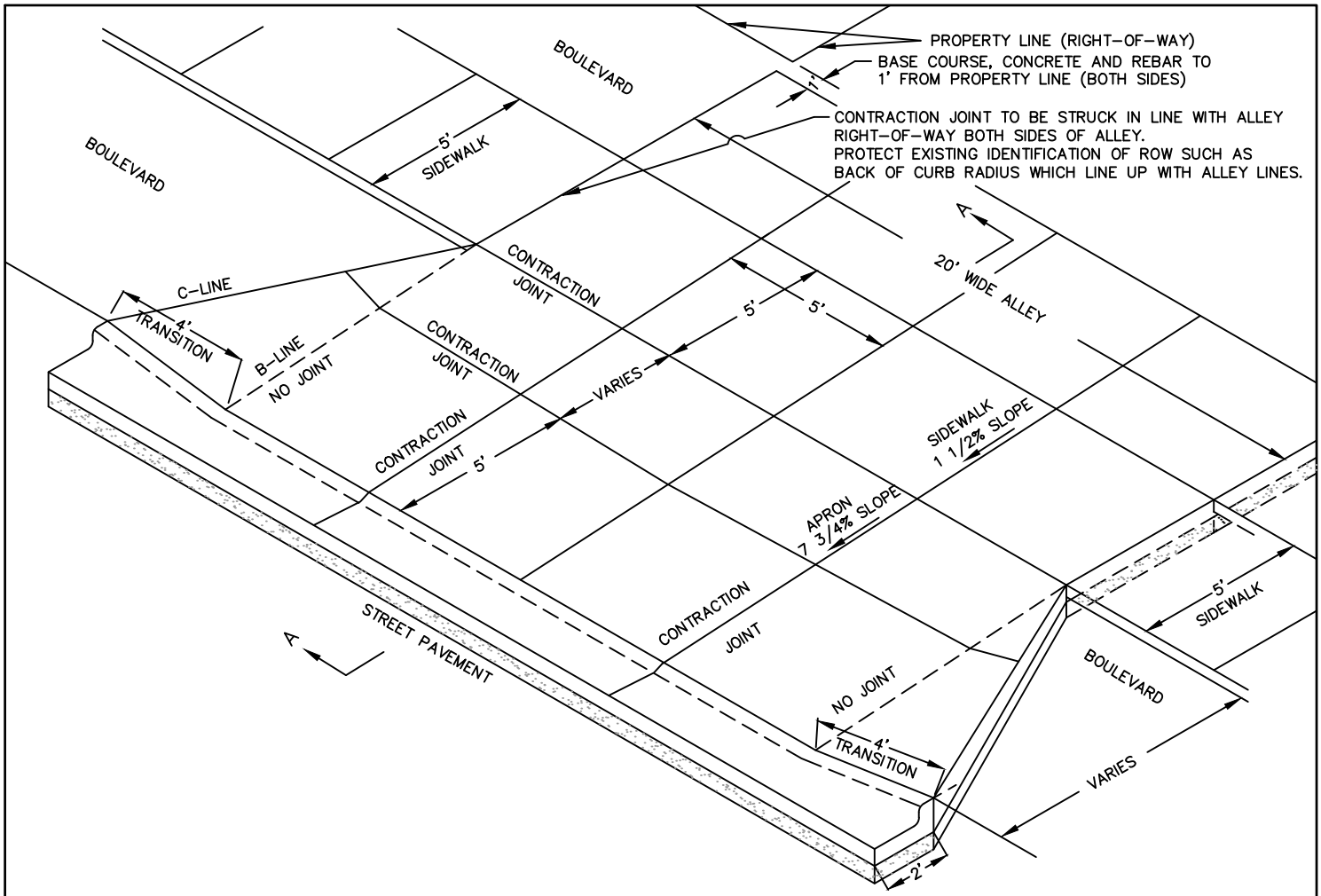


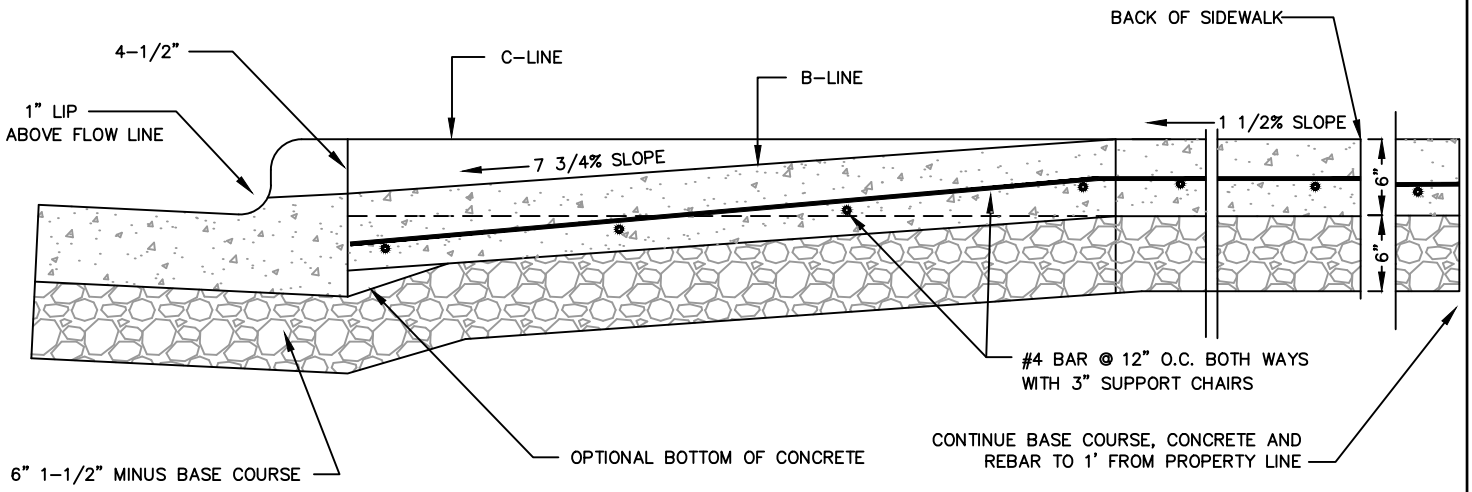
NOTES:

1. CURB & GUTTER SHALL HAVE A TOOLED CONTRACTION JOINT EVERY 10' AND BE SCORED A MIN. DEPTH OF 3/4"
2. CURB & GUTTER SHALL HAVE 1/2" EXPANSION JOINT AT P.C.'s, P.T.'s, CURB RETURNS, VERTICAL AND HORIZONTAL POINTS OF CURVATURE AND AT MAXIMUM OF 300' INTERVALS.
3. PLACE GRAVEL BASE COURSE AS REQUIRED IN SPECIFICATIONS.

INTEGRAL CURB AND GUTTER DETAILS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED: MARCH 2018	5 – 0





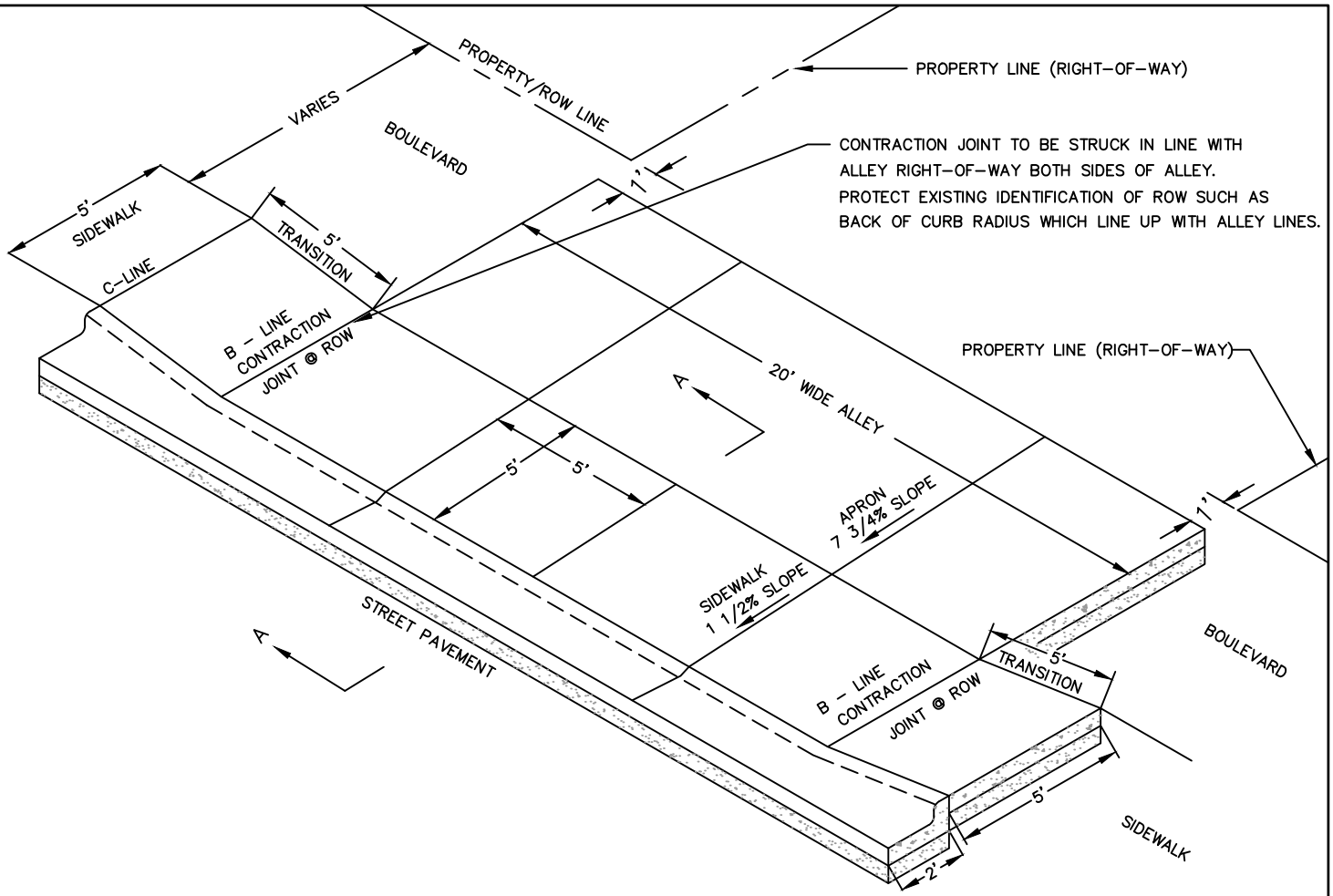
SECTION A-A

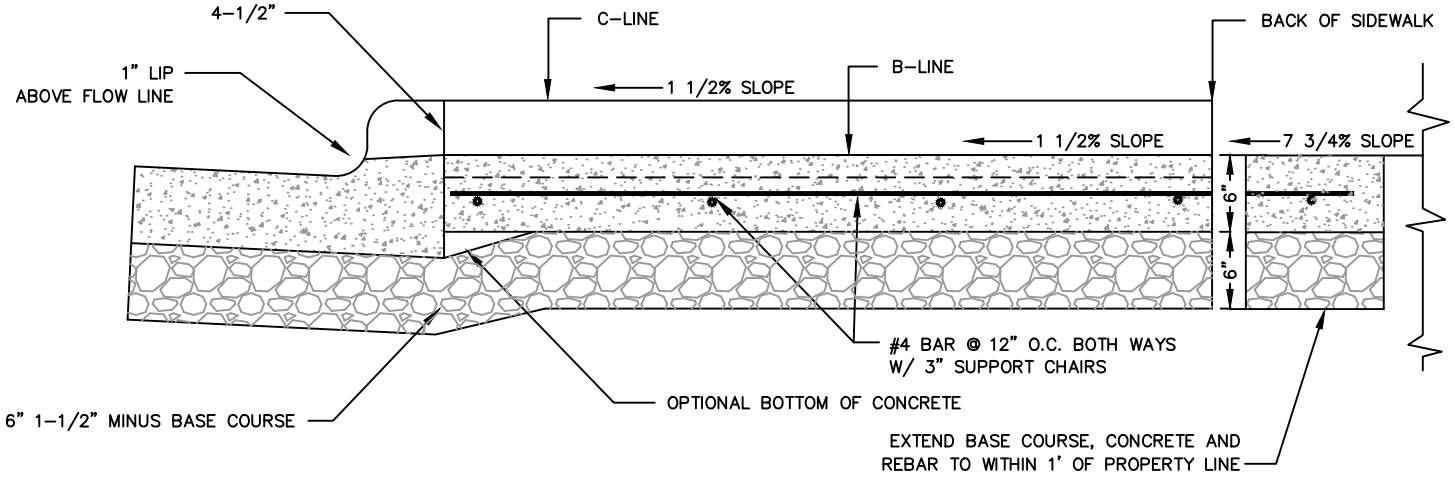
NOTE: ALLEY APPROACH WILL BE PLACED MONOLITHICALLY. P/C CONCRETE SHALL BE 4000 P.S.I. AND 6.5 SACK

NO SCALE

STANDARD DETAIL FOR CONCRETE ALLEY APRON WHERE SIDEWALK NOT AT BACK OF CURB - TYPE 1

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED: MARCH 2018	5 - 08





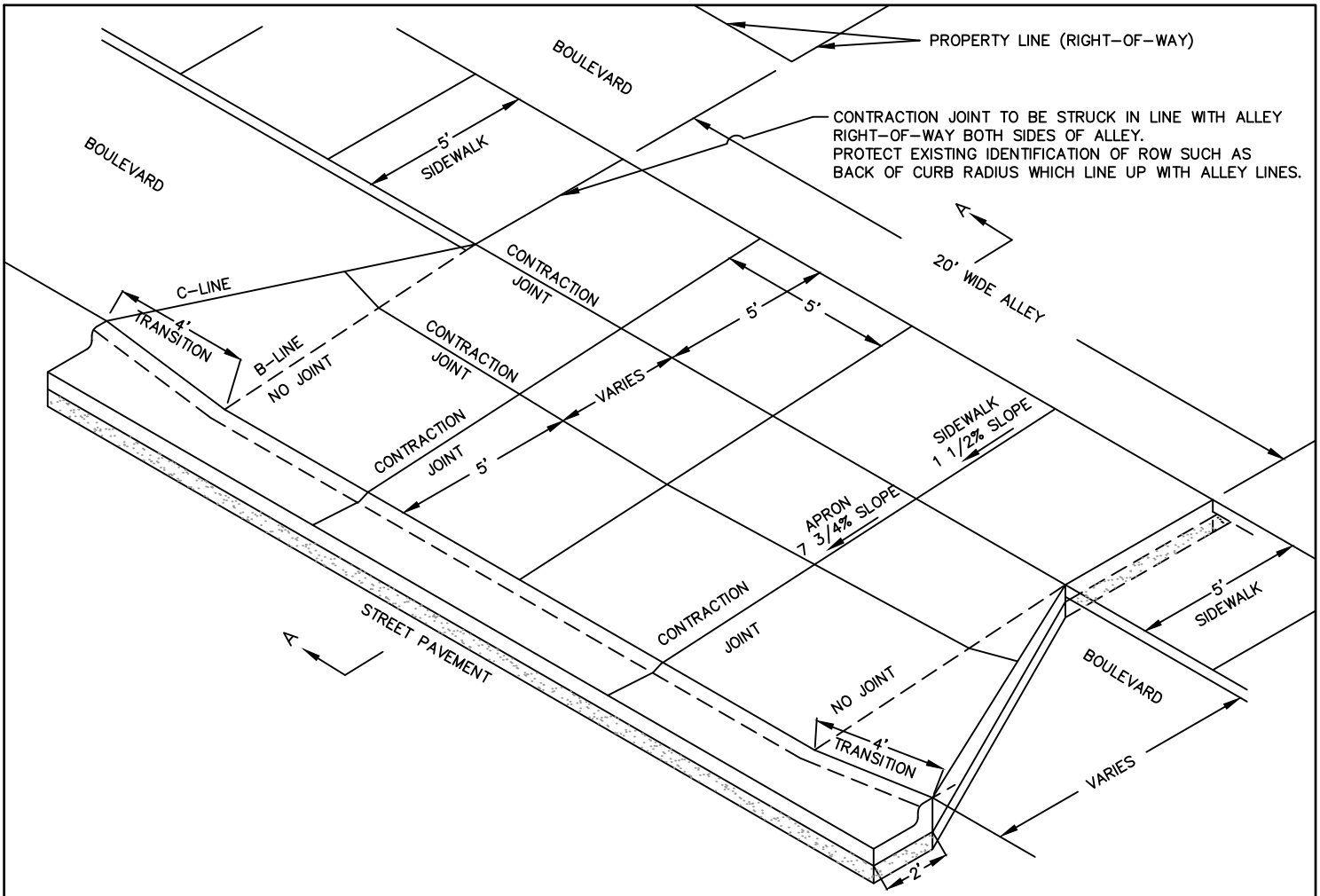
SECTION A-A

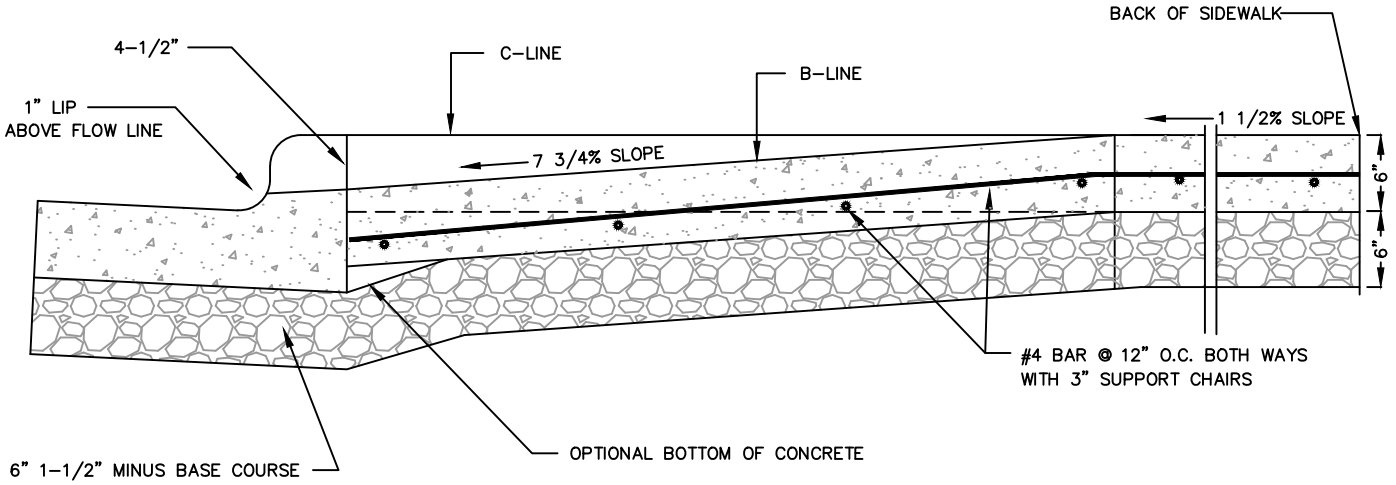
NOTE: ALLEY APPROACH WILL BE PLACED MONOLITHICALLY. P/C CONC. SHALL BE 4000 P.S.I. AND 6.5 SACK

NO SCALE

STANDARD DETAIL FOR CONCRETE ALLEY APRON WITH SIDEWALK AT CURB - TYPE 2

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED: MARCH 2018	5 - 08





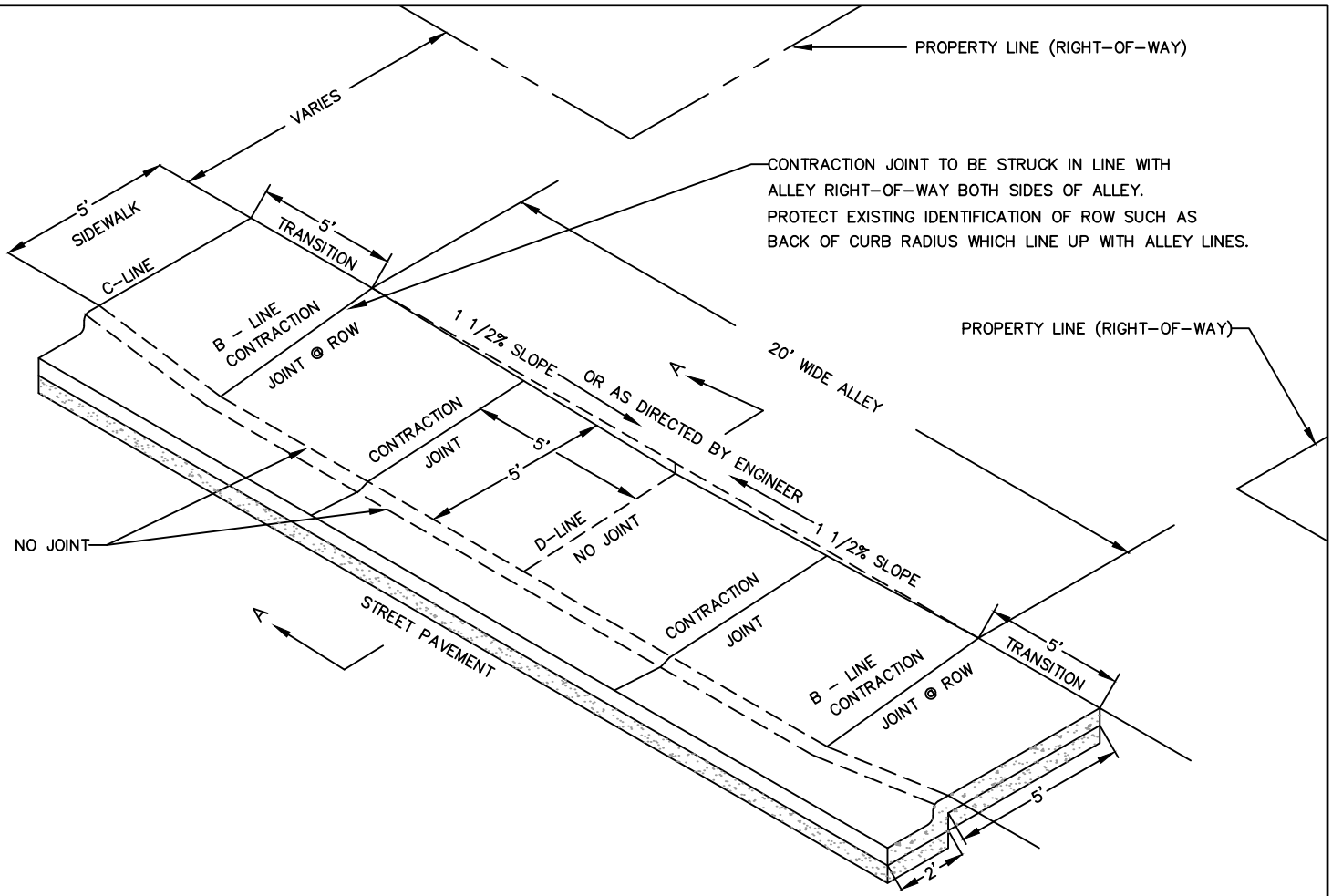
SECTION A-A

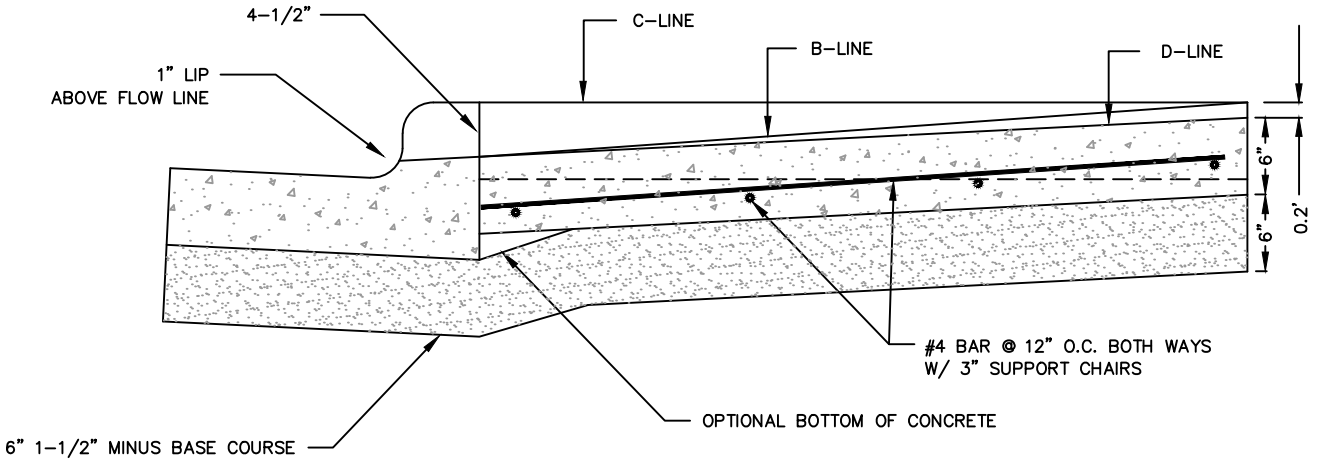
NOTE: ALLEY APPROACH WILL BE PLACED MONOLITHICALLY. P/C CONCRETE SHALL BE 4000 P.S.I. AND 6.5 SACK

NO SCALE

STANDARD DETAIL FOR CONCRETE ALLEY APRON WHERE SIDEWALK NOT AT BACK OF CURB – TYPE 3

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED: MARCH 2018	5 – 08





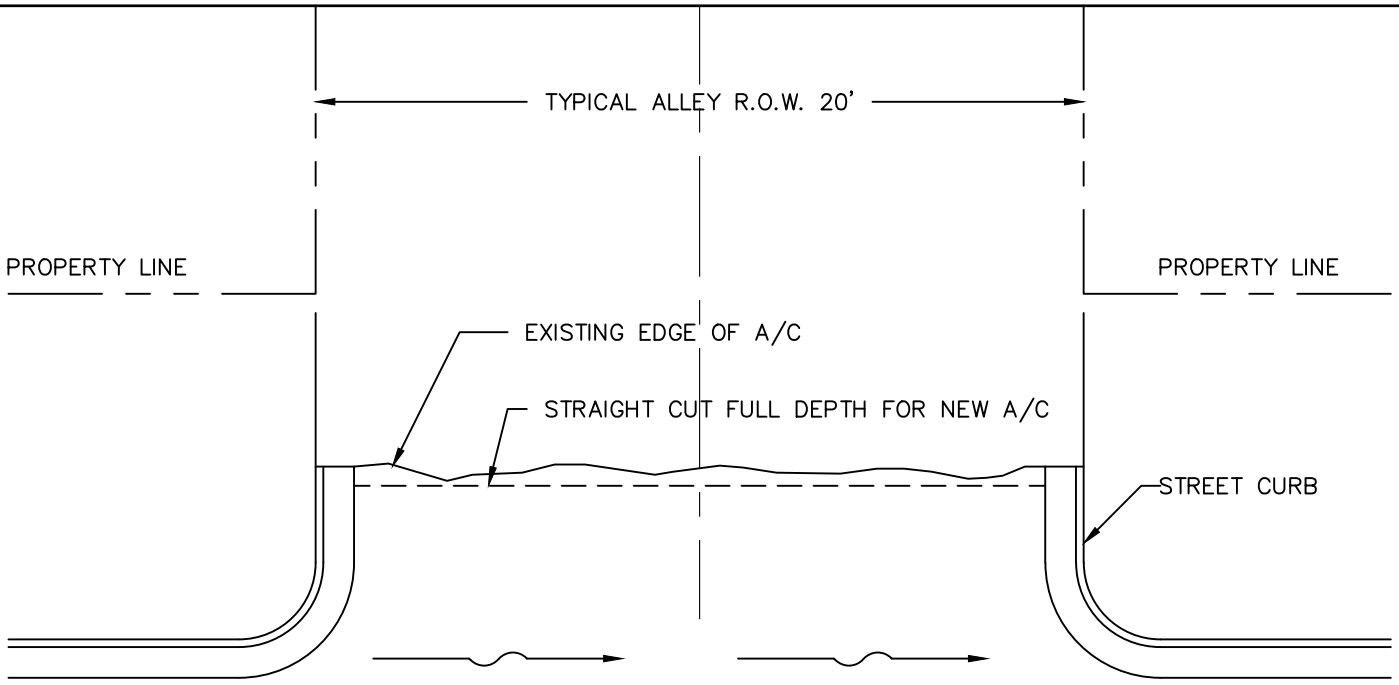
SECTION A-A

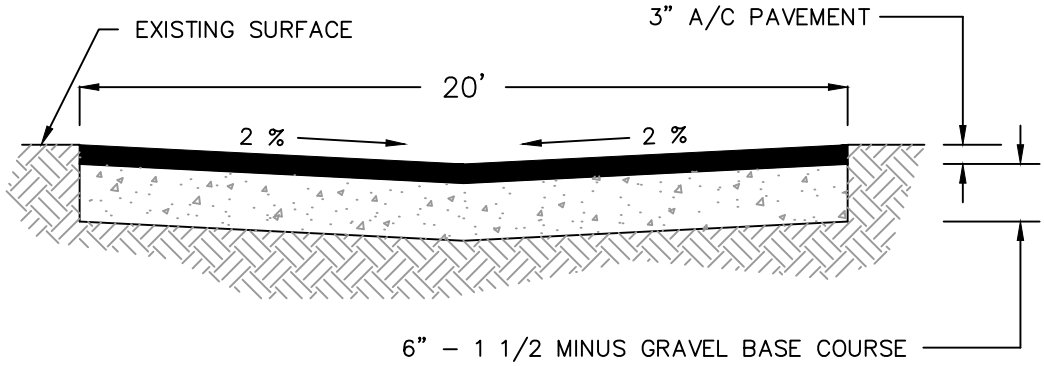
NOTE: ALLEY APPROACH WILL BE PLACED MONOLITHICALLY. P/C CONC. SHALL BE 4000 P.S.I.

NO SCALE

STANDARD DETAIL FOR CONCRETE ALLEY APRON WITH SIDEWALK AT CURB - TYPE 4

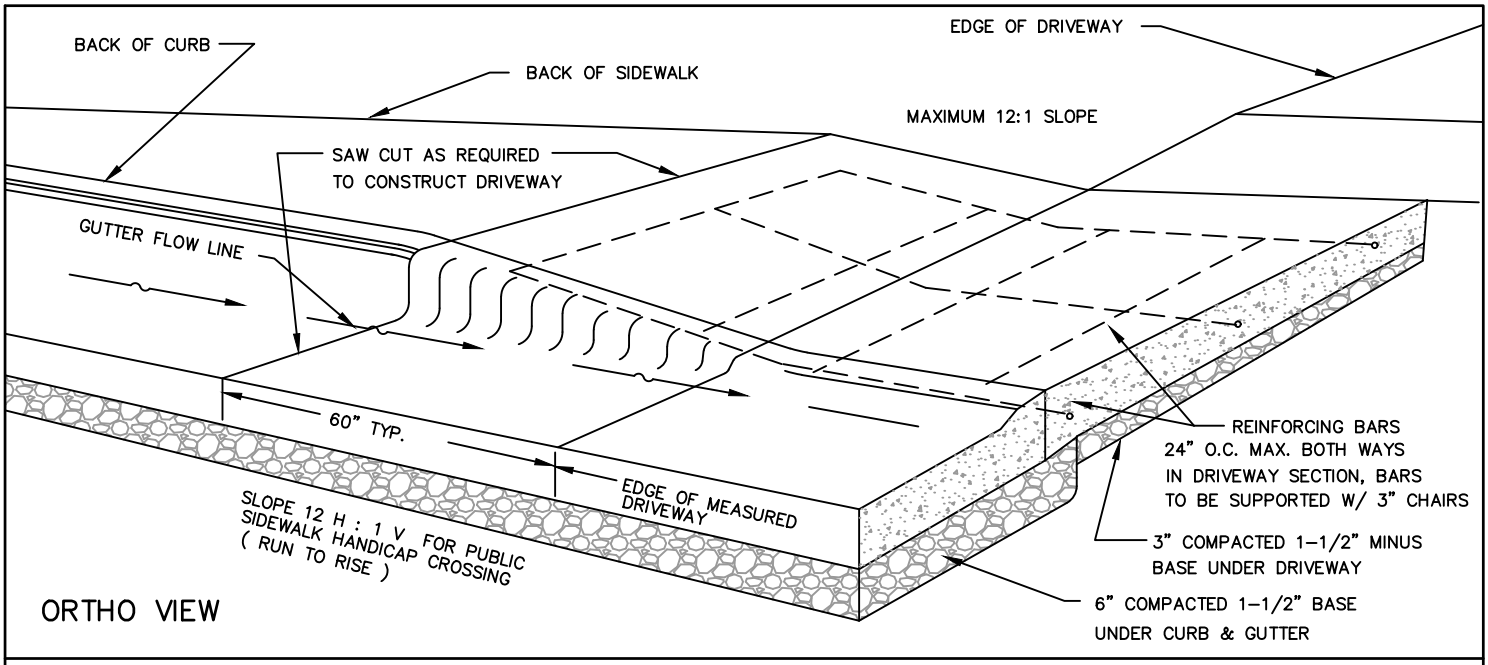
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED APRIL 2012	5 - 08

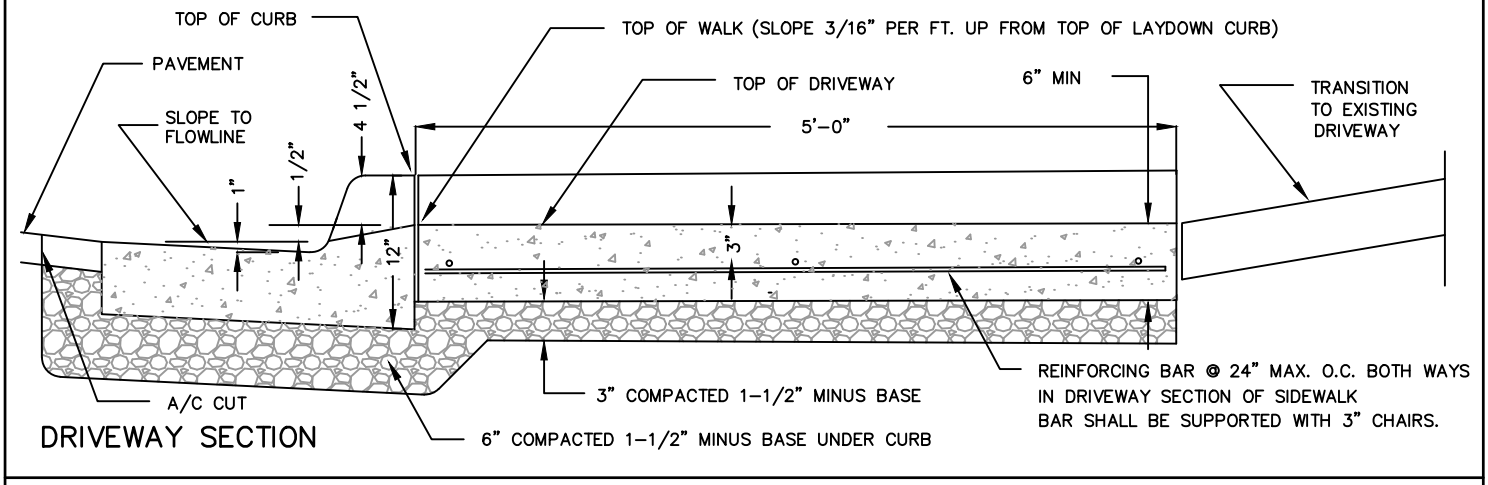


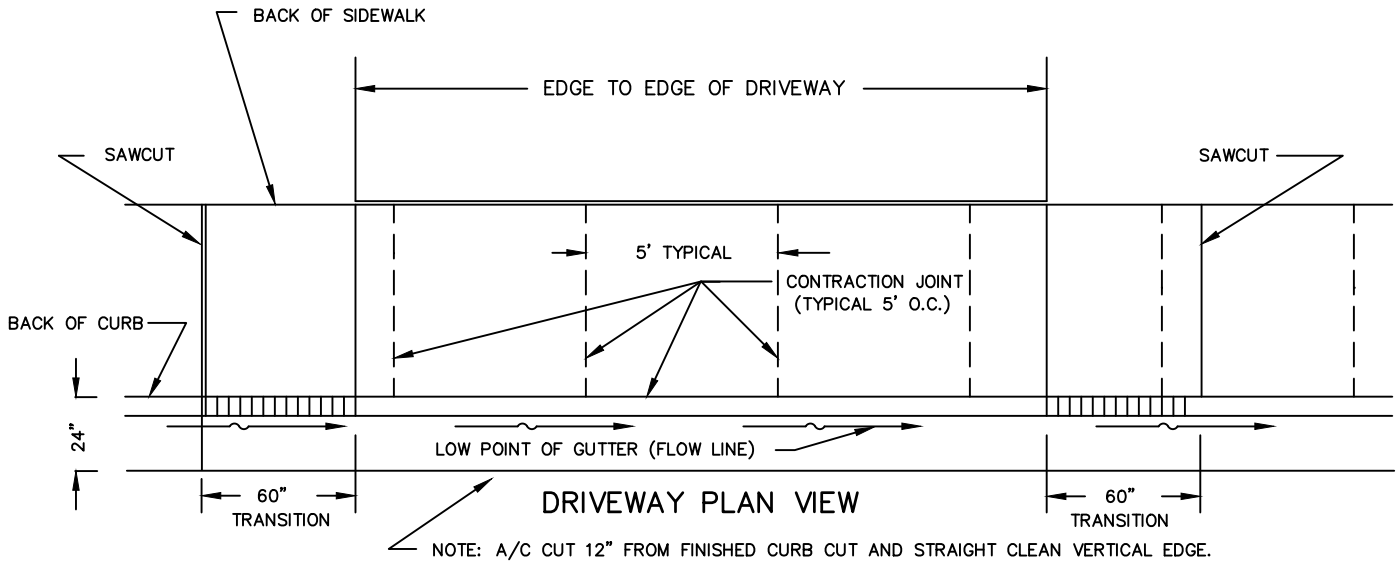


STANDARD DETAIL FOR ASPHALT PAVING OF PUBLIC ALLEY

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	APRIL 1994 REVISED	5 – 09

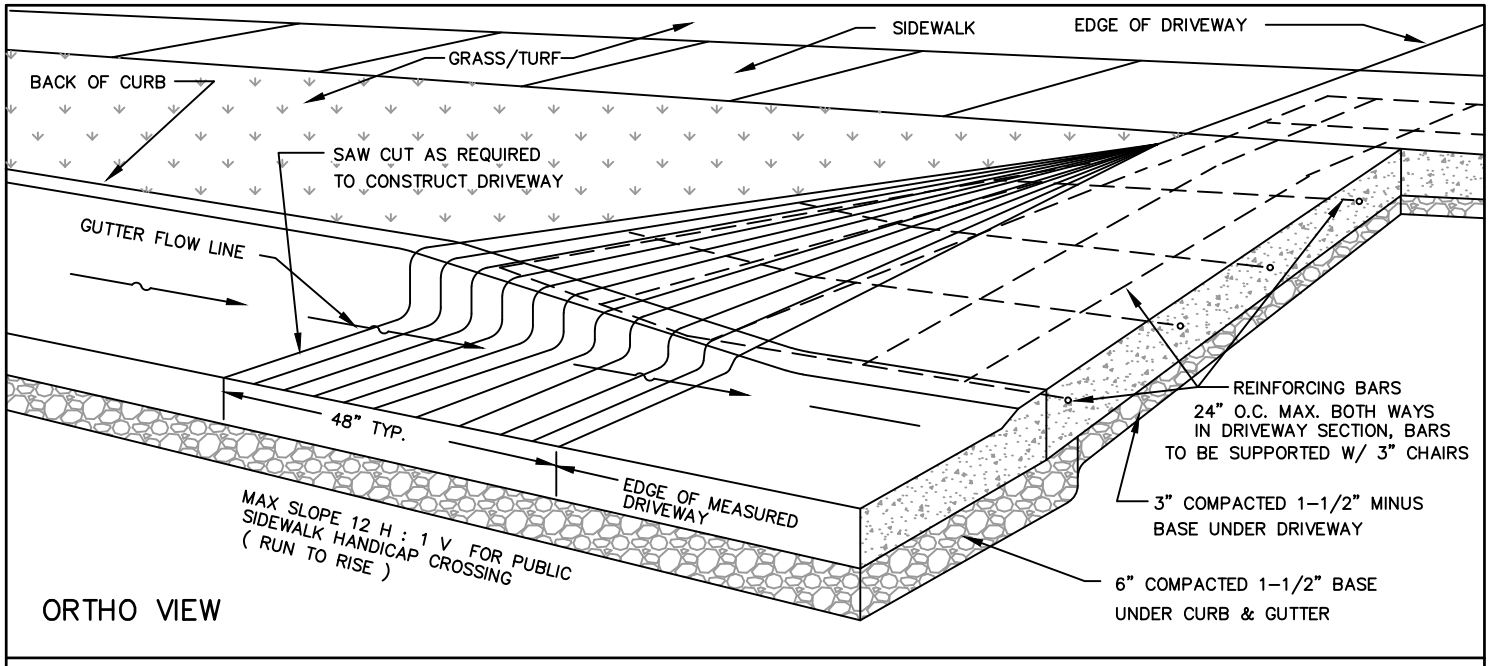




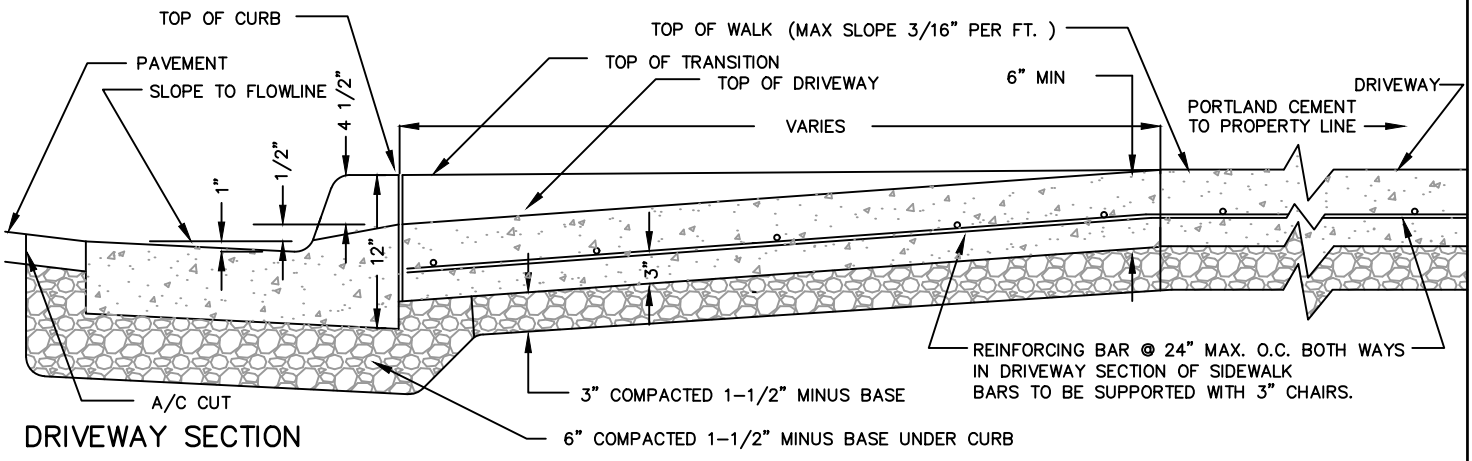


CURB AND SIDEWALK SECTION FOR DRIVEWAYS WITH SIDEWALK AT CURB

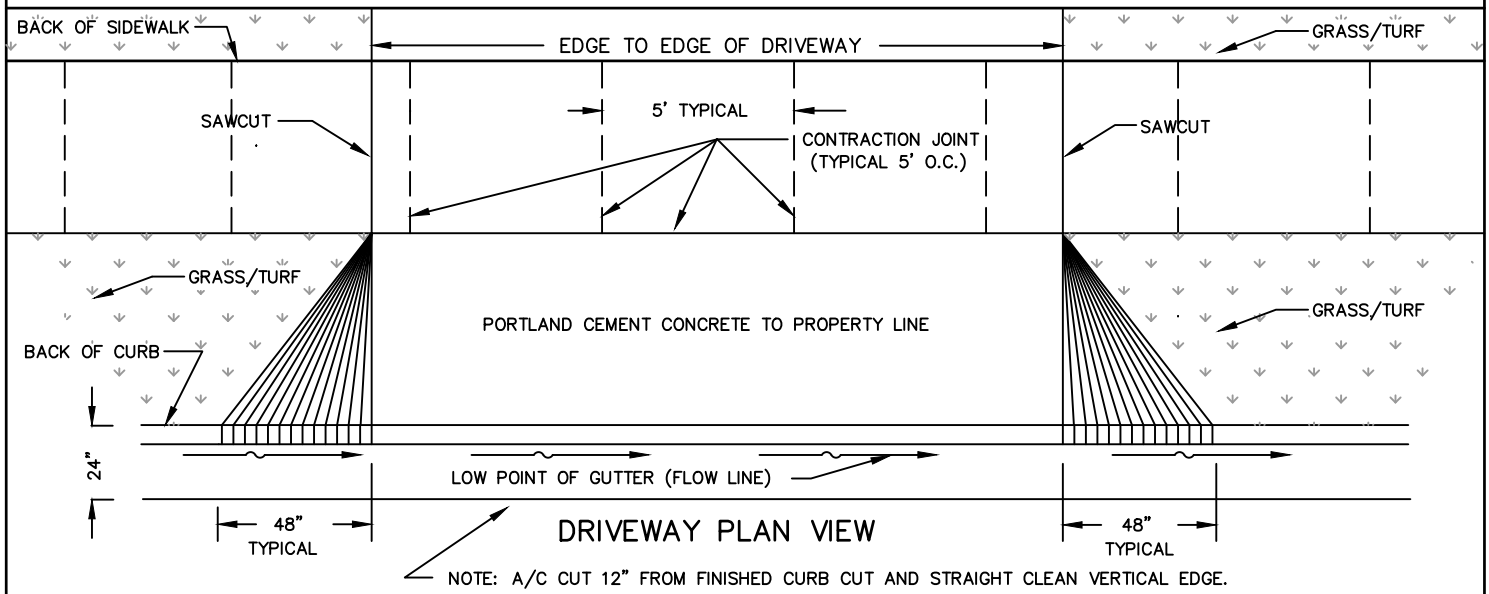
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED JAN 2019	5 – 10



ORTHO VIEW



DRIVEWAY SECTION

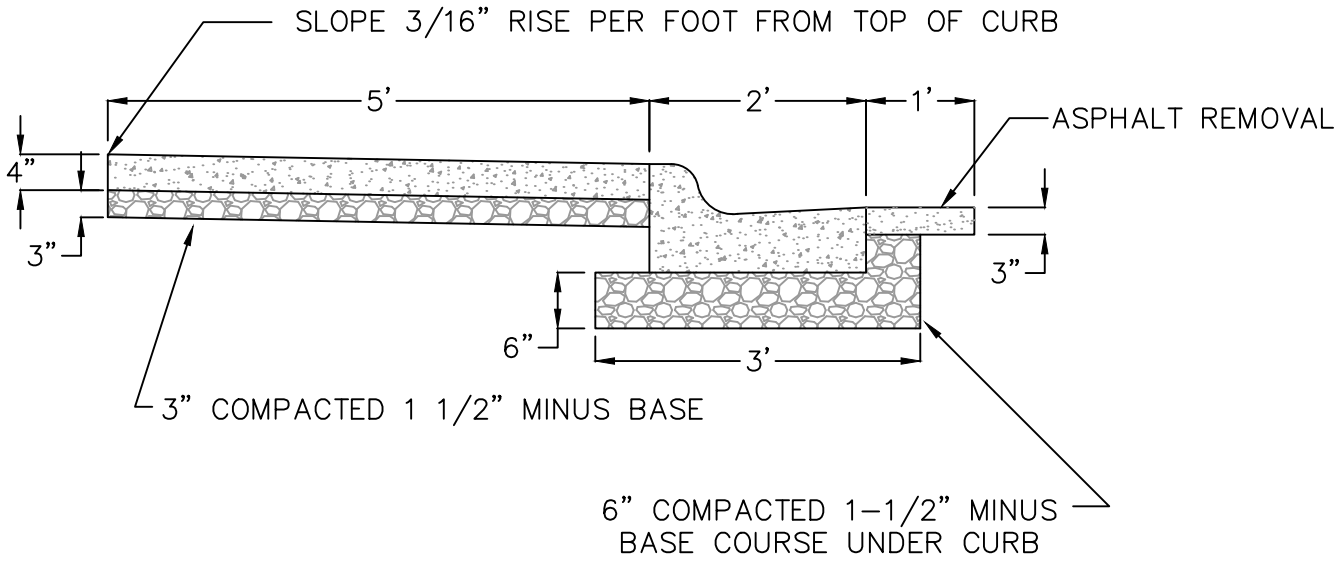


DRIVEWAY PLAN VIEW

NOTE: A/C CUT 12" FROM FINISHED CURB CUT AND STRAIGHT CLEAN VERTICAL EDGE.

CURB AND SIDEWALK SECTION FOR DRIVEWAYS WITH GRASS BOULEVARD BETWEEN CURB AND WALK

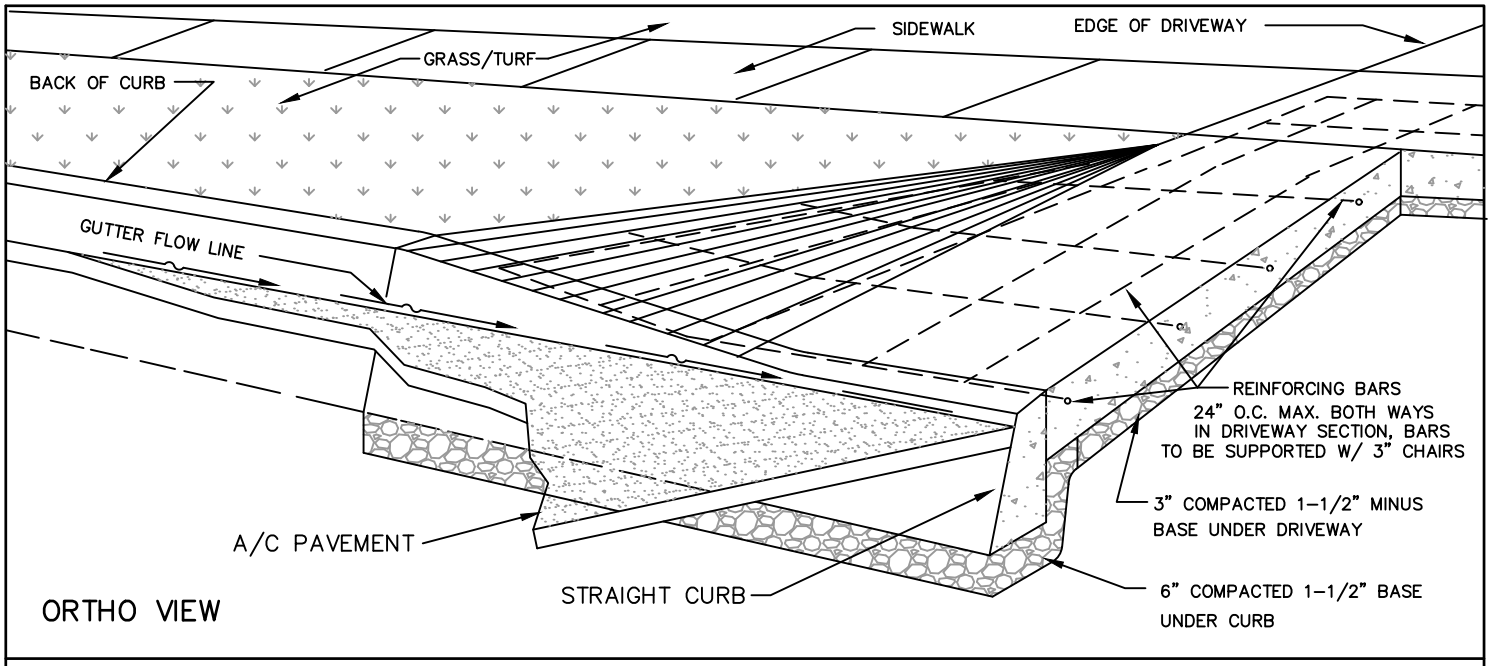
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED JAN 2019	5 – 10

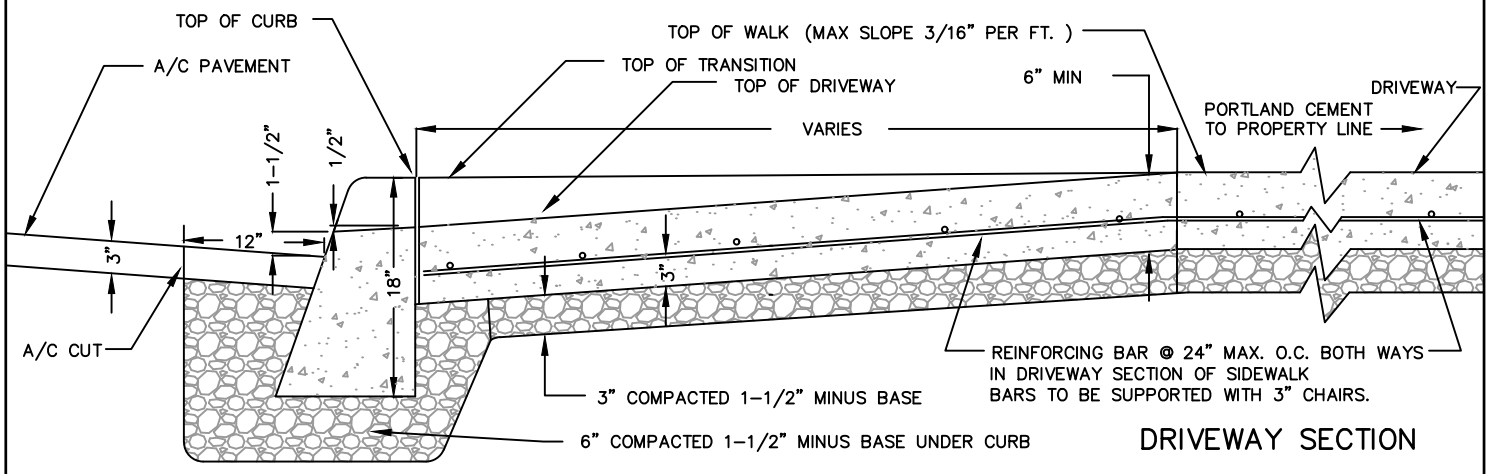


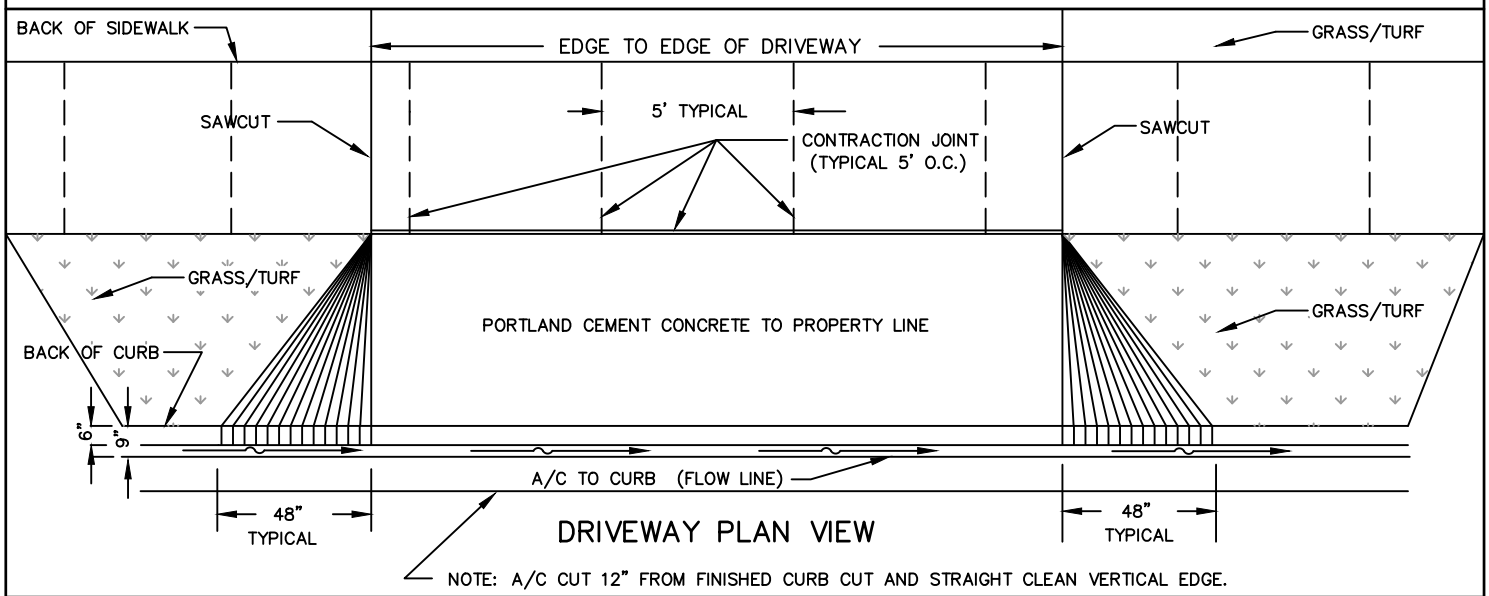
1. CURB & GUTTER SHALL HAVE A TOOLED CONTRACTION JOINT EVERY 10' AND BE SCORED A MIN. DEPTH OF 3\4"
2. CURB & GUTTER AND SIDEWALK SHALL HAVE 1\2" EXPANSION JOINT AT PC's, D.T's AND CURB TURNS
3. SIDEWALK SHALL HAVE A TOOLED CONTRACTION JOINT EVERY 5' AND BE SCORED A MIN. DEPTH OF 3\4"
4. ALL CONCRETE POURED INSIDE CITY R.O.W. SHALL BE 6 1\2 SACK AND 4000 PSI MIX DESIGN
5. PLACE GRAVEL BASE COURSE AS REQUIRED IN SPECIFICATIONS

CURB AND SIDEWALK SECTION

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	APRIL 2000 REVISED SEPT 2015	5 – 10

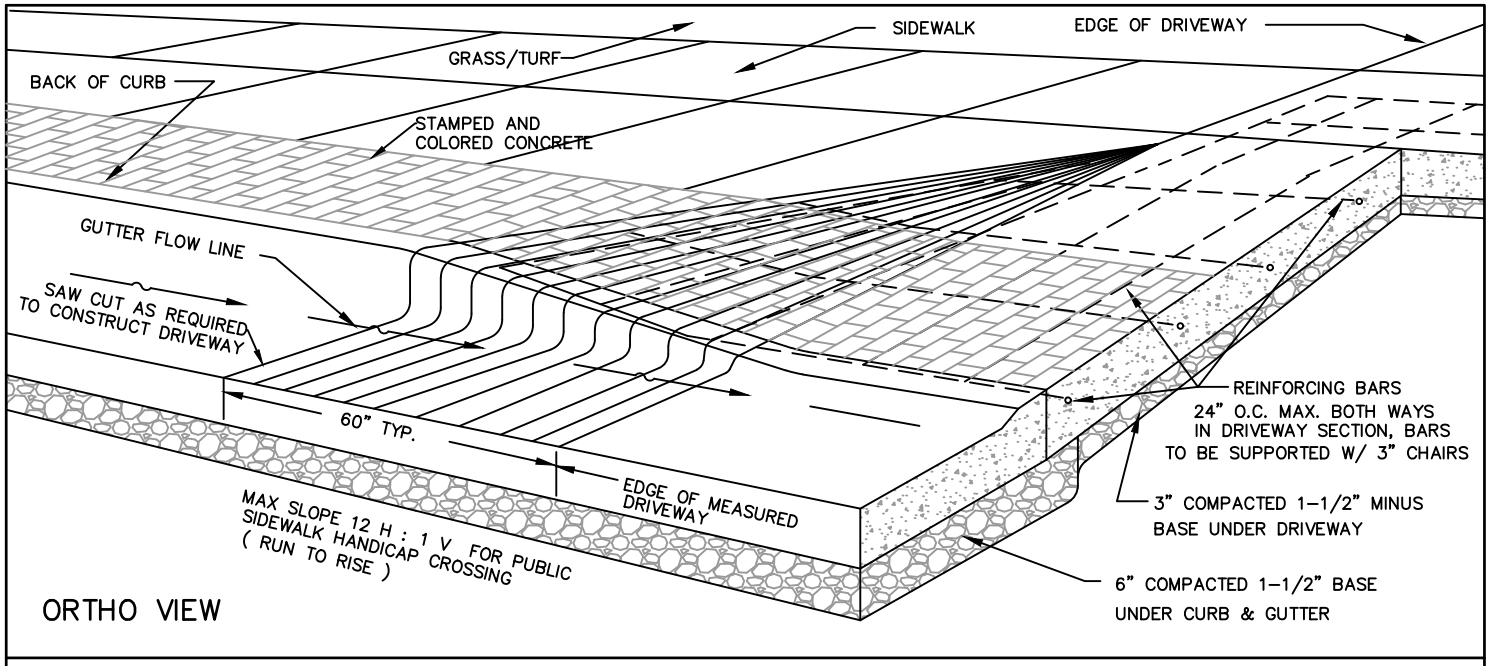


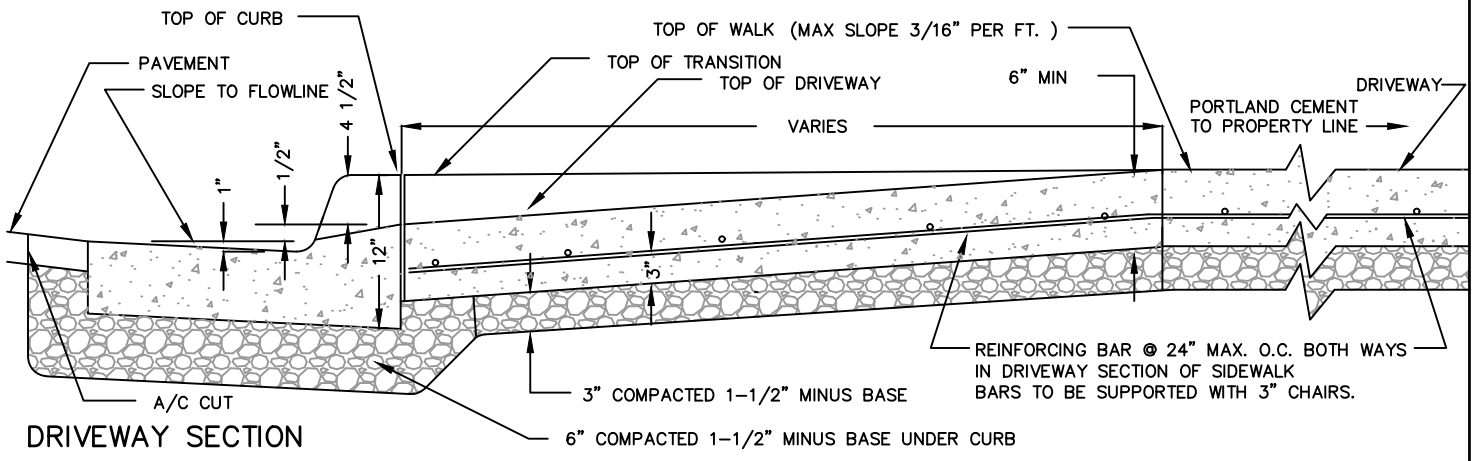


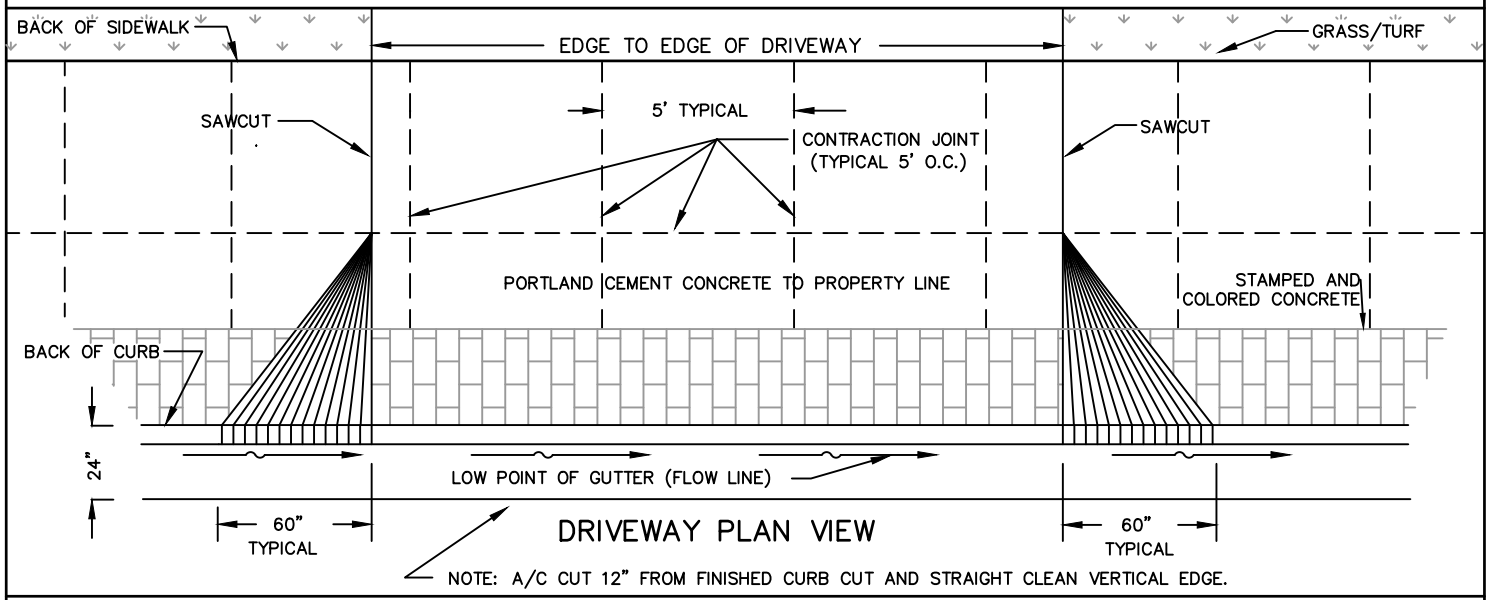


STRAIGHT CURB AND SIDEWALK SECTION FOR DRIVEWAYS WITH GRASS BOULEVARD BETWEEN CURB AND SIDEWALK

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED APRIL 2015	5 – 10

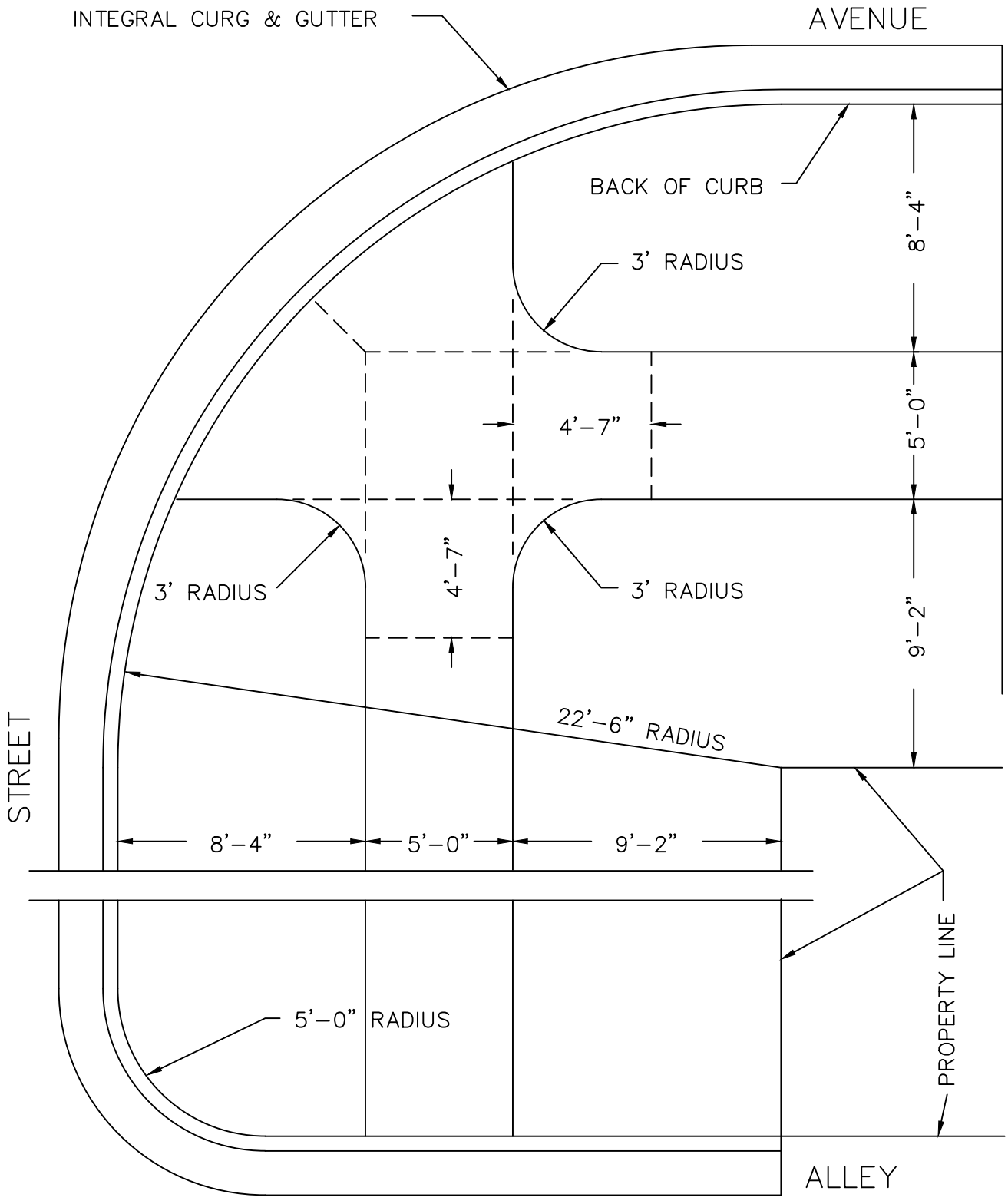






CURB AND SIDEWALK SECTION FOR DRIVEWAYS DOWNTOWN WITH STAMPED DECORATIVE BRICK PATTERN

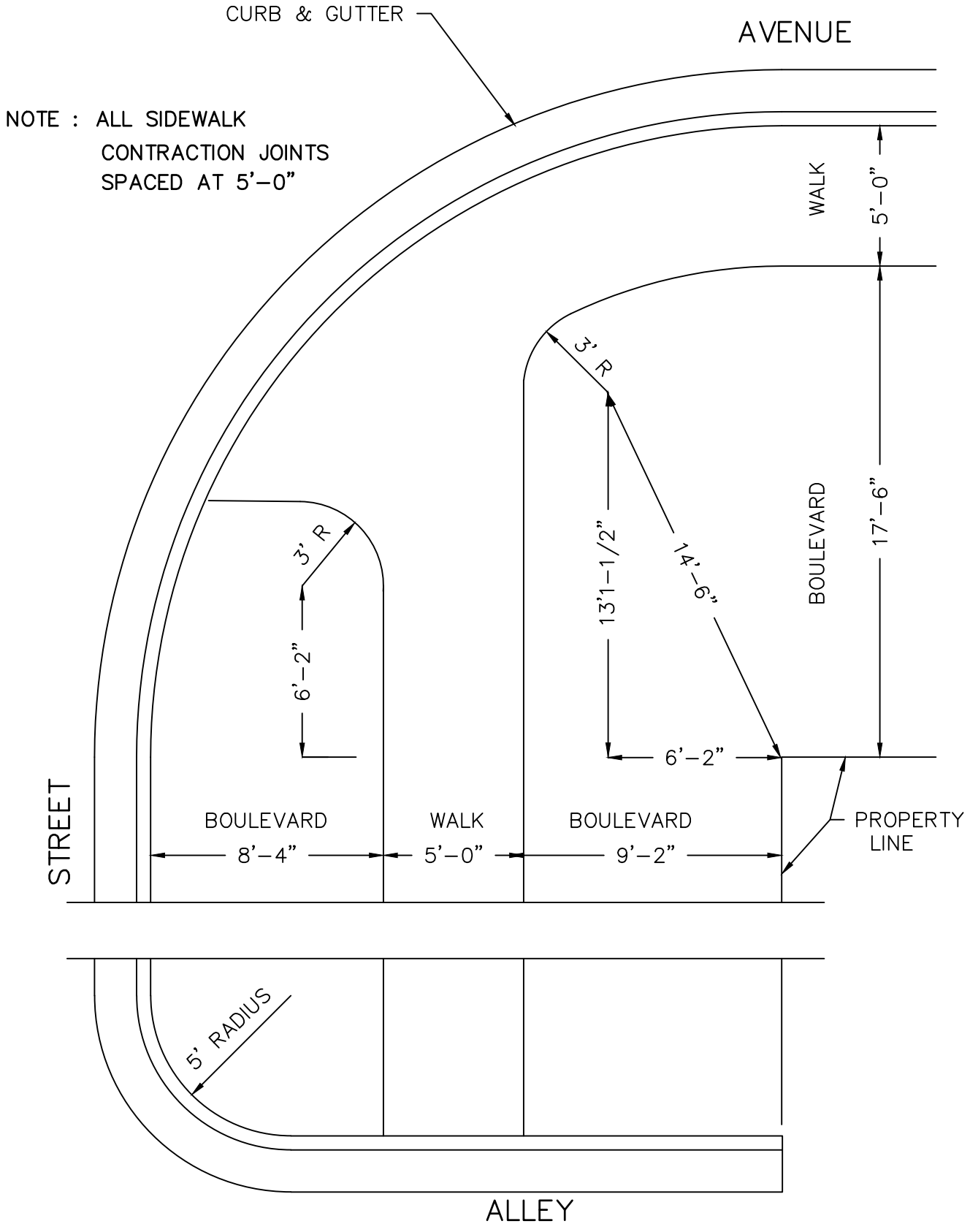
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED JAN 2019	5 – 10



NOTE : ALL WALK CONTRACTION JOINTS SPACED AT 5'-0" EXCEPT WHERE NOTED. EXPANSION JOINTS AT 25' INTERVALS.

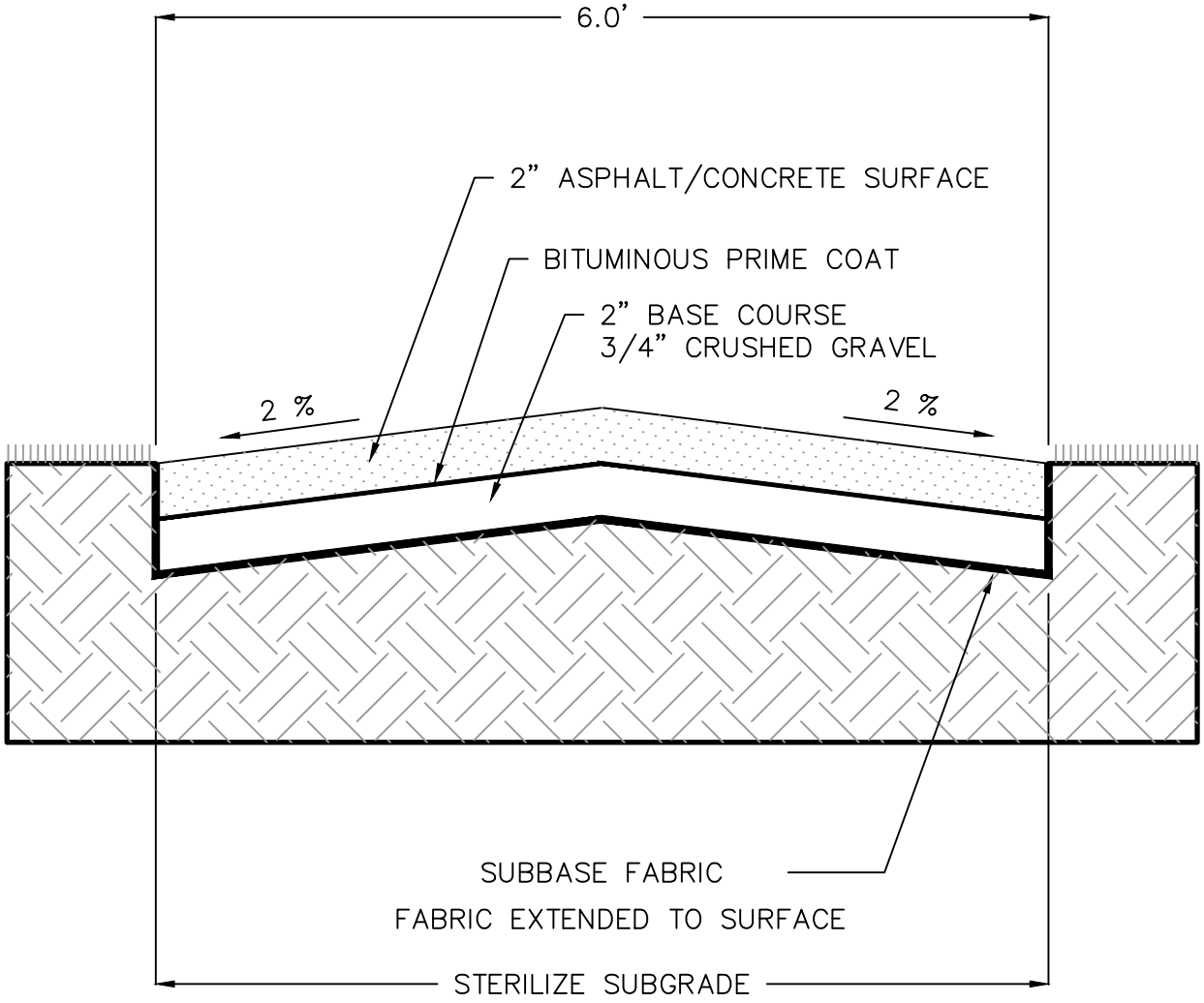
TYPICAL OLD TYPE SIDEWALK AND INTEGRAL CURB & GUTTER

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 (ORG. 1950) REVISED	5 – 11



TRANSITIONAL SIDEWALK INTERSECTION – OLD STYLE TO NEW

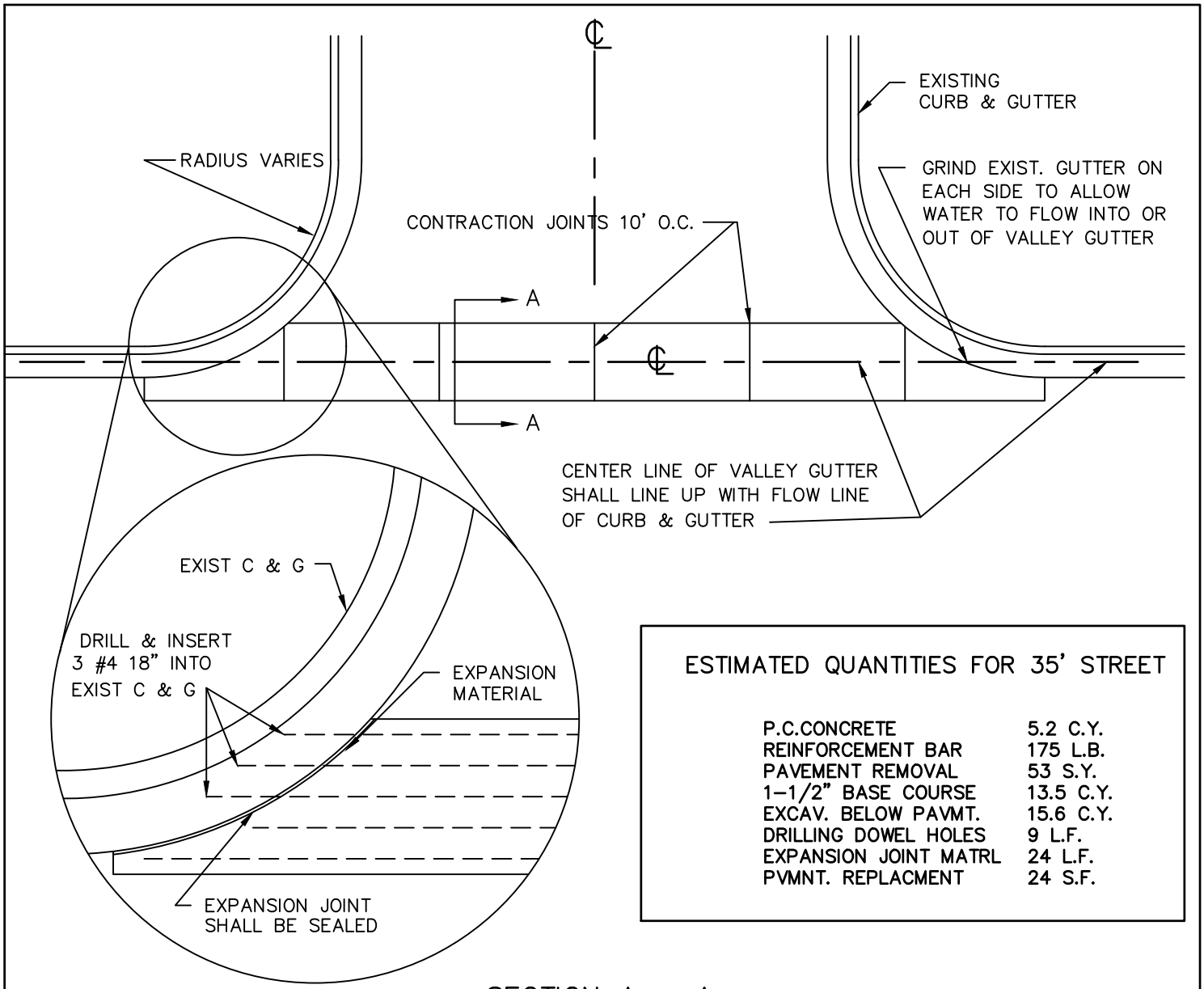
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 (ORG. 1950) REVISED	5 – 13



NOTE: 2% GRADE IS EQUAL TO 1/4" PER FOOT.

TYPICAL PARK PATH CROSS-SECTION

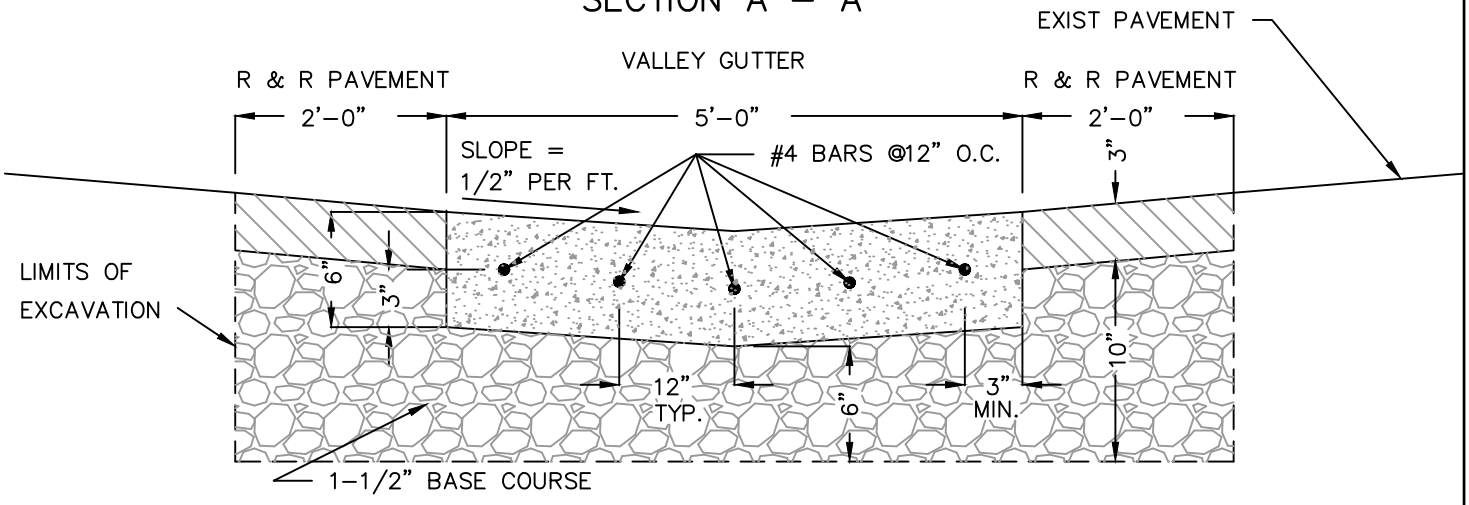
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	JANUARY 1988 REVISED	5 – 14



ESTIMATED QUANTITIES FOR 35' STREET

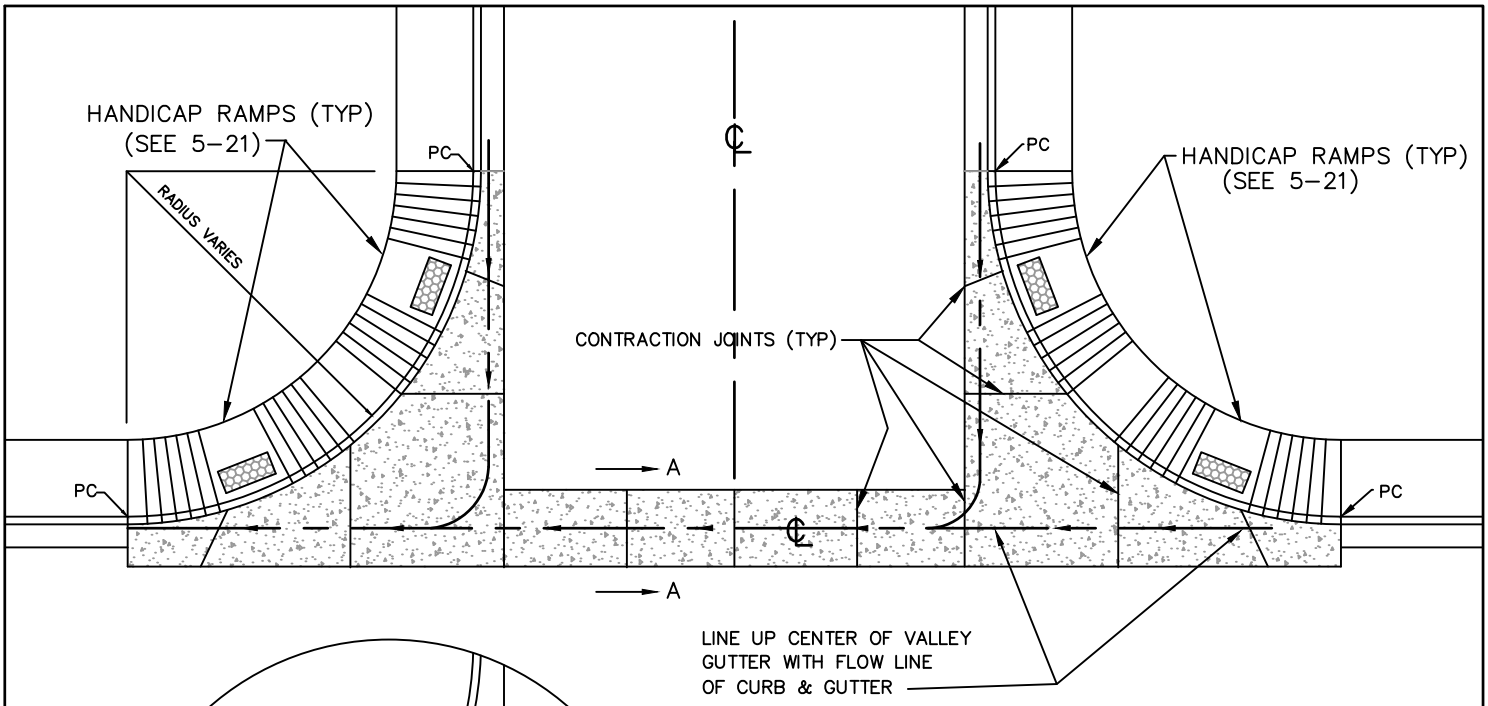
P.C.CONCRETE	5.2 C.Y.
REINFORCEMENT BAR	175 L.B.
PAVEMENT REMOVAL	53 S.Y.
1–1/2" BASE COURSE	13.5 C.Y.
EXCAV. BELOW PAVMT.	15.6 C.Y.
DRILLING DOWEL HOLES	9 L.F.
EXPANSION JOINT MATRL	24 L.F.
PVMNT. REPLACMENT	24 S.F.

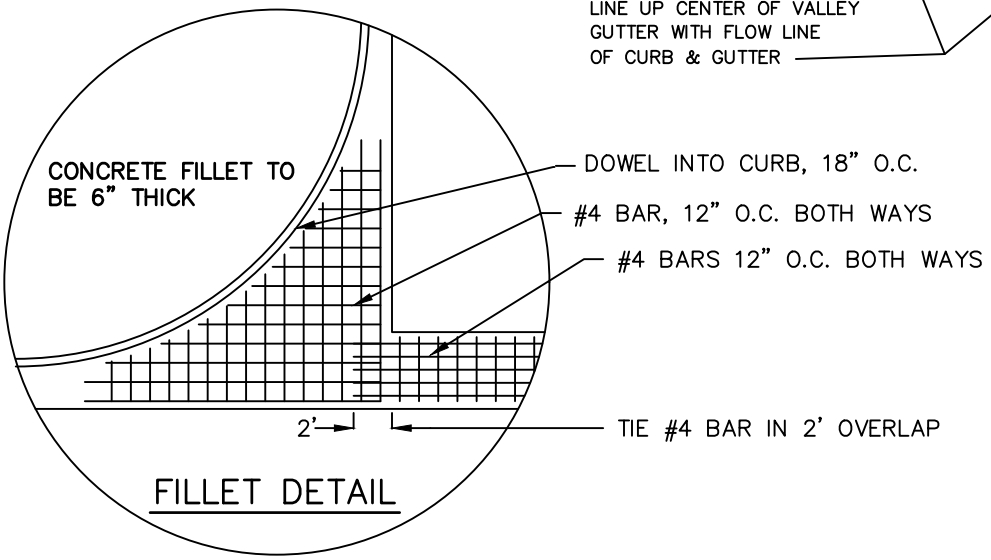
SECTION A – A



TYPICAL VALLEY GUTTER INSTALLATION WITH EXISTING CURBS

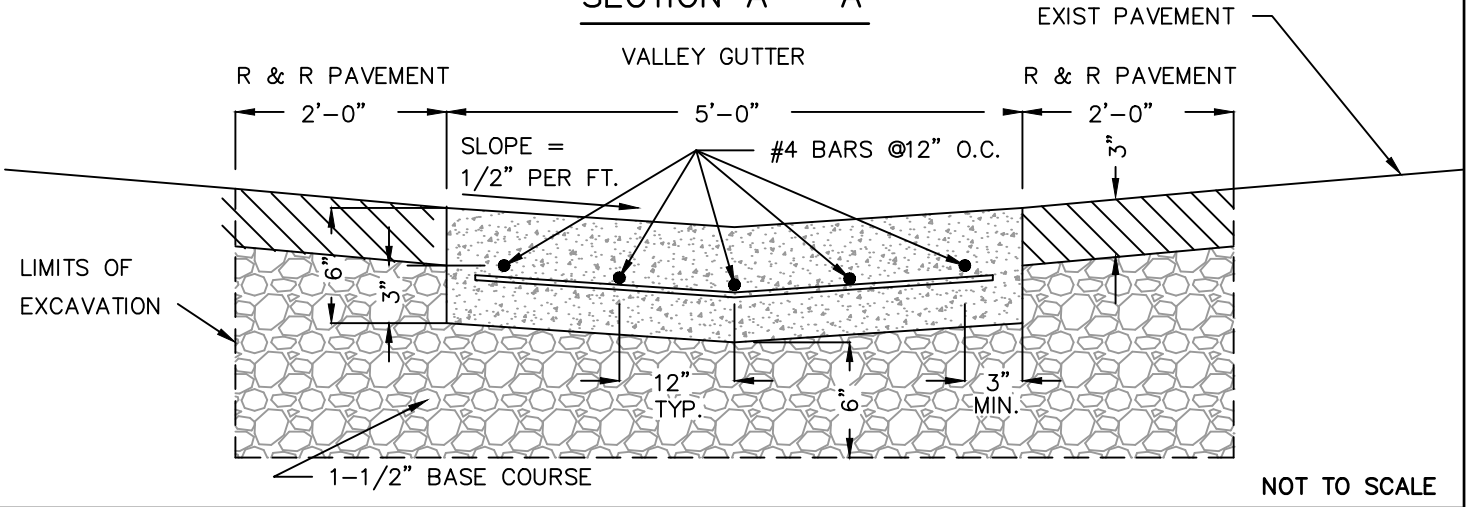
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	MAY 1991 REVISED	5 – 15





FILLET DETAIL

SECTION A – A

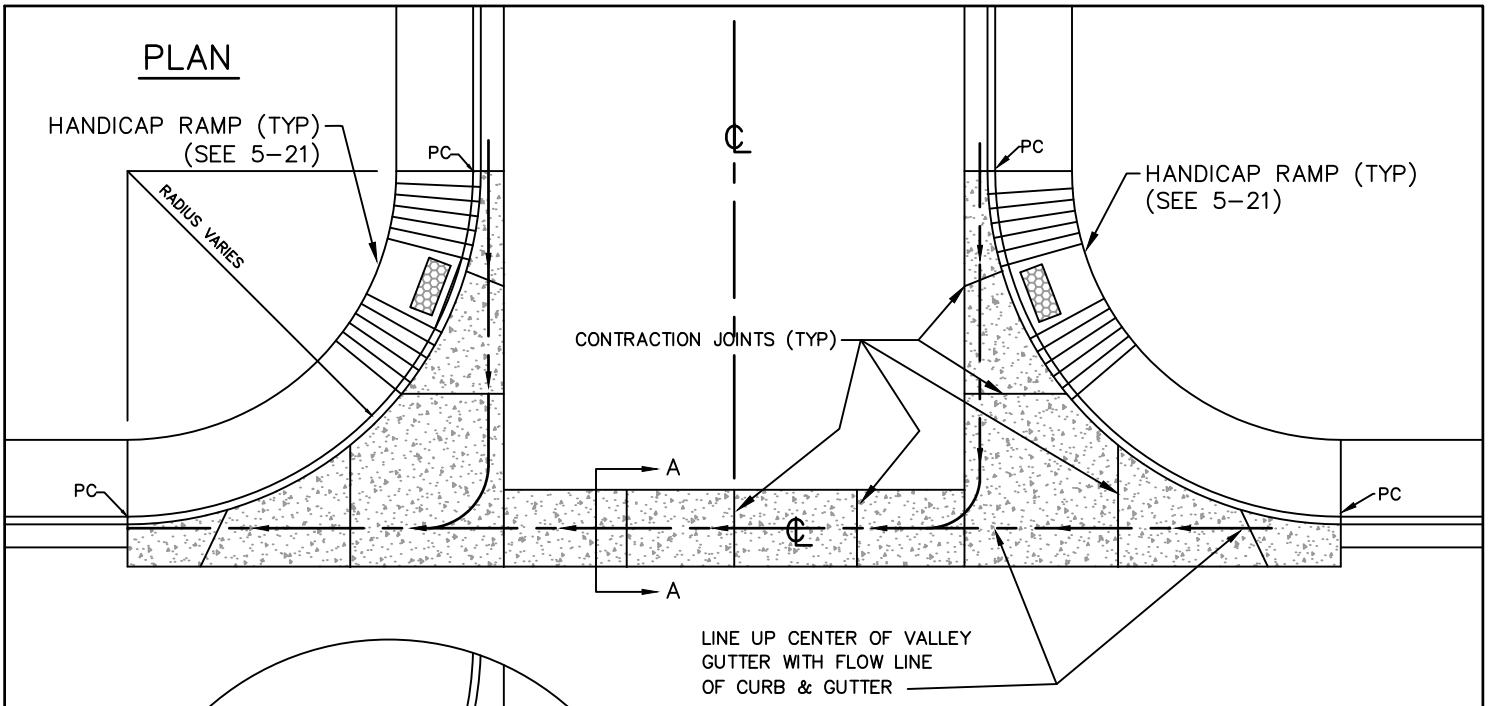


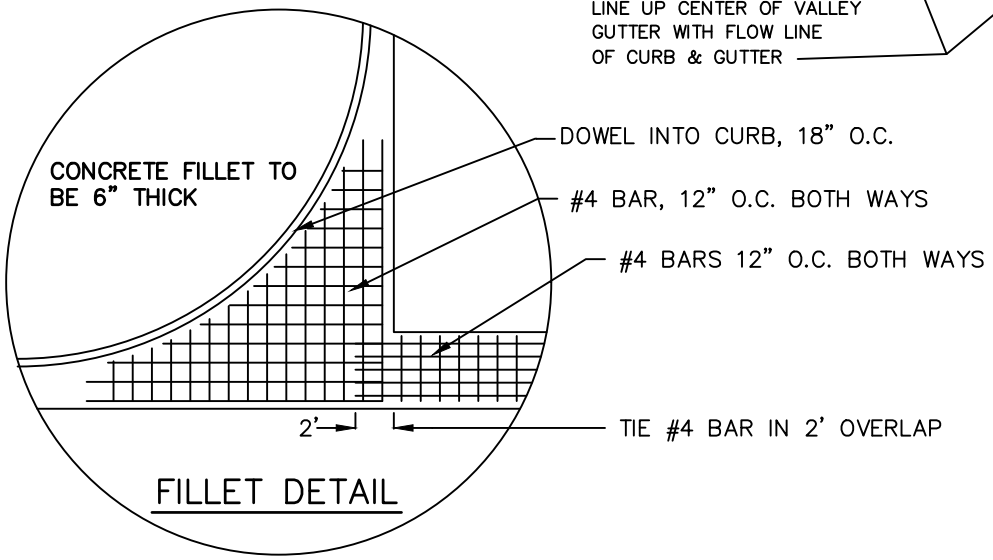
NOT TO SCALE

VALLEY GUTTER WITH CORNER CURB FILLETS & DOUBLE RAMPS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	94, 97, 04, 06, 07 REVISED: APRIL 2009	5 – 15

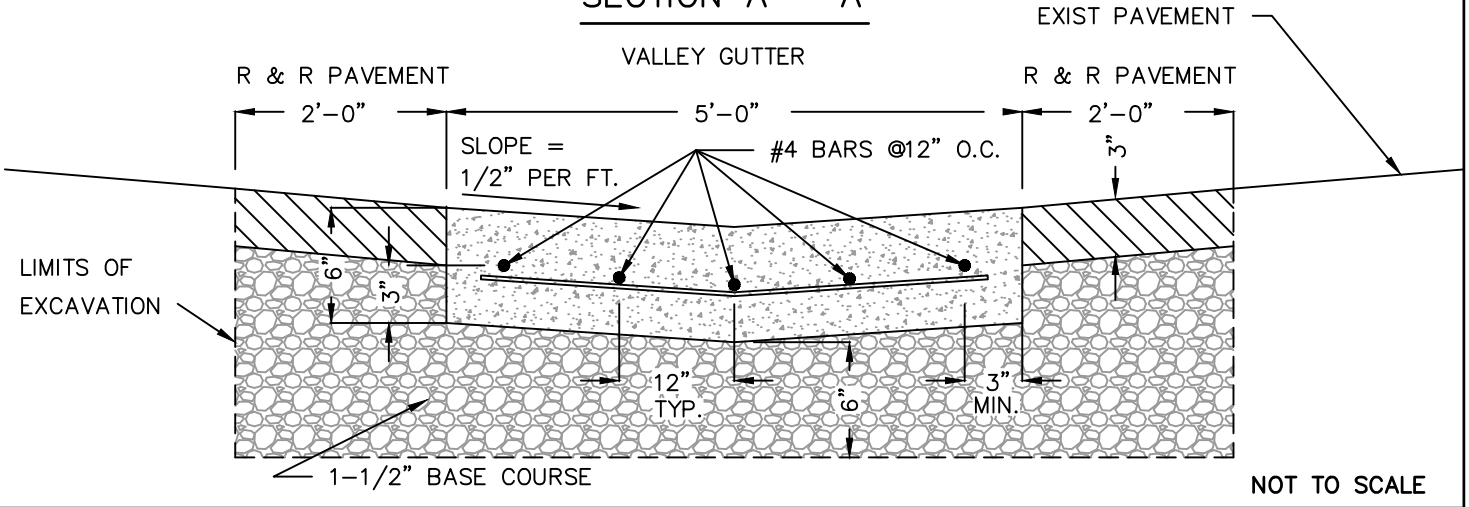
PLAN





FILLET DETAIL

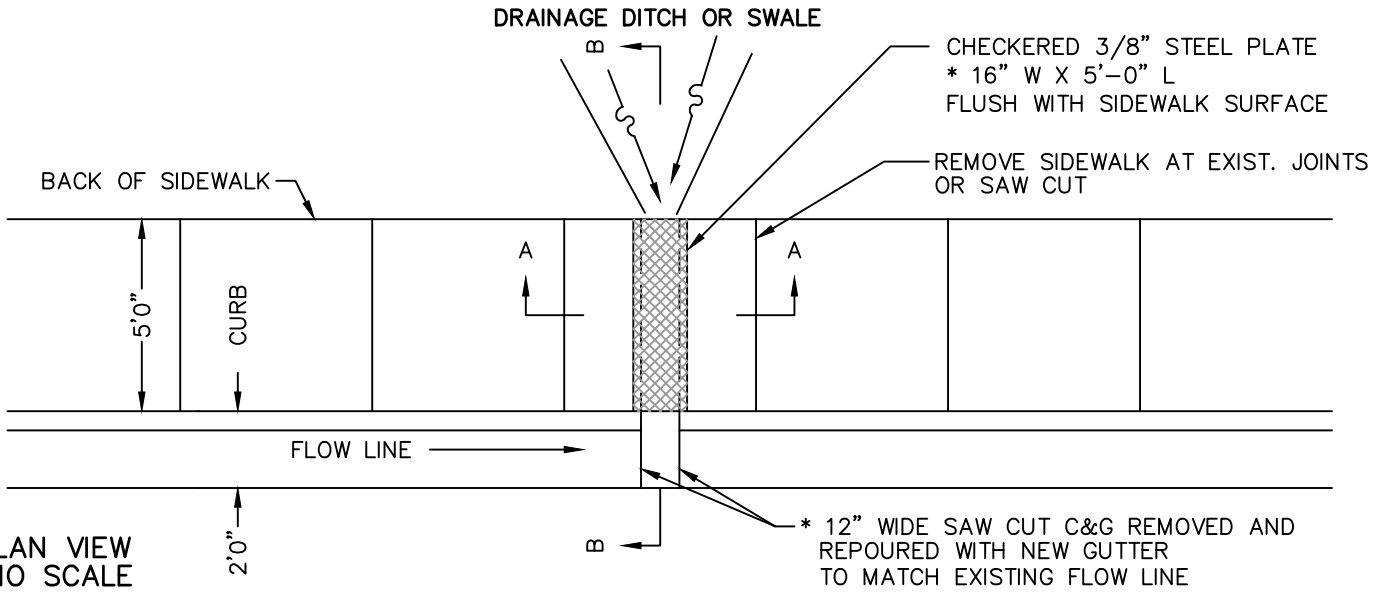
SECTION A – A



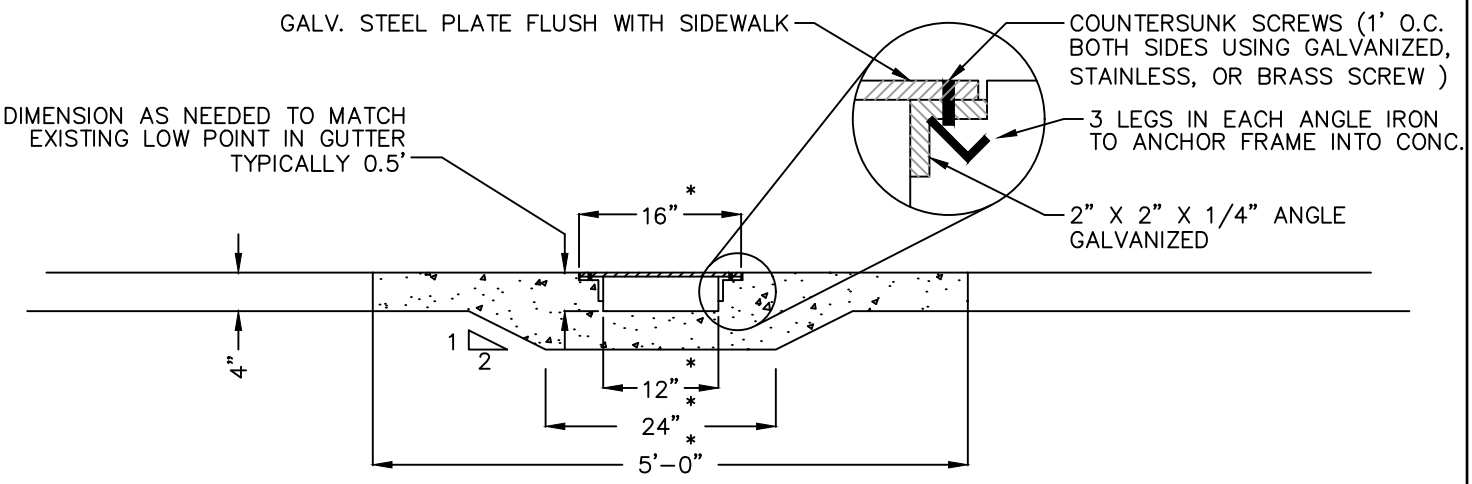
NOT TO SCALE

VALLEY GUTTER WITH CORNER CURB FILLETS & SINGLE RAMPS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED: APRIL 2009	5 – 15

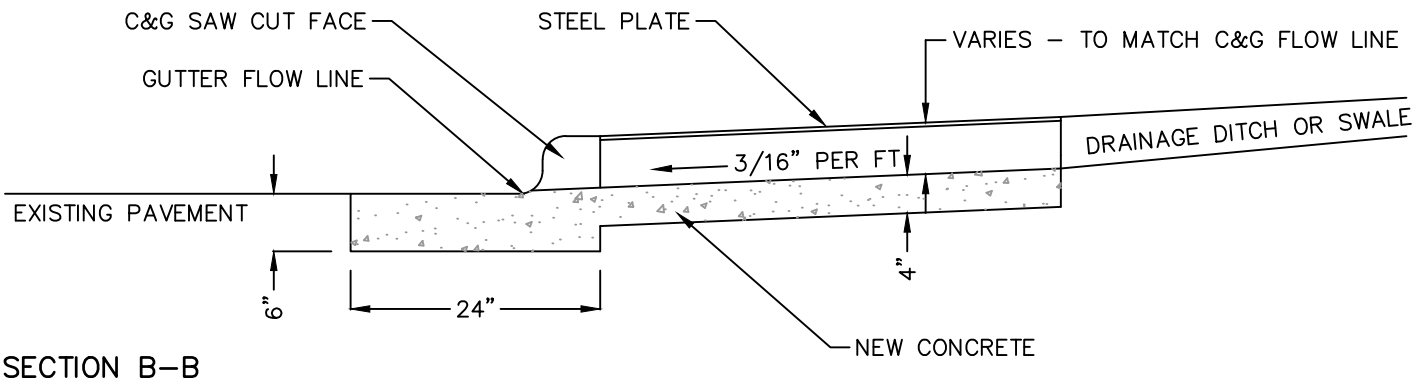


PLAN VIEW
NO SCALE



SECTION A–A
NO SCALE

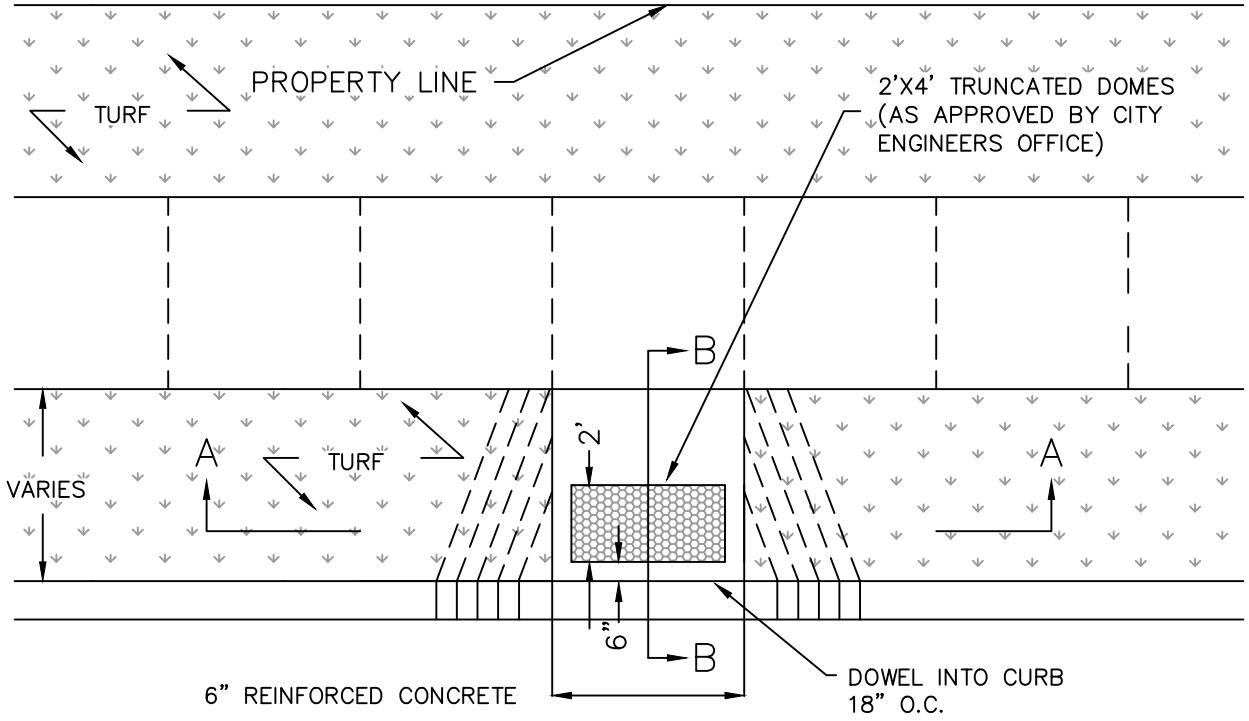
* NOTE: WIDTH OF CHANNEL AND STEEL PLATE MAY VARY DEPENDING ON OUTLET FLOW REQUIREMENTS.

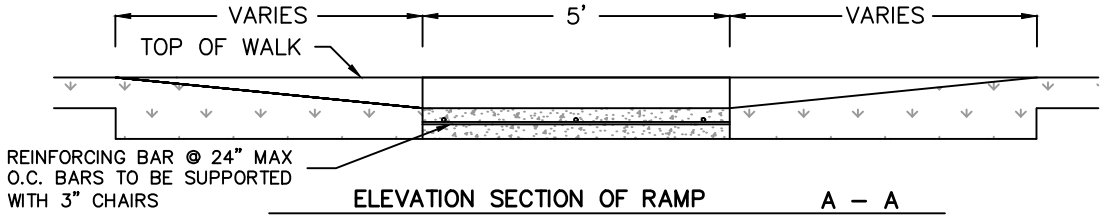


SECTION B–B
NO SCALE

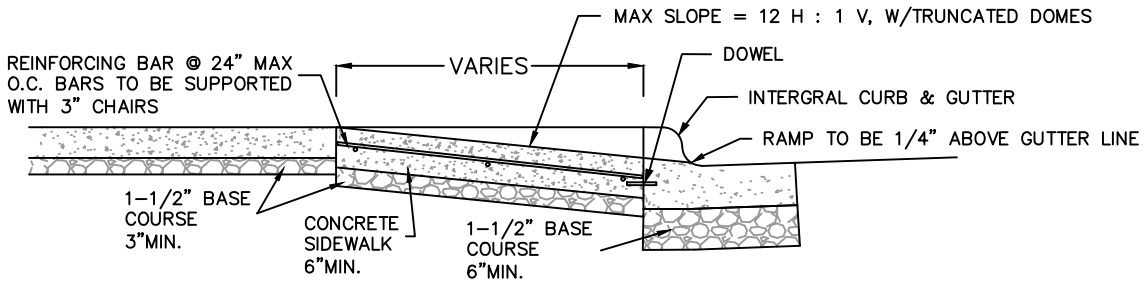
TYPICAL SIDEWALK DRAINAGE CROSSING GUTTER DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	JULY 1991 REVISED AUGUST 2018	5 – 16





ELEVATION SECTION OF RAMP A – A



CROSS SECTION OF RAMP B – B

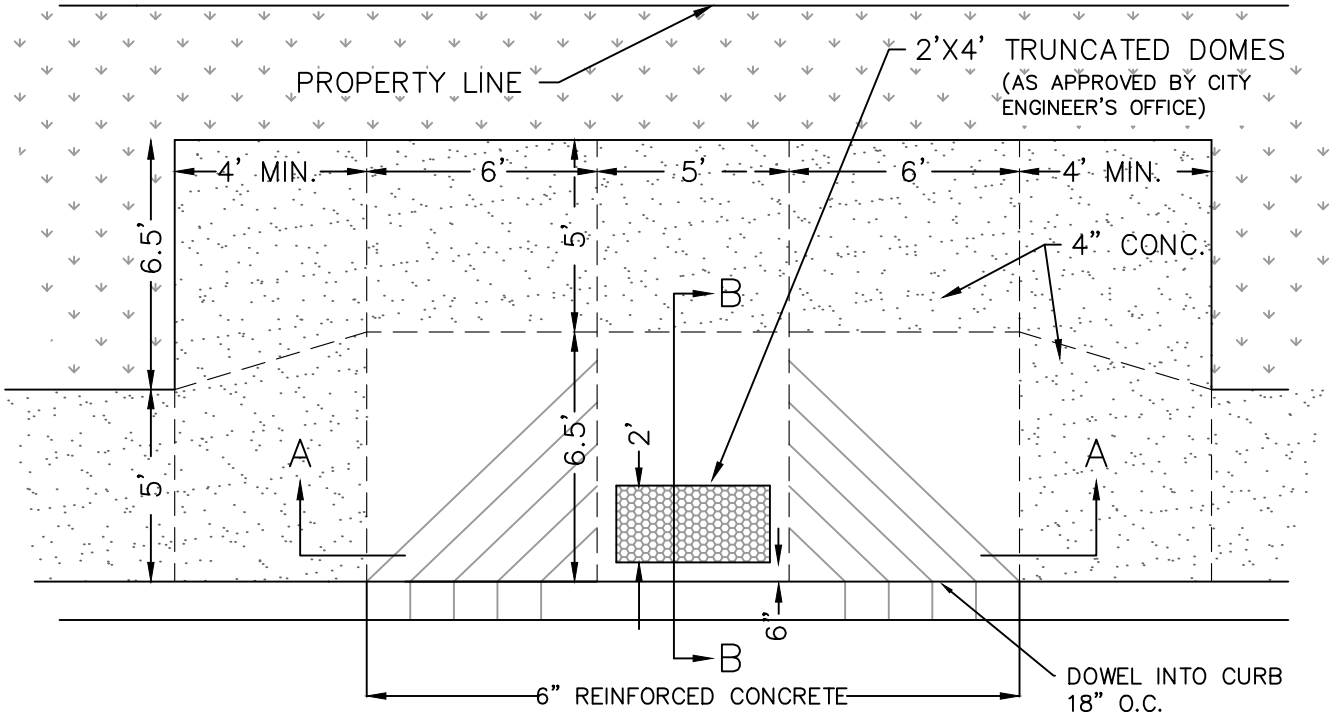
NOT TO SCALE

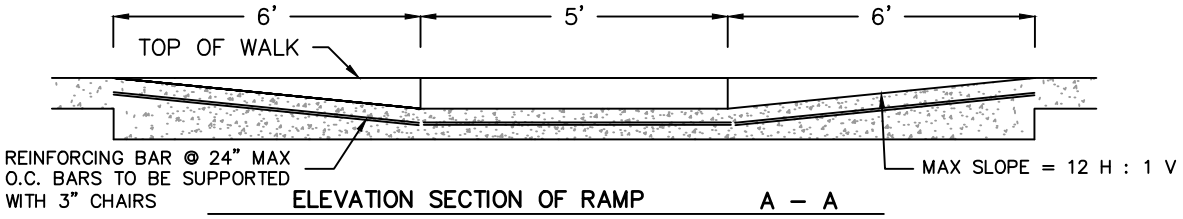
NOTES :

1. SURFACE TEXTURE OF RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING TRAVERSE TO THE SLOPE OF THE RAMP.
2. CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.
3. DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH THE RAMP. LOCATION OF THE HANDICAP RAMP SHOULD TAKE PRECEDENCE OVER LOCATION OF NEW STORM DRAINAGE STRUCTURE INSTALLATIONS.
4. THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP. RAMP LIP TO BE 1/4" ABOVE THE GUTTER LINE.
5. CROSSWALK AND STOP LINE MARKINGS , IF USED , SHALL BE SO LOCATED TO STOP TRAFFIC SHORT OF RAMP CROSSINGS.
6. TRUNCATED DOMES SHALL BE INSTALLED AT THE BOTTOM 2' OF RAMPS, LOCATE THE EDGE OF THE PANEL NO MORE THAN 6" FROM THE BACK OF CURB. RED BRICK COLOR ONLY ON TRUNCATED DOMES.
7. CONCRETE IN RAMP AREAS SHALL BE 6" REINFORCED (24" O.C) USING 4,000 PSI MIX (6.5 SACK).
8. ALL 6" REINFORCED CONCRETE IN RAMP AREAS SHALL BE DOWELED INTO CURB AND GUTTER (18" O.C.)
9. DOWEL INTO EXISTING CONCRETE AS DIRECTED BY CITY ENGINEER'S OFFICE.
10. DOWELS SHALL BE #3 STRAIGHT (SMOOTH) BAR WITH A MIN. LENGTH OF 12" MIN. EMBED DEPTH SHALL BE 3"

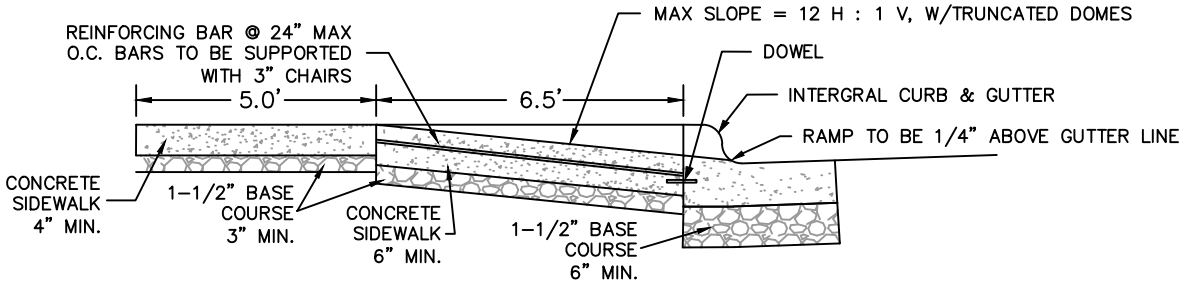
HANDICAP RAMP – MID BLOCK (BOULEVARD)

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MAY 2016	5 – 17





ELEVATION SECTION OF RAMP A – A



CROSS SECTION OF RAMP B – B

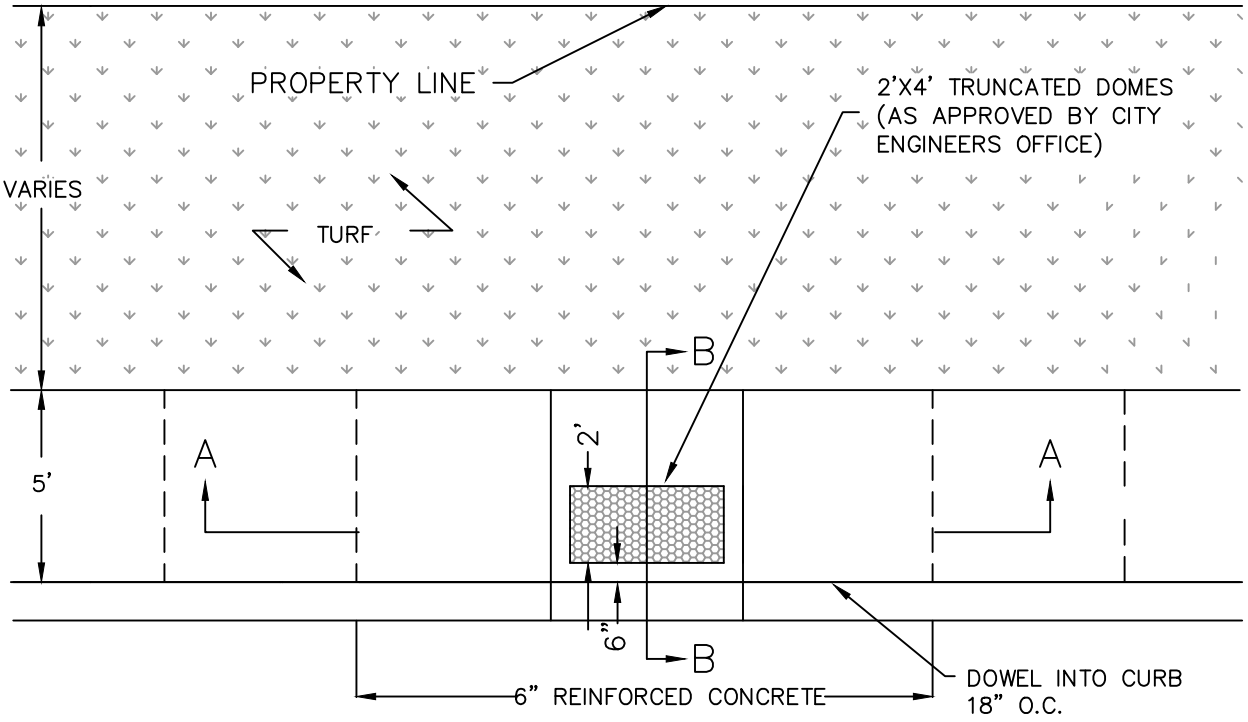
NOT TO SCALE

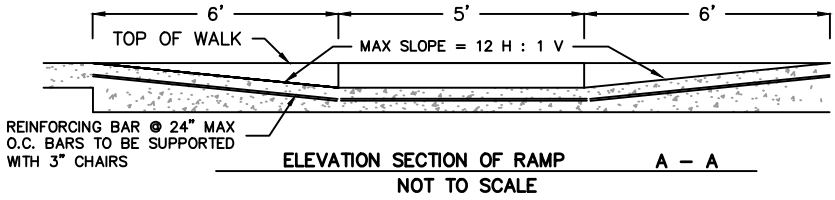
NOTES :

1. SURFACE TEXTURE OF RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING TRAVERSE TO THE SLOPE OF THE RAMP.
2. CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.
3. DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH THE RAMP. LOCATION OF THE HANDICAP RAMP SHOULD TAKE PRECEDENCE OVER LOCATION OF NEW STORM DRAINAGE STRUCTURE INSTALLATIONS.
4. THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP. RAMP LIP TO BE 1/4" ABOVE THE GUTTER LINE.
5. CROSSWALK AND STOP LINE MARKINGS , IF USED , SHALL BE SO LOCATED TO STOP TRAFFIC SHORT OF RAMP CROSSINGS.
6. TRUNCATED DOMES SHALL BE INSTALLED AT THE BOTTOM 2' OF RAMPS. WIDTH OF RAMPS MAY VARY. BRICK RED COLOR ONLY ON CONCRETE TRUNCATED DOMES.
7. CONCRETE IN RAMP AREAS SHALL BE 6" REINFORCED (24" O.C) USING 4,000 PSI MIX (6.5 SACK).
8. ALL 6" REINFORCED CONCRETE IN RAMP AREAS SHALL BE DOWELED INTO CURB AND GUTTER (18" O.C.)
9. DOWEL INTO EXISTING CONCRETE AS DIRECTED BY CITY ENGINEER'S OFFICE.
10. DOWELS SHALL BE #3 STRAIGHT (SMOOTH) BAR WITH A MIN. LENGTH OF 12" MIN. EMBED DEPTH SHALL BE 3"

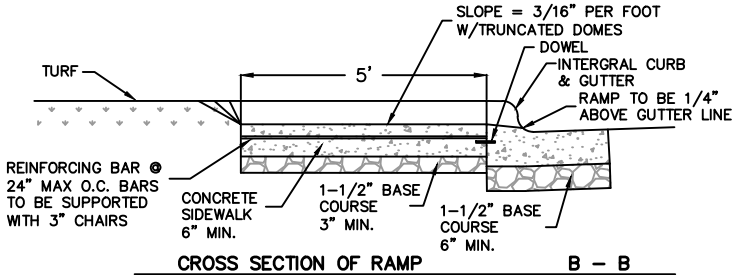
HANDICAP RAMP – MID BLOCK
(SIDEWALK ADJACENT TO CURB, OFFSET LANDING)

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	JUNE 2016	5 – 17





ELEVATION SECTION OF RAMP A – A
NOT TO SCALE

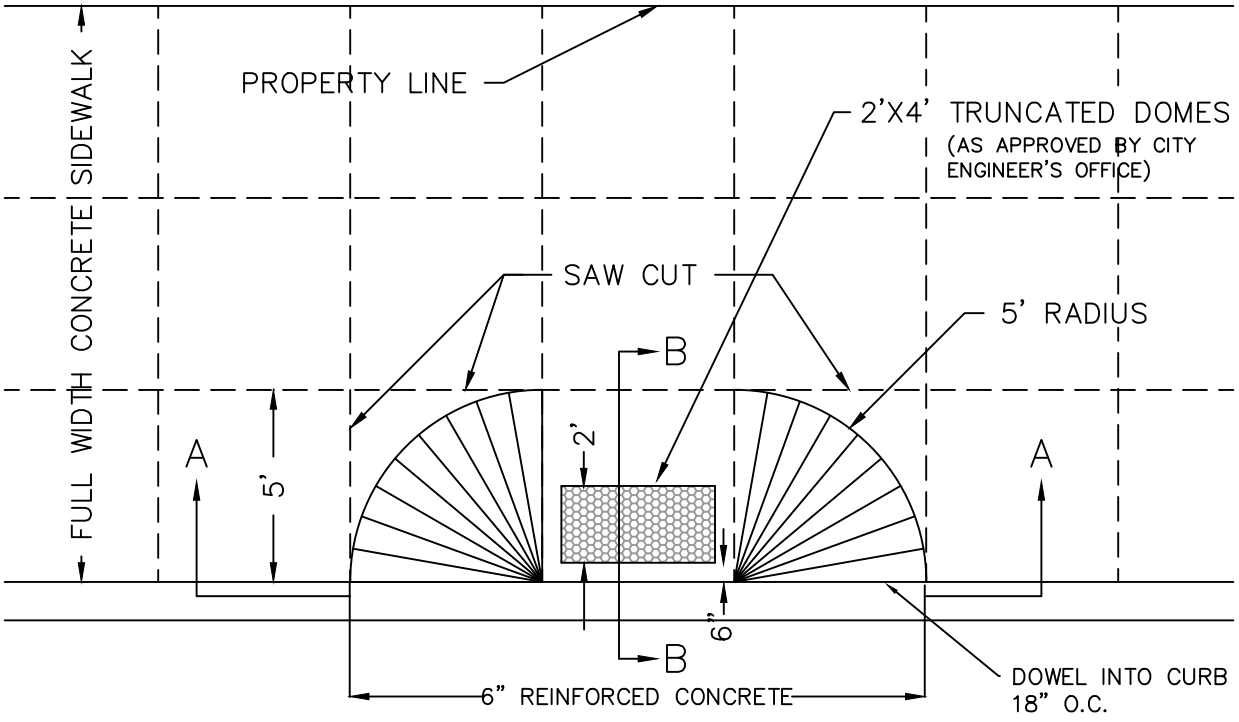


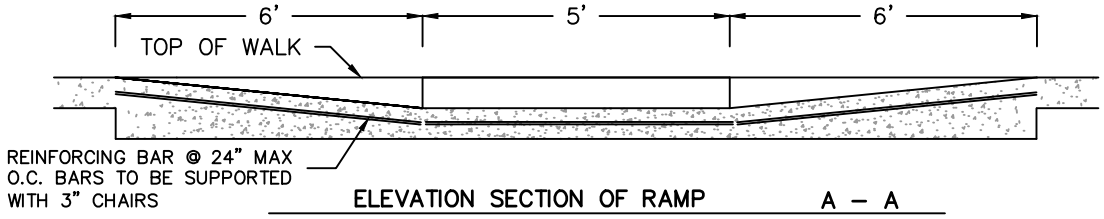
CROSS SECTION OF RAMP B – B
NOT TO SCALE

NOTES :

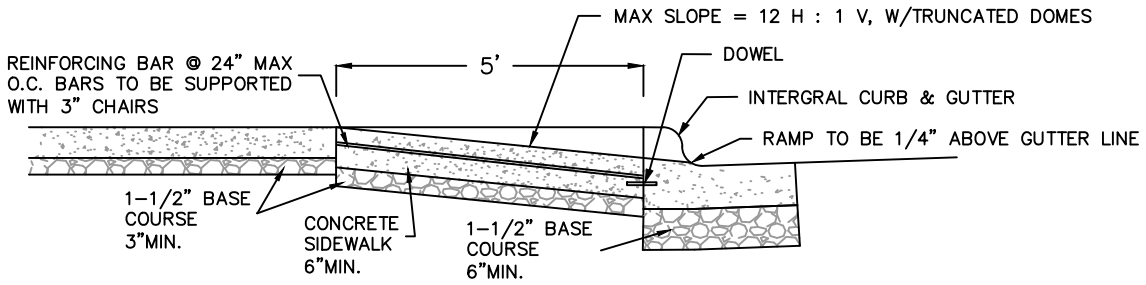
1. SURFACE TEXTURE OF RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING TRAVERSE TO THE SLOPE OF THE RAMP.
2. CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.
3. DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH THE RAMP. LOCATION OF THE HANDICAP RAMP SHOULD TAKE PRECEDENCE OVER LOCATION OF NEW STORM DRAINAGE STRUCTURE INSTALLATIONS.
4. THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP. RAMP LIP TO BE 1/4" ABOVE THE GUTTER LINE.
5. CROSSWALK AND STOP LINE MARKINGS , IF USED , SHALL BE SO LOCATED TO STOP TRAFFIC SHORT OF RAMP CROSSINGS.
6. TRUNCATED DOMES SHALL BE INSTALLED AT THE BOTTOM 2' OF RAMPS, LOCATE THE EDGE OF THE PANEL NO MORE THAN 6" FROM THE BACK OF CURB. RED BRICK COLOR ONLY ON TRUNCATED DOMES.
7. CONCRETE IN RAMP AREAS SHALL BE 6" REINFORCED (24" O.C) USING 4,000 PSI MIX (6.5 SACK).
8. ALL 6" REINFORCED CONCRETE IN RAMP AREAS SHALL BE DOWELED INTO CURB AND GUTTER (18" O.C.)
9. DOWEL INTO EXISTING CONCRETE AS DIRECTED BY CITY ENGINEER'S OFFICE.
10. DOWELS SHALL BE #3 STRAIGHT (SMOOTH) BAR WITH A MIN. LENGTH OF 12" MIN. EMBED DEPTH SHALL BE 3"

HANDICAP RAMP – MID BLOCK (SIDEWALK ADJACENT)





ELEVATION SECTION OF RAMP A – A



CROSS SECTION OF RAMP B – B

NOT TO SCALE

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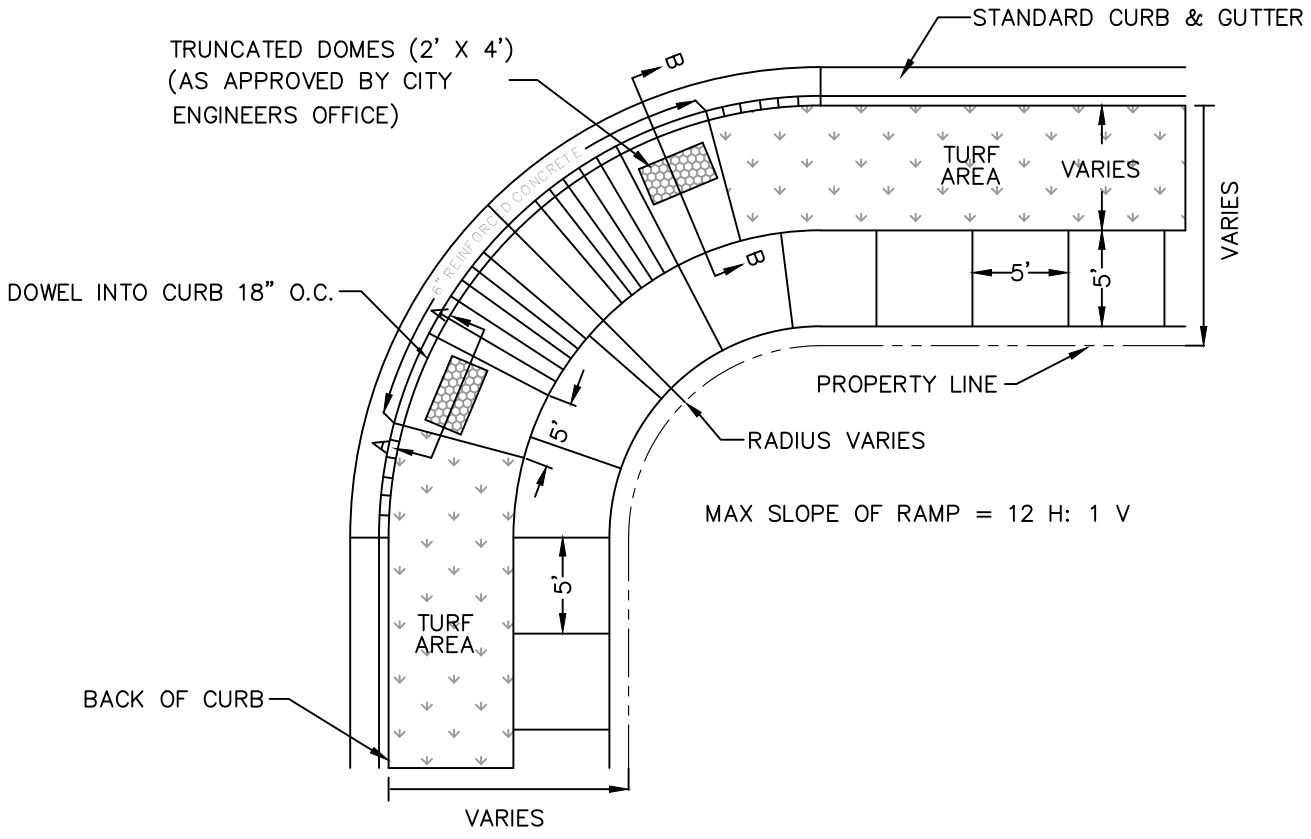
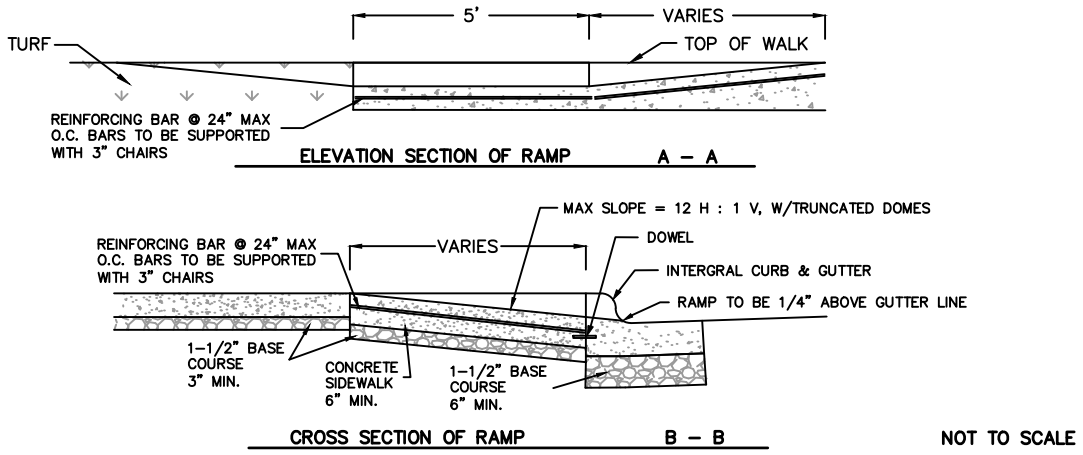
HANDICAP RAMP – MID BLOCK

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MAY 2016	5 – 18





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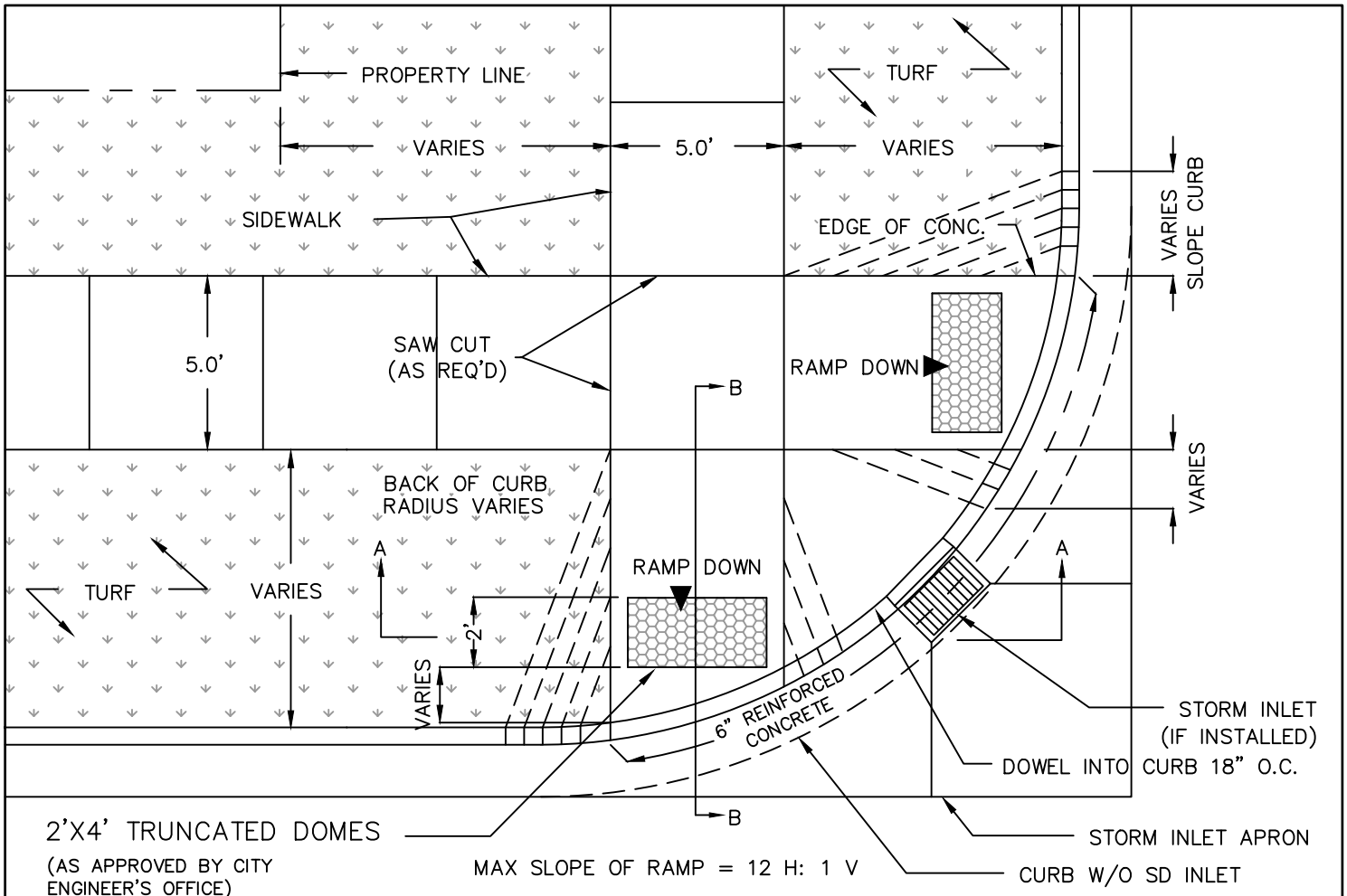
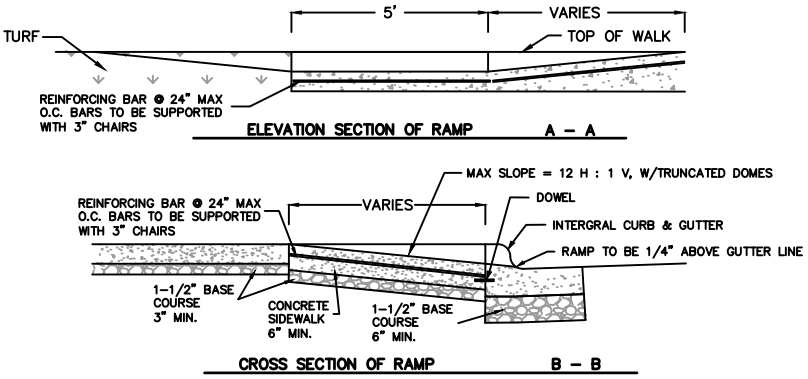
DOUBLE HANDICAP RAMPS AT ROUNDED SIDEWALK BOULEVARD AREAS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MAY 2016	5 – 19 148





NOT TO SCALE

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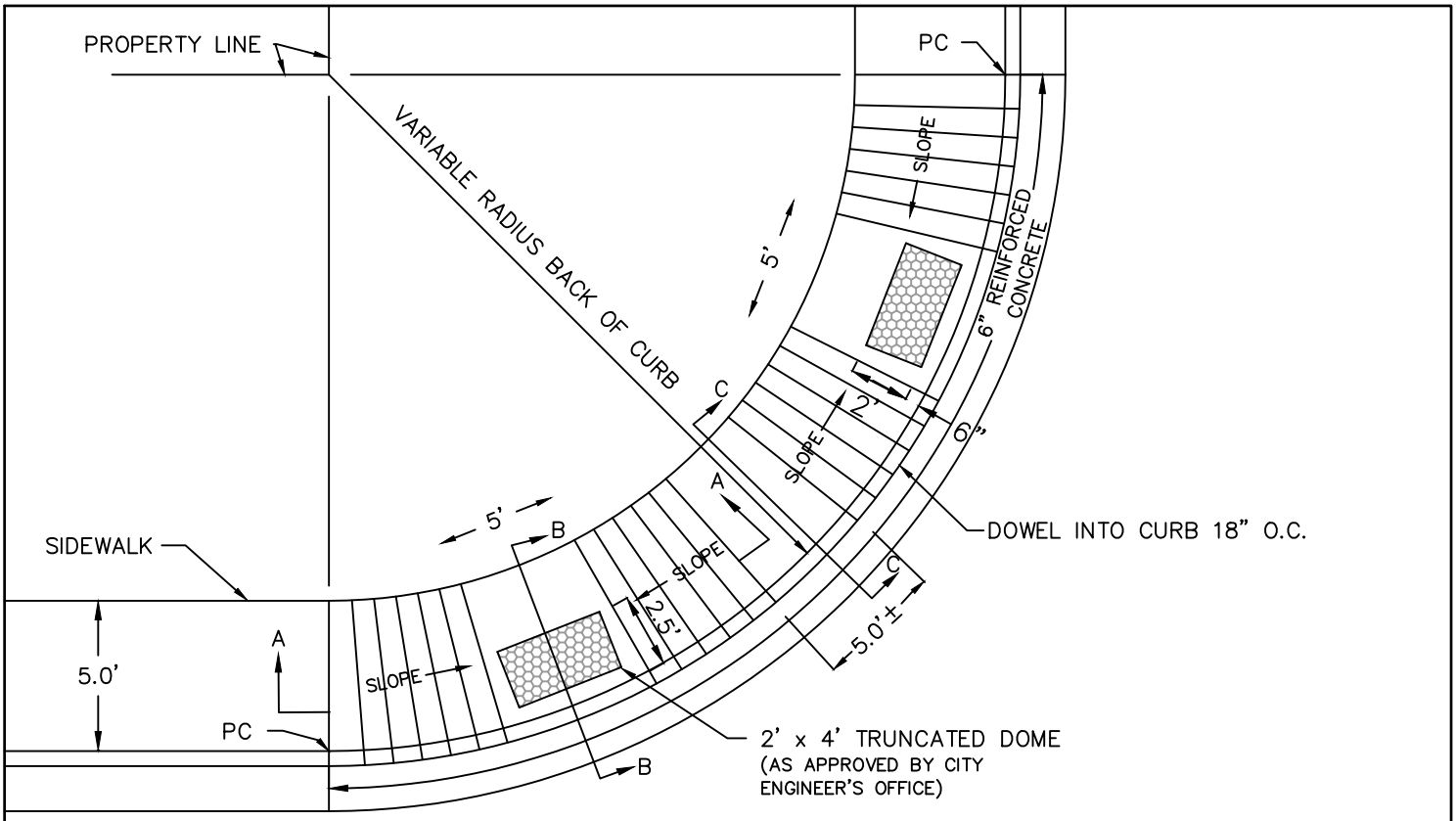
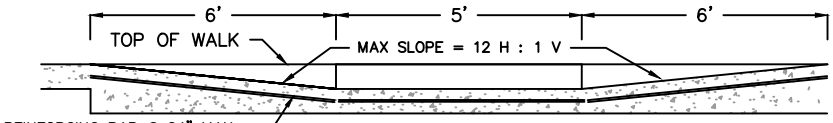
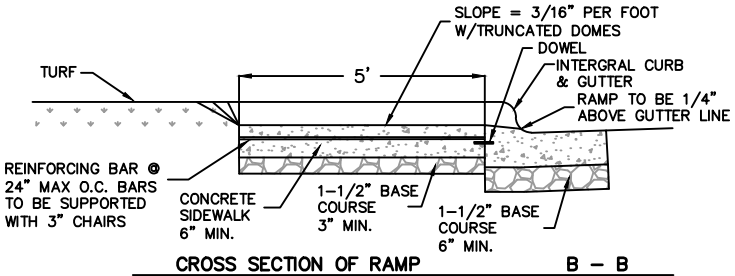
DOUBLE HANDICAP RAMPS AT CORNERS IN BOULEVARD AREAS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MAY 2016	5 – 2(

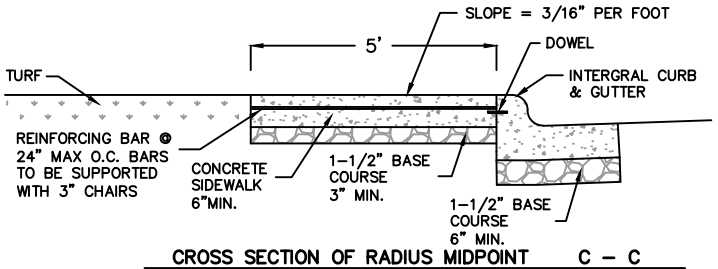




ELEVATION SECTION OF RAMP A – A
NOT TO SCALE



CROSS SECTION OF RAMP B – B
NOT TO SCALE



CROSS SECTION OF RADIUS MIDPOINT C – C
NOT TO SCALE

NOTES :

1. SURFACE TEXTURE OF RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING TRAVERSE TO THE SLOPE OF THE RAMP.
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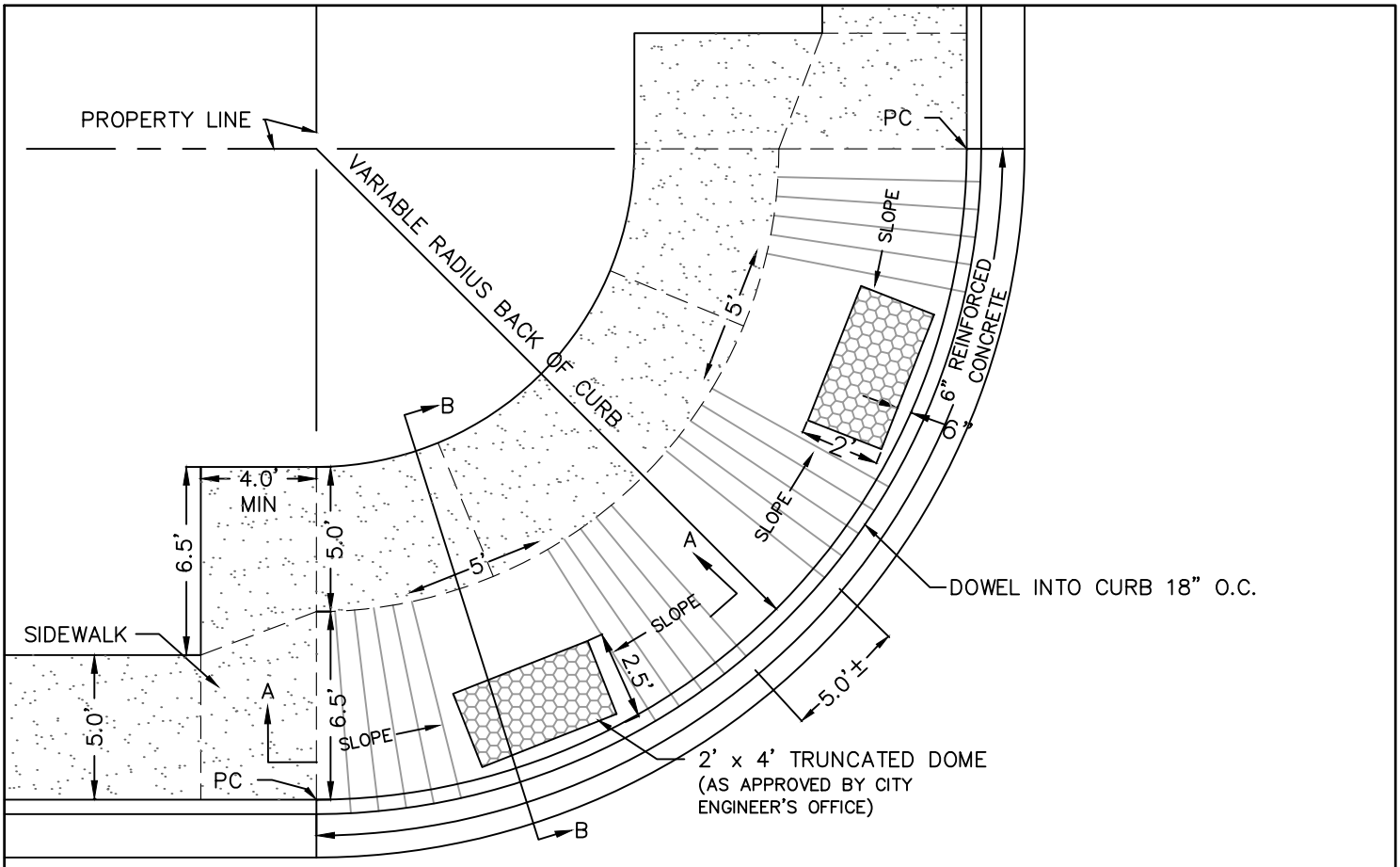
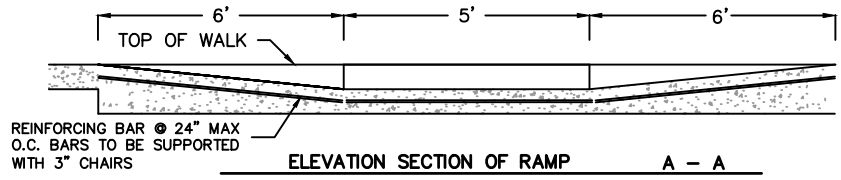
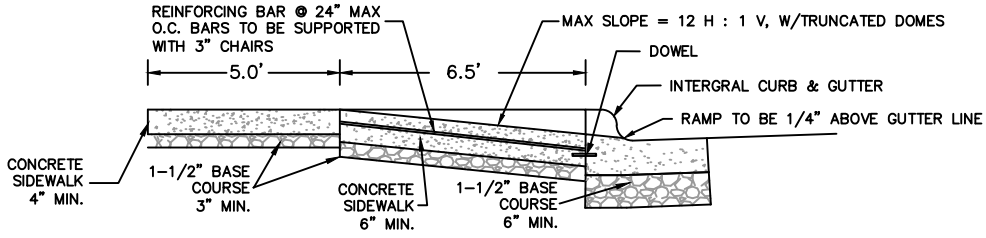
DOUBLE HANDICAP RAMPS WITH SIDEWALK ADJACENT TO CURB

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MAY 2016	5 – 2 150





ELEVATION SECTION OF RAMP A – A



CROSS SECTION OF RAMP B – B

NOT TO SCALE

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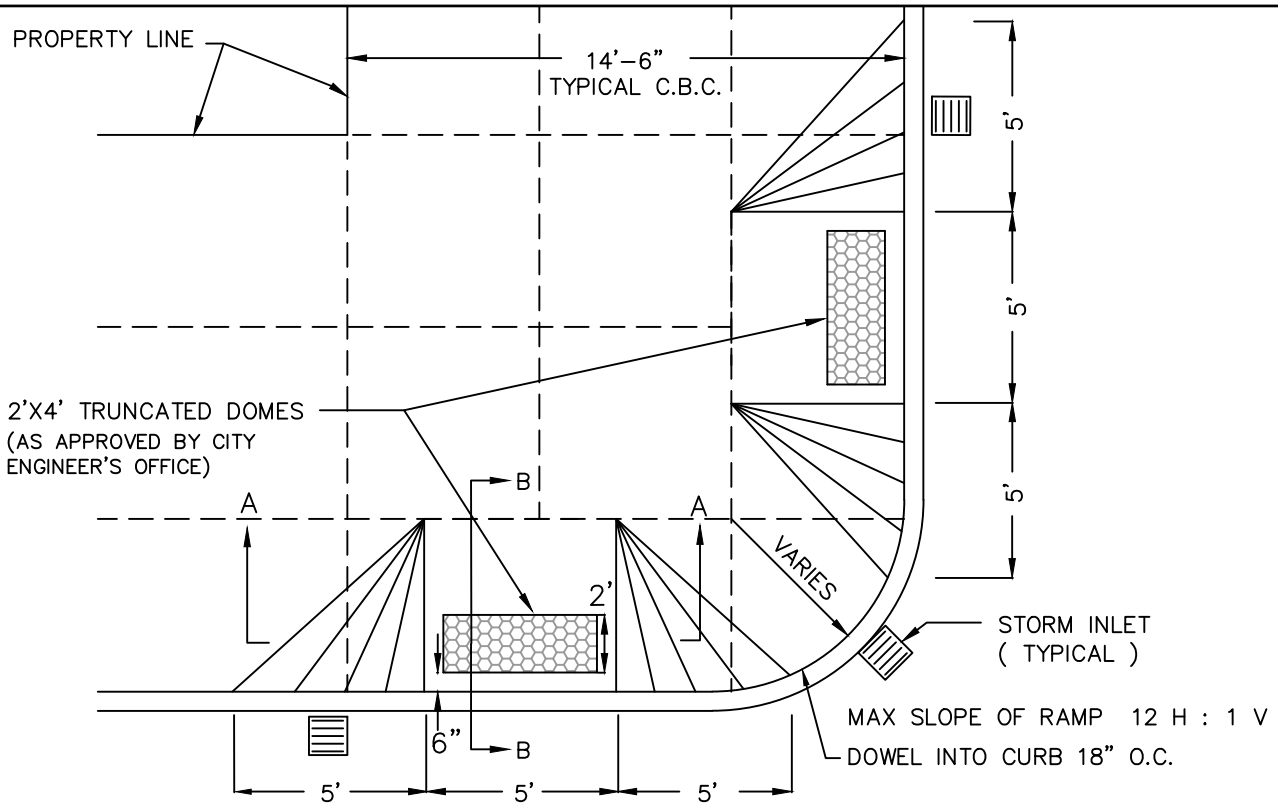
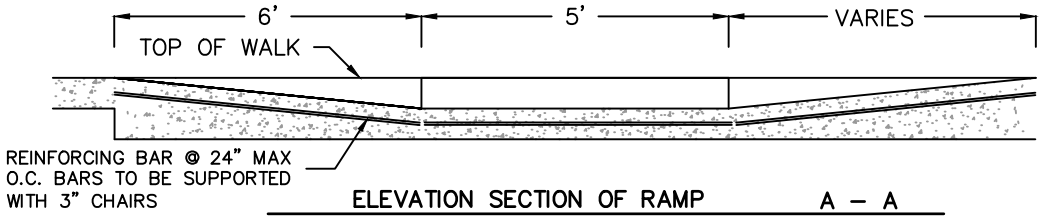
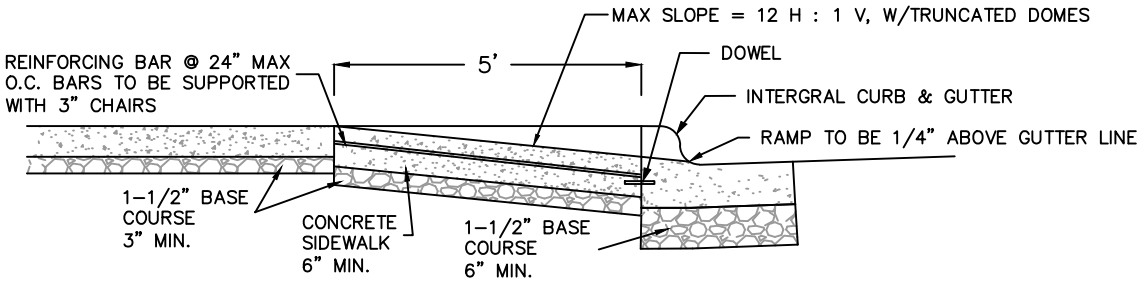
DOUBLE HANDICAP RAMPS WITH SIDEWALK ADJACENT TO CURB

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED JUNE 2016	5 – 21 151





ELEVATION SECTION OF RAMP A – A



CROSS SECTION OF RAMP B – B

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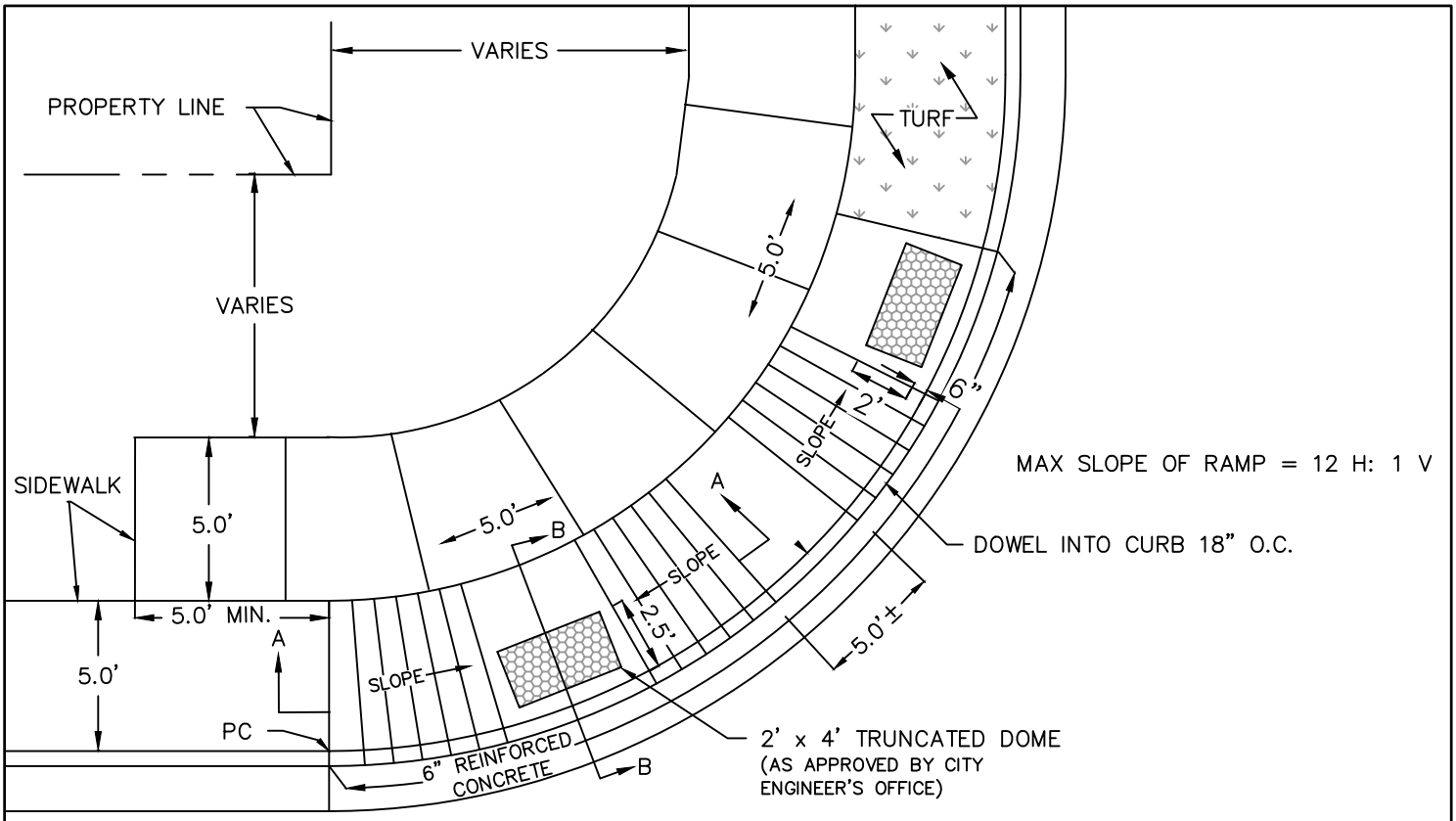
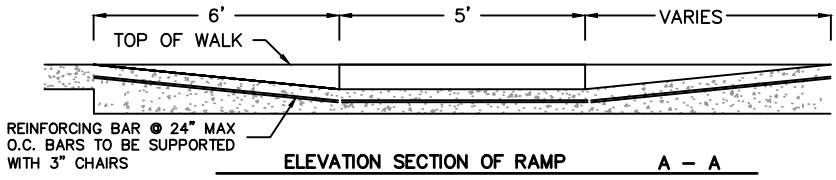
HANDICAP RAMPS – CENTRAL BUSINESS DISTRICT

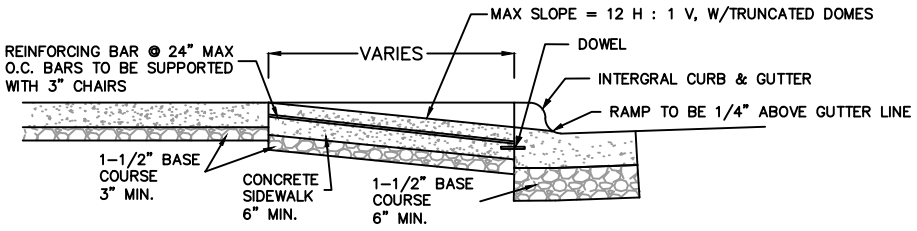
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MAY 2016	5 – 21



MAX SLOPE OF RAMP = 12 H: 1 V



ELEVATION SECTION OF RAMP A – A



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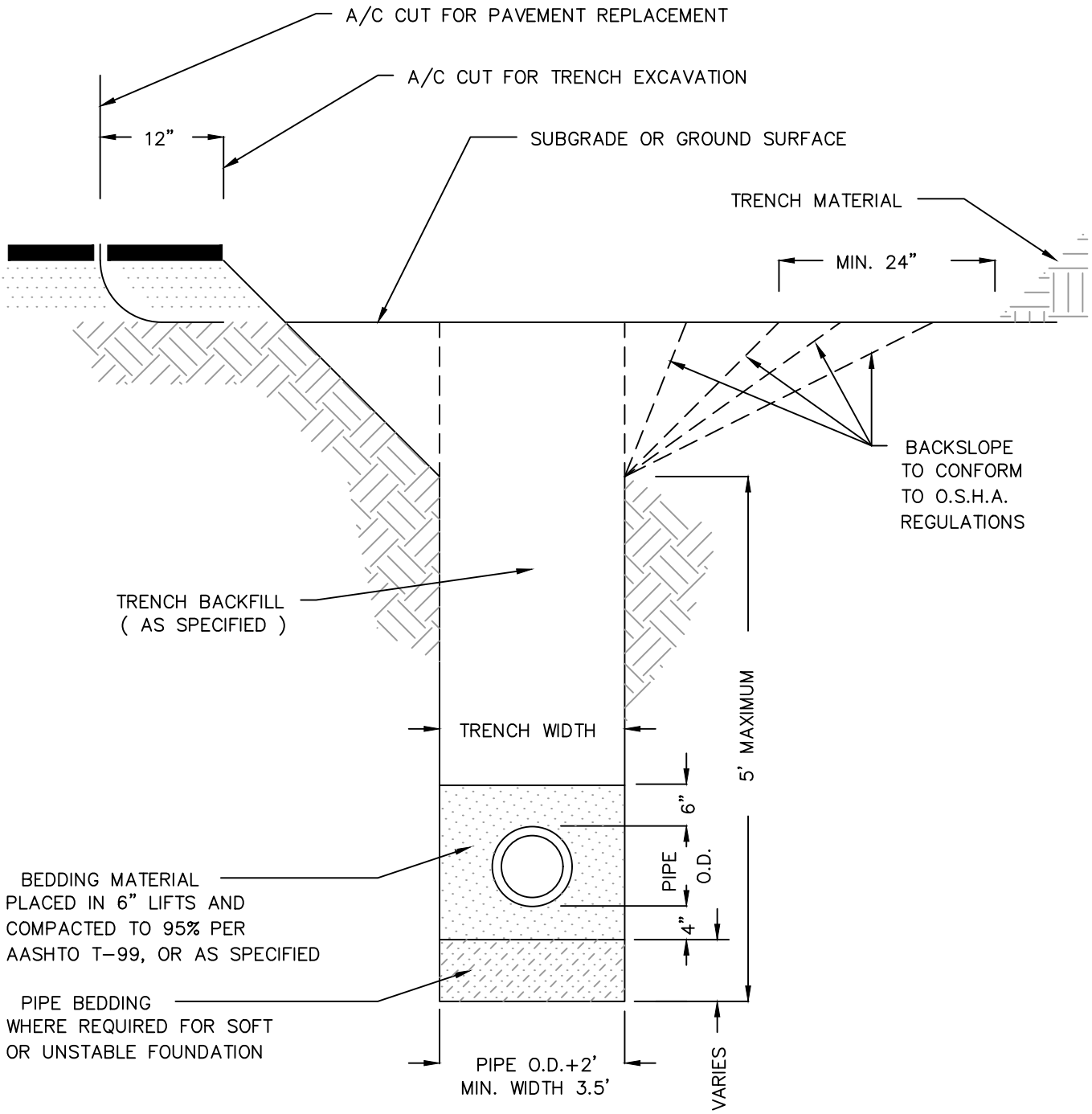
DOUBLE HANDICAP RAMPS WITH SIDEWALK ADJACENT TO CURB AND BOULEVARD AREAS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	REVISED MARCH 2017	5 – 24

NOTE : WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT
THE PAVEMENT SHALL BE CUT ALONG A NEAT VERTICAL LINE
12" FROM THE A/C CUT AT THE EDGE OF THE TRENCH OPENING
AFTER RESTORATION OF THE TRENCH BACKFILL.



NOTE : WHEN IN UNSTABLE OR SOFT MATERIAL, TRENCH WALLS
SHALL BE BACKSLOPED FROM THE BOTTOM OF THE TRENCH

TYPICAL TYPE 1 TRENCH DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 30

NOTE : WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT
THE PAVEMENT SHALL BE CUT ALONG A NEAT VERTICAL LINE
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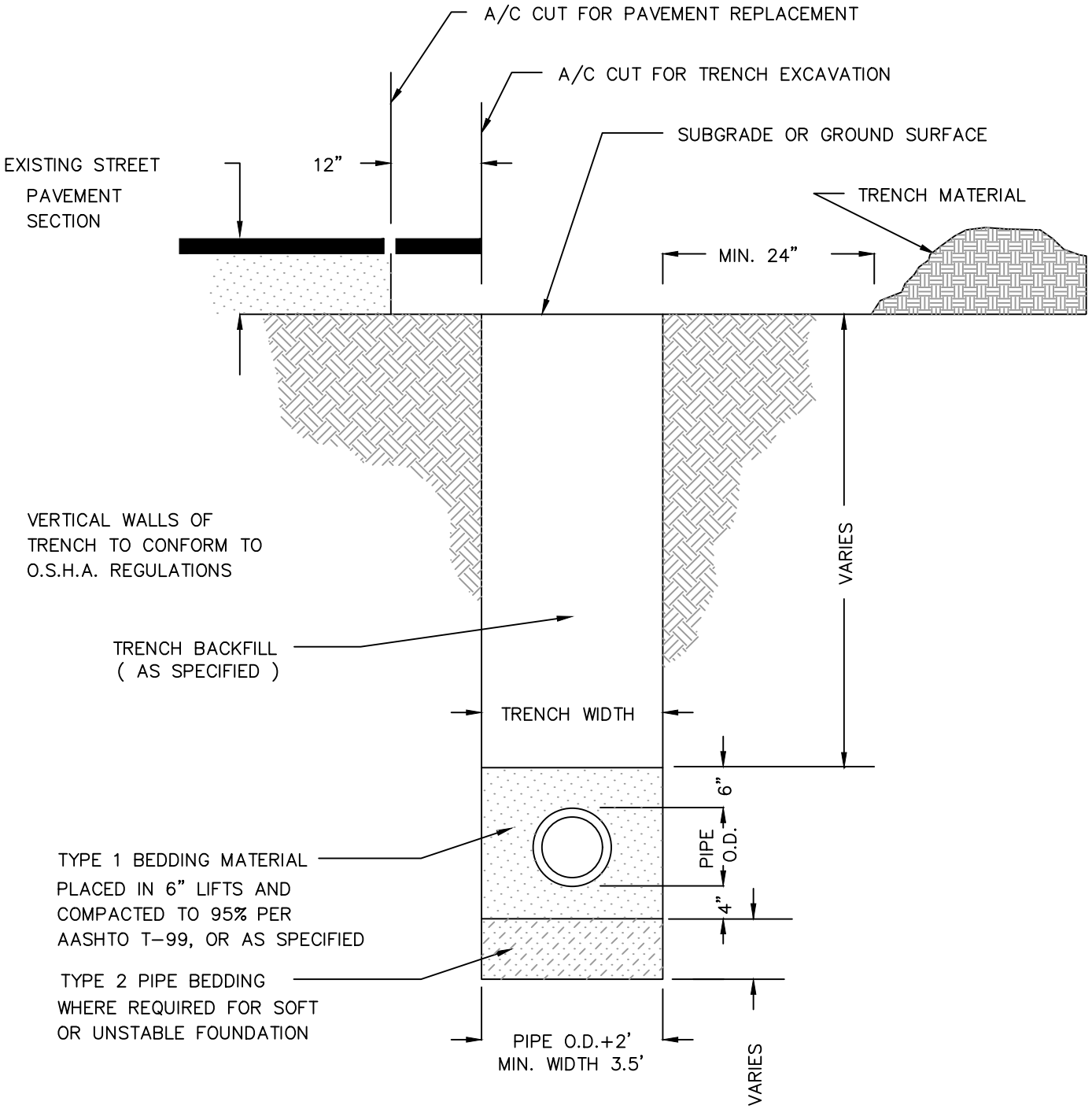
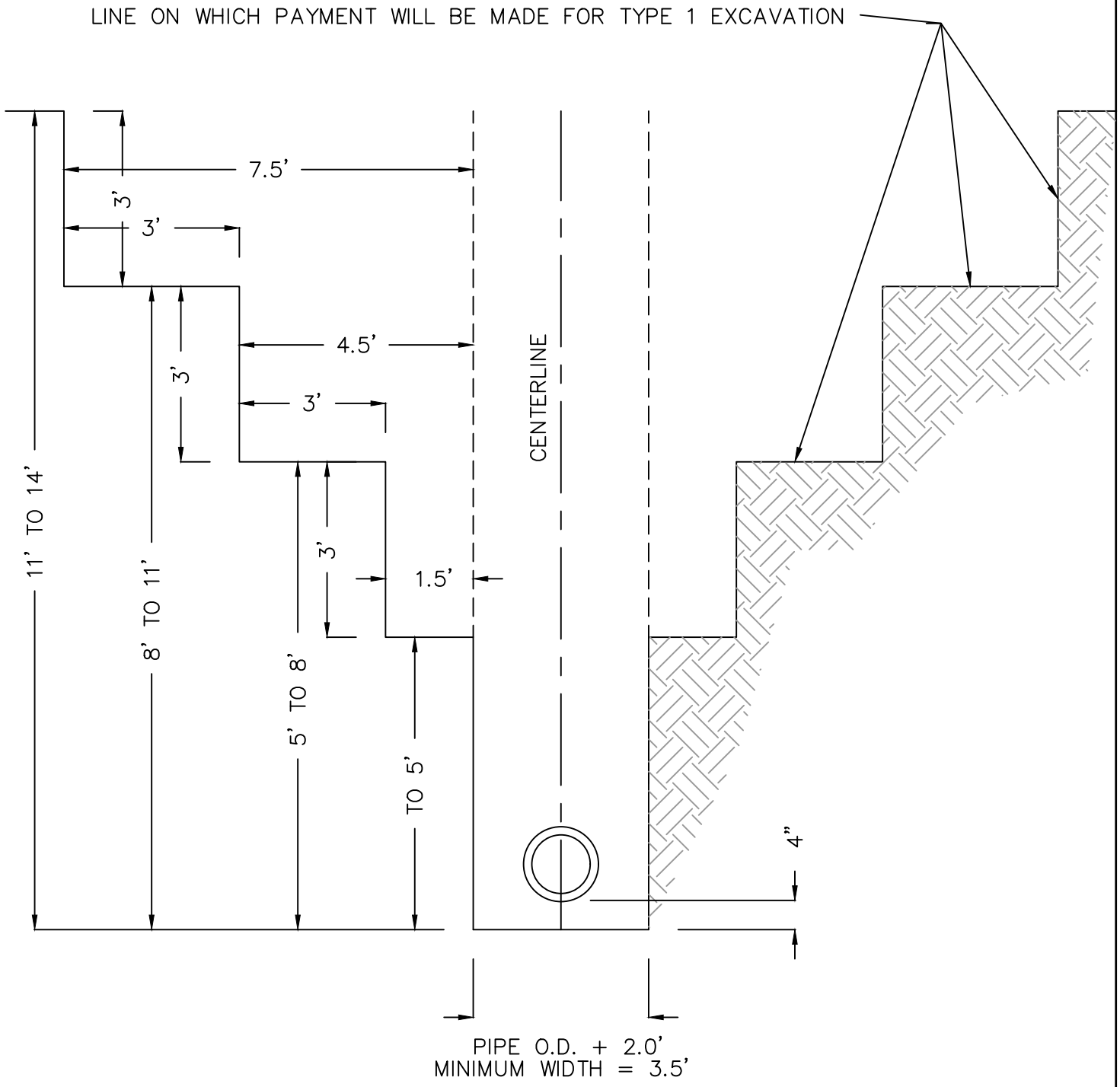
AFTER RESORATION OF THE TRENCH BACKFILL.



TYPICAL TYPE 2 TRENCH DETAIL

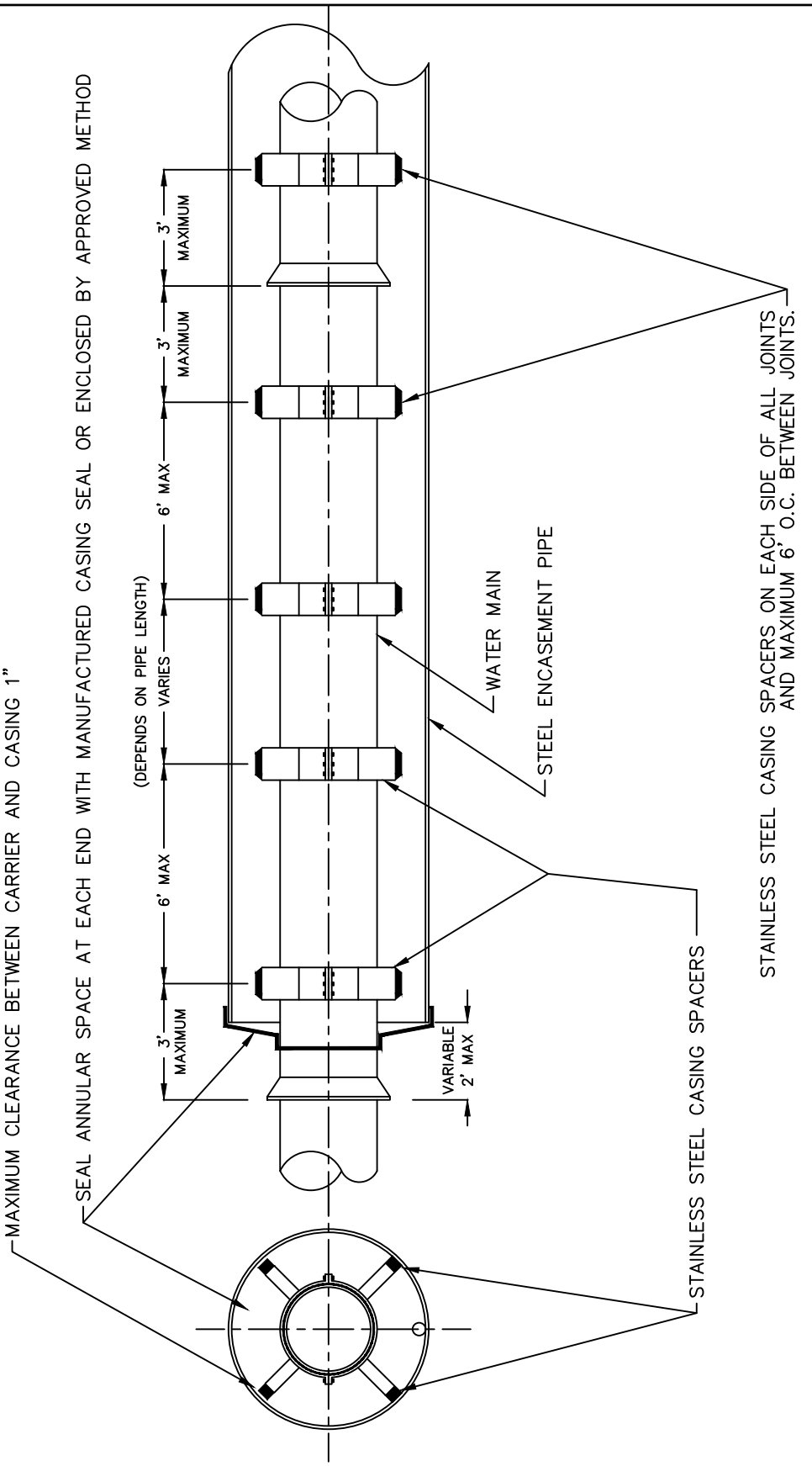
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED APR 1999	5 – 3



TRENCH DEPTH WILL BE MEASURED ALONG THE CENTERLINE OF THE TRENCH AT DEPTHS EQUAL TO THE VERTICAL DISTANCE FROM THE FINISHED GROUND SURFACE, OR TOP OF PAVEMENT, TO THE FLOW (INVERT) LINE OF THE PIPE PLUS THE THICKNESS OF THE PIPE BARREL AND BEDDING MATERIAL.

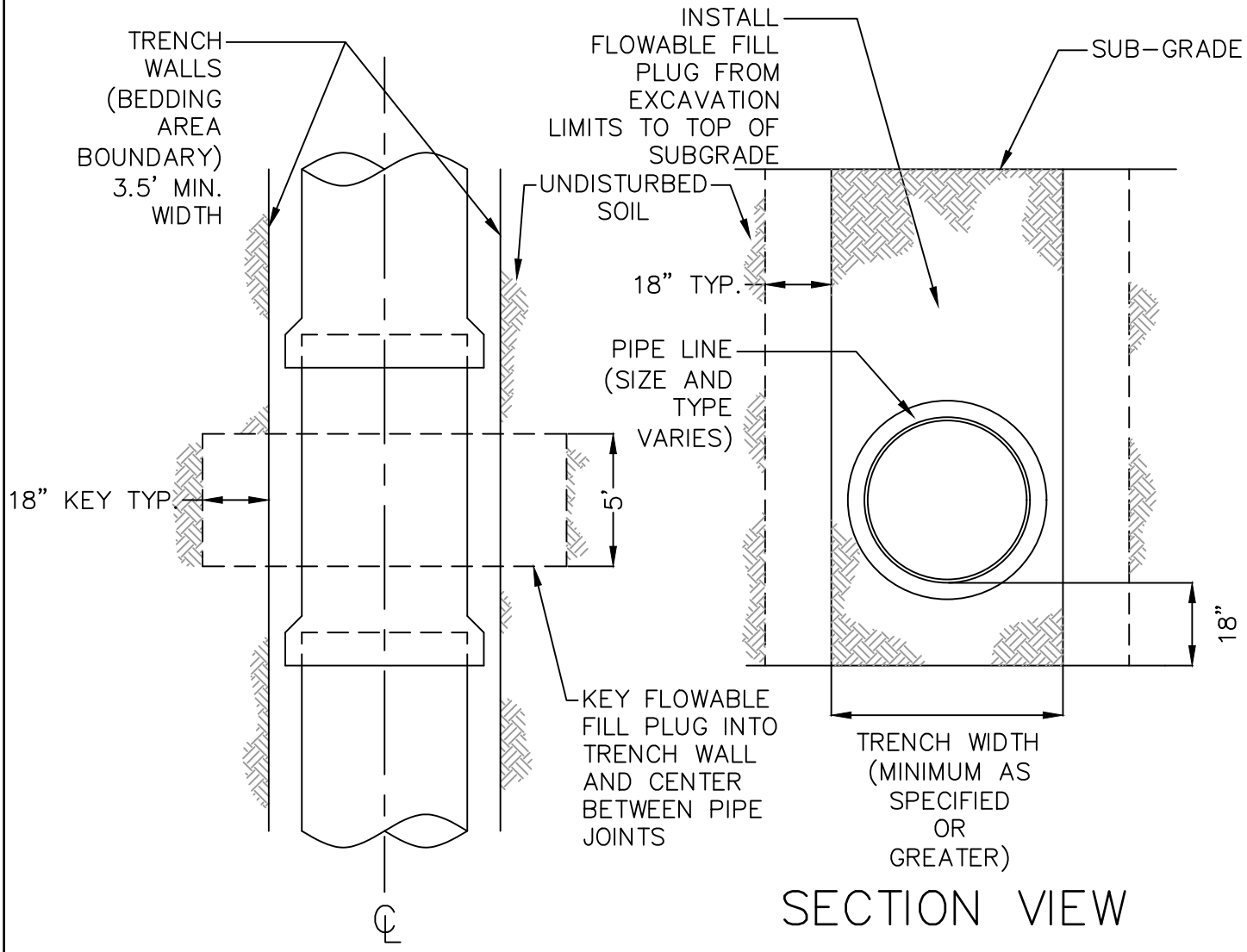
TYPE 1 TRENCH – METHOD OF PAYMENT

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 3



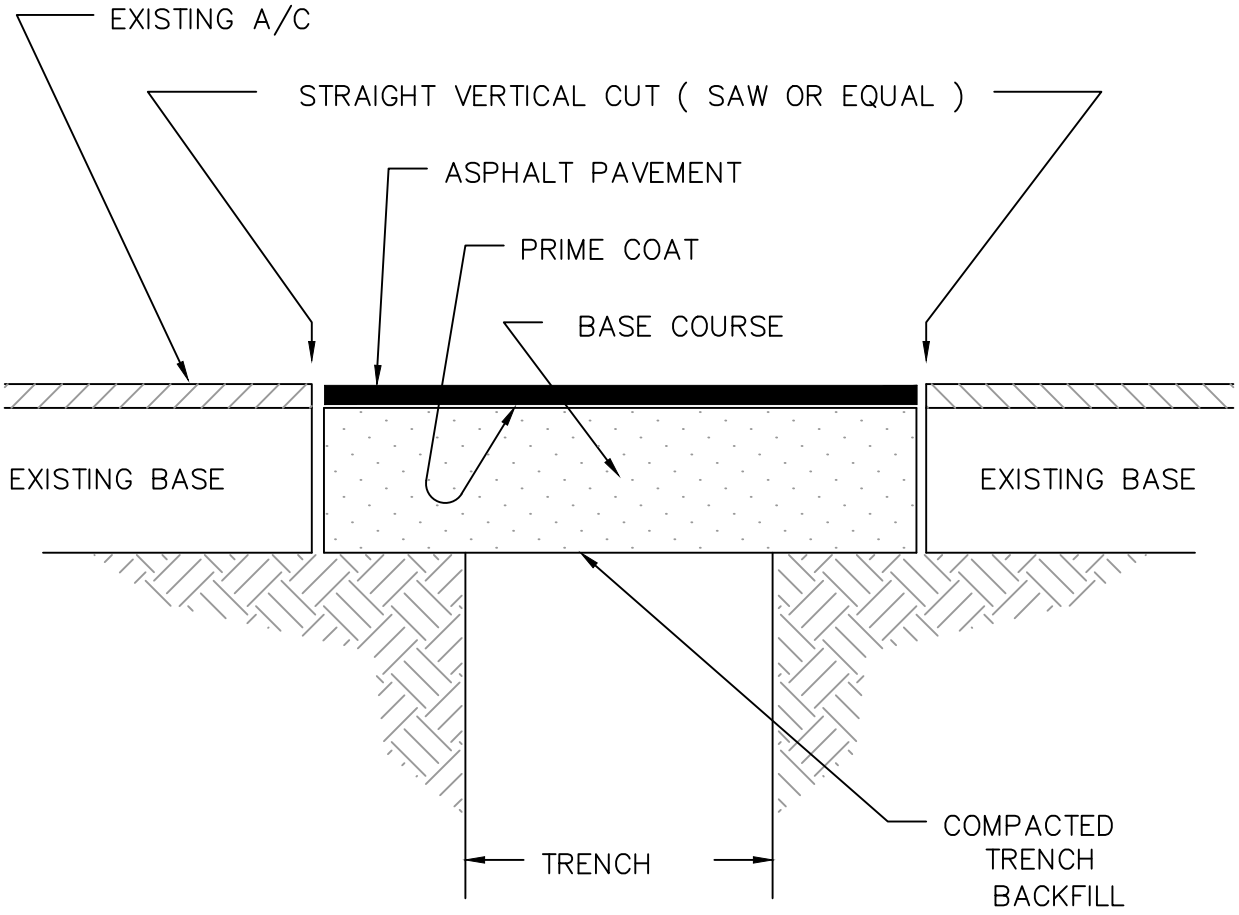
WATER MAIN CASING DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	FEBRUARY 1995 REVISED	5 – 3



FLOWABLE FILL TRENCH PLUG

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	FEB 2009 REVISED	5 – 3 158



PAVEMENT TO BE 2'–0" WIDER THAN PAY WIDTH OF TRENCH EXCAVATION.

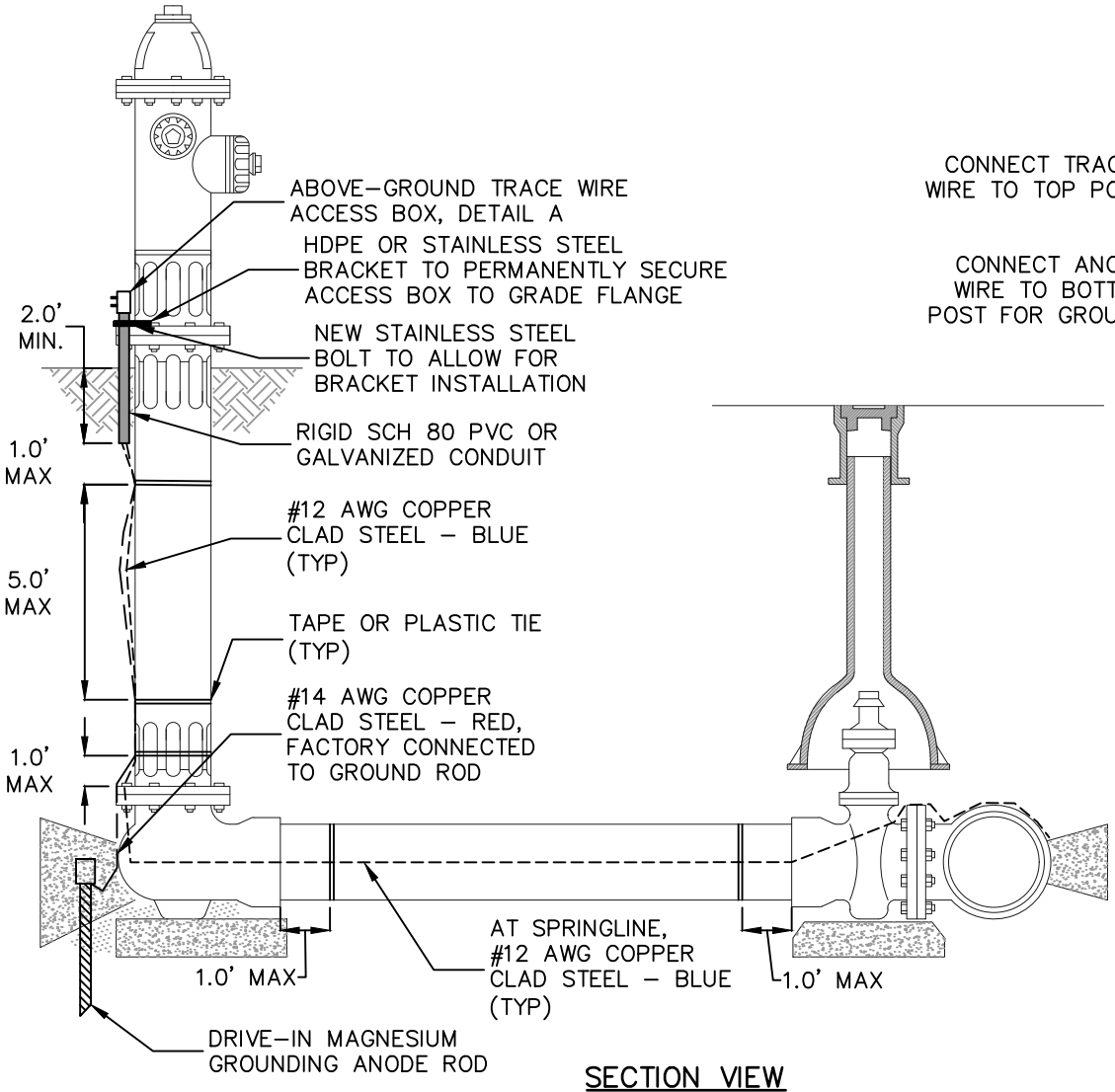
PAVEMENT SHALL BE ASPHALTIC CONCRETE ,UNLESS SPECIFIED OTHERWISE.

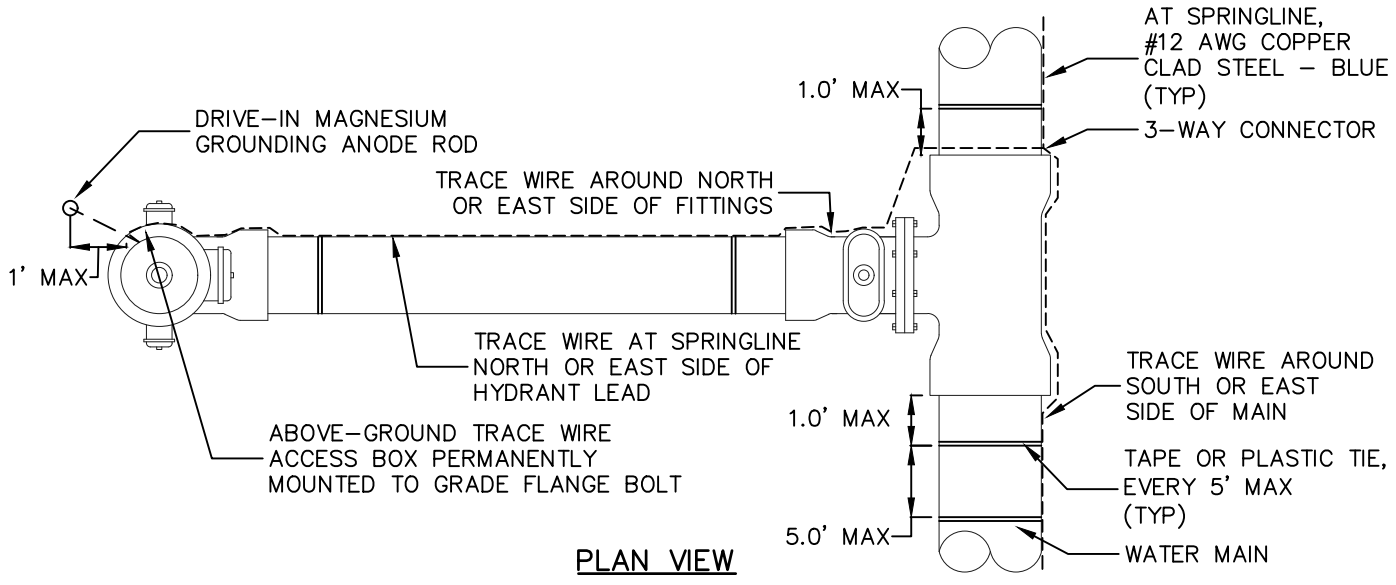
ASPHALTIC CONCRETE AND BASE COURSE MATERIALS SHALL
BE PLACED AS CALLED FOR IN SPECIFICATIONS.

PAY WIDTH OF PAVEMENT REPLACEMENT EQUALS
WIDTH OF TRENCH EXCAVATION PLUS 2'–0".

TYPICAL TRENCH PAVEMENT REPLACEMENT

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 3



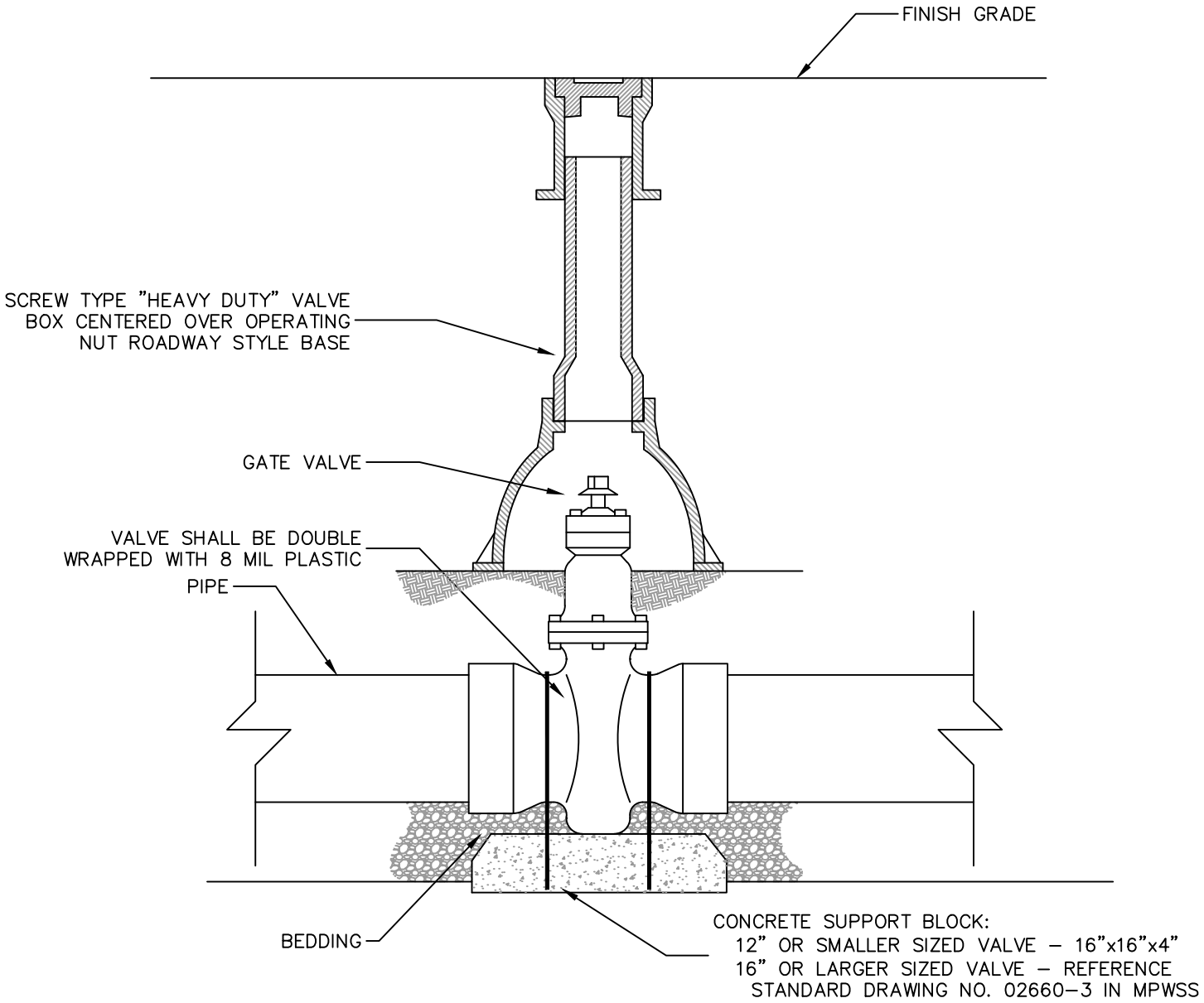


TRACE WIRE – HYDRANT DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	JANUARY 2018 REVISED	5 – 38

Notes :

1. The use of "Drop In" risers to achieve final grade is not allowed.
2. Three piece riser shall be used. A four piece riser with upward adjustment shall be allowed for deeper valves.
3. Engineer may require additional support and rebar anchor system for valves 12" and smaller depending on location and project conditions.
4. All bolts, mechanical and flanged joint fittings shall be double wrapped with polyethylene encasement in accordance with AWWA C105, and wrapped with Wax–Tape System.
5. 16" or larger sized valves shall be butterfly valves. Operating nut shall be on south or east side of water main. Rebar anchor system required.

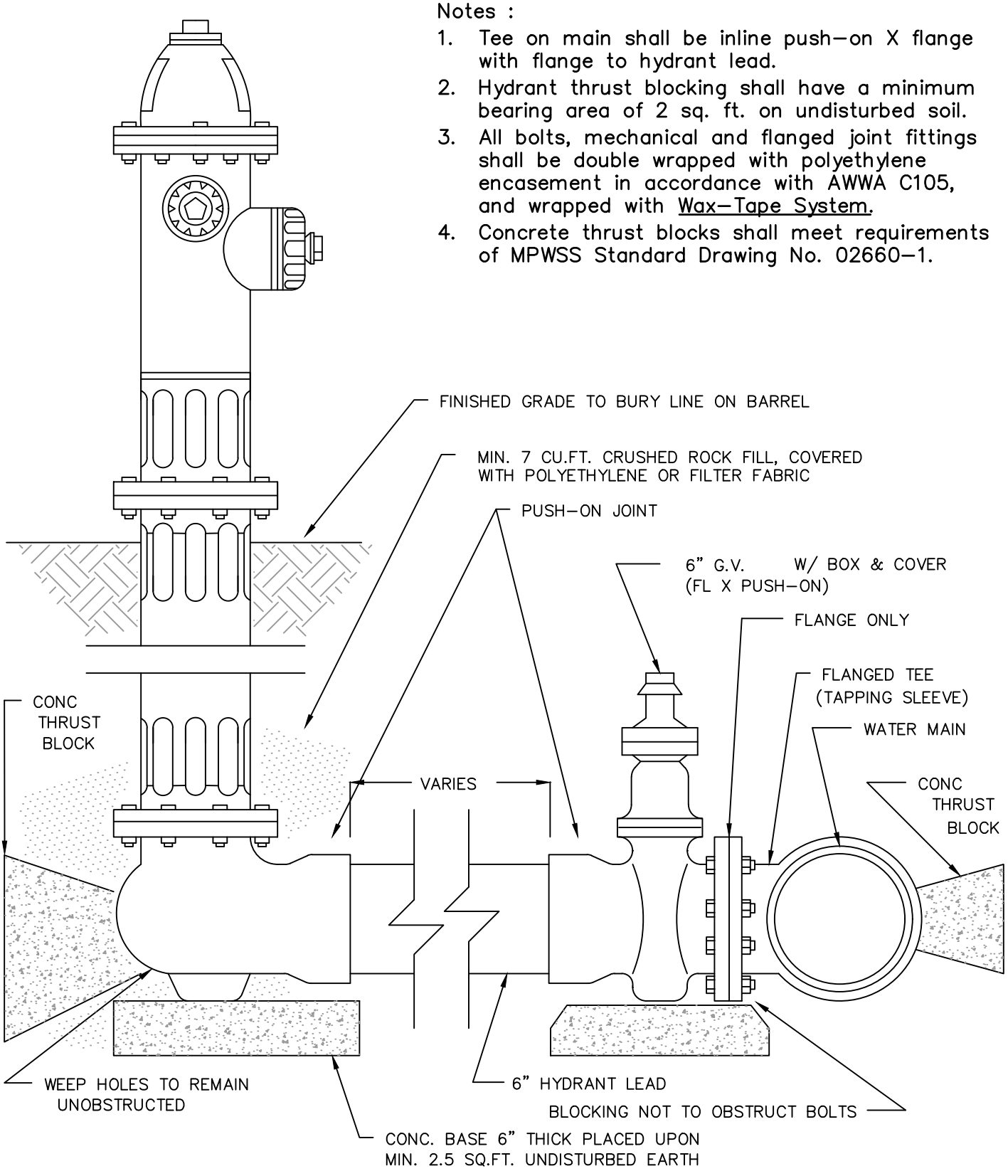


STANDARD GATE VALVE DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	OCT 2011 REVISED MAY 2018	5 – 39

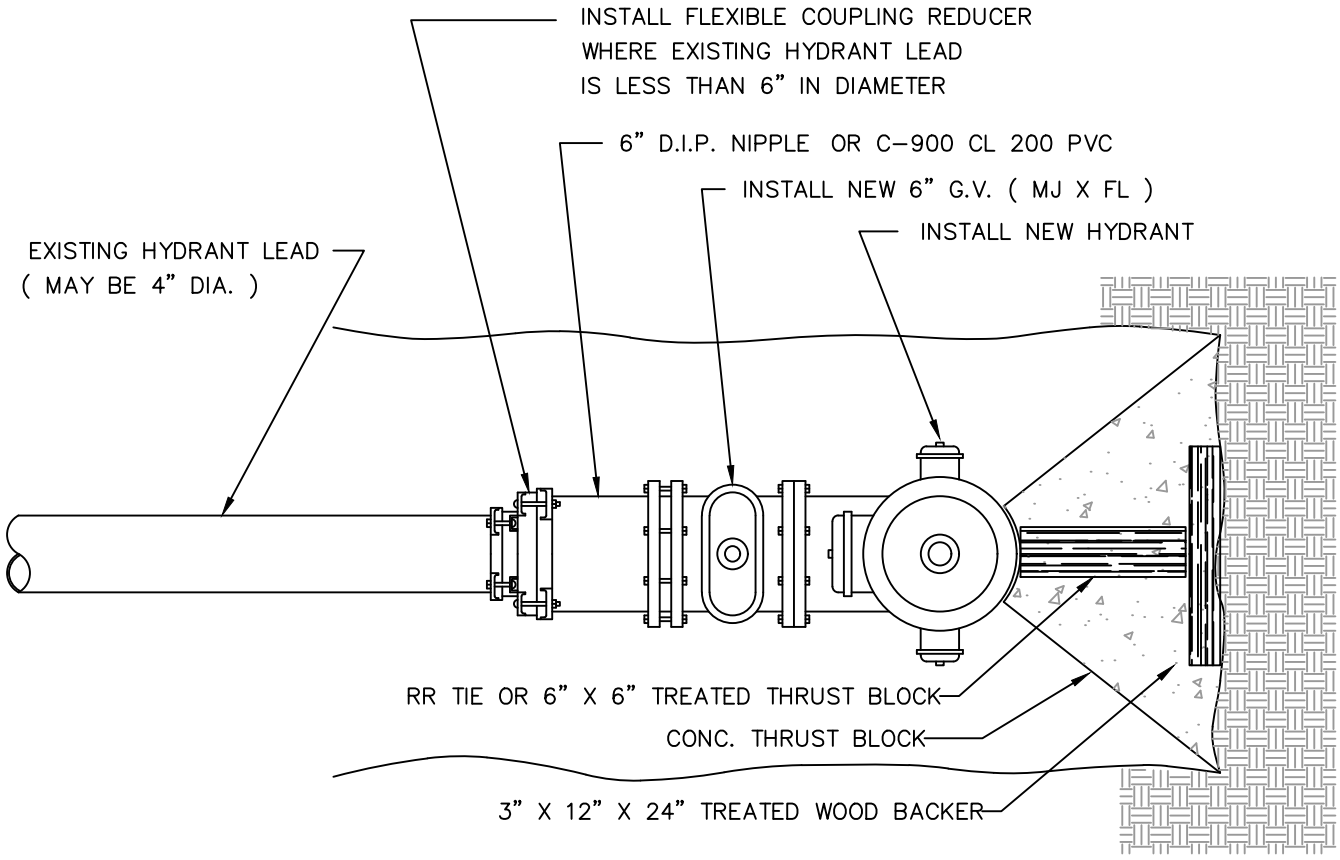
Notes :

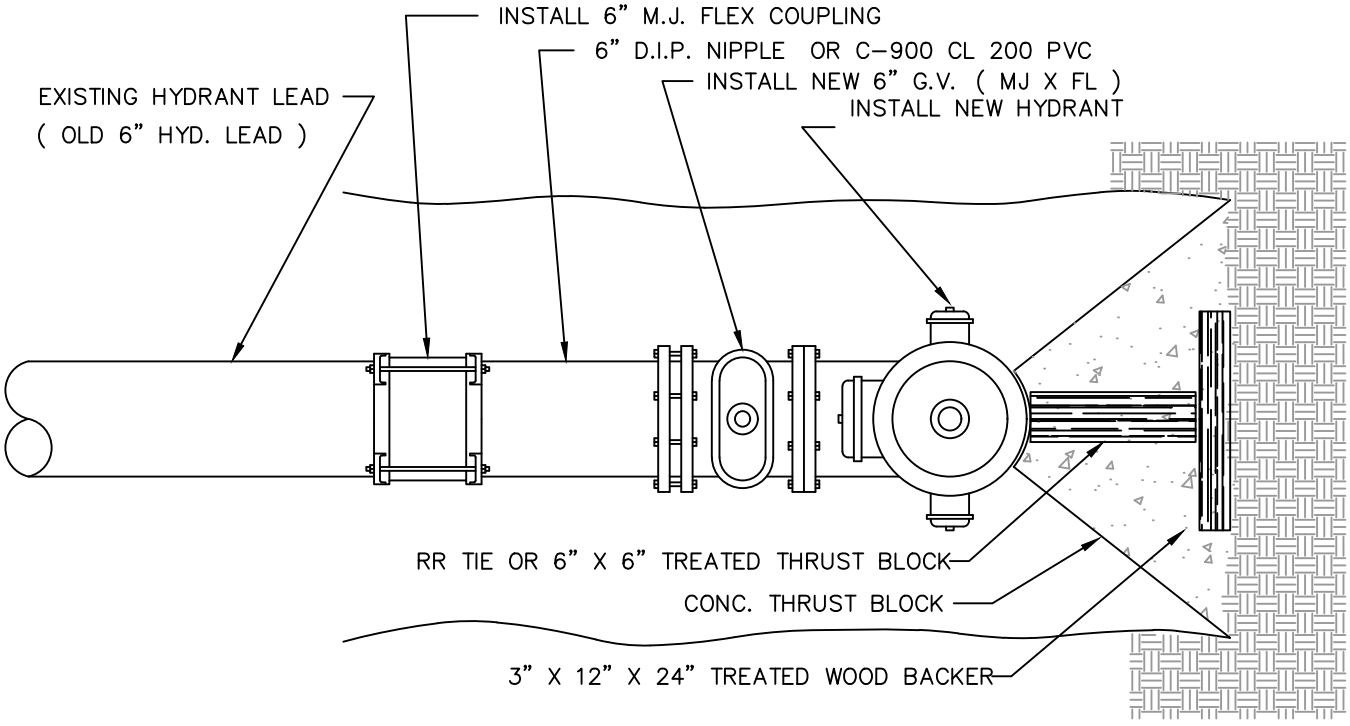
1. Tee on main shall be inline push–on X flange with flange to hydrant lead.
2. Hydrant thrust blocking shall have a minimum bearing area of 2 sq. ft. on undisturbed soil.
3. All bolts, mechanical and flanged joint fittings shall be double wrapped with polyethylene encasement in accordance with AWWA C105, and wrapped with Wax–Tape System.
4. Concrete thrust blocks shall meet requirements of MPWSS Standard Drawing No. 02660–1.



STANDARD FIRE HYDRANT DETAIL

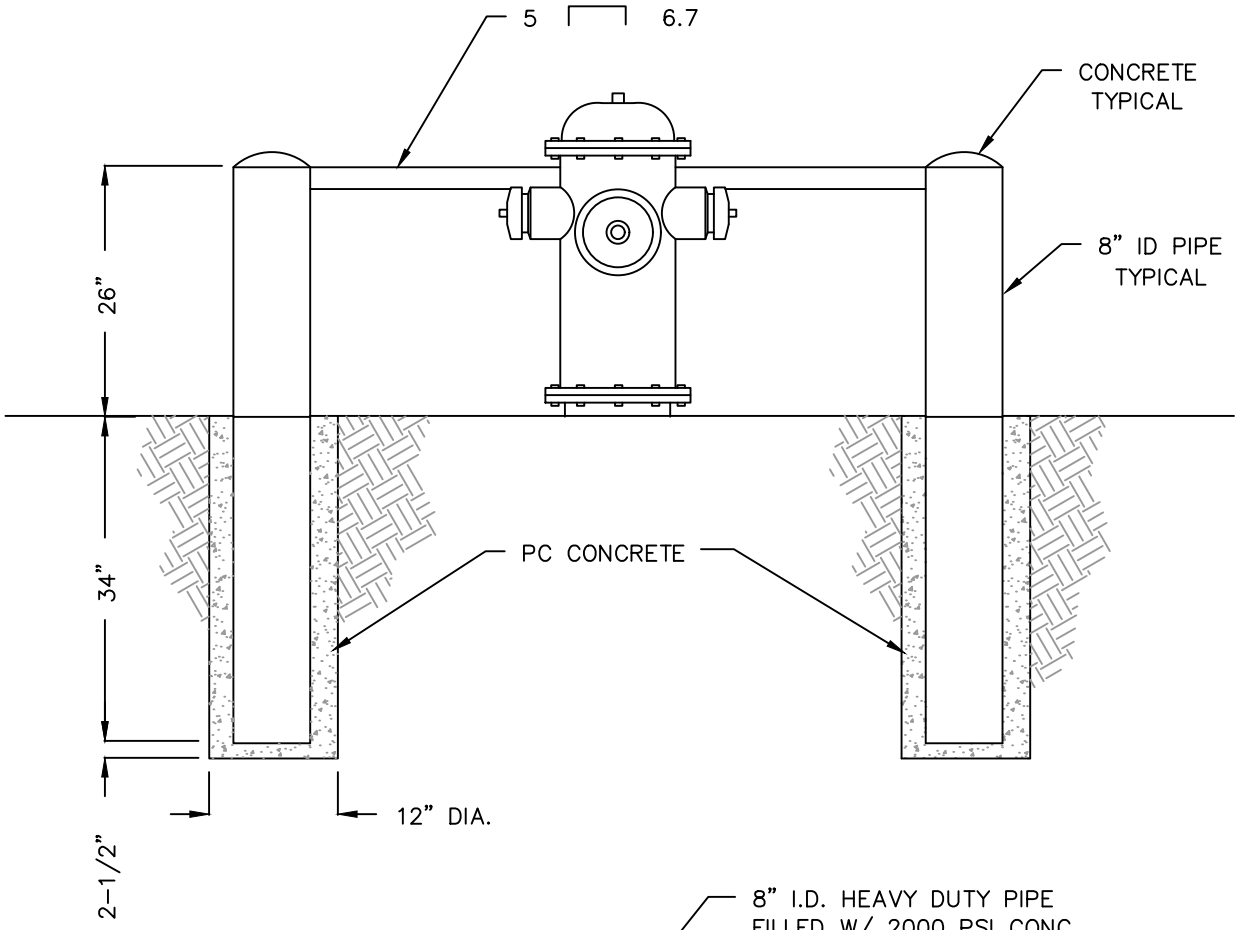
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED MARCH 2018	5 – 40

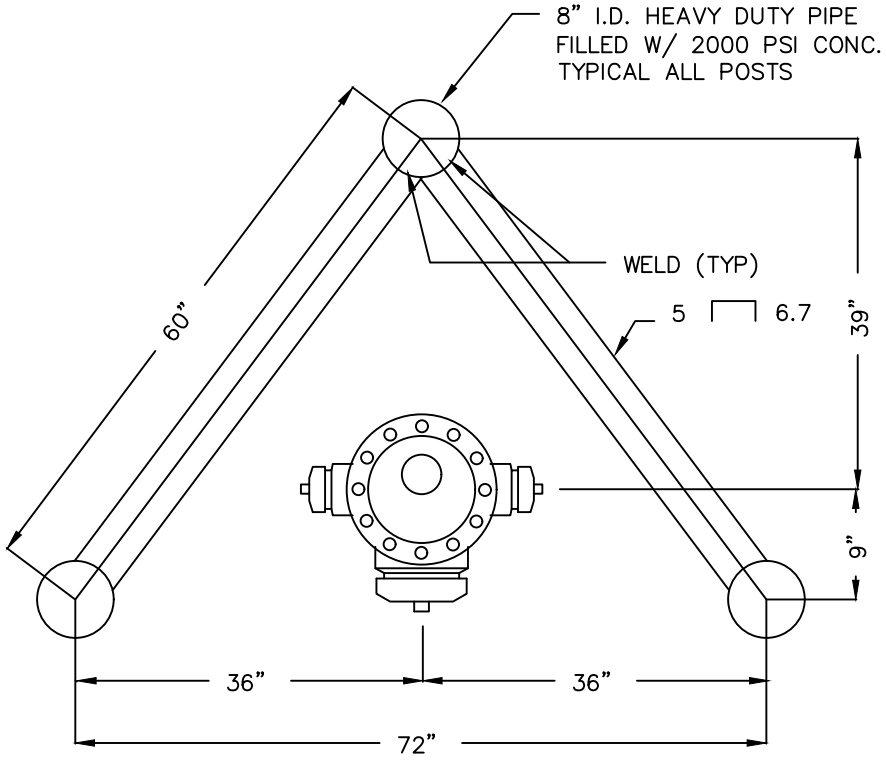




FIRE HYDRANT REPLACEMENT ON EXISTING HYDRANT LEAD

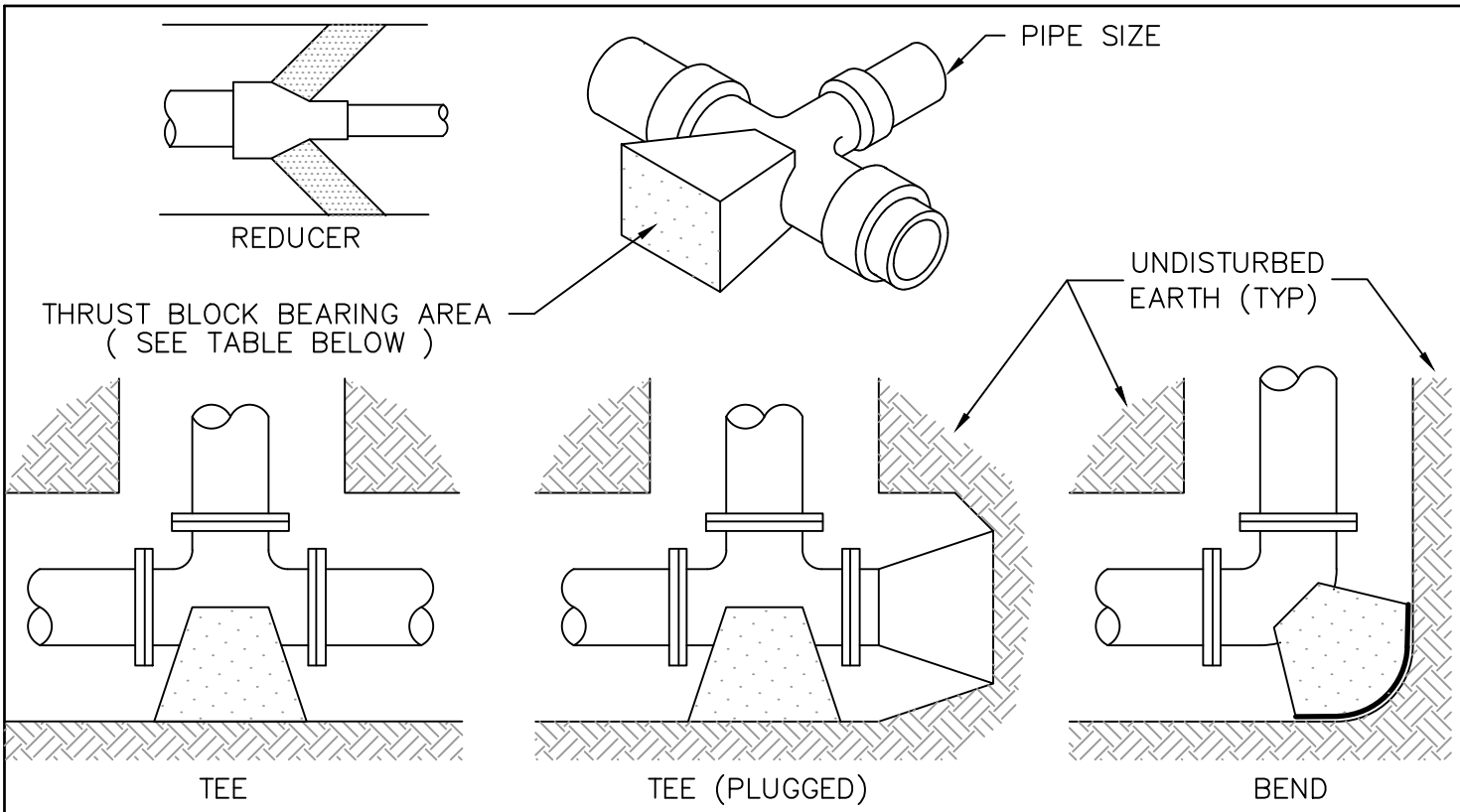
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	JANUARY 1993 REVISED MARCH 1993	5 – 41





TYPICAL FIRE HYDRANT GUARD

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 4



* Blocking for tapping sleeves shall be the same as tee.

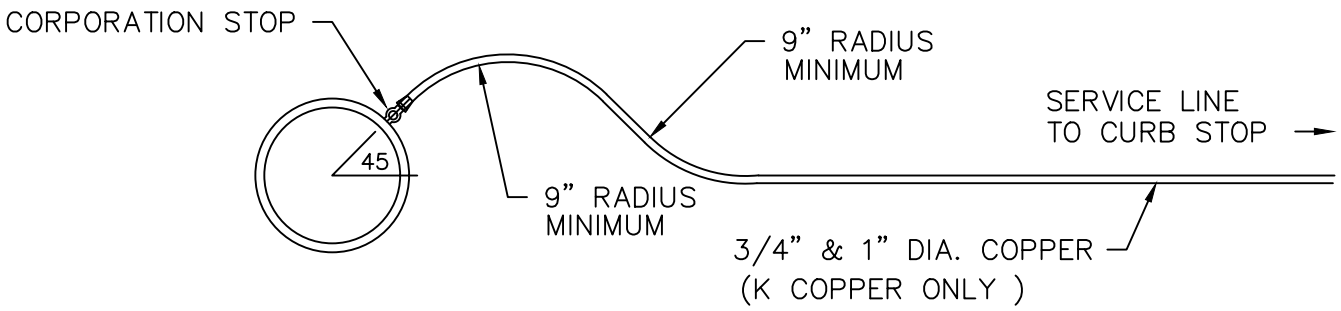
\# Blocking is required on reducer (or increaser) if reducing over one pipe size.

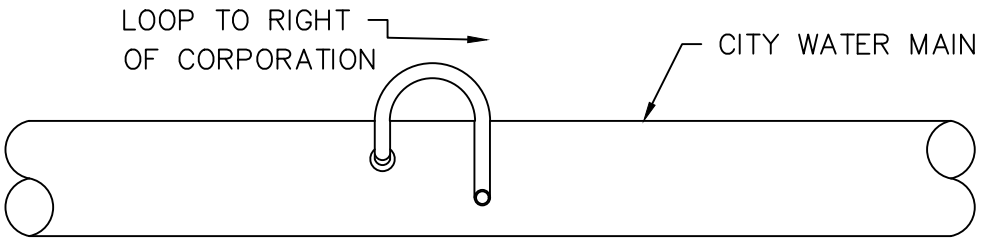
MINIMUM THRUST BLOCK BEARING AREA (SQUARE FEET)					
PIPE SIZE	TEES * & PLUGS	90 Deg BEND	45 Deg & WYES	22–1/2 BEND & REDUCER #	VALVES
4"	1.8	2.6	1.4	0.8	4.0
6"	3.8	5.2	2.9	1.5	4.0
8"	6.7	9.5	5.0	2.6	4.0
10"	10.8	15.3	8.3	4.2	6.25
12"	15.3	21.8	11.9	5.8	9.0
14"	20.8	28.8	16.2	8.3	10.5
16"	27.4	37.7	20.9	10.8	16.0
18"	34.7	47.7	26.6	13.6	16.25
20"	42.8	58.9	32.7	16.8	
24"	61.7	84.8	47.1	24.2	32.5
30"	96.4	123.5	73.6	37.9	

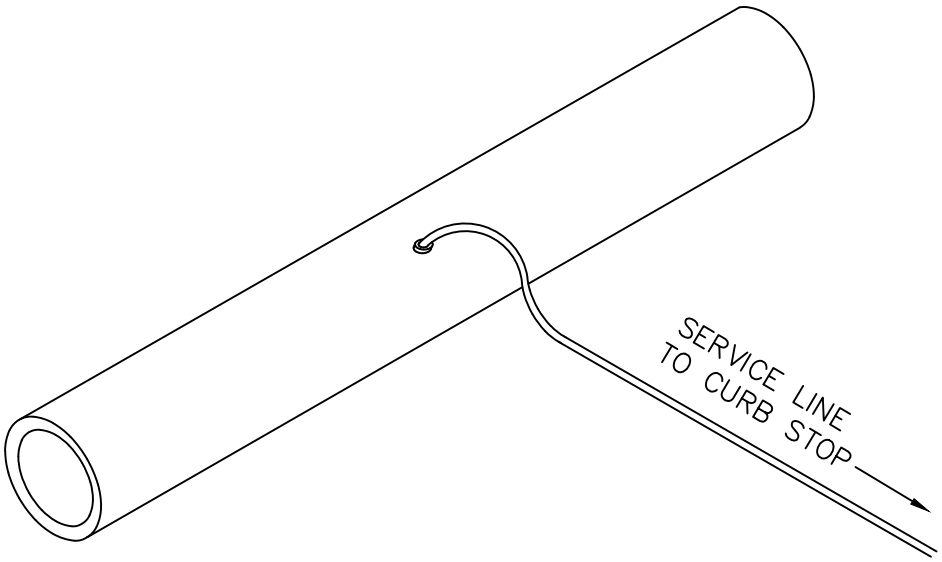
NOTE:
1. This table is based on 150# PSI main pressure & 2000 # soil pressure.
2. Wrap all fittings with polyethlene.
3. Blocking for valves where determined by Engineer.
4. Concrete used for thrust blocks shall be allowed to 'CURE' for approx. 24 hours.

THRUST BLOCKING DETAILS FOR WATER MAIN FITTINGS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 4





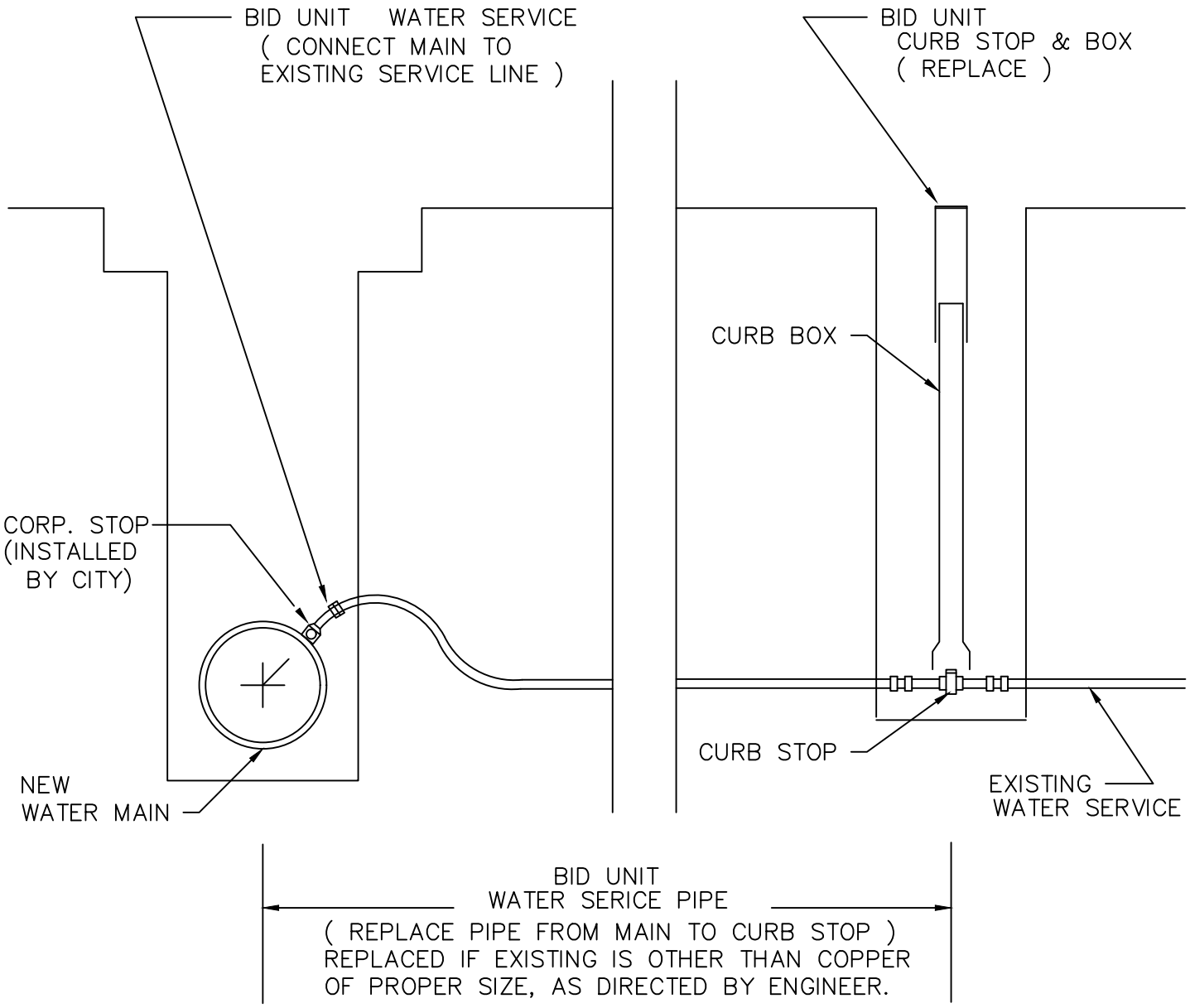


NOTE : CORPORATION STOP PROVIDED & INSTALLED BY CITY.

TAP MAY REQUIRE SADDLE ON ACP OR PVC MAINS.

EXPANSION LOOP – WATER SERVICE LINE CONNECTION AT MAIN

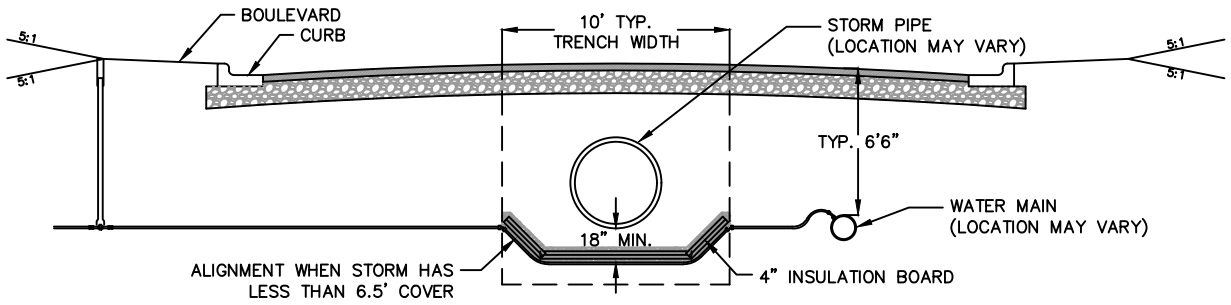
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 4



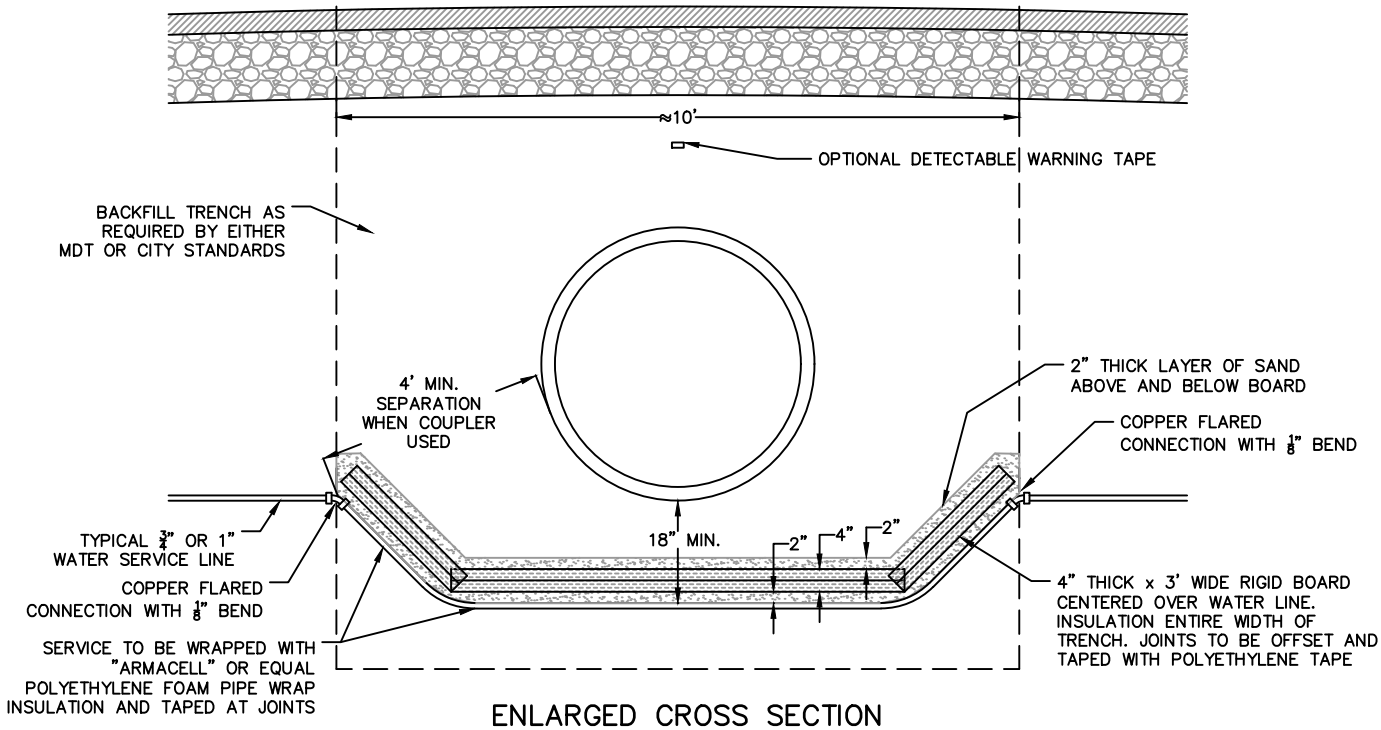
NOTE :
CORP. STOP PROVIDED BY CONTRACTOR & INSTALLED BY CITY
CURB STOP & CURB BOX PROVIDED BY AND INSTALLED BY CONTRACTOR
TAPPING SADDLE MAY BE REQUIRED IF MAIN OTHER THAN D.I.P.

WATER MAIN REPLACEMENT – WATER SERVICE CONNECTIONS

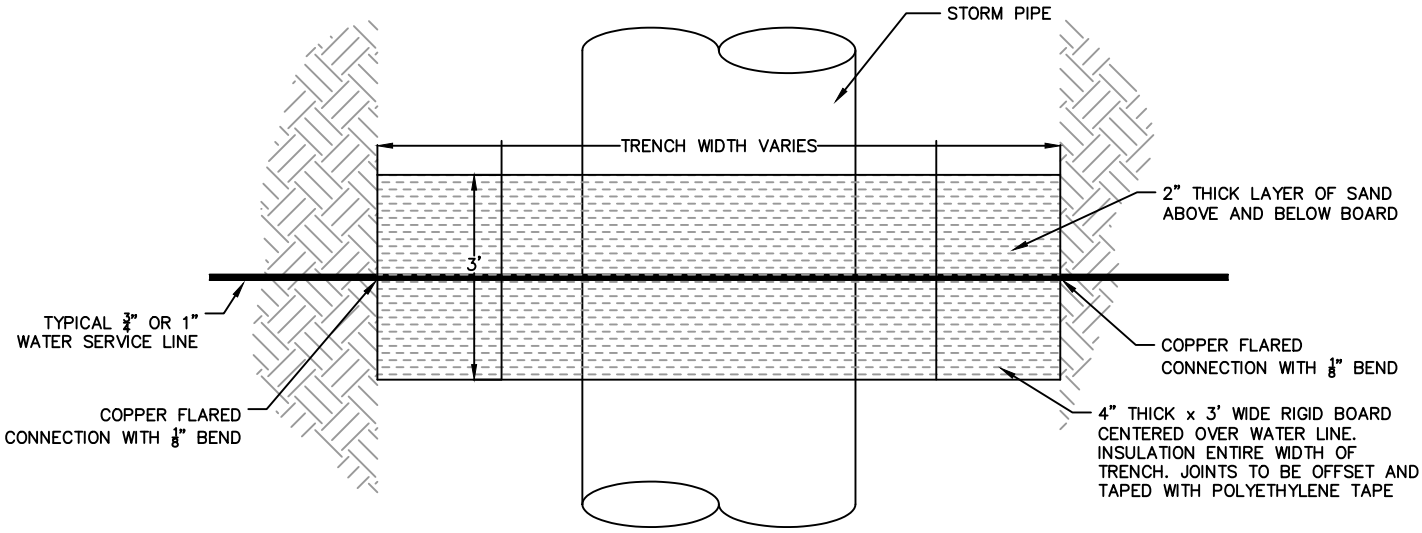
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED JULY 2001	5 – 45



CROSS SECTION



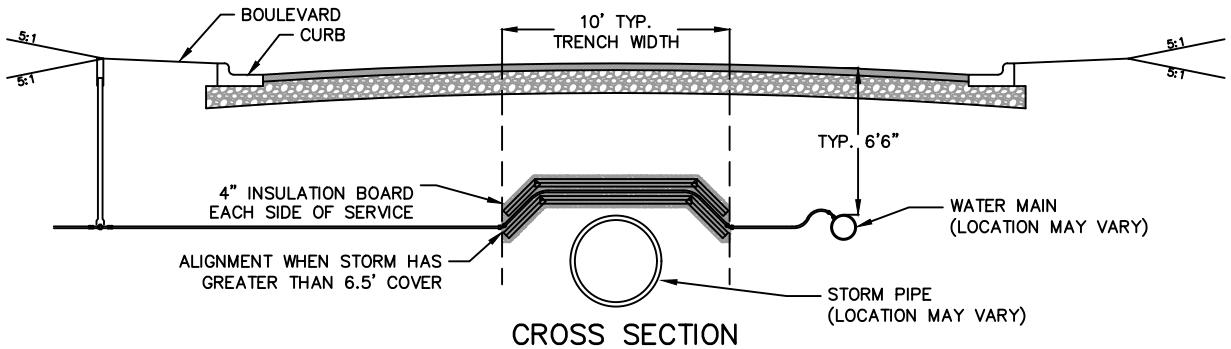
ENLARGED CROSS SECTION



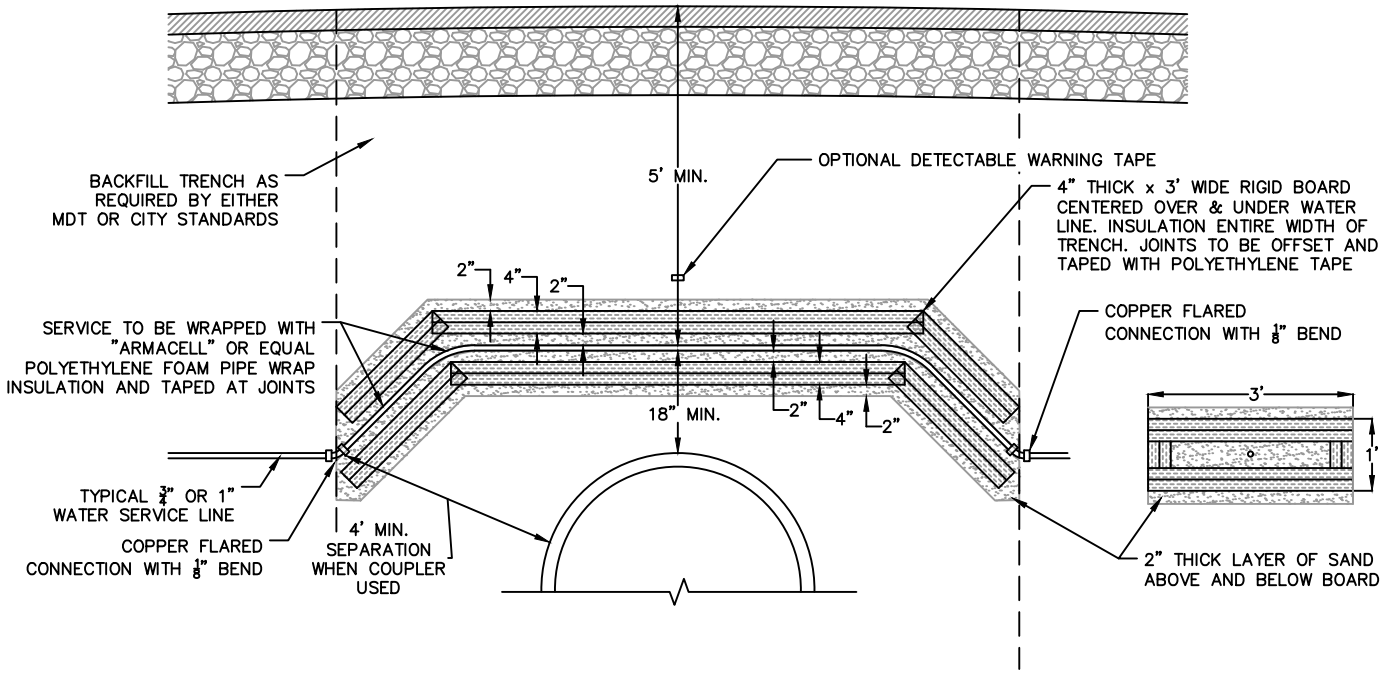
PLAN DETAIL

WATER SERVICE CROSSING BELOW STORM

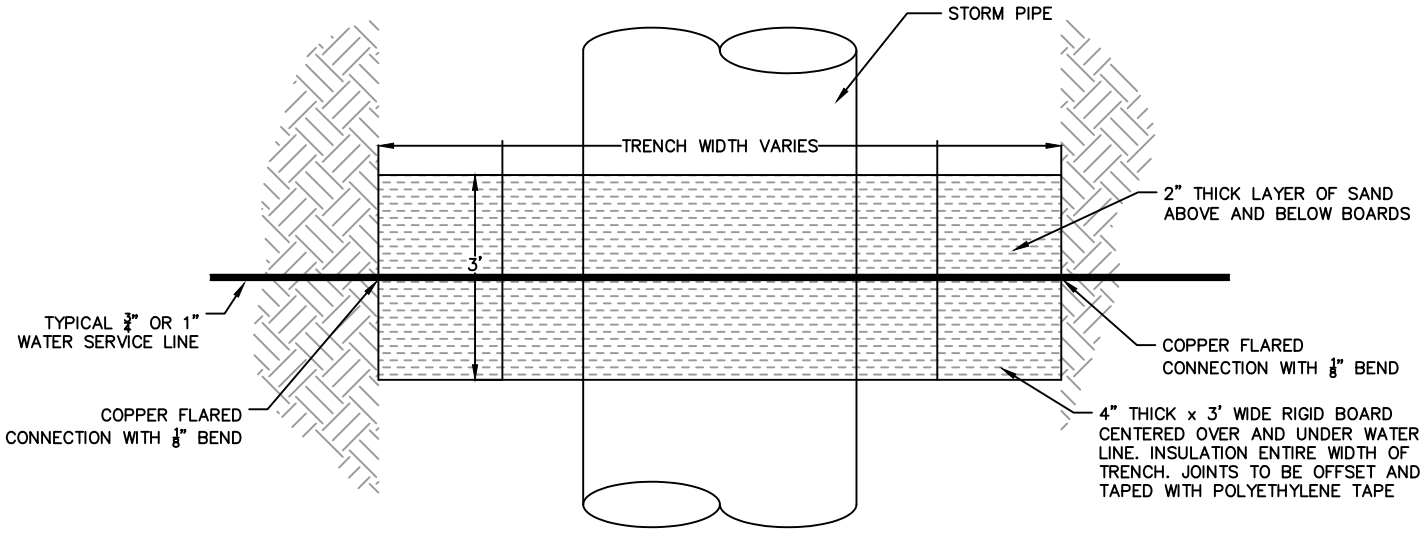
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	MARCH 2017 REVISED: MARCH 2018	5 – 45



CROSS SECTION



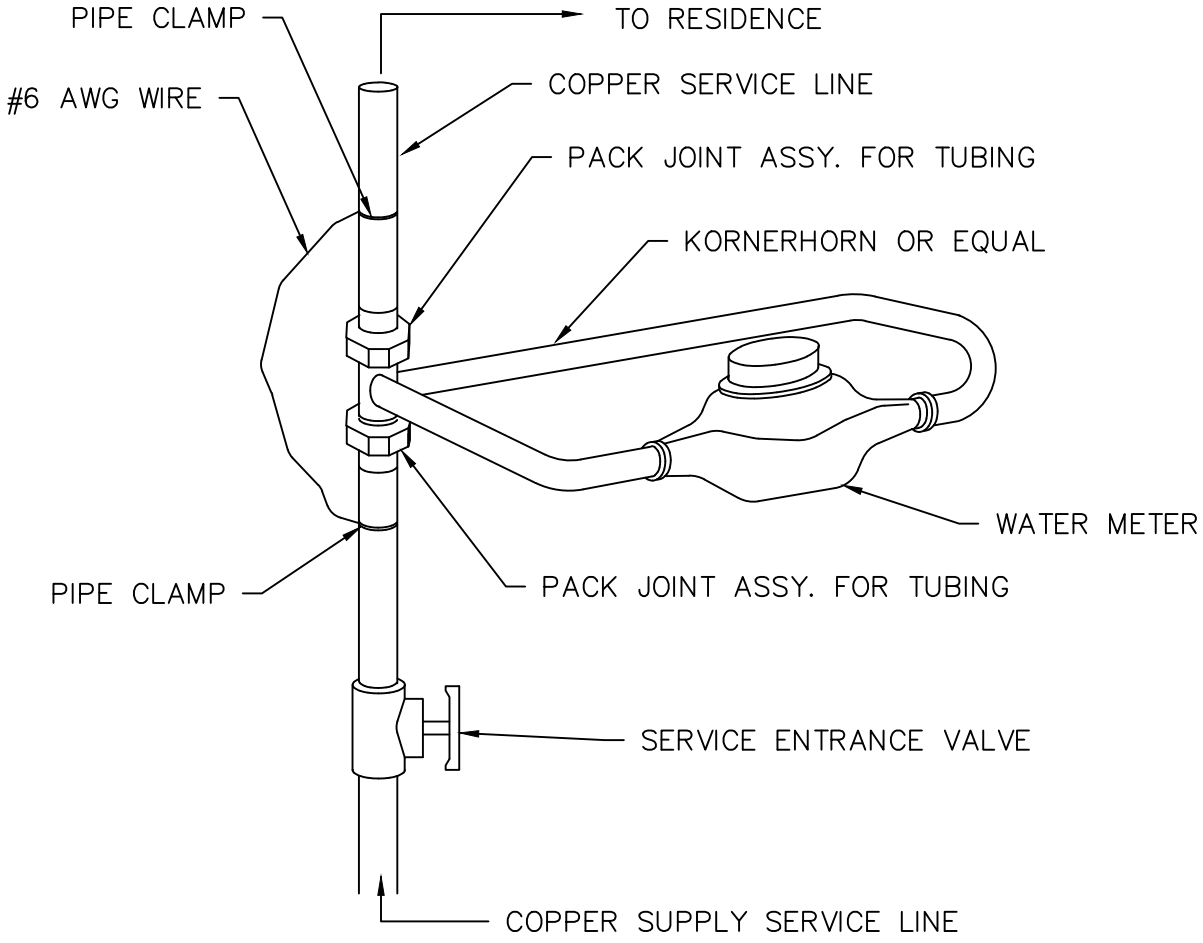
ENLARGED CROSS SECTION

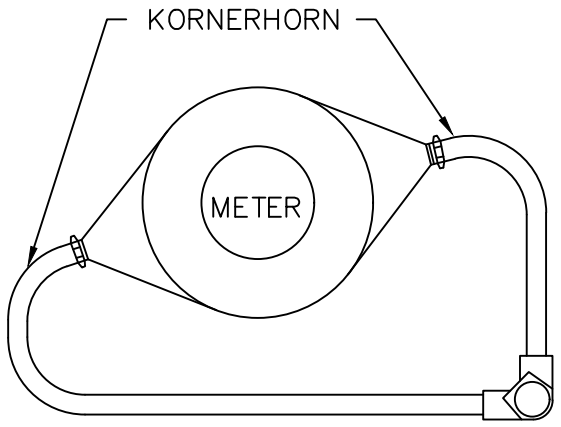


PLAN DETAIL

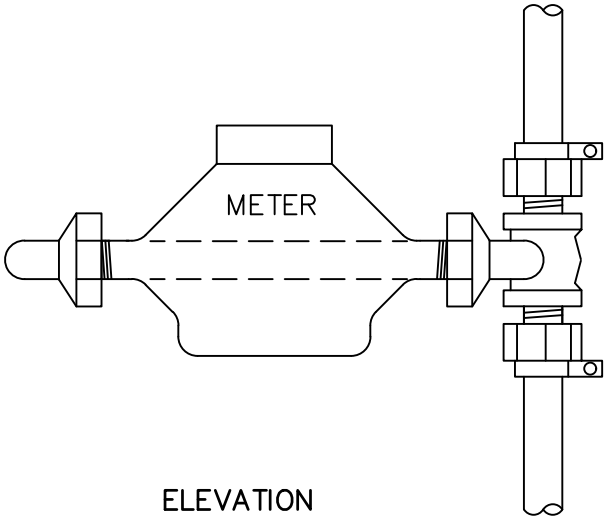
WATER SERVICE CROSSING ABOVE STORM

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	MARCH 2017 REVISED: MARCH 2018	5 – 45





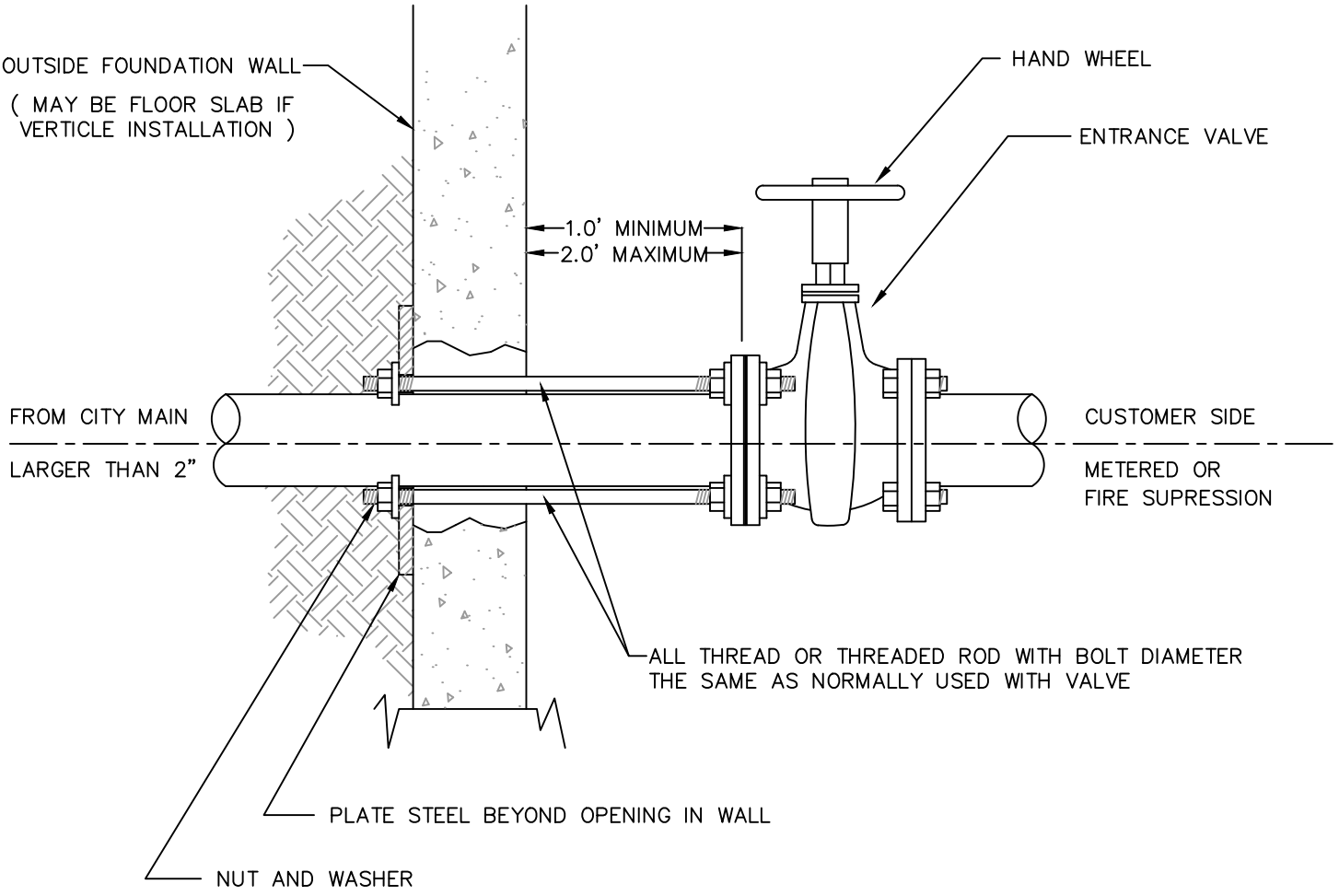
PLAN (TOP VIEW)



ELEVATION

TYPICAL WATER METER INSTALLATION

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 46

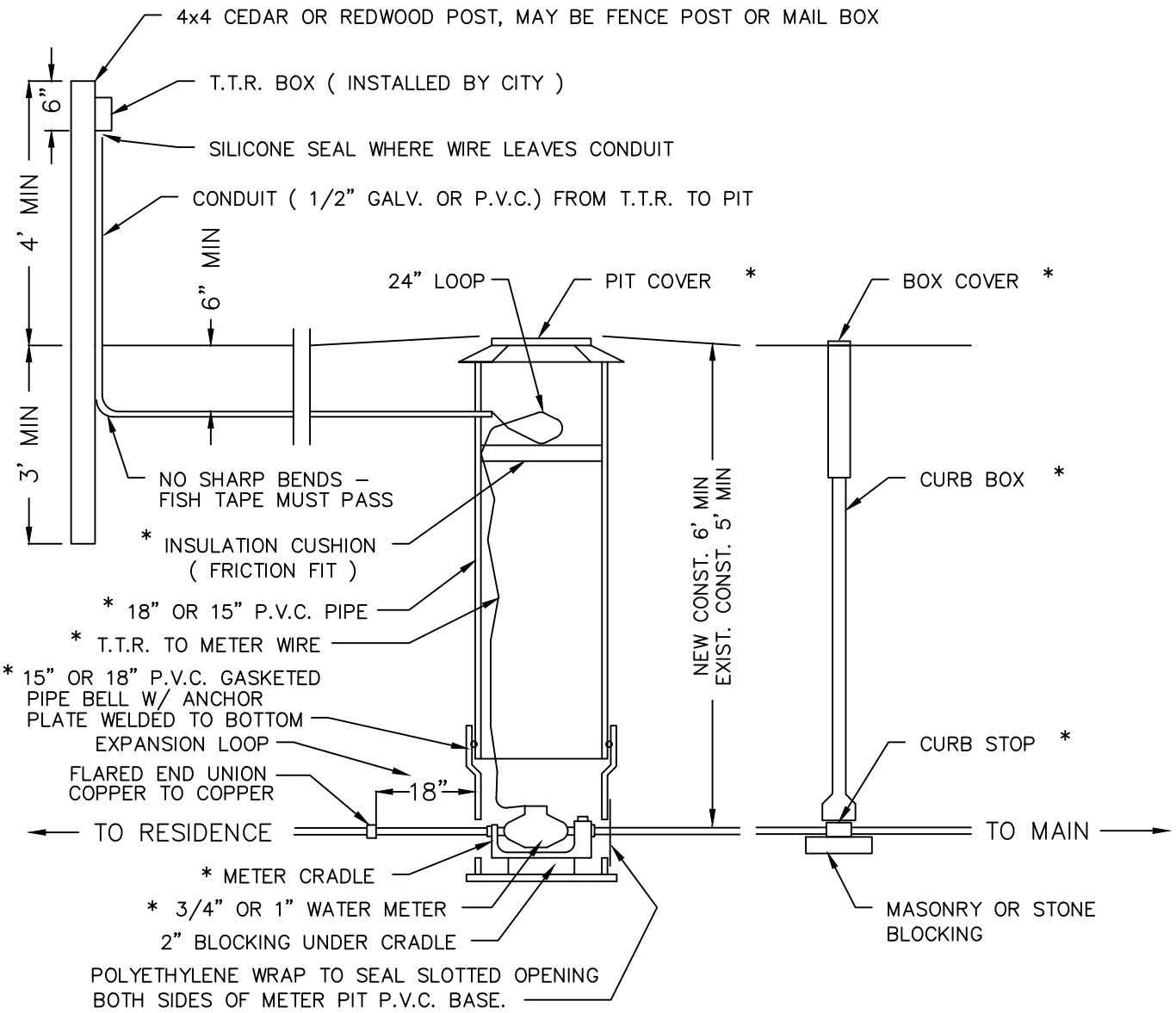


WATER PROOF COATING ON ALL METAL OUTSIDE FOUNDATION WALL

WATER SERVICE ENTRANCE OVER 2" DIAMETER

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	FEBRUARY 1995 REVISED	5 – 4

NOTE :
CURB BOX SHALL BE LOCATED IMMEDIATELY BEHIND CURB OR SIDEWALK
METER PIT SHALL BE PLACED ADJACENT TO DISCHARGE SIDE OF CURB BOX.



* = PARTS SUPPLIED BY CITY TO CONTRACTOR

NOTE:
PLUMBER SHALL SEAL METER REGISTER WITH DOW–CORNING SILICONE SEALANT OR APPROVED EQUAL. (BLACK IN COLOR)

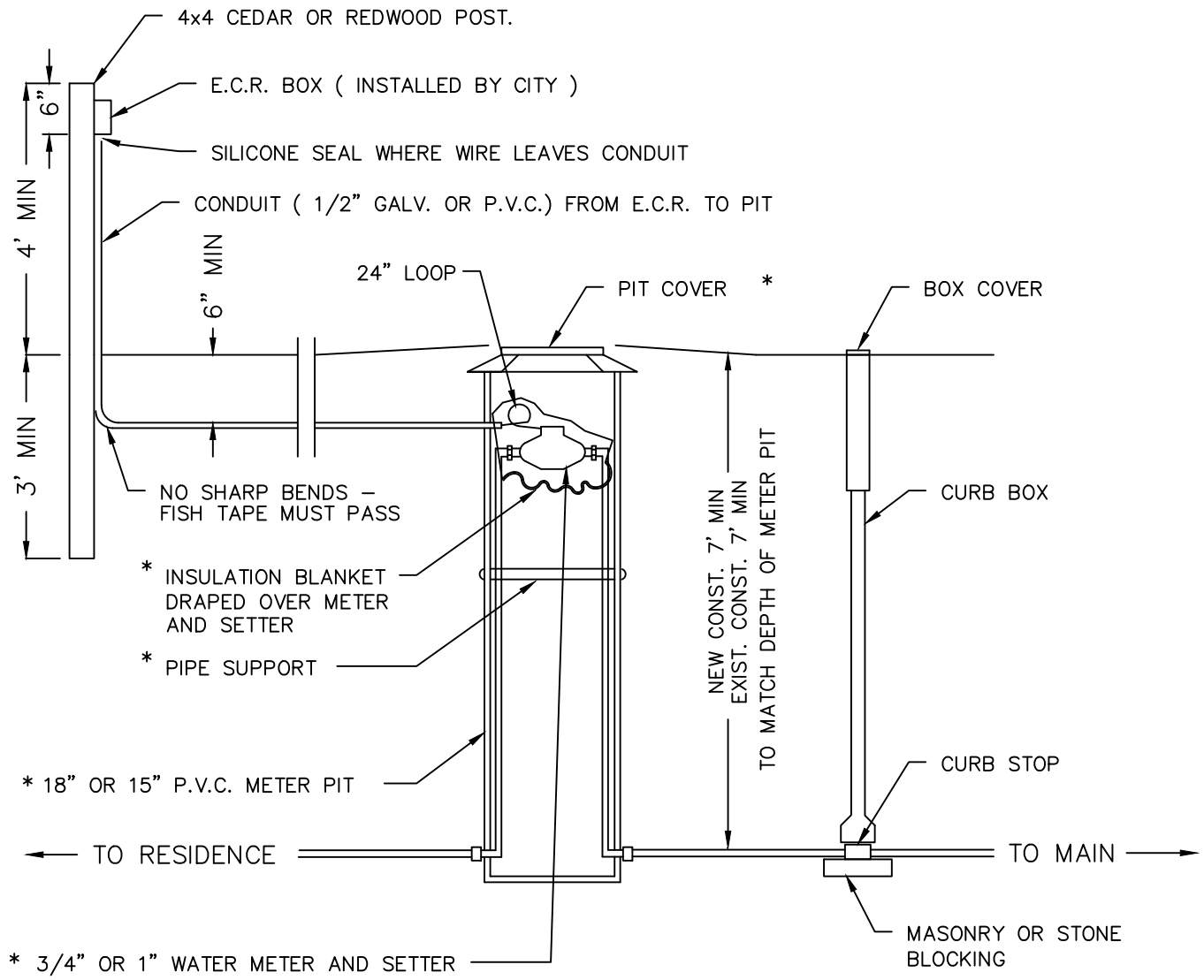
RESIDENTIAL WATER METER PIT

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 48

NOTE :

CURB BOX SHALL BE LOCATED IMMEDIATELY BEHIND CURB OR SIDEWALK
METER PIT SHALL BE PLACED ADJACENT TO DISCHARGE SIDE OF CURB BOX.

METER PIT DEPTH IS APPROXIMATELY 7' WITH LID. MAKE DEPTH ADJUSTMENTS ON SERVICE LINES OUTSIDE PIT BY RAISING OR LOWERING SERVICE LINE.
DO NOT CUT METER PIT TO MATCH DEPTH OF SERVICE LINE.



* = PARTS SUPPLIED BY CITY TO CONTRACTOR ON EXIST. USED SERVICE LINES

NOTE:

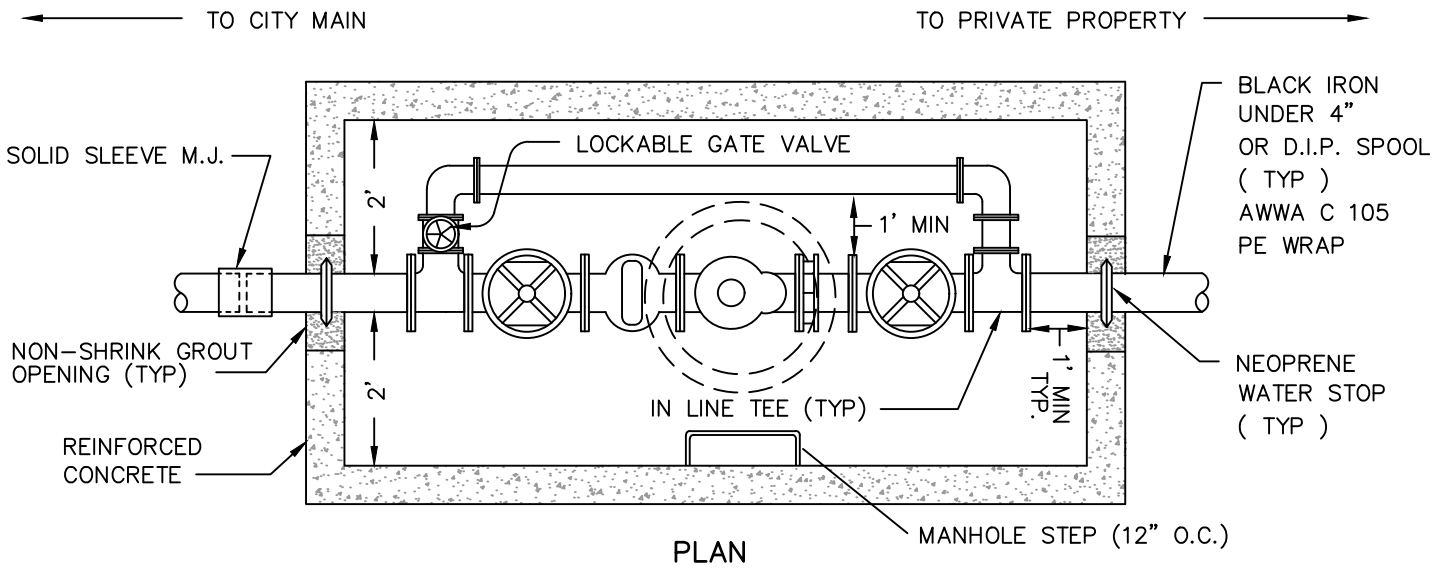
PLUMBER SHALL SEAL METER REGISTER WITH DOW–CORNING SILICONE SEALANT OR APPROVED EQUAL.

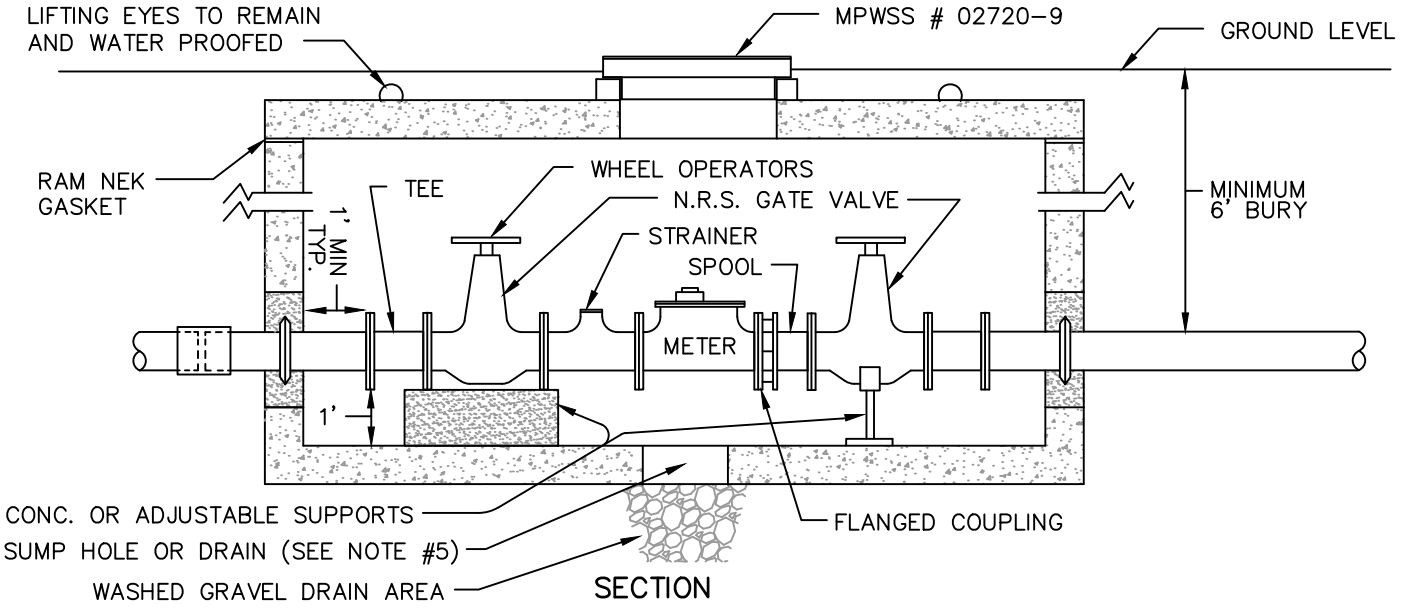
RESIDENTIAL WATER METER PIT

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED OCT 1994	5 – 48

NOTES :

1. THE SIZE OF BYPASS LINE TO BE DETERMINED BY FIRE FLOW REQUIREMENTS, HOWEVER, IN NO CASE SHALL A BYPASS LINE BE MORE THAN ONE (1) PIPE SIZE SMALLER THAN THE PRIMARY FEED. ALL FITTINGS ON 4" AND LARGER PIPE SHALL BE FLANGED, LESS THAN 4" MAY BE THREADED.
2. A CHECK VALVE SHALL BE INSTALLED ON DISCHARGE SIDE OF VALVING IF ON A LOOPED SYSTEM OR WHERE HIGHER HEADS MAY BE DEVELOPED ON DISCHARGE SIDE.
3. VAULT SHALL NOT BE PLACED IN AN AREA ACCESSIBLE TO VEHICLE TRAFFIC. ACCESS HATCH TO BE CENTERED OVER WATER METER AND SIZED TO ALLOW REMOVAL OF METER, MINIMUM SIZE OF HATCH MUST ALLOW PERSONNEL TO ENTER AND EXIT VAULT. HATCH SHALL BE APPROVED BY CITY PRIOR TO INSTALLATION.
4. RIGID INSULATION SHALL BE APPLIED TO OUTSIDE OF VAULT TO A DEPTH OF 3' BELOW GROUND SURFACE. MANHOLE FRAME AND COVER SHALL BE INSULATED WITH ADHESIVE TYPE FOAM INSULATION.
5. IF VAULT IS NEAR GROUND WATER, WATER PROOFING SHALL BE APPLIED TO THE OUTSIDE OF VAULT, NO DRAIN HOLE.
6. REMOTES FOR REMOTE READ METERS SHALL BE MOUNTED ON A 4X4 POST 42" ABOVE GROUND. WIRE SHALL BE RAN INSIDE CONDUIT FROM VAULT TO THE 4X4 POST.





TYPICAL WATER METER VAULT DETAIL

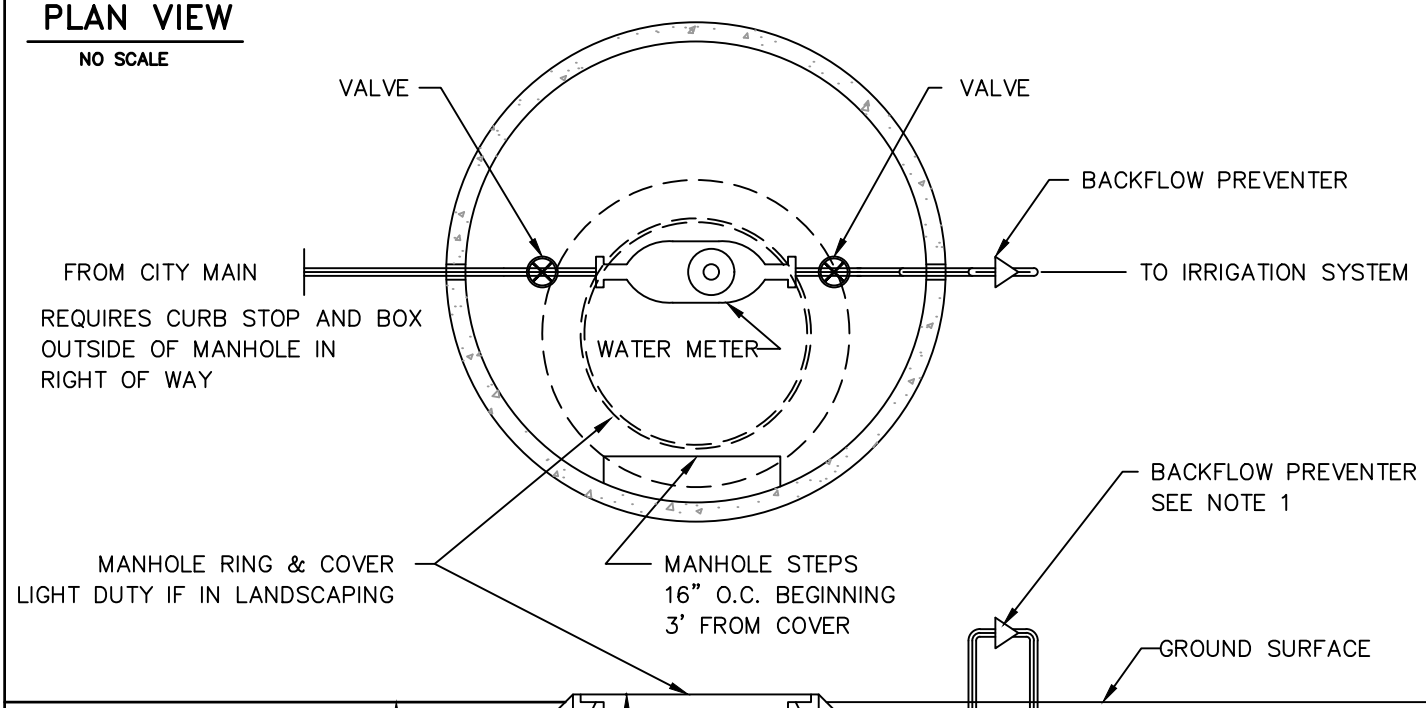
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	1987, 1991, REVISED: JULY 2006	5 – 49

NOTES :

1. BACKFLOW PREVENTER TYPE AND LOCATION TO BE APPROVED BY CITY PLUMBING INSPECTOR.

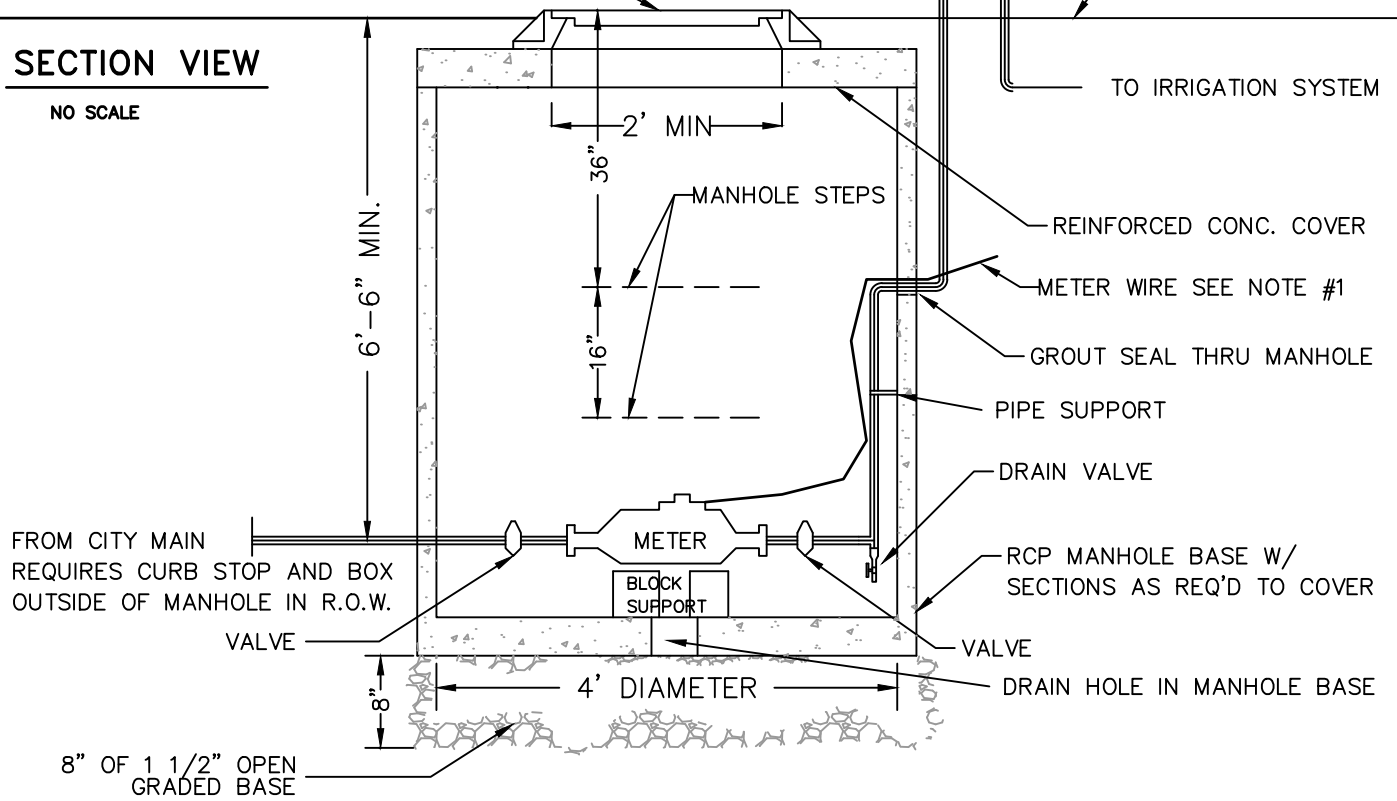
PLAN VIEW

NO SCALE



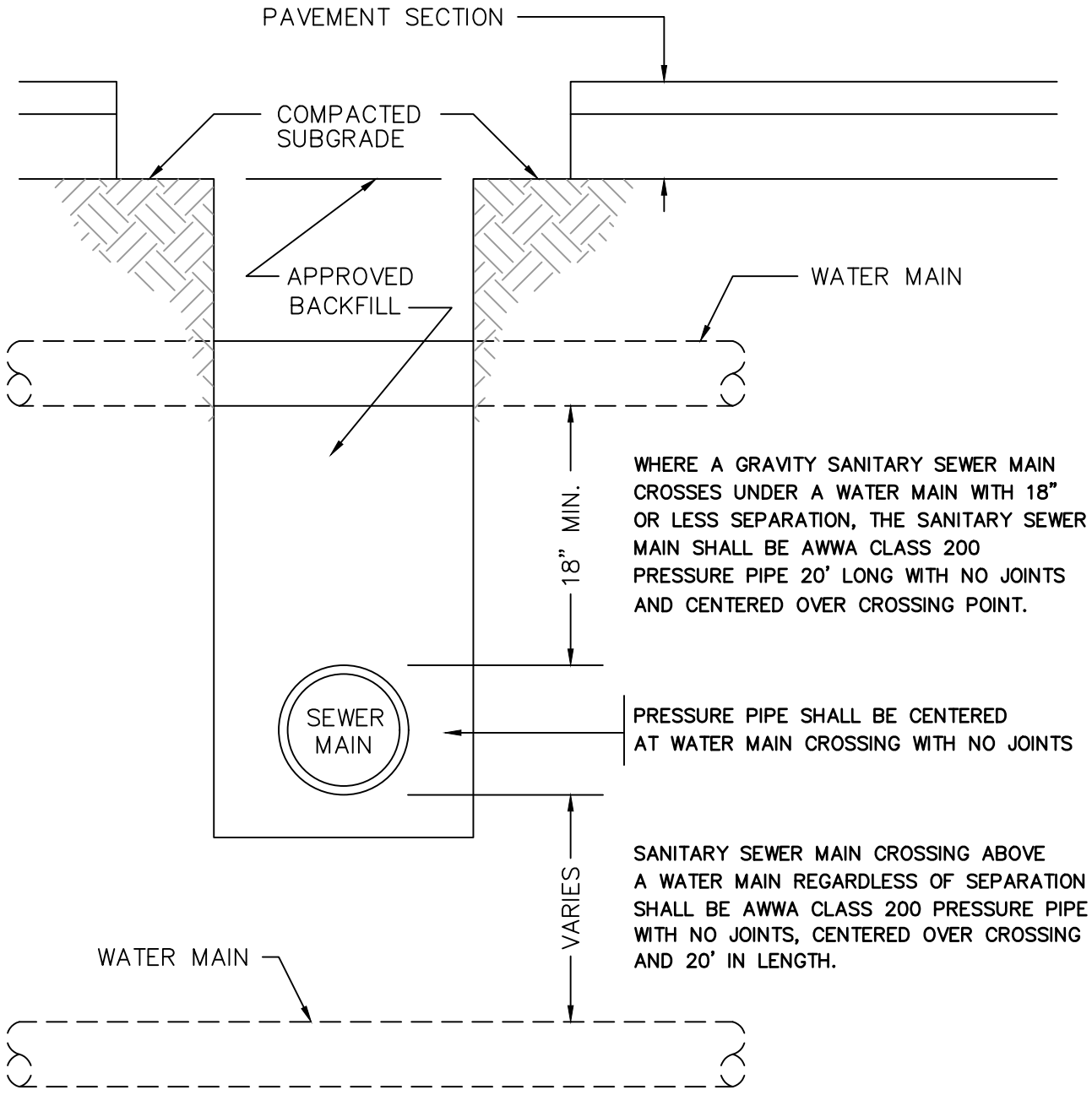
SECTION VIEW

NO SCALE



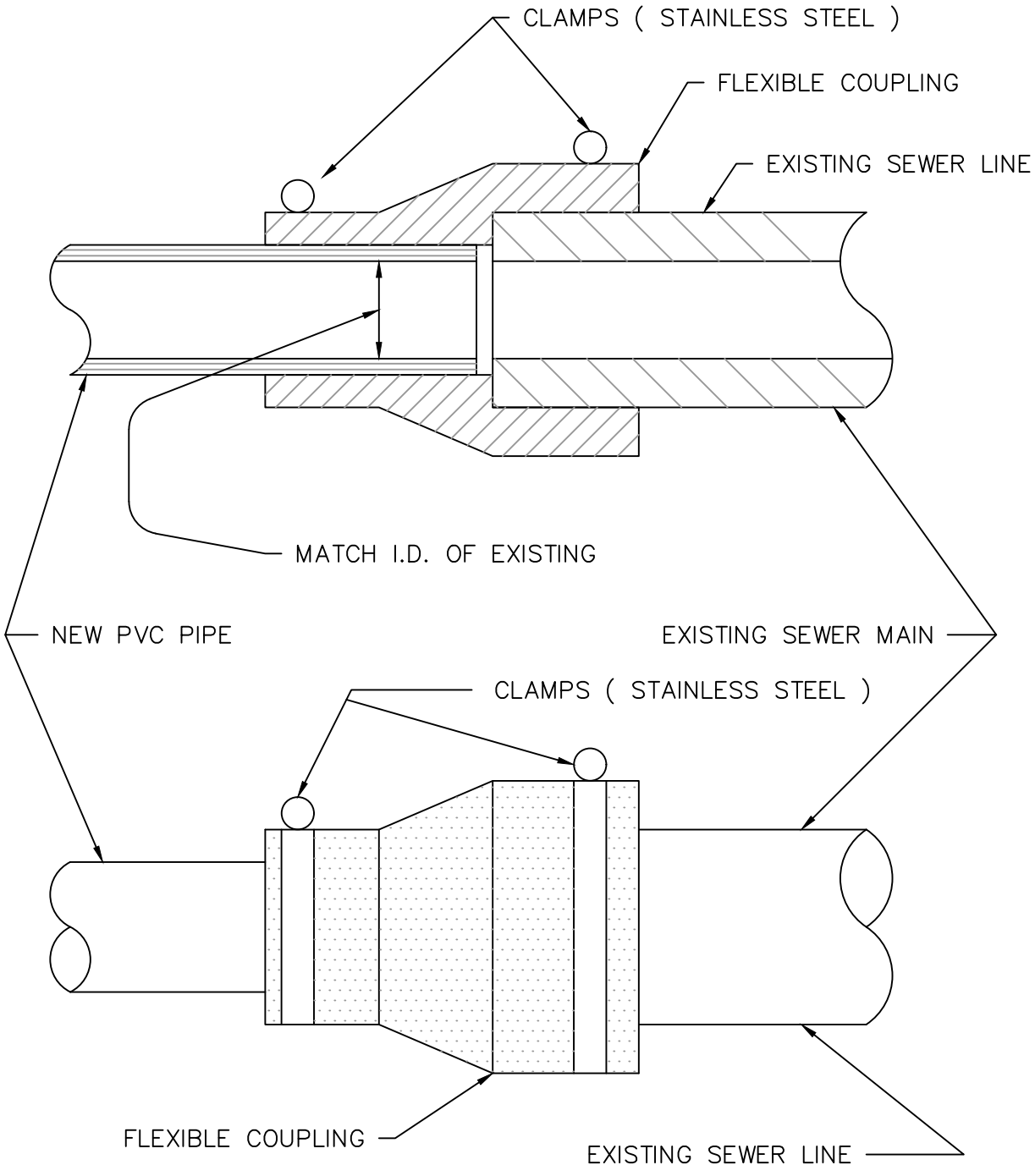
IRRIGATION MANHOLE FOR 1-1/2" OR LARGER WATER METER

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	MAY 2009 REVISED	5 – 49



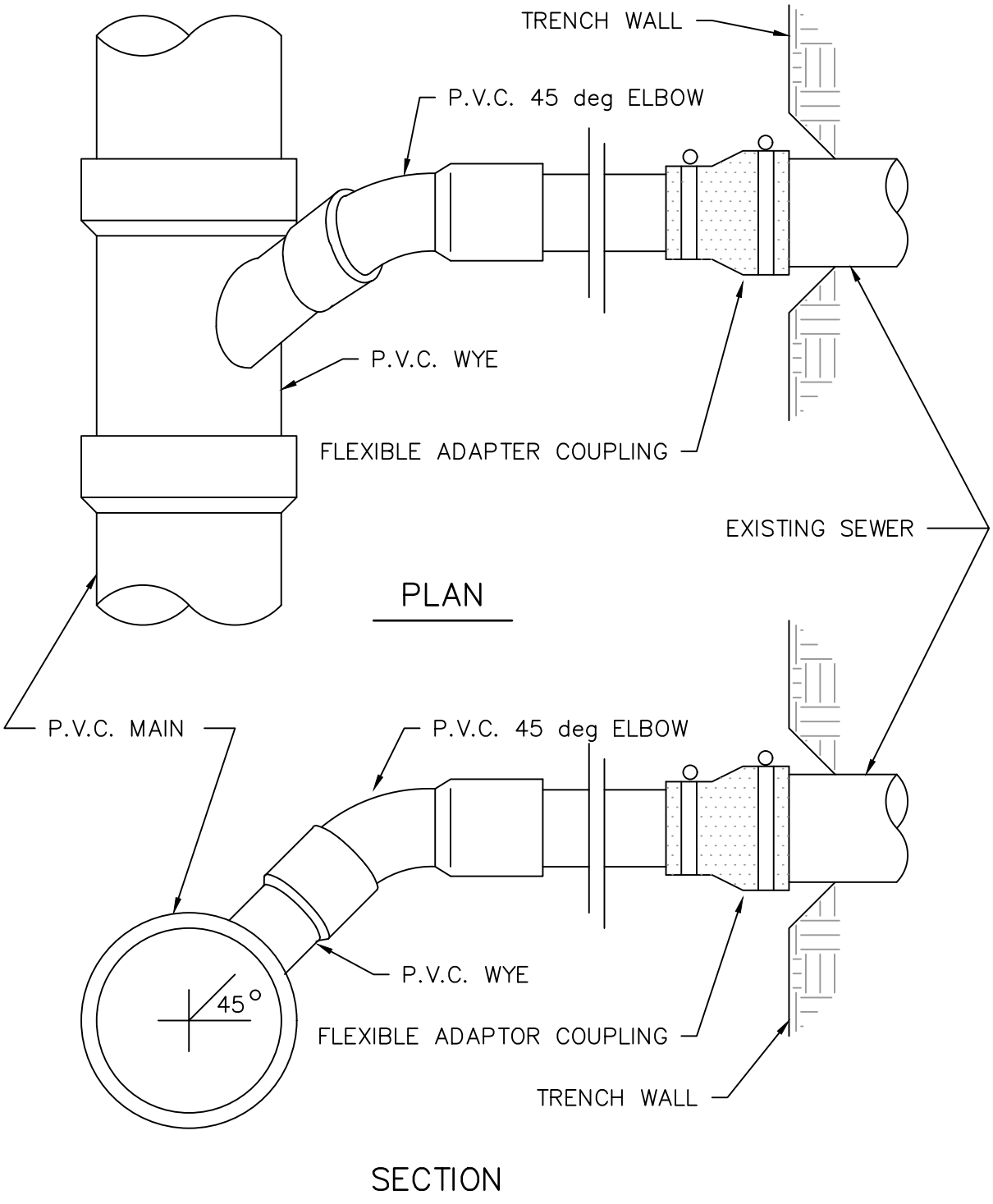
SANITARY SEWER MAINS AT WATER MAIN CROSSINGS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED AUGUST 1993	5 – 5(176



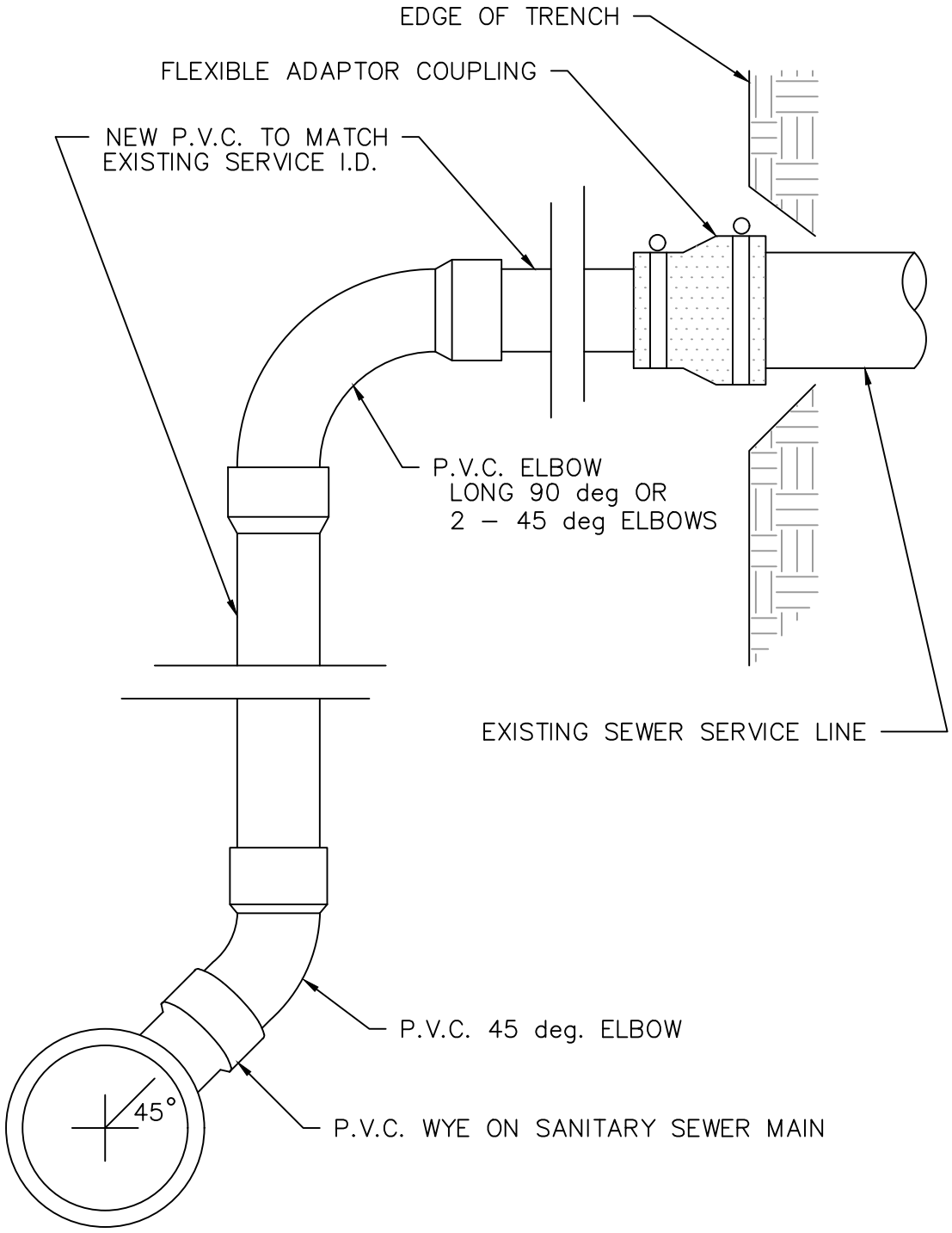
SEWER REPAIR COUPLING – PVC TO CONCRETE, CLAY OR IRON

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 5



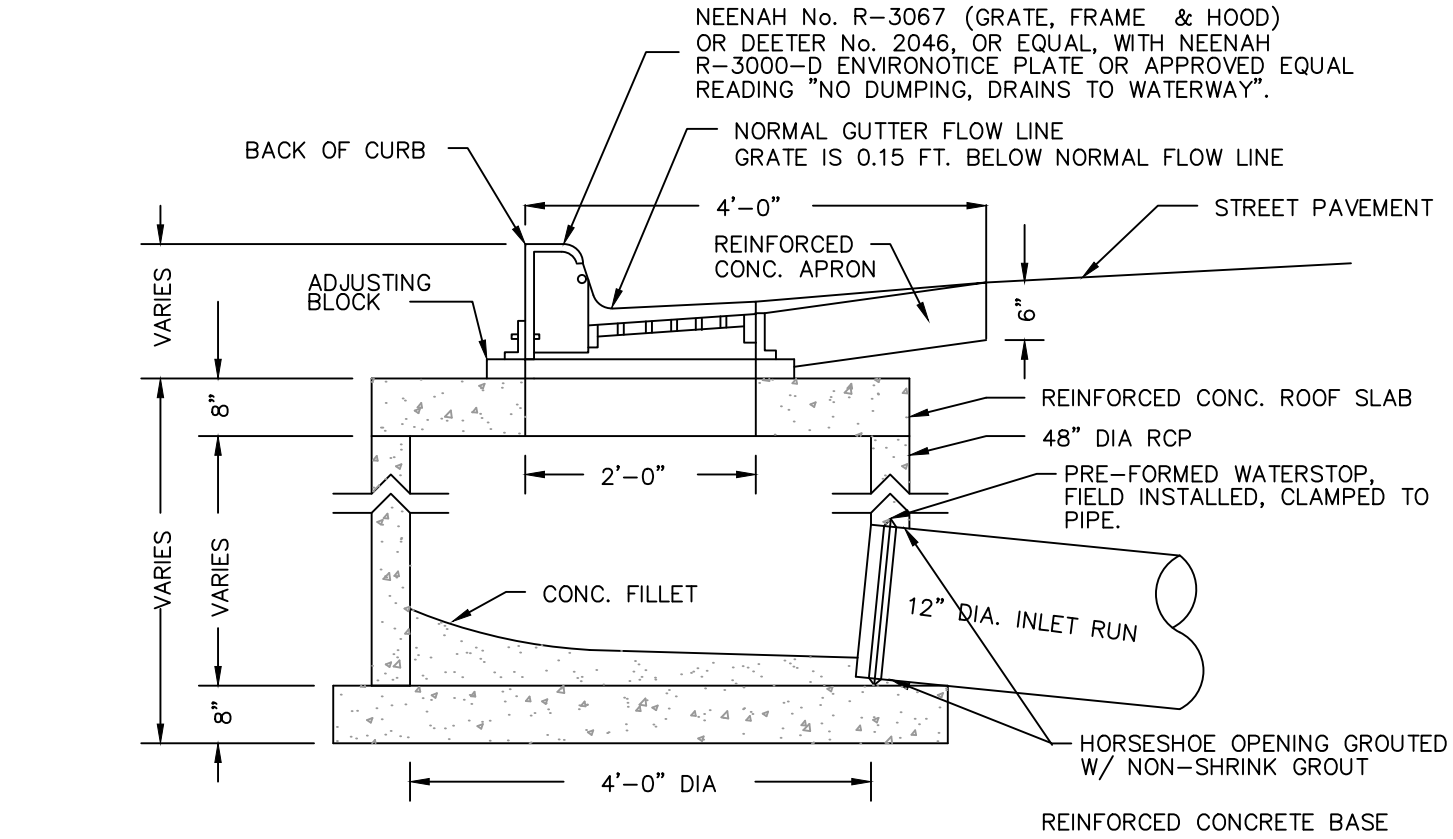
PVC LATERAL TO EXISTING SEWER SERVICE LINE

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 53

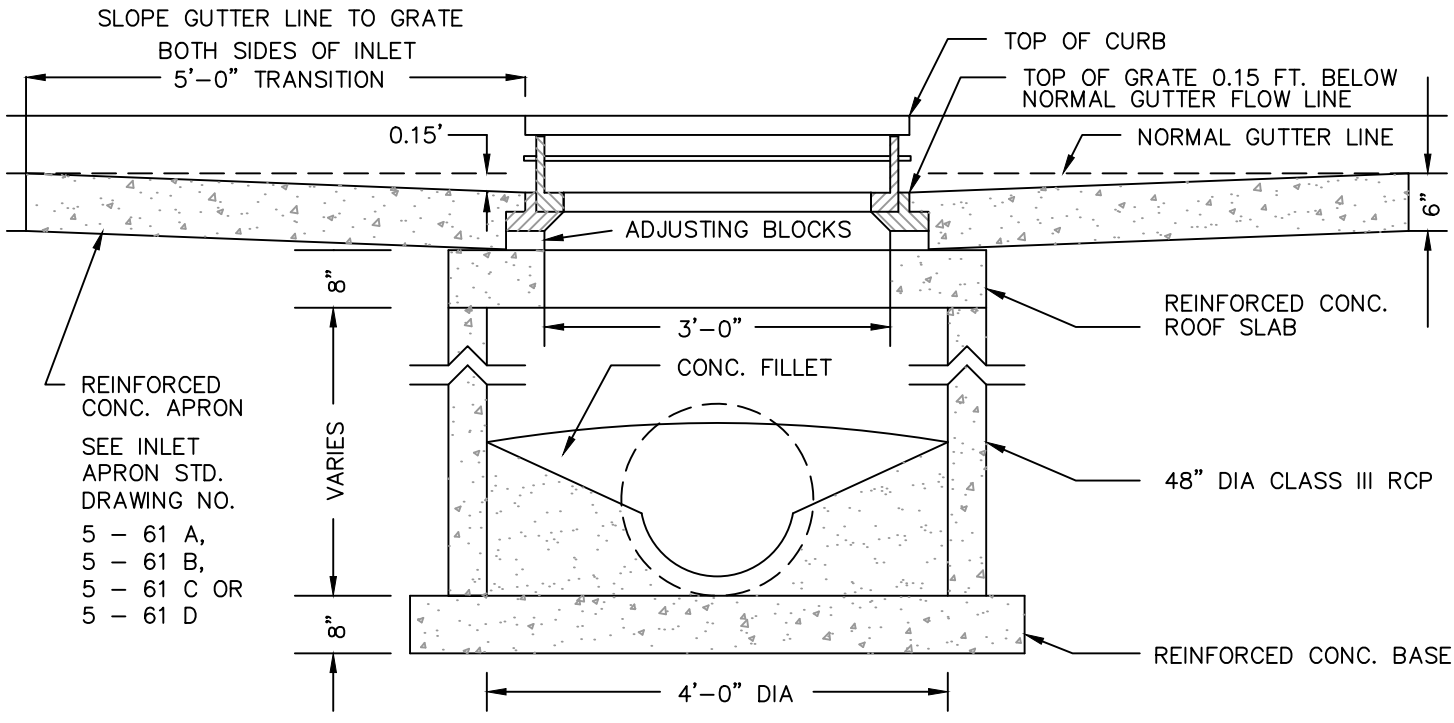


PVC RISER LATERAL WITH RISER TO EXISTING SERVICE LINE

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 5 179



SECTION A – A

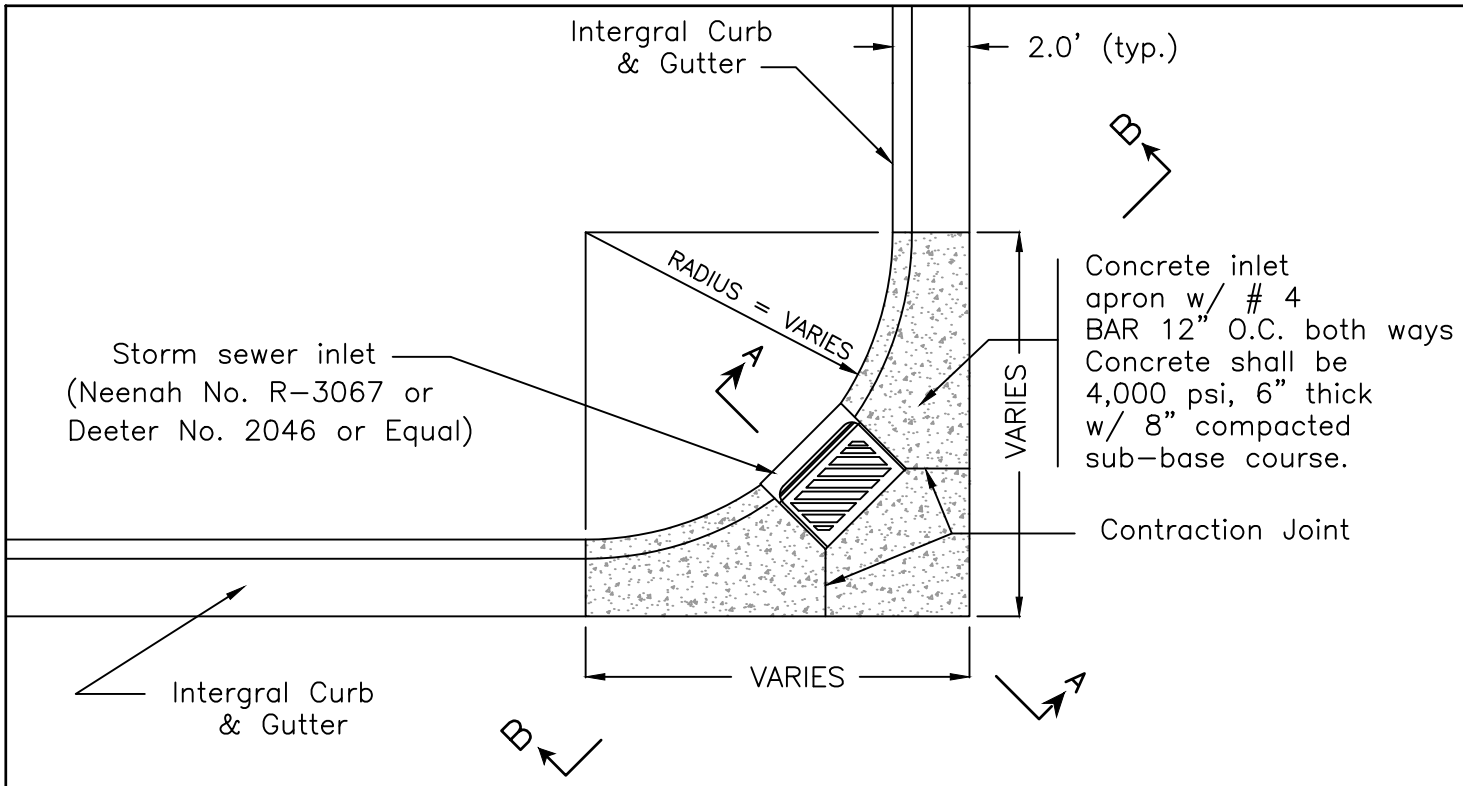


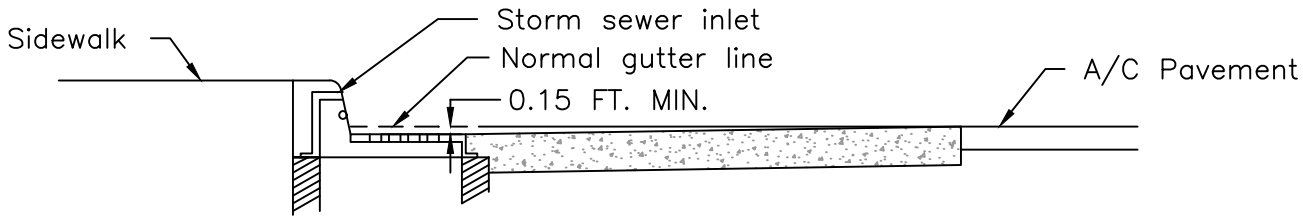
SECTION B – B

NOT TO SCALE

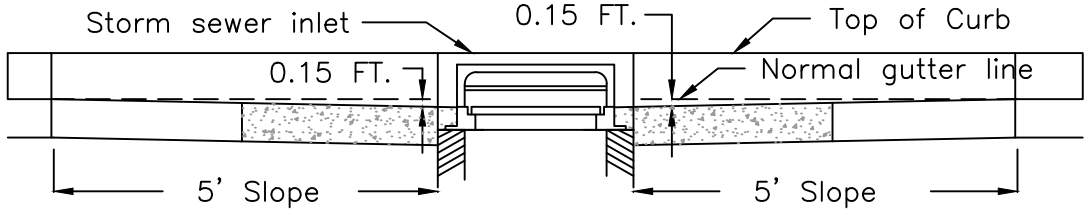
TYPE I STORM SEWER STANDARD INLET DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED: AUGUST 2014	5 – 60





SECTION A – A



SECTION B – B

Note :

1. Inner two ft.(2') of apron shall match TYPICAL BARRIER INTERGRAL CURB & GUTTER cross-section except for the additional slope to gutter depression at grate.
2. Slope outer portion of apron to match grade at pavement cut.
3. Install Neenah R-3000-D environotice plate or approved equal reading "NO DUMPING, DRAINS TO WATERWAY"

TYPE I TYPICAL CORNER INLET APRON DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	AUGUST 1987 REVISED: MAY 2017	5 – 61

OFFICE OF CITY ENGINEER
GREAT FALLS, MONTANA

JANUARY 1992
REVISED AUGUST 2014

5 – 61

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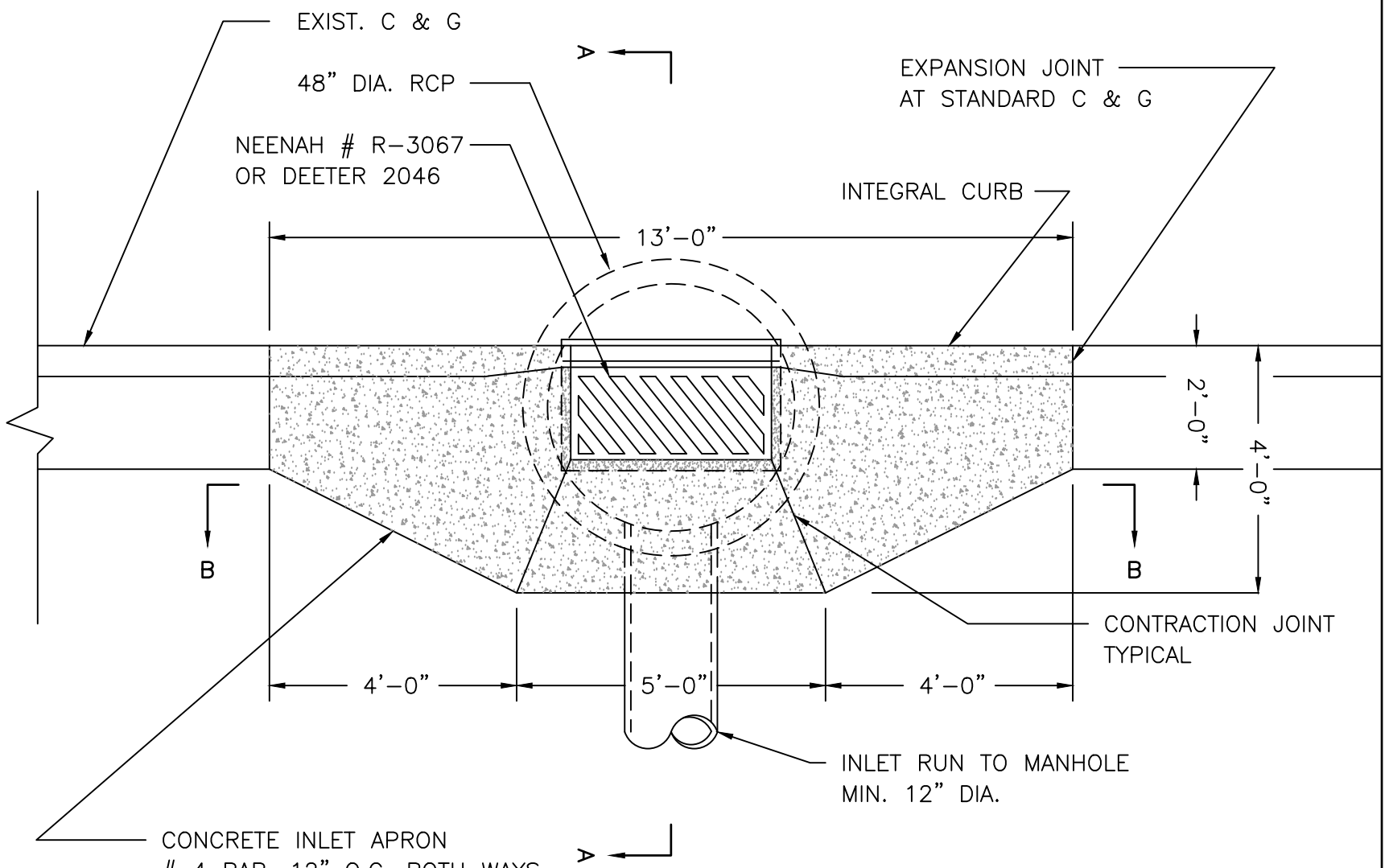
TYPE I STORM SEWER INLET APRON DETAIL



NOTE: INSTALL NEENAH R–3000–D ENVIRONOTICE PLATE OR APPROVED EQUAL READING "NO DUMPING, DRAINS TO WATERWAY"

OFFICE OF CITY ENGINEER
GREAT FALLS, MONTANA

JANUARY 1992
REVISED AUGUST 2014

5 – 6

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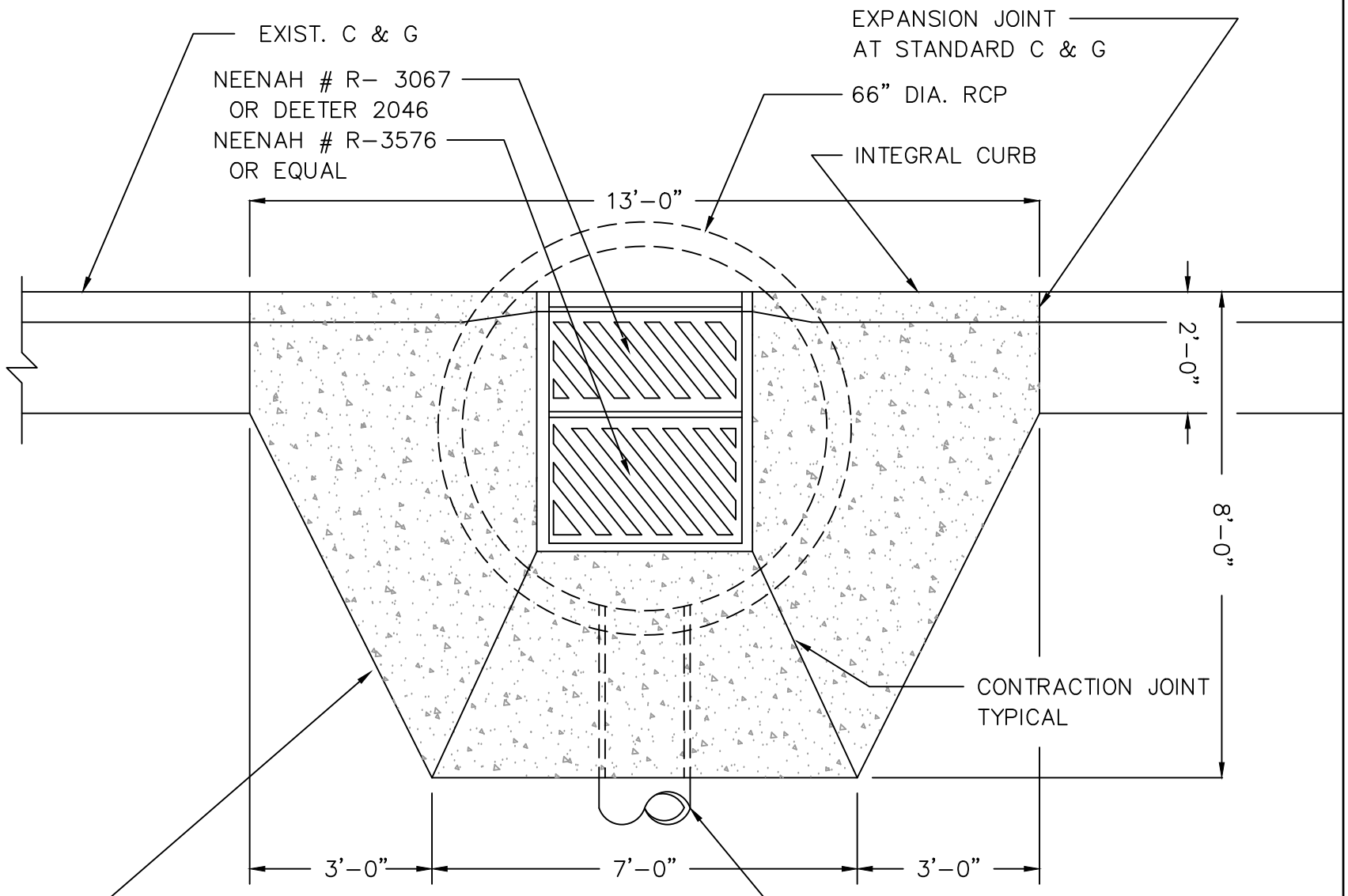
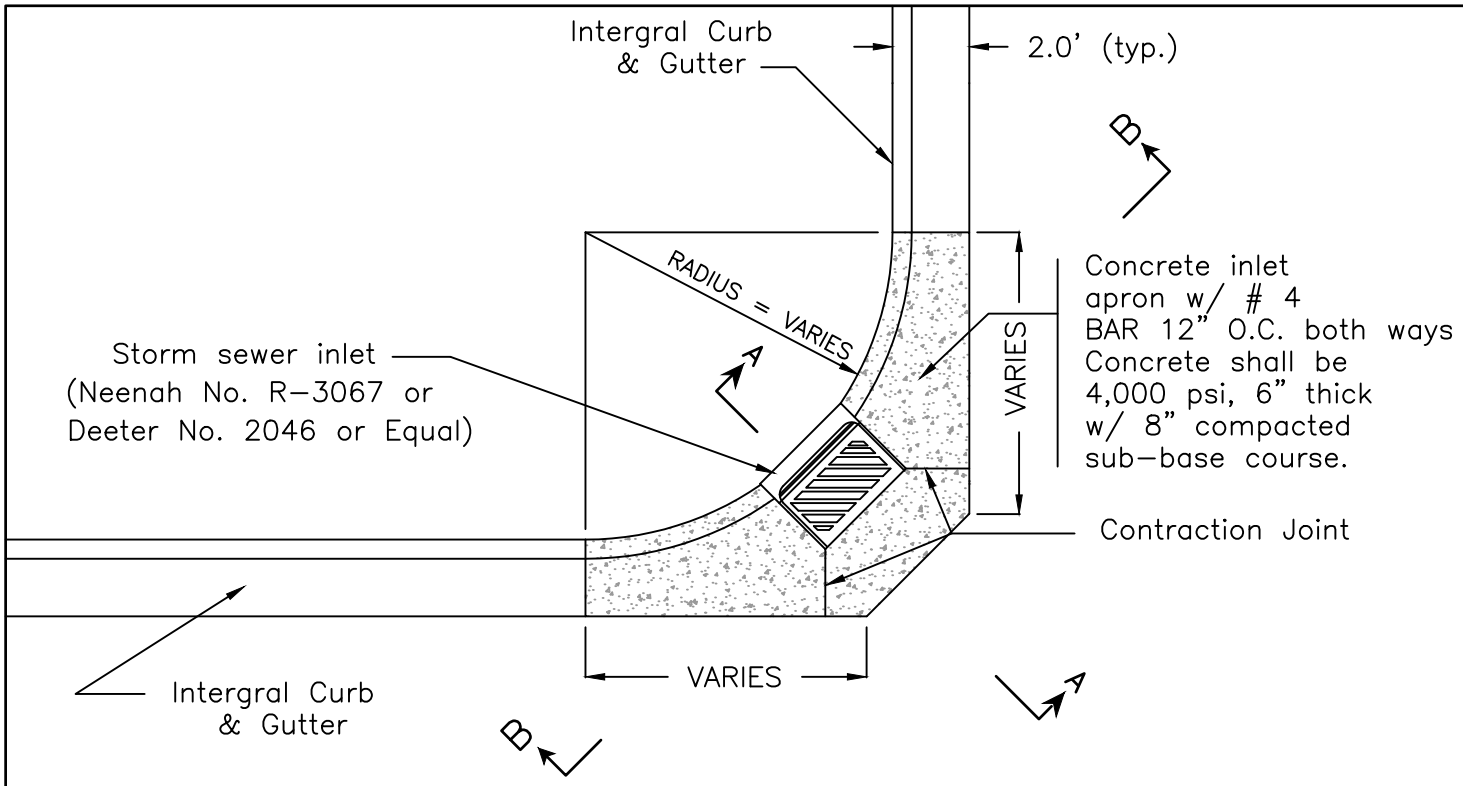
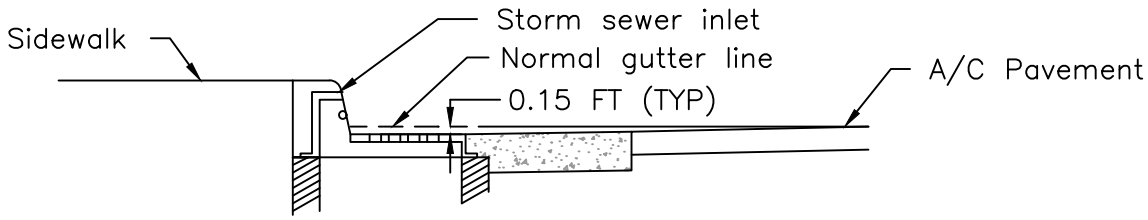
TYPE II STORM SEWER INLET APRON DETAIL

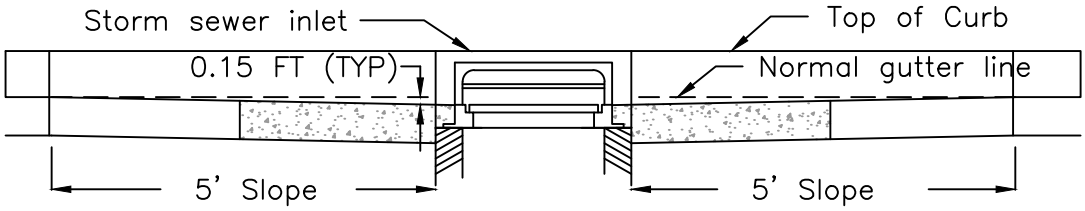


NOTE: INSTALL NEENAH R–3000–D ENVIRONOTICE PLATE OR APPROVED EQUAL READING "NO DUMPING, DRAINS TO WATERWAY"





SECTION A – A



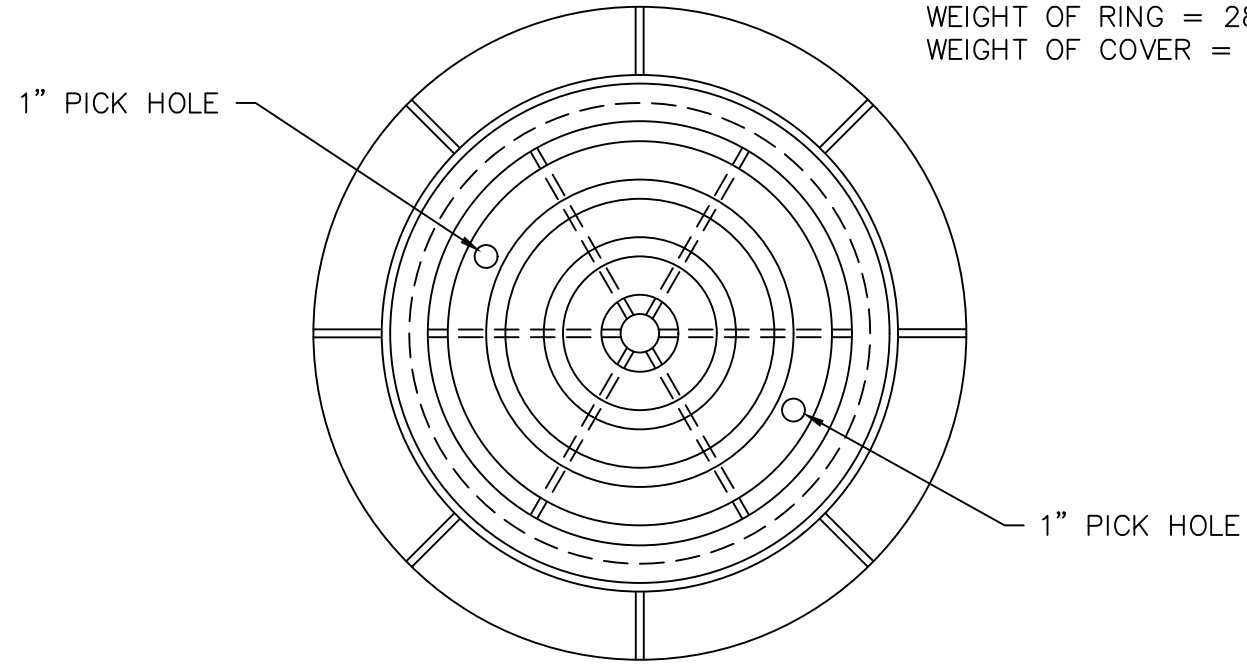
SECTION B – B

Note :

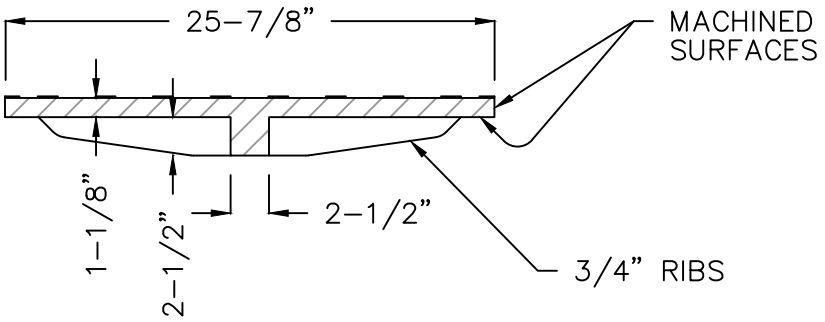
1. Inner two ft.(2') of apron shall match TYPICAL BARRIER INTERGRAL CURB & GUTTER cross-section except for the additional slope to gutter depression at grate.
2. Slope outer portion of apron to match grade at pavement cut.
3. Install Neenah R-3000-D environotice plate or approved equal reading "NO DUMPING, DRAINS TO WATERWAY".

TYPE I TYPICAL CORNER INLET APRON DETAIL

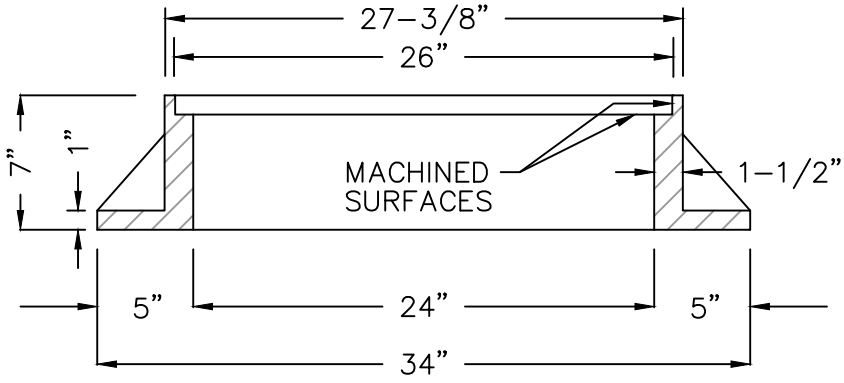
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	AUGUST 1987 REVISED: AUGUST 2014	5 – 61



MANHOLE RING & COVER PLAN



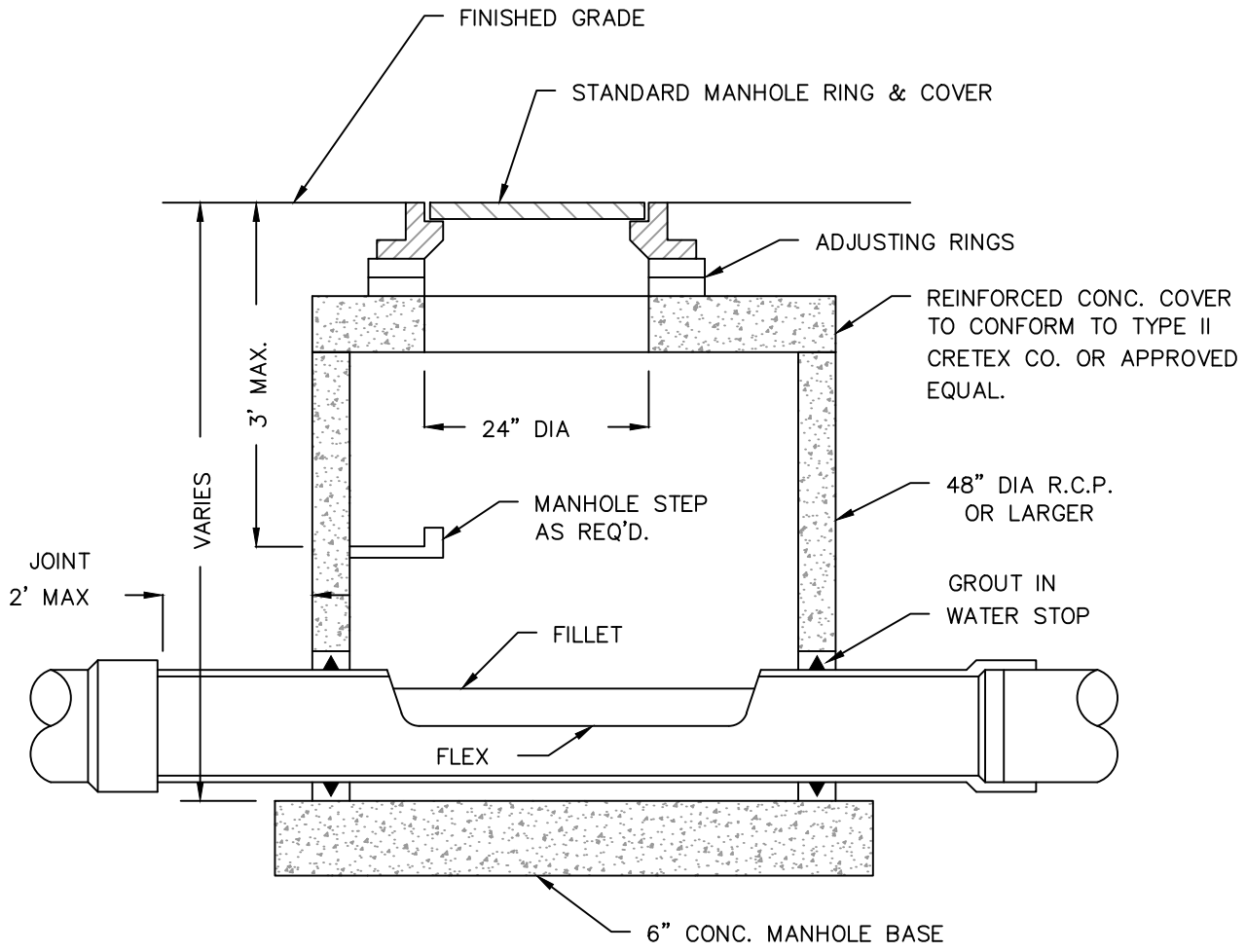
MANHOLE COVER SECTION



MANHOLE RING (FRAME) SECTION

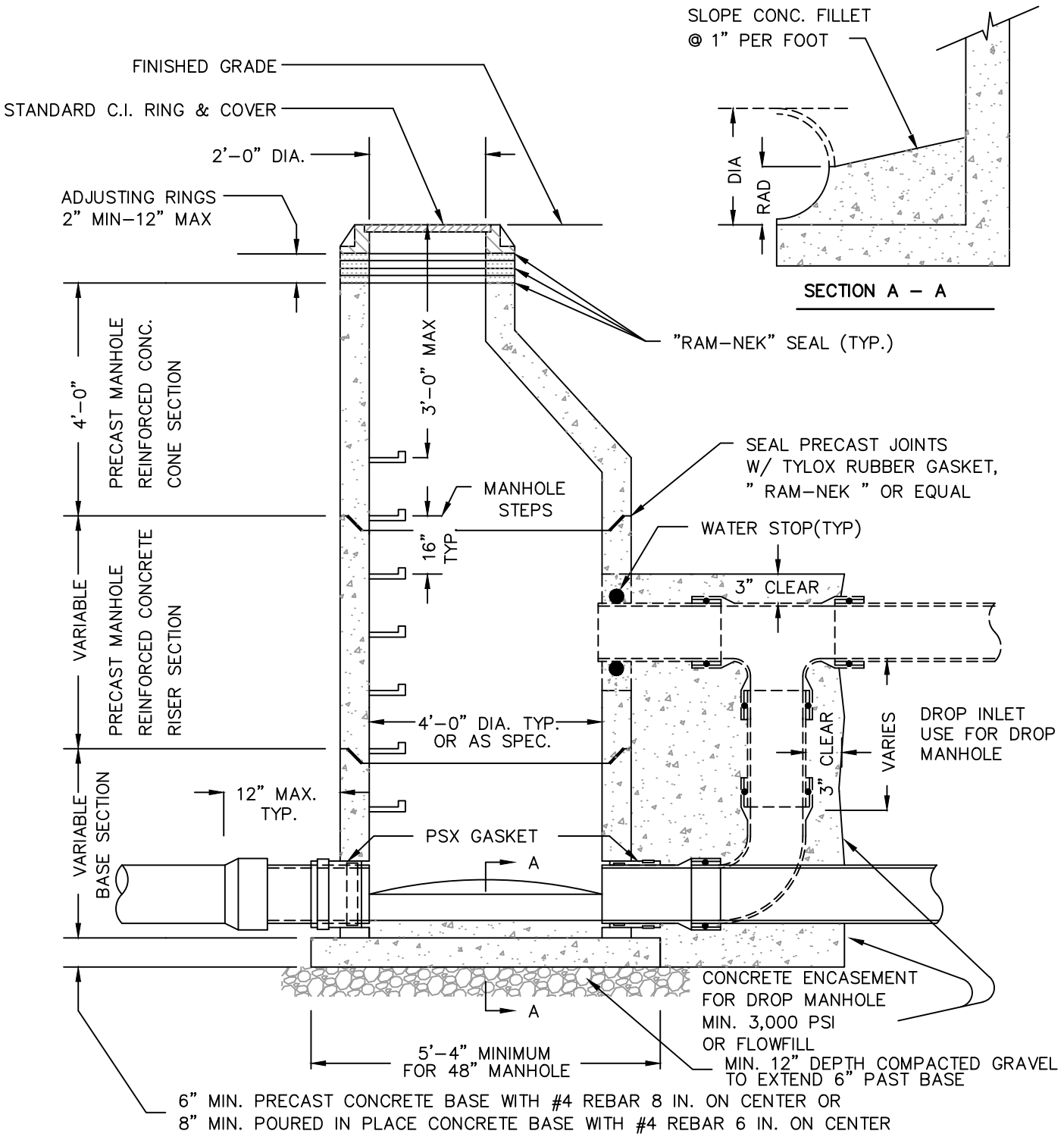
SANITARY SEWER MANHOLE RING & COVER

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 6



SHORT SEWER MANHOLE

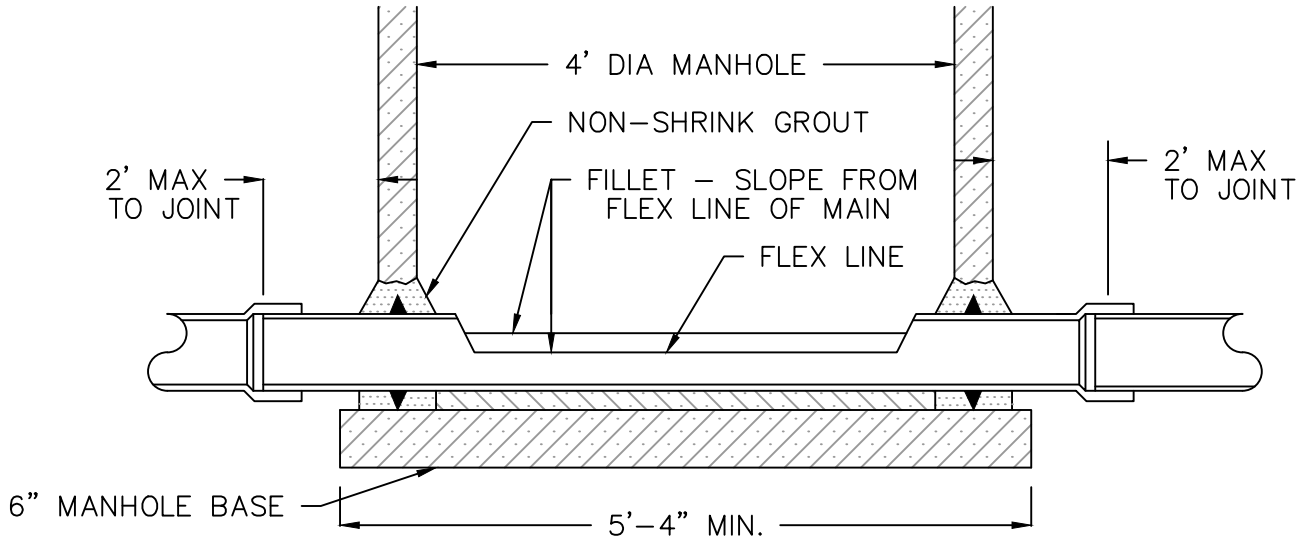
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 6

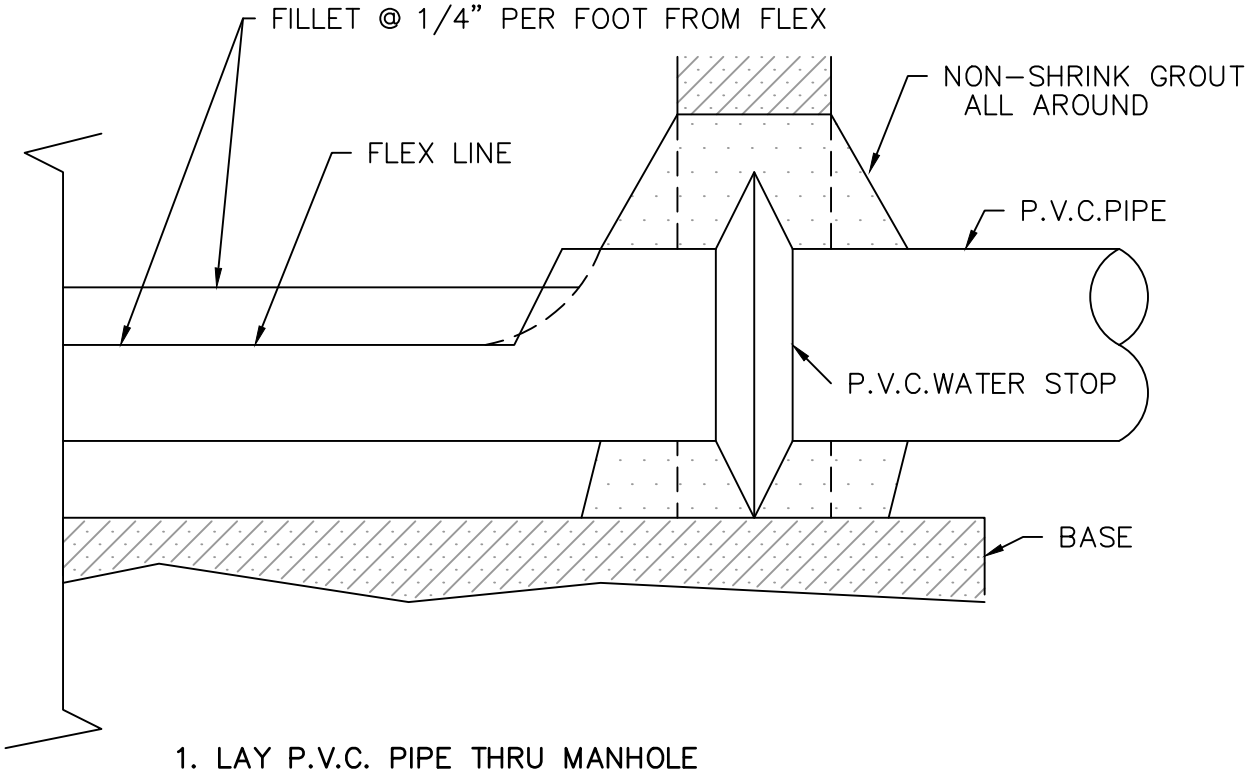


NOTE : ALL JOINTS BETWEEN MANHOLE SECTIONS, ADJUSTING RINGS, MANHOLE RING AND TOP SECTION, AND AROUND SEWER PIPE INTO MANHOLE SHALL BE WATERTIGHT.
FOR CONNECTION TO NEW MANHOLES USE PSX OR EQUIVALENT GASKET AT ALL PIPE PENETRATIONS.
FOR CONNECTIONS TO EXISTING MANHOLES USE WATERSTOP.
MANHOLE CONSTRUCTION TO ADHERE TO ASTM C-478.

STANDARD SANITARY SEWER MANHOLE (AND DROP INLET MH)

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DEC 1987, AUG 1993 REVISED MAY 2010	5 - 6





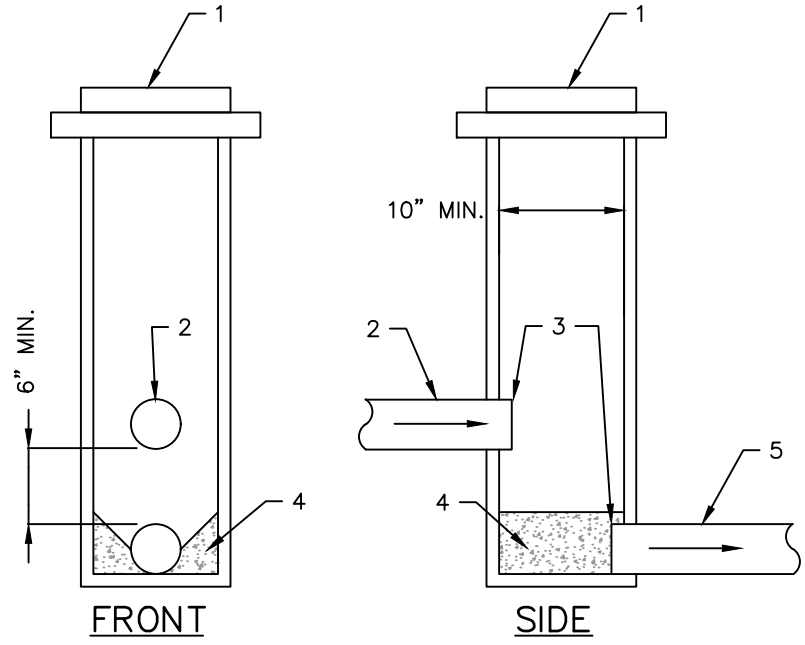
1. LAY P.V.C. PIPE THRU MANHOLE
2. REMOVE UPPER 1/2 OF PIPE IN MANHOLE, CLEAN CUT EDGES.
3. SHAPE FILLET IN MANHOLE @ SLOPE OF 1/4" PER FOOT FROM PIPE FLEX TO MANHOLE PERIMITER.

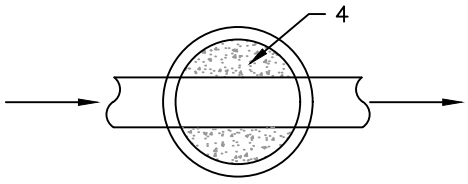
MANHOLE CONNECTION - P.V.C. MAIN

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 - 69

SAMPLE PORTS

1. ALL INTERCEPTORS ARE TO BE INSTALLED WITH A SAMPLING PORT THAT RECEIVES FLOW FROM THE INTERCEPTOR'S EFFLUENT.
2. TEE PIPING ON THE INTERCEPTOR'S INTERIOR WILL NOT SUFFICE AS A SAMPLE PORT.
3. SAMPLE PORTS MUST BE LOCATED IN AREAS PROTECTED FORM VEHICLE TRAFFIC.
4. SAMPLE PORTS ARE TO BE CLEANED AND INSPECTED DURING ROUTINE INTERCEPTOR PUMPING.
5. SAMPLE PORTS WILL HAVE A MINIMUM 10" DIAMETER ACCESS COVER.
6. SAMPLE PORTS WILL HAVE A MINIMUM 6" DROP BETWEEN INLET AND DISCHARGE PIPING.
7. SAMPLE PORTS MUST DRAIN COMPLETELY AND NOT HOLD WATER. BOTTOM TO BE GROUTED AND SLOPED
8. INLET PIPE PENETRATION MUST EXTEND 1" PAST THE INSIDE WALL OF THE SAMPLE PORT. PENETRATIONS ARE TO BE SEALED TO PREVENT LEAKS.

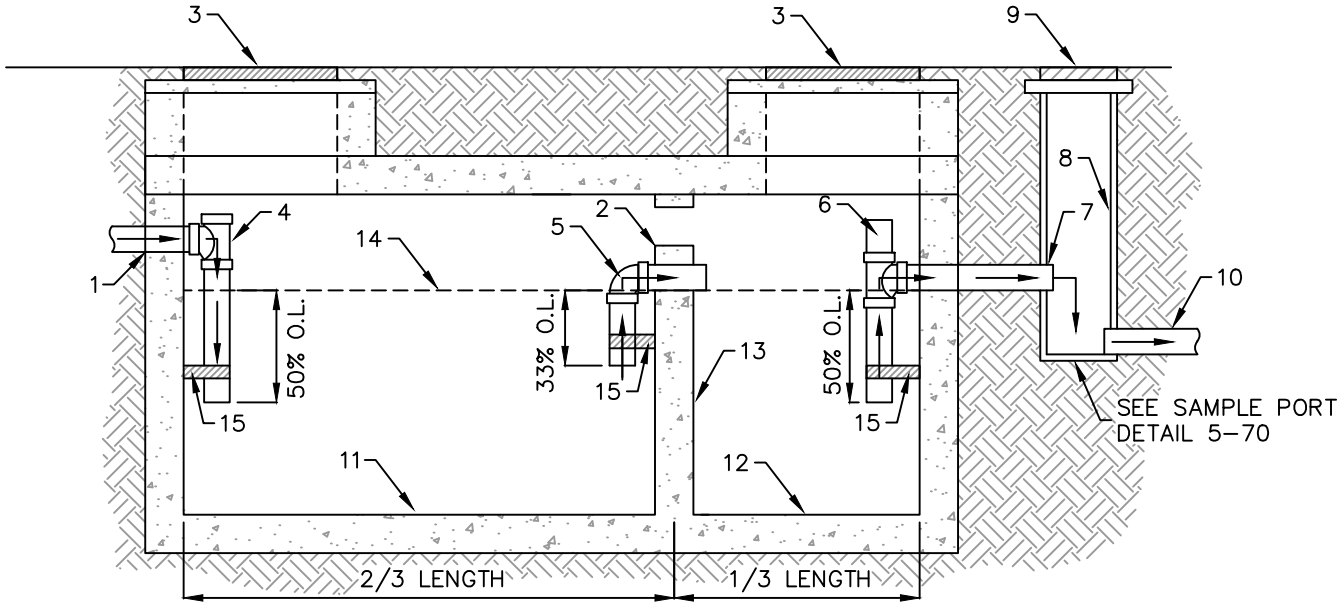




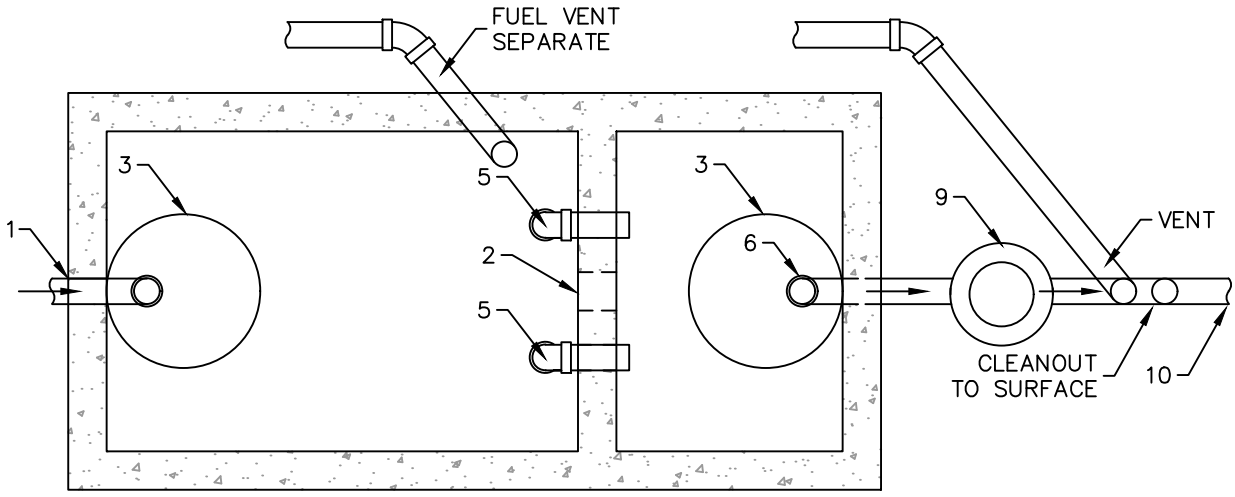
NOTES:
1. SAMPLE PORT RING AND LID
2. GREASE INTERCEPTOR DISCHARGE LINE
3. PIPE PENETRATION (EXTEND 1" PAST THE INSIDE WALL OF THE SAMPLE PORT – MUST BE SEALED TO PREVENT LEAKS. IF USING PVC, A SADDLE MUST BE USED)
4. GROUT (SLOPED TO WASTEWATER CHANNEL – THE SAMPLE PORT MUST DRAIN COMPLETELY AND NOT HOLD WATER)
5. SAMPLE PORT DISCHARGE LINE TO CITY'S SANITARY SEWER

SAMPLE PORT

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DEC 2019	5 – 7(



SECTION VIEW



PLAN VIEW

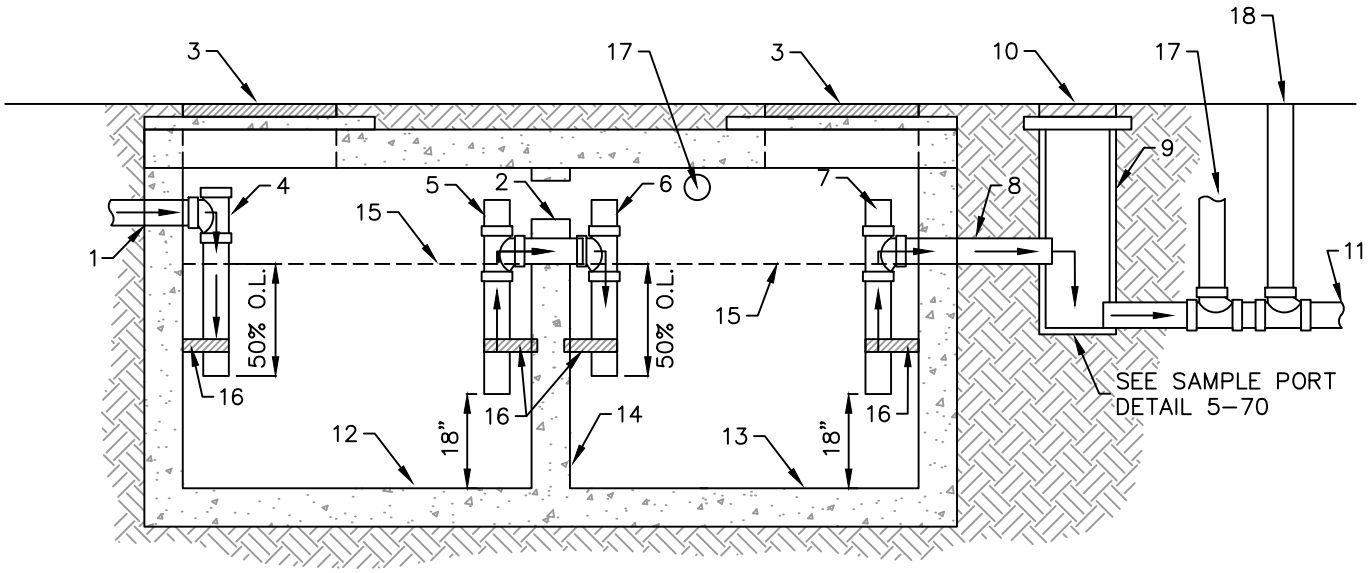
NOTES:

1. INFLUENT LINE
2. 6" DIAMETER VENT SLEEVE
3. MINIMUM 24" OPENING, BOLTED LID WITH GASKET
4. PRIMARY CHAMBER INLET PIPING (MUST EXTEND TO 50% OF THE OPERATING LEVEL)
5. PRIMARY CHAMBER OUTLET PIPING (MUST EXTEND TO 33% OF THE OPERATING LEVEL)
6. SECONDARY CHAMBER OUTLET PIPING (MUST EXTEND TO 50% OF THE OPERATING LEVEL)
7. SAND & OIL INTERCEPTOR DISCHARGE LINE
8. SAMPLE PORT (MINIMUM 10" DIAMETER, PROVIDE A 6" VERTICAL DROP – SEE 5-70)
9. SAMPLE PORT RING AND LID
10. SAMPLE PORT DISCHARGE LINE TO CITY'S SANITARY SEWER
11. PRIMARY CHAMBER (2/3 TOTAL VOLUME). CHAMBER SHALL BE VENTED SEPARATELY
12. SECONDARY CHAMBER (1/3 TOTAL VOLUME)
13. BAFFLE
14. OPERATING LEVEL
15. PIPE SUPPORT

FOR MORE INFORMATION, CONTACT THE INDUSTRIAL PRETREATMENT COORDINATOR'S OFFICE AT 406-727-8390

TYPICAL EXTERIOR SAND & OIL INTERCEPTOR

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DEC 2019	5 – 71



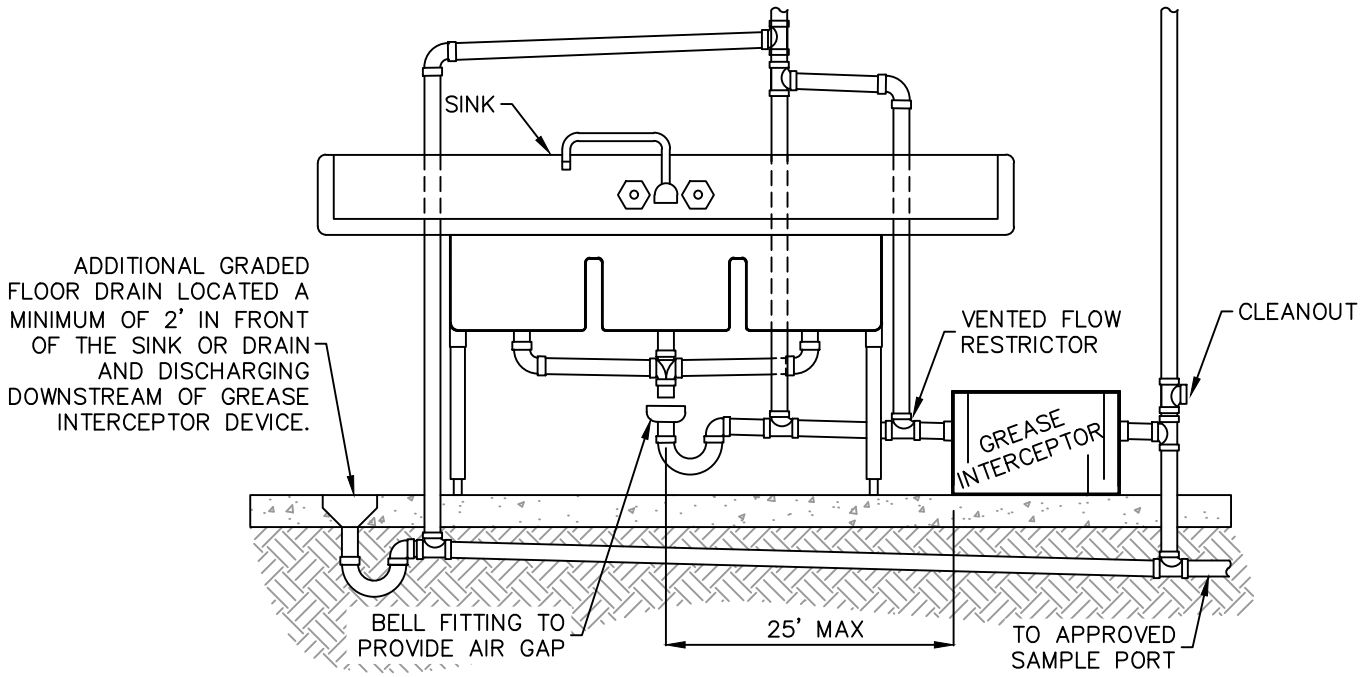
NOTES:

1. INFLUENT LINE
2. 6" DIAMETER VENT SLEEVE
3. MINIMUM 24" OPENING WITH RING AND LID, OR VENTED AND BOLTED CASKETED LID IN AREAS OF HIGH TRAFFIC
4. PRIMARY CHAMBER INLET PIPING (MUST EXTEND TO 50% OF THE OPERATING LEVEL)
5. PRIMARY CHAMBER OUTLET PIPING (MUST EXTEND TO 18" FROM BOTTOM OF CHAMBER)
6. SECONDARY CHAMBER INLET PIPING (MUST EXTEND TO 50% OF THE OPERATING LEVEL)
7. SECONDARY CHAMBER OUTLET PIPING (MUST EXTEND TO 18" FROM BOTTOM OF CHAMBER)
8. GREASE INTERCEPTOR DISCHARGE LINE
9. SAMPLE PORT
10. SAMPLE PORT RING AND LID
11. SAMPLE PORT DISCHARGE LINE TO CITY'S SANITARY SEWER
12. PRIMARY CHAMBER (2/3 TOTAL VOLUME)
13. SECONDARY CHAMBER (1/3 TOTAL VOLUME)
14. BAFFLE
15. GREASE INTERCEPTOR OPERATING LEVEL
16. PIPE SUPPORT
17. VENT
18. CLEANOUT

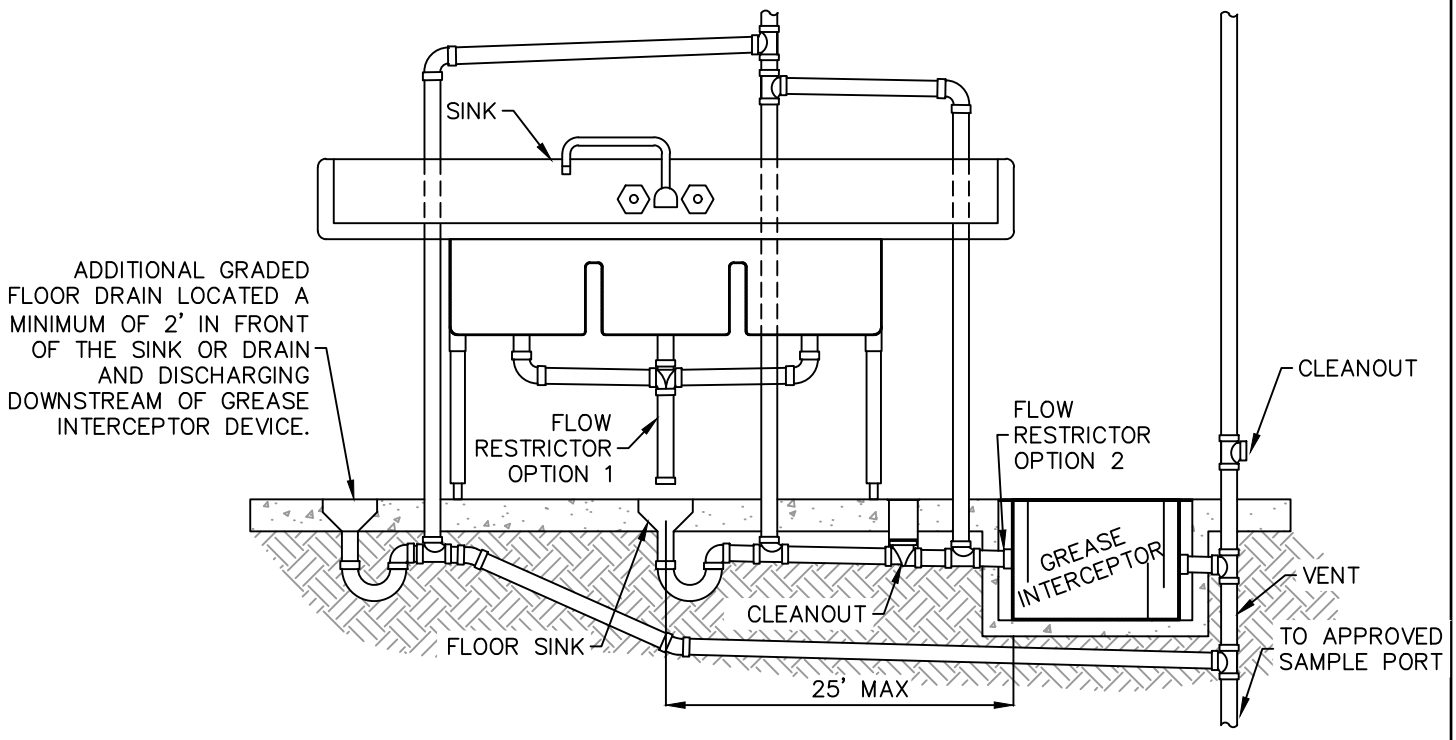
FOR MORE INFORMATION, CONTACT THE INDUSTRIAL PRETREATMENT COORDINATOR'S OFFICE AT 406-727-8390

TYPICAL EXTERIOR GREASE INTERCEPTOR

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DEC 2019	5 – 7



INTERIOR ABOVE GRADE GREASE INTERCEPTOR

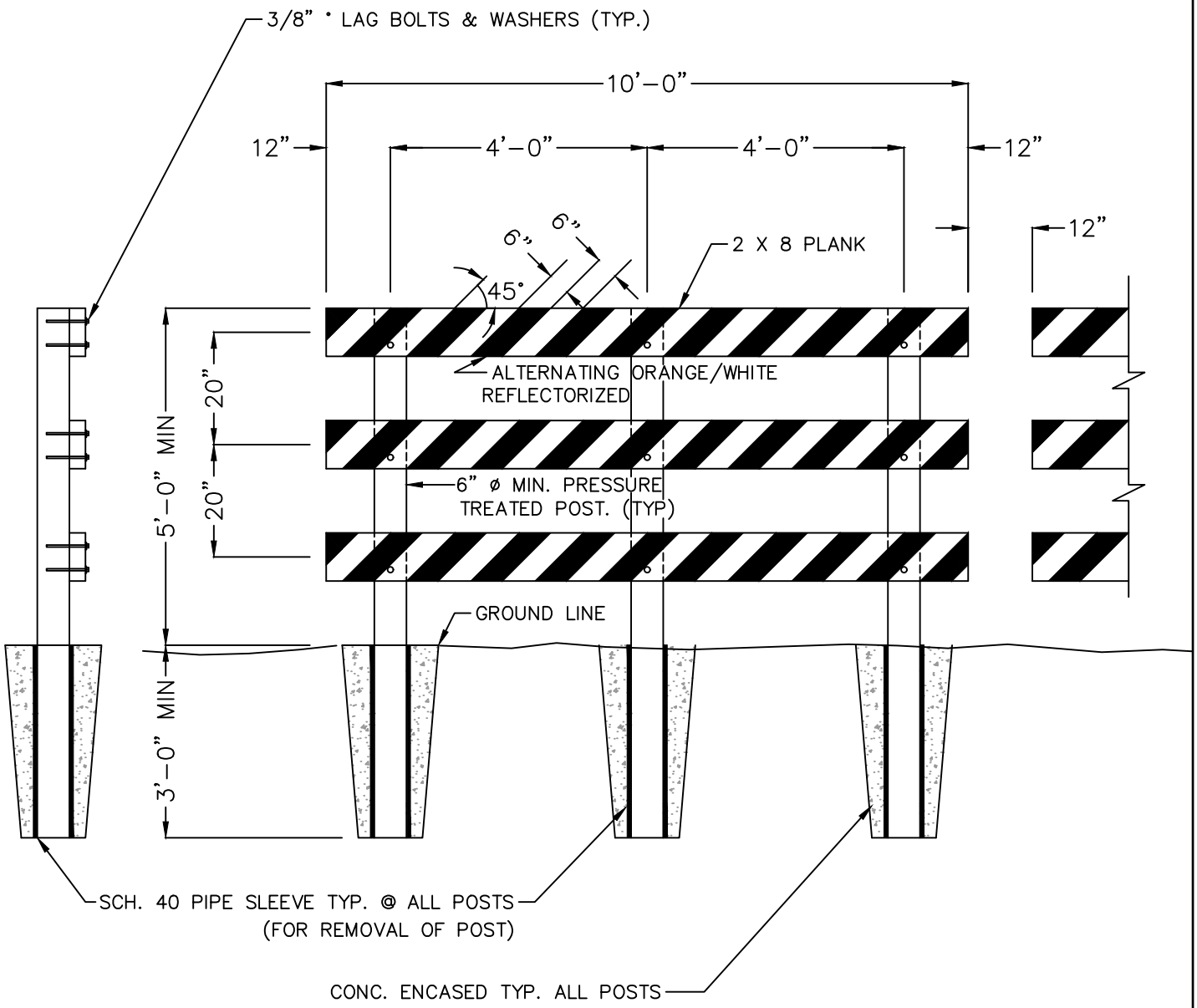


INTERIOR BELOW GRADE GREASE INTERCEPTOR

FOR MORE INFORMATION, CONTACT THE INDUSTRIAL PRETREATMENT COORDINATOR'S OFFICE AT 406-727-8390

TYPICAL INTERIOR GREASE INTERCEPTORS

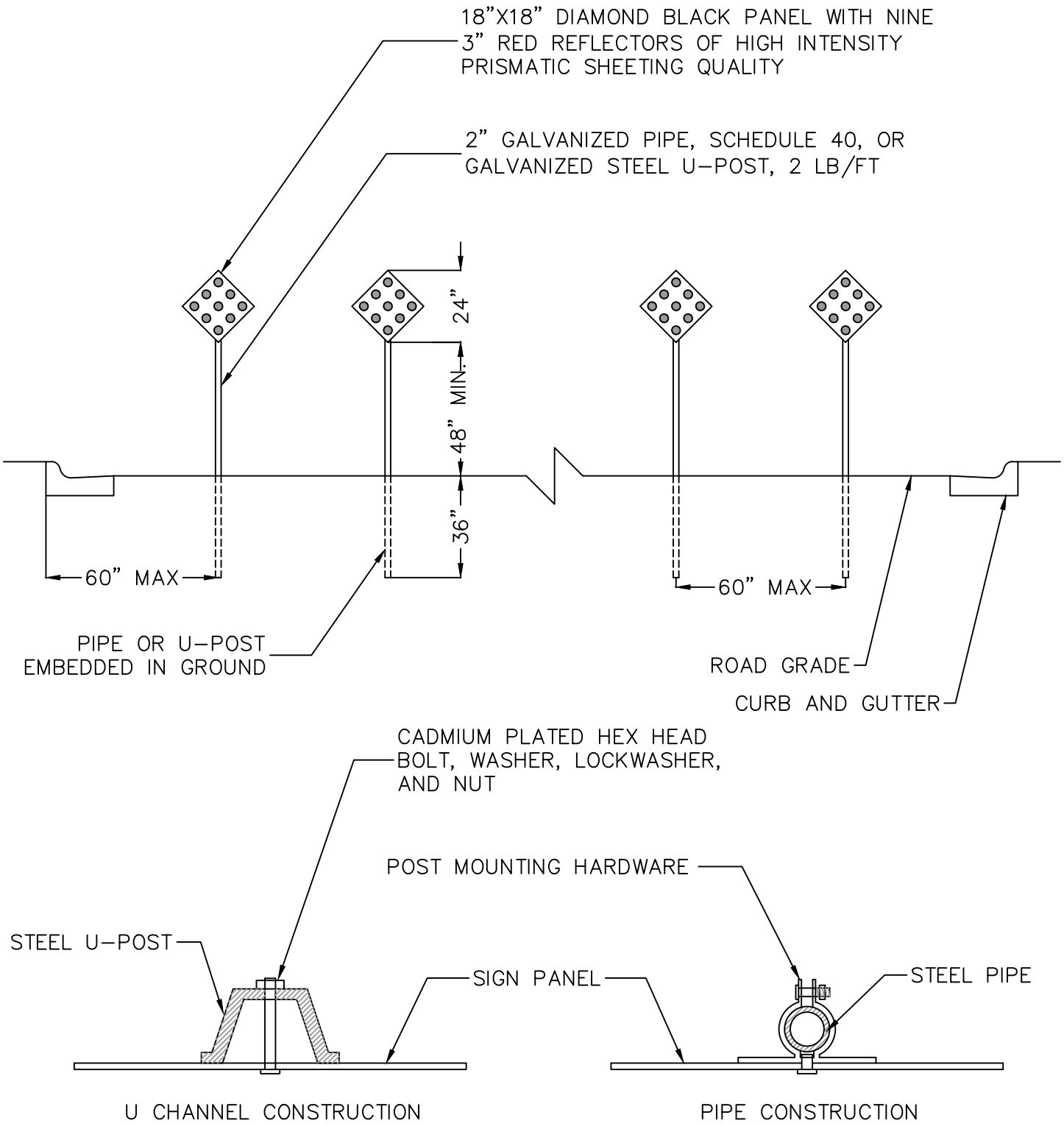
OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DEC 2019	5 – 7



1. STRIPES SHALL SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN.
2. USE 3/8" • LAG BOLTS AND WASHERS. (6 EA PER BOARD)
3. ALL BARRICADES SHALL BE PAINTED WITH TWO COATS OF WHITE PAINT IN ACCORDANCE WITH SECTION M-280.02, (4) AND (8) OF THE STANDARD SPECIFICATION MANUAL, STATE OF MONTANA - DEPARTMENT OF HIGHWAYS.
4. ALL BARRICADES SHALL BE REFLECTORIZED WITH SHEETING MOUNTED ON A SHEET ALUMINUM BACKING AT LEAST 0.019" THICK. THIS REFLECTIVE ALUMINUM SHEETING SHALL BE SECURED WITH ALUMINUM WOOD SCREWS AND SHEETS SHALL BE THE SAME WIDTH AS 2 X 8.

STANDARD FIXED BARRICADE

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	MAY 1993 REVISED	5 – 8(193



DEAD END – WARNING SIGN DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	FEB 2009 REVISED	5 – 8

Agenda #: 7
Meeting Date: March 10, 2020

CITY OF GREAT FALLS
PLANNING ADVISORY BOARD / ZONING COMMISSION AGENDA REPORT

Item:	City of Great Falls Extension of Services Plan.
Initiated By:	Public Works Department
Presented By:	Jim Young, Interim City Engineer
Action Requested:	Recommend Approval by the City Commission.

Suggested Motion:

1. Board Member moves:

"I move that the Planning Advisory Board recommend the City Commission (adopt/deny) the City of Great Falls Extension of Services Plan."

2. Chairman calls for a second, public comment, board/commission discussion, and calls for the vote.

Background:
In 2015, City management directed staff to prepare an Extension of Services Plan (referred to herein as the "Plan") in accordance with Montana statutory laws Mont. Code Ann. § 7-2-4731 "Plans and report on extension of services required" and Mont. Code Ann. § 7-2-4732 "Contents of plan for extension of services." Those statutes require municipalities to prepare plans which include the framework for managing the annexation of properties into the City and provide a level of service to the annexed areas similar to other currently incorporated properties. Montana law also requires that the Plan include long range planning for the extension of services and acquisition of properties outside the corporate limits for a minimum 5-year period into the future.

The Public Works Department took the lead in researching and developing a Plan that anticipates development through year 2025. The process of drafting the Plan involved reviewing and evaluating existing plans from Kalispell, Whitefish and Polson, along with the City's Imagine Great Falls 2025 - Growth Policy 2013 Update. Furthermore, the drafting of the Plan included consultation and input from other City departments and stakeholder groups. A draft of the plan was completed in March of 2019, with several revisions occurring since then.

In accordance with Montana statutes, the Plan addresses the following City services:

- Garbage Collection Service
- Streets Service
- Street Maintenance Service
- Water Service
- Sanitary Sewer Service

- Storm Water Management Service
- Police Protection Service
- Fire Protection & Emergency Services
- Parks and Recreation Service

The statutes also require the City to outline its methods for financing the extension of services in order to distribute the tax burden for the services evenly throughout the entire municipality. Furthermore, it also requires an orderly transfer of services from a county, special improvement district or other district to the City.

The general contents of the Plan include the following sections: overview of the City's urban growth boundaries, economic conditions and trends, physical growth trends, impediments to growth, growth stimulants, prevailing growth patterns, and project growth areas. It also includes a narrative describing aspects of each City service including the scope, extent, and size of service, related master plans and planning documents, funding and financing mechanisms, and associated City codes. Additionally, it includes policies for the general extension of services, services to undeveloped areas, services in existing developed areas, services for areas annexed as wholly surrounded land, and for meeting the cost of services. Maps are included showing potential growth areas, residential development by year, street network, fire districts, City parks, a 50–year growth map, zoning, and floodplains. An Appendix includes examples of cost responsibilities for the extension of public improvements.

The Plan will serve as a complementary document to the Growth Policy Update and provide a more concise focus on providing a plan and method for annexing properties into the City limits and providing the required services to these properties. As the City grows and changes, it will be updated periodically to address future City planning needs and requirements. At the present time, stakeholders are still reviewing and assessing the content of the document, so it is anticipated that there will be an update to the document within the next year.

Concurrences:
City management and other staff have reviewed and approve the Plan as drafted. The draft Plan has also been presented to the development community at a Town Hall Meeting held on January 8, 2020, and at two meetings with engineers, architects and developers. It was also presented to City Commission at a Work Session held on January 7, 2020. To date, staff has mostly received positive feedback.

Fiscal Impact:
The financing of the extension of services includes policies that distribute the tax burden for services through the entire municipality. The Plan includes sources and methods of financing and funding for services currently provided. Those sources include user fees (enterprise funds), tax assessments paid by property owners, developer contributions, special improvement districts, and occasionally grant funds and State fuel tax monies. The Plan does not propose any changes to financing mechanisms for the extension of services. The Plan does outline policies regarding developer, property owner and City responsibilities for providing services and who shall bear the cost of improvements to meet the demands for providing such services.

Staff Recommendation:
Staff recommends that the Planning Advisory Board recommend the City Commission adopt the City of Great Falls Extension of Services Plan.

Alternatives:

The Planning Advisory Board could choose to take no action, recommend that the City Commission deny the City of Great Falls Extension of Services Plan, or recommend revisions before presentation of the Plan to the City Commission.

Attachments/Exhibits:
City of Great Falls Extension of Services Plan (Draft)

EXTENSION OF SERVICES PLAN

January 21, 2020

Contents

Introduction

Statutory Requirements

The City of Great Falls developed this Extension of Services Plan to outline the framework in place for managing the annexation of properties into the City and providing a level of service to the newly annexed areas similar to the service experienced by properties that are currently in the City limits. The City is required to provide this plan under Montana statutory law, including but not limited to M.C.A. § 7-2-4731, "Plans and Report on Extension of Services Required," and M.C.A. § 7-2-4732, "Contents of Plan for Extension of Services". Montana law requires that the Extension of Service Plan include “a long-range plan for the extension of services and the acquisition of properties outside the corporate limits”. This plan includes anticipated development through the year 2025, meeting the requirement of the state statute to plan a minimum of 5 years into the future.

In accordance with Montana law, the City of Great Falls Extension of Services Plan will evaluate and provide plans for the following services:

- Police Protection
- Fire Protection
- Garbage Collection
- Streets
- Street Maintenance
- Water Service
- Sanitary Sewer Service
- Stormwater Management

Montana law requires that these services be provided to the annexed areas “on substantially the same basis and in the same manner as those services are provided within the rest of the municipality prior to annexation”.

In addition to the service required by Montana law, this plan will also review other services provided by the City including Parks and Recreation.

The Extension of Services Plan, according to Montana law, must also include the City’s methods for financing the extension of services in a means that distributes the tax burden for services through the entire municipality. The plan also requires that a transfer of service plan be in place to orderly transfer services from a county, special district, or improvement district that may currently provide any of the services listed above.

City of Great Falls Growth Policy

The City of Great Falls Extension of Services Plan includes by reference, and draws heavily from the technical information included in the Imagine Great Falls 2025, City of Great Falls Growth Policy Update released in 2013. This Extension of Services Plan will serve as a complementary document to the Growth Policy Update and will provide a more concise document focused on providing a plan and method for annexing properties into the city limits and providing the required services to these properties.

Urban Growth Boundaries

The Urban Growth Boundaries are anticipated limits that include potential growth areas not currently included in the Great Falls City limits. The potential growth areas, as shown in Figure 1. illustrates logical areas for future development that are adjacent to or surrounded by the existing City limits. For the purposes of this Extension of Services Plan, only growth projected to occur within the next ten years is evaluated. Figure 1 shows residential (yellow), non-residential (red) and industrial (blue) growth areas through 2019. These areas were defined by evaluating local economic factors and population growth patterns to provide the best projections as to where new residential, commercial, and industrial development could occur in the next ten years.

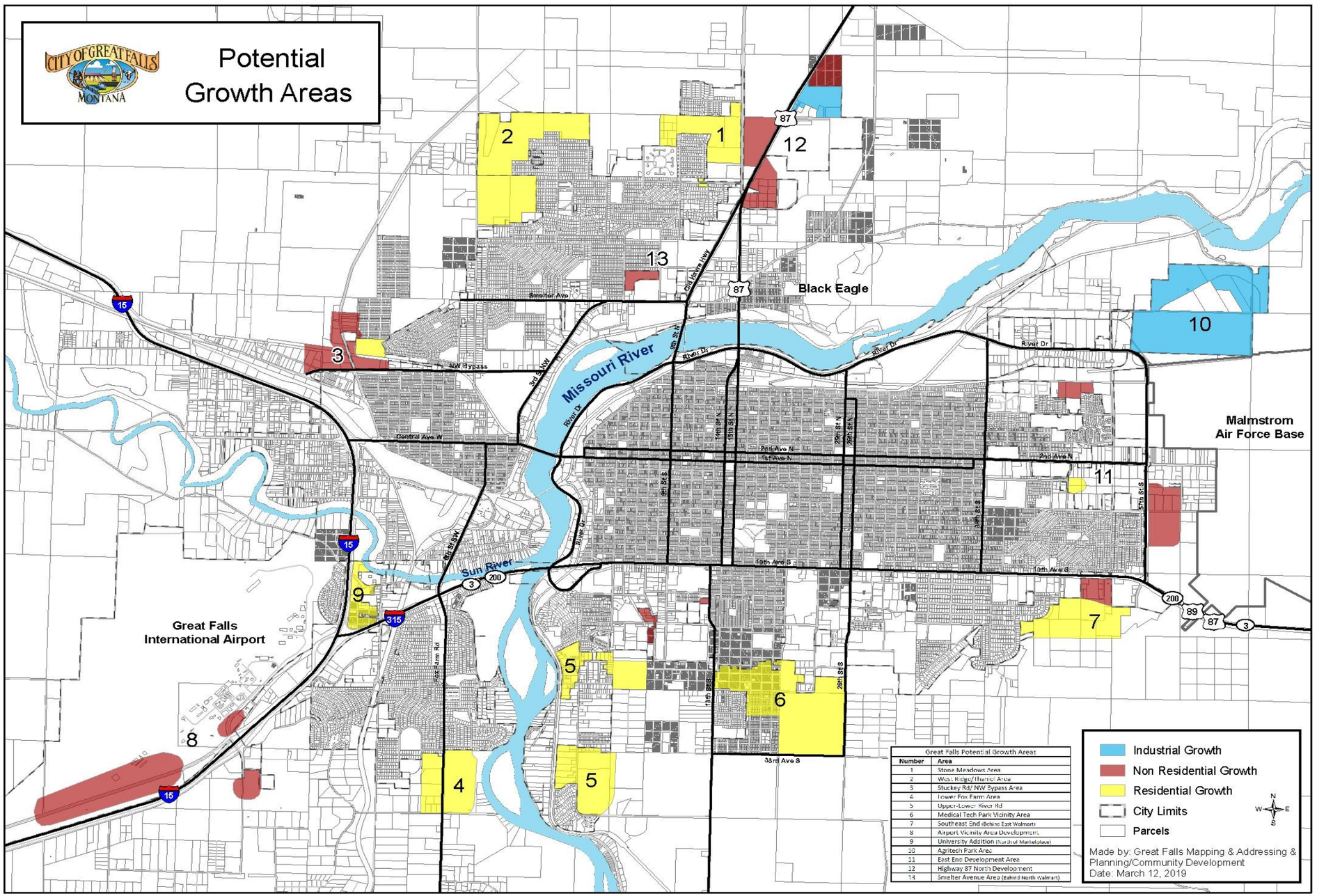


Figure 1. Urban Growth Boundary and Potential Growth Areas

Economic Conditions and Trends

The City of Great Falls is located in Cascade County on the Missouri River, approximately 60 miles east of the Rocky Mountains. Great Falls is the largest city in North Central Montana and serves as a regional hub for medical services, retail, and transportation. The 2010 US Census reported the City's population as 58,505. Malmstrom Air Force Base is located on the eastern border of the City and while the on base population is not included in the City's total population, the base does significantly impact housing and the local economy. The City experienced a decline in population for a 20 year period from the early 1970s until the early 1990s and has experienced slow steady growth for the last 20 years. Cascade County population projections reported in the Great Falls Area Long Range Transportation Plan predict a slow steady growth at approximately 0.75 percent per year during the next 20 years.

Documents that are available to provide additional information on the area's economic conditions and trends include: the 2013 Growth Policy Update, the Great Falls Area Long Range Transportation Plan, and the 2010 Federal Census. Additional information and resources may also be available from the State of Montana Census and Economic Information Center.

Physical Growth Trends

The original town site for Great Falls was platted in 1883 and the City was founded in 1884. Development has extended out from the downtown core with major commercial development following transportation corridors. Table 2 and Figure 2. taken from the Growth Policy Update, depict the residential growth during the last 138 years. The residential growth observed during the 30 year period from 1950 to 1979 is almost three times greater than the period from 1980 to 2012. Recent growth trends indicate that Great Falls is experiencing steady modest growth that is anticipated to continue for the duration of this plan. The residential development from 1980 to 2018 highlighted in blue provides a useful depiction of where the majority of residential growth has occurred recently and where growth may be expected in the future.

Table 2 Residential Building Units in Great Falls 1880-2018

Year	Count
1880-1919	2,775
1920-1949	3,522
1950-1959	5,085
1960-1979	5,687
1980-2012	4,160
Total	21,229

Source: Montana Department of Revenue 2019 data
Note: Redeveloped lots are not included as data for purposes of this map.

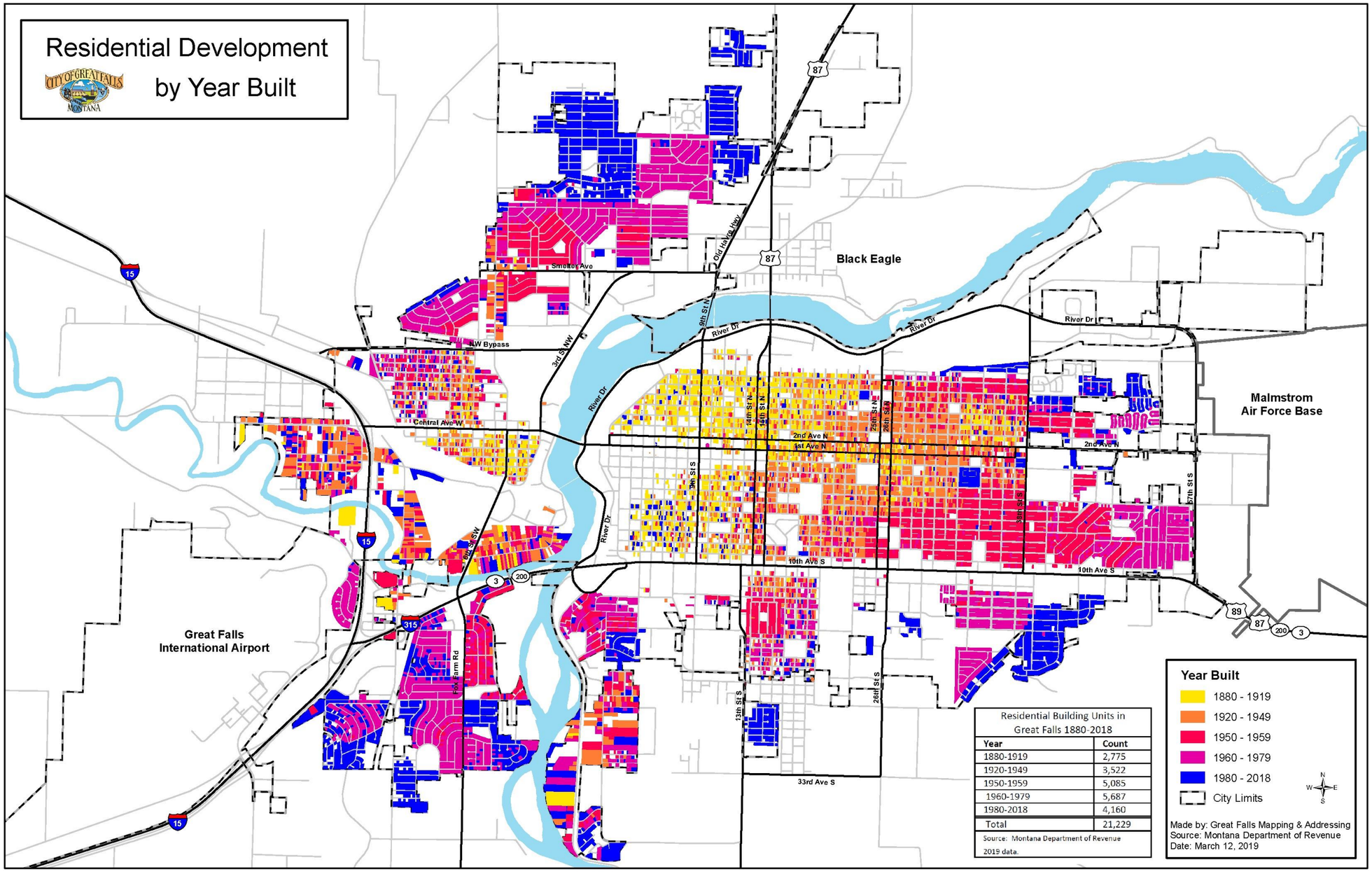


Figure 2. Residential Growth

Impediments to Growth

A significant impediment to growth for the City of Great Falls as well as many other cities is the cost of providing and maintaining utilities and services to the areas seeking incorporation into the City limits. The Urban Growth Boundaries provided for in this plan include properties that are close in proximity to existing utilities and services. This plan assumes that through the next 10 years, the areas closest to existing utility infrastructure will be the most likely for annexation.

In addition to the challenge of funding and providing new water and sewer and updating streets to meet city standards, there are other physical factors such as stream and river locations, steep slopes, poor soils, and City/County development patterns that also impede growth.

The confluence of the Missouri River and Sun River is located near downtown and the associated floodplain limits development in some of the lowest lying areas adjacent to these rivers. The floodplain map for the Great Falls area is included in appendices to this report.

Steeper topography located in some areas including Gore Hill, Hill 57 and the perimeter of Gibson Flats presents additional challenges for construction of public infrastructure and buildings. Because of these challenges, these areas have been slower to develop than other areas.

Areas with expansive clay soils, more prevalent in the northwestern and northeastern sections of the City, have experienced increased development costs in recent years.

In some instances, the development pattern of County subdivisions in close proximity to the City is a factor in determining the City's future growth. Overall there are 160 subdivisions within a two mile periphery of the City. These areas can often times develop more slowly and differently from today's typical subdivisions.

Growth Stimulants

There are currently four major economic factors leading development in Great Falls. The largest factor and one that has impacted Great Falls for many years is Malmstrom Air Force Base. The Federal Government military spending and staffing decisions have historically affected Great Falls economically and are anticipated to continue to have a significant impact on the local economy. The second is the Medical Industry. Great Falls has become a regional hub for healthcare and Benefis Health System is the largest civilian employer in the City. The Great Falls Clinic also employs a significant local workforce in addition to many smaller health related companies and

practices operating in Great Falls. Oil and gas production in eastern Montana, North Dakota, and Canada has led to a recent increase in industrial activity that has impacted Great Falls as well. While oil prices have dropped significantly in the past few years, there is still the potential that northern Montana will continue to develop its natural resources and jobs associated with this work may stimulate growth in Great Falls. Finally, economic opportunities associated with supporting the region's heavy agricultural operations continue to provide a solid base to the Great Falls economy.

The higher education opportunities in Great Falls also provide some impact on the local economy. The private University of Providence has a listed enrollment of just over 1,000 students, while the public Great Falls College-Montana State University has an enrollment of approximately 2,600 students.

Prevailing Growth Patterns

Figure 2 (page 8) included in the Physical Growth Trends section of this plan illustrates the residential growth trends in Great Falls.

The majority of residential development that has occurred over the past 30 years has been concentrated in the following areas:

North:
The largest growth area over the last 30 years has been north of Skyline Drive, to the west of 5th Street Northeast and to the East of 9th Street Northeast. This development has been primarily residential with the exception of some commercial development near Bootlegger Trail. The heaviest Industrial growth in this area has been to the east of U.S. Highway 87. The land north of Great Falls was used primarily for agriculture before being developed. There are some areas of poor soils and poor drainage that provide additional challenges for the development of these areas.

Southeast:
The residential areas of the city southeast of Mountain View Drive and to the east of 39th Street South, and south of 10th Avenue South, make up another large concentrated area that has experienced significant growth during the last 30 years. This area is primarily residential with commercial growth near 10th Avenue South including a new Wal-Mart that has the potential to generate additional commercial growth in the area. Growth is restricted in parts of this area due

to the steep slopes that lead down to the Gibson Flats area, and drainages that move through this area.

South:
The primary residential development that has occurred south of Great Falls is the Castle Pines development, between 13th and 17th Streets South and 24th and 29th Avenues South and the Talus, Rockcress and Meriwether Crossing multi-family developments located between 20th Street 21st Avenue South and 26th Street South and 24th Avenue South. There has also been significant recent commercial development near the medical district between 20th and 32nd Streets South.

Southwest:
The Fox Farm area south of 10th Avenue South and west of the Missouri River is another area of residential growth that has been active over the last 30 years. This is an area that has been developed for many years, but additional growth has occurred in various open spaces in the area.

Projected Growth Areas

The steady growth experienced in the past few years in Great Falls is expected to continue similar to prevailing growth patterns described in the previous section. Some infill and development within the existing City boundaries should be expected, though most of the growth will likely occur on the periphery of the City. There is a large supply of open space and agricultural land that borders the City, helping to keep land costs low for development. The largest impediment to growth in these areas on the outside of the existing City Limits is the costs associated with providing and maintaining City services. The six residential areas called out on Figure 1 are all located close to subdivisions with roadways and utilities in the City limits, though there are still considerable costs associated with providing and maintaining utilities to these new residential areas. These costs are discussed further in the Extension of City Services section below. Development within the three industrial areas called out in Figure 1 will require larger utility investments than the residential areas as these areas are located farther away from the existing utility infrastructure and some industrial users have specialized utility needs that require additional costs.

Extension of City Services

In order to achieve compact, orderly and efficient urban growth, plans for the extension of, including providing and maintaining, municipal services into growth areas must be developed and implemented. In addition to identifying the services available and a plan to physically provide those services within a defined area, it is also essential to identify both the party responsible for service extensions and a method of financing the extensions.

The services which are considered for extension into the future growth areas of the City are streets, sanitary sewer, storm sewer, water, police protection, fire protection and emergency services, solid waste collection, and parks.

Streets

The transportation network within and around a community plays a significant role in its physical development and growth. This network of streets, roads and highways should be coordinated to form a system that not only provides efficient internal circulation, but one that also facilitates through traffic. Since streets serve two basic functions of moving traffic and providing access to abutting lands, each street should be classified and designed for the specific function or combination of functions it is intended to serve. This functional classification system forms the basis for planning, designing, constructing, maintaining and operating the street system. For these reasons urban streets are designed and developed in a hierarchy comprised of the following types:

Major Arterials:
A major road or highway with moderate to high speeds and high traffic volumes. Major arterials provide access to the regional transportation network, and move traffic across the county and between cities and communities. Access to abutting lands is limited. Traffic volumes would typically exceed 15,000 vehicles per day.

Minor Arterials:
A major road with moderate speeds designed to collect and move traffic from one major part of the community to another or to move traffic to and from the major arterial system. Traffic volumes would generally range from 5,000 to 15,000 vehicles per day.

Collectors:
A secondary or intermediate street with moderate speeds and low to moderate volumes. Such streets would collect local traffic from neighborhoods and carry it to adjacent neighborhoods or transfer the traffic to the arterial system. Such streets would typically serve a neighborhood or area with 150 or more dwellings and carry 1,000 to 5,000 vehicles per day.

Local:
These are minor streets intended to serve individual sites, buildings or lots, and provide access to residential neighborhoods. Local streets either feed into collectors or provide destination access off collectors.

The City of Great Falls is currently responsible for approximately 300 miles of paved roadway and alleys, as well as another 80 miles including mostly unpaved alleys. The Montana Department of Transportation (MDT) is responsible for 39 miles of roadway in Great Falls.

The primary planning document for transportation funding is the *Great Falls Area Transportation Plan*, last adopted in 2014 and updated in 2018. This document provides a comprehensive evaluation of the transportation system for the City of Great Falls and the surrounding urban areas. Included in this Transportation Plan is an evaluation of Major Street Network (MSN) Improvements that includes larger, high cost projects that are needed to meet the anticipated Traffic Demands through 2038. Figure 3 below is taken from the Transportation Plan and provides MSN improvement options recommended to meet the anticipated traffic demands. The proposed improvements on this figure include work north and south of Great Falls that will provide new or improved arterial and collector roadways in the areas that are anticipated to see the largest growth over the next 20 years. These projects will likely be funded through State and Federal Funding sources. Two of these improvements projects, 24th Avenue South and Fox Farm Road were recently completed.

Additional local roads and collector streets may be necessary to meet the anticipated growth evaluated in this Extension of Services Plan. It will be the responsibility of the developer of a new subdivision to provide streets built to city standards, including curbs, gutters, sidewalks, boulevards, and street signs.

The City of Great Falls requires that new streets associated with annexation meet the requirements of Official Code of the City of Great Falls (OCCGF), Title 16, Chapter 16, Article 7, as may be amended. New City streets need to meet the anticipated service levels prescribed in the Growth Plan and Transportation Plan. Street corridors should take into account the anticipated storm water conveyance requirements, either curb and gutter flow or inlet capacity and pipe installation depending on the site, and also make accommodations for other public utilities and transportation improvements.

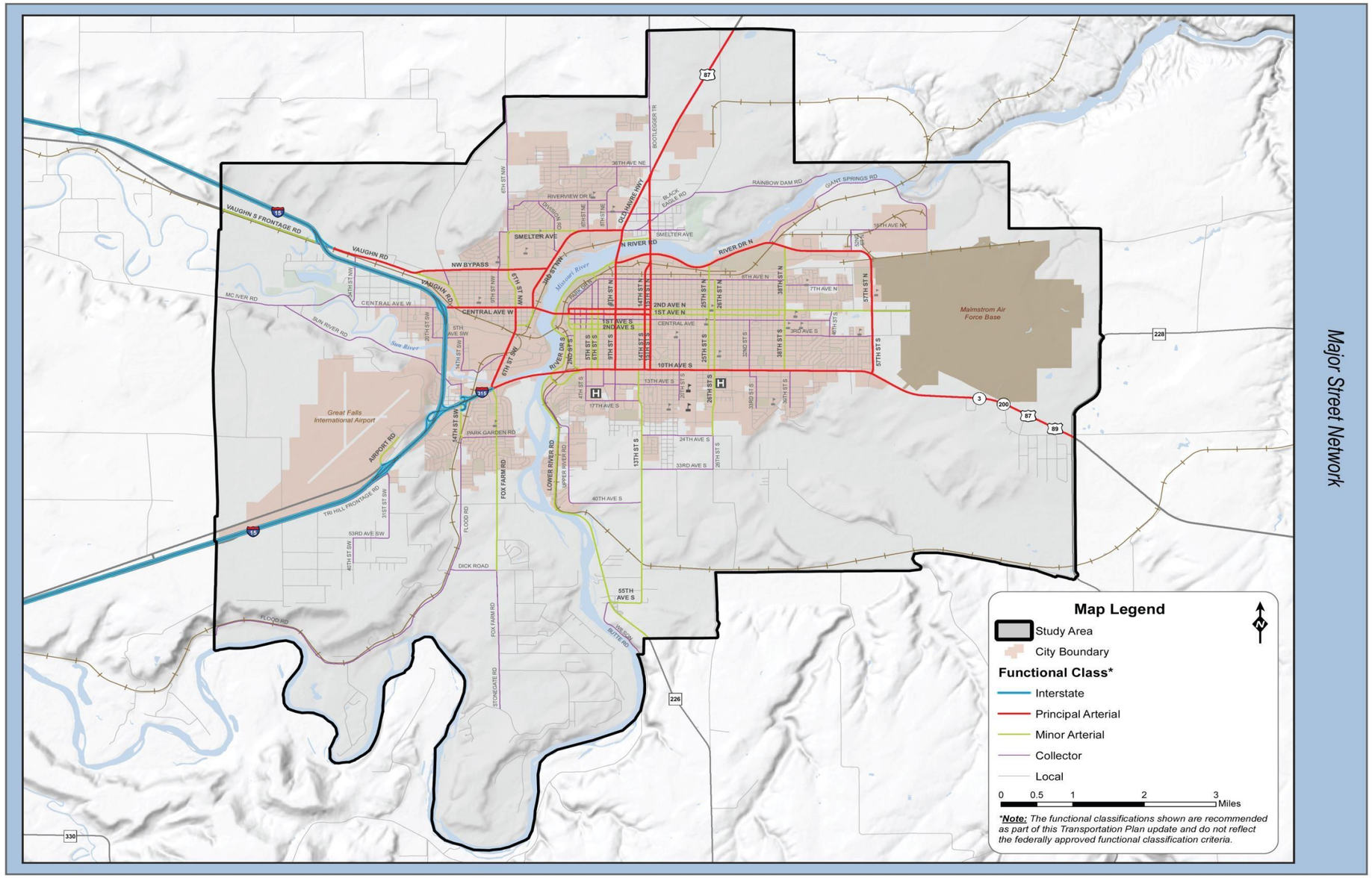


Figure 3. Major Street Network

Street Maintenance

The City maintains, sweeps and plows 307 miles of streets and 80 miles of alleys located within the City limits. The Montana Department of Transportation (MDT) maintains another 39 miles of federal aid urban (FAU) routes and interstate highway that fall under MDT's jurisdiction. The City provides maintenance on some of the FAU routes and MDT manages any projects involving FAUs where federal funding is utilized.

Street maintenance includes, but is not limited to, sprinkling, graveling, oiling, chip sealing, seal coating, overlaying, treating, general cleaning, sweeping, flushing, snow and ice removal, and leaf and debris removal.

The City is currently adequately equipped to handle large snow storms. MDT manages the snow plowing and removal from their major arterials and the City plows the remaining arterials and collectors. Local roads are not commonly plowed.

The means to add additional staff and equipment to meet the added demands for road maintenance and snow removal caused by growth depends on future City budgets.

Street - Funding/Financing Capital Improvements and Operation & Maintenance

Capital Improvements costs associated with the extension of streets and alleys to serve a new subdivision and/or development are typically financed and paid for by the Developer. If an extension of streets is not in the development boundaries to connect to the existing transportation system, or the street section or capacity needs to be upgraded (over-sizing) to serve other areas located outside the development, then the City may choose to share in the cost of the extension or over-sizing. The City's cost participation will be limited to available capital improvements funding. The Developer will be responsible for the balance of the cost not funded by the City. The Developer and City will be eligible for reimbursement of costs incurred for extending and over-sizing improvements outside a development to serve other areas and/or connect to the existing public transportation system. The recommended method of determining cost splits and responsibility is 1) to identify the actual costs for each of the improvements, 2) identify the sources and the amount of funding provided, 3) perform a traffic usage analysis that may include trip generation and vehicular loading from each benefitting area, 4) determine the sub-area and collective area demands on each capital improvement, and 5) calculate the reimbursement cost splits based on ratios of funding amounts provided from each party and a ratio of the sub-area/collective area demand contributions. Policies regarding costs and other

responsibilities for implementing capital improvements, are also found in the *Recommended Policies for Extending Services* section of this plan.

At present the City relies on State Gas Tax Apportionment, Gas Tax Special Allocation, State Entitlement and Special Assessments (Street Maintenance District, Street Lighting Districts) to fund the majority of the cost of street capital improvements and operation and maintenance services. Each parcel within the City limits is assessed for street maintenance with a cap of 12,000 square feet for residential properties and 1,000,000 square feet for commercial properties. Other funding that is received on a periodic and case by case basis includes: grants, tax increment funding, special improvement district bonding, State and Federal Transportation (State Transportation Program Urban and Congestion Mitigation Air Quality) funding.

Sanitary Sewer

The sanitary sewer system is designed to collect, convey, treat and dispose of sewage through collector, trunk, interceptor, and force mains, lift stations, and a treatment plant. These facilities presently consist of 270 miles of mains, 4,618 sewer manholes, 32 lift stations, and the wastewater treatment plant located on the northwest side of the City along the Missouri River. Together this system operates to collect and treat 3.6 billion gallons of wastewater per year. Veolia Water North America is currently under contract to operate the wastewater treatment plant and lift stations.

In 2018, the City completed an update to the *Facility Plan for Wastewater* last published in 1998. The plan states that the basic facilities of the City will provide adequate service for the next 20 years. In the plan, a one percent growth rate was applied. This rate includes a projection up through the year 2035. The capacity of the system was evaluated based on a 2035 population of 66,561. The Master Plan analysis indicates the City has adequate capacity and estimates approximate locations of future collection system mains and lift stations consistent with the transportation planning predicted growth areas. Also, capacity hinges somewhat on whether any large industrial users are added to the system. To help minimize this potential impact, the City maintains and enforces an approved industrial pretreatment program.

In 1960, the City of Great Falls constructed a primary treatment plant, located at 1600 6th Street Northeast, which included sedimentation, chlorine disinfection and anaerobic digestion for solids processing. The facility was upgraded and expanded in the mid 1970's to include secondary biological treatment, solids thickening facilities, and a heat treatment system for solids processing. In 2003, the heat treatment system was replaced by anaerobic digesters.

In 2014, work was completed to replace the plant aeration with new diffused air bioreactors and to replace the chlorine disinfection system with Ultraviolet (UV) disinfection, and add improved metering.

The City's collection system was recently extended to provide service to a new commercial development on the eastern limits of the City near 57th Street South.

In addition to the 2018 *Wastewater Facilities Plan*, the Department of Public Works maintains a Capital Improvements Plan (CIP) that projects improvements needed for the wastewater treatment plant and the sanitary sewer collection system for the next five years.

The City of Great Falls requires that new properties included in an annexation have access to Sanitary Sewer Collection as required by OCCGF Tile 17, Chapter 16, Article 7, as be amended and Tile 13, as be amended. These codes include requirements to install a City Engineer approved sanitary sewer collection system and to complete the collection system in City right of way or in easements to be provided to the City to allow for access to the new utility. The City Commission does have the ability to allow for the extension of sanitary sewer to areas that are not planned for immediate annexation under special circumstances, such as the Upper/Lower River Road area where sanitary sewer was extended to address ground water pollution caused by privately owned septic and sewage drain fields and a subsequent moratorium of permitting of new private sewage treatment systems issued by the Montana Department of Environmental Quality and local Health Department.

Sewer - Funding/Financing Capital Improvements and Operation & Maintenance

Capital Improvements costs associated with the extension of sewer mains and other wastewater facilities to serve a new subdivision and/or development are typically financed and paid for by the Developer. If an extension of sewer main or other wastewater facilities is required beyond the development boundaries in order to connect to the existing system, or the sewer main capacity needs to be upgraded (over-sizing) to serve other areas located outside the development, then it is the intent of the City to share in the cost of the extension or over-sizing. The City's cost participation will be limited to available capital improvements funding. The Developer will be responsible for the balance of the cost not funded by the City or other funding sources. Both the Developer and the City will be eligible for reimbursement from future developments for the costs associated with serving those future developments. The recommended method of determining cost splits and responsibility is 1) to identify the actual costs for each of the improvements, 2) identify the sources and the amount of funding provided,

3) perform an engineering analysis of contributing volumes and/or peak flows demands from each benefitting development area, 4) determine the sub-area and collective area demands on each capital improvement, and 5) calculate the reimbursement cost splits based on ratios of funding amounts provided from each party and a ratio of the sub-area/collective area demand contributions. Policies regarding costs and other responsibilities for implementing capital improvements, are also found in the *Recommended Policies for Extending Services* section of this plan.

At present the City relies on Enterprise Fund (Sewer) assessments to fund the cost of capital improvement and operation and maintenance of the sanitary sewer/wastewater system. Each developed parcel is assessed based on water usage and land use. Other funding sources received on a periodic and case by case basis include grants, tax increment funding, special improvement district and State Revolving Fund loans.

Storm Water

The City of Great Falls operates a storm drain utility to collect, detain, retain, treat, convey, and discharge precipitation falling on developed areas in an effort to minimize flooding and impacts to receiving water quality. The City's storm sewer system is separate from its sanitary sewer system and discharges to the Missouri River, Sun River, Sand Coulee Creek, and Whitmore Ravine.

The City's Public Works Department prepared a *Storm Drain Master Plan* in 1989 and since then there have been regional studies completed for the northwest, southwest, south central and southeast areas of town. These studies have led to millions of dollars of storm drain improvements over the last 30 years. The City maintains approximately 113 miles of public storm drains, 2,042 manholes, 3,333 inlets, and 17 detention and retention basins. The majority of the storm water improvements recently designed and constructed by the City were completed to address drainage infrastructure deficiencies within the City system. Improvements and major repair projects are guided by a five year Capital Improvements Plan. New development is assessed a stormwater fee of $250 per acre. Developers must work with the Department of Public Works to demonstrate that the area to be annexed provides adequate storm water storage and conveyance and that adjacent property owners will not be adversely impacted.

Storm Water Quality

The Great Falls urbanized area is classified as a small Municipal Separate Storm Sewer System (MS-4); therefore the City is subject to Montana Department of Environmental Quality's General Permit for Storm Water Discharges Associated with Small Municipal Separate Storm Sewer Systems Montana Pollutant Discharge Elimination System Permit (Permit). The Permit requires the City to develop and implement a program that requires development and redevelopment projects to retain or treat the first 0.5 inch of precipitation falling on the impervious surfaces of the development.

The City has identified significant liability concerns/issues with requiring developments to capture and convey stormwater from existing public right-of-way or newly established right-of-way (dedicated as part of the project or Common Plan of Development as defined in the City Storm Drain Design Manual) to private stormwater facilities. The City finds that the potential liability assumed by requiring this type of practice exceeds the "maximum extent practicable" for its MS-4 program implementation, within the intended meaning of this standard at Section 402 (p)(3)(B)(iii) of the federal Clean Water Act. The City to could be exposed to a myriad of citizen claims and lawsuits that could render the stormwater utility administratively inoperable. Therefore, the City will consider waiver requests submitted for that portion of the Water Quality Volume or Water Quality Flow from the project or Common Plan of Development originating from the right-of-way associated with newly created and dedicated City streets. The waiver request must comply with the OCCGF, Title 17, Chapter 52, as may be amended, by demonstrating the following criteria, and any other criteria deemed necessary by the Director of Public Works, are met:

- Stormwater will be conveyed to an existing regional treatment facility (RTF) that is currently owned and operated by the City. An engineering evaluation is provided demonstrating that the existing RTF has available capacity to meet the Water Quality Requirement described below for run-off from the driving surface and right of-way of the street in question. The project proposing to discharge to the RTF may be responsible to construct alterations (relative to the size of the proposed development) in order to address Water Quality Requirement; or

- Stormwater will be conveyed to a newly constructed RTF chosen at the time of development. In addition to addressing the Water Quality Requirements for the proposed development, the chosen RTF will need to be designed and sized appropriately to address the Water Quality Requirement for the undeveloped portion of MS-4 basin or sub-basin to allow for treatment capacity for future development in the same basin and/or sub-basin, as defined in the City's stormwater master plan. However, the planned

development will only need to provide payment for its share of the *stormwater quality assessment/cost* associated with the portion (relative to the size of the proposed development) of the RTF required for that specific development. The City will cover the remaining portion and receive reimbursements finances from future developments as they come along. After construction, the chosen RTF will be owned/operated and maintained by the City.

- The chosen RTF will need to be submitted to and approved by the Director of Public Works. Proposed best management practices (BMPs) must meet the Water Quality Requirement using sizing and design parameters of the *Montana Post-Construction Storm Water BMP Design Guidance Manual* (Statewide BMP Manual, available upon request). Please refer to Chapter 8 of this document for additional information on various RTFs.

The City has also identified implementation challenges that exceed the maximum extent practicable standard related to design, construction, operation and maintenance of onsite BMPs at single family, duplex and four-plex residential developments. The City has identified three feasible options by which Water Quality Requirements could be achieved for these types of residential developments. They are to (1) require each individual property owner to install pre-approved BMPs at specific locations that are reviewed and approved prior to construction as part of the Common Plan of Development, (2) to require the developer to design and construct an RTF for the Common Plan of Development that is owned, operated and maintained by the Citizenry, or (3) require the developer to design and construct an RTF for the Common Plan of Development that dedicated to the City to own, operated and maintained.

With respect to option (2) the City finds that formation of Homeowners Associations (HOA) or similar neighborhood-based entities as the only feasible approach to achieve a level of organization necessary to demonstrate compliance with a Stormwater Management Permit (SMP) permit, and to operate and maintain stormwater or, raise the funding necessary to hire skilled professionals to conduct these activities on the HOA's behalf. The City will not prohibit and does not discourage residential property owners from forming an HOA or similar neighborhood-based entities for these purposes, nor will the City prohibit or discourage individual residential property owners from installing low impact development features on their property. However, the City finds requiring option (1) or (2) to generally exceed the maximum extent practicable for the Great Falls MS-4, for reasons including but not limited to the following:

- The City is unaware of any Federal, State or Local Code that enables the City to require segments of its Citizenry to form a HOA.

- In general the average citizenry does not contain the training and technical expertise necessary to install, operate or maintain the BMPs that achieve the Water Quality Requirement.
- Such a requirement is impracticable because it dictates required land use on private property.

- Issuing and providing compliance service for a SMP to each individual private land owner as a mechanism to ensure compliance exceeds the available program resources making this option impracticable.

- The requirement would violate Clean Water Act requirement related to the right to meaningful opportunity for participation.

- In accordance with the MS-4 permit for maintenance of each individual property would fall to the City if not completed by the property owner. This demand on City resources would far outpace resource availability making this option impracticable.

Therefore, the City will consider waiver requests submitted for the Water Quality Volume or Water Quality Flow from project or Common Plan of Development comprised of individual residences, duplexes or four-plexes. The Waiver request must comply with OCCGF Title 17, Chapter 52, as may be amended, by demonstrating the following criteria, and any other criteria deemed necessary by the Director of Public Works, are met:

- Stormwater will be conveyed to a newly constructed RTF chosen at the time of development. In addition to addressing the Water Quality Requirements for the proposed development, the chosen RTF will need to be designed and sized appropriately to address the Water Quality Requirement for the undeveloped portion of MS-4 basin or sub-basin to allow for treatment capacity for future development in the same basin and/or sub-

basin, as defined in the City's stormwater master plan. However, the planned development will only need to provide payment for its share of the *stormwater quality assessment/cost* associated with the portion (relative to the size of the proposed development) of the RTF required for that specific development. The City will cover the remaining portion and receive reimbursements finances from future developments as they come along. After construction, the chosen RTF will be owned/operated and maintained by the City.

- The chosen RTF will need to be submitted to and approved by the Director of Public Works. Proposed BMPs must meet the Water Quality Requirement using sizing and design parameters of the then-current *Montana Post-Construction Storm Water BMP Design Guidance Manual* (Statewide BMP Manual, available upon request). Please refer to Chapter 8 of this document for additional information on various RTFs.

Storm Drain - Funding/Financing Capital Improvements and Operation & Maintenance

Capital Improvements costs associated with the extension of storm drains and other stormwater management facilities to serve a new subdivision and/or development are typically financed and paid for by the Developer. If an extension of storm drain or other stormwater management facilities is required beyond the development boundaries in order to connect to the existing system, or the sewer main capacity needs to be upgraded (over-sizing) to serve other areas located outside the development, then the City may choose to share in the cost of the extension or over-sizing. The City's cost participation will be limited to available capital improvements funding. The Developer will be responsible for the balance of the cost not funded by the City or other funding sources. The Developer and City may be eligible for reimbursement of costs incurred for extending and over-sizing improvements outside a development to serve other areas and or connect to the existing public system. The recommended method of determining cost splits and responsibility is 1) to identify the actual costs for each of the improvements, 2) identify the sources and the amount of funding provided, 3) perform a hydrological and hydraulic analysis of contributing volumes and/or peak flows demands from each benefitting development area and compare individual with the collective volumes and flows contributing to a particular improvement, 4) determine the development and collective area demands on each improvement, and 5) reconcile the improvement cost splits based on ratios of funding source amounts and areas demand contributions. Policies regarding costs and other responsibilities for

implementing capital improvements, are also found in the *Recommended Policies for Extending Services* section of this plan.

At present the City relies on Enterprise Fund (Storm Drain) assessments to fund the cost of capital improvement and operation and maintenance of the storm drain system. Each developed parcel is assessed based on land area and use. Residential properties served by existing storm drain facilities have a cap of 15,000 square feet while residential properties that are not served by existing facilities are capped at 1000 square feet. Other non-residential parcels are assessed on land use and total developed area. Other funding sources received on a periodic and case by case basis include grants, tax increment funding, special improvement district and State Revolving Fund loans.

Water

Potable water facilities include structures designed to collect, treat, and distribute clean water, including distribution mains, a treatment plant and storage tanks or reservoirs. The Great Falls Water Plant uses a conventional filtration system which treats and delivers an average of 4.5 billion gallons of drinking water per year. The municipal water system consists of a water treatment plant, 323 miles of water mains and three booster pump stations. The system serves approximately 64,000 customers. Single family per capita water usage was estimated at 123 gallons per day (GPD) in 2005. Per capita water usage has been decreasing due to the advent of conservation methods.

Today, raw water from the Missouri River receives modern treatment methods of coagulation, flocculation, sedimentation, filtration and disinfection before it is pumped into water distribution mains. There are seven storage facilities in the distribution system with a total capacity of over 12 million gallons.

The City's water distribution system pipes average 40 years old - the oldest in the state. This leads to the potential for more frequent water main breaks impacting the distribution system and requiring Utility Department resources to repair. Recently completed Water Plant improvements include UV disinfection to meet new regulatory standards, re-locating ammonia feed facilities for safety reasons and replacement of the aging heavy duty electrical switch gear.

The City has a *Water Master Plan* that was developed in 2006 based on a planning horizon of 2025. The report reviewed the Great Falls water treatment, storage, and distribution system. The report found that the water quality delivered to customers in Great Falls is excellent and exceeds regulatory requirements. The report identified needs over the next 20 years based on facility age,

conditions, and service areas with less than ideal pressures, vulnerability issues, regulatory and safety issues and expanded service areas. The report also recommended that the City vigorously defend its water rights on an on-going basis.

In addition to the *Water Master Plan,* the Department of Public Works maintains a Capital Improvements Plan that projects the improvements needed for the water system for the next five years. Current planned improvements include the installation of a new bulk ammonia handling system, replacing and upgrading filter media, and replacing electric switch gear at the Water Treatment Plant. In addition, water storage tank repair, removal and relocating projects are nearly complete. Also, an aggressive water main replacement program has been ongoing for 25 years and will continue to replace the most vulnerable components of the City's aging distribution system. Future distribution system projects also include adding river crossing locations to provide additional supply to and/or redundancy of the north and west sides of the Missouri River.

The onsite Water Testing Lab routinely tests for contaminants in the water, as required by Federal and State laws. A Water Quality - Consumer Confidence Report is created annually from the previous year's analysis data and is distributed to water system users. The City is currently constructing facility improvements to continue to supply clean safe water while upgrading the treatment plant to meet the recent addition of regulation requirements.

The City of Great Falls requires that potable water service be provided to each property in association with the annexation to meet the requirements of OCCGF Title 17, Chapter 16, as may be amended. Fire hydrants providing the adequate flows necessary for the associated land use are required to be included as part of the water system.

Water - Funding/Financing Capital Improvements and Operation & Maintenance

Capital Improvements costs associated with the extension of water mains and other facilities to serve a new subdivision and/or development are typically financed and paid for by the Developer. If an extension of a water main or other water facilities is required beyond the development boundaries to connect to the existing system, or the water main capacity needs to be increased (over-sizing) to serve other areas located outside the development, then the City may choose to share in the cost of the extension and/or over-sizing. The City's cost participation will be limited to available capital improvements funding. The Developer will be responsible for the balance of the cost not funded by the City. Both the Developer and the City will be eligible for

reimbursement from future developments for the costs associated with serving those future developments. The recommended method of determining cost splits and responsibility is: 1) to identify the actual costs for each of the improvements, 2) identify the sources and the amount of funding provided, 3) perform an engineering analysis of contributing peak demands (flow) from each benefitting area, 4) determine the sub-areas and collective area benefitting each improvement segment or component, and 5) calculate the reimbursement cost splits based on ratios of funding amounts provided from each party and the sub-area and collective area demand amounts. Policies regarding costs and other responsibilities for implementing capital improvements, are also found in the *Recommended Policies for Extending Services* section of this plan.

At present the City relies on Enterprise Fund (Water) assessments to fund the cost of capital improvement and operation and maintenance of the water distribution and treatment system. Each developed parcel is billed based on water usage and land use. Other funding sources which are received on a periodic and case by case basis include grants, tax increment funding, special improvement district and State Revolving Fund loans.

Solid Waste Management

The Sanitation Division is responsible for the collection and transportation of solid waste from approximately 15,700 residential and 1,200 commercial customers to approved disposal sites. Nearly 40,000 tons of solid waste are collected and disposed of annually. The City of Great Falls has a long-term contract with Montana Waste Systems, Inc. (Republic Services) for solid waste disposal. The High Plains Landfill is located 10.5 miles north of Great Falls on Havre Highway. For commercial and residential customers, there is a fee at the landfill. Montana Waste Systems, Inc. also provides sanitation services for residential and commercial customers in Great Falls. The capacity of the permitted and licensed portion of the landfill is estimated to be sufficient for the life of the planning horizon and beyond.

The means to add additional staff and equipment to meet the added demands of additional services areas and customers caused by growth depends on future City budgets.

Solid Waste Management - Funding/Financing Capital Improvements and Operation & Maintenance

Currently, the City utilizes a privately owned landfill for disposal of solid waste. Land has been purchased for a future landfill and composing site; however capital improvements are limited to

storage facilities at the Public Works Complex. Typically, any solid waste receptacle storage facilities associated with a multi-family, commercial or industrial development are privately owned and financed.

At present the City relies on Enterprise Fund (Sanitation) assessments to fund the cost of a limited capital improvement and operation and maintenance of the solid waste equipment and storage buildings. Each City customer is billed based on residential or commercial classification and the size of the receptacle.

Fire and Emergency Services Protection

The City of Great Falls provides fire and Emergency Management Service (EMS) services to land and real and personal property located within the City limits, along with 16 County Contracted Fire Districts." The City receives payment through a series of agreements for these contracted services. The City of Great Falls Fire Rescue (GFFR) has 65 uniformed firefighters with 60 assigned to four shifts (15 per shift). The Fire Chief along with other administrative personnel are primarily responsible for Emergency Management.

The City has four frontline apparatuses in four Fire Stations (see Figure 4). Three Engine Companies and one Ladder Company are staffed 24 hours a day, seven days a week. The other apparatus options are reserves and not staffed. They are brought into service when one of the frontline apparatus needs repair or when firefighters are called for large incidents.

The Insurance Service Office (ISO), an independent entity, recently upgraded the City's Public Protection Classification (PPC) from 4 to 2. The City's PPC has improved due to staffing levels. These ratings can influence what a homeowner pays for insurance, especially in locations that are more challenging to serve.

GFFR also conducts safety inspections of each business in Great Falls, maintains fire hydrants, maintains equipment and buildings and offers educational outreach, extinguisher classes and tours of the fire stations.

In addition to impacts created by the geographic spread of the City, the existence of County enclaves that are located within the City limits further challenges GFFR at this time. The update to the City's Growth Policy is emphasizing infill and redevelopment to lessen the potential impacts of geographic expansion on public services until a plan is developed to address long term fire services. This need becomes even more important considering that the last fire station built in Great Falls was in 1969.

In the future, the GFFR anticipates being impacted by increased environmental regulatory measures and expanded roles to contain and possibly cleanup HAZMAT accidents as well as an increase in the number of non-emergent calls related to social support needs. Figure 4 below, depicts the City's fire districts and the type of responses reported for 2012.

Currently, hydrant locations in the city could be considered adequate in most areas. Proposed annexations will require additional hydrants and an improved water delivery system including mains to provide adequate fire flows.

Additional paid firefighting personnel may be required for future growth, not totally contingent upon annexations but by the increased growth, development, and increased emergency calls in both the city and rural areas.

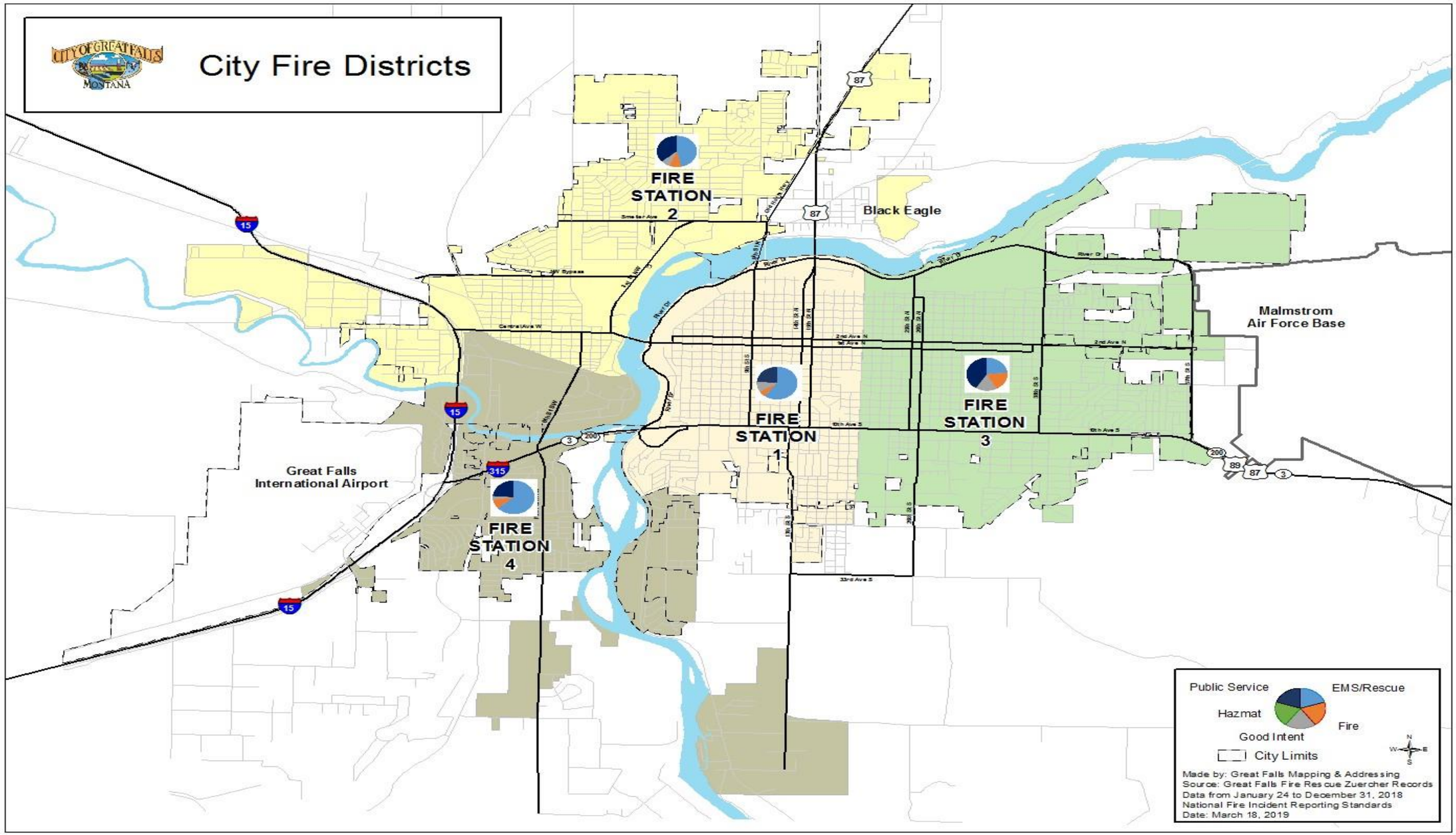


Figure 4. City Fire Districts

Law Enforcement

The City's Police Department consists of five bureaus. These are the Patrol, Investigative Services, Support, Records and Communications Bureaus. The Patrol Services Bureau consists of day to day patrol operations referred to as the backbone of the police department. Patrol officers are the front line for community services and traffic enforcement. The Investigative Services Bureau encompasses the Detective Division, Property and Evidence and the department's crime lab. This Bureau provides specialized services, general case investigations, sex crime and registration, drugs, street crimes, school resource detectives and the Safe Street Task Force. The Support Services Bureau includes community oriented policing, education, crime prevention, training, and process servicing. In addition, the police manage animal control and dispatch. The Records Bureau ensures that police reports are properly coded and entered into the records management system. Records also include the evidence custodians and technicians. The Communications Bureau handles 911 calls and dispatch personnel.

In 2019 the Great Falls Police Department had a staff of 122, of which 83 were police officers. The Montana average for staffing per 1000 residents is 1.91. In the City of Great Falls the ratio is at 1.43 officers per 1000 residents.

The Police Department also is impacted by expanding geographic boundaries, the City's irregular boundaries, unfunded State mandates, and the impacts of regional growth such as those from oil and gas development. As a result, the Police Department is increasingly using innovative methods and community outreach to maintain its level of service.

Parks and Recreation

The City's Park and Recreation Department has 66 parks (915 acres), 57 of which are developed (775 acres). Overall, the Department is responsible for maintaining and improving more than 75 properties and 1,718 acres of land, including pocket parks, the two golf courses, the Recreation Center, roadway medians, and the River's Edge Trail (see Figure 5). The Department also oversees the 36,000 trees on public land. These activities are guided by the City's *Comprehensive Park and Recreation Master Plan (2016)*. The City's Park and Recreation Department also offers active, organized and structured recreational programs for adults and children including basketball, softball, soccer, golf, skating, swimming and volleyball, as well as special events.

City parks, trails and natural assets were recognized and highly touted during the public outreach process. Parks can also make a positive contribution to the desirability of a neighborhood, through the amenities, aesthetics and the community-building opportunities they create. In addition, local parks can add value to homes nearby. A recent study showed that in the United

States homes near parks sold for $2,262 dollars more than homes without access to parks nearby. Parks and open space also enhance the environmental ambiance of the City.

Other recreational amenities exist in the City such as those provided by the Great Falls Public School system, Malmstrom Air Force Base, Centene Stadium, the University of Providence, the State of Montana, and private entities. The City oftentimes partners and has cooperative arrangements with these other recreational providers and together they contribute to the needs of the community in this regard.

The City evaluates potential new user impacts to existing park facilities located within the City during every new residential development that requires annexation into the City of Great Falls. When annexation proposals are submitted for review that involve either single family or multifamily development, staff works with the applicant to determine whether such a development will either provide new park space to potentially be taken over by the City Park and Recreation Department, or, conversely, whether a "park in-lieu" fee will be assessed and collected upon annexation. This process is spelled out in both Montana Code Annotated and the City's Land Development Code.

Because the City owns a significant inventory of park property, but is emphasizing the maintenance and enhancement of existing parks rather than new land acquisition, the City's common approach during the annexation process is to require a park in-lieu of fee to be paid by residential developers. To also assist the City Park and Recreation Department with maintenance and enhancement of existing facilities, the City adopted its first ever Parks District. In May 2018 voters supported the creation of Great Falls Park District Number 1 with an assessment amount of $1.5 million annually for the first three years to address over $12.6 million in deferred maintenance and other operational needs."

To conclude, the *Comprehensive Park and Recreation Master Plan* states that input from the community revealed that the Great Falls parks and recreation system has a physical operational presence in the community. Participants also see the system has operational presence in the community. Participants also see the system as one that is well maintained with great staff. They also enjoy the numerous programs and amenities. Unmet needs exist, however, as the demand for select services its currently outweighing the available facilities and/or amenities.

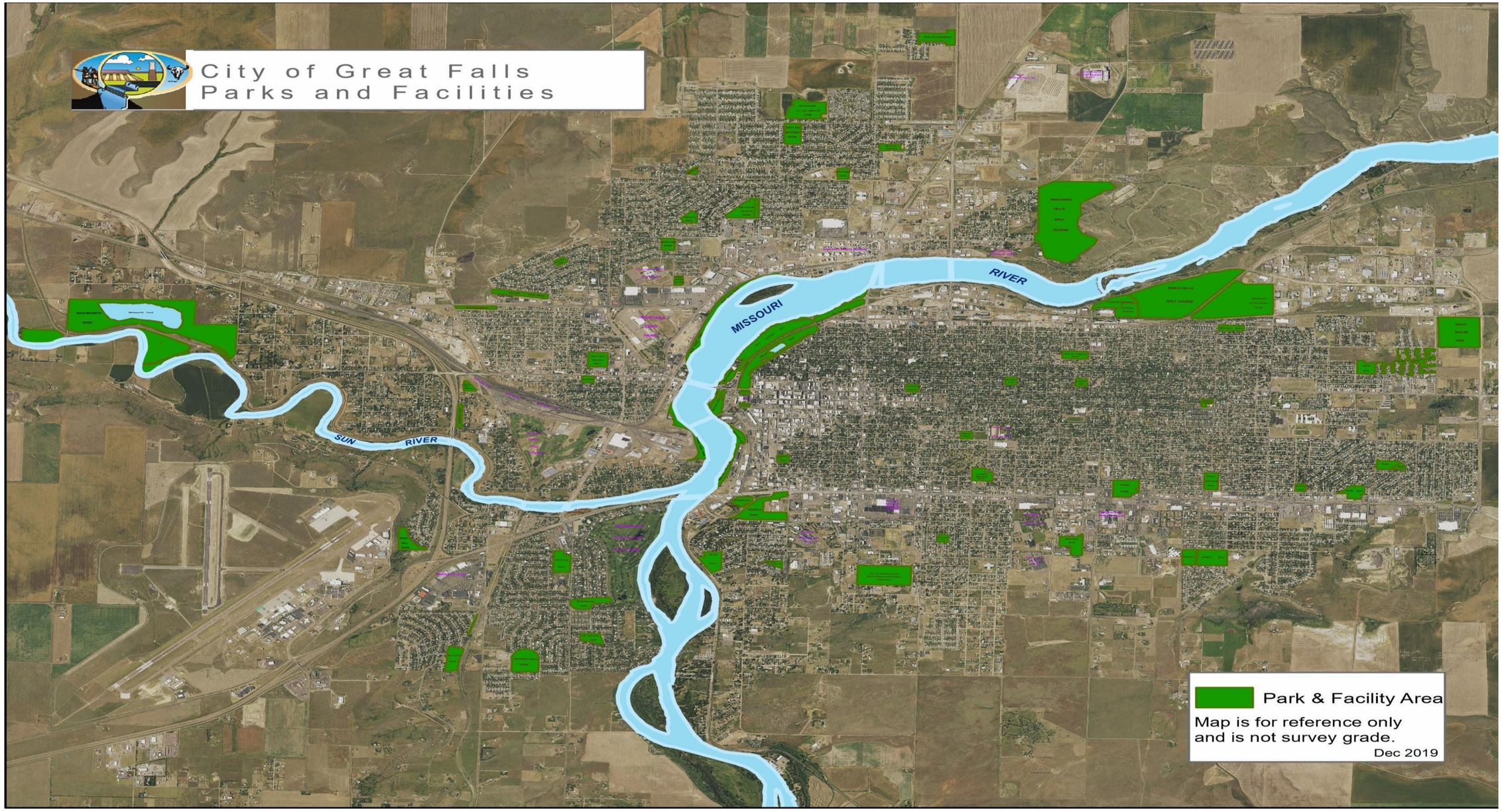


Figure 5. City Parks, Golf Courses, Recreation Facilities

Recommended Policies for Extending Services

General Policies

Developers must become familiar with the current City Development and Engineering requirements, and incorporate them into the design. The following general policies shall be pursued for all properties proposed to be developed within the City of Great Falls ("City") limits or with annexation into the City:

1. It is the responsibility of the developer or property owner to construct improvements or infrastructure in accordance to the Extension of Services Plans contained herein as well as the *Subdivision Requirements of the City of Great Falls* and the *Engineering Standards for Design and Construction.* The infrastructure improvements will be of adequate size and design to accommodate the needs of the proposed development. **Improvements shall include:**

    - City right of way necessary to properly convey City streets and utilities.
    - The streets including curb and gutter and sidewalk.
    - The potable water system including storage and distribution pipe and associated appurtenances.
    - The potable water system design shall also take into consideration the fire protection requirements and appurtenances necessary to properly protect the associated land use.
    - The sanitary sewer collection system including lift stations, pretreatment requirements (oil water separators, and grease traps) and collection system piping and appurtenances.
    - The storm water drainage systems including curb and gutter, culverts, inlets, drainage pipe and associated appurtenances, detention and retention ponds, Low Impact Development (LID) tools, and any other treatment technologies.

    If a development creates impacts requiring off-site improvements, the City Commission will determine whether the developer shall wholly or partially bear the costs of such improvements.

2. The developer or property owner will be responsible for providing fire protection appurtenances and required water flows and pressures, to the satisfaction of the City Fire Chief, based on the use of land and the type of construction employed.

3. Water systems and sewer systems will be designed in such a manner as to avoid the provision of booster pumps or lift stations if feasible. All proposed booster pump stations and lift stations shall receive the approval of the City Engineer.

4. Before a development beyond City limits can connect to a City-owned utility, an Agreement for Annexation and City Water/Sewer Services form will be properly filed with the City Attorney.

5. Prior to receiving services, the developer or property owner annexing must initiate and secure a rezone to appropriate City of Great Falls zoning when necessary. If the City initiates an annexation, it will assume responsibility for needed zoning map amendments.

While all of the above mentioned items may not be required for each property, the Developer should review existing engineering and development studies and plans associated with the greater area surrounding the development to determine if any of these systems will need to be designed to provide future capacity outside of the development that is being considered. In the event that the developer is required to provide for additional capacity for any of these items, the City will determine if the developer is not wholly responsible for the improvements and participate in the funding of the associated work.

6. To connect to City utilities and to receive City services including fire protection and emergency services, garbage removal, and police protection, the Developer must first comply with the Annexation by Petition requirements of OCCGF Title 17, Chapter 16, Article 7, as may be amended. These code requirements set up the procedures for official application and review of developments. If a property completes the application and review process and is approved for annexation, the City Commission shall adopt a resolution officially annexing the subject property. The property owner shall be responsible for complying with any conditions that may have been included with the approval. This section of the City code is available at https://library.municode.com/mt/great_falls_/codes/code_of_ordinances.

Policies for Extension of Services to Undeveloped Areas

Each development should be considered an integral part of the comprehensive services plan of the City. Therefore, the following general policies for extension of services to undeveloped areas should be observed:

1. Any subdivision or development of property within the identified growth area will be designed in accordance with the current edition of the City's "Engineering Standards".

2. Any subdivision or development of land beyond the Great Falls City limits, but within the urban growth boundary, will be reviewed and commented upon by the City's Development Review officials and staff. Planned development that lies within the City's anticipated growth areas, and is currently undeveloped will be designed to meet the most recent City Development and Engineering requirements. Meeting these standard requirements will allow the City to properly extend services to the new residences or businesses as efficiently as possible, whether the developed area is annexed into the City immediately or at a later date.

3. If the property to be developed lies outside of the City's anticipated growth, and there are impacts to the City, the City may recommend to the Cascade County Commission that the development be reviewed with respect to certain impacted service plans contained in this Plan.

4. Where construction of a sewerage system is being considered, the future drainage basin of the system will be identified, and facilities sized accordingly. The cost and construction of all sewerage systems are the responsibility of the developer and/or property owner. Under certain circumstances, the City Commission will determine whether the City will participate in financing the over-sizing of infrastructure.

5. It is the responsibility of the developer or property owner to have designed and constructed water mains and lines of adequate size to provide the required flows for the intended land use and fire protection.

6. It is the responsibility of the developer or property owner to provide all required infrastructure improvements, as well as rights-of-way and easements.

7. Construction of any dwelling which is not equipped with adequate facilities for the sanitary disposal of sewage is a violation of the Cascade County Regulations for Onsite Sewage Treatment Systems. If an approved publicly owned sewage collection and treatment system is readily available within 200 feet of the property line, the County will not issue a septic permit and the property owner must connect to the public system. A connection is not readily available if the cost of the connection, as determined by the County, is greater than three times the cost to install an onsite wastewater treatment system.

8. The City's standard permit and connection and other fees to connect to the public sewage or water system will apply for connections outside the City limits. Fees for inspection of existing water and sewer facilities may also result in additional costs to the property owner associated with ensuring compliance state and local plumbing and engineering codes and standards.

9. With respect to the extension of utilities through undeveloped and areas outside the City, the development designs will take into consideration the whole contributing drainage basin with respect to storm water and sanitary sewer collection and any applicable plans for streets and water distribution. If there is a need for over-sizing infrastructure for future development, the City will determine if it can participate in the funding of the cost of improvements. In some instances, conditioned upon benefit to the City and available funding, it is the intent of the City to participate in the development of the public infrastructure and seek to reimbursement of the associated costs at the time that infrastructure becomes of benefit or service to others.

10. With respect to the annexation and/or subdivisions, the applicant will submit adequate development information for the City to verify the ability of the City to provide adequate services and facilities to meet the municipal needs of the subdivision. Prior to making the municipal service(s) available to a new development area located outside the City, the following information (if applicable) will be required of the developer:

    - Storm drainage volumes and peak flows (development and offsite run-on contributions).
    - Stormwater treatment method and plan.
    - Water demands from new development.
    - Fire flow demands.
    - Wastewater peak discharge flow and total volume.
    - Characterization of wastewater constituents.
    - Solid waste generation.
    - Characterization of solid waste constituents.
    - Traffic volumes and types.
    - Building(s) size, materials, layout.
    - Preliminary layout of the proposed public infrastructure extensions.

Policies for Services in Existing Developed Areas

Planned development that is considered infill within the City's existing service area and already has access to utilities and facilities will be required to review the condition of the water, sewer, and storm utilities serving the development, as well as the current rights-of-way, streets, curb and gutter, and sidewalk. Before the development is allowed to receive City services and connect to City water and sewer, the above mentioned utilities and facilities must be improved to meet City Standards. In such situations, the following policies shall apply:

1. Prior to making the municipal service(s) available to an existing developed area within the service area, the following information is required of the developer:

    - Approximate year or period in which the existing area was developed.
    - Location, size and condition of existing water lines or systems.
    - Location and condition of the existing sewer system, including the size, material and grades of all pipes.
    - Size, location and legal purpose of all existing rights-of-way and easements.
    - Surface type, condition and width of all roadways.
    - Storm drainage volumes and peak flows (from development and offsite run-on contributions).
    - Stormwater treatment method and plan for new development.
    - Water demands from new development.
    - Fire flow demands.
    - Wastewater peak discharge flow and total volume.
    - Characterization of wastewater constituents.
    - Solid waste generation.
    - Characterization of solid waste constituents.
    - Traffic volumes and types.
    - Building(s) size, materials, layout.
    - Preliminary layout of the proposed public infrastructure extensions.

    The information will also include the estimated costs associated with correcting the deficiencies and bringing the utility or improvement to City standards. The City may require such a report to be prepared by a professional engineer, with the cost of the report borne by the developer or property owner.

2. If the property is to be annexed, the City's annexation ordinance or resolution will specifically state the method and time frame for bringing the existing conditions into compliance with City standards and will identify the parties responsible for the improvements.

3. If City services are to be extended without concurrent annexation, the property owner will sign an Agreement for Annexation and City Sewer/Water Service. The agreement shall be recorded with the County Clerk and Recorder's Office. The property owner will also sign, and the City will record, a waiver of the right to protest and appeal participation in and the formation of any special improvement district that may be formed to improve the existing services, utilities, streets or other improvements.

4. In some locations there may be utilities and facilities that were installed previously that will benefit the planned development, but would require that the current developer reimburse the City for a portion of the cost of the existing utilities.

Policies for Areas Annexed as Wholly Surrounded Land (M.C.A. 7-2-4501 *et seq*)

Properties that are wholly surrounded by the City generally have been receiving City services such as police and fire and emergency services protection, access to parks and recreation facilities, and road maintenance (roads leading to property and those throughout the City that homeowners use frequently) for no cost. Once annexed, access to those services continues. Payment for these services is shared by all City taxpayers. Extension of sewer and water infrastructure and connection to City service will be at the expense of the homeowners, though the cost of maintaining sewer and water facilities, once constructed, is shared by all City taxpayers. A homeowner may continue to rely on private wells and septic sewage systems after annexation and will not be required to connect to City water and sewer services until such time as the septic sewage systems or private wells require expansion, upgrading, or replacement.

Policies for Meeting the Costs of Services

1. For the purpose of setting aside adequate funds to replace components of the physical infrastructure, the following shall be considered as the estimated service life of each of the components:

Structures	50 Years
Pipelines:	
- Concrete	100 Years
- Ductile/Cast Iron	50 Years
- PVC/Polyethylene	100 Years

Stationary Equipment 15 Years
(Motors, pumps, conveyors, etc.)

Asphalt Pavement Streets:

- Local Streets 20 Years
- Collector Streets 20 Years
- Arterial Streets 20 Years

The amount to be set aside each year for the replacement of municipal infrastructure components shall be the cost of construction, if new, or the total estimated replacement cost divided by the remaining number of years of the life of the component.

2. It is the responsibility of the developer or property owner to extend all roadways and utilities from the existing City facilities to the site of development in accordance with all City standards and specifications and provide appropriate easements. Furthermore, it is the responsibility of the developer or property owner to construct all streets and utilities to the furthest boundary of the property to be developed in order to facilitate future development.

3. The ability of the City to increase existing utility line capacities to meet the demands of growth is dependent upon the availability of funding. If the City's ability to finance the necessary enlargement or over-sizing cannot keep pace with development, or if the improvements schedule does not mesh with that of the developer, it is the responsibility of the developer to finance and construct City-approved alterations to the existing infrastructure sufficient to accommodate the development. In the event of this occurrence, it is the intent of the City to reimburse the developer for the cost of enlargement or over-sizing conditioned upon available City utility funding. Said reimbursement shall not exceed the cost, including interest, of the improvements to the existing City system.

4. If the developer bears the costs of extending services and/or utilities, the developer will, with the approval of the City, enter into an "Annexation, Development and/or Improvement Agreement" with the City. The Agreement, shall include a provision for developer reimbursement for that portion of the construction cost that benefits the adjoining properties and/or is in excess of the minimum standard. Cost apportionment for reimbursements may be based on lot area, front footage, or any other equitable means. The Agreement may include a list of those properties which will benefit from the extension, a map outlining and designating properties, legal descriptions of properties,

backup data supporting both the costs submitted and cost apportionment, and other terms of the Agreement(s). The developer is responsible for initiating, executing, and, after City approval, filing the Agreement(s) and providing the City with a copy of the recorded Agreement(s). A proposed Agreement(s) must be submitted and approved by City staff prior to action by the governing body (presently the City Commission). Acceptance of the public improvements by the City shall occur once the design Engineer has certified to the City that the facilities are complete and installed in substantial compliance with the approved plans and specifications. Approval of the Agreement(s) are at the City's sole discretion. The City will exercise good faith efforts to collect, but is not required to enforce collection of, reimbursements from other developments wanting to connect to the utility extension(s) or street improvements.

5. Because the developer has extended public infrastructure and has borne construction costs that benefits other properties, the owners of the benefitted properties shall pay the extender a pro-rata share of the extension costs, including design and inspection fees. The pro-rata share may be based on lot area, front footage, or other means agreeable to both the City and the developer which is equitable to both parties as well as future customers.

6. If the City requires the customer or developer extending a sewer or water line to install a larger size than that required by City standards for a particular project, the City will determine whether the City will participate in financing the over-sizing of infrastructure.

7. The City reserves the right to further extend sewer or water mains installed by the preceding developer or property owner without paying compensation. The City also reserves the right to charge future sewer or water utility users beyond those areas identified in the Agreement(s), if applicable, for their pro-rated share of the City's cost for the over-sizing of the line. This in no way shall diminish the preceding developer's right to collect reimbursements for capital improvements installed as part of the Agreement(s).

8. Financing the construction of new streets in a proposed development, or the upgrading of streets in an existing developed area, will be accomplished in one, or a combination of, the following methods:

9.

    a. The developer will provide all necessary right-of-way, or additional right-of-way if less than adequate right-of-way exists.

b. The developer will bear the cost of constructing all improvements within the right-of-way in accord with this Plan, the City's Standards for Design and Construction, and the City of Great Falls Land Development Code.

c. Through the formation of a Special Improvement District (S.I.D.).

d. Federal or State grant funds.

e. State Fuel Tax monies.

10. Connection and user fees for properties located outside the City limits for sewer and water services will be charged in accordance with rates, charges and tariffs adopted by ordinance or resolution by the City Commission.

11. As new City streets are constructed, and as existing streets are improved, storm drainage infrastructure will be installed or improved to City standards. It is the responsibility of the developer to convey storm water from their property to an appropriate point of disposal. The quantity and rate of runoff from a developed parcel cannot exceed City design standards and requirements set established by ordinance.

12. For the purposes of fire, police, and all general government services, the tax burden for these services will be shared by all taxpayers in the Great Falls Fire Service District.

APPENDIX A – Examples of Cost Responsibilities for Extension of Public Improvements

Municipal Code References

It is the policy of the City of Great Falls to consider financial reimbursement for the cost of up-sizing and/or enlarging utility and roadway improvements to the developer who initially covers the cost of new infrastructure installations. **In some cases, the developer will also be eligible for reimbursement from third parties due to past Annexation, Improvement or other Agreements at the time of future annexations. The City may also be eligible for reimbursement for costs the City paid for new infrastructure.**

The City may require the developer to install infrastructure that is larger than is needed to serve the immediate development, in order to serve broader areas. In this case, the developer may be eligible to be reimbursed for the differential costs of installing the larger mains, street sections, etc.

Various methods will be used to determine how reimbursements are calculated. The following are examples of how this may be done.

Example 1: A new subdivision can be adequately served by an 8-inch diameter water main, which is the minimum size main allowed in the system. However, in order to serve future subdivisions, a 12-inch main will be required. Conditioned upon available City funding, the City will pay the developer the difference in cost between an 8-inch and a 12-inch main, as well as the difference in costs for valves, fittings, and other items installed. It is preferred that prices received during the bidding of the project be used to calculate the cost difference. However, if bid prices are not available or if in the City's judgement the prices received in the bid are not realistic, the City will use material prices with a modest markup or prices received for similar projects as a basis for calculating reimbursable costs.

Reimbursement for upsizing must not include consultant costs paid by the developer or any portion of inspection or other fees charged by the City.

Note: The minimum size pipe normally required may not be adequate to serve a particular development. For example, in areas where water pressure is low or for land uses where fire flow demand is high, and it as necessary to install a 12-inch water main in order to provide adequate fire flows. The City would not reimburse for the difference in cost between an 8-inch and a 12-

inch main. However, if the City required that a 16-inch main be installed, the City would reimburse the difference in cost between a 12-inch and a 16-inch main.

Example 2: A new development can be adequately served by a residential classification street, which is 35 feet wide with a standard section thickness of 9-inches of gravel and 3-inches of asphalt pavement. However, in order to serve other existing and future subdivisions, a collector classification roadway with a width of 45 feet and a section thickness of 12-inches of gravel and 4-inches of asphalt pavement is required. Conditioned upon available City funding, the City will reimburse the developer for the difference in cost between constructing a 35 and 45 foot wide roadway and the additional section thickness between 12 and 16 inches the entire width (45 feet) of the roadway. Should poor subgrade soils be encountered within the new subdivision that would have required a thicker roadway section, the developer is responsible for the cost of the additional thickness over the 35 feet width. Should the subdivision require a higher capacity street width and depth and traffic devices, the developer is responsible for the full cost of that higher capacity.

Example 3: A new development can be adequately served by an 8-inch sewer main but future contributory flows from the upper portion the basin or master plan area require the main size be increased to 12-inch to handle additional future flows. Also, the new development needs to extend the main downstream of the new development to connect to the existing public system. Conditioned upon available City funding, the City will reimburse the developer for the cost difference between an 8-inch and 12-inch main installation both inside and outside the development. The developer will be responsible the cost of the 8-inch main inside and outside of the new development.

Example 4: A new development requires a new public wastewater lift station to serve the development. In this case, the lift station must be located in accordance with any City Wastewater Master Plans to serve other possible future development areas. Providing funding availability, the City will be responsible for the prorated share of the cost to equip the station to serve future development areas. In the absence of City funding, the new development will be responsible of equipping the station for future capacity upgrades. Lift stations that only serve the needs of the new subdivision and have pumping capacities of less than 100 gpm will not generally be approved to as part of the City or public system.

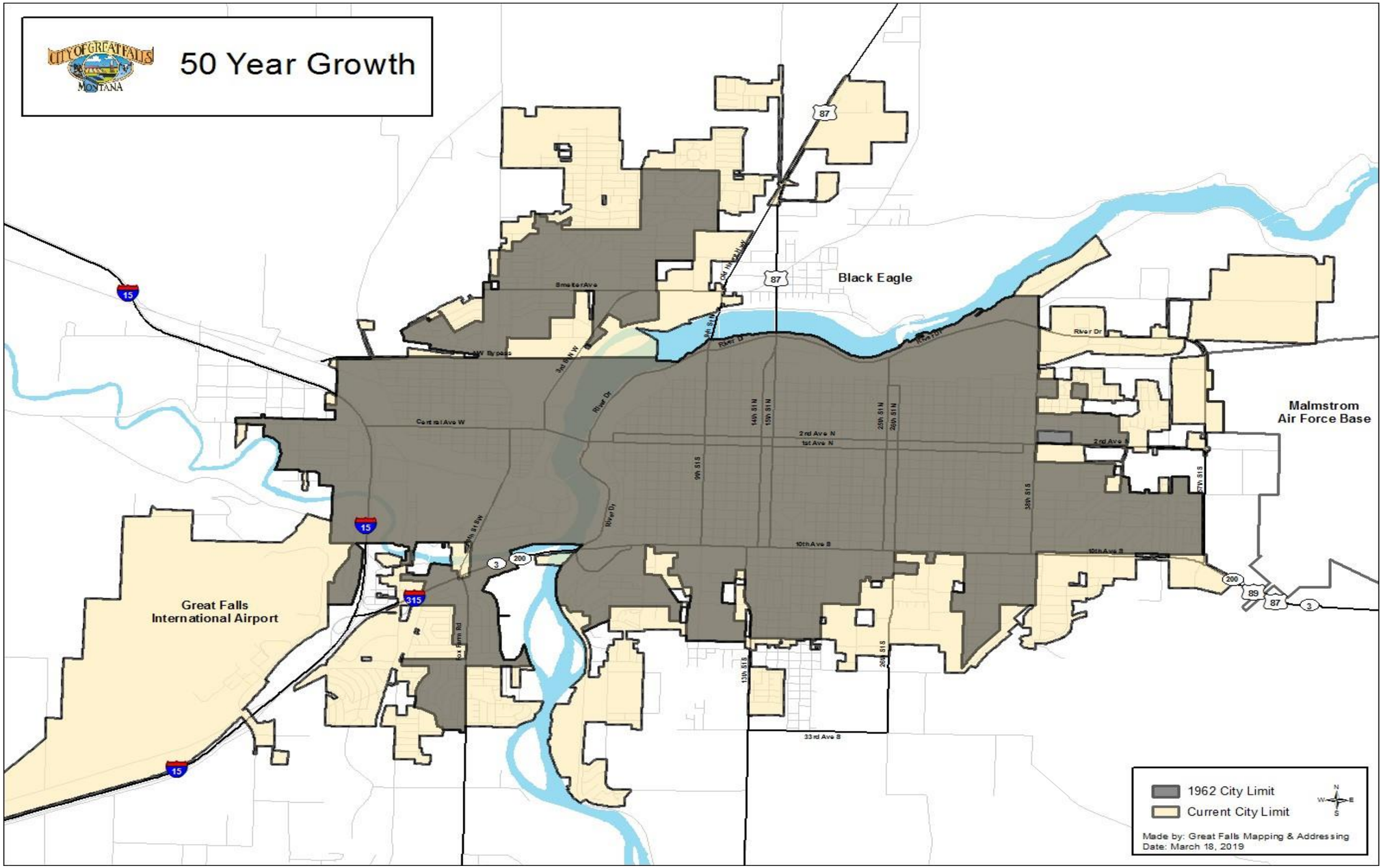
Example 5: A new development can be adequately served by an 18-inch storm drain pipe and 4 standard curb inlets, however, off site runoff from the upstream drainage basin (run-on) requires that the pipe size be increased to 24-inch and that 2 additional inlets be installed within the new subdivision to increase capacity to handle the run-on flow. Conditioned upon available funding,

the City will reimburse the developer the difference in cost between an 18-inch and 24-inch storm drain and for the two additional inlets.

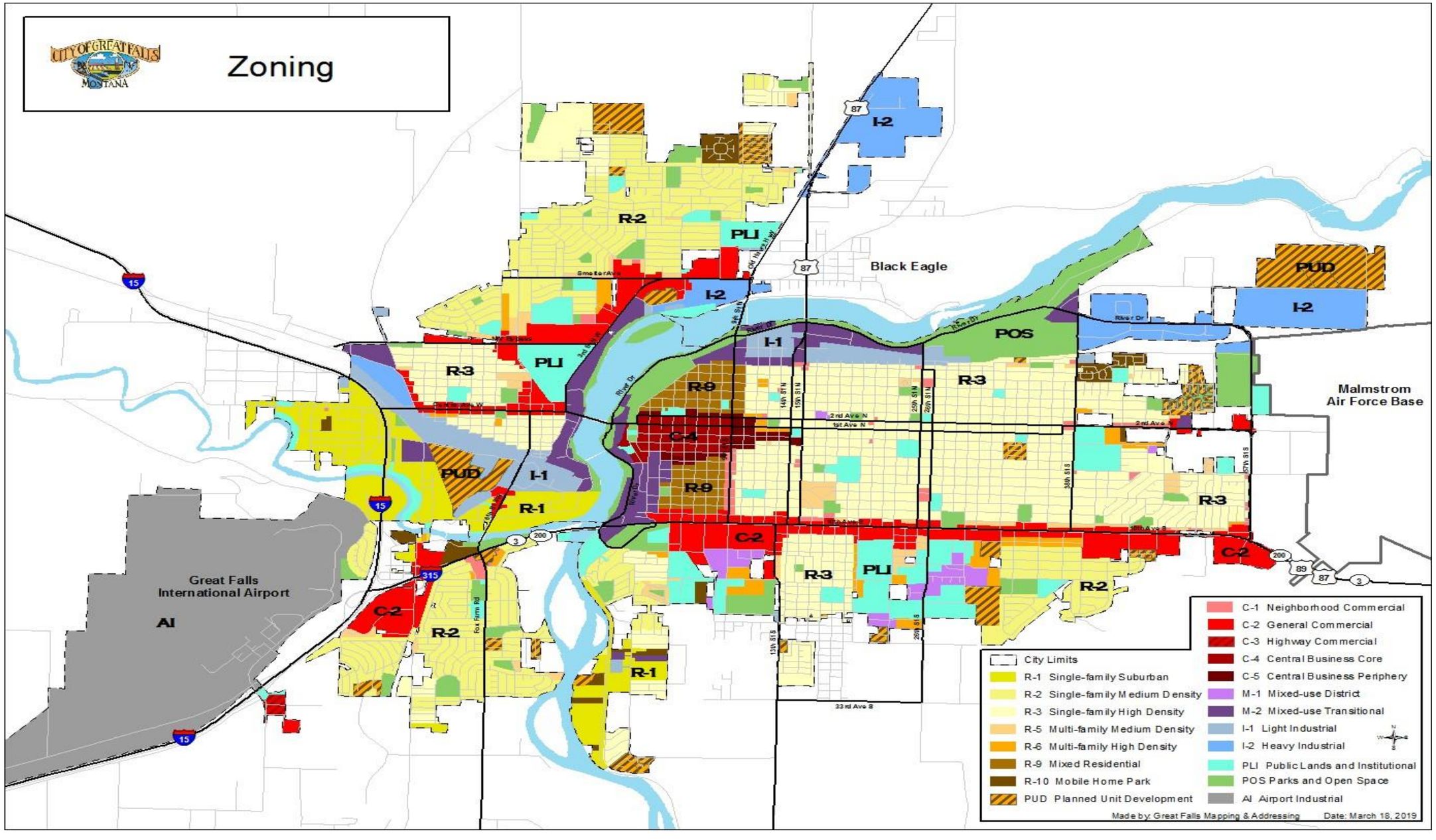
Example 6: A new residential development subdivision contributes to a previously constructed and paid for regional public storm water management facility (ponds and wetlands) which serves a drainage basin with multiple developments all having residential zoning. The new subdivision will be responsible for reimbursing a prorated share (based on land area) of the total cost of designing and constructing the facility. Reimbursement would go to the parties whom initially fronted the cost of the facility. Should the facility capacity and size need to be increased to handle the runoff from the new development, the new development will be responsible for that portion of the cost associated with increasing the size and capacity.

Example 7: A new multi family, commercial or industrial development requires both runoff control and stormwater quality management in accordance with City Code and Permitting; and requires facilities to provide that management; and no existing regional public facilities exist to provide that management. The new development must then provide privately owned, maintained and operated facilities to serve the needs of the new development under an agreement with the City. The new development is responsible for the full cost of locating, designing and constructing such private facilities.

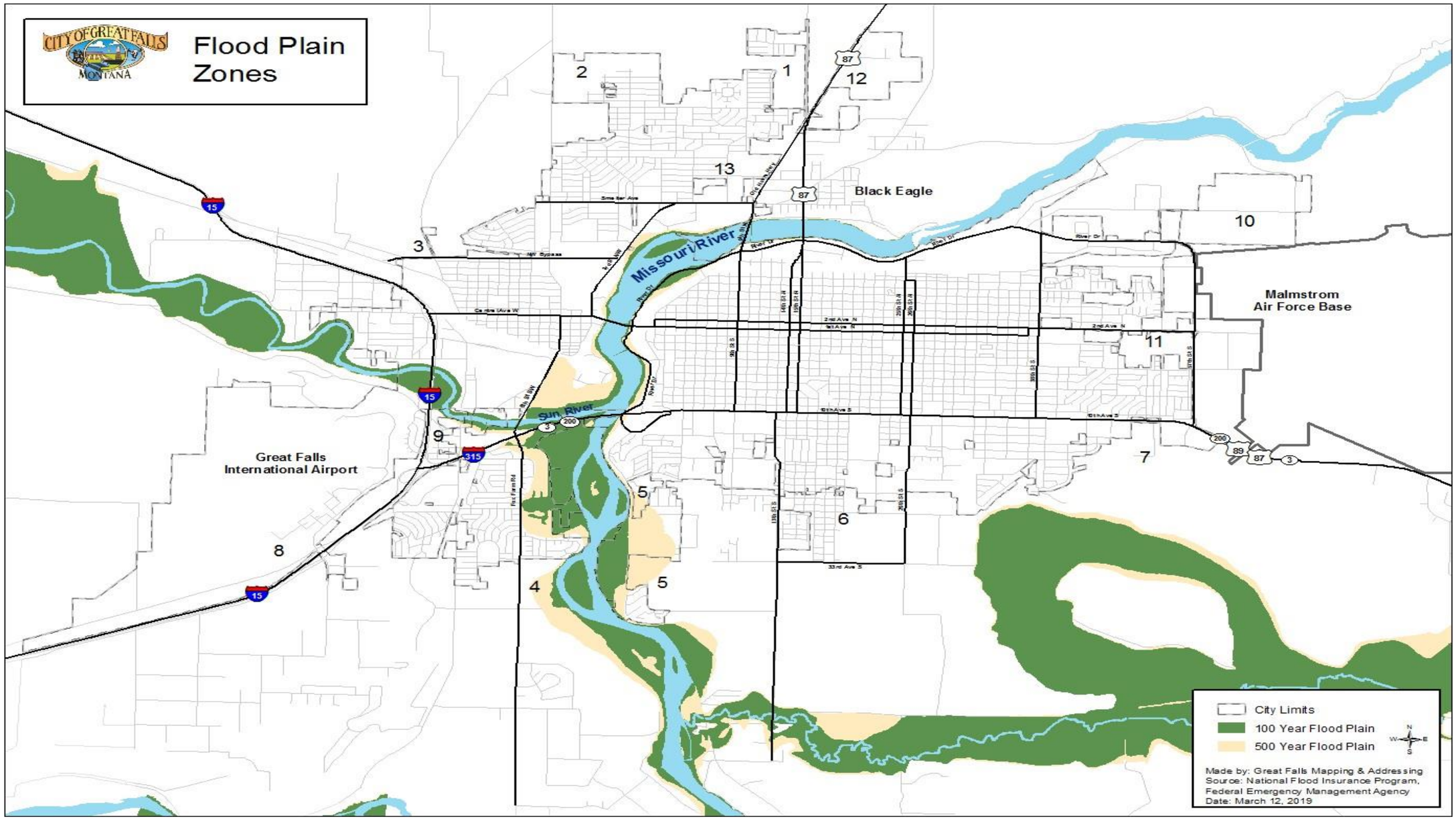
APPENDIX B – Great Falls Urban Growth Boundary Map



APPENDIX C – Great Falls Zoning Map



APPENDIX D – Great Falls Flood Plain Map



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