City of Missoula
Land Use and Planning Committee Agenda

Date:	August 14, 2019
Time:	1:05 pm - 4:05 pm
Location:	City Council Chambers
	140 W. Pine Street, Missoula , MT
Members:	Stacie Anderson, Julie Armstrong, Mirtha Becerra, Michelle Cares, John DiBari, Heather Harp, Jordan Hess, Gwen Jones, Julie Merritt, Jesse Ramos, Bryan von Lossberg, Heidi West

			Pages
1.	ADMINISTRATIVE BUSINESS		
1.1	Roll Call		
1.2	Approval of the Minutes		
1.2.1	Approve Minutes from July 31, 2019 as presented.		1
2.	PUBLIC COMMENT ON ITEMS NOT ON THE AGENDA		
3.	COMMITTEE BUSINESS		
3.1	Conditional Use Request – Hillview Crossing - Townhome Exemption Development (10+ units)	Mary McCrea	3
4.	ADJOURNMENT		

Missoula City Council Land Use and Planning Committee Minutes

Date:	July 31, 2019
Time:	3:10 pm
Location:	City Council Chambers 140 W. Pine Street, Missoula , MT
Members present:	**Mirtha Becerra, Michelle Cares, John DiBari, Heather Harp, Julie Merritt, Jesse Ramos, Bryan von Lossberg, Heidi West**
Members absent:	**Stacie Anderson, Julie Armstrong, Jordan Hess, Gwen Jones**
Others present:	**Ben Brewer, Reagan Brandt, Jim Nugent, Laval Means, Jeremy Keene, Randy Frazier**

1. ADMINISTRATIVE BUSINESS

1.1 Roll Call

1.2 Approval of the Minutes from July 24, 2019

The minutes from July 24, 2019 as presented

2. PUBLIC COMMENT ON ITEMS NOT ON THE AGENDA

3. COMMITTEE BUSINESS

3.1 Ordinance to Amend Title 20 Related to Townhome Exemption Development (TED)

John DiBari shared this item was discussed at Land Use & Planning on July 24, 2019; today is a continuation of that discussion.

Ben Brewer, Development Services, spoke on this item along with a PowerPoint presentation attached to the history of this item. Mr. Brewer shared the strategy for the Townhome Exemption Development (TED) ordinance. He informed that TED projects do not necessarily lead to homes being built in the "affordable" pricing range but rather creates a useful tool to add to the overall housing inventory.

This item will be discussed at Planning Board on August 6, 2019.

Reagan Brandt stated the proposed ordinance could have unintended consequences and spoke on why she was not in support of the draft ordinance as presented.

Heather Harp asked why ADUs would not be allowed in TEDs. Ben Brewer stated that TED Ownership Units are not lots; a future conversation focused on ADUs may occur that would address this specific topic.

Julie Merritt asked when a traffic study would be triggered. Ben Brewer informed that a traffic study would be required when a project is expected to create an additional 200 trips to an area per day.

Jesse Ramos voiced concerns that this ordinance may result in developers building more apartment complexes opposed to single family homes and TEDs. Laval Means stated that type of build is market driven.

Heidi West asked if TED projects be converted to a subdivision that would then allow for ADUs. Ben Brewer stated that he was unaware of a mechanism to convert TEDs into subdivision.

Ben Brewer covered sections of the draft ordinance that identifies land types that would not allow TED projects such as floodplain and land that is substantially constrained. He shared that if passed, this ordinance would not impact already approved TED projects.

4. ADJOURNMENT

City of Missoula, Montana
Item to be Referred to City Council Committee

Committee:	Land Use & Planning
Agenda item title:	Conditional Use Request – Hillview Crossing - Townhome Exemption Development (10+ units)
Date:	December 6, 2018
Prepared by:	Anita McNamara, Development Services
Ward(s) affected:	Ward 5

Action Required:

1. Refer the Hillview Crossing Townhome Exemption Development (10+ units) conditional use request to the **December 12, 2018** LUP Committee meeting as a pre-public hearing informational item.

2. Approve or deny the conditional use request for a townhome exemption development of more than 10 units at Hillview Crossing, in accordance with the City Zoning Ordinance, Title 20, Sections 20.05.040D, 20.05.050, 20.40.180 and 20.85.070 based on the findings of fact in the staff report and subject to the conditions of approval.

Staff Recommendation: See Staff Report.

Timeline:

Referred to committee:	December 10, 2018
Committee discussion:	December 12, 2018 (Info Item)
City Council Public Hearing:	December 17, 2018
Deadline:	None

Background:
This is a request from Hillview Crossing LLC, represented by Territorial Landworks Inc., for approval of a Townhome Exemption Development (10+ units) conditional use for Hillview Crossing, a 68 dwelling unit Townhome Exemption Development (TED) on 25.63 acres west of Hillview Way and south of the Wapikya neighborhood.

Title 20 Zoning Ordinance requires conditional use approval of a TED of more than 10 units. Title 20, Section 20.100.010 defines a Townhome Exemption Development (TED) as a residential development containing one or more dwelling units that are owned subject to an arrangement under which persons own their own units and hold separate title to the land beneath their units but under which they may jointly own the common area and facilities in accordance with MCA §§ 70-23-102(14) and 76-3-203.

Financial Implications: Minimal increase from property tax revenue once completed.

Attachments:

A. Staff Report
B. Application Packet
C. Site Development Plan
D. Title 20, Section 20.85.070(H & I) Conditional Use Review Criteria & Factors to be Considered
E. Title 20, Section 20.40.180 Townhome Exemption Development Standards
F. Agency Comment – DS Engineering, Troy Monroe
G. Agency Comment – Parks & Recreation, Elizabeth Erickson
H. Agency Comment – MUTD, Corey Aldridge
I. Public Comment – Paul and Chris Kilzer
J. Public Comment – Donald and Karen Henrikson

Home | Legislation | Contact us

Item Information

Title:	Conditional Use Request – Hillview Crossing - Townhome Exemption Development (10+ units)		
Item #:		**Status:**	Held in Committee
Type:		**#:**	Land Use & Planning
Version:	11th	**Sponsor:**	Mary McCrea, Development Services
Meeting Date:	1/1/2050	**Ward:**	Ward 5
Meeting Type:	PAZ Referrals Held in Committee	**Video:**	*No Video Available*
Attachments:			

Text

No Text Available

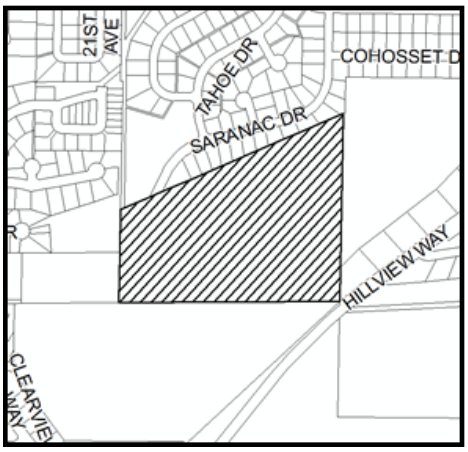
History

Version	Item #	Type	Status	Meeting Date	Meeting Type
1st				12/10/2018	City Council
2nd			Public Hearing	12/12/2018	PAZ
3rd				12/17/2018	City Council
4th			Held in committee	1/16/2019	PAZ
5th			Held in committee	1/23/2019	PAZ
6th			Held in committee	2/27/2019	PAZ
7th			Held in committee	3/6/2019	PAZ
8th			Held in committee	3/13/2019	PAZ
9th			Held in committee	3/20/2019	PAZ
10th			Held in committee	4/3/2019	PAZ
11th			Held in Committee	1/1/2050	PAZ Referrals Held in Committee

Vote Records

No voting recorded

E X E C U T I V E S U M M A R Y



CASE PLANNER: Anita McNamara, AICP, CFM

REVIEWED AND APPROVED BY: Mary McCrea

PUBLIC HEARINGS: CC: December 17, 2018

AGENDA ITEM: **Hillview Crossing Townhome Exemption Development (TED) Conditional Use Request**

APPLICANT: Hillview Crossing Missoula, LLC
3605 Arthur St
Caldwell, ID 83605

PROPERTY OWNERS: Hillview Crossing Missoula, LLC
3605 Arthur St
Caldwell, ID 83605

AGENT: Territorial Landworks, Inc.
1817 South Avenue West, Suite A
Missoula, MT 59801

LOCATION OF REQUEST: West of Hillview Way, south of Wapikya area (see map)

LEGAL DESCRIPTION: A strip, piece or parcel of land situated in Lot 4, Section 5 and the ENE1/4 of Section 6, Township 12 North, Range 19 West, Missoula county, Montana and more particularly described as follows: Beginning at the North section corner common to Section 5 and 6, Township 12 North, Range 19 West; thence East along the section line a distance of 1,320 feet; thence S.0°10'W. a distance of 1,195.2 feet; thence S.89°53'30"W. a distance of 1,324 feet; thence S.0°22·W. a distance of 1,320 feet; thence S.89°53'30"W. a distance of 1,322.6 feet; thence N.0°25'E. a distance of 1,536.1 feet; thence N.33°34'E. a distance of 282.34 feet; thence N.64°04'E. a distance of 509.75 feet; thence N.12°27'W. a distance of 538.6 feet; thence East 828.9 feet to the place of beginning. EXCEPTING THEREFROM that portion platted as Wapikiya Addition #1, a platted subdivision in Missoula County, Montana, according to the official recorded plat thereof in Book 4 of Plats at Page 9. ALSO EXCEPTING THEREFROM that portion platted as Wapikiya Addition #2, a platted subdivision in Missoula County, Montana, according to the official recorded plat thereof in Book 5 of Plats at Page 13. ALSO EXCEPTING THEREFROM that portion platted as Wapikiya Addition #3, a platted subdivision in Missoula County, Montana, according to the official recorded plat thereof in Book 6 of Plats at Pages 1 and 2, and amended Plat in Book 6 of Plats at Pages 7 and 8.

LEGAL NOTIFICATION: The legal ad for the December 17, 2018 public hearing was published in the *Missoulian* on December 2 and 9, 2018. The site was posted on November 20, 2018. Adjacent property owners within 150 feet of the site were notified by certified mail on November 2, 2018.

ZONING: RT10 Residential

GROWTH POLICY: The applicable regional plan is *Our Missoula: City Growth Policy 2035,* which recommends a land use designation of Residential Medium, with 3-11 dwelling units per acre. The applicable vicinity plan is the *1986 South Hills Comprehensive Plan,* which recommends a density of 2 dwelling units per acre.

Surrounding Land Uses	Surrounding Zoning
North: Residential	R8 Residential
South: Residential	R40 Residential
East: Residential / Common Area	R8 Residential
West: Residential / City Park / Vacant	RT10/PUD Homesteads; R40/PUD Homesteads; R40

RECOMMENDATION

APPROVAL of the townhome exemption development conditional use request based on the findings of fact in the staff report and subject to the conditions of approval.

Hillview CrossingTownhome Exemption Development (TED) Conditional Use Request

December 6, 2018

I. RECOMMENDED MOTION

APPROVAL of the townhome exemption development conditional use, in accordance with Missoula City Zoning Ordinance, Title 20, Sections 20.05.040D, 20.05.050, 20.40.180, and 20.85.070, based on the findings of fact in the staff report and subject to the conditions of approval.

II. CONDITIONS OF APPROVAL

1. The Hillview Crossing townhome exemption development conditional use shall comply with all applicable portions of Title 20. Plans submitted at the time of zoning compliance approval of the townhome exemption declaration and of building permit application shall substantially conform to the plans submitted at the time of conditional use review, subject to the review and approval of Development Services.
2. The applicant shall revise the Stormwater Plan to address both Section 5.2B and Section 5.2C related to stormwater calculations as specified in the email message from the City Assistant City Engineer dated October 9, 2018, prior to zoning compliance approval of the townhome exemption declaration. The final stormwater plan for construction shall be reviewed and approved by City Engineering prior to zoning compliance approval of the townhome exemption declaration. Stormwater facilities shall be installed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to review and approval of the City Engineer.
3. The final stormwater plan shall specify long-term maintenance requirements for the stormwater facilities. The applicant shall specify in the Development Covenants that the maintenance of the stormwater facilities shall be the responsibility of the Developer, transferring to the Homeowners' Association once formed and shall include all maintenance and replacement costs as outlined in the final stormwater plan, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.
4. The applicant shall prepare plans for and install a pedestrian crossing at the intersection of Hillview Way and the southern segment of Road "A" to include crosswalk markings, crossing beacon and ADA accessible ramps. Plans shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.
5. The applicant shall provide a minimum 20-foot wide non-motorized trail easement and construct the trail within the easement through the subject property to connect the existing Tonkin Trail south of the TED to Wapikya Park. Plans shall be reviewed and approved by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration and improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer and City Parks and Recreation. The developer shall work with the City's Conservation Land Manager to determine the exact width and location for the trail and shall construct the trail during construction of development to maximize cost-efficiency and reduce disturbance.

6. The applicant shall provide a 20-foot wide public access easement in the location of the east-west trail as shown on the site development plan, subject to review and approval by City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration. The developer shall employ effective means to protect the trail easement areas from construction disturbance such as a temporary fence throughout construction.
7. The applicant shall provide a minimum 20-foot wide non-motorized trail easement and construct the portion of the relocated Tonkin Trail where it connects with Hillview Way as shown on the site development plan. Plans shall be reviewed and approved by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration and improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer and City Parks and Recreation.
8. The applicant shall prepare a plan for protection of trail easement areas during construction, subject to review and approval of City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration. The developer shall employ effective means to protect the trail easement areas from construction disturbance such as a temporary fence throughout construction.
9. The applicant shall dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road “A” through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road “B” then continuing between unit ownership parcel number 18 and 19, crossing the common area and extending between unit ownership parcels 38 and 39, crossing the northern segment of Road “A” then continuing between unit ownership parcel number 56 and 57. An easement for future trail improvements shall be dedicated from northern parcel boundaries of unit ownership parcel numbers 56 & 57 northward through the common area and connecting to the east-west trail easement near the northern property line of the TED. Plans for the pedestrian pathway/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.
10. The applicant shall specify in the Development Covenants that the maintenance of the paved pedestrian pathway/stairs shall be the responsibility of the developer, transferring to the Homeowners’ Association once formed and shall include maintenance and replacement, drainage facilities and snow removal, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.
11. The applicant shall prepare plans and install road improvements for the northern segment of Road “A” and Road “B” resulting in a 28-foot wide back-of-curb to back-of-curb road section within a 52-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and 5-foot wide curbside sidewalk on each side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

12. The applicant shall prepare plans and install road improvements for the southern segment of Road “A” resulting in a 21-foot wide back-of-curb to back-of-curb road section within a 40-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and a 5-foot wide curbside sidewalk on one side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

13. The Development Covenants shall include a statement that parking is prohibited on one side of the northern segment of Road “A” and Road “B” and both sides of the southern segment of Road “A” subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration. The road improvement plans for Road “A” and Road “B” shall include provisions for restricting parking on one side of the northern segment of Road “A” and Road “B” and on both sides of the southern segment of Road “A” in the form of painting the curb yellow and installation of No parking signage, subject to review and approval of the City Engineer, prior to zoning compliance approval of the townhome exemption declaration.

14. The following statement shall appear in the Development Covenants, subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration: “The purchaser and/or owner of the lot or unit understands and agrees that private road construction, maintenance, drainage facilities and snow removal for Road “A” and Road “B” are the obligation of the owner or property owners’ association and that the City of Missoula is in no way obligated to perform such maintenance or upkeep until the roads are brought up to standards and accepted by the City of Missoula for maintenance.”

15. The applicant shall provide a boulevard landscaping and maintenance plan attached to the Development Covenants for the boulevards within the public access easement for the northern and southern segment of Road “A” and Road “B” including tree palette, general planting plan and irrigation, subject to review and approval by City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration. The boulevard landscaping shall be included in an Improvements Agreement guaranteed by a security, subject to review and approval by City Parks and Recreation.

16. The applicant shall petition into the Missoula Urban Transportation District prior to zoning compliance approval of the townhome exemption declaration.

17. The applicant shall provide a hydrant plan to include existing or proposed hydrant locations meeting fire code standards, subject to review and approval by City Fire, prior to zoning compliance approval of the townhome exemption declaration. For new hydrants required to serve the TED, hydrant installation shall occur prior to combustible construction.

18. The applicant shall provide a Missoula County Weed District approved Revegetation Plan for disturbed areas of the site prior to zoning compliance approval of the townhome declaration, subject to review and approval by Development Services.

19. The applicant shall provide a Missoula County Weed District approved Weed Management Plan for common areas and undeveloped portions of the site prior to zoning compliance approval of the townhome declaration, subject to review and approval by Development Services. The Weed Management Plan shall specify that the

developer is responsible for weed management for all undeveloped land including the common area. Once the Homeowners' Association is established, weed management of the common areas and boulevard areas within the public access easement of the private roads transfers from the developer to the Homeowners' Association. Control of weed management on developed unit ownership parcels shall transfer from the developer to each unit owner at the time of sale.

20. The Weed Management Plan approved by the Missoula County Weed District shall be attached as an Appendix to the Development Covenants prior to zoning compliance approval of the townhome exemption declaration, subject to review and approval by Development Services.

21. The applicant shall include a common area landscaping and maintenance plan for all common areas, including irrigation, street trees along the portions of Road "A" and Road "B" adjacent to common areas and parks and lawn for park areas shown with hatching on the Site Development Plan, subject to review and approval by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of City Parks and Recreation and Development Services.

22. The following statements shall appear in the Development Covenants, subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration:

    a. "Radon Mitigation: The EPA has designated the Missoula area as having a high radon gas potential (Zone 1). Therefore, the Missoula City-County Health Department recommends that all new buildings incorporate radon resistant construction features."

    b. "Wood Stoves: The Missoula City-County Air Pollution Control Program regulations prohibit the installation of wood burning stoves or fireplaces inside the Air Stagnation Zone. This development is inside the Air Stagnation Zone. Pellet stoves that meet emission requirements or natural gas or propane fireplaces may be installed. Pellet Stoves require an installation permit from the Health Department."

    c. "Energy Efficiency: Builders should consider using energy efficient building techniques such as building orientation to the sun, appropriately sized eaves, wind breaks, super insulation techniques, day lighting, passive solar design, photovoltaic cells, and ground source heat pumps for heating/cooling. Ground Source heat pumps are usually more efficient and so create less pollution than other systems for heating and cooling. Increased energy efficiency reduces air pollution, reduces the need for people to use cheaper heating methods that pollute more and helps protect the consumer from energy price changes."

23. The applicant shall include the following Amendments section in the Development Covenants subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration: "Amendments: Sections relating to Common Area Landscaping and Maintenance Plan, Weed Management Plan, Boulevard Landscaping and Maintenance Plan, Pedestrian Pathway/Stairs and Sidewalk Maintenance, Private Road Maintenance, Parking on Road "A" (north and south segments) and Road "B", Stormwater Facilities Maintenance, Radon Mitigation, Woodstoves, and Energy Efficiency may not be amended or deleted without prior written approval of the governing body."

III. INTRODUCTION

Development Services has received a request from Hillview Crossing LLC, represented by Territorial Landworks Inc., requesting approval of a conditional use for a Townhome Exemption Development (TED) consisting of 68 dwelling units (34 two-unit buildings) on 25.63 acres. Title 20 Zoning Ordinance requires conditional use approval of a Townhome Exemption Development (TED) of more than 10 units.

Title 20, Section 20.100.010 defines a Townhome Exemption Development (TED) as a residential development containing one or more dwelling units that are owned subject to an arrangement under which persons own their own units and hold separate title to the land beneath their units but under which they may jointly own the common area and facilities in accordance with MCA §§ 70-23-102(14) and 76-3-203.

IV. APPLICABLE ZONING REGULATIONS IN TITLE 20

Title 20 Zoning Ordinance, Section 20.05.040D describes the process for review of Townhome Exemption Developments and Section 20.05.050 describes the parcel and building standards. Section 20.40.180 describes the use and building-specific standards for Townhome Exemption Developments.

Title 20 Zoning Ordinance, Section 20.85.070(H) outlines the review criteria for review of conditional use applications. According to the Zoning Ordinance, "not all review criteria will apply in every case… [and] only the applicable review criteria need to be met." Uses that require conditional use approval may be approved by the City Council only when Council determines that the proposed uses meet all the applicable review criteria. Section 20.85.070(I) outlines "Factors to be Considered" that City Council may specifically consider in determining whether all applicable review criteria have been satisfied. This townhome proposal has also been reviewed according to TED-specific standards as outlined in Title 20, Section 20.40.180.

V. CONDITIONAL USE REVIEW CRITERIA

Findings of Fact:

General

1. The subject property is located west of Hillview Way, south of the Wapikya area in the South 39th Street neighborhood and north of the Moose Can Gully neighborhood.
2. The subject property is vacant and is surrounded by existing residential development.
3. The subject property will be accessed via Hillview Way. Two new private cul-de-sac streets are proposed. Road "A" provides access from Hillview Way and will serve forty (40) dwelling units, while Road "B", which is accessed from Road "A" will serve twenty-eight (28) dwelling units within the development.
4. The property is subject to Special Improvement District Agreement 549 for improvements to Hillview Way. This SID assesses property based on number and dwelling building type and does not terminate until 2040.
5. The subject property is surrounded by the Missoula Urban Transportation District. The closest bus is Route 12, roughly six-tenths of a mile north measured from the intersection of Road "A" and Hillview Way. Route 12 runs along S 39th Street.
6. The subject property has a gross site area of 25.63 acres and a net site area of 22.76 acres. The net site area excludes portions of the site with steep slopes.
7. There are curbside sidewalks along the eastside of Hillview Way, the opposite side of the street from the subject property.

8. Bicycle transportation facilities are located along both the east and west sides of Hillview Way.
9. The subject property is inside the Urban Growth Area, the Wastewater Facilities Service Area, and Air Stagnation Zone.
10. The property is served by City sewer and water and is located within an established service area for Missoula emergency services.

Growth Policy

11. The applicable regional plan is the Our Missoula 2035 City Growth Policy, which recommends a land use designation of "Residential Medium, 3-11 dwelling units per acre."
12. The applicable vicinity plan is the *1986 South Hills Comprehensive Plan,* which recommended a density of "two dwelling units per acre" due to slopes, poor soils for septic systems and limited availability of city sewer at the time.
13. The subject property contains 25.63 acres of which 22.76 acres are developable and 2.87 acres contain slopes in excess of 25%. The overall density for the 22.76 acres is just under three dwelling units per acre.

Zoning

Title 20 Zoning Standards

14. According to Title 20, Section 20.05.040.D, townhome exemption developments of greater than 10 units require a conditional use approval.
15. The zoning of surrounding properties is R8 Residential, RT10/PUD/Homesteads, R40/PUD/Homesteads, R40 Residential and RM1-35 (multi-dwelling).
16. Surrounding uses in the area include primarily single-dwellings with some two-unit residential development and city parkland.
17. Access to the subject property is from Hillview Way, which is a public right-of-way.
18. The subject property is zoned RT10 (two-unit/townhouse).
19. Per Title 20 Section 20.40.180.B, townhome exemption development (TED) density is determined by dividing the net area of the site by the subject zoning district's minimum parcel area-per unit standard.
20. Title 20 Section 20.40.180.B.1-4 states that net site area cannot include land that is a special flood hazard area; sloped at greater than 25%; riparian resource area; or wetlands and waterways under the jurisdiction of the Army Corps of Engineers. The subject property contains areas of slopes greater than 25%. The application packet includes a slopes category map that shows that ±2.1 acres of the site have slopes greater than 25%. The site plan shows that the net area after removing the slopes greater than 25% is ± 22.76 acres.
21. The net area of the north portion of this parcel intended for the TED development is 22.76 acres or 991,429 square feet. The zoning requires 10,000 square feet per unit, which equals a density of approximately 2.99 dwelling units per acre and up to 99 dwelling units.
22. The applicant proposes 68 dwelling units for this parcel, which equals a density of approximately 2.99 dwelling units per acre. The proposal meets the density requirement.

23. Per Title 20 Section 20.40.180.C, TED projects must meet the setbacks of the underlying zoning district. Setbacks for the RT10 Residential district are 20 feet for front and rear yards, 7.5 feet or 1/3 the height, whichever is greater for side interior yards, and 10 feet for street side yards.

24. Per the applicant's site development plan, each unit appears to meet all required setbacks: 20 feet in front and rear, and either 7.5 feet or 33% of the building height, whichever is greater, for side interior yards, and 10 feet for street side yards. Compliance with setbacks will be confirmed prior to building permit approval per condition of approval #1. A condition of approval requires substantial compliance to the plan submitted for the Conditional Use with plans submitted at the time of zoning compliance approval of the townhome declaration and of building permit application.

25. Per Title 20 Section 20.40.180.F, blocks may not be longer than 480 feet. Pedestrian access easements that create a break within a block may be required where there is a need for pedestrian access to school bus or transit stops, schools, shopping, parks, common areas or open space, and community facilities. The applicant shows mid-block pedestrian crossings on the northern segment of Road "A" and on Road "B." This provides a pedestrian crossing of each cul-de-sac road but does not mitigate block length by providing a pedestrian connection mid-block between the northern segment of Road "A" and Road "B" and between Road "B" and the southern segment of Road "A."

26. A pedestrian walking from the eastern end of the northern segment of Road "A" travels roughly a half mile to reach Hillview Way. Condition of approval #9 will help mitigate the longer distances by creating a more direct pedestrian connection between the northern segment of Road "A" with the southern segment of Road "A" greatly shortening the distance to the planned Hillview Way pedestrian crossing and bringing the TED into compliance with the maximum block length standards.

27. City Parks provided comment that walkability is important within this development to promote health and wellness and that it is essential that residents, including children walking to school, can access the sidewalk and trail system within a reasonable distance from each unit and between blocks and connect to routes to services and to the Hillview Way sidewalk.

28. The Missoula Urban Transportation District provided comment that with the current proposed layout of the site, with cul-de-sacs with lengths up to a half mile, the layout would require a pedestrian to walk between 0.9 and 1.2 miles to reach the closest bus stop. A walking path through the center or along the eastern area of the development would shorten the walking distance to Hillview Way, which would reduce the distance to the closest bus stop by 12 to 20%. As the Future Long-Term Network in the MUTD Strategic Plan plans for bus service on Hillview Way, this development has an opportunity to be designed and built to support public transit.

29. Title 20 Section 20.40.180.G.3 specifies that 11% of the site area must be used as open space accessible to residents of the development and useable for passive or active recreation. Per the standard, 2.5 acres of open space is required for this TED development. The applicant's site plan shows 2.68 acres of park/trail/open space in the four HOA park areas, the north-south trail easement and the east-west trail easement on this TED parcel meeting the standard.

30. Conditions of approval require the applicant to dedicate public access easements for both the north-south and east-west trails on the site layout plan and to construct the trail connections from the Tonkin Trail to Wapikya Park and from the Tonkin Trail to

Hillview Way, subject to review and approval by City Parks and Recreation. A condition also requires the applicant to dedicate the trail easement areas for a future east-west trail at the northern edge of the subject property.

31. Conditions of approval require the applicant prepare a plan for protection of trail easement areas during construction, subject to review and approval of City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration.

32. Per Title 20 Section 20.40.180.H bus stop facilities may be required for TEDs within one-fourth mile of an established public transit or school bus route. If the Townhome Exemption Development parcel is not in the Missoula Urban Transportation District, a petition to annex into the District shall be provided prior to receiving zoning compliance approval.

33. Although surrounding properties are within the Missoula Urban Transportation District (MUTD), the subject site is not currently within the District. The MUTD commented that it requests the developer to petition into the District. A condition of approval requires the applicant petition the subject property be added to the District prior to zoning compliance approval of the townhome exemption declaration.

34. The closet transit stop is located .6 miles south of the intersection of Russell Street / Hillview Way and South 39th Street /Southwest Higgins Avenue, which is on Route 12.

<u>Missoula Municipal Code Title 12 Standards</u>

35. According to Title 12, Section 12.22.140.C regarding Engineering Requirements for Townhome Exemption Developments, all roadways serving 12 or more living units must be paved to a 35 foot width from back of curb to back of curb if there is parking on both sides of the street; paved to a 28 foot width from back of curb to back of curb if there is parking on one side of the street; or paved to a 21 foot width from back of curb to back of curb if there is no on-street parking. Private roads shall be within public access easements.

36. The Conditional Use Exhibit Layout Plan shows two internal roads – Road “A” and Road “B” - within the parcel boundaries of the TED. The northern segment of Road “A” and Road “B” are shown as 28-foot wide back-of-curb to back-of-curb roads with parking on one side, curbside sidewalks on both sides with a public access easement per the applicant’s Site Development Plan.

37. The southern segment of Road “A” is shown as a 21-foot wide back-of-curb to back-of-curb road with no parking and curbside sidewalk on one side within a public access easement per the applicant’s Site Development Plan.

38. The 28-foot road width with parking along one side of the street for the northern segment of Road “A” and Road “B” meets the Title 12 standard. The 21-foot road width, without parking for the southern segment of Road “A” meet the Title 12 standard. However, the proposed 5-foot curbside sidewalks do not meet the Title 12 standard requiring boulevard sidewalks.

39. Title 12, Section 12.22.140.D and E, requires all sidewalks within public rights-of-way and public access easements to be boulevard sidewalks and those sidewalks shall be a minimum width of 5 feet, unless the Development Services Director approves a deviation to the standard.

40. Per Title 12 Section 12.22.140.D, the Development Services Director may approve a deviation to the boulevard sidewalk standard if one of three criteria are met. One these

criteria is that “topography would make the installation of boulevard sidewalks unusually expensive.”

41. The City Engineer reviewed the site development plan and recommended approval of the road design for Road “A” and Road “B” to have curbside sidewalk in front the townhome units and on one side of the southern segment of Road “A” due to topographical constraints. The Director of Development Services approved the deviation from the boulevard sidewalk standard for both Road “A” and Road “B.”

42. Conditions of approval require the northern segment of Road “A” and Road “B” be constructed to 28-feet back-of-curb to back-of-curb distance, with 5-foot wide curbside sidewalks on both sides of the road within a 52-foot wide public access easement, and the southern segment of Road “A” be constructed to a 21-foot width with a 5-foot wide curbside on one side within a 40-foot wide public access easement. City Engineer approval of the road plans is required and all road improvements shall be constructed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to City Engineer approval.

43. A condition of approval requires the road improvement plans include provisions for painting the curb yellow and No Parking signage in order to restrict parking on one side of the northern segment of Road “A” and Road “B” and prohibit parking on both sides of the southern segment of Road “A”, subject to review and approval of the City Engineer. The No Parking provisions shall also be included in the Development Covenants.

44. Title 12, Section 12.22.140.H regarding access and parking states that a Townhome Exemption Development unit shall be permitted only one (1) access or approach to the public right-of-way or public access easement in the following order of priority: alley, side road, fronting road. No alley or side roads are proposed.

45. According to the Site Development Plan in the conditional use application, each unit in this TED project has parking that is accessed via a driveway approach from either Road “A” or Road “B”, which meets the access standard.

46. Title 12, Section 12.22.140.K requires driveway approaches from a private road within a public access easement to have a minimum 20 foot distance measured from the back of curb and/or sidewalk to the garage doors. Confirmation of the minimum 20-foot distance for each dwelling unit will be confirmed by Engineering at the time of building permit approval.

47. Both the northern and southern segments of Road “A” and Road “B” will be private roads within public access easements and as such maintained by the developer or property owner’s association, in accordance with Missoula Municipal Code (MMC) Title 12. A condition of approval requires a private road maintenance statement be added to the Development Covenants for the northern and southern segments of Road “A” and Road “B.”

48. The site plan shows curbs along both sides of the northern and southern segments of Road “A” and Road “B”, thus meeting the standard specified in Title 12, Section 12.22.140.F, which requires all roadways or streets to have curbing on both sides.

49. Title 12, Section 12.32 includes standards for landscaping and maintenance of boulevard areas. A condition of approval requires review and approval by City Parks and Recreation of the boulevard landscaping and maintenance plan reviewed.

50. Title 20 Section 20.40.180.E states that all surface infrastructure shall meet the standards in Title 12. Conditions of approval ensure compliance with Title 12

standards, and review and approval by Development Services Engineering and City Parks and Recreation staff.

51. Conditions of approval require all road improvements to be constructed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to City Engineer approval.

Stormwater, Grading and Drainage

52. The applicant provided a preliminary stormwater and drainage report plan as part of the application packet.

53. City Engineering commented that while the proposed stormwater and drainage report/design in the application packet is sufficient, two calculations must be corrected for the final report.

54. A condition of approval requires that the final stormwater and drainage plan shall include the corrected calculations noted by City Engineering and shall be reviewed and approved by City Engineering prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

55. A condition of approval requires the final stormwater plan include provision s for long-term maintenance and the Development Covenants specify the maintenance and replacement of stormwater facilities are the responsibility of the developer and transferring to the Homeowners' Association when the Homeowners' Association is formed.

56. City Parks provided comment that there is coordination between Parks and City Engineering and that if City Engineering's review of the final Stormwater and Drainage Plan determines that the post-development flows from the development meet pre-development flows as proposed and do not exceed the capacity of the stormwater system as designed, that Parks has no concerns with the design of the stormwater system.

57. Geotechnical evaluations are required at the time of building permit for each structure. If a foundation drain is required by the geotechnical evaluation, the foundation drain system shall be connected to the storm drain system.

Development Covenants, Revegetation and Weed Management

58. Title 20, Section 20.01.060 requires all uses and development to comply with all other applicable regulations. The Missoula City-County Air Pollution Control Program commented that the property is within the Missoula Air Stagnation Zone. A condition of approval requires statements regarding Woodstoves, Radon Mitigation, and Energy Efficiency to be included in the Development Covenants.

59. Title 20, Section 20.01.060 requires all uses and development to comply with all other applicable regulations. A condition of approval requires the applicant to provide a Revegetation Plan for disturbed areas of the site prior to zoning compliance approval of the townhome declaration.

60. Title 20, Section 20.01.060 requires all uses and development to comply with all other applicable regulations. A condition of approval requires the applicant to provide a Weed Management Plan that requires the developer, Homeowners' Association and townhome unit owners to maintain their property in conformance with the Montana County Weed Control Act and the Missoula County Noxious Weed Management Plan

61. A condition of approval requires an Amendments section be added to the Development Covenants that requires written approval by the governing body prior to amending or deleting any Development Covenants that are required by conditions of approval.

Conditional Use Review

62. Title 20, Section 20.85.070.H.2 outlines criteria for the review of conditional uses, which include whether the proposed uses are: compliant with all applicable Title 20 zoning standards; compatible with the character of the surrounding area; in the interest of public convenience; will not have a significant adverse impact on the general welfare of the neighborhood or community; compatible operating characteristics in terms of hours of operation, noise, outdoor lighting and traffic generation; and will not have a significant adverse impact on traffic safety or comfort – both motorized and non-motorized.

63. Title 20, Section 20.01.060 requires all uses and development to comply with all other applicable regulations. A condition of approval requires the applicant to provide a hydrant plan to include existing or proposed hydrant locations meeting fire code standards, subject to review and approval by City Fire, prior to zoning compliance approval of the townhome exemption declaration. If new hydrants are required to serve the townhome exemption development (TED), hydrant installation shall occur prior to combustible construction.

64. The TED as shown on the site development plan must comply with all applicable regulations, subject to compliance with the conditions of approval.

65. Residential development on this parcel is generally compatible with both the character and operating characteristics of uses in the surrounding area, which are primarily residential. The TED is compatible with the single dwelling and duplex residential building types found on the west side of Hillview Way.

66. The scale of the proposed TED residential use in this location should not compromise either public convenience or the general welfare of the neighborhood or community, subject to compliance with the conditions of approval. The setbacks of the RT10 zoning for the TED and the surrounding subdivisions, which are zoned R8 to the north and east and RT10/PUD/Homesteads to west are identical.

67. Any signs or outdoor lighting associated with this project will be required to meet all applicable standards as outlined in the Title 20 zoning regulations, as well as all other applicable Missoula Municipal Codes.

68. The TED will generate additional traffic in this area. The TED as shown on the site development plan includes installation of roads within the TED boundaries that are private roads within public access easements maintained by the Homeowners' Association.

69. The property is subject to Special Improvement District Agreement 549 for improvements to Hillview Way. This SID assesses property based on number of dwelling units and dwelling building type constructed and does not terminate until 2040.

70. The owner/developer is responsible for paying these fees on a per unit ownership parcel basis at the time of building permit issuance.

71. The increase in traffic generated by this development should impose no significant adverse impact on traffic safety or comfort in the area, regardless of the mode of transportation, subject to compliance with the conditions of approval. The additional traffic generated by this TED will not result in significant adverse impacts to the capacity

or safety of the roads and Hillview Way will remain well within the range of the local street classification.

72. The public sidewalk runs along the eastern side of Hillview Way. In order to provide safe access routes to schools and transit, a pedestrian crossing of Hillview Way is required.

73. A condition of approval requires that the applicant prepare plans for and installation of a pedestrian crossing at the intersection of Hillview Way and Road “A” to include crosswalk markings, crossing beacon and ADA accessible ramps.

74. The TED layout includes long cul-de-sacs with a pedestrian travelling roughly a half mile from the eastern end of Road “A” to the intersection with Hillivew Way. In order to meet the minimum block length standard of 480 feet and provide safe and efficient pedestrian routes to schools and transit, a mid–block pedestrian pathway/stairs is required.

75. A condition of approval requires that the applicant dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road “A” through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road “B” then continuing between unit ownership parcel number 18 and 19, crossing the common area, then continuing between unit ownership parcels 38 and 39, crossing the northern segment of Road “A” then continuing between unit ownership parcel number 56 and 57.

Conclusions of Law:

1. Whether the proposed use complies with all applicable standards of the Title 20 Zoning Ordinance;

1. The townhome exemption development will comply with all applicable sections of the Title 20 Zoning Ordinance and other applicable Missoula Municipal Codes, subject to compliance with the conditions of approval.

2. Whether the proposed use is in the interest of public convenience and will not have a significant adverse impact on the general welfare of the neighborhood or community;

1. Residential development as shown on the TED site development plan for this parcel is compatible with both the character and operating characteristics of uses in the surrounding area, which are primarily residential.
2. The scale of the development in this location will not compromise either public convenience or the general welfare of the neighborhood or community if the conditions of approval are imposed.

3. Whether the proposed use is compatible with the character of the surrounding area in terms of site planning, building scale and project design;

1. Residential development as shown on the TED site development plan is compatible with the single dwelling and duplex residential building types found along Hillview Way. The area includes a mix of large and small lots.
2. The setbacks of the RT10 zoning for the TED and the surrounding subdivisions, which are zoned R8 to the north and east and RT10/PUD/Homesteads to west are identical.
3. The site design, building and project scale of the TED buildings as shown on the site development plan are similar to those in the surrounding area and are compatible if the conditions of approval are imposed.

4. Whether the proposed use has operating characteristics that are compatible with the surrounding area in terms of hours of operation, outdoor lighting, noise, and traffic generation; and

1. The hours of operation and noise generated by the residential development are generally compatible with those of the surrounding uses.
2. Outdoor lighting for the project will conform to the regulations described in the Missoula Outdoor Lighting Ordinance.
3. Surrounding infrastructure is adequate to manage the amount of additional traffic generated by this TED project.

5. Whether the proposed use will not have a significant adverse impact on traffic safety or comfort, including all modes of transport (non-motorized and motorized).

1. Additional traffic generated by the TED project will not have significant adverse impacts on traffic safety or comfort, regardless of the mode of transportation if the conditions of approval are imposed.
2. The property is subject to Special Improvement District Agreement 549 for improvements to Hillview Way. This SID assesses property based on number and dwelling building type and does not terminate until 2040.
3. The owner/developer is responsible for paying these fees at the time of building permit approval for each building.

4. A condition of approval of requires that the applicant install a striped pedestrian crossing with crossing beacon at the intersection of the southern segment of Road “A” and Hillview Way to provide a safe crossing of Hillview Way to access the sidewalk on the east side of the street.
5. The additional traffic generated by this TED will not result in significant adverse impacts to the capacity or safety of the roads and Hillview Way will remain well within the range of the local street classification.
6. A condition of approval provides increased safety and comfort by requiring the applicant to dedicate a minimum 20-foot wide easement and to construct a paved pedestrian pathway/stairs from southern segment of Road “A” up through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road “B” then continuing between unit ownership parcel number 18 and 19, crossing the common area, then continuing between unit ownership parcels 38 and 39, crossing the northern segment of Road “A” then continuing between unit ownership parcel number 56 and 57.
7. The existing motorized and non-motorized transportation infrastructure through and around the subject property is adequately sized and designed to manage the anticipated loading if the conditions of approval are imposed.

VI. AGENCY COMMENT

HEALTH DEPARTMENT – AIR QUALITY DIVISION:	No comment received.
DS ENGINEERING DIVISION:	Troy Monroe, see attached comment letter.
MOUNTAIN LINE:	Corey Aldridge, see attached comment letter.
CITY PARKS & RECREATION:	Elizabeth Erickson: see attached comment letter.
CITY ATTORNEY:	No comment received.
CITY POLICE:	No comment received.
CITY FIRE:	No comment received.
MISSOULA HOUSING & COMMUNITY DEVELOPMENT:	No comment received
WASTEWATER TREATMENT:	No comment received.

VI. ATTACHMENTS

1. Agency Comment: Comment letter from Troy Monroe, Development Services Engineering Division
2. Agency Comment: Comment letter from Elizabeth Erickson, City Parks and Recreation
3. Agency Comment: Comment Letter from Corey Aldridge, MUTD

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MEMO

TO: City Council

DATE: December 14, 2018

FROM: Anita McNamara, Development Services

RE: Hillview Crossing TED Conditional Use

On Wednesday, December 12, 2018 the Land Use and Planning Committee discussed the Hillview Crossing Townhome Exemption Development Conditional Use as a pre-public hearing information item. Council member questions and associated answers are provided below:

A. Private Roads:

1. Is it typical to have Home Owner's Associations (HOA) maintain private roads within their developments?
   a. Yes. It is typical in both Subdivisions and TED developments for the City to require a HOA to maintain their private roads. Condition of approval #14 requires the applicant to include the following statement in the Development Covenants:

      "The purchaser and/or owner of the lot or unit understands and agrees that private road construction, maintenance, drainage facilities and snow removal for Road "A" and Road "B" are the obligation of the owner or property owners' association and that the City of Missoula is in no way obligated to perform such maintenance or upkeep until the roads are brought up to standards and accepted by the City of Missoula for maintenance."
2. How prevalent are private roads in the surrounding area that are maintained by Home Owner's Associations?
   a. The loop road in the Village at Elk Hills Condominium (Village View Way) appears to be the only privately maintained private road in the area.
3. What are the Fire Code design requirements for hammerhead turnarounds? Is there a diagram?
   a. City Fire provided comment that the Hammerhead turnarounds are acceptable, provided that the measurements are consistent with Appendix D (Fire Code for Fire Apparatus Access Roads) of the International Fire Code (attached as Exhibit #1).
   b. City Fire provided comment that the proposed private roads within the Hillview Crossing TED meet the minimum requirements of the Fire Code. City Fire comments are attached to the SIRE record. Further City Fire commented that emergency traffic on private roads like this that have slope and are narrow is slow with optimal conditions. If the parking prohibitions are enforced and snow removal is provided, emergency vehicles access meets the minimum requirements.
   c. City Fire also commented that if the hydrants are located on the No Parking side of the road, the private road width would need to be expanded to 34 feet in width for the portion of the road near the hydrant so that fire apparatus does not block a travel lane.

4. Who enforces the “No Parking” prohibitions on one or both sides of the streets within the Hillview Crossing TED? Who enforces snow removal on the private roads to ensure emergency personnel have access?

    a. No Parking Prohibitions: Each TED unit owner and the Home Owner’s Association are the appropriate parties responsible for enforcement of the No Parking prohibitions. Condition of Approval #13 requires the applicant to include a statement in the Development Covenants that parking is prohibited on one side of the northern segment of Road “A” and Road “B” and both sides of the southern segment of Road “A”. Condition of approval #13 also requires the road improvement plans and installation include provisions for restricting parking on one side of the northern segment of Road “A” and Road “B” and on both sides of the southern segment of Road “A” in the form of painting the curb yellow and installation of No parking signage.

    b. Snow Removal: Each TED unit owner and the Home Owner’s Association are the appropriate parties responsible for ensuring private road maintenance including snow removal on the roads within the Hillview Crossing TED. Condition of Approval #14 requires the applicant to include a statement in the Development Covenants that private road construction and maintenance including snow removal are the responsibility of the TED unit owners and the Home Owner’s Association.

    c. The conditions of approval require language be placed in the Development Covenants designating the TED unit owners and the Home Owner’s Association as the responsible parties for enforcing the “No Parking” prohibitions and maintenance tasks such as snow removal on the private roads.

    d. The Development Covenants are provided to each purchaser at the time of sale. The City’s responsibility is to review the road improvement plans, storm water plans, and maintenance plans. The City ensures that the facilities are constructed per the approved plans.

    e. It is the responsibility of the developer to ensure maintenance and enforcement occurs per the approved plans until units are sold and the Home Owner’s Association is formed, at which time the maintenance and enforcement responsibilities transfer to the TED Unit Owners and the Home Owner’s Association.

    f. Staff is not aware of any regulations that would require the City to take over the maintenance of the private facilities.

B. What would the Homeowners’ Association annual maintenance costs be for roads, common areas, parks, boulevards, stormwater management, pedestrian walkway/stairs? What are the replacement costs roads, sidewalks, pedestrian pathway/stairs and stormwater facilities?

1. Staff contacted City Parks and Recreation, City Street Maintenance and City Stormwater Utility to obtain information on possible costs for maintenance of the proposed parks & trails, private streets and stormwater system.

2. Brian Hensel, City Streets Maintenance provided a rough estimate in FY 2018 numbers of the typical yearly maintenance costs per centerline mile for City streets of $19,852. The following is a breakdown of the street lengths of the proposed private roadways and rough cost estimate for maintenance of each. Mr. Hensel also was firm to clarify that city would not take over maintenance.

    a. Road “A” South: 1,400 linear feet or ± 0.26 mile times $19,852 equals $5,264 per year.

    b. Road “A” North: 1,320 linear feet or ±0.25 mile times $19,852 equals $4,963 per year.

    c. Road “B”: 1,020 linear feet or ±0.19 mile times $19,582 equals $3,835 per year.

3. David Selvage, City Parks provided information on the average cost to maintain an acre of City parkland with limited amenities (no shelter, pool, etc.) is $6,800 per acre per year. Mr. Selvage stated that the city would not take over maintenance of the private park areas as it is highly unlikely that the amenities would be built to City public park standards and the provided the following estimates.

a. At 2.68 acres of parks and trails lands at $6,800 per acre per year, the cost estimate for maintenance is approximately $18,224 per year.

b. Staff did not receive an estimate for the maintenance of the 11.68 acres of Common Area which will require Weed Management and maintenance to prevent a fire hazard situation.

4. Bob Hayes, Stormwater Utility provided information on possible costs for maintenance of the storm water facilities based on wide assumptions as we do not have a engineered design from the applicant to review. Mr. Hayes also clarified that the city would not take over maintenance and that the maintenance would have to be performed by a private company.

   a. Possible cost to maintain the storm water facilities could be ± $2,000 to $10,000 per year. Due to unknowns, such as storage capacity, road treatments during snow / icing events (liquid deicer formulation and ratio, usage frequency, usage amount OR solid traction material, i.e. sand or gravel, usage frequency, usage amount)

   b. Possible cost to replace the storm water facilities could be ± $363,000. This is based on the storm event information provided by developer's engineer, which results in an estimated 130,000 gallons of stormwater storage required. This translates to ± 900 lineal feet of sixty (60") inch diameter pipe. With an estimated price of ± one hundred sixty ($160) per lineal foot, the estimated cost for nine hundred (900) lineal feet of stormwater storage pipe would be $144,000, not including installation, labor and equipment costs, which could double the cost to ± 288,000, just for the Storage pipe.

   c. Replacement cost for the remaining stormwater infrastructure components could be an additional $50,000 to $75,000 material and labor, depending on the design and components used.

C. With regard to Human Resource Council (HRC) property to the west of Hillview Crossing, can the City require a road connection as part of the TED review? Are there other properties that could provide access to the HRC property?

1. The subject property of the Hillview Crossing TED conditional use request (subject property) owned by Hillview Crossing – Missoula, LLC (HC LLC) is adjacent to a 4-acre landlocked parcel owned by District XI Human Resource Council (HRC).

2. Prior to HC LLC acquiring the subject property, there was an approved subdivision (Southern Hills subdivision) on the property that included a vehicular connection to the HRC property. The subdivision approval was never acted upon and after several phasing plan extensions the subject property was sold and the preliminary plat for the Southern Hills subdivision was allowed to expire.

3. HC LLC has been unwilling to voluntarily provide a vehicular connection to the HRC property since their TED project was first proposed in 2015. In 2016, HRC filed a lawsuit against HC LLC, the City of Missoula and Zoning Officer Mike Haynes claiming that those parties had a legal obligation to accommodate a vehicular connection to the HRC property, as shown on the expired Southern Hills subdivision preliminary plat.

4. In February 2018, after protracted legal proceedings, Judge John Larson dismissed with prejudice all HRC claims against the defendants. City staff would have no objection to a mutual agreement between HC LLC and HRC to provide a vehicular connection but that connection is not required by City Code.

D. Could staff provide explanation of applicant's statement that Condition of Approval #9 was late and not anticipated?

1. Staff advised the applicant in early scoping/pre-application meeting that the proposed roadways exceeded the maximum block length standard in Title 20, Section 20.40.180.F and suggested mitigation to meet the intent of this standard. At first, the applicant asked if they could request a variance to this standard within the conditional use review process as you can request a variance with a subdivision. Staff responded that there are no criteria in the TED standards or in the

Conditional Use review process that provide an option to vary from required standards. Staff suggested a pedestrian connection between Road A and Road B to help mitigate the block length.

2. The applicant submitted the first application for sufficiency review on June 22, 2018. Staff reviewed for sufficiency and provided comments to the applicant on July 5, 2018. One of the staff comments was that the block lengths exceed the maximum. Staff again suggested a pedestrian pathway/stairs connection between Road A and Road B for mitigation and told the applicant that not including this item would likely result in a condition on the project.
3. The applicant submitted for second sufficiency on July 20, 2018. In the cover letter, the applicant listed out and addressed each staff comment. To address the comment about the pathway/stairs between Road A and Road B, the applicant stated: "Thank you for your comment, a stair path has not been included on the exhibits with this submittal." The applicant was again reminded that not including the connection could result in a condition being placed on the Conditional Use.

E. Could staff explain the pedestrian circulation in the development, length of pathways to get to Hillview Way and how kids would get to the school bus stop?

1. Road "A" south is approximately 1,400 linear feet (over one-quarter mile). Road "A" north is approximately 1,320 linear feet (one-quarter mile). Road "B" is approximately 1,020 linear feet (one-fifth mile).
2. Without the pathway/stairs required in Condition of approval #9, a pedestrian starting out from the eastern end of the northern segment of Road "A" has to walk approximately one half mile to reach Hillview Way.
3. Without the pathway/stairs required in Condition of approval #9, a pedestrian starting from the eastern end of Road "B" has to walk approximately just under one half mile to get to Hillview Way.
4. An elementary school student walking to Russell School would need to walk from their home on either the northern segment of Road "A" or from Road "B" toward the intersection with the southern segment of Road "A" and then to Hillview Way, up to approximately one-half mile. From the intersection of Road A with Hillview Way it is another mile to Russell Elementary School.
5. A middle school student walking to school could take the proposed north-south trail toward Wapikya Park and walk westward on the Meadow Hill trail to school, however this is a natural trail and not accessible in winter.
6. The 2018 Mountain Line Strategic Plan identifies extending Route 6 to run on Hillview Way that will get students to Sentinel high school.

F. Is the parkland that is required by the Title 20 TED standards located on the sloping hillside or on flatter ground?

1. The proposed parkland meets Title 20, Section 20.40.180.G.3 and includes 2.68 acres of parks and trails. This exceeds the 11% of the site area requirement. The five small park areas are located on flat ground.
2. Common Area totals 11.68 acres and is located on the sloping hillside, which is in addition to the parks and trails areas.

G. Will Hillview Crossing TED be required to contribute toward the Hillview Way SID?

1. Hillview Way from 39th Street to Alliance Way was recently reconstructed at a cost of about $3.8 million. The roadway improvement project was funded by impact fees and a Special Improvement District (SID #549). The SID assessed existing properties benefitting from the roadway project as well as establishing assessments for future development.
2. The Hillview Crossing property directly benefits from the roadway improvement and is within the SID assessment area. The assessments for future development were set at ±$1,700 for single-family homes and ±$1,200 for duplex, condo or apartment units (in 2015 dollars, increasing

incrementally in each subsequent year). The assessments are payable per unit at time of building permit issuance.

H. Is Hillview Way designed to handle the additional traffic?

1. Troy Monroe, Assistant City Engineer stated Hillview Way has the capacity to accommodate the Hillview Crossing TED and other future developments. Hillview Way was recently reconstructed and is designated as an urban collector street. Hillview Way has a capacity greater than 10,000 vehicles per day, which is greater than the current use of 5,000 vehicles per day.

I. Storm Water Plan:

1. Could staff provide a summary of the preliminary storm water plan?

   a. Troy Monroe, Assistant City Engineer, provided a Summary of the Preliminary Storm Water Plan for Hillview Crossing TED that includes relevant background information and relationship to the South Missoula Storm Drainage Project (SID 524). See Exhibit #2.

2. When will the final storm water plan be submitted, who will review and approve the plan and will the final plan be approved before development starts?

   a. Condition of approval #3 requires the final storm water plan to be reviewed and approved by City Engineering prior to zoning compliance permit approval of the townhome exemption declaration.

   b. Troy Monroe, Assistant City Engineer states that the final storm water plan will be reviewed during the design stage #4 - *Release for Construction.* Excavation could start prior to approval of the storm water plan, but would be required to obtain a Storm Water Pollution Prevention Plan (SWPPP) permit, which includes storm water retention/detention requirements.

3. Provide the total percentage of impervious surface area for this development.

   a. The proposed development will have approximately 6.9 acres of asphalt (roads), concrete (sidewalks and driveways) and homes which combines for 28% impervious area. Per the storm water preliminary report, the total site is 24.6 acres.

4. How much of the Common Areas will be used as drainage basins?

   a. Until the applicant provides a final storm water plan that is unknown. The applicant's consultant stated that they were looking at increasing pipe sizes or supplying tanks to retain the required storm water volume. However, they could decide to go with an open detention basin, which would take up some of the open space hillside area.

5. Clarify whether a Geotechnical Report is required for grading and drainage plans for the private road and home locations.

   a. The City Engineer will require a Geotechnical Report for roads, infrastructure and home locations, including any excavation or embankment locations, in order to protect the general welfare of the prospective homeowners and the residents below the Hillview Crossing TED.

   b. City Engineering is recommending a condition of approval be added to clarify the breadth and scope of the Geotechnical Report to ensure the report is provided as part of the design submittal, conforms to the requirements of the City Engineer and includes the following:

      1) Includes an evaluation of existing conditions;

      2) Recommendations for excavation and embankment;

      3) Requirements for construction and oversight; and

      4) Requirements for submission of as-built and testing results to the City Engineer.

   c. Similar to other infrastructure submittals, the Geotechnical Report must be approved by City Engineering before permits are issued.

6. Regarding Council members concerns about the large amount of cut and fill that will be required for roads and building sites: How will the drainage issues with cut and fill be analyzed and by whom?

    a. The developer will be required to perform a geotechnical investigation (see above) the result of which will be a Geotechnical Report that includes specific protocol to be followed to excavate or place embankment. It will be up to the consulting engineers to ensure the protocols are followed. Limited testing results and construction observation submittals will be required.

7. Would there be a more rigorous review for drainage issues and cut and fill if this were a subdivision?

    a. Yes. Section 3-010.2 of the City Subdivision regulations specifies that lands on which there is evidence of hazards such as, but not limited to, swelling soils, subsidence, improper drainage, slopes of 25% or more, or other features that will be harmful to the health, safety, and/or welfare of the present or future inhabitants of the subdivision or its environs; or that will impose unreasonable burdens upon the general public such as environmental degradation or requirements for the excessive expenditure of public funds may not be approved for subdividing until an engineering or other professional design sufficient to alleviate the foregoing hazard or unreasonable burdens has been submitted by the applicant and approved by the City Council as required by MCA 76-3-504.

    b. With an added condition of approval meeting City Engineering specifications for a Geotechnical Report, and the consultants and developer implementing the recommendations of the Geotechnical Report, public health and safety can be protected and significant adverse impact on the general safety and welfare of the neighborhood or community can be avoided.

J. What are the densities of the surrounding development?

1. Staff has provided a map that shows densities of development surrounding Hillview Crossing TED in Exhibit #3 and the map will be included in the staff presentation at the public hearing.

K. Could staff provide a copy of Denise Alexander's presentation to City Council on November 4, 2015 regarding the differences between Subdivisions and Townhome Exemption Development Exemption from Subdivision review provided for in State Law?

1. Denise Alexander's Presentation is provided in Exhibit #4. Each slide is numbered and her presentations notes are included with each numbered note corresponding to the same numbered slide.

L. Could staff provide information regarding the public notification process followed for the Hillview Crossing TED conditional use?

1. Title 20, Section 20.85.070.E requires notification of the public hearing in the following three formats:

    a. Newspaper Notice: At least two separate notices of required public hearings on conditional use requests must be published in the newspaper, with the first notice appearing at least 15 days before the scheduled hearing. A legal ad (See Exhibit #5) appeared in the Missoulian on December 2nd and 9th, 2018.

    b. Mailed Notice: Notice of the required public hearing for a conditional use must be mailed by certified mail to the subject property owner and all property owners within 150 feet of the subject property at least 15 days before the scheduled hearing. Exhibit #5 includes a map and list of property owners to whom notification was sent on November 2, 2018 by certified mail. The South 39th Street Neighborhood Council, the council in which the subject property is located was notified. In addition, the northerly abutting Moose Can Gully Neighborhood Council was notified as well.

    c. Posted Notice: Notice of the required public hearing for a conditional use must be posted at least 15 days before the public hearing. The poster must be placed on each public street

frontage abutting the subject property. On November 20, 2018, posters were placed on Hillview Way where the southeast corner of the subject property touches Hillview Way and at the end of Saranac Drive near Wapikiya Park.

M. Could staff provide a slide of the floodplain map related to this property?

1. A floodplain map of the area around the subject property is attached as Exhibit #6 and the map has been included as a slide in the staff presentation.
2. The beige color is the .02% annual chance or 500-year floodplain. As this is a non-regulatory zone, staff did not include this map in the materials originally and no conditions related to floodplain were included.
3. The blue color, as shown in a portion of Wapikya Park depicts the 1% annual chance or 100-year floodplain.

N. Could staff seek comment from Montana Fish, Wildlife and Parks (FWP)?

1. Staff contacted FWP and received comment from Randy Arnold, Regional Supervisor for Region 2 FWP and his comments are attached in Exhibit #7. Due to the location of the subject property within one-quarter mile of Moose Can Gully draw and its associated semi-riparian and forested draws leading uphill to forested areas of Mount Dean Stone, FWP notes that there are many deer in the area which in turn attract bear and mountain lions. FWP commented that there is a high likelihood of human/wildlife conflict in this location, and as a result recommends that a "Living With Wildlife" section be added to the Development Covenants for this TED in order to help residents deal with and avoid wildlife problems. FWP provided a recommended version of such covenants.
2. If City Council would like to implement FWP recommendations regarding the inclusion of Living With Wildlife section in the Hillview Crossing TED Development covenants staff recommends the addition of the following condition of approval and revision of condition of approval #23 to include the Living With Wildlife section as one of the covenants that require written approval by the City council in order to be amended or deleted.
   a. Condition of approval #24: The following section on Living With Wildlife shall be included in the Development Covenants, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration:

      "Section __: Living with Wildlife

      Homeowners and residents must accept the responsibility of living with wildlife and must be responsible for protecting their vegetation from damage, confining their pets, and properly storing garbage, pet food, and other potential attractants. Homeowners must be aware of potential problems associated with the presence of wildlife such as deer, black bear, mountain lion, coyote, fox, skunk and raccoon. Please contact the Montana Fish, Wildlife & Parks office in Missoula (3201 Spurgin Road, Missoula, MT 59804) for information that can help homeowners "live with wildlife." Alternatively, see FWP's web site at http://fwp.mt.gov.

      The following covenants are designed to help minimize problems that homeowners could have with wildlife, as well as helping homeowners protect themselves, their property and the wildlife that Montanans value.

      a. There is high potential for **vegetation damage by wildlife, particularly from deer** feeding on green lawns, gardens, flowers, ornamental shrubs and trees in this subdivision. Homeowners should be prepared to take the responsibility to plant non-palatable vegetation or protect their vegetation (fencing, netting, repellents) in order to avoid problems.

      b. **Landscaping** comprised of native vegetation is less likely to suffer extensive feeding damage by deer than non-native plants. Native flowering plants will benefit pollinating insects, and native shrubs and trees produce favorable food sources and nesting sites

for a variety of bird species. Landscape plants can often spread beyond the original planting site, so using native plants also avoids problems with non-native plants spreading in nearby open areas.

c. **Gardens and fruit trees** can attract wildlife such as deer and bears. Keep produce and fruit picked and off the ground, because ripe and rotting vegetable material can attract bears and skunks. To help keep wildlife such as deer out of gardens, fences should be 8 feet or taller. Netting over gardens can help deter birds from eating berries.

d. This townhouse development is in the City of Missoula's **Bear Buffer Zone** (Municipal Code (Chapter 8.28.085, Special provisions for the accumulation and storage of garbage within the Bear Buffer Zone), which has regulations related to garbage handling in this area. Store all g**arbage** in a bear-resistant container, bear-resistant enclosure, or enclosed building to avoid attracting wildlife such as bears or raccoons. If your garbage containers are not bear-resistant, you must keep them inside a bear-resistant enclosure or enclosed building. These containers may only be outside the enclosure between 5:00 a.m. and 9:00 p.m. on the day of waste pickup.

e. **Do not feed wildlife** or offer supplements (including salt blocks), attractants, or bait for deer or other wildlife, including during the winter. Feeding wildlife results in unnatural concentrations of animals that could lead to overuse of vegetation and disease transmission. Such actions unnecessarily accustom wild animals to humans, which can be dangerous for both. It is against state law (§ 87-3-130, MCA) to purposely or knowingly attract any ungulates (deer, elk, etc.), bears, or mountain lions with supplemental food attractants (any food, garbage, or other attractant for game animals) or to provide supplemental feed attractants in a manner that results in "an artificial concentration of game animals that may potentially contribute to the transmission of disease or that constitutes a threat to public safety." Also, homeowners must be aware that deer can attract mountain lions to an area.

f. **Pets** must be confined to the house, in a fenced yard, or in an outdoor kennel area when not under the immediate control of the owner, and not be allowed to roam as they can chase and/or kill big game and small birds and mammals. Under current state law it is illegal for a dog to chase, stalk, pursue, attack, or kill a hooved game animal, and the owner may be held personally responsible (§ 87-6-404, MCA). Keeping pets confined also helps protect them from predatory wildlife.

g. **Pet food** must be stored indoors, in closed sheds or in animal-resistant containers in order to avoid attracting wildlife such bears, mountain lions, skunks, and raccoons. **When feeding pets** do not leave food out overnight. Consider feeding pets indoors so that wild animals do not learn to associate food with your home.

h. **Bird feeders** attract bears and should not be used from March to December 1. If used, bird feeders should: a) be suspended a minimum of 20-feet above ground level, b) be at least 4 feet from any support poles or points, and c) should be designed with a catch plate located below the feeder and fixed such that it collects the seed knocked off the feeder by feeding birds.

i. **Barbecue grills** should be stored indoors. Keep all portions of the barbecues clean, because food spills and smells on/near the grill can attract bears and other wildlife. (Due to the potential hazard of fire and explosion, propane cylinders for gas-fueled grills should be disconnected and kept outdoors. Under no circumstances should propane cylinders be stored indoors.)

j. **Compost piles** can attract skunks and bears. If used, they should be kept in wildlife-resistant containers or structures. Compost piles should be limited to grass, leaves, and garden clippings, and piles should be turned regularly. Do not add food scraps. Adding lime can reduce smells and help decomposition. (Due to the potential fire

hazard associated with decomposition of organic materials, compost piles should be kept at least 10 feet from structures.)

k. Consider **boundary fencing** that is no higher than 3-1/2 feet (at the top rail or wire) and no lower than 18 inches (at the bottom rail or wire) in order to facilitate wildlife movement and help avoid animals such as deer becoming entangled in the wire or injuring themselves when trying to jump the fence. (Contact FWP or see its website for information or a brochure regarding building fence with wildlife in mind.)"

b. Staff recommends revisions to Condition of approval #23 as follows:

23. The applicant shall include the following Amendments section in the Development Covenants subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration: "Amendments: Sections relating to Common Area Landscaping and Maintenance Plan, Weed Management Plan, Boulevard Landscaping and Maintenance Plan, Pedestrian Pathway/Stairs and Sidewalk Maintenance, Private Road Maintenance, Parking on Road "A" (north and south segments) and Road "B", Stormwater Facilities Maintenance, Radon Mitigation, Woodstoves, ~~and~~ Energy Efficiency, and Living with Wildlife may not be amended or deleted without prior written approval of the governing body."

O. What are they planning to sell the home for?

1. Staff contacted Paul Forsting with Territorial Landworks on Wednesday, December 12. Staff has not yet received a response.

APPENDIX D

FIRE APPARATUS ACCESS ROADS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION D101
GENERAL

D101.1 Scope. Fire apparatus access roads shall be in accordance with this appendix and all other applicable requirements of the *International Fire Code*.

SECTION D102
REQUIRED ACCESS

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

SECTION D103
MINIMUM SPECIFICATIONS

D103.1 Access road width with a hydrant. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders (see Figure D103.1).

D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade.

Exception: Grades steeper than 10 percent as *approved* by the fire chief.

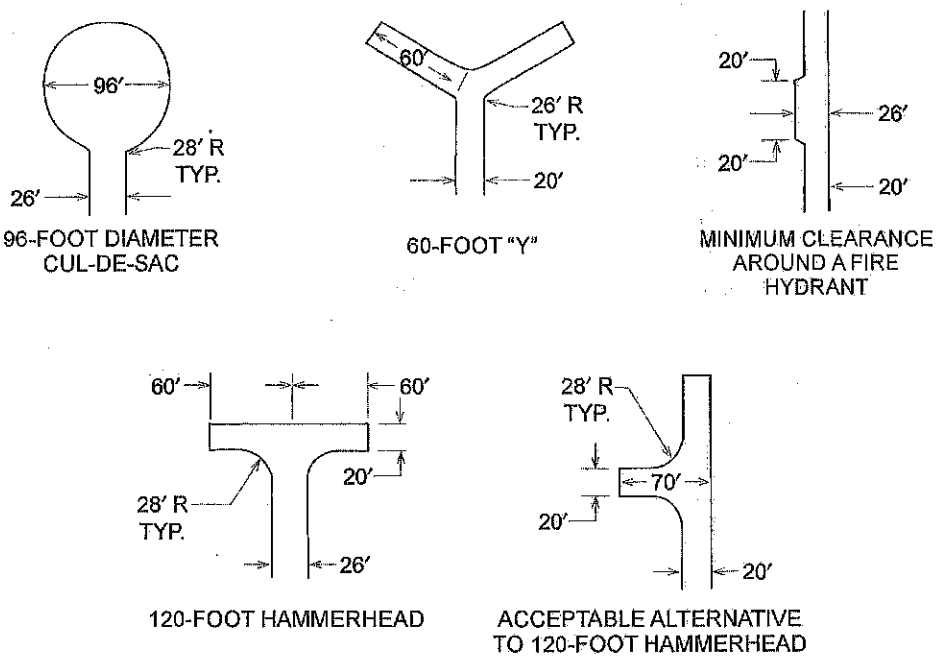
D103.3 Turning radius. The minimum turning radius shall be determined by the *fire code official*.

D103.4 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

TABLE D103.4
REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0-150	20	None required
151-500	20	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure D103.1
501-750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure D103.1
Over 750	Special approval required	

For SI: 1 foot = 304.8 mm.



For SI: 1 foot = 304.8 mm.

FIGURE D103.1
DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND

Hillview Crossing TED **Exhibit #2**

Storm Water Summary
Prepared by Troy Monroe, Assistant City Engineer

The storm water storage and conveyance system that serves the proposed Hillview Crossing TED is part of the South Missoula Storm Drainage Project (SID 524). Specifically, the portion of the Project that serves the Wapikiya Park area is the Honeysuckle Park Reach. The Honeysuckle Park Reach begins at the toe of the South Hills and includes a drainage swale between Hillview Way and Hillside Drive. There is approximately 66 acres that drain into the swale of which Hillview Crossing TED occupies approximately 25.6 acres, or 38.5%.

There is a 24 inch inlet and culvert that conveys storm water from the drainage swale into Wapikiya Park. The model used for the South Missoula Storm Drainage Project calculated the runoff from the 66 acres to be about 7 cubic feet per second (cfs). The majority of the 66 acres is undeveloped and the model did not include future development in the design. Therefore, the City will limit the runoff for all future development to remain at the 7 cfs for the entire 66 acres. The allowable flowrate associated with the 25.6 acres of Hillview Crossing TED is 2.7 cfs. Therefore, the developers of Hillview Crossing TED will have to design a storm water storage and conveyance system that limits the discharge from the development to a maximum 2.7 cfs.

In addition to storm water runoff flow rate, the developers of Hillview Crossing TED will also have to retain the difference between pre-development runoff flow volume and post-developmet runoff flow volume. Through the use of the TR-55 model, running the Soil Conservation Service runoff model (SCS Method) the developers have shown a retention volume of 17,393 cubic feet (cf) or 130,100 gallons. This volume must be designed within the storm water system through enlarged pipes, tanks or retention basins.

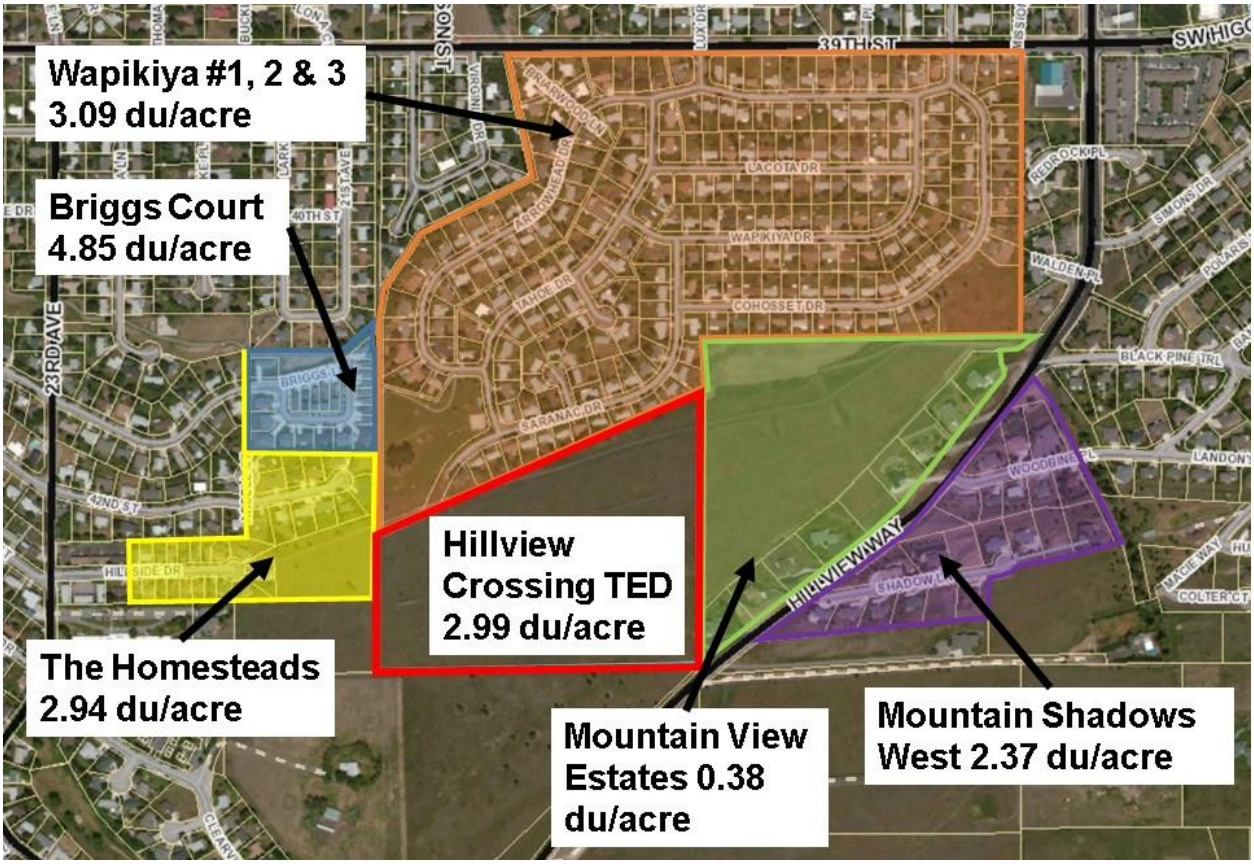
Storm water that is discharged from the Hillview Crossing TED is collected in the drainage swale and conveyed into Wapikiya Park. Wapikiya Park has a designed retention basin which FEMA has designated a 100 year floodplain and water elevation. Storm water is released from this retention basin into a storm water conveyance pipe main. The conveyance pipe leaving Wapikiya Park has a design flow rate of 12 cfs. It is our understanding that if the inflow into the retention basin remains at 7 cfs from the drainage swale, there will be no adverse impact to Wapikiya Park or the homes surrounding the Park. The FEMA floodplain and water elevation does extend into the adjacent Homesteads subdivision but remains within City owned property.

City Engineering reviewed the remaining Honeysuckle Park Reach conveyance system, analyzing conveyance pipes, road culverts and other retention basins. Our review shows that the downstream system should be able to handle the discharge volume without negative effects given the discharge flow remains at pre-development rates.

Hillview Crossing TED **Exhibit #3**

Surrounding Land Densities & Lot Sizes

Adjacent Property Density shown in photo below:



Additional Information for each subdivision shown in photo:

Hillview Crossing TED (outlined in red)

- 68 TED unit ownership parcels on net acreage of 22.76 acres
- 2.99 dwelling units per acre density
- TED unit ownership parcel sizes range between 4,800+/- sq. ft. to 10,800+/- sq. ft.
- 2.68 acres Park Land (Park areas, North/South Trail & East/West Trail easement)
- 11.68 acres Common Area

Wapikiya Subdivision #1, 2 & 3 (shown in orange)

- 236 lots on approximately 76.4 acres
- 3.09 dwelling units per acre density
- Lot sizes range between 7,116 sq. ft. to 17,600 sq. ft.
- 6.2 acres parkland

Briggs Court Subdivision (shown in blue)

- 21 lots on 5.09 acres
- 4.85 dwelling units per acre density
- Lot sizes range between 3,819 sq. ft. to 11,226 sq. ft.
- 0.72 acres parkland

The Homesteads Subdivision (shown in yellow)

- 31 lots on 10.544 acres
- 2.94 dwelling units per acre density
- Lot sizes range between 4,136 sq. ft. to 13,885 sq. ft.
- 3.23 acres parkland

Mountain View Estates Subdivision (shown in green)

- 9 lots on 23.77 acres
- 0.38 dwelling units per acre density
- Lot sizes range between 28,314 sq. ft. to 42,253 sq. ft.
- 16.29 acres Common Area

Mountain Shadows West Subdivision (shown in purple)

- 21 lots on 8.87 acres
- 2.37 dwelling units per acre density
- Lot sizes range between 15,681 sq. ft. to 30,927 sq. ft.
- 1 acre Park and Common Area

Exhibit #4

Townhome Exemptions

Land Use & Planning Committee

Denise Alexander
Development Services

November 4, 2015

2011 Legislature HB460

WHY?

- In 2001 revision to MCA Title 76 making condominiums exempt from subdivision review if property zoned
- Condominium projects are regulated by the Unit Ownership Act in MCA Title 70
- Many condos were created during Boom and later foreclosed during Bust
- Fannie Mae, Freddy Mac, HUD made it difficult to finance because no land for security
- Because no definition of Townhomes in the Unit Ownership Act they're treated the same as Condos for appraisals and financing

2011 Legislature HB460

HOW?

- Draft HB460 initiated at Taxation Committee
- Revised Title 15 Taxation to require Dept. of Revenue to write a rule to determine taxable value of townhomes
- Revised Title 70 Property by adding definition of "townhouse or townhome"
- Revised Title 76 Land Resources and Use to include townhouses or townhomes as exempt from subdivision review on zoned property

MCA Title 70 - Condominium

"Condominium" means the ownership of single units with common elements located on property submitted to the provisions of this chapter."

MCA Title 70 - Townhome

Townhome means "property that is owned subject to an arrangement under which persons own their units and hold separate title to the land beneath their units, but under which they may jointly own the common areas and facilities."

Condo/Townhome Exemption

Impacts from revision to Title 76 Condo Exemption

- Townhome definition too broad- 'unit with land beneath'
- Units surveyed under building - looks like a lot without benefits of subdivision review
- No Public notification
- No design standards for access
- No mitigation of impacts required

Subdivision Notification

Neighborhood Meeting Notification

- Notify via mail Neighborhood Council and Associations, residents w/in 300', Ward Reps, and Planners

Public Hearing Notification

- Legal Ad, notification via mail to adjacent property owners, posters on site

Subdivision Standards

- Design and arrangement of lots, blocks, and roads
- Grading and Drainage
- Water and sewage disposal meet DEQ standards
- Location and installation of utilities & easements
- Parks and Open Space
- Hillside
- Riparian

Subdivision Mitigation

Subdivision review criteria for impacts include:

- Agriculture and ag water user facilities;
- Local services - complete streets, parks, water/sewer;
- Natural environment, wildlife and wildlife habitat; and,
- Public health and safety - floodplain, steep slopes, radon, air quality

City Council must ensure the design of the subdivision minimizes significant adverse impacts.

Zoning review – Title 20

Zoning regulates:

- Lot area per unit
- Permitted building type
- Setbacks to property lines and between residential buildings
- Multi-dwelling site plan standards when multiple 2-unit houses or multi-dwelling buildings are proposed
- Parking requirements
- Hillside standards-density reduction, design
- Riparian protection

Engineering Review – Title 12

Title 12 regulates:

- Private road standards & maintenance
- Public access easements
- Utility easements
- Pedestrian facilities
- Grading and drainage standards
- Driveways, parking and ADA standards
- Sewer Availability

Other Review

- City Fire-Access, hydrants
- Building Code
- Parks - Activity Areas
- Mountain Water-Water availability

Requirements Lost

- Minimum lot size
- Parks and Common areas or Cash-in-lieu
- Trail connections
- Complete Streets
- Public Transit Facilities
- 2000 sq. ft. building sites <25% slope
- Townhouse design standards
- Neighborhood impacts, citizen input

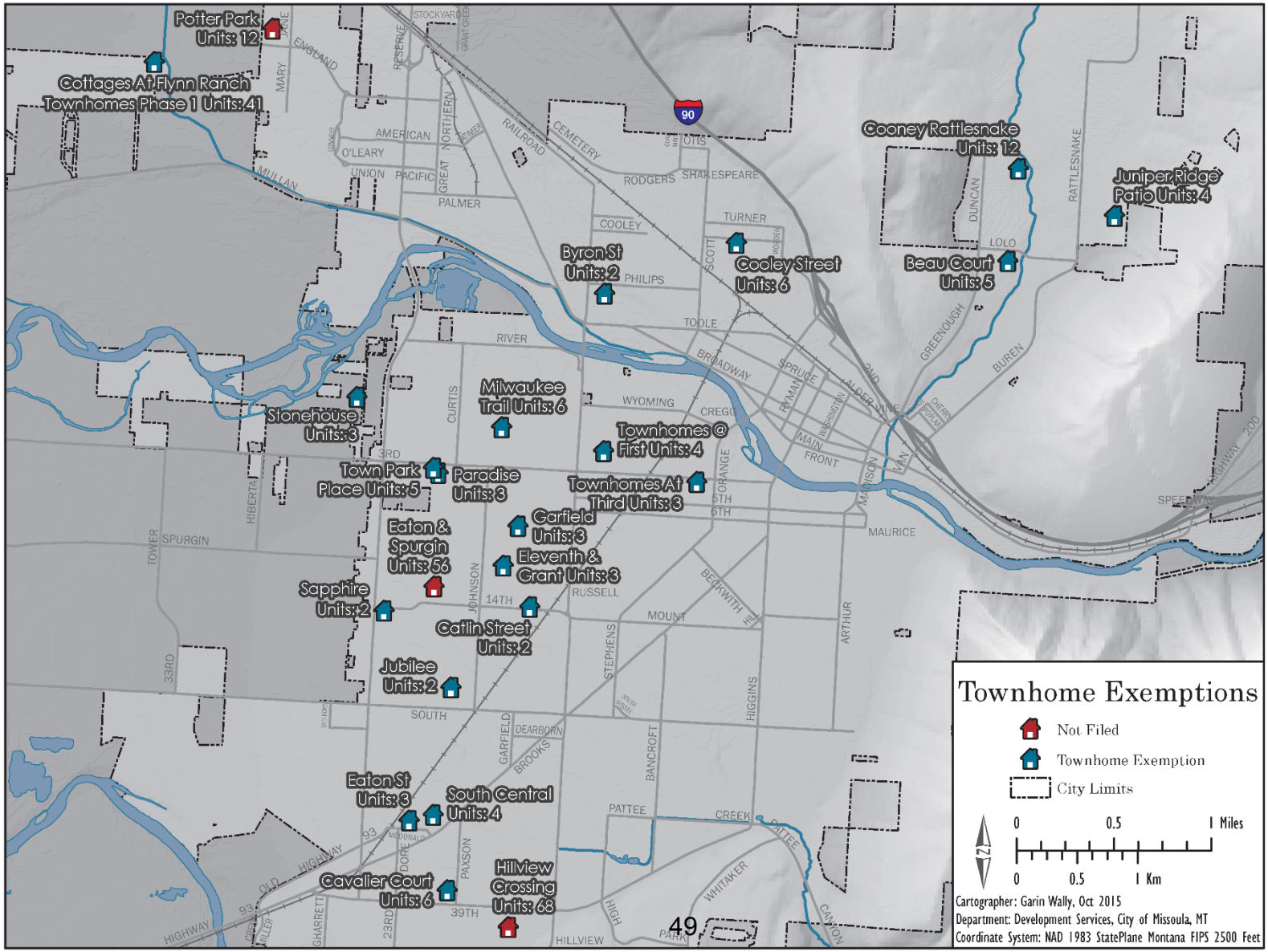
Townhouse Exemptions to-date

Project Name	No. of units	Building type
Townhomes at First	4	2 two-unit houses
Beau Court	4	4 Detached houses + 4-plex
Juniper Ridge Patio Homes	4	4 Detached houses
Cottages at Flynn Ranch	41	41 Detached houses
Milwaukee Trail	6	Multi-dwelling building with 6 units
Stonehouse Townhomes	3	3 Detached houses
Eaton Street	3	3 Detached houses
Catlin Street	2	2 Detached houses
Jubilee	2	2 Detached houses
Eleventh and Grant	2	2 Detached houses
Town Park Place	5	4-plex + one commercial
Sapphire	2	2 Detached houses
Rattlesnake Townhouses	12	12 Detached houses
Cavalier Court	5	5 Detached houses
Townhomes at Third	6	2 Detached houses + 4-plex
Byron Street	2	2 Detached houses
Garfield St.	3	3 Attached units
Paradise	6	3 Attached 2-unit townhomes
South Central	4	2 Two-unit houses

Total filed 18
Total units 113

Total in process 3
Units in process 136

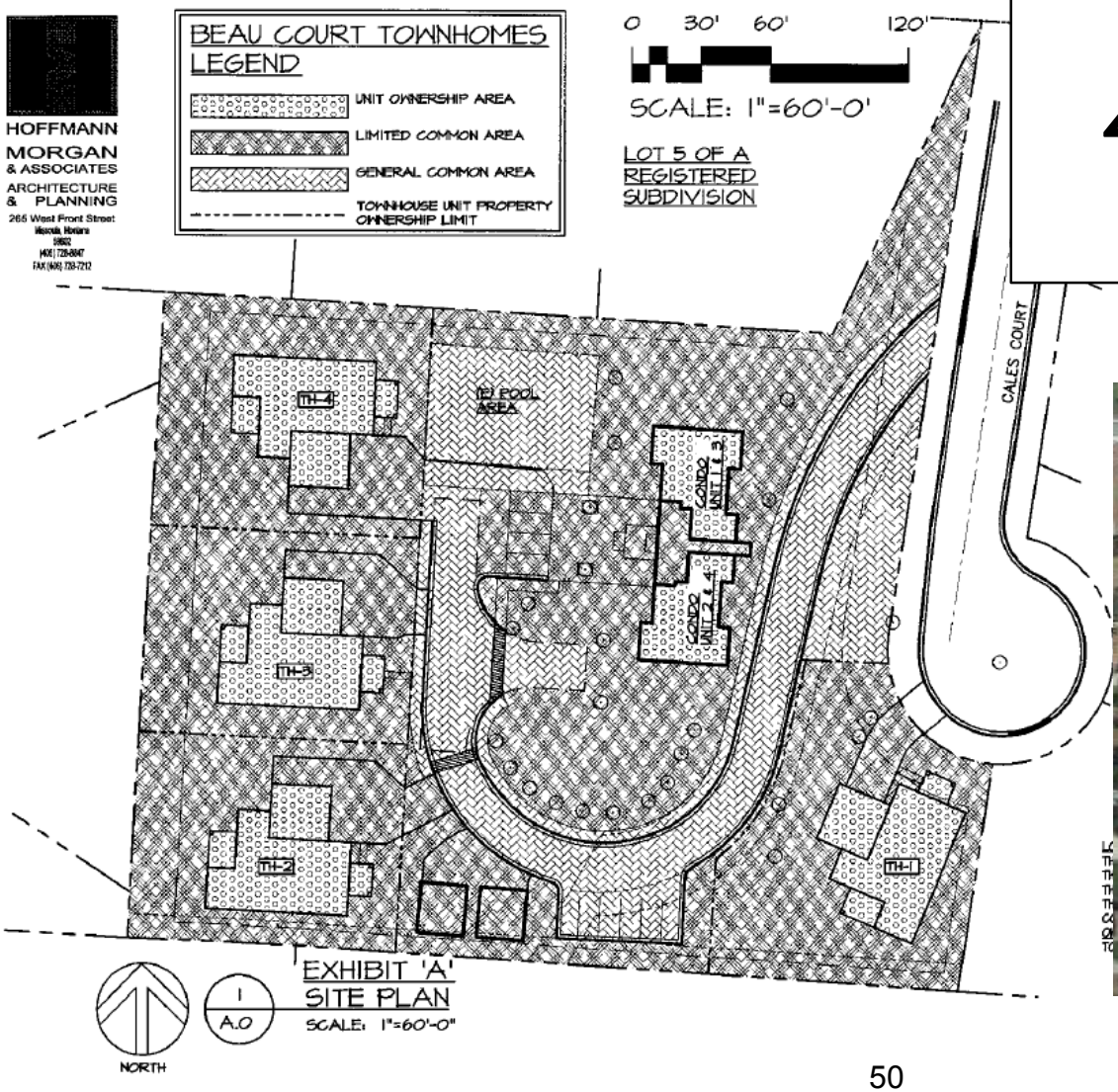
Filed Declarations Map



Filed Declaration

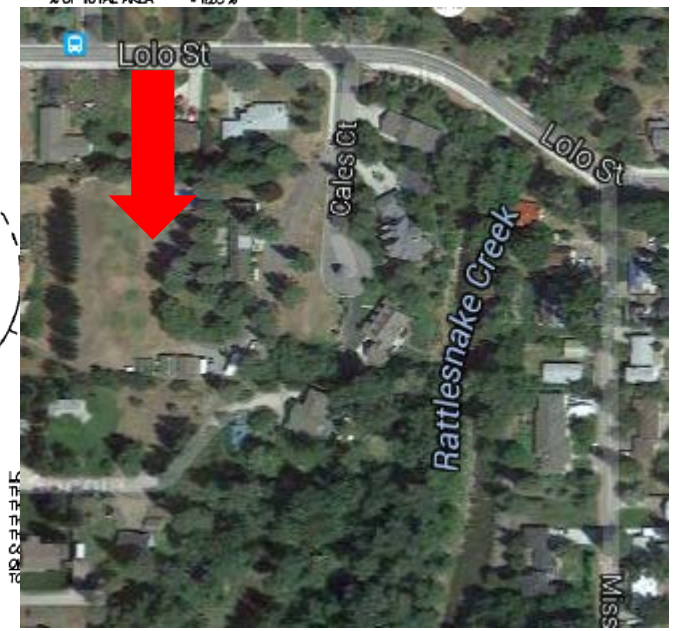
Beau Court-

4 new units, one existing 4-plex.

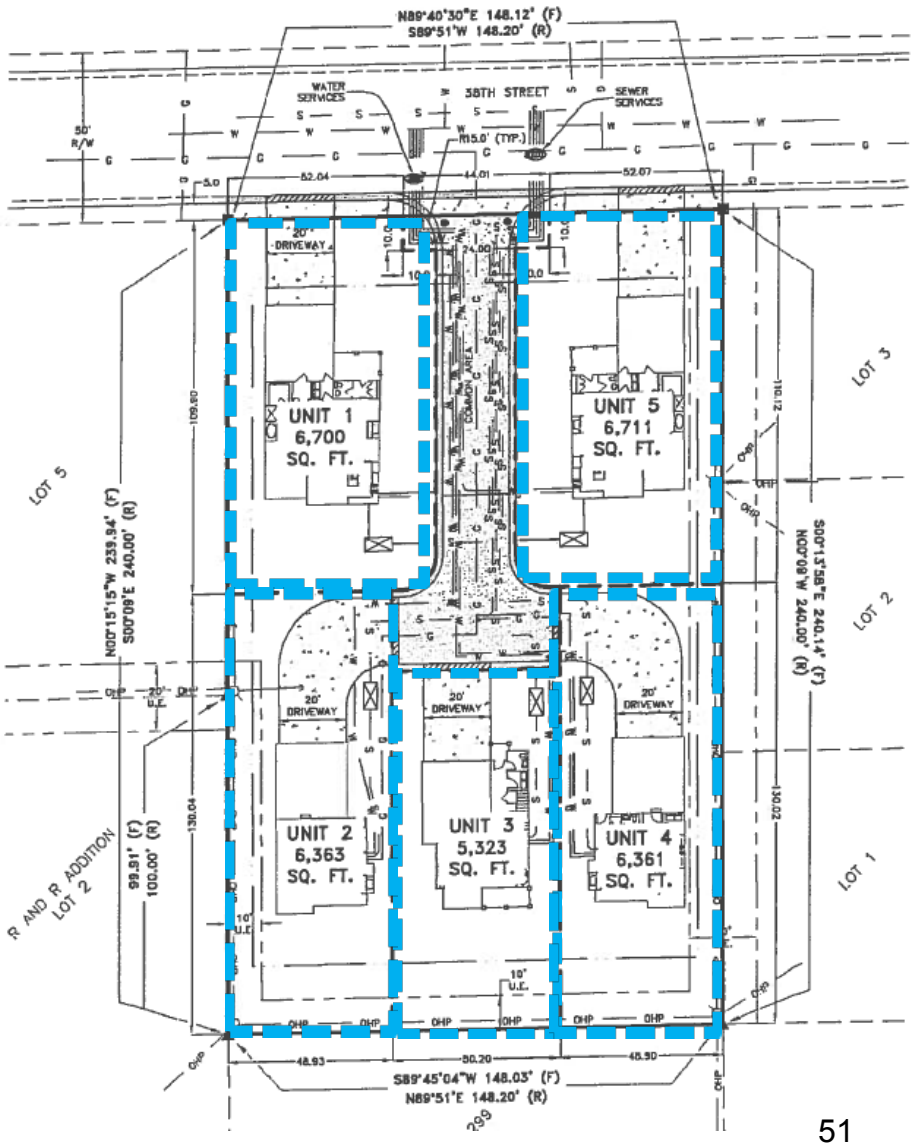


% OF TOTAL AREA = 10.54 %

TH-4 OWNERSHIP DATA
UNIT OWNERSHIP AREA = 2460 S.F.
LIMITED COMMON AREA = 8880 S.F.
TOTAL OWNERSHIP = 11,840 S.F.
% OF TOTAL AREA = 11.85 %



Filed Declaration

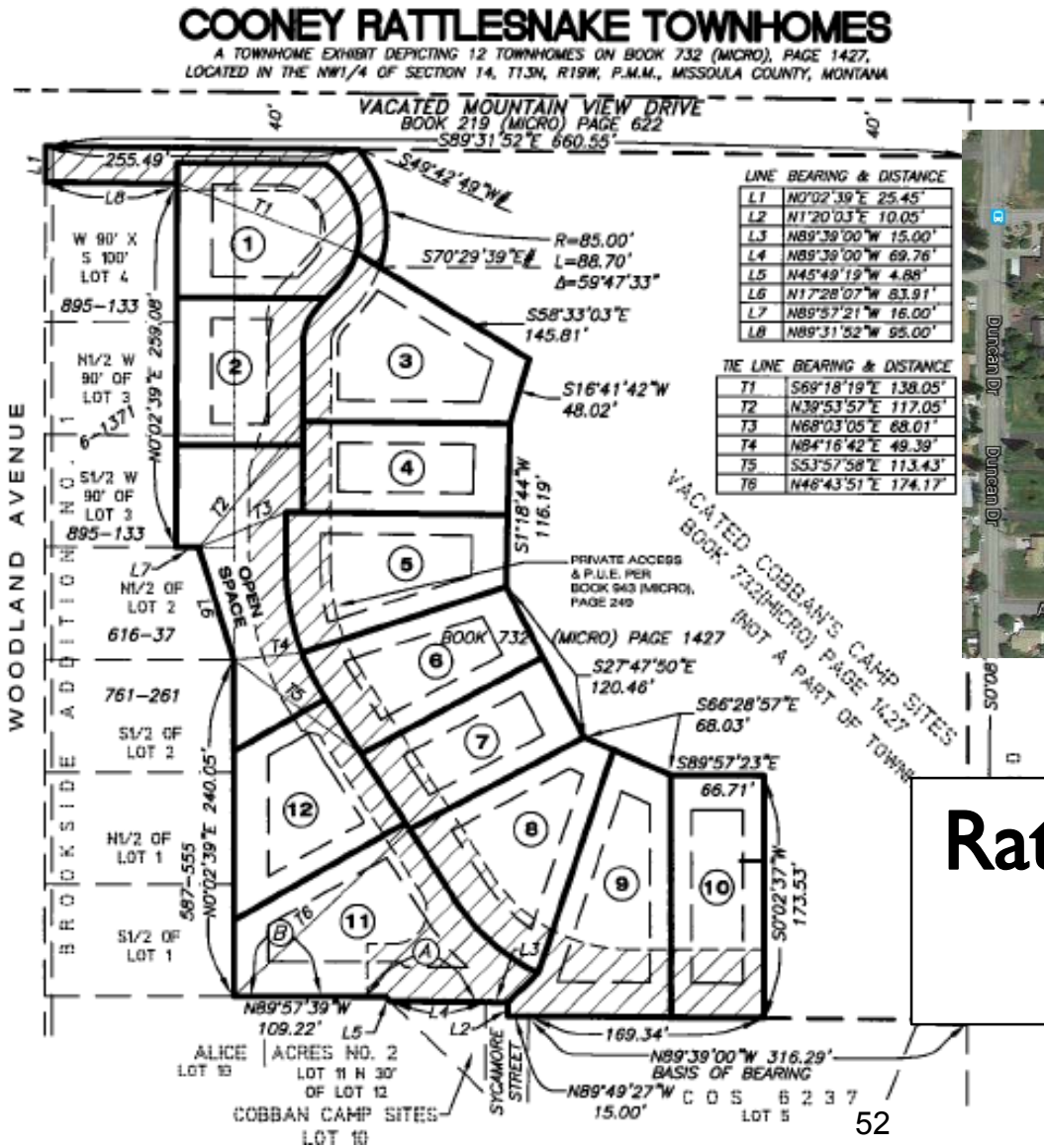


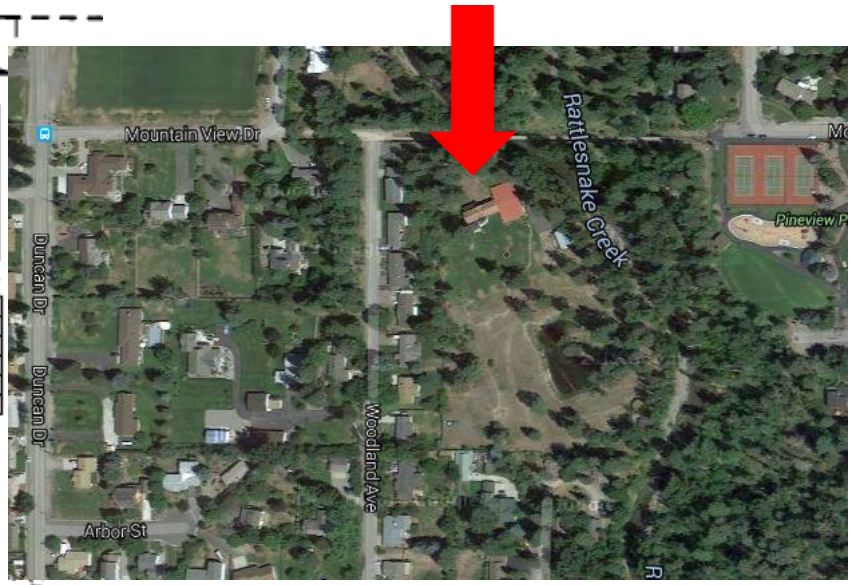
51

Cavalier Court-

5 new units

Filed Declaration

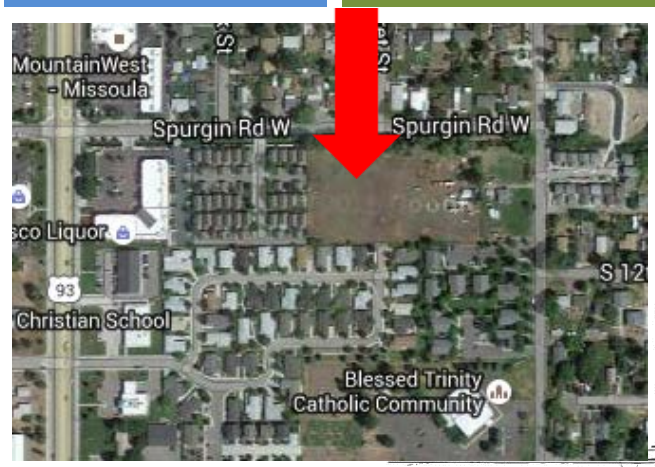




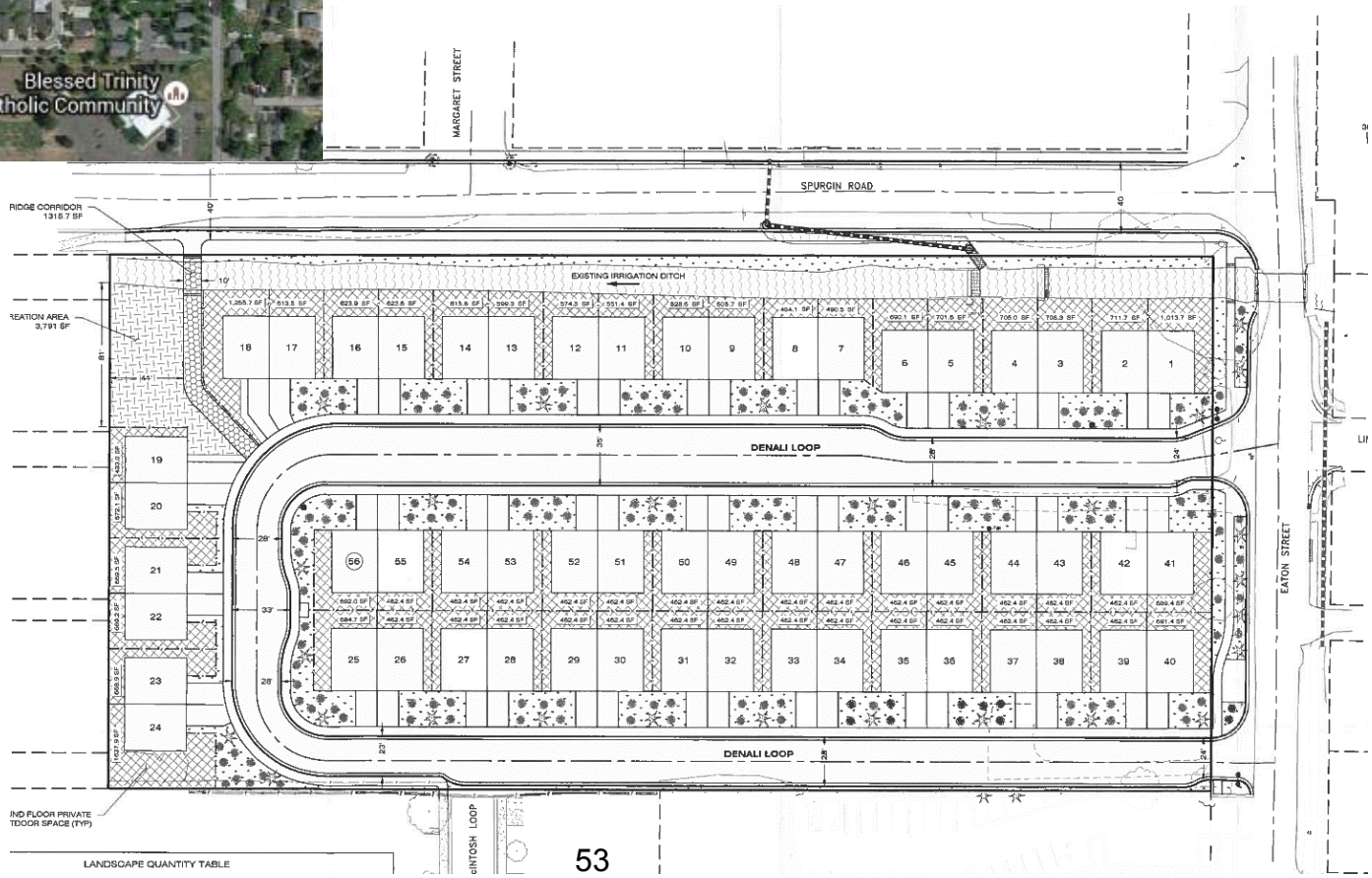
Rattlesnake Townhomes

12 units

In Process

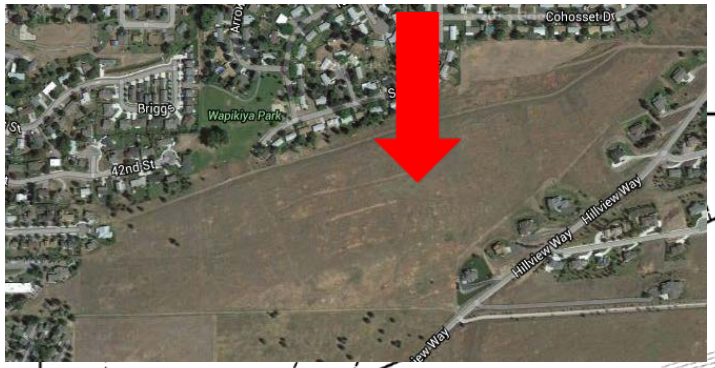


Eaton Townhouses 56 Units (28 two-unit houses)



53

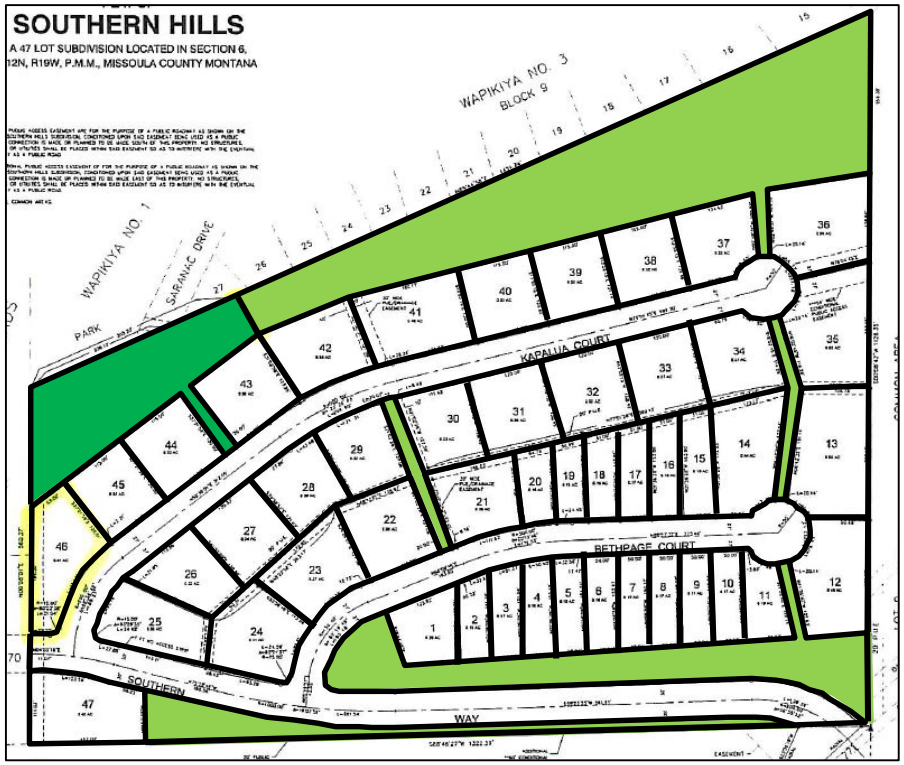
In Process



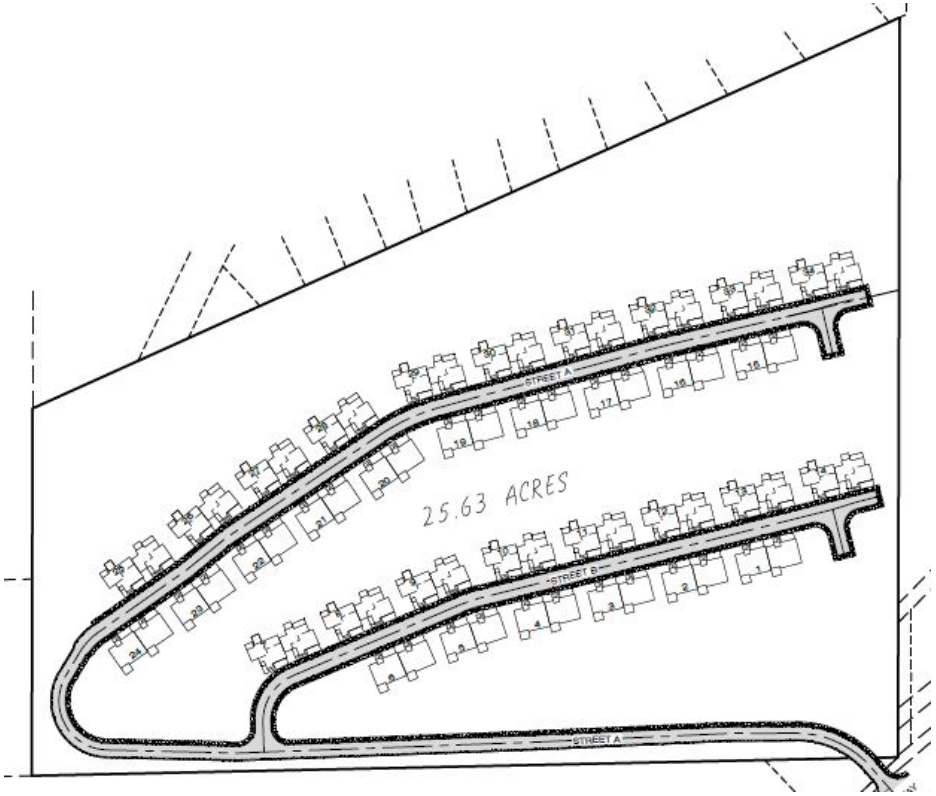
Hillview Crossing 68 units (34 two-unit houses)

Townhome vs. Subdivision Layout

Southern Hills Subdivision
46 Lots



Townhome Exemption
68 Units



Townhome Exemption

Recommended Motion:

The Committee requests that Development Services prepare ordinances and regulations to address the townhome exemption to subdivision and that those items be returned to LUP Committee for review along with public involvement plan and timeline adoption.

Townhome Exemption presentation notes -11/4/15

1. I've been asked to explain how State law was amended with the Townhome Exemption to Subdivision, what it means, how it differs from subdivision review, and what problems arise with reviewing them solely as zoning projects.

2. HB460 was the bill adopted at the 2011 legislature that created the Townhome Exemption. However, we need to go back to the 2001 Legislature first to set the stage. At that time a bill passed that revised Title 76 to allow the conversion of apartments to condominiums without subdivision review if the property met zoning. Condominiums are regulated by Title 70 where the unit ownership act is found. This bill was supported because there weren't additional impacts if the units were **owned** rather than **rented** in a multi-dwelling building that met all zoning standards.

   Subsequently a lot of apartments were built and filed as condos during the housing boom. But later, when the economy crashed, many of them were foreclosed. After that happened the lenders and title companies made it much more difficult to finance condos, part of the problem being that there was no land associated with the units for security.

   In reaction to the financing problems some developers built townhomes, buildings with multiple units attached side by side so that each unit had land beneath it thinking it would be easier to get financing. But this didn't help because there was no definition of Townhomes in the Unit Ownership Act.

3. So in 2011 a draft bill HB460 was initiated in the House Taxation Committee. What was explained to the committee is that this was just a small change to the Unit Ownership Act in Title 70 to allow townhomes to be treated the same as condominiums and make it easier to obtain financing for them since each unit had land beneath it. In the Bill there was an amendment to Title 15 Taxation to require the Department of Revenue write a rule for appraising these units, and an amendment to Title 70 to add a definition of Townhome in the Unit Ownership Act.

   This bill was heard at the House Taxation Committee and there were no opponents since it sounded like a great idea to make it easier to finance townhomes. It was also under the radar of most lobbyists and organizations that track zoning and subdivision bills because they normally go to the Local Government committee. This was a taxation and unit ownership bill until, at the last minute, the Representative who sponsored the bill recommended a revision that inserted language into the condominium subdivision exemption in Title 76 so that townhomes, as defined by Title 70, were exempt from subdivision review if they meet zoning. I'm not sure the legislators understood the consequences of this amendment.

4. The definition of Condominium in Title 70 is “the ownership of single units with common elements located on property submitted to the provisions of this chapter”. The chapter being the Unit Ownership Act. Here is a picture of a condo project on Toole Avenue. These are what we typically call a Multi-Dwelling building where the units are stacked horizontally and the land beneath is owned in common.

5. Here is the definition in Title 70 of a townhome as “property that is owned subject to an arrangement under which persons own their units and hold separate title to the land beneath their units.” The more conventional definition of a townhouse is what was adopted in Title 20. It is defined as a residential building containing multiple dwelling units, each located on their own parcel with a common or abutting wall along a shared property line. (talk about the picture of 2-unit townhomes on slide)

6. Here are some impacts this law has had. The definition in Title 70 is too broad. Because there is no reference to these units “being on separate parcels with common or abutting walls” the tool has been used for all building types including detached houses, 2-unit houses, multi-dwelling buildings, and commercial. When the Townhouse Declaration is filed the ‘land beneath the unit’ needs to be surveyed and when the Dept of Revenue puts that information if their GIS layer they look like lots without subdivision review. I’ll have more to say about that when we look at some filed projects. Other impacts are no public notice, using zoning standards to review a defacto subdivision, and no ability to require mitigation of impacts. The only process these projects go through is a review of a Zoning Compliance Permit to determine if the project meets zoning. Luckily Title 20 requires all projects to also comply with all applicable city, state, and federal regulations so that a Title 12 Engineering review is also done.

7. Since many of you have not been involved in a subdivision review, or haven’t for a long time, the next few slides are a quick primer on the process and standards.

   First of all, after a pre-application meeting with staff, the developer is required to hold a Neighborhood Meeting and notify all those listed in the slide, to describe the project and collect comments that are included in the subdivision application. Later, for subdivisions over 5 lots, there is required notification of the public hearing. This encourages participation from the public in the process of review.

   Because the townhouse projects are exempt from subdivision review there are no neighborhood meetings or notice required.

8. The subdivision standards regulate division of land. Zoning regulates the use of the land. The two laws complement each other; lots in a subdivision have to meet minimum parcel area and density of zoning. Then zoning regulates the uses, and parcel and building standards, on the lots. This slide lists the standards by which a subdivision is reviewed.

   We have Hillside and Riparian chapters in Title 20 but some of the provisions are difficult to interpret when the development is on one parcel. We have grading, drainage and easement standards in Title 12 which we can enforce in the Municipal code but the

subdivision regulations are more prescriptive and cannot be varied from unless approved by Council. Zoning does not have standards for the arrangement of lots, blocks and roads, nor requirement for park dedication. Currently for subdivisions with 6 or more lots that are smaller than ½ acre the park dedication required is 11% of the land being subdivided.

No parkland is required for the townhome projects because they are exempted from subdivision review.

9. Subdivision law requires an application to be reviewed for any impacts that might occur if the project is approved as presented. The review criteria for impacts are included on this slide and the City Council may condition the subdivision to ensure the impacts are minimized.

10. So, as explained earlier we are limited to reviewing these projects for zoning compliance.

    We make sure the projects meets lot area per unit so that they meet the density allowed on the parcel. They have to meet the building types that are allowed in the zoning district. We review for building setbacks from property lines, but those are measured from the perimeter property lines only since they are usually a single parcel, and we require twice the side yard setback between buildings. Projects that have more than three 2-unit houses or multi-dwelling buildings have to meet the Multi-dwelling standards-landscaping and activity area. If there are steep slopes Hillside density reduction is applied along with building design standards on slopes. And if there is a Riparian area they need to provide a Riparian protection plan.

11. These are the items that Engineering must review from Title 12, although it's difficult to apply some of the standards when there are not internal property lines or dedicated streets.

12. We also involve other departments and utility providers

13. Here is a list of the requirements that we lose right now when we use Title 20 for review of these projects:

    Currently you can put more than one building on a lot if the lot meets minimum parcel size for the zoning and meets the minimum area per unit. This doesn't happen often as a larger scale because most detached house developments would only want 2-3 homes on a lot for lease or rent. But now with this exemption you can put multiple units on a parcel and **sell** them without subdivision review.

    Because all these units are on one parcel we make sure they meet the density, parcel area per unit, but they meet the minimum lot size based on the size of the whole parcel. Consequently, they are able to fit many more units on the parcel because each unit is not constrained by the required minimum parcel area.

We cannot require a park dedication. If it is a multi-dwelling project we can require outdoor activity area but for two unit houses - that usually end up being their back yards, and nothing is required if it's a detached house project.

The next three are not specifically addressed in zoning or Title 12 (Trails, complete streets, public transit)

The hillside standard of requiring 2000 sq ft building sites less than 25% is difficult to apply when lots are not being created

We can't require the Townhouse design Standards in Title 20 because the definition is different than the MCA Title 70 definition

And we can't compell mitigation or citizen input if the use is permitted and no public process is required.

14. Alright, lots of words, now for some numbers and pictures: This is a list of Townhouse projects that have been approved and filed and three that are in process. As you can see most of the projects have been quite small with the exception of the Cottages at Flynn Ranch. However, the most recent projects in process are much larger and we are concerned that this may be a trend.

15. This is a map showing where projects have been approved and the Townhouse Declaration has been filed in blue, and ones in process in red. There are three up the Rattlesnake, a couple on the Northside, some throughout mid-town, some further south, and the two west; one 41 detached homes at Flynn Ranch and 12 units in Windsor Park. The larger projects in process are at Eaton and Spurgin with 28 two-unit houses for 56 units, and Hillview Crossing with 34 two-unit houses for 68 units.

16. Now I'll show you some filed and in process projects. This is the Beau Court exemption. There was an existing non-conforming 4-plex on the property and the zoning allowed four more detached house units. Their plan shows the unit ownership area as the footprint of the proposed homes and then limited common area around the homes and general common area is the road access and overflow parking.

17. This is Cavalier Court- five new detached houses clustered around a private road serving as access. It has sidewalks on 38th Street and on one side of the private road.

18. This was filed as Cooney Rattlesnake Townhomes but is commonly known now as Woodland Estates. This is a larger project with 12 units on a private road. This property borders Rattlesnake Creek so there were floodplain and riparian reviews and a large area that could not be disturbed. It is also constrained with only one way in and out so a turnaround at the south end was necessary for emergency vehicle. This also illustrates how the declarations are not only showing the footprint of the proposed buildings but now show lines that resemble lots. When we looked at this as one parcel the front and rear of the property are the north and south boundaries and the side property lines are on the east and west boundaries. The distance between buildings had to be twice a side yard

setback. We have learned lately that this project may be modified to increase the number of units. If that's the case they will need to re-apply for a zoning compliance permit and either void the current declaration and file a new one, or file an amended declaration.

19. This is the Eaton Townhouses. It has not been filed yet so this is the site plan that was reviewed. 28 two-unit houses on a private loop road off Eaton Street. This was reviewed as a multi-dwelling project so you can see the landscaping in front of the units and private activity areas between and behind the units. There is also a small common activity area in the northwest corner of the property with a trail over the irrigation ditch to Spurgin Rd. One concern we have about all of these projects is the future maintenance of the private roads. The Unit Ownership Act requires an "Association of unit owners" to be formed and bylaws included in the declaration to deal with the general common areas, such as landscaping, roads, common activity areas. There has been instances in the past when home owners associations have become inactive and the residents expect the City to maintain their private streets. These projects will be increasing the miles of private streets in the City.

20. This is Hillview Crossing, the largest project we have seen to date. This is a 34 two-unit house development on 25 acres of very steep slopes off Hillview Way and south of Wakipia Park. This property was approved for a 46 lot subdivision but the developer never filed the final plat. The hillside density reduction calculation in zoning reduced the number of units that could be built on the site from 11 to 68. So this plan is meeting the allowed density but, again because we can't apply the minimum parcel size to the units they are able to fit many more units than if this were a subdivision.

    The road layout is similar to the subdivision but it is narrower and only allows parking on one side. Each unit has a 2 car garage with a 10 foot driveway. The standards in Title 12 require driveways to be 20 feet from the garage door to the property line. Since there are no property lines we could not apply that standard and worry that the cars will be encroaching on the sidewalks.

    They are providing curbside sidewalks on both sides of the street except for on the entrance road, where there is sidewalk on one side. The landscaping is in the front yards and the private activity areas will be behind the units on slopes of 30-40%, either up or down depending on what side of the road the unit is on. The activity area standards for multi-dwelling projects does not specify a maximum slope for private activity areas since most apartment buildings have flat decks or patios so we could not require the private activity areas to be less sloped.

    Engineering is very concerned about the drainage on this hillside when there will be so much cut and fill and impervious surface, and, how the storm drainage will be kept on-site. A Geo-technical report that was done for the previous subdivision suggested that an individual geo-technical report be done for each home with the building permit which was required as a condition of the zoning compliance permit.

The Parks Department hoped for a trail to Wapikia Park but the developer did not want to commit to a trail.

21. Here is a slide visually comparing the subdivision preliminary plat that was approved on this property to the proposed townhome exemption. There are larger lots, park dedicated adjacent to Wapikia Park, trails through the long blocks and to the park, wider roads, and a road connection to the west.

22. In closing, I hope this has been informative regarding this exemption. I think the original intention was a good one but cross-referencing the Unit Ownership Act definition into the subdivision exemption had consequences no one really understood at the time. It hasn't been too difficult to deal with these on the smaller scale it has been until recently. But as these projects get larger and larger it becomes more apparent that there needs to be some revisions to Title 20 and Title 12 to address them.

Maybe at a certain threshold require them to be a conditional use with standards?

Require PUD zoning? Incorporate some parts of Cluster Development Standards?

Adjacent Property Owner Map & List

Adjacent Property Owner notices (APOs) were sent via certified mail to the parcels outline in blue in the map on November 2, 2018.

The excel spreadsheet contains the list of recipients who received the certified mailing.

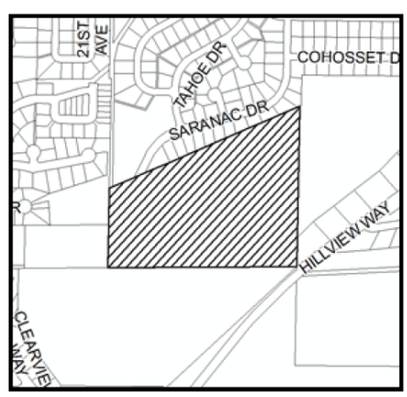
The Legal Ad was run in the Missoulian on December 2 & 9, 2018.

	A	B	C	D	E	F	G
1	FullName	Address1	Address2	City	State	ZIP	FULL_ADDRESS
2	ALDRIDGE COREY DAVID	4607 HILLVIEW WAY		MISSOULA	MT	59803-3162	4607 HILLVIEW WAY
3	ARNOTT BEN	125 SARANAC DR		MISSOULA	MT	59803-1263	125 SARANAC DR
4	BERG MICHAEL E	133 SARANAC DR		MISSOULA	MT	59803-1263	133 SARANAC DR
5	BROCCI JAN K	2109 42ND ST		MISSOULA	MT	59803-1100	2109 42ND ST
6	CARTER HAROLD H & GAIL S	120 SARANAC DR		MISSOULA	MT	59803-1241	120 SARANAC DR
7	CITY OF MISSOULA	435 RYMAN ST		MISSOULA	MT	59802-4207	134 TAHOE DR
8	DISTRICT XI HUMAN RESOURCE COUNCIL	1801 S HIGGINS AVE		MISSOULA	MT	59801-5763	4824 CLEARVIEW DR
9	FREDENBERG PAUL J	1616 34TH ST		MISSOULA	MT	59801-8938	127 SARANAC DR
10	GARNETT LINDA K	117 SARANAC DR		MISSOULA	MT	59803-1263	117 SARANAC DR
11	HEARTH LLC	PO BOX 160		KELLY	WY	83011	900 RIMEL RD
12	HENRIKSON DONALD C	121 SARANAC DR		MISSOULA	MT	59803-1263	121 SARANAC DR
13	HERMES TERRI L	115 SARANAC DR		MISSOULA	MT	59803-1263	115 SARANAC DR
14	HILLVIEW CROSSING MISSOULA LLC	401 E BECKWITH AVE		MISSOULA	MT	59801-4426	
15	JACOBY JAIME H	131 SARANAC DR		MISSOULA	MT	59803-1263	131 SARANAC DR
16	KELLEY MICHAEL J	116 SARANAC DR		MISSOULA	MT	59803-1241	116 SARANAC DR
17	KIMBLE LINDA FREY	100 HILLVIEW WAY		MISSOULA	MT	59803-1316	
18	KUMPF NANCY ANN	135 SARANAC DR		MISSOULA	MT	59803-1263	135 SARANAC DR
19	LANKTREE JOHNNY J	119 SARANAC DR		MISSOULA	MT	59803-1263	119 SARANAC DR
20	MCATEE NICHOLAS T	111 SARANAC DR		MISSOULA	MT	59803-1263	111 SARANAC DR
21	MINISH JOHN N	114 SARANAC DR		MISSOULA	MT	59803-1241	114 SARANAC DR
22	MOUNTAINVIEW ESTATES HOMEOWNERS ASSOC	MAIL TO GLASS MARC	4407 HILLVIEW WAY	MISSOULA	MT	59803-3159	
23	NURSE EDWARD E & CHERYL	129 SARANAC DR		MISSOULA	MT	59803-1263	129 SARANAC DR
24	PICKENS DIANNE P	4610 HILLVIEW WAY		MISSOULA	MT	59803-3177	4610 HILLVIEW WAY
25	SLATER RICHARD G	4603 HILLVIEW WAY		MISSOULA	MT	59803-3162	4603 HILLVIEW WAY
26	STEVENS JEFFREY T	123 SARANAC DR		MISSOULA	MT	59803-1263	123 SARANAC DR
27	STOSICH TYLER K	139 SARANAC DR		MISSOULA	MT	59803-1263	137 SARANAC DR
28	SUN DEVELOPMENTS LLC	PO BOX 1479		MISSOULA	MT	59806-1479	4810 HILLVIEW WAY
29	TAYLOR CASEY J	118 SARANAC DR		MISSOULA	MT	59803-1241	118 SARANAC DR
30	TONKIN K PATRICIA	4824 CLEARVIEW WAY		MISSOULA	MT	59803-2106	4824 CLEARVIEW WAY
31	WOODFORD ORVILLE D	113 SARANAC DR		MISSOULA	MT	59803-1263	113 SARANAC DR
32	YOUTH HOMES INC	PO BOX 7616		MISSOULA	MT	59807-7616	2105 42ND ST
33	SOUTH 39TH ST NEIGHBORHOOD COUNCIL	ATTN JEFFREY STEVENS	123 SARANAC DR	MISSOULA	MT	59803-1263	123 SARANAC DR
34	MOOSE CAN GULLY NEIGHBORHOOD COUNCIL	ATTN JANET VAN DYKE	5602 GHARRETT ST	MISSOULA	MT	59803	5602 GHARRETT ST

Legal Ad (run 12/2 and 12/9

PUBLIC NOTICE

The Missoula City Council will conduct a public hearing on the following item on Monday, December 17, 2018, at 7:00 p.m., in the Missoula City Council Chambers located at 140 W. Pine Street in Missoula, Montana:

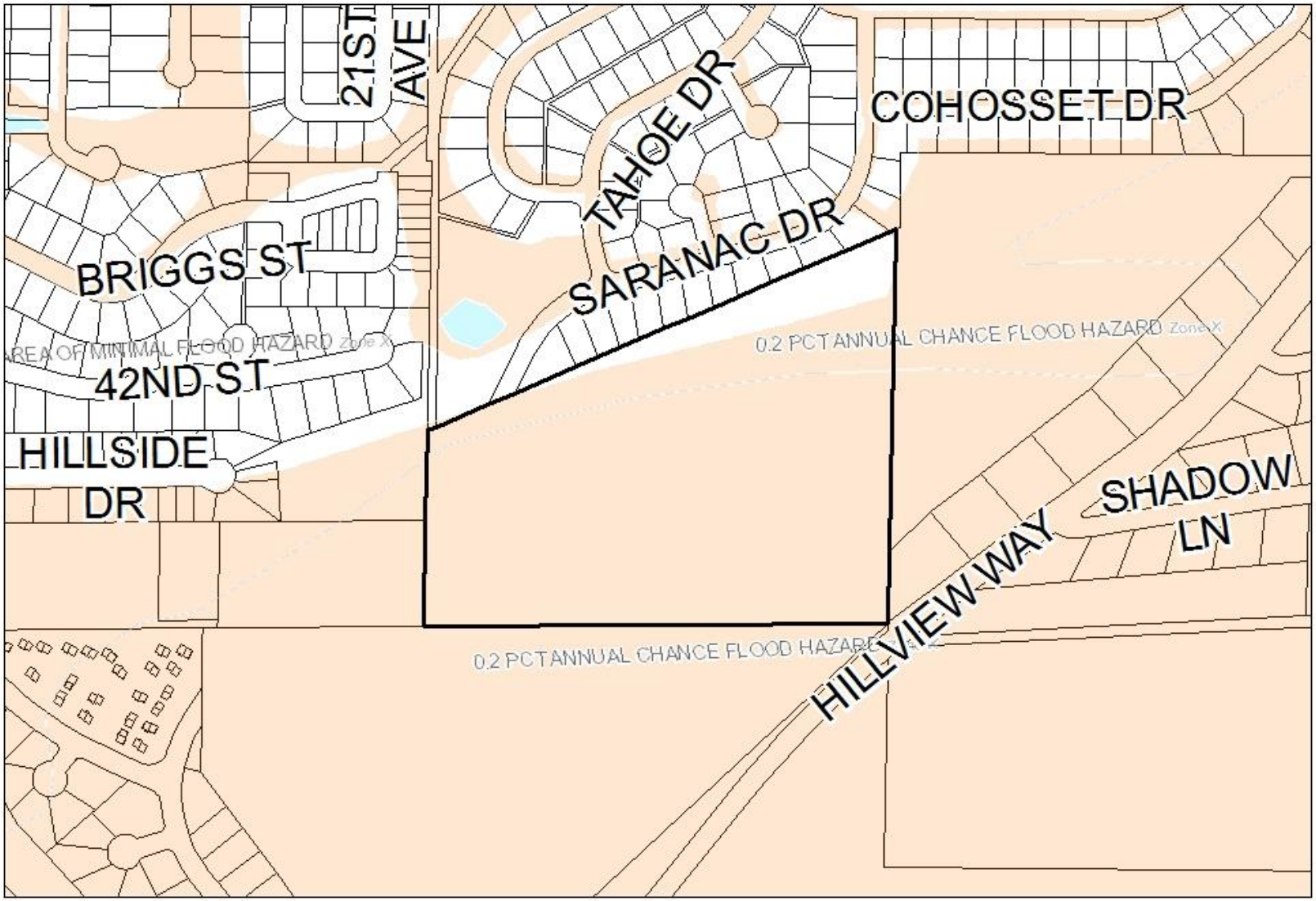


Hillview Crossing Townhome Exemption Development (10+ units) Conditional Use Request
Request from Territorial Landworks Inc., on behalf of Hillview Crossing, LLC, the owner of a 25.6 acre parcel west of Hillview Way and south of Saranac Drive (see Map) for conditional use approval for construction of a townhome exemption development of 68 units (in 34 duplex/two-unit buildings)

Your attendance and comments are welcomed and encouraged. The application can be viewed online at **www.ci.missoula.mt.us/PrivateProjects** or at Development Services office, 435 Ryman Street.

If anyone attending any of these meetings needs special assistance, please provide 48 hours advance notice by calling 552-6630. The Development Services office will provide auxiliary aids and services.

Exhibit #6



This map was created by the City of Missoula Development Services

1 in = 373 ft

N

Floodplain Map
Hillview Crossing TED Conditional Use

Exhibit #7

FWP.MT.GOV

THE **OUTSIDE** IS IN US ALL.

Region 2 Headquarters
3201 Spurgin Road
Missoula, MT 59804
Phone 406-542-5500
December 13, 2018

Anita McNamara
City of Missoula Development Services
435 Ryman
Missoula, MT 59802
< McNamaraA@ci.missoula.mt.us>

Reference: Hillview Crossing---Proposed townhouse exemption development (34 two-unit townhouses on 25.63 acres; T12N R19W Sec 6 SE4 of NE4; Geocode 04-2093-06-1-01-01-0000), South Hills area of Missoula

Dear Ms. McNamara,

Montana Fish, Wildlife & Parks (FWP) has reviewed the application materials for the proposed Hillview Crossing townhouse exemption development (TED), and we offer the following comments.

The proposed TED is within the city limits, but in the fringe of the built-out area of South Hills. It is on an open hillside and within ¼ mile of Moose Can Gully and its associated semi-riparian and forested draws leading uphill to forested areas of Mount Dean Stone. There are many deer in the Moose Can draw, and as a result this could bring mountain lions into the area. It is imperative that there be no salting or feeding for deer, as this could further concentrate deer, leading to disease in deer as well as increased lion activity. Other wildlife such as coyote, fox, skunk, racoon and birds would also be expected to occur on site.

The proposed TED is within the City of Missoula's bear buffer zone, and there is a lot of black bear activity in this vicinity of Moose Can Gully, where they feed on natural feed sources (berries and other vegetation, deer fawns). Bears can then wander into the adjoining neighborhoods, drawn in by fruit trees, bird feeders and garbage. FWP has responded to several complaints of black bear activity in the South Hills neighborhoods over the years. Bear (and mountain lion) conflicts can result in property damage, risk to human (and their pets') safety, and mortality of bears. There is also resulting high expenditure of FWP staff time and money (travel, supplies, equipment) for each response needed to address bear or lion issues.

There is high likelihood of human/wildlife conflict at this location, so FWP recommends strict sanitation and attractant management in this area of the urban wildlife interface. Therefore, FWP recommends that a "living with wildlife" section be required in the Development Covenants for this TED, in order to help residents deal with and avoid wildlife problems. Attached is our recommended version of such covenants for this location.

Thank you for providing the opportunity for FWP to comment on this proposal.

Sincerely,

Randy Arnold
Regional Supervisor

RA/sr

C: Mary McCrae, Development Services, City of Missoula; <McCreaM@ci.missoula.mt.us>

Recommended Development Covenant for Hillview Crossing Townhouse Exemption Development, recommended by Montana Fish, Wildlife & Park; Missoula; December 13, 2018

Section __: Living with Wildlife

Homeowners and residents must accept the responsibility of living with wildlife and must be responsible for protecting their vegetation from damage, confining their pets, and properly storing garbage, pet food, and other potential attractants. Homeowners must be aware of potential problems associated with the presence of wildlife such as deer, black bear, mountain lion, coyote, fox, skunk and raccoon. Please contact the Montana Fish, Wildlife & Parks office in Missoula (3201 Spurgin Road, Missoula, MT 59804) for information that can help homeowners "live with wildlife." Alternatively, see FWP's web site at http://fwp.mt.gov.

The following covenants are designed to help minimize problems that homeowners could have with wildlife, as well as helping homeowners protect themselves, their property and the wildlife that Montanans value.

a. There is high potential for **vegetation damage by wildlife, particularly from deer** feeding on green lawns, gardens, flowers, ornamental shrubs and trees in this subdivision. Homeowners should be prepared to take the responsibility to plant non-palatable vegetation or protect their vegetation (fencing, netting, repellents) in order to avoid problems.

b. **Landscaping** comprised of native vegetation is less likely to suffer extensive feeding damage by deer than non-native plants. Native flowering plants will benefit pollinating insects, and native shrubs and trees produce favorable food sources and nesting sites for a variety of bird species. Landscape plants can often spread beyond the original planting site, so using native plants also avoids problems with non-native plants spreading in nearby open areas.

c. **Gardens and fruit trees** can attract wildlife such as deer and bears. Keep produce and fruit picked and off the ground, because ripe and rotting vegetable material can attract bears and skunks. To help keep wildlife such as deer out of gardens, fences should be 8 feet or taller. Netting over gardens can help deter birds from eating berries.

d. This townhouse development is in the City of Missoula's **Bear Buffer Zone** (Municipal Code (Chapter 8.28.085, Special provisions for the accumulation and storage of garbage within the Bear Buffer Zone), which has regulations related to garbage handling in this area. Store all **garbage** in a bear-resistant container, bear-resistant enclosure, or enclosed building to avoid attracting wildlife such as bears or raccoons. If your garbage containers are not bear-resistant, you must keep them inside a bear-resistant enclosure or enclosed building. These containers may only be outside the enclosure between 5:00 a.m. and 9:00 p.m. on the day of waste pickup.

e. **Do not feed wildlife** or offer supplements (including salt blocks), attractants, or bait for deer or other wildlife, including during the winter. Feeding wildlife results in unnatural concentrations of animals that could lead to overuse of vegetation and disease transmission. Such actions unnecessarily accustom wild animals to humans, which can be dangerous for both. It is against state law (§ 87-3-130, MCA) to purposely or knowingly attract any ungulates (deer, elk, etc.), bears, or mountain lions with supplemental food attractants (any food, garbage, or other attractant for game animals) or to provide supplemental feed attractants in a manner that results in "an artificial concentration of game animals that may potentially contribute to the transmission of disease or that constitutes a threat to public safety." Also, homeowners must be aware that deer can attract mountain lions to an area.

f. **Pets** must be confined to the house, in a fenced yard, or in an outdoor kennel area when not under the immediate control of the owner, and not be allowed to roam as they can chase and/or kill big game and small birds and mammals. Under current state law it is illegal for a dog to

chase, stalk, pursue, attack, or kill a hooved game animal, and the owner may be held personally responsible (§ 87-6-404, MCA). Keeping pets confined also helps protect them from predatory wildlife.

g. **Pet food** must be stored indoors, in closed sheds or in animal-resistant containers in order to avoid attracting wildlife such bears, mountain lions, skunks, and raccoons. **When feeding pets** do not leave food out overnight. Consider feeding pets indoors so that wild animals do not learn to associate food with your home.

h. **Bird feeders** attract bears and should not be used from March to December 1. If used, bird feeders should: a) be suspended a minimum of 20-feet above ground level, b) be at least 4 feet from any support poles or points, and c) should be designed with a catch plate located below the feeder and fixed such that it collects the seed knocked off the feeder by feeding birds.

i. **Barbecue grills** should be stored indoors. Keep all portions of the barbecues clean, because food spills and smells on/near the grill can attract bears and other wildlife. (Due to the potential hazard of fire and explosion, propane cylinders for gas-fueled grills should be disconnected and kept outdoors. Under no circumstances should propane cylinders be stored indoors.)

j. **Compost piles** can attract skunks and bears. If used, they should be kept in wildlife-resistant containers or structures. Compost piles should be limited to grass, leaves, and garden clippings, and piles should be turned regularly. Do not add food scraps. Adding lime can reduce smells and help decomposition. (Due to the potential fire hazard associated with decomposition of organic materials, compost piles should be kept at least 10 feet from structures.)

k. Consider **boundary fencing** that is no higher than 3-1/2 feet (at the top rail or wire) and no lower than 18 inches (at the bottom rail or wire) in order to facilitate wildlife movement and help avoid animals such as deer becoming entangled in the wire or injuring themselves when trying to jump the fence. (Contact FWP or see its website for information or a brochure regarding building fence with wildlife in mind.)

MISSOULA
DEVELOPMENT SERVICES
435 RYMAN • MISSOULA, MT 59802 - 4297 • (406) 552-6630 • FAX: (406) 552-6053

MEMO No. 2

TO: City Council

DATE: March 6, 2019

FROM: Mary McCrea, Development Services

RE: Hillview Crossing TED Conditional Use – Summary of LUP Discussion on January 16 & 23, 2019 and February 27, 2019.

The Land Use and Planning (LUP) committee of City Council has discussed the Hillview Crossing TED Conditional Use on January 16 & 23, and February 27, 2019 following the public hearing for this project on December 17, 2018 and the pre-public hearing discussion at LUP on December 12, 2018. The following is a summary of discussions on Hillview Crossing TED at Land Use and Planning Committee on January 16, 23 and February 27, 2019:

A. On January 16, 2019 there was discussion at LUP regarding:
   1. Road-related issues including City Fire comments related to concerns for provision of emergency services for the private cul-de-sac road designs if parking restrictions of one side on Road B & northern Road A & no parking on southern Road A were not enforced by the HoA and if snow removal is not completed properly; and
   2. Maintenance costs-Agencies have concerns related to maintenance costs. City Storm Water Utility is concerned with the potential of having to take over maintenance of the storm water facilities if the HoA goes defunct. Streets has concerns that if the HoA does not enforce plowing or other maintenance items of the streets that the streets do not meet city standards and city equipment is designed for maintenance of sub-standard roads.

B. On January 23, 2019 there was discussion at LUP regarding:
   1. Continuation of discussion on road related issues and whether the Missoula Police Department could enforce parking and snow removal on a private street within a public access easement. City Police and City Attorney's office responded that City Police can not enforce "No Parking" restrictions and snow removal on private streets.
   2. City Engineering does not approve of the roads dedicated as right-of-way because they are dead end cul-de-sacs and the roads would be difficult to maintain using standard City equipment such as snow plows because the roads are narrow.
   3. An option Council could consider is a new condition of approval requiring all the roads be built wide enough to allow parking on both sides which would eliminate the need for the No Parking Restrictions. Title 12, Section 12.22.140 requires a minimum 35 feet back of curb to back of curb with parking on both sides.
   4. Jason Rice provided some estimates on maintenance costs for the roads, parks, storm water facilities etc. Council discussed the need for a consultant to prepare a detailed estimate of regular maintenance fees and replacement costs for the HOA. Council also discussed whether a condition of approval is warranted to require creation of an SID to provide a backstop in the event the HOA did not provide adequate maintenance of the facilities.

5. Human Resource Council comments related to connectivity. City Attorney stated that there was no way for City Council to require the Hillview Crossing development to provide access through their site to the adjacent site owned by the Human Resource Council. City Council requested the Judge's decision on the prior lawsuit be uploaded to SIRE and that has been done.
6. Public comment concerning construction staging in Wapikiya Park. Extension of the sewer main to serve the subject property will go through Wapikiya Park. The applicant stated that staging of construction equipment in the park would occur only for the sewer main extension and only until the sewer extension work is completed. All other construction staging would occur from Hillview Way access to the subject property.
7. Comment concerning that the trail to 39th Street would be impacted by construction to extend the Sewer Main. Neil Minor explained the process and permits required for work within a trail easement or a park. Once the construction work for the sewer is complete, the applicant will be required to restore the trail easement area and park to conditions prior to construction.
8. Traffic Impacts to Hillview Way from the Hillview Crossing development. Troy Monroe Assistant City Engineer stated that Hillview Way currently has 5,000 vehicles per day and the road was built to handle 10,000 vehicles per day. From an engineering standpoint, there are no concerns with people exiting the site onto Hillview Way and turn lanes are not warranted. The intersection of Road A with Hillview Way meets engineering design standards for vertical curve and site distance per AASHTO.
9. Project's participation in the Hillview Way SID. Yes the Hillview Crossing property directly benefits from the roadway improvement and is within the SID assessment area. The assessments for future development are outlined in item G of the Memo dated December 12, 2018. The assessments are payable per unit at time of building permit issuance.
10. Agency comment related to Wildlife. Council discussed comment from Randy Arnold, Regional Supervisor for Region 2 of Fish, Wildlife and Parks and his recommendation that the Hillview Crossing TED Development Covenants include a Living With Wildlife section as provided by Mr. Arnold. This is found in item N of the Memo dated December 12, 2018. Staff recommends a new condition of approval #24 requiring the inclusion of the Living With Wildlife section and amendment of condition of approval #23 to include the Living With Wildlife section as one of the covenants that require written approval by the City Council in order to be amended or deleted.
11. Public comment related to Wildlife included concerns regarding the long stretch of buildings blocks movement of wildlife from Miller Creek to the valley floor. Fencing both at the boundary of the site and if all unit parcels are fenced will force deer into the roadways. Council expressed a desire that the developer pursue the use of wildlife friendly fencing.
12. Concerns regarding cut and fill, manufactured slopes, location and height of retaining walls, and the need for a geotechnical report for both building sites and roads. The applicant stated they had provided a Geotechnical Report from 2015, however it was not included in the conditional use submittal packet.
13. The applicant provided the 2015 Geotechnical Report which was uploaded to SIRE. The applicant provided an email to City Engineering with comment and their position regarding why they feel the report is adequate which has also been uploaded to SIRE. The Memo dated December 12, 2018 included a recommendation from the City Engineer that a condition of approval be added to require a Geotechnical Report for roads, infrastructure, and home locations, including any excavation or embankment

locations. See #5, under Item I in the Memo. Council discussed the need for an updated Geotechnical Report before making a decision on the conditional use request.

C. On February 27, 2019 there was discussion at LUP regarding:

1. Mary McCrea presented a Summary of Discussion to date. The applicant provided additional information regarding the Geotech report, fencing on TED unit parcels, and storm water. The following items discussed on December 12, 2018, December 17, 2018, January 16, 2019 & January 23, 2019 have yet to be resolved:

   a. Road issues regarding enforcement of No Parking restrictions and snow removal by HOA on private roads that if not enforced could impede emergency vehicle access. An option Council could consider is a new condition of approval requiring all the roads be built wide enough to allow parking on both sides which would eliminate the need for the No Parking Restrictions. Title 12, Section 12.22.140 requires a minimum 35 feet back of curb to back of curb with parking on both sides.

   b. If HOA does not adequately fund reserve for replacement and regular maintenance of the roads, parks, storm water facilities etc. facilities may fall into disrepair and impact public health and safety.

      i. An option would be to add a condition of approval that requires the developer to hire a consultant to prepare a detailed estimate of regular maintenance fees and replacement costs for the roads, parks, storm water facilities etc. and provide that information in the Development Covenants and to each buyer.

      ii. Council also discussed whether a condition of approval is warranted to require creation of an SID to provide a backstop in the event the HOA did not provide adequate maintenance of the facilities.

   c. Concerns regarding impacts to wildlife were expressed by the public and staff received comments from Fish, Wildlife and Parks. Public was concerned about wildlife movement from Miller Creek to the valley floor obstructed by the wall of buildings and fencing. The applicant presented some diagrams with fencing at the rear of structures, however there are no rules in place that would limit fencing to what the applicant presented.

      i. An option would be to add a condition of approval to require the Living with Wildlife covenants be included in the Development Covenants as recommended by Fish, Wildlife and Parks.

      ii. Additionally a condition of approval could be added allowing only wildlife friendly fencing at the perimeter of the subject property; and prohibiting fencing for unit ownership parcels except at the rear of units that does not enclose the space between duplex structures.

2. Council discussed concerns regarding whether the Geotechnical Report from 2015 needs to be updated related to the following:

   a. The recommendations in the report are only valid until December 3, 2020. Construction of project will not be complete by that date. Option is to add a condition of approval requiring a new geotechnical report for the site grading for roads, utilities, home construction locations and retaining walls.

   b. Troy Monroe, Assistant City Engineer has reviewed the 2015 *Updated Geotechnical Evaluation Report, Mass Grading, Utilities and Roadways, Hillview Crossing – Missoula* and provided the following comments.

i. The report was specific to the proposed 2015 TED layout and would need to be updated for the proposed TED. There is enough similarity between layouts that generalizations for the geotechnical aspects can be made.

ii. The report is for the overall site grading. It can not be used to determine specific home requirements but does give an overall evaluation of the proposed home sites.

iii. The report recommends 2.5 horizontal to 1 vertical slopes maximum; 3:1 slopes recommended - with the uphill portion of the entry road only allowed to be 2:1 slopes.
City Engineering has not seen any exhibit which shows maximum design slopes.

iv. The report requires that all fill be placed on a horizontal plane. This requires that the existing ground be stair-stepped with eight feet (8') minimum horizontal steps. This method of embankment eliminates any weak plane soils that may be at the surface.

Speaking with the Geotechnical Engineer who wrote the report – this stair-step is a general requirement for MDT embankments. He stated that major earth moving construction firms will know how to do this type of embankment but cautioned that smaller excavation firms may not have done this before.

v. The report uses customary loadings for streets and homes and does include utilities that normally reside in the ROW.

vi. The report <u>does not</u> evaluate any storm water detention/retention basin. As noted in the storm water report the development will be required to hold 17,393 cubic feet of storm water.

1). City Engineering has not seen any proposal from the developer as to how they plan to retain the required storm water.

2). A storm water basin built up at the base or dug into the hillside would affect the stability of the hillside and should be evaluated.

vii. There were no retaining walls in the 2015 TED layout so retaining walls and their associated point loads were not included in the geotechnical evaluation.

viii. Factors of Safety range from 1.4 to 1.5 for static conditions (1.4 is the recommended minimum) and 1.1 to 1.4 for seismic conditions (1.1 is the minimum).

1). A Factor of Safety can be described as 100,000 pounds force acting on the hill and if there is 140,000 pounds force counteracting, this would be a FOS of 1.4.

ix. The geotechnical report was written from a mass-grading standpoint. Meaning that all excavation and embankment would be performed at once. The Geotechnical Engineer would have concern if the excavation and embankment were made into smaller projects and performed at different time intervals.

x. The overall conclusion from the report is that the 2015 TED layout and geotechnical construction requirements would allow the building of the project and would meet minimum safety factors. The changes between the 2015 TED application and the 2018 TED application, including both retaining walls and an unknown storm water storage facility, would require a new geotechnical evaluation.

xi. City Engineering does not have enough information to determine if the retaining walls and storm water facility would significantly reduce the factors of safety or not.

c. City Council has not resolved whether the 2015 Geotechnical Report, with an expiration date in December of 2020, is adequate for City Council to determine that the Hillview Crossing TED conditional use will not have a significant adverse impact on the general welfare of the perspective homeowner's of the TED ownership units and the residents below the Hillview Crossing TED.

d. Additionally City Council has requested a condition of approval requiring a Geotech report for each building site at the time of building permit review for each two-unit townhouse structure.

Referring to the email from Councilman DiBari on topics for discussion, under those listed for January 16th the Transit Agency Comment has not been discussed. Under topics for January 23rd and subsequent meetings, Council started the discussion on the Geotechnical related issues but did not finish that topic. None of the other topics listed for January 23rd have been covered.

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MEMO No. 3

TO: City Council

DATE: March 11, 2019

FROM: Mary McCrea, Development Services

RE: Hillview Crossing TED Conditional Use – Road A – North & Road B Widths

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The Land Use and Planning (LUP) committee of City Council has discussed the Hillview Crossing TED Conditional Use on January 16 & 23, February 27, and March 6, 2019 following the public hearing for this project on December 17, 2018 and the pre-public hearing discussion at LUP on December 12, 2018. City Council members discussed concerns related to emergency vehicle access on the private cul-de-sac road designs if parking restrictions were not enforced by the Homeowner's Association consistently and if snow removal is not completed properly.

One option for City Council consideration is to revise the design of the private cul-de-sac roads to be 35-foot back-of-curb to back-of-curb, which per Title 12, Section 12.22.140.C.1(a) is a local residential street with parking on both sides. Condition of approval #11 from the staff report addresses the construction of Road A – North and Road B adjacent to where the dwelling units are located. Possible revision to the condition #11 is shown below in underline/strikethrough for City Council's consideration.

Condition of approval #12 addresses the construction of Road A – South which is the 21-foot wide road that intersects with Hillview Way. No revisions are proposed for condition of approval #12 because there are no dwellings fronting Road A - South. Condition of approval #13 addresses the No Parking restrictions and has been revised below to remove the No Parking restrictions from Road A – North and Road B for City Council's consideration.

A. If City Council would like to eliminate the requirement for the Homeowner's Association to enforce the "No Parking" restriction on Road A – North and Road B the following is a revised condition of approval #11 and #13, with related findings of fact for Council's consideration:

Revised conditions of approval:

11. The applicant shall prepare plans and install road improvements for the northern segment of Road "A" (Road A – North) and Road "B" resulting in a ~~28-foot~~ 35-foot wide back-of-curb to back-of-curb road section within a ~~52-foot~~ 59-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and 5-foot wide curbside sidewalk on each side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

12. The applicant shall prepare plans and install road improvements for the southern segment of Road "A" resulting in a 21-foot wide back-of-curb to back-of-curb road section within a 40-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and a 5-foot wide curbside sidewalk on one side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included

in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

13. The Development Covenants shall include a statement that parking is prohibited on ~~one side of the northern segment of Road "A" and Road "B" and~~ both sides of the southern segment of Road "A" subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration. The road improvement plans ~~for Road "A" and Road "B"~~ shall include provisions for restricting parking ~~on one side of the northern segment of Road "A" and Road "B" and~~ on both sides of the southern segment of Road "A" in the form of painting the curb yellow and installation of No parking signage, subject to review and approval of the City Engineer, prior to zoning compliance approval of the townhome exemption declaration.

Findings of Fact for revisions to conditions of approval #11 & #13:

1. Title 20, Review Criteria for conditional uses, Section 20.85.070.H.2b states that uses that require conditional use approval may be approved by the City Council when they determine that the proposed use is in the interest of public convenience and will not have a significant adverse impact on the general welfare of the neighborhood or community.
2. In determining whether all applicable review criteria have been satisfied, the City Council may specifically consider the factors listed under Title 20, Section 20.85.070.I. Section 20.85.070.I.4 requires that the overall project will be functional, attractive and safe in terms of pedestrian, bicycle and vehicular access, parking, loading and servicing. Section 20.85.070.I.5 lists the factor of agency and public testimony.
3. On December 12, 2018 at the Land Use and Planning committee meeting City Council asked the question of who is responsible to enforce the "No Parking" prohibitions on one or both sides of the private roads and snow removal on the private roads within the Hillview Crossing TED to ensure emergency personnel have access.
4. In the first staff Memo dated December 14, 2018, staff responded that the Homeowner's Association for the TED development would be responsible for snow removal and enforcing the "No Parking" restrictions on the private roads within Hillview Crossing TED.
5. City Engineering does not approve of the roads dedicated as right-of-way because they are dead end cul-de-sacs. Public Works, Street Maintenance staff stated that the roads would be difficult to maintain using standard City equipment such as snow plows because the roads are narrow.
6. The applicant's representative testified that the City Police Department could enforce the "No Parking" restrictions.
7. City Police Department and City Attorney's office responded that City Police officers can not enforce the "No Parking" restrictions and snow removal on private roads.
8. City Fire Marshal, Dax Fraser commented that Road A – South proposed at a 21 foot width needs to be signed prohibiting parking on both sides of the road and Road A – North and Road B proposed at a 28 foot width needs to be signed prohibiting parking on one side of the road.
9. Dax Fraser also stated that concerns about emergency traffic on these streets holds merit. Emergency traffic on narrow roads with slope is slow with optimal conditions, but has the potential to inhibit arrival on the scene in an emergency situation if the restrictions for parking on one or both sides of the road are not followed or enforced or if snow removal does not occur.
10. Public testimony received expressed concern regarding the requirement for a Homeowner's Association to be responsible for enforcing the "No Parking" restrictions and for snow removal, especially if the Homeowner's Association did not remain active over time or if Homeowner's did not pay their dues to cover road maintenance and snow removal.
11. Title 12, Section 12.22.140.C.1(a) requires a 35-foot wide back-of-curb to back-of-curb road for a local residential street with parking on both sides. The need for the Homeowner's Association to enforce the "No Parking" restrictions on Road A – North and Road B is eliminated with the amendment to condition of approval #11 & #13 because a 35-foot (boc to boc) road width provides parking on both sides of these roads.

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MEMO No. 4

TO: City Council

DATE: March 11, 2019

FROM: Mary McCrea, Development Services

RE: Hillview Crossing TED Conditional Use – Geotech Report & Storm Water Plan

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The Land Use and Planning (LUP) committee of City Council has discussed the Hillview Crossing TED Conditional Use on January 16 & 23, February 27, and March 6, 2019 following the public hearing for this project on December 17, 2018 and the pre-public hearing discussion at LUP on December 12, 2018.

City Council members discussed concerns regarding cut and fill, manufactured slopes, location and height of retaining walls, stockpiling of topsoil, location of storm water retention facilities and the need for a geotechnical report for both building sites and roads. City Council discussed whether the 2015 Geotech Report is adequate for City Council review.

2015 Geotech Report – City Engineering Review
Referring to the Hillview Crossing - Summary of LUP.022719 document, the following summarizes comments provided by Troy Monroe, Assistant City Engineer, regarding his review of the 2015 Geotech Report:

1. The 2015 Report is only valid until December 3, 2020.
2. The 2015 Report would need to be updated for the proposed TED layout, however there is enough similarity between the layouts that generalizations between the geotechnical aspects can be made.
3. The 2015 report is for the overall site grading. It can not be used to determine specific home requirements but does give an overall evaluation of the proposed home sites.
4. The current TED layout includes retaining wall locations and the 2015 Report would need to be updated to evaluate the associated point loads of the retaining walls and their point loads.
5. The applicant has not provided an exhibit that shows the maximum design slopes, therefore City Engineering can not confirm the design meets the 2015 report recommendations of maximum vertical slopes following grading.
6. The 2015 report was written from a mass-grading standpoint. Meaning that all excavation and embankment would be performed at once. The Geotechnical Engineer would have concern if the excavation and embankment were made into smaller projects and performed at different time intervals.
7. The 2015 report requires that all fill be placed on a horizontal plane which requires the existing ground be stair-stepped. This method of embankment eliminates any weak plane soils that may be at the surface, however requires a major earth moving construction firm, familiar with this type of embankment, to perform the work.
8. The 2015 report does not evaluate any storm water detention/retention basin or storage facilities. City Engineering has not seen any proposal from the developer regarding the plan to retain the required 17,393 cubic feet of storm water. A storm water basin built up at the base or dug into the hillside would affect the stability of the hillside and should be evaluated.

9. City Engineering does not have enough information to determine if the retaining walls and storm water facility would significantly reduce the factors of safety or not.

City Engineering Recommendations
City Engineering recommends an updated Geotechnical Report be provided for roads, infrastructure, utility locations, storm water facility locations, retaining wall locations, pedestrian pathway locations, including any excavation or embankment locations, construction staging of topsoil and erosion control measures during construction.

The updated report should be valid for a minimum of 5 years and include:

- an evaluation of existing conditions,
- recommendations for excavation and embankment,
- requirements for construction and oversight, and
- requirements for the submission of as-built and testing results to the City Engineer.

Options:

A. Option A: The updated Geotechnical Report for the mass grading and a Grading and Drainage Plan shall be provided for City Engineering review prior to City Council decision on the Hillview Crossing TED conditional use.

The updated Geotechnical Report shall include mass site grading for roads, pedestrian walkways, and infrastructure such as utilities, sewer, water and storm water facilities, retaining wall locations, locations for storm water detention/retention, locations for construction staging of topsoil, erosion control measures during construction, and including any excavation or embankment locations.

Option A also includes adoption of conditions of approval #25 and #26 as shown below. Staff recommends approval of condition of approval #25 below in order to ensure that the findings of fact at the time of conditional use approval remain valid, and all the infrastructure is installed within the five year timeframe of the updated Geotechnical Report.

City Engineering also recommends a Geotech Report for each building site be approved at the time of building permit review for each two-unit townhouse structure. See condition of approval #26 below.

25. The townhome exemption declaration for the Hillview Crossing TED shall be submitted in one zoning compliance permit application and shall include all sixty-eight (68) TED unit ownership parcels, all infrastructure, and meeting conditions of approval for the conditional use, subject to review and approval of Development Services, prior to approval of the zoning compliance permit of the townhome exemption declaration. All infrastructure shall be constructed within five years of approval of the Geotechnical report and an improvements agreement guaranteed by a security that covers the cost of all the roads, sidewalks, pedestrian pathways, storm water facilities, retaining walls and site grading is approved by City Engineering prior to zoning compliance permit approval of the townhome exemption declaration.

26. A Geotechnical Report is required for each two unit townhouse structure submitted with the building permit application, subject to review and approval by City Engineering, prior to building permit approval.

B. Option B includes adoption of conditions of approval #25, #26 and #27 as shown below. Staff recommends approval of condition of approval #25 below in order to ensure that the findings of fact at the time of conditional use approval remain valid, and all the infrastructure is installed within the five year timeframe of the updated Geotechnical Report.

City Engineering also recommends a Geotech Report for each building site be approved at the time of building permit review for each two-unit townhouse structure. See condition of approval #26 below.

The Geotech Report is updated prior to approval of the zoning compliance permit for the townhome exemption declaration per condition of approval #27 below:

25. The townhome exemption declaration for the Hillview Crossing TED shall be submitted in one zoning compliance permit application and shall include all sixty-eight (68) TED unit ownership parcels, all infrastructure, and meeting conditions of approval for the conditional use, subject to review and approval of Development Services, prior to approval of the zoning compliance permit of the townhome exemption declaration. All infrastructure shall be constructed within five years of approval of the Geotechnical report and an improvements agreement guaranteed by a security that covers the cost of all the roads, sidewalks, pedestrian pathways, storm water facilities, retaining walls and site grading is approved by City Engineering prior to zoning compliance permit approval of the townhome exemption declaration.
26. A Geotechnical Report is required for each two unit townhouse structure submitted with the building permit application, subject to review and approval by City Engineering, prior to building permit approval.
27. The applicant shall provide a Grading and Drainage Plan and an updated Geotechnical Report for mass site grading for roads, pedestrian walkways, and infrastructure such as utilities, sewer, water and storm water facilities, retaining wall locations, locations for storm water detention/retention, locations for construction staging of topsoil, erosion control measures during construction, and including any excavation or embankment locations, subject to review and approval by City Engineering, prior to zoning compliance approval of the townhome exemption declaration. The scope of the Geotechnical Report shall include an evaluation of existing conditions, recommendations for excavation and embankment, requirements for construction and oversight and requirements for submission of as-built and testing results to the City Engineer. The Geotechnical report shall be part of the design submittal for roads and infrastructure and be valid for five (5) years from the date the report was approved by City Engineering.

Storm Water Plan – City Engineering Review

City Engineering reviewed the preliminary Storm Water Plan provided in the applicant's submittal packet for the Hillview Crossing TED conditional use application. Troy Monroe, Assistant City Engineer noted in an email to the applicant's representative that Section 5.2B and Section 5.2C related to storm water calculations need to be revised in the Storm Water Plan.

The preliminary Storm Water Plan specifies that the development will be required to hold 17,393 cubic feet of storm water. The preliminary plan did not include a proposal from the developer regarding how they plan to retain the required storm water nor locations for required storm water detention/retention basins or facilities.

The locations of any storm water detention/retention basin or facilities built up at the base of the hillside or dug into the hillside would affect the stability of the hillside and should be evaluated in the recommended update to the Geotechnical Report.

Options:

A. Option A: The Final Storm Water Plan with locations of all Storm Water detention/retention basins or facilities shall be provided for City Engineering review prior to City Council decision on the Hillview Crossing conditional use.

The applicant shall revise the Storm Water Plan to address both Section 5.2B and Section 5.2C related to storm water calculations as specified in the email message from the Assistant City Engineer dated October 9, 2018. The final storm water plan shall specify long-term maintenance requirements for the storm water facilities.

The Geotechnical Engineer shall review and approve all locations of storm water detention/retention basins and facilities for conformance with the recommendations in the updated Geotechnical Report.

Condition of approval #2 and #3 shall be revised as follows:

2. ~~The applicant shall revise the Storm Water Plan to address both Section 5.2B and Section 5.2C related to storm water calculations as specified in the email message from the City Assistant City Engineer dated October 9, 2018, prior to zoning compliance approval of the townhome exemption declaration. The~~ Construction plans for the final Storm Water Plan ~~for construction~~ shall be reviewed and approved by City Engineering and the Geotechnical Engineer prior to zoning compliance approval of the townhome exemption declaration. Storm water facilities shall be installed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to review and approval of the City Engineer.

3. ~~The final storm water plan shall specify long-term maintenance requirements for the storm water facilities.~~ The applicant shall specify in the Development Covenants the long-term maintenance requirements for the storm water facilities and that the maintenance of the storm water facilities shall be the responsibility of the Developer, transferring to the Homeowners' Association once formed and shall include all maintenance and replacement costs as outlined in the final storm water plan, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.

B. Option B: The Final Storm Water Plan for construction with locations of all Storm Water detention/retention basins or facilities shall be provided to City Engineering and the Geotechnical Engineer for review and approval prior to approval of the zoning compliance permit for the townhome exemption declaration per amended condition of approval #2 and condition of approval #3 from the staff report as show below:

2. The applicant shall revise the Storm Water Plan to address both Section 5.2B and Section 5.2C related to storm water calculations as specified in the email message from the ~~City~~ Assistant City Engineer dated October 9, 2018, prior to zoning compliance approval of the townhome exemption declaration. The Geotechnical Engineer shall review and approve all locations of storm water detention/retention basins and facilities for conformance with the recommendations in the updated Geotechnical Report. The final Storm Water Plan for construction shall be reviewed and approved by City Engineering and the Geotechnical Engineer prior to zoning compliance approval of the townhome exemption declaration. Storm water facilities shall be installed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to review and approval of the City Engineer.

3. The final storm water plan shall specify long-term maintenance requirements for the storm water facilities. The applicant shall specify in the Development Covenants that the maintenance of the storm water facilities shall be the responsibility of the Developer, transferring to the Homeowners' Association once formed and shall include all maintenance and replacement costs as outlined in the final storm water plan, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.

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MEMO No. 5

TO: City Council

DATE: March 18, 2019

FROM: Mary McCrea, Development Services

RE: Hillview Crossing TED Conditional Use – Block Length & Pedestrian Pathways

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The Land Use and Planning (LUP) committee of City Council has discussed the Hillview Crossing TED Conditional Use on January 16 & 23, February 27, and March 6 & 13, 2019 following the public hearing for this project on December 17, 2018 and the pre-public hearing discussion at LUP on December 12, 2018. City Council members discussed compliance with Title 20, Section 20.40.180.F Blocks and pedestrian pathways to provide shorter access to school bus and transit stops, schools and community facilities.

Regulatory Basis for Review:
Title 20, Section 20.40.180.F Blocks requires:
Blocks shall be designed to assure traffic safety and ease of pedestrian and automobile circulation. Blocks shall not exceed 480 feet in length and be wide enough to allow two tiers of dwelling units in a Townhome Exemption Development unless topography or other constraining circumstances are present. Pedestrian access easements that create a break within a block may be required where there is a need for pedestrian access to school bus or transit stops, schools, shopping, parks, common areas or open space and community facilities.

All of the roads greatly exceed the 480 foot maximum block length.

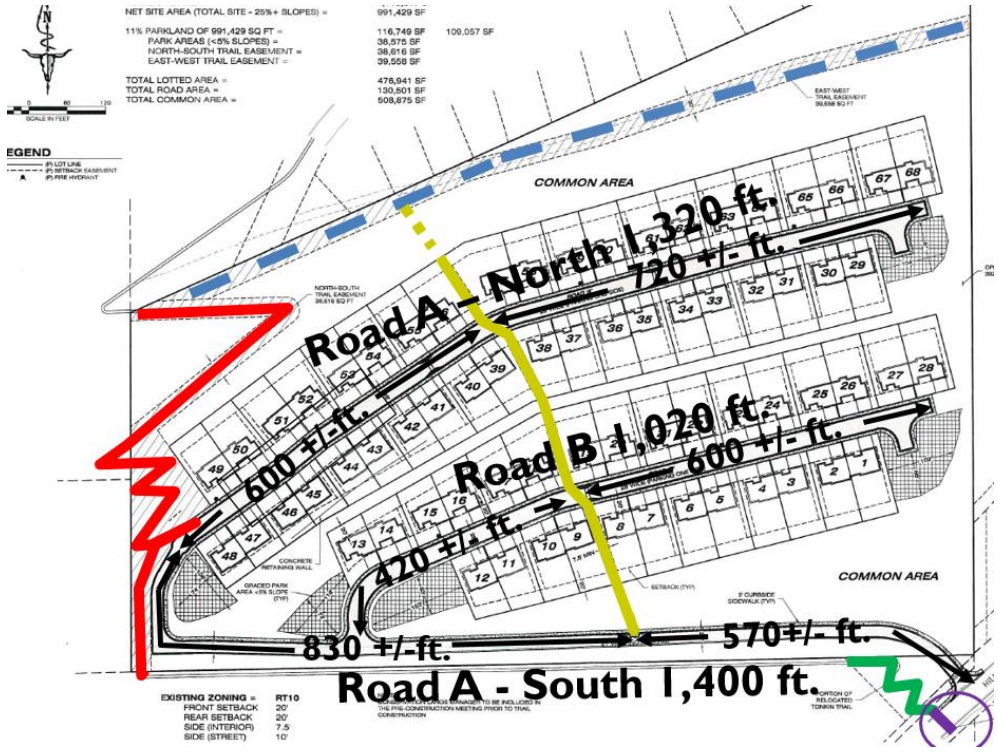
- Road A – South is approximately 1,400 linear feet or +/- 0.26 miles
- Road A – North is approximately 1,320 linear feet or +/- 0.25 miles
- Road B is approximately 1,020 linear feet or +/- 0.19 miles

In addition Title 20, Review Criteria for conditional uses, Section 20.85.070.H.2e states that uses that require conditional use approval may be approved by the City Council when they determine that the proposed use will not have a significant adverse impact on traffic safety or comfort, including all modes of transportation (non-motorized and motorized).

In determining whether all applicable review criteria have been satisfied, the City Council may specifically consider the factors listed under Title 20, Section 20.85.070.I. Section 20.85.070.I.4 requires that the overall project will be functional, attractive and safe in terms of pedestrian, bicycle and vehicular access, parking, loading and servicing. Section 20.85.070.I.5 lists the factor of agency and public testimony.

Options for City Council Consideration:

A. Condition of approval #9 in the staff report provides a mid-block paved pedestrian pathway/stairs from the northernmost road to the southernmost road. Condition of approval #9 mitigates impact of the extremely long block lengths by providing a mid-block pedestrian pathway, and mitigates impacts on traffic safety and comfort for pedestrians by providing a safe pathway that shortens the route to Hillview Way.



Condition of approval #9:

9. The applicant shall dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road "A" through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road "B" then continuing between unit ownership parcel number 18 and 19, crossing the common area and extending between unit ownership parcels 38 and 39, crossing the northern segment of Road "A" then continuing between unit ownership parcel number 56 and 57. An easement for future trail improvements shall be dedicated from northern parcel boundaries of unit ownership parcel numbers 56 & 57 northward through the common area and connecting to the east-west trail easement near the northern property line of the TED. Plans for the pedestrian pathway/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

Findings of Fact in the Staff Report:

25. Per Title 20 Section 20.40.180.F, blocks may not be longer than 480 feet. Pedestrian access easements that create a break within a block may be required where there is a need for pedestrian access to school bus or transit stops, schools, shopping, parks, common areas or open space, and community facilities. The applicant shows mid-block pedestrian crossings on the northern segment of Road "A" and on Road "B." This provides a pedestrian crossing of each cul-de-sac road but does not mitigate block length by providing a pedestrian connection mid-block between the northern segment of Road "A" and Road "B" and between Road "B" and the southern segment of Road "A."

26. A pedestrian walking from the eastern end of the northern segment of Road "A" travels roughly a half mile to reach Hillview Way. Condition of approval #9 will help mitigate the longer distances by creating a more direct pedestrian connection between the northern segment of Road "A" with the southern segment of Road "A" greatly shortening the distance to the planned Hillview Way pedestrian crossing and bringing the TED into compliance with the maximum block length standards.

27. City Parks provided comment that walkability is important within this development to promote health and wellness and that it is essential that residents, including children walking to school, can access the sidewalk and trail system within a reasonable distance from each unit and between blocks and connect to routes to services and to the Hillview Way sidewalk.

28. The Missoula Urban Transportation District provided comment that with the current proposed layout of the site, with cul-de-sacs with lengths up to a half mile, the layout would require a pedestrian to walk between 0.9 and 1.2 miles to reach the closest bus stop. A walking path through the center or along the eastern area of the development would shorten the walking distance to Hillview Way, which would reduce the distance to the closest bus stop by 12 to 20%. As the Future Long-Term Network in the MUTD Strategic Plan plans for bus service on Hillview Way, this development has an opportunity to be designed and built to support public transit.

62. Title 20, Section 20.85.070.H.2 outlines criteria for the review of conditional uses, which include whether the proposed uses are: compliant with all applicable Title 20 zoning standards; compatible with the character of the surrounding area; in the interest of public convenience; will not have a significant adverse impact on the general welfare of the neighborhood or community; compatible operating characteristics in terms of hours of operation, noise, outdoor lighting and traffic generation; and will not have a significant adverse impact on traffic safety or comfort – both motorized and non-motorized.

74. The TED layout includes long cul-de-sacs with a pedestrian travelling roughly a half mile from the eastern end of Road "A" to the intersection with Hillivew Way. In order to meet the minimum block length standard of 480 feet and provide safe and efficient pedestrian routes to schools and transit, a mid–block pedestrian pathway/stairs is required.

75. A condition of approval requires that the applicant dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road "A" through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road "B" then continuing between unit ownership parcel number 18 and 19, crossing the common area, then continuing between unit ownership parcels 38 and 39, crossing the northern segment of Road "A" then continuing between unit ownership parcel number 56 and 57.

<u>Additional Findings of Fact from Memo #1 dated December 14, 2018 under Item "E":</u>

1. Road "A" south is approximately 1,400 linear feet (over one-quarter mile). Road "A" north is approximately 1,320 linear feet (one-quarter mile). Road "B" is approximately 1,020 linear feet (one-fifth mile).

2. Without the pathway/stairs required in Condition of approval #9, a pedestrian starting out from the eastern end of the northern segment of Road "A" has to walk approximately one half mile to reach Hillview Way.

3. Without the pathway/stairs required in Condition of approval #9, a pedestrian starting from the eastern end of Road "B" has to walk approximately just under one half mile to get to Hillview Way.

4. An elementary school student walking to Russell School would need to walk from their home on either the northern segment of Road "A" or from Road "B" toward the intersection with the southern segment of Road "A" and then to Hillview Way, up to approximately one-half mile. From the intersection of Road A with Hillview Way it is another mile to Russell Elementary School.

5. A middle school student walking to school could take the proposed north-south trail toward Wapikya Park and walk westward on the Meadow Hill trail to school, however this is a natural trail and not accessible in winter.

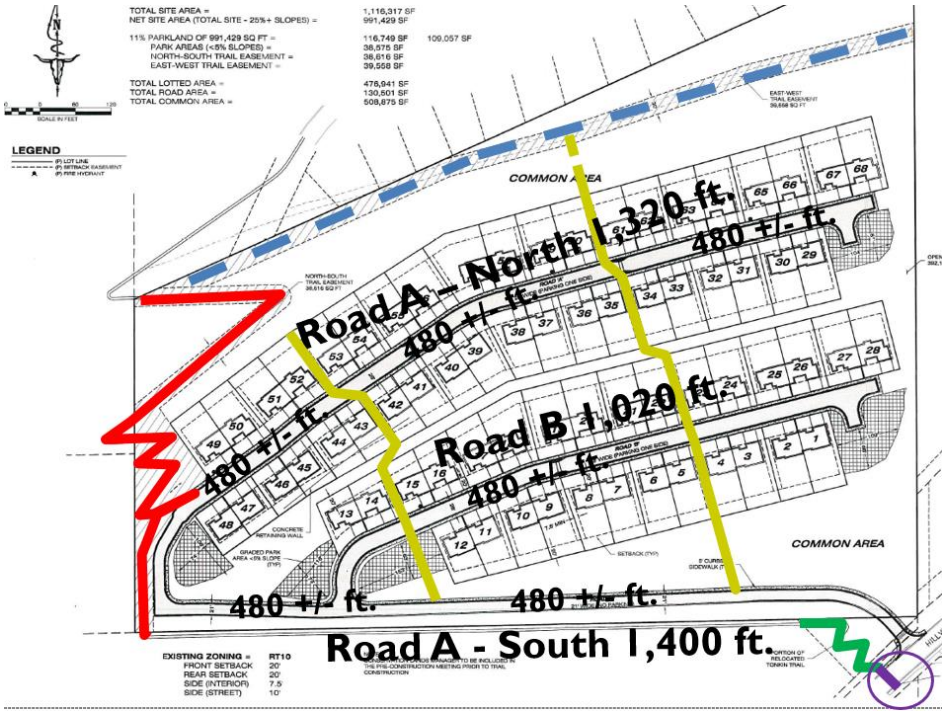
6. The 2018 Mountain Line Strategic Plan identifies extending Route 6 to run on Hillview Way that will get students to Sentinel high school.

<u>Additional Findings of Fact:</u>

7. A pedestrian starting from Unit 68 at the eastern end of Road A – North using the pathway/stairs per condition of approval #9 walks approximately 1,800 linear feet (0.34 mile) to Hillview Way. The pedestrian pathway/stairs shortens the route by approximately 920 linear feet (0.17 mile).

8. In determining whether all applicable review criteria have been satisfied, the City Council may specifically consider the factors listed under Title 20, Section 20.85.070.I. Section 20.85.070.I.4 requires that the overall project will be functional, attractive and safe in terms of pedestrian, bicycle and vehicular access, parking, loading and servicing. Section 20.85.070.I.5 lists the factor of agency and public testimony.

B. Another option is to require the installation of two pedestrian pathway/stairs from the northernmost road to the southernmost road in order to mitigate block length and provide pedestrian pathway connections of roads approximately 480 feet apart. This option mitigates block length and mitigates impacts on traffic safety and comfort for pedestrians by providing safe pathways at intervals that shorten the route to Hillview Way.



Replace Condition of approval #9 with the following:

9. The applicant shall amend the site plan to dedicate two (2) 20-foot wide minimum pedestrian easements and construct a paved pedestrian pathway/stairs from southern segment of Road "A" through to Road "B", crossing Road "B" then continuing through to the northern segment of Road "A", crossing the northern segment of Road "A" then continuing between TED ownership units to the common area north of the northern segment of Road "A" in the locations shown on Exhibit A (see above), such that the pedestrian pathway/stairs are approximtely 480 feet apart. An easement for future trail improvements shall be dedicated from northern TED ownership unit boundary of the easternmost pedestrian pathway/stairs northward through the common area and connecting to the east-west trail easement near the northern property line of the TED. Plans for the pedestrian pathways/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

Findings of Fact for amended condition of approval #9:

1. Per Title 20 Section 20.40.180.F, blocks may not be longer than 480 feet. Pedestrian access easements that create a break within a block may be required where there is a need for pedestrian access to school bus or transit stops, schools, shopping, parks, common areas or open space, and community facilities. The applicant shows mid-block pedestrian crossings on the northern segment of Road "A" and on Road "B." This provides a pedestrian crossing of each cul-de-sac road but does not mitigate block length by providing a pedestrian connection mid-block

between the northern segment of Road “A” and Road “B” and between Road “B” and the southern segment of Road “A.”

2. Road “A” south is approximately 1,400 linear feet (over one-quarter mile). Road “A” north is approximately 1,320 linear feet (one-quarter mile). Road “B” is approximately 1,020 linear feet (one-fifth mile).
3. Without the pathway/stairs required in amended condition of approval #9, a pedestrian starting out from the eastern end of the northern segment of Road “A” has to walk approximately one half mile to reach Hillview Way.
4. Without the pathway/stairs required in amended condition of approval #9, a pedestrian starting from the eastern end of Road “B” has to walk approximately just under one half mile to get to Hillview Way.
5. An elementary school student walking to Russell School would need to walk from their home on either the northern segment of Road “A” or from Road “B” toward the intersection with the southern segment of Road “A” and then to Hillview Way, up to approximately one-half mile. From the intersection of Road A with Hillview Way it is another mile to Russell Elementary School.
6. A middle school student walking to school could take the proposed north-south trail toward Wapikya Park and walk westward on the Meadow Hill trail to school, however this is a natural trail that is not shoveled in winter.
7. The 2018 Mountain Line Strategic Plan identifies extending Route 6 to run on Hillview Way that will get students to Sentinel high school.
8. A pedestrian starting from Unit 68 at the eastern end of Road A – North using the easternmost pathway/stairs per amended condition of approval #9 walks approximately 1,380 linear feet (0.26 mile) to Hillview Way. The pedestrian pathway/stairs shortens the route by approximately 1,380 linear feet (0.25 mile).
9. A pedestrian starting from Unit 53 on Road A – North using the westernmost pathway/stairs per amended condition of approval #9 walks approximately 1,280 linear feet (0.24 mile) to Hillview Way. The pedestrian pathway/stairs shortens the route by approximately 490 linear feet (0.09 mile).
10. Condition of approval #9 (as amended) will help mitigate the longer distances by creating two pedestrian pathways/stairs between the northern segment of Road “A” with the southern segment of Road “A” greatly shortening the distance to the planned Hillview Way pedestrian crossing and bringing the TED into compliance with the maximum block length standards.
11. City Parks provided comment that walkability is important within this development to promote health and wellness and that it is essential that residents, including children walking to school, can access the sidewalk and trail system within a reasonable distance from each unit and between blocks and connect to routes to services and to the Hillview Way sidewalk.
12. The Missoula Urban Transportation District provided comment that with the current proposed layout of the site, with cul-de-sacs with lengths up to a half mile, the layout would require a pedestrian to walk between 0.9 and 1.2 miles to reach the closest bus stop. A walking path through the center or along the eastern area of the development would shorten the walking distance to Hillview Way, which would reduce the distance to the closest bus stop by 12 to 20%. As the Future Long-Term Network in the MUTD Strategic Plan plans for bus service on Hillview Way, this development has an opportunity to be designed and built to support public transit.
13. Title 20, Section 20.85.070.H.2 outlines criteria for the review of conditional uses, which include whether the proposed uses are: compliant with all applicable Title 20 zoning standards; compatible with the character of the surrounding area; in the interest of public convenience; will not have a significant adverse impact on the general welfare of the neighborhood or community; compatible operating characteristics in terms of hours of operation, noise, outdoor lighting and traffic generation; and will not have a significant adverse impact on traffic safety or comfort – both motorized and non-motorized.
14. In determining whether all applicable review criteria have been satisfied, the City Council may specifically consider the factors listed under Title 20, Section 20.85.070.I. Section 20.85.070.I.4

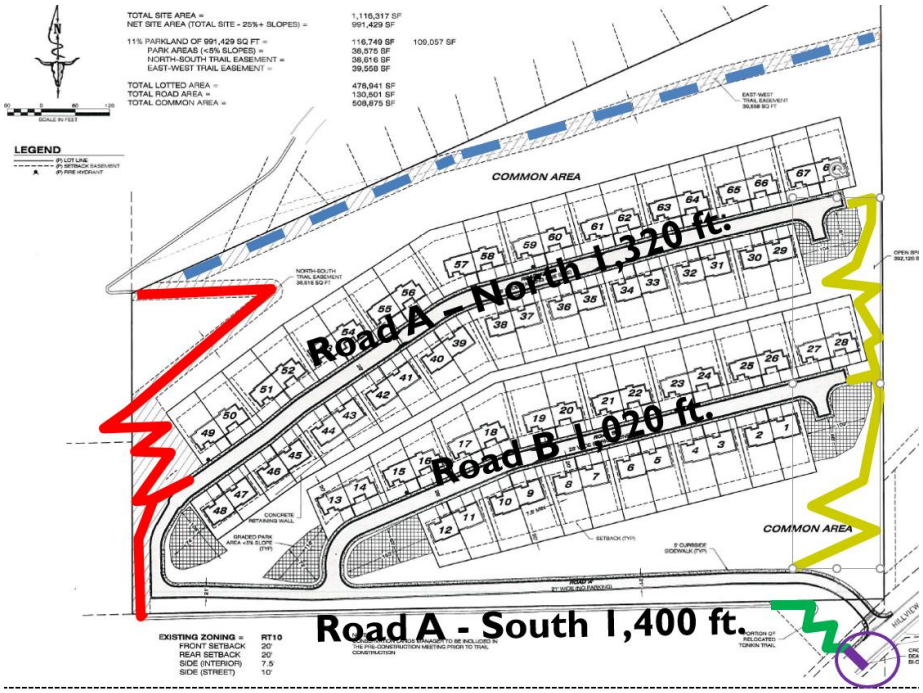
requires that the overall project will be functional, attractive and safe in terms of pedestrian, bicycle and vehicular access, parking, loading and servicing. Section 20.85.070.I.5 lists the factor of agency and public testimony.

15. The TED layout includes long cul-de-sacs with a pedestrian travelling roughly a half mile from the eastern end of Road “A” to the intersection with Hillview Way. In order to meet the minimum block length standard of 480 feet and provide safe and efficient pedestrian routes to schools and transit, the two (2) pedestrian pathway/stairs connecting all the roads at intervals of approximately 480 feet is required.

16. Amended condition of approval #9 requires that the applicant dedicate minimum 20-foot wide easements in two locations as shown in Exhibit A and construct paved pedestrian pathway/stairs within the easements from northern segment of Road “A” to Road “B”, crossing Road “B” and continuing to continuing the southern segment of Road “A”.

C. The applicant’s representative presented the option of a trail linking the eastern end of Road A – North to eastern end of Road B continuing to connect to Road A – South in lieu of the pedestrian pathway/stairs required in condition of approval #9. This option would not mitigate block length, however could provide an additional recreational trail connection between the roads in the subdivision.

More information is required to determine whether, after mass site grading, all sections of the trail could meet City Park’s standards for a recreational dirt trail at a slope comparable to the westernmost trail.



<u>Replace Condition of approval #9 with the following:</u>

9. The applicant shall amend the site plan to dedicate a 20-foot wide minimum pedestrian easement and construct a recreational trail from the fire turnaround at the eastern end of the northern segment of Road “A” through to the fire turnaround at the eastern end of the Road “B”, then continuing through to the southern segment of Road “A”. The trail shall be designed to meet City Park’s standards for a recreational trail, including width, surface, maximum slope and drainage. Dedication of the easement and plans for the recreational trail shall be reviewed and approved by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

Findings of Fact for amended condition of approval #9:

1. Title 20, Section 20.85.070.H.2 outlines criteria for the review of conditional uses, which include whether the proposed uses are: compliant with all applicable Title 20 zoning standards; compatible with the character of the surrounding area; in the interest of public convenience; will not have a significant adverse impact on the general welfare of the neighborhood or community; compatible operating characteristics in terms of hours of operation, noise, outdoor lighting and traffic generation; and will not have a significant adverse impact on traffic safety or comfort – both motorized and non-motorized.
2. In determining whether all applicable review criteria have been satisfied, the City Council may specifically consider the factors listed under Title 20, Section 20.85.070.I. Section 20.85.070.I.4 requires that the overall project will be functional, attractive and safe in terms of pedestrian, bicycle and vehicular access, parking, loading and servicing. Section 20.85.070.I.5 lists the factor of agency and public testimony.
3. Road "A" south is approximately 1,400 linear feet (over one-quarter mile). Road "A" north is approximately 1,320 linear feet (one-quarter mile). Road "B" is approximately 1,020 linear feet (one-fifth mile).
4. A pedestrian starting from Unit 68 at the eastern end of Road A – North using the easternmost recreational trail per amended condition of approval #9 walks approximately 1,345 linear feet (0.25 mile) to Hillview Way. The recreational trail shortens the route by approximately 1,375 linear feet (0.26 mile).
5. A pedestrian starting from Unit 57 on Road A – North, using the sidewalk along the road, walks approximately 2,050 linear feet (0.39 mile) to Hillview Way. A pedestrian starting from Unit 57 on Road A – North, using the sidewalk on the road to the recreational trail at the eastern end of the road per amended condition of approval #9 walks approximately 2,005 linear feet (0.38 mile) to Hillview Way. The eastern recreational trail only shortens the route to Hillview Way by approximately 45 linear feet for Unit 57 located near the mid-point of Road A – North.
6. The TED layout includes long cul-de-sacs with a pedestrian travelling roughly a half mile from the eastern end of Road "A" to the intersection with Hillview Way. In order to provide safe and efficient pedestrian routes to schools and transit, a recreational trail connecting the eastern ends of Road A – north and Road B to Road A – South is required in order to limit adverse impact on traffic safety and comfort for non-motorized transportation.

TERRITORIAL LANDWORKS, INC.

June 22, 2018

Missoula Development Services
ATTN: Anita McNamara
435 Ryman St
Missoula, MT 59802-4297

RE: Hillview Crossing Townhomes – Conditional Use Permit Application
A portion of the SE1/4, NE1/4 of Section 06, Township 12 North, and Range 19 West, Missoula County, MT

Dear Anita:

Hillview Crossing Missoula, LLC is requesting a conditional use permit for the above referenced property to allow the development of 34 two-unit townhomes for a total of 68 units. The property is currently designated as RT10 zoning in the city. It is also included in the City of Missoula Growth Policy and future land use designation map amended February 13, 2017 as residential Medium Density – 3 to 11 units per acre. According to the City of Missoula zoning ordinance 3570, amending Section 20.05.040, titled "Townhome Exemption Development," ten or more two-unit townhomes are a conditional use for property located in RT10.

Territorial-Landworks, Inc. (TLI) has been contracted by Hillview Crossing Missoula, LLC to apply for the conditional use permit and on May 29, 2018, TLI held a neighborhood meeting for the properties surrounding the project. TLI has endeavored to prepare a thorough application based on the requirements set forth in Title 20 of the Missoula Municipal Code City Zoning Ordinance. TLI's responses to the application questions are in **bold**.

Below is a list of the items that have been included in this submittal:

1. *Check #1054 in the amount of $2,121.28 for the Review Fee*
2. *City Conditional Use Application*
3. *Vicinity Map*
4. *Zoning Map*
5. *Aerial Photo*
6. *Comprehensive Plan Map*
7. *Neighborhood Meeting Minutes*
8. *Conditional Use Exhibit*
9. *Zoning Compliance – Parking Exhibit*
10. *Architect Renderings for Proposed Structures*

If you have any questions or require any additional materials, please feel free to contact me at (406) 721-0142 or ChristinaL@territoriallandworks.com.

Sincerely,
Territorial-Landworks, Inc.

Christina Loucks, Project Assistant

Enclosures: As noted in the text above.

C: File & Scan w/ Enclosures

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September 12, 2018

Missoula Development Services
ATTN: Anita McNamara & Mary McCrea
435 Ryman St
Missoula, MT 59802-4297

RE: Hillview Crossing Townhomes – Conditional Use Permit Application Revised Resubmittal
A portion of the SE1/4, NE1/4 of Section 06, Township 12 North, and Range 19 West, Missoula County, MT

Dear Anita:

Please consider the following responses an amendment to the letter and exhibits submitted to your office on September 4th. We believe with this response that we have adequately addressed the comments you provided to us in your email on August 15th. If there are any items that need to be further addressed or any additional items required before the application is deemed sufficient, please provide us with detailed information. Our client has asked that we respectfully request a response to this letter by next Wednesday, September 19th. Below is a list of the items that have been included with this submittal.

1. *Preliminary Grading and Drainage Engineering Design Report*
2. *Email and Attachments to Parks & Engineering regarding our Sight Triangle Analysis for the new approach off Hillview*
3. *Hillview Way Intersection Detail Exhibit*
4. *Revised Conditional Use Exhibit*
5. *Revised Parking and Pedestrian Circulation Exhibit*
6. *Utility Layout Exhibit*

Your comments addressed in the letter below are provided in ***bold italics*** with our response in traditional font.

Items for Sufficiency

2. ***Please prepare a stormwater drainage and management plan and include it in your submittal. This plan shall address the following: If desiring to connect to existing stormwater infrastructure on adjacent properties, the developer shall confirm the existing system has sufficient capacity and access and appropriate easements can be obtained.***
   We cannot deem the application packet sufficient without it.
   A preliminary Grading and Drainage Engineering Design Report is included with this submittal. Given the guidance we received from City Engineering, we have adequately addressed the 100-year storm event. The park should not see any additional flow rate than what exists today with proper mitigation. Flows are limited to predevelopment conditions.

3. ***Please show the crosswalk location on Hillview Way, including striping, and location of flashing light for safety. Engineering has concerns of the location of the crosswalk with regard to visibility by motorists.***
   The proposed location of the crosswalk on Hillview Way has been shown on the attached exhibits, and in detail on the Hillview Way Intersection Detail exhibit. Our proposed crosswalk would be on the south side of the approach and would facilitate a path to the existing sidewalk on the east side of Hillview. Attached is also an email that has been provided to Parks and City Engineering noting the site triangle analysis for the new approach off Hillview to help alleviate any concerns regarding visibility by motorists.

5. ***Parks has the following comments related to the trail easements and stormwater and sewer easements in Wapikiya Park:***
   - ***At the DRT, proposed stormwater and sewer utilities were shown crossing Wapikiya Park in the existing 20' easement. Because this is City park land, utilities in this location would need to go before the City Park Board, which may be a lengthy process.***
     While it was not clear to us initially that this is a comment to be addressed before sufficiency, it has now been brought to our attention that you are requiring that this item be addressed. The attached utility layout shows the utilities crossing Wapikiya Park from the property within the 20' right-of-way on the west side of the park. We also understand that the contractor will need to get a vehicle access permit for the park prior to beginning work on the utilities within the right-of-way.
   - ***Otherwise, the "North-South Trail Easement" represents what has discussed in the past, except for the trail needs to connect to the Tonkin Trail to the south, and not just the sidewalk. Based on our conversations, the developer is required to construct the 36" minimum to 48" maximum trail to make the easement 'useable'. (A typical mini-excavator is between 39"-48". A narrower trail will be acceptable, but would require hand-work, which is likely more expensive). Please include our Conservation Lands manager (Morgan Villiant) in a preconstruction meeting prior to trail construction. The area is an intact native plant community, and he would like to ensure that the weeds are kept at bay and the cut/fill slopes are revegetated after the trail construction, prior to us accepting management/maintenance of the trail.***
     The attached exhibits have been revised to show that the North-South trail connects with the Tonkin Trail. A note has been added to the Conditional Use Exhibit to include the Conservation Lands Manager in the preconstruction meeting prior to trail construction to address the comment above.

If you have any questions or require any additional materials, please feel free to contact me at (406) 721-0142 or ChristinaL@territoriallandworks.com.

Sincerely,
Territorial-Landworks, Inc.

Christina Loucks, Project Assistant

Enclosures: As noted in the text above.
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September 4, 2018

Missoula Development Services
ATTN: Anita McNamara & Mary McCrea
435 Ryman St
Missoula, MT 59802-4297

RE: Hillview Crossing Townhomes – Conditional Use Permit Application Resubmittal
A portion of the SE1/4, NE1/4 of Section 06, Township 12 North, and Range 19 West, Missoula County, MT

Dear Anita:

We are in receipt of your email dated August 15, 2018 for the above-mentioned project. Please consider the following responses to each of your comments in the order presented in the email. Your comments are provided in ***bold italics*** with our response in traditional font.

Below is a list of the items that have been included with this submittal.

1. *Conditional Use Exhibit*
2. *Parking and Pedestrian Circulation Exhibit*
3. *Architect Conceptual Design Exhibits*

Items for Sufficiency

1. ***For the common areas, please provide a breakdown of the parkland, roads, open space, etc.***
   Attached are revised exhibits noting the common area breakdown. The breakdown has also been provided below:
   Open Space - 392,126 square feet
   Trail Easements - 78,174 square feet
   Park Areas - 38,575 square feet
   Total Common Area – 508,875 square feet
   Total Road Area – 130,501 square feet

2. ***Please prepare a stormwater drainage and management plan and include it in your submittal. This plan shall address the following: If desiring to connect to existing stormwater infrastructure on adjacent properties, the developer shall confirm the existing system has sufficient capacity and access and appropriate easements can be obtained.***
   We cannot deem the application packet sufficient without it.
   A stormwater drainage and management plan is in the process of being developed. We anticipate that this will be submitted by or around the end of this week.

3. ***Please show the crosswalk location on Hillview Way, including striping, and location of flashing light for safety. Engineering has concerns of the location of the crosswalk with regard to visibility by motorists.***
   The proposed location of the crosswalk on Hillview Way has been shown on the attached exhibits. We will continue to work with City Engineering to address any concerns regarding the location of the crosswalk and the request to add a flashing light.

4. ***Floor plans:***
   Downhill Plan
   <u>Main Level Building Plan</u>
   Legends don't match the floor plans/drawings, such as:
   1. ***Based on the legend, the Dining Room in the left-side unit is labeled as a half-bath (there are two "E"s).***
   2. ***In the right-side unit, there is a room labeled "W" that is off the master bath. There is no "W" on the legend.***
   3. ***Please have the plans and legend revised so that they match.***

   Attached are updated Floorplans addressing the above comments.

5. ***Parks has the following comments related to the trail easements and stormwater and sewer easements in Wapikiya Park:***
   - ***At the DRT, proposed stormwater and sewer utilities were shown crossing Wapikiya Park in the existing 20' easement. Because this is City park land, utilities in this location would need to go before the City Park Board, which may be a lengthy process.***
     Thank you for sending the comment from Parks. We understand that the City Park Board will need to approve utilities within the existing easement.
   - ***Otherwise, the "North-South Trail Easement" represents what has discussed in the past, except for the trail needs to connect to the Tonkin Trail to the south, and not just the sidewalk. Based on our conversations, the developer is required to construct the 36" minimum to 48" maximum trail to make the easement 'useable'. (A typical mini-excavator is between 39"-48". A narrower trail will be acceptable, but would require hand-work, which is likely more expensive). Please include our Conservation Lands manager (Morgan Villiant) in a preconstruction meeting prior to trail construction. The area is an intact native plant community, and he would like to ensure that the weeds are kept at bay and the cut/fill slopes are revegetated after the trail construction, prior to us accepting management/maintenance of the trail.***
     Thank you for sending the comment from Parks. The attached exhibits have been revised to show that the North-South trail connects with the Tonkin Trail. We have also noted to include Morgan Villiant in the preconstruction meeting prior to trail construction.

If you have any questions or require any additional materials, please feel free to contact me at (406) 721-0142 or ChristinaL@territoriallandworks.com.

Sincerely,
Territorial-Landworks, Inc.

Christina Loucks, Project Assistant

Enclosures: As noted in the text above.

C: File & Scan w/ Enclosures

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July 20, 2018

Missoula Development Services
ATTN: Anita McNamara & Mary McCrea
435 Ryman St
Missoula, MT 59802-4297

RE: Hillview Crossing Townhomes – Conditional Use Permit Application Resubmittal
A portion of the SE1/4, NE1/4 of Section 06, Township 12 North, and Range 19 West, Missoula County, MT

Dear Anita:

We are in receipt of your email dated July 5, 2018 for the above-mentioned project. Please consider the following responses to each of your comments in the order presented in the email. Your comments are provided in ***bold italics*** with our response in traditional font.

Below is a list of the items that have been included with this submittal.

1. *City Conditional Use Application*
2. *Vicinity Map*
3. *Zoning Map*
4. *Aerial Photo*
5. *Comprehensive Plan Map*
6. *Neighborhood Meeting Minutes*
7. *Conditional Use Exhibit*
8. *Parking and Pedestrian Circulation Exhibit*
9. *Slope Category Map*
10. *Architect Renderings for Proposed Structures*
11. *Architect Conceptual Design Exhibits*
12. *Retaining Wall Exhibit*
13. *Draft Covenants*

Important discussion items for the overall packet:

1. ***Please provide a discussion of how this project will meet the Hillside Standards of 20.50.010 and include a Net Density / Slope category map that shows areas of greater than 25% slopes as excluded from the density calculation.***
   A discussion of how this project will meet the Hillside Standards of 20.50.010 has been provided within the Conditional Use Application. A Slope Category Map has also been included in this submittal showing areas of greater than 25% as excluded from the density calculation.

2. ***Pay special attention to section C Hillside Development Site Analysis.***
   Thank you for your comment. We have reviewed Section C, Hillside Development Site Analysis, and noted that an analysis must be submitted before the zoning officer may approve a zoning compliance permit.

3. ***Please also provide an explanation of how Section E Minimum Pad Size and Maximum Buildable Slope (2,000 sf contiguous disturbance area) is met.***
   An explanation of how Section E is met has been included in the revised Conditional Use Application.

4. ***In one of the DRT project meetings, the architect mentioned that the design might use retaining walls. If retaining walls are to be used, Section G contains requirements for retaining walls that can be added to the packet.***
   Due to the existing slope on the property, a retaining wall has been proposed. The revised exhibits included in this submittal depict the proposed retaining wall and a retaining wall exhibit has also been included. The Conditional Use Application has been revised to include the requirements provided in Section G.

5. ***Please also address Section I Building Height Envelope and Section L Building Wall Elements.***
   The Conditional Use Application has been revised to address Section I and Section L requirements. In addition, a conceptual design exhibit has been provided to further address this comment.

Cover Letter:

1. ***Please provide a slope category map and add to the list of items included.***
   The slope category map has been noted as an item that has been included with this submittal.

Conditional Use Application:

1. ***Section B. Subject Property Information: Please provide a full legal description without abbreviations.***
   A full legal description without abbreviations has been provided in this submittal.

2. ***Section C. Zoning and Growth Policy Information, #4: Please add language that references that section 20.05.040.D.2.b, requires conditional use approval for 10 or more TED units in RT10.***
   Section C, #4 has been revised include the language noted above.

3. ***Section D. Responses to Title 20 Zoning Ordinance Conditional Use Review Criteria***
   - ***1.a. Please add discussion of slopes of greater than 25% and reference the slope category map. Also, discuss the common areas and who will maintain them.***
     Section D, #1a has been revised to include a discussion of slopes greater than 25%, to reference the slope category map, and to discuss the common areas and who will maintain them.

   - ***1.d. In the second paragraph, please reword the second sentence to refer to the Hillview Way Special Improvement District (SID).***
     The second sentence in the second paragraph of Section D, #1d has been revised to refer to the Hillview Way Special Improvement District (SID).

- ***2.d. Address the Section 20.40.180.F requirement for the maximum 480 block length and the topography of the site and how you propose to mitigate. Discuss bulb-outs and pedestrian circulation. Section F also provides that "Pedestrian access easements that create break within a block may be required where there is a need for pedestrian access to school bus or transit stops, schools, shopping, parks, common areas or open space, and community facilities." Please also provide a pedestrian circulation plan (see Exhibits heading below).***
  Section D, #2d has been revised to address the Section 20.40.180.F requirement. A pedestrian circulation plan has also been included in this submittal.

- ***Add more discussion on the Tonkin Trail connection and its importance for connecting this site and other to Hillview Way and other trails systems and pedestrian routes. Also, mention how the intersection of the Tonkin Trail and Hillview are designed to help kids get to school or school bus stop.***
  Additional discussion on the Tonkin Trail connection has been included in the Conditional Use Application submittal.

Exhibits:

1. ***Make sure the labels on each map exhibit are visible. On a couple of the maps, the yellow font is difficult to see.***
   The exhibits have been revised to ensure all labels on each map exhibit is visible.

2. ***We recommend that fewer renderings of the units be shown and be shown in a variety of colors (show label of each model or unit type) and show elevations of each model or unit type, such as "Model A front elevation" or "Model B rear elevation" etc. and add labels. The two renderings we recommend are attached. The other three submitted were too busy and would not show well in Power Point.***
   Thank you for the recommendation. The two recommended renderings of the units have been included with this submittal.

3. ***Site Plan:***
   - ***Provide a legend or explanation of the dashed lines (building envelopes?) and the solid lines (TED unit ownership parcel?)***
     A legend has been provided in the revised site plan that has been included with this submittal.

   - ***Park areas – will these be active areas with amenities or grassy/landscaped areas, etc.?***
     The Conditional Use application has been revised to note that these graded park areas will be landscaped.

   - ***Common area – what is the total acreage of the common areas?***
     The total acreage of the common areas has been shown on the revised site plan.

   - ***Please show the location of proposed fire hydrants. Fire Department will review.***
     The locations of the proposed fire hydrants have been shown on the revised site plan.

4. ***Provide a pedestrian circulation plan that demonstrates how residents will get to school bus stops, schools, transit stops, etc. as required in Section 20.40.180.F.***
   A pedestrian circulation plan has been included in this submittal.

5. ***Provide floor plans of each model with labels.***
   Floor plans have been included with this submittal.

6. ***Please provide a stormwater management plan as this is a point that is important to the neighborhood residents.***
   A stormwater management plan is being designed and our office is meeting with the City Engineering Department to discuss the plan. It will be designed to ensure that it does not overtop the 100 year flood elevation within the park below the development.

Other Issues (Providing these items in advance may result in fewer conditions and make the Zoning Compliance Permit review smoother):

1. ***Weed Management Plan***
   Thank you for your comment, a weed management plan has not been included in this submittal.

2. ***Revegetation Plan***
   Thank you for your comment, a revegetation plan has not been included in this submittal.

3. ***Draft Covenants (see attached sample – Kolendich Exhibit C Development Covenants)***
   Thank you for your comment, draft Development Covenants have been included with this submittal.

4. ***Consider adding a staired path crossing between Road A and Road B between units 18 & 19 and units 38 & 39.***
   Thank you for your comment, a stair path has not been included on the exhibits included with this submittal.

If you have any questions or require any additional materials, please feel free to contact me at (406) 721-0142 or ChristinaL@territoriallandworks.com.

Sincerely,
Territorial-Landworks, Inc.

Christina Loucks, Project Assistant

Enclosures: As noted in the text above.

C: File & Scan w/ Enclosures

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\4_PLANNING\CUP Application.2018-06-22\ltr.2018-07-20.Development Services.CUP App Resubmittal.docx

MISSOULA

DEVELOPMENT SERVICES

435 RYMAN • MISSOULA, MT 59802 - 4297 • (406) 552-6630 • FAX: (406) 552-6053

CITY CONDITIONAL USE APPLICATION

A. GENERAL INFORMATION

1. One submittal packet is required for Completeness/Sufficiency Review.

2. Once the application is deemed complete by Development Services (DS), 2 submittal packets and the appropriate fee shall be submitted.

3. Name of Conditional Use Request: **Hillview Crossing Townhomes**

4. Name(s) of Applicant: **Hillview Crossing Missoula, LLC**
   Mailing Address: **3605 Arthur Street, Caldwell, Idaho 83605**
   Telephone Number: **(406) 721-0142**
   Email Address: **Not applicable**

5. Name(s) of all Owners of Record: **Hillview Crossing Missoula, LLC**
   Mailing Address(es): **3605 Arthur Street, Caldwell, Idaho 83605**
   Telephone Number(s): **(406) 721-0142**
   Email Address(es): **Not applicable**

6. Name and Company of Representative: **Territorial-Landworks, Inc. c/o Christina Loucks**
   Mailing Address: **1817 South Ave W, Suite A, Missoula, MT 59801**
   Telephone Number: **(406) 721-0142**
   Email Address: **ChristinaL@territoriallandworks.com**

7. If the applicant is someone other than the property owner, the owner must also sign the application in the space provided below.

Certification: I hereby certify that the foregoing information contained or accompanied in this application is true and correct to the best of my knowledge.

DocuSigned by:

6/22/2018 8:32:18 AM PDT

Applicant's Signature — Date

DocuSigned by:

6/22/2018 8:32:18 AM PDT

Owner's Signature — Date

Christina M. Loucks — 6/22/2018

Representative's Signature — Date

B. SUBJECT PROPERTY INFORMATION

General location of subject property and address (if address has been assigned): **No address currently assigned**

Legal Description - complete and unabbreviated: **A strip, piece or parcel of land situated in Lot 4, Section 5 and the E½NE¼ of Section 6, Township 12 North, Range 19 West, Missoula county, Montana and more particularly described as follows: Beginning at the North section corner common to Section 5 and 6, Township 12 North, Range 19 West; thence East along the section line a distance of 1,320 feet; thence S.0°10'W. a distance of 1, 195.2 feet; thence S.89°53'30"W. a distance of 1,324 feet; thence S.0°22'W. a distance of 1,320 feet; thence S.89°53'30"W. a distance of 1,322.6 feet; thence N.0°25'E. a distance of 1,536.1 feet; thence N.33°34'E. a distance of 282.34 feet; thence N.64°04'E. a distance of 509.75 feet; thence N.12°27'W. a distance of 538.6 feet; thence East 828.9 feet to the place of beginning. EXCEPTING THEREFROM that portion platted as Wapikiya Addition #1, a platted subdivision in Missoula County, Montana, according to the official recorded plat thereof in Book 4 of Plats at Page 9½. ALSO EXCEPTING THEREFROM that portion platted as Wapikiya Addition #2, a platted subdivision in Missoula County, Montana, according to the official recorded plat thereof in Book 5 of Plats at Page 13. ALSO EXCEPTING THEREFROM that portion platted as Wapikiya Addition #3, a platted subdivision in Missoula County, Montana, according to the official recorded plat thereof in Book 6 of Plats at Pages 1 and 2, and amended Plat in Book 6 of Plats at Pages 7 and 8.**

Township, Range, Section(s): **T. 12N., R. 19 W., S. 6**

Subdivision, Lot(s), Block(s): **N/A**

Tract(s), COS#: **N/A**

Bearings & Distances Descriptions (if boundaries of proposed Conditional Use are not exactly the same as the boundaries of the property legally described above): **N/A**

Geocode: **04-2093-06-1-01-01-0000**

C. ZONING AND GROWTH POLICY INFORMATION

1. Complete the following table (where applicable, indicate Unzoned):

	Zoning	Current Land Use
Adjacent (North)	**R8**	**Residential & Community Park**
Adjacent (South)	**R40**	**Residential & Agricultural Land**
Adjacent (East)	**R8**	**Undeveloped Residential & Residential**
Adjacent (West)	**R40 & R40/PUD/Homesteads**	**Park & Vacant Land**

2. What is the current zoning of the property? **The current zoning of the property is RT10.**

3. What is the applicable comprehensive plan and land use designation for the property? **This property is included in the City of Missoula Growth Policy and future land use designation map amended February 13, 2017 as residential Medium Density – 3 to 11 units per acre. The proposed townhome exemption development would fit well into this land use designation as it would not be the most or the least dense development designed for the property.**

4. What is the conditional use requested? **The property is currently zoned with RT10 zoning. The City of Missoula Municipal Code Zoning Ordinance, Title 20 notes in section 20.05.040.D.2.b, that conditional use approval is required for 10 or more TED units within RT10 zoning. Therefore, the conditional use requested is for a Townhome Exemption Development (TED) which includes 34 two-unit townhomes for a total of 68 dwelling units. The total density of the requested development is just under 3 dwelling units per every one acre. This is less than the**

maximum density of RT10 zoning which would be approximately one dwelling unit per 10,000 square feet or approximately 4 dwelling units per acre.

D. RESPONSES TO TITLE 20 ZONING ORDINANCE CONDITIONAL USE REVIEW CRITERIA

1. **Review Criteria.** Describe how the proposal meets the following review criteria. (Not all review criteria will apply in every case. Only the applicable review criteria need to be met.)

   a. Whether the conditional use complies with all applicable standards of the zoning ordinance.
   The proposed property is in compliance with all applicable standards of the City of Missoula Municipal Code zoning ordinance, Title 20. The maximum number of dwelling units for the area using the proposed RT10 zoning is calculated as one per 10,000 square feet or approximately 4 dwelling units per acre. There are 68 proposed townhomes in the property area of 25.63 acres for a proposed density of just under 3 dwelling units per every one acre. This is less than the maximum density of dwelling units for the area per the proposed RT10 zoning as referenced in Table 20.05-3.

   As this property is also located on a hillside, item D, Allowed Density by Average Slope in Section 20.50.010 of Title 20 has also been used to further calculate the allowed density for the property. A Slope Category Map has been included with this submittal to reference the various slopes located on the property by categories. Areas on the property with slopes of greater than 25% have not been included in the calculation for the maximum density of dwelling units for the development. As shown on the Slope Category Map that has been included with this submittal, the allowed net density on the property using the calculations shown in item D referenced above is for a total of approximately 68.6 units. Due to the existing slope on the property, a two tiered retaining wall has been proposed in one area of the site. Item G, Retaining Walls in Section 20.50.010 of Title 20 has been utilized for the design of the wall to ensure that the proposed height does not exceed the maximum wall height and the proposed width meets the minimum required width. A retaining wall exhibit has been included in this submittal to depict the proposed wall. As stated in item G, the walls will be separated by at least three feet.

   Table 20.05-3 has been utilized to ensure that each proposed townhome will not exceed the maximum building height and will meet the setback requirements referenced for RT10 zoning. In addition, item I, Building Height Envelope in Section 20.50.010 of Title 20 has been referenced to ensure the townhomes meet the provided building height "envelope" measurements. Section L, Building Wall Elements has also been utilized to ensure that the building wall elements do not exceed the maximum building wall height. A conceptual design exhibit has been provided with this application to further depict that the townhomes meet these regulations. The surface infrastructure meets the standards in Title 12. A 5' wide sidewalk is proposed to run adjacent to the proposed road network and parking is proposed along one side of the proposed roads. The project will preserve the area by constructing a trail and landscaped park areas on the property for residents and the community to utilize. The area on the property that has not been proposed as townhome parcels will be common area, which will be an additional area for the residents to utilize. This area will be maintained by the Hillview Crossing Homeowner's Association. Easements have been proposed in several portions of this area for trail easements and road access easements.

   b. Whether the conditional use is in the interest of the public convenience and will not have a significant adverse impact on the general welfare of the neighborhood or community.
   The proposed project is in the interest of the public for convenience and will not have a significant adverse impact on the general welfare of the community and neighborhood.

The location of these proposed townhomes is in a primarily residential area. The proposed density is similar to the density of the surrounding neighborhoods. The project is in the interest of the public for convenience as easy and quick access to the commercial facilities located nearby will provide a benefit to families who live in these townhomes.

The proposed development is located within the Russell Elementary School, Meadow Hill Middle School, and Sentinel High School districts. Conveniently, there is an existing school bus stop at 39th Street & Arrowhead Drive for Russell Elementary School and the development is located within walking distance of the Middle and High Schools. There are existing Mountain Line bus stops within walking distance of the development in the interest of public convenience as well.

The proposed road network will provide access to the townhomes. One new access point has been proposed onto Hillview Way. A 5' wide sidewalk has been proposed for public convenience. This sidewalk system will encourage the families that live within this development to safely walk throughout the development in the interest of the general welfare of the community. A trail has been proposed on the west side of the property. This is in the interest of public convenience as the proposed development as well as the neighboring communities will have access to this trail. The proposed trail will connect the proposed development to the existing park located directly adjacent to the northwestern corner of the property. It also will connect the development to the neighborhood adjacent to the north side of the property so residents can easily and safely walk to nearby areas.

c. Whether the conditional use is compatible with the character of the surrounding area in terms of site planning, building scale, and project design.
The conditional use is compatible with the character of the surrounding area. The proposed townhomes will match the character of most of the properties that have been recently developed nearby. They will match the infrastructure requirements of the other residential developments surrounding the property. The project design is a similar site plan to the surrounding residential developments, creating townhomes that are comparable in size and distance. These townhomes will provide additional residential homes for this area while utilizing the existing sewer and proposed water services. The townhomes will be connected to the surrounding area by sidewalks and a trail, similar to the project design of other nearby developments.

d. Whether the conditional use has operating characteristics that are compatible with the surrounding area in terms of hours of operation, outdoor lighting, noise, and traffic generation.
The conditional use of this property has operating characteristics that are compatible with the surrounding area. The surrounding area is currently being utilized for residential homes and vacant lots. The proposed project will be consistent and compatible with this utilization by creating additional residential homes. All outdoor lighting will meet the Missoula Outdoor Lighting Ordinance and the lighting and noise will be similar to that of the residential properties surrounding the site. The townhomes are not expected to create a noticeable adverse impact.

The hours of operation will not be different from any other standard area of residence and any increased traffic generation will be sufficiently mitigated by utilizing the proposed road network. Hillview Way was recently upgraded and this project will help fund the upgrade via the pay back agreement with the Hillview Way Special Improvement District (SID). These townhomes will also be connected to the surrounding area by the trail which will connect to existing trails in the area. This will allow pedestrians to utilize the area and alleviate any additional vehicular traffic congestion that would be generated

from the townhomes. As the properties surrounding this proposed development are generally residential properties, adverse impacts to the operating characteristics are not expected by creating additional residential homes.

e. Whether the conditional use will not have a significant adverse impact on traffic safety or comfort, including all modes of transport (non-motorized and motorized).
The conditional use of this property is not proposed to have a significant adverse impact on comfort and is proposed to minimize any significant adverse impact on traffic safety in the surrounding area. One new road access point has been proposed onto Hillview Way for access to these townhomes. The proposed roads will tie into the roads in the area and will meet all city road requirements. TLI is committed to working with the City Engineering Department and Public Works Department to minimize the traffic impact to the area. Proposing 68 townhomes does increase the number of trips generated each day for the area. Until a time when additional roads are created, residents of Missoula that are familiar with the area will understand the existing traffic situation.

These townhomes are unique in that they are proposed with easy and quick access to commercial facilities nearby. A trail has been proposed to encourage non-motorized transportation options to safely enter and exit the property. This additional pedestrian option will minimize the motorized traffic impact to the area. A sidewalk has been proposed to run adjacent to the road network within the development. This will provide pedestrians with a route to safely walk in and through the townhome area. The proposed trail will also connect the development to the existing park located adjacent to the northwestern corner of the property. In addition, it will connect to the surrounding area to alleviate any adverse impact on the non-motorized traffic safety and comfort in this area.

2. **Factors to be Considered.**

Section 20.85.070(I) includes factors that City Council may consider in determining whether all applicable review criteria have been satisfied. These are listed below for reference.

a. That new buildings and structures are located to create a positive relationship with their environment, both urban and natural. **The proposed townhomes are located to create a positive relationship with the environment. These homes will benefit from a view overlooking the urban area nearby. They will also benefit from the proposed trail which will create a positive relationship with the natural areas located near the development. There are no natural features located on this property so the townhome locations have been proposed appropriately. The existing slope of the property has been considered and proper building techniques will be utilized to construct these townhomes. The townhome locations have been proposed to create a positive relationship with the other residential properties in the area while creating additional housing for residents of Missoula.**

The proposed trail will benefit residents of the townhomes by providing them a place for safe recreation. The trail will enhance the natural environment, offering further space for the community to be able to appreciate the beauty of living in Montana. Sidewalks have been proposed along the road network for future residents to safely walk from the trail throughout the development. The townhomes will also be located near commercial facilities, creating a positive relationship with the urban environment and giving families the opportunity to be located close to these facilities.

The City of Missoula Municipal Code Zoning Ordinance, Title 20 notes in Section E of the Hillside Standards of 20.50.010, that parcels must have at least a 2,000 square foot

contiguous building and disturbance area with an average slope of no more than 25%. A 2,000 square foot contiguous disturbance area will be achieved for each parcel of Hillview Crossing development by grading as a part of the grading and drainage plan for the property.

b. That the site design properly addresses building orientation, open space, light, sun exposure, views, and protection of natural features. **The design of the site properly addresses building orientation, open space, light, sun exposure, views, and the protection of natural features. The building orientation of the site will be similar to the residential homes surrounding the property. The design was created to maintain and centrally locate the open spaces on the property. As the property is located on the hillside, the residents will receive additional light due to the slope of the property. They will also have a beautiful view of Missoula and the surrounding hills.**

A trail has been proposed for additional preservation needs of the natural area and for residents to appreciate the beauty of this part of Missoula. Adequate light and sun exposure will be available to the townhomes on the lots as well as the surrounding area. A road network has been proposed to reduce any residential vehicle congestion and for future residents to access their homes. The proposed townhomes will be similar in height and distance to other townhome properties, while also preserving the optimal view for each building.

c. That buildings, structures, and uses are compatible with adjacent properties and uses in terms of physical design elements, such as volume and mass management, building materials, color, open space design, screening, and other design elements. **The proposed townhome buildings will be visually similar to other properties in the area. They will be utilized as residential homes, similar to the use of other residences in the area. They will not exceed the maximum density or building height for the existing zoning of RT10 and as noted in item D in section 20.50.010 of Title 20. The volume and mass of the buildings on the property will be appropriate to the area and comparable to other residential townhomes. A trail has been proposed on the property to provide future residents with an open space for recreation, similar to the design of the surrounding residential properties. A local Missoula Builder will be used for building the residences and the building materials used will be standard to most Missoula residential homes. The colors of the buildings will be traditional colors and will blend with the other homes in the area. They are not presumed to be overstated in any way. The design of this development has been created to provide sufficient open space for each townhome on the property.**

d. That the overall project will be functional, attractive, and safe in terms of pedestrian, bicycle, and vehicular access, parking, loading, and servicing. **The overall project will be functional, attractive, and safe in terms of pedestrian, bicycle, and vehicular access including parking, loading and servicing. One new access point has been proposed for access onto Hillview Way from the proposed development. This access point will be made available for vehicles without sacrificing the attractiveness of the area. The proposed road network will comply with city road standards throughout the development and will provide safe vehicular access through the townhome area. Development of the road due to the topography of the site will be accomplished as a part of the grading and drainage plan for the property. Parking has been proposed along one side of the proposed roads as well as the townhome driveways as shown on the parking and pedestrian circulation exhibit included with this submittal.**

Due to the existing topography of the site, the townhomes have been proposed along block lengths that allow access to each townhome. As extensive trail and sidewalk access has been proposed throughout the site, an additional access to provide a break

in the blocks has not been proposed. A pedestrian circulation exhibit has been included to show that over a linear mile of sidewalk has been proposed for ease of access throughout the townhomes. Additional access would be a duplicate effort as safe pedestrian access to school and transit bus stops, schools, parks, shopping, and common areas has been provided by a proposed trail and sidewalk.

A sidewalk has been proposed along the road network in order to keep pedestrians safe while providing non-motorized access to the townhomes. Bulb-outs have been proposed to connect the 3 crosswalks with the sidewalk for pedestrians to safely cross the roads. The sidewalk has been proposed along both sides of roads 'A' and 'B', with the exception of the portion of Road 'A' adjacent to the proposed trail on the west side of the property and adjacent to the south side of the property. A sidewalk has been proposed along one side of this road segment. This sidewalk will connect with Hillview Way where there is an existing sidewalk along one side of the road as well as a bike lane. This will provide safe non-motorized transportation to areas outside of the townhome development. The existing Tonkin Trail, located adjacent to the south eastern corner of the property, is also designed to help children get to school or bus stops and meets with Hillview Way at this same point. Residents of Hillview Crossing will have the option to utilize this non-motorized route for access to schools, bus stops, Mountain Line stops, and commercial shopping. A pedestrian circulation exhibit has been included with this submittal to show the pedestrian mobility options.

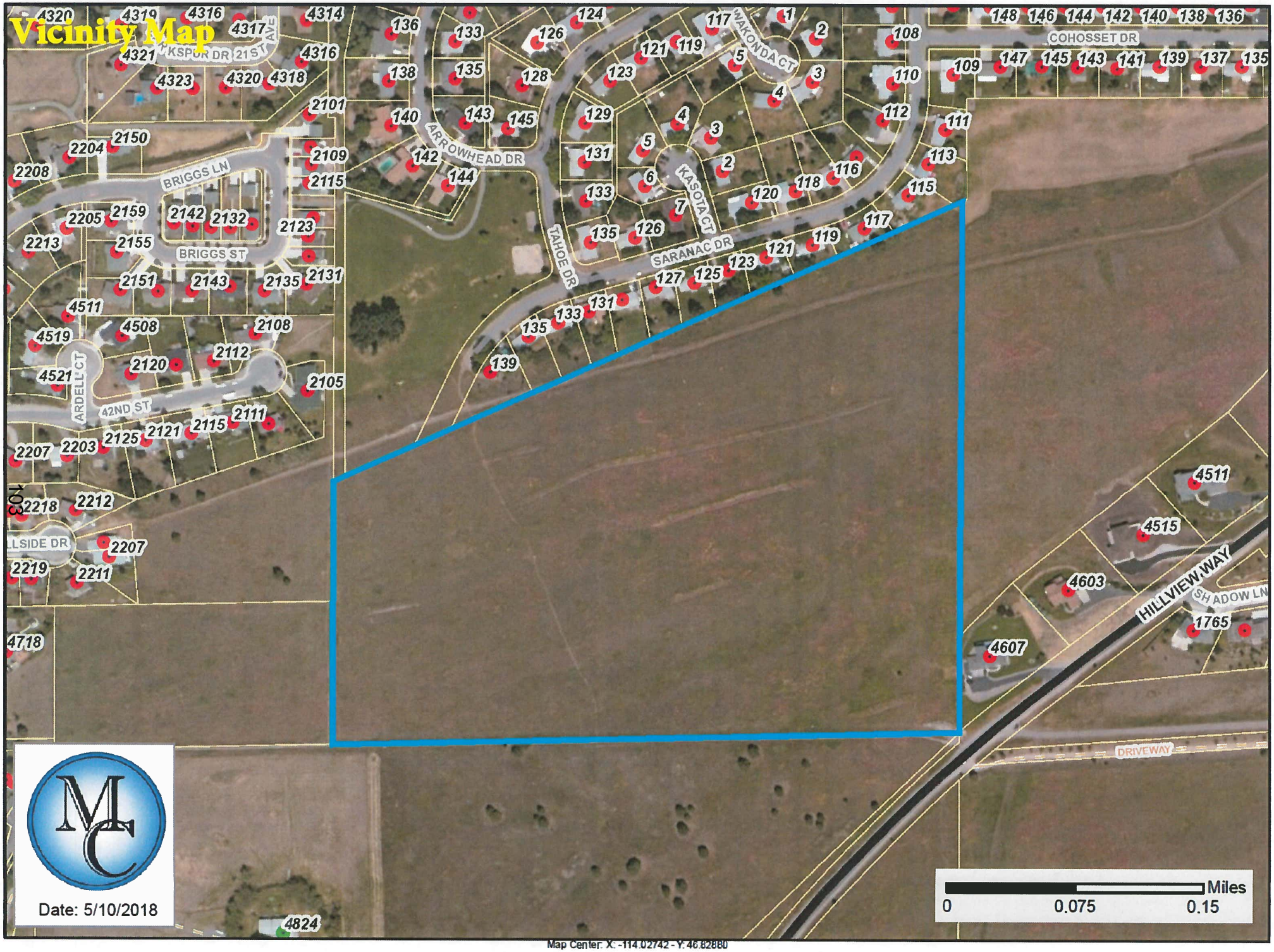
A trail has been proposed in addition to the sidewalk, to run on the west side of the property from the north to the south end of the site. This will provide an additional non-motorized transportation option for the residents and will be functional as it will connect to existing trails and park areas nearby. The trail will also provide pedestrian access to nearby schools, school bus stops, and mountain line stops. The proposed trail, sidewalk and road access throughout the townhome area will be of use to the residents without disturbing the natural environment or attractiveness of the area. Each townhome will be built with the necessary parking allotment, loading, and servicing needs.

E. ATTACHMENTS

As separate attachments (8.5" x 11" or 11" x 17"), provide the following materials with the site clearly identified. Where appropriate, required information may be combined as long as the information is clearly presented. Please check the box if the material is included in the packet. If the material is not included in the submittal packet, please note "N/A".

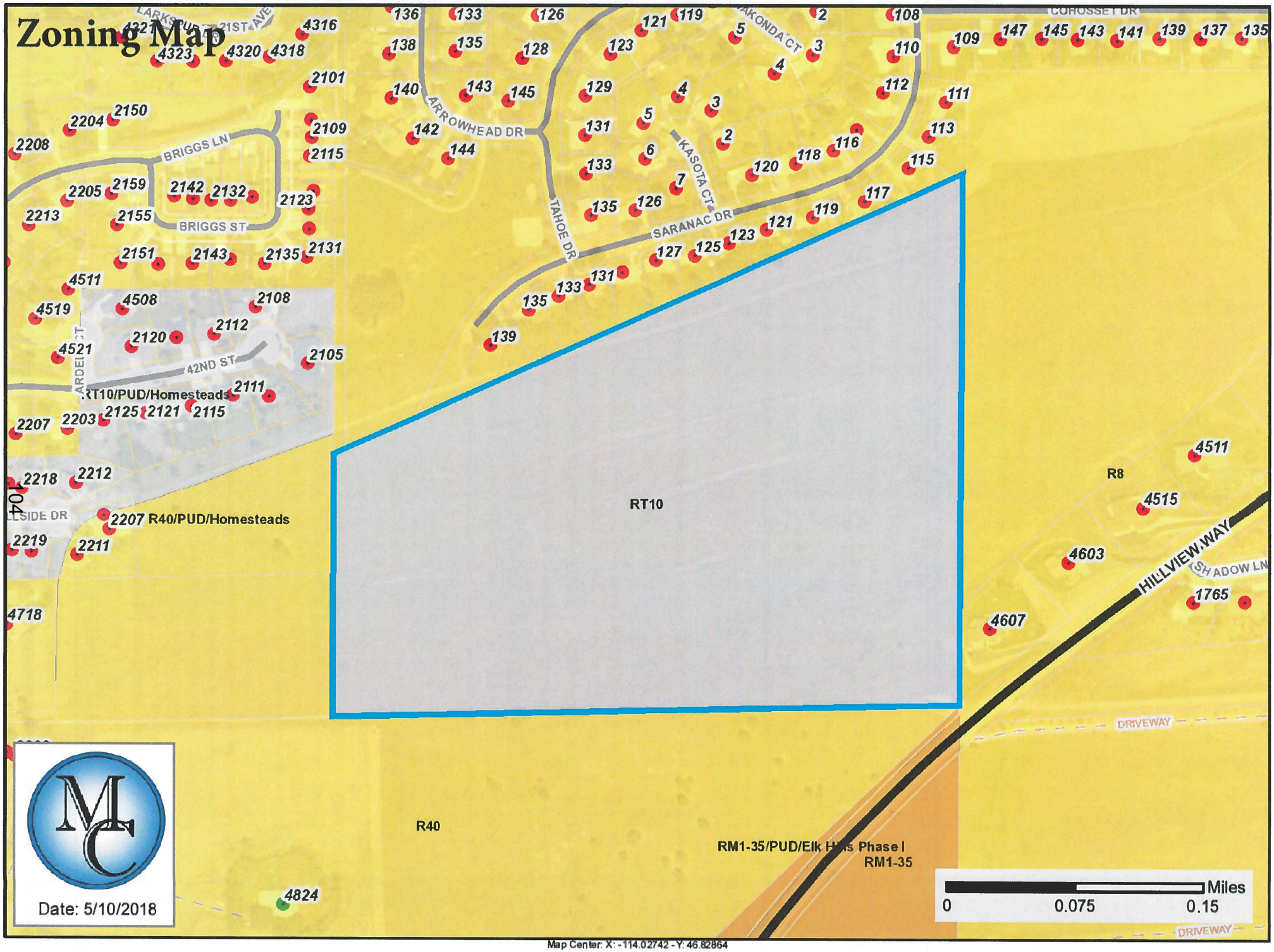
- ☒ **A cover letter** describing the purpose of the proposed project, existing site conditions, and a brief description of the proposal.
- ☒ **A vicinity map** showing the subject property and the area within 300 feet of the subject property.
- ☒ **A Zoning map** of the subject property and vicinity (showing the existing zoning district), extending at least 300 feet from the property boundaries.
- ☒ **An aerial photo** of the subject property and vicinity extending at least 300 feet from the property boundaries.
- ☒ **A Growth Policy/Comprehensive Plan map** of the subject property and vicinity extending at least 300 feet from the property boundaries for the applicable comprehensive plan, clearly showing the land use designation of the subject property and surrounding properties.
- ☐ **The current plat** of the subject property. **N/A**
- ☒ **A site plan**, including existing and proposed landscaping, parking, streets/access, sidewalks, bike lanes, and any other improvements to the property.
- ☒ **Building elevation drawings** of all proposed structures and/or photos of existing structures.
- ☒ **Floor plans** of all existing and proposed buildings.

Vicinity Map



Map Center: X: -114.02742 - Y: 46.82880

Zoning Map



Map Center: X: -114.02742 - Y: 46.82864

Map Center: X: -114.02694 - Y: 46.82872

Comprehensive Plan Map

Map Center: X: -114.02742 - Y: 46.82882

AREA TOTALS

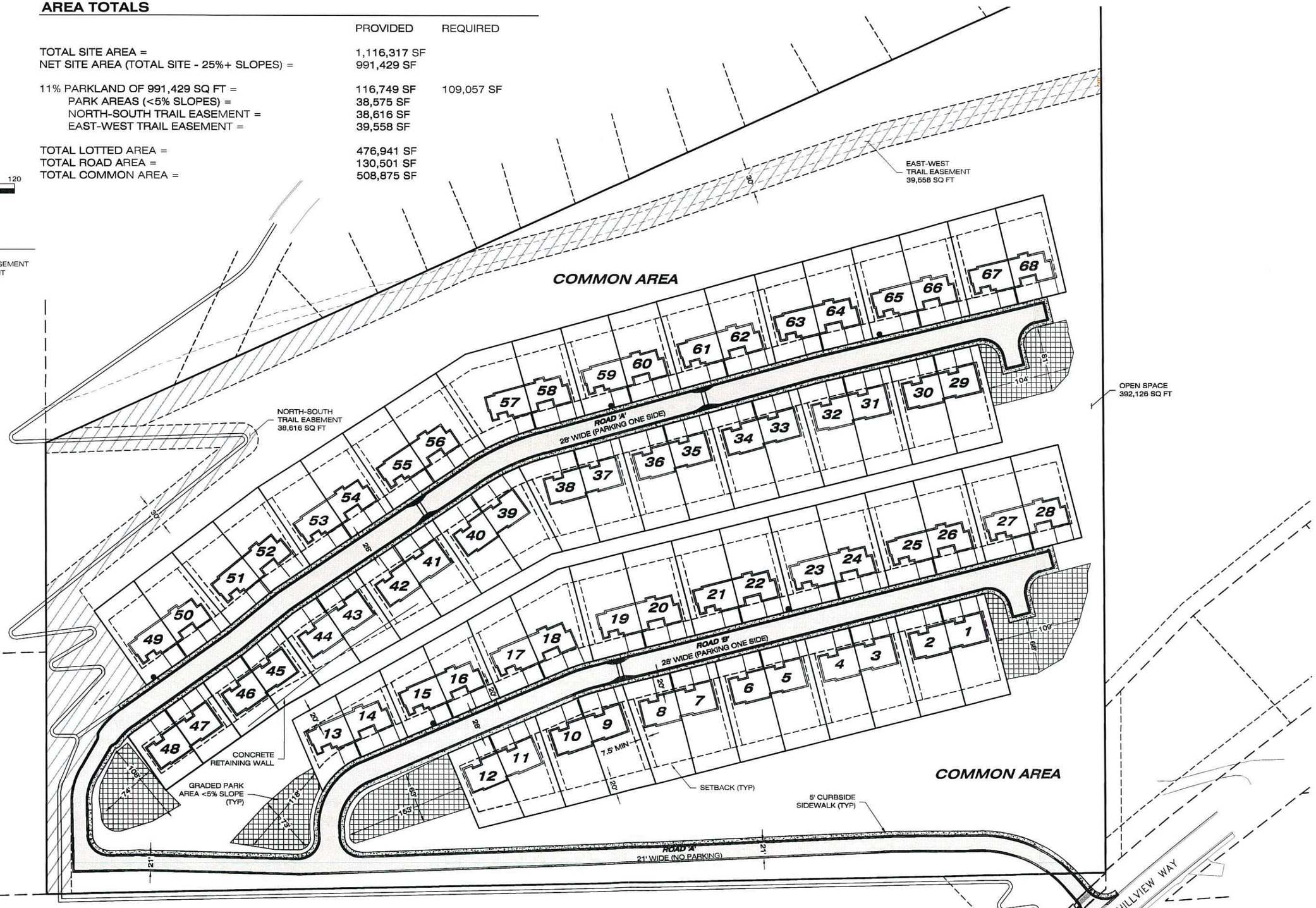
	PROVIDED	REQUIRED
TOTAL SITE AREA =	1,116,317 SF	
NET SITE AREA (TOTAL SITE - 25%+ SLOPES) =	991,429 SF	
11% PARKLAND OF 991,429 SQ FT =	116,749 SF	109,057 SF
PARK AREAS (<5% SLOPES) =	38,575 SF	
NORTH-SOUTH TRAIL EASEMENT =	38,616 SF	
EAST-WEST TRAIL EASEMENT =	39,558 SF	
TOTAL LOTTED AREA =	476,941 SF	
TOTAL ROAD AREA =	130,501 SF	
TOTAL COMMON AREA =	508,875 SF	

N

60 0 60 120
SCALE IN FEET

LEGEND

- (P) LOT LINE
- (P) SETBACK EASEMENT
- (P) FIRE HYDRANT



EXISTING ZONING =	RT10
FRONT SETBACK	20'
REAR SETBACK	20'
SIDE (INTERIOR)	7.5'
SIDE (STREET)	10'

NOTE:
CONSERVATION LANDS MANAGER TO BE INCLUDED IN THE PRE-CONSTRUCTION MEETING PRIOR TO TRAIL CONSTRUCTION

TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
www.TerritorialLandworks.com
P.O. Box 3051
Missoula, MT 59806
Ph: (406)721-0142
Fax: (406)721-0324

P-LOT DATE: 3/11/2018 4:00 PM

REVISIONS	DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 4/19/2018

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: CONDITIONAL USE EXHIBIT

PROJECT NO. 14-3592

SHEET: 1 OF 1

DWG LOCATION TO ACTIVE F:\2002\1 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA & HILLS DEVELOPMENTS, DRAFTING\1_DRAWINGS\JJ\CDADCK\BETSZONING COMP JANCD\CDH-14-3592_CONDITIONAL USE.DWG

PARKING TOTALS

ON-SITE PARKING	=	272 SPACES
ON-STREET PARKING	=	47 SPACES
TOTAL	=	**319**

PEDESTRIAN MOBILITY ROUTE TOTALS:

LINEAR FEET OF ON-SITE SIDEWALK	=	6203'
LINEAR FEET OF ON-SITE TRAILS	=	1123'
TOTAL	=	**7326'**

LEGEND

- PEDESTRIAN CIRCULATION
- SIDEWALK
- PARK AREA
- COMMON AREA
- NORTH-SOUTH TRAIL EASEMENT
- EAST-WEST TRAIL EASEMENT
- TRAIL

AREA TOTALS

	PROVIDED	REQUIRED
TOTAL SITE AREA =	1,116,317 SF	
NET SITE AREA (TOTAL SITE - 25%+ SLOPES) =	991,429 SF	
11% PARKLAND OF 991,429 SQ FT =	116,749 SF	109,057 SF
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EAST-WEST TRAIL EASEMENT =	39,558 SF	
TOTAL LOTTED AREA =	476,941 SF	
TOTAL ROAD AREA =	130,501 SF	
TOTAL COMMON AREA =	508,875 SF	

~0.4 MILES TO RUSSELL ELEMENTARY SCHOOL
BUS STOP AND MOUNTAIN LINE BUS STOP
~0.6 MILES TO MEADOW HILL MIDDLE SCHOOL

TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
www.TerritorialLandworks.com
P.O. Box 3051
Missoula, MT 59806
Ph: 406721-0142
Fax: 406721-3221

PLOT DATE: 6/11/2018 4:02 PM

REVISIONS	DATE

DESIGNED:
DRAFTED: DO
CHECKED:
DATE: 6-11-18

LOCATION: CITY OF MISSOULA
SEC. 6, T12N, R19W, P.M.M.
MISSOULA COUNTY
MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.

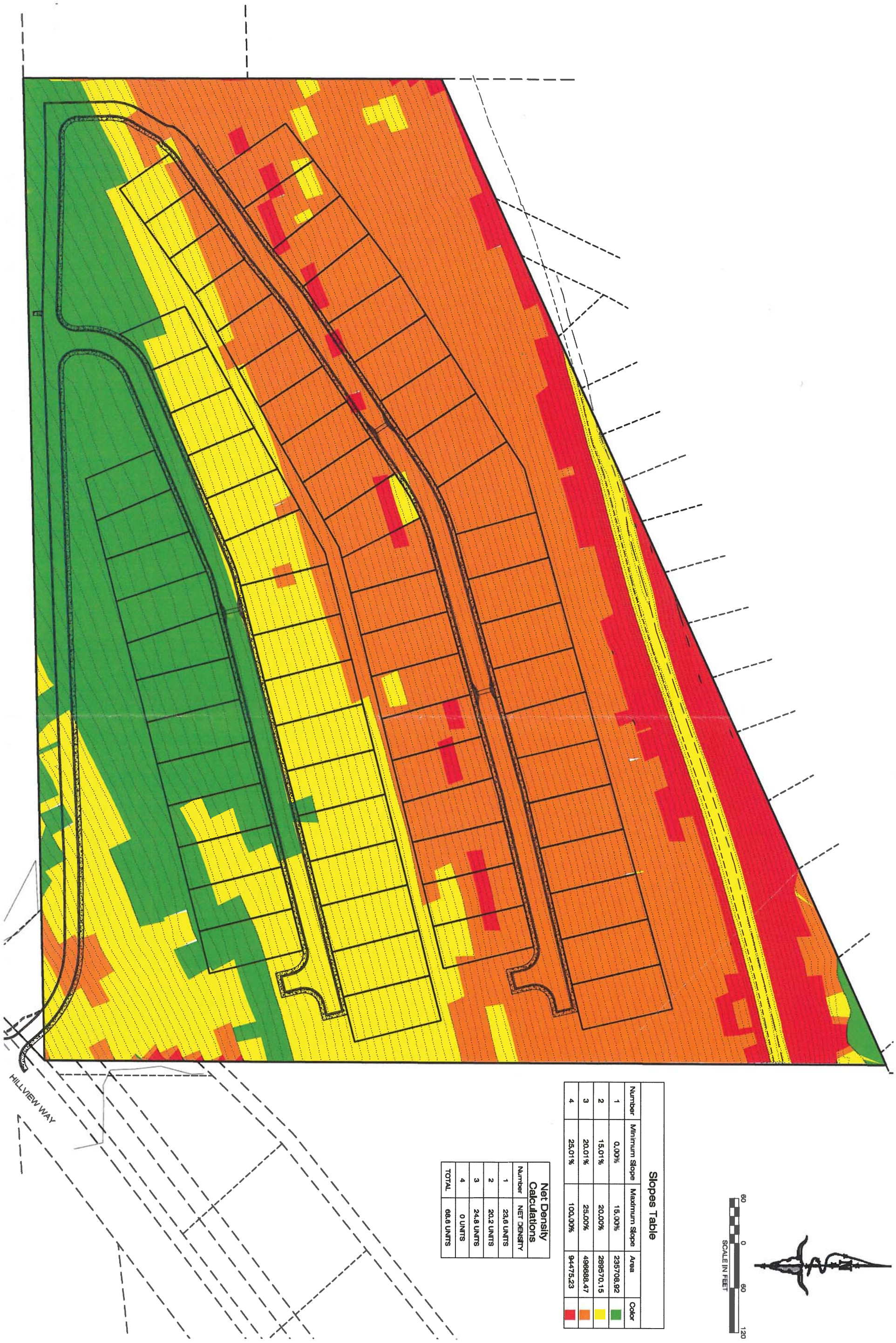
PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: PARKING AND PEDESTRIAN CIRCULATION EXHIBIT

PROJECT NO.: 14-3592

SHEET: 1 OF 1

DWG LOCATION: T:\LACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING\MISSOULA S HILLS DEVELOPMENT_DRAFTING\01_DRAWINGS\AUTOCAD\PLAN SETS\ZONING COMP\PLAN\ZOC-PARKING EXH_14-3592.DWG



Slopes Table

Number	Minimum Slope	Maximum Slope	Area	Color
1	0.00%	15.00%	235708.92	
2	15.01%	20.00%	289570.15	
3	20.01%	25.00%	496688.47	
4	25.01%	100.00%	94475.23	

Net Density Calculations

Number	NET DENSITY
1	23.6 UNITS
2	20.2 UNITS
3	24.8 UNITS
4	0 UNITS
TOTAL	68.6 UNITS

PROJECT NO. 14-3592	PROJECT NAME HILLVIEW CROSSING	LOCATION: TAX ID # 1339100 CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA	DESIGNED: NL DRAFTED: RD CHECKED: NL DATE: 7/18/18
SHEET: 1 OF 1	SHEET TITLE: CONDITIONAL USE PERMIT SUBMITTAL SLOPE CATEGORY	PREPARED FOR: HILLVIEW CROSSING, LLC.	

REVISIONS DATE

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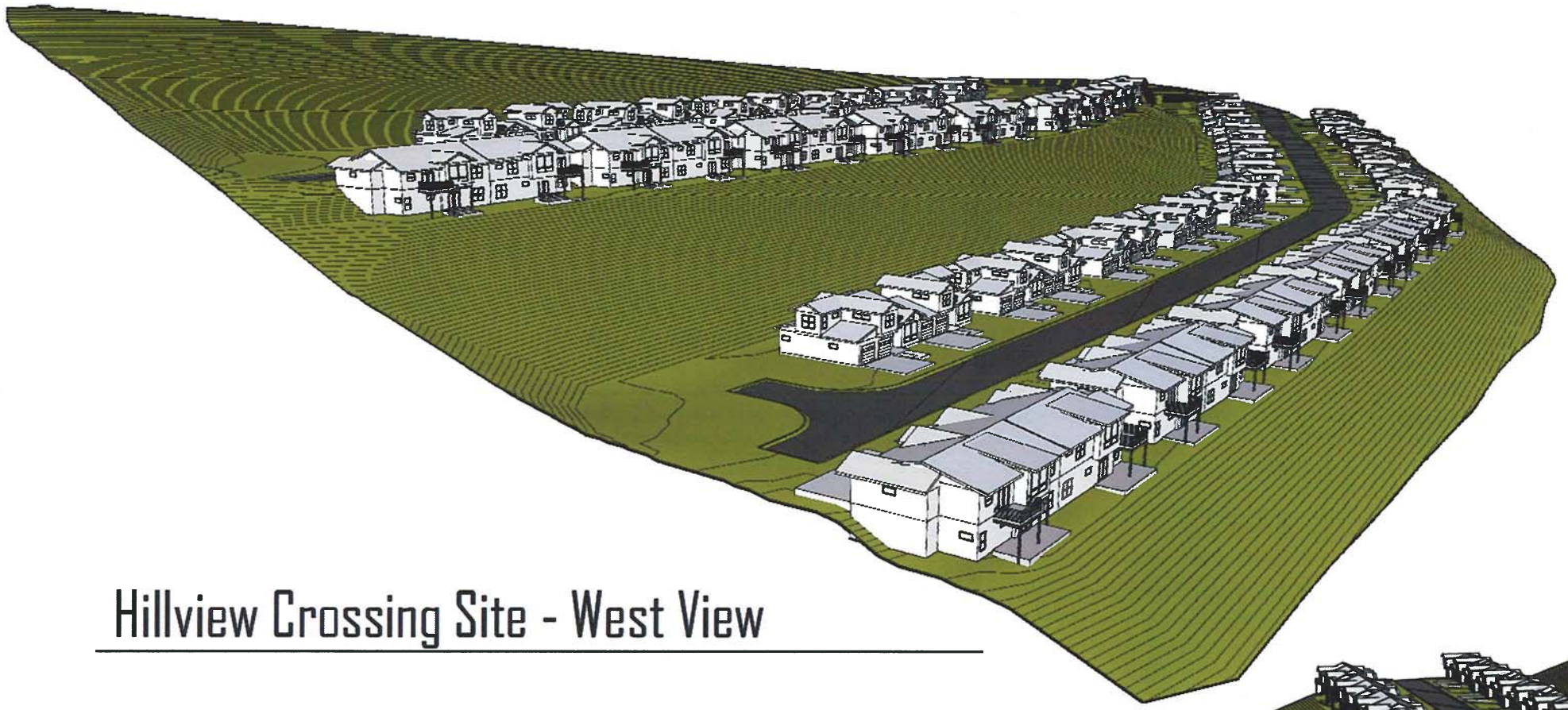
Fax: 406/721-5324
P.O. Box 3051
Missoula, MT 59806

DWG LOCATION: T:\1_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA\HILL DEVELOPMENT\DRAFTING\1_DRAWINGS\AUTOCAD\PLAN SETS\ZONING COMPLIANCE\20-EX SLOPE BANDING_14-3592.DWG

PLOT DATE: 7/20/2018 10:59 AM



Hillview Crossing Site - West View

Hillview Crossing Site - East View

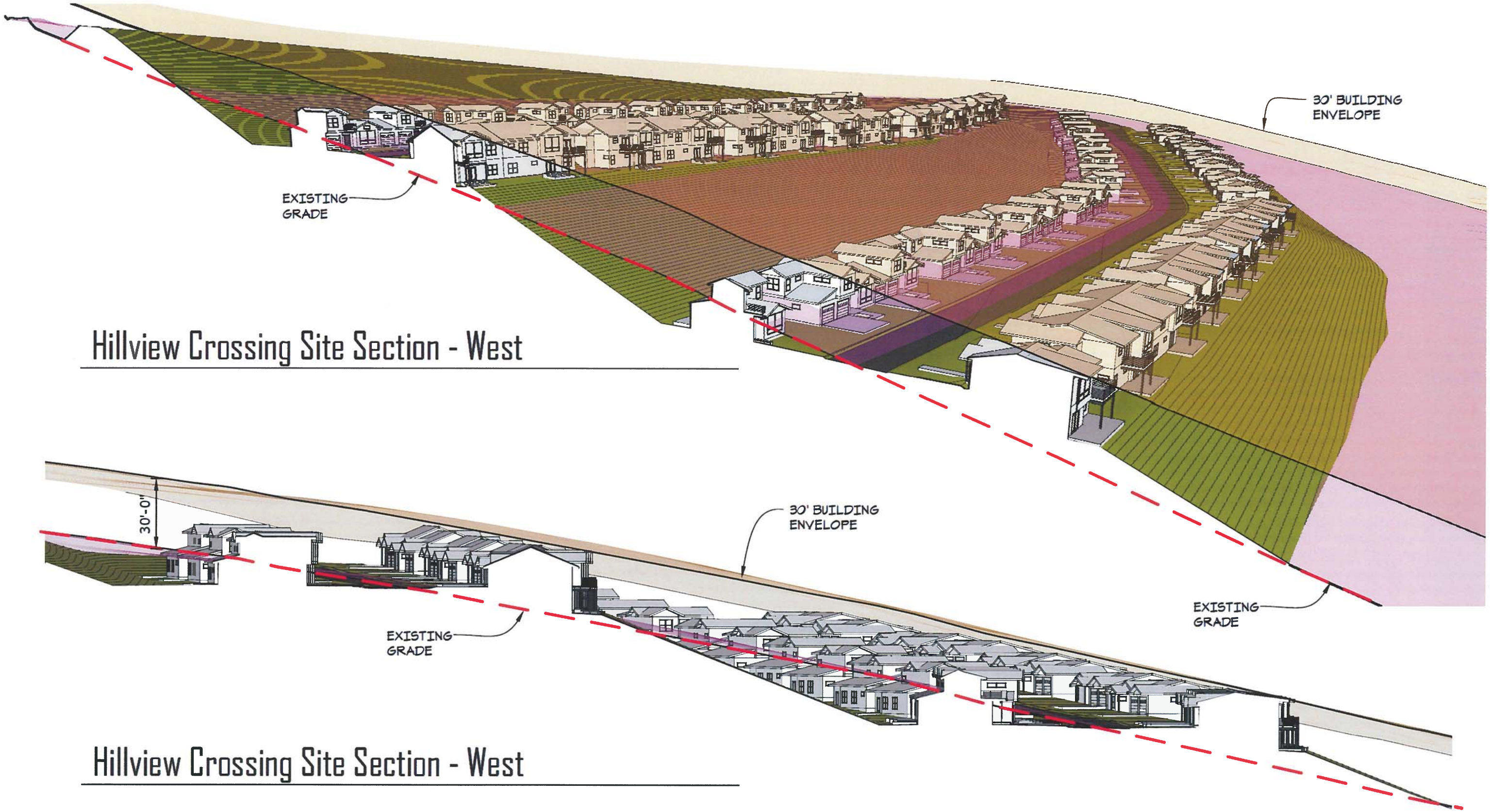
1

Hillview Cross Site Section

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

July 20, 2018

GH architects



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Hillview Cross Site Section

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

July 20, 2018

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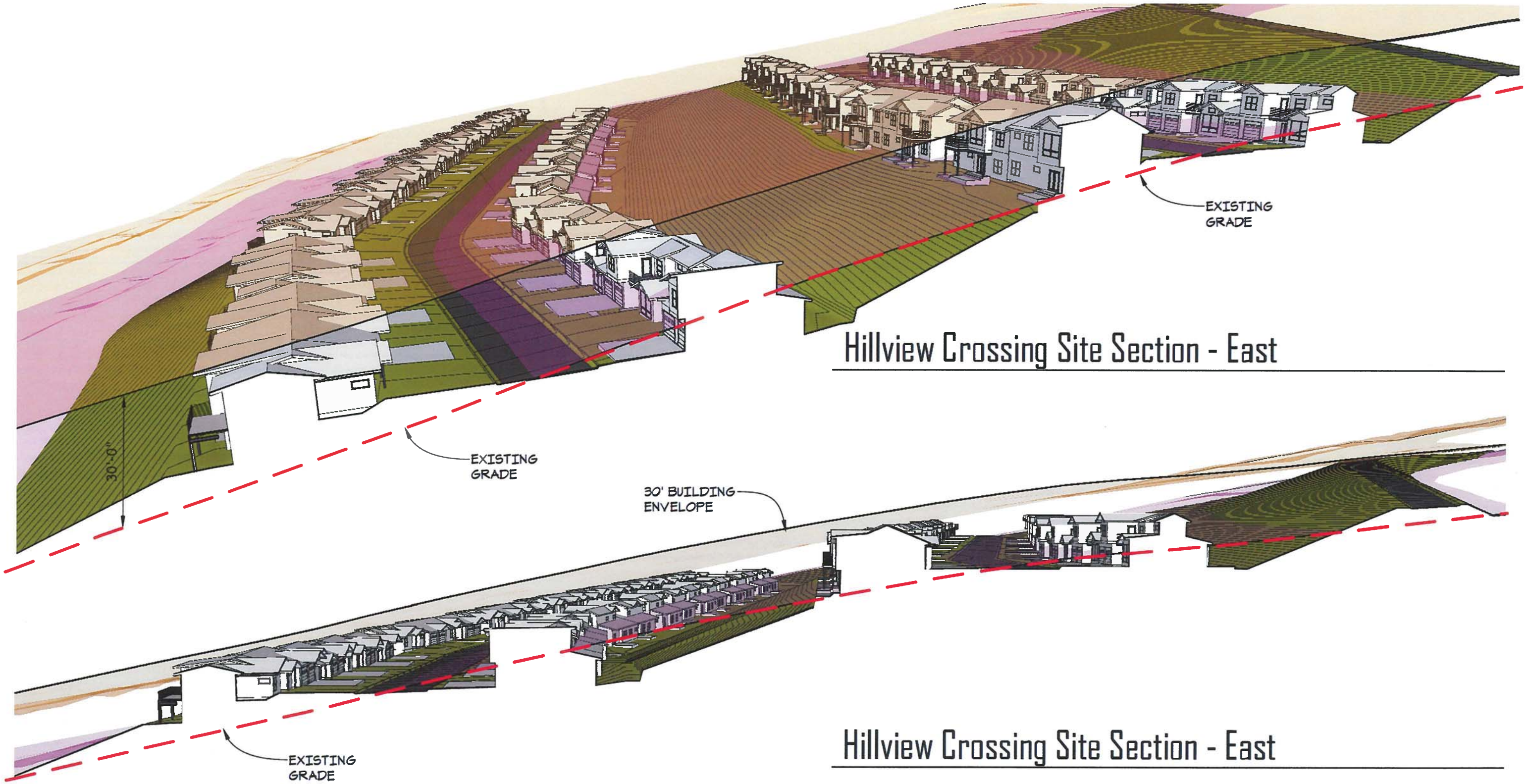

3

Hillview Cross Site Section

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

July 20, 2018

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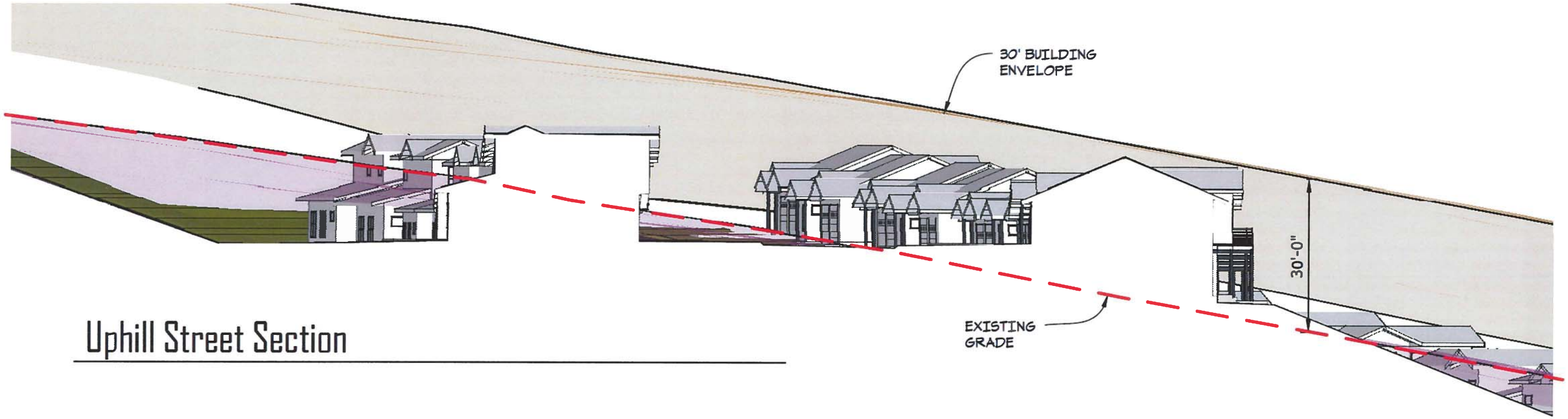
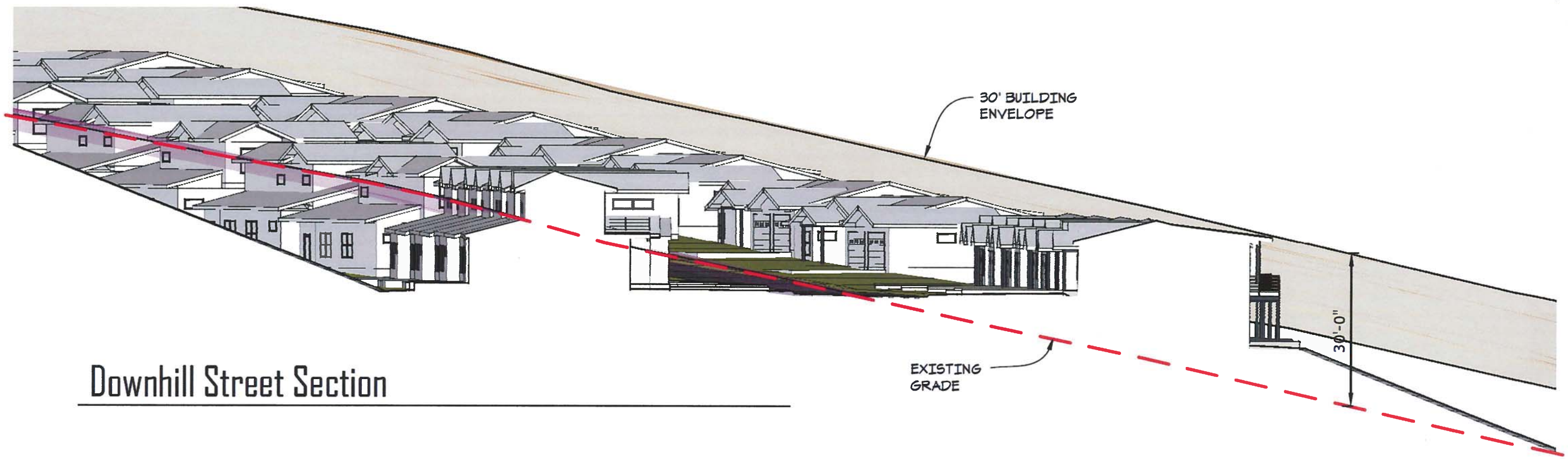


Uphill Street Section



Downhill Street Section

4

Hillview Cross Site Section

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

July 20, 2018

0 10' 20'

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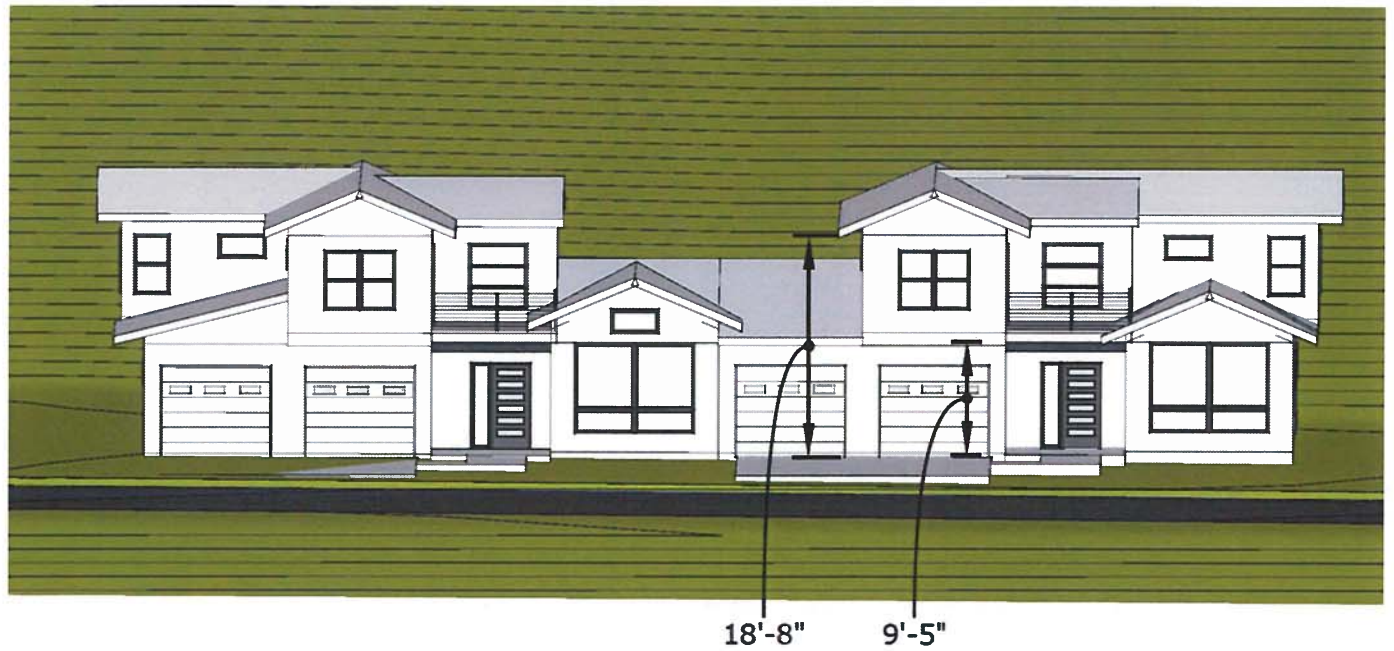
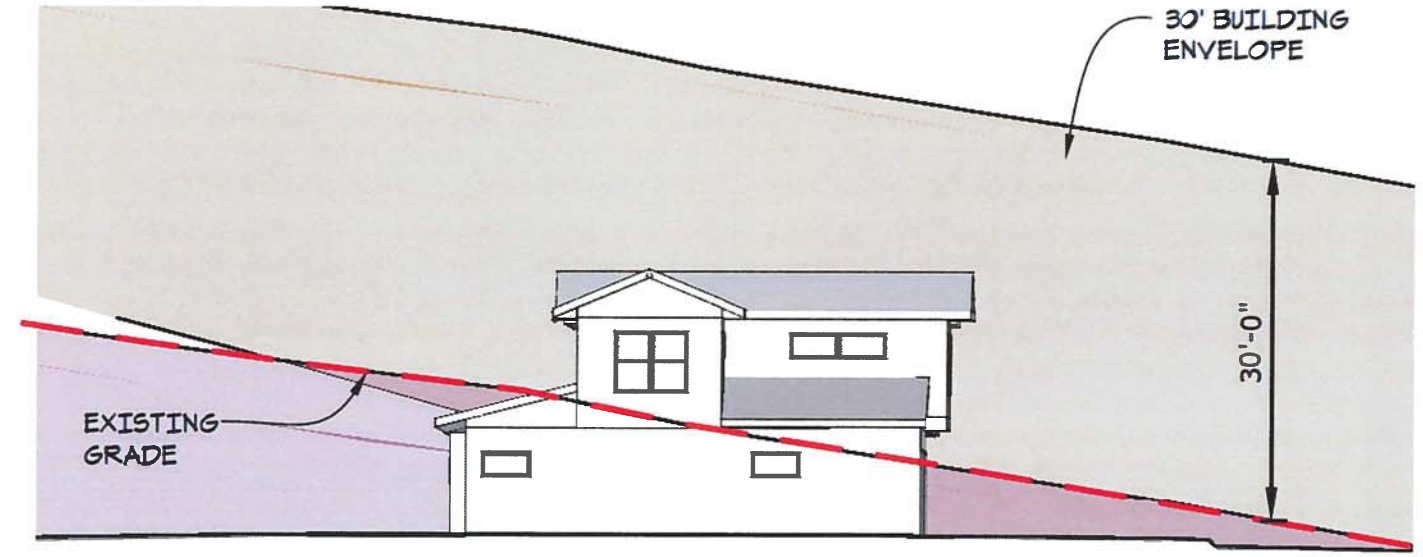
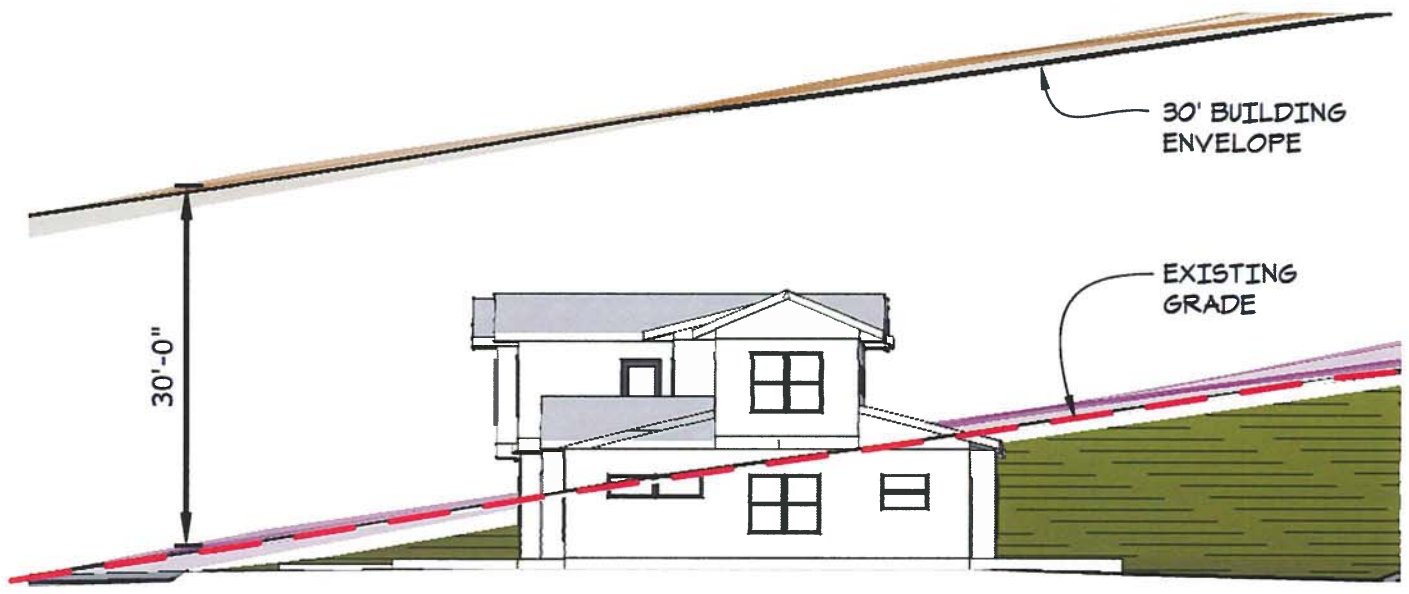


Uphill Unit - Front Elevation



Uphill Unit - Right-Side Elevation



Uphill Unit - Left-Side Elevation

Uphill Unit - Rear Elevation

5

Hillview Cross Site Section

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

July 20, 2018

0 8' 16'

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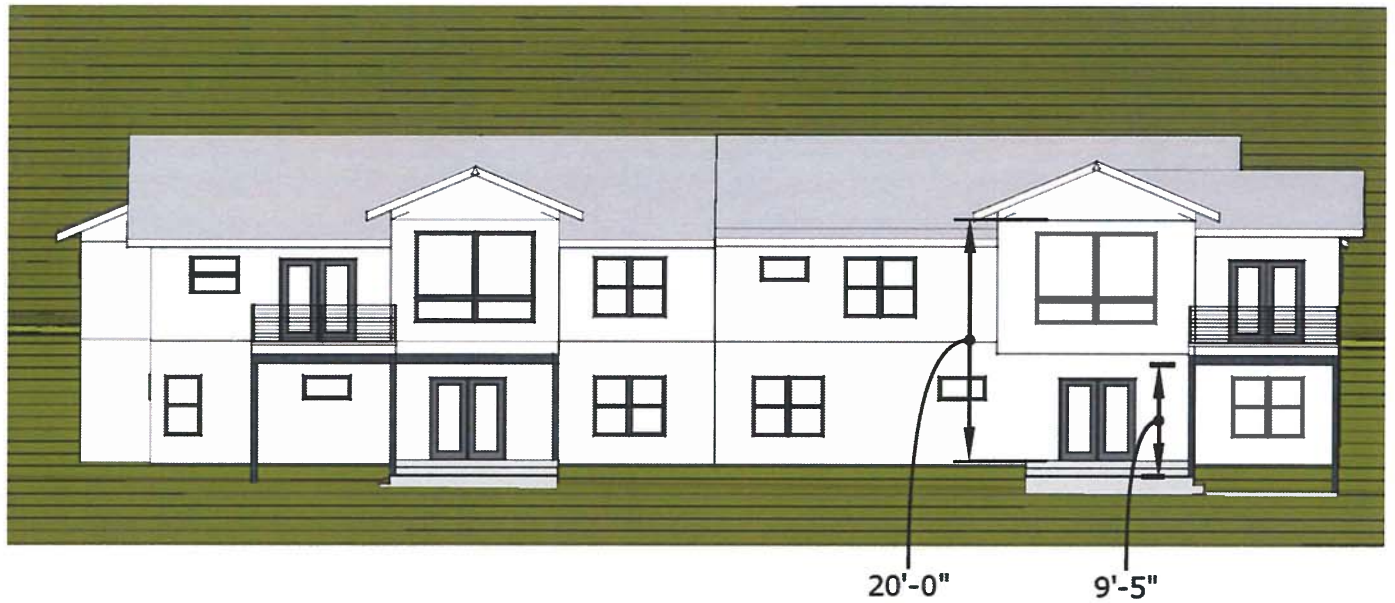
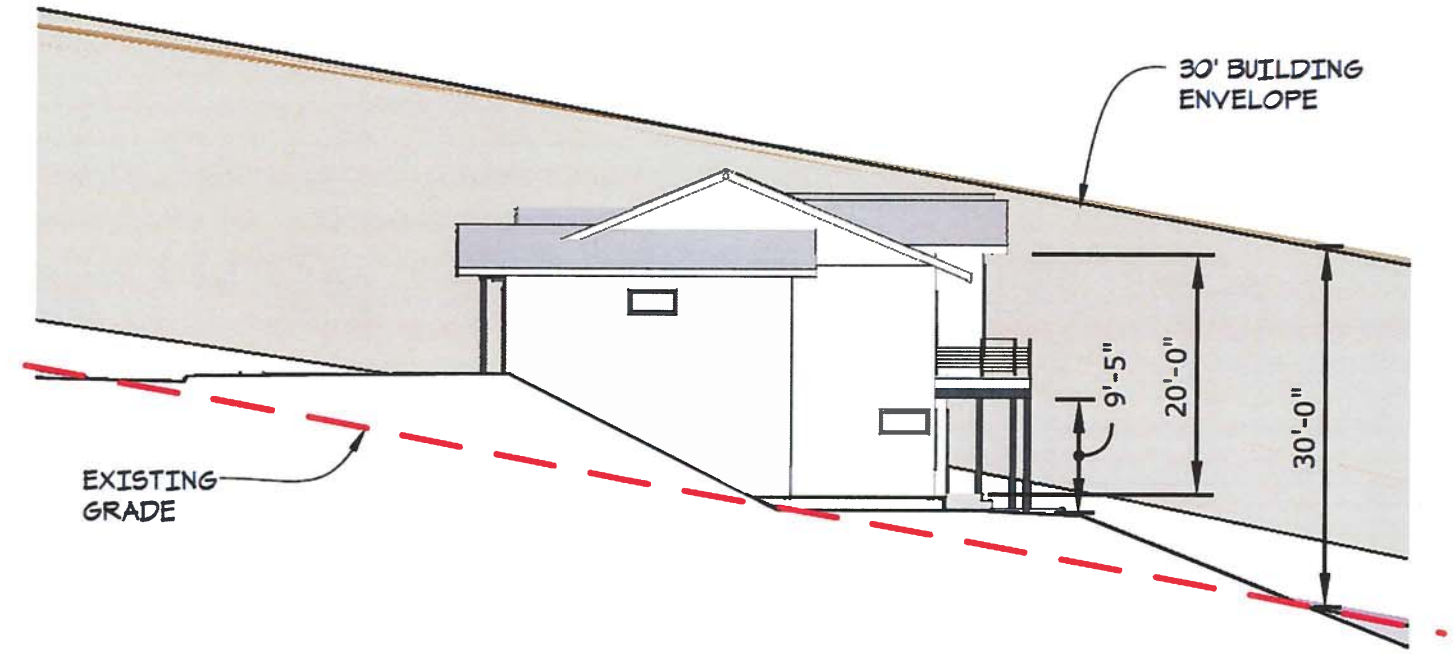
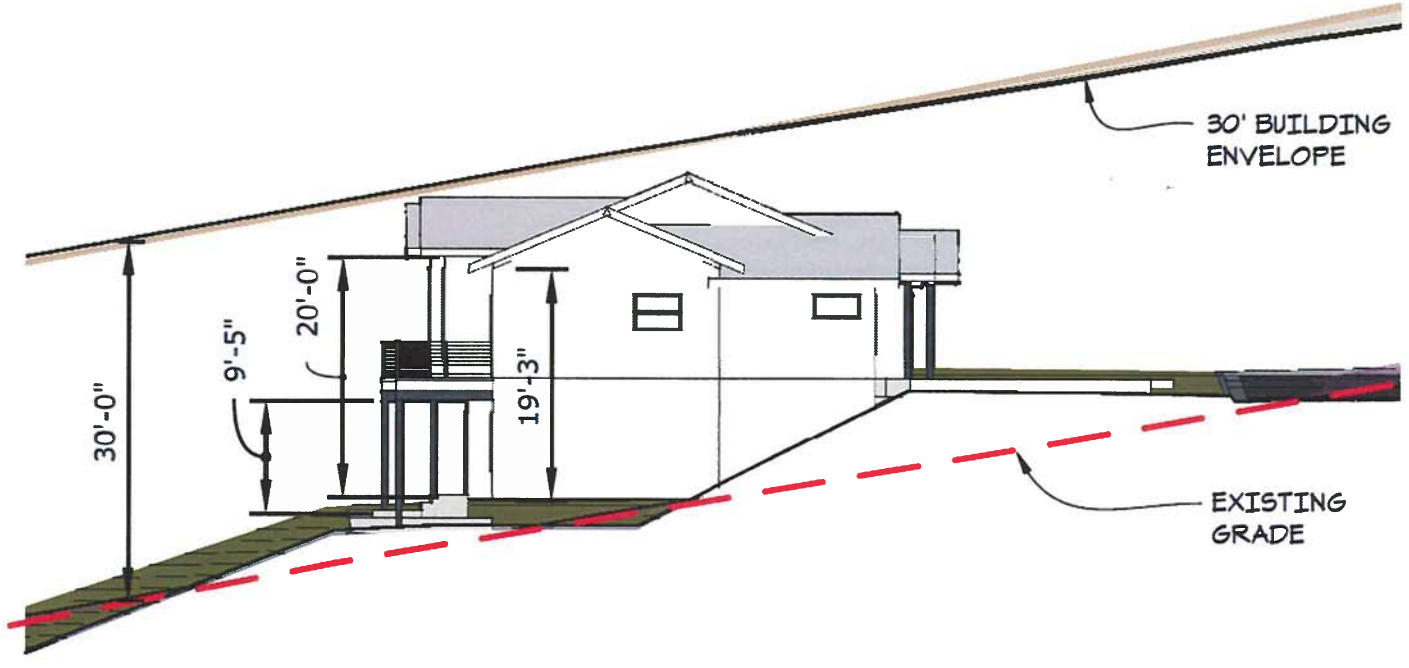


Downhill Unit - Rear Elevation



Downhill Unit - Right-Side Elevation



Downhill Unit - Left-Side Elevation

Downhill Unit - Front Elevation

6

Hillview Cross Site Section

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

July 20, 2018

0 3' 16'

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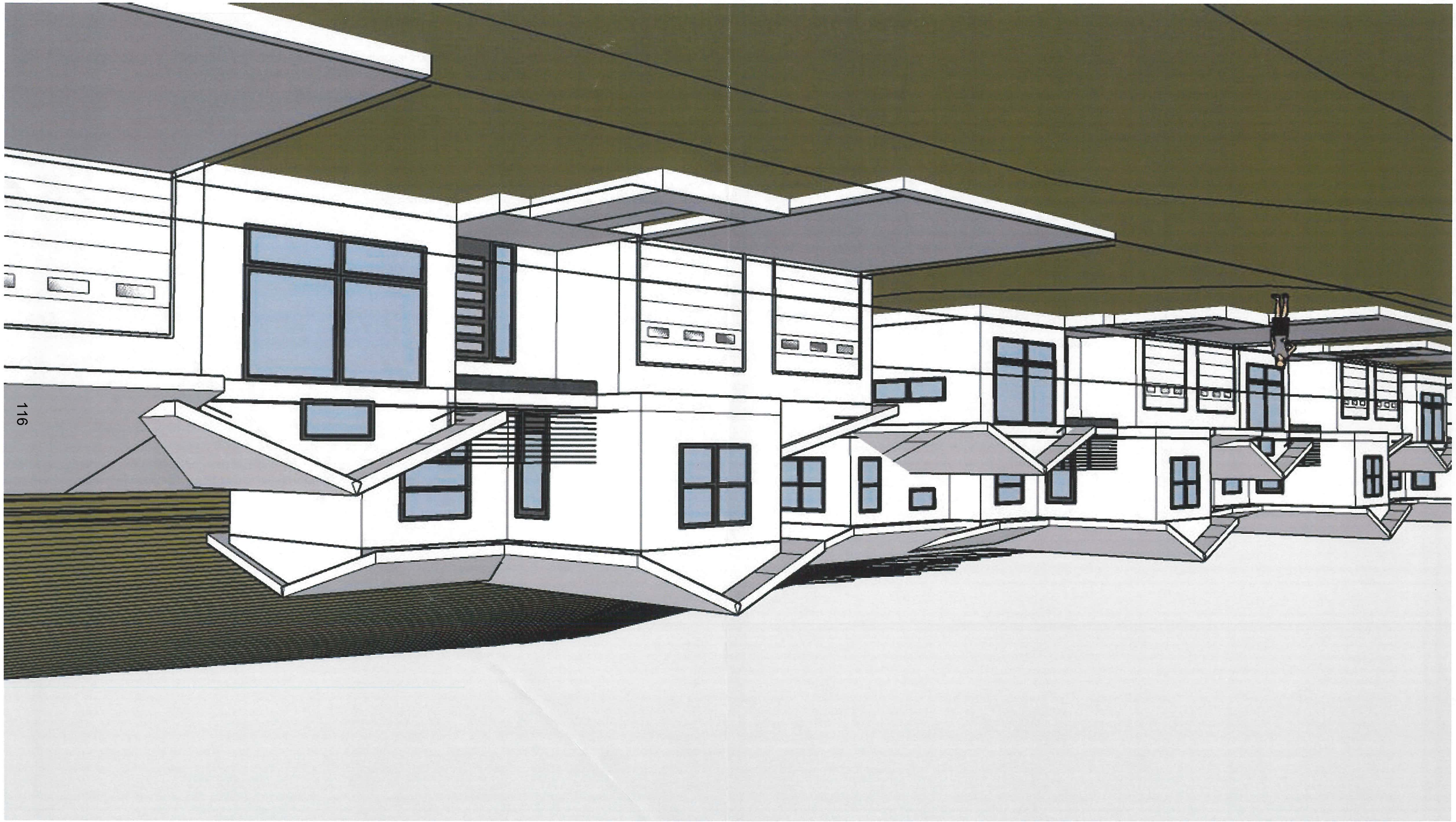
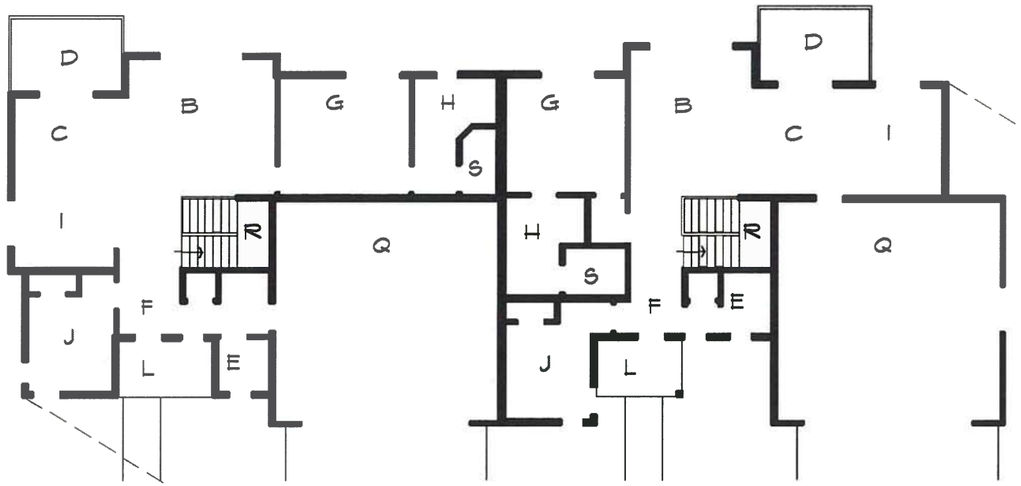


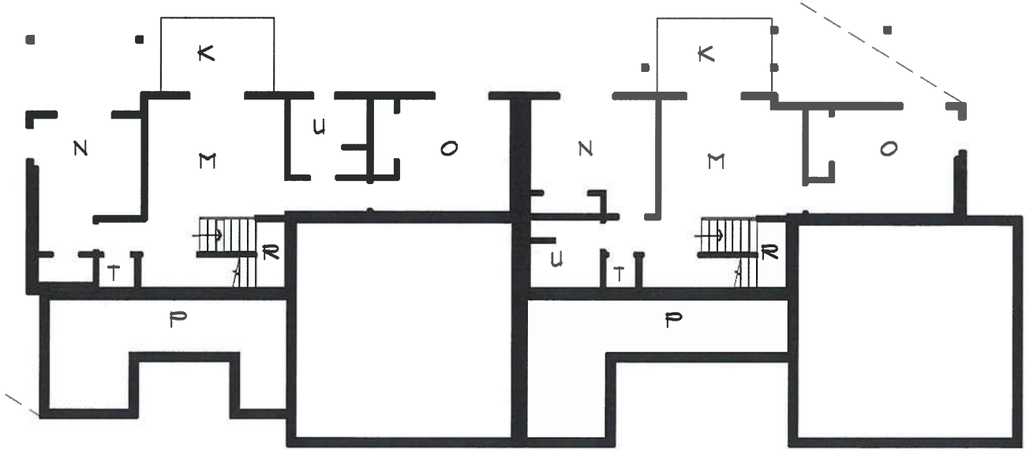

147



Downhill Main Level Building Plan

Legend Key

A	ENTRY	K	PATIO
B	LIVING RM.	L	PORCH
C	DINING RM.	M	REC ROOM
D	DECK	N	BEDROOM NO 1
E	1/2 BATH RM.	O	BEDROOM NO 2
F	ENTRY	P	UNFINISHED
G	M. BEDRM.	Q	2-CAR GARAGE
H	M. BATH	R	STAIRS
I	KITCHEN	S	W.I.C.
J	STUDY	T	MECHANICAL
		U	FULL BATH RM.



Downhill Basement Level Building Plan

7

Overall Downhill Building Plan

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

JULY 20, 2018

0 8' 16'

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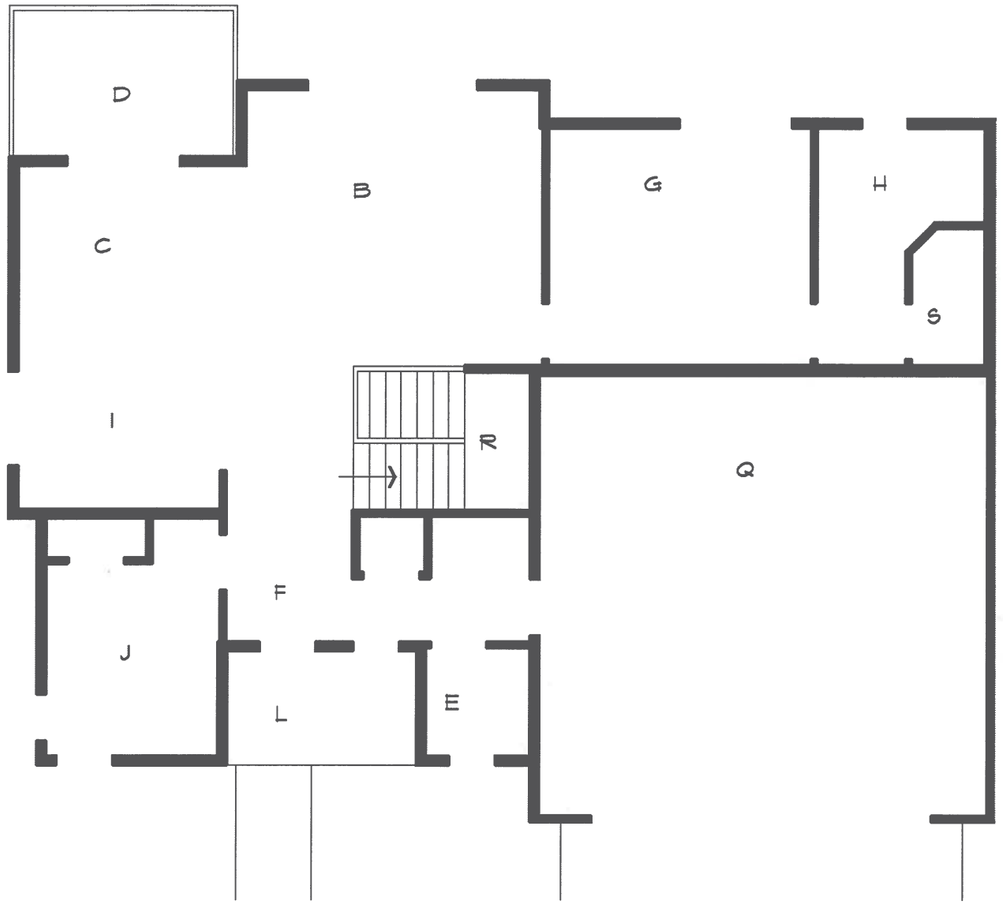
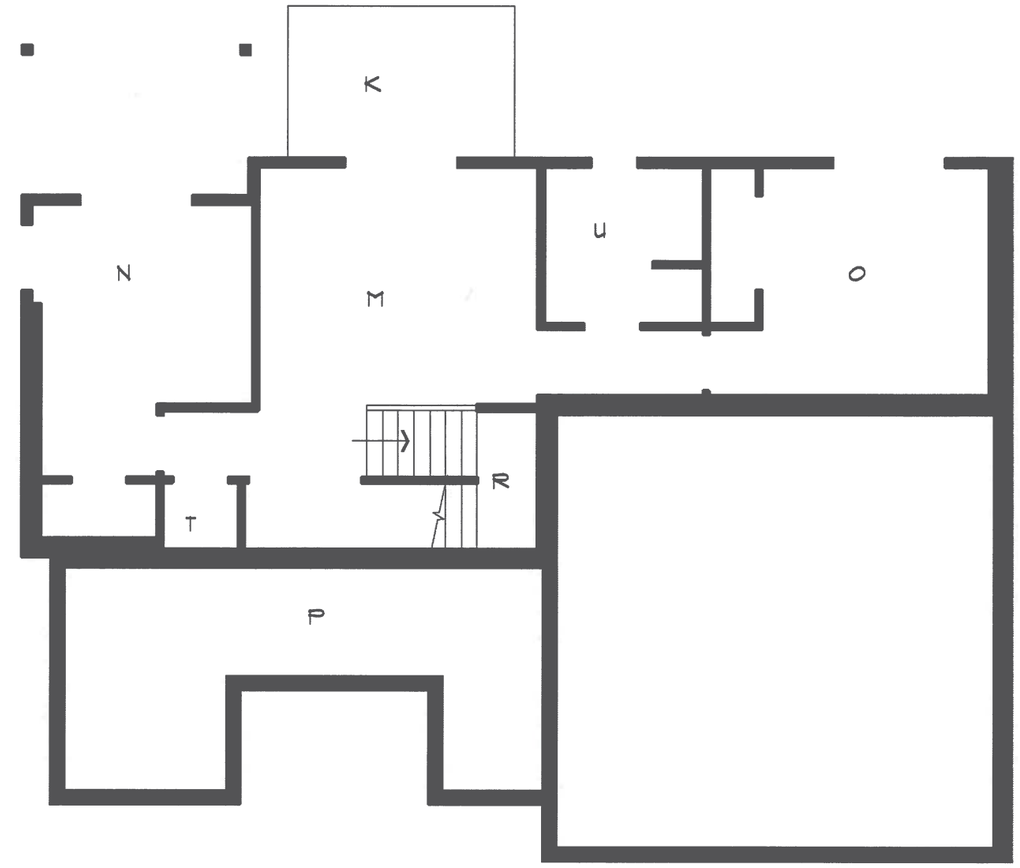


Downhill Main Level Unit Plan



Downhill Basement Level Unit Plan

Legend Key

A	ENTRY	I	KITCHEN	Q	2-CAR GARAGE
B	LIVING RM.	J	STUDY	R	STAIRS
C	DINING RM.	K	PATIO	S	W.I.C.
D	DECK	L	PORCH	T	MECHANICAL
E	1/2 BATH RM.	M	REC ROOM	U	FULL BATH RM.
F	ENTRY	N	BEDROOM NO 1		
G	M. BEDRM.	O	BEDROOM NO 2		
H	M. BATH	P	UNFINISHED		

8

Overall Downhill Unit Plans

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

JULY 20, 2018

0 4' 8'

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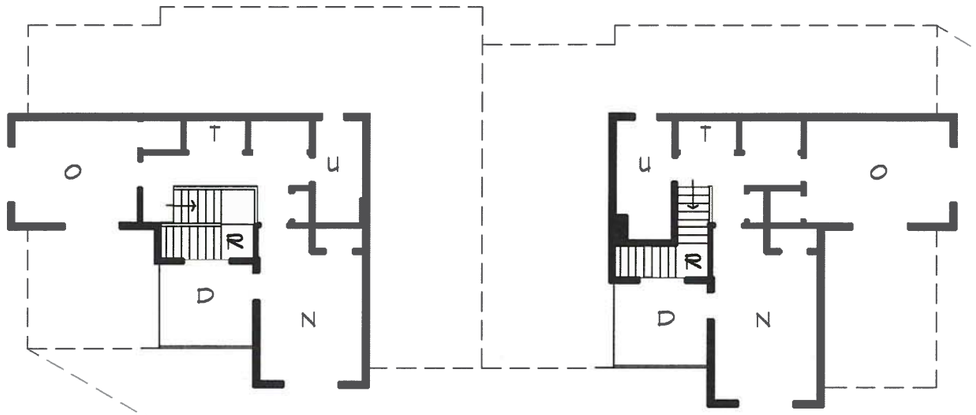
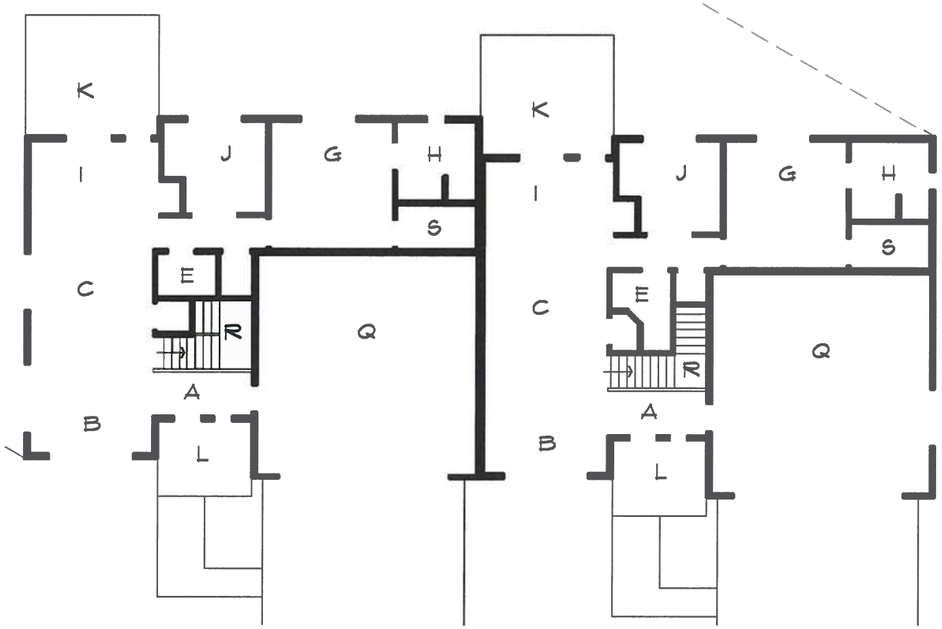


Uphill Upper Level Building Plan

Legend Key

A	ENTRY	K	PATIO
B	LIVING RM.	L	PORCH
C	DINING RM.	M	REC ROOM
D	DECK	N	BEDROOM NO 1
E	1/2 BATH RM.	O	BEDROOM NO 2
F	ENTRY	P	UNFINISHED
G	M. BEDRM.	Q	2-CAR GARAGE
H	M. BATH	R	STAIRS
I	KITCHEN	S	W.I.C.
J	STUDY	T	MECHANICAL
		U	FULL BATH RM.



Uphill Main Level Building Plan

9

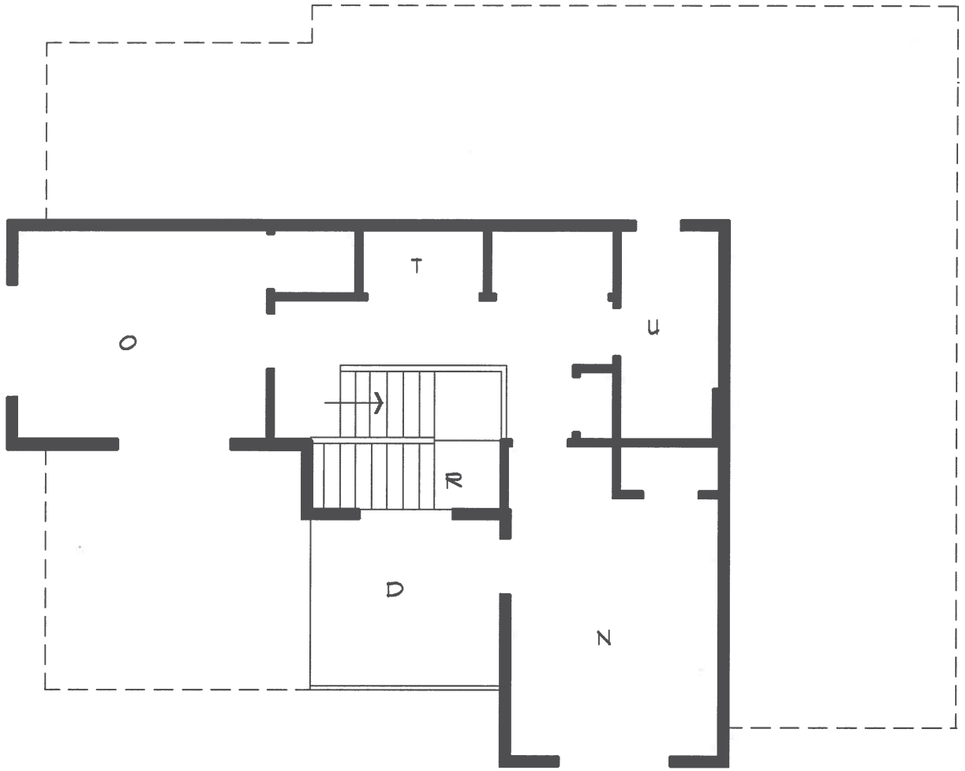
Overall Uphill Building Plan

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

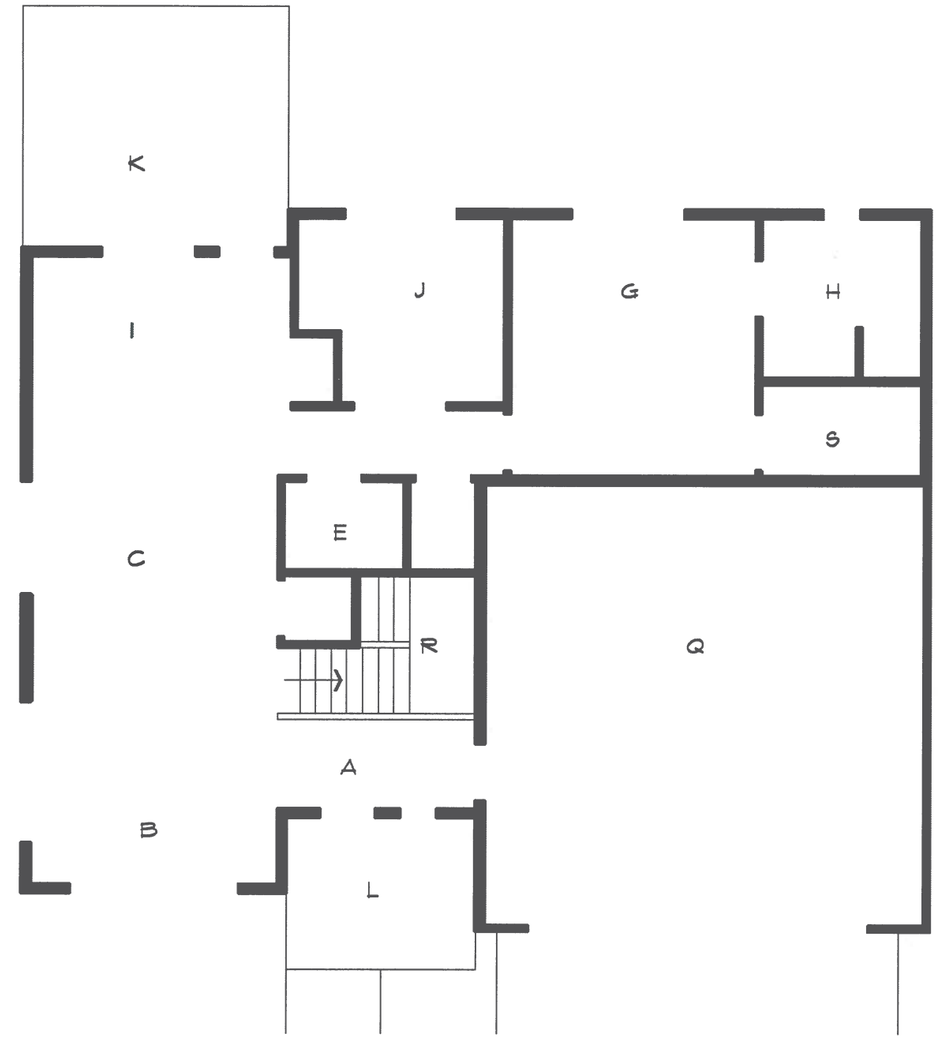
JULY 20, 2018

0 8' 16'

GH architects



Uphill Upper Level Unit Plan



Uphill Main Level Unit Plan

Legend Key

A	ENTRY	G	M. BEDRM.	M	REC ROOM	S	W.I.C.
B	LIVING RM.	H	M. BATH	N	BEDROOM NO 1	T	MECHANICAL
C	DINING RM.	I	KITCHEN	O	BEDROOM NO 2	U	FULL BATH RM.
D	DECK	J	STUDY	P	UNFINISHED		
E	1/2 BATH RM.	K	PATIO	Q	2-CAR GARAGE		
F	ENTRY	L	PORCH	R	STAIRS		

10

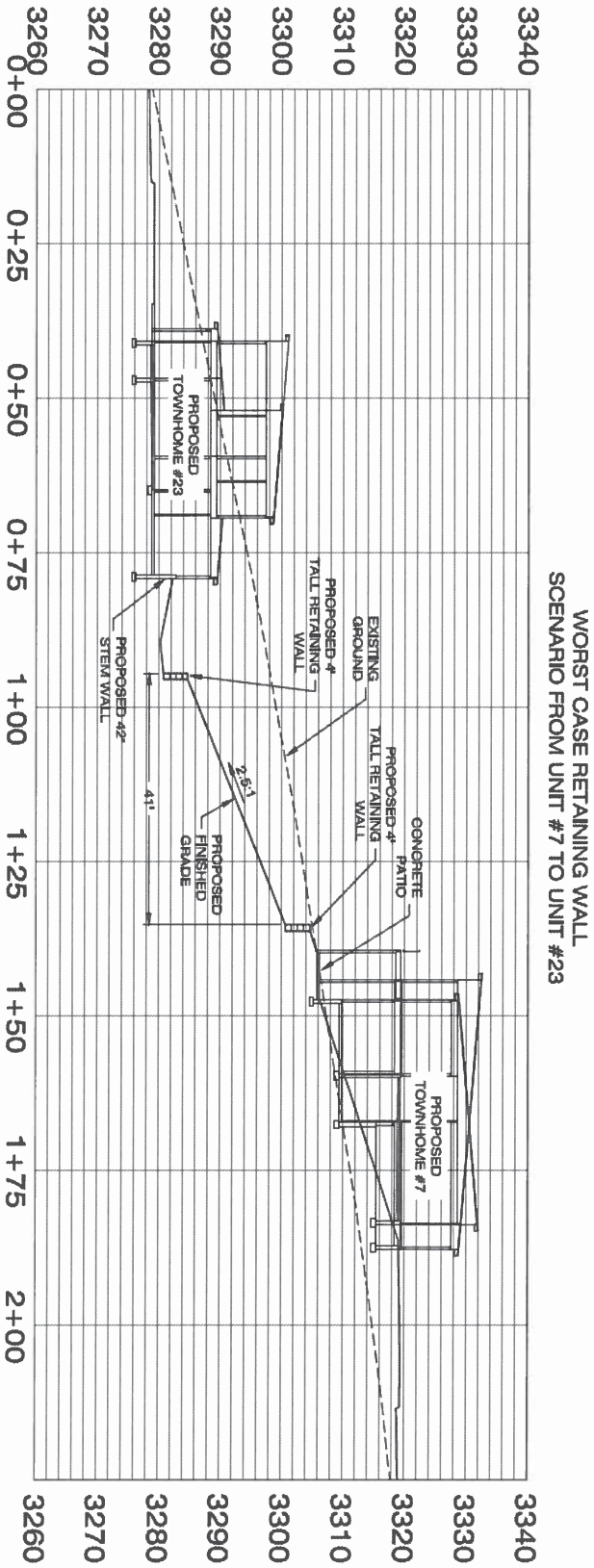
Overall Uphill Unit Plans

Hillview Crossing - South Hills Missoula, MT Exhibit Conceptual Design

JULY 20, 2018

0 4' 8'

GH architects



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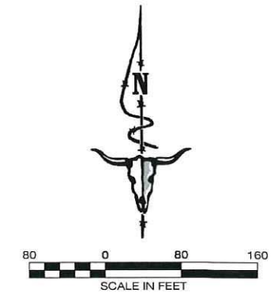
RETAINING WALL
SCHEMATIC SECTION VIEW
HILLVIEW CROSSING
MISSOULA COUNTY

PROJECT#: 14-3592
TAB: RET WALL
DRAFTER: JW
DATE: 7/16/2018
SHEET 1 OF 1

PLOT DATE: 7/19/2018 4:53PM LOCATION: T:\1_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA S HILLS\1-DEVELOPMENT\8_DRAFTING\8.1_DRAWINGS\AUTOCAD\EXHIBITS\ZONING COMPLIANCE\EXH-14-3592_RET WALL SECTION.DWG



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Missoula, MT 59806
Ph: 406721.0142
Fax: 406721.5224

PLOT DATE: 9/11/2019 11:31 AM

REVISIONS | DATE

DESIGNED: JS
DRAFTED: BD
CHECKED: NL
DATE: 2015-11-25

LOCATION: TAX ID # 1339100 CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: DJ HOLDINGS, LLC

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: UTILITY LAYOUT

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION TO: J:\ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA B HILLS DEVELOPMENT\8_DRAFTING\8.1_DRAWINGS\AUTOCAD\DESIGN\14-3592_UTILITIES_JW.DWG

PRELIMINARY

GRADING AND DRAINAGE ENGINEERING DESIGN REPORT

FOR CALCULATIONS USING USDA/NRCS WinTR-55 PROGRAM &
IN ACCORDANCE WITH CITY OF MISSOULA PUBLIC WORKS STANDARDS

for

Hillview Crossing
Townhome Development

Located at:
Off of Hillview Way
Section 6, T12N, R19W, P.M.M.
City of Missoula, Missoula County, Montana

September 7, 2018
Revised: October 2, 2018

Prepared For:
City of Missoula
435 Ryman Street
Missoula, MT 59802

Prepared On Behalf Of:
Hillview Crossing Missoula LLC
3605 Arthur Street
Caldwell, ID 83605

Prepared By:
Territorial-Landworks, Inc.
1817 South Ave W, Suite A
P.O. Box 3851
Missoula, MT 59806

1.0 GENERAL

Hillview Crossing is a proposed Townhome Development of approximately 25.6 acres located below and north of Hillview Way in Missoula's South Hills area. The legal description of the property is: Portion of the Southeast ¼, Northeast ¼, Section 6, T12N, R19W, less Wapikiya Addition No. 3, located in the City of Missoula, Missoula County, Montana. As part of the townhome development, there will be a total of 68 separate townhome units. Development will include new roads, sidewalks, a trail, extensions to the public water and wastewater systems, and a stormwater collection and management system will all be required. The proposed development is located on undeveloped land surrounded by urban developments with open space, fair conditioned grassland and steeper slopes (10%-15%).

This storm water report will outline the existing conditions, review the proposed development, summarize the storm water analysis/design, provide the anticipated storm water results and summarize the findings. The pre-developed and post-developed storm water runoff volumes will be calculated. The objective is to manage the storm water flows so that the peak flows for the post-developed conditions that leave the subdivision are not greater than the pre-development flows and ensure that the site drainage functions properly because of the steeper slopes found on-site. Traditional flow paths will be maintained as well as reasonably possible.

This report was prepared based on preliminary discussions with the City of Missoula and in accordance with their requirements, with input from MDEQ Circular 8 for data and methods used.

2.0 DRAINAGE DESIGN CRITERIA AND METHODS USED

The SCS method, also known as the Curve Number method or the TR-55 method, was used to estimate the storm runoff rate for the site and each individual basin, if applicable. For Montana, typically the SCS Type II Rainfall Distribution is utilized as part of the TR-55 analysis. Both the TR-55 Manual and Chapter 7

of the MDT Hydraulics Manual have been used as references for the SCS method in this report. MDEQ and the City of Missoula requires that the intent of the design for the site is that flows for a 2-year storm will not increase above existing levels, no roads will be overtopped for the 10-year storm, and no property damage (inundation of drainfields or structures) will occur for the 100-year storm.

The runoff volumes and peak flows from the 2-year and 100-year, 24-hour storms were analyzed for both pre-development and post-development conditions.

The primary inputs for the SCS Method are as follows:

- Curve Number: A curve number is selected for the watershed based on the soil texture (hydrologic soil group) and ground cover. Standard tables developed by the NRCS (formerly SCS) are used to select the appropriate number.
- Time of Concentration: The time of concentration is equal to the longest theoretical time for any drop of rain to flow from the point where it lands in the basin to the basin outflow point based on the longest flow path. Calculating a time of concentration involves summing flow times for runoff as sheet flow, shallow concentrated flow, and channel flow, if applicable. With other factors being equal, the shorter the time of concentration, the higher the design peak flows for a basin.
- Watershed/Basin Area: A basin is generally defined as an area which drains to a single point.
- Design Storm Depth: The SCS Method uses 24-hour storm depths developed by the National Oceanic and Atmospheric Administration (NOAA) with a selected design recurrence interval, such as 2, 5, 10, 25, 50, or 100-year storms. NOAA Atlas Maps for Montana are attached.
- Storm Distribution: To evaluate peak flows, it is necessary to select a design storm hyetograph, or rainfall time distribution pattern. TR-55 recommends a Type II design storm for all of Montana. This storm distribution concentrates a majority of 24-hour rainfall within a sharp peak lasting less than one hour. It is the most conservative of the standard SCS hyetographs for calculating peak flows.

The selection of a curve number enables the SCS method to model the capacity of the soil and land cover to capture and infiltrate rainfall. The model is highly non-linear in that relatively small percent increases in rainfall can lead to large increases in runoff, because as the infiltrative capacity of the soil is used up a higher percentage of precipitation will run off. As the SCS method accounts for soil saturation while the Rational Method generally does not, the SCS method may be more accurate in modeling runoff from natural soils and vegetation than the Rational Method.

Note that the TR-55 method has no specific considerations or adjustment for steep slopes and therefore, none are factored in for this site.

3.0 EXTENT OF STORM DRAINAGE

The following information pertains to offsite flow that may affect the proposed development as well as mitigation for storm water flow rates that will be increased due to the development.

3.1 DELINEATION OF DRAINAGE AREAS INSIDE THE SITE (ON-SITE)

3.1A HISTORICAL BASINS

The site is relatively steep (10%-15% slopes) and consists of open space grassland in fair to good condition groundcover. Note the previously discussed limitations of the TR-55 method regarding steeper slopes. Due to the surrounding topography, some off-site flow contributes runoff to this site. This is generally the same as the on-site flows and is considered the area southwest of the site and north of the existing road, Hillview Way. This off-site flow and the historical drainage patterns were considered for the runoff calculations for the site. Due to the off-site flow and the

proposed development layout, provisions will be made to pass these flows without entering the development's proposed storm infrastructure.

Any bypass drainage as described above will likely concentrate along the proposed road and then routed along the western property line, under/over and then away from the proposed trail. To remedy the potential for erosion due these concentrated flows, appropriately designed dissipation considerations will be planned for, which could include rip-rap or gravel check dams or other engineered infrastructure specifically for the prevention of hillside erosion.

As part of the property, there is an existing drainage collection swale on the north end of the property (downhill side) that collects runoff from the hillside for the surrounding area and then congregates at a single outlet point. This outlet then flows through an existing pipe down the remaining hillside into an open channel in Wapikiya Park, which from there enters the City of Missoula storm drainage system. As part of the proposed development, if post-development runoff rates and volumes are controlled and released at pre-development rates, then there should be no significant increase in runoff into the park drainage basin and City of Missoula storm infrastructure.

It is understood that the existing ditch/swale on the north (downhill) side of the site and all other existing piping are part of the City of Missoula's storm drainage system and any adjustment to such needs approved by the City before any work is to occur. Although we don't anticipate any major alterations to the City's infrastructure, where the controlled outlet from this proposed development into the City infrastructure (i.e. existing ditch) will need approval upon completion of final designs and construction plans.

3.1B DEVELOPED BASINS

Although the proposed roads and structures will alter the localized drainage patterns on the property, the overall drainage patterns and discharge points from the property will remain the same. The post-development conditions have been classified into five (5) separate drainage basins. The breakdown of the basins is based on these proposed drainage patterns of the proposed roads and structures on the steeper lot. As discussed in the section above, historical drainage patterns will be held, and the localized flow patterns will be collected and contained such that they can be routed to the existing patterns downstream. Collection and mitigation of storm water runoff will be accomplished by drainage infrastructure including (but not limited to) concrete curb and gutter, roadside ditches, catch basins, storm pipe, culverts, and collection ponds/basins.

A breakdown of the development basins with areas of different proposed groundcover are discussed later in this report and attached with curve numbers and basin areas.

3.2 DELINEATION OF DRAINAGE AREAS OUTSIDE THE SITE (OFF-SITE)

The off-site conditions are generally the same conditions as on-site with relatively steep slopes (10%-15%) and consists of open space grassland in fair to good condition groundcover. The off-site areas contributing flow that needs accounted for includes some areas southwest of our site and north of the existing Hillview Way. Due to the surrounding topography, some off-site flow contributes runoff to this site. This is generally the same as the on-site flows and is considered the area southwest of the site and north of the existing road, Hillview Way. This off-site flow and the historical drainage patterns were considered for the runoff calculations for the site. Due to the off-site flow and the proposed development layout, provisions will be made to pass these flows without

entering the development's proposed storm infrastructure. To plan for this flow, roadside ditch with gravel check dams and culverts to route this flow around or through the site.

4.0 PROVISIONS TO MITIGATE OFF-SITE STORM WATER FLOWS

As described in Section 3.2 of this report, off-site flows into the subdivision are expected due to the existing topography in the area southwest of our site and north of Hillview Way. All off-site flows concentrating to the site are accounted for and will be included in the on-site calculations below and will be mitigated accordingly. Existing drainage patterns will be maintained off-site and on-site.

5.0 PROVISIONS TO MITIGATE ON-SITE STORM WATER FLOWS

The calculations below and attached show that there will be an increase in storm runoff from the proposed development. See the table below for the post-development runoff generated for each basin.

5.1 CALCULATONS & DESIGN

Calculations for this report are based on the SCS Type II Rainfall Distribution for calculating storm water runoff and conducted using the USDA/NRCS TR-55 method. Pre and post-development runoff rates and volumes were determined for the 2-year and 100-year design storms with 24-hour durations. Calculations were made using curve numbers, basins, and time of concentration to ensure proper routing and that any proposed infrastructure is not inundated. Per City of Missoula and standards, the design for the site is that flows for the 100-year storm and developed peak flows are limited to the pre-development flows for the 100-year event. For all calculations, refer to the attached TR-55 calculations.

5.1A HYDROLOGIC SOIL GROUP

The NRCS Soils Data was obtained from the Web Soil Survey website (located at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) to determine hydrologic soil group (HSG). The NRCS Soils Data for this site shows it to be a combination of Bigarm Gravelly Loam, which is HSG=B and Minesinger-Bigarm Complex, which is HSG=C.

5.1B CURVE NUMBERS & LAND USE DATA

Curve numbers were obtained from the TR-55 Manual, Tables 2-2a, 2-2b, and 2-2c. When there are multiple or combination of hydrologic soil groups, a weighted curve number is determined for the different areas. Due to the existing on-site soil is a combination of HSG B and C (from above) and is primarily groundcover classified as *"pasture, grassland, or range in fair condition,"* the Curve Number (CN) of 69 and 79, respectively for the HSG's was utilized for existing condition in the TR-55 method. For post-development, all proposed impervious infrastructure (i.e. structures, asphalt, concrete, etc.), landscaping (sod, re-seeded), and undisturbed areas were included for the site. See the summary table below and the attached to this report for the data used for this site.

Hydrologic Soil Group (HSG)	B & C	from Web Soil Survey in 4.1A above
Curve Number (CN) – Existing Ground	69	HSG = B for "pasture, grassland, or range in fair condition"
	79	HSG = C for "pasture, grassland, or range in fair condition"
Curve Number (CN) – Impervious Areas	98	standard for impervious (asphalt, concrete, buildings, etc.) from TR-55 for all hydrologic soils groups (HSGs)
Curve Number (CN) – Seeding & Landscape*	61	HSG = B for "open space – good condition, >75% ground cover" or "pasture, grassland, or range in good condition"
	74	HSG = C for "open space – good condition, >75% ground cover" or "pasture, grassland, or range in good condition"

**Note: for the final landscaping/sod/seeding of disturbed areas, the same curve numbers are the same for "open space, good condition (grass cover >75%)" as for "pasture, grassland, or range in good condition" for both HSG 'B' and 'C' (i.e. CN=61 for HSG=B, and CN=74 for HSG=C for both open space lawns and natural looking vegetation that is classified as pasture/grassland/range). Generally, lawn areas are classified by the City as irrigated and mowed, and natural vegetation will be all other landscaped areas, not specifically sodded areas.*

5.1C BASINS AND AREAS

The site was split into five (5) different basins/areas for the drainage areas based on the post-development grading. Each basin has an area associated with it and incorporates the post-development infrastructure such as impervious area (asphalt, concrete, buildings, roads, etc.), landscaping (re-seeded areas), and undisturbed areas. A breakdown of the basin areas with associated groundcover is attached to this report.

5.1D TIME OF CONCENTRATION

Time of concentration was determined by the TR-55 Program and is calculated based on the longest flow path and watercourse slope of the pre-development and post-development conditions for the site and individual basin(s). Time of concentration is broken down into sheet flow, shallow concentrated flow, and channel flow for all pre- and post-development drainage basins. A summary of the calculations is attached showing flow lengths, slopes, and types of flow are attached. Also, time of concentration calculations are attached with the WinTR-55 program inputs/outputs. Note that the minimum allowable value of time of concentration for TR-55 is 0.100 hr. If the calculated value falls below this minimum, the minimum value will be utilized as shown in the WinTR-55 program.

5.1E STORM DATA

The SCS Method uses 24-hour storm depths developed by the National Oceanic and Atmospheric Administration (NOAA) with a selected design recurrence interval, such as 2, 5, 10, 25, 50, or 100-year storms. The state of Montana uses the Atlas 2 method. Also, the MDT and MDEQ have published specific storm data for specific sites through the state. Also, there is a NOAA website that allows for site specific precipitation values for the 2-year and 100-year storms from NOAA Atlas 2, which can be deemed more accurate. Using the NOAA website (http://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm) with a site specific latitude/longitude of 46.8285°N, -114.0282°W provides the following precipitation amounts and intensities:

	Design Storm (24-hour)	
	2-year	**100-year**
Precipitation Amount (in)	1.20	2.58
Precipitation Intensity (in/hr)	0.05	0.11

5.1F INPUTS FOR WinTR-55 PROGRAM

The values described in Section 5.1 above are input into the WinTR-55 program to determine the runoff rate and volume of the pre- and post-development basins. See the attached printout of the WinTR-55 Input data showing variable inputs.

5.2 STORMWATER MANAGEMENT & CALCULATION OUTPUTS

On-site collection of stormwater runoff is planned to contain the runoff from the design storm. Detention will be required if the site was to hold the change in runoff from the pre-development vs. post-development for the 100-year, 24-hour storm runoff and meet the requirements for both storage and flowrate. Site constraints and surrounding topography determine the stormwater management requirements. For this specific site, the proposed collection and stormwater management is discussed later in this report.

5.2A RUNOFF VOLUMES AND RUNOFF RATES (WinTR-55 Results)

After using the TR-55 Method by inputting values into the WinTR-55 Program, the analysis was run and calculated the flow rates for the storm event(s) analyzed for this project. A summary of the results is presented below, with the WinTR-55 program output pages and drainage summaries attached.

Pre or Post	Basin	Runoff Volume (V) (cf)	Runoff Rate (Q) (cfs)
		100-yr	100-yr
Pre	On-Site	50,940	17.93
Pre & Post	Off-Site	26,921	9.66
Post	1	14,653	5.50
Post	2	13,957	6.01
Post	3	15,909	6.73
Post	4	12,579	4.80
Post	5	11,235	3.93

As is demonstrated by the calculations, the development will increase the stormwater runoff from the site generally due to the increase of additional impervious areas (asphalt, buildings, gravel, etc.). The higher post-development runoff volume than pre-development means containment and conveyance is required.

Note, that since this is preliminary planning for this development to determine magnitudes of runoff rates and volumes for preliminary sizing of stormwater infrastructure. As final grading occurs, basins may change slightly, and calculations will need updated. Different or additional drainage mitigation design will be required for the basins in this case. As for now, the site will utilize curb, catch basins, storm pipe, and containment areas (i.e. swales or ponds) are planned for the associated post-development runoff.

Full preliminary calculations and summaries are attached.

5.2B GENERAL STORMWATER DESIGN – ON-SITE

To meet the requirement to not exceed the pre-development runoff rates and due to site constraints, the proposed stormwater design will be to mitigate the difference in pre-development and post-development runoff rates and volumes for the 100-year, 24-hour storm event. A storm drainage collection system of curb, catch basins, storm piping, swales and collection pond(s) will route post-development runoff throughout the site. All roof drains from the proposed structures will tie into the proposed storm drainage system to prevent excess runoff on the finished ground surface so not to inundate structures or surface infrastructure.

Catch basins with storm pipe that outlet to culverts are planned to route the stormwater runoff from the design storm. Future calculations will follow to size the proposed storm pipes between catch basins and ensure the existing downstream culvert is adequate to handle the increase of runoff flow rates from the post-development site.

Basin 1

Runoff will route on the south-eastern portion of the site and then west down the curb line and storm drainage system and combine with Basin 2 stormwater runoff at the mainline of the storm drainage system that runs south-to-north down the hillside between the townhomes.

Basin 2
Includes the road from Hillview Way and eventually catches the storm drain, which will combine with the stormwater flow from Basin 1 at the storm drainage system that runs south-to-north down the hillside between the townhomes.

Basin 3
Includes the south-western stormwater runoff and follows the proposed curb into the storm drainage system via inlets, then routes through the storm drainage system (catch basins and piping) to a junction point at a proposed catch basin that runs south-to-north down the hillside between the townhomes. This junction point will also need to consider the stormwater flow from Bains 1, 2, and 4 as all stormwater congregates at this point.

Basin 4
Includes the middle-eastern stormwater runoff and follows the proposed curb into the storm drainage system via inlets, then routes through the storm drainage system (catch basins and piping) to a junction point at a proposed catch basin that runs south-to-north down the hillside between the townhomes. This junction point will also need to consider the stormwater flow from Bains 1, 2, and 3 as all stormwater congregates at this point. This will be considered the last point before release of runoff at pre-development rates.

Basin 5
Will be the runoff associated with the backside (downhill) of the entire development. This accounts for developed lawn areas and the undisturbed areas, including the existing drainage collection swale that outlet through Wapikiya Park. Additionally, this includes the area to the western side of the site where a future gravel trail will be constructed. This basin generally runs off-site without being collected.

Off-Site
Off-site stormwater runoff calculations will remain the same both pre- and post-development since no changes will occur off-site, meaning no increase in runoff. However, mitigation will be required to prevent runoff into the development. Generally, the off-site will be caught in the roadside ditch and routed around the subdivision on the western side to avoid the mitigation on-site in the proposed storm drainage system. The utilization of a roadside ditch with gravel check dams and culverts will help route stormwater flow through and around the site.

Summary
Based on the calculations in Section 5.2A above, provisions will need to be made to contain the excess runoff from post-development compared to pre-development. Due to Basin 5 automatically running off to the existing drainage swale down the hill to the north, it counts against the post-development containment requirement. The requirement to limit post-development runoff to pre-development runoff rates requires analysis of what automatically leaves the site versus what is collected on-site. From the above (and attached summary):

Runoff Rates
Pre-Development (On-Site) = 17.93 cfs
Post-Development Flow (Basin 1-4) = 23.04 cfs
Post-Development Flow (Basin 5) = 3.93 cfs

Max. post-development release (total pre-development rate) = 17.93 cfs
Max. remaining post-development release due to Basin 5 = 17.93 cfs – 3.93 cfs = **14.00 cfs**

Runoff Volumes
Pre-Development (On-Site) = 50,940 CF
Post-Development (Basin 1-4) = 57,099 CF
Post-Development (Basin 5) = 11,235 CF

Difference that needs to be detained on-site = 57,099 CF + 11,235 – 50,940 CF = **17,393 CF**

However, in discussions with the City of Missoula, it was determined that the maximum design flow for the existing 18-inch outlet pipe into Wapikiya Park is 7 cfs from previous City of Missoula design models. Because of this, we can't at exceed this design flow at all. Additionally, because this existing design flow (7 cfs) is for the entire hillside where the existing drainage ditch contributes (i.e. more than just the proposed development site area), we need to "pro-rate" the ratio of existing design flow from our site versus the entire design flow (the 7 cfs).

To perform this "pro-rated" ratio of our site's contribution to the design flow, we analyzed aerial and topographic imaging to determine that total hillside contributing area to the existing drainage swale and outlet into Wapikiya Park. An exhibit is attached showing the determined contributing area and site area and a summary of the pro-rated calculation shown here:

"Pro-Rated" Outlet Design Flow to City of Missoula Existing Drainage Infrastructure
Existing Design Outlet Flow to Wapikiya Park = 7 cfs (provided from City of Missoula)

Total Contributing Area to Existing City of Missoula Drainage Ditch = 66.5 acres

Total Proposed Development Site Contributing Area = 25.6 acres

Percentage of Contributing Flow from Proposed Development Area versus Overall Contributing Flow to Existing Ditch = (25.6 acres) / (66.5 acres) = 38.5 %

Allowable "pro-rated" flow to be released from the proposed site = (7 cfs)*(38.5%) = **2.7 cfs**

An outlet pipe or orifice will be sized so not to exceed the "pro-rated" flow rate of **2.7 cfs** (from above). The site will be utilized to develop containment basin(s), exact placement to be determined upon completion of construction plans, that will hold this required volume. After containment on-site, for the 100-year design storm event, runoff will exit the containment (i.e. pond, concrete structure, etc.) through a rip-rap and concrete structure that will dissipate the high flow rates generated from the site prior to entering the existing downhill on-site swale. Note that the required volume to be detained is only for the 100-year design storm event. In the possibility that a larger storm event occurs, the runoff will overtop the detainment structure and release down the hillside slope with erosion control measures and into the existing drainage ditch.

As is shown on the hydrographs developed by the WinTR-55 program for the pre-development on-site conditions and the post-development on-site conditions (Basins 1-4), the peak occurs at generally the same time near the mid-storm at 12 hours. See the attached hydrographs.

5.2C STORM PIPE SIZING AND OUTLET

Site Outlet – Pond/Final Collection Area to Existing City of Missoula Infrastructure

As described above, the final collection area (i.e. pond or vault, exact TBD) collects all interior storm drainage from the catch basins and storm piping. The collection area will be designed to detain the difference in runoff volume between pre and post-development. The outlet from the detention infrastructure will be designed to be released only at the "pro-rated" flow rate previously described in Section 5.2B of this report. This will limit and prevent adverse effects on the existing City of Missoula drainage infrastructure.

Site Interior – Catch Basin to Catch Basin

Catch basins with storm pipe that outlet to culverts are planned to route the stormwater runoff from the design storm. Future calculations will follow to size the proposed storm pipes between catch basins and ensure the existing downstream culvert is adequate to handle the increase of runoff flow rates from the post-development site.

The basin breakdown will be clearly defined in the post-development grading with the different curb collection and catch basin locations. Each catch basin had its individual contributing basin, and as it moved downstream may have other contributing basins.

Different pipe sizes will be analyzed to determine their maximum flow capacity. Often, especially on steep sites with tight drainage areas, a factor-of-safety can be applied by assuming a percentage flowing full. For future storm pipe calculations, we will likely assume 75% flowing full. Note that is only for pipes interior to the project. All interior site piping eventually collects at the overall collection detention area. This on-site collection area then outlets only at the "pro-rated" flow rate previously described in Section 5.2B of this report.

Pipe capacities will still depend on slopes of the pipe between catch basins, which will be determined upon final site grading. See the attached spreadsheet "Pipe Flow Calculations" that shows how different pipe sizes and different flow full capacities can be utilized to carry the required flows. This spreadsheet will be included with the future report for all catch basin pipe sizing calculations.

Based on the above maximum flow rates for different size storm pipes, the outlet storm pipe from the different catch basins can be analyzed. An example of the breakdown of the future selected outlet storm pipe from each catch basin is as follows:

EXAMPLE ONLY– Future Catch Basin Storm Pipe Sizing

Basin	Peak Flow Rate at Outlet of CB (cfs)	Inlet Storm Pipe Size (inches)	Outlet Storm Pipe Size (inches)
CB #1	TBD	N/A – first catch basin	TBD
CB #2	TBD	TBD	TBD
CB #3	TBD	TBD	TBD
CB #4	TBD	TBD	TBD

Refer to the Civil Construction Plans for drainage patterns and finished grading with locations of catch basins, storm piping, culverts, concrete cove gutter and other drainage infrastructure.

5.3 STORMWATER DISCHARGE TO GROUND

Generally, the TR-55 method accounts for some infiltration due to the curve number based on groundcover and hydrologic soil group conditions. Other than the infiltration accounted for using

this drainage analysis method, no infiltration is planned, and the collection to containment of stormwater runoff will be utilized.

6.0 EROSION CONTROL

Erosion control will likely be required due to the size of the site and to ensure no excess sediment leaves the site. With the existing site topography (10-15%) and proposed grading, high flow velocities are a potential and stormwater infrastructure will be designed to handle these flows and mitigate them as much as possible. Any excess sediment generated from the site will be collected and allowed to settle in catch basins or collection ponds, depending on the final site design.

If a stormwater pollution prevention plan (SWPPP) will be required through the Montana Department of Environmental Quality (MDEQ) and/or the City of Missoula, it will be the responsibility of the Contractor (or owner if previously agreed upon) to prepare, obtain, and administrate a SWPPP and any other erosion control permits required by the City of Missoula.

7.0 CONCLUSIONS

This report and drainage calculations are considered preliminary to understand the magnitude of stormwater rates and volumes. A future final grading and drainage report will be completed that will include final sizing of stormwater collection areas, catch basin sizing, storm pipe sizing, and outlet sizing such that runoff volumes are contained, and that post-development runoff leaves the site only at pre-development rates. Final site grading will be required before the final drainage calculations can be completed. Other existing drainage patterns in non-disturbed (i.e. drainage collection swale) or off-site (i.e. property to the southwest) areas will be maintained with flows being routed to these areas. All drainage will be directed away from any proposed structures and the site is graded so that the building will not be affected.

It is understood that the existing ditch/swale on the north (downhill) side of the site and all other existing piping are part of the City of Missoula's storm drainage system and any adjustment to such needs approved by the City upon completion of final designs and construction plans, and prior to any work occurring on-site.

Because this report is preliminary, the calculations shown herein could change depending on final site conditions and grading.

All construction will be in accordance with the final Construction Plans, Montana Public Works Standard Specifications (MPWSS), City of Missoula requirements, and MDEQ regulations, as required.

Prepared by:
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Andrew Mill, E.I.

Reviewed by:
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Cory Davis, P.E.

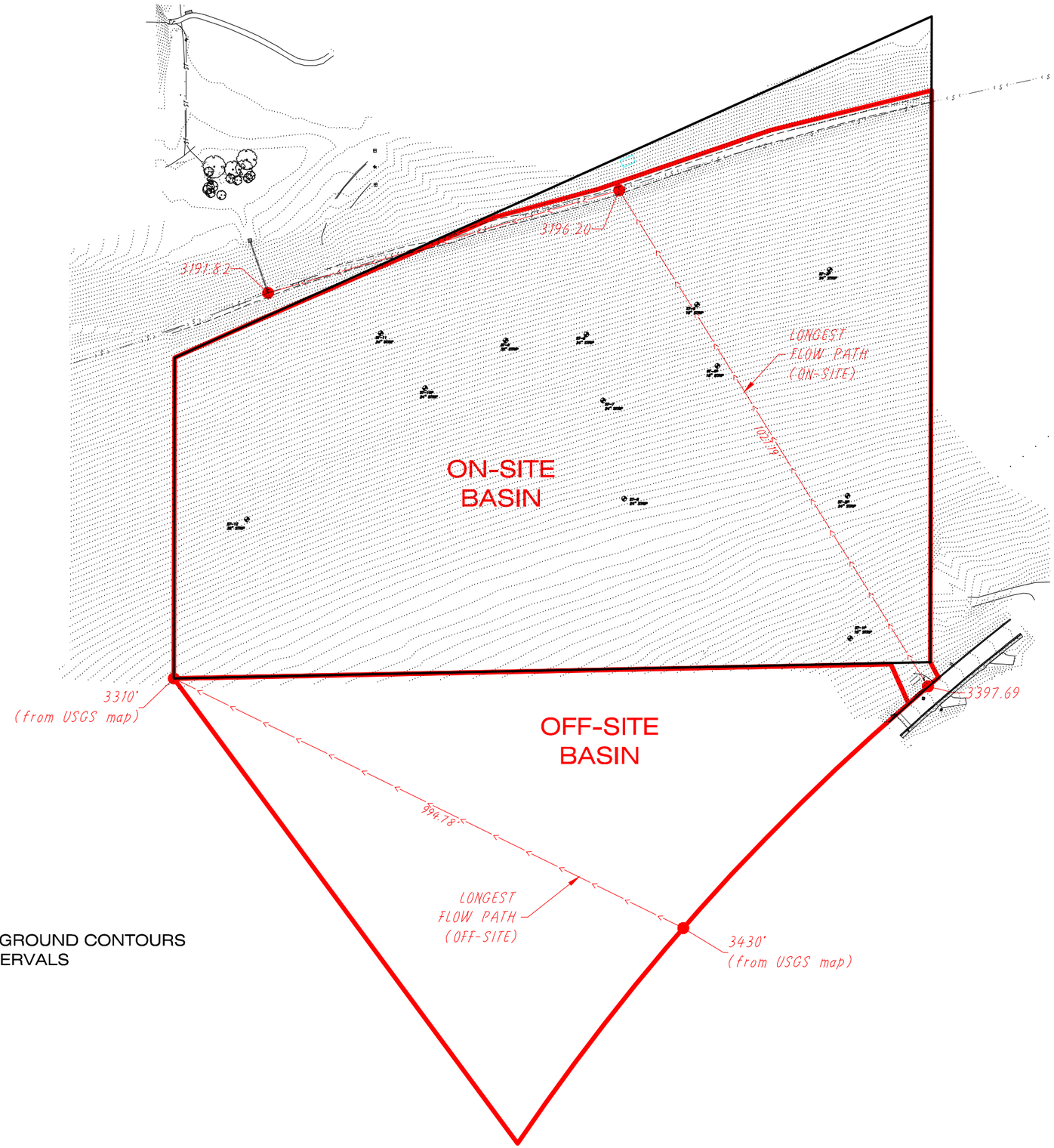
T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\3_ENG DESIGN\3.5_DEQ8 (Storm Drainage)\Rpt.TR-55.Hillview Crossing.Prelim.2018-10-02.Revised CN & City Comments.doc

LIST OF ATTACHMENTS

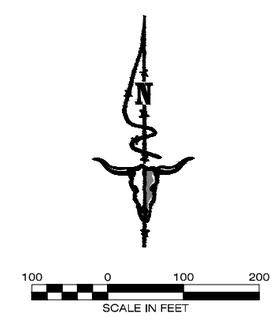
- Drainage Exhibits with Basin Delineation *(2 total sheets)*
  - Pre-Development Conditions Exhibit *(1 sheet)*
  - Post-Development Conditions Exhibit *(1 sheet)*
- Drainage Flow Pro-Rated Exhibit *(1 page)*
- "Preliminary Drainage Calculations" Spreadsheet *(3 pages)*
- NRCS Soils Data – Hydrologic Soil Group *(4 pages)*
- Precipitation Frequency Data Output NOAA – Site Specific Precipitation *(1 page)*
- TR-55 Tables 2-2a, 2-2b, 2-2c for Curve Numbers *(3 pages)*
- "Pipe Flow Calculations" Spreadsheet *(1 page)*
- Manning's Roughness Coefficients *(1 page)*
- WinTR-55 Input Data *(4 total pages)*
  - Identification Data, Sub-Area Data, Storm Data *(1 page)*
  - Sub-Area Summary Table *(1 page)*
  - Sub-Area Land Use and Curve Number Details *(1 page)*
  - Sub-Area Time of Concentration Details *(1 page)*
- WinTR-55 Output Data *(2 total pages)*
  - Watershed Peak Table *(1 page)*
  - Hydrograph Peak/Peak Time Table *(1 page)*
  - Hydrograph – Pre-Development *(1 page)*
  - Hydrograph – Post-Development *(1 page)*
- WinTR-20 Output Data – Runoff Volumes *(60 pages)*
- ~~Civil Construction (Grading & Drainage) Plans *(attached separately)*~~ **Not complete or included yet**

INCLUDED BY REFERENCE

USDA NRCS TR-55 Urban Hydrology for Small Watersheds Manual *(June 1986)*
WinTR-55 Program *(version 1.00.10)*
WinTR-55 User Guide – Small Watershed Hydrology *(January 2009)*
Montana Department of Transportation Drainage Manual
Montana Public Works and Specifications *(latest edition)*
Missoula County Public Works Manual *(January 2010)*
Montana Department of Environmental Quality Circular 8 *(2017 Edition)*



NOTE: EXISTING GROUND CONTOURS SHOWN AT 2' INTERVALS



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PLOT DATE: 10/3/2018 9:16 AM

REVISIONS | DATE

DESIGNED:
DRAFTED: AM
CHECKED:
DATE: 10/2/2018

LOCATION: HILLVIEW WAY
SECTION 6, T12N, R19W, P.M.M.
CITY OF MISSOULA
MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING LLC

PROJECT NAME: HILLVIEW CROSSING TOWNHOMES

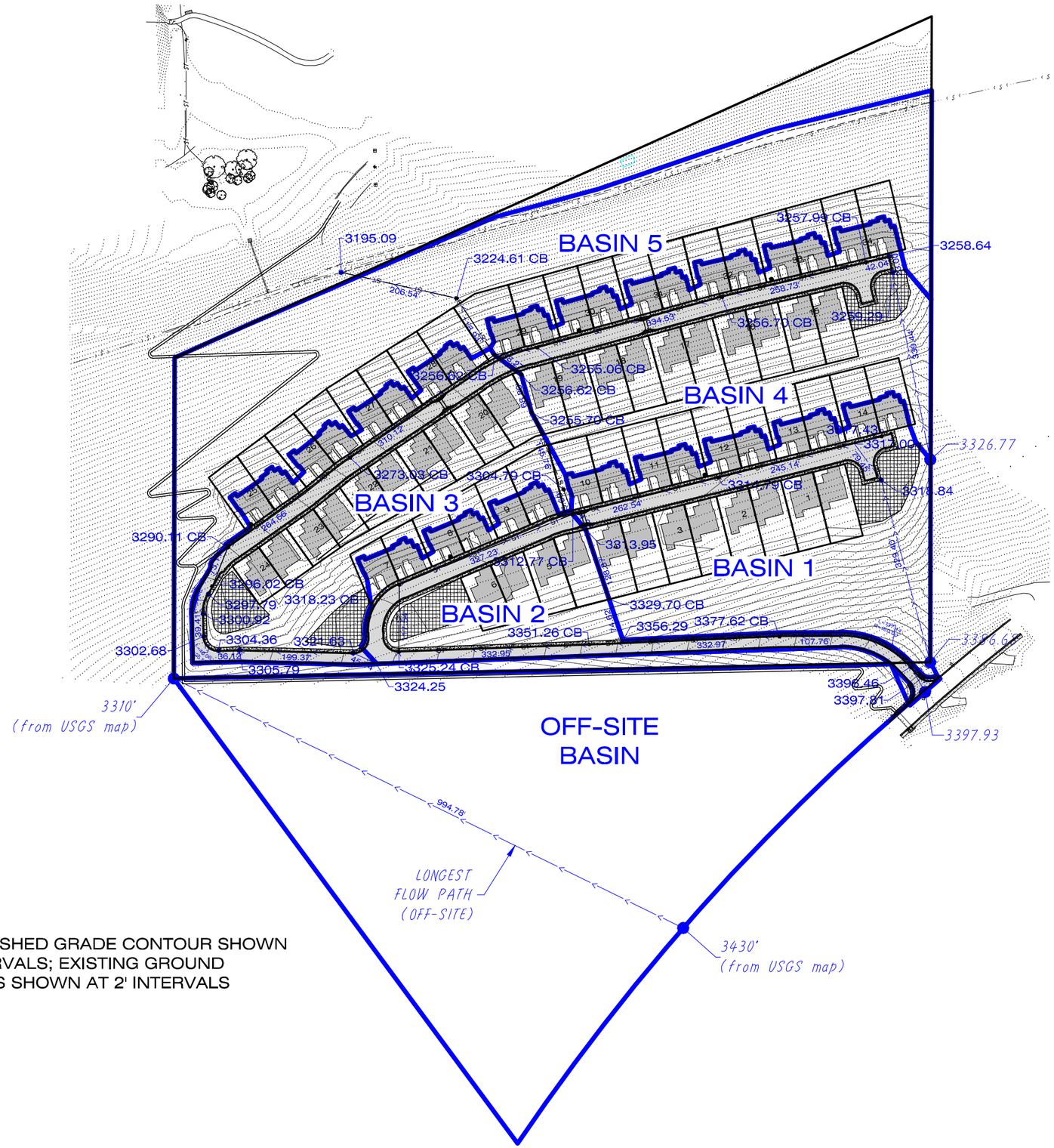
SHEET TITLE: PRE-DEVELOPMENT CONDITIONS

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE PROJECTS\3592 - HILLVIEW CROSSING\MISSOULA & HILLS DRIVE\DRAFTING\DEVELOPMENT_DRAFTING\DEVELOPMENT_DRAWINGS\AUTOCAD\1\MSC-DTW\WIDSEDH1-14-3592-01PMNVASE (AV 2018-09-14) 2018-10-02.DWG



NOTE: FINISHED GRADE CONTOUR SHOWN AT 5' INTERVALS; EXISTING GROUND CONTOURS SHOWN AT 2' INTERVALS

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Fax: 406/721-5224

PLOT DATE: 10/3/2018 9:15 AM

REVISIONS	DATE

DESIGNED:
DRAFTED: AM
CHECKED:
DATE: 10/2/2018

LOCATION: HILLVIEW WAY SECTION 6, T12N, R19W, P.M.M. CITY OF MISSOULA MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING LLC

PROJECT NAME: HILLVIEW CROSSING TOWNHOMES

SHEET TITLE: POST-DEVELOPMENT CONDITIONS

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

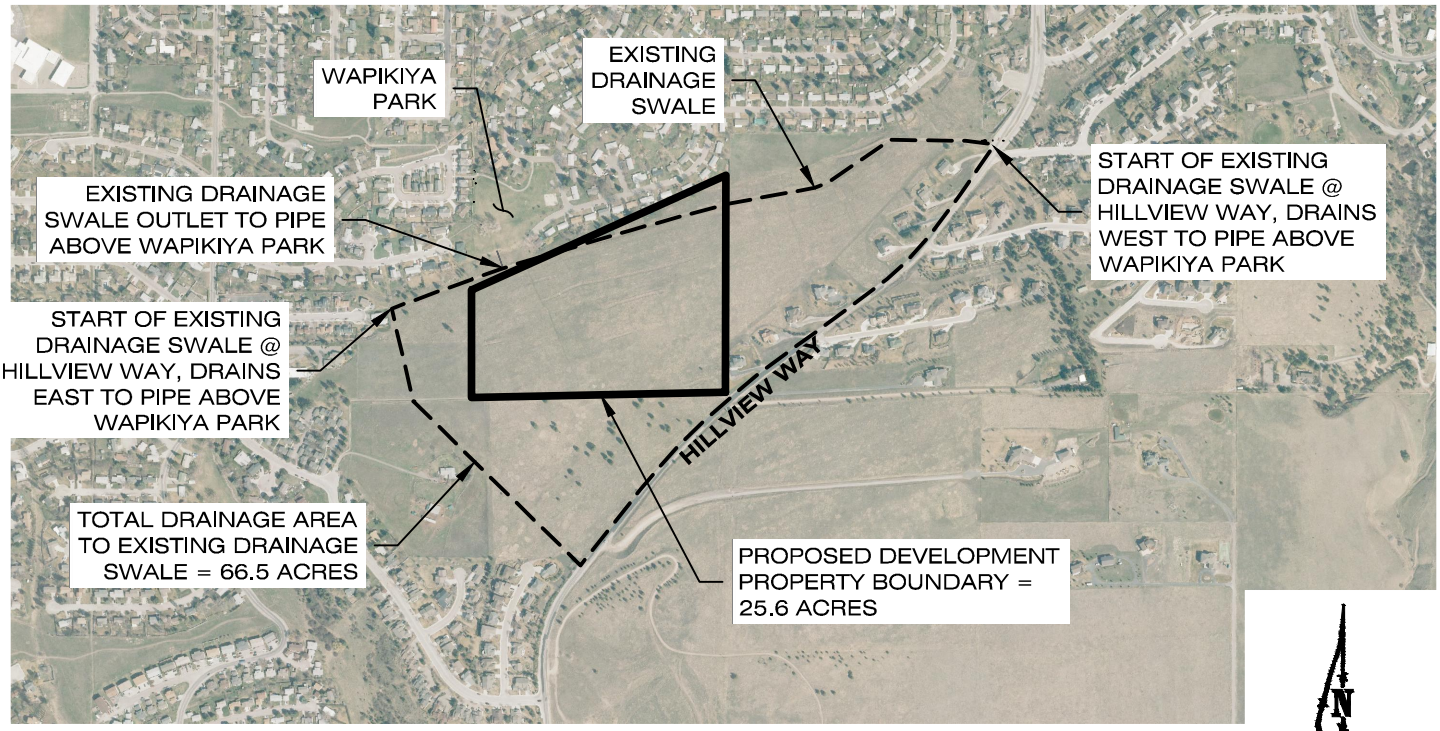
FILE LOCATION: T:_ACTIVE PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA & HILLS DRIVE-DOWNTOWN_DEPARTMENTS\LANDWORKS\AUTOCAD\MSC-DTW\WRGS\DP1-14-3592-DPM\NASE (AV 2018-09-14) 2018-10-02.DWG

DRAINAGE PRO-RATED FLOW TO OUTLET (LEAVE SITE) INTO SWALE

EXISTING OUTLET FLOW FROM EXISTING DITCH = 7 CFS

PERCENTAGE OF CONTRIBUTING FLOW FROM PROPOSED DEVELOPMENT AREA VERSUS OVERALL CONTRIBUTING FLOW TO EXISTING SWALE = (25.6 ACRES)/(66.5 ACRES) = 38.5%

ALLOWABLE PRO-RATED FLOW TO BE RELEASED FROM PROPOSED DEVELOPMENT = (7 CFS)*(38.5 %) = 2.7 CFS



AERIAL MAP

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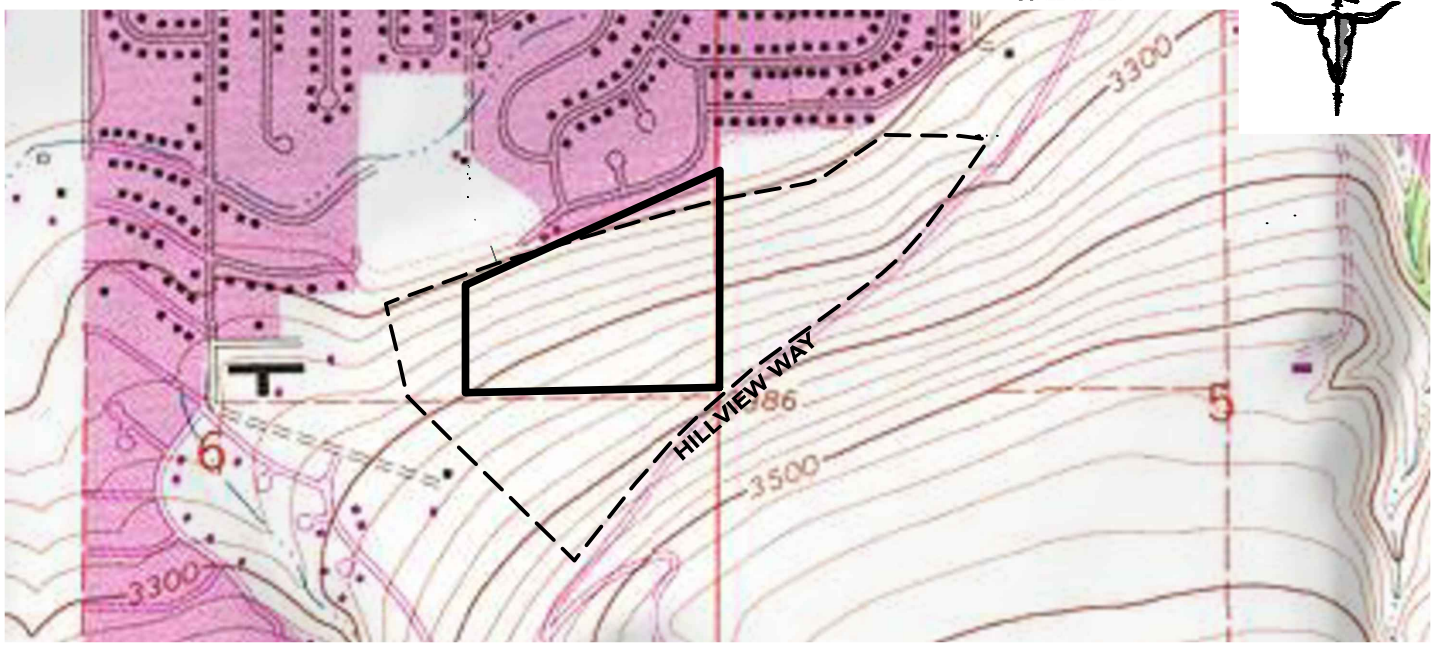
SCALE IN FEET



USGS TOPOGRAPHIC MAP

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DRAINAGE FLOW PRO-RATED MAP
HILLVIEW CROSSING TOWNHOMES
CITY OF MISSOULA
SECTION 6, T12N, R19W, P.M.M.
MISSOULA COUNTY, MONTANA

PROJECT#: 14-3592
TAB: PRO-RATED FLOW
DRAFTER: AM
DATE: 9/28/2018
SHEET 1 OF 1

PLOT DATE: 9/28/2018 12:31 PM DWG LOCATION: T:\1_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA\1-DEVELOPMENT\DRAFTING\1_DRAWINGS\AUTOCAD\MISC. DRAWINGS\EXH-14-35_2-DRAINAGE (AM 2018-09-14).DWG

Preliminary Drainage Calculations

Development Name: **Hillview Crossing Townhomes**
Project Number: **14-3592**
Date: **10/2/2018**

Pre-Development (Existing Conditions)

NRCS Soils: **Bigarm Gravelly Loam (18) / Minesinger-Bigarm Complex (8)**
HSG: **B / C**

Groundcover: **Pasture/Rangeland/Grassland - Fair Condition (50%-75% cover)**
(Table 2-2 of TR-55 Manual)
Curve Number: **69 / 79** (CN=69 for HSG 'B', CN=79 for HSG 'C')
(Table 2-2 of TR-55 Manual)

Post-Development (Proposed Conditions)

Basin #	Description	Included Townhome #s
1	SE Corner	1-4, 10-14
2	Access & Southern	5-9
3	Western	20-28
4	Eastern	15-19, 29-34
5	Northern & Western Trail Area	None

Basin Areas

		Pre-Development		Post Development					
		On-Site	**Off-Site**	**1**	**2**	**3**	**4**	**5**	
Total Area	**sq.ft.**	1,070,548	528,734	209,825	116,962	181,470	216,575	345,680	
	acres	24.58	12.14	4.82	2.69	4.17	4.97	7.94	
Impervious	**sq.ft.**	0	0	67,619	69,064	80,129	82,187	0	=house + roads/concrete
CN = 98	**acres**	0.00	0.00	1.55	1.59	1.84	1.89	0.00	
Semi-Impervious	**sq.ft.**	0	0	0	0	0	0	4877	
CN = 85 or 89	**acres**	---	---	---	---	---	---	0.11	
Landscaping	**sq.ft.**	0	0	142,206	47,898	101,341	134,388	134,878	assumes B1-B4 will all be good condition grass post-dev.
CN = 61 or 74	**acres**	---	---	3.26	1.10	2.33	3.09	3.10	assumes only portion of B5 good condition landscape
Existing Undisturbed	**sq.ft.**	1,070,548	528,734	0	0	0	0	205,925	
CN = 69 or 79	**acres**	24.58	12.14	0.00	0.00	0.00	0.00	4.73	

Preliminary Drainage Calculations

Development Name: **Hillview Crossing Townhomes**
Project Number: **14-3592**
Date: **10/2/2018**

Longest Flow Path

		Pre-Development		Post Development					
	Basin	**On-Site**	**Off-Site**	**1**	**2**	**3**	**4**	**5**	
Total	**feet**	1021	1000	917	1356	1044	998	119	
Longest Flow Path Description		Sheet flow across hill to (E) drainage swale	Sheet flow across hill and across part of our site	Sheet flow from near Hillview Way to end Road 'B' then to (P) curb to inlet	from Hillview Way access and down (P) curb to storm inlet in middle Road 'B'	flow in (P) curb line to storm inlet on bottom Road 'A'	sheet flow east side of site to end Road 'A' and in (P) curb to storm inlet middle of bottom road	backside of last of houses to existing storm swale	
Sheet	feet	100	100	100		45	100		note: max. 100 feet allowed for WinTR-55 program
	elev. Δ	----	----	69.68		3.42	----		
	slope	0.121	0.121	0.170		0.076	0.198		
	description	1st 100' sheet	1st 100' sheet	start		across road	sheet		
Shallow Conc.	feet	921	895	309	245	351	240		
	elev. Δ	----	----	69.68	18.84	84.31	----		
	slope	0.121	0.121	0.170	0.077	0.240	0.198		
	description	after 1st 100'	after 1st 100'	to curb line	curb flow line	curb flow line	after 1st 100'		
Shallow Conc.	feet			245			65		
	elev. Δ			2.21			1.30		
	slope			0.009			0.020		
	description			curb flowline			curb flowline		
Channel	feet			263	1111	648	593	119	
	elev. Δ			2.02	64.85	39.40	1.37	32.01	
	slope			0.008	0.058	0.061	0.002	0.269	
	description			storm pipe	storm pipe	storm pipe	storm pipe	storm pipe	

Preliminary Drainage Calculations

Development Name: **Hillview Crossing Townhomes**
Project Number: **14-3592**
Date: **10/2/2018**

WinTR-55 Outputs

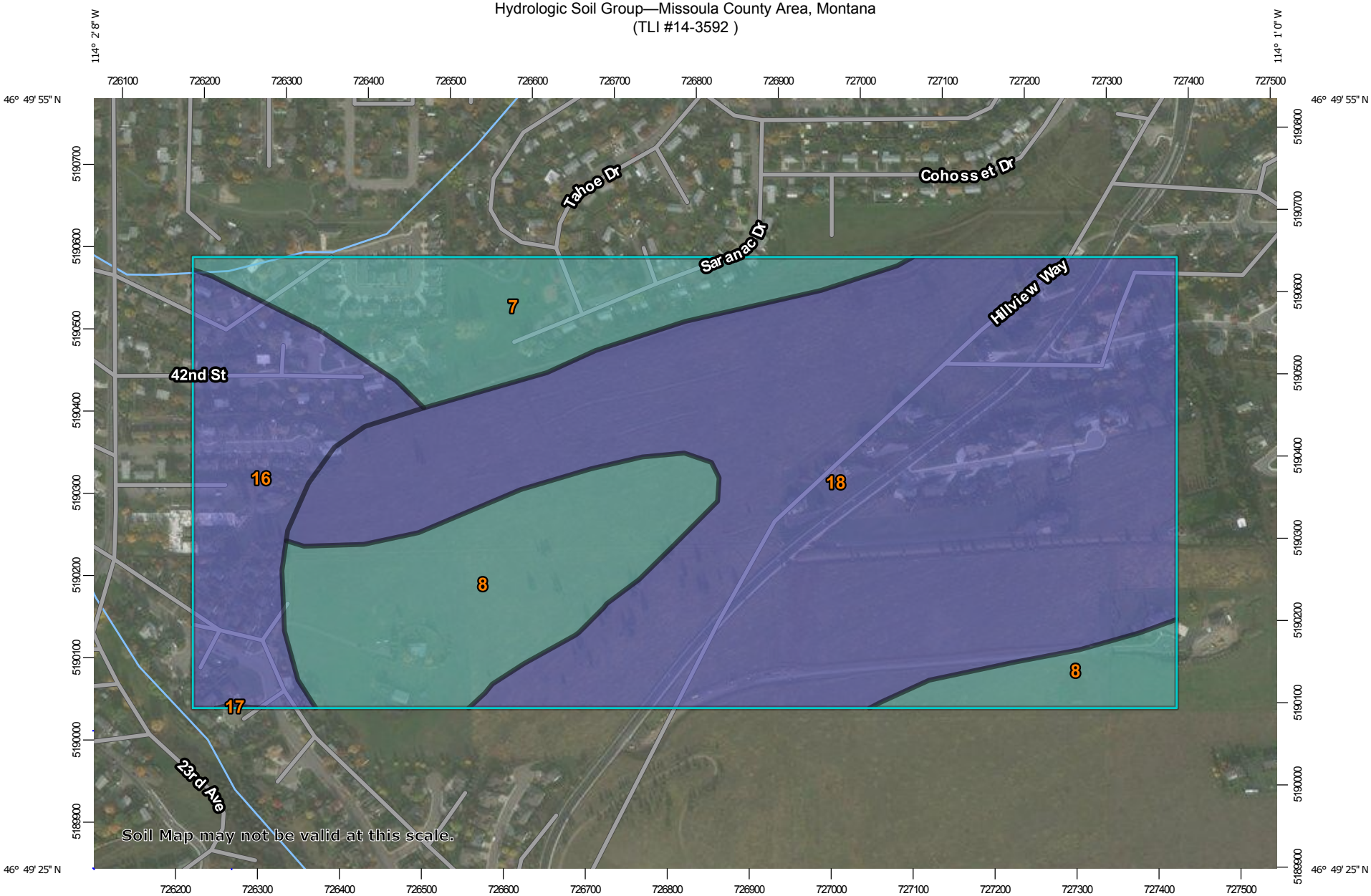
	Pre-Development		Post Development					
Basin	**On-Site**	**Off-Site**	**1**	**2**	**3**	**4**	**5**	
Basin Area (sf)	1,070,548	528,734	209,825	116,962	181,470	216,575	345,680	from above
Q 2-year	0.15	0.12	0.48	1.49	1.06	0.21	0.00	output from WinTR-55 program
			3.24					
Q 100-year	17.93	9.66	5.50	6.01	6.73	4.80	3.93	output from WinTR-55 program
			23.04					
V 2-year (in.)	0.041	0.027	0.058	0.275	0.131	0.020	0	TR-20 output from WinTR-55 program
V 2-year (cf)	3,658	1,190	1,014	2,680	1,981	361	0	calc'd using basin area
V 100-year (in.)	0.571	0.611	0.838	1.432	1.052	0.697	0.39	TR-20 output from WinTR-55 program
V 100-year (cf)	50,940	26,921	14,653	13,957	15,909	12,579	11,235	calc'd using basin area
Total Volume (cf)	50,940	26,921	57,099				11,235	

Pre-Development Flow Rate (100-year)	17.93	cfs	On-Site Pre-Dev.
Post-Dev. Flow Rate (100-year) - Lost Off-Site	3.93	cfs	Basin 5, flows automatically lost off-site
Post-Dev. Flow Rate (100-year) - On-Site	23.04	cfs	Basins 1-4
Remaining Flow Rate Allowed to Leave Site	**14.00**	cfs	Pre-Development - Basin 5 (flows off-site)
Volume Difference b/w Pre & Post	**17,393**	cubic feet	

Catch Basin Sizing

Catch Basin	Basin Description	Peak Flow Rate (cfs)		Total Peak Flow Rate (cfs)
CB 1/2	Basins 1 & 2	5.50	Basin 1	11.51
		6.01	Basin 2	
CB 3/4	Basins 1, 2, 3, & 4	5.50	Basin 1	23.04
		6.01	Basin 2	
		6.73	Basin 3	
		4.80	Basin 4	

Hydrologic Soil Group—Missoula County Area, Montana
(TLI #14-3592)



Map Scale: 1:6,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Missoula County Area, Montana
Survey Area Data: Version 15, Sep 21, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 6, 2014—Nov 2, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7	Minesinger-Bigarm complex, 0 to 4 percent slopes	C	19.7	12.1%
8	Minesinger-Bigarm complex, 4 to 15 percent slopes	C	29.3	17.9%
16	Bigarm gravelly loam, 0 to 4 percent slopes	B	19.1	11.7%
17	Bigarm gravelly loam, 4 to 15 percent slopes	B	0.0	0.0%
18	Bigarm gravelly loam, 15 to 30 percent slopes	B	95.3	58.3%
Totals for Area of Interest			**163.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Precipitation Frequency Data Output

NOAA Atlas 2

Montana 46.8285°N 114.0282°W
Site-specific Estimates

Map	Precipitation (inches)	Precipitation Intensity (in/hr)
2-year 6-hour	0.75	0.13
2-year 24-hour	1.20	0.05
100-year 6-hour	1.70	0.28
100-year 24-hour	2.58	0.11

Go to PFDS
Go to NA2

Hydrometeorological Design Studies Center - NOAA/National Weather Service
1325 East-West Highway - Silver Spring, MD 20910 - (301) 713-1669
Tue Aug 28 17:00:36 2018

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.
2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2]	Hydrologic condition [3]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4]	48	65	73
Woods—grass combination (orchard or tree farm). [5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.
3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.
4 Actual curve number is less than 30; use CN = 30 for runoff computations.
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Pipe Flow Calculations

Pipe Size (inches)	Pipe Size (feet)	% Flowing Full	Flow Depth (feet)[1]	Cross-Sectional Flow Area (sf)[2]	Wetted Perim. WP (feet)[3]	Pipe Type	Manning's n-value[4]	Pipe Slope (%)	Manning's Eqn. Pipe Velocity (ft/s)[5]	Pipe Flow Qmax (cfs)[6]
6	0.50	75%	0.38	0.160	1.06	PVC	0.011		0.00	0.000
		100%	0.50	0.196	1.57	PVC	0.011		0.00	0.000
8	0.67	75%	0.50	0.283	1.40	PVC	0.011		0.00	0.000
		100%	0.67	0.353	2.10	PVC	0.011		0.00	0.000
10	0.83	75%	0.63	0.442	1.76	PVC	0.011		0.00	0.000
		100%	0.83	0.541	2.61	PVC	0.011		0.00	0.000
12	1.00	75%	0.75	0.632	2.10	PVC	0.011		0.00	0.000
		100%	1.00	0.785	3.14	PVC	0.011		0.00	0.000
15	1.25	75%	0.94	0.991	2.63	PVC	0.011		0.00	0.000
		100%	1.25	1.227	3.93	PVC	0.011		0.00	0.000
18	1.50	75%	1.13	1.431	3.16	PVC	0.011		0.00	0.000
		100%	1.50	1.767	4.71	PVC	0.011		0.00	0.000
21	1.75	75%	1.31	1.936	3.67	PVC	0.011		0.00	0.000
		100%	1.75	2.405	5.50	PVC	0.011		0.00	0.000
24	2.00	75%	1.50	2.528	4.19	PVC	0.011		0.00	0.000
		100%	2.00	3.142	6.28	PVC	0.011		0.00	0.000

**Values are calculated on flow as pipe-full from the AutoCAD Hydraflow Express pipe modeling software*

Notes:

[1] flow depth based on % flowing full and radius of pipe

[2] cross-sectional flow area of pipe at flow depth

[3] wetted perimeter based on pipe size and flow depth

[4] Manning's n-value based on pipe type: PVC = 0.011, PE = 0.012, RCP = 0.011-0.013

[5] Pipe velocity is calculated using Manning's equation: V = [(1.49*r^(2/3)*s^(1/2)] / n; where r=hydraulic radius (flow area/wetted perim.), s=slope (ft/ft)

[6] Pipe flow is the maximum flow at the pipe depth, calculated as Q=v*A, where v=pipe velocity and A=cross-sectional flow area

Manning's Roughness Coefficients

Manning's roughness coefficients for common materials

The Manning's roughness coefficient is used in the Manning's formula to calculate flow in open channels.

Coefficients for some commonly used surface materials:

Surface Material	Manning's Roughness Coefficient - *n* -
Asbestos cement	0.011
Asphalt	0.016
Brass	0.011
Brick	0.015
Canvas	0.012
Cast-iron, new	0.012
Clay tile	0.014
Concrete - steel forms	0.011
Concrete (Cement) - finished	0.012
Concrete - wooden forms	0.015
Concrete - centrifugally spun	0.013
Copper	0.011
Corrugated metal	0.022
Earth, smooth	0.018
Earth channel - clean	0.022
Earth channel - gravelly	0.025
Earth channel - weedy	0.030
Earth channel - stony, cobbles	0.035
Floodplains - pasture, farmland	0.035
Floodplains - light brush	0.050
Floodplains - heavy brush	0.075
Floodplains - trees	0.15
Galvanized iron	0.016
Glass	0.010
Gravel, firm	0.023
Lead	0.011
Masonry	0.025
Metal - corrugated	0.022
Natural streams - clean and straight	0.030
Natural streams - major rivers	0.035
Natural streams - sluggish with deep pools	0.040
Natural channels, very poor condition	0.060
Plastic	0.009
Polyethylene PE - Corrugated with smooth inner walls	0.009 - 0.015
Polyethylene PE - Corrugated with corrugated inner walls	0.018 - 0.025
Polyvinyl Chloride PVC - with smooth inner walls	0.009 - 0.011
Rubble Masonry	0.017
Steel - Coal-tar enamel	0.010
Steel - smooth	0.012
Steel - New unlined	0.011
Steel - Riveted	0.019
Vitrified Sewer	0.013 - 0.015
Wood - planed	0.012
Wood - unplaned	0.013
Wood stove pipe, small diameter	0.011 - 0.012
Wood stove pipe, large diameter	0.012 - 0.013

WinTR-55 Current Data Description

--- Identification Data ---

User: TLI (AM)
Project: TLI #14-3592
SubTitle: Hillview Crossing
State: Montana
County: Missoula
Filename: T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\3_ENG DESIGN\3.5_DE

Date: 10/3/2018
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
B1 Post	Basin 1	Outlet	4.81	78	.162
B2 Post	Basin 2	Outlet	2.69	88	0.1
B3 Post	Basin 3	Outlet	4.17	82	0.1
B4 Post	Basin 4	Outlet	4.98	75	.122
B5 Post	Basin 5	Outlet	7.94	67	0.1
Off-Site	Off-Site Pre & Post	Outlet	12.14	73	.16
Pre	On-Site Pre	Outlet	24.58	72	.162

Total area: 61.31 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
1.2	.0	.0	.0	.0	2.58	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

TLI #14-3592
Hillview Crossing
Missoula County, Montana

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
B1 Post	4.81	0.162	78	Outlet	Basin 1
B2 Post	2.69	0.100	88	Outlet	Basin 2
B3 Post	4.17	0.100	82	Outlet	Basin 3
B4 Post	4.98	0.122	75	Outlet	Basin 4
B5 Post	7.94	0.100	67	Outlet	Basin 5
Off-Site	12.14	0.160	73	Outlet	Off-Site Pre & Post
Pre	24.58	0.162	72	Outlet	On-Site Pre

Total Area: 61.31 (ac)

TLI #14-3592
Hillview Crossing
Missoula County, Montana

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B1 Post	Open space; grass cover > 75%	(good)	B	1.81	61
	Open space; grass cover > 75%	(good)	C	1.23	74
	Paved parking lots, roofs, driveways		B	.82	98
	Paved parking lots, roofs, driveways		C	.95	98
	Total Area / Weighted Curve Number			4.81	78
				====	==
B2 Post	Open space; grass cover > 75%	(good)	C	1.1	74
	Paved parking lots, roofs, driveways		B	.26	98
	Paved parking lots, roofs, driveways		C	1.33	98
	Total Area / Weighted Curve Number			2.69	88
				====	==
B3 Post	Open space; grass cover > 75%	(good)	B	.91	61
	Open space; grass cover > 75%	(good)	C	1.42	74
	Paved parking lots, roofs, driveways		B	1.58	98
	Paved parking lots, roofs, driveways		C	.26	98
	Total Area / Weighted Curve Number			4.17	82
				====	==
B4 Post	Open space; grass cover > 75%	(good)	B	3.09	61
	Paved parking lots, roofs, driveways		B	1.89	98
	Total Area / Weighted Curve Number			4.98	75
				====	==
B5 Post	Open space; grass cover > 75%	(good)	B	2.53	61
	Open space; grass cover > 75%	(good)	C	.57	74
	Gravel (w/ right-of-way)		B	.1	85
	Gravel (w/ right-of-way)		C	.01	89
	Pasture, grassland or range	(fair)	B	4.73	69
	Total Area / Weighted Curve Number			7.94	67
				====	==
Off-Site	Pasture, grassland or range	(fair)	B	7.36	69
	Pasture, grassland or range	(fair)	C	4.78	79
	Total Area / Weighted Curve Number			12.14	73
				=====	==
Pre	Pasture, grassland or range	(fair)	B	17.94	69
	Pasture, grassland or range	(fair)	C	6.64	79
	Total Area / Weighted Curve Number			24.58	72
				=====	==

TLI #14-3592
Hillview Crossing
Missoula County, Montana

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B1 Post							
SHEET	100	0.1700	0.130				0.101
SHALLOW	309	0.1700	0.050				0.013
SHALLOW	245	0.0090	0.025				0.035
CHANNEL	263	0.0080	0.011	0.63	2.10	5.620	0.013
					Time of Concentration		.162
B2 Post							
SHALLOW	245	0.0770	0.025				0.012
CHANNEL	1111	0.0580	0.011	0.63	2.10	14.696	0.021
					Time of Concentration		0.1
B3 Post							
SHEET	45	0.0760	0.130				0.074
SHALLOW	351	0.2400	0.025				0.010
CHANNEL	648						
					Time of Concentration		0.1
B4 Post							
SHEET	100	0.1980	0.130				0.095
SHALLOW	240	0.1980	0.050				0.009
SHALLOW	65	0.0200	0.025				0.006
CHANNEL	593	0.0500	0.011	0.63	2.10	13.727	0.012
					Time of Concentration		.122
B5 Post							
CHANNEL	119	0.0600	0.011	0.63	2.10	16.528	0.002
					Time of Concentration		0.1
Off-Site							
SHEET	100	0.1210	0.130				0.116
SHALLOW	895	0.1210	0.050				0.044
					Time of Concentration		.16
Pre							
SHEET	100	0.1210	0.130				0.116
SHALLOW	921	0.1210	0.050				0.046
					Time of Concentration		.162

TLI #14-3592
Hillview Crossing
Missoula County, Montana

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	100-Yr (cfs)
SUBAREAS		
B1 Post	0.48	5.50
B2 Post	1.49	6.01
B3 Post	1.06	6.73
B4 Post	0.21	4.80
B5 Post	.00	3.93
Off-Site	0.12	9.66
Pre	0.15	17.93
REACHES		
OUTLET	3.03	52.76

TLI #14-3592
Hillview Crossing
Missoula County, Montana

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS				
B1 Post	0.48	12.05	5.50	12.01
B2 Post	1.49	11.94	6.01	11.93
B3 Post	1.06	12.02	6.73	11.94
B4 Post	0.21	12.05	4.80	11.97
B5 Post	.00	n/a	3.93	12.02
Off-Site	0.12	12.36	9.66	12.02
Pre	0.15	12.46	17.93	12.03
REACHES				
OUTLET	3.03		52.76	

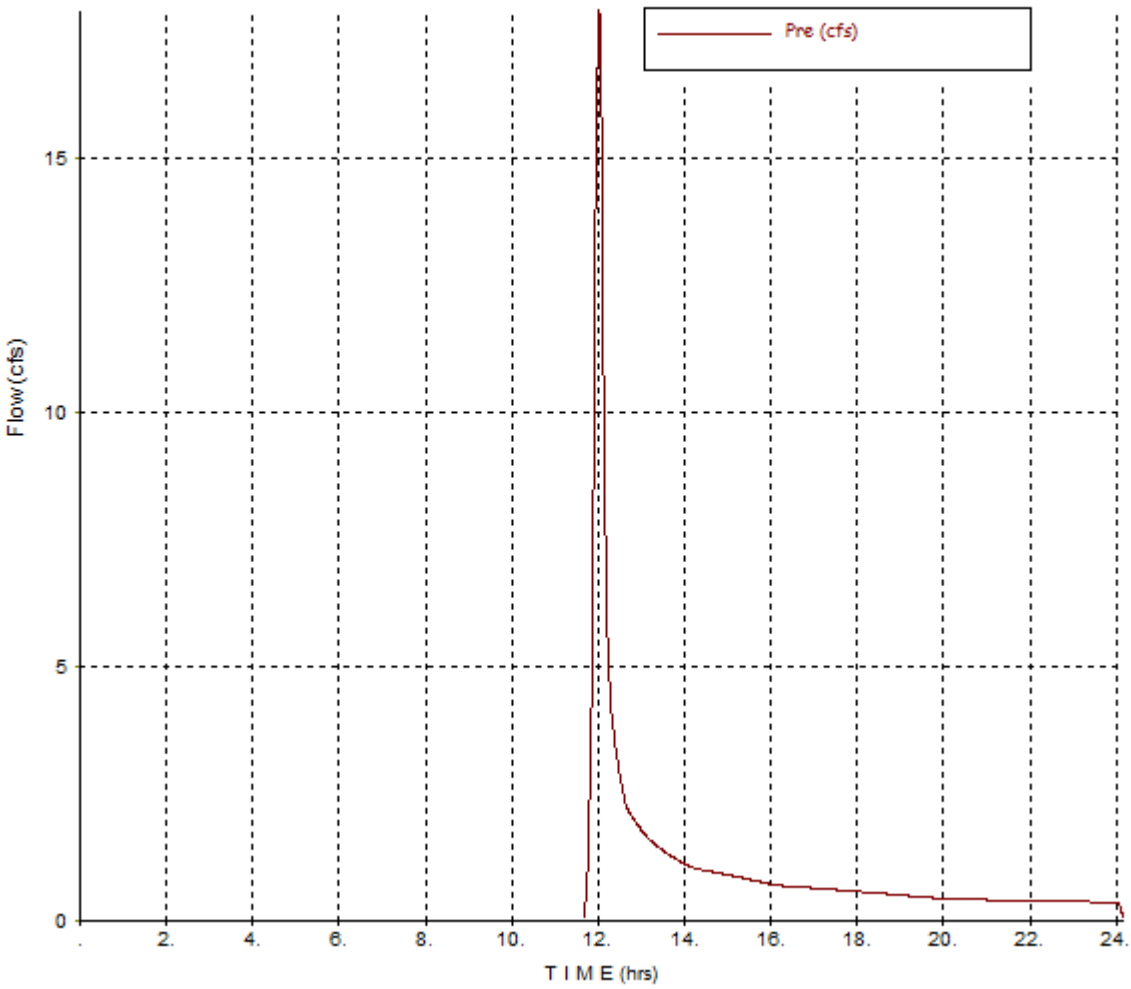
WinTR-55 Output Hydrograph

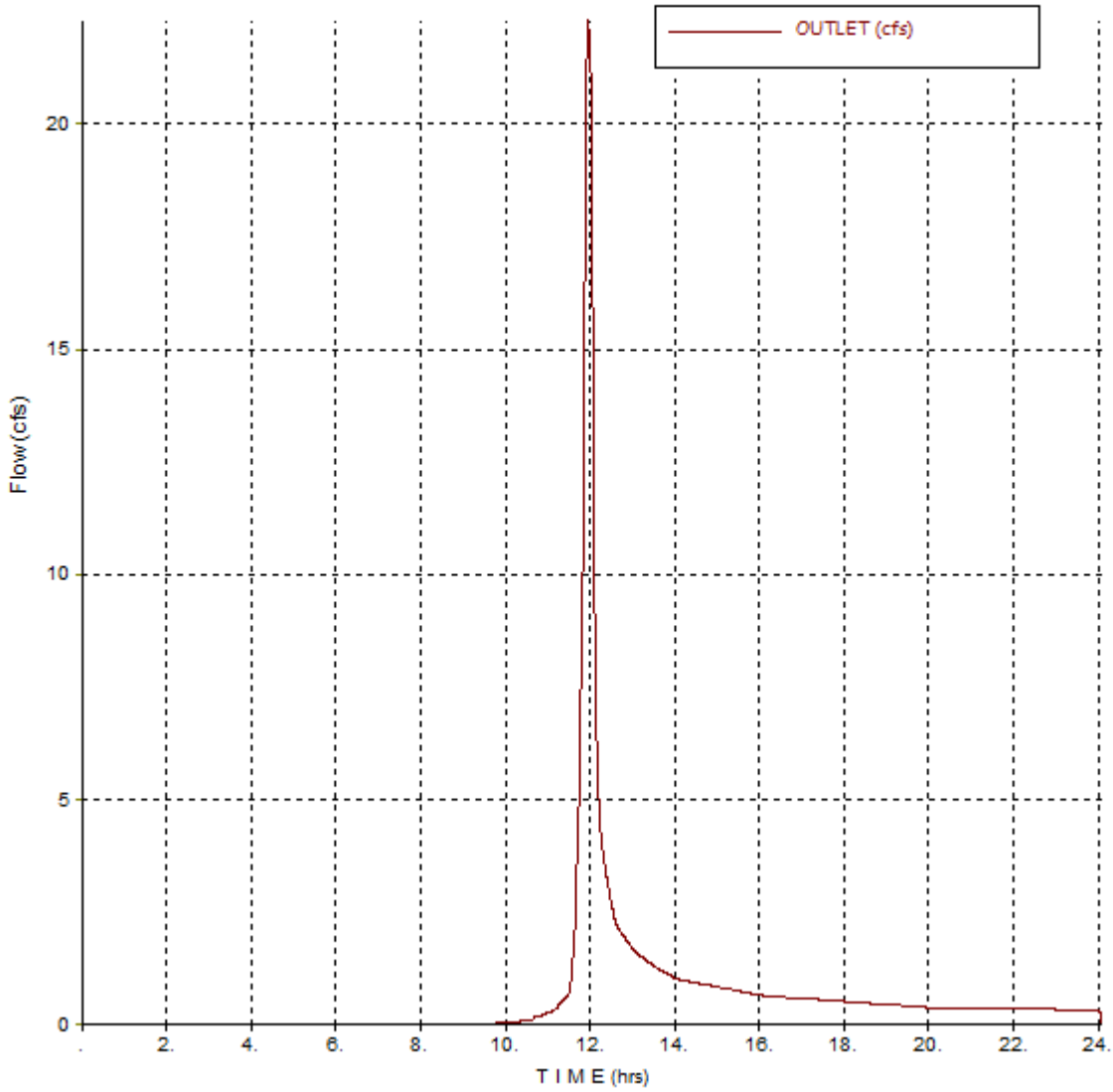
Project: TLI #14-3592

Subarea: (Pre) Storm: 100-Yr

10/2/2018

ojects\3592 - HillMew Crossing-Missoula S Hills Development\3_ENG DESIGN\3.5_DEQ8 (Storm Drainage)\WinTR-55\WinTR55.HillMew Crossing.2018-10-02.Revised CN.Pre.w55




OUTLET (cfs)
Flow(cfs)
0
5
10
15
20
.
2.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
24.
T I M E (hrs)

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WinTR-20: Version 1.10                  0         0         0.05
TLI #14-3592
Hillview Crossing

SUB-AREA:
          B1 Post   Outlet              .00752    78.       .162
          B2 Post   Outlet              .0042     88.       .1
          B3 Post   Outlet              .00652    82.       .1
          B4 Post   Outlet              .00778    75.       .122
          B5 Post   Outlet              .01241    67.       .1
          Off-Site  Outlet              .01897    73.       .16
          Pre       Outlet              .03841    72.       .162

STREAM REACH:

STORM ANALYSIS:
          2-Yr                          1.2       Type II   2
          100-Yr                        2.58      Type II   2

STRUCTURE RATING:


GLOBAL OUTPUT:
          2         0.05                YYYYN     YYYYNN
```


TLI #14-3592
Hillview Crossing

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STORM 2-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B1 Post	0.008		0.058		12.05	0.48	64.34

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.911	0.06	0.08	0.11	0.15	0.18	0.22	0.26
11.982	0.30	0.34	0.37	0.41	0.44	0.46	0.48
12.054	0.48	0.48	0.47	0.45	0.43	0.40	0.37
12.125	0.35	0.32	0.30	0.28	0.26	0.24	0.23
12.197	0.22	0.21	0.20	0.20	0.19	0.19	0.18
12.269	0.18	0.17	0.17	0.17	0.16	0.16	0.16
12.340	0.16	0.15	0.15	0.15	0.15	0.15	0.14
12.412	0.14	0.14	0.14	0.14	0.13	0.13	0.13
12.483	0.13	0.12	0.12	0.12	0.12	0.12	0.12
12.555	0.11	0.11	0.11	0.11	0.11	0.11	0.10
12.627	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.698	0.10	0.10	0.10	0.09	0.09	0.09	0.09
12.770	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.842	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.913	0.09	0.09	0.09	0.09	0.08	0.08	0.08
12.985	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.056	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.128	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.200	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.271	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.343	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.415	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

13.486	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.558	0.07	0.06	0.06	0.06	0.06	0.06	0.06
13.629	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.701	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.773	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.844	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.916	0.06	0.06	0.06	0.06	0.06	0.06	0.06
13.988	0.06	0.06	0.05	0.05	0.05	0.05	0.05
14.059	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.131	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.202	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.274	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.346	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.417	0.05	0.05	0.05	0.05	0.05	0.05	0.05
14.489	0.05	0.05					

WinTR-20 Version 1.10 Page 1 10/03/2018 9:33

TLI #14-3592
Hillview Crossing

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B2 Post	0.004		0.275		11.94	1.49	353.97

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.565	0.05	0.05	0.06	0.06	0.07	0.07	0.07
11.609	0.07	0.08	0.08	0.09	0.09	0.10	0.11
11.653	0.12	0.13	0.14	0.16	0.17	0.18	0.19
11.697	0.20	0.21	0.22	0.23	0.24	0.25	0.27
11.742	0.29	0.31	0.33	0.35	0.38	0.40	0.42
11.786	0.45	0.47	0.49	0.51	0.53	0.56	0.59
11.830	0.62	0.67	0.72	0.78	0.84	0.90	0.97
11.874	1.04	1.10	1.16	1.22	1.28	1.33	1.38
11.918	1.42	1.45	1.47	1.48	1.49	1.48	1.47
11.963	1.46	1.45	1.44	1.43	1.42	1.41	1.41
12.007	1.40	1.40	1.38	1.36	1.32	1.26	1.20
12.051	1.12	1.04	0.95	0.87	0.79	0.72	0.66
12.095	0.60	0.55	0.51	0.48	0.45	0.43	0.41
12.140	0.39	0.37	0.36	0.35	0.33	0.32	0.32
12.184	0.31	0.30	0.30	0.29	0.29	0.29	0.28
12.228	0.28	0.28	0.27	0.27	0.26	0.26	0.26
12.272	0.25	0.25	0.25	0.25	0.25	0.24	0.24
12.316	0.24	0.24	0.24	0.24	0.23	0.23	0.23
12.361	0.23	0.22	0.22	0.22	0.21	0.21	0.21
12.405	0.21	0.21	0.21	0.21	0.20	0.20	0.20
12.449	0.20	0.19	0.19	0.19	0.18	0.18	0.18
12.493	0.18	0.18	0.17	0.17	0.17	0.17	0.17
12.537	0.17	0.17	0.16	0.16	0.16	0.16	0.16
12.582	0.15	0.15	0.15	0.15	0.15	0.15	0.15
12.626	0.15	0.15	0.15	0.14	0.14	0.14	0.14
12.670	0.14	0.14	0.14	0.14	0.14	0.14	0.14
12.714	0.14	0.14	0.14	0.14	0.14	0.14	0.13

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

12.758	0.13	0.13	0.13	0.13	0.13	0.13	0.13
12.803	0.13	0.13	0.13	0.13	0.13	0.13	0.13
12.847	0.13	0.13	0.13	0.13	0.12	0.12	0.12
12.891	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.935	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.980	0.12	0.12	0.11	0.11	0.11	0.11	0.11
13.024	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.068	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.112	0.11	0.11	0.11	0.11	0.11	0.11	0.10
13.156	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.201	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.245	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.289	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.333	0.10	0.10	0.10	0.10	0.10	0.09	0.09
13.377	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.422	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.466	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.510	0.09	0.09	0.09	0.09	0.09	0.09	0.09

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.554	0.09	0.09	0.09	0.09	0.09	0.09	0.08
13.598	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.643	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.687	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.731	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.775	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.820	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.864	0.08	0.08	0.08	0.07	0.07	0.07	0.07
13.908	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.952	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.996	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.041	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.085	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.129	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.173	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.217	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.262	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.306	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.350	0.07	0.07	0.07	0.07	0.07	0.06	0.06
14.394	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.438	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.483	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.527	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.571	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.615	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.660	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.704	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.748	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.792	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.836	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.881	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.925	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.969	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

15.013	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.057	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.102	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.146	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.190	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.234	0.06	0.06	0.05	0.05	0.05	0.05	0.05
15.278	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.323	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.367	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.411	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.455	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.500	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.544	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.588	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.632	0.05	0.05	0.05	0.05			

TLI #14-3592
Hillview Crossing

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B3 Post	0.007		0.131		12.02	1.06	162.16

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.797	0.06	0.07	0.08	0.10	0.12	0.15	0.17
11.841	0.21	0.25	0.29	0.33	0.38	0.43	0.49
11.886	0.54	0.59	0.65	0.70	0.75	0.80	0.84
11.930	0.88	0.91	0.94	0.95	0.97	0.98	0.99
11.974	1.00	1.01	1.01	1.02	1.04	1.05	1.06
12.018	1.06	1.05	1.03	1.00	0.96	0.90	0.84
12.062	0.78	0.71	0.65	0.60	0.54	0.50	0.46
12.107	0.43	0.40	0.38	0.36	0.35	0.33	0.32
12.151	0.31	0.30	0.29	0.28	0.27	0.27	0.26
12.195	0.26	0.25	0.25	0.25	0.25	0.24	0.24
12.239	0.24	0.24	0.23	0.23	0.23	0.22	0.22
12.283	0.22	0.22	0.22	0.22	0.21	0.21	0.21
12.328	0.21	0.21	0.21	0.21	0.20	0.20	0.20
12.372	0.20	0.19	0.19	0.19	0.19	0.19	0.19
12.416	0.19	0.19	0.18	0.18	0.18	0.18	0.17
12.460	0.17	0.17	0.17	0.16	0.16	0.16	0.16
12.505	0.16	0.16	0.16	0.15	0.15	0.15	0.15
12.549	0.15	0.15	0.15	0.14	0.14	0.14	0.14
12.593	0.14	0.14	0.14	0.14	0.14	0.13	0.13
12.637	0.13	0.13	0.13	0.13	0.13	0.13	0.13
12.681	0.13	0.13	0.13	0.13	0.13	0.13	0.13
12.726	0.13	0.13	0.13	0.13	0.12	0.12	0.12
12.770	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.814	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.858	0.12	0.12	0.12	0.12	0.12	0.11	0.11
12.902	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.947	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

12.991	0.11	0.11	0.11	0.11	0.11	0.11	0.11
13.035	0.11	0.11	0.10	0.10	0.10	0.10	0.10
13.079	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.123	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.168	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.212	0.10	0.10	0.10	0.10	0.10	0.10	0.10
13.256	0.10	0.09	0.09	0.09	0.09	0.09	0.09
13.300	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.345	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.389	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.433	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.477	0.09	0.09	0.09	0.09	0.09	0.09	0.08
13.521	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.566	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.610	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.654	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.698	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.742	0.08	0.08	0.08	0.08	0.08	0.08	0.08

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.787	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.831	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.875	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.919	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.963	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.008	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.052	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.096	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.140	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.185	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.229	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.273	0.07	0.07	0.07	0.06	0.06	0.06	0.06
14.317	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.361	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.406	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.450	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.494	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.538	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.582	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.627	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.671	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.715	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.759	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.803	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.848	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.892	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.936	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.980	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.025	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.069	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.113	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.157	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.201	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing
STORM 2-Yr
SUB-AREA:
B1 Post Outlet .00752 78. .162
B2 Post Outlet .0042 88. .1
B3 Post Outlet .00652 82. .1

15.246	0.06	0.06	0.06	0.05	0.05	0.05	0.05
15.290	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.334	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.378	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.422	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.467	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.511	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.555	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.599	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.643	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.688	0.05	0.05					

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B4 Post	0.008		0.020		12.05	0.21	26.55

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.976	0.06	0.08	0.09	0.11	0.13	0.15	0.17
12.030	0.19	0.20	0.21	0.21	0.20	0.20	0.19
12.084	0.18	0.17	0.16	0.15	0.14	0.13	0.12
12.138	0.12	0.12	0.11	0.11	0.11	0.10	0.10
12.192	0.10	0.10	0.10	0.10	0.10	0.10	0.09
12.245	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.299	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.353	0.09	0.09	0.08	0.08	0.08	0.08	0.08
12.407	0.08	0.08	0.08	0.08	0.08	0.08	0.08
12.461	0.08	0.08	0.08	0.07	0.07	0.07	0.07
12.515	0.07	0.07	0.07	0.07	0.07	0.07	0.07
12.569	0.07	0.07	0.07	0.06	0.06	0.06	0.06
12.623	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.677	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.731	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.785	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.839	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.893	0.06	0.06	0.06	0.06	0.06	0.06	0.06
12.947	0.06	0.06	0.05	0.05	0.05	0.05	0.05
13.001	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.055	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.108	0.05	0.05	0.05	0.05	0.05	0.05	0.05
13.162	0.05	0.05	0.05	0.05	0.05		

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B5 Post	0.012		0.0		14.02	0.0	0.0
Off-Site	0.019		0.027		12.36	0.12	6.13

Line
Start Time Flow Values @ time increment of 0.010 hr

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
12.042	0.06	0.07	0.08	0.09	0.10	0.10	0.11
12.113	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.183	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.254	0.11	0.11	0.11	0.11	0.11	0.11	0.12
12.325	0.12	0.12	0.12	0.12	0.12	0.12	0.12
12.396	0.12	0.12	0.12	0.11	0.11	0.11	0.11
12.466	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12.537	0.11	0.10	0.10	0.10	0.10	0.10	0.10
12.608	0.10	0.10	0.10	0.10	0.10	0.10	0.10
12.679	0.10	0.09	0.09	0.09	0.09	0.09	0.09
12.749	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.820	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.891	0.09	0.09	0.09	0.09	0.09	0.09	0.09
12.962	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.032	0.09	0.09	0.09	0.09	0.09	0.09	0.09
13.103	0.09	0.09	0.08	0.08	0.08	0.08	0.08

TLI #14-3592
Hillview Crossing

Line
Start Time ---------- Flow Values @ time increment of 0.010 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.174	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.245	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.315	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.386	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.457	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.527	0.08	0.08	0.08	0.08	0.08	0.08	0.08
13.598	0.08	0.08	0.08	0.08	0.08	0.07	0.07
13.669	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.740	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.810	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.881	0.07	0.07	0.07	0.07	0.07	0.07	0.07
13.952	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.023	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.093	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.164	0.07	0.07	0.07	0.07	0.07	0.07	0.07
14.235	0.07	0.07	0.07	0.07	0.06	0.06	0.06
14.306	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.376	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.447	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.518	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.589	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.659	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.730	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.801	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.871	0.06	0.06	0.06	0.06	0.06	0.06	0.06
14.942	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.013	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.084	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.154	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.225	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.296	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.367	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.437	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

15.508	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.579	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.650	0.06	0.06	0.06	0.06	0.06	0.06	0.06
15.720	0.06	0.06	0.06	0.06	0.06	0.06	0.05
15.791	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.862	0.05	0.05	0.05	0.05	0.05	0.05	0.05
15.933	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.003	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.074	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.145	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.215	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.286	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.357	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.428	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.498	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.569	0.05	0.05	0.05	0.05	0.05	0.05	0.05
16.640	0.05	0.05	0.05	0.05	0.05		

TLI #14-3592
Hillview Crossing

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
Pre	0.038		0.041		12.46	0.15	3.90

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
12.117	0.05	0.06	0.06	0.07	0.07	0.08	0.08
12.189	0.09	0.09	0.10	0.10	0.11	0.11	0.11
12.261	0.12	0.12	0.12	0.13	0.13	0.13	0.13
12.332	0.14	0.14	0.14	0.14	0.14	0.15	0.15
12.404	0.15	0.15	0.15	0.15	0.15	0.15	0.15
12.476	0.15	0.15	0.15	0.15	0.15	0.15	0.15
12.547	0.15	0.14	0.14	0.14	0.14	0.14	0.14
12.619	0.14	0.14	0.14	0.14	0.14	0.14	0.14
12.690	0.14	0.14	0.14	0.14	0.14	0.14	0.14
12.762	0.14	0.14	0.14	0.14	0.14	0.14	0.14
12.834	0.14	0.14	0.14	0.14	0.14	0.14	0.14
12.905	0.14	0.14	0.14	0.14	0.14	0.14	0.14
12.977	0.14	0.14	0.14	0.14	0.14	0.13	0.13
13.048	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.120	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.192	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.263	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.335	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.407	0.13	0.13	0.13	0.13	0.13	0.13	0.13
13.478	0.13	0.13	0.13	0.13	0.13	0.12	0.12
13.550	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.621	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.693	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.765	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.836	0.12	0.12	0.12	0.12	0.12	0.12	0.12
13.908	0.12	0.11	0.11	0.11	0.11	0.11	0.11
13.980	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

14.051	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.123	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.194	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.266	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.338	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.409	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.481	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.553	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.624	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.696	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.767	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.839	0.11	0.11	0.11	0.11	0.11	0.11	0.11
14.911	0.11	0.11	0.11	0.10	0.10	0.10	0.10
14.982	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.054	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.125	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.197	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.269	0.10	0.10	0.10	0.10	0.10	0.10	0.10

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.340	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.412	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.484	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.555	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.627	0.10	0.10	0.10	0.10	0.10	0.10	0.10
15.698	0.10	0.10	0.10	0.10	0.10	0.09	0.09
15.770	0.09	0.09	0.09	0.09	0.09	0.09	0.09
15.842	0.09	0.09	0.09	0.09	0.09	0.09	0.09
15.913	0.09	0.09	0.09	0.09	0.09	0.09	0.09
15.985	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.057	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.128	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.200	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.271	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.343	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.415	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.486	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.558	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.630	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.701	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.773	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.844	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.916	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.988	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.059	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.131	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.202	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.274	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.346	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.417	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.489	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.561	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.632	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

17.704	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.775	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.847	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.919	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.990	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.062	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.134	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.205	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.277	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.348	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.420	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.492	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.563	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.635	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.707	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.778	0.08	0.08	0.08	0.08	0.07	0.07	0.07
18.850	0.07	0.07	0.07	0.07	0.07	0.07	0.07
18.921	0.07	0.07	0.07	0.07	0.07	0.07	0.07

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
18.993	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.065	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.136	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.208	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.280	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.351	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.423	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.494	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.566	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.638	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.709	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.781	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.852	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.924	0.07	0.07	0.07	0.07	0.07	0.06	0.06
19.996	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.067	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.139	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.211	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.282	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.354	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.425	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.497	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.569	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.640	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.712	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.784	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.855	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.927	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.998	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.070	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.142	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.213	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.285	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162	
B2 Post	Outlet	.0042	88.	.1	
B3 Post	Outlet	.00652	82.	.1	

21.357	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.428	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.500	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.571	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.643	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.715	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.786	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.858	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.929	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.001	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.073	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.144	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.216	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.288	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.359	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.431	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.502	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.574	0.06	0.06	0.06	0.06	0.06	0.06	0.06

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
22.646	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.717	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.789	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.861	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.932	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.004	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.075	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.147	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.219	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.290	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.362	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.434	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.505	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.577	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.648	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.720	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.792	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.863	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.935	0.06	0.06	0.06	0.06	0.06	0.06	0.06
24.006	0.06	0.06	0.06	0.06	0.06	0.05	0.05

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.096		0.049		12.02	3.03	31.61

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.570	0.05	0.06	0.06	0.06	0.07	0.07	0.07
11.614	0.08	0.08	0.09	0.09	0.10	0.11	0.12

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

11.658	0.13	0.14	0.15	0.16	0.17	0.19	0.20
11.702	0.20	0.21	0.22	0.24	0.25	0.26	0.28
11.747	0.30	0.32	0.35	0.37	0.40	0.42	0.44
11.791	0.46	0.54	0.57	0.61	0.65	0.70	0.76
11.835	0.83	0.91	1.01	1.11	1.23	1.34	1.46
11.879	1.58	1.69	1.81	1.92	2.05	2.17	2.28
11.923	2.37	2.45	2.52	2.57	2.61	2.64	2.67
11.968	2.69	2.75	2.79	2.83	2.87	2.92	2.96
12.012	3.00	3.03	3.03	3.00	2.97	2.90	2.79
12.056	2.66	2.51	2.36	2.21	2.07	1.93	1.81
12.100	1.70	1.61	1.55	1.50	1.44	1.38	1.33
12.145	1.29	1.25	1.21	1.18	1.15	1.13	1.11
12.189	1.09	1.08	1.07	1.06	1.05	1.04	1.03
12.233	1.02	1.02	1.01	1.00	1.00	0.99	0.98
12.277	0.98	0.97	0.97	0.96	0.96	0.96	0.95
12.321	0.95	0.95	0.95	0.94	0.94	0.93	0.92
12.366	0.92	0.91	0.90	0.90	0.89	0.89	0.89
12.410	0.88	0.88	0.87	0.87	0.86	0.86	0.85

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
12.454	0.84	0.83	0.83	0.82	0.81	0.80	0.80
12.498	0.79	0.78	0.78	0.77	0.77	0.76	0.76
12.542	0.75	0.75	0.74	0.73	0.73	0.72	0.71
12.587	0.71	0.70	0.70	0.70	0.69	0.69	0.69
12.631	0.68	0.68	0.68	0.67	0.67	0.67	0.67
12.675	0.66	0.66	0.66	0.66	0.66	0.65	0.65
12.719	0.65	0.65	0.65	0.65	0.65	0.64	0.64
12.763	0.64	0.64	0.64	0.64	0.63	0.63	0.63
12.808	0.63	0.63	0.63	0.63	0.63	0.63	0.62
12.852	0.62	0.62	0.62	0.62	0.61	0.61	0.61
12.896	0.61	0.61	0.61	0.61	0.60	0.60	0.60
12.940	0.60	0.60	0.60	0.59	0.59	0.59	0.59
12.985	0.59	0.58	0.58	0.58	0.58	0.58	0.58
13.029	0.58	0.57	0.57	0.57	0.57	0.57	0.56
13.073	0.56	0.56	0.56	0.56	0.56	0.56	0.55
13.117	0.55	0.55	0.55	0.55	0.55	0.55	0.55
13.161	0.55	0.54	0.54	0.54	0.54	0.54	0.54
13.206	0.49	0.49	0.49	0.49	0.49	0.48	0.48
13.250	0.48	0.48	0.48	0.48	0.48	0.48	0.48
13.294	0.48	0.48	0.47	0.47	0.47	0.47	0.47
13.338	0.47	0.47	0.47	0.47	0.47	0.47	0.46
13.382	0.46	0.46	0.46	0.46	0.46	0.46	0.46
13.427	0.46	0.46	0.46	0.45	0.45	0.45	0.45
13.471	0.45	0.45	0.45	0.45	0.44	0.44	0.44
13.515	0.44	0.44	0.44	0.44	0.44	0.44	0.44
13.559	0.44	0.43	0.43	0.43	0.43	0.43	0.43
13.603	0.43	0.43	0.43	0.43	0.43	0.42	0.42
13.648	0.42	0.42	0.42	0.42	0.42	0.42	0.42
13.692	0.42	0.42	0.42	0.41	0.41	0.41	0.41
13.736	0.41	0.41	0.41	0.41	0.41	0.41	0.41
13.780	0.41	0.40	0.40	0.40	0.40	0.40	0.40
13.825	0.40	0.40	0.40	0.40	0.40	0.40	0.40
13.869	0.39	0.39	0.39	0.39	0.39	0.39	0.39

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post Outlet	.00752	78.	.162
B2 Post Outlet	.0042	88.	.1
B3 Post Outlet	.00652	82.	.1

13.913	0.39	0.39	0.39	0.39	0.39	0.38	0.38
13.957	0.38	0.38	0.38	0.38	0.38	0.38	0.38
14.001	0.38	0.37	0.37	0.37	0.37	0.37	0.37
14.046	0.37	0.37	0.37	0.37	0.37	0.37	0.37
14.090	0.37	0.37	0.36	0.36	0.36	0.36	0.36
14.134	0.36	0.36	0.36	0.36	0.36	0.36	0.36
14.178	0.36	0.36	0.36	0.36	0.36	0.36	0.36
14.222	0.36	0.36	0.36	0.36	0.36	0.36	0.36
14.267	0.36	0.36	0.36	0.36	0.36	0.36	0.36
14.311	0.35	0.35	0.35	0.35	0.35	0.35	0.35
14.355	0.35	0.35	0.35	0.35	0.35	0.35	0.35
14.399	0.35	0.35	0.35	0.35	0.35	0.35	0.35
14.443	0.35	0.35	0.35	0.35	0.35	0.35	0.35
14.488	0.35	0.35	0.35	0.35	0.31	0.30	0.30
14.532	0.30	0.30	0.30	0.30	0.30	0.30	0.30
14.576	0.30	0.30	0.30	0.30	0.30	0.30	0.30
14.620	0.29	0.29	0.29	0.29	0.29	0.29	0.29
14.665	0.29	0.29	0.29	0.29	0.29	0.29	0.29

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.709	0.29	0.29	0.29	0.29	0.29	0.29	0.29
14.753	0.29	0.29	0.29	0.29	0.29	0.29	0.29
14.797	0.29	0.29	0.29	0.29	0.29	0.29	0.29
14.841	0.29	0.29	0.29	0.29	0.29	0.29	0.29
14.886	0.29	0.29	0.29	0.29	0.29	0.29	0.28
14.930	0.28	0.28	0.28	0.28	0.28	0.28	0.28
14.974	0.28	0.28	0.28	0.28	0.28	0.28	0.28
15.018	0.28	0.28	0.28	0.28	0.28	0.28	0.28
15.062	0.28	0.28	0.28	0.28	0.28	0.28	0.28
15.107	0.28	0.28	0.28	0.28	0.28	0.28	0.28
15.151	0.28	0.28	0.28	0.28	0.27	0.27	0.27
15.195	0.27	0.27	0.27	0.27	0.27	0.27	0.27
15.239	0.27	0.27	0.27	0.27	0.27	0.27	0.27
15.283	0.27	0.27	0.27	0.27	0.27	0.27	0.27
15.328	0.27	0.27	0.27	0.27	0.27	0.27	0.27
15.372	0.27	0.27	0.27	0.27	0.26	0.26	0.26
15.416	0.26	0.26	0.26	0.26	0.26	0.26	0.26
15.460	0.26	0.26	0.26	0.26	0.26	0.26	0.26
15.505	0.26	0.26	0.26	0.26	0.26	0.26	0.26
15.549	0.26	0.26	0.26	0.26	0.26	0.26	0.26
15.593	0.26	0.26	0.26	0.25	0.25	0.25	0.25
15.637	0.25	0.25	0.25	0.25	0.20	0.20	0.20
15.681	0.20	0.20	0.20	0.20	0.15	0.15	0.15
15.726	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.770	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.814	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.858	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.902	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.947	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.991	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.035	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.079	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.123	0.14	0.14	0.14	0.14	0.14	0.14	0.14

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

16.168	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.212	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.256	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.300	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.345	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.389	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.433	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.477	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.521	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.566	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.610	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.654	0.14	0.14	0.14	0.14	0.14	0.14	0.09
16.698	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.742	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.787	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.831	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.875	0.09	0.09	0.09	0.09	0.09	0.09	0.09
16.919	0.09	0.09	0.09	0.09	0.09	0.09	0.09

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
16.963	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.008	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.052	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.096	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.140	0.09	0.09	0.09	0.09	0.09	0.09	0.09
17.185	0.09	0.09	0.08	0.08	0.08	0.08	0.08
17.229	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.273	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.317	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.361	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.406	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.450	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.494	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.538	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.582	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.627	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.671	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.715	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.759	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.803	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.848	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.892	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.936	0.08	0.08	0.08	0.08	0.08	0.08	0.08
17.980	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.025	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.069	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.113	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.157	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.201	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.246	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.290	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.334	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.378	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

18.422	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.467	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.511	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.555	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.599	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.643	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.688	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.732	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.776	0.08	0.08	0.08	0.08	0.08	0.08	0.08
18.820	0.07	0.07	0.07	0.07	0.07	0.07	0.07
18.865	0.07	0.07	0.07	0.07	0.07	0.07	0.07
18.909	0.07	0.07	0.07	0.07	0.07	0.07	0.07
18.953	0.07	0.07	0.07	0.07	0.07	0.07	0.07
18.997	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.041	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.086	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.130	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.174	0.07	0.07	0.07	0.07	0.07	0.07	0.07

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
19.218	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.262	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.307	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.351	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.395	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.439	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.483	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.528	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.572	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.616	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.660	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.705	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.749	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.793	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.837	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.881	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.926	0.07	0.07	0.07	0.07	0.07	0.07	0.07
19.970	0.07	0.06	0.06	0.06	0.06	0.06	0.06
20.014	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.058	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.102	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.147	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.191	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.235	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.279	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.323	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.368	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.412	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.456	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.500	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.545	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.589	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.633	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

20.677	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.721	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.766	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.810	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.854	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.898	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.942	0.06	0.06	0.06	0.06	0.06	0.06	0.06
20.987	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.031	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.075	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.119	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.163	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.208	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.252	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.296	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.340	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.385	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.429	0.06	0.06	0.06	0.06	0.06	0.06	0.06

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
21.473	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.517	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.561	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.606	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.650	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.694	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.738	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.782	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.827	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.871	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.915	0.06	0.06	0.06	0.06	0.06	0.06	0.06
21.959	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.003	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.048	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.092	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.136	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.180	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.225	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.269	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.313	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.357	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.401	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.446	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.490	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.534	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.578	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.622	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.667	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.711	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.755	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.799	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.843	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.888	0.06	0.06	0.06	0.06	0.06	0.06	0.06

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 2-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

22.932	0.06	0.06	0.06	0.06	0.06	0.06	0.06
22.976	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.020	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.065	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.109	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.153	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.197	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.241	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.286	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.330	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.374	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.418	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.462	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.507	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.551	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.595	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.639	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.683	0.06	0.06	0.06	0.06	0.06	0.06	0.06

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
23.728	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.772	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.816	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.860	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.905	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.949	0.06	0.06	0.06	0.06	0.06	0.06	0.06
23.993	0.06	0.06	0.06	0.06	0.06	0.06	0.06
24.037	0.06	0.06	0.06	0.05	0.05	0.05	

STORM 100-Yr

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
B1 Post	0.008		0.838		12.01	5.50	731.70

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.257	0.05	0.05	0.06	0.06	0.06	0.06	0.06
11.329	0.07	0.07	0.07	0.07	0.08	0.08	0.08
11.400	0.09	0.09	0.09	0.09	0.10	0.10	0.10
11.472	0.11	0.11	0.11	0.12	0.12	0.13	0.13
11.543	0.14	0.15	0.16	0.18	0.20	0.21	0.23
11.615	0.25	0.28	0.30	0.34	0.37	0.42	0.46
11.687	0.52	0.57	0.63	0.69	0.76	0.83	0.92
11.758	1.01	1.11	1.22	1.33	1.46	1.58	1.72
11.830	1.88	2.05	2.26	2.49	2.76	3.06	3.37
11.901	3.69	4.01	4.32	4.61	4.86	5.07	5.23
11.973	5.35	5.42	5.47	5.50	5.50	5.47	5.40
12.045	5.29	5.12	4.89	4.62	4.31	3.99	3.67

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

12.116	3.35	3.05	2.77	2.52	2.31	2.13	1.98
12.188	1.84	1.73	1.64	1.55	1.48	1.41	1.36
12.260	1.30	1.26	1.22	1.18	1.15	1.12	1.09
12.331	1.06	1.04	1.02	1.00	0.98	0.96	0.94
12.403	0.92	0.90	0.89	0.87	0.86	0.84	0.82
12.474	0.81	0.79	0.78	0.76	0.75	0.73	0.72
12.546	0.71	0.70	0.68	0.67	0.66	0.65	0.64
12.618	0.63	0.62	0.61	0.61	0.60	0.59	0.59
12.689	0.58	0.58	0.57	0.57	0.56	0.56	0.55
12.761	0.55	0.55	0.54	0.54	0.53	0.53	0.53
12.833	0.52	0.52	0.52	0.51	0.51	0.51	0.50
12.904	0.50	0.50	0.49	0.49	0.49	0.48	0.48
12.976	0.48	0.47	0.47	0.47	0.46	0.46	0.46
13.047	0.45	0.45	0.45	0.45	0.44	0.44	0.44
13.119	0.43	0.43	0.43	0.43	0.42	0.42	0.42
13.191	0.42	0.42	0.41	0.41	0.41	0.41	0.41
13.262	0.40	0.40	0.40	0.40	0.40	0.39	0.39
13.334	0.39	0.39	0.39	0.39	0.38	0.38	0.38

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.406	0.38	0.38	0.37	0.37	0.37	0.37	0.37
13.477	0.36	0.36	0.36	0.36	0.36	0.36	0.35
13.549	0.35	0.35	0.35	0.35	0.35	0.34	0.34
13.620	0.34	0.34	0.34	0.34	0.33	0.33	0.33
13.692	0.33	0.33	0.33	0.33	0.32	0.32	0.32
13.764	0.32	0.32	0.32	0.32	0.31	0.31	0.31
13.835	0.31	0.31	0.31	0.31	0.30	0.30	0.30
13.907	0.30	0.30	0.30	0.30	0.29	0.29	0.29
13.979	0.29	0.29	0.29	0.29	0.29	0.28	0.28
14.050	0.28	0.28	0.28	0.28	0.28	0.28	0.27
14.122	0.27	0.27	0.27	0.27	0.27	0.27	0.27
14.193	0.27	0.27	0.27	0.27	0.27	0.27	0.27
14.265	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.337	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.408	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.480	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.551	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.623	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.695	0.25	0.24	0.24	0.24	0.24	0.24	0.24
14.766	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.838	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.910	0.24	0.24	0.23	0.23	0.23	0.23	0.23
14.981	0.23	0.23	0.23	0.23	0.23	0.23	0.23
15.053	0.23	0.23	0.23	0.23	0.23	0.23	0.23
15.124	0.23	0.23	0.22	0.22	0.22	0.22	0.22
15.196	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.268	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.339	0.22	0.21	0.21	0.21	0.21	0.21	0.21
15.411	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.483	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.554	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.626	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.697	0.20	0.20	0.20	0.20	0.20	0.20	0.19

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

15.769	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.841	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.912	0.19	0.19	0.19	0.19	0.19	0.18	0.18
15.984	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.056	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.127	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.199	0.18	0.18	0.17	0.17	0.17	0.17	0.17
16.270	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.342	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.414	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.485	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.557	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.628	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.700	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.772	0.17	0.17	0.17	0.16	0.16	0.16	0.16
16.843	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.915	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.987	0.16	0.16	0.16	0.16	0.16	0.16	0.16

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
17.058	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.130	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.201	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.273	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.345	0.16	0.16	0.16	0.16	0.15	0.15	0.15
17.416	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.488	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.560	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.631	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.703	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.774	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.846	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.918	0.15	0.15	0.15	0.15	0.14	0.14	0.14
17.989	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.061	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.133	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.204	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.276	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.347	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.419	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.491	0.14	0.14	0.13	0.13	0.13	0.13	0.13
18.562	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.634	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.705	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.777	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.849	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.920	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.992	0.13	0.13	0.13	0.13	0.13	0.12	0.12
19.064	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.135	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.207	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.278	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.350	0.12	0.12	0.12	0.12	0.12	0.12	0.12

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

19.422	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.493	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.565	0.12	0.12	0.11	0.11	0.11	0.11	0.11
19.637	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.708	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.780	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.851	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.923	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.995	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.066	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.138	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.210	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.281	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.353	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.424	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.496	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.568	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.639	0.10	0.10	0.10	0.10	0.10	0.10	0.10

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
20.711	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.783	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.854	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.926	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.997	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.069	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.141	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.212	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.284	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.355	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.427	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.499	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.570	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.642	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.714	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.785	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.857	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.928	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.000	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.072	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.143	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.215	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.287	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.358	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.430	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.501	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.573	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.645	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.716	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.788	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.860	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.931	0.10	0.10	0.10	0.10	0.10	0.09	0.09
23.003	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

23.074	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.146	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.218	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.289	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.361	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.432	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.504	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.576	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.647	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.719	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.791	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.862	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.934	0.09	0.09	0.09	0.09	0.09	0.09	0.09
24.005	0.09	0.09	0.09	0.09	0.09	0.08	0.08
24.077	0.07	0.06	0.06				

TLI #14-3592
Hillview Crossing

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B2 Post	0.004		1.432		11.93	6.01	1429.91

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
9.774	0.05	0.05	0.05	0.05	0.05	0.05	0.05
9.818	0.05	0.05	0.05	0.05	0.05	0.05	0.05
9.862	0.05	0.05	0.06	0.06	0.06	0.06	0.06
9.907	0.06	0.06	0.06	0.06	0.06	0.06	0.06
9.951	0.06	0.06	0.06	0.06	0.06	0.06	0.06
9.995	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.039	0.06	0.06	0.06	0.06	0.07	0.07	0.07
10.084	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.128	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.172	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.216	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.260	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.305	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.349	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.393	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.437	0.09	0.09	0.09	0.09	0.09	0.10	0.10
10.481	0.10	0.10	0.10	0.10	0.10	0.10	0.10
10.526	0.10	0.10	0.10	0.10	0.10	0.10	0.10
10.570	0.11	0.11	0.11	0.11	0.11	0.11	0.11
10.614	0.11	0.11	0.11	0.11	0.11	0.11	0.11
10.658	0.12	0.12	0.12	0.12	0.12	0.12	0.12
10.702	0.12	0.12	0.12	0.12	0.12	0.13	0.13
10.747	0.13	0.13	0.13	0.13	0.13	0.13	0.13
10.791	0.13	0.13	0.14	0.14	0.14	0.14	0.14
10.835	0.14	0.14	0.14	0.14	0.14	0.14	0.15
10.879	0.15	0.15	0.15	0.15	0.15	0.15	0.15
10.924	0.15	0.15	0.15	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

10.968	0.16	0.16	0.16	0.16	0.16	0.17	0.17
11.012	0.17	0.17	0.17	0.17	0.17	0.17	0.18
11.056	0.18	0.18	0.18	0.18	0.18	0.19	0.19
11.100	0.19	0.19	0.19	0.19	0.19	0.20	0.20
11.145	0.20	0.20	0.20	0.21	0.21	0.21	0.21
11.189	0.22	0.22	0.22	0.22	0.22	0.22	0.23
11.233	0.23	0.23	0.23	0.24	0.24	0.24	0.24
11.277	0.25	0.25	0.25	0.25	0.26	0.26	0.26
11.321	0.26	0.26	0.27	0.27	0.27	0.27	0.28
11.366	0.28	0.28	0.29	0.29	0.29	0.29	0.29
11.410	0.30	0.30	0.30	0.30	0.31	0.31	0.31
11.454	0.31	0.32	0.32	0.32	0.33	0.33	0.33
11.498	0.33	0.34	0.34	0.35	0.36	0.37	0.39
11.542	0.41	0.44	0.47	0.50	0.53	0.56	0.59
11.587	0.62	0.64	0.66	0.68	0.70	0.72	0.75
11.631	0.79	0.84	0.90	0.96	1.03	1.10	1.17
11.675	1.23	1.30	1.35	1.41	1.45	1.49	1.54
11.719	1.59	1.64	1.71	1.79	1.88	1.99	2.09

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.764	2.20	2.30	2.40	2.50	2.59	2.67	2.74
11.808	2.81	2.90	2.99	3.11	3.26	3.44	3.66
11.852	3.89	4.13	4.38	4.62	4.85	5.07	5.28
11.896	5.46	5.62	5.76	5.86	5.94	5.99	6.01
11.940	5.98	5.93	5.85	5.76	5.67	5.57	5.48
11.985	5.40	5.32	5.26	5.21	5.15	5.08	4.98
12.029	4.85	4.66	4.42	4.15	3.85	3.55	3.24
12.073	2.95	2.68	2.43	2.21	2.02	1.87	1.74
12.117	1.63	1.54	1.45	1.38	1.32	1.26	1.21
12.161	1.17	1.13	1.09	1.06	1.04	1.02	1.00
12.206	0.98	0.97	0.96	0.95	0.93	0.92	0.91
12.250	0.90	0.88	0.87	0.86	0.85	0.84	0.83
12.294	0.82	0.82	0.81	0.81	0.80	0.80	0.79
12.338	0.78	0.77	0.76	0.75	0.74	0.73	0.72
12.382	0.71	0.71	0.70	0.69	0.69	0.69	0.68
12.427	0.67	0.67	0.66	0.65	0.64	0.63	0.62
12.471	0.61	0.60	0.59	0.58	0.58	0.57	0.57
12.515	0.56	0.56	0.55	0.55	0.54	0.54	0.53
12.559	0.52	0.52	0.51	0.50	0.50	0.49	0.49
12.604	0.49	0.48	0.48	0.48	0.48	0.47	0.47
12.648	0.47	0.46	0.46	0.46	0.46	0.45	0.45
12.692	0.45	0.45	0.45	0.45	0.45	0.44	0.44
12.736	0.44	0.44	0.44	0.43	0.43	0.43	0.43
12.780	0.43	0.42	0.42	0.42	0.42	0.42	0.42
12.825	0.42	0.41	0.41	0.41	0.41	0.41	0.40
12.869	0.40	0.40	0.40	0.40	0.39	0.39	0.39
12.913	0.39	0.39	0.39	0.39	0.38	0.38	0.38
12.957	0.38	0.37	0.37	0.37	0.37	0.37	0.37
13.001	0.36	0.36	0.36	0.36	0.36	0.36	0.36
13.046	0.35	0.35	0.35	0.35	0.35	0.35	0.34
13.090	0.34	0.34	0.34	0.34	0.34	0.34	0.34
13.134	0.34	0.34	0.33	0.33	0.33	0.33	0.33
13.178	0.33	0.33	0.33	0.32	0.32	0.32	0.32

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

13.222	0.32	0.32	0.32	0.32	0.32	0.32	0.32
13.267	0.31	0.31	0.31	0.31	0.31	0.31	0.31
13.311	0.31	0.31	0.31	0.31	0.31	0.30	0.30
13.355	0.30	0.30	0.30	0.30	0.30	0.30	0.29
13.399	0.29	0.29	0.29	0.29	0.29	0.29	0.29
13.444	0.29	0.29	0.29	0.28	0.28	0.28	0.28
13.488	0.28	0.28	0.28	0.28	0.28	0.28	0.28
13.532	0.28	0.27	0.27	0.27	0.27	0.27	0.27
13.576	0.27	0.27	0.27	0.27	0.26	0.26	0.26
13.620	0.26	0.26	0.26	0.26	0.26	0.26	0.26
13.665	0.26	0.26	0.26	0.26	0.25	0.25	0.25
13.709	0.25	0.25	0.25	0.25	0.25	0.25	0.25
13.753	0.25	0.25	0.25	0.25	0.24	0.24	0.24
13.797	0.24	0.24	0.24	0.24	0.24	0.24	0.24
13.841	0.24	0.24	0.24	0.24	0.24	0.23	0.23
13.886	0.23	0.23	0.23	0.23	0.23	0.23	0.23
13.930	0.23	0.23	0.23	0.23	0.23	0.22	0.22
13.974	0.22	0.22	0.22	0.22	0.22	0.22	0.22

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.018	0.22	0.22	0.22	0.22	0.22	0.22	0.22
14.062	0.22	0.21	0.21	0.21	0.21	0.21	0.21
14.107	0.21	0.21	0.21	0.21	0.21	0.21	0.21
14.151	0.21	0.21	0.21	0.21	0.21	0.21	0.21
14.195	0.21	0.21	0.21	0.21	0.21	0.21	0.21
14.239	0.21	0.21	0.21	0.21	0.20	0.20	0.20
14.284	0.20	0.20	0.20	0.20	0.20	0.20	0.20
14.328	0.20	0.20	0.20	0.20	0.20	0.20	0.20
14.372	0.20	0.20	0.20	0.20	0.20	0.20	0.20
14.416	0.20	0.20	0.20	0.20	0.20	0.20	0.20
14.460	0.20	0.20	0.20	0.20	0.20	0.20	0.20
14.505	0.20	0.20	0.20	0.20	0.20	0.20	0.19
14.549	0.19	0.19	0.19	0.19	0.19	0.19	0.19
14.593	0.19	0.19	0.19	0.19	0.19	0.19	0.19
14.637	0.19	0.19	0.19	0.19	0.19	0.19	0.19
14.681	0.19	0.19	0.19	0.19	0.19	0.19	0.19
14.726	0.19	0.19	0.19	0.19	0.19	0.19	0.19
14.770	0.19	0.19	0.18	0.18	0.18	0.18	0.18
14.814	0.18	0.18	0.18	0.18	0.18	0.18	0.18
14.858	0.18	0.18	0.18	0.18	0.18	0.18	0.18
14.902	0.18	0.18	0.18	0.18	0.18	0.18	0.18
14.947	0.18	0.18	0.18	0.18	0.18	0.18	0.18
14.991	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.035	0.18	0.18	0.18	0.17	0.17	0.17	0.17
15.079	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.124	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.168	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.212	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.256	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.300	0.17	0.17	0.16	0.16	0.16	0.16	0.16
15.345	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.389	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.433	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

15.477	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.521	0.16	0.16	0.16	0.16	0.16	0.16	0.16
15.566	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.610	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.654	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.698	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.742	0.15	0.15	0.15	0.15	0.15	0.15	0.15
15.787	0.15	0.15	0.15	0.14	0.14	0.14	0.14
15.831	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.875	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.919	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.964	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.008	0.14	0.14	0.14	0.14	0.14	0.14	0.14
16.052	0.14	0.14	0.14	0.14	0.13	0.13	0.13
16.096	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.140	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.185	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.229	0.13	0.13	0.13	0.13	0.13	0.13	0.13

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
16.273	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.317	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.361	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.406	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.450	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.494	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.538	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.582	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.627	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.671	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.715	0.13	0.13	0.13	0.13	0.13	0.13	0.13
16.759	0.12	0.12	0.12	0.12	0.12	0.12	0.12
16.804	0.12	0.12	0.12	0.12	0.12	0.12	0.12
16.848	0.12	0.12	0.12	0.12	0.12	0.12	0.12
16.892	0.12	0.12	0.12	0.12	0.12	0.12	0.12
16.936	0.12	0.12	0.12	0.12	0.12	0.12	0.12
16.980	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.025	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.069	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.113	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.157	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.201	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.246	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.290	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.334	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.378	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.422	0.12	0.12	0.12	0.12	0.12	0.12	0.12
17.467	0.12	0.11	0.11	0.11	0.11	0.11	0.11
17.511	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.555	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.599	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.644	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.688	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

17.732	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.776	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.820	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.865	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.909	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.953	0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.997	0.11	0.11	0.11	0.11	0.11	0.11	0.11
18.041	0.11	0.11	0.11	0.11	0.11	0.11	0.11
18.086	0.11	0.11	0.11	0.11	0.11	0.11	0.11
18.130	0.11	0.11	0.11	0.11	0.11	0.11	0.11
18.174	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.218	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.262	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.307	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.351	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.395	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.439	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.484	0.10	0.10	0.10	0.10	0.10	0.10	0.10

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
18.528	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.572	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.616	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.660	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.705	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.749	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.793	0.10	0.10	0.10	0.10	0.10	0.10	0.10
18.837	0.10	0.10	0.10	0.10	0.10	0.10	0.09
18.881	0.09	0.09	0.09	0.09	0.09	0.09	0.09
18.926	0.09	0.09	0.09	0.09	0.09	0.09	0.09
18.970	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.014	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.058	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.102	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.147	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.191	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.235	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.279	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.324	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.368	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.412	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.456	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.500	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.545	0.09	0.09	0.09	0.08	0.08	0.08	0.08
19.589	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.633	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.677	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.721	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.766	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.810	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.854	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.898	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.942	0.08	0.08	0.08	0.08	0.08	0.08	0.08

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162	
B2 Post	Outlet	.0042	88.	.1	
B3 Post	Outlet	.00652	82.	.1	

19.987	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.031	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.075	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.119	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.164	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.208	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.252	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.296	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.340	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.385	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.429	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.473	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.517	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.561	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.606	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.650	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.694	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.738	0.08	0.08	0.08	0.08	0.08	0.08	0.08

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
20.782	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.827	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.871	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.915	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.959	0.08	0.08	0.07	0.07	0.07	0.07	0.07
21.004	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.048	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.092	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.136	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.180	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.225	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.269	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.313	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.357	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.401	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.446	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.490	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.534	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.578	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.622	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.667	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.711	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.755	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.799	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.844	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.888	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.932	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.976	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.020	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.065	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.109	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.153	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.197	0.07	0.07	0.07	0.07	0.07	0.07	0.07

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing
STORM 100-Yr
SUB-AREA:
B1 Post Outlet .00752 78. .162
B2 Post Outlet .0042 88. .1
B3 Post Outlet .00652 82. .1

22.241	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.286	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.330	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.374	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.418	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.462	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.507	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.551	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.595	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.639	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.684	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.728	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.772	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.816	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.860	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.905	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.949	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.993	0.07	0.07	0.07	0.07	0.07	0.07	0.07

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
23.037	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.081	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.126	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.170	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.214	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.258	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.302	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.347	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.391	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.435	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.479	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.524	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.568	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.612	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.656	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.700	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.745	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.789	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.833	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.877	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.921	0.07	0.07	0.07	0.07	0.07	0.07	0.07
23.966	0.07	0.07	0.07	0.07	0.07	0.07	0.07
24.010	0.07	0.07	0.06	0.06	0.06	0.06	0.05

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
B3 Post	0.007		1.052		11.94	6.73	1031.44

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162	
B2 Post	Outlet	.0042	88.	.1	
B3 Post	Outlet	.00652	82.	.1	

10.660	0.05	0.05	0.05	0.05	0.05	0.05	0.05
10.704	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.748	0.06	0.06	0.06	0.06	0.06	0.06	0.07
10.792	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.837	0.07	0.07	0.07	0.07	0.07	0.08	0.08
10.881	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.925	0.08	0.08	0.08	0.09	0.09	0.09	0.09
10.969	0.09	0.09	0.09	0.09	0.09	0.09	0.10
11.013	0.10	0.10	0.10	0.10	0.10	0.10	0.10
11.058	0.11	0.11	0.11	0.11	0.11	0.11	0.11
11.102	0.11	0.12	0.12	0.12	0.12	0.12	0.12
11.146	0.12	0.13	0.13	0.13	0.13	0.13	0.14
11.190	0.14	0.14	0.14	0.14	0.14	0.15	0.15
11.234	0.15	0.15	0.15	0.16	0.16	0.16	0.16
11.279	0.17	0.17	0.17	0.17	0.17	0.18	0.18
11.323	0.18	0.18	0.18	0.19	0.19	0.19	0.19
11.367	0.20	0.20	0.20	0.21	0.21	0.21	0.21

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.411	0.21	0.22	0.22	0.22	0.22	0.23	0.23
11.456	0.23	0.24	0.24	0.24	0.24	0.25	0.25
11.500	0.25	0.26	0.26	0.27	0.27	0.29	0.30
11.544	0.32	0.35	0.37	0.40	0.42	0.45	0.47
11.588	0.49	0.51	0.53	0.55	0.57	0.59	0.62
11.632	0.66	0.70	0.76	0.82	0.88	0.94	1.01
11.677	1.07	1.13	1.18	1.24	1.28	1.33	1.38
11.721	1.43	1.49	1.57	1.65	1.75	1.86	1.97
11.765	2.09	2.20	2.31	2.41	2.51	2.60	2.69
11.809	2.78	2.88	3.00	3.15	3.33	3.55	3.80
11.853	4.07	4.36	4.65	4.93	5.21	5.48	5.73
11.898	5.96	6.16	6.34	6.49	6.61	6.69	6.73
11.942	6.72	6.68	6.62	6.55	6.47	6.38	6.30
11.986	6.23	6.18	6.13	6.10	6.05	5.98	5.87
12.030	5.71	5.49	5.20	4.88	4.53	4.17	3.81
12.074	3.47	3.15	2.86	2.61	2.39	2.22	2.07
12.119	1.95	1.84	1.74	1.66	1.59	1.52	1.46
12.163	1.41	1.37	1.33	1.30	1.27	1.24	1.22
12.207	1.20	1.19	1.17	1.16	1.15	1.13	1.12
12.251	1.10	1.09	1.07	1.06	1.04	1.03	1.02
12.296	1.01	1.01	1.00	1.00	0.99	0.98	0.98
12.340	0.97	0.95	0.94	0.93	0.92	0.91	0.90
12.384	0.89	0.88	0.87	0.86	0.86	0.85	0.85
12.428	0.84	0.83	0.82	0.81	0.79	0.78	0.77
12.472	0.76	0.75	0.74	0.73	0.72	0.71	0.71
12.517	0.70	0.70	0.69	0.68	0.68	0.67	0.66
12.561	0.65	0.64	0.64	0.63	0.62	0.62	0.61
12.605	0.61	0.61	0.60	0.60	0.60	0.59	0.59
12.649	0.59	0.58	0.58	0.58	0.57	0.57	0.57
12.693	0.57	0.56	0.56	0.56	0.56	0.56	0.56
12.738	0.55	0.55	0.55	0.55	0.54	0.54	0.54
12.782	0.53	0.53	0.53	0.53	0.53	0.53	0.53
12.826	0.52	0.52	0.52	0.52	0.51	0.51	0.51

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

12.870	0.51	0.50	0.50	0.50	0.50	0.50	0.49
12.914	0.49	0.49	0.49	0.49	0.49	0.48	0.48
12.959	0.48	0.47	0.47	0.47	0.47	0.46	0.46
13.003	0.46	0.46	0.46	0.46	0.46	0.45	0.45
13.047	0.45	0.45	0.44	0.44	0.44	0.44	0.44
13.091	0.43	0.43	0.43	0.43	0.43	0.43	0.43
13.136	0.43	0.43	0.42	0.42	0.42	0.42	0.42
13.180	0.42	0.41	0.41	0.41	0.41	0.41	0.41
13.224	0.41	0.41	0.41	0.41	0.40	0.40	0.40
13.268	0.40	0.40	0.40	0.40	0.39	0.39	0.39
13.312	0.39	0.39	0.39	0.39	0.39	0.39	0.39
13.357	0.38	0.38	0.38	0.38	0.38	0.38	0.38
13.401	0.37	0.37	0.37	0.37	0.37	0.37	0.37
13.445	0.37	0.37	0.36	0.36	0.36	0.36	0.36
13.489	0.36	0.36	0.36	0.35	0.35	0.35	0.35
13.533	0.35	0.35	0.35	0.35	0.35	0.34	0.34
13.578	0.34	0.34	0.34	0.34	0.34	0.34	0.34
13.622	0.34	0.34	0.34	0.33	0.33	0.33	0.33

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
13.666	0.33	0.33	0.33	0.33	0.33	0.32	0.32
13.710	0.32	0.32	0.32	0.32	0.32	0.32	0.32
13.754	0.32	0.32	0.32	0.31	0.31	0.31	0.31
13.799	0.31	0.31	0.31	0.31	0.31	0.31	0.31
13.843	0.31	0.30	0.30	0.30	0.30	0.30	0.30
13.887	0.30	0.30	0.30	0.30	0.30	0.30	0.29
13.931	0.29	0.29	0.29	0.29	0.29	0.29	0.29
13.976	0.29	0.29	0.28	0.28	0.28	0.28	0.28
14.020	0.28	0.28	0.28	0.28	0.28	0.28	0.28
14.064	0.28	0.28	0.27	0.27	0.27	0.27	0.27
14.108	0.27	0.27	0.27	0.27	0.27	0.27	0.27
14.152	0.27	0.27	0.27	0.27	0.27	0.27	0.27
14.197	0.27	0.27	0.27	0.27	0.27	0.27	0.27
14.241	0.27	0.26	0.26	0.26	0.26	0.26	0.26
14.285	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.329	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.373	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.418	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.462	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.506	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.550	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.594	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.639	0.25	0.25	0.25	0.25	0.25	0.24	0.24
14.683	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.727	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.771	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.816	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.860	0.24	0.24	0.24	0.23	0.23	0.23	0.23
14.904	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.948	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.992	0.23	0.23	0.23	0.23	0.23	0.23	0.23
15.037	0.23	0.23	0.23	0.23	0.23	0.23	0.23
15.081	0.23	0.22	0.22	0.22	0.22	0.22	0.22

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

15.125	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.169	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.213	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.258	0.22	0.22	0.22	0.22	0.22	0.22	0.21
15.302	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.346	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.390	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.434	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.479	0.21	0.21	0.21	0.20	0.20	0.20	0.20
15.523	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.567	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.611	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.656	0.20	0.20	0.20	0.20	0.20	0.20	0.19
15.700	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.744	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.788	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.832	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.877	0.19	0.19	0.18	0.18	0.18	0.18	0.18

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.921	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.965	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.009	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.053	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.098	0.18	0.18	0.18	0.18	0.18	0.18	0.17
16.142	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.186	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.230	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.274	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.319	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.363	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.407	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.451	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.496	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.540	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.584	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.628	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.672	0.17	0.17	0.17	0.16	0.16	0.16	0.16
16.717	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.761	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.805	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.849	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.893	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.938	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.982	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.026	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.070	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.114	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.159	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.203	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.247	0.16	0.16	0.15	0.15	0.15	0.15	0.15
17.291	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.336	0.15	0.15	0.15	0.15	0.15	0.15	0.15

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

17.380	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.424	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.468	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.512	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.557	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.601	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.645	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.689	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.733	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.778	0.15	0.15	0.15	0.15	0.15	0.15	0.14
17.822	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.866	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.910	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.954	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.999	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.043	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.087	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.131	0.14	0.14	0.14	0.14	0.14	0.14	0.14

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
18.176	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.220	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.264	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.308	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.352	0.14	0.14	0.13	0.13	0.13	0.13	0.13
18.397	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.441	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.485	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.529	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.573	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.618	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.662	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.706	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.750	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.794	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.839	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.883	0.13	0.13	0.13	0.13	0.13	0.12	0.12
18.927	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.971	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.016	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.060	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.104	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.148	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.192	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.237	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.281	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.325	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.369	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.413	0.12	0.12	0.12	0.12	0.11	0.11	0.11
19.458	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.502	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.546	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.590	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

19.634	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.679	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.723	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.767	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.811	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.856	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.900	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.944	0.11	0.11	0.11	0.10	0.10	0.10	0.10
19.988	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.032	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.077	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.121	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.165	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.209	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.253	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.298	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.342	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.386	0.10	0.10	0.10	0.10	0.10	0.10	0.10

TLI #14-3592
Hillview Crossing

Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
20.430	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.474	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.519	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.563	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.607	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.651	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.696	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.740	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.784	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.828	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.872	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.917	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.961	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.005	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.049	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.093	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.138	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.182	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.226	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.270	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.314	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.359	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.403	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.447	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.491	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.536	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.580	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.624	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.668	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.712	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.757	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.801	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.845	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162	
B2 Post	Outlet	.0042	88.	.1	
B3 Post	Outlet	.00652	82.	.1	

21.889	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.933	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.978	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.022	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.066	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.110	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.154	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.199	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.243	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.287	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.331	0.10	0.10	0.10	0.10	0.10	0.09	0.09
22.376	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.420	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.464	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.508	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.552	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.597	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.641	0.09	0.09	0.09	0.09	0.09	0.09	0.09

TLI #14-3592
Hillview Crossing

Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
22.685	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.729	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.773	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.818	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.862	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.906	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.950	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.994	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.039	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.083	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.127	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.171	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.216	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.260	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.304	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.348	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.392	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.437	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.481	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.525	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.569	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.613	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.658	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.702	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.746	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.790	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.834	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.879	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.923	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.967	0.09	0.09	0.09	0.09	0.09	0.09	0.09
24.011	0.09	0.09	0.09	0.08	0.08	0.07	0.07
24.056	0.06	0.05					

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162	
B2 Post	Outlet	.0042	88.	.1	
B3 Post	Outlet	.00652	82.	.1	

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B4 Post	0.008		0.697		11.97	4.80	617.44

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.551	0.06	0.06	0.07	0.08	0.09	0.10	0.11
11.605	0.12	0.13	0.14	0.15	0.17	0.19	0.22
11.659	0.24	0.27	0.31	0.34	0.37	0.41	0.45
11.713	0.48	0.52	0.57	0.62	0.68	0.74	0.82
11.767	0.89	0.98	1.06	1.15	1.23	1.32	1.41
11.821	1.52	1.64	1.77	1.94	2.13	2.34	2.57
11.875	2.82	3.07	3.32	3.57	3.81	4.04	4.24
11.929	4.41	4.55	4.66	4.73	4.77	4.80	4.80

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.983	4.80	4.80	4.79	4.79	4.77	4.73	4.67
12.037	4.56	4.40	4.19	3.94	3.67	3.39	3.11
12.090	2.83	2.58	2.35	2.15	1.97	1.83	1.71
12.144	1.61	1.52	1.44	1.37	1.30	1.25	1.21
12.198	1.17	1.13	1.10	1.08	1.05	1.03	1.01
12.252	0.99	0.98	0.96	0.94	0.93	0.91	0.90
12.306	0.89	0.88	0.87	0.86	0.85	0.84	0.83
12.360	0.82	0.81	0.80	0.79	0.78	0.77	0.76
12.414	0.75	0.75	0.74	0.73	0.72	0.71	0.70
12.468	0.69	0.68	0.67	0.66	0.65	0.64	0.63
12.522	0.62	0.62	0.61	0.60	0.59	0.59	0.58
12.576	0.57	0.56	0.56	0.55	0.54	0.54	0.53
12.630	0.53	0.53	0.52	0.52	0.52	0.51	0.51
12.684	0.51	0.50	0.50	0.50	0.50	0.49	0.49
12.738	0.49	0.49	0.49	0.48	0.48	0.48	0.47
12.792	0.47	0.47	0.47	0.47	0.47	0.46	0.46
12.846	0.46	0.46	0.45	0.45	0.45	0.45	0.44
12.900	0.44	0.44	0.44	0.44	0.43	0.43	0.43
12.953	0.43	0.43	0.42	0.42	0.42	0.42	0.41
13.007	0.41	0.41	0.41	0.41	0.40	0.40	0.40
13.061	0.40	0.40	0.39	0.39	0.39	0.39	0.39
13.115	0.39	0.38	0.38	0.38	0.38	0.38	0.38
13.169	0.38	0.37	0.37	0.37	0.37	0.37	0.37
13.223	0.37	0.37	0.36	0.36	0.36	0.36	0.36
13.277	0.36	0.36	0.35	0.35	0.35	0.35	0.35
13.331	0.35	0.35	0.35	0.35	0.34	0.34	0.34
13.385	0.34	0.34	0.34	0.34	0.34	0.33	0.33
13.439	0.33	0.33	0.33	0.33	0.33	0.33	0.32
13.493	0.32	0.32	0.32	0.32	0.32	0.32	0.32
13.547	0.32	0.31	0.31	0.31	0.31	0.31	0.31
13.601	0.31	0.31	0.30	0.30	0.30	0.30	0.30
13.655	0.30	0.30	0.30	0.30	0.30	0.29	0.29
13.709	0.29	0.29	0.29	0.29	0.29	0.29	0.29

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

13.763	0.29	0.29	0.28	0.28	0.28	0.28	0.28
13.816	0.28	0.28	0.28	0.28	0.28	0.28	0.27
13.870	0.27	0.27	0.27	0.27	0.27	0.27	0.27
13.924	0.27	0.27	0.27	0.26	0.26	0.26	0.26
13.978	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.032	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.086	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.140	0.25	0.25	0.25	0.24	0.24	0.24	0.24
14.194	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.248	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.302	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.356	0.24	0.24	0.24	0.24	0.24	0.23	0.23
14.410	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.464	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.518	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.572	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.626	0.23	0.23	0.23	0.22	0.22	0.22	0.22
14.679	0.22	0.22	0.22	0.22	0.22	0.22	0.22

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.733	0.22	0.22	0.22	0.22	0.22	0.22	0.22
14.787	0.22	0.22	0.22	0.22	0.22	0.22	0.22
14.841	0.22	0.22	0.22	0.22	0.22	0.22	0.22
14.895	0.21	0.21	0.21	0.21	0.21	0.21	0.21
14.949	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.003	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.057	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.111	0.21	0.21	0.21	0.21	0.20	0.20	0.20
15.165	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.219	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.273	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.327	0.20	0.20	0.20	0.20	0.20	0.19	0.19
15.381	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.435	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.489	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.542	0.19	0.19	0.19	0.19	0.19	0.19	0.18
15.596	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.650	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.704	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.758	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.812	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.866	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.920	0.17	0.17	0.17	0.17	0.17	0.17	0.17
15.974	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.028	0.17	0.16	0.16	0.16	0.16	0.16	0.16
16.082	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.136	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.190	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.244	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.298	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.351	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.405	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.459	0.16	0.16	0.16	0.16	0.16	0.16	0.16

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

16.513	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.567	0.16	0.16	0.15	0.15	0.15	0.15	0.15
16.621	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.675	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.729	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.783	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.837	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.891	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.945	0.15	0.15	0.15	0.15	0.15	0.15	0.15
16.999	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.053	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.107	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.161	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.214	0.15	0.15	0.15	0.14	0.14	0.14	0.14
17.268	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.322	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.376	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.430	0.14	0.14	0.14	0.14	0.14	0.14	0.14

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
17.484	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.538	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.592	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.646	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.700	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.754	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.808	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17.862	0.14	0.13	0.13	0.13	0.13	0.13	0.13
17.916	0.13	0.13	0.13	0.13	0.13	0.13	0.13
17.970	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.024	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.077	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.131	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.185	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.239	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.293	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.347	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.401	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.455	0.13	0.13	0.13	0.12	0.12	0.12	0.12
18.509	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.563	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.617	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.671	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.725	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.779	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.833	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.887	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.940	0.12	0.12	0.12	0.12	0.12	0.12	0.12
18.994	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.048	0.12	0.12	0.12	0.11	0.11	0.11	0.11
19.102	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.156	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.210	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

19.264	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.318	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.372	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.426	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.480	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.534	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.588	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.642	0.11	0.10	0.10	0.10	0.10	0.10	0.10
19.696	0.10	0.10	0.10	0.10	0.10	0.10	0.10
19.750	0.10	0.10	0.10	0.10	0.10	0.10	0.10
19.803	0.10	0.10	0.10	0.10	0.10	0.10	0.10
19.857	0.10	0.10	0.10	0.10	0.10	0.10	0.10
19.911	0.10	0.10	0.10	0.10	0.10	0.10	0.10
19.965	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.019	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.073	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.127	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.181	0.10	0.10	0.10	0.10	0.10	0.10	0.10

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.008 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
20.235	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.289	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.343	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.397	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.451	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.505	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.559	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.613	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.666	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.720	0.10	0.10	0.10	0.10	0.10	0.10	0.10
20.774	0.10	0.10	0.10	0.10	0.09	0.09	0.09
20.828	0.09	0.09	0.09	0.09	0.09	0.09	0.09
20.882	0.09	0.09	0.09	0.09	0.09	0.09	0.09
20.936	0.09	0.09	0.09	0.09	0.09	0.09	0.09
20.990	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.044	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.098	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.152	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.206	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.260	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.314	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.368	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.422	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.475	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.529	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.583	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.637	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.691	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.745	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.799	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.853	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.907	0.09	0.09	0.09	0.09	0.09	0.09	0.09
21.961	0.09	0.09	0.09	0.09	0.09	0.09	0.09

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing
STORM 100-Yr
SUB-AREA:
B1 Post Outlet .00752 78. .162
B2 Post Outlet .0042 88. .1
B3 Post Outlet .00652 82. .1

22.015	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.069	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.123	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.177	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.231	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.285	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.338	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.392	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.446	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.500	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.554	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.608	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.662	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.716	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.770	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.824	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.878	0.09	0.09	0.09	0.09	0.09	0.09	0.09
22.932	0.09	0.09	0.09	0.09	0.09	0.09	0.09

TLI #14-3592
Hillview Crossing

Line Start Time (hr) — Flow Values @ time increment of 0.008 hr (cfs)

22.986	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.040	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.094	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.148	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.201	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.255	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.309	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.363	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.417	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.471	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.525	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.579	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.633	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.687	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.741	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.795	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.849	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.903	0.09	0.09	0.09	0.09	0.09	0.09	0.09
23.957	0.09	0.09	0.09	0.09	0.09	0.09	0.09
24.011	0.08	0.08	0.08	0.08	0.08	0.07	0.07
24.064	0.06	0.05					

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
B5 Post	0.012		0.390		12.02	3.93	316.46

Line Start Time (hr) — Flow Values @ time increment of 0.006 hr (cfs)

11.793	0.07	0.10	0.14	0.18	0.24	0.31	0.39

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

11.837	0.50	0.62	0.76	0.91	1.08	1.26	1.45
11.881	1.65	1.85	2.05	2.26	2.46	2.66	2.84
11.925	3.01	3.16	3.28	3.37	3.45	3.51	3.56
11.970	3.61	3.65	3.69	3.73	3.78	3.84	3.89
12.014	3.92	3.93	3.90	3.82	3.69	3.52	3.31
12.058	3.08	2.84	2.61	2.39	2.18	1.99	1.83
12.102	1.70	1.59	1.50	1.42	1.35	1.29	1.23
12.146	1.19	1.15	1.11	1.08	1.05	1.02	1.00
12.191	0.99	0.97	0.96	0.95	0.94	0.93	0.92
12.235	0.91	0.90	0.89	0.88	0.87	0.86	0.85
12.279	0.84	0.84	0.83	0.83	0.82	0.82	0.81
12.323	0.81	0.81	0.80	0.79	0.78	0.77	0.77
12.367	0.76	0.75	0.74	0.73	0.73	0.72	0.72
12.412	0.71	0.71	0.71	0.70	0.69	0.68	0.67
12.456	0.66	0.65	0.64	0.64	0.63	0.62	0.61
12.500	0.61	0.60	0.60	0.60	0.59	0.59	0.58
12.544	0.57	0.57	0.56	0.55	0.55	0.54	0.54
12.589	0.53	0.53	0.52	0.52	0.52	0.52	0.52

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
12.633	0.51	0.51	0.51	0.51	0.50	0.50	0.50
12.677	0.50	0.49	0.49	0.49	0.49	0.49	0.49
12.721	0.49	0.49	0.48	0.48	0.48	0.48	0.48
12.765	0.47	0.47	0.47	0.47	0.47	0.47	0.46
12.810	0.46	0.46	0.46	0.46	0.46	0.46	0.46
12.854	0.45	0.45	0.45	0.45	0.44	0.44	0.44
12.898	0.44	0.44	0.44	0.44	0.44	0.43	0.43
12.942	0.43	0.43	0.43	0.42	0.42	0.42	0.42
12.986	0.42	0.41	0.41	0.41	0.41	0.41	0.41
13.031	0.41	0.41	0.40	0.40	0.40	0.40	0.40
13.075	0.40	0.39	0.39	0.39	0.39	0.39	0.39
13.119	0.39	0.39	0.39	0.39	0.38	0.38	0.38
13.163	0.38	0.38	0.38	0.38	0.38	0.37	0.37
13.207	0.37	0.37	0.37	0.37	0.37	0.37	0.37
13.252	0.37	0.37	0.37	0.36	0.36	0.36	0.36
13.296	0.36	0.36	0.36	0.36	0.36	0.36	0.36
13.340	0.36	0.35	0.35	0.35	0.35	0.35	0.35
13.384	0.35	0.35	0.34	0.34	0.34	0.34	0.34
13.429	0.34	0.34	0.34	0.34	0.34	0.34	0.33
13.473	0.33	0.33	0.33	0.33	0.33	0.33	0.33
13.517	0.33	0.33	0.33	0.33	0.32	0.32	0.32
13.561	0.32	0.32	0.32	0.32	0.32	0.32	0.32
13.605	0.31	0.31	0.31	0.31	0.31	0.31	0.31
13.650	0.31	0.31	0.31	0.31	0.31	0.31	0.30
13.694	0.30	0.30	0.30	0.30	0.30	0.30	0.30
13.738	0.30	0.30	0.30	0.30	0.30	0.30	0.29
13.782	0.29	0.29	0.29	0.29	0.29	0.29	0.29
13.826	0.29	0.29	0.29	0.29	0.29	0.29	0.28
13.871	0.28	0.28	0.28	0.28	0.28	0.28	0.28
13.915	0.28	0.28	0.28	0.28	0.28	0.28	0.27
13.959	0.27	0.27	0.27	0.27	0.27	0.27	0.27
14.003	0.27	0.27	0.27	0.27	0.27	0.27	0.26
14.047	0.26	0.26	0.26	0.26	0.26	0.26	0.26

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

14.092	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.136	0.26	0.26	0.26	0.26	0.26	0.26	0.26
14.180	0.26	0.25	0.25	0.25	0.25	0.25	0.25
14.224	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.269	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.313	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.357	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.401	0.25	0.25	0.25	0.25	0.25	0.25	0.25
14.445	0.25	0.25	0.25	0.25	0.24	0.24	0.24
14.490	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.534	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.578	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.622	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.666	0.24	0.24	0.24	0.24	0.24	0.24	0.24
14.711	0.24	0.24	0.24	0.24	0.24	0.24	0.23
14.755	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.799	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.843	0.23	0.23	0.23	0.23	0.23	0.23	0.23

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.887	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.932	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.976	0.23	0.22	0.22	0.22	0.22	0.22	0.22
15.020	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.064	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.109	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.153	0.22	0.22	0.22	0.22	0.22	0.22	0.22
15.197	0.22	0.22	0.22	0.22	0.22	0.22	0.21
15.241	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.285	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.330	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.374	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.418	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.462	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.506	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.551	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.595	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.639	0.20	0.20	0.20	0.20	0.20	0.20	0.19
15.683	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.727	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.772	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.816	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.860	0.19	0.19	0.19	0.19	0.19	0.19	0.18
15.904	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.949	0.18	0.18	0.18	0.18	0.18	0.18	0.18
15.993	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.037	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.081	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.125	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.170	0.18	0.17	0.17	0.17	0.17	0.17	0.17
16.214	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.258	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.302	0.17	0.17	0.17	0.17	0.17	0.17	0.17

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post Outlet	.00752	78.	.162
B2 Post Outlet	.0042	88.	.1
B3 Post Outlet	.00652	82.	.1

16.346	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.391	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.435	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.479	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.523	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.567	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.612	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.656	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.700	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.744	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.789	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.833	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.877	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.921	0.16	0.16	0.16	0.16	0.16	0.16	0.16
16.965	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.010	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.054	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.098	0.16	0.16	0.16	0.16	0.16	0.16	0.16

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
17.142	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.186	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.231	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.275	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.319	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.363	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.407	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.452	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.496	0.16	0.16	0.16	0.16	0.16	0.16	0.16
17.540	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.584	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.629	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.673	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.717	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.761	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.805	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.850	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.894	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.938	0.15	0.15	0.15	0.15	0.15	0.15	0.15
17.982	0.15	0.15	0.15	0.15	0.15	0.15	0.15
18.026	0.15	0.15	0.15	0.15	0.15	0.15	0.15
18.071	0.15	0.15	0.15	0.15	0.15	0.15	0.15
18.115	0.15	0.15	0.15	0.15	0.14	0.14	0.14
18.159	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.203	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.247	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.292	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.336	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.380	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.424	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.469	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.513	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.557	0.14	0.14	0.14	0.14	0.14	0.14	0.14

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing
STORM 100-Yr
SUB-AREA:
B1 Post Outlet .00752 78. .162
B2 Post Outlet .0042 88. .1
B3 Post Outlet .00652 82. .1

18.601	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.645	0.14	0.14	0.14	0.14	0.14	0.14	0.14
18.690	0.14	0.14	0.14	0.13	0.13	0.13	0.13
18.734	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.778	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.822	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.866	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.911	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.955	0.13	0.13	0.13	0.13	0.13	0.13	0.13
18.999	0.13	0.13	0.13	0.13	0.13	0.13	0.13
19.043	0.13	0.13	0.13	0.13	0.13	0.13	0.13
19.087	0.13	0.13	0.13	0.13	0.13	0.13	0.13
19.132	0.13	0.13	0.13	0.13	0.13	0.13	0.13
19.176	0.13	0.13	0.13	0.13	0.13	0.13	0.13
19.220	0.13	0.13	0.13	0.13	0.13	0.12	0.12
19.264	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.309	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.353	0.12	0.12	0.12	0.12	0.12	0.12	0.12

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
19.397	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.441	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.485	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.530	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.574	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.618	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.662	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.706	0.12	0.12	0.12	0.12	0.12	0.12	0.12
19.751	0.12	0.12	0.12	0.12	0.12	0.11	0.11
19.795	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.839	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.883	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.927	0.11	0.11	0.11	0.11	0.11	0.11	0.11
19.972	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.016	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.060	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.104	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.149	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.193	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.237	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.281	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.325	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.370	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.414	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.458	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.502	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.546	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.591	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.635	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.679	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.723	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.767	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.812	0.11	0.11	0.11	0.11	0.11	0.11	0.11

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

20.856	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.900	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.944	0.11	0.11	0.11	0.11	0.11	0.11	0.11
20.989	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.033	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.077	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.121	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.165	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.210	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.254	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.298	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.342	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.386	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.431	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.475	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.519	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.563	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.607	0.11	0.11	0.11	0.11	0.11	0.11	0.11

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
21.652	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.696	0.11	0.11	0.11	0.11	0.11	0.11	0.11
21.740	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.784	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.829	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.873	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.917	0.10	0.10	0.10	0.10	0.10	0.10	0.10
21.961	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.005	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.050	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.094	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.138	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.182	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.226	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.271	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.315	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.359	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.403	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.447	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.492	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.536	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.580	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.624	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.669	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.713	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.757	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.801	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.845	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.890	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.934	0.10	0.10	0.10	0.10	0.10	0.10	0.10
22.978	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.022	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.066	0.10	0.10	0.10	0.10	0.10	0.10	0.10

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

23.111	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.155	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.199	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.243	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.287	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.332	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.376	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.420	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.464	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.509	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.553	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.597	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.641	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.685	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.730	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.774	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.818	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.862	0.10	0.10	0.10	0.10	0.10	0.10	0.10

TLI #14-3592
Hillview Crossing

Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
23.906	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.951	0.10	0.10	0.10	0.10	0.10	0.10	0.10
23.995	0.10	0.10	0.10	0.10	0.09	0.09	0.09
24.039	0.08	0.08	0.07	0.06	0.06		

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
Off-Site	0.019		0.611		12.02	9.66	509.22

Line
Start Time ---------- Flow Values @ time increment of 0.010 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.637	0.07	0.09	0.12	0.16	0.21	0.26	0.32
11.708	0.39	0.47	0.55	0.65	0.76	0.89	1.04
11.778	1.21	1.39	1.58	1.78	2.01	2.28	2.57
11.849	2.92	3.33	3.80	4.33	4.89	5.49	6.09
11.920	6.69	7.26	7.79	8.26	8.64	8.94	9.17
11.991	9.36	9.51	9.62	9.66	9.64	9.52	9.31
12.061	8.98	8.54	8.03	7.47	6.90	6.33	5.78
12.132	5.27	4.80	4.39	4.05	3.77	3.52	3.31
12.203	3.13	2.97	2.83	2.71	2.61	2.51	2.43
12.273	2.35	2.28	2.22	2.17	2.12	2.07	2.03
12.344	1.99	1.95	1.91	1.87	1.84	1.80	1.77
12.415	1.74	1.71	1.68	1.66	1.63	1.60	1.57
12.486	1.54	1.51	1.48	1.46	1.43	1.41	1.38
12.556	1.36	1.34	1.32	1.29	1.27	1.25	1.24
12.627	1.22	1.20	1.19	1.18	1.16	1.15	1.14
12.698	1.13	1.12	1.12	1.11	1.10	1.09	1.09
12.769	1.08	1.07	1.06	1.06	1.05	1.04	1.04
12.839	1.03	1.03	1.02	1.01	1.01	1.00	0.99

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing
STORM 100-Yr
SUB-AREA:
B1 Post Outlet .00752 78. .162
B2 Post Outlet .0042 88. .1
B3 Post Outlet .00652 82. .1

12.910	0.99	0.98	0.98	0.97	0.96	0.96	0.95
12.981	0.94	0.94	0.93	0.92	0.92	0.91	0.91
13.052	0.90	0.90	0.89	0.88	0.88	0.87	0.87
13.122	0.86	0.86	0.85	0.85	0.84	0.84	0.84
13.193	0.83	0.83	0.82	0.82	0.82	0.81	0.81
13.264	0.81	0.80	0.80	0.80	0.79	0.79	0.79
13.335	0.78	0.78	0.78	0.77	0.77	0.76	0.76
13.405	0.76	0.75	0.75	0.75	0.74	0.74	0.74
13.476	0.73	0.73	0.72	0.72	0.72	0.71	0.71
13.547	0.71	0.70	0.70	0.70	0.69	0.69	0.69
13.617	0.68	0.68	0.68	0.68	0.67	0.67	0.67
13.688	0.66	0.66	0.66	0.66	0.65	0.65	0.65
13.759	0.65	0.64	0.64	0.64	0.63	0.63	0.63
13.830	0.63	0.62	0.62	0.62	0.62	0.61	0.61
13.900	0.61	0.61	0.60	0.60	0.60	0.59	0.59
13.971	0.59	0.59	0.58	0.58	0.58	0.58	0.57
14.042	0.57	0.57	0.57	0.56	0.56	0.56	0.56
14.113	0.56	0.55	0.55	0.55	0.55	0.55	0.55

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
14.183	0.55	0.54	0.54	0.54	0.54	0.54	0.54
14.254	0.54	0.54	0.54	0.54	0.53	0.53	0.53
14.325	0.53	0.53	0.53	0.53	0.53	0.53	0.53
14.396	0.53	0.52	0.52	0.52	0.52	0.52	0.52
14.466	0.52	0.52	0.52	0.52	0.52	0.52	0.51
14.537	0.51	0.51	0.51	0.51	0.51	0.51	0.51
14.608	0.51	0.51	0.51	0.50	0.50	0.50	0.50
14.679	0.50	0.50	0.50	0.50	0.50	0.50	0.50
14.749	0.50	0.49	0.49	0.49	0.49	0.49	0.49
14.820	0.49	0.49	0.49	0.49	0.48	0.48	0.48
14.891	0.48	0.48	0.48	0.48	0.48	0.48	0.48
14.961	0.48	0.48	0.47	0.47	0.47	0.47	0.47
15.032	0.47	0.47	0.47	0.47	0.47	0.46	0.46
15.103	0.46	0.46	0.46	0.46	0.46	0.46	0.46
15.174	0.46	0.46	0.45	0.45	0.45	0.45	0.45
15.244	0.45	0.45	0.45	0.45	0.45	0.44	0.44
15.315	0.44	0.44	0.44	0.44	0.44	0.44	0.44
15.386	0.44	0.44	0.43	0.43	0.43	0.43	0.43
15.457	0.43	0.43	0.43	0.43	0.43	0.42	0.42
15.527	0.42	0.42	0.42	0.42	0.42	0.42	0.42
15.598	0.42	0.41	0.41	0.41	0.41	0.41	0.41
15.669	0.41	0.41	0.41	0.41	0.40	0.40	0.40
15.740	0.40	0.40	0.40	0.40	0.40	0.40	0.40
15.810	0.39	0.39	0.39	0.39	0.39	0.39	0.39
15.881	0.39	0.39	0.39	0.38	0.38	0.38	0.38
15.952	0.38	0.38	0.38	0.38	0.38	0.38	0.37
16.023	0.37	0.37	0.37	0.37	0.37	0.37	0.37
16.093	0.37	0.37	0.37	0.37	0.36	0.36	0.36
16.164	0.36	0.36	0.36	0.36	0.36	0.36	0.36
16.235	0.36	0.36	0.36	0.36	0.36	0.36	0.36
16.305	0.36	0.36	0.36	0.36	0.36	0.36	0.36
16.376	0.36	0.35	0.35	0.35	0.35	0.35	0.35
16.447	0.35	0.35	0.35	0.35	0.35	0.35	0.35

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

16.518	0.35	0.35	0.35	0.35	0.35	0.35	0.35
16.588	0.35	0.35	0.35	0.35	0.35	0.35	0.35
16.659	0.35	0.35	0.35	0.34	0.34	0.34	0.34
16.730	0.34	0.34	0.34	0.34	0.34	0.34	0.34
16.801	0.34	0.34	0.34	0.34	0.34	0.34	0.34
16.871	0.34	0.34	0.34	0.34	0.34	0.34	0.34
16.942	0.34	0.34	0.34	0.34	0.34	0.33	0.33
17.013	0.33	0.33	0.33	0.33	0.33	0.33	0.33
17.084	0.33	0.33	0.33	0.33	0.33	0.33	0.33
17.154	0.33	0.33	0.33	0.33	0.33	0.33	0.33
17.225	0.33	0.33	0.33	0.33	0.33	0.33	0.32
17.296	0.32	0.32	0.32	0.32	0.32	0.32	0.32
17.367	0.32	0.32	0.32	0.32	0.32	0.32	0.32
17.437	0.32	0.32	0.32	0.32	0.32	0.32	0.32
17.508	0.32	0.32	0.32	0.32	0.32	0.32	0.32
17.579	0.31	0.31	0.31	0.31	0.31	0.31	0.31
17.649	0.31	0.31	0.31	0.31	0.31	0.31	0.31
17.720	0.31	0.31	0.31	0.31	0.31	0.31	0.31

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
17.791	0.31	0.31	0.31	0.31	0.31	0.31	0.31
17.862	0.30	0.30	0.30	0.30	0.30	0.30	0.30
17.932	0.30	0.30	0.30	0.30	0.30	0.30	0.30
18.003	0.30	0.30	0.30	0.30	0.30	0.30	0.30
18.074	0.30	0.30	0.30	0.30	0.30	0.30	0.30
18.145	0.29	0.29	0.29	0.29	0.29	0.29	0.29
18.215	0.29	0.29	0.29	0.29	0.29	0.29	0.29
18.286	0.29	0.29	0.29	0.29	0.29	0.29	0.29
18.357	0.29	0.29	0.29	0.29	0.29	0.28	0.28
18.428	0.28	0.28	0.28	0.28	0.28	0.28	0.28
18.498	0.28	0.28	0.28	0.28	0.28	0.28	0.28
18.569	0.28	0.28	0.28	0.28	0.28	0.28	0.28
18.640	0.28	0.28	0.28	0.28	0.27	0.27	0.27
18.711	0.27	0.27	0.27	0.27	0.27	0.27	0.27
18.781	0.27	0.27	0.27	0.27	0.27	0.27	0.27
18.852	0.27	0.27	0.27	0.27	0.27	0.27	0.27
18.923	0.27	0.27	0.27	0.26	0.26	0.26	0.26
18.993	0.26	0.26	0.26	0.26	0.26	0.26	0.26
19.064	0.26	0.26	0.26	0.26	0.26	0.26	0.26
19.135	0.26	0.26	0.26	0.26	0.26	0.26	0.26
19.206	0.25	0.25	0.25	0.25	0.25	0.25	0.25
19.276	0.25	0.25	0.25	0.25	0.25	0.25	0.25
19.347	0.25	0.25	0.25	0.25	0.25	0.25	0.25
19.418	0.25	0.25	0.25	0.25	0.25	0.24	0.24
19.489	0.24	0.24	0.24	0.24	0.24	0.24	0.24
19.559	0.24	0.24	0.24	0.24	0.24	0.24	0.24
19.630	0.24	0.24	0.24	0.24	0.24	0.24	0.24
19.701	0.24	0.24	0.24	0.23	0.23	0.23	0.23
19.772	0.23	0.23	0.23	0.23	0.23	0.23	0.23
19.842	0.23	0.23	0.23	0.23	0.23	0.23	0.23
19.913	0.23	0.23	0.23	0.23	0.23	0.23	0.23
19.984	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.055	0.22	0.22	0.22	0.22	0.22	0.22	0.22

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

20.125	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.196	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.267	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.337	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.408	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.479	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.550	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.620	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.691	0.22	0.22	0.22	0.22	0.22	0.22	0.22
20.762	0.22	0.22	0.22	0.21	0.21	0.21	0.21
20.833	0.21	0.21	0.21	0.21	0.21	0.21	0.21
20.903	0.21	0.21	0.21	0.21	0.21	0.21	0.21
20.974	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.045	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.116	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.186	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.257	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.328	0.21	0.21	0.21	0.21	0.21	0.21	0.21

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
21.399	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.469	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.540	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.611	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.681	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.752	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.823	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.894	0.21	0.21	0.21	0.21	0.21	0.21	0.21
21.964	0.21	0.21	0.21	0.21	0.21	0.21	0.21
22.035	0.21	0.21	0.21	0.21	0.21	0.21	0.21
22.106	0.21	0.21	0.21	0.21	0.21	0.21	0.21
22.177	0.21	0.21	0.21	0.21	0.21	0.21	0.21
22.247	0.21	0.21	0.21	0.21	0.21	0.21	0.21
22.318	0.21	0.21	0.21	0.21	0.20	0.20	0.20
22.389	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.460	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.530	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.601	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.672	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.743	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.813	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.884	0.20	0.20	0.20	0.20	0.20	0.20	0.20
22.955	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.025	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.096	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.167	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.238	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.308	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.379	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.450	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.521	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.591	0.20	0.20	0.20	0.20	0.20	0.20	0.20
23.662	0.20	0.20	0.20	0.20	0.20	0.20	0.20

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

23.733	0.20	0.20	0.20	0.20	0.20	0.20	0.19
23.804	0.19	0.19	0.19	0.19	0.19	0.19	0.19
23.874	0.19	0.19	0.19	0.19	0.19	0.19	0.19
23.945	0.19	0.19	0.19	0.19	0.19	0.19	0.19
24.016	0.19	0.19	0.19	0.18	0.17	0.16	0.15
24.087	0.13	0.12	0.11	0.09	0.08	0.07	0.06

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
Pre	0.038		0.571		12.03	17.93	466.92

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
11.659	0.07	0.12	0.17	0.24	0.32	0.43	0.55
11.731	0.69	0.86	1.06	1.29	1.56	1.86	2.19
11.803	2.55	2.94	3.39	3.90	4.49	5.18	6.00
11.874	6.92	7.94	9.03	10.17	11.33	12.46	13.53
11.946	14.50	15.35	16.04	16.59	17.04	17.42	17.70
12.017	17.88	17.93	17.83	17.54	17.02	16.29	15.41
12.089	14.41	13.36	12.29	11.25	10.27	9.37	8.56
12.161	7.87	7.30	6.82	6.40	6.04	5.73	5.46
12.232	5.22	5.02	4.83	4.67	4.52	4.38	4.26
12.304	4.15	4.06	3.97	3.88	3.80	3.73	3.65
12.376	3.58	3.51	3.45	3.39	3.33	3.27	3.22
12.447	3.16	3.11	3.05	2.99	2.93	2.88	2.83
12.519	2.78	2.73	2.68	2.64	2.60	2.55	2.51
12.590	2.47	2.43	2.39	2.36	2.33	2.30	2.27
12.662	2.25	2.22	2.20	2.18	2.17	2.15	2.13
12.734	2.12	2.10	2.09	2.08	2.06	2.05	2.03
12.805	2.02	2.01	2.00	1.99	1.97	1.96	1.95
12.877	1.94	1.92	1.91	1.90	1.89	1.88	1.86
12.948	1.85	1.84	1.83	1.82	1.80	1.79	1.78
13.020	1.77	1.75	1.74	1.73	1.72	1.71	1.70
13.092	1.69	1.68	1.67	1.66	1.65	1.64	1.63
13.163	1.62	1.62	1.61	1.60	1.59	1.58	1.58
13.235	1.57	1.56	1.56	1.55	1.54	1.54	1.53
13.307	1.52	1.52	1.51	1.50	1.50	1.49	1.48
13.378	1.48	1.47	1.46	1.45	1.45	1.44	1.44
13.450	1.43	1.42	1.41	1.41	1.40	1.39	1.39
13.521	1.38	1.37	1.37	1.36	1.35	1.35	1.34
13.593	1.33	1.33	1.32	1.32	1.31	1.30	1.30
13.665	1.29	1.29	1.28	1.28	1.27	1.27	1.26
13.736	1.26	1.25	1.24	1.24	1.23	1.23	1.22
13.808	1.22	1.21	1.21	1.20	1.20	1.19	1.19
13.880	1.18	1.18	1.17	1.17	1.16	1.16	1.15
13.951	1.15	1.14	1.14	1.13	1.13	1.12	1.12

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

14.023	1.11	1.11	1.10	1.10	1.09	1.09	1.08
14.094	1.08	1.08	1.07	1.07	1.07	1.06	1.06
14.166	1.06	1.05	1.05	1.05	1.05	1.04	1.04
14.238	1.04	1.04	1.04	1.04	1.03	1.03	1.03
14.309	1.03	1.03	1.03	1.02	1.02	1.02	1.02
14.381	1.02	1.02	1.01	1.01	1.01	1.01	1.01
14.453	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14.524	0.99	0.99	0.99	0.99	0.99	0.99	0.98
14.596	0.98	0.98	0.98	0.98	0.97	0.97	0.97
14.667	0.97	0.97	0.97	0.96	0.96	0.96	0.96
14.739	0.96	0.96	0.96	0.95	0.95	0.95	0.95
14.811	0.95	0.94	0.94	0.94	0.94	0.94	0.93
14.882	0.93	0.93	0.93	0.93	0.93	0.93	0.92
14.954	0.92	0.92	0.92	0.92	0.91	0.91	0.91
15.025	0.91	0.91	0.90	0.90	0.90	0.90	0.90
15.097	0.90	0.89	0.89	0.89	0.89	0.89	0.89
15.169	0.88	0.88	0.88	0.88	0.88	0.87	0.87
15.240	0.87	0.87	0.87	0.86	0.86	0.86	0.86

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.312	0.86	0.86	0.85	0.85	0.85	0.85	0.85
15.384	0.84	0.84	0.84	0.84	0.84	0.83	0.83
15.455	0.83	0.83	0.83	0.83	0.82	0.82	0.82
15.527	0.82	0.82	0.81	0.81	0.81	0.81	0.81
15.598	0.80	0.80	0.80	0.80	0.80	0.79	0.79
15.670	0.79	0.79	0.79	0.79	0.78	0.78	0.78
15.742	0.78	0.78	0.77	0.77	0.77	0.77	0.77
15.813	0.76	0.76	0.76	0.76	0.76	0.75	0.75
15.885	0.75	0.75	0.75	0.74	0.74	0.74	0.74
15.957	0.74	0.73	0.73	0.73	0.73	0.73	0.72
16.028	0.72	0.72	0.72	0.72	0.71	0.71	0.71
16.100	0.71	0.71	0.71	0.71	0.71	0.70	0.70
16.171	0.70	0.70	0.70	0.70	0.70	0.70	0.70
16.243	0.70	0.70	0.69	0.69	0.69	0.69	0.69
16.315	0.69	0.69	0.69	0.69	0.69	0.69	0.69
16.386	0.69	0.69	0.69	0.69	0.68	0.68	0.68
16.458	0.68	0.68	0.68	0.68	0.68	0.68	0.68
16.530	0.68	0.68	0.68	0.68	0.68	0.68	0.67
16.601	0.67	0.67	0.67	0.67	0.67	0.67	0.67
16.673	0.67	0.67	0.67	0.67	0.67	0.67	0.67
16.744	0.67	0.66	0.66	0.66	0.66	0.66	0.66
16.816	0.66	0.66	0.66	0.66	0.66	0.66	0.66
16.888	0.66	0.66	0.65	0.65	0.65	0.65	0.65
16.959	0.65	0.65	0.65	0.65	0.65	0.65	0.65
17.031	0.65	0.65	0.65	0.64	0.64	0.64	0.64
17.103	0.64	0.64	0.64	0.64	0.64	0.64	0.64
17.174	0.64	0.64	0.64	0.64	0.63	0.63	0.63
17.246	0.63	0.63	0.63	0.63	0.63	0.63	0.63
17.317	0.63	0.63	0.63	0.63	0.63	0.62	0.62
17.389	0.62	0.62	0.62	0.62	0.62	0.62	0.62
17.461	0.62	0.62	0.62	0.62	0.62	0.62	0.61
17.532	0.61	0.61	0.61	0.61	0.61	0.61	0.61
17.604	0.61	0.61	0.61	0.61	0.61	0.61	0.60

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

17.675	0.60	0.60	0.60	0.60	0.60	0.60	0.60
17.747	0.60	0.60	0.60	0.60	0.60	0.60	0.59
17.819	0.59	0.59	0.59	0.59	0.59	0.59	0.59
17.890	0.59	0.59	0.59	0.59	0.59	0.59	0.59
17.962	0.58	0.58	0.58	0.58	0.58	0.58	0.58
18.034	0.58	0.58	0.58	0.58	0.58	0.58	0.58
18.105	0.57	0.57	0.57	0.57	0.57	0.57	0.57
18.177	0.57	0.57	0.57	0.57	0.57	0.57	0.56
18.248	0.56	0.56	0.56	0.56	0.56	0.56	0.56
18.320	0.56	0.56	0.56	0.56	0.56	0.56	0.56
18.392	0.55	0.55	0.55	0.55	0.55	0.55	0.55
18.463	0.55	0.55	0.55	0.55	0.55	0.55	0.55
18.535	0.54	0.54	0.54	0.54	0.54	0.54	0.54
18.607	0.54	0.54	0.54	0.54	0.54	0.54	0.53
18.678	0.53	0.53	0.53	0.53	0.53	0.53	0.53
18.750	0.53	0.53	0.53	0.53	0.53	0.52	0.52
18.821	0.52	0.52	0.52	0.52	0.52	0.52	0.52
18.893	0.52	0.52	0.52	0.52	0.52	0.51	0.51

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.010 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
18.965	0.51	0.51	0.51	0.51	0.51	0.51	0.51
19.036	0.51	0.51	0.51	0.51	0.50	0.50	0.50
19.108	0.50	0.50	0.50	0.50	0.50	0.50	0.50
19.180	0.50	0.50	0.50	0.49	0.49	0.49	0.49
19.251	0.49	0.49	0.49	0.49	0.49	0.49	0.49
19.323	0.49	0.49	0.49	0.48	0.48	0.48	0.48
19.394	0.48	0.48	0.48	0.48	0.48	0.48	0.48
19.466	0.48	0.47	0.47	0.47	0.47	0.47	0.47
19.538	0.47	0.47	0.47	0.47	0.47	0.47	0.47
19.609	0.47	0.46	0.46	0.46	0.46	0.46	0.46
19.681	0.46	0.46	0.46	0.46	0.46	0.46	0.46
19.752	0.45	0.45	0.45	0.45	0.45	0.45	0.45
19.824	0.45	0.45	0.45	0.45	0.45	0.44	0.44
19.896	0.44	0.44	0.44	0.44	0.44	0.44	0.44
19.967	0.44	0.44	0.44	0.44	0.43	0.43	0.43
20.039	0.43	0.43	0.43	0.43	0.43	0.43	0.43
20.111	0.43	0.43	0.43	0.43	0.43	0.43	0.43
20.182	0.43	0.43	0.43	0.43	0.42	0.42	0.42
20.254	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.325	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.397	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.469	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.540	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.612	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.684	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.755	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.827	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.898	0.42	0.42	0.42	0.42	0.42	0.42	0.42
20.970	0.42	0.42	0.42	0.42	0.42	0.41	0.41
21.042	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.113	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.185	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.257	0.41	0.41	0.41	0.41	0.41	0.41	0.41

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing
STORM 100-Yr
SUB-AREA:
B1 Post Outlet .00752 78. .162
B2 Post Outlet .0042 88. .1
B3 Post Outlet .00652 82. .1

21.328	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.400	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.471	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.543	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.615	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.686	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.758	0.41	0.41	0.41	0.41	0.41	0.41	0.41
21.829	0.41	0.40	0.40	0.40	0.40	0.40	0.40
21.901	0.40	0.40	0.40	0.40	0.40	0.40	0.40
21.973	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.044	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.116	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.188	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.259	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.331	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.402	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.474	0.40	0.40	0.40	0.40	0.40	0.40	0.40
22.546	0.40	0.40	0.40	0.40	0.40	0.40	0.40

TLI #14-3592
Hillview Crossing

Line
Start Time ---------- Flow Values @ time increment of 0.010 hr ----------

(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
22.617	0.40	0.39	0.39	0.39	0.39	0.39	0.39
22.689	0.39	0.39	0.39	0.39	0.39	0.39	0.39
22.761	0.39	0.39	0.39	0.39	0.39	0.39	0.39
22.832	0.39	0.39	0.39	0.39	0.39	0.39	0.39
22.904	0.39	0.39	0.39	0.39	0.39	0.39	0.39
22.975	0.39	0.39	0.39	0.39	0.39	0.39	0.39
23.047	0.39	0.39	0.39	0.39	0.39	0.39	0.39
23.119	0.39	0.39	0.39	0.39	0.39	0.39	0.39
23.190	0.39	0.39	0.39	0.39	0.39	0.39	0.39
23.262	0.39	0.39	0.39	0.39	0.39	0.39	0.39
23.334	0.39	0.39	0.39	0.39	0.39	0.39	0.38
23.405	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.477	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.548	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.620	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.692	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.763	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.835	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.907	0.38	0.38	0.38	0.38	0.38	0.38	0.38
23.978	0.38	0.38	0.38	0.38	0.37	0.37	0.36
24.050	0.35	0.33	0.31	0.28	0.25	0.22	0.20
24.121	0.17	0.15	0.12	0.10	0.09	0.07	0.06
24.193	0.05						

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)
OUTLET	0.096		0.657		12.01	52.76	550.66

Line
Start Time ---------- Flow Values @ time increment of 0.006 hr ----------
(hr) (cfs) (cfs) (cfs) (cfs) (cfs) (cfs) (cfs)

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162	
B2 Post	Outlet	.0042	88.	.1	
B3 Post	Outlet	.00652	82.	.1	

9.776	0.05	0.05	0.05	0.05	0.05	0.05	0.05
9.820	0.05	0.05	0.05	0.05	0.05	0.05	0.05
9.864	0.05	0.05	0.06	0.06	0.06	0.06	0.06
9.908	0.06	0.06	0.06	0.06	0.06	0.06	0.06
9.952	0.06	0.06	0.06	0.06	0.06	0.06	0.06
9.997	0.06	0.06	0.06	0.06	0.06	0.06	0.06
10.041	0.06	0.06	0.06	0.06	0.07	0.07	0.07
10.085	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.129	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.173	0.07	0.07	0.07	0.07	0.07	0.07	0.07
10.218	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.262	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.306	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10.350	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.394	0.09	0.09	0.09	0.09	0.09	0.09	0.09
10.439	0.09	0.09	0.09	0.09	0.10	0.10	0.10
10.483	0.10	0.10	0.10	0.10	0.10	0.10	0.10

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
10.527	0.10	0.10	0.10	0.10	0.10	0.10	0.10
10.571	0.11	0.11	0.11	0.11	0.11	0.11	0.11
10.616	0.11	0.11	0.11	0.11	0.11	0.11	0.11
10.660	0.17	0.17	0.17	0.17	0.17	0.17	0.18
10.704	0.18	0.18	0.18	0.18	0.18	0.18	0.19
10.748	0.19	0.19	0.19	0.19	0.20	0.20	0.20
10.792	0.20	0.20	0.20	0.20	0.21	0.21	0.21
10.837	0.21	0.21	0.21	0.22	0.22	0.22	0.22
10.881	0.22	0.23	0.23	0.23	0.23	0.23	0.23
10.925	0.24	0.24	0.24	0.24	0.24	0.25	0.25
10.969	0.25	0.25	0.26	0.26	0.26	0.26	0.26
11.013	0.26	0.27	0.27	0.27	0.27	0.28	0.28
11.058	0.28	0.29	0.29	0.29	0.30	0.30	0.30
11.102	0.30	0.31	0.31	0.31	0.31	0.32	0.32
11.146	0.32	0.33	0.33	0.34	0.34	0.35	0.35
11.190	0.36	0.36	0.36	0.36	0.37	0.37	0.38
11.234	0.38	0.38	0.39	0.43	0.45	0.46	0.46
11.279	0.47	0.48	0.48	0.49	0.49	0.50	0.50
11.323	0.51	0.51	0.52	0.53	0.53	0.54	0.55
11.367	0.55	0.56	0.57	0.58	0.58	0.59	0.59
11.411	0.60	0.61	0.61	0.62	0.63	0.63	0.64
11.456	0.65	0.66	0.67	0.67	0.68	0.69	0.70
11.500	0.70	0.71	0.72	0.74	0.76	0.79	0.84
11.544	0.89	0.99	1.07	1.14	1.21	1.28	1.35
11.588	1.41	1.47	1.53	1.59	1.65	1.72	1.81
11.632	1.95	2.12	2.28	2.48	2.73	2.97	3.21
11.677	3.46	3.71	3.96	4.21	4.47	4.73	5.01
11.721	5.31	5.65	6.03	6.47	6.95	7.47	8.04
11.765	8.63	9.25	9.88	10.52	11.21	11.90	12.59
11.809	13.33	14.13	15.02	16.03	17.19	18.52	20.01
11.853	21.64	23.41	25.29	27.25	29.27	31.33	33.42
11.898	35.49	37.54	39.52	41.41	43.19	44.81	46.26
11.942	47.50	48.56	49.43	50.13	50.70	51.15	51.53

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

11.986	51.86	52.15	52.43	52.65	52.76	52.73	52.47
12.030	51.99	51.20	50.06	48.66	46.99	45.14	43.15
12.074	41.05	38.95	36.85	34.80	32.86	31.01	29.27
12.119	27.63	26.11	24.67	23.34	22.11	20.97	19.98
12.163	19.06	18.26	17.54	16.88	16.30	15.77	15.28
12.207	14.86	14.45	14.09	13.76	13.44	13.15	12.88
12.251	12.61	12.37	12.14	11.92	11.72	11.52	11.35
12.296	11.19	11.04	10.90	10.77	10.65	10.53	10.41
12.340	10.28	10.16	10.03	9.91	9.79	9.67	9.55
12.384	9.44	9.34	9.24	9.15	9.06	8.97	8.89
12.428	8.80	8.71	8.61	8.51	8.41	8.30	8.20
12.472	8.09	7.99	7.89	7.80	7.71	7.63	7.55
12.517	7.48	7.40	7.33	7.26	7.18	7.10	7.03
12.561	6.95	6.87	6.80	6.73	6.66	6.59	6.53
12.605	6.48	6.43	6.38	6.33	6.28	6.24	6.19
12.649	6.15	6.11	6.07	6.04	6.00	5.97	5.94
12.693	5.91	5.88	5.86	5.83	5.81	5.79	5.76
12.738	5.74	5.72	5.69	5.67	5.64	5.62	5.59

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
12.782	5.57	5.54	5.52	5.50	5.49	5.47	5.45
12.826	5.43	5.41	5.39	5.37	5.35	5.32	5.30
12.870	5.27	5.25	5.23	5.21	5.19	5.17	5.15
12.914	5.13	5.11	5.10	5.08	5.06	5.03	5.01
12.959	4.99	4.96	4.94	4.92	4.89	4.87	4.85
13.003	4.83	4.81	4.80	4.78	4.76	4.74	4.72
13.047	4.70	4.68	4.66	4.64	4.62	4.60	4.58
13.091	4.57	4.55	4.54	4.52	4.51	4.49	4.48
13.136	4.46	4.45	4.43	4.42	4.40	4.39	4.37
13.180	4.36	4.35	4.33	4.32	4.31	4.30	4.29
13.224	4.28	4.27	4.26	4.25	4.23	4.22	4.21
13.268	4.19	4.18	4.17	4.16	4.14	4.13	4.12
13.312	4.11	4.10	4.09	4.08	4.07	4.06	4.05
13.357	4.03	4.02	4.01	3.99	3.98	3.97	3.96
13.401	3.95	3.94	3.93	3.92	3.91	3.90	3.89
13.445	3.87	3.86	3.85	3.83	3.82	3.81	3.79
13.489	3.78	3.77	3.76	3.75	3.74	3.73	3.72
13.533	3.71	3.70	3.69	3.67	3.66	3.65	3.64
13.578	3.63	3.61	3.60	3.59	3.58	3.57	3.57
13.622	3.56	3.55	3.54	3.53	3.52	3.51	3.50
13.666	3.49	3.48	3.47	3.46	3.45	3.44	3.43
13.710	3.42	3.42	3.41	3.40	3.39	3.38	3.37
13.754	3.37	3.36	3.35	3.34	3.33	3.32	3.31
13.799	3.30	3.29	3.28	3.28	3.27	3.26	3.25
13.843	3.24	3.23	3.23	3.22	3.21	3.20	3.19
13.887	3.18	3.17	3.16	3.15	3.14	3.14	3.13
13.931	3.12	3.11	3.10	3.09	3.08	3.07	3.06
13.976	3.05	3.04	3.04	3.03	3.02	3.01	3.00
14.020	3.00	2.99	2.98	2.97	2.97	2.96	2.95
14.064	2.94	2.94	2.93	2.92	2.92	2.91	2.90
14.108	2.90	2.89	2.89	2.88	2.88	2.87	2.87
14.152	2.86	2.86	2.85	2.85	2.84	2.84	2.84
14.197	2.83	2.83	2.83	2.82	2.82	2.82	2.81

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

14.241	2.81	2.81	2.80	2.80	2.80	2.79	2.79
14.285	2.79	2.79	2.78	2.78	2.78	2.78	2.77
14.329	2.77	2.77	2.77	2.76	2.76	2.76	2.75
14.373	2.75	2.75	2.74	2.74	2.74	2.73	2.73
14.418	2.73	2.73	2.72	2.72	2.72	2.71	2.71
14.462	2.71	2.71	2.70	2.70	2.70	2.69	2.69
14.506	2.69	2.69	2.69	2.68	2.68	2.68	2.68
14.550	2.67	2.67	2.66	2.66	2.66	2.65	2.65
14.594	2.65	2.64	2.64	2.64	2.64	2.63	2.63
14.639	2.63	2.63	2.62	2.62	2.62	2.61	2.61
14.683	2.61	2.60	2.60	2.60	2.60	2.60	2.59
14.727	2.59	2.59	2.58	2.58	2.58	2.57	2.57
14.771	2.57	2.56	2.56	2.56	2.55	2.55	2.55
14.816	2.54	2.54	2.54	2.54	2.53	2.53	2.53
14.860	2.52	2.52	2.52	2.51	2.51	2.51	2.51
14.904	2.50	2.50	2.50	2.50	2.49	2.49	2.49
14.948	2.49	2.48	2.48	2.47	2.47	2.47	2.46
14.992	2.46	2.46	2.45	2.45	2.45	2.45	2.44

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
15.037	2.44	2.44	2.43	2.43	2.43	2.42	2.42
15.081	2.42	2.41	2.41	2.41	2.41	2.40	2.40
15.125	2.40	2.40	2.39	2.39	2.39	2.38	2.38
15.169	2.38	2.37	2.37	2.36	2.36	2.36	2.36
15.213	2.35	2.35	2.35	2.34	2.34	2.34	2.33
15.258	2.33	2.33	2.32	2.32	2.32	2.31	2.31
15.302	2.31	2.31	2.30	2.30	2.30	2.30	2.29
15.346	2.29	2.29	2.28	2.28	2.27	2.27	2.27
15.390	2.26	2.26	2.26	2.25	2.25	2.25	2.25
15.434	2.24	2.24	2.24	2.23	2.23	2.23	2.22
15.479	2.22	2.22	2.21	2.21	2.21	2.21	2.20
15.523	2.20	2.20	2.19	2.19	2.19	2.18	2.18
15.567	2.18	2.17	2.17	2.16	2.16	2.16	2.15
15.611	2.15	2.15	2.15	2.14	2.14	2.14	2.13
15.656	2.13	2.13	2.12	2.12	2.12	2.11	2.11
15.700	2.11	2.10	2.10	2.10	2.10	2.09	2.09
15.744	2.09	2.08	2.08	2.08	2.07	2.07	2.06
15.788	2.06	2.06	2.05	2.05	2.05	2.04	2.04
15.832	2.04	2.03	2.03	2.03	2.02	2.02	2.02
15.877	2.01	2.01	2.01	2.00	2.00	2.00	2.00
15.921	1.99	1.99	1.99	1.98	1.98	1.98	1.97
15.965	1.97	1.96	1.96	1.96	1.95	1.95	1.95
16.009	1.94	1.94	1.94	1.93	1.93	1.93	1.93
16.053	1.92	1.92	1.92	1.91	1.91	1.91	1.91
16.098	1.91	1.90	1.90	1.90	1.90	1.90	1.89
16.142	1.89	1.89	1.89	1.89	1.89	1.88	1.88
16.186	1.88	1.88	1.88	1.88	1.87	1.87	1.87
16.230	1.87	1.87	1.87	1.87	1.87	1.87	1.86
16.274	1.86	1.86	1.86	1.86	1.86	1.86	1.86
16.319	1.86	1.86	1.85	1.85	1.85	1.85	1.85
16.363	1.85	1.85	1.85	1.84	1.84	1.84	1.84
16.407	1.84	1.84	1.84	1.84	1.84	1.83	1.83
16.451	1.83	1.83	1.83	1.83	1.83	1.83	1.83

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

16.496	1.83	1.82	1.82	1.82	1.82	1.82	1.82
16.540	1.82	1.82	1.82	1.82	1.81	1.81	1.81
16.584	1.81	1.81	1.81	1.81	1.81	1.80	1.80
16.628	1.80	1.80	1.80	1.80	1.80	1.80	1.80
16.672	1.79	1.79	1.79	1.79	1.79	1.79	1.79
16.717	1.79	1.79	1.79	1.79	1.78	1.78	1.78
16.761	1.78	1.78	1.78	1.78	1.78	1.77	1.77
16.805	1.77	1.77	1.77	1.77	1.77	1.77	1.77
16.849	1.76	1.76	1.76	1.76	1.76	1.76	1.76
16.893	1.76	1.76	1.75	1.75	1.75	1.75	1.75
16.938	1.75	1.75	1.75	1.75	1.75	1.74	1.74
16.982	1.74	1.74	1.74	1.74	1.74	1.73	1.73
17.026	1.73	1.73	1.73	1.73	1.73	1.73	1.73
17.070	1.72	1.72	1.72	1.72	1.72	1.72	1.72
17.114	1.72	1.72	1.72	1.72	1.71	1.71	1.71
17.159	1.71	1.71	1.71	1.71	1.70	1.70	1.70
17.203	1.70	1.70	1.70	1.70	1.70	1.70	1.69
17.247	1.69	1.69	1.69	1.69	1.69	1.69	1.69

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
17.291	1.69	1.68	1.68	1.68	1.68	1.68	1.68
17.336	1.68	1.68	1.68	1.68	1.67	1.67	1.67
17.380	1.67	1.67	1.67	1.67	1.66	1.66	1.66
17.424	1.66	1.66	1.66	1.66	1.66	1.66	1.65
17.468	1.65	1.65	1.65	1.65	1.65	1.65	1.65
17.512	1.65	1.65	1.64	1.64	1.64	1.64	1.64
17.557	1.64	1.64	1.64	1.63	1.63	1.63	1.63
17.601	1.63	1.63	1.63	1.63	1.62	1.62	1.62
17.645	1.62	1.62	1.62	1.62	1.62	1.61	1.61
17.689	1.61	1.61	1.61	1.61	1.61	1.61	1.61
17.733	1.61	1.60	1.60	1.60	1.60	1.60	1.60
17.778	1.60	1.59	1.59	1.59	1.59	1.59	1.59
17.822	1.59	1.59	1.59	1.58	1.58	1.58	1.58
17.866	1.58	1.58	1.58	1.58	1.57	1.57	1.57
17.910	1.57	1.57	1.57	1.57	1.57	1.57	1.57
17.954	1.56	1.56	1.56	1.56	1.56	1.56	1.56
17.999	1.55	1.55	1.55	1.55	1.55	1.55	1.55
18.043	1.55	1.55	1.54	1.54	1.54	1.54	1.54
18.087	1.54	1.54	1.54	1.54	1.53	1.53	1.53
18.131	1.53	1.53	1.53	1.53	1.53	1.52	1.52
18.176	1.52	1.52	1.52	1.52	1.52	1.51	1.51
18.220	1.51	1.51	1.51	1.51	1.51	1.51	1.51
18.264	1.50	1.50	1.50	1.50	1.50	1.50	1.50
18.308	1.50	1.50	1.49	1.49	1.49	1.49	1.49
18.352	1.49	1.49	1.49	1.48	1.48	1.48	1.48
18.397	1.48	1.48	1.48	1.47	1.47	1.47	1.47
18.441	1.47	1.47	1.47	1.47	1.47	1.46	1.46
18.485	1.46	1.46	1.46	1.46	1.46	1.46	1.46
18.529	1.45	1.45	1.45	1.45	1.45	1.45	1.45
18.573	1.45	1.44	1.44	1.44	1.44	1.44	1.44
18.618	1.44	1.43	1.43	1.43	1.43	1.43	1.43
18.662	1.43	1.43	1.42	1.42	1.42	1.42	1.42
18.706	1.42	1.42	1.42	1.42	1.42	1.41	1.41

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

18.750	1.41	1.41	1.41	1.41	1.41	1.40	1.40
18.794	1.40	1.40	1.40	1.40	1.40	1.40	1.39
18.839	1.39	1.39	1.39	1.39	1.39	1.39	1.39
18.883	1.38	1.38	1.38	1.38	1.38	1.38	1.38
18.927	1.38	1.38	1.37	1.37	1.37	1.37	1.37
18.971	1.37	1.37	1.36	1.36	1.36	1.36	1.36
19.016	1.36	1.36	1.36	1.35	1.35	1.35	1.35
19.060	1.35	1.35	1.35	1.35	1.34	1.34	1.34
19.104	1.34	1.34	1.34	1.34	1.34	1.34	1.33
19.148	1.33	1.33	1.33	1.33	1.33	1.33	1.32
19.192	1.32	1.32	1.32	1.32	1.32	1.32	1.31
19.237	1.31	1.31	1.31	1.31	1.31	1.31	1.31
19.281	1.30	1.30	1.30	1.30	1.30	1.30	1.30
19.325	1.30	1.30	1.30	1.29	1.29	1.29	1.29
19.369	1.29	1.29	1.28	1.28	1.28	1.28	1.28
19.413	1.28	1.28	1.28	1.27	1.27	1.27	1.27
19.458	1.27	1.27	1.27	1.27	1.26	1.26	1.26
19.502	1.26	1.26	1.26	1.26	1.26	1.26	1.25

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
19.546	1.25	1.25	1.25	1.25	1.25	1.25	1.24
19.590	1.24	1.24	1.24	1.24	1.24	1.24	1.23
19.634	1.23	1.23	1.23	1.23	1.23	1.23	1.23
19.679	1.22	1.22	1.22	1.22	1.22	1.22	1.22
19.723	1.22	1.22	1.21	1.21	1.21	1.21	1.21
19.767	1.21	1.21	1.20	1.20	1.20	1.20	1.20
19.811	1.20	1.20	1.19	1.19	1.19	1.19	1.19
19.856	1.19	1.19	1.19	1.18	1.18	1.18	1.18
19.900	1.18	1.18	1.18	1.18	1.18	1.17	1.17
19.944	1.17	1.17	1.17	1.17	1.17	1.16	1.16
19.988	1.16	1.16	1.16	1.16	1.16	1.15	1.15
20.032	1.15	1.15	1.15	1.15	1.15	1.15	1.15
20.077	1.15	1.14	1.14	1.14	1.14	1.14	1.14
20.121	1.14	1.14	1.14	1.14	1.14	1.14	1.14
20.165	1.14	1.14	1.14	1.14	1.13	1.13	1.13
20.209	1.13	1.13	1.13	1.13	1.13	1.13	1.13
20.253	1.13	1.13	1.13	1.13	1.13	1.13	1.13
20.298	1.13	1.13	1.13	1.13	1.13	1.13	1.13
20.342	1.13	1.13	1.13	1.13	1.13	1.13	1.13
20.386	1.13	1.13	1.13	1.13	1.13	1.13	1.12
20.430	1.12	1.12	1.12	1.12	1.12	1.12	1.12
20.474	1.12	1.12	1.12	1.12	1.12	1.12	1.12
20.519	1.12	1.12	1.12	1.12	1.12	1.12	1.12
20.563	1.12	1.12	1.12	1.12	1.12	1.12	1.12
20.607	1.12	1.12	1.12	1.12	1.12	1.12	1.12
20.651	1.12	1.12	1.12	1.12	1.12	1.12	1.12
20.696	1.12	1.12	1.12	1.12	1.12	1.12	1.12
20.740	1.12	1.12	1.12	1.12	1.12	1.11	1.11
20.784	1.11	1.11	1.11	1.11	1.11	1.11	1.11
20.828	1.11	1.11	1.11	1.11	1.11	1.11	1.11
20.872	1.11	1.11	1.11	1.11	1.11	1.11	1.11
20.917	1.11	1.11	1.11	1.11	1.11	1.11	1.11
20.961	1.11	1.11	1.11	1.11	1.11	1.11	1.11

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing

STORM 100-Yr

SUB-AREA:

B1 Post	Outlet	.00752	78.	.162
B2 Post	Outlet	.0042	88.	.1
B3 Post	Outlet	.00652	82.	.1

21.005	1.11	1.11	1.11	1.11	1.10	1.10	1.10
21.049	1.10	1.10	1.10	1.10	1.10	1.10	1.10
21.093	1.10	1.10	1.10	1.10	1.10	1.10	1.10
21.138	1.10	1.10	1.10	1.10	1.10	1.10	1.10
21.182	1.10	1.10	1.10	1.10	1.10	1.10	1.10
21.226	1.10	1.10	1.10	1.10	1.10	1.10	1.10
21.270	1.10	1.10	1.10	1.10	1.10	1.10	1.10
21.314	1.10	1.10	1.10	1.10	1.10	1.10	1.10
21.359	1.10	1.09	1.09	1.09	1.09	1.09	1.09
21.403	1.09	1.09	1.09	1.09	1.09	1.09	1.09
21.447	1.09	1.09	1.09	1.09	1.09	1.09	1.09
21.491	1.09	1.09	1.09	1.09	1.09	1.09	1.09
21.536	1.09	1.09	1.09	1.09	1.09	1.09	1.09
21.580	1.09	1.09	1.09	1.09	1.09	1.09	1.09
21.624	1.08	1.08	1.08	1.08	1.08	1.08	1.08
21.668	1.08	1.08	1.08	1.08	1.08	1.08	1.08
21.712	1.08	1.08	1.08	1.08	1.08	1.08	1.08
21.757	1.08	1.08	1.08	1.08	1.08	1.08	1.08

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
21.801	1.08	1.08	1.08	1.08	1.08	1.08	1.08
21.845	1.08	1.08	1.08	1.08	1.08	1.08	1.08
21.889	1.08	1.08	1.08	1.08	1.08	1.08	1.08
21.933	1.08	1.08	1.08	1.08	1.07	1.07	1.07
21.978	1.07	1.07	1.07	1.07	1.07	1.07	1.07
22.022	1.07	1.07	1.07	1.07	1.07	1.07	1.07
22.066	1.07	1.07	1.07	1.07	1.07	1.07	1.07
22.110	1.07	1.07	1.07	1.07	1.07	1.07	1.07
22.154	1.07	1.07	1.07	1.07	1.07	1.07	1.07
22.199	1.07	1.06	1.06	1.06	1.06	1.06	1.06
22.243	1.06	1.06	1.06	1.06	1.06	1.06	1.06
22.287	1.06	1.06	1.06	1.06	1.06	1.06	1.06
22.331	1.06	1.06	1.06	1.06	1.06	1.06	1.06
22.376	1.06	1.06	1.06	1.06	1.06	1.06	1.06
22.420	1.06	1.06	1.06	1.06	1.06	1.06	1.06
22.464	1.06	1.06	1.06	1.06	1.06	1.06	1.06
22.508	1.06	1.06	1.06	1.05	1.05	1.05	1.05
22.552	1.05	1.05	1.05	1.05	1.05	1.05	1.05
22.597	1.05	1.05	1.05	1.05	1.05	1.05	1.05
22.641	1.05	1.05	1.05	1.05	1.05	1.05	1.05
22.685	1.05	1.05	1.05	1.05	1.05	1.05	1.05
22.729	1.05	1.05	1.05	1.05	1.05	1.05	1.05
22.773	1.05	1.05	1.04	1.04	1.04	1.04	1.04
22.818	1.04	1.04	1.04	1.04	1.04	1.04	1.04
22.862	1.04	1.04	1.04	1.04	1.04	1.04	1.04
22.906	1.04	1.04	1.04	1.04	1.04	1.04	1.04
22.950	1.04	1.04	1.04	1.04	1.04	1.04	1.04
22.994	1.04	1.04	1.04	1.04	1.04	1.04	1.04
23.039	1.03	1.03	1.03	1.03	1.03	1.03	1.03
23.083	1.03	1.03	1.03	1.03	1.03	1.03	1.03
23.127	1.03	1.03	1.03	1.03	1.03	1.03	1.03
23.171	1.03	1.03	1.03	1.03	1.03	1.03	1.03
23.216	1.03	1.03	1.03	1.03	1.03	1.03	1.03

WinTR-20: Version 1.10 0 0 0.05
14-3592 (continued)
Hillview Crossing
STORM 100-Yr
SUB-AREA:
B1 Post Outlet .00752 78. .162
B2 Post Outlet .0042 88. .1
B3 Post Outlet .00652 82. .1

23.260	1.03	1.03	1.03	1.03	1.03	1.03	1.03
23.304	1.03	1.03	1.03	1.03	1.03	1.03	1.03
23.348	1.03	1.02	1.02	1.02	1.02	1.02	1.02
23.392	1.02	1.02	1.02	1.02	1.02	1.02	1.02
23.437	1.02	1.02	1.02	1.02	1.02	1.02	1.02
23.481	1.02	1.02	1.02	1.02	1.02	1.02	1.02
23.525	1.02	1.02	1.02	1.02	1.02	1.02	1.02
23.569	1.02	1.02	1.02	1.02	1.01	1.01	1.01
23.613	1.01	1.01	1.01	1.01	1.01	1.01	1.01
23.658	1.01	1.01	1.01	1.01	1.01	1.01	1.01
23.702	1.01	1.01	1.01	1.01	1.01	1.01	1.01
23.746	1.01	1.01	1.01	1.01	1.01	1.01	1.01
23.790	1.01	1.01	1.01	1.01	1.01	1.01	1.01
23.834	1.01	1.01	1.01	1.00	1.00	1.00	1.00
23.879	1.00	1.00	1.00	1.00	1.00	1.00	1.00
23.923	1.00	1.00	1.00	1.00	1.00	1.00	1.00
23.967	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24.011	0.99	0.99	0.98	0.96	0.94	0.91	0.87

TLI #14-3592
Hillview Crossing

Line Start Time (hr)	Flow Values @ time increment of 0.006 hr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
24.056	0.82	0.74	0.70	0.57	0.49	0.46	0.43
24.100	0.40	0.36	0.29	0.27	0.24	0.22	0.20
24.144	0.18	0.16	0.15	0.09	0.08	0.07	0.06
24.188	0.06	0.05					

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WinTR-20: Version 1.10                  0         0         0.05
14-3592                                                                  (continued)
Hillview Crossing
                                            STORM 100-Yr
SUB-AREA:
          B1 Post   Outlet              .00752    78.       .162
          B2 Post   Outlet              .0042     88.       .1
          B3 Post   Outlet              .00652    82.       .1
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TLI #14-3592
Hillview Crossing

Area or Reach Identifier	Drainage Area (sq mi)	Alternate	Peak Flow by Storm 2-Yr (cfs)	100-Yr (cfs)	(cfs)	(cfs)	(cfs)
B1 Post	0.008		0.48	5.50			
B2 Post	0.004		1.49	6.01			
B3 Post	0.007		1.06	6.73			
B4 Post	0.008		0.21	4.80			
B5 Post	0.012		0.0	3.93			
Off-Site	0.019		0.12	9.66			
Pre	0.038		0.15	17.93			
OUTLET	0.096		3.03	52.76			

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WinTR-20: Version 1.10                  0         0         0.05
14-3592                                                                    (continued)
Hillview Crossing
                                            STORM 100-Yr
SUB-AREA:
          B1 Post   Outlet              .00752    78.       .162
          B2 Post   Outlet              .0042     88.       .1
          B3 Post   Outlet              .00652    82.       .1
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SITE DISTANCE REPORT FOR HILLVIEW WAY AND HILLVIEW CROSSING ROADS

VEHICULAR AND PEDESTRIAN SAFETY

for

Hillview Crossing Townhome Development

Located in Section 6, Township 12 North, Range 19 West, P.M.M.,
City of Missoula, Missoula County, Montana

September 28, 2018

Prepared For:
Hillview Crossing Missoula, LLC
3605 Arthur Street
Caldwell, ID 83605

Prepared By:
Territorial-Landworks, Inc.
P.O. Box 3851
Missoula, MT 59806

Background

The Hillview Crossing project proposes to have an intersection with Hillview Way in a section of roadway with a 35 mph speed limit. In addition, pedestrians that already cross the road from the Tonkin Trail without a crosswalk and pedestrians from the development will be expected to cross Hillview since there are only sidewalks on the South side of Hillview Way. Hillview way is at a 6.34% grade and has a slight curve. Please consider the following analysis for the site distance evaluation.

Vehicular Access to Hillview Way

This analysis is per the AASHTO Green Book for Geometric Design of Highways and Streets (section 3.2.6) based on the speed limit (35 MPH or 51.3 ft/sec) for Hillview Way. The Hillview Improvement plans were provided to TLI by City Engineering. The approach location is at STA 38+70, and per the method of determining sight distance in the AASHTO manual, we have an uphill vertical sight distance at 29+52 (918 feet) and a downhill vertical sight distance 47+82(912 feet). In review of the Hillview Way designs and from a site visit, there is adequate site distance in both directions for a safe ingress to Hillview Way from the proposed roadway on the north side of Hillview Way. Additionally, the recent reconstruction of Hillview Way contemplated this location as shown on those plans.

Pedestrian Crossing of Hillview Way

The AASHTO Green Book specifies per Exhibit 3-2 with a grade of approximately 6% that the stopping sight distance is 271 feet for a speed of 35 mph. However, the area in concern is on a vertical curve and has a slight horizontal curve as well. In addition, this is a pedestrian crossing and therefore poses a higher risk and need for adequate stopping sight distance. Therefore, Exhibit 3-3 of the AASHTO Green Book is utilized to determine the Decision Sight Distance. Condition B is used for stopping on an urban road. For 35 mph, the determined distance is 590'.

For the north side crossing, there is ample sight distance in both directions. However, the east side is on the inside of the curve. There is roughly 600' of sight distance based on a site visit with Troy Monroe, PE of the City Engineering staff. However, the site line is marginal and may become obstructed over time. Since the sight line is marginal and on a vertical curve, we are recommending that a Rectangular Rapid Flash Beacon (RRFB) system be installed on each side of the roadway. They will be set to both flash

regardless of which side of the road is actuated by a pedestrian and designed in accordance with the Manual of Uniform Traffic Control Devices (MUTCD) Interim Approval 21 and the City of Missoula Standards for roadside construction.

Conclusion

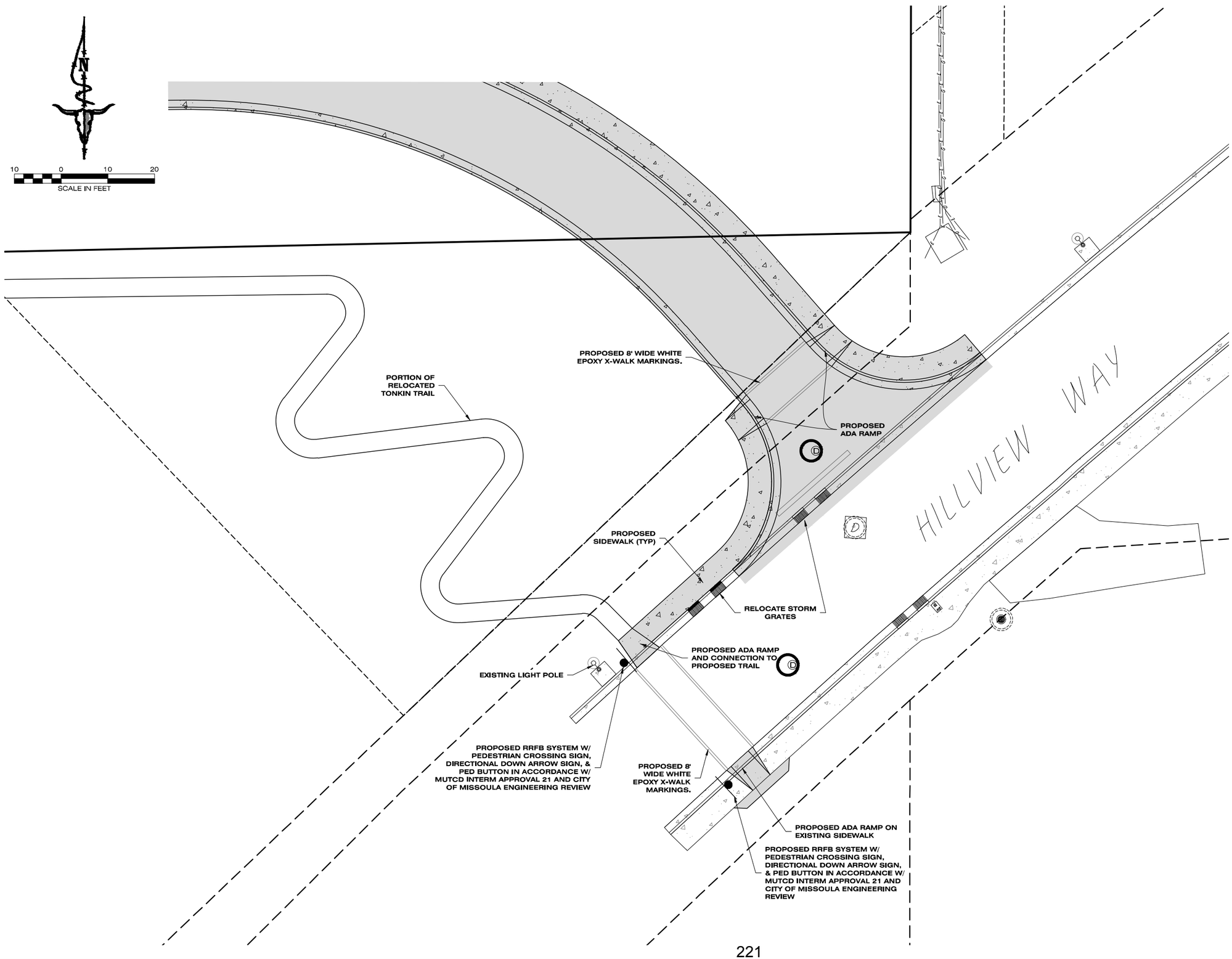
Vehicles exiting the proposed road should have ample sight distance to safely ingress from the proposed development. However, due to the crossing maneuver from the south side of Hillview Way and concerns of the east bound traffic, we are recommending that a RRFB be installed. A site plan showing the crosswalk area is attached.

Prepared by:
TERRITIORIAL-LANDWORKS, INC.

Jason Rice, P.E.

MONTANA
JASON S RICE
13470 PE
9-28-18
LICENSED
PROFESSIONAL ENGINEER

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\4_PLANNING\CUP Application.2018\rpt.2018-09-27.Site Distance Report.docx



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Missoula, MT 59806
Ph: 406/721-0142
Fax: 406/721-5221

PLOT DATE: 9/17/2018 1:26 PM

REVISIONS	DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 4/19/2018

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.

PROJECT NAME: HILLVIEW CROSSING – MISSOULA

SHEET TITLE: HILLVIEW WAY INTERSECTION DETAIL

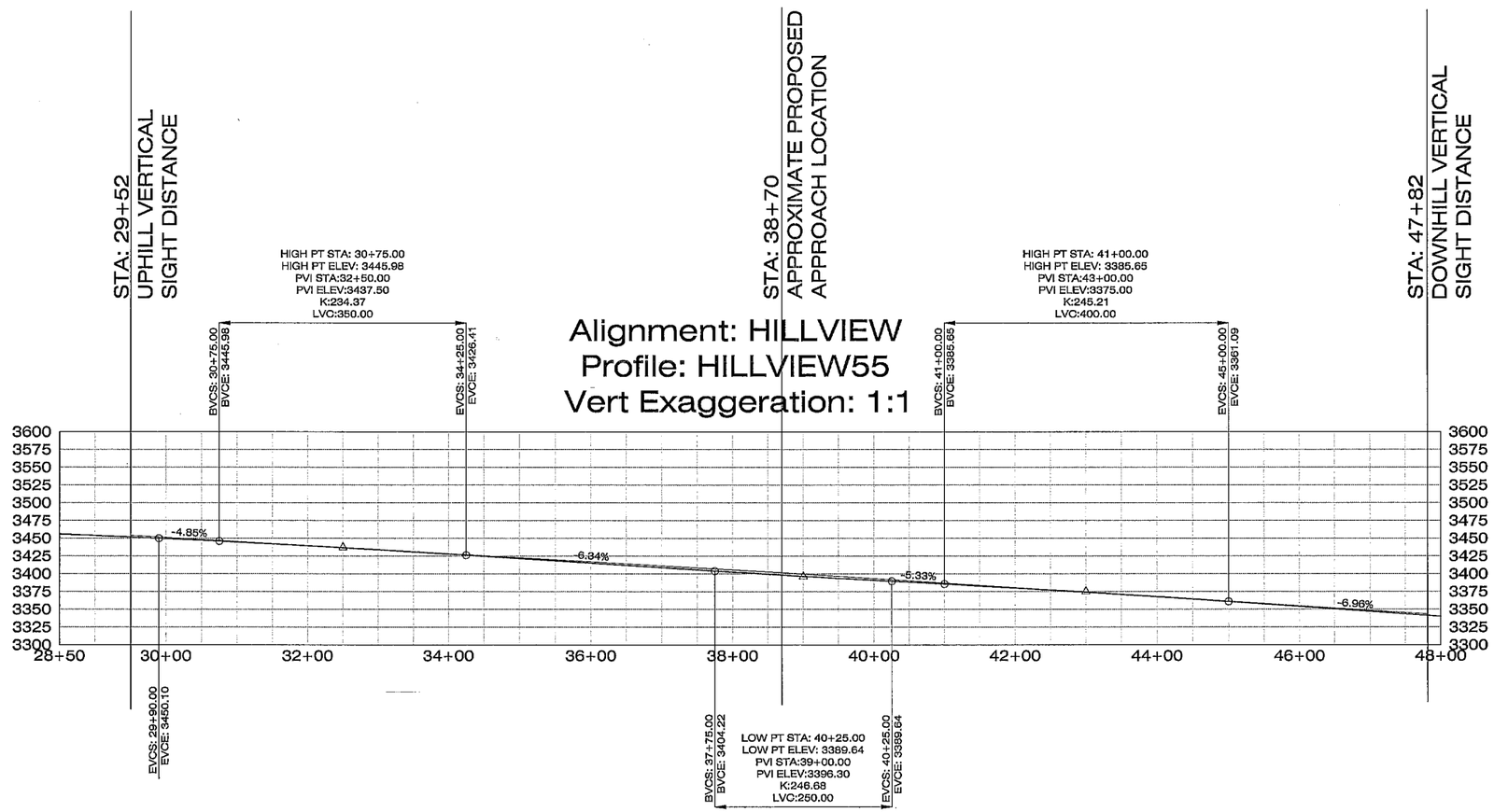
PROJECT NO. 14-3592

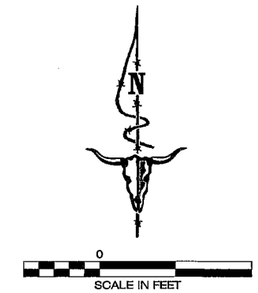
SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE PLEDGES\14-3592\14-3592-HILLVIEW CROSSING-MISSOULA & HILLS DEVELOPMENT\PLDWT\TNGIA_L2\HWWRIDGEVAUTOCAD\2-14-3592-ALT CONNECTION.DWG

*Assumes 3.5' eye height and 2' target height per Aushto Green book





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Missoula, MT 59806
Ph: 406/721-9152
Fax: 406/721-3224

PLOT DATE: 8/1/2018 1:01 PM

REVISIONS | DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 7/31/2018

LOCATION:

PREPARED FOR:

PROJECT NAME: HILLIVEW CROSSING

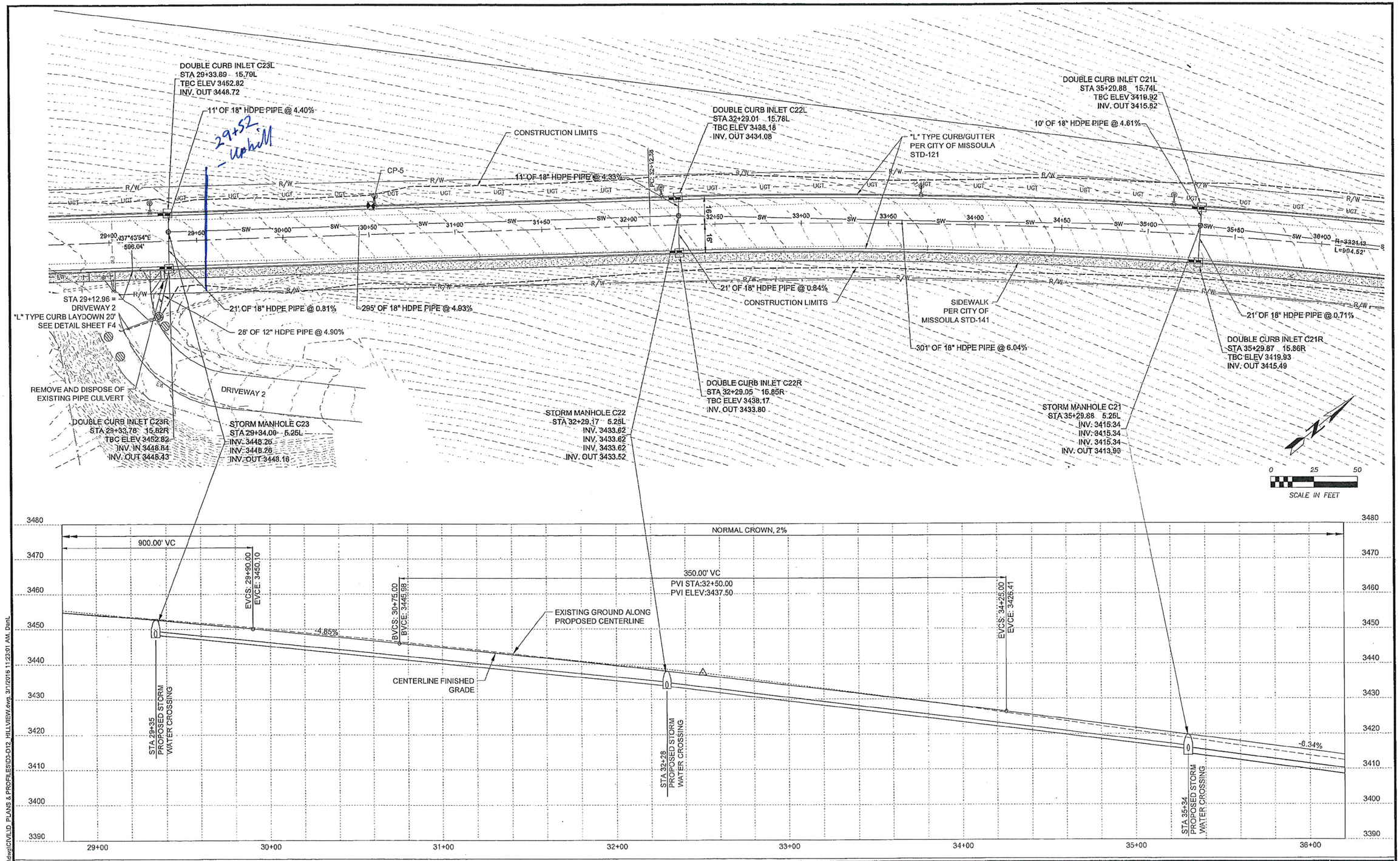
SHEET TITLE: VERTICAL SIGHT DISTANCE ON HILLVIEW WAY

PROJECT NO.: 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE FILES\2014 PROJECTS\592 - HILLVIEW CROSSING-MISSOULA & PHILS DEVELOPMENT_DRAFTING\8.1_DRAWINGS\AUTOCAD\SDH-VERTICAL SIGHT DISTANCE.DWG



BY	DATE	REVISION DESCRIPTION

DESIGN PD PROJ. NO. 6469
DRAWN ML DATE 5/2015
CHECKED MU SURVEYED DJ&A

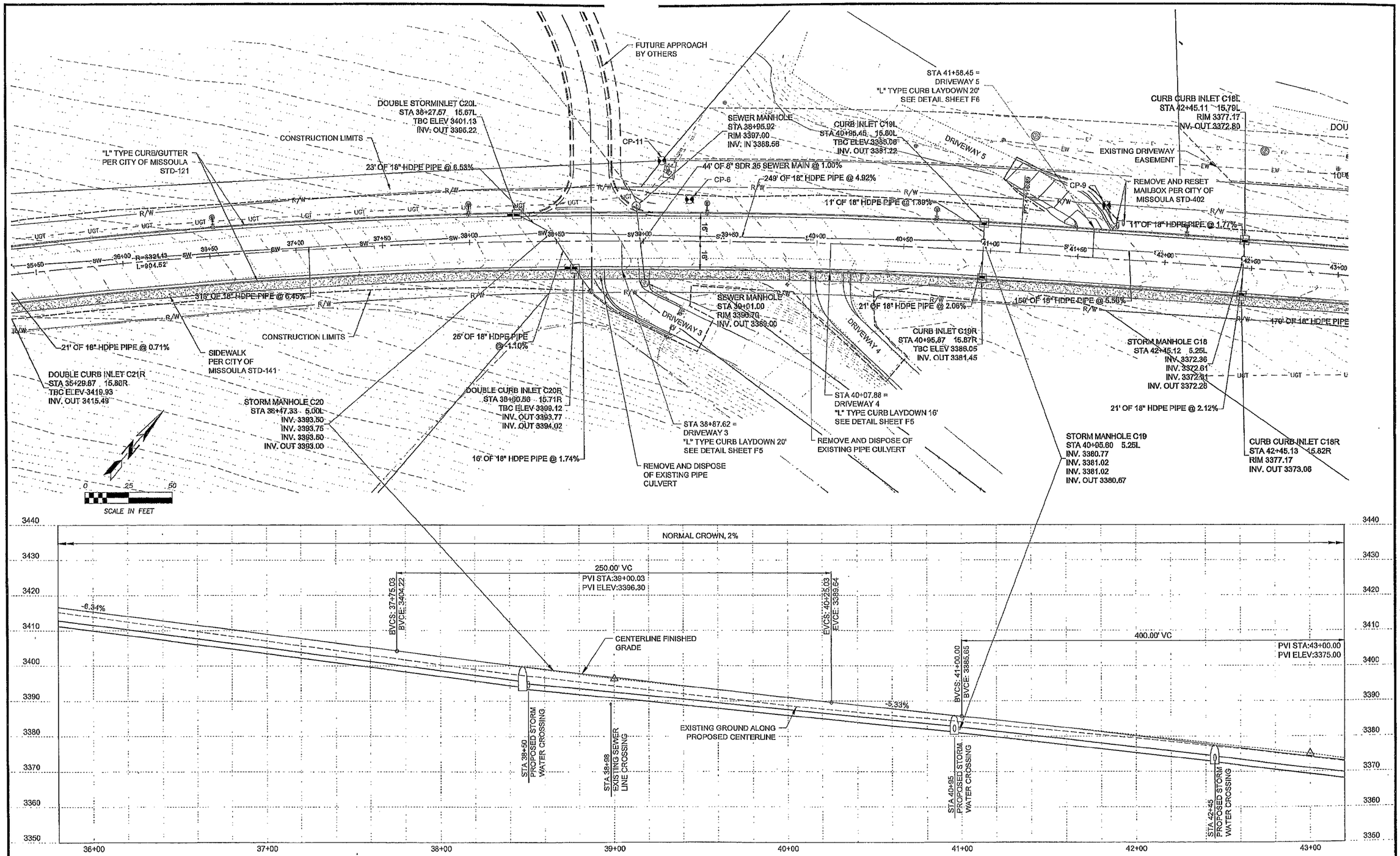
DJ&A, P.C.
CONSULTING ENGINEERS & LAND SURVEYORS
3203 Russell Street, Missoula, Montana 59801-6591
Phone 406/721-4320 Fax 406/549-6371

CITY OF MISSOULA
HILLVIEW WAY
SID #549

HILLVIEW WAY
STREET PLAN & PROFILE
STA 29+00 to STA 36+00

SHEET D7 OF D12

F:\6469 Hillview Way\dwg\CIVIL\D_PLANS & PROFILES\D3-D12_HILLVIEW.dwg, 3/17/2016 11:23:01 AM, DanL



BY	DATE	REVISION DESCRIPTION

DESIGN PD PROJ. NO. 6469
DRAWN ML DATE 12/2015
CHECKED MU SURVEYED D&A

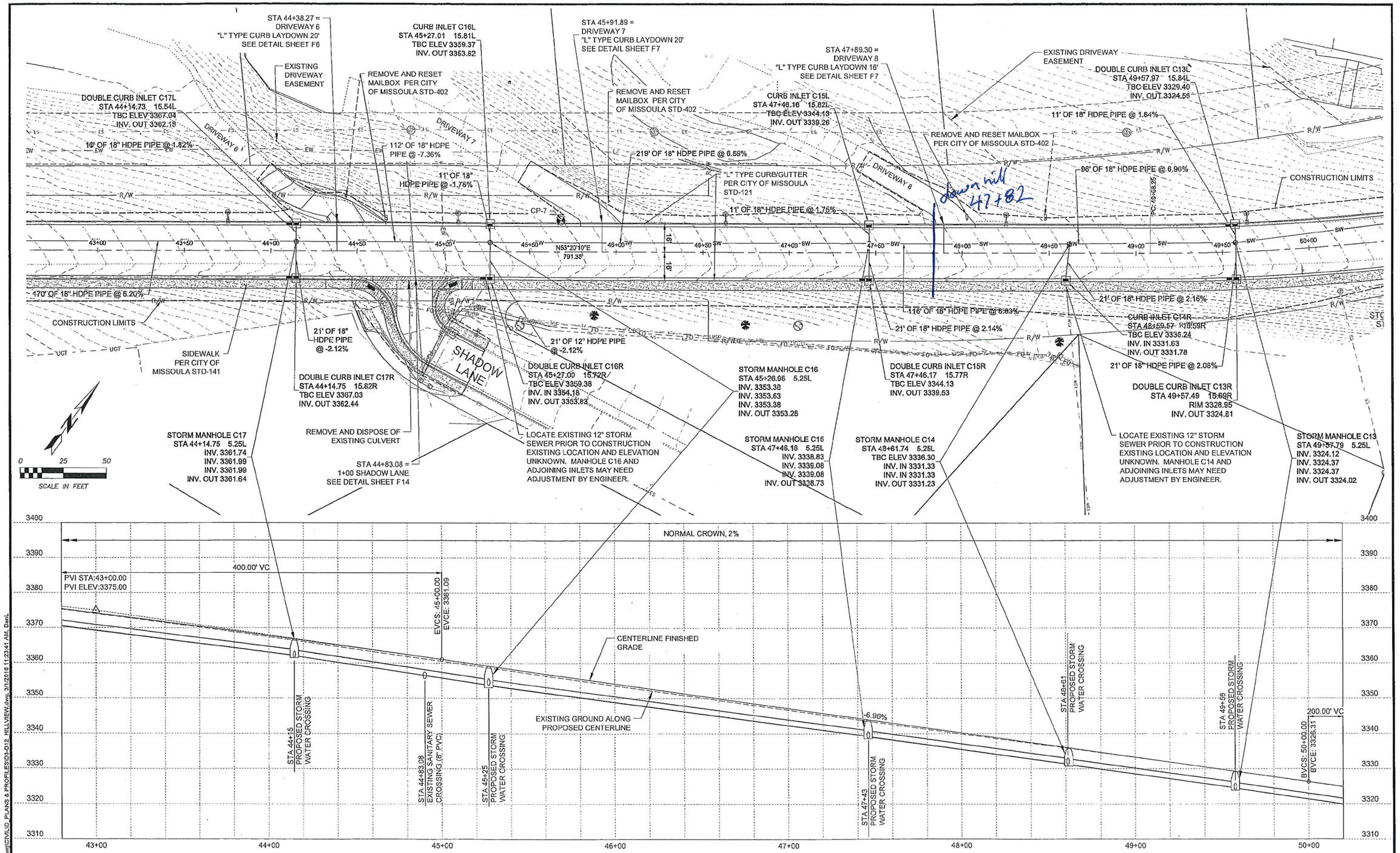
D&A, P.C.
CONSULTING ENGINEERS & LAND SURVEYORS
3203 Russell Street, Missoula, Montana 59801-5761
Phone 406/721-1320 Fax 406/549-0371

224

CITY OF MISSOULA
HILLVIEW WAY
SID #549

HILLVIEW WAY
STREET PLAN & PROFILE
STA 36+00 to STA 43+00

SHEET D8 OF D12



BY	DATE	REVISION DESCRIPTION

DESIGN FD PROJ. NO. 6469
DRAWN ML DATE 12/2015
CHECKED MU SURVEYED DJ&A

DJ&A, P.C.
CONSULTING ENGINEERS & LAND SURVEYORS
2703 Russell Street, Missoula, Montana 59801-6501
Phone 406/721-4320 Fax 406/549-5371

CITY OF MISSOULA
HILLVIEW WAY
SID #549

HILLVIEW WAY
STREET PLAN & PROFILE
STA 43+00 to STA 50+00

SHEET D9 OF D12

F:\6469 Hillview Way\dwg\CIVIL\D_PLANS & PROFILES\D3-D12_HILLVIEW.dwg, 3/1/2016 11:23:41 AM, DanL

Hillview Crossing Townhome Exemption Development – Neighborhood Meeting
Meeting Minutes
Tuesday - May 29, 2018
6:00 p.m.

Location: Wapikiya Park, Missoula, MT

ATTENDEES:

- A Sign-in Sheet is attached.

ITEMS:

➢ **Topic: Introduction & General Information**

- Paul Forsting and Jason Rice, of Territorial Landworks, Inc. (TLI) introduced themselves before giving a brief overview of the proposed project.
- A 24" x 36" copy of the preliminary lot layout was present at the meeting along with four preliminary architectural building elevation renderings.
- A neighbor asked when the construction of the project infrastructure would occur. TLI described that the schedule will be based on the review and approval decision for the project. Construction is tentatively scheduled to start in the spring of 2019.
- A neighbor asked about the type/style of proposed housing. TLI said that 34 two-unit townhouses will be constructed.
- A neighbor asked about the proposed density and why it was denser than the previously approved 48 lot subdivision. TLI described the rational (project costs & demand) for the number of proposed units.
- A neighbor asked about housing heights and setback/spacing distances. TLI discussed how the project will comply with the hillside design standards, maximum building height and internal side yard setback as required by Missoula zoning rules.
- A neighbor asked if there would be street lighting. TLI stated that they did not believe lighting would be required or proposed.
- A representative of the Human Resource Council stated that the council would like to purchase an access easement to their adjacent property. TLI noted the comment.

➢ **Topic: Parks, Trails and Common Area**

- TLI described the proposed common area plans and how the project will comply with the parkland requirements. A neighbor asked for information on what will be proposed for sidewalks and trails. TLI discussed the proposed trail and sidewalk designs and described how the HOA would maintain the common facilities.
- A neighbor asked about weed upkeep. TLI indicated that a weed management plan will be established as part of the City Development Services' review process. TLI let the neighbors know that weed control will be required of the future lot owners and the HOA will maintain the common areas.

➢ **Topic: Stormwater**

- TLI described the proposed stormwater system. A neighbor asked several questions regarding the suitability, capacity and design of the system for this proposed development.

TLI described the proposed stormwater methods and required review processes for the infrastructure. TLI encouraged the neighbors to follow up with the City Development Services Dept. to review any stormwater plans and/or reports once they are submitted for the project.

- **Topic: Sewer**
  - TLI discussed the plans to connect the homes to the City of Missoula's sewer system. A neighbor asked if STEP system's will be required. TLI explained that the proposed sewer mains will utilize gravity, so STEPs are not required.
- **Topic: Grading**
  - TLI discussed how the site will be graded to accommodate the development. A neighbor asked about the soils and the findings of a previously prepared Geotechnical Analysis of the site's soils. TLI confirmed that the development will be constructed based on the findings from the Geotechnical Analysis.
- **Topic: Roads**
  - TLI discussed the proposed roads for the development. A neighbor asked several questions about the suitability of Hillview Way for accommodating the additional traffic created by the development. TLI discuss the road review process that will be required. TLI agreed that the access point onto Hillview will need to be designed appropriately to minimize potential conflicts. TLI explained how the new units will need to pay "latecomers" fees to the City for the recent Hillview improvements.
- **Topic: Next Steps**
  - TLI stated that the first application for this project will likely be submitted to the City Development Services Dept. within a week or two.
  - TLI noted that this project will require both a Land Use and Planning Committee meeting and a City Council Hearing. TLI indicated that the City Development Services Office will be sending out notices for these meetings.

Attachments:

- Sign-in Sheet for Neighborhood Meeting

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\4_PLANNING\Neighborhood Meeting.2018-05-29\Minutes - Neighborhood Meeting 2018-05-30.doc.

HILLVIEW CROSSING TOWNHOMES
DEVELOPMENT COVENANTS

As required by the conditions of approval imposed upon the Project by the Missoula City Council, the following Development Covenants are in addition to those set forth in the Declaration and shall run with the land and be binding upon and inure to the benefit of the Lot Owners within the Project.

1. Radon Mitigation. The EPA has designated the Missoula area as having a high radon gas potential (Zone 1). Therefore, the Missoula City-County Health Department recommends that all new buildings incorporate radon resistant construction features.

2. Wood Stoves. The Missoula City-County Air Pollution Control Program regulations prohibit the installation of wood burning stoves or fireplaces inside the Air Stagnation Zone. This development is inside the Air Stagnation Zone. Pellet stoves that meet emission requirements or natural gas or propane fireplaces may be installed. Pellet Stoves require an installation permit from the Health Department.

3. Energy Efficiency. Builders should consider using energy efficient building techniques such as building orientation to the sun, appropriately sized eaves, wind breaks, super insulation techniques, day lighting, passive solar design, photovoltaic cells, and ground source heat pumps for heating/cooling. Ground Source heat pumps are usually more efficient and so create less pollution than other systems for heating and cooling. Increased energy efficiency reduces air pollution, reduces the need for people to use cheaper heating methods that pollute more and helps protect the consumer from energy price changes.

4. Parking. Parking is prohibited on the north side of Road A and the north side of Road B.

5. Private Road Construction and Maintenance. All owners acknowledge that private road construction, maintenance, drainage facilities and snow removal for Road A and Road B are the obligation of the owner or the Association and the City of Missoula is in no way obligated to perform such maintenance or upkeep until the roads are brought up to standards and accepted by the City of Missoula for maintenance.

6. Revegetation and Weed Management. Attached is a Revegetation Plan and Weed Management Plan approved by the Missoula County Weed District. The Association and Lot Owners, as applicable, shall provide for the revegetation and weed management as provided in plan.

7. Amendment to Development Covenants. All provisions of these Development Covenants, may not be amended or deleted without prior written approval of the governing body, the Missoula City Council.

AREA TOTALS

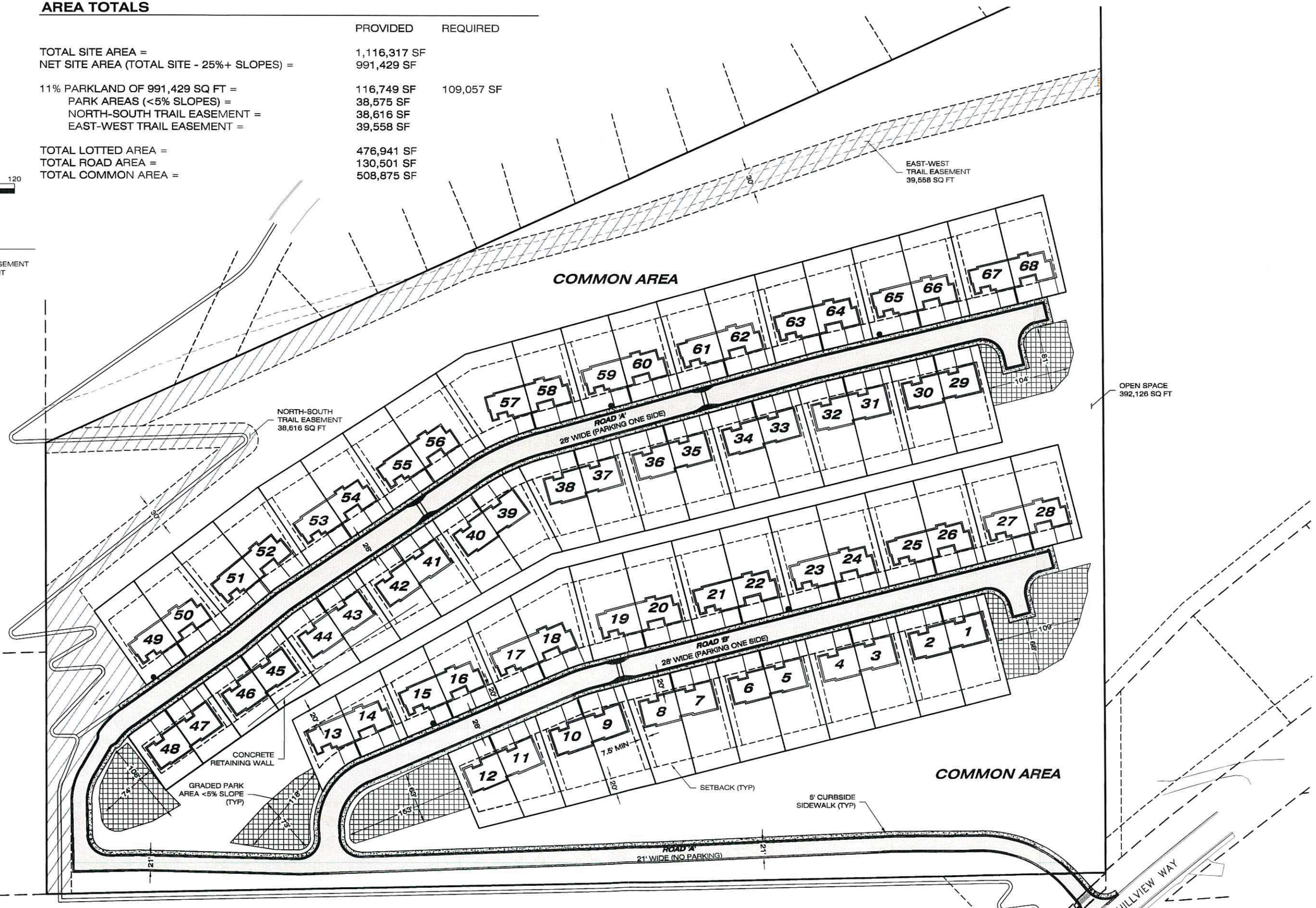
	PROVIDED	REQUIRED
TOTAL SITE AREA =	1,116,317 SF	
NET SITE AREA (TOTAL SITE - 25%+ SLOPES) =	991,429 SF	
11% PARKLAND OF 991,429 SQ FT =	116,749 SF	109,057 SF
PARK AREAS (<5% SLOPES) =	38,575 SF	
NORTH-SOUTH TRAIL EASEMENT =	38,616 SF	
EAST-WEST TRAIL EASEMENT =	39,558 SF	
TOTAL LOTTED AREA =	476,941 SF	
TOTAL ROAD AREA =	130,501 SF	
TOTAL COMMON AREA =	508,875 SF	

N

60 0 60 120
SCALE IN FEET

LEGEND

- (P) LOT LINE
- (P) SETBACK EASEMENT
- (P) FIRE HYDRANT



EXISTING ZONING =	RT10
FRONT SETBACK	20'
REAR SETBACK	20'
SIDE (INTERIOR)	7.5'
SIDE (STREET)	10'

NOTE:
CONSERVATION LANDS MANAGER TO BE INCLUDED IN THE PRE-CONSTRUCTION MEETING PRIOR TO TRAIL CONSTRUCTION

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Fax: (406)721-0324

P-LOT DATE: 3/11/2018 4:00 PM

REVISIONS	DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 4/19/2018

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

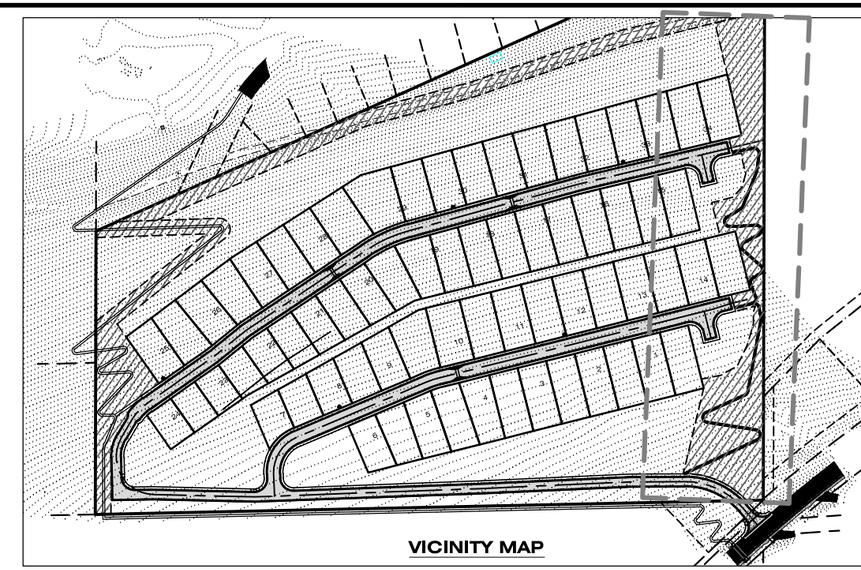
PREPARED FOR: HILLVIEW CROSSING, LLC.

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

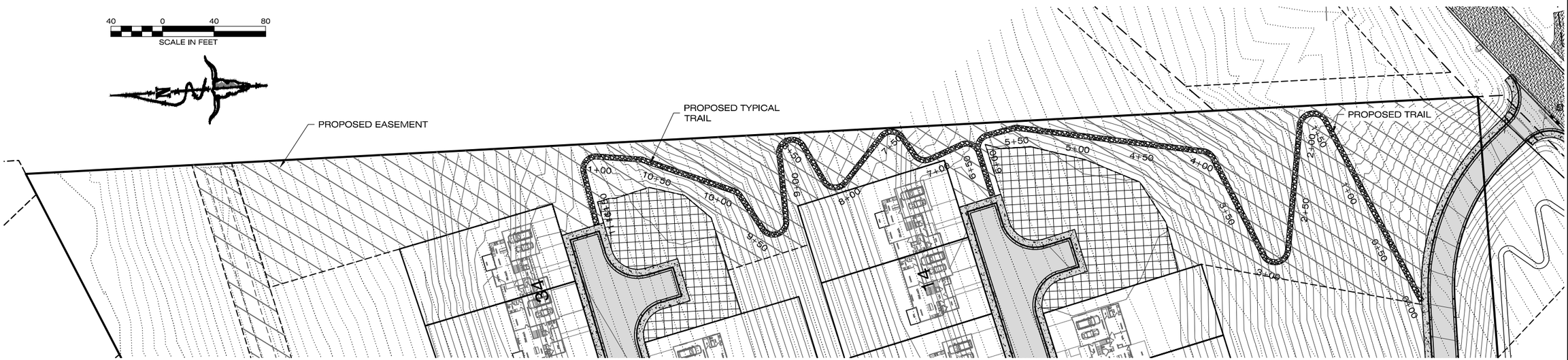
SHEET TITLE: CONDITIONAL USE EXHIBIT

PROJECT NO. 14-3592

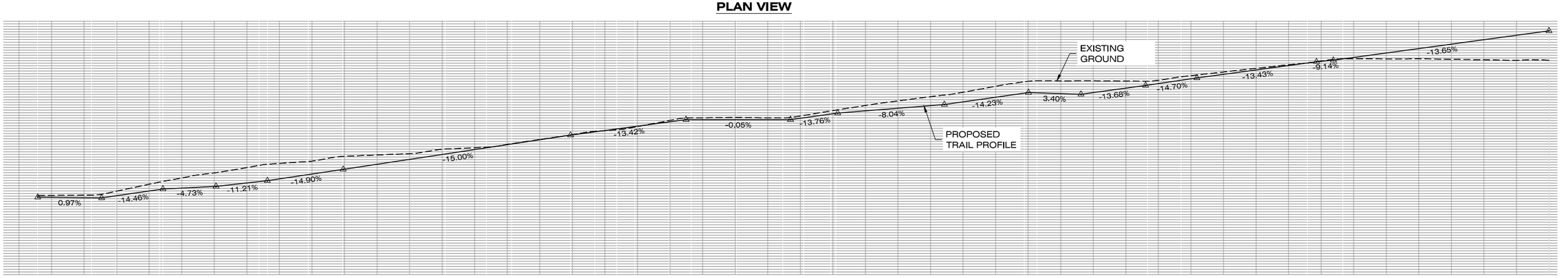
SHEET: 1 OF 1



VICINITY MAP



PLAN VIEW



PROFILE VIEW

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P.O. Box 3851
Missoula, MT 59806
Ph: 406/721-0142
Fax: 406/721-3221

PLOT DATE: 12/14/2018 2:42 PM

REVISIONS	DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 4/19/2018

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: PROPOSED TRAIL EXHIBIT SECONDARY OPTION

PROJECT NO.: 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING\CAD\MISSOULA S HILLS DEVELOPMENT_DRAFTING\8_LDRAWINGS\AUTOCAD\CD-14-3592-ALT CONNECTION.DWG

REVIEW CRITERIA FOR CONDITIONAL USES

Per Missoula Zoning Code, Section 20.85.070 H:

1. Conditional use applications may be approved by the City Council only when they determine that the review criteria listed below, as applicable, have been satisfied. All of the applicable review criteria must be addressed in the City Council's findings of fact in support of their decision.

Commentary: Not all review criteria will apply in every case. Only the applicable review criteria need to be met.

2. Uses that require conditional use approval may be approved by the City Council when they determine that the proposed use:
   - **a.** complies with all applicable standards of this zoning ordinance;
   - **b.** is in the interest of the public convenience and will not have a significant adverse impact on the general welfare of the neighborhood or community;
   - **c.** is compatible with the character of the surrounding area in terms of site planning, building scale and project design;
   - **d**. has operating characteristics that are compatible with the surrounding area in terms of hours of operation, outdoor lighting, noise, and traffic generation; and
   - **e.** will not have a significant adverse impact on traffic safety or comfort, including all modes of transport (non-motorized and motorized).

FACTORS TO BE CONSIDERED

Per Missoula Zoning Code, Section 20.85.070 I:

In determining whether all applicable review criteria have been satisfied, the City Council may specifically consider the following factors:

1. that new buildings and structures are located to create a positive relationship with their environment, both urban and natural;
2. that the site design properly addresses building orientation, open space, light, sun exposure, views and protection of natural features;
3. that buildings, structures and uses are compatible with adjacent properties and uses in terms of physical design elements such as volume and mass management, building materials, color, open space design, screening, any applicable use-specific standards and any other design elements considered important by the City Council;
4. that the overall project will be functional, attractive and safe in terms of pedestrian, bicycle and vehicular access, parking, loading, and servicing; and
5. agency and public testimony.

20.40.180 - **Townhome Exemption Development (TED) Standards**

Commentary: Townhome vs. Townhouse - Townhome refers to a development type consisting of residential dwellings that may be single unit, two-unit or, multi-unit and described above (20.05.040.D). Townhouse refers to a building type that is two or more units which have common walls along shared property lines. A townhouse can also be attached or be located on its own parcel (20.100.010).

A. **Applicability**
The following standards apply to Townhome Exemption Developments of more than five units in districts that only allow detached or two-unit houses, or more than ten units in districts that allow multi-dwelling buildings.

B. **Maximum Density**
The maximum number of dwelling units allowed within a Townhome Exemption Development is computed by dividing the net area of the site by the subject zoning district's minimum parcel area-per unit standard. Net site area is calculated by subtracting all of the following from the site's gross land area:

1. Special flood hazard areas;
2. Jurisdictional (Army Corps of Engineers) wetlands and waterways;
3. Land with a slope of greater than 25%;
4. Riparian resource areas.

C. **Setbacks and Separations**
Minimum Setbacks for dwellings in Townhome Exemption Developments are found in Table 20.05-3.

D. **Minimum buildable envelope area**
Each townhome exemption building envelope must have an average slope of no more than 25% and at least a 2,000 square foot contiguous building and disturbance area on parcels that are subject to hillside standards. See 20.50.010.B.1 for average slope determination.

E. **Surface Infrastructure**
All surface infrastructure shall meet the standards in Title 12 and be approved by Development Services Engineering Department.

F. **Blocks**
Blocks shall be designed to assure traffic safety and ease of pedestrian and automobile circulation. Blocks shall not exceed 480 feet in length and be wide enough to allow two tiers of dwelling units in a Townhome Exemption Development unless topography or other constraining circumstances are present. Pedestrian access easements that create a break within a block may be required where there is a need for pedestrian access to school bus or transit stops, schools, shopping, parks, common areas or open space, and community facilities.

G. **Parks and Trails**

1. Meet applicable goals and policies of the Missoula Open Space Plan, Long Range Transportation Plan, Active Transportation Plan, Conservation Lands Management Plan, Missoula County Parks and Conservation Plan and the Master Parks and Recreation Plan for the Greater Missoula Area:

   a. Provide for trail connection to existing or planned public trail, park, open space, school, shopping, or community facilities.

   b. Provide for protection of high quality resources and sensitive features by grant of conservation easement, dedication as public open space, or establishment of a managed common area.

c. Provide for useable private open space, landscaped boulevards, social interaction and livability.

2. Preserve and protect the site's natural resource values that include but are not limited to: floodways, wetlands, riparian lands, hillsides greater than 25% slope, established upland forested areas, culturally significant features, natural drainage courses, irrigation canals and ditches, etc. Means of preservation and protection may include establishing a single common area, conservation easement, or dedication of said areas as public open space.

3. Provide for 11% of the net site area (see 20.40.180.B above) as contiguous, useable private or public open space, on site, that is accessible by residents of the development and useable for passive or active recreation in conformance with the following standards:

   a. Private Open Space shall not be sloped more steeply than five percent and must be a minimum 40 feet in width and length, unless it is used for the purpose of a trail and then the area must be a minimum of 20 feet in width.

   b. Shall not include natural resource value areas of the site that are to be preserved.

   c. Shall not include required zoning setback areas, parking spaces, drainage basins, driveways, or public utility features.

   d. May be improved and dedicated as a public park, trail or open spaces subject to meeting minimum standards and approval of the Parks and Recreation Board.

H. **Transit**

If the Townhome Exemption Development is within one-fourth mile of an established public transit or school bus route, bus stop facilities may be required by the City Engineer. If the Townhome Exemption Development parcel is not in the Missoula Urban Transportation District, a petition to annex into the District shall be provided prior to receiving zoning compliance approval.

(Ord. 3570 , 2016)

From:	Paul Forsting
To:	Anita McNamara
Cc:	Mary McCrea; Daniel L. Ermatinger; John Giuliani; Jason Rice
Subject:	RE: Hillview Crossing LUP Meeting Exhibits
Date:	Friday, December 14, 2018 4:21:24 PM
Attachments:	Hillview Crossing East Trail Exhibit.2018-12-14.pdf

Hi Anita,

The costs of the houses has yet to be determined. It will be dependent on numerous factors including the conditions of approval that end up being required, the building material costs at the time of construction, and the land/carrying costs.

Regarding the paved trail/stairs that are required per Condition #9. The applicant does not support this condition and would like it removed. The project includes the mid-block crossings that were agreed upon as appropriate measures to address the 480' block length requirement. The mid-block crossings were added specifically for that purpose based on conversations with your office. This matches what was approved on the Kolendich's Grove St/Koly Court Townhomes.

Requiring a paved trail/stairs will significantly increase the project cost and it will create maintenance and liability issues for the Hillview Crossing homeowners. Further, the trail will detract from the value and privacy of the homes that would be adjacent to it. The applicant is opposed to the condition.

In lieu of agreeing to Condition #9, the applicant proposes to construct a trail along the eastern portion of the property as shown on the attached exhibit. The trail will connect the hammerheads from Road A and Road B up into the southern segment Road A. This trail will constructed in a similar fashion and with similar materials as the trail on the western portion of the property will be. The trail will be located within an easement which is also shown on the attached exhibit. The easement will extend north until it ties into the east-west trail easement. This will provide the residents of the project an alternative route to access Hillview Way. Having this newly proposed trail combined with the western trail and the sidewalks will permit the Hillview Crossing residents many options for pedestrian mobility.

Paul Forsting, *AICP, Land Use & Environmental Planner*

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406/721-0142 phone | 406/721-5224 fax
PaulF@TerritorialLandworks.com

website newsletter facebook linkedin

From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Wednesday, December 12, 2018 4:09 PM
To: Paul Forsting <paulf@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>
Subject: RE: Hillview Crossing LUP Meeting Exhibits

Hi Paul.

As requested by the LUP committee today, we are working on a memo to address their questions.

Do you have a ballpark figure on the anticipated selling prices for the homes to address Mirtha Becerra's question?

I appreciate it.

Thanks,
Anita

From: Paul Forsting <paulf@territoriallandworks.com>
Sent: Tuesday, December 11, 2018 1:32 PM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Vince Gavin <vince@gavin-hanks.com>; Christina Loucks <christinal@territoriallandworks.com>; Danny Oberweiser <dannyo@territoriallandworks.com>; Daniel L. Ermatinger <dan.ermatinger@bhhsmt.com>; John Giuliani <jgiuliani@montanatimberproducts.com>; Tim Lee <tim@gavin-hanks.com>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: RE: Hillview Crossing LUP Meeting Exhibits

Hi Anita,

Thanks for the information. The exhibits are the same expect they are higher quality and have slight color changes. I look forward to presenting them tomorrow.

Paul Forsting, *AICP, Land Use & Environmental Planner*

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1817 South Ave West Suite A | Missoula, MT 59801

406/721-0142 phone | 406/721-5224 fax
PaulF@TerritorialLandworks.com

From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Tuesday, December 11, 2018 12:29 PM
To: Paul Forsting <paulf@territoriallandworks.com>; Mary McCrea <McCreaM@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Vince Gavin <vince@gavin-hanks.com>; Christina Loucks <christinal@territoriallandworks.com>; Danny Oberweiser <dannyo@territoriallandworks.com>; Daniel L. Ermatinger <dan.ermatinger@bhhsmt.com>; John Giuliani <jgiuliani@montanatimberproducts.com>; Tim Lee <tim@gavin-hanks.com>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: RE: Hillview Crossing LUP Meeting Exhibits

Hi Paul.

The exhibits provided in the packets to staff is what was posted on the web site and available to the public for review. Comments received have all been based on the existing exhibits. At this point, it is too late to change the exhibits for the packets posted online and in SIRE.

Please feel free to bring them to LUP tomorrow. In the future, please remember that what is originally provided in the submittal packet is what any approval will be conditioned upon. Otherwise, it would conflict with public comment requirements in state law.

Let me know if you have any questions.

Thanks,
Anita

From: Paul Forsting <paulf@territoriallandworks.com>
Sent: Tuesday, December 11, 2018 11:47 AM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Vince Gavin <vince@gavin-hanks.com>; Christina Loucks <christinal@territoriallandworks.com>; Danny Oberweiser <dannyo@territoriallandworks.com>; Daniel L. Ermatinger <dan.ermatinger@bhhsmt.com>; John Giuliani <jgiuliani@montanatimberproducts.com>; Tim Lee <tim@gavin-hanks.com>
Subject: Hillview Crossing LUP Meeting Exhibits

Hi Anita,

Vince updated some of his exhibits (see attached). We wanted to get these to you as soon as we could so you can swap out the outdated elevation exhibits with these ones. They look really nice.

I'll plan on bringing them with me on a thumb drive so I can present some of them if you weren't planning on doing so. See you tomorrow morning at 10:20 am.

Paul Forsting, *AICP, Land Use & Environmental Planner*

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PaulF@TerritorialLandworks.com

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From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Friday, December 7, 2018 4:51 PM
To: Jason Rice <jasonr@territoriallandworks.com>; Paul Forsting <paulf@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Christina Loucks <christinal@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hello all.

Please find the attached staff report for Hillview Crossing TED, along with public comments received thus far.

The Land Use and Planning Committee is scheduled for 10:20am on Wednesday, December 12.

Please let us know if you have any trouble with any of the attachments or have any questions.

Thanks,
Anita

From: Christina Loucks <christinal@territoriallandworks.com>
Sent: Thursday, December 6, 2018 5:11 PM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Anita,

Thank you for the easement information.

Can you also copy Jason and Paul when you send out the staff report tomorrow? I will be out of the office but want to make sure they receive it.

Thanks!
Christina

Christina Loucks, *Project Assistant*

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From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Thursday, December 6, 2018 8:22 AM
To: Christina Loucks <christinal@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Christina.

Thanks for the update.

In order to provide room for boulevard trees behind the sidewalk on the southern segment of Road "A," a minimum 40 feet easement is necessary. This allows for the 21 foot back-of-curb to back-of-curb width, a 5-foot curbside sidewalk on one side, plus a 7-foot "boulevard" area on each side for

trees (with the trees being installed behind the curbside sidewalk on the one side) and adjacent to the road on the other side.

For the northern segment of Road "A" and Road "B", a minimum 52-foot easement is necessary. This allows for the 28-foot back-of-curb to back-of-curb width, 5-foot curbside sidewalk on both sides and 7-foot boulevard areas behind the sidewalk for trees.

The easement widths will not affect building setbacks, but will allow for the planting of trees, meeting the intent of the municipal codes and creating a better quality of life for residents of the development.

The staff report will be complete on Friday and I will be sure to email it to you as soon as it is ready.

Please let me know if you have any questions.

Thanks,
Anita

From: Christina Loucks <christinal@territoriallandworks.com>
Sent: Wednesday, December 5, 2018 11:15 AM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Anita,

We will be working with the utility companies to ensure that the easements are wide enough for providing their services. As such, the proposed easements may be revised in the future to reflect their needs. However we would propose a minimum width of 28' for the public access easement for the southern segment of Road "A", and a minimum width of 40' for the public access easement for the northern segment of Road "A" and for Road "B".

Thanks!
Christina

Christina Loucks, *Project Assistant*

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From: Christina Loucks
Sent: Wednesday, December 5, 2018 9:25 AM
To: 'Anita McNamara' <McNamaraA@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Anita,

I am working on finding out the public access easement widths and will follow up with you shortly when I have that. I also wanted to send you a copy of the attached letter we received from a neighboring property. You may have also received a copy of the letter in the mail.

Also, would it be possible for you to send us a draft copy of the staff report to take a look at?

Thanks!
Christina

Christina Loucks, *Project Assistant*

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From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Tuesday, December 4, 2018 3:22 PM
To: Christina Loucks <christinal@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Christina.

We are getting close to having the staff report complete. I have just a couple questions related to the width of the public access easements (not just the back-of-curb to back-of-curb distance) for

both Road “A” and Road “B.”

1. What is the width of the public access easement for the northern segment of Road “A” and for Road “B”?
2. What is the width of the public access easement for the southern segment of Road “A”?

We will have the final report before the end of the week and will forward it you when ready.

Thanks!
Anita

From: Anita McNamara
Sent: Thursday, October 18, 2018 9:05 AM
To: 'Jason Rice' <jasonr@territoriallandworks.com>; Christina Loucks <christinal@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Neil Miner <MinerN@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Paul Forsting <paulf@territoriallandworks.com>; 'John Giuliani' <jgiuliani@montanatimberproducts.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Jason.

We have a tentative schedule with LUP on December 12 and City Council on December 17. I have emailed these dates to the city clerk and LUP chair for approval to ensure that there no conflicts with these dates. There are several large projects that are hitting the city council schedules in December, so I will let you right away if there any scheduling conflicts that might push the dates out.

Anita

From: Jason Rice <jasonr@territoriallandworks.com>
Sent: Thursday, October 18, 2018 7:54 AM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>; Christina Loucks <christinal@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Neil Miner <MinerN@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Paul Forsting <paulf@territoriallandworks.com>; 'John Giuliani' <jgiuliani@montanatimberproducts.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Anita – I note from below that we were hoping to hear from you by last Friday. As you know this process has stretched out. The reason it is important is that pricing of infrastructure is very volatile and we are best to be bidding in January and February. Any later has a ripple effect on all housing cost of Missoula for projects. We are simply trying to adjust our plan of attack in trying to get this project going and would appreciate knowing when the hearings can be expected.

Thanks

Jason Rice, *P.E., CEO*

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JasonR@TerritorialLandworks.com

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From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Thursday, October 11, 2018 9:35 AM
To: Christina Loucks <christinal@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Neil Miner <MinerN@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Jason Rice <jasonr@territoriallandworks.com>; Paul Forsting <paulf@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Christina.

With the stormwater plan now deemed sufficient, we will take a look at the calendar to determine a potential schedule for the project. We hope to have some dates for you before the end of this week.

Thanks,
Anita

From: Christina Loucks <christinal@territoriallandworks.com>
Sent: Wednesday, October 10, 2018 2:22 PM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Neil Miner <MinerN@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Jason Rice <jasonr@territoriallandworks.com>; Paul Forsting <paulf@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hello Anita,

As the city has reviewed the storm water report for Hillview Crossing and found it sufficient yesterday, we would like to request the status of the Hillview Crossing Townhomes application?

Thanks!
Christina

Christina Loucks, *Project Assistant*

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From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Thursday, September 27, 2018 9:33 AM
To: Christina Loucks <christinal@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Neil Miner <MinerN@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Jason Rice <jasonr@territoriallandworks.com>; Paul Forsting <paulf@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Christina.

Yes, at this time, the City Engineering comments are the only ones that still need to be addressed.

Thanks,
Anita

From: Christina Loucks <christinal@territoriallandworks.com>
Sent: Wednesday, September 26, 2018 3:08 PM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Denise Alexander

<alexanderd@ci.missoula.mt.us>; Neil Miner <MinerN@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Jason Rice <jasonr@territoriallandworks.com>; Paul Forsting <paulf@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Hi Anita,

Thank you for providing the sufficiency review comments today. We are working to address these comments, but I wanted to confirm if the comments from City Engineering are the only items needing to be addressed for sufficiency?

We want to make sure that we are correct in understanding that once City Engineering confirms that we have addressed the comments they provided today, there are no additional items that need to be addressed for the application to be sufficient.

Thank you,
Christina

Christina Loucks, *Project Assistant*

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From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Wednesday, September 26, 2018 11:38 AM
To: Christina Loucks <christinal@territoriallandworks.com>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; Denise Alexander <alexanderd@ci.missoula.mt.us>; Neil Miner <MinerN@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: FW: City Engineering comments on Hillside Crossing sufficiency

Hi Christina.

As promised, below are the sufficiency review comments from city engineering pertaining to the

proposed Stormwater plan and pedestrian crossing for the Hillview Crossing TED project.

Please let me know if you have questions.

Thanks,
Anita

From: Troy Monroe
Sent: Wednesday, September 26, 2018 11:02 AM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Cc: Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Engineering <Engineering@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Subject: City Engineering comments on Hillside Crossing sufficiency

Anita -

Attached are City Engineering comments on the submitted Hillside Crossing application. City Engineering finds both the stormwater and the pedestrian crossing analysis insuffient and requiring resubmittal. The document has specific comments highlighted in addition to emails to/from the consultant and City Engineering. A summary of comments is below:

Stormwater

1. The development is located in both Group B and Group C soil groups. For each sub-basin determine a composite CN based on the proportion of each soil type.
2. Update all numbers in relation to changes in no. 1 above.
3. (discussed in meetings) Discharge rates from the development must be a prorated rate based on drainage area captured in existing system ditch.
4. Include all other information discussed in meetings or in emails.
5. The drainage report needs to be stand-alone and does not need any explaination from City staff to those who are reviewing the report.

Pedestrian passage

1. The visibility calculation must take into account the horizontal curve of Hillview Way and any roadside obstruction including the hillside itself.

Thanks,

Troy Monroe PE
Assistant City Engineer
552-6091

John W. Larson, District Judge
Fourth Judicial District, Dept. 3
Missoula County Courthouse
200 West Broadway
Missoula, MT 59802
(406) 258-4773

MONTANA FOURTH JUDICIAL DISTRICT COURT, MISSOULA COUNTY

DISTRICT XI HUMAN RESOURCE COUNCIL, INC., a Montana non-profit corporation, Plaintiff, vs. HILLVIEW CROSSING – MISSOULA, LLC, a Montana limited liability company, the CITY OF MISSOULA, a Montana municipality, MIKE HAYNES, Director of the City of Missoula Development Services Department, and JOHN DOES 1-20, Defendants.	Dept. 3 Cause No. DV-16-167

ORDER GRANTING DEFENDANT HILLVIEW'S MOTION FOR PARTIAL SUMMARY JUDGMENT, GRANTING DEFENDANT CITY AND MIKE HAYNES MOTION FOR PARTIAL SUMMARY JUDGMENT ON REMAINING CLAIMS; DENYING PLAINTIFF'S MOTION FOR PARTIAL SUMMARY JUDGMENT; AND DENYING PLAINTIFF'S MOTION FOR PARTIAL SUMMARY JUDGMENT RE M.C.A. § 76-3-203

Before the Court are the following summary judgment motions: 1) Defendant Hillview Crossing-Missoula, LLC's Motion for Partial Summary Judgment; 2) Defendants' City of Missoula's and Mike Haynes' Motion for Partial Summary Judgment on Plaintiff's Remaining Claims; 3) Defendant

Mike Haynes' Motion for Summary Judgment Based on Mont. Code Ann. § 2-9-305(5); 4) Plaintiff's Motion for Partial Summary Judgment, 5) Plaintiff's Motion for Partial Summary Judgment regarding Constitutionality of Mont. Code Ann. § 76-3-203; and 6) Motion for Summary Judgment Re Hillview Crossing-Missoula, LLC's Counterclaim-Count I and Alternative Motion *in Limine*.

On September 21, 2016, the parties stipulated to agree to limit the scope of September 26, 2016, oral argument to Defendant Hillview-Crossing, LLC's Motion for Partial Summary Judgment, Defendant City and Mike Haynes' Motion for Partial Summary Judgment on Plaintiff's Remaining Claims, Plaintiff's Motion for Partial Summary Judgment, and Plaintiff's Motion for Partial Summary Judgment regarding Mont. Code Ann. § 76-3-203. Plaintiff's Motion for Declaratory Judgment and Defendants' City of Missoula's, Hillview Crossing-Missoula's and Mike Haynes' Cross-Motion for Declaratory Judgment were previously submitted. The parties are presently scheduled to conduct a settlement conference on February 23, 2017.

Background

The Court finds the facts alleged in the Complaint as the following. In 1995, James M. Rowan gifted a four-acre landlocked parcel to the Plaintiff

District XI Human Resource Council, Inc. (the "HRC"). Adjacent to the east of the HRC parcel is a 25-acre parcel presently owned by Defendant Hillview-Crossing, LLC ("Hillview").

In 2006, the Johnson Brothers, prior owners of Hillview's 25-acre parcel, initiated the procedure for subdividing its 25-acre parcel adjacent to the HRC's land-locked parcel pursuant to Mont. Code Ann. § 76-3-601 *et seq*. On May 22, 2006, the prior owners of the Hillview parcel received from the Missoula City Council a preliminary plat approval for a 46-lot residential subdivision. On May 19, 2008, the City Council approved a one year extension and plat adjustment. On May 11, 2009, the City Council approved a Phasing Plan for the subdivision. The preliminary plat was never recorded and depicted an access labeled "Southern Way" to Plaintiff's land-locked parcel. On November 24, 2014, the City Council approved amending the Phasing Plan, allowing the developer until December 22, 2016, to complete the first phase of the development. HRC's Complaint alleges that in reliance upon the preliminary plat, Plaintiff negotiated a Buy-Sell agreement with a willing buyer. Complaint, ¶ 13.

On December 31, 2014, Hillview purchased the twenty-five (25) acre parcel adjoining Plaintiff's land-locked parcel. In August 2015, Hillview

submitted an application to the City to develop the property as a townhouse development utilizing the Townhouse Exemption set forth in Mont. Code Ann. § 76-3-203 (the "Townhouse Exemption") of the Montana Subdivision and Platting Act ("MSPA"). Unlike provisions in the MSPA, the Townhouse Exemption does not require public hearings. Mont. Code Ann. § 76-3-203. Hillview's site plan did not include access to Plaintiff's land-locked parcel.

On October 15, 2015, the City approved Hillview's townhouse proposal and issued a Zoning Compliance Permit, authorizing the development of sixty-eight (68) townhouse units. On February 25, 2016, HRC filed a Complaint against Hillview asserting the following claims: Count (1) Action for Declaratory Judgment, Count (2) Action for Injunction, Count (7) Clouded Title and Implied Covenant, and Count (8) Illegal Transfer. HRC also asserted the following claims against City of Missoula, and Mike Haynes, as director of the City's Development Services Department (collectively "City"): Count (1) Action for Declaratory Judgment, Count (3) Action for Writ of Prohibition, Count (4) Tortious Violation of Statutory Duties, Count (5) 42 U.S.C. Violation of the Equal Protection Clause, and Count (6) Promissory Estoppel/Detrimental Reliance.

On March 17, 2016, Hillview filed an Answer and Counterclaim,

asserting Tortuous Interference with Business Relations and Prospective Economic Advantage, Abuse of Process, and Declaratory Judgment. On April 27, 2016, the Court held a hearing on Plaintiff's Application for Temporary Restraining Order and Preliminary Injunction, Motion for Writ of Prohibition, or Alternative Relief. On May 3, 2016, the Court denied HRC's Application for Temporary Restraining Order and Preliminary Injunction, Motion for Writ of Prohibition, and deemed HRC's Motion for Declaratory Judgment submitted. Before the Court are the parties competing summary judgment motions, as well as the motions for declaratory judgment previously heard by the Court on April 27, 2016.

Standard

Summary judgment is appropriate if the pleadings, the discovery and disclosure materials on file, and any affidavits show that there is no genuine issue as to any material fact and that the movant is entitled to judgment as a matter of law. Rule 56(c)(3), M.R.Civ.P. Conclusory or speculative statements are insufficient basis to raise a genuine issue of material fact. *Barich v. Ottenstror*, 170 Mont. 38, 42, 550 P.2d 395, 397 (1976).

Discussion

I. Hillview's Motion for Partial Summary Judgment (#80)

A. Count I – Request for Declaratory Judgment

Hillview argues that HRC's action for declaratory judgment must fail because HRC does not have either an express easement or easement-by-reference across Hillview's property. Hillview argues that there is no dispute that HRC's claim to access is based solely on the unrecorded preliminary plat. HRC responds that an unrecorded preliminary plat is not material to judgment in this case. HRC asserts that while the preliminary plat was not recorded, it was incorporated by reference in the Trustee Deed issued August 8, 2013, which described the property commonly known as Southern Hills Subdivision. See Exh. C to Hillview Motion Partial Summ. Judgmt. HRC argues that the City violated the Missoula Subdivision Regulations in issuing a Zoning Compliance Permit and a Townhouse Certification Letter to Hillview, arguing that "...the City's treatment of townhouse exempt developments is unequal compared to other exempt developments." HRC Response Motion Partial Summary Judgment, p. 3.

HRC's action for declaratory judgment alleges that HRC "possesses an access right pursuant to the preliminary plat and Hillview denies access will be granted under the townhouse exemption." HRC's Complaint, ¶ 25. The June 17, 2016, deposition of Jim Morton provides that HRC does not

have a recorded access easement for its property. Morton Depo., 191:17-25, 192:1. HRC also admitted in discovery that the preliminary plat was never filed with the County Clerk and Recorder. Exh. C to Hillview Motion. The Court finds that Hillview abandoned any 2006 preliminary plat that was initiated by the prior owners. The Court finds that there is no genuine issue of material fact that HRC does not have a recorded access right. Therefore, HRC's request for declaratory judgment as to an access right pursuant to a preliminary, unrecorded plat is denied.

HRC also asserts that a question of construction or validity arises in Mont. Code Ann. § 76-3-203 and Mont. Code Ann. § 70-23-101 *et. seq* regarding whether the statutes are facially unconstitutional, unconstitutional as applied to the Plaintiffs, or ambiguous. Complaint, ¶ 26. HRC has no basis for asserting its constitutional claims without a "protected property interest." *See Kiely Const., L.L.C. v. City of Red Lodge*, 2002 MT 241, ¶ 47, 312 Mont. 52, 57 P.3d 836. This Court has determined Article 4, which contains a much more specific statutory scheme dealing exclusively with the review procedures for condominium and townhouse proposals, applies to this case. During summary judgment hearing, both Hillview and the City argued that it is not logical to attempt to harmonize two different procedures

in Article 4 and Article 8 of the Missoula City Subdivision Regulations, and there is no prohibition against a land use owner abandoning a preliminary plat. The Court notes that regulations that control subdivision application pursuant to Mont. Code Ann. § 76-3-504 are separate and distinct from townhome development pursuant to Mont. Code Ann. § 76-3-203. As there are no facts genuinely at issue, Hillview is entitled to summary judgment on Count I.

IT IS HEREBY ORDERED that Hillview's motion as to declaratory judgment is GRANTED.

B. Count VI – Promissory Estoppel

As to HRC's claim of promissory estoppel/detrimental reliance, Hillview argues it is entitled to summary judgment because HRC judicially admitted it cannot maintain a promissory estoppel claim against Hillview. HRC concedes that "HRC does not allege any promise was made by Hillview." *See* Pltff. Response to Hillview Motion Part. Summ. Judgmt. at 4:8-9. Instead, HRC requests the Court rescind the Zoning Compliance Permit issued to Hillview based on its detrimental reliance.

IT IS FURTHER ORDERED that Hillview's motion regarding promissory estoppel is GRANTED because it is pled solely against the City, not Hillview.

C. Count VII – Clouded Title

As to HRC's claim regarding clouded title and the implied covenant, Hillview argues that it is entitled to summary judgment because in Montana, no implied covenant is created unless a complying final plat is recorded. *See Majers v. Shining Mountains*, 219 Mont. 366, 370, 711 P.2d 1375 (1986). HRC's response brief did not address this claim of its Complaint, which this Court interprets as a motion well taken.

HRC's Count VII alleges that the title identifying the property at issue in this matter, known as Southern Hills Subdivision, included a preliminary plat granting access to HRC's property via "Southern Hills Way." Complaint, ¶ 66. HRC argues that "[w]hen the property was sold by Trustee's Deed on August 8, 2013, with a reference to a plat designating a street, an implied covenant arose requiring the designated street to be used on the manner designated." Complaint, ¶ 67.

IT IS FURTHER ORDERED that Hillview's motion as to the HRC's claim of clouded title and implied covenant is GRANTED, as HRC has failed to specifically oppose this motion. Mont. R. Civ. P. 56(e)(2).

D. Count VIII – Illegal Transfer

As to HRC's Count VIII, Illegal Transfer, Hillview seeks summary judgment, as there is no evidence that the bank or Hillview sold or attempted to sell any of the individual lots depicted on the face of the unrecorded preliminary plat for the subdivision proposed by the prior owners. Hillview contends that Mont. Code Ann. § 76-3-301 is not implicated in this case because the purpose of the statute is to prevent sellers from attempting to subdivide a larger parcel into smaller lots by language in a deed instead of by compliance with the MSPA. Hillview argues that HRC admits that the warranty deed from the bank to Hillview transferred title to the whole twenty-five-acre parcel.

HRC responds that there is a genuine issue as to whether the land transferred from the bank to Hillview was subdivided land. HRC responds that the illegal transfer claim against Hillview should continue, as there are material issues of fact as to whether Hillview needed to meet "five conditions" to legally take title to the property pursuant to Mont. Code Ann. §

76-3-303. Specifically, HRC argues that the bank did not record a final plat for the Southern Hills Subdivision and did not meet the conditions to transfer the land once the preliminary plat was conditionally approved.

HRC's Complaint alleges that the transfer of property by the bank to Hillview violated Mont. Code Ann. § 76-3-301 because the parcel had previously been subdivided, but no final plat for Southern Hills was recorded. Complaint, ¶ 69, ¶ 70. Mont. Code Ann. § 76-3-303, provides that the conditions relied upon by HRC apply where "the subdivider" attempts to "enter into contracts to sell lots in the proposed subdivision." Here, there is no evidence in the record that First Interstate Bank or Hillview sold or attempted to sell any of the individual lots depicted on the face of the unrecorded preliminary plat for the subdivision proposed by the prior owners. HRC admits that the Warranty Deed from the bank to Hillview transferred title to the whole 25-acre parcel. *See* Morton Depo., 236:21-25, 237:1-19. This Court has determined that the Hillview's motion as to HRC's claim of illegal transfer is granted because there is no genuine dispute as to a material fact.

IT IS HEREBY ORDERED that Hillview's motion as to HRC's claim of illegal transfer is GRANTED.

II. City's Motion for Partial Summary Judgment (ROA #88) on Remaining Claims

A. Count I – Declaratory Judgment

The City argues that HRC does not have a property right in the City's approval of the preliminary plat. The City argues that HRC cannot rely on a promise between the City and the prior owners of the adjoining twenty-five-acre parcel regarding the conditional approval of a preliminary plat because the HRC was not a party to that promise. Therefore, HRC has no basis as an adjoining landowner to claim damages because Hillview chose to abandon the preliminary plat. The City further argues that bald assertions of equal protection are properly disposed of through summary judgment. *See Roe v. City of Missoula, ex rel. Missoula City Council*, 354 Mont. 1, ¶ 38, 221 P.3d 1200. HRC responds that the City's failure to perform a subdivision evasion review violated HRC's due process and equal protection rights because the City treated HRC differently as a neighboring landowner to a subdivision than it treated HRC as a neighboring landowner to a townhouse development. HRC argues that the constitutional issues raised are not dependent or related to an access right.

IT IS FURTHER ORDERED that the City's motion as to declaratory judgment is GRANTED, as there was no final plat recorded showing access

to HRC's parcel. Therefore, no protected property interest nor access right resulted from the preliminary plat.

B. Count IV - Tortious Violation of Statutory Duties

The City argues that as to HRC's claim of tortious violation of statutory duties, there is no special relationship between the City and the HRC because the notice requirements for approval of a preliminary plat do not apply to Hillview's townhouse application. The City contends that the submission of Jim Morton's Affidavit dated August 18, 2016, should be stricken because it contains hearsay of alleged conversations with unknown city council members in 2006, and contradicts Mr. Morton's prior discovery responses offered on behalf of the HRC. The City argues that even if the Court relies on the August 18, 2016, Morton Affidavit, HRC cannot show that it justifiably relied on any alleged representations regarding the approval of a subdivision application, as opposed to Hillview's townhouse application.

HRC responds that while Montana has not recognized a cause of action for tortious violations of a statutory duty, it also has not rejected the claim as unactionable. *Roe v. City of Missoula*, 2009 MT 417, ¶ 35, 354 Mont. 1, 221 P.3d 1200. HRC asserts that a genuine issue of material fact exists whether a special relationship arises between the City and HRC

because the Missoula Subdivision Regulations are intended to protect a specific class of persons of which HRC is a member. HRC argues that there is an issue of material fact under either the first or the third exception to the public duty doctrine. HRC argues that a special relationship arose between the HRC and the City sometime in early 2006 when the City contacted HRC about the proposal to create the Southern Hills Subdivision. HRC asserts that it relied on the City ward representatives' assurances that major changes to the development of HRC's neighboring property required further public input, including input from HRC.

A special relationship may be established by the following: 1) a statute intended to protect a specific class of persons of which the plaintiff is a member; 2) a government agent undertakes a specific action to protect a person or property; 3) the plaintiff was reasonably induced to rely on government action; or 4) a third person in custody of the government caused harm to the plaintiff. *Prosser v. Kennedy Enterprs.*, 2008 MT 87, ¶ 19, 342 Mont. 209,179 P.3d 1178. In order to establish a special relationship under the third exception to the public doctrine duty, a plaintiff must demonstrate 1) direct contact between the public official and the plaintiff; 2) that the official has provided express assurances in response to the plaintiff's specific

inquiry; and 3) that the plaintiff justifiably relied on the representations of the official. *Prosser* at ¶ 36.

Here, the August 18, 2016, Affidavit of Morton provides that Mr. Morton spoke with one or more ward representatives, and based on the conversations he understood that HRC would continue to be appraised of major changes to the development adjoining HRC's property. ¶ 7. The Affidavit of Morton also provides that "[b]ased upon my understanding from the ward representative(s), I believed the changes proposed by Hillview required a continuing public process, both in front of the Planning Board and the City Council." ¶ 9.

The Court finds there no genuine issue as to whether a special relationship existed between HRC and the City, separate and apart from the public at-large. There is no special relationship between the City and the HRC because the notice requirements for approval of a preliminary plat do not apply to Hillview Crossing's Townhouse Application under Mont. Code Ann. § 76-3-203. The Court does not find that the August 18, 2016, Morton Affidavit, which contradicts prior discovery responses, creates a genuine issue of material fact. HRC also has not adequately demonstrated direct

contact between a public official and HRC, express assurances, and that HRC justifiably relied on the representations. *Prosser* at ¶ 36.

IT IS FURTHER ORDERED that the City's motion as to HRC's claim of tortious violation of statutory duties is GRANTED.

C. Count V - Equal Protection

The City argue that it is entitled to summary judgment on HRC's claim of 42 U.S.C. Violation of the Equal Protection Clause of Amendment XIV, because HRC has acknowledged that it is not challenging the constitutionality of the City's zoning ordinance, which authorizes the issuance of a Zoning Compliance Permit. *Town & Country Foods v. City of Bozeman*, 2009 MT 72, 349 Mont. 453, 203 P.3d 1283. The City argues that challenging a municipality's land use decision does not support a claim of substantive due process or equal protection. HRC responds its due process and equal protection rights were violated by the City when it failed to provide notice to HRC and failed to allow HRC to participate in the decisions made about the adjacent property while the subdivision review process remained in force.

Here, HRC has alleged due process and equal protection violations based upon the City's alleged failure to protect HRC's right to know and right

to participate. The City is entitled to summary judgment on HRC's equal protection claim because there were two separate land use procedures, and the Court finds that the City did not violate any notice requirements for Hillview's 2015, townhouse exemption application.

IT IS FURTHER ORDERED that the City's motion as to HRC's equal protection claim is GRANTED.

D. Count VI-Promissory Estoppel/Detrimental Reliance

HRC argues that the original Southern Hills Subdivision preliminary plat was conditionally approved on May 22, 2006, and the City granted Hillview's demand that the subdivision review be extended until December 22, 2016. *See* Exh. A and Exh. H to Pltff. Response to City's Motion Part. Summ. Judgmt. on Remaining Claims. HRC argues it was injured by its' reliance on the City's promise to leave the preliminary plat "in force" until December 22, 2016. HRC alleges that the City made promises to regulate subdivisions in accordance with municipal ordinances and state law; HRC reasonably relied upon the City's promise to enforce municipal ordinances; and HRC was injured as a result of its reliance. HRC argues that the preliminary plat and subdivision review was extended several times after

May 2006, including an extension granted as a condition of Hillview's buy-sell agreement with the bank

HRC's Count VI alleges that the City owes the public a duty to regulate subdivision in accordance with municipal ordinances consistent with state law. Complaint, ¶ 57. Next, HRC argues that the City unequivocally promised the Southern Hills Subdivision, including its filed preliminary plat, would be effective until Dec. 22, 2016. Complaint, ¶ 58. HRC claims that it would be unconscionable to allow the City to allow Hillview to construct 68 units on the adjacent property without provided access to HRC. Complaint, ¶ 61.

The elements of promissory estoppel are the following: 1) a promise clear and unambiguous in its terms; 2) reliance on the promise by the party to whom the promise is made; 3) reasonableness and foreseeability of the reliance; and 4) the party asserting the reliance must be injured by the reliance. *Keil v. Glacier Park*, 188 Mont. 455, 462, 614 P.2d 502, 506 (1980). Upon hearing argument at the summary judgment hearing, the Court has determined that Hillview, as the current property owner, is entitled to develop the parcel how it prefers without obligation to the previous developer's promises. There is no evidence of a promise to HRC under the

current development procedure, therefore, HRC has not made an adequate showing to establish a claim of promissory estoppel against the City.

IT IS FURTHER ORDERED that the City's motion regarding HRC's claim of promissory estoppel is GRANTED.

E. VIII-Illegal Transfer

HRC argues that whether a private right of action exists under the MSPA is a matter of first impression. HRC asserts that because neither the City nor the county attorney has developed regulations implementing the authority granted under § 76-3-301, interpreting the statute in favor of a private right of action is appropriate. *Mark Ibsen, Inc. v. Caring for Montanans, Inc.* 2016 MT 111, ¶ 49, 383 Mont. 346, 371 P.3d 446. HRC argues that it is undisputed the preliminary plat depicted lots segregated from the original tract, and a genuine issue exists as to whether Hillview was a "subdivider" as defined in Mont. Code Ann. § 76-3-104 because it proposed a subdivision of land. HRC argues that Mont. Code Ann. § 76-3-303 authorizes the sale of land "after a preliminary plat of a subdivision has been approved or conditionally approved" the developer may only sell lots provided conditions are met. HRC asserts that because the bank did not record a final plat for the Southern Hills Subdivision and did not meet the

conditions to transfer the land once the preliminary plat was conditionally approved, the sale was illegal.

IT IS FURTHER ORDERED that HRC's claim as to private right of illegal transfer is dismissed as to the City, as HRC admits that this claim "does not" apply to the City. HRC's Response Brief, p. 14.

III. Plaintiff's Motion for Partial Summary Judgment (#99)

HRC argues that it is entitled to partial summary judgment that the City violated its own regulations and procedures when it issued a Townhouse Exemption to Hillview to circumvent subdivision review. Hillview responds that HRC's motion is nearly identical to HRC's Motion for Partial Summary Judgment regarding Constitutionality of § 76-3-203, M.C.A., as applied to HRC. HRC argues that the City violated the Missoula Subdivision Regulations in issuing a Zoning Compliance Permit and a Townhouse Certification Letter to Hillview. Hillview argues that the procedures that HRC accuses the City of failing to follow are contained in Article 8 in the City's Regulations; however, Article 8 does not apply to townhouse exempt proposals such as Hillview. Hillview argues that the application of Article 4 is fatal to HRC's argument that the City violated its own procedures in Article 8. The City concurs with Hillview's arguments that Article 4 of the City's

Subdivision Regulations sets forth a specific review procedure for townhouse proposals, and Article 8 is a general statutory provision that does not reference a townhouse proposal.

Article 4, entitled "Review and Approval Procedures," contains a specific section, § 4-040, that sets forth the "Review Procedure for Condominiums or Townhouse Proposals." Subsection 4-040.3 mirrors the language of the Townhouse Exemption set forth at Mont. Code Ann. § 76-3-203 of the MSPA. That statute exempts condominiums, townhomes and townhouses from the MSPA if they are constructed "on lots within incorporated cities and towns" and if the proposal is in conformance with applicable local zoning regulations..." Mont. Code Ann. § 76-3-203. The Court notes that the exemption for townhouses set forth in Mont. Code Ann. § 76-3-203 is not referenced anywhere in Article 8. Here, the Court has determined that the more specific provisions of Article 4, not Article 8 apply to the matters at issue. Article 8 is a more general statute, and specific statutory construction governs over more general statutory construction.

The Townhouse Exemption to the MSPA found at Mont. Code Ann. § 76-3-203 does not require an evasion analysis. Article 4 of the Missoula City Subdivision Regulations does not require an evasion analysis to a

townhouse proposal which is consistent with the statutory scheme of the MSPA. Hillview pursued a lawful alternative to subdivision review that was made available by the Montana Legislature, and it was entitled to develop the parcel pursuant to the Townhouse Exemption provision. As a matter of law, the Court finds that Article 4's procedure for review of a townhouse proposal is consistent with the MSPA. HRC's recourse, if any, is to seek legislative remedy.

IT IS FURTHER ORDERED that the Plaintiff's Motion for Partial Summary Judgment is DENIED.

IV. Plaintiff's Motion for Partial Summary Judgment re: Constitutionality of M.C.A. § 76-3-203 (#100)

HRC argues that the City's unequal application of Mont. Code Ann. § 76-3-203 is discriminatory because the City treats townhouse exemptions differently than all other exemptions without a compelling state interest. HRC argues that the Montana Supreme Court has imposed a duty to conduct an evasion review upon local governments. *Dreher v. Fuller*, 257 Mont. 445, 451, 849 P.2d 1045, 1048 (1993)

Hillview responds that HRC choose to brief this issue in its prior Motion for Declaratory Judgment when no discovery had been conducted, and the motion should be stricken because HRC already had an opportunity to be

heard on the constitutional issue. Hillview argues that HRC's argument is based on the erroneous conclusion that Article 8 in the City's Subdivision Regulations applies to the review procedures for townhouses. Hillview argues that Section 4-040 does not require the City to conduct any evasion analysis nor does it require the filing of an exemption affidavit prior to the issuance of the ZCP or the Townhouse Certification Letter. Hillview also argues that *Dreher* case cited by Hillview is misplaced as the case pre-dates relevant amendments to Mont. Code Ann. § 76-3-203, by eighteen years and does not involve a townhouse proposal.

The City contends that Plaintiff does not have standing to challenge the constitutionality of the Townhouse Exemption because it does not have either a property right or a civil right in an access depicted on an unrecorded preliminary plat for an adjoining property. The City argues that Plaintiff has not alleged any facts to contradict the City's testimony that Hillview's townhouse proposal complies with the requirements of the Townhouse Exemption and Section 4-040.3.

The Court notes that HRC's motion regarding the constitutionality of Mont. Code Ann. § 76-3-203 is identical to its March 1, 2016, Motion for Declaratory Judgment. ROA # 8. As previously discussed, Mont. Code

Ann. § 76-3-203 provides for exemptions for certain condominiums, townhomes, or townhouses on lots within incorporated cities and towns. The Court finds that the Legislature specifically amended Mont. Code Ann. § 76-3-203 to allow for exemptions for subdivision review for certain townhomes, such as Hillview's proposal. The Court notes that there is no reference in the Missoula City Subdivision Regulations Article 4, Section 4-040, to Article 8. There is no express inconsistency between Article 4 and Article 8, and both procedures could have occurred independent of one another. Accordingly, the Court finds no validity to HRC's arguments regarding the constitutionality of Mont. Code Ann. § 76-3-203.

IT IS FURTHER ORDERED that the Plaintiff's Motion for Summary Judgment Regarding Constitutionality of Mont. Code Ann. § 76-3-203 is DENIED.

DATED this 30th day of January, 2017.

JOHN W. LARSON, District Judge

Copies of the foregoing were sent to:

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FILED FEB 27 2018
SHIRLEY E. FAUST CLERK
By
Deputy

MONTANA FOURTH JUDICIAL DISTRICT COURT
MISSOULA COUNTY

DISTRICT XI HUMAN RESOURCE COUNCIL, INC., a Montana non-profit corporation, Plaintiff, v. HILLVIEW CROSSING-MISSOULA, LLC, a Montana limited liability company; CITY OF MISSOULA, a Montana municipality; MIKE HAYNES, director of the City of Missoula Development Services Department; and, JOHN DOES 1-20, Defendants.	Cause No. DV-16-167 Hon. John W. Larson **ORDER OF DISMISSAL**

Pursuant to written Stipulation between the HRC and Hillview, through their respective counsel, that the above-entitled action has been fully settled,

IT IS HEREBY ORDERED that all claims, counterclaims and issues between the HRC and Hillview in the above-entitled cause are dismissed with prejudice, by and between the parties, with each party to pay their own costs and attorney fees.

DATED this 27th day of February, 2018.

By: _____
Hon. John W. Larson,
District Judge

cc: Michael O'Brien, Esq.
JR Casillas, Esq.
Jack Jenks, Esq.

From:	Jason Rice
To:	Paul Forsting; Anita McNamara; Mary McCrea; John DiBari; Troy Monroe; Kevin Slovarp
Cc:	Daniel L. Ermatinger; John Giuliani; "brian@walkerhd.com"; Cory Davis; Vince Gavin
Subject:	RE: Hillview Crossing - Updated Geotechnical Report
Date:	Thursday, January 31, 2019 8:45:48 PM
Attachments:	2015-12-03.SK Geotechnical.Updated Geotechnical Report.pdf

Troy and Kevin – I wanted to loop you in on this information that was requested from City Council and our stance on the subject. It is our understanding that City staff is not able to meet with us while in hearings, but I do think it is important to be prepared to discuss at the LUP.

This was the updated report that we did in 2015 when it was required as part of the ZCP. You will note that there are some differences in the current layout that were not there for the original report. I can say that we have evaluated the grading to make sure that the foundations will be in direct connection to the native soil and not placed on any fill. There are also retaining walls now. As a professional engineer, I feel that this report is adequate to show that the project can be successfully implemented on the site. From my knowledge of the site, things have not changed. As far as what the report addresses, we will need the final infrastructure layout that is somewhat dependent on the City Council review. Therefore, we agree that update will be needed, but that it is not prudent or appropriate to do so at this time as the updates will be for specific elements such as stairs (if required), walls, and storm water facilities. We feel that the condition as written allowing the qualified City Engineering staff to do a final review is adequate. Again, the purpose of having a Geotech report at this stage is to show that the project is feasible on this site.

As noted in the report, we will also have continuous re-evaluation as the site is developed. I had inquired to SK as to why they recommended this. They stated that it is due to the fact that as the site is opened up, we will have even more of a picture of what is going on. Also, they noted if grading does not happen per the plan, which is not likely, then there may need to be adjustments.

I just wanted you to be aware of our position. If there is disagreement up front, then it would be appreciated to know so that we could try to get more information to help in the discussion if needed.

We have about a month to get prepared and appreciate all that we can do to keep this moving. Thanks

Jason Rice, *P.E., CEO*

TERRITORIAL LANDWORKS, INC.

CIVIL ENGINEERING · SURVEYING · LAND USE CONSULTING

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From: Paul Forsting <paulf@territoriallandworks.com>
Sent: Monday, January 28, 2019 2:58 PM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>
Cc: Daniel L. Ermatinger <dan.ermatinger@bhhsmt.com>; John Giuliani <jgiuliani@montanatimberproducts.com>; 'brian@walkerhd.com' <brian@walkerhd.com>; Cory Davis <CoryD@territoriallandworks.com>; Vince Gavin <vince@gavin-hanks.com>; Jason Rice <jasonr@territoriallandworks.com>
Subject: Hillview Crossing - Updated Geotechnical Report

Hi Anita & Mary,

Here is a copy of the Geotech Report from December of 2015. SK Geotechnical updated the report for Hillview Crossing. This should address what John Dibari was looking for.

Paul Forsting, *AICP, Land Use & Environmental Planner*

TERRITORIAL LANDWORKS, INC.
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UPDATED GEOTECHNICAL EVALUATION REPORT

Mass Grading, Utilities, and Roadways
Hillview Crossing – Missoula
Missoula, Montana
Project 15-3338G

Submitted by

2511 Holman Avenue
P. O. Box 80190
Billings, Montana 59108-0910

Prepared for

Territorial Landworks, Inc.
P. O. Box 3851
Missoula, Montana 59806-3851

December 3, 2015

2511 Holman Avenue
P. O. Box 80190
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www.skgeotechnical.com

December 3, 2015 Project 15-3338G

Mr. Nathan Lucke, PE
Territorial Landworks, Inc.
P.O. Box 3851
Missoula, Montana 59806-3851

Dear Mr. Lucke:

Re: Updated Geotechnical Evaluation for Mass Grading, Utilities, and Roadways, Hillview Crossing – Missoula, Missoula, Montana

We have completed our update of the geotechnical evaluation for the above-referenced project, which you authorized on April 21, 2015. The purpose of the updated evaluation was to evaluate the current design and site conditions and to assist Territorial Landworks, Inc., in designing public utilities, earthwork, and pavements, and in preparing plans and specifications for construction of the new Hillview Crossing – Missoula Subdivision, formerly known as the Southern Hills Subdivision. The geotechnical evaluation update was completed in general accordance with our proposal to you dated April 14, 2015.

Summary of Results

Engineering Reconnaissance. An engineering reconnaissance was performed by our personnel in May of 2015 to observe the current site topography. The site conditions appear to be little changed and relatively similar to the conditions observed during our fieldwork in 2006. Six piezometers were still in place to allow for additional water level measurements. In 2006 and 2007, groundwater was not observed in these piezometers. However, in 2015, groundwater levels were observed in three of the piezometers at depths ranging from about 42 1/2 to 43 1/2 feet. Wet mud was also observed in one of the piezometers, indicating groundwater was near the bottom of the piezometer or had been previously wet, but had since drained away. The water level measurements indicate static groundwater levels are generally below depths of about 33 1/2 to 42 1/2 feet and below future cut depths. However, some seeps should be anticipated in deeper utility excavations. Also, some periodic seepage, most likely from rain and snow melt, could be encountered in future cut slopes, excavation sideslopes, basement excavations, and utility trenches. We anticipate surface water infiltrates into the ground surface through more permeable sand and gravel layers, and then travels laterally along more clay and silt layers until it either exits the slope face or encounters a more permeable sand or gravel layer and infiltrates deeper.

The ground surface observations indicate the current slopes are stable and signs of current instability were not observed. We did observe somewhat lusher grass present near the southeast corner of the subdivision. It is our opinion this is most likely due to the presence of more clay soils being present on this side of the subdivision that can better retain surface water, allowing lusher vegetation to establish. The western two-thirds of the subdivision appear to be more gravelly near the surface, which is less likely for lush vegetation to establish.

Soils. Twelve soil borings (six to 20 feet and six to 45 feet) were completed in 2006 on or near the proposed residential street alignments, and at more critical slope cross sections in maximum cut and fill areas. The current subdivision layout is relatively similar to the original layout, but has been somewhat modified.

The general soil profile at the borings generally consisted of about 1 1/2 to 3 feet of topsoil and root zone underlain by alluvial deposits consisting of interbedded clayey sands, silty sands, gravels, silts, and lean clays. These interbedded soils vary in thickness and depth across the site. As indicated above, groundwater was generally not observed in the borings at the time of drilling. However, a waterbearing zone was observed at a depth of about 12 1/2 feet in one boring at the time of drilling. Groundwater was originally not observed in the piezometers, but most recent water level measurements indicate groundwater present in at least three of the piezometers.

Summary of Analysis and Recommendations

Cut and Fill Slopes. It is planned to construct the future fill slopes out of a mixture of the on-site clays, silts, sands, and gravels. Due to the current slope and the desire to use on-site soils for embankments, roadways, and residences, it is critical all earthwork be properly constructed with a high degree of inspection and testing. This will allow you to better evaluate the earthwork is properly keyed into the existing slopes, properly compacted, and variations requiring additional recommendations (if encountered) are properly addressed. Based on the results of our additional slope stability analysis, we recommend all future fill slopes be constructed at a slope of 2.5:1 (horizontal:vertical), or flatter. We also recommend the embankment fill slopes below the future residences incorporate geogrid reinforcement to provide additional strength at the embankment toe and provide a higher factor of safety for slopes near or below the future residences. Alternatively, the slopes can be placed at 3.0:1 or flatter. The 3.0:1 fill slopes will still need to be properly keyed into the existing slopes and properly compacted, but the geogrid can be eliminated. It is our opinion the embankment fill slope on the left hand (uphill) side of the entrance access road can be constructed at a slope of 2:1, but the downhill sideslope should be constructed at 2.5:1, assuming no residences are planned along these slopes.

It is our opinion cut slopes can be constructed at a slope of 2.5:1 or flatter. Topsoil seeding and erosion control measures should be implemented to control surface erosion. We wish to point out, however, slopes (cut or fill) of 3.0:1 are generally considered the practical maximum (steepest) for maintenance operations, erosion control, and safety.

Streets. The streets servicing the subdivision will be local/residential streets, and it is our opinion the City of Missoula Asphalt Paving Section for Medium Subgrades can be used for design. This section consists of 3 inches of asphalt concrete over 6 inches of crushed gravel base over 8 inches of gravel subbase for a total thickness of 17 inches, not including the 6 inches of compacted subgrade.

Utilities. The borings indicate the soils will generally be suitable for direct support of the proposed utilities. However, low permeability trench backfill plugs should be constructed at each individual service and at 200-foot intervals along the main lines. This is critical along trenches to reduce the risk of bedding acting as a conduit for water. A high level of testing and inspection is also recommended during trench work to reduce the risk of excessive backfill settlement.

Drainage. Proper control of surface water, roof run-off, and subsurface drainage will be critical for proper performance of the future slopes, roadways, and residences. We recommend all surface water run-off in the roadways be collected by a properly constructed series of curb and gutter, and storm sewer manholes and inlets. All roof run-off from the residences should also be collected by high quality gutters, downspouts, and piping systems, and this water routed to defined collection ditches to carry surface water down and away from the subdivision. We recommend any ditches constructed above future residences be lined with an impermeable PVC or HDPE liner to prevent surface water from infiltrating into the ground surface and affecting adjacent homes.

Although the borings indicate groundwater will likely not be encountered in permanent cut slopes, there is some risk of seepage exiting the cut slopes. If seepage areas are identified during or after construction, seepage collection systems should be implemented to control seepage exiting the slope face and route it down and away from the subdivision.

The need for perimeter foundation and subfloor drains will need to be determined by the lot specific project geotechnical report recommended for each individual residence as they are designed. At a minimum, they are recommended for any below-grade spaces, such as basements and crawl spaces. Water collected in these systems should also be routed to the stormwater collection system, and not discharged on adjacent residential lots.

Geotechnical Report Limitations

It should be noted, this geotechnical work is only to be used for design of the proposed streets, utilities, and mass grading. It is ***not*** to be used for design of the proposed residences. Individual geotechnical evaluations will be needed for each individual residence, including site-specific soil borings, laboratory testing, and geotechnical recommendations addressing the specific structure, and homeowner and design needs.

This updated geotechnical report is based on the current site observations and design information provided. Over time, surface and/or subsurface conditions can change along with code requirements, engineering design standards, and other considerations that could affect the performance of the subdivision, streets, utilities, or residences. ***The recommendations contained in this report will not be valid after a period of five years from the date of this report, or after December 3, 2020.*** After this date, any additional work relying on recommendations obtained from this report will need to be re-evaluated and redone, including, but not limited to, a new geotechnical report, fieldwork, laboratory tests, and all analyses and recommendations used for design purposes.

General

Please refer to the attached report for more detailed results of our fieldwork, engineering analyses, and recommendations.

Thank you for using SK Geotechnical. If you have any questions regarding this report, please call Cory Rice at (406) 652-3930.

Sincerely,

Cory G. Rice, PE
Senior Engineer

Gregory T. Staffileno, PE
Reviewing Engineer

Attachment:
Geotechnical Evaluation Report

Table of Contents

Description **Page**

Table of Contents (continued)

A. Introduction

A.1. Project

SK Geotechnical was originally retained by Professional Consultants, Inc. (PCI), in 2006 to assist them in designing the Southern Hills Subdivision in Missoula, Montana. This project was never developed, and design of the subdivision was recently picked up by Territorial Landworks. The current name of the subdivision is Hillview Crossing – Missoula and is located in Missoula, Montana. The project is located west of the existing residence at 4607 Hillview Way. The approximate location of the subdivision is presented on the Site Location Sketch in the Appendix of this report.

A.2. Purpose of this Evaluation

The purpose of this updated geotechnical evaluation is to utilize the work originally performed for PCI and to develop an updated geotechnical evaluation to assist Territorial Landworks in the current subdivision design. This work will consist of asphalt pavement design for residential streets, utility construction, and mass earthwork constructing the proposed cut and fill slopes. This evaluation will also assist Territorial Landworks in preparing plans and specifications for construction of the proposed Hillview Crossing Subdivision. It is not the purpose of this evaluation to develop lot-specific geotechnical recommendations for the individual residences. Individual geotechnical evaluations will need to be conducted by others for these structures.

A.3. Scope

Our scope of services to update the geotechnical evaluation was summarized in our proposal to Territorial Landworks dated April 14, 2015, and consisted of the following.

- Conduct a geotechnical reconnaissance and document review to observe the current ground conditions and review our original geotechnical report as it relates to the current planned construction and to evaluate recommended changes as required.
- Conduct up to three additional slope stability analyses on typical cross sections on future fill and cut slope areas based on the proposed updated grading plan.
- Provide updated pavement design for the residential roadways.
- Develop additional geotechnical recommendations regarding utility support, backfill recommendations, and fill and cut slope construction.
- Provide an updated geotechnical report incorporating our additional slope stability analysis, pavement design, and updated recommendations for the current project owner and current design and code standards.

- **Individual residence foundations – not included in scope of services.** As indicated previously, this work will not address subgrade preparation or foundation design for individual residences, and this work is specifically excluded from our scope of services. Individual geotechnical evaluations will need to be performed by others for each individual residence to determine subgrade and foundation design parameters.

A.4. Documents Provided

To assist in our evaluation, Territorial Landworks provided us with the following documents.

- Overall Grading Plan, dated August 14, 2015
- Site cross sections for steeper slopes (approximately 2.5 horizontal:1.0 vertical), or flatter, dated August 14, 2015.
- Site cross sections for flatter slopes, approximately 3.0:1, or flatter, dated August 14, 2015.
- Preliminary Utility Layout, dated November 25, 2015.

We also utilized our original Geotechnical Evaluation Report, Project 067358, dated April 26, 2007, for available soils and laboratory information.

A.5. Boring Locations and Elevations

The original boring locations were selected by Mr. Kevin Dansie, PE, a geotechnical engineer with our firm. The locations were plotted on a Preliminary Site Plan, and a copy was provided to PCI. Boring locations were then staked in the field by PCI, and the locations of the borings were plotted on a Final Site Plan prepared by PCI. This plan was overlaid on the current Overall Grading Plan, and the approximate locations are shown on the attached Overall Grading Plan with the drawn boring locations.

B. Results

B.1. Logs

Log of Boring sheets indicating the depths and identifications of the various soil strata, the penetration resistances, laboratory test data, and water level information are attached. It should be noted the depths shown as boundaries between the strata are only approximate. The actual changes may be transitions and the depths of the changes may vary between borings. At the completion of logging and soil sampling, Borings ST-1P, ST-2P, ST-3P, ST-4P, ST-10P, and ST-12P were converted to temporary piezometers.

Geologic origins presented for each stratum on the Log of Boring sheets are based on the soil types, blows per foot, and available common knowledge of the depositional history of the site. Because of the complex glacial and post-glacial depositional environments, geologic origins are frequently difficult to ascertain. A detailed evaluation of the geologic history of the site was not performed.

B.2. Geology

Based on the geology map titled *Geologic Map of the Missoula West 30' X 60' Quadrangle*, compiled and mapped by Reed S. Lewis, 1998, the general geology at the site consists of "**Taf** – Alluvial Fan Deposits (Miocene through Pliocene) – Locally derived, poorly sorted, angular to rounded boulders, cobbles, gravel, sand, and silt. Probably equivalent to the Sixmile Formation of southwest Montana (Sears 1997)" and "**Tgc** – Gravel and Clay (Eocene through Miocene) – Channel and flood plain deposits of the ancestral Bitterroot and Clark Fork Rivers. May also be present and includes well-sorted and well-rounded cobbles, gravel, sand, clay, and volcanic ash deposits….Coarser intervals are permeable, but clay-rich zones are not. Probably equivalent to the Renova Formation of southwest Montana (Jim Sears, prs. Comm., 1997)."

B.3. Site Conditions

At the time of our original evaluation in 2006, the site was an undeveloped lot covered with native grasses. Since that time, it appears the lot has little changed. The only significant change appeared to be trails that were cut parallel to the existing slope to allow access to our drill rig during the 2006 fieldwork. On May 1, 2015, Mr. Cory Rice, PE, a senior geotechnical engineer with our firm, visited the site to observe the existing surface conditions and obtain several updated photographs. We also obtained current groundwater level readings in six PVC piezometers that were installed in 2006.

As indicated above, the site appears to be little changed with the exception of the trails cut to access the proposed boring locations. The site was still covered with native grasses. We did observe the grass on the eastern side, and primarily southwestern side, of the subdivision appeared to generally be lusher, indicating a higher level of moisture available for surface vegetation. The center and western portions of the site appeared to generally be drier with coarser gravels observed on the surface and in the shallow access road cuts. Existing slopes generally ranged from about 10 to 19 degrees from horizontal, which equate to about 5:1 to 3:1 horizontal to vertical (H:V) slopes. The existing cut slopes appeared to be stable and signs of instability were not observed. Seepage from the existing hillside was also not observed, although somewhat lusher vegetation was observed on the eastern portion of the site, as indicated above.

Some boulders with a maximum dimension of about 3 feet were observed in isolated areas. We also observed the existing cut slope near the northwest side of the subdivision near the end of Saranac Drive. This cut slope appeared to be about 20 feet in height and constructed at an angle of about 36 degrees

(1.4:1). Based on our observations, this cut slope appeared to be stable. We also observed an embankment slope to the east of the subdivision that we estimated to have a height of about 12 feet and was constructed at a slope of about 22 degrees (2.5:1). This slope also visually appeared to be stable. We also observed an 8-foot high cut slope along an access road at the northwest corner of the subdivision that was constructed at a slope of about 18 degrees (3.0:1) that also appeared to be stable. Updated photographs of the subdivision are attached. Our groundwater level measurements are discussed in more detail in Section B.5 of this report.

B.4. Soils

The soil borings performed in 2006 encountered 1 1/2 to 3 feet of topsoil and root zone at all locations. Beneath the topsoil and root zone, the general soil profile encountered at the borings was clayey sands with gravel, silty sands with gravel, and poorly graded gravel with silt and sand. Underlying these soils, lean clays with gravel, poorly graded gravel with silt and sand, and inter-bedded lean clays, silty sands and poorly graded gravel with silt and sand were encountered. These strata are described in more detail below.

B.4.a. Topsoil/Root Zone. The topsoil generally consisted of loose to medium dense clayey sand with roots. The topsoil ranged in depth from 1 1/2 feet to 3 feet. Penetration resistances generally ranged from 3 to 26 blows per foot (BPF), but generally averaged between 7 and 12 BPF.

B.4.b. Clayey Sand with Gravel Alluvium. Beneath the existing topsoil, clayey and silty-clayey sand with gravel was encountered in Borings ST-1P, ST-2P, and ST-7. Penetration resistances generally ranged from 13 to 34 BPF, indicating these soils were medium dense to dense. These soils were encountered to depths ranging from 4 to 9 feet.

B.4.c. Silty Sand with Gravel Alluvium. Underlying the topsoil in Borings ST-4P and ST-5 were silty sands with gravel. Penetration resistances generally ranged from 10 to 22 BPF, indicating these soils were loose to medium dense. These soils were generally encountered to depths ranging from 3 to 6 feet.

B.4.d. Poorly Graded Gravel with Silt and Sand Alluvium. Underlying the topsoil in Borings ST-6, and ST-8 through ST-11 were poorly graded gravels with silt and sand. These soils were encountered to depths ranging from 12 to 29 feet. Penetration resistances generally ranged from 18 to 87 BPF, indicating these soils were medium dense to very dense. The average BPF ranged from about 22 to 35.

B.4.e. Sandy Lean Clay Alluvium. Underlying the topsoil in Boring ST-12P, stiff to hard sandy lean clay was encountered to a depth of 12 feet. Penetration resistances ranged from 28 to 36, indicating these soils were hard to very hard.

B.4.f. Interbedded Alluvium Soils. Interbedded soils encountered at deeper depths in the borings generally consisted of silty clays, silty clayey sands, silty sands, clayey sands, clayey gravels with silt and sand, poorly graded gravels with silt and sand, silt with sand, and sandy lean clay. Penetration resistances generally indicated these soils ranged from medium dense to very dense and stiff to hard. Unusually very dense and moderately cemented silty clay and silty clayey sand soils and gravels were encountered in Boring ST-12P below a depth of about 12 feet. These soils had penetration resistances ranging from 74 BPF to 50 blows for 3 inches. These soils, while being very dense, could be penetrated with our hollow-stem auger drilling equipment, indicating it likely was not hard bedrock. However, these soil deposits could be older alluvial sediments that are intermediate geomaterials (IGMs), which are typically dense soils with physical characteristics between soil and harder bedrock.

B.5. Groundwater Observations

Groundwater was generally not observed in the borings at the time of drilling. The exception was a waterbearing zone observed at a depth of about 12 1/2 feet in Boring ST-1P. Six piezometers were installed in the borings (Borings ST-1P through ST-4P, ST-10P, and ST-12P) for extended water level measurements. On November 28, 2006, the piezometers were measured for groundwater, but groundwater was not encountered. Again, on April 5, 2007, the piezometers were rechecked and groundwater was not encountered. However, on May 1, 2015, groundwater was observed in three of the piezometers, ST-1P, ST-4P, and ST-10P, at depths ranging from 42.7 to 43.8 feet. Also, muddy soils were present at a depth of 33.4 feet in ST-2P, indicating water was recently present in the piezometer, but has likely since drained away. A summary of the May 1, 2015, groundwater level measurements are summarized in Table 1 below.

Table 1. Summary of Groundwater Level Measurements – 2015

Piezometer	Ground Surface	Depth to Groundwater	Groundwater Elevation
ST-1P	3365.9	42.7'	3323.2
ST-2P	3328.5	Mud – 33.4'	3295.1 – Mud
ST-3P	3252.8	N/E – 43.7'	Below 3209.1
ST-4P	3261.9	43.4'	3218.5
ST-10P	3251.4	43.8'	3207.6
ST-12P	3277.6	N/E – 39.6'	Below 3238.0

As indicated in the above table, groundwater is present at elevations ranging from about 3207 1/2 to 3323. Including the muddy soils, groundwater is also present near elevation 3295. These water levels were generally near the bottom of the piezometer and indicate groundwater may generally follow the ground surface at a depth of about 42 to 44 feet. The water levels observed also may be seasonal groundwater

that became perched on less permeable silt or clay layers that then travelled laterally until the groundwater encountered the piezometer and then accumulated near the bottom of the piezometer pipe. We recommend additional groundwater level measurements be obtained, especially in the spring and fall to evaluate groundwater fluctuations.

The water level measurements indicate, at a minimum, perched groundwater does exist during wetter periods. It is our opinion the perched water is likely related to surface water that infiltrates down through the surface through sand or gravel layers and then becomes perched on less permeable silt or clay layers. This water then travels laterally until it encounters a more permeable sand or gravel layer and can infiltrate downward. Alternatively, the water can exit the slope face which may partially contribute to the more lush vegetation on the eastern side of the subdivision.

B.6. Laboratory Tests

The results of the laboratory tests completed in 2006 are summarized on the boring logs and graphs in the Appendix. Additional laboratory testing since that time has not been completed.

B.6.a. Classification Tests. Classification tests consisting of Atterberg limits and percent-finer-than-a-200-sieve were conducted on both split-spoon samples and loose bulk samples obtained from the borings. Table 2 below provides a summary of the classification tests.

Table 2. Summary of Laboratory Tests

Boring	Depth (feet)	Atterberg Limits			P_{200} (%)
		LL	PL	PI	
ST-2P	1½ to 9 (bulk sample)	24	14	10	26
ST-2 P	12 to 13	47	21	26	82
ST-4P	7 to 14 (bulk sample)	47	16	31	70
ST-6	14½ to 15½	46	21	25	67
ST-7	0 to 9 (bulk sample)	24	17	7	24

The Atterberg limits tests indicate the on-site clayey soils have a moderate potential for volume change, i.e., shrinking and swelling with changes in moisture content.

Based on the results indicated above, samples from Borings ST-2P, ST-4P, and ST-6 classify as lean clay while the sample from Boring ST-7 classified as silty clayey sand. The American Society for Testing and Materials (ASTM) symbols for these soils are CL and SC-SM, respectively.

B.6.b. Proctor Tests

Three Proctor tests were performed on larger bag samples obtained from Borings ST-2P, ST-4P, and ST-7. The results of these tests are shown on the graphs in the Appendix and are summarized in Table 3 below.

Table 3. Summary of Proctor Tests

Boring	Depth (feet)	ASTM Classification	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
ST-2P	11/2 to 9	SC	132	8
ST-4P	7 to 14	CL	106	18
ST-7	0 to 9	SC-SM	133	7

The results indicated above are typical for alluvial clays and sands with gravel, but are quite variable, indicating a high level of testing and inspection will be required during construction.

B.6.c. Corrosion Tests

Corrosion tests were conducted on two thin-walled tube samples obtained from Borings ST-4P and ST- 12P at a depth of 11 feet. Results of the corrosion testing are presented in Table 4 below.

Table 4. Summary of Corrosion Tests

Boring	Depth (feet)	Resistivity (ohm/cm)	Conductivity (mmhos)	pH	Marble pH	Sulfate (%)
ST-4P	10½ to 11½	9,250	0.1081	7.01	7.28	< 0.01
ST-12P	10½ to 11½	7,900	0.1265	8.18	7.88	< 0.01

Based on the results of the corrosion tests, the clay soils tested generally have a moderate to low potential for corrosion to steel materials. The sulfate tests indicate the clay soils would be Class S0 as defined by Table 4.2.1 of the American Concrete Institute (ACI) Manual 318-56, and will have a low risk of detrimental effect on reinforced concrete from sulfate exposure.

C. Analyses and Recommendations

C.1. Proposed Construction

The proposed subdivision will include 34 duplex townhomes and two residential streets as shown on the attached Overall Grading Plan. To create relatively level or split-level building pads for the future townhomes, two sidehill cuts will be made running roughly parallel to the existing slopes. The maximum height of these cuts will be about 45 feet measured from the top of the cut slope to the bottom. The maximum vertical cut depth measured from the existing ground to the base of the cut will be about 24 feet. The material removed from the cut slopes will generally be used to construct embankments on the downhill side of the future roadways. The fills will generally have a maximum height of about 27 feet as measured from the toe of the fill slope to the top. The maximum thickness of the fills will generally be about 12 feet as measured from the existing ground surface to the top of the embankment fill. A larger 40-foot high fill will be required for the access road coming off of Hillview Way, and this embankment will have a maximum thickness of about 23 feet. All future cut and fill slopes will be constructed at slopes of 2.5:1, or flatter. The exception will be the uphill, or left hand, embankment sideslopes for the access road off of Hillview Way that will need to be constructed at a slope of 2:1 to keep within current right-of-way limits.

The future utilities will consist of 8-inch PVC sewer main with burial depths ranging from 8 to 15 feet, and an 8-inch ductile water main with burial depths of approximately 6 1/2 feet. Stormwater infrastructure will include standard curb inlets connected to corrugated metal pipe structures ranging in size from about 18 to 30 inches. Footing and roof drains from all of the townhomes will also be directed into the stormwater system that will eventually drain into a dry creek bed between the upper and lower homes that will be routed to a detention pond near the northwest corner of the site that will eventually overflow into Wapikiya Park.

The residential roadways will be paved with asphaltic concrete and will be about 25 feet in width with concrete curb and gutter. The streets will be subjected primarily to light car and truck traffic with occasional trucks, such as moving vans, garbage trucks, and delivery vehicles.

If the proposed grades differ from the drawings provided or if there are changes to the design, we should be informed. Additional analyses and recommendations may be necessary.

C.2. Discussion

Based on the results of the soil borings and laboratory tests conducted for our 2006 work and our recent geotechnical reconnaissance, it is our opinion the on-site natural soils will generally be suitable for reuse as fill material during mass grading operations, provided they are thoroughly mixed, moisture conditioned to a moisture content near optimum, and properly compacted to specification. It is also critical the

embankment fills be properly keyed into the existing sideslopes. Also, we recommend geogrid reinforcement for the embankment toes to provide a higher factor of safety for embankments with residences constructed near the top of the slopes. The soils encountered during mass grading will consist of a mixture of silt and lean clay soils along with alluvial granular soils such as sands and gravels. We recommend these soils be thoroughly mixed to improve the workability and strength of the silt and clay soils and to provide embankment fill soils that will have a minimum internal friction angle of at least 32 degrees, or higher.

Based on our updated stability analysis, it is our opinion all future fill and cut slopes should be constructed at a slope of 2.5:1 (horizontal:vertical), or flatter. The exception is the access road embankment sideslope on the uphill side (left of centerline) that can be constructed at a slope of 2.0:1, or flatter. There is some potential for seasonal groundwater seeps that could emanate from future permanent and/or temporary cut slopes. These seeps could develop into cut slope instability. Therefore, we recommend close observation of all cut slope excavations during construction, and if seeps or signs of past seepage are encountered, additional measures to control seepage from exiting on the slope surface should be implemented. A contingency should be provided for this purpose.

The future embankments will be constructed on a sideslope with clayey soils. Wetting or saturation of these embankment fill slopes could result in embankment instability that could affect future roadways, utilities, embankments, or structures. Therefore, it is critical stormwater be properly collected in a well maintained stormwater collection system. Also, all roof run-off needs to be collected in a similar system and well maintained throughout the life of the structures. Xeriscaping is strongly recommended to reduce lawn irrigation and potential uncontrolled water sources that are difficult to maintain and reliably control.

Moderately deep utility excavations will extend into the alluvial clays and silts. It has been our experience, obtaining proper compaction on these soils in utility trench excavations is very difficult and can result in several inches or even several feet of settlement if not properly compacted. A large amount of embankment material will also be placed for the future building pads. Inadequate compaction could result in excessive settlement or instability. We recommend a project-specific specification be written outlining or requiring the contractor to submit a detailed plan of how the soils will be processed to obtain a moisture content near optimum and documentation of how the material will be placed in sufficiently thin lifts, compacted to specification, and providing full-time construction inspection and testing, documenting the fill material has been properly placed and compacted to specification.

Provided the cuts and fills are constructed as recommended, it is our opinion these soils and the undisturbed native soils will generally be suitable for direct support of the proposed utilities and roadways. Evaluating the suitability of the soil or groundwater conditions for support of the individual residences was not included in our scope of services. ***Separate geotechnical evaluations will be needed***

for each individual residence to determine the specific soils at each residence and to address the specific design.

Seasonal and annual fluctuations of the groundwater table will occur due to variations in rainfall, irrigation, snow melt, and other factors not evident at the time of our original fieldwork. It appears seasonal fluctuations do occur, however, the current depths of groundwater appear to be below the future cut slope and utility depths. Careful observations should be performed during construction to identify seepage, or recent seepage, areas that require additional seepage control measures. However, careful observations during construction are recommended to control seepage from future cut slopes, if encountered.

C.3. Slope Stability

Stability analyses of the maximum cut and fill slopes along cross sections C and D, which in our opinion, are the more critical sections due to the more predominant clayey soils and steeper slopes, were performed. Our stability analysis was conducted with the SVSLOPE™ computer program for static and seismic conditions. Strength parameters utilizing the analyses were based on our past experience and published data on similar soils as those encountered at the site. Table 5 presents the strength parameters utilized in the analyses. Based on the International Building Code (IBC) 2012, it is our opinion the site is classified as Site Class "C" for very dense soil and soft rock profiles. Based on this, seismic force coefficients of 0.081 horizontal were used in the slope stability analysis for pseudo-static (seismic) conditions. Boundary loads of approximately 1,000 pounds per square foot (psf) were also utilized to represent future residential structure loads.

Several program runs were performed using the Ordinary Method and Bishop Method of determining circular failure surfaces. Initiation and termination ranges were varied until factors of safety converged on a minimum value. The calculated minimum factors of safety are presented in Table 6. The program output outlining the results of our analysis are presented in the Appendix.

The recommended a minimum factor of safety for earthfill embankments under static conditions is 1.3 for embankment slopes with only roadways above them. We recommend a minimum factor of safety between 1.4 and 1.5 for embankments with structures above them. We also recommend a minimum factor of safety between 1.4 and 1.5 for cut slopes constructed above residences. For seismic conditions, we recommend a minimum factor of safety of 1.1.

Based on our review of our original stability analysis conducted in 2006, the original analysis was based on an assumption the soil layers were generally horizontal in nature. However, based on our current review, it is our opinion it is more likely the soil layering generally follows the ground surface, which also results in a more conservative analysis.

Table 5. Material Strength Parameters

Material Type	Total Unit Weight (lbs/ft^3)	Drained		Undrained	
		Friction Angle	Cohesion (lbs/ft^2)	Friction Angle	Cohesion (lbs/ft^2)
Fill (SC-GC)	130	32	0	32	0
Clayey Sand (SC)	126	29	0	29	0
Sandy Lean Clay (CL)	115	22	250	0	3,000
Clayey Gravel (GC)	138	32	0	32	0
Gravel with Sand (GP)	140	36	0	36	0

Table 6. Slope Stability Analysis Results, Minimum Factors of Safety for Circular Failure

Cross Section/Slope	Analysis	Factor of Safety (Static)	Factor of Safety (Seismic)
2.5:1 Cut and Fill Slopes			
C –Upper Embankment	Undrained	1.4	1.2
	Drained	1.5	---
C-Middle Cut Slope/Embankment	Undrained	1.4 to 1.5	1.1
	Drained	1.4 to 1.5	---
C – Lower Embankment	Undrained	1.5	1.2
	Drained	1.5	---
D – Upper Cut Slope	Undrained	1.4	1.1 to 1.2
	Drained	1.4	---
D – Middle Embankment/Cut Slope	Undrained	1.4 to 1.5	1.1 to 1.3
	Drained	1.4 to 1.5	---
D – Lower Embankment	Undrained	1.5	1.2
	Drained	1.5	---
2.5:1 Cut Slopes and 3.0:1 Fill Slopes			
C –Upper Embankment	Undrained	1.5	1.2
	Drained	1.5	---
C-Middle Cut Slope/Embankment	Undrained	1.5	1.2
	Drained	1.7	---
C – Lower Embankment	Undrained	1.7	1.3
	Drained	1.8	---
D – Upper Cut Slope/Embankment	Undrained	1.4	1.1 to 1.2
	Drained	1.4	---
D – Middle Embankment/Cut Slope	Undrained	1.4 to 1.5	1.1 to 1.2
	Drained	1.4	---
D – Lower Embankment	Undrained	1.7	1.3 to 1.4
	Drained	1.7	---

C.4. Site Preparation and Mass Grading

C.4.a. Stripping. We recommend vegetation, topsoil, and root zone be removed from beneath all proposed embankments, roadways and foundations and slabs. The thickness of topsoil and root zone at the borings ranged from about 1 1/2 to 3 feet. Actual depth of removal across the site should be determined by observations during stripping. As indicated above, a significant volume of topsoil will be generated during the stripping operation. This topsoil can be reused as topsoil over future embankment and cut slopes and landscape areas. After final construction of the future embankment sideslopes, surplus topsoil could also be used for further flattening of fill slopes, but it is critical the topsoil be placed in a controlled manner, i.e., placed in lifts and moisture conditioned to a moisture content near optimum, and compacted to specification. Loosely placing or dumping the topsoil would result in severe erosion and failure of these fill slopes. The flattened slopes using topsoil should have slopes of 3:1 (horizontal:vertical) or flatter.

C.4.b. Embankments. All embankments should be constructed of slopes no steeper than 2.5:1 so they will be stable. The exception is the access road embankment sideslope on the uphill side, left of centerline that can be constructed as steep as 2:1 after the topsoil has been removed. All fill material should be keyed into the existing slope's natural, undisturbed soils using benches with a minimum width of at least 8 feet and maximum vertical separation between benches should not exceed 4 feet. In addition, at the toe of the proposed slope, a keyway with a minimum depth of 18 inches and a width of at least 10 feet should be keyed into the natural undisturbed soils prior to placement of fill material. We also recommend reinforcing the embankment toes that are constructed at 2.5:1 with a minimum of three layers of geogrid reinforcement as shown on the attached Embankment Construction Detail. Slopes constructed at 3:1, or flatter, should also be keyed into the existing slopes as described above, but the geogrid reinforcement can be eliminated. We wish to point out fill slopes of 3:1 are generally considered the practical maximum (steepest) for maintenance operations, erosion control, and safety.

Geogrid should be used for fill slope reinforcement. We recommend using a biaxial geogrid with a minimum Long Term Allowable Design Strength (LTDS) of at least 500 pounds per foot in the cross machine direction. Tensar BX1200 geogrid will meet this requirement. Alternative grids should meet or exceed the properties of the Tensar BX1200 geogrid.

Before fill is placed, all exposed soil surfaces should be scarified to a minimum depth of 8 inches, moisture conditioned to near or slightly above optimum moisture content, and compacted to at least 95 percent of its standard Proctor density determined in accordance with ASTM Method of Test D 698.

A combination of sandy gravel, sand, silt, or clay with a plastic index less than 20 can be used to construct the future embankments. Based on our laboratory test results, some of the natural soils have

plastic limits ranging from about 20 to 30. It is our opinion these soils will not be suitable for direct use as embankment construction. If they are to be reused for embankment construction, we recommend the natural clayey soils be thoroughly mixed with the natural granular soils prior to placement so they have a plastic index less than 20 and a minimum internal friction angle of 32 degrees, or higher. If imported soils are required, we recommend importing 3-inch minus sandy gravel or sand meeting the requirements of *Montana Public Works Standard Specifications* (MPWSS), 6th Edition, April 2010, Section 02234 for 4-inch minus subbase.

All fill material should be placed in lifts not exceeding 8 inches (loose thickness) and moisture conditioned within 2 percentage points of optimum moisture content. Since the majority of the embankment fills will have maximum heights near 8 to 10 feet, we recommend all embankment fill be compacted to at least 98 percent of its standard Proctor maximum dry density. The differential fill thickness should not range by more than 8 feet across an individual building pad. If embankments below residences will have heights greater than 10 feet, the material should be compacted to 100 percent. Full-time inspection and compaction testing are recommended during placement of fills on the site. Testing frequency is addressed in Section D.3 of this report.

C.4.c. Cut Slopes. We also recommend all cut slopes be cut to slopes of 2.5:1, or flatter, so they will be stable. As indicated, there is some potential for seepage from the proposed cut slopes that could reduce cut slope stability. Therefore, we recommend closely observing the exposed cut slopes for signs of seepage or past seepage during construction. We wish to point out cut slopes of 3:1 are generally considered the practical maximum (steepest) for maintenance operations, erosion control, and safety.

If seepage is encountered, we recommend armoring the cut slope with a layer of 3- to 6-inch minus cobbles on the slope surface to collect the seepage and prevent it from exiting on the slope surface. The cobbles should be laid over a geotextile filter fabric to control the loss of fines. The cobble layer should be a minimum of 18 inches thick, and the seepage should be routed to a toe drain constructed at the toe of the cut slope. The toe drain should consist of a perforated pipe embedded in drainage aggregate and wrapped in a geotextile filter fabric. The drainage should be drained by gravity down and away from the structures and into the storm drainage collection system.

C.4.d. Setback Requirements. The slope designs and future residence designs will also need to meet the minimum foundation setback requirements as outlined in the current International Residential Code and as required by the local building official.

C.4.e. Shrinkage. The earthwork will consist of excavating a mixture of silt, clay, sand, and gravel from cut areas and placing and compacting in future embankment areas. The clays and silts will tend to shrink more and the sands and gravels less. Based on our review of the boring logs, we estimate shrinkage will

range from about 15 to 20 percent from its current "bank" condition to its final "compacted in place" condition. We recommend using a value of 18 percent for design, but it should be considered approximate. The actual shrinkage value will not be known until significant earthwork is completed.

C.5. Utilities

C.5.a. Materials. Silty to clayey soils (silt with sand, sandy lean clay, and lean clay with sand and gravel) were commonly encountered by the borings. Silty and clayey soils are generally corrosive to metallic conduits. Also, based on the results of the corrosion tests, we recommend specifying non-corrosive materials or providing corrosion protection for steel materials. We also recommend polyethylene encasement for ductile iron pipe, if used.

C.5.b. Type 1 Bedding. Based on our borings, it is our opinion the alluvial clays, silts, sands, and gravels will generally not meet the requirements for Type 1 bedding. MPWSS indicates Type 1 bedding shall be 1 1/2-inch minus free draining and nonplastic material. An alternative is 3/4-inch minus well graded gravel (GW) or well graded sand (SW). It is our opinion none of the on-site soils encountered in the borings will meet these requirements, therefore, Type 1 bedding will need to be imported.

It is our opinion the MPWSS Type 1 bedding is often too openly graded and the well graded gravel with sand makes a more suitable material to place beneath the proposed sewer lines. Well graded gravel with sand contains an even distribution of sand and gravel size particles. Once placed and compacted, it does not contain excessive void spaces. Crushed base course is a typical well graded gravel with sand material, while common Type 1 bedding material is open graded. The open graded material contains void spaces between the gravel particles. Surface water infiltration, groundwater, or vibrations can cause sand, silt, and clay backfill to fill the voids, which can result in settlement of the trench backfill, above, below, and on the sides of the bedding.

Therefore, we recommend using crushed base course meeting the requirements of MPWSS Section 02235 as Type 1 bedding beneath the proposed utility pipes. The gradation requirements are shown in the MPWSS. The 1- and 3/4-inch minus materials generally contain more sand and are preferable to the 1 1/2-inch minus material, in our opinion. If open graded bedding is used, it should be wrapped in a geotextile filter fabric to reduce the risk of "piping of fines" into the open graded material. We recommend all bedding be placed in lifts and compacted to a minimum of 95 percent of its standard Proctor density.

C.5.c. Trench Backfill above Bedding. Trench settlement of deeper utility excavations is a common problem and is often difficult to avoid. Even well compacted backfill will settle, in our opinion, and we anticipate normal trench settlement will be approximately 1 percent of the total trench depth. Therefore,

for a 15-foot deep trench, at least 1 1/2 inches of trench settlement should be anticipated. If the backfill is poorly compacted, excessively thick lifts are placed, or surface water infiltrates into the trench, several inches or several feet of settlement can occur. This can obviously adversely affect roadways or nearby utilities or structures within the influence of the trench. In areas where up to 2 inches of trench settlement cannot be tolerated, we recommend replacing the on-site clays and silts with imported 4-inch minus sandy gravels that can be more readily compacted to specification. Sandy gravel should be used until the backfill is within at least 5 feet of the final surface.

In areas where the on-site soils are to be used as backfill, a larger amount of work will be required to properly place and compact these soils to specification. The on-site silts and clays will need to be moisture conditioned to obtain a moisture content near or slightly above optimum moisture content, which is necessary to achieve the specified compaction.

We recommend all trench backfill be compacted to a minimum of 98 percent of its standard Proctor density. The material should also be placed at a moisture content within plus or minus 2 percent of optimum moisture content. The material should also be placed in maximum loose lift thicknesses ranging from 4 to 8 inches, depending on the compaction equipment being used. Recommendations for compaction and inspection control are discussed in Section D of this report. Full-time inspection and compaction testing are recommended during placement of trench backfill. Testing frequency is addressed in Section D.3 of this report.

C.5.d. Trench Backfill and Bedding Plugs. It is our opinion low permeability trench backfill plugs should be used along the utility alignments at frequencies to be determined by the civil engineer in accordance with MPWSS Section 02222. At a minimum, we recommend trench backfill plugs be installed at each service entrance and at a minimum horizontal interval of 200 feet along the utility alignments. Trench backfill plugs should be installed in accordance with MPWSS to reduce the risk of piping and water transfer along the pipe bedding. Again, they should be inspected during placement and testing to confirm they meet specifications, especially permeability of $1x10^{-7}$ cm/sec or less.

C.6. Pavement

C.6.a. Subgrade Preparation. Where residential streets are located in cut areas, after mass grading, we recommend the upper 6 inches of the resulting subgrade be scarified, moistened to a moisture content near optimum, and compacted to a minimum of 95 percent of its standard Proctor maximum dry density. In addition, when residential streets are located in fill areas, after mass grading, we recommend the fill be placed and compacted as described in Section C.4 of this report.

C.6.b. Pavement Sections. The required flexible pavement sections for the residential roadways were evaluated using the software program DARwin™ developed by the Federal Highway Administration (FHWA) based on the 1993 American Association of State Highway and Transportation Officials (AASHTO) *Guide for Design of Pavement Structures*. The following parameters were used in the DARwin program for calculating the pavement, crushed base, and subbase thicknesses. We also compared our design to the Minimum Local/Residential Street Standards required by the City of Missoula – Engineering Division.

Table 7. Pavement Design Parameters

Parameter	Value
18-kip ESAL	67,991*
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level (%)	85
Overall Standard Deviation	0.45
Roadbed Modulus (M_R)	9,480**

*Calculated using DARWin program.
**Calculated using an estimated resistance value, R-value, of 15.

Using the parameters listed in Table 7 and the DARWin program, a structural number of 1.96 was calculated to determine the minimum pavement section. The minimum City of Missoula Standard for Local/Residential Streets with a "medium" subgrade is 3 inches of asphalt pavement over 6 inches of 3/4-inch crushed gravel base over 8 inches of 3-inch minus subbase. The City minimum pavement section correlates to a structural number of 2.63, which exceeds the minimum calculated value of 1.96. Therefore, it is our opinion the City minimum Standard for Local/Residential Streets with a medium subgrade can be used for design. This section is summarized in Table 8 below.

Table 8. Residential Street Pavement Sections

Alternative	Subbase Section
Asphalt Surface	3"
¾" or 1 1/2" Crushed Base	6"
3" Sandy Gravel Subbase	8"

C.6.c. Materials and Compaction. We recommend specifying crushed gravel base and sandy gravel subbase courses meeting the requirements of MPWSS Sections 02235 and 02234. We recommend the gravel base and subbase be compacted to a minimum of 95 percent of its standard Proctor maximum dry

density. We recommend the asphaltic concrete meet the requirements of Section 02503. We recommend the asphaltic concrete pavement be compacted to an average density of 93 percent or greater of the maximum density as determined by ASTM D 2041 (Rice's) and no individual sample shall be less than 92 percent.

C.7. Drainage

Proper control of surface water, roof run-off, and subsurface drainage will be critical for proper performance of the future slopes, roadways, and residences. We recommend all surface water run-off in the roadways be collected by a properly constructed series of curb and gutter, and storm sewer manholes and inlets. All roof run-off from the residences should also be collected by high quality gutters, downspouts, and piping systems, and this water routed to defined collection ditches to carry surface water down and away from the subdivision. We recommend any ditches constructed above future residences be lined with an impermeable PVC or HDPE liner to prevent surface water from infiltrating into the ground surface and affecting adjacent homes.

C.8. Concrete

We recommend using cement meeting the requirements of ASTM C 150 Type II to provide moderate resistance to sulfate attack. We recommend specifying 5 to 7 percent entrained air for exposed concrete to provide resistance to freeze-thaw deterioration. We recommend using a water-cement ratio of 0.50 or less for exposed concrete and a water-cement ratio of 0.45 or less for concrete exposed to deicers.

D. Construction

D.1. Excavation

It is our opinion the majority of the soils encountered by the borings can be excavated with a backhoe, front-end loader, or scraper. The very dense soils, if encountered, at Boring ST-12P may require larger excavating equipment with ripping attachments. Blasting is not anticipated. Due to the variable soil conditions, it is our opinion all soils should be considered Type C soils under Department of Labor Occupational Safety and Health Administration (OSHA) guidelines. All earthwork and construction should be performed in accordance with OSHA guidelines.

During fill placement, the work surface should be graded to direct run-off away from fill areas to prevent saturation of the exposed surface of fill material during a precipitation event. The contractor should also provide positive drainage away from all excavations. No frozen fill shall be placed and no fill shall be placed on frozen ground, on standing water, or on yielding soil. The compaction of fill should be completed under continuous engineering inspection and testing as outlined in Sections C.4 and D.3 of this report.

D.2. Observations

We recommend all stripping, embankment, and pavement subgrades be observed by a geotechnical engineer or an engineering technician working under the direction of a geotechnical engineer to see if the subgrade soils are similar to those encountered by the borings, identify areas of seepage, if any, and determine adequate stripping has been completed. The mixture of on-site soils should also be observed to determine the mixed soils are a uniform mixture of silty clayey sand and/or gravels, will have an internal friction angle of at least 32 degrees, and a plasticity index less than 20. We anticipate this can be performed by a qualified soils inspector based on visual and manual procedures.

D.3. Compaction and Inspection Control of Embankments and Trench Backfill

It is our opinion a detailed site specific specification should be written addressing how embankment and trench backfill shall be placed, tested, and inspected, and how failing tests will be treated so all failed areas are removed and properly replaced. In particular, we recommend the following.

- On-site clays and silts that are found to be excessively wet should be transported to a larger designated processing area where they can be spread out, mixed, and dried with tractors and discs to obtain a uniform material near optimum moisture content. Additional moisture may need to be added depending on weather conditions. If additional moisture is required, the moisture should be added with trucks and spray bars and applied uniformly, and then thoroughly mixed with discs. After the material has been uniformly mixed and moisture conditioned to a moisture content plus or minus 2 percent of optimum, it can be transported back to the utility alignment or fill area, placed, and compacted.

- All trench backfill above bedding should be placed in maximum loose lift thicknesses between 4 to 8 inches and compacted to a minimum of 98 percent of its standard Proctor density.

- Embankment fill should be thoroughly mixed and be uniform material, placed in maximum loose lifts of 8 inches. It should be compacted as follows per standard Proctor.

    - 98 percent for fills less than 10 feet thick
    - 100 percent for fills 10 feet or greater

- Full-time quality control (QC) testing should be provided for each crew working on the utility alignments and embankments to document the specified lift thickness has not been exceeded, the material has been properly mixed and is uniform, and compacted to specification.

- Daily quality assurance (QA) testing should also be performed by a separate independent testing agency (not the QC testing firm) to avoid potential conflict of interest and to determine the QC testing is representative.

- Full-time inspection should also be provided for each crew performing earthwork. QC and QA test results should be reported to the inspector on site. Any discrepancies between QC and QA test results should be resolved before proceeding with any additional earthwork.

- The contractor and inspector should be required to prepare daily production reports of the amount and rate of material placement. At the onset of construction, the contractor's production rate should be established for a zone of properly compacted and tested backfill. This production rate should then be compared on a daily basis to the contractor's production. If the production exceeds the normal production rate, additional testing and inspection should be performed to verify all of the material is being placed and compacted to specification.

- If a compaction test fails, the failed lift should be removed both horizontally and vertically to the point where previous passing tests were obtained. This is the best approach, in our opinion, to make sure adequate compaction effort is applied to every lift. Simple recompaction of the immediate testing area should ***not*** be allowed. The contractor should be made aware of this requirement during the bidding process.

- The surface of the trench backfill should be crowned to allow surface water to drain off of the trench excavation and to allow for some trench settlement.

- Compaction tests should be performed on each 1 1/2-foot vertical lift of trench backfill and one test for every 100 lineal feet of trench. For mass grading areas, compaction tests should be performed on each 1 1/2-foot vertical lift of fill and for every 2,500 square feet of embankment.

- The QC and QA testing firms should prepare a continuous plan and profile plot of the compaction test results and include this with their daily reports. This will allow the project inspector to evaluate the specified testing frequency is being met.

- The contractor should be required to provide safe trench entrances and exits to allow testing personnel to safely enter the bottom of the excavation and perform compaction tests.

D.4. Moisture Conditioning

The majority of site soils that will be excavated and reused as backfill and fill material appeared to be below optimum moisture content. We anticipate it will be necessary to moisture condition these soils to achieve a moisture content near or slightly above optimum. Silt and clay layers were generally above optimum, and these soils will need to be spread out and dried or mixed with drier soils to obtain a moisture content near optimum. It should also be anticipated imported fill and backfill materials will be below optimum moisture content and additional moisture will be necessary to achieve a moisture content near or slightly above optimum.

D.5. Subgrade Disturbance

The borings indicated the surficial subgrade will be clayey sands, sandy lean clays, and clayey gravels. These fine-grained soils are considered to be moisture sensitive and are easily disturbed when wet. We therefore recommend good drainage of surface water be provided during construction to help avoid ponding areas. Ponding water will result in saturation of the clayey soils, creating soft spots. Construction traffic driving across these soft spots can create large ruts and excessively disturb the areas. It is then very difficult to recompact these areas to specification, and they can result in construction delays.

D.6. Subgrade Stabilization

There is a possibility that some excessively soft subgrade areas may be encountered and/or created due to improper drainage, inclement weather, or other unforeseen conditions or site features currently present. Excessively soft soils can also be created during construction due to heavy construction traffic. Excessively soft areas can be identified by proof-rolling with a loaded tandem-axle dump truck. Where deflection of 3/4 inch or more occurs beneath the rubber tires, the areas can be considered excessively soft, and corrective earthwork will be required.

Several alternatives are available to repair excessively soft areas. The least expensive method is to avoid the area and allow it to dry. Consideration can be given to scarifying the subgrade to promote drying. Eventually, the area will likely stabilize, the subgrade can be recompacted, and the pavement sections constructed on top of it. This method, however, can take several weeks or longer and is dependant on weather conditions.

Another alternative to more quickly repair excessively soft subgrades is to use geotextiles and geogrids. For these areas, we recommend subexcavating the unstable soils and adding an additional 12 inches of subbase to the sections indicated in Table 7.

The subbase should be placed in one lift by end-dumping methods over the geotextile/geogrid, depending on the section selected. The crushed base course and asphaltic pavement can then be placed above the subbase. The fabric should be placed in accordance with the manufacturer's guidelines. We suggest contract documents contain a bid item for this stabilization approach.

Numerous other alternatives for stabilizing excessively soft subgrades are also available. The contractor may have a preferred method, which should be considered when determining the actual method of stabilization.

We also recommend specifying either 1) Tensar BX1200 geogrid over a 4-ounce, or heavier, non-woven geotextile filter fabric, or 2) a Mirafi RS530i woven geotextile. The geotextile fabrics and geogrid, if utilized, should be installed in accordance with the manufacturer's recommendations.

Tensar and Mirafi have been providing geosynthetics for subgrade stabilization for many years and have the research data, case histories, and performance to support their products. Both products also have geotechnical software based on the AASHTO 1993 Pavement Design Guide, which can be used to evaluate required thicknesses to support the anticipated traffic. Alternative products can be submitted at least two weeks in advance of the bid date and must include the following.

1. A pavement section design signed and sealed by a registered professional engineer in the state of Montana.

2. A thickness design analysis (software or calculations) based on the AASHTO 1993 Pavement Design Guide. The analysis should include equivalency factors and/or modified layer coefficients based on full scale laboratory or field testing. A report documenting the full-scale laboratory or field testing must also be included.

D.7. Testing

We recommend full-time testing and inspection be performed during the construction of fills and backfills required for the embankment fill slopes, pavements, and utilities. Testing and inspection requirements for individual residences will need to be determined by the geotechnical engineer of record for each of the individual residences. We recommend density testing of the compacted pavement subgrade and gravel base course. We recommend slump, temperature, air content, and strength tests on Portland cement concrete.

We recommend density testing of the asphaltic concrete pavement (cores and nuclear density gauge). The maximum density of the asphaltic concrete mix should be determined by ASTM D 2041 (Rice). We also recommend Marshall tests of the asphalt mix to evaluate strength and air voids.

D.8. Cold Weather Construction

If site grading and construction is anticipated during cold weather, we recommend good winter construction practices be observed. All snow and ice should be removed from cut and fill areas prior to additional grading. No fill should be placed on soils that have frozen or contain frozen material. No frozen soils should be used as fill.

Concrete delivered to the site should meet the temperature requirements of ASTM C 94. Concrete should not be placed on frozen soils or soils that contain frozen material. Concrete should be protected from

freezing until the necessary strength is attained. Frost should not be permitted to penetrate below footings bearing on frost-susceptible soil since such freezing could heave and crack the footings and/or foundation walls.

E. Procedures

E.1. Drilling and Sampling

The penetration test borings were performed with our CME 550 ATV core and auger drill. Sampling for the borings was conducted in accordance with ASTM D 1586, "Penetration Test and Split-Barrel Sampling of Soils." Using this method, we advanced the borehole with hollow-stem auger to the desired test depth. Then a 140-pound hammer falling 30 inches drove a standard, 2-inch OD, split-barrel sampler a total penetration of 1 1/2 feet below the tip of the hollow-stem auger. The blows for the last foot of penetration were recorded and are an index of soil strength characteristics.

Twelve 3-inch diameter thin-walled tube samples were taken in clayey and silty soils in general accordance with ASTM D 1587, "Thin-walled Tube Sampling of Soils." The tubes were slowly pushed into undisturbed soils below the hollow-stem auger. After they were withdrawn from the boreholes, the ends of the tubes were sealed and the tubes were carefully transported to our laboratory.

Five of the borings encountered very hard clays and very dense clayey gravels below 20 feet. When the sampler could not be driven 6 inches with 50 blows of the hammer, the distance the sampler was advanced with 50 blows was recorded. When this situation occurred during the first 6 inches of the drive, it was noted as occurring within the "set."

E.2. Soil Classification

The drill crew chief visually and manually classified the soils encountered in the borings in accordance with ASTM D 2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)." A summary of the ASTM classification system is attached. All samples were then returned to our laboratory for review of the field classifications by a geotechnical engineer. Representative samples will remain in our office for a period of 60 days to be available for your examination.

E.3. Groundwater Observations

About 10 minutes after taking the final sample in the bottom of a boring, the driller probed through the hollow-stem auger to check for the presence of groundwater. Immediately after withdrawal of the auger, the driller again probed the depth to water or cave-in. The boring was then generally backfilled.

Prior to withdrawing the hollow-stem auger from Borings ST-1P, ST-2P, ST-3P, ST-4P, ST-10P, and ST-12P, PVC pipe with a well-screen section at the bottom was placed in the borings to permit long-term monitoring of the groundwater level.

F. General Recommendations

F.1. Basis of Recommendations

The analyses and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the attached sketch. Often, variations occur between these borings, the nature and extent of which do not become evident until additional exploration or construction is conducted. A reevaluation of the recommendations in this report should be made after performing on-site observations during construction to note the characteristics of any variations. The variations may result in additional foundation or site preparation costs, and it is suggested a contingency be provided for this purpose.

F.2. Review of Design

This report is based on the design of the proposed subdivision as related to us for preparation of this report. It is recommended we be retained to review the geotechnical aspects of the designs and specifications. With the review, we will evaluate whether any changes in design have affected the validity of the recommendations, and whether our recommendations have been correctly interpreted and implemented in the design and specifications.

F.3. Groundwater Fluctuations

We made water level observations in the borings at the times and under the conditions stated on the boring logs. These data were interpreted in the text of this report. The period of observation was relatively short, and fluctuation in the groundwater level may occur due to rainfall, flooding, irrigation, spring thaw, drainage, and other seasonal and annual factors not evident at the time the observations were made. Design drawings and specifications and construction planning should recognize the possibility of fluctuations.

F.4. Use of Report

This report is for the exclusive use of Territorial Landworks to use to design the proposed subdivision (excluding the residences) and prepare construction documents. It is not to be used for design of the proposed residential structures. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend parties contemplating other structures or purposes contact us.

This updated geotechnical report is based on the current site observations and design information provided. Over time, surface and/or subsurface conditions can change along with code requirements, engineering design standards, and other considerations that could affect the design of the subdivision, streets, utilities, or residences. The recommendations contained in this report will not be valid after a period of five years from the date of this report, or after December 3, 2020. After this date, any additional work relying on recommendations obtained from this report will need to be re-evaluated and redone, including, but not limited to, a new geotechnical report, fieldwork, laboratory tests, and/or analyses.

F.5. Level of Care

Services performed by SK Geotechnical Corporation personnel for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar budget and time restraints. No warranty, expressed or implied, is made.

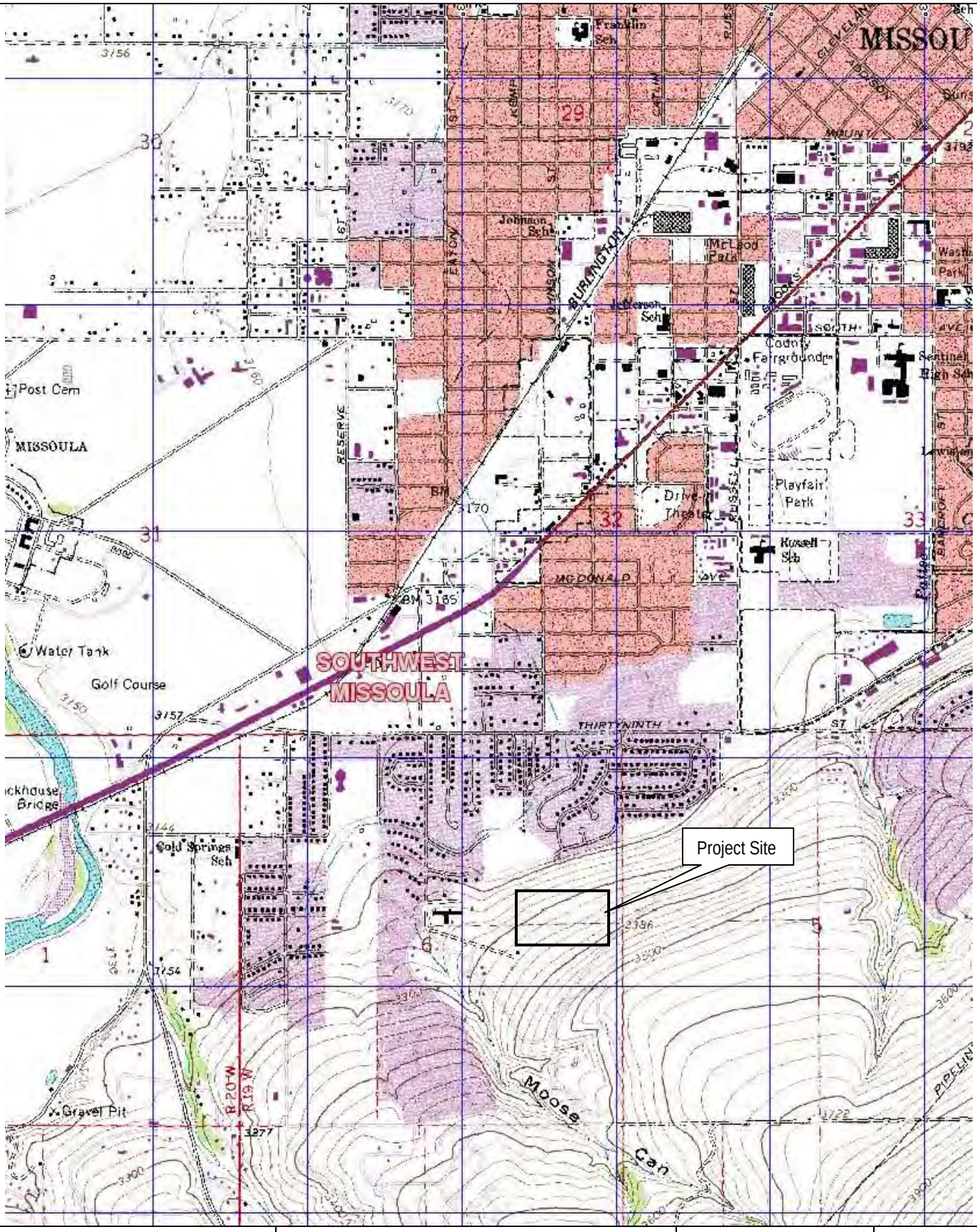
Professional Certification

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.

MONTANA
CORY G. RICE
9914PE
LICENSED PROFESSIONAL ENGINEER

Cory G. Rice, PE
Senior Engineer
License Number 9914PE
December 3, 2015

Appendix



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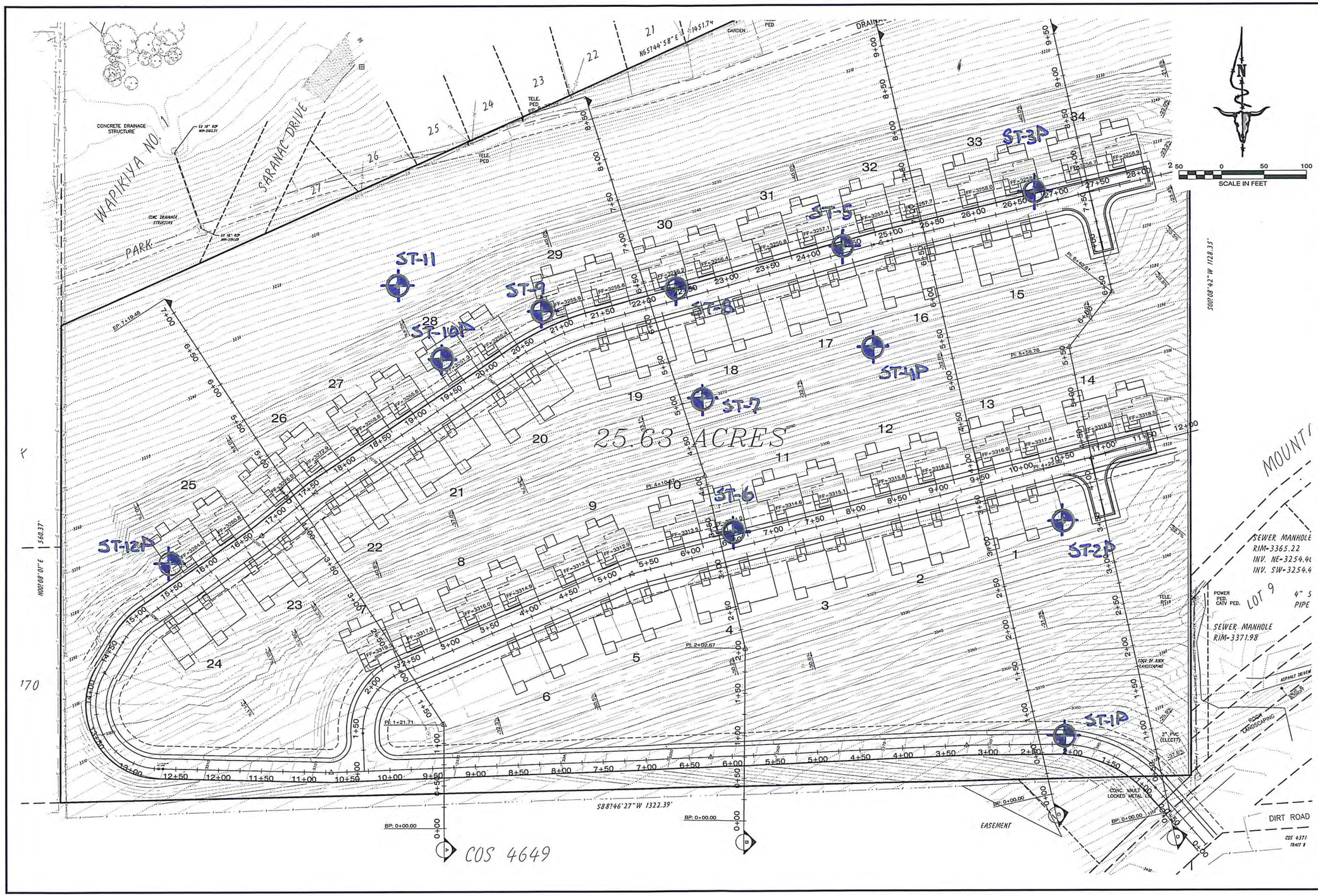
		Project: 06-7358	
		Scale: N/A	FIGURE
		Sheet 1 of 1	



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PLOT DATE: 8/4/2015 3:41 PM

REVISIONS	DATE

DESIGNED: NL
DRAFTED: BD
CHECKED:
DATE: 08/16/2015

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: DJ HOLDINGS

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: OVERALL GRADING

PROJECT NO. 14-3592

SHEET: 1 OF 3

PRELIMINARY

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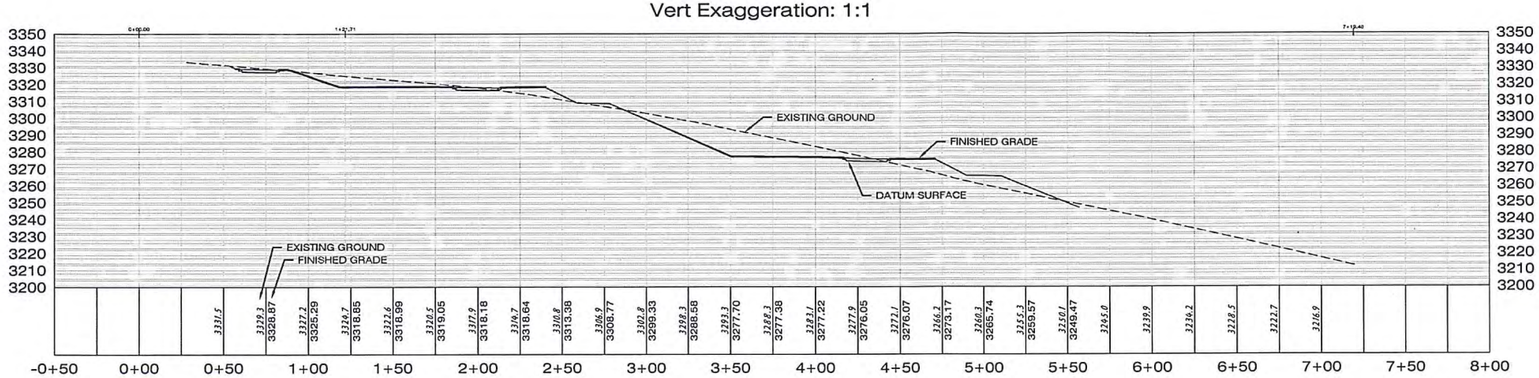

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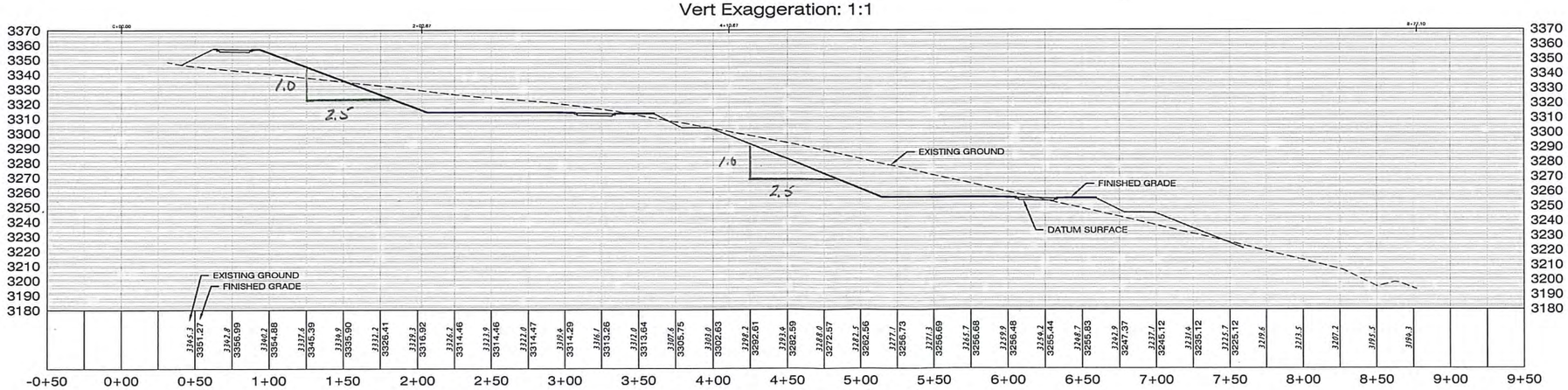

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SCALE IN FEET

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PLOT DATE: 8-14-2015 3:52 PM

REVISIONS	DATE

DESIGNED: NL
DRAFTED: BD
CHECKED:
DATE: 08/14/2015

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: DJ HOLDINGS

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: SITE CROSS SECTIONS

PROJECT NO: 14-3592

SHEET: 2 OF 3

PRELIMINARY

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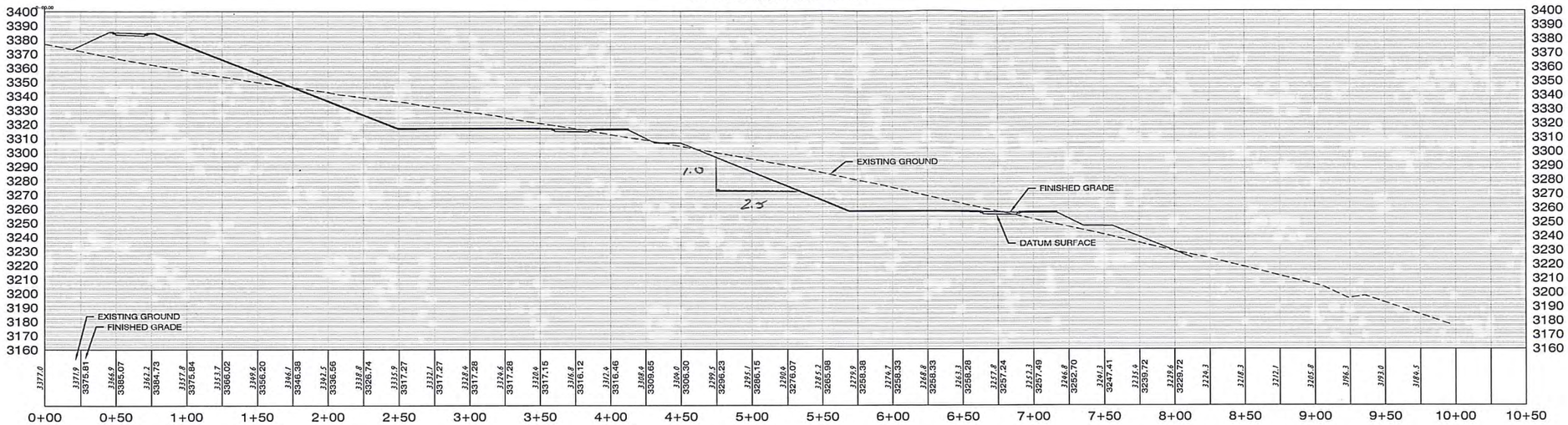

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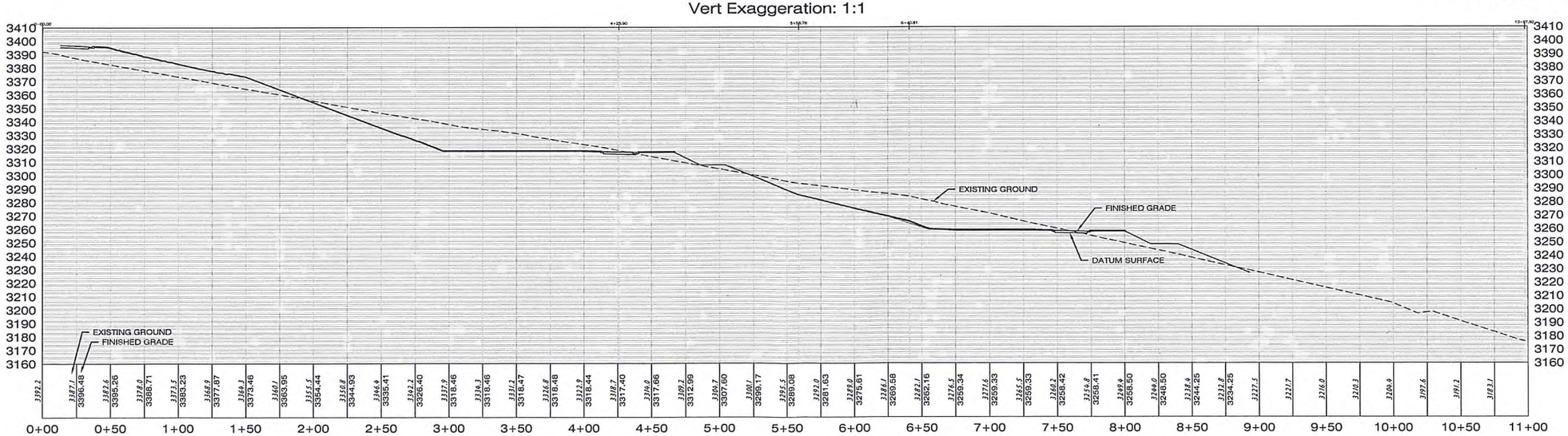

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REVISIONS	DATE

DESIGNED: NL
DRAFTED: BD
CHECKED:
DATE: 08/14/2015

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: DJ HOLDINGS

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: SITE CROSS SECTIONS

PROJECT NO. 14-3592

SHEET: 3 OF 3

PRELIMINARY

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Descriptive Terminology

Standard D 2487
Classification of Soils for Engineering Purposes (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 [C]	$C_U \geq 4$ and $1 \leq C_C \leq 3$ [E]	GW	Well graded gravel [F]
			$C_U < 4$ and/or $1 > C_C > 3$ [E]	GP	Poorly graded gravel [F]
		Gravels with Fines More than 12% fines [C]	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 [D]	$C_U \geq 6$ and $1 \leq C_C \leq 3$ [E]	SW	Well graded sand [I]
			$C_U < 6$ and/or $1 > C_C > 3$ [E]	SP	Poorly graded sand [I]
		Sands with Fines More than 12% fines [D]	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 [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	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" (75 mm) sieve.

B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" 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-SC well-graded sand with clay
- SP-SM poorly graded sand with silt
- SP-SC poorly graded sand with clay

E $C_U = D_{50} / D_{10}$
$C_C = (D_{30})^2 / (D_{10} \times D_{50})$

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 hatched 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.

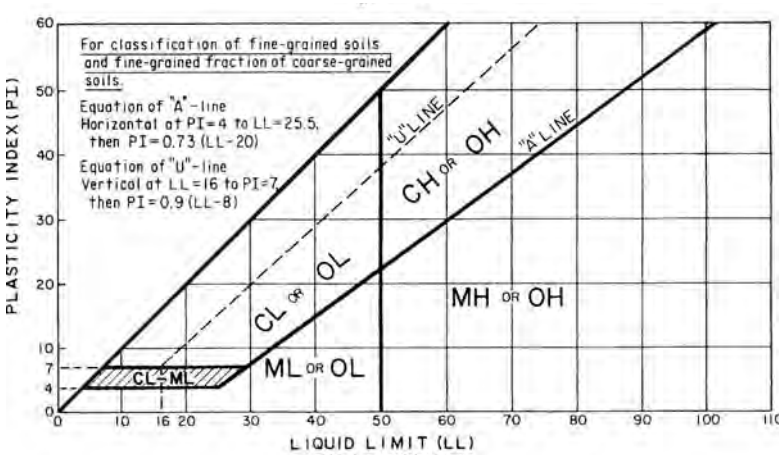

FIG. 4 Plasticity Chart

Laboratory Tests

DD	Dry density, pcf	OC	Organic content, %
WD	Wet density, pcf	P_{200}	% passing 200 sieve
LL	Liquid limit	PL	Plastic limit
PI	Plasticity index	MC	Natural moisture content, %
qu	Unconfined compressive strength, psf		
qp	Pocket penetrometer strength, tsf		

Particle Size Identification

Boulders	over 12"
Cobbles	3" to 12"
Gravel	
coarse	3/4" to 3"
fine	No. 4 to 3/4"
Sand	
coarse	No. 4 to No. 10
medium	No. 10 to No. 40
fine	No. 40 to No. 200
Silt	No. 200 to .005 mm
Clay	less than .005 mm

Relative Density of Cohesionless Soils

very loose	0 to 4 BPF
loose	5 to 10 BPF
medium dense	11 to 30 BPF
dense	31 to 50 BPF
very dense	over 50 BPF

Consistency of Cohesive Soils

very soft	0 to 1 BPF
soft	2 to 3 BPF
rather soft	4 to 5 BPF
medium	6 to 8 BPF
rather stiff	9 to 12 BPF
stiff	13 to 16 BPF
very stiff	17 to 30 BPF
hard	over 30 BPF

Moisture Content (MC) Description

rather dry	MC less than 5%, absence of moisture, dusty
moist	MC below optimum, but no visible water
wet	Soil is over optimum MC
waterbearing	Granular or low plasticity soil with free water, typically near or below groundwater table
saturated	Cohesive soil, typically near or below groundwater table

Drilling Notes

Standard penetration test borings were advanced by 3¼" or 4¼" ID hollow-stem augers, unless noted otherwise. Standard penetration test borings are designated by the prefix "ST" (split tube). Hand auger borings were advanced manually with a 2 to 3" diameter auger to the depths indicated. Hand auger borings are indicated by the prefix "HA."

Sampling. All samples were taken with the standard 2" OD split-tube sampler, except where noted. TW indicates thin-walled tube sample. CS indicates California tube sample.

BPF. Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6" into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6" increments and added to get BPF. Where they differed significantly, they were separated by backslash (/). In very dense/hard strata, the depth driven in 50 blows is indicated.

WH. WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

Note. All tests were run in general accordance with applicable ASTM standards.

October 13, 2014

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-1P**
LOCATION: See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/16/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3365.9	0.0						
3364.4	1.5	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, few Gravels, dark brown, moist, loose. (Topsoil and Root Zone)	10			Bag sample 1'-5'
3361.9	4.0	SC	CLAYEY SAND with GRAVEL, fine- to coarse-grained, low plasticity, brown, moist, medium dense. (Alluvium)	26			
3356.9	9.0	CL	SANDY LEAN CLAY with GRAVEL, fine- to coarse-grained, medium plasticity, brown, moist, very stiff. (Alluvium)	26			
				22			
		CL	LEAN CLAY with SAND and GRAVEL, fine- to coarse-grained, medium plasticity, brown, moist, rather stiff to stiff. (Alluvium)	12			
			-waterbearing, layer observed at 12 1/2'.	13			
				10			An open triangle in the water level (WL) column indicates the depth at which groundwater was first observed while drilling. Groundwater levels fluctuate. Please refer to the discussion in our report.
3346.9	19.0	CL	LEAN CLAY, medium plasticity, brown, moist, very stiff. (Alluvium)	22			
				TW			
			-light brown below 25'.	25			
3337.4	28.5	GC	CLAYEY GRAVEL with SAND, fine- to coarse-grained, brown, moist, very dense. (Alluvium)	50 - 5"			

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-1P (cont.)**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/16/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
		GC	CLAYEY GRAVEL with SAND continued.				
3331.9	34.0		POORLY GRADED GRAVEL with SAND, fine- to coarse-grained, brown, moist, very dense. (Alluvium)	50 - 3"			
		GP		50 - 2"			
3320.5	45.4			50 - 5.5"			

END OF BORING

Water down 14' with 14' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 29.6' immediately after withdrawal of auger.

A 2" PVC piezometer was installed in the boring.

Groundwater not observed when rechecked on 11/28/06.

Groundwater not observed when rechecked on 04/05/07.

gw - 42.7', 5/1/15

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-2P**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/8/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3328.5	0.0						
3326.5	2.0	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, few Gravels, dark brown, moist, very loose, few Roots. (Topsoil and Root Zone)	3			MC = 20.6%
3324.5	4.0	SC	CLAYEY SAND with GRAVEL, fine- to coarse-grained, brown, dry, dense. (Alluvium)	34			Bag sample 1.5' - 9. LL=24, PL=14, PI=10, P_{200}=26.2%
		GC	CLAYEY GRAVEL with SAND, fine- to coarse-grained, low plasticity, brown, dry, very dense. (Alluvium)	54			MC = 4.3%
							MC = 5.1%
			-dense below 7'.	30			
3319.5	9.0	CL	LEAN CLAY with SAND, fine-grained, medium plasticity, dark brown, moist, rather stiff. (Alluvium)	10			
			-brown below 11'.	TW			LL=47, PL=21, PI=26, P_{200}=82.2%, MC=27.3%
			-stiff to very stiff below 12'.	16			
			-medium to high plasticity, light brown, below 14'.				
3313.0	15.5	GC	CLAYEY GRAVEL with SAND, fine- to coarse-grained, low plasticity, brown, moist, very dense. (Alluvium)	24			
				69			MC = 63%
				50 - 5"			
3304.5	24.0	GP	POORLY GRADED GRAVEL with SAND, fine- to coarse-grained, trace Clay, brown, moist, very dense. (Alluvium)	50 - 5"			MC = 4.4%
				50 - 3"			

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-2P (cont.)**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/8/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
		GP	POORLY GRADED GRAVEL with SAND continued.				
3294.5	34.0		END OF BORING				
			Water not observed with 34' of hollow-stem auger in the ground when checking borehole after 10 minutes.				
			Water down 15' immediately after withdrawal of auger.				
			A 2" PVC piezometer was installed in the boring.				
			Groundwater not observed when rechecked on 11/28/06.				
			Groundwater not observed when rechecked on 04/05/07.				
			NOTE Mud @ 33.4, silty, free water not observed				

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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PROJECT: 067358
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Southern Hills Subdivision
Missoula, Montana

BORING: **ST-3P**
LOCATION: See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/14/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3252.8	0.0						
3250.8	2.0	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, few Gravels, dark brown, moist, medium dense. (Topsoil and Root Zone)	26			MC = 2.9%
3246.8	6.0	GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, medium dense. (Alluvium)	20			MC = 18.7%
				12			MC = 4.9%
3243.3	9.5	SM	SILTY SAND, fine- to coarse-grained, brown, moist, medium dense. (Alluvium) -loose below 7'	10			
				TW			
3241.8	11.0	SM	SILTY SAND with GRAVEL, fine- to coarse-grained, brown, moist, medium dense. (Alluvium)	27			
3238.3	14.5	SC SM	SILTY-CLAYEY SAND, fine- to medium-grained, low plasticity, light brown, moist, medium dense. (Alluvium)	15			
3231.8	21.0	SM	SILTY SAND, fine- to medium-grained, some Gravel, light brown to grey, moist, dense. (Alluvium)	49			
				39			MC = 5.4%
		GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, light brown, moist, dense. (Alluvium) -very dense below 24'.	50 - 5"			
				50 - 5"			MC = 3.8%

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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PROJECT: 067358
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Missoula, Montana

BORING: **ST-3P (cont.)**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/14/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
		GP GM	POORLY GRADED GRAVEL with SILT and SAND continued.				
3218.8	34.0						
		CL	LEAN CLAY, low plasticity, trace Gravel light brown, wet, very stiff. (Alluvium)	22			MC = 36.4%
3217.3	35.5						
		GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, trace Clay, light brown, moist, very dense. (Alluvium)	66			MC = 4.6%
3208.0	44.8			50 - 3"			
			END OF BORING				

Water not observed with 44' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 24' immediately after withdrawal of auger.

A 2" PVC piezometer was installed in the boring.

Groundwater not observed when rechecked on 11/28/06.

Groundwater not observed when rechecked on 04/05/07.

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BORING: **ST-4P**
LOCATION: See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/15/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3261.9	0.0						
3260.4	1.5	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, few GravelS, dark brown to black, moist, loose. (Topsoil and Root Zone)	9			
		SM	SILTY SAND with GRAVEL, fine- to coarse-grained, brown, moist, medium dense to loose. (Alluvium)	12			MC = 2.8%
			-trace Clay below 5'.	10			
3255.9	6.0	GP	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, very dense. (Alluvium)	50 - 3"			MC = 2.4%
3253.9	8.0	CL	SANDY LEAN CLAY, fine-grained, low to medium plasticity, brown, wet, rather stiff to stiff. (Alluvium)	9			MC = 21.2% Bag sample 7 - 14'. LL=47, PL=16, PI=31, P_{200}=64.6%.
				15			
3246.9	15.0	SM	SILTY SAND, fine-grained, brown, moist, medium dense. (Alluvium)	20			MC = 11.9%
3241.9	20.0	GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, very dense. (Alluvium)	60			
3236.9	25.0	ML	SILT with SAND, fine-grained Sand, low plasticity, yellowish brown, moist to wet, stiff to hard. (Alluvium)	15			MC = 6.2% MC = 20.8%
			-hard below 29'.	55			MC = 31.3%

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BORING: **ST-4P (cont.)**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/15/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
			SILT with SAND continued.				
				28			MC = 31.8%
		ML					
				34			
3216.4	45.5			24			MC = 24.9
			END OF BORING				
			Water not observed with 44' of hollow-stem auger in the ground when checking borehole after 10 minutes.				
			Water not observed when probing boring immediately after withdrawal of auger.				
			A 2" PVC piezometer was installed in the boring.				
			Groundwater not observed when rechecked on 11/28/06.				
			Groundwater not observed when rechecked on 04/05/07.				
			N/E 43.4' - 5-1-15				

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
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Missoula, Montana

BORING: **ST-5**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/14/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3253.6	0.0						
3252.1	1.5	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, dark brown to black, moist. (Topsoil and Root Zone)	7			
3250.6	3.0	SM	SILTY SAND with GRAVEL, fine- to coarse-grained, dark brown, moist, medium dense. (Alluvium)	22			
		GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, few Cobbles, brown, moist, medium dense to dense. (Alluvium)	34			
			-low plasticity, Clayey below 7'.	17			
				24			
				27			
				39			
3233.1	20.5		END OF BORING	19 - 20.5'2			

Water not observed with 19' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 11' immediately after withdrawal of auger.

Boring then backfilled.

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

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Missoula, Montana

BORING: **ST-6**
LOCATION: See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/16/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3313.4	0.0						
3311.4	2.0	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, few Gravels, dark brown to black, wet, loose. (Topsoil and Root Zone)	6			MC = 26.7%
		GP GM	POORLY GRADED GRAVEL wtih SILT and SAND, fine- to coarse-grained, brown, moist, dense to very dense.	45			
				59			
				87			MC = 3.1%
				49			
3301.4	12.0	CL	SANDY LEAN CLAY, fine-grained, medium plasticity, light brown, moist, very stiff to stiff. (Alluvium)	18			
				15			MC = 22.6%, LL=46, PL=21, PI=25, P_{200}=67%
				TW			
3294.4	19.0	GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, very dense. (Alluvium)	64			MC = 3.3%
3292.9	20.5		END OF BORING				

Water not observed with 19' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 9.6' immediately after withdrawal of auger.

Boring then backfilled.

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-7**

LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/16/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3281.8	0.0						
3279.8	2.0	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, trace Gravel, dark brown to black, moist, medium dense. (Topsoil and Root Zone)	11			MC = 17.2%
		SC SM	SILTY CLAYEY SAND with GRAVEL, fine- to coarse-grained, brown, moist, medium dense to dense. (Alluvium)	29			Bag sample 0 - 9'. LL=24, PL=17, PI=7, P_{200}=24.2%
				13			MC = 5.7%
				31			
3272.8	9.0	CL	LEAN CLAY, medium plasticity, trace Sand and Gravel, brown, moist. (Alluvium)	14			MC = 12.7%
3270.3	11.5	GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, dense to medium dense. (Alluvium)	34			
			-trace Clay below 15'.	28			
3261.3	20.5			36			MC 4.8%

END OF BORING

Water not observed with 19' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 9.8' immediately after withdrawal of auger.

Boring then backfilled.

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
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Southern Hills Subdivision
Missoula, Montana

BORING: **ST-8**
LOCATION: See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/13/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3251.3	0.0						
3249.3	2.0	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, dark brown to black, moist, loose to medium dense. (Topsoil and Root Zone)	11			MC = 11.2%
		GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, dense. (Alluvium)	46			
			-medium dense below 5'.	24			MC = 3.1%
				22			
			-Clayey below 10'.	25			MC = 6.8%
				28			
3237.3	14.0	CL	LEAN CLAY, medium plasticity, trace Sand and Gravel, brown, moist, rather stiff. (Alluvium)	9			MC = 18.2%
3232.8	18.5	GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, dense. (Alluvium)	40			MC = 6.0%
3230.8	20.5		END OF BORING				

Water not observed with 19' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 11.7' immediately after withdrawal of auger.

Boring then backfilled.

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
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Southern Hills Subdivision
Missoula, Montana

BORING: **ST-9**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/13/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3247.2	0.0						
		SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, trace Gravel, dark brown to black, moist, loose. (Topsoil and Root Zone)	5			
3244.7	2.5		POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, medium dense to dense. (Alluvium)	18			
		GP GM		34			
				42			
			-trace Clay below 10'.	26			
				25			
				25			
3226.7	20.5			39			

END OF BORING

Water not observed with 19' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 11.2' immediately after withdrawal of auger.

Boring then backfilled.

LOG OF BORING 7358.GPJ LAGNNN05.GDT 4/26/07

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Missoula, Montana

BORING: **ST-10P**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/13/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3251.4	0.0						
3249.4	2.0	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, dark brown to black, moist, medium dense. (Topsoil and Root Zone)	11			
		GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, medium dense. (Alluvium)	21			
				27			
				25			
			-dense to very dense below 9'.	35			
				38			
				31			
			-Clayey below 20'.	40			
				50 - 3"			
3222.4	29.0	GC	CLAYEY GRAVEL with SAND and SILT, fine- to coarse-grained, low to medium plasticity, brown, moist, dense. (Alluvium)	31			

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-10P (cont.)**
LOCATION: See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/13/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
			CLAYEY GRAVEL with SAND and SILT continued.				
				29			
		GC					
				33			
3206.4	45.0	GP					
3205.9	45.5	GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, dense. (Alluvium)	46			
			END OF BORING				

Water not observed with 44' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 25.5' immediately after withdrawal of auger.

A 2" PVC piezometer was installed in the boring.

Groundwater not observed when rechecked on 11/28/06.

Groundwater not observed when rechecked on 04/05/07.

GW - 43.8', 5-1-15

LOG OF BORING 7358.GPJ LAGNNW06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-11**
LOCATION: See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/14/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3229.4	0.0						
3227.4	2.0	SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, few Gravel, dark brown to black, moist. (Topsoil and Root Zone)	12			
		GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, moist, medium dense to very dense. (Alluvium)	38			
				24			
				23			
			-Clayey below 9'.	30			
				39			
			-Cobbles, very dense below 14'.	57			
3208.9	20.5			59			

END OF BORING

Water not observed with 19' of hollow-stem auger in the ground when checking borehole after 10 minutes.

Water not observed to dry cave-in depth of 8.3' immediately after withdrawal of auger.

Boring then backfilled.

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-12P**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/15/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
3277.6	0.0						
		SC	CLAYEY SAND, fine- to coarse-grained, low plasticity, dark brown to black, moist, loose to medium dense. (Topsoil and Root Zone)	12			MC = 17.1%
3274.6	3.0			10			
		CL	SANDY LEAN CLAY, fine- to coarse-grained, low plasticity, light brown, moist, stiff to very stiff. (Alluvium)	28			MC = 15.6%
			-hard below 7'.	36			
				34			MC = 24.0%
3265.6	12.0						
		CL ML	SILTY CLAY, fine-grained, low plasticity, yellowish brown, moist, very hard, cemented. (Alluvium)	74			
				81 - 11.5"			
3258.6	19.0						
		SC SM	SILTY CLAYEY SAND, fine-grained, low to medium plasticity, light brown, moist, very dense, moderately cemented. (Alluvium)	98 - 9"			MC = 27.4%
				87 - 9"			
				81			

LOG OF BORING 7358.GPJ LAGNNN06.GDT 4/26/07

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LOG OF BORING

PROJECT: 067358
GEOTECHNICAL EVALUATION
Southern Hills Subdivision
Missoula, Montana

BORING: **ST-12P (cont.)**
LOCATION:
See attached sketch.

DRILLED BY: CTL&JSF/SKG | METHOD: CME 550 | DATE: 11/15/06 | SCALE: 1" = 4'

Elev.	Depth	Symbol	Description of Materials	BPF	WL	qp	Remarks
		SC SM	SILTY CLAYEY SAND continued.				
3243.6	34.0						
		GP GM	POORLY GRADED GRAVEL with SILT and SAND, fine- to coarse-grained, brown, very dense. (Alluvium)	50 - 3"			
				50 - 5"			
3233.6	44.0		END OF BORING Water not observed wtih 44' of hollow-stem auger in the ground when checking borehole after 10 minutes. Water not observed to dry cave-in depth of 19' immediately after withdrawal of auger. A 2" PVC piezometer was installed in the boring. Groundwater not observed when rechecked on 11/28/06. Groundwater not observed when rechecked on 04/05/07. H/E - 39.6' - 5-1-15				

LOG OF BORING 7358.GPJ LAGNNNC6.GDT 4/26/07

SE corner of site, looking west

SE corner of site, looking downhill, note lusher vegetation

East side of site, looking west

NE corner of site, looking west, note drainage swale cut into slope

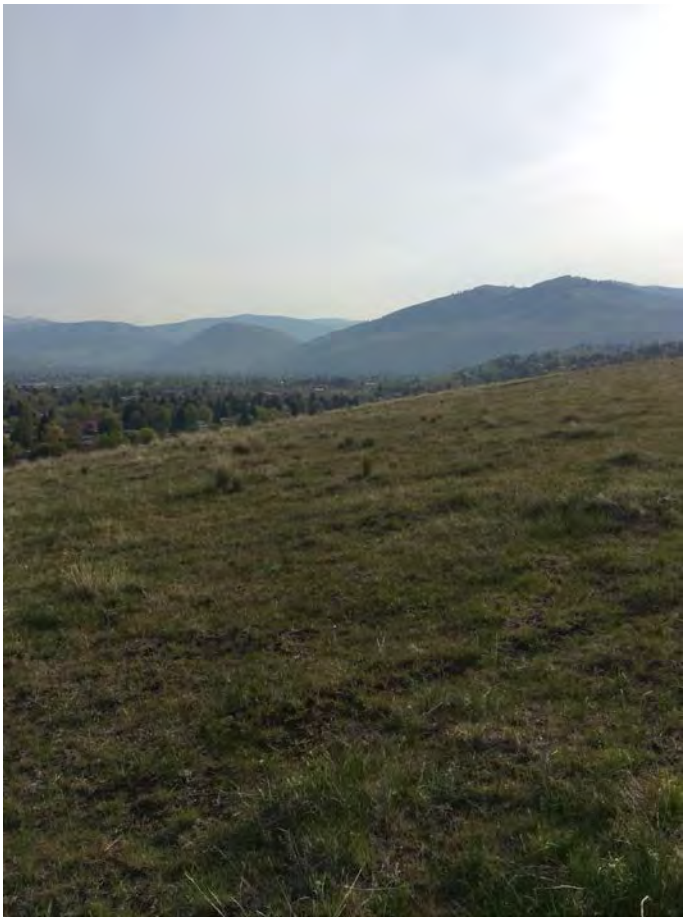
NW corner of site, looking east, note drainage swale cut into slope

North center portion of site, note 8-foot high cut for drainage swale

36-degree cut, 20 feet high near end of Saranac Drive

Existing home site, ~12' high embankment, ~22-degree slope

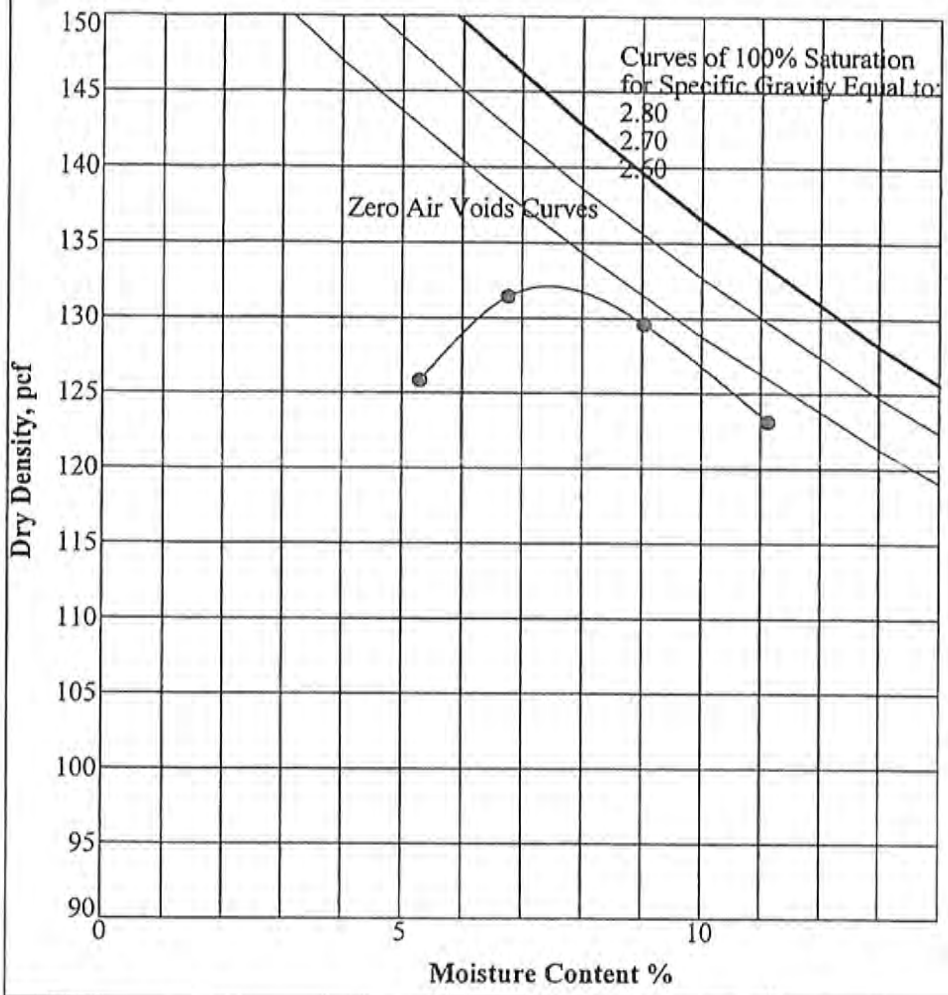
Boulder on west side of site



SW corner of site, looking NE, 14-degree slope, drier ground

Piezometer ST-1P, groundwater at 42.7 feet

Center of site, looking west



AASHTO T99 Method D

Maximum Dry Density, pcf	Optimum Moisture Content %
132	8

Rammer Type: Manual
Preparation Method: Wet

Soil Description

CLAYEY SAND with GRAVEL (SC)

Sieve Size	% Retained
3/4"	3
3/8"	17
#4	38

Sample No:	ST-2
Lab Sample No:	P-1
Date Received:	11/16/06
Sampled By:	CTL&JSF/SKG
Date Sampled:	11/16/06
Sampled From:	ST-2
Depth:	1.5' - 9'
Performed by:	CTL&JSF/SKG
Date Performed:	11/22/06

Comments

Additional Remarks

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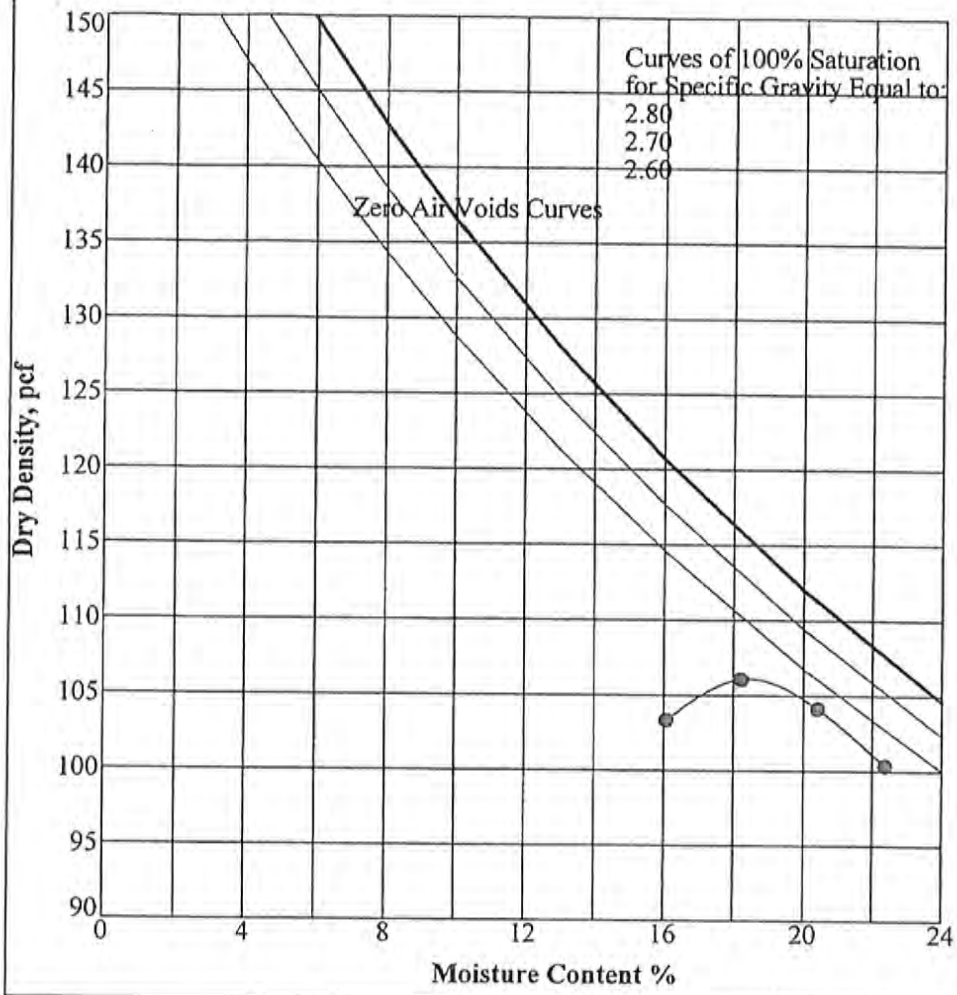
Laboratory Compaction Characteristics of Soil (Proctor)

Project No.: 067358
Southern Hills Subdivision
Missoula, Montana

PROCTOR

P-1

4/26/07



AASHTO T99 Method A

Maximum Dry Density, pcf	Optimum Moisture Content %
106	18

Rammer Type: Manual
Preparation Method: Wet

Soil Description

SANDY LEAN CLAY (CL)

Sieve Size	% Retained
3/4"	1
3/8"	2
#4	2

Sample No:	ST-4
Lab Sample No:	P-2
Date Received:	11/15/06
Sampled By:	CTL&AMS/SKG
Date Sampled:	11/15/06
Sampled From:	ST-4
Depth:	7' - 14'
Performed by:	CTL&JSF/SKG
Date Performed:	11/22/06

Comments

Additional Remarks

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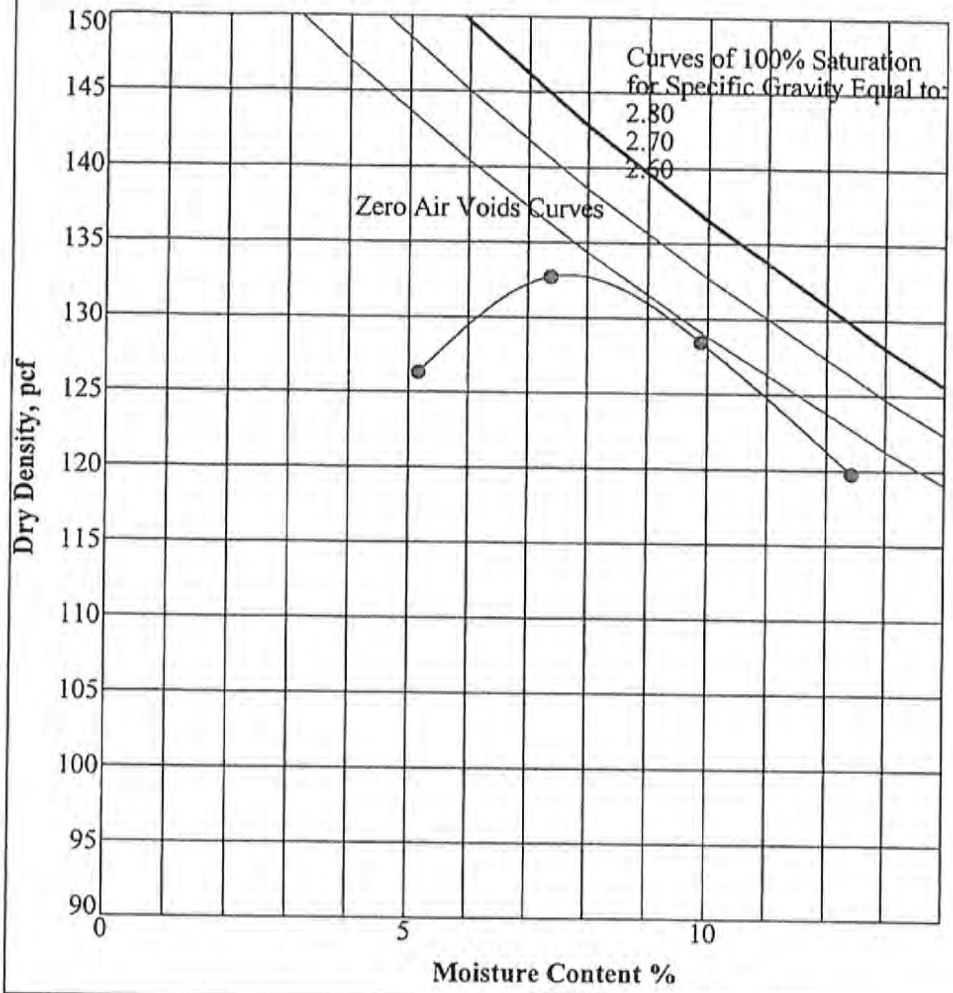
Laboratory Compaction Characteristics of Soil (Proctor)

Project No.: 067358
Southern Hills Subdivision
Missoula, Montana

PROCTOR

P-2

4/26/07



AASHTO T99 Method D

Maximum Dry Density, pcf	Optimum Moisture Content %
133	7

Rammer Type: Manual
Preparation Method: Wet

Soil Description

SILTY CLAYEY SAND (SC-SM)

Sieve Size	% Retained
3/4"	4
3/8"	18
#4	40

Sample No:	ST-7
Lab Sample No:	P-3
Date Received:	11/16/06
Sampled By:	CTL&JSF/SKG
Date Sampled:	11/16/06
Sampled From:	ST-7
Depth:	0 - 9'
Performed by:	AMS/SKG
Date Performed:	11/21/06

Comments

Additional Remarks

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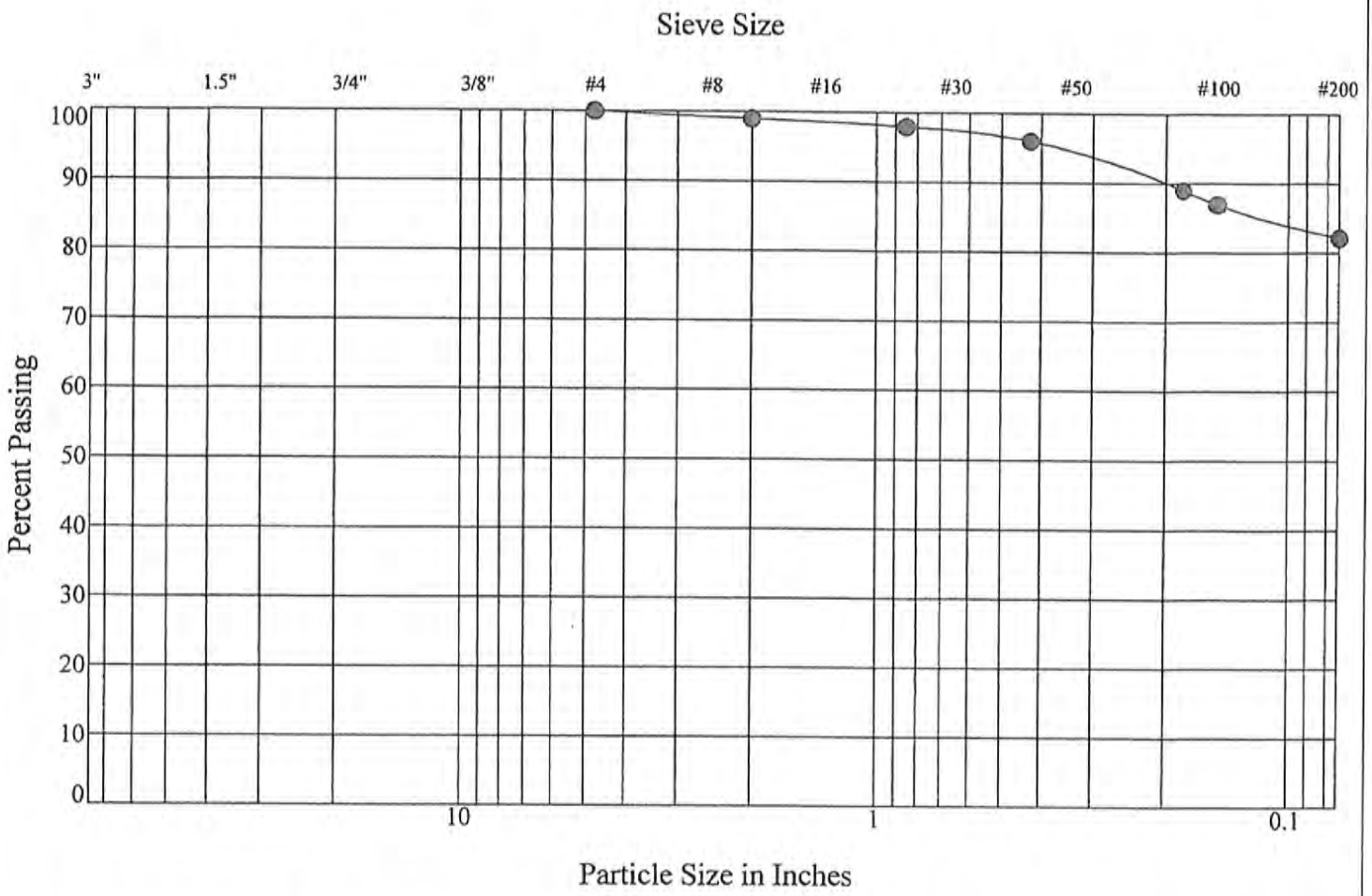
Laboratory Compaction Characteristics of Soil (Proctor)

Project No.: 067358
Southern Hills Subdivision
Missoula, Montana

PROCTOR

P-3

4/26/07



Gravel		Sand		
coarse	fine	coarse	medium	fine

Percent Passing U.S. Standard Sieve Size

3"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200
				100	99	98	97	93	87	82.2

Boring No.: ST-2P
Lab No.: ST-2
Depth (m): #6 Bag

Date Received: 11/16/06
Comments:

Approved By:

Liquid Limit:	47
Plastic Limit:	21
Plasticity Index:	26
Classification:	CL
Moisture Content:	

Percent Gravel: 0.0
Percent Sand: 17.8
Percent Silt + Clay: 82.2
ASTM Group Name: Lean Clay With Sand
AASHTO Classification: A-7-6

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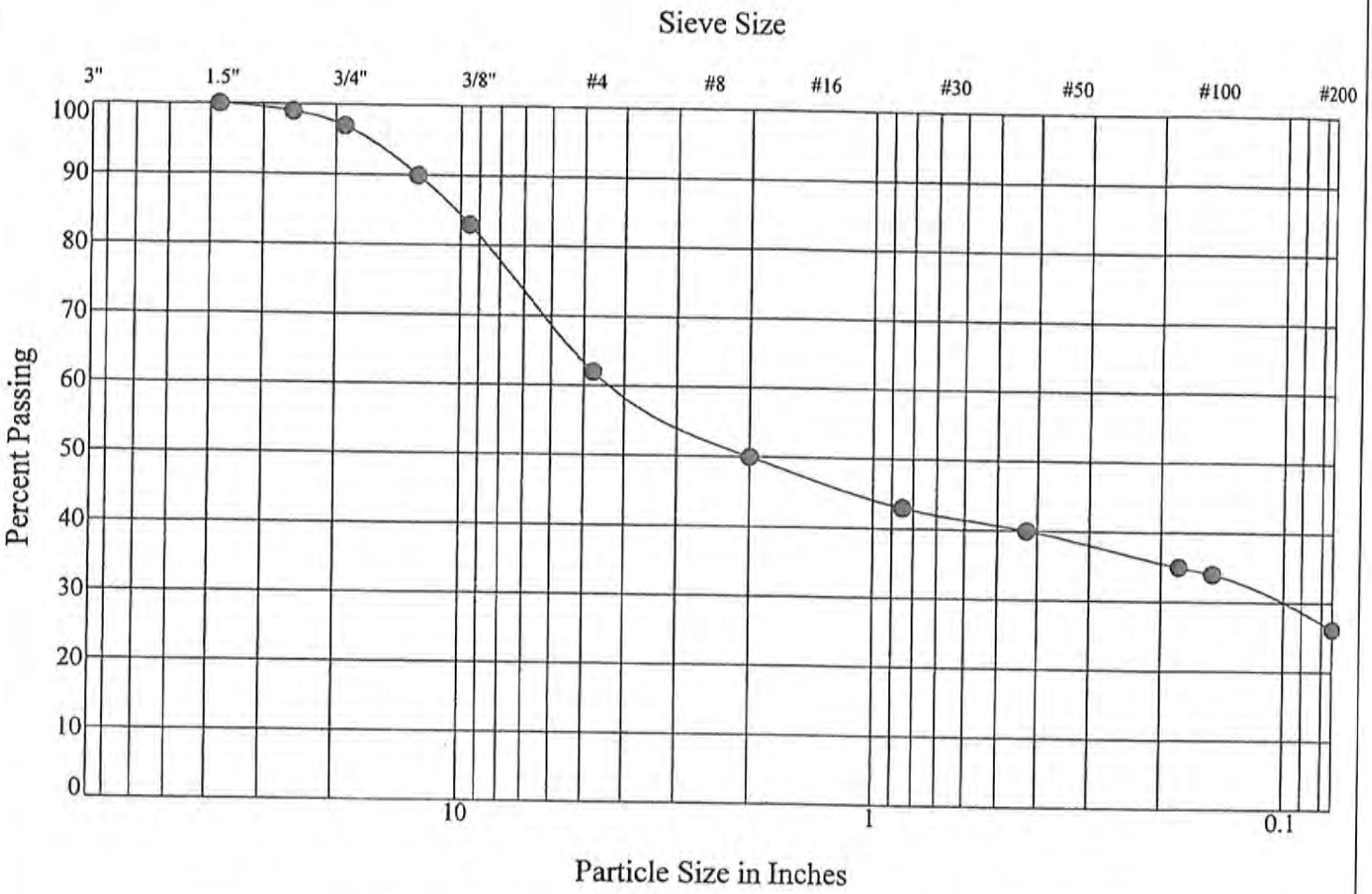
Sieve Analysis
Project Number: 067358
Project Name: Southern Hills Subdivision
Project Location: Missoula, Montana

4/27/07



Gravel		Sand		
coarse	fine	coarse	medium	fine

Percent Passing U.S. Standard Sieve Size

3"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200
	100	97	83	62	52	46	41	38	34	26.2

Boring No.: ST-2P
Lab No.: ST-2
Depth (m): 1.5' - 9.0'

Date Received: 11/16/06
Comments:

Approved By:

Liquid Limit:	24
Plastic Limit:	14
Plasticity Index:	10
Classification:	GC
Moisture Content:	

Percent Gravel: 38.0
Percent Sand: 35.8
Percent Silt + Clay: 26.2
ASTM Group Name: Clayey Gravel With Sand
AASHTO Classification: A-2-4

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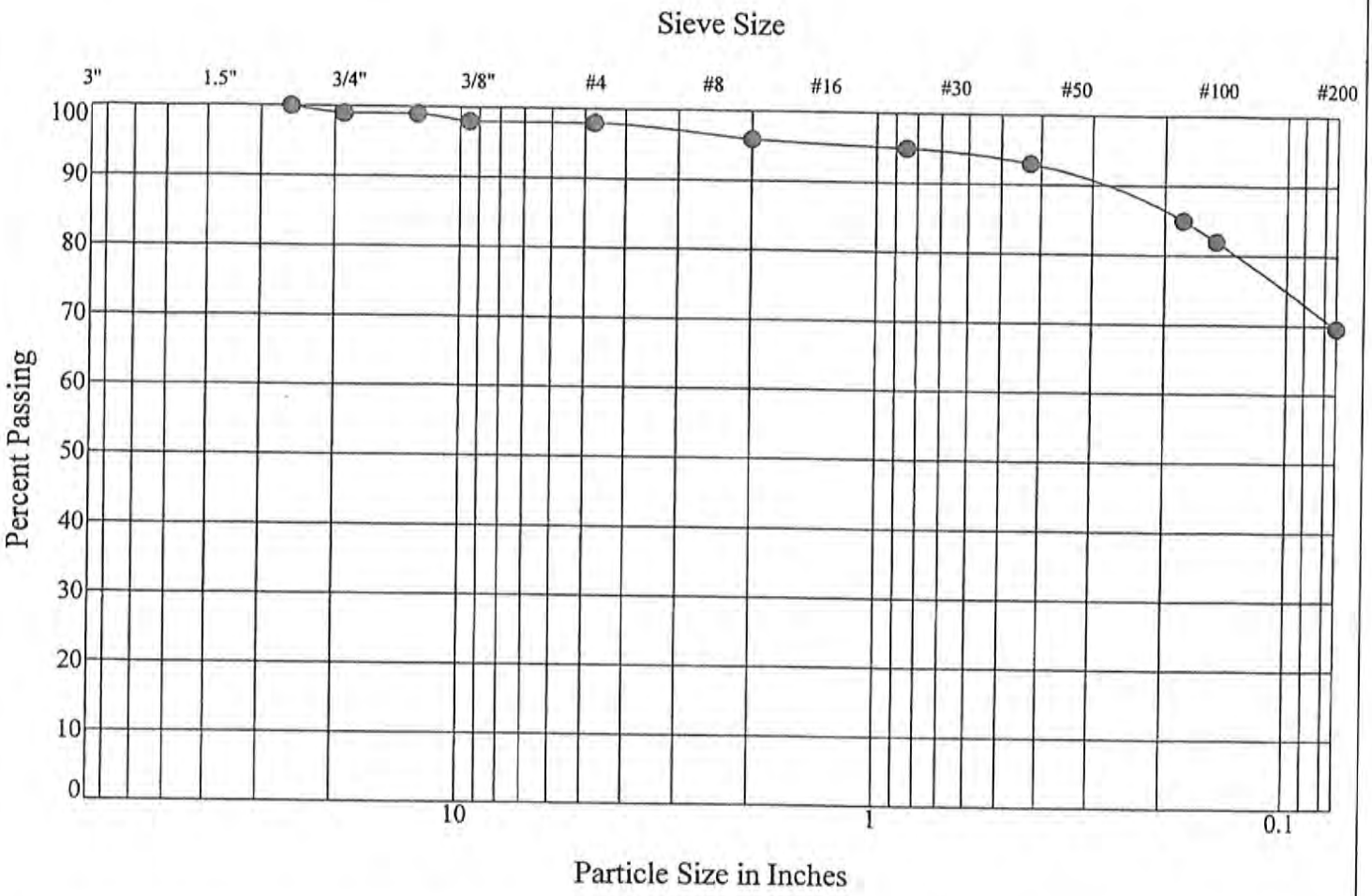
Sieve Analysis
Project Number: 067358
Project Name: Southern Hills Subdivision
Project Location: Missoula, Montana

4/27/07



Gravel		Sand		
coarse	fine	coarse	medium	fine

Percent Passing U.S. Standard Sieve Size

3"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200
		99	98	98	96	95	94	90	82	69.6

Boring No.: ST-4P
Lab No.: ST-4
Depth (m): 7' - 14'

Date Received: 11/15/06
Comments:

Approved By:

Liquid Limit:	47
Plastic Limit:	16
Plasticity Index:	31
Classification:	CL
Moisture Content:	

Percent Gravel: 2.0
Percent Sand: 28.4
Percent Silt + Clay: 69.6
ASTM Group Name: Sandy Lean Clay
AASHTO Classification: A-7-6

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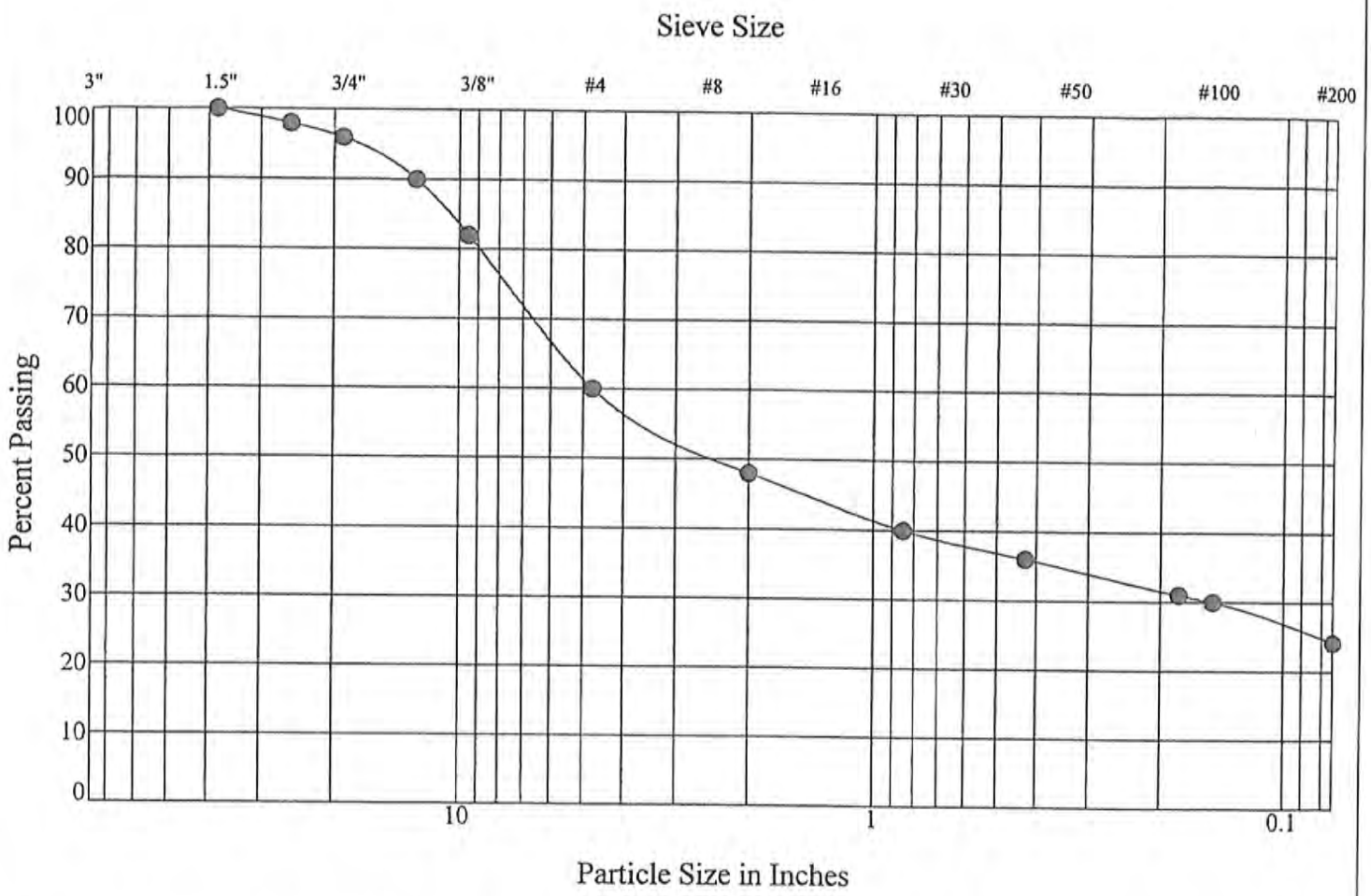
Sieve Analysis
Project Number: 067358
Project Name: Southern Hills Subdivision
Project Location: Missoula, Montana

4/27/07



Gravel		Sand		
coarse	fine	coarse	medium	fine

Percent Passing U.S. Standard Sieve Size

3"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200
	100	96	82	60	50	43	38	34	30	24.2

Boring No.: ST-7
Lab No.: ST-7
Depth (m): 0 - 9'

Date Received: 11/16/06
Comments:

Approved By:

Liquid Limit:	24
Plastic Limit:	17
Plasticity Index:	7
Classification:	GC-GM
Moisture Content:	

Percent Gravel: 40.0
Percent Sand: 35.8
Percent Silt + Clay: 24.2
ASTM Group Name: Silty, Clayey Gravel With Sand
AASHTO Classification: A-2-4

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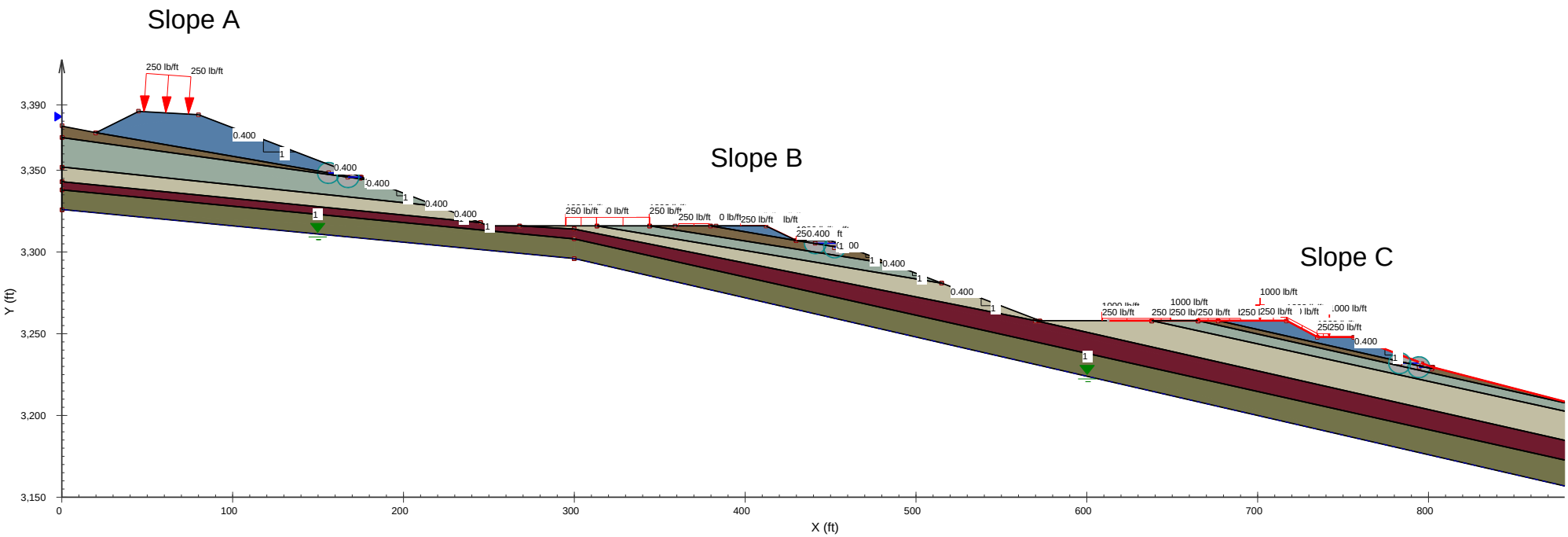
Sieve Analysis

Project Number: 067358
Project Name: Southern Hills Subdivision
Project Location: Missoula, Montana

4/27/07

Materials				
SC	Mohr Coulomb	Unit Weight = 105 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 29 (deg)
Fill SCGC	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
GCwS	Mohr Coulomb	Unit Weight = 125 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 31 (deg)
CLwS	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 3000 (psf)	Phi = 0 (deg)
GCwS 2	Mohr Coulomb	Unit Weight = 138 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
GPwS	Mohr Coulomb	Unit Weight = 140 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 36 (deg)



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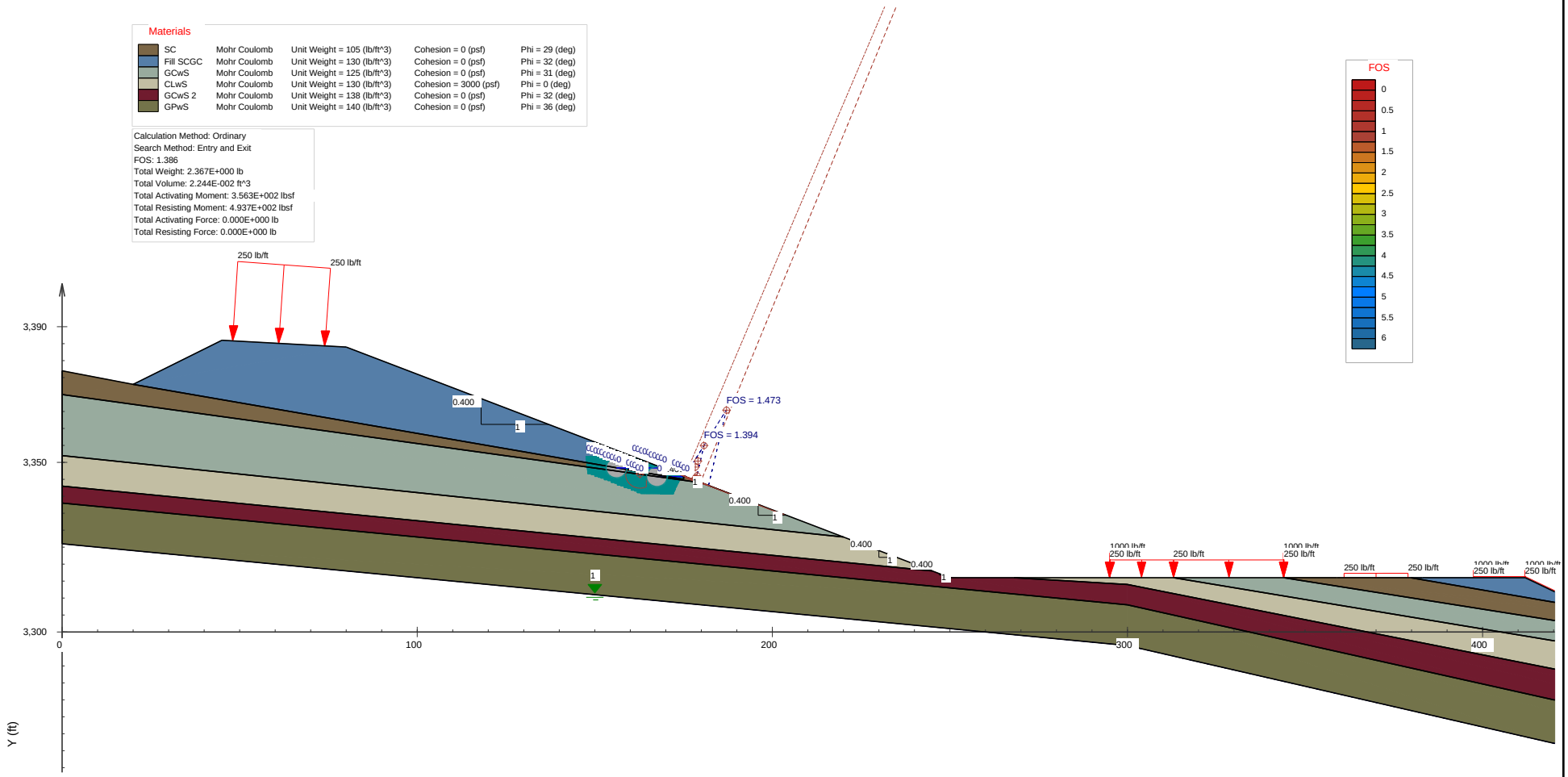
PROJECT	Hillview Crossing-Missoula	
TITLE	Cross Section C	
SK GEOTECHNICAL	PROJECT No. 15-3338G	File No.
	Author D.Hutzenbiler	FIGURE
	Date 11/30/2015	



2.5:1 Cut and Fill Slope

PROJECT	**Hillview Crossing-Missoula**
TITLE	**Cross Section C, Undrained Condition, Slope A**
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	**FIGURE**
Date 11/17/2015	

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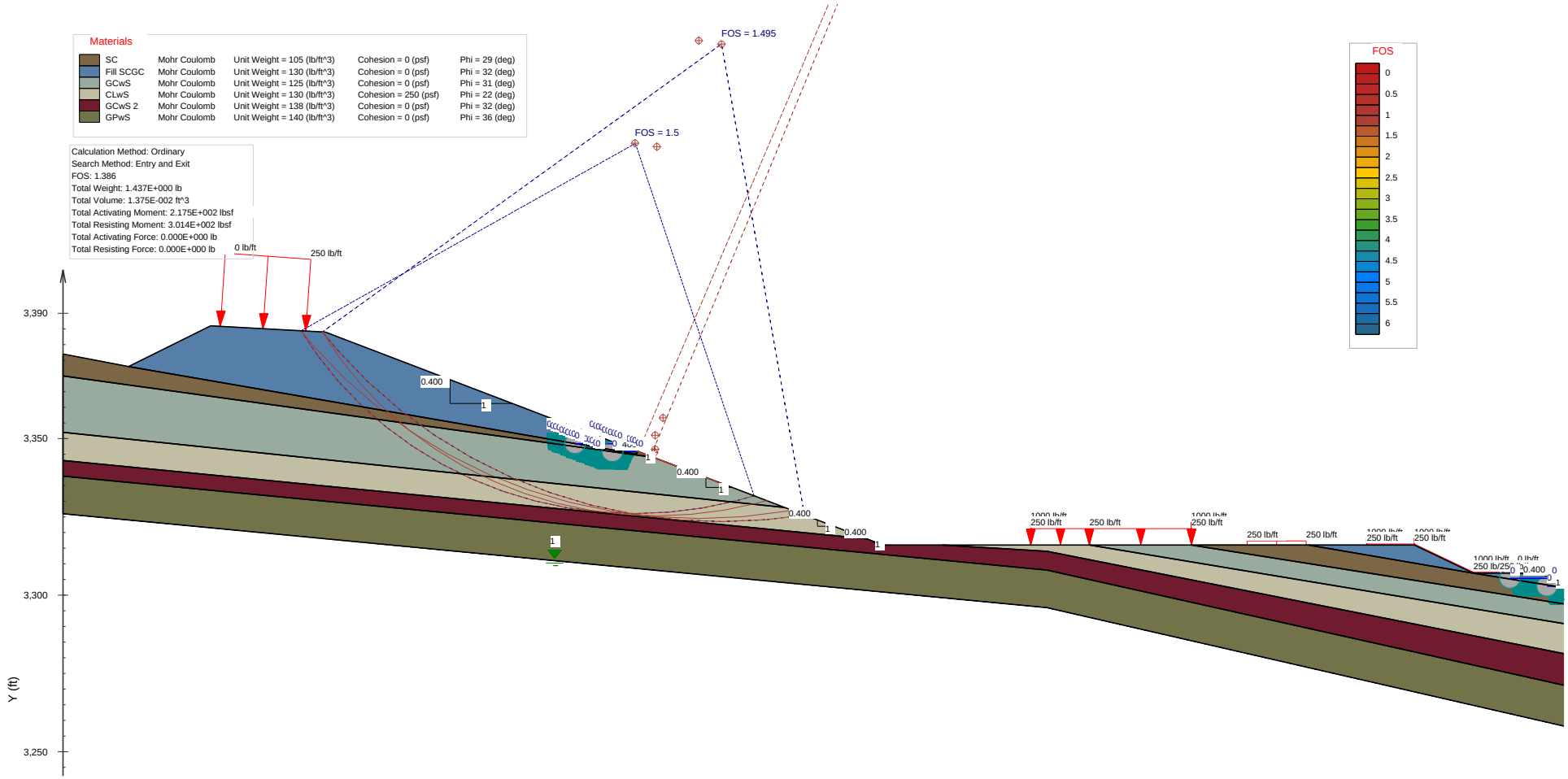

2.5:1 Cut and Fill Slope

PROJECT	Hillview Crossing-Missoula
TITLE	Cross Section C, Drained Condition, Slope A
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	FIGURE
Date 11/30/2015	

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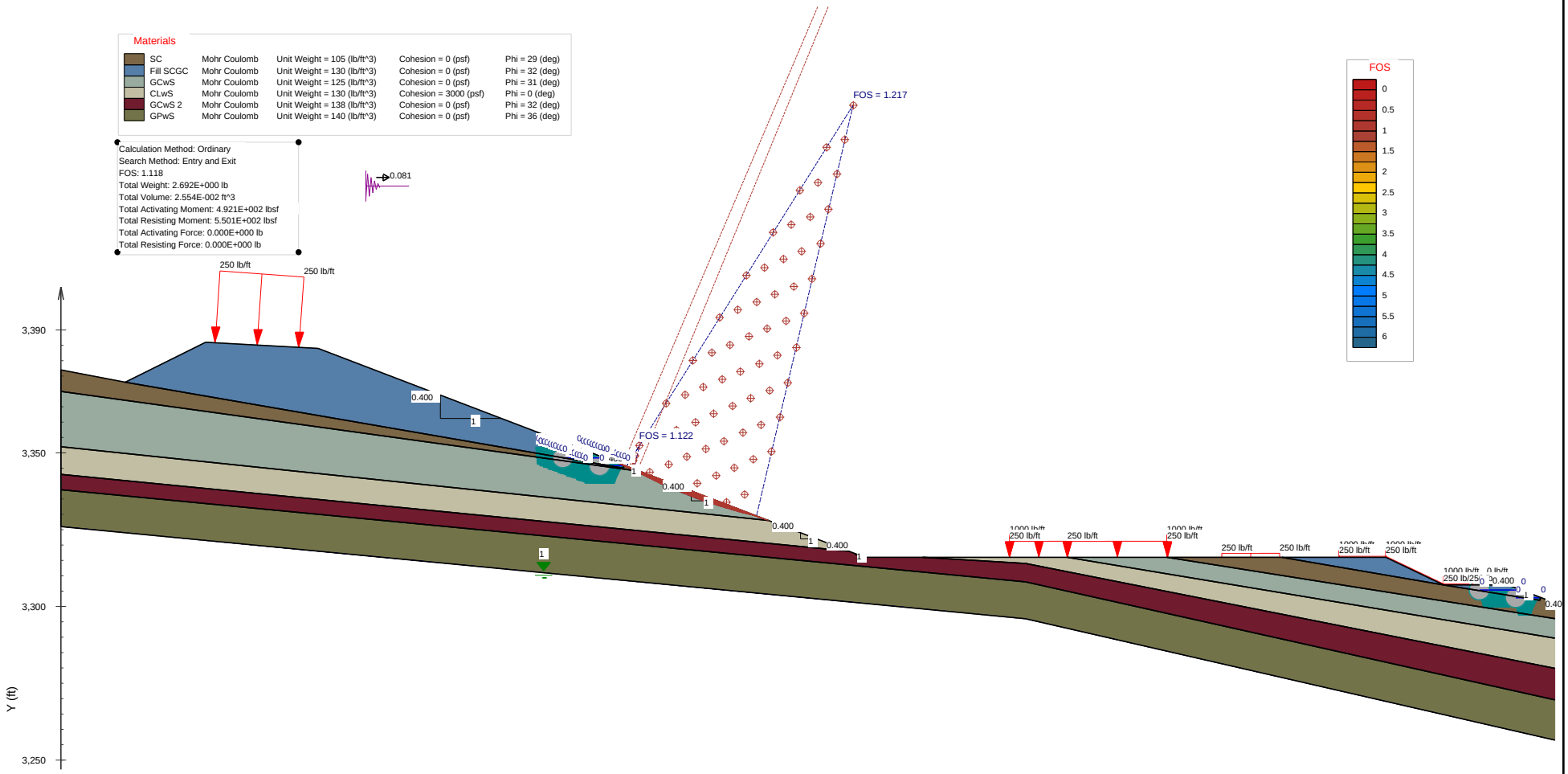

2.5:1 Cut and Fill Slope

PROJECT	Hillview Crossing-Missoula
TITLE	Cross Section C, Undrained-Seismic Condition, Slope A
PROJECT No.	15-3338G
File No.	
Author	D.Hutzenbiler
Date	11/30/2015
FIGURE	

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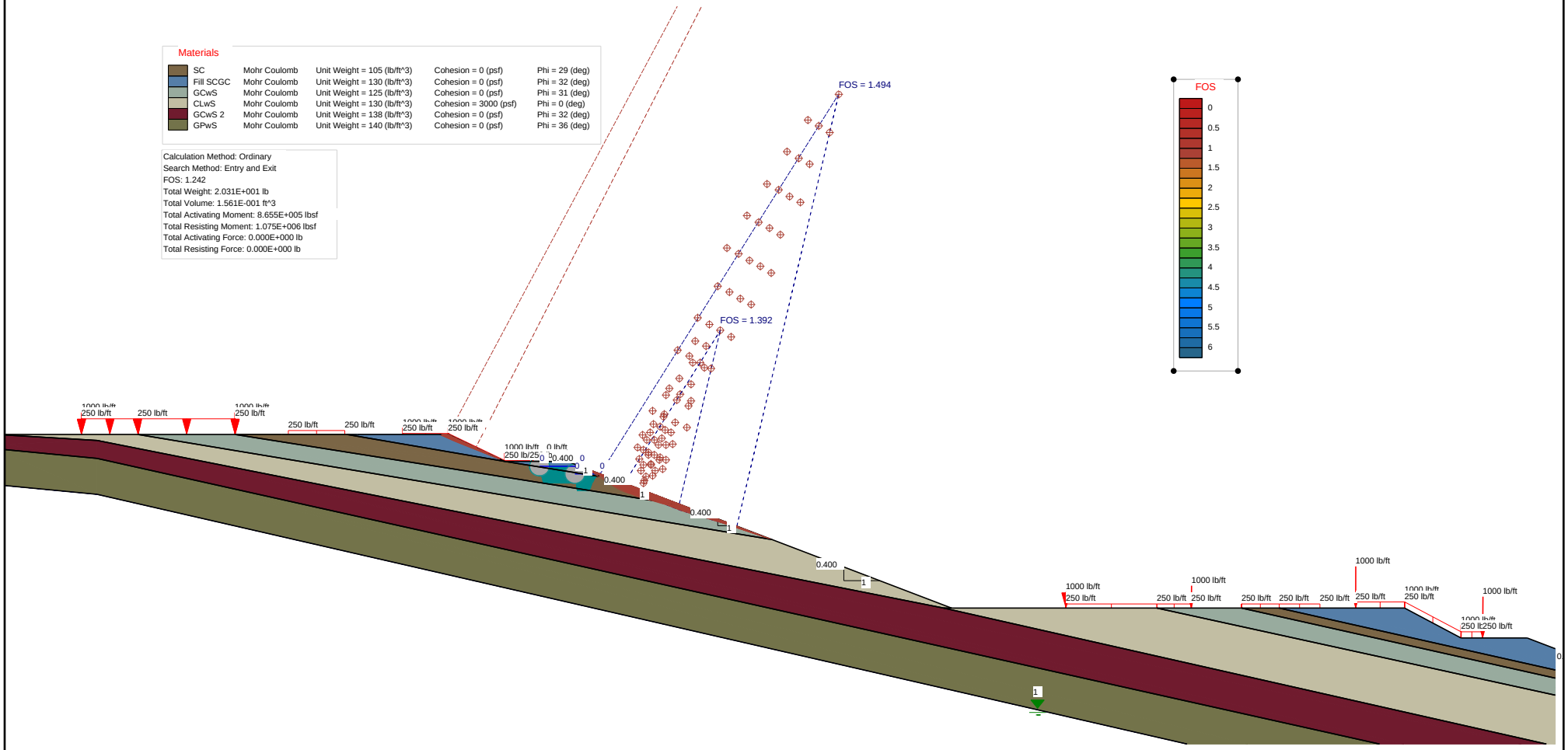

2.5:1 Cut and Fill Slope

PROJECT	**Hillview Crossing-Missoula**
TITLE	**Cross Section C, Undrained Condition, Slope B**
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	**FIGURE**
Date 11/30/2015	

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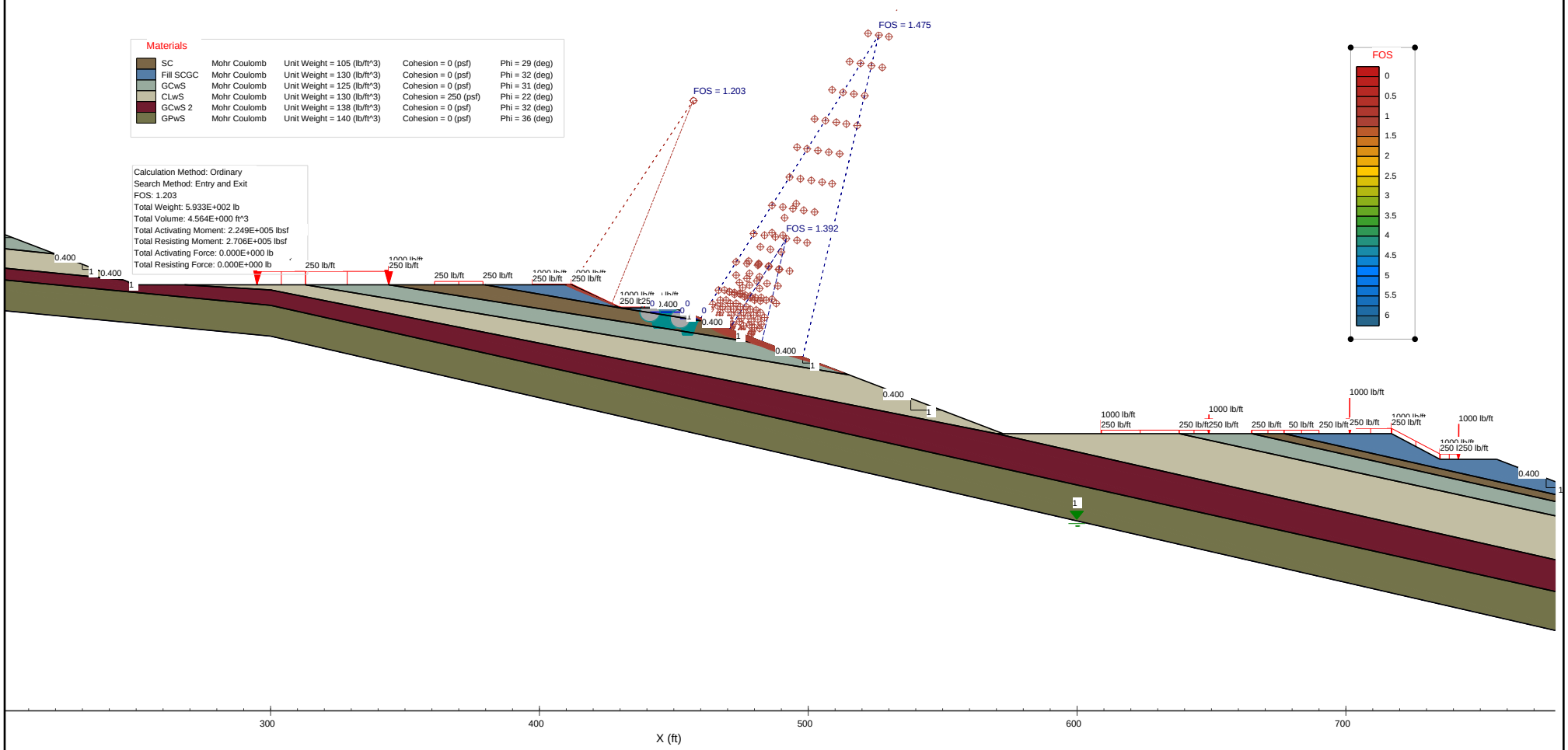

2.5:1 Cut and Fill Slope

PROJECT	**Hillview Crossing-Missoula**
TITLE	**Cross Section C, Drained Condition, Slope B**
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	**FIGURE**
Date 11/30/2015	

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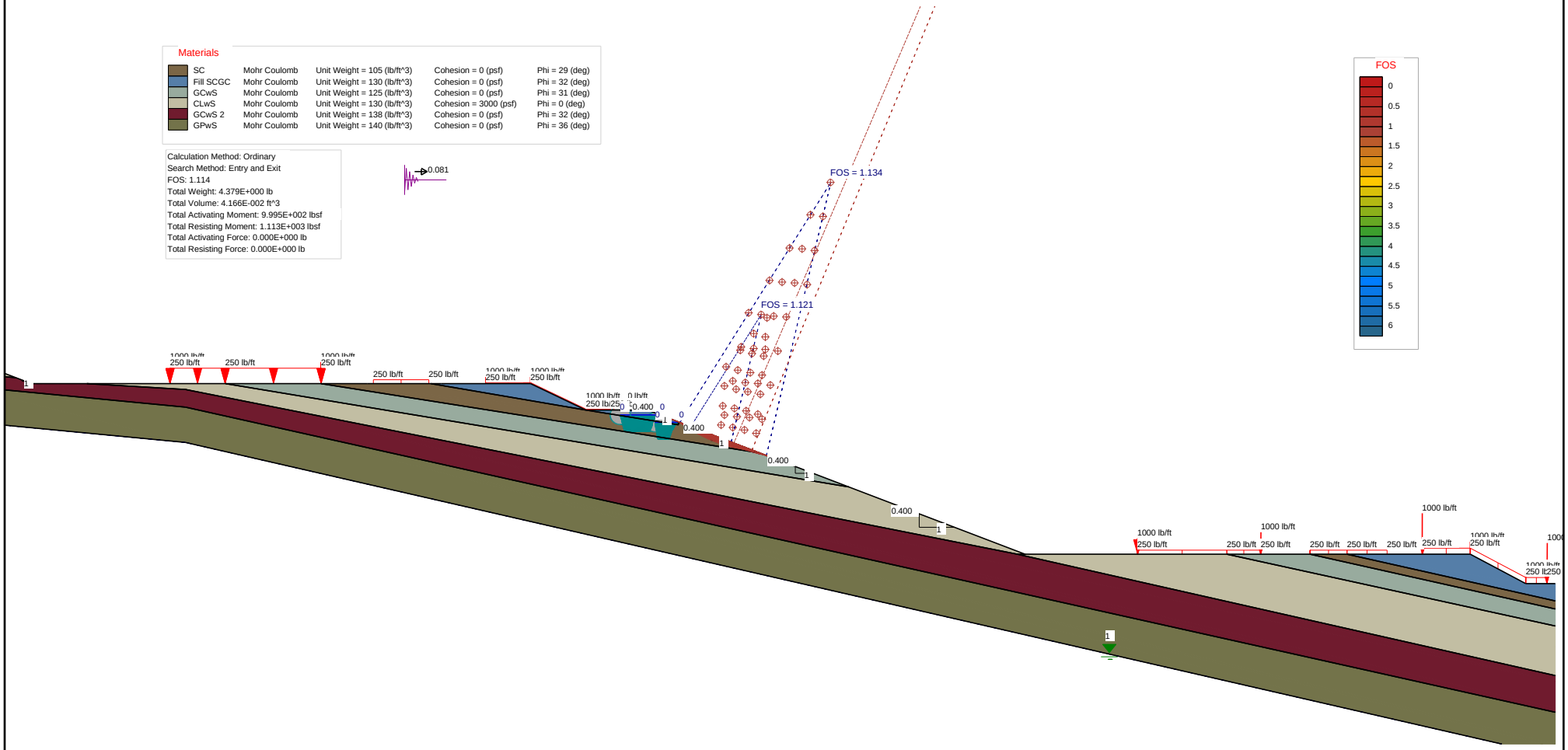

2.5:1 Cut and Fill Slope

PROJECT	**Hillview Crossing-Missoula**
TITLE	**Cross Section C, Undrained-Seismic Condition, Slope B**
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	**FIGURE**
Date 11/30/2015	

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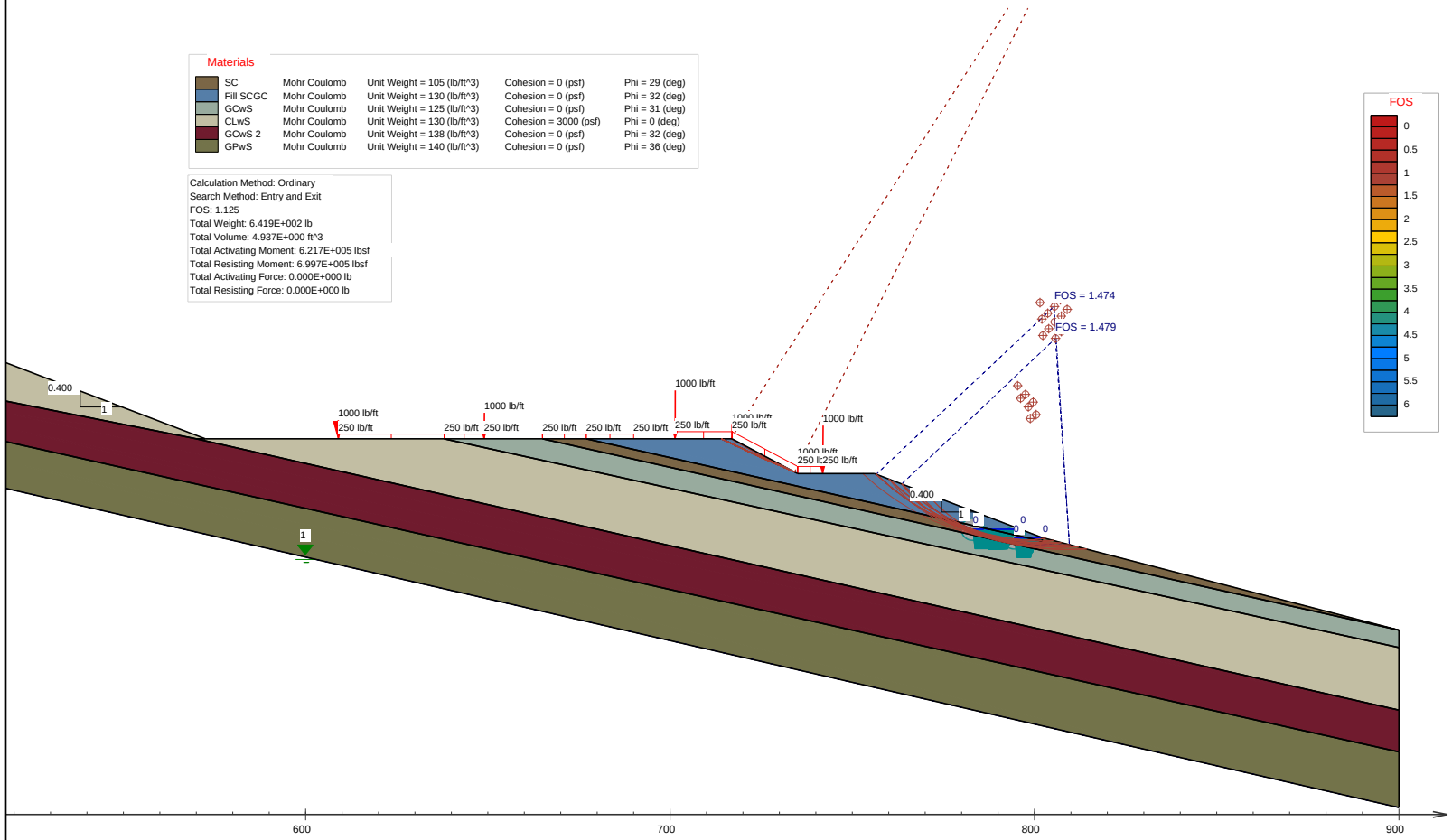

2.5:1 Cut and Fill Slope

PROJECT	Hillview Crossing-Missoula
TITLE	Cross Section C, Undrained Condition, Slope C
PROJECT No.	15-3338G
File No.	
Author	D.Hutzenbiler
Date	11/30/2015
	FIGURE

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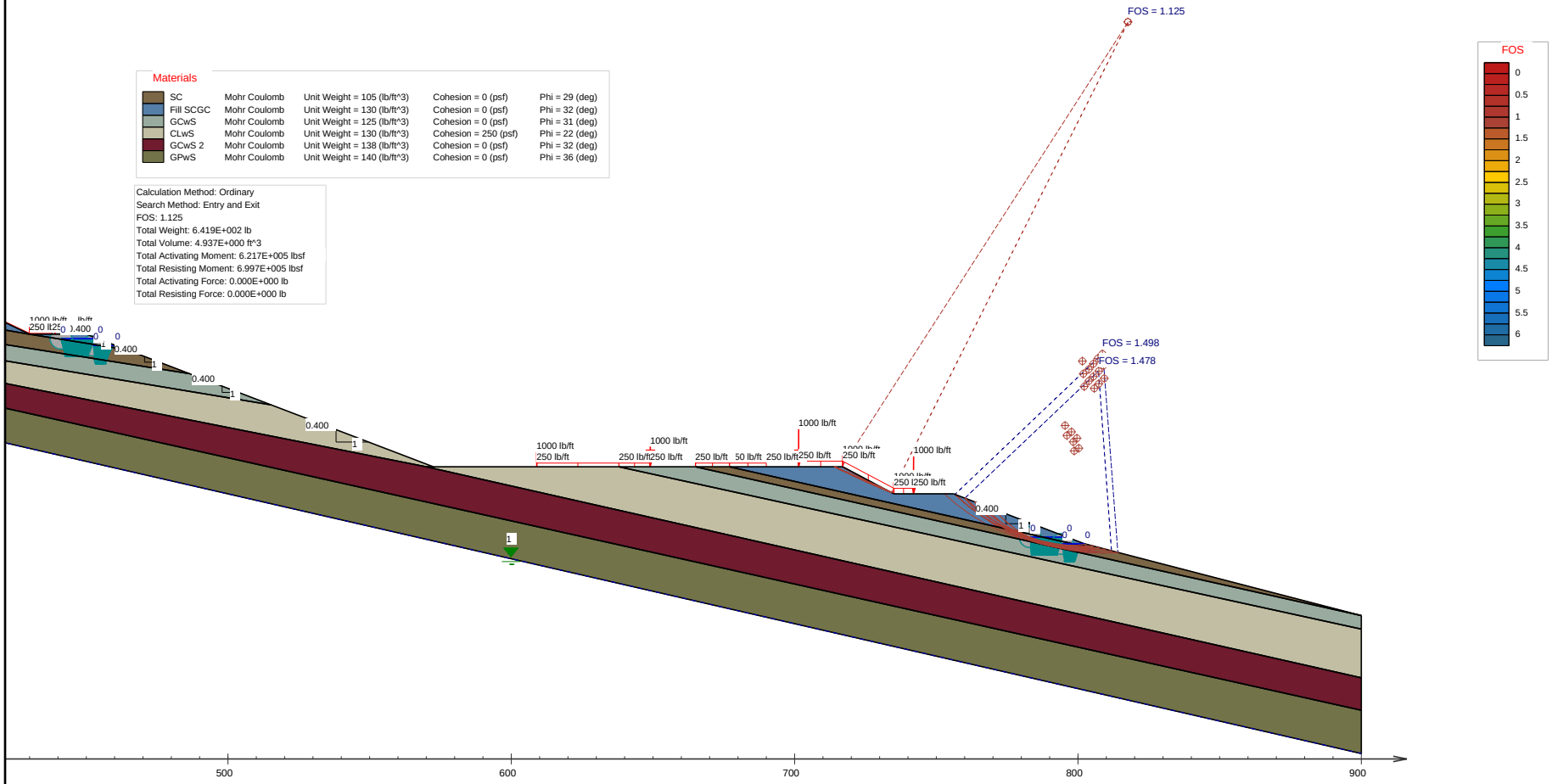

2.5:1 Cut and Fill Slope

PROJECT	Hillview Crossing-Missoula
TITLE	Cross Section C, Drained Condition, Slope C
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	FIGURE
Date 11/30/2015	

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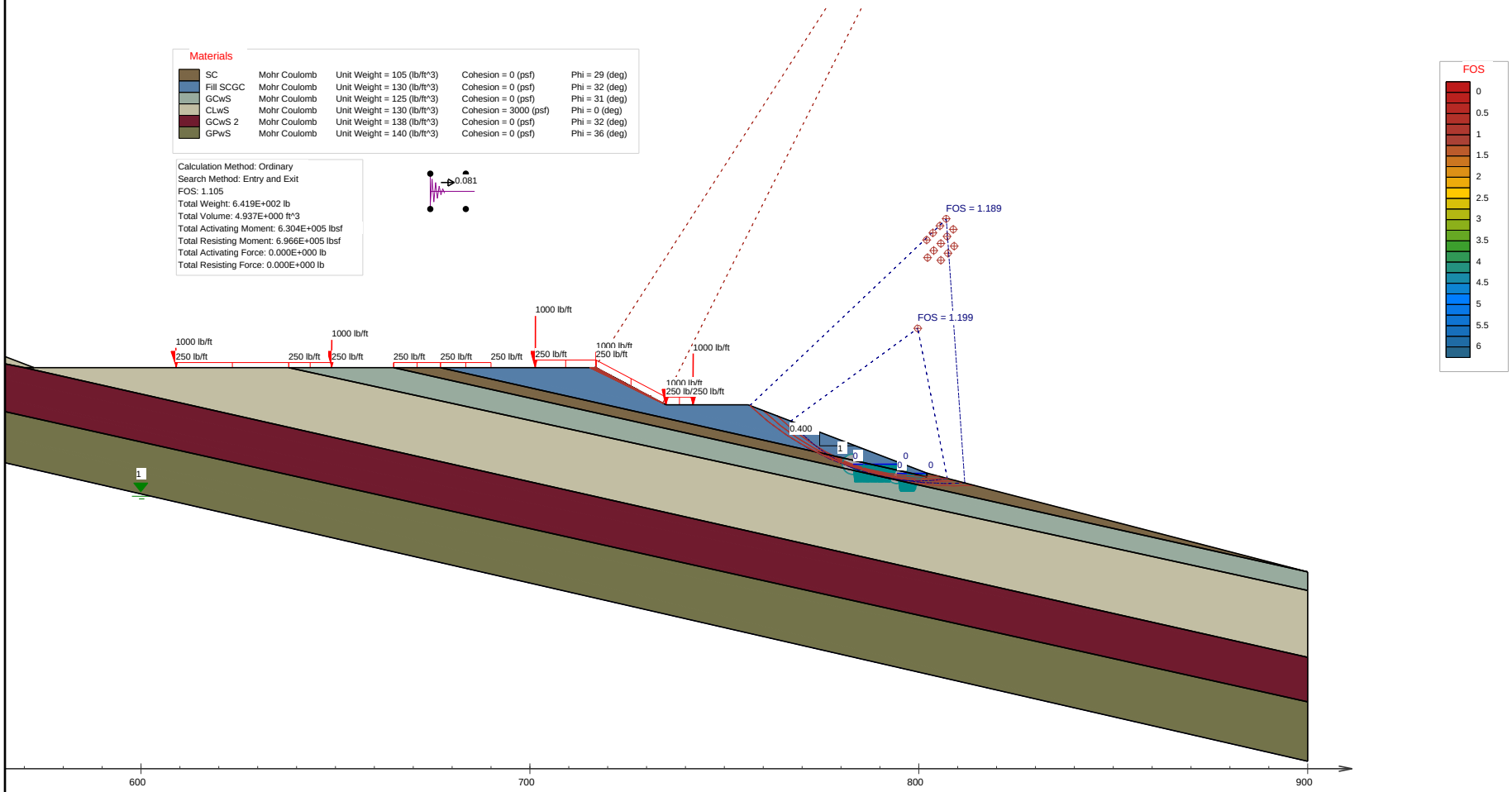

2.5:1 Cut and Fill Slope

PROJECT	**Hillview Crossing-Missoula**
TITLE	**Cross Section C, Undrained-Seismic Condition, Slope C**
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	**FIGURE**
Date 11/30/2015	

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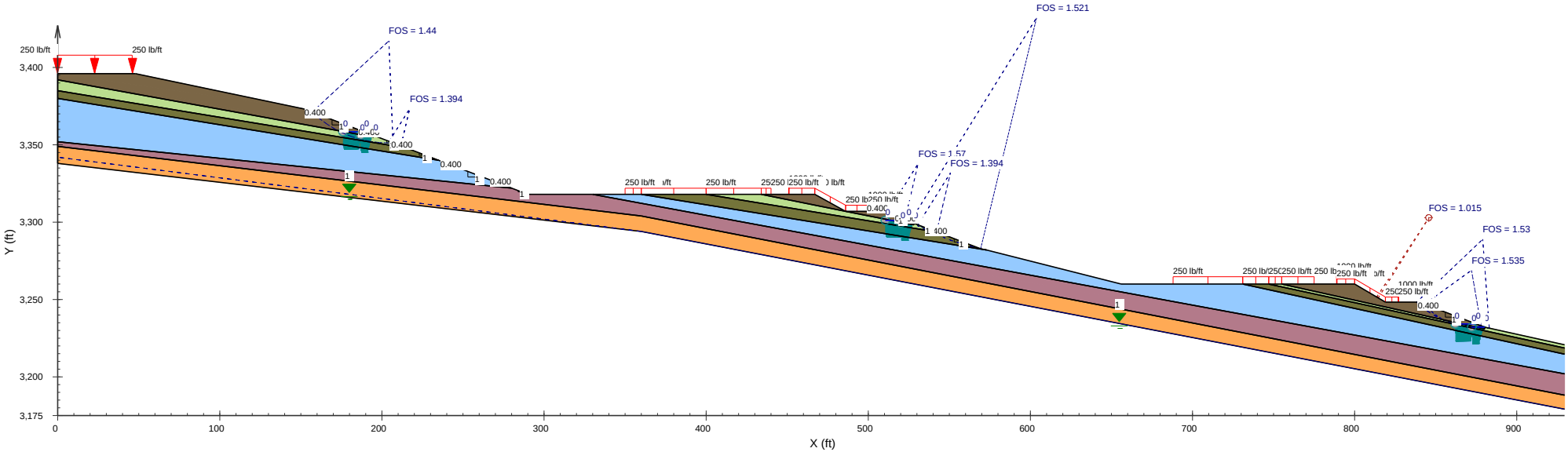
Materials

Fill SC GC	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
SC	Mohr Coulomb	Unit Weight = 105 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 29 (deg)
GC CL	Mohr Coulomb	Unit Weight = 125 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 31 (deg)
CLwS	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 3000 (psf)	Phi = 0 (deg)
GCwS	Mohr Coulomb	Unit Weight = 138 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
GPGM	Mohr Coulomb	Unit Weight = 140 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 36 (deg)

Calculation Method: Ordinary
Search Method: Entry and Exit
FOS: 1.015
Total Weight: 2.303E-001 lb
Total Volume: 1.786E-003 ft^3
Total Activating Moment: 8.713E+003 lbsf
Total Resisting Moment: 8.842E+003 lbsf
Total Activating Force: 0.000E+000 lb
Total Resisting Force: 0.000E+000 lb



2.5:1 Cut and Fill Slope

PROJECT	Hillview Crossing - Missoula	
TITLE	Cross Section D, Undrained Condition	
SK GEOTECHNICAL	PROJECT No. 15-3338G	File No.
	Author D.Hutzenbiler	FIGURE
	Date 11/18/2015	

SVSLOPE®

Materials

Fill SC GC	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
SC	Mohr Coulomb	Unit Weight = 105 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 29 (deg)
GC CL	Mohr Coulomb	Unit Weight = 125 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 31 (deg)
CLwS	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 250 (psf)	Phi = 22 (deg)
GCwS	Mohr Coulomb	Unit Weight = 138 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
GPGM	Mohr Coulomb	Unit Weight = 140 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 36 (deg)

Calculation Method: Ordinary
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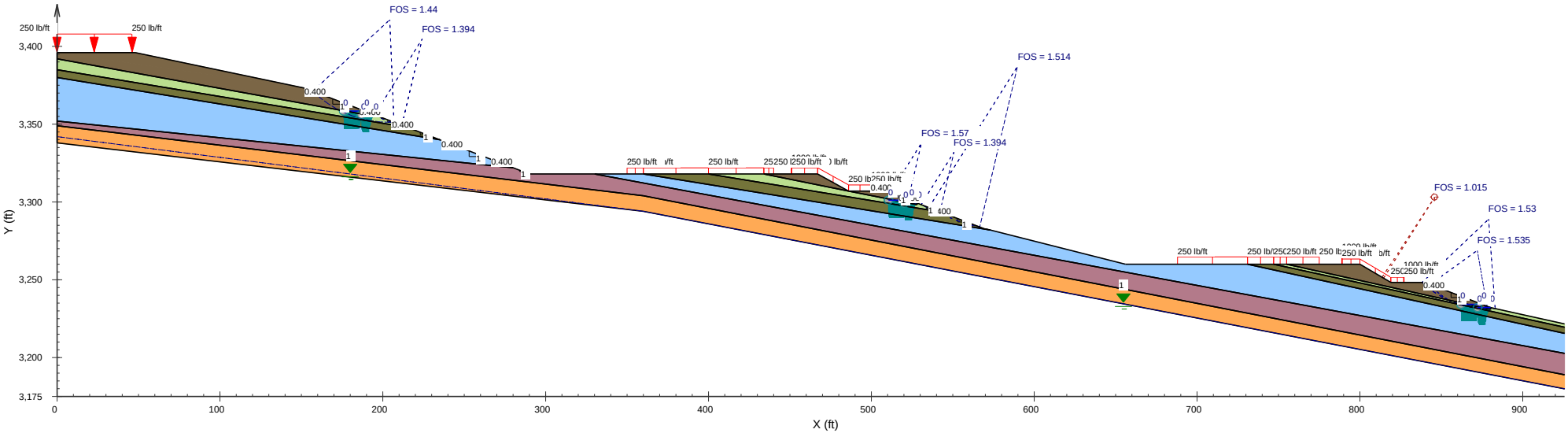
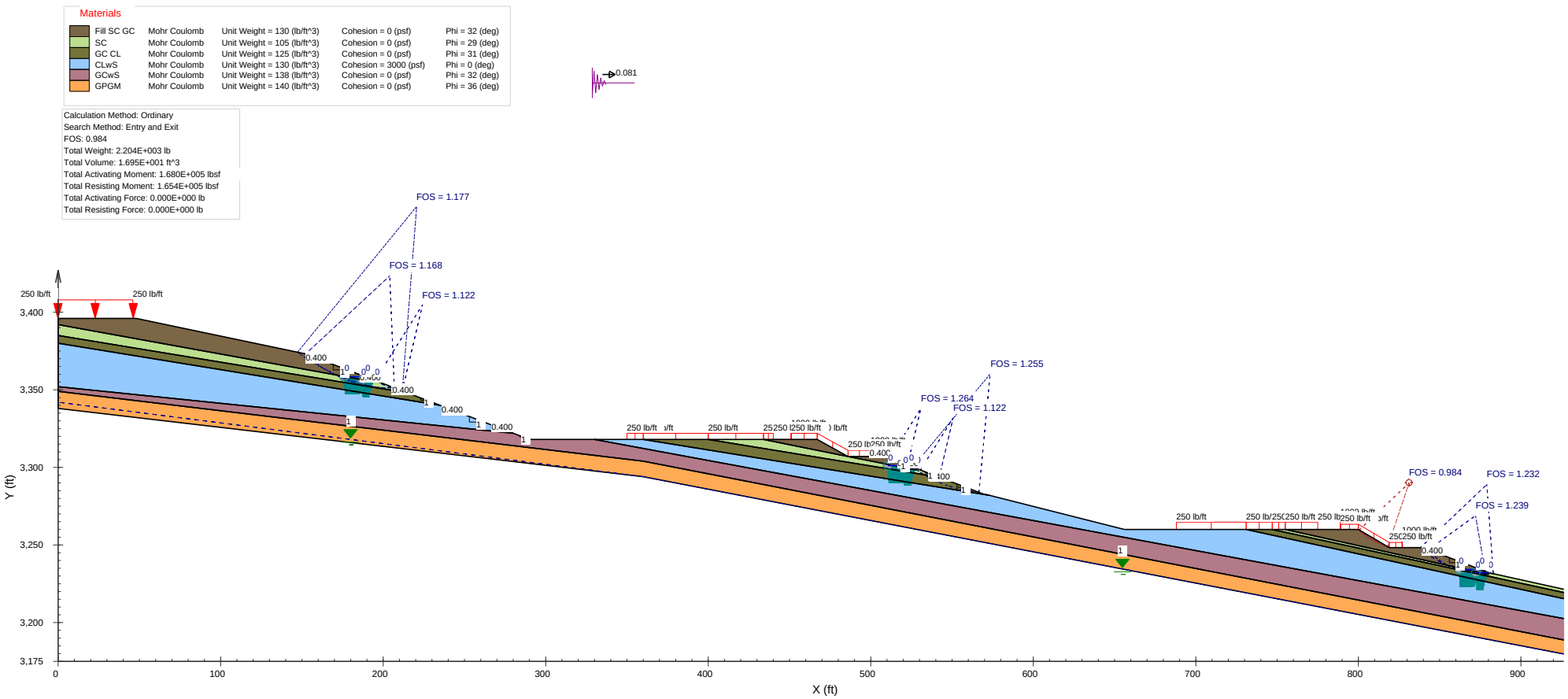


2.5:1 Cut and Fill Slope

PROJECT	Hillview Crossing - Missoula
TITLE	Cross Section D, Drained Condition
PROJECT No.	15-3338G
File No.	
Author	D.Hutzenbiler
Date	11/18/2015
	FIGURE

SVSLOPE®



2.5:1 Cut and Fill Slope

PROJECT	**Hillview Crossing - Missoula**
TITLE	**Cross Section D, Undrained-Seismic Condition**
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	**FIGURE**
Date 11/18/2015	

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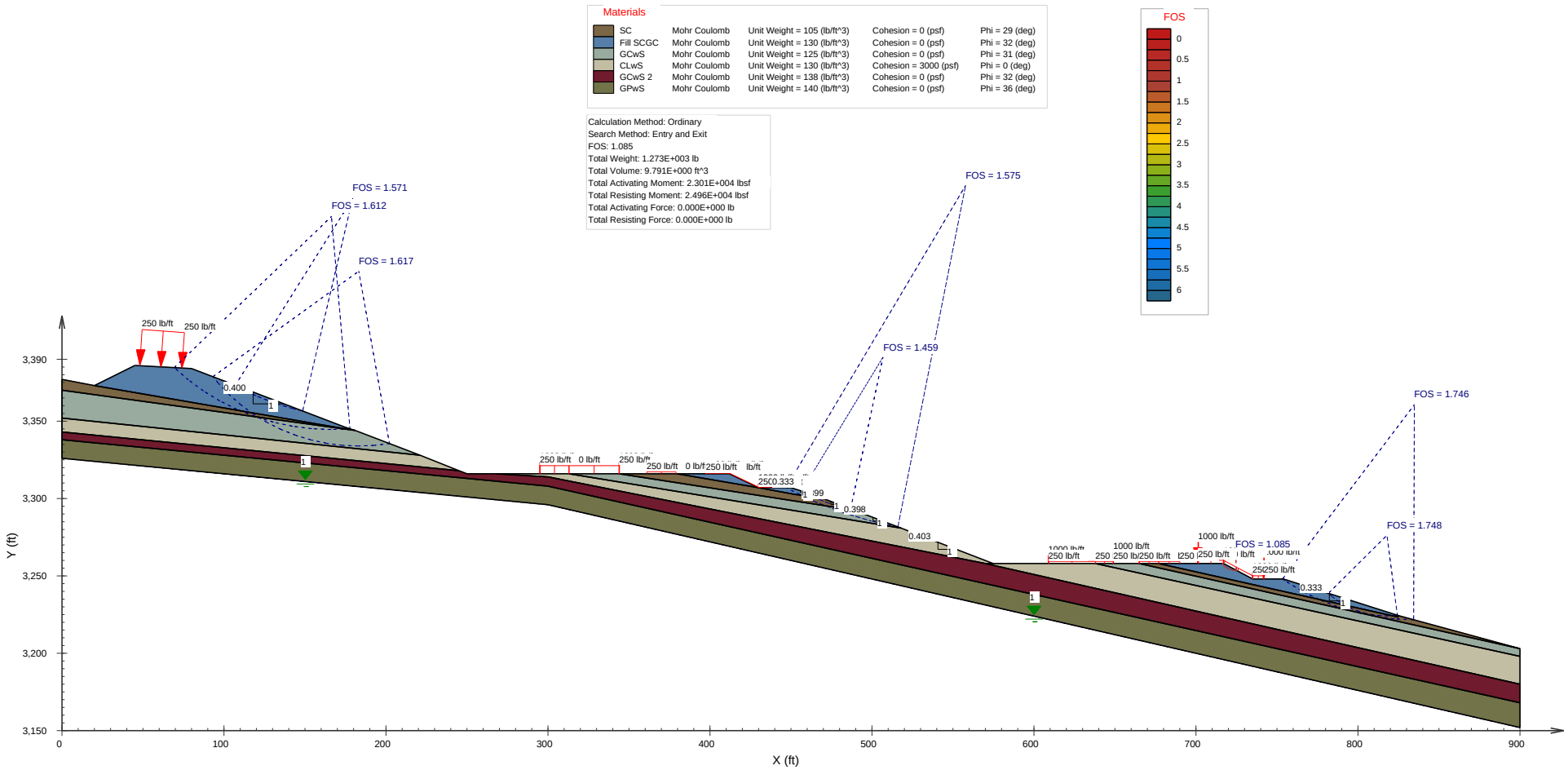
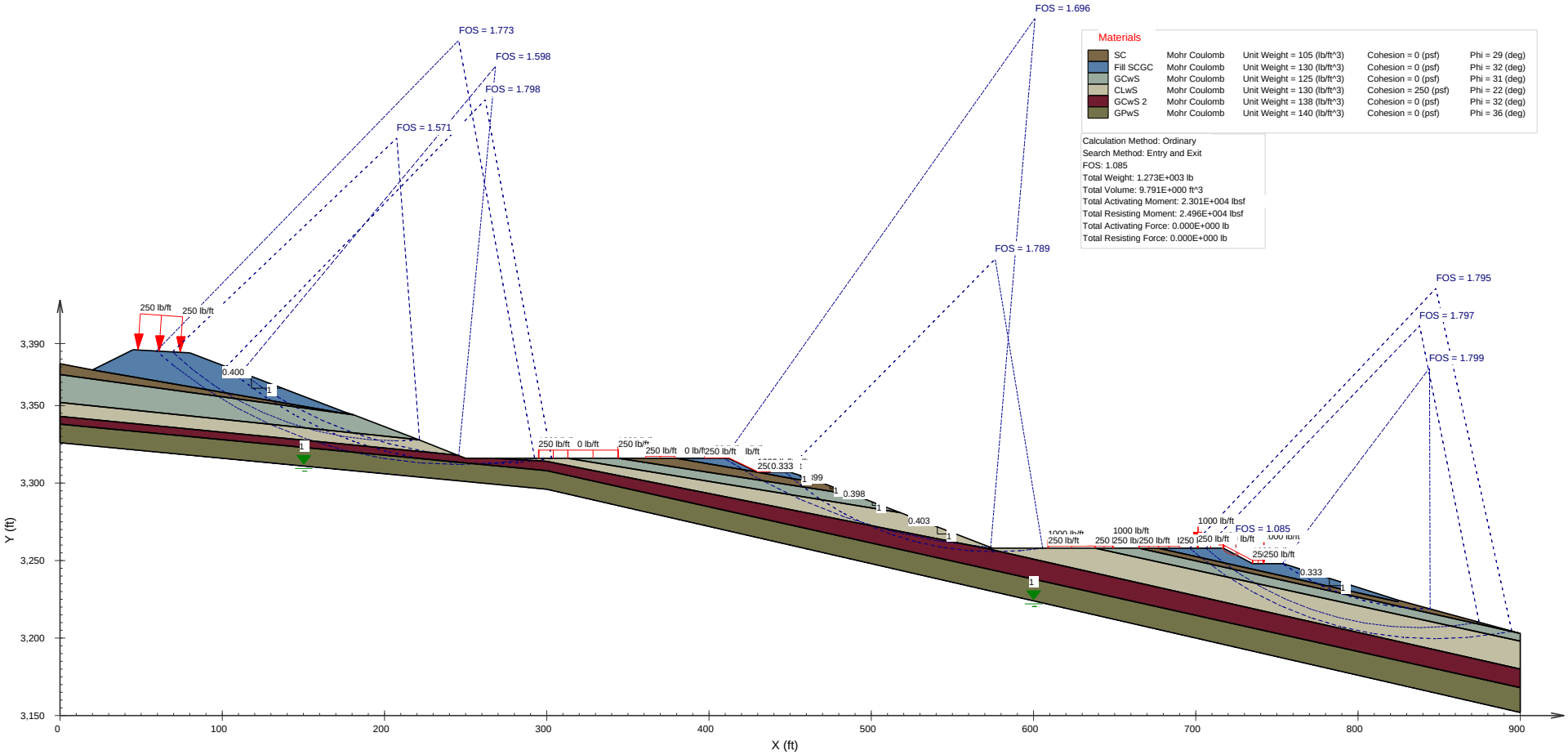
SK GEOTECHNICAL



3:1 Fill Slopes and 2.5:1 Cut Slopes

PROJECT	Hillview Crossing-Missoula
TITLE	Cross Section C, Undrained Condition
PROJECT No. 15-3338G	File No.
Author D.	FIGURE
Date 11/17/2015	

SVSLOPE®

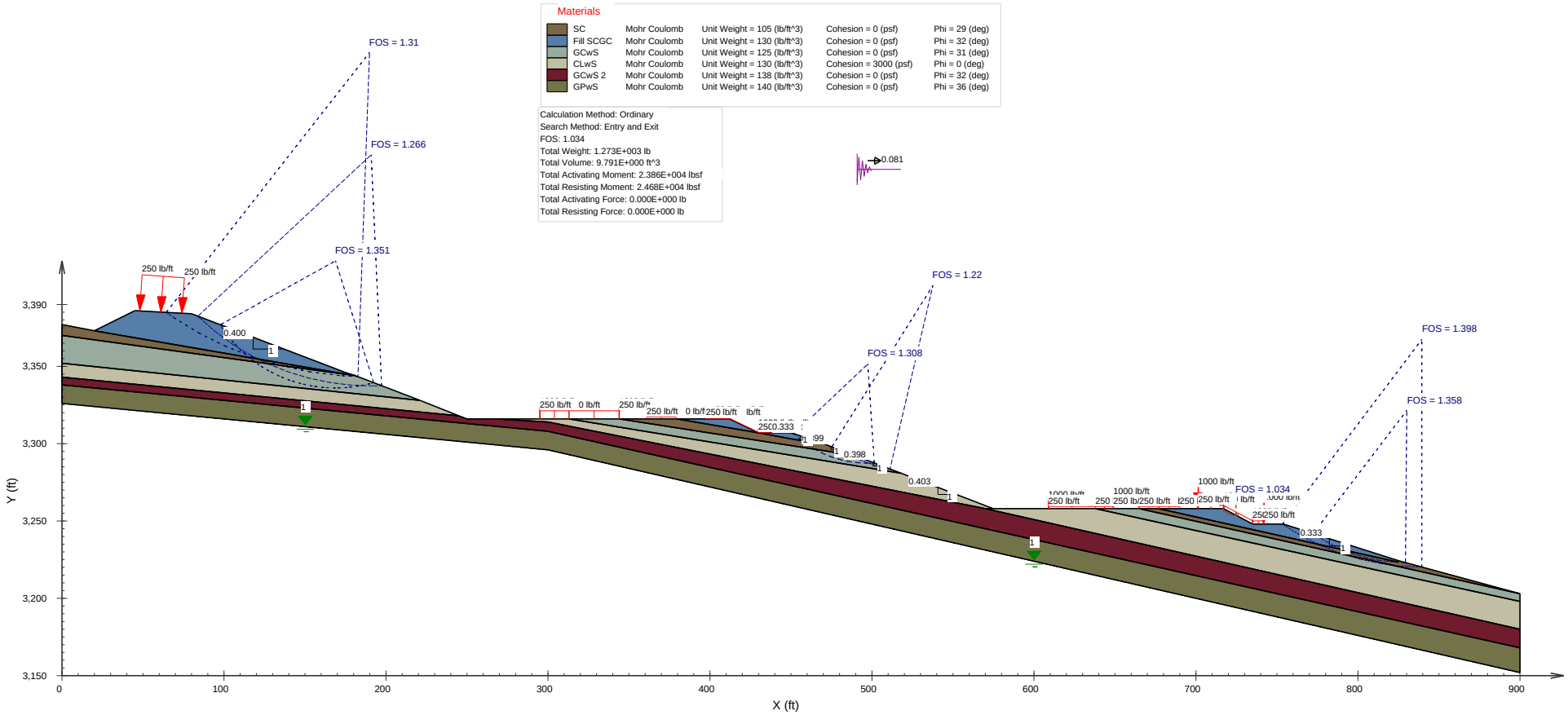


3:1 Fill Slopes and 2.5:1 Cut Slopes

PROJECT	**Hillview Crossing-Missoula**
TITLE	**Cross Section C, Drained Condition**
PROJECT No. 15-3338G	File No.
Author D.	**FIGURE**
Date 11/17/2015	

SVSLOPE®

SK GEOTECHNICAL



3:1 Fill Slopes and 2.5:1 Cut Slopes

PROJECT	Hillview Crossing-Missoula
TITLE	Cross Section C, Undrained-Seismic Condition
PROJECT No. 15-3338G	File No.
Author D.	FIGURE
Date 11/17/2015	

SVSLOPE®

SK GEOTECHNICAL

Materials

Fill SC GC	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
SC	Mohr Coulomb	Unit Weight = 105 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 29 (deg)
GC CL	Mohr Coulomb	Unit Weight = 125 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 31 (deg)
CLwS	Mohr Coulomb	Unit Weight = 130 (lb/ft^3)	Cohesion = 3000 (psf)	Phi = 0 (deg)
GCwS	Mohr Coulomb	Unit Weight = 138 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 32 (deg)
GPGM	Mohr Coulomb	Unit Weight = 140 (lb/ft^3)	Cohesion = 0 (psf)	Phi = 36 (deg)

Calculation Method: Ordinary
Search Method: Entry and Exit
FOS: 1.015
Total Weight: 9.805E-002 lb
Total Volume: 7.507E-004 ft^3
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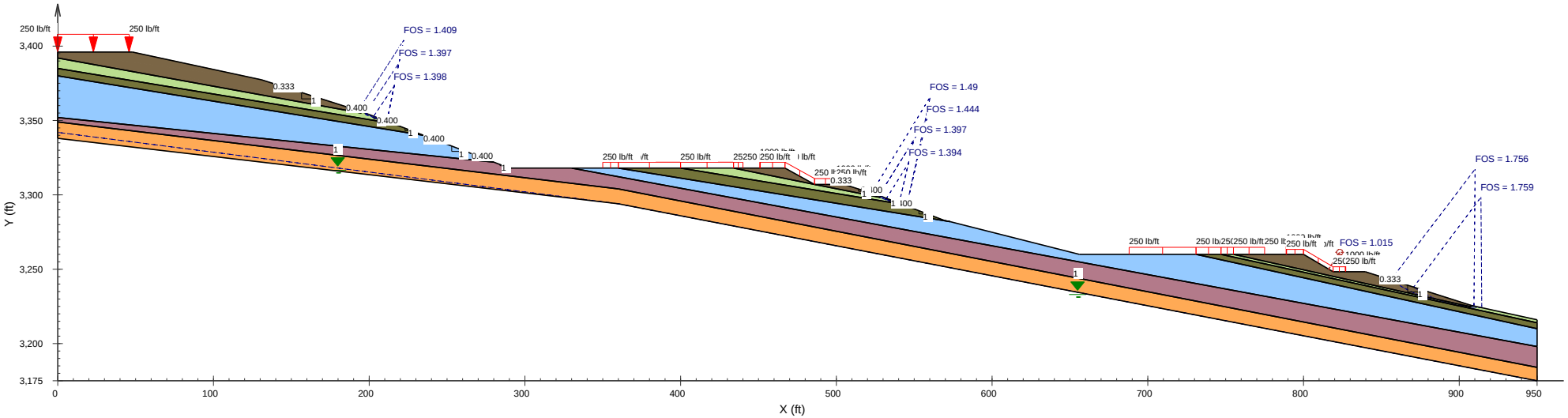
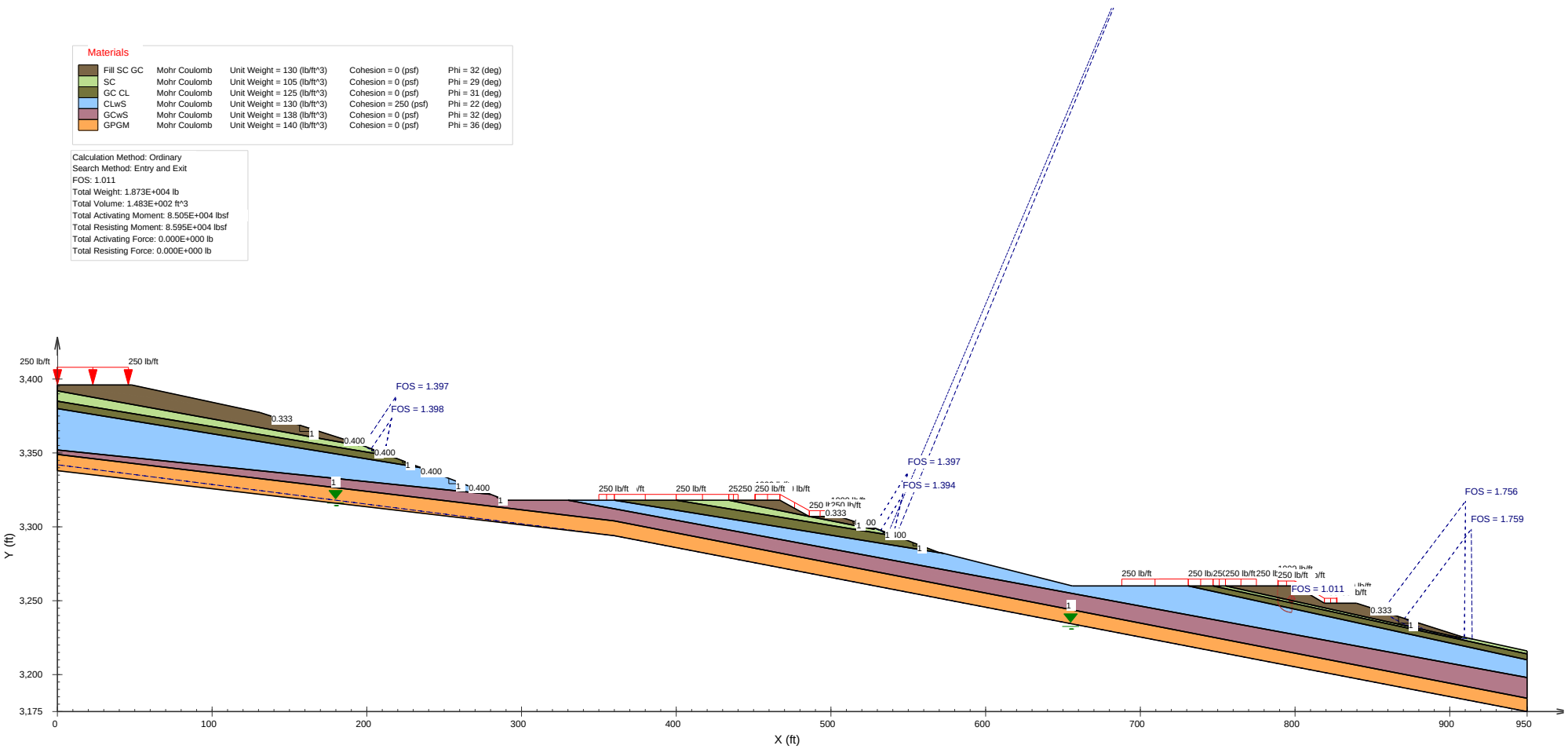
Total Resisting Moment: 8.797E+002 lbsf
Total Activating Force: 0.000E+000 lb
Total Resisting Force: 0.000E+000 lb



3:1 Fill Slopes and 2.5:1 Cut Slopes

PROJECT	Hillview Crossing - Missoula	
TITLE	Cross Section D, Undrained Condition	
SK GEOTECHNICAL	PROJECT No. 15-3338G	File No.
	Author D.Hutzenbiler	FIGURE
	Date 11/18/2015	

SVSLOPE®



3:1 Fill Slopes and 2.5:1 Cut Slopes

PROJECT	Hillview Crossing - Missoula	
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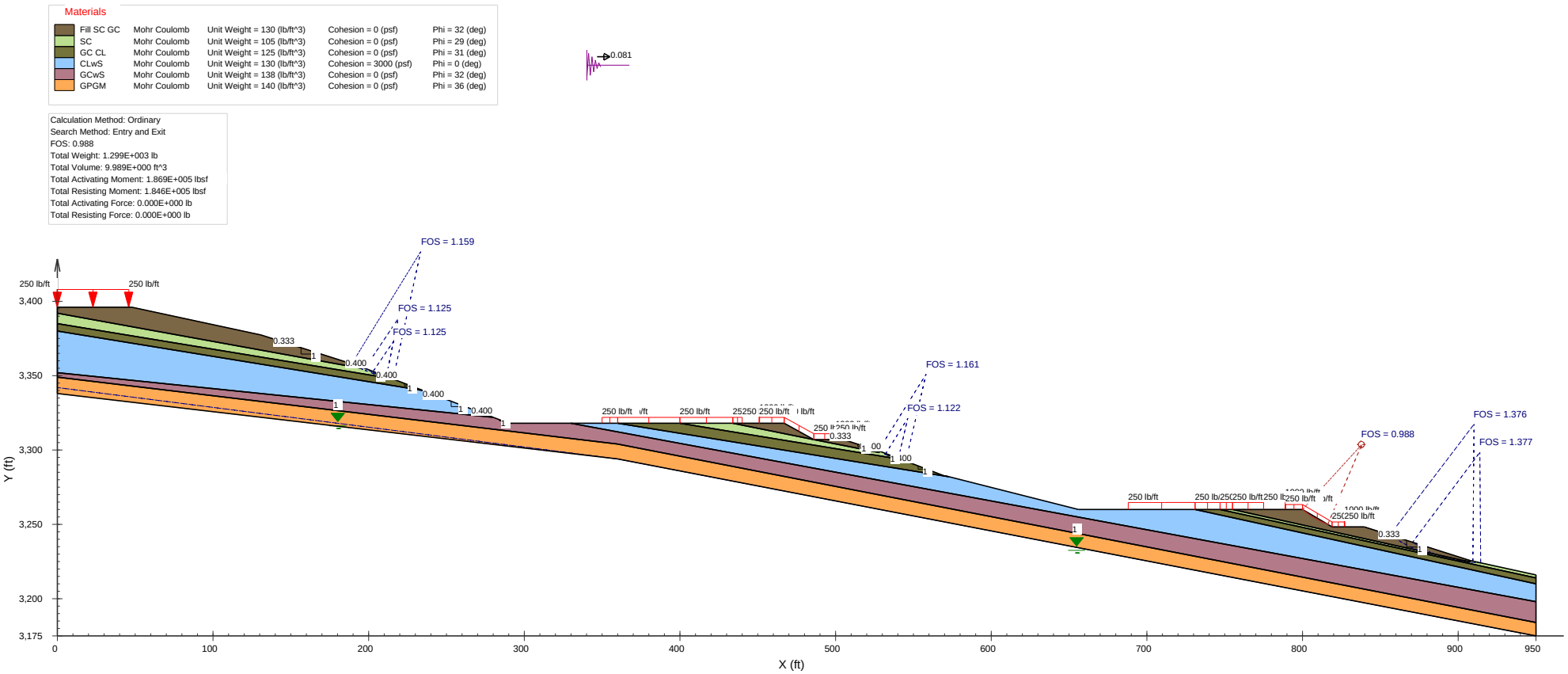
SVSLOPE®

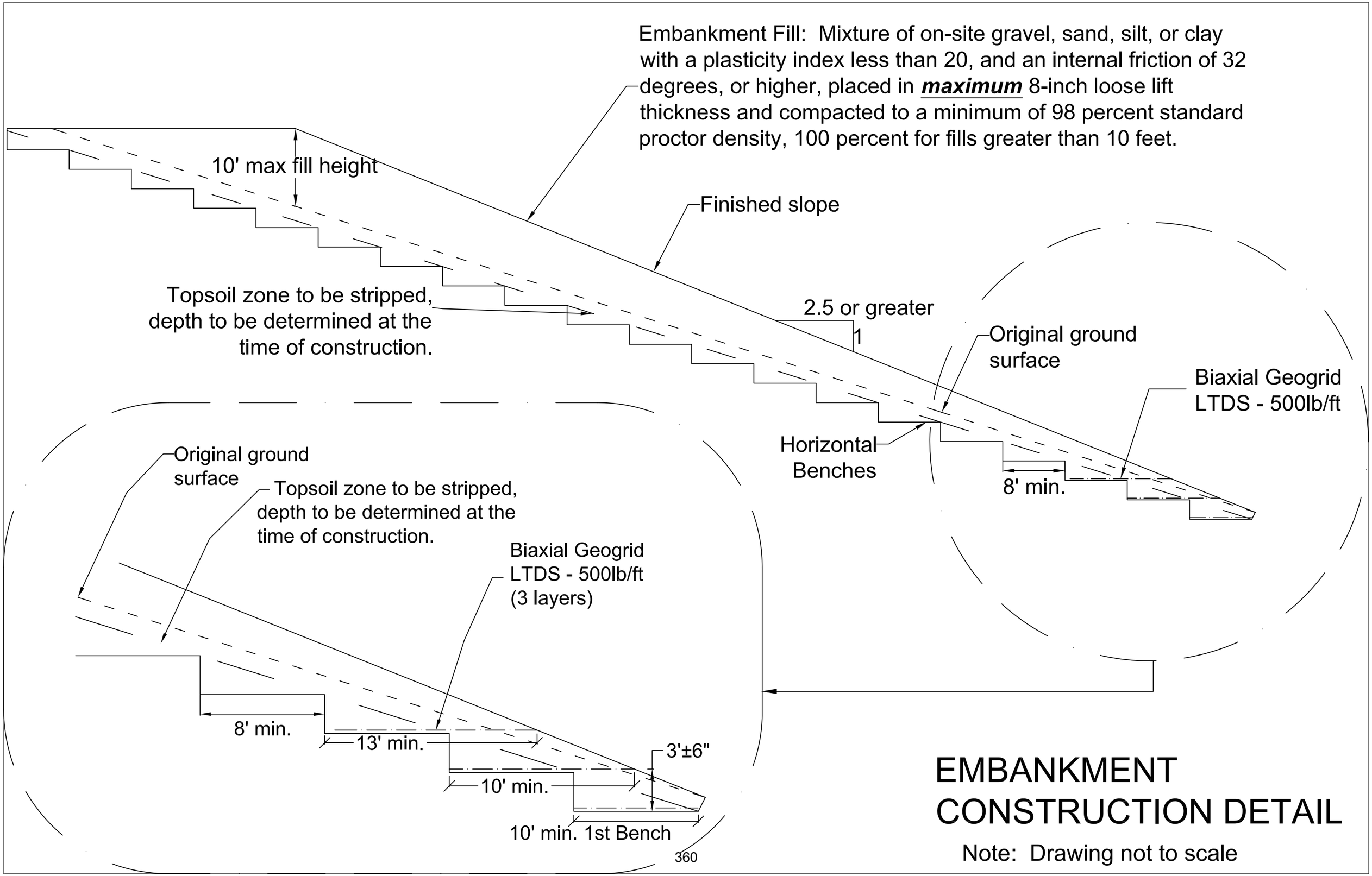


3:1 Fill Slopes and 2.5:1 Cut Slopes

PROJECT	**Hillview Crossing - Missoula**
TITLE	**Cross Section D, Undrained-Seismic Condition**
PROJECT No. 15-3338G	File No.
Author D.Hutzenbiler	**FIGURE**
Date 11/18/2015	

SVSLOPE®

SK GEOTECHNICAL


Embankment Fill: Mixture of on-site gravel, sand, silt, or clay with a plasticity index less than 20, and an internal friction of 32 degrees, or higher, placed in maximum 8-inch loose lift thickness and compacted to a minimum of 98 percent standard proctor density, 100 percent for fills greater than 10 feet.
10' max fill height
Finished slope
Topsoil zone to be stripped, depth to be determined at the time of construction.
2.5 or greater
1
Original ground surface
Biaxial Geogrid LTDS - 500lb/ft
Horizontal Benches
8' min.
Original ground surface
Topsoil zone to be stripped, depth to be determined at the time of construction.
Biaxial Geogrid LTDS - 500lb/ft (3 layers)
8' min.
13' min.
3'±6"
10' min.
10' min. 1st Bench
EMBANKMENT CONSTRUCTION DETAIL
Note: Drawing not to scale

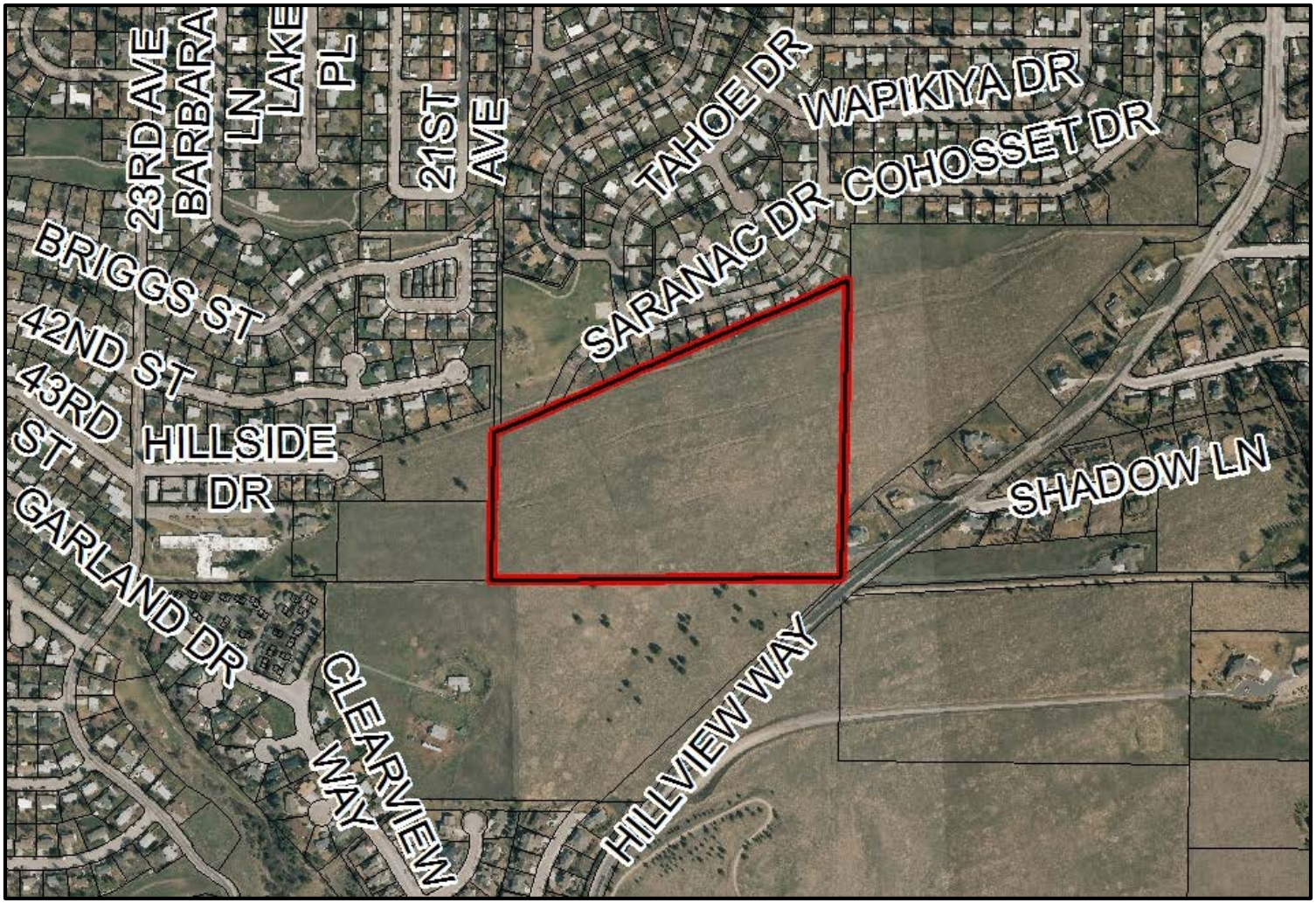
Hillview Crossing Townhome Exemption Development: Conditional Use Request

Land Use and Planning

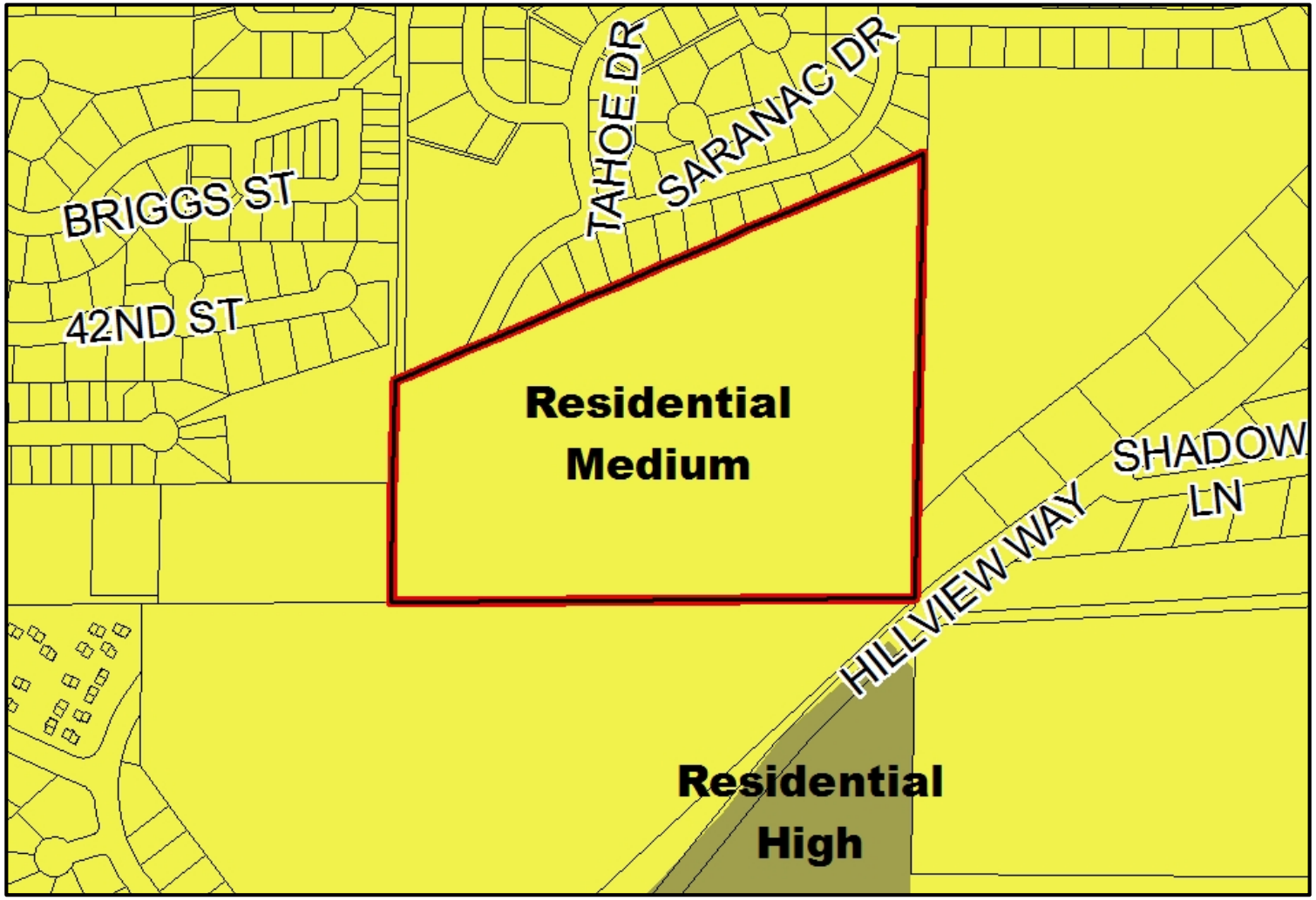
Anita McNamara, AICP, CFM
Development Services

December 12, 2018

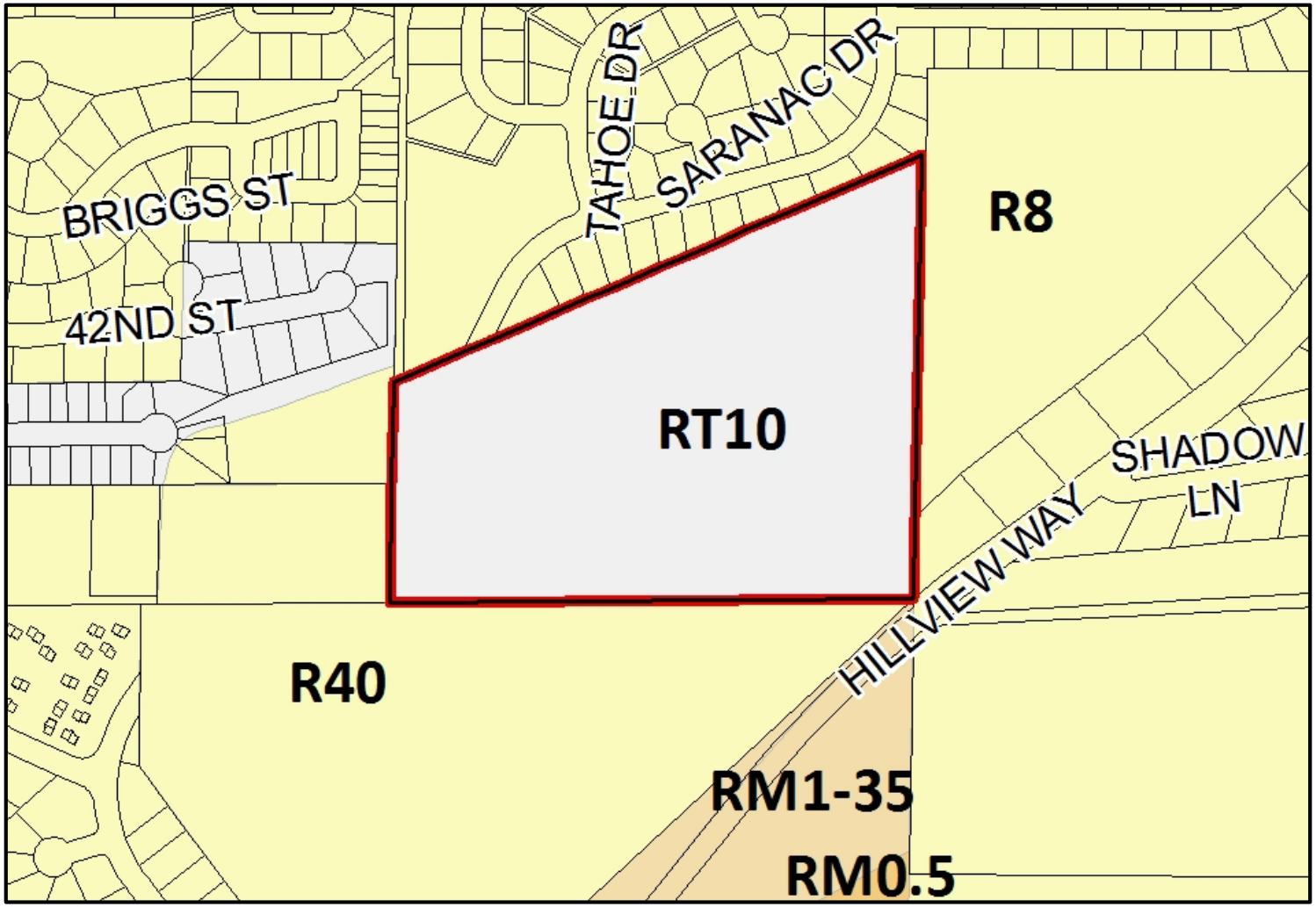
Location /Aerial Map



Growth Policy Land Use Map



Area Zoning Map



View from Hillview Way

Townhome Exemption

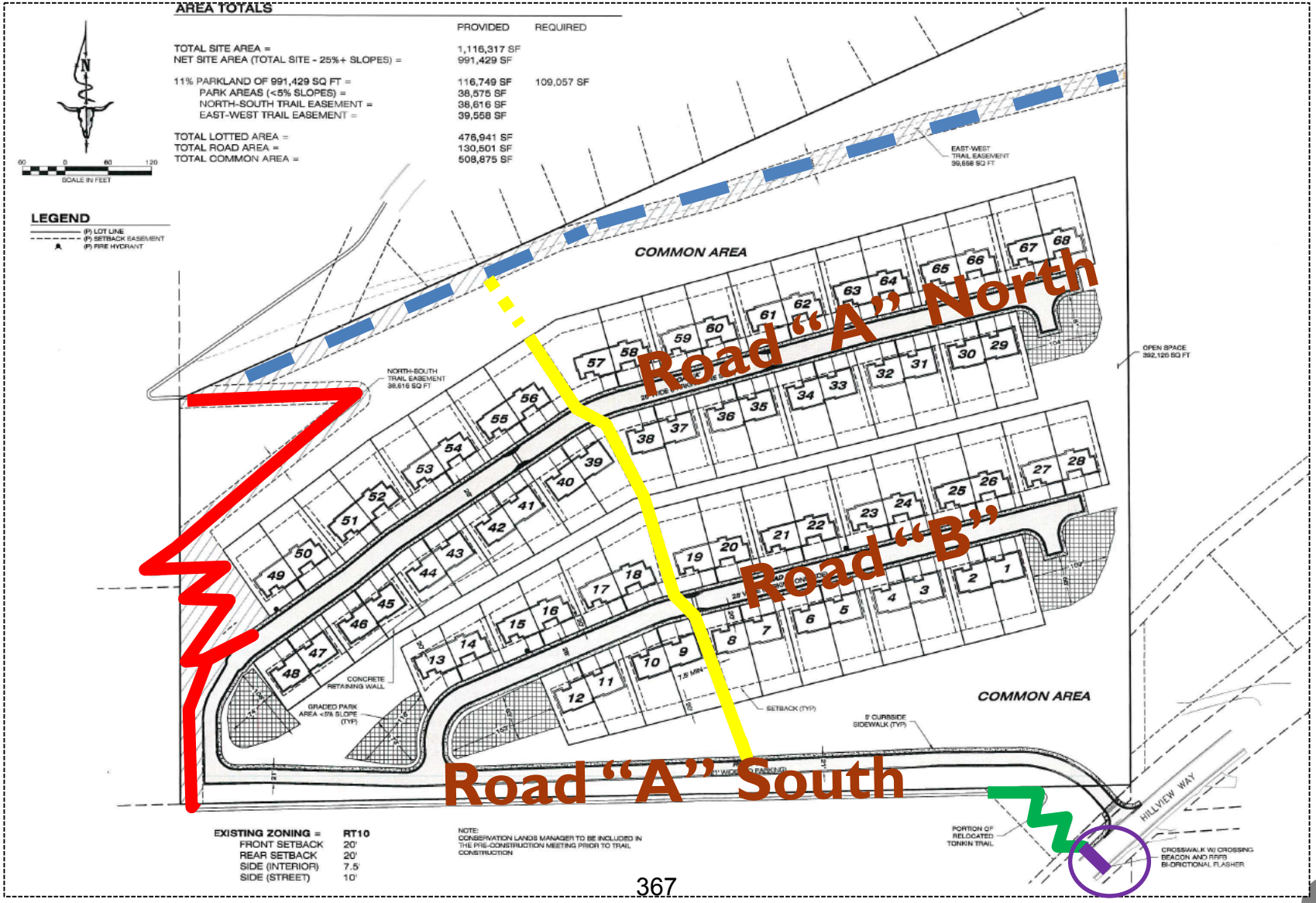
What it is:

- **Compliance with applicable federal, state & local regulations**
- **Title 20, section 20.40.180, must comply with zoning:**
  - **Density**
  - **Setbacks**
  - **Infrastructure**
  - **Maximum Block Lengths**
  - **Parks, Trails, Open Space**
  - **Title 12 TED Road and Access Standards**

What it is not:

- **A subdivision, because it is an exemption from subdivision**

Proposed Site Plan

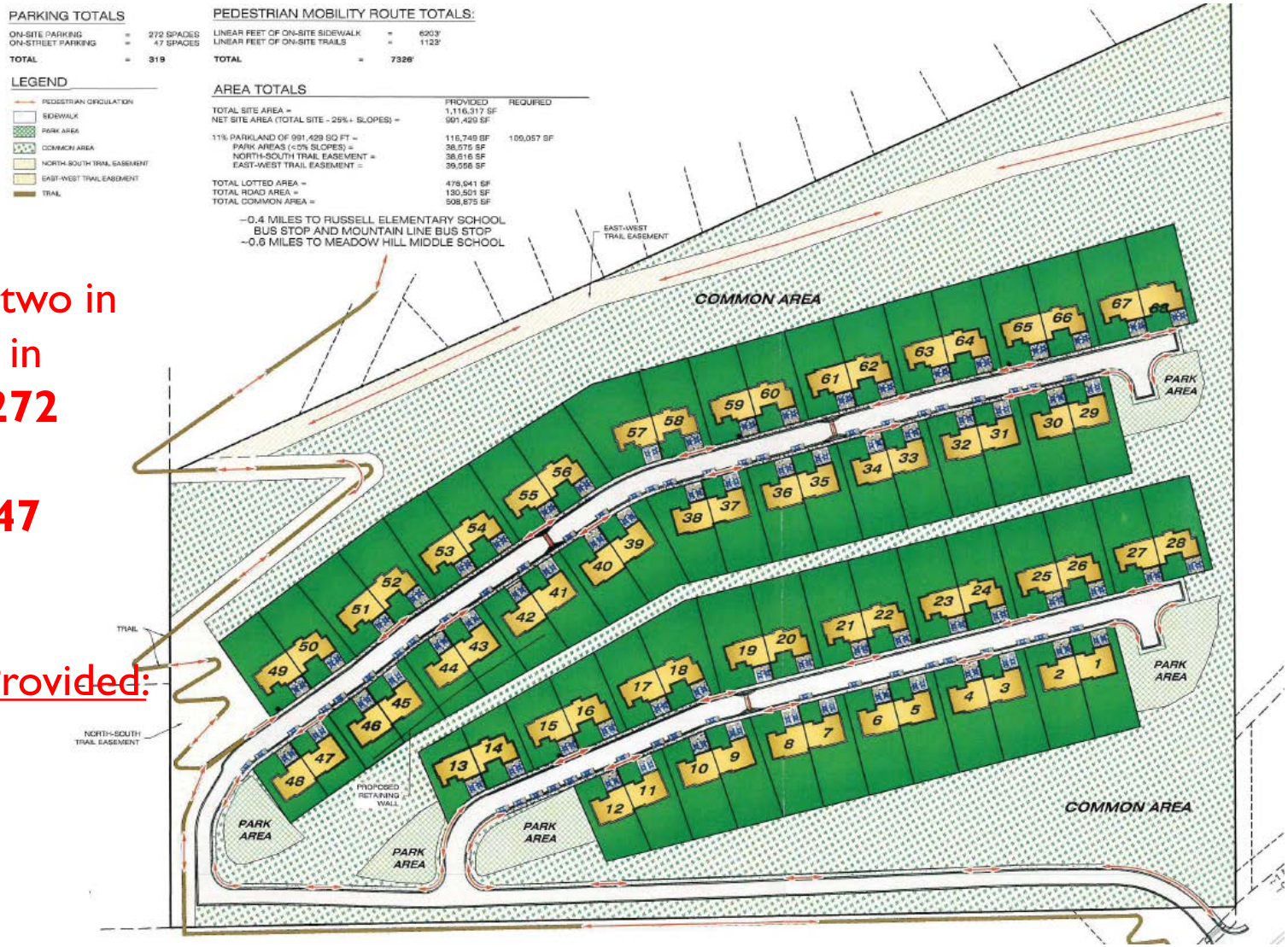


Parking and Ped Circulation Plan

Parking

- Off-street (two in garage, two in driveway): **272** spaces
- On-street: **47** spaces

Total Parking Provided: **319** spaces



Renderings

Renderings

TED Review Criteria

With staff recommended conditions, will meet TED standards regarding:

- **Density**
- **Setbacks**
- **Infrastructure**
- **Maximum Block Lengths**
- **Parks & Trails and Open Space**

Conditional Use Review Criteria

- **Compliance with Zoning standards and other applicable regulations;**
- **Compatible with the character – site and building design;**
- **Compatible operating characteristics; and**
- **Traffic safety – all modes of transportation.**

Staff Recommendation

APPROVAL of the townhome exemption development (TED) conditional use request, in accordance with Missoula City Zoning Ordinance, Title 20, Sections 20.01.060.B, 20.05.040D, 20.05.050, 20.40.180 and 20.85.070 based on the findings of fact in the staff report and subject to the conditions of approval.

HILLVIEW CROSSING ROAD WIDTH SUMMARY

for

Missoula City Council Review

March 2019

Prepared For:
Hillview Crossing Missoula, LLC (Applicant)

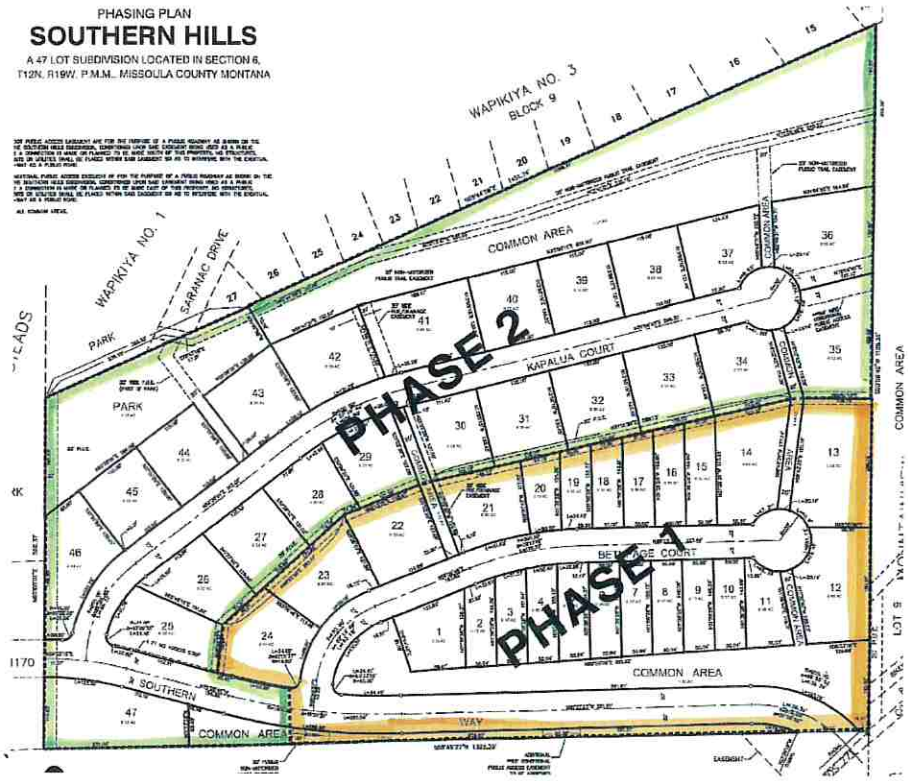
Prepared By:
Territorial-Landworks, Inc.
P.O. Box 3851
Missoula, MT 59806

INTENT SUMMARY

In light of the recent motion by the Land Use and Planning (LUP) Committee to include a condition to require 35' roads on the Hillview Crossing project rather than 28' roads as proposed, our client has requested we provide clarification and facts to support the original design for the full committee to consider prior to finalizing their vote.

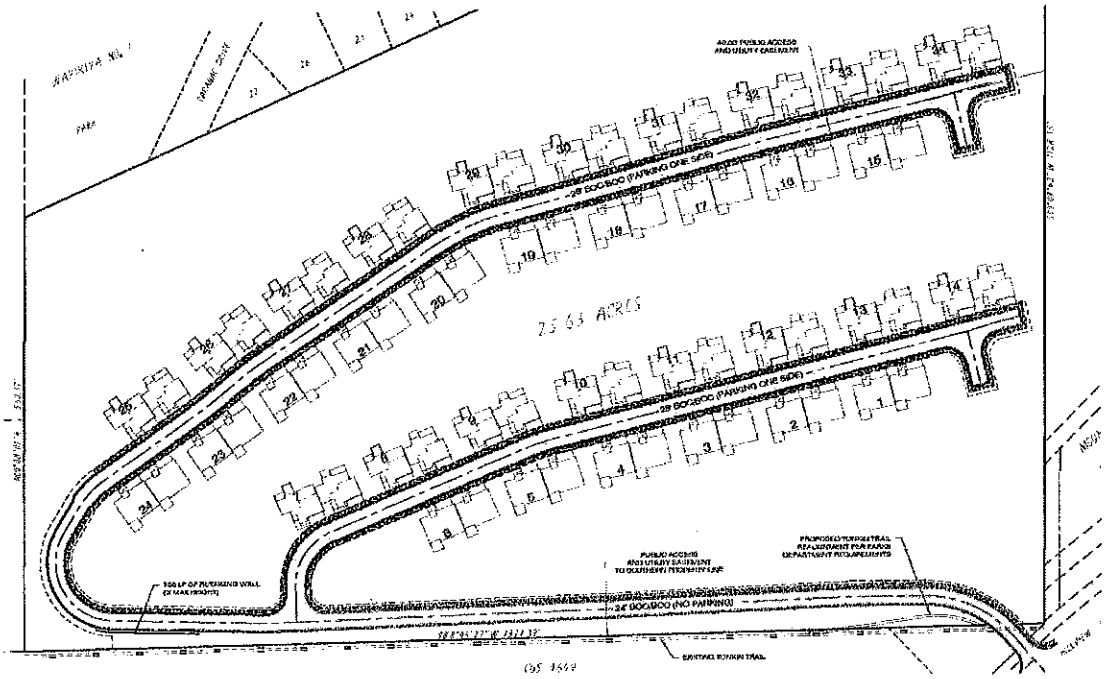
FINDINGS OF FACT

1. On May 22, 2006 the City Council approved a Subdivision on the subject property called Southern Hills Subdivision (see layout below). This project included 47 lots with 31 single family units and 16 townhome units.



2. The road layout for the Southern Hills Subdivision was very similar in design to the currently proposed Hillview Crossing. The roads that fronted the residential lots were approved at a width of 32'.

3. On October 16, 2015 the City Staff issued a Zoning Compliance Permit for an exempt Townhouse project on the subject property called Hillview Crossing (see layout below). This project included 68 units of residential housing in duplex style, very similar to that as proposed in the current Hillview Crossing Project.



4. The road widths approved on this original Hillview Crossing Townhouse project were 28' wide and permitted parking on one side of the road.

5. On November 4, 2015 City Staff presented a power point presentation to City Council as the pre-cursor to an amendment to Title 20 as well as Title 12 in an attempt to curb the perceived ill effects of the exempt Townhouse projects. This presentation is on the record for the current proposal and includes the layout for the original Hillview Crossing Townhouse project that included 28' dead end roads.

6. The Human Resource Council (HRC) lodged a legal complaint against the City and the Developers that was eventually dismissed. However, the prior approvals had since lapsed.

7. On April 18, 2016 the City of Missoula adopted changes to Title 12 and Title 20 for Townhouse Exempt Developments (TED) that included allowances for streets where parking could be limited to one side if the road was 28' wide.

8. In the Spring of 2018, the Developers met with City Staff as well as City Leaders to discuss moving the project forward. The land was offered to the City as open space. However, the Developers were encouraged to proceed with an updated layout so that additional housing supply could be created for Missoula. City Staff reviewed the old layout and determined that the only place where the new Title 20 TED standards were not in compliance were the setbacks from street infrastructure.

9. The original Hillview Crossing layout had the homes 10' from the street which did not facilitate off street parking in the driveways. Initial discussions included leaving the road widths as is and applying for a variance to allow the homes to remain within 10' of the street. The development team explored other options and found that we could use the original grading plan and slide the homes to meet the 20' setback. This started to push the footings into the areas where they

might not meet native soils. Options were explored to mitigate the foundation design issues and we moved forward without a variance for the setbacks.

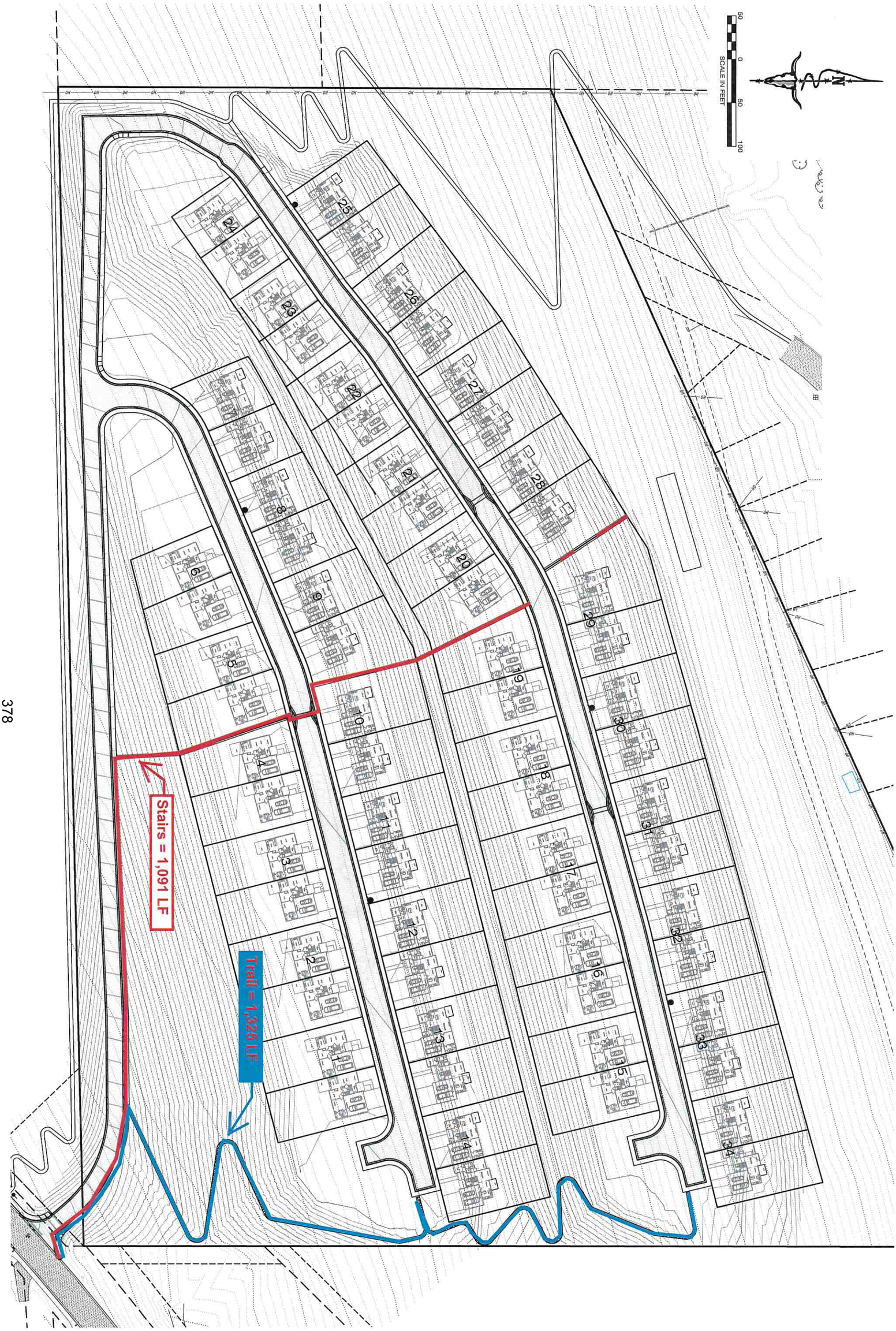
10. Moving the garages to meet the 20' setback added 136 off-street parking spaces not previously included when approved with 28' wide roads and on-street parking limitations.
11. The development team continued to meet with City Staff including but not limited to City Planners, City Engineering, and the City Fire Department. All of the technical agencies did not recommend widening the roads.
12. In discussions with City Staff and in an attempt to gain support for public maintenance, the Developers asked TLI to evaluate 35' wide roads. The conclusion was that this would render the project infeasible if the 20' setback is maintained.
13. City Planning Staff issued a Staff Report on December 6, 2018 that included a recommendation for approval with the road width at 28' since it meets the Title 12 standards.
14. Driveway openings are 20' wide for each Duplex. Road A has 20 driveway openings on the North side and 20 driveway openings on the South side. Road B has 16 driveway openings on the North side and 12 driveway openings on the South side.
15. Due to pedestrian crossings and driveway openings only 44-50% of the street is available for parking. If parking was proposed along both sides of the street, this would create an additional 33-35 street parking spaces. However, a variance may be requested to decrease the front yard setback, resulting in a loss of 64-72 parking spaces if only one side of the street received the variance.
16. No parking requirements are routinely enforced by private entities throughout Missoula including Condominium Projects that are not currently reviewed by the same process found in the TED process. No parking signs and curb painting will be installed as required by the City of Missoula.
17. The Hillview Crossing Townhouse project includes parking that exceeds the requirements of Title 20 with parking on one side of the street.
18. Adding 7' to the width of the road will increase the impervious area by approximately 16,163 square feet and will therefore increase runoff more than previously planned.
19. The entry road grading is such that the southern most homes are where they need to be in order to have a functional backyard. Widening the road will require that the homes along Road B (Southern road) be moved 7' down the slope. This will create a ripple effect where the downhill homes along Road A (Northern road) will be moved 14' further down the hill. However, the road grades will need to stay as is to maintain appropriate road access to the homes. Therefore, the foundations will need to be 3'-5' taller than currently proposed in order to interact with native soils.
20. Allowing parking on both sides of the street will impede snow removal due to offsets for the plow from vehicle edge if there were cars parked on both sides during a snow event. Plows will typically ride against a curb whereas they typically need at least 2' of clearance from a vehicle side.
21. Requiring the road widths to be increased above that required in the published regulations will add an estimated $6,000 to $7,000 per unit in foundation expense and service line lengths. In addition, this will add approximately $53,000 in street construction. The cost of additional mass grading needed is not possible to calculate at this time without re-running the grading model.

22. After consultation with engineers, Architects, and their Builder, it is the Developer's professional opinion that widening the road will render the project infeasible and is effectively a denial, unless a variance is granted for front yard setbacks.

ATTACHMENTS

- N/A

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\4_PLANNING\Governing Body Hearings\Rpt.City Council Road Width.2019-03-19.docx

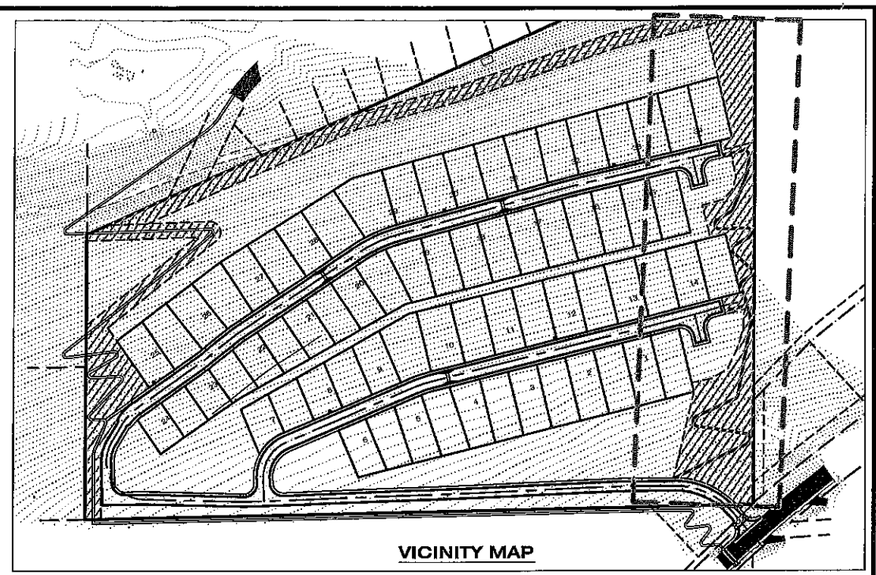


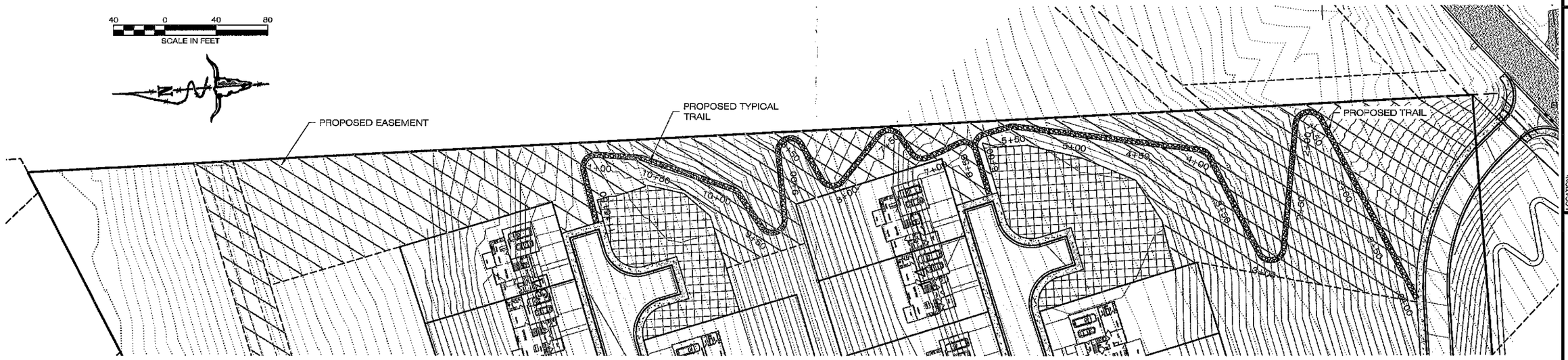
PRELIMINARY	PROJECT NO. 14-3592	PROJECT NAME HILLVIEW CROSSING - MISSOULA	LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA	DESIGNED: JW DRAFTED: CHECKED: DATE: 6/19/2018	REVISIONS DATE
	SHEET: 1 OF 1	SHEET TITLE: PROPOSED TRAIL EXHIBIT	PREPARED FOR: HILLVIEW CROSSING, LLC.		

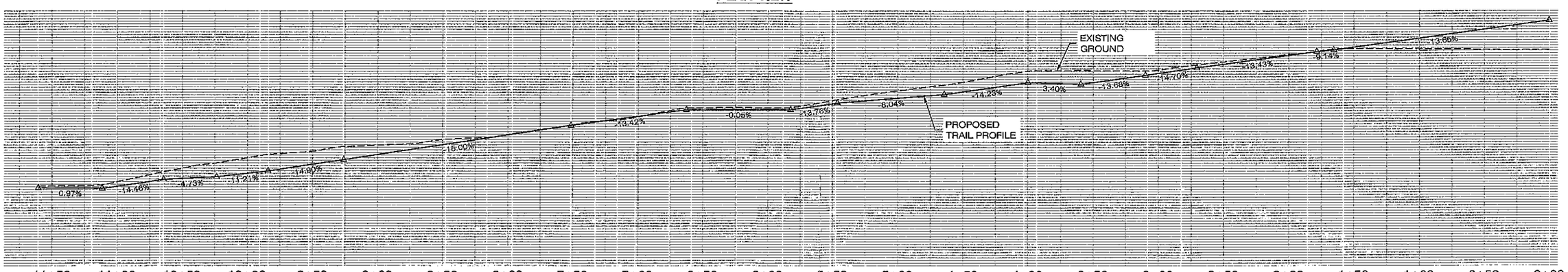
TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
www.TerritorialLandworks.com
Ph: 406/721-0142 Fax: 406/721-5224
P.O. Box 3851 Missoula, MT 59806

DWG LOCATION: T:_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA S HILLS DEVELOPMENT\8_DRAFTING & 1_DRAWINGS\AUTOCAD D-14-3592-ALT CONNECTION.DWG

PLOT DATE: 3/20/2019 9:59 AM







TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
www.TerritorialLandworks.com
P.O. Box 8951
Missoula, MT 59807
Ph: 406721-0182
Fax: 406721-5224

PLOT DATE: 12/14/2018 2:04:2 PM

REVISIONS	DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 4/19/2018

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: PROPOSED TRAIL EXHIBIT SECONDARY OPTION

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA & HILLS DEVELOPMENT\PLAN_DRAFTING\1_DRAWINGS\AUTOCAD\DWG\14-3592SAT CONNECTION.DWG

From:	Paul Forsting
To:	John DiBari; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes
Cc:	Jason Rice; John Giuliani; "Alan F. McCormick (afmccormick@GARLINGTON.COM)"; Daniel L. Ermatinger
Subject:	Hillview Crossing Council Review
Date:	Monday, March 11, 2019 8:54:53 AM

Hello Mary et al.,

We would like to suggest the following conditions of approval for the project. These conditions would be in addition to the current list in the staff report. These conditions relate to comments that have been communicated during the LUP meetings. They capture the important timing and reporting requirements for the project's Geotechnical considerations, stormwater improvements, mass grading, utilities, and roadways.

Proposed Conditions of Approval

1. Specific Geotechnical Reports shall be prepared for each building permit. The Geotechnical Report shall be prepared no more than six months in advance of the building permit. Each foundation excavation shall be inspected by a geotechnical engineer in accordance to the specifications in the Geotechnical Report.
2. The applicant shall provide an updated Geotechnical Report that is valid for a minimum of five years. The report shall include provisions for roads, infrastructure, home locations, excavation or embankment locations, construction staging of topsoil, erosion control measures during construction, retaining walls, final grading, stormwater facilities, and other applicable final plans for construction. The updated Geotechnical Report shall be reviewed and approved by City Engineering prior to zoning compliance approval of the townhome exemption declaration.
3. The mass grading, utilities and roadways shall be constructed and certified by a professional engineer in accordance with the Geotechnical Report. The mass grading, utilities and roadways construction plans shall be reviewed and approved by City Engineering prior to zoning compliance approval of the townhome exemption declaration. The mass grading, utilities and roadways shall be installed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to review and approval of the City Engineer.
4. The applicant shall provide an Operation and Maintenance (O&M) Manual prepared by a professional engineer. The O&M Manual shall include appropriate inspections, maintenance, and repairs provisions to ensure the long term viability of the stormwater facilities. A budget for stormwater facilities regular maintenance and replacement costs shall be included with O&M Manual. The manual shall be reviewed by City Engineering prior to zoning compliance approval of the townhome exemption declaration.
5. A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared and submitted for review in conjunction with the Geotechnical Report and infrastructure construction plans. The SWPPP shall be followed until the site is stabilized in accordance with the City of Missoula and Montana Department of Environmental Quality (MDEQ) regulations. The SWPPP shall be reviewed by City Engineering prior to zoning compliance approval of the townhome exemption declaration.

Paul Forsting, *AICP, Land Use & Environmental Planner*

TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING · SURVEYING · LAND USE CONSULTING

1817 South Ave West Suite A | Missoula, MT 59801
406/721-0142 phone | 406/721-5224 fax
PaulF@TerritorialLandworks.com

website newsletter facebook linkedin

From: John DiBari <JDibari@ci.missoula.mt.us>
Sent: Wednesday, March 6, 2019 8:03 AM
To: Grp. City Council and City Web Site <Council@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Paul Forsting <paulf@territoriallandworks.com>
Subject: Note from Teresa Jacobs

Good morning,

Ms. Jacobs sent me a note with issues she would like addressed as she will be unable to attend LUP today.

Please see attached.

Thanks,

John

From: Troy Monroe
To: "Jason Rice"; Andrew Mill; Kevin Slovarp; Bob Hayes
Cc: Cory Davis; Anita McNamara; Mary McCrea; Mike Haynes
Subject: RE: City Engineering comments on Hillside Crossing sufficiency
Date: Tuesday, October 09, 2018 11:30:13 AM

Cory –

The City has reviewed the submitted storm water report and find the report sufficient. However, there are items that need to be addressed in the final submittal after infrastructure has been designed. Additionally, this review and the finding of sufficiency does not, in any way, relieve the consultant of responsibility of storm water design. Since first submittal the errors that the City has found has almost doubled the amount of storm water being produced by the development. Having these errors being found by City review verses the consultant's quality assurance does not give us faith that engineering concepts are being followed. If additional errors or omissions are discovered in this preliminary design or in future submittals it will be the developer's responsibility to correct them. The City's deeming the preliminary design sufficient does not indicate full acceptance of design.

With that said, here are two items that need to be addressed in the final report:

1. Section 5.2B – The pro-rated outlet flow calculation must only include the area that can drain to the collection ditch. Adding acreage that is below the ditch to the calculation of what flows to the ditch is incorrect.
2. Section 5.2C – Calculations for pipe capacity must look at the system as a whole and not just individual pipe sections. The capacity of pipes in a system are dependent on both upstream and downstream conditions and therefore should be modeled as a system.

Again, the City has deemed the preliminary design report sufficient and no submittals are required at this time.

Please contact me with any questions or concerns.

Thanks,

Troy Monroe PE
Assistant City Engineer
552-6091

From: Jason Rice <jasonr@territoriallandworks.com>
Sent: Tuesday, October 9, 2018 9:06 AM
To: Troy Monroe <MonroeT@ci.missoula.mt.us>; Andrew Mill <AndrewM@territoriallandworks.com>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Cory Davis <CoryD@territoriallandworks.com>; Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: Re: City Engineering comments on Hillside Crossing sufficiency

Troy. Have you completed the reciew?

Jason Rice, *P.E., CEO*

Territorial-Landworks, Inc
1817 South Ave West Suite A | P.O. Box 3851 | Missoula, MT 59806
406/721-0142 phone | 406/215-1016 direct | 406/240-4265 cell | 406/721-5224 fax
JasonR@TerritorialLandworks.com

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Troy Monroe <MonroeT@ci.missoula.mt.us>
Date: 10/3/18 11:00 AM (GMT-07:00)
To: Andrew Mill <AndrewM@territoriallandworks.com>, Jason Rice <jasonr@territoriallandworks.com>, Kevin Slovarp <KSlovarp@ci.missoula.mt.us>, Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Cory Davis <CoryD@territoriallandworks.com>, Anita McNamara <McNamaraA@ci.missoula.mt.us>, Mary McCrea <McCreaM@ci.missoula.mt.us>, Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Thanks Andrew. I am assuming that this has been QA reviewed by the signing PE and all basic engineering concepts have been followed.

If so, I should have a review completed in the next couple of days.

Thanks,

Troy Monroe PE
Assistant City Engineer
552-6091

From: Andrew Mill <AndrewM@territoriallandworks.com>
Sent: Wednesday, October 3, 2018 10:14 AM
To: Jason Rice <jasonr@territoriallandworks.com>; Troy Monroe <MonroeT@ci.missoula.mt.us>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Cory Davis <CoryD@territoriallandworks.com>; Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Troy,

See attached for the again revised preliminary drainage report. The areas (pre vs. post development) now match, as the western proposed trail area was added to Basin 5 (not a separate Basin 6 as Jason described below) for purposes of the drainage analysis.

Andrew Mill, *E.I., Staff Engineer*

1817 South Ave West Suite A | Missoula, MT 59801
406/721-0142 phone | 406/381-2320 cell | 406/721-5224 fax
AndrewM@TerritorialLandworks.com

From: Jason Rice
Sent: Tuesday, October 02, 2018 2:07 PM
To: Troy Monroe <MonroeT@ci.missoula.mt.us>; Andrew Mill <AndrewM@territoriallandworks.com>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Cory Davis <CoryD@territoriallandworks.com>; Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Troy – I did not review the original, but did notice that they were different as I was filling in for Cory. However, as you can see, we used the exact same basin sizes that you discussed in the original report. This seems like a moving target to me, but perhaps the original report did not get reviewed as rigorously?

The maps have been the same in both reports and show that the area west of Basin 3 and 5 was not included (we will call it post development basin 6) and also includes the area along the entry road. I suggest that it will also be improved as the upper area will be planted and landscaped so we can certainly add that basin in, but doubt that it will change much since it has no impervious other than the gravel trail, but does see the benefit in the upper area from the landscaping that will occur roadside and next to the home. I am not sure why it was done that way or why it was agreed upon. Also note that neither sets include the area below the cut-off ditch. Picture of basin 6 below…

I do not think a face to face meeting is needed, but do you only want us to include the Basin 6 as described above or do you want us to update all the calcs to include the area below the cut-off ditch too?

I phone call could also accommodate the conversation.

From the original report..

cid:image019.png@01D45B00.4CD54580

From the updated report… (the acreage of the basins did not change)

cid:image020.png@01D45B00.4CD54580

cid:image021.png@01D45B00.4CD54580

Jason Rice, *P.E., CEO*

1817 South Ave West Suite A | Missoula, MT 59801
406/721-0142 phone | 406/215-1016 direct | 406/240-4265 cell | 406/721-5224 fax
JasonR@TerritorialLandworks.com

From: Troy Monroe <MonroeT@ci.missoula.mt.us>
Sent: Tuesday, October 2, 2018 1:01 PM
To: Jason Rice <jasonr@territoriallandworks.com>; Andrew Mill <AndrewM@territoriallandworks.com>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Cory Davis <CoryD@territoriallandworks.com>; Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

No, this is not correct. You have 24.58 acres in the pre-development calculation and 22.76 acres in the post-development calculation. You are adding 1.82 acres to the pre-development calculation and taking that volume off of the increase in post-development.

Please schedule a meeting to come in and I can walk you through the math.

Troy Monroe PE
Assistant City Engineer
552-6091

From: Jason Rice <jasonr@territoriallandworks.com>
Sent: Tuesday, October 2, 2018 12:43 PM
To: Troy Monroe <MonroeT@ci.missoula.mt.us>; Andrew Mill <AndrewM@territoriallandworks.com>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Cory Davis <CoryD@territoriallandworks.com>; Anita McNamara <McNamaraA@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: Re: City Engineering comments on Hillside Crossing sufficiency

Troy. This is the same method that you agreed to when Cory and you met with our client. If methodology was approved then why change? We are comparing entire de eloped site to entire developed site.

Jason Rice, *P.E., CEO*

Territorial-Landworks, Inc
1817 South Ave West Suite A | P.O. Box 3851 | Missoula, MT 59806
406/721-0142 phone | 406/215-1016 direct | 406/240-4265 cell | 406/721-5224 fax
JasonR@Territoriall.andworks.com

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Troy Monroe <MonroeT@ci.missoula.mt.us>
Date: 10/2/18 12:01 PM (GMT-07:00)
To: Andrew Mill <AndrewM@territoriallandworks.com>, Kevin Slovarp <KSlovarp@ci.missoula.mt.us>, Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>, Cory Davis <CoryD@territoriallandworks.com>, Anita McNamara <McNamaraA@ci.missoula.mt.us>, Mary McCrea <McCreaM@ci.missoula.mt.us>, Mike Haynes <HaynesM@ci.missoula.mt.us>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Guys, you have to compare the same area pre-development to post-development. There is obviously a difference between your whole lot (used for pre-development rate) and the summation of the post-development basins (used for post-development rates.

So, this is how I would approach the calculation. Either use the whole lot and account for the overall acreage change to impervious and landscaping per soil group. Or, use the basins acreage and do a pre-development calculation (in addition to the post-development calculation) and show the difference for each basin.
One way or another you must compare the same acreage pre-development to post-development.

Before I can mark storm water as sufficient I have to be certain that your methodology is correct.

As a note, there are a lot of holidays in the next three (3) months. This issue has already pushed the Council meeting from November to December. Anita has warned me that if this isn't sufficient by next week then it will probably get pushed to January.

Troy Monroe PE
Assistant City Engineer
552-6091

From: Andrew Mill <AndrewM@territoriallandworks.com>
Sent: Tuesday, October 2, 2018 10:20 AM
To: Troy Monroe <MonroeT@ci.missoula.mt.us>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Cory Davis <CoryD@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Troy,

See attached for the revised report and calculations. After the previous back and forth, we completed a more thorough review of the calculations to determine if there were any other errors that those previously pointed out.

After review, a few calculation changes were made, mainly what you described previously. Basin 5 is in fact to be included in both pre and post development calculations. Additionally, the combination of HSG 'B' and 'C' were taken into account throughout the site due to both occurring. This was an oversight and scaling of the HSG Soils Map compared to our site and should be corrected now (i.e. Basin 1 is both 'B' and 'C'; Basin 2 is primarily 'C' with some 'B'; Basin 3 is both 'B' and 'C'; Basin 4 and 5 are all 'B', etc.). Originally, it appeared that there were more 'C' areas than 'B' areas, but that is not the case. Another error encountered was that Basin 5 is actually all HSG 'B' and not 'C' as previously specified within the calculations. This altered the post-development conditions and total runoff volume that will need to be detained, which is actually closer to 14,100 cubic feet. The calculations showing how this was obtained is in the attached report.

Please review and let me know if you have any further questions or comments.

Andrew

Andrew Mill, *E.I., Staff Engineer*

1817 South Ave West Suite A | Missoula, MT 59801
406/721-0142 phone | 406/381-2320 cell | 406/721-5224 fax
AndrewM@TerritorialLandworks.com

From: Troy Monroe <MonroeT@ci.missoula.mt.us>
Sent: Friday, September 28, 2018 10:40 PM
To: Andrew Mill <AndrewM@territoriallandworks.com>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Cory Davis <CoryD@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Andrew –

I think you have a serious calculation problem. You need to go back and separate the basins and recalculate based on basin pre to post. If you have 25 acres in the pre-development calculation then you need to include all 25 acres in the post development calculation. If one

basin is the same pre-development and post-development either not include it in both calculations or include it in both calculations. When you do you should come up with 19k CF difference.

Please check your calculations and re-submit.

Troy Monroe PE
Assistant City Engineer
552-6091

From: Andrew Mill <AndrewM@territoriallandworks.com>
Sent: Friday, September 28, 2018 4:37 PM
To: Troy Monroe <MonroeT@ci.missoula.mt.us>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Cory Davis <CoryD@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Troy,

My apologies. In the urgency of revising all the calculations and report, I erased the calculation. See attached for the report showing how this value was obtained.

Thanks,
Andrew

Andrew Mill, *E.I., Staff Engineer*

1817 South Ave West Suite A | Missoula, MT 59801
406/721-0142 phone | 406/381-2320 cell | 406/721-5224 fax
AndrewM@TerritorialLandworks.com

From: Troy Monroe <MonroeT@ci.missoula.mt.us>
Sent: Friday, September 28, 2018 4:01 PM
To: Andrew Mill <AndrewM@territoriallandworks.com>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Cory Davis <CoryD@territoriallandworks.com>
Subject: RE: City Engineering comments on Hillside Crossing sufficiency

Andrew –

Can you send me the calculation for the Runoff Volumes. You show 6,158 CF but not the calculation used to obtain this value. Why is the calculation not included in the revised report?

cid:image024.jpg@01D45A37.7EFDA440

Thanks,

Troy Monroe PE
Assistant City Engineer
552-6091

From first report:

cid:image025.jpg@01D45A37.7EFDA440

From: Andrew Mill <AndrewM@territoriallandworks.com>
Sent: Friday, September 28, 2018 3:15 PM
To: Troy Monroe <MonroeT@ci.missoula.mt.us>; Kevin Slovarp <KSlovarp@ci.missoula.mt.us>; Bob Hayes <BHayes@ci.missoula.mt.us>
Cc: Jason Rice <jasonr@territoriallandworks.com>; Cory Davis <CoryD@territoriallandworks.com>
Subject: City Engineering comments on Hillside Crossing sufficiency

Hi Troy,

See our revised preliminary drainage report for the City's sufficiency review. We should have addressed all of the comments or questions you had regarding our previously submitted one. A few things to point out that have changed:

- A "pro-rated" allowable discharge rate from the design 7 cfs. There is also an exhibit included showing how that calculations was completed.
- A combination curve number was used for the mixed hydrologic soil groups B and C. This subsequently updated a majority of the runoff calculations.
- Language throughout was updated based on the comments in the previous report. Generally, the sections updated due to City comments were 3.1A, 5.1A, 5.1B, 5.2A, 5.2B, 5.2C, and the conclusion. These can be pointed out if needed.

If you have any further questions, comments, or concerns, please let me know.

Thanks,
Andrew

Andrew Mill, *E.I., Staff Engineer*

1817 South Ave West Suite A | Missoula, MT 59801
406/721-0142 phone | 406/381-2320 cell | 406/721-5224 fax
AndrewM@TerritorialLandworks.com

From:	Elizabeth Erickson
To:	Mary McCrea; Anita McNamara
Cc:	Neil Miner; Donna Gaukler; David Selvage; Morgan Valliant; Chris Boza
Subject:	Parks Department Hillview Way TED Agency Comments
Date:	Friday, November 16, 2018 11:04:09 AM

Anita and Mary,

Thank you for the opportunity to comment on the proposed Hillview Way TED conditional use application. The Parks Department provides the following comments:

The Parks Department has worked in partnership with the applicants to design and refine a trail plan that directly mitigates impacts of the development by providing non-motorized trail connections between the development, Wapikiya Park, the existing public Tonkin Trail, the pedestrian sidewalk system on Hillview Way and the non-motorized pedestrian access to Chief Charlo Elementary School, the public school for this neighborhood.

The North-South trail connection, between Wapikiya Park and the Tonkin Trail, is the most important portion of the open space dedication, because it provides significant non-motorized connections for the residents of the development and the neighborhood. This project will entail a significant amount of excavation work. During construction is the most cost-effective time to construct a trail, and developers have agreed to construct the north-south trail during that construction. The trail shall be an unpaved, gravel trail, with a width of approximately 24”-36”. This width is wide enough to accommodate a mini-excavator to construct the trail, which is much more cost-effective than constructing the trail by hand.

Developers will work together with the City’s Conservation Lands Manager to determine the exact width and location of the trail. Because the trail will cross a portion of the City’s Homestead Park, the Developers will also work with the City’s Conservation Lands Manager to determine the specific location where the trail will cross City land. The trail will also be located within a public access easement, and upon completion of construction of the trail, the City will manage and maintain the trail after it is opened to the public.

The trail plan also depicts an east-west public access easement across the northern (downhill) property line of the development, which is consistent with previous meetings between the developers and Parks Department staff. This easement is beneficial to preserve public access between the development and any future connections to the City parkland to the east, and between Wapikiya Park and the City parkland to the east. However, because there is currently no public access through the adjacent and intervening Mountain View Estates Homeowners Association land to the east, it is not beneficial for the developers to construct the trail in that location at this time. The current trail plan accurately shows the developers will grant to the City a public access easement in that location, which could accommodate a future trail.

Walkability is important within this development to promote health and wellness of the residents, and the ability to travel locally without a car, for recreation, school and accessing services. The sidewalk on Hillview Way will be the route children can use to walk to school at Chief Charlo, and it is essential that residents be able to access the sidewalk and trail system within a reasonable distance from each unit and between blocks. The current walking distance to the sidewalk system is too far from certain units.

Aside from the two public access trail easements for the north-south and east-west trail connections, the common area/open space will be privately owned without public access. The common areas will need active weed management by the townhome/homeowners association.

It appears the developers have relocated the sewer alignment out of Wapikiya Park and into the right-of-way, so there should be no need for developers to obtain an easement from City Council or the Park Board. If the sewer line needs to encroach into the park, because of required offsets to the existing utilities in the right-of-way, developers will need to request the City grant a utility easement, which will require the Council/Park Board process described above.

The Parks Department has also coordinated with City Engineering about the capacity of the storwater system. If the City Engineering department's review determines that the post-development flows of stormwater from the development meet pre-development flows as proposed, and those flows do not exceed the capacity of the stormwater system as designed, the Parks Department does not have any concerns with the design of the stormwater system.

Finally, appropriate trees for the width of the boulevards need to be installed. Develop a tree planting plan for the TED using appropriate trees from the city's approved tree list and the adopted neighborhood tree planting plan

Elizabeth Erickson

MISSOULA URBAN TRANSPORTATION DISTRICT
1221 Shakespeare | Missoula, MT 59802
(406) 543.8386 | Fax (406) 543.8387
WWW.MOUNTAINLINE.COM

TO: Anita McNamara, Planner III
FROM: Corey Aldridge
DATE: November 15, 2018

Re: Agency Comments on Proposed Hillview Crossing Townhome Exemption Development Conditional

Transportation District Considerations

The proposed development is not currently in the Transportation District. The surrounding properties are part of the Transportation District, and MUTD requests the developer be required to petition into the District as part of the approval process.

If the developer is not required to petition into the Transportation District, the result will be a loss of future funding for Mountain Line transit services, and continued fracturing of the Transportation District boundaries.

Site Design and Layout

The applicant states "there are existing Mountain Line bus stops within walking distance of the development in the interest of public convenience". The acceptable walking distance to public transit is ¼ mile. The planned layout for the development is essentially a giant cul-de-sac, and would require a person to walk up to ½ mile just to get to Hillview Way. In total, the proposed development would require someone to walk between 0.9 miles and 1.2 miles to reach an existing Mountain Line bus stop, depending on where in the development they start from.

The future Long-Term Network in the recently adopted MUTD Strategic Plan shows bus service on Hillview Way. MUTD requests a more pedestrian friendly layout in this development that will facilitate better access to transit services, which are overwhelmingly accessed by foot. At the minimum, a walking path in the middle of the development should be added to shorten the walking distance to Hillview Way. Part of this walking path could go on top of the proposed sewer lines. In addition, a walking path on the eastern of the development would reduce the longest walking distances in the neighborhood. The addition of these walking paths would reduce the distance to closest bus stop to a minimum of 0.8 miles and a maximum of 0.96 miles – a reduction of 12% to 20%.

This is likely the only opportunity to ensure the proposed development is designed and built to support public transit use.

From: Gordy Hughes
To: Dax Fraser; Anita McNamara
Cc: Mary McCrea
Subject: RE: Hillview Crossing Townhome Exemption Development
Date: Tuesday, December 11, 2018 9:54:12 AM

I might add to Dax's e-mail:

- If Dax is requiring the hydrants location opposite the parking side of the roadway, then they must have a compliant curb cut that would ensure 26' clear road width, this added to the required 8' for parking would make these portions of the roadway 34'. These specifications are out of appendix D as well.
- Hydrants and approved fire department access road must be installed prior to combustible construction
- HOA covenants might want to include Emergency Procedures for all hazards evacuation plan. I would offer up the assistance of the Missoula Fire Department Fire Prevention Bureau to assist in drafting the language of the procedures.

This proposed development meets the minimum requirements of the Fire Code.

Gordy Hughes
Asst. Fire Chief
Missoula Fire Dept.
625 E. Pine, Missoula, MT 59802
Work: (406) 552-6210
Direct: (406) 552-6189
Fax: (406) 552-6184
ghughes@ci.missoula.mt.us

From: Dax Fraser
Sent: Monday, December 10, 2018 6:15 PM
To: Anita McNamara <McNamaraA@ci.missoula.mt.us>; Gordy Hughes <HughesG@ci.missoula.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>
Subject: RE: Hillview Crossing Townhome Exemption Development

Most of the fire department's concerns were dealt with at the DRT meeting, but a quick recap is probably in order. The 21' wide road needs to be signed no parking on both sides of the road which will probably be very doable because there are no dwellings on that portion of road. The two portions of road that are 28' wide and have the dwelling units will need to be signed no parking on one side of the street, and I believe the signed side will be the north/low side of the street where the fire hydrants are located (fire hydrants should be on the no parking side). The turnaround is a hammerhead and is acceptable to the fire department as long as it's measurements are consistent with Appendix D of the IFC (developers are familiar with this from discussions we've had). In the DRT Kevin Slovarp mentioned they'd have to have a snow removal plan since the roads are going to be private, which is much needed on this project, but I'm not sure how that looks up front (contract, handshake?). Also, I'm guessing the City won't have a lot of good options in the future if the homeowners association decides not to provide or enforce their own snow removal plan for their development.

Lastly, Council Member DiBari's concerns about emergency traffic on these streets holds merit. Emergency traffic on roads like this (with slope and narrow) is slow with optimal conditions, but has the potential to pose various problems if the conditions above aren't followed or enforced. If the parking and snow removal aren't accounted for or ignored the possibility for an accident or inability to arrive on scene in an emergency situation.

Dax Fraser
Fire Marshal
Direct #: (406)552-6190

From: Anita McNamara
Sent: Thursday, December 6, 2018 10:22 AM
To: Gordy Hughes <HughesG@ci.missoula.mt.us>; Dax Fraser <FraserD@ci.missoula.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>
Subject: Hillview Crossing Townhome Exemption Development
Importance: High

Hi Gordy and Dax.

We met with Council Member DiBari yesterday to talk about the Hillview Crossing project, which is scheduled for a public hearing before City Council on December 17th. The roads in the project are proposed as private streets within public access easements. See attached site layout. The paving width of the southern segment of Road "A" is 21 feet back of curb to back of curb, and signed for No Parking for approximately 1,400 linear feet. The northern segment of Road "A" is 28 feet back of curb to back of curb with parking on one side for approximately 1,320 linear feet. Road "B" is 28 feet back of curb to back of curb with parking on one side for approximately 1,020 linear feet. Council Member DiBari raised some concerns as to whether fire equipment would be able to access the ends of the cul-de-sacs, the northern segment of Road "A" in particular, especially when there is a fire and fire trucks are having to navigate the roads while simultaneously residents are going the opposite direction in an attempt to drive out of the development to get to Hillview Way.

Attached is the site development layout plan for the project for reference. We have yet to receive fire comments on this project, so please take a look and provide us with comments by Tuesday, December 11th.

Please let me know if you have any questions.

Thanks,
Anita

Anita McNamara, AICP, CFM
Planner III
City of Missoula Development Services

From: Burley McWilliams
To: Anita McNamara
Subject: RE: Proposed Hillview Crossing Townhome Development
Date: Wednesday, January 23, 2019 11:28:34 AM

Anita,

Thanks for reaching out! The design as currently drawn makes it very difficult and probably impossible to take a school bus into the subdivision. There just isn't enough room to turn around a 70' bus. The other logical thought would be to add a stop at the entrance along Hillview to accommodate those students in that area. Unfortunately, I think that would be a potential safety issue as in the winter time it may be hard for the buses to get going again given the significant incline. Currently the nearest bus stop to that subdivision would be the intersection of Hillview and Clearview. Assuming safe sidewalks are available, students living in this area would need to walk up Hillview to Clearview to catch the bus. The safety concern with that is that there are no sidewalks on that side of Hillview. To get to the sidewalk kids would need to cross Hillview which is definitely a safety issue.

Would there be an option for a continues loop throughout that neighborhood for buses to gain access? Also, what is the proposed grade of the exit/entrance? There may be concern that the buses may have a difficult time getting out back onto Hillivew.

Thanks again,

Burley McWilliams
Director of Operations and Maintenance
406/728-2400 x3032

From: Anita McNamara <McNamaraA@ci.missoula.mt.us>
Sent: Tuesday, January 22, 2019 11:08 AM
To: Burley McWilliams <bmcwilliams@mcps.k12.mt.us>
Subject: RE: Proposed Hillview Crossing Townhome Development

Hi Burley.

I am following up with you on any comments that you might have for this project. The council committee is tomorrow morning and it would be great if I could provide them with an update.

Thanks,

Anita

From: Anita McNamara
Sent: Thursday, January 17, 2019 10:03 AM
To: 'bmcwilliams@mcps.k12.mt.us' <bmcwilliams@mcps.k12.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>
Subject: Proposed Hillview Crossing Townhome Development

Hi Burley.

The Missoula City Council is reviewing the Hillview Crossing Townhome Exemption Development project located on the west side of Hillview Way, just south of the Wapikiya neighborhood. I am the city planner assigned to this project and City Council member John DiBari recommended that I reach out to you concerning a question that came up in our committee meeting yesterday.

The project proposes 68 dwelling units on private roads. The development has just one access, from Hillview Way.

The question that came up is regarding whether or not MCPS would want a bus stop within the development and also whether the road design is adequate for a school bus to maneuver on.

Below are plans to provide more information and detail on the project with regard to access and transportation.

Here is the link to the site layout plan:
http://www.ci.missoula.mt.us/DocumentCenter/View/47981/5-Hillview-Crossing-Application-Submittal-Exhibit---Layout

Here is the link to the pedestrian circulation plan for the project:
http://www.ci.missoula.mt.us/DocumentCenter/View/47982/6-Hillview-Crossing-Applicatoin-Submittal-Exhibit--Parking-and-Pedestrian-Circulation

Here is the link to the drawings that show the intersection details:
http://www.ci.missoula.mt.us/DocumentCenter/View/47991/15-Hillview-Crossing-Application-Submittal-Exhibit---Sight-Distance-and-Turning-Drawings

Please let me know if a bus stop would be required here and if so, if the proposed private roads are adequate for school bus access. This project will be discussed on Wednesday, January 23, so a response before this date is very much appreciated.

Please let me know if you have any questions for me. Thank you very much for help.

Anita

Anita McNamara, AICP, CFM
Planner III/Floodplain Administrator
City of Missoula Development Services

March 13, 2019

Comment on Conditional Use Permit Approval for Hillview Crossing TED

To members of the Land Use and Planning Committee:

In the opinion of the District XI Human Resource Council (HRC) the conditional use review exists to tease out those hazards and risks and, hopefully, resolve those issues inherent in the proposed land use design that may threaten the unique natural and social contexts of the proposed use. This includes geophysical and biological factors as well as public infrastructure and services, property rights and interests of the surrounding land owners, as well as public health and safety.

If the Hillview Crossing TED presents a wide range of these potential threats, hazards, and risks which require scrutiny by the Land Use and Planning Committee (Committee), and ultimately the City Council, it is entirely within the legal power of the Committee and/or the City Council to reject it in its entirety or require such mitigations as it thinks best. Given the conditional use ordinance contains criteria regarding the public health and safety and neighborhood and general welfare, the Council is at liberty to require those conditions it deems necessary to mitigate the risks and hazards it recognizes in the TED.

As the Committee now knows, review of a project under conditional use standards can be a painstaking and difficult process, especially when the sticking points are technical in nature. However, there is one consequence of the present project that is not technical but rather has a solution in reason and the underlying philosophy of land use regulation in general. I am referring, of course, to the failure in the present project design to accommodate mitigation of the landlocked status of a four-acre parcel of land that is owned by the HRC and lies immediately west of the proposed project. This is certainly a consequence of the developer's preferred design and is within the Council's power, discretion, and prerogative to mitigate in the conditional use approval process.

This parcel acquired its present landlocked status due to the failure of past governmental oversight to prevent the subdivision of a certain parcel of land of which this four acre piece was once a part. Subsequent official approval of development around this isolated piece without resolving this landlocked condition has maintained its unusable status for too long. This is a problem for the neighborhood and community for several reasons.

1. Prevention of access for required care and maintenance. The landlocked status of HRC's parcel makes complying with the legal requirement to suppress noxious weeds

HUMAN RESOURCE COUNCIL
A LEADER IN COMMUNITY ACTION SINCE 1965
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and cut hazardous vegetation difficult. Without rightful access, getting to HRC's parcel must be with the permission of the adjacent land owners who are not obliged to grant it.

2. Increasing threat of wildfire due to expected increase in drought conditions of climate change. The HRC parcel grows up to tall grass in the summer. With the increase in density around this piece, there is an ever-present chance that a fire could be ignited there by whatever means, which surely would be a threat to the proposed TED lying immediately east of this parcel in an area with prevailing westerly winds.
3. Inability to use the four acres to fulfill the Growth Management Plan goal for maximizing development within the city limits. The lack of access to a "public" road prevents this land from being developed for use by the community as housing or parkland.
4. Landlocked status prevents HRC from realizing reasonable value for its property. Although the land was a gift, HRC has a duty to try to maximize the value of all its assets both real and human in furtherance of its mandated goals in its three-county service area to provide social services and benefits. HRC has been paying exorbitant property taxes on this parcel for years and would like to see it placed into service to benefit the community. Missing yet another opportunity to provide the needed access to a "public" road by failing to require the developer to grant an easement to HRC to its road system is perpetuation of a hardship on an important public agency providing needed services to the general welfare.

To reiterate, the conflict for access to the HRC parcel appears to be between the developer's project design and the hazards and risks to the neighborhood and general welfare inherent in the proposed project at this particular location. Analysis and scrutiny of these hazards and risks is the heart and soul of the conditional use approval process. It is not an acceptable outcome to approve a project if such approval leaves unresolved certain issues which could have been dealt with before, but remedies were forgone to the detriment of the neighborhood, the general welfare, and public health and safety.

As I have previously stated, HRC is willing to compensate Hillview Crossing for access from its proposed road to this 4-acre parcel.

Thank you for consideration of these comments and I look forward to working with you on this issue.

Respectfully submitted,

Jim Morton
Executive Director

From: Elizabeth Erickson
To: Mary McCrea
Cc: Morgan Valliant; Donna Gaukler; Neil Miner
Subject: FW: CLM trail guidelines
Date: Monday, March 18, 2019 11:29:27 AM

Hi Mary,

Below is a chart with the trail standards from the City's Conservation Lands Management Plan. These standards are for conservation lands trails. Keep in mind, most conservation lands trails are anticipated to be unpaved, recreational trails, such as those on the side of Mount Jumbo going to the L, or the single track trails on the side of Waterworks Hill. More importantly, conservation lands trails may "receive" year-round use (as stated in Morgan's email that Paul Forsting presented in the LUP presentation last week); however, those trails are not maintained for year-round use. They are not plowed, and while they are open year round, they are icy, require post-holing through snow, and generally get pretty treacherous during many months of the year. The winter use they "*receive"* is usually only by serious hikers with yak-tracks. For hiking trails, the standards state tread width is 18"-48", and desirable 1-10% grade with a *maximum* of 20% grade. What these standards don't convey is that for steeper trails, there is also a lot of drainage work that has to be done (culverts, water bars, etc.) and other important considerations such as aspect (north-facing slopes get more snow and ice) to plan for the snow, ice and drainage.

Conservation lands trails do not meet, and should not replace, standards for developed land. They are designed for undeveloped areas such as Park Preserves (Mount Jumbo, Mount Sentinel, North Hills). They should not be confused with or conflated with standards for developed areas.

Regardless of whether Council decides to waive the block length standard, I think it is important that Council understands the block length standard and the recreational trail proposed at Hillview Crossing are solving for two entirely different variables. The western trail provides a recreational trail to connect Wapikiya Park with the Tonkin Trail and the sidewalk system on Hillview Way. It is not a commuter trail. It seems the eastern trail proposed by developers would also potentially serve a recreational purpose. It would not solve the issue of safe pedestrian connections between units to access the sidewalk system, and to reduce dependence on vehicles to get to school, bus stop, etc. Again, those two standards are solving for completely different variables. If Council decides to waive the block length standard, it should not, in my opinion, be based on the Developer providing a trail on the eastern side of the property, since that trail will not serve the intended purpose of the breaks in the block length.

This is the email Paul Forsting showed at LUP. Again, it is referring to the western trail the City worked on with the Hillview Crossing developers. The City anticipates maintaining that trail, but that maintenance does not include any sort of plowing, sanding, etc.

"Hi Jason, On our Conservation Lands we do build up to 20% for ped-only trails. However given that the trail on Hillview Crossing will serve as a connector between a developed Park and the Tonkin Trail I believe we decided to shoot for around 12-15%.....an ideal range for construction of **sustainable low-maintenance trails that receive year-round use**."

Elizabeth Erickson

From: Morgan Valliant <ValliantM@ci.missoula.mt.us>
Sent: Monday, March 18, 2019 10:54 AM
To: Elizabeth Erickson <EricksonE@ci.missoula.mt.us>
Subject: CLM trail guidelines

Designed Use	Hiker	Bike	Equestrian
Tread Width	18”-48”	24”-48”	48”–96”
Target Grade Range	Desirable 1–10% Max 20%	Max 15%	Max 10%
Target Cross-slope Range	3–7% Max 10%	3–7% Max 10%	5% Max 10%
Clearing Width	12”-18” outside of tread edge	36”-72” outside of tread edge	36”-72” outside of tread edge
Clearing Height	8’	8’	10-12’
Minimum Turn Radius	4’	8’-12'	10’-12’
Surface Type	Native or imported materials	Native or imported materials	Native or imported materials
Surface Obstacles	Smooth with few obstacles. Occasional protrusions 2-3”		

Morgan Valliant
Conservation Lands Manager
Missoula Parks and Rec.
100 Hickory St.
Missoula Mt. 59801
(406) 552-6263

121 Saranac Drive
Missoula, MT 59803

November 30, 2018

Territorial Landworks, Inc.
PO Box 3851
Missoula. MT 59806

We have received the letter regarding the Hillview Crossing development and have a number of concerns and questions. We are 53 years residents of Missoula and of 121 Saranac Drive. Our phone number is 251-4107. We are also sending these concerns to the Missoula City Council.

We have lived in our home on Saranac Drive since July 1965. Our house is located directly beneath the proposed development. During our time here we have experienced three events in which runoff was a problem. In one such case enough water ran between our house and the neighbors over three days that was deep enough to potentially run a jet boat. These events all happened prior to completion of the drainage project, including the repair and improvement of the ditch above our house. Even though the ditch has been improved it is still a gravel and earthen ditch which is susceptible to washing out and is what happened with the previous smaller ditch.

The situations which caused flooding in the past included an early winter heavy freeze on a bare hillside, enough that moisture could not be absorbed into the ground. What followed was the equivalent of a chinook with warm wind and rain, causing the snow to rapidly melt.

Until the drainage system was built we were in the hundred year flood plain. For us this meant that, when we wanted to build a second garage on to our house, FEMA restrictions would require that the floor of the new garage would end up being 3 feet higher than the existing garage floor. Needless to say, we dropped that plan until the drainage system was complete and we were removed from the hundred year flood plain.

We are aware that much work has gone into the planning for this development. At the community meeting held this summer in Wapikya Park the engineers assured us that they would be able to design the basin project so that runoff would not be a danger to the homes at the bottom of the hill.

We are concerned about water coming off the hill if it is not properly drained. In looking at the drawing it looks like the drainage water could possibly come out the northeast end of the basin project if the streets are running downhill in that direction as it appears. How much water could possibly come down and wash out the ditch below?

The total site area is 1,116,317 square feet. The area covered with buildings, driveways, streets and sidewalks will become impermeable to water absorption, much like the frozen hill which only happened in the winter. Now we will have the equivalent of frozen ground year round in that area. With spring and summer rains the water will come down rapidly from this sloped development. Imagine if we received two inches of rain in 4 hours, which is certainly possible. How many gallons of water would be coming down the storm drain system that is being developed?

Statistics for average rainfall are interesting, but weather patterns can change. A couple of years ago there was a heavy rainfall above the Weaver Ranch east of Bearmouth on Interstate 90 which caused

many small washouts visible yet today on the mountainside. Just this spring our son who lives off Colorado Gulch west of Helena experienced eleven inches of rain in one rainfall. Water rushed down the mountainside and saturated the ground such that there were streams of water both above ground and under ground. The rapidly moving water actually penetrated the electrical panel located on the basement wall.

What has been a hundred year average may be changing to a 50 year pattern due to what seems to be happening with the weather. No matter what the average is one weather event could flood us out. We have homes with basements and some with basement bedrooms. A flooded basement could destroy a house. Would Hillview Crossing development cause FEMA to designate our area once again as being on the 100 year flood plain? Would flood insurance be required for us on the bottom of the hill? Does FEMA have any input into the final project or is the decision only made by local engineers and City Council?

Please consider this: Do not locate any drain pipes above any houses on Saranac Drive. Any drain pipes should drain to the west of Saranac because of the possibility of the ditch being breached. A plan I saw looked as if a drain pipe might come out above the house at the end of Saranac which is owned by Tyler who is wheelchair bound and in no way could hurriedly exit his house in case of sudden flooding.

When we have had a sudden heavy rainfall our street has looked like a river as the French drains cannot contain all of the water. The water from Cohosset flows into Saranac and then overflows into Wapikiya Park where we have seen water 3 to 4 feet deep even without the water from the hill.

Regarding the project design we are disappointed about the height of the buildings as the winter sun right now just clears the hill enough to give us some sunlight in our sunroom. When the development is built we fear the shadow created by the buildings will impact the winter sun for us plus affect melting of snow and ice on Saranac Drive itself, which will then impact all the foot traffic on our street —people jogging, parents walking children, bicyclists of all ages and dog walkers. And consider Tyler who needs to operate his mouth-driven wheelchair on such a street.

Other questions and concerns we have:

- Will any runoff water from Hillview Way join the runoff from Hillview Crossing and thus impact that runoff?
- Has there been any consideration of the seconds it takes for a vehicle exiting from Hillview Crossing to safely enter Hillview Way given the crest of the hill which limits vision? From about November 10 until early January anyone exiting Hillview Crossing in late afternoon will find that in checking for downhill traffic their vision will be dangerously impacted because they will be looking directly into the sun. Likewise, anyone driving up Hillview Way will have a difficult time seeing a pedestrian in the planned crosswalk.
- Is it legal to have only one entrance/exit for such a large development?
- We have always had a concern about arcing wires, firecrackers, lawn mowers, kids with matches and adults throwing cigarettes out car windows. With the sometimes 25-30 mph wind we can get (like the wind the afternoon and evening before the Cat/Griz game) and the grass in the pasture land both east and west of the development the chance of a fast-moving grass fire is a definite possibility. Add to that the closeness of all those units in the development—could we be looking at our version of Paradise, California? We all know how dry our summers can be.

- Could you provide a contour map overlaying the site plan to show where water will run on/off the streets in the development? Using a GPS we discovered that the elevation at the top is 3620 and the elevation to the runoff ditch at the bottom is 3420, a drop of 200 vertical feet.
- Who will maintain the ditch?
- We understand that originally the area along the bottom of the hill was a cattail swamp and was filled in before the houses were built. When we were being sewered we were able to see the black dirt which was at the bottom of the cattail swamp before fill was added. Could Hillview Crossing cause a cattail swamp to be reformed in Wapikiya Park, Honeysuckle Park and Meadow Hill School?
- In the future will there be another development on the other side of Hillview Way to add to the runoff problem?

We wrote this letter in lieu of appearing before the City Council where we could not properly address our concerns and questions in the allotted time. We appreciate your taking time to read this and consider our concerns.

Most of the people in our area have not lived here long enough to experience runoff from the hill, but we do have some history upon which to draw. We love this area and just want it to retain its character as a safe environment for kids, adults and pets.

Thank you for your consideration.

Sincerely,

Donald C. Henrikson

Donald C Henrikson

Karen E. Henrikson

Karen E. Henrikson

From: Jeff Buszmann
To: Anita McNamara
Subject: Hillview way comments
Date: Friday, December 7, 2018 8:44:15 AM

I am a resident of the south hills in Missoula and would like to make a comment regarding the Hillview Crossing proposed subdivision.

In general, I'm for the project, more housing, with higher density makes sense. If the city has capacity in the existing utility infrastructure I'm all for it. My major concern is the lack of turn lane into the project from Hillview Way. I drive this road at least twice a day so speaking from experience, I know how valuable the turn lanes are. When Hillview was redone a few years ago, this proposed project was known about and should have been considered in the master plan. Turn lanes were developed on several streets along Hillview including Clearview Way and Black Pine. Turn lanes are really important for safety and traffic flow. Because Hillview is so steep, gaining and keeping momentum is important for fuel efficiency and safety in poor road conditions. A lack of turn lane into this new development would most certainly cause a back up of traffic as vehicles turn into the area. That makes all the traffic behind need to slow down and loose momentum on a steep slope. During the construction period, there will be trucks and equipment entering the area and with no turn lane this will obviously cause issues. A point may be made that Hillview is so new and making a turn lane would mean removing some perfectly good roadway or at minimum modifying it. This argument is near-sighted and flawed as the long term traffic flow is much more important. I'm sure all of residents who are paying for the road (over the next several years) would very much appreciate a turn lane here. Furthermore, it should be the developer's responsibility to secure the space and funding for this turn lane as a benefit to the subdivision. Let's not build a big new project with functional impediments right from the start.

Please require a turn lane into this development, it would make the hundreds of drivers that use Hillview every day more happy and safe.

Thank you.
--
Jeff Buszmann, SRA
Streamline Appraisals, LLC
196 Grandview Way
Missoula, MT 406-860-4885

From: Paul and Chris Kilzer
To: Grp. City Council and City Web Site; Anita McNamara
Subject: Conditional Use Request for proposed Hillview Crossing Townhome Exemption Development
Date: Friday, November 16, 2018 5:41:16 PM

Missoula City Council and Missoula Development Services
435 Ryman St.
Missoula, MT 59802

Dear Members of the Missoula City Council and Missoula Development Services:

Having attended the May 29, 2018 **Hillview Crossing** presentation in Wapikiya Park by representatives of Territorial Landworks, Inc. and the **Hillview Crossing** presentation by Paul Forsting at the June 27, 2018 Moose Can Gully/South 39th Joint Neighborhood Council General Meeting, I have the following comments regarding the Conditional Use Request for proposed Hillview Crossing Townhome Exemption Development:

- In the two presentations that I attended, the representatives of Territorial Landworks were well-informed and respectful in discussing the Hillview Crossing proposal and answering questions.
- The June 22, 2018 Application Submittal Cover Letter and the September 12, 2018 letter from Territorial Landworks, Inc. to Missoula Development Services, together with the supporting documents, offer a lucid and credible basis for the Hillview Crossing Townhome Exemption Development.
- Despite the opposition voiced by a few individuals at the May 29, 2018 presentation, it is my opinion that the Hillview Crossing Development is a good fit with the surrounding neighborhood and with the general interests of Missoula as we strive to improve our city and mitigate urban sprawl.
- As a longtime resident of south Missoula and a member of the South 39th Street Neighborhood Council Leadership Team (since 10/2016), my personal view is that this Hillview Crossing Townhome Exemption Development proposal should be accepted.

Sincerely,

Paul B. Kilzer
4321 Cold Springs Court
Missoula, MT 59803

From: John Minish
To: Anita McNamara
Cc: Zoning DeskOnCall
Subject: Proposed Hillview Crossing Townhouse Development
Date: Sunday, December 16, 2018 10:33:16 PM

I am writing to you as I will be unable to attend the public hearing on the Conditional Use request for the proposed TED Hillview Crossing Townhouse Development. My major concern is how the develpments arrangement and streets will effect water drainage and flow into the Wapikiya area where I am located. I know that the houses on the hill side of Saranac Street are in the 100 year flood plain, and I am concerned that the streets and housing arrangements will channel the water, localizing it into something akin to a creek that will come down into our area. I'm not against the housing per se because of esthetics, and I know it won't increase the traffic in my area, but I am deeply concerned about how rain and snow melt will impact our area due to the construction. Thank you for your consideration.

John N. Minish
114 Saranac Drive
Missoula, MT 59803
(406) 251-2616

From:	Marty Rehbein
To:	Anita McNamara
Subject:	FW: Glacial Lake Missoula Erratic
Date:	Friday, December 28, 2018 1:52:33 PM
Attachments:	GLM erratic location.PNG

FYI...

Marty Rehbein, CMC
Legislative Services Director/City Clerk
City of Missoula
435 Ryman
Missoula. MT 59802
mrehbein@ci.missoula.mt.us
406.552.6078
www.ci.missoula.mt.us/cityclerk

From: Lynne Dickman <lrdickman@gmail.com>
Sent: Friday, December 28, 2018 1:22 PM
To: Grp. City Council and City Web Site <Council@ci.missoula.mt.us>
Subject: Glacial Lake Missoula Erratic

This was discovered in the Hillview area - possibly where new housing is proposed. Please consider saving the rock and an area around the rock, e.g., as a "green area." An erratic is a rock that has been "rafted" into location - not usually matching the surrounding rock type and out of place.

I'm vice-president of the Glacial Lake Missoula Chapter of the Ice Age Floods Institute. Please let me know if you'd like more information.

406-728-5221

--
Lynne Dickman
530 Woodworth Ave
Missoula, MT 59801

Public Comment
Conditional Use Application Review of Hillview Crossing TED

Date: December 14, 2018

To: City Council, City of Missoula

From: Rocky Sehnert, MS Rural, Town, and Regional Planning, U of MT

RE: Discussion of a Townhouse Development Exemption Request in the Overall Context of the Conditional Use Regulations of the Missoula Zoning Ordinance and Solution to an Adverse Impact of the Proposed Hillview Crossing Development.

After attending and testifying at the city council Zoning and Land Use Committee meeting on the review of the conditional use application by Hillview Crossing, LLC is have the impression that the majority of the city council members in attendance, which was most of them, do not fully comprehend the concept of a conditional use permit application or the process necessary to complete a full and legal analysis of the impacts of the proposed project on "adverse effects on the surrounding neighborhood and the general welfare of the community as required by the zoning ordinance.

The purpose of any conditional use permit (CUP) application is to allow the unique facts and impacts of the proposed use at a particular site to be discovered, examined, and analyzed according to a mandated, legally required set of criteria found in the zoning ordinance and thus develop "conditions" of granting the CUP necessary to abate, remove, or mitigate the adverse effects of that particular use at that particular site.

Some of these effects are those arising from facts about the site, the proposed use and the necessary buildings and infrastructure to accommodate the use. Other effects or impacts arise out of analysis of the site and the use in the context of the neighborhood and wider community. Identification of the potentially adverse impacts is the role of the city council assisted by the professional city planning staff. The applicant cannot be expected to discover and reveal all effects of his development, especially ones that will cost him money and lower his profit. In other words, he is biased.

Two important purposes of a public hearing on the CUP application is to find out what the public thinks about the project and discover impacts and problems relating to the proposed use

that might have escaped the attention of the city planning staff in its review of the CUP application.

During the hearing on Wednesday, Dec. 12, the council committee was informed by three persons that the District XI Human Resource Council was the owner of a parcel adjacent to the HC project. This parcel shares a property line with the HC project. The HRC parcel is presently landlocked by HC property and two others. This landlocked status severely restricts the ability of the HRC to use or dispose of this parcel to HRC's best advantage. Despite several attempts, HRC has been unable to secure motorized access to a roadway so that the parcel can be developed to its highest and best use. Keep in mind that HRC is a public, non-profit mandated by the state of Montana whose programs and operation directed impact the general welfare of the Missoula community and three counties.

Legal purposes of conditions on land use

Conditions placed on uses requiring CUP review arise because of the relationship of the project's impacts on public heath, public safety, and/or general welfare. These three areas re the general and always cited reasons that private land use can be regulated by cities and specific restrictions, specifications and requirement imposed on land limiting the owner's uses.

Uncompensated easement for public trail access

One such use in the requirement to grant the city an uncompensated easement to continue public non-motorized trails across a developer's property ostensibly to promote the public health and whatever other values are associated with having a system of hiking and biking trails in a city. This is clearly an imposition of an easement which is the result of the circumstance of a particular development laying the path of an established trail system and the city desiring to maintain continuity of that trail across the land in question.

Failure to acknowledge the "fact" of landlocked status of HRC property as adverse effect of the HC project

It is commonly agreed that having landlocked land parcels in any jurisdiction is a bad thing and that, if official action can prevent it, the authorities should do so. If it is not the case that landlocking is a bad thing, that perpetuating the landlocked status of the HRC parcel is NOT an adverse effect of the EC development, and that the city intends to NOT make resolution of the landlocked status a condition of approval of the EC project, the Missoula Zoning Ordinance requires that the city council back up its decision not to act on this "fact" concerning the EC

proposal and the impact on neighboring land and do so in writing. It is worth pointing out that we are talking about procedural and, maybe, substantive due process here and that arbitrary and capricious decisions by authorities not supported by facts and reasoning are subject to judicial review. I interject this information not to threaten the council or city any with legal action but rather to point out the gravity of the responsibility of conducting a complete and professional review of a conditional use application in light of clearly mandated criteria found in the city's own ordinances.

Pursuing a remedy for the landlocked HRC parcel

In the case of the HRC landlocked status, what is requested is an easement or other access arrangement from the HC developer to access the internal road system of that development, possibly with compensation for the easement

By invoking the TED procedure, the developer has chosen to expose itself to the rigors of examination of its project by conditional use criteria. This was freely chosen. The developer acquired the land in question with a subdivision almost ready for final plat filing, but chose to throw out that plan in favor of one of its own liking. On that subdivision plan a road to the HRC property line was clearly a part of the internal road system of that development. The HC developer could have acquiesced to that intention and the appeals of HRC to honor that design, but declined. The fact that the developer has resisted attempts by HRC to gain access in the past from the developer should not color the opinion of the staff or council now. In the past, CUP review of TEDs was not possible. But now under the catchall criteria of adverse impact of the neighborhood and general community welfare, new and different condition to mitigate impacts to these two important criteria are required when all the facts about an proposed development are know.

Just as the city requires an uncompensated easement for non-motorized trail access across the applicant's property, the easiest solution to the HRC landlock problem is to require that the applicant provide an easement from its road system west to the property line of the four-acre HRC parcel sufficient to match the design of the southern portion of Road A on the developer's site plan and grant future uses of the HRC parcel an easement to use the part of Road A required to access Hillview Way.

However, that is kind of heavy handed even though that is precisely what the city does in requiring trail easements. HRC has expressed a willingness to share or bear the costs building the short roadway extension to its property line and and share maintenance expenses of that

section and the part of Road A leading to Hillview Way. I suspect all of this could be negotiated forthwith.

The developer's spokesman stated in the committee hearing that no negotiation is possible without first getting approval of the project. But it would take a very naïve person indeed to believe that the developer would grant an easement at a future date without being required to do so, when it so vigorously defended itself against provision of any such access in a recent court case.

Negotiated settlement of access as a condition of approval of the CUP

Stipulation by the council of a negotiated arrangement with a time limit (say 90 days) for achieving agreement as a condition of approval of the project is the way to go. It must be required that the parties will negotiate in good faith and that price gouging will not be tolerated in setting the costs for construction and maintenance of any roadway or even provision of the requested easement. Failure to meet the time limit or the fairness requirement should result in suspension of the project, building permits, etc. until resolution can be obtained. In this manner, the developer can proceed with its plans, but if the time limit is not met or the fairness provision violated, the threat of suspending the

Please do the right thing and require as a condition of granting the conditional use that the developer of the Hillview Crossing project work with the HRC to develop an access solution for the HRC four acres. HRC always needs more funding and so must manage its assets accordingly for the highest value. Clearly, no organization operates more in the interest of the general welfare of the community. Failure to liberate the land value of HRC's four-acre parcel my maintaining its landlocked status is an adverse impact of the HC project on the general welfare of the community.

The details of a condition specifying an access arrangement should make any solution a written condition of approval of the HC development, put that agreement in the Homeowners' Association founding documents, and require that any easement be recorded as a deed amendment to the HC crossing. Justice and fairness as well as good land use planning require nothing less.

Table vote or send back to committee

I suspect that crafting this additional condition will not be possible within the time space and atmosphere of a public hearing at a city council meeting. Careful consideration and honest

negotiation will be required to achieve an outcome beneficial to all concerned. I think the immediate action to be taken is to table a vote on this application or send it back to committee, whichever is the more judicious for the council.

Thank you,

Rocky Sehnert,
MS Rural, Town, and Regional Planning, U of MT
Former planner Missoula and Hamilton, MT

12/14/18
To: Missoula City Council, Missoula Development Services and Territorial Landworks, LLC
From: Teresa Jacobs, 25 year resident of the Wapikiya neighborhood

Re: Hillview Crossing Townhome Exemption item on 12/17 meeting

I am trying to see the proposed project from the perspective of all involved (including financial interests and expertise). And likewise, I trust you value my perspective as a caring citizen that supports infill instead of sprawl – up to a point that it is reasonable.

As I stated at the Dec 12th Informational Meeting of Land Use and Planning Committee, I would like see the project modified. I understand that a balance has already been achieved in maximizing the number of units that can be built, while also including the requirements easements and open space (also desirable for future residents). But I think the design has not struck a balance with the current inhabitants of the area. Looking at the map I provided on the 12th (I superimposed the proposed design on a map of the area), you can see the project is significantly denser than local homes, so not 'compatible with the character of the area'. The design has also has not taken into account the need to be compatible with the wildlife in the area. It seems important to get comment from Fish, Wildlife and Parks before proceeding. The proposed project blocks a wildlife corridor. That is sure to create a hazard to the deer that could be funneled up onto Hillview Way (a safety hazard for cars and pedestrians) or into the narrow open space and trail area below the townhomes (a hazard for hundreds of people including children who are also anticipated to be using this relatively narrow space).

A concern that I did not have time to express on the 12th is my desire to hear more about how city officials have determined that the potential of adding traffic from over 300 cars onto Hillview Way is not a concern. It seems disproportionate. Citizens who already rely on this road as well as potential future developers along this road need to see the calculations presented publicly. Given the grade of the road, it could also be both hazardous and/or inconvenient for cars to stop for crosswalk users when it's icy.

A solution is to be conservative, and only build 46-48 units on this land (as was once proposed and approved by the city in the past). This could provide less congestion for Hillview Way, allow more space for deer to safely pass through without causing injury or aggravation for residents and drivers on Hillview, create less visual density and weight on this open and potentially unstable hillside (settling dangers), and effectively prevent storm run-off from swamping the park, the storm sewer channels, or the basements of homes on Saranac and other even lower-lying basements at the base of the hill. 48 town houses high on the hill will afford the best views, and allow more space to excavate below so as to naturally catch rushing storm water, and create a physical separation for deer and people.

From: jminish55
To: Zoning DeskOnCall
Subject: Re: Revised Land Use and Planning Committee Schedule for Hillview Crossing - February 27
Date: Thursday, February 7, 2019 9:10:17 AM

As I am unable to make any Monday night meeting due to other commitments, I will reiterate that my main concern is the drainage from the new streets created by this housing project. As I live in the Wapikiya area, the hill across the street from my house is in the hundred year flood plain as it now exists. Hence my concern about future runoff from rain and snow melt in these new streets. I hope the city council and the planning and land use committee give this very serious consideration. Thank you.
John Minish
114 Saranac Dr.

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Zoning DeskOnCall <CityZoner@ci.missoula.mt.us>
Date: 2/4/19 10:33 AM (GMT-07:00)
To: Neighborhood Council - South 39th <South39@ci.missoula.mt.us>, '"jbrocci@gmail.com"' <jbrocci@gmail.com>, '"jeffbuszmann@gmail.com"' <jeffbuszmann@gmail.com>, '"jminish55@gmail.com"' <jminish55@gmail.com>, '"lrdickman@gmail.com"' <lrdickman@gmail.com>, Paul Kilzer <pckzer@msn.com>, 'Rocky Sehnert' <turahcat@earthlink.net>, '"tcjmontana@gmail.com"' <tcjmontana@gmail.com>, Neighborhood Council - Moose Can Gully <MooseCanGully@ci.missoula.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>, Anita McNamara <McNamaraA@ci.missoula.mt.us>
Subject: Revised Land Use and Planning Committee Schedule for Hillview Crossing - February 27

You are being contacted because you provided written comment previously for or expressed interest in the Hillview Crossing project.

The Land Use and Planning Committee date for the continued discussion of the Hillview Crossing Conditional Use has been **changed from February 13th to February 27th**. The exact time has yet to be set.

The City Council sets the committee schedules for the week on Monday night during the City Council meeting. The Land Use and Planning Committee meeting time for February 27 will be set during the February 25 City Council meeting. Current meeting calendars are posted and updated here: http://www.ci.missoula.mt.us/1149/AgendasWebcastsMinutes. The February 25 City Council meeting agenda will be posted on the Friday afternoon before the meeting (February 22).

From: Zoning DeskOnCall
To: Denise Alexander; Mary McCrea
Subject: FW: Hillview Townhomes project - public comment
Date: Wednesday, February 27, 2019 9:48:28 AM

See below:
-Matt

From: Anita McNamara
Sent: Wednesday, February 27, 2019 9:41 AM
To: Zoning DeskOnCall <CityZoner@ci.missoula.mt.us>
Subject: FW: Hillview Townhomes project - public comment

From: Alexandra Scranton
Sent: Wednesday, February 27, 2019 9:41:21 AM (UTC-07:00) Mountain Time (US & Canada)
To: Anita McNamara; John DiBari; Stacie Anderson; Julie Merritt
Subject: Hillview Townhomes project - public comment

To the Missoula Land Use and Planning Committee,
My name is Alexandra Scranton, and I live at 83 Lacota Drive in the Wapakiya area. While I do not live immediately adjacent to the proposed townhome site, I do live in the neighborhood.
I and my two girls are frequent users of Wapakiya Park. I am writing to express my concerns of the potential impacts of the construction of the townhomes on the park. Specifically I have read of concerns about stormwater diversions and am concerned about the potential for flooding in the park. I hope that there will be special modelling and planning taken to ensure that this will not happen.
Secondly, when we first saw the signs about the first hearing on the site, our greatest concern was the impact of the townhomes on our beloved sledding hill. It appears the townhomes will be right at the top of what is commonly used for sledding into Wapakiya Park now. Its a great hill - because of its reasonable steepness that leads to a flat meadow - with very little to run into - making for fun (and safe) sledding. We hope that the construction of the townhomes wont eliminate our sledding hill (its hard to tell from the plans - but we are concerned that we would be starting our sledding basicaly right off the frontporches of the townhomes. So its worth you understanding that the sledding (done by many kids in the neighborhood who can walk there by themselves from their homes) will still take place as long as the hill is there - so worth ensuring this isnt a major hassle to folks living in the townhomes.
Secondly we are also concerned about the potential impact of construction equipment and staging - and how much of that would take place in Wapakiya park. Again, we use this park in all seasons and want to ensure the impact is minimal as possible. Especially I want to make sure that if there is a pause in construction over winter months - that there isnt construction equipment parked for weeks at a time in the park in what seems like an out of the way place (ie - like the bottom of the sledding hill) Because as you can imagine - kids will still attempt to sled if there is snow - and it could create a dangerous situation if there was construction equipment to run into. So if there are ways of ensuring that doesnt happen - it would be greatly

appreciated.
Overall - the easiest solution from our standpoint would be to not construct the townhomes at all - (that eliminates all of our concerns!) I understand that folks have a right to develop on the property they own. So if it has to happen I hope you will take these concerns into consideration to make sure there are minimal impacts on the park and its users.
Thanks very much
Alexandra Scranton

Property Record Card

Summary

Primary Information

Property Category: RP
Subcategory: Non-Qualified Ag
Geocode: 04-2093-06-1-01-01-0000
Assessment Code: 0001339100
Primary Owner:
HILLVIEW CROSSING MISSOULA LLC
401 E BECKWITH AVE
MISSOULA, MT 59801-4426
NOTE: See the Owner tab for all owner information
PropertyAddress:
COS Parcel:
Certificate of Survey:
Subdivision:
Legal Description:
S06, T12 N, R19 W, ACRES 24.98, PORTION OF SE4 NE4
Last Modified: 10/3/2018 12:36:06 PM

Glacial Lake Erratic

General Property Information

Neighborhood: 204.012.2
Property Type: VAC_R - Vacant Land - Rural
Living Units: 0
Levy District: 04-0583-1-1
Zoning: 1
Ownership %: 100
Linked Property:
No linked properties exist for this property

Exemptions:
No exemptions exist for this property

Condo Ownership:
General: 0
Limited: 0

Property Factors

Topography: 8
Fronting: 4 - Residential Street
Utilities: 3
Parking Type:
Access: 1
Parking Quantity:
Location: 5 - Neighborhood or Spot
Parking Proximity:

Land Summary

Land Type	Acres	Value
Grazing	0.000	00.00
Fallow	0.000	00.00
Irrigated	0.000	00.00
Continuous Crop	0.000	00.00
Wild Hay	0.000	00.00
Farmsite	0.000	00.00
ROW	0.000	00.00
NonQual Land	24.980	1,202.00
Total Ag Land	24.980	1,202.00
Total Forest Land	0.000	00.00
Total Market Land	0.000	00.00

Deed Information:

Deed Date	Book	Page	Recorded Date	Document Number	Document Type
12/30/2014	938	597	12/31/2014		Warranty Deed
8/8/2013	917	892	8/8/2013		Trustee's Deed (and Deed of Trust)
12/20/2006	0789	00374			

Owners

Party #1

Default Information: HILLVIEW CROSSING MISSOULA LLC
401 E BECKWITH AVE

Ownership %: 100

Primary Owner: "Yes"

Interest Type: Conversion

Last Modified: 2/23/2015 2:33:37 PM

Other Names

Name **Type**

Other Addresses

Appraisals

Appraisal History

Tax Year	Land Value	Building Value	Total Value	Method
2018	1202	0	1202	COST
2017	1202	0	1202	COST
2016	1112	0	1112	COST

Market Land

Market Land Info

No market land info exists for this parcel

Dwellings

Existing Dwellings

No dwellings exist for this parcel

Other Buildings/Improvements

Outbuilding/Yard Improvements

No other buildings or yard improvements exist for this parcel

Commercial

Existing Commercial Buildings

No commercial buildings exist for this parcel

Ag/Forest Land

Ag/Forest Land Item #1

Acre Type: NQ - Non Qualified Ag Land

Class Code: 1701

Irrigation Type:

Timber Zone:

Productivity

Quantity: 0

Units: Non Qual

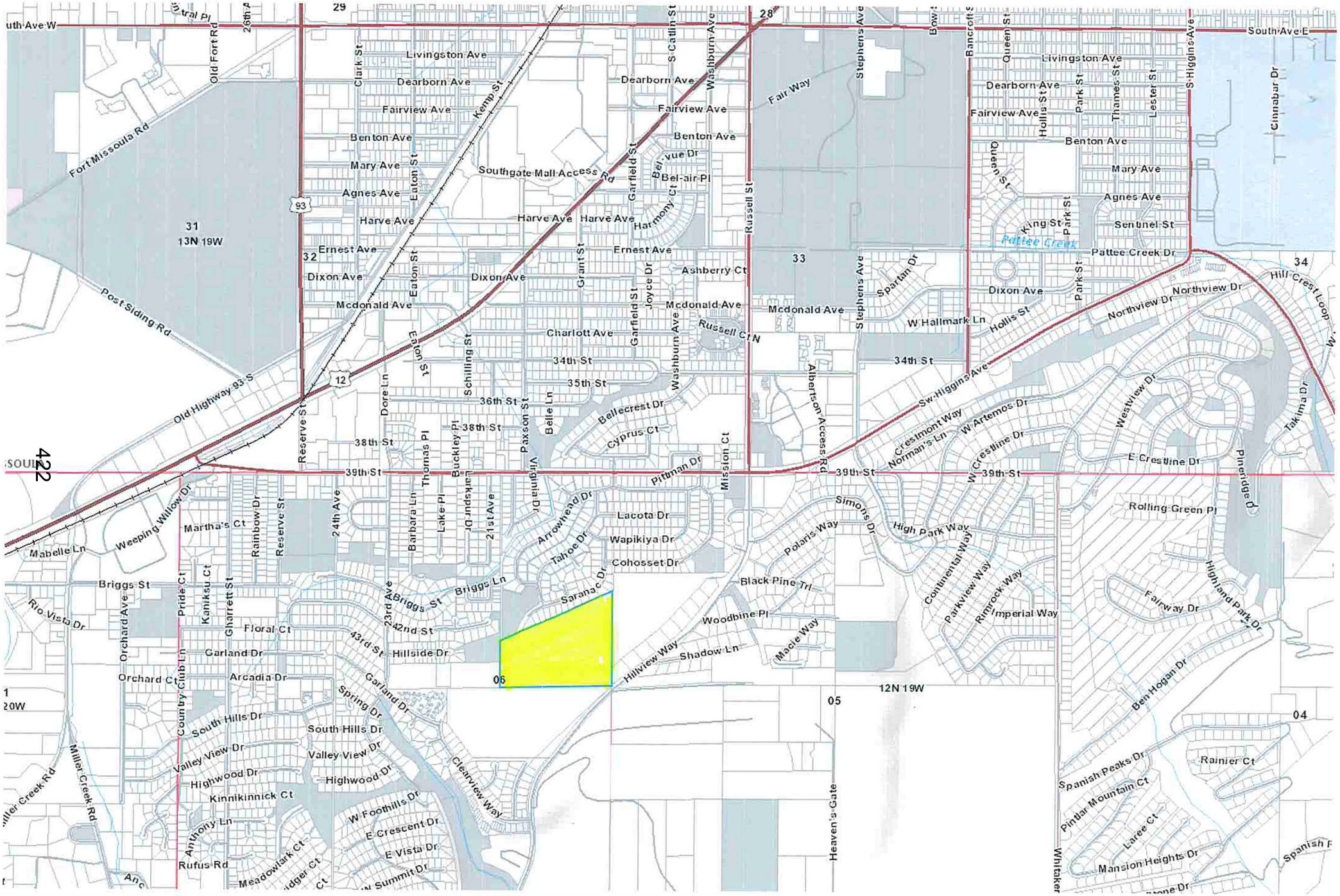
Commodity:

Valuation

.res: 24.98

Per Acre Value: 48.13

Value: 1202


South Ave E
Livingston Ave
Dearborn Ave
Fairview Ave
Benton Ave
Mary Ave
Agnes Ave
Harve Ave
Ernest Ave
Dixon Ave
Mcdonald Ave
Charlott Ave
34th St
35th St
36th St
38th St
39th St
Fort Missoula Rd
Post Siding Rd
Old Highway 93 S
Old Fort Rd
Clark St
Kemp St
Eaton St
Southgate Mall Access Rd
Garfield St
Grant St
Joyce Dr
Ashberry Ct
Washburn Ave
Russell St
Russell Ct N
Schilling St
Dore Ln
Reserve St
Thomas Pl
Buckley Pl
Paxson St
Belle Ln
Bellecrest Dr
Cyprus Ct
Pittman Dr
Mission Ct
Albertson Access Rd
Stephens Ave
Spartan Dr
W Hallmark Ln
Hollis St
Queen St
King St
Park St
Thames St
Lester St
S Higgins Ave
Cinnabar Dr
Pattee Creek
Pattee Creek Dr
Sentinel St
Northview Dr
Hill Crest Loop
Sw Higgins Ave
Crestmont Way
Norman's Ln
W Artemos Dr
W Crestline Dr
E Crestline Dr
Westview Dr
Takima Dr
Pinenidge Dr
Rolling Green Pl
High Park Way
Simons Dr
Polaris Way
Continental Way
Parkview Way
Rimrock Way
Imperial Way
Highland Park Dr
Fairway Dr
Ben Hogan Dr
Spanish Peaks Dr
Pintlar Mountain Ct
Laree Ct
Mansion Heights Dr
Rainier Ct
Whitaker
Heaven's Gate
Fair Way
Weeping Willow Dr
Mabelle Ln
Martha's Ct
Rainbow Dr
24th Ave
Barbara Ln
Lake Pl
Lakespur Dr
21st Ave
Virginia Dr
Arrowhead Dr
Tahoe Dr
Lacota Dr
Wapikiya Dr
Cohosset Dr
Sarana Dr
Black Pine Trl
Woodbine Pl
Macie Way
Hillview Way
Shadow Ln
Briggs St
Briggs Ln
23rd Ave
42nd St
43rd St
Hillside Dr
Floral Ct
Garland Dr
Arcadia Dr
Orchard Ct
Orchard Ave
Rio Vista Dr
Pride Ct
Kanksu Ct
Gharrett St
Country Club Ln
Spring Dr
South Hills Dr
Valley View Dr
Highwood Dr
Kinnikinnick Ct
Anthony Ln
Rufus Rd
Meadowlark Ct
W Foothills Dr
E Crescent Dr
E Vista Dr
N Summit Dr
Clearview Way
Miller Creek Rd
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31
13N 19W
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28
93
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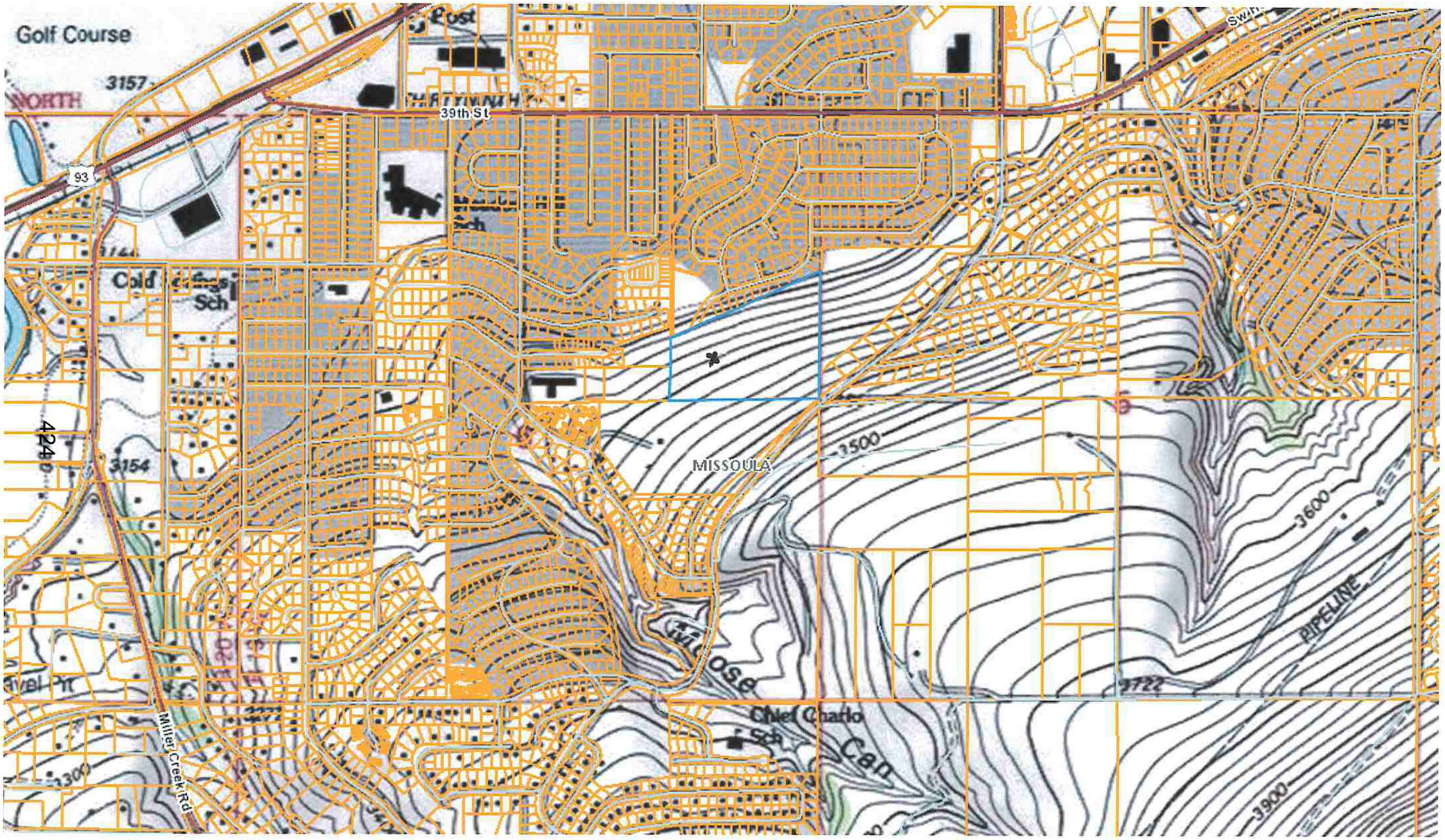

x = Approximate Location
3380'
46°49'42" N 114°01'42" W

O = Rock

To: John DeBari, Missoula City Council Chair

From: Teresa Jacobs, Missoula resident (Wapikiya development) for 25 years, 406-251-6450

Tuesday, March 5, 2019

I will not be able to attend the March 6 HUP committee meeting, but have some last minute public comment about a couple issues regarding Hillview Crossing's Conditional Use Request. I was glad to reach you by phone, John. You asked me to email my comments so you can share it with other council members and others as part of the public record. Thank you. Here it is:

1) I want to raise the foundational question again, as to whether developers can build on land that is shown to have some slopes great than 25% on a required topographical slope map. **I have received conflicting information about this from city staff this last week.**

Context: At the last meeting on 2/17 the four-colored topographical slope map for the proposed Hillview Crossing development (found in the supporting materials list online) was discussed. I offered public comment, noting that it is created "before any grading or other site modification has occurred" in accordance with Missoula Municipal Code 20.50.010 (Hillside Protection). I pointed out red areas of the map indicating slopes greater than 25% (according to the map's color coding) where "building is prohibited" (20.50.010 D1. I then pointed to lined outlines on the map of proposed townhouse right over patches of red and asked whether city code allows such buildings on this red areas (slopes).

On Thursday or Friday of last week, I talked on the phone with Development Planner Mary McCrea seeking clarification about the slope map. She acknowledged what she called a "bench" of more than 25% slope (red) in a region of 20-25% slope (orange). But said that building could happen on the bench because developers plan to flatten it out by pushing the extra soil down the hill (making the area below the townhouses steeper).

Over the weekend, I was studying the formula in city code for determining "allowed density by average slope". The formula relies on the square footage of "building and disturbance area" and the "zoning district's minimum area per unit requirement". I left a phone message at the "Zoning Help Desk" 552-6625 yesterday (Monday) hoping to get help with definitions and numbers. Today (Tuesday) a city developer named Matt called me back. He explained that RT-10 zones requires a minimum of 10,000 sq. ft per unit, but that taking slope into account, there needs to be 14,300 sq ft per dwelling on 15-20% slopes and 20,000 sq. ft. per dwelling on 20-25% slopes. **I asked Matt if there was a way to build on slopes greater than 25% (if the plan was to modify the original surface to reduce the slope). Matt said "No, there is no building on slopes over 25% based on measurements of the original, natural slope." I asked him if he was sure. He said he was. But at my request he conferred with others in the office. He said an "Engineering permit staff person, and two other planners concurred" that there is no building on slopes identified as over 25% on the topographical slope map. When I asked him if I could quote him, Matt readily agreed.**

2) **Process Question:** Who will be writing and compiling the "finding of facts" for City Council in regards to Hillview Crossing's Conditional Use Request? Missoula Zoning Code Section 20.85.070 H and I states that all five of the criteria must be addressed by Council (and specific actors to be considered). Will the public be allowed to review a draft and provide input on key issues that have been part of neighborhood and community testimony - alongside all the documents, conditions of this complex proposal?

3) **Upcoming Agenda Item: Density (compatible)**
Statements and documents provided to City Council assert that Hillview Crossing's proposed density of 2.99 units per acre "is similar to the density of the surrounding neighborhoods" and is "compatible with the character of the surrounding area". I disagree. The proposed Hillview Crossing development would be on a steep hillside overseeing the Missoula valley. While its proposed 2.99 units per acre is similar in density to the neighborhood below (on the valley floor), Hillview Crossing would NOT be similar in density to the two developed properties adjacent to it on the hillside. To the southwest of the proposed development is one home on many roomy acres. To the east is Mountain View Estates - an association of 8 single family homes – with a density is .38 units per acre. So Hillview Crossing with it's 68 townhomes and manicured yards on private, narrow private streets would be nearly 8 times more dense than Mountain View Estates with its mostly natural, original sloped property. This incompatible pairing of density and design would unfortunately be on display on the hillside, visible from the south side and center of Missoula. Hillview Crossing - as proposed -is not a good match. Note: Mountain View Homeowners Association has agreed to keep the land below their homes as private open space that will not be in-filled with buildings, so the .38 unites per acre figure for Mountain View is solid.

4) **Upcoming Agenda Item: Transportation:**
Who makes determinations of traffic flow, and potential traffic jams and hazards in relationship to proposed developments in Missoula? Who would be the one to estimate the number of cars lining up on Hillview Crossings private roads during peak traffic times, waiting to turn left onto Hillview Way from the proposed development? Will anyone be addressing the hazards of this? If safety concerns make a traffic light needed where the private road would feed into Hillview, who would pay for it (and how much would it cost)?

But on the other hand, would it be prudent for the city even to ask cars, buses, dump trucks, etc. going up Hillview Way from 39th and Russell on an icy day, to stop on the incline below the proposed Hillview Crossing entrance - for the sake of pedestrians at a proposed crosswalk, or to pick up bus passengers there, to even to stop for a red light at a possible traffic signal there someday? If one or more vehicles were to loose their momentum after stopping on Hillview on an icy day, which kind of road blocking and hazards might be created as drivers try and turn their vehicles into the other lane to head back downhill?

Note: The MCPS school district's Director of Operations and Maintenance has let the city staff know that it would be near impossible to have a school bus try to turn around in the proposed development, and that it "would be a potential safety issue" to have school buses stop on the incline near the entrance to the proposed development in the winter time " as it may be hard for the buses to get going again give the significant incline".

PROPOSED HILLVIEW WAY DEVELOPMENT
Wednesday, March 13, 1pm

Dear Mayor, City Council, and Land Planning Staff.

For years the city has worked together to develop the guide lines we have before us today. These include street width, lot size, structure size , spacing access etc. They were made with a great deal of input and discussion, often times requiring such items as parks or playgrounds. A good example is the adjacent community on either side of 23rd street.

I would very much like to have a similar development adjacent to our subdivision (Mountainview Estates). It is on a similar slope, aspect and soil type as the proposed development. If the city has updated subdivision requirements for sewers, fire hydrants, street drains etc, they should also be included in this proposed subdivision. Some developers have been required to set aside areas for a play ground or playground equipment. With a grade school so near to attract first time buyers something like this should be considered. One thing I consider essential is a second entrance to this proposed development, which 23rd street could provide.

Thank you for your attention to these suggestions,

Joseph W. Gorsh
Barbara Gorsh
4511 Hillview Way

March 3, 2019

To: Missoula City Council

From: Don & Karen Henrikson

Re: Hillview Crossing TED

- Thank you for allowing Don to speak regarding this project at the City Council meeting of January 17, 2018 and the Land Use & Development Committee meetings of January 16 & 23 and February 27, 2019. We appreciate your listening and consideration .
- If you have not had a chance to look at the area of the proposed development, we urge you to drive by and note the huge of amount of snow that will have to melt one of these days. Also drive through the Wapikiya area and particularly Saranac Drive and note also the huge amount of snow that will be melting. Since the snow has been steadily accumulating the level of the street is now higher than the end of our driveway.
- Now that the sun is shining again we can tell that at this time of year (and beginning in late fall and continuing until now, there will be a safety hazard for motorists exiting the development to head downhill. Before turning left they will look right to see cars heading downhill and be blinded by the sun. A pedestrian crossing there could face the same problem.
- What is the plan for containment of sediment from runoff should it rain during the grading process?
- The meeting on February 27 was the first time we heard about a retention(?) detention (?) construct which will evidently be below the lowest street in the TED. We need more information on this.
- We remain very concerned about geo-technical aspects of the proposed development. We have witnessed the effect of hill movement because a portion of our backyard is hillside. We terraced a place for our garden and built a retaining wall to hold the garden. Three times we rebuilt the wall due to that movement. One rebuilt occurred after the top of the three-foot wall tipped out 6 inches. This wall has footings 12 inches deep and is made of concrete blocks. Granted, frost may have played a part; if so, retaining walls in the devlopment could also be subject to frost as well as hill movement.
- A concern remains about who or what will be liable for any financial negative impact for anyone living below the TED.
- It seems to us that this development has so many issues that continue to cause concern that the Council needs to be positive that whatever your decision, it is based on solid research and science.

Thank you.

Don & Karen Henrikson
121 Saranac Drive
Missoula, MT 59803

Don Henrikson Karen Henrikson

From:	Mary McCrea
To:	Alicia Vanderheiden
Cc:	Grp. DS Admin Staff
Subject:	FW: News Report Great Falls in relation to Hillview Crossing...
Date:	Wednesday, April 3, 2019 4:04:57 PM
Attachments:	image002.png

Alicia,
Please post the public comment below to the SIRE record for Hillview Crossing.
Thanks,
Mary

From: Teresa C Jacobs <tcjmontana@gmail.com>
Sent: Wednesday, April 3, 2019 2:00 PM
To: Grp. City Council and City Web Site <Council@ci.missoula.mt.us>; John DiBari <JDibari@ci.missoula.mt.us>
Subject: News Report Great Falls in relation to Hillview Crossing...

Please see attached pdf of news report in March 28th, 2019 edition of the Great Falls Tribune.

And here is the link:
https://www.greatfallstribune.com/story/news/2019/03/28/flooding-frustrates-residents-who-say-snowmelt-isnt-only-problem/3304983002/

My synopsis:

To: Missoula City Council Members From: Teresa Jacobs, Missoula citizen April 3, 2019

This March 28, 2019 news article in the Great Falls Tribute seems to pertain to your review of the Hillview Crossing Conditional Use Request before you. Here is a brief synopsis:

Only a week ago, a rapid rise of water in a low lying area of Great Falls left a dozen homes in surrounded by water. Residents say the water is more than they've ever had to contend with, and that it's not from regular, snow melt. One gentleman whose 25 acre property has become a wetland in a matter of 1-2 days reports that the flooding is due to a broken stormwater pipe that is dumping water from a private subdivision built above his home. He said the pipe was damaged in February by a car. He's frustrated that nobody is taking responsibility for fixing it. He has tried to plug it himself with a basketball and some cement. The pipe is not the responsibility of the city's public work department; they can't even confirm or deny that the pipe is broken. The county is also not responsible for the pipe. The Great Falls health department and the Montana DEQ has been asked to intervene.

The news article does not even mention a homeowner's association in relation to the private subdivision, and what that association might be doing - or not doing - to investigate whether one of their stormwater pipes is broken below them and flooding their neighbors.

Does this not demonstrate some of the risks and concerns inherent in the proposed Hillview Crossing, that has inspired Wapikiya residents to attend these meetings and provide input? There is wisdom in erring on the side of caution in regards to unforeseeable circumstances - whether its unpredictable weather, an earthquake, or something else - like a human-caused crisis. I appreciate your transparency as you engage in critical analysis of all five of the criteria in relation to the Conditional Use Request. Please keep this news story in mind as you work to ensure the safety of people and their property, and to address many other workability issues that will effect all city residents. Thanks.

Teresa Jacobs, Missoula resident

To: Missoula City Council, Mary McCrea (City Development Services) cc. Burley McWilliams
From: Teresa Jacobs, Wapikiya neighborhood resident

Friday May 17, 2019

Pedestrian routes, bus stops, and traffic flow/safety are still on my mind in regards to the proposed Hillview Crossing development. I hope that you will require Hillview Crossing to align with the city's commitments (green and clean) to help residents access buses and otherwise move safety around the city on bikes and on foot, while also not creating hazards for buses and other vehicles. I hope you will consider inviting MCPS's Operations Director Burley McWilliams and others (Beach Transportation that serves MCPS and Mountain Line) to help sort out some possible ramifications of current plans and what might be other better alternatives.

Please reject the developers' most recently proposed route for a year-around pedestrian access through Hillview Crossing that does not directly connect the top and bottom tiers of townhomes, as that could discourage efficient walking to and from bus stops. Please also reject the developer's assertion to you that any kids living in Hillview Crossing will just be driven to school (as a self-fulfilling prophecy).

1) Concerns about current bus stops to get students to Russell Elementary, etc.:

<u>Bus Stop A - Too far and too difficult to walk uphill, and could be safer</u>
Students carrying backpacks would walk up or down Hillview Crossing neighborhood (undecided - 1/4 to 1/2 mile?) with 150 foot elevation change for some), then walk over nearly 1/2 mile through the Wapikiya neighborhood (narrow roads and no sidewalks) to the current bus stop at 39th and Russell where there is a Mountain Line bus road pull-off. FYI: The MCPS website states that students are not allowed to cross 39th Street.

<u>Bus Stop B - Too far and too difficult to walk uphill, and not safe</u>
Students carrying backpacks would walk up or down Hillview Crossing neighborhood (unclear - 1/4 to 1/2 mile?) with 150 foot elevation change for some), cross Hillview Way (crosswalk on a hill), walk up or down for nearly .4 miles on Hillview Way on sidewaliks before crossing Hillview Way (existing sidewalk on relatively flat evevation) to get to the current bus stop at Clearview Way (entrance to Oak Hills). MCPS Operations Direction Burley McWilliams (in his January email to city staffer Anita McNamara) stated that having students cross Hillview would be a safety concern. Would requiring them to cross twice even be acceptable?

2) Concern that proposed cross walk near the entrance to Hillview Crossing poses a potential public traffic hazard, and a risk for pedestrians too:

In the course of speaking with MCPS's Burley McWilliams about school bus routes, he was surprised and concerned to learn about a proposed crosswalk. He mentioned the danger of impeding the momentum of traffic heading uphill on slippery winter days (the same concern he mentioned in his email to city staff about buses on steep roads within Hillview Crossing. He mentioned that he's seen many vehicles get stuck on Hillview, sometimes behind cars that slow down or stop approaching the crest of the steep hill.

Members of the public have also expressed concerned about the safety of pedestrians crossing Hillview Way **on the hill**, considering the speed of vehicles coming downhill,

especially on slippery days (35 mph speed limit going downhill but it is easy to get going faster due to decline) and the angle of the sun in winter impeding sight there at certain times of the day.

3) **Brainstorming "win-win" options – practical, safe routes to school and city bus stops (and the safest links between public trail systems across major roads)**

a) A better bus stop for getting to school: I've asked Burley McWilliams if MCPS would consider adding a bus stop at Wapikiya Park, at the base of the hillside to shorten the walking distance for students living in Hillview Crossing development as well as students in the Wapikiya neighborhood, and to increase safety since Wapikiya is without sidewalks. Students living on the hill would walk downhill to their bus stop.

b) A better bus stop for getting home from school: I've also asked if MCPS would consider dropping Hillview Crossing students (after school) at a new bus stop on Hillview Way (beyond Hillview Crossing's proposed entrance where it starts to level out a bit). This way, students would only walk downhill a short distance home and avoid the risks of students crossing Hillview Way.

c) And if Mountain Line were to add Hillview Way route, then adult bike commuters heading downhill to work or the UM in the morning could hook bikes onto a bus to avoid the big hill and utilize this new bus stop too.

d) A possible resource – The Montana Cadastral system map showis that Hillview Crossing Missoula, LLC that owns the nearly 25 acres being proposed for townhouse development, also apparently owns a long strip of land along that undeveloped side of Hillview Way (no sidewalks) uphill from their proposed entrance road. Would these land,owners be willing to create a road turn-off spot exclusively for use by buses (MCPS buses and also Mountain Line buses in the future?)

e) Technical questions - Is there a spot uphill from the proposed entrance flat enough to create a bus pull-off area? Could the pull off be engineered to allow traction by buses even in the winter? Is there better place for a crosswalk for use by Tonkin Trail hikers that is easily seen by vehicles approaching from both directions (and as far away as practical from the crest of the hill so as not to impede uphill traffic)?

Photo:
See right turn lane off Hillvew Way at the entrance to Elk Hills development (at Hilliview and Clearview) that keeps uphill traffic from being impeded. Also note the sidewalk there on a relatively flat stretch of road.

Thanks for reading! T.J.

From: John DiBari
To: Anita McNamara
Subject: Fwd: Today"s Land Use and Planning meeting
Date: Friday, January 25, 2019 7:57:25 AM

For your project file.

Thanks!

John DiBari
City Council Ward 4
jdibari@ci.missoula.mt.us

Note: All emails to and from this address are in the public domain.

Sent from my iPhone

Begin forwarded message:

> **From:** Jan Brocci <jkbrocci@gmail.com>
> **Date:** January 23, 2019 at 6:10:26 PM MST
> **To:** jdibari@ci.missoula.mt.us
> **Subject: Today's Land Use and Planning meeting**
>
> Dear Councilor DiBari,
> I want to thank you and the rest of the city council, especially my representative Stacie Anderson, for the seriousness with which you are approaching the Hillview Crossing townhome development. I very much appreciate your understanding of the uniqueness of this particular project --a large townhome development on a 25 percent slope-- and its potential impacts to our neighborhood below. I also respect your commitment to addressing our concerns, as well as some of staff, and trying to find solutions.
>
> As the leader of the committee, you have created comfortable and open atmosphere for the representatives of the developer as well as those of us who live where the development will occur. I thank you for that.
>
> I also want to thank you for what you said today about requiring a geotechnical report PRIOR to approving the project. That is very important to our neighborhood, especially with all the drainage, grading, floodplain and maintenance challenges. I mentioned at one public meeting that when we went to build our home in 1999, we were told that we could NOT build into the hill as the design called for. The city told us we needed to be "so many" feet from the toe of the 25% slope due to the danger of earthquakes. (I don't remember exactly how many.) So I'd like to know what changed.Why is the potential for ground movement from an earthquake no longer important? This development poses a serious threat not only to its own residents, but also to those of us who live below.
>
> In the city's Criteria for Conditional Uses, it says that the City Council must

"determine that the proposed use ... will not have a significant adverse impact on the general welfare of the neighborhood or community." Also that it "is compatible with the character of the surrounding area in terms of site planning, building scale and project design." This project does not meet those criteria. It has a public trail and farmland above it. It is surrounded by mostly single family homes, with a few duplexes on 43rd, and a neighborhood park below. And the adverse impacts it poses to the neighborhood are severe.

Territorial Landworks would like us to believe they are doing us a big favor by already having reduced the density of the development (based on what is allowed per acre) to 68 units. But all they've done is maximize the number of units allowed due to the steepness of the hillside and the Criteria for Conditional uses. I would like to see the City Council ask them to reduce the number of units to make the development fit the hillside it is being built on. They need to provide openings between the units so it's not just a huge blockade on the hill, and people and wildlife can travel the breaks between the units. Three north-to-south breaks through the four levels of the development, or something similar, could help resolve some of the wildlife issues, turn it into a more liveable environment and keep it from being an eyesore for the rest of the neighborhood.

Thank you for your time, Mr. DiBari. I appreciate the opportunity to share my thoughts. Once again, the main reason I'm writing is to thank you for the way you are running the meetings and for your comment about requiring the geotechnical report *prior* to granting approval for the development. That is very important, considering what is at stake here.

Many thanks,
Jan Brocci
jbrocci@gmail.com
2109 42nd Street
Missoula, MT 59803

OFFICE OF THE CITY ATTORNEY

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Legal Opinion 2018-032

TO: City Council, Mayor John Engen, Mike Haynes, Dale Bickell, Leigh Griffing, Mary McCrea, Denise Alexander, John Wilson, Kevin Slovarp, Troy Monroe, Eric Andersen, Marty Rehbein, Kirsten Hands, Kelly Elam, Department Attorney

FROM: Jim Nugent, City Attorney

DATE December 14, 2018

RE: Potential inverse condemnation/eminent domain liability exposure if City Council requires a private property owner in a private subdivision exemption project to provide land for a public way to provide ingress and egress to an adjacent property and/or if City Council significantly increases motor vehicle traffic from outside the subdivision exemption project utilizing a private road(s) within the subdivision exemption project for public traffic going to and from an adjacent property.

FACTS:

Hillview Crossing Missoula, LLC is proposing a 68 townhome exemption development (TED) dwelling unit residential development in Missoula's south hills utilizing the townhome/townhouse subdivision exemption set forth in Montana Subdivision and Platting Act, section 76-3-203 MCA identifying and authorizing subdivision exemption status for condominiums, townhomes or townhouses. The residential dwelling unit project is not a subdivision proposed project.

During recent years pursuant to Cause No. DV-16-167 Montana Fourth Judicial District Court, Missoula County, the District XI Human Resource Council, Inc has been unsuccessfully suing Hillview Crossing –Missoula, LLC, City of Missoula and Mike Haynes primarily in an effort to require Hillview Crossing-Missoula to provide a road across their private property to adjacent XI Human Resource Council, Inc. property in order to facilitate public ingress and egress to and from the adjacent Human Resource council property. Basically the lawsuit involved claims by Plaintiff District XI Human Resource Council, Inc. that a 2006 City Council subdivision preliminary conditional approval of a subdivision application that proposed a connecting public roadway to the adjacent Human Resource Council property thereby created a right for Human Resource Council to a public road across adjacent private property. The subdivision approved preliminary plat approval was never implemented and the preliminary plat approval time period has expired. Human Resource Council also was attempting to assert claims against the City of Missoula and Mike Haynes based on the City's issuance of a Zoning Compliance Permit on October 16, 2015 to Defendant Hillview Crossing-Missoula, LLC for a residential dwelling unit

development project that did not provide a roadway across the privately owned Hillview Crossing-Missoula, LLC land to connect to adjacent Human Resource Council land.

Some of the District XI Human Resource Council lawsuit claims were dismissed by the District Court on May 3, 2016. District XI Human Resource council's remaining lawsuit claims against Hillview Crossing-Missoula, LLC, the City of Missoula and Mike Haynes were dismissed by the District Court pursuant to summary judgment in favor of lawsuit Defendants on January 30, 2017.

Wednesday December 12, 2018 representatives of Human Resource Council LLC appeared at the Missoula City Council land use and planning committee requesting with respect to a pending Hillview Crossing Townhome Exemption Development (TED) zoning Conditional Use request that the Missoula City Council require Hillview Crossing-Missoula, LLC to negotiate with Human Resource Council to provide land for a road connection across Hillview Crossing – Missoula's private land from the proposed Hillview Crossing-Missoula, LLC townhome subdivision exemption project land area to the adjacent Human Resource council property. The roadways within the Hillview Crossing-Missoula, LLC will be private roads located on privately owned land.

ISSUE:

If the Missoula City Council attempts to require a connecting road across private property to facilitate ingress and egress travel to an adjacent Human Resource Council property, could there be potential inverse condemnation/eminent domain monetary liability exposure for the City of Missoula either taking private land for a public use and/or potentially negatively impacting the proposed Hillview Crossing Townhome Exemption (TED) Development zoning conditional use project if a City Council required connecting road across private property that also potentially significantly increases the volume of motor vehicle traffic passing through the Hillview Crossing-Missoula project on private roadways?

CONCLUSION:

Article II, section 29 of the Montana Constitution provides that private property shall not be taken or damaged for public use without just compensation to the full extent of the loss. Also, see the statutory provisions of title 70, chapter 30 MCA "EMINENT DOMAIN" to the same effect.

LEGAL DISCUSSION:

Wednesday December 12, 2018 representatives of the Human Resource Council were requesting the Missoula City Council to require that the City Council require Hillview Crossing-Missoula, LLC to negotiate with Human Resource Council for use of private land to be utilized as a connecting public way road, a public use, between the Human Resource Council land and the Hillview Crossing-Missoula LLC residential townhome subdivision exemption project in order to facilitate ingress and egress motor vehicle traffic to and from the Human Resource Council property and also apparently have the effect of significantly increasing the volume of motor

vehicle traffic that would be utilizing the private streets located within the Hillview Crossing-Missoula LLC project.

Article II, section 29 of Montana's constitution states:

> "Section 29. EMINENT DOMAIN. PRIVATE PROPERTY SHALL NOT BE TAKEN OR DAMAGED FOR PUBLIC USE WITHOUT JUST COMPENSATION TO THE FULL EXTENT OF THE LOSS HAVING FIRST BEEN MADE TO OR PAID INTO COURT FOR THE OWNER. IN THE EVENT OF LITIGATION, JUST COMPENSATION SHALL INCLUDE NECESSARY EXPENSES OF LITIGATION TO BE AWARDED BY THE COURT WHEN THE PRIVATE PROPERTY OWNER PREVAILS." (emphasis added)

Title 70, chapter 30 MCA entitled "EMINENT DOMAIN" establishes similar just compensation requirements. Statutorily in Montana's eminent domain laws, roads, streets and alleys are identified as "public uses". The right of eminent domain may be exercised for public uses such as roads, streets, and alleys for the benefit of a city or the inhabitants of the city. See subsection 70-30-102(7) MCA. When eminent domain has not been officially initiated; yet a public use taking occurs, inverse condemnation is the legal term utilized to describe the legal aspects of the factual circumstances.

Missoula City Council members should also be aware of the Montana Supreme Court inverse condemnation decision against the City of Billings in the case of Knight v. City of Billings, 197 Mont. 165, 642 P. 2d 141, 1982 Mont. LEXIS 749(1982) . The factual circumstances in Knight v. City of Billings involved the City of Billings condemning property on one side of a then residential street in order to be able to facilitate motor vehicle traffic through a residential area to accommodate commercial development along the street. The city widened the street and installed traffic lights. The property on the opposite side of the street had a residential deed restriction. The property owners on the opposite side of the street sued in inverse condemnation. Property owner testimony identified some of the adverse impacts to them from the street widening project to include:

(1) Significantly more motor vehicle traffic passing by their residences;
(2) More intense street lighting, which they had unsuccessfully protested the creation of the lighting district;
(3) Prior to the street widening the residential area had been relatively quiet;
(4) Prior to the street widening the residences front yards had been suitable for family and social gatherings;
(5) Prior to the street widening residents and guests could park on the street;
(6) Prior to the street widening there was no difficulty getting in and out of residential driveways along eh street;
(7) Prior to the street widening noise and pollutant levels were low and not distracting or harmful;
(8) Prior to the street widening there was no undue refuse along the street; Prior to the street widening family pets were safe;
(9) Prior to the street widening there was no noticeable vibration from passing traffic;
(10)Prior to the street widening it was quiet at night.

The 1982 Montana Supreme Court in Knight v. City of Billings held that the residential property owners' property had been inversely condemned by the actions of the City of Billings. The Montana Supreme Court indicated that with respect to damages, the residential property owners were entitled to the amount of depreciation to their residential property.

The Knight v. City of Billings Montana Supreme Court decision is noted to the Missoula City Council in part for the reasons that in addition to Human Resource Council desiring a connecting public roadway across Hillview Crossing-Missoula private property, the Hillview Crossing Townhome subdivision exemption project zoning conditional use request is a proposal for residential neighborhood located in a private geographical area with private streets or roadways planned. The connecting roadway on currently private property that Human Resource Council desires to facilitate development of Human Resource Council land is intended to provide the ingress and egress route across private streets/roadways in order to serve the Human Resource Council property which is likely to significantly increase the motor vehicle traffic and perceived adverse side effects that accompany additional motor vehicle traffic through what is proposed to be private road private land development.

CONCLUSION:

Article II, section 29 of the Montana Constitution provides that private property shall not be taken or damaged for public use without just compensation to the full extent of the loss. Also, see the statutory provisions of title 70, chapter 30 MCA "EMINENT DOMAIN" to the same effect.

OFFICE OF THE CITY ATTORNEY

Jim Nugent

Jim Nugent, City Attorney
JN:jb

OFFICE OF THE CITY ATTORNEY

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attorney@ci.missoula.mt.us

Legal Opinion 2019-001

TO: John Engen, Mayor, City Council, Dale Bickell, Anita McNamara, Mary McCrea, Mike Haynes, Mike Brady, Scott Hoffman, Mike Colyer, Chris Odlin, Richard Stepper, Laurie Clark, Greg Amundsen, Marty Rehbein, Kirsten Hands, Kelly Elam, Tiffany Brander, Kevin Slovarp, Troy Monroe, Lori Hart, Brian Hensel, Department Attorney

FROM: Jim Nugent, City Attorney

DATE January 24, 2019

RE: A public highway must be publicly maintained in order for general motor vehicle regulations set forth in title 61, chapter 8, MCA to be applicable or enforceable on a public highway, except when a specific statutory provision authorizes a specific traffic regulation be enforceable on public ways which include private roads.

FACTS:

A proposed residential development of townhouses that is pending before the city council will include three (3) lengthy private roadways; since the project is not a subdivision development; but instead is a subdivision exemption development. The private roadways will be narrower than typical subdivision streets and motor vehicle parking will only be allowed on one side of the private roadways. Discussion has arisen as to who will be responsible for enforcing motor vehicle parking violations on the private roads.

ISSUE:

Generally, are Montana traffic parking regulations enforceable on private roadways by city law enforcement?

CONCLUSION:

No, motor vehicle traffic parking violations are not enforceable by public law enforcement on private roadways that are not publicly maintained, except for disabled parking violations. Other traffic offenses such as DUI, reckless driving and accident reporting laws are also able to be enforced on private roadways.

LEGAL DISCUSSION:

Title 61, chapter 8, MCA is entitled "TRAFFIC REGULATION". Part 1 of title 61, chapter 8 is entitled "GENERAL PROVISIONS". Section 61-8-101 MCA is entitled "APPLICATION-EXCEPTIONS". Pursuant to subsection 61-8-101(2) MCA Montana state law states that the provisions of the chapter entitled "TRAFFIC REGULATIONS" are applicable or "refer exclusively to the operation of vehicles upon highways" except for statutory exceptions for specified traffic offenses, such as DUI and reckless driving.

Subsection 61-8-101(1) MCA identifies "ways of the state open to the public" as meaning highways roads, alleys and lanes as well as public or private places adopted and fitted for public travel that is in common use by the public. This definition of "ways of state open to the public includes private roadways. However, as noted above subsection 61-8-101(2) MCA indicates that Montana's general traffic regulations related to the operation of vehicles EXCLUSIVELY on highways, except for specific statutory exceptions, such as DUI and reckless driving. Other statutory provisions authorize the enforcement of accident reporting laws and disabled parking on public ways that include private roadways on private property.

The Montana traffic regulation definition of "highways" or "public highway" set forth in subsection 61-1-101(27) MCA defines the term in pertinent part as "EVERY PUBLICLY MAINTAINED WAY". (emphasis added) To the same effect see the definition of highway reference in subsection 61-8-102(2)(i) MCA. Therefore, unless the roadway is publicly maintained by a government entity, the roadway is not a "highway" or "public highway" on which general traffic regulations may be enforced. It is important to ascertain if the roadway is publicly maintained when determining if state traffic laws may be enforced on the roadway.

Also, more specifically with respect to Montana local governments the roadway must be accepted by the city in order to be a city street, see subsection 60-1-201(2) MCA. Further, subsection 61-12-101(1)(n) MCA states that a local government traffic regulation ordinance enforcement is not to be "in conflict with state law or federal regulations"

CONCLUSION:

No, motor vehicle traffic parking violations are not enforceable by public law enforcement on private roadways that are not publicly maintained, except for disabled parking violations. Other traffic offenses such as DUI, reckless driving and accident reporting laws are also able to be enforced on private roadways.

OFFICE OF THE CITY ATTORNEY

Jim Nugent, City Attorney
JN:ka

TETRA TECH

MEMO

To:	Jason Rice, P.E., Territorial-Landworks, Inc.
Cc:	Alan McCormick
From:	Jeremy Dierking, P.E.
Date:	April 1, 2019
Subject:	Review of Geotechnical Report – Hillview Crossing Project, Missoula, Montana

Tetra Tech has been retained to provide third-party review of the geotechnical report for the above referenced project. The following documents were provided to Tetra Tech for review:

- Updated Geotechnical Evaluation Report, dated December 3, 2015 by SK Geotechnical
- Preliminary Site Plan and Typical Cross Sections, dated April 19, 2018 (attached for reference)
- Memo No. 4, dated March 11, 2019 to the City Council from Mary McCrea, Development Services

Tetra Tech performed a general review of the above documents with respect to the project's current preliminary mass grading, utilities, and roadway design. General comments on the report are as follows:

In general, the geotechnical report appears to be appropriate for the scope of project site development. Slope stability analyses were performed on the maximum cut and fill slope cross-sections, which indicated acceptable factors of safety for both static and seismic conditions. Detailed geotechnical recommendations for site grading, including; topsoil stripping, embankment construction with keyed benches and toe keyways with geogrid reinforcement, fill material and compaction, cut slopes, seepage, utility installation, pavement sections, and drainage. Detailed recommendations for earthwork observation, quality assurance/quality control inspection and testing, and subgrade preparation and stabilization were also provided in the report. In our opinion, the report satisfactorily addresses the key geotechnical issues identified for the project scope at the time of report preparation.

Current preliminary site grading plans do not appear to have not substantially changed since preparation of the report in 2015. Notable exceptions include; 1) an approximately 270-foot long retaining wall with a max height of approximately 7.5 feet, and 2) a stormwater detention tank near the toe of the slope below the mass site grading area.

Tetra Tech understands the City of Missoula's concern is that the geotechnical report does not address the following primary items related to the current preliminary grading plans and should be updated to include; 1) geotechnical evaluation and recommendations for the proposed retaining wall, 2) geotechnical evaluation and recommendations for the proposed stormwater detention tank, and 3) geotechnical evaluation and recommendations for topsoil stockpile staging locations. In our opinion, the geotechnical report can be updated to satisfactorily address the above items and general comments on these items are provided below.

The preliminary retaining wall and stormwater detention tank layout appears to be feasible based on the subsurface conditions presented in the 2015 report. The proposed retaining wall will be located in the native cut slope and is

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2525 Palmer Street, Suite 2; Missoula, MT 59808
Tel 406.543.3045 Fax 406.543.3088 tetratech.com

anticipated to perform as desired provided it is designed to meet standard retaining wall design factors of safety for global stability, overturning, and sliding, and includes appropriate drainage behind the wall.

The proposed stormwater detention tank will be mostly below grade and the net difference between the weight of the existing soil in place and the maximum weight of the tank is anticipated to be low enough that the slope factor of safety would not decrease below acceptable values. The proposed configuration and weight of the tank should be evaluated with respect to the slope to verify the factor of safety as part of the final geotechnical report.

Topsoil stockpile staging should be located in designated areas deemed appropriate by the geotechnical engineer. The slope stability analyses in the report included boundary loads of 1,000 pounds per square foot (psf) to represent future residential structure loads and indicated acceptable factors of safety. A topsoil stockpile with a height of 8 ft or less would not exceed the 1,000 psf load modeled in the stability analyses. In our opinion, topsoil stockpiles located on the benches excavated in native soils at the end of the roadways would be acceptable. Based on discussions with the project team, stormwater runoff during construction will be properly administered by the project Stormwater Pollution Prevention Plan (SWPPP), included installation of temporary lined swales to provide drainage and prevent infiltration into fill slopes.

The geotechnical report states that cut and fill slopes can be constructed at maximum slopes of 2.5H:1V but also states that 3H:1V slopes are generally considered the practical maximum for maintenance operations, erosion control, and safety. It is Tetra Tech's opinion that 2.5H:1V slopes can be designed and maintained with appropriate landscaping and erosion control to provide long term performance.

Tetra Tech understands there has been some discussion on widening the streets, which may shift the lower downhill lots to the north (downslope), resulting in footing elevations bearing within the new fill slopes, which is a concern for long term foundation settlement. This concern can be mitigated by various alternatives, including; 1) extending footing walls down through the fill and bear footings on native soils, or 2) bearing footings on helical piers or similar structural foundation elements extending through the fill and into the native soils.

Foundations bearing adjacent to slopes are typically designed to include a minimum setback distance from the edge of slope. The setback distance is dependent on several factors, including; foundation depth, foundation width, soil type, and slope angle. In this case, a setback distance on the order of four times the foundation width is likely appropriate. It should be noted that foundation recommendations for buildings were not included in the geotechnical report and that the report recommends individual geotechnical reports for each individual residence.

Tetra Tech understands the City was concerned about the expiration date stated in SK's report. If Tetra Tech is retained to complete an updated geotechnical investigation and report, a report expiration date will not be included, provided the subsurface conditions and project details are not substantially different than those detailed and SK's previous investigation and report.

This memo is intended solely to provide a general review and comment on the project geotechnical report and is not intended to change or supplement the geotechnical report in any respect. SK Geotechnical is the current Geotechnical Engineer of Record.

Prepared by:

MONTANA
JEREMY DIERKING
No. 15692 PE
LICENSED
PROFESSIONAL ENGINEER

Jeremy Dierking, P.E.
Project Geotechnical Engineer

= AREAS 5% OR LESS SLOPE

(XX) = UNITS W/ 42" STEM WALL AT REAR OF BUILDING

SCALE IN FEET

SECTION A

SECTION B

SECTION C

SECTION D

EAST-WEST TRAIL EASEMENT

PROPOSED STORMWATER TANK

NORTH-SOUTH TRAIL EASEMENT

PROPOSED RETAINING WALL, MAX 7.5' TALL, 1450 SF

THE HOMESTEADS

PARK

WARRIVA RD.

SAGING DRIVE

DE LITO

HILLVIEW WAY

COS 4649

TERRITORIAL LANDWORKS, INC.

CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING

www.TerritorialLandworks.com

P.O. Box 4984
Missoula, MT 59806

Ph: 406/721-0142
Fax: 406/721-0334

REVISIONS	DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 4/19/2018

LOCATION: CITY OF MISSOULA 12N, 19W, S8 MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

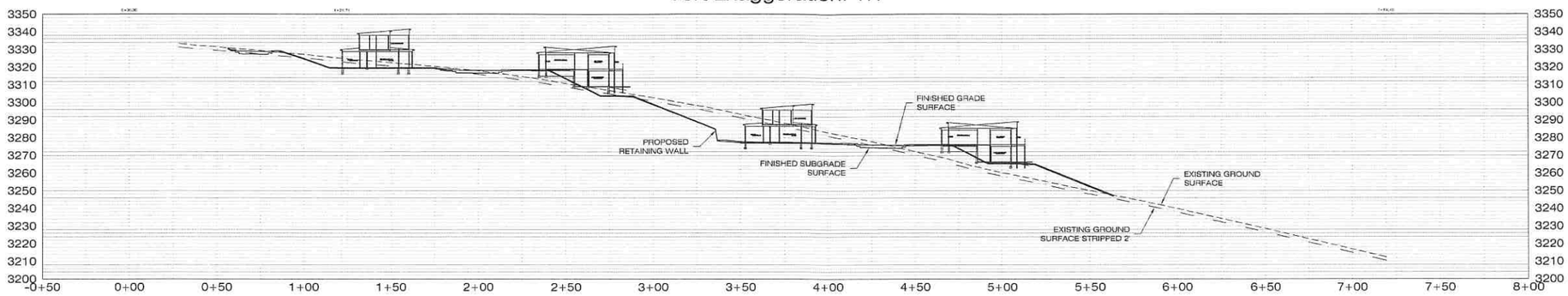
SHEET TITLE: SITE PLAN

PROJECT NO.: 14-3592

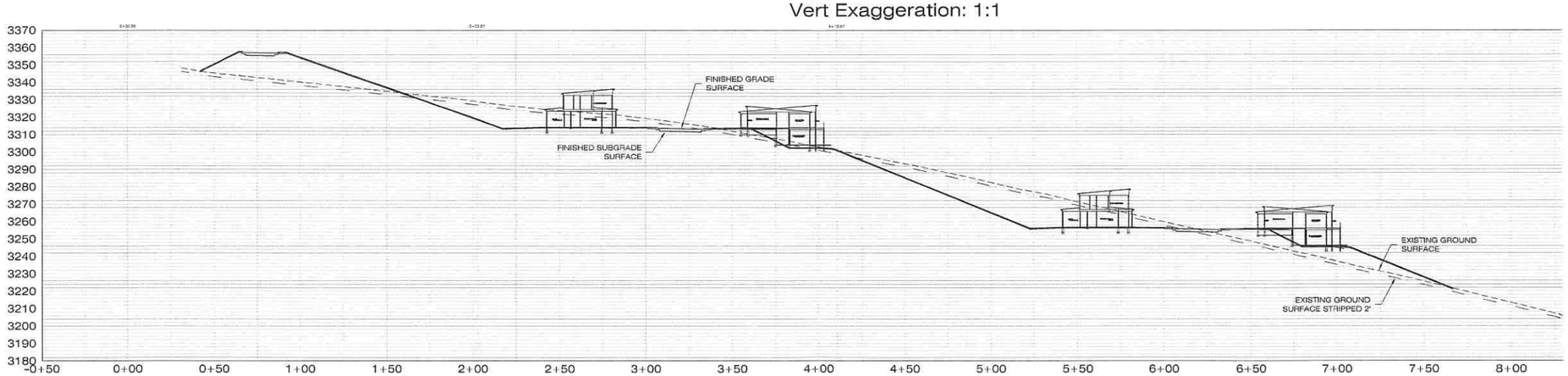
SHEET: 1 OF 1

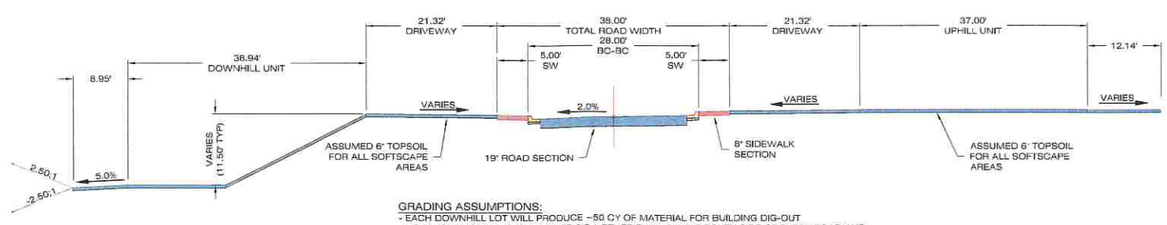
PRELIMINARY

Alignment: SECTION A
Vert Exaggeration: 1:1



Alignment: SECTION B
Vert Exaggeration: 1:1





GRADING ASSUMPTIONS:
- EACH DOWNHILL LOT WILL PRODUCE ~50 CY OF MATERIAL FOR BUILDING DIG-OUT
- NO FINISHED GRADE SLOPES OVER 2.5:1 OTHER THAN ON THE SOUTH SIDE OF ENTRY ROAD AND BENCHES WHERE BUILDINGS WILL BE BUILT
- ASSUMED 8.25' REVEAL FROM FINISHED FLOOR TO FG
- PER GEOTECH REPORT THERE WILL BE AN AVERAGE 2' OF TOPSOIL STRIPPING ACROSS THE SITE
- FINISHED FLOOR ELEVATIONS WERE SET ASSUMING MAX DRIVEWAY SLOPE OF 8% AND MIN OF 1%
- ELEVATION DIFFERENCE BETWEEN FINISHED FLOOR AND BASEMENT FLOOR IS 9.85'
- DOWNHILL LOTS WERE GRADED WITH THE ASSUMPTION OF A 2.5' REVEAL FROM BASEMENT EL TO FINISHED GRADE

TYPICAL LOT GRADING SCHEMATIC

TERRITORIAL LANDWORKS, INC.
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P.O. Box 3861
Missoula, MT 59806
Ph: 406721-0142
Fax: 406721-0324

REVISIONS | DATE

DESIGNED: NC
DRAFTED: BD
CHECKED:
DATE: 08/16/2017

LOCATION: CITY OF MISSOULA 12N, 19W, S5 MISSOULA COUNTY, MONTANA

PREPARED FOR: DJ HOLDINGS

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

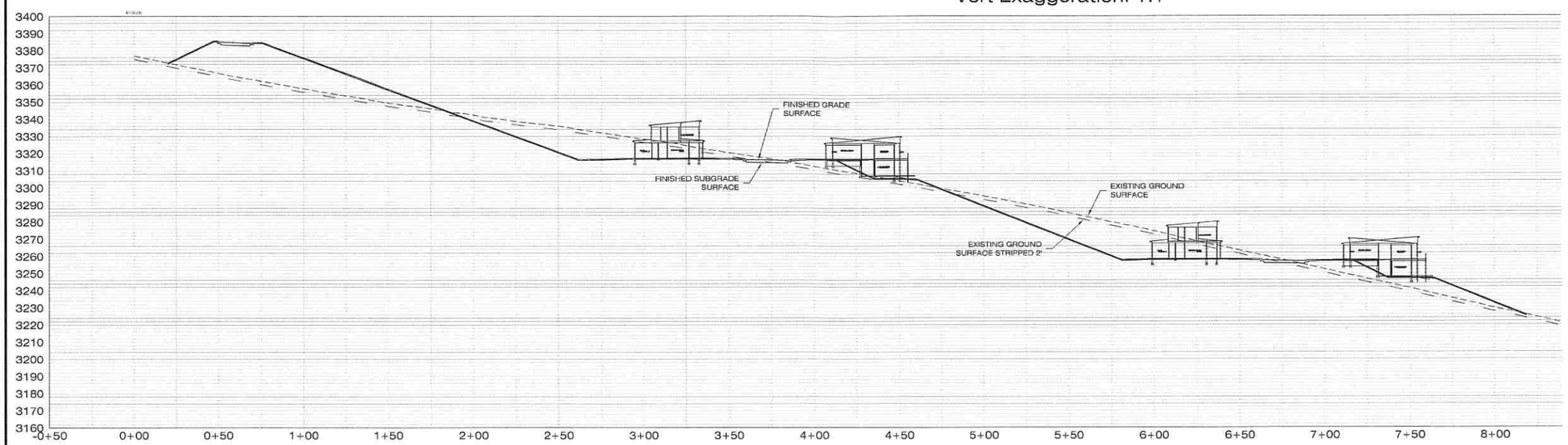
SHEET TITLE: TYPICAL CROSS SECTION

PROJECT NO. 14-3592

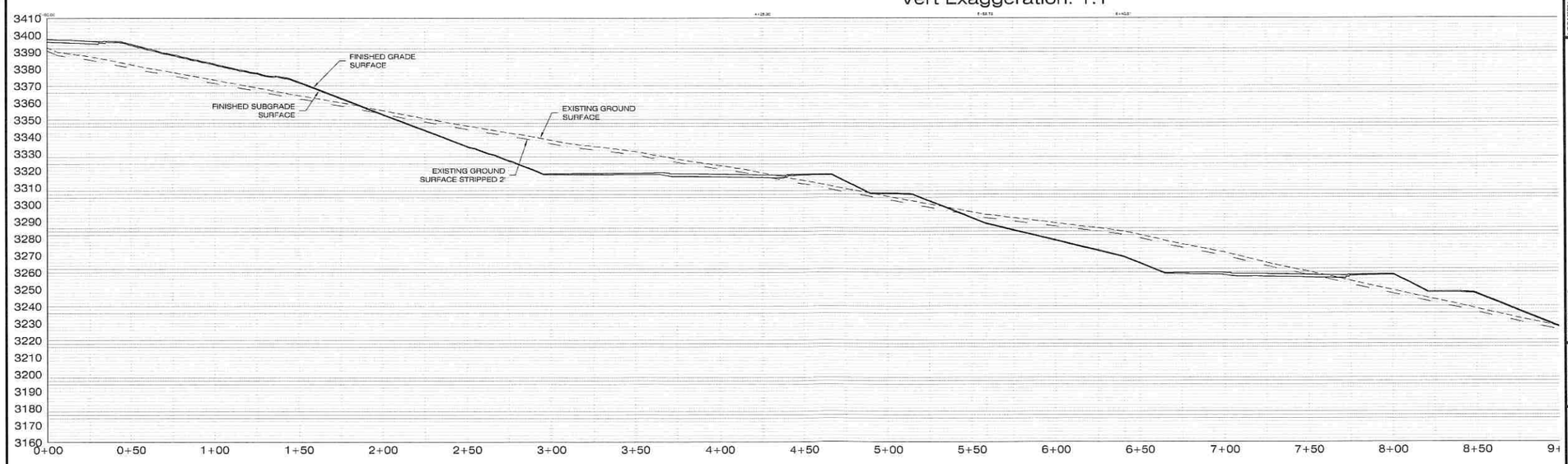
SHEET: 1 OF 1

PRELIMINARY

Alignment: SECTION C
Vert Exaggeration: 1:1



Alignment: SECTION D
Vert Exaggeration: 1:1



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Fax: 406721-0251

REVISIONS | DATE

DESIGNED: NL
DRAFTED: BD
CHECKED:
DATE: 08/14/2015

LOCATION: CITY OF MISSOULA 12N, 19W, S5 MISSOULA COUNTY, MONTANA

PREPARED FOR: DJ HOLDINGS

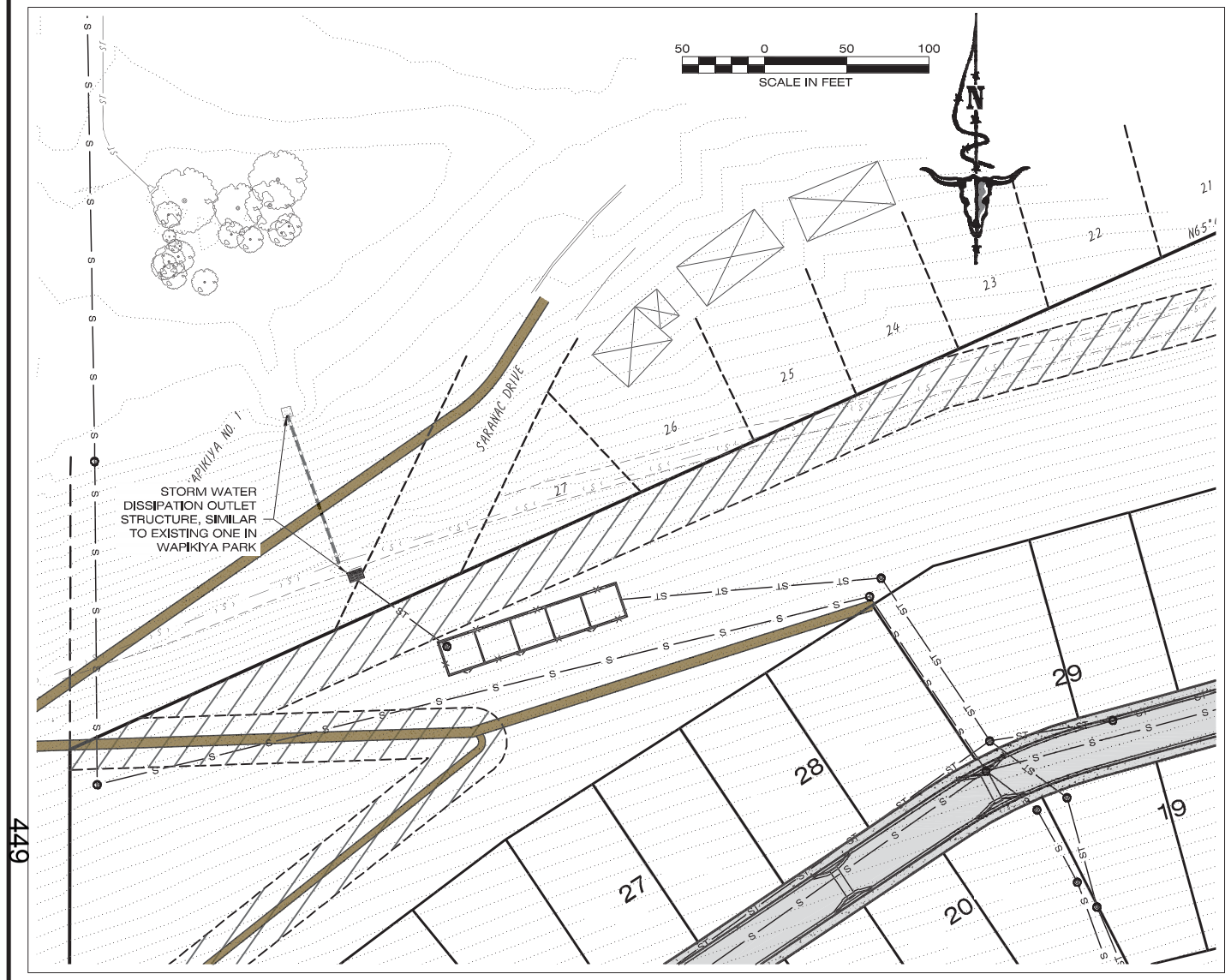
PROJECT NAME: HILLVIEW CROSSING - MISSOULA

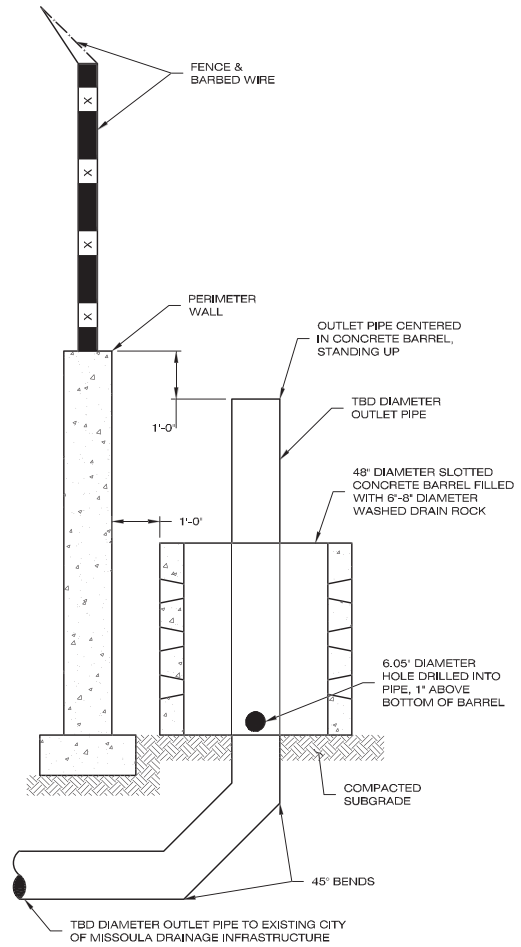
SHEET TITLE: TYPICAL CROSS SECTION

PROJECT NO. 14-3592

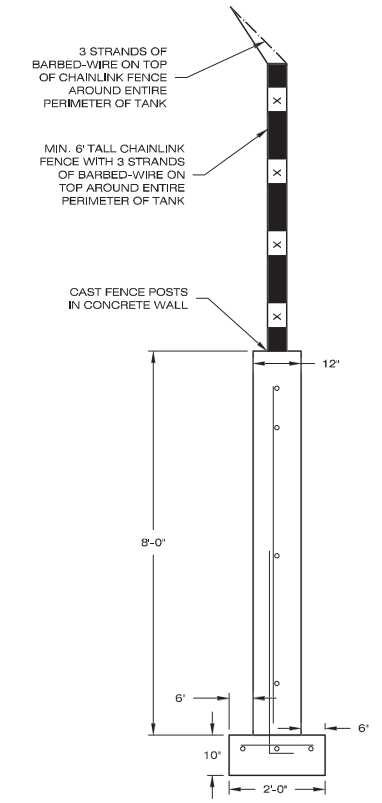
SHEET 1 OF 1

PRELIMINARY

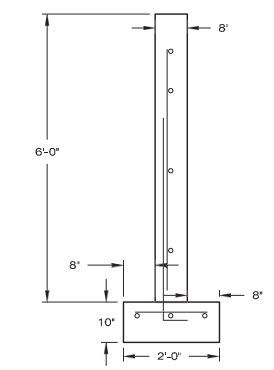




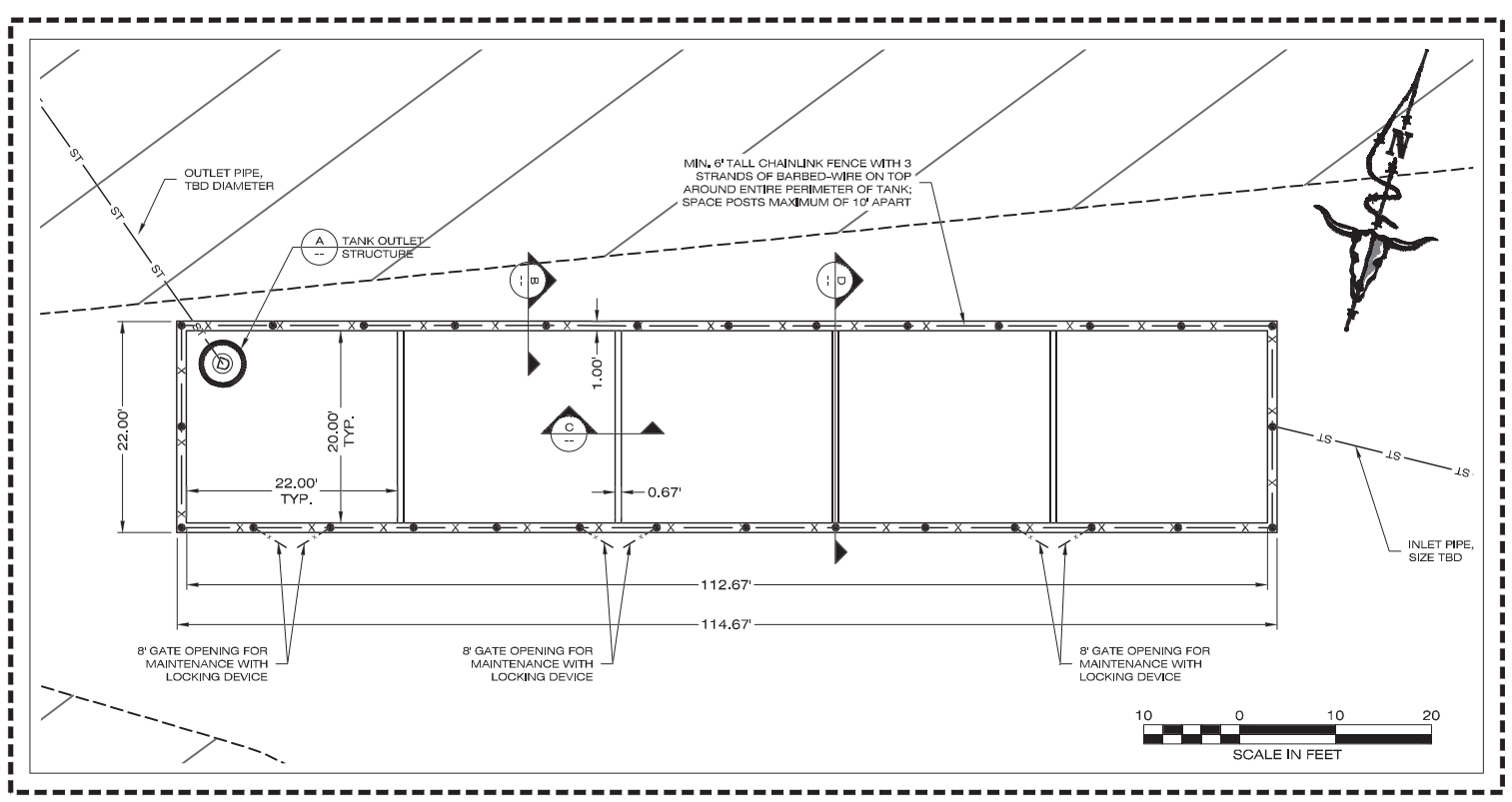
A -- TANK OUTLET DETAIL
NOT TO SCALE

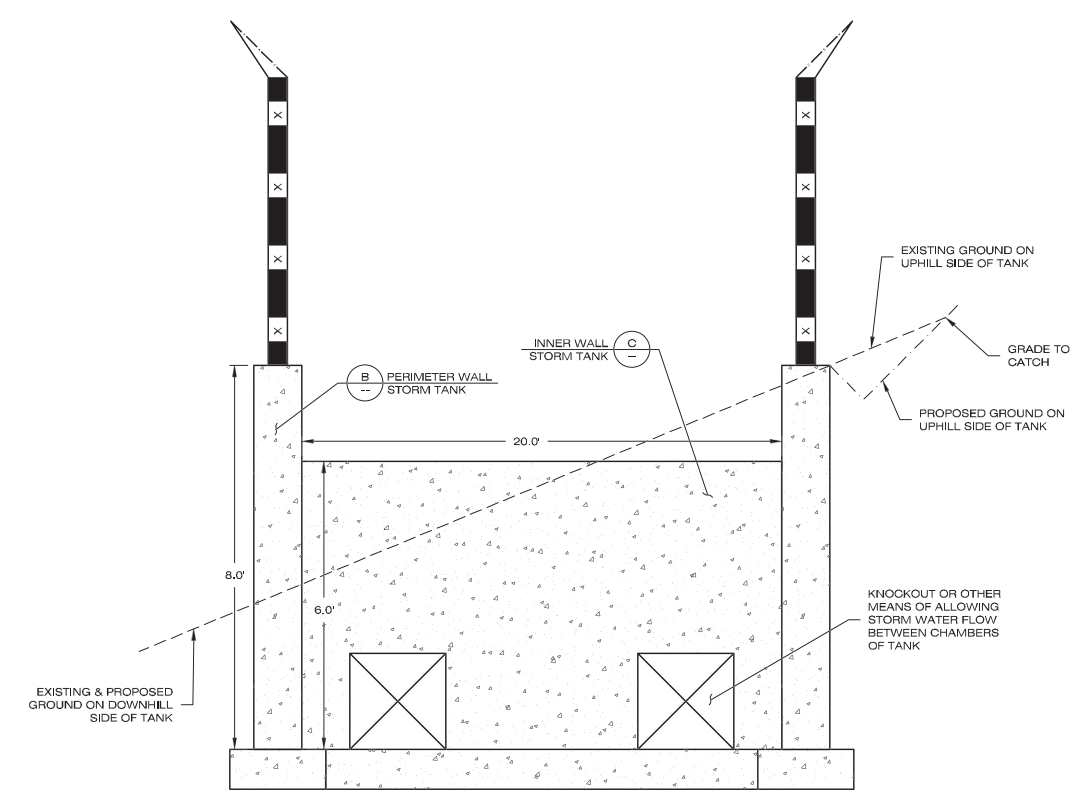


B -- PERIMETER WALL STORM TANK
NOT TO SCALE



C -- INNER WALL STORM TANK
NOT TO SCALE





D -- INNER WALL - SIDE VIEW STORM TANK
NOT TO SCALE

TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
www.TerritorialLandworks.com
P.O. Box 3551
Missoula, MT 59806
Ph: 406/721-0142
Fax: 406/721-5224

PLOT DATE: 4/22/2019 9:55 AM

REVISIONS	DATE

DESIGNED:
DRAFTED: AM
CHECKED:
DATE: 4/22/2019

LOCATION: HILLVIEW WAY SECTION 6, T12N, R19W, P.M.M. CITY OF MISSOULA MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING LLC

PROJECT NAME: HILLVIEW CROSSING TOWNHOMES

SHEET TITLE: STORMWATER COLLECTION TANK DETAILS

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE RESIDENTIAL PROJECTS\3592 - HILLVIEW CROSSING\MISSOULA & HILLS DRIVE_DEVELOPMENT_DRAFTING\A.1_DRAWINGS\AUTOCAD\MISC. DRAWINGS\DEDH-14-3592-DRAINAGE 2019-03-26.DWG

MEMORANDUM

DATE: April 11, 2019

TO: Missoula City Council & Troy Monroe, P.E.

FROM: Jason Rice, P.E., CEO

RE: Hillview Crossing Townhomes – Storm Water (TLI #14-3592)

Council and Troy,

As was promised at the last LUP Committee meeting, attached to this Memo is an updated stormwater report. We have not included any of the original calculations that did not change as outlined in the text below. Following is a summary of what has been updated and what was not updated, along with our reasoning.

UPDATED: We heard that members of City Council wanted a "Feasibility Level" stormwater report. When we reported that this is what was provided originally, it was clarified that what was of interest is how the water would be stored and conveyed to the City stormwater system. Following is a list of what was revised. Please note that when designing infrastructure that interacts with the City systems, we would prefer to work directly with City Engineering, but understand that we are not allowed to have direct communication outside of the hearings at this time. If this is a misunderstanding or if City Council can direct staff to work directly with us, we would be happy to address any concerns.

1. Per Troy Monroe, PE's email dated October 9, 2018, we revised the pro-rated flow in Section 5.2B. This included removing the area of the property that doesn't contribute to the existing collection ditch. The revised exhibit and calculation show the actual contributing "pro-rated" flow to be 2.57 cfs (not 2.7 cfs as previously submitted).

2. Per Troy Monroe, PE's email dated October 9, 2018, Section 5.2C was amended to include a preliminary analysis showing pipe sizes at different slopes to show how the final pipe sizing will be handled and actually calculated. The full time-intensive calculations are not completed as they depend on final grading and final road design. This spreadsheet instead gives an idea how different pipe sizes can handle different flows at varying slopes. The contributing area to different catch basins and associated storm pipes will be modeled as a system and factor in all upstream and downstream conditions in a future final report.

3. Per previous public comment, the actual existing topography and slope of the site is closer to 15%-30% (not 10%-15%) and the report, specifically Section 3.1A, was updated accordingly for the existing conditions and general slope discussion.

4. As requested by City Council, we evaluated the outlet structure from the stormwater vault that will lead to the park and sized an orifice that will limit stormwater flows as discussed in the original report and amended with this submittal per Troy's email.

5. As requested by City Council, we also have included an exhibit and diagrams of how a vault could store the waters generated by the current proposal. This includes a vault that has been preliminarily analyzed structurally by Eclipse Engineering and an outlet structure orifice that will limit flows to the allowed 2.57 cfs, while storing the required volume.

NOT UPDATED: Given the limited time to turn this report around and the fact that there are still some unanswered questions and requests, we have not included the following updates that may or may not be needed to consider the stormwater design as final:

1. Final Road Design – depending on final mass grading to meet any other changes that may be requested, the street grades may need to be adjusted which could change the location and slope of the storm pipes. Additionally, Council has required that the road width be increased to 35'. However, this makes the project infeasible with 20' setbacks. The Developer's attorney has written a legal memo requesting reconsideration. Given that the calculations have been previously reviewed, this would only increase the storage and flow rates slightly, and therefore, these updates were not completed at this time. Following is a partial list of all the work that will need to be updated upon final decisions:
    - New impervious areas and other surface use area calculation revisions (i.e. asphalt, concrete, gravel, sidewalk, etc.)
    - Curve Number Calculation revisions
    - Time of Concentration revisions
    - TR-55 calculation revisions for Runoff Rates & Runoff Volumes

2. A full Catch Basin & Storm Pipe Analysis has not been completed at this time as requested in Troy's October email for the same reasons above. Currently, we estimate 20 catch basins and an estimated 3430 lineal feet of storm pipe to be analyzed.

3. Final Stormwater Detailing on construction grade plans has not been completed for items including, but not limited to:
    - Stormwater Details (Catch Bains, Pipes, Curb Inlets, etc.)
    - Stormwater Storage Vault Details for Rebar, Backfilling, Compaction, Concrete, etc.

Attachments:
- Updated Preliminary Grading and Drainage Engineering Design Report
- Updated or New Calculations
    - Exhibit Showing Revised Pro-Rated Flow Calculation
    - Orifice Sizing Calculation
    - Example Pipe Flow Calculations for Different Pipe Sizes at Varying Slopes
- Outlet Pipe and Storage Vault Structure Schematic and Site Plan

Copied to: Mary McCrea – City of Missoula Development Services

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\3_ENG DESIGN\3.5_DEQ8 (Storm Drainage)\Memo.StormwaterReport2.Hillview Crossing.2019-04-11.docx

PRELIMINARY

GRADING AND DRAINAGE ENGINEERING DESIGN REPORT

FOR CALCULATIONS USING USDA/NRCS WinTR-55 PROGRAM &
IN ACCORDANCE WITH CITY OF MISSOULA PUBLIC WORKS STANDARDS

for

Hillview Crossing
Townhome Development

Located at:
Off of Hillview Way
Section 6, T12N, R19W, P.M.M.
City of Missoula, Missoula County, Montana

Original: September 7, 2018
Revised: October 2, 2018
Revised: April 9, 2019

Prepared For:
City of Missoula
435 Ryman Street
Missoula, MT 59802

Prepared On Behalf Of:
Hillview Crossing Missoula LLC
3605 Arthur Street
Caldwell, ID 83605

Prepared By:
Territorial-Landworks, Inc.
1817 South Ave W, Suite A
P.O. Box 3851
Missoula, MT 59806

1.0 GENERAL

Hillview Crossing is a proposed Townhome Development of approximately 25.6 acres located below and north of Hillview Way in Missoula's South Hills area. The legal description of the property is: Portion of the Southeast ¼, Northeast ¼, Section 6, T12N, R19W, less Wapikiya Addition No. 3, located in the City of Missoula, Missoula County, Montana. As part of the townhome development, there will be a total of 68 separate townhome units. Development will include new roads, sidewalks, a trail, extensions to the public water and wastewater systems, and a stormwater collection and management system will all be required. The proposed development is located on undeveloped land surrounded by urban developments with open space, fair conditioned grassland and steeper slopes.

This storm water report will outline the existing conditions, review the proposed development, summarize the storm water analysis/design, provide the anticipated storm water results and summarize the findings. The pre-developed and post-developed storm water runoff volumes will be calculated. The objective is to manage the storm water flows so that the peak flows for the post-developed conditions that leave the subdivision are not greater than the pre-development flows and ensure that the site drainage functions properly because of the steeper slopes found on-site. Traditional flow paths will be maintained as well as reasonably possible.

This report was prepared based on preliminary discussions with the City of Missoula and in accordance with their requirements, with input from MDEQ Circular 8 for data and methods used.

2.0 DRAINAGE DESIGN CRITERIA AND METHODS USED

The SCS method, also known as the Curve Number method or the TR-55 method, was used to estimate the storm runoff rate for the site and each individual basin, if applicable. For Montana, typically the SCS

Type II Rainfall Distribution is utilized as part of the TR-55 analysis. Both the TR-55 Manual and Chapter 7 of the MDT Hydraulics Manual have been used as references for the SCS method in this report. MDEQ and the City of Missoula requires that the intent of the design for the site is that flows for a 2-year storm will not increase above existing levels, no roads will be overtopped for the 10-year storm, and no property damage (inundation of drainfields or structures) will occur for the 100-year storm.

The runoff volumes and peak flows from the 2-year and 100-year, 24-hour storms were analyzed for both pre-development and post-development conditions.

The primary inputs for the SCS Method are as follows:

- Curve Number: A curve number is selected for the watershed based on the soil texture (hydrologic soil group) and ground cover. Standard tables developed by the NRCS (formerly SCS) are used to select the appropriate number.
- Time of Concentration: The time of concentration is equal to the longest theoretical time for any drop of rain to flow from the point where it lands in the basin to the basin outflow point based on the longest flow path. Calculating a time of concentration involves summing flow times for runoff as sheet flow, shallow concentrated flow, and channel flow, if applicable. With other factors being equal, the shorter the time of concentration, the higher the design peak flows for a basin.
- Watershed/Basin Area: A basin is generally defined as an area which drains to a single point.
- Design Storm Depth: The SCS Method uses 24-hour storm depths developed by the National Oceanic and Atmospheric Administration (NOAA) with a selected design recurrence interval, such as 2, 5, 10, 25, 50, or 100-year storms. NOAA Atlas Maps for Montana are attached.
- Storm Distribution: To evaluate peak flows, it is necessary to select a design storm hyetograph, or rainfall time distribution pattern. TR-55 recommends a Type II design storm for all of Montana. This storm distribution concentrates a majority of 24-hour rainfall within a sharp peak lasting less than one hour. It is the most conservative of the standard SCS hyetographs for calculating peak flows.

The selection of a curve number enables the SCS method to model the capacity of the soil and land cover to capture and infiltrate rainfall. The model is highly non-linear in that relatively small percent increases in rainfall can lead to large increases in runoff, because as the infiltrative capacity of the soil is used up a higher percentage of precipitation will run off. As the SCS method accounts for soil saturation while the Rational Method generally does not, the SCS method may be more accurate in modeling runoff from natural soils and vegetation than the Rational Method.

Note that the TR-55 method has no specific considerations or adjustment for steep slopes and therefore, none are factored in for this site.

3.0 EXTENT OF STORM DRAINAGE

The following information pertains to offsite flow that may affect the proposed development as well as mitigation for storm water flow rates that will be increased due to the development.

3.1 DELINEATION OF DRAINAGE AREAS INSIDE THE SITE (ON-SITE)

3.1A HISTORICAL BASINS

The site is relatively steep (15%-30% slopes) and consists of open space grassland in fair to good condition groundcover. Note the previously discussed limitations of the TR-55 method regarding steeper slopes. Due to the surrounding topography, some off-site flow contributes runoff to this site. This is generally the same as the on-site flows and is considered the area southwest of the site and north of the existing road, Hillview Way. This off-site flow and the historical drainage patterns were considered for the runoff calculations for the site. Due to the off-site flow and the

proposed development layout, provisions will be made to pass these flows without entering the development's proposed storm infrastructure.

Any bypass drainage as described above will likely concentrate along the proposed road and then routed along the western property line, under/over and then away from the proposed trail. To remedy the potential for erosion due these concentrated flows, appropriately designed dissipation considerations will be planned for, which could include rip-rap or gravel check dams or other engineered infrastructure specifically for the prevention of hillside erosion.

As part of the property, there is an existing drainage collection swale on the north end of the property (downhill side) that collects runoff from the hillside for the surrounding area and then congregates at a single outlet point. This outlet then flows through an existing pipe down the remaining hillside into an open channel in Wapikiya Park, which from there enters the City of Missoula storm drainage system. As part of the proposed development, if post-development runoff rates and volumes are controlled and released at pre-development rates, then there should be no significant increase in runoff into the park drainage basin and City of Missoula storm infrastructure.

It is understood that the existing ditch/swale on the north (downhill) side of the site and all other existing piping are part of the City of Missoula's storm drainage system and any adjustment to such needs approved by the City before any work is to occur. Although we don't anticipate any major alterations to the City's infrastructure, where the controlled outlet from this proposed development into the City infrastructure (i.e. existing ditch) will need approval upon completion of final designs and construction plans.

3.1B DEVELOPED BASINS

Although the proposed roads and structures will alter the localized drainage patterns on the property, the overall drainage patterns and discharge points from the property will remain the same. The post-development conditions have been classified into five (5) separate drainage basins. The breakdown of the basins is based on these proposed drainage patterns of the proposed roads and structures on the steeper lot. As discussed in the section above, historical drainage patterns will be held, and the localized flow patterns will be collected and contained such that they can be routed to the existing patterns downstream. Collection and mitigation of storm water runoff will be accomplished by drainage infrastructure including (but not limited to) concrete curb and gutter, roadside ditches, catch basins, storm pipe, culverts, and collection ponds/basins.

A breakdown of the development basins with areas of different proposed groundcover are discussed later in this report and attached with curve numbers and basin areas.

3.2 DELINEATION OF DRAINAGE AREAS OUTSIDE THE SITE (OFF-SITE)

The off-site conditions are generally the same conditions as on-site with relatively steep slopes and consists of open space grassland in fair to good condition groundcover. The off-site areas contributing flow that needs accounted for includes some areas southwest of our site and north of the existing Hillview Way. Due to the surrounding topography, some off-site flow contributes runoff to this site. This is generally the same as the on-site flows and is considered the area southwest of the site and north of the existing road, Hillview Way. This off-site flow and the historical drainage patterns were considered for the runoff calculations for the site. Due to the off-site flow and the proposed development layout, provisions will be made to pass these flows without entering the

development's proposed storm infrastructure. To plan for this flow, roadside ditch with gravel check dams and culverts to route this flow around or through the site.

4.0 PROVISIONS TO MITIGATE OFF-SITE STORM WATER FLOWS

As described in Section 3.2 of this report, off-site flows into the subdivision are expected due to the existing topography in the area southwest of our site and north of Hillview Way. All off-site flows concentrating to the site are accounted for and will be included in the on-site calculations below and will be mitigated accordingly. Existing drainage patterns will be maintained off-site and on-site.

5.0 PROVISIONS TO MITIGATE ON-SITE STORM WATER FLOWS

The calculations below and attached show that there will be an increase in storm runoff from the proposed development. See the table below for the post-development runoff generated for each basin.

5.1 CALCULATONS & DESIGN

Calculations for this report are based on the SCS Type II Rainfall Distribution for calculating storm water runoff and conducted using the USDA/NRCS TR-55 method. Pre and post-development runoff rates and volumes were determined for the 2-year and 100-year design storms with 24-hour durations. Calculations were made using curve numbers, basins, and time of concentration to ensure proper routing and that any proposed infrastructure is not inundated. Per City of Missoula and standards, the design for the site is that flows for the 100-year storm and developed peak flows are limited to the pre-development flows for the 100-year event. For all calculations, refer to the attached TR-55 calculations.

5.1A HYDROLOGIC SOIL GROUP

The NRCS Soils Data was obtained from the Web Soil Survey website (located at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) to determine hydrologic soil group (HSG). The NRCS Soils Data for this site shows it to be a combination of Bigarm Gravelly Loam, which is HSG=B and Minesinger-Bigarm Complex, which is HSG=C.

5.1B CURVE NUMBERS & LAND USE DATA

Curve numbers were obtained from the TR-55 Manual, Tables 2-2a, 2-2b, and 2-2c. When there are multiple or combination of hydrologic soil groups, a weighted curve number is determined for the different areas. Due to the existing on-site soil is a combination of HSG B and C (from above) and is primarily groundcover classified as *"pasture, grassland, or range in fair condition,"* the Curve Number (CN) of 69 and 79, respectively for the HSG's was utilized for existing condition in the TR-55 method. For post-development, all proposed impervious infrastructure (i.e. structures, asphalt, concrete, etc.), landscaping (sod, re-seeded), and undisturbed areas were included for the site. See the summary table below and the attached to this report for the data used for this site.

Hydrologic Soil Group (HSG)	B & C	from Web Soil Survey in 4.1A above
Curve Number (CN) – Existing Ground	69	HSG = B for "pasture, grassland, or range in fair condition"
	79	HSG = C for "pasture, grassland, or range in fair condition"
Curve Number (CN) – Impervious Areas	98	standard for impervious (asphalt, concrete, buildings, etc.) from TR-55 for all hydrologic soils groups (HSGs)
Curve Number (CN) – Seeding & Landscape*	61	HSG = B for "open space – good condition, >75% ground cover" or "pasture, grassland, or range in good condition"
	74	HSG = C for "open space – good condition, >75% ground cover" or "pasture, grassland, or range in good condition"

**Note: for the final landscaping/sod/seeding of disturbed areas, the same curve numbers are the same for "open space, good condition (grass cover >75%)" as for "pasture, grassland, or range in good condition" for both HSG 'B' and 'C' (i.e. CN=61 for HSG=B, and CN=74 for HSG=C for both open space lawns and natural looking vegetation that is classified as pasture/grassland/range). Generally, lawn areas are classified by the City as irrigated and mowed, and natural vegetation will be all other landscaped areas, not specifically sodded areas.*

5.1C BASINS AND AREAS

The site was split into five (5) different basins/areas for the drainage areas based on the post-development grading. Each basin has an area associated with it and incorporates the post-development infrastructure such as impervious area (asphalt, concrete, buildings, roads, etc.), landscaping (re-seeded areas), and undisturbed areas. A breakdown of the basin areas with associated groundcover is attached to this report.

5.1D TIME OF CONCENTRATION

Time of concentration was determined by the TR-55 Program and is calculated based on the longest flow path and watercourse slope of the pre-development and post-development conditions for the site and individual basin(s). Time of concentration is broken down into sheet flow, shallow concentrated flow, and channel flow for all pre- and post-development drainage basins. A summary of the calculations is attached showing flow lengths, slopes, and types of flow are attached. Also, time of concentration calculations are attached with the WinTR-55 program inputs/outputs. Note that the minimum allowable value of time of concentration for TR-55 is 0.100 hr. If the calculated value falls below this minimum, the minimum value will be utilized as shown in the WinTR-55 program.

5.1E STORM DATA

The SCS Method uses 24-hour storm depths developed by the National Oceanic and Atmospheric Administration (NOAA) with a selected design recurrence interval, such as 2, 5, 10, 25, 50, or 100-year storms. The state of Montana uses the Atlas 2 method. Also, the MDT and MDEQ have published specific storm data for specific sites through the state. Also, there is a NOAA website that allows for site specific precipitation values for the 2-year and 100-year storms from NOAA Atlas 2, which can be deemed more accurate. Using the NOAA website (http://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm) with a site specific latitude/longitude of 46.8285°N, -114.0282°W provides the following precipitation amounts and intensities:

	Design Storm (24-hour)	
	2-year	**100-year**
Precipitation Amount (in)	1.20	2.58
Precipitation Intensity (in/hr)	0.05	0.11

5.1F INPUTS FOR WinTR-55 PROGRAM

The values described in Section 5.1 above are input into the WinTR-55 program to determine the runoff rate and volume of the pre- and post-development basins. See the attached printout of the WinTR-55 Input data showing variable inputs.

5.2 STORMWATER MANAGEMENT & CALCULATION OUTPUTS

On-site collection of stormwater runoff is planned to contain the runoff from the design storm. Detention will be required if the site was to hold the change in runoff from the pre-development vs. post-development for the 100-year, 24-hour storm runoff and meet the requirements for both storage and flowrate. Site constraints and surrounding topography determine the stormwater management requirements. For this specific site, the proposed collection and stormwater management is discussed later in this report.

5.2A RUNOFF VOLUMES AND RUNOFF RATES (WinTR-55 Results)

After using the TR-55 Method by inputting values into the WinTR-55 Program, the analysis was run and calculated the flow rates for the storm event(s) analyzed for this project. A summary of the results is presented below, with the WinTR-55 program output pages and drainage summaries attached.

Pre or Post	Basin	Runoff Volume (V) (cf)	Runoff Rate (Q) (cfs)
		100-yr	100-yr
Pre	On-Site	50,940	17.93
Pre & Post	Off-Site	26,921	9.66
Post	1	14,653	5.50
Post	2	13,957	6.01
Post	3	15,909	6.73
Post	4	12,579	4.80
Post	5	11,235	3.93

As is demonstrated by the calculations, the development will increase the stormwater runoff from the site generally due to the increase of additional impervious areas (asphalt, buildings, gravel, etc.). The higher post-development runoff volume than pre-development means containment and conveyance is required.

Note, that since this is preliminary planning for this development to determine magnitudes of runoff rates and volumes for preliminary sizing of stormwater infrastructure. As final grading occurs, basins may change slightly, and calculations will need updated. Different or additional drainage mitigation design will be required for the basins in this case. As for now, the site will utilize curb, catch basins, storm pipe, and containment areas (i.e. swales or ponds) are planned for the associated post-development runoff.

Full preliminary calculations and summaries are attached.

5.2B GENERAL STORMWATER DESIGN – ON-SITE

To meet the requirement to not exceed the pre-development runoff rates and due to site constraints, the proposed stormwater design will be to mitigate the difference in pre-development and post-development runoff rates and volumes for the 100-year, 24-hour storm event. A storm drainage collection system of curb, catch basins, storm piping, swales and collection pond(s) will route post-development runoff throughout the site. All roof drains from the proposed structures will tie into the proposed storm drainage system to prevent excess runoff on the finished ground surface so not to inundate structures or surface infrastructure.

Catch basins with storm pipe that outlet to culverts are planned to route the stormwater runoff from the design storm. Future calculations will follow to size the proposed storm pipes between catch basins and ensure the existing downstream culvert is adequate to handle the increase of runoff flow rates from the post-development site.

Basin 1

Runoff will route on the south-eastern portion of the site and then west down the curb line and storm drainage system and combine with Basin 2 stormwater runoff at the mainline of the storm drainage system that runs south-to-north down the hillside between the townhomes.

Basin 2
Includes the road from Hillview Way and eventually catches the storm drain, which will combine with the stormwater flow from Basin 1 at the storm drainage system that runs south-to-north down the hillside between the townhomes.

Basin 3
Includes the south-western stormwater runoff and follows the proposed curb into the storm drainage system via inlets, then routes through the storm drainage system (catch basins and piping) to a junction point at a proposed catch basin that runs south-to-north down the hillside between the townhomes. This junction point will also need to consider the stormwater flow from Bains 1, 2, and 4 as all stormwater congregates at this point.

Basin 4
Includes the middle-eastern stormwater runoff and follows the proposed curb into the storm drainage system via inlets, then routes through the storm drainage system (catch basins and piping) to a junction point at a proposed catch basin that runs south-to-north down the hillside between the townhomes. This junction point will also need to consider the stormwater flow from Bains 1, 2, and 3 as all stormwater congregates at this point. This will be considered the last point before release of runoff at pre-development rates.

Basin 5
Will be the runoff associated with the backside (downhill) of the entire development. This accounts for developed lawn areas and the undisturbed areas, including the existing drainage collection swale that outlet through Wapikiya Park. Additionally, this includes the area to the western side of the site where a future gravel trail will be constructed. This basin generally runs off-site without being collected.

Off-Site
Off-site stormwater runoff calculations will remain the same both pre- and post-development since no changes will occur off-site, meaning no increase in runoff. However, mitigation will be required to prevent runoff into the development. Generally, the off-site will be caught in the roadside ditch and routed around the subdivision on the western side to avoid the mitigation on-site in the proposed storm drainage system. The utilization of a roadside ditch with gravel check dams and culverts will help route stormwater flow through and around the site.

Summary
Based on the calculations in Section 5.2A above, provisions will need to be made to contain the excess runoff from post-development compared to pre-development. Due to Basin 5 automatically running off to the existing drainage swale down the hill to the north, it counts against the post-development containment requirement. The requirement to limit post-development runoff to pre-development runoff rates requires analysis of what automatically leaves the site versus what is collected on-site. From the above (and attached summary):

Runoff Rates
Pre-Development (On-Site) = 17.93 cfs
Post-Development Flow (Basin 1-4) = 23.04 cfs
Post-Development Flow (Basin 5) = 3.93 cfs

Max. post-development release (total pre-development rate) = 17.93 cfs

Max. remaining post-development release due to Basin 5 = 17.93 cfs – 3.93 cfs = **14.00 cfs**

Runoff Volumes
Pre-Development (On-Site) = 50,940 CF
Post-Development (Basin 1-4) = 57,099 CF
Post-Development (Basin 5) = 11,235 CF

Difference that needs to be detained on-site = 57,099 CF + 11,235 – 50,940 CF = **17,393 CF**

The site will utilize a stormwater storage vault, exact placement to be determined upon completion of construction plans, that holds this required volume.

The storage volume of the stormwater vault as shown on attached exhibits or details is shown calculated here:

Interior Length Dimension of Storage Vault (Entire Length) = 122.67 feet
Thickness & Number of Interior Walls = 4 interior walls @ 8" (0.67') thick each
Total Usable Length for Volume = 122.67' – (4*0.67) = 120 feet
Interior Width Dimension of Storage Vault = 20 feet
Effective Vault Depth (from bottom of tank to top of outlet overflow pipe) = 7.5 feet

Actual Stormwater Vault Storage Volume = (120 feet) * (20 feet) * (7.5 feet) = **18,000 CF**

Stormwater will exit the storage vault via the orifice discussed below and the outlet pipe inside the vault and down the hill towards the existing collection ditch. At that point, a dissipation structure at the outlet near the existing ditch will slow down the flow and direct it towards the existing inlet structure and pipe in the collection ditch.

In discussions with the City of Missoula, it was determined that the maximum design flow for the existing 18-inch pipe into Wapikiya Park is 7 cfs from previous City of Missoula design models. Because this existing design flow (7 cfs) is for the entire hillside where the existing drainage ditch contributes (i.e. more than just the proposed development site area), we need to "pro-rate" the ratio of existing design flow from our site versus the entire design flow (the 7 cfs).

To perform this "pro-rated" ratio of our site's contribution to the design flow, we analyzed aerial and topographic imaging to determine that total hillside contributing area to the existing drainage swale and outlet into Wapikiya Park. An exhibit is attached showing the determined contributing area and site area and a summary of the pro-rated calculation shown here:

"Pro-Rated" Outlet Design Flow to City of Missoula Existing Drainage Infrastructure
Existing Design Outlet Flow to Wapikiya Park = 7 cfs (provided from City of Missoula)

Total Contributing Area to Existing City of Missoula Drainage Ditch = 66.5 acres

Total Development Property Area = 25.6 acres

Total Property Area Below Existing Ditch at NE corner (Not Contributing) = 1.1 acres

Total Proposed Development Site Contributing Area to Existing Ditch = 24.5 acres

Percentage of Contributing Flow from Proposed Development Area versus Overall Contributing Flow to Existing Ditch = (24.5 acres) / (66.5 acres) = 36.8%

Allowable "pro-rated" flow to be released from the site = (7 cfs)*(36.8%) = **2.57 cfs**

An outlet pipe or orifice will be sized so not to exceed the "pro-rated" flow rate of **2.57 cfs** (from above). An orifice was sized based on the maximum head over the orifice. The larger the head over the orifice, the larger the flow through the orifice. The distance was utilized from the centerline of orifice to the top of outlet stand pipe. See the attached analysis showing that a **5.94-inch orifice** is the maximum diameter so that the outlet flow will not exceed the pro-rated flow shown above.

Although it is unlikely that much sediment or debris will make it to the outlet structure within the vault, anything can happen. The top of outlet pipe will be left open so that once the vault fills up, flow could overflow directly into this pipe rather than overtopping the vault wall to avoid any degradation to the vault wall backfill.

As is shown on the hydrographs developed by the WinTR-55 program for the pre-development on-site conditions and the post-development on-site conditions (Basins 1-4), the peak occurs at generally the same time near the mid-storm at 12 hours. See the attached hydrographs.

5.2C STORM PIPE SIZING AND OUTLET

Site Outlet – Pond/Final Collection Area to Existing City of Missoula Infrastructure

As described above, the final collection area (i.e. pond or vault, exact TBD) collects all interior storm drainage from the catch basins and storm piping. The collection area will be designed to detain the difference in runoff volume between pre and post-development. The outlet from the detention infrastructure will be designed to be released only at the "pro-rated" flow rate previously described in Section 5.2B of this report. This will limit and prevent adverse effects on the existing City of Missoula drainage infrastructure.

Site Interior – Catch Basin to Catch Basin

Catch basins with storm pipe that outlet to culverts are planned to route the stormwater runoff from the design storm. Future calculations will follow to size the proposed storm pipes between catch basins and ensure the existing downstream culvert is adequate to handle the increase of runoff flow rates from the post-development site.

The basin breakdown will be clearly defined in the post-development grading with the different curb collection and catch basin locations. Each catch basin had its individual contributing basin, and as it moves downstream, may have other contributing basins from upstream.

A detailed analysis will be prepared to show the interaction between the contributing flow areas to the receiving catch basins and associated storm pipes, while analyzing upstream and downstream conditions. Different pipe sizes will be analyzed to determine their maximum flow capacity. Often, especially on steep sites with tight drainage areas, "free-board" or factor-of-safety can be applied by assuming a percentage flowing full. For future storm pipe calculations, ample free-board will be assumed, with standard practice assumptions of 75%-80% flowing full. Note that is only for pipes interior to the project. All interior site piping eventually collects at the stormwater vault area. This on-site stormwater vault then outlets only at the "pro-rated" flow rate previously described in Section 5.2B of this report.

Pipe capacities will still depend on slopes of the pipe between catch basins, which will be determined upon final site grading. See the attached spreadsheet "Pipe Flow Calculations" that shows, preliminarily, how different pipe sizes and different flow full capacities can be utilized to carry the required flows. This spreadsheet will be included with the future report for all catch basin pipe sizing calculations. Additionally, pipe entrance losses will be included in an analysis to evaluate and ensure no excess flows affect upstream or downstream conditions. We anticipate pipe sizes to vary between 12-inch minimum and 24-inch diameter. As is shown by the attached spreadsheet, pipe capacity varies depending on slope of the pipe. As this is unknown until final grading, pipe sizes throughout the storm drain system cannot be determined or finalized at this time.

Based on the above maximum flow rates for different size storm pipes, the outlet storm pipe from the different catch basins can be analyzed. An example of the breakdown of the future selected outlet storm pipe from each catch basin is as follows:

EXAMPLE ONLY– Future Catch Basin Storm Pipe Sizing

Basin	Peak Flow Rate at Outlet of CB (cfs)	Inlet Storm Pipe Size (inches)	Outlet Storm Pipe Size (inches)
CB #1	TBD	N/A – first catch basin	TBD
CB #2	TBD	TBD	TBD
CB #3	TBD	TBD	TBD
CB #4	TBD	TBD	TBD

Refer to the Civil Construction Plans for drainage patterns and finished grading with locations of catch basins, storm piping, culverts, concrete cove gutter and other drainage infrastructure.

5.3 STORMWATER DISCHARGE TO GROUND

Generally, the TR-55 method accounts for some infiltration due to the curve number based on groundcover and hydrologic soil group conditions. Other than the infiltration accounted for using this drainage analysis method, no infiltration is planned, and the collection to containment of stormwater runoff will be utilized.

6.0 EROSION CONTROL

Erosion control will likely be required due to the size of the site and to ensure no excess sediment leaves the site. With the existing site topography and proposed grading, high flow velocities are a potential and stormwater infrastructure will be designed to handle these flows and mitigate them as much as possible. Any excess sediment generated from the site will be collected and allowed to settle in catch basins or collection ponds, depending on the final site design.

If a stormwater pollution prevention plan (SWPPP) will be required through the Montana Department of Environmental Quality (MDEQ) and/or the City of Missoula, it will be the responsibility of the Contractor (or owner if previously agreed upon) to prepare, obtain, and administrate a SWPPP and any other erosion control permits required by the City of Missoula.

7.0 CONCLUSIONS

This report and drainage calculations are considered preliminary to understand the magnitude of stormwater rates and volumes. A future final grading and drainage report will be completed that will include final sizing of stormwater collection areas, catch basin sizing, storm pipe sizing, and outlet sizing such that runoff volumes are contained, and that post-development runoff leaves the site only at pre-

development rates. Final site grading will be required before the final drainage calculations can be completed. Other existing drainage patterns in non-disturbed (i.e. drainage collection swale) or off-site (i.e. property to the southwest) areas will be maintained with flows being routed to these areas. All drainage will be directed away from any proposed structures and the site is graded so that the building will not be affected.

It is understood that the existing ditch/swale on the north (downhill) side of the site and all other existing piping are part of the City of Missoula's storm drainage system and any adjustment to such needs approved by the City upon completion of final designs and construction plans, and prior to any work occurring on-site.

Because this report is preliminary, the calculations shown herein could change depending on final site conditions and grading.

All construction will be in accordance with the final Construction Plans, Montana Public Works Standard Specifications (MPWSS), City of Missoula requirements, and MDEQ regulations, as required.

Prepared by:
TERRITORIAL-LANDWORKS, INC.

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Reviewed by:
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Jason Rice, P.E.

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\3_ENG DESIGN\3.5_DEQ8 (Storm Drainage)\Rpt.TR-55.Hillview Crossing.Prelim.2019-04-09.doc

LIST OF ATTACHMENTS (only the highlighted items are included at this time)

- Drainage Exhibits with Basin Delineation *(2 total sheets)*
  - Pre-Development Conditions Exhibit *(1 sheet)*
  - Post-Development Conditions Exhibit *(1 sheet)*
- Drainage Flow Pro-Rated Exhibit *(1 page)*
- "Preliminary Drainage Calculations" Spreadsheet *(3 pages)*
- NRCS Soils Data – Hydrologic Soil Group *(4 pages)*
- Precipitation Frequency Data Output NOAA – Site Specific Precipitation *(1 page)*
- TR-55 Tables 2-2a, 2-2b, 2-2c for Curve Numbers *(3 pages)*
- Orifice Sizing for Outlet Release Structure Spreadsheet *(1 page)*
- "Pipe Flow Calculations" Spreadsheet *(2 pages)*
- Manning's Roughness Coefficients *(1 page)*
- WinTR-55 Input Data *(4 total pages)*
  - Identification Data, Sub-Area Data, Storm Data *(1 page)*
  - Sub-Area Summary Table *(1 page)*
  - Sub-Area Land Use and Curve Number Details *(1 page)*
  - Sub-Area Time of Concentration Details *(1 page)*
- WinTR-55 Output Data *(2 total pages)*
  - Watershed Peak Table *(1 page)*
  - Hydrograph Peak/Peak Time Table *(1 page)*
  - Hydrograph – Pre-Development *(1 page)*
  - Hydrograph – Post-Development *(1 page)*
- WinTR-20 Output Data – Runoff Volumes *(60 pages)*
- Preliminary Storm Water Collection Vault Exhibit *(1 page)*
- ~~Civil Construction (Grading & Drainage) Plans *(attached separately)*~~ **Not complete or included yet**

INCLUDED BY REFERENCE

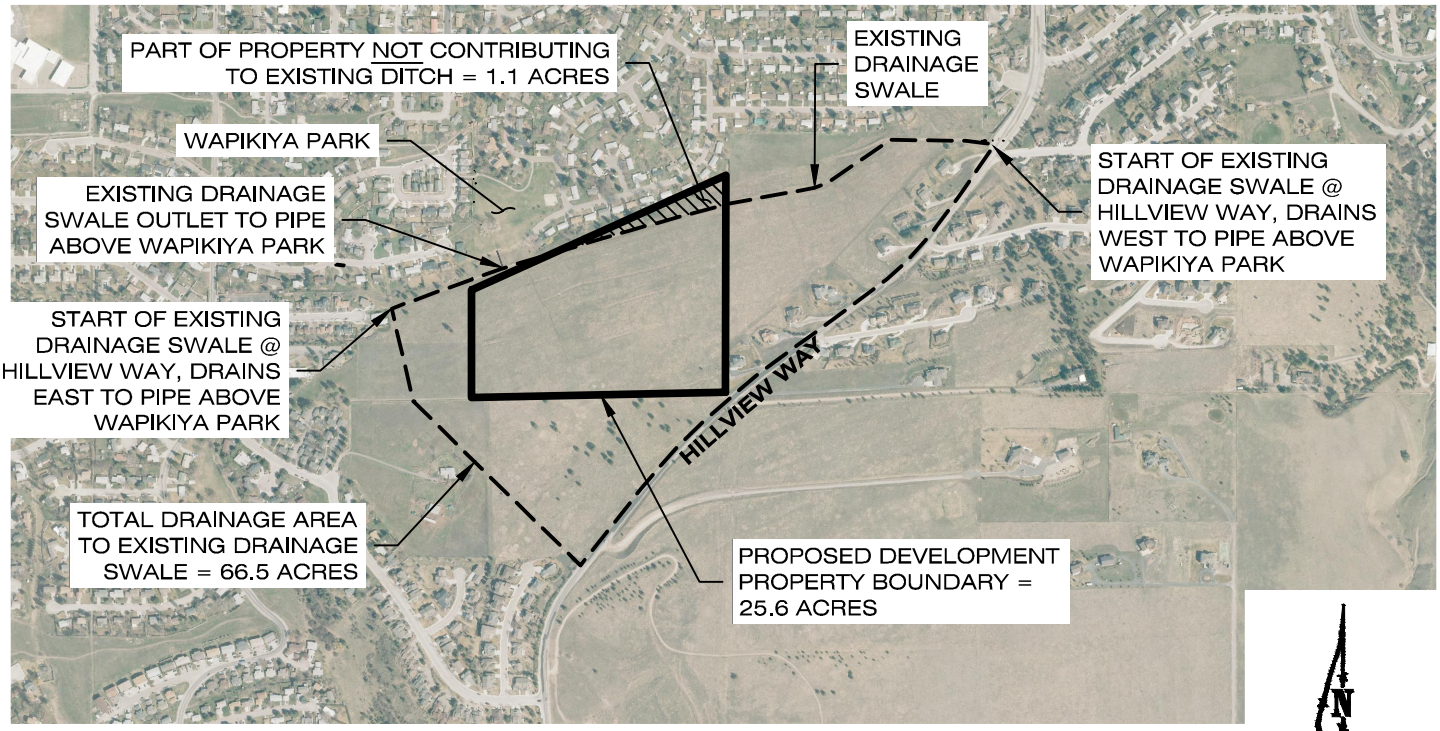
USDA NRCS TR-55 Urban Hydrology for Small Watersheds Manual *(June 1986)*
WinTR-55 Program *(version 1.00.10)*
WinTR-55 User Guide – Small Watershed Hydrology *(January 2009)*
Montana Department of Transportation Drainage Manual
Montana Public Works and Specifications *(latest edition)*
Missoula County Public Works Manual *(January 2010)*
Montana Department of Environmental Quality Circular 8 *(2017 Edition)*

DRAINAGE PRO-RATED FLOW TO OUTLET (LEAVE SITE) INTO SWALE

EXISTING OUTLET FLOW FROM EXISTING DITCH = 7 CFS

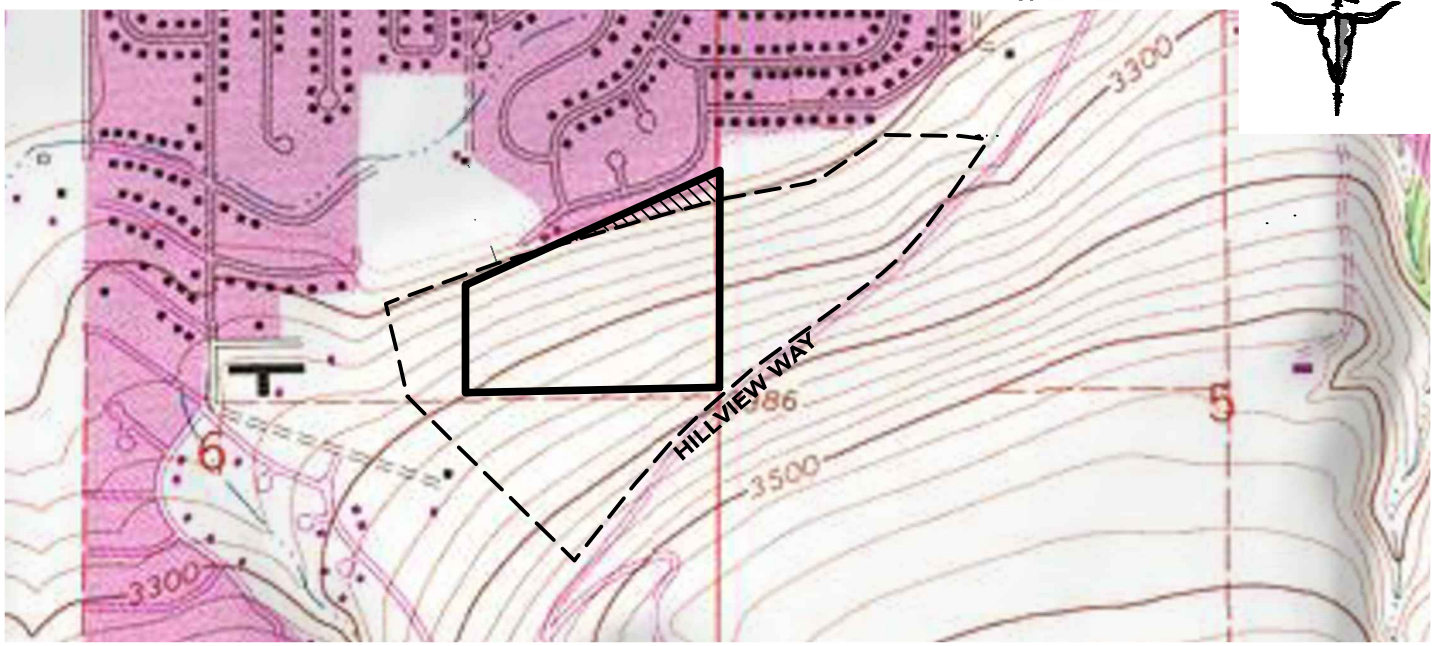
PERCENTAGE OF CONTRIBUTING FLOW FROM PROPOSED DEVELOPMENT AREA VERSUS OVERALL CONTRIBUTING FLOW TO EXISTING SWALE = (25.6 ACRES - 1.1 ACRES)/(66.5 ACRES) = 36.8%

ALLOWABLE PRO-RATED FLOW TO BE RELEASED FROM SITE = (7 CFS)*(36.8%) = 2.57 CFS



AERIAL MAP

500 0 500 1000
SCALE IN FEET



USGS TOPOGRAPHIC MAP

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DRAINAGE FLOW PRO-RATED MAP
HILLVIEW CROSSING TOWNHOMES
CITY OF MISSOULA
SECTION 6, T12N, R19W, P.M.M.
MISSOULA COUNTY, MONTANA

PROJECT#: 14-3592
TAB: PRO-RATED FLOW
DRAFTER: AM
DATE: 4/9/2019
SHEET 1 OF 1

ORIFICE SIZING FOR OUTLET RELEASE STRUCTURE

PROJECT: Hillview Crossing Development, City of Missoula, MT (TLI #14-3592)

DEVELOPER/OWNER: Hillview Crossing LLC

PREPARED BY: Territorial-Landworks, Inc.

DATE: 4/9/2019

VARIABLE SUMMARY

$Q = C_d * A(2gh)^{0.5}$ Orifice equation from McGraw-Hill Water and Wastewater Calculatios Manual

C_d = unitless, coefficient of discharge, value is 0.62 typical for sharp-edged orifice (circular)

g = 32.174 ft/s^2, acceleration due to gravity

h = feet, head over centerline of orifice

A = $feet^2$, area of orifice ($\pi * r^2$)

Q_{ST} = cfs, sub-total flow through orifices

Q_T = cfs, total flow through orifices

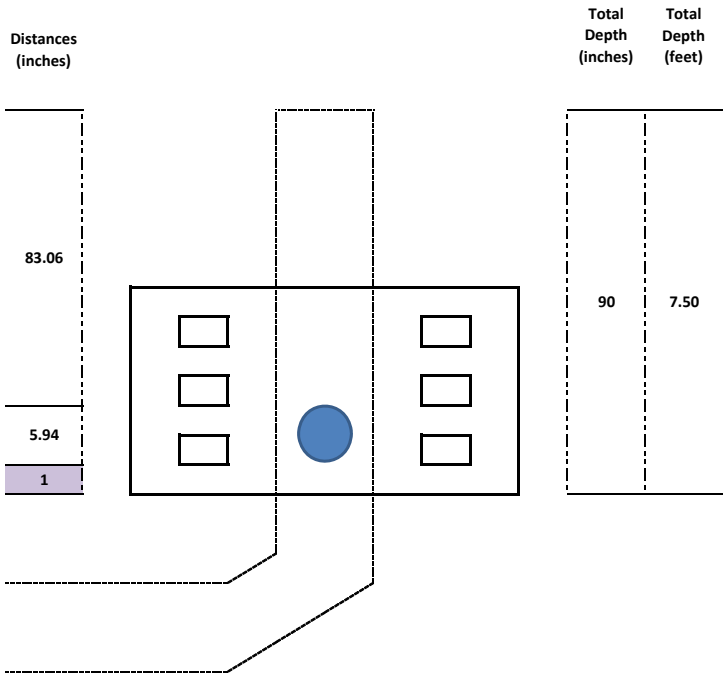
O_n = Number of orifices

q_o = cfs, target release rate from pond sizing (usually a pre-development flow rate)

	user input
	acceptable value
	un-acceptable value

	Orifice Sizing		
Orifice Diameter =	5.94	inches	
C_d =	0.62		
dist. to next orifice	83.06	inches	distance from top of orifice to top of overflow pipe
h =	86.03	inches	
A =	0.19	ft^2	
Q =	2.56	cfs	
O_n =	1	orifice(s)	number of orifices
Q_{ST} =	2.56	cfs	flow through an individual orifice
Q_T =	2.56	cfs	total flow through total number of orifice(s)
q_o =	2.57	cfs	maximum flow rate based on pro-rated flow
Acceptable Release?	YES		

OUTLET STRUCTURE SCHEMATIC (not to scale)



Pipe Flow Calculations

Notes:

[1] flow depth based on % flowing full and radius of pipe

[2] cross-sectional flow area of pipe at flow depth

[3] wetted perimeter based on pipe size and flow depth

[4] Manning's n-value based on pipe type: PVC = 0.011, PE = 0.012, RCP = 0.011-0.013

[5] Pipe velocity is calculated using Manning's equation: V = [(1.49*r^(2/3)*s^(1/2)] / n; where r=hydraulic radius (flow area/wetted perim.), s=slope (ft/ft)

[6] Pipe flow is the maximum flow at the pipe depth, calculated as Q=v*A, where v=pipe velocity and A=cross-sectional flow area

Pipe Size (inches)	Pipe Size (feet)	% Flowing Full	Flow Depth (feet)[1]	Cross-Sectional Flow Area (sf)[2]	Wetted Perim. WP (feet)[3]	Pipe Type	Manning's n-value[4]	Pipe Slope (%)	Manning's Eqn. Pipe Velocity (ft/s)[5]	Pipe Flow Qmax (cfs)[6]
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	0.50%	4.30	2.718
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	1.00%	6.08	3.845
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	2.00%	8.60	5.437
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	3.00%	10.54	6.659
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	5.00%	13.60	8.597
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	10.00%	19.24	12.157
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	15.00%	23.56	14.890
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	20.00%	27.20	17.193
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	25.00%	30.42	19.223
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	0.50%	3.80	2.984
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	1.00%	5.38	4.220
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	2.00%	7.60	5.968
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	3.00%	9.31	7.309
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	5.00%	12.02	9.436
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	10.00%	17.00	13.344
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	15.00%	20.82	16.343
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	20.00%	24.04	18.871
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	25.00%	26.88	21.099
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	0.50%	5.00	4.952
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	1.00%	7.07	7.003
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	2.00%	9.99	9.904
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	3.00%	12.24	12.129
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	5.00%	15.80	15.659
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	10.00%	22.35	22.145
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	15.00%	27.37	27.122
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	20.00%	31.60	31.318
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	25.00%	35.33	35.015
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	0.50%	4.41	5.409
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	1.00%	6.23	7.649
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	2.00%	8.82	10.817
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	3.00%	10.80	13.249
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	5.00%	13.94	17.104
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	10.00%	19.71	24.188
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	15.00%	24.14	29.625
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	20.00%	27.88	34.207
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	25.00%	31.17	38.245
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	0.50%	5.65	8.083
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	1.00%	7.99	11.431
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	2.00%	11.30	16.165
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	3.00%	13.84	19.798
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	5.00%	17.86	25.560
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	10.00%	25.26	36.147
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	15.00%	30.94	44.270
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	20.00%	35.72	51.119
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	25.00%	39.94	57.153
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	0.50%	4.98	8.804
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	1.00%	7.05	12.450
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	2.00%	9.96	17.607
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	3.00%	12.20	21.564
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	5.00%	15.76	27.839
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	10.00%	22.28	39.371
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	15.00%	27.29	48.219
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	20.00%	31.51	55.679
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	25.00%	35.23	62.251

Pipe Flow Calculations

Notes:

[1] flow depth based on % flowing full and radius of pipe

[2] cross-sectional flow area of pipe at flow depth

[3] wetted perimeter based on pipe size and flow depth

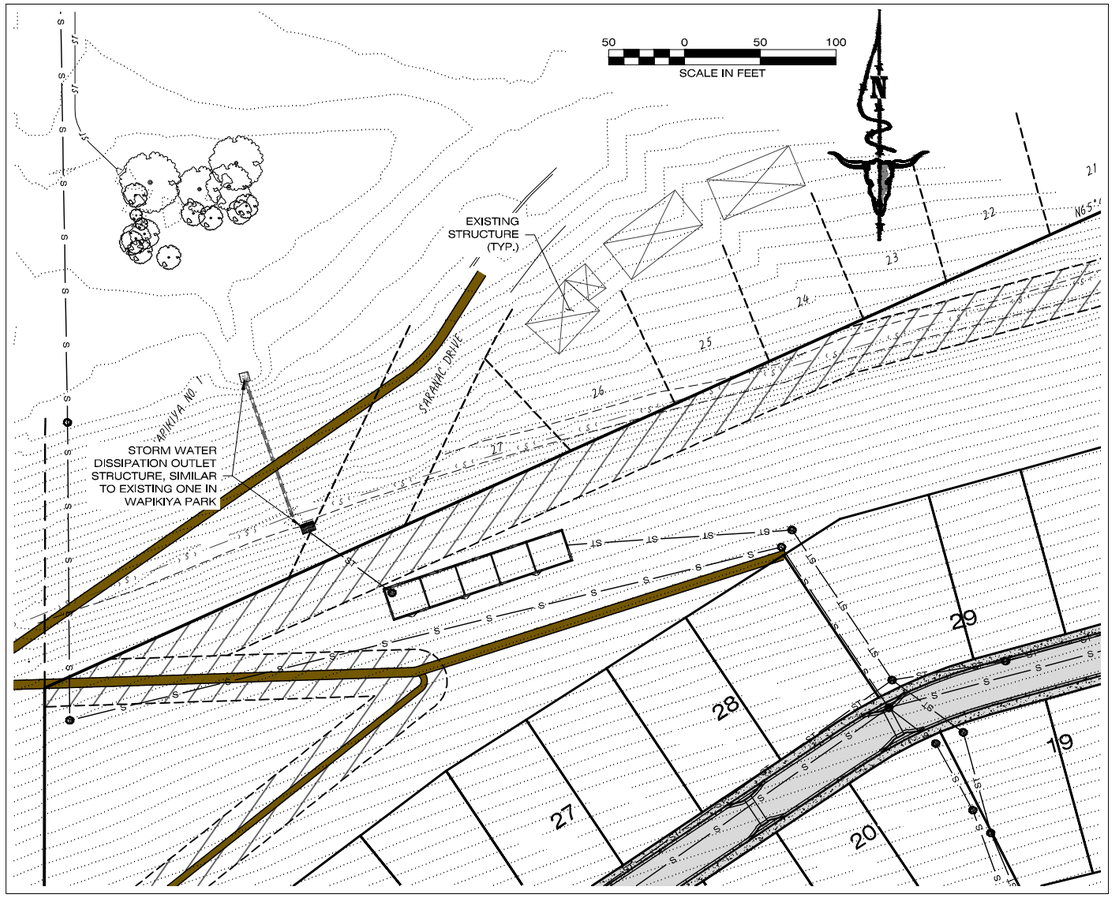
[4] Manning's n-value based on pipe type: PVC = 0.011, PE = 0.012, RCP = 0.011-0.013

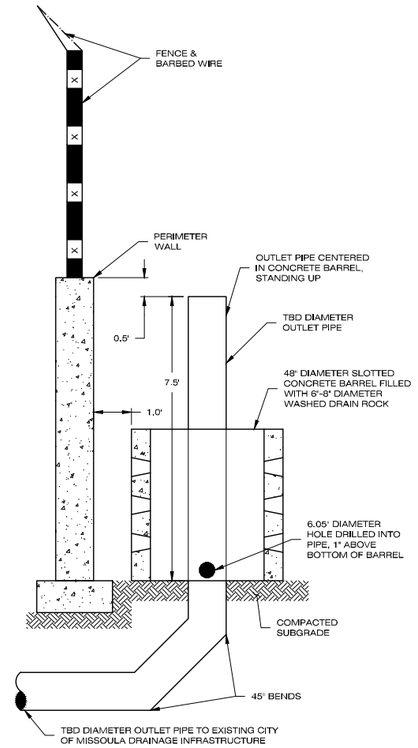
[5] Pipe velocity is calculated using Manning's equation: V = [(1.49*r^(2/3)*s^(1/2)] / n; where r=hydraulic radius (flow area/wetted perim.), s=slope (ft/ft)

[6] Pipe flow is the maximum flow at the pipe depth, calculated as Q=v*A, where v=pipe velocity and A=cross-sectional flow area

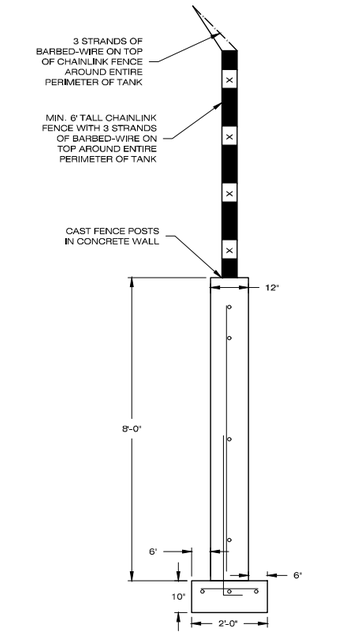
Pipe Size (inches)	Pipe Size (feet)	% Flowing Full	Flow Depth (feet)[1]	Cross-Sectional Flow Area (sf)[2]	Wetted Perim. WP (feet)[3]	Pipe Type	Manning's n-value[4]	Pipe Slope (%)	Manning's Eqn. Pipe Velocity (ft/s)[5]	Pipe Flow Qmax (cfs)[6]
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	0.50%	6.25	12.106
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	1.00%	8.84	17.121
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	2.00%	12.51	24.213
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	3.00%	15.32	29.654
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	5.00%	19.77	38.283
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	10.00%	27.97	54.141
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	15.00%	34.25	66.309
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	20.00%	39.55	76.567
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	25.00%	44.22	85.604
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	0.50%	5.52	13.271
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	1.00%	7.80	18.768
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	2.00%	11.04	26.541
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	3.00%	13.52	32.507
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	5.00%	17.45	41.966
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	10.00%	24.68	59.349
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	15.00%	30.22	72.687
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	20.00%	34.90	83.932
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	25.00%	39.02	93.838
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	0.50%	6.84	17.289
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	1.00%	9.67	24.450
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	2.00%	13.68	34.578
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	3.00%	16.75	42.349
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	5.00%	21.63	54.672
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	10.00%	30.58	77.318
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	15.00%	37.46	94.695
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	20.00%	43.25	109.344
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	25.00%	48.36	122.250
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	0.50%	6.04	18.966
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	1.00%	8.54	26.822
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	2.00%	12.07	37.933
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	3.00%	14.79	46.458
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	5.00%	19.09	59.977
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	10.00%	27.00	84.820
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	15.00%	33.06	103.883
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	20.00%	38.18	119.953
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	25.00%	42.68	134.112

**Values are calculated on flow as pipe-full from the AutoCAD Hydraflow Express pipe modeling software*

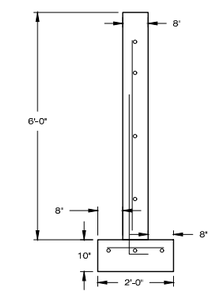




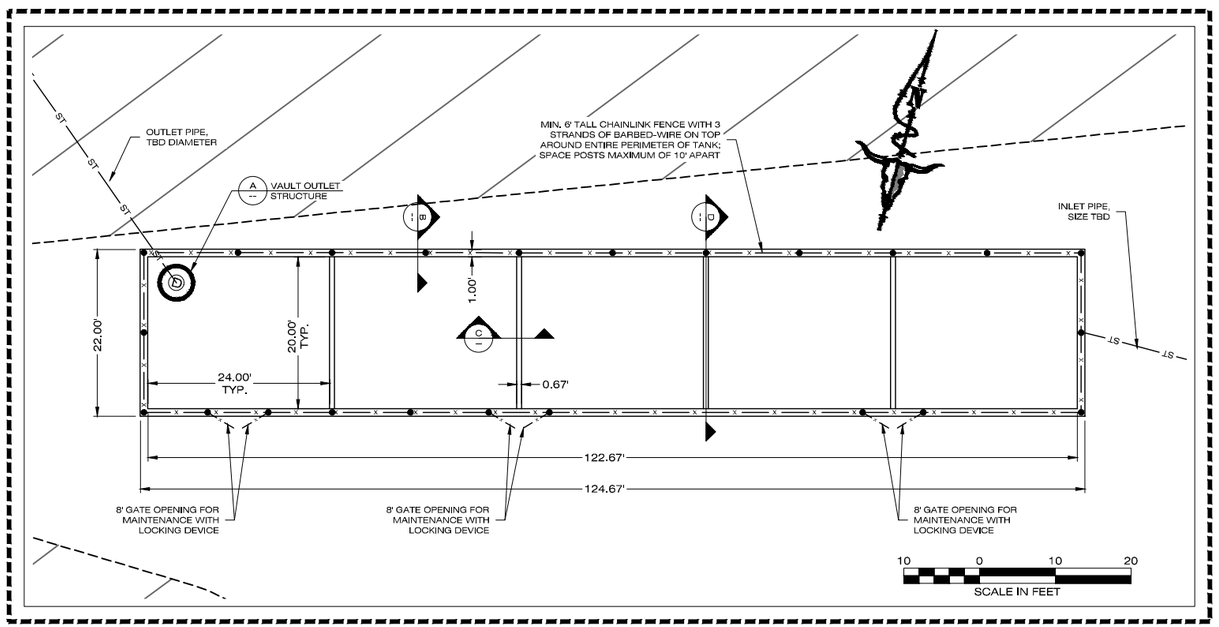
A -- OUTLET STRUCTURE DETAIL
STORM VAULT
NOT TO SCALE

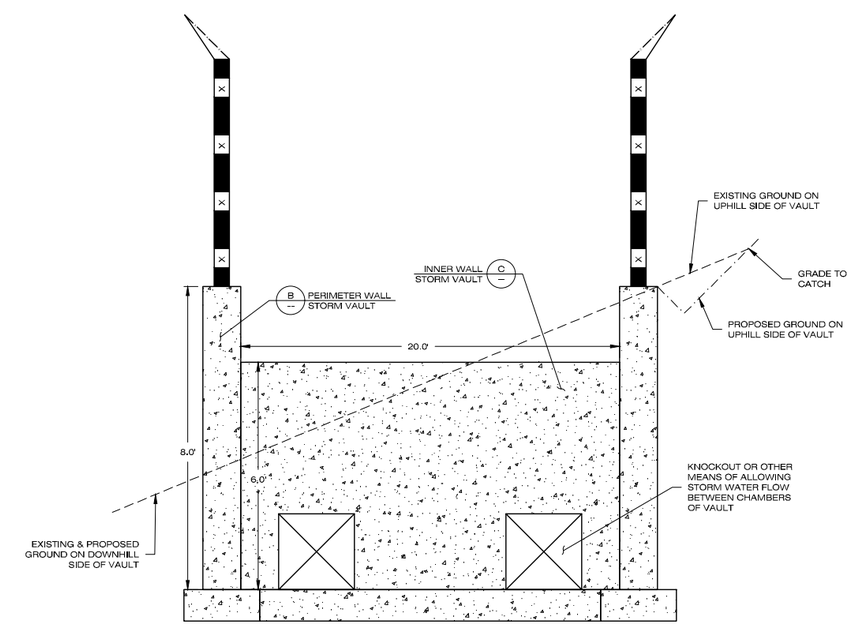


B -- PERIMETER WALL
STORM VAULT
NOT TO SCALE



C -- INNER WALL
STORM VAULT
NOT TO SCALE





D -- INNER WALL - SIDE VIEW
STORM VAULT
NOT TO SCALE

TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
www.TerritorialLandworks.com
P.O. Box 3551
Missoula, MT 59806
Ph: 406/721-0142
Fax: 406/721-5224

PLOT DATE: 4/9/2019 12:13 PM

REVISIONS | DATE

DESIGNED:
DRAFTED: AM
CHECKED:
DATE: 4/9/2019

LOCATION: HILLVIEW WAY SECTION 6, T12N, R19W, P.M.M. CITY OF MISSOULA MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING LLC

PROJECT NAME: HILLVIEW CROSSING TOWNHOMES

SHEET TITLE: STORMWATER COLLECTION VAULT EXHIBIT

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:\1_ACTIVE FILES\2014 PROJECTS\2002 - HILLVIEW CROSSING\MISSOULA & MILLS DEVELOPMENT_DRAFTING\3_DRAWINGS\A_DRAWINGS\A-700-ADV.MSC
DWG WIN GIS EXPORT: 14-2592-DEVMN.AGE (2019-04-09) DWG

From:	Jason Rice
To:	John DiBari; Mary McCrea
Cc:	Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick; Jim Nugent; Troy Monroe; Cory Davis
Subject:	RE: Hillview Crossing TED Conditional Use
Date:	Thursday, April 11, 2019 8:01:31 AM
Attachments:	2019-04-10.CityMsla.Hillview Crossing Storm Water Updates.pdf

City Council and Troy – As promised at the last LUP, here is the feasibility level stormwater info that has been amended to include more detail regarding the outlet. Thanks

Jason Rice, *P.E., CEO*

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1817 South Ave West Suite A | Missoula, MT 59801
406/721-0142 *phone* | 406/215-1016 *direct* | 406/240-4265 *cell* | 406/721-5224 *fax*
JasonR@TerritorialLandworks.com

website newsletter facebook linkedin

From: John DiBari
Sent: Sunday, April 7, 2019 6:19 PM
To: Jason Rice ; Mary McCrea
Cc: Paul Forsting ; Grp. City Council and City Web Site ; Mary McCrea ; Mike Haynes ; Alan F. McCormick ; Jim Nugent
Subject: RE: Hillview Crossing TED Conditional Use

Hi Jason,

I wanted to let you know that staff is reviewing the items you left at the meeting Wednesday. Once they have reviewed them, I'll be back in touch with next steps.

Thanks,

John

From: Jason Rice [mailto:jasonr@territoriallandworks.com]
Sent: Friday, March 22, 2019 2:43 PM
To: John DiBari; Mary McCrea
Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick; Jim Nugent
Subject: RE: Hillview Crossing TED Conditional Use

John – are there any preliminary ideas of when we would have our next LUP?

Also, what else do we need to cover while we get updates on the stormwater and Geotech info? I have lost track of what needs to be addressed.

Jason Rice, *P.E., CEO*

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JasonR@TerritorialLandworks.com

From: John DiBari <JDibari@ci.missoula.mt.us>
Sent: Tuesday, March 19, 2019 9:53 AM
To: Jason Rice <jasonr@territoriallandworks.com>; Mary McCrea <McCreaM@ci.missoula.mt.us>
Cc: Paul Forsting <paulf@territoriallandworks.com>; Grp. City Council and City Web Site <Council@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Alan F. McCormick <afmccormick@GARLINGTON.COM>; Jim Nugent <NugentJ@ci.missoula.mt.us>
Subject: RE: Hillview Crossing TED Conditional Use

Hi Jason,
We covered this point during last week's meeting.
I appreciate your interest in responding through email, but these conversations need to happen in public at our committee meetings.
I expect we will have the opportunity to discuss both block length and pedestrian access Wednesday.
Thanks,
John

From: Jason Rice [mailto:jasonr@territoriallandworks.com]
Sent: Tuesday, March 19, 2019 9:29 AM
To: Mary McCrea
Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick
Subject: RE: Hillview Crossing TED Conditional Use

Mary – I see one item in the Findings of Fact in Memo 5 that is not complete in my opinion. I believe it was not complete in the original staff report prepared by Anita. I think it is important to have the complete language as the part you have chosen to show does not convey the original intent of the regulation which allowed flexibility in design when topographic constraints exist.

25. Per Title 20 Section 20.40.180.F, blocks may not be longer than 480 feet. Pedestrian access easements that create a break within a block may be required where there is a need for pedestrian access to school bus or transit stops…

I read directly from Title 20:

Blocks shall not exceed 480 feet in length and be wide enough to allow two tiers of dwelling units in a Townhome Exemption Development ***unless topography or other constraining circumstances are present*** .

Thanks

Jason Rice, *P.E., CEO*

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JasonR@TerritorialLandworks.com

website newsletter facebook linkedin

From: Mary McCrea <McCreaM@ci.missoula.mt.us>
Sent: Monday, March 18, 2019 5:26 PM
To: Jason Rice <jasonr@territoriallandworks.com>
Cc: Paul Forsting <paulf@territoriallandworks.com>
Subject: Hillview Crossing TED Conditional Use

Attached is Memo No.5 – Block Length and Pedestrian Paths for the Hillview Crossing TED Conditional Use and comment from Elizabeth Erickson regarding trails and block length. Both of these documents will be uploaded to the SIRE record for this item at LUP this Wednesday, March 20, 2019.

Best regards,

Mary McCrea

Mary McCrea
Planning Supervisor
Development Services
Permits and Land Use Section
435 Ryman
Missoula, MT 59802
406-552-6627

MEMORANDUM

DATE: April 10, 2019

TO: Missoula City Council & Troy Monroe, P.E.

FROM: Jason Rice, P.E., CEO

RE: Hillview Crossing Townhomes – Storm Water (TLI #14-3592)

Council and Troy,

As was promised at the last LUP Committee meeting, attached to this Memo is an updated stormwater report. We have not included any of the original calculations that did not change as outlined in the text below. Following is a summary of what has been updated and what was not updated, along with our reasoning.

UPDATED: We heard that members of City Council wanted a "Feasibility Level" stormwater report. When we reported that this is what was provided originally, it was clarified that what was of interest is how the water would be stored and conveyed to the City stormwater system. Following is a list of what was revised. Please note that when designing infrastructure that interacts with the City systems, we would prefer to work directly with City Engineering, but understand that we are not allowed to have direct communication outside of the hearings at this time. If this is a misunderstanding or if City Council can direct staff to work directly with us, we would be happy to address any concerns.

1. Per Troy Monroe, PE's email dated October 9, 2018, we revised the pro-rated flow in Section 5.2B. This included removing the area of the property that doesn't contribute to the existing collection ditch. The revised exhibit and calculation show the actual contributing "pro-rated" flow to be 2.57 cfs (not 2.7 cfs as previously submitted).

2. Per Troy Monroe, PE's email dated October 9, 2018, Section 5.2C was amended to include a preliminary analysis showing pipe sizes at different slopes to show how the final pipe sizing will be handled and actually calculated. The full time-intensive calculations are not completed as they depend on final grading and final road design. This spreadsheet instead gives an idea how different pipe sizes can handle different flows at varying slopes. The contributing area to different catch basins and associated storm pipes will be modeled as a system and factor in all upstream and downstream conditions in a future final report.

3. Per previous public comment, the actual existing topography and slope of the site is closer to 15%-30% (not 10%-15%) and the report, specifically Section 3.1A, was updated accordingly for the existing conditions and general slope discussion.

4. As requested by City Council, we evaluated the outlet structure from the stormwater vault that will lead to the park and sized an orifice that will limit stormwater flows as discussed in the original report and amended with this submittal per Troy's email.

5. As requested by City Council, we also have included an exhibit and diagrams of how a vault could store the waters generated by the current proposal. This includes a vault that has been preliminarily analyzed structurally by Eclipse Engineering and an outlet structure orifice that will limit flows to the allowed 2.57 cfs, while storing the required volume.

NOT UPDATED: Given the limited time to turn this report around and the fact that there are still some unanswered questions and requests, we have not included the following updates that may or may not be needed to consider the stormwater design as final:

1. Final Road Design – depending on final mass grading to meet any other changes that may be requested, the street grades may need to be adjusted which could change the location and slope of the storm pipes. Additionally, Council has required that the road width be increased to 35'. However, this makes the project infeasible with 20' setbacks. The Developer's attorney has written a legal memo requesting reconsideration, and if not granted, then a variance would need to be requested to shorten the driveways on at least half of the units, which would then offset the area somewhat of the increased street width. Given that the calculations have been previously reviewed, this would only increase the storage and flow rates slightly, but the work may need to be re-done yet again, and therefore, these updates were not completed at this time, considering that the effects would likely be inconsequential. Following is a partial list of all the work that will need to be updated upon final decisions:
    - New impervious areas and other surface use area calculation revisions (i.e. asphalt, concrete, gravel, sidewalk, etc.)
    - Curve Number Calculation revisions
    - Time of Concentration revisions
    - TR-55 calculation revisions for Runoff Rates & Runoff Volumes

2. A full Catch Basin & Storm Pipe Analysis has not been completed at this time as requested in Troy's October email for the same reasons above. Currently, we estimate 20 catch basins and an estimated 3430 lineal feet of storm pipe to be analyzed.

3. Final Stormwater Detailing on construction grade plans has not been completed for items including, but not limited to:
    - Stormwater Details (Catch Bains, Pipes, Curb Inlets, etc.)
    - Stormwater Storage Vault Details for Rebar, Backfilling, Compaction, Concrete, etc.

Attachments:
- Updated Preliminary Grading and Drainage Engineering Design Report
- Updated or New Calculations
    - Exhibit Showing Revised Pro-Rated Flow Calculation
    - Orifice Sizing Calculation
    - Example Pipe Flow Calculations for Different Pipe Sizes at Varying Slopes
- Outlet Pipe and Storage Vault Structure Schematic and Site Plan

Copied to: Mary McCrea – City of Missoula Development Services

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\3_ENG DESIGN\3.5_DEQ8 (Storm Drainage)\Memo.StormwaterReport.Hillview Crossing.2019-04-09.docx

PRELIMINARY

GRADING AND DRAINAGE ENGINEERING DESIGN REPORT

FOR CALCULATIONS USING USDA/NRCS WinTR-55 PROGRAM &
IN ACCORDANCE WITH CITY OF MISSOULA PUBLIC WORKS STANDARDS

for

Hillview Crossing
Townhome Development

Located at:
Off of Hillview Way
Section 6, T12N, R19W, P.M.M.
City of Missoula, Missoula County, Montana

Original: September 7, 2018
Revised: October 2, 2018
Revised: April 9, 2019

Prepared For:	**Prepared On Behalf Of:**	**Prepared By:**
City of Missoula	Hillview Crossing Missoula LLC	Territorial-Landworks, Inc.
435 Ryman Street	3605 Arthur Street	1817 South Ave W, Suite A
Missoula, MT 59802	Caldwell, ID 83605	P.O. Box 3851
		Missoula, MT 59806

1.0 GENERAL

Hillview Crossing is a proposed Townhome Development of approximately 25.6 acres located below and north of Hillview Way in Missoula's South Hills area. The legal description of the property is: Portion of the Southeast ¼, Northeast ¼, Section 6, T12N, R19W, less Wapikiya Addition No. 3, located in the City of Missoula, Missoula County, Montana. As part of the townhome development, there will be a total of 68 separate townhome units. Development will include new roads, sidewalks, a trail, extensions to the public water and wastewater systems, and a stormwater collection and management system will all be required. The proposed development is located on undeveloped land surrounded by urban developments with open space, fair conditioned grassland and steeper slopes.

This storm water report will outline the existing conditions, review the proposed development, summarize the storm water analysis/design, provide the anticipated storm water results and summarize the findings. The pre-developed and post-developed storm water runoff volumes will be calculated. The objective is to manage the storm water flows so that the peak flows for the post-developed conditions that leave the subdivision are not greater than the pre-development flows and ensure that the site drainage functions properly because of the steeper slopes found on-site. Traditional flow paths will be maintained as well as reasonably possible.

This report was prepared based on preliminary discussions with the City of Missoula and in accordance with their requirements, with input from MDEQ Circular 8 for data and methods used.

2.0 DRAINAGE DESIGN CRITERIA AND METHODS USED

The SCS method, also known as the Curve Number method or the TR-55 method, was used to estimate the storm runoff rate for the site and each individual basin, if applicable. For Montana, typically the SCS

Type II Rainfall Distribution is utilized as part of the TR-55 analysis. Both the TR-55 Manual and Chapter 7 of the MDT Hydraulics Manual have been used as references for the SCS method in this report. MDEQ and the City of Missoula requires that the intent of the design for the site is that flows for a 2-year storm will not increase above existing levels, no roads will be overtopped for the 10-year storm, and no property damage (inundation of drainfields or structures) will occur for the 100-year storm.

The runoff volumes and peak flows from the 2-year and 100-year, 24-hour storms were analyzed for both pre-development and post-development conditions.

The primary inputs for the SCS Method are as follows:

- Curve Number: A curve number is selected for the watershed based on the soil texture (hydrologic soil group) and ground cover. Standard tables developed by the NRCS (formerly SCS) are used to select the appropriate number.
- Time of Concentration: The time of concentration is equal to the longest theoretical time for any drop of rain to flow from the point where it lands in the basin to the basin outflow point based on the longest flow path. Calculating a time of concentration involves summing flow times for runoff as sheet flow, shallow concentrated flow, and channel flow, if applicable. With other factors being equal, the shorter the time of concentration, the higher the design peak flows for a basin.
- Watershed/Basin Area: A basin is generally defined as an area which drains to a single point.
- Design Storm Depth: The SCS Method uses 24-hour storm depths developed by the National Oceanic and Atmospheric Administration (NOAA) with a selected design recurrence interval, such as 2, 5, 10, 25, 50, or 100-year storms. NOAA Atlas Maps for Montana are attached.
- Storm Distribution: To evaluate peak flows, it is necessary to select a design storm hyetograph, or rainfall time distribution pattern. TR-55 recommends a Type II design storm for all of Montana. This storm distribution concentrates a majority of 24-hour rainfall within a sharp peak lasting less than one hour. It is the most conservative of the standard SCS hyetographs for calculating peak flows.

The selection of a curve number enables the SCS method to model the capacity of the soil and land cover to capture and infiltrate rainfall. The model is highly non-linear in that relatively small percent increases in rainfall can lead to large increases in runoff, because as the infiltrative capacity of the soil is used up a higher percentage of precipitation will run off. As the SCS method accounts for soil saturation while the Rational Method generally does not, the SCS method may be more accurate in modeling runoff from natural soils and vegetation than the Rational Method.

Note that the TR-55 method has no specific considerations or adjustment for steep slopes and therefore, none are factored in for this site.

3.0 EXTENT OF STORM DRAINAGE

The following information pertains to offsite flow that may affect the proposed development as well as mitigation for storm water flow rates that will be increased due to the development.

3.1 DELINEATION OF DRAINAGE AREAS INSIDE THE SITE (ON-SITE)

3.1A HISTORICAL BASINS

The site is relatively steep (15%-30% slopes) and consists of open space grassland in fair to good condition groundcover. Note the previously discussed limitations of the TR-55 method regarding steeper slopes. Due to the surrounding topography, some off-site flow contributes runoff to this site. This is generally the same as the on-site flows and is considered the area southwest of the site and north of the existing road, Hillview Way. This off-site flow and the historical drainage patterns were considered for the runoff calculations for the site. Due to the off-site flow and the

proposed development layout, provisions will be made to pass these flows without entering the development's proposed storm infrastructure.

Any bypass drainage as described above will likely concentrate along the proposed road and then routed along the western property line, under/over and then away from the proposed trail. To remedy the potential for erosion due these concentrated flows, appropriately designed dissipation considerations will be planned for, which could include rip-rap or gravel check dams or other engineered infrastructure specifically for the prevention of hillside erosion.

As part of the property, there is an existing drainage collection swale on the north end of the property (downhill side) that collects runoff from the hillside for the surrounding area and then congregates at a single outlet point. This outlet then flows through an existing pipe down the remaining hillside into an open channel in Wapikiya Park, which from there enters the City of Missoula storm drainage system. As part of the proposed development, if post-development runoff rates and volumes are controlled and released at pre-development rates, then there should be no significant increase in runoff into the park drainage basin and City of Missoula storm infrastructure.

It is understood that the existing ditch/swale on the north (downhill) side of the site and all other existing piping are part of the City of Missoula's storm drainage system and any adjustment to such needs approved by the City before any work is to occur. Although we don't anticipate any major alterations to the City's infrastructure, where the controlled outlet from this proposed development into the City infrastructure (i.e. existing ditch) will need approval upon completion of final designs and construction plans.

3.1B DEVELOPED BASINS

Although the proposed roads and structures will alter the localized drainage patterns on the property, the overall drainage patterns and discharge points from the property will remain the same. The post-development conditions have been classified into five (5) separate drainage basins. The breakdown of the basins is based on these proposed drainage patterns of the proposed roads and structures on the steeper lot. As discussed in the section above, historical drainage patterns will be held, and the localized flow patterns will be collected and contained such that they can be routed to the existing patterns downstream. Collection and mitigation of storm water runoff will be accomplished by drainage infrastructure including (but not limited to) concrete curb and gutter, roadside ditches, catch basins, storm pipe, culverts, and collection ponds/basins.

A breakdown of the development basins with areas of different proposed groundcover are discussed later in this report and attached with curve numbers and basin areas.

3.2 DELINEATION OF DRAINAGE AREAS OUTSIDE THE SITE (OFF-SITE)

The off-site conditions are generally the same conditions as on-site with relatively steep slopes and consists of open space grassland in fair to good condition groundcover. The off-site areas contributing flow that needs accounted for includes some areas southwest of our site and north of the existing Hillview Way. Due to the surrounding topography, some off-site flow contributes runoff to this site. This is generally the same as the on-site flows and is considered the area southwest of the site and north of the existing road, Hillview Way. This off-site flow and the historical drainage patterns were considered for the runoff calculations for the site. Due to the off-site flow and the proposed development layout, provisions will be made to pass these flows without entering the

development's proposed storm infrastructure. To plan for this flow, roadside ditch with gravel check dams and culverts to route this flow around or through the site.

4.0 PROVISIONS TO MITIGATE OFF-SITE STORM WATER FLOWS

As described in Section 3.2 of this report, off-site flows into the subdivision are expected due to the existing topography in the area southwest of our site and north of Hillview Way. All off-site flows concentrating to the site are accounted for and will be included in the on-site calculations below and will be mitigated accordingly. Existing drainage patterns will be maintained off-site and on-site.

5.0 PROVISIONS TO MITIGATE ON-SITE STORM WATER FLOWS

The calculations below and attached show that there will be an increase in storm runoff from the proposed development. See the table below for the post-development runoff generated for each basin.

5.1 CALCULATONS & DESIGN

Calculations for this report are based on the SCS Type II Rainfall Distribution for calculating storm water runoff and conducted using the USDA/NRCS TR-55 method. Pre and post-development runoff rates and volumes were determined for the 2-year and 100-year design storms with 24-hour durations. Calculations were made using curve numbers, basins, and time of concentration to ensure proper routing and that any proposed infrastructure is not inundated. Per City of Missoula and standards, the design for the site is that flows for the 100-year storm and developed peak flows are limited to the pre-development flows for the 100-year event. For all calculations, refer to the attached TR-55 calculations.

5.1A HYDROLOGIC SOIL GROUP

The NRCS Soils Data was obtained from the Web Soil Survey website (located at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) to determine hydrologic soil group (HSG). The NRCS Soils Data for this site shows it to be a combination of Bigarm Gravelly Loam, which is HSG=B and Minesinger-Bigarm Complex, which is HSG=C.

5.1B CURVE NUMBERS & LAND USE DATA

Curve numbers were obtained from the TR-55 Manual, Tables 2-2a, 2-2b, and 2-2c. When there are multiple or combination of hydrologic soil groups, a weighted curve number is determined for the different areas. Due to the existing on-site soil is a combination of HSG B and C (from above) and is primarily groundcover classified as *"pasture, grassland, or range in fair condition,"* the Curve Number (CN) of 69 and 79, respectively for the HSG's was utilized for existing condition in the TR-55 method. For post-development, all proposed impervious infrastructure (i.e. structures, asphalt, concrete, etc.), landscaping (sod, re-seeded), and undisturbed areas were included for the site. See the summary table below and the attached to this report for the data used for this site.

Hydrologic Soil Group (HSG)	B & C	from Web Soil Survey in 4.1A above
Curve Number (CN) – Existing Ground	69	HSG = B for "pasture, grassland, or range in fair condition"
	79	HSG = C for "pasture, grassland, or range in fair condition"
Curve Number (CN) – Impervious Areas	98	standard for impervious (asphalt, concrete, buildings, etc.) from TR-55 for all hydrologic soils groups (HSGs)
Curve Number (CN) – Seeding & Landscape*	61	HSG = B for "open space – good condition, >75% ground cover" or "pasture, grassland, or range in good condition"
	74	HSG = C for "open space – good condition, >75% ground cover" or "pasture, grassland, or range in good condition"

**Note: for the final landscaping/sod/seeding of disturbed areas, the same curve numbers are the same for "open space, good condition (grass cover >75%)" as for "pasture, grassland, or range in good condition" for both HSG 'B' and 'C' (i.e. CN=61 for HSG=B, and CN=74 for HSG=C for both open space lawns and natural looking vegetation that is classified as pasture/grassland/range). Generally, lawn areas are classified by the City as irrigated and mowed, and natural vegetation will be all other landscaped areas, not specifically sodded areas.*

5.1C BASINS AND AREAS

The site was split into five (5) different basins/areas for the drainage areas based on the post-development grading. Each basin has an area associated with it and incorporates the post-development infrastructure such as impervious area (asphalt, concrete, buildings, roads, etc.), landscaping (re-seeded areas), and undisturbed areas. A breakdown of the basin areas with associated groundcover is attached to this report.

5.1D TIME OF CONCENTRATION

Time of concentration was determined by the TR-55 Program and is calculated based on the longest flow path and watercourse slope of the pre-development and post-development conditions for the site and individual basin(s). Time of concentration is broken down into sheet flow, shallow concentrated flow, and channel flow for all pre- and post-development drainage basins. A summary of the calculations is attached showing flow lengths, slopes, and types of flow are attached. Also, time of concentration calculations are attached with the WinTR-55 program inputs/outputs. Note that the minimum allowable value of time of concentration for TR-55 is 0.100 hr. If the calculated value falls below this minimum, the minimum value will be utilized as shown in the WinTR-55 program.

5.1E STORM DATA

The SCS Method uses 24-hour storm depths developed by the National Oceanic and Atmospheric Administration (NOAA) with a selected design recurrence interval, such as 2, 5, 10, 25, 50, or 100-year storms. The state of Montana uses the Atlas 2 method. Also, the MDT and MDEQ have published specific storm data for specific sites through the state. Also, there is a NOAA website that allows for site specific precipitation values for the 2-year and 100-year storms from NOAA Atlas 2, which can be deemed more accurate. Using the NOAA website (http://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm) with a site specific latitude/longitude of 46.8285°N, -114.0282°W provides the following precipitation amounts and intensities:

	Design Storm (24-hour)	
	2-year	**100-year**
Precipitation Amount (in)	1.20	2.58
Precipitation Intensity (in/hr)	0.05	0.11

5.1F INPUTS FOR WinTR-55 PROGRAM

The values described in Section 5.1 above are input into the WinTR-55 program to determine the runoff rate and volume of the pre- and post-development basins. See the attached printout of the WinTR-55 Input data showing variable inputs.

5.2 STORMWATER MANAGEMENT & CALCULATION OUTPUTS

On-site collection of stormwater runoff is planned to contain the runoff from the design storm. Detention will be required if the site was to hold the change in runoff from the pre-development vs. post-development for the 100-year, 24-hour storm runoff and meet the requirements for both storage and flowrate. Site constraints and surrounding topography determine the stormwater management requirements. For this specific site, the proposed collection and stormwater management is discussed later in this report.

5.2A RUNOFF VOLUMES AND RUNOFF RATES (WinTR-55 Results)

After using the TR-55 Method by inputting values into the WinTR-55 Program, the analysis was run and calculated the flow rates for the storm event(s) analyzed for this project. A summary of the results is presented below, with the WinTR-55 program output pages and drainage summaries attached.

Pre or Post	Basin	Runoff Volume (V) (cf)	Runoff Rate (Q) (cfs)
		100-yr	100-yr
Pre	On-Site	50,940	17.93
Pre & Post	Off-Site	26,921	9.66
Post	1	14,653	5.50
Post	2	13,957	6.01
Post	3	15,909	6.73
Post	4	12,579	4.80
Post	5	11,235	3.93

As is demonstrated by the calculations, the development will increase the stormwater runoff from the site generally due to the increase of additional impervious areas (asphalt, buildings, gravel, etc.). The higher post-development runoff volume than pre-development means containment and conveyance is required.

Note, that since this is preliminary planning for this development to determine magnitudes of runoff rates and volumes for preliminary sizing of stormwater infrastructure. As final grading occurs, basins may change slightly, and calculations will need updated. Different or additional drainage mitigation design will be required for the basins in this case. As for now, the site will utilize curb, catch basins, storm pipe, and containment areas (i.e. swales or ponds) are planned for the associated post-development runoff.

Full preliminary calculations and summaries are attached.

5.2B GENERAL STORMWATER DESIGN – ON-SITE

To meet the requirement to not exceed the pre-development runoff rates and due to site constraints, the proposed stormwater design will be to mitigate the difference in pre-development and post-development runoff rates and volumes for the 100-year, 24-hour storm event. A storm drainage collection system of curb, catch basins, storm piping, swales and collection pond(s) will route post-development runoff throughout the site. All roof drains from the proposed structures will tie into the proposed storm drainage system to prevent excess runoff on the finished ground surface so not to inundate structures or surface infrastructure.

Catch basins with storm pipe that outlet to culverts are planned to route the stormwater runoff from the design storm. Future calculations will follow to size the proposed storm pipes between catch basins and ensure the existing downstream culvert is adequate to handle the increase of runoff flow rates from the post-development site.

Basin 1

Runoff will route on the south-eastern portion of the site and then west down the curb line and storm drainage system and combine with Basin 2 stormwater runoff at the mainline of the storm drainage system that runs south-to-north down the hillside between the townhomes.

Basin 2
Includes the road from Hillview Way and eventually catches the storm drain, which will combine with the stormwater flow from Basin 1 at the storm drainage system that runs south-to-north down the hillside between the townhomes.

Basin 3
Includes the south-western stormwater runoff and follows the proposed curb into the storm drainage system via inlets, then routes through the storm drainage system (catch basins and piping) to a junction point at a proposed catch basin that runs south-to-north down the hillside between the townhomes. This junction point will also need to consider the stormwater flow from Bains 1, 2, and 4 as all stormwater congregates at this point.

Basin 4
Includes the middle-eastern stormwater runoff and follows the proposed curb into the storm drainage system via inlets, then routes through the storm drainage system (catch basins and piping) to a junction point at a proposed catch basin that runs south-to-north down the hillside between the townhomes. This junction point will also need to consider the stormwater flow from Bains 1, 2, and 3 as all stormwater congregates at this point. This will be considered the last point before release of runoff at pre-development rates.

Basin 5
Will be the runoff associated with the backside (downhill) of the entire development. This accounts for developed lawn areas and the undisturbed areas, including the existing drainage collection swale that outlet through Wapikiya Park. Additionally, this includes the area to the western side of the site where a future gravel trail will be constructed. This basin generally runs off-site without being collected.

Off-Site
Off-site stormwater runoff calculations will remain the same both pre- and post-development since no changes will occur off-site, meaning no increase in runoff. However, mitigation will be required to prevent runoff into the development. Generally, the off-site will be caught in the roadside ditch and routed around the subdivision on the western side to avoid the mitigation on-site in the proposed storm drainage system. The utilization of a roadside ditch with gravel check dams and culverts will help route stormwater flow through and around the site.

Summary
Based on the calculations in Section 5.2A above, provisions will need to be made to contain the excess runoff from post-development compared to pre-development. Due to Basin 5 automatically running off to the existing drainage swale down the hill to the north, it counts against the post-development containment requirement. The requirement to limit post-development runoff to pre-development runoff rates requires analysis of what automatically leaves the site versus what is collected on-site. From the above (and attached summary):

Runoff Rates
Pre-Development (On-Site) = 17.93 cfs
Post-Development Flow (Basin 1-4) = 23.04 cfs
Post-Development Flow (Basin 5) = 3.93 cfs

Max. post-development release (total pre-development rate) = 17.93 cfs

Max. remaining post-development release due to Basin 5 = 17.93 cfs – 3.93 cfs = **14.00 cfs**

Runoff Volumes
Pre-Development (On-Site) = 50,940 CF
Post-Development (Basin 1-4) = 57,099 CF
Post-Development (Basin 5) = 11,235 CF

Difference that needs to be detained on-site = 57,099 CF + 11,235 – 50,940 CF = **17,393 CF**

The site will utilize a stormwater storage vault, exact placement to be determined upon completion of construction plans, that holds this required volume.

The storage volume of the stormwater vault as shown on attached exhibits or details is shown calculated here:

Interior Length Dimension of Storage Vault (Entire Length) = 122.67 feet
Thickness & Number of Interior Walls = 4 interior walls @ 8" (0.67') thick each
Total Usable Length for Volume = 122.67' – (4*0.67) = 120 feet
Interior Width Dimension of Storage Vault = 20 feet
Effective Vault Depth (from bottom of tank to top of outlet overflow pipe) = 7.5 feet

Actual Stormwater Vault Storage Volume = (120 feet) * (20 feet) * (7.5 feet) = **18,000 CF**

Stormwater will exit the storage vault via the orifice discussed below and the outlet pipe inside the vault and down the hill towards the existing collection ditch. At that point, a dissipation structure at the outlet near the existing ditch will slow down the flow and direct it towards the existing inlet structure and pipe in the collection ditch.

In discussions with the City of Missoula, it was determined that the maximum design flow for the existing 18-inch pipe into Wapikiya Park is 7 cfs from previous City of Missoula design models. Because this existing design flow (7 cfs) is for the entire hillside where the existing drainage ditch contributes (i.e. more than just the proposed development site area), we need to "pro-rate" the ratio of existing design flow from our site versus the entire design flow (the 7 cfs).

To perform this "pro-rated" ratio of our site's contribution to the design flow, we analyzed aerial and topographic imaging to determine that total hillside contributing area to the existing drainage swale and outlet into Wapikiya Park. An exhibit is attached showing the determined contributing area and site area and a summary of the pro-rated calculation shown here:

"Pro-Rated" Outlet Design Flow to City of Missoula Existing Drainage Infrastructure
Existing Design Outlet Flow to Wapikiya Park = 7 cfs (provided from City of Missoula)

Total Contributing Area to Existing City of Missoula Drainage Ditch = 66.5 acres

Total Development Property Area = 25.6 acres

Total Property Area Below Existing Ditch at NE corner (Not Contributing) = 1.1 acres

Total Proposed Development Site Contributing Area to Existing Ditch = 24.5 acres

Percentage of Contributing Flow from Proposed Development Area versus Overall Contributing Flow to Existing Ditch = (24.5 acres) / (66.5 acres) = 36.8%

Allowable "pro-rated" flow to be released from the site = (7 cfs)*(36.8%) = **2.57 cfs**

An outlet pipe or orifice will be sized so not to exceed the "pro-rated" flow rate of **2.57 cfs** (from above). An orifice was sized based on the maximum head over the orifice. The larger the head over the orifice, the larger the flow through the orifice. The distance was utilized from the centerline of orifice to the top of outlet stand pipe. See the attached analysis showing that a **5.94-inch orifice** is the maximum diameter so that the outlet flow will not exceed the pro-rated flow shown above.

Although it is unlikely that much sediment or debris will make it to the outlet structure within the vault, anything can happen. The top of outlet pipe will be left open so that once the vault fills up, flow could overflow directly into this pipe rather than overtopping the vault wall to avoid any degradation to the vault wall backfill.

As is shown on the hydrographs developed by the WinTR-55 program for the pre-development on-site conditions and the post-development on-site conditions (Basins 1-4), the peak occurs at generally the same time near the mid-storm at 12 hours. See the attached hydrographs.

5.2C STORM PIPE SIZING AND OUTLET

Site Outlet – Pond/Final Collection Area to Existing City of Missoula Infrastructure

As described above, the final collection area (i.e. pond or vault, exact TBD) collects all interior storm drainage from the catch basins and storm piping. The collection area will be designed to detain the difference in runoff volume between pre and post-development. The outlet from the detention infrastructure will be designed to be released only at the "pro-rated" flow rate previously described in Section 5.2B of this report. This will limit and prevent adverse effects on the existing City of Missoula drainage infrastructure.

Site Interior – Catch Basin to Catch Basin

Catch basins with storm pipe that outlet to culverts are planned to route the stormwater runoff from the design storm. Future calculations will follow to size the proposed storm pipes between catch basins and ensure the existing downstream culvert is adequate to handle the increase of runoff flow rates from the post-development site.

The basin breakdown will be clearly defined in the post-development grading with the different curb collection and catch basin locations. Each catch basin had its individual contributing basin, and as it moves downstream, may have other contributing basins from upstream.

A detailed analysis will be prepared to show the interaction between the contributing flow areas to the receiving catch basins and associated storm pipes, while analyzing upstream and downstream conditions. Different pipe sizes will be analyzed to determine their maximum flow capacity. Often, especially on steep sites with tight drainage areas, "free-board" or factor-of-safety can be applied by assuming a percentage flowing full. For future storm pipe calculations, ample free-board will be assumed, with standard practice assumptions of 75%-80% flowing full. Note that is only for pipes interior to the project. All interior site piping eventually collects at the stormwater vault area. This on-site stormwater vault then outlets only at the "pro-rated" flow rate previously described in Section 5.2B of this report.

Pipe capacities will still depend on slopes of the pipe between catch basins, which will be determined upon final site grading. See the attached spreadsheet "Pipe Flow Calculations" that shows, preliminarily, how different pipe sizes and different flow full capacities can be utilized to carry the required flows. This spreadsheet will be included with the future report for all catch basin pipe sizing calculations. Additionally, pipe entrance losses will be included in an analysis to evaluate and ensure no excess flows affect upstream or downstream conditions. We anticipate pipe sizes to vary between 12-inch minimum and 24-inch diameter. As is shown by the attached spreadsheet, pipe capacity varies depending on slope of the pipe. As this is unknown until final grading, pipe sizes throughout the storm drain system cannot be determined or finalized at this time.

Based on the above maximum flow rates for different size storm pipes, the outlet storm pipe from the different catch basins can be analyzed. An example of the breakdown of the future selected outlet storm pipe from each catch basin is as follows:

EXAMPLE ONLY– Future Catch Basin Storm Pipe Sizing

Basin	Peak Flow Rate at Outlet of CB (cfs)	Inlet Storm Pipe Size (inches)	Outlet Storm Pipe Size (inches)
CB #1	TBD	N/A – first catch basin	TBD
CB #2	TBD	TBD	TBD
CB #3	TBD	TBD	TBD
CB #4	TBD	TBD	TBD

Refer to the Civil Construction Plans for drainage patterns and finished grading with locations of catch basins, storm piping, culverts, concrete cove gutter and other drainage infrastructure.

5.3 STORMWATER DISCHARGE TO GROUND

Generally, the TR-55 method accounts for some infiltration due to the curve number based on groundcover and hydrologic soil group conditions. Other than the infiltration accounted for using this drainage analysis method, no infiltration is planned, and the collection to containment of stormwater runoff will be utilized.

6.0 EROSION CONTROL

Erosion control will likely be required due to the size of the site and to ensure no excess sediment leaves the site. With the existing site topography and proposed grading, high flow velocities are a potential and stormwater infrastructure will be designed to handle these flows and mitigate them as much as possible. Any excess sediment generated from the site will be collected and allowed to settle in catch basins or collection ponds, depending on the final site design.

If a stormwater pollution prevention plan (SWPPP) will be required through the Montana Department of Environmental Quality (MDEQ) and/or the City of Missoula, it will be the responsibility of the Contractor (or owner if previously agreed upon) to prepare, obtain, and administrate a SWPPP and any other erosion control permits required by the City of Missoula.

7.0 CONCLUSIONS

This report and drainage calculations are considered preliminary to understand the magnitude of stormwater rates and volumes. A future final grading and drainage report will be completed that will include final sizing of stormwater collection areas, catch basin sizing, storm pipe sizing, and outlet sizing such that runoff volumes are contained, and that post-development runoff leaves the site only at pre-

development rates. Final site grading will be required before the final drainage calculations can be completed. Other existing drainage patterns in non-disturbed (i.e. drainage collection swale) or off-site (i.e. property to the southwest) areas will be maintained with flows being routed to these areas. All drainage will be directed away from any proposed structures and the site is graded so that the building will not be affected.

It is understood that the existing ditch/swale on the north (downhill) side of the site and all other existing piping are part of the City of Missoula's storm drainage system and any adjustment to such needs approved by the City upon completion of final designs and construction plans, and prior to any work occurring on-site.

Because this report is preliminary, the calculations shown herein could change depending on final site conditions and grading.

All construction will be in accordance with the final Construction Plans, Montana Public Works Standard Specifications (MPWSS), City of Missoula requirements, and MDEQ regulations, as required.

Prepared by:
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Jason Rice, P.E.

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LIST OF ATTACHMENTS (only the highlighted items are included at this time)

- Drainage Exhibits with Basin Delineation *(2 total sheets)*
  - Pre-Development Conditions Exhibit *(1 sheet)*
  - Post-Development Conditions Exhibit *(1 sheet)*
- Drainage Flow Pro-Rated Exhibit *(1 page)*
- "Preliminary Drainage Calculations" Spreadsheet *(3 pages)*
- NRCS Soils Data – Hydrologic Soil Group *(4 pages)*
- Precipitation Frequency Data Output NOAA – Site Specific Precipitation *(1 page)*
- TR-55 Tables 2-2a, 2-2b, 2-2c for Curve Numbers *(3 pages)*
- Orifice Sizing for Outlet Release Structure Spreadsheet *(1 page)*
- "Pipe Flow Calculations" Spreadsheet *(2 pages)*
- Manning's Roughness Coefficients *(1 page)*
- WinTR-55 Input Data *(4 total pages)*
  - Identification Data, Sub-Area Data, Storm Data *(1 page)*
  - Sub-Area Summary Table *(1 page)*
  - Sub-Area Land Use and Curve Number Details *(1 page)*
  - Sub-Area Time of Concentration Details *(1 page)*
- WinTR-55 Output Data *(2 total pages)*
  - Watershed Peak Table *(1 page)*
  - Hydrograph Peak/Peak Time Table *(1 page)*
  - Hydrograph – Pre-Development *(1 page)*
  - Hydrograph – Post-Development *(1 page)*
- WinTR-20 Output Data – Runoff Volumes *(60 pages)*
- Preliminary Storm Water Collection Vault Exhibit *(1 page)*
- ~~Civil Construction (Grading & Drainage) Plans *(attached separately)*~~ **Not complete or included yet**

INCLUDED BY REFERENCE

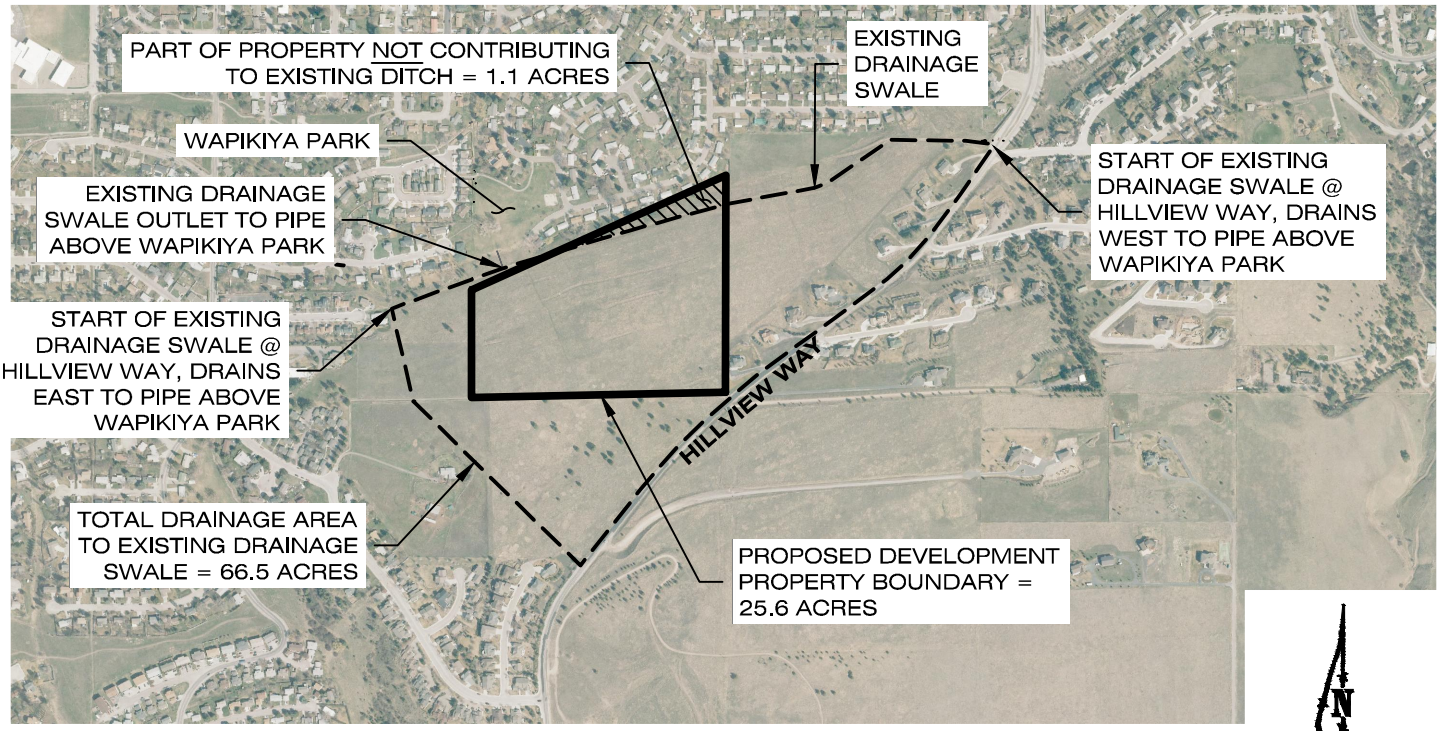
USDA NRCS TR-55 Urban Hydrology for Small Watersheds Manual *(June 1986)*
WinTR-55 Program *(version 1.00.10)*
WinTR-55 User Guide – Small Watershed Hydrology *(January 2009)*
Montana Department of Transportation Drainage Manual
Montana Public Works and Specifications *(latest edition)*
Missoula County Public Works Manual *(January 2010)*
Montana Department of Environmental Quality Circular 8 *(2017 Edition)*

DRAINAGE PRO-RATED FLOW TO OUTLET (LEAVE SITE) INTO SWALE

EXISTING OUTLET FLOW FROM EXISTING DITCH = 7 CFS

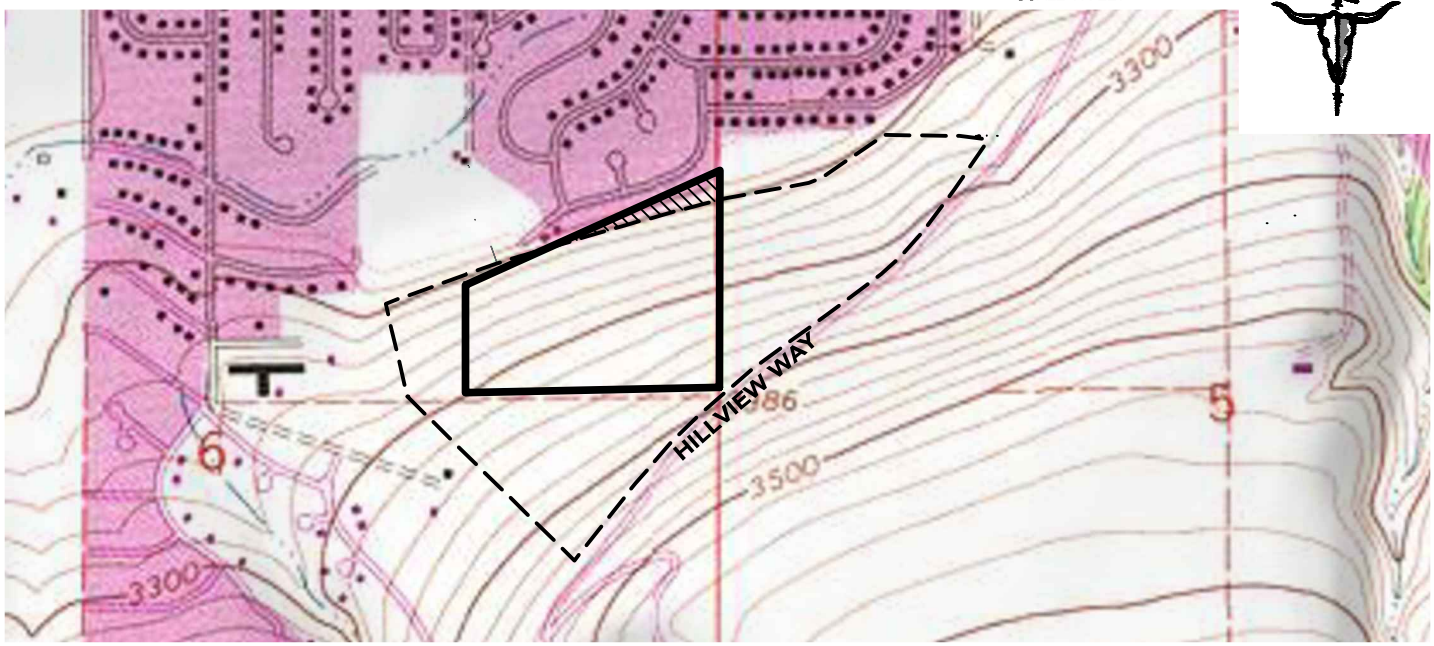
PERCENTAGE OF CONTRIBUTING FLOW FROM PROPOSED DEVELOPMENT AREA VERSUS OVERALL CONTRIBUTING FLOW TO EXISTING SWALE = (25.6 ACRES - 1.1 ACRES)/(66.5 ACRES) = 36.8%

ALLOWABLE PRO-RATED FLOW TO BE RELEASED FROM SITE = (7 CFS)*(36.8%) = 2.57 CFS



AERIAL MAP

500 0 500 1000
SCALE IN FEET



USGS TOPOGRAPHIC MAP

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DRAINAGE FLOW PRO-RATED MAP
HILLVIEW CROSSING TOWNHOMES
CITY OF MISSOULA
SECTION 6, T12N, R19W, P.M.M.
MISSOULA COUNTY, MONTANA

PROJECT#: 14-3592
TAB: PRO-RATED FLOW
DRAFTER: AM
DATE: 4/9/2019
SHEET 1 OF 1

PLOT DATE: 4/9/2019 12:33 PM DWG LOCATION: T:\1_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA\HILLS DEVELOPMENT_DRAFTING\1_DRAWINGS\AUTOCAD\MISC. DRAWINGS\EXH-14-35_2-DRAINAGE (2019-04-09).DWG

ORIFICE SIZING FOR OUTLET RELEASE STRUCTURE

PROJECT: Hillview Crossing Development, City of Missoula, MT (TLI #14-3592)

DEVELOPER/OWNER: Hillview Crossing LLC

PREPARED BY: Territorial-Landworks, Inc.

DATE: 4/9/2019

VARIABLE SUMMARY

$Q = C_d * A(2gh)^{0.5}$ Orifice equation from McGraw-Hill Water and Wastewater Calculatios Manual

C_d = unitless, coefficient of discharge, value is 0.62 typical for sharp-edged orifice (circular)

g = 32.174 ft/s^2, acceleration due to gravity

h = feet, head over centerline of orifice

A = $feet^2$, area of orifice ($\pi * r^2$)

Q_{ST} = cfs, sub-total flow through orifices

Q_T = cfs, total flow through orifices

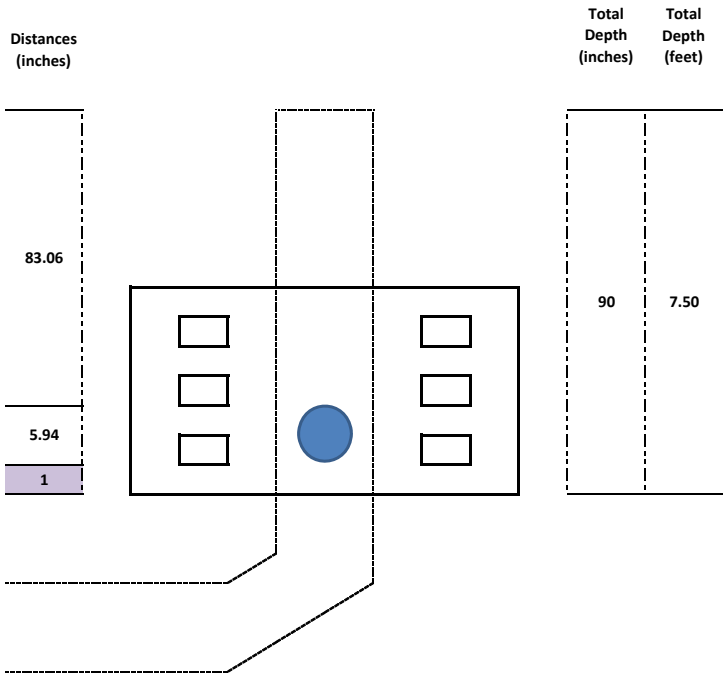
O_n = Number of orifices

q_o = cfs, target release rate from pond sizing (usually a pre-development flow rate)

	user input
	acceptable value
	un-acceptable value

	Orifice Sizing		
Orifice Diameter =	5.94	inches	
C_d =	0.62		
dist. to next orifice	83.06	inches	distance from top of orifice to top of overflow pipe
h =	86.03	inches	
A =	0.19	ft^2	
Q =	2.56	cfs	
O_n =	1	orifice(s)	number of orifices
Q_{ST} =	2.56	cfs	flow through an individual orifice
Q_T =	2.56	cfs	total flow through total number of orifice(s)
q_o =	2.57	cfs	maximum flow rate based on pro-rated flow
Acceptable Release?	YES		

OUTLET STRUCTURE SCHEMATIC (not to scale)



Pipe Flow Calculations

Notes:

[1] flow depth based on % flowing full and radius of pipe

[2] cross-sectional flow area of pipe at flow depth

[3] wetted perimeter based on pipe size and flow depth

[4] Manning's n-value based on pipe type: PVC = 0.011, PE = 0.012, RCP = 0.011-0.013

[5] Pipe velocity is calculated using Manning's equation: V = [(1.49*r^(2/3)*s^(1/2)] / n; where r=hydraulic radius (flow area/wetted perim.), s=slope (ft/ft)

[6] Pipe flow is the maximum flow at the pipe depth, calculated as Q=v*A, where v=pipe velocity and A=cross-sectional flow area

Pipe Size (inches)	Pipe Size (feet)	% Flowing Full	Flow Depth (feet)[1]	Cross-Sectional Flow Area (sf)[2]	Wetted Perim. WP (feet)[3]	Pipe Type	Manning's n-value[4]	Pipe Slope (%)	Manning's Eqn. Pipe Velocity (ft/s)[5]	Pipe Flow Qmax (cfs)[6]
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	0.50%	4.30	2.718
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	1.00%	6.08	3.845
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	2.00%	8.60	5.437
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	3.00%	10.54	6.659
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	5.00%	13.60	8.597
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	10.00%	19.24	12.157
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	15.00%	23.56	14.890
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	20.00%	27.20	17.193
12	1.00	75%	0.75	0.632	2.10	PVC	0.011	25.00%	30.42	19.223
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	0.50%	3.80	2.984
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	1.00%	5.38	4.220
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	2.00%	7.60	5.968
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	3.00%	9.31	7.309
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	5.00%	12.02	9.436
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	10.00%	17.00	13.344
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	15.00%	20.82	16.343
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	20.00%	24.04	18.871
12	1.00	100%	1.00	0.785	3.14	PVC	0.011	25.00%	26.88	21.099
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	0.50%	5.00	4.952
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	1.00%	7.07	7.003
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	2.00%	9.99	9.904
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	3.00%	12.24	12.129
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	5.00%	15.80	15.659
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	10.00%	22.35	22.145
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	15.00%	27.37	27.122
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	20.00%	31.60	31.318
15	1.25	75%	0.94	0.991	2.63	PVC	0.011	25.00%	35.33	35.015
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	0.50%	4.41	5.409
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	1.00%	6.23	7.649
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	2.00%	8.82	10.817
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	3.00%	10.80	13.249
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	5.00%	13.94	17.104
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	10.00%	19.71	24.188
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	15.00%	24.14	29.625
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	20.00%	27.88	34.207
15	1.25	100%	1.25	1.227	3.93	PVC	0.011	25.00%	31.17	38.245
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	0.50%	5.65	8.083
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	1.00%	7.99	11.431
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	2.00%	11.30	16.165
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	3.00%	13.84	19.798
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	5.00%	17.86	25.560
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	10.00%	25.26	36.147
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	15.00%	30.94	44.270
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	20.00%	35.72	51.119
18	1.50	75%	1.13	1.431	3.16	PVC	0.011	25.00%	39.94	57.153
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	0.50%	4.98	8.804
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	1.00%	7.05	12.450
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	2.00%	9.96	17.607
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	3.00%	12.20	21.564
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	5.00%	15.76	27.839
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	10.00%	22.28	39.371
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	15.00%	27.29	48.219
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	20.00%	31.51	55.679
18	1.50	100%	1.50	1.767	4.71	PVC	0.011	25.00%	35.23	62.251

Pipe Flow Calculations

Notes:

[1] flow depth based on % flowing full and radius of pipe

[2] cross-sectional flow area of pipe at flow depth

[3] wetted perimeter based on pipe size and flow depth

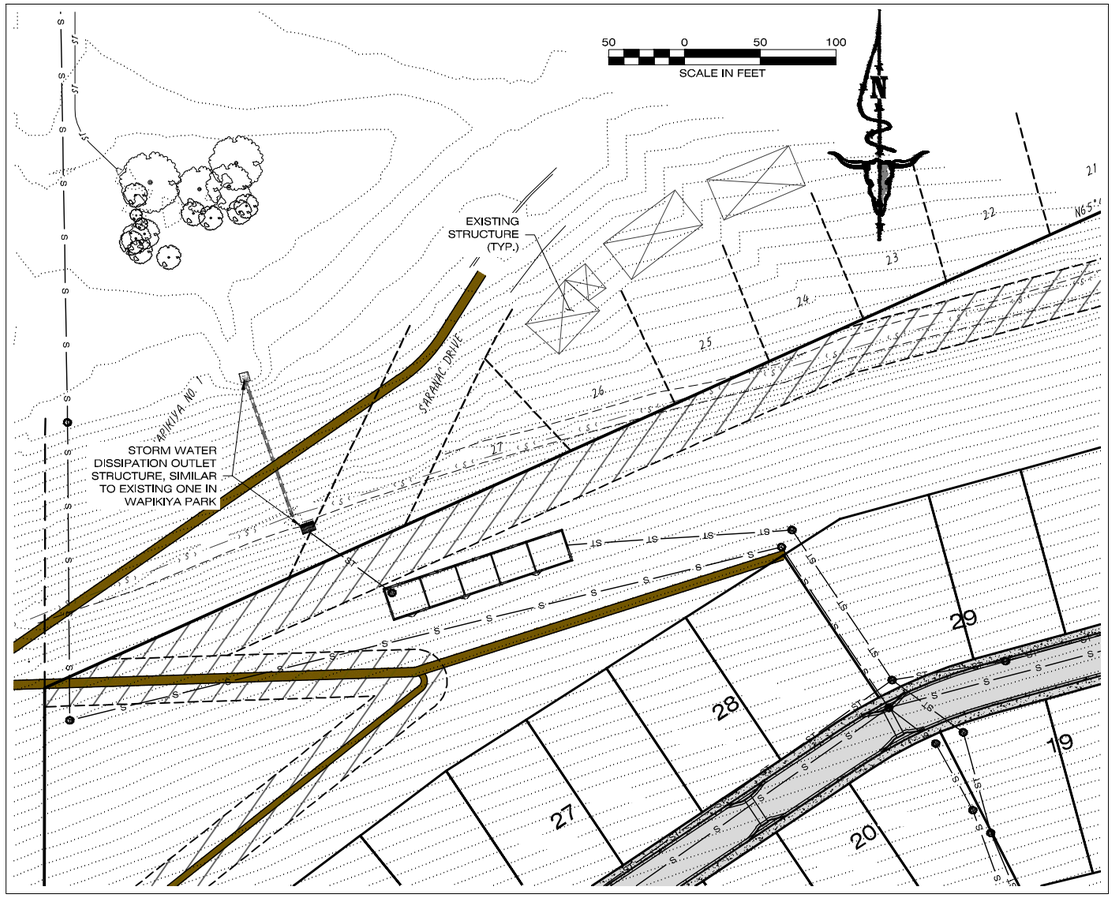
[4] Manning's n-value based on pipe type: PVC = 0.011, PE = 0.012, RCP = 0.011-0.013

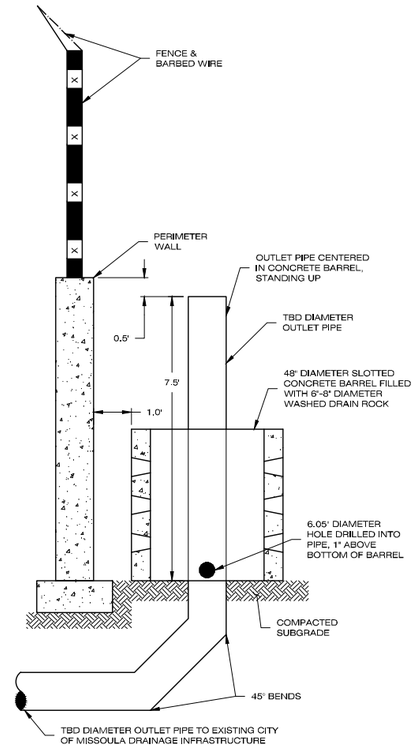
[5] Pipe velocity is calculated using Manning's equation: V = [(1.49*r^(2/3)*s^(1/2)] / n; where r=hydraulic radius (flow area/wetted perim.), s=slope (ft/ft)

[6] Pipe flow is the maximum flow at the pipe depth, calculated as Q=v*A, where v=pipe velocity and A=cross-sectional flow area

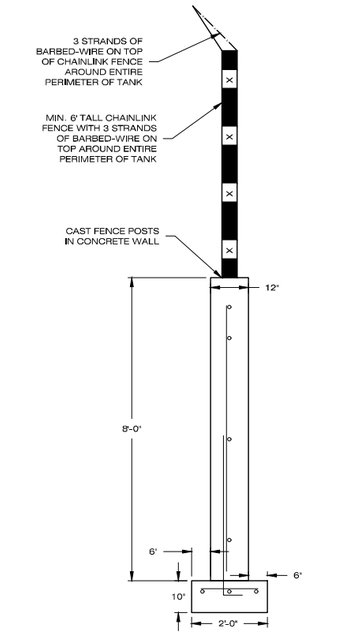
Pipe Size (inches)	Pipe Size (feet)	% Flowing Full	Flow Depth (feet)[1]	Cross-Sectional Flow Area (sf)[2]	Wetted Perim. WP (feet)[3]	Pipe Type	Manning's n-value[4]	Pipe Slope (%)	Manning's Eqn. Pipe Velocity (ft/s)[5]	Pipe Flow Qmax (cfs)[6]
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	0.50%	6.25	12.106
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	1.00%	8.84	17.121
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	2.00%	12.51	24.213
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	3.00%	15.32	29.654
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	5.00%	19.77	38.283
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	10.00%	27.97	54.141
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	15.00%	34.25	66.309
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	20.00%	39.55	76.567
21	1.75	75%	1.31	1.936	3.67	PVC	0.011	25.00%	44.22	85.604
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	0.50%	5.52	13.271
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	1.00%	7.80	18.768
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	2.00%	11.04	26.541
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	3.00%	13.52	32.507
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	5.00%	17.45	41.966
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	10.00%	24.68	59.349
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	15.00%	30.22	72.687
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	20.00%	34.90	83.932
21	1.75	100%	1.75	2.405	5.50	PVC	0.011	25.00%	39.02	93.838
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	0.50%	6.84	17.289
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	1.00%	9.67	24.450
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	2.00%	13.68	34.578
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	3.00%	16.75	42.349
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	5.00%	21.63	54.672
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	10.00%	30.58	77.318
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	15.00%	37.46	94.695
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	20.00%	43.25	109.344
24	2.00	75%	1.50	2.528	4.19	PVC	0.011	25.00%	48.36	122.250
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	0.50%	6.04	18.966
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	1.00%	8.54	26.822
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	2.00%	12.07	37.933
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	3.00%	14.79	46.458
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	5.00%	19.09	59.977
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	10.00%	27.00	84.820
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	15.00%	33.06	103.883
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	20.00%	38.18	119.953
24	2.00	100%	2.00	3.142	6.28	PVC	0.011	25.00%	42.68	134.112

**Values are calculated on flow as pipe-full from the AutoCAD Hydraflow Express pipe modeling software*

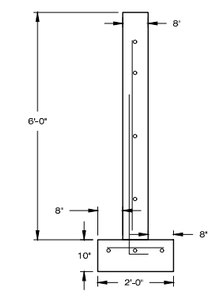




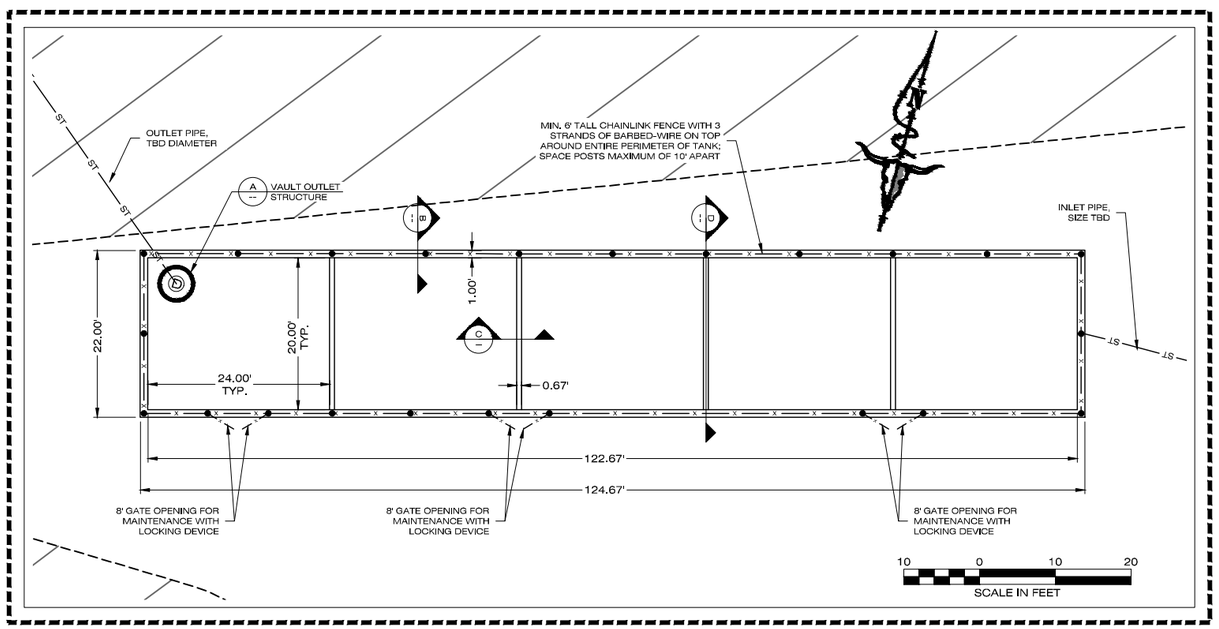
A -- OUTLET STRUCTURE DETAIL
STORM VAULT
NOT TO SCALE

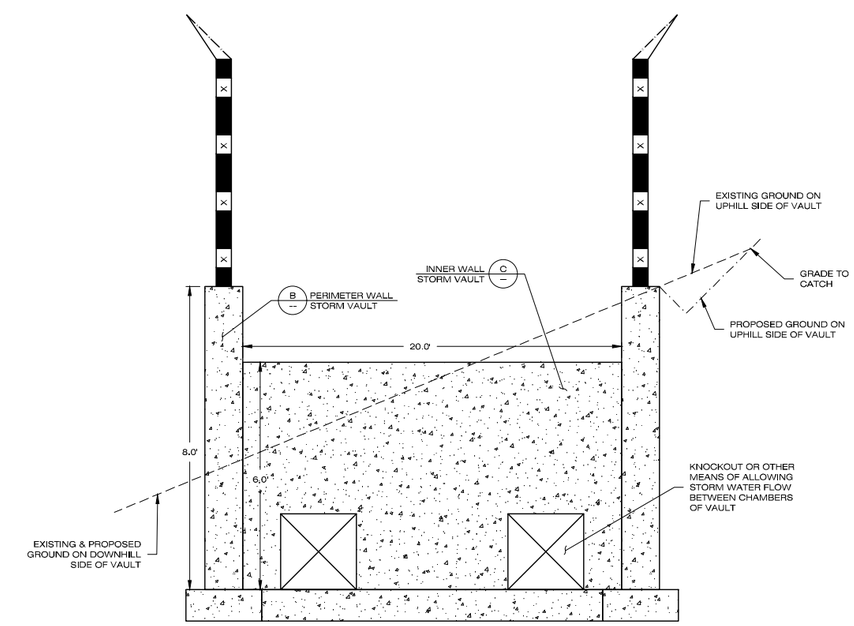


B -- PERIMETER WALL
STORM VAULT
NOT TO SCALE



C -- INNER WALL
STORM VAULT
NOT TO SCALE





D -- INNER WALL - SIDE VIEW
STORM VAULT
NOT TO SCALE

TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
www.TerritorialLandworks.com
P.O. Box 3551
Missoula, MT 59806
Ph: 406/721-0142
Fax: 406/721-5224

PLOT DATE: 4/9/2019 12:13 PM

REVISIONS	DATE

DESIGNED:
DRAFTED: AM
CHECKED:
DATE: 4/9/2019

LOCATION: HILLVIEW WAY SECTION 6, T12N, R19W, P.M.M. CITY OF MISSOULA MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING LLC

PROJECT NAME: HILLVIEW CROSSING TOWNHOMES

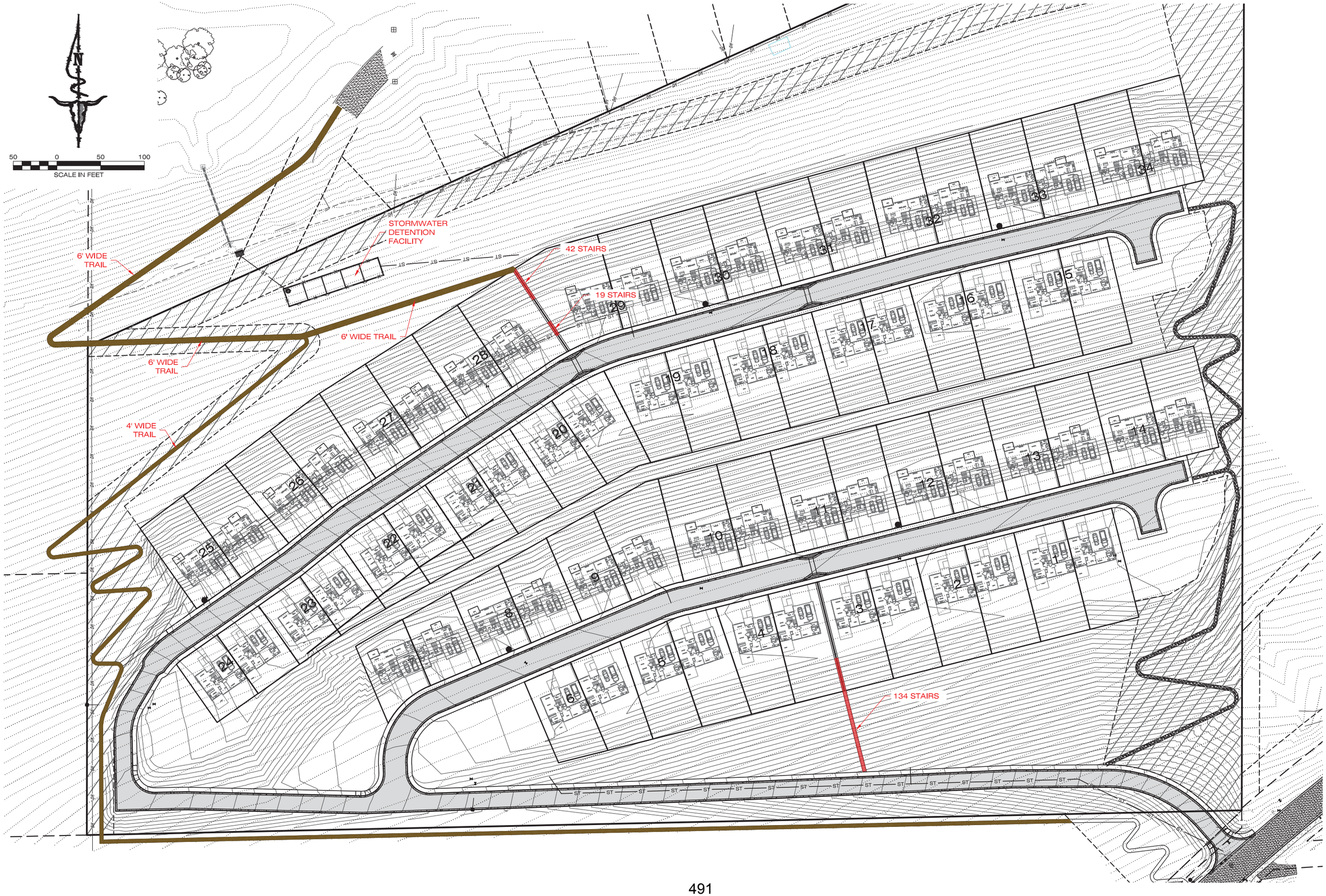
SHEET TITLE: STORMWATER COLLECTION VAULT EXHIBIT

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:\1_ACTIVE FILES\2014 PROJECTS\2002 - HILLVIEW CROSSING\MISSOULA & WILLS DEVELOPMENT_DRAFTING\3_DRAWINGS\A_DRAWINGS\A-700-ADV.MSC.
DWG WIN GIS LOPH-14-2592-DEMIN.AGE (2019-04-09) DWG



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Fax: 406/721-3221

PLOT DATE: 4/19/2018 10:43 AM

REVISIONS	DATE

DESIGNED:
DRAFTED: JW
CHECKED:
DATE: 4/19/2018

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: PROPOSED TRAIL EXHIBIT SECONDARY OPTION

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA\14-3592 DEVELOPMENT_PLDPMT\Civil_1\DRAWINGS\AUTOCAD\2D-14-3592-ALT CONNECTION.DWG

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Fax: 406/721-3224

PLOT DATE: 4/3/2019 9:35:56 AM

REVISIONS	DATE

DESIGNED: NL
DRAFTED: BD
CHECKED:
DATE: 08/14/2015

LOCATION: CITY OF MISSOULA 12N, 19W, S6 MISSOULA COUNTY, MONTANA

PREPARED FOR: DJ HOLDINGS

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: TYPICAL CROSS SECTION

PROJECT NO. 14-3592

SHEET: 1 OF 1

PRELIMINARY

DWG LOCATION: T:_ACTIVE FILES\2014 PROJECTS\3592 - HILLVIEW CROSSING-MISSOULA S 19 L5 DEVELOPMENT_DRAFTING\4. _DRAWINGS\AUTOCAD\DESIGN\14-3592_CORRIDOR_XV_ALT.DWG

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April 3, 2019

VIA EMAIL ONLY
Missoula City Council
435 Ryman
Missoula, MT 59802

RE: Hillview Crossing Townhouse Development

Dear Council Members:

Due process is a fundamental requirement of all land use review processes. At its core, it requires proper notice and an opportunity to be heard. But diving into the details reveals more. Proper notice means an applicant for a land use permit has been fairly apprised of the requirements needed to obtain a fair review. The past three months of discussions on the Hillview Crossing project have revealed quite the opposite in this case. Shifting design standards and vague information requests have left our client, the landowners and developers, with little means to ascertain what is required to advance their application.

At the end of the last LUP meeting, we specifically asked what the Council needed in regards to geotechnical and stormwater information. We received no useful response. We understand issues arise in any review process which may call for additional information. Our client has repeatedly been responsive to all such requests made since December, but can't provide what we can't decipher.

Protecting public health and safety is an essential role for the Council to advance. Finding reasonable mitigation for potential impacts is a legitimate interest in a conditional use permit process. That said, the review criteria are not blank checks for ignoring adopted standards. In this letter we address three of the topics of conversation that have taken on an arbitrary quality and strayed far from reasonable mitigation.

Road Width

The Hillview Crossing project has a long history. The City Council first approved a traditional subdivision for the property in 2006 with a similar road and development layout. The preliminary plat approval expired in 2016. Meanwhile, the City issued a zoning compliance permit for a townhouse project with 68 dwelling units with 28' wide streets and parking on one side of the road in October 2015. The configuration was very similar to the current project. That approval lapsed during litigation filed by an adjacent landowner challenging the validity of the approval. The City and developers of the Hillview Crossing project prevailed.

In the interim, the Council adopted new standards for townhouse projects. These new standards were adopted with the 2015 Hillview Project fully in mind. It was even included in the presentation materials for the Council's consideration of the new standards.

Even after the Council's actions, the 2015 version of the Hillview Project complied with every newly adopted design standard except for front yard setbacks which increased from 10' to 20'. In response, the developers redesigned the project to meet the setback requirements which had the benefit of adding 136 off-street parking spaces. Development Services issued a staff report recommending approval of the 2018 version of the project on December 6, 2018, including approval of the proposed 28' road width.

Development Services' subsequent Memo No. 3 of March 11, 2019 states, as a proposed finding of fact, that Title 12, Section 12.22.140.C.1(a) requires a 35-foot wide back-of-curb to back-of-curb road for a local residential street with parking on both sides. This is not correct.

The full text of Section 12.22.140.C.1(a) states:

1. Roadway or street widths (Back of curb to back of curb minimum widths)
    a. Local Residential Roadway or streets (serving 12 or more living units)
        i. 35' with parking on both sides
        ii. 28' with parking on one side
        iii. 21' with no parking

These are the standards adopted by the City Council specifically for Townhome Exemption Developments. In adopting them, the City Council deemed them acceptable. There are no criteria for determining when one might be more acceptable or less acceptable. They are approved options for project design. They are not a menu of options for the Council to pick from when its feels more comfortable with one design over another. That is the epitome of arbitrariness.

The genesis for the road width discussion appears to stem from two sources: 1) comments submitted by City Fire; and 2) conditional use permit review criteria 20.85.070 H.1.(e) which requires a determination that the project "will not have a significant adverse impact on traffic safety or comfort, including all modes of transport (non-motorized and motorized.)" One of the "Factors to be Considered" to determine whether the criteria have been met (which is different than the criteria themselves) is "that the overall project will be functional, attractive and safe in terms of pedestrian, bicycle and vehicular access, parking, loading and servicing." (Section 20.85.070 I.4.)

City Fire submitted comments expressing concern for the provision of emergency services if the residents do not honor the parking prohibition along one side of the street or fail to properly address snow removal. These are the same concerns City Fire expressed during design review team meetings where all parties accepted the 28' road width. They are valid concerns and the mitigation City Fire requested is appropriate – proper signage and striping. At no point over the course of more than three years of meetings and discussions did anyone suggest, much less require, the project to be designed to a 35' standard.

Nevertheless, members of the LUP committee subsequently voted to require the developers to increase the width of the street to 35 feet to allow for parking on both sides of the street. Ironically, this has the effect of making snow removal more difficult and decreases the width of the driving lanes during snow events because the snow can no longer be plowed completely off one side of the street. Anyone traveling a city-maintained side street during this past winter is familiar with this phenomenon.

The decision has other consequences as well. It increases stormwater generation for one. More importantly, given Council's other concerns, it requires more mass grading of the slopes and pushes the houses further out onto non-native soils.

As an alternative, the developers could seek a variance from the 20' setback for part of the project to leave the mass grading and house locations as presently designed. The net result would be a loss of approximately 34 parking spaces. Again, an ironic result stemming from a concern the "no parking" restrictions would not be enforced on a street that fully meets the City's design standards.

For these reasons, we respectfully ask the Council to reverse its decision to increase the road width to 35'.

Block Lengths and Pedestrian Pathways

The Staff Report, and much of the Council's subsequent discussion about block lengths, states "Per Title 20 Section 20.40.180.F, blocks may not be longer than 480 feet. This is not correct.

Per the plain language of the zoning provision, which is applicable only to townhouse exemption developments, block lengths are expressly allowed to be longer than 480 feet where topography or other constraining circumstances are present:

> 20.40.180 (F)
> Blocks shall be designed to assure traffic safety and ease of pedestrian and automobile circulation. Blocks shall not exceed 480 feet in length and be wide enough to allow two tiers of dwelling units in a Townhome Exemption Development *unless topography or other constraining circumstances are present*. Pedestrian access easements that create a break within a block *may be* required where there is a need for pedestrian access to school bus or transit stops, schools, shopping, parks, common areas or open space, and community facilities.

It is universally agreed the subject property has topographic and constraining circumstances. Thus, the regulation allows block lengths to exceed 480 feet, but kicks in a possible new requirement: pedestrian access easements to create a break within a block where there is a need for pedestrian access, etc. By adopting these zoning provisions – adopted only for townhouse exemption developments – the Council already determined the required mitigation for blocks exceeding 480 feet in length.

Nevertheless, the Staff Report recommends a condition of approval exceeding this standard and requiring actual construction of a vertical pathway through the center of the project. Accomplishing this construction would absurdly require more than 200 steps on the belief this would be a reasonable, functional, safe means for reducing the walking distance for pedestrians to reach Hillview Way. Subsequent discussions by Council have varied from requiring one such pathway, to two such pathways, to a goalpost style pathway, to a blend of all three.

Despite the limitation in 20.40.180 (F) for pedestrian easements only, our client is willing to provide a reasonable alternative to providing a staircase that is four times the height of the west stands at Washington Grizzly Stadium. In December, they provided an alternative trail along the east side of the development which would comply with City trail construction standards. Oddly, this alternative was not presented in Staff Memos and presentations on the subject.

More recently, our client has proposed creating a trail from the northern road and heading downhill, a much more likely path for pedestrians to take. This would be coupled with a trail from the middle road traveling uphill to reach the southern road. These routes still involve the construction of many stairs, but are an attempt

to compromise with the Council's desires and exceed what is required by the zoning regulations. We encourage you to take advantage of this offer and adopt this proposal in lieu of all others.

Geotechnical and Stormwater Reports

Any development project on a hillside creates geotechnical issues. Yet the City's zoning regulations specifically allow hillside development and do not prohibit disturbance and development on slopes exceeding 25%. Rather, the 25% slope category is taken into consideration for determining density.

The Hillview Crossing Parcel is zoned RT 10 residential. Per Title 20 townhouse standards, land which exceeds 25% is excluded from determining permitted density. The proposed 68 units in the Hillview Crossing project fully comply with all density calculations in the zoning regulations.

Ensuring construction of the roads and dwellings can be done without adverse impacts onsite and to adjacent properties is a legitimate interest for the Council to consider. In that regard, the developers have submitted a geotechnical report. The report is based on actual soil borings of the site and considers a road and dwelling layout that closely matches the project proposed by the developers. The report indicates the site is suitable for the proposed development and includes recommendations for additional testing as the project is carried out.

No one has submitted any evidence in the record indicating the site is not suitable for the proposed development from a geotechnical perspective. No one has submitted any evidence suggesting a condition of approval requiring updated reports for small changes to the layout and development would not adequately mitigate potential impacts.

Instead, the Council has demanded our client provide an updated geotechnical report without specifying the contents which would satisfy its needs. Our client's consultants, Territorial Landworks, attempted to get clarification on the issue. In an email from John DiBari on March 25, he noted the Geotech report would need to address the Council's previous actions to increase the road width "as well as whatever subsequent action is taken concerning the block length and/or pedestrian access issue."

In other words, our client is required to submit a geotechnical report as a prerequisite to obtaining project approval and it must address decisions the Council has not made yet. This is an impossible, unrealistic, arbitrary request to meet. Further, it appears the Council has determined the applicant's information is inadequate based on preliminary changes the Council made to the project during its review. Redesigning the project for the developer, then telling the developer its information is inadequate for review wreaks of due process failures.

The same is true for the Council's request pertaining to stormwater facilities. We have no idea whether the Council desires feasibility level information or complete construction plans. To our knowledge, no such information has been required for any other project. The City uses a standardized methodology for determining stormwater impacts, calculations for which were included in the application materials. If the Council has a need for additional information, it must be able to articulate that request in a form that allows the applicant to comply. No such request has been provided.

In an attempt to address this situation, our client has provided additional memoranda addressing both geotechnical and stormwater facilities. We urge you to take this information into consideration as an appropriate response to the Council's requests.

In closing, we respectfully request the Council revisit its decision to require a 35' road width, request the council accept our client's compromise proposal on the pedestrian pathways, and ask the Council to consider the additional geotechnical and stormwater information as properly and fully addressing those remaining issues.

Sincerely,

GARLINGTON, LOHN & ROBINSON, PLLP

Alan F. McCormick
Direct Line: (406) 523-2518
Email: afmccormick@garlington.com

AFM:jdl

GARLINGTON | LOHN | ROBINSON
MONTANA'S ATTORNEYS SINCE 1870

May 23, 2019

VIA EMAIL ONLY
Bryan von Lossberg, Council President
Missoula City Council
435 Ryman
Missoula, MT 59802
council@ci.missoula.mt.us

RE: Hillview Crossing Townhome Development

Dear Bryan and Council Members:

We have received and reviewed the attached email from John DiBari outlining the conditions necessary for our client to satisfy before the Land Use and Planning Committee will place the Hillview Crossing TED Conditional Use Request back on the agenda. We are perplexed by this request.

The email refers to votes taken at LUP meetings and follows with a list of items requested of the development team to be reviewed for completeness by staff before any further action will be taken.

Having witnessed the discussions and votes taken at LUP meetings, we do not recognize this list of items as originating from any actions taken by the Committee.

For example, the first item requests a variety of information regarding pedestrian access. The LUP Committee voted to approve the development team's compromise proposal on April 3. The newly requested information could easily be part of a required condition of approval, as has been common for prior development projects.

The second item requires information related to stormwater facilities, but does not comport to any request for information made during an LUP meeting. At the April 3 LUP meeting, Territorial Landworks provided information which we believe corresponded to earlier requests made during LUP meetings which the development team agreed to provide.

The third item requires additional geotechnical information, but the request acknowledges the information must address decisions the Council has not made. We have previously pointed out the constantly shifting sands make it impossible to satisfy the Council's requests. At the April 3

2751123

P.O. Box 7909 | 350 Ryman St. | Missoula, MT 59807-7909 | PHONE: (406) 523-2500 | FAX: (406) 523-2595 garlington.com
Professional Limited Liability Partnership

LUP meeting, Territorial Landworks provided additional geotechnical information. To our knowledge, no additional LUP meetings have been held to discuss the submitted information and determine whether it represents a reasonable approach to the Council's concerns.

Further, the email states it "is not true" that the development team cannot talk with staff. We have several emails from City staff that use consistent language informing us that all discussions must take place in front of the Council. For example, one states "once a project goes to Council all communications must be through the Council to be included in the public record." We apologize if we have misinterpreted these communications and are pleased to know the development team can discuss relevant issues with staff. We hope City staff has been appraised of this permission as well.

The issues discussed above raise the following questions: Who made the decision to request the additional information and impose these new conditions as a pre-requisite for any further action on the application? When was this decision made? What authority exists for making these demands? And what records exist of communications among Council members regarding this decision?

Finally, on April 3, 2019, I sent a letter to Council explaining various errors in the process and erroneous findings of fact, particularly concerning city standards for road width, and asked the Council to reconsider its decisions in light of this information. We have not received a response to our letter or any discussion of the issues raised therein and renew our request to do so.

We respectfully request the LUP Committee place the application back on the agenda to complete the review process at its next regularly scheduled meeting.

Sincerely,

GARLINGTON, LOHN & ROBINSON, PLLP

Alan F. McCormick
Direct Line: (406) 523-2518
Email: afmccormick@garlington.com

AFM:jdl
Enclosure

2751123

From:	John DiBari
To:	"Jason Rice"; Paul Forsting; Alan F. McCormick; Grp. City Council and City Web Site
Cc:	Mike Haynes; Mary McCrea; Troy Monroe
Subject:	Hillview Crossing TED
Date:	Tuesday, May 7, 2019 5:26:42 PM
Attachments:	TMonroe_memo_20190501.docx

Good afternoon,

All parties -- staff, the public, council and the development team -- have been diligently working to move the proposed Hillview Crossing TED conditional use permit application forward to resolution. I appreciate that effort.

As discussions have progressed, LUP has voted on several items in the effort to provide direction to the development team. The LUP's actions are as follows:

- March 13, 2019, LUP voted for revised conditions 11 and 13 in Memo #3.
- March 20, 2019, LUP voted for Option A (Geotech Report updated before Council decision) and proposed conditions 25 and 26 in Memo #4, and Option A (Storm Water plan updated before Council decision) and revised conditions 2 and 3 in Memo #4.
- April 3, 2019, the committee voted for a concept drawing entitled Proposed Trail Exhibit Secondary Option proposed by the development team.

Jason Rice left with the committee and staff several documents relating to the Geotechnical and Storm Water reports at the April 3, 2019 LUP meeting. Troy Monroe, Assistant City Engineer, reviewed the items left by Jason as they relate to the above committee actions and prepared an email memo (see attached). Similarly, a review by staff of the Proposed Trail Exhibit Secondary Option brought to light some questions, the answers to which would help everyone better understand whether the trail meets standards and would achieve its intended purpose.

What follows is a list of items I am requesting from the development team. Once those items have been submitted and reviewed for completeness by staff, we should be ready to meet again and carry on the process. Thanks to all for your patience.

-

Pedestrian access:

A fully detailed version of the concept drawing known as Proposed Trail Exhibit Secondary Option, vetted by city staff to ensure the proposed trails can meet applicable standards and regulations. Once complete, and provided it meets city standards, the plan will need to be distributed for committee and public review in advance of any subsequent meeting.

This revised concept drawing needs to include:

1. A description of the width and construction materials for the proposed pathway and stairs between units 58 & 59 and between units 8 & 9.
2. Slope calculations and widths for all segments of the proposed trails.
3. Grading plans describing side slopes for areas adjacent to the trails, including side slopes along the east boundary of the parcel.

Storm Water:

A storm water plan, complete with details regarding site-wide grading and drainage as articulated in Option A and revised conditions 2 and 3 in Memo #4 as approved by the LUP.

Please update the storm water plan to address:

1. Storm water discharge calculations associated with the 35-foot wide roads.
2. Location of retention facilities relative to the slopes.
3. Calculations and discussion of how the offsite storm water flow will be handled along the

west side of the development adjacent to the gravel path.

4. The design detailing pipe sizes and slopes.
5. Long-term maintenance requirements for the storm water facilities including maintenance of and access to the detention tank.

The plan needs to be reviewed and approved by a geotechnical engineer and the City Engineer.

Geotechnical:

A new geotechnical report stamped by a certified geotechnical engineer and effective for a 5-year period that addresses revised conditions 11 and 13 in Memo #3, and all items in Option A and proposed conditions 25 and 26 in Memo #4, as approved by the LUP.

The new geotechnical report needs to include an analysis of:

1. The current site plan including the 35-foot road width and retaining wall.
2. Slope stability at the site proposed for the storm water detention tank, as the location would be affected by development of the 35-foot wide roads.

Given there hasn't been resolution to the issues of pedestrian access and block length, the geotechnical report should address both condition 9 of the staff report and the fully-vetted version of the drawing entitled Proposed Trail Exhibit Secondary Option (as noted in the *Pedestrian Access* section) provided the proposal meets all appropriate city standards and regulations.

As mentioned above, LUP will reconvene when staff has reviewed the above items and determined that what has been submitted by the development team is complete and ready for further review by the committee.

Also, Mr. Rice stated during the April 3, 2019 LUP meeting that the development team can't talk with staff. That is not true. The development team can talk with staff to share with them requested information and seek clarity on a topic. What the development team cannot do is advocate a position or solicit support for what is being submitted. Advocacy has to happen in public.

Thanks, again, to all.

John

^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

John DiBari
City Council Ward 4

Jdibari@ci.missoula.mt.us

From: Jason Rice
To: Mary McCrea
Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick
Subject: RE: Hillview Crossing TED Conditional Use
Date: Tuesday, March 19, 2019 9:44:52 AM

Mary – I see one item in the Findings of Fact in Memo 5 that is not complete in my opinion. I believe it was not complete in the original staff report prepared by Anita. I think it is important to have the complete language as the part you have chosen to show does not convey the original intent of the regulation which allowed flexibility in design when topographic constraints exist.

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Thanks

Jason Rice, *P.E., CEO*

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JasonR@TerritorialLandworks.com

website newsletter facebook linkedin

From: Mary McCrea <McCreaM@ci.missoula.mt.us>
Sent: Monday, March 18, 2019 5:26 PM
To: Jason Rice <jasonr@territoriallandworks.com>
Cc: Paul Forsting <paulf@territoriallandworks.com>
Subject: Hillview Crossing TED Conditional Use

Attached is Memo No.5 – Block Length and Pedestrian Paths for the Hillview Crossing TED Conditional Use and comment from Elizabeth Erickson regarding trails and block length. Both of

these documents will be uploaded to the SIRE record for this item at LUP this Wednesday, March 20, 2019.
Best regards,

Mary McCrea

Mary McCrea
Planning Supervisor
Development Services
Permits and Land Use Section
435 Ryman
Missoula, MT 59802
406-552-6627

From:	Alan F. McCormick
To:	Grp. City Council and City Web Site
Cc:	Mary McCrea; Attorney Admin; Alicia Vanderheiden
Subject:	RE: Letter to Council on Hillview Crossing Townhouse Project
Date:	Thursday, April 4, 2019 11:36:54 AM
Attachments:	EXH-STAIRS.2019-04-03.pdf EXH-14-3592.Road Widen Cross Section.20 scale.pdf Hillview Crossing - Geotechnical Report Review MEMO.pdf 2019-04-02.EXH-14-3592-DRAINAGE-STORM TANK.pdf Stormwater Report List.pdf

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Council,

As a follow up to our letter yesterday, I am attaching the materials which Jason Rice handed out yesterday and which are referenced in the letter. These documents are:

1. An Exhibit showing the location of the development team's alternative proposal for trail and stair locations which the Committee acted upon yesterday;
2. An exhibit showing the effect on the location of dwelling units and mass grading from changing the road to 35';
3. A memorandum from Tetra Tech providing a third-party review of the existing geotechnical report in light of the current project layout;
4. An exhibit showing the approximate location and preliminary design for the stormwater collection tank; and
5. Powerpoint slides from Territorial Landworks explaining the status of stormwater information.

As Jason also mentioned during yesterday's meeting, when our team members have attempted to discuss various issues with Staff, they have been told they are not allowed to have discussions about the project during the Council's review. This is a very odd policy shift that is counterproductive to the review process. Providing the information requested by Council requires our team to work with Staff, particularly the engineering department. We hope you will revisit this policy decision.

Finally, we understand the Council has other matters to address, but our team remains ready to participate in weekly meetings (or more frequently) to complete the current review and forward the project to the Council as a whole for a final decision. We hope the information provided in the attachments will allow the necessary meetings to be scheduled quickly without waiting until May to complete the discussion.

Alan.

From: Alan F. McCormick
Sent: Wednesday, April 3, 2019 12:32 PM
To: 'council@ci.missoula.mt.us' <council@ci.missoula.mt.us>
Cc: Mary McCrea <McCreaM@ci.missoula.mt.us>; 'attorney@ci.missoula.mt.us' <attorney@ci.missoula.mt.us>
Subject: Letter to Council on Hillview Crossing Townhouse Project

Council,

Please see the attached letter on the Hillview Crossing Townhouse Project.

Alan.

ALAN F. MCCORMICK
Direct Line: (406) 523-2518

garlington|lohn|robinson
A Professional Limited Liability Partnership
Attorneys at Law Since 1870

PO Box 7909 (350 Ryman Street)
Missoula, MT 59807-7909
Phone: (406) 523-2500, Fax: (406) 523-2595
http://www.garlington.com

GARLINGTON | LOHN | ROBINSON
MONTANA'S ATTORNEYS SINCE 1870

July 29, 2019

VIA EMAIL ONLY
Mayor Engen, City of Missoula
Bryan von Lossberg, Council President
Missoula City Council
435 Ryman
Missoula, MT 59802
council@ci.missoula.mt.us

RE: Hillview Crossing Townhome Development

Dear Mayor Engen, Mr. von Lossberg, and Council Members:

We write today to demand the City Council place the Hillview Crossing TED Conditional Use Request on the next Land Use and Planning Committee Agenda and take action on the application as required by the City's zoning regulations, Title 20.

Section 20.85.070 of the City's ordinance defines the review procedure for Conditional Uses. Subsection D requires the landowner to file an application that includes all materials required by the zoning officer. Subsection E requires the City to provide public notice of the required public hearing. Subsection F requires the zoning officer to prepare a report and recommendation that evaluates the proposed conditional use.

Subsection G requires the Council to hold a public hearing and take action as follows:

G. Hearing and Final Action—City Council

1. The City Council must hold at least one public hearing on a proposed conditional use.

2. Following the close of the hearing, at the same or subsequent meeting, the City Council must take action to approve, approve with modifications or conditions or deny the conditional use based on the review criteria of 20.85.070.H. The City Council's decision must be supported by written findings of fact.

3. The City Council may act by a simple majority vote of those City Council members present and voting.

2806067

At present, the Council refuses to follow its ordinance, resulting in damages to our client. The demand for our client to provide additional information as a prerequisite to getting back on the LUP agenda is an ad hoc, arbitrary and capricious action that has no legal basis under the Council's adopted zoning regulations. The Council's recent actions to adopt emergency zoning related to TEDs makes this abundantly clear.

As we explained in our previous correspondence, the list of demands was not created by the Council, or even by a vote of the LUP Committee. It appears to have been created by Councilman DiBari in coordination with staff. We understand the LUP Committee did vote to require additional geotechnical information prior to taking final action, but the demand presented by Councilman DiBari is impossible to achieve. It incredulously requires the applicant to evaluate geotechnical impacts from decisions the Council has not yet made. Further, no development project in Missoula has been required to provide final site designs prior to obtaining any subdivision or townhouse conditional use permit.

Effectively, the Council has denied the application by presenting arbitrarily derived barriers to a full and complete consideration of the application.

In accordance with Section 20.85.070, Development Services staff received the application and determined it contained all required information for review. As required by Section 20.85.070, staff prepared a report and recommendation which evaluated the required criteria. Staff recommended approval of the conditional use permit request with conditions. As required by Section 20.85.070, the City provided public notice of the hearings. Now, after an astounding ten meetings in the LUP Committee, the Council has not and cannot comply with the final requirements of Section 20.85.070 because it refuses to place the application on its agenda and complete the process.

As confirmed by Development Services staff, our client has submitted more than sufficient information to allow for a full review of the application and corresponding conditional use criteria. Our client has submitted substantial information related to geotechnical and stormwater issues that demonstrate the property is suitable for development in both regards. Our client has agreed to conduct final geotechnical review and stormwater designs as a condition to obtaining zoning compliance permits. Some of this work cannot be completed until after mass grading is done.

Staff has provided the Council with proposed conditions of approval requiring the final geotechnical and stormwater designs to be completed before issuing a zoning compliance permit. Such conditions are acceptable to our client, are reasonable, and are consistent with the manner in which the Council has treated all other development projects.

For the reasons stated above, we demand the Council place the Hillview Crossing TED Conditional Use Request on the next LUP Committee meeting and promptly complete the review process and take final action on the request. Please let us know at your earliest convenience if the Council is unwilling to do so, as our only remaining option is to file litigation to compel the Council's compliance with its Title 20 requirements.

Sincerely,

GARLINGTON, LOHN & ROBINSON, PLLP

Alan F. McCormick
Direct Line: (406) 523-2518
Email: afmccormick@garlington.com

AFM:jdl

2806067

From:	John DiBari
To:	"Jason Rice"; Mary McCrea
Cc:	Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick; Jim Nugent
Subject:	RE: Hillview Crossing TED Conditional Use
Date:	Tuesday, March 19, 2019 9:53:25 AM

Hi Jason,

We covered this point during last week's meeting.

I appreciate your interest in responding through email, but these conversations need to happen in public at our committee meetings.

I expect we will have the opportunity to discuss both block length and pedestrian access Wednesday.

Thanks,

John

From: Jason Rice [mailto:jasonr@territoriallandworks.com]
Sent: Tuesday, March 19, 2019 9:29 AM
To: Mary McCrea
Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick
Subject: RE: Hillview Crossing TED Conditional Use

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Jason Rice, *P.E., CEO*

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To: Jason Rice <jasonr@territoriallandworks.com>
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Best regards,

Mary McCrea

Mary McCrea
Planning Supervisor
Development Services
Permits and Land Use Section
435 Ryman
Missoula, MT 59802
406-552-6627

From: John DiBari
To: Jason Rice; Mary McCrea
Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick; Jim Nugent
Subject: RE: Hillview Crossing TED Conditional Use
Date: Monday, March 25, 2019 7:44:08 PM

Hi again, Jason.

Please consult Memo 4 items A, Geotech and A, Stormwater for the information and associated conditions that are related to both topics. The Geotech will need to contemplate previous action regarding road width as well as whatever subsequent action is taken concerning the block length and/or pedestrian access issue (the items may or may not be married). Both the Geotech and Stormwater plan will need to also contemplate whatever other infrastructure the developer is planning (e.g., retaining walls), mass grading, etc. When we are done moving through the items in the first staff memo, which shouldn't take much time, we will have a meeting summarizing what action council took.

We are trying to determine if there is time on April 3rd to take up where we left off. We should know by the end of the week. There are multiple lengthy committee items planned that day, including a joint city council – county commissioner meeting. Due to a number of scheduling issues the next meeting opportunity may be April 17th, May 1st or May 8th.

I hope this helps.

John

From: Jason Rice [mailto:jasonr@territoriallandworks.com]
Sent: Friday, March 22, 2019 2:43 PM
To: John DiBari; Mary McCrea
Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick; Jim Nugent
Subject: RE: Hillview Crossing TED Conditional Use

John – are there any preliminary ideas of when we would have our next LUP?

Also, what else do we need to cover while we get updates on the stormwater and Geotech info? I have lost track of what needs to be addressed.

Jason Rice, *P.E., CEO*

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From: John DiBari <JDibari@ci.missoula.mt.us>
Sent: Tuesday, March 19, 2019 9:53 AM
To: Jason Rice <jasonr@territoriallandworks.com>; Mary McCrea <McCreaM@ci.missoula.mt.us>
Cc: Paul Forsting <paulf@territoriallandworks.com>; Grp. City Council and City Web Site <Council@ci.missoula.mt.us>; Mary McCrea <McCreaM@ci.missoula.mt.us>; Mike Haynes <HaynesM@ci.missoula.mt.us>; Alan F. McCormick <afmccormick@GARLINGTON.COM>; Jim Nugent <NugentJ@ci.missoula.mt.us>
Subject: RE: Hillview Crossing TED Conditional Use

Hi Jason,

We covered this point during last week's meeting.

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I expect we will have the opportunity to discuss both block length and pedestrian access Wednesday.

Thanks,

John

From: Jason Rice [mailto:jasonr@territoriallandworks.com]
Sent: Tuesday, March 19, 2019 9:29 AM
To: Mary McCrea
Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick
Subject: RE: Hillview Crossing TED Conditional Use

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Development Services
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Cc: Paul Forsting; Grp. City Council and City Web Site; Mary McCrea; Mike Haynes; Alan F. McCormick; Jim Nugent
Subject: RE: Hillview Crossing TED Conditional Use
Date: Sunday, April 7, 2019 6:19:08 PM

Hi Jason,
I wanted to let you know that staff is reviewing the items you left at the meeting Wednesday. Once they have reviewed them, I'll be back in touch with next steps.
Thanks,
John

From: Jason Rice [mailto:jasonr@territoriallandworks.com]
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From:	John DiBari
To:	Jason Rice; Paul Forsting; Alan F. McCormick
Cc:	Grp. City Council and City Web Site; Mike Haynes; Mary McCrea; Troy Monroe
Subject:	Hillview Crossing update
Date:	Wednesday, April 17, 2019 7:38:40 PM

Good evening, Jason.
I wanted to drop you a note to provide a status report regarding Hillview Crossing.
Mary and Troy are in the process of reviewing the documents you left with councilors and staff at the last LUP committee meeting. Once that task is complete I will be back in touch with "next-steps" regarding how to keep the process moving forward.
Thanks for your patience. I anticipate a more detailed follow up email by the end of next week.
Take care,
John
~~~~~~~~~~~~~~~~~~~~~~~~~~

John DiBari, PhD
City Council, Ward 4
406.274.7337
jdibari@ci.missoula.mt.us
Please note, emails to and from this address are in the public domain.
~~~~~~~~~~~~~~~~~~~~~~~~~~

From:	John DiBari
To:	"Jason Rice"; Paul Forsting; Alan F. McCormick; Grp. City Council and City Web Site
Cc:	Mike Haynes; Mary McCrea; Troy Monroe
Subject:	Hillview Crossing TED
Date:	Tuesday, May 7, 2019 5:26:24 PM
Attachments:	TMonroe_memo_20190501.docx

Good afternoon,

All parties -- staff, the public, council and the development team -- have been diligently working to move the proposed Hillview Crossing TED conditional use permit application forward to resolution. I appreciate that effort.

As discussions have progressed, LUP has voted on several items in the effort to provide direction to the development team. The LUP's actions are as follows:

- March 13, 2019, LUP voted for revised conditions 11 and 13 in Memo #3.
- March 20, 2019, LUP voted for Option A (Geotech Report updated before Council decision) and proposed conditions 25 and 26 in Memo #4, and Option A (Storm Water plan updated before Council decision) and revised conditions 2 and 3 in Memo #4.
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Given there hasn't been resolution to the issues of pedestrian access and block length, the geotechnical report should address both condition 9 of the staff report and the fully-vetted version of the drawing entitled Proposed Trail Exhibit Secondary Option (as noted in the *Pedestrian Access* section) provided the proposal meets all appropriate city standards and regulations.

As mentioned above, LUP will reconvene when staff has reviewed the above items and determined that what has been submitted by the development team is complete and ready for further review by the committee.

Also, Mr. Rice stated during the April 3, 2019 LUP meeting that the development team can't talk with staff. That is not true. The development team can talk with staff to share with them requested information and seek clarity on a topic. What the development team cannot do is advocate a position or solicit support for what is being submitted. Advocacy has to happen in public.

Thanks, again, to all.

John

^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

John DiBari
City Council Ward 4

Jdibari@ci.missoula.mt.us

Staff Review Supplemental Geotechnical and Storm Water Updates

City Engineering reviewed additional information submitted in early April, 2019 in regards to the proposed Hillview Way Townhome Exemption Development (TED), specifically additions to the Geotechnical Report and the Storm Water Report. The following are City Engineering review comments as related to the Hillview Crossing TED Conditional Use Memo No.4.

2015 Geotech Report

A. The updated Geotechnical Report for the mass grading and a Grading and Drainage Plan shall be provided for City Engineering review prior to City Council decision on the Hillview Crossing TED conditional use.

The updated Geotechnical Report shall include mass site grading for roads, pedestrian walkways, and infrastructure such as utilities, sewer, water and storm water facilities, retaining wall locations, locations for storm water detention/retention, locations for construction staging of topsoil, erosion control measures during construction, and including any excavation or embankment locations.

The City received and reviewed the "Hillview Crossing –Geotechnical Report Review MEMO", a five(5) page memo from Tetra Tech dated April 1, 2019 and stamped by Jeremy Dierking, Professional Engineer (geo tech memo). The geo tech memo does not update the Geotechnical Report as requested in Hillview Crossing TED Conditional Use Memo No.4 (memo). The geo tech memo does not analyze a current site plan, does not analyze the required 35-foot road width, does not analyze the planned retaining wall, nor does it analyze slope stability at the location of the proposed storm water detention tank. The geo tech memo does give a third-party professional opinion that the proposed retaining wall and storm water detention tank locations are feasible. Additionally, the geo tech memo gives their opinion that the original "report satisfactorily addresses the key geotechnical issues identified for the project scope *at the time of report preparation*." (emphasis added). In regards to the storm water detention tank the geo tech memo states that the net difference in weight of the storm water detention tank is low enough that the slope stability safety factor will not decrease below acceptable values. It should be noted that this statement is in reference to the provided location of the proposed detention tank downslope of the toe-of-fill for the development. As shown in the provided exhibit (EXH-14-3592.Road Widen Cross Section.20 scale) widening the road widths to the required 35-foot widths will push the toe-of-fill approximately 20 feet downslope which would then include a portion of the proposed storm water detention tank. It is unclear if Tetra Tech's comments would pertain to a situation where the tank is located partially in fill.

25. The townhome exemption declaration for the Hillview Crossing TED shall be submitted in one zoning compliance permit application and shall include all sixty-eight (68) TED unit ownership parcels, all infrastructure, and meeting conditions of approval for the conditional use, subject to review and approval of Development Services, prior to approval of the zoning compliance permit of the townhome exemption declaration. All infrastructure shall be constructed within five years of approval of the Geotechnical report and an improvements agreement guaranteed by a security that covers the cost of all the roads, sidewalks, pedestrian pathways, storm water facilities, retaining walls and site grading is approved by City Engineering prior to zoning compliance permit approval of the townhome exemption declaration.

The geo tech memo is not an updated Geotechnical Report but is a third-party opinion of the original 2015 Geotechnical Report. The geo tech memo does give a statement that if Tetra Tech provided an updated geotechnical report for the Hillview Crossing TED it would not have an expiration date and would be good as long as the subsurface conditions and project details are not substantially different then the conditions and details in 2015.

26. A Geotechnical Report is required for each two unit townhouse structure submitted with the building permit application, subject to review and approval by City Engineering, prior to building permit approval.

No additional information is needed for Condition No. 26 at this time.

Storm Water Plan

A. The Final Storm Water Plan with locations of all Storm Water detention/retention basins or facilities shall be provided for City Engineering review prior to City Council decision on the Hillview Crossing conditional use.

The applicant shall revise the Storm Water Plan to address both Section 5.2B and Section 5.2C related to storm water calculations as specified in the email message from the Assistant City Engineer dated October 9, 2018. The final storm water plan shall specify long-term maintenance requirements for the storm water facilities.

The Geotechnical Engineer shall review and approve all locations of storm water detention/retention basins and facilities for conformance with the recommendations in the updated Geotechnical Report.

A preliminary storm water plan was updated. The update included calculations for the storage tank orifice and prorated site discharge amount. The update did not include storm water discharge calculations of road widths of 35-ft. Additionally, the update did not include calculation or discussion of how the offsite flow will be passed along the west side of the development where the "gravel path" is planned.

The updated plan includes calculations showing that the development can contain the required 17,393 cubic feet of increased storm water and discharge it at the required pre-development rate of 2.57 cfs (5.2B). The updated plan shows calculations for storm water conveyance pipe flowing at 75% and 100% full. Not included is the actual design which would show pipe sizes and slopes. This information is typically reviewed with final plans. No information was provided to specify long-term maintenance requirements for the storm water facilities. Specifically, the plan did not show how maintenance of the detention tank could occur. Without a stable road constructed to the tank, maintenance such as sediment removal, would need to occur by hand (this is true for both the homeowners association and for the City if the City ever needed to take over maintenance duties).

A third-party geotechnical engineer reviewed the 2015 slope stability analysis and the 2019 proposed location for the detention basin (tank) and concluded that the location was "feasible" and that the net difference in weight of the storm water detention tank is low enough that the slope stability safety factor will not decrease below acceptable values. The third-party geotechnical engineer did not "approve", and their memo is "intended solely to provide a general review and comment…and is not intended to supplement the geotechnical report in any respect."

Condition of approval #2 and #3 shall be revised as follows:

2. ~~The applicant shall revise the Storm Water Plan to address both Section 5.2B and Section 5.2C related to storm water calculations as specified in the email message from the City Assistant City Engineer dated October 9, 2018, prior to zoning compliance approval of the townhome exemption declaration. The~~ Construction plans for the final Storm Water Plan ~~for construction~~ shall be reviewed and approved by City Engineering and the Geotechnical Engineer prior to zoning compliance approval of the townhome exemption declaration. Storm water facilities shall be installed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to review and approval of the City Engineer.

No construction plans have been sent to City Engineering nor have any comments from a Geotechnical Engineer stated that they have received/reviewed current plans.

3. ~~The final storm water plan shall specify long-term maintenance requirements for the storm water facilities.~~ The applicant shall specify in the Development Covenants the long-term maintenance requirements for the storm water facilities and that the maintenance of the storm water facilities shall be the responsibility of the Developer, transferring to the Homeowners' Association once formed and shall include all maintenance and replacement costs as outlined in the final storm water plan, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.

No additional information is needed for Condition No. 3 at this time. However, the site plan does not show a road providing access to the storm water detention tank, therefore maintenance such as sediment removal would need to occur by hand.

Submitted by:
Troy Monroe PE
Assistant City Engineer
May 1, 2019

From:	John DiBari
To:	Alan F. McCormick; Grp. City Council and City Web Site
Cc:	Attorney Admin; jasonr@territoriallandworks.com; Paul Forsting; Mike Haynes; Mary McCrea
Subject:	RE: Letter on Hillview Crossing TED Conditional Use Request
Date:	Wednesday, June 5, 2019 9:21:15 AM
Attachments:	image001.png image003.png

Alan,

I know and appreciate that you are working hard to represent your client's interests. I also know and appreciate that you and your client may disagree with some of the actions the LUP committee has taken. Both you and your client are entitled to your opinions in that regard. However, please know that sentiment is not shared by all the parties involved in this process. It is the committee's job to address all substantive agency and public comment under the auspices of the rules that govern TEDs and conditional uses. As I have mentioned on more than one occasion during committee meetings, the committee is working hard to do its job to get to "yes" regarding this project. It would be most helpful for all involved to keep the process on track so that the committee can move towards that end should the information support that outcome. That, after all, is all we are trying to do – gather information that can support an outcome that provides the landowner a reasonable opportunity to develop his land in a way that protects public health and safety.

The points articulated in my previous email were designed to provide a roadmap to the development team so that the project can stay on course. The email I wrote in consultation with staff was intended to be helpful, clear, provide specificity and suggest options that would hopefully reduce/eliminate duplicative actions on the part of the committee or development team. Please accept that in the spirit in which it was intended.

The discussions and actions that have taken place in committee are all part of the public record. The committee has been methodical in its approach. Staff has prepared several memos documenting issues, staff's review of those issues, and the committee's corresponding actions. That you or your client may disagree with committee actions or what it has asked for does not change the fact it has taken those actions to protect public health and safety and asked for specific information it has deemed useful to evaluating the project.

I also appreciate you believe information submitted by Mr. Rice adequately covered some of the issues addressed in committee and my email. However, staff disagrees. Because the committee relies on staff's advice to guide its actions and protect the public interest, health and safety, it appears the development team has some work to do to satisfy the committee's interest in that regard, and in your client's interest to keep the process moving.

The ball, as it were, is in your client's court. As soon as the information the committee requested has been submitted and reviewed for sufficiency by staff – information that will be helpful to your client, the committee and the public – we'll schedule another LUP meeting. Please let me know when that information may be forthcoming so we can plan accordingly.

And finally, regarding on-going communications, the development team is welcome to interact with

staff regarding issues of process and substance, it is, however, not welcome to advocate for or cajole staff into agreeing with the development team's position. Advocacy needs to happen during a public meeting.

Thanks again for your letter and I look forward to hearing from you regarding when information may be forthcoming.

Best,

John

~~~~~~~~~~~~~~~~~~~~~~~~

John DiBari
City Council, Ward 4
406.274.7337

Please note, all emails to and from this address are in the public domain.

From: Alan F. McCormick <afmccormick@GARLINGTON.COM>
Sent: Thursday, May 23, 2019 11:22 AM
To: Grp. City Council and City Web Site <Council@ci.missoula.mt.us>
Cc: Attorney Admin <ADepartment@ci.missoula.mt.us>
Subject: Letter on Hillview Crossing TED Conditional Use Request

Council,

Please see the attached letter regarding the Hillview Crossing Ted Conditional Use request.

Alan.

Alan F. McCormick // Partner

Garlington, Lohn & Robinson, PLLP
Montana's attorneys since 1870
P: 406-523-2518 (direct line) F: 406-523-2595
E: afmccormick@garlington.com
A: P.O. Box 7909 Missoula, MT 59807
~~~~~~~~~~~~~~~~~~~~~~~~

From:	John DiBari
To:	Alan F. McCormick; Grp. City Council and City Web Site; John Engen
Cc:	Jim Nugent; Mary McCrea; Jeremy Keene
Subject:	RE: Letter on Hillview Crossing
Date:	Monday, July 29, 2019 12:10:57 PM
Attachments:	image001.png image003.png

Thanks for the note, Alan.

As I have communicated in the past, the LUP committee and staff have worked to provide the development team with a clear path forward for the proposed TED. That has come in multiple forms -- committee discussion and action, memos from staff, and emails from me. It remains unclear to me, and I believe staff as well, what the impediment is to further action on the part of the development team.

Staff is working to summarize council deliberations/actions and corresponding findings of fact/agency and public comment. Once that is complete, I intend to reach out to you and the development team to gain clarity on what the impediment(s) may be that has (have) led the development team to not provide the committee with information it requested so that this process could move along.

In simple terms, the committee has been waiting for the development team to provide it with the information it requested. And it seems the development team has not provided that information because that information is "impossible to achieve." Hence the conundrum.

My sincere hope is to sort out what the issue(s) may be so that we may all have a better understanding of how to move forward.

Thanks again,

John

From: Alan F. McCormick <afmccormick@GARLINGTON.COM>
Sent: Monday, July 29, 2019 10:47 AM
To: Grp. City Council and City Web Site <Council@ci.missoula.mt.us>; John Engen <EngenJ@ci.missoula.mt.us>
Cc: Jim Nugent <NugentJ@ci.missoula.mt.us>
Subject: Letter on Hillview Crossing

Mayor Engen and Council,

Please see the attached letter on the Hillview Crossing TED project.

Alan.

Alan F. McCormick // Partner

Garlington, Lohn & Robinson, PLLP
Montana's attorneys since 1870
P: 406-523-2518 (direct line) F: 406-523-2595
E: afmccormick@garlington.com
A: P.O. Box 7909 Missoula, MT 59807

A Professional Limited Liability Partnership

From:	John Engen
To:	All Council
Cc:	Mary McCrea; Jeremy Keene; Jim Nugent; Alan F. McCormick; Marty Rehbein; Dale Bickell; Eran Pehan
Subject:	Hillview Crossing Townhome Exemption Development conditional use
Date:	Friday, August 9, 2019 11:12:50 AM
Attachments:	Conditions of Approval.Draft Amendments Plus LWW & Fences & Amended COA 9.080919.pdf ATT00001.htm

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Council members, the Hillview Crossing Townhome Exemption Development conditional-use application was first heard in the Land Use and Planning Committee in December 2018 and is returning to committee on August 14 after a long hiatus for the committee's consideration.

The committee and the applicant appear in disagreement over three issues decided in split votes by the committee: First, the necessity of a geotechnical report in advance of council approval; second, a stormwater report in advance of council approval; third, the width of the road serving the housing project.

While I understand committee members' concern over ground and stormwater conditions, the applicant has made it clear in correspondence that demanding those reports in advance of a conditional approval and an agreed-upon design is untenable. Toward that end, I've asked staff to provide alternative conditions that meet what appears to be the committee's intent with regard to protecting public safety, health and welfare. These alternative conditions, which I hope the committee will consider, provide the City with the necessary information for a review of zoning compliance and building permits in an order that makes practical sense for the applicant and staff.

In addition, the applicant has asked through correspondence that the committee reconsider the change it made to widen the street and will likely make that request in the LUP meeting. Widening the street is clearly council's prerogative, but I'd suggest that the original design of the road met engineering standards and that if there are concerns regarding stormwater management and cost of maintenance of the private road, a wider section seems at odds with those concerns. And while public-safety staff, when asked, will always advocate for wider streets, agencies signed off on the 28-foot street width very early in the process.'

Attached are revised conditions prepared by staff for your consideration. These conditions are largely what the committee has approved, with alternate language regarding geotech and stormwater, along with a new "Living with Wildlife" condition that the applicant has not opposed.

The applicant is in agreement with the new conditions, but will argue for a narrower street design.

My hope is that you'll consider these conditions, adopt them and allow the full council to make a decision on the request in a timely manner.

--
John Engen
Mayor
City of Missoula
435 Ryman Street
Missoula, Montana 59801
jengen@ci.missoula.mt.us
Office: 406-552-6001

MISSOULA
DEVELOPMENT SERVICES
435 RYMAN • MISSOULA, MT 59802 - 4297 • (406) 552-6630 • FAX: (406) 552-6053

Hillview Crossing TED Conditional Use – Amended Conditions of Approval
(including Living with Wildlife and Fences conditions)
August 5, 2019

CONDITIONS OF APPROVAL:

1. The Hillview Crossing townhome exemption development conditional use shall comply with all applicable portions of Title 20. Plans submitted at the time of zoning compliance approval of the townhome exemption declaration and of building permit application shall substantially conform to the plans submitted at the time of conditional use review, subject to the review and approval of Development Services.

2. The applicant shall revise the ~~Stormwater~~ Storm Water Plan to address both Section 5.2B and Section 5.2C related to ~~stormwater~~ storm water calculations as specified in the email message from the ~~City~~ Assistant City Engineer dated October 9, 2018, prior to zoning compliance approval of the townhome exemption declaration. The Geotechnical Engineer shall review and approve all locations of storm water detention/retention basins and facilities for conformance with the recommendations in the updated Geotechnical Report. The final ~~stormwater plan~~ Storm Water Plan for construction shall be reviewed and approved by City Engineering and the Geotechnical Engineer prior to zoning compliance approval of the townhome exemption declaration. ~~Stormwater~~ Storm water facilities shall be installed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to review and approval of the City Engineer.

3. The final ~~stormwater~~ storm water plan shall specify long-term maintenance requirements for the ~~stormwater~~ storm water facilities. The applicant shall specify in the Development Covenants that the maintenance of the ~~stormwater~~ storm water facilities shall be the responsibility of the Developer, transferring to the Homeowners' Association once formed and shall include all maintenance and replacement costs as outlined in the final ~~stormwater~~ storm water plan, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.

4. The applicant shall prepare plans for and install a pedestrian crossing at the intersection of Hillview Way and the southern segment of Road "A" to include crosswalk markings, crossing beacon and ADA accessible ramps. Plans shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

5. The applicant shall provide a minimum 20-foot wide non-motorized trail easement and construct the trail within the easement through the subject property to connect the existing Tonkin Trail south of the TED to Wapikya Park. Plans shall be reviewed and approved by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration and improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer and City Parks and Recreation. The developer shall work with the City's Conservation Land Manager to determine the exact width and location for the trail and shall construct the trail during construction of development to maximize cost-efficiency and reduce disturbance.

6. The applicant shall provide a 20-foot wide public access easement in the location of the east-west trail as shown on the site development plan, subject to review and approval by City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome

exemption declaration. The developer shall employ effective means to protect the trail easement areas from construction disturbance such as a temporary fence throughout construction.

7. The applicant shall provide a minimum 20-foot wide non-motorized trail easement and construct the portion of the relocated Tonkin Trail where it connects with Hillview Way as shown on the site development plan. Plans shall be reviewed and approved by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration and improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer and City Parks and Recreation.

8. The applicant shall prepare a plan for protection of trail easement areas during construction, subject to review and approval of City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration. The developer shall employ effective means to protect the trail easement areas from construction disturbance such as a temporary fence throughout construction.

9. The applicant shall dedicate a trail easement and prepare plans for and install a trail meeting recreational trail standards of City Parks and recreation along the eastern edge of the property per the handout from the applicant received at the April 3, 2019 Land Use and Planning Committee meeting, subject to review and approval by City Parks and Recreation prior to zoning compliance approval of the townhome exemption declaration. The trail at the eastern edge of the property shall be maintained by the developer and/or the Homeowner's Association. If the trail plans for the trail at the eastern edge of the property do not meet City Parks and Recreation recreational trail standards of slopes of 10% - 15% with limited areas not exceeding 20% slope, the applicant shall dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road “A” through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road “B” then continuing between unit ownership parcel number 18 and 19, crossing the common area and extending between unit ownership parcels 38 and 39, crossing the northern segment of Road “A” then continuing between unit ownership parcel number 56 and 57. An easement for future trail improvements shall be dedicated from northern parcel boundaries of unit ownership parcel numbers 56 & 57 northward through the common area and connecting to the east-west trail easement near the northern property line of the TED. Plans for the pedestrian pathway/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

10. The applicant shall specify in the Development Covenants that the maintenance of the paved pedestrian pathway/stairs shall be the responsibility of the developer, transferring to the Homeowners’ Association once formed and shall include maintenance and replacement, drainage facilities and snow removal, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.

11. The applicant shall prepare plans and install road improvements for the northern segment of Road “A” and Road “B” resulting in a 28-foot wide back-of-curb to back-of-curb road section within a 52-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and 5-foot wide curbside sidewalk on each side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

12. The applicant shall prepare plans and install road improvements for the southern segment of Road “A” resulting in a 21-foot wide back-of-curb to back-of-curb road section within a 40-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and a 5-foot wide curbside sidewalk on one side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration.

Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

13. The Development Covenants shall include a statement that parking is prohibited on one side of the northern segment of Road “A” and Road “B” and both sides of the southern segment of Road “A” subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration. The road improvement plans for Road “A” and Road “B” shall include provisions for restricting parking on one side of the northern segment of Road “A” and Road “B” and on both sides of the southern segment of Road “A” in the form of painting the curb yellow and installation of No parking signage, subject to review and approval of the City Engineer, prior to zoning compliance approval of the townhome exemption declaration.

14. The following statement shall appear in the Development Covenants, subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration: “The purchaser and/or owner of the lot or unit understands and agrees that private road construction, maintenance, drainage facilities and snow removal for Road “A” and Road “B” are the obligation of the owner or property owners’ association and that the City of Missoula is in no way obligated to perform such maintenance or upkeep until the roads are brought up to standards and accepted by the City of Missoula for maintenance.”

15. The applicant shall provide a boulevard landscaping and maintenance plan attached to the Development Covenants for the boulevards within the public access easement for the northern and southern segment of Road “A” and Road “B” including tree palette, general planting plan and irrigation, subject to review and approval by City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration. The boulevard landscaping shall be included in an Improvements Agreement guaranteed by a security, subject to review and approval by City Parks and Recreation.

16. The applicant shall petition into the Missoula Urban Transportation District prior to zoning compliance approval of the townhome exemption declaration.

17. The applicant shall provide a hydrant plan to include existing or proposed hydrant locations meeting fire code standards, subject to review and approval by City Fire, prior to zoning compliance approval of the townhome exemption declaration. For new hydrants required to serve the TED, hydrant installation shall occur prior to combustible construction.

18. The applicant shall provide a Missoula County Weed District approved Revegetation Plan for disturbed areas of the site prior to zoning compliance approval of the townhome declaration, subject to review and approval by Development Services.

19. The applicant shall provide a Missoula County Weed District approved Weed Management Plan for common areas and undeveloped portions of the site prior to zoning compliance approval of the townhome declaration, subject to review and approval by Development Services. The Weed Management Plan shall specify that the developer is responsible for weed management for all undeveloped land including the common area. Once the Homeowners’ Association is established, weed management of the common areas and boulevard areas within the public access easement of the private roads transfers from the developer to the Homeowners’ Association. Control of weed management on developed unit ownership parcels shall transfer from the developer to each unit owner at the time of sale.

20. The Weed Management Plan approved by the Missoula County Weed District shall be attached as an Appendix to the Development Covenants prior to zoning compliance approval of the townhome exemption declaration, subject to review and approval by Development Services.

21. The applicant shall include a common area landscaping and maintenance plan for all common areas, including irrigation, street trees along the portions of Road “A” and Road “B” adjacent to common areas and parks and lawn for park areas shown with hatching on the Site Development Plan, subject to review and approval by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements

Agreement guaranteed by a security, subject to review and approval of City Parks and Recreation and Development Services.

22. The following statements shall appear in the Development Covenants, subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration:

    a. "Radon Mitigation: The EPA has designated the Missoula area as having a high radon gas potential (Zone 1). Therefore, the Missoula City-County Health Department recommends that all new buildings incorporate radon resistant construction features."

    b. "Wood Stoves: The Missoula City-County Air Pollution Control Program regulations prohibit the installation of wood burning stoves or fireplaces inside the Air Stagnation Zone. This development is inside the Air Stagnation Zone. Pellet stoves that meet emission requirements or natural gas or propane fireplaces may be installed. Pellet Stoves require an installation permit from the Health Department."

    c. "Energy Efficiency: Builders should consider using energy efficient building techniques such as building orientation to the sun, appropriately sized eaves, wind breaks, super insulation techniques, day lighting, passive solar design, photovoltaic cells, and ground source heat pumps for heating/cooling. Ground Source heat pumps are usually more efficient and so create less pollution than other systems for heating and cooling. Increased energy efficiency reduces air pollution, reduces the need for people to use cheaper heating methods that pollute more and helps protect the consumer from energy price changes."

23. The applicant shall include the following Amendments section in the Development Covenants subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration: "Amendments: Sections relating to Common Area Landscaping and Maintenance Plan, Weed Management Plan, Boulevard Landscaping and Maintenance Plan, Pedestrian Pathway/Stairs and Sidewalk Maintenance, Private Road Maintenance, Parking on Road "A" (north and south segments) and Road "B", ~~Stormwater~~ Storm Water Facilities Maintenance, Radon Mitigation, Woodstoves, Private Maintenance Acknowledgement of Infrastructure and Facilities, Living With Wildlife, Fences, and Energy Efficiency may not be amended or deleted without prior written approval of the governing body."

25. The townhome exemption declaration for the Hillview Crossing TED shall be submitted in one zoning compliance permit application and shall include all sixty-eight (68) TED unit ownership parcels, all infrastructure, and meeting conditions of approval for the conditional use, subject to review and approval of Development Services, prior to approval of the zoning compliance permit of the townhome exemption declaration. All infrastructure shall be constructed within five years of approval of the Geotechnical report and an improvements agreement guaranteed by a security that covers the cost of all the roads, sidewalks, pedestrian pathways, storm water facilities, retaining walls and site grading is approved by City Engineering prior to zoning compliance permit approval of the townhome exemption declaration.

26. A Geotechnical Report is required for each two unit townhouse structure submitted with the building permit application, subject to review and approval by City Engineering, prior to building permit approval.

25. The applicant shall provide a Grading and Drainage Plan and an updated Geotechnical Report for mass site grading for roads, pedestrian walkways, and infrastructure such as utilities, sewer, water and storm water facilities, retaining wall locations, locations for storm water detention/retention, locations for construction staging of topsoil, erosion control measures during construction, and including any excavation or embankment locations, subject to review and approval by City Engineering, prior to zoning compliance approval of the townhome exemption declaration. The scope of the Geotechnical Report shall include an evaluation of existing conditions, recommendations for excavation and embankment, requirements for construction and oversight and requirements for submission of as-built and testing results to the City Engineer. The Geotechnical report shall be part of the design submittal for roads and infrastructure and be valid for five (5) years from the date the report was approved by City Engineering.

26. At completion of construction of storm water facilities, the applicant shall provide a Storm Water Management System As-Built and Maintenance Manual to the Home Owners Association (HOA), for use by the HOA in managing and maintaining the storm water infrastructure designed and constructed within this development. An equal copy of this document shall be provided to the City of Missoula Storm Water Utility for permanent record and future inspection for compliance, as required by the Montana Department of Environmental Quality (MDEQ), Municipal Separate Storm Sewer System (MS4) Permit. All storm water management infrastructure shall be constructed and placed within a "Public Storm Water Drainage Easement" on the development plat for future legal and rightful access by the City Storm Water Utility for inspection for compliance with the operations and maintenance document. This easement shall also provide for maintenance access, if necessary.

27. The following statement shall appear on the TED Ownership Unit Site Plan and in the Development Covenants prior to zoning compliance approval of the towhnhome exemption declaration. The TED Ownership Unit Site Plan and Development Covenants shall be provided to all Ownership Unit purchases within this development: " Private Maintenance Acknowledgement of Infrastructure and Facilities: The project developer and all future property owners acknowledge and accept that by purchasing a Townhome Exemption Development (TED) Ownership Unit within this development, that maintenance of all roadways, sidewalks, storm drainage facilities, and other infrastructure within the development are the responsibility of the Home Owners Association (HOA). In the event that the City of Missoula must act to protect public safety, adjacent private property, or compliance with applicable permits and regulations, all resultant costs shall be equally divided among all Ownership Units and assessed to their property tax bills."

28. The following section on Living With Wildlife shall be included in the Development Covenants, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration:

"Section : Living with Wildlife

Homeowners and residents must accept the responsibility of living with wildlife and must be responsible for protecting their vegetation from damage, confining their pets, and properly storing garbage, pet food, and other potential attractants. Homeowners must be aware of potential problems associated with the presence of wildlife such as deer, black bear, mountain lion, coyote, fox, skunk and raccoon. Please contact the Montana Fish, Wildlife & Parks office in Missoula (3201 Spurgin Road, Missoula, MT 59804) for information that can help homeowners "live with wildlife." Alternatively, see FWP's web site at http://fwp.mt.gov.

The following covenants are designed to help minimize problems that homeowners could have with wildlife, as well as helping homeowners protect themselves, their property and the wildlife that Montanans value.

a. There is high potential for **vegetation damage by wildlife, particularly from deer** feeding on green lawns, gardens, flowers, ornamental shrubs and trees in this subdivision. Homeowners should be prepared to take the responsibility to plant non-palatable vegetation or protect their vegetation (fencing, netting, repellents) in order to avoid problems.

b. **Landscaping** comprised of native vegetation is less likely to suffer extensive feeding damage by deer than non-native plants. Native flowering plants will benefit pollinating insects, and native shrubs and trees produce favorable food sources and nesting sites for a variety of bird species. Landscape plants can often spread beyond the original planting site, so using native plants also avoids problems with non-native plants spreading in nearby open areas.

c. **Gardens and fruit trees** can attract wildlife such as deer and bears. Keep produce and fruit picked and off the ground, because ripe and rotting vegetable material can attract bears and skunks. To help keep wildlife such as deer out of gardens, fences should be 8 feet or taller. Netting over gardens can help deter birds from eating berries.

d. This townhouse development is in the City of Missoula's **Bear Buffer Zone** (Municipal Code, Chapter 8.28.085, Special provisions for the accumulation and storage of garbage within the Bear Buffer Zone), which has regulations related to garbage handling in this area. Store all **garbage** in a bear-resistant container, bear-resistant enclosure, or enclosed building to avoid attracting wildlife such as bears or raccoons. If your garbage containers are not bear-resistant, you must keep them inside a bear-resistant enclosure or enclosed building. These containers may only be outside the enclosure between 5:00 a.m. and 9:00 p.m. on the day of waste pickup.

e. **Do not feed wildlife** or offer supplements (including salt blocks), attractants, or bait for deer or other wildlife, including during the winter. Feeding wildlife results in unnatural concentrations of animals that could lead to overuse of vegetation and disease transmission. Such actions unnecessarily accustom wild animals to humans, which can be dangerous for both. It is against state law (§ 87-3-130 MCA) to purposely or knowingly attract any ungulates (deer, elk, etc.), bears, or mountain lions with supplemental food attractants (any food, garbage, or other attractant for game animals) or to provide supplemental feed attractants in a manner that results in "an artificial concentration of game animals that may potentially contribute to the transmission of disease or that constitutes a threat to public safety." Also, homeowners must be aware that deer can attract mountain lions to an area.

f. **Pets** must be confined to the house, in a fenced yard, or in an outdoor kennel area when not under the immediate control of the owner, and not be allowed to roam as they can chase and/or kill big game and small birds and mammals. Under current state law it is illegal for a dog to chase, stalk, pursue, attack, or kill a hooved game animal, and the owner may be held personally responsible (§ 87-6-404, MCA). Keeping pets confined also helps protect them from predatory wildlife.

g. **Pet food** must be stored indoors, in closed sheds or in animal-resistant containers in order to avoid attracting wildlife such bears, mountain lions, skunks, and raccoons. **When feeding pets** do not leave food out overnight. Consider feeding pets indoors so that wild animals do not learn to associate food with your home.

h. **Bird feeders** attract bears and should not be used from March to December 1. If used, bird feeders should: a) be suspended a minimum of 20-feet above ground level, b) be at least 4 feet from any support poles or points, and c) should be designed with a catch plate located below the feeder and fixed such that it collects the seed knocked off the feeder by feeding birds.

i. **Barbecue grills** should be stored indoors. Keep all portions of the barbecues clean, because food spills and smells on/near the grill can attract bears and other wildlife. (Due to the potential hazard of fire and explosion, propane cylinders for gas-fueled grills should be disconnected and kept outdoors. Under no circumstances should propane cylinders be stored indoors.)

j. **Compost piles** can attract skunks and bears. If used, they should be kept in wildlife-resistant containers or structures. Compost piles should be limited to grass, leaves, and garden clippings, and piles should be turned regularly. Do not add food scraps. Adding lime can reduce smells and help decomposition. (Due to the potential fire hazard associated with decomposition of organic materials, compost piles should be kept at least 10 feet from structures.)

k. Consider **boundary fencing** that is no higher than 3-1/2 feet (at the top rail or wire) and no lower than 18 inches (at the bottom rail or wire) in order to facilitate wildlife movement and help avoid animals such as deer becoming entangled in the wire or injuring themselves when trying to jump the fence. (Contact FWP or see its website for information or a brochure regarding building fence with wildlife in mind.)"

29. The following section on Fencing shall be included in the Development Covenants, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration:

"Section : Fencing:

Fencing at the perimeter of the subject property shall comply with boundary fencing standards in sub-section K of the Living with Wildife: no higher than 3-1/2 feet (at the top rail or wire) and no lower than 18 inches (at the bottom rail or wire) in order to facilitate wildlife movement and help avoid animals such as deer becoming entangled in the wire or injuring themselves when trying to jump the fence.

Fencing is prohibited in the following locations of each TED ownership unit: Front yard, Side Interior yard, and may not extend into the Side Interior yard portion of the Rear yard."

GARLINGTON | LOHN | ROBINSON
MONTANA'S ATTORNEYS SINCE 1870

August 9, 2019

VIA EMAIL ONLY
Bryan von Lossberg, Council President
Missoula City Council
435 Ryman
Missoula, MT 59802
council@ci.missoula.mt.us

RE: Hillview Crossing Townhome Development – Road Width Issue

Dear Council:

We previously asked the LUP committee to reconsider its decision to change the road width for the Hillview Crossing TED Conditional Use Permit from 28' to 35'. We write to reiterate the explanation we provided in our letter of April 3, 2019 and provide additional information.

TED projects are required to meet the road width standards adopted by the Council in Title 12, Section 12.22.140.C.1(a) which provides as follows:

1. Roadway or street widths (Back of curb to back of curb minimum widths)
   a. Local Residential Roadway or streets (serving 12 or more living units)
      i. 35' with parking on both sides
      ii. 28' with parking on one side
      iii. 21' with no parking

These are the Council's approved design specifications for TED projects and represent options for the landowner to select from.

The Hillview Crossing project did not select the 28' road width in a vacuum. Rather, project design team members met and discussed the project numerous times over the course of three years with staff members from Development Services and the Missoula Fire Department.

The landowners did not submit the Hillview Crossing permit application until receiving approval from the Fire Department for the proposed width and configuration of the roads, turnarounds, and other design specifications.

As mentioned in our April 3 letter, the Hillview Crossing project originally received approval from the City in October 2015. Then, the project fully complied with zoning regulations,

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P.O. Box 7909 | 350 Ryman St. | Missoula, MT 59807-7909 | PHONE: (406) 523-2500 | FAX: (406) 523-2595 garlington.com
Professional Limited Liability Partnership

including a 28' road width. After the approval lapsed during litigation filed against the City that was ultimately deemed frivolous, the Council rewrote its TED development standards.

The only impact the new TED standards had on the Hillview Crossing project was to increase the front-yard setback from 10' to 20'. The Council did not change the 28' road width, even knowing that was the width designed and approved for the original Hillview Crossing project.

Redesigning the project to accommodate the required 20' setback resulted in adding 136 off-street parking spaces. It did increase the amount of mass-grading around the garages required to develop the project and a redesign of the dwelling floor plans, but the design was nevertheless largely consistent with previous geotechnical investigations of the site.

Development services staff recommended approval of the Hillview Crossing TED application with a road width of 28'.

In voting to require the project to be redesigned with a 35' road width, council members cited a few reasons, including concerns for fire access, parking restriction enforcement, and overall livability. However, as noted, the project design team secured the fire department's approval for a 28' road width prior to submitting the application which received a recommendation of approval by staff. Livability is a subjective matter, but in revising the TED standards and corresponding road width options, the Council already deemed 21', 28' and 35' widths to be acceptable design options.

In fact, the City has many 28' wide roads, some of which are in the south hills on the same topography. Attached to this letter is a report from Territorial-Landworks evaluating various existing 28' and similar width streets in Missoula. Some allow parking on one side of the street, others allow parking on both sides of the street. Of note is the "drive aisle" created by the various street options. The report concludes that a 28' wide street with parking prohibited on one side is more optimal that a 35' wide street. Even if there is an occasional lack of enforcement for parking in a prohibited area, the street would still be comparable to existing streets of comparable width that allow parking on both sides.

Further, increasing the street width to 35' is counterproductive relative to several of the Council's other expressed concerns. For example, the extra width creates additional surface area that increases stormwater runoff. The extra width requires additional mass grading of the slopes and pushes some housing locations on to areas of greater fill. Plus, adding parking to both sides makes it significantly more difficult to remove snow, thus further reducing the drive aisle and hampering resident and emergency access.

For these reasons we respectfully request the Council permit the project to proceed with the

original 28' width road design as recommended for approval in the staff report.

Sincerely,

GARLINGTON, LOHN & ROBINSON, PLLP

Alan F. McCormick
Direct Line: (406) 523-2518
Email: afmccormick@garlington.com

AFM:jdl
Enclosure

Sample of Comparable Hillside and Cul-de-sac Street Configurations in Missoula Report

for

Hillview Crossing Townhome Development

Located at:
Off of Hillview Way
Section 6, T12N, R19W, P.M.M.
City of Missoula, Missoula County, Montana

August 1, 2019

Prepared For:
Alan McCormick
Garlington, Lohn & Robinson
350 Ryman St
Missoula, MT 59802

Prepared On Behalf Of:
Hillview Crossing Missoula LLC
3605 Arthur Street
Caldwell, ID 83605

Prepared By:
Territorial-Landworks, Inc.
1817 South Ave W, Suite A
P.O. Box 3851
Missoula, MT 59806

1.0 GENERAL

Hillview Crossing is a proposed Townhome Development of approximately 25.6 acres located below and north of Hillview Way in Missoula's South Hills area. The proposed street width for this Townhome Development is 28 feet, with parking restricted to one side of the street. This width with cars parked on one side of the street will allow for a 19.1' drive aisle. We feel that this design is more advantageous to the City of Missoula than the previously approved 32' width with parking on either side.

This report will compare cul-de-sac streets around Missoula in which the city maintains streets with similar or more narrow drive aisles. The report will focus on cul-de-sac streets in the South Hills Area, although will include some streets from other areas of the City. Our intent with this report is to show that not only is a 28' width with restricted parking feasible, it is better for the City than many roads which are currently maintained and accepted by the City. This is important to note as it appears the main sticking point is that the City will not accept the Hillview Streets although the Siren Place and Grove Street Townhomes had their Streets accepted by the City. The reason given for the difference here was the fact that the streets are dead ends. However, as shown below, the City has a recent track record of accepting dead narrow streets.

2.0 Concerns Heard To Date

2.1. Width – There have been questions by Land Use and Planning Committee (LUP) about whether or not a 28' wide street with "No-Parking" on one side, as allowed by the City Regulations, is appropriate or not. The regulations specifically allow this street configuration and during agency comment period, there were no objections to choosing this street cross section. As discussed in 3.0 below, there are many streets in Missoula that are this width. Some prohibit parking on one side and others do not. If there were problems with these streets, it is presumed that they would not have been allowed and that the ones that allow parking on both sides would have been easily modified to parking on one side or no parking at all.

LUP has recommended that the next street size of 35' with parking on both sides be used. Primarily for the fact that there would be no need for enforcement of the No Parking rules (see below) and for better emergency ingress/egress and maintenance. However, if you encourage parking on both

sides with a 35' wide street, the effective width is actually cut down from 19.1' to 18.5'. Further, in an emergency, the typical Type L curb is mountable and useable for egress and ingress.

See the attached Parking Cross-Section Options exhibit that demonstrates the above discussion.

2.2. Enforcement – The City of Missoula Public Works office has elected to not accept maintenance of the streets and therefore they would be private streets in a public access easement. Therefore, "No-Parking" restrictions could not be enforced by the City Police. However, the Townhouse Association can enforce the restriction. They have a vested interest in keeping the streets available for their citizens and maintenance. Additionally, the citizens that use our streets are generally law-abiding citizens and would not be aware of who can enforce the requirement and are therefore likely to abide by the no parking restriction. Public Works has requested that we both paint the curb and install signs indicating no parking. Most citizens would not violate this level of traffic control and limited enforcement is anticipated.

The Hillview Crossing project provides for a total of 4 off-site parking spaces per unit. Two in the garage and two in the driveway. Additionally, the Site Plan with a 28' wide street provides for a total of 47 on-street parking spaces resulting in a total of 319 spaces or approximately 4.7 parking spaces per unit. Widening the street would provide an additional 38 spaces since the driveway opening, and traffic calming/pedestrian crossing areas are natural deterrents from parking vehicles. If a motorist chooses to violate the "No Parking" restrictions, there are very few locations where there would be a narrowing of the street due to the spacing of the driveways. Please see the attached Parking Exhibit where the allowed parking is shown in green and the "No Parking" potential violators are shown in red. It is very unlikely that should a person choose to violate the "No Parking" restriction that there would be a conflict.

3.0 Hillview Area Comparable Streets

The Hillview Area contains many cul-de-sac roads, some of which are very similar to what Hillview Crossing is proposing and others with smaller drive aisles. On a field visit to observe these roads, no issues with parking were observed. Shown below in Figure 1 is a map of the streets which were observed in the field within the South Hills Area.

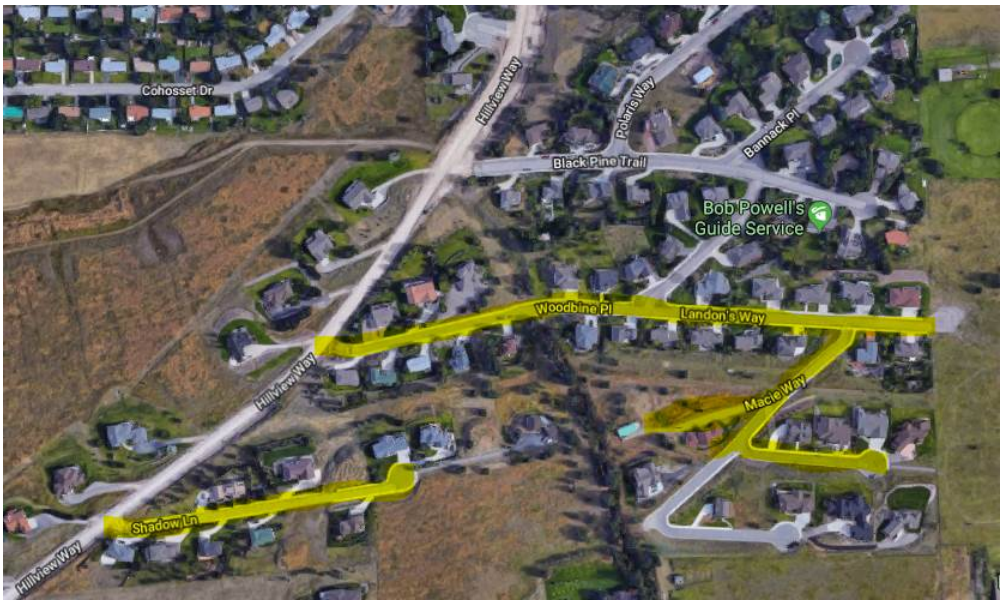


Figure 1: Map of Streets (Highlighted with Yellow) Which Were Observed in the Field.

In this area, it was common for parking to be restricted to one side of the street if a road was 28' wide or less. In cases where the streets were wider, parking was allowed on either side. The following roads observed in the field are listed with additional detail, in no order:

Woodbine Place & Landon Way

Woodbine Place is located off Hillview Way. As shown in Figure 2 below (no parking sign on right side of road), parking is restricted to one side of the street. The road eventually turns into Landon Way shown in Figure 3 where it ends in a cul-de-sac. The road width initially off Hillview Way is 24.3 feet back of curb to back of curb. After approximately 503' the road widens to 32.5 feet back of curb to back of curb and parking is allowed on either side of the street. The total length of both these streets is 1618 feet, which exceeds the length of either of the two proposed townhome development roads. The effective drive aisle width for Woodbine Place is 15.4' while the drive aisle for Landon Way is 14.7'. This is a good example of how even though a road is wider, drive aisle is the more important parameter.

Figure 2: Woodbine Place (24.3' Wide Street)

Figure 3: Landon Way (32.5' Wide Street)

Figure 4: Street Map of Woodbine Place & Landon's Way

Shadow Lane

Shadow Lane is an 823’ cul-de-sac street located off Hillview Way. As shown in Figure 5 below, parking is restricted to one side of the street by a yellow painted curb. The street width is 24.3’ back of curb to back of curb. The drive aisle for this street is 14.7’ which is narrower than that of the proposed townhome development.

Figure 5: Shadow Lane (24.3’ Wide Street)

Figure 6: Street Map of Shadow Lane

Macie Way

Macie Way is an 823' cul-de-sac street located off Landon Way. As shown in Figure 7 below, parking is restricted to one side of the street by street signs. The street width is 24.3' back of curb to back of curb. The drive aisle for this street is 14.7' which is narrower than that of the proposed townhome development.

Figure 7: Macie Way (24.3' Wide Street)

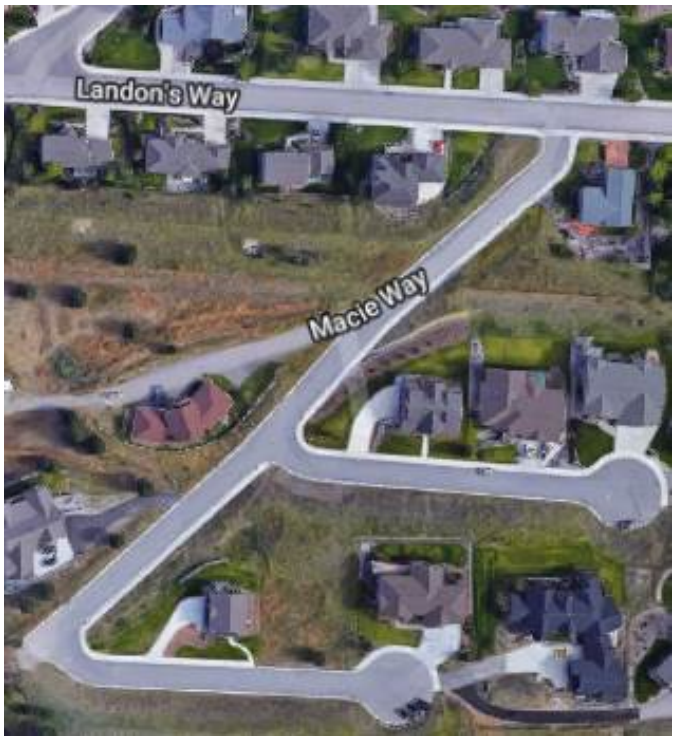


Figure 8: Street Map of Macie Way

Hunter Way

Hunter Lane is a 364' cul-de-sac street located off Macie Way. As shown in Figure 9 below, parking is restricted to one side of the street by street signs. The street width is 28.3' back of curb to back of curb. The drive aisle for this street is 19.4 which is comparable to that of the proposed townhome development.

Figure 9: Hunter Lane (28.3' Wide Street)

Figure 10: Street Map of Hunter Lane

4.0 Similar Cul-de-sac Streets Around Missoula

These following streets are a small sample of many around Missoula which have narrower drive aisles than the proposed townhome development.

Pintler Mountain Road

Pintler Mountain Road is a 984' cul-de-sac street located off Mansion Heights Drive within the Mansion Heights Subdivision. As shown in Figure 11 below, parking is allowed on either side of the street. The street width is 28' back of curb to back of curb. The drive aisle for this street is approximately 10 feet which is substantially less than that of the proposed townhome development. Allowing parking on either side of the street has created a very narrow drive aisle which would be hard to drive when the street is at capacity.

Figure 11: Pintler Mountain Road (28' Wide Street)

Figure 12: Street Map of Pintler Mountain Road

Lafray Lane

Lafray Lane is a 662' street which ends in a dead end located off River Road. The street width is 28' back of curb to back of curb. As shown in Figure 13 below, parking is allowed on either side of the street. The drive aisle for this street is 9.8 which is substantially less than that of the proposed townhome development. Lafray Lane is street which has substantial density on one side of the street as well as a public park on the other. This street most likely sees the most cars parked considered in this report.

Figure 13: Lafray Lane (28' Wide Street)

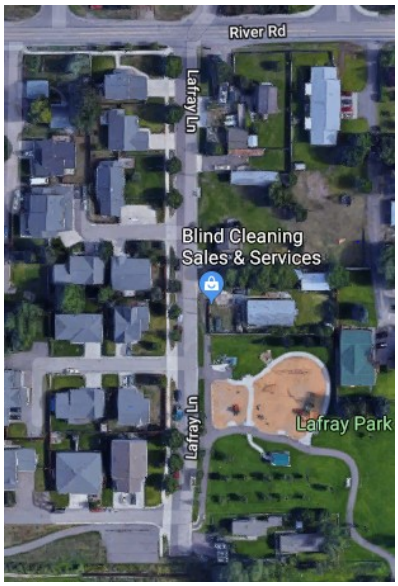


Figure 14: Street Map of Lafray Lane

Canyon Creek

Canyon Creek Boulevard located off Expressway is a high-density development which has been built in phases starting in the late 90s and finishing in the late 2000s. Several street widths were measured within the development, all streets measured were between 29 & 30 feet wide. Parking is allowed on either side of the street, which causes the drive aisle to be very narrow. Due to the density of the development and the lack of a driveway in front of the units, many cars were parked on the street. This is not very comparable to the proposed Hillview Crossing in that this is denser and additionally, there are no natural or regulatory barriers or breaks to the parking.

Figure 15: Canyon Creek area street (29'

Figure 16: Canyon Creek Development Street map

5.0 Report Conclusion

We believe that a 28' street with parking restricted to one side of the street is not only suitable for the proposed development but more optimal than recommended width of 35' with parking on both sides. As experienced in the field, road widths under 37' wide with parking on either side are difficult to drive when the road is at parking capacity. Since each unit has both a garage and driveway, parking in the road will be the third option for residents and visitors. Therefore, parking on the restricted side of the road should be a non-issue. Limiting parking to a single side of the street has additional benefits such as ease of snowplowing in the winter, as well as creating a safer traveled way for bikes. Additionally, considering the number of accepted public streets with long cul de sacs in Missoula, it may be appropriate to reconsider the adoption of the streets as public. Two recent Townhome projects had streets accepted into the City network.

Prepared by:
TERRITORIAL-LANDWORKS, INC.

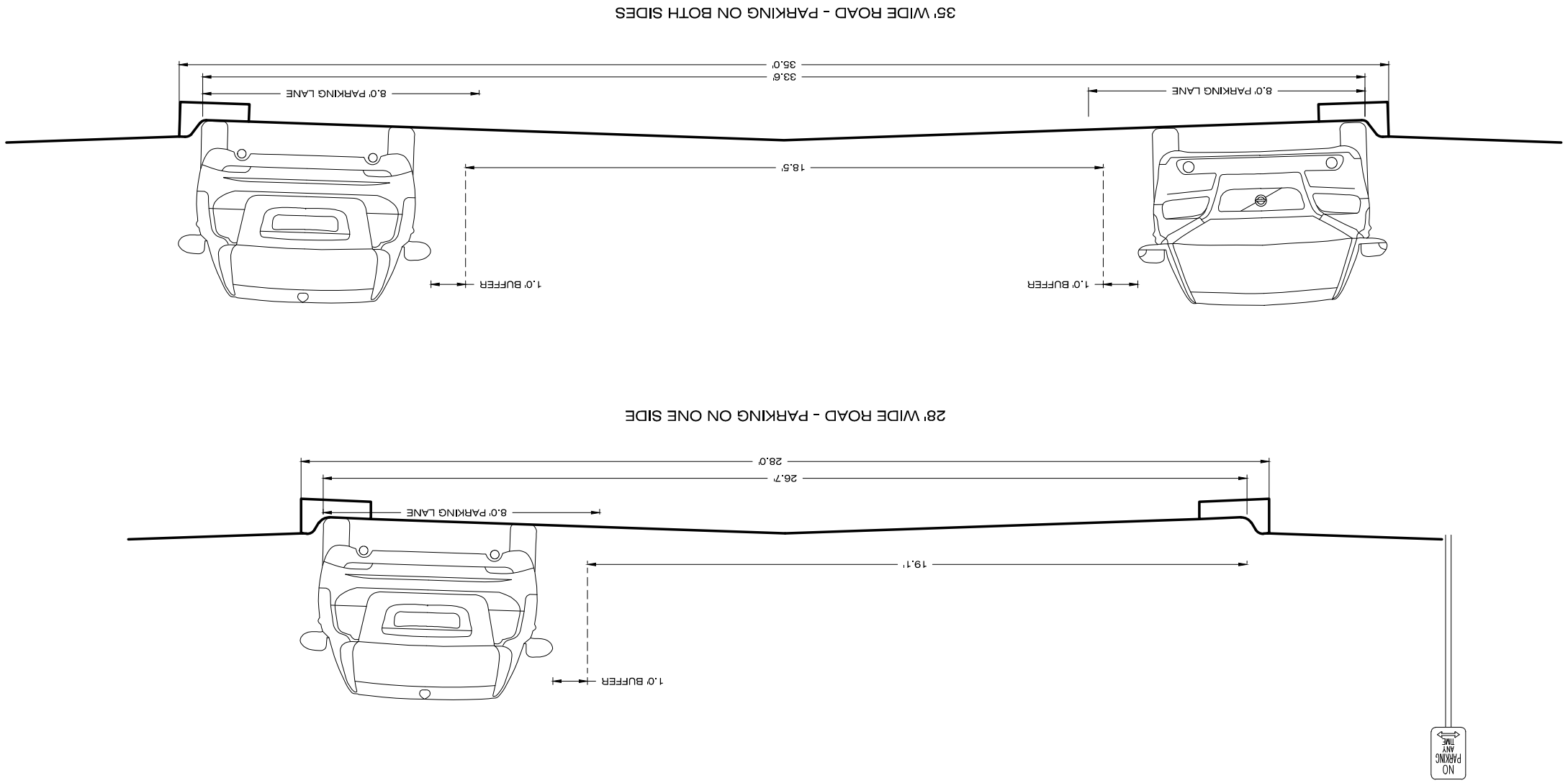
Mike Mayen, E.I.

Reviewed by:
TERRITORIAL-LANDWORKS, INC.

Jason Rice, P.E.

Attachments: Cross Section Comparison
Plan View Showing Parking Configuration

T:\1_ACTIVE FILES\2014 Projects\3592 - Hillview Crossing-Missoula S Hills Development\3_ENG DESIGN\Streets\Rpt.Sample of Comparable Hillside and Culdesac Street Configurations in Missoula.doc



PROJECT NO.
14-3592

SHEET:
1 OF 1

PROJECT NAME
HILLVIEW CROSSING - MISSOULA

SHEET TITLE:
PARKING CROSS-SECTION OPTIONS

LOCATION:
CITY OF MISSOULA
SEC. 6, T12N, R19W, P.M.M.
MISSOULA COUNTY
MONTANA

PREPARED FOR:
HILLVIEW CROSSING, LLC.
548

DESIGNED:
DRAFTED: DD
CHECKED:
DATE: 6-11-18

REVISIONS DATE

TERRITORIAL LANDWORKS, INC.
CIVIL ENGINEERING • SURVEYING • LAND USE CONSULTING
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Ph: 406/721-0142
Fax: 406/721-5224
P.O. Box 3651
Missoula, MT 59806

P:\CF\ DATE: 7/26/2019 11:26 AM
SDF:\\LOCALTCA_T1 - AUTOFILE\BS\2014-PROJ\3592\3592 - HILLVIEW CROSSING-MISSOULA\5-HILLS DEVELOPMENT\PLAN\PARKING\1_DRAWINGS\AUTOCAD\PLAN SETS\ZONING COMPLIANCE\ZC-PARKING EXH_14-3592.DWG

PARKING TOTALS

ON-SITE PARKING	=	272 SPACES
ON-STREET PARKING	=	47 SPACES
TOTAL	=	**319**

PEDESTRIAN MOBILITY ROUTE TOTALS:

LINEAR FEET OF ON-SITE SIDEWALK	=	6203'
LINEAR FEET OF ON-SITE TRAILS	=	1123'
TOTAL	=	**7326'**

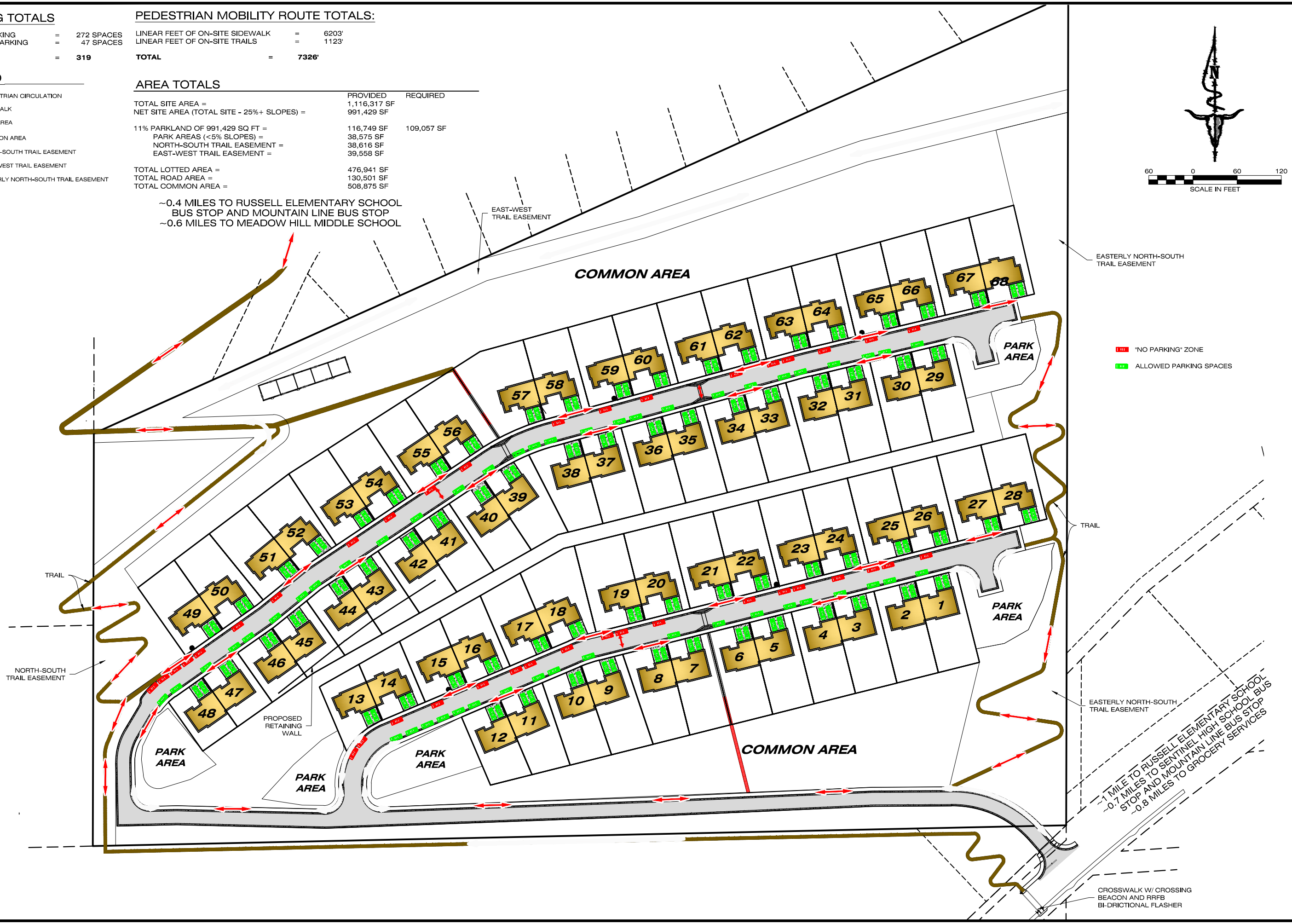
LEGEND

- PEDESTRIAN CIRCULATION
- SIDEWALK
- PARK AREA
- COMMON AREA
- NORTH-SOUTH TRAIL EASEMENT
- EAST-WEST TRAIL EASEMENT
- EASTERLY NORTH-SOUTH TRAIL EASEMENT
- TRAIL

AREA TOTALS

	PROVIDED	REQUIRED
TOTAL SITE AREA =	1,116,317 SF	
NET SITE AREA (TOTAL SITE - 25%+ SLOPES) =	991,429 SF	
11% PARKLAND OF 991,429 SQ FT =	116,749 SF	109,057 SF
PARK AREAS (<5% SLOPES) =	38,575 SF	
NORTH-SOUTH TRAIL EASEMENT =	38,616 SF	
EAST-WEST TRAIL EASEMENT =	39,558 SF	
TOTAL LOTTED AREA =	476,941 SF	
TOTAL ROAD AREA =	130,501 SF	
TOTAL COMMON AREA =	508,875 SF	

~0.4 MILES TO RUSSELL ELEMENTARY SCHOOL
BUS STOP AND MOUNTAIN LINE BUS STOP
~0.6 MILES TO MEADOW HILL MIDDLE SCHOOL



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www.TerritorialLandworks.com
P.O. Box 3851
Missoula, MT 59806
Ph: 406/721-0142
Fax: 406/721-3221

PLOT DATE: 7/31/2019 9:45 AM

REVISIONS	DATE

DESIGNED:
DRAFTED: DO
CHECKED:
DATE: 6-11-18

LOCATION: CITY OF MISSOULA
SEC. 6, T12N, R19W, P.M.M.
MISSOULA COUNTY
MONTANA

PREPARED FOR: HILLVIEW CROSSING, LLC.
549

PROJECT NAME: HILLVIEW CROSSING - MISSOULA

SHEET TITLE: PARKING AND PEDESTRIAN CIRCULATION EXHIBIT

PROJECT NO. 14-3592

SHEET: 1 OF 1

DWG LOCATION: T:_ACTIVE FILES\2014 PROJECTS\549 - HILLVIEW CROSSING-MISSOULA S HILLS DEVELOPMENT_DRAWINGS_AUTOCAD\PLAN SETS\ZONING COMPLIANCE\ZC-PARKING EXH_14-3592.DWG

MISSOULA
DEVELOPMENT SERVICES
435 RYMAN • MISSOULA, MT 59802 - 4297 • (406) 552-6630 • FAX: (406) 552-6053

Hillview Crossing TED Conditional Use – Amended Conditions of Approval
(including Living with Wildlife and Fences conditions)
August 5, 2019 REVISED NUMBERING

CONDITIONS OF APPROVAL:

1. The Hillview Crossing townhome exemption development conditional use shall comply with all applicable portions of Title 20. Plans submitted at the time of zoning compliance approval of the townhome exemption declaration and of building permit application shall substantially conform to the plans submitted at the time of conditional use review, subject to the review and approval of Development Services.

2. The applicant shall revise the ~~Stormwater~~ Storm Water Plan to address both Section 5.2B and Section 5.2C related to ~~stormwater~~ storm water calculations as specified in the email message from the ~~City~~ Assistant City Engineer dated October 9, 2018, prior to zoning compliance approval of the townhome exemption declaration. The Geotechnical Engineer shall review and approve all locations of storm water detention/retention basins and facilities for conformance with the recommendations in the updated Geotechnical Report. The final ~~stormwater plan~~ Storm Water Plan for construction shall be reviewed and approved by City Engineering and the Geotechnical Engineer prior to zoning compliance approval of the townhome exemption declaration. ~~Stormwater~~ Storm water facilities shall be installed prior to building permit approval for the first structure or included in an Improvements Agreement guaranteed by a security subject to review and approval of the City Engineer.

3. The final ~~stormwater~~ storm water plan shall specify long-term maintenance requirements for the ~~stormwater~~ storm water facilities. The applicant shall specify in the Development Covenants that the maintenance of the ~~stormwater~~ storm water facilities shall be the responsibility of the Developer, transferring to the Homeowners' Association once formed and shall include all maintenance and replacement costs as outlined in the final ~~stormwater~~ storm water plan, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.

4. The applicant shall prepare plans for and install a pedestrian crossing at the intersection of Hillview Way and the southern segment of Road "A" to include crosswalk markings, crossing beacon and ADA accessible ramps. Plans shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

5. The applicant shall provide a minimum 20-foot wide non-motorized trail easement and construct the trail within the easement through the subject property to connect the existing Tonkin Trail south of the TED to Wapikya Park. Plans shall be reviewed and approved by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration and improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer and City Parks and Recreation. The developer shall work with the City's Conservation Land Manager to determine the exact width and location for the trail and shall construct the trail during construction of development to maximize cost-efficiency and reduce disturbance.

6. The applicant shall provide a 20-foot wide public access easement in the location of the east-west trail as shown on the site development plan, subject to review and approval by City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome

exemption declaration. The developer shall employ effective means to protect the trail easement areas from construction disturbance such as a temporary fence throughout construction.

7. The applicant shall provide a minimum 20-foot wide non-motorized trail easement and construct the portion of the relocated Tonkin Trail where it connects with Hillview Way as shown on the site development plan. Plans shall be reviewed and approved by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration and improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer and City Parks and Recreation.

8. The applicant shall prepare a plan for protection of trail easement areas during construction, subject to review and approval of City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration. The developer shall employ effective means to protect the trail easement areas from construction disturbance such as a temporary fence throughout construction.

9. The applicant shall dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road "A" through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road "B" then continuing between unit ownership parcel number 18 and 19, crossing the common area and extending between unit ownership parcels 38 and 39, crossing the northern segment of Road "A" then continuing between unit ownership parcel number 56 and 57. An easement for future trail improvements shall be dedicated from northern parcel boundaries of unit ownership parcel numbers 56 & 57 northward through the common area and connecting to the east-west trail easement near the northern property line of the TED. Plans for the pedestrian pathway/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

10. The applicant shall specify in the Development Covenants that the maintenance of the paved pedestrian pathway/stairs shall be the responsibility of the developer, transferring to the Homeowners' Association once formed and shall include maintenance and replacement, drainage facilities and snow removal, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration.

11. The applicant shall prepare plans and install road improvements for the northern segment of Road "A" and Road "B" resulting in a 28-foot wide back-of-curb to back-of-curb road section within a 52-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and 5-foot wide curbside sidewalk on each side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

12. The applicant shall prepare plans and install road improvements for the southern segment of Road "A" resulting in a 21-foot wide back-of-curb to back-of-curb road section within a 40-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and a 5-foot wide curbside sidewalk on one side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

13. The Development Covenants shall include a statement that parking is prohibited on one side of the northern segment of Road "A" and Road "B" and both sides of the southern segment of Road "A" subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration. The road improvement plans for Road "A" and Road "B"

shall include provisions for restricting parking on one side of the northern segment of Road “A” and Road “B” and on both sides of the southern segment of Road “A” in the form of painting the curb yellow and installation of No parking signage, subject to review and approval of the City Engineer, prior to zoning compliance approval of the townhome exemption declaration.

14. The following statement shall appear in the Development Covenants, subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration: “The purchaser and/or owner of the lot or unit understands and agrees that private road construction, maintenance, drainage facilities and snow removal for Road “A” and Road “B” are the obligation of the owner or property owners’ association and that the City of Missoula is in no way obligated to perform such maintenance or upkeep until the roads are brought up to standards and accepted by the City of Missoula for maintenance.”

15. The applicant shall provide a boulevard landscaping and maintenance plan attached to the Development Covenants for the boulevards within the public access easement for the northern and southern segment of Road “A” and Road “B” including tree palette, general planting plan and irrigation, subject to review and approval by City Parks and Recreation and Development Services, prior to zoning compliance approval of the townhome exemption declaration. The boulevard landscaping shall be included in an Improvements Agreement guaranteed by a security, subject to review and approval by City Parks and Recreation.

16. The applicant shall petition into the Missoula Urban Transportation District prior to zoning compliance approval of the townhome exemption declaration.

17. The applicant shall provide a hydrant plan to include existing or proposed hydrant locations meeting fire code standards, subject to review and approval by City Fire, prior to zoning compliance approval of the townhome exemption declaration. For new hydrants required to serve the TED, hydrant installation shall occur prior to combustible construction.

18. The applicant shall provide a Missoula County Weed District approved Revegetation Plan for disturbed areas of the site prior to zoning compliance approval of the townhome declaration, subject to review and approval by Development Services.

19. The applicant shall provide a Missoula County Weed District approved Weed Management Plan for common areas and undeveloped portions of the site prior to zoning compliance approval of the townhome declaration, subject to review and approval by Development Services. The Weed Management Plan shall specify that the developer is responsible for weed management for all undeveloped land including the common area. Once the Homeowners’ Association is established, weed management of the common areas and boulevard areas within the public access easement of the private roads transfers from the developer to the Homeowners’ Association. Control of weed management on developed unit ownership parcels shall transfer from the developer to each unit owner at the time of sale.

20. The Weed Management Plan approved by the Missoula County Weed District shall be attached as an Appendix to the Development Covenants prior to zoning compliance approval of the townhome exemption declaration, subject to review and approval by Development Services.

21. The applicant shall include a common area landscaping and maintenance plan for all common areas, including irrigation, street trees along the portions of Road “A” and Road “B” adjacent to common areas and parks and lawn for park areas shown with hatching on the Site Development Plan, subject to review and approval by City Parks and Recreation and Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of City Parks and Recreation and Development Services.

22. The following statements shall appear in the Development Covenants, subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration:

    a. “Radon Mitigation: The EPA has designated the Missoula area as having a high radon gas potential (Zone 1). Therefore, the Missoula City-County Health Department recommends that all new buildings incorporate radon resistant construction features.”

b. "Wood Stoves: The Missoula City-County Air Pollution Control Program regulations prohibit the installation of wood burning stoves or fireplaces inside the Air Stagnation Zone. This development is inside the Air Stagnation Zone. Pellet stoves that meet emission requirements or natural gas or propane fireplaces may be installed. Pellet Stoves require an installation permit from the Health Department."

c. "Energy Efficiency: Builders should consider using energy efficient building techniques such as building orientation to the sun, appropriately sized eaves, wind breaks, super insulation techniques, day lighting, passive solar design, photovoltaic cells, and ground source heat pumps for heating/cooling. Ground Source heat pumps are usually more efficient and so create less pollution than other systems for heating and cooling. Increased energy efficiency reduces air pollution, reduces the need for people to use cheaper heating methods that pollute more and helps protect the consumer from energy price changes."

23. The applicant shall include the following Amendments section in the Development Covenants subject to review and approval by Development Services, prior to zoning compliance approval of the townhome exemption declaration: "Amendments: Sections relating to Common Area Landscaping and Maintenance Plan, Weed Management Plan, Boulevard Landscaping and Maintenance Plan, Pedestrian Pathway/Stairs and Sidewalk Maintenance, Private Road Maintenance, Parking on Road "A" (north and south segments) and Road "B", ~~Stormwater~~ Storm Water Facilities Maintenance, Radon Mitigation, Woodstoves, Private Maintenance Acknowledgement of Infrastructure and Facilities, and Energy Efficiency may not be amended or deleted without prior written approval of the governing body."

24. The townhome exemption declaration for the Hillview Crossing TED shall be submitted in one zoning compliance permit application and shall include all sixty-eight (68) TED unit ownership parcels, all infrastructure, and meeting conditions of approval for the conditional use, subject to review and approval of Development Services, prior to approval of the zoning compliance permit of the townhome exemption declaration. All infrastructure shall be constructed within five years of approval of the Geotechnical report and an improvements agreement guaranteed by a security that covers the cost of all the roads, sidewalks, pedestrian pathways, storm water facilities, retaining walls and site grading is approved by City Engineering prior to zoning compliance permit approval of the townhome exemption declaration.

25. A Geotechnical Report is required for each two unit townhouse structure submitted with the building permit application, subject to review and approval by City Engineering, prior to building permit approval.

26. The applicant shall provide a Grading and Drainage Plan and an updated Geotechnical Report for mass site grading for roads, pedestrian walkways, and infrastructure such as utilities, sewer, water and storm water facilities, retaining wall locations, locations for storm water detention/retention, locations for construction staging of topsoil, erosion control measures during construction, and including any excavation or embankment locations, subject to review and approval by City Engineering, prior to zoning compliance approval of the townhome exemption declaration. The scope of the Geotechnical Report shall include an evaluation of existing conditions, recommendations for excavation and embankment, requirements for construction and oversight and requirements for submission of as-built and testing results to the City Engineer. The Geotechnical report shall be part of the design submittal for roads and infrastructure and be valid for five (5) years from the date the report was approved by City Engineering.

27. At completion of construction of storm water facilities, the applicant shall provide a Storm Water Management System As-Built and Maintenance Manual to the Home Owners Association (HOA), for use by the HOA in managing and maintaining the storm water infrastructure designed and constructed within this development. An equal copy of this document shall be provided to the City of Missoula Storm Water Utility for permanent record and future inspection for compliance, as required by the Montana Department of Environmental Quality (MDEQ), Municipal Separate Storm Sewer System (MS4) Permit. All storm water management infrastructure shall be constructed and placed within a "Public Storm Water Drainage Easement" on the development plat for future legal and rightful access by the City Storm Water Utility for inspection for compliance with the operations and maintenance document. This easement shall also provide for maintenance access, if necessary.

28. The following statement shall appear on the TED Ownership Unit Site Plan and in the Development Covenants prior to zoning compliance approval of the towhnhome exemption declaration. The TED Ownership Unit Site Plan and Development Covenants shall be provided to all Ownership Unit purchases within this development: " Private Maintenance Acknowledgement of Infrastructure and Facilities: The project developer and all future property owners acknowledge and accept that by purchasing a Townhome Exemption Development (TED) Ownership Unit within this development, that maintenance of all roadways, sidewalks, storm drainage facilities, and other infrastructure within the development are the responsibility of the Home Owners Association (HOA). In the event that the City of Missoula must act to protect public safety, adjacent private property, or compliance with applicable permits and regulations, all resultant costs shall be equally divided among all Ownership Units and assessed to their property tax bills."

29. The following section on Living With Wildlife shall be included in the Development Covenants, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration:

"Section : Living with Wildlife

Homeowners and residents must accept the responsibility of living with wildlife and must be responsible for protecting their vegetation from damage, confining their pets, and properly storing garbage, pet food, and other potential attractants. Homeowners must be aware of potential problems associated with the presence of wildlife such as deer, black bear, mountain lion, coyote, fox, skunk and raccoon. Please contact the Montana Fish, Wildlife & Parks office in Missoula (3201 Spurgin Road, Missoula, MT 59804) for information that can help homeowners "live with wildlife." Alternatively, see FWP's web site at http://fwp.mt.gov.

The following covenants are designed to help minimize problems that homeowners could have with wildlife, as well as helping homeowners protect themselves, their property and the wildlife that Montanans value.

a. There is high potential for **vegetation damage by wildlife, particularly from deer** feeding on green lawns, gardens, flowers, ornamental shrubs and trees in this subdivision. Homeowners should be prepared to take the responsibility to plant non-palatable vegetation or protect their vegetation (fencing, netting, repellents) in order to avoid problems.

b. **Landscaping** comprised of native vegetation is less likely to suffer extensive feeding damage by deer than non-native plants. Native flowering plants will benefit pollinating insects, and native shrubs and trees produce favorable food sources and nesting sites for a variety of bird species. Landscape plants can often spread beyond the original planting site, so using native plants also avoids problems with non-native plants spreading in nearby open areas.

c. **Gardens and fruit trees** can attract wildlife such as deer and bears. Keep produce and fruit picked and off the ground, because ripe and rotting vegetable material can attract bears and skunks. To help keep wildlife such as deer out of gardens, fences should be 8 feet or taller. Netting over gardens can help deter birds from eating berries.

d. This townhouse development is in the City of Missoula's **Bear Buffer Zone** (Municipal Code, Chapter 8.28.085, Special provisions for the accumulation and storage of garbage within the Bear Buffer Zone), which has regulations related to garbage handling in this area. Store all **garbage** in a bear-resistant container, bear-resistant enclosure, or enclosed building to avoid attracting wildlife such as bears or raccoons. If your garbage containers are not bear-resistant, you must keep them inside a bear-resistant enclosure or enclosed building. These containers may only be outside the enclosure between 5:00 a.m. and 9:00 p.m. on the day of waste pickup.

e. **Do not feed wildlife** or offer supplements (including salt blocks), attractants, or bait for deer or other wildlife, including during the winter. Feeding wildlife results

in unnatural concentrations of animals that could lead to overuse of vegetation and disease transmission. Such actions unnecessarily accustom wild animals to humans, which can be dangerous for both. It is against state law(§ 87-3-130 MCA) to purposely or knowingly attract any ungulates (deer, elk, etc.), bears, or mountain lions with supplemental food attractants (any food, garbage, or other attractant for game animals) or to provide supplemental feed attractants in a manner that results in "an artificial concentration of game animals that may potentially contribute to the transmission of disease or that constitutes a threat to public safety." Also, homeowners must be aware that deer can attract mountain lions to an area.

f. **Pets** must be confined to the house, in a fenced yard, or in an outdoor kennel area when not under the immediate control of the owner, and not be allowed to roam as they can chase and/or kill big game and small birds and mammals. Under current state law it is illegal for a dog to chase, stalk, pursue, attack, or kill a hooved game animal, and the owner may be held personally responsible(§ 87-6-404, MCA). Keeping pets confined also helps protect them from predatory wildlife.

g. **Pet food** must be stored indoors, in closed sheds or in animal-resistant containers in order to avoid attracting wildlife such bears, mountain lions, skunks, and raccoons. **When feeding pets** do not leave food out overnight. Consider feeding pets indoors so that wild animals do not learn to associate food with your home.

h. **Bird feeders** attract bears and should not be used from March to December 1. If used, bird feeders should: a) be suspended a minimum of 20-feet above ground level, b) be at least 4 feet from any support poles or points, and c) should be designed with a catch plate located below the feeder and fixed such that it collects the seed knocked off the feeder by feeding birds.

i. **Barbecue grills** should be stored indoors. Keep all portions of the barbecues clean, because food spills and smells on/near the grill can attract bears and other wildlife. (Due to the potential hazard of fire and explosion, propane cylinders for gas-fueled grills should be disconnected and kept outdoors. Under no circumstances should propane cylinders be stored indoors.)

j. **Compost piles** can attract skunks and bears. If used, they should be kept in wildlife-resistant containers or structures. Compost piles should be limited to grass, leaves, and garden clippings, and piles should be turned regularly. Do not add food scraps. Adding lime can reduce smells and help decomposition. (Due to the potential fire hazard associated with decomposition of organic materials, compost piles should be kept at least 10 feet from structures.)

k. Consider **boundary fencing** that is no higher than 3-1/2 feet (at the top rail or wire) and no lower than 18 inches (at the bottom rail or wire) in order to facilitate wildlife movement and help avoid animals such as deer becoming entangled in the wire or injuring themselves when trying to jump the fence. (Contact FWP or see its website for information or a brochure regarding building fence with wildlife in mind.)"

30. The following section on Fencing shall be included in the Development Covenants, subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration:

"Section_: Fencing:

Fencing at the perimeter of the subject property shall comply with boundary fencing standards in sub-section K of the Living with Wildife: no higher than 3-1/2 feet (at the top rail or wire) and no lower than 18 inches (at the bottom rail or wire) in order to facilitate wildlife movement and help avoid animals such as deer becoming entangled in the wire or injuring themselves when trying to jump the fence.

Fencing is prohibited in the following locations of each TED ownership unit: Front yard, Side Interior yard, and may not extend into the Side Interior yard portion of the Rear yard."

To: John DiBari, Chair of the Land Use and Planning Committee and Committee members
From: Don & Karen Henrikson
121 Saranac Drive, Missoula
Re: Hillview Crossing
Date: July 31, 2019

In light of the Missoulian article of July 30th reporting the possible lawsuit by the developers of the Hillview Crossing townhome project against the City of Missoula we feel the Land Use and Planning Committee should be made aware of the following.

We recently received a revised homeowner's policy (from our national insurance company which has been our provider for nearly the entire time we have lived in our home). The company has stipulated some exclusions, two of which made us sit up and take notice. Of particular and timely notice to us were those that had to do with earth movement and water.

Regarding earth movement, the policy excludes any damage related to earth movement *including landslides, mudslides, or mudflow resulting from improper compaction, site selection, or excavation.*

Regarding water, the policy excludes any damage resulting from overflow of any body of water, including any release, escape or rising of any body of water, or *any water held, contained, diverted by a dam, levee, dike or any type of water containment, diversion or flood control device.*

Those are circumstances that could potentially result from the Hillview Crossing development.

We still have concerns that we identified earlier to you, but feel that these issues of earth movement and water should be part of the record as they raise concerns about liability. If this development goes through and we experience damage from earth movement or water damage as listed above, who is liable? The developers? The City of Missoula? Or us because 54 years ago we bought a house situated below an undeveloped area which we understood to be too unstable to support a development of the density proposed for Hillview Crossing?

We do appreciate the diligence that you and your committee are doing and know a huge amount of time and effort has gone into the approval process thus far. Whatever the outcome we thank you for your hard work to arrive at a fair and safe decision.

Sincerely,

Don Henrikson

Don Henrikson

Karen Henrikson

Karen Henrikson

Hillview Crossing Townhome Exemption Development: Conditional Use Request

Land Use & Planning Committee

Mary McCrea
Development Services

August 14, 2019

August 5, 2019 - Draft Conditions

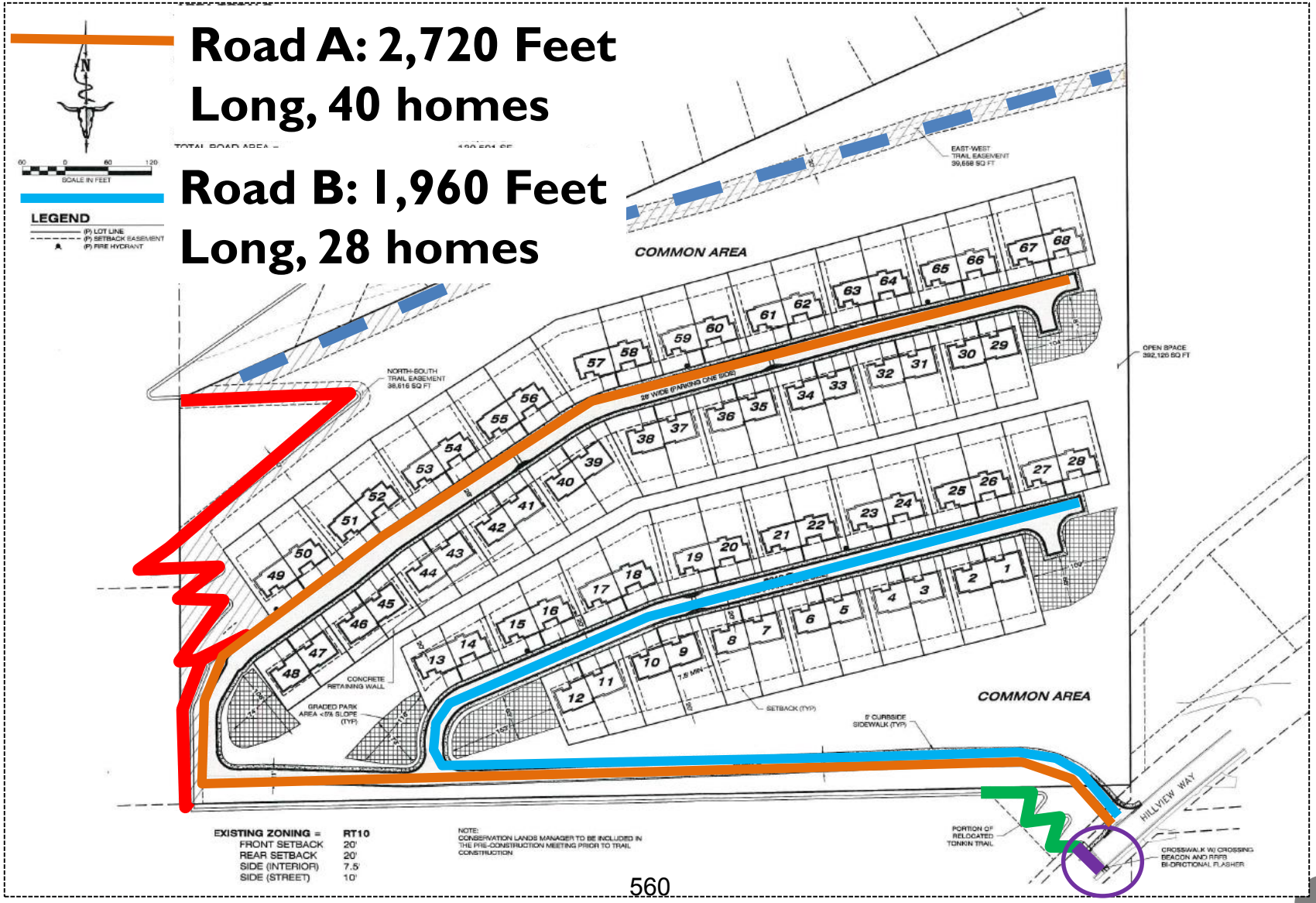
Topics covered in this presentation:

- **Road Width** – Conditions #11, #12 and #13,
- **Mid-block Pedestrian Pathway** – Condition #9,
- **Geotech -** Conditions #2, #24, #25, and #26,
- **Storm Water Plan** – Conditions #2, #3, #23, #24, #26, #27 and #28,
- **Living With Wildlife** – Condition #29, and
- **Fencing** – Condition #30

Road Width – Hillview Crossing

Road A: 2,720 Feet Long, 40 homes

Road B: 1,960 Feet Long, 28 homes

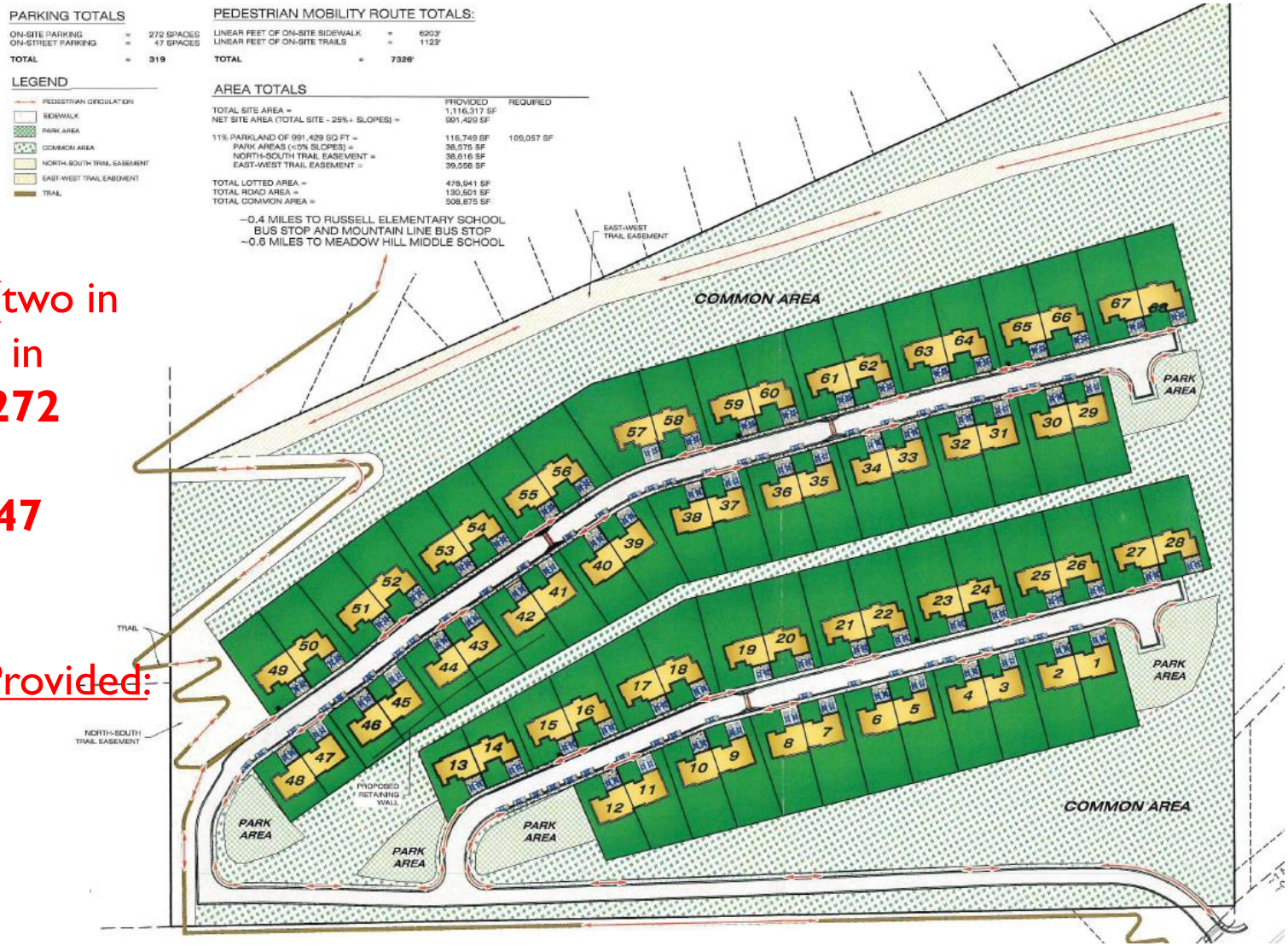


Parking

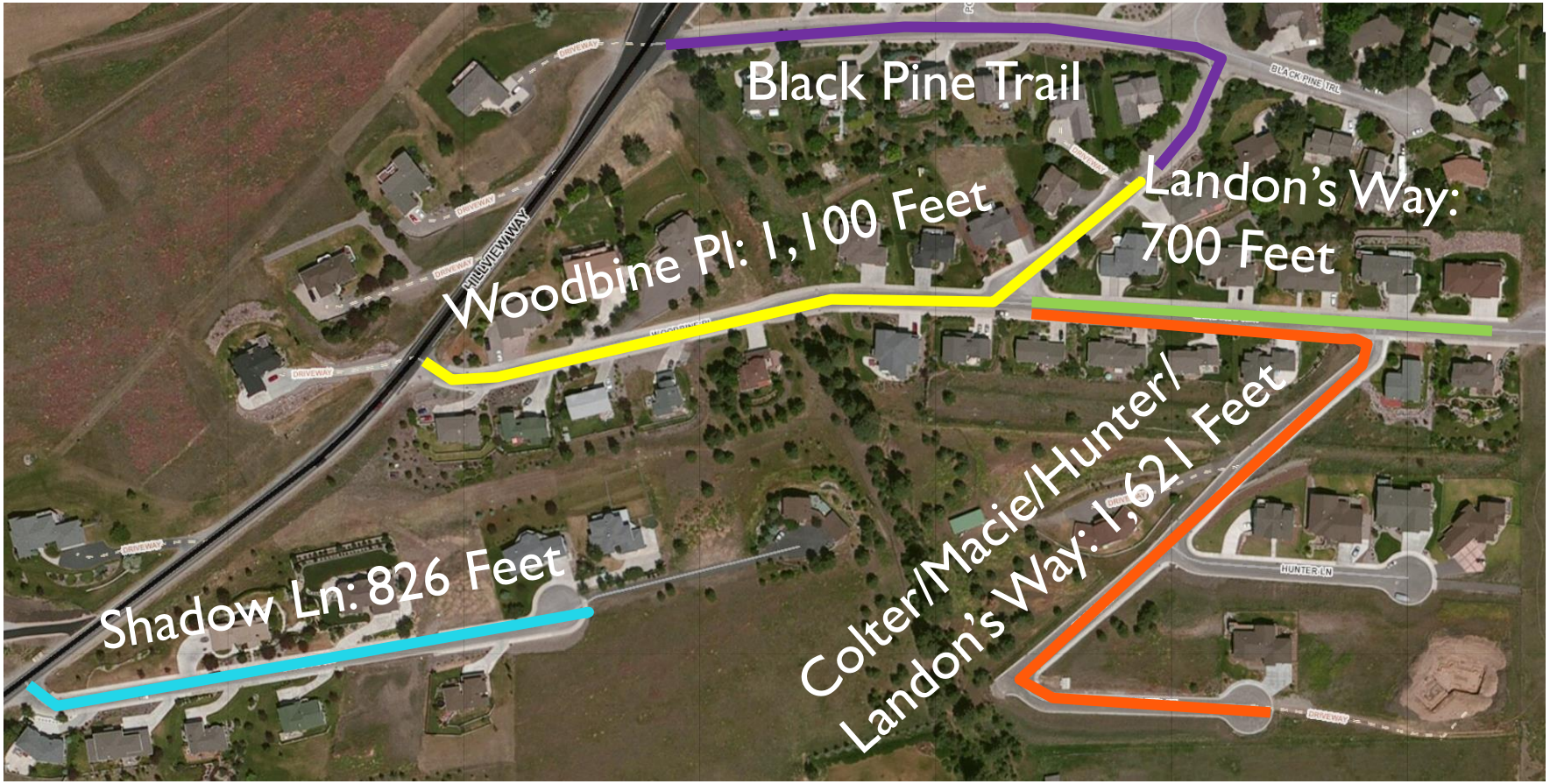
Parking

- Off-street (two in garage, two in driveway): **272** spaces
- On-street: **47** spaces

Total Parking Provided: **319** spaces



Road Width – Surrounding Area



Shadow LN: 826 Feet, 10 homes

Woodbine Pl: 1,100 Feet, 16 homes

Landon's Way: 700 Feet, 11 homes

Colter/Macie/Hunter/Landon's Way: 1,621 Feet, 20 homes

Road Width – Conditions 11 & 13

11. The applicant shall prepare plans and install road improvements for the northern segment of Road "A" (Road A – North) and Road "B" resulting in a ~~28-foot~~ 35-foot wide back-of-curb to back-of-curb road section within a ~~52-foot~~ 59-foot wide public access easement including paving, curb and gutter, drainage facilities, ADA improvements and 5-foot wide curbside sidewalk on each side of the road per the Site Development Plan Exhibit in the Conditional Use application packet. Plans for road improvements shall be approved by the City Engineer prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval of the City Engineer.

13. The Development Covenants shall include a statement that parking is prohibited on ~~one side of the northern segment of Road "A" and Road "B" and~~ both sides of the southern segment of Road "A" subject to review and approval of Development Services, prior to zoning compliance approval of the townhome exemption declaration. The road improvement plans ~~for Road "A" and Road "B"~~ shall include provisions for restricting parking ~~on one side of the northern segment of Road "A" and Road "B" and~~ on both sides of the southern segment of Road "A" in the form of painting the curb yellow and installation of No parking signage, subject to review and approval of the City Engineer, prior to zoning compliance approval of the townhome exemption declaration.

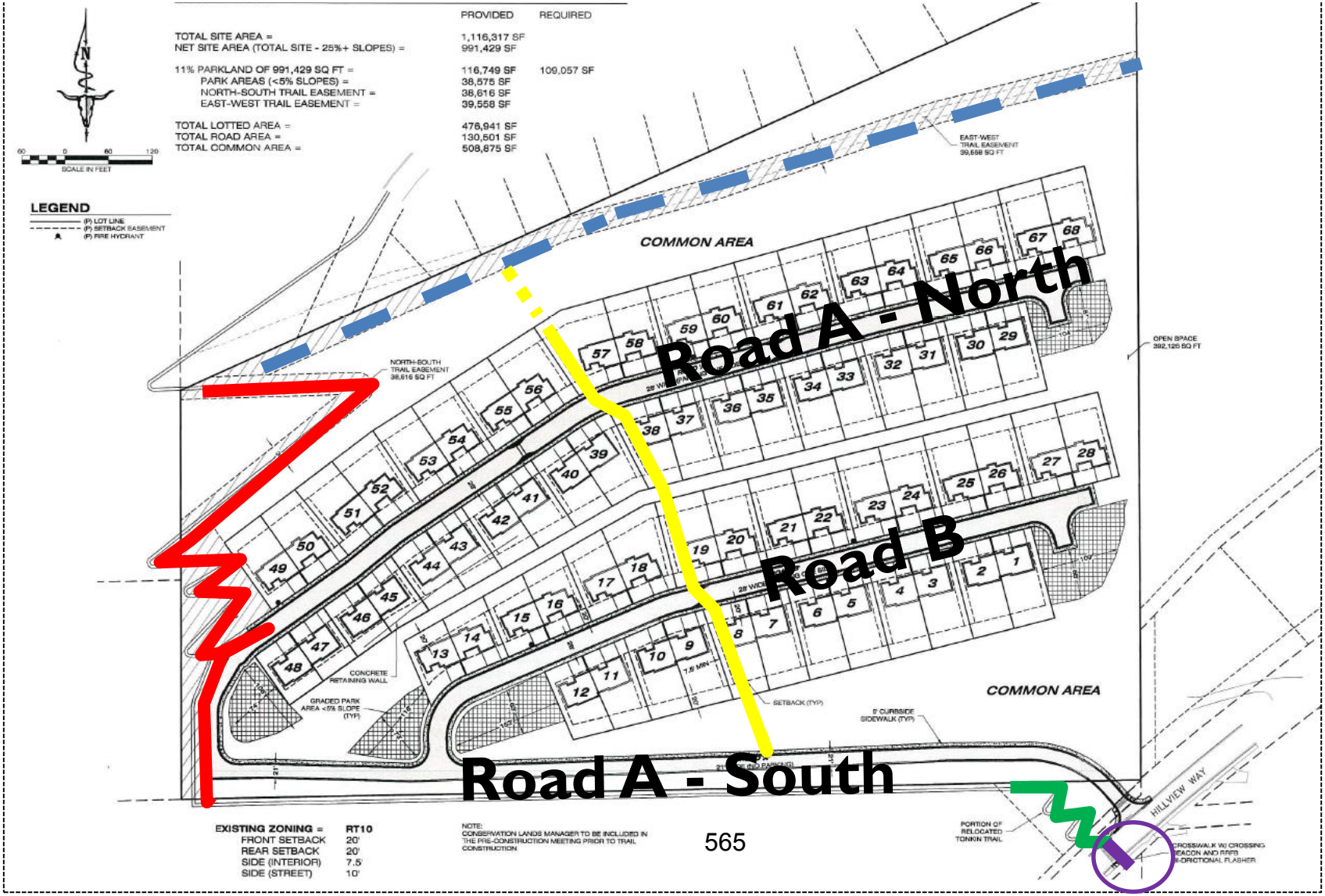
Mid-block Pedestrian Path

Condition of Approval #9 from the Staff Report:

9. The applicant shall dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road "A" through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road "B" then continuing between unit ownership parcel number 18 and 19, crossing the common area and extending between unit ownership parcels 38 and 39, crossing the northern segment of Road "A" then continuing between unit ownership parcel number 56 and 57. An easement for future trail improvements shall be dedicated from northern parcel boundaries of unit ownership parcel numbers 56 & 57 northward through the common area and connecting to the east-west trail easement near the northern property line of the TED. Plans for the pedestrian pathway/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

Mid-block Pedestrian Path

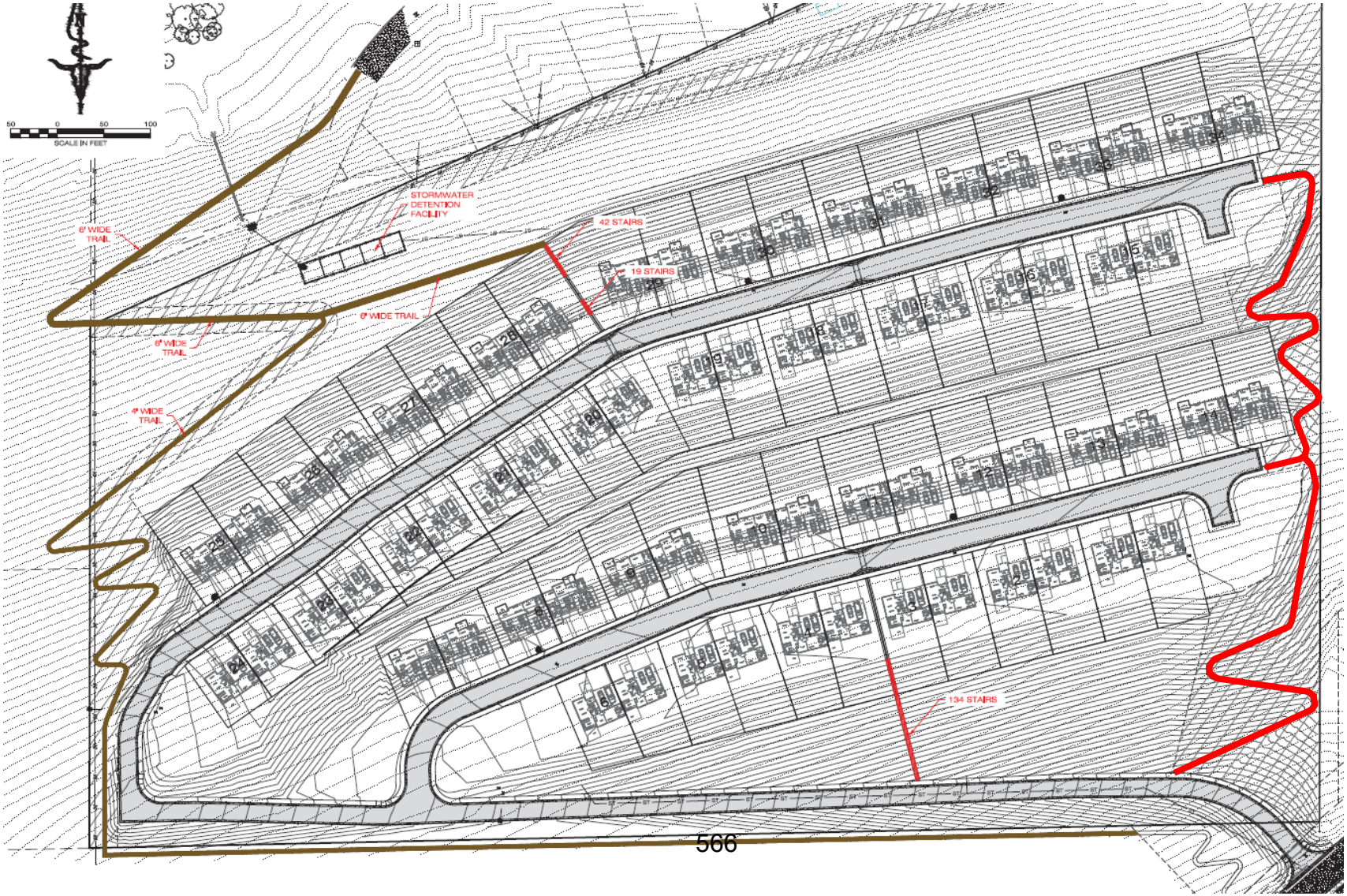
Condition of Approval #9 from the Staff Report:



565

Trail at Eastern Edge

Condition of Approval #9 from Applicant's April 3rd Handout:



Trail at Eastern Edge

New Condition of Approval #9 Prepared by the Applicant:

9. The applicant shall dedicate a trail easement and prepare plans for and install a trail meeting recreational trail standards of City Parks and Recreation along the eastern edge of the property per the handout from the applicant received at the April 3, 2019 Land Use and Planning Committee meeting, subject to review and approval by City Parks and Recreation prior to zoning compliance approval of the townhome exemption declaration. The trail at the eastern edge of the property shall be maintained by the developer and/or the Homeowner's Association. The applicant shall also prepare plans for and install a pedestrian pathway/stairs from southern segment of Road "A" through the common area extending between unit ownership parcel numbers 6 and 7, crossing Road "B" per the handout from the applicant received at the April 3, 2019 Land Use and Planning Committee meeting. The exact route to be determined in coordination with City Parks and Recreation. The applicant shall also prepare plans for and install a pedestrian pathway/stairs crossing the northern segment of Road "A" then continuing between unit ownership parcel number 56 and 57 and continuing as a 6 foot wide trail to meet the western trail per the handout from the applicant received at the April 3, 2019 Land Use and Planning Committee meeting. The exact route to be determined in coordination with City Parks and Recreation. Plans for the pedestrian pathway/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

August 5th Draft of Condition #9

Amended Condition of Approval #9 in August 5th Draft:

9. The applicant shall dedicate a trail easement and prepare plans for and install a trail meeting recreational trail standards of City Parks and recreation along the eastern edge of the property per the handout from the applicant received at the April 3, 2019 Land Use and Planning Committee meeting, subject to review and approval by City Parks and Recreation prior to zoning compliance approval of the townhome exemption declaration. The trail at the eastern edge of the property shall be maintained by the developer and/or the Homeowner's Association. If the trail plans for the trail at the eastern edge of the property do not meet City Parks and Recreation recreational trail standards of slopes of 10% - 15% with limited areas not exceeding 20% slope, the applicant shall dedicate a minimum 20-foot wide easement and construct a paved pedestrian pathway/stairs from southern segment of Road "A" through the common area extending between unit ownership parcel numbers 8 and 9, crossing Road "B" then continuing between unit ownership parcel number 18 and 19, crossing the common area and extending between unit ownership parcels 38 and 39, crossing the northern segment of Road "A" then continuing between unit ownership parcel number 56 and 57. An easement for future trail improvements shall be dedicated from northern parcel boundaries of unit ownership parcel numbers 56 & 57 northward through the common area and connecting to the east-west trail easement near the northern property line of the TED. Plans for the pedestrian pathway/stairs shall be reviewed and approved by Development Services prior to zoning compliance approval of the townhome exemption declaration. Improvements shall be installed prior to building permit approval of the first structure or included in an Improvements Agreement guaranteed by a security, subject to review and approval by Development Services.

August 5, 2019 - Draft Conditions

Geotech Report :

- August 5th Draft of Conditions includes Option B from Memo #4.
- Condition #2: Geotech Engineer to approve locations for Storm Water detention/retention basins and facilities.
- Condition #24: Requires all units, infrastructure and conditions of approval met in one TED declaration and all infrastructure constructed within 5 years of approval of Geotech Report.
- Condition #25: Requires a Geotech Report for each two-unit townhome at building permit review.
- Condition #26: Outlines scope and requirements for the Geotech Report.

August 5, 2019 - Draft Conditions

Storm Water Plan:

- August 5th Draft of Conditions includes Option B from Memo #4.
- Condition #2: Requires final Storm Water Plan approval by Geotechnical Engineer.
- Condition #23: Adds several sections to the Amendments section of the Development Covenants that require City Council approval to amend or delete the sections.
- Condition #24: Includes storm water facilities in the list of infrastructure that is required to be constructed within 5 years of approval of the Geotech Report.
- Condition #26: Requires a grading and drainage plan, storm water facilities locations, etc. to be considered in the scope of the updated Geotech Report.
- Condition #27: Requires a Storm Water Management System As-built and Maintenance Manual be provided to the HOA and City of Missoula Storm Water utility. Also all Storm Water infrastructure is required to be placed within a public Storm Water Drainage Easement.
- Condition #28: Requires a "Private Maintenance Acknowledgement of Infrastructure and Facilities" statement placed on the TED Ownership Unit Site Plan and in the Development Covenants filed with the TED Declaration.

August 5, 2019 - Draft Conditions

Living With Wildlife and Fences:

- Condition #29: Requires the Living With Wildlife Covenants recommended by Fish, Wildlife and Parks be included in the Hillview Crossing TED Development Covenants.
- Condition #30: Requires fences be excluded from the front and side yard areas of the TED Ownership Units in response to public concerns that the long stretch of buildings would block movement of wildlife from Miller Creek to the valley floor.