Planning Advisory Board/Zoning Commission
June 24, 2025 Agenda
2 Park Drive South, Great Falls, MT
Commission Chambers, Civic Center
3:00 PM

In order to honor the Right of Participation and the Right to Know (Article II, Sections 8 and 9 of the Montana Constitution), the City of Great Falls and Planning Advisory Board/Zoning Commission are making every effort to meet the requirements of open meeting laws: • The agenda packet material is available on the City's website: https://greatfallsmt.net/meetings. The Public may view and listen to the meeting on government access channel City-190, cable channel 190; or online at https://greatfallsmt.net/livestream. • Public participation is welcome in the following ways: • Attend in person. Please refrain from attending in person if you are not feeling well. • Provide public comments via email. Comments may be sent via email before 12:00 PM on Tuesday, June 24, 2025 to: jnygard@greatfallsmt.net. Include the agenda item or agenda item number in the subject line, and include the name of the commenter and either an address or whether the commenter is a city resident. Written communication received by that time will be shared with the Planning Advisory Board/Zoning Commission and appropriate City staff for consideration during the agenda item and before final vote on the matter; and, will be so noted in the official record of the meeting.

OPENING MEETING

1. Call to Order - 3:00 P.M.
2. Roll Call - Board Introductions

   Tory Mills - Chair

   Julie Essex- Vice Chair

   Michael Bicsak

   David Cantley

   Michael Gorecki

   Joe McMillen

   Jim Wingerter
3. Staff Recognition
4. Approval of Meeting Minutes - June 10, 2025

CONFLICT DISCLOSURE/EX PARTE COMMUNICATIONS

BOARD ACTIONS REQUIRING PUBLIC HEARING

5. Public Hearing – Annexation of Lot 1 of the Mercedes Minor Subdivision, the adjoining right-of-way of 21st Avenue South, and the adjoining 30' wide parcel owned by the City of Great Falls; establishing the City zoning classification of Planned Unit Development (PUD); and, Preliminary Plat of Peace Harbor Phase 1.

BOARD ACTIONS NOT REQUIRING PUBLIC HEARING

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
GREAT FALLS PLANNING ADVISORY BOARD/ZONING COMMISSION
June 10, 2025

CALL TO ORDER

Chair Mills called the regular meeting of the Great Falls Planning Advisory Board/Zoning Commission to order at 3:01 p.m. in the Commission Chambers at the Civic Center.

ROLL CALL & ATTENDANCE

Planning Board Members present:

Tory Mills, Chair

Julie Essex, Vice Chair

Michael Bicsak

Joe McMillen

Jim Wingerter

Planning Board Members absent:

David Cantley

Michael Gorecki

Planning Staff Members present:

Brock Cherry, Director of Planning and Community Development

Lonnie Hill, Deputy Director of Planning and Community Development

Jamie Nygard, Sr. Administrative Assistant

Other Staff present:

David Dennis, City Attorney

Rachel Taylor, Deputy City Attorney

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

MINUTES

Chair Mills asked if there were any comments or corrections to the meeting minutes from May 13, 2025. Seeing none, Mr. McMillen motioned to approve, which was seconded by Ms. Essex. All in favor, the minutes were approved.

BOARD ACTIONS REQUIRING A PUBLIC HEARING

Request for a Conditional Use Permit (CUP) to allow "marijuana cultivation" within the I-1 Light Industrial Zoning district upon the property addressed as 748 Crescent Circle, legally described as Lot 2A, Block 2, BN Car Shop Addition, Great Falls, MT

Lonnie Hill, Deputy Director of Planning and Community Development, addressed the Board. He noted that in the 2021 election, the citizens of Great Falls voted against prohibiting marijuana businesses from operating within the city limits, resulting in the passage of Ordinance 3249, which provides a regulatory framework for these businesses. He mentioned that the applicant, Bobby Long, owner of Flower, was requesting to permit marijuana cultivation, which requires a Conditional Use Permit (CUP). The CUP request is in addition to establishing a marijuana dispensary, which is allowed under the regulations of the I-1 zoning district.

Mr. Hill presented a location and zoning map, site photos, and development plans.

Mr. Hill stated that the development proposal was to remodel the existing building for business operations to include state-licensed retail sales, indoor cultivation and packaging, and administrative functions. He mentioned that the business would operate during typical business hours and employ approximately 10 to 15 trained employees.

Mr. Hill stated that the applicant was asked to provide information regarding common concerns related to the operation of a marijuana cultivation facility:

1. Odor
    - Managed by the design of the growing environment
    - Sealed grow system that utilizes carbon filters and a closed-loop HVAC system
    - The applicant states odor will not be detectable beyond the facility perimeter under normal operations.
2. Security
    - It is required by the State, including video surveillance, where products are grown, processed, stored, and sold.
    - Controlled-access doors and alarm systems
    - Flower's security plan exceeds the State requirements, such as video surveillance for all back-office spaces.
    - Staff included a condition of approval that requires a Security Plan detailing safety operations upon the property.
3. Visibility
    - The cultivation component of the business will have no external visual impacts.
    - There will be no outdoor cultivation.
    - There will be no exterior venting or large industrial fans.
    - There will be no cultivation garbage disposal visible to the public.
    - There will be no signage that will identify the activity of cultivation.

- Staff included a condition of approval that does not permit exterior signage for marijuana cultivation and activities shall be conducted within an enclosed, secure, and climate-controlled indoor facility.

4. Traffic
    - The applicant states that traffic will be limited to staff, deliveries, lab testing visits, and equipment testing.
    - Staff finds that the existing street network can accommodate the proposed use.

Mr. Hill stated that the applicant presented the project at Neighborhood Council #2's May 14, 2025, meeting and that members asked questions about the business operations and the State's regulations for marijuana facilities. He stated that the Council voted 4-1 to "not oppose" the request, which indicates that the Council does not object to the proposal moving forward, but also does not actively endorse it. Mr. Hill stated that the Council shared concerns with City staff about the number of marijuana businesses in their area and inquired whether the city could limit the number allowed. He stated that Staff explained that under current City rules, dispensaries are automatically allowed in areas zoned for light industrial use (I-1) and that Council #2 includes the closest I-1 zoning district to the center of the city.

Mr. Hill presented the Findings for the Basis of Decision for the Conditional Use Permit. He highlighted a few key points, stating that the entirety of the information was included in the Staff Report in the Agenda Packet.

1. The CUP is consistent with the City's Growth Policy and applicable neighborhood plans, if any.
    - ECO 3.4 – Continue efforts to expand, retain, and attract new businesses in Great Falls.
    - ECO 3.5 – Continue efforts to support and develop small businesses in Great Falls.
    - PHY. 4.1.1 – Promote and incentivize infill development that is compatible with the scale and character of established neighborhoods.
    - PHY. 4.1.5 – Encourage and incentivize the redevelopment or adaptive reuse of vacant or underutilized properties to maximize the City's existing infrastructure.
    -
2. The establishment, maintenance, or operation of the zoning and conditional use will not be detrimental to, or endanger the health, safety, morals, comfort, or general welfare.
    - The request will not be detrimental to or endanger the health, safety, morals, comfort, or general welfare of the community. The staff has reviewed the application for compliance with local code and proposed mitigation measures to address common concerns associated with its use, as reflected in the Conditions of Approval. These include a required security plan, a prohibition on any outdoor cultivation, and a restriction on exterior signage advertising marijuana cultivation. The request is a legal activity under Montana state law. The applicant must comply with all applicable regulations of the Montana Department of Revenue's Cannabis Control Division.

3. The conditional use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood.
    - The conditional use will not be injurious to the use and enjoyment of other property in the vicinity for the purposes already permitted. It is not anticipated that the project will

diminish or impair property values within the neighborhood, as it is similar in use and impact to nearby uses within the Light Industrial zoning district, including other marijuana businesses.

4. The conditional use will not hinder the regular and orderly development and enhancement of the adjacent property for uses allowed in the district.
    - The conditional use will not impede the regular and orderly development and improvement of surrounding properties. The I-1 zoning district encircles it. To the north of the property lies 6th Street SW, along with a mixture of light industrial and commercial uses, including a marijuana dispensary. To the south, there is a multi-tenant commercial building that includes a coffee shop, casino and lounge, marijuana dispensary, and a beauty salon. To the east of the property is a large parking lot and other light industrial uses. The area features a blend of light industrial and commercial uses. The conditional use is suitable for the subject property and fits within the context of the surrounding area.
5. Adequate utilities, access roads, drainage, and /or necessary facilities have been or are being provided.
    - Utilities, access roads, drainage, and other necessary facilities currently exist around and serve the subject property. The proposed project will utilize the existing facilities, including roads and utility connections.
6. Adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion in the public streets.
    - The project does not propose to modify any existing ingress or egress. The applicant states that traffic will be limited to staff, deliveries, lab testing visits, and equipment testing. Staff finds that the existing street network can accommodate the proposed use. As a result, there is no concern of additional traffic congestion in the public streets resulting from the approval of the CUP.
7. The conditional use shall, in all other respects, conform to the applicable regulations of the district in which it is located, except as such regulations may, in each instance, be modified by the City Commission.
    - The proposed CUP will conform to all applicable regulations of the Title 17- Land Development Code, including the dimensional standards of the I-1 zoning district. Any proposed redevelopment of the property or building would require a building permit and would be required to comply with all codes and ordinances of the City of Great Falls, the State of Montana, and all other applicable regulatory agencies.

Mr. Hill stated that Staff is not making a formal recommendation for or against the CUP request and that they reviewed the application for compliance with local code and evaluated the proposed mitigation measures. Based on the review, Staff finds the request acceptable as presented. He noted that the applicant has agreed to the conditions of approval, which reflect the discussions, and that if the Commission approves the request, Staff recommends that approval be subject to these conditions. Mr. Hill mentioned that if the Commission chooses to deny the request, it must adopt alternative findings.

Mr. Hill presented the list of conditions of Approval:

1. Modifications: It is understood that minor changes are often necessary during the development and operation of a conditional use. The Administrator (the City employee assigned by the City Manager to administer conditional uses) is hereby authorized to permit minor changes

2. Changes in Use: Conditional uses are regulated in this manner because they have the potential to impact the community significantly. Therefore, changes in conditional uses must be strictly limited. A significant change in the type or level of activity may void the conditional use permit. Proposed changes shall be submitted to the Administrator, who may require that the license be amended following the same public process used for its adoption.
3. Expiration: The conditional use permit shall expire one year after the date of issuance. If the operation has been established for the applicant's request, the Administrator may extend the expiration date if substantial work is ongoing.
4. Abandonment: If a conditional use ceases to operate for more than six months, the conditional use permit is void.
5. Security Plan: The applicant shall submit a Security Plan that details the standard operating procedures related to physical and procedural security. The document shall be submitted and will be kept on file at the Planning and Community Development Department.
6. Exterior Signage: No exterior signage shall be permitted regarding the use or operation of marijuana cultivation; however, signage typical of a retail establishment is permitted as allowed by the City's sign code.
7. Outdoor Cultivation Prohibited: All marijuana cultivation activities shall be conducted entirely within an enclosed, secure, and climate-controlled indoor facility. Outdoor cultivation is strictly prohibited on the subject property, including within any greenhouses, hoop houses, or temporary structures.
8. General Code Compliance: The proposed project shall be developed consistent with the conditions of approval adopted by the City Commission, and all codes and ordinances of the City of Great Falls, the State of Montana, and all other applicable regulatory agencies.
9. Acceptance of Conditions: No zoning or building permits shall be issued until the property owner acknowledges in writing that it has received, understands, and agrees to comply with the conditions of approval.

APPLICANT PRESENTATION

Bobby Long, the owner of Flower, presented to the Commission. He stated that he founded the company over a decade ago and described it as a vertically integrated business. He owns another facility outside of Missoula, in Lolo, which has the same layout. This request has a slightly larger footprint. His dispensary has been voted Best Dispensary in Missoula nine out of the last ten years, demonstrating his success as a businessman. He claimed that the proposal will bring jobs and funds back into the Great Falls community. He noted that cultivation takes place in an indoor farm. He also addressed the issues of odor, parking, traffic, and security.

PUBLIC QUESTIONS

John Paul, 2704 4th Ave N., wanted to know if the conditional use is permitted, if there are regulations already in place, and what codes would be followed, or if they would be created as the project progresses.

Mr. Hill responded that land use entitlement is the first step, and the proposed project will require a building permit. If approved, the applicant will be required to submit all necessary

documentation and plans to confirm that they are meeting all code requirements, including building codes.

Mr. Cherry stated that the Conditions of Approval will be addressed well before the Certificate of Occupancy is released.

PROPONENTS

None.

OPPONENTS

John Paul, 2704 4th Ave. N. is concerned that when CUPs are granted without having everything in place, it is not a good impression of Great Falls and what the leadership is about. The workforce and properties are likely cheaper than in Missoula. The extractions and post-packaging processes are much more hazardous than cultivation, so we want to know where it will stop. Processes need to be slowed down, and a good plan needs to be laid out and stuck to.

BOARD QUESTIONS

Mr. Mills asked if the Conditional Use Permit (CUP) had been granted, and the neighbors complained about the odor. Can the City do anything after the fact? Mr. Cherry responded that the CUP could be revoked if the conditions of approval are not met.

Mr. McMillen inquired about the number of employees who would be assigned solely to the dispensary if the Conditional Use Permit (CUP) were denied. Mr. Long replied that the number would be approximately three to four.

Mr. McMillen inquired about how many other local businesses would be needed to support the proposed project. Mr. Long replied that several businesses would benefit from the services of electricians, plumbers, contractors, and HVAC technicians, in addition to the power company.

Mr. McMillen inquired whether any businesses interested in establishing a grow facility would need to undergo the Conditional Use Permit (CUP) process. Mr. Hill replied that the CUP is required due to the I-1 zoning for cultivation, while it is permitted outright in an I-2 zone. He also noted that this was the first CUP related to marijuana cultivation, and currently, none exist within the City limits.

Mr. Wingerter asked if there had been any issues at his facility outside Missoula. Mr. Long responded that there had not been any issues.

Mr. Mills asked Mr. Long if there was any backup power for the security recordings in case of a power outage. Mr. Long stated that they are required to have 60 days' worth of NVR, but there is no backup power source.

BOARD DISCUSSION AND ACTION

Ms. Essex read from a report she found on the Congressional Research Service titled “State Marijuana and 'Legalization' and Federal Drug Law” from May 14, 2024, and stated that the report could be found online at www.crsreports.congress.govlsb10482.

Ms. Essex also read from Article VI, Section 2 of the United States Constitution, specifically the Supremacy Clause.

Ms. Essex read from www.constitution.congress.gov.

Ms. Essex stated that she has a judicial responsibility to the public and, as a result, is obligated to follow local, state, and federal law, except where there is a conflict with federal law; in that case, federal law binds her according to the Supremacy Clause. Federal law, as defined by the Controlled Substances Act, classifies marijuana as a Schedule I controlled substance, indicating that it is illegal to produce, distribute, or possess marijuana unless it is within the context of a federally approved scientific study. Therefore, to fulfill her duty to act in the best interest of the public, which includes upholding the law and her decision-making, she will vote no.

Mr. Mills stated that the applicant is proposing to invest significantly in the community, and he noted that he couldn’t say he was a proponent of marijuana. Nevertheless, he is an advocate for growth in the City.

Mr. Wingerter stated that City Staff presenting the proposal had done their due diligence, and if it were against the law, it would not be offered. He also mentioned that it is the Commissioners' responsibility to set aside personal feelings.

In response to Ms. Essex’s comments, City Attorney David Dennis observed that the City had litigated the very issue raised by Ms. Essex in 2022. At the time, City zoning ordinances prohibited any use of property that violated federal law. The City was sued by a local marijuana business who was denied a business license based on the ordinance. District Court Judge David Grubich ruled in favor of the business owners, writing in his judgment that, in 2020, voters in Cascade County voted to legalize commercial marijuana activities, and that the power to allow or prohibit marijuana business rested solely with the voters. Given this history, Great Falls City Attorney David Dennis advised the planning board that it should vote strictly on the merits of the application and the criteria for approval, and avoid consideration of the federal status of marijuana.

MOTION: That the Zoning Commission recommend the City Commission approve the Conditional Use Permit for the subject property as legally described in the Staff Report and the accompanying Findings of Fact, subject to the Conditions of Approval being fulfilled by the applicant.

Made by: Mr. Wingerter

Second by: Mr. McMillen

VOTE: 4-1, with Ms. Essex voting to deny. Motion passed.

COMMUNICATIONS

Mr. Hill stated that information was attached to the Agenda Packet and included a link to planning board training materials for the new Board members. He noted that formal in-person training will take place in January 2026, organized by the City. He also mentioned that if any Board member would like additional training, they should inform Staff.

https://www.youtube.com/watch?v=yZaFe3v2778

PUBLIC COMMENT

None.

ADJOURNMENT

There being no further business, Chair Mills adjourned the meeting at 4:16 p.m.

CHAIRMAN TORY MILLS

SECRETARY BROCK CHERRY

Meeting Date: June 24, 2025

CITY OF GREAT FALLS

PLANNING ADVISORY BOARD / ZONING COMMISSION AGENDA REPORT

Item:	Public Hearing – Annexation of Lot 1 of the Mercedes Minor Subdivision, the adjoining right-of-way of 21st Avenue South, and the adjoining 30' wide parcel owned by the City of Great Falls; establishing the City zoning classification of Planned Unit Development (PUD); and, Preliminary Plat of Peace Harbor Phase 1.
Initiated By:	Karl Birky, KIB Homes
Presented By:	Sara Reynolds, Associate Planner, Planning and Community Development
Action Requested:	Recommendation to the City Commission

Public Hearing:

1. Chairman of the Board conducts the public hearing, pursuant to OCCGF 1.2.050 and Title 17, Chapter 16, Article 6.

2. Chairman of the Board closes the public hearing and asks the will of the Board.

Suggested Motions:

1. Board Member moves:

"I move that the Planning Advisory Board recommend the City Commission (approve/deny) the annexation of the property as legally described in the staff report, the Improvement Agreement, and the accompanying Basis of Decision, subject to the Conditions of Approval being fulfilled by the applicants, and annexation of the adjoining right-of-way of 21st Avenue South, and the adjoining 30' wide parcel owned by the City of Great Falls."

And;

"I move that the Zoning Commission recommend the City Commission (approve/deny) the establishment of Planned Unit Development zoning for the property as legally described in the staff report, and the accompanying Basis of Decision, subject to the Conditions of Approval being fulfilled by the applicants."

And;

"I move that the Planning Advisory Board recommend the City Commission (approve/deny) the Preliminary Plat of Peace Harbor Phase 1 Major Subdivision as legally described in the Staff Report, and the accompanying Basis of Decision, subject to the Conditions of Approval being fulfilled by the applicants."

2. Chairman calls for a second, board discussion, and calls for the vote.

Staff Recommendation: Staff recommends approval of the annexation, and assignment of PUD zoning, and Preliminary Plat of Peace Harbor with the following conditions:

Conditions of Approval:

1. **General Code Compliance.** Any future development of the property shall be consistent with the conditions in this report, as well as all codes and ordinances of the City of Great Falls, the State of Montana, and all other applicable regulatory agencies.
2. **Improvement Agreement.** The applicant shall abide by the terms and conditions and pay all fees specified in the attached Improvement Agreement for the subject property. The Improvement Agreement must be signed by the applicant and recorded with the Cascade County Clerk and Recorder.
3. **Final Plat.** The Final Plat of Peace Harbor Phase 1 shall incorporate correction of any errors or omissions noted by staff.
4. **Engineering Drawings.** The final engineering drawings, specifications, and cost estimates for public improvements for Peace Harbor shall be submitted to the City Public Works Department for review and approval prior to consideration of the Final Plat.
5. **Land Use & Zoning.** The property's development shall be consistent with the allowed uses and specific development standards of the proposed Planned Unit Development (PUD) zoning district.

Background: Karl Birky with KIB Homes submitted an application to the Planning and Community Development Department on January 14th, 2025, to annex and subdivide the property located to the east of 20th Avenue South and to the south of Benefis Court. The subject property is legally described as Lot 1 of the Mercedes Minor Subdivision located in the SE1/4 SW1/4 and NE1/4 SW1/4 of Section 13, T20N, R3E, Cascade County, Montana and is approximately 15.47 acres in size. The applicant is requesting annexation of the subject property, establishment of the City zoning designation of Planned Unit Development (PUD), and approval of the Preliminary Plat of the proposed Peace Harbor Phase 1 major subdivision.

The applicant has expressed a commitment to expanding housing opportunities by offering a wide range of lot and home sizes, with the goal of increasing access to housing for more individuals and families. To support this objective, the applicant is seeking a Planned Unit Development (PUD) designation, which allows for deviations from standard residential zoning requirements. Specifically, they are proposing smaller lot sizes with a minimum of 5,000 square feet and increased lot coverage up to 60%. The preliminary plat for Peace Harbor Phase 1 Subdivision includes 66 single-family lots ranging from approximately 5,200 to 12,200 square feet in area, shown on the preliminary plat. These proposed adjustments would support a more diverse residential development with increased density, aligning with broader goals of promoting housing variety and making efficient use of available land.

The proposed request at full build out would create 66 lots for single-family home development that will be accessed by two points of entry, 20th Avenue South to the west and 21st Avenue South to the east. It is the developer's intention to continue building out subsequent phases of the development. The developer proposes to complete the request in two (2) phases, with the first phase being the northern thirty (30) lots off of Columbia Street and Harvard Avenue. The second phase will include the extension of 21st Avenue South and the remaining thirty-six (36) homes. An exhibit of the proposed phasing plan is shown within the *Exhibit A* of the *Improvement Agreement*, which is provided as an attachment. Note that approval of

the current request would authorize the developer to construct only the 66 lots shown in the approved preliminary plat. Any future development phases would require a new application for subdivision and platting approval.

Annexation Request: The applicant requests annexation of the 15.47 acre property legally described above. The site is contiguous to City limits on the west, connecting from 20th Avenue South, and the north through properties owned by Great Falls Athletic Club and Benefis Health System (1901 Benefis Court).

The City proposes to also annex the adjoining right-of-way of 21st Avenue South, extending from the eastern property line of the subject property to the intersection of 8th Street South, as well as the adjoining 30-foot-wide parcel owned by the City of Great Falls, north of the subject property and legally described in Reel 100, Document No. 1068. Staff supports the annexation request to allow for residential development.

The basis of decision for an annexation by petition request is listed in OCCGF 17.16.7.050. The recommendation of the Planning Advisory Board and the decision of the City Commission shall, at a minimum, consider the criteria which are attached as *Basis of Decision – Annexation.*

Establishment of PUD Zoning: The applicant proposes a Planned Unit Development (PUD) zoning designation for the property. According to City code, a PUD is a special type of zoning district that is proposed by the developer to account for a desired mix of uses. Each district is unique and therefore has its own set of development standards which are documented in the approval. The applicant states deviations from OCCGF are needed to help the project achieve the goal of providing attainable housing. The applicant has provided a *PUD Narrative and Development Standards* within the application packet that lists the deviations in lot sizes and dimensions. The PUD will include an underlying Zoning District of R-3 Single-family high density.

The basis for decision on zoning map amendments is listed in the OCCGF 17.16.40.030 of the Land Development Code. The recommendation of the Zoning Commission and the decision of the City Commission shall at a minimum consider the criteria, which are attached as *Findings of Fact – Planned Unit Development.*

Preliminary Plat Request: The applicant is requesting a preliminary plat of the subject property, which would subdivide the property into 66 single-family residential lots. Staff has determined the preliminary plat is consistent with the standards listed within OCCGF and the Montana Subdivision and Platting Act. The applicant submitted a Preliminary Plat of Peace Harbor Phase 1 within the *Application Packet*, which shows the layout for the proposed subdivision.

The basis for decision on zoning map amendments is listed in the OCCGF 17.16.26.040 of the Land Development Code in addition to the requirements of 76-3-608 of Montana Code Annotated (MCA). The recommendation of the Zoning Commission and the decision of the City Commission shall at a minimum consider the criteria, which are attached as *Findings of Fact - Subdivision.*

Improvements: An *Improvement Agreement* is included as an attachment to this report, outlining the developer's responsibilities and proportionate cost shares for public infrastructure improvements associated with the proposed subdivision. The development will be accessed from two points—20th Avenue South and 21st Avenue South—enhancing overall connectivity. As stated above, the developer proposes to complete the request in two (2) phases, with the first phase being the northern thirty (30) lots off of Columbia Street and Harvard Avenue. The second phase will include the extension of 21st Avenue

South and the remaining thirty-six (36) homes. As part of the agreement, the developer will construct all necessary public streets and avenues to serve the subdivision, including the off-site extension of 21st Avenue South to its intersection with 8th Street South. All new streets will include curb and gutter, with sidewalks and boulevard landscaping installed throughout the development to support a walkable, attractive neighborhood environment. The off-site extension of 21st Avenue South will not require sidewalks at this time, but will be required to be built when those adjacent properties request annexation into the City.

To ensure adequate utility service, the developer will install a looped 8-inch public water main through the subdivision, connecting to the existing water system. This includes the installation of fire hydrants in compliance with City standards. Sanitary sewer service will also be extended to all lots. While installation of the water and sewer systems is the responsibility of the developer, ownership and long-term maintenance of these public utilities will transfer to the City upon completion.

Stormwater management will be addressed through the construction of a regional stormwater detention facility sized to serve the contributing basin. This facility will be located on a parcel dedicated to the City during the final plat phase of the development. Upon completion, the stormwater system—including the pond—will be owned and maintained by the City (excluding any temporary facilities). A fully operational stormwater system is required prior to approval of the final plat for Phase One.

As stated in the conditions of approval, the final engineering drawings, specifications, and cost estimates for public improvements for the development shall be submitted to the City Public Works Department for review and approval prior to consideration of the Final Plat.

Traffic Analysis: A 66-lot single-family subdivision **is** proposed east of the current terminus of 20th Avenue South, just east of 4th Street South, and extending eastward to the Highland Park subdivision and south to the extension of 21st Avenue South.

The proposed subdivision would connect to 20th Avenue South on the northwest and construct an extension of 21st Avenue South on the east to connect to 8th Street South. All external connections would be to local streets feeding to Collector streets just to the north – 17th Avenue South, 4th Street South north of 17th Avenue South, and 9th Street South north of 17th Avenue South are designated Collector roadways.

The appropriate Land Use type from the *ITE Trip Generation Manual, 11th Ed.*, is "210-Single Family Detached Housing." The ITE Manual's definition is:

> *"A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed (by ITE) is a suburban subdivision."*

Referencing the *ITE Trip Generation Manual*, a Single-Family Detached Housing land use would be expected to generate an average of 9.43 trips per dwelling unit on a weekday, for a total estimated average trips generated by the proposed subdivision's 66 dwelling units (at full buildout) of 623 trips per weekday.

Traffic from the proposed subdivision during "peak hour" – that is, the hour of the day generating the highest traffic – is estimated to be generated at the rate of .99 vehicle trips per dwelling unit for a one-hour period during the afternoon/evening. For the 66 dwelling units, this equates to 66 vehicle trips at full buildout *(Source: ITE Trip Generation Manual, 11th Ed.)*.

Sidewalks exist on the existing segment of 20th Avenue South, and connect to a larger sidewalk network. No sidewalks exist east of the proposed subdivision.

There are no traffic counts in the immediate vicinity of the proposed subdivision.

To analyze impact upon the current street network, assumptions must be made regarding the distribution of the trips upon existing street segments. There are two possible routes to and from the proposed development –west onto 20th Avenue South and east on 21st Avenue South.

It is assumed that more traffic will use the 21st Avenue South route, as it is a more direct route to 10th Avenue South (at 7th Street South) – the closest major arterial. Therefore, the estimated trip distribution percentage would be 35% via 20th Avenue South and 65% via 21st Avenue South.

TABLE 1

STREET SEGMENT	DAILY VOLUME (DATE)	PROJECTED DAILY VOLUME	PROJECTED PEAK HOUR VOLUME
20th Ave. S.	n/a	218	23
21st Ave. S.	n/a	405	43

Note: all numbers are vehicle trips per day or vehicle trips per hour

The developer would be required to build sidewalk within the subdivision, connecting to the existing network on 20th Avenue South as is outlined in the *Improvements Agreement.*

Although not immediately adjacent to the proposed subdivision, Great Falls Transit does provide service along 17th Avenue South, approximately 1/3 of a mile to the north of the proposed subdivision.

Due to the relatively low projected volumes generated by the proposed subdivision, the local road network has sufficient capacity to accommodate the additional traffic. The eastern access via 21st Avenue South is projected to be the most heavily used access point by residents, and would be the most direct route for emergency responders. Therefore, it is recommended that the second phase of the proposed development be conditioned upon construction of the 21st Avenue South connection to 8th Street South.

Growth Policy Compliance: The proposed project is substantially consistent with the overall intent and purpose of the City of Great Falls 2013 Growth Policy Update. The proposal to annex and assign the zoning of PUD for the proposed property will allow the developer to construct a single-family residential development. Staff finds the City's Growth Policy supports the proposed zoning map amendment to facilitate higher density development upon a partial infill parcel, providing much needed attainable housing. The proposed project is consistent with several of the Plan's policies including:

<u>Social – Housing</u> (page 134)

Soc1.4.2 Expand the supply of residential opportunities including single-family homes, apartments, manufactured homes, and assisted living facilities.

Soc1.4.3 Support the development of affordable housing in all neighborhoods to ensure geographic dispersal and reduce concentrations of poverty.

Soc1.4.6 Encourage a variety of housing types and densities so that residents can choose by price or rent, location, and place of work.

Economic – Community Vitality (pages 157-158)

Eco3.7.2 Encourage reinvestment in older neighborhoods and infill housing to support existing services and commercial districts.

Eco3.4.3 Support quality of life investments such as recreation, housing, and amenities that help attract and retain the workforce. (page 155)

Physical - Land Use (page 162)

Phy4.1.4 Foster the development of safe, walkable neighborhoods with a mix of uses and diversity of housing types.

Phy4.1.5 Encourage and incentivize the redevelopment or adaptive reuse of vacant or underutilized properties so as to maximize the City's existing infrastructure.

Phy4.3.1 Support development patterns that optimize existing City utilities and limit the extension of public infrastructure. (page 166)

In conclusion, the proposed development will enable these policies to be addressed and further the implementation of the Growth Policy.

Neighborhood Council Input: The project was presented to Neighborhood Council #6 at its regularly scheduled May 7th, 2025 meeting. The project was well received, and the Council voted unanimously to support the project.

Concurrences: Representatives from multiple departments, including Planning and Community Development, Public Works, and Fire Departments have been involved throughout the review process for this request. In addition, both the Engineering Division of Public Works and the Legal Department have collaborated on the proposed Improvement Agreement.

Fiscal Impact: The proposed development reflects a strategic and fiscally responsible approach to growth, with City boundaries extending in a logical and incremental way. While water and sewer services will be provided by the City, all infrastructure improvements will be funded by the applicant, as outlined in the attached Improvement Agreement. New connections via 20th and 21st Avenues South will enhance neighborhood access and overall connectivity. The preliminary plat increases the number of residential lots, strengthening the City's tax base and supporting long-term revenue. Peace Harbor Phase 1 further demonstrates the advantages of this development model. With higher residential density, infrastructure costs are distributed across more units, improving cost efficiency and lowering the per-unit financial impact. This approach supports a more resilient and economically sustainable pattern of residential development aligning infrastructure investment with community benefit.

Alternatives: The Planning Advisory Board/Zoning Commission could recommend denial of the annexation and assignment of PUD zoning, and Subdivision of Peace Harbor. For these actions, the Planning Advisory Board/Zoning Commission must provide an alternative Basis of Decision.

Attachments/Exhibits:

- Improvement Agreement
  - Exhibit A
- Basis of Decision – Annexation
- Basis of Decision – Planned Unit Development
- Basis of Decision – Subdivision
- Location and Zoning Map
- Application Packet

  - Narrative
  - Preliminary Plat
  - PUD Zoning and Development Standards
  - Geotechnical Report
- Public Comment – Great Falls Public Schools

IMPROVEMENT AGREEMENT FOR THE DEVELOPMENT OF PEACE HARBOR SUBDIVISION BY KARL JOHN BIRKY, UPON THE PROPERTY LEGALLY DESCRIBED AS LOT 1 OF THE MERCEDES MINOR SUBDIVISION SE1/4 SW1/4 AND NE1/4 SW1/4 OF SECTION 13, T20N, R3E, P.M.M., CASCADE COUNTY, MONTANA

The following is a binding Agreement dated this _____ day of _____, 2025, between **Karl John Birky**, hereinafter referred to as "**Owner**", and the **CITY OF GREAT FALLS**, Montana, a municipal corporation of the State of Montana, hereinafter referred to as "**City**", regarding the requirements for the annexation and development of a tract of land into the corporate limits of the City legally described as Lot 1 of the Mercedes Minor Subdivision SE1/4 SW1/4 and NE1/4 SW1/4 of Section 13, Township 20 North, Range 3 East, Cascade County, Montana, hereinafter referred to as "**Subject Property**". The Owner agrees to, and is bound by, the provisions of this Agreement, and by signing this Agreement, therefore agrees to terms applicable to the Subject Property. The City is authorized to enter into this Agreement by §§ 17.68.010-040 of the Official Code of the City of Great Falls (OCCGF).

1. Purpose. The purpose of this Agreement is to ensure that certain improvements are made and certain conditions are fulfilled by the Owner, as required by the City's approval of the annexation, subdivision, and supporting documents. Generally, this Agreement:

1.1 Declares that the Owner is aware of and has properly accounted for any natural conditions that may adversely affect the development of the Subject Property;

1.2 Insulates the Subject Property from the impact of changes in the City's zoning regulations, provided that no substantial changes in the development of the Subject Property are proposed;

1.3 Requires the Owner to guarantee that the agreed-upon improvements contained in this agreement are made in a timely manner by providing the financial securities required by OCCGF;

1.4 Provides for the inspection and warranty of the required improvements before they are accepted for operation and maintenance by the City;

1.5 Waives protest and appeal by the Owner and its successors against the creation of special improvement districts that would provide and maintain necessary infrastructure;

1.6 Establishes how necessary changes of final construction plans required by the Agreement may be made with the approval of the City;

1.7 Contemplates reimbursements to the Owner when neighboring properties that benefit from certain improvements made by the Owner are developed;

1.8 Embodies certain conditions that are imposed by the City upon approval of the annexation of the Subject Property in order to facilitate their enforcement; and

1.9 Indemnifies the City from challenges to its approval of the annexation of the Subject Property, for natural conditions of the Subject Property and for any faults in Owner's assessment of those conditions; and holds it harmless from errors and omissions in the approval and oversight of the improvements relating to development of the Subject Property.

2. Duration. The term of this Agreement begins at the date here above written and with the exceptions stated below, is a perpetual recorded agreement between the Owner and the City.

2.1 If Work Does Not Begin. This Agreement may be amended if final construction plans for the first phase of the Development are not submitted for approval within three years of the date of the City Manager's signature on this Agreement.

2.2 Failure to Build. The Owner's failure to complete improvements in accordance with the final construction plans may result in the City retaining the security required in Section 15 of this Agreement. It may also void this Agreement and the vested rights established by Section 8, below.

2.3 Failure to Pay. The Owner's failure to make timely payment of its share of any of the required improvements listed in this Agreement, voids the Agreement and the vested rights established by Section 8. It may also result in the City attempting to collect the amount due by any lawful means.

3. Supporting Documents. Each of the following supporting documents are to be submitted for review and approval by the City.

3.1 Preliminary Plat. This agreement is based on the Preliminary Plat of Peace Harbor Subdivision and accompanying materials approved by the City Commission. Changes in the plat and the accompanying materials are governed by Section 4 of this Agreement. To remain valid, the preliminary plat must be periodically renewed according to Montana Code Annotated (MCA) 76-3-610, which requires that preliminary plat approval be for no more than three years, unless it proceeds to final plat before that time. The Owner understands and agrees that it must submit a letter to the Administrator requesting renewal of the preliminary plat at least 90 days before the third anniversary of this Agreement, and then again, before every third anniversary until this Agreement expires. The preliminary plat may also be renewed if and when an amendment is approved.

3.2 Final Plat. The final plat of each phase of Peace Harbor Subdivision is to be filed on record in the Clerk and Recorder's Office of Cascade County, Montana, upon approval by the City. Final plat approval is contingent upon full compliance with the provisions of this Agreement, the approved Peace Harbor PUD Document, and the OCCGF.

3.3 Construction Documents. Engineering drawings, specifications, reports, and cost estimates (preliminary and final), prepared for the Subject Property, consisting of documents for, but not limited to the public sanitary sewer, water, storm drain, and street improvements. Construction documents shall be designed in compliance with the City's Standards for Design and Construction Manual.

3.4 As Built Drawings. "As Built" reproducible 4 mil mylar drawings and one electronic copy of public infrastructure, private utilities, and drainage facilities shall be supplied to the City, and one electronic copy of public infrastructure, private utilities, and drainage facilities shall be supplied to the City upon completion of the construction.

3.5 Legal Documentation. Legal documents, including but not limited to any articles of incorporation, bylaws, covenants, and declarations establishing the authority and responsibilities of the Owner relating to the Subject Property, which may be recorded in the Clerk and Recorder's Office of Cascade County, Montana.

***3.6 Peace Harbor Planned Unit Development Standards*.** The Peace Harbor Planned Unit Development Document, including all associated development standards, tables, and exhibits, is incorporated herein by reference. The Owner agrees that all development on the Subject Property shall conform to the approved PUD standards. Any deviation not authorized by OCCGF §§ 17.16.29.100 shall be subject to review as a Major or Minor Change as defined in Section 4 of this Agreement and OCCGF.

4. Changes. The Owner understands that failure to install required improvements in accordance with the final construction plans approved for the development of the Subject Property is a breach of, and may void, this Agreement. The Owner also understands that such failure is a violation of the OCCGF and is subject to the penalties provided for such violations. The City recognizes, however, that minor changes are often necessary as construction proceeds and the Administrator (the Administrator is the person or persons charged by the City Manager with the administration of this improvement agreement) is hereby authorized to allow minor changes to approved plans, as provided below:

4.1 Minor Changes. Minor changes to engineering documents and such revisions to the engineering drawings as are deemed appropriate and necessary by the Administrator and which do not materially affect the hereinabove mentioned Subject Property, can be made as follows:

4.1.1 Before making changes, the Owner must submit revised plans to the Administrator for review. Failure to do this before the proposed change is made may be considered by the City to be a breach of this Agreement and a violation of the OCCGF. The Administrator shall respond to all proposed changes within fifteen (15) days of receipt of the revised plans.

4.1.2 Based on a review of the revised plans, the Administrator may permit minor dimensional changes provided they do not result in a violation of the conditions of approval for the annexation of the Subject Property or the OCCGF.

4.1.3 Based on a review of the revised plans, the Administrator may permit substitutions for proposed building and construction materials provided that the proposed substitute has the same performance and, for exterior materials, appearance as the originally approved material.

4.1.4 Minor changes in the location and specifications of the required public improvements may be permitted by the Administrator. The Owner must submit revised plans showing such changes to the Administrator. Revised plans are not accepted until approved by the Administrator.

4.2 Substantial Changes. Substantial changes are not permitted by this Agreement. A new public review and permitting process will be required for such changes. “Substantial Change” versus “Minor Change” is described as follows in order to further clarify what may be permitted as a “Minor Change”:

4.2.1 A substantial change adds one or more lots; changes the approved uses; changes the location or extent of the area proposed to be cleared, graded, or otherwise disturbed by more than 4,000 square feet (a smaller change in the area that will be cleared, graded, or otherwise disturbed may be treated as a minor dimensional change); changes the location, extent, or design of any required public improvement, except where a minor change is approved by the Administrator; A smaller change in the size of a lot, or other minor deviations may be treated as a minor dimensional change and may be approved by the Administrator.

5. Fees. The Owner understands that it is required to pay the following fees as they come due. The absence of any fee from this Agreement which is lawfully charged by the City in connection with construction activity associated with the Subject Property shall not constitute a waiver by the City.

5.1 Recording Fees. The Owner is responsible for all recording fees at the rate charged by Cascade County at the time a document or plat is submitted for recording.

5.2 Park Fee in Lieu of Land Dedication or Parkland Dedication. A Park Fee in lieu of a parkland dedication is required and shall be based on the State of Montana statutory requirement as applied to the current appraisal of the undivided, undeveloped value of the acreage included in the Development that is prepared by a licensed real estate appraiser and submitted by the Owner along with the final plat for each phase of the Development. This payment will be due and payable within 30 days after the final plat for each phase is approved by the City Commission, and before any permits, including the construction of streets and trenching for utilities, are issued.

5.3 Engineering Inspections. The Owner is responsible to pay all applicable engineering fees established by Resolution of the City Commission of the City of Great Falls.

5.4 Permit Fees. The Owner is responsible to pay all applicable planning and building permit fees established by Resolution of the City Commission of the City of Great Falls.

5.5 Connection and Construction Fees. Water service tapping and water and sewer service connection fees will be paid By Owner at the times of tapping and connections.

5.6 Storm Drain Fee. The Owner is responsible to pay a storm drain fee in the amount of $250 per acre for the Subject Property. This would equal a total of $3,867.50 for the total 15.47 acres of the Subject Property. The total storm drain fee is to be paid to the City no later than 30 days after the annexation resolution for the Subject Property is recorded.

5.7 Application Fees. In addition to the fees outlined above, application fees paid by the Owner are: the $9,320.50 application fee for annexation and zoning, and the $10,600.00 subdivision application fee which have been paid prior to this Agreement. Application fees are to be paid by the Owner for each phase of the final plat.

6. Site Conditions. The Owner warrants that it has conducted site investigations sufficient to be aware of all natural conditions, including, but not limited to, flooding, slopes, and soils characteristics, that may affect the installation of improvements on the site and its development for the approved use. The Owner further warrants that all plans submitted pursuant to this Agreement and all applications for building permits within the development will properly account for all such conditions. The Owner indemnifies, defends, and holds the City harmless for natural conditions and for any faults in their own assessment of those conditions.

7. Permits. This Agreement must be approved by the City Commission and signed by the City Manager and the Owner before permits for any work will be approved, including, but not limited to, grading for streets or trenching for the installation of utilities.

8. Vested Rights. The approval of this Agreement by the City creates a vested right that protects the Owner from changes in the zoning regulations of Title 17 of the OCCGF. This vested right does not exempt the Owner from compliance with other provisions of the OCCGF, including specifically those intended to prevent and remediate public nuisances, nor does it exempt the Owner from changes in the City's building codes and fees, development fees, and inspection fees. This vested right does not exempt the owner from compliance with changes to state and federal requirements, including those of the Montana Department of Transportation (MDT). This vested right may be voided, in whole or in part, if the Owner proposes substantial changes in the approved final construction plans of the development of the Subject Property.

9. On-Site Improvements. The on-site improvements required prior to certificate of occupancy of any structure built upon the Subject Property shall include everything required to provide water, sanitary sewer, sanitary sewer industrial pretreatment (as applicable), fire protection, storm drainage, storm water quality treatment, access, and other requirements as may be required by OCCGF. Access for purposes of emergency vehicles shall be installed to City specifications prior to the issuance of any building permits for the Subject Property. The Owner shall provide public utility easements for all required public utilities, including City water, sewer, and storm main easements for mains being dedicated to the City. The Owner agrees to install on-site stormwater quality and quantity improvements consistent with City standards and submitted plans approved by the City. Stormwater quantity and quality control measures must comply with standards of the City of Great Falls Storm Drainage Design Manual. The design, installation, inspection, and maintenance responsibilities of these improvements shall be approved by the City. Temporary public stormwater facilities will not be owned and maintained by the city and an enforceable operation and maintenance agreement with the City and the Owner is required to ensure private stormwater control measures function properly.

10. Required Public Improvements. The public improvements required for the development of the Subject Property shall be installed as shown on the final construction plans that are submitted to and approved by the City prior to issuance of the applicable Certificates of Occupancy for each development phase. As an alternative, the Owner may provide a financial security for said improvements as prescribed in Section 14.

10.1 Water. The Owner hereby agrees to extend a looped eight (8) inch public water main through the development and connect to the existing water mains as shown on the proposed Infrastructure Plans consistent with City standards and submitted plans approved by the City, including the addition of the required fire hydrants. The improvements shall be in accordance with City and Montana Department of Environmental Quality standards and approved plans and specifications. Any portion of water main service located outside of the public right-of-way shall be located in a minimum 20-foot wide public City water main easement, the location of which shall be approved by the City. The improvement, exclusive of service lines, is to be owned and maintained by the City upon completion.

10.2 Sanitary Sewer. All buildings upon the subject property shall be served by sanitary sewer as shown on the proposed Infrastructure Plans. Installation of sewer mains is the responsibility of the Owner. Sanitary sewer mains shall be constructed consistent with City standards and submitted plans approved by the City of Great Falls. The improvements shall be in accordance with City and Montana Department of Environmental Quality standards and approved plans and specifications. All sewer

service lines shall be stubbed to all lots shown on the final plat during construction of the public improvements. Changes to lot configuration shall require the Owner to dig up and abandon un-needed service lines at the main and rebuild the effected street section at the Owner's expense. Any portion of sewer main located outside of the public right-of-way shall be located in a minimum 20-foot wide public sewer main easement, the location of which shall be approved by the City. The improvement, exclusive of service lines, is to be owned and maintained by the City upon completion.

10.3 Storm Water. The Owner agrees to install stormwater quality, quantity, piping, above ground conveyance features, and pond improvements consistent with City Standards, the City Storm Drainage Design Manual, and approved by the City of Great Falls Public Works Department. The Owner agrees to construct a regional stormwater detention facility or pond sized to accommodate the contributing basin. The pond parcel will be dedicated to the City during the final plat process of the appropriate phase. A City storm drainage easement shall be provided for all off-site storm features including the full pond buildout, the off-site conveyance features to the pond, and access to the off-site features. Access shall be provided to the pond at the first phase. Owner agrees to install minimum 15-foot wide xeriscape conveyance swales to route off-site run on to the designated stormwater conveyance facilities and elsewhere as deemed necessary by the City. The Owner shall install a fenced and gated minimum 15-foot wide gravel maintenance access road and 15-foot wide xeriscape conveyance swale within the City parcel which adjoins the north side of Subject Property. The Owner shall install a gated minimum 15-foot wide gravel maintenance access road and 15-foot wide xeriscape conveyance swale to the pond. Any portion of storm main or surface conveyance feature located outside of the public right-of-way shall be located in a minimum 20-foot wide City storm drainage easement. The improvements are to be owned and maintained by the City upon completion, exclusive of temporary facilities. A fully functional stormwater system shall be in place prior to approval of the final plat of the first phase. Temporary facilities will not be owned or maintained by the City.

10.4 Streets and Sidewalks. The Owner agrees to extend and construct all public streets and avenues necessary to serve the subdivision. This includes the off-site extension of 21st Avenue South to the easterly intersection of 21st Avenue South and 8th Street South. (see attached Exhibit A). Design and installation shall be consistent with City standards and submitted plans approved by the City of Great Falls. Construction of these streets shall include curb, gutter, and sidewalks; however, sidewalks will not be required on 21st Avenue South east of the subject property line. All street improvements are to be owned and maintained by the City upon completion.

The Owner also agrees to extend and construct the connection to the current eastern terminus of 20th Avenue South, including street, curb and gutter and sidewalk on both sides of the street. The sidewalk shall be back-of-curb style leading from the current eastern terminus of 20th Avenue South and transition to boulevard-style sidewalk after the lot-line of the first lot within the subdivision. The back-of-curb portion of sidewalk shall be constructed at the same time as the adjoining street segment. After construction, the City will maintain that portion of sidewalk and boulevard area adjoining the City utility easement. The City and Owner agree that the cost of construction of this portion of 20th Avenue South and sidewalk shall be the full responsibility of the Owner, with no participation from or future reimbursement by the City of Great Falls.

As part of the required infrastructure for Phase 1A, the Owner shall provide a performance bond, or other financial security acceptable to the City, in an amount equal to one hundred thirty-five percent (135%) of the estimated costs associated with the construction of the roadway and vehicle access from 20th Avenue South to 8th Street South via 21st Avenue South. This financial guarantee shall ensure the timely construction of the roadway improvements, including the off-site extension and required connector road.

In the event construction does not commence for Phase 1B, a connector road must still be installed to City standards to provide vehicle access from 20th Avenue South to 8th Street South via 21st Avenue South within five (5) years after the date of this Agreement, unless an extension is granted by the Administrator to the Owner.

11. Reimbursements owed to Owner. Except as set forth herein, the City will assist in obtaining initial reimbursements due from other adjacent or benefitted property owners under this Agreement, however the Owner remains responsible for any legal enforcement of the terms of this agreement as against future benefitted owners. The owner shall provide the city with documentation of its actual out-of-pocket costs of the installation of the hereafter mentioned improvements within four months after approval and acceptance thereof by the City. In the event of Owner's failure to provide the City with said cost data or other required documents, the City shall not be obliged to undertake collection of the reimbursement provided for herein, and the responsibility for collection thereof shall be that of the Owner, its heirs, successors and assigns. Failure of the Owner to provide the City with said cost data for reimbursement as herein required shall in no way alter the obligation of any other party to make reimbursement as provided for herein, said failure will affect only the City's obligation to assist in collection thereof.

11.1 Oversizing. The City shall reimburse the Owner the cost difference of any required over-sizing of public water main, sanitary main, and storm drain improvements. The amount to be reimbursed shall be determined by the Administrator's evaluation of the Owner's actual improvement cost for over-sizing of the pipe, including fittings and valves. The reimbursement amount shall be based on actual quantity of improvements constructed. In the event that the improvement costs are not provided by the Owner or they are determined by the City to be unreasonable, the City will determine the reimbursement amount using standard bid and/or material prices.

11.2 Streets. Proportional reimbursements for the costs of the street design and construction is required from the adjoining beneficiary parcels of the off-site eastern extension of 21st Avenue South and the construction of 20th Avenue South in accordance to the signed Improvement Agreement for Benefis West Minor Subdivision and Amended Plat of St.Peregrine Addition (recording #R000150.) The reimbursement amount shall be based on actual quantity of improvements constructed. In the event that the improvement costs are not provided by the Owner or they are determined by the City to be unreasonable, the City will determine the reimbursement amount using standard bid and/or material prices.

11.3 Regional Stormwater Facility. The Owner shall provide the City with a contributing basin exhibit (see attached Exhibit B) that delineates contributing acreages by parcel. Final proportional cost shares will be based on final construction costs as provided to the City by the Owner. Annexed parcels within the contributing drainage basin which have cost share obligations per their signed

Improvements or Annexation Agreements are to provide their proportional share of the regional stormwater facility based on their contributing acreage as listed below. If these funds are not able to be obtained, the Owner shall be responsible for those costs. Un-annexed parcels that are in the basin will reimburse the Owner a future proportional share in accordance with their contributing acreage at the time of annexation. The City will provide a proportional share for the contributing acreage of the existing or proposed City right of ways and City owned parcels within the basin. The City cost sharing shall not exceed the remaining available funds in the unscheduled development item of the Stormwater Fund at the time of request for payment.

City – Contributing areas of existing and proposed Rights of Way and city owned parcels within the contributing basin – _____ acres as defined in the basin exhibit

Williamson Fence – Contributing areas of this parcel per its signed Annexation Agreement R0201776 GFA - _____ acres as defined in the basin exhibit

Benefis West Subdivision – Contributing areas of this Subdivision per its signed Improvements Agreement R-000150 - _____ acres as defined in the basin exhibit

Hylande Heights Lot 11A, Block 3 – Contributing areas of this parcel which previously were within the Benefis West Subdivision per the Benefis West signed Improvements Agreement (recording number R-000150) - _____ acres as defined in the basin exhibit

Peace Harbor – Contributing areas of this development and the remainder acreage of the basin - _____ acres as defined in basin exhibit

12. Waiver of Protest. Owner agrees to waive protest against the creation of one or more special improvement districts for the construction and maintenance of necessary facilities, including, but not limited to, storm water management facilities, sanitary sewer facilities, sanitary sewer lift stations, roadways and major streets. As with all other provisions of this agreement, this waiver applies to the Binding Effect of Section 20.

13. Warranty, Ownership and Inspection of Public Improvements. The Owner is responsible for the repair or replacement of any faults in the materials or workmanship of the required on-site and off-site public improvements for a period of two years from the date those improvements are accepted for maintenance by the City. This warranty will be enforced by the City receiving 10% of the security required by Section 14 of this Agreement for the two-year warranty period. That sum will be released at the end of two years unless the parties are involved in a dispute about the condition, repair, or replacement of any of the required improvements, in which case funds will be held by the City until that dispute is resolved. The release of warranty funds follow the procedure established in Section 14 of this Agreement for the release of securities.

Installation of all sidewalks, curb ramps, water, sewer, storm drain, and other public improvements for the Subject Property shall be subject to the City's inspection policy in place at the time of installation.

14. Security for Public Improvements. If any public improvements in each construction phase need to be deferred, the Owner shall, provide the City with a performance bond, an irrevocable letter of credit, or another form of security acceptable to the Administrator in an amount equal to one hundred thirty-five percent (135%) of the costs of the required public improvements.

The security required by this section shall be returned or released upon acceptance of the required improvements, except as provided in Section 13. Following the final required inspection and City Approval

of the public improvements, the Director of Public Works shall promptly inform the Administrator, in writing, that all improvements have been inspected and are acceptable for maintenance by the City. If all other improvements relating to the development of the Subject Property are in compliance with all conditions of approval, this Agreement, and the OCCGF, the Administrator shall then instruct the City Clerk to release the security to the Owner, minus the retained portion to be held in warranty as required by Section 13 of this Agreement.

15. Maintenance & Special Improvement Districts. The Owner hereby agrees to waive its right to protest and appeal the lawful creation of maintenance or special improvement districts for any proper purpose including, but not limited to, fire hydrant and street maintenance and shall pay the proportionate share of the costs associated with said maintenance districts as they may be applied to the Subject Property.

16. Park District. Owner acknowledges that the Subject Property is, by operation of law and pursuant to Resolution No. 10238, adopted by the City Commission on June 5, 2018, included within the boundaries of the Great Falls Park District Number 1. Owner acknowledges that property within the Great Falls Park District Number 1, including the Subject Property, is subject to annual assessments for the purposes of the Great Falls Park District Number 1 in amounts to be determined by the City Commission each year, in accordance with Resolution No. 10238, as it may be amended or supplemented.

17. Public Roadway Lighting. The Owner agrees to waive its right to protest and appeal the creation of any future special lighting district for public roadway lighting facilities that service the Subject Property,

18. City Acceptance and Zoning. In consideration of the terms of this Agreement, the City hereby accepts the Subject Property for incorporation by annexation into the corporate limits of the City of Great Falls, Montana, with an assigned City zoning classifications of Planned Unit Development (PUD) for the Subject Property.

19. Limitation of Liability. The City will conduct a limited review of plans and perform inspections for compliance with requirements set forth in this agreement and/or in applicable law. The scope of such review and inspections will vary based upon development type, location and site characteristics. The Owner is exclusively responsible for ensuring that the design, construction drawings, completed construction, and record drawings comply with acceptable engineering practices, State requirements, and other applicable standards. The City's limited plans review and inspections are not substantive reviews of the plans and engineering. The City's approval of any plans or completed inspections is not an endorsement of the plan or approval or verification of the engineering data and plans. Neither the Owner, nor any third party may rely upon the City's limited review or approval.

The Owner shall indemnify, hold harmless and defend the City, its officers, agents, servants and employees and assigns from and against all claims, debts, liabilities, fines, penalties, obligations and costs including reasonable attorney fees, that arise from, result from or relate to obligations relating to the Subject Property described herein including, but not limited to, approval and oversight of the improvements related to development of the Subject Property. This indemnification by the Owner of shall apply unless such damage or injury results from the gross negligence or willful misconduct of the City. Any obligation of the City shall be limited by the amounts set forth in MCA § 2-9-108.

Upon the transfer of ownership of the Lots comprising the Subject Property, the prior owner's (whether it is the Owner that signed this Agreement or a subsequent owner) indemnity obligation herein is released, for the Lots transferred, and the indemnity obligation runs to the new owner of the Lot(s). Only the owner of the Subject Property, or Lot(s) contained therein, with adverse conditions at the time the City incurs the claim, debt, liability, fine, penalty, obligation or cost is obligated to indemnify, and no owner of uninvolved Lot(s) is obligated to indemnify.

20. Future Phase Approvals and Entitlement Contingencies. The Owner acknowledges and agrees that any future phases of the proposed subdivision are subject to, and contingent upon, the Owner obtaining all necessary zoning and subdivision approvals from the City of Great Falls. Approval of this agreement, or the acceptance of Phase 1 infrastructure, shall not be interpreted as approval of any subsequent phase of development, nor shall it be construed to imply or guarantee the granting of future entitlements by the City. All future phases must independently satisfy applicable review procedures, standards, and regulatory requirements.

21. Binding Effect. The provisions, covenants and terms of this Agreement shall run with the land and bind the present owners, their devisees, heirs, successors, and assigns; and any and all parties claiming by, through, or under them, shall be taken to agree and covenant with each of the parties to the Agreement, their devisees, heirs, successors and assigns, to conform to the provisions, covenants and terms of this Agreement.

IN WITNESS WHEREOF, the parties hereto have set their hands and seal the day, month and year first hereinabove written.

THE CITY OF GREAT FALLS, MONTANA

A Municipal Corporation of the State of Montana

_____

Gregory T. Doyon, City Manager

ATTEST:

(Seal of City)

_____

Lisa Kunz, City Clerk

APPROVED FOR LEGAL CONTENT*:

_____

David Dennis, City Attorney

*By law, the City Attorney may only advise or approve contract or legal document language on behalf of the City of Great Falls, and not on behalf of other parties. Review and approval of this document was conducted solely from the legal perspective, and for the benefit, of the City of Great Falls. Other parties should not rely on this approval and should seek review and approval by their own respective counsel.

Karl John Birky

By: _____

Its: _____

State of _____)
:ss.
County of _____)

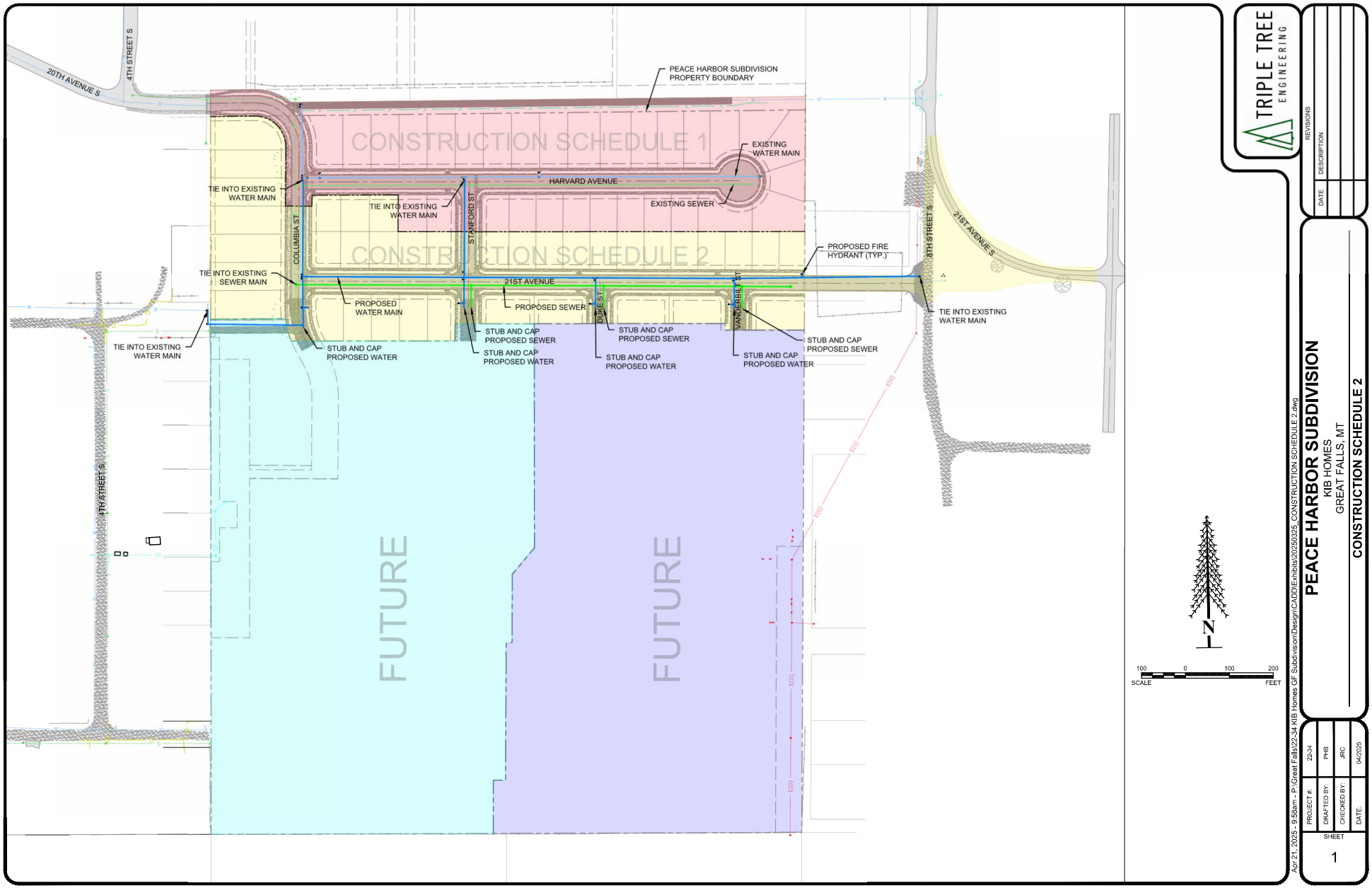
On this _____ day of _____, in the year Two Thousand and Twenty-Five, before me, the undersigned, a Notary Public for the State of _____, personally appeared _____, known to me to the persons whose names are subscribed to the instrument within and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Notarial Seal the day and year first above written.

(NOTARIAL SEAL)

_____
Notary Public

Exhibit A


20TH AVENUE S
4TH STREET S
PEACE HARBOR SUBDIVISION PROPERTY BOUNDARY
CONSTRUCTION SCHEDULE 1
CONSTRUCTION SCHEDULE 2
HARVARD AVENUE
EXISTING WATER MAIN
EXISTING SEWER
TIE INTO EXISTING WATER MAIN
TIE INTO EXISTING WATER MAIN
COLUMBIA ST
STANFORD ST
TIE INTO EXISTING SEWER MAIN
21ST AVENUE
PROPOSED WATER MAIN
PROPOSED SEWER
BLUE ST
VANDERBILT ST
PROPOSED FIRE HYDRANT (TYP.)
8TH STREET S
21ST AVENUE S
TIE INTO EXISTING WATER MAIN
TIE INTO EXISTING WATER MAIN
STUB AND CAP PROPOSED WATER
STUB AND CAP PROPOSED SEWER
STUB AND CAP PROPOSED WATER
STUB AND CAP PROPOSED SEWER
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SCALE
FEET
TRIPLE TREE ENGINEERING
REVISIONS
DATE
DESCRIPTION
PEACE HARBOR SUBDIVISION
KIB HOMES
GREAT FALLS, MT
CONSTRUCTION SCHEDULE 2
PROJECT #: 22-34
DRAFTED BY: PHB
CHECKED BY: JRC
DATE: 04/2025
SHEET
1
Apr 21, 2025 - 9:58am - P:\Great Falls\22-34 KIB Homes GF Subdivision\Design\CADD\Exhibits\20250325_CONSTRUCTION SCHEDULE 2.dwg

BASIS OF DECISION – ANNEXATION

Lot 1 of the Mercedes Minor Subdivision located in the SE1/4 SW1/4 and NE1/4 SW1/4 of Section 13, T20N, R3E, Cascade County, Montana.

PRIMARY REVIEW CRITERIA:

The basis for decision on annexation is listed in the Official Code of the City of Great Falls (OCCGF) § 17.16.7.050 of the Land Development Code. The recommendation of the Planning Advisory Board and the decision of the City Commission shall at a minimum consider the following criteria:

1. The subject property is contiguous to the existing City limits.

The subject property is contiguous to the existing City limits, with previously annexed property present to the west, north, and east of the proposed annexation.

2. The proposed annexation is consistent with the City's growth policy.

The proposed project is substantially consistent with the overall intent and purpose of the City of Great Falls 2013 Growth Policy Update. The proposal to annex and assign the zoning of PUD for the proposed property will allow the developer to construct a single-family residential development. Staff finds the City's Growth Policy supports the proposed zoning map amendment to facilitate higher density development upon a partial infill parcel, providing much-needed attainable housing. The proposed project is consistent with several of the Plan's policies including:

Social – Housing (page 134)

Soc1.4.2 Expand the supply of residential opportunities including single-family homes, apartments, manufactured homes, and assisted living facilities.

Soc1.4.3 Support the development of affordable housing in all neighborhoods to ensure geographic dispersal and reduce concentrations of poverty.

Soc1.4.6 Encourage a variety of housing types and densities so that residents can choose by price or rent, location, and place of work.

Economic – Community Vitality (pages 157-158)

Eco3.7.2 Encourage reinvestment in older neighborhoods and infill housing to support existing services and commercial districts.

Eco3.4.3 Support quality of life investments such as recreation, housing, and amenities that help attract and retain the workforce. (page 155)

Physical - Land Use (page 162)

Phy4.1.4 Foster the development of safe, walkable neighborhoods with a mix of uses and diversity of housing types.

Phy4.1.5 Encourage and incentivize the redevelopment or adaptive reuse of vacant or underutilized properties so as to maximize the City's existing infrastructure.

Phy4.3.1 Support development patterns that optimize existing City utilities and limit the extension of public infrastructure. (page 166)

In conclusion, the proposed project will enable these policies to be addressed and further the implementation of the Growth Policy.

3. The proposed annexation is consistent with applicable neighborhood plans, if any.

The subject property is located adjacent to Neighborhood Council #6. There is no adopted neighborhood plan for Neighborhood Council #6, nor any other Council within the City. Neighborhood Council #6 discussed the project at their May 7th, 2025, meeting. The Council voted unanimously to support the request.

4. The proposed annexation is consistent with other planning documents adopted by the City Commission, including a river corridor plan, transportation plan, and sub-area plans.

The subject property is not located within any adopted plan or sub-area planning areas.

5. The City has, or will have, the capacity to provide public services to the subject property.

The City Public Works Department has verified that capacity is adequate to provide public utility services to the subject property. A more detailed description of the various public utility services that will be provided to the development has been outlined in the agenda report as well as in the Improvement Agreement. Additionally, the City has the ability to provide public emergency services to the subject property. Lastly, the proposed annexation will result in the construction of 66 single-family homes that will generate traffic onto the existing City of Great Falls transportation network. The existing roads can accommodate the additional traffic generated from the project.

6. The subject property has been or will be improved to City standards.

The proposed annexation includes a 66 lot subdivision. These lots and supporting infrastructure, including roads, will be developed to applicable City standards, requirements detailed in the Improvement Agreement, and standards provided within the proposed Planned Unit Development.

7. The owner of the subject property will bear all of the cost of improving the property to City standards and or/ the owner has signed an agreement waiving the right of protest to the creation of a special improvement district created to pay, in whole or in part, any necessary improvement.

An Improvement Agreement for the subject property has been drafted outlining the responsibilities and proportionate shares of costs for various improvements. The Improvement Agreement has been attached to the agenda report. This Improvement Agreement addresses the creation of any special improvement.

8. The subject property has been or will be surveyed and officially recorded with the County Clerk and Recorder.

The subject property has been surveyed as part of the Mercedes Minor Subdivision. In addition, a preliminary plat is provided as part of the request to annex and proposed to subdivide the subject property into 66 single-family lots. The preliminary plat is required to be reviewed by City staff and the City Commission. A final plat will be recorded with the Cascade County Clerk and Recorder.

9. **The City will provide both water and sewer service to each of the uses in the subject property that may require potable water and waste water treatment and disposal.**

Public improvements for City water and City sewer services are required of the project. Timing and obligations are detailed within the agenda report as well as in the Improvement Agreement.

10. **The subject property is not located in an area the City Commission has designated as unsuitable for annexation.**

The subject property is not located in an area the City Commission has designated as unsuitable for annexation.

11. **The subject property is not located in another city or town. (See: 7-2-4608 (1), MCA)**

The subject property is not located in another city or town.

12. **The subject property is not used in whole or in part for agriculture, mining, smelting, refining, transportation, or any other industrial or manufacturing purpose or any purpose incidental thereto. (See: 7-2-4608 (2), MCA)**

The subject property is not used for the uses listed above. The tract of land is contiguous to the City limits and has always been considered a logical extension of the City's urban area

FINDINGS OF FACT – PLANNED UNIT DEVELOPMENT

Lot 1 of the Mercedes Minor Subdivision located in the SE1/4 SW1/4 and NE1/4 SW1/4 of Section 13, T20N, R3E, Cascade County, Montana.

PRIMARY REVIEW CRITERIA:
The basis of decision for Planned Unit Development (PUD) is listed in Official Code of the City of Great Falls § 17.16.29.050 of the Land Development Code. The recommendation of the Zoning Commission and the decision of City Commission shall at a minimum consider the following criteria:

1. The development project is consistent with the City's growth policy
The proposed project is substantially consistent with the overall intent and purpose of the City of Great Falls 2013 Growth Policy Update. The proposal to annex and assign the zoning of PUD for the proposed property will allow the developer to construct a single-family residential development. Staff finds the City's Growth Policy supports the proposed zoning map amendment to facilitate higher density development upon a partial infill parcel, providing much-needed attainable housing. The proposed project is consistent with several of the Plan's policies including:

Social – Housing (page 134)

Soc1.4.2 Expand the supply of residential opportunities including single-family homes, apartments, manufactured homes, and assisted living facilities.

Soc1.4.3 Support the development of affordable housing in all neighborhoods to ensure geographic dispersal and reduce concentrations of poverty.

Soc1.4.6 Encourage a variety of housing types and densities so that residents can choose by price or rent, location, and place of work.

Economic – Community Vitality (pages 157-158)

Eco3.7.2 Encourage reinvestment in older neighborhoods and infill housing to support existing services and commercial districts.

Eco3.4.3 Support quality of life investments such as recreation, housing, and amenities that help attract and retain the workforce. (page 155)

Physical - Land Use (page 162)

Phy4.1.4 Foster the development of safe, walkable neighborhoods with a mix of uses and diversity of housing types.

Phy4.1.5 Encourage and incentivize the redevelopment or adaptive reuse of vacant or underutilized properties so as to maximize the City's existing infrastructure.

Phy4.3.1 Support development patterns that optimize existing City utilities and limit the extension of public infrastructure. (page 166)

In conclusion, the proposed project will enable these policies to be addressed and further the implementation of the Growth Policy.

2. The development project is consistent with applicable neighborhood plans, if any

The subject property is located adjacent to Neighborhood Council #6. There is no adopted neighborhood plan for Neighborhood Council #6, nor any other Council within the City. Neighborhood Council #6 discussed the project at their May 7th, 2025, meeting. The Council voted unanimously to support the request.

3. The establishment, maintenance, or operation of the development project will not be detrimental to, or endanger the public health, safety, morals, comfort or general welfare;

There are no existing public health, safety, or welfare issues that have been identified for the subject property. The zoning assignment of a PUD will have no impact on these issues. The surrounding area already within the City limits is currently receiving law enforcement and fire protection service from the City of Great Falls. Providing these services to the subdivision is not expected to have a negative effect on public health and safety.

4. The development project will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood;

The proposed PUD includes a mix of single-family housing lot sizes and provides two access to the development, improving neighborhood connectivity. The development project fits the context of the surrounding area and land uses. The development project will not negatively impact the use and enjoyment of nearby properties, nor will it substantially diminish or impair property values in the surrounding area.

5. The development project will not impede the normal and orderly development and improvement of the surrounding property for uses permitted in the district;

The proposed project is not expected to impede the normal and orderly development or improvement of surrounding properties. The surrounding area includes a mix of land uses, including residential, commercial, and light-industry properties. The development project fits harmoniously with the surrounding area.

6. The proposed design of the building and other structures are compatible with the desired character of the neighborhood;

The proposed buildings and structures are single-family residences, which are compatible with the character of the neighborhood. Maximum building heights and lot coverage requirements are provided within the PUD standards to ensure the development fits within the context of the surrounding area.

7. Adequate utilities, access roads, drainage and/or necessary facilities have been or are being provided;

The City Public Works Department has verified that capacity is adequate to provide public utility services to the subject property. A more detailed description of the various public utility services

that will be provided to the development has been outlined in the agenda report as well as in the Improvement Agreement. The development will be accessed from two points—20th Avenue South and 21st Avenue South—enhancing overall connectivity. Additionally, the City has the ability to provide public emergency services to the subject property, as the subject property is within an area served by Great Falls Fire Rescue and Great Falls Police Department.

8. Adequate measures have been or will be taken to provide ingress and egress so as to minimize traffic congestion in the public streets.

A 66-lot single-family subdivision is proposed east of 20th Avenue South, extending toward the Highland Park subdivision and 21st Avenue South. The development will connect to local streets at 20th Avenue South (northwest) and 21st Avenue South (east), which provide access to nearby Collector streets. Based on the ITE Trip Generation Manual *(Source: ITE Trip Generation Manual, 11th Ed.)*, the subdivision is expected to generate approximately 623 vehicle trips per weekday and 66 trips during the peak afternoon hour at full buildout. Projected traffic volumes are relatively low and can be accommodated by the existing local road network.

FINDINGS OF FACT – SUBDIVISION

For the proposed Peace Harbor Phase 1 Major Subdivision legally described as Lot 1 of the Mercedes Minor Subdivision located in the SE1/4 SW1/4 and NE1/4 SW1/4 of Section 13, T20N, R3E, Cascade County, Montana.

PRIMARY REVIEW CRITERIA:

The basis for decision on subdivision is listed in the Official Code of the City of Great Falls § 17.16.26.040 of the Land Development Code. The recommendation of the Planning Advisory Board and the decision of the City Commission to approve, conditionally approve, or deny an application shall be based on whether the application, preliminary plat or minor plat, environmental assessment and public hearing, if applicable, or additional information demonstrates that the proposed subdivision:

1. meets the standards of this Title and the Montana Subdivision and Platting Act (Title 76, Chapter 3, MCA);
2. is consistent with the City's zoning regulations and covenants, if any (See: 76-3-608(1), MCA); and
3. is in the public interest.

Staff has determined the request meets the standards listed above and is consistent with the City's zoning regulations. Additionally, to determine whether the proposal would be in the public interest, the governing body shall weigh and make specific findings regarding each of the following criteria:

1. **Effects on agriculture:** The subject property has not recently been used for agriculture. Agricultural use in the vicinity of the subject property has not occurred due to land being within the urban envelope of the City. The proposed subdivision and development do not interfere with agricultural operations in the area.

2. **Effects on agricultural water-user facilities:** There is not an agricultural water user facility in the area that the proposed development will interfere with.

3. **Effects on local services:** Staff has reviewed the effects on local services and determined the City can accommodate the proposed subdivision and development.

   The existing public road system has sufficient capacity to accommodate the traffic that would be generated by the proposed development. The nearest fire station, Station #1, is approximately 1.8 miles away from the subject property. The surrounding area within the City limits is currently receiving law enforcement and fire protection service from the City of Great Falls. Providing these services to the subdivision is expected to be a manageable cost to the City and increased tax revenues from improved properties may cover increased costs.

   The developer will extend and connect to City water and sewer mains. The Owner will pay

the cost of extending these utility mains. The occupants of the single-family residences within the subdivision are responsible for the cost of private service connections to City mains and they will pay regular water and sewer charges, and monthly storm drain charges.

4. **Effects on the natural environment:** The subdivision is not expected to adversely affect the natural environment. The project will have to provide stormwater quantity and quality features to ensure discharge from the project does not negatively impact the water quality. This will come in the form of construction of a regional stormwater detention facility or pond sized to accommodate the contributing basin. In addition, the project will not adversely impact soils or soil erosion, vegetation and air pollution, or noxious weeds.
5. **Effects on wildlife and wildlife habitat:** The proposed subdivision is not in an area of significant wildlife habitat beyond occasional grazing deer or migrating fowl. This subdivision will not result in closure of public access to hunting or fishing areas, nor to public lands.

6. **Effects on public health and safety:** As stated in criteria #3 above, the surrounding area already within the City limits is currently receiving law enforcement and fire protection service from the City of Great Falls. Providing these services to the subdivision is not expected to have a negative effect on public health and safety. The subject property is not within a wildland fire hazard area, or exposed to the presence of other known hazards.

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

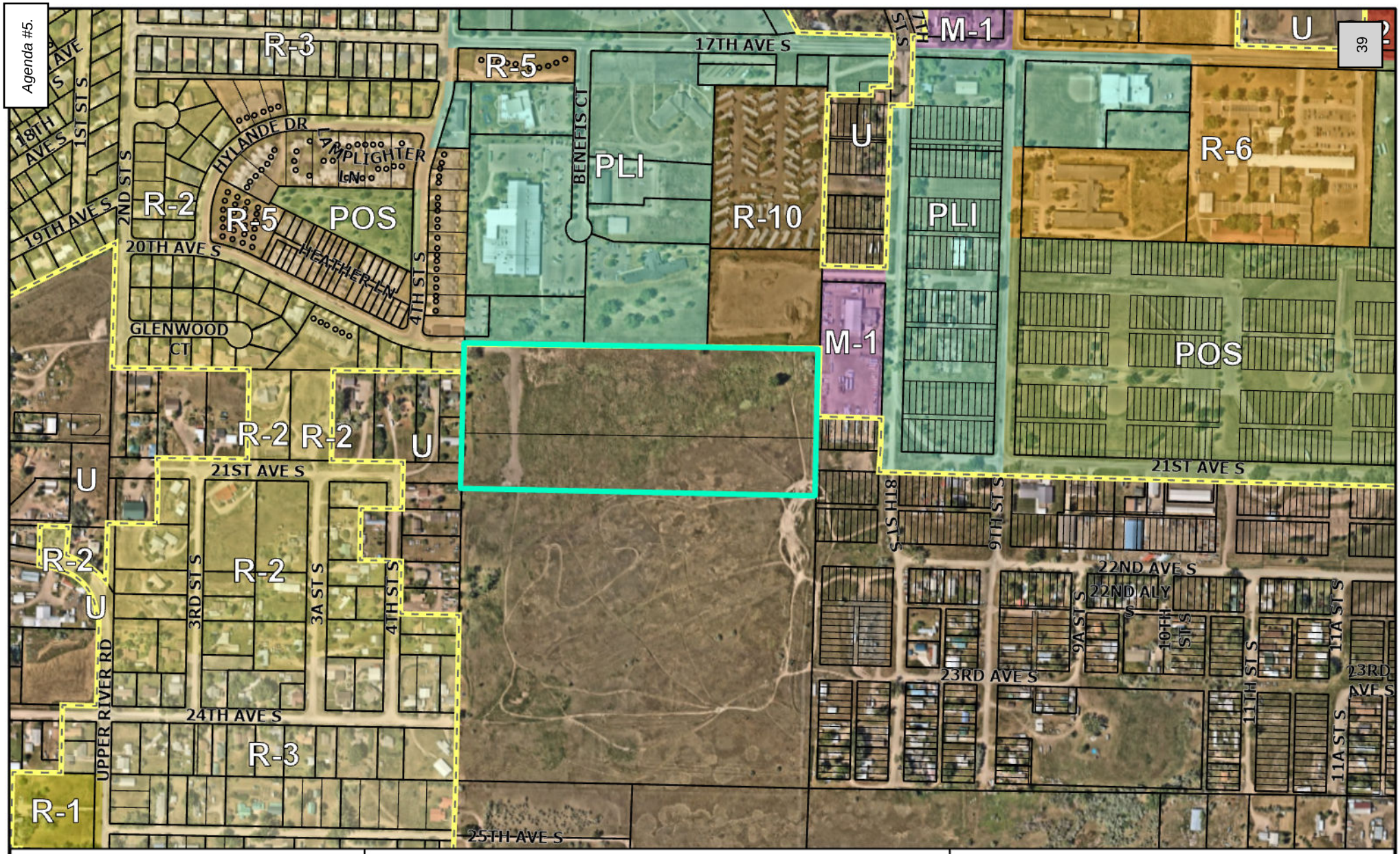
The subdivision meets the requirements of the Montana Subdivision and Platting Act and the surveying requirements specified in the Uniform Standards for Monumentation, and conforms to the design standards specified in the local subdivision regulations. The local government has complied with the subdivision 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, stormwater mains, and private utilities to serve all lots of the subdivision.

LEGAL AND PHYSICAL ACCESS

The proposed subdivision will be legally accessed by 20th Avenue South and 21st Avenue South, connections the developer has agreed to construct, including street, curb, gutter, and sidewalk. As part of the agreement, the developer will construct all necessary public streets and avenues to serve the subdivision, including the off-site extension of 21st Avenue South to its intersection with 8th Street South. All new streets will include curb and gutter, with sidewalks and boulevard landscaping installed throughout the development to support a walkable, attractive neighborhood environment.



CITY OF GREAT FALLS MONTANA

Location Map

Peace Harbor Subdivision

City Addresses
City Streets
Boulevards
City Limit
Lot Lines
Parcels

N

0 50 100 200 Feet

January 2025

Planning & Community Development Department
City of Great Falls
P.O. Box 5021
Great Falls, MT 59403

RE: Peace Harbor PUD Narrative

Nestled within the picturesque landscapes of Great Falls, Montana, Peace Harbor Subdivision emerges as a diverse planned urban development that seamlessly blends modern living with the region's natural beauty. Designed to enhance the quality of life for residents and foster a sense of community, this development seeks to create a harmonious balance between urban conveniences and serene surroundings. The developer is requesting a PUD to better fit the need for housing that Great Falls is in dire need of. Creating a higher density of units and options of lot and housing sizes will allow more citizens access to housing.

A site sensitive design layout works with the existing landscapes, streets that follow the natural contours of the land, this will aid in the look and feel while also assisting in the movement of storm water.

The Lot Layout of Peace Harbor Subdivision will boast a diverse range of sizes to accommodate a larger range of buyers. As this is a need in Great Falls, the hope is that more citizens will have the opportunity to own a home.

Architectural styles that pay homage to Montana's heritage while offering modern comforts. Rustic elements, such as stone accents and wood finishes, will evoke a sense of warmth, while contemporary design features ensure that homes are equipped with energy-efficient technologies and sustainable building materials.

An Economic Boost, the development also holds the potential to boost the local economy by creating jobs during construction and attracting new businesses once completed.

Thank You!

Sincerely,

Triple Tree Engineering, Inc.

PEACE HARBOR SUBDIVISION – PHASE 1 (PRELIMINARY PLAT)

LOCATED IN: SW1/4 OF SECTION 13 T20N, R03E, P.M. MT, CASCADE COUNTY, MONTANA
PURPOSE: 66 LOT MAJOR SUBDIVISION
COMMISSIONED BY: KARL JOHN BIRKY
OWNER: KARL JOHN BIRKY

CERTIFICATE OF SURVEY:
WE, THE UNDERSIGNED PROPERTY OWNERS, DO HEREBY CERTIFY THAT WE HAVE CAUSED TO BE SURVEYED, SUBDIVIDED AND PLATTED INTO BLOCKS, LOTS AND EASEMENTS, AS SHOWN BY THE ATTACHED PLAT, THE TRACT OF LAND TO BE KNOWN AS THE PLAT OF PEACE HARBOR SUBDIVISION –PHASE 1, TO THE CITY OF GREAT FALLS, A SUBDIVISION IN THE SW1/4 OF SECTION 13, T20N, R03E P.M. MONTANA, CASCADE COUNTY, MONTANA MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF LOT 1 OF MERCEDES MINOR SUBDIVISION; THENCE S00°17'25"W, 501.03 FEET ALONG THE EAST LINE OF SAID MERCEDES MINOR SUBDIVISION; THENCE S89°57'28"W, 180.00 FEET; THENCE N00°17'25"E, 15.24 FEET; THENCE S89°57'28"W, 615.01 FEET; THENCE S00°17'25"W, 39.17 FEET; THENCE S89°57'28"W, 372.52' FEET; THENCE ALONG A NON–TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 205.00 FEET, ARC LENGTH OF 50.25 FEET, DELTA ANGLE OF 14°02'42", CHORD BEARING OF N14°29'31"W AND CHORD DISTANCE OF 50.13 FEET; THENCE S89°36'51"W, 170.96 FEET TO THE WEST LINE OF SAID MERCEDES MINOR SUBDIVISION; THENCE N00°02'59"W, 523.16 FEET ALONG THE WEST LINE OF SAID MERCEDES MINOR SUBDIVISION TO THE SOUTH LINE OF LOT 11A, BLOCK 3 OF HYLANDE HEIGHTS ADDITION; THENCE N89°21'13"E, 100.55 ALONG THE SOUTH LINE OF SAID LOT 11A AND LOT 3BC, BLOCK 1 OF BENEFIS WEST ADDITION; THENCE ALONG A NON–TANGENT CURVE THE RIGHT HAVING A RADIUS OF 130.00 FEET, ARC LENGTH OF 129.81 FEET, DELTA ANGLE OF 57°12'39", CHORD BEARING OF S61°49'49"E AND CHORD DISTANCE OF 124.48 FEET TO THE NORTH LINE OF SAID LOT 1 OF MERCEDES MINOR SUBDIVISION; THENCE N89°21'13"E, 1143.95 FEET ALONG THE NORTH LINE OF SAID LOT 1 OF MERCEDES MINOR SUBDIVISION TO THE POINT OF BEGINNING. SAID TRACT OF LAND CONTAINS 15.48 ACRES MORE OR LESS AND IS SUBJECT TO ALL EXISTING EASEMENTS, EASEMENTS SHOWN ON PLAT AND DOCUMENTS OF RECORD.

CERTIFICATE OF ACKNOWLEDGEMENT/APPROVAL

(1) THE UNDERSIGNED HEREBY GRANTS UNTO EACH AND EVERY PERSON, FIRM OR CORPORATION, WHETHER PUBLIC OR PRIVATE, PROVIDING OR OFFERING TO PROVIDE TELEPHONE, TELEGRAPH, ELECTRIC POWER, GAS, CABLE TELEVISION, WATER OR SEWER SERVICE TO THE PUBLIC, THE RIGHT TO THE JOINT USE OF AN EASEMENT FOR THE CONSTRUCTION, MAINTENANCE, REPAIR AND REMOVAL OF THEIR LINES AND OTHER FACILITIES, IN, OVER, UNDER AND ACROSS EACH AREA DESIGNATED ON THIS PLAT AS "UTILITY EASEMENT" TO HAVE AND HOLD FOREVER, TOGETHER AS DEFINED BY MONTANA LAW AND WITH THE FOLLOWING CONDITIONS: (A) NO PERMANENT STRUCTURES MAY BE PLACED ON THE EASEMENT: (B) FEATURES SUCH AS FENCING OR LANDSCAPING ARE SUBJECT TO BE TORN UP FOR MAINTENANCE NEEDS.

(2) WEED MANAGEMENT WILL BE THE RESPONSIBILITY OF THE INDIVIDUAL PROPERTY OWNERS WITHIN THE SUBDIVISION.

(3) THE UNDERSIGNED HEREBY CREATES A 10' WIDE UTILITY EASEMENT AS SHOWN AND DEPICTED ON PLAT.

(4) THE UNDERSIGNED HEREBY CREATES A 20' WIDE STORMWATER EASEMENT AS SHOWN AND DEPICTED ON PLAT.

(4) THE UNDERSIGNED HEREBY DEDICATE COLUMBIA STREET, HARVARD AVENUE, DUKE STREET, 21ST AVENUE SOUTH AND VANDERBILT STREET AS SHOWN AND DEPICTED ON PLAT TO THE CITY OF GREAT FALLS AS A CITY STREET.

UNDER PENALTIES OF PERJURY, WE DECLARE THAT WE HAVE EXAMINED THIS FINAL PLAT OF THE PROPOSED DIVISION OF LAND, AND TO THE BEST OF OUR KNOWLEDGE AND BELIEF, IT IS TRUE, CORRECT, COMPLETE AND IS IN COMPLIANCE WITH ALL STATE LAWS AND LOCAL REGULATIONS.

_____ _____
OWNER: KARL JOHN BIRKY (LOT 1 MERCEDES MINOR SUBDIVISION)

STATE OF MONTANA, COUNTY OF CASCADE
ON THIS _____ DAY OF _____, 20___, _____
PERSONALLY APPEARED BEFORE ME AND HAVING BEEN DULY SWORN DID HEREIN EXECUTE THE ABOVE INSTRUMENT FOR THE PURPOSES STATED.

_____
PRINTED NAME OF NOTARY

NOTARY PUBLIC FOR THE STATE OF _____

RESIDING AT_____

MY COMMISSION EXPIRES_____, 20___

_____ _____ _____
OWNER: CITY OF GREAT FALLS (REEL 100, DOC. 1068) TITLE

STATE OF MONTANA, COUNTY OF CASCADE
ON THIS _____ DAY OF _____, 20___, _____
PERSONALLY APPEARED BEFORE ME AND HAVING BEEN DULY SWORN DID HEREIN EXECUTE THE ABOVE INSTRUMENT FOR THE PURPOSES STATED.

_____
PRINTED NAME OF NOTARY

NOTARY PUBLIC FOR THE STATE OF _____

RESIDING AT_____

MY COMMISSION EXPIRES_____, 20___

_____ _____ _____
OWNER: GREAT FALLS ATHLETIC CLUB LLC TITLE
(LOT 3BC, BLOCK 1 BENEFIS WEST ADDITION)

STATE OF _____, COUNTY OF _____
ON THIS _____ DAY OF _____, 20___, _____
PERSONALLY APPEARED BEFORE ME AND HAVING BEEN DULY SWORN DID HEREIN EXECUTE THE ABOVE INSTRUMENT FOR THE PURPOSES STATED.

_____
PRINTED NAME OF NOTARY

NOTARY PUBLIC FOR THE STATE OF _____

RESIDING AT_____

MY COMMISSION EXPIRES_____, 20___

CERTIFICATE OF PUBLIC WORKS DIRECTOR:
I, PAUL SKUBINNA, PUBLIC WORKS DIRECTOR FOR THE CITY OF GREAT FALLS, MONTANA DO HEREBY CERTIFY THAT I HAVE EXAMINED THE ACCOMPANYING PEACE HARBOR SUBDIVISION, PHASE I AND THE SURVEY IT REPRESENTS. I FIND THAT IT CONFORMS TO REGULATIONS GOVERNING THE PLATTING OF LANDS AND PRESENTLY PLATTED ADJACENT LANDS, AS NEAR AS CIRCUMSTANCES WILL PERMIT. I HEREBY APPROVE THIS PLAT.

DATED THIS, _____DAY OF _____, 20__

_____
PAUL SKUBINNA, PUBLIC WORKS DIRECTOR, CITY OF GREAT FALLS

CERTIFICATE OF CITY COMMISSION:
I, GREGORY T. DOYON, CITY MANAGER FOR THE CITY OF GREAT FALLS, MONTANA DO HEREBY CERTIFY THAT THE ACCOMPANYING PEACE HARBOR SUBDIVISION, PHASE I AND THE SURVEY IT REPRESENTS WAS DULY EXAMINED AND APPROVED BY THE COMMISIONOF THE CITY OF GREAT FALLS, MONTANA AT ITS REGULAR MEETING HELD ON THE ___ DAY _____, 2023

_____
GREGORY T. DOYON, CITY MANAGER, CITY OF GREAT FALLS, MONTANA

CERTIFICATE OF AVAILABLE MUNICIPAL SERVICES:
I, GREGORY T. DOYON, CITY MANAGER FOR THE CITY OF GREAT FALLS, MONTANA DO HEREBY CERTIFY THAT THE CITY COMMISSION OF THE CITY OF GREAT FALLS, MONTANA AT IT'S REGULAR MEETING HELD ON THE ___ DAY OF _____, 20__ FOUND THAT ADEQUATE MUNICIPAL FACILITIES FOR THE WATER AND THE DISPOSAL OF SEWAGE AND SOLID WASTE ARE AVAILABLE TO THE ABOVE DESCRIBED PROPERTIES, NAMELY THE SAID FACILITIES OF THE CITY OF GREAT FALLS, MONTANA. THIS CERTIFICATE IS MADE PURSUANT TO SECTION 76–4–125(1)(d) M.C.A. AND PERMITS THE OFFICE OF 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, DO HEREBY CERTIFY THAT THE ACCOMPANYING PEACE HARBOR SUBDIVISION, PHASE I AND THE SURVEY IT REPRESENTS HAS BEEN SUBMITTED TO THE GREAT FALLS PLANNING BOARD FOR EXAMINATION BY THEM AND THE SAME WAS APPROVED AT ITS REGULAR MEETING HELD ON THE ___ DAY OF _____, 20__

_____ _____
DAVID BERTELSEN, PRESIDENT, GREAT FALLS PLANNING BOARD CRAIG RAYMOND, SECRETARY, GREAT FALLS PLANNING BOARD

CERTIFICATE OF SURVEYOR

I, THE UNDERSIGNED, JUSTIN STEFANIK, PROFESSIONAL LAND SURVEYOR, DO HEREBY CERTIFY THAT THIS CERTIFICATE OF SURVEY WAS SURVEYED UNDER MY SUPERVISION AND DESCRIBED AS SHOWN ON THE ACCOMPANYING PLAT AND PLATTED IN ACCORDANCE WITH THE PROVISION OF THE MONTANA SUBDIVISION AND PLATTING ACT, SECTION 76–3–101 THROUGH 76–3–625, MCA, AND THE CITY OF GREAT FALLS SUBDIVISION REGULATIONS.

DATED THIS _____ DAY OF _____, 20__.

_____
JUSTIN STEFANIK, PLS
MT REG. NO. 32881LS

CERTIFICATE OF COUNTY TREASURER:
I, DIANE HEIKKILA, COUNTY TREASURER OF CASCADE COUNTY, MONTANA HEREBY CERTIFY PURSUANT TO SECTION 76–3–207(3), M.C.A. THAT ALL REAL PROPERTY TAXES ASSESSED AND LEVIED ON THE LAND DESCRIBED HEREIN HAVE BEEN PAID.

LOT 1 OF MERCEDES MINOR SUBDIVISION
ASSESSMENT CODE: 0002422300 GEOCODE: 02–3015–13–3–02–01–0000

LOT 3BC, BLOCK 1, BENEFIS WEST ADDITION
ASSESSMENT CODE: 0001485415 GEOCODE: 02–3015–13–3–11–13–0000

REEL 100, DOC. No. 1068 (CITY OF GREAT FALLS)
ASSESSMENT CODE: N/A GEOCODE: N/A

DATED THIS, ___ DAY OF _____, 20__

_____
DIANE HEIKKILA, COUNTY TREASURER, CASCADE COUNTY

P.M. MONTANA,
CASCADE COUNTY

1/4	SEC.	T.	R.
⊠	13	20N	03E

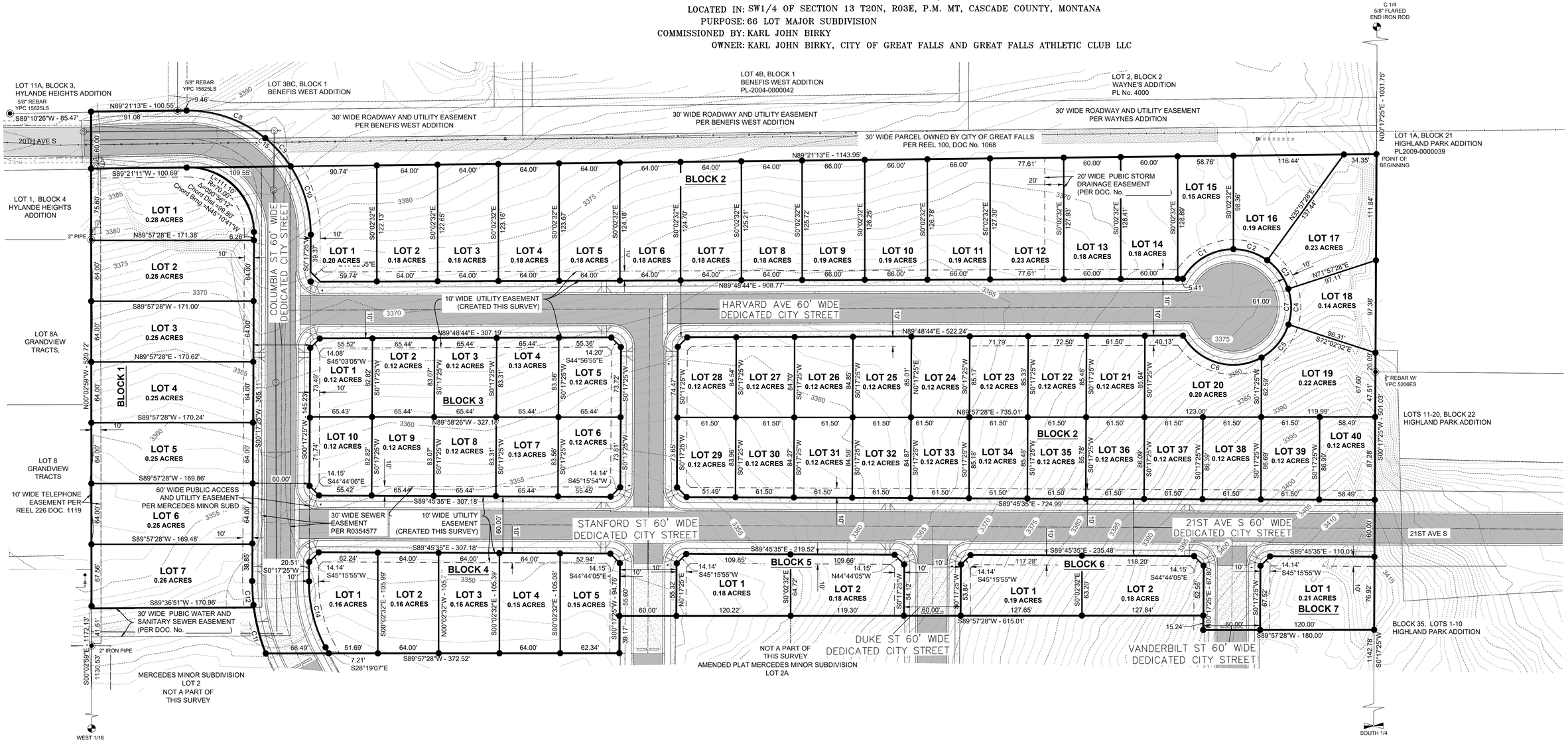
KLJ
2969 Airport Road
Helena, MT 59601
(406) 449-7764
www.kljeng.com

SHEET 1 OF 2 Field Book:

DRWN. BY	CHK'D BY	PROJECT NO.	DATE
CEM	JWS	2224-01707	6/19/2025

PEACE HARBOR SUBDIVISION – PHASE 1 (PRELIMINARY PLAT)

LOCATED IN: SW1/4 OF SECTION 13 T20N, R03E, P.M. MT, CASCADE COUNTY, MONTANA
PURPOSE: 66 LOT MAJOR SUBDIVISION
COMMISSIONED BY: KARL JOHN BIRKY
OWNER: KARL JOHN BIRKY, CITY OF GREAT FALLS AND GREAT FALLS ATHLETIC CLUB LLC



NOTES:
FIELD WORK STARTED AUGUST 2024 AND COMPLETED IN _____ 2025.

LEGEND

- 1/4 CORNER 2.5" BRASS CAP
- 1/16 CORNER 2" PIPE
- FOUND 5/8" PROPERTY CORNER AS DESCRIBED
- SET 5/8"x24" REBAR WITH YPC 32881LS
- (R) RECORD DIMENSION PER MERCEDES MINOR SUBDIVISION
- YPC YELLOW PLASTIC CAP
- TELEPHONE PEDESTAL
- SANITARY MANHOLE
- TELEPHONE LINE
- SANITARY SEWER LINE
- WATER LINE
- EASEMENT CREATED THIS SURVEY
- EXISTING EASEMENT

PARCEL CURVE DATA					
SEGMENT	LENGTH	RADIUS	DELTA	CHORD DISTANCE	CHORD BEARING
C1	64.76	61.00'	60°49'46"'	61.76'	N 59°41'10" E
C2	38.11	61.00'	35°47'39"'	37.49'	S 72°00'07" E
C3	38.13	61.00'	35°49'05"'	37.52'	S 36°11'46" E
C4	38.23	61.00'	35°54'41"'	37.61'	S 00°19'52" E
C5	45.99	61.00'	43°11'43"'	44.91'	S 39°13'20" W
C6	95.32	61.00'	89°32'00"'	85.91'	N 74°24'49" W
C7	320.55	61.00'	301°04'54"'	60.00'	S 00°11'16" E
C8	89.63	130.00'	39°30'19"'	87.87'	S 70°40'59" E
C9	40.18	130.00'	17°42'27"'	40.02'	S 42°04'37" E
C10	76.04	130.00'	33°30'48"'	74.96'	S 16°27'59" E
C11	50.25	205.00'	14°02'42"'	50.13'	N 14°29'31" W
C12	27.76	205.00'	7°45'35"'	27.74'	N 03°35'22" W
C14	72.40	145.00'	28°36'32"'	71.65'	S 14°00'51" E
C15	129.81	130.00'	57°12'45"'	124.48'	S 61°49'46" E

AREA	
STREETS	4.57 ACRES
LOTS	10.09 ACRES
TOTAL	15.48 ACRES

BASIS OF BEARING:
GEODETIC NORTH: BASED UPON G.P.S. OBSERVATIONS AT
N47°28'56.73270"
W111°17'44.49230"

P.M. MONTANA, CASCADE COUNTY

1/4	SEC.	T.	R.
	13	20N	03E

KLJ
2969 Airport Road
Helena, MT 59601
(406) 449-7764
www.kljeng.com

SHEET 2 OF 2 | Field Book:

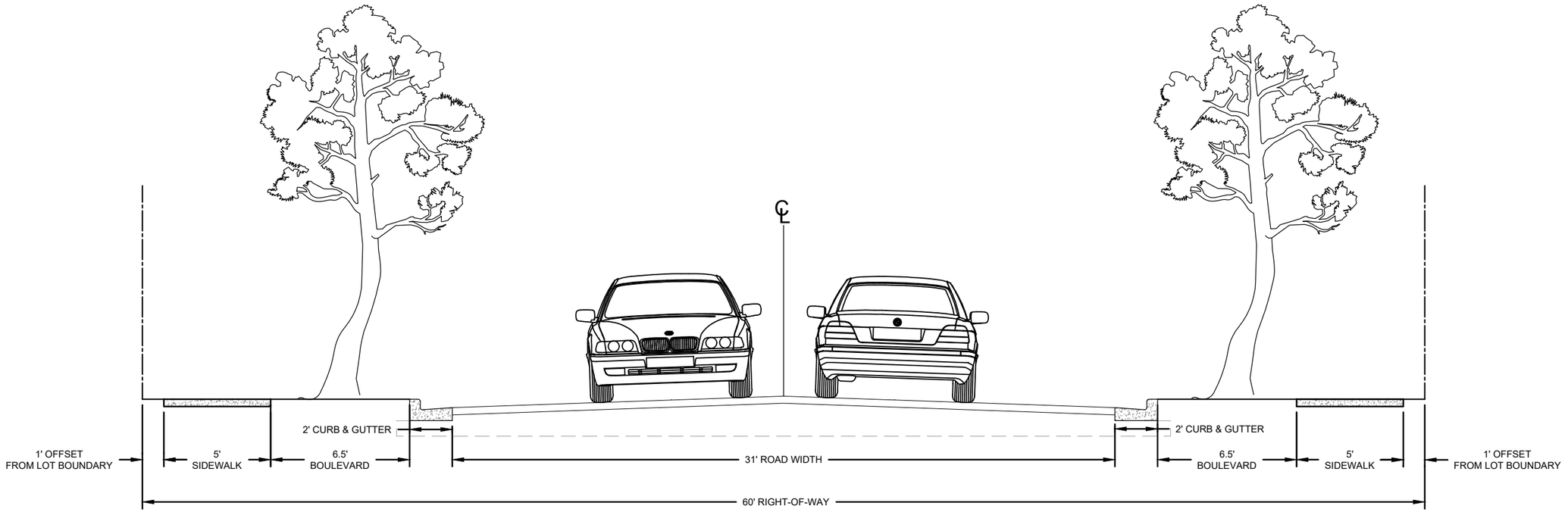
DRWN. BY	CHK'D BY	PROJECT NO.	DATE
CEM	JWS	2224-01707	6/19/2025

PEACE HARBOR SUBDIVISION

TABLE 1 PER LOT DEVELOPMENT STANDARDS

STANDARD	PUD	R-3
Residential density	NA	NA
Minimum lot size for newly created lots	**5,000 square feet**	7,500 square feet
Minimum lot width for newly created standard lots	60 feet	60 feet
Minimum lot width for newly created cottage lots	**50 feet**	
Minimum lot width for newly created CUL-DE-SAC lots	**32 feet** (FACING CUL-DE-SAC)	60 feet
Lot proportion for newly created standard lots (maximum depth to width)	**5:1**	2.5:1
Lot proportion for newly created cottage lots (maximum depth to width)	**2.5:1**	2.5:1
Lot proportion for newly created CUL-DE-SAC lots (maximum depth to width)	**5.5:1**	2.5:1
Maximum building height of principal building	35 feet	35 feet
Maximum building height of detached garage	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
Maximum building height of other accessory structures and buildings	12 feet	12 feet
Minimum front yard setback for standard lots	20 feet	20 feet
Minimum front yard setback for cottage lots	20 feet	20 feet
Minimum front yard setback for CUL-DE-SAC	20 feet	20 feet
Minimum rear yard setback for standard lot	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
Accessory structures and buildings minimum rear yard setback	2 feet	2 feet
Minimum side yard setback	Principal building: 6 feet each side; accessory building: 2 feet provided the front of the building is at least 40 feet from the front lot line	Principal building: 6 feet each side; accessory building: 2 feet provided the front of the building is at least 40 feet from the front lot line
Maximum lot coverage of principal and accessory buildings	**Corner lot: 60%; Other types: 60%**	Corner lot: 55%; Other types: 50%
Boulevard trees required	2	2
Parking requirement	2	2 off street

* This includes Peace Harbor Subdivision, Peace Harbor Subdivision 2, and Peace Harbor Subdivision 3



TYPICAL ROADWAY SECTION

NO SCALE

TRIPLE TREE
ENGINEERING

REVISIONS		
DATE	DESCRIPTION	

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PEACE HARBOR SUBDIVISION

KIB HOMES
GREAT FALLS, MT

ROAD TYPICAL SECTION

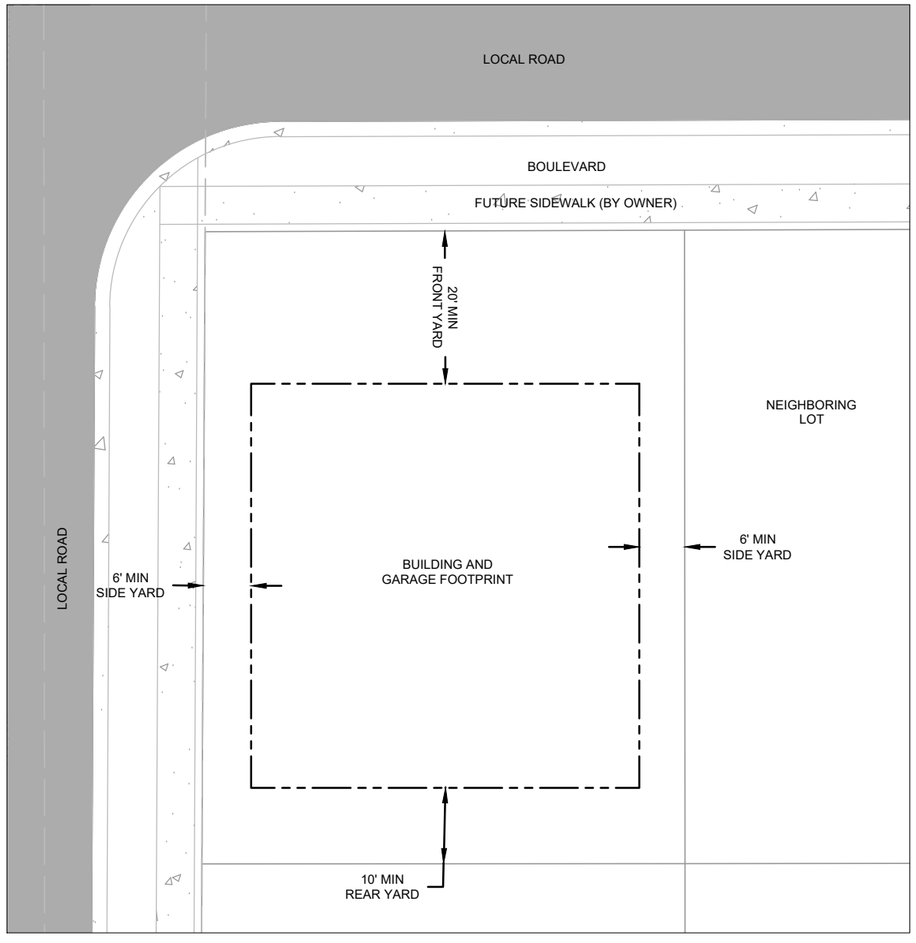
PROJECT #:	22-34
DRAFTED BY:	PHB
CHECKED BY:	JRC
DATE:	SEPT 2024

SHEET
1

LOT DESIGN - COTTAGE

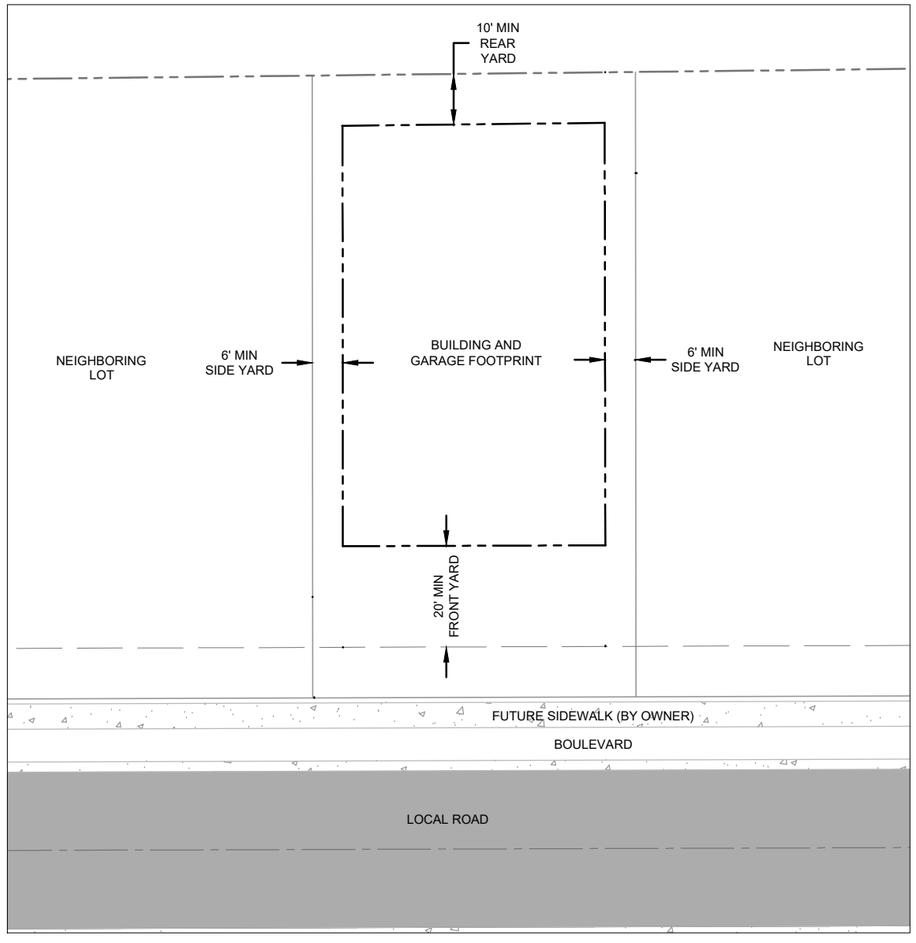
DEPTH =	MAX 130', MIN. 80'	* THE MAX AND MIN FOR DEPTH AND WIDTH ACCOUNT FOR ANTICIPATED FUTURE DEVELOPMENTS
WIDTH =	MIN 50'	
FRONT YARD SETBACK =	20'	
SIDE YARD SETBACK =	6'	
REAR YARD SETBACK =	10'	
PORCHES =	MAY EXTEND INTO THE FRONT YARD SETBACK, NO MORE THAN 9', TOTAL AREA NOT TO BE MORE THAN 60% OF HOUSE COVERAGE	
GARAGES =	ALLOWED	

FOR CORNER LOTS, THE OWNER MAY CHOOSE WHICH DIRECTION THE ORIENTATION OF THE HOUSE FACES.



LOT DESIGN - STANDARD

DEPTH =	MAX 290', MIN. 90'	* THE MAX AND MIN FOR DEPTH AND WIDTH ACCOUNT FOR ANTICIPATED FUTURE DEVELOPMENTS
WIDTH =	MIN 60'	
FRONT YARD SETBACK =	20'	
SIDE YARD SETBACK =	6'	
REAR YARD SETBACK =	10 FEET FOR LOTS LESS THAN 150' IN DEPTH; 15 FEET FOR LOTS 150 FEET IN DEPTH AND OVER	
PORCHES =	MAY EXTEND INTO THE FRONT YARD SETBACK, NO MORE THAN 9', TOTAL AREA NOT TO BE MORE THAN 60% OF HOUSE COVERAGE	
GARAGES =	ALLOWED	



TRIPLE TREE ENGINEERING

REVISIONS		
	DESCRIPTION	DATE

PEACE HARBOR SUBDIVISION
KIB HOMES
GREAT FALLS, MT

PROPOSED UNIT DEVELOPMENT

PROJECT #:	22-34		
DRAFTED BY:	PHB	CHECKED BY:	JRC
DATE:	SEPT 2024		

SHEET 4

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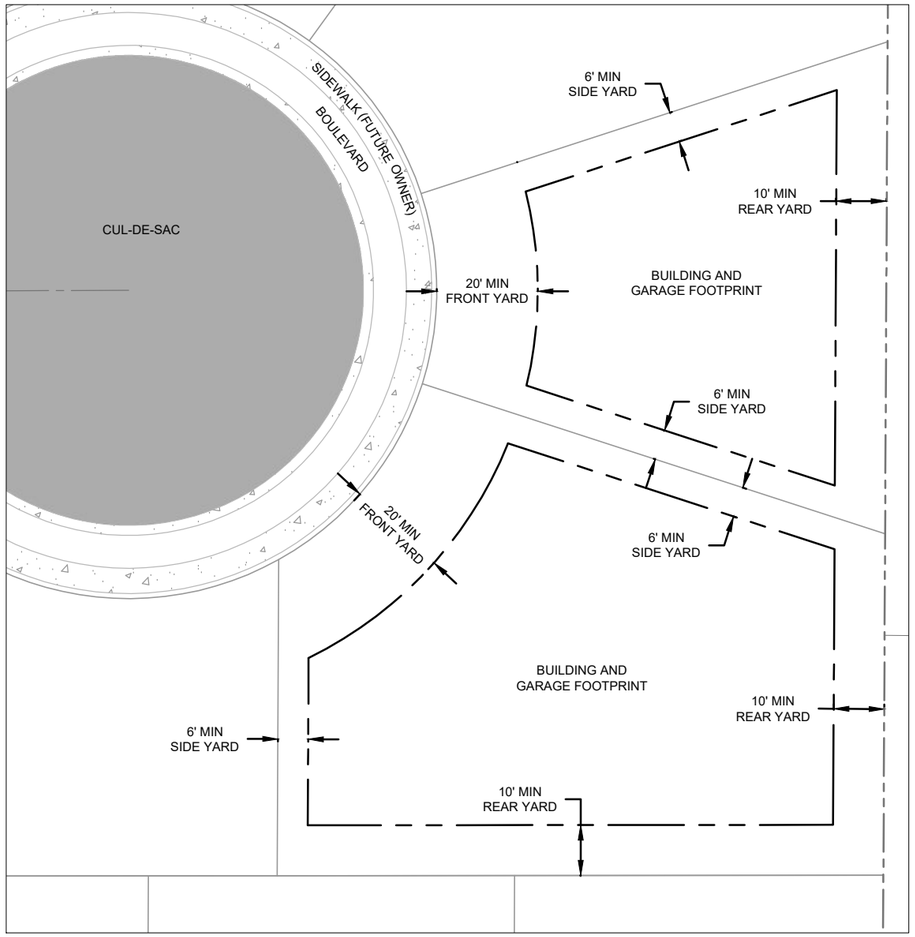
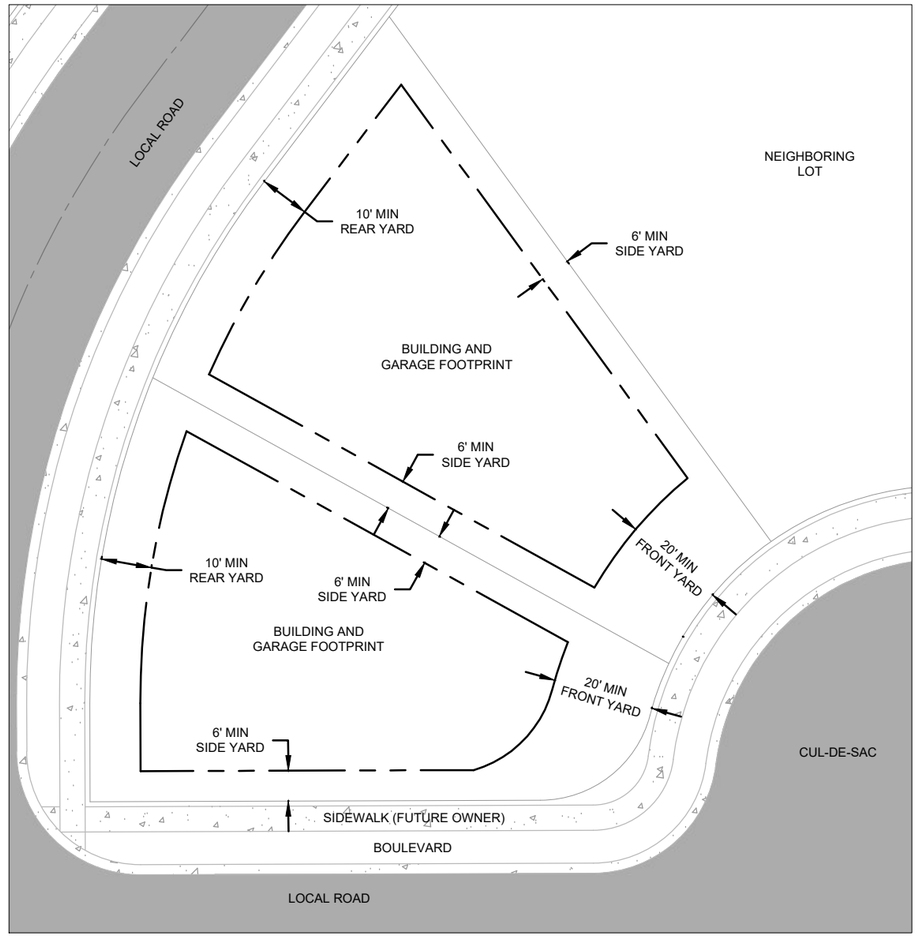
LOT DESIGN - CUL-DE-SAC

DEPTH =	MAX 180', MIN. 60'	* THE MAX AND MIN FOR DEPTH AND WIDTH ACCOUNT FOR ANTICIPATED FUTURE DEVELOPMENTS
WIDTH =	MIN 30'	
FRONT YARD SETBACK =	20'	
SIDE YARD SETBACK =	6'	
REAR YARD SETBACK =	10 FEET FOR LOTS LESS THAN 150' IN DEPTH; 15 FEET FOR LOTS 150 FEET IN DEPTH AND OVER	
PORCHES =	MAY EXTEND INTO THE FRONT YARD SETBACK, NO MORE THAN 9', TOTAL AREA NOT TO BE MORE THAN 60% OF HOUSE COVERAGE	
GARAGES =	ALLOWED	

FOR CORNER LOTS, THE OWNER MAY CHOOSE WHICH DIRECTION THE ORIENTATION OF THE HOUSE FACES.





TRIPLE TREE ENGINEERING

REVISIONS		
DATE	DESCRIPTION	

PEACE HARBOR SUBDIVISION
KIB HOMES
GREAT FALLS, MT

PROPOSED UNIT DEVELOPMENT - 2

PROJECT #:	22-34		
DRAFTED BY:	PHB	CHECKED BY:	JRC
DATE:	SEPT 2024		

SHEET
5

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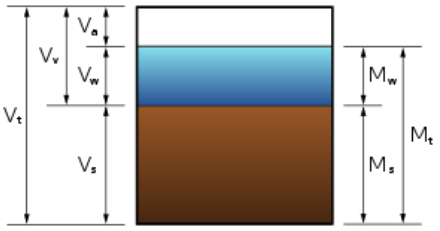

Lorenzen Soil Mechanics, Inc.

Peace Harbor

Great Falls, Montana

Geotechnical Engineering Report

Prepared for:
KIB Homes
2743 Vaughn Road
Great Falls, MT 59404
&
Triple Tree Engineering
800 North Last Chance Gulch
Suite 101
Helena, MT 59601

Prepared by:
Lorenzen Soil Mechanics, Inc.
5730 Unit H Expressway
Missoula, Montana 59808

August 18, 2023

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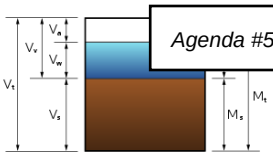


1 INTRODUCTION

KIB Homes has requested Lorenzen Soil Mechanics, Inc. (LSM) to conduct a geotechnical soil survey evaluation of a roughly 50-acre undeveloped lot in Great Falls, Montana. The lot is between 4th Street South and 7th Street South and between 20th Avenue South and 25th Avenue South. The lot will be developed for a residential neighborhood and will be called Peace Harbor. Triple Tree Engineering from Helena, Montana is the Civil Engineering Firm for this development.

Based on a preliminary site layout from Triple Tree Engineering, the primary access to Peace Harbor will be from 20th Avenue South to the west and from an extension of 21st Avenue South to the east. Peace Harbor's streets will include a loop around the perimeter of the site, two interior north/south streets, and two interior east/west streets. There are four cul-de-sacs at the southern of the site.

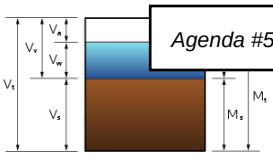
This geotechnical report addresses the subgrade preparations for the streets and general foundation recommendations for the residential building sites.

2 SITE EVALUATION

The proposed site is mostly undeveloped and has been used for spreading construction demolition debris such as concrete and asphalt. The demolition debris is primarily within the northern portion of the site. Some underground mainline utilities have been put in. A street subgrade has been roughed in the lot's northwest corner. The site has rolling terrain located primarily within the southern one-half of the lot. Based on elevations from Google Earth, the elevation difference is roughly from 3444 feet near the southeast corner to 3353 feet in a drainage swale near the middle of the lot at its western property border. The drainage swale extends to the northeastern portion of the lot. LSM understands a culvert outlet from adjoining properties is also at the northeastern portion of the lot. Several dirt bike trails crisscross the site.

Geologically, this area is mapped on the Montana Bureau of Mines and Geology (MBMG) Open File Report No. 407, "Geologic Map of the Great Falls South 30' x 60' Quadrangle". The map depicts the site as being Holocene and Pleistocene epoch Glacial Lake Deposits (Qgl). The area includes nearby Lower Cretaceous period, Albian age, Fourth Member of the Kootenai Formation (Kk_4) – Middle Portion. Figure 1 presents a portion of the Open File Report's geologic map. The Qgl materials are described in the Open File Report as "Grayish-brown, yellowish-brown, and pale orange silt interbedded with very fine-grained sand and clay. Lake deposits are horizontally bedded and may be laminated." The Kk_4 materials are described as "Dusky red to pale reddish-brown weathered, and locally light brownish-gray weathered, fine- to medium-grained, platy, thin- to medium-bedded sandstone interbedded with very dark reddish-brown weathered mudstone."

An older geologic map for the City of Great Falls, published by the U.S. Department of the Interior as the U.S.G.S. Miscellaneous Investigation Series Map I-1025 in 1977 was also



reviewed. The map also features depths to bedrock contours. It aligned with the MBMG Open File Report, using the symbols Qls as the sand and silt subunit to Glacial Lake Deposits and Kk for the Middle Kootenai Formation (4th Member). It also includes Pleistocene epoch Older Gravel (Qgo) as mined gravel pits on, and to the north, of the site, and Dune Sand (Qs) mapped south of the site. A portion of this map is shown as Figure 3. The bedrock contours from the same U.S.G.S. map are presented as Figure 4 and indicate the Kootenai Formation is relatively shallow with some outcropping near the eastern portion of the lot. The deeper depths to rock extend to 15 feet below the ground surface.

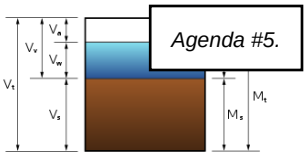
Four nearby water wells, data-based at the Montana Bureau of Mines and Geology, were reviewed. Their depths ranged from 175 to 400 feet. The groundwater table depth ranged from 90 to 113 feet. Bedrock was encountered in each of the four water wells. The depths to bedrock were logged as ranging from 16 to 21 feet below the ground surface. The overburden soils were logged primarily as clay. One of the water wells was logged as having 5 feet of sand overlying clay before transitioning to red shale.

Based on the lithologies presented in the water well logs and LSM's own site investigation, LSM recommends using a seismic site class 'B –Rock' for design.

Boland Drilling of Great Falls drilled eleven boreholes (BH) during March 6 through March 8, 2023. They used their CME 45 track mount drill rig ODEX hammer to drill ten of the boreholes. BH-07 was the second borehole drilled and hollow stem augers were used instead of the ODEX hammer. The change was based on encountering loose sandy silt within a perched groundwater table in the first borehole (BH-09) drilled. The auger drilling was relatively slow, and since the groundwater table was not encountered, ODEX hammer drilling was used for the remainder of the drilling. The ODEX drilling also encountered slow drilling rates in the clay soils, which is to be expected. Figure 4 is a Google Earth image depicting the LSM borehole locations. The overlying materials tended to agree with the MBMG and the 1977 U.S.G.S. mapping characterizations of the Glacial Lake Deposits, Dune Sand Deposits, and with the 4th Member of the Kootenai Formation. Fat clay with alkaline inclusions was logged at depth in most of the boreholes. Figure 4 includes test pits and auger drilling completed by others. LSM can present those results if necessary in an addendum to this report.

With the exception of BH-09, the samples had moisture conditions recorded as 'damp' or 'moist'. BH-09 had free water and wet conditions from 5 to 11 feet. The wet condition made for a 'bull's liver' appearance which is generally ascribed to rock flour or inelastic silt. The fat clay below 11 feet acted as an aquitard, preventing the groundwater from migrating downward. The fat clay acting as an aquitard would be witnessed during the infiltration testing completed by Big Sky Civil & Environmental on June 7, 2023. That testing produced infiltration rates of 50 hours per foot and greater.

Poorly graded sand with silt (SP-SM) was encountered across much of the upper portion of the overburden soils. This soil also classifies in the American Association for State Highway Transportation Officials (AASHTO) as an 'A-3' soil which is akin to beach sand. As long as this material is laterally contained, it is considered a 'good' material as a subgrade.



The fat clay (CH) soils encountered are problematic to structures, whether they are buildings or street sections. They are considered a poor subgrade material. Provided there is proper drainage and the subgrades are properly prepared, the amount of movement associated with volume changes inch soils can be minimized to tolerable amounts.

Factors that play a role in the shrink/swell potential are the plasticity index, shrinkage limit, and the colloid content. The moisture content ultimately plays a major role. Table 1 presents criteria developed by Robert Holtz (1959) and the U.S. Department of Interior (1998) for the probable expansion of a soil. It is noted that the probable expansion is a function of the soil going from a dry to a saturated condition. The shrinkage limit can be considered the soil's saturated condition. The shrinkage limit identifies the moisture content at which the sample no longer undergoes a volume change upon further moisture loss. Highly plastic soils are capable of taking on much more moisture beyond being saturated. This results in the expansive capabilities on highly plastic soils.

TABLE 1: Expansion Potential from Classification Test Data

Degree of Expansion	Probable Expansion as a % of Total Volume Change[1]	Plasticity Index (%)	Shrinkage Limit (%)	Colloid Content % < 0.001 μm
Very High	>30	>35	<11	>28
High	20 – 30	25 - 41	7 – 12	20 – 31
Medium	10 – 20	15 - 28	10 – 16	13 – 23
Low	<10	<18	>15	<15

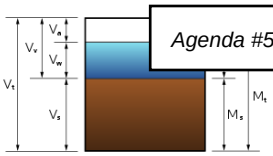
[1]Dry to a saturated condition under a surcharge of 1 psi

Table 2 presents the measured values for samples collected at depths ranging from 5 to 15 feet.

TABLE 2: Testing Results

BH/Depth (ft)	Moisture Content (%)	Plasticity Index (%)	Shrinkage Limit (%)	Colloid Content % < 0.001 μm
BH-05/15	33	64	13	76
BH-06/7.5	22	30	17	67
BH-06/10	23	39	20	62
BH-07/10	31	53	11	64
BH-08/5	19	26	16	47

Based on most of these values, the volume change potential of the overburden soils are considered very high. The colloidal content and plasticity index values indicate the very high potential for volume change. If water is allowed to collect at that depth with no discharge exit, it will soak onto the colloidal-size particles and the swelling process will begin. The moisture content is higher than the shrinkage limit which indicates the soil is likely saturated. These soils do have the ability to continue to take on incredible amounts of water, even after they are saturated. It is the excess water that causes the volume expansion in these soils. For this reason, LSM recommends moisture-conditioning the subgrade to initiate some swell. The moisture-conditioning may seem counter-intuitive but getting moisture into these materials at the beginning of construction will put some of the inevitable swell in place and will help act as a seal to limit migration of infiltrated water. LSM will recommend a 2-foot digout within the street



sections if the clay is exposed at the subgrade. In other words, there is to be at least a 2-foot subbase between the fat clay and the typical section base course.

Grading the residential sites such that no surface water is allowed to collect against the foundation walls and footings and a footing perimeter drain are absolutely necessary.

In regards to new subdivisions, LSM does recognize that unwanted free water can arrive at a developed site. When free water arrives, it is usually from poor surface drainage, irrigation, leaking underground utilities, or a combination of any of these. Therefore, with any new development, new sources of free water will be introduced. This will come from hard surfaces directing runoff water to localized areas and from landscape irrigation. The hard surfaces include roofs, sidewalks, pads, and streets.

In LSM's opinion there is no conceivable way to totally eliminate all free water from infiltrating into the fine-grained soils. The Homebuyer must recognize there is a risk the soils may experience volume expansion. However, the recommendations made in this report are intended to limit the amount of volume change such that differential movement is kept to less than 1 inch and total settlement to less than 2 inches. It is imperative that positive grading extend the full perimeter of each building for at least 10 feet and that irrigation water is limited and regulated. Dry landscaping is recommended for at least 10 horizontal feet away from the building perimeter. This area can be used for decks, patios, lanais, and sidewalks. If plantings are desired, LSM suggests using planter boxes.

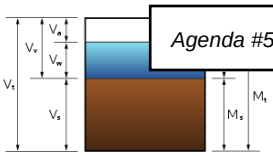
The silt soils present their own problems in that they may be considered 'collapsible' upon wetting. The moisture conditions of these soils tended to be described as 'moist'. LSM recommends limited irrigation water within 10 feet of homes that are being supported on collapsible or expansive fine-grained soils. The Homeowner must be made aware of this limitation. LSM suggests that decks, patios, porches, lanais, sidewalks, dry landscaping, or planter boxes occupy the 10-foot space around the residential buildings rather than irrigated plantings.

The logs of the borehole are provided in Appendix A along with the four MBMG water well logs and the spectral acceleration design values. Photographs of the March 6 - 8 subsurface investigation and the accompanying laboratory testing appear in Appendix B.

3 RECOMMENDATIONS

In general, LSM believes the poorly graded sand with silt (SP-SM) soils encountered across much of the upper portion of the soil profile are considered good for residential street and building construction. If fine-grained layers are encountered at the street subgrade elevations, the subgrade will require some stabilization such as the use of geosynthetics and the inclusion of a subbase course within the street typical section.

The residential structure recommendations herein are generic to the LSM borehole investigations completed thus far. LSM recommends including a more in-depth geotechnical investigation for



individual structures, or at the very least, a geotechnical review during the residential foundation excavations to verify the soils are consistent with what is provided in this general report. Some locations can expect to encounter perched groundwater zones that may develop into springs upon excavation. French drains and sumps may be necessary in some locations.

3.1 Mass Grading

The materials and topography encountered across the site are such that there will likely be some significant cuts and fill. At this time, LSM recommends limiting the cut slopes to no steeper than a 2.5 Horizontal to 1 Vertical (2H:1V) geometry. All cut slopes will need to be vegetated with grasses, shrubs, and trees. Fill slope geometries should be no steeper than a 3H:1V.

LSM is available to address steeper cut slopes and retaining wall design recommendations.

3.2 Street Typical Sections

LSM has evaluated two typical sections for standard duty street traffic for this site using the Montana Department of Transportation (MDT) and American Association of State Highway and Transportation Officials (AASHTO) methods.

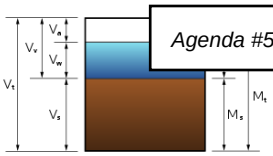
The AASHTO A-3, A-2-4, and A-2-6 granular soils are considered good as street subgrade soils. The A-4 and A-7-6 subgrade soils are considered 'poor'. The A-4 and A-7-6 soils tended to be encountered at depth in the boreholes and are likely not within much of the upper 2 feet of the typical section subgrade.

Using Table 14.2-A in the MDT Geotechnical Manual, the ASSHTO soil classifications correlate to a Resistance value (R-value) ranging from 45 to greater than 70 for an A-3 soil. LSM has conservatively based the typical section design on an R-value of 45. A California Bearing Ratio (CBR) range of 10 to 30 can be expected for the A-3 soils. These values correlate to a Resilient Modulus (M_R) of 15,000 psi. A CBR range of 2 to 14 can be expected for the A-7-6 soils. LSM will recommend a 24-inch thick subbase over a woven geotextile when the subgrade classifies as an A-7-6 soil.

3.2.1 Typical Section for A-3 Subgrades

The Resilient Modulus (M_R) was used to calculate the design structural number for a flexible pavement. The Resistance (R) value was correlated to a table provided in MDT's Geotechnical Manual, which in turn, correlates to the M_R. Other variables include the 18-kip equivalent single axle loadings (ESALs), initial serviceability, terminal serviceability, design serviceability loss, reliability level, and the overall standard deviation. Their values and description are provided below.

- Resistance Value, R-value = 45 - a material property used by MDT to characterize the support characteristics of the roadbed soil in flexible pavement design. It measures the response of a compacted sample of soil or aggregate to a vertically applied pressure.



- Roadbed Soil Resilient Modulus, M_R = 15,000 psi - a material property used by AASHTO to characterize the support characteristics of the roadbed soil in flexible pavement design. In general terms, it is a measure of the soil's deformation in response to repeated applications of load much smaller than a failure load.

- Equivalent Single Axle Loadings, ESALs = 1,000,000. This is an assumed value and is intended to take into account residential structure construction.

- Initial Serviceability, p_o = 4.2 - a measure of the pavement's smoothness or rideability immediately after construction. Serviceability is rated on a scale of 0 to 5, with 5 being a perfectly smooth pavement and 0 being a very rough or impassable pavement.

- Terminal Serviceability, p_t = 2.2 - the minimum tolerable serviceability of a pavement, on the same 0 to 5 scale as described in Initial Serviceability.

- Design Serviceability Loss, ΔPSI, = 2.0 – the difference between p_o and p_t.

- Reliability Level, R = 90 percent - the probability that a pavement structure will survive the design period traffic. Generally, as traffic volumes become larger, the consequences of premature pavement failure increases dramatically; therefore, high-volume roadways must be constructed with a much higher level of reliability than low-volume roadways.

- Overall Standard Deviation, S_o = 0.49 - accounts for all variability associated with design and construction inputs, including variability in material properties, roadbed soil properties, traffic estimates, climatic conditions, and quality of construction.

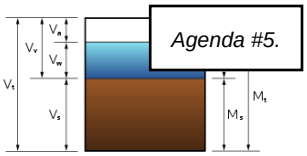
Based on the above criteria, a required Structural Number (SN) of 2.70 was calculated using a nomograph developed by AASHTO. The nomograph is included in Appendix A.

The SN represents the ability of a flexible pavement to withstand structural loadings. Using the required SN, the thicknesses of the different material layers within the typical section can be determined as:

$$SN = a_1D_1m_1 + a_2D_2m_2 + a_nD_nm_n$$

The 'a' values represent structural coefficients, the 'D' values represent the layer thicknesses, and the 'm' values represent the drainage coefficients. A value of 0.41 was used for the asphalt cement structural coefficient, a_1. A value of 0.14 for virgin crushed base course was used for its structural coefficient, a_2. The structural coefficients are recommended values from a May 11, 2006 MDT memorandum for 'Revised Surfacing Structural Coefficients and Layer Thicknesses'. The drainage coefficient, m, is a function of the time required for the pavement to drain and the amount of time during the year that the pavement structure is exposed to moisture levels approaching saturation. MDT recommends a conservative drainage coefficient value of 1.0 for the plant mix surfacing and for the base course.

To match or exceed the required SN of 2.70, LSM proposes a typical section of:



Asphalt Plant Mix 3 inches – in one lift
3/4-inch Crushed Base 11 inches
Scarified and Wetted Subgrade 6 inches

This typical section produces a design SN of 2.77. LSM believes this to be an appropriate value, given the actual ESAL loadings are unknown at this time but may likely be less than the assumed value of 1,000,000 over a 20-year period in a residential neighborhood.

The gradation for the 3/4-inch crushed base course is provided in Table 3. Recycled concrete can be blended with the base course, provided the end result meets the gradation recommendation.

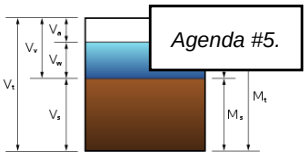
TABLE 3: 3/4" Crushed Base Course

Sieve Size	Percent Passing
3/4"	90 - 100
3/8"	70 - 90
No. 4	40 - 70
No. 10	25 - 55
No. 200	2 - 8

LSM recommends preparing the new street typical sections by:

1. Grading to the subgrade depth, extending the typical section to at least 1 horizontal foot beyond any curb and gutter section.
2. Scarifying to a depth of at least 6 inches and wetting the scarified surface.
3. Compacting the wetted, scarified surface to a standard relative compaction (ASTM D698) of at least 95 percent and at a moisture content within 2 percent of its optimum moisture content. The subgrade may be too coarse to have a relevant Proctor moisture density curve and, similar to the perimeter footing and slab-on-graded subgrades, the maximum dry density may need to be established in the field. LSM recommends using a roller compactor having an operating weight of at least 25,000 pounds and a centrifugal force of at least 50,000 pounds.
4. Providing an 11-inch compacted thickness of 3/4-inch crushed aggregate base course meeting the gradation in Table 1. Recycled concrete can be blended with the base course, provided the end result meets the gradation recommendation.
5. Placing the crushed base course in 8-inch (maximum) loose lifts and compacting each lift to a **modified relative compaction (ASTM D1557)** of at least 95 percent and to a moisture content within 2 percent of its optimum moisture content.
6. Grading the final surface to drain stormwater to dry well sumps or other City-approved stormwater detention area.
7. Providing a plant mix that meets the following paragraph:

LSM recommends a performance graded PG 58-28 binder for the asphalt concrete and the plant mix surfacing aggregate meeting the Montana Public Work's gradation presented in Table 4. The gradation bands in Table 4 represent the job mix target limits, which determine the suitability of aggregate. Provide the final job mix target gradation within the specified bands and uniformly graded from coarse to fine, not to vary from the low limit on one sieve to the high



limit on the adjacent sieve, or vice-versa. For example, using the 3/8" and No. 4 sieves, a gradation of 73 percent and 48 percent passing their respective sieves is acceptable, 73 percent and 62 percent passing their respective sieves is not.

TABLE 4: Plant Mix Surfacing Gradation

Sieve Size	% Passing Job Mix Target Bands	Job Mix Tolerances
3/4"	100	---
1/2"	83 - 93	+/- 7
3/8"	73 - 87	+/- 7
No. 4	47 - 63	+/- 6
No. 10	32 - 43	+/- 6
No. 40	15 - 25	+/- 5
No. 200	5 - 7	+/- 2

The job mix formula establishes target values. During mix production, the gradations are to fall within the job mix limits presented in Table 4, i.e. if a QA job mix target of 6 has been selected for the No. 200 sieve and since the tolerance is +/-2, the job mix gradation for production would be 4 - 8.

8. Placing the asphalt concrete plant mix surfacing in a single 3-inch thick lift and compacting it to an average relative compaction (ASTM D2041) of at least 93 percent, and no individual sample being less than 92 percent.

3.2.2 Typical Section for A-4 and A-7-6 Subgrades

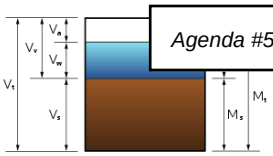
Based on the subgrade soils encountered during the March 2023 subsurface investigation, LSM does not expect the upper 2 feet of the street subgrade will encounter appreciable amounts of highly plastic fine-grained soils. Regardless, if encountered, this section provides remedial construction procedures.

Fine-grained subgrades that include A-4 and A-7-6 soils will require a 24-inch thick subbase and a woven geotextile. The subbase is needed to counteract against frost heave potential inherent with silty soils. The woven geotextile acts as a separation/stabilization layer that keeps the fine-grained soils from migrating up into the subbase and provides some stabilization for when the fine-grained soils become saturated.

LSM proposes a typical section over the fine-grained subgrades of:

Asphalt Plant Mix	3 inches
3/4-inch Crushed Base	8 inches
3-inch Crushed Subbase	24 inches
Woven Geotextile	Propex 200ST, Contech C200
Scarified and Wetted Subgrade	6 inches

Appling a value of 0.12 to represent the subbase's structural coefficient, a_3, this typical section provides an SN of at least 5.23. The 5.23 SN does not credit the presence of woven geotextile.



On previous projects, LSM has given credit for up to 3 inches of base course with the placement of a stabilization geotextile. Nor did LSM give a structural coefficient credit for a scarified and wetted fine-grained subgrade.

LSM recommends constructing the typical section over the fine-grained soils in a manner similar to that of the A-3 soils. The subbase and the woven geotextile placements need to be included as:

1. Over-excavating below the base course depth of 24 inches, extending the typical section to at least 1 horizontal foot beyond any curb and gutter section.
2. Scarifying to a depth of at least 6 inches and wetting the scarified surface.
3. Compacting the wetted, scarified surface to a standard relative compaction of at least 95 percent and at a moisture content within 2 percent of its optimum moisture content.
4. Providing a separation/stabilization woven geotextile meeting the engineering characteristics of Propex 200ST or Contech C200.
5. Placing the woven geotextile over the scarified, wetted, and compacted subgrade, overlapping the joints by at least 1 foot.
6. Providing a subbase meeting the gradation provided in Table 5. Recycled concrete can be blended with the base course, provided the end result meets the gradation recommendation.

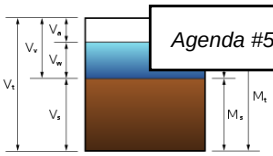
TABLE 5: Subbase/Structural Backfill

Sieve Size	Percent Passing
3”	100
1”	80 - 100
1/2”	60 - 75
No. 4	35 - 55
No. 40	5 - 30
No. 200	0 - 8

7. Placing the subbase in 8-inch (maximum) thick, loose lifts and compacting each lift to a **modified relative compaction (ASTM D1557)** of at least 95 percent.
8. Providing an 8-inch compacted thickness of 3/4-inch crushed aggregate base course meeting the gradation in Table 3. Recycled concrete can be blended with the base course, provided the end result meets the gradation recommendation.
9. Compacting the base course to a **modified relative compaction (ASTM D1557)** of at least 95 percent and to a moisture content within 2 percent of its optimum moisture content.
10. Grading the final surface to drain stormwater to City-approved stormwater detention areas.

3.3 Residential Foundations

LSM presents recommendations for frost-protected monolithic structural slab with thickened edge foundations and conventional footings for the Peace harbor sites. The frost-protected shallow foundations are meant to provide a thicker overburden above the fine-grained soils. An



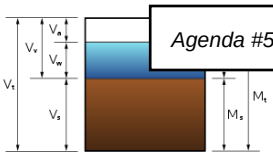
air-freezing index (AFI) map with an estimated 100-year return period, generated by the National Oceanic and Atmospheric Administration (NOAA) indicates the Great Falls area has 2000 to 3000 ^{o}F days. The AFI is the combined duration and magnitude of below freezing temperatures during a given freezing season. This value is used to determine the amount of insulation needed to protect a building foundation. The International Residential Code (IRC) includes prescriptive methods for constructing frost-protected shallow foundations in heated buildings. The American Society of Civil Engineers (ASCE 32-01) has published a report 'Design and Construction of Frost-Protected Shallow Foundations, 2001 that address semi-heated and unheated buildings that meet the requirements of the IRC. Design tables from the September 2004 'Revised Builder's Guide to Frost-Protected Shallow Foundations' were used to establish the foundation depth, insulation thickness, and horizontal placement. This publication is supported by the U.S. Department of Housing and Urban Development (HUD) and the National Association of Home Builders (NAHB).

The overlying factor at this site is to absolutely limit the infiltration of free water to the fine-grained soil layers. If that can be maintained, this sites will likely not experience noticeable volume changes. LSM again recommends that no irrigation water be allowed within 10 feet of the building perimeter. This area can be used as outdoor living spaces by the use of decks, patios, lanais, and sidewalks. If some vegetation is desired, LSM suggests using planter boxes.

3.3.1 Frost-Protected Shallow Foundation Monolithic Structural Slab with Thickened Edges on A-3, A-2, or A-1 Soils

LSM believes a frost-protected monolithic structural slab is a viable option for carrying the building loads across this site. LSM recommends preparing the monolithic structural slab subgrade by:

1. Following the compaction of the coarse-grained subgrade to the monolithic slab subgrade elevation, excavating to the thickened edge subgrade elevation. Extend the excavation horizontally by 3 feet beyond the exterior building footprint.
2. Including a 4-inch diameter slotted perimeter drain system in its own trench that is graded to drain to daylight on a slope of at least 0.2%. The perimeter drain system is to include a 6-inch cover of drain rock and wrapped in a filter geotextile meeting the engineering characteristics of Geotex® 111F. It is also to include a rodent guard and a landmark such as riprap at its exit. Final grading must provide positive drainage at least 10 feet away from the building perimeter.
3. Providing and placing insulation forms for the thickened edges that extend at least 2.5 feet horizontally from the building perimeter.
4. Providing and placing a 6- to 15-mil polyethylene moisture barrier across the compacted subgrade, overlapping the joints by at least 1 foot.
5. Providing and placing XPS Type VI rigid horizontal insulation board, at least 2-inches thick over the vapor barrier.
6. Providing a 3-inch thick leveling course of 3/4-inch minus cushion material meeting the gradation in Table 3. Alternatively, 3/4-inch drain rock can be used as the leveling course. A compacted, level surface prior to placing fresh concrete will help minimize concrete cracking.



7. Compacting the cushion to a firm surface and ensuring there are no visible rises or valleys across the prepared surface.
8. Setting the reinforcement steel on enough dobies or chairs such that they are not allowed to sink past the Structural Engineer's recommended placement depths.
9. Backfilling against the insulation form board with native spoils in 8-inch (maximum) thick, loose lifts and compacting each lift to a standard relative compaction of at least 95 percent and at a moisture content within 2 percent of either side of the fine-grained soil's optimum moisture content.
10. Ensuring that the grading provides at least a 2 percent positive drainage around the entire building perimeter for a horizontal distance of at least 10 feet.
11. Providing dry landscaping across the positive drainage slope. The dry landscaping may include decks, patios, lanais, and sidewalks.
12. Providing wide eaves and a rain gutter system with downspouts that discharges its roof runoff water at least 7 horizontal feet away from the building perimeter onto the ground surface. LSM does not recommend the downspouts discharge its water into buried pipe. LSM has noted the buried pipes may become disjointed and are likely not noticed until after there is building movement.

Positive drainage and proper roof water runoff are absolutely necessary to prevent excess surface water from getting beneath the structural monolithic slab. LSM suggests the hose bibs have a hard surfacing beneath them to route potential leaking water away from the thickened edge foundations.

The prepared SP-SM subgrade surface will offer an allowable soil bearing capacity of 2,000 pounds per square foot (psf). A modulus of subgrade reaction, k, of 175 pounds per square inch per inch of deflection (pci) can be used for the structural monolithic slab design. A coefficient of friction, μ, of 0.40 can be used for the foundation sliding resistance designs on the compacted SP-SM materials.

3.3.2 Full Basement Foundations on A-3, A-2, or A-1 soils

In LSM's opinion, the southern portion of the lot may offer the best locations for full basements. This area is represented by BH-01, BH-02, and BH-03. Based on the U.S.G.S. mapping, the southeastern portion had been mined for a gravel pit. Conventional basement footings can be used these locations. LSM recommends following the subgrade preparations discussed in Section 3.2.1 for the full basement on granular soils.

3.3.3 Full Basement Foundations on Fine-Grained (CH, A-7-6) Soils

LSM does not recommend constructing full basements on the fat clay soils unless a site specific geotechnical investigation has been completed.

3.4 Foundation Stem Walls/Retaining Walls

The excavated overburden soils can be re-used as backfill against the walls provided they are moisture-conditioned as they are being placed. Prepare the foundation walls for backfilling by:

1. Ensuring there is a water stop at the wall and footing interface.
2. Providing waterproofing as per the Architect or Structural Engineer's recommendations.
3. Providing rigid XPS Type VI rigid vertical insulation at least 2 inches thick along the exterior perimeter of the building foundation walls. In addition to insulation, the insulation will provide a cushion to help protect the waterproofing on the foundation walls during the backfilling operations.
4. Ensuring the walls are properly braced prior to backfilling.
5. Placing each of the backfill lifts in 8-inch (maximum) thick, loose lifts and compacting each lift to a standard relative compaction of at least 95 percent and at a moisture content within 2 percent of its optimum moisture content.

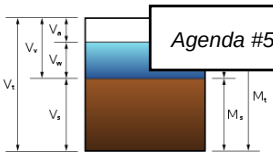
Compacting these materials as backfill will offer an internal angle of friction (ϕ) of 25°, and a moist unit weight (γ_m) of at least 105 pcf. For the on-site soils being used as backfill, LSM recommends using an active equivalent fluid unit weight (γ_{fa}) of 42.6 pounds per cubic foot (pcf) for wall design where the tops of the walls are allowed to rotate, such as for retaining walls. Where the walls are rigid, such as for foundation walls, LSM recommends an at-rest γ_{f0} of 60.6 pcf. With a level backfill, the following equations can be used to obtain a resultant lateral force (pounds per lineal foot) acting at the lower one-third of the wall heights (H in feet):

Active Pressure, P_a: $21.3 \times H^2$
Passive Pressure, P_p: $129.4 \times H^2$
At-rest Pressure, P_0: $30.3 \times H^2$
Seismic Pressure, P_E: $1.7 \times H^2$
Seismic Active Pressure, $P_{(E+a)}$: $23.0 \times H^2$

Retaining walls for this project can be designed using these lateral earth pressures and a 1,500 psf allowable soil bearing capacity. The lower soil bearing capacity is due to the retaining wall base likely having a depth of only 1 foot below the ground surface. Similar to the perimeter footing drain, a 4-inch diameter slotted drain system is recommend directly behind the retaining walls. The drain system includes a PVC drain tile graded to drain to daylight and a 1-foot wide layer of 3/4-inch drain rock that extends from the base of the wall to its full height. The drain rock and drain tile are to be burrito-wrapped in a non-woven geotextile meeting the engineering characteristics of Geotex 401.

3.5 Fresh Concrete

LSM recommends Type I/II or Type IL cement for the footings and foundation walls. LSM suggests a concrete mix design have a 4-inch maximum slump before any water reducer (plasticizer) admixture is added or up to 8 inches after it is added. The air content range should range from 5 to 8 percent for footings, foundation walls, and exterior flatwork. The inclusion of



entrained air in the footings is a safeguard against concrete being placed and exposed during cold temperatures and if the frost depth extends below the footing elevation.

For the interior slab and exterior flatwork concrete, LSM recommends Type II cement *or* including a shrinkage reducing admixture and/or a hydration control admixture to Type I/II or cement. The admixtures are to be chloride-free. LSM understands Type II cement is no longer readily available in this region and that Type IL is being promoted as a general-use cement, replacing Type I/II. The purpose of the cement type recommendation is to limit shrinkage cracking. LSM understands Type I/II cement meets the strength requirements for Type I cement and the composition requirements for Type II cement. Type I and Type III cements usually give higher early strengths than Type II cement but all else being equal, will also have higher concrete shrinkage than Type II cement. LSM recommends the maximum aggregate size be 1 1/2 inches for the slab mix designs. LSM suggests the mix design have a 3-inch maximum slump before any water reducer (plasticizer) admixture is added or up to 8 inches after it is added. If fiber reinforced concrete is used, give consideration to providing a slump value associated with the fibers. Erect windbreaks and sunshades to limit rapid surface drying. Avoid curing with water that is more than 20^{o}F cooler than the concrete. These recommendations are intended to limit the amount of shrinkage cracking in the slabs.

If the concrete will be freshly cast during cold temperatures, protect the fresh concrete from freezing. Do not cast fresh concrete on frozen ground. LSM recommends the Contractor provide an approved plan for protecting concrete being placed during cold weather.

LSM yields to the Structural Engineer in each of the concrete mix designs for footings, foundation walls, slabs-on-grade, and exterior flatwork.

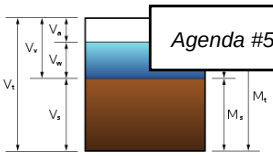
3.6 Groundwater Table and Surface Water

Perched groundwater tables are a possibility across the site. If encountered, LSM recommends developing it and piping it to a detention pond site. LSM does not anticipate the groundwater table to be an issue during construction. Regardless, the sites must be graded during construction to limit ponding in any of the excavations. LSM recommends berming all open excavations to prevent surface water from entering into them. Final grading is to ensure positive drainage away from the entire building footprint.

LSM included a 4-inch diameter PVC pipe prior to backfilling BH-10 and BH-11. The pipe was used for infiltration testing, which was completed by Big Sky Civil & Environmental on June 7, 2023. Their results were such that the infiltration rate was 50 hours per foot in BH-10 (INF-02) and greater than 50 hours peer foot in BH-11 (INF-01). There was essentially no change in the water table height within the PVC pipe over a 4-hour period in BH-11.

3.7 Underground Utilities

For utility trench excavations, the trench materials are expected to meet OSHA's requirements for a Type C soil. The steepest unsupported slope within a Type C soil trench is a 1.5H:1V.



Use the spoils as bedding soils, limiting the maximum particle size as 3/4 inches. Normally, the bedding materials would be sand with fine gravels. This material could be an unwelcome conduit for water to access the potentially expansive materials at and below the foundation elevations. Use pipe materials such as PVC that resist corrosion.

Soil compaction in utility trenches deeper than 5 feet should be performed using a remote trench compactor and observed by an inspector. When the backfill has been brought back to within 5 feet of the surface, perform compaction testing. Compact the trench backfill soils in 8-inch (maximum) thick lifts to a standard relative compaction of at least 95 percent and at a moisture content within 2 percent of its optimum moisture content.

3.8 Seismic Considerations

The Great Falls area is within the Northern Great Plains and constitutes part of the stable continental U.S. interior. The ASCE/SEI 7-22 Hazards Report was used to develop the spectral response values for a seismic site class 'B', "Rock". LSM recommends the maximum credible spectral response accelerations at short 0.2-second periods, S_{MS}, and at 1-second periods, S_{M1}, to determine the seismic design base shear. A risk category of II was used. The spectral response acceleration parameters are presented in Table 6.

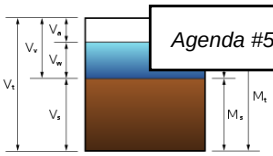
TABLE 6: Seismic Coefficients

ASCE/SEI 7-22, Earthquake Loads	
Site Class Definition	B
Mapped Spectral Response Acceleration Parameter, S_S for 0.2 second	0.160g
Mapped Spectral Response Acceleration Parameter, S_1 for 1.0 second	0.058g
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter, S_{MS}	0.120g
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter, S_{M1}	0.043g
Design Spectral Response Acceleration Parameter, S_{DS}	0.077g
Design Spectral Response Acceleration Parameter, S_{D1}	0.029g
Peak Ground Acceleration at the Surface, PGA_M	0.062g

The seismic backfill pressures against the buried portion of the foundation walls can be determined by adding a seismic event component, P_E, based on Seed and Whitman (1970) to the coefficient of active pressure P_a. The P_E was given to be 1.7 x H^2, making the active pressure against the wall during an earthquake equal to 23.0 x H^2 and was presented in Section 3.4. A factor of safety of 1.1 can be used for earthquake design lateral earth pressures and the allowable bearing capacity can be increased by one-third for seismic design. Provided there are no perched groundwater tables within 20 feet below the ground surface, liquefaction is not considered a concern at this site during a major earthquake. The Great Falls area is not known to be a seismically active area.

3.9 Shrink/Swell Characteristics

The volume change potential for the overburden soils are considered very high during seasonal moisture fluctuations. LSM recommended to moisture-condition the subgrades and to provide a thin layer of washed rock compacted into the wetted surface to provide a stable surface at the



time of construction. LSM also recommended a perimeter drainage trench that is graded to drain and to provide positive surface drainage away from the building's exterior perimeters.

3.10 Compaction and Fresh Concrete Testing Frequency

LSM suggests a compaction testing frequency presented in Table 7 for the foundation, monolithic slab, and driveway subgrades, wall backfill, and utility trench backfill. The table includes the frequency for fresh concrete sampling and testing. LSM suggests including applicable special inspections as per the International Building Code, Chapter 17.

TABLE 7: Testing Frequency

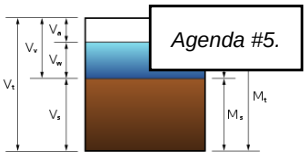
Compaction Testing	
Beneath Column Footings	1 Test per Footing
Beneath Wall Footings	1 Test per 75 Lineal Feet of Wall
Foundation Wall/Column Backfill	1 Test per 100 Lineal Feet of Wall per Lift
Monolithic / Slabs-on-Grade Subgrade	1 Test per 2,000 Square Feet
Exterior Flatwork Subgrade	1 Test per 1,000 Square Feet
Utility Trench Backfill	1 Test per 200 Lineal Feet per Lift
Concrete Testing	
Structural Concrete[1]	1 Test per 50 Cubic Yards per Day
Non-Structural Concrete	1 Test per Day

[1.] Structural concrete includes all footings, foundation walls, slabs, and other load bearing elements.

4 BASIS OF RECOMMENDATIONS

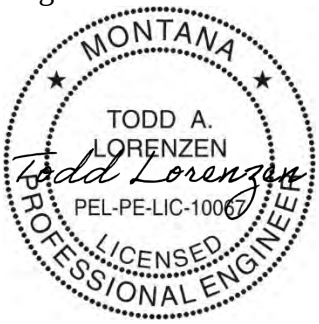
The analyses and recommendations submitted in this report are based upon a limited site review. Often, variations occur within the subgrade, the nature and extent of which do not become evident until construction is conducted.

This report is for the exclusive use of KIB Homes and their design team. In the absence of LSM's written approval, LSM makes no representation and assumes no responsibility to other parties regarding this report. The data, analyses, and recommendations may not be appropriate for other structures or purposes.



Professional Certification

I hereby certify that this report was prepared by me and that I am a duly Licensed Professional Engineer under the laws of the State of Montana.



August 8, 2023

Todd Lorenzen, P.E.
Geotechnical Engineer

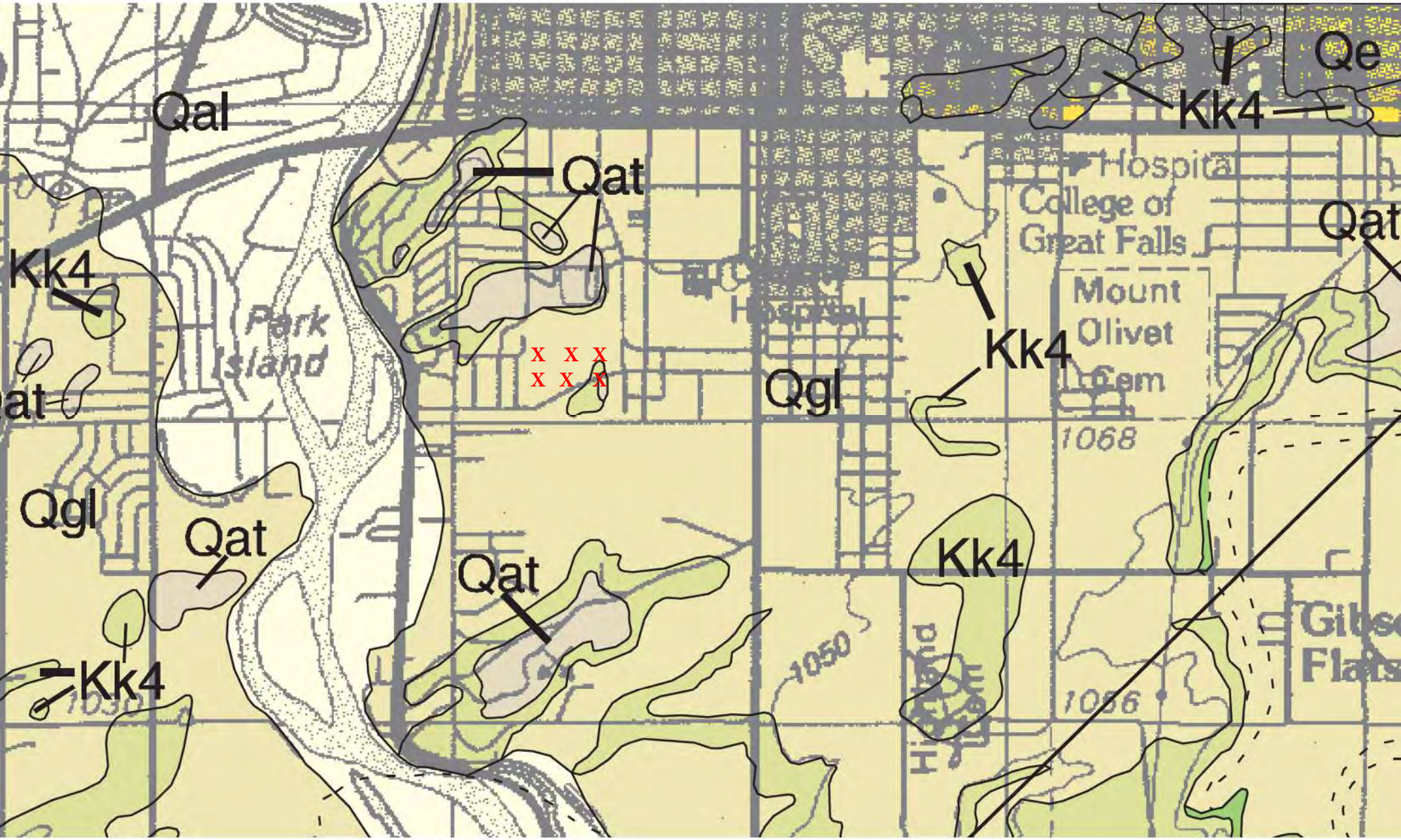


Figure 1; Portion of the MBMG Open File Report 407, "Geologic Map of the Great Falls South 30' x 60' Quadrangle", 2000; by Susan Vuke.

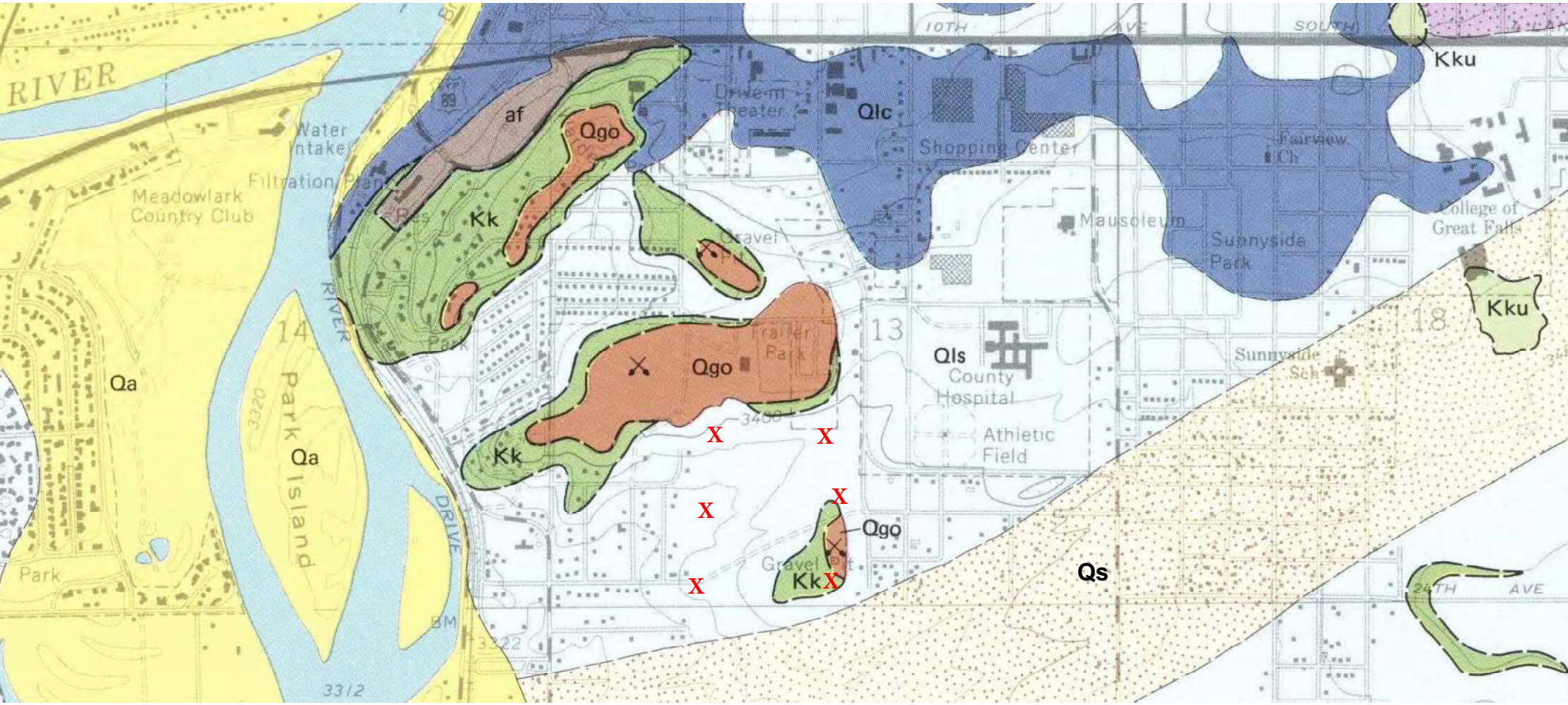


Figure 2: U.S. Department of the Interior U.S.G.S. Miscellaneous Investigations Series Map I-1025, "The Engineering Geology of the City of Great Falls and Vicinity, Montana", 1977; by Richard Lemke and Edwin Maughn.

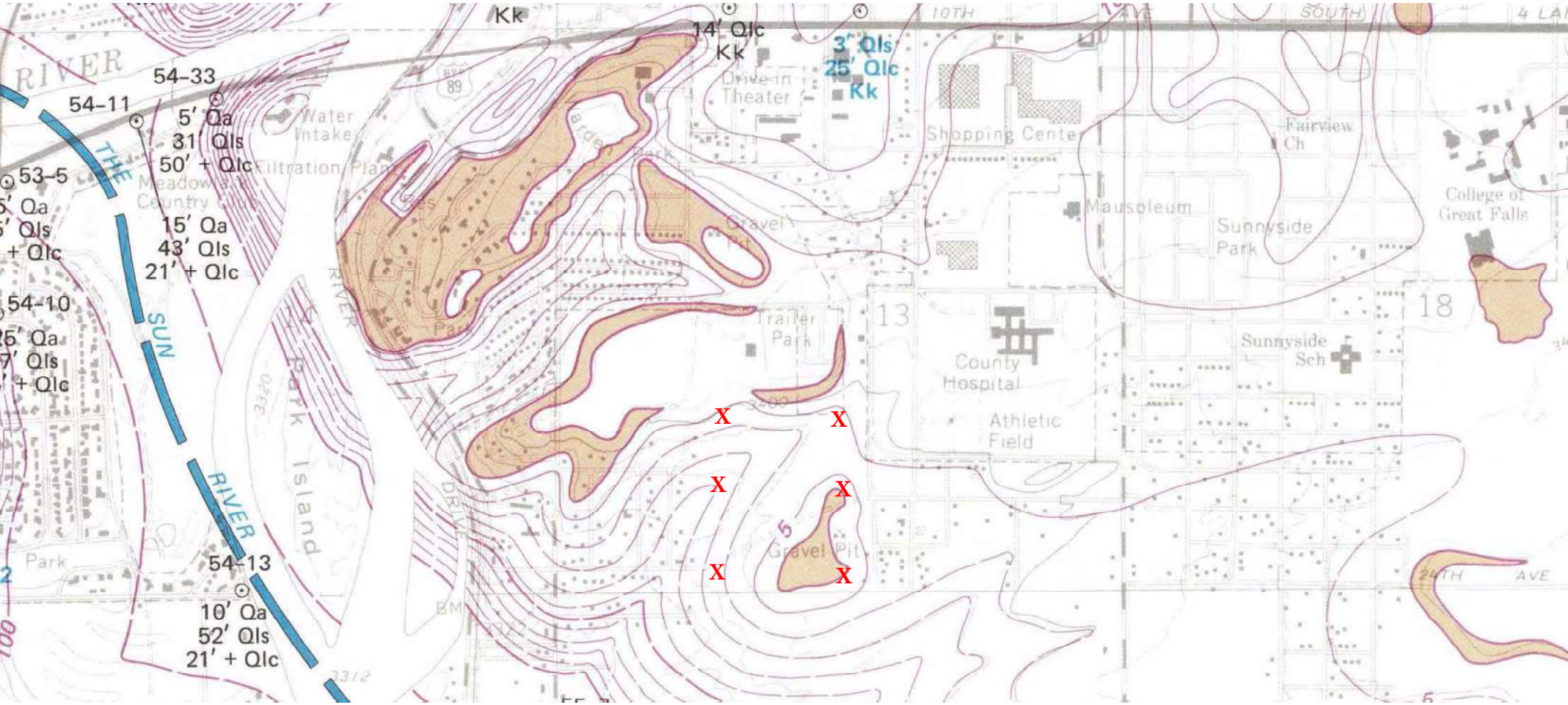


Figure 3: U.S. Department of the Interior U.S.G.S. Miscellaneous Investigations Series Map I-1025, "The Engineering Geology of the City of Great Falls and Vicinity, Montana", 1977; by Richard Lemke and Edwin Maughn.

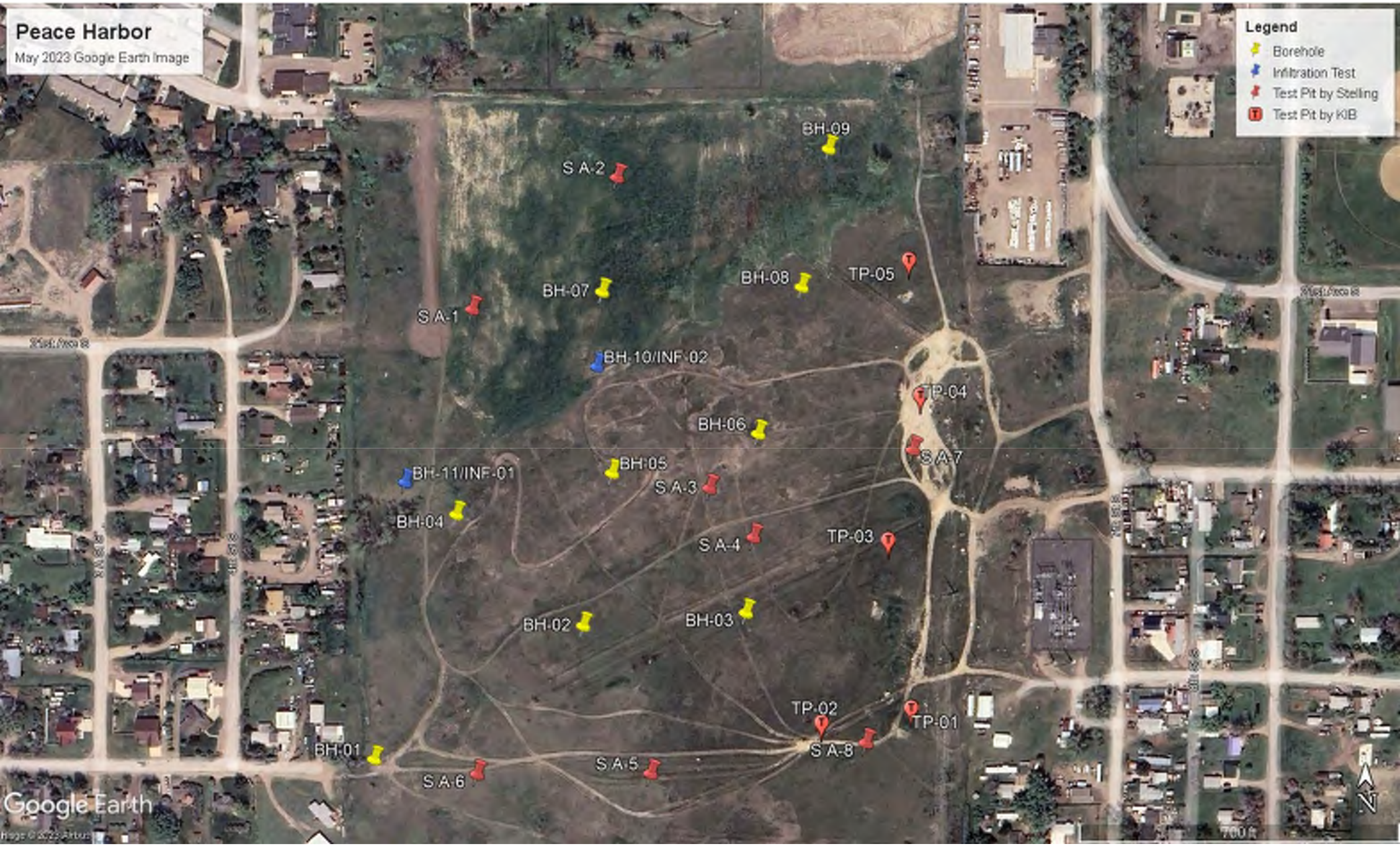
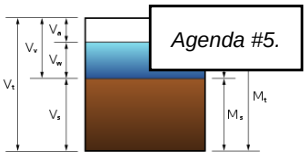


Figure 4: Borehole and Infiltration Test Locations (LSM yellow and blue pins); Test Pits (KIB red balloons); Auger Holes (Stelling red pins).



APPENDIX A. LOGS OF BOREHOLE & TESTING INFORMATION

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS:	Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted	CA:	Casing Advancer
ST:	Thin-Walled Tube - 2" O.D., unless otherwise noted	DA:	Drill Auger
CB:	California Sampler - 2" I.D., 2.5" O.D., unless otherwise noted	HA:	Hand Auger
DB:	Diamond Bit Coring - 4", NX, unless otherwise noted	RB:	Rock Bit
BS:	Bulk Sample or Auger Sample	GS:	Grab Sample

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". The field blow counts are reported for each 6-inch interval, or portion thereof if greater than 50 blows are required to advance the full 6-inch interval. For over-sized split spoon samplers, non-standard hammers, or non-standard drop heights, the field penetration values are reported on the bore log. The values must be corrected to obtain the N-value.

WL:	Water Level	WS:	While Sampling	NE:	Not Encountered
WCl:	Wet Cave-In	WD:	While Drilling		
DCI:	Dry Cave-In	BCR:	Before Casing Removal		
AB:	After Boring	ACR:	After Casing Removal		

Groundwater table levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater table levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater table levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION: Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: gravel or sand. Cobbles and boulders are not part of the USCS system but are included, when present, as percentages. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; depending on their plasticity, they are described as clay or silt. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils are defined on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-value (SS) Blows/Ft.	Consistency
< 500	0 - 1	Very Soft
500 - 1,000	2 - 4	Soft
1,001 - 2,000	5 - 8	Medium Stiff
2,001 - 4,000	9 - 15	Stiff
4,001 - 8,000	16 - 30	Very Stiff
8,000 +	30 +	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Standard Penetration or N-value (SS) Blows/Ft.	California Barrel (CB) Blows/Ft.	Relative Density
0 - 4	0 - 6	Very Loose
5 - 10	7 - 18	Loose
11 - 30	19 - 58	Medium Dense
31 - 50	59 - 98	Dense
50 +	99 +	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of Other Constituents	Percent of Dry Weight
Trace	< 15
With	15 - 30
Modifier	> 30

USCS* GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

*For AASHTO grain size the #4 sieve is replaced with the #10 sieve

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of Other Constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifiers	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-Plastic	0
Slightly	1 - 5
Low	6 - 10
Medium	11 - 20
Highly	21 - 40
Very Highly	> 40

GENERAL NOTES

Description of Rock Properties

WEATHERING

Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very Slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately Severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Highly	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very Highly	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete/Residual Soil	Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

FIELD HARDNESS (for engineering description of rock not to be confused with Moh's scale for minerals)

Very Hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately Hard	Can be scratched with knife or pick. Gouges or grooves to 1/4 in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very Soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

Joint, Bedding and Foliation Spacing in Rock [a]

Spacing	**Joints**	**Bedding/Foliation**
Less than 2 in.	Very Close	Very Thin
2 in. - 1 ft.	Close	Thin
1 ft. - 3 ft.	Moderately Close	Medium
3 ft.-10 ft.	Wide	Thick
More than 10 ft.	Very Wide	Very thick

Rock Quality Designation (RQD)[b]		**Joint Openness Descriptors**	
ROD, as a percentage	Diagnostic description	Openness	Descriptor
Exceeding 90	Excellent	No Visible Separation	Tight
90 - 75	Good	Less than 1/32 in.	Slightly Open
74 - 50	Fair	1/32 to 1/8 in.	Moderately Open
49 - 25	Poor	1/8 to 3/8 in.	Open
Less than 25	Very poor	1/2 in. to 1 1/4 in.	Moderately Wide
		Greater than 1 1/4 in.	Wide

a. Spacing refers to the distance normal to the planes of the described feature, which are parallel to each other or nearly so.

b. RQD (given as a percentage) = (Σ of core 4 in. and longer) / (length of run).

References: American Society of Civil Engineers Manuals and Reports on Engineering Practice - No. 56, American Society of Civil Engineers, 1976.
U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.
AASHTO M145, 2010.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines	Cu ≥ 4 and 1≤ Cc ≤ 3	GW	Well-graded Gravel [F]
			Cu < 4 and/or 1 > Cc > 3	GP	Poorly graded gravel [F]
		Gravels with Fines More than 12% fines	Fines classify as ML or MH	GM	Silty Gravel [F,G,H]
			Fines classify as CL or CH	GC	Clayey Gravel [F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines	Cu ≥ 6 and 1 ≤ Cc ≤ 3	SW	Well-graded Sand [I]
			Cu < 6 and/or 1 > Cc > 3	SP	Poorly graded Sand [I]
		Sands with Fines More than 12% fines	Fines classify as ML or MH	SM	Silty Sand [G,H,I]
			Fines classify as CL or CH	SC	Clayey Sand [G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	PI > 7 and plots on or above "A" line	CL	Lean Clay [K,L,M]
			PI < 4 or plots below "A" line	ML	Silt [K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OL	Organic Clay [K,L,M,N]
					Organic Silt [K,L,M,O]
	Silts and Clays Liquid Limit 50 or more	inorganic	PI plots on or above "A" Line	CH	Fat Clay [K,L,M]
			PI plots below "A" line	MH	Elastic Silt [K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OH	Organic Clay [K,L,M,P]
					Organic Silt [K,L,M,Q]
Highly organic soils	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contains cobbles and/or boulders, add "with cobbles or boulders, or both" as necessary to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt. GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60} / D_{10} \quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.

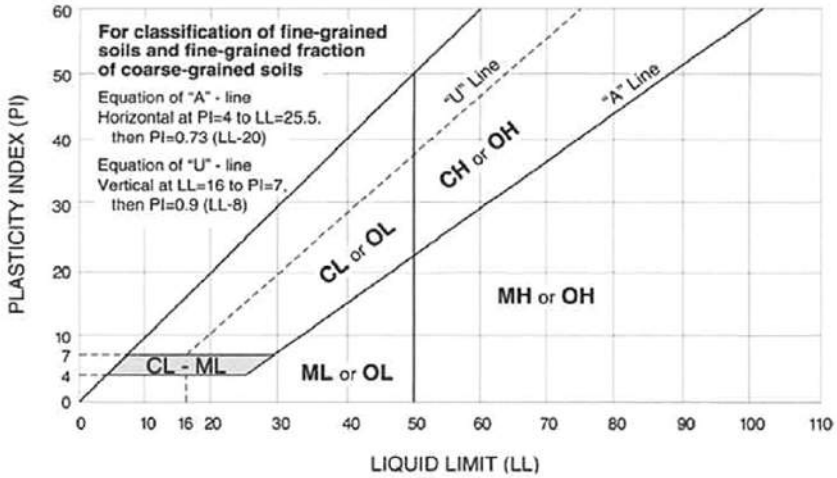
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

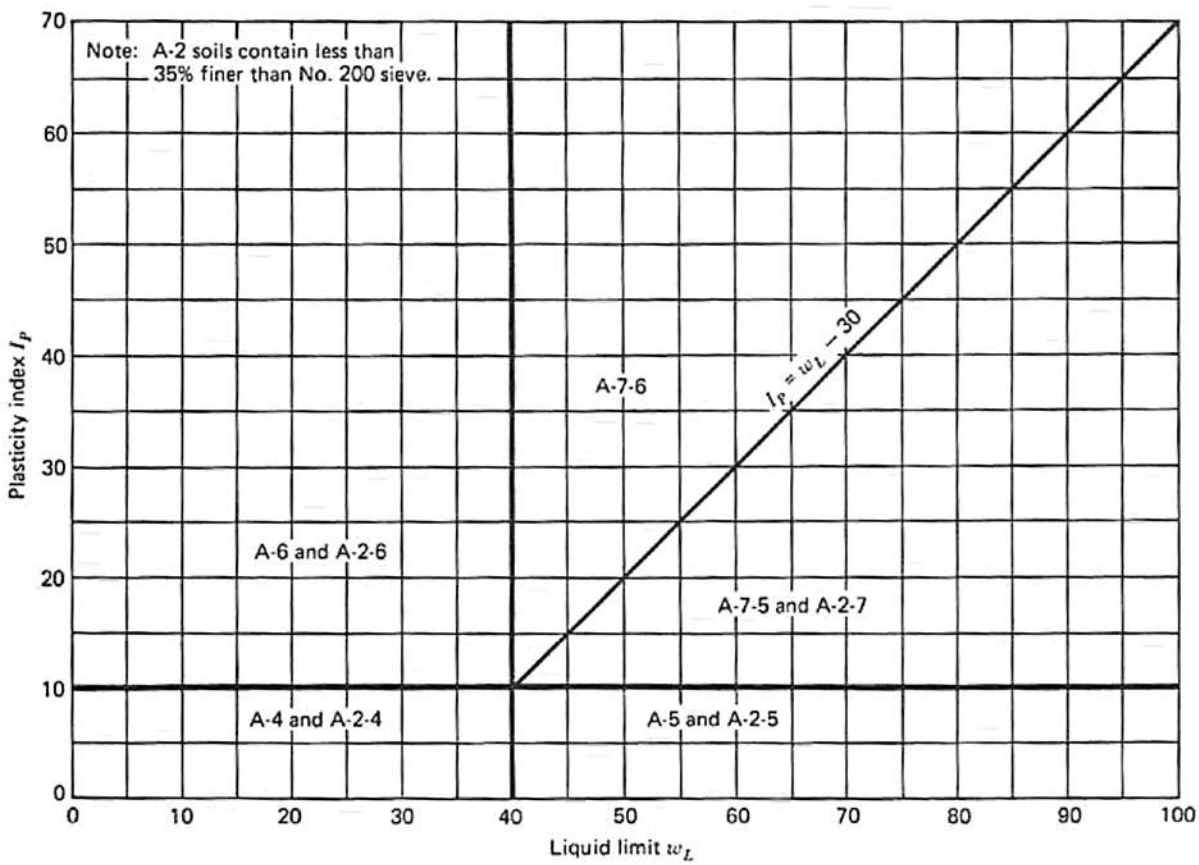
[Q] PI plots below "A" line.



AASHTO SOIL CLASSIFICATION SYSTEM

General classification	Granular materials (35 percent or less of total sample passing No. 200)							Silt-clay material (More than 35 percent of total sample passing No. 200)			
Group classification	A-1		A-3	A-2				A-4	A-5	A-6	A-7 [1]
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6
Sieve analysis percent passing											
No. 10	50 max										
No. 40	30 max	50 max	51 max								
No. 200	15 max	25 max	10 max	35 max	35 max	35 max	35 max	36 min	36 min	36 min	36 min
Characteristics of fraction passing No. 40											
Liquid limit, w_L				40 max	41 min	40 max	41 min	40 max	41 min	40 max	41 min
Plastic Index, I_P	6 max		NP	10 max	10 max	11 min	11 min	10 max	10 max	11 min	11 min
Significant constituent materials	gravel and sand		fine sand	silty and clayey gravel and sand				silty soils		clayey soils	

[1] Plasticity index of A-7-5 subgroup is equal to or less than LL minus 30. Plasticity index of A-7-6 subgroup is greater than LL minus 30.



Lorenzen Soil Mechanics, Inc.
2720 Palmer Street, Unit C
Missoula, MT 59808
Telephone: 406-830-0633

BORING NUMBER B

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/7/23 **COMPLETED** 3/8/23
GROUND ELEVATION 3379 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.812'; W111° 18.019'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; dark brown (10YR 3/3); strong reaction to 10% HCl solution. Gravels are subrounded.										
		(SM) [A-2-4] Silty SAND with Gravel; dark brown (10YR 3/3); strong reaction to 10% HCl solution. Gravels are subrounded. Drilling rate from 0 to 2.5 feet = 165 ft/hr.	GB					8				
		Very Highly Weathered Sandy SILTSTONE/ RESIDUAL SOIL; damp; brown (7.5YR 4/2); dense as a soil, soft field hardness as a rock; strong reaction to 10% HCl solution.	SPT	83	12-17-19 (36)			7				
			GB					7				
		Drilling rate from 2.5 to 5 feet = 155 ft/hr.										
5		Moderately Weathered SANDSTONE; damp; brown (7.5 YR 5/3) and gray (7.5YR 5/1); medium field hardness; strong reaction to 10% HCl solution within the upper portion of layer, no reaction within the lower portion.	SPT	100	50R/5"			7				
		Drilling rate from 5 to 7.5 feet = 30 ft/hr.	GB					7				
		Highly Weathered Sandy SILTSTONE; damp; gray (7.5YR 6/1) and very dark gray (7.5YR 3/1) to dark reddish brown (5YR 3/2); soft to medium field hardness; no reaction to 10% HCl solution.	SPT	78	16-29-35 (64)			9				
			GB					9				
		Drilling rate from 7.5 to 10 feet = 45 ft/hr.										
10			SPT	81	24-42-50R/4"			9				
		Changed from ODEX to Open Hole Drilling at 11.5 feet. Drilling rate from 10 to 15 feet = 30 ft/hr.	GB					9				
15		Moderately Weathered Sandy SILTSTONE; damp; reddish gray (5YR 5/2) and dark reddish brown (5YR 2.5/2); medium field hardness; no reaction to 10% HCl solution.										

Bottom of borehole at 15.0 feet.

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BORING NUMBER B

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/8/23 **COMPLETED** 3/8/23
GROUND ELEVATION 3388 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.862'; W111° 17.903'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; dark brown (10YR 3/3); no reaction to 10% HCl solution. Gravels are subrounded.										
		Drilling rate from 0 to 2.5 feet = 215 ft/hr.	GB					10				
		(ML) [A-4] Sandy SILT; damp; dark reddish gray (5YR 4/2) with pinkish gray (5YR 7/2) partings; stiff; strong reaction to 10% HCl solution; low plasticity; low dry strength, crumbly.										
			SPT	56	6-7-7 (14)			15				
			GB					15				
		Drilling rate from 2.5 to 5 feet = 90 ft/hr.										
5		(CL) [A-7-6] Fat CLAY; damp; dark brown (7.5YR 3/3) and brown (7.5YR 4/3) with white (7.5YR 8/1) partings; hard; medium reaction to 10% HCl solution; highly plastic, some shrinkage cracks; high dry strength, brittle.										
			SPT	83	9-11-20 (31)			17				
		Drilling rate from 5 to 7.5 feet = 60 ft/hr.	GB					12				
		Moderately Weathered Sandy SILTSTONE; damp; brown (7.5YR 5/3) with white (7.5YR 8/1) partings; medium field hardness; strong reaction to 10% HCl solution.										
			SPT	86	24-50R/5"			4				
			GB					4				
		Drilling rate from 7.5 to 10 feet = 75 ft/hr.										
10		Moderately Weathered Sandy SILTSTONE, traces of COAL; dry to damp; dark brown (7.5YR 3/3) and gray (7.5YR 5/1) with white (7.5YR 8/1) inclusions; medium field hardness; dark brown and gray matrices have no reaction to 10% HCl solution, white inclusions have a strong reaction to 10% HCl solution. 5-inch thick layer of Coal at 11 feet.										
			SPT	72	16-25-19 (44)			10				
			GB					11				
		Drilling rate from 10 to 15 feet = 210 ft/hr.	GB					7				
		Moderately Weathered Sandy SILTSTONE; dry; dark brown (7.5YR 3/3) and gray (7.5YR 5/1) with white (7.5YR 8/1) inclusions; moderately hard field hardness; strong reaction to 10% HCl solution.										
15			SPT	100	50R-25/0"			6				

Bottom of borehole at 15.5 feet.

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Telephone: 406-830-0633

BORING NUMBER B

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/8/23 **COMPLETED** 3/8/23
GROUND ELEVATION 3410 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.867'; W111° 17.820'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; very dark brown (10YR 2/2); no reaction to 10% HCl solution. Gravels are subrounded.										
		Drilling rate from 0 to 2.5 feet = 210 ft/hr.	GB					9				
		(ML) [A-4] Sandy SILT with Gravel clasts; damp; dark grayish gray (10YR 4/2) with light brownish gray (10YR 6/2) partings; very stiff; strong reaction to 10% HCl solution; low plasticity; low dry strength, crumbly.	SPT	83	6-14-13 (27)			12				
		Drilling rate from 2.5 to 5 feet = 130 ft/hr.	GB					10				
5		(GM) [A-2-4] Silty GRAVEL; subrounded to subangular; damp; yellowish brown (10YR 5/4); dense; strong reaction to 10% HCl solution. Fines are medium plastic.										
			SPT		16-21-13 (34)			5				
		Drilling rate from 5 to 10 feet = 145 ft/hr.	GB					9				
10		(GC) [A-2-6] Clayey GRAVEL; subrounded to subangular; damp to moist; brown (10YR 4/3) interbedded with dusky red (10R 3/4) matrices; medium dense to dense; strong reaction to 10% HCl solution. Fines are medium plastic.	SPT	89	7-13-8 (21)			10				
		Drilling rate from 10 to 15 feet = 60 ft/hr.	GB					14				
15			SPT	0	7-15-21 (36)							

Bottom of borehole at 16.5 feet.

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BORING NUMBER B

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/7/23 **COMPLETED** 3/7/23
GROUND ELEVATION 3364 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.903'; W111° 17.977'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; moist - frost to 0.5 feet; dark brown (10YR 3/3); strong reaction to 10% HCl solution. Gravels are subrounded. Drilling rate from 0 to 2.5 feet = 100 ft/hr.	GB					15				
		(SP-SM) [A-3] Poorly Graded SAND with Silt, traces of Mica flakes; moist to damp; dark brown (10YR 3/3); medium dense; strong reaction to 10% HCl solution. Fines are non-plastic.	SPT	72	3-4-7 (11)			5				
			GB					5				
		Drilling rate from 2.5 to 5 feet = 225 ft/hr.										
5		No SPT at 5-foot depth - the casing would not unlock in the sand.	SPT	61	8-10-11 (21)			12				
			GB					12				
		(CH) [A-7-6] Fat CLAY; damp to moist; dark grayish brown (10YR 4/2) to brown (10YR 4/3) with light gray (10YR 7/1) specks; very stiff; strong reaction to 10% HCl solution; highly plastic; medium dry strength, brittle, shrinkage cracks. Drilling rate from 5 to 10 feet = 30 ft/hr.	SPT	61	8-10-11 (21)	4.25		24				
			GB					21				
10		(CH) [A-7-6] Fat CLAY; moist; dark grayish brown (10YR 4/2) to very dark grayish brown (10YR 3/2) with alkali salts and white (10YR 8/1) specks; stiff; no reaction to 10% HCl solution; highly plastic; medium dry strength, brittle, shrinkage cracks.	SPT	72	3-4-7 (11)	1.75		38				
							79	38				
		Drilling rate from 10 to 15 feet = 10 ft/hr. Slow rate due to ODEX hammer hitting against clay.	GB					34				
15			SPT	100	2-5-7 (12)			42				
							75	44				

Bottom of borehole at 16.5 feet.

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BORING NUMBER B

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/7/23 **COMPLETED** 3/7/23
GROUND ELEVATION 3384 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.919'; W111° 17.890'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; dark brown (10YR 3/3); strong reaction to 10% HCl solution. Gravels are subrounded.										
		Drilling rate from 0 to 2.5 feet = 115 ft/hr.	GB					9				
		(SP-SM) [A-3] Poorly Graded SAND with Silt; damp; dark brown (10YR 3/3); loose; strong reaction to 10% HCl solution. Fines are non-plastic.	SPT	67	2-2-2 (4)			10	NP	NP	NP	8
			GB					11				
		Drilling rate from 2.5 to 5 feet = 245 ft/hr.										
5		(SP-SM) {A-3] Poorly Graded SAND with Silt; dry; brown (10YR 5/3, 5/4); medium dense to loose; strong reaction to 10% HCl solution. Fines are non-plastic.	SPT	61	6-8-6 (14)			5	NP	NP	NP	10
			GB					4				
		Drilling rate from 5 to 7.5 feet = 210 ft/hr.										
			SPT	67	4-3-4 (7)			6				
			GB					5				
		Drilling rate from 7.5 to 10 feet = 245 ft/hr.										
10			SPT	72	7-8-11 (19)			14				
		(CL) [A-6] Sandy Lean CLAY; damp; yellowish brown (10YR 4/4) with white (10YR 8/1) dendritic inclusions; very stiff; strong reaction to 10% HCl solution; highly plastic; medium dry strength, friable.	GB					24				
		Drilling rate from 10 to 15 feet = 25 ft/hr. Slow rate due to ODEX hammer hitting against clay.										
15		(CH) [A-7-6] Fat CLAY; damp; brown (10YR 5/3) and very dark gray (10YR 3/1); stiff; no reaction to 10% HCl solution; very highly plastic; medium dry strength, brittle, few shrinkage cracks.	SPT	100	3-6-9 (15)	3.0	85	33	100	36	64	100
		Bottom of borehole at 16.5 feet.						33				

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BORING NUMBER B

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/7/23 **COMPLETED** 3/7/23
GROUND ELEVATION 3399 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.934'; W111° 17.813'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; dark brown (10YR 3/3); medium reaction to 10% HCl solution. Gravels are subrounded.										
		Drilling rate from 0 to 2.5 feet = 80 ft/hr.	GB					6				
		(SP-SM) [A-3] Poorly Graded SAND with Silt; damp; dark brown (10YR 3/3); loose [inferred]; weak reaction to 10% HCl solution. Fines are non-plastic.										
		(SP-SM) [A-3]Poorly Graded SAND; dry; brown (10YR 5/3); medium dense; strong reaction to 10% HCl solution. Fines are non-plastic.	GB					7				
		Drilling rate from 2.5 to 5 feet = 300 ft/hr.										
5			SPT	67	3-7-11 (18)			4				
			GB					5				
		Drilling rate from 5 to 7.5 feet = 255 ft/hr.										
		(CH) [A-7-6] Fat CLAY; damp; very dark brown (10YR 3/2) and dark yellowish brown (10YR 4/4); very stiff; strong to weak reaction to 10% HCl solution; highly plastic; high dry strength, brittle, few shrinkage cracks.						22				
			SPT	56	9-13-13 (26)	>4.5			57	27	30	90
			GB					24				
		Drilling rate from 7.5 to 10 feet = 40 ft/hr. Slow rate due to ODEX hammer hitting against clay.						22				
10												
			SPT	100	6-9-14 (23)	>4.5		23	73	34	39	95
			GB				91	26				
								21				
		Drilling rate from 10 to 15 feet = 20 ft/hr. Slow rate due, in part, to ODEX hammer hitting against clay.										
		Slightly Weathered SANDSTONE; dry; reddish gray (10YR 4/2); hard field hardness; medium reaction to 10% HCl solution.										
			GB					4				
15												
		Bottom of borehole at 15.0 feet.	SPT		25/0"							

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BORING NUMBER BH-09

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/6/23 **COMPLETED** 3/6/23
GROUND ELEVATION 3372 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.984'; W111° 17.900'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; dark brown (10YR 3/3). Gravels are subrounded.										
		Drilling rate from 0 to 2.5 feet = 120 ft/hr.										
		(SM) [A-2-4] Silty SAND, trace of Mica flakes; damp; brown (10YR 4/3); medium dense [inferred]; strong reaction to 10% HCl solution. Fines are slightly plastic.										
		Drilling rate from 2.5 to 5 feet = 15 ft/hr. Slow drill rate is a function of the drill rig not having adequate torque for augers in clay.	SPT	72	9-10-11 (21)			8				
5		(CH) [A-7-6] Fat CLAY, some Sand Pockets; damp; brown (10YR 4/3) and yellowish brown (10YR 5/3) with white (10YR 8/1) dendritic inclusions and alkali inclusions; strong reaction to 10% HCl solution; very stiff; very highly plastic; high dry strength, brittle, some shrinkage cracks.	SPT	83	6-8-12 (20)			21				
		Drilling rate from 5 to 10 feet = 25 ft/hr. Slow drill rate is a function of the drill rig not having adequate torque for augers in clay.										
10			SPT	72	3-7-10 (17)	2.0	79	31 39	81	28	53	94
		Drilling rate from 10 to 15 feet = 40 ft/hr. Slow drill rate is a function of the drill rig not having adequate torque for augers in clay.										
		(CH) [A-7-6] Fat CLAY; moist; yellowish brown (10YR 5/4); no reaction to 10% HCl solution; stiff; very highly plastic; medium dry strength, brittle, shrinkage cracks.										
15			SPT	100	2-5-5 (10)	1.5	78	41 42				
		Auger Drilled - after drilling BH-09 the ODEX hammer was not performing well in saturated fine-grained soils. Bottom of borehole at 16.5 feet.										

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BORING NUMBER B

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/7/23 **COMPLETED** 3/7/23
GROUND ELEVATION 3397 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.986'; W111° 17.790'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; dark brown (10YR 3/3); strong reaction to 10% HCl solution. Gravels are subrounded.										
		Drilling rate from 0 to 2.5 feet = 105 ft/hr.	GB					10				
		(SP-SM) [A-3] Poorly Graded SAND with Silt; damp; dark brown (10YR 3/3); loose [inferred]; strong reaction to 10% HCl solution. Fines are non-plastic.										
		(CH) [A-7-6] Fat CLAY with Sand and Alkali inclusions and partings; damp; brown (10YR 4/3) and dark grayish brown (10YR 4/2) with very pale brown (10YR 7/3) inclusions and partings; stiff; strong reaction to 10% HCl solution; highly plastic; high dry strength, brittle, crumbly.	SPT	39	5-5-7 (12)			15				
			GB					19				
5		Drilling rate from 2.5 to 5 feet = 130 ft/hr.										
			SPT	78	7-7-10 (17)			19	50	24	26	83
			GB					19				
		Drilling rate from 5 to 7.5 feet = 40 ft/hr. Slow rate due to ODEX hammer hitting against clay.										
		Very Highly Weathered Sandy SILTSTONE; damp; light gray (10YR 7/1) and dark reddish brown (5YR 3/4) to gray (10YR 5/1) with white (10YR 8/1) partings; soft field hardness; matrix has mild reaction to 10% HCl solution, partings have a strong reaction to 10% HCl solution.	SPT	50	10-14-21 (35)			16				
			GB					13				
10		Drilling rate from 7.5 to 10 feet = 65 ft/hr.										
			SPT	72	15-22-10 (32)			8				
		Drilling rate from 10 to 15 feet = 55 ft/hr.	GB					4				
		Slightly Weathered SANDSTONE; dry; reddish gray (5YR 5/2); hard field hardness; no reaction to 10% HCl solution.										
15		Highly Weathered Sandy SILTSTONE; damp; very dark gray (10YR 3/1) to gray (10YR 5/1); soft field hardness; no reaction to 10% HCl solution.	SPT		11-42-50R/3"			10				

Bottom of borehole at 16.3 feet.

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2720 Palmer Street, Unit C
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BORING NUMBER BH-06

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/6/23 **COMPLETED** 3/6/23
GROUND ELEVATION 3392 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- Wet from 5 ft to 10 ft
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- No free water had collected at the BH bottom
NOTES N47° 29.034'; W111° 17.776'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) FILL, Sandy Loam Topsoil with scattered Gravel, pieces of Concrete; moist; brown (10YR 4/3); strong reaction to 10% HCl solution. Gravels are subrounded to subangular. Drilling rate from 0 to 2.5 feet = 600 ft/hr. A tire innertube was encountered that the ODEX hammer could not advance through. The hole loctionwasmoced slightly.	GB					21				
		(SP-SM) [A-3] Poorly Graded SAND with Silt; moist to wet; very dark brown (10YR 2/2); loose; strong reaction to 10% HCl solution; medium dry strength - cemented, friable. Fines are non-plastic.	SPT	61	2-3-2 (5)			23				
			GB					21				
		Drilling rate from 2.5 to 5 feet = 600 ft/hr.										
5		(ML) [A-4] Sandy SILT; wet - bull's liver; yellowish brown (10YR 5/4); very loose; strong reaction to 10% HCl solution; slightly plastic, rapid dilatancy; high dry strength - cemented, friable.	SPT	67	1-2-1 (3)			27				
			GB					25				
		Drilling rate from 5 to 7.5 feet = 600 ft/hr.										
		(ML) [A-4] Sandy SILT; wet - bull's liver; yellowish brown (10YR 5/4); medium dense; strong reaction to 10% HCl solution; slightly plastic, rapid dilatancy; high dry strength - cemented, friable.	SPT	72	2-6-5 (11)			25				
			GB					25				
		Drilling rate from 7.5 to 10 feet = 600 ft/hr.										
10			SPT	67	2-5-7 (12)	1.25		28				
		(CH) [A-7-6] Fat CLAY with Sand; moist; dark grayish brown (10YR 4/2) with dark yellowish brown (10YR 4/4); stiff; strong reaction to 10% HCl solution; highly plastic, no shrinkage cracks; high dry strength, brittle.						27				
		Drilling rate from 10 to 15 feet = 100 ft/hr.	GB					29				
15		(CH) [A-7-6] Fat CLAY with some Alkali salts; moist; brown (10YR 4/3) with white (10YR 8/1) Alkali; stiff; Clay has no reaction to 10% HCl solution, Alkali has a strong reaction to 10% HCl solution; very highly plastic, with shrinkage cracks; high dry strength, brittle.	SPT	100	3-5-8 (13)	1.75		38				
							80	38				

Bottom of borehole at 16.5 feet.

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BORING NUMBER BH-10 [illegible]

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/8/23 **COMPLETED** 3/8/23
GROUND ELEVATION 3375 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered.
NOTES N47° 28.903'; W111° 17.977'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; brown (10YR 4/3); strong reaction to 10% HCl solution. Gravels are subrounded.										
		(SP-SM) [A-3] Poorly Graded SAND with Silt; damp to moist; brown (10YR 4/3); loose; strong reaction to 10% HCl solution. Fines are non-plastic.	GB					14				
		Sand Lock kept the ODEX hammer from disengaging at the 2.5-foot sample depth. No SPT was taken at 2.5 feet.	SPT	72	4-11-13 (24)	>4.5		22				
		Drilling rate from 0 to 5 feet = 190 ft/hr.	GB					21				
5												
			SPT		9-19-27 (46)	>4.5		21				
			GB					23				
		Drilling rate from 5 to 7.5 feet = 30 ft/hr. Slow rate due to ODEX hammer hitting against clay.										
		(CH) [A-7-6] Fat CLAY with Alkali partings; damp to moist; brown (10YR 5/3) to very dark grayish brown (10YR 3/2) with white (10YR 8/1) Alkali partings; very stiff; strong reaction to 10% HCl solution; highly plastic with shrinkage cracks; high dry strength, brittle.						32				
			SPT	100	6-9-11 (20)	4.5		30				
			GB				85	32				
		Drilling rate from 7.5 to 9 feet = 25 ft/hr. Slow rate due to ODEX hammer hitting against clay.										
10			SPT	100	3-5-7 (12)	2.75		35				
							80	39				

Infiltration Testing = 50 hr/ft
Bottom of borehole at 10.5 feet.

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BORING NUMBER BH-11

CLIENT KIB Homes
PROJECT NAME Peace Harbor
PROJECT NUMBER P23
PROJECT LOCATION Great Falls
DATE STARTED 3/8/23 **COMPLETED** 3/8/23
GROUND ELEVATION 3359 ft **HOLE SIZE** 6 inches
DRILLING CONTRACTOR Boland Drilling
GROUND WATER LEVELS:
DRILLING METHOD CME 45
AT TIME OF DRILLING --- GW table was not encountered.
LOGGED BY Lorenzen **CHECKED BY** Lorenzen
AT END OF DRILLING --- GW table was not encountered
NOTES N47° 28.915'; W111° 18.006'
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		(ML) TOPSOIL, Sandy Loam with scattered Gravel; damp; dark yellowish brown (10YR 3/4); strong reaction to 10% HCl solution. Gravels are subrounded. Drilling rate from 0 to 2.5 feet = 200 ft/hr.						12				
		(SP-SM) [A-3] Poorly Graded SAND with Silt; damp; dark yellowish brown (10YR 3/4); loose [inferred]; strong reaction to 10% HCl solution. Fines are non-plastic.										
		(CH) [A-7-6] Fat CLAY; damp; dark grayish brown (10YR 4/2) and brown (10YR 5/3); very stiff; strong reaction to 10% HCl solution; highly plastic, no shrinkage cracks; high dry strength, brittle.	GB					12				
5		Drilling rate from 2.5 to 5 feet = 30 ft/hr. Slow rate due to ODEX hammer hitting against clay.										
		(CH) [A-7-6] Fat CLAY; damp; dark brown (10YR 3/3) and dark yellowish brown (10YR 5/4) with white (10YR 8/1) Alkali specks and partings; very soft field hardness as rock, hard as soil; strong reaction to 10% HCl solution; high dry strength, brittle, few shrinkage cracks.	SPT	72	3-4-3 (7)			19 17				
		Drilling rate from 5 to 7.5 feet = 20 ft/hr. Slow rate due to ODEX hammer hitting against clay.	GB					25				
		(CH) [A-7-6] Fat CLAY; damp; dark brown (10YR 3/3) and dark grayish brown (10YR 4/2) with white (10YR 8/1) Alkali specks and partings; stiff; matrix has no reaction to 10% HCl solution, alkali partings have a strong reaction to 10% HCl solution; highly plastic; medium dry strength, brittle.	SPT	94	4-7-8 (15)	3.0	85	29 25 33				
10		Drilling rate from 7.5 to 9 feet = 10 ft/hr. Slow rate due to ODEX hammer hitting against clay.	SPT	72	3-6-9 (15)	2.75	89	31 31				

Infiltration Testing = >50 hr/ft

Bottom of borehole at 10.5 feet.

GRAIN SIZE DISTRIBUTION

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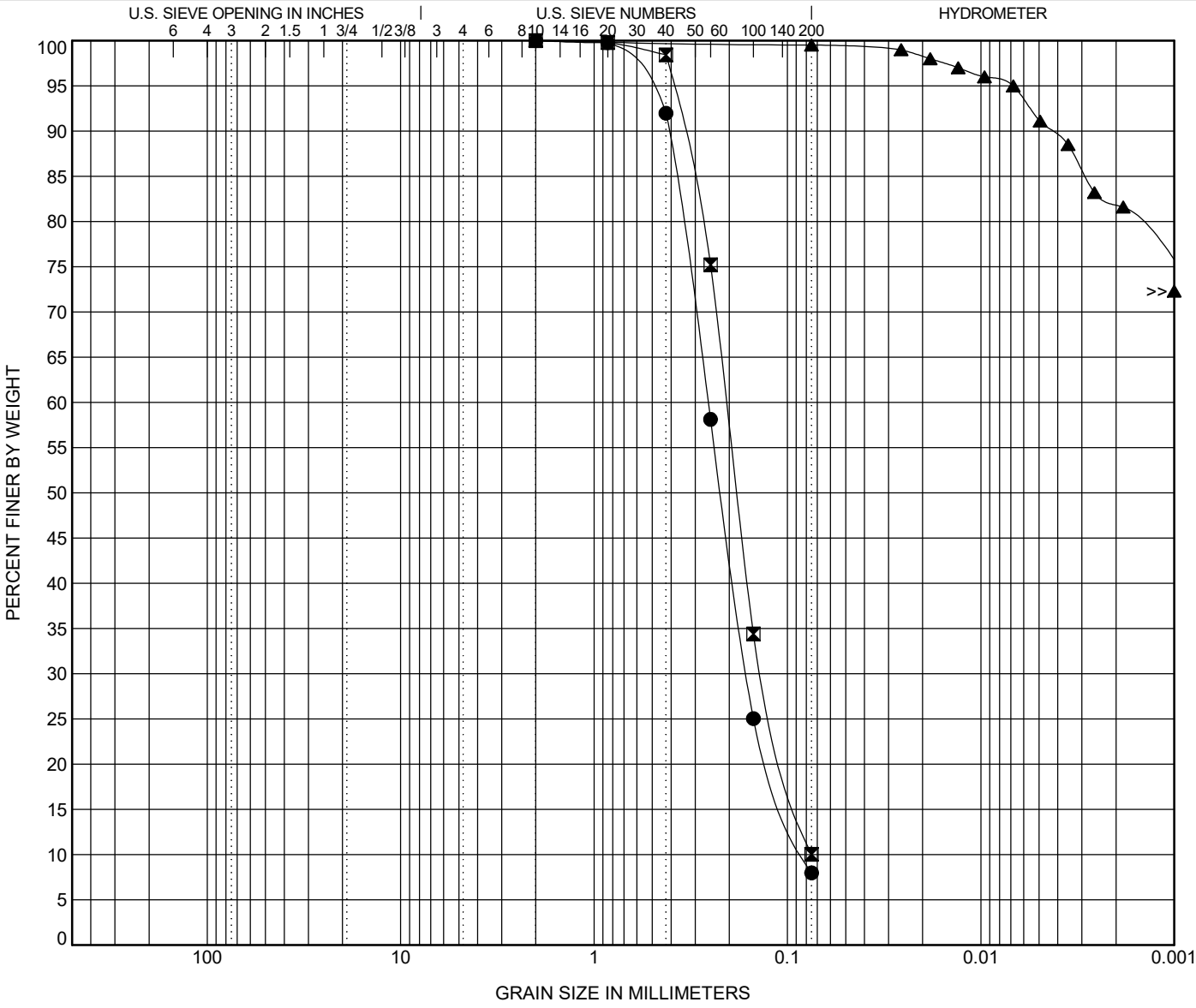
CLIENT KIB Homes **PROJECT NAME** Peace Harbor

PROJECT NUMBER P23 **PROJECT LOCATION** Great Falls



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BH-05**	**2.5**	**POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**	**1.25**	**3.16**
⊠	**BH-05**	**5.0**	**POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**	**1.13**	**2.76**
▲	**BH-05**	**15.0**	**FAT CLAY(CH)**	**100**	**36**	**64**		

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-05**	**2.5**	**2**	**0.257**	**0.162**	**0.081**	**0.0**	**92.0**	**8.0**	
⊠	**BH-05**	**5.0**	**2**	**0.207**	**0.132**		**0.0**	**90.0**	**10.0**	
▲	**BH-05**	**15.0**	**2**				**0.0**	**0.5**	**8.3**	**91.2**

GRAIN SIZE DISTRIBUTION

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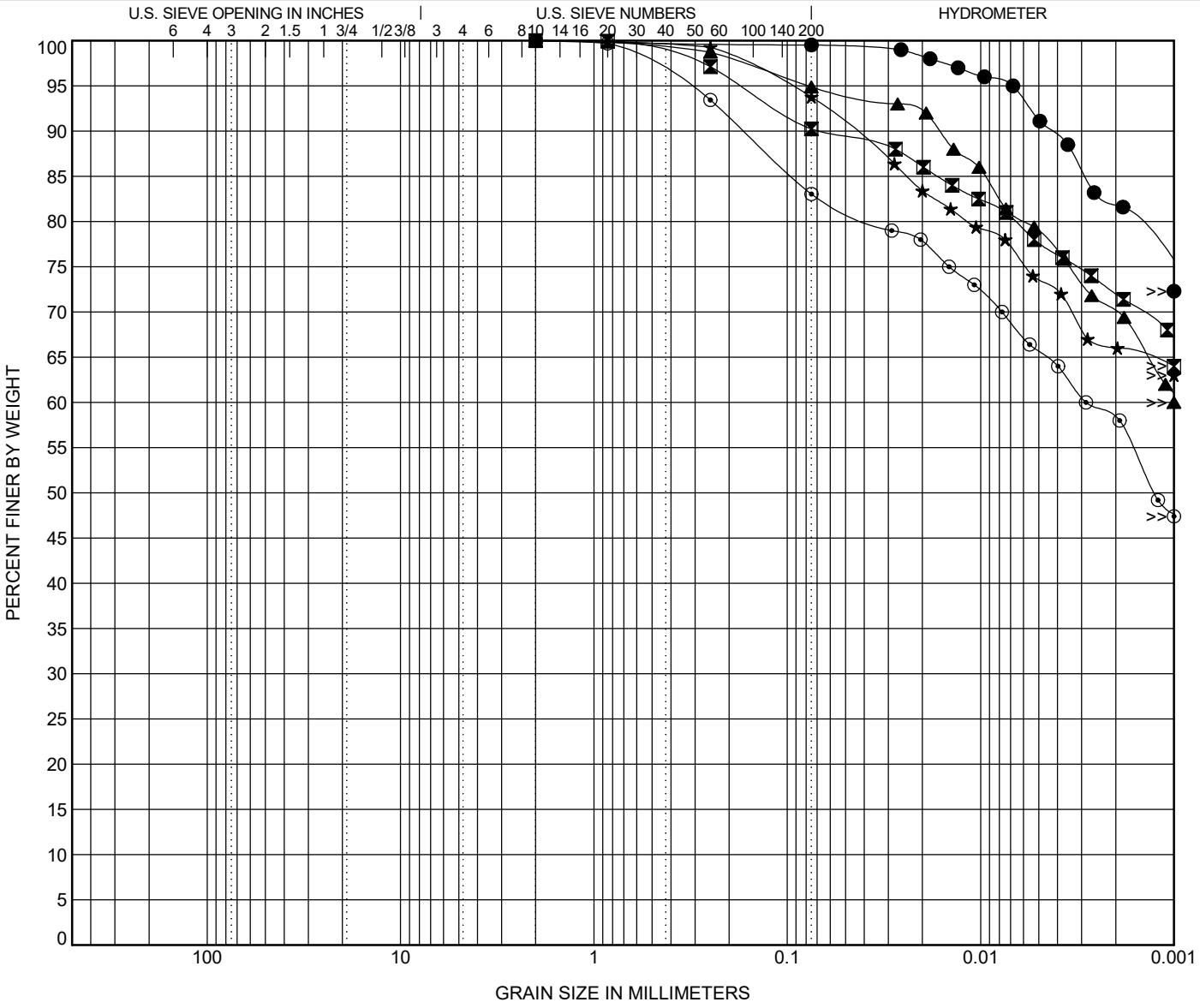
CLIENT KIB Homes **PROJECT NAME** Peace Harbor

PROJECT NUMBER P23 **PROJECT LOCATION** Great Falls



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BH-05**	**15.0**	**FAT CLAY(CH)**	**100**	**36**	**64**		
⊠	**BH-06**	**7.5**	**FAT CLAY(CH)**	**57**	**27**	**30**		
▲	**BH-06**	**10.0**	**FAT CLAY(CH)**	**73**	**34**	**39**		
★	**BH-07**	**10.0**	**FAT CLAY(CH)**	**81**	**28**	**53**		
⊙	**BH-08**	**5.0**	**FAT CLAY with SAND(CH)**	**50**	**24**	**26**		

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-05**	**15.0**	**2**				**0.0**	**0.5**	**8.3**	**91.2**
⊠	**BH-06**	**7.5**	**2**				**0.0**	**9.8**	**12.6**	**77.7**
▲	**BH-06**	**10.0**	**2**	**0.001**			**0.0**	**5.1**	**16.0**	**78.8**
★	**BH-07**	**10.0**	**2**				**0.0**	**6.2**	**20.2**	**73.6**
⊙	**BH-08**	**5.0**	**2**	**0.003**			**0.0**	**17.0**	**17.4**	**65**

ATTERBERG LIMITS' RESULTS

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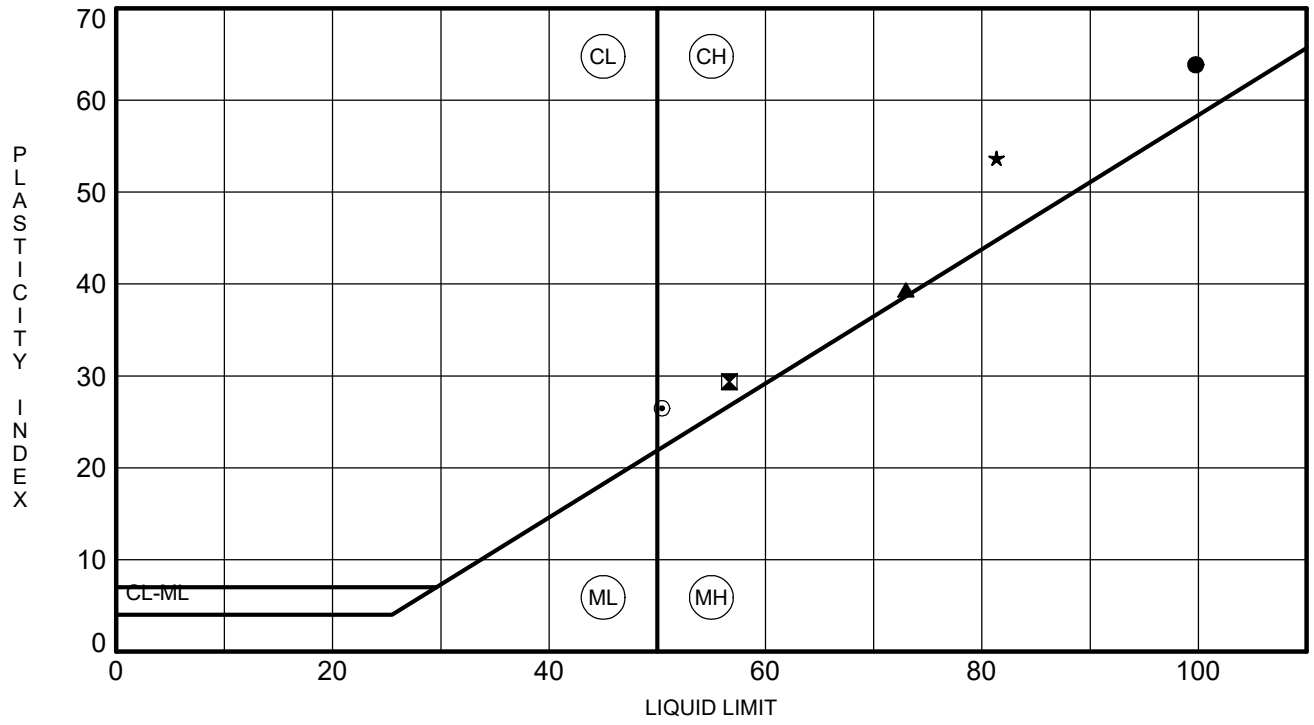
CLIENT KIB Homes **PROJECT NAME** Peace Harbor

PROJECT NUMBER P23 **PROJECT LOCATION** Great Falls



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BH-05**	**15.0**	**100**	**36**	**64**	**100**	**FAT CLAY(CH)**
⊠	**BH-06**	**7.5**	**57**	**27**	**30**	**90**	**FAT CLAY(CH)**
▲	**BH-06**	**10.0**	**73**	**34**	**39**	**95**	**FAT CLAY(CH)**
★	**BH-07**	**10.0**	**81**	**28**	**53**	**94**	**FAT CLAY(CH)**
⊙	**BH-08**	**5.0**	**50**	**24**	**26**	**83**	**FAT CLAY with SAND(CH)**

Peace Harbor Street Typical Section for A-3 Soils

NOMOGRAPH SOLVES:

$$\log_{10} W_{18} = Z_R * S_o + 9.36 * \log_{10}(SN+1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.2 - 1.5}\right]}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \log_{10} M_R - 8.07$$

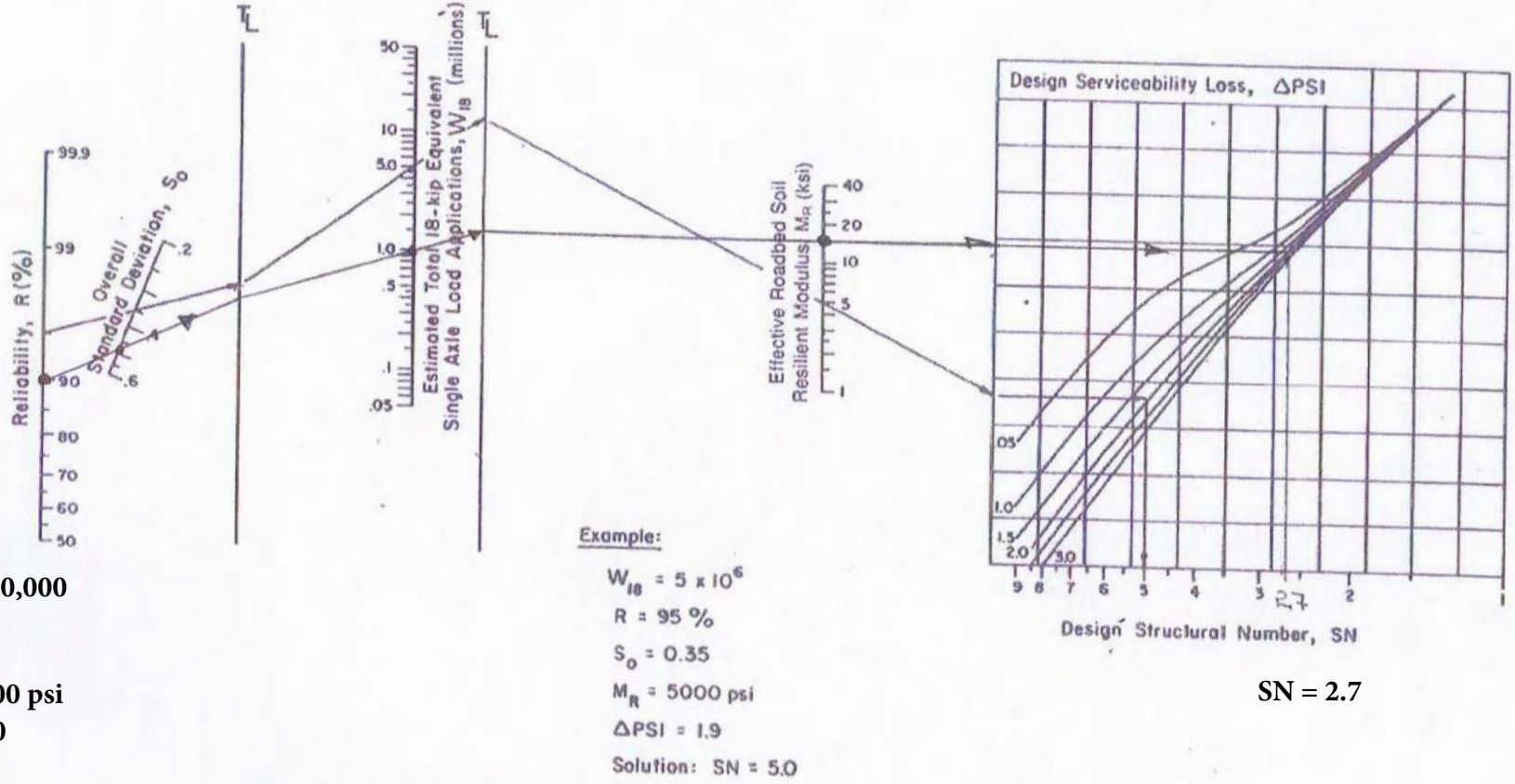


Figure 3.1. Design Chart for Flexible Pavements Based on Using Mean Values for Each Input

W_{18} = 1,000,000
R = 90%
S_o = 0.49
M_R = 15,000 psi
Δ PSI = 2.0

SN = 2.7

a_1 = 0.41 - Plant Mix
a_2 = 0.14 - CBC

D_1 = 3 inches
D_2 = 11 inches
$a_1(D_1) + a_2(D_2) = 2.77 > 2.7$ OK

MONTANA WELL LOG REPORT

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Other Options

Return to menu
Plot this site in State Library Digital Atlas
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View hydrograph for this site
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View water quality for this site
View scanned well log (7/20/2006 1:28:24 PM)

Site Name: HARVIE ROY
GWIC Id: 125353
DNRC Water Right: 86627

Section 1: Well Owner(s)

1) HARVIE, ROY (MAIL)
800 23 AVE. SOUTH
GREAT FALLS MT 59405 [10/02/2005]
2) HARVIE, RICHARD (MAIL)
2305 9TH ST S
GREAT FALLS MT 59405 [05/25/1990]

Section 2: Location

Township	Range	Section	Quarter Sections
20N	03E	13	SW¼ SE¼ SW¼ SE¼

County: CASCADE
Geocode:

Latitude	Longitude	Geomethod	Datum
47.4806	-111.2923	NAV-GPS	NAD83

Ground Surface Altitude	Ground Surface Method	Datum	Date
3390			10/2/2005

Measuring Point Altitude	MP Method	Datum	Date Applies
3391.2			10/2/2005 2:35:00 PM

Addition: PARK PLACE
Block:
Lot: 28

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Friday, May 25, 1990

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	31	10
31	175	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-1.5	31	6	0.250		WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
31	175	6			OPEN HOLE

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	31	BENTONITE CLAY	

Section 7: Well Test Data

Total Depth: 175
Static Water Level: 90
Water Temperature:

Air Test *

6.3 gpm with drill stem set at 175 feet for 1 hours.
Time of recovery 0.5 hours.
Recovery water level 90 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source
217KOTN - KOOTENAI FORMATION

From	To	Description
0	5	SAND
5	21	BROWN CLAY
21	25	RED SHALE
25	38	HARD RED ROCK
38	41	RED SANDY SHALE
41	50	RED ROCK
50	59	GREY SANDSTONE
59	62	DARK GRAY SHALEROCK
62	63	GRAY SANDSTONE
63	75	GRAY SHALE W/SANDSTONE STREAMERS
75	78	HARD GRAY SANDSTONE
78	81	GRAY SANDY SHALE
81	100	LIGHT GRAY SANDSTONE
100	121	HARD GRAY SANDSTONE
121	124	GRAY SANDY SHALE

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BYRNE
License No: WWC-318
Date Completed: 5/25/1990

Site Name: HARVIE ROY
GWIC Id: 125353
Additional Lithology Records

From	To	Description
124	142	RED ROCK
142	162	LIGHT BROWN SANDSTONE
162	175	GRAY-DARK GRAY SANDSTONE

MONTANA WELL LOG REPORT

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Other Options

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Plot this site in Google Maps
View scanned well log (7/20/2006 9:30:20 AM)

Site Name: MEISMER MICKEY A.
GWIC Id: 185531
DNRC Water Right: 30002282

Section 1: Well Owner(s)

1) MEISMER, MICKEY A (MAIL)
824 21ST AVE SO
GREAT FALLS MT 59405 [08/16/2000]

Section 2: Location

Township	Range	Section	Quarter Sections
20N	03E	13	NW¼ SW¼ SE¼

County CASCADE **Geocode**

Latitude	Longitude	Geomethod	Datum
47.482395	-111.294095	TRS-SEC	NAD83

Ground Surface Altitude **Ground Surface Method** **Datum** **Date**

Addition **Block** **Lot**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Wednesday, August 16, 2000

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	20	9
20	400	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	20	6			WELDED	STEEL
16	400	5		250.00	SOLVENT WELD	PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
380	398	5	40	.125X6	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	BENTONITE	
335	335	SHALETRAP PACKER	

Section 7: Well Test Data

Total Depth: 400
Static Water Level: 111
Water Temperature:

Air Test *

22 gpm with drill stem set at 395 feet for 1 hours.
Time of recovery 1 hours.
Recovery water level 111 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

330MDSN - MADISON GROUP OR LIMESTONE

From	To	Description
0	20	TOP SANDY CLAY TO SHALE
20	25	HARD GREY SANDY SHALE
25	35	STICKY GREY SHALE
35	40	RED SANDSTONE
40	45	RED ROCK
45	50	RED SHALEROCK
50	58	GREY SANDSTONE
58	59	DARK GREY BLACK OILY SANDSTONE
59	65	LIGHT GREY SANDSTONE
65	67	HARD LIGHT BROWN LIMEY ROCK
67	79	HARD DARK GREY BLACK SHALEROCK
79	101	LIGHT GREY BROWN SANDSTONE
101	107	VERIGATED SANDY SHALE
107	130	GREY BROWN SANDSTONE
130	150	RED SHALE AND SHALEROCK

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BYRNE
License No: WWC-318
Date Completed: 8/16/2000

Site Name: MEISMER MICKEY A.
GWIC Id: 185531
Additional Lithology Records

From	To	Description
150	190	LIGHT GREY BROWN SANDSTONE BASIL SANDSTONE OF KOOTENAI
190	198	DARK GREY BLACK SHALEROCK
198	200	YELLOW SHALE
200	208	DARK PURPLE SHALE
208	217	GREY SANDY SHALE SOME PINK SHALE MIXED
217	223	GREY BROWN SANDSTONE
223	227	GREY SHALE W/RED MUD
227	237	GREY GREEN SANDY SHALE
237	260	GREY SHALE
260	275	GREY SANDSTONE
275	280	GREY SHALEROCK
280	287	VERY HARD GREY LIMEY SANDROCK
287	288	GREY GREEN SHALEROCK
288	299	GREY BROWN SANDSTONE
299	311	GREY SANDY SHALE
311	316	GREY GREEN SANDY SHALE
316	334	DARK GREY SHALEROCK
334	335	GREY GREEN AND BLACK SANDSTONE WITH PYRITE
335	340	BROWN SANDSTONE
340	347	GREY SANDSTONE
347	348	SWIFT
348	351	BROWN LIMESTONE WATER
351	353	LIGHT BROWN LIMESTONE WITH SOME RUST
353	374	LIGHT BROWN WHITE LIMESTONE
374	375	BROWN AND GLASSY LIME WITH SOME BLACK FLOATING MATERIAL
375	378	BROWN LIMESTONE WATER
378	379	LIGHT BROWN TO WHITE SUGARY LIMESTONE
379	383	BROWN LIMESTONE
383	387	LIGHT BROWN LIMESTONE WITH SOME RUST AND PINK WATER
387	390	BROWN LIMESTONE
390	400	WHITE SUGARY LIMESTONE

MONTANA WELL LOG REPORT

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Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View hydrograph for this site
View field visits for this site
View water quality for this site
View scanned well log (7/20/2006 1:37:08 PM)

Site Name: HARVIE MARTIN W. AND JEAN L.
GWIC Id: 179563
DNRC Water Right: 115105

Section 1: Well Owner(s)

1) HARVIE, MARTIN W AND JEAN (MAIL)
940 21ST AVE SO
GREAT FALLS MT 59405 [07/03/2000]

Section 2: Location

Township	Range	Section	Quarter Sections
20N	03E	13	SW¼ NE¼ SW¼ SE¼

County: CASCADE
Geocode:

Latitude	Longitude	Geomethod	Datum
47.4822	-111.2913	NAV-GPS	NAD83

Ground Surface Altitude	Ground Surface Method	Datum	Date
3395			10/2/2005

Measuring Point Altitude	MP Method	Datum	Date Applies
3381			10/2/2005 1:20:00 PM

Addition	Block	Lot
HIGHLAND PARK	33	21 AND 22

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Monday, July 3, 2000

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	18	9
18	360	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-1.5	18	6	0.250		WELDED	STEEL
10	360	5		250.00	SOLVENT WELD	PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
340	360	5		1/8X5	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	18	BENTONITE	
180	180	RUBBER SHALE TRAP	
339	339	RUBBER SHALE TRAP	

Section 7: Well Test Data

Total Depth: 360
Static Water Level: 112
Water Temperature:

Air Test *

30 gpm with drill stem set at 360 feet for 1 hours.
Time of recovery 1.5 hours.
Recovery water level 112 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

330MDSN - MADISON GROUP OR LIMESTONE

From	To	Description
0	7	TOP DIRT AND CLAY
7	16	REDDISH BROWN CLAY
16	22	HARD SANDROCK
22	50	RED SANDSTONE AND SHALEROCK
50	57	GRAY SANDSTONE
57	78	GRAY SHALE
78	160	RED AND GRAY SANDSTONE
160	178	GRAY SANDSTONE SUNBURST
178	187	DARK GRAY SHALE
187	190	VERIGATED SHALE WITH SOFT YELLOW CLAY
190	200	RED AND GRAY SHALE
200	320	GRAY TO GREENISH GRAY SHALE AND SANDSTONE
320	335	GRAY AND BROWN SANDSTONE
335	340	GRAY SHALEROCK AND SANDSTONE
340	345	RUSTY BROWN LIMESTONE AND WATER

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BYRNE
License No: WWC-317
Date Completed: 7/3/2000

Site Name: HARVIE MARTIN W. AND JEAN L.
GWIC Id: 179563
Additional Lithology Records

From	To	Description
345	350	HARD BROWNISH GRAY LIME
350	360	WHITE LIMESTONE AND WATER

MONTANA WELL LOG REPORT

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Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
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Site Name: BAIR HAROLD
GWIC Id: 190678

Section 1: Well Owner(s)

1) BAIR, HAROLD (MAIL)
2201 9TH SO
GREAT FALLS MT 59405 [07/05/2001]

Section 2: Location

Township	Range	Section	Quarter Sections
20N	03E	13	SW¼ SE¼

County

CASCADE

Geocode

Latitude	Longitude	Geomethod	Datum
47.481481	-111.292727	TRS-SEC	NAD83

Ground Surface Altitude	Ground Surface Method	Datum	Date

Addition	Block	Lot

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: DEEPENED

Section 5: Well Completion Date

Date well completed: Thursday, July 5, 2001

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	36	9
36	350	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-1.5	36	6	0.250		WELDED	STEEL
10	350	5		250.00	SOLVENT WELD	PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
342	348	5	30	1/8X4IN	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	36	CEMENT	
340	340	SHALE TRAP	

Section 7: Well Test Data

Total Depth: 350
Static Water Level: 113
Water Temperature:

Air Test *

150 gpm with drill stem set at 350 feet for 1 hours.
Time of recovery 1 hours.
Recovery water level 113 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

330MDSN - MADISON GROUP OR LIMESTONE

From	To	Description
0	3	TOP
3	16	LIGHT BROWN CLAY
16	40	RED ROCK
40	48	VERIGATED SHALE ROCK
48	123	GRAY SANDSTONE W/THIN SHALE BEDS
123	129	RED ROCK
129	161	GRAY AND RED SANDSTONE
161	177	LIGHT GRAY SANDSTONE AND WATER
177	183	DARK GRAY SHALE
183	205	VERIGATED RED GRAY YELLOW
205	240	GRAY SANDSTONE
240	280	LIGHT RED AND GRAY SANDSTONE AND SHALE
280	315	GRAY SHALE AND SANDSTONE
315	342	GRAY SANDSTONE W/ PYRITE
342	345	BROKEN LIMESTONE AND WATER

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BYRNE
License No: WWC-317
Date Completed: 7/5/2001

Site Name: BAIR HAROLD
GWIC Id: 190678
Additional Lithology Records

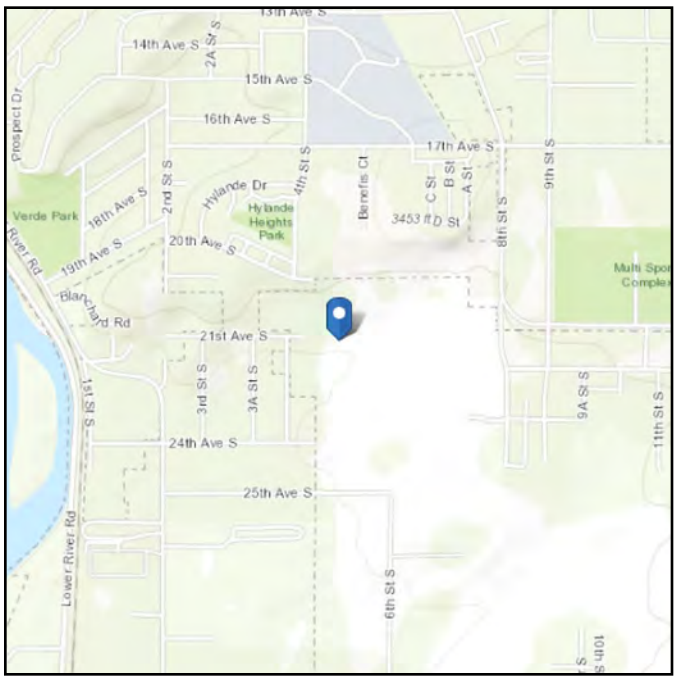
From	To	Description
345	350	WHITE LIMESTONE

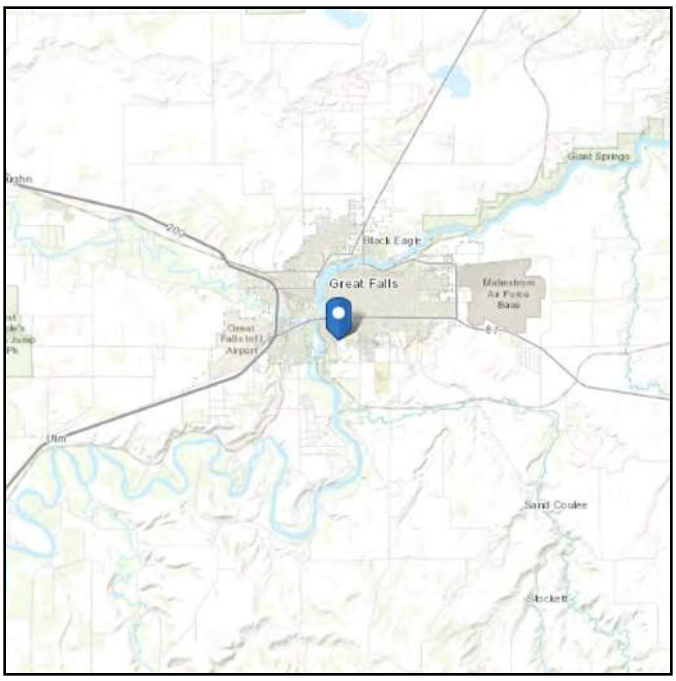
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: B - Rock

Latitude: 47.482709
Longitude: -111.299753
Elevation: 3362.467315220342 ft (NAVD 88)





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

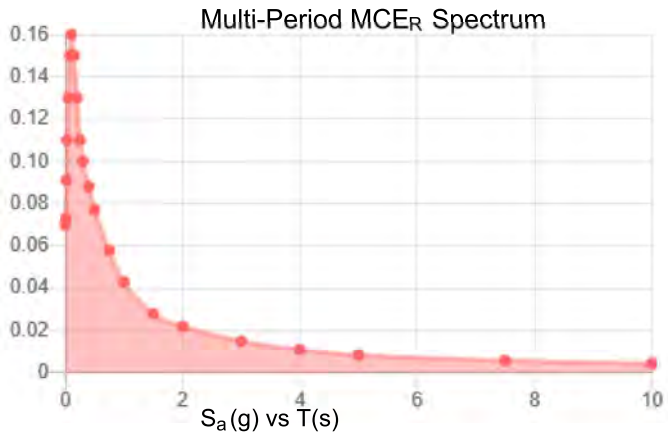
B - Rock

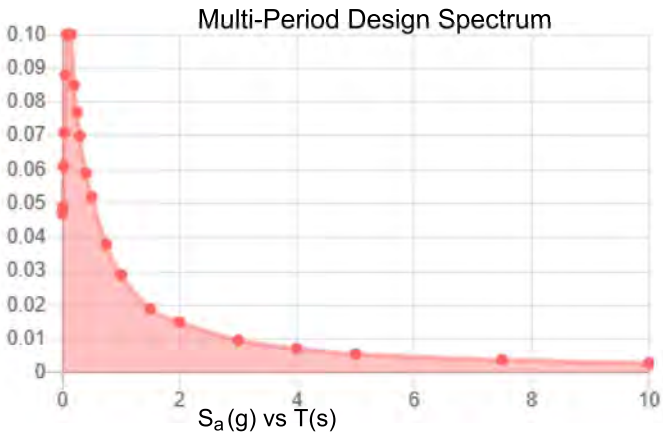
Site Soil Class:

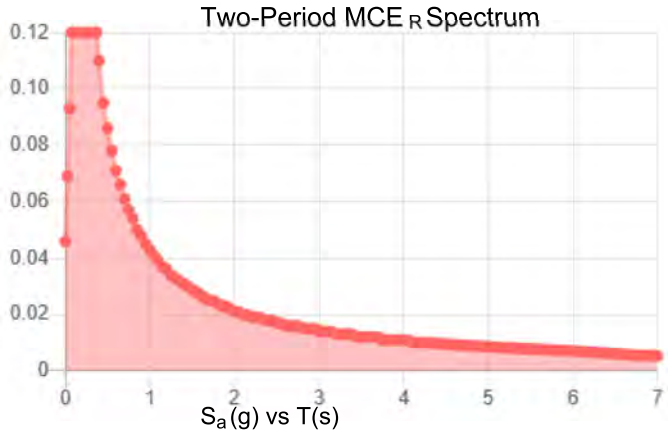
Results:

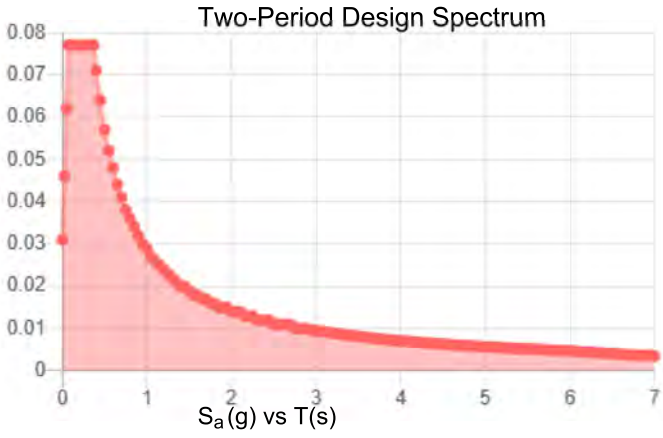
PGA_M :	0.062	T_L :	6
S_{MS} :	0.12	S_S :	0.16
S_{M1} :	0.043	S_1 :	0.058
S_{DS} :	0.077	V_{S30} :	1080
S_{D1} :	0.029		

Seismic Design Category: A









MCE_R Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Data Accessed: Fri Aug 18 2023

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

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Great Falls Public Schools

District Offices • 1100 4th Street South • P.O. Box 2429 • Great Falls, Montana 59403
406.268.6052 • www.gfps.k12.mt.us

June 13, 2025

City of Great Falls
PCD
PO Box 5021
Great Falls, MT 59403

To Whom It May Concern,

Thank you for your letter denoting the Peace Harbor Minor Subdivision Permit Application. This property is located within our school district boundaries. The following is a response to the information sent to the Great Falls Public School District. We have formulated the questions below to comment on the proposed subdivision.

1. Will the existing school facilities be able to accommodate additional students?
The addition of the development will have an impact on the Great Falls Public School District. The estimated increase in students will be able to be accommodated by the school district.

2. Do you have any other comments or requirements on the proposed subdivision as it affects the public school system?

The students will be able to ride the existing bus routes to Sunnyside Elementary School, East Middle School, and Great Falls High School.

Sincerely,

Brian Patrick
Director of Business Operations
Great Falls Public Schools